Section B: Grading Plans

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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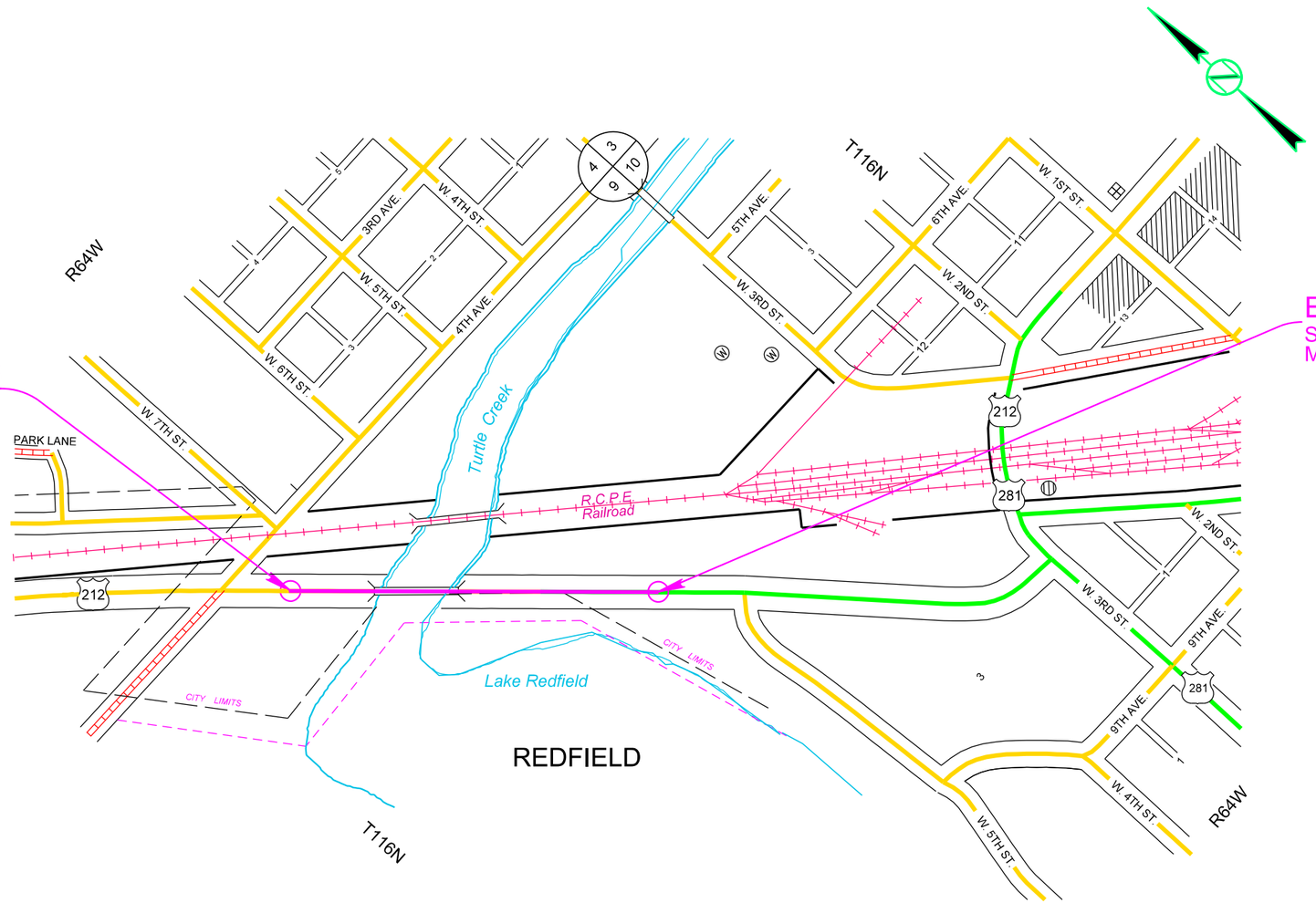
B9	Topography Symbology & Legend
B10-B11	Plan & Profile Sheets
B12	Guardrail Layout
B13-B26	Standard Plates



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SECTION B ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	0.352	Mile
009E3260	Miscellaneous Staking	Lump Sum	LS
009E3280	Slope Staking	0.176	Mile
009E3290	Structure Staking	1	Each
009E3300	Three Man Survey Crew	20.0	Hour
100E0100	Clearing	Lump Sum	LS
110E0730	Remove Beam Guardrail	366.0	Ft
110E1100	Remove Concrete Pavement	1,536.0	SqYd
120E0010	Unclassified Excavation	4,305	CuYd
120E0600	Contractor Furnished Borrow	6,595	CuYd
120E2000	Undercutting	3,083	CuYd
120E6100	Water for Embankment	98.7	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
* 270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	1,285.5	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	1,565.3	Ton
450E0123	18" RCP Class 3, Furnish	76	Ft
450E0130	18" RCP, Install	76	Ft
450E4757	18" CMP 12 Gauge, Furnish	98	Ft
450E4760	18" CMP, Install	98	Ft
450E5010	18" CMP Elbow, Furnish	4	Each
450E5011	18" CMP Elbow, Install	4	Each
450E5211	18" CMP Flared End, Furnish	2	Each
450E5212	18" CMP Flared End, Install	2	Each
450E8009	18" RCP to CMP Transition, Furnish	2	Each
450E8010	18" Pipe Transition, Install	2	Each
462E0100	Class M6 Concrete	2.3	CuYd
480E0100	Reinforcing Steel	317	Lb
600E0200	Type II Field Laboratory	1	Each
630E0110	Straight Double Class A Thrie Beam Guardrail with Wood Posts	50.0	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	150.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	4	Each
630E2020	W Beam Guardrail Tangent End Terminal	4	Each
650E4380	Type D48 Concrete Curb and Gutter	36	Ft
670E3200	Type D Frame and Grate	4	Each
670E5400	Precast Drop Inlet Collar	4	Each
720E1015	Bank and Channel Protection Gabion	4.5	CuYd

*** - Denotes Non-Participating**

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

Special ditch grades and other sections of the roadway different than the typical section shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets shall be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

TYPE II FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer.

The Contractor shall submit a copy of each monthly bill for calls charged to this phone at the end of each month. The Project Engineer will then audit the bills to ensure all calls are legitimate and then initiate a Construction Change Order (CCO) to reimburse the Contractor for the actual phone calls made, including local and long distance calls. Reimbursement will not be made for fees associated with the purchase, installation, disconnection, monthly line charges, and incidentals involved in the installation, maintenance, and disconnection of the phone (including attachments). These items shall be incidental to the contract unit price per each for "Type II Field Laboratory".

UTILITIES

The Contractor shall be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor shall contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided elsewhere in the plans or bidding documents.

City of Redfield

The City has a 12" drain, for Lake Redfield, that crosses the project at 21+54.50 and exits in Turtle Creek at 20+66.50 Lt. The pipe outlet (under water) is near the existing storm sewer outlet at 20+76.41.30 Lt.
The Contractor shall contact the City of Redfield prior to any work in close proximity to the drain pipe.

City of Redfield
626 Main Street
Redfield, SD 57469
Tom Lesselyoung – 605-460-1968

CLEARING

Before clearing activities begin, the Contractor shall contact the Engineer to determine the limits of clearing for the project. If the trees or shrubs that are supposed to remain within the limits of work are damaged or destroyed by the Contractor, the Contractor shall replace them with the same size and type at the Contractor's expense.

EXISTING (IN-PLACE) RIPRAP

Approximately 850 tons of Class C Riprap was previously installed adjacent to the existing structure. The existing (In-place) riprap may be reused as riprap for the final placement, as long as all specifications are met. All costs incurred to salvage the existing riprap, if done, shall be incidental to the contract unit price per ton for "Class C Riprap". Refer to Section E- Structures for the total quantity of Class C Riprap needed under the structure.

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SHRINKAGE FACTOR: Embankment +40%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Station to	Station	Excavation (CuYd)	* Undercut (CuYd)	* Contractor Furnished Borrow (CuYd)	Total Excavation (CuYd)	** Haul (CuYdSta)
13+50	17+86.56	52	1390	2728	4170	3369
21+06.44	26+00	139	1693	3867	5699	14576
	Totals:	191	3083	6595	9869	17945

* The quantities for these items are in the Estimate of Quantities under their respective bid items.
** The quantities for these items are for information only.

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	191
Undercut	3083
Topsoil	631
Salvaged Asphalt Mix and Granular Base Material (from cut sections)	400
Total	4305

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity shall be used for final payment. If final cross sections are taken in the field, add all of the items in the Table of Unclassified Excavation using the following procedures:

The Topsoil quantity in the Table of Unclassified Excavation is an estimate. When finaling a project, the total quantity of field measured Topsoil shall be used in place of the estimated Topsoil quantity. The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed.

The quantity of Salvaged Asphalt Mix and Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

The volume of in place Concrete Surfacing removed will NOT be paid for as Unclassified Excavation.

The Excavation quantities from individual balances and the table above have been reduced by the volume of in place concrete pavement that will be removed.

When finaling a project, the estimated quantity of 341 cubic yards of Concrete Pavement removed from the cut sections shall be subtracted from the Unclassified Excavation quantity for final payment. The quantity of Concrete Pavement from cut sections subtracted from the Unclassified Excavation quantity shall be plans quantity and will not be adjusted according to field measurements.

HAUL

Included in the Table of Excavation Quantities by Balances is Haul. Haul was not estimated for moving Contractor Furnished Borrow. The mass haul diagram is available at the Aberdeen Region and Huron Area offices for use in figuring this haul.

Haul: Estimated quantity (CuYdSta) for moving unclassified excavation material to the locations where it is needed throughout the earthwork balance.

For Purpose of Extra Haul Computations:

Average Haul = Haul/Unclassified Excavation = 17945/4305 = 4.2 Sta.

UNDERCUTTING

In all cut sections the earthen subgrade shall be undercut 2 feet below the earthen subgrade surface. The undercut material or other suitable material, as directed by the Engineer, shall then be replaced and compacted to the density specified for the section being constructed.

Shallow embankment sections, fills less than 2 feet in height measured at the finished subgrade shoulders, shall be undercut to ensure a minimum 2 feet height of earth embankment for the entire width of roadbed. The upper 6 inches of undercut material that consists of topsoil with a high humus content shall be used as topsoil, placed in the fill slopes outside the shoulders of the earthen subgrade, or placed in the lower portion (below 4 foot depth) in fills which are greater than 4 feet in height. The remaining undercut soil and soil obtained from adjacent excavation (excluding the upper 6 inches) shall then be replaced and compacted to the density specified for the section being constructed.

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

TABLE OF UNDERCUTTING

Station	to	Station	Quantity (CuYd)
13+50		17+86.56	1390
21+06.44		26+00	1693
		Total:	3083

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SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

An estimated 2850.8 tons (1508.4 Cubic Yards) of asphalt mix and granular base material shall be salvaged from the entire length of the existing highway and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer.

The quantity of salvage asphalt mix and granular base material may vary from the plans. No adjustment will be made to the contract unit price for variations of the quantity of "Salvage and Stockpile Asphalt Mix and Granular Base Material."

Asphalt mix and granular material that is not used on this project as Gravel Cushion, Salvaged is estimated at 1285.5 tons. This material shall be hauled and stockpile at the Redfield SDDOT Yard. The location of the stockpile site in the Redfield SDDOT yard shall be as directed by the Engineer. The State is only supplying the stockpile location and all costs associated with maintaining the stockpile site (due to rain or other conditions) to allow equipment and trucks to move freely shall be the responsibility of the Contractor. No major difficulties are anticipated but it is the responsibility of the Contractor to inspect the stockpile site prior to letting. Contact Brad Letcher with Huron Area DOT for more information 1-605-353-7140.

Prior to incorporation into the stockpile, cold milled asphalt material shall be processed over a 1 ½" screen. Material screened off shall be crushed and reincorporated. Equipment will not be allowed on the stockpile.

Cost for picking up, hauling and stockpiling the asphalt mix and granular base material including equipment and labor shall be incidental to the contract unit price per ton for "Salvage and Stockpile Asphalt Mix and Granular Base Material".

Salvaged material shall be processed to provide material meeting the following gradation:

Sieve Size	% Passing
1 1/2 inch (50.0 mm)	100
1 inch (25.0 mm)	70-100

It is estimated that there are 198 cubic yards of salvageable material per station. This rate was used to compute the unclassified excavation quantities. The rate of salvageable material is based on a 40 foot width.

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

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

The Contractor furnished borrow excavation material shall be uniform in texture and free from organic material. The liquid limit shall not exceed 45 and the plastic index shall not exceed 25.

The Contractor will be responsible for the following minimum testing prior to use of each borrow site:

A minimum of one test for liquid limit and plastic index and a 4 point for each location and soil type, with samples obtained according to SD201.

INCIDENTAL WORK, GRADING

Station	Remarks
17+58-43'L to 18+87-58'L	Take Out 18"-131' CMP & 2 End Sections

REMOVAL OF EXISTING CONCRETE PAVEMENT STA. 21+06.44 to STA.26+00

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

The existing 8 inch P.C.C. Pavement is typically 28 feet wide.

