DESIGN DATA				
Traffic	Average Daily			MAX HR
Current (2021)	Pass: 1177	Trucks: 97	Total: 1274	N/A
Forecast (2051)	Pass: 2266	Trucks: 186	Total: 2452	N/A
Clear Zone Distance: N/A		Design Speed: 25 mph		
Minimum Sight Distance for Stopping: 155'		Bridges: N/A		
Sight Distance for No Passing Zone: N/A				
Pavement Design Life: 30 years				
Design Accumulated One-way ESAL's: 651,034				

CITY OF DICKINSON
NORTH DAKOTA

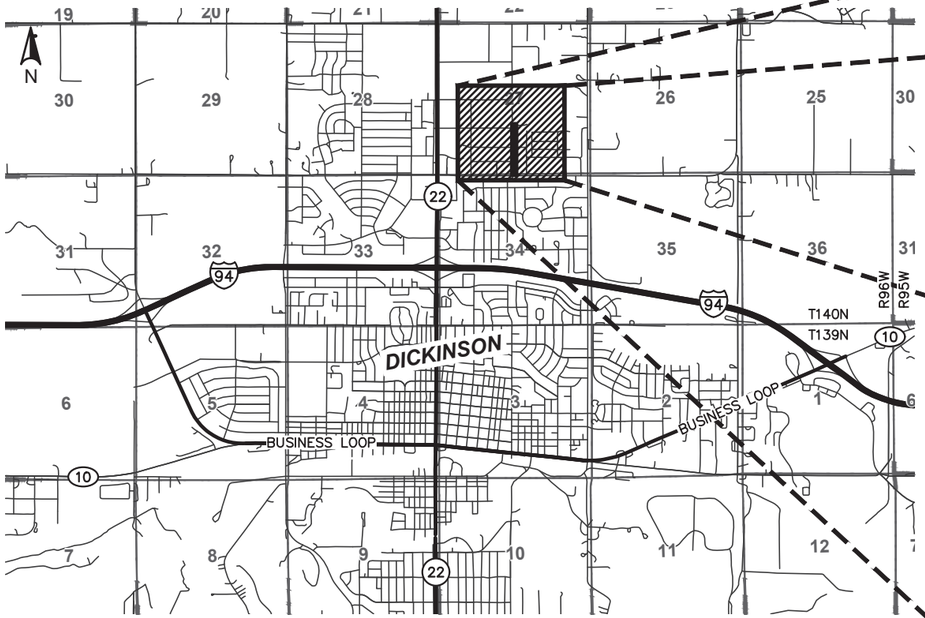
NDDOT PROJECT NO. SU-CVD-5-983(066)
STARK COUNTY
4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

Excavation, Concrete Paving, Valley Gutter,
Curb & Gutter, Curb Ramps, Sidewalk, Driveway, Signs, and Lighting

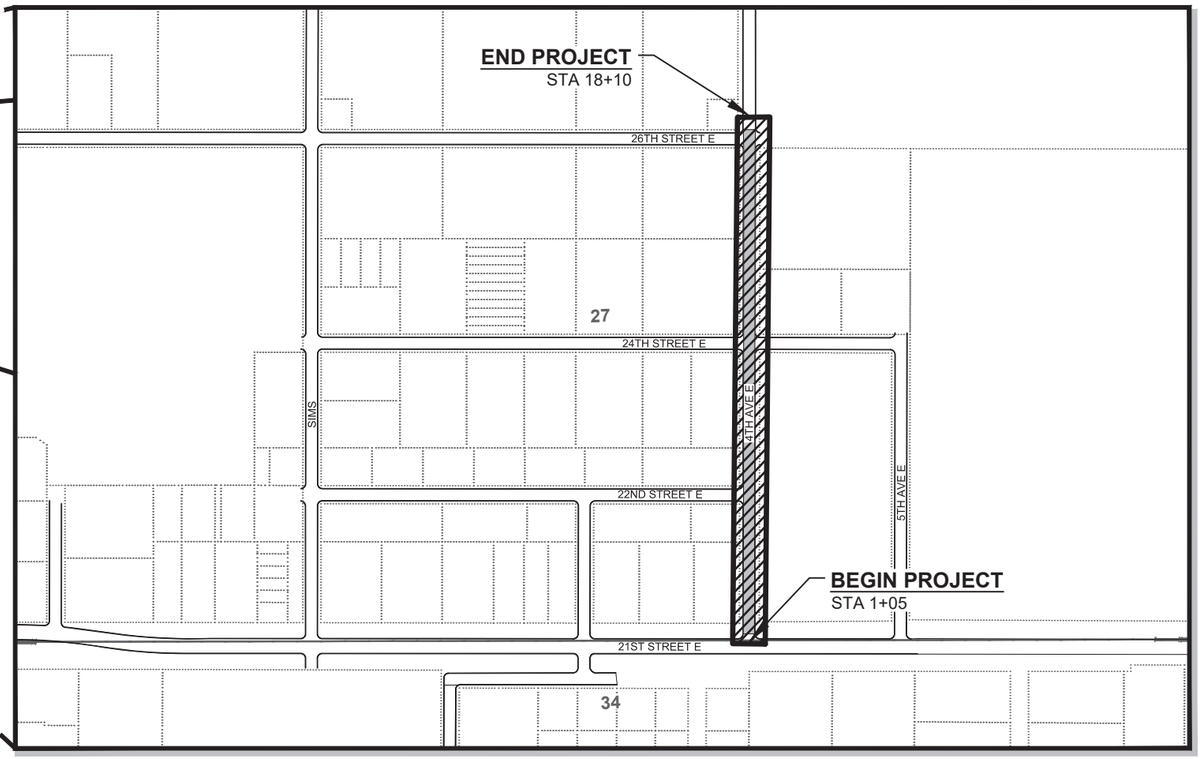
	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	23165	1	1

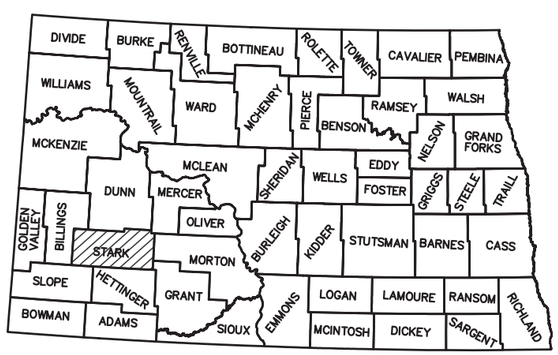
GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	10/01/2020
Supplemental Specification	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SU-CVD-5-983(066) \ 4TH AVE E RECONSTRUCTION	0.323	0.323



CITY MAP
1"=1 mile





STATE COUNTY MAP

DESIGNER
Andrew Schrank, PE
DESIGNER
Andrew Albrecht, PE

CITY OF DICKINSON REVIEW

Loretta A. Marshik

Digitally signed by Loretta A. Marshik
DN: cn=Loretta A. Marshik, o=City of Dickinson, ou=Interim City Engineer, email=loretta.marshik@dickinsongov.com, c=US
Date: 2022.03.07 10:22:16 -07'00'

Loretta Marshik, Interim City Engineer
City of Dickinson, ND

Date: _____

HIGHLANDS ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	2	1

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Section No.	Sheet No.	Description
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1-2	Notes
8	1	Quantities
10	1	Basis of Estimate
11	1	Data Tables
20	1-5	General Details
30	1-2	Typical Sections
40	1-2	Removals
60	1-4	Plan & Profile
76	1-2	Temporary Sediment and Erosion Control
81	1	Survey Coordinate and Curve Data
82	1-2	Survey Data Layouts
90	1-10	Paving Layouts
100	1-7	Work Zone Traffic Control
110	1-4	Signing
140	1-6	Lighting
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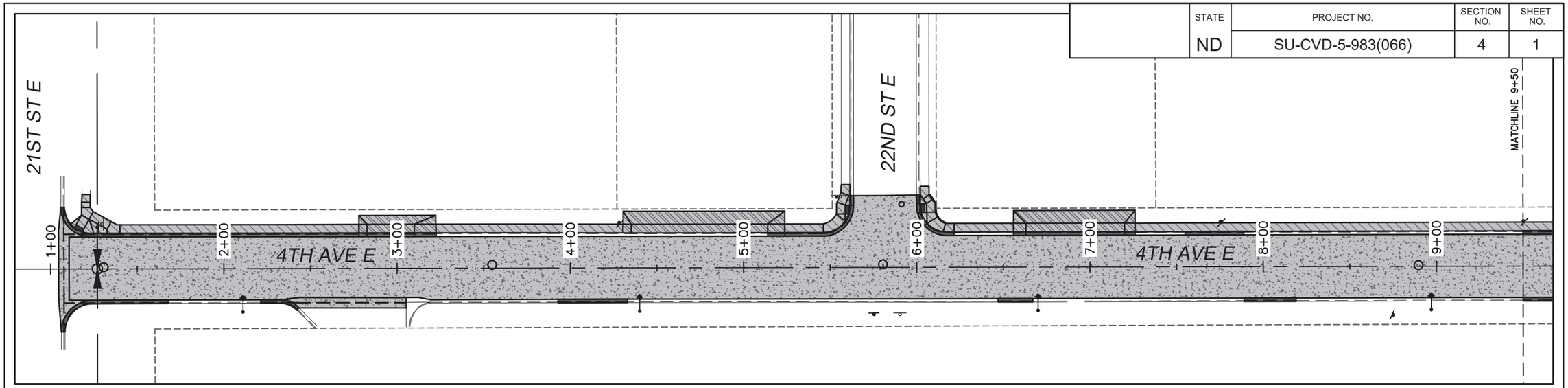
LIST OF STANDARD DRAWINGS

