

PLOT SCALE - 1:6000

PLOTTED FROM - TRAB17882

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

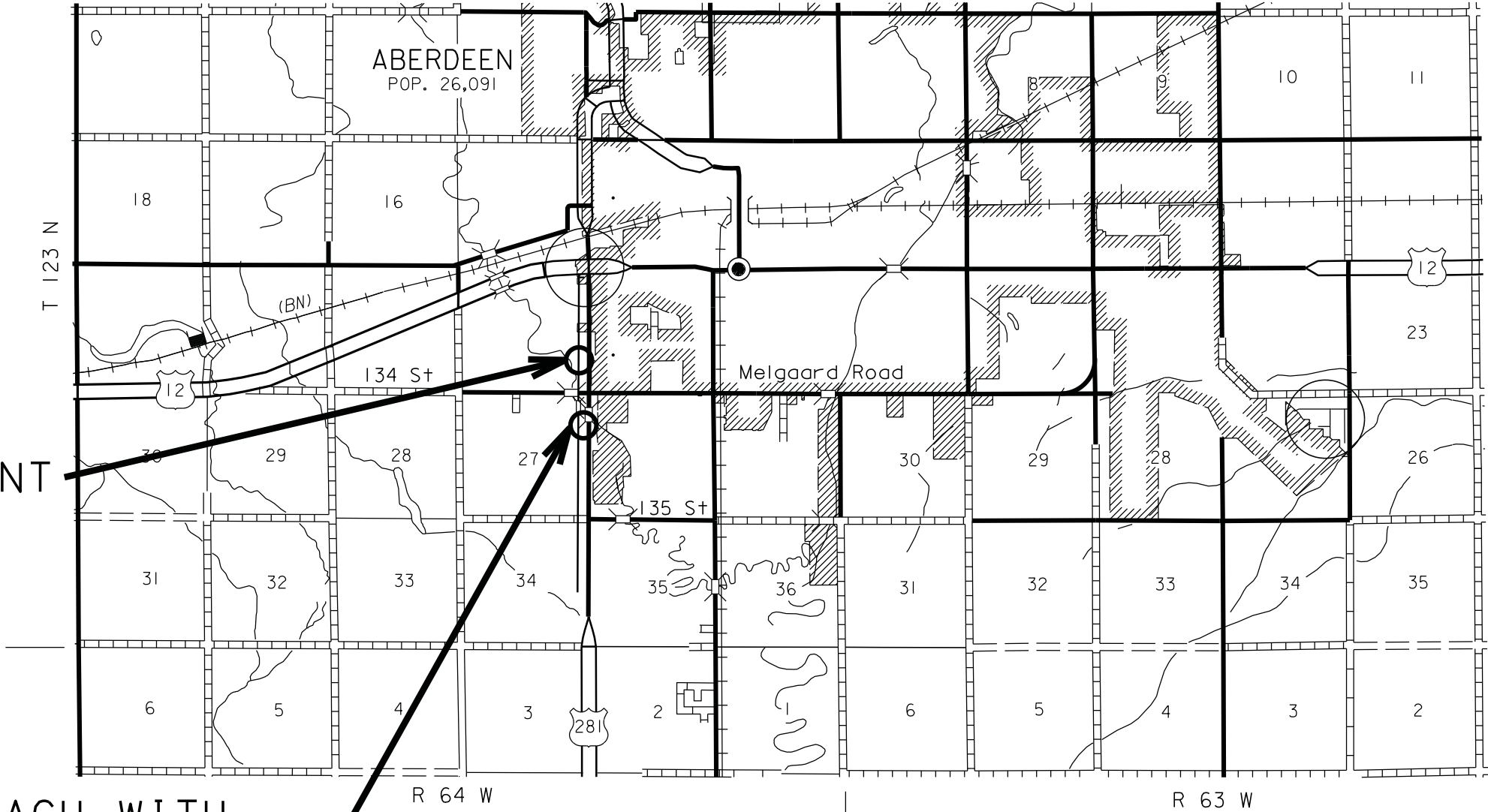
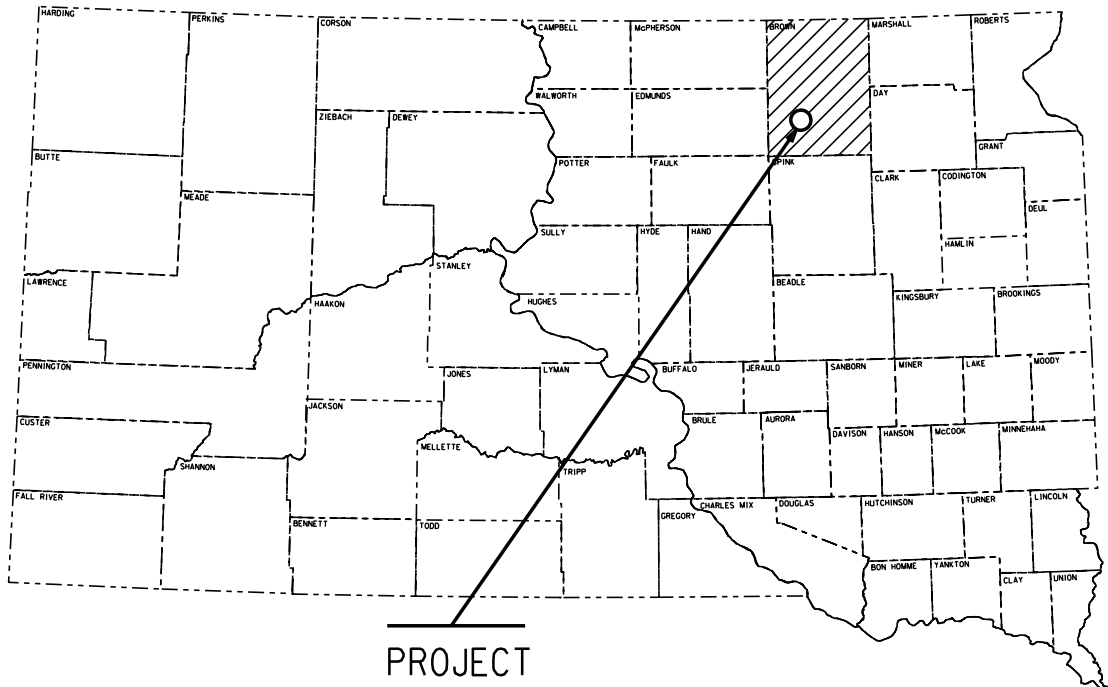
PROJECT 281 SF-151
U.S. HIGHWAY 281
SERVICE ROAD
BROWN COUNTY

CULVERT REPLACEMENT AND
APPROACH WITH ASPHALT SURFACING
PCN i2wd

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	1	19
Plotting Date: 07/15/2013			

INDEX OF SHEETS

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CULVERT REPLACEMENT
MRM 193.45

APPROACH WITH
ASPHALT SURFACING
MRM 193.0

DESIGN DESIGNATION (US281)

ADT (2012)	4617
ADT (2032)	6256
DHV	1107.3
D	51%
T DHV	5.1%
T ADT	11.2%

STORM WATER PERMIT
(None Required)

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	2	19

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	55	Ft
110E1000	Remove Asphalt Concrete Pavement	Lump Sum	LS
120E0600	Contractor Furnished Borrow	525	CuYd
260E0010	Subbase	400.0	Ton
260E1010	Base Course	375.0	Ton
320E1200	Asphalt Concrete Composite	155.0	Ton
421E0100	Pipe Culvert Undercut	16.4	CuYd
450E0142	24" RCP Class 2, Furnish	54	Ft
450E0150	24" RCP, Install	54	Ft
450E2200	24" RCP Sloped End, Furnish	2	Each
450E2201	24" RCP Sloped End, Install;	2	Each
450E4759	18" CMP 16 Gauge, Furnish	90	Ft
450E4760	18" CMP 16 Gauge, Install	90	Ft
450E5406	18" CMP Safety End, Furnish	2	Each
450E5407	18" CMP Safety End, Install	2	Each
634E0010	Flagging	25	Hour
634E0100	Traffic Control	1277	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	30	Ft
831E1010	Geogrid Reinforcement	300	SqYd

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

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 pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and 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 shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

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

Action Taken/Required:

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

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

Action Taken/Required:

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

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

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

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

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

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

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

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	3	19

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact Jim Donohue, State Archaeological Research Center (ARC) at 605-394-1741 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

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

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

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

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

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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	4	19

SCOPE OF WORK

Work on this project involves installing an asphalt surfaced approach between US Highway 281 and the adjacent Service Road. Location of proposed approach is 1.1 miles south of the US12 and US281 Intersection in Aberdeen. Work on this project also involves the replacement of a mainline culvert located 0.8 miles south of the US12 and US281 Intersection in Aberdeen.

SEQUENCE OF OPERATIONS

The Service Road at MRM 193.45 may be closed to traffic for up to 10 calendar days to allow for Culvert Replacement and asphalt surfacing replacement.

Once work starts at any location of the project the Contractor shall be required to work continuously on the project. Closing sections of road and leaving the project will not be permitted.

UTILITIES

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

TRAFFIC CONTROL

One lane of Traffic shall be maintained at all times on the Service Road when the approach is being constructed. The outside south bound lane of US 281 may be closed to traffic during working hours. During nonworking hours all lanes of traffic shall be open to traffic. Type III Barricades shall be placed along the shoulders, as directed by the Engineer.

During replacement of the culvert the Service Road shall be closed to traffic. Full Roadway Closures shall be placed on the Service Road north of Melgaard Road (134 St) and south of 12th Ave SW.

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

Storage of vehicles and equipment shall be as near the right-of-way line as possible. Contractor’s employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Work activities during non-daylight hours are subject to prior approval.

Traffic approaching the project from intersecting roadways, streets, and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.

The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

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

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

SAWING OF ASPHALT CONCRETE PAVEMENT

Where new Asphalt Concrete Pavement is placed adjacent to existing asphalt concrete the existing asphalt concrete shall be sawed full depth to a true line with a vertical face. No separate payment shall be made for sawing.

REMOVE ASPHALT CONCRETE PAVEMENT FOR NEW APPROACH

The Asphalt Concrete Pavement shall be sawcut as shown on the Detail sheet within these plans.

The Asphalt Concrete Pavement on the shoulders outside the sawcut lines shall be neatly removed to allow for placement of the new Asphalt Concrete Composite surfacing on the new approach and the shoulder of US 281.

All costs associated with sawing and asphalt concrete removal shall be incidental to the contract lump sum price for REMOVE ASPHALT CONCRETE PAVEMENT.

CONTRACTOR FURNISHED BORROW

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

Restoration of the Contractor furnished borrow site shall be the responsibility of the Contractor.