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 ⅔-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.

The corrugated metal pipes including the elbows, tees, and ends shall be 12 gauge and aluminum-coated (Type 2) in accordance with AASHTO M36.

PIPE FOR DOWNSPOUTS

Class II reinforced concrete pipe, high density polyethylene pipe, corrugated polypropylene pipe, or steel reinforced polyethylene pipe may be substituted for corrugated metal pipe at no additional cost to the State.

High density polyethylene pipe may be substituted for 36 inch and smaller pipe downspouts at no additional cost to the State. All necessary connections, transitions, and anchoring methods shall be in accordance with the manufacturer's recommendations and be approved by the Engineer. Bedding and backfill material and installation procedures shall conform to the manufacturer's design requirements.

The end sections shall be metal, be compatible, and conform to the type of end section as shown in the plans if high density polyethylene pipe, corrugated polypropylene pipe, or steel reinforced polyethylene pipe is provided.

DROP INLETS

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

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

TABLE OF DROP INLETS AND QUANTITIES

Station	L / R	Drop Inlet Size	Drop Inlet Type	Class M6 Concrete (CuYd)	Reinf. Steel (Lb)	Concrete Collar (Each)	Frame and Grate/Lid Type
17+48	R	1.5'x3'	D	0.55	79	1	D
17+48	L	1.5'x3'	D	0.60	79	1	D
21+50	L	1.5'x3'	D	0.61	84	1	D
21+50	R	1.5'x3'	D	0.56	75	1	D
			Totals:	2.32	317	4	

TABLE OF BANK AND CHANNEL PROTECTION GABIONS

Station	L/R	Quantity (CuYd)
21+50-86.1'	L	4.5
	Total:	4.5

TABLE OF TYPE D48 CONCRETE CURB AND GUTTER

Station	to Station	L/R	Quantity (Ft)
17+44.74	17+50.74	L	6.0
21+42.21	21+52.21	L	10.0
17+40.74	17+50.74	R	10.0
21+42.21	21+52.21	R	10.0
		Total:	36.0

TABLE OF GUARDRAIL

Location	Remove Beam Guardrail (Ft)	Straight Double Class A Thrie Beam Guardrail with Wood Posts (Ft)	Straight Class A W Beam Guardrail with Wood Posts (Ft)	W Beam to Thrie Beam Guardrail Transition (Each)	W Beam Guardrail Tangent End Terminal (Each)
Structure No. 58-086-251					
Begin Bridge	202	25	75	2	2
End Bridge	164	25	75	2	2
Totals:	366	50	150	4	4

TABLE OF CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking: Length (Mile)	Grade Staking: Lane Factor	Grade Staking: *Sets of Stakes	Grade Staking: **Grade Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)	Miscellaneous Staking Quantity (LS)
US 212 (2 lanes PCCP)	1350	2600	2	931	0.176	1	2	0.352	0.176	1	
							Totals:	0.352	0.176	1	

* 2 = Blue Top and Paving Hub Stakes (PCC Pavement)

** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)

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TYPICAL GRADING SECTION

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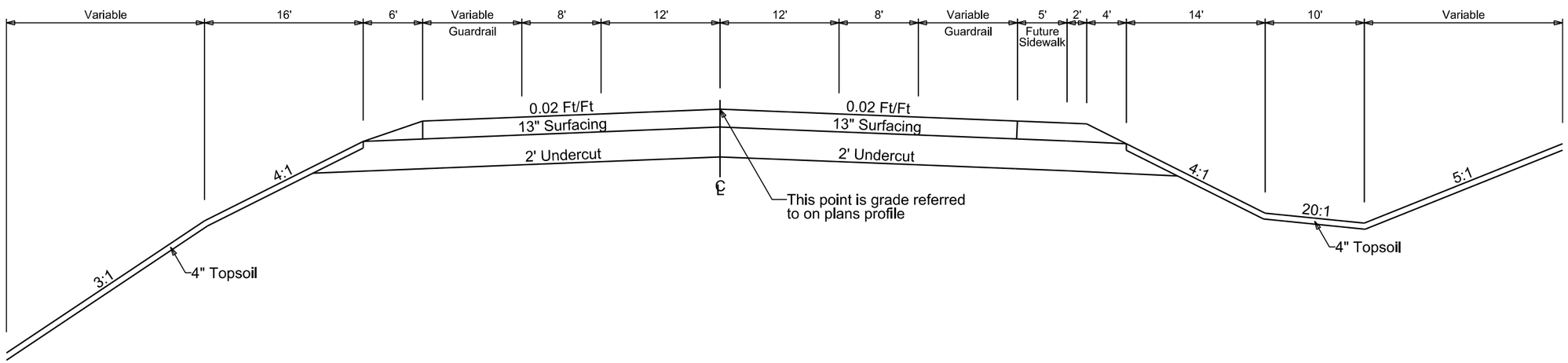
Bridge 17+86.56 to 21+06.44

13+50 to 26+00



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HORIZONTAL ALIGNMENT DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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MAINLINE

Type	Station			Northing	Easting
POB	10+00.00			384938.905	2349323.720
		TL= 350.00	S 42°58'52" E		
PI	13+50.00			384682.852	2349562.335
		TL= 350.00	S 42°12'55" E		
PI	17+00.00			384423.632	2349797.507
		TL= 500.00	S 42°26'32" E		
PI	22+00.00			384054.653	2350134.932
		TL= 618.91	S 42°13'35" E		
POE	28+18.91			383596.355	2350550.877

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011); Geoid 09; SF = 0.9998855391

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CONTROL DATA

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HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
RM 800	13+31.91	70.04' L	HARN G 470	384743.832	2349601.242	1296.753
RM 801	17+79.27	17.51' R	PUNCHMARK IN TOP OF NW CONCRETE BRIDGE ABUTMENT	384353.318	2349838.074	1295.893
RM 802	17+99.37	17.89' L	PUNCHMARK IN TOP OF NE CONCRETE BRIDGE ABUTMENT	384362.377	2349877.764	1296.167
RM 803	20+92.47	17.64' R	PUNCHMARK IN TOP OF SW CONCRETE BRIDGE ABUTMENT	384122.107	2350049.348	1295.681
RM 804	21+12.65	17.73' L	PUNCHMARK IN TOP OF SE CONCRETE BRIDGE ABUTMENT	384131.078	2350089.067	1295.727

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011);
Geoid 09; SF = 0.9998855391
The elevations shown on this sheet are based on NAVD 88.

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND

Anchor
Antenna
Approach
Assumed Corner
Azimuth Marker
BBQ Grill/ Fireplace
Bearing Tree
Bench Mark
Box Culvert
Bridge
Brush
Buildings
Bulk Tank
Cattle Guard
Cemetery
Centerline
Cistern
Clothes Line
Commercial Sign Double Face
Commercial Sign One Post
Commercial Sign Overhead
Commercial Sign Two Post
Concrete Symbol
Creek Edge
Curb/Gutter
Curb
Dam Grade/Dike/Levee
Deck Edge
Ditch Block
Doorway Threshold
Drainage Profile
Drop Inlet
Edge Of Asphalt
Edge Of Concrete
Edge Of Gravel
Edge Of Other
Edge Of Shoulder
Elec. Trans./Power Jct. Box
Fence Barbwire
Fence Chainlink
Fence Electric
Fence Misc.
Fence Rock
Fence Snow
Fence Wood
Fence Woven
Fire Hydrant
Flag Pole
Flower Bed
Gas Valve Or Meter
Gas Pump Island
Grain Bin
Guardrail
Guide Sign One Post
Guide Sign Two Post
Gutter
Guy Pole
Haystack

Hedge
Highway R.O.W. Marker
Interstate Close Gate
Iron Pin
Irrigation Ditch
Lake Edge
Lawn Sprinkler
Mailbox
Manhole Electric
Manhole Gas
Manhole Misc
Manhole Sanitary Sewer
Manhole Storm Sewer
Manhole Telephone
Manhole Water
Merry-Go-Round
Microwave Radio Tower
Misc. Line
Misc. Property Corner
Misc. Post
Overhang Or Encroachment
Overhead Utility Line — OH —
Parking Meter
Pipe With End Section
Pipe With Headwall
Pipe Without End Section
Playground Slide
Playground Swing
Power And Light Pole
Power And Telephone Pole
Power Meter
Power Pole
Power Pole And Transformer
Power Tower Structure
Propane Tank
Property Pipe
Property Pipe With Cap
Property Stone
Public Telephone
Railroad Crossing Signal
Railroad Milepost Marker
Railroad Profile
Railroad R.O.W. Marker
Railroad Signs
Railroad Switch
Railroad Track
Railroad Trestle
Rebar
Rebar With Cap
Reference Mark
Regulatory Sign One Post
Regulatory Sign Two Post
Retaining Wall
Riprap
River Edge
Rock And Wire Baskets
Rockpiles
Satellite Dish
Septic Tank

Shrub Tree
Sidewalk
Sign Face
Sign Post
Slough Or Marsh
Spring
Stream Gauge
Street Marker
Subsurface Utility Exploration Test Hole
Telephone Fiber Optics — T/F —
Telephone Junction Box
Telephone Pole
Television Cable Jct Box
Television Tower
Test Wells/Bore Holes
Traffic Signal
Trash Barrel
Tree Belt
Tree Coniferous
Tree Deciduous
Tree Stumps
Triangulation Station
Underground Electric Line — P —
Underground Gas Line — G —
Underground High Pressure Gas Line — HG —
Underground Sanitary Sewer — S —
Underground Storm Sewer — S —
Underground Tank
Underground Telephone Line — T —
Underground Television Cable — TV —
Underground Water Line — W —
Warning Sign One Post
Warning Sign Two Post
Water Fountain
Water Hydrant
Water Meter
Water Tower
Water Valve
Water Well
Weir Rock
Windmill
Wingwall
Witness Corner

State and National Line
County Line
Section Line
Quarter Line
Sixteenth Line
Property Line
Construction Line
R. O. W. Line
New R. O. W. Line
Cut and Fill Limits
Control of Access
New Control of Access
Proposed ROW
(After Property Disposal)

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15+23 R
Retain 18"-74' CMP
& 2 End Sections

15+71-86' R to 15+81-57' R
Retain 18"-31' CMP

17+48
Install 18"-38' RCP
(Between Drop Inlets)

17+48
Install 18" - 34' CMP (6' & 20' & 8')
And 2 - 12.5^ Elbows
& 1-18" RCP to CMP Outlet Transition
& 1 CMP Flared End

17+58-43' L to 18+87-58' L
Take Out 18"-131' CMP
& 2 End Sections
(Incidental Work, Grading)

20+63-33' L to 41' L to 21+99-92' R
Retain 24" CMP & 24" RCP Outlet Pipe
& Manholes

Install Guardrail
(See Guardrail Layout)

19+46
Take Out Bridge
(Incidental Work, Structures)

17+86.56 to 21+06.44
Install 319'-10 5/8" Prestr. Girder Bridge
DA=146.11 sq mi
(See Section E-Structures)

20+76-41' L to 26+00-48' L
Retain 36" RCP Storm Sewer

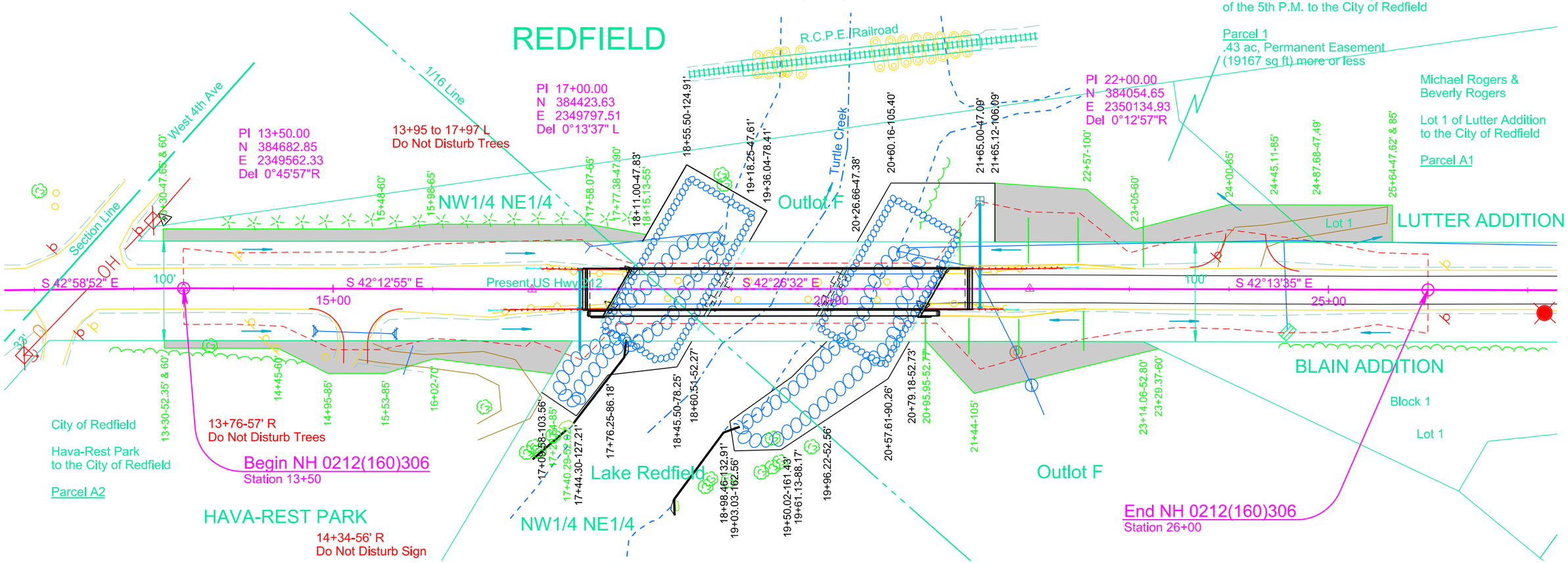
21+50
Install 18" - 64' CMP (8' & 48' & 8')
And 2 - 17.5^ Elbows
& 1-18" RCP to CMP Outlet Transition
& 1 CMP Flared End

