

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2014	Pass: 70	Trucks: 15	Total: 85	NA
Forecast 2034	Pass: 71	Trucks: 15	Total: 86	NA
Clear Zone Distance: 18		Design Speed: 55 M.P.H		
Minimum Sight Dist. for Stopping: 495		Bridges: N/A		
Minimum Sight Dist. for Safe Passing: N/A				
Sight Dist. for No Passing Zone: N/A				
Pavement Design Life N/A (years)				

JOB #14

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-4324(058)	20765	1	1

# SIoux COUNTY NORTH DAKOTA

Federal Aid Project  
SC-4324(058)

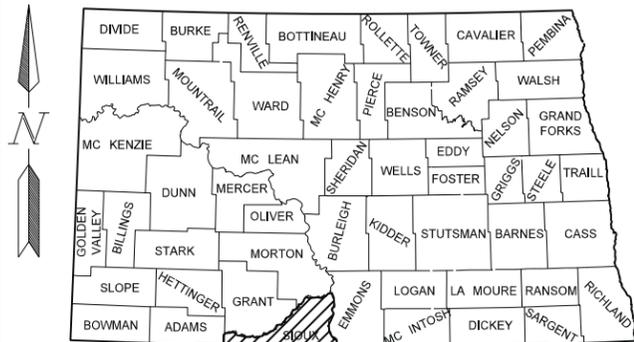
CMC 4324 (95th Street)  
from 2.5 miles west to Selfridge

Project consists of grading, aggregate surfacing,  
drainage improvements & incidental items.

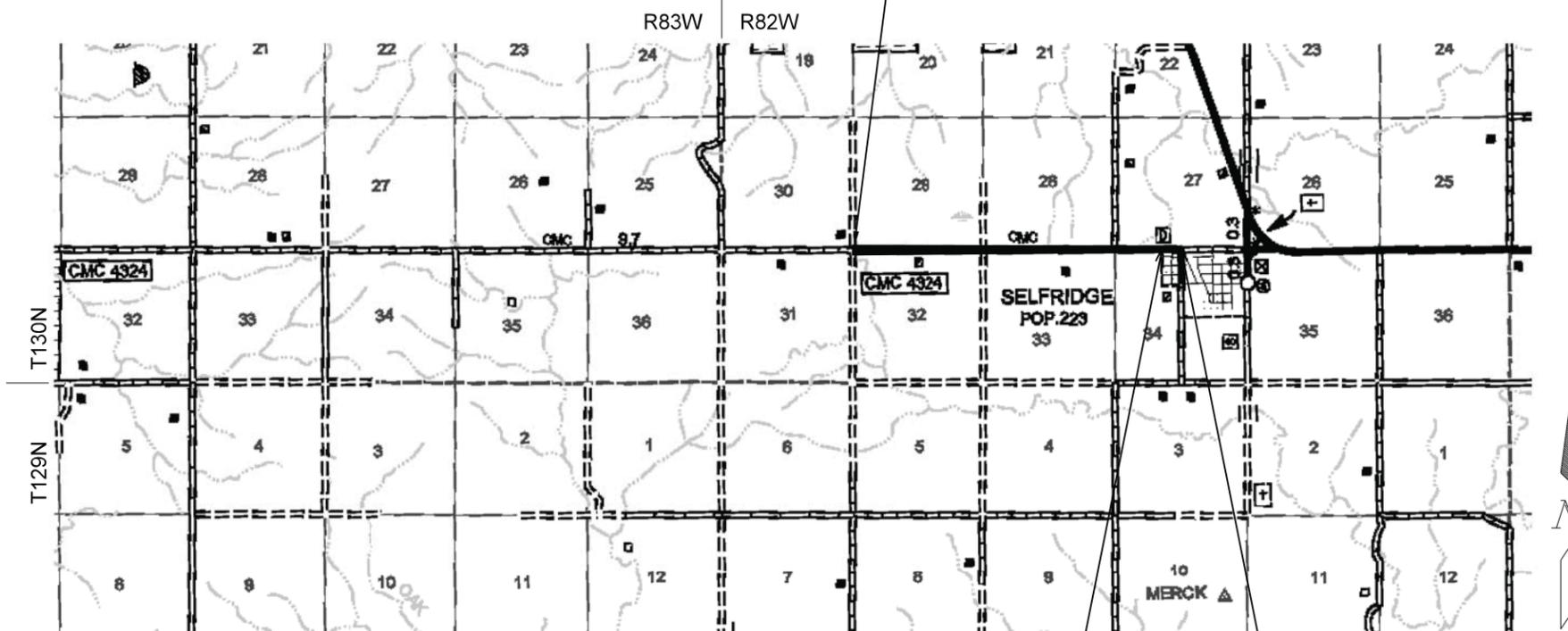
**GOVERNING SPECIFICATIONS:**

Standard Specifications adopted by the North Dakota  
Department of Transportation October 2014; Standard Drawings  
currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SC-4324(058) \ CMC 4324	2.500	2.500



SKETCH MAP OF NORTH DAKOTA  
SHOWING COUNTIES



BEGIN PROJECT SC-4324(058)  
STA. 231+27.17  
NW Cor of Section 32, T130N, R82W

CITY LIMITS  
City of Selfridge  
Sta 355+47.91  
776.80' west of the NE corner of the  
NW1/4 Section 34 T130N, R82W

END PROJECT SC-4324(058)  
Sta 363+24.70  
N¼ Cor of Section 34 T130N, R82W

DESIGNERS
Daren Peterka, PE
Tim Pearson



I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 8-29-2014

Daren Peterka /s/  
Daren Peterka, PE

M1400100

This document was originally issued and sealed by Daren Peterka Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

### TABLE OF CONTENTS

<u>Section No.</u>	<u>Sheet No.</u>	<u>Description</u>
1	1	Title Sheet
2	1	Table of Contents/Standard Drawings
6	1-4	Notes
8	1	Summary of Quantities
10	1	Basis of Estimate
20	1-2	General Details
30	1	Typical Sections
51	1	Pipe Summary
60	1-8	Plan & Profile Sheets
75	1	Erosion Control
81	1	Survey Coordinate and Curve Data
100	1-3	Work Zone Traffic Control
200	1-37	Cross Sections

### SPECIAL PROVISIONS

SP 3(14)	Temporary Erosion and Sediment Best Management Practices
SP 49(14)	TERO
SP 5018(14)	Permits and Environmental Considerations

### LIST OF STANDARD DRAWINGS

<u>Drawing No.</u>	<u>Description</u>
D-101-1,2,3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20,21	Line Styles
D-101-30,31,32	Symbols
D-203-8	Standard Rural Approaches
D-255-2	Erosion and Siltation Control - Erosion Control Blanket Installation
D-260-1	Erosion and Siltation Controls
D-261-1	Erosion and Siltation Controls - Silt Fence
D-704-7	Breakaway Systems for Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems for Construction Zone Signs – U-Channel Post
D-704-9	Construction Sign Details – Terminal and Guide Signs
D-704-10	Construction Sign Details – Regulatory Signs
D-704-11	Construction Sign Details – Warning Signs
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign Punching and Mounting Details
D-704-15	Road Closure Layouts
D-704-19	Road Closure and Lane Closure on a Two Way Road Layouts
D-704-20	Terminal and Seal Coat Sign Layouts
D-704-22	Construction Truck and Temporary Detour Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-30	Windrow Marking
D-708-6	Erosion and Siltation Controls – Median or Ditch Inlet Protection
D-714-1	Reinforced Concrete Pipe Culvert and End Section (Round Pipe)
D-714-4	Corrugated Steel Pipe Culverts and End Sections
D-714-11	Traversable End Sections For Corrugated Steel Pipe Culverts
D-714-25	Transverse Mainline Pipe Excavation and Installation Detail for Pipes More Than 4 Feet Below The Top
D-714-26	Transverse Mainline Pipe Excavation and Installation Detail for Pipes 4 Feet or Less Below the Top
D-714-28	Transverse Mainline Pipe Excavation and Installation Detail for Pipes Installed in New Embankment
D-720-1	Standard Monuments and Right of Way Markers
D-754-23	Perforated Tube Assembly Details
D-754-24, 25	Mounting Details Perforated Tube
D-754-26, 27, 29, 51	Sign Punching, Stringer, and Support Location Details Regulatory, Warning, and Guide Signs
D-754-87	Sign Punching, Stringer and Support Location Details for Street Name Signs and 911 Signing
D-766-1	Mailbox Location Details

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	6	1

## NOTES

### 105-P01 CONTROL OF WORK:

1. Thicknesses shown on the typical sections for the surfacing are approximate. It is intended that the plan tonnages provided for by the basis of estimate will be used uniformly throughout the project unless otherwise authorized by the Engineer.
2. Approaches are to be constructed to the dimensions shown in Standard Drawing D203-8 except that culverts shall be placed at the toe of the back slope.

### 107-P01 HISTORICAL PRESERVATION RESPONSIBILITIES:

In accordance with Section 107 of the Standard Specifications, the Contractor is reminded of their environmental and historic preservation responsibilities where they must contact the NDDOT Archeologist at (701) 328-2731 and SRST THPO Officer for clearance of materials sources before work begins.

### 107-P02 HAUL ROADS:

1. The Contractor is referred to Section 39-12-05.3 of the North Dakota Century Code, which pertains to weight limits. A portion of Paragraph #2 of this section of the code reads: "The gross weight on state highways may not exceed one hundred five thousand five hundred pounds (47,854.00 kilograms) unless otherwise posted and on all other highways the gross weight may not exceed eighty thousand pounds (36,287.39 kilograms) unless designated by local authorities for highways under their jurisdiction for gross weights not to exceed one hundred five thousand five hundred pounds (47,854.00 kilograms)..."
2. Any haul road repair deemed necessary by the County or owner of the roadway or the Engineer to designated haul roads occurring after the pre-haul inspection and as a result of the Contractors hauling and in accordance with the specifications will be paid for according to Section 107.08F. Any repair required because of overload or over speed hauling will be paid for by the Contractor at no additional cost to the owner.
3. Contractors are advised to check with the County Road Superintendent for the load limits on roads that will be considered for use as "haul roads" for this project. The Contractor shall contact the Standing Rock Sioux Tribe, appropriate State, County, Township and City officials to determine if there are any No Haul Routes prior to preparing a bid for this project.

### 107-P03 STORM WATER RUNOFF PERMIT:

A Storm Water Runoff Permit will be required from the ND Department of Health as detailed in the project proposal. Any additional temporary erosion controls required due to this permit, directed by the engineer, or needed due to site conditions shall be installed and paid for under the conditions of Specification 107. SRST/EPA storm water permit shall be obtained by the Contractor. Sioux County shall be listed as the owner.

### 201-P01 CLEARING AND GRUBBING:

Removed trees, stumps (all sizes), brush and debris shall be disposed of by the Contractor at a site outside of the right-of-way. Payment shall be in accordance with Section 201.06 of the Standard Specifications (Lump Sum). (Approximately 36 acres for informational purposes only, not to be used for bidding).

### 202-P01 REMOVE AND SALVAGE BASE AND SURFACING:

1. Two inches of existing aggregate surfacing shall be salvaged.
2. The contractor can use the salvaged aggregate as traffic aggregate during construction. All salvaged aggregate not used as traffic aggregate during construction shall be spread on the new graded road top.
3. All costs to salvage and spread the existing aggregate surfacing shall be included in the item "Remove & Salvage Base & Surfacing."

### 202-P02 REMOVAL OF CULVERTS AND END SECTIONS:

1. Existing Pipe and End Sections Removal: The Contractor shall remove and salvage all of the existing culverts and end sections using caution not to cause any damage. The salvaged pipe and end sections shall be cleaned and stockpiled at the County shop on the east end of the project. All costs to salvage, clean, transport, and stockpile the existing culverts and end sections shall be included in the bid item "Removal of Culverts – All Types and Sizes."

### 203-P01 EXCAVATION AND EMBANKMENT:

1. Placement of embankment shall be in accordance with Section 203.04E of the Standard Specifications (Compaction Control, Type B).
2. An average shrinkage factor of 135% (1.35) has been applied to the embankment material.
3. Common Excavation: Measurement for Common Excavation shall to be in accordance with Section 203.05A of the Standard Specifications (Contract Quantity). The material obtained from within the right-of-way shall be used in construction of the new road as shown on the cross sections.
4. The topsoil shall be stripped to its full depth. The topsoil depth was estimated be (4) inches for the overall average.



This document was originally issued and sealed by Daren Peterka Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

**NOTES**

- The Contractor shall spread the topsoil evenly over the entire disturbed right-of-way and construction easement areas, except the road top, approach tops, and riprap.
- Topsoil will not be measured separately but will be paid at plan quantity. All costs to salvage, stockpile, and replace the topsoil shall be included in the unit price bid for "Remove and Salvage Topsoil".

**216-P01 WATER:**

The cost of water required for compaction of the Excavation, and Embankment, dust control and laying aggregate has been included in the quantities and shall be paid for at the unit price bid for "Water".

**251-P01 SEEDING:**

- Seeding shall cover the entire disturbed right-of-way and construction easement areas. Seeding shall be Class III in accordance with Section 251 of the Standard Specifications. Payment for seeding shall be per mile. (Approximately 38 acres, for informational purposes only, not to be used for bidding.)

<b>CLASS III</b>		<b>POUNDS PURE LIVE SEED</b>
<u>GRASS SPECIES</u>	<u>VARIETY</u>	<u>PER ACRE</u>
Western Wheatgrass	Rodan or Rosanna	6
Slender Wheatgrass	Revenue or Primer	4
Pubescent Wheatgrass	Mandan 906 or Greenleaf	6
Intermediate Wheatgrass	Oahe	4
<b>Total</b>		<b>20</b>

- A cover crop is required as per Section 251.03E.

**255-P01 EROSION CONTROL BLANKET:**

An estimated quantity of erosion control blanket has been included in the plans to be placed at erosion critical locations primarily around the structures as directed by the engineer.

Erosion control blanket called for at the ends of the Pipe Conduit shall be ECB Type 3.

**256-P01 ROCK RIPRAP:**

- Any shaping necessary to prepare for the riprap placement shall be included in the price bid for "Riprap Grade I." Riprap shall be paid for by the Cubic Yard (C.Y.) as shown on the Plans unless otherwise directed by the Engineer in the field. All riprap shall conform to Section 256 of the Standard Specifications. Geotextile filter fabric

shall be installed under the Rock Riprap and shall be included in the price bid for "Riprap Grade I." (Approximately 98 SY – for informational purposes only, not to be used for bidding.)

**261-P01 FIBER ROLLS:**

- An estimated quantity of fiber rolls for Temporary Erosion Control has been included in the plans to be placed at erosion critical locations on the project as either shown on the plans or as directed by the engineer.
- The quantity of fiber rolls may vary from that shown on the plans. There will be no additional cost increases for overruns or underruns on this item.
- After replacement of the topsoil, a quantity of fiber rolls has been included for the Permanent Erosion Control and shall be installed at the locations shown on the Plan and Profile or as designated by the Engineer in the field, and in accordance with plan details and the standard specifications.
- Any and all costs required to furnish, install, repair and maintain the fiber rolls shall be included in the unit price bid for the various sizes of fiber rolls on the project.

**261-P02 TEMPORARY EROSION CONTROL MEASURES:**

- During the course of the project, the installation of fiber rolls will be required according to the Standard Drawings. The fiber rolls will be placed at various locations along the project, which will be determined by the Engineer in the field.
- Immediately after the removal of topsoil, fiber rolls will be required at locations where runoff leaves the project. The locations will be determined by the Field Engineer. The Field Engineer may allow the fiber rolls to be reused as construction advances. If the fiber rolls are reused in different locations, the Contractor will be paid the unit price bid for "Fiber Rolls" each time the fiber rolls are reset. The fiber rolls are to be placed immediately after the removal of topsoil shall be on-site before the stripping of topsoil may begin. An estimated quantity of fiber rolls is included in the summary of quantities for use at locations where runoff leaves the project.

**704-P01 TEMPORARY TRAFFIC CONTROL:**

- Local traffic shall be maintained through the project during construction.
- While construction operations are active, local traffic shall be maintained utilizing traffic control devices and flagging.
- Traffic control layout D-704-26 Type Y shall be installed on each end of the active construction operations as directed by the Engineer. The speed limit shall be 25 mph.



This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

## NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	6	3

4. At the end of every day's operations the road shall be in a two way traversable condition for the traveling public as directed by the Engineer.
5. Traffic control for the installation of mainline pipe conduits shall be in accordance with Standard Drawing D-704-22 Type M. All excavations for mainline pipe shall be backfilled at the end of each day's operations.
6. The special signs identified in section 100 shall be installed at the intersections of CMC 4324 and ND HWYS 6 & 31. The exact location will be identified by the Engineer.

### **714-P01 CULVERTS:**

1. Culvert Bedding: All pipe culverts shall be installed in accordance with Section 714.04A.1 of the Standard Specifications and Standard Drawings D714-25, 26 & 28.

### **720-P01 MONUMENTS:**

All section and quarter corner monuments within the project limits shall be offset prior to construction by a registered land surveyor hired by the contractor. The monument will be reset and recorded as per state law by a surveyor licensed to practice in the state of North Dakota. All monuments shall be installed in accordance with Section 720 of the Standard Specifications.

### **752-P01 FENCE BARBED WIRE 4 STRAND:**

Fence Barbed Wire 4 Strand shall be installed as per Standard Specification 752. All costs to place fence shall be included in the bid item "Fence Barbed Wire 4 Strand".

### **752-P02 TEMPORARY FENCE:**

1. Temporary fencing may be needed by some of the landowners. It shall be the Contractor's responsibility to communicate with the landowner to coordinate time and locations of Temporary Fence.
2. All costs to place temporary fence and removing the temporary fence shall be included in the bid item "Temporary Fence".

### **754-P01 RESET SIGN PANEL AND RESET SIGN SUPPORTS:**

The signs and supports shown on the plans as reset are to be removed, salvaged, cleaned and stockpiled at the County shop on the east end of the project until they are reset. Any signs or supports damaged during removal, storage, and resetting shall be replaced at the contractor's expense. The signs shall have anchors removed and the anchors used in the resetting operation. The cost of removing and resetting signs and supports with perforated tube supports shall be included in the price bid for "Reset Sign Panel" and "Reset Sign Support". All costs associated with the salvage, cleaning, transport, and stockpiling shall not be paid for separately and shall be included in the price bid for other items.

### **766-P01 MAILBOXES**

The bid item for mail boxes shall include all costs to temporarily relocate for construction and install the new permanent mailbox. The Contractor is responsible to coordinate the location and installation details with the US Postal Service.



This document was originally issued and sealed by  
Daren Peterka  
Registration Number  
PE-4358,  
On 8/29/14 and the original document is stored at  
Interstate Engineering, Inc.,  
Mandan, ND

## ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	6	4

**ENVIRONMENTAL COMMITMENTS:** Sioux County, the NDDOT, and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

**Commitment No. 1:** All disturbed vegetation will be reseeded upon completion of construction.

Action taken/required: Native grass seed will be used to reseed any disturbed areas in a timely manner. The contractor will place seed as indicated.

**Commitment No. 2:** Dust emissions from construction needs to be minimized.

Action taken/required: All necessary means will be taken by the contractor to control fugitive dust emissions during construction.

**Commitment No. 3:** Noise from construction activities must be minimized.

Action taken/required: The contractor will ensure that equipment is equipped with a recommended muffler in good working order.

**Commitment No. 4:** Conversion of prime farmland to non-agricultural use must be documented.

Action taken/required: Form AD-1006 has been filled out and submitted to the National Resource Conservation Service (NRCS).

**Commitment No. 5:** An erosion control plan will be developed.

Action taken/required: The contractor shall install and maintain erosion control devices as shown on the plans and directed by the Engineer.

**Commitment No. 6:** All waste material associated with the project must be disposed of properly and not placed in identified flooding areas.

Action taken/required: The contractor shall properly dispose of any construction/demolition material in accordance with the waste disposal note contained in the North Dakota Standard Specification for Road & Bridge Construction.

**Commitment No. 7:** All unavoidable impacts to wetlands shall be mitigated.

Action taken/required: Sioux County will mitigate all impacts to wetlands on site. The mitigation will be completed at a 2:1 ratio as depicted in the plans.

**Commitment No. 8:** In the event that human remains are encountered during construction or an inadvertent find is made, construction must be halted.

Action taken/required: In the event that the above situation is encountered, the Contractor is required to stop construction activities and immediately contact the Standing Rock Tribal Historic Preservation Office at (701) 854-2120.

**PERMITS / FORMS REQUIRED:**

- 1) SRST/EPA storm water permit shall be obtained by the Contractor. Sioux County shall be listed as the owner.
- 2) Department of the Army 404 Permit, has been obtained by Sioux County.
- 3) Certification of Tribal Requirements
- 4) TERO Special Provision as required

Wetland Number	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands	Impacts to Wetlands	
						Temp.	Perm.
**NO WETLANDS PRESENT**							
TOTALS:			0.00			0.00	0.00

USACE project number (NWO-2009-2826-BIS)



This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, on 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

## ESTIMATED QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	8	1

Spec	Code	Unit		Quantity
103	0100	L SUM	CONTRACT BOND	1
201	0330	L SUM	CLEARING & GRUBBING	1
202	0165	TON	REMOVE & SALVAGE BASE & SURFACING	3361
202	0170	LF	REMOVAL OF CULVERTS-ALL TYPES & SIZES	243
202	0312	LF	REMOVE EXISTING FENCE	15523
203	0102	CY	COMMON EXCAVATION-TYPE B	34741
203	0125	CY	REMOVE & SALVAGE TOPSOIL	7483
216	0100	M GAL	WATER	580
251	0350	MILE	SEEDING-CL III	2.5
251	2001	MILE	TEMPORARY COVER CROP	2.5
255	0103	SY	ECB TYPE 3	500
256	0100	CY	RIPRAP GRADE I	32.4
261	0112	LF	FIBER ROLLS 12IN	6976
261	0113	LF	REMOVE FIBER ROLLS 12IN	3488
302	0356	TON	AGGREGATE SURFACE COURSE CL 13	12270
702	0100	L SUM	MOBILIZATION	1
704	0100	MHR	FLAGGING	200
704	1000	UNIT	TRAFFIC CONTROL SIGNS	1186
704	1052	EA	TYPE III BARRICADE	10
704	1060	EA	DELINEATOR DRUMS	10
704	1081	EA	VERTICAL PANELS-BACK TO BACK	50
704	1185	HR	PILOT CAR	100
709	0701	SY	GEOTEXTILE FABRIC-TYPE R1	670
714	4099	LF	PIPE CONDUIT 18IN-APPROACH	412
714	4105	LF	PIPE CONDUIT 24IN	212
720	0100	EA	MONUMENTS	6
752	0200	LF	FENCE BARBED WIRE 4 STRAND	15369
752	0905	LF	TEMPORARY FENCE	15369
752	2100	EA	VEHICLE GATE	2
754	0592	EA	RESET SIGN PANEL	4
754	0593	EA	RESET SIGN SUPPORT	4
766	0100	EA	MAILBOX-ALL TYPES	2



This document was originally issued and sealed by  
Daren Peterka  
Registration Number PE-4358,  
On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

### Summary of Quantities

CMC 4324  
95<sup>th</sup> Street

Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	10	1

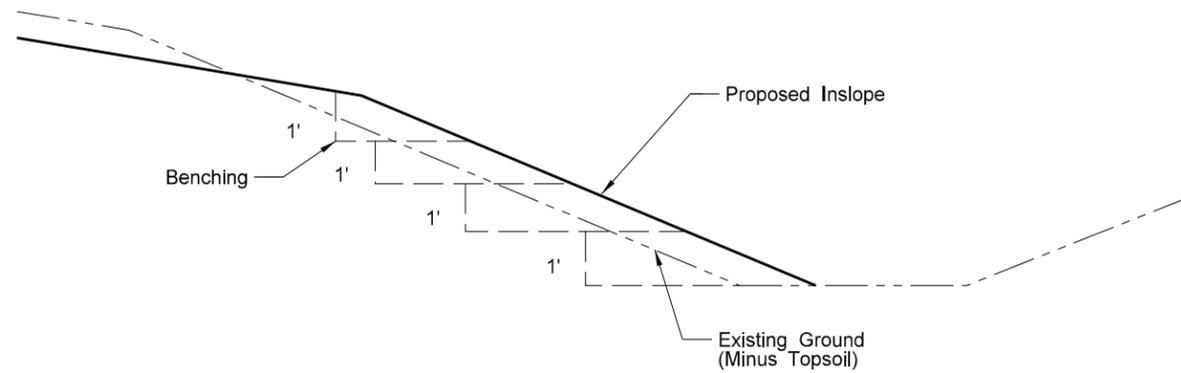
**BASIS OF ESTIMATE**

<u>SPEC</u>	<u>CODE</u>	<u>ITEM</u>	<u>RATE</u>	<u>UNIT</u>
202	0165	<b>REMOVE &amp; SALVAGE BASE &amp; SURFACING</b> 22' wide by 2" depth	1344	TON/MILE
203	0125	<b>REMOVE &amp; SALVAGE TOPSOIL</b> 4" Depth (See Cross Sections for Stripping Limits)		
216	0100	<b>WATER</b> Common Excavation & Embankment	10	GAL/CY
		Salvage Aggregate	10	GAL/CY
		Dust Palliative	25	MGAL/MI
251	0301	<b>SEEDING-CL III</b> Entire disturbed area except the newly constructed roadtop. Estimated area is 38 acres.		
255	0103	<b>ECB TYPE 3</b> As directed by the Engineer	200SY/MILEx2.5=500SY	
261	0112	<b>FIBER ROLLS 12IN</b> Where Runoff Leaves the Project	800	LF/MILE
302	0356	<b>AGGREGATE SURFACE COURSE CL 13</b> Mainline - 6" Surface Course	1.875	TON/CY
		Private Drives - 3" Surface Course (See Standard Drawing D-203-08)	4767	TON/MILE
		Section Line Drive - 3" Surface Course (See Standard Drawing D-203-08)	24	TON/EA
			42	TON/EA
704	0100	<b>FLAGGING</b>	80	HOURS/MILE
704	1185	<b>PILOT CAR</b>	40	HOURS/MILE
766	0100	<b>MAILBOX-ALL TYPES</b> 261+90 LT, Single, Replace 317+40 LT, Single, Replace		

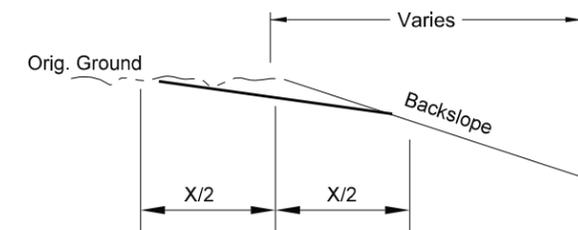


This document was originally issued and sealed by Daren Peterka Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	20	1

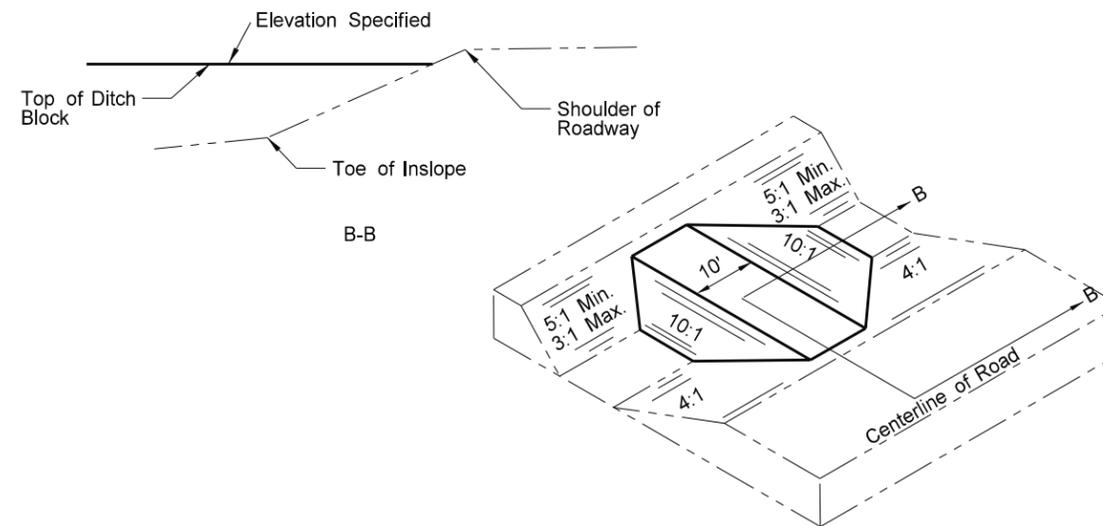


**BENCHING TYPICAL SECTION**  
N.T.S.



Backslope rounding where  $X = 10'$   
unless restricted by height of backslope

**BACKSLOPE ROUNDING**  
N.T.S.



**DITCH BLOCK DETAIL**  
N.T.S.



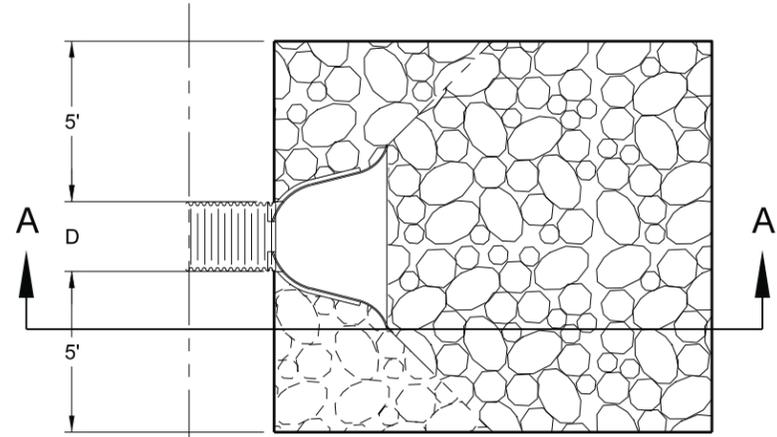
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Benching and Ditch Block Details

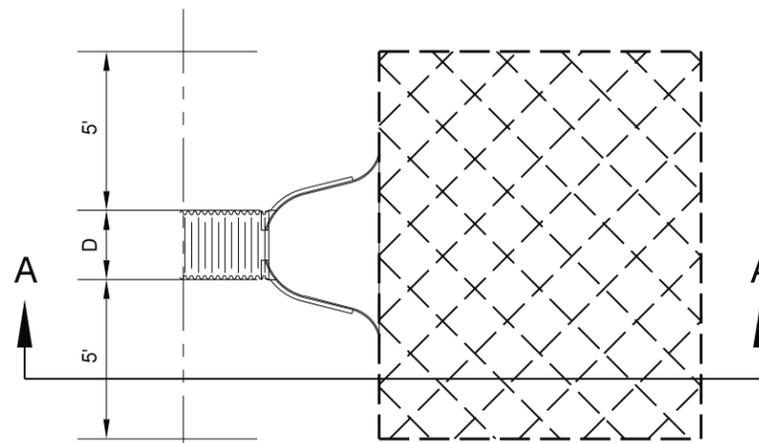
CMC 4324  
95th Street

Sioux County, North Dakota

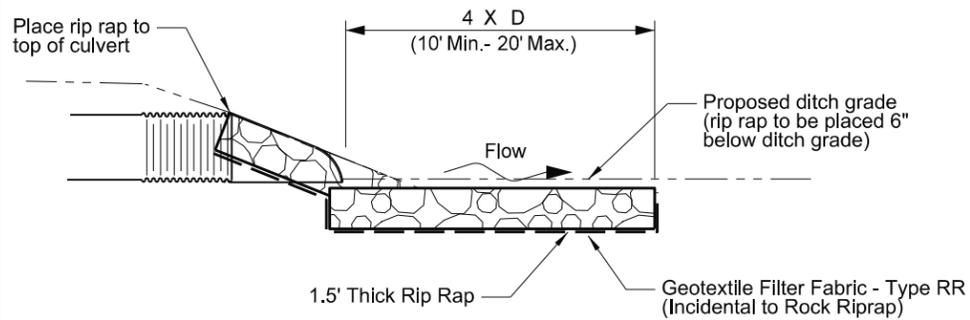
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	20	2



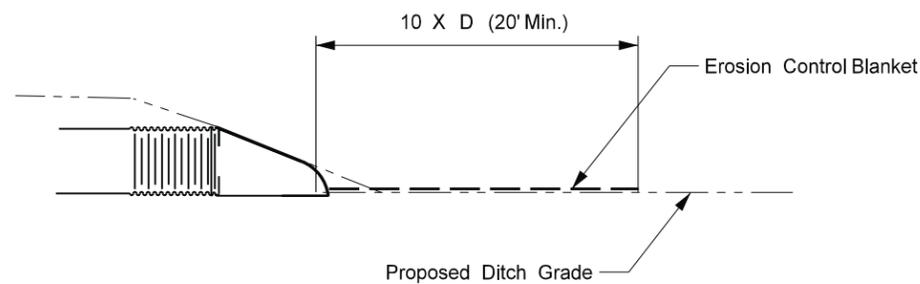
PLAN VIEW - SINGLE PIPE CONDUIT



PLAN VIEW - SINGLE PIPE CONDUIT



SECTION A-A



SECTION A-A

RIPRAP AT CULVERT OUTLETS		
SIZE (IN)	QUANTITY OF RIPRAP (CY)	QUANTITY OF FILTER FABRIC
12	5.8	17.3
15	6.3	18.9
18	6.9	20.7
24	8.1	24.3
30	9.4	28.2
36	10.8	32.3
48	13.7	11.2

**RIP RAP AT CENTERLINE CULVERT OUTLETS**

Culvert with Step Flared Ends N.T.S.

Erosion Control Blanket at Culvert Ends		
Dia. of Culvert (IN)	Span of Culvert (IN)	Quantity of Erosion Control Blanket (SY)
12	21	25
15	24	25
18	28	26
24	35	27
30	42	35
36	49	43
48	57	62

SEE STD DWG D-255-2

**EROSION CONTROL BLANKET AT APPROACH CULVERT OUTLETS**

Culvert with Step Flared Ends N.T.S.



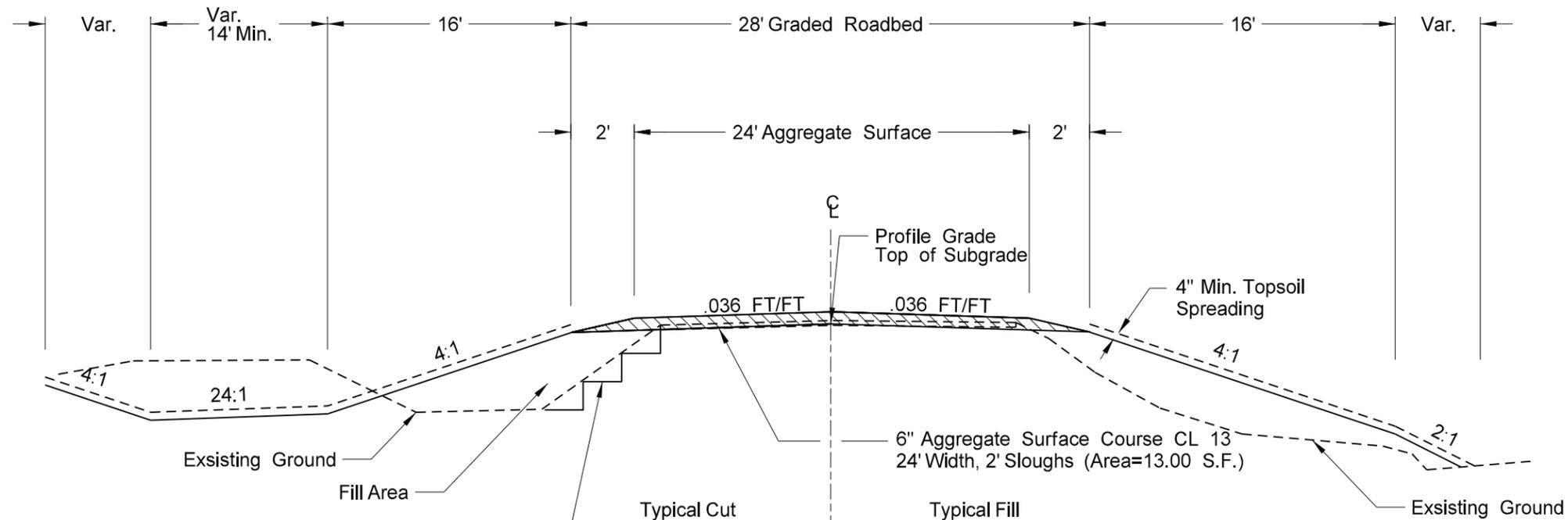
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Fiber Roll Details at Center Line Culverts

CMC 4324  
95th Street

Sioux County, North Dakota

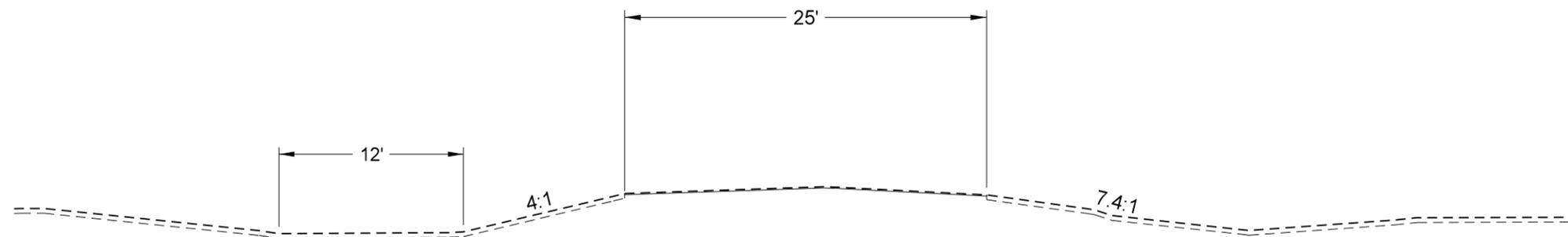
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	30	1



ROADWAY SYMMETRICAL ABOUT CENTERLINE

Proposed Typical Section (N.T.S.)

CMC 4324 (95th St)  
Station 231+27.17 - Station 363+24.70



Existing Typical Section (N.T.S.)

CMC 4324 (95th St)  
Station 231+27.17 - Station 363+24.70



This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

TYPICAL SECTIONS  
CMC 4324  
95th Street  
Sioux County, North Dakota

## Pipe Summary

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	51	1

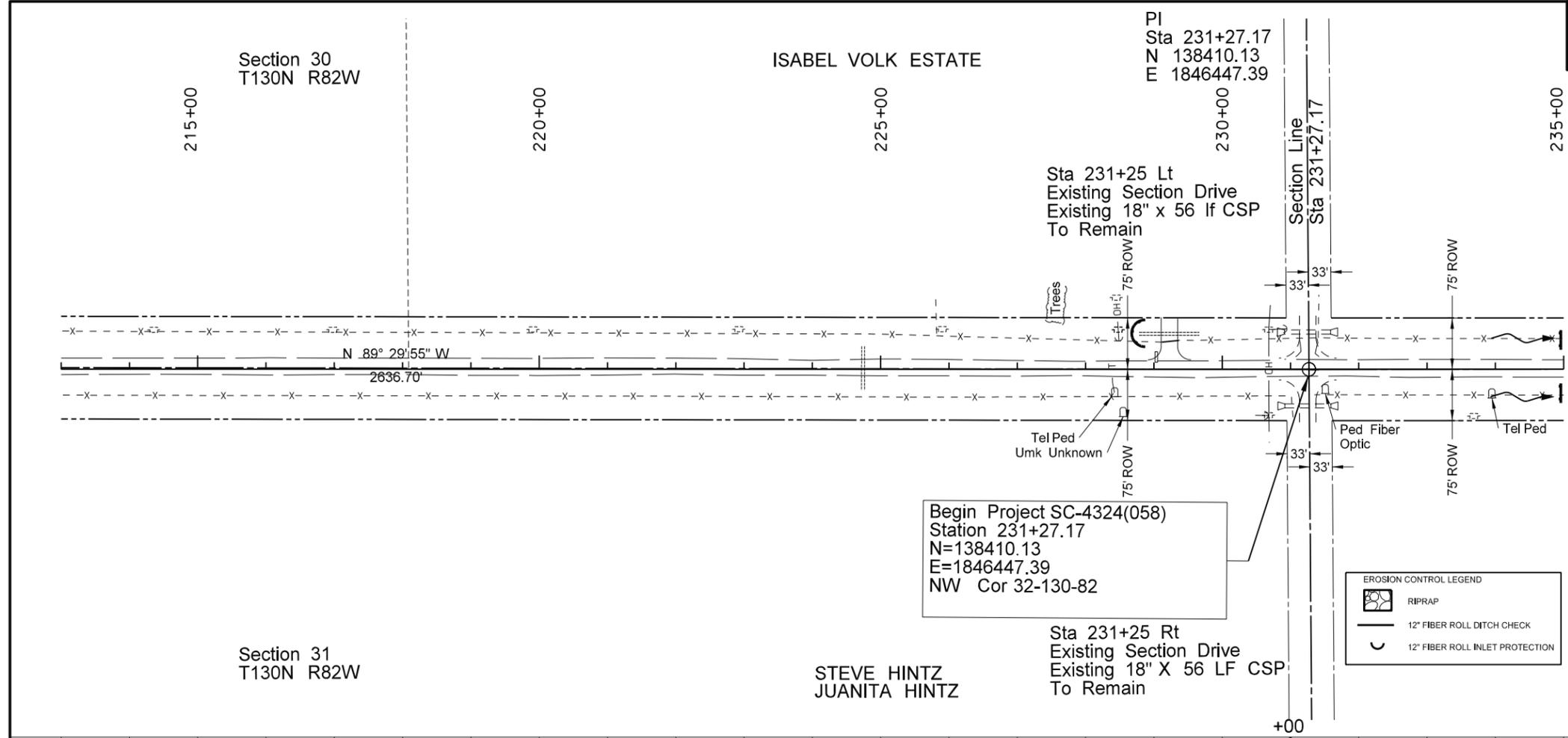
Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Pay Size	Pipe Conduit Approach Pay Size	Pipe Conduit Storm Drain Pay Size	Allowable Material	Required Diameter	Minimum Thickness	R1 Fabric (Pay Item)	(A) End Sections		(A) Backfill	Applicable Backfill Detail
												Begin	End	Cl 3 or Cl 5	
												EA	EA	CY	
239+00	27' Lt	239+00	25' Rt	52	24			Reinforced Concrete Pipe - Class III (barrel length = 42 LF)	24		150	Y	Y	54	D-714-26
								Polymeric Coated Steel (over zinc or aluminum coated steel)	24	0.064		(Traversable)	(Traversable)	52	
261+54	Rt	262+10	Rt	56		18		Reinforced Concrete Pipe - Class III (barrell length = 50 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
273+07	27' Lt	273+07	25' Rt	52	24			Reinforced Concrete Pipe - Class III (barrel length = 48 LF)	24		120	Y	Y	54	D-714-26
								Polymeric Coated Steel (over zinc or aluminum coated steel)	24	0.064		(Traversable)	(Traversable)	52	
283+75	Rt	284+35	Rt	60		18		Reinforced Concrete Pipe - Class III (barrell length = 54 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
283+75	Lt	284+35	Lt	60		18		Reinforced Concrete Pipe - Class III (barrell length = 54 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
296+92	Rt	297+52	Rt	60		18		Reinforced Concrete Pipe - Class III (barrell length = 54 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
316+33	26' Lt	316+33	30' Rt	56	24			Reinforced Concrete Pipe - Class III (barrel length = 52 LF)	24		200	Y	Y	54	D-714-26
								Polymeric Coated Steel (over zinc or aluminum coated steel)	24	0.064		(Traversable)	(Traversable)	56	
317+02	Rt	317+58	Rt	56		18		Reinforced Concrete Pipe - Class III (barrell length = 50 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
336+59	Lt	337+19	Lt	60		18		Reinforced Concrete Pipe - Class III (barrell length = 54 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
336+59	Rt	337+19	Rt	60		18		Reinforced Concrete Pipe - Class III (barrell length = 54 LF)	18			Y	Y		N/A
								High Density Polyethylene (HDPE)	18						
								Polymeric Coated Steel (over zinc or aluminum coated steel)	18	0.064					
350+03	25' Lt	350+03	27' Rt	52	24			Reinforced Concrete Pipe - Class III (barrel length = 48 LF)	24		200	Y	Y	54	D-714-25
								Polymeric Coated Steel (over zinc or aluminum coated steel)	24	0.064		(Traversable)	(Traversable)	52	



This document was originally issued and sealed by  
 Daren Peterka  
 Registration Number PE-4358,  
 On 8/29/14 and the original document is stored at Interstate Engineering, Inc.,  
 Mandan, ND

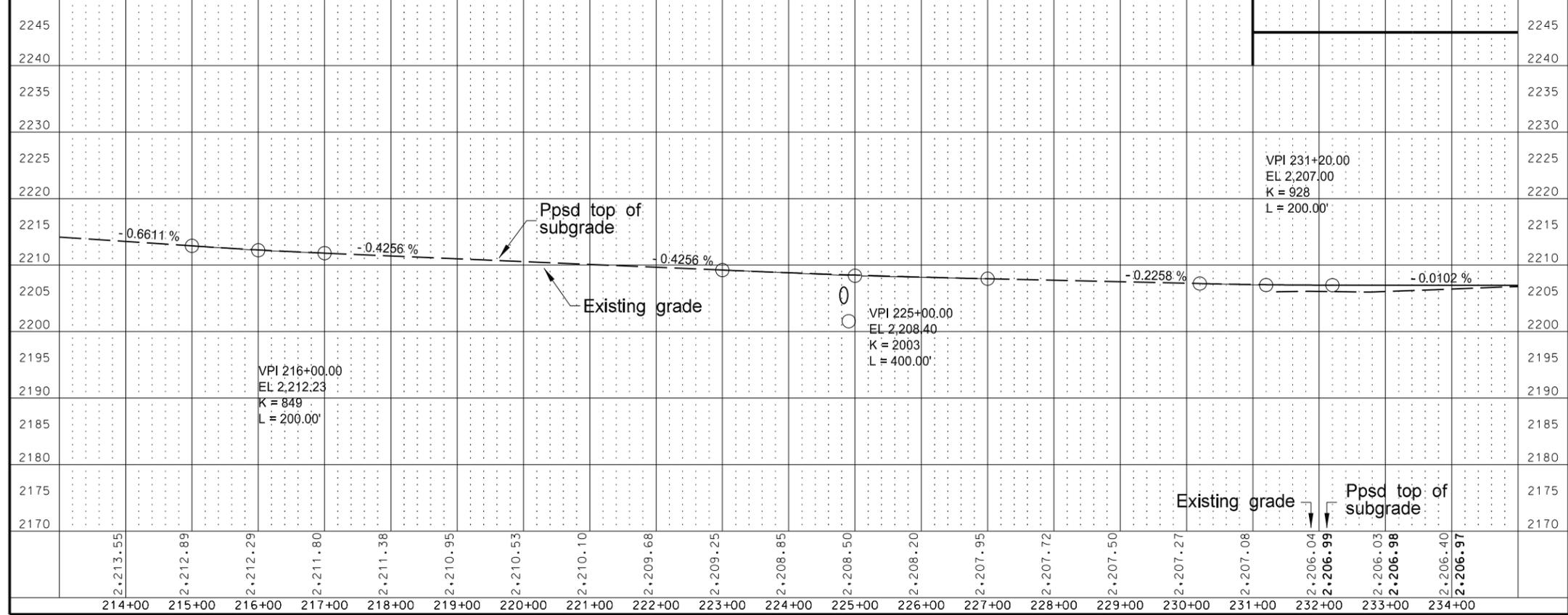
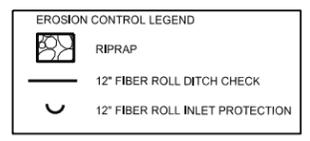
Pipe Summary  
  
 CMC 4324  
 95<sup>th</sup> Street  
  
 Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	1



Fiber Rolls 12in Sta 233+00 Rt&Lt	48 LF
Monuments Sta 231+27.17 ☉	1 EA
Remove Fence Sta 231+35 to 235+00 Lt Sta 231+35 to 235+00 Rt	387 LF 387 LF
Fence Barbed Wire 4 Strand Sta 231+35 to 235+00 Lt Sta 231+35 to 235+00 Rt	365 LF 365 LF

Begin Project SC-4324(058)  
Station 231+27.17  
N=138410.13  
E=1846447.39  
NW Cor 32-130-82



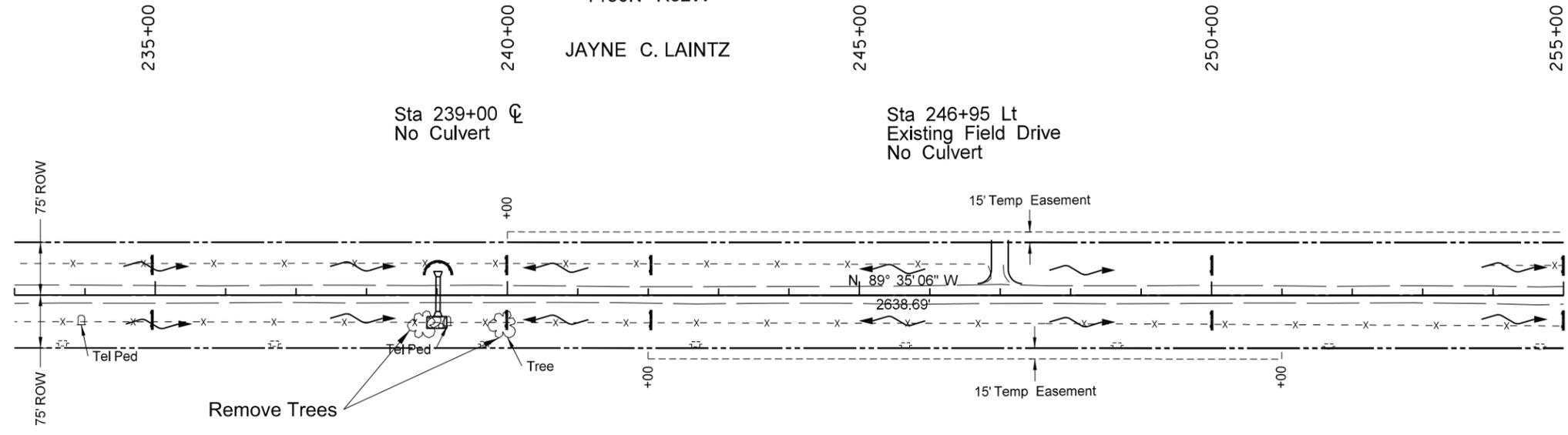
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 214+00 - Sta 234+00  
  
