

PLOT SCALE - 200,000,000:1,000,000

PLOTTED FROM - TRRC12608

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT NO. 016A-491
US HIGHWAY NO. 16A
CUSTER COUNTY

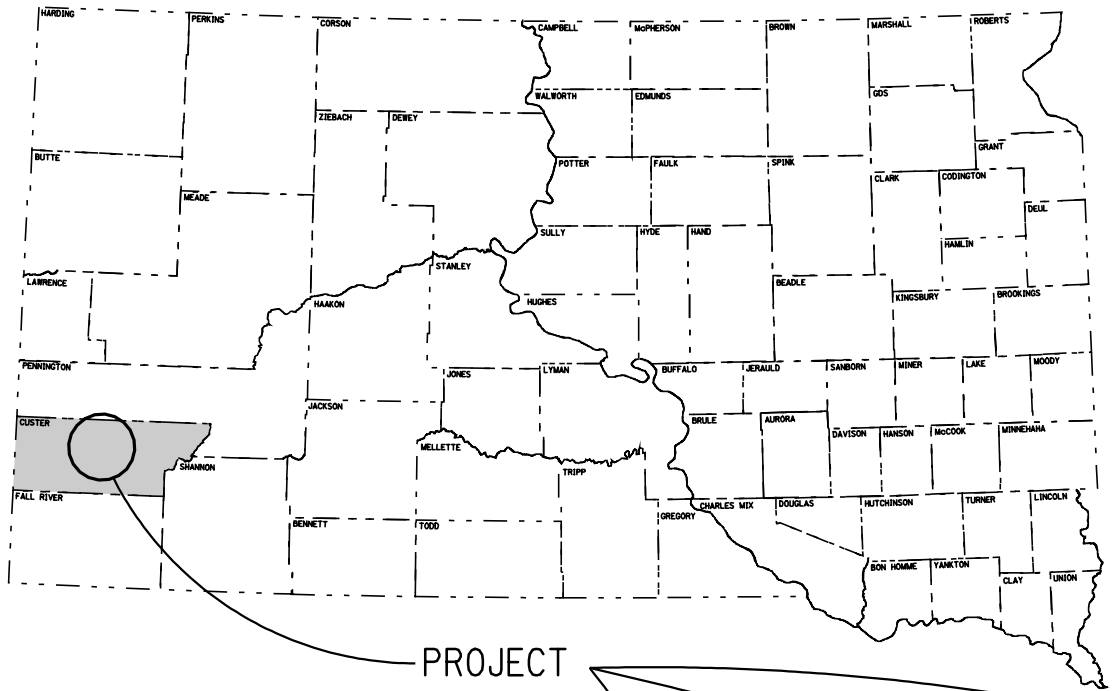
REMOVE AND REPLACE BUFFALO GUARDS
PCN 123T

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	016A_491	1	12

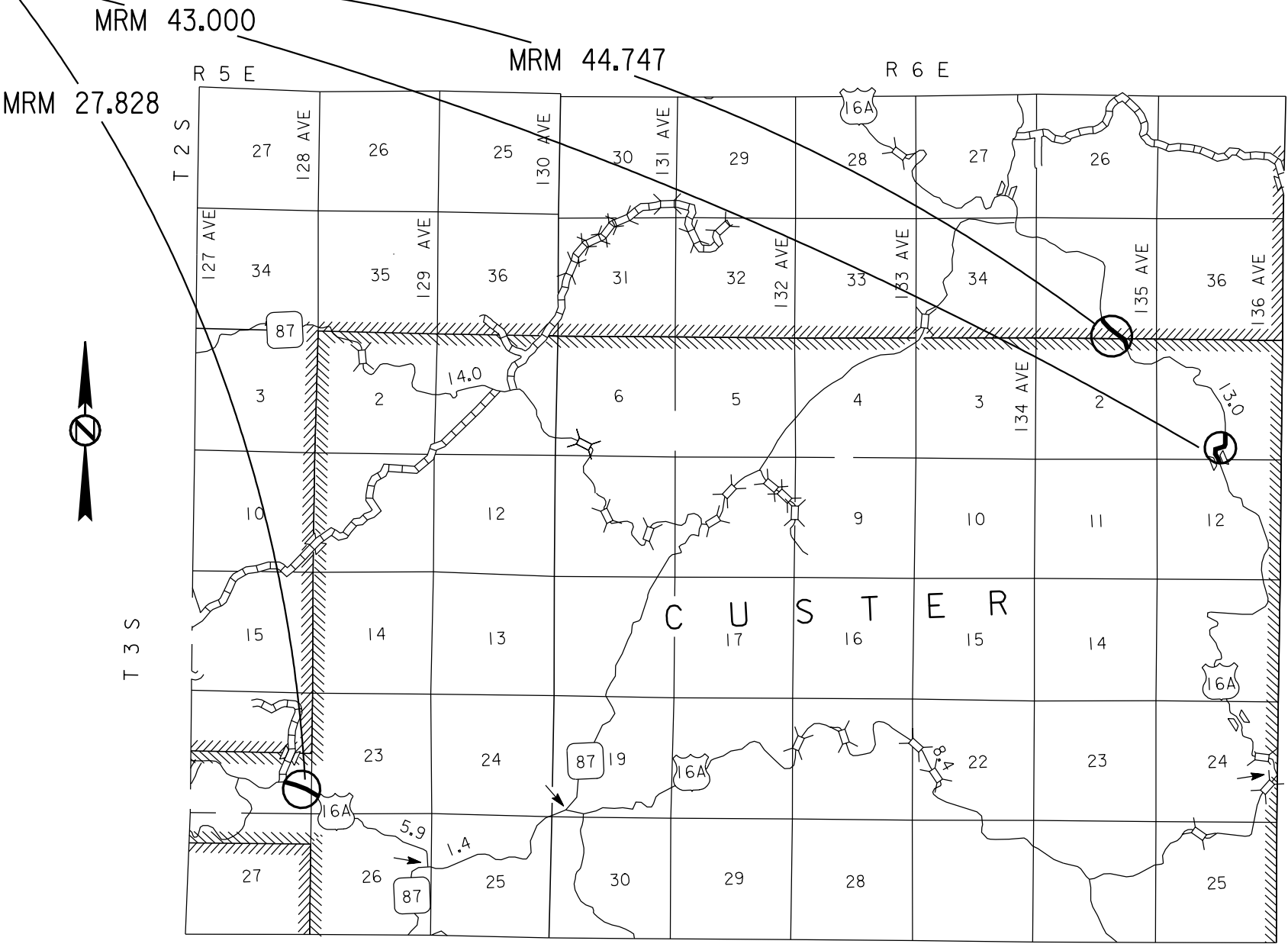
Plotting Date: 09-MAR-2011

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PROJECT



STORM WATER PERMIT
No Storm Water Permit Required

DESIGN DESIGNATION

ADT (2010)	1005
ADT (2030)	1075
DHV	165
D	50%
T DHV	3.3%
T ADT	7.3%
V	45 mph

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0550	Remove Cattle Guard	3	Each
120E0010	Unclassified Excavation	267	CuYd
120E0600	Contractor Furnished Borrow	83	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0010	Incidental Work	Lump Sum	LS
260E1010	Base Course	360.0	Ton
320E1200	Asphalt Concrete Composite	120.0	Ton
610E5124	24' Buffalo Guard with Wings	1	Each
610E5130	30' Buffalo Guard with Wings	1	Each
634E0010	Flagging	36	Hour
634E0100	Traffic Control	1,160	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
734E0010	Erosion Control	Lump Sum	LS

SPECIFICATIONS

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

WORK DESCRIPTION

Work on this project will consist of the following:

- Remove old buffalo guards at MRM 27.828, MRM 43.000, and MRM 44.747.
- Install new buffalo guards at MRM 27.828 and MRM 44.747.
- Eliminate buffalo guard at MRM 43.000.

GENERAL MAINTENANCE OF TRAFFIC

At the end of each day's operations Buffalo Guards shall be fully functional such that animals may not cross.

Traffic control shall be in accordance with MUTCD Standards, the Standard Specifications and the layouts contained in these plans.

The Contractor shall at all times, keep the portion of the project being used by the traveling public in a condition that will adequately and safely accommodate traffic.

Storage of vehicles, materials, and equipment shall be not closer than 30' from the edge of the driving lane. 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.