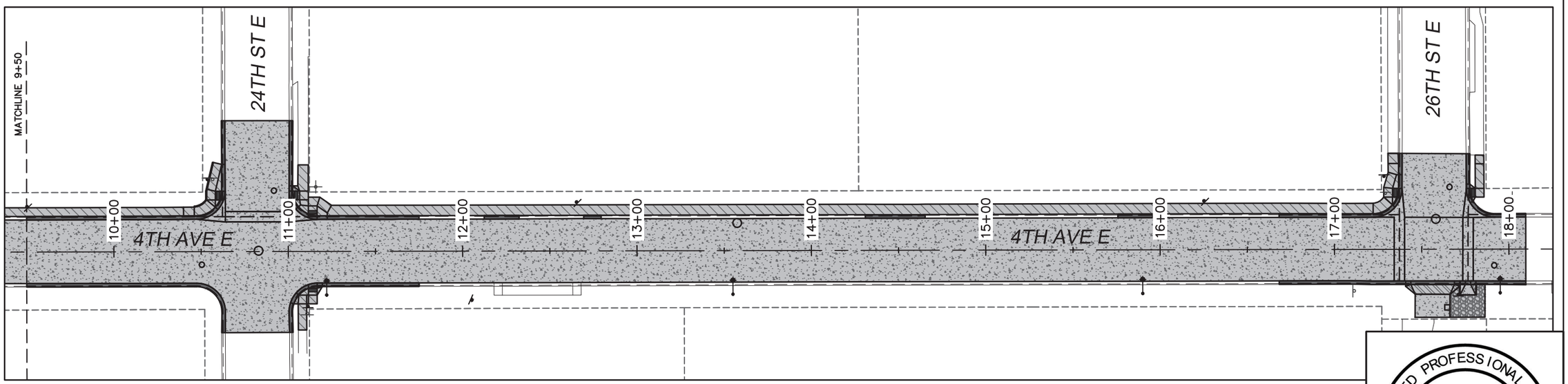
Standard No.	Description
D-101-1,-2,-3,-4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20,-21	Line Styles
D-101-30,-31,-32,-33	Symbols
D-260-1	Erosion and Siltation Controls - Silt Fence
D-550-2	Longitudinal Joint Details
D-550-3	Transverse Contraction Joint Details
D-550-4	Transverse Expansion Joint Detail
D-550-5	Transverse Construction Joint
D-704-6	Construction Sign Details - Project Funding Sign
D-704-7	Breakaway Systems for Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems for Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details Terminal and Guide Signs
D-704-10	Construction Sign Details Regulatory Signs
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
D-704-24	Shoulder Closures and Bridge Painting Layouts
D-704-50	Portable Sign Support Assembly
D-748-1	Curb & Gutter and Valley Gutter
D-750-1	Concrete Driveway - Urban
D-750-2	Sidewalk
D-750-3	Curb Ramp Retrofit Details
D-750-4	Curb Ramp Retrofit Transitional Area Details
D-754-23	Perforated Tube Assembly Details
D-754-24	Mounting Details Perforated Tube
D-754-24A	Breakaway Coupler System for Perforated Tubes
D-754-25	Mounting Details Perforated Tube
D-754-26,-27,-32	Sign Punching, Stringer and Support Location Details Regulatory, Warning, and Guide Signs
D-754-87	Sign Punching, Stringer and Support Location Details for Street Name Signs and 911 Signs
D-770-2	Feed Points (Roadway Lighting)
D-770-2A	Combination Feed Point Details

LIST OF SPECIAL PROVISIONS (SP)

SP #	Description
SSP 1	Temporary Erosion and Sediment Control Measures
SSP 3	Local Agency Contracts
SSP 5	Limitation of Operations
SSP 8	Federal Prohibition on Certain Technological Hardware
SP 379(20)	Street Lighting
SP 380(20)	Internal Manhole Chimney Seals
SP 399(20)	Temporary Pedestrian Facilities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	4	1





0 60' 120'

SCALE: 1" = 60'

LEGEND

6IN NON-REINF CONCRETE PAVEMENT CL AE	DRIVEWAY CONCRETE
VALLEY GUTTER 72IN	MANHOLE/ GATE VALVE ADJUSTMENT
CURB & GUTTER	DETECTABLE WARNING PANEL
SIDEWALK CONCRETE	RIP RAP
	NEW LIGHT STANDARD

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

SCOPE OF WORK

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	6	1

NOTES

105-110 PAVEMENT SWEEPING: Sweep paved areas that were used by construction traffic before opening these areas to public traffic.

Sweep all newly constructed pavement no more than 24 hours before a scheduled final inspection.

Use a vacuum or pick-up type sweeper to perform this work.

105-P01 COORDINATION WITH CITY FOR TRAFFIC INTERRUPTIONS: At least 48 hours prior to interrupting traffic flow or access, notify Police (701.456.7762), Ambulance (701.225.1500), Fire Department (701.456.7625), and Dispatch (701.456.7620). Complete the City's *Application for Street Closure for Construction* form found on the City's web site *www.dickinsongov.com*, and comply with the required lead time for submitting the application.

108-P01 CONTRACT TIME: Complete all pay items for the project by November 4, 2022 with the exception of the lighting system items required for this project under Specification Section 770. Liquidated damages for failure to complete the work by November 4, 2022 will be charged according to section 108.07. The road closure allowed by the Plans can only be in-place through November 4, 2022 at which time it will need to be removed.

Complete installation of the lighting system on or before June 30, 2023. liquidated damages for failure to complete the lighting system by June 30, 2023 will be charged at a rate of $350 per calendar day until completed.

202-P01 REMOVAL OF PAVEMENT: Haul all concrete and bituminous pavement removed from the site to the City Landfill at 3880 Lehigh Road during normal business hours, unless otherwise permitted by the City, and stockpile in designated location. The City Landfill normal hours of operation are Monday thru Friday from 7:00 am MT to 5:00 pm MT and the first and third Saturday of the month from 8:00 am MT to 12:00 pm MT. Unless otherwise approved by the City, no commercial disposal, including removed pavement, is allowed Monday thru Friday after 4:00 pm MT or on Saturdays. Removed material becomes the property of the City once stockpiled. Contact Aaron Praus during normal business hours (701.456.7979) a minimum of one week prior to delivery to coordinate stockpiling and to ensure proper scale certifications, scale tickets, and haul sheets are produced for this Work if the City's scale is to be used for producing the necessary weight tickets and haul summaries. Include this work in the contract unit price for “Removal of Concrete Pavement”, "Removal of Curb & Gutter", or "Removal of Bituminous Surfacing", as applicable.

203-P01 TOPSOIL: Place a 6-inch thickness of topsoil in areas where pavement is to be removed and no pavement replacement is proposed. Stabilize topsoil by seeding with Class I Seed or by placing landscape rock over R1 fabric as noted by Section 60 of these Plans. Landscape rock shall be ±2-to-4-inch KLTC rock to match the existing rock in the project area. Include all work noted in the unit price bid for "Topsoil".

203-P02 COMMON EXCAVATION-WASTE: Remove existing aggregate base and subsoils from the bottom of removed pavements, aggregate base, or existing grade, as applicable, to the proposed subgrade. Include removal, loading, hauling, and stockpiling in the contract unit price for “Common Excavation-Waste”.

Engineer will determine final Common Excavation-Waste pay quantity by entering the final pay quantities for "Removal of Concrete Pavement", "Removal of Curb & Gutter", and "Removal of Bituminous Surfacing" into the data tables in Section 11 of these Plans and re-calculating the Common Excavation-Waste quantity per the equations in these data tables. If changes are made to the improvements shown in these plans that would affect this quantity, the Engineer will measure those areas separately and add or subtract the quantity as appropriate.

216-P01 WATER: If City water is used, coordinate with the City of Dickinson to have them install a meter on an existing hydrant. The City will charge a $25.00 meter fee and $19.00 per MGal for water.