CMC 4324  
95th Street  
Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	2

Section 29  
T130N R82W

JAYNE C. LAINTZ



Riprap Grade I	Sta 239+00 Rt	8.1 CY
Fiber Rolls 12in	Sta 235+00 Rt&Lt	48 LF
	Sta 239+00 Lt Inlet Protection	24 LF
	Sta 240+00 Rt&Lt	48 LF
	Sta 242+00 Rt&Lt	48 LF
	Sta 250+00 Rt&Lt	48 LF
Pipe Conduit 24IN	Sta 239+00 C	52 LF
Remove Fence	Sta 235+00 to 246+90 Lt	1190 LF
	Sta 254+00 to 255+00 Lt	122 LF
	Sta 235+00 to 255+00 Rt	2022 LF
Fence Barbed Wire 4 Strand	Sta 235+00 to 246+90 Lt	1190 LF
	Sta 254+00 to 255+00 Lt	100 LF
	Sta 235+00 to 255+00 Rt	2000 LF

DAVID, CHARLES, ALVIN, JEFFERY VOLK  
BONNIE SILBERNAGEL

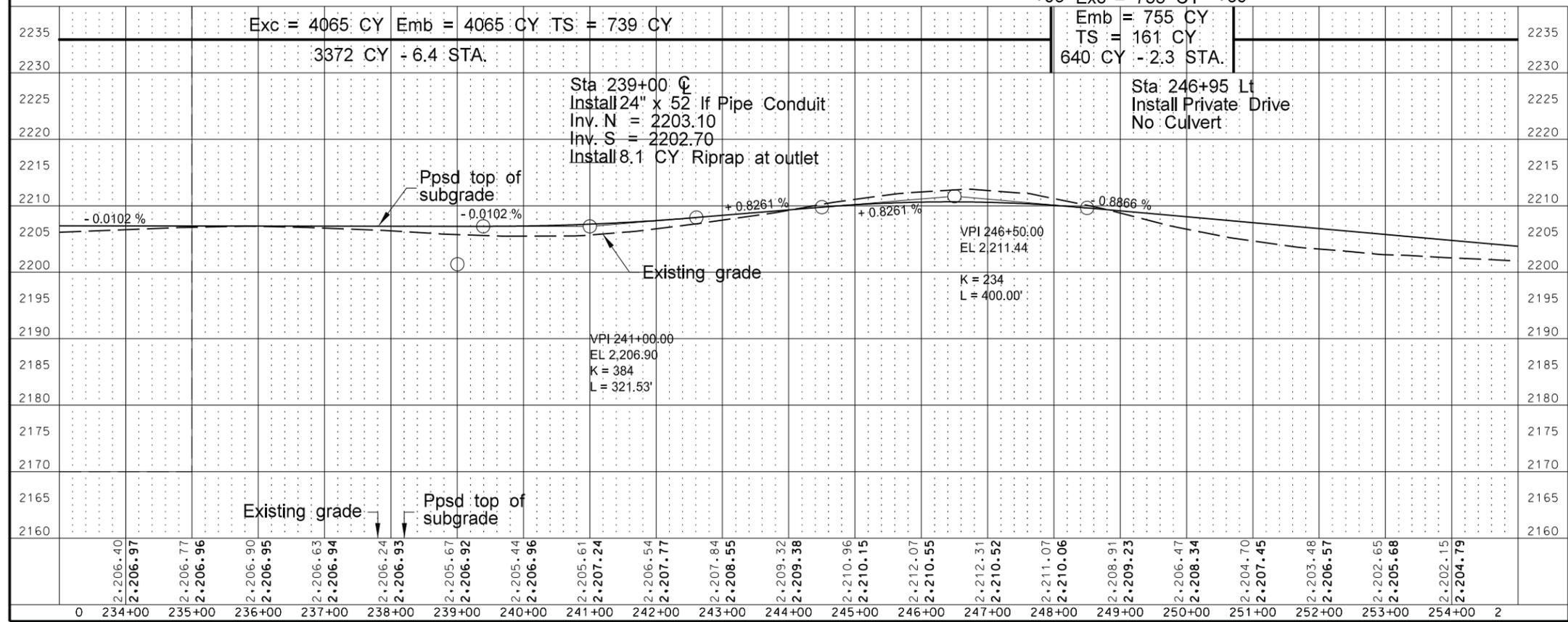
Section 32  
T130N R82W

EROSION CONTROL LEGEND

	RIPRAP
	12" FIBER ROLL DITCH CHECK
	12" FIBER ROLL INLET PROTECTION



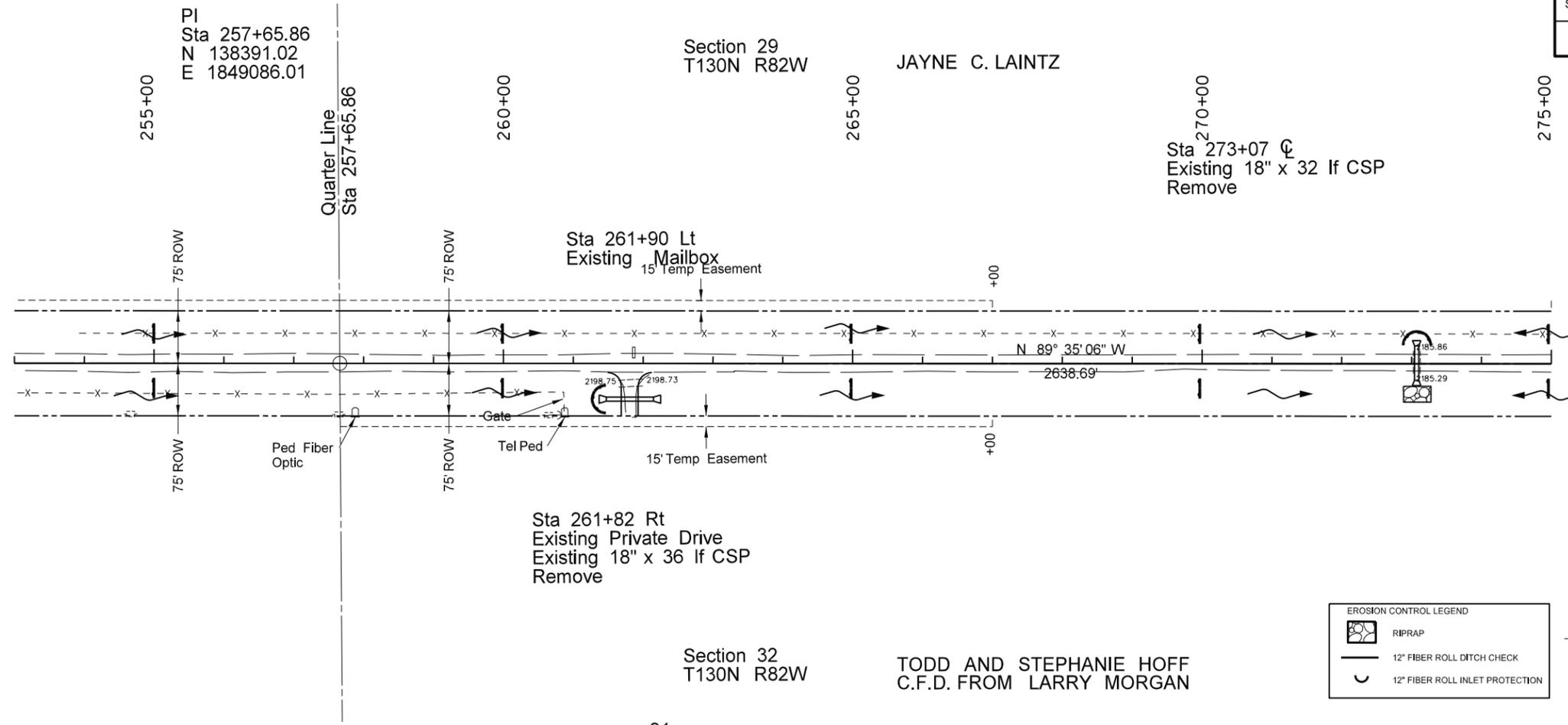
+96 Exc = 755 CY +69



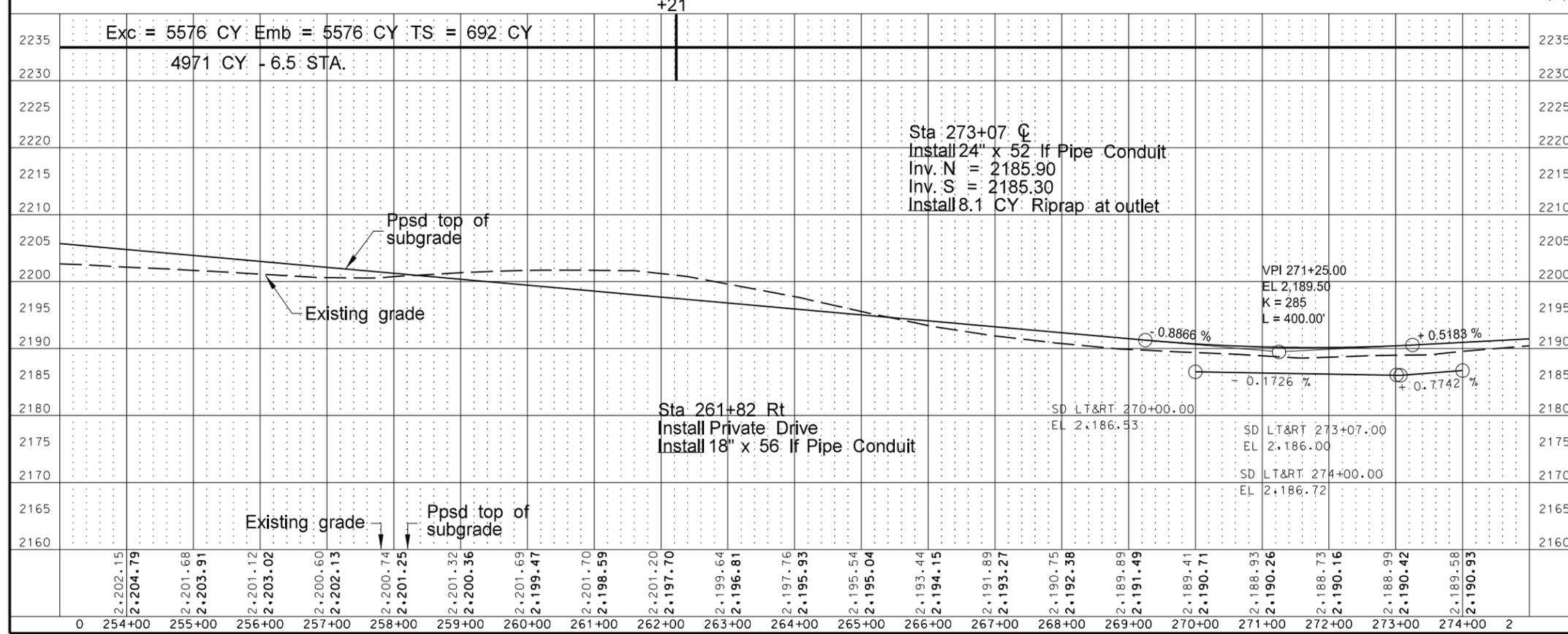
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 234+00 - Sta 254+00  
  
CMC 4324  
95th Street  
  
Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	3



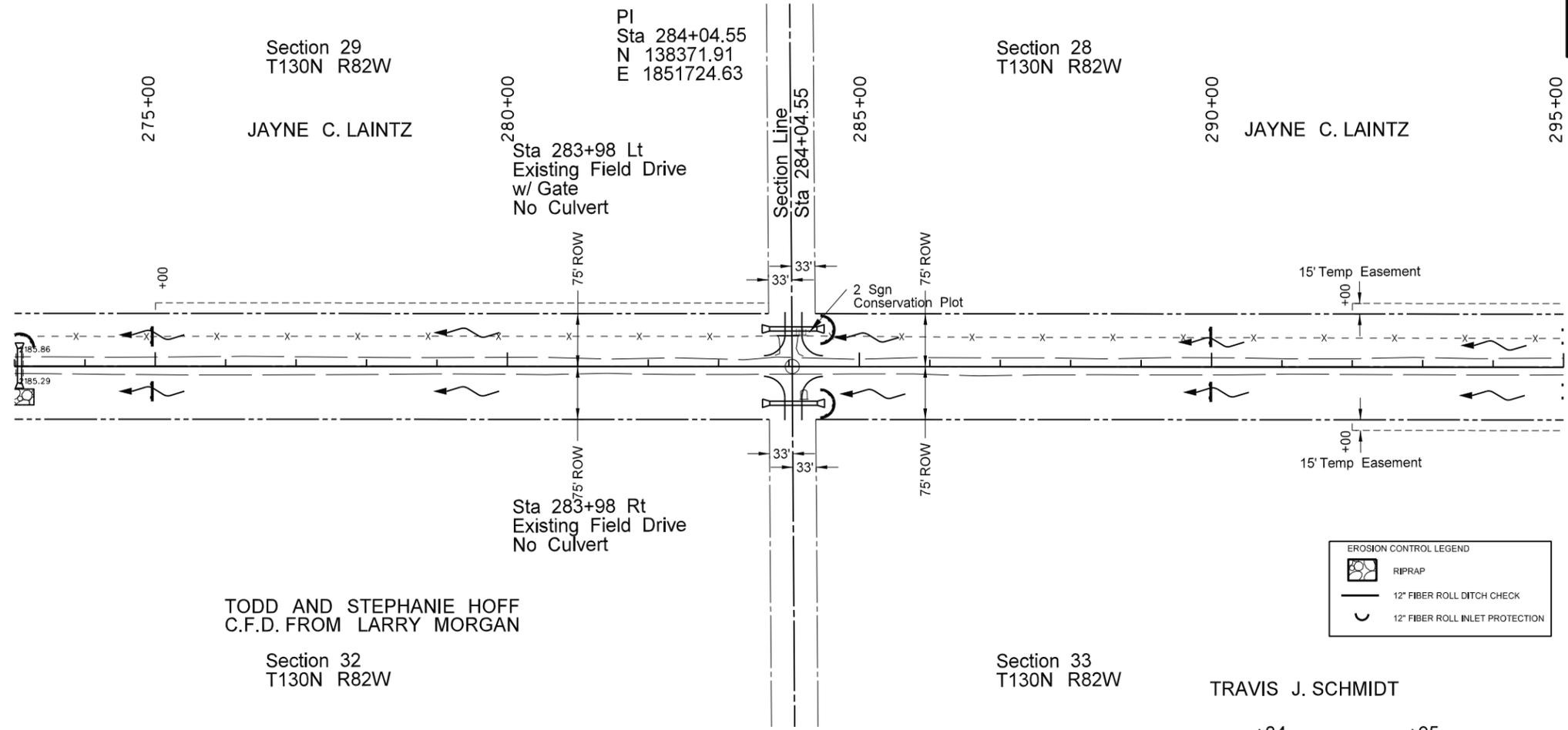
<b>Removal of Culverts-All Types &amp; Sizes</b>		
Sta 261+82 Rt		36 LF
Sta 273+07 C		32 LF
<b>Riprap Grade I</b>		
Sta 273+07 Rt		8.1 CY
<b>Fiber Rolls 12in</b>		
Sta 255+00 Rt&Lt		48 LF
Sta 260+00 Rt&Lt		48 LF
Sta 261+82 Rt Inlet Protection		24 LF
Sta 265+00 Rt&Lt		48 LF
Sta 270+00 Rt&Lt		48 LF
Sta 273+07 Lt Inlet Protection		24 LF
<b>Pipe Conduit 18in Approach</b>		
Sta 261+82 Rt		56 LF
<b>Pipe Conduit 24in</b>		
Sta 273+07 C		52 LF
<b>Mailbox-All Types</b>		
Sta 261+90 LT		1 EA
<b>Monuments</b>		
Sta 257+65.86 C		1 EA
<b>Remove Fence</b>		
Sta 255+00 to 275+00 Lt		2000 LF
Sta 255+00 to 260+90 Rt		612 LF
<b>Fence Barbed Wire 4 Strand</b>		
Sta 255+00 to 275+00 Lt		2000 LF
Sta 255+00 to 260+90 Rt		590 LF



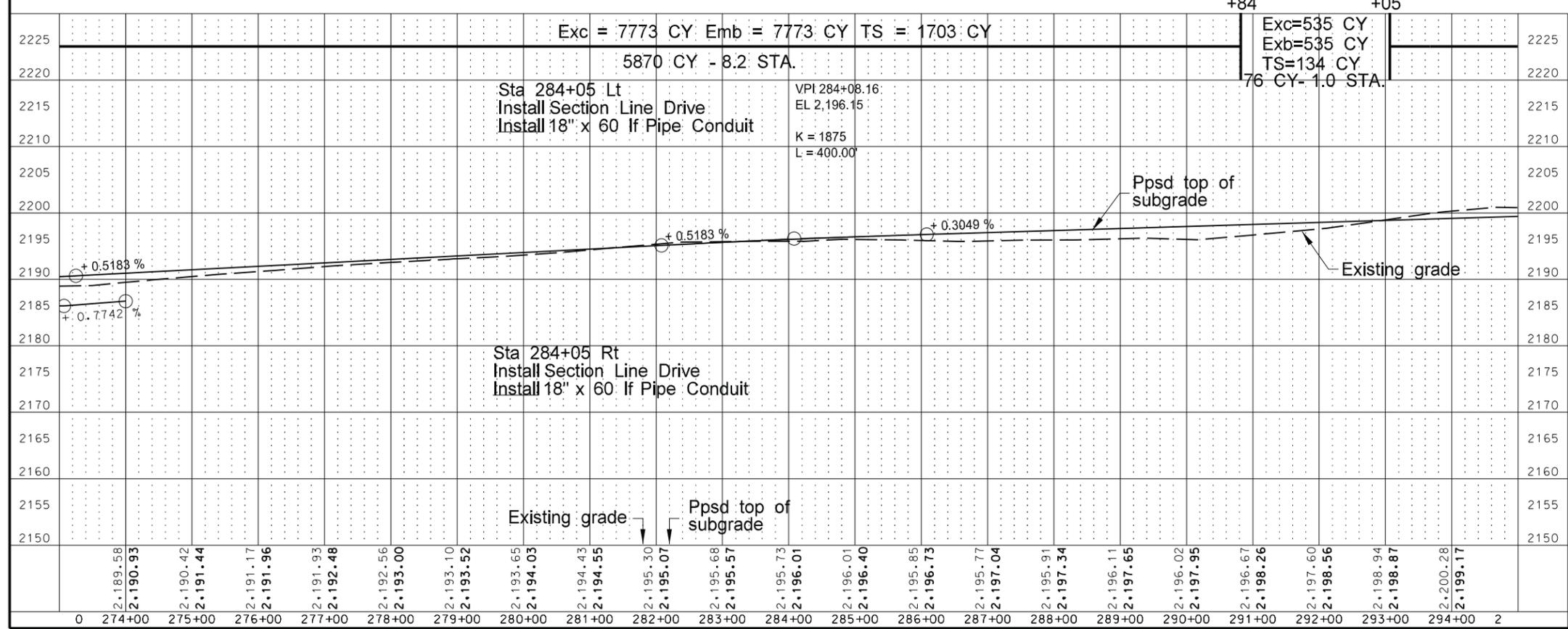
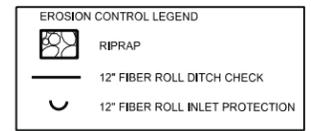
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 254+00 - Sta 274+00  
  
CMC 4324  
95th Street  
Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	4



Fiber Rolls 12in	
Sta 275+00 Rt&Lt	48 LF
Sta 283+98 Rt&Lt Inlet Protection	48 LF
Sta 290+00 Rt&Lt	48 LF
Pipe Conduit 18in Approach	
Sta 284+05 Rt	60 LF
Sta 284+05 Lt	60 LF
Reset Sign Panel	
Sta 284+25 Lt	2 EA
Reset Sign Support	
Sta 248+75 Lt	2 EA
Monuments	
Sta 284+04.55 $\oslash$	1 EA
Remove Fence	
Sta 275+00 to 295+00 Lt	2000 LF
Fence Barbed Wire 4 Strand	
Sta 275+00 to 295+00 Lt	2000 LF
Vehicle Gate	
Sta 283+98 Lt	1 Ea



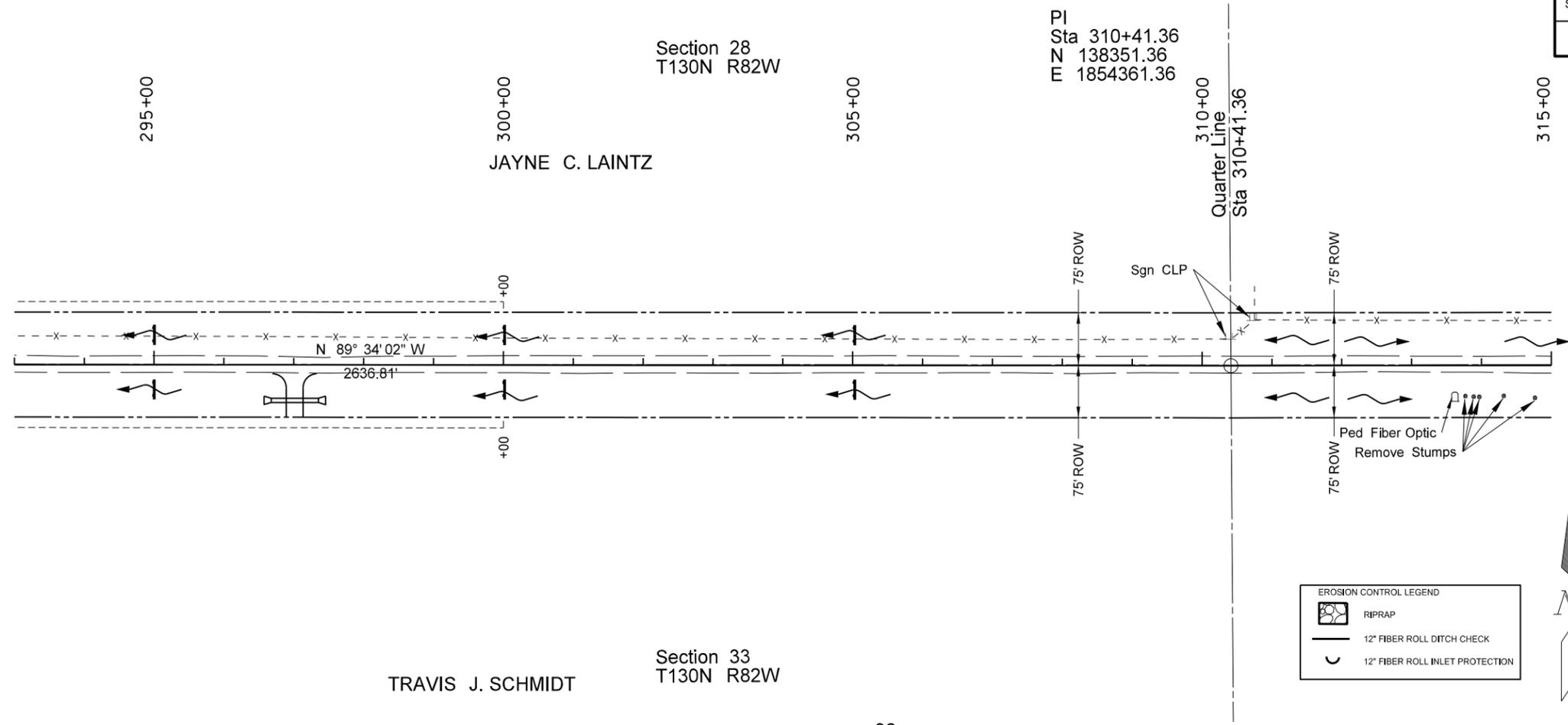
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 274+00 - Sta 294+00

CMC 4324  
95th Street

Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	5

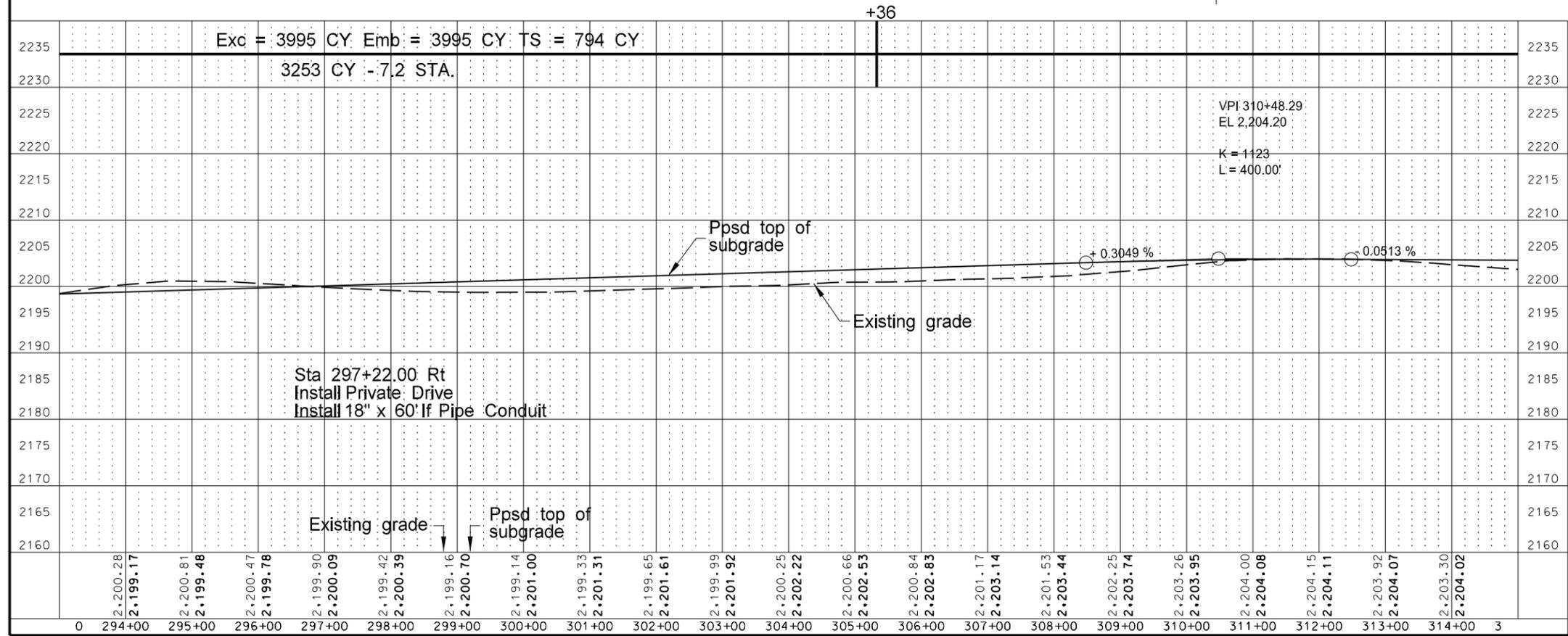


Fiber Rolls 12in	
Sta 295+00 Rt&Lt	48 LF
Sta 300+00 Rt&Lt	48 LF
Sta 305+00 Rt&Lt	48 LF
Reset Sign Panel	
Sta 310+40 Lt	1 EA
Sta 310+75 Lt	1 EA
Reset Sign Support	
Sta 310+40 Lt	1 EA
Sta 310+75 Lt	1 EA
Monuments	
Sta 310+41.36	1 EA
Pipe Conduit 18in Approach	
Sta 297+22 Rt	60 LF
Remove Fence	
Sta 295+00 to 315+00 Lt	2000 LF
Fence Barbed Wire 4 Strand	
Sta 295+00 to 315+00 Lt	2000 LF

EROSION CONTROL LEGEND	
	RIPRAP
	12" FIBER ROLL DITCH CHECK
	12" FIBER ROLL INLET PROTECTION



Section 33  
T130N R82W  
TRAVIS J. SCHMIDT



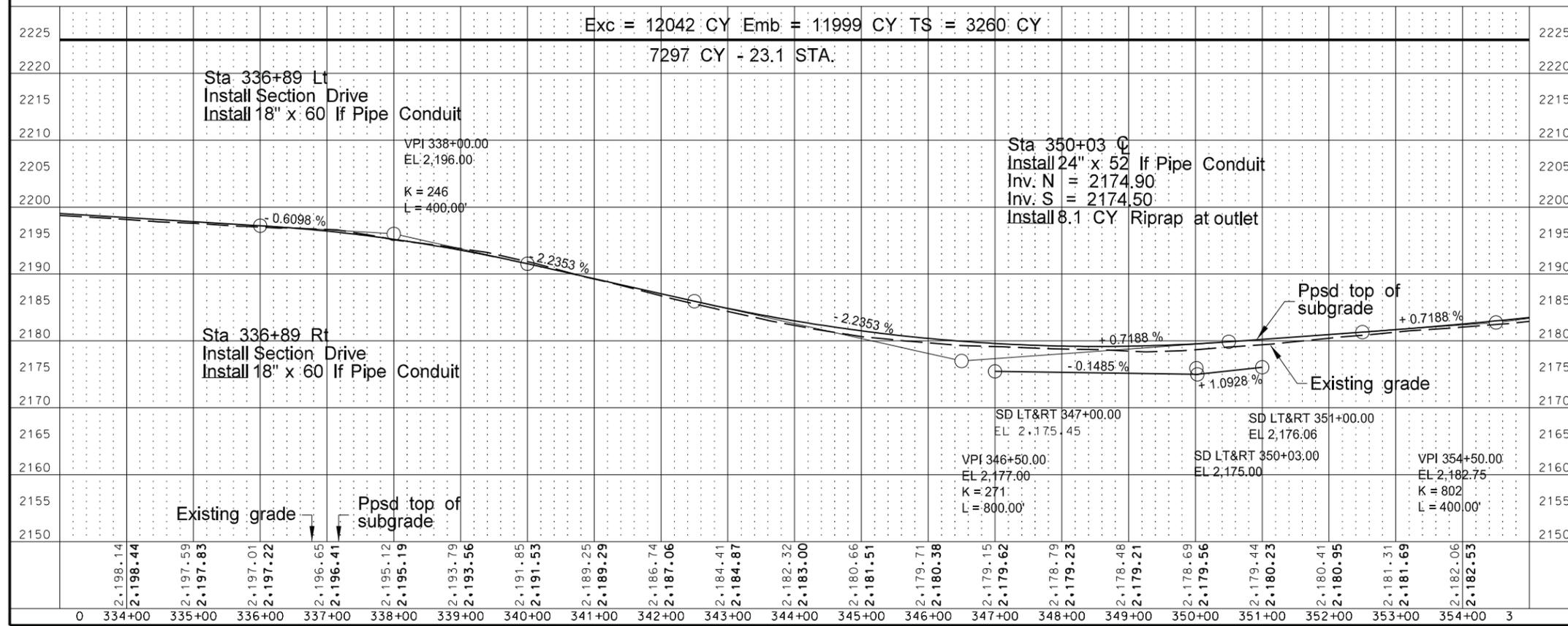
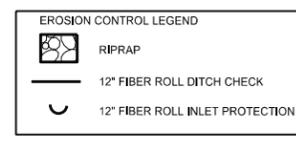
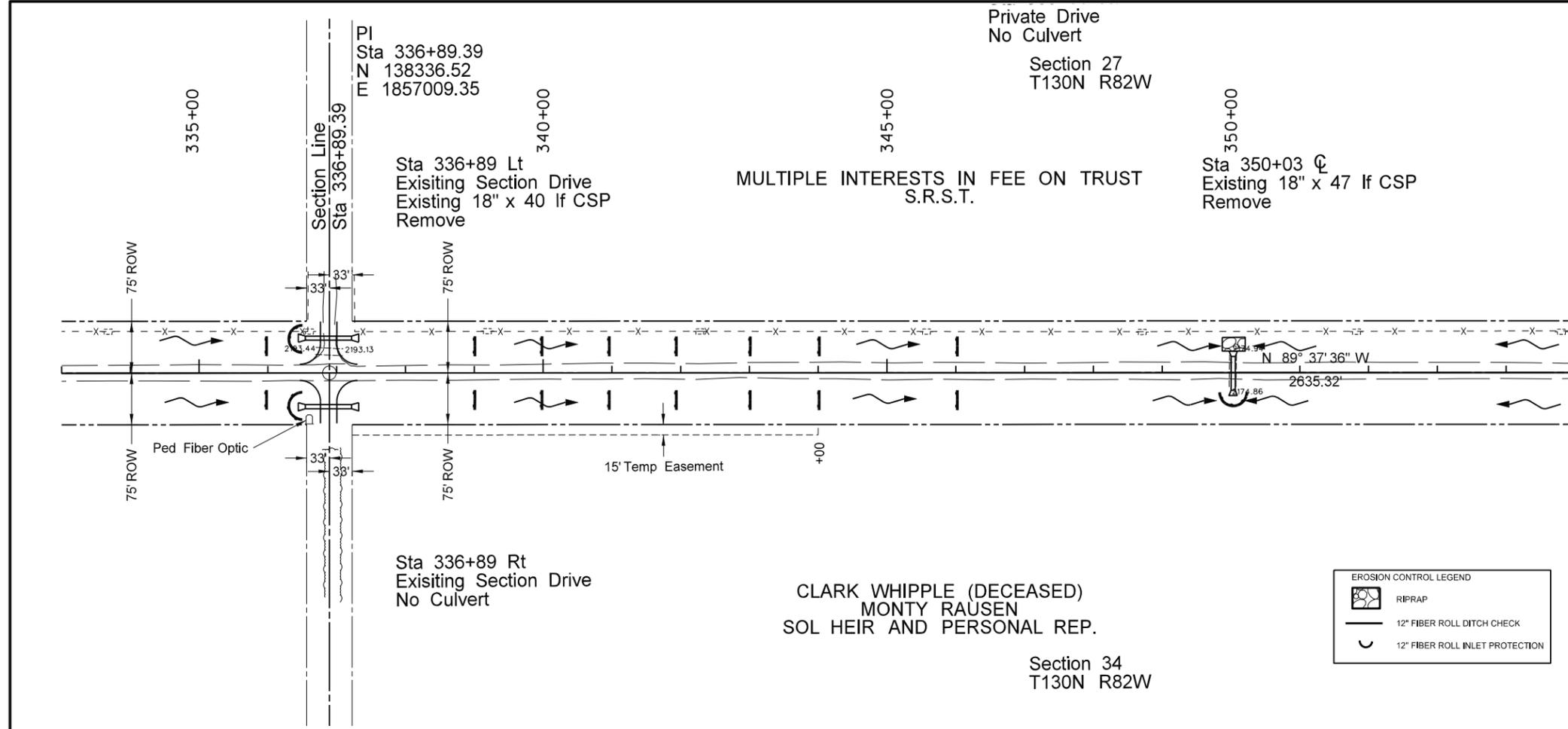
This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 294+00 - Sta 314+00  
  
CMC 4324  
95th Street  
Sioux County, North Dakota



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	7

<b>Removal of Culverts-All Types &amp; Sizes</b>	
Sta 336+89 Lt	40 LF
Sta 350+03 C	47 LF
<b>Riprap Grade I</b>	
Sta 350+03 Lt	8.1 CY
<b>Fiber Rolls 12in</b>	
Sta 336+00 Rt&Lt	48 LF
Sta 336+89 Rt&Lt Inlet Protection	48 LF
Sta 339+00 Rt&Lt	48 LF
Sta 340+00 Rt&Lt	48 LF
Sta 341+00 Rt&Lt	48 LF
Sta 342+00 Rt&Lt	48 LF
Sta 343+00 Rt&Lt	48 LF
Sta 344+00 Rt&Lt	48 LF
Sta 346+00 Rt&Lt	48 LF
Sta 350+03 Rt Inlet Protection	24 LF
<b>Pipe Conduit 18in Approach</b>	
Sta 336+89 Lt	60 LF
Sta 336+89 Rt	60 LF
<b>Pipe Conduit 24in</b>	
Sta 350+03 C	52 LF
<b>Monuments</b>	
Sta 336+89.39 C	1 EA
<b>Remove Fence</b>	
Sta 355+00 to 336+50 Lt	172 LF
Sta 337+15 to 354+00 Lt	1707 LF
<b>Fence Barbed Wire 4 Strand</b>	
Sta 355+00 to 336+50 Lt	150 LF
Sta 337+15 to 354+00 Lt	1685 LF

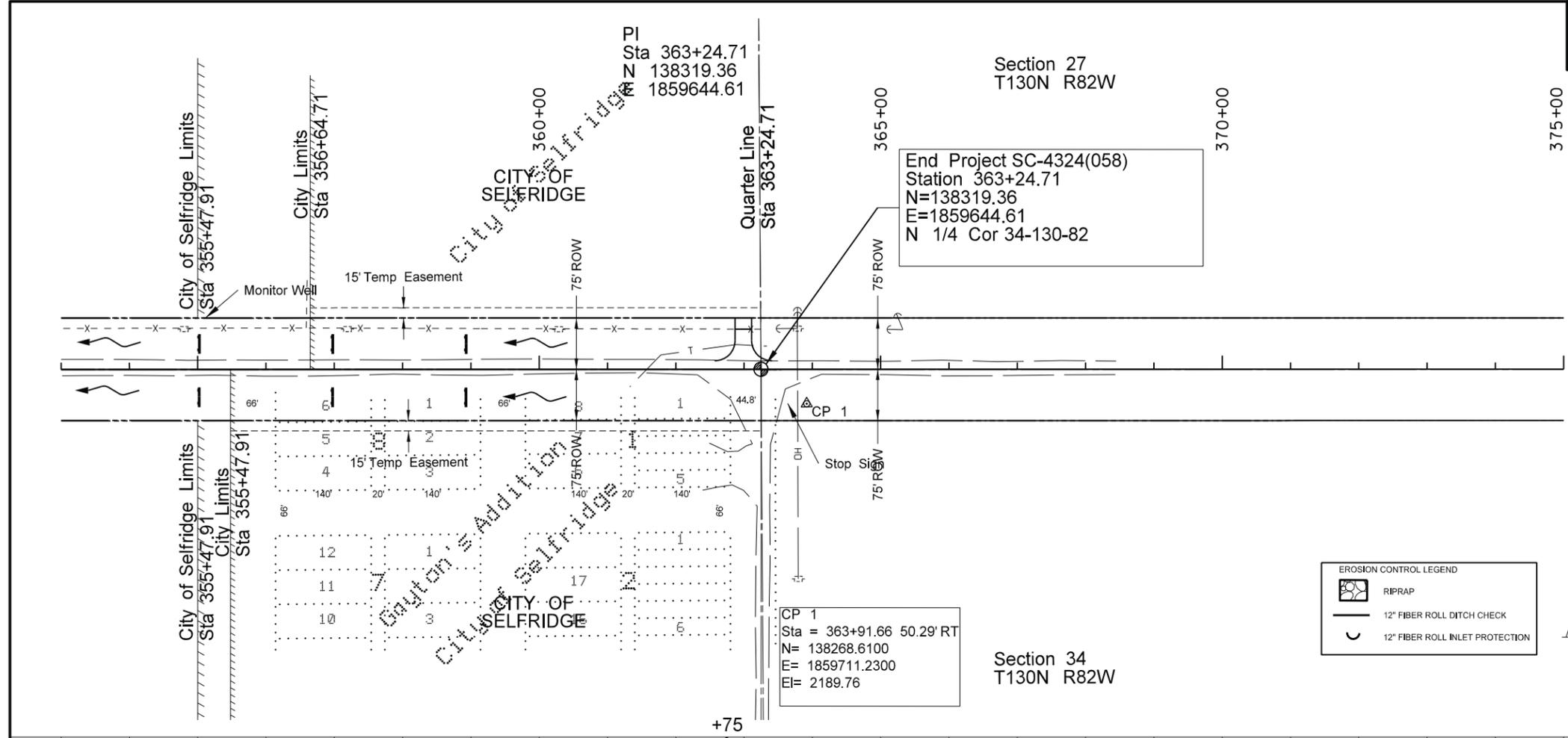


This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Plan and Profile  
Sta 334+00 - Sta 354+00  
  
CMC 4324  
95th Street  
Sioux County, North Dakota

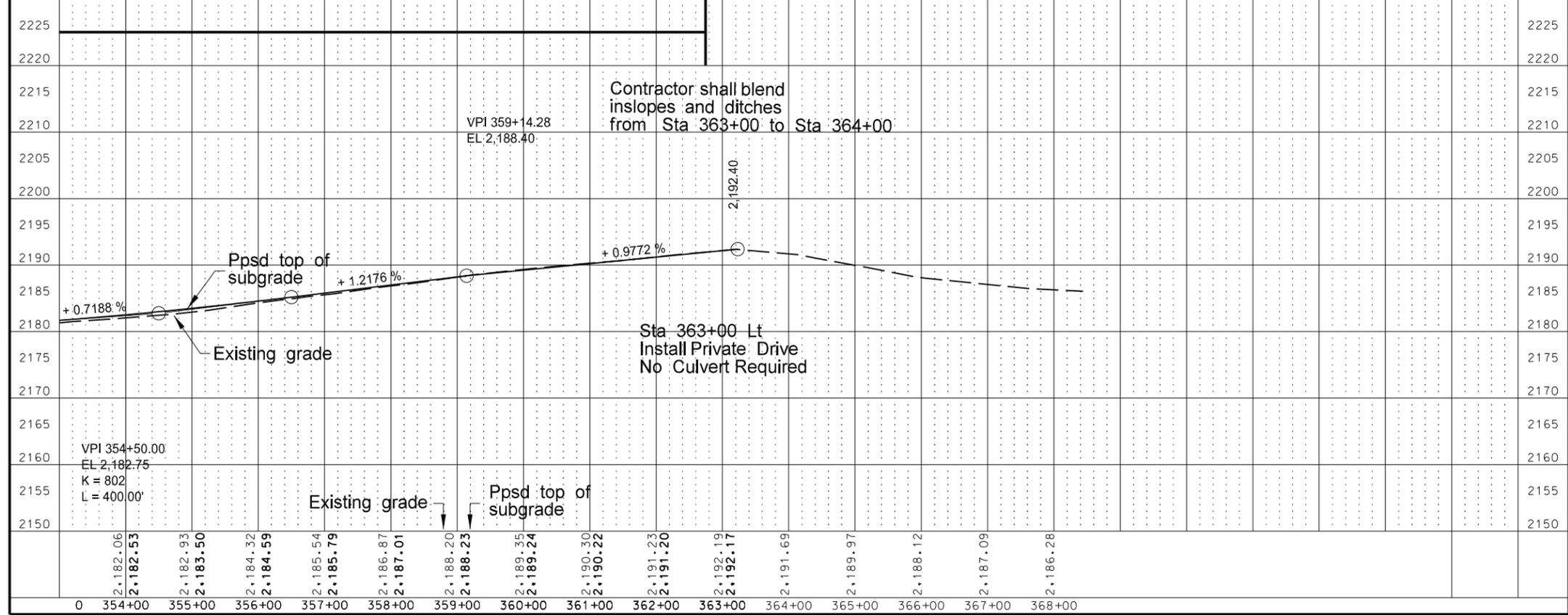
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	60	8

Fiber Rolls 12in	
Sta 355+00 Rt&Lt	48 LF
Sta 357+00 Rt&Lt	48 LF
Sta 359+00 Rt&Lt	48 LF
Monuments	
Sta 363+24.71 ☉	1 EA
Remove Fence	
Sta 354+00 to 363+24 Lt	924 LF
Fence Barbed Wire 4 Strand	
Sta 354+00 to 363+24 Lt	924 LF
Vehicle Gate	
Sta 363+00 Lt	1 EA



EROSION CONTROL LEGEND

	RIPRAP
	12" FIBER ROLL DITCH CHECK
	12" FIBER ROLL INLET PROTECTION



This document was originally issued and sealed by Daren Peterka, Registration Number PE-4358, on 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND.