GENERAL MAINTENANCE OF TRAFFIC (CONTINUED)

The intent of the plan sequence of operations is to have the least amount of impact on the traveling public and adjacent landowners. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review two weeks prior to any proposed deviation. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

All Contractors' vehicles or equipment entering or leaving a closed work area shall display a flashing amber light.

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

Non-applicable signing will be covered or removed and reset during periods of inactivity. All costs to do this work shall be incidental to Traffic Control, Miscellaneous.

Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

The Contractor or designated traffic control subcontractor shall make night (after dark) inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the related contract items.

The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

Work activities shall only be during daylight hours. Daylight hours are considered to be ½ hour before sunrise until ½ hour after sunset.

SEQUENCE OF OPERATIONS:

- Set up traffic control.
- Remove and replace buffalo guard or fill area for half of the roadway.
- At a minimum, base course shall be placed up to grade to permit traffic use during continued construction operations.
- Remove and replace buffalo guard or fill area for remaining half of the roadway.
- Place Base Course and Asphalt Concrete Composite adjacent to new buffalo guard or in newly filled area.
- Seed and mulch disturbed areas in ditches.
- Remove traffic control.

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 project engineer to determine modifications that will be necessary to avoid utility impacts.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to Tom Lehmkuhl, DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

WASTE DISPOSAL SITE

Construction/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 Engineer.

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

1. Construction/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/demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.
3. 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.
4. 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.
5. 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.

INCIDENTAL WORK

Included in this item are the following

1. Sawing

REMOVE AND REPLACE TOPSOIL

All cost associated with removing and replacing the topsoil on all grading areas shall be incidental to the contract lump sum price for “Remove and Replace Topsoil”.

SAWING

The existing surface will be sawed full depth to a true line with a vertical face where asphalt concrete is to be placed adjacent to existing asphalt or concrete.

All costs associated with this work shall be incidental to the contract lump sum price for Incidental Work.

UNCLASSIFIED EXCAVATION

Asphalt, granular base, and embankment material approximately 10 feet wide on each side of the existing buffalo guards shall be removed for the installation of the new buffalo guards.

Fifty feet of asphalt pavement removal is provided for the installation of the new buffalo guards. The 50-foot dimension may be modified as directed by the Engineer.

The costs associated with this work shall be incidental to the contract unit price per cubic yard of Unclassified Excavation.

REMOVE CATTLE GUARD

Excavation and removal of the in-place structures shall include all foundations, grates, wings, hardware and removal of fence or removal of fence for reset.

All costs associated with these items shall be incidental to the contract unit price per each for Remove Cattle Guard.

INSTALLATION OF NEW BUFFALO GUARDS

Foundations for the new Buffalo Guards shall be precast, and constructed to the specifications of the special details in these plans.

Buffalo Guard grates shall be constructed to the specifications of the special details in these plans.

Reset of fence associated with those buffalo guards being replaced shall be included in this item.

To facilitate the installation of the 24’ Buffalo Guard ½ at a time, this Buffalo Guard shall be constructed of 2 of the 12-foot grates and 8 of the 6-foot foundation units.

Cost for installation of Buffalo guards shall be incidental to the contract unit price per each for 24’ Buffalo Guard with Wings or 30’ Buffalo Guard with Wings respective of specified length

The Contractor shall assure that buffalo guards are functional at all times.

FILLING OF BUFFALO GUARD AT MRM 43.000

Grates and foundation shall be removed.

The area shall be filled with Contractor Furnished Borrow, 12” of Base Course and 4” of Asphalt Concrete Composite.

TABLE OF BUFFALO GUARDS

MRM	Size
27.828	30’ Buffalo Guard with Wings
44.747	24’ Buffalo Guard with Wings

BASE COURSE

Base Course shall be placed 12” deep.

Density shall be to the satisfaction of the Engineer.

All costs associated with removing Base Course that was used for the maintenance of traffic prior to the installation of the new asphalt concrete shall be incidental to the contract unit price per ton for Base Course.

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite shall be used to replace asphalt removed for Buffalo Guard installation.

Asphalt Concrete Composite shall be placed in two 2” lifts.

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 either PG 64-28 or PG 64-34 Asphalt Binder.

PERMANENT SEEDING

The location to be seeded is comprised of disturbed areas of the inslope.

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.

Approximately 1000 SqFt per installation will require permanent seeding. All costs associated with permanent seeding shall be incidental to the contract lump sum price for Erosion Control.

It is the Contractor’s responsibility to verify estimated acreage. No adjustment in quantity will be allowed unless additional work is ordered by the Engineer.

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/1000 SqFt)
Western Wheatgrass	Flintlock, Rodan, Rosana	1.3
Green Needlegrass	Lodorm	0.8
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	0.6
Blue Grama	Bad River, Willis	0.4
Oats or Spring Wheat: April through July; Winter Wheat: August through November		1.9
Total:		5.0

INVENTORY OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	4	17	68
R1-1	48" x 48"	STOP	4	34	136
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)	4	34	136
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	4	34	136
W8-7	36" x 36"	LOOSE GRAVEL	4	27	108
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	4	34	136
W20-4	48" x 48"	ONE LANE ROAD ##### FT. OR AHEAD	4	34	136
W20-7a	48" x 48"	FLAGGER	4	34	136
*****	*****	TYPE III BARRICADE - 6 FT. DOUBLE SIDED	4	42	168
TOTAL UNITS					1160

Plotting Date: 09-MAR-2011

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 - 50	500	50
55	750	50
60 - 65	1000	50

- Flagger
- Channelizing Device

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

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

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

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

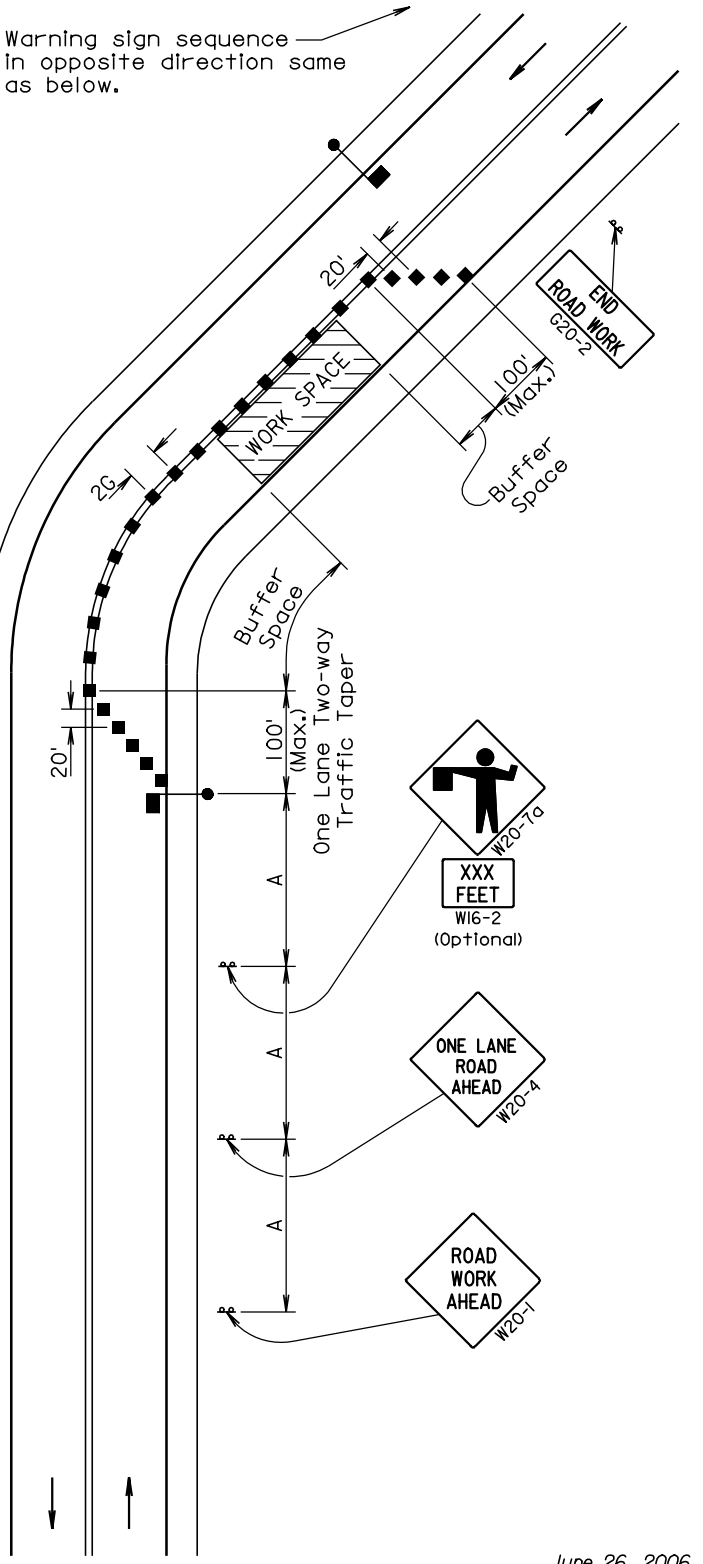
The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums or type II barricades along the centerline.

