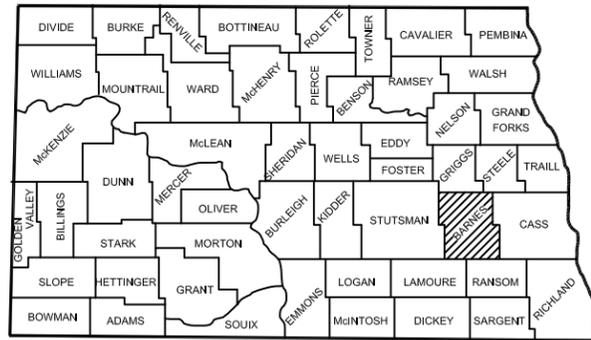


**JOB #25**

**CITY OF VALLEY CITY, NORTH DAKOTA  
PROJECT NUMBER TEU-2-990(050)054**

STATE	PROJECT NUMBER	PCN	SECTION NUMBER	SHEET NUMBER
ND	TEU-2-990(050)054	20386	1	1



STATE OF NORTH DAKOTA  
SHOWING COUNTIES

**9TH ST NE SHARED-USE PATH  
GRADING, AGGREGATE BASE,  
HOT BITUMINOUS PAVING & INCIDENTALS**

Project consists of approximately 0.296 miles of Hot Bituminous Pavement Shared-Use Path Construction and Incidentals.

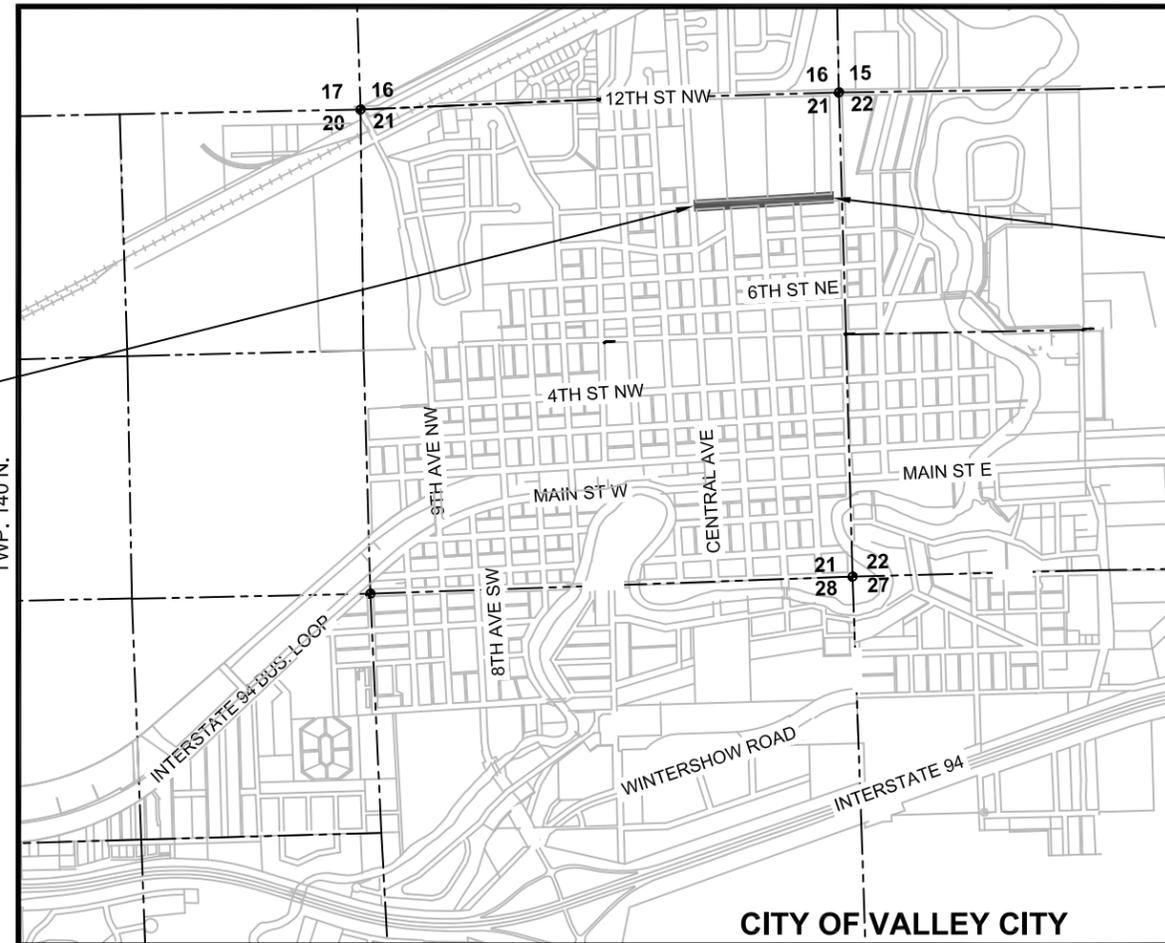
**GOVERNING SPECIFICATIONS**

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

**PROJECT LENGTH**

Project	Gross Miles	Net Miles
9th Street NE	0.296	0.296
Total	0.296	0.296

**Begin Project Number TEU-2-990(050)054  
9th St NE Shared-Use Path**  
Sta. 10+00 = A Point 3,716 Feet East and  
1,062 Feet South of the Northwest Corner of  
Sec. 21, Twp. 140 N., Rge. 58 W.



**End Project Number TEU-2-990(050)054  
9th St NE Shared-Use Path**  
Sta. 25+62 = A Point 5,272 Feet East and  
962 Feet South of the Northwest Corner of  
Sec. 21, Twp. 140 N., Rge. 58 W

PS&E Corrections Made \_\_\_\_\_

Surveyed & Designed Date \_\_\_\_\_

January 2014

TEU-2-990(050)054

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CHAD A. PETERSEN  
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PE 4884  
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VALLEY CITY, ND.

**CERTIFICATION**  
I HEREBY CERTIFY THAT THESE 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 NORTH DAKOTA.

Chad A. Petersen  
KADRMAS, LEE & JACKSON, INC.

DATE 08/25/2014 REGISTRATION NUMBER 4884



1010 4TH AVENUE SW  
P.O. BOX 937  
VALLEY CITY, ND 58072-0937  
(701) 845-4980, FAX (701) 845-0252  
© KLJ 2014

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	2	1

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2	1	Table of Contents & List of Standard Drawings
4	1	Scope of Work
6	1-2	Plan Notes
6	3	Environmental Commitments
8	1	Estimate of Quantities
10	1	Basis of Estimate
30	1	Typical Sections
40	1-2	Removals
60	1-4	Plan & Profile
100	1	Traffic Control Devices List
100	2	Traffic Control Signing Layout
110	1	Sign Summary
110	2-5	Signing Layouts
110	6	Special Assembly
140	1-4	Lighting Layouts
140	5	Electrical Details
200	1-6	Cross Sections

**LIST OF STANDARD DRAWINGS**

<u>STANDARD 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-261-01	Erosion Control – Fiber Roll Placement Details
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
D-704-50	Portable Sign Support Assembly
D-708-6	Erosion and Siltation Controls - Median or Ditch Inlet Protection
D-714-22	Concrete Pipe Ties
D-714-27	Pipe Excavation and Installation Detail for Longitudinal Mainline Pipe or Pipe Not Under the Roadway
D-722-1A	Inlet-Catch Basin
D-750-1	Concrete Driveway - Urban
D-750-2	Sidewalk
D-750-3	Curb Ramp Detail
D-754-23	Perforated Tube Assembly Details
D-754-24 & 25	Mounting Details Perforated Tube
D-754-46	Bike Route Signs-Punching, Stringer, Support Location Details for Regulatory Warning and Guide Signs
D-762-1	Pavement Marking Message Details
D-770-1	Concrete Foundations (Traffic Signals & Highway Lighting)
D-770-2	Feed Points (Roadway Lighting)
D-770-3	Pull Box Details
D-770-5	Light Standard Details



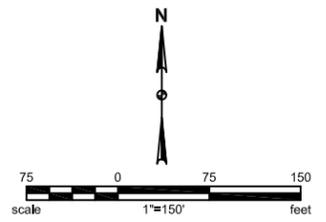
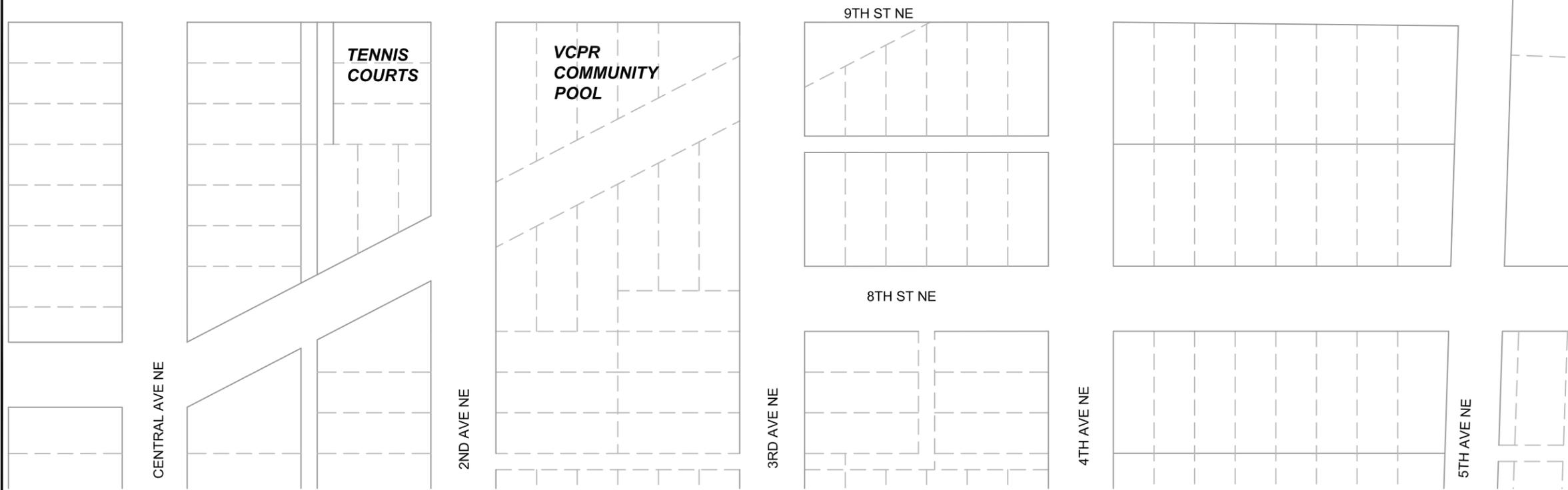
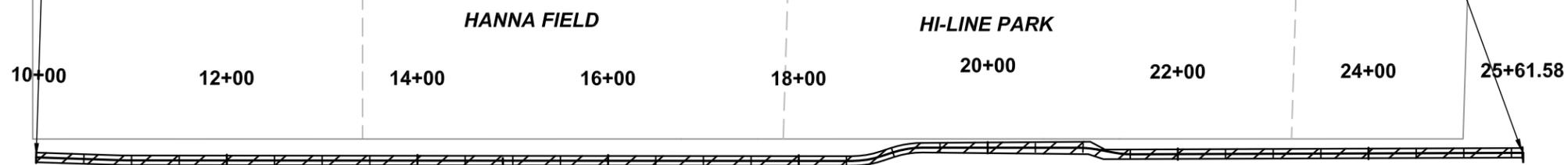
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	4	1

**BEGIN PROJECT**

Sta. 10+00 = A Point 3,716 Feet East and 1,062 Feet South of the Northwest Corner of Sec. 21, Twp. 140 N., Rge. 58 W.

**END PROJECT**

Sta. 25+62 = A Point 5,272 Feet East and 962 Feet South of the Northwest Corner of Sec. 21, Twp. 140 N., Rge. 58 W.



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 SHARED-USE PATH

<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA			
	<b>SCOPE OF WORK</b>		
	<table border="1"> <tr> <td>DRWN. BY MS</td> <td>CHKD BY CP</td> <td>PROJECT NO. 5413106</td> </tr> </table>	DRWN. BY MS	CHKD BY CP
DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106	

## PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	6	1

**105-P01 PAVEMENT SWEEPING:** The contractor shall sweep new pavements before opening to traffic and for final acceptance. All costs connected with this work shall be included in the price bid for "COMMERCIAL GRADE HOT MIX ASPHALT".

**203-P01 COMMON EXCAVATION-TYPE A:** Payment for "COMMON EXCAVATION-TYPE A" shall be at plan quantity.

**230-P01 SUBGRADE PREPARATION-TYPE A:** Prepare the subgrade to a depth of 6 inches and construct in accordance with Section 230.04 D of the Standard Specifications.

The engineer will complete two (2) compaction tests for every 500 LF of subgrade preparation. The engineer will randomly select the test locations and perform the compaction tests.

**251-P01 SEEDING CLASS III:** The seed mixture will be as follows:

<u>Species</u>	<u>Pound Pure Live Seed/Acre</u>
Kentucky Bluegrass	50
Perennial Rye Grass	20
Six-Week Fescue or Dural-hard Fescue	30
Annual Rye Grass	<u>50</u>
	150

**430-P01 COMMERCIAL GRADE HOT MIX ASPHALT:** Provide commercial grade asphalt that meets the requirements of Superpave FAA 40 or 41 in Section 430.03 C, "Superpave Mix Properties".

**704-P01 CONSTRUCTION SIGNING:** Furnish the necessary traffic control devices as included in Section 100. Portable signs, delineator drums and tubular markers have been provided for construction activities taking place on or immediately adjacent to the roadway. Sidewalk Closed signs (R9-9-48) will also be used for path closures as needed.

The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the contract unit price for each device. Additional devices required to accommodate the Contractor's operation will be the Contractor's responsibility.

**714-P01 PIPE CONDUIT:** If the end of the pipe in the existing inlet is not a bell section, the contractor will remove the existing pipe to the next joint. The contractor will seal the joint between the existing pipe bell and the new pipe conduit. The pay length will be measured from the point where the new pipe ties into the existing pipe to the new inlet. The cost of removing existing pipe and material cost to couple the ends together will be included in the price bid for "PIPE CONDUIT 18IN-STORM DRAIN".

**724-P01 WATERMAIN 4IN PVC:** The existing 4-inch irrigation line that services Hanna Field will be removed and replaced. Bury the irrigation line 5 feet below the proposed finish grade. Remove and reuse the existing valve and place a new valve box. All costs associated with removing the existing watermain and installing the new watermain is included in the price bid for "WATERMAIN 4IN PVC". All costs associated with removing and reinstalling the valve and supplying the valve box is included in the price bid for "RELOCATE GATE VALVE & BOX".

**970-P01 HERBICIDE WEED CONTROL:** Place a granular herbicide in the areas where the hot bituminous pavement shared-use path will be placed. Place the herbicide to the width shown on the typical sections (centered on the shared-use path centerline and incorporated into the subgrade prior to placement of the base material). Use Norasac 106 at an application rate of 100-120 lbs/acre (2.3-2.8 lbs/1,000 s.f.), Dyclomec 46 at an application rate of 250-300 lbs/acre (5.75-7.0 lbs/1,000 s.f.), or an approved equal. Place the herbicide immediately ahead of the placement of the aggregate base course. The cost of the materials, equipment, labor, and incidentals to complete this item is included in the price bid per linear foot of "HERBICIDE WEED CONTROL" measured along the shared-use path centerline.

### Section 110

**754-120 PEDESTRIAN/SCHOOL CROSSING SIGNS:** The pedestrian and school crossing signs shall have a fluorescent yellow green background with black letters and border.

### Section 140

**770-P01 LIGHT STANDARD 8 FT MA 40 FT MT HT BREAKAWAY:** The breakaway light standard will be of the davit type and with mast arms as scheduled and shall be galvanized. The mounting height will be as scheduled from the top of the foundation to the bottom of the luminaire or as shown in the plans. Duct seal all conduit stubs in concrete foundation. The 40' breakaway light standards will have transformer bases. Hand holes will face opposite direction of the roadway.

**770-P02 FEED POINT-TYPE II PAD MOUNTED:** Install the feedpoint at the location indicated in the plans. Incoming electrical service will be underground. See standard drawing D-770-2 for details along with the wiring detail provided on sheet 14 of section 140. The contractor will be responsible for coordinating with the Valley City Public Works Electric Department (Stan Hansen 701-845-4255) for the new incoming electrical service. The city will be responsible for providing and installing the meter and connections to the transformer at the weatherhead on the existing power pole. The contractor will provide and install the meter socket (on the side of the feedpoint cabinet), conduit, trenching, service conductors, conduit up the existing power pole, and weatherhead.

The metersocket will be 100 amp minimum rated and a by-pass option is not required. Mount the metersocket on the side of the feedpoint cabinet. Provide 2" rigid steel conduit where exposed from the metersocket to the concrete pad. Provide 2" PVC conduit from the feedpoint base to the pullbox. Provide an additional spare 2" PVC conduit from the cabinet interior to the pullbox. Provide 2" PVC conduit from the pullbox to the power pole and up the power pole. Use Schedule 80 conduit from the elbow at the base of the power pole to the first 10 feet up the power pole. Use Schedule 40 conduit everywhere else. Bury service conduit at a minimum depth of 24" below grade. Mount the weatherhead at approximately 25' from the finished grade. Provide 6' of service conductor slack at the weatherhead. The contractor is responsible for coordination and meeting all requirements imposed by the city for the service installation at the contractor's expense.

The feedpoint cabinet will be as sized and constructed at a minimum as shown on detail sheet D-770-2 and according to the NDDOT Standard Specifications for Road and Bridge Construction sections 770 and 895. The feedpoint cabinet will be rated NEMA 3R for outdoor locations at a minimum. Provide a permanent label for the exterior feedpoint cabinet and for the contactors inside the cabinet. Provide all the necessary breakers as shown in the detail and panel schedule.

**770-P03 CONCRETE FOUNDATION-FEED POINT-TYPE B:** Top of concrete foundations will be 6" above the surrounding grade. Provide two spare 2" Schedule 40 PVC conduits in the concrete feed point foundation. Duct seal all conduit stubs in the concrete foundation.

**770-P04 LED LUMINAIRE - 18,570 LUMENS:** Provide luminaires capable of operating at 240 volts. Mount the luminaires to the 8' mast arm 40' breakaway light standards. The luminaires shall utilize a minimum of 60 light emitting diodes and they shall deliver a minimum of 18,570 initial delivered lumens with a type 2 optical distribution. Luminaires shall have an L<sub>70</sub> (at 25°C) minimum life of 65,000 hours and they shall have a color temperature (CCT) between 4000K and 4300K. Each luminaire shall have a maximum system current that does not exceed 1.05 amps at 240 volts. All luminaires shall be matching in all characteristics. Exterior finish shall be gray. Furnish an electronic set of shop drawings to the engineer for approval before orders are placed. Submit an electronic ".ies" file of the exact luminaire to be used. The luminaire shall provide an average maintained illuminance of 0.8 foot-candles (minimum) and an illuminance uniformity ratio of 3:1 avg/min (maximum) for the locations shown on the plans with a lighting loss factor of 0.69. The luminaire shall be reviewed for approval by the engineer to ensure standard AASHTO lighting level values are met.

**770-P05 PULL BOXES:** The pull boxes shall be polymer concrete type. The cover shall clearly be marked as "Lighting" as required. See standard drawing D-770-3 for details. Duct seal all conduits entering and exiting pull boxes.

**770-P06 PADLOCKS:** Obtain a padlock from the Valley City Public Works Electric Department for the feedpoint.

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TEU-2-990(050)054 CITY OF VALLEY CITY, NORTH DAKOTA		
	<b>PLAN NOTES</b>	
DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106

## PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	6	2

**770-P07**

**LIGHTING FOUNDATION:** Construction light foundations meeting the following requirements:

1. The foundation diameter shall be the largest of the following scenarios:
  - a. Anchor bolt diameter plus 12"
  - b. Light base plus 6"
  - c. 24"
2. The foundation depth shall be as follows:

FOOTING DEPTH "D" 24" DIAMETER FOUNDATION	FOOTING DEPTH "D" 30" DIAMETER FOUNDATION
6'	5'

3. Concrete used in the work shall be Class AE-3 Portland Cement Concrete mixed and proportioned as specified in Section 802.
4. Casing will be required to install the foundations. It shall be of sufficient strength to withstand handling and installation procedures. The contractor shall submit a casing material proposal to the engineer for review two weeks prior to ordering casing material. All costs associated with the casing shall be included in the price bid for "LIGHTING SYSTEM".
5. See Standard Drawing D-770-1 for additional information.

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# ENVIRONMENTAL COMMITMENTS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	6	3

ENVIRONMENT COMMITMENTS: The City of Valley City, the North Dakota Department of Transportation, 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: Disturbed areas would be returned to pre-construction conditions following construction.

Action taken/required: All disturbed areas would be re-seeded upon completion of construction to match surrounding vegetation. Best management practices (BMPs) would be implemented to minimize the likelihood of invasive plant species while vegetation is being established.

Commitment No. 2: Erosion and sediment control devices would be used as needed during construction.

Action taken/required: Contract documents would require that the contractor install and maintain erosion and sediment control devices.

Commitment No. 3: Fugitive dust emissions created during construction would be minimized.

Action taken/required: The contractor would implement BMPs, such as using water as a palliative, to control dust during construction as appropriate.

Required Permits:

North Dakota Department of Health – NDPDES Permit  
 Status: To be obtained by the Contractor prior to construction

Wetland Impact Table									
Wetland Number	Location	LONG / LAT (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetland	Impacts to Wetlands	
								Temp.	Perm.
""NO WETLANDS PRESENT""									
TOTALS					-			-	-

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DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106

## ESTIMATE OF QUANTITIES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	SHARED- USE PATH
103	0100	CONTRACT BOND	L SUM	1
202	0136	REMOVAL OF PAVEMENT	TON	111
202	0230	REMOVAL OF INLETS	EA	1
203	0101	COMMON EXCAVATION-TYPE A	CY	1,035
203	0109	TOPSOIL	CY	500
216	0100	WATER	M GAL	5
230	0300	SUBGRADE PREPARATION-TYPE A	STA	15.6
251	0300	SEEDING CLASS III	ACRE	0.622
253	0201	HYDRAULIC MULCH	ACRE	0.622
261	0112	FIBER ROLLS 12IN	LF	1,560
261	0113	REMOVE FIBER ROLLS 12IN	LF	1,560
302	0121	AGGREGATE BASE COURSE CL 5	CY	387
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	327
702	0100	MOBILIZATION	L SUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	94
704	1052	TYPE III BARRICADE	EA	6
704	1060	DELINEATOR DRUMS	EA	20
704	1067	TUBULAR MARKERS	EA	20
714	0315	PIPE CONC REINF 18IN CL III-STORM DRAIN	LF	21
722	4000	INLET CATCH BASIN-TYPE A	EA	1
724	0375	RELOCATE GATE VALVE & BOX	EA	1
724	0488	SLEEVE 4IN	EA	1
724	0790	WATERMAIN 4IN PVC	LF	100
748	0585	PRECAST CONCRETE WHEEL STOP	EA	21
750	0115	SIDEWALK CONCRETE 4IN	SY	7
750	1000	DRIVEWAY CONCRETE	SY	51
750	2115	DETECTABLE WARNING PANELS	SF	24
752	0660	FENCE CHAIN LINK REMOVE & RESET	LF	100
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	33.2
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	15.2
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	87.7
762	1106	PVMT MK PAINTED 6IN LINE	LF	62
762	1124	PVMT MK PAINTED 24IN LINE	LF	64
770	0001	LIGHTING SYSTEM	L SUM	1
970	0110	HERBICIDE WEED CONTROL	LF	1,562

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DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106

**BASIS OF ESTIMATE**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	10	1

Material	Unit	TYPICAL SECTION A		TYPICAL SECTION B	
		Width (ft)	Quantity per Station	Width (ft)	Quantity per Station
Aggregate Base Course CL 5 <b>(To be measured as in-place compacted volume (CY). The measured volume will not be adjusted for an additional 25% due to compaction shrinkage.)</b>	CY	12'	22.2	14'	25.9
SS1H or CSS1H or MS1 Emulsified Asphalt for HBP Tack Coat @ 0.05 Gal/SY <b>(To be included in the price bid for Hot Mix Asphalt)</b>	GAL	10'	5.6	13'	7.2
Commercial Grade Hot Mix Asphalt (FAA 40 or 41) @ 2 Ton/CY	TON	10'	18.5	13'	24.1
Asphalt Cement PG 58-28 @ 6.5% of Hot Mix Asphalt <b>(To be included in the price bid for Hot Mix Asphalt)</b>	TON	10'	1.2	13'	1.6
Subgrade Preparation-Type A	STA	14'	1.0	15'	1.0
Herbicide Weed Control	LF	14'	100.0	15'	100.0
Removal of Pavement @ 2.0 Ton/CY					
Topsoil Removal and Replacement 6"					
Water for Compaction: 10 Gal/CY of Embankment Quantities 30 Gal/CY of Salvaged Base Course 10 M Gal for Dust Palliative					
Seeding: The entire area outside the graded roadway disturbed by construction of this project shall be seeded. The exact limits shall be determined by the Engineer in the field.					

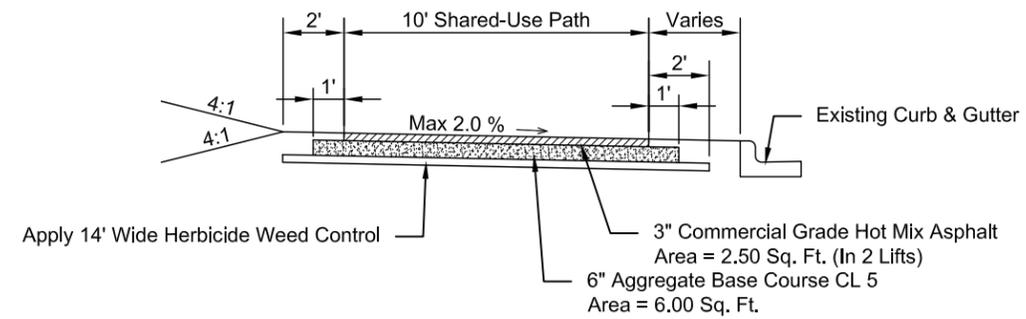
Common Excavation (CY)	Embankment (CY)	Borrow (CY)	Excess Excavation (CY)
1,035	130	0	905

Topsoil Excavation (CY)	Topsoil Embankment (CY)	Additional Topsoil (CY)
500	500	0

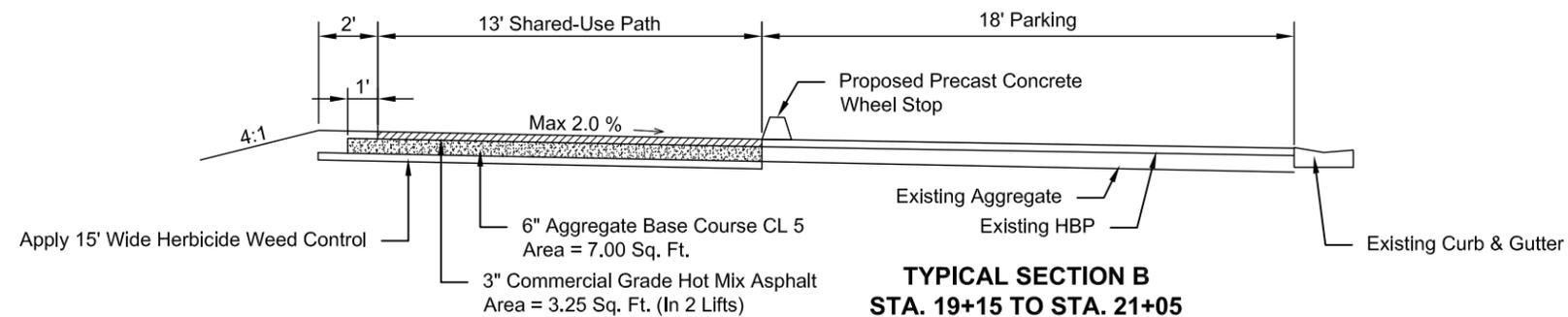
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	30	1



**TYPICAL SECTION A**  
**STA. 10+00 TO STA. 19+15**  
**STA. 21+05 TO STA. 25+62**

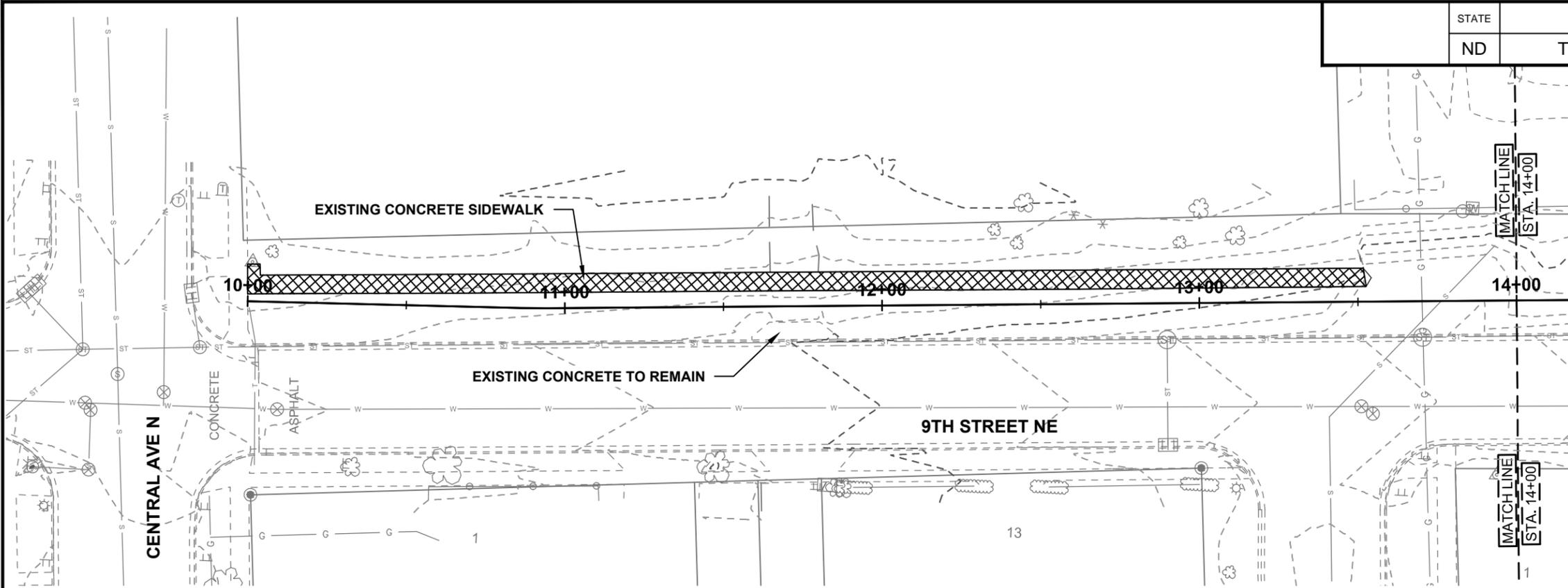


**TYPICAL SECTION B**  
**STA. 19+15 TO STA. 21+05**

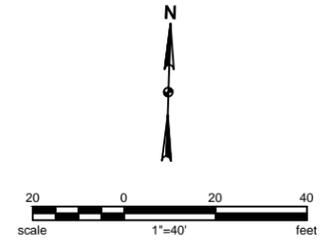
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	<b>TYPICAL SECTIONS</b>	
	<small>DRWN. BY</small> MS	<small>CHKD BY</small> CP

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	40	1



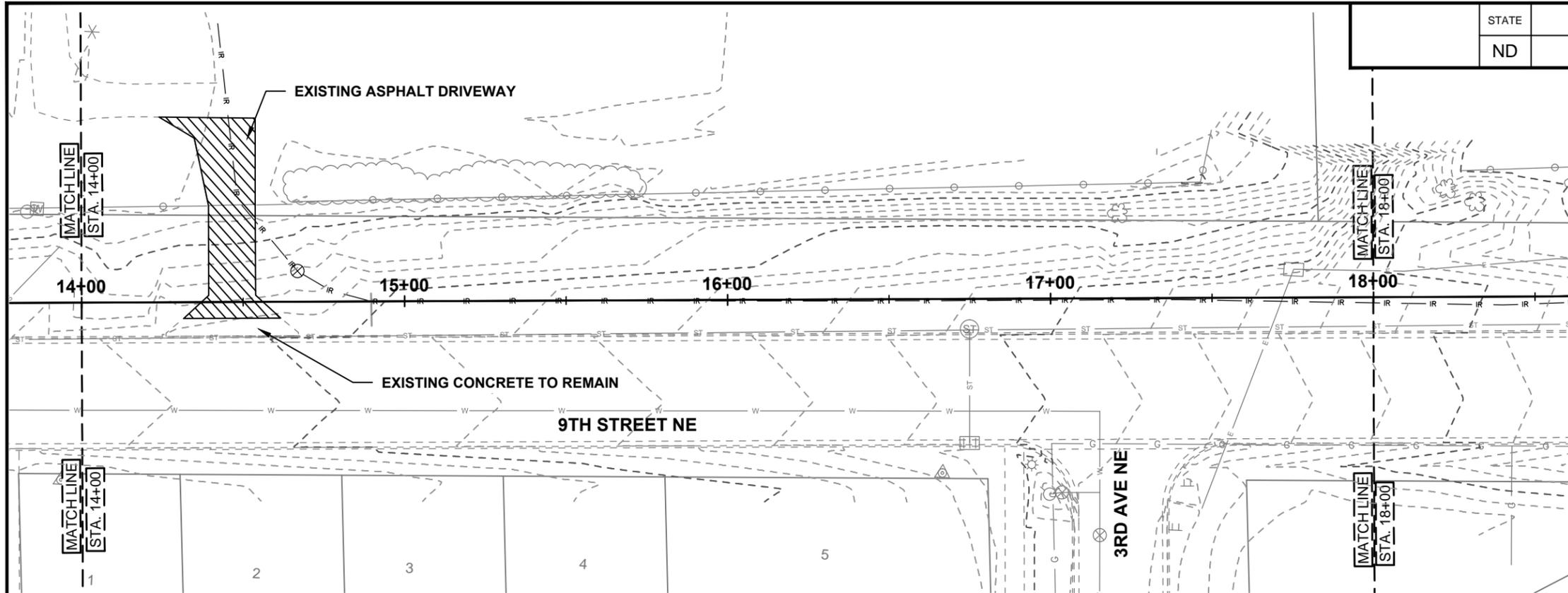
REMOVAL OF PAVEMENT  
STA. 10+00 TO 14+00 78 TON



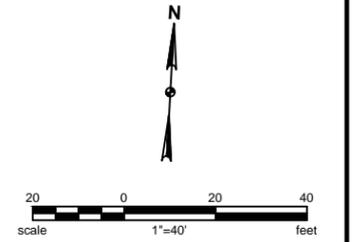
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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA			
	<b>REMOVALS</b> <b>STA. 10+00 TO 14+00</b>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">DRWN. BY MS</td> <td style="font-size: 8px;">CHKD BY CP</td> <td style="font-size: 8px;">PROJECT NO. 5413106</td> </tr> </table>	DRWN. BY MS	CHKD BY CP
DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	40	2



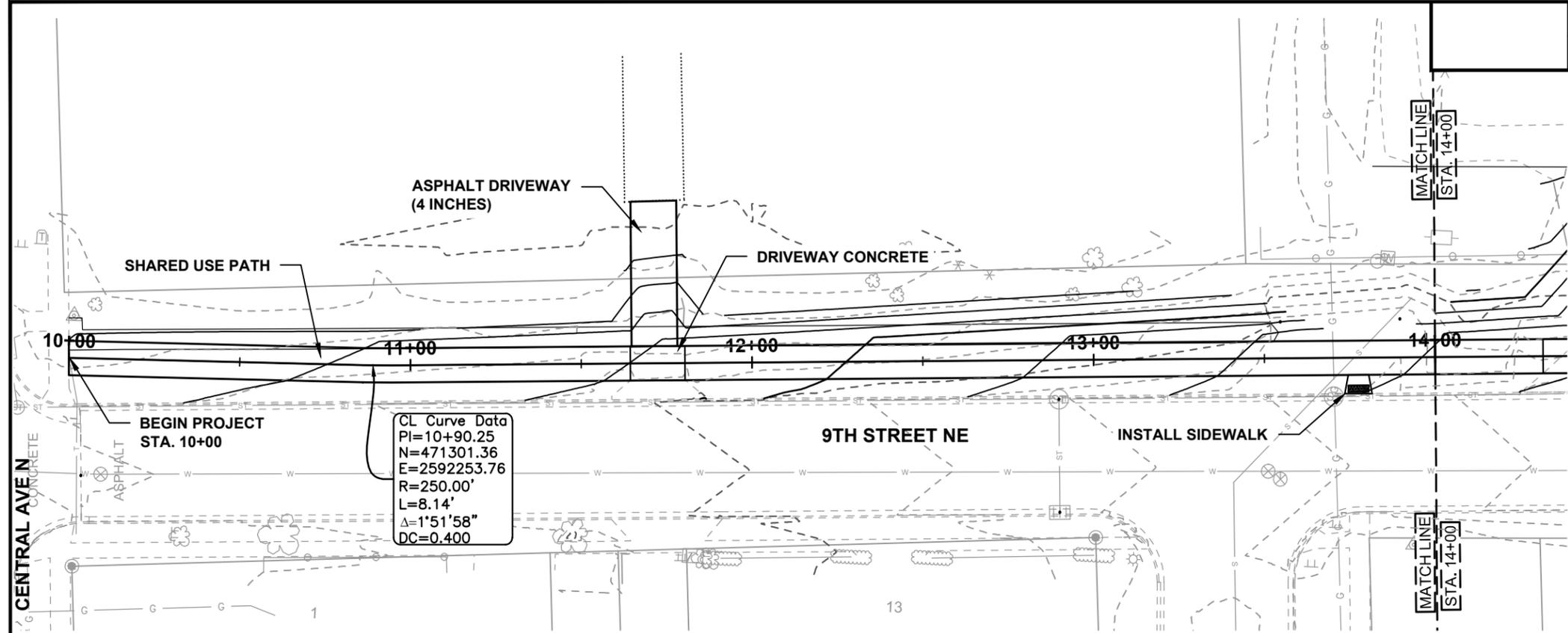
<u>REMOVAL OF PAVEMENT</u> STA. 14+00 TO 18+00	33 TON
<u>REMOVE AND RESET FENCE</u> STA. 14+00 TO 18+00	100 LF