Plan and Profile  
Sta 354+00 - Sta 374+00

CMC 4324  
95th Street  
Sioux County, North Dakota

Temporary Erosion Control Locations

STATION	LT	RT	TYPE	LENGTH (LF)
233+00	24	24	DITCH	48
235+00	24	24	DITCH	48
239+00	24	---	INLET PROTECTION	24
240+00	24	24	DITCH	48
242+00	24	24	DITCH	48
250+00	24	24	DITCH	48
255+00	24	24	DITCH	48
260+00	24	24	DITCH	48
261+82	---	24	INLET PROTECTION	24
265+00	24	24	DITCH	48
270+00	24	24	DITCH	48
273+07	24	---	INLET PROTECTION	24
275+00	24	24	DITCH	48
283+98	24	24	INLET PROTECTION	48
290+00	24	24	DITCH	48
295+00	24	24	DITCH	48
300+00	24	24	DITCH	48
305+00	24	24	DITCH	48
316+33	---	24	INLET PROTECTION	24
317+30	---	24	INLET PROTECTION	24
330+00	24	24	DITCH	48
336+00	24	24	DITCH	48
336+89	24	24	INLET PROTECTION	48
339+00	24	24	DITCH	48
340+00	24	24	DITCH	48
341+00	24	24	DITCH	48
342+00	24	24	DITCH	48
343+00	24	24	DITCH	48
344+00	24	24	DITCH	48
346+00	24	24	DITCH	48
350+03	---	24	DITCH	24
355+00	24	24	DITCH	48
357+00	24	24	DITCH	48
359+00	24	24	DITCH	48

RUNOFF LOCATIONS TO BE DETERMINED BY  
 THE ENGINEER 2000  
**TOTAL 12 IN FIBER ROLLS 3,488**

Permanent Erosion Control Locations

STATION	LT	RT	TYPE	LENGTH (LF)
233+00	24	24	DITCH	48
235+00	24	24	DITCH	48
239+00	24	---	INLET PROTECTION	24
240+00	24	24	DITCH	48
242+00	24	24	DITCH	48
250+00	24	24	DITCH	48
255+00	24	24	DITCH	48
260+00	24	24	DITCH	48
261+82	---	24	INLET PROTECTION	24
265+00	24	24	DITCH	48
270+00	24	24	DITCH	48
273+07	24	---	INLET PROTECTION	24
275+00	24	24	DITCH	48
283+98	24	24	INLET PROTECTION	48
290+00	24	24	DITCH	48
295+00	24	24	DITCH	48
300+00	24	24	DITCH	48
305+00	24	24	DITCH	48
316+33	---	24	INLET PROTECTION	24
317+30	---	24	INLET PROTECTION	24
330+00	24	24	DITCH	48
336+00	24	24	DITCH	48
336+89	24	24	INLET PROTECTION	48
339+00	24	24	DITCH	48
340+00	24	24	DITCH	48
341+00	24	24	DITCH	48
342+00	24	24	DITCH	48
343+00	24	24	DITCH	48
344+00	24	24	DITCH	48
346+00	24	24	DITCH	48
350+03	---	24	DITCH	24
355+00	24	24	DITCH	48
357+00	24	24	DITCH	48
359+00	24	24	DITCH	48

RUNOFF LOCATIONS TO BE DETERMINED BY  
 THE ENGINEER 2000  
**TOTAL 12 IN FIBER ROLLS 3,488**



This document was originally issued and sealed by  
 Daren Peterka  
 Registration Number PE-4358,  
 On 8/29/14 and the original document is stored at Interstate Engineering, Inc., Mandan, ND

Erosion Control  
 CMC 4324  
 95<sup>th</sup> Street  
 Sioux County, North Dakota



SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1-60	60"x24"	ROAD WORK NEXT ___ MILES		34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
<b>G20-2-48</b>	<b>48"x24"</b>	<b>END ROAD WORK</b>	<b>2</b>	<b>19</b>	<b>38</b>
<b>G20-4-36</b>	<b>36"x18"</b>	<b>PILOT CAR FOLLOW ME (Mounted to back of pilot car)</b>	<b>1</b>	<b>18</b>	<b>18</b>
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
<b>G20-50a-72</b>	<b>72"x36"</b>	<b>ROAD WORK NEXT ___ MILES RT &amp; LT ARROWS</b>	<b>2</b>	<b>37</b>	<b>74</b>
<b>G20-52a-72</b>	<b>72"x24"</b>	<b>ROAD WORK NEXT ___ MILES RT or LT ARROW</b>	<b>2</b>	<b>30</b>	<b>60</b>
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT (Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
<b>R1-1a-18</b>	<b>18"x18"</b>	<b>STOP and SLOW PADDLE Back to Back</b>	<b>2</b>	<b>5</b>	<b>10</b>
R1-2-60	60"x60"	YIELD		29	
R2-1-48	48"x60"	SPEED LIMIT ___		39	
R2-1a-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)		10	
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
<b>R11-2-48</b>	<b>48"x30"</b>	<b>ROAD CLOSED</b>	<b>2</b>	<b>28</b>	<b>56</b>
R11-2a-48	48"x30"	STREET CLOSED		28	
<b>R11-3a-60</b>	<b>60"x30"</b>	<b>ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY</b>	<b>1</b>	<b>31</b>	<b>31</b>
R11-3c-60	60"x30"	STREET CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
<b>W3-1-48</b>	<b>48"x48"</b>	<b>STOP AHEAD SYMBOL</b>	<b>2</b>	<b>35</b>	<b>70</b>
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
<b>W3-4-48</b>	<b>48"x48"</b>	<b>BE PREPARED TO STOP</b>	<b>2</b>	<b>35</b>	<b>70</b>
W3-5-48	48"x48"	SPEED REDUCTION AHEAD		35	
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
<b>W8-1-48</b>	<b>48"x48"</b>	<b>BUMP</b>	<b>2</b>	<b>35</b>	<b>70</b>
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
<b>W8-12-48</b>	<b>48"x48"</b>	<b>NO CENTER STRIPE</b>	<b>2</b>	<b>35</b>	<b>70</b>
<b>W8-53-48</b>	<b>48"x48"</b>	<b>TRUCKS ENTERING HIGHWAY</b>	<b>2</b>	<b>35</b>	<b>70</b>
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or ___ FT.		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or ___ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	___ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
<b>W20-1-48</b>	<b>48"x48"</b>	<b>ROAD WORK AHEAD or ___ FT or ___ MILE</b>	<b>7</b>	<b>35</b>	<b>245</b>
W20-2-48	48"x48"	DETOUR AHEAD or ___ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or ___ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or ___ FT.		35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or ___ FT.		35	
<b>W20-7a-48</b>	<b>48"x48"</b>	<b>FLAGGING SYMBOL</b>	<b>2</b>	<b>35</b>	<b>70</b>
<b>W20-7k-24</b>	<b>24"x18"</b>	<b>___ FEET (Mounted on warning sign post)</b>	<b>2</b>	<b>10</b>	<b>20</b>
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT ___ MILES (Mounted on warning sign post)		12	
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or ___ FT		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or ___ FT.		35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or ___ FT.		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)		11	
<b>R11-4-60</b>	<b>60"x30"</b>	<b>ROAD CLOSED TO THRU TRAFFIC</b>	<b>2</b>	<b>31</b>	<b>62</b>

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
<b>SS1</b>	<b>156"x42"</b>	<b>SIoux COUNTY ROUTE 10 ROAD CLOSED 00 MILES AHD LOCAL TRAFFIC OI</b>	<b>2</b>	<b>76</b>	<b>152</b>

SPEC & CODE	DESCRIPTION	TOTAL UNITS
<b>704-1000</b>	<b>TRAFFIC CONTROL SIGNS</b>	<b>1186</b>

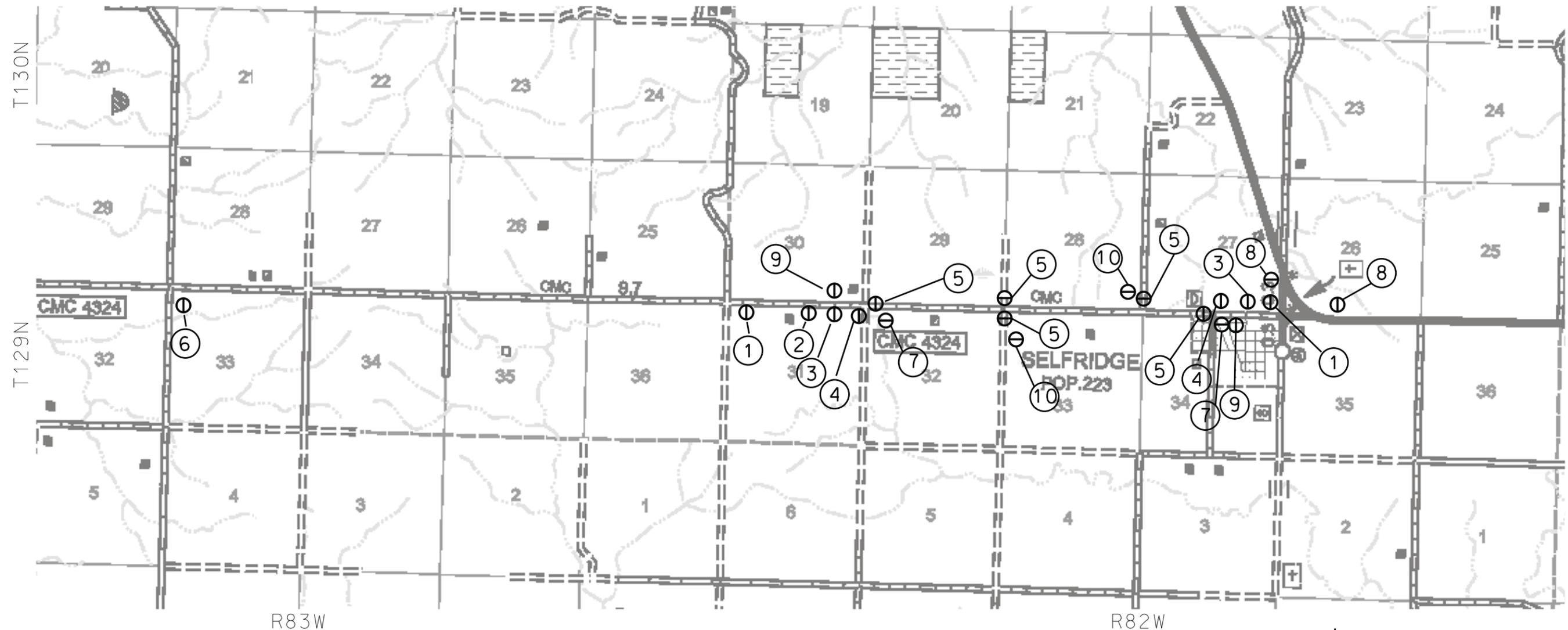
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
<b>704-0100</b>	<b>FLAGGING</b>	<b>MHR</b>	<b>200</b>
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
<b>704-1052</b>	<b>TYPE III BARRICADES</b>	<b>EACH</b>	<b>10</b>
<b>704-1060</b>	<b>DELINEATOR DRUMS</b>	<b>EACH</b>	<b>10</b>
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
<b>704-1081</b>	<b>VERTICAL PANELS - BACK TO BACK</b>	<b>EACH</b>	<b>50</b>
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
<b>704-1185</b>	<b>PILOT CAD</b>	<b>MHR</b>	<b>100</b>
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-1500	OBLITERATION OF PVMT MK	SF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

NOTE:  
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.  
<http://www.dot.nd.gov/>

This document was originally issued and sealed by  
Daren Peterka  
Registration Number PE-4358,  
On 8/29/14 and the original document is stored at  
Interstate Engineering, Inc.,  
Mandan, ND

Traffic Control Devices List  
CMC 4324  
85th Street  
Sioux County, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4324(058)	100	2



- ① W20-1-48 "ROAD WORK AHEAD"  
Post Mounting
- ② W20-1-48 "ROAD WORK ½ MILE"  
Post Mounting
- ③ W20-1-48 "ROAD WORK 1000 FEET"  
Post Mounting
- ④ W20-1-48 "ROAD WORK 500 FEET"  
Post Mounting
- ⑤ R11-4-60 "ROAD CLOSED TO THRU TRAFFIC"  
Type III Barricade Mounting (2 Barricades)

- ⑥ R11-3a-60 "Road Closed xx Miles AHD Local Traffic Only"  
Post Mounting
- ⑦ G20-52a-72 "ROAD WORK LT or RT NEXT 4 MILES"  
Post Mounting
- ⑧ SS1 " Sioux County Route 10 Road Closed xx Miles AHD Local Traffic Only.  
Post Mounting
- ⑨ G20-2a-48 "END ROAD WORK"  
Post Mounting
- ⑩ G20-50a-72 LT and RT Arrows  
Post Mounting

⓪ Sign Location

The construction signing layout is for informational purposes only. Traffic control signing shall be installed as per MUTCD manual and/or the Standard Drawings.



This document was originally issued and sealed by  
Daren Peterka  
Registration Number PE-4358,  
On 8/29/14 and the original document is stored at  
Interstate Engineering, Inc.,  
Mandan, ND

Traffic Control

CMC 4324  
95th Street

Sioux County, North Dakota





NDDOT ABBREVIATIONS

? This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.

Abn abandoned  
 Abut abutment  
 Ac acres  
 Adj adjusted  
 Aggr aggregate  
 Ahd ahead  
 ARV air release valve  
 Align alignment  
 Al alley  
 Alt alternate  
 Alum aluminum  
 ADA Americans with Disabilities Act  
 A ampere  
 & and  
 Appr approach  
 Approx approximate  
 ACP asbestos cement pipe  
 Asph asphalt  
 AC asphalt cement  
 Assmd assumed  
 @ at  
 Atten attenuation  
 ATR automatic traffic recorder  
 Ave Avenue  
 Avg average  
 ADT average daily traffic  
 Az azimuth  
 Bk back  
 BF back face  
 Bs backsight  
 Balc balcony  
 B Wire barbed wire  
 Barr barricade  
 Btry battery  
 Brg bearing  
 BI beehive inlet  
 Beg begin  
 BM bench mark  
 Bkwy bikeway  
 Bit bituminous  
 Blk block  
 Bd Ft board feet  
 BH bore hole  
 BS both sides  
 Bot bottom  
 Blvd Boulevard  
 Bndry boundary  
 BC brass cap  
 Brkwy breakaway  
 Br bridge  
 Bldg building

BV butterfly valve  
 Byp bypass  
 C Gdrl cable guardrail  
 Calc calculate  
 Cd candela  
 CIP cast iron pipe  
 CB catch basin  
 CRS cationic rapid setting  
 C Gd cattle guard  
 C To C center to center  
 Cl or C centerline  
 Cm centimeter  
 Ch chain  
 Chnlk chain-link  
 Ch Blk channel block  
 Ch Ch channel change  
 Chk check  
 Chsld chiseled  
 Cir circle  
 Cl class  
 Cl clay  
 Cl F clay fill  
 Cl Hvy clay heavy  
 Cl Lm clay loam  
 Clnt clean-out  
 Clr clear  
 Cl&gr clearing & grubbing  
 Co S coal slack  
 Comb. combination  
 Coml commercial  
 Compr compression  
 CADD computer aided drafting & design  
 Conc concrete  
 Cond conductor  
 Const construction  
 Cont continuous  
 CSB continuous split barrel sample  
 Contr contraction  
 Contr contractor  
 CP control point  
 Coord coordinate  
 Cor corner  
 Corr corrected  
 CAES corrugated aluminum end section  
 CAP corrugated aluminum pipe  
 CMES corrugated metal end section  
 CMP corrugated metal pipe  
 CPVCP corrugated poly-vinyl chloride pipe  
 CSES corrugated steel end section  
 CSP corrugated steel pipe  
 C coulomb  
 Co County  
 Crse course  
 C Gr course gravel  
 CS course sand

Ct Court  
 Xarm cross arm  
 Xbuck cross buck  
 Xsec cross sections  
 Xing crossing  
 Xrd Crossroad  
 Crn crown  
 CF cubic feet  
 M3 cubic meter  
 M3/s cubic meters per second  
 CY cubic yard  
 Cy/mi cubic yards per mile  
 Culv culvert  
 C&G curb & gutter  
 CI curb inlet  
 CR curb ramp  
 CS curve to spiral  
 C cut  
 Dd Ld dead load  
 Defl deflection  
 Defm deformed  
 Deg or D degree  
 DInt delineate  
 DIntr delineator  
 Depr depression  
 Desc description  
 Det detail  
 DWP detectable warning panel  
 Dtr detour  
 Dia diameter  
 Dir direction  
 Dist distance  
 DM disturbed material  
 DB ditch block  
 DG ditch grade  
 Dbl double  
 Dn down  
 Dwg drawing  
 Dr drive  
 Drwy driveway  
 DI drop inlet  
 D dry density  
 Ea each  
 Esmt easement  
 E East  
 EB Eastbound  
 Elast elastomeric  
 EL electric locker  
 E Mtr electric meter  
 Elec electric/al  
 EDM electronic distance meter  
 Elev or El elevation  
 Ellipt elliptical  
 Emb embankment  
 Emuls emulsion/emulsified

ES end section  
 Engr engineer  
 ESS environmental sensor station  
 Eq equal  
 Eq equation  
 Evgr evergreen  
 Exc excavation  
 Exst existing  
 Exp expansion  
 Expy Expressway  
 E external of curve  
 Extru extruded  
 FOS factor of safety  
 F Fahrenheit  
 FS far side  
 F farad  
 Fed Federal  
 FP feed point  
 Ft feet/foot  
 Fn fence  
 Fn P fence post  
 FO fiber optic  
 FB field book  
 FD field drive  
 F fill  
 FAA fine aggregate angularity  
 FS fine sand  
 FH fire hydrant  
 Fl flange  
 Flrd flared  
 FES flared end section  
 F Bcn flashing beacon  
 FA flight auger sample  
 FL flow line  
 Ftg footing  
 FM force main  
 Fs foresight  
 Fnd found  
 Fdn foundation  
 Frac fractional  
 Frwy freeway  
 Frt front  
 FF front face  
 F Disp fuel dispenser

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-101-2

FFP	fuel filler pipes	IP	iron Pipe	M	mega	Ped	pedestrian
FLS	fuel leak sensor	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Furn	furnish/ed	J	joule	M	meter	Pen.	penetration
Gal	gallon	Jct	junction	M/s	meters per second	Perf	perforated
Galv	galvanized	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gar	garage	Kn	kilo newton	Mi	mile	PL	pipeline
Gs L	gas line	Kpa	kilo pascal	MM	mile marker	PI	place
G Reg	gas line regulator	Kg	kilogram	MP	mile post	P&P	plan & profile
GMV	gas main valve	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
G Mtr	gas meter	Km	kilometer	Mm	millimeter	PI	plate
GSV	gas service valve	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GVP	gas vent pipe	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
GV	gate valve	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Ga	gauge	Ln	lane	Mon	monument	PI	point of intersection
Geod	geodetic	Lg	large	Mnd	mound	PRC	point of reverse curvature
GIS	Geographical Information System	Lat	latitude	Mtbl	mountable	PT	point of tangent
G	giga	Lt	left	Mtd	mounted	POC	point on curve
GPS	Global Positioning System	L	length of curve	Mtg	mounting	POT	point on tangent
Gov	government	Lens	lenses	Mk	muck	PE	polyethylene
Grd	graded/grade	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Gr	gravel	LB	level book	N	nano	PCC	Portland Cement concrete
Grnd	ground	LvIng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
GWM	ground water monitor	Lht	light	NS	near side	PP	power pole
Gdrl	guardrail	LP	light pole	Neop	neoprene	Preempt	preemption
Gtr	gutter	Ltg	lighting	Ntwk	network	Prefab	prefabricated
H Plg	H piling	Lig Co	lignite coal	N	newton	Prfmd	performed
Hdwl	headwall	Lig Sl	lignite slack	N	North	Prep	preparation
Ha	hectare	LF	linear foot	NE	North East	Press.	pressure
Ht	height	Liq	liquid	NW	North West	PRV	pressure relief valve
HI	height of instrument	LL	liquid limit	NB	Northbound	Prestr	prestressed
Hel	helical	L	litre	No. or #	number	Pvt	private
H	henry	Lm	loam	Obsc	obscure(d)	PD	private drive
HZ	hertz	Loc	location	Obsn	observation	Prod.	production/produce
HDPE	high density polyethylene	LC	long chord	Ocpd	occupied	Prog	programmed
HM	high mast	Long.	longitude	Ocpy	occupy	Prop.	property
HP	high pressure	Lp	loop	Off Loc	office location	Prop Ln	property line
HPS	high pressure sodium	LD	loop detector	O/s	offset	Ppsd	proposed
Hwy	highway	Lm	lumen	OC	on center	PB	pull box
Hor	horizontal	Lum	luminaire	C	one dimensional consolidation		
HBP	hot bituminous pavement	L Sum	lump sum	OC	organic content		
Hr	hour(s)	Lx	lux	Orig	original		
Hyd	hydrant	ML	main line	O To O	out to out		
Ph	hydrogen ion content	M Hr	man hour	OD	outside diameter		
Id	identification	MH	manhole	OH	overhead		
In or "	inch	Mkd	marked	PMT	pad mounted transformer		
Incl	inclinometer tube	Mkr	marker	Pg	pages		
IMH	inlet manhole	Mkg	marking	Pntd	painted		
ID	inside diameter	MA	mast arm	Pr	pair		
Inst	instrument	Matl	material	Pnl	panel		
Intchg	interchange	Max	maximum	Pk	park		
Intmdt	intermediate	MC	meander corner	PK	Parker-Kalon nail		
Intscn	intersection	Meas	measure	Pa	pascal		
Inv	invert	Mdn	median	PSD	passing sight distance		
IM	iron monument	MD	median drain	Pvmt	pavement		
IPn	Iron Pin	MC	medium curing	Ped	pedestal		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-101-3

Qty	quantity	Sig	signal	TS	tangent to spiral	WB	Westbound
Qtr	quarter	Si Cl	silt clay	Tel	telephone	Wrng	wiring
Rad or R	radius	Si Cl Lm	silty clay loam	Tel B	Telephone Booth	W/	with
RR	railroad	Si Lm	silty loam	Tel P	telephone pole	W/o	without
Rlwy	railway	Sgl	single	Tv	television	WC	witness corner
Rsd	raised	SC	slow curing	Temp	temperature	WGS	World Geodetic System
RTP	random traverse point	SS	slow setting	Temp	temporary	Z	zenith
Rge or R	range	Sm	small	TBM	temporary bench mark		
RC	rapid curing	S	South	T	tesla		
Rec	record	SE	South East	T	thinwall tube sample		
Rcy	recycle	SW	South West	T/mi	tons per mile		
RPCC	recycled Portland cement concrete	SB	Southbound	Ts	topsoil		
Ref	reference	Sp	spaces	Twp or T	township		
R Mkr	reference marker	Spcl	special	Traf	traffic		
RM	reference monument	SA	special assembly	TSCB	traffic signal control box		
Refl	reflectorized	SP	special provisions	Tr	trail		
RCB	reinforced concrete box	G	specific gravity	Transf	transformer		
RCES	reinforced concrete end section	Spk	spike	TB	transit book		
RCP	reinforced concrete pipe	SC	spiral to curve	Trans	transition		
RCPS	reinforced concrete pipe sewer	ST	spiral to tangent	TT	transmission tower		
Reinf	reinforcement	SB	split barrel sample	Trans	transverse		
Res	reservation	SH	sprinkler head	Trav	traverse		
Ret	retaining	SV	sprinkler valve	TP	traverse point		
Rev	reverse	Sq	square	Trtd	treated		
Rt	right	SF	square feet	Trmt	treatment		
R/W	right of way	Km2	square kilometer	Qc	triaxial compression		
Riv	river	M2	square meter	TERO	tribal employment rights ordinance		
Rd	road	SY	square yard	Tpl	triple		
Rdbd	road bed	Stk	stake	TP	turning point		
Rdwy	roadway	Std	standard	Typ	typical		
RWIS	Roadway Weather Information System	N	standard penetration test	Qu	unconfined compressive strength		
Rk	rock	Std Specs	Standard Specifications	Ugrnd	underground		
Rt	route	Sta	station	USC&G	US Coast & Geodetic Survey		
Salv	salvage(d)	Sta Yd	station yards	USGS	US Geologic Survey		
Sd	sand	Stm L	steam line	Util	utility		
Sdy Cl	sandy clay	SEC	steel encased concrete	VG	valley gutter		
Sdy Cl Lm	sandy clay loam	SSD	stopping sight distance	Vap	vapor		
Sdy Fl	sandy fill	SD	storm drain	Vert	vertical		
Sdy Lm	sandy loam	St	street	VC	vertical curve		
San	sanitary sewer line	SPP	structural plate pipe	VCP	vitrified clay pipe		
Sc	scoria	SPPA	structural plate pipe arch	V	volt		
Sec	seconds	Str	structure	Vol	volume		
Sec	section	Subd	subdivision	Wkwy	walkway		
SL	section line	Sub	subgrade	W	water content		
Sep	separation	Sub Prep	subgrade preparation	WGV	water gate valve		
Seq	sequence	Ss	subsoil	WL	water line		
Serv	service	SE	superelevation	WM	water main		
Sh	shale	SS	supplement specification	WMV	water main valve		
Sht	sheet	Supp	supplemental	W Mtr	water meter		
Shtng	sheeting	Surf	surfacing	WSV	water service valve		
Shldr	shoulder	Surv	survey	WW	water well		
Sw	sidewalk	Sym	symmetrical	W	watt		
S	siemens	SI	Systems International	Wrng	wearing		
SD	sight distance	Tan	tangent	Wb	weber		
SN	sign number	T	tangent (semi)	WIM	Weigh In Motion		
				W	West		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications	GT PLNS NAT GAS	Great Plains Natural Gas Company	RED RIV TEL	Red River Rural Telephone
ACCENT	Accent Communications	HALS TEL	Halstad Telephone Company	RESVTN TEL	Reservation Telephone
AGASSIZ WU	Agassiz Water Users Incorporated	IDEA1	Idea1	ROBRTS TEL	Roberts Company Telephone
AGC	Associated General Contractors of America	INT-COMM TEL	Inter-Community Telephone Company	R-RIDER ELEC	Roughrider Electric Coop
All PI	Alliance Pipeline	KANEB PL	Kaneb Pipeline Company	RRVW	Red River Valley & Western Railroad
ALL SEAS WU	All Seasons Water Users Association	KEM ELEC	Kem Electric Cooperative Incorporated	RSR ELEC	R.S.R. Electric Cooperative
AMOCO PI	Amoco Pipeline Company	KOCH GATH SYS	Koch Gathering Systems Incorporated	S E W U	South East Water Users Incorporated
AMRDA HESS	Amerada Hess Corporation	LKHD PL	Lakehead Pipeline Company	SCOTT CABLE	Scott Cable Television Dickinson
AT&T	AT&T Corporation	LNGDN RWU	Langdon Rural Water Users Incorporated	SHERDN ELEC	Sheridan Electric Cooperative
B PAW	Bear Paw Energy Incorporated	LWR YELL R ELEC	Lower Yellowstone Rural Electric	SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
BAKER ELEC	Baker Electric	MCKNZ CON	McKenzie Consolidated Telcom	SKYTECH	Skyland Technologies Incorporated
BASIN ELEC	Basin Electric Cooperative Incorporated	MCKNZ ELEC	McKenzie Electric Cooperative	SLOPE ELEC	Slope Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative	MCKNZ WRD	McKenzie County Water Resource District	SOURIS RIV TELCOM	Souris River Telecommunications
BELLE PL	Belle Fourche Pipeline Company	MCLEOD	McLeod USA	ST WAT COMM	State Water Commission
BLM	Bureau of Land Management	MCLN ELEC	McLean Electric Cooperative	STATE LN WATER	State Line Water Cooperative
BNSF	Burlington Northern Santa Fe Railway	MCLN-SHRDN R WAT	McLean-Sheridan Rural Water	STER ENG	Sterling Energy
BOEING	Boeing	MDU	Montana-dakota Utilities	STUT RWU	Stutsman Rural Water Users
BRNS RWD	Barnes Rural Water District	MID-CONT CABLE	Mid-Continent Cable	SW PL PRJ	Southwest Pipeline Project
BURK-DIV ELEC	Burke-Divide Electric Cooperative	MIDSTATE TEL	Midstate Telephone Company	T M C	Turtle Mountain Communications
BURL WU	Burleigh Water Users	MINOT CABLE	Minot Cable Television	TCI	TCI of North Dakota
Cable One	Cable One	MINOT TEL	Minot Telephone Company	TESORO GHG PLNS PL	Tesoro High Plains Pipeline
CABLE SERV	Cable Services	MISS W W S	Missouri West Water System	TRI-CNTY WU	Tri-County Water Users Incorporated
CAP ELEC	Capital Electric Cooperative Incorporat	MNKOTA PWR	Minnkota Power	TRL CO RWU	Traill County Rural Water Users
CASS CO ELEC	Cass County Electric Cooperative	MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative	UNTD TEL	United Telephone
CASS RWU	Cass Rural Water Users Incorporated	MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative	UPPR SOUR WUA	Upper Souris Water Users Association
CAV ELEC	Cavalier Rural Electric Cooperative	MRE LBTY TEL	Moore & Liberty Telephone	US SPRINT	U.S. Sprint
CBLCOM	Cablecom Of Fargo	MUNICIPAL	City Water And Sewer	USAF MSL CABLE	U.S.A.F. Missile Cable
CENEX PL	Cenex Pipeline	MUNICIPAL	City Of '.....'	USFWS	US Fish and Wildlife Service
CENT PL WATER DIST	Central Pipe Line Water District	N CENT ELEC	North Central Electric Cooperative	USW COMM	U.S. West Communications
CENT PWR ELEC	Central Power Electric Cooperative	N VALL W DIST	North Valley Water District	VRNDRY ELEC	Verendrye Electric Cooperative
COE	Corps of Engineers	ND PKS & REC	North Dakota Parks And Recreation	W RIV TEL	West River Telephone Incorporated
CONS TEL	Consolidated Telephone	ND TEL	North Dakota Telephone Company	WEB	W. E. B. Water Development Association
CONT RES	Continental Resource Inc	NDDOT	North Dakota Department of Transportation	WILLI RWA	Williams Rural Water Association
CPR	Canadian Pacific Railway	NDSU SOIL SCI DEPT	NDSU Soil Science Department	WILSTN BAS PL	Williston Basin Interstate Pipeline Company
D O E	Department Of Energy	NEMONT TEL	Nemont Telephone	WLSH RWD	Walsh Water Rural Water District
DAK CARR	Dakota Carrier Network	NODAK R ELEC	Nodak Rural Electric Cooperative	WOLVRTN TEL	Wolverton Telephone
DAK CENT TEL	Dakota Central Telephone	NOON FRMS TEL	Noonan Farmers Telephone Company	XLENER	Xcel Energy
DAK RWD	Dakota Rural Water District	NPR	Northern Plains Railroad	YSVR	Yellowstone Valley Railroad
DGC	Dakota Gasification Company	NSP	Northern States Power		
DICKEY R NET	Dickey Rural Networks	NTH PRAIR RW	Northern Prairie Rural Water Association		
DICKEY RWU	Dickey Rural Water Users Association	NTHN BRDR PL	Northern Border Pipeline		
DICKEY TEL	Dickey Telephone	NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated		
DNRR	Dakota Northern Railroad	NTHWSTRN REF	Northwestern Refinery Company		
DOME PL	Dome Pipeline Company	NW COMM	Northwest Communication Cooperation		
DVELEC	Dakota Valley Electric Cooperative	ONEOK	Oneok gas		
DVMW	Dakota, Missouri Valley & Western	OSHA	Occupational Safety and Health Administration		
ENBRDG	Enbridge Pipelines Incorporated	OTTR TL PWR	Otter Tail Power Company		
ENVENTIS	Enventis Telephone	P L E M	Prairielands Energy Marketing		
FALK MNG	Falkirk Mining Company	POLAR COM	Polar Communications		
FHWA	Federal Highway Administration	PVT ELEC	Private Electric		
G FKS-TRL WD	Grand Forks-traill Water District	QWEST	Qwest Communications		
GETTY TRD & TRAN	Getty Trading & Transportation	R&T W SUPPLY	R & T Water Supply Association		
GLDN W ELEC	Golden West Electric Cooperative	RAMSEY R SEW	Ramsey Rural Sewer Association		
GRGS CO TEL	Griggs County Telephone	RAMSEY RW	Ramsey Rural Water Association		
		RAMSEY UTIL	Ramsey County Rural Utilities		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

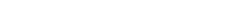
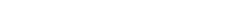
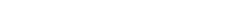
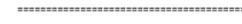
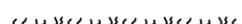
Line Styles

.....	Limits of Const Transition Line	—— s —— s ——	Floating Silt Curtain	—— ——— ———	Existing Aggregate (Cross Section View)	- - - - -	Existing Centerline
.....	Bale Check	—— ——— T ——	Existing Telephone Line	—— ——— ———	Existing Curb and Gutter (Cross Section View)	- - - - -	Supplemental Contour
.....	Rock Check	—— ——— TV ——	Existing TV Line	—— ——— ———	Existing Riprap	—— - - - - -	Right of Way
.....	Sight Distance Triangle Line	Void — void — void — v	Existing Assumed Ground (Not Surveyed)	—— ——— ———	Existing Underground Vault or Lift Station	—— - - - - -	Existing Right of Way
- - - - -	Small Hidden Object	Void — void — void — v	Tentative Ground Line	—— ——— ———	Tangent Line	—— - - - - -	Existing Right of Way Railroad
- - - - -	Dimension Leader	—— ——— w ——	Existing Water or Steam Line	- - - - -	Hidden Object	- - - - -	Failure Line
- - - - -	Existing Ground	=====	Existing Under Drain	—— - - - - -	Existing Dirt Surface	- - - - -	Existing Conditions
- - - - -	Existing Topsoil (Cross Section View)	=====	Under Drain	—— ——— ———	Existing Conduit	- - - - -	Existing Ground (Details)
—— ——— ———	Large Hidden Object	=====	Wall	—— ——— ———	Topsoil Profile	—— - - - - -	Existing Sixteenth Section Line
—— ——— ———	Edge Drain	=====	Existing Slotted Drain	- - - - -	Existing Conductor	- - - - -	Existing Right of Way Not State Owned
—— D —— D ——	Geotextile Fabric Type D	—— + —— + ——	Existing Cemetary Boundary	- - - - -	Conductor	- - - - -	Phantom Object
—— ——— E ——	Existing Electrical	—— ——— ———	Centerline Pavement Marking	- - - - -	Fiber Optic	- - - - -	Centerline Main
—— ——— FO ——	Existing Fiber Optic Line	=====	Barrier with Centerline Pavement Marking	- - - - -	Existing Loop Detector	- . . . .	Existing Guardrail Cable
—— ——— FO ——	Existing TV Fiber Optic	=====	Barrier Pavement Marking	- - - - -	Subgrade, Subcut or Ditch Grade	— • — • — • — •	Existing Guardrail Metal
—— ——— G ——	Existing Gas Pipe	- - - - -	Stripe 4 IN Dotted Extension White	—— ——— ———	Existing Asphalt Surface	—— . ——— . ——— . ——— .	Existing Edge of Water
—— <b>Geo</b> —— <b>Geo</b> ——	Geogrid	- - - - -	Stripe 8 IN Dotted Extension White	—— ——— ———	Existing Asphalt (Cross Section View)	- - - - -	Excavation Limits
—— ——— OH ——	Existing Overhead Utility Line	- - - - -	Stripe 8 IN Lane Drop	—— ——— ———	Existing Reinforcement Rebar	—— . . . . .	Existing Government Lot Line
—— ——— P ——	Existing Power	—— v v v v ——	Wetland Mitigation	—— ——— ———	Existing Tie Point Line	.....	Existing Adjacent Block Lines
—— ——— PL ——	Existing Fuel Pipeline	- - - - -	Existing Box Culvert Bridge	—— ——— ———	Existing State or International Line	.....	Existing Adjacent Lot Lines
—— ——— <b>PL</b> ——	Existing Undefined Above Ground Pipe Line	- - - - -	Existing Concrete Surface	—— ——— ———	Existing Quarter Section Line	.....	Existing Adjacent Property Line
—— ——— R —— R ——	Geotextile Fabric Type R	- - - - -	Existing Drainage Structure	—— ——— ———	Existing County	.....	Existing Adjacent Subdivision Lines
—— ——— R —— R ——	Geotextile Fabric Type R1	- - - - -	Easement	—— ——— ———	Existing Section Line	.....	
—— REMOVE —— REMOVE ——	Remove Line	- - - - -	Existing Concrete	—— - - - - -	Existing Township	.....	
—— RR —— RR ——	Geotextile Fabric Type RR	- - - - -	Existing Easement	—— ——— ———	Existing Railroad Centerline	.....	
—— S —— S ——	Geotextile Fabric Type S	—— ——— ———	Existing Gravel Surface	—— - - - - -	Centerline	.....	

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

Line Styles

	Subgrade Reinforcement		Existing Railroad Switch		Sheet Piling
	Existing Down Guy Wire Down Guy		Overhead Sign Structure Cantilever		W-Beam w Posts
	Existing Fence		24 Inch Pipe		Existing W-Beam Guardrail with Posts
	Existing Railroad		Reinforced Concrete Pipe		Exst Wet Area-Vegetation Break
	Existing Sanitary Sewer		Signal Head with Mast Arm		Existing Wetland Delineated
	Existing Sanitary Force Main		Existing Signal Head with Mast Arm		
	Existing Storm Drain		Tie Bar at Random Spacing		
	Existing Storm Drain Force Main		3-Cable w Posts		
	Fence		Existing 3-Cable w Posts		
	Silt Fence		Site Boundary		
	Existing Field Line		Fiber Rolls		
	Exst Flow		Doweled Joint		
	Flow		Tie Bar 30 Inch 4 Foot Center to Center		
	Existing Culvert		Tie Bar 18 Inch 3 Foot Center to Center		
	Existing Curb		Existing Berm, Dike, Pit, or Earth Dam		
	Existing Valley Gutter		Existing Ditch Block		
	Existing Driveway Gutter		Depression Contours		
	Existing Curb and Gutter		Existing City Corporate Limits or Reservation Boundary		
	Existing Mountable Curb and Gutter		Gravel Pit - Borrow Area		
	Existing Double Micro Loop Detector		Existing Tree Boundary		
	Micro Loop Detector Double		Tree Row		
	Existing Overhead Sign Structure		Existing Brush or Shrub Boundary		
	Existing Micro Loop Detector		Existing Retaining Wall		
	Micro Loop Detector		Existing Planter or Wall		
	Existing Overhead Sign Structure Cantilever		Retaining Wall (Plan View)		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

Symbols

	North Arrow (Half Scale)		Attenuation Device		Existing Railroad Battery Box		Existing Delineator Type E
	Truck Mounted Attenuator		Diamond Grade Delineator Type A		Existing Bush or Shrub		Existing EFB Misc
	Type I Barricade		Diamond Grade Delineator Type B		Existing Gas Cap or Stub		Existing Flashing Beacon
	Type II Barricade		Diamond Grade Delineator Type C		Existing Sanitary Cap or Stub		Existing Pipe Mounted Flasher
	Type III Barricade		Diamond Grade Delineator Type D		Existing Storm Drain Cap or Stub		Existing Pad Mounted Feed Point
	Catch Basin		Diamond Grade Delineator Type E		Existing Water Cap or Stub		Existing Pipe Mounted Feed Point with Pad
	Cairn or Stone Circle		Flexible Delineator		Existing Sanitary Cleanout		Existing Pole Mounted Feed Point
	Video Detection Camera		Flexible Delineator Type A		Existing Concrete Foundation		Existing Railroad Frog
	Storm Drain Cap or Stub		Flexible Delineator Type B		Existing Traffic Signal Controller		Existing Snow Gate 18
	Corrugated Metal End Section 18 Inch		Flexible Delineator Type C		Existing Pad Mounted Signal Controller		Existing Snow Gate 28
	Corrugated Metal End Section 24 Inch		Flexible Delineator Type D		Existing Sixteenth Section Corner		Existing Snow Gate 40
	Corrugated Metal End Section 30 Inch		Flexible Delineator Type E		Existing Quarter Section Corner		Existing Headwall
	Corrugated Metal End Section 36 Inch		Delineator Type A		Existing Section Corner		Existing Pedestrian Head with Number
	Corrugated Metal End Section 42 Inch		Delineator Type A Reset		Existing Railroad Crossbuck		Existing Signal Head
	Corrugated Metal End Section 48 Inch		Delineator Type B		Existing Satellite Dish		Existing Sprinkler Head
	Concrete Foundation		Delineator Type B Reset		Existing Fuel Dispensers		Existing Fire Hydrant
	Ground Connection Conductor		Delineator Type C		Existing Flexible Delineator Type A		Existing Catch Basin Drop Inlet
	Neutral Connection Conductor		Delineator Type D		Existing Flexible Delineator Type B		Existing Curb Inlet
	Phase 1 Connection Conductor		Delineator Type E		Existing Flexible Delineator Type C		Existing Manhole Inlet
	Phase 2 Connection Conductor		Delineator Drums		Existing Flexible Delineator Type D		Existing Junction Box
	Traffic Cone		Spot Elevation		Existing Flexible Delineator Type E		
	Signal Controller		Existing Access Control Arrow		Existing Delineator Type A		
	Pad Mounted Signal Controller		Existing Artifact		Existing Delineator Type B		
	Alignment Data Point		Existing Flashing Beacon		Existing Delineator Type C		
	Emergency Vehicle Detector		Existing Benchmark		Existing Delineator Type D		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

Symbols

	Existing Light Standard		Existing Manhole with Valve Water		Existing Telephone Pole		Existing Undefined Manhole
	Existing High Mast Light Standard 10 Luminaire		Existing Water Manhole		Existing Wood Pole		Existing Undefined Pull Box
	Existing High Mast Light Standard 3 Luminaire		Existing Mile Post Type A		Existing Post		Existing Undefined Pedestal
	Existing High Mast Light Standard 4 Luminaire		Existing Mile Post Type B		Existing Pedestrian Push Button Post		Existing Undefined Valve
	Existing High Mast Light Standard 5 Luminaire		Existing Mile Post Type C		Existing Control Point CP		Existing Undefined Pipe Vent
	Existing High Mast Light Standard 6 Luminaire		Existing Reference Marker		Existing Control Point GPS-RTK		Existing Gas Valve
	Existing High Mast Light Standard 7 Luminaire		Existing RW Marker		Existing Control Point TRI		Existing Water Valve
	Existing High Mast Light Standard 8 Luminaire		Existing Utility Marker		Existing Reference Marker Point NGS		Existing Fuel Pipe Vent
	Existing High Mast Light Standard 9 Luminaire		Iron Monument Found		Existing Pull Box		Existing Gas Pipe Vent
	Existing Overhead Sign Structure Load Center		Iron Pin R/W Monument		Existing Intelligent Transportation Pull Box		Existing Sanitary Pipe Vent
	Existing Luminaire		Existing Object Marker Type I		Existing Water Pump		Existing Storm Drain Pipe Vent
	Existing Light Standard Luminaire		Existing Object Marker Type II		Existing Slotted Reinforced Concrete Pipe		Existing Water Pipe Vent
	Existing Federal Mailbox		Existing Object Marker Type III		Existing RR Profile Spot		Existing Weather Station
	Existing Private Mailbox		Existing Electrical Pedestal		Existing Fuel Leak Sensors		Existing Ground Water Well Bore Hole
	Existing Meander Section Corner		Existing Telephone Pedestal		Existing Highway Sign		Existing Windmill or Tower
	Existing Meter		Existing Fiber Optic Telephone Pedestal		Existing Miscellaneous Spot		Existing Witness Corner
	Existing Electrical Manhole		Existing TV Pedestal		Existing Lighting Standard Pole		Flashing Beacon
	Existing Gas Manhole		Existing Fiber Optic TV Pedestal		Existing Traffic Signal Standard		Flagger
	Existing Sanitary Manhole		Existing Fuel Filler Pipes		Existing Transformer		Pipe Mounted Flasher
	Existing Sanitary Force Main Manhole		Existing Traverse PI Aerial Panel		Existing Large Evergreen Tree		Sanitary Force Main with Valve
	Existing Sanitary Manhole with Valve		Existing Pole		Existing Small Evergreen Tree		
	Existing Storm Drain Manhole		Existing Power Pole		Existing Large Tree		
	Existing Force Main Storm Drain Manhole		Existing Power Pole with Transformer		Existing Small Tree		
	Existing Force Main Storm Drain Manhole with Valve				Existing Tree Trunk		
	Existing Telephone Manhole				Existing Pad Mounted Traffic Signal Control Box		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

# Symbols

D-101-32

 Pad Mounted Feed Point  Pipe Mounted Feed Point with Pad  Pole Mounted Feed Point  Headwall  Double Headwall with Vegetation Barrier  Single Headwall with Vegetation Barrier  Pole Mounted Head  Sprinkler Head  Fire Hydrant  Inlet Type 1  Inlet Type 2  Double Inlet Type 2  Inlet Grate Type 2  Junction Box  High Mast Light Standard 10 Luminaire  High Mast Light Standard 3 Luminaire  High Mast Light Standard 4 Luminaire  High Mast Light Standard 5 Luminaire  High Mast Light Standard 6 Luminaire  High Mast Light Standard 7 Luminaire  High Mast Light Standard 8 Luminaire  High Mast Light Standard 9 Luminaire  Relocate Light Standard  Overhead Sign Structure Load Center  Light Standard 100 Watt High Pressure Sodium Vapor Luminaire	 Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire  Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  Light Standard 175 Watt High Pressure Sodium Vapor Luminaire  Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  Light Standard 35 Watt High Pressure Sodium Vapor Luminaire  Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  Light Standard 50 Watt High Pressure Sodium Vapor Luminaire  Light Standard 70 Watt High Pressure Sodium Vapor Luminaire  Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  Manhole  Manhole 48 Inch  Sanitary Force Main Manhole  Sanitary Sewer Manhole  Storm Drain Manhole  Storm Drain Manhole with Inlet  Reset Mile Post  Mile Post Type A  Mile Post Type B  Mile Post Type C  Right of Way Marker  Tubular Marker  Alignment Monument  Iron Pin Reference Monument	 Object Marker Type I  Object Marker Type II  Object Marker Type III  Caution Mode Arrow Panel  Back to Back Vertical Panel Sign  Double Direction Arrow Panel  Left Directional Arrow Panel  Right Directional Arrow Panel  Sequencing Arrow Panel  Truck Mounted Arrow Panel  Power Pole  Wood Pole  Pedestrian Push Button Post  Property Corner  Pull Box  Intelligent Transportation Pull Box  Sanitary Pump  Storm Drain Pump  Reinforced Pavement  Reinforced Concrete End Section 15 Inch  Reinforced Concrete End Section 18 Inch  Reinforced Concrete End Section 24 Inch  Reinforced Concrete End Section 30 Inch  Reinforced Concrete End Section 36 Inch  Reinforced Concrete End Section 42 Inch	 Reinforced Concrete End Section 48 Inch  Reinforced Concrete End Section 54 Inch  Reset Right of Way Marker  Reset USGS Marker  Right of Way Markers  Riser 30 Inch  Continuous Split Barrel Sample  Flight Auger Sample  Split Barrel Sample  Thinwall Tube Sample  Highway Sign  SNOW GATE 18 FT  SNOW GATE 28 FT  SNOW GATE 40 FT  Standard Penetration Test  Transformer  Inclinometer Tube  Underdrain Cleanout  Excavation Unit  Water Valve
--	--	---	--

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

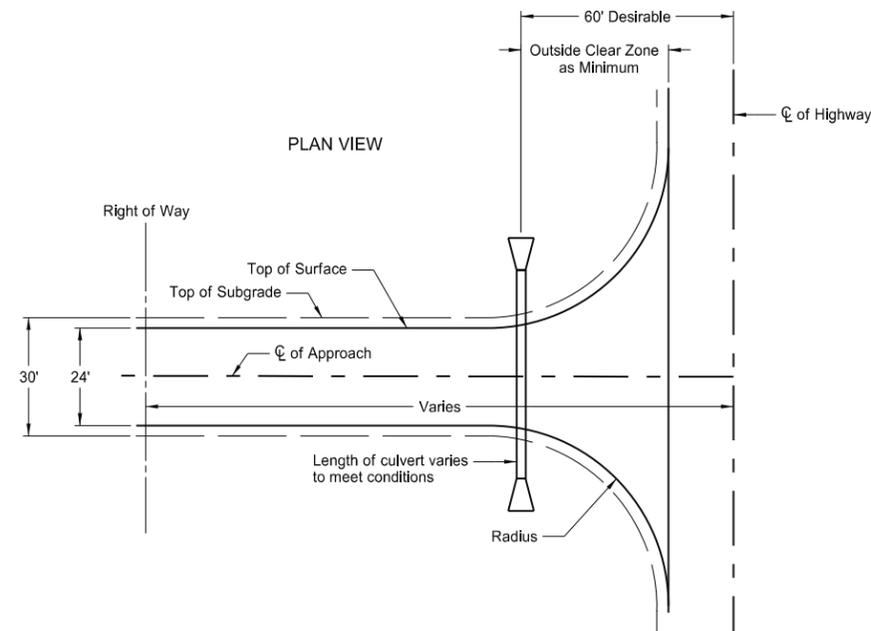
This document was originally issued and sealed by  
**Roger Weigel,**  
 Registration Number  
 PE-2930,  
 on 07/01/14 and the original document is stored at the  
 North Dakota Department  
 of Transportation

# STANDARD RURAL APPROACHES

D-203-8

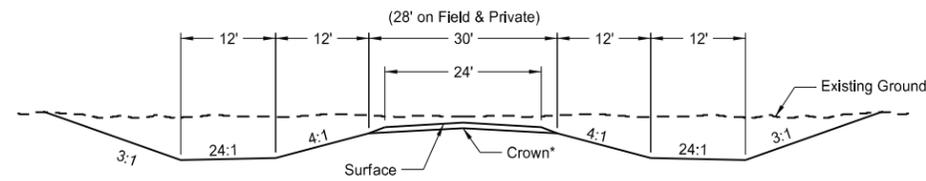
**NOTES:**

1. Max breakover between approach storage platform and highway shall not exceed 5%.
2. The approach slope shall be measured outside the area of mainline inslope influence.