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

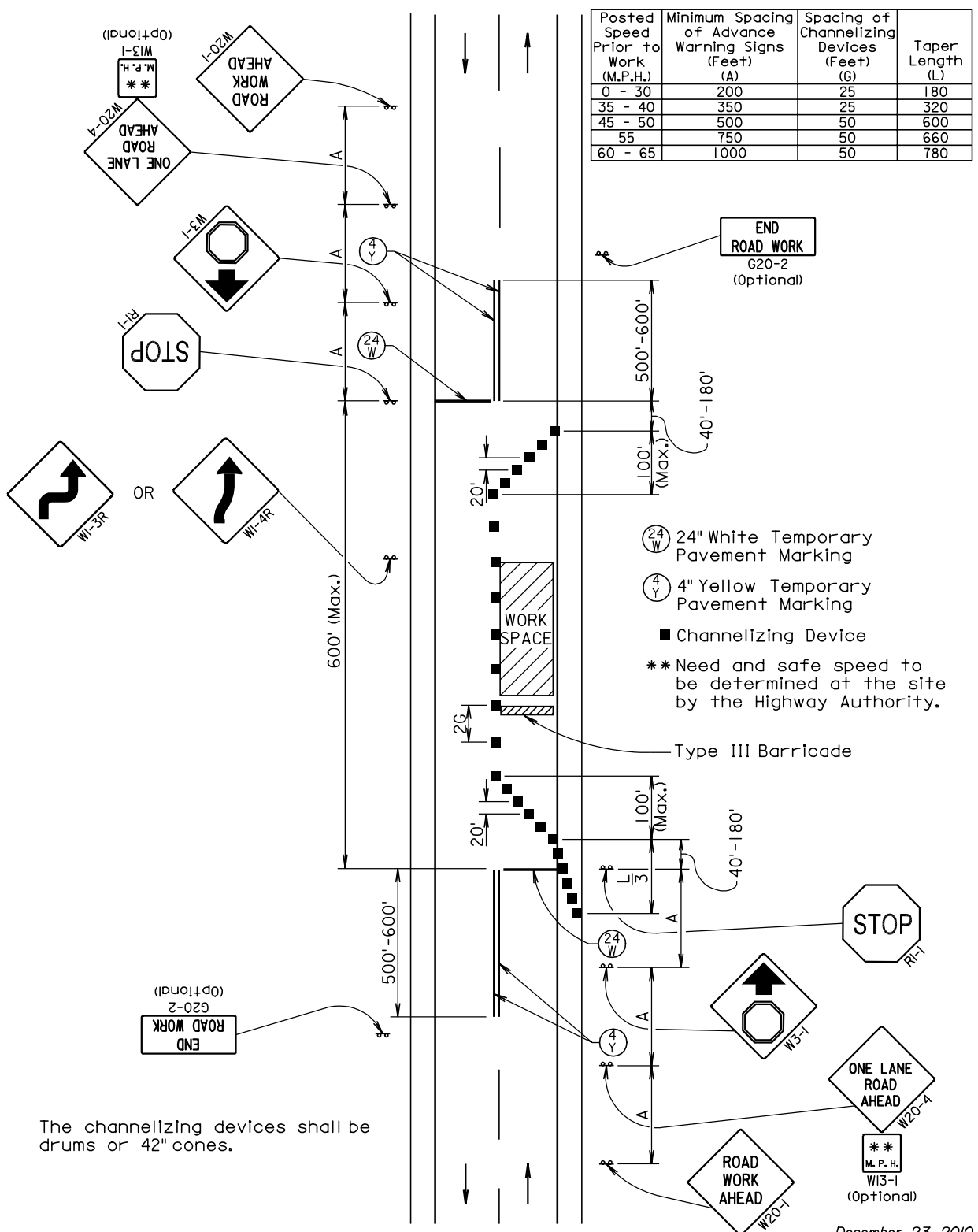
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space shall be a sufficient length so that the channelizing devices are visible to approaching traffic.

Warning sign sequence in opposite direction same as below.

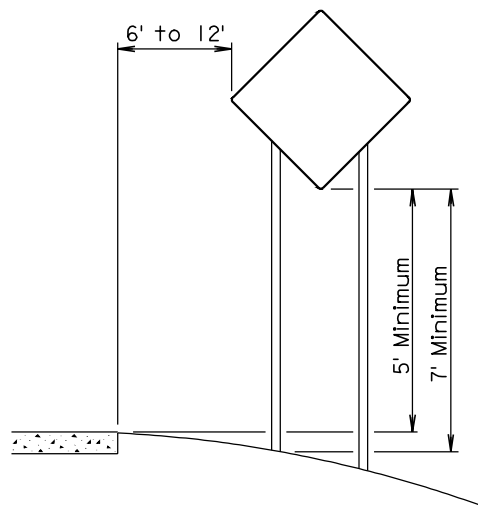


June 26, 2006

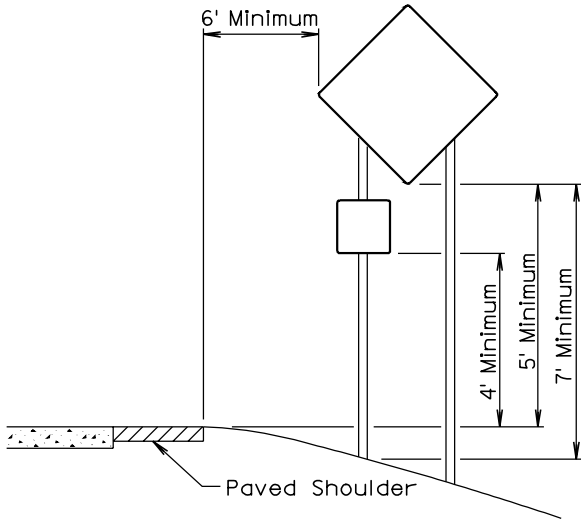


December 23, 2010

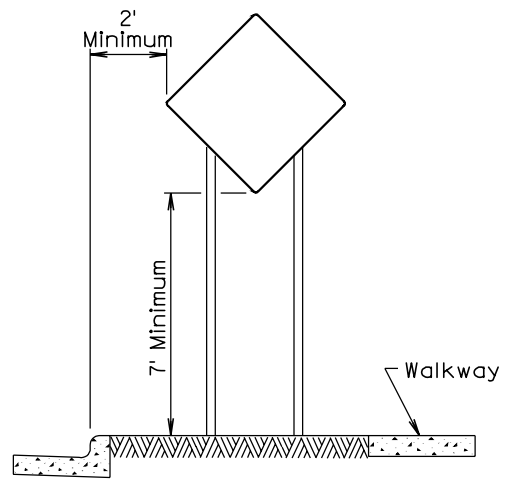
Plotting Date: 09-MAR-2011



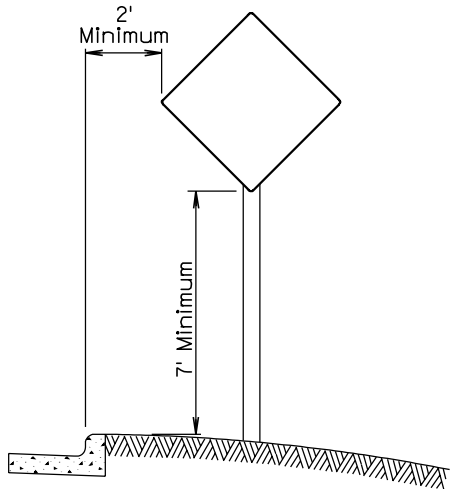
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