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REGISTRATION NUMBER  
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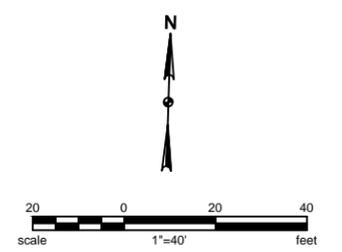
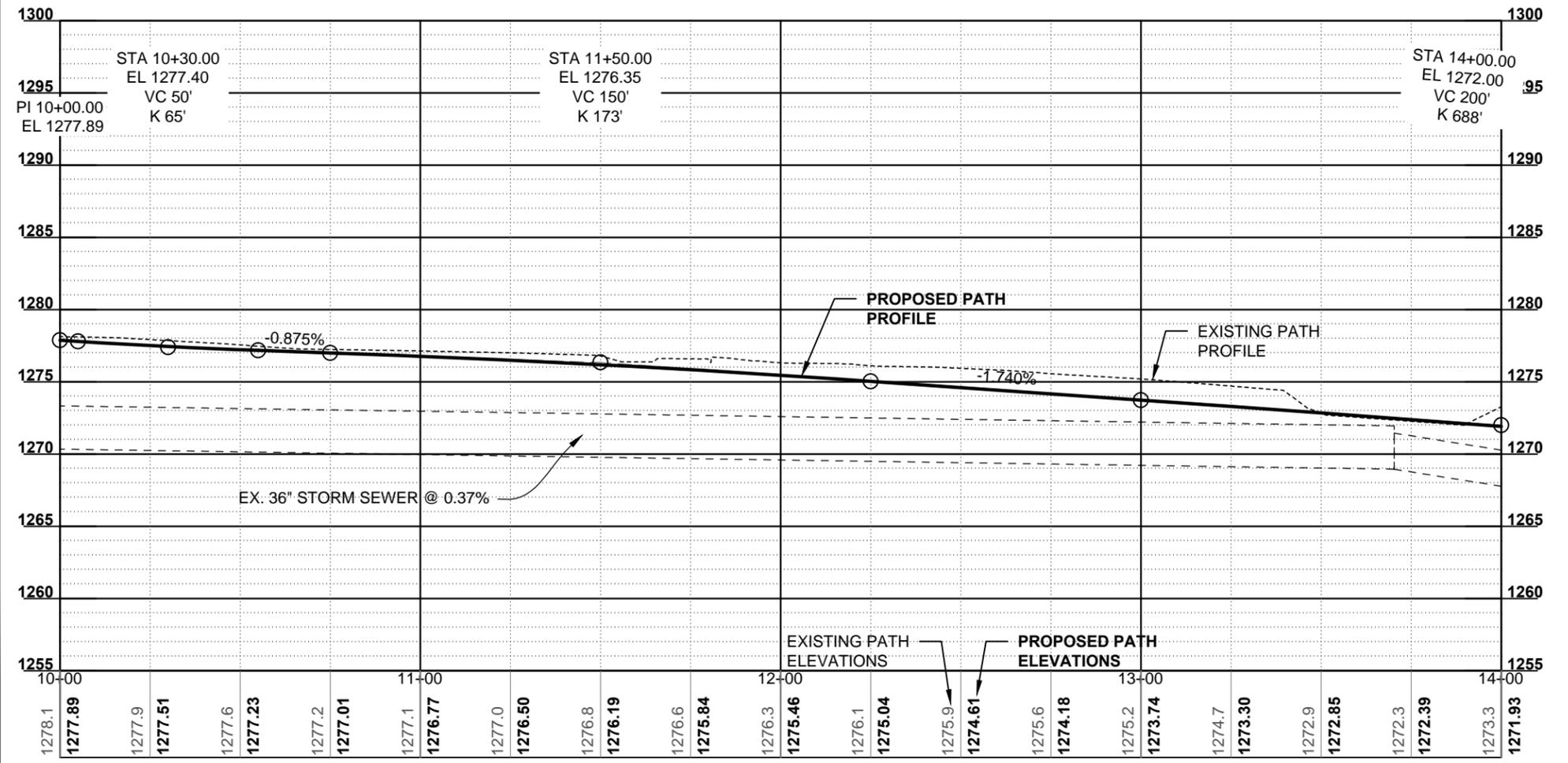
<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA			
	<b>REMOVALS</b> <b>STA. 14+00 TO 18+00</b>		
	<table border="1" style="width: 100%; font-size: small;"> <tr> <td>DRWN. BY MS</td> <td>CHKD. BY CP</td> <td>PROJECT NO. 5413106</td> </tr> </table>	DRWN. BY MS	CHKD. BY CP
DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	60	1



SUBGRADE PREPARATION -TYPE A	STA. 10+00 TO 14+00	4.0 STA
AGGREGATE BASE COURSE CL 5	STA. 10+00 TO 14+00	102 CY
COMMERCIAL GRADE HOT MIX ASPHALT	STA. 10+00 TO 14+00	85 TON
SIDEWALK CONCRETE 4IN	STA. 10+00 TO 14+00	4.3 SY
DRIVEWAY CONCRETE	STA. 10+00 TO 14+00	17.8 SY
DETECTABLE WARNING PANELS	STA. 10+00 TO 14+00	12 SF
HERBICIDE WEED CONTROL	STA. 10+00 TO 14+00	400 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CURS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



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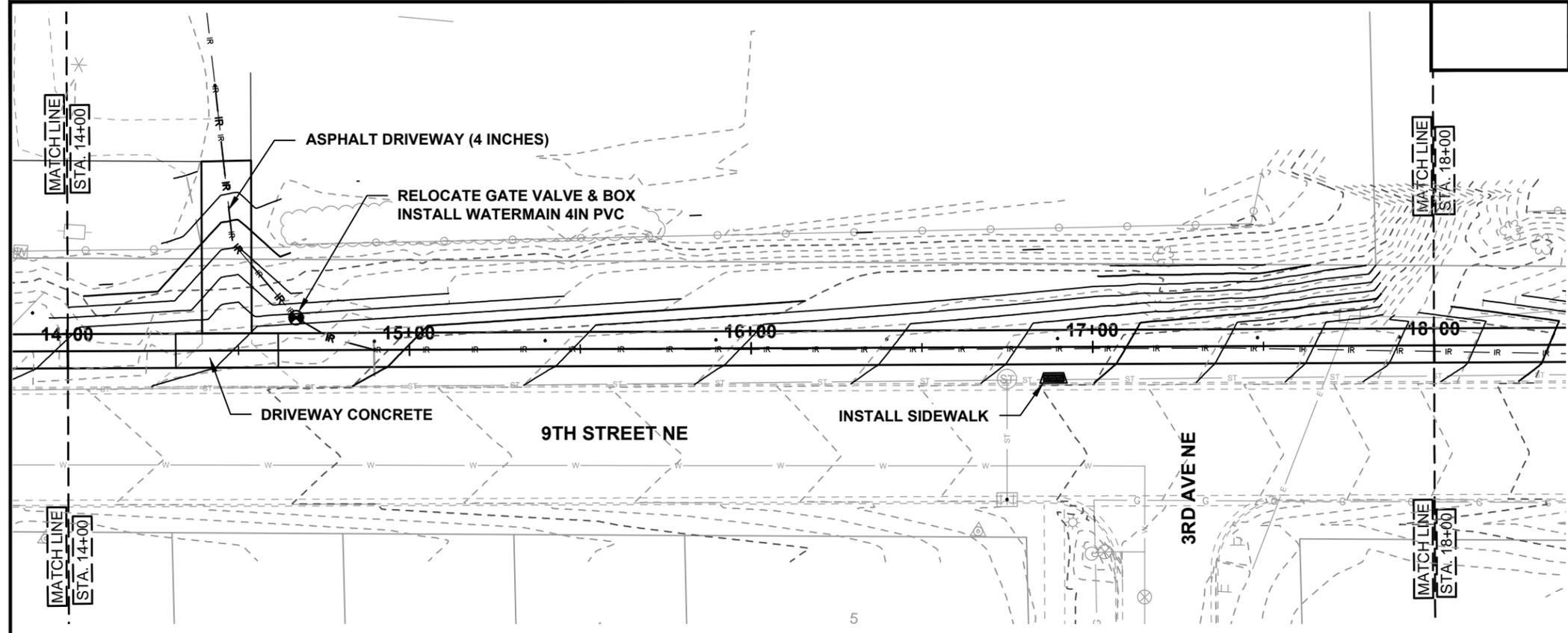
TEU-2-990(050)054  
 CITY OF VALLEY CITY, NORTH DAKOTA

**KLJ**

PLAN & PROFILE  
 STA. 10+00 TO 14+00

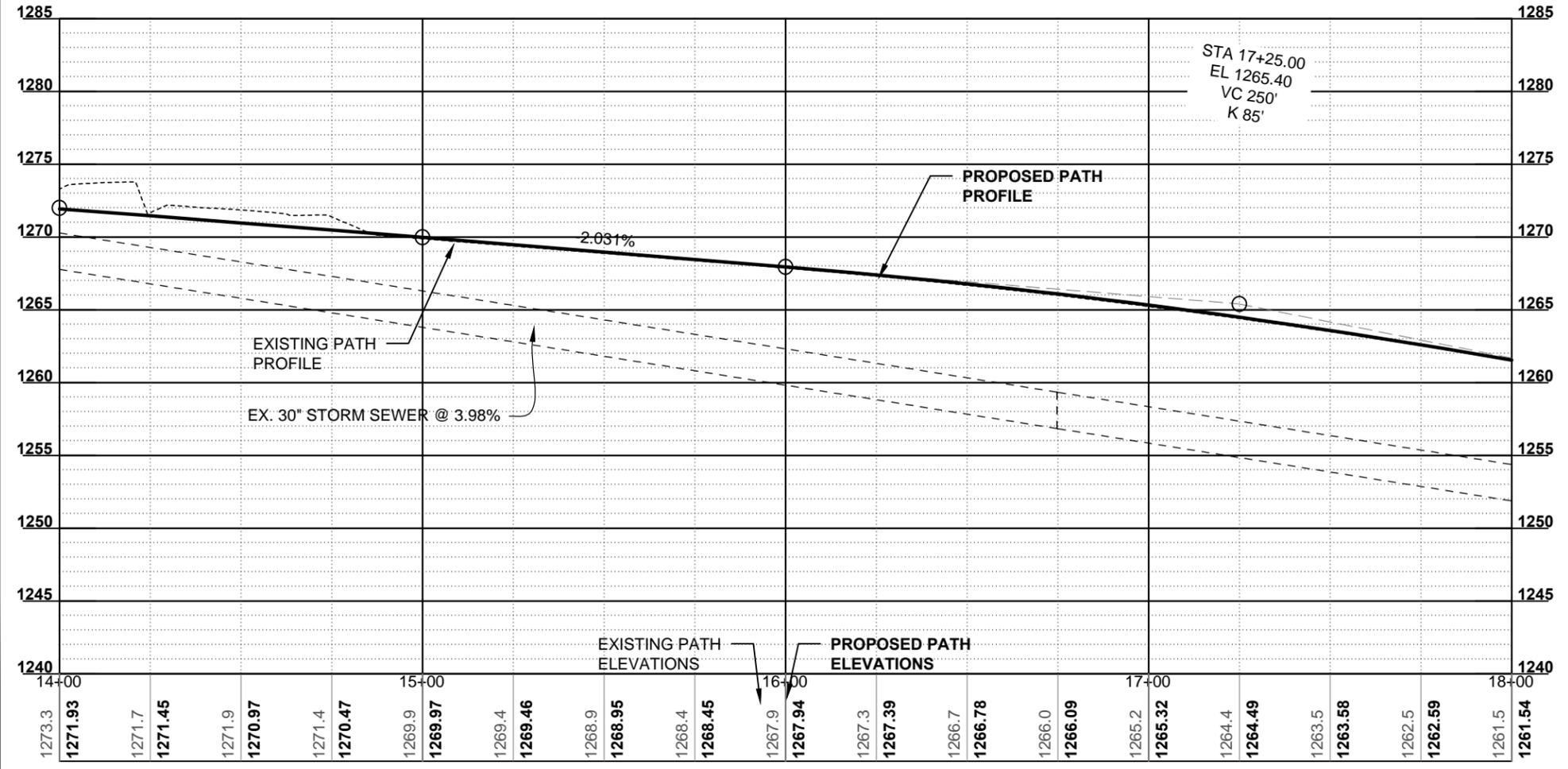
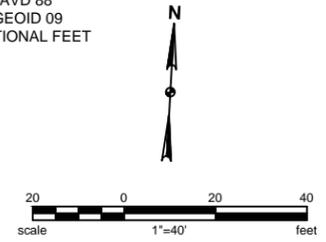
DRWN. BY: MS  
 CHK. BY: CP  
 PROJECT NO.: 5413106

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	60	2



<u>SUBGRADE PREPARATION -TYPE A</u> STA. 14+00 TO 18+00	4.0 STA
<u>AGGREGATE BASE COURSE CL 5</u> STA. 14+00 TO 18+00	105 CY
<u>COMMERCIAL GRADE HOT MIX ASPHALT</u> STA. 14+00 TO 18+00	88 TON
<u>RELOCATE GATE VALVE &amp; BOX</u> STA. 14+67 ~ 10' LT	1 EA
<u>SLEEVE 4IN</u> STA. 14+43 ~ 77' LT	1 EA
<u>WATERMAIN 4IN PVC</u> STA. 14+43 ~ 77' LT TO 14+90 ~ 6'	100 LF
<u>SIDEWALK CONCRETE 4IN</u> STA. 14+00 TO 18+00	2.3 SY
<u>DRIVEWAY CONCRETE</u> STA. 14+00 TO 18+00	33.3 SY
<u>DETECTABLE WARNING PANELS</u> STA. 14+00 TO 18+00	12 SF
<u>HERBICIDE WEED CONTROL</u> STA. 14+00 TO 18+00	400 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
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 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



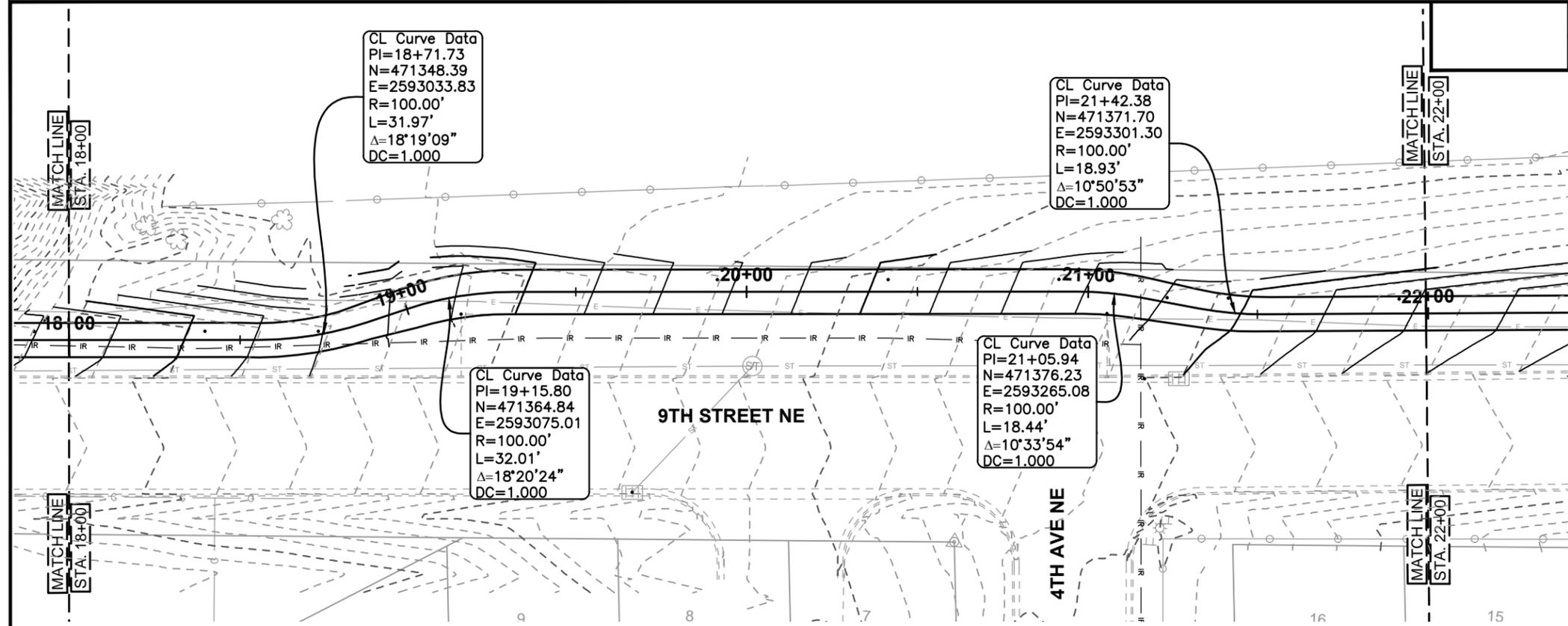
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**PLAN & PROFILE**  
 STA. 14+00 TO 18+00

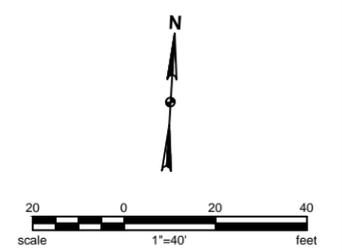
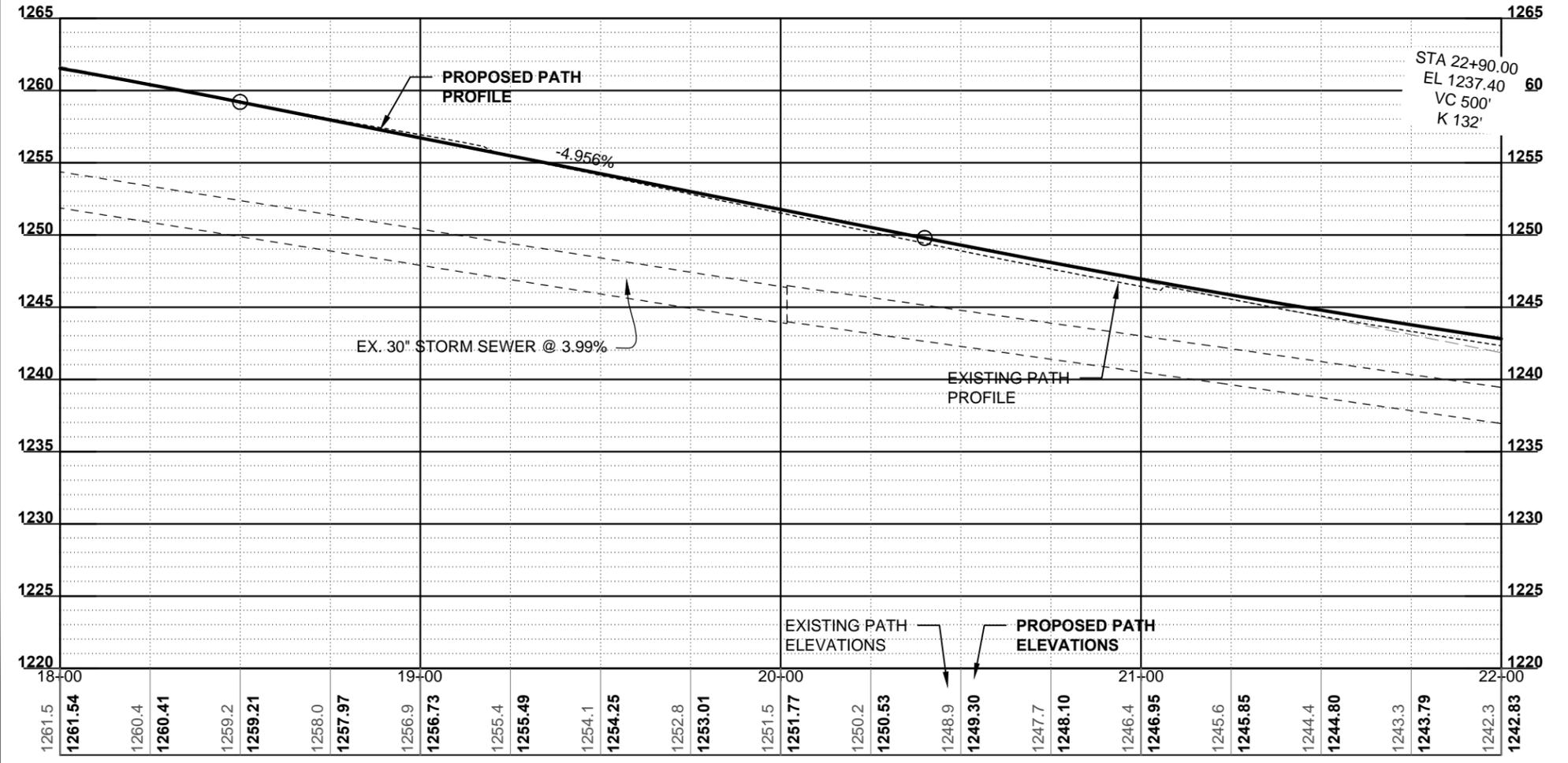
DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	60	3



- SUBGRADE PREPARATION - TYPE A  
STA. 18+00 TO 22+00 4.0 STA
- AGGREGATE BASE COURSE CL 5  
STA. 18+00 TO 22+00 99 CY
- COMMERCIAL GRADE HOT MIX ASPHALT  
STA. 18+00 TO 22+00 87 TON
- HERBICIDE WEED CONTROL  
STA. 18+00 TO 22+00 400 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



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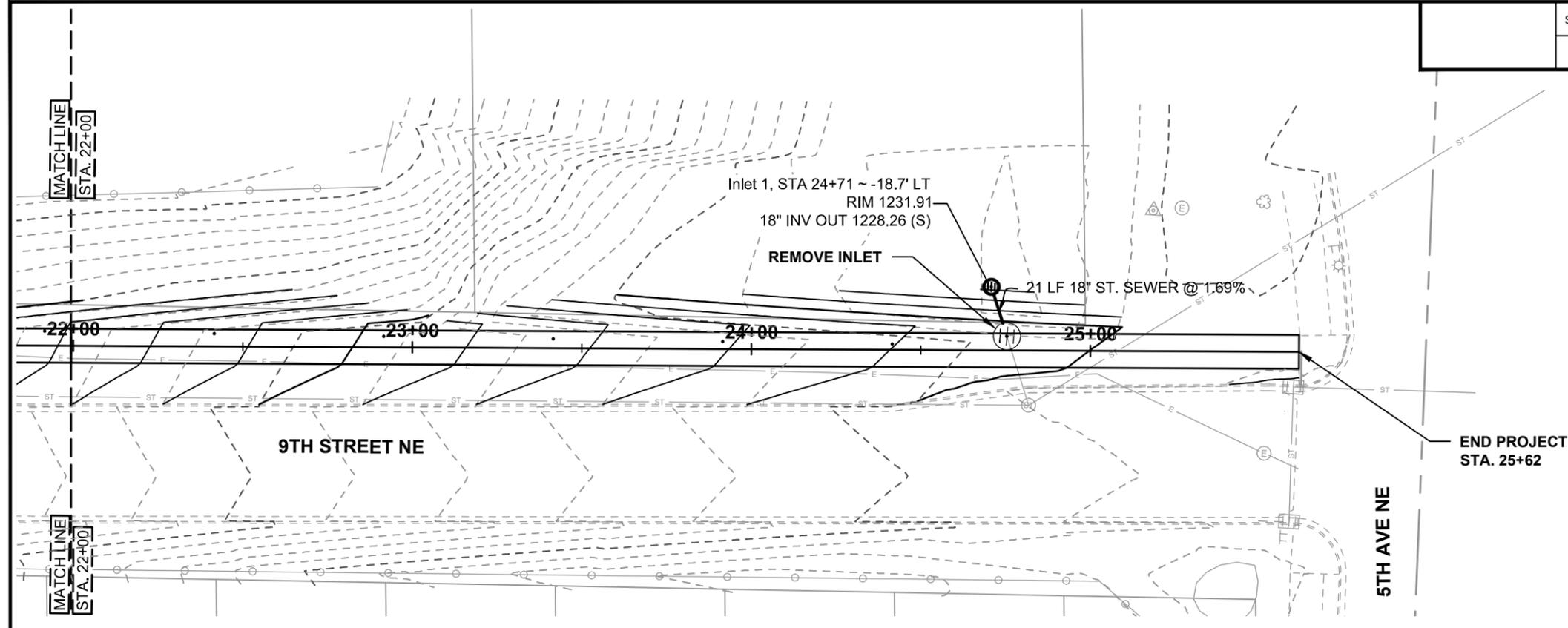
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**KLJ**

**PLAN & PROFILE**  
 STA. 18+00 TO 22+00

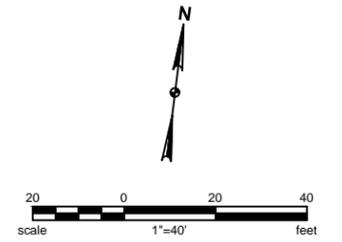
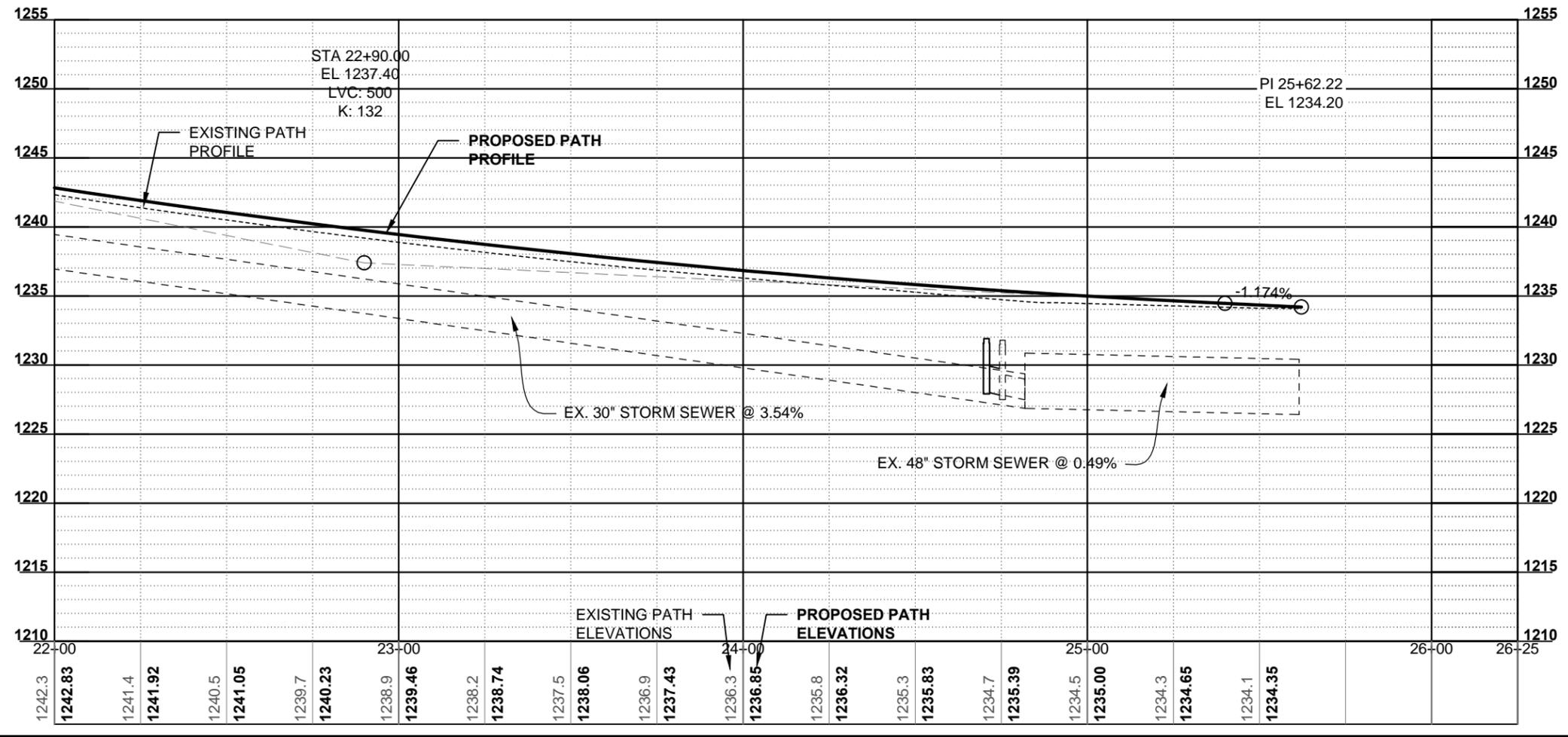
DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	60	4



<b>REMOVAL OF INLETS</b>	
STA. 24+75 ~ 4' LT	1 EA
<b>SUBGRADE PREPARATION -TYPE A</b>	
STA. 22+00 TO 25+62	4.2 STA
<b>AGGREGATE BASE COURSE CL 5</b>	
STA. 22+00 TO 25+62	81 CY
<b>COMMERCIAL GRADE HOT MIX ASPHALT</b>	
STA. 22+00 TO 25+62	67 TON
<b>PIPE CONC REINF 18IN CL III-STORM DRAIN</b>	
STA. 24+75-4' LT TO 24+71-19' LT	21 LF
<b>INLET CATCH BASIN-TYPE A</b>	
STA. 24+71 ~ 19' LT	1 EA
<b>HERBICIDE WEED CONTROL</b>	
STA. 22+00 TO 25+62	419 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA	
	<b>PLAN &amp; PROFILE</b> STA. 22+00 TO 25+62
	<small>DRWN. BY: MS    CHKD. BY: CP    PROJECT NO.: 5413106</small>

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	100	1

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	-
G20-1a-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	-
G20-2a-48	48"x24"	END ROAD WORK	-	19	-
G20-4-36	36"x18"	PILOT CAR FOLLOW ME	-	18	-
G20-10-108	108"x48"	CONTRACTOR SIGN	-	64	-
G20-50a-72	72"x36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS	-	37	-
G20-52a-72	72"x24"	ROAD WORK NEXT ___ MILES RT or LT ARROW	-	30	-
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT	-	59	-
M1-1-36	36"x36"	ROUTE MARKER (Post and installation only)	-	10	-
M1-4-24	24"x24"	ROUTE MARKER (Post and installation only)	-	10	-
M1-5-24	24"x24"	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	-
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back	-	5	-
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	-
R11-2-48	48"x30"	ROAD CLOSED	-	28	-
R11-2a-48	48"x30"	STREET CLOSED	-	28	-
R11-3a-60	60"x30"	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY	-	31	-
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	-
W3-1a-48	48"x48"	STOP AHEAD SYMBOL	-	35	-
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL	-	35	-
W3-4-48	48"x48"	BE PREPARED TO STOP	-	35	-
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	-
W8-1-48	48"x48"	BUMP	-	35	-
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	-
W8-12-48	48"x48"	NO CENTER STRIPE	-	35	-
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY	-	35	-
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	-
W20-1-48	48"x48"	ROAD WORK AHEAD or ___ FT or ___ MILE	2	35	70
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	-
W20-7a-48	48"x48"	FLAGGING SYMBOL	-	35	-

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB-TOTAL
W20-7k-24	24"x18"	___ FEET (Mounted on warning sign post)	-	10	-
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"	MEN WORKING SYMBOL	-	35	-
W21-2-48	48"x48"	FRESH OIL	-	35	-
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or ___ FT	-	35	-
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	-
<b>R9-9-12</b>	<b>48"x30"</b>	<b>SIDEWALK CLOSED</b>	<b>2</b>	<b>12</b>	<b>24</b>

SPEC & CODE

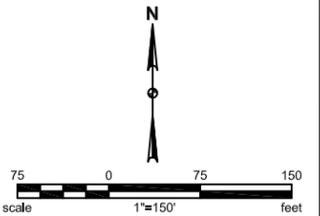
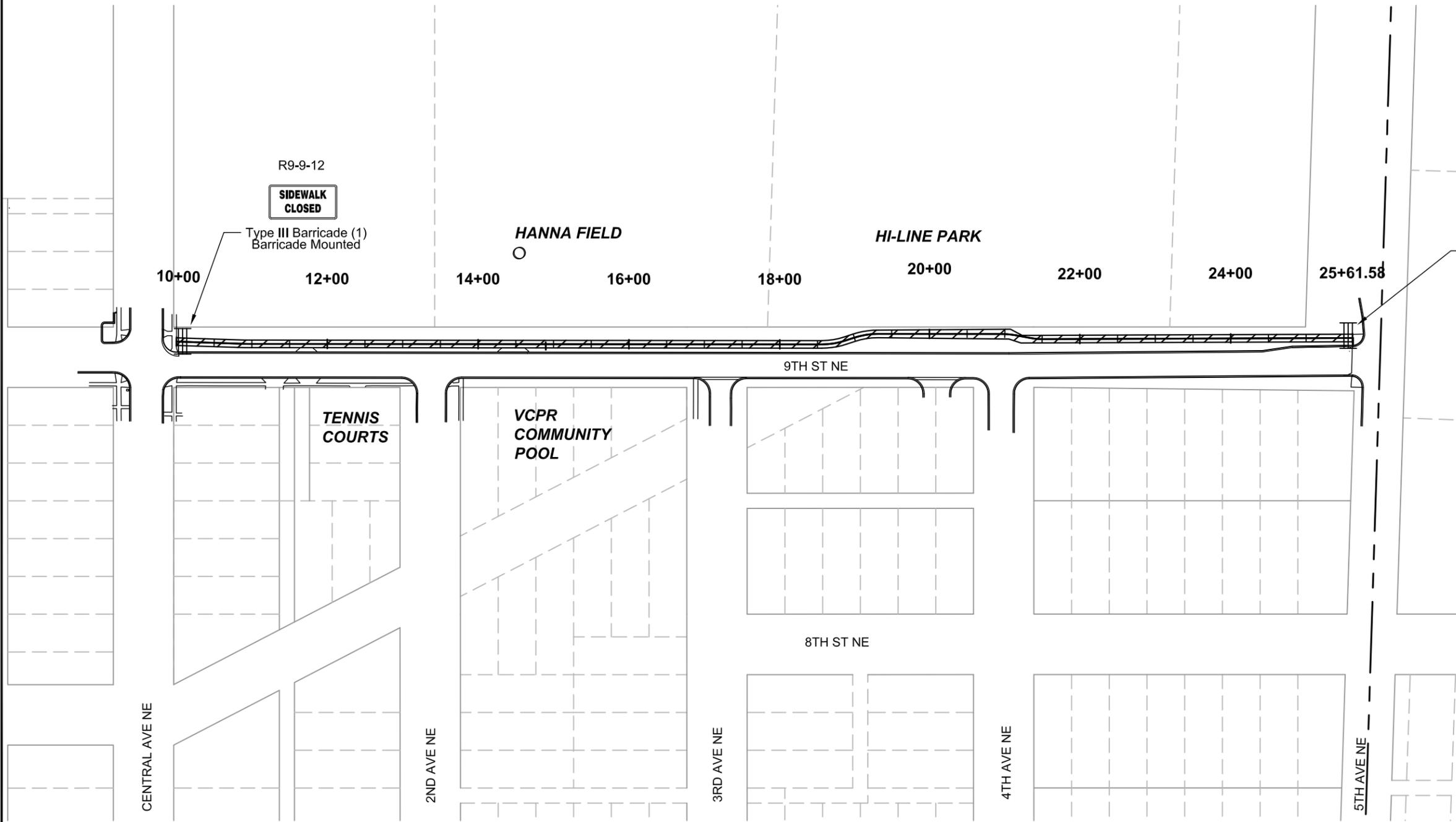
<b>704-1000</b>	<b>TRAFFIC CONTROL SIGNS</b>	<b>TOTAL UNITS</b>	<b>94</b>
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SPEC & CODE	DESCRIPTION	UNIT	PARTICIPATING QUANTITY
704-0100	FLAGGING	MHR	-
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	-
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	-
704-1044	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>6</b>
<b>704-1060</b>	<b>DELINEATOR DRUMS</b>	<b>EACH</b>	<b>20</b>
<b>704-1065</b>	<b>TRAFFIC CONES</b>	<b>EACH</b>	<b>20</b>
704-1067	TUBULAR MARKERS	EACH	-
704-1070	DELINEATOR	EACH	-
704-1072	FLEXIBLE DELINEATORS	EACH	-
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	-
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	-
704-1185	PILOT CAR	HR	-
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	-
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	-
762-0200	RAISED PAVEMENT MARKERS	EACH	-
762-0405	SHORT TERM 4IN BROKEN LINE-PNT TAPE OR RSD MRK	LF	-
762-0410	SHORT TERM 4IN LINE NPZ-PN TP OR RS MRK	LF	-
762-1500	OBLITERATION OF PVMT MK	SF	-
772-2110	FLASHING BEACON - POST MOUNTED	EACH	-