261-P01 WEIGHTED FIBER ROLLS: Provide Weighted Fiber Rolls that meet the following specifications:

- Non-degradable, extruded netting tube filled with wood curled excelsior and weighted inner core
- 8-inch roll diameter
- 6-foot roll length
- 8.33 lb/ft roll weight

Place weighted fiber rolls per the Plans to prevent sediment from leaving the work site. Fiber rolls may need to be relocated periodically to accommodate construction operations and traffic. Include cost for placement, maintenance, and relocations within the unit bid price for “Weighted Fiber Rolls”.

302-P01 SALVAGE AND RELAY AGGREGATE BASE COURSE 3IN: Existing aggregate base thicknesses vary throughout the site as noted on the Existing Typical Sections sheet. Salvage and relay an average of 3-inches thickness of existing aggregate base course throughout the project. This may require salvaging extra aggregate base in areas with greater thickness to account for areas that have an aggregate base thickness less than 3-inches to acquire sufficient material to relay. The quantity of aggregate base to be salvaged to obtain and average thickness of 3-inches across the site is approximately 605 CY based on the project area. Include the costs associated with removing, stockpiling, and relaying existing aggregate base in the unit price bid for "Salvage and Relay Aggregate Base Course 3IN".

302-P02 BUSINESS ACCESS: Maintain access to Roughrider Electric's approach near Sta 2+50 to Sta 3+00 RT at all times. Maintain an access of sufficient width to allow trucks to enter and leave this site, and construct the access of 6-inch thick CL 5 Aggregate Base Course or Salvaged Aggregate Base Course after the existing pavement providing access is removed until the new pavement to provide access is constructed. Phase work as needed in this area to maintain this access as noted. Include the costs associated with maintaining this access in the unit price bid for "Salvage and Relay Aggregate Base Course 3IN".

550-P01 6IN NON-REINF CONCRETE PAVEMENT CL AE: The following requirements shall be incorporated into NDDOT Standard Specification Section 550.

- *550.C. Roadbed Condition*: This site has restricted access due to the limited right-of-way widths and urban nature of this area. Therefore, equipment may be operated on the finish grade if necessary. Correct any damage caused by operating equipment on the finish grade prior to placement of pavement over the finish grade.
- *550.D. Placing and Spreading Concrete*: Portable vibratory equipment will be allowed for concrete placement. Thermocouple wire will not be required for this project.
- *550.G. Joints, 2. Transverse Contraction Joints*: One longitudinal row of dowel bar assemblies may be left out during the advanced placement of these assemblies and placed directly in front of the paving operations to allow for equipment to pass through if necessary for concrete placement. Engineer must approve placement of all dowel bar assemblies after installation and prior to placement of pavement over this reinforcement.
- *550.H. Finishing Concrete, 1. General, e. Imprinting Pavement*: Do not imprint pavement as indicated.

704-P01 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the layouts shown in Section 100 of the Plans, and the following layouts shown on the Standard Drawings when applicable work conditions exist.

- D-704-24 Shoulder Closures and Bridge Painting Layouts, Type R and Type S: For shoulder work if road is open to traffic.

722-P01 ADJUST GATE VALVE BOX: Include all labor, equipment, and materials needed to adjust previously installed gate valves boxes, and to construct concrete collars as shown by the "Gate Valve Box Adjustment" detail and "Utility Adjustment Concrete Collars" detail in Section 20 of the Plans in the unit price bid for "Adjust Gate Valve Box". If valve boxes cannot be adjusted to grade due to their existing condition, install a new valve box to be supplied by the City.

722-P02 ADJUST MANHOLE: Remove without damage and salvage existing manhole frames and grates. Remove existing adjusting rings and clean top of existing manhole structure. Deliver removed frames and grates to the City at the Public Works maintenance shop located at 3411 Public Works Boulevard.

After manhole has been adjusted, install an internal chimney seal per the "Internal Chimney Seal" detail in Section 20 of the Plans and the "Internal Manhole Chimney Seals" Special Provision.

Include all labor, equipment, and materials needed to remove existing frames and grates, to install and adjust new manhole frames and grates, to install internal chimney seals, and to construct concrete collars on existing manhole structures in the unit price bid for "Adjust Manhole".

748-P01 CURB & GUTTER: Construct curb and gutter as shown by the "Standard Curb and Gutter" detail in the detail sheets. Construct a keyway as shown by the "Keyway for Curb & Gutter" detail on Standard Drawing D-748-1 in the back of the curb beginning 2-1/4-inches from the top of the curb with 'T' being equal to 6-inches.

Follow Standard Drawing D-750-3 when constructing curb and gutter sections at curb ramps.

Grade landscape areas behind new curb and gutter at a 4:1 or flatter slope, when feasible, from the back of the sidewalk to existing grade. In areas where a 4:1 slope cannot be achieved, the finish grade may be steeper but shall not exceed a 2:1 slope. If adjacent landscape area is grass, replace the existing topsoil and seed with Class I Seed. If adjacent landscape area is landscaping rock, place existing landscape rock over R1 fabric. Include costs in the unit price bid for "Curb & Gutter".

748-P02 CURB-TYPE I: The height of the “Curb-Type 1” will vary depending on the existing locations and will need to match the existing elevations at tie in locations. The height of the curb shall not exceed 24-inches above the adjacent sidewalk.

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	6	2

NOTES

750-P01 SIDEWALK CONCRETE: Construct sidewalk per Standard Drawing D-750-2, but replace the "Sidewalk Detail (Installed adjacent to curb and gutter)" with the "Sidewalk Abutting Curb & Gutter" detail in the General Detail Sheets.

Construct sidewalk turning space areas shown by Section 90 of these Plans in a separate pour and prior to constructing the adjacent concrete sidewalk. Install 18-inch long, 1/2-inch diameter dowels at 12-inches on-center through construction joints where the turning space concrete will connect to sidewalk concrete.

Adjust existing gate valve boxes that are in the sidewalk to finish sidewalk grade prior to pouring sidewalk concrete. Include costs to adjust existing gate valve boxes in sidewalk areas in the unit price bid for "Sidewalk Concrete".

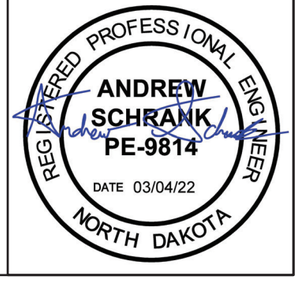
Grade landscape areas behind new sidewalk at a 4:1 or flatter slope, when feasible, from the back of the sidewalk to existing grade. In areas where a 4:1 slope cannot be achieved, the finish grade may be steeper but shall not exceed a 2:1 slope. If adjacent landscape area is grass, replace the existing topsoil and seed with Class I Seed. If adjacent landscape area is landscaping rock, place existing landscape rock over R1 fabric. Include costs in the unit price bid for "Sidewalk Concrete".

Repair any damage to the existing sprinkler system during construction of the new sidewalk on the west side of 4th Ave E near Sta 1+00 to Sta 1+50. Include costs in the unit price bid for "Sidewalk Concrete".

750-P02 DRIVEWAY CONCRETE: Construct driveway concrete per Standard Drawing D-750-1 utilizing the 8-inch thick concrete sections. Driveways shall be "Driveway Type 1" or "Driveway Type 3" as applicable.

754-P01 SIGNS: Deliver removed signs and supports which will not be reset to the Public Works maintenance shop located at 3411 Public Works Boulevard. Provide all equipment, labor, loading, unloading, and hauling to remove and deliver these signs as noted in the unit price bid for "Steel Galv Posts-Telescoping Perforated Tube".