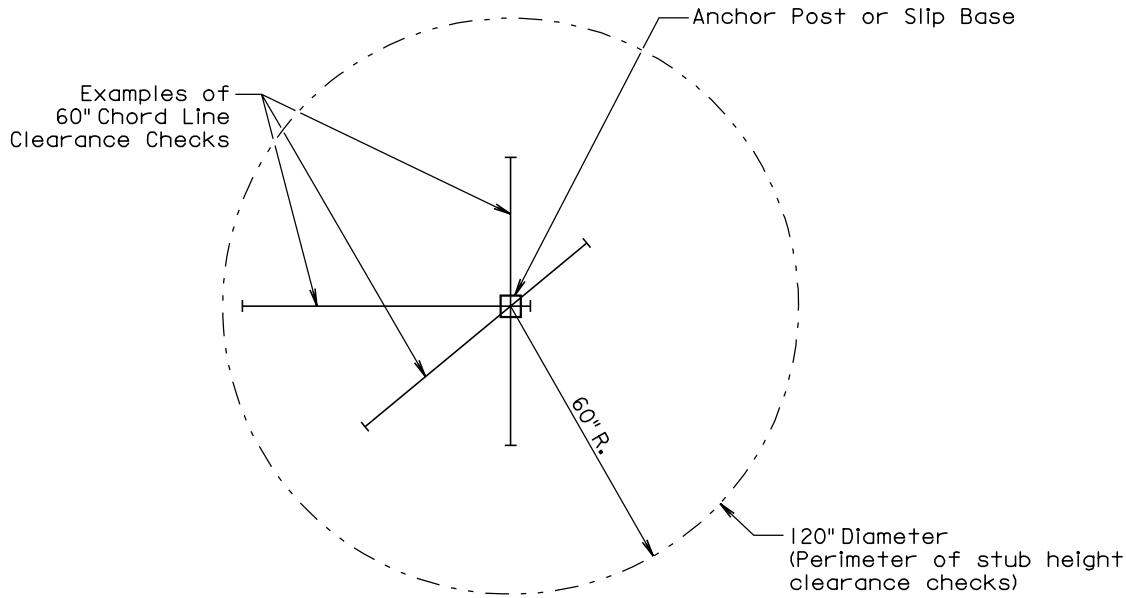
Published Date: 1st Qtr. 2011

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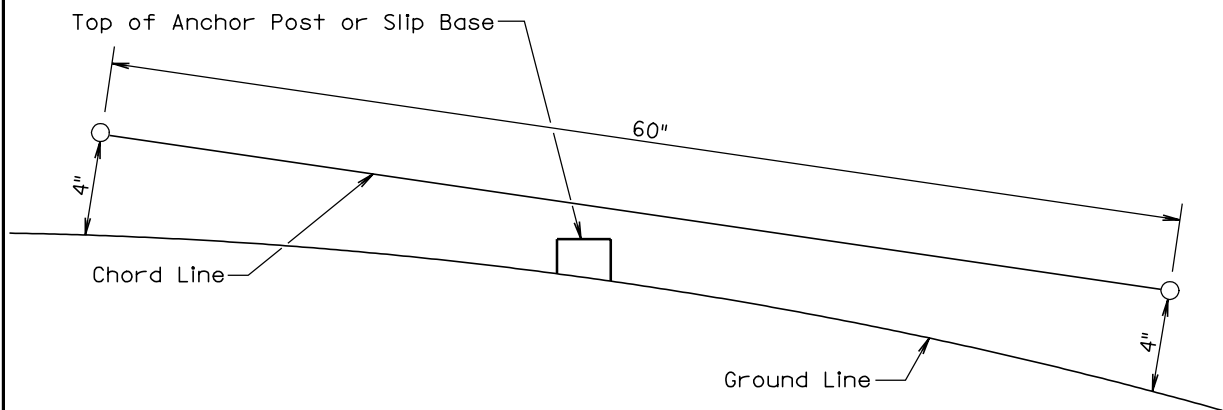
BREAKAWAY SIGN SUPPORTS
(Typical Construction Signing)

PLATE NUMBER
634.85

Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 1st Qtr. 2011

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BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER
634.99

Sheet 1 of 1

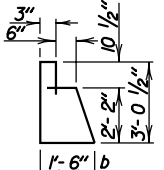
SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges, 17th Edition (Service Load).
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications and/or Special Provisions as Included In the Proposal.

GENERAL NOTES

- Design Loading: HS20-44 AASHTO.
- Buffalo Guards shall be constructed in accordance with Section 610.
- All concrete shall be Class M6 in accordance with Section 462.
- All reinforcing steel shall conform to ASTM A615, Grade 60.
- Use 1 1/2" clear cover on all reinforcing steel except as shown.
- All structural steel shall conform to ASTM A709, Grade 36. The End Welded Deformed Bar Anchors shall conform to ASTM A496. The 1/2" ϕ x 6" Concrete Anchors shall conform to Section 970.2 (1). All bolts, nuts and washers shall conform to ASTM A307, except that lock washers shall conform to AISI B18.21.1.
- Welding and weld inspection shall be in accordance with AWS D1.1 (Current Year).
- 3/4" ϕ Concrete Inserts shall be internally threaded for use with a standard galvanized A307 Bolt and shall be of such design that when installed in the concrete it will be capable of sustaining a safe working load in tension of 5500 pounds. The inserts shall be galvanized or made of a corrosion resistant material.
- The Armor Angles, Connecting Plates, Connecting Channels and Bearing Plates shall be painted with a paint system which conforms to Section 412.2A and shall be applied in accordance with the manufacturer's recommendations. The top coat shall be green in color, conforming to Federal Standard 24325.
- All elements of the Buffalo Guard foundation shall be built normal to the roadway profile grade.
- Alternate designs will be considered; submit detailed drawings and specifications of the proposed similar buffalo guard through proper channels to the Office of Bridge Design for approval.
- Soil Bearing capacity under the Buffalo Guard Foundations shall be a minimum of 3000 psf as approved by the Engineer.
- Placement of foundation and guards shall conform to cross-slope of the roadway. If a broken slope (crowned) roadway section is used at the guard, the bearing plate on centerline will need adjusting to conform to crown.

QUANTITIES FOR PRECAST FOUNDATION UNITS

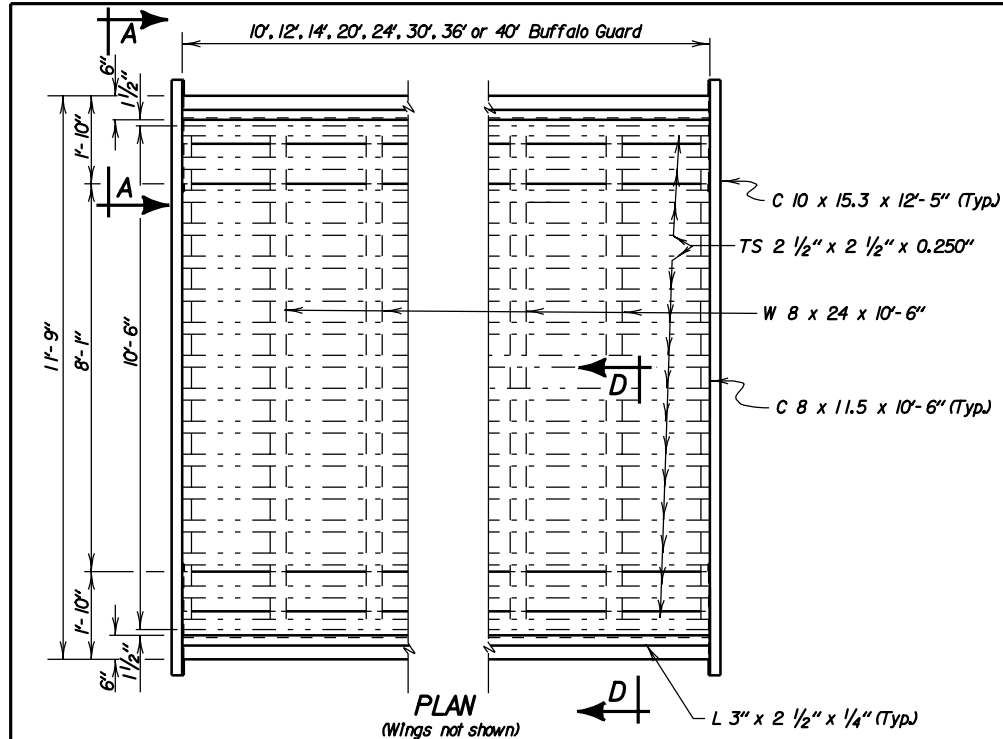
TYPE OF UNIT	BEARING PLATES		M6 CONC. (Cu. Yds.)	APPROX. WEIGHT OF UNIT (lb.)	CHANNEL CONN. PLATES	REINFORCING SCHEDULE					
	6" Width	12" Width				Mk.	No.	Size	Length	Type	Bending Details
6'-0"	2	2	0.9	3760	2	b	6	4	9'-0"	2/A	
8'-0"	2	3	1.2	4990	2	e	7	4	5'-8"	Str.	
10'-0"	2	4	1.5	6270	2						
						b	7	4	9'-0"	2/A	
						e	7	4	7'-8"	Str.	
						b	9	4	9'-0"	2/A	Type 2/A
						e	7	4	9'-8"	Str.	