21+50
Install 18"-38' RCP
(Between Drop Inlets)

21+50-86.1' L
Install Bank and Channel
Protection Gabions
(4.5 CY)

24+59
Retain 24"-92' RCP Storm Sewer
w/ Drop Inlet

Install 1.5' X 3' Type D Drop Inlet
with 6" Concrete Collar
and Type D Frame & Grate
at the following locations:
17+48 - 19.62' R
17+48 - 19.62' L
21+50 - 19.62' R
21+50 - 19.62' L



Parcel 2
13+30 to 17+77.38 L
Temporary Easement for
Cut & Fill containing 0.15 ac
(6315 sq ft), more or less

Parcel 1
17+58.07 to 18+15.13 L
Temporary Easement for
Cut & Fill containing 0.01 ac
(512 sq ft), more or less

Parcel A2
13+30 to 17+40.29 R
Temporary Easement for
Cut & Fill containing 0.19 ac
(8370 sq ft), more or less

Parcel 1
20+95.95 to 23+29.37 R
Temporary Easement for
Cut & Fill containing 0.15 ac
(6692 sq ft), more or less

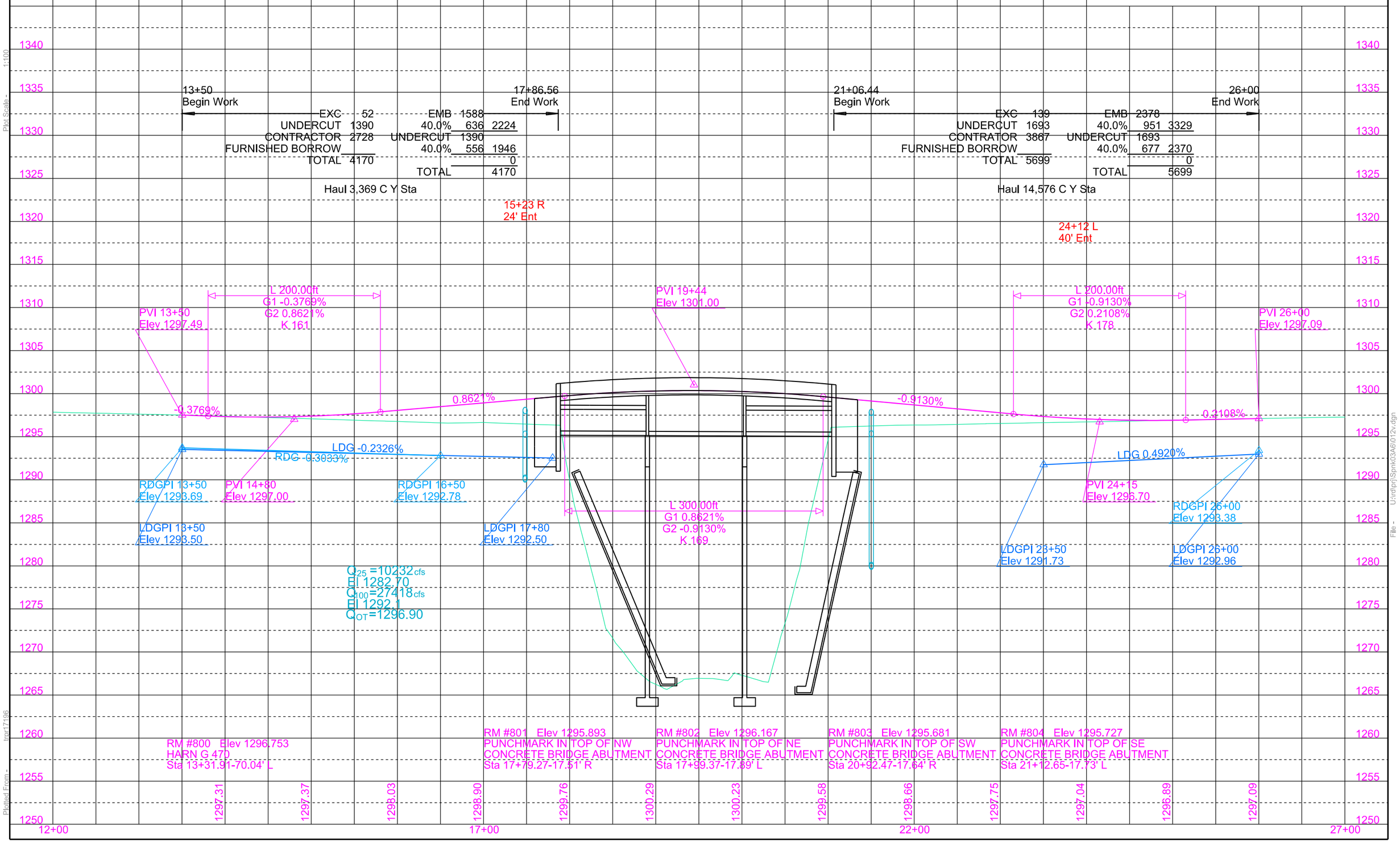
Parcel 1
21+65 to 24+87.68 L
Temporary Easement for
Cut & Fill containing 0.32 ac
(11631 sq ft), more or less

Parcel A1
24+45.11 to 25+64 L
Temporary Easement for
Cut & Fill containing 0.08 ac
(3656 sq ft), more or less

Plot Scale - 1:100
Plotted From - tpp17196
File - U:\drlpj\SprtK03A6\0212.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(160)306	B11	B26

Plotting Date: 07/22/2015



Plot Scale - 1:100

Plotted From - tpr17196

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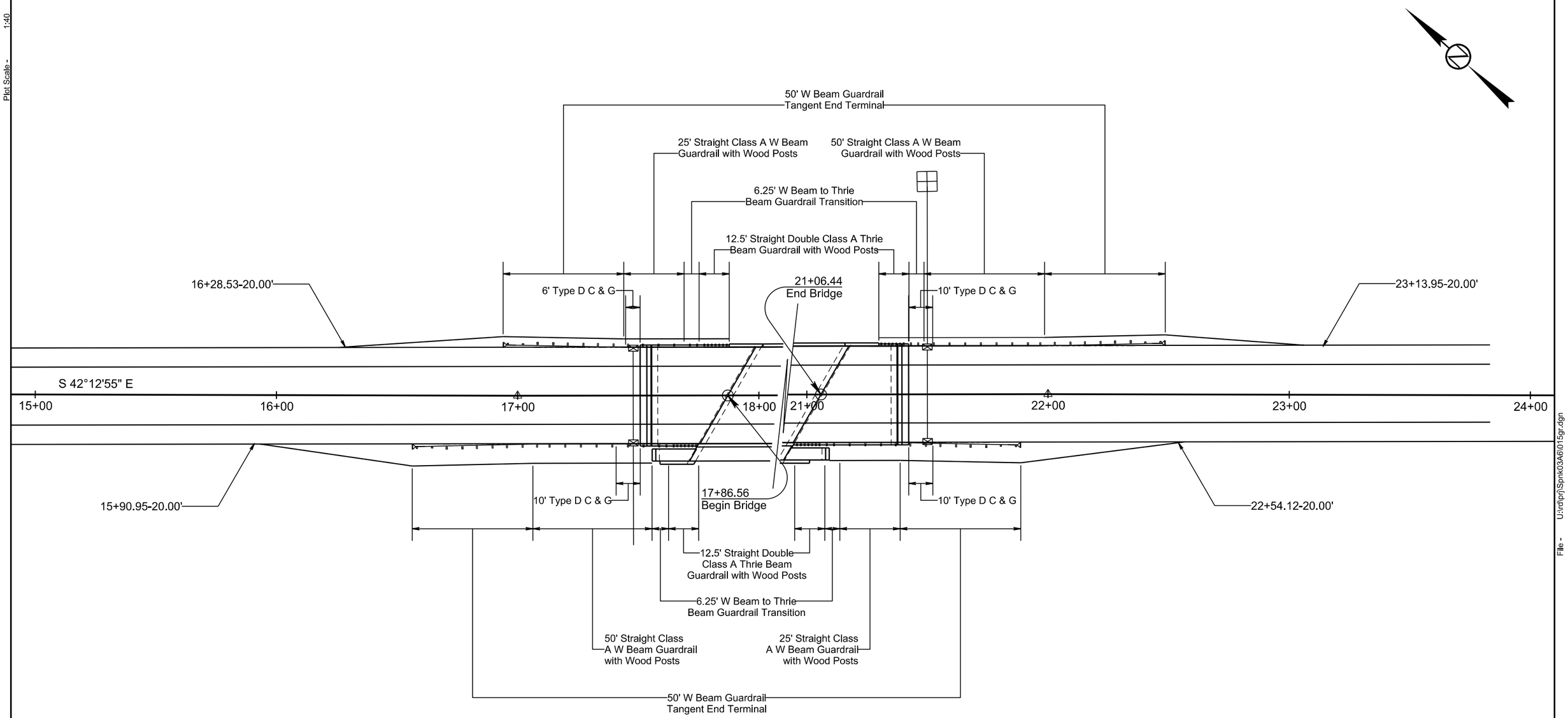
GUARDRAIL LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(160)306	B12	B26

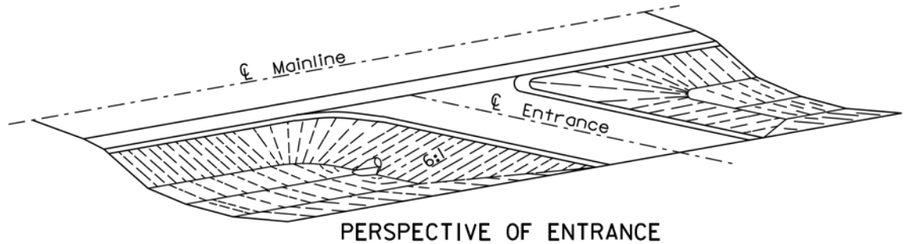
Plotting Date: 07/22/2015



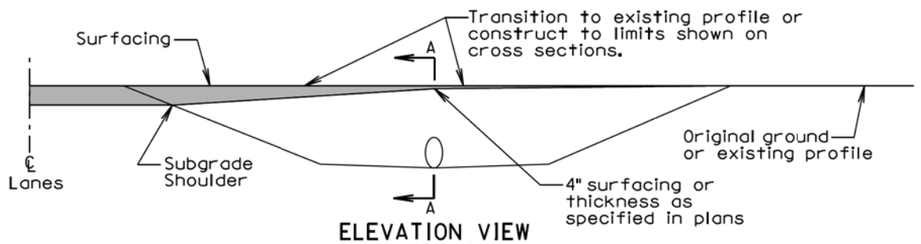
Plot Scale - 1:40

Plotted From - tnpr17196

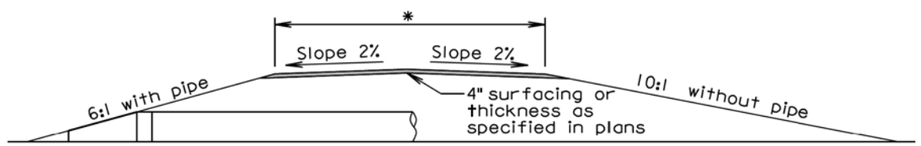
File - U:\rdlprj\Spnk03A6\015gr.dgn



PERSPECTIVE OF ENTRANCE



ELEVATION VIEW (ENTRANCE)



SECTION A-A (ENTRANCE)

*The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

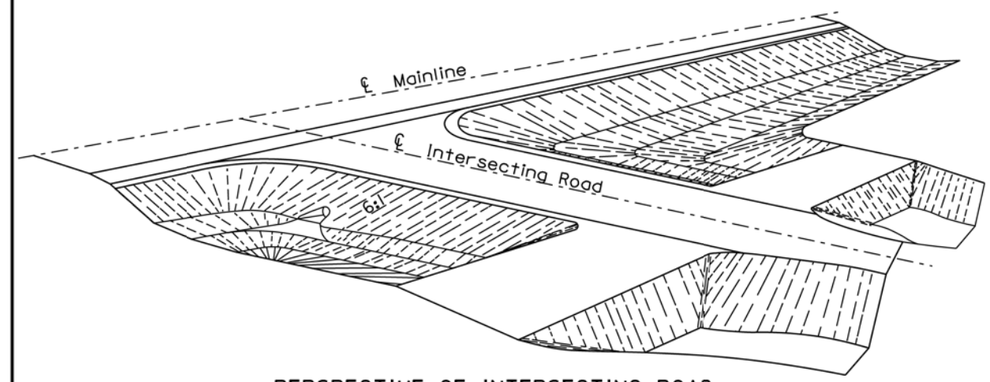
Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances shall be rounded to eliminate an abrupt transition.