885-P01 DETECTABLE WARNING PANELS: Use yellow, polymer composite detectable warning panels.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	8	1

SPEC	CODE	ITEM DESCRIPTION	UNITS	QTY.
103	100	CONTRACT BOND	LSUM	1
202	114	REMOVAL OF CONCRETE PAVEMENT	SY	1,492
202	130	REMOVAL OF CURB & GUTTER	LF	1,479
202	135	REMOVAL OF BITUMINOUS SURFACING	TON	2,190
203	109	TOPSOIL	CY	9
203	113	COMMON EXCAVATION-WASTE	CY	763
216	100	WATER	MGAL	43
256	101	RIPRAP GRADE 1	TON	33
260	200	SILT FENCE SUPPORTED	LF	50
260	201	REMOVE SILT FENCE SUPPORTED	LF	50
261	200	WEIGHTED FIBER ROLLS	LF	72
261	201	REMOVE WEIGHTED FIBER ROLLS	LF	72
302	120	AGGREGATE BASE COURSE CL 5	TON	1,745
302	411	SALVAGE AND RELAY AGGREGATE BASE COURSE 3IN	MILE	0.3
550	105	6IN NON-REINF CONCRETE PAVEMENT CL AE	SY	7,416
702	100	MOBILIZATION	LSUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	896
704	1052	TYPE III BARRICADE	EA	42
704	1054	SIDEWALK BARRICADE	EA	13
704	1058	PEDESTRIAN WALKWAY	LF	681
704	1060	DELINEATOR DRUMS	EA	6
704	1067	TUBULAR MARKERS	EA	40
704	2108	TEMPORARY CURB RAMP	EA	5
709	155	GEOSYNTHETIC MATERIAL TYPE RR	SY	33
722	6140	ADJUST GATE VALVE BOX	EA	6
722	6200	ADJUST MANHOLE	EA	7
748	100	CURB & GUTTER	LF	1,498
748	520	CURB-TYPE I	LF	49
748	1030	VALLEY GUTTER 72IN	SY	192
750	100	SIDEWALK CONCRETE	SY	948
750	1000	DRIVEWAY CONCRETE	SY	293
750	2115	DETECTABLE WARNING PANELS	SF	90
754	110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	46.0
754	206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	188
754	592	RESET SIGN PANEL	EA	3
754	593	RESET SIGN SUPPORT	EA	1
770	20	CONCRETE FOUNDATION-HIGHWAY LIGHTING	EA	8
770	220	CABLE TRENCH-TYPE II	LF	1,239
770	330	2IN DIAMETER RIGID CONDUIT	LF	427
770	503	UNDERGROUND CONDUCTOR NO2-TYPE RHW	LF	174
770	504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	3,455
770	505	UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	1,729
770	735	FEED POINT-TYPE I-PAD MOUNTED	EA	1
770	1120	LT STD 8FT MA 32FT HT	EA	8
770	4210	LED LUMINAIRE	EA	8

QUANTITIES

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	10	1

BASIS OF ESTIMATE

REMOVAL OF BITUMINOUS SURFACING

					A	B (SEE SEC. 40)	2 x (A x B / 324)
Spec.	Code	Pay Item	Unit	Assumed Unit Weight	Depth (IN)	Area (SF)	Subtotal (TON)
202	135	Removal of Bituminous Surfacing	Ton	2 Ton/CY	5.5	64,513	2,190

AGGREGATE BASE COURSE CL 5 @ 1.875 TON/CY FOR CURB & GUTTER, VALLEY GUTTER, SIDEWALK CONCRETE, DRIVEWAY CONCRETE, AND ROADWAY PAVEMENT

		A		B		C = A x B / 3	D = 1.875 * C
Item Aggregate Base will be Beneath	Unit	Depth (FT)	End Area (SY)	Surface Area (SY)	Linear Feet (LF)	Volume (CY)	Subtotal
Curb & Gutter - When Abutting New Sidewalk or Unpaved Areas *	Ton	---	0.17	---	1,498	84.9	159.2
Valley Gutter	Ton	0.50	---	192	---	288.0	540.0
Sidewalk & Driveway Concrete	Ton	0.33	---	1,241	---	136.5	256.0
6IN Non-Reinf Concrete Pavement CL AE - Sta. 1+11 to 17+75	Ton	0.167	---	7,259	---	404.1	757.7
6IN Non-Reinf Concrete Pavement CL AE - Sta. 17+75 to 18+10	Ton	0.33	---	157	---	17.3	32.4
						Total	1,745

* Includes aggregate base beneath and 1-foot behind curb & gutter.

WATER:

25 MGal/Mile of Dust Paliative = (0.32 Miles) x (25 MGal/Mile) = 8 MGal

20 Gal/Ton for Aggregates = (1,745 Ton) x (20 Gal/Ton) ÷ (1000 MGal/Gal) = 35 MGal

REGISTERED PROFESSIONAL ENGINEER
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PE-9814
DATE 03/04/22
NORTH DAKOTA

BASIS OF ESTIMATE

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	11	1

EARTHWORK SUMMARY						
	Top of Existing Pavement to Proposed Subgrade Volume for all Improvements (CY)	Removal of Bituminous Surfacing Quantity (TON)	Bituminous Surfacing Pavement Removal Volume within Roadway @ 2 Ton/CY (CY)	Salvage and Relay Aggregate Base Volume within Roadway @ 3" Depth (CY)	Pavement Removal Volume for Concrete and Curb & Gutter (CY)	PAY ITEM Common Excavation - Waste (CY)
	A	B	C = B / 2	D	E (See Table Below) *	F = A - (C + D+ E)
Sta 1+07 to 18+10	2,766	2,190*	1,095	605	303	763

* Replace estimated quantities shown in this table with the final pay quantities. After replacing these values, use the equations in the table above to determine the final pay quantity for "Common Excavation-Waste".

PAVEMENT REMOVAL VOLUMES FOR CONCRETE PAVEMENT AND CURB & GUTTER

		A		B		A x B / 3
Item	Unit	Depth (FT)	End Area (SY)	Area (SY)	Linear Feet (LF)	Subtotal
Removal of Curb & Gutter	CY	---	0.15	---	1,479*	74
Removal of Concrete Pavement	CY	0.46	---	1,492*	---	229
					Total = E	303

* Replace estimated quantities shown in this table with the final pay quantities. After replacing these values, use the equations in the tables above to determine the final pay quantity for "Common Excavation-Waste".

REGISTERED PROFESSIONAL ENGINEER
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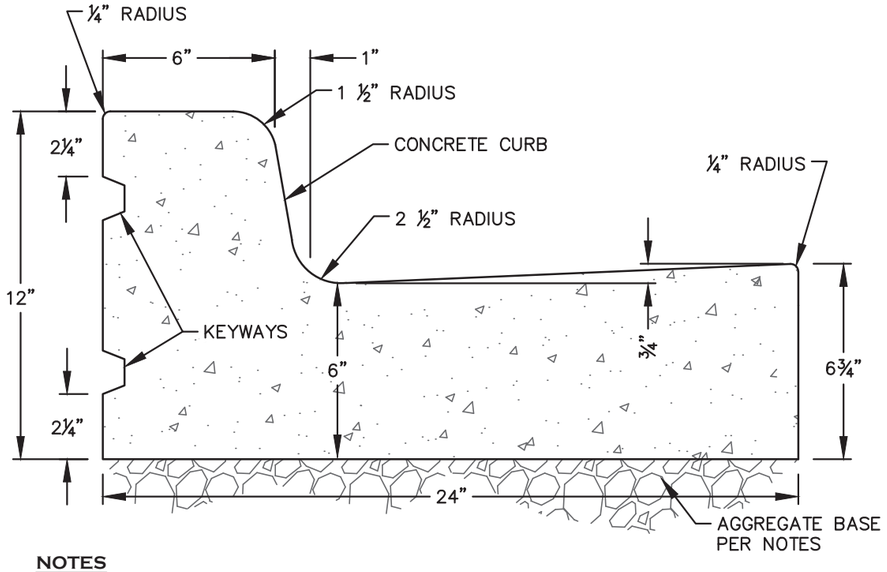
DATE 03/04/22
NORTH DAKOTA

DATA TABLES
Earthwork Summary

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	20	1

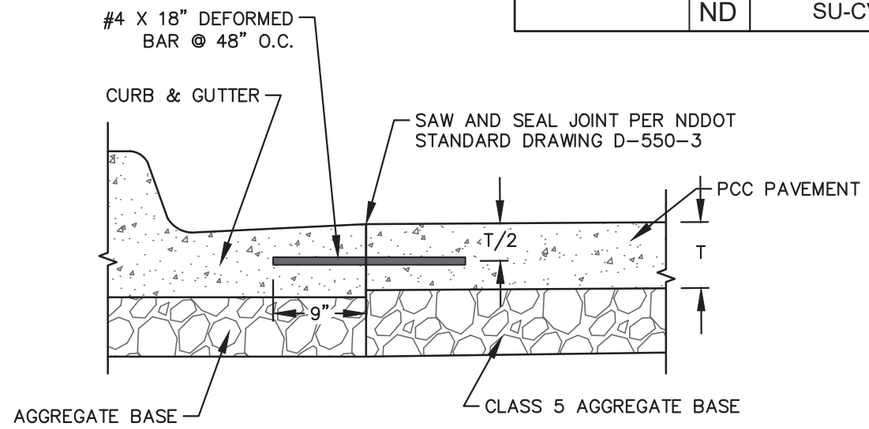


NOTES

1. FOLLOW STANDARD DRAWING D-748-1 FOR CONSTRUCTION OF CURB AND GUTTER JOINTS AND SPACING.
2. KEYWAYS IN THE BACK OF THE CURB SHALL BE CONSTRUCTED WHEN THE BACK OF CURB WILL ABUT SIDEWALK OR OTHER CONCRETE PAVEMENT. CONSTRUCT KEYWAYS AS SHOWN BY THE "KEYWAY FOR CURB & GUTTER" DETAIL ON STANDARD DRAWING D-748-1 WITH 'T' EQUAL TO 6-INCHES.
3. CONSTRUCT CURB & GUTTER OVER 6-INCHES OF CLASS 5 AGGREGATE BASE. EXTEND BASE 12-INCHES BEHIND CURB WHEN AREAS BEHIND CURB ARE UNPAVED, OR WHEN PAVED AREAS BEHIND THE CURB ARE BEING RECONSTRUCTED. AGGREGATE BASE WILL BE MEASURED AND PAID FOR AS "AGGREGATE BASE COURSE CL 5".