APPROACH CONSTRUCTION

Prior to placing the Contractor Furnished Borrow for construction of the new approach embankment, the Contractor shall remove and stockpile 3 inches of in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes. The Contractor is responsible for arranging an agreement with the landowner for topsoil replacement in borrow areas. Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW.

Removal of topsoil and other construction activities shall be done so as to cause the least amount of disturbed area on this project in order to cause the least amount of impact on the environment.

Fill material used for slope flattening shall be obtained from Contractor furnished sources and approved by the Engineer.

Compaction of inslope embankments shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required. However, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. All costs for any added water shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW.

Excavation quantities are computed using the volume of embankment plus **30%** for shrinkage. Basis of payment will be plans quantity of CONTRACTOR FURNISHED BORROW. No separate field measurements will be taken. All material used for embankment shall be approved by the Engineer.

Haul of embankment material on established traveled roadways shall be limited to trucks or small scrapers hauling legal loads and which do not sustain damage to the roadway, as approved by the Engineer. Hauling of material in the roadway ditches will not be allowed.

Additional excavation may be required to ensure positive drainage into and out of culverts. Excavated material shall be incorporated into the approach embankment. The flow line elevation of the new culvert shall be established by the Engineer during construction.

The Contractor shall be responsible for restoration of any areas disturbed outside the limits of the work area.

TABLE OF APPROACH CONSTRUCTION QUANTITIES

MRM	Base Course (12”) (Ton)	Asphalt Concrete Composite (4”) (Ton)	Contractor Furnished Borrow (CuYd)	Culvert to be installed
	193.0	210	105	
		210	105	
			525	
			525	

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	281 SF-151	5	19

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 ⅜-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

PIPE CULVERT REPLACEMENT

The Contractor shall remove and stockpile all the in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes.

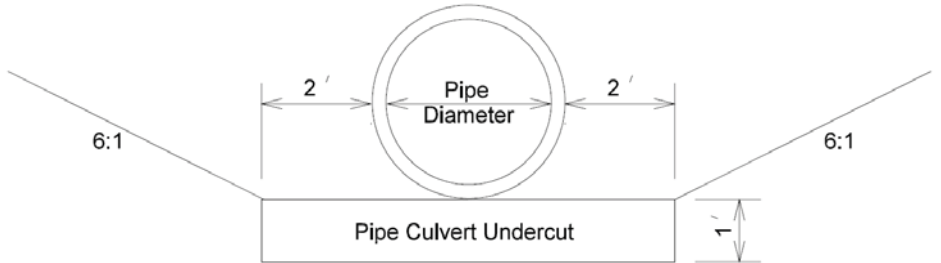
The Contractor is encouraged to thoroughly investigate the culvert repair site prior to bidding. Prior to working on the sites that are inundated with water, a complete dewatering plan shall be submitted for approval to the Engineer. No separate payment for dewatering will be made.

All pipe designated for removal shall become the property of the Contractor for his disposal.

After the existing pipe culvert has been removed, the area shall be undercut to a depth of 1 foot and backfilled with Subbase. The undercut area shall extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 6:1 upward to the top of the roadway surface. The remainder of the pipe shall be backfilled with Subbase as approved by the Engineer. The Subbase shall be tapered outward at a slope of 6:1 to eliminate a vertical trench of granular backfill material. Compaction of backfilled material shall be governed by Specified Density. All costs to remove topsoil, replace topsoil, saw cut asphalt, remove and dispose of Asphalt, excavate and dispose of the material to the bottom of the pipe and slope the excavating limits at a 6:1 backslope shall be incidental to the contract unit price per ton for SUBBASE. Undercut shall be paid for at the contract unit price per cubic yard for PIPE CULVERT UNDERCUT.

Subbase shall be used as backfill up to 1.33' below the existing pavement. A depth of 1.0' of Base Course shall be placed above the Subbase backfill. A depth of 4" of Asphalt Concrete Composite shall be placed on top of the compacted Base Course prior to opening the roadway to traffic.

Subbase shall meet the requirements of Section 882 of the Standard Specifications.



MRM	Subbase (Ton)
193.45	400
Total	400

TABLE OF PIPE CULVERT UNDERCUT

The Table of Pipe Culvert Undercut is intended to be used to establish an estimated quantity of Pipe Culvert Undercut for bidding purposes only. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. Pipes shown may or may not require undercutting. Engineer will determine which pipe shall be undercut in accordance with Section 421 of the Standard Specifications.

MRM	Undercut Depth(ft)	Quantity (Cu Yd)
193.45	1	16.4
Total		16.4

The table contains the rate of pipe culvert undercut per foot of pipe length and should be used as an aid in determining the actual amount of undercut to be performed during construction. The table is derived from the preceding drawing and conforms to the Standard Specifications. When calculating pipe culvert undercut, the length of pipe ends should be included in the overall pipe length.

Pipe Diameter	Round Pipe Undercut Rate for 1' Depth (CuYd/Ft)	Arch Pipe Undercut Rate for 1' Depth (CuYd/Ft)
(In)		
24	0.2407	0.2577

TABLE OF PIPE CULVERT REPLACEMENT QUANTITIES

MRM	Base Course (12") (Ton)	Asphalt Concrete Composite (4") (Ton)	Approximate Elevation Difference Between Roadway Centerline and Pipe Flow Line	Distance from CL of Pipe to End of 6:1 Slope	Culvert to be installed
193.45	165	50	6'	39'	24" x 54' RCP w/ Sloped Ends
	165	50			

GEOGRID

Geogrid shall be placed between the Subbase and Base Course layers. 300 sq. yds of geogrid have been included in the Estimate of Quantities. This quantity is assumed to cover 260 sq. yds. The grid quantity has been increased by 15% to account for overlaps. This quantity should cover 78 feet of roadway full width, based on a 30 foot top subgrade width.

Geogrid Specification:

The geogrid will be a biaxial grid of single layer construction. Either integrally formed or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
Wide Width Strip Tensile Strength (Ultimate)	ASTM6637 Method B	850lb/ft MD and XD

Geogrid will be paid for at the contract unit price per sq. yd. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the geogrid only.

Installation Procedure:

- The geogrid should be kept as taut as possible prior to backfilling.
- Granular material will be dumped at least 20 feet behind the leading edge of the fill and pushed into place with a loader or dozer.
- No equipment is to be allowed on the geogrid until the first lift of granular material is in place.
- All seams in the geogrid will be overlapped at least 2 feet and in manner that prevents granular material being pushed under the geogrid.

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	281 SF-151	6	19

BASE COURSE

Aggregate for Base Course shall conform to the Standard Specifications, except that the density shall be to the satisfaction of the Engineer.

At the new approach location, upon removal of the asphalt concrete shoulder and prior to placing the Asphalt Concrete Composite, Base Course shall be placed along the white edge lines on both the Service Road and US281 to eliminate any drop-offs.

WATER FOR COMPACTION OF GRANULAR MATERIALS

Cost of water for compaction of the granular material shall be incidental to the contract unit price for the various contract items. Six percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1.

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

The asphalt binder used in the mixture shall be a [PG 64-22](#), [PG 64-28](#), or [PG 64-34](#) Asphalt Binder.

Asphalt Concrete Composite shall be paver laid in lifts not exceeding 2” in depth.

It can be anticipated that hand work will be required to shape the asphalt concrete.

FERTILIZING

Application of fertilizer will not be required on this project.

PERMANENT SEEDING

The areas to be seeded comprise of all newly graded areas within the project limits except for the top of roadways.

All permanent seed shall be planted in the topsoil at a depth of ¼” to ½”.

All seed broadcast must be raked or dragged in (incorporated) within the top ¼” to ½” of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

Type C Permanent Seed Mixture shall be used on this project. All costs associated with Seeding shall be incidental to the contract lump sum price for EROSION CONTROL.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
Total:		18

The estimated area to seed is ½ acre.

EROSION CONTROL WATTLE

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

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

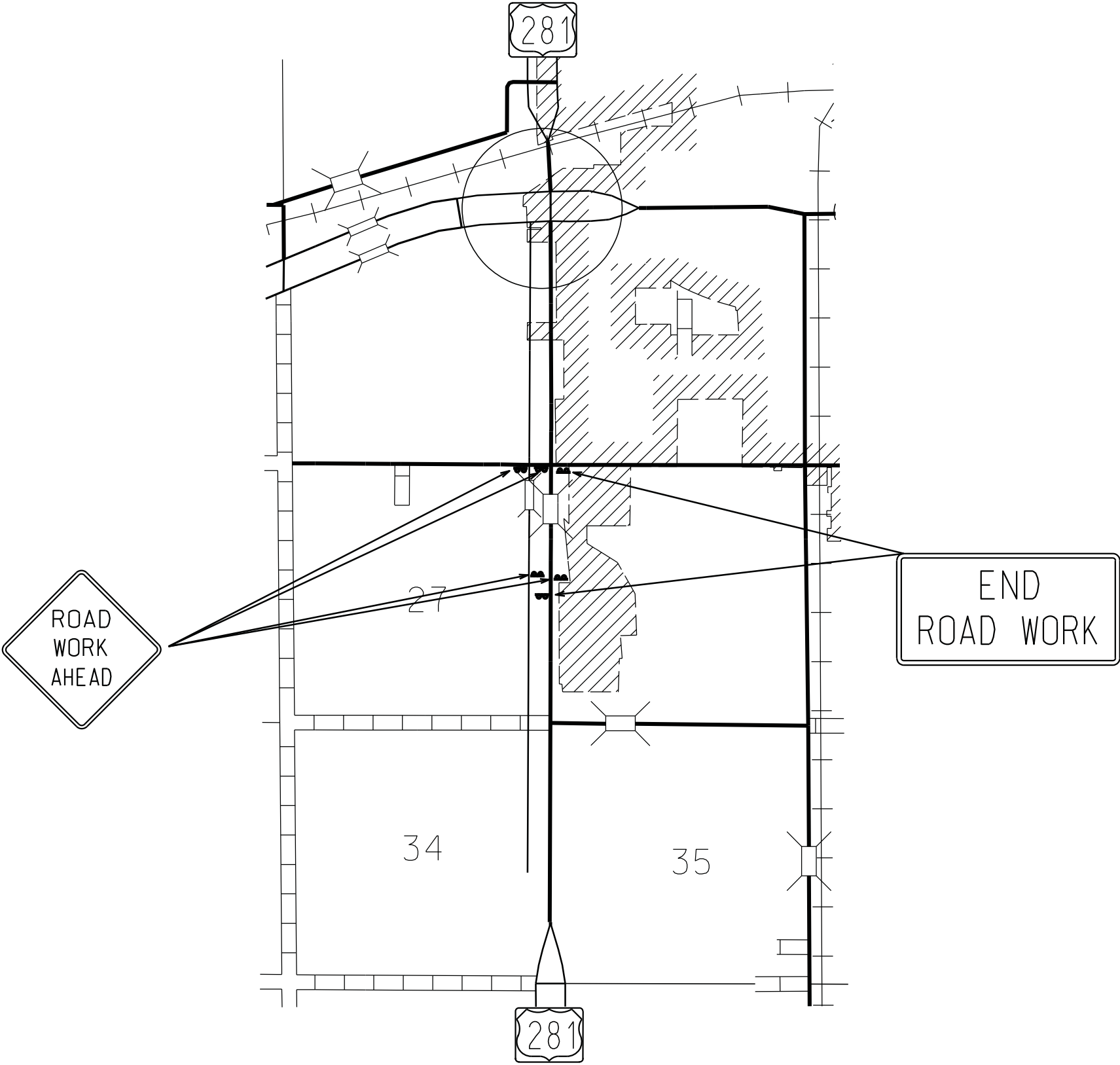
Erosion Control Wattles shall be removed by State Forces upon completion of the project and establishment of vegetation.