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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA		
	<b>TRAFFIC CONTROL DEVICE LIST</b>	
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PROJECT NO. 5413106		

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TEU-2-990(050)054  
 CITY OF VALLEY CITY, NORTH DAKOTA

 SHARED-USE PATH



TRAFFIC CONTROL  
 SIGNING LAYOUT

DRWN. BY	CHKD BY	PROJECT NO.
MS	CP	5413106

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	TEU-2-990(050)054	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Support Size	Max Post Len LF	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF			1st LF	2nd LF	3rd LF	4th LF								
10+05 Lt	M4-12		3.8			5.4			2 x 2 12 ga	13.8					1	4	2.25 x 2.25 12 ga					
10+05 Rt	M4-11		3.8			6.3			2 x 2 12 ga	13.8					1	4	2.25 x 2.25 12 ga					
12+46 Rt	W11-2			8.3	11.7				2.5 x 2.5 12 ga	12.9					1	4	3 x 3 7 ga					
13+73 Rt	W11-2			8.3	11.7				2.5 x 2.5 12 ga	12.9					1	4	3 x 3 7 ga					
13+94 Lt	W11-2			8.3	11.7				2.5 x 2.5 12 ga	12.9					1	4	3 x 3 7 ga					
15+24 Lt	W11-2			8.3																	Light Standard Mounted	
25+57 Lt	M6-3	103	3.8			6.5			2 x 2 12 ga	14.8					1	4	2.25 x 2.25 12 ga					
25+57 Rt	M6-4	103	3.8			6.5			2 x 2 12 ga	14.8					1	4	2.25 x 2.25 12 ga					
<b>Sub Total</b>			15.2	33.2		<b>Total 59.7</b>									<b>Total 28</b>			0	0	0		
<b>Grand Total</b>			15.2	33.2		<b>Total 59.7</b>									<b>Total 28</b>			0	0	0		

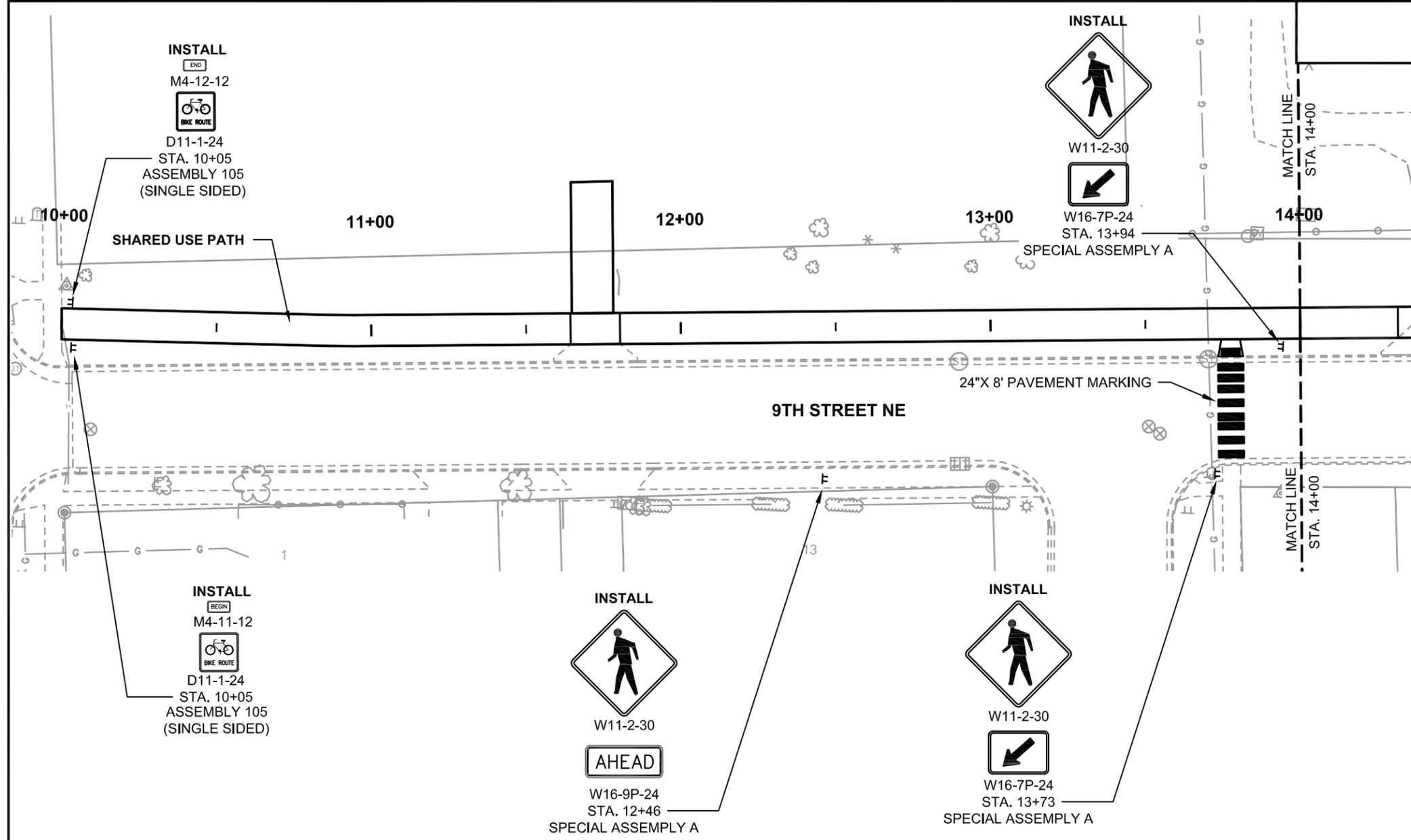
Basis of Estimate  
Sign Support Lengths

The sign support lengths have been calculated using the following vertical clearances:

Areas where parking and/or pedestrian movement will occur - 84"

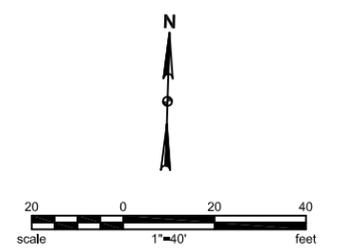
<p>This document was originally issued and sealed by Chad A. Petersen, Registration Number 4884, on 8/25/2014 and the original document is stored at the North Dakota Department of Transportation</p>	<p>Sign Summary Perforated Tube</p>
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	110	2



- FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING  
STA. 10+00 TO 14+00 24.9 SF
- FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING  
STA. 10+00 TO 14+00 7.6 SF
- STEEL GALV POSTS-TELESCOPING PERFORATED TUBE  
STA. 10+00 TO 14+00 69.8 LF
- PVMT MK PAINTED 24IN LINE  
STA. 10+00 TO 14+00 64 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



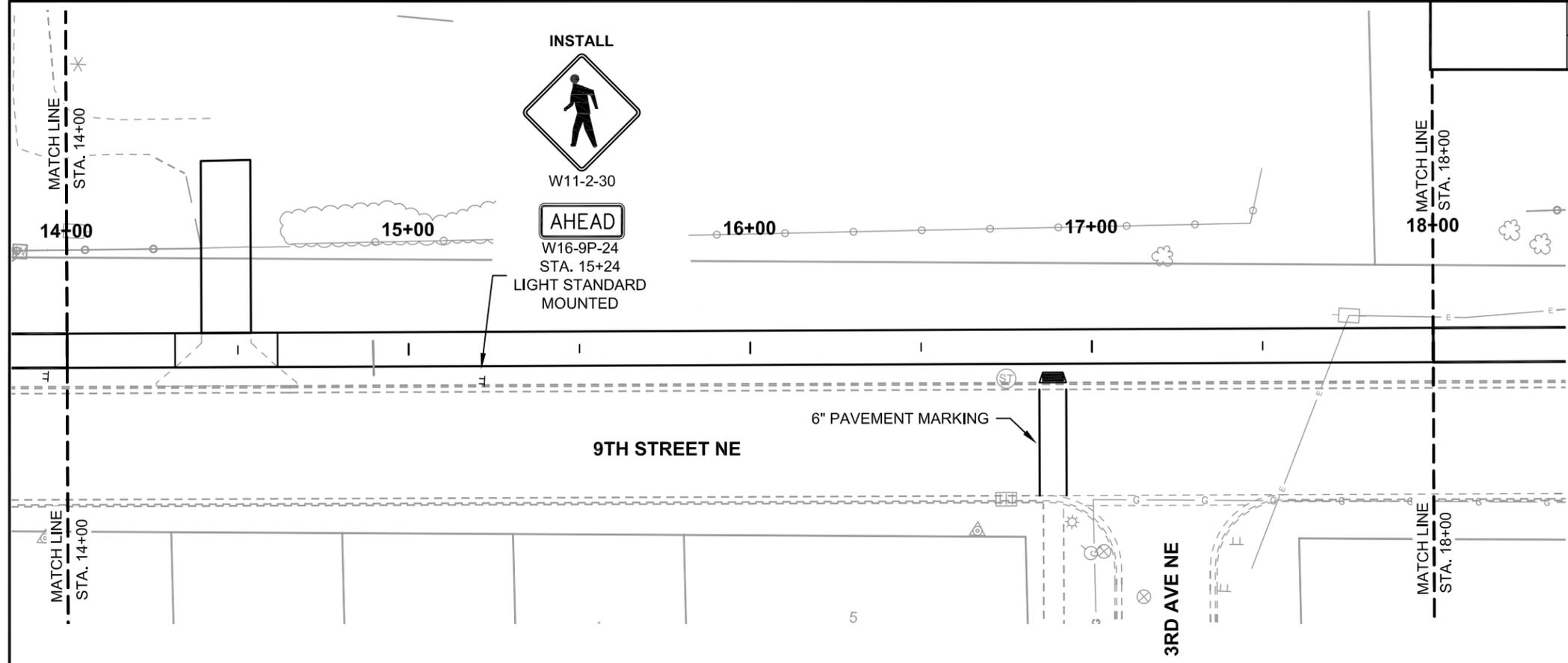
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 PE 4884  
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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA			
	<b>SIGNING LAYOUT</b> <b>STA. 10+00 TO 14+00</b>		
	<table border="1" style="width: 100%; font-size: small;"> <tr> <td>DRWN. BY MS</td> <td>CHKD BY CP</td> <td>PROJECT NO. 5413106</td> </tr> </table>	DRWN. BY MS	CHKD BY CP
DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106	

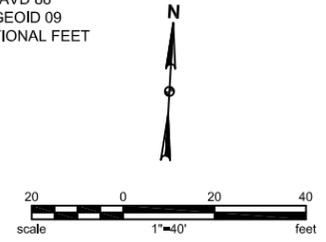
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	110	3

FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING  
STA. 14+00 TO 18+00 8.3 SF

PVMT MK PAINTED 6IN LINE  
STA. 14+00 TO 18+00 62 LF



COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
VERT. DATUM: NAVD 88  
GEOID MODEL: GEOID 09  
UNITS: INTERNATIONAL FEET



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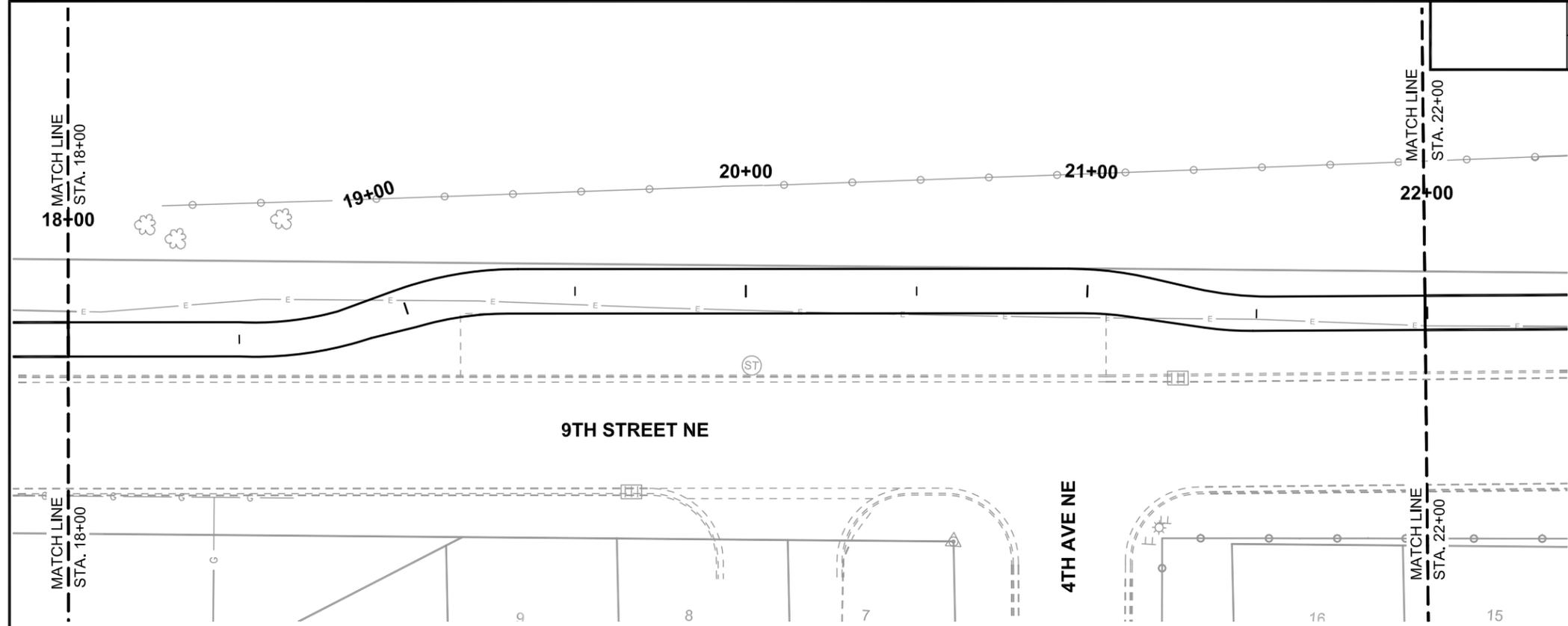
TEU-2-990(050)054  
CITY OF VALLEY CITY, NORTH DAKOTA



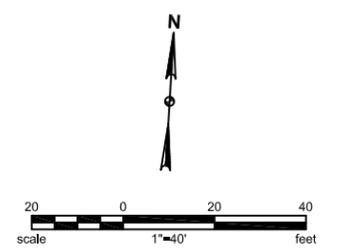
**SIGNING LAYOUT**  
STA. 14+00 TO 18+00

DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	110	4



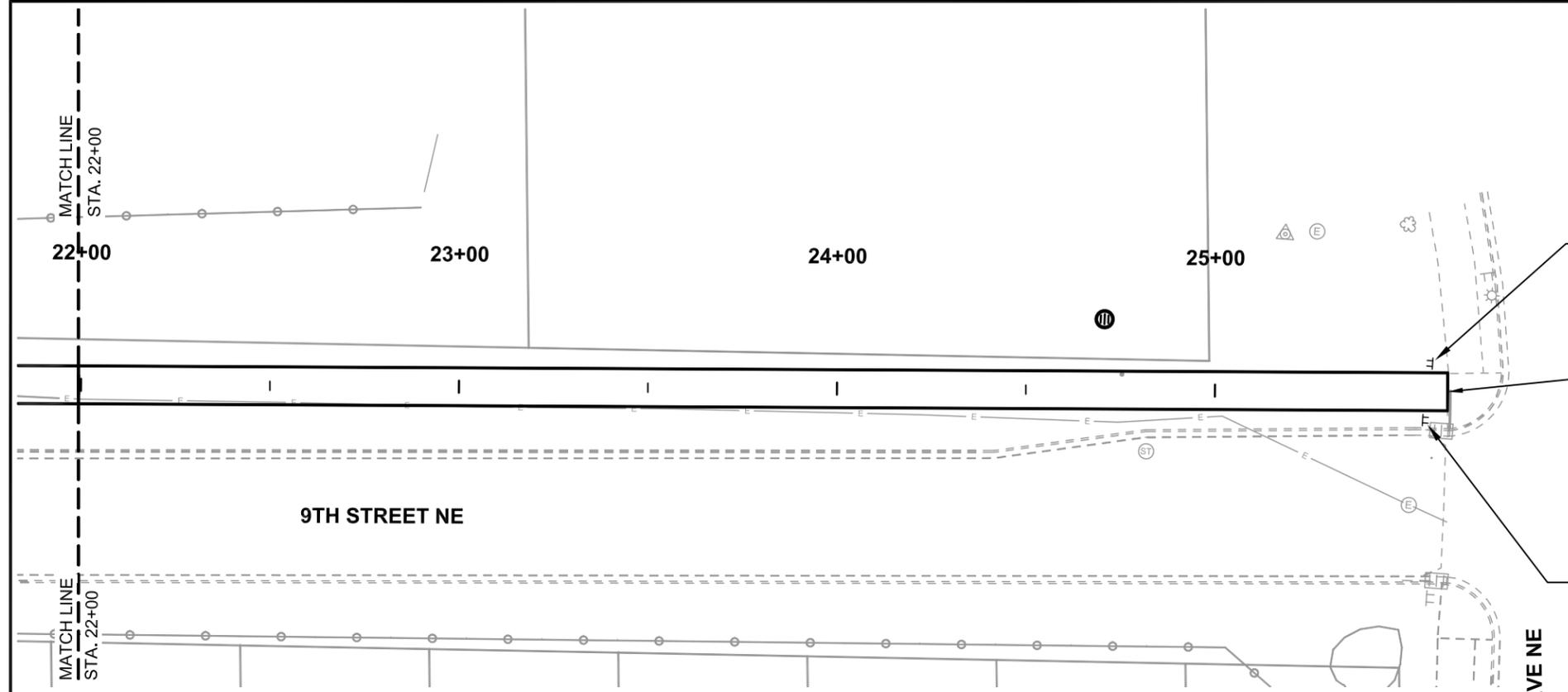
COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
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 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA		
	<b>SIGNING LAYOUT</b> STA. 18+00 TO 22+00	
	DRWN. BY MS	CHKD BY CP

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	110	5



INSTALL  
  
 D11-1-24  
  
 M6-3-12  
 STA. 25+57  
 ASSEMBLY 103

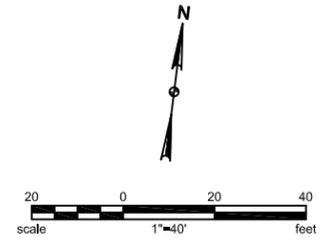
END PROJECT  
 STA. 25+62

INSTALL  
  
 D11-1-24  
  
 M6-4-12  
 STA. 25+57  
 ASSEMBLY 103

FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING  
 STA. 22+00 TO 25+62 7.6 SF

STEEL GALV POSTS-TELESCOPING PERFORATED TUBE  
 STA. 22+00 TO 25+62 21.0 LF

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



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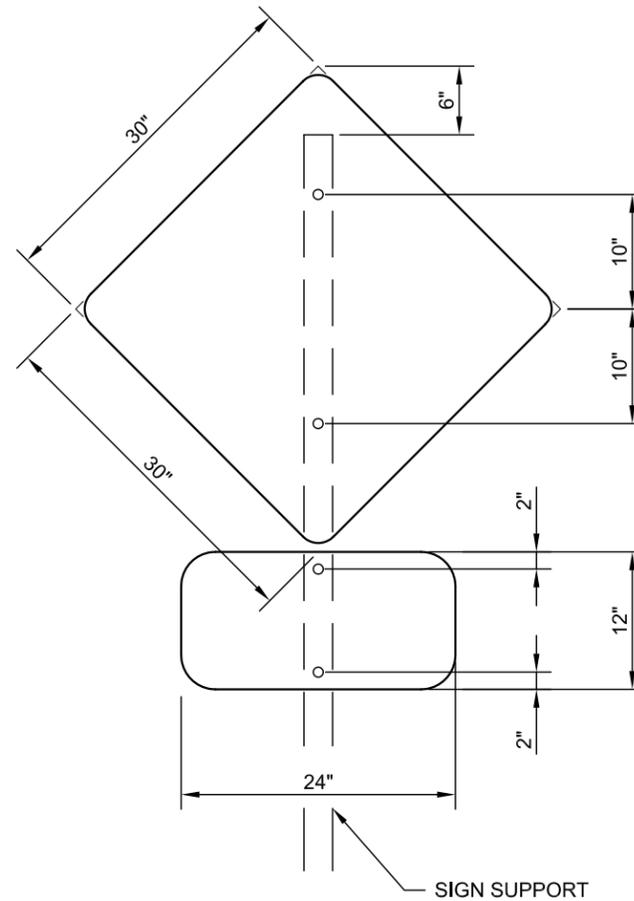
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SIGNING LAYOUT  
 STA. 22+00 TO 25+62

DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-2-990(050)054	110	6



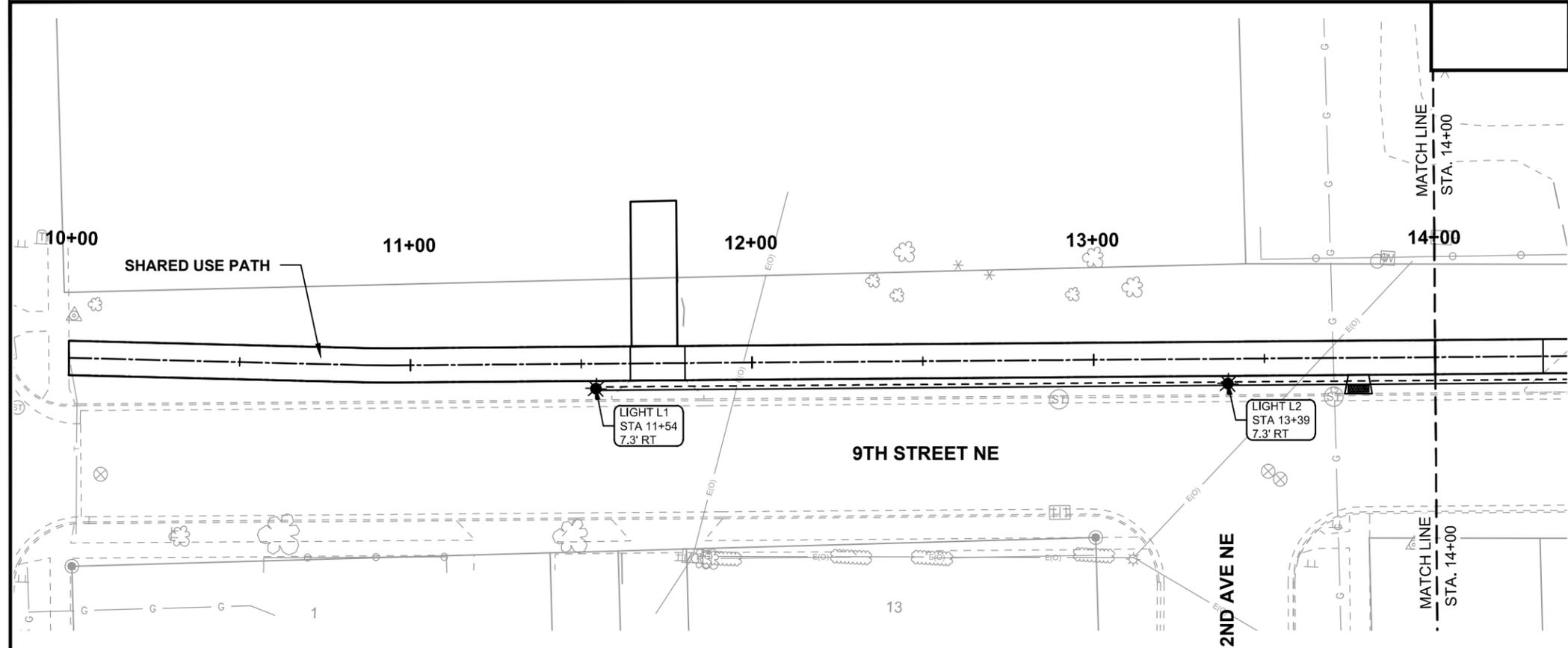
**SPECIAL ASSEMBLY A**

12+46 RT  
 13+73 RT  
 13+94 LT

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<b>TEU-2-990(050)054</b> CITY OF VALLEY CITY, NORTH DAKOTA		
	<b>SPECIAL ASSEMBLY</b>	
	<small>DRWN. BY</small> MS	<small>CHKD BY</small> CP

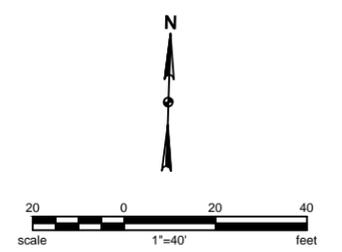
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	140	1



COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L1 to Light L2	Sta. 11+54 ~ 7.3' RT. to Sta. 13+39 ~ 7.3' RT.	186	2"	388	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
Light L2 to Light L3	Sta. 13+39 ~ 7.3' RT. to Sta. 15+24 ~ 7.3' RT.	186	2"	388	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW

**LEGEND**  
 PROPOSED LIGHT POLE  
 CONDUCTOR WIRE  
 2" DIAMETER CONDUIT



LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L1, L2	LED	III	Round Tapered Steel	40'	8'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.

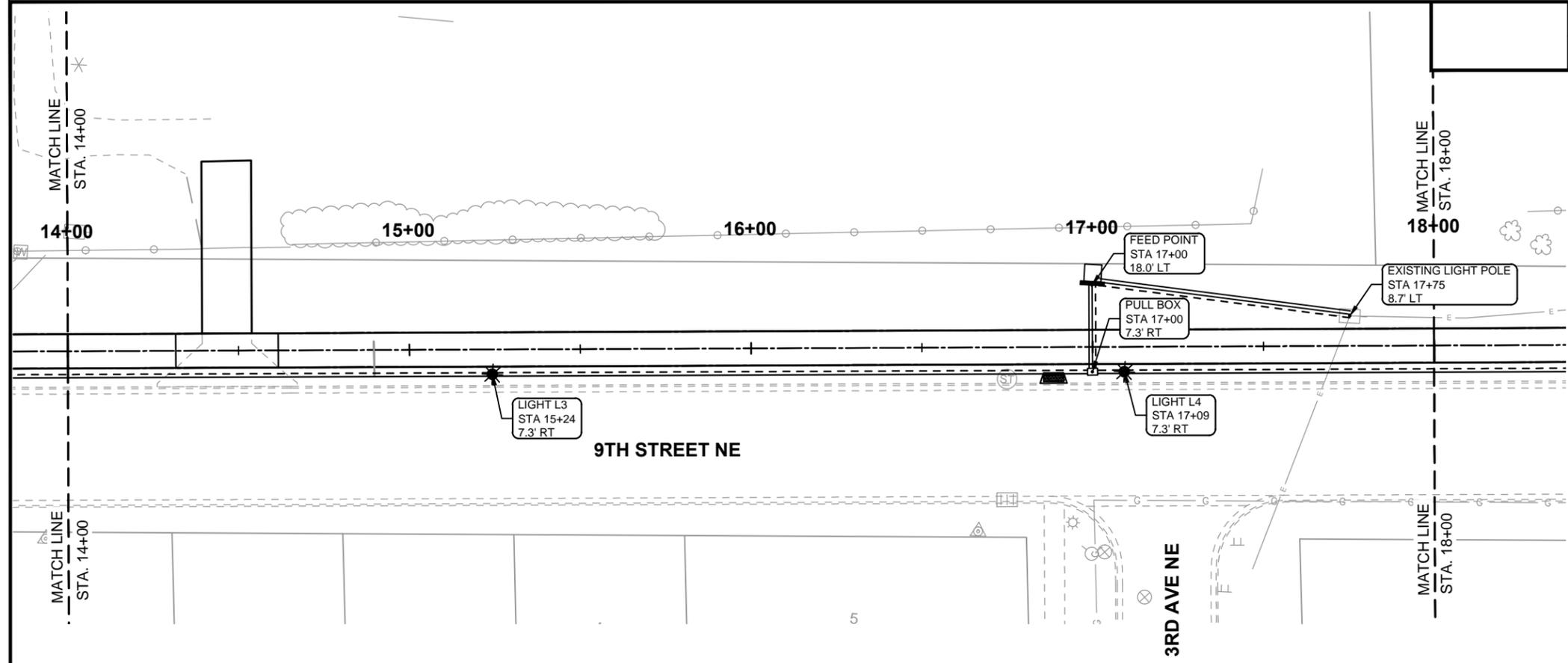
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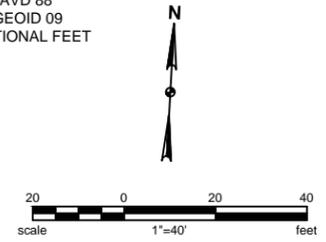
**LIGHTING LAYOUT**  
 STA. 10+00 TO 14+00

DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	140	2



COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
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 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET



**LEGEND**  
 PROPOSED LIGHT POLE  
 CONDUCTOR WIRE  
 2" DIAMETER CONDUIT

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L3 to Pull Box	Sta. 15+24 ~ 7.3' RT. to Sta. 17+00 ~ 7.3' RT.	176	2"	372	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
Pull Box to Feed Point	Sta. 17+00 ~ 7.3' RT. to Sta. 17+00 ~ 18.0' RT.	25	2"	164	(4) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
Feed Point to Existing Light Pole	Sta. 17+00 ~ 18.0' RT. to Sta. 17+75 ~ 8.7' RT.	25	2" SPARE	41	
		75	2"	267	(3) UNDERGROUND CONDUCTOR NO. 2 RHW
		75	2" SPARE		
Pull Box to Light L4	Sta. 17+00 ~ 7.3' RT. to Sta. 17+09 ~ 7.3' RT.	9	2"	38	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
				19	
Light L4 to Light L5	Sta. 17+09 ~ 7.3' RT. to Sta. 18+90 ~ 14.0' RT.	186	2"	388	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
				194	

LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L3, L4	LED	III	Round Tapered Steel	40'	8'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.

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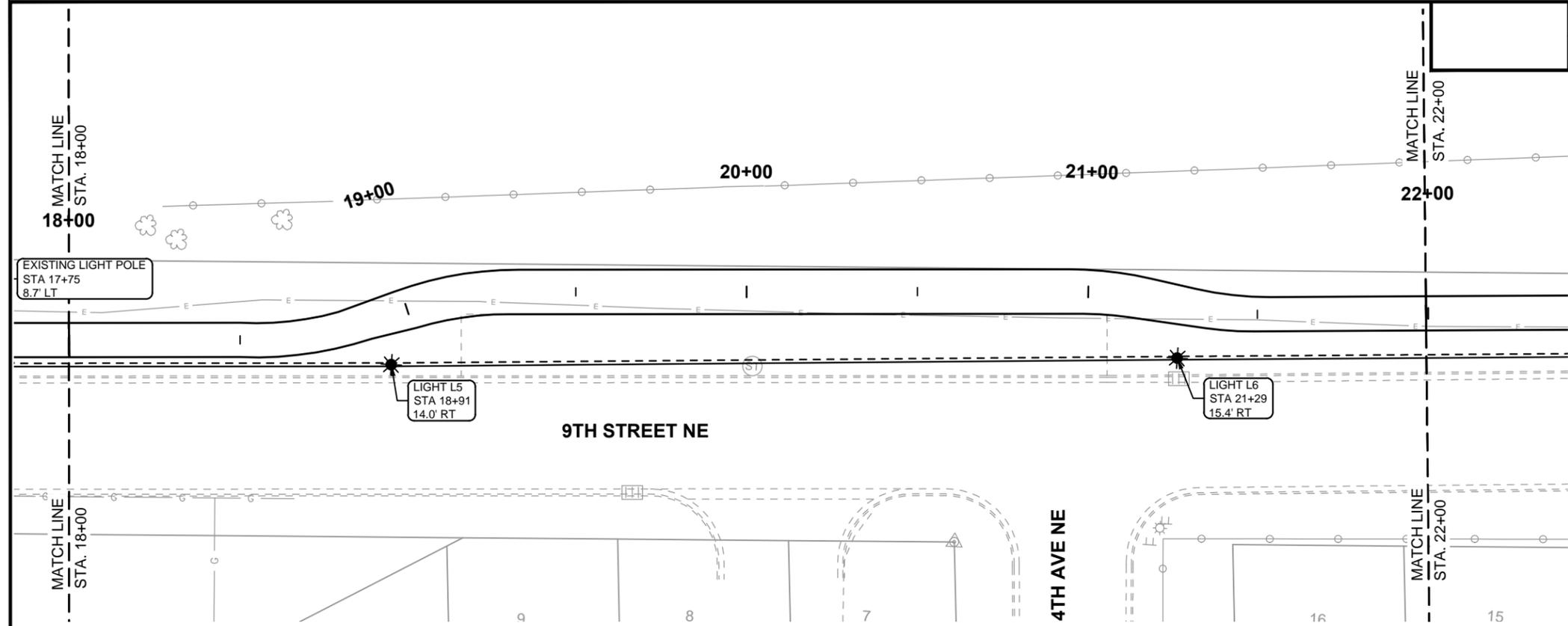
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 CITY OF VALLEY CITY, NORTH DAKOTA



**LIGHTING LAYOUT**  
 STA. 14+00 TO 18+00

DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106
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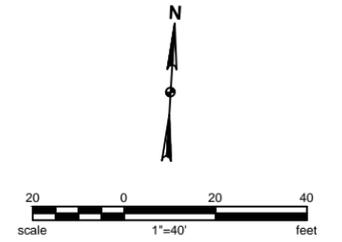
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	140	3



COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L5 to Light L6	Sta. 18+90 ~ 14.0' RT. to Sta. 21+30 ~ 15.4' RT.	231	2"	478	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW
Light L6 to Light L7	Sta. 21+30 ~ 15.4' RT. to Sta. 22+77 ~ 12.4' RT.	150	2"	316	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW

**LEGEND**  
 PROPOSED LIGHT POLE  
 CONDUCTOR WIRE  
 2" DIAMETER CONDUIT



LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L5, L6	LED	III	Round Tapered Steel	40'	8'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.

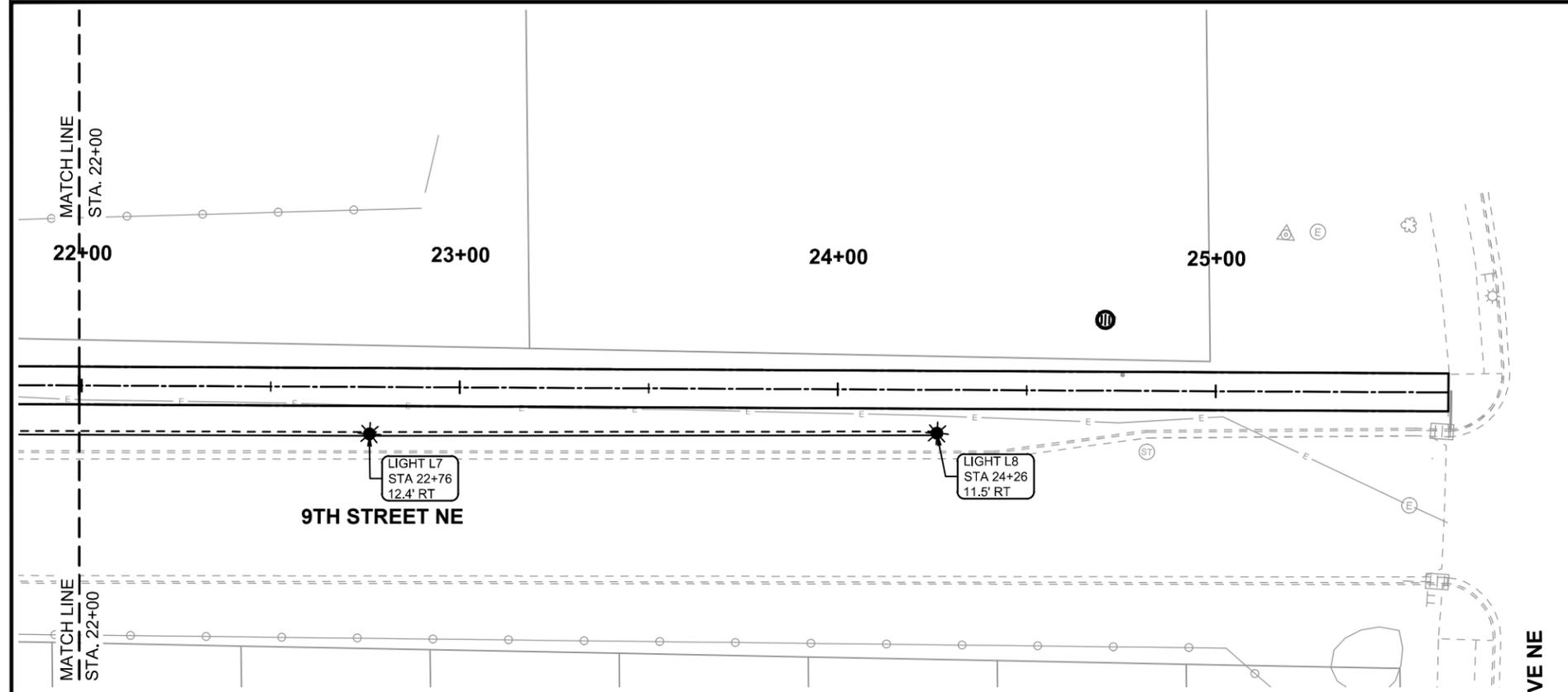
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**LIGHTING LAYOUT**  
 STA. 18+00 TO 22+00

DRWN. BY: MS      CHKD BY: CP      PROJECT NO.: 5413106

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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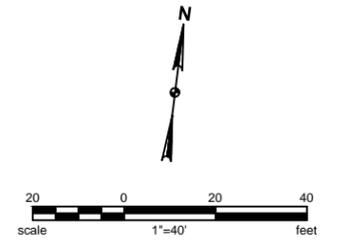
5TH AVE NE

COORDINATE SYSTEM: US STATE PLANE 1983 ND SOUTH 3302  
 HORIZ. DATUM: NAD 83 (CORS 96) OPUS  
 VERT. DATUM: NAVD 88  
 GEOID MODEL: GEOID 09  
 UNITS: INTERNATIONAL FEET

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L7 to Light L8	Sta. 22+77 ~ 12.4' RT. to Sta. 24+27 ~ 11.5' RT.	150	2"	316 158	(2) UNDERGROUND CONDUCTOR NO. 4 RHW UNDERGROUND CONDUCTOR NO. 6 THW

LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L7, L8	LED	III	Round Tapered Steel	40'	8'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.