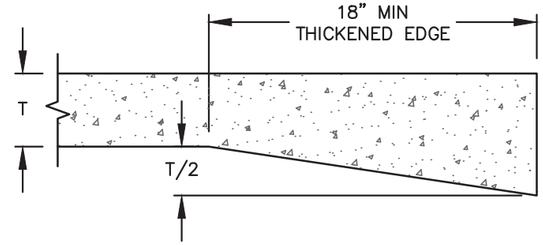
CURB AND GUTTER

NOT TO SCALE



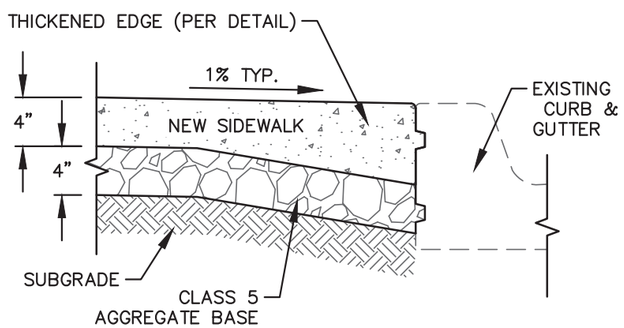
CURB & GUTTER ADJOINING PCC PAVEMENT

NOT TO SCALE

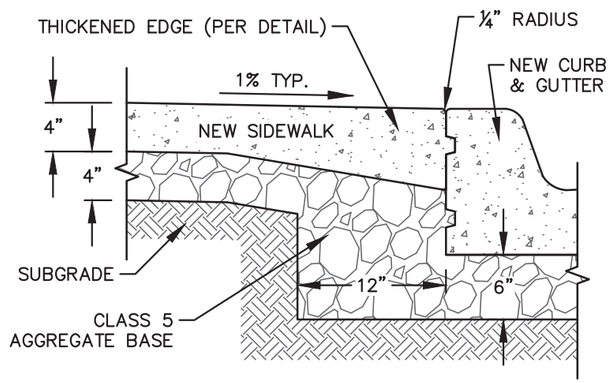


THICKENED EDGE

NOT TO SCALE



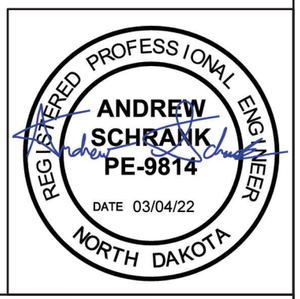
NEW SIDEWALK ADJACENT TO EXISTING CURB



NEW SIDEWALK ADJACENT TO NEW CURB

SIDEWALK ABUTTING CURB & GUTTER

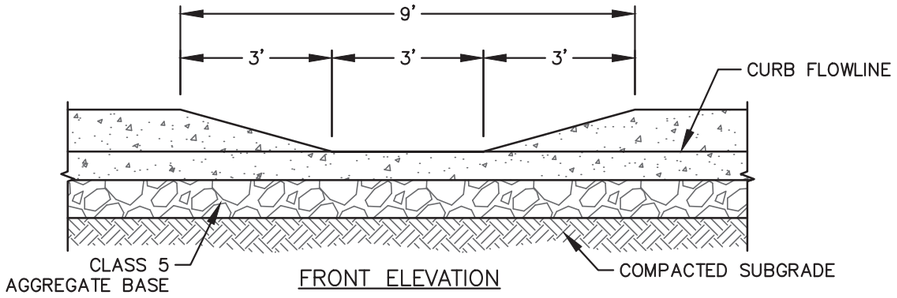
NOT TO SCALE



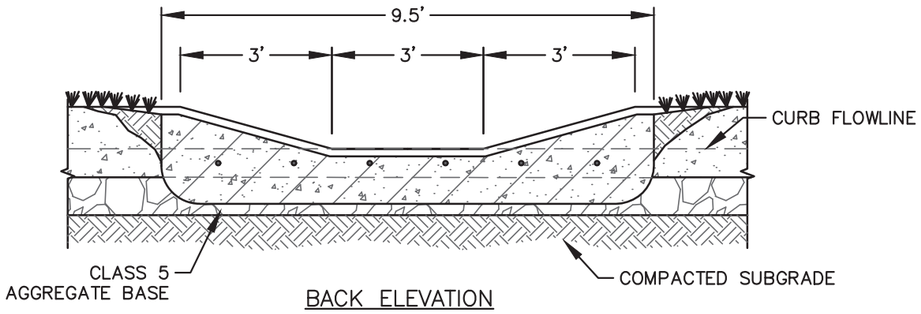
GENERAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

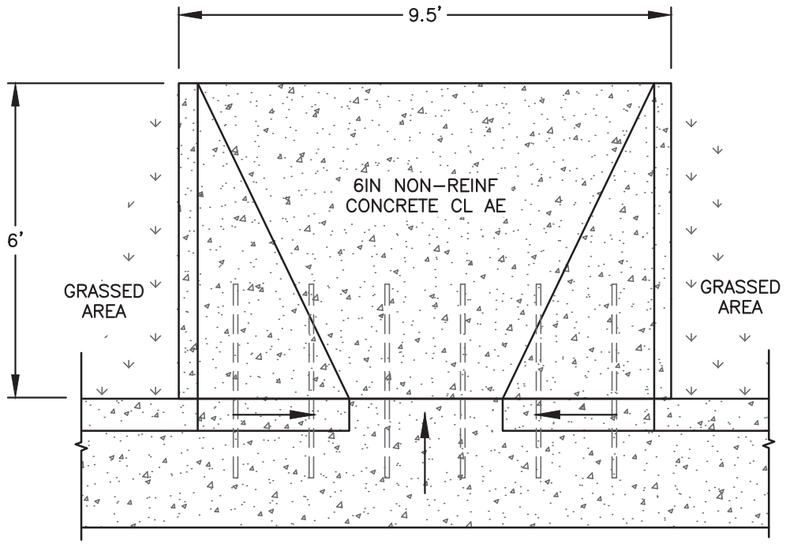
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	20	2