BILL OF MATERIALS FOR BUFFALO GUARD FOUNDATIONS

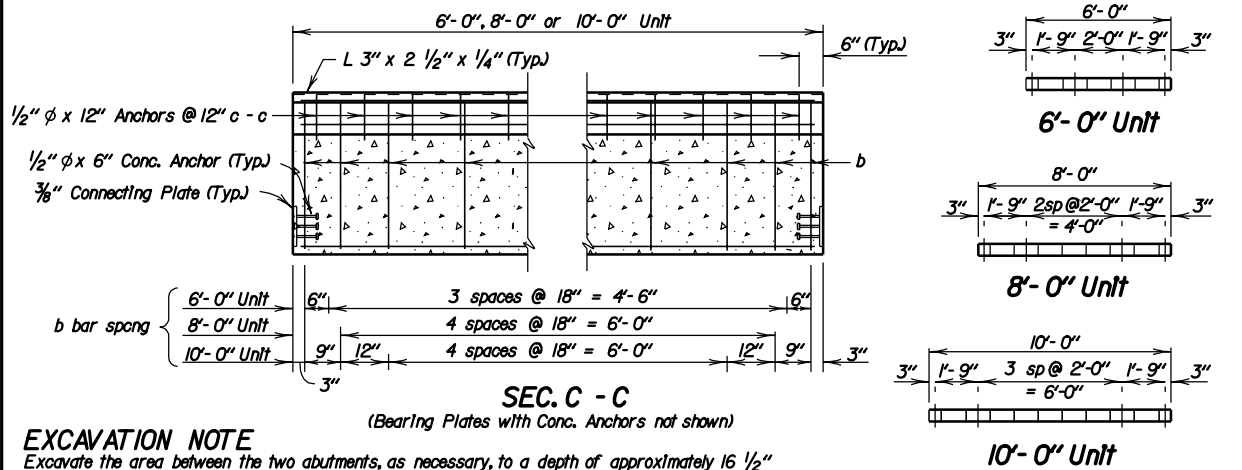
WIDTH OF BUFFALO GUARD	PRECAST FOUNDATION UNITS			CONN. CHANNELS	CLAMP. BOLTS	CONN. BOLTS
	6'-0"	8'-0"	10'-0"			
10'			2	2	20	24
12'	4			2	24	36
14'	2	2		2	28	36
20'			4	2	40	36
24'		6		2	48	48
30'			6	2	60	48
36'	2		6	2	72	48
40'			8	2	80	48

SPECIAL DETAIL FOR PRECAST BUFFALO GUARD FOUNDATIONS

Sheet 1 of 3



PLAN OF PRECAST FOUNDATION UNITS (Bearing Plates not shown)



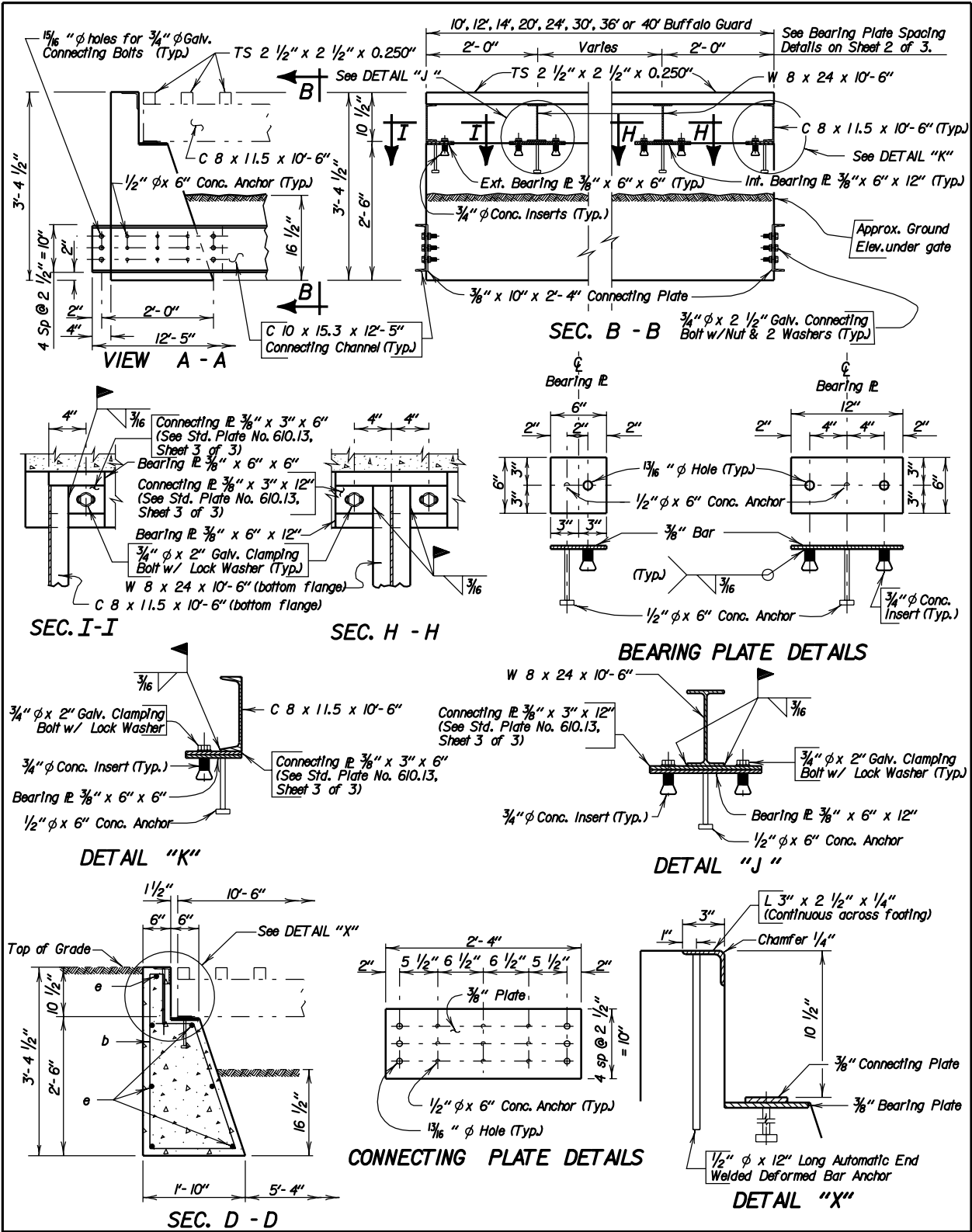
EXCAVATION NOTE

Excavate the area between the two abutments, as necessary, to a depth of approximately 16 1/2" above bottom of abutment footing elevation. Cut short outlet ditches from at least one side of the buffalo guard for drainage.

BEARING PLATE SPACING DETAILS (All dimensions refer to ϕ of Bearing Plates)

SPECIAL DETAIL FOR PRECAST BUFFALO GUARD FOUNDATIONS

Sheet 2 of 3



SPECIAL DETAIL FOR PRECAST BUFFALO GUARD FOUNDATIONS

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges, 17th Edition (Service Load).
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications and/or Special Provisions as Included in the Proposal.