**LEGEND**  
 PROPOSED LIGHT POLE  
 CONDUCTOR WIRE  
 2" DIAMETER CONDUIT



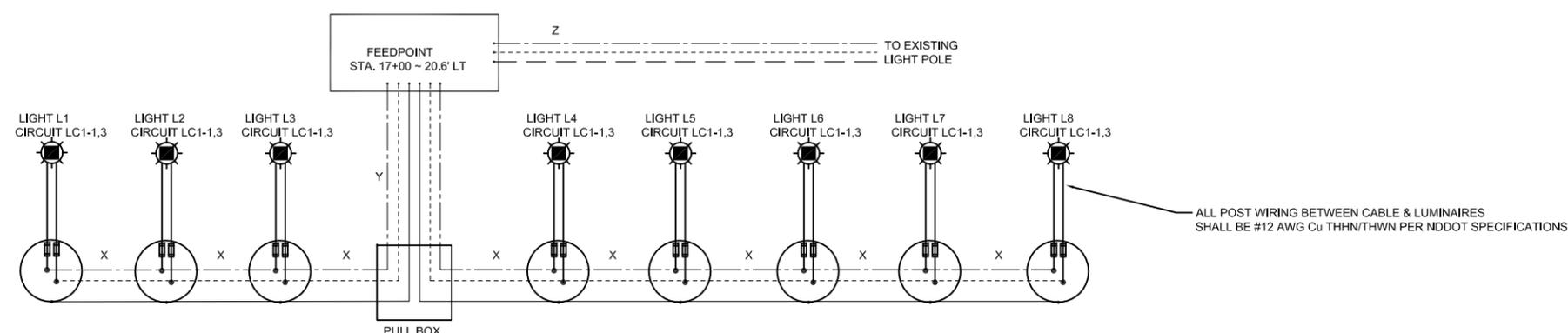
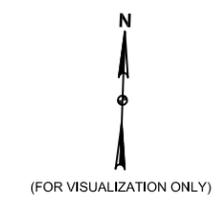
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 CITY OF VALLEY CITY, NORTH DAKOTA



**LIGHTING LAYOUT**  
**STA. 22+00 TO 25+62**

DRWN. BY MS	CHKD. BY CP	PROJECT NO. 5413106
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**FEED POINT PANEL SCHEDULE**

100A Main Breaker, 22kAIC minimum, 120/240 Volt, 1Ø, 16 Position Minimum, Surface Mount  
NEMA 1 Enclosure, Fed from Utility Meter via Existing Light Pole. UL Service Entrance Rated.  
Reuse existing conductors for service from terminal box. Provide Typed Identifications according to NEC 408.  
Per NEC/NDDOT provide and bond new #6 AWG ground electrodes to two new ground rods minimum 6' apart

CKT	DESCRIPTION	BRK	V-A	AMPS	Φ	AMPS	V-A	BRK	DESCRIPTION	CKT
1	LC1	50	1,728	7.2	A	0.0	0	50	SPARE	2
3				7.2	B	0.0				4
5			0		A	0				6
7			0		B	0				8
9			0		A	0				10
11			0		B	0				12
13	GFI Receptacle (Feed Point Internal)	20	180	1.5	A	0				14
15	Photoeye	15	50	0.4	B	0				16
<b>Total Connected VA and Amps</b>			1,958		8.7	A				
					7.6	B				

- LEGEND**
- LED LUMINAIRE - 18,570 LUMENS, OPERATED AT 240 VOLTS
  - 40' LIGHT STANDARD WITH A 8' MAST ARM, AS SHOWN IN THE PLANS
  - PHASE A CONDUCTOR
  - PHASE B CONDUCTOR
  - NEUTRAL CONDUCTOR
  - EQUIP GROUND CONDUCTOR
  - IN-LINE FUSE
- Circuit Description
- Lighting Contactor Number
  - Circuit Breaker Number(s)
- LC1-3

- X 2-#4 AWG Cu RHW-USE, W/ #6 AWG Cu GND
  - Y 4-#4 AWG Cu RHW-USE, W/ 2-#6 AWG Cu GND
  - Z 3-#2 AWG Cu RHW-USE
- EQUIPMENT GROUNDING CONDUCTOR SHALL BE STRANDED UL TYPE THW OR THHN/THWN
- MULTI-CONDUCTOR CABLE SHALL NOT BE USED

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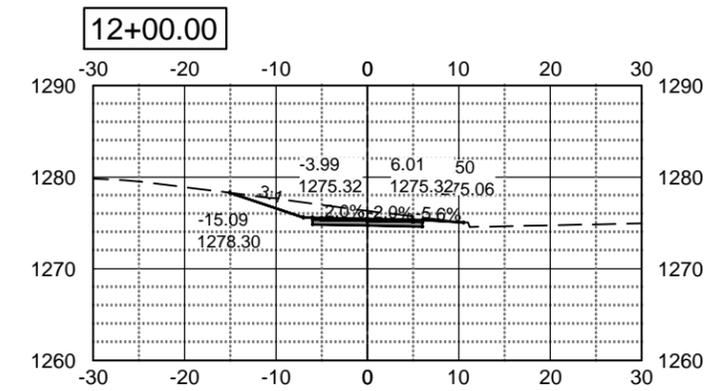
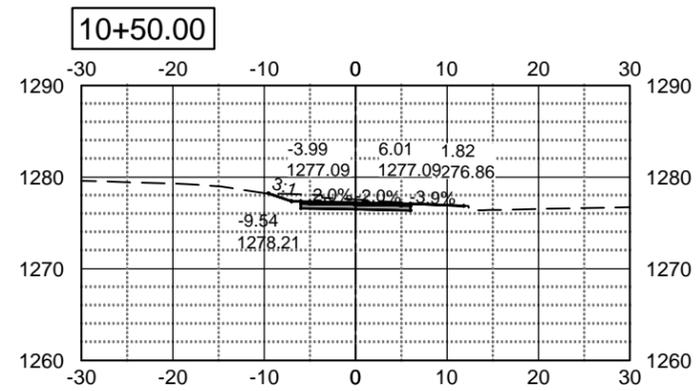
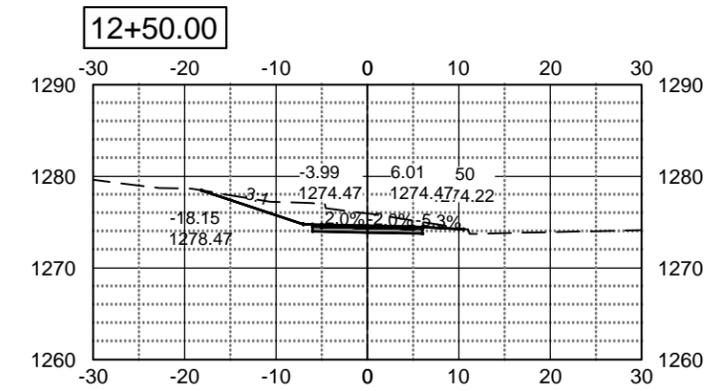
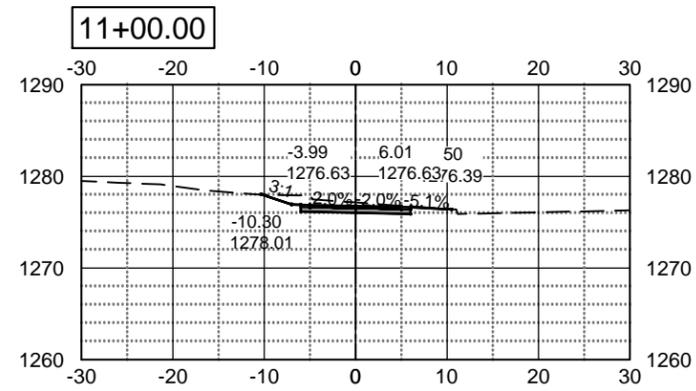
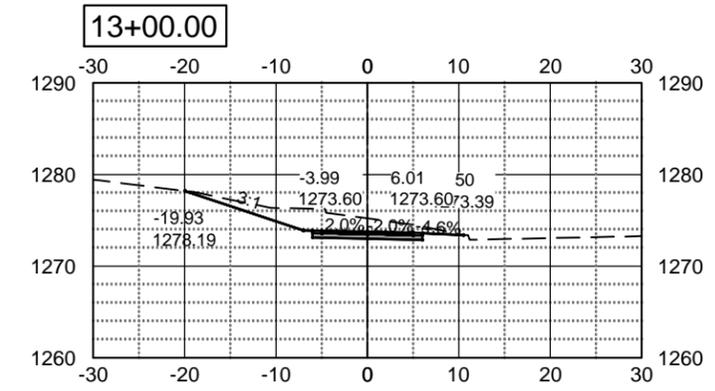
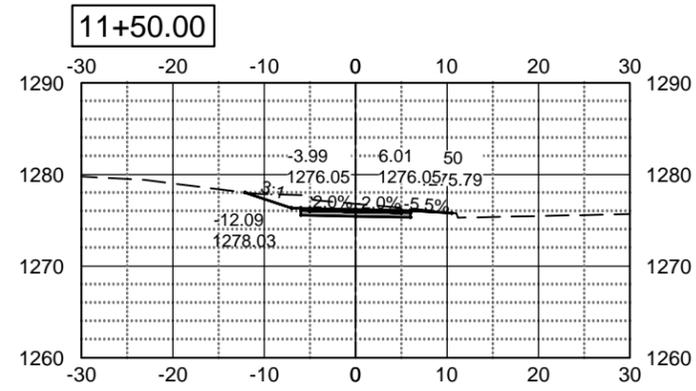
**ELECTRICAL DETAILS**

DRWN. BY MS	CHKD BY CP	PROJECT NO. 5413106
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# CROSS-SECTIONS



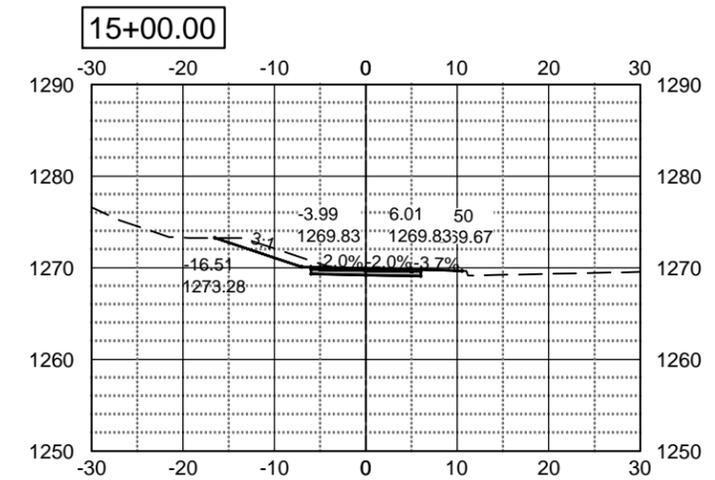
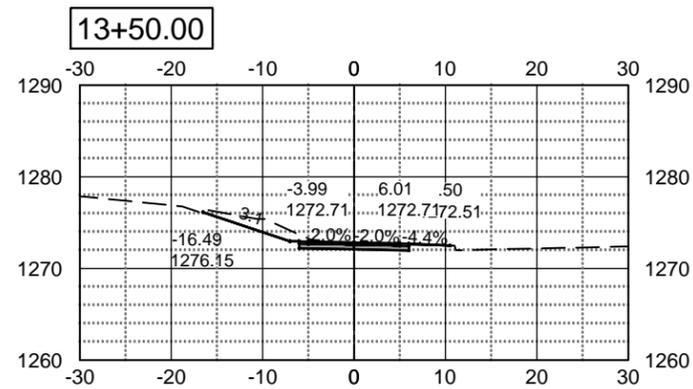
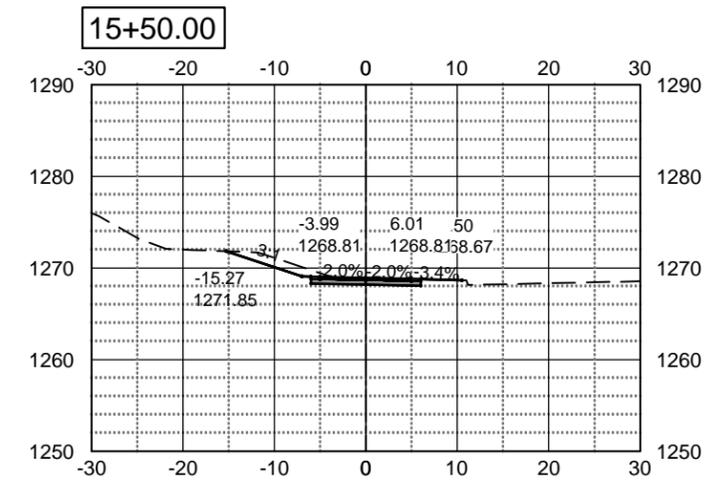
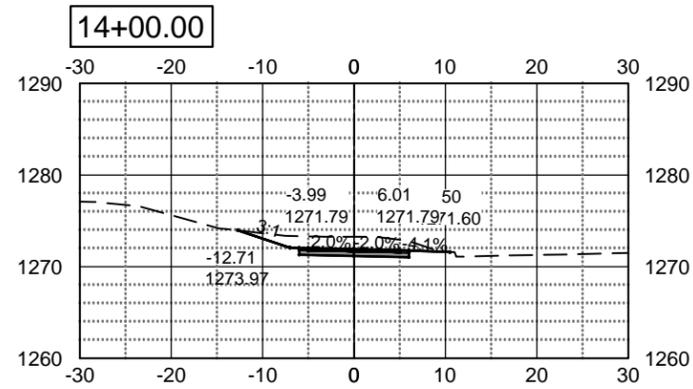
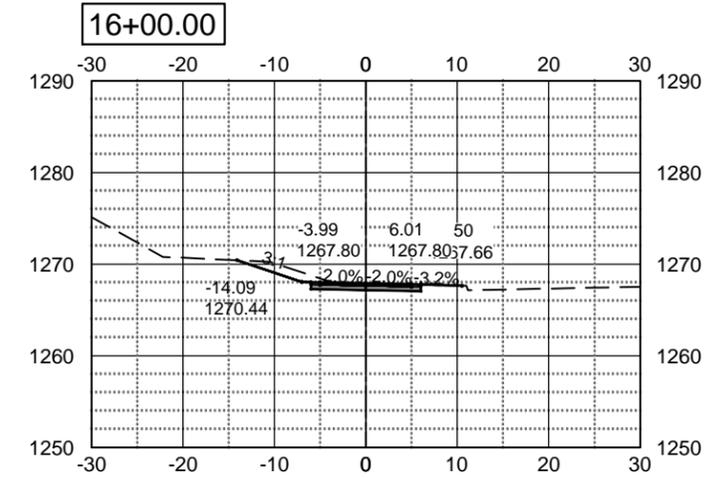
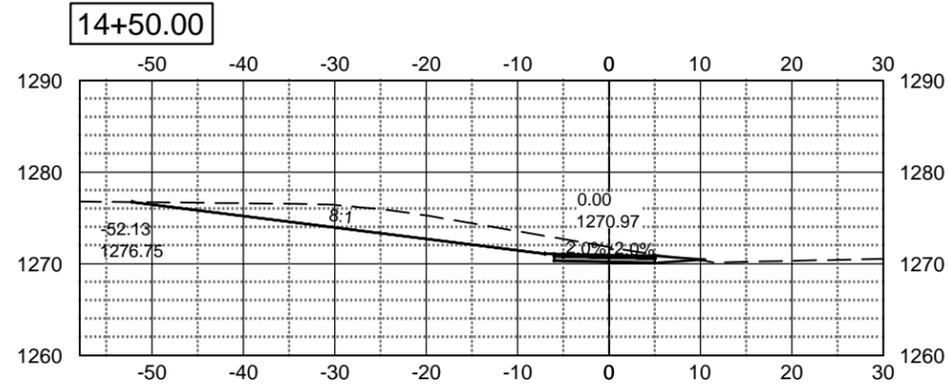
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	200	1



# CROSS-SECTIONS



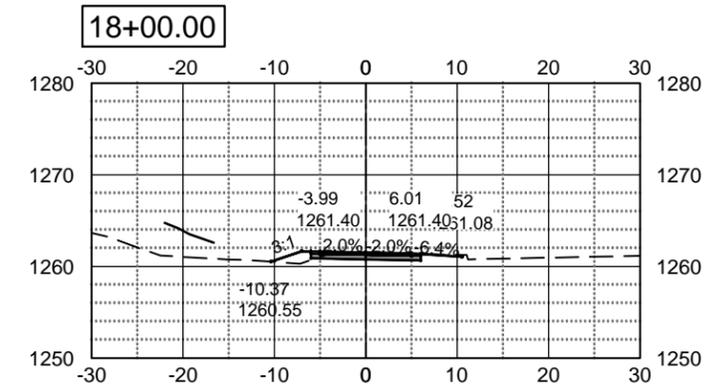
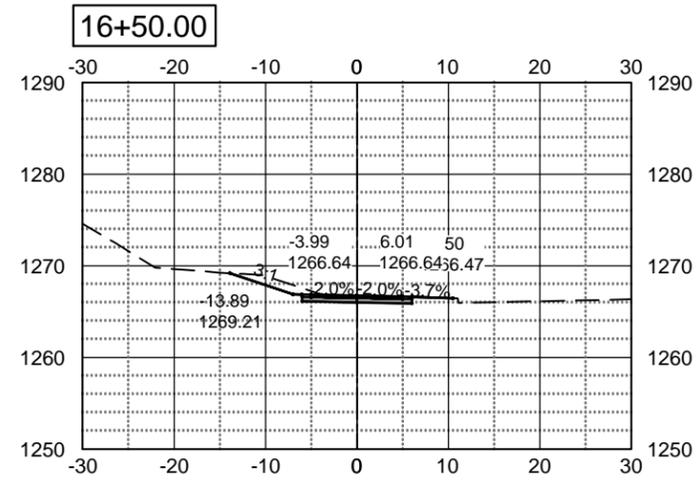
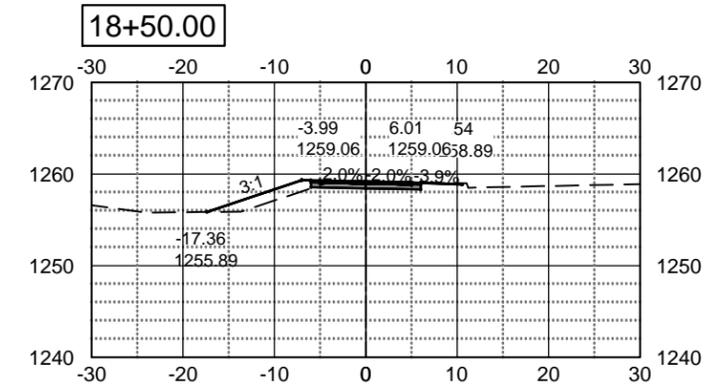
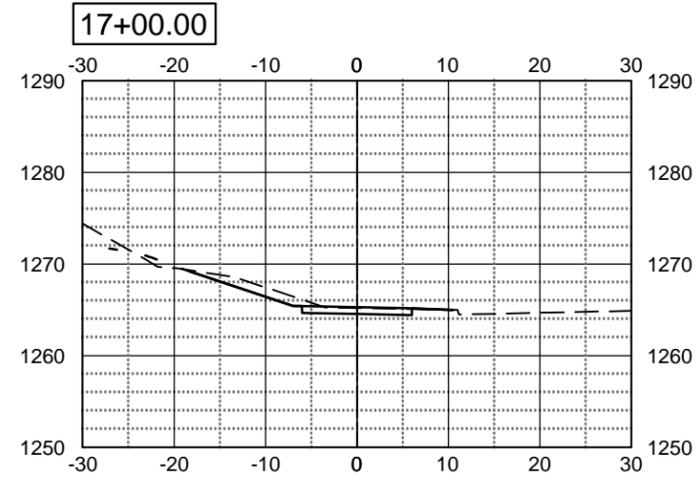
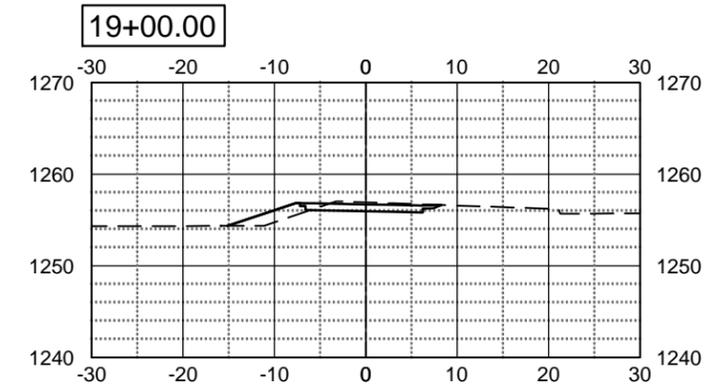
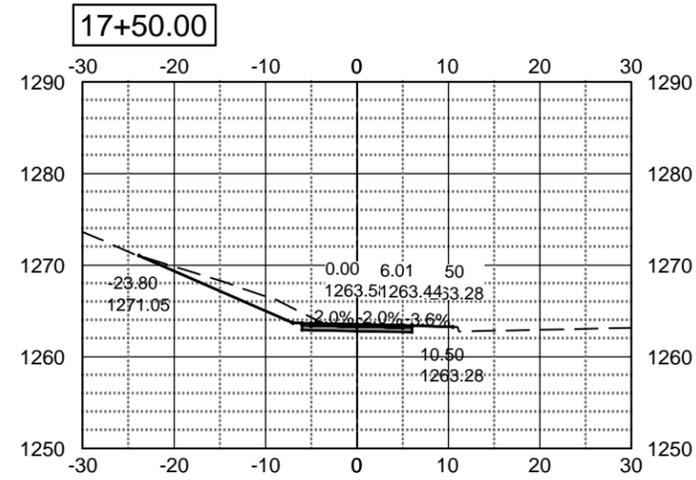
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# CROSS-SECTIONS



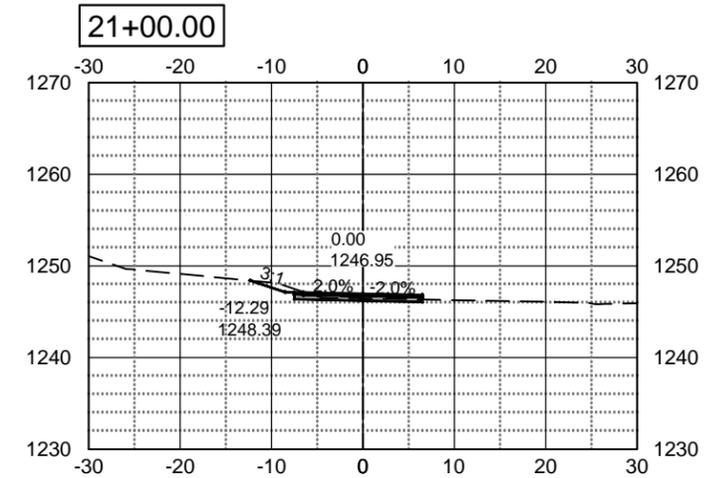
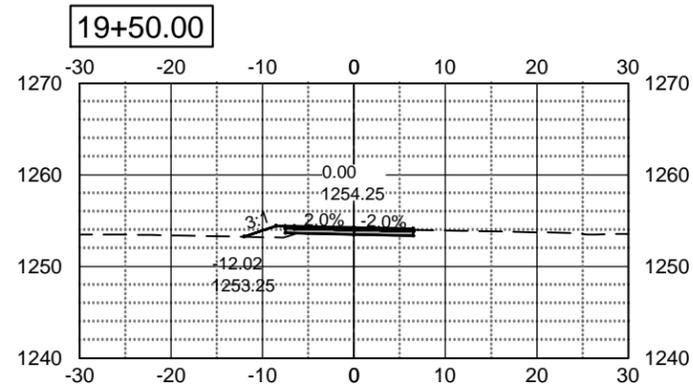
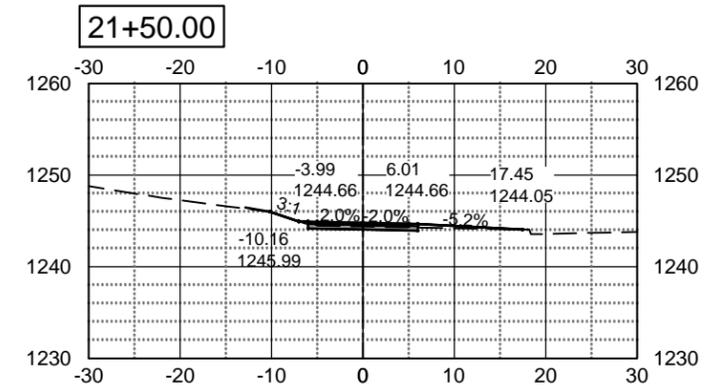
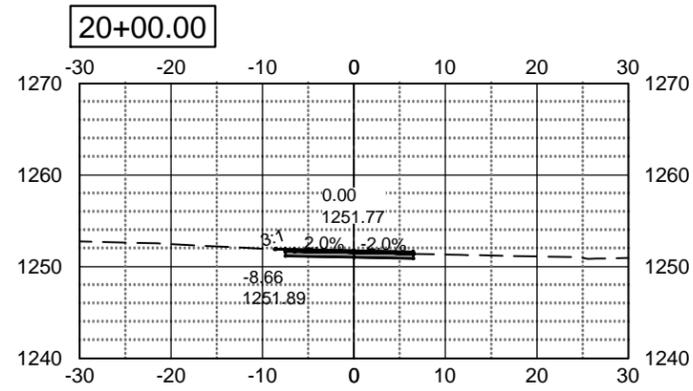
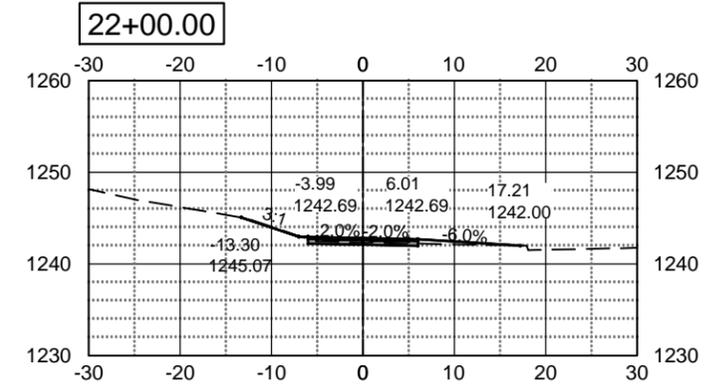
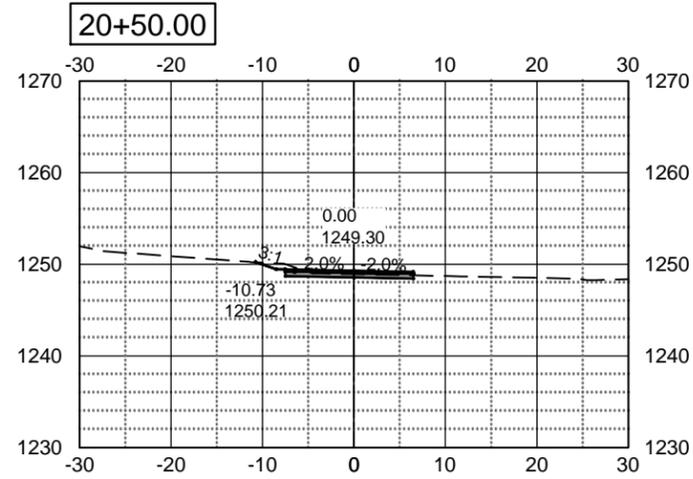
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# CROSS-SECTIONS



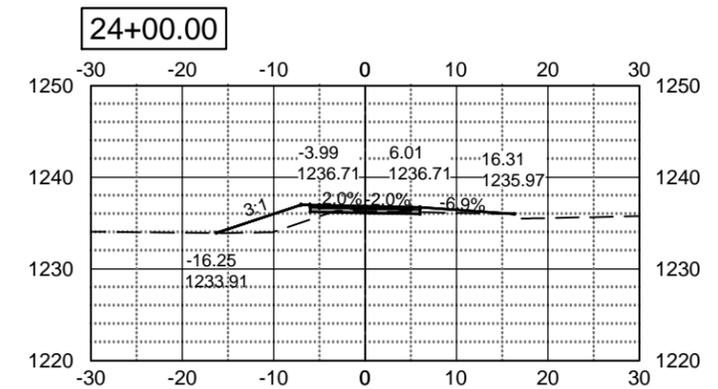
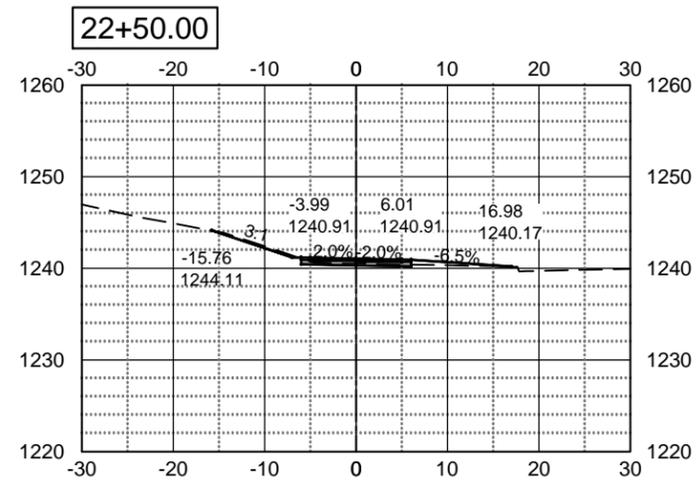
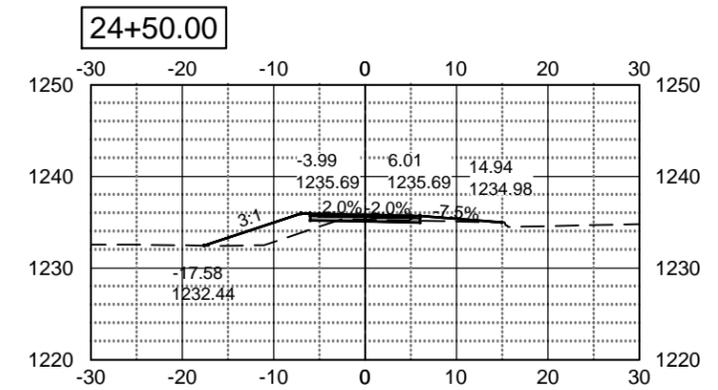
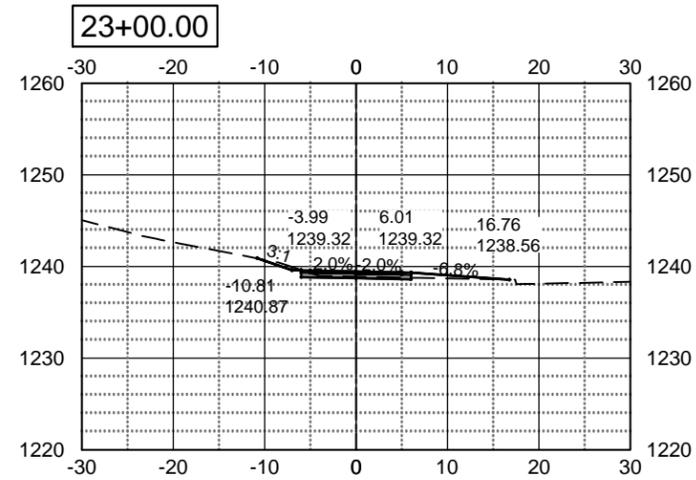
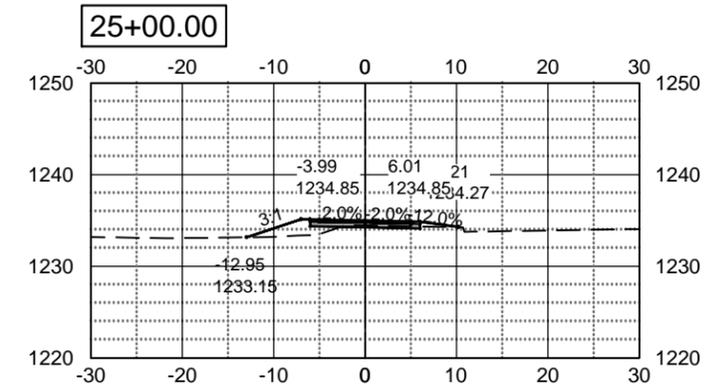
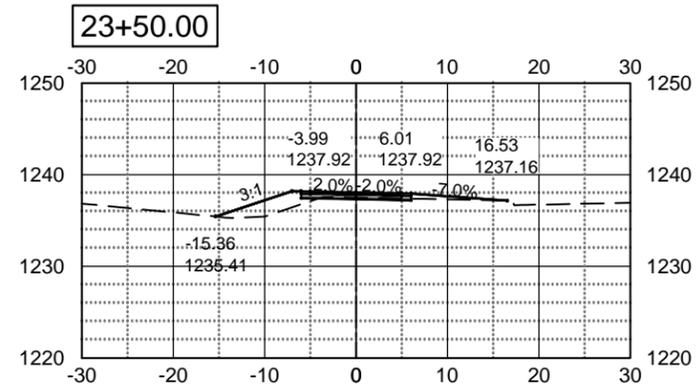
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# CROSS-SECTIONS



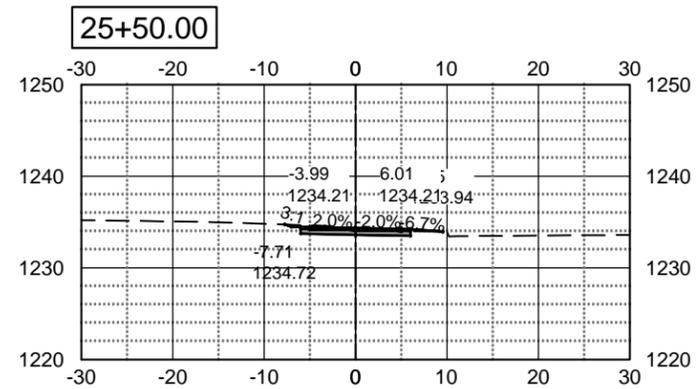
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ND	TEU-2-990(050)054	200	5



# CROSS-SECTIONS



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-2-990(050)054	200	6



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	
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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		

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NDDOT ABBREVIATIONS

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		

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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		
DOPE 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		

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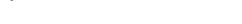
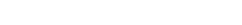
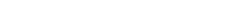
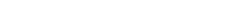
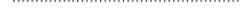
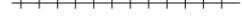
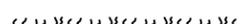
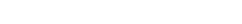
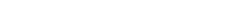
Line Styles

.....	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

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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	
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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		

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07-01-14	
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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	
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# Symbols