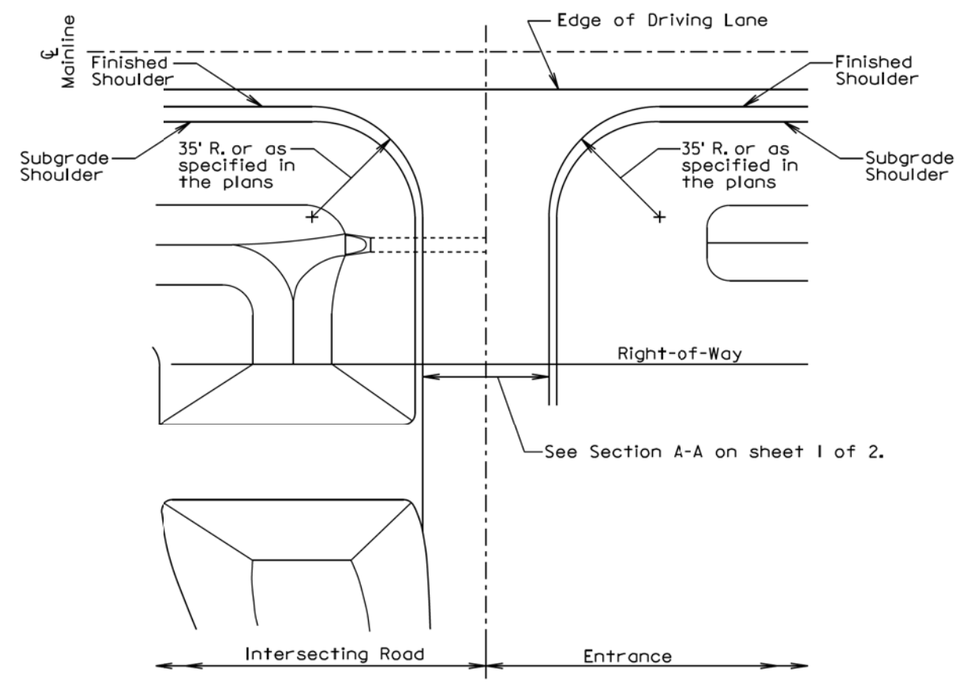
The turning radii shall be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 6, 2013

Published Date: 4th Qtr. 2016	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

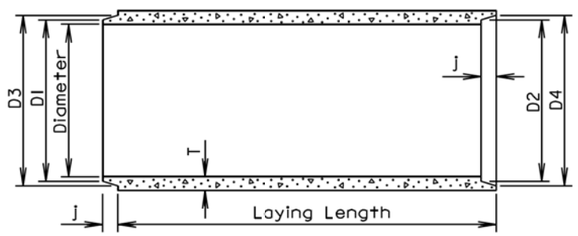
September 6, 2013

Published Date: 4th Qtr. 2016	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2

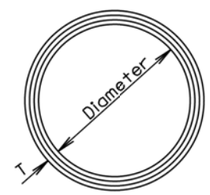
Plot Scale - 1:200
Plotted From - tqar17196
File - ...\Spnk03A6\s12001_1s12001_2.dgn

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

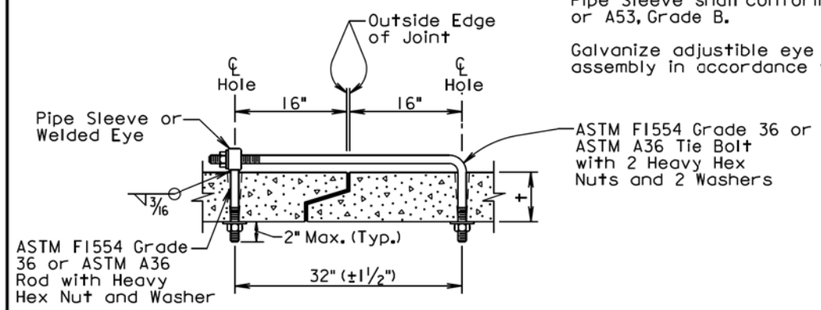
Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

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

June 26, 2015

Published Date: 4th Qtr. 2016 | SDDOT | **REINFORCED CONCRETE PIPE** | PLATE NUMBER 450.01 | Sheet 1 of 1

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



ADJUSTABLE EYE BOLT TIE

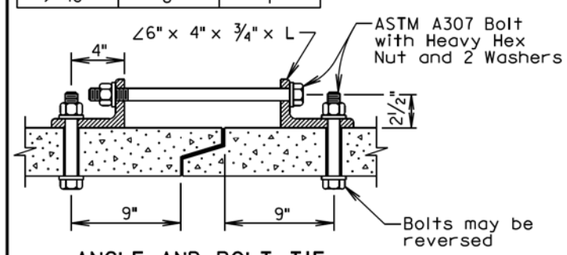
GENERAL NOTES:

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 adjustible eye bolt tie assembly in accordance with ASTM A153.

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	3/4
> 48	6	1



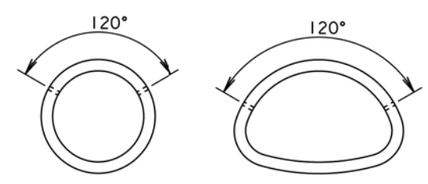
ANGLE AND BOLT TIE

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.



END VIEW "CIRCULAR"

END VIEW "ARCH"

GENERAL NOTES:

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

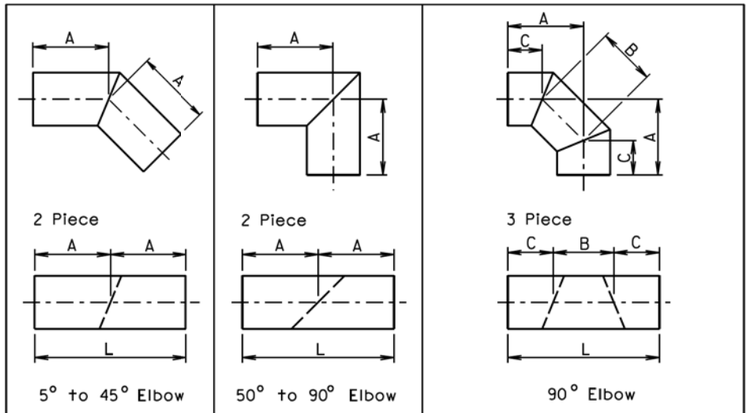
All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

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

February 28, 2013

Published Date: 4th Qtr. 2016 | SDDOT | **TIE BOLTS FOR R.C.P. AND R.C.P. ARCH** | PLATE NUMBER 450.18 | Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tmpr17196
File - ...\prj\Spnk03A6\s450015s450 18.dgn



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	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	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: 4th Qtr. 2016

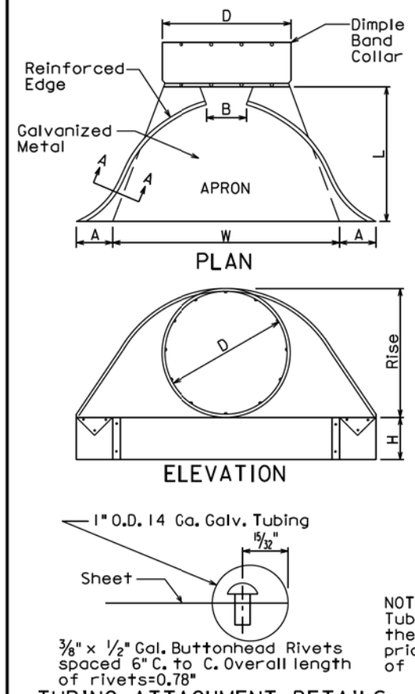
SDDOT

C.M.P. FABRICATED LENGTHS FOR ELBOWS

PLATE NUMBER 450.32

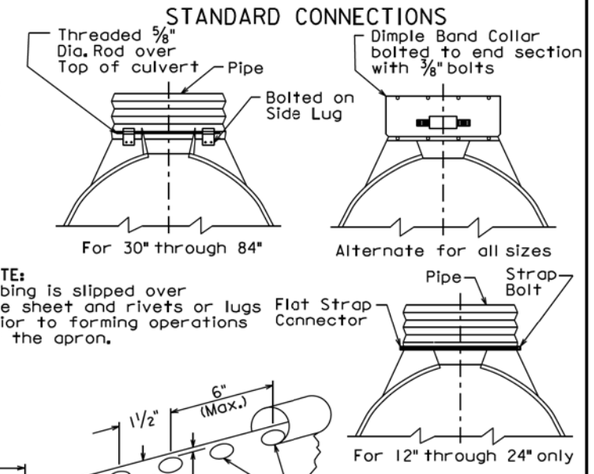
Sheet 1 of 1

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

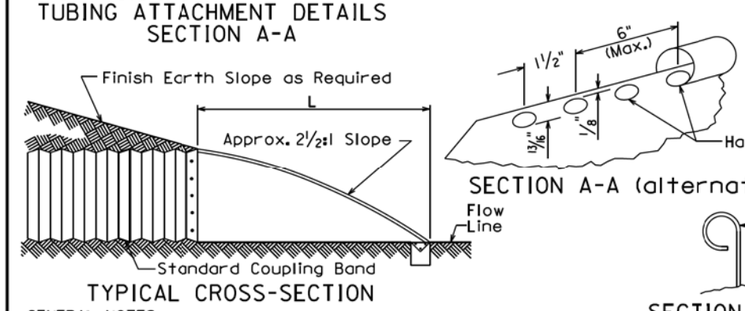


Dia. D (in.)	Ga.	DIMENSIONS (in.) A	B	H	L	W	Approx. Slope	Body
12	16	6	6	6	21	24	2½:1	1 Pc.
15	16	7	8	6	26	30	2½:1	1 Pc.
18	16	8	10	6	31	36	2½:1	1 Pc.
21	16	9	12	6	36	42	2½:1	1 Pc.
24	16	10	13	6	41	48	2½:1	1 Pc.
30	14	12	16	8	46	60	2½:1	1 Pc.
36	14	14	19	9	51	72	2½:1	2 Pc.
42	12	16	22	11	60	84	2½:1	2 Pc.
48	12	18	27	12	69	90	2¼:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1¾:1	3 Pc.
66	12	18	36	12	87	120	1½:1	3 Pc.
72	12	18	39	12	87	126	1⅓:1	3 Pc.
78	12	18	42	12	87	132	1¼:1	3 Pc.
84	12	18	45	12	87	138	1⅙:1	3 Pc.

STANDARD CONNECTIONS



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



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 2½" x 2½" 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: 4th Qtr. 2016

SDDOT

C.M.P. FLARED ENDS

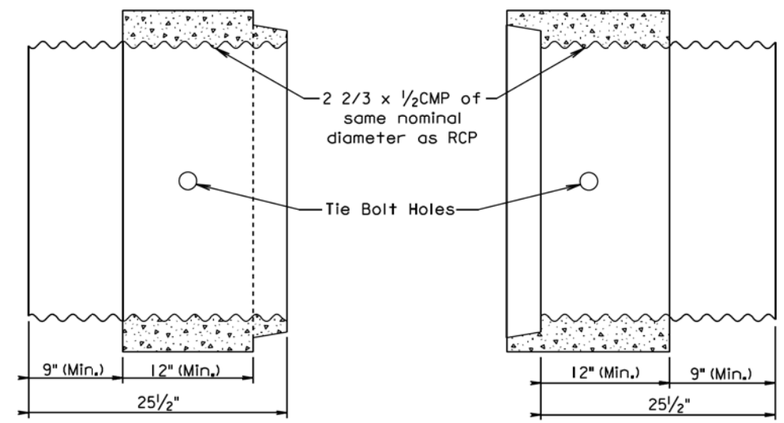
PLATE NUMBER 450.35

Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tnpr17196
File - ...\pnj\Spnk03A6\s45032s450 35.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(160)306	B16	B26

Plotting Date: 11/03/2016



INLET
(CMP to RCP Transition)

OUTLET
(RCP to CMP Transition)