The erosion control wattle provided shall be from the list shown below:

Product	Manufacturer
Curlex Sediment Log AEC Premier Straw Wattles	American Excelsior Company Arlington, TX Phone: 1-800-777-7645 www.amerexcel.com
Aspen Excelsior Logs and Excel Straw Logs	Western Excelsior Corporation Mancos, CO Phone: 1-800-833-8573 www.westernexcelsior.com
Earth Saver Rice Straw Wattles	R.H. Dyck Inc. Winters, CA Phone: 1-866-928-8537 www.earth-savers.com
Amber Waves Straw Wattles	GroNatural Winsted, MN Phone: 1-320-485-2800 www.gronatural.com
EarthTec Erosion Control Wattles	EarthTec/the Dukes, Inc. Devils Lake, ND Phone: 1-701-662-6666
Bio Logs	Flaxtech, LLC Rock Lake, ND Phone: 1-866-444-3529
Stenlog	Erosion Control Blanket Riverton, MB Phone: 1-866-280-7327 www.erosioncontrolblanket.com
Winters Wattles	Winters Excelsior Company Birmingham, AL Phone: 1-800-248-7237 www.wintersexcelsior.com

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS
for Approach Construction at MRM 193.0

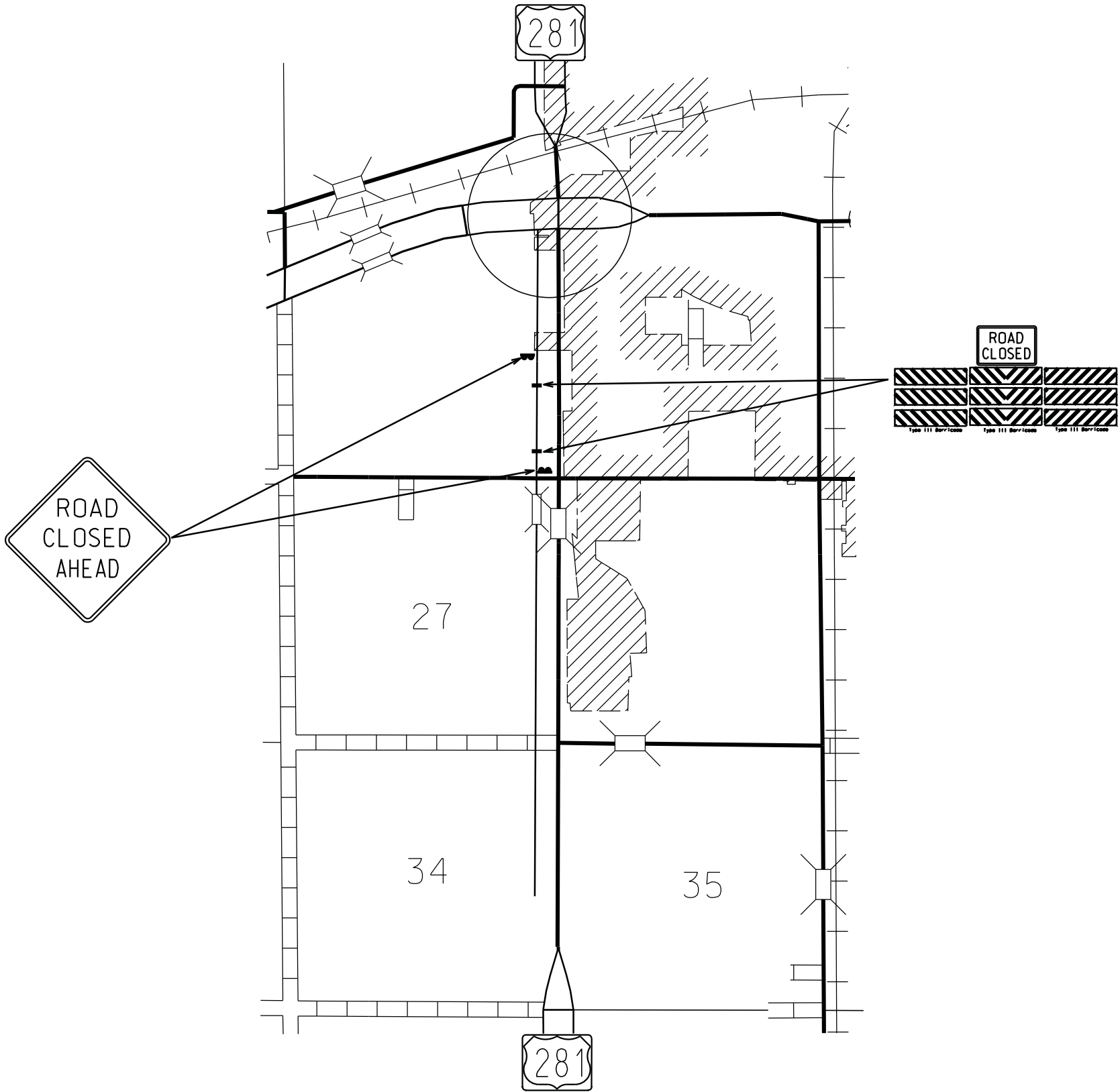
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	7	19



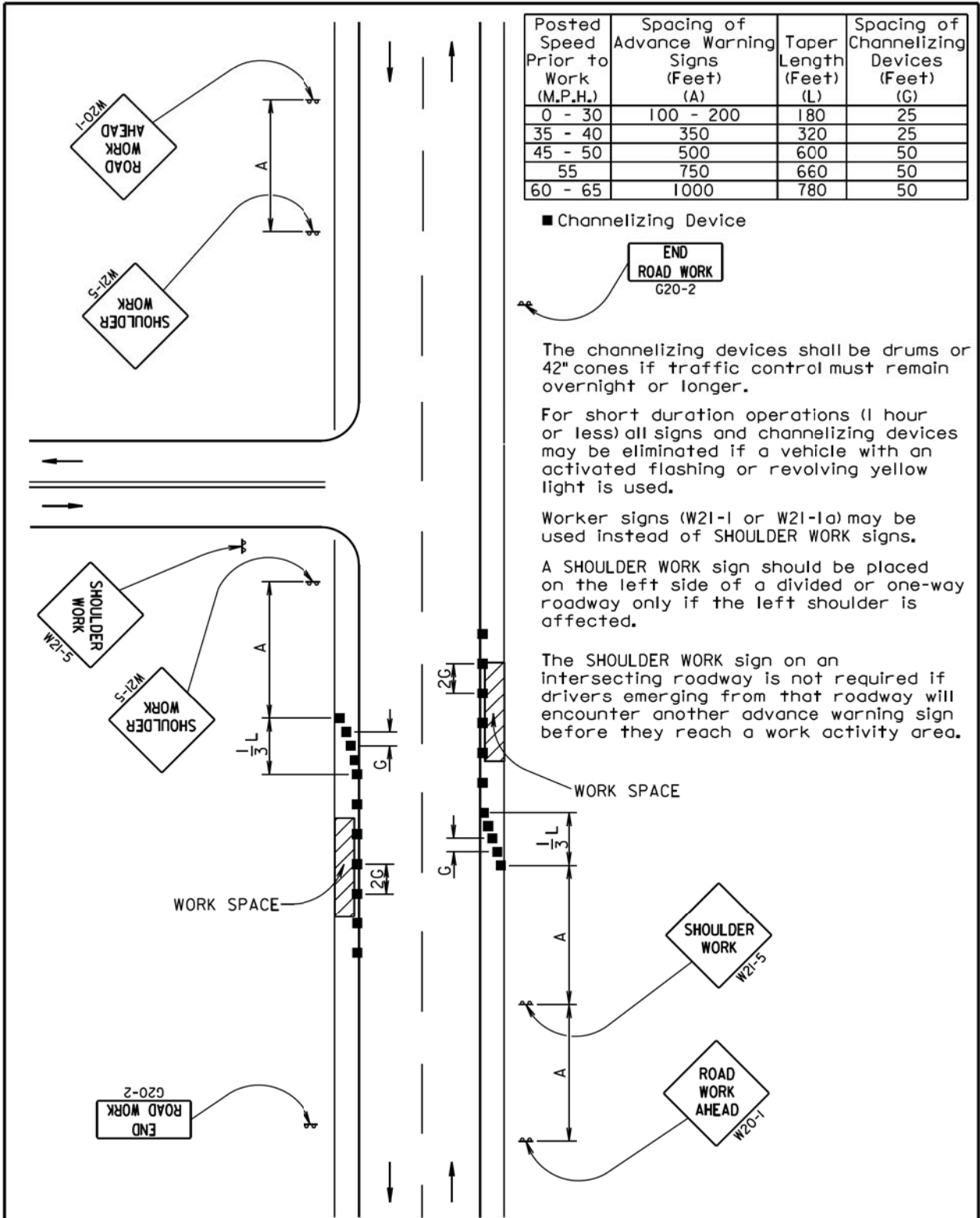
EXACT LOCATION OF SIGNS TO BE DETERMINED
IN THE FIELD BY THE ENGINEER.