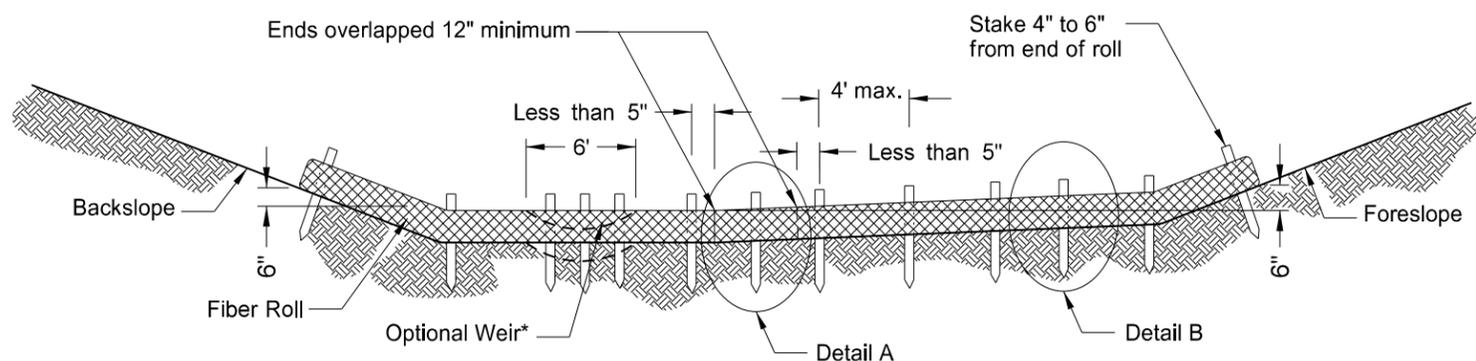
D-101-32

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

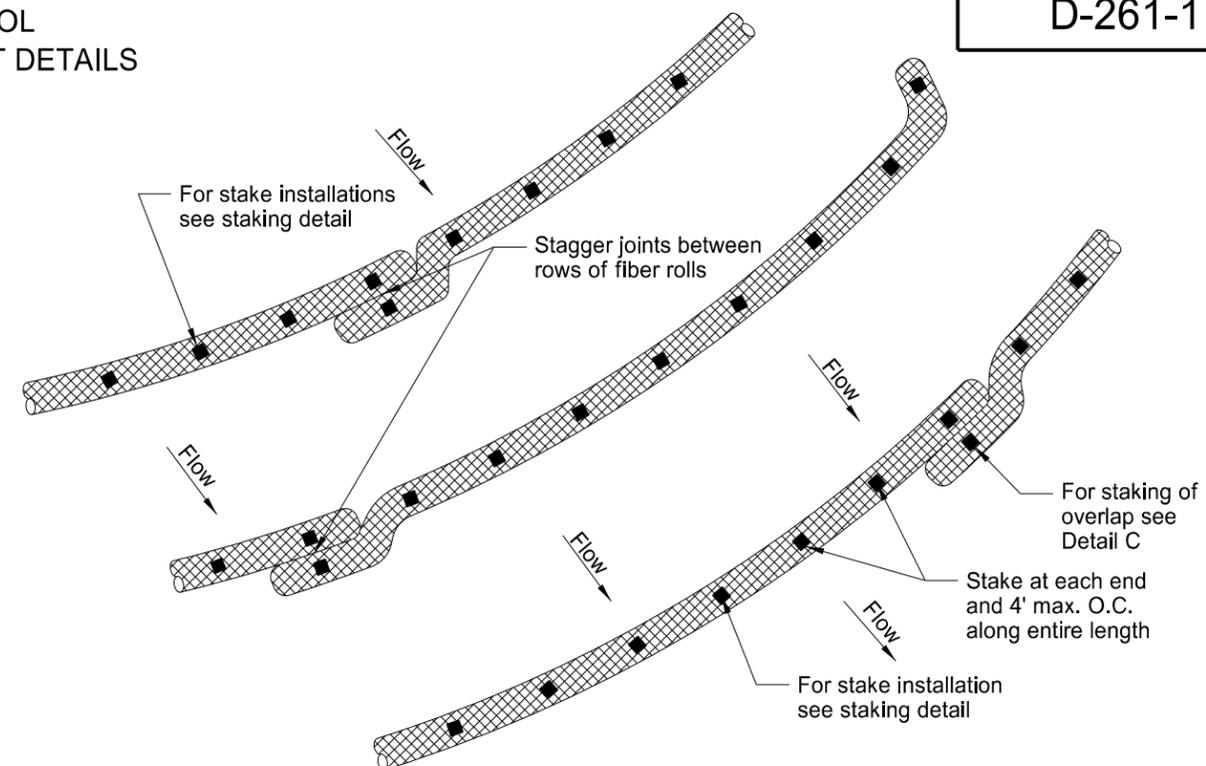
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EROSION CONTROL  
FIBER ROLL PLACEMENT DETAILS

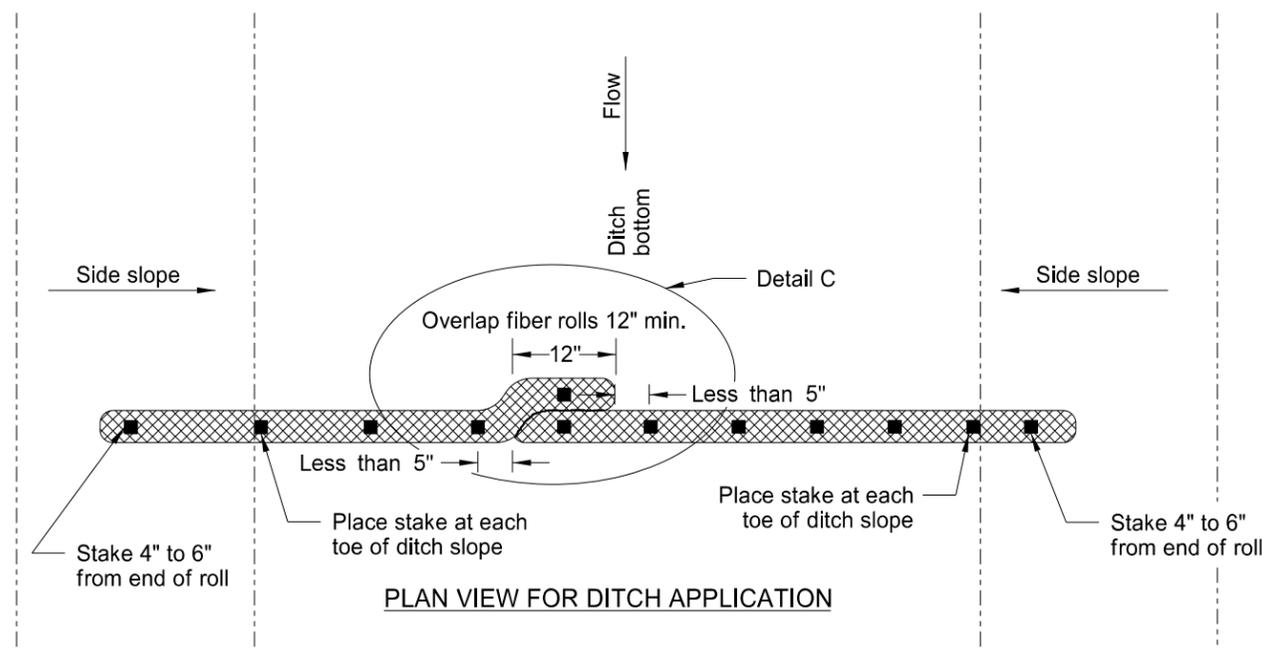


\*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back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

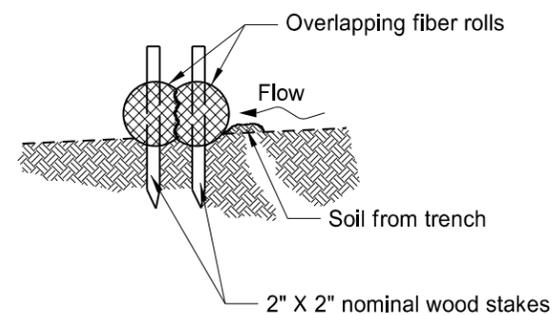
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



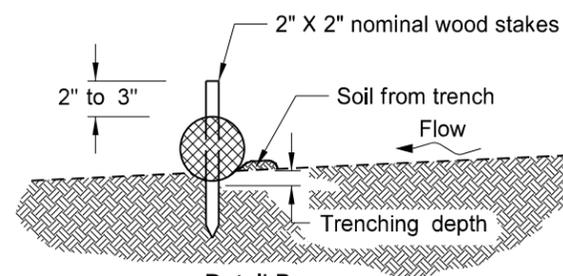
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A  
Fiber Roll Overlapping Staking Detail



Detail B  
Fiber Roll Staking Detail

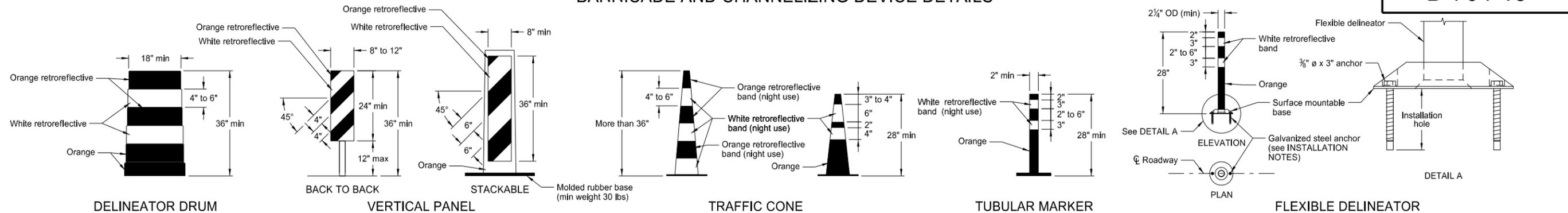
FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

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

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BARRICADE AND CHANNELIZING DEVICE DETAILS



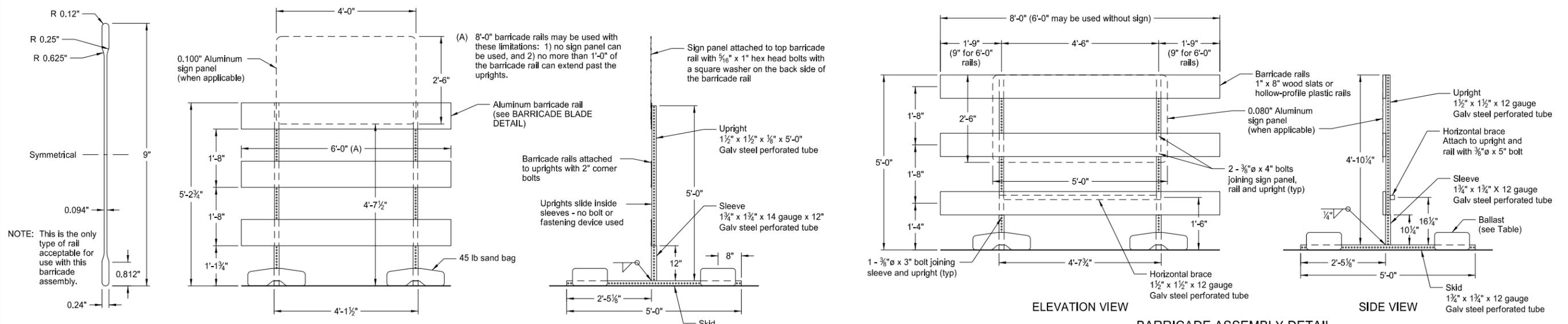
- INSTALLATION NOTES:**
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
  2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
  3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl 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 nonretroreflective 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.

Retroreflectization 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 nonretroreflective space between the orange and white stripes shall not exceed 3" wide.

Retroreflectization 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.

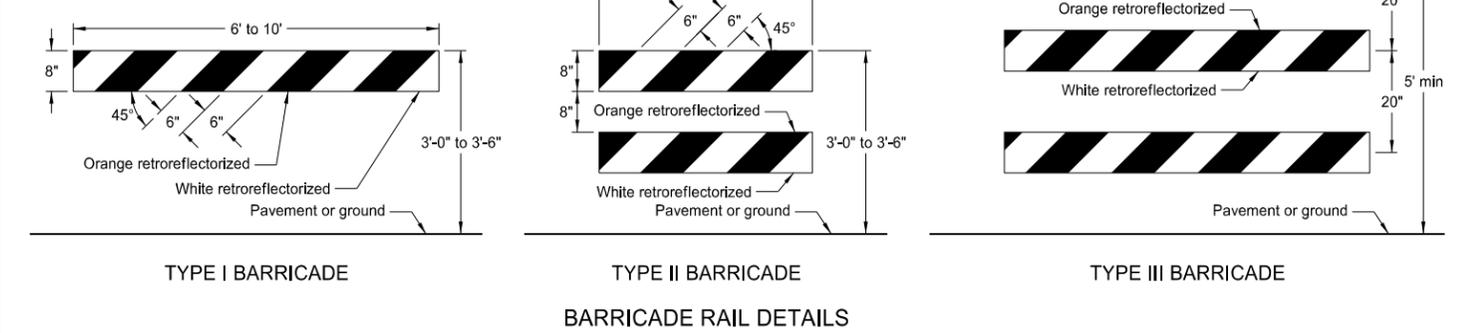


BARRICADE BLADE DETAIL

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

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".

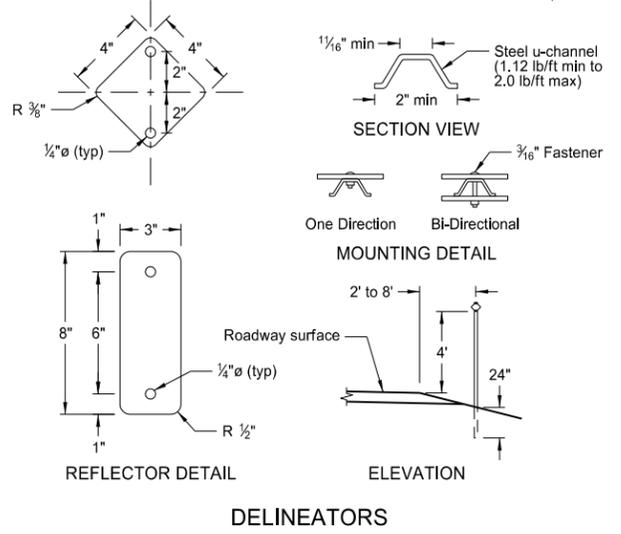


TYPE I BARRICADE

TYPE II BARRICADE

TYPE III BARRICADE

BARRICADE RAIL DETAILS



MINIMUM BALLAST (For each side of barricade support)

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

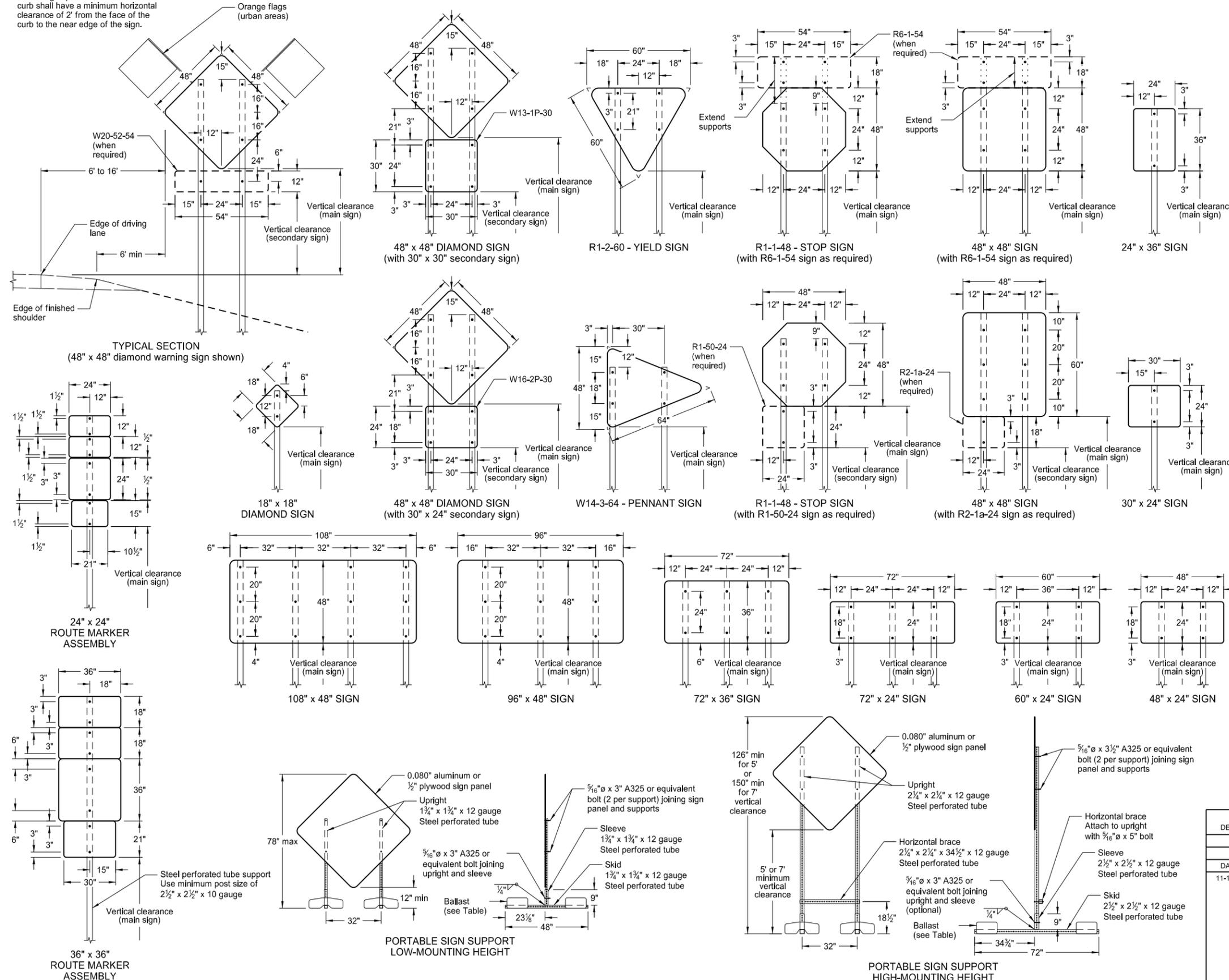
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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

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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.



- NOTES:
1. 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.

2. 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.
3. 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)

4. 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

5. 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.

6. 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

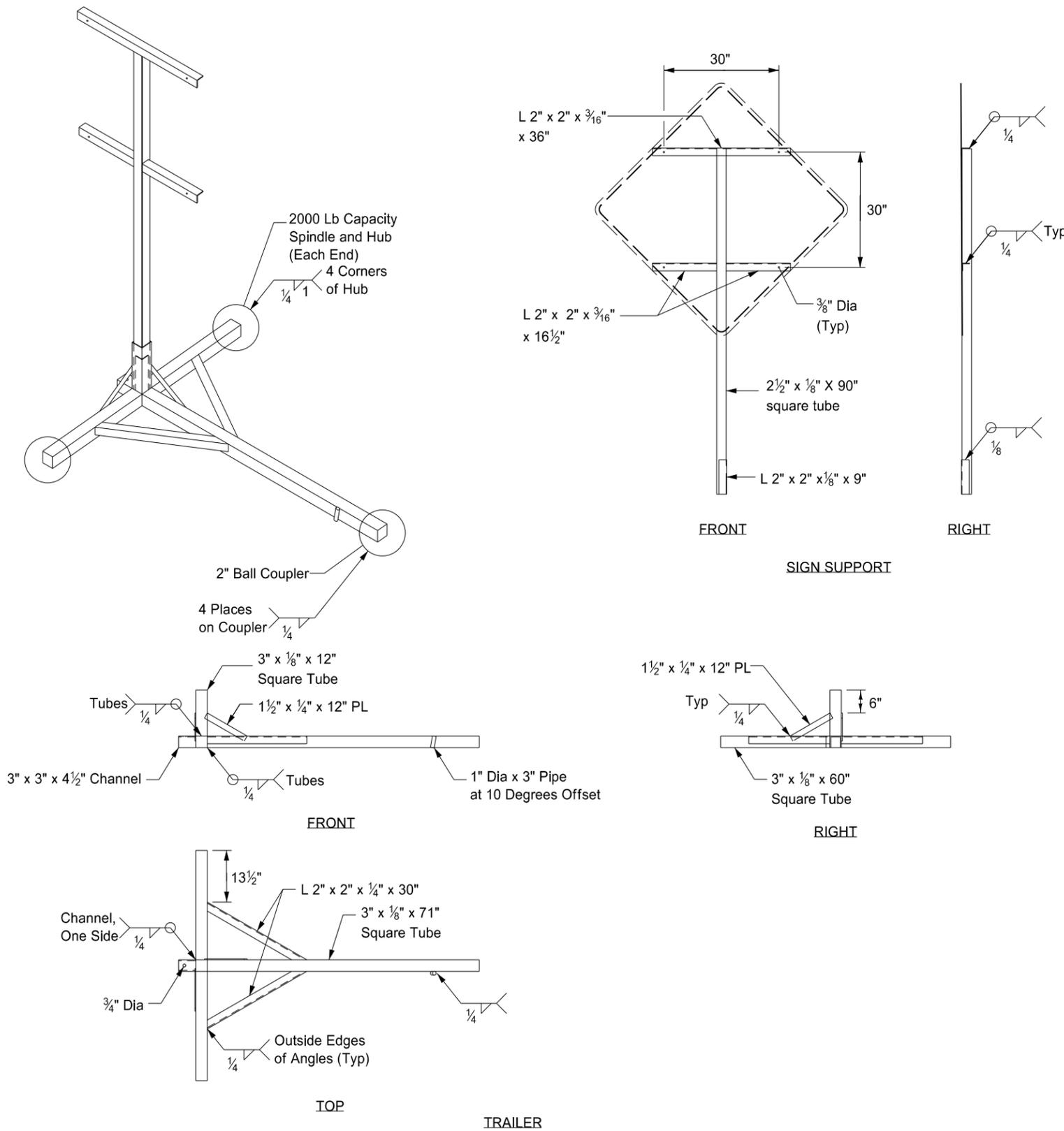
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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

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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



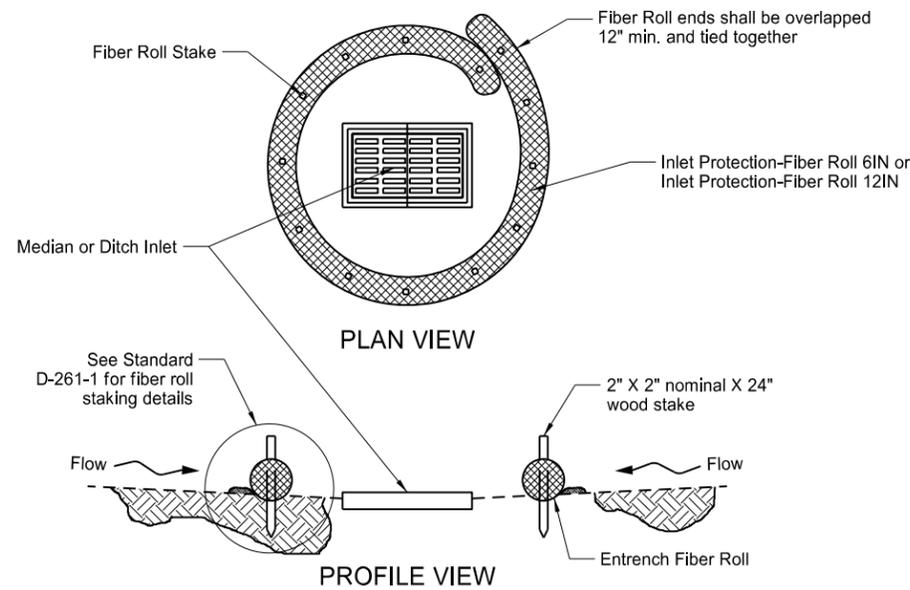
Notes:

- ① The maximum weight of the assembly is 250 pounds.
- ② Use a 14" wheel and tire.
- ③ Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
- ④ Other NCHRP 350 crash tested assemblies are acceptable.

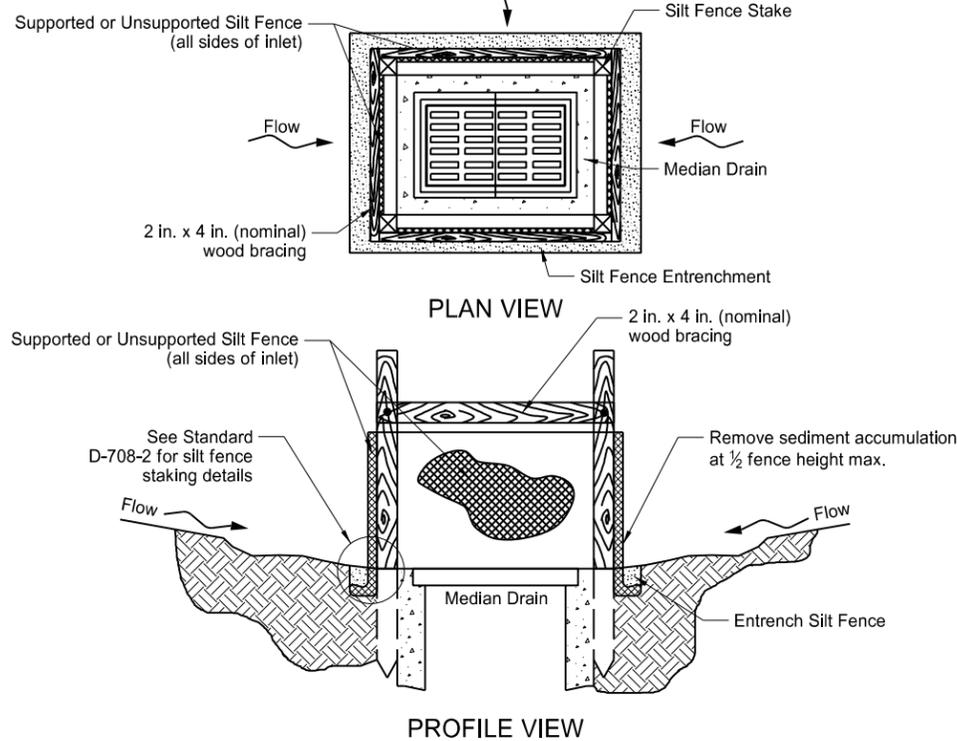
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE

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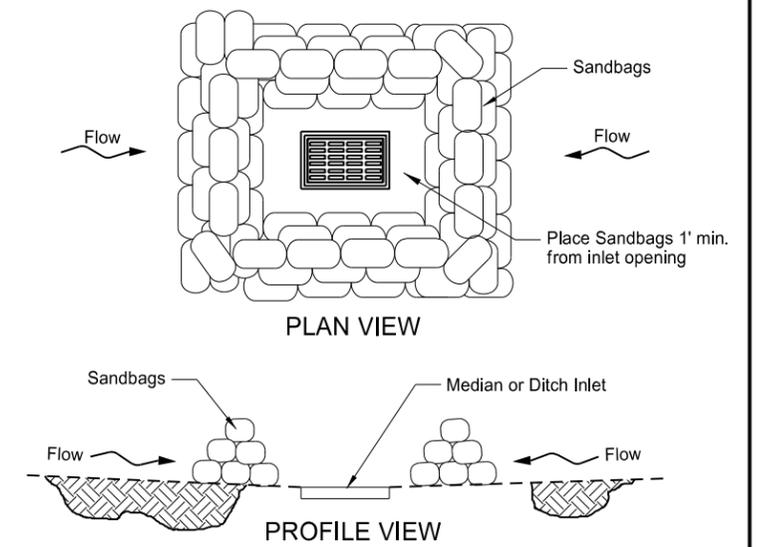
EROSION AND SILTATION CONTROLS  
MEDIAN OR DITCH INLET PROTECTION



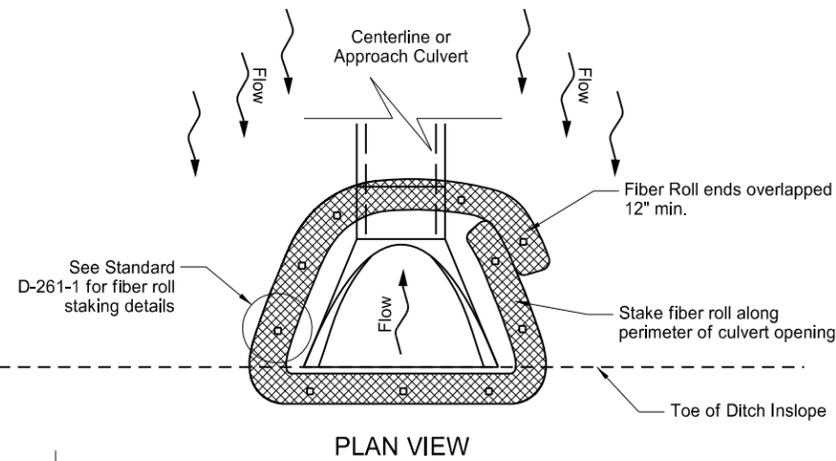
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



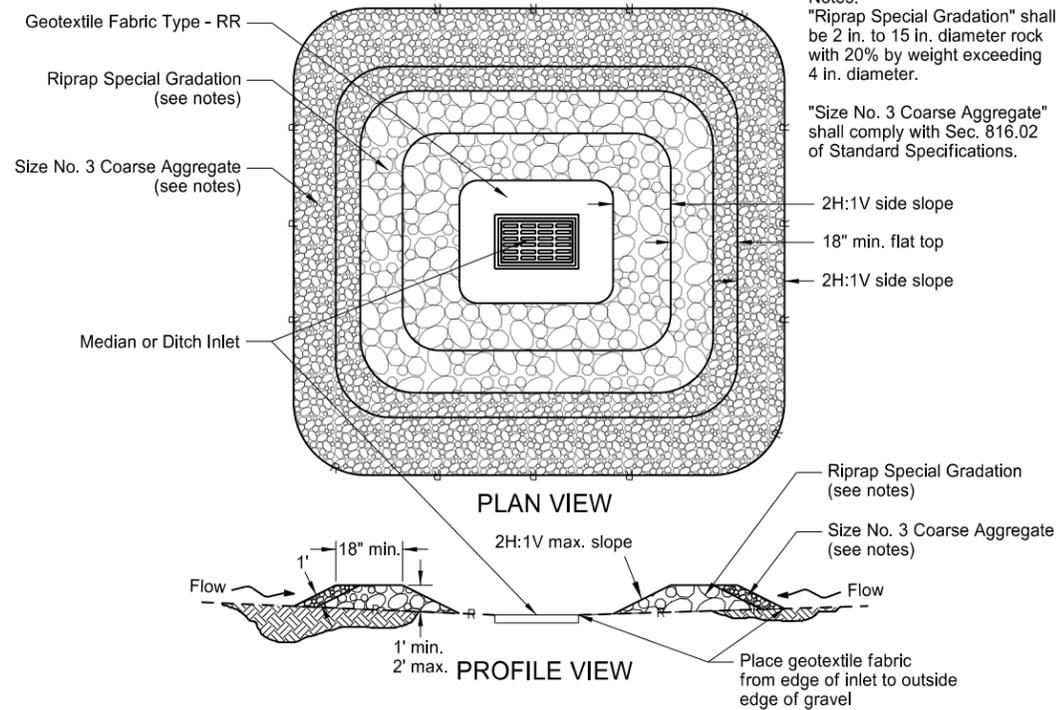
SILT FENCE PROTECTION (MEDIAN OR DITCH INLET)



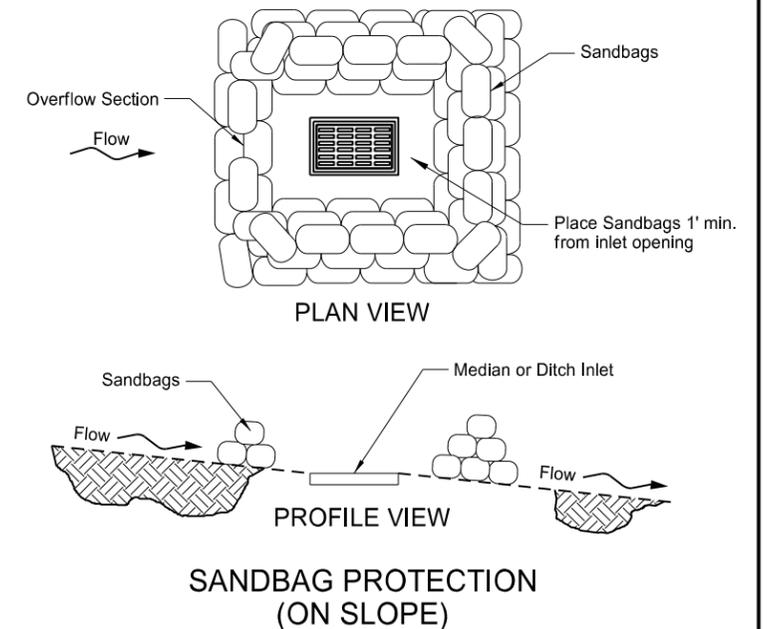
SANDBAG PROTECTION (LOW POINT)



FIBER ROLL PROTECTION (INLET OF CULVERT)



GRAVEL INLET PROTECTION (MEDIAN OR DITCH INLET)



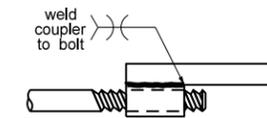
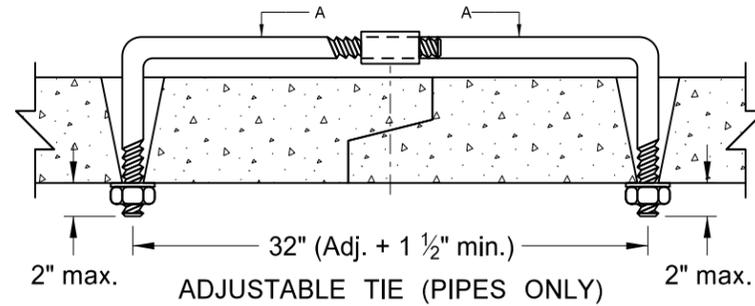
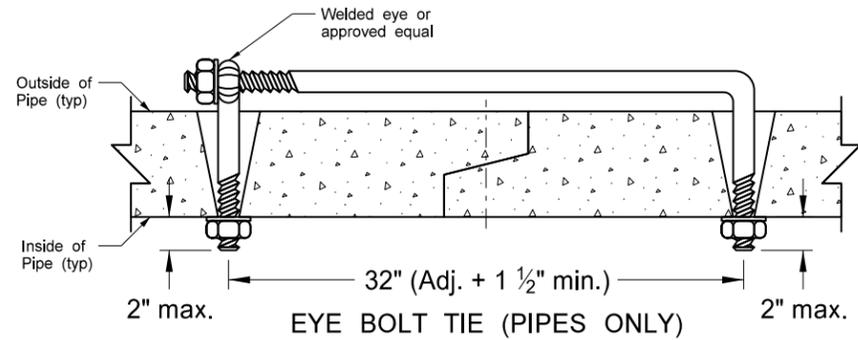
SANDBAG PROTECTION (ON SLOPE)

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.

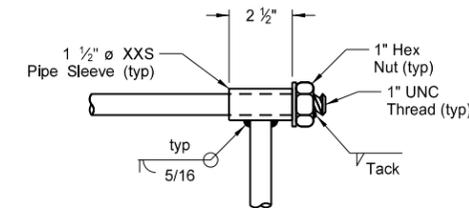
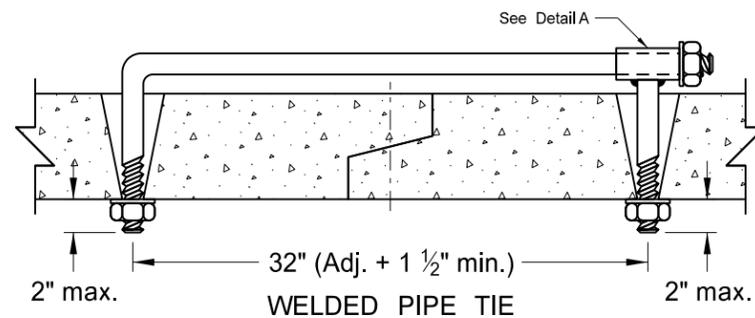
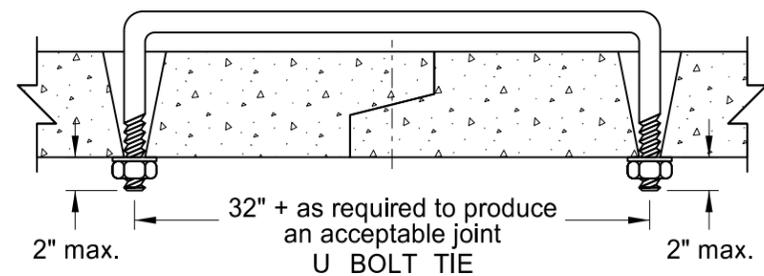
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.