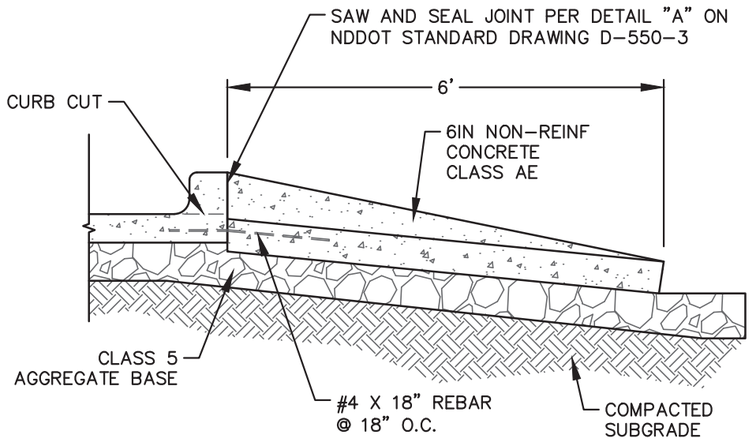
FRONT ELEVATION



BACK ELEVATION



PLAN VIEW



CROSS-SECTION

CURB CUT AND CONCRETE DRAINAGE SWALE

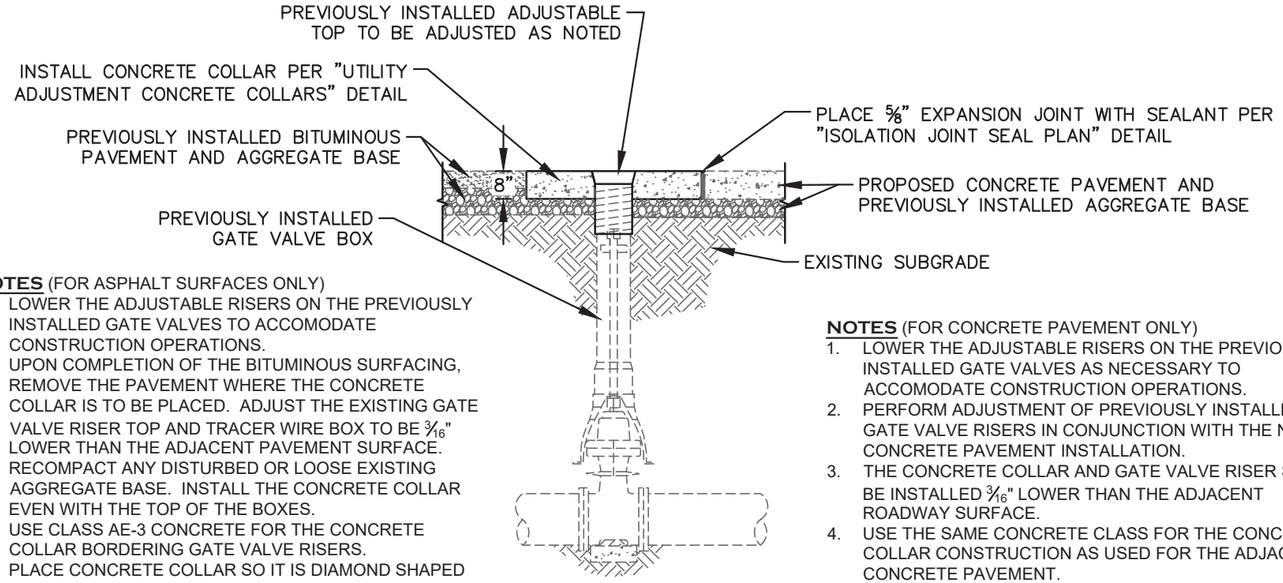
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

GENERAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	20	3



NOTES (FOR ASPHALT SURFACES ONLY)

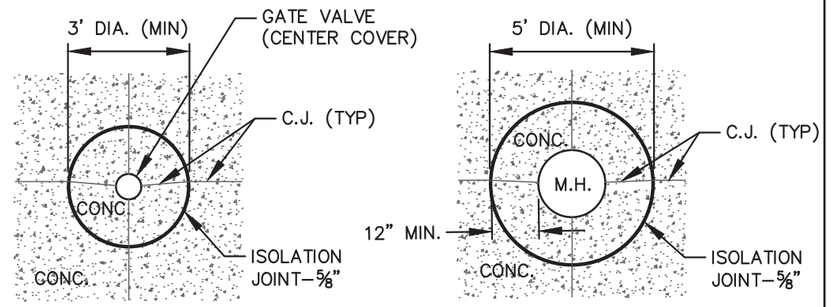
1. LOWER THE ADJUSTABLE RISERS ON THE PREVIOUSLY INSTALLED GATE VALVES TO ACCOMODATE CONSTRUCTION OPERATIONS.
2. UPON COMPLETION OF THE BITUMINOUS SURFACING, REMOVE THE PAVEMENT WHERE THE CONCRETE COLLAR IS TO BE PLACED. ADJUST THE EXISTING GATE VALVE RISER TOP AND TRACER WIRE BOX TO BE 3/16" LOWER THAN THE ADJACENT PAVEMENT SURFACE. RECOMPACT ANY DISTURBED OR LOOSE EXISTING AGGREGATE BASE. INSTALL THE CONCRETE COLLAR EVEN WITH THE TOP OF THE BOXES.
3. USE CLASS AE-3 CONCRETE FOR THE CONCRETE COLLAR BORDERING GATE VALVE RISERS.
4. PLACE CONCRETE COLLAR SO IT IS DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.

NOTES (FOR CONCRETE PAVEMENT ONLY)

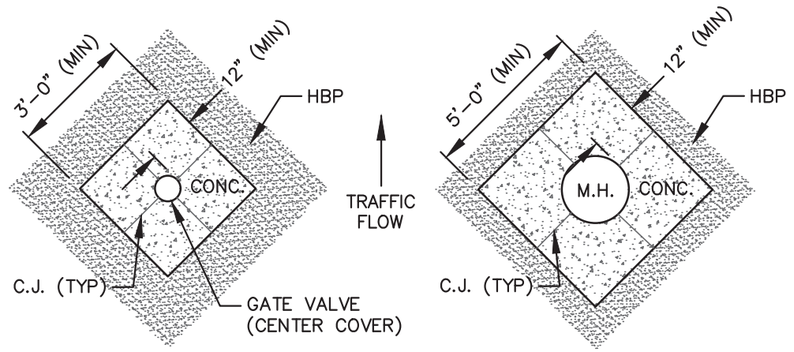
1. LOWER THE ADJUSTABLE RISERS ON THE PREVIOUSLY INSTALLED GATE VALVES AS NECESSARY TO ACCOMODATE CONSTRUCTION OPERATIONS.
2. PERFORM ADJUSTMENT OF PREVIOUSLY INSTALLED GATE VALVE RISERS IN CONJUNCTION WITH THE NEW CONCRETE PAVEMENT INSTALLATION.
3. THE CONCRETE COLLAR AND GATE VALVE RISER SHALL BE INSTALLED 3/16" LOWER THAN THE ADJACENT ROADWAY SURFACE.
4. USE THE SAME CONCRETE CLASS FOR THE CONCRETE COLLAR CONSTRUCTION AS USED FOR THE ADJACENT CONCRETE PAVEMENT.

GATE VALVE AND BOX ADJUSTMENT

NOT TO SCALE

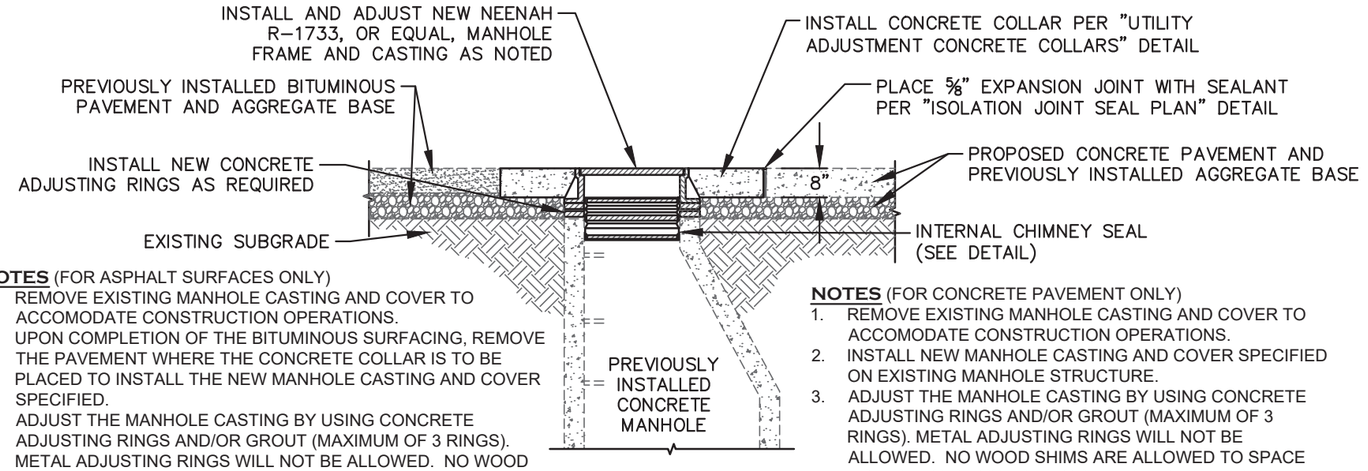


NOTE: UNLESS SHOWN OTHERWISE IN THE JONTING PLAN, USE ROUND COLLARS IN CONCRETE PAVEMENTS, AND USE DIAMOND SHAPED COLLARS IN BITUMINOUS PAVEMENTS.



UTILITY ADJUSTMENT CONCRETE COLLARS

NOT TO SCALE



NOTES (FOR ASPHALT SURFACES ONLY)

1. REMOVE EXISTING MANHOLE CASTING AND COVER TO ACCOMODATE CONSTRUCTION OPERATIONS.
2. UPON COMPLETION OF THE BITUMINOUS SURFACING, REMOVE THE PAVEMENT WHERE THE CONCRETE COLLAR IS TO BE PLACED TO INSTALL THE NEW MANHOLE CASTING AND COVER SPECIFIED.
3. ADJUST THE MANHOLE CASTING BY USING CONCRETE ADJUSTING RINGS AND/OR GROUT (MAXIMUM OF 3 RINGS). METAL ADJUSTING RINGS WILL NOT BE ALLOWED. NO WOOD SHIMS ARE ALLOWED TO SPACE ADJUSTING RINGS. RECOMPACT ANY DISTURBED OR LOOSE EXISTING AGGREGATE BASE.
4. INSTALL THE MANHOLE CASTING WITH COVER 3/16" LOWER THAN THE ADJACENT PAVEMENT SURFACE. INSTALL THE CONCRETE COLLAR EVEN WITH THE TOP OF THE PAVEMENT AND MANHOLE CASTING.
3. USE CLASS AE-3 CONCRETE FOR THE CONCRETE COLLAR BORDERING MANHOLES.
4. PLACE CONCRETE COLLAR SO IT IS DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.