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS
for Culvert Replacement at MRM 193.45

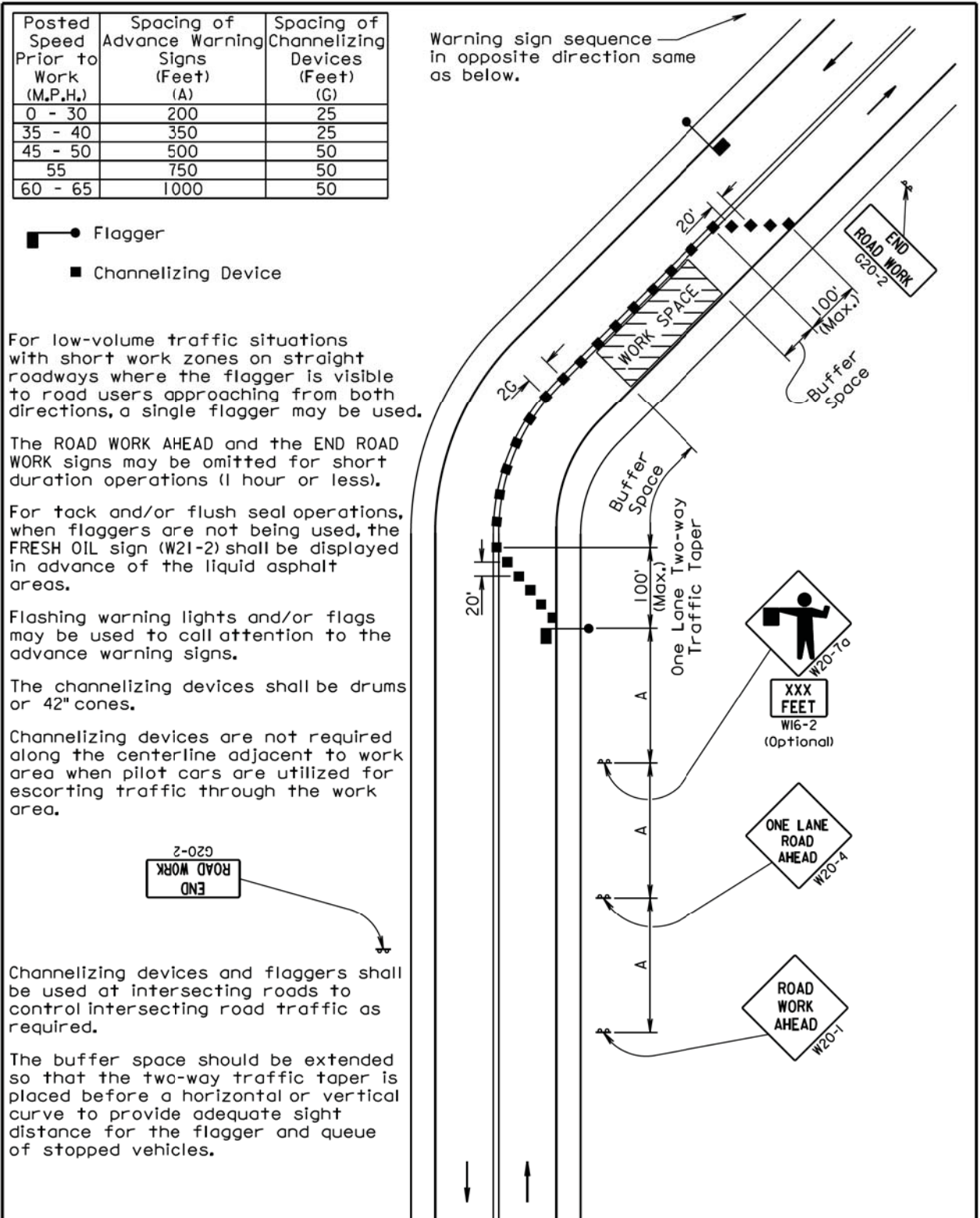
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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EXACT LOCATION OF SIGNS TO BE DETERMINED
IN THE FIELD BY THE ENGINEER.



February 14, 2011



February 14, 2011

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

* Spacing to be every 40' for 42" cones.

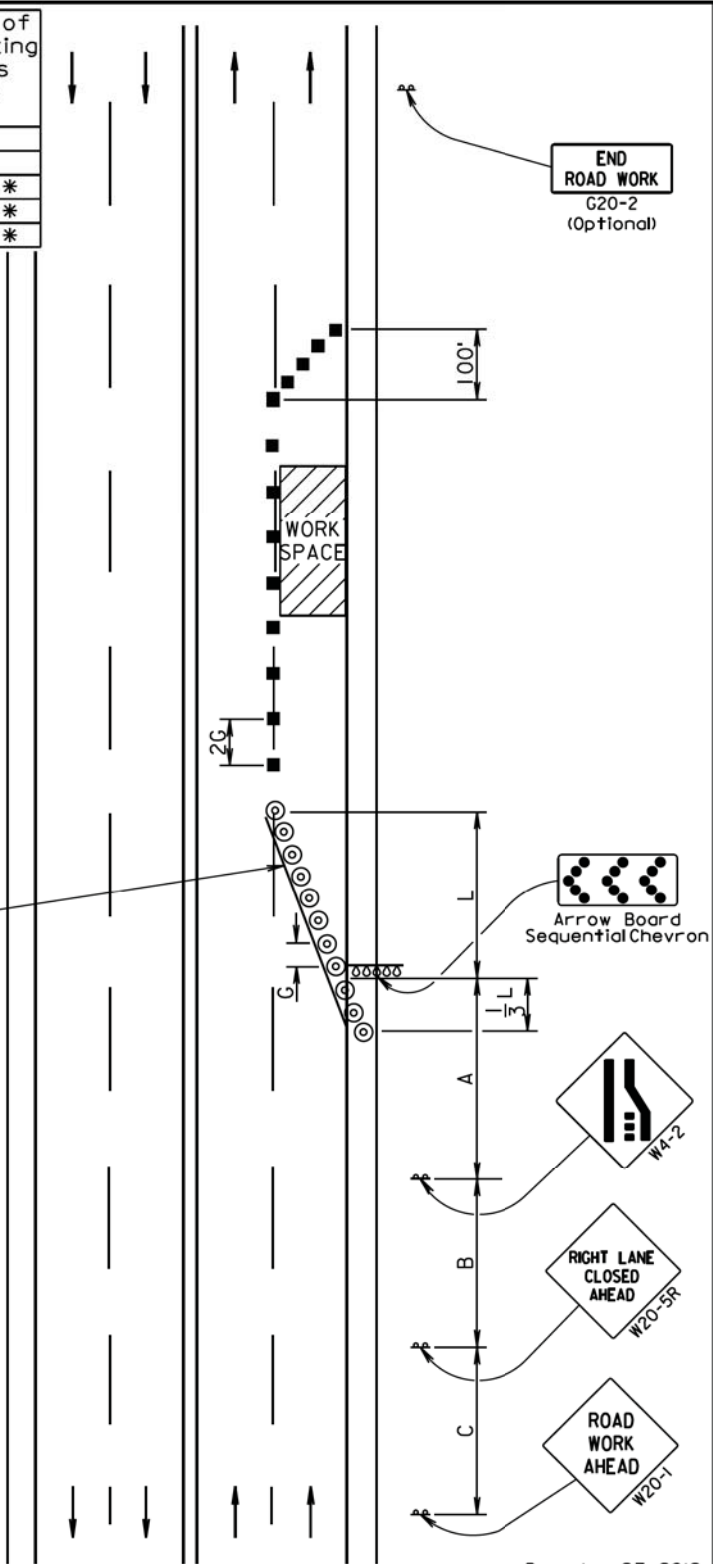
⊙ Reflectorized Drum

■ Channelizing Device 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 any night time hours.

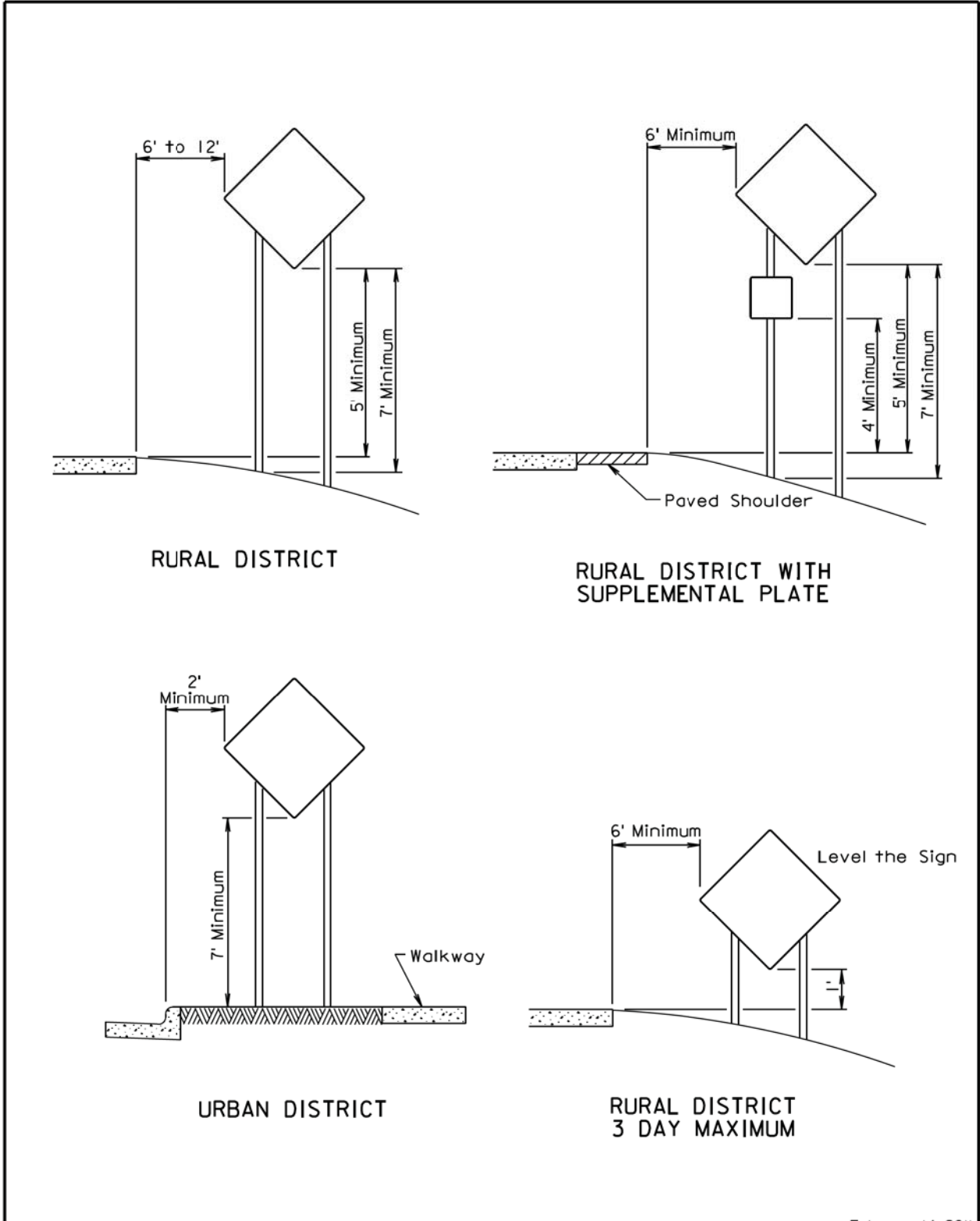
4" white temporary pavement marking shall be used for overnight and long term operations.