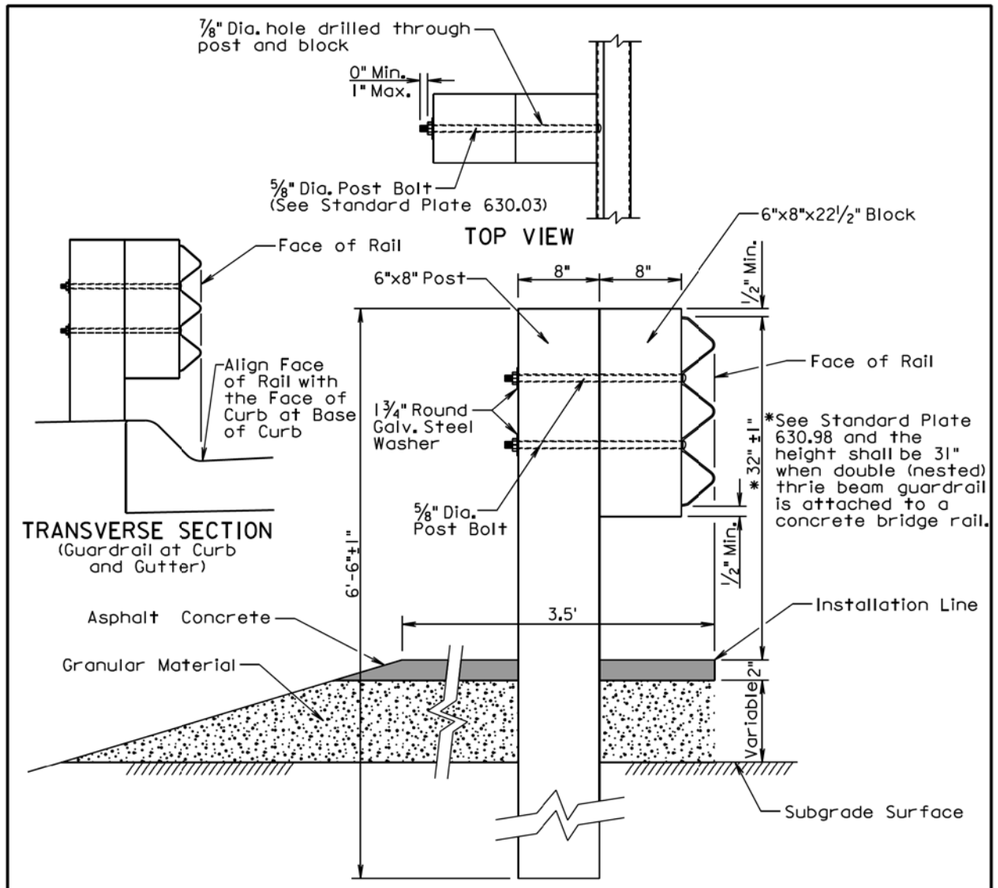
GENERAL NOTE:

Arch pipe transitions shall be fabricated similar to the round transition shown above.

March 31, 2000

Published Date: 4th Qtr. 2016	SDDOT	C.M.P. TO R.C.P. TRANSITION AND R.C.P. TO C.M.P. TRANSITION	PLATE NUMBER 450.50
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tqpr17196
File - U:\rdprj\Spnk03A6\s450\50.dgn



GENERAL NOTES:

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

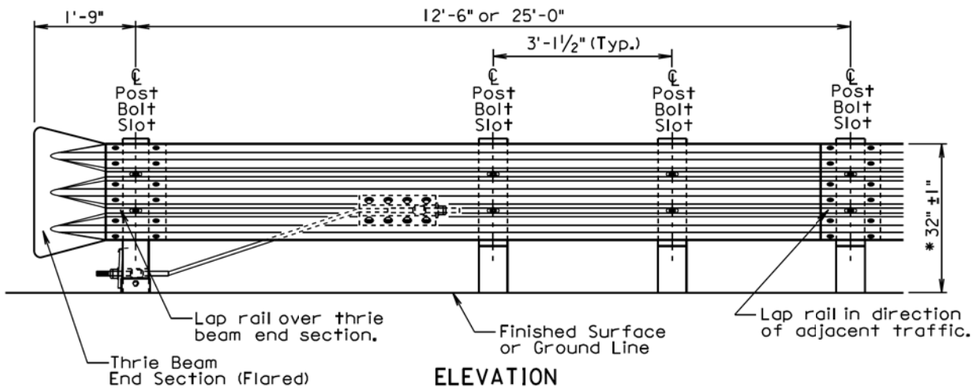
The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

The top of post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

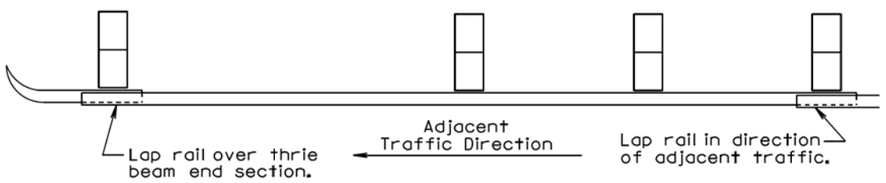
Published Date: 4th Qtr. 2016	SDDOT	**THRIE BEAM GUARDRAIL POST INSTALLATION**	PLATE NUMBER 630.01
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tpgr17196
File - ...\SpnK03A6\s45038_1\s45038_2.dgn



ELEVATION

* See Standard Plate 630.98 and the height shall be 31" when double (nested) thrie beam guardrail is attached to a concrete bridge rail.



PLAN

THRIE BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	2'-6"
3'-1½"	1'-9"

For Informational Purposes Only

GENERAL NOTES:

All thrie beam rail shall be Type I.

There will be no separate payment for furnishing and installing Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors. All costs for the Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

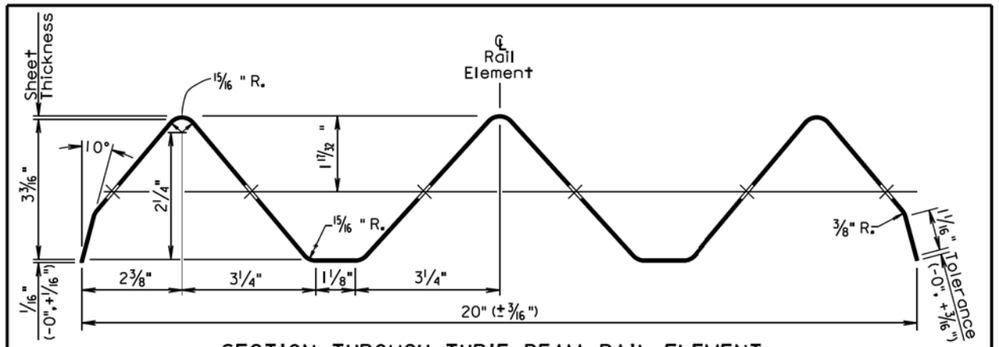
Thrie beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

Thrie Beam End Sections (Flared) shall only be used in a one-way traffic situation. See Standard Plate 630.80 for Thrie Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

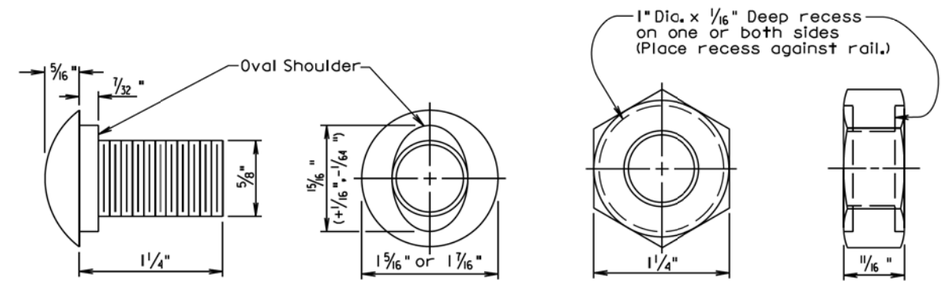
All costs for constructing thrie beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

June 26, 2015

Published Date: 4th Qtr. 2016	SDDOT	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02 Sheet 1 of 1

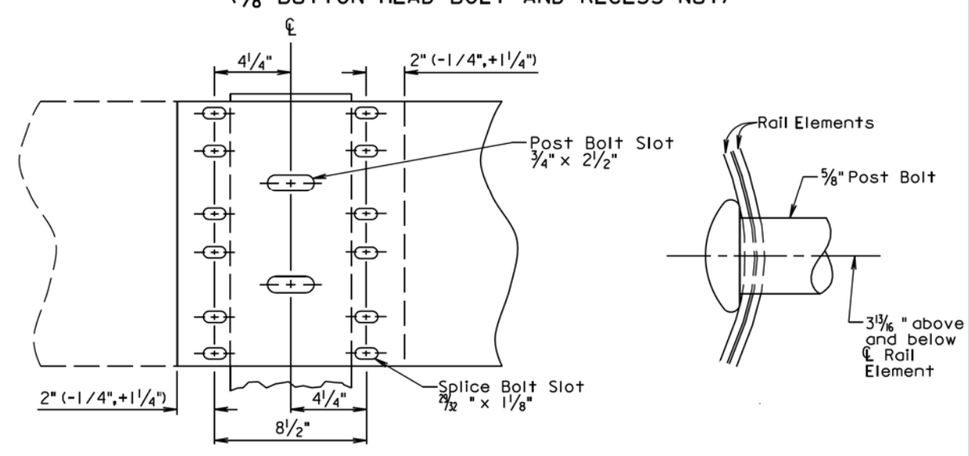


SECTION THROUGH THRIE BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

SPLICE BOLT
(5/8" BUTTON HEAD BOLT AND RECESS NUT)



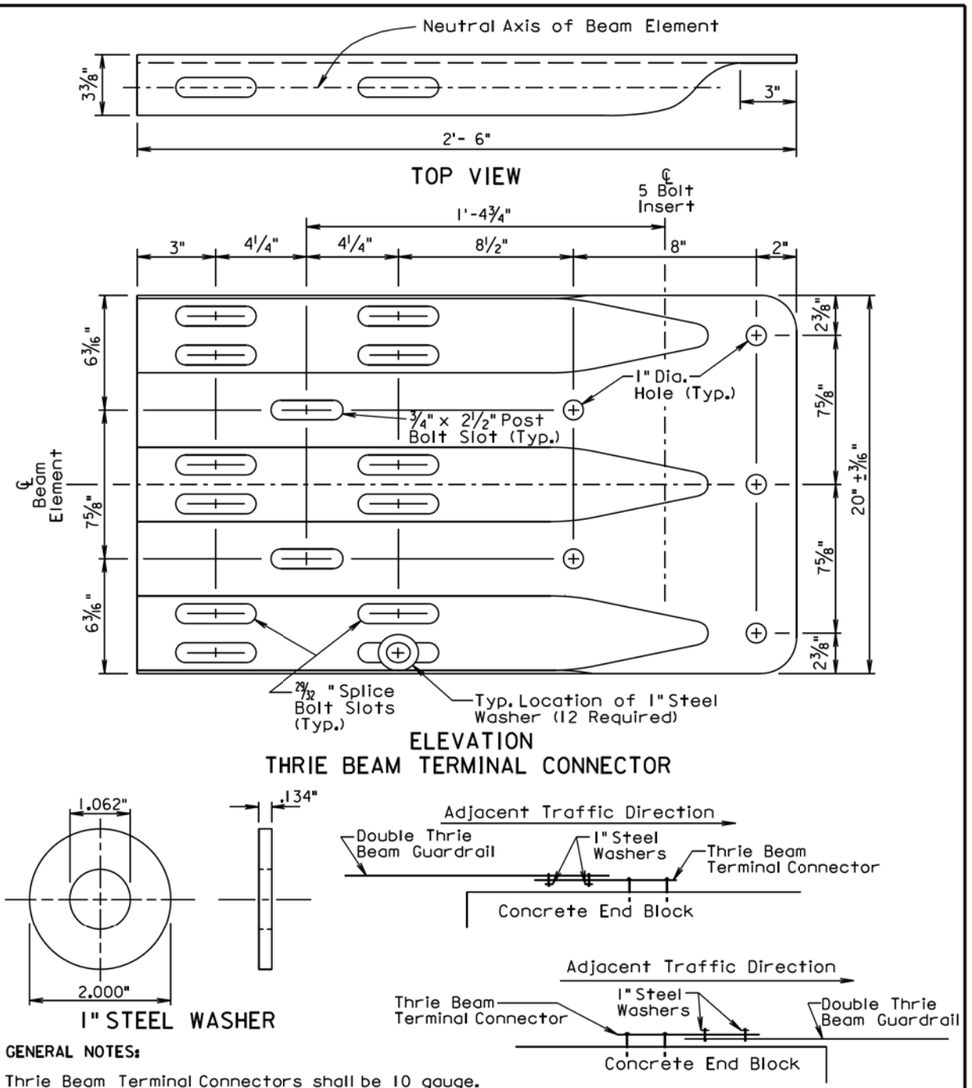
Lap in direction of traffic.