NOTES (FOR CONCRETE PAVEMENT ONLY)

1. REMOVE EXISTING MANHOLE CASTING AND COVER TO ACCOMODATE CONSTRUCTION OPERATIONS.
2. INSTALL NEW MANHOLE CASTING AND COVER SPECIFIED ON EXISTING MANHOLE STRUCTURE.
3. ADJUST THE MANHOLE CASTING BY USING CONCRETE ADJUSTING RINGS AND/OR GROUT (MAXIMUM OF 3 RINGS). METAL ADJUSTING RINGS WILL NOT BE ALLOWED. NO WOOD SHIMS ARE ALLOWED TO SPACE ADJUSTING RINGS. PERFORM THIS ADJUSTMENT IN CONJUCTION WITH THE NEW CONCRETE PAVEMENT INSTALLATION.
4. INSTALL THE MANHOLE CASTING WITH COVER 3/16" LOWER THAN THE ADJACENT PAVEMENT SURFACE. INSTALL THE CONCRETE COLLAR EVEN WITH THE TOP OF THE PAVEMENT AND MANHOLE CASTING.
5. USE THE SAME CONCRETE CLASS FOR THE CONCRETE COLLAR CONSTRUCTION AS USED FOR THE ADJACENT CONCRETE PAVEMENT.

MANHOLE ADJUSTMENT PLAN

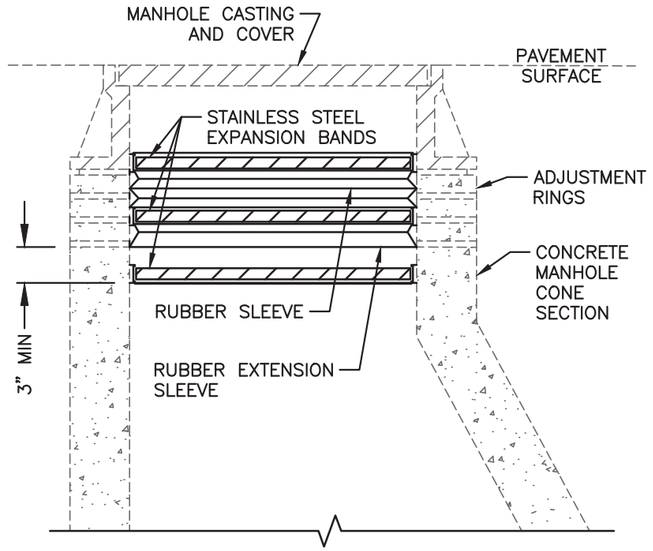
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

GENERAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	20	4



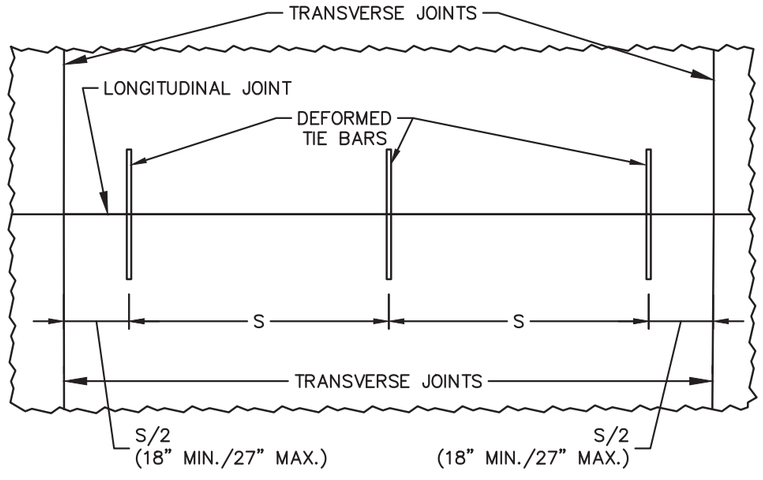
NOTES

1. THE RUBBER SLEEVE IS AVAILABLE IN HEIGHTS OF 8.5" (STANDARD) OR 10" (WIDE) OR 13" (EXTRA WIDE). THE SAME EXPANSION BANDS ARE USED ON ALL THREE.
2. SEE THE CHIMNEY HEIGHT TABLE BELOW FOR SEAL AND EXTENSION COMBINATIONS NEEDED TO SPAN FROM THE FRAME TO THE TOP OF THE CONE ON MANHOLES WITH VARIOUS CHIMNEY HEIGHTS. FRAME OFFSETS OR DIAMETER DIFFERENTIALS WILL REDUCE THESE SPAN HEIGHTS. PREPARE THE SURFACE IN ACCORDANCE WITH THE FRAME SEAL MANUFACTURER'S INSTRUCTIONS IF THIS VERTICAL SURFACE DOES NOT EXIST.
3. THE TOP OF THE CONE SHALL HAVE A MINIMUM OF 3" HIGH VERTICAL SEALING SURFACE THAT IS SMOOTH AND FREE OF ANY FORM OF OFFSETS OR EXCESSIVE HONEYCOMB.

SEALS AND EXTENSIONS	TO SPAN HEIGHTS OF:		
	W/ STANDARD SEAL	W/ WIDE SEAL	W/ EXTRA WIDE SEAL
SEAL ONLY	0" - 4.5"	2" - 7.5"	6" - 12"
SEAL + 7" EXTENSION	OVER 4.5" - 10.5"	OVER 7.5" - 13.5"	OVER 12" - 18"
SEAL + 10" EXTENSION	OVER 10.5" - 13"	OVER 13.5" - 16"	OVER 18" - 20.5"
SEAL + MULTI EXTENSIONS	OVER 13"	OVER 16"	OVER 20.5"
ADD 6" OF COVERAGE FOR EACH ADDITIONAL 7" EXTENSION ADD 8.5" OF COVERAGE FOR EACH ADDITIONAL 10" EXTENSION			

INTERNAL CHIMNEY SEAL

NOT TO SCALE



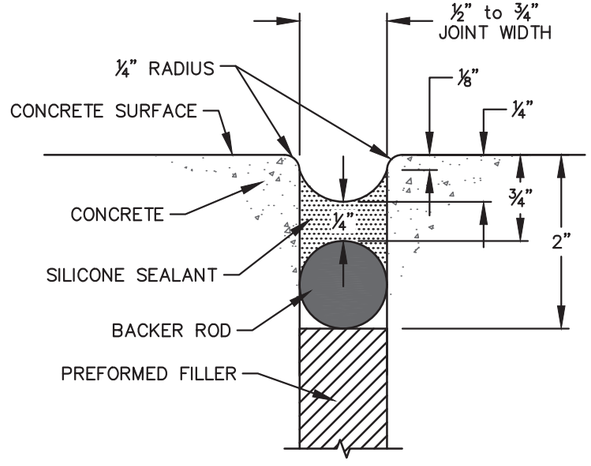
LONGITUDINAL JOINT TIE BAR SIZE, LENGTH, AND SPACING			
PVMT THICKNESS 'T'	STEEL GRADE	BAR SIZE & LENGTH	SPACING 'S'
6"	40	#4 BAR X 24"	48"

NOTES

1. LONGITUDINAL CONSTRUCTION JOINTS SHALL BE TIED BUTT JOINTS CONSTRUCTED PER STANDARD DRAWING D-550-2.
2. SEE SECTION 90 FOR JOINT LAYOUT.