Longitudinal dimensions may be adjusted to fit project conditions such as horizontal curves, vertical curves, and other site restrictions.



December 23, 2012

Published Date: 3rd Qtr. 2013	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER
			634.47
			Sheet 1 of 1



February 14, 2011

Published Date: 3rd Qtr. 2013	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER
			634.85
			Sheet 1 of 1

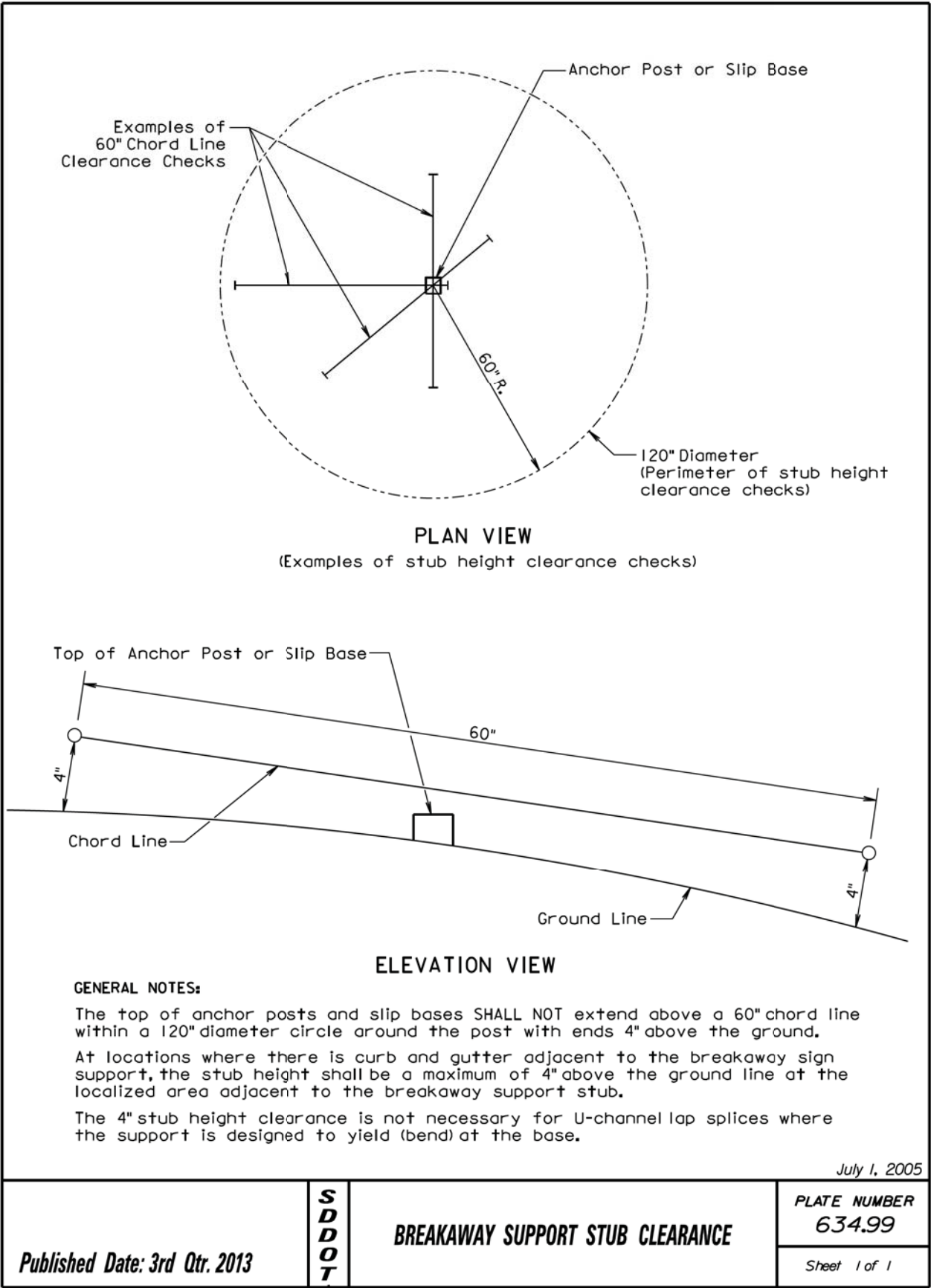
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	281 SF-151	11	19

Plotting Date: 07/15/2013

ITEMIZED LIST FOR TRAFFIC CONTROL - CONVENTIONAL ROADS

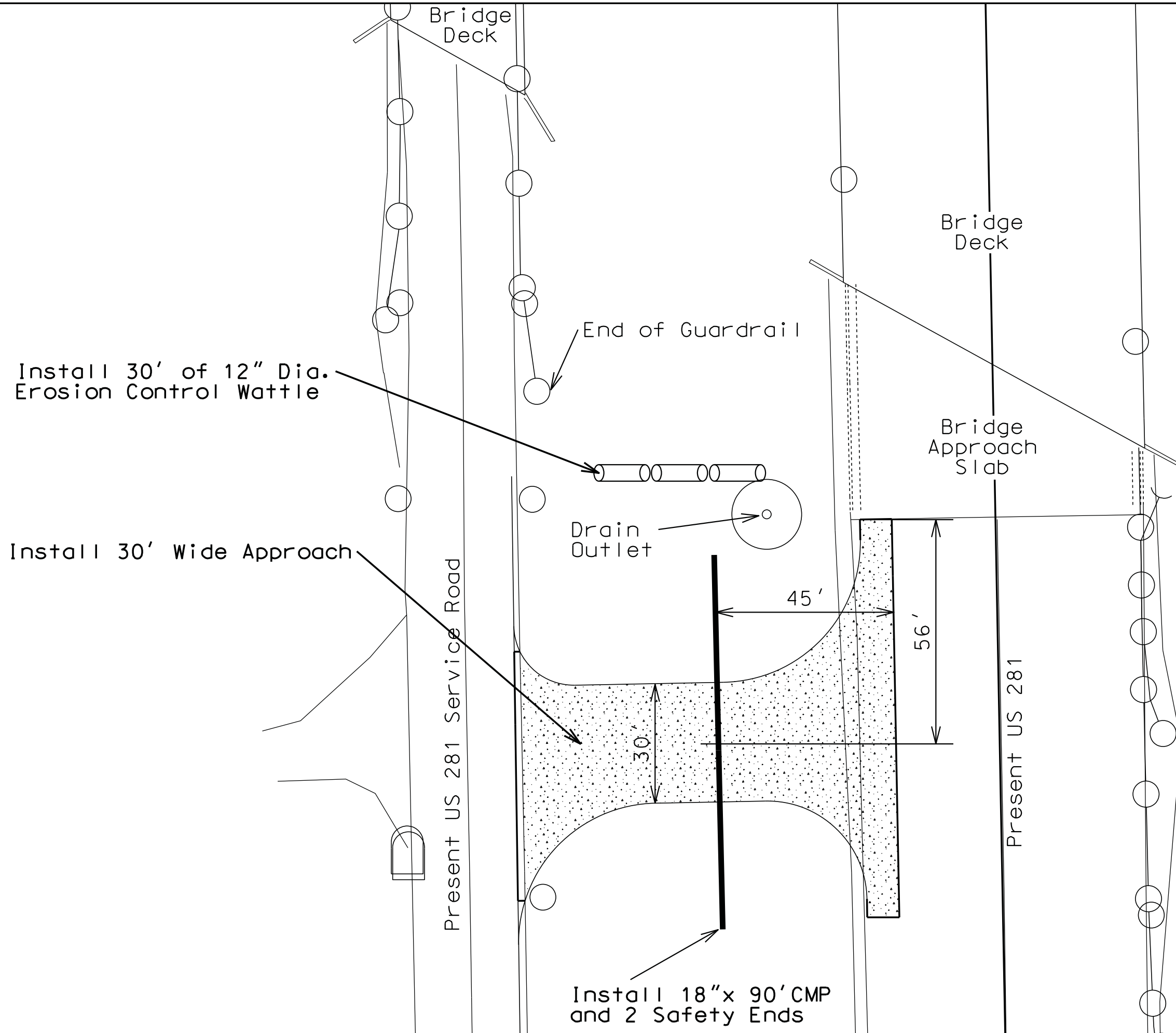
SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	3	17	51
R11-2	48" x 30"	ROAD CLOSED	2	27	54
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	1	34	34
W8-6	48" x 48"	TRUCK CROSSING	2	34	68
W8-9a	48" x 48"	SHOULDER DROP-OFF	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	4	34	136
W20-3	48" x 48"	ROAD CLOSED ##### FT. OR AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD ##### FT. OR AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED ##### FT. OR AHEAD	1	34	34
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	10	56	560
TOTAL UNITS					1277

If a sign is required on a project and not listed in the above inventory, the units per sign will be determined as follows:
Signs 36" x 36" will be measured at 27 units each and signs 48" x 48" will be measured at 34 units each, otherwise:
If a sign measures less than 25" high and 25" wide the units per sign will be computed as sign size (sq ft) x 3.
If a sign measures between 23H" and 37H" the units per sign will be computed as sign size (sq ft) x 1.2 +15.