GENERAL NOTES

- Design Loading: HS20-44 AASHTO.
- Buffalo Guards shall be constructed in accordance with Section 610.
- All structural steel shall conform to ASTM A709, Grade 36. Structural tubing shall conform to ASTM A500, Grade B. All bolts and nuts shall be galvanized and shall conform to ASTM A307. All lock washers shall be galvanized and shall conform to AISI B18.21.1.
- Welding and weld inspection shall be in accordance with AWS D1.1 (Current Year).
- Buffalo Guard Grate, Wings and Connecting Plates shall be painted with a paint system which conforms to Section 412.2A and shall be applied in accordance with the manufacturer's recommendations. The top coat shall be green in color, conforming to Federal Standard 24108.
- Grate Sections may be combined to obtain larger grate widths. Refer to Detail of Multiple Installation Joint on sheet 3 of 3 when larger grate widths are required.
- Buffalo Guard Grate & Wing Details shall be used in conjunction with Cast-In-Place or Precast Buffalo Guard Foundation Details on Std. Plate No. 610.11 or 610.12 when Buffalo Guard Foundations are required.
- Alternate designs will be considered; submit detailed drawings and specifications of the proposed similar buffalo guard grate or wing through proper channels to the Office of Bridge Design for approval.

INFORMATIONAL QUANTITIES

ITEM	UNIT	QUANTITY			
		10' GRATE	12' GRATE	14' GRATE	2-WINGS
Structural Steel	Lb.	2387	2867	3346	130

BILL OF MATERIALS
FOR BUFFALO GUARD GRATES

WIDTH OF BUFFALO GUARD	BUFFALO GUARD GRATE			CONNECTING PLATES		GRATE CONN. BOLTS
	10'-0"	12'-0"	14'-0"	6"	12"	
10'	1			4	8	—
12'		1		4	10	—
14'			1	4	12	—
20'	2			4	18	6
24'		2		4	22	6
30'	3			4	28	12
36'		3		4	34	12
40'		1	2	4	38	12

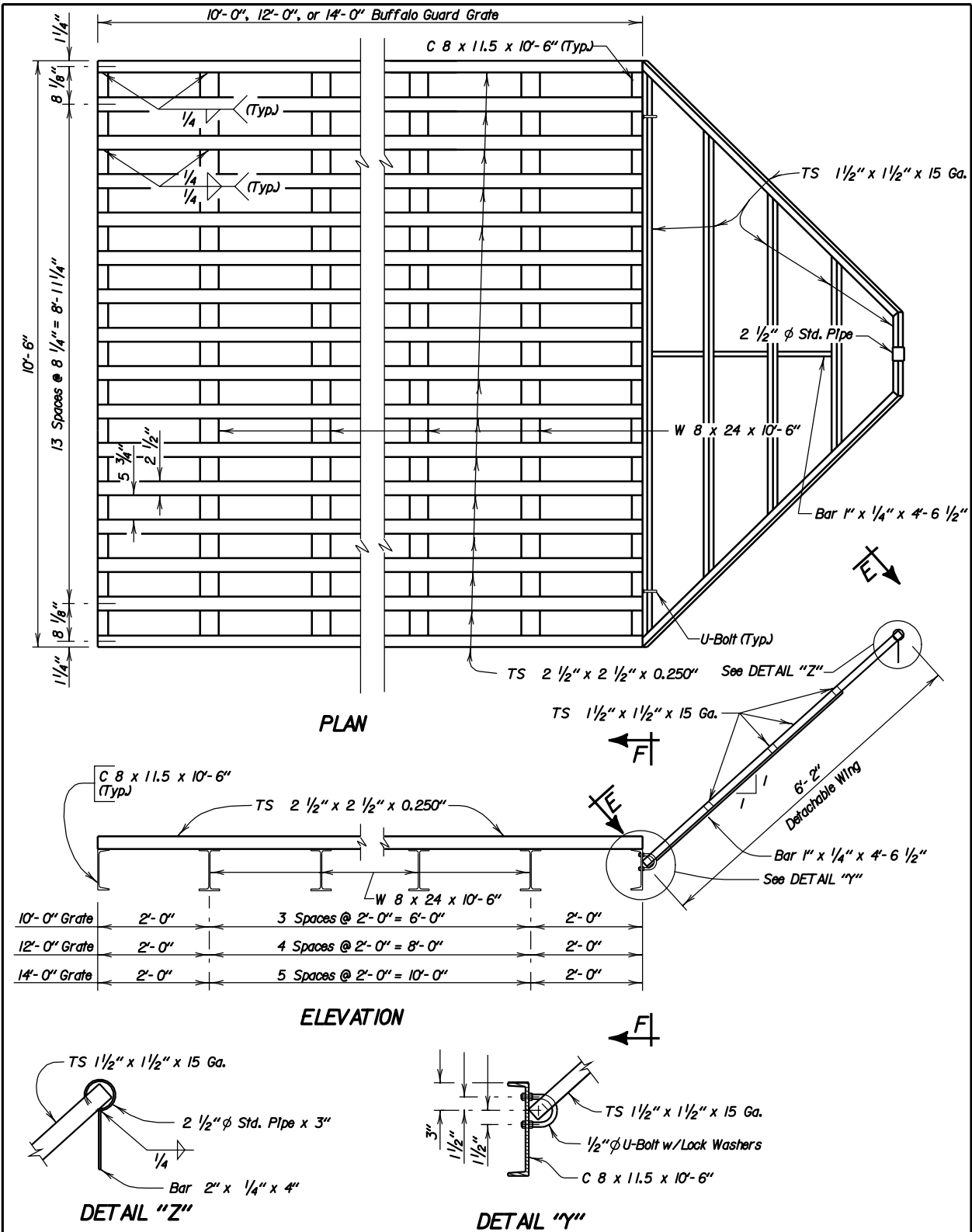
SPECIAL DETAIL FOR BUFFALO GUARD GRATE AND WING

PLOT SCALE - 200,000000:1,000000

PLOTTED FROM - TRRC12608

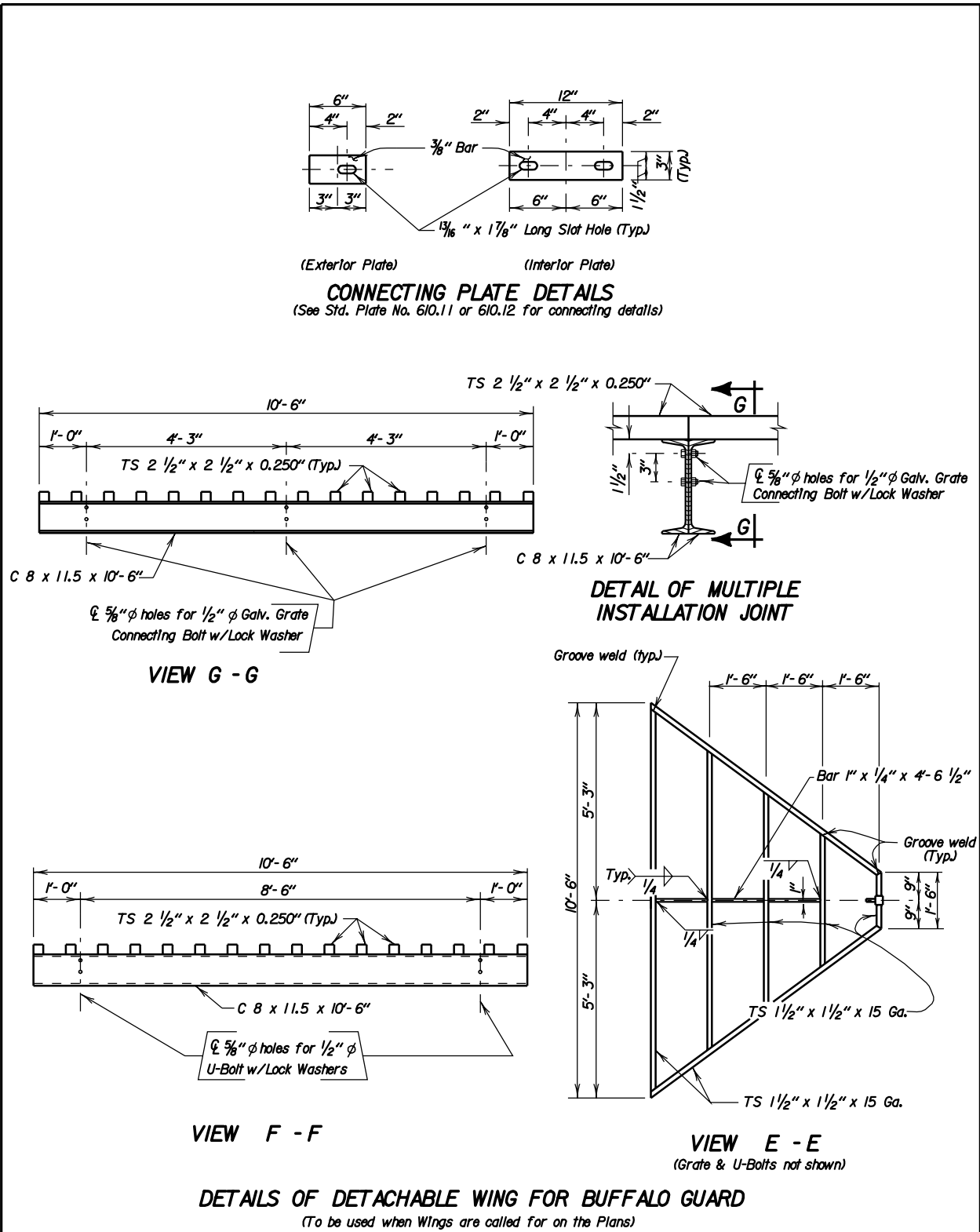
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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SPECIAL DETAIL FOR BUFFALO GUARD GRATE AND WING