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

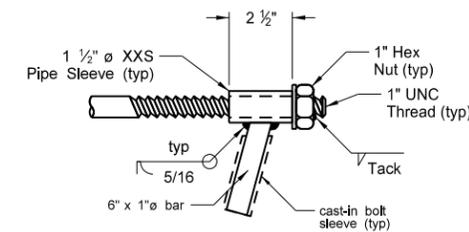
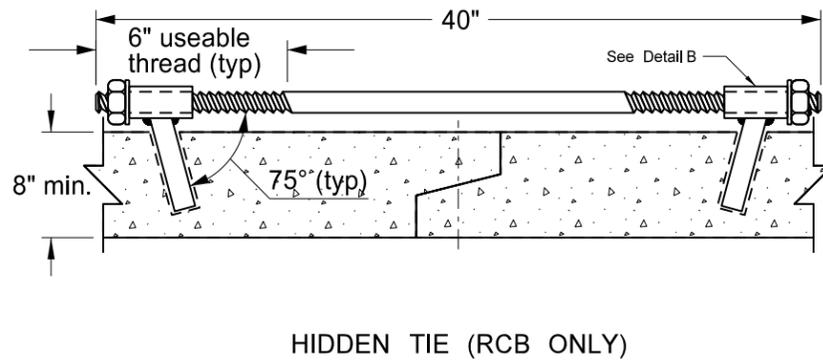
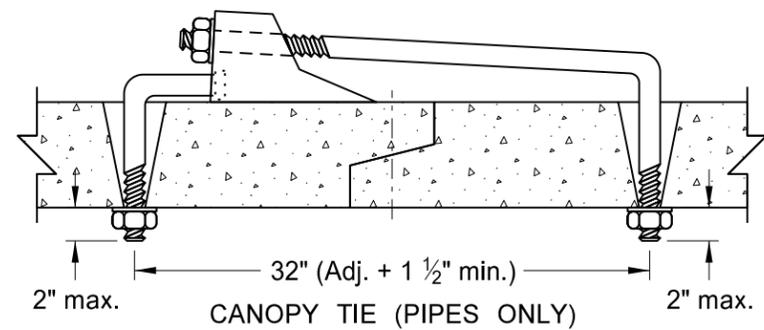
# CONCRETE PIPE OR PRECAST CONCRETE BOX CULVERT TIES



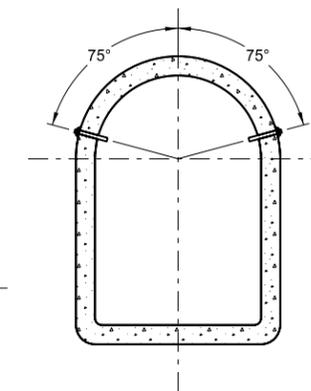
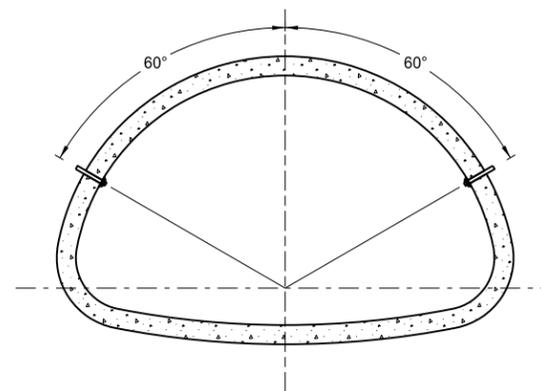
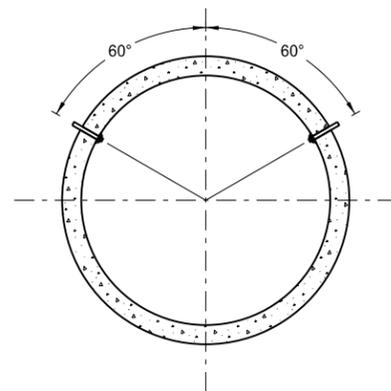
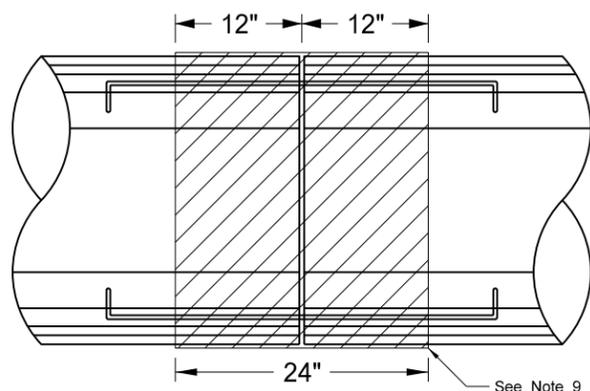
**SECTION A-A**



**DETAIL A**



**DETAIL B**



REQUIRED SIZE OF TIE BOLTS		
Pipe Size	Thread $\phi$	XXS Pipe Sleeve Inner $\phi$
18" - 24"	5/8" See note 2	3/4"
30" - 66"	3/4"	1"
72" - 78"	1"	1 1/4"
RCB		

**NOTES:**

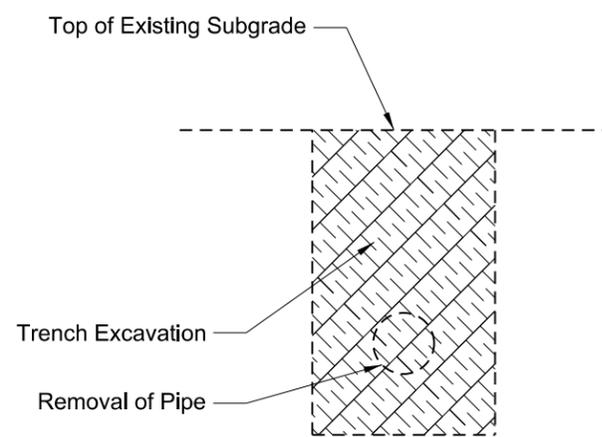
- The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
- Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Where nuts and washers are not used, the tie bars shall be inserted and grouted into place.
- Ties are only for holding pipe or RCB sections together, not for pulling sections tight.
- Tie bolt assembly shall be hot dip galvanized in accordance with AASHTO M232.
- Holes in pipes to accommodate tie bolts can be precast or drilled. Tapered holes are permitted when precast. Holes shall have a diameter 1/4" larger than the diameter of the thread. Holes in precast RCB's shall contain cast-in bolt sleeves with an inside diameter of 1 1/4".
- The contractor has the option of selecting the type of tie bolt used from those shown.
- The cost of precasting or drilling the required holes and furnishing and installing the tie bolts shall be included in the price bid for the appropriate conduit or RCB pay item.
- All concrete culvert and storm sewer joints, including the end section joints, shall be tied unless otherwise specified.
- When joint wrap is specified in the plans, place wrap beneath ties. Overlap the joint by 12" in both directions.
- Tie bolts shall conform to ASTM A 36. Nuts shall be heavy hex and conform to ASTM A 563. Washers shall conform to ASTM F 436, Type 1. Welded pipe sleeves and cast-in bolt sleeves shall conform to ASTM A 53, Grade B.
- Cattle Pass and Jacked and Bored pipes shall have pipe ties inserted from the inside of the pipes and grouted into place. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
- RCB tie locations shall be as shown on the plans.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-18-14	
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DATE	CHANGE

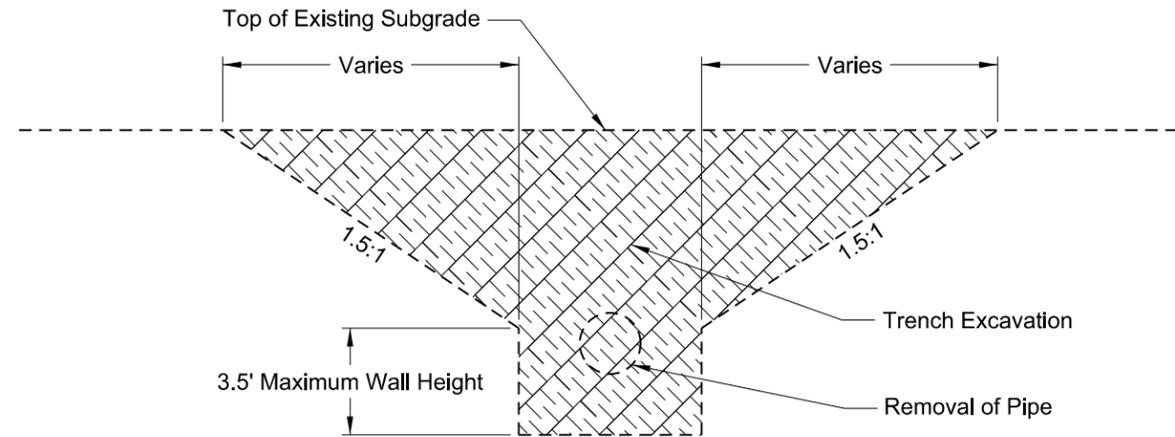
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PIPE EXCAVATION AND INSTALLATION DETAIL FOR LONGITUDINAL MAINLINE PIPE  
OR PIPE NOT UNDER THE ROADWAY

D-714-27



EXCAVATION DETAIL A



EXCAVATION DETAIL B

Pay Items

- 1) Pipe\*
- 2) 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
- 5) Common Excavation - Type B

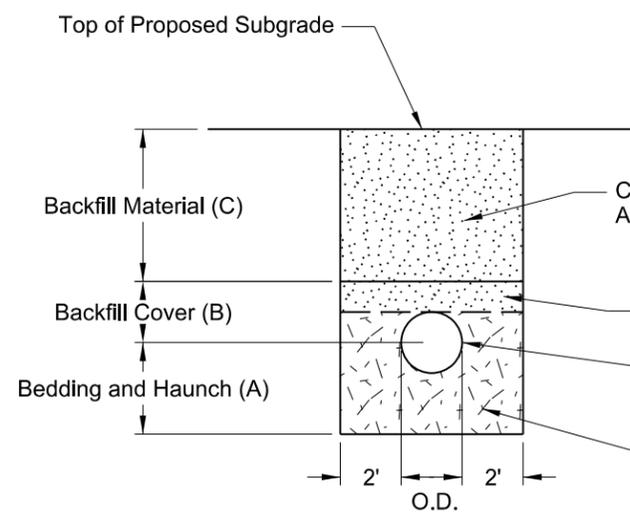
NOTES:

- 1) This drawing does not apply to pipes in approaches.
- 2) It is the contractor's option to select Detail A or B.

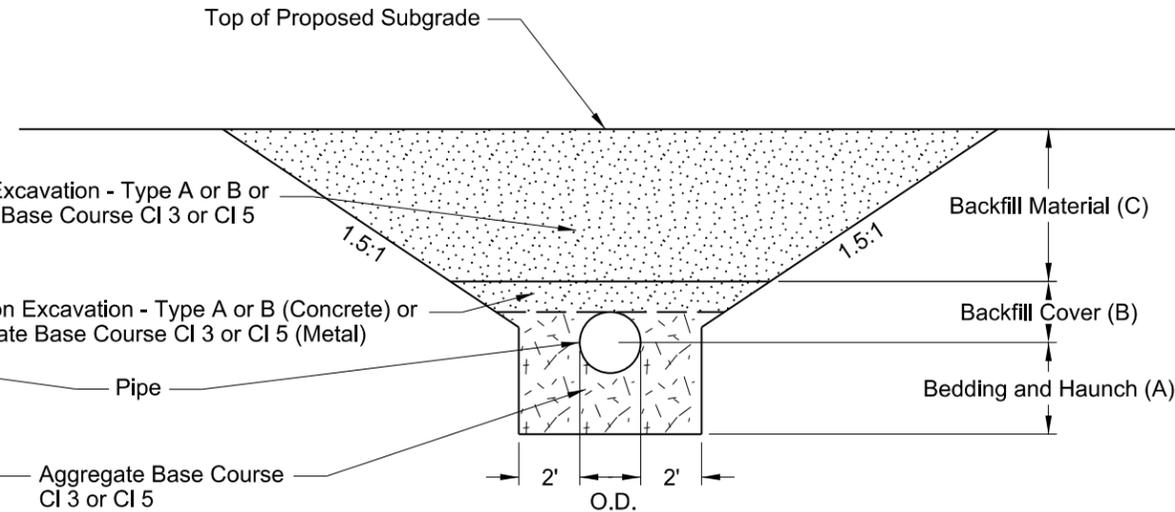
Bedding and Haunch (A)
Pipes Not Under Roadway = 0.5 O.D. + 4 Inches
Pipes Under the Roadway = 0.5 O.D. + 2 Feet

Backfill Cover (B)
Concrete Pipe = 0.5 O.D.
Metal Pipe = 0.5 O.D. + 1 Foot
PVC/HDPE = 0.5 O.D. + 1 Foot

Backfill Material (C)
Top of Pipe 4 Feet or Less Below the Top of Proposed Subgrade = Aggregate Base Course CI 3 or CI 5
Top of Pipe Greater than 4 Feet Below the Top of Proposed Subgrade = Common Excavation - Type A
Pipe Not Under Roadway = Common Excavation - Type B



BACKFILL DETAIL A



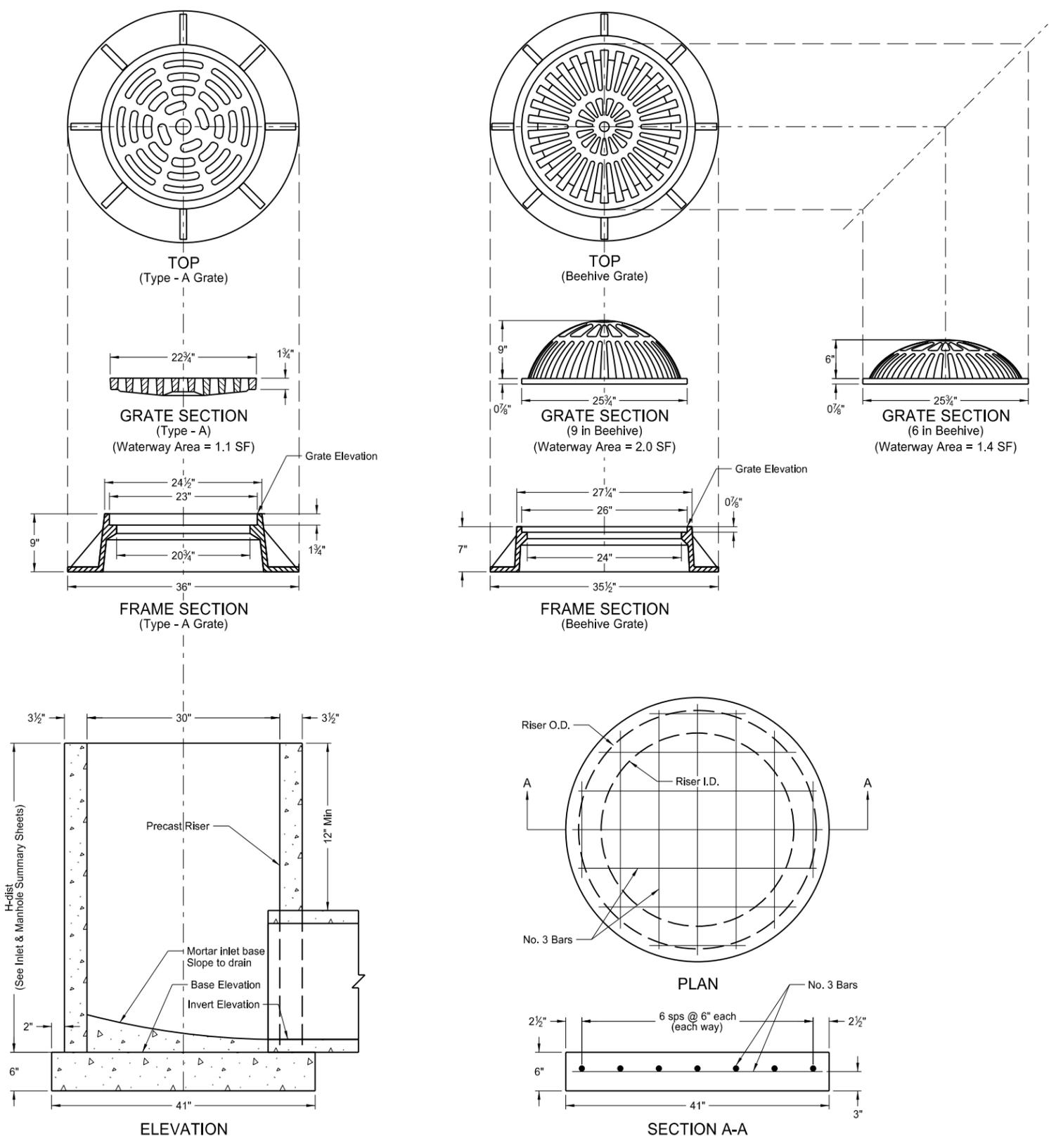
BACKFILL DETAIL B

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

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Ron Horner,  
Registration Number  
PE-2087,  
on 10/15/13 and the original document is stored at the  
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of Transportation

INLET - CATCH BASIN

D-722-1A



NOTES:

1. Other castings, similar in dimension, may be used if the casting conforms to the riser section and has a grate style as specified in the plans which meets or exceeds the waterway area listed. If modifications to the inlet are required to facilitate similar castings the contractor must receive written approval from the Engineer.
2. Castings shall be manufactured in accordance with AASHTO M306-09. Metal used in the manufacture of castings shall conform to AASHTO M105 Class 35B.
3. The contractor shall have the option of using precast or cast-in-place bases. Class of concrete shall be AE. The aggregate size shall be approved by the engineer in the field. Construction shall be in accordance with the NDDOT Standard Specifications.
4. Precast concrete risers shall be constructed in accordance with AASHTO M199.
5. On projects with P.C.C. pavement all inlet risers shall be constructed 4 to 5 inches below final elevation and adjusted to final grade after paving. Adjustment may be done with adjusting rings, masonry or cast-in-place concrete. All costs for this adjustment shall be included in the price bid for the inlet.
6. All reinforcing steel shall be Grade 60 steel.

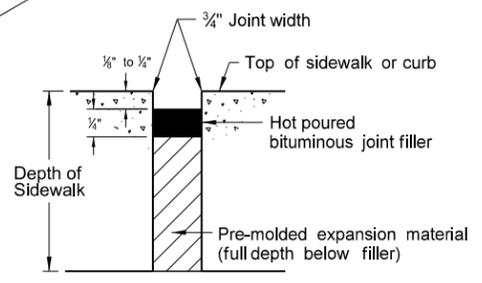
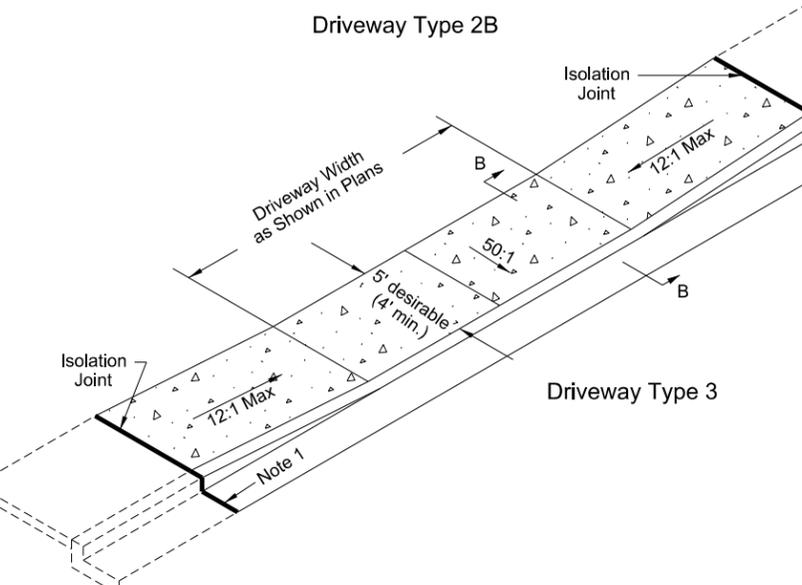
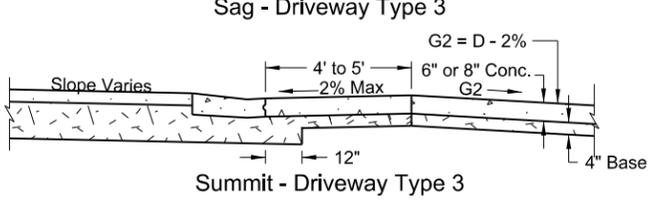
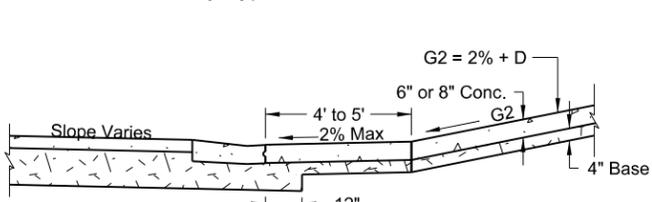
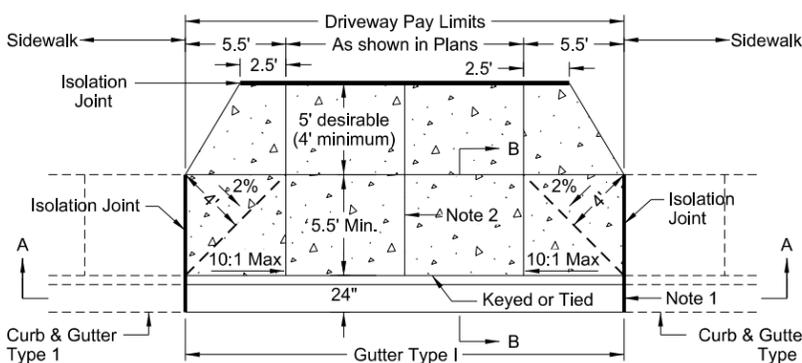
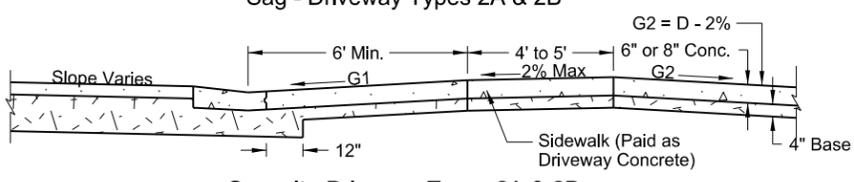
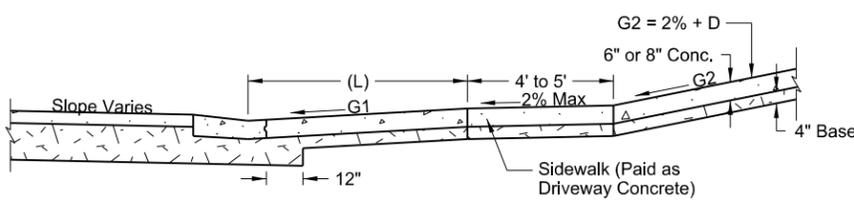
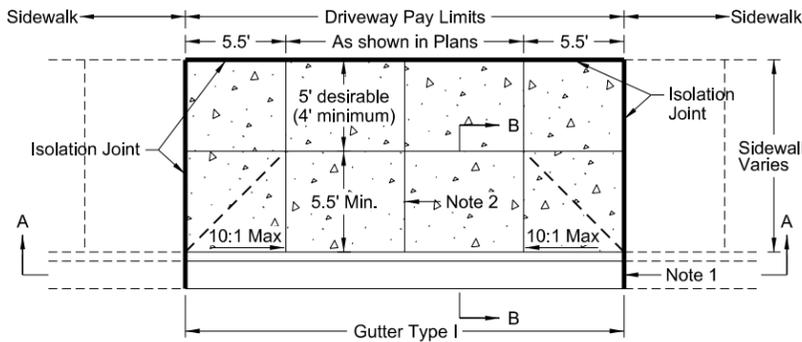
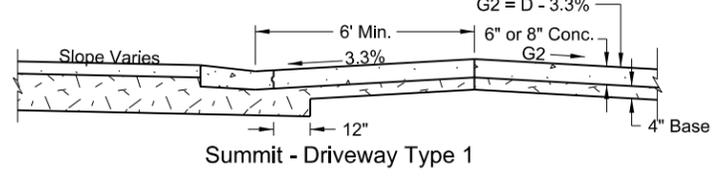
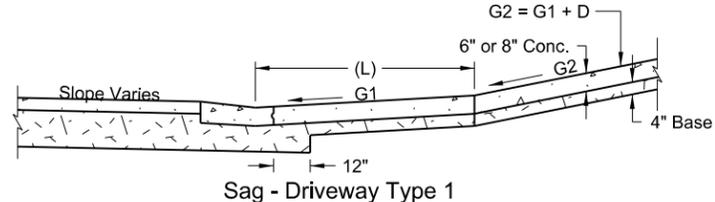
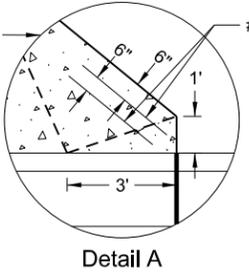
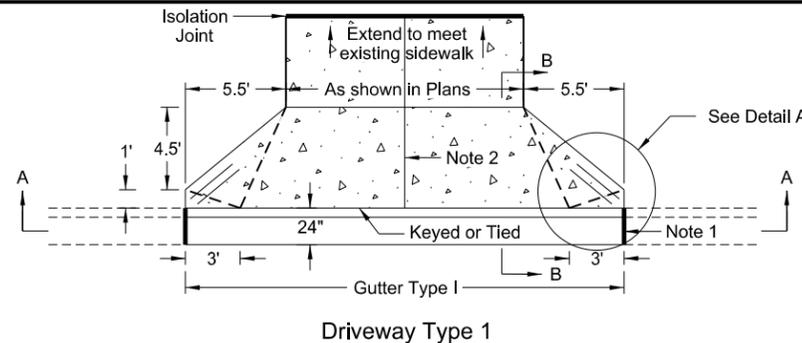
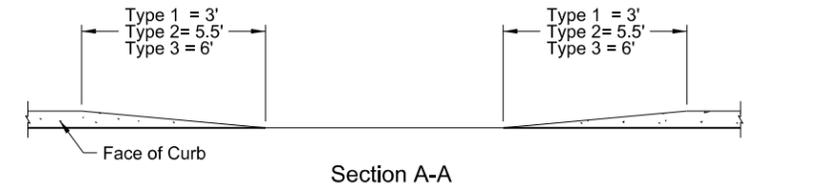
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-13	
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6-24-14	Revised Note 3

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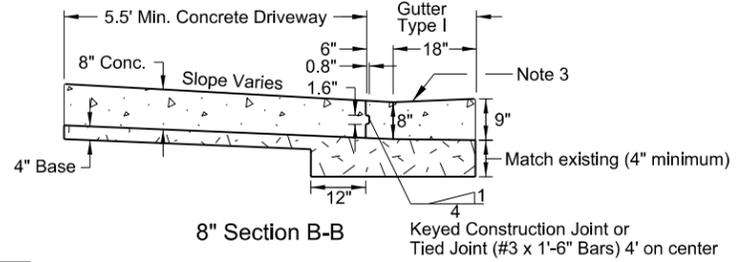
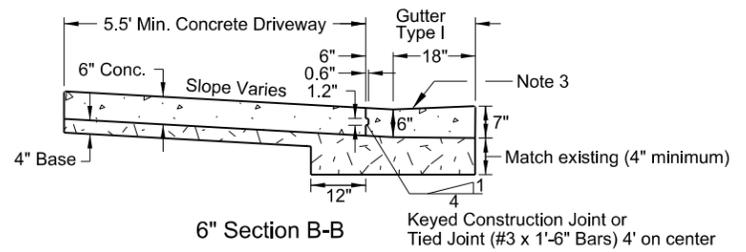
CONCRETE DRIVEWAY - URBAN

NOTES:

- See Standard D-748-1 for curb and gutter isolation joint detail. On PCC roadways, the curb and gutter joints should match those of the pavement as much as practical.
- Joint Spacing: 1 Center contraction joint to be used on all driveways 20' width or less, 2 center contraction joints for driveways > 20' to 30' width, and 3 center contraction joints for driveways greater than 30' width.  
The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete.  
Isolation joints should also be used between separately poured concretes, or between old and new concrete.  
All joints shall be sealed with hot pour bituminous filler or low modulus silicone. The sealant shall be installed and tooled in accordance with the manufacturer's recommendations.  
All costs for labor, equipment, and material necessary to construct and seal joints shall be included in the price bid for the driveway.
- Gutter-Type 1 shall be paid for at the unit price bid for "Curb and Gutter-Type 1".
- 6" Driveway to be used unless otherwise specified.
- 4" base material shall be placed under the concrete driveway. All labor and materials necessary to place the base material shall be included in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
- Sidewalk that falls behind a driveway shall be constructed to the same thickness as the driveway and shall be paid for as driveway concrete.



Typical Isolation Joint Seal (longitudinal and transverse)



Driveway ADT	Grade G1		Dimension (L) ft.		Grade Changes (D)	
	Desirable	Maximum	Desirable	Maximum	Desirable	Maximum
(0-500)	5%	12% or controlled by vehicle clearance	12	6	6%	15% or controlled by vehicle clearance
(500-1500)	3%	8%	20	20	3%	6%
(> 1500)	2%	5%	40	40	0%	3%

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2-13-2014	
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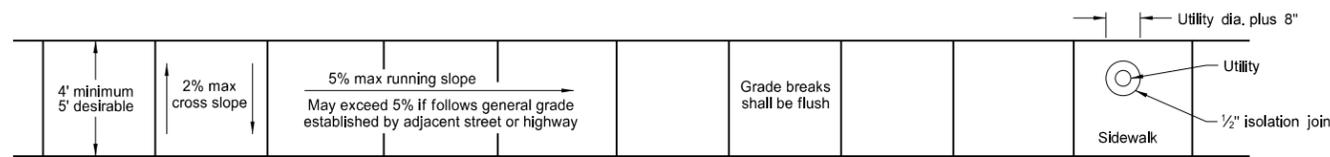
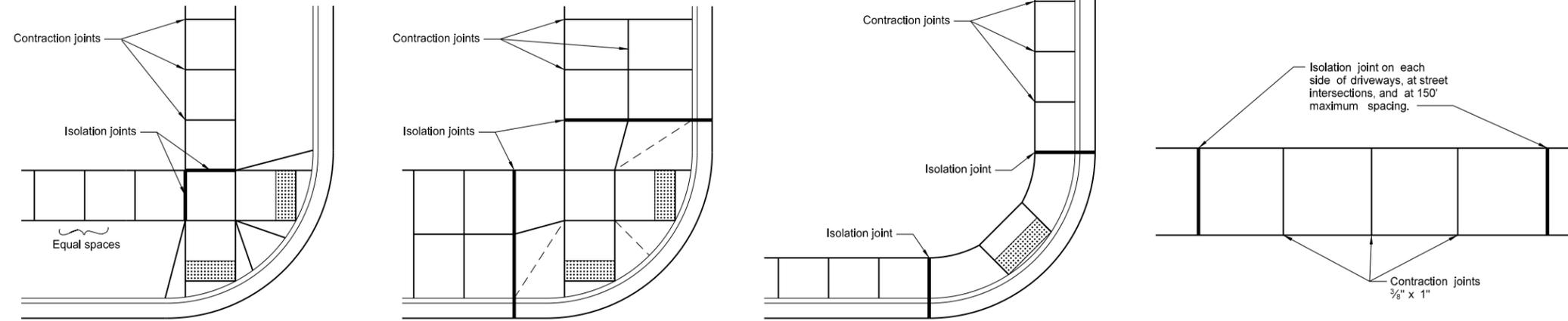
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# SIDEWALK

D-750-2

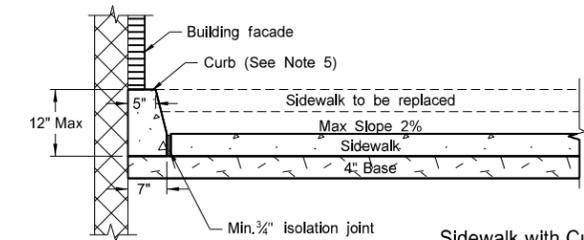
**NOTES:**

1. Curb ramp and detectable warning panel layouts are for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Transverse contraction joint spacing shall vary from 4' to 6' to create approximate square panels. Longitudinal contraction joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width. The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete. When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied to match up with the curb & gutter joints. Isolation joints should also be used between separately poured concretes, or between old and new concrete. The cost for all labor, equipment, and material necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk concrete.
3. 4" sidewalk concrete thickness to be used unless otherwise specified in the plans.
4. 4" base material thickness to be used unless otherwise specified in the plans. All labor and materials necessary to place the base material shall be included in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."
5. Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.

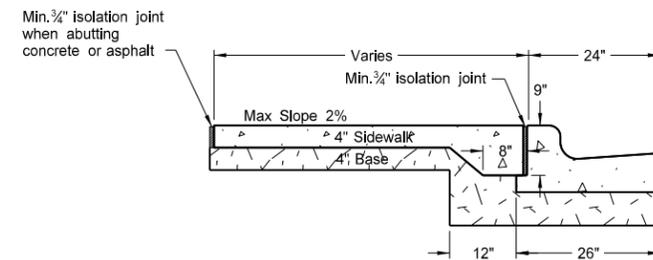


Sidewalk Width and Grade

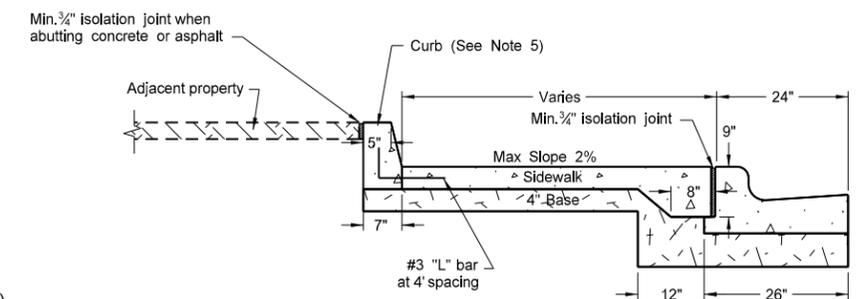
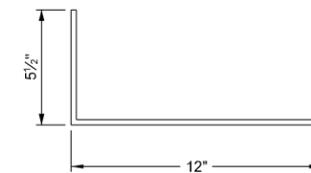
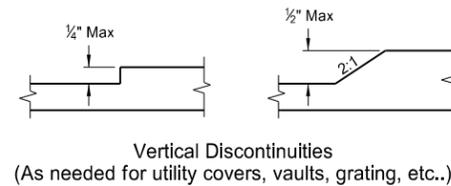
Utility Blockout



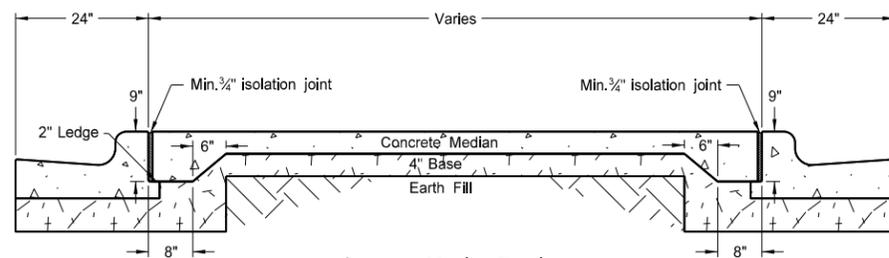
Sidewalk with Curb Detail (Building face application)



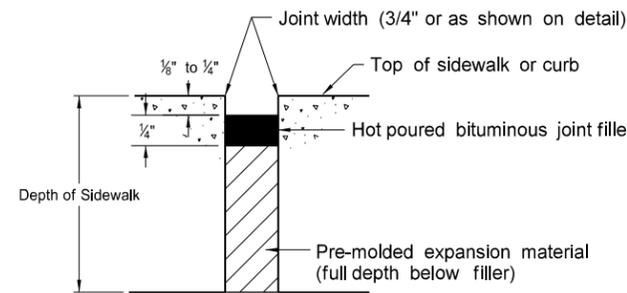
Sidewalk Detail (Installed adjacent to curb and gutter)



Sidewalk with Curb Detail (Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal (longitudinal and transverse)

NORTH DAKOTA	
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11-26-13	
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# CURB RAMP DETAILS

D-750-3

+More Right of Way

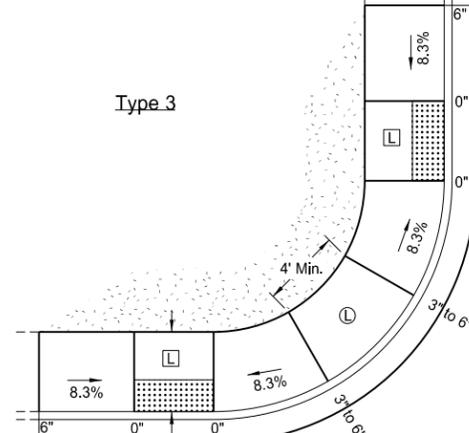
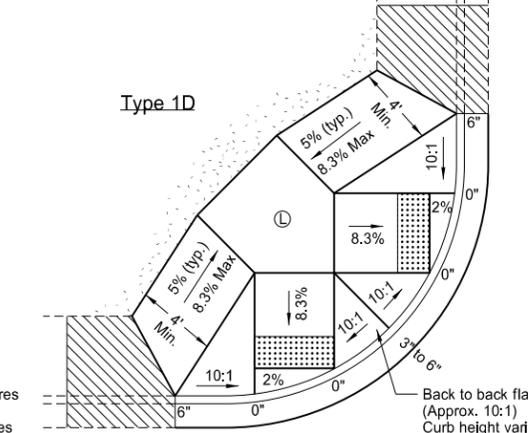
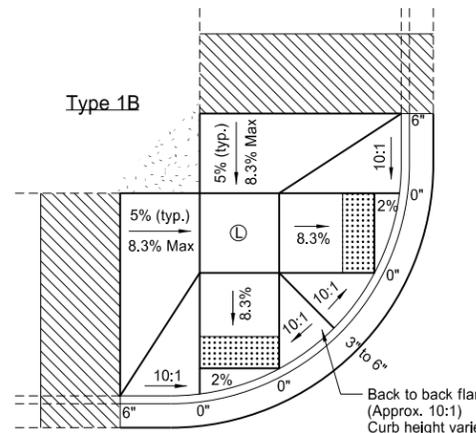
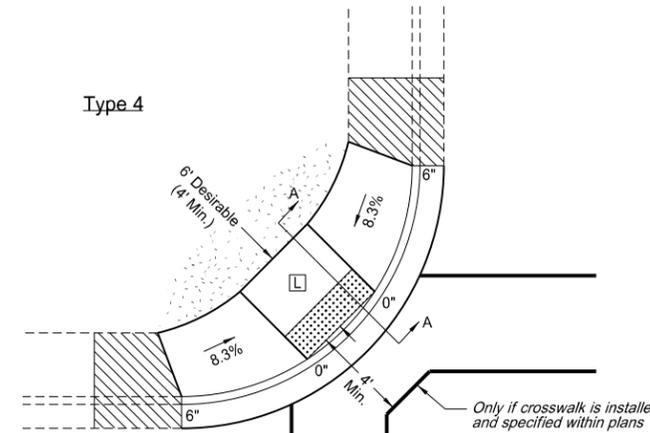
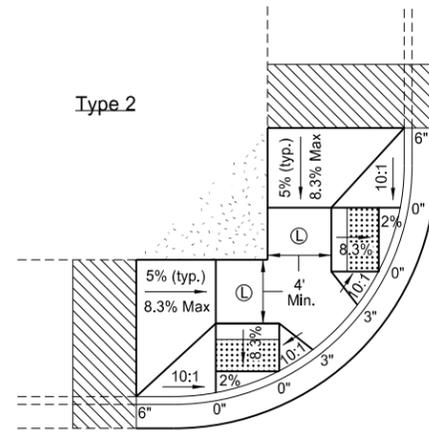
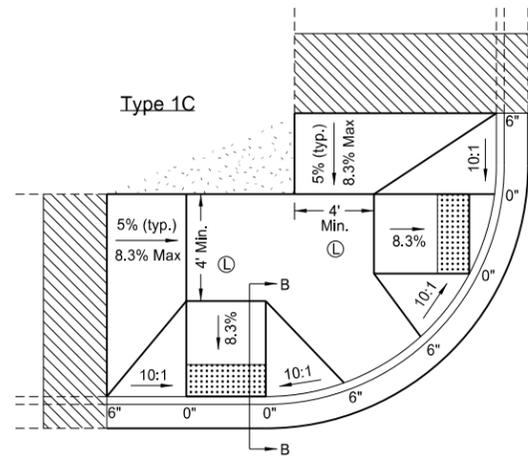
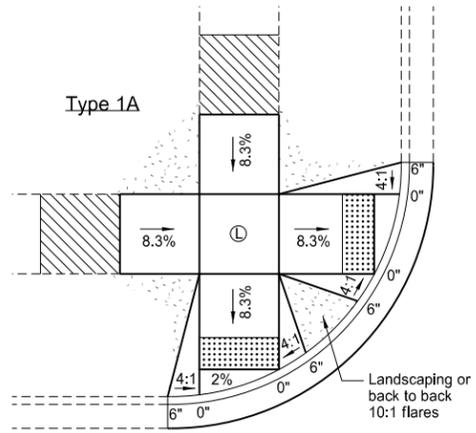
Less Right of Way

**NOTES:**

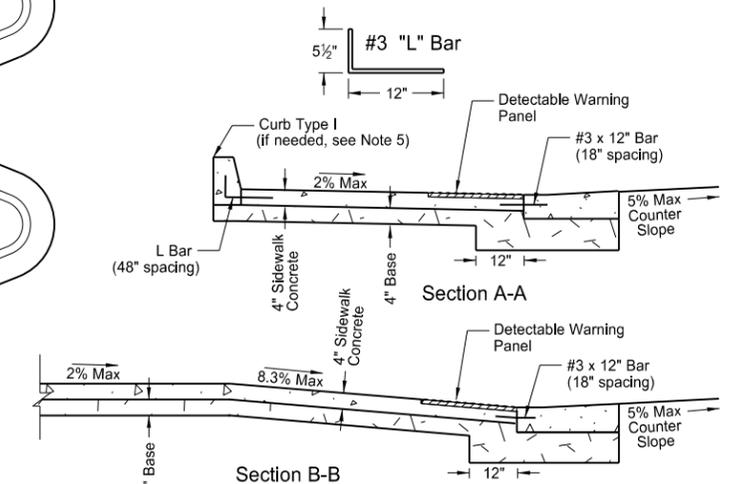
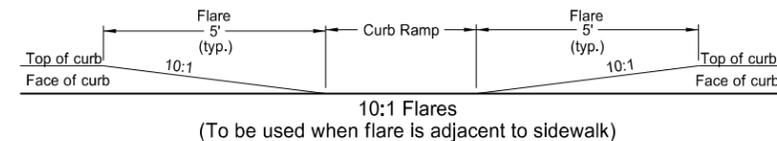
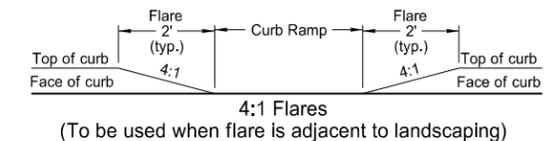
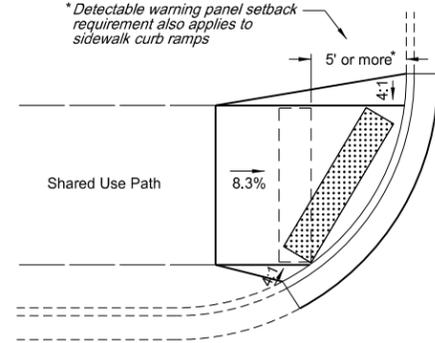
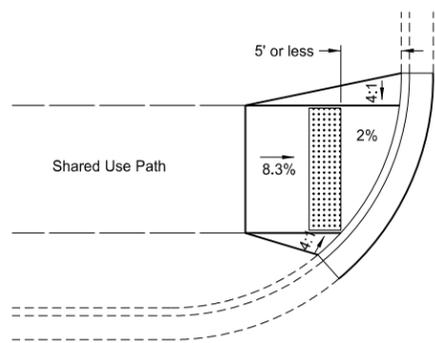
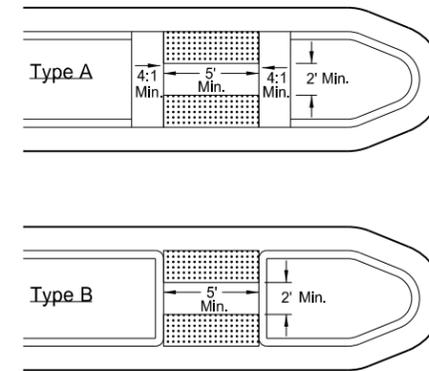
- Ramp width is defined as the useable portion of the ramp, excluding flares if used.  
Curb ramp width should match the existing sidewalk width. 4' width minimum.  
Ramp width for shared-use paths should match the existing shared use path width.  
Ramp length shall be maximum of 15'.
- Landings shall be a minimum of 4' x 4' and shall have a max 2% slope in any direction. Landings are desirably 5' x 5' or larger.
- Detectable warning panels shall match the ramp width. Radial panels may also be used. The detectable warning panel may be located within the lower landing.
- The pedestrian access route shall be continuous 4' min. width. Max 2% cross slope applies to all concrete, excluding flares.
- Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.