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	12	19
Plotting Date: 07/15/2013			

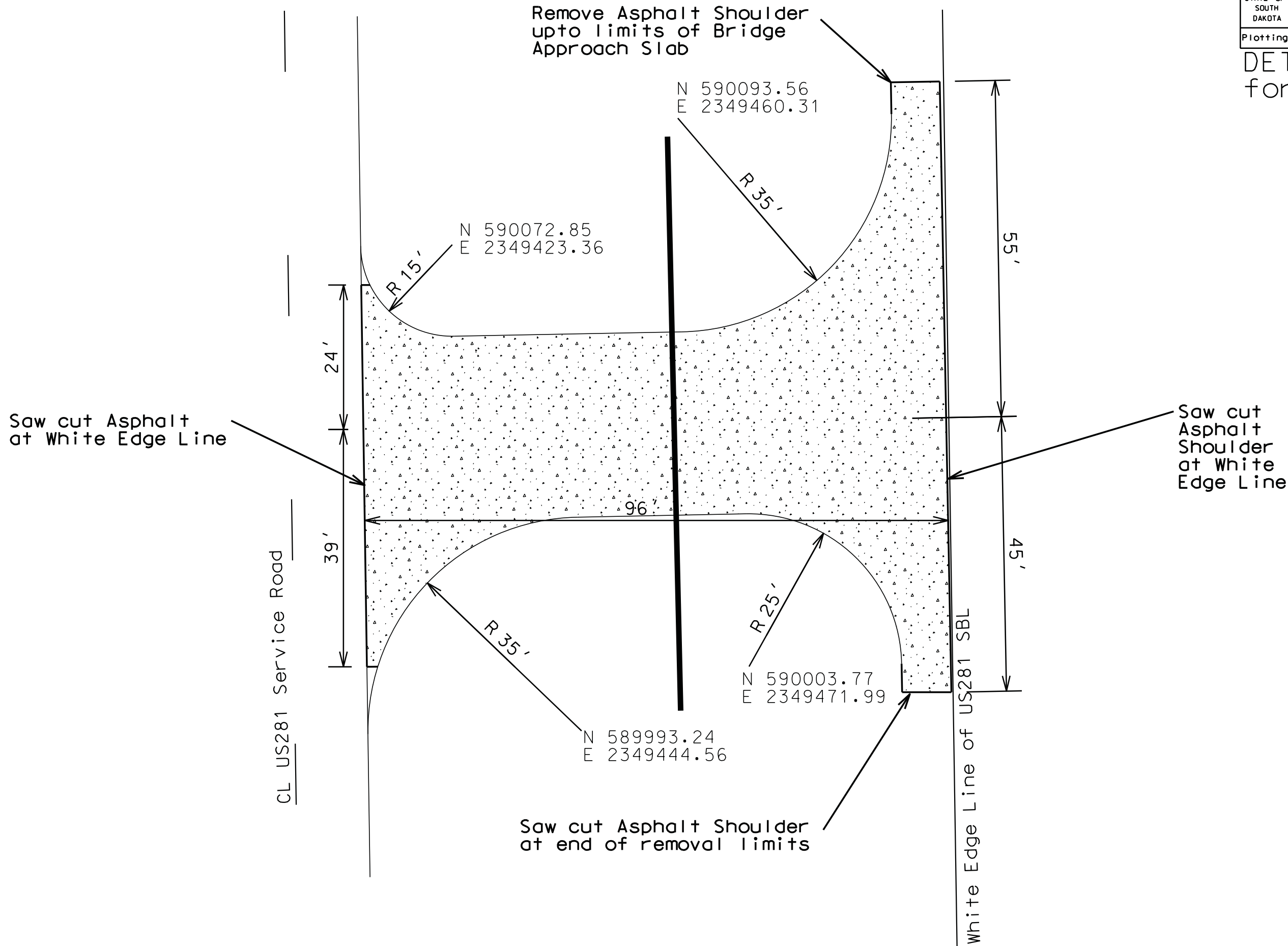
GENERAL LAYOUT
for New Approach
Scale 1' = 25'



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	13	19

Plotting Date: 07/15/2013

DETAIL SHEET
for New Approach

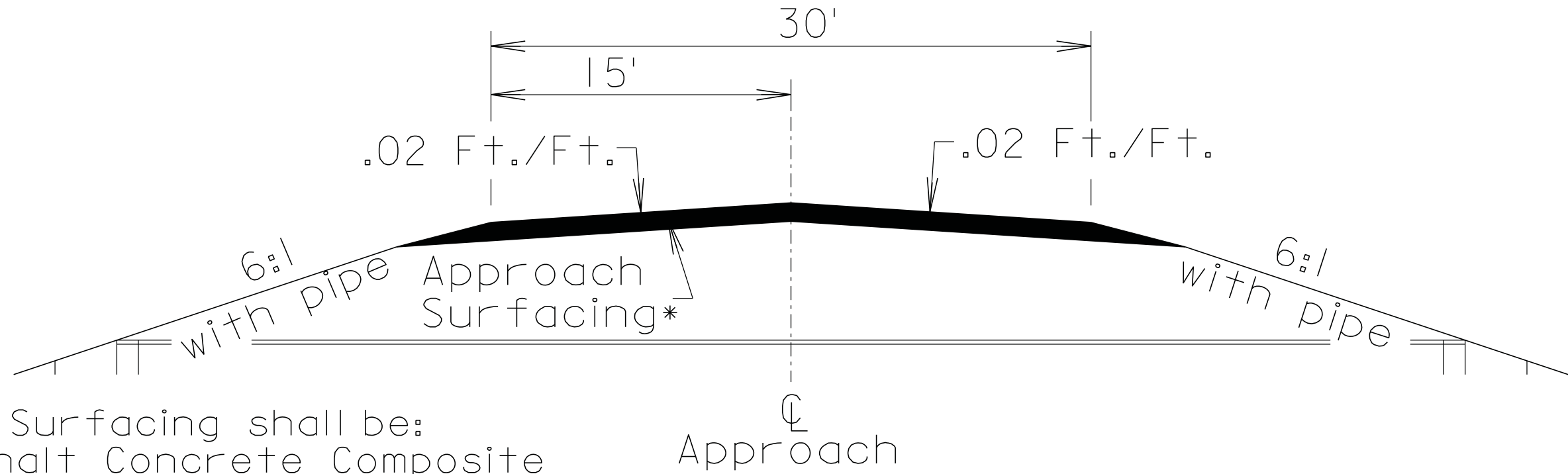


PLOT SCALE - 1:20

PLOTTED FROM - TRAB17882

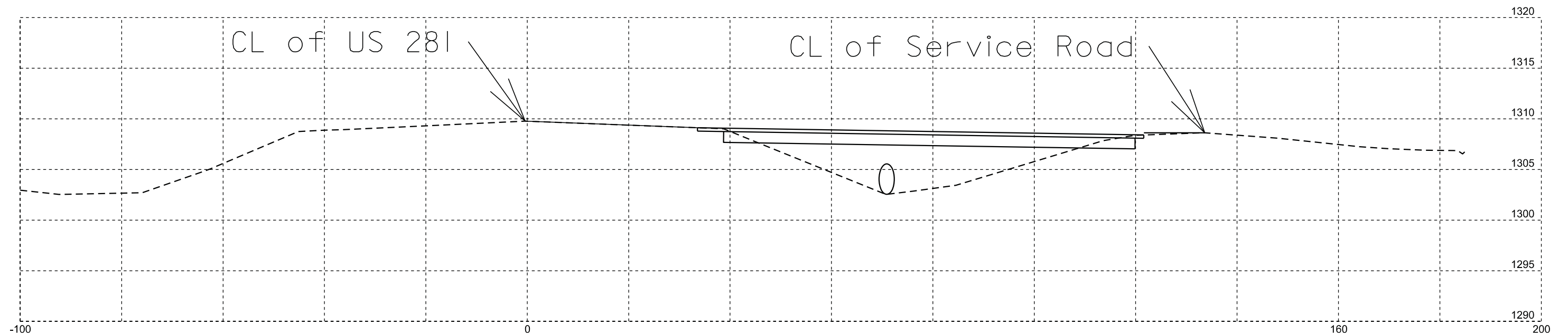
TYPICAL SECTION OF APPROACH

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	281 SF-151	14	19
Plotting Date: 07/15/2013			