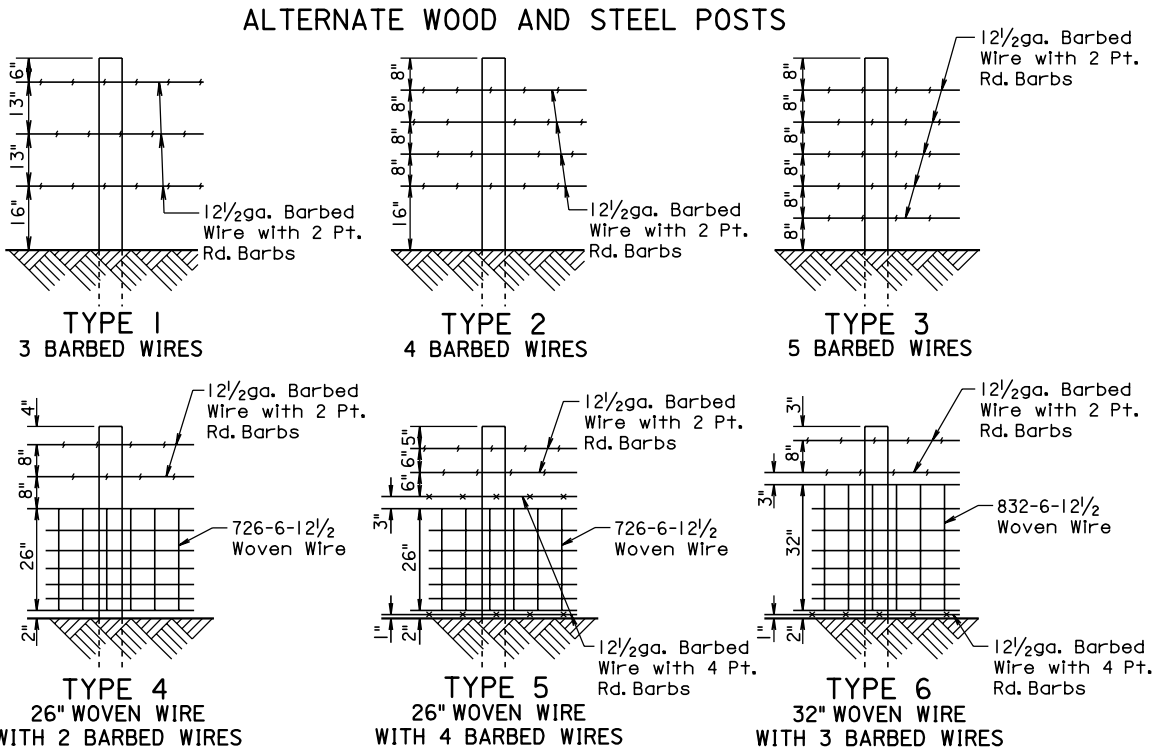
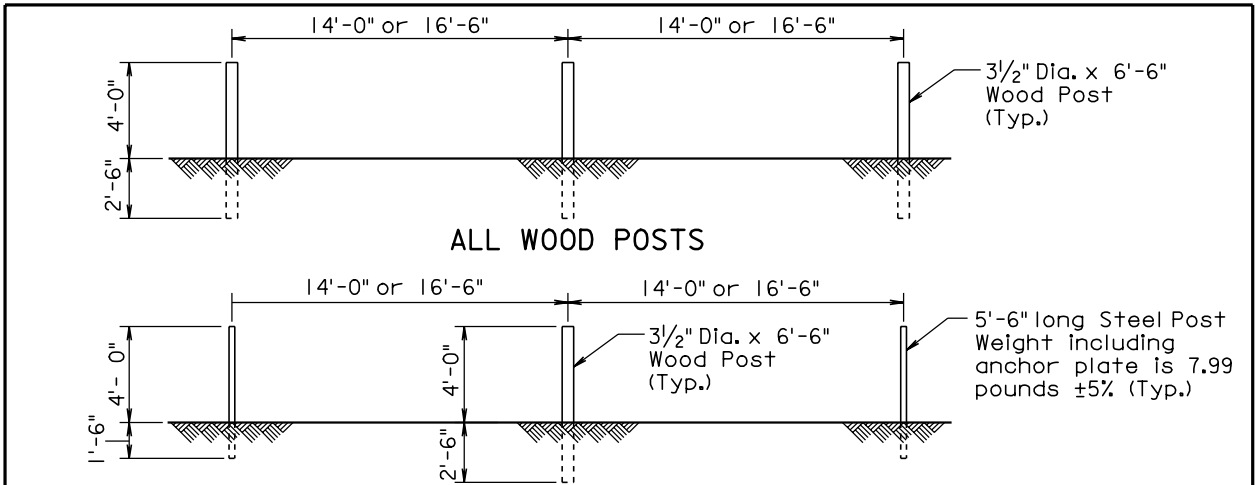
Sheet 2 of 3



SPECIAL DETAIL FOR BUFFALO GUARD GRATE AND WING

Sheet 3 of 3

FILE - U:\REGIONRC\PR\2011RCREGMAINT\PLANS\16A-491 REPLACE AUTO GATES\BUFFALOGRATE.BGN231_09



TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
			WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
TYPE	DESCRIPTION				
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½

GENERAL NOTES:

Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.

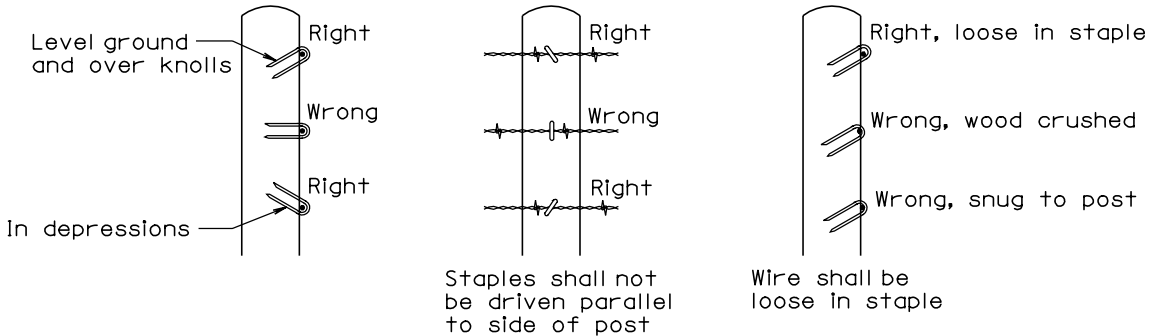
When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

September 14, 2009

December 23, 2004

<i>Published Date: 1st Qtr. 2011</i>	S D D O T	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

Right-of-Way fence on Interstate Projects shall be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