RAIL SPLICE

March 31, 2000

Published Date: 4th Qtr. 2016	SDDOT	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.03 Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tpp17196
File - ...\prj\SpnK03A6\s630013s630103.dgn



GENERAL NOTES:

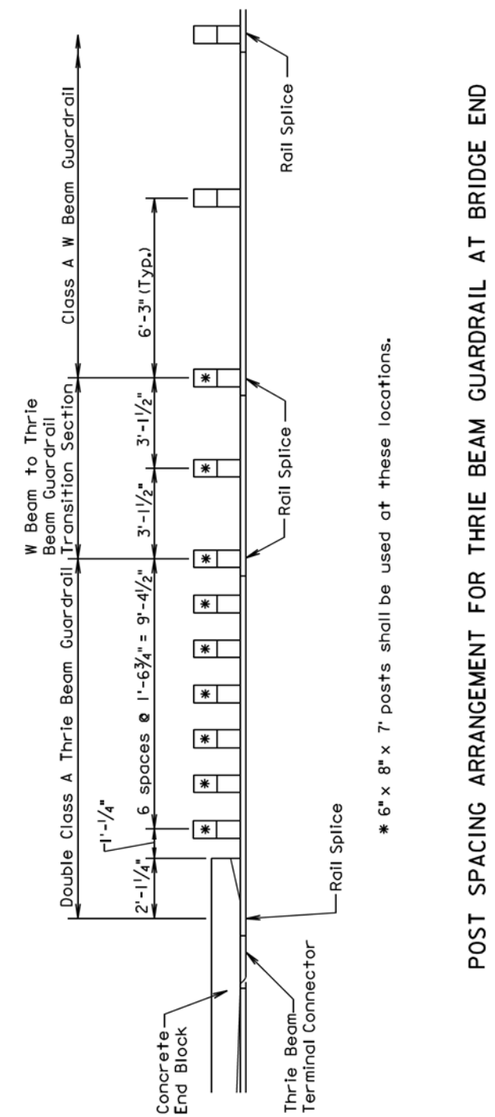
Thrie Beam Terminal Connectors shall be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge, 1" steel washers shall be used at the lap splice and the washers shall be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

There will be no separate payment for furnishing and installing the Thrie Beam Terminal Connector. All costs for the Thrie Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

September 14, 2001

Published Date: 4th Qtr. 2016	SDDOT	THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER	PLATE NUMBER 630.05 Sheet 1 of 1



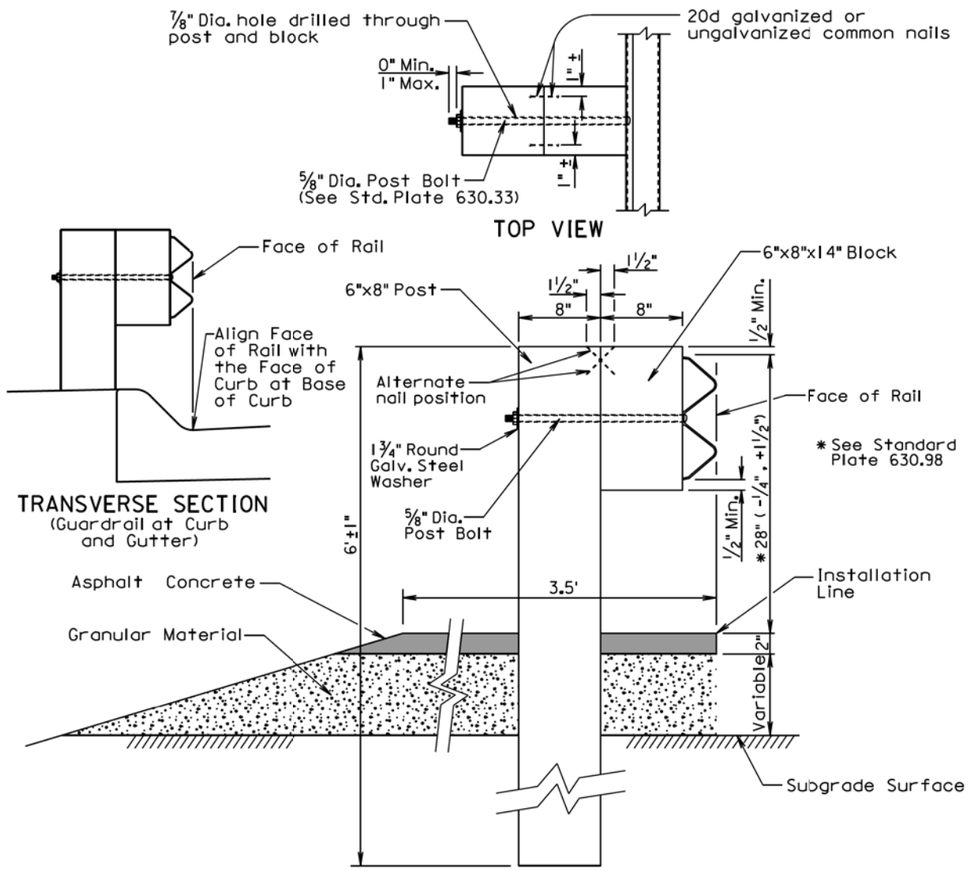
* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 4th Qtr. 2016	SDDOT	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.15 Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tnpr17196
File - ...\pn\Spnk03A6\s630\0563015.dgn



TRANSVERSE SECTION

GENERAL NOTES:

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

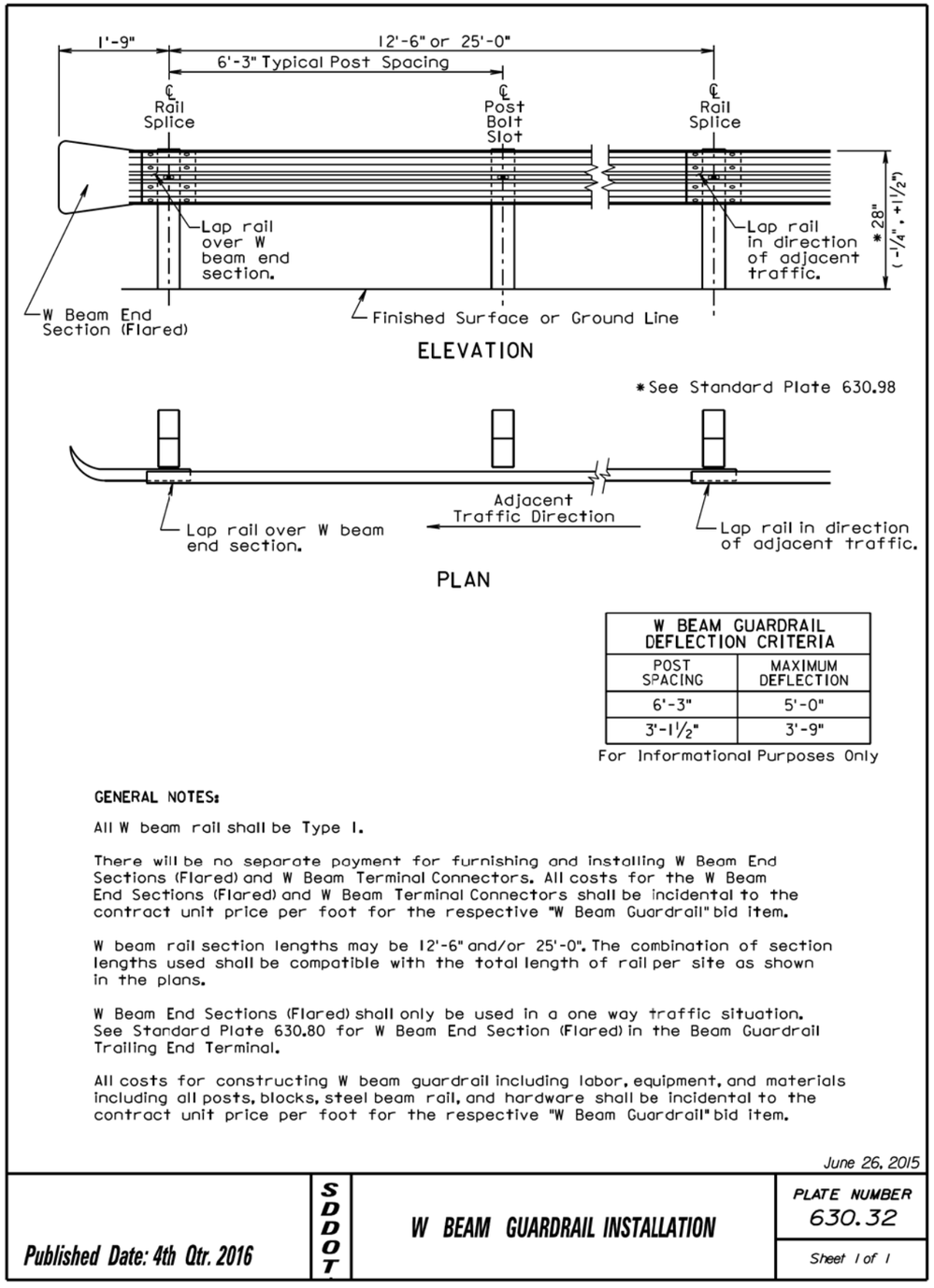
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

The top of post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

Published Date: 4th Qtr. 2016	SDDOT	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31 Sheet 1 of 1



W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	5'-0"
3'-1 1/2"	3'-9"

For Informational Purposes Only

GENERAL NOTES:

All W beam rail shall be Type 1.

There will be no separate payment for furnishing and installing W Beam End Sections (Flared) and W Beam Terminal Connectors. All costs for the W Beam End Sections (Flared) and W Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

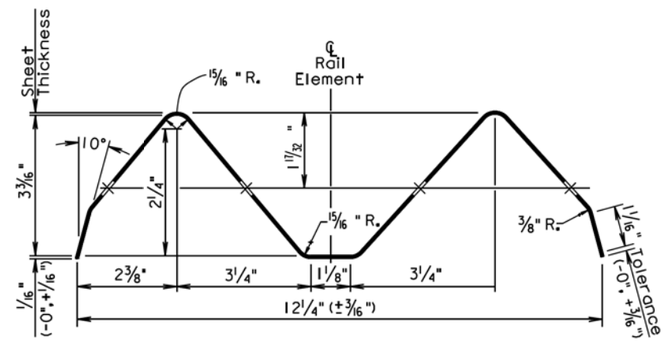
W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

All costs for constructing W beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

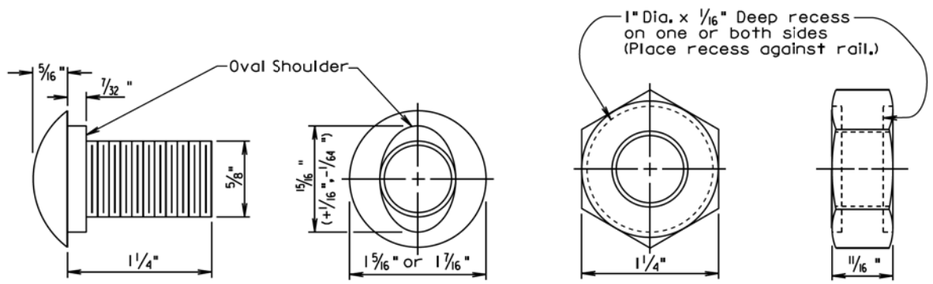
June 26, 2015

Published Date: 4th Qtr. 2016	SDDOT	W BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.32 Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tnpl17196
File - ...\pl\SpnK03A6\s630316\630032.dgn

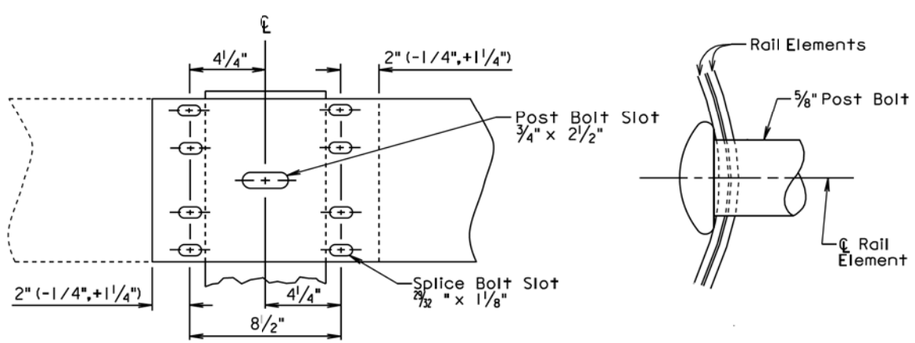


SECTION THROUGH W BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

SPLICE BOLT
(5/8" BUTTON HEAD BOLT AND RECESS NUT)

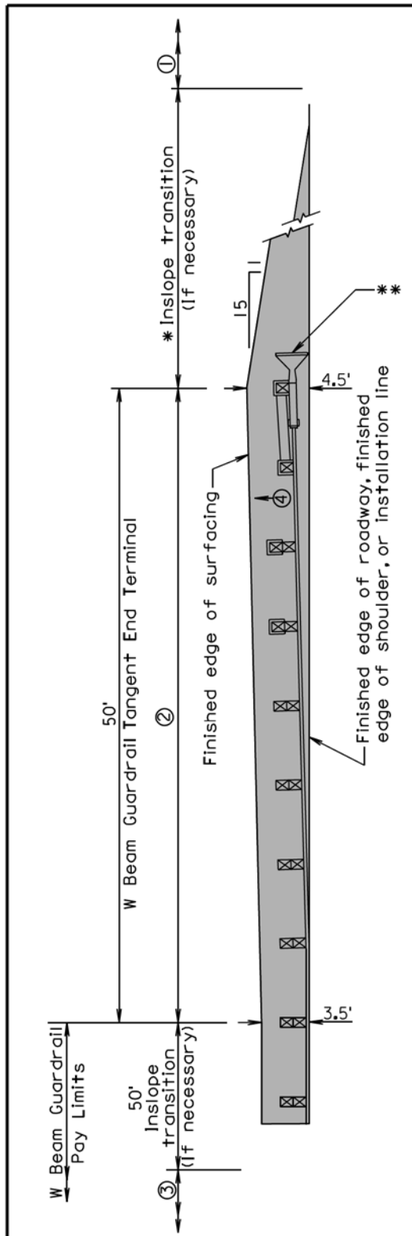


Lap in direction of traffic.