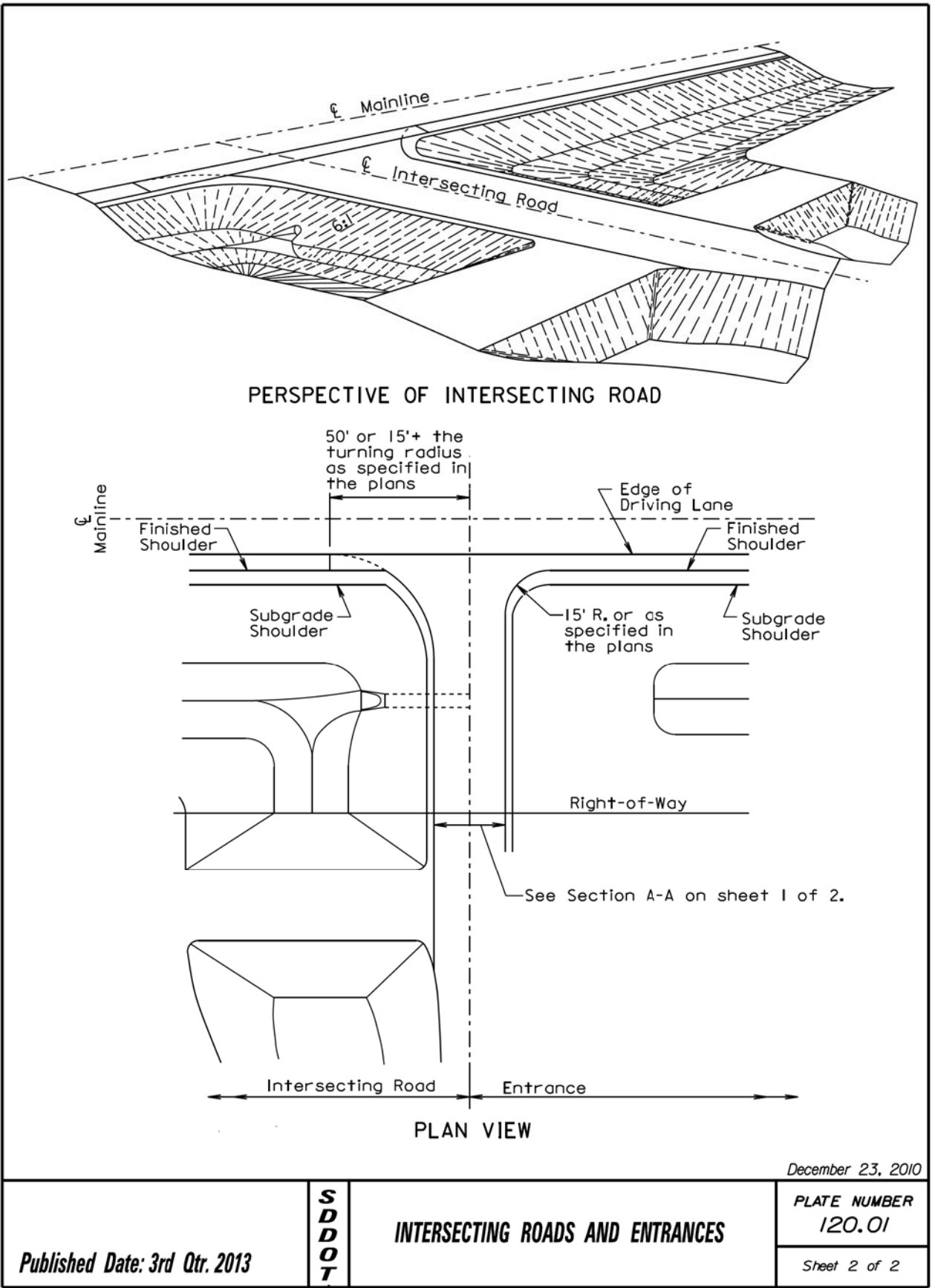
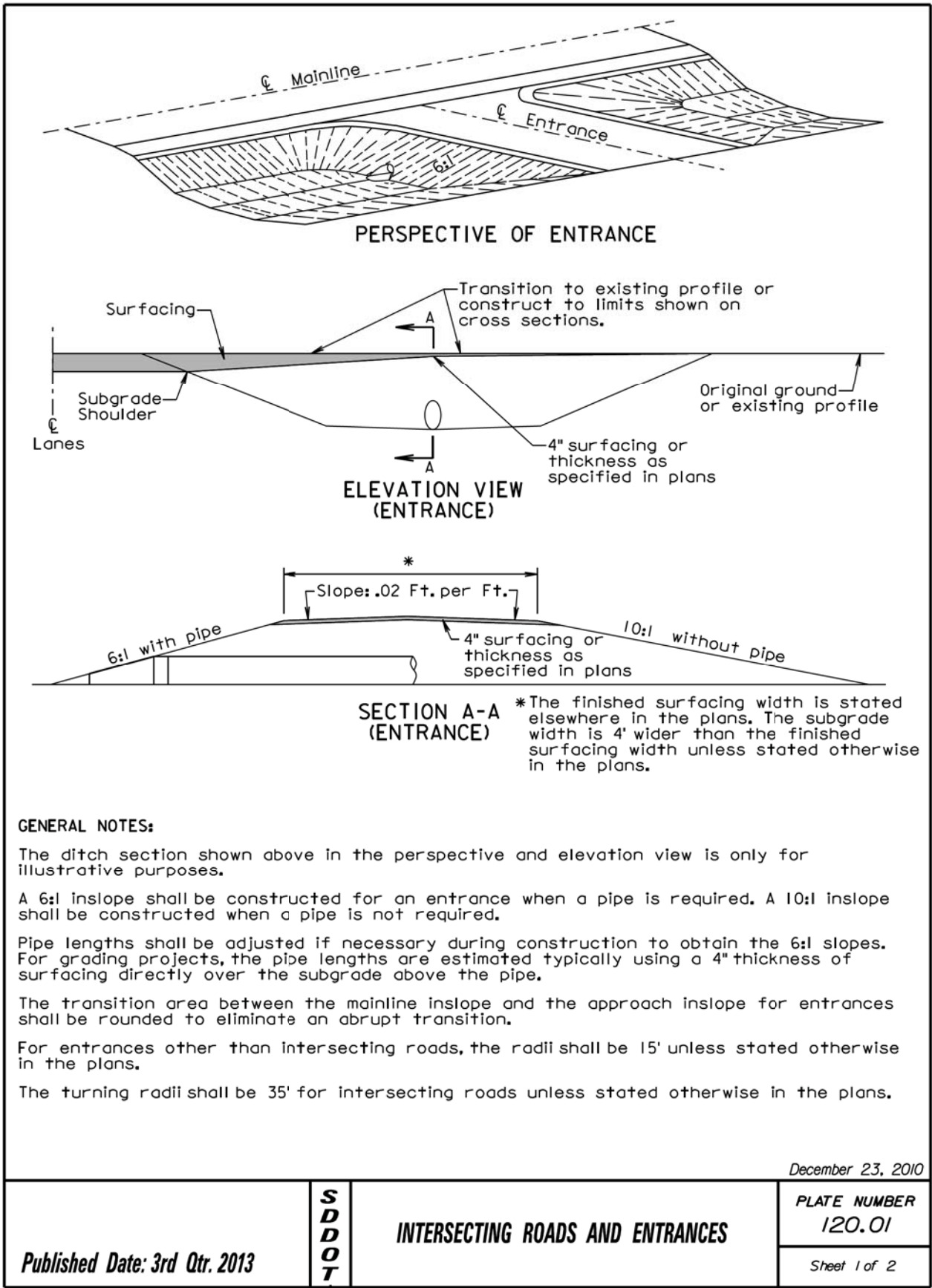
* Approach Surfacing shall be:
4" of Asphalt Concrete Composite
and 12" of Base Course

CROSS SECTION AT CL OF APPROACH



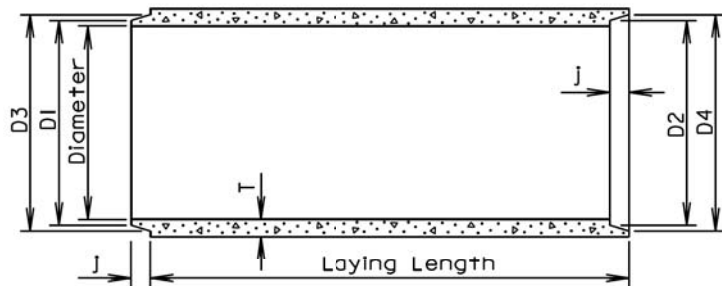
PLOT NAME - 6

FILE - ... \REGION\PR\BRWN12WD\12WD.DGN

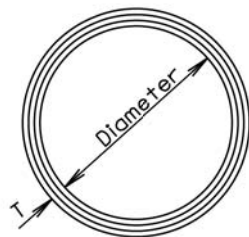


TOLERANCES IN DIMENSIONS

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: $\pm 3/16$ " for 30" Dia. or less and $\pm 1/4$ " for 36" or greater.
Length of joint (J): $\pm 1/4$ ".
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:

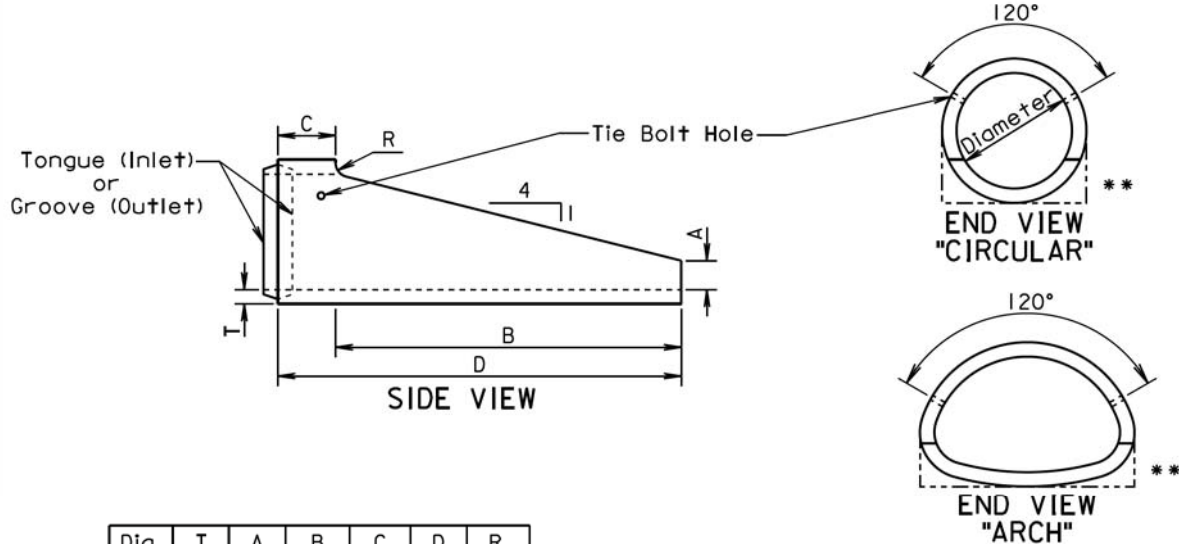
Construction of R.C.P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

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 3/8	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 3/8
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

March 31, 2000

Published Date: 3rd Qtr. 2013	S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER
			450.01
			Sheet 1 of 1

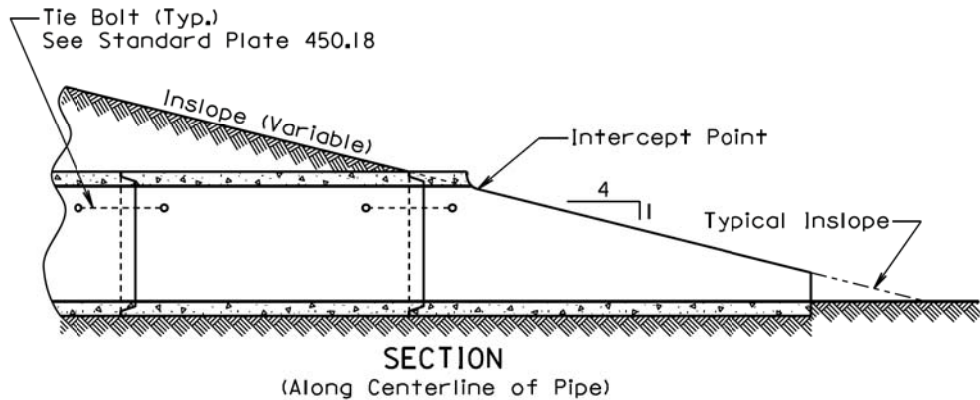


Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
ALTERNATE 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.



GENERAL NOTE:

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

September 22, 2006

Published Date: 3rd Qtr. 2013	S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER
			450.13
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	281 SF-151	17	19

Plotting Date: 07/15/2013

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3 1/4	5/8	3/4
3 1/2-6 1/2	3/4	1
≥ 7	1	1 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	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.

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.