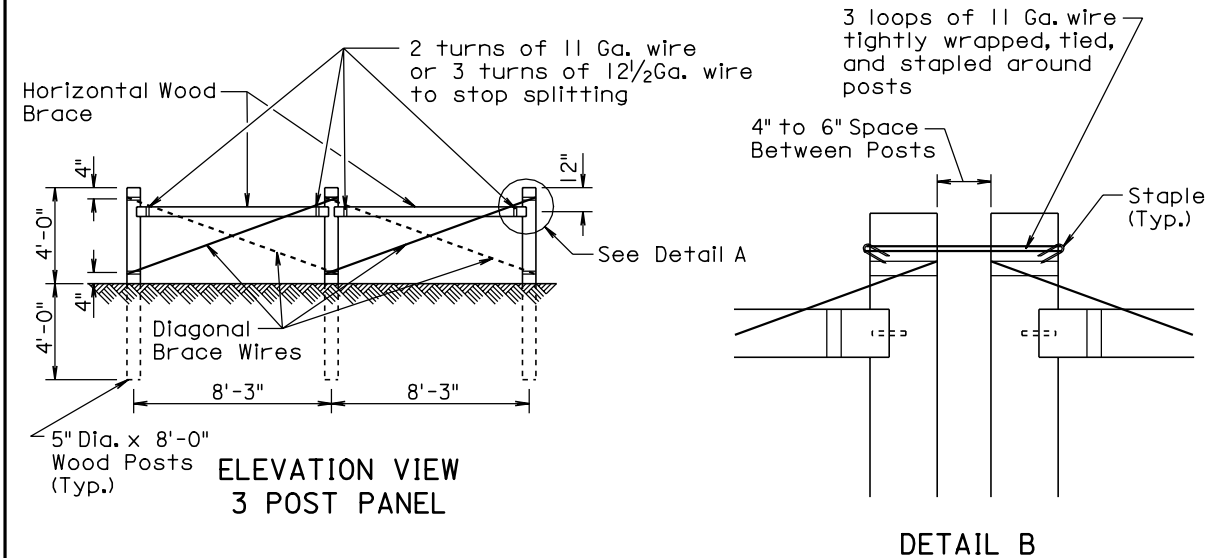
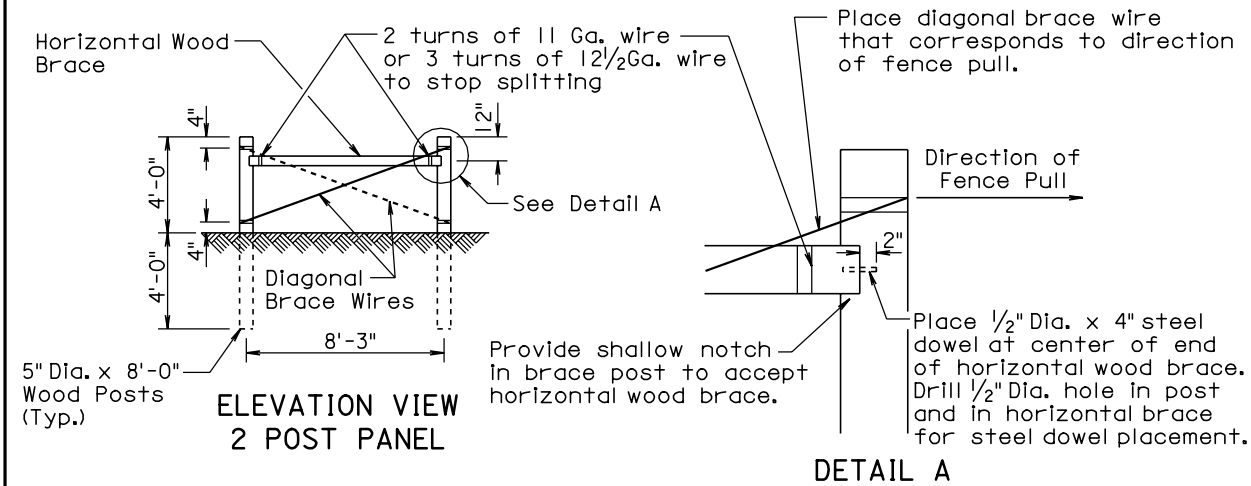
Right-of-Way fence other than on Interstate Projects shall be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

<i>Published Date: 1st Qtr. 2011</i>	S D D O T	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1

Plotting Date: 09-MAR-2011



GENERAL NOTES:

Two Post Panels shall be installed at least every 1320' between corners.

Two Post Panels shall be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces shall consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires shall be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires shall be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

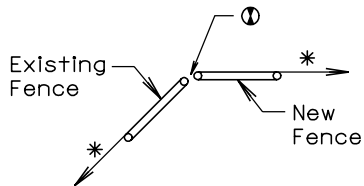
December 23, 2004

SPACING OF 2 POST PANELS WITHIN CURVES	
DEGREE OF CURVE	SPACING OF 2 POST PANEL
less than 3°15'	** 1320'
3°15' and greater	**At P.C., P.T., and at every 1320' between P.C. and P.T.

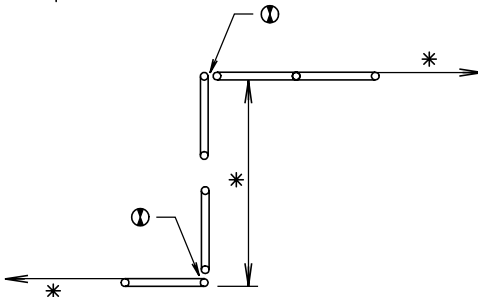
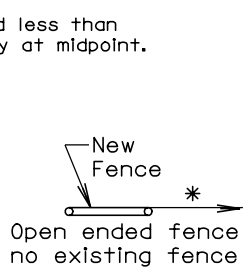
GENERAL NOTE:

All degrees of curvature stated for fence are at centerline of roadway.

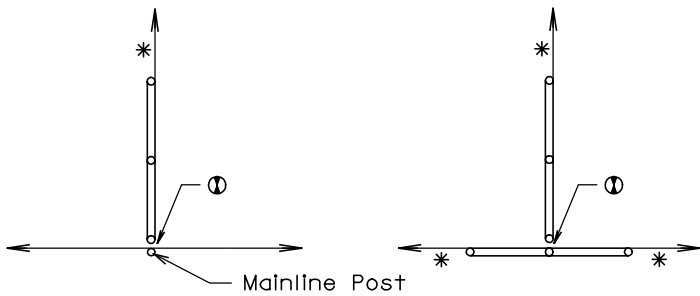
- * If fence length is less than 600' to next corner use a 2 post panel.
- * If fence length is greater than 600' to next corner use a 3 post panel.
- ** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.
- ① See Detail B on Sheet 1 of 3.



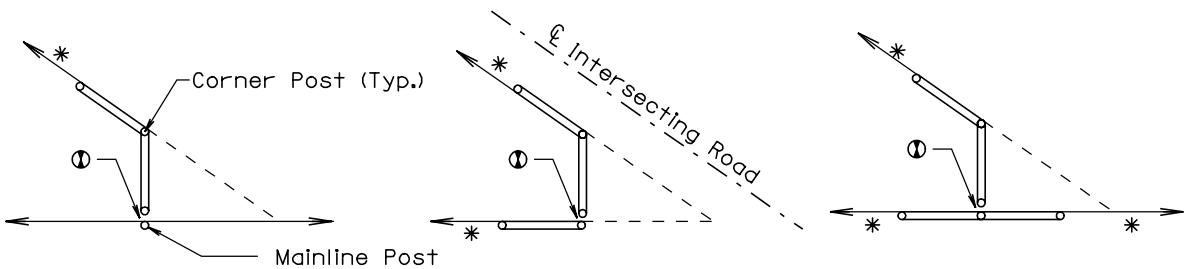
BEGIN OR END FENCE
(where new fence ties into existing fence)



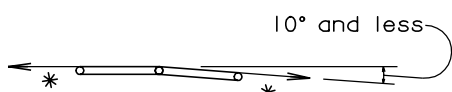
SHORT JOGS IN FENCE



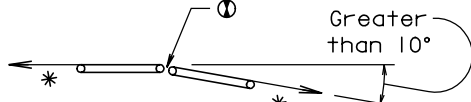
CROSS FENCE



SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.



Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

December 23, 2004

Plotting Date: 09-MAR-2011