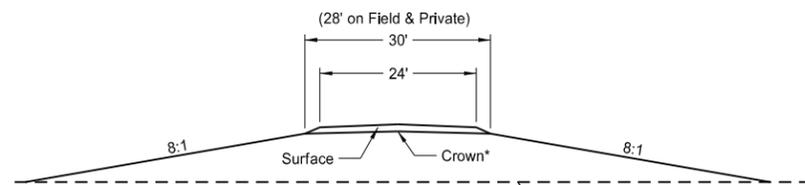
CRITERIA FOR RURAL APPROACH TYPES

	Field Drives	Private Drives	Low Volume Public Roads
Radius	R=24 ft	R=30 ft	R=40 ft
Maximum Grade	10%	7%	7%
Storage Platform	20 ft	24 ft	30 ft
Vertical Curve Length	10 ft	10 ft	Varies (Min. 20 mph)

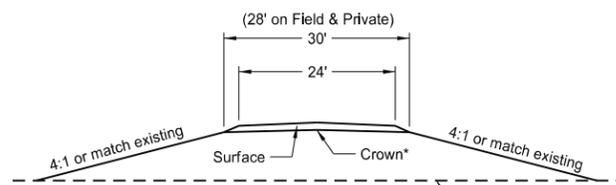


SECTION A-A

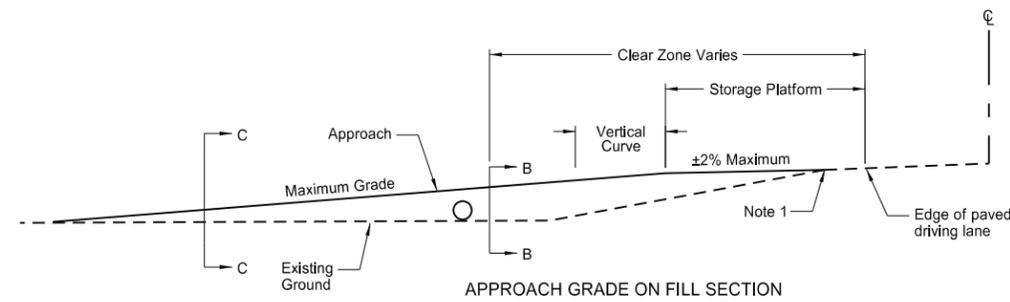
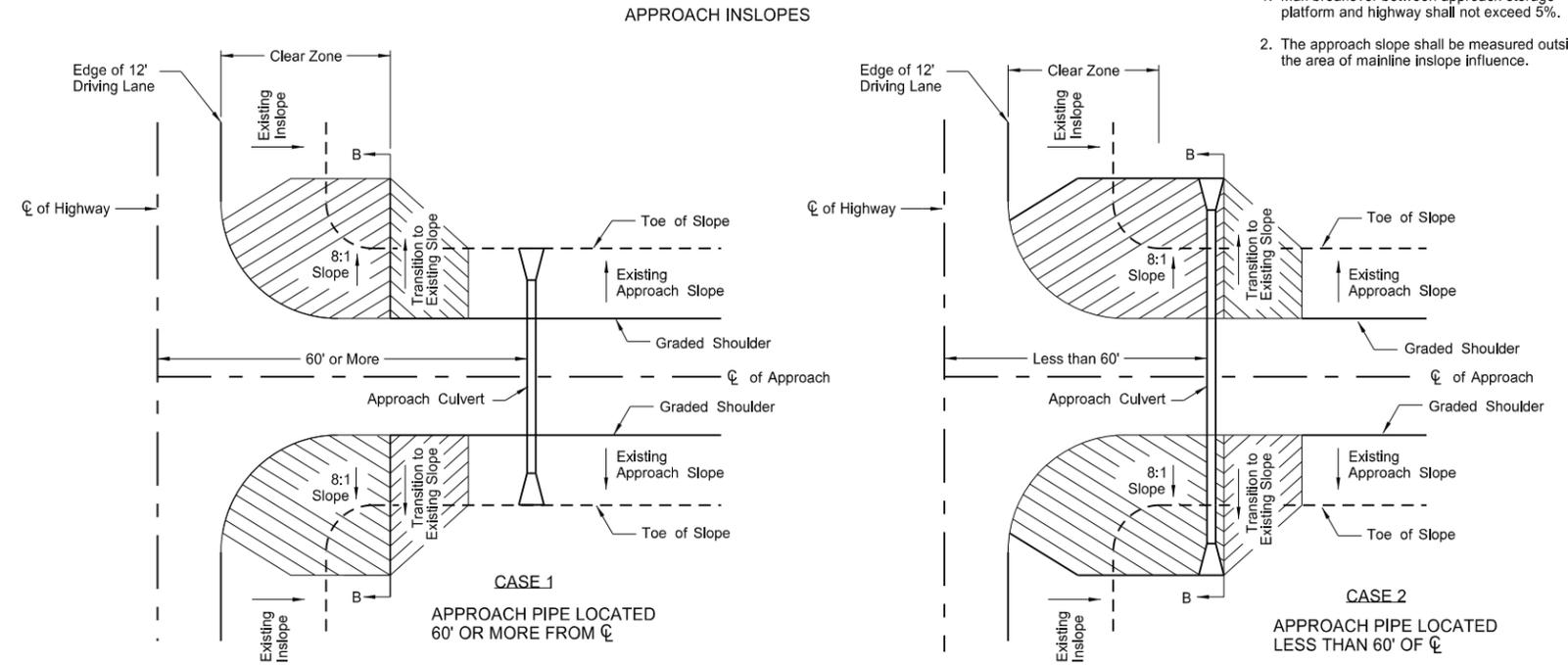
\*2.1% crown for paved surface  
\*3.0% crown for gravel surface



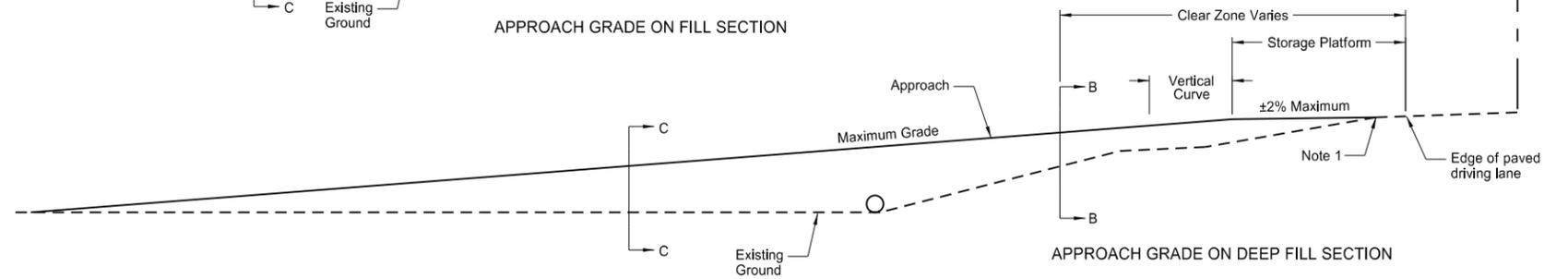
SECTION B-B



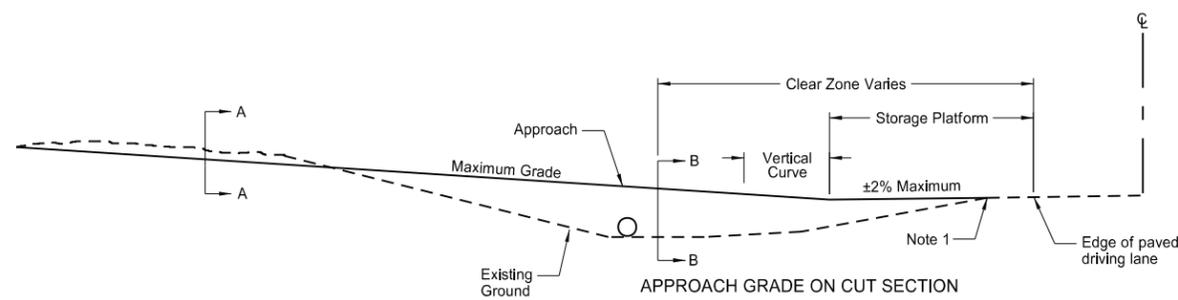
SECTION C-C



APPROACH GRADE ON FILL SECTION



APPROACH GRADE ON DEEP FILL SECTION

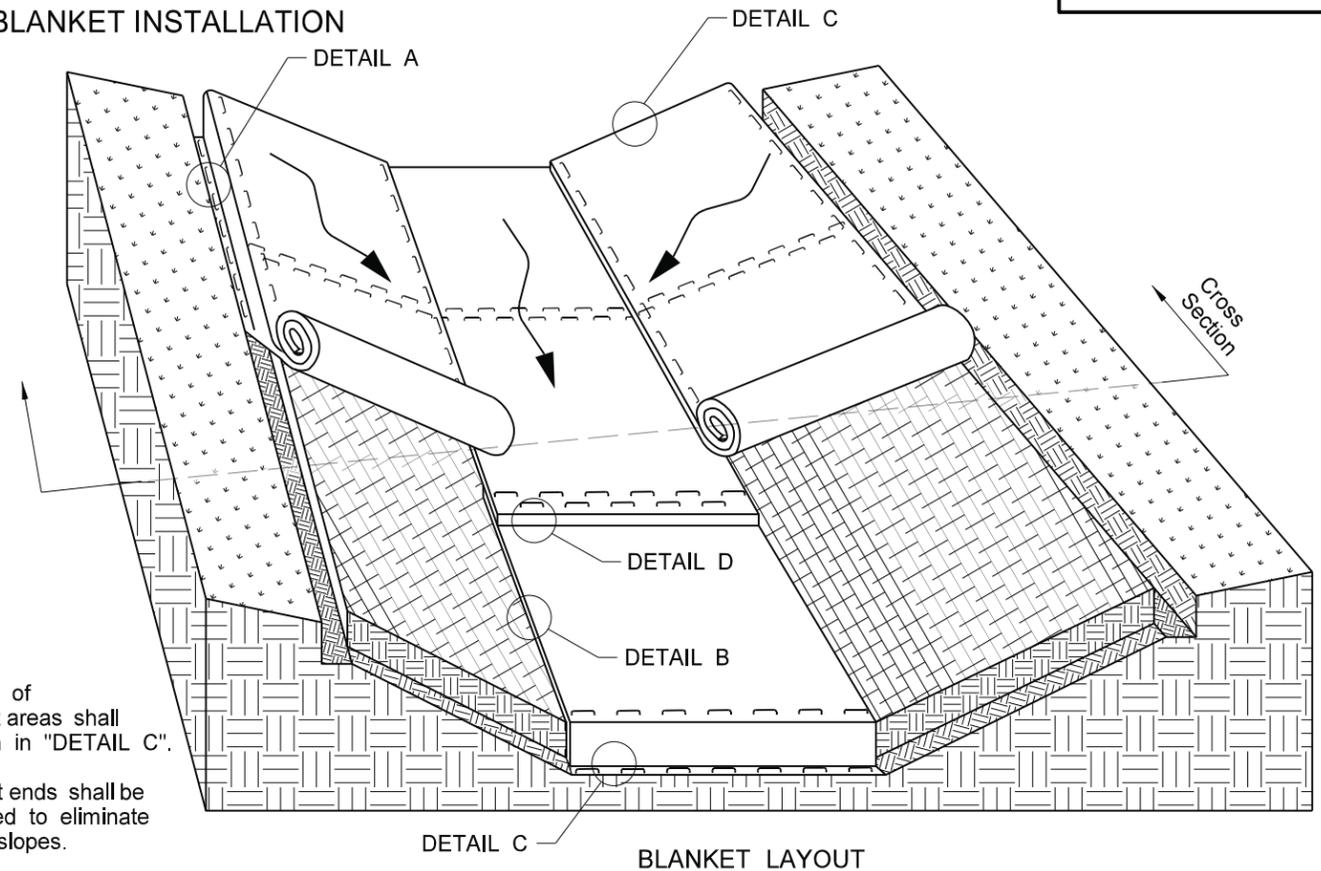
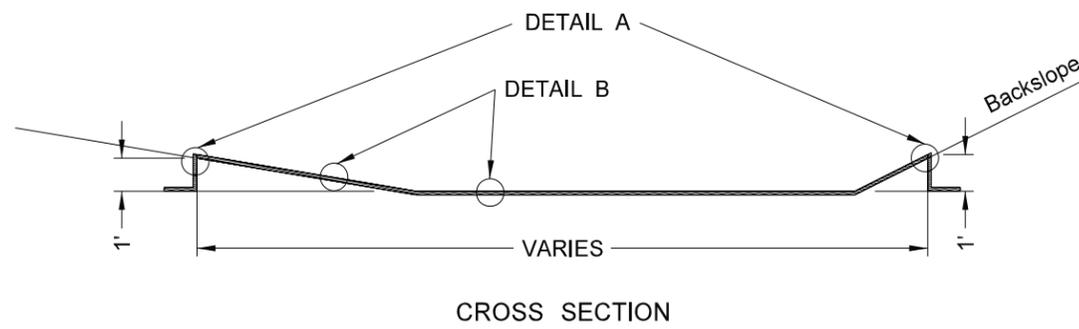


APPROACH GRADE ON CUT SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-25-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 02/25/14 and the original document is stored at the North Dakota Department of Transportation.

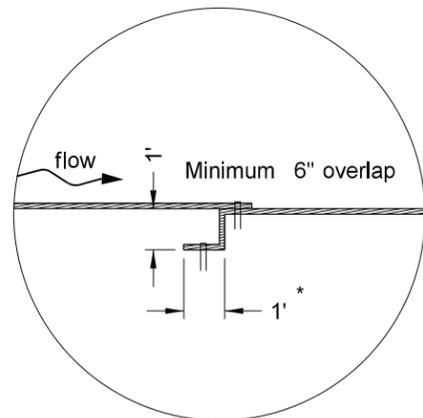
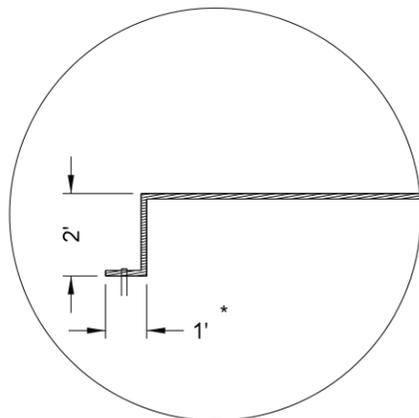
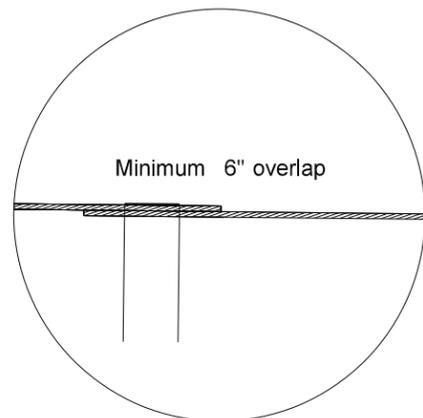
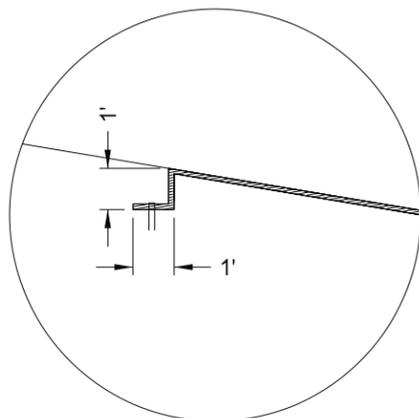
EROSION AND SILTATION CONTROL  
EROSION CONTROL BLANKET INSTALLATION



Notes:  
Beginning and ending of erosion control blanket areas shall be installed as shown in "DETAIL C".

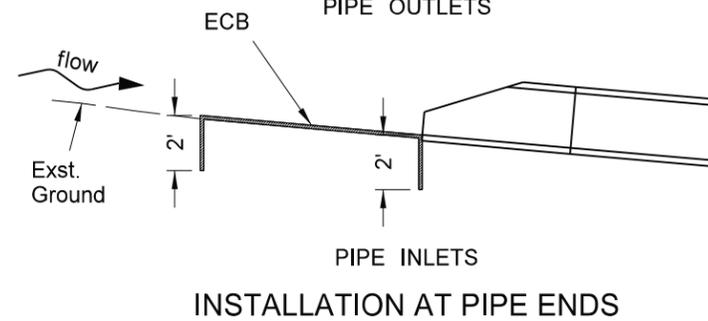
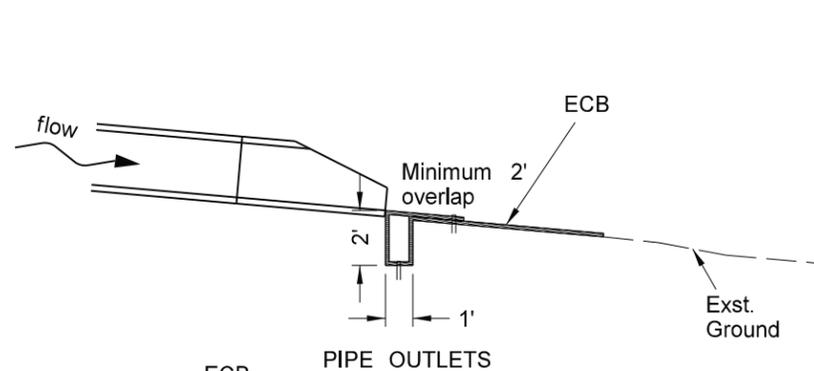
Erosion control blanket ends shall be entrenched and stapled to eliminate undermining on side slopes.

CHANNEL OR SLOPE INSTALLATION



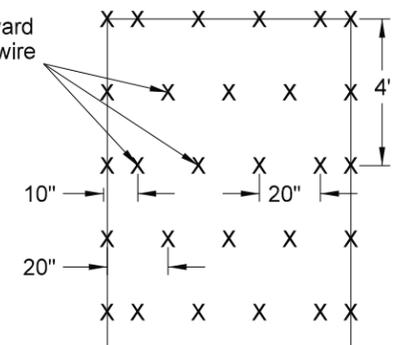
\* This tie may be placed ahead or back.

DETAILS  
CHANNEL OR SLOPE INSTALLATION



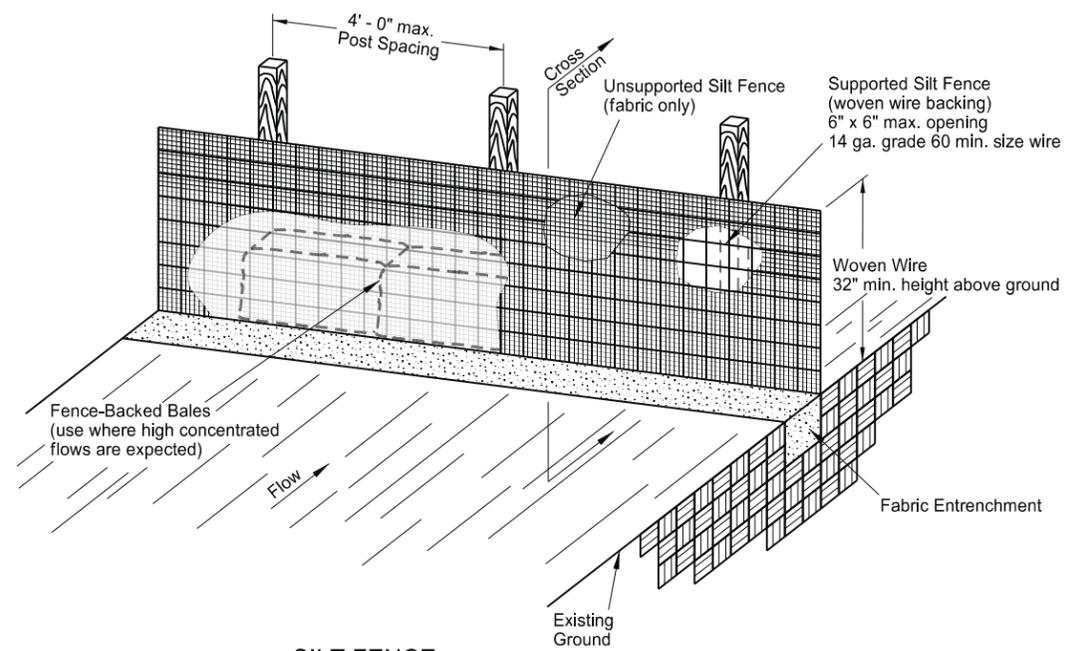
INSTALLATION AT PIPE ENDS

3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.

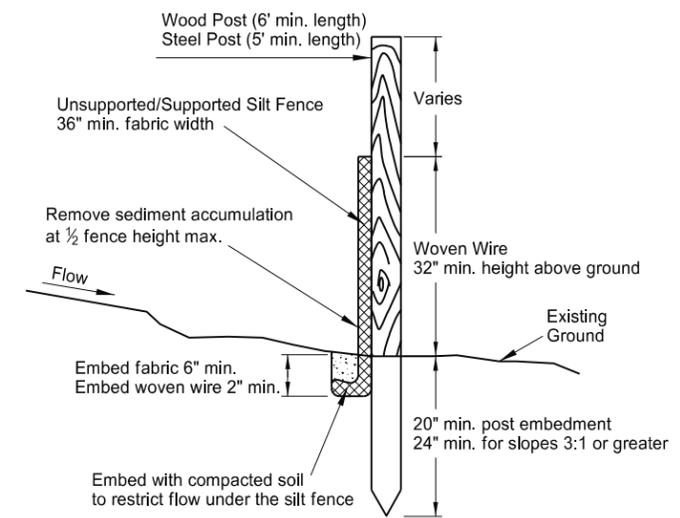


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-5 to D-255-2.

This document was originally issued and sealed by  
Roger Weigel  
Registration Number  
PE-2930,  
on 06/26/14 and the original document is stored at the North Dakota Department of Transportation



SILT FENCE SUPPORTED AND UNSUPPORTED

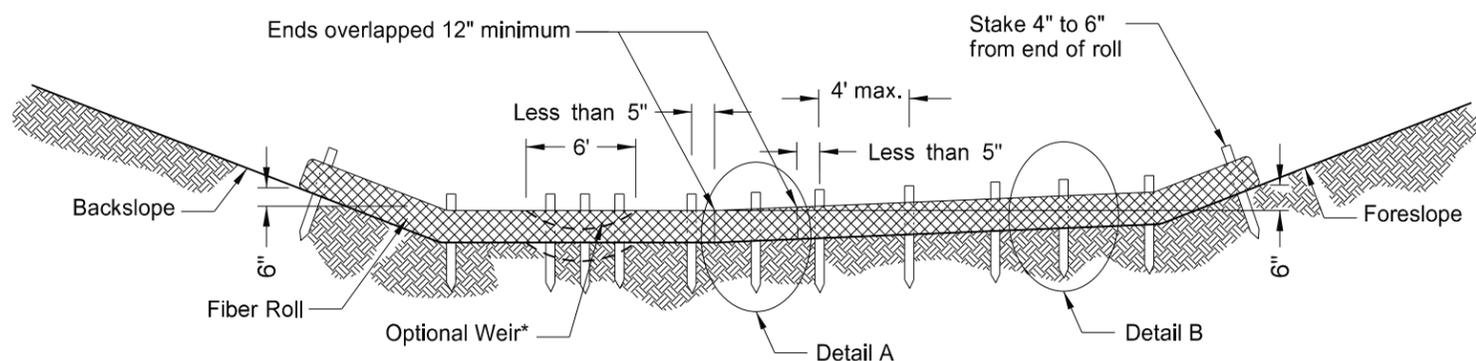


SILT FENCE CROSS SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION 10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.

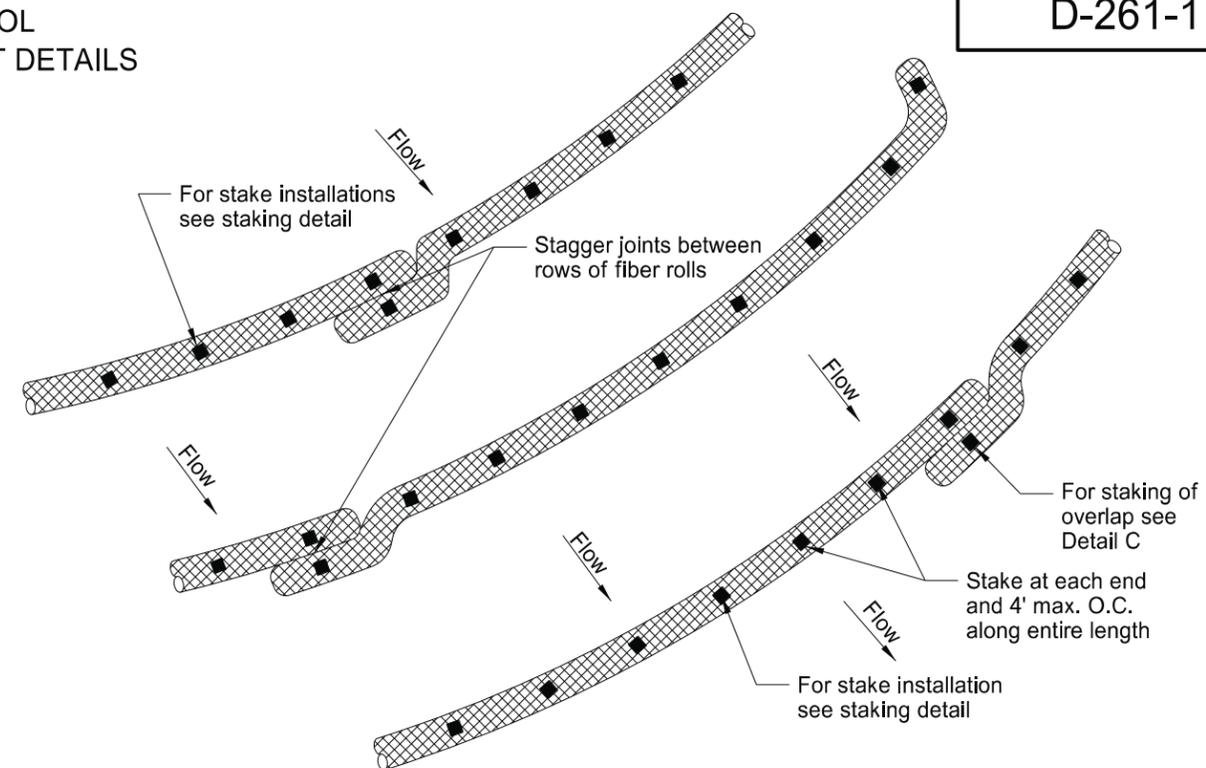
This document was originally issued and sealed by  
 Roger Weigel  
 Registration Number  
 PE-2930,  
 on 06/26/14 and the original document is stored at the North Dakota Department of Transportation

EROSION CONTROL  
FIBER ROLL PLACEMENT DETAILS

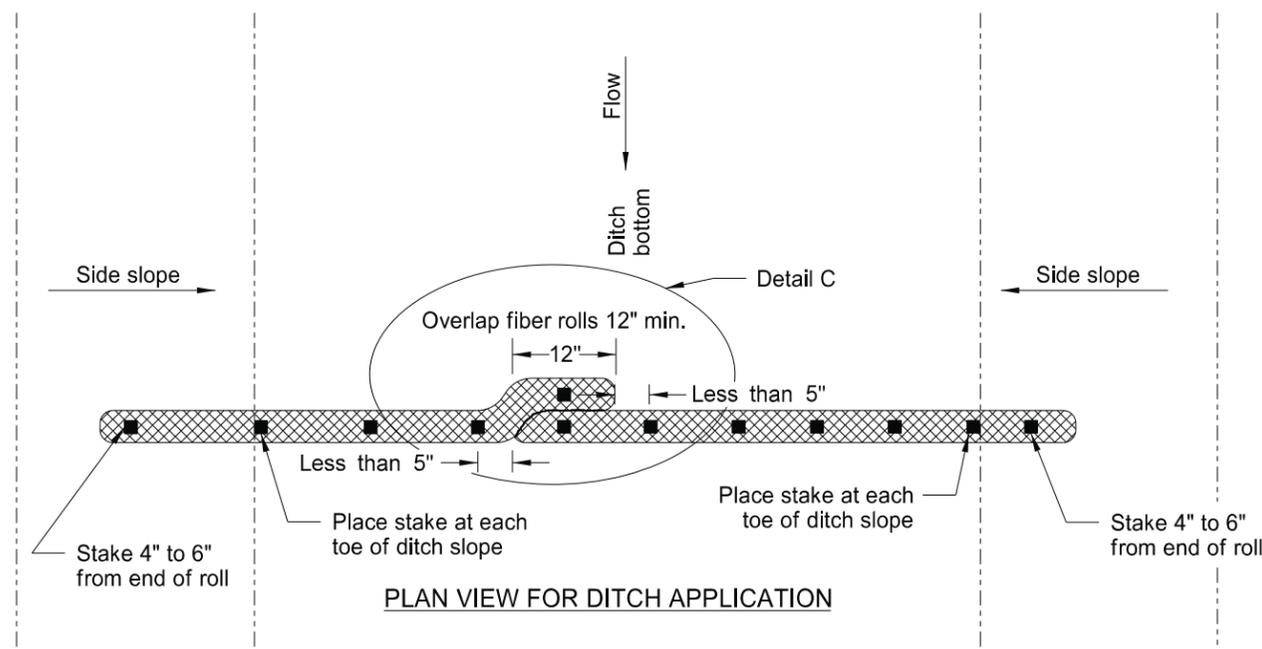


\*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

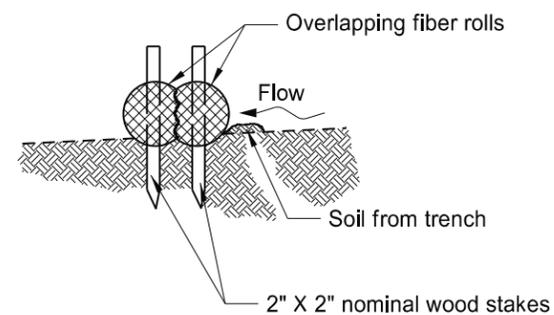
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



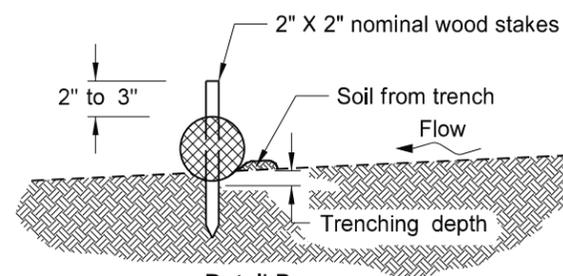
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A  
Fiber Roll Overlapping Staking Detail



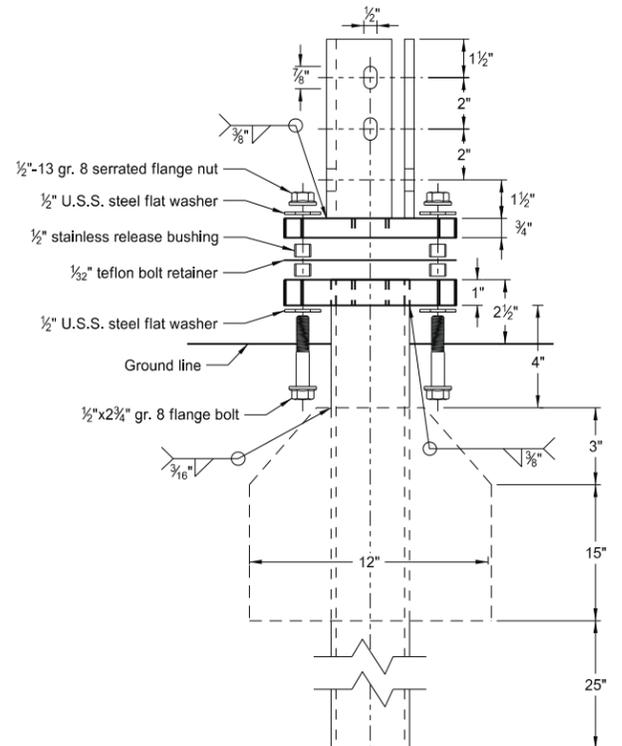
Detail B  
Fiber Roll Staking Detail

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

NOTE: Runoff must not be allowed to run under or around roll.

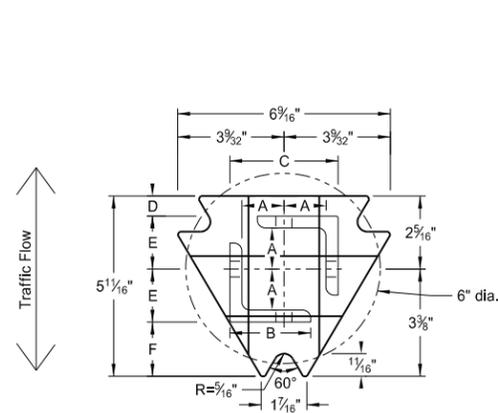
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application, Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 06/26/14 and the original document is stored at the North Dakota Department of Transportation

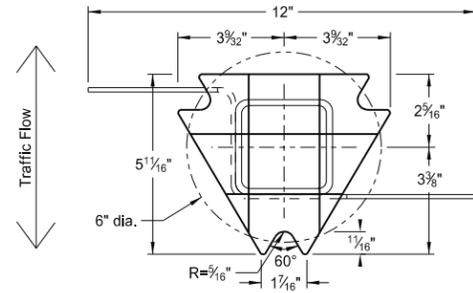


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver  
Plate - ASTM A572 grade 50  
Angle Receiver - 2 1/2"x2 1/2"x3/8" ASTM A36 structural angle



Bottom Soil Stub  
Tube - 3"x3"x7 gauge ASTM A500 grade B tube  
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011  
Plate - ASTM A572 grade 50

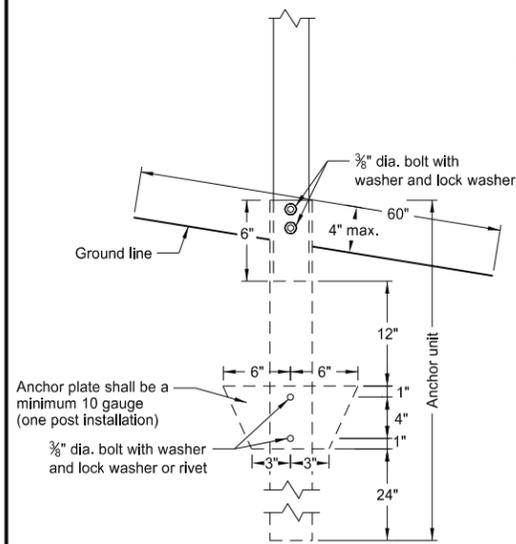
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

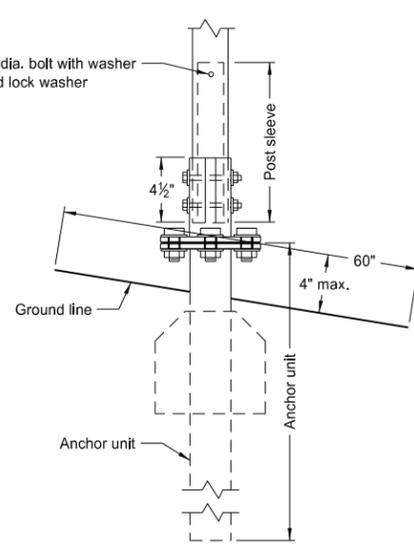
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. <sup>4</sup>	Cross Sec. Area in. <sup>2</sup>	Section Modulus in. <sup>3</sup>
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

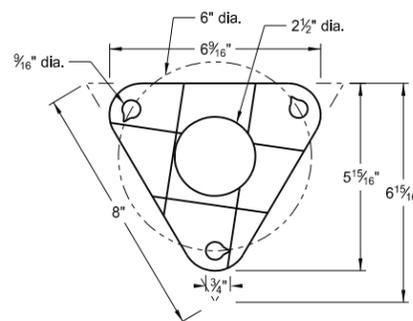
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



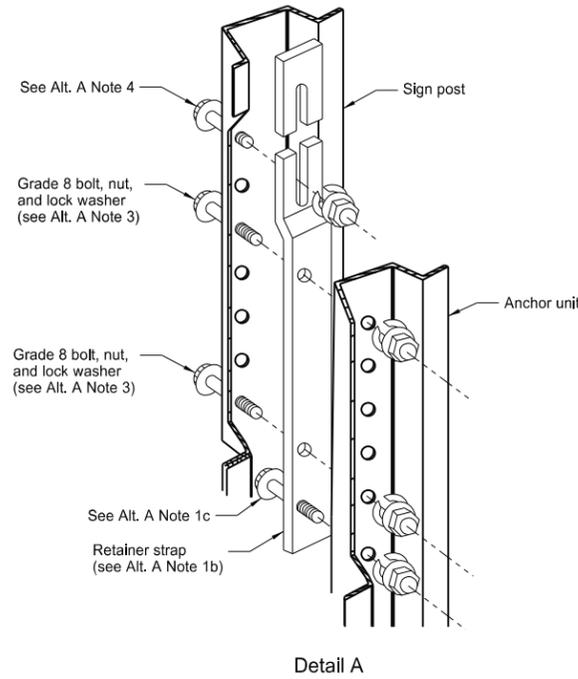
Bolt Retainer for Base Connection  
Bolt Retainer - 1/32" Reprocessed Teflon

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.  
(B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

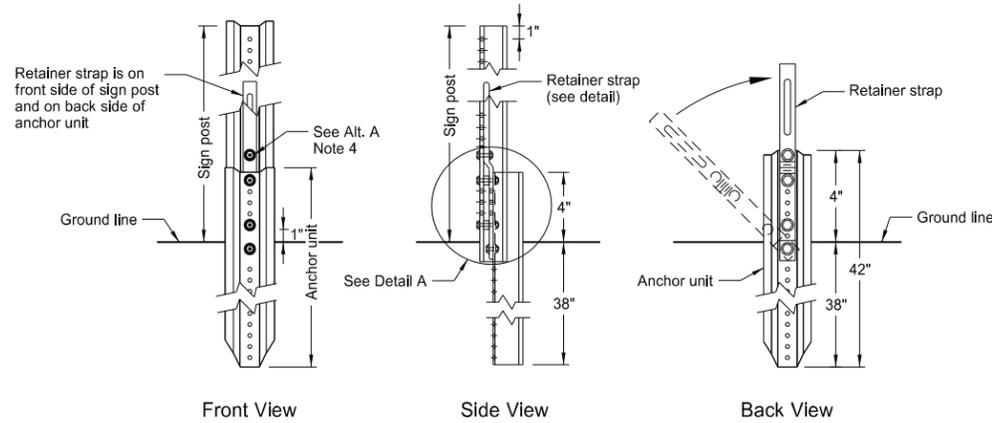
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 2/28/14 and the original document is stored at the North Dakota Department of Transportation

U-Channel Post



Detail A



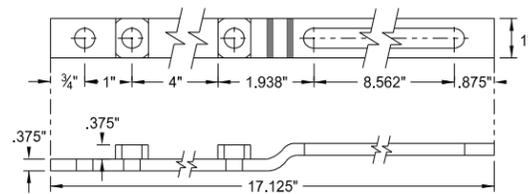
Front View

Side View

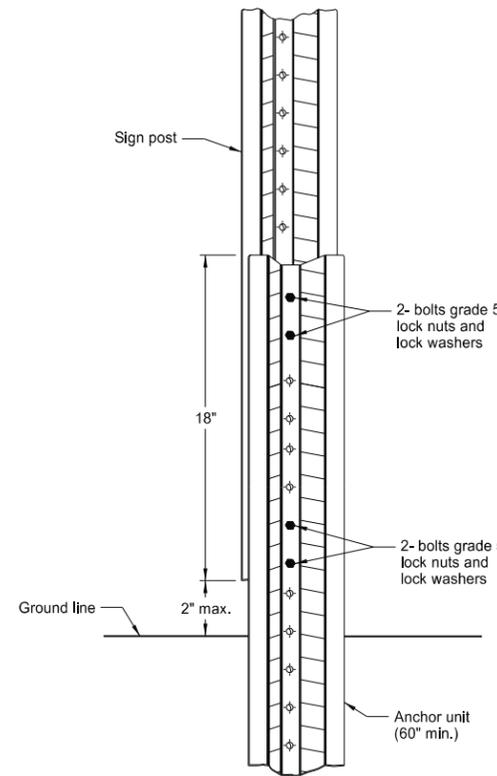
Back View

Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

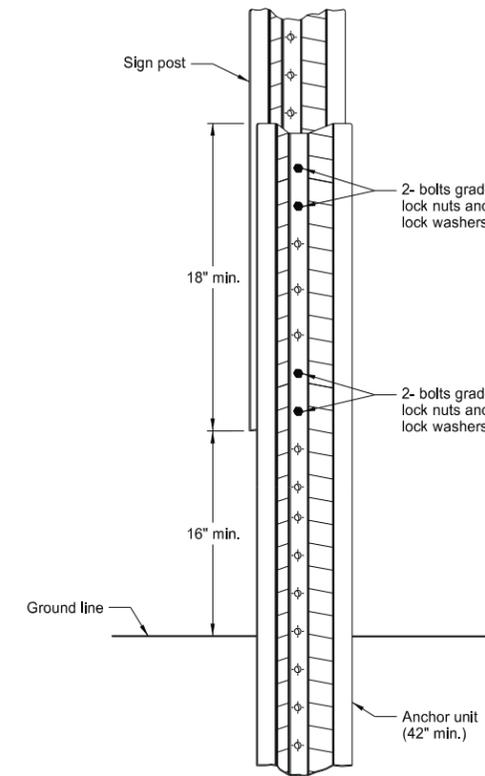


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

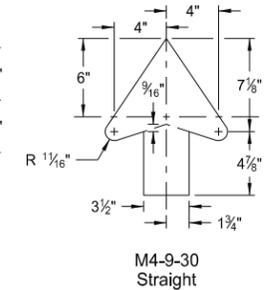
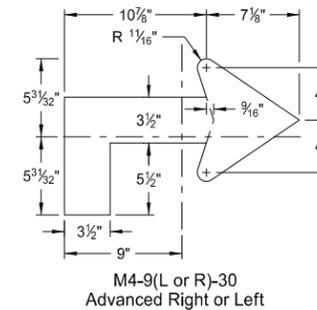
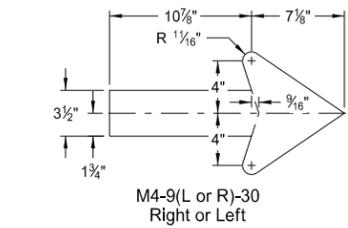
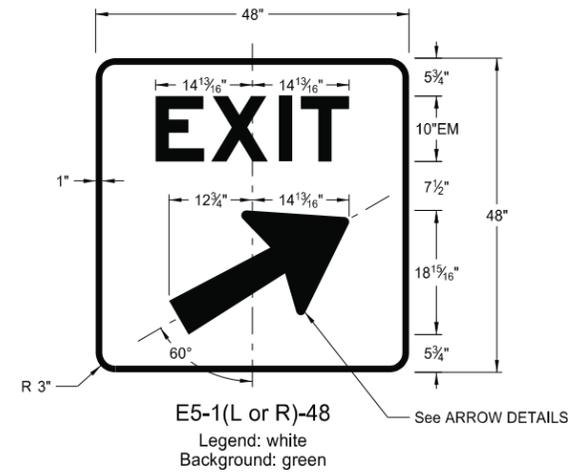
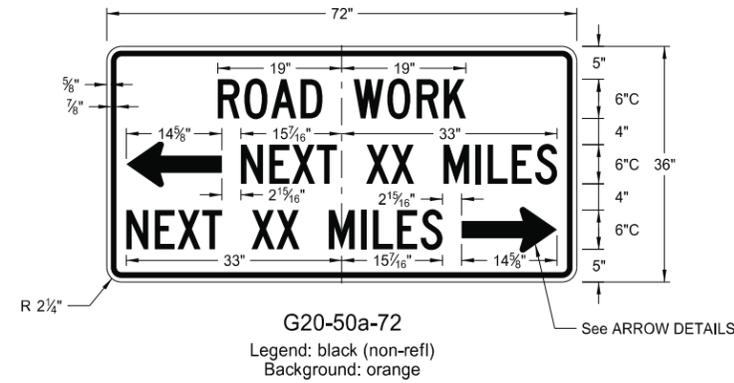
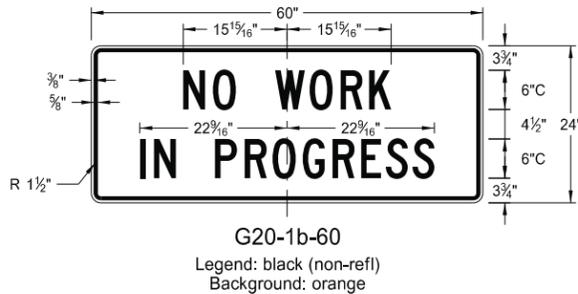
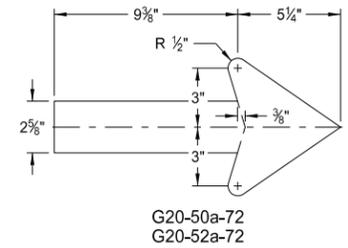
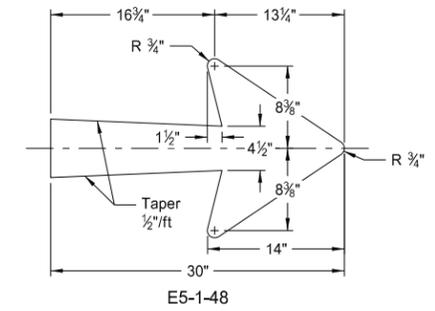
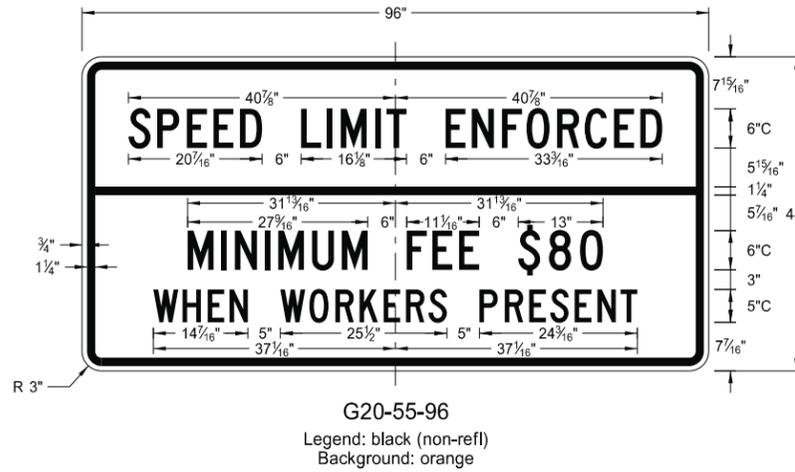
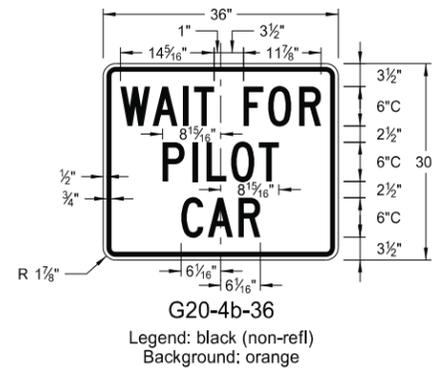
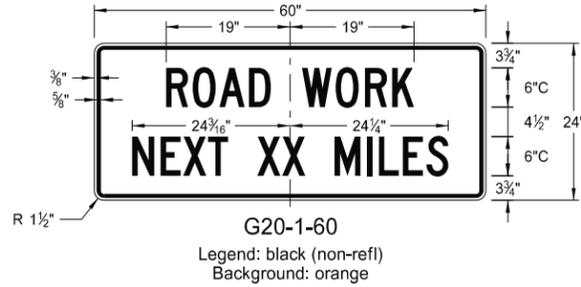
1. a) Drive anchor unit to within 12" of ground level.  
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.  
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.  
d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.  
b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.  
b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. The base post, strap and sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 2/28/14 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN DETAILS  
 TERMINAL AND GUIDE SIGNS

D-704-9



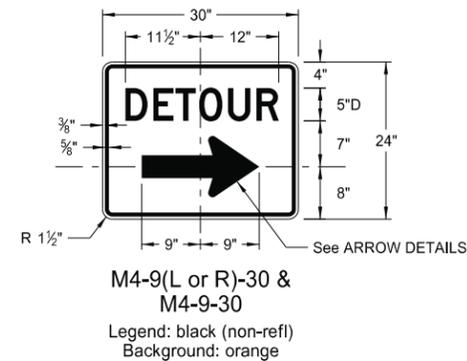
ARROW DETAILS

NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

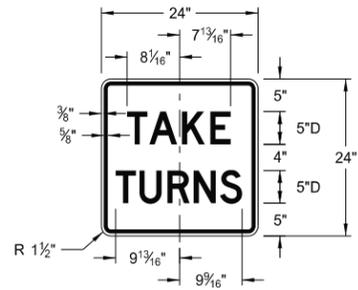
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by  
 Roger Weigel,  
 Registration Number  
 PE- 2930,  
 on 8/13/13 and the original document is stored at the  
 North Dakota Department  
 of Transportation

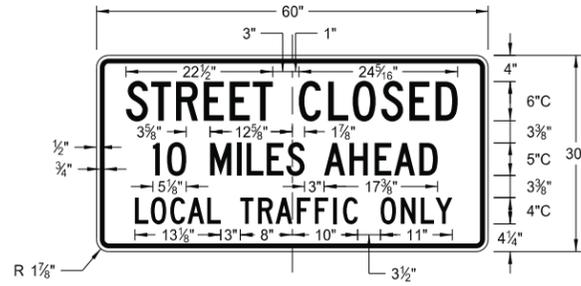


CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

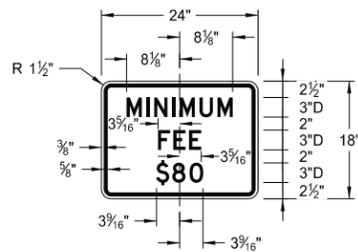
D-704-10



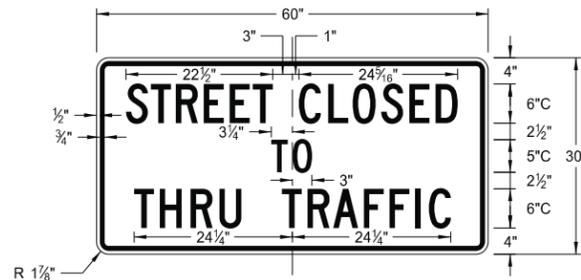
R1-50-24  
Legend: black (non-refl)  
Background: white



R11-3c-60  
Legend: black (non-refl)  
Background: white



R2-1a-24  
Legend: black (non-refl)  
Background: white



R11-4a-60  
Legend: black (non-refl)  
Background: white



R11-2a-48  
Legend: black (non-refl)  
Background: white

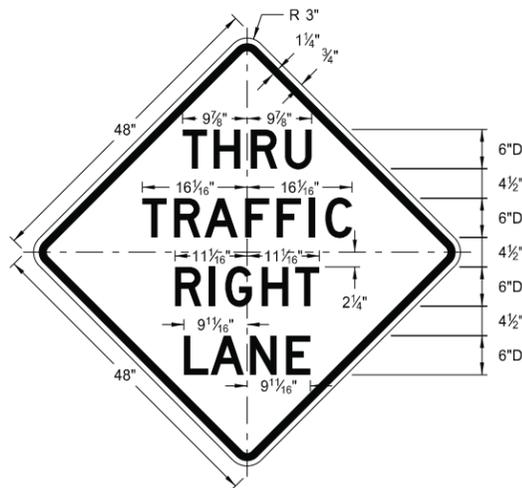
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

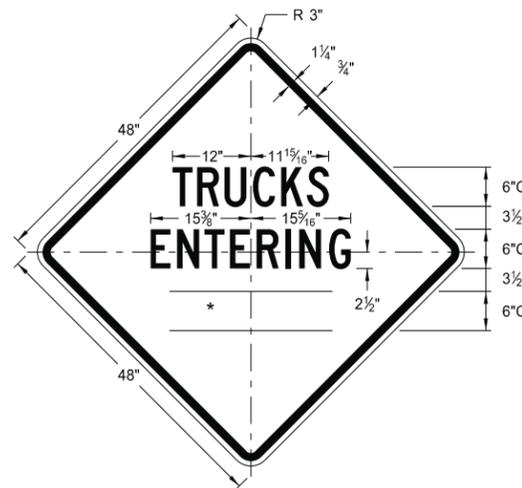
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

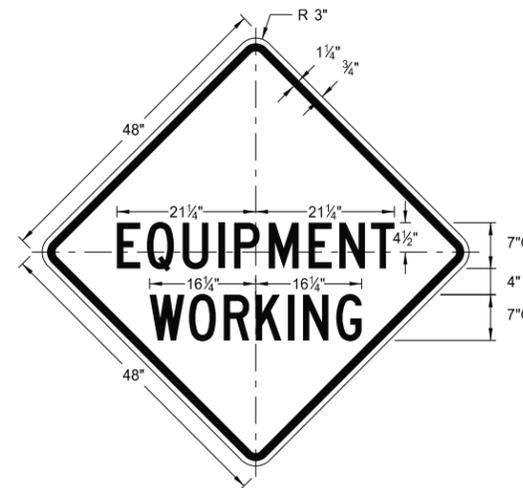
\* DISTANCE MESSAGES



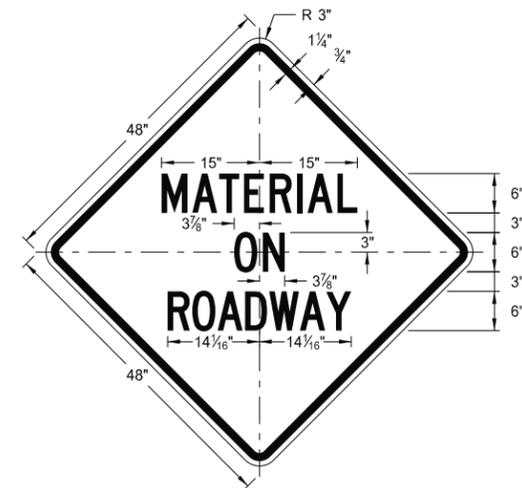
W5-8-48  
Legend: black (non-refl)  
Background: orange