**LEGEND:**

- : Detectable Warning Panel
- : Landscaping
- : Transitional tie-in segment if needed for retrofits. Max grade slope 8.3%.
- : Upper Landing
- : Lower Landing
- 0", 3", or 6" : Curb Height
- 8.3% : All slopes shown are max grades. Flatter slopes may be used.



**Median Refuge Islands (Cut-Through)**



NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE

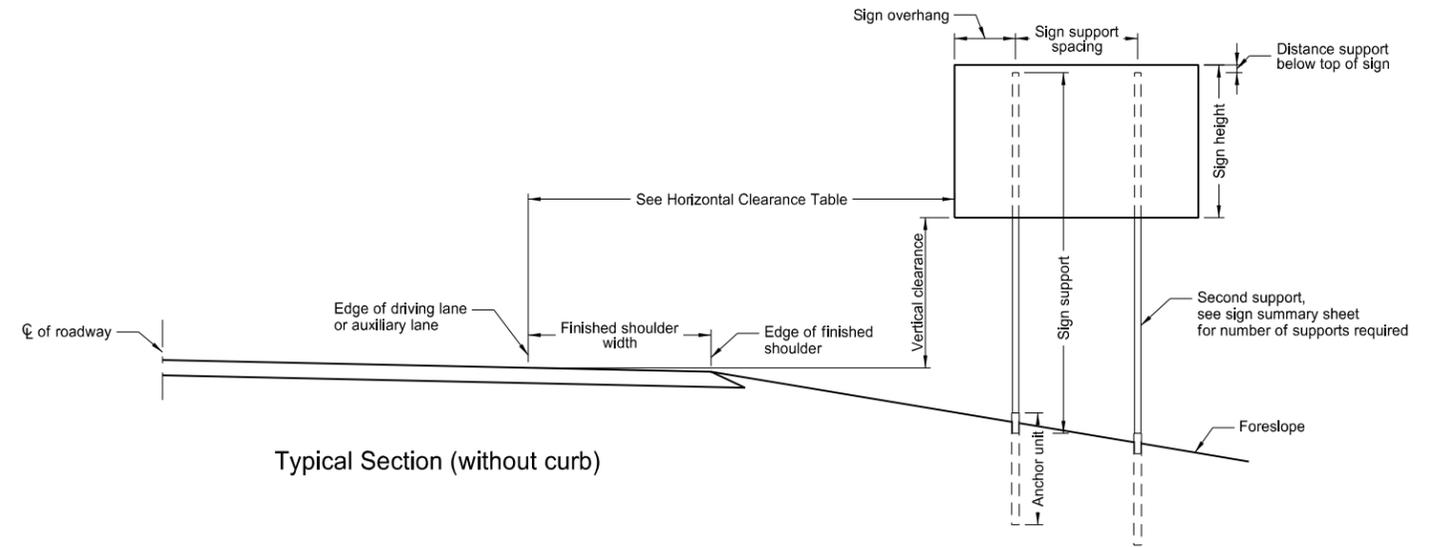
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# PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

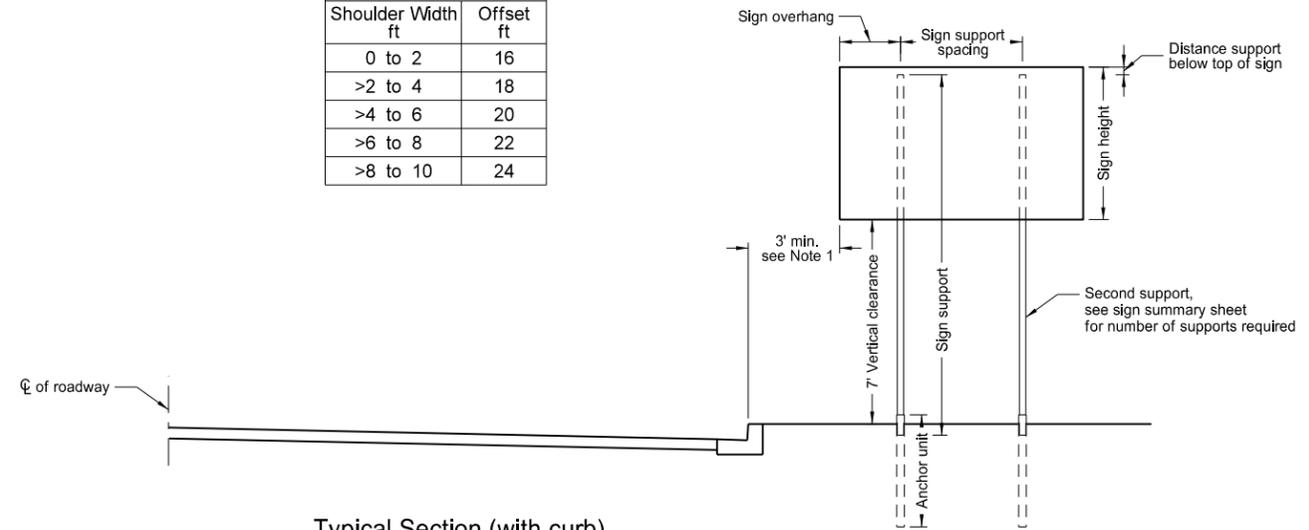
**Notes:**

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.

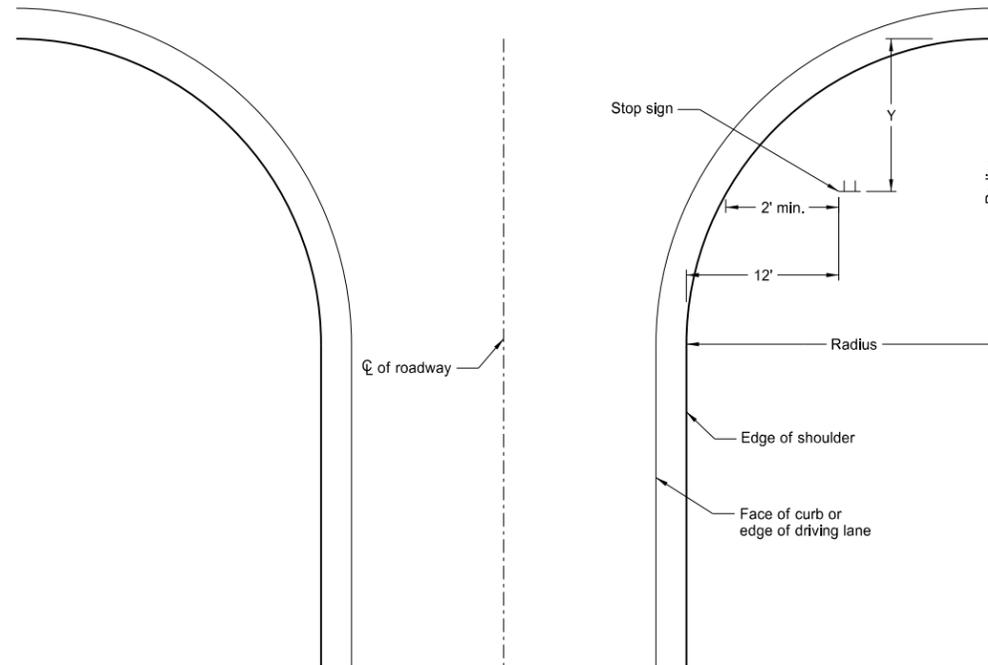


Typical Section (without curb)

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



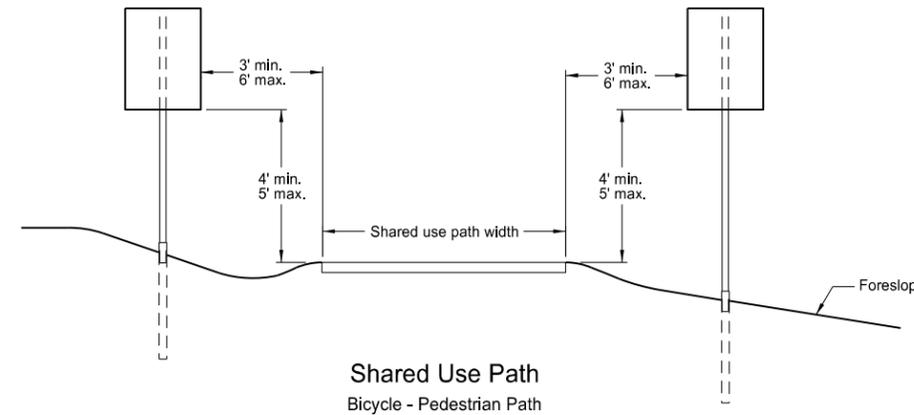
Typical Section (with curb)  
Residential or Business District



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



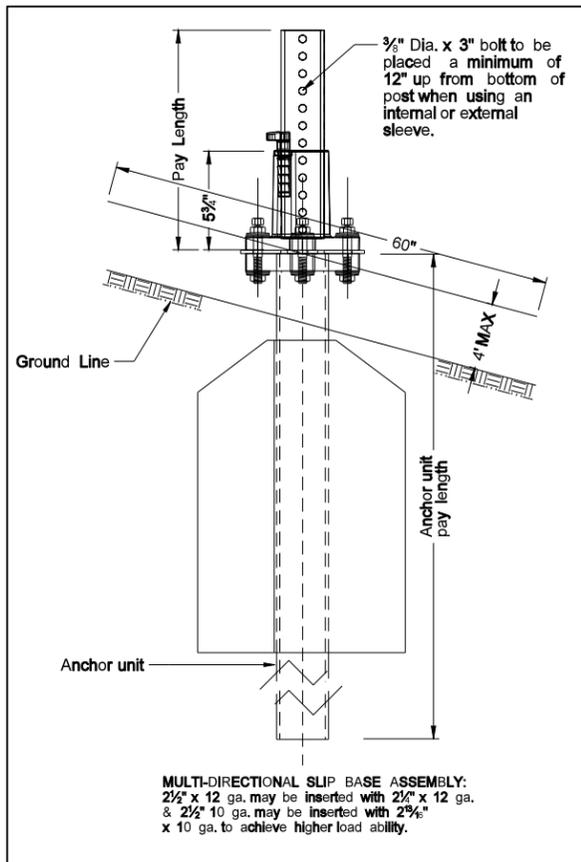
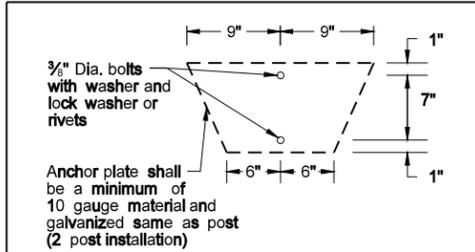
Shared Use Path  
Bicycle - Pedestrian Path

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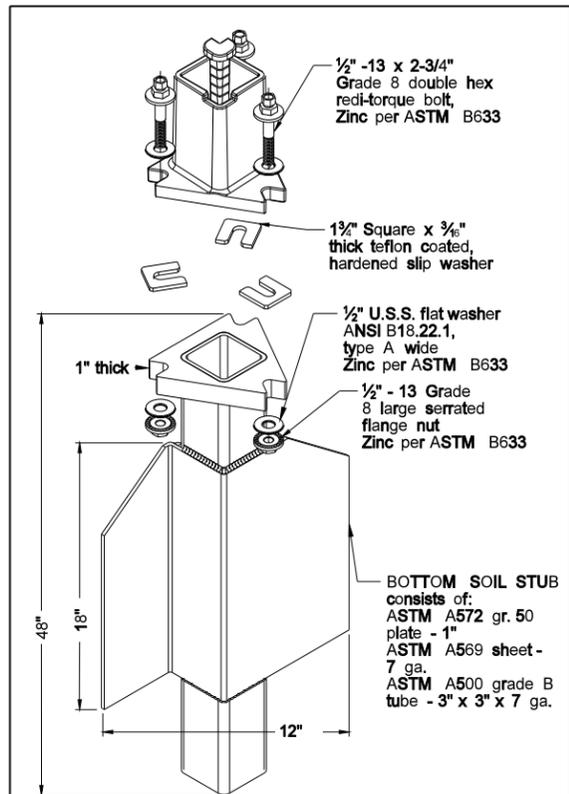
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/2	12
1	2 1/2	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/2	12	2 1/2(D)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

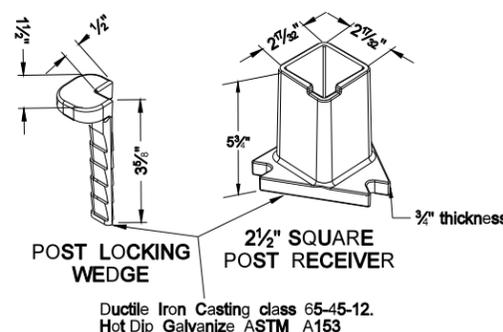


MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:  
 2 1/2" x 12 ga. may be inserted with 2 1/2" x 12 ga. & 2 1/2" 10 ga. may be inserted with 2 3/8" x 10 ga. to achieve higher load ability.

Mounting Details Perforated Tube



SLIP BASE FOR 2 1/2" POST



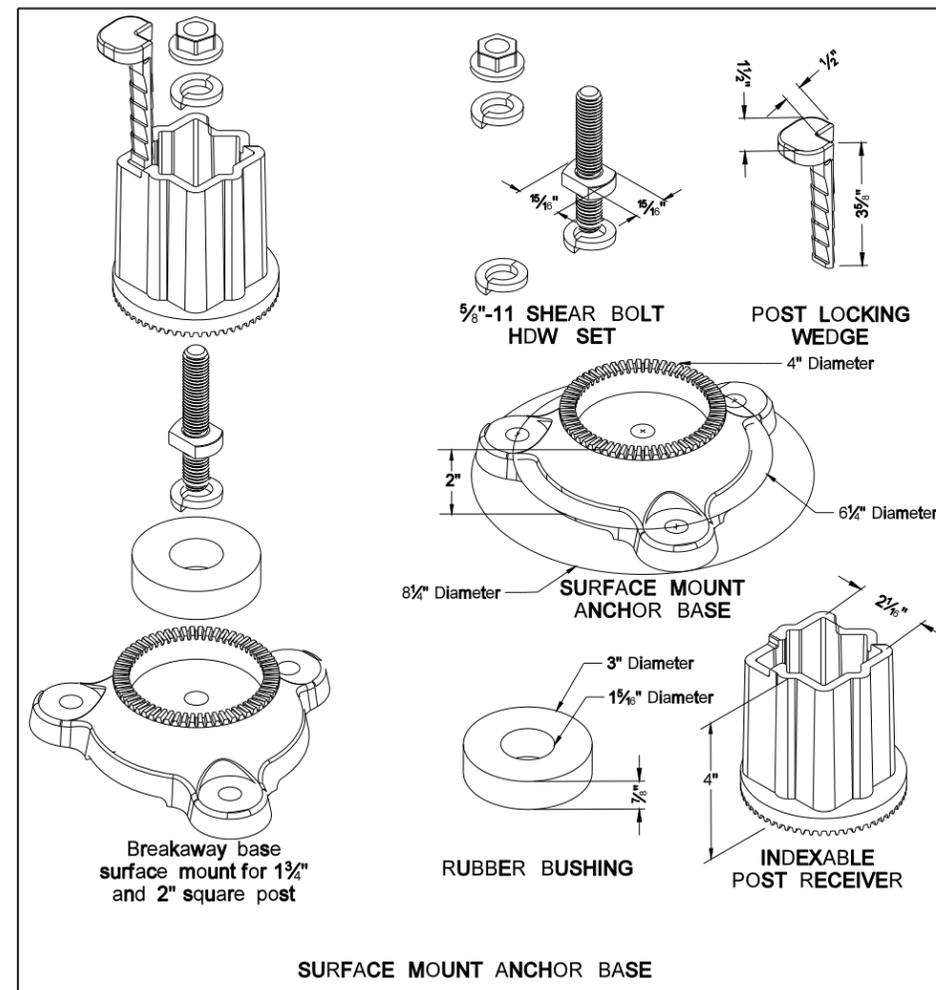
SLIP BASE DETAIL

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.

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.



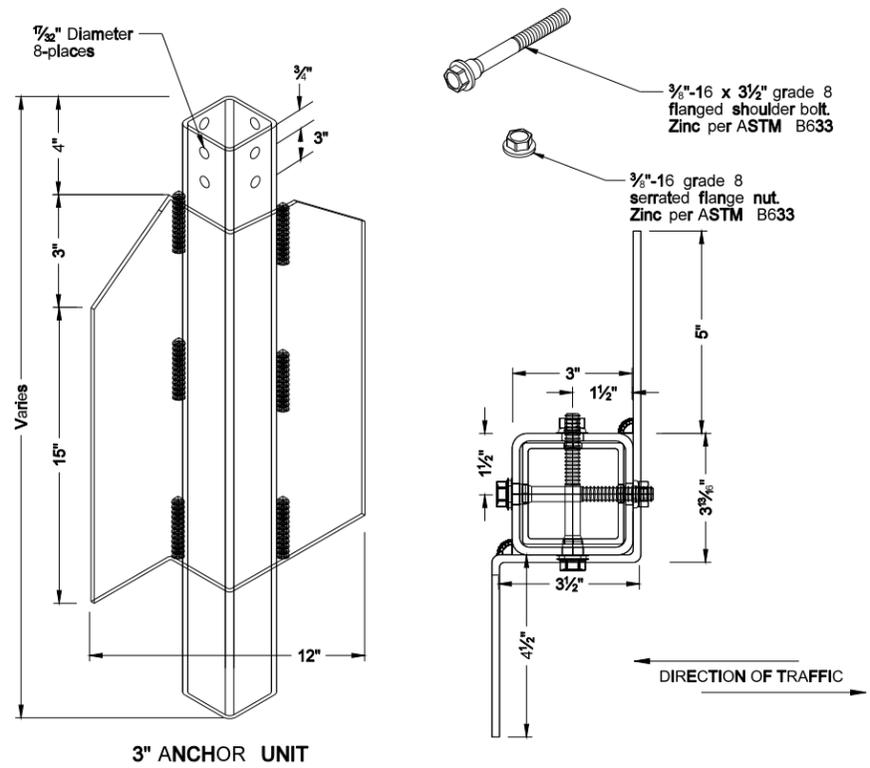
SURFACE MOUNT ANCHOR BASE

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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)

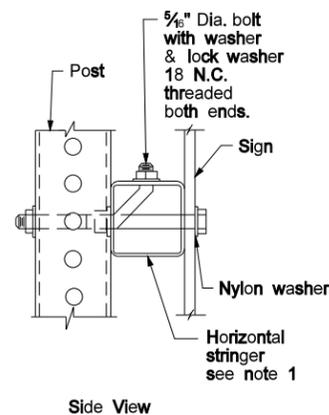


3" ANCHOR UNIT

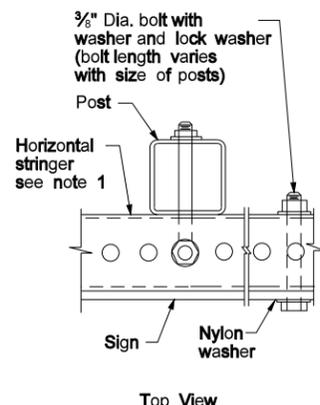
Mounting Details Perforated Tube

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 5/8" ± 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.

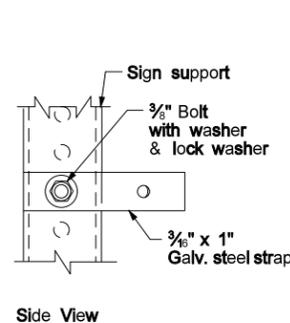


Side View

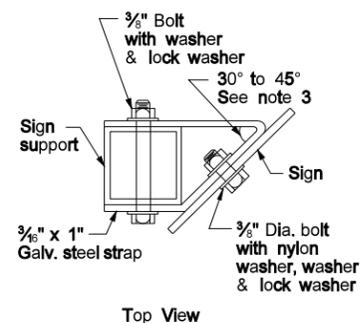


Top View

STRINGER MOUNTING  
(WITH STRINGER IN FRONT OF POST)

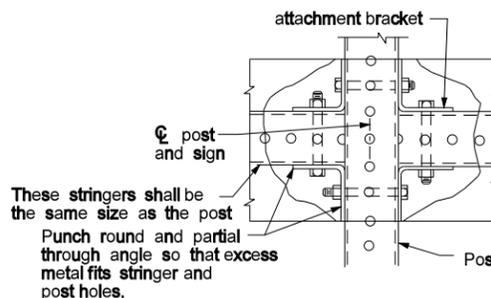


Side View



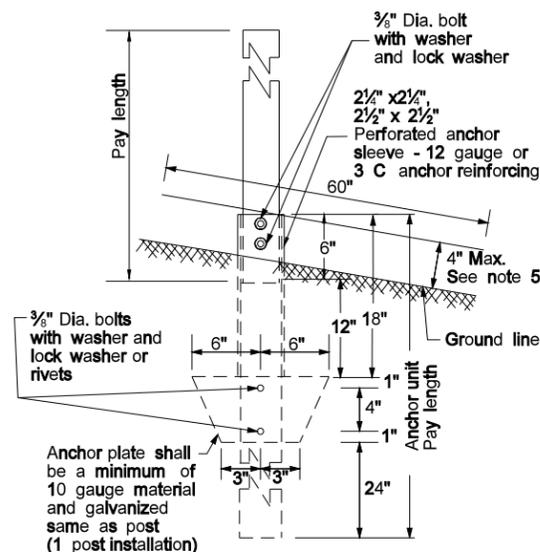
Top View

STRAP DETAIL

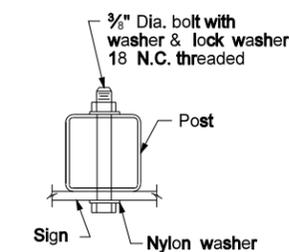
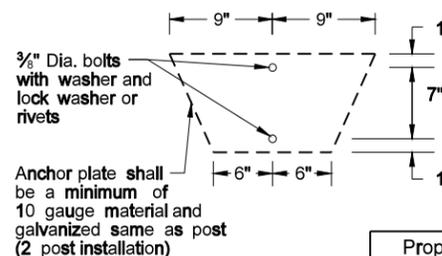


These stringers shall be the same size as the post. Punch round and partial through angle so that excess metal fits stringer and post holes.

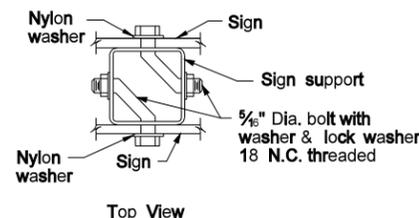
STREET NAME SIGNS  
AND ONE WAY SIGNS  
SINGLE POST ASSEMBLY  
ONE STRINGER OR  
BACK TO BACK MOUNTING



ANCHOR UNIT AND  
POST ASSEMBLY



BOLT MOUNTING



Top View

BACK TO BACK  
MOUNTING

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>	Gross 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

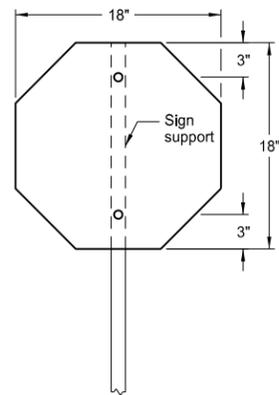
The 2 1/4" size 10 gauge is shown as 2.19" size on the plans.  
The 2 1/2" size is shown as 2.51" size on the plans.

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 1/2	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	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

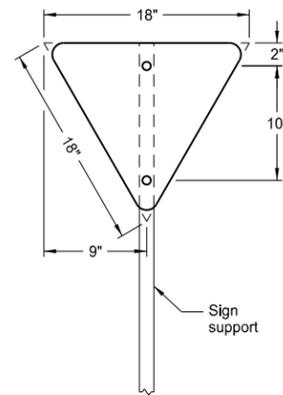
(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy,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

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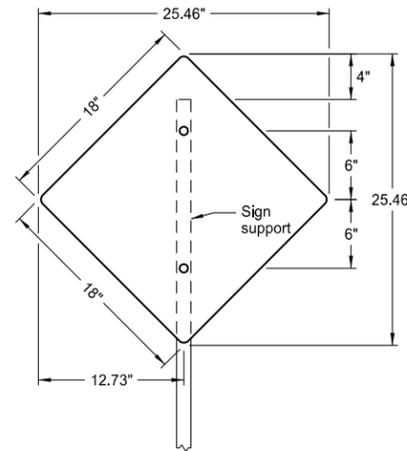
BIKE ROUTE SIGNS  
PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR  
REGULATORY, WARNING AND GUIDE SIGNS



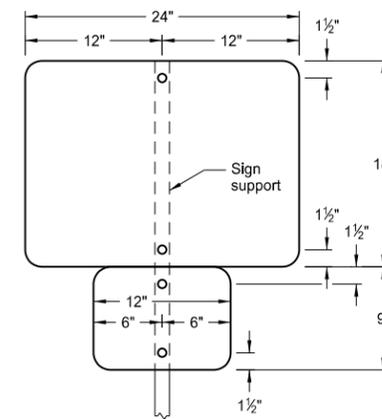
1 Post  
Assembly No. 100



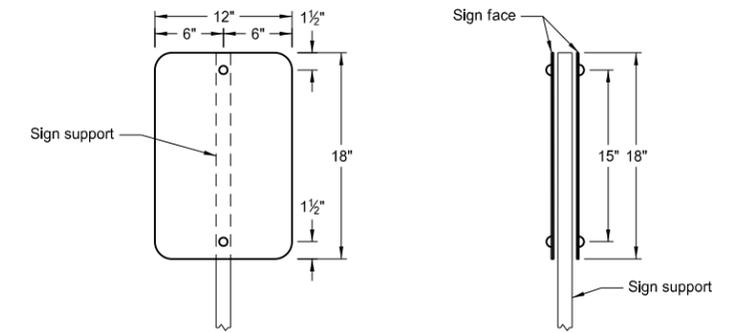
1 Post  
Assembly No. 101



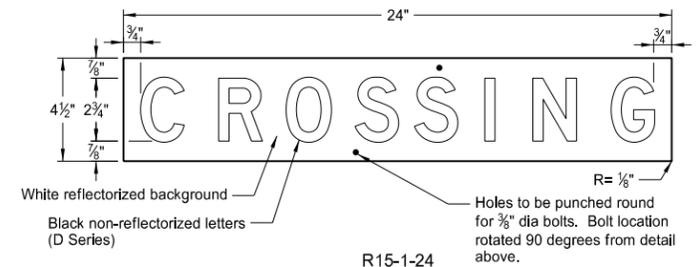
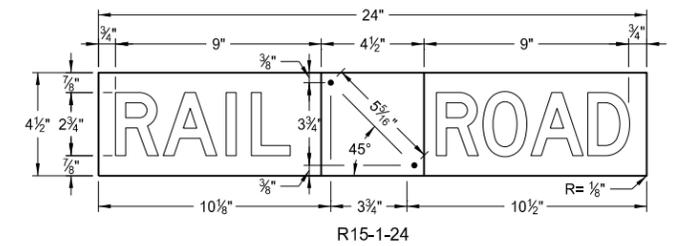
1 Post  
Assembly No. 102



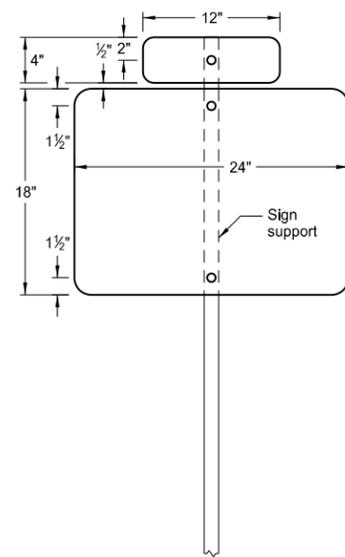
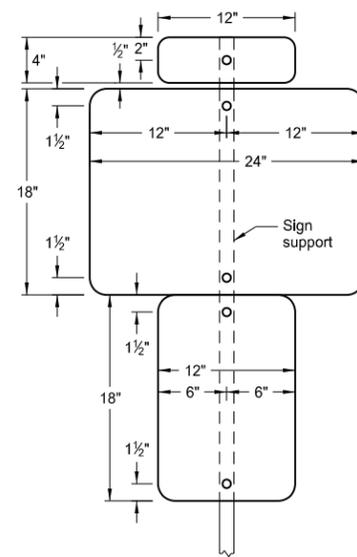
1 Post  
Assembly No. 103



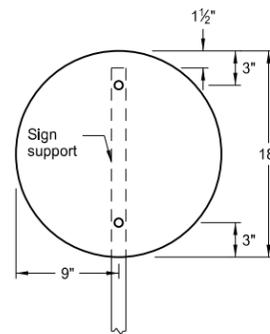
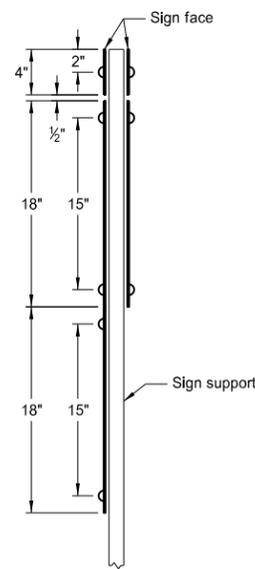
1 Post  
back to back  
Assembly No. 104



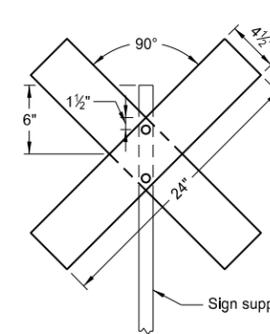
Railroad Crossing Sign Details



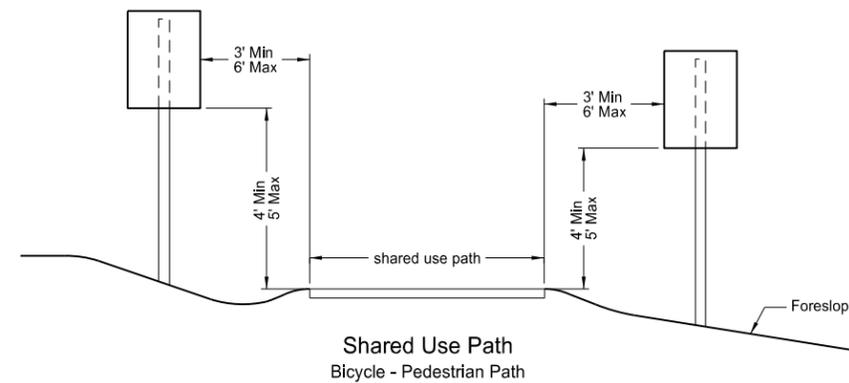
1 Post  
back to back  
Assembly No. 105



1 Post  
Assembly No. 106



1 Post  
Assembly No. 107



Shared Use Path  
Bicycle - Pedestrian Path

Notes:

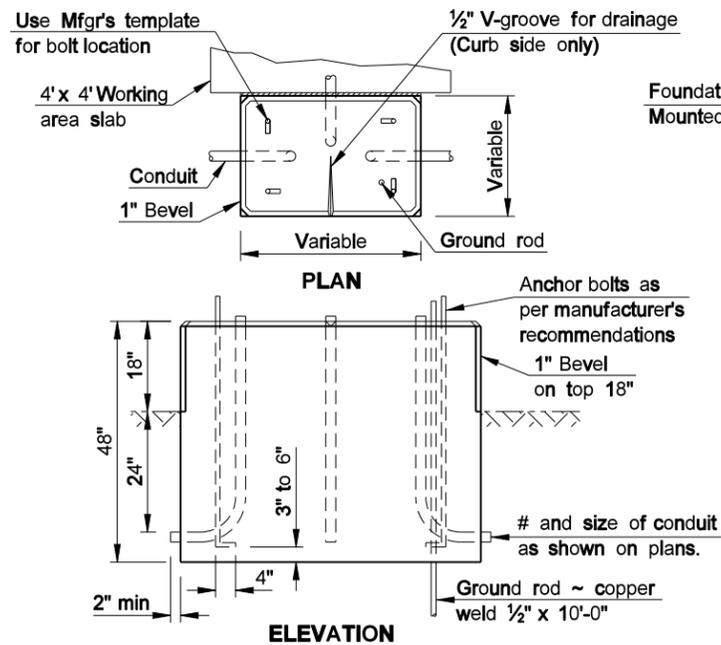
1. The minimum sign backing material thickness shall be 0.100 inch.
2. All holes shall be punched round for 3/8" bolt.