RAIL SPLICE

December 23, 2004

Published Date: 4th Qtr. 2016	SDDOT	W BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.33 Sheet 1 of 1



PLAN

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition shall change 100' for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 100'. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200'.

2" Asphalt concrete surfacing with variable thickness granular material

① Same inslope as mainline inslope
② 4:1 inslope
③ 2:1 inslope or flatter, or inslope as specified in plans
④ Same slope as roadway cross slope

GENERAL NOTES:

The W beam guardrail tangent end terminal shall be installed according to the manufacturer's installation instructions.

**An adhesive object marker shall be placed on the end section buffer or extruder after placement of the end section buffer or extruder. The adhesive object marker dimensions may be 16" x 16" or other variation due to the shape of the end section buffer or extruder. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

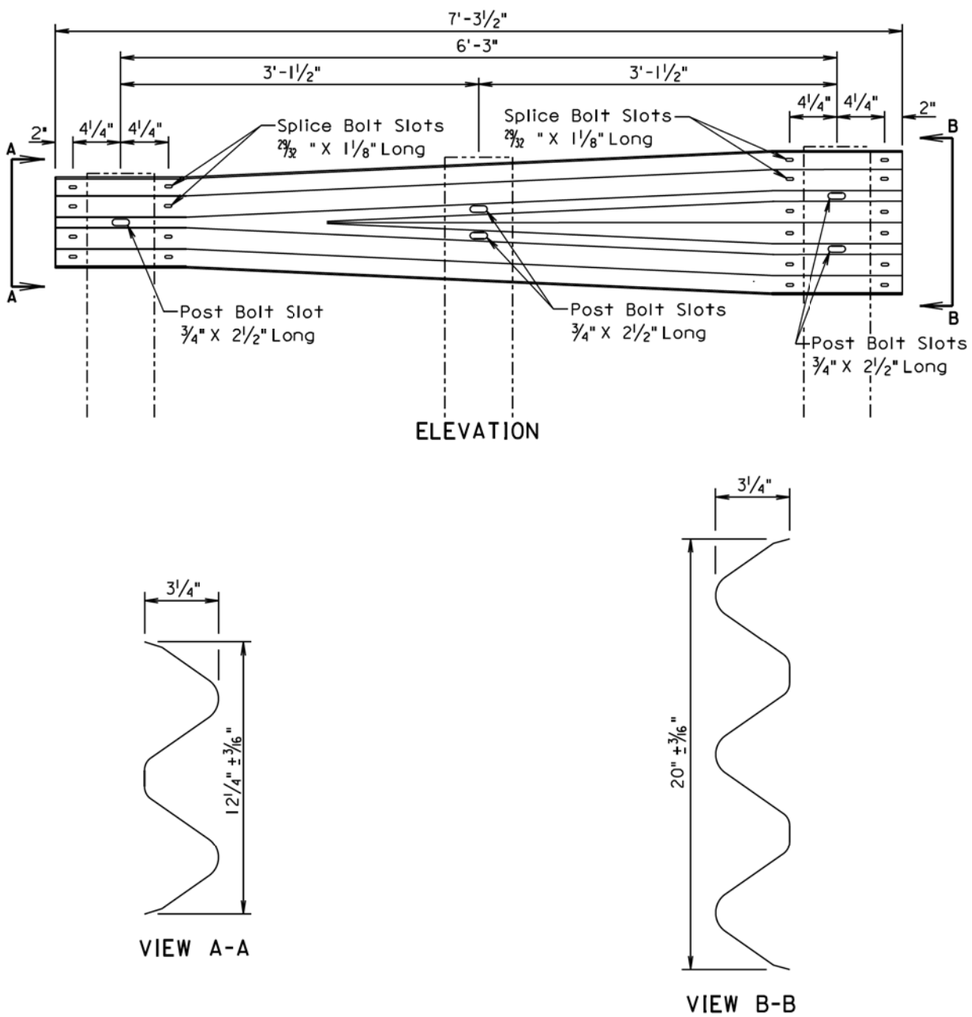
Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite."

Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

December 16, 2014

Published Date: 4th Qtr. 2016	SDDOT	EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL TANGENT END TERMINAL	PLATE NUMBER 630.46 Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tpr17196
File - ...\pn\SpnK03A6\s63033s63046.dgn

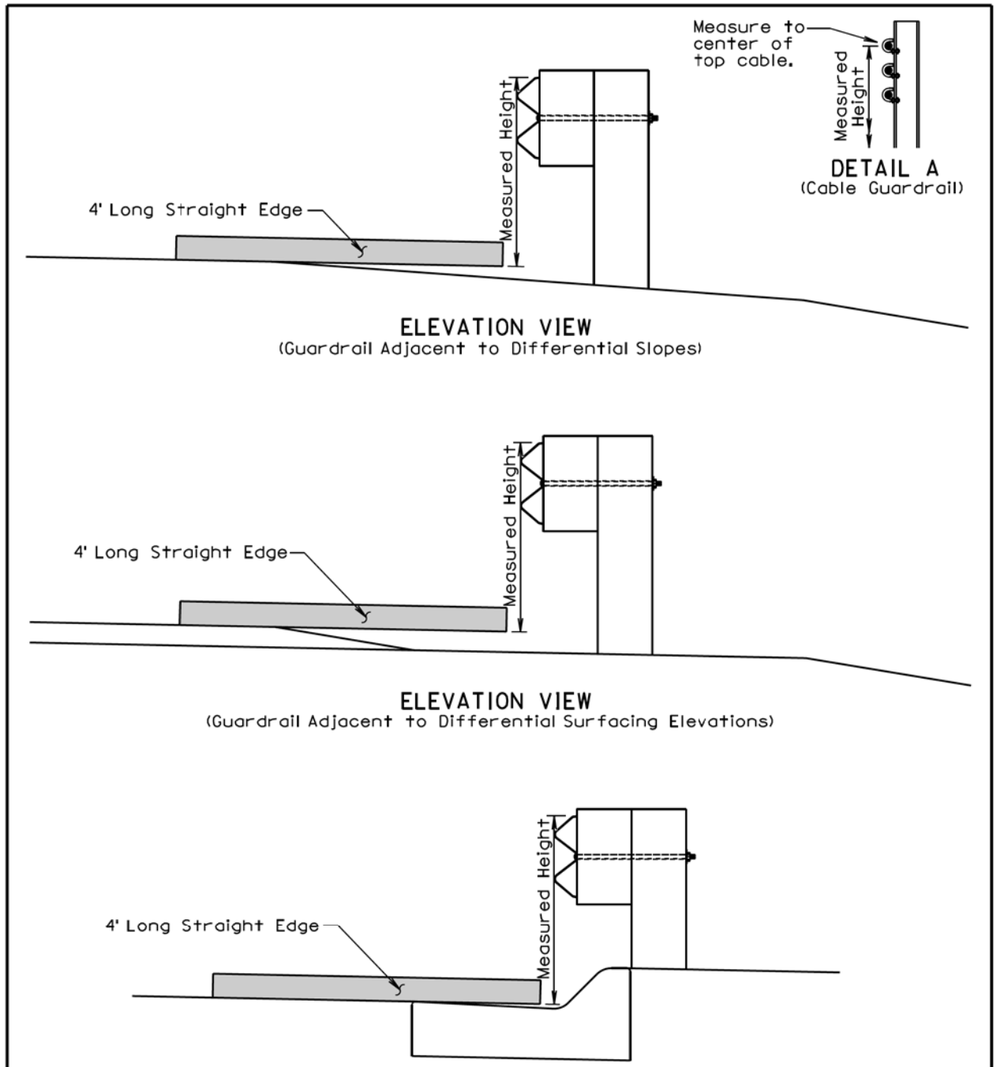


GENERAL NOTE:

All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

March 31, 2000

Published Date: 4th Qtr. 2016	SDDOT	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82
			Sheet 1 of 1



GENERAL NOTES:

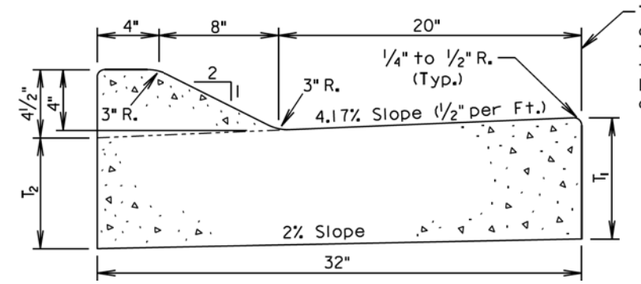
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems shall be measured in accordance with this standard plate.

When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

June 26, 2010

Published Date: 4th Qtr. 2016	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.98
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - tmpr17196
File - ...\prj\Spnk03A6\is63082s63098.dgn



The stated radii on the plans and cross sections refer to this line and it shall also be the basis for horizontal linear foot measurement and payment.

Type	T_1 (Inches)	T_2 (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
D46	6	5 5/16	0.056	18.0
D47	7	6 5/16	0.064	15.7
D48	8	7 5/16	0.072	13.9
D48.5	8.5	7 13/16	0.076	13.1
D49	9	8 5/16	0.080	12.5
D49.5	9.5	8 13/16	0.084	11.9
D410	10	9 5/16	0.088	11.3
D410.5	10.5	9 13/16	0.093	10.8
D411	11	10 5/16	0.097	10.3
D411.5	11.5	10 13/16	0.101	9.9
D412	12	11 5/16	0.105	9.5

GENERAL NOTES:

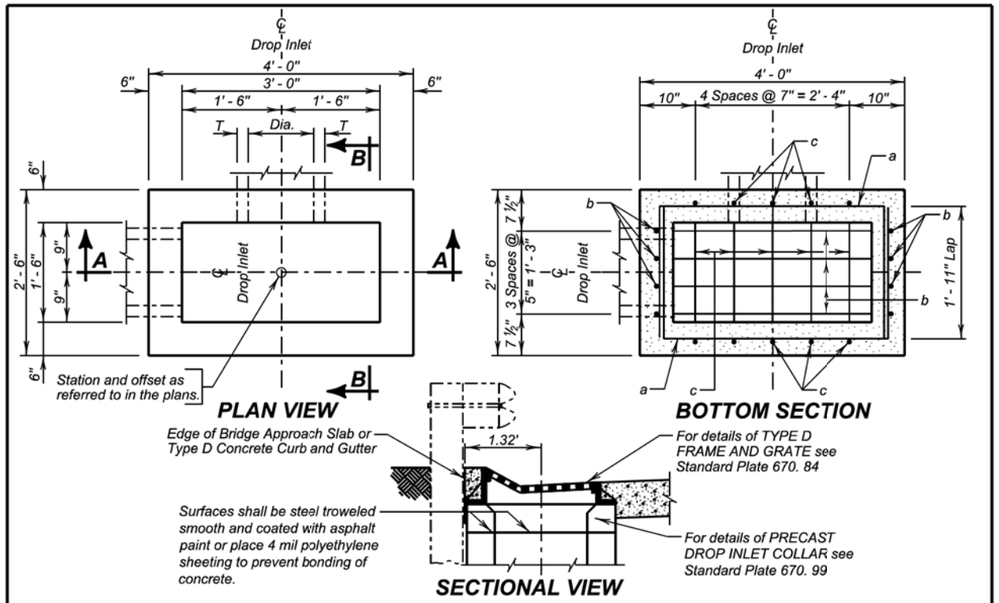
When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

September 6, 2006

Published Date: 4th Qtr. 2016	SDDOT	***TYPE D CONCRETE CURB AND GUTTER***	***PLATE NUMBER*** *650.15*
			Sheet 1 of 1

Plot Scale - 1:200
- Plotted From - tqpr17196
File - U:\rdproj\Spnk03A6\s650115.dgn



DROP INLETS FOR 12" TO 24" DIAMETER PIPE

ESTIMATED QUANTITIES

ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
✳ Class M6 Concrete	Cu. Yd.	0.22	0.20H
Reinforcing Steel	Lb.	39.95	25.40H
Frame and Grate Assembly	Each	1	———

SPECIFICATIONS

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

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

GENERAL NOTES:

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

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

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

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

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

Maximum R.C.P. diameter shall not exceed 12 inches (No R. C. arch) on the 1-foot 6-inch wide side and shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side of the drop inlet.