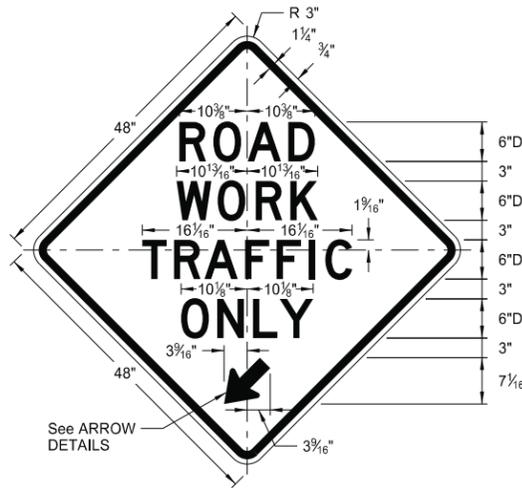
W8-54-48  
Legend: black (non-refl)  
Background: orange



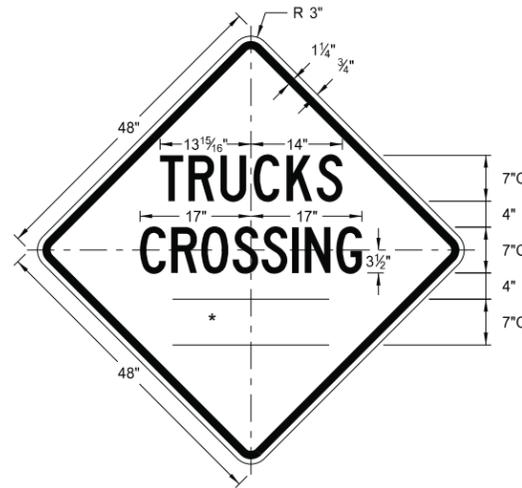
W20-51-48  
Legend: black (non-refl)  
Background: orange



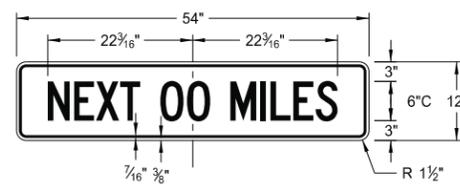
W21-51-48  
Legend: black (non-refl)  
Background: orange



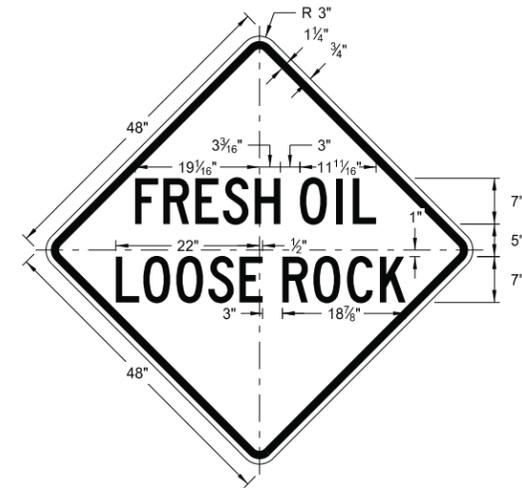
W5-9-48  
Legend: black (non-refl)  
Background: orange



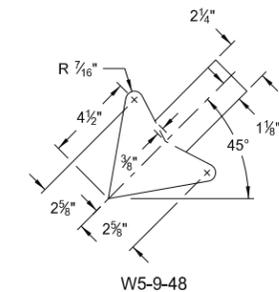
W8-55-48  
Legend: black (non-refl)  
Background: orange



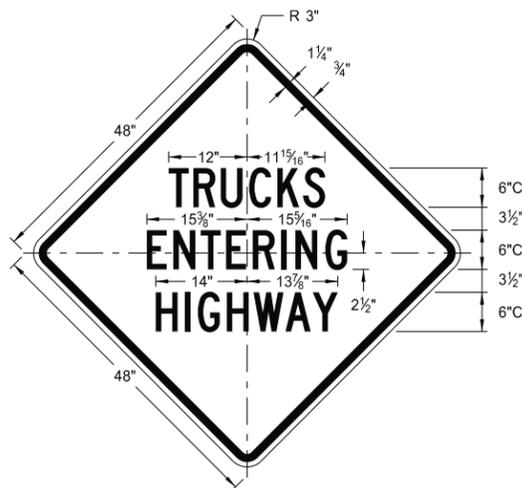
W20-52-54  
Legend: black (non-refl)  
Background: orange



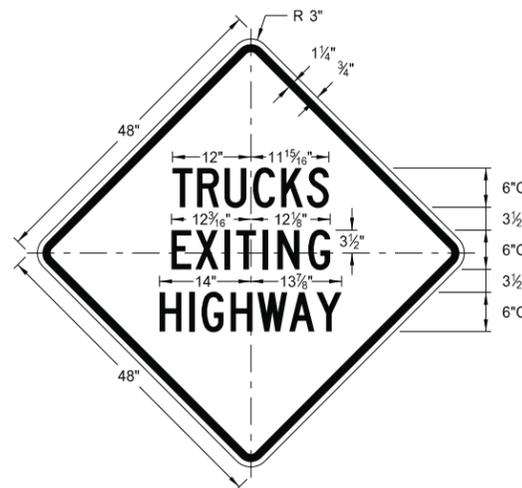
W22-8-48  
Legend: black (non-refl)  
Background: orange



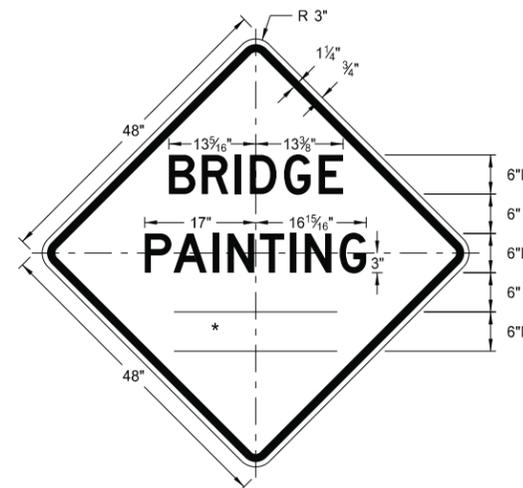
W5-9-48  
ARROW DETAILS



W8-53-48  
Legend: black (non-refl)  
Background: orange



W8-56-48  
Legend: black (non-refl)  
Background: orange

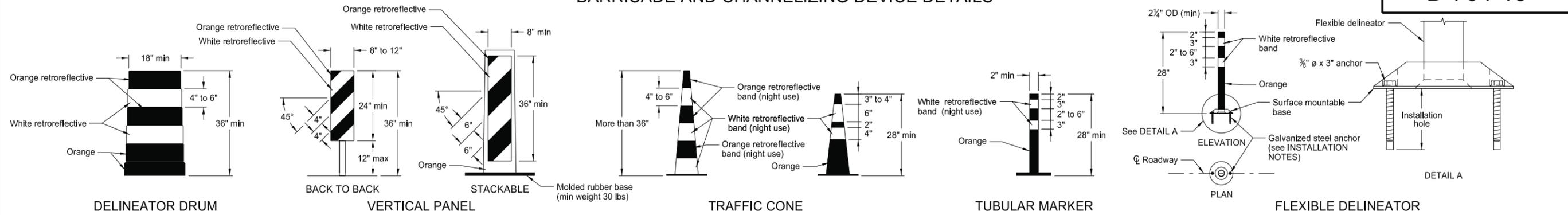


W21-50-48  
Legend: black (non-refl)  
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

BARRICADE AND CHANNELIZING DEVICE DETAILS



INSTALLATION NOTES:

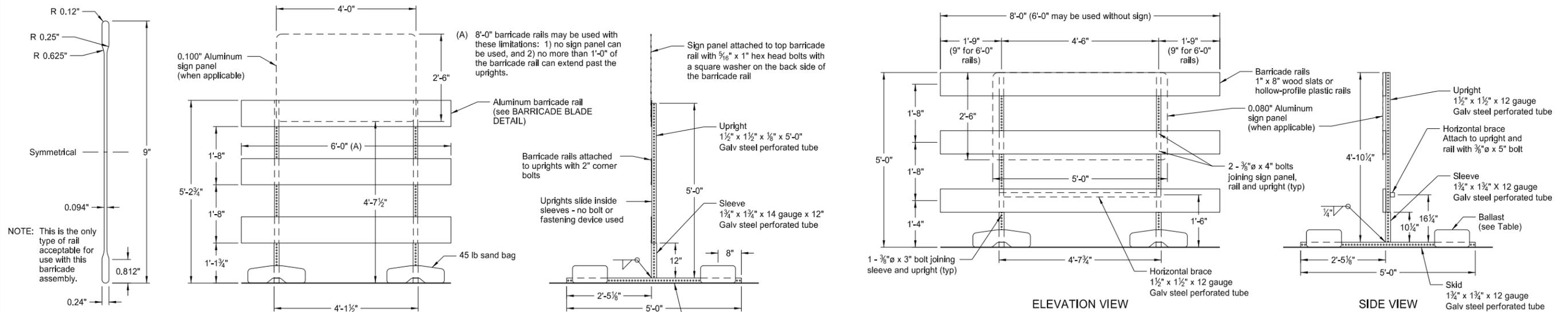
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl pad or hot melt butyl. Butyl shall be removed as close as possible to pavement surface.

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED spaces between the horizontal orange and white stripes shall not exceed 3" wide. Stripes shall not be placed on ribs or indentations in the drum. Drums shall have closed tops that will not allow collection of construction debris or other debris. Ballast shall not be placed on the top of a drum.

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, a stripe width of 6 inches shall be used.

RetroreflectORIZATION of cones more than 36" in height shall be provided by alternating orange and white retroreflective stripes. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED space between the orange and white stripes shall not exceed 3" wide.

RetroreflectORIZATION of tubular markers more than 42" in height shall be provided by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



BARRICADE BLADE DETAIL

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

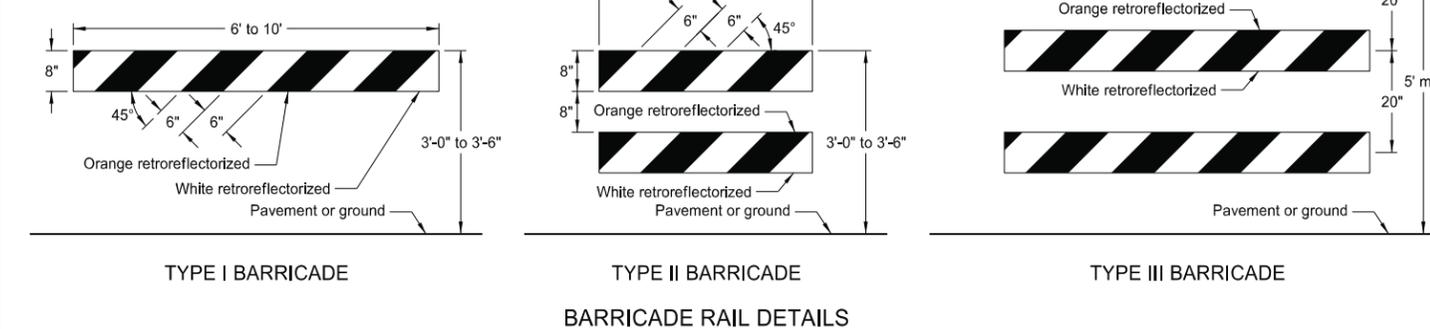
SIDE VIEW

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

SIDE VIEW

NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", the rail stripe width shall be 4".

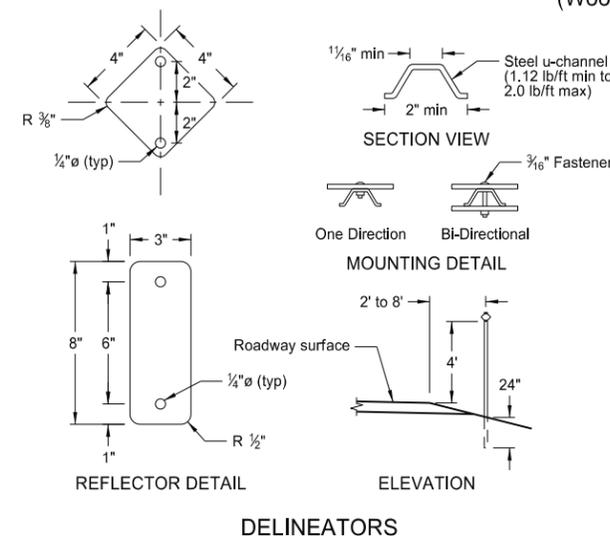


TYPE I BARRICADE

TYPE II BARRICADE

TYPE III BARRICADE

BARRICADE RAIL DETAILS



REFLECTOR DETAIL

DELINEATORS

MINIMUM BALLAST (For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

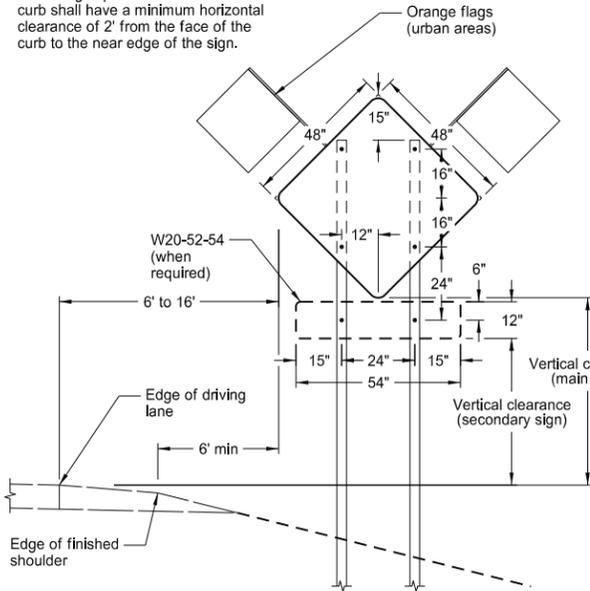
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

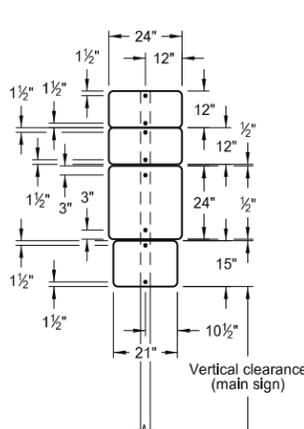
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 10/3/13 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

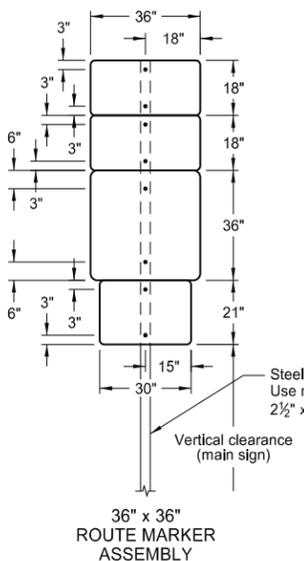
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



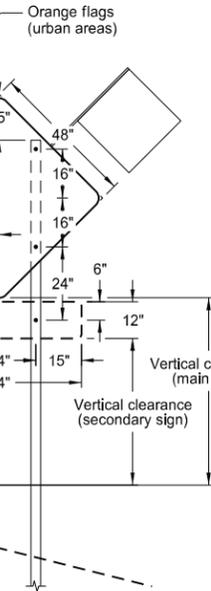
TYPICAL SECTION (48" x 48" diamond warning sign shown)



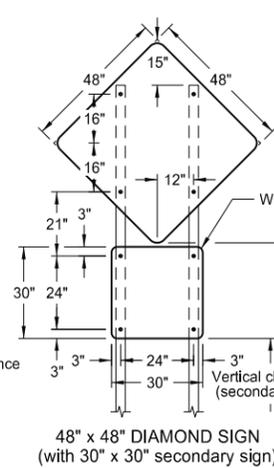
24" x 24" ROUTE MARKER ASSEMBLY



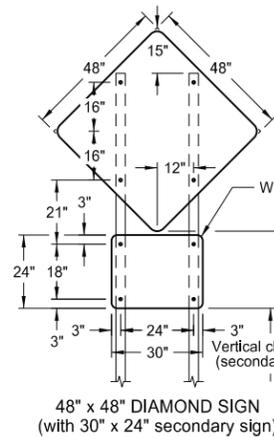
36" x 36" ROUTE MARKER ASSEMBLY



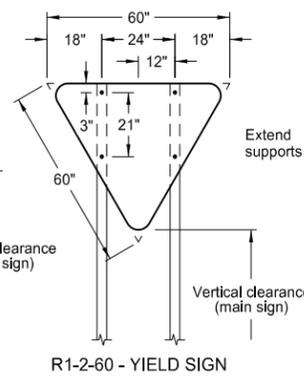
18" x 18" DIAMOND SIGN



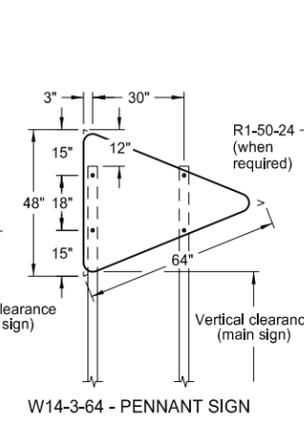
48" x 48" DIAMOND SIGN (with 30" x 30" secondary sign)



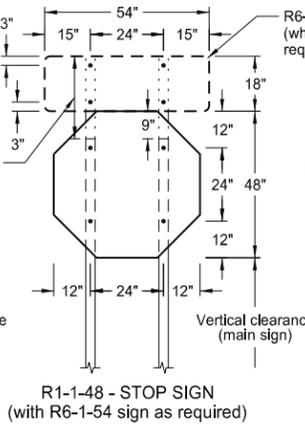
48" x 48" DIAMOND SIGN (with 30" x 24" secondary sign)



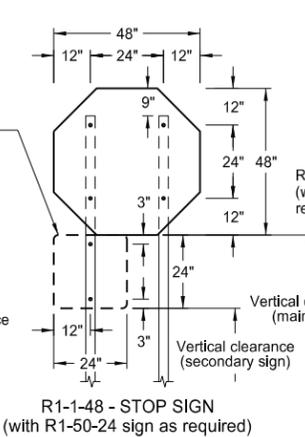
R1-2-60 - YIELD SIGN



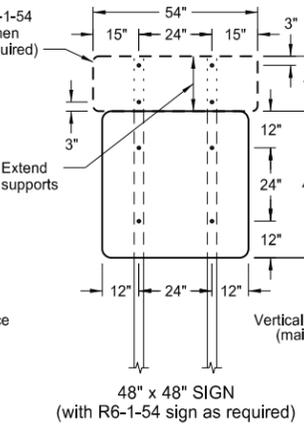
W14-3-64 - PENNANT SIGN



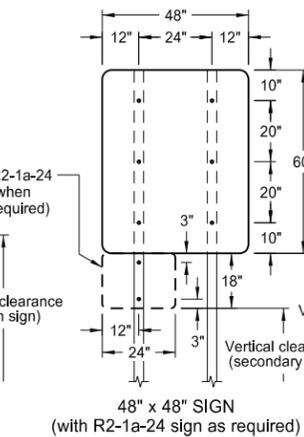
R1-1-48 - STOP SIGN (with R6-1-54 sign as required)



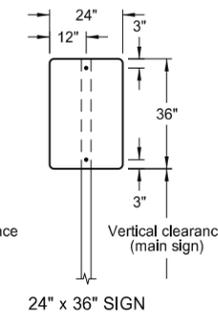
R1-1-48 - STOP SIGN (with R1-50-24 sign as required)



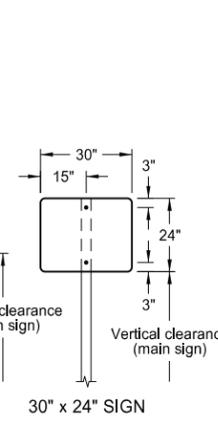
48" x 48" SIGN (with R6-1-54 sign as required)



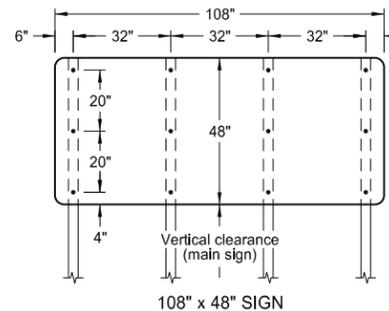
48" x 48" SIGN (with R2-1a-24 sign as required)



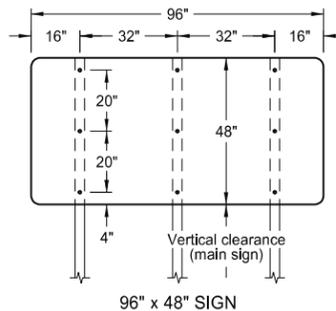
24" x 36" SIGN



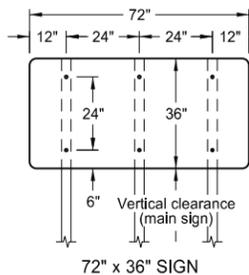
30" x 24" SIGN



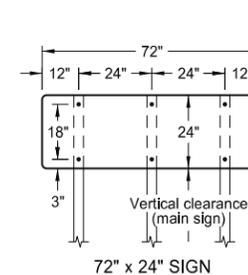
108" x 48" SIGN



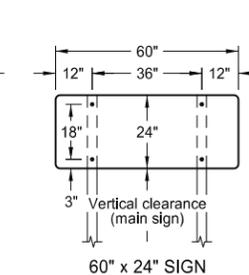
96" x 48" SIGN



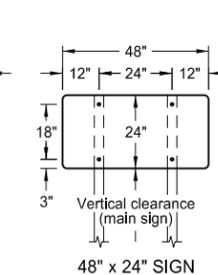
72" x 36" SIGN



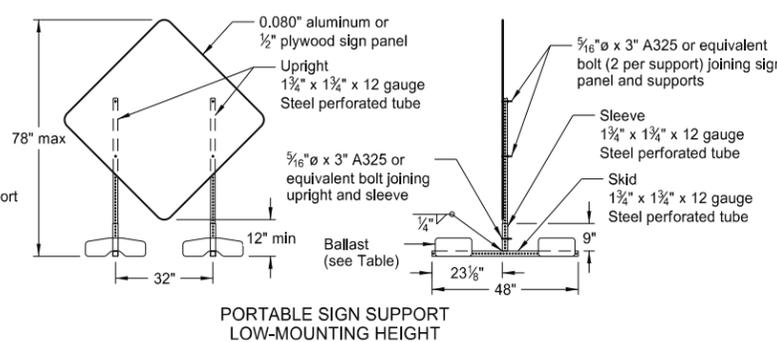
72" x 24" SIGN



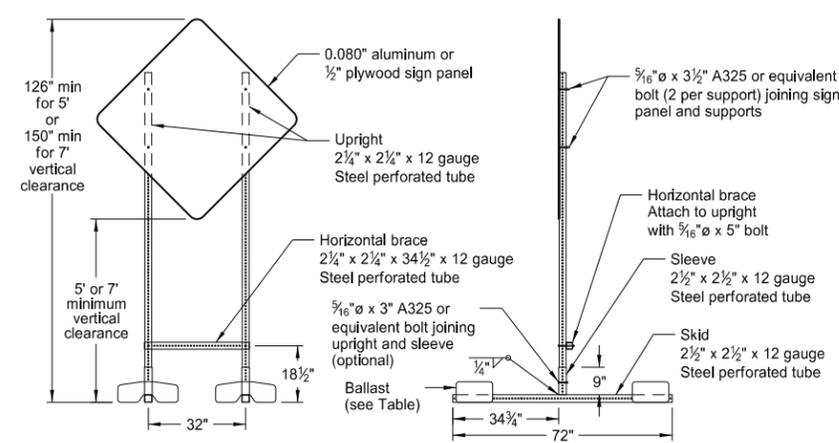
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT HIGH-MOUNTING HEIGHT

NOTES:

- Sign Supports:** Supports shall be galvanized or painted. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.  
  
Signs over 50 square feet should be installed on 2 1/2" x 2 1/2" perforated tube supports as a minimum.  
  
Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.
- Sign Panels:** Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. All holes to be punched round for 3/8" bolts.
- Alternate Messages:** The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a lane closure sign)
- Route Marker Auxiliary Signs:** Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:  
  
Interstate - white legend on blue background  
Interstate Business Loop - white legend on green background  
US and State - black legend on white background  
County - yellow legend on blue background
- Vertical Clearance:** Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.  
  
The vertical clearance to secondary signs is 1'-0" less than the vertical clearance as stated above.  
  
Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.
- Portable Signs:** Provide portable signs that meet the vertical clearance as stated above. Use portable signs when it is necessary to place signs within the pavement surface.  
  
When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used as long as the view of the sign is not obstructed. Time delays caused by unforeseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. The R9-8 through R9-11a series, W1-5 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.  
  
Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST (For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6.

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 11/14/13 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

Notes

- Variables  
 S = Numerical value of speed limit or 85th percentile.  
 W = The width of taper.  
 L = Minimum length of taper, or  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S^2/60$  for urban, residential, and other streets with speeds of 40 mph or less.
- Barricades placed on roadway shall be on a moveable assembly. Signs placed on roadway shall be placed on skid mounted assemblies.
- Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "S".
- Sequencing Arrow Panels  
 Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface. See Shoulder Closure Standard Drawing.  
 Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).  
 Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).  
 Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at  $\frac{1}{2}$  B.
- Use when work area is 1 mile or longer.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- Where necessary, safe speed to be determined by the Engineer.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- G20-55-96 sign is not required if this standard is part of other traffic control layouts, or the work is less than 15 days.

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

**KEY**

	Type III barricade		Work area
	Sign		Flagger
	Delineator drum		Sequencing arrow panel
	Tubular markers		Vertical panels back to back

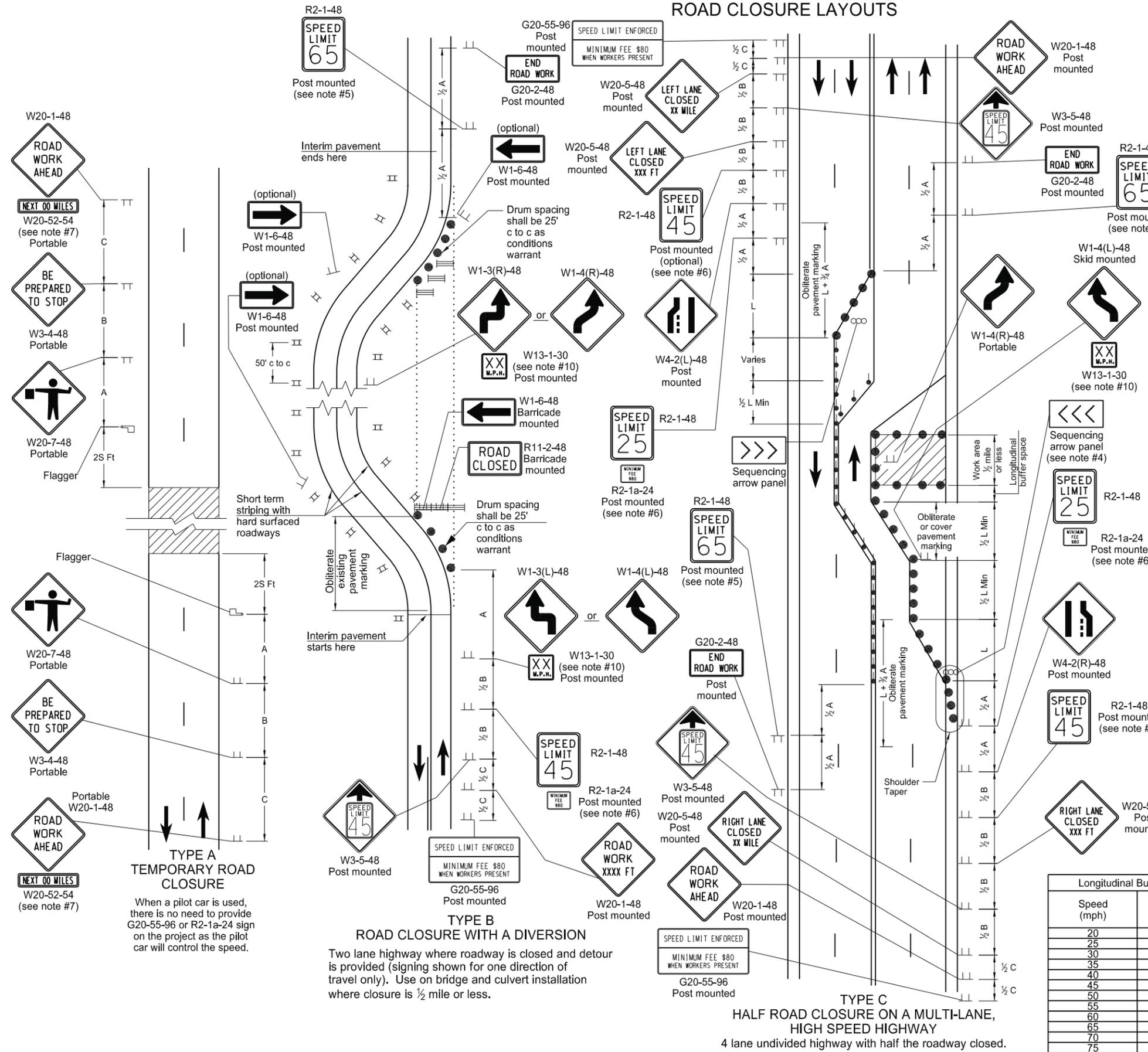
**Longitudinal Buffer Space**

Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
9-27-13

REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by  
 Roger Weigel  
 Registration Number  
 PE-2930,  
 on 09/27/13 and the original document is stored at the  
 North Dakota Department  
 of Transportation

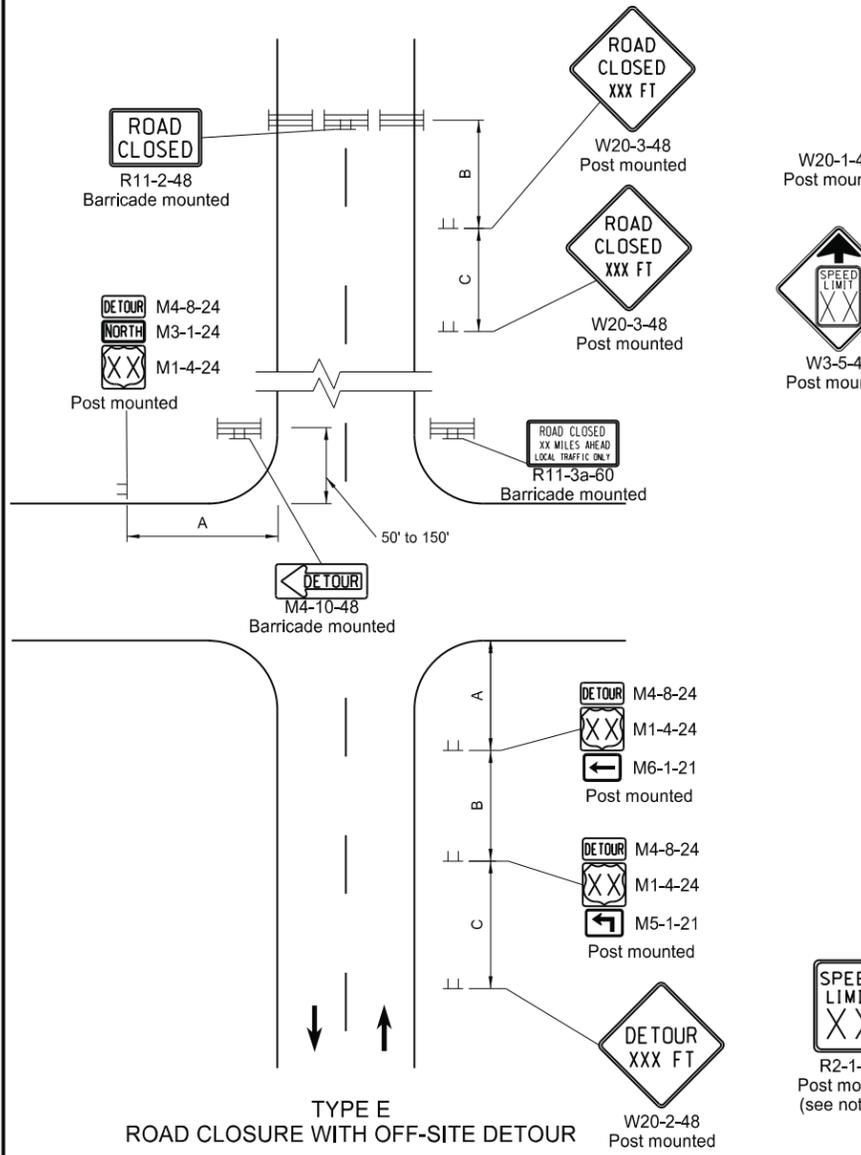


# ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS

D-704-19

**Notes**

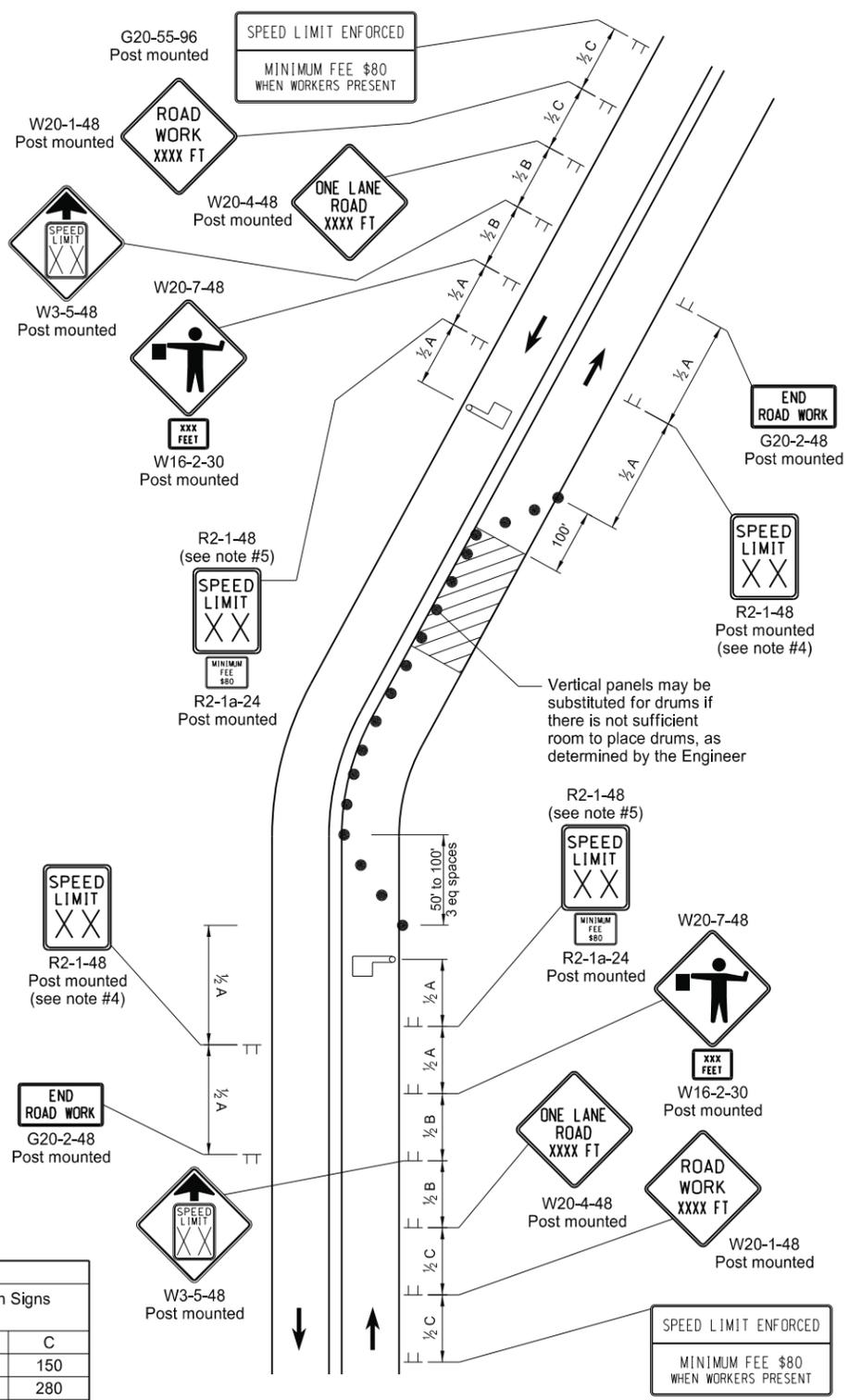
- Variables
  - S = Numerical value of speed limit or 85th percentile.
  - W = The width of taper
  - L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S<sup>2</sup>/60 for urban, residential, and other streets with speeds of 40 mph or less.
- Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
- Delineator drums used for tapering traffic shall be placed at 3 equal spaces. Delineator drums for tangents shall be spaced at 2 times dimension "S".
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- Where necessary, safe speed to be determined by the Engineer.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- G20-55-96 or R2-1a-24 sign are not required when a pilot car operation is used, if this standard is part of other traffic control layouts, or the work is less than 15 days.
- When highway-rail grade crossings exist either within or in the vicinity of the roadway work activities:
  - Extra care shall be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing (considered as being 15 feet on either side of the closest and farthest rail.)
  - A "Do Not Stop on Tracks" sign (R8-8-24) should be placed near the cross buck in each direction while the lane closure is in the vicinity of the tracks.
  - A buffer space between the work zone and the lane closure transition should be extended upstream of the highway-rail grade crossing so a queue created by the flagging operation will not extend across the highway-rail grade crossing.
  - If the queuing of vehicles across active rail tracks cannot be avoided, a flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing, even if automatic warning devices are in place.



**TYPE E  
ROAD CLOSURE WITH OFF-SITE DETOUR**

Used where a road is closed beyond a detour point. Signing shown for one direction only. Sign not shown on detour shall be shown in plans and installed and maintained by the contractor.

Road Type	ADVANCE WARNING SIGN SPACING		
	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500



**TYPE F  
LANE CLOSURE ON A TWO ROAD USING FLAGGERS**

Two lane highway with one lane closed. Flagger is at a point where it is visible to approaching traffic.

**KEY**

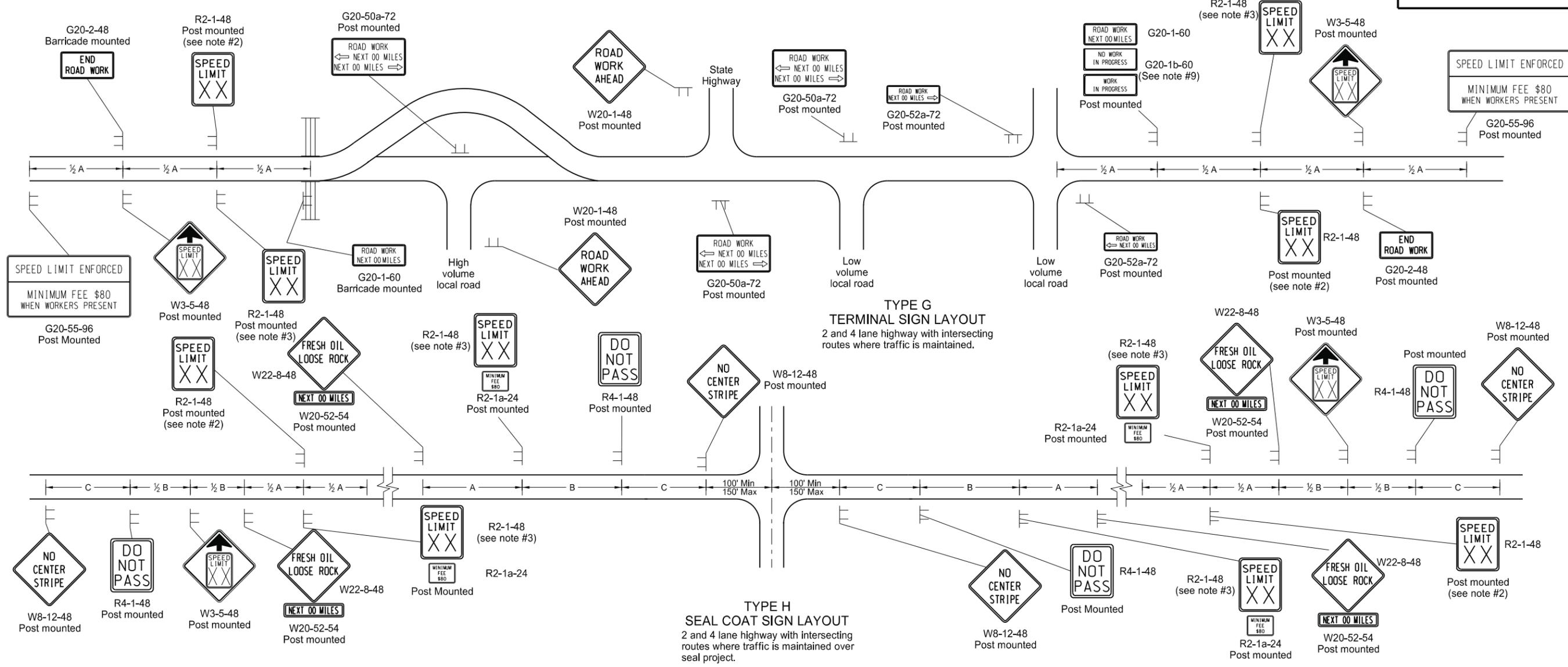
- Delineator Drum
- ▬ Sign
- ▬ Type III Barricade
- ▨ Work/Hazard Area
- ☞ Flagger

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
3-13-14	Revised Sign Cell "ROAD WORK XXX FT"

This document was originally issued and sealed by  
**Roger Weigel**  
 Registration Number  
 PE-2930,  
 on 03/13/14 and the original document is stored at the  
 North Dakota Department  
 of Transportation

# TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



- Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 MPH below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 MPH. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- On seal projects, signs R2-1-48, R2-1a-24, R4-1-48, W22-8-48 and W20-52-54 shall be placed just after all important intersections and at five mile intervals thereafter. Sign W8-12-48 shall be placed just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. No short term pavement markings are placed when traffic volumes are 750 ADT or less.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
- The contractor shall install the G20-1b-60 sign when work is suspended for winter.
- Other traffic control layouts will be required in the immediate work areas. If the speed limit is reduced in the work area, speed limit signs shall have the R2-1a-24 sign placed below.
- G20-55-96 sign is not required if work is less than 15 days.

**KEY**

≡ Type III barricade

⊥ Sign

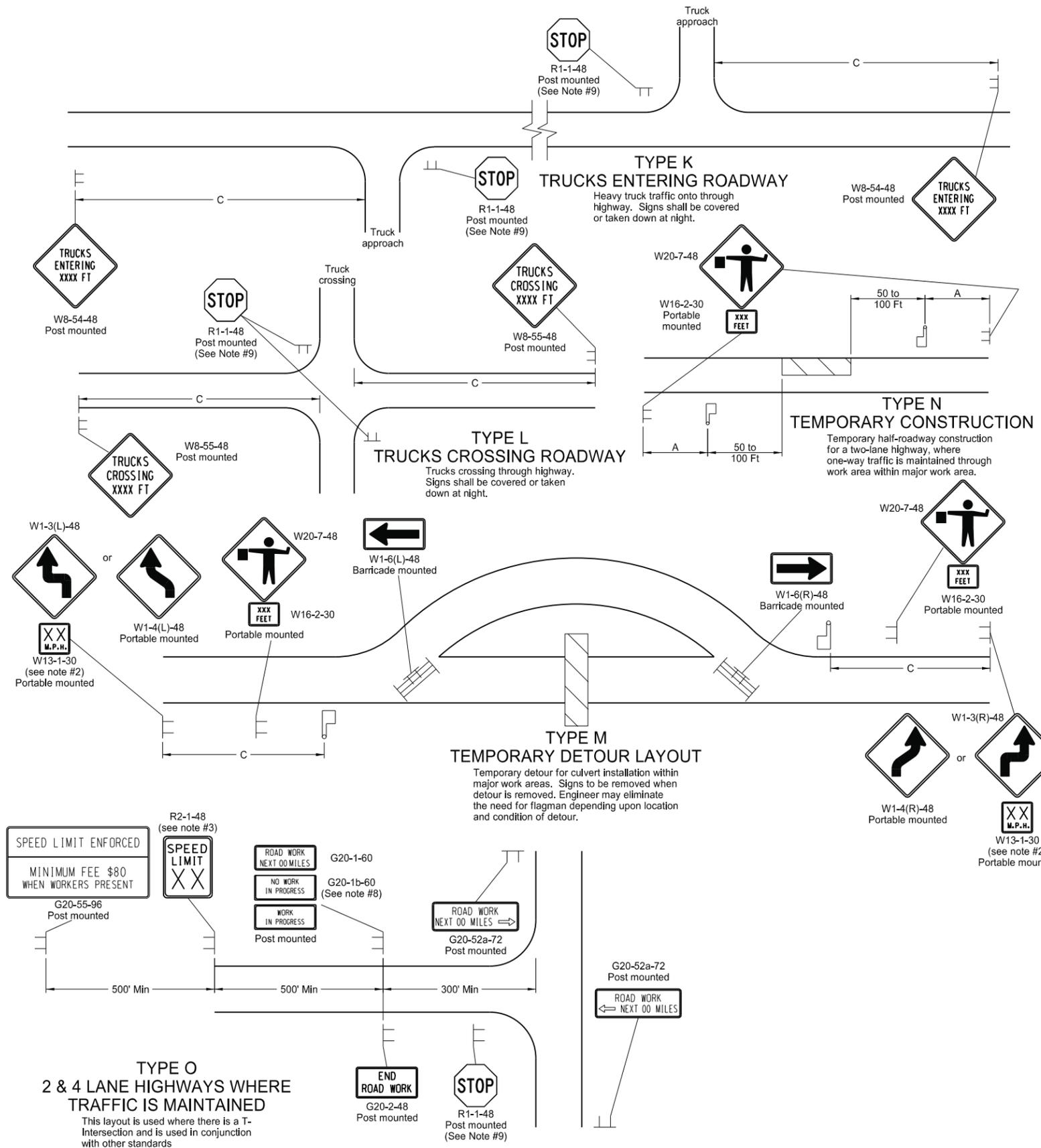
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 09/27/13 and the original document is stored at the North Dakota Department of Transportation

# CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



- Notes
1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies. Where necessary, safe speed to be determined by the Engineer.
  2. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
  3. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
  4. Existing speed limit signs within a reduced speed zone shall be covered. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
  5. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
  6. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
  7. If existing stop sign is in place, a 48" stop sign is not required.
  8. G20-55-96 sign is not required if this standard is part of other traffic control layouts with this sign or the work is less than 15 days.