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8-22-12	
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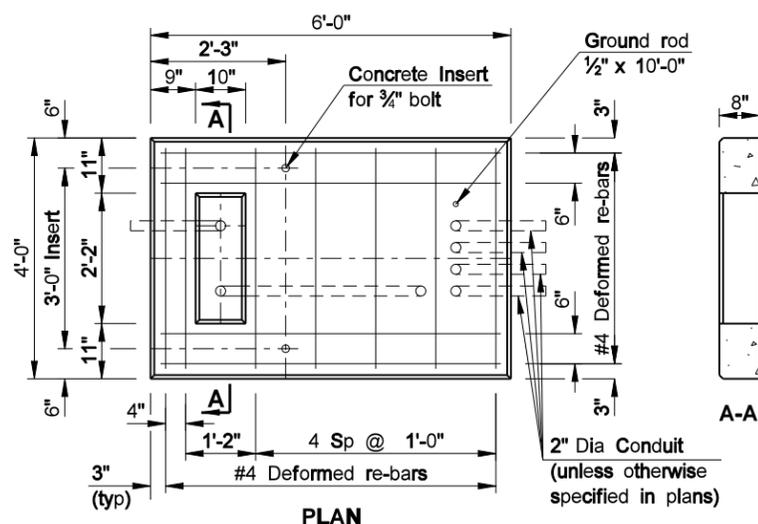


**CONCRETE FOUNDATIONS  
(TRAFFIC SIGNALS & HIGHWAY LIGHTING)**

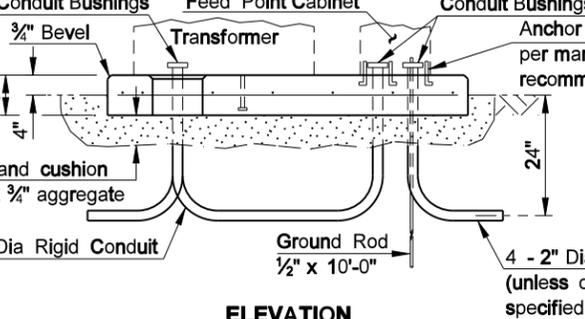


**CONTROLLER CABINET FOUNDATION PAD MOUNT**

The Controller Cabinet Foundation shall be bid as Concrete Foundation - Traffic Signals.

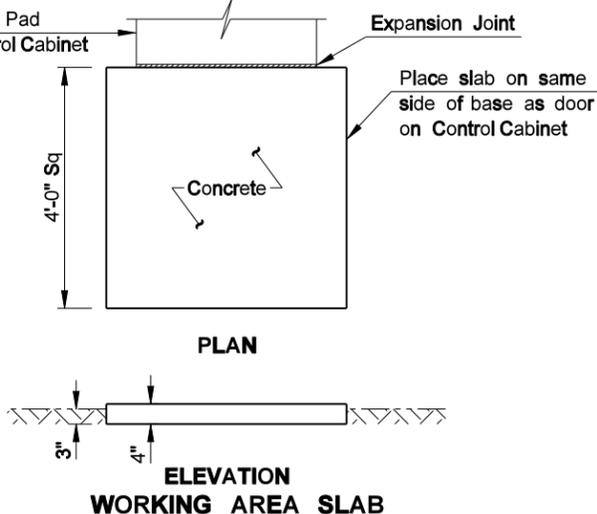


**TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNT**

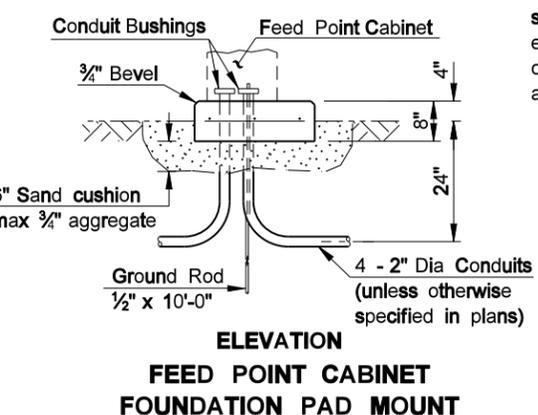
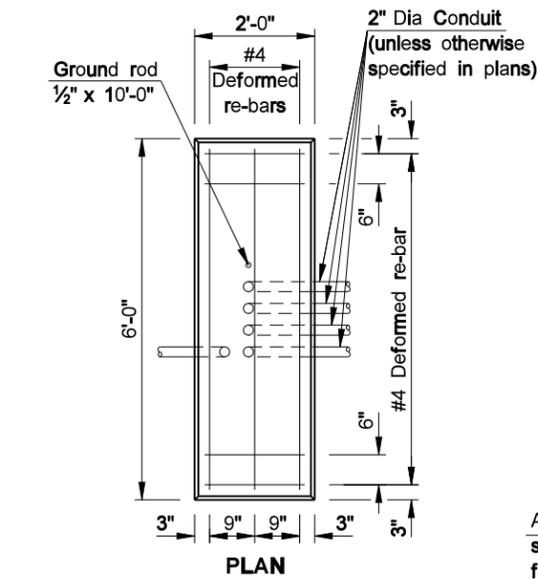


**TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNT**

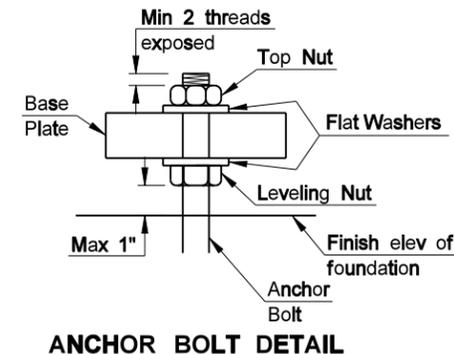
The Transformer & Feed Point Cabinet Foundation Pad Mount shall be bid as Concrete Foundation ~ Feed Point ~ Type A.



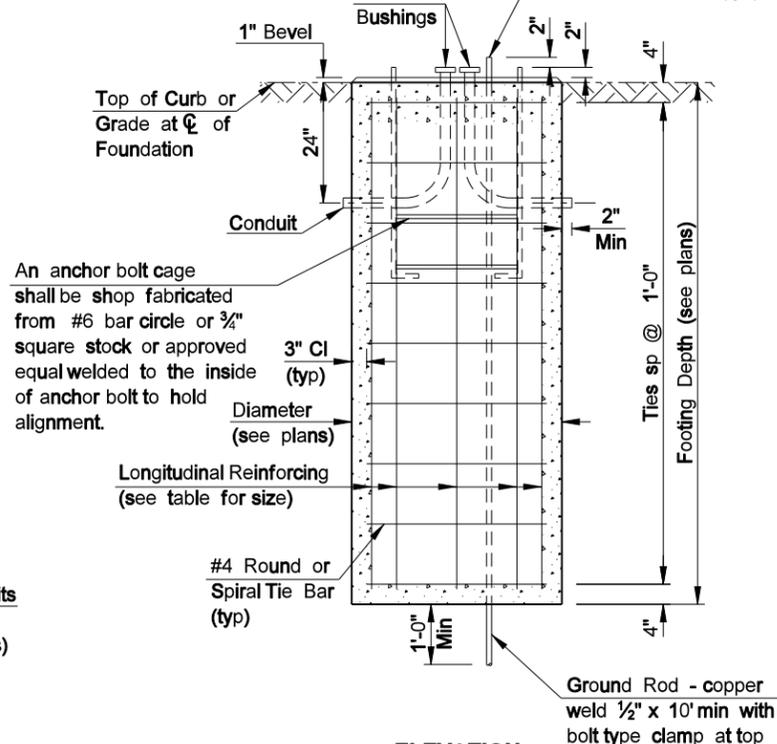
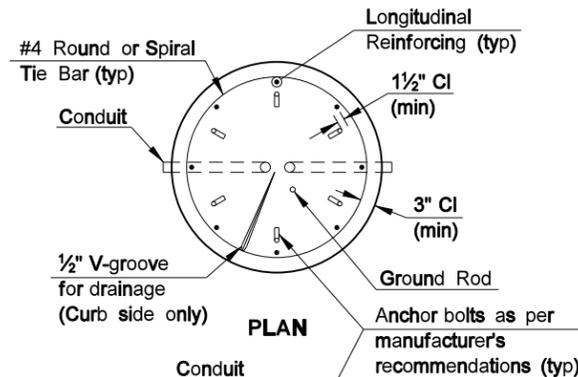
The Working Area Slab shall be installed where shown on the plans and shall not be bid separately but shall be included in the price bid for Concrete Foundation - Traffic Signals.



The Feed Point Cabinet Foundation Pad Mount shall be bid as Concrete Foundation ~ Feed Point ~ Type B.



**ANCHOR BOLT DETAIL**



An anchor bolt cage shall be shop fabricated from #6 bar circle or 3/4\"/>

**LIGHT & SIGNAL STANDARD FOUNDATION**

**NOTES:**

**LIGHT & SIGNAL STANDARD FOUNDATIONS:** See plans for conduit size, number of bends and correct position for each foundation. When conduit does not continue beyond the foundation, conduit with a 105° bend and bushings on both ends may be substituted for the 90° bends shown. See plans for correct size & location of foundations. The grade and exact location shall be established by the Engineer in the field. All reinforcing shall be Grade 60. Tie bars shall have a minimum of a 12\"/>

**CONTROLLER CABINET FOUNDATION PAD MOUNT FOUNDATION:** See plans for the number of 90° bends per foundation and correct positioning. The foundation for Pad Mounted Controller Cabinet shall be of sufficient size so that there is a minimum of 3\"/>

**WORKING AREA SLAB:** The materials and preparation of this slab shall be as approved by the Engineer in the field.

**TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNTED:** The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plug.

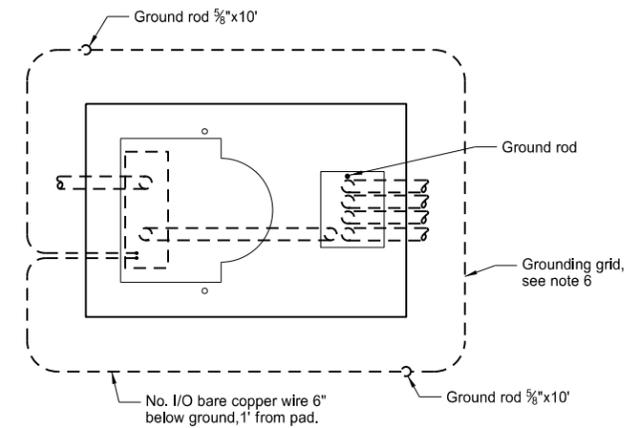
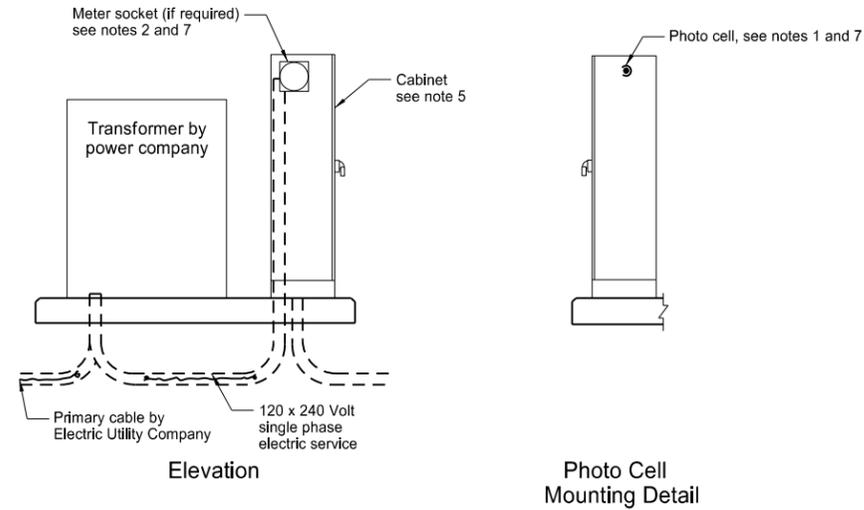
**FEED POINT CABINET FOUNDATION PAD MOUNTED:** The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plug.

LIGHT & SIGNAL FOUNDATION TABLE	
FOOTING DEPTH (ft)	LONGITUDINAL REINFORCING
≤ 12	8 - #5
13 - 14	8 - #6
15 - 16	8 - #7
17 - 19	8 - #8

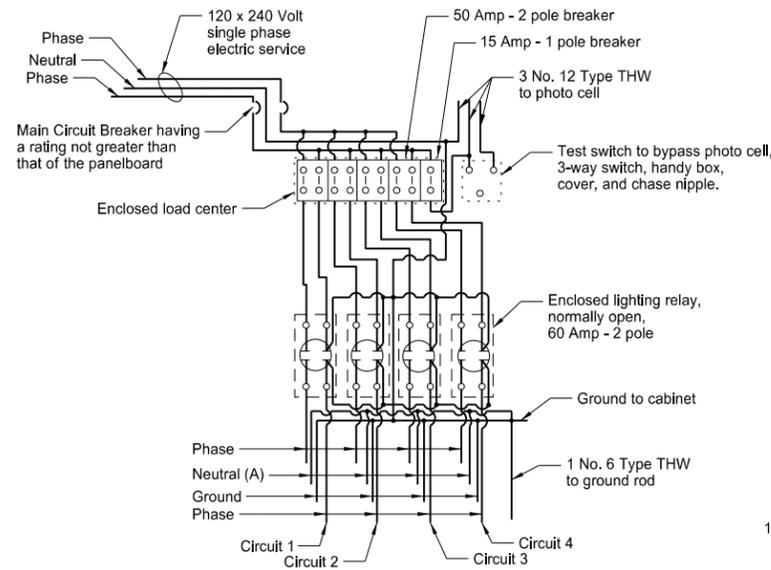
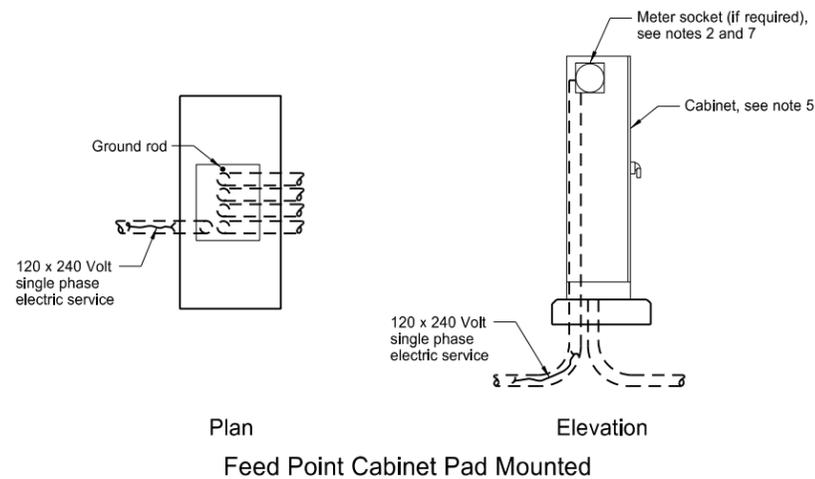
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FEED POINTS  
(ROADWAY LIGHTING)



Plan  
Transformer and Feed Point Cabinet Pad Mounted



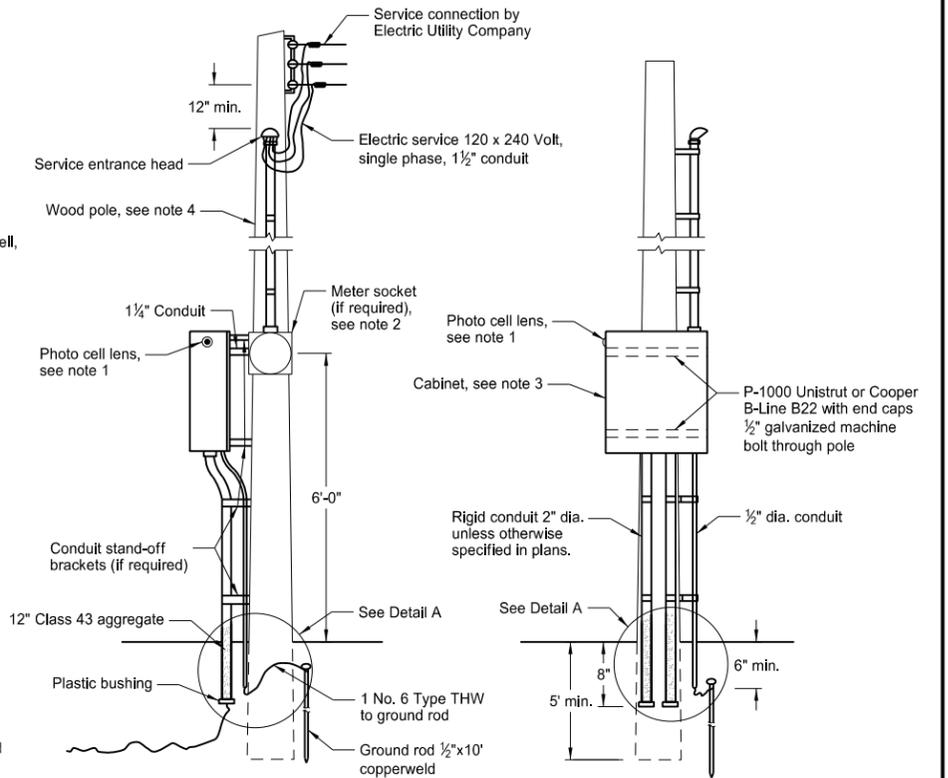
Feed Point Type IV

Type I feed point is similar to Type IV except only one electrical circuit, one 50 Amp - 2 pole breakers and one lighting relay, normally open, shall be installed.

Type II feed point is similar to Type IV except only two electrical circuit, two 50 Amp - 2 pole breakers and two lighting relays, normally open, shall be installed.

Type III feed point is similar to Type IV except only three electrical circuits, three 50 Amp - 2 pole breakers and three lighting relays, normally open, shall be installed.

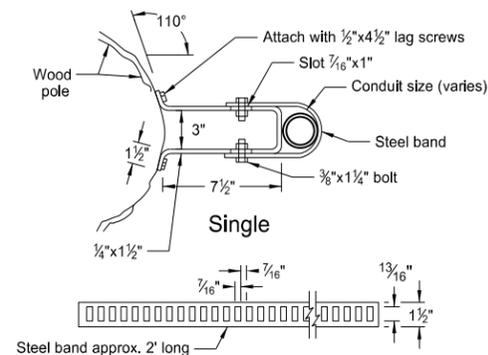
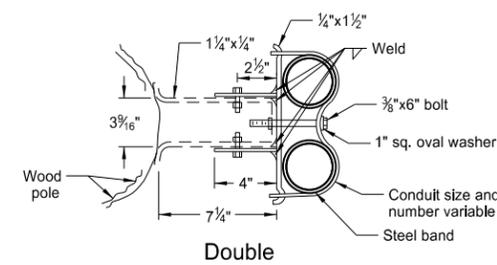
(A) Install when festoon circuit is required.



Feed Point Pole Mounted

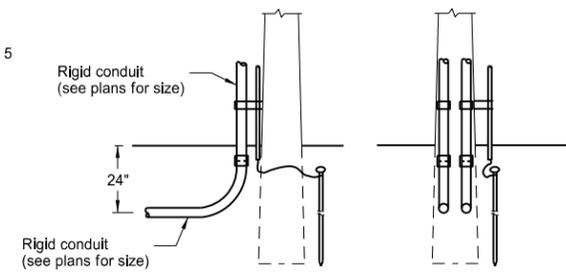
Notes:

1. Photo Cell: The electrical contractor shall furnish and install the photoelectric cell. The photo lens shall face north.
2. Meter Socket: The contractor shall install the meter socket and trim if the meter is required by local Utility Company. Meter to be furnished and installed by Utility Company.
3. Pole Mounted Cabinet: Cabinet shall have lock drip shield, factory installed steel backing, stainless steel hardware, and side hinge door. Cabinet shall be shop coated with one coat of primer and have two coats of exterior gray enamel.  
Type I and II feed point shall be 30" high x 24" wide x 8" deep, Type III and IV feed point shall be 30" high x 42" wide x 10" deep or 36" high x 36" wide x 10" deep.
4. Wood Pole: Minimum 20' Class VII full length penta pressure treated wood pole. (if required, see layout sheets)
5. Pad Mounted Cabinet: Cabinet shall be 56" high x 26" wide x 14" deep. Minimum 12 gauge steel or aluminum with provisions for padlock. Cabinet shall be weatherproof. A steel cabinet shall have one coat of primer and two coats of exterior dark green enamel.
6. Grounding Grid: The grounding grid shall have a ground resistance not to exceed 25 ohms. This shall be obtained by one or more 5/8"x10' copperweld ground rods in parallel or series at two corners. Minimum distance between ground unit assemblies shall be 6'0".
7. Meter Location: The meter (if required) shall not be mounted on the same side of the cabinet as the photo cell.



Conduit Standoff Bracket

The conduit standoff brackets may be omitted if not required by the local utility company.

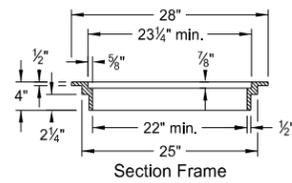
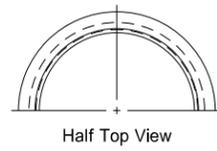
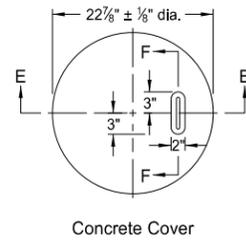
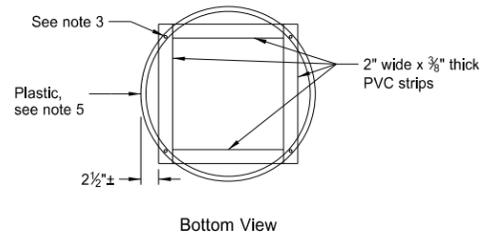
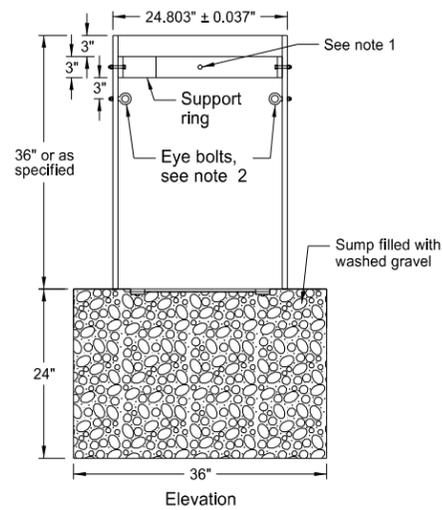
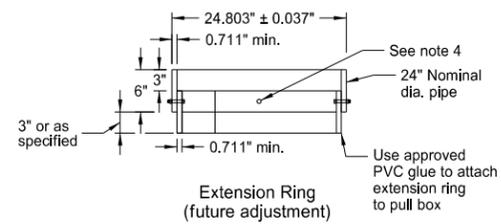


Use this detail if there is a continuous run of conduit from the feed point to the first light standard.

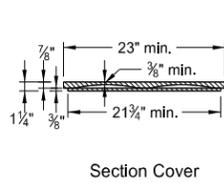
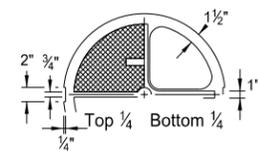
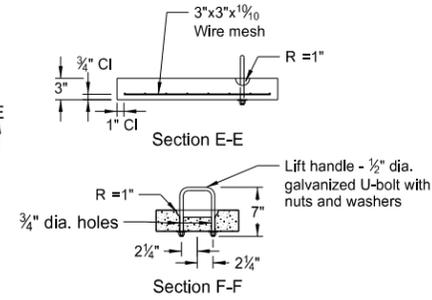
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7-8-14	Revised note 3

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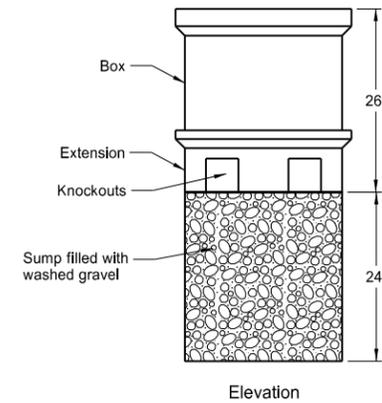
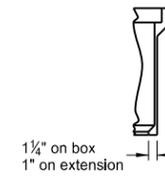
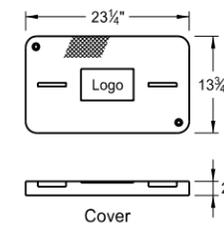
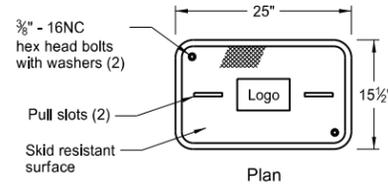
PULL BOX DETAILS



Cast Iron Frame and Cover



Section Cover



Elevation

Polymer Concrete Pull Box

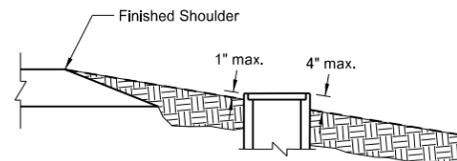
Note: Polymer concrete reinforced by a heavy weave fiberglass

Notes:

1. Place top of pull box flush with surfaced area and approximately one inch above earth or sodded areas on level surfaces.
2. Pull box shall have at least one knockout per side.
3. Polymer Concrete pull box shall be Tier 22 as per ANSI / SCTE 77.

PVC Pull Box Notes:

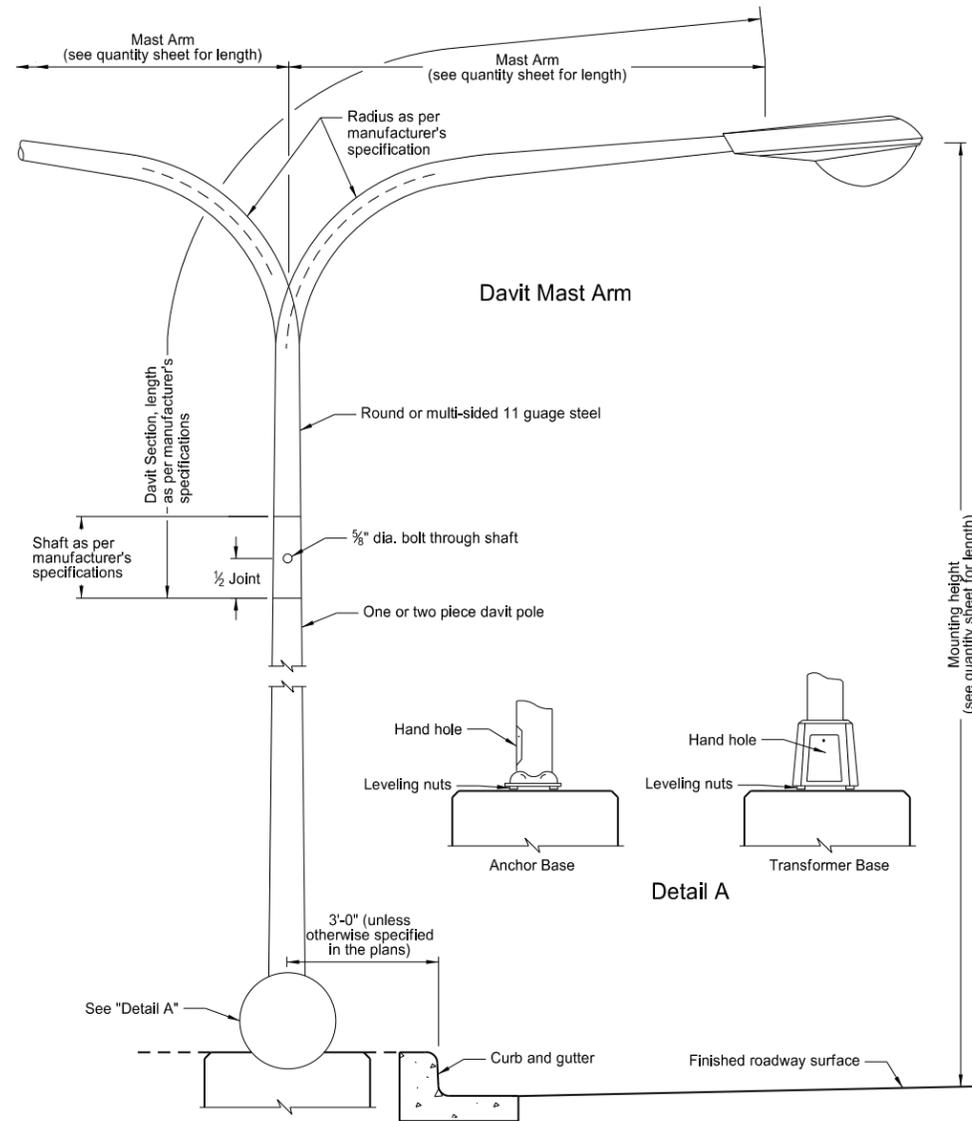
1. Attach split 24" nominal diameter PVC cover support ring with four 3/8" dia. x 2" long stainless steel hex head bolts with nuts at 90 degrees apart.
2. Two type 2 shoulder eye bolts, 3/8" dia. x 1 1/4" shank length with hex nuts 180 degrees apart (for lifting pull box and supporting electric cable).
3. Four 1/4" x 1 1/4" long galvanized lag screws. Screw assembly together.
4. Attach split 24" nominal diameter PVC cover support extension ring with four 3/8" dia. x 2" long stainless steel hex head bolts with nuts at 90 degrees apart.
5. Bolt assembly together.
6. Conduit holes located in barrel section shall be sized no more than 1" larger than size of conduit being used.
7. After pull box and conduit installation all inside walls and cover shall be made water tight to the satisfaction of the Engineer.
8. PVC pipe to meet requirements of ASTM F679T-1 or equal.
9. Hex head bolts and nuts shall be austenitic stainless steel. Other fasteners to be galvanized as per AASHTO M-232.
10. Concrete cover shall be coated on top and sides with an approved epoxy coating. The epoxy protective coating shall be light gray, clear, or neutral in color and shall be applied as recommended by the manufacturer. The surfaces of the concrete to which the epoxy protective coating is applied, shall be cleaned by wire brush and shall be dry before application.
11. Cast Iron Cover castings shall be gray iron as per AASHTO M 105, Class 35B.



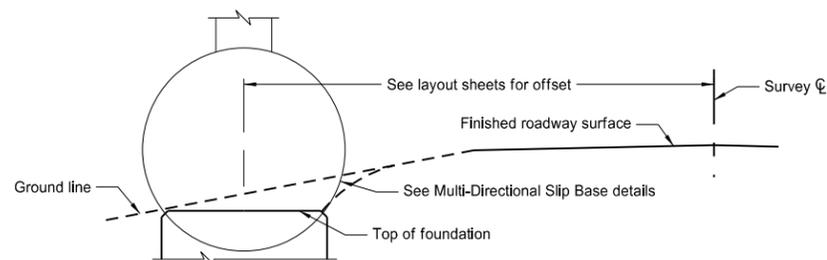
Typical Pull Box in Rural Section

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7-8-14	Added Note 3

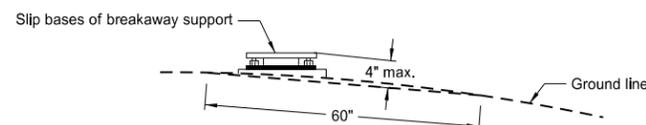
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Light Standard Details



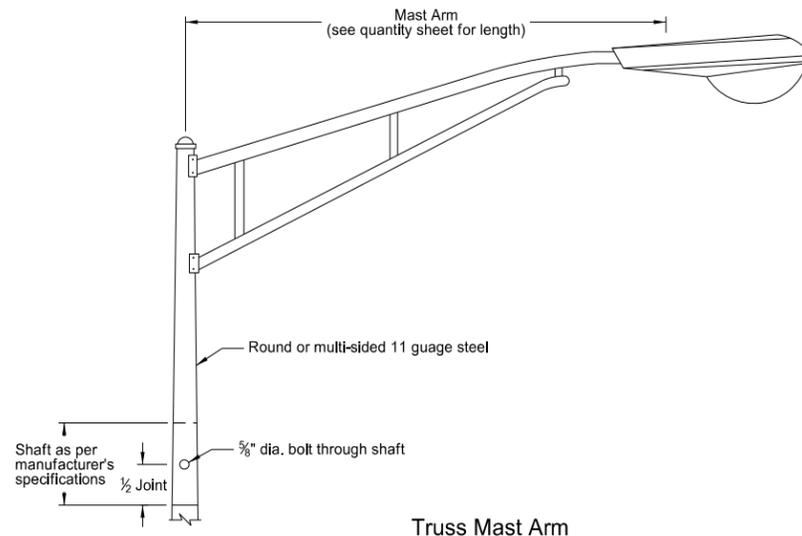
Concrete Foundation Location



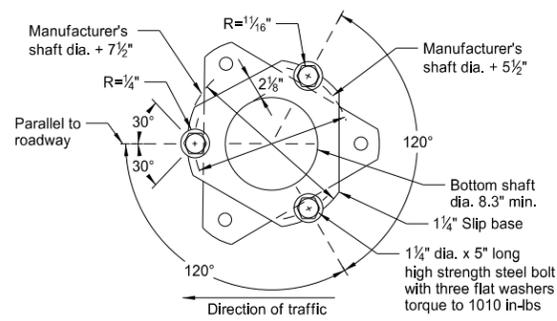
Breakaway Support Stub Clearance Diagram

Mounting height (see quantity sheet for length)

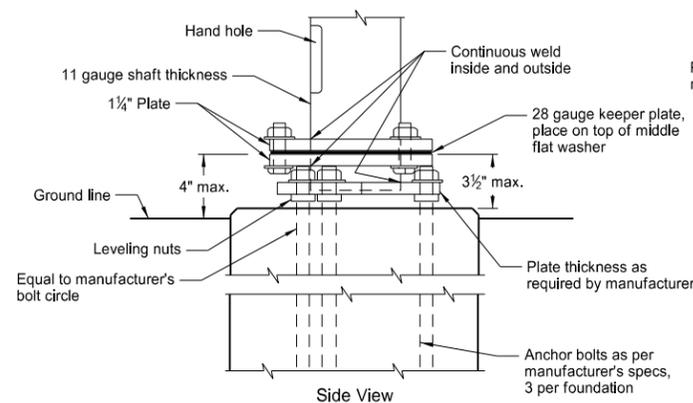
LIGHT STANDARD DETAILS



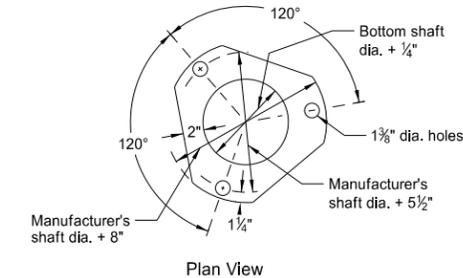
Truss Mast Arm



Top View



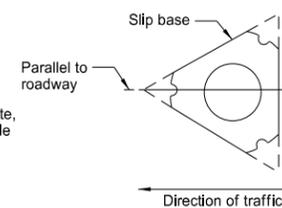
Steel Base Detail



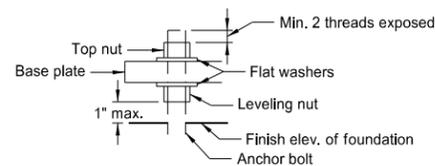
Plan View

Keeper Plate Detail (A)

(A) ASTM A446 Grade "A" 28 gauge keeper plate on top of middle flat washer. The Keeper plate shall be galvanized after fabrication.

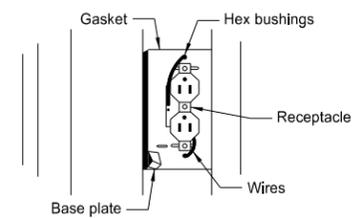


Slip Base Placement Detail

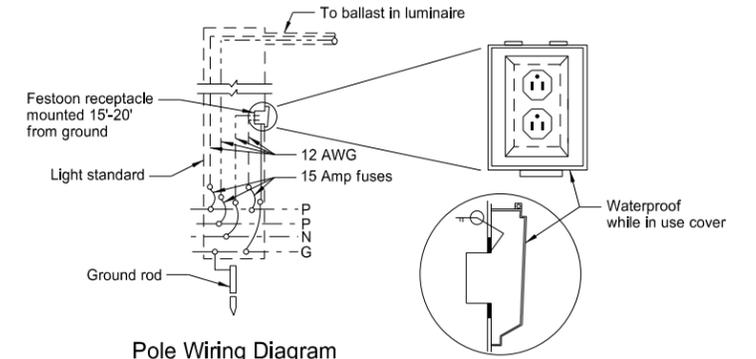


Anchor Bolt Detail

Multi-Directional Slip Base



Optional: Festoon receptacle mounted on multi-sided pole.



Pole Wiring Diagram

Receptacle Mounting Detail (B)

(B) Receptacle shall be mounted on the side of the pole that faces the street side. Festoon Receptacle shall be installed only when specified in the plans.

Notes:

Light Standard Locations: The offset distance shall have a minimum offset from the curb face of 3 feet. Light standards that are placed in urban areas and where speeds are less than 30 mph, may be placed at 3 feet. Where speeds are 30 mph or more, light standards shall be placed at least 16 feet from the driving lane.

Steel Standards: Marred or scratched areas shall be touched up after erection.

Luminaire: Shall be internal ballast-constant wattage 120x240 voltage. See layout sheets for type of luminaire, wattage, I.E.S. distribution, and operating system.

Fusing: Fusing in base, see specifications.

Slip Base Bolt Torque Procedure:

1. Tighten all bolts the maximum possible with 12" to 15" wrench to bed washers and to clean bolt threads, then loosen.
2. Retighten bolts with a systematic order to prescribed torque.
3. Loosen each bolt and retighten to prescribed torque in the same order as initial retightening.
4. Burr threads of junction with nut using center punch to prevent nut loosening.

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