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

PIPE DISPLACEMENT REDUCTIONS

	Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
R.C.P.	12	2	0.03
	15	2 ¼	0.04
	18	2 ½	0.05
	24	3	0.09
R.C. ARCH	18	2 ½	0.05
	24	3 ½	0.09

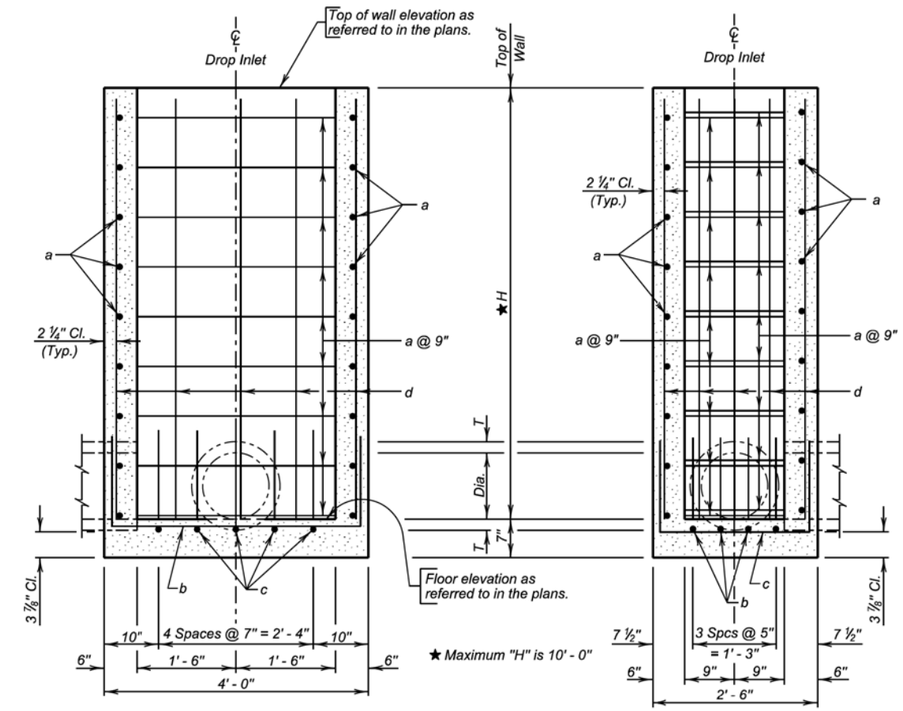
December 16, 2015

Published Date: 4th Qtr. 2016

SDDOT

1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET

PLATE NUMBER 670.20



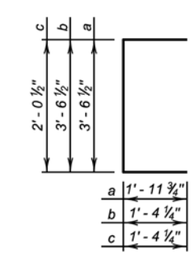
SEC. A - A

SEC. B - B

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a	2.67H	4	7' - 6"	17	
b	4	5	6' - 3"	17	
c	5	4	4' - 9"	17	
d	18	4	H - 2"	Str.	

NOTE:
All dimensions are out to out of bars.



Type 17

December 16, 2015

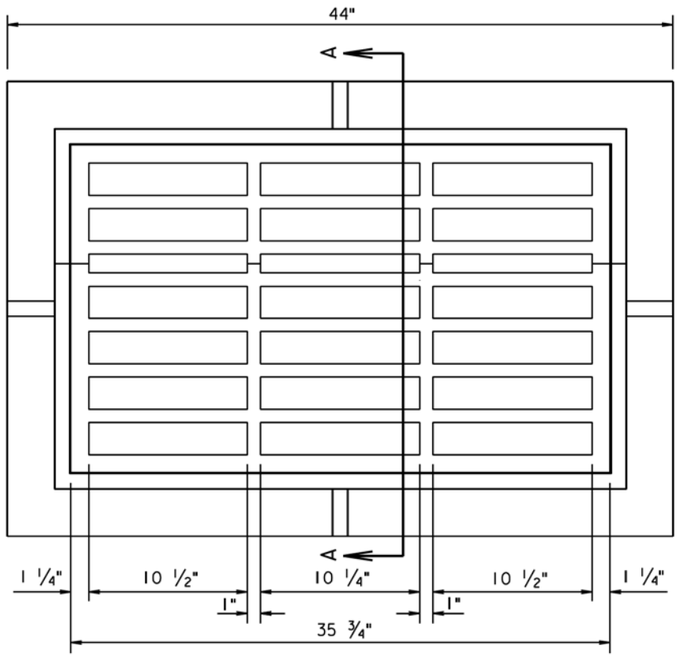
Published Date: 4th Qtr. 2016

SDDOT

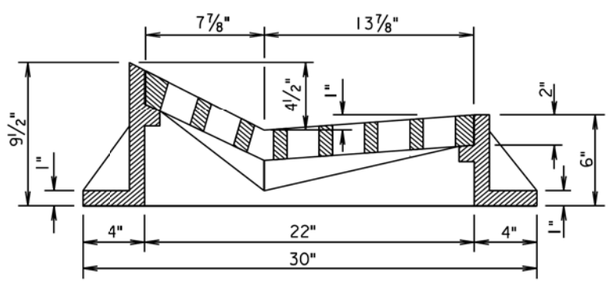
1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET

PLATE NUMBER 670.20

Plot Scale - 1:200
- Plotted From - tnpr17196
File - ...\Spnk03A6\ts67020_1\ts67020_2.dgn



PLAN VIEW



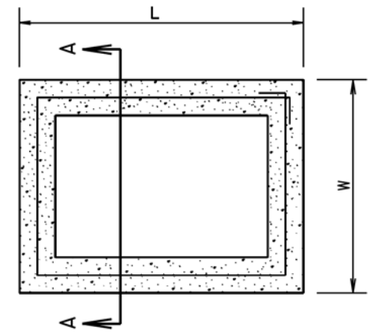
SECTION A-A

GENERAL NOTE:

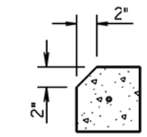
The total weight of the frame and grate shall be 620 pounds minimum.

March 31, 2000

Published Date: 4th Qtr. 2016	SDDOT	TYPE D FRAME AND GRATE	PLATE NUMBER 670.84
			Sheet 1 of 1

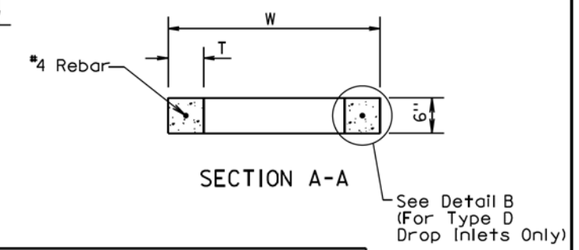


PLAN VIEW



For Type D Drop Inlets only:
Use Precast Drop Inlet Collar with 2" chamfer on L sides only.

DETAIL B



SECTION A-A

INFORMATIONAL QUANTITIES					
FRAME AND GRATE TYPE	L Ft-In	W Ft-In	T In	CLASS M6 CONCRETE CuYd	REINFORCING STEEL Lb
TYPE B	4'-0"	3'-0"	6	0.11	9
TYPE C	5'-0"	4'-0"	6	0.15	11
TYPE D	4'-0"	2'-6"	6	0.10	8

GENERAL NOTES:

All reinforcing steel shall conform to ASTM A615, Grade 60.

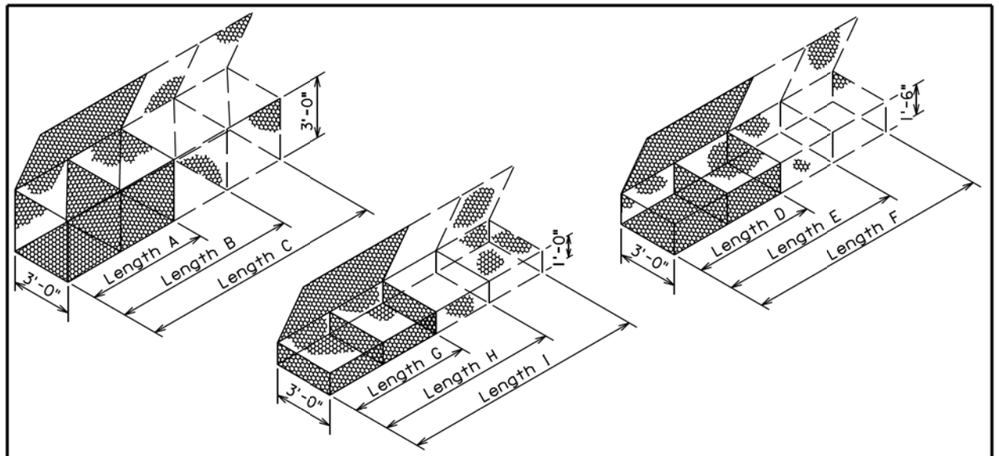
The 1/2" diameter bar shall lap 6" ± and shall be centered in the concrete.

The cost of furnishing and installing Precast Drop Inlet Collars, including labor, materials, and incidentals shall be incidental to the contract unit price per Each for "Precast Drop Inlet Collar".

March 31, 2000

Published Date: 4th Qtr. 2016	SDDOT	PRECAST DROP INLET COLLAR	PLATE NUMBER 670.99
			Sheet 1 of 1

Plot Scale - 1:200
- Plotted From - tnpr17196
File - ...\pn\Spnk03A6\s67004s67099.dgn



GABION DETAILS

STANDARD SIZES

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

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

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

The lacing procedure is as follows:

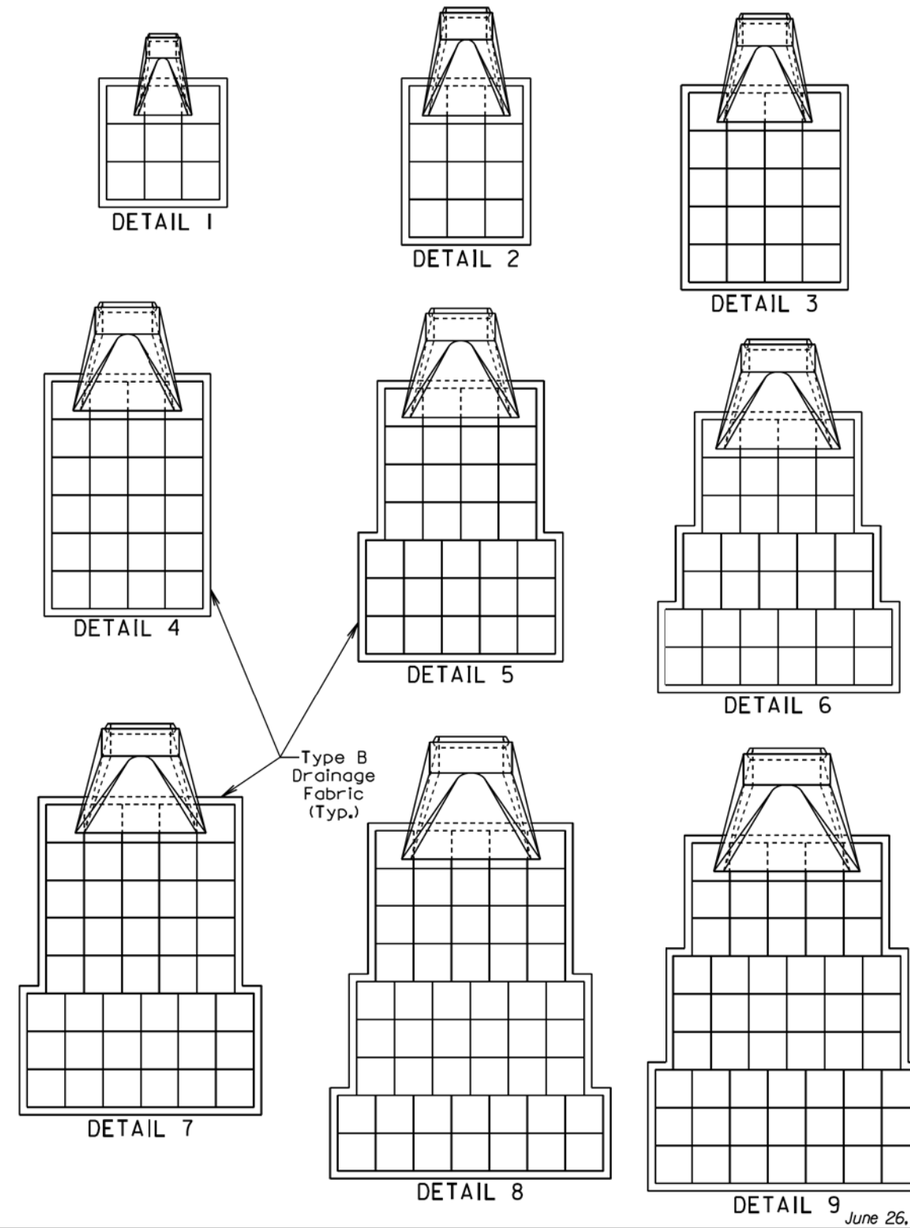
1. Cut a length of lacing wire approximately 1 ½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

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

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

June 26, 2001

Published Date: 4th Qtr. 2016	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1



June 26, 2016

Published Date: 4th Qtr. 2016	SDDOT	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 1 of 2

Plot Scale - 1:200
Plotted From - tnpr17196
File - ...\prj\Spnk03A6\s72001s72003.dgn