KEY

	Type III barricade		Work area
	Sign		Flagger

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

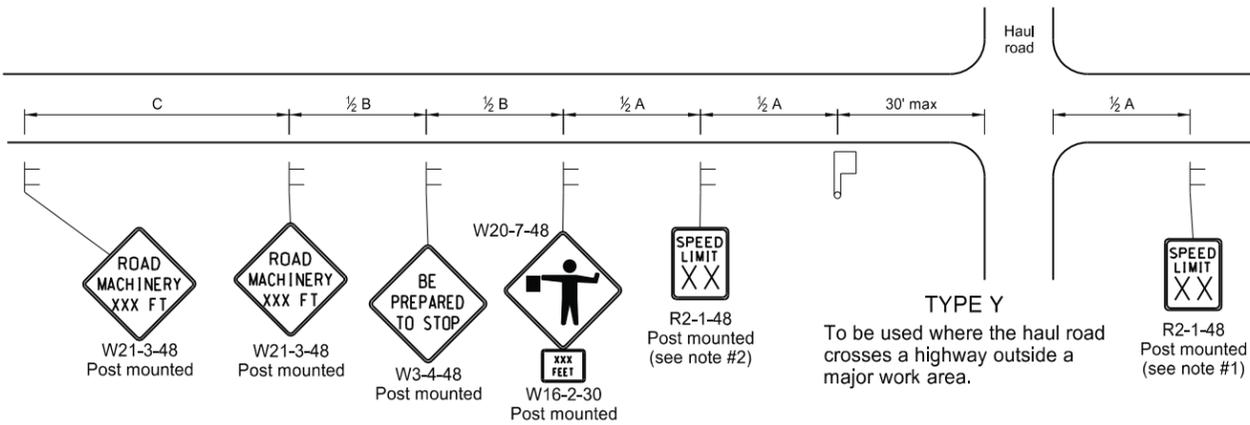
REVISIONS

DATE	CHANGE

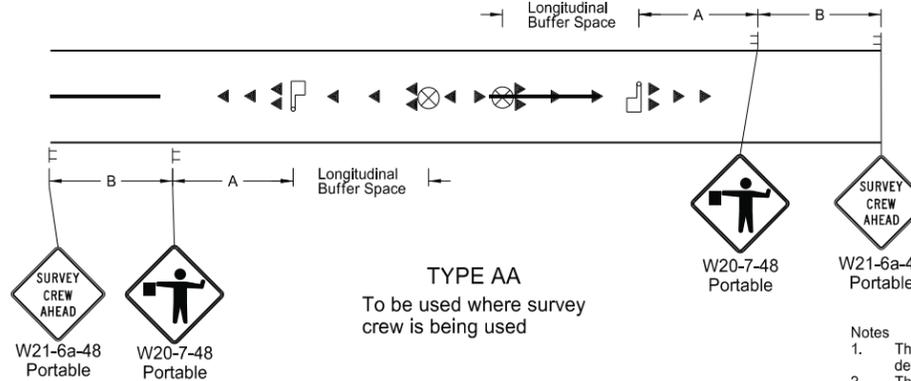
This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 09/27/13 and the original document is stored at the North Dakota Department of Transportation

MISCELLANEOUS SIGN LAYOUTS

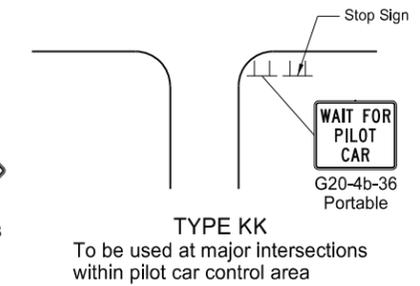
D-704-26



**TYPE Y**  
To be used where the haul road crosses a highway outside a major work area.

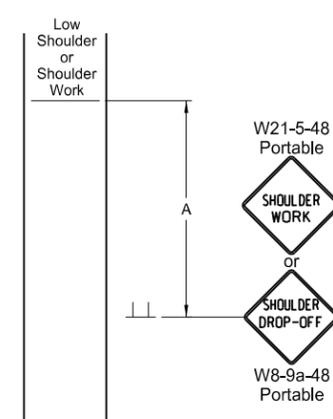


**TYPE AA**  
To be used where survey crew is being used

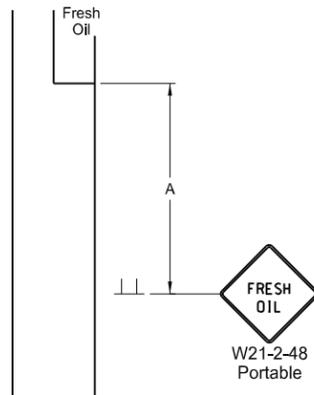


**TYPE KK**  
To be used at major intersections within pilot car control area

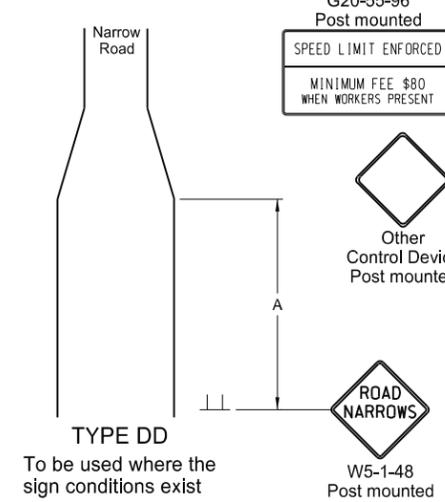
- Notes
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
  - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
  - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
  - Existing speed limit signs within a reduced speed zone shall be covered.
  - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
  - G20-55-96 signs are not required if this standard is part of other traffic control layouts, or the work is less than 15 days.
  - When a pilot car operation is used, place a G20-4b-36 "Wait For Pilot Car" sign at major intersections within pilot car control area.



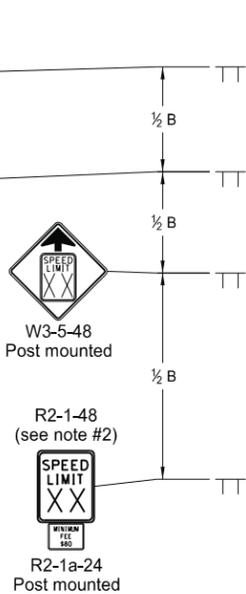
**TYPE BB**  
To be used within a major work area where the sign conditions exist



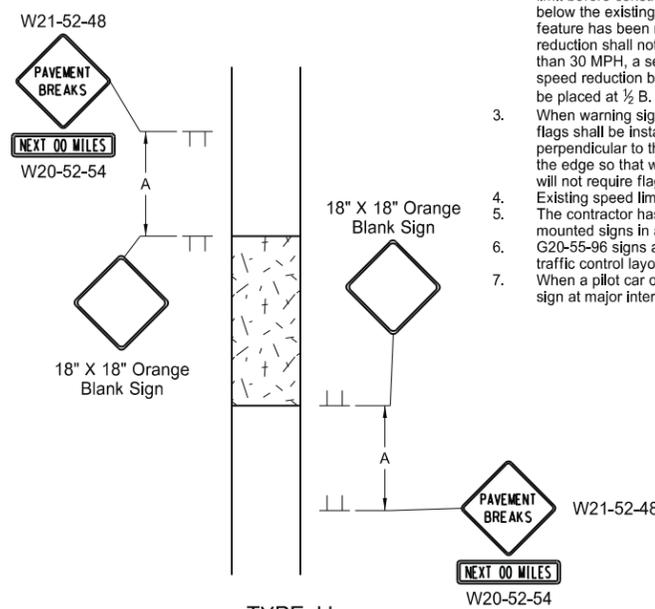
**TYPE CC**  
To be used where the sign conditions exist



**TYPE DD**  
To be used where the sign conditions exist



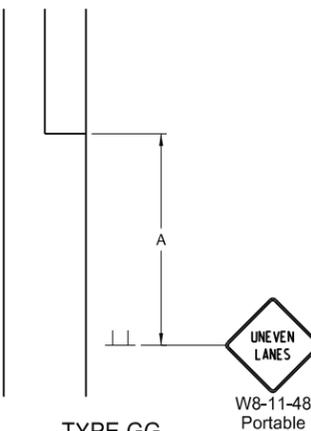
**TYPE Z**  
To be used where speed zone is needed



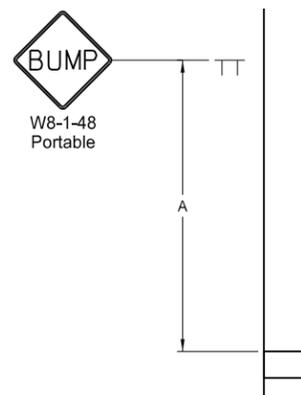
**TYPE JJ**  
To be used where there is a break in the pavement. These signs may be skid mounted or post mounted and shall be installed when conditions exist and removed when not applicable.

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

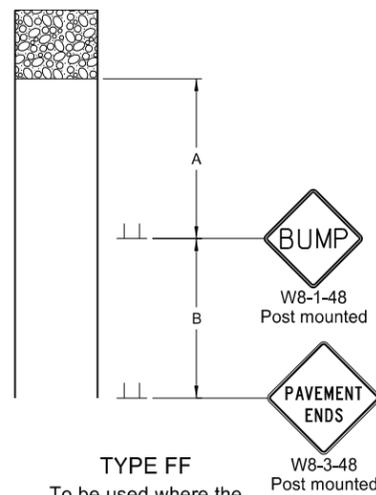
\* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.



**TYPE GG**  
To be used where a difference of elevation between lanes exist

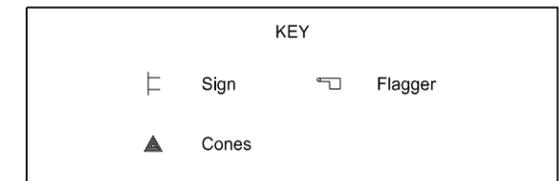


**TYPE EE**  
To be used where the sign conditions exist



**TYPE FF**  
To be used where the sign conditions exist

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500



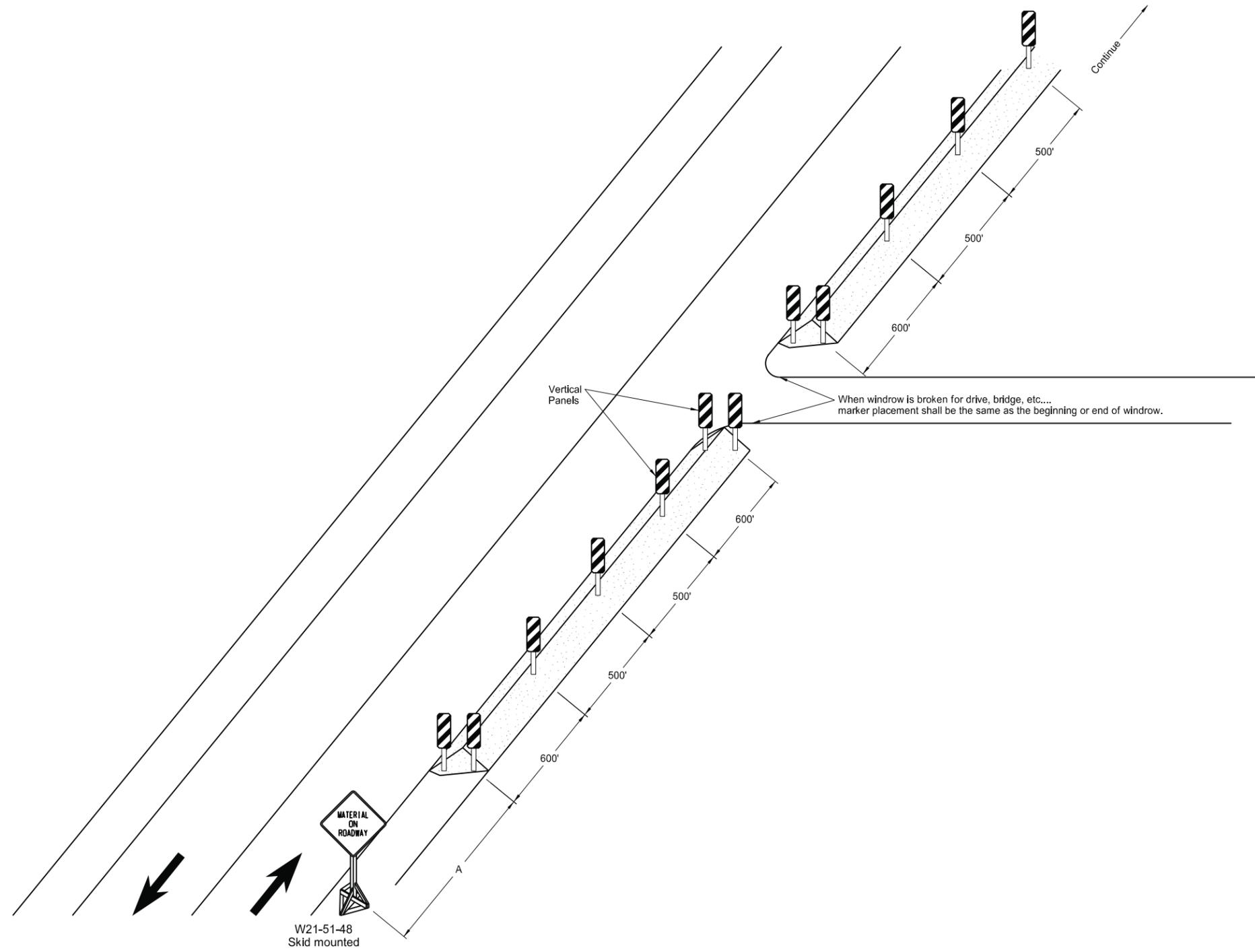
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 09/27/13 and the original document is stored at the North Dakota Department of Transportation

# WINDROW MARKING

D-704-30

Notes:  
The contractor has the option of using portable sign supports in lieu of post mounted sign in accordance with the NDDOT Standard Specifications.

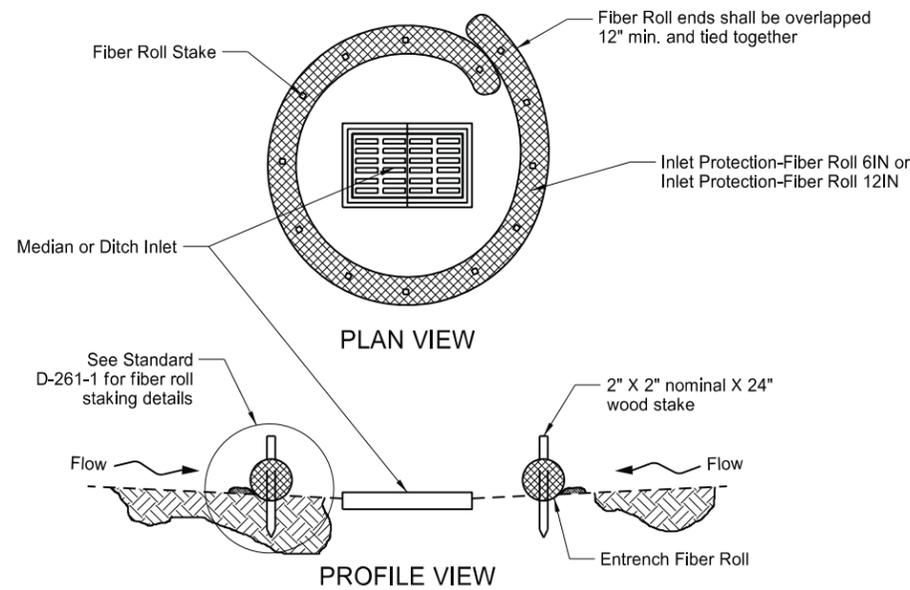


Road Type	ADVANCE WARNING SIGN SPACING		
	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (55 mph to 60 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

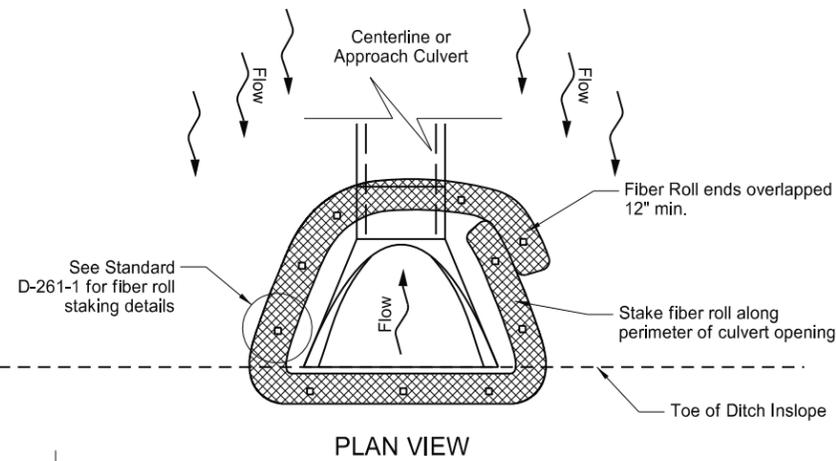
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-24-14	Revised Note

This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 06/24/14 and the original document is stored at the North Dakota Department of Transportation

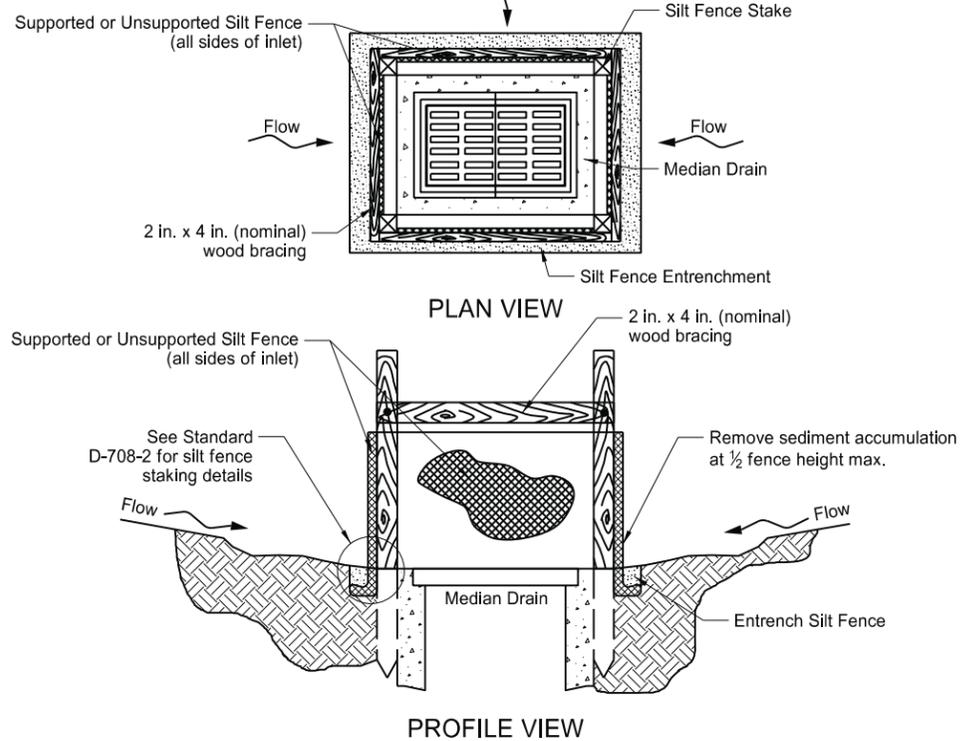
EROSION AND SILTATION CONTROLS  
MEDIAN OR DITCH INLET PROTECTION



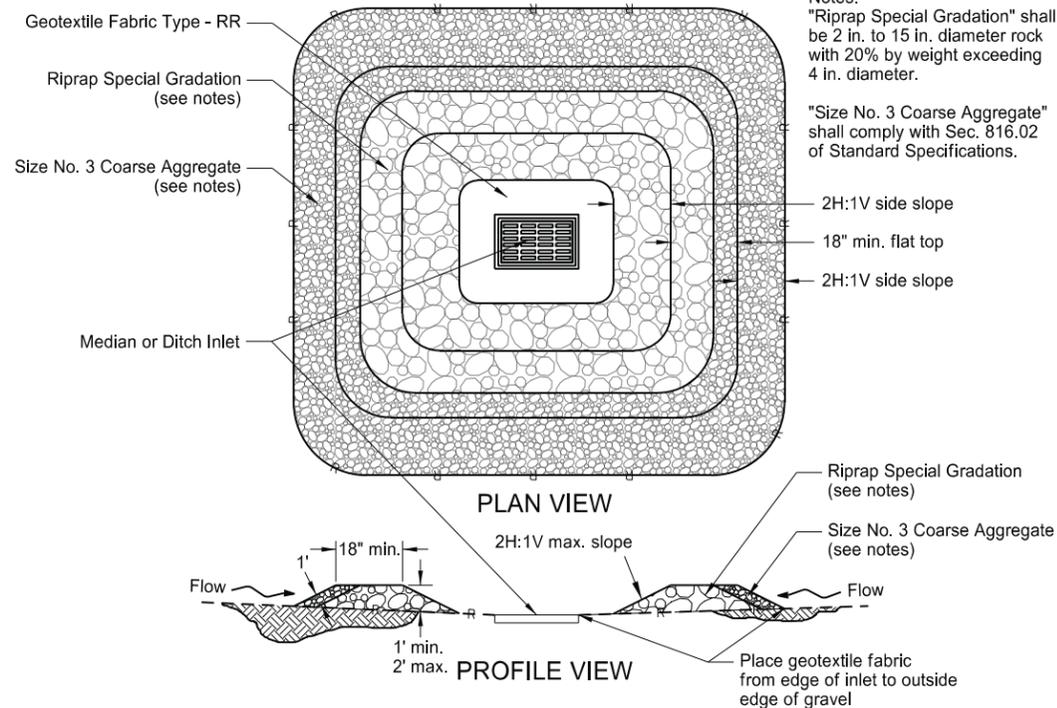
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



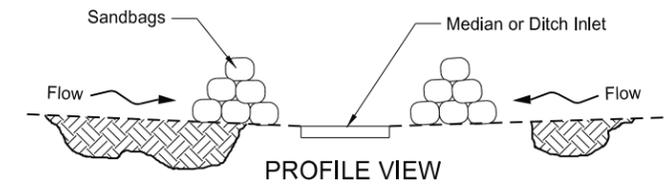
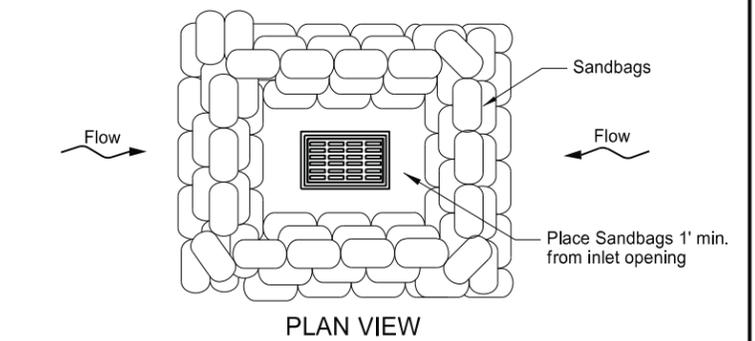
FIBER ROLL PROTECTION (INLET OF CULVERT)



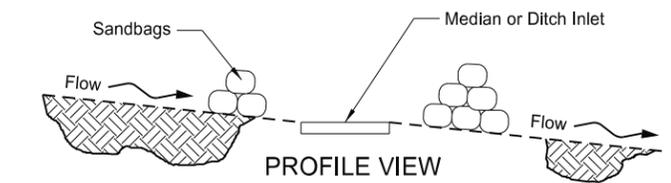
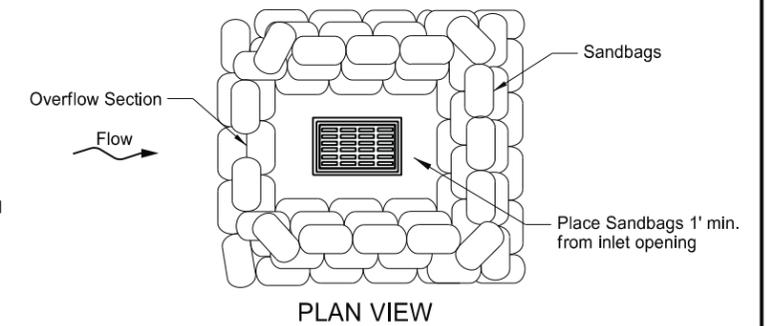
SILT FENCE PROTECTION (MEDIAN OR DITCH INLET)



GRAVEL INLET PROTECTION (MEDIAN OR DITCH INLET)



SANDBAG PROTECTION (LOW POINT)



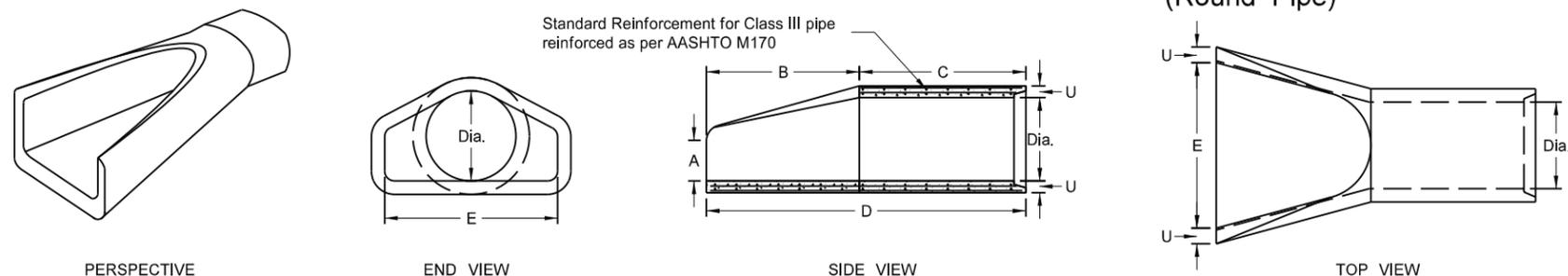
SANDBAG PROTECTION (ON SLOPE)

Notes:  
"Riprap Special Gradation" shall be 2 in. to 15 in. diameter rock with 20% by weight exceeding 4 in. diameter.  
"Size No. 3 Coarse Aggregate" shall comply with Sec. 816.02 of Standard Specifications.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.

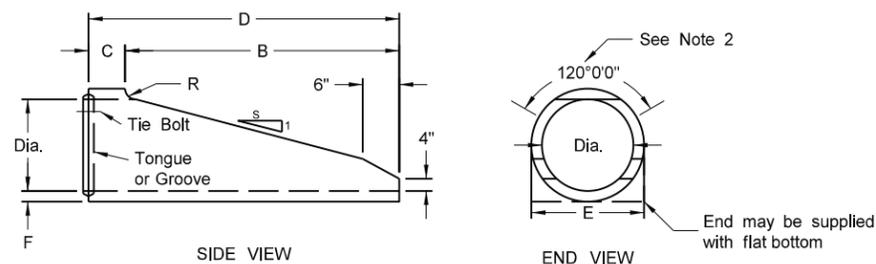
This document was originally issued and sealed by  
**Roger Weigel**  
Registration Number  
PE-2930,  
on 06/26/14 and the original document is stored at the North Dakota Department of Transportation

REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS  
(Round Pipe)



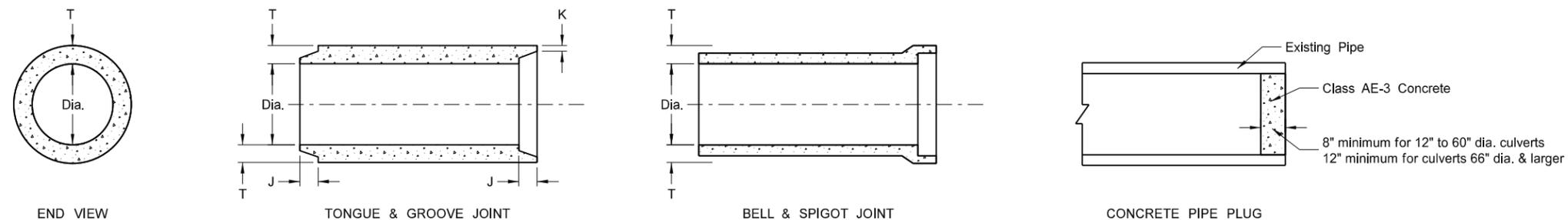
REINFORCED CONCRETE PIPE - FLARED END SECTION  
Reinforcement to be equivalent to Class III RCP

TRAVERSABLE END SECTION							
DIA	B	C	D	E	F	R	S
15"	4"	9"	4'-9"	1'-7½"	2½"	3"	6"
18"	5'-9"	9"	6'-6"	1'-11"	2½"	3"	6"
24"	6"	1'	7'	2'-6"	3"	3"	4"
30"	7'-6"	1'	8'-6"	3'-1"	3½"	3½"	4"
36"	7'-3"	15"	8'-6"	3'-8"	4"	3"	4"



- NOTES (Traversable End Section):
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
  2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION  
Reinforcement to be equivalent to Class III RCP



CIRCULAR PIPE

JOINTS FOR REINFORCED CONCRETE PIPE

CONCRETE PIPE PLUG

FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0½"	6'-0½"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2½"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2½"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3½"
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3½"
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4½"
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9½"	8'-2½"	7'-6"	5½"
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0"	6½"
90	3'-5"	7'-3½"	2'-0"	9'-3½"	11'-0"	6½"

All Classifications of Round Concrete Pipe

Internal Dia. of Pipe (In.)	Cross-Sectional Water Area (Sq. ft.)	Weight per Lin. Foot of Pipe (Lbs.)	Joint Groove Min./Max. (In.)	Joint Tongue Min./Max. (In.)	Minimum Wall Thickness (In.)
12	0.79	92	1½-2¾	¾	2
15	1.23	127	1¾-2¾	¾	2½
18	1.77	168	1½-2¾	1	2½
21	2.40	214	1¾-3¾	1½	2¾
24	3.14	265	2¾-3¾	1½	3
27	3.98	322	2¾-4	1¾	3¼
30	4.91	384	3¼-4¼	1¾	3½
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¼-4¼	1¾	4½
48	12.57	685	3¼-4¼	1¾	5
54	15.90	1070	4½-5½	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5-6	2½	6½
72	28.27	1810	5½-6¾	2½	7
78	33.18	2098	6¼-7¼	2½	7½
84	38.48	2410	5½-7¼	3¾	8
90	44.18	2793	6¾-8½	3¾	8½
96	50.27	3092	7-8¼	3½	9
102	56.75	3466	7-8¼	3½	9½
108	63.62	3864	7¼-8½	3¾	10

NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet  
66" to 108" (incl.) = not less than 6 feet
4. Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
5. For Class IV and Class V reinforced concrete pipe and end sections, shop drawings and design calculations shall be sealed by a Professional Engineer and submitted for Engineer's review.

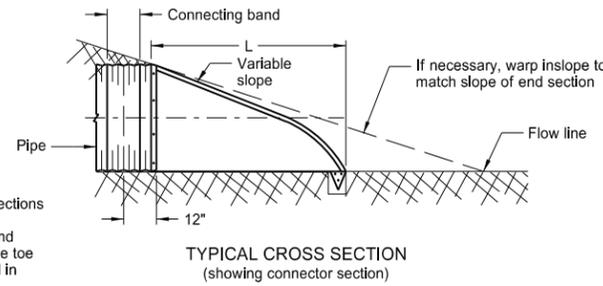
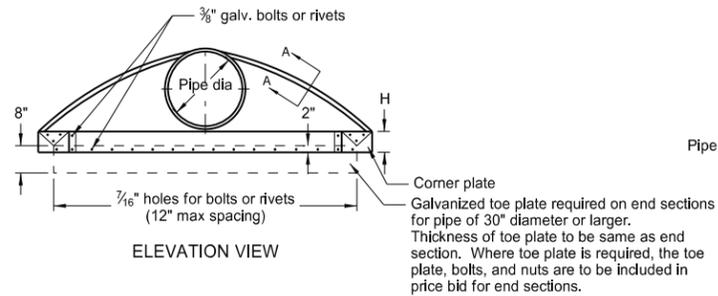
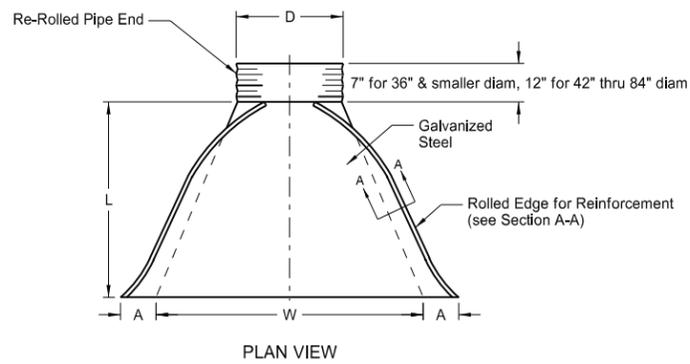
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE-2674, on 05/12/14 and the original document is stored at the North Dakota Department of Transportation

# ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

D-714-4



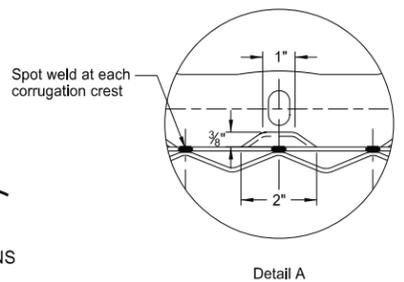
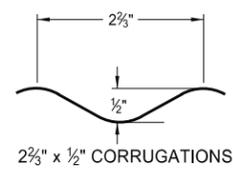
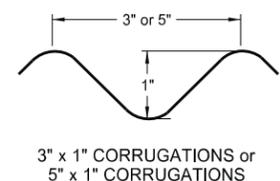
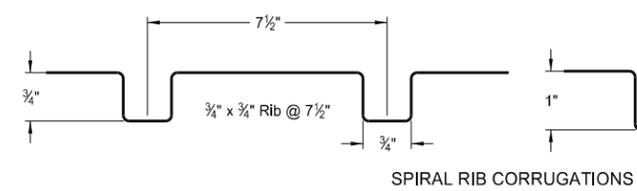
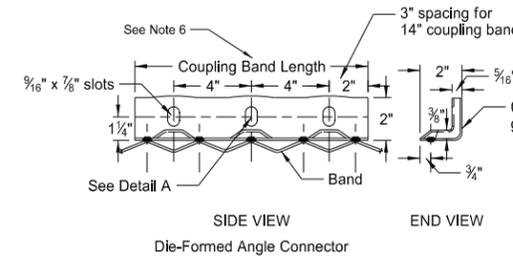
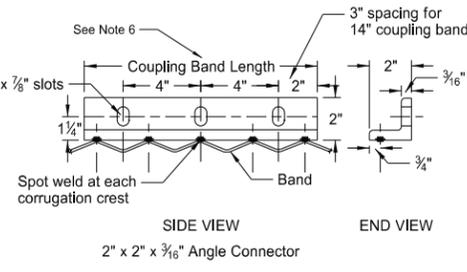
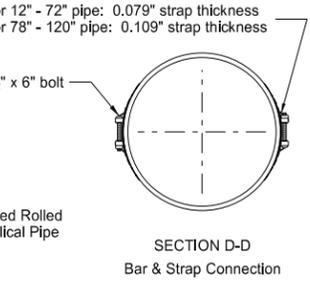
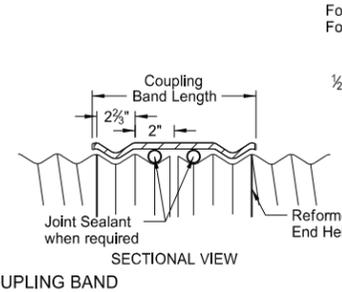
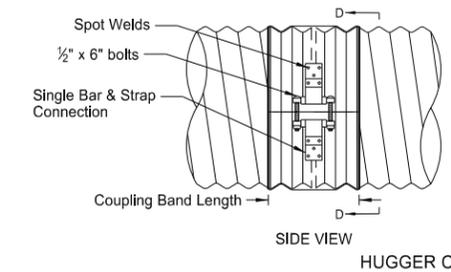
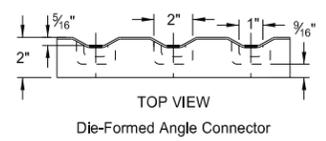
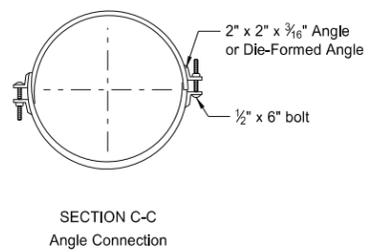
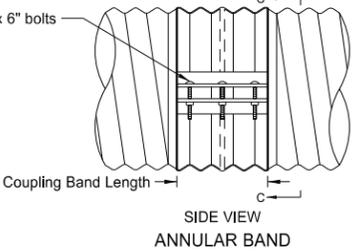
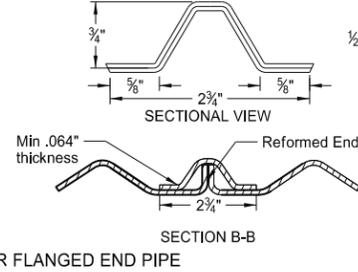
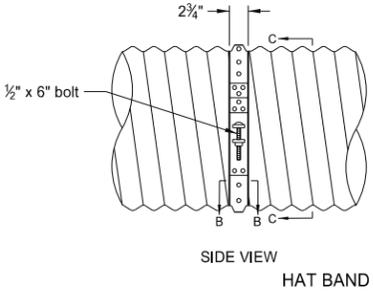
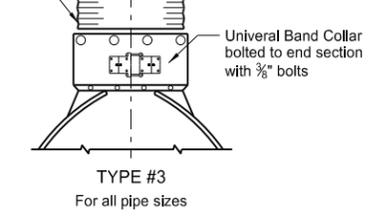
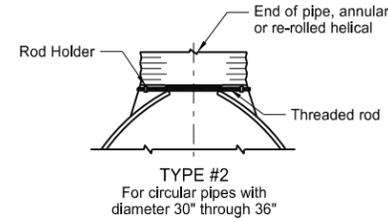
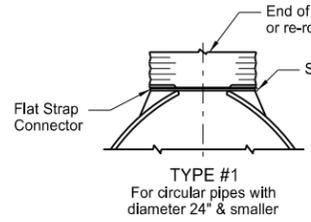
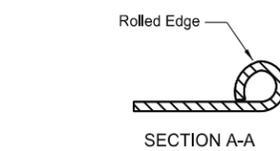
PIPE DIA.	GALV. THICK.	END SECTION DIMENSIONS					APPROX. SLOPE	BODY PIECE
		A	B	H	L	W		
15	0.064	7	8	6	26	30	2 1/2:1	1
18	0.064	8	10	6	31	36	2 1/2:1	1
24	0.064	10	13	6	41	48	2 1/2:1	1
30	0.079	12	16	8	51	60	2 1/2:1	1 or 2
36	0.079	14	19	9	60	72	2 1/2:1	2
42	0.109	16	22	11	69	84	2 1/2:1	2
48	0.109	18	27	12	78	90	2 1/2:1	2
54	0.109	18	30	12	84	102	2:1	2
* 60	0.109	18	33	12	87	114	1 1/2:1	3
* 66	0.109	18	36	12	87	120	1 1/2:1	3
* 72	0.109	18	39	12	87	126	1 1/3 :1	3
* 78	0.109	18	42	12	87	132	1 1/2:1	3
* 84	0.109	18	45	12	87	138	1 1/6 :1	3

- These sizes have 0.109" sides and 0.138" center panels.
  - Pipe diameter is equal to dimension "D" of end section.
- Manufacturers tolerances of above dimensions will be allowed.
- Splices to be the lap riveted type.

Multiple panel bodies shall have lap seams which are to be tightly joined with 3/8" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.

- NOTES:**
- Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
  - Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x 1/4" galv. angle for 60" through 72" dia. and 2 1/2" x 2 1/2" x 1/4" galv. angle for 78" and 84" dia.. Angles to be attached by galv. 3/8" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
  - Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
  - Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
  - 1/2" x 8" bolts may be used as a substitute for the 1/2" x 6" bolts shown in the details.
  - Coupling bands wider than 14" may be used if a minimum of four 1/2" bolts with maximum spacing of 5 1/2" are used for the connection.
  - Length of spot welds shall be minimum 1/2".

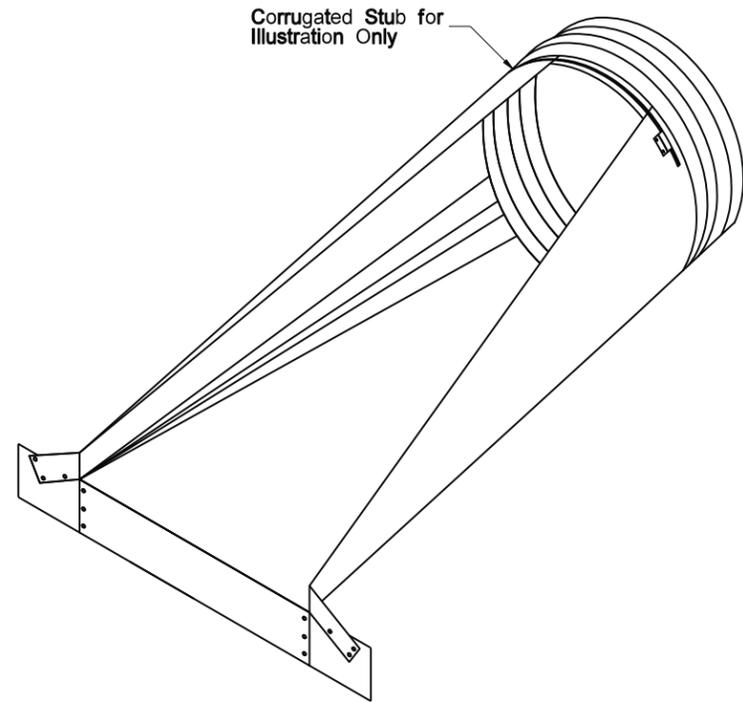
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2 3/8" x 1/2"	12" - 48"	2 3/4"	.064"
Annular Band	2 3/8" x 1/2"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
Hugger Band	2 5/8" x 1/2" Rerolled End	12" - 72"	10 1/2"	.052"
		78" - 84"	10 1/2"	.079"
	3" x 1" Rerolled End	48" - 120"	10 1/2"	.052"
	5" x 1" Rerolled End	48" - 120"	12"	.064"



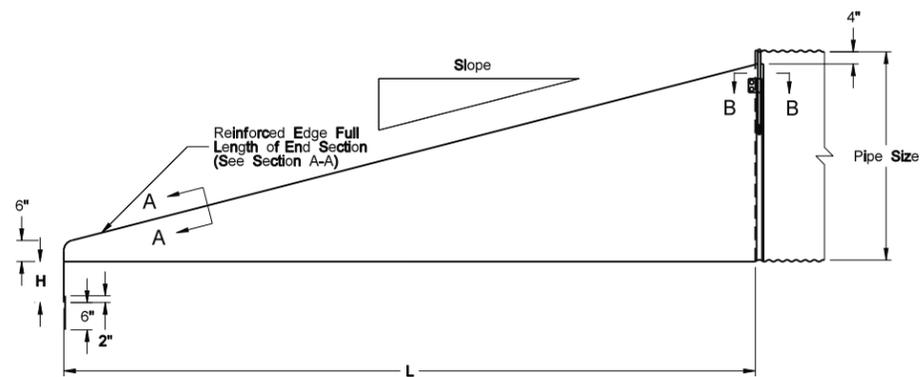
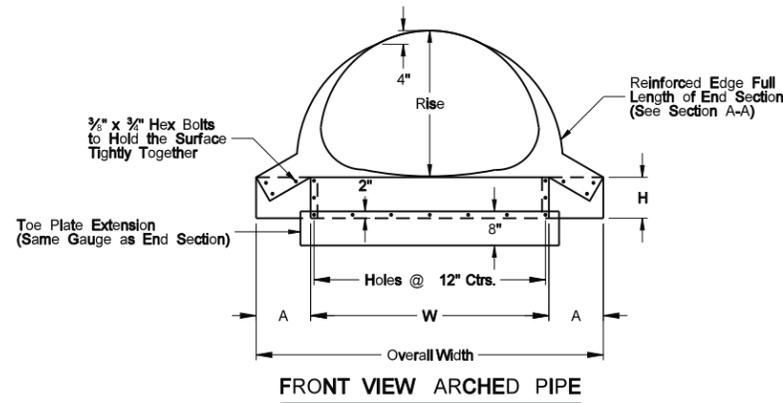
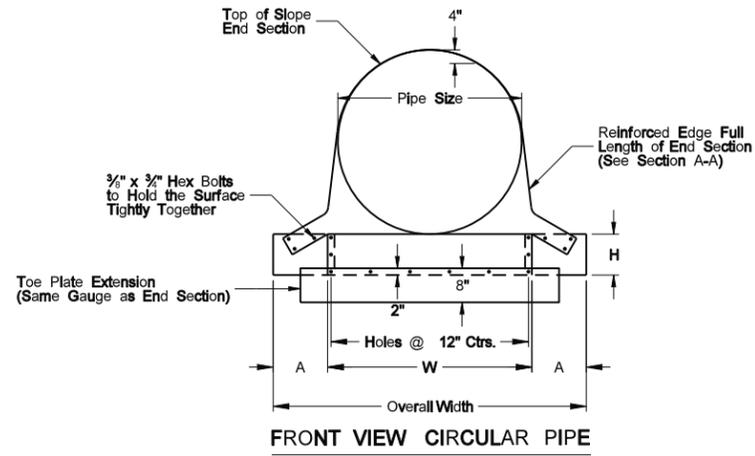
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-06-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674 , on 02/27/2014 and the original document is stored at the North Dakota Department of Transportation

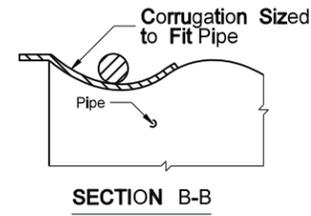
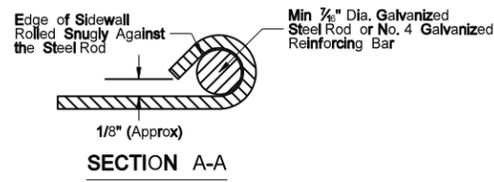
TRAVERSABLE END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS



ISOMETRIC VIEW



SIDE VIEW



TRAVERSABLE END SECTIONS FOR CIRCULAR PIPES										
Pipe Dia. (in.)	Min. Thick.		Dimensions (inches)				L Dimensions			
	in.	Gauge	A	H	W	Overall Width	Slope	Length (in.)	Slope	Length (in.)
15	.064	16	8	6	21	37	4:1	20	6:1	30
18	.064	16	8	6	24	40	4:1	32	6:1	48
24	.064	16	8	6	30	46	4:1	56	6:1	84
30	.109	12	12	9	36	60	4:1	80	6:1	120

TRAVERSABLE END SECTIONS FOR ARCHED PIPES												
Equiv. Dia. (in.)	(inches)		Min. Thick.		Dimensions (inches)				L Dimensions			
	Span	Rise	in.	Gauge	A	H	W	Overall Width	Slope	Length (in.)	Slope	Length (in.)
18	21	15	.064	16	8	6	27	43	4:1	20	6:1	30
21	24	18	.064	16	8	6	30	46	4:1	32	6:1	48
24	28	20	.064	16	8	6	34	50	4:1	40	6:1	60

Note: See Standard Drawing D-714-04 for end section to pipe details.

For 15", 18" and 24" diameter end sections, 1/2" diameter rod, or strap type connection to corrugated steel pipe shall be used.

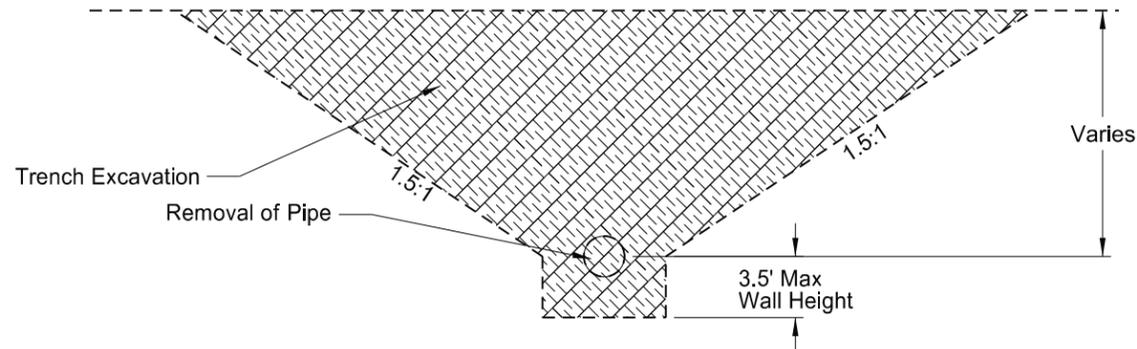
For 30" diameter round end sections, rod type connection to corrugated steel pipe, using 5/8" diameter rod shall be used.

For arched pipe end sections (21" X 15" through 28" X 20"), rod type connection to corrugated steel pipe, using 1/2" diameter rod shall be used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-23-09	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674 , on 07/23/09 and the original document is stored at the North Dakota Department of Transportation

TRANSVERSE MAINLINE PIPE EXCAVATION AND INSTALLATION DETAIL FOR PIPES MORE THAN 4 FEET BELOW THE TOP OF PROPOSED SUBGRADE



EXCAVATION DETAIL

Pay Items

- 1) Pipe\*
- 2) Reinforcement Fabric - Type R1
- 3) Removal of Pipe (if required)

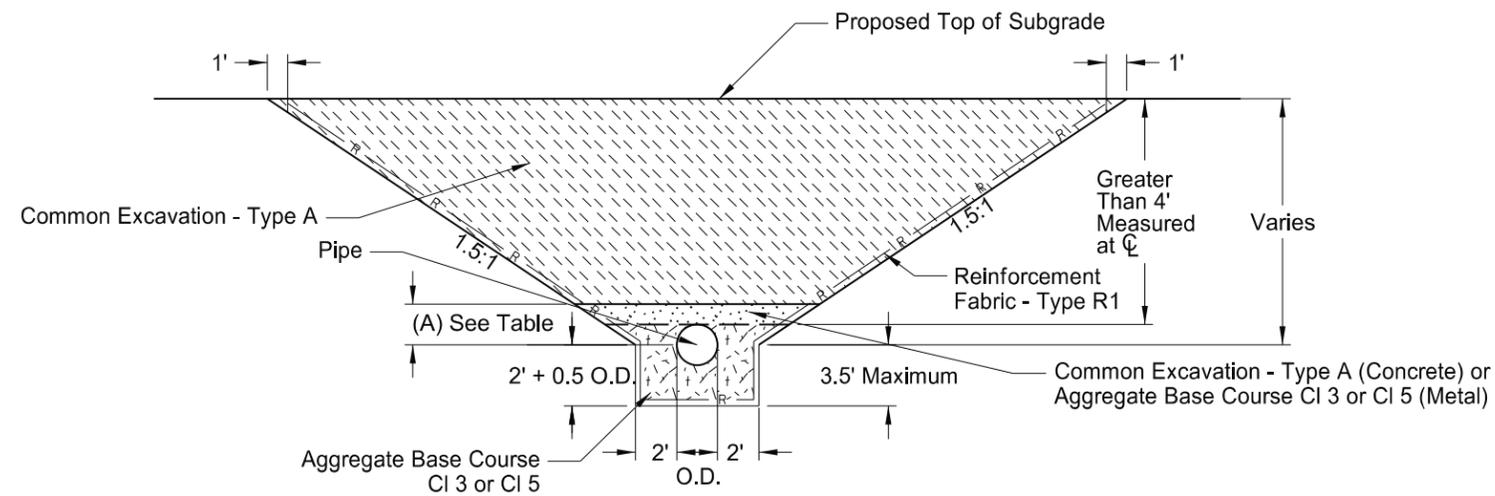
\*Included in Pipe Pay Item

- 1) Pipe
- 2) Trench excavation
- 3) Aggregate Base Course CI 3 or CI 5
- 4) Common Excavation - Type A

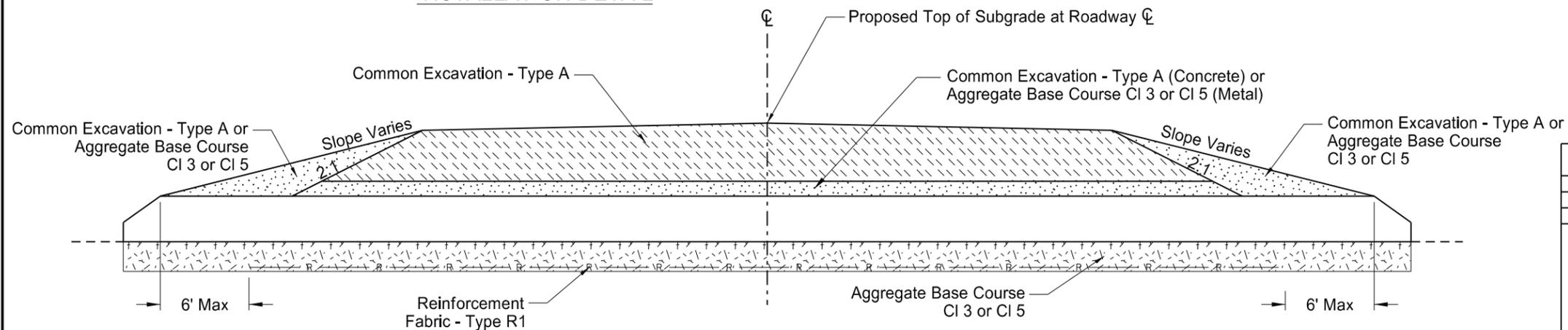
NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadways (including ramps). It does not include pipes in approaches.

Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal	0.5 O.D. + 1 Foot



INSTALLATION DETAIL

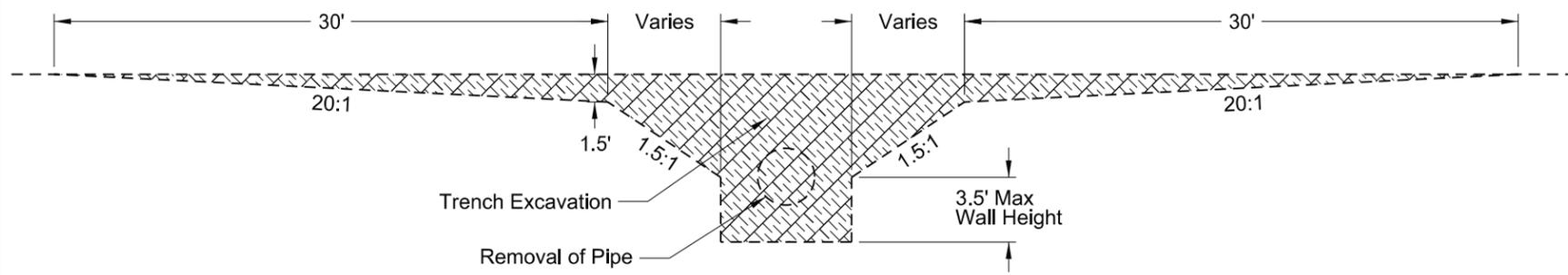


CROSS SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE
10-15-13	Label Formatting

This document was originally issued and sealed by Ron Horner, Registration Number PE-2087, on 10/15/13 and the original document is stored at the North Dakota Department of Transportation

TRANSVERSE MAINLINE PIPE EXCAVATION AND INSTALLATION DETAIL FOR PIPES  
4 FEET OR LESS BELOW THE TOP OF THE PROPOSED SUBGRADE



EXCAVATION DETAIL

Pay Items

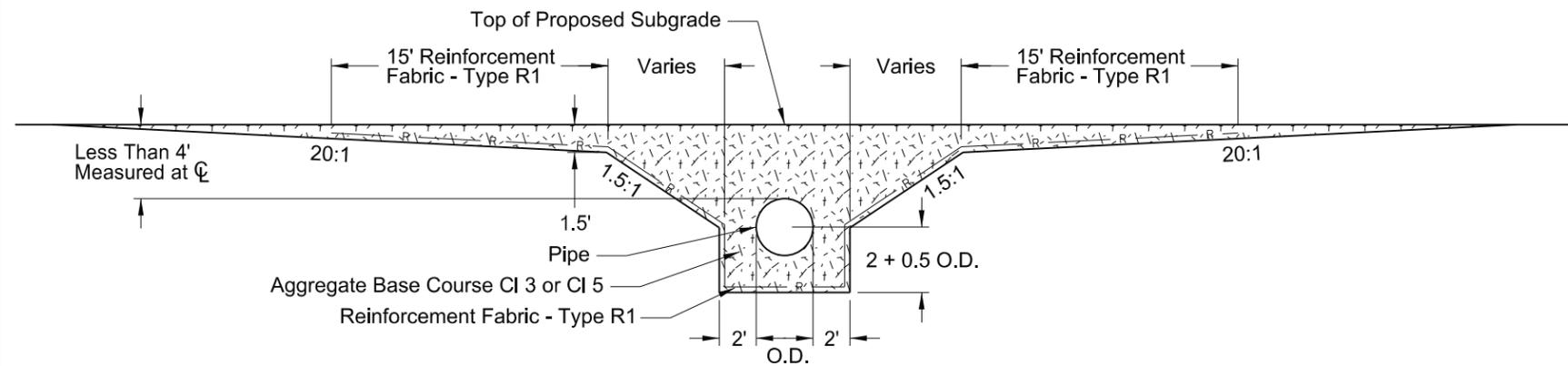
- 1) Pipe\*
- 2) Reinforcement Fabric - Type R1
- 3) Removal of Pipe (if required)

\*Included in Pipe Pay Item

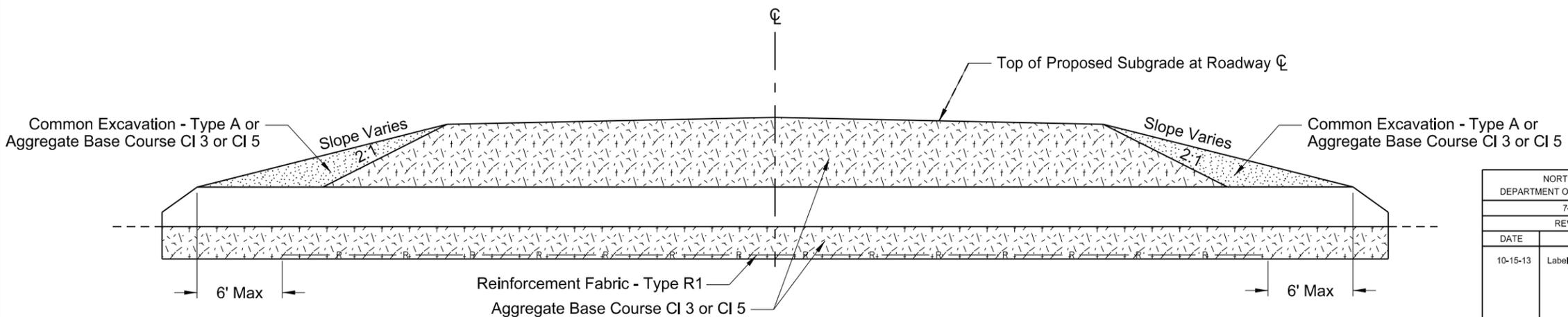
- 1) Pipe
- 2) Trench Excavation
- 3) Aggregate Base Course CI 3 or CI 5
- 4) Common Excavation - Type A

NOTES:

- 1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.



INSTALLATION DETAIL

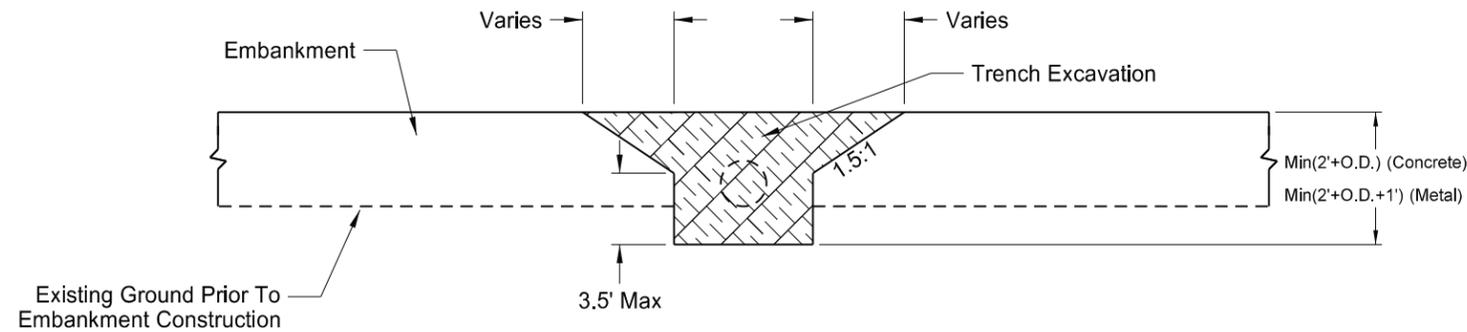


CROSS SECTION

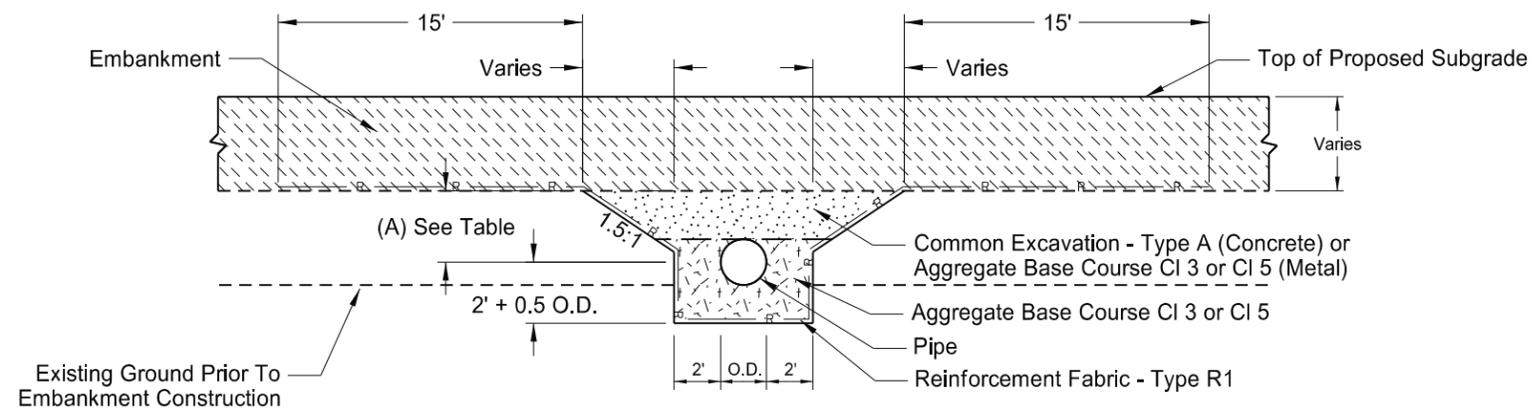
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE
10-15-13	Label Formatting

This document was originally issued and sealed by  
Ron Homer,  
Registration Number  
PE-2087,  
on 10/15/13 and the original document is stored at the North Dakota Department of Transportation

TRANSVERSE MAINLINE PIPE EXCAVATION AND INSTALLATION DETAIL FOR PIPES INSTALLED IN NEW EMBANKMENT AREAS



EXCAVATION DETAIL



INSTALLATION DETAIL

Pay Items

- 1) Pipe\*
- 2) Reinforcement Fabric - Type R1

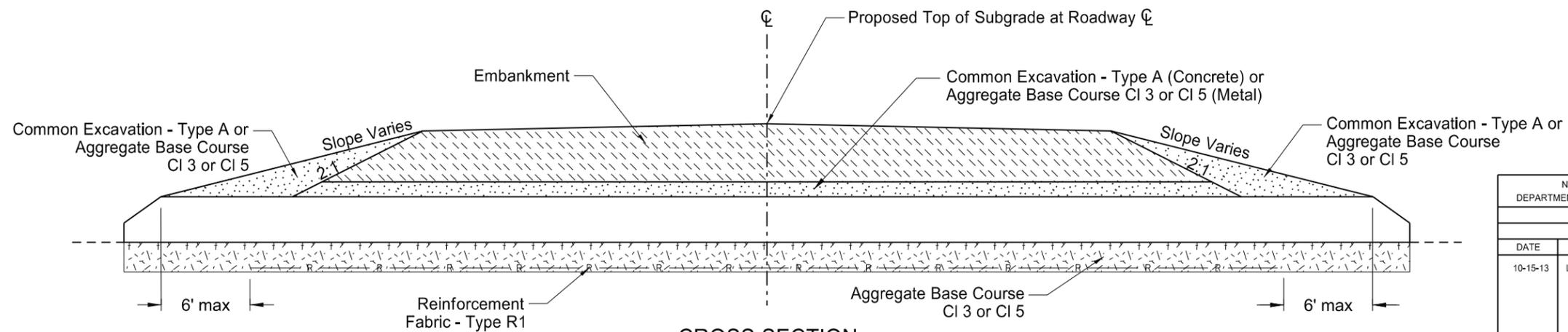
\*Included in Pipe Pay Item

- 1) Pipe
- 2) Trench excavation
- 3) Aggregate base course CI 3 or CI 5
- 4) Common Excavation - Type A

NOTES:

- 1) This drawing applies to new/extended mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches

Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal	0.5 O.D. + 1 foot



CROSS SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE
10-15-13	Label Formatting

This document was originally issued and sealed by  
 Ron Horner,  
 Registration Number  
 PE-2087,  
 on 10/15/13 and the original document is stored at the  
 North Dakota Department  
 of Transportation

STANDARD MONUMENTS AND RIGHT OF WAY MARKERS

NOTES:

The construction and installation of Alignment Monuments, Iron Pin Reference Monuments, Iron Pin R/W Monuments, and Right of Way Markers (witness posts) shall conform to Section 720 of the Standard Specifications.

ALIGNMENT MONUMENTS:

Iron Pin or Precast Concrete Alignment Monuments with aluminum caps will be placed on the centerline alignment PI's, section corners, quarter corners, section line crossings, quarter line crossings, and at curve points (PC's, PT's, TS's, and ST's) on the centerline.

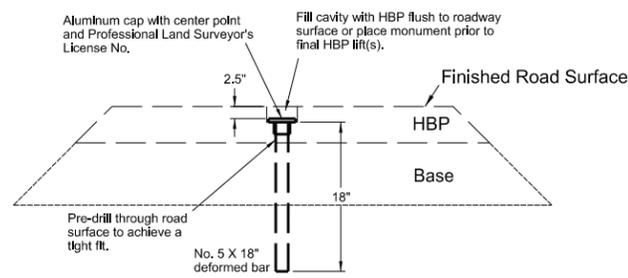
IRON PIN R/W MONUMENT:

Iron pins with aluminum caps (No. 5 X 18") will be placed at breaks on the Right of Way line, and at curve points (PC's, PT's, TS's and ST's) on the Right of Way line.

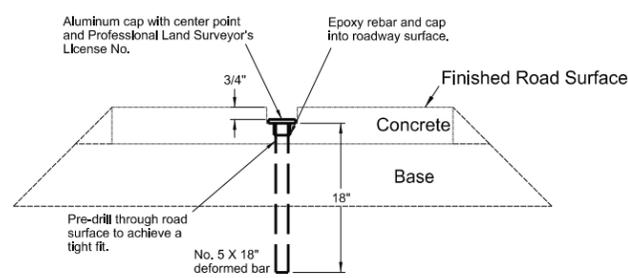
IRON PIN REFERENCE MONUMENT:

Iron Pins without aluminum caps (No. 5 X 18") will be placed as reference monuments on the Right of Way line at section corners, quarter corners, section line crossings, and quarter line crossings.

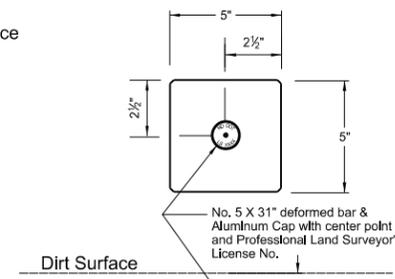
ALIGNMENT MONUMENT DETAILS



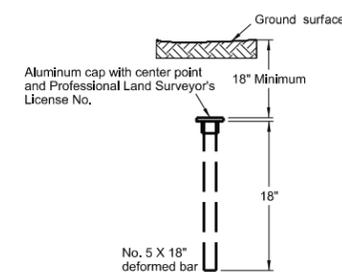
IRON PIN  
(Within Finished Roadway Surface)



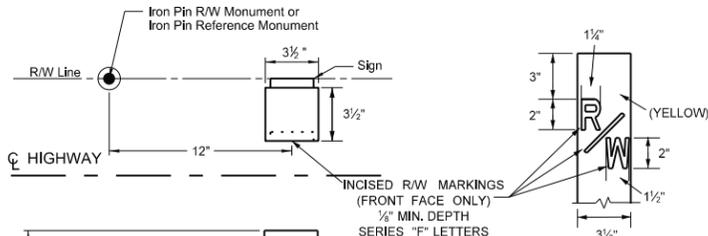
IRON PIN  
(Within Finished Roadway Surface)



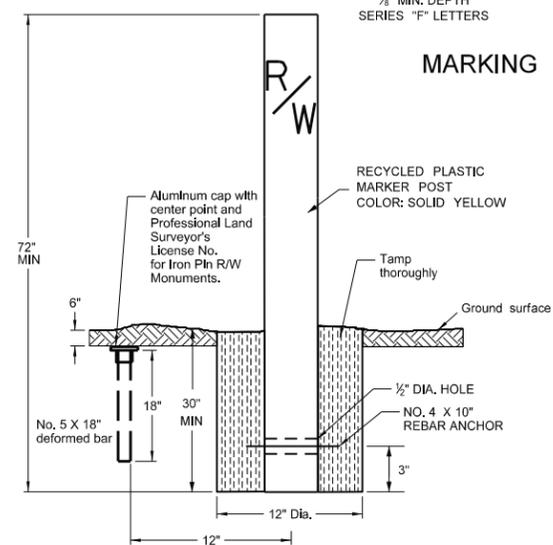
PRECAST CONCRETE  
(Outside Finished Roadway Surface)  
(Inside R/W Limits)



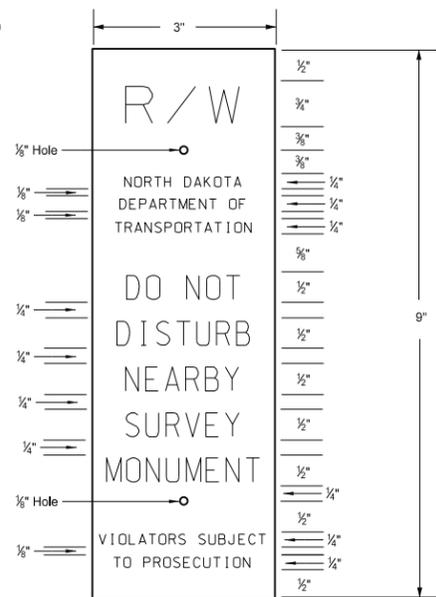
IRON PIN  
(Outside Finished Roadway Surface)  
(Outside R/W Limits)



MARKING DETAIL



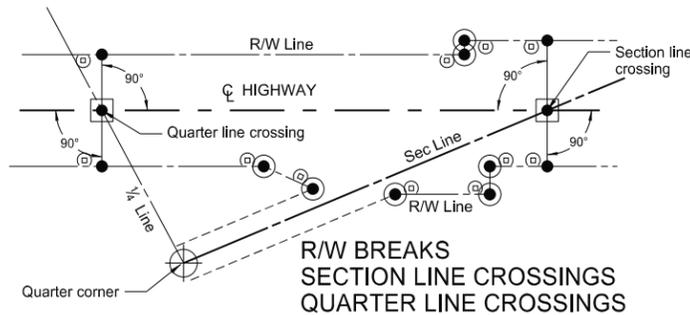
RECYCLED PLASTIC  
RIGHT OF WAY MARKER  
(WITNESS POST) DETAILS  
&  
IRON PIN REFERENCE AND R/W  
MONUMENT DETAILS



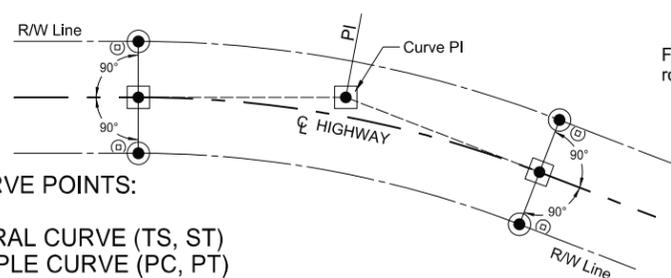
SIGN DETAIL

Black letters on orange high intensity background sheeting meeting ASTM D-4956 Type III or higher on 80 gauge 5052-H38 aluminum. Silk screen graphics. One color print. Sign shall be attached by drilling two holes in the face of the post (side facing the private owner, away from the Department of Transportation right of way). Put inserts into the holes and mount the sign with #4 vandal proof screws. Sign shall be installed 2" from top of post.

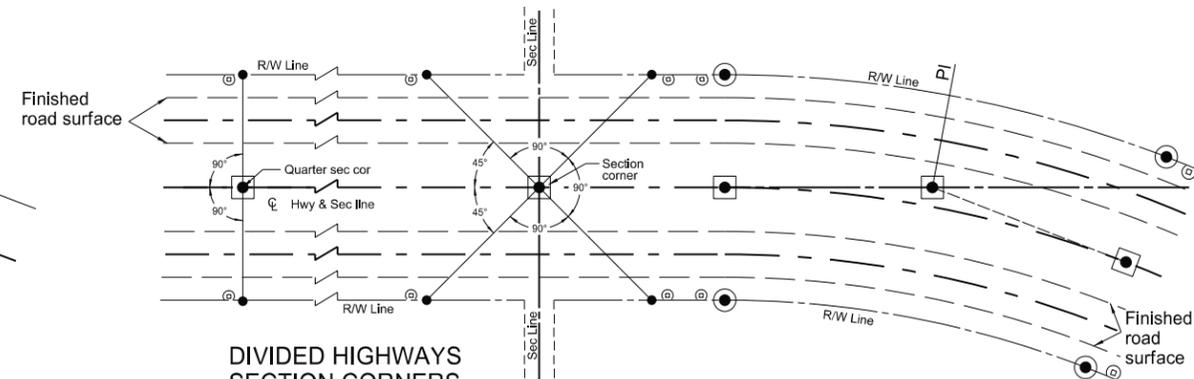
VARIOUS MONUMENT AND MARKER PLACEMENTS



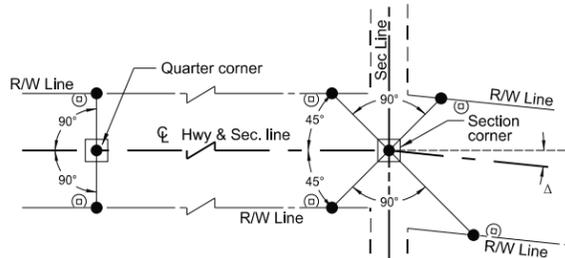
R/W BREAKS  
SECTION LINE CROSSINGS  
QUARTER LINE CROSSINGS



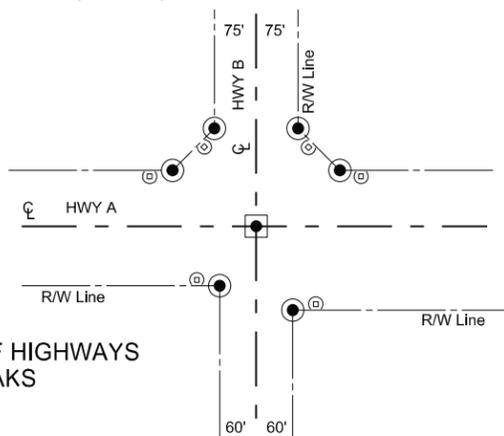
CURVE POINTS:  
PI  
SPIRAL CURVE (TS, ST)  
SIMPLE CURVE (PC, PT)



DIVIDED HIGHWAYS  
SECTION CORNERS  
QUARTER CORNERS



SECTION CORNERS  
QUARTER CORNERS



INTERSECTION OF HIGHWAYS  
FLARED R/W BREAKS

LEGEND

- Iron Pin Reference Monument
- ⊙ R/W Marker (witness post)
- ⊠ Alignment Monument
- Iron Pin R/W Monument

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-2013	
REVISIONS	
DATE	CHANGE
11/12/13	Note for SIGN DETAIL modified to meet ASTM D-4956 Type III or higher on 80 gauge 5052-H38

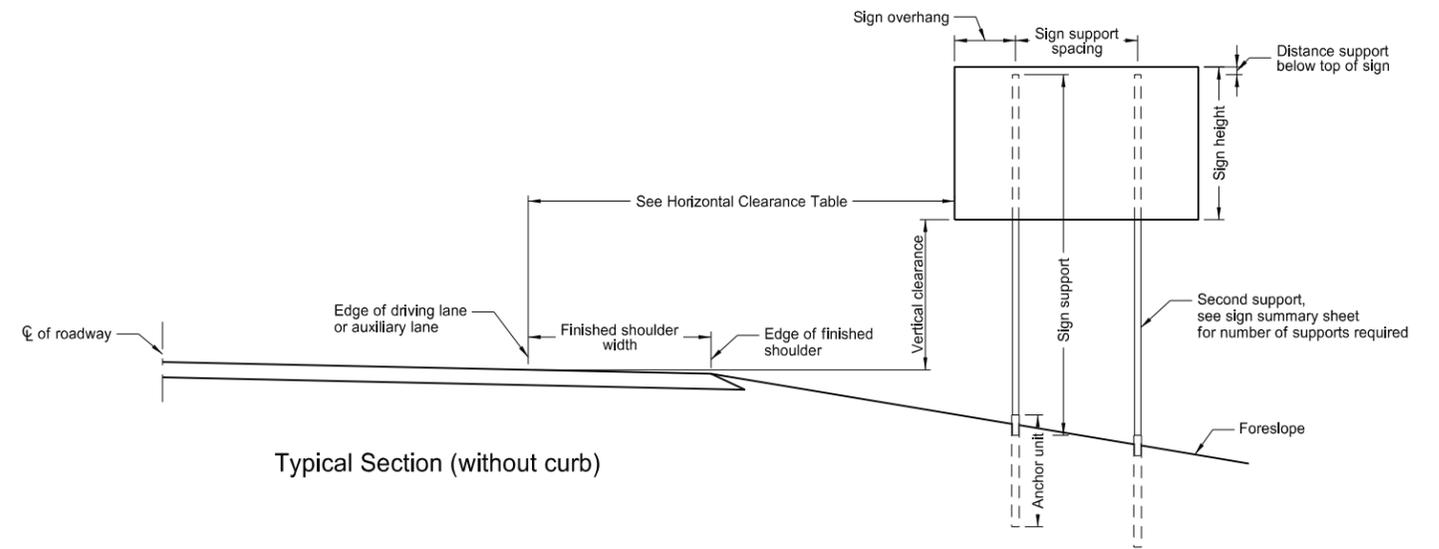
This document was originally issued and sealed by  
Roger Weigel  
Registration Number  
PE-2930,  
on 11/12/13 and the original document is stored at the  
North Dakota Department  
of Transportation

# PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

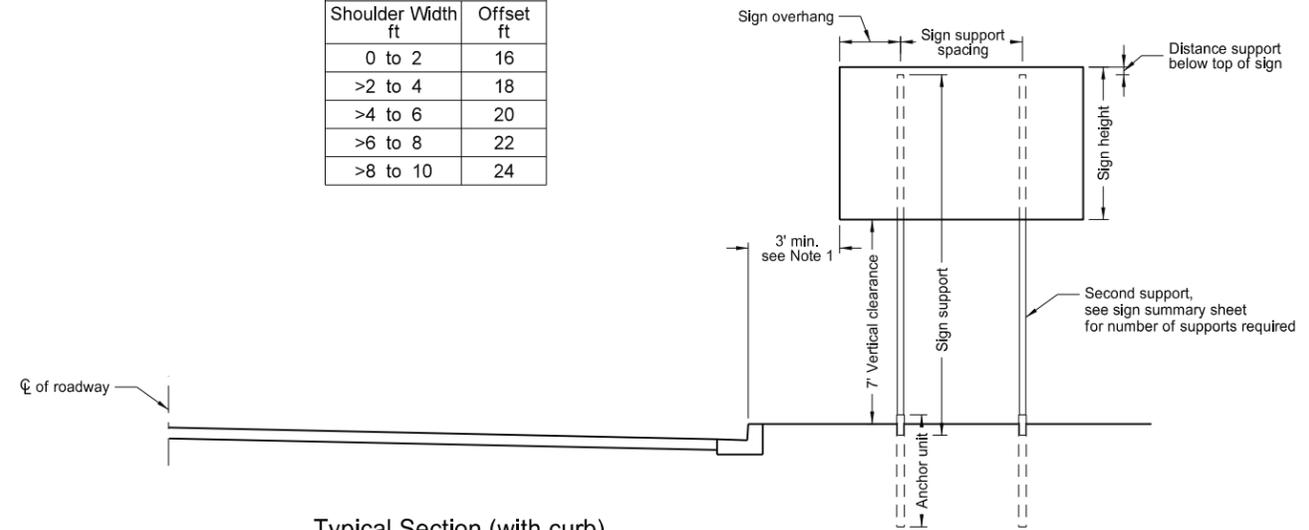
**Notes:**

1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
  2. Minimum vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.
- Directional signs on expressways shall be installed with a minimum height of 7'. If the secondary sign is mounted below another sign, the major sign shall be installed at least 8' and the secondary sign shall be installed at least 5' above the edge of the driving lane.
- All route signs, warning signs, and regulatory signs on expressways shall be at least 7' above the edge of the driving lane.
- Adopt-a-highway signs installed on Freeways shall be at least 7' above the edge of the driving lane.
- The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.
3. Offset signs: Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.

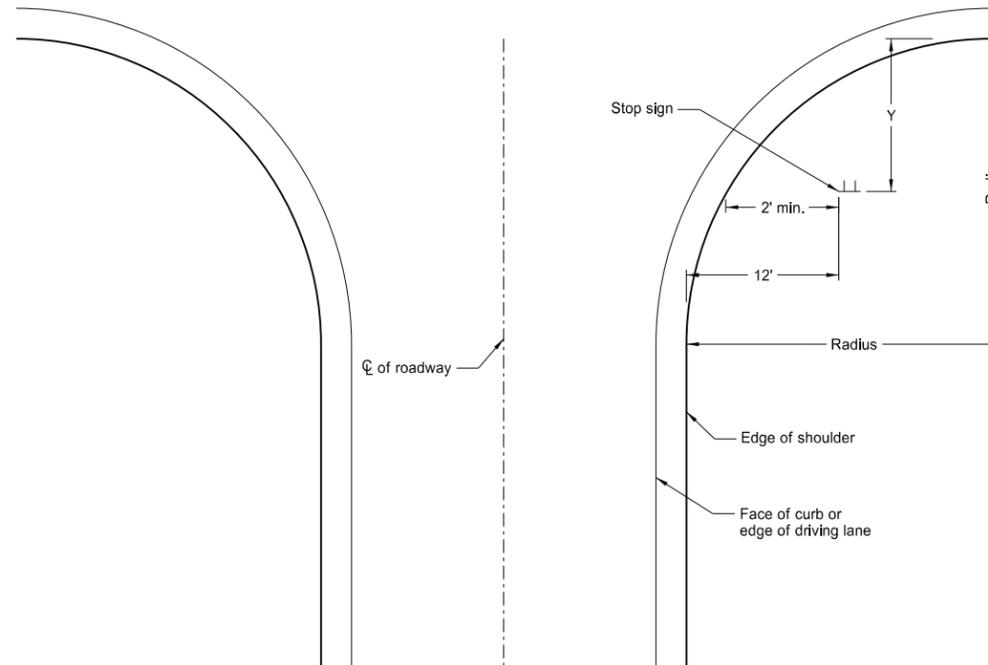


Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



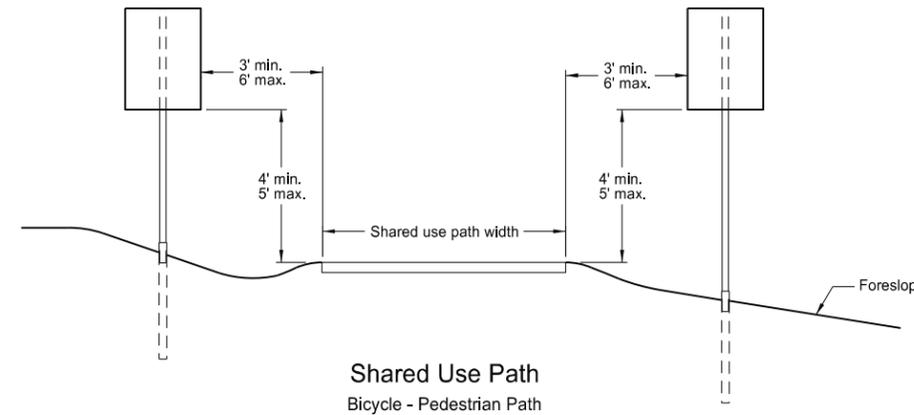
Typical Section (with curb)  
Residential or Business District



Stop Sign Location  
Wide Throat Intersection

This layout is to be used for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



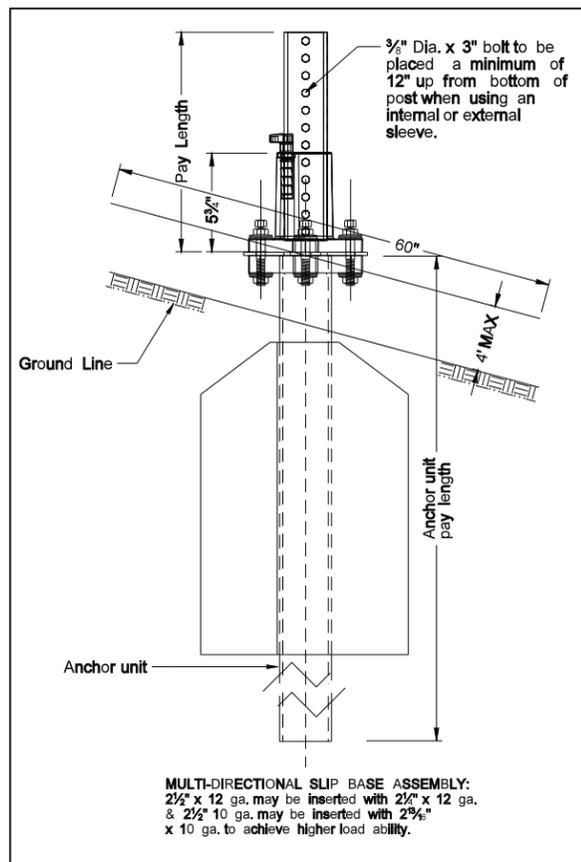
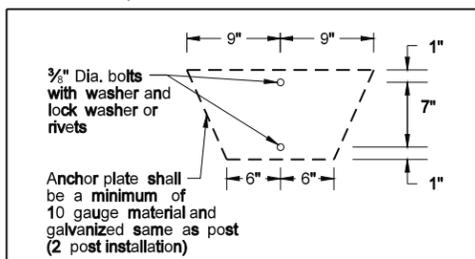
Shared Use Path  
Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by  
 Roger Weigel  
 Registration Number  
 PE-2930,  
 on 10/3/13 and the original document is stored at the  
 North Dakota Department  
 of Transportation

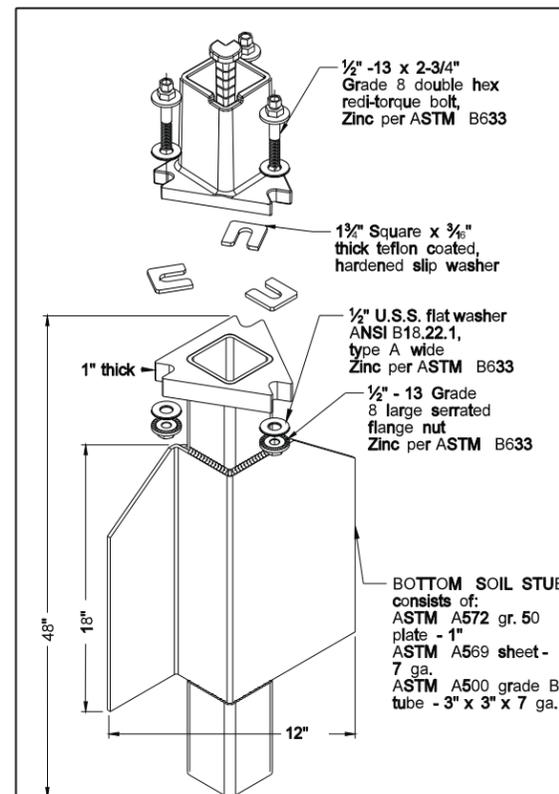
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/2	12
1	2 1/2	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/2	12	2 1/2(D)	12	Yes		7
1	2 1/2	12	2 1/2	12	Yes		7
2	2 1/2	10			Yes		7
2	2 1/2	12	2 1/2(D)	12	Yes		7
2	2 1/2	12	2 1/2	12	Yes		7
3 & 4	2 1/2	12			Yes		7
3 & 4	2 1/2	10			Yes		7
3 & 4	2 1/2	12	2 1/2	12	Yes		7
3 & 4	2 1/2	12	2 1/2(D)	12	Yes		7
3 & 4	2 1/2	10	2 1/2	10	Yes		7

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.  
 (C) - 3" anchor unit  
 (D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

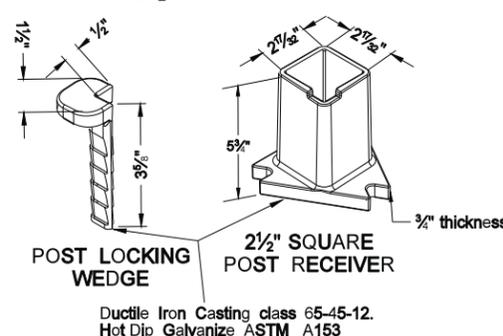


MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:  
 2 1/2" x 12 ga. may be inserted with 2 1/2" x 12 ga. & 2 1/2" 10 ga. may be inserted with 2 3/8" x 10 ga. to achieve higher load ability.

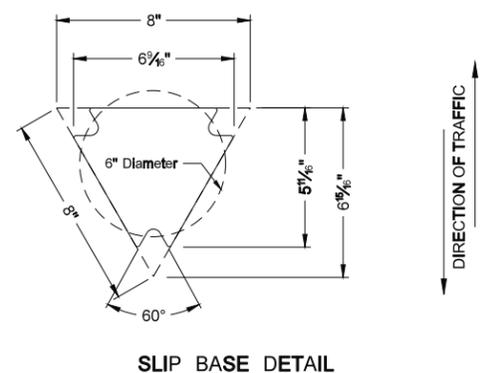
Mounting Details Perforated Tube



SLIP BASE FOR 2 1/2" POST



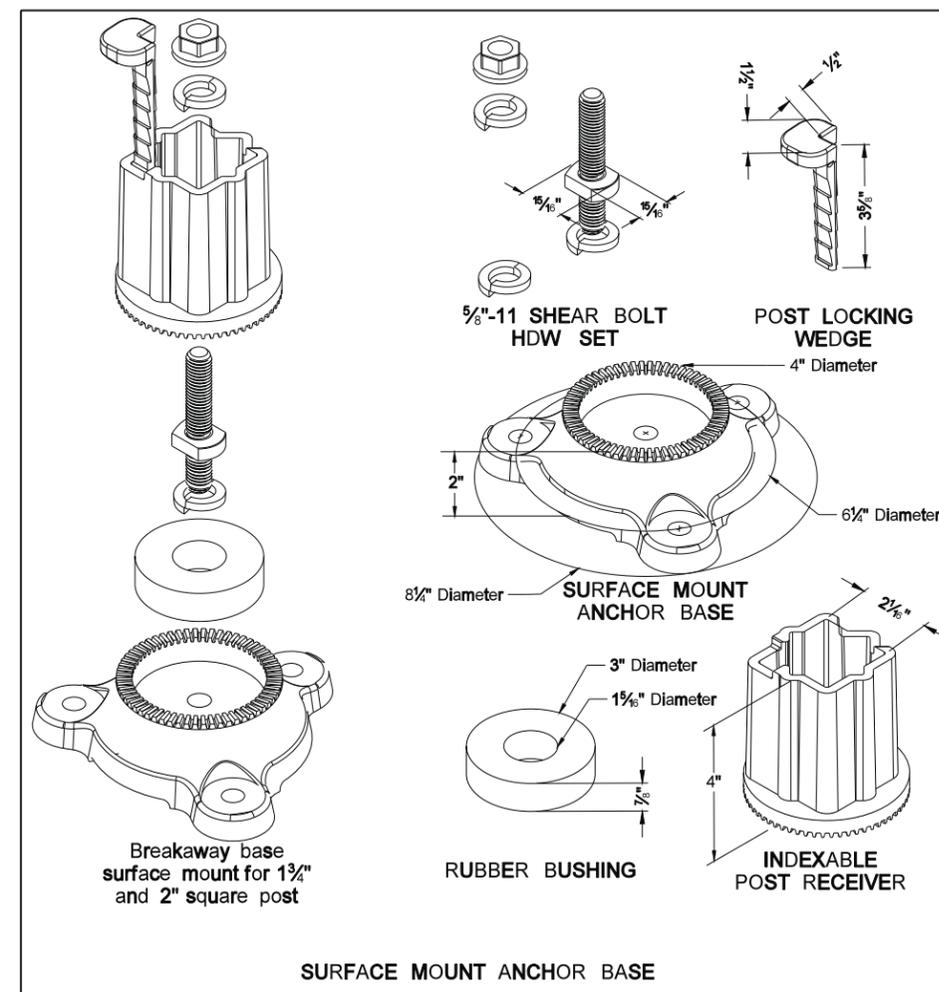
POST LOCKING WEDGE  
 2 1/2" SQUARE POST RECEIVER  
 Ductile Iron Casting class 65-45-12. Hot Dip Galvanize ASTM A153



SLIP BASE DETAIL

Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. <sup>4</sup>	Cross Sect. Area In. <sup>2</sup>	Section Modulus In. <sup>3</sup>
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/2 x 2 1/2	0.105	12	2.773	0.561	0.695	0.499
2 3/8 x 2 3/8	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.783

The 2 3/8" size 10 gauge is shown as 2.19" size on the plans;  
 The 2 1/2" size is shown as 2.51" size on the plans.



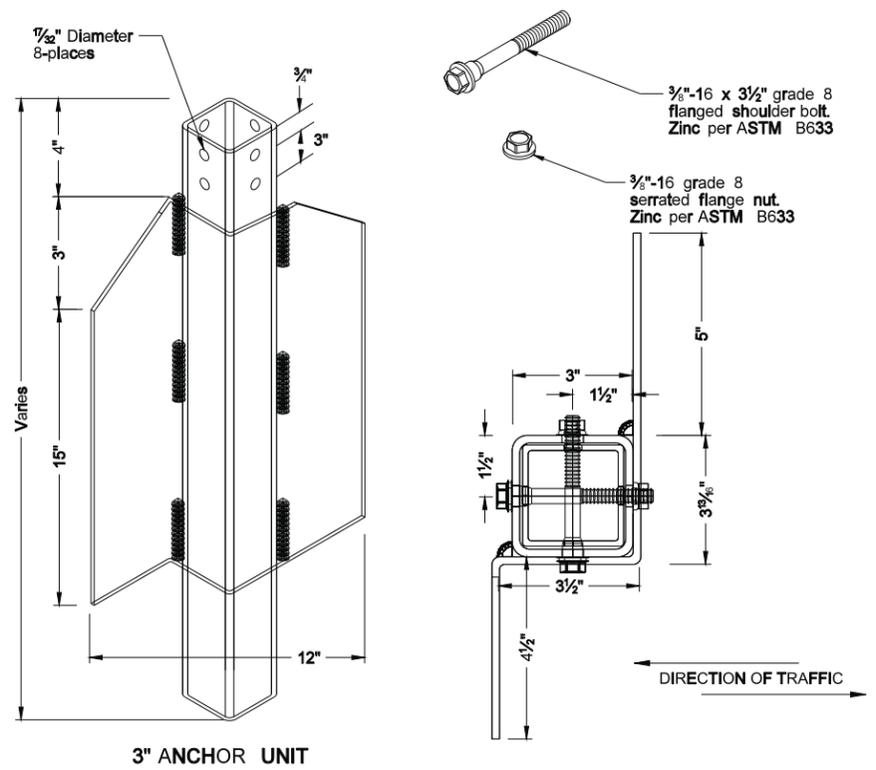
SURFACE MOUNT ANCHOR BASE

NOTE:

- 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
- Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3" x 3" x 7" gauge ASTM A500 grade B. Anchor shall have a yield strength 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/153. All tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless otherwise noted.
- When used in concrete sidewalk, anchor shall be the same concept without the wings.
- Four post signs shall have over 8" between the first and fourth posts.
- Installation procedures as per manufacturers recommendation.
- Concrete fasteners for surface mount breakaway base shall be a minimum 1/2" diameter x 4" grade 8.

SHOULDER BOLT

Shimming agent to reduce tolerance between 3" anchor unit and 2 1/2" post.  
 (standard 3/8" diameter grade 8 bolt may be used with proper shim)



3" ANCHOR UNIT

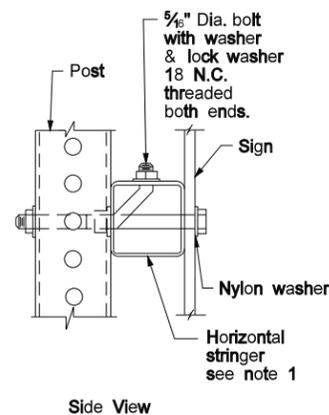
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 08/06/09 and the original document is stored at the North Dakota Department of Transportation

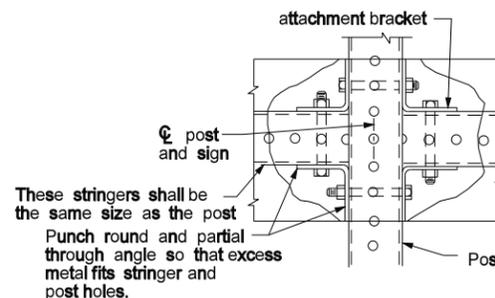
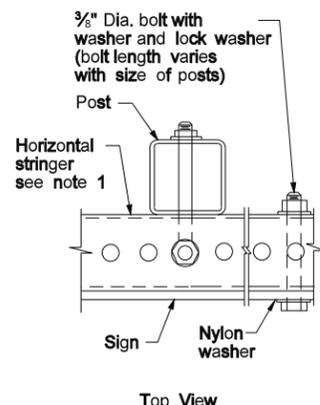
Mounting Details Perforated Tube

Note:

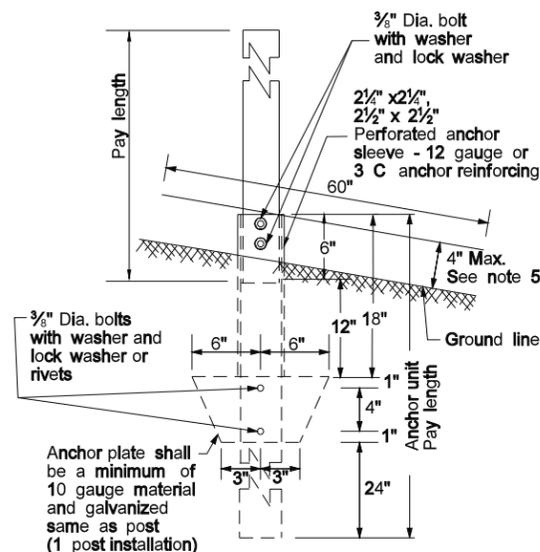
- Horizontal stringers - In lieu of perforated tubes, the contractor may substitute z bar stringers. The z bar stringers shall be 1 1/2" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel.
- Metal washers used on sign face shall have a minimum outside diameter of 5/16" ± 1/16" and 10 gauge thickness.
- No Parking Signs: All no parking signs with directional arrows shall be placed at a 30 to 45 degree angle with the line of traffic flow. No parking signs required at the above angles may have the support turned to the correct angle. If the no parking sign is placed with another sign that has to be placed at a 90 degree angle with the line of traffic flow, the detailed angle strap should be used to mount the no parking sign. Flat washers and lock washers shall be used with all nylon washers. Material used for the attachment strap shall be included in the price bid for "Flat sheet for signs."
- In lieu of using the bent bolt to attach the post to the stringer, the contractor may choose to punch the sign backing and place the bolt through the sign, the stringer and the post.
- 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.