END VIEW "CIRCULAR" **END VIEW "ARCH"**

Published Date: 3rd Qtr. 2013

S

D

O

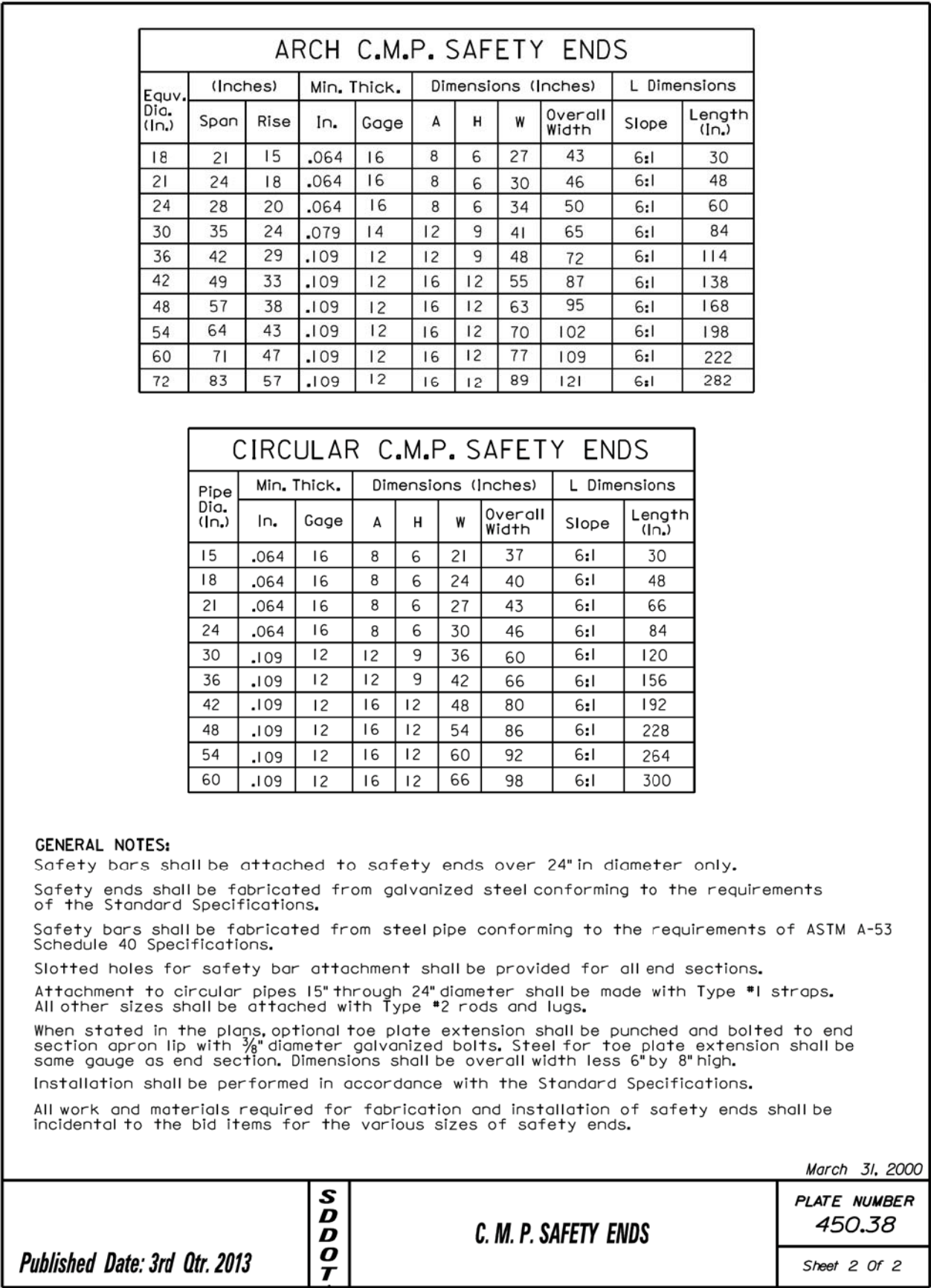
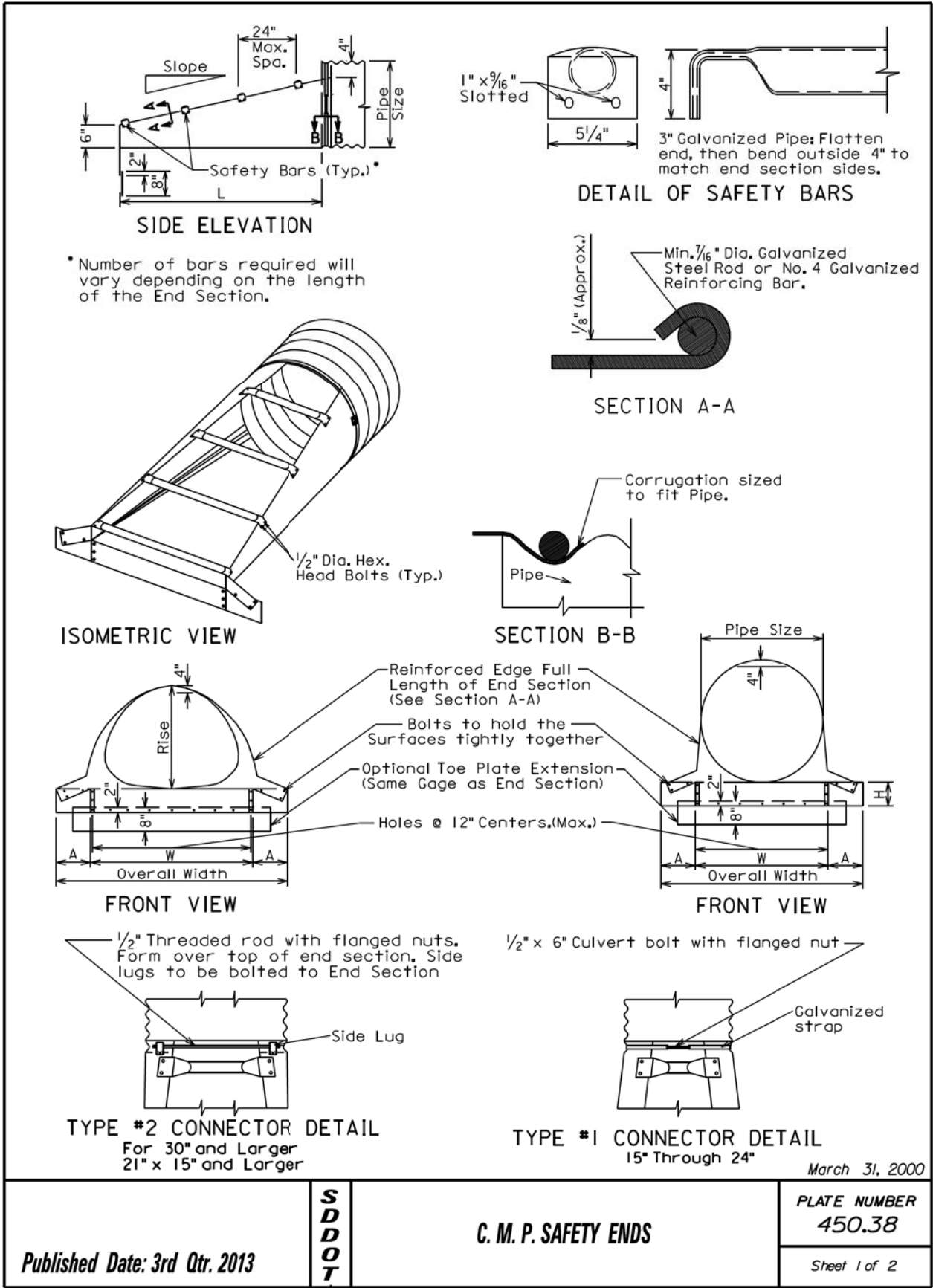
T

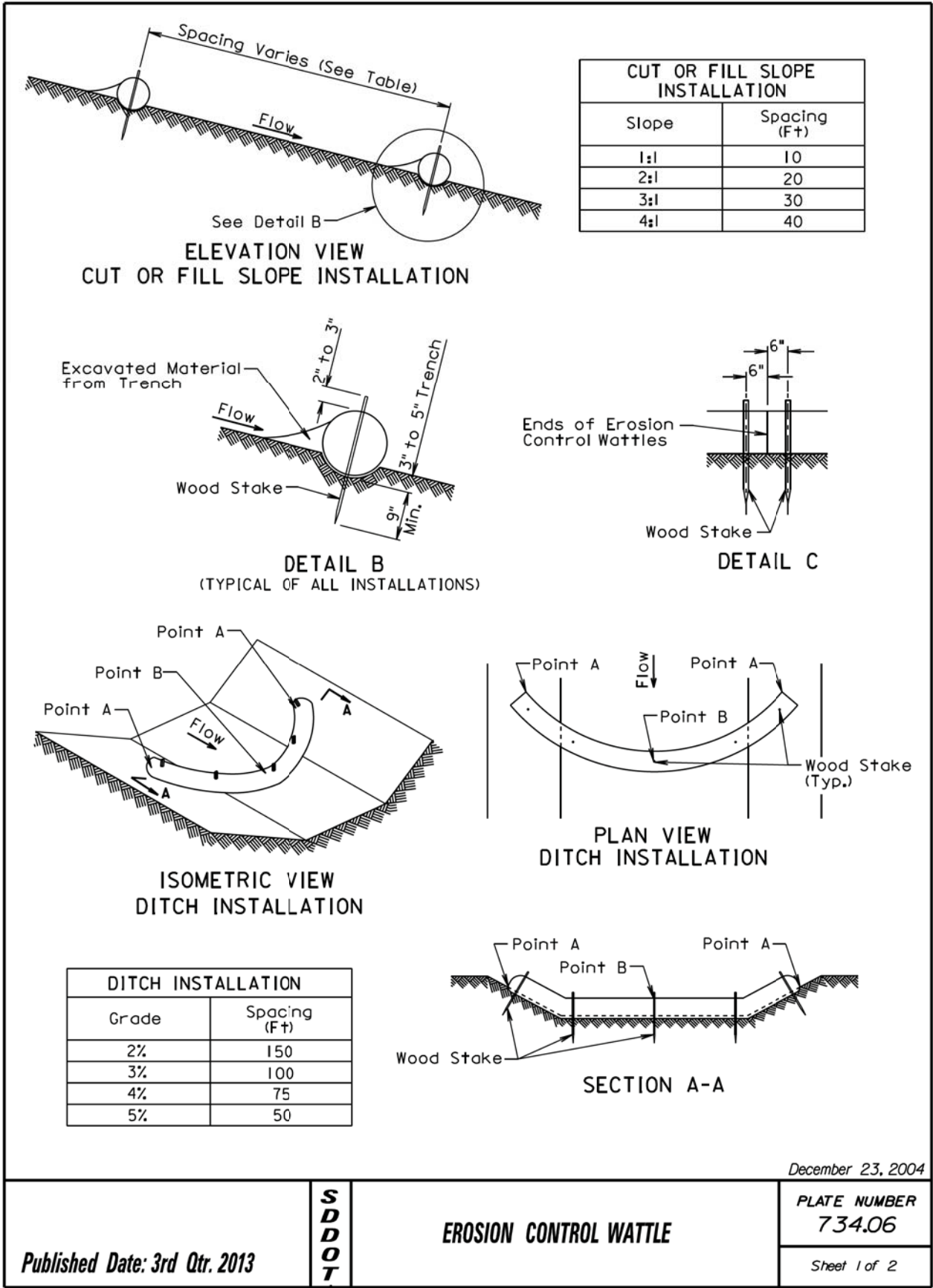
TIE BOLTS FOR R.C.P. AND R.C.P. ARCH

February 28, 2013

PLATE NUMBER
450.18

Sheet 1 of 1





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".