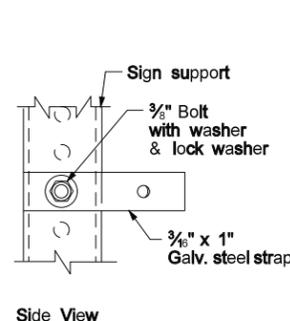
STRINGER MOUNTING  
(WITH STRINGER IN FRONT OF POST)



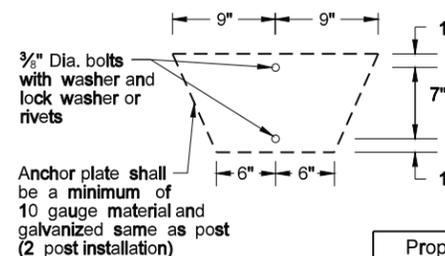
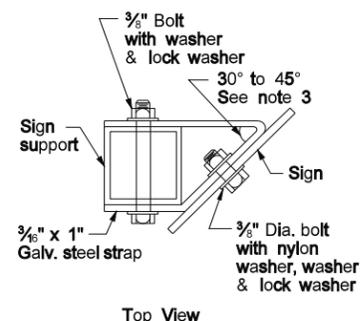
STREET NAME SIGNS  
AND ONE WAY SIGNS  
SINGLE POST ASSEMBLY  
ONE STRINGER OR  
BACK TO BACK MOUNTING



ANCHOR UNIT AND  
POST ASSEMBLY



STRAP DETAIL

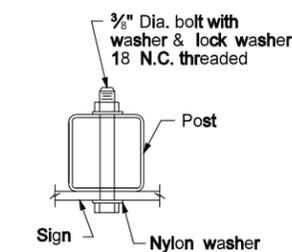


Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. <sup>4</sup>	Cross Sect. area In. <sup>2</sup>	Section Modulus In. <sup>3</sup>
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/8 x 2 3/8	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.783

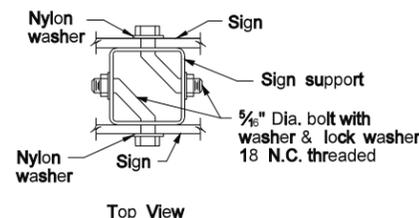
The 2 1/4" size 10 gauge is shown as 2.19" size on the plans.  
The 2 1/2" size is shown as 2.51" size on the plans.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	12	2 1/2(D)	12	Yes		7
1	2 1/2	12	2 1/4	12	Yes		7
2	2 1/2	10			Yes		7
2	2 1/4	12	2 1/2(D)	12	Yes		7
2	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/2	12			Yes		7
3 & 4	2 1/2	10			Yes		7
3 & 4	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/4	12	2 1/2(D)	12	Yes		7
3 & 4	2 1/2	10	2 3/8	10	Yes		7

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.  
(C) - 3" anchor unit  
(D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.



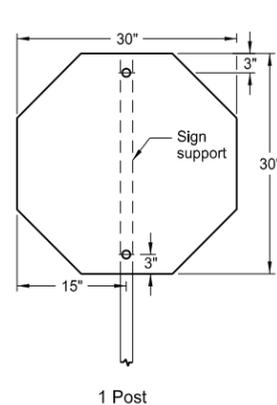
BOLT MOUNTING



BACK TO BACK  
MOUNTING

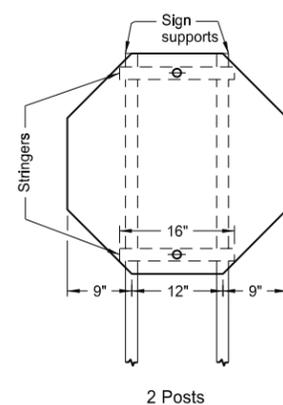
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 08/06/09 and the original document is stored at the North Dakota Department of Transportation
8-6-09		
REVISIONS		
DATE	CHANGE	

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

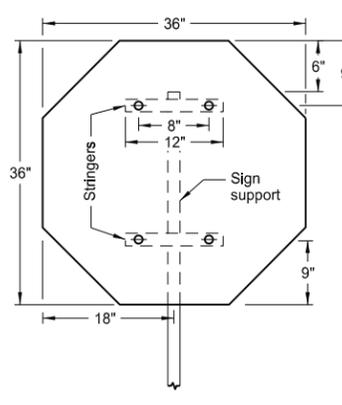


1 Post

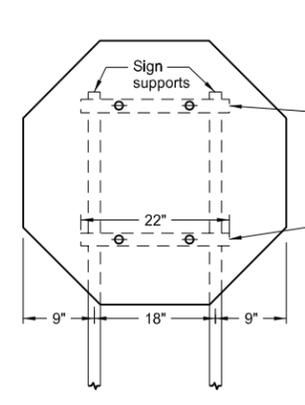
Assembly No. 1



2 Posts

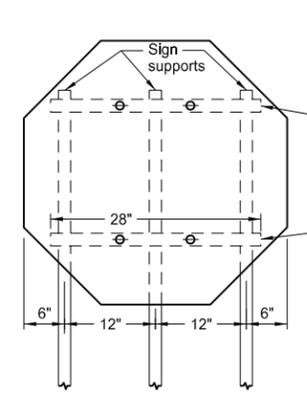


1 Post



2 Posts

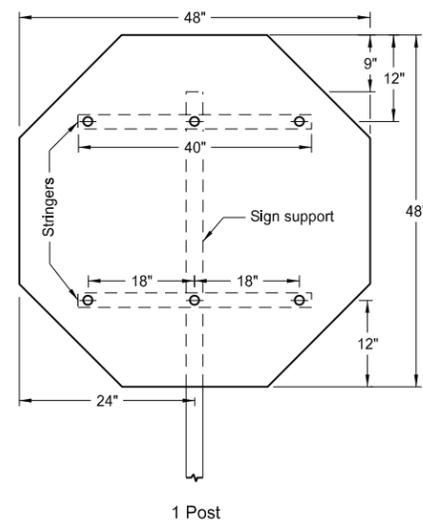
Assembly No. 2



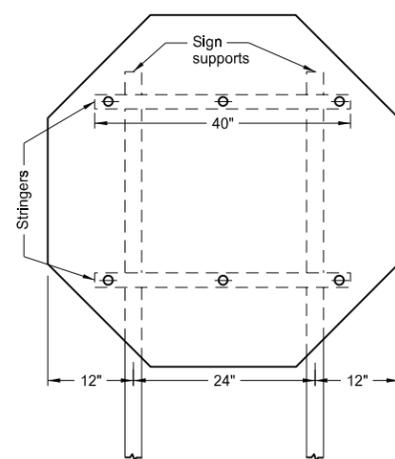
3 Posts

Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ¾" bolt.

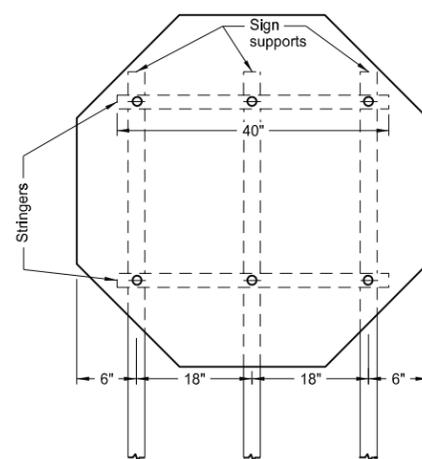


1 Post

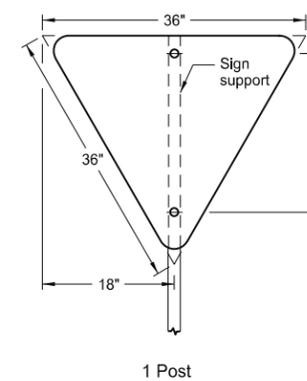


2 Posts

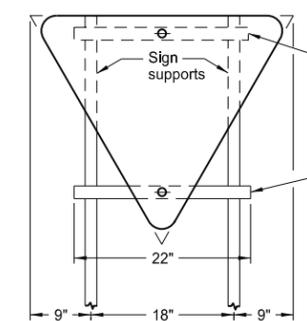
Assembly No. 3



3 Posts

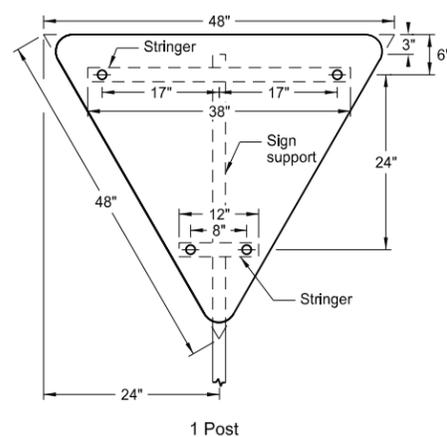


1 Post

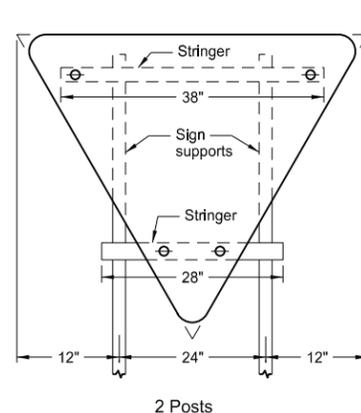


2 Posts

Assembly No. 4

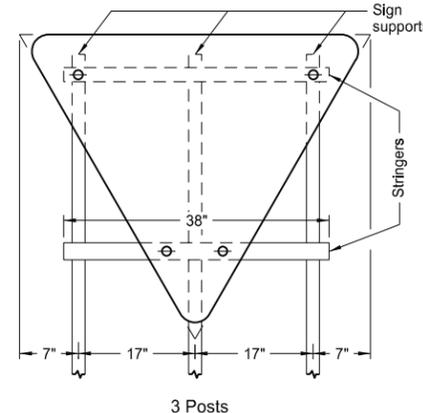


1 Post



2 Posts

Assembly No. 5

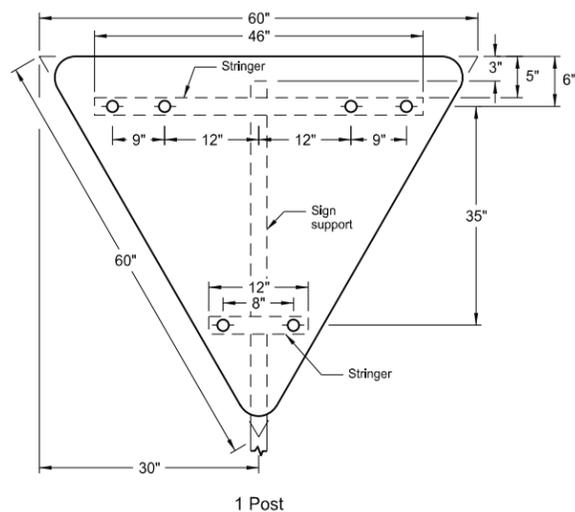


3 Posts

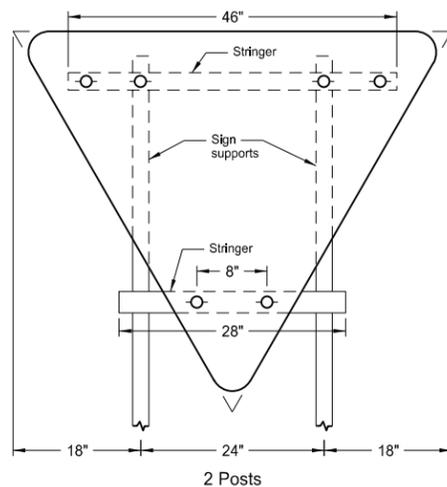
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

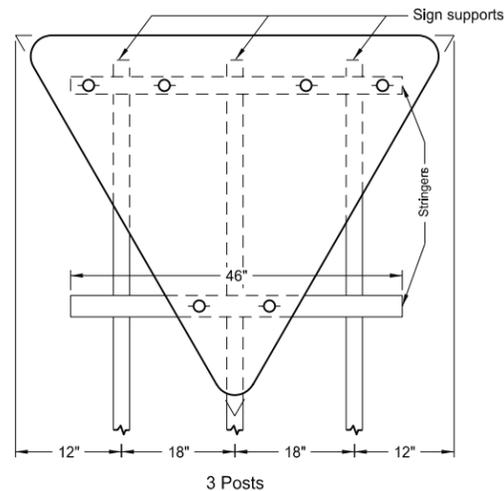
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post



2 Posts

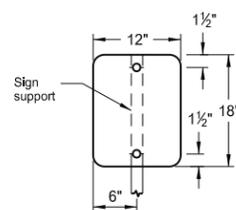


3 Posts

Assembly No. 6

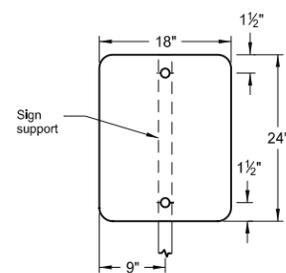
Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1 1/2" x 1 1/2".
4. All holes shall be punched round for 3/8" bolt.



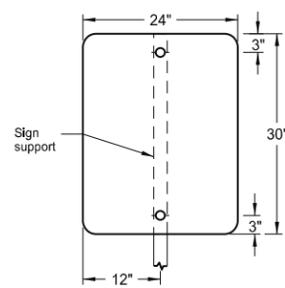
1 Post

Assembly No. 7



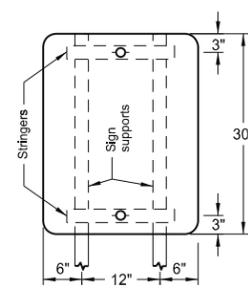
1 Post

Assembly No. 8

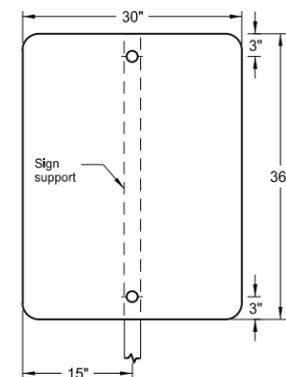


1 Post

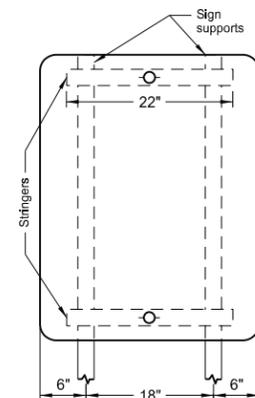
Assembly No. 9



2 Posts

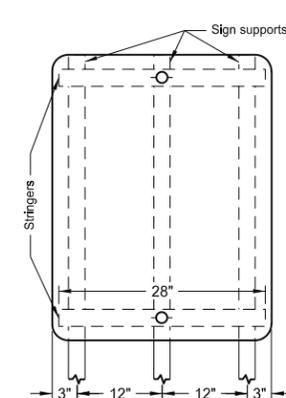


1 Post

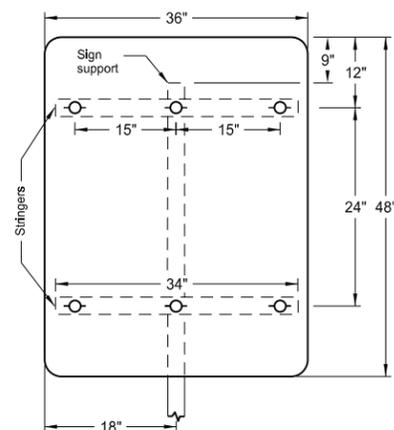


2 Posts

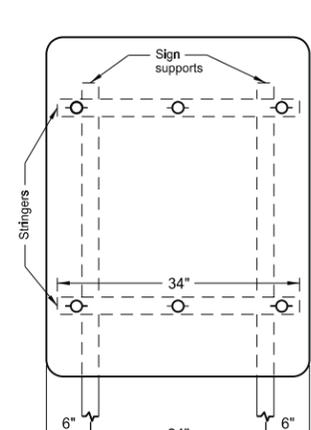
Assembly No. 10



3 Posts

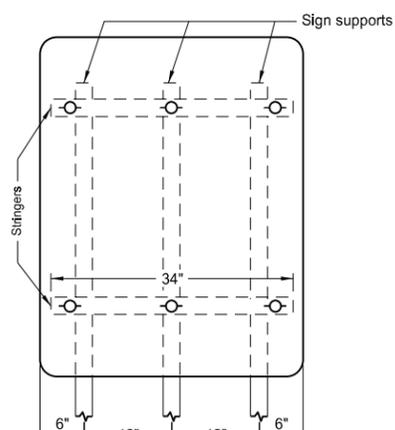


1 Post



2 Posts

Assembly No. 11

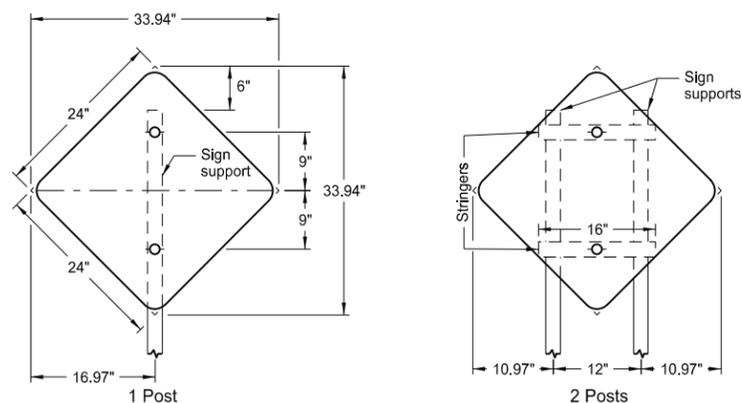


3 Posts

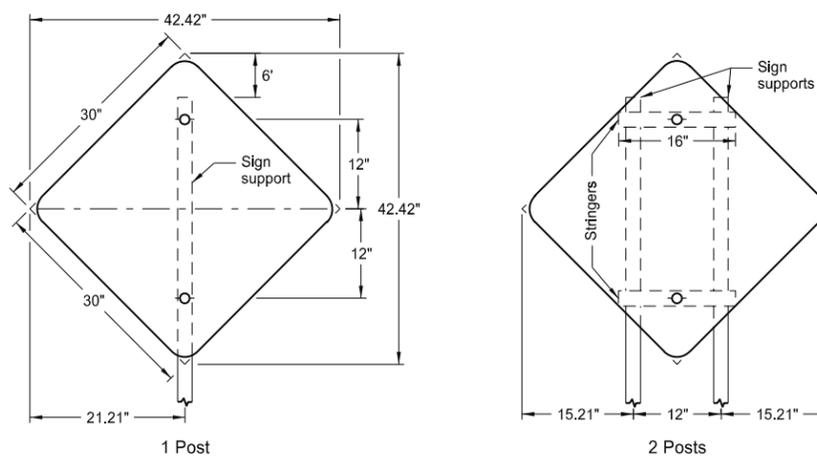
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

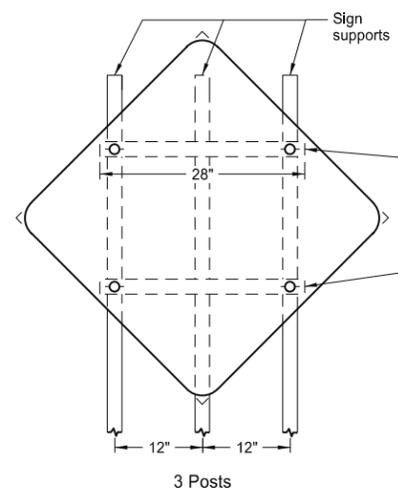
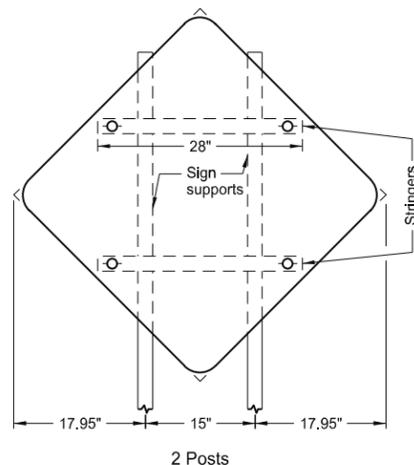
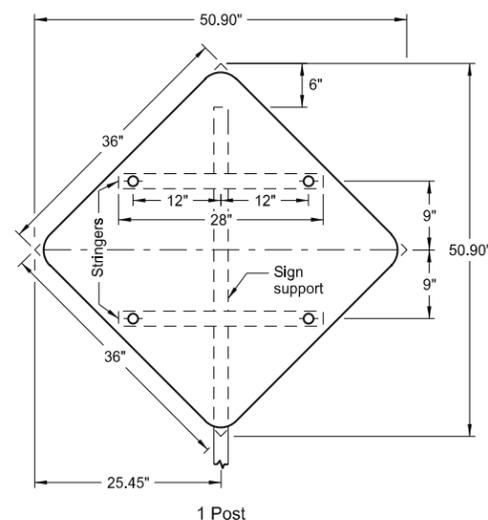
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS



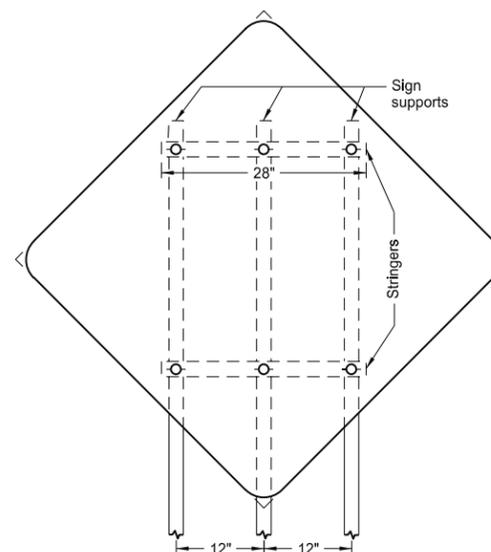
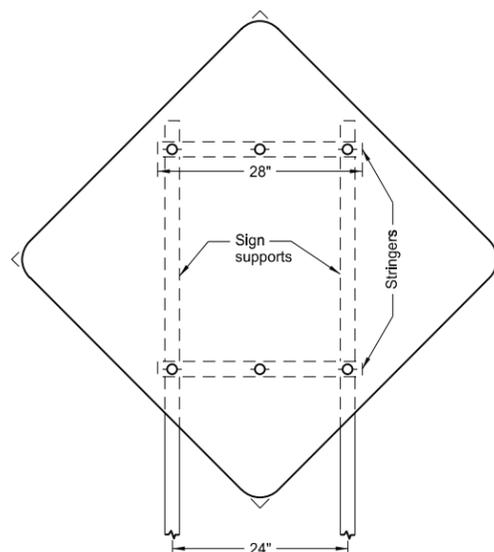
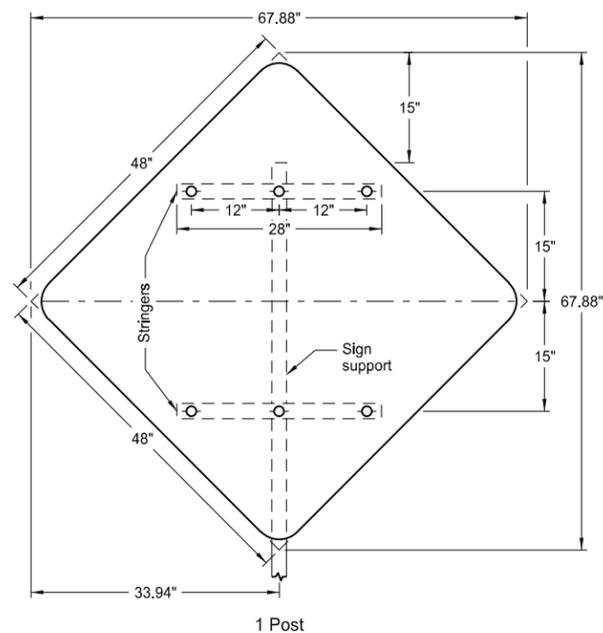
Assembly No. 18



Assembly No. 19



Assembly No. 20



Assembly No. 21

Notes:

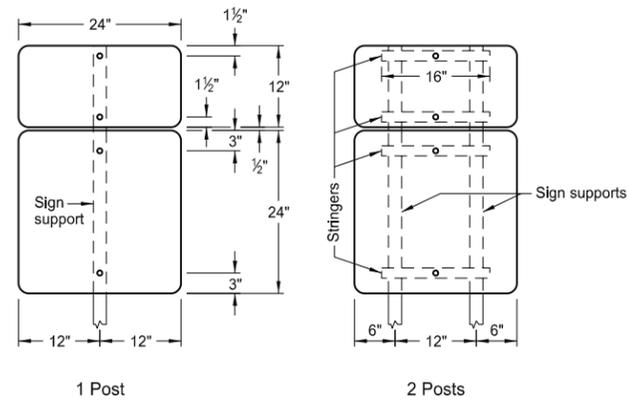
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

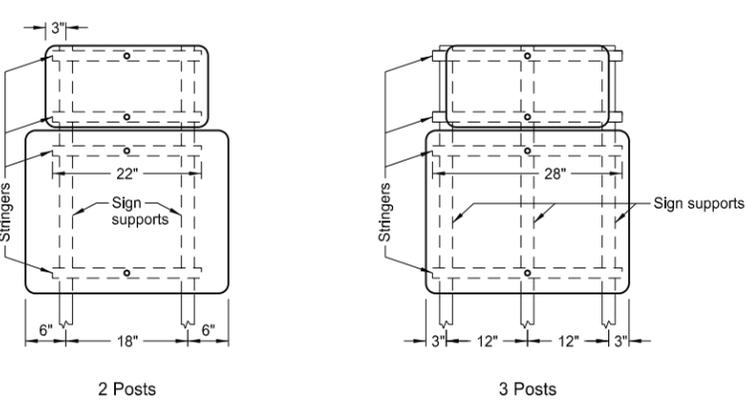
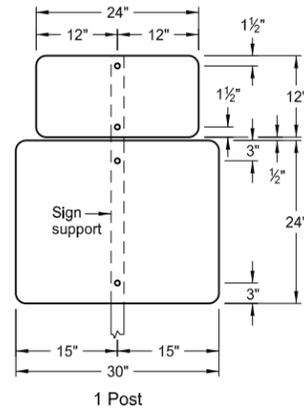
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-51

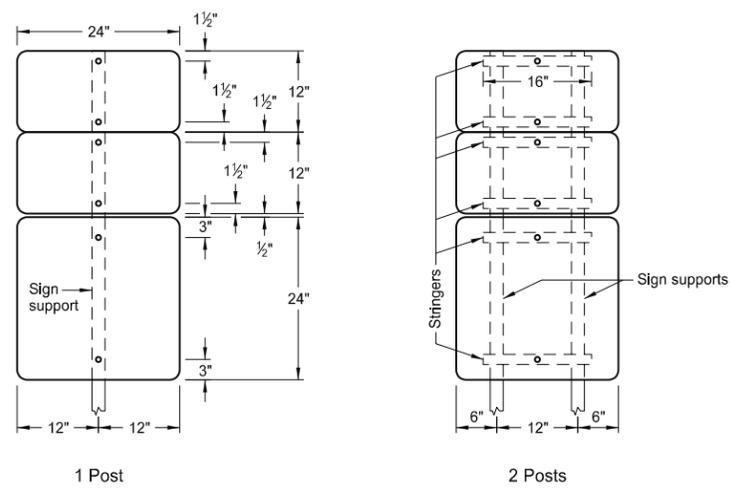


ASSEMBLY NO. 371

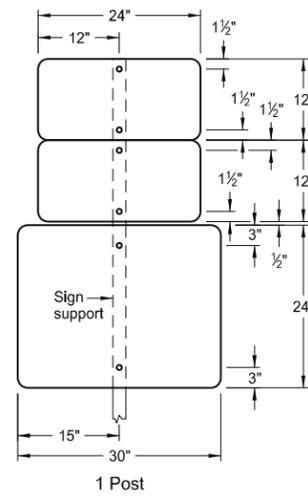
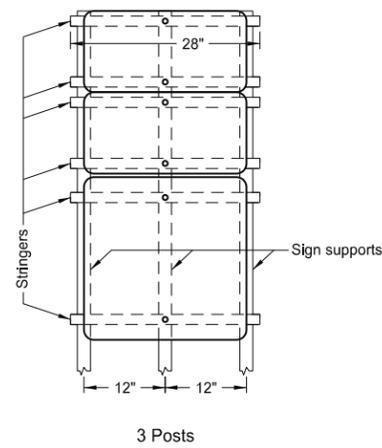


ASSEMBLY NO. 372

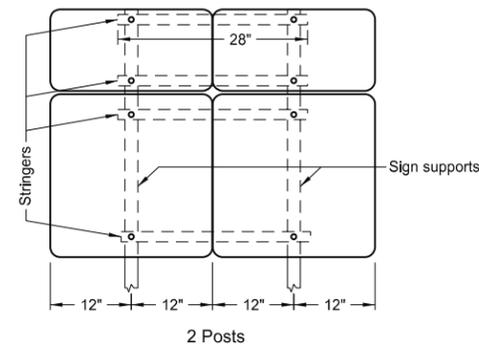
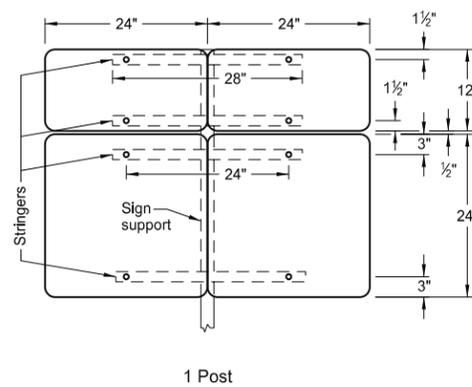
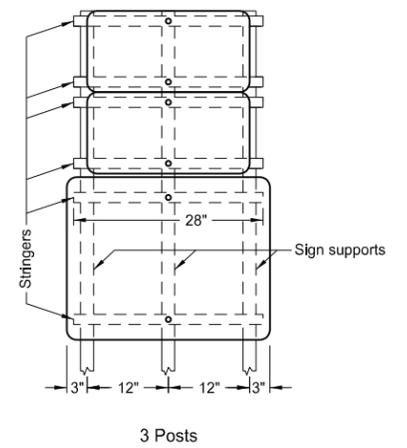
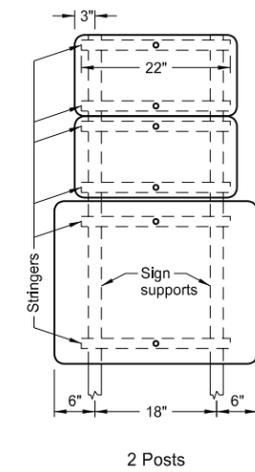
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.



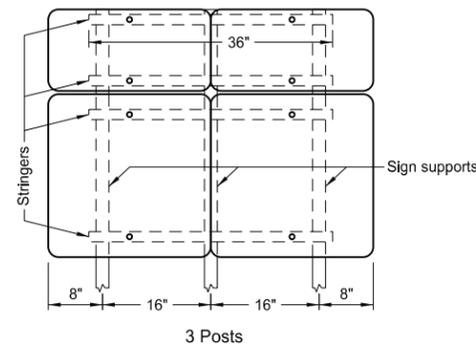
ASSEMBLY NO. 373



ASSEMBLY NO. 374



ASSEMBLY NO. 375

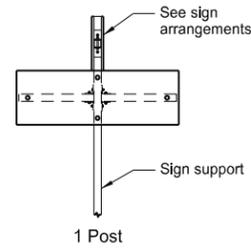


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION 8-22-12	
REVISIONS	
DATE	CHANGE

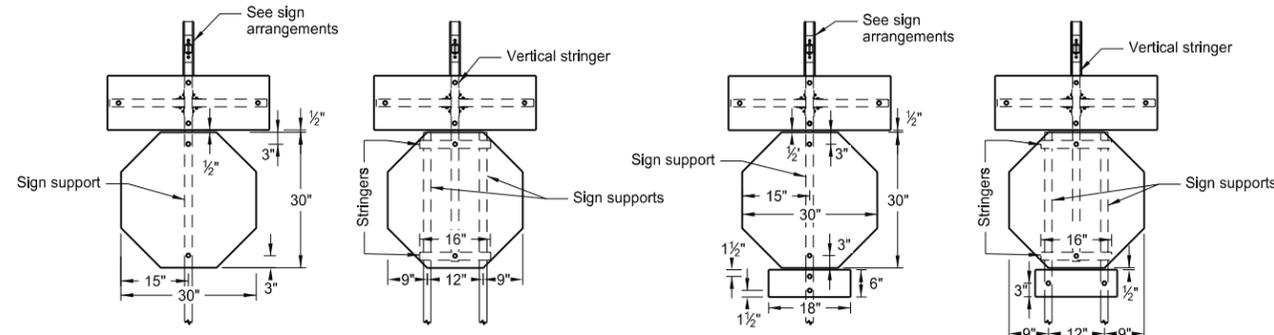
This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 8/22/12 and the original document is stored at the North Dakota Department of Transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR STREET NAME SIGNS AND 911 SIGNS

- A - Single sign
- B - Single sign back to back
- C - Single sign each direction
- D - Single sign one direction, back to back other direction
- E - Back to back both directions

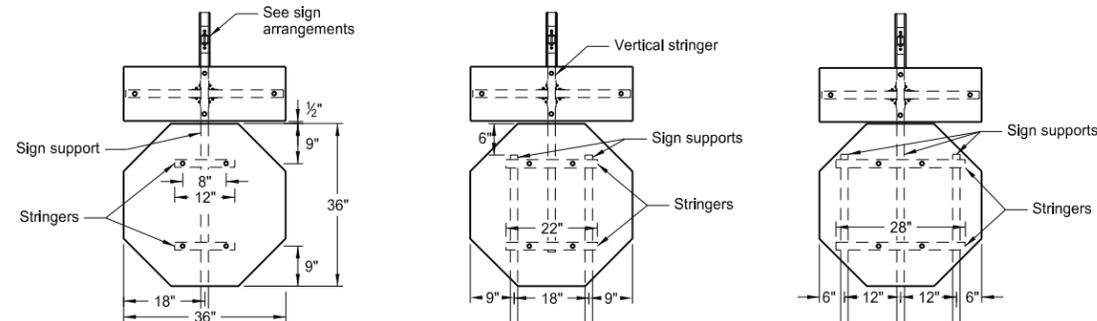


Special Assembly 1 (A, B, C, D or E)

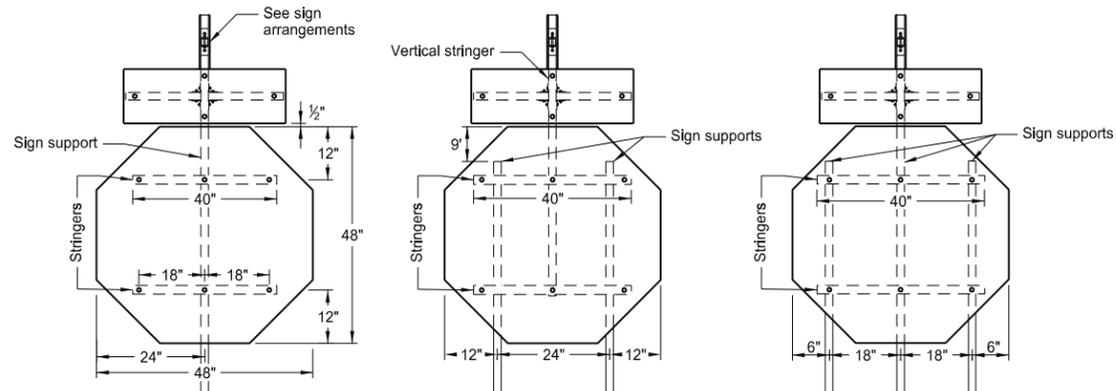


Special Assembly 2 (A, B, C, D or E)

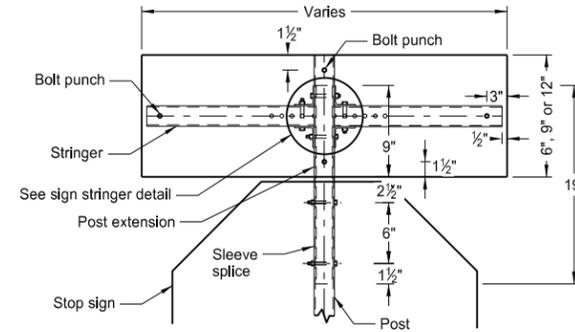
Special Assembly 3 (A, B, C, D or E)



Special Assembly 4 (A, B, C, D or E)

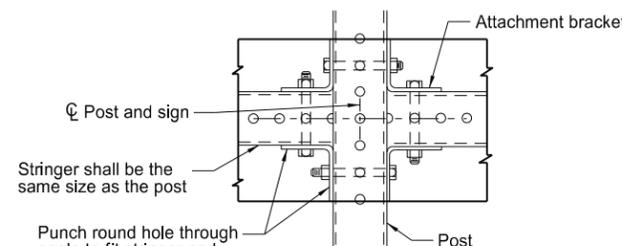


Special Assembly 5 (A, B, C, D or E)



Sleeve Splice Detail

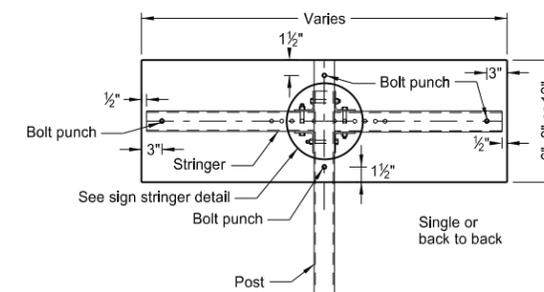
Note: The splice method may be used upon approval of the engineer.



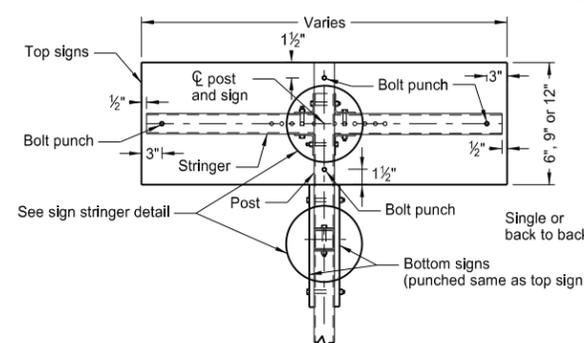
Sign Stringer Detail

Stringer shall be the same size as the post

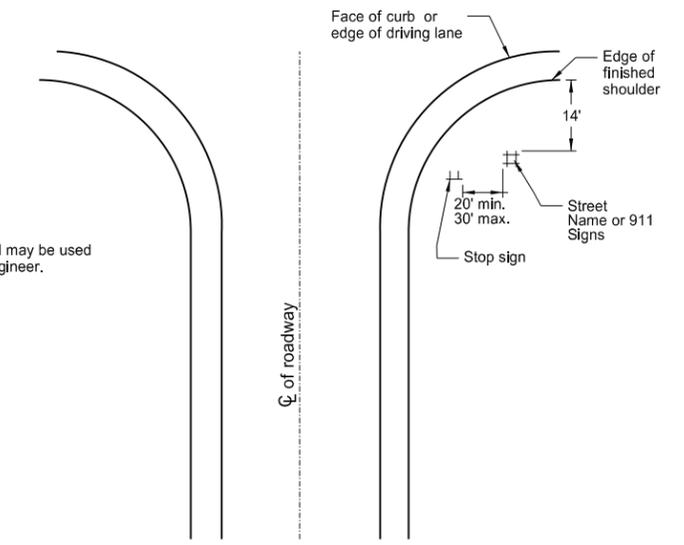
Punch round hole through angle to fit stringer and post holes.



Detail A or B

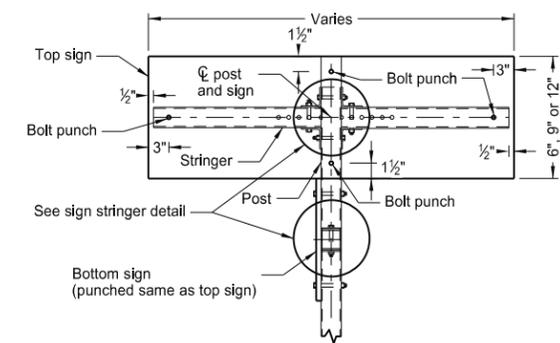


Detail D or E



Intersection Layout

Note: This layout is to be used for street name signs or 911 signs that are used with Special Assembly 1.



Detail C

Sign Arrangements

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by  
 Roger Weigel  
 Registration Number  
 PE-2930,  
 on 10/3/13 and the original document is stored at the  
 North Dakota Department  
 of Transportation

MAILBOX LOCATION DETAILS

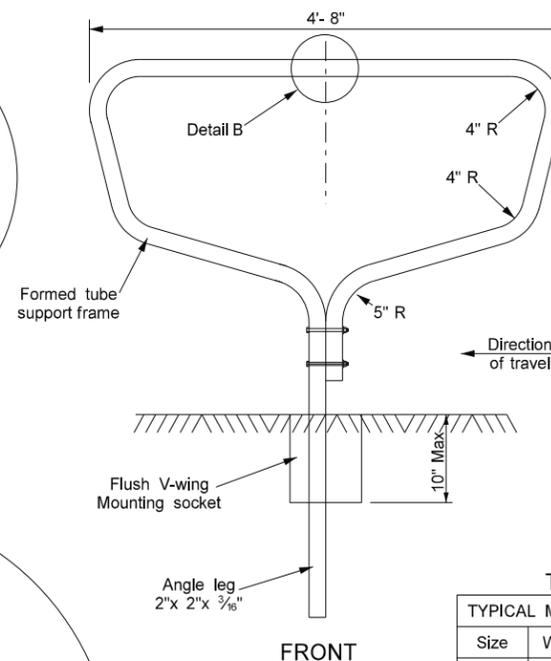
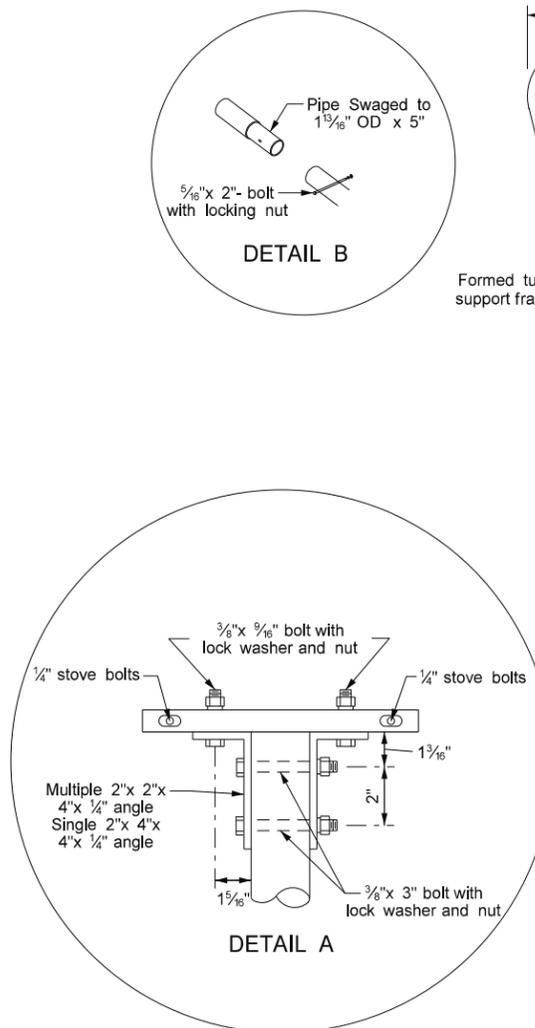
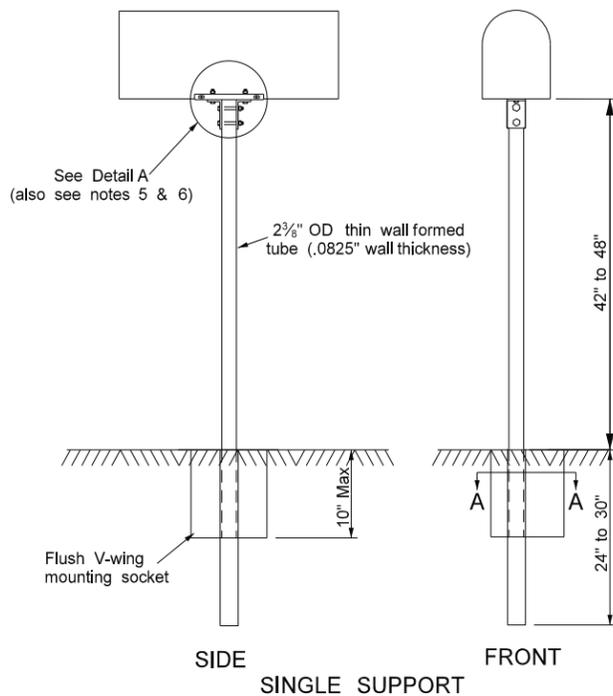
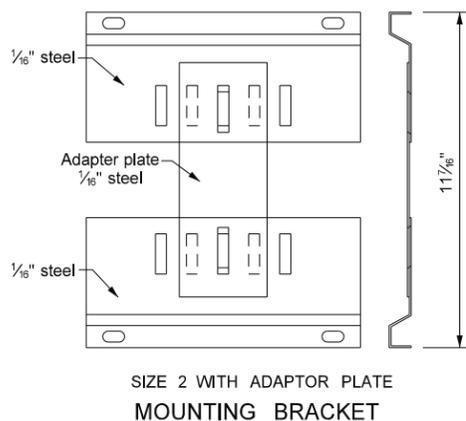
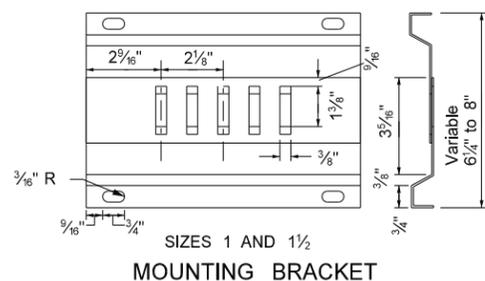
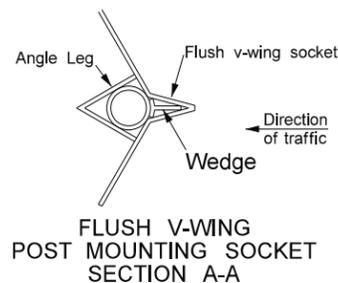
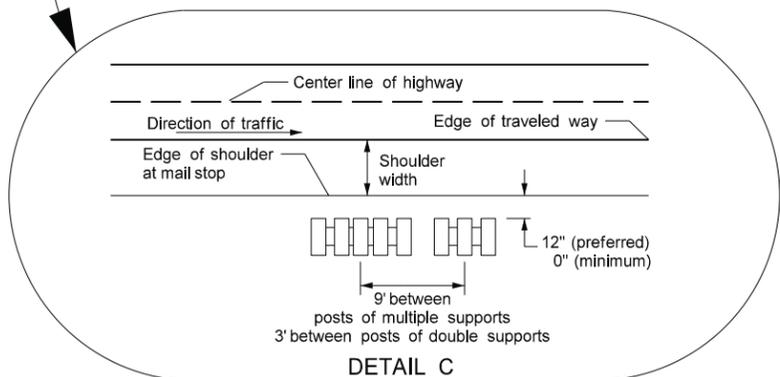
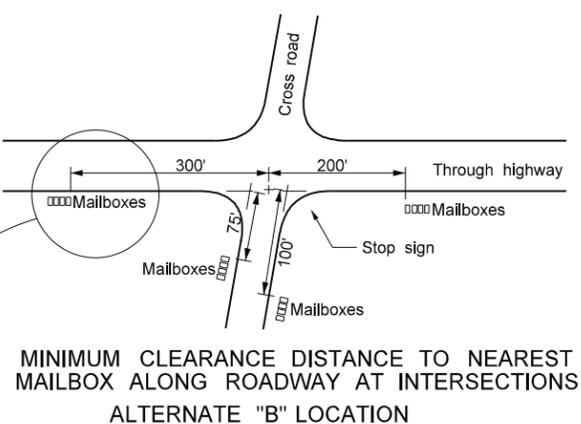
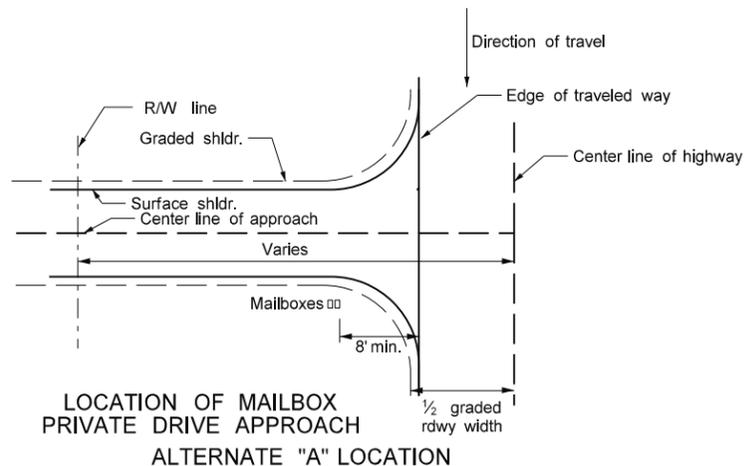


TABLE A

TYPICAL MAILBOX DIMENSIONS

Size	Width	Height	Length
1	6.5"	8.5"	19"
1A	8"	10.5"	21"
2	11.5"	13.5"	23.5"

Notes:

- The mailbox support and hardware details shall consist of the "V-Loc Mailbox Support System" manufactured by: Tapco Traffic & Parking Control Co. Inc.  
Any other equal support system meeting the requirements of NCHRP Report 350, which has been crash tested, and approved by the Federal Highway Administration may be used. Approved alternate mailbox assemblies shall be installed in the manner and arrangement crash tested.
- The preferred location for all mailboxes is the Alternate "A" location. However, the Engineer may approve the Alternate "B" location if warranted by existing field conditions.
- Postal regulations require that mailboxes must be located on the right-hand side of the road in the direction traveled by the carrier. Therefore, the Engineer shall contact the local carrier or postmaster before installing new mailboxes to verify the direction of travel.
- Mailboxes installed on private drive approaches must always be located on the downstream side of the approach.
- Install angle connection parallel to traffic flow for size 2 mailbox mounted on single posts.
- Size 2 mailbox mounted on multiple support requires 2 each, 3/8" by 3/4" bolts with lock washers and nuts to attach the adaptor plate to mounting bracket. The unit will then require 4 angle connections to attach to the formed tube support frame. See Detail A.
- Space multiple support frames a minimum of 4 feet apart. Space single support frames a minimum of 3 ft apart. Do not place more than five No. 1 mailboxes, three No. 2 mailboxes, or any combination of four No. 1-A and No. 2 mailboxes on multiple support frames.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-15-2010

REVISIONS

DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 9/15/2010 and the original document is stored at the North Dakota Department of Transportation