LONGITUDINAL TIE BAR ASSEMBLY

NOT TO SCALE



SILICONE SEALANT

ISOLATION JOINT SEAL PLAN

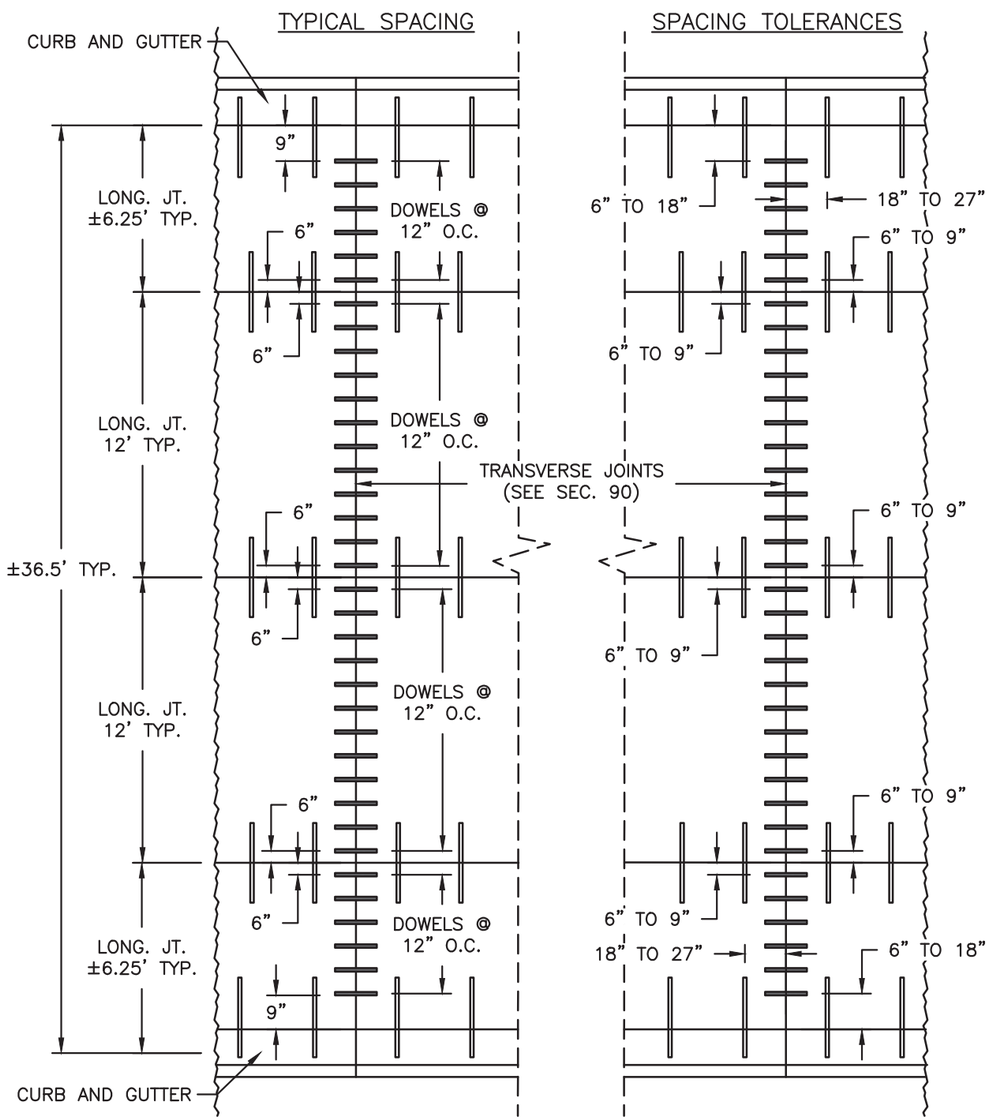
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

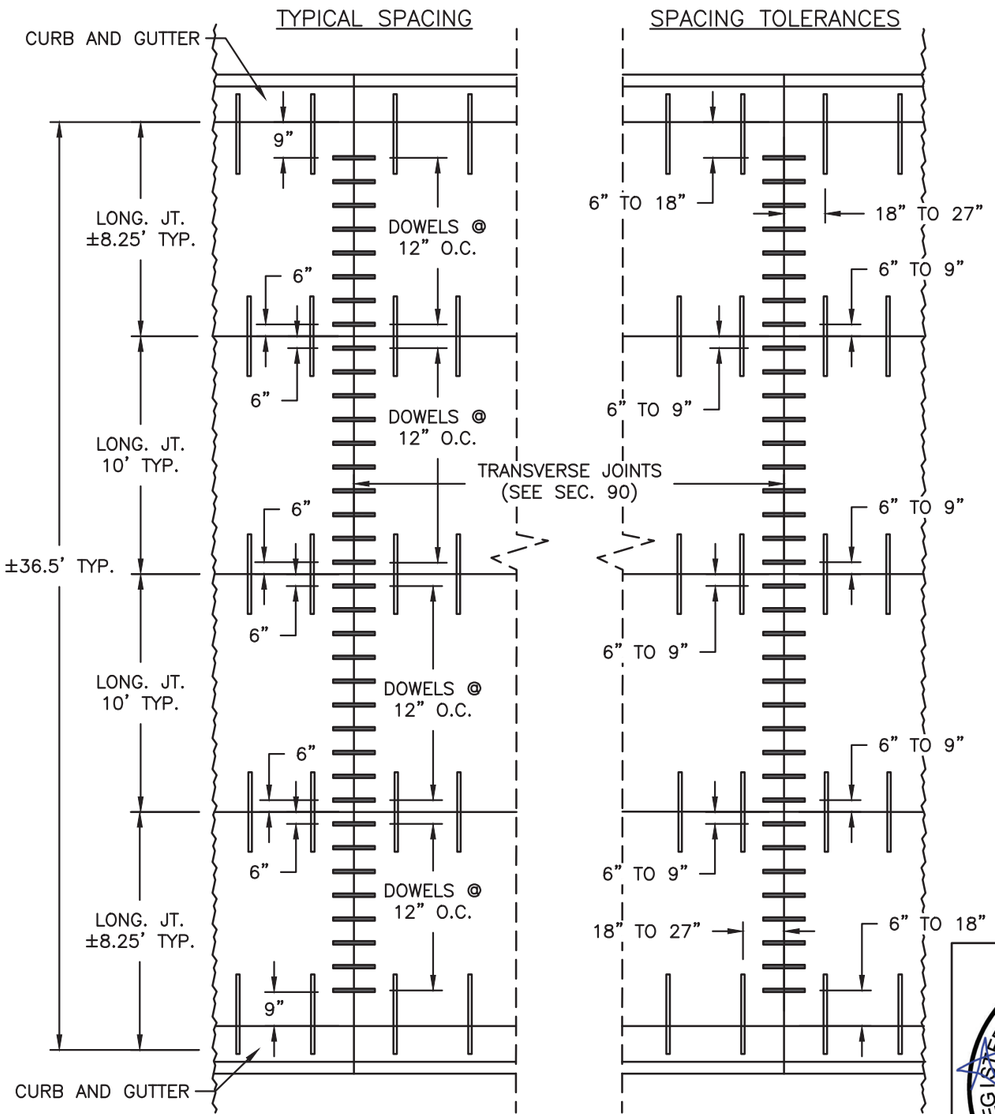
GENERAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	20	5



STA 1+11 TO STA 17+75



STA 17+75 TO STA 18+10

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

NOTES

1. DOWEL BARS SHALL BE 18-INCHES LONG WITH A ¾" DIAMETER.
2. TRANSVERSE JOINTS SHALL BE CONSTRUCTED PER STANDARD DRAWING D-550-3, EXCEPT THAT SPACING SHALL BE AS SHOWN ABOVE.
3. SEE SECTION 90 FOR JOINT LAYOUT.

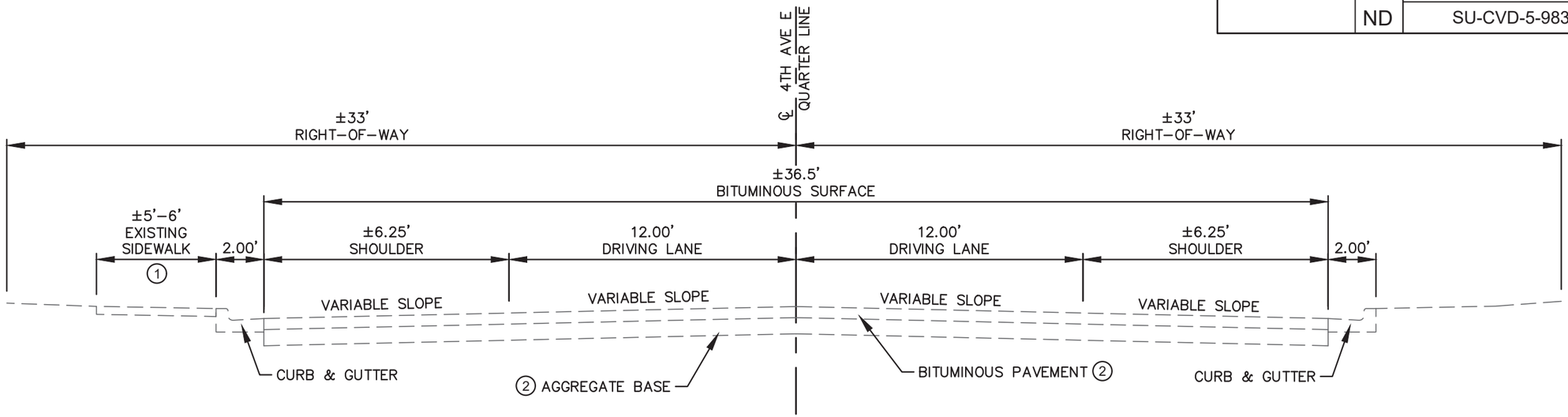
TRANSVERSE DOWEL BAR SPACING

NOT TO SCALE

GENERAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	30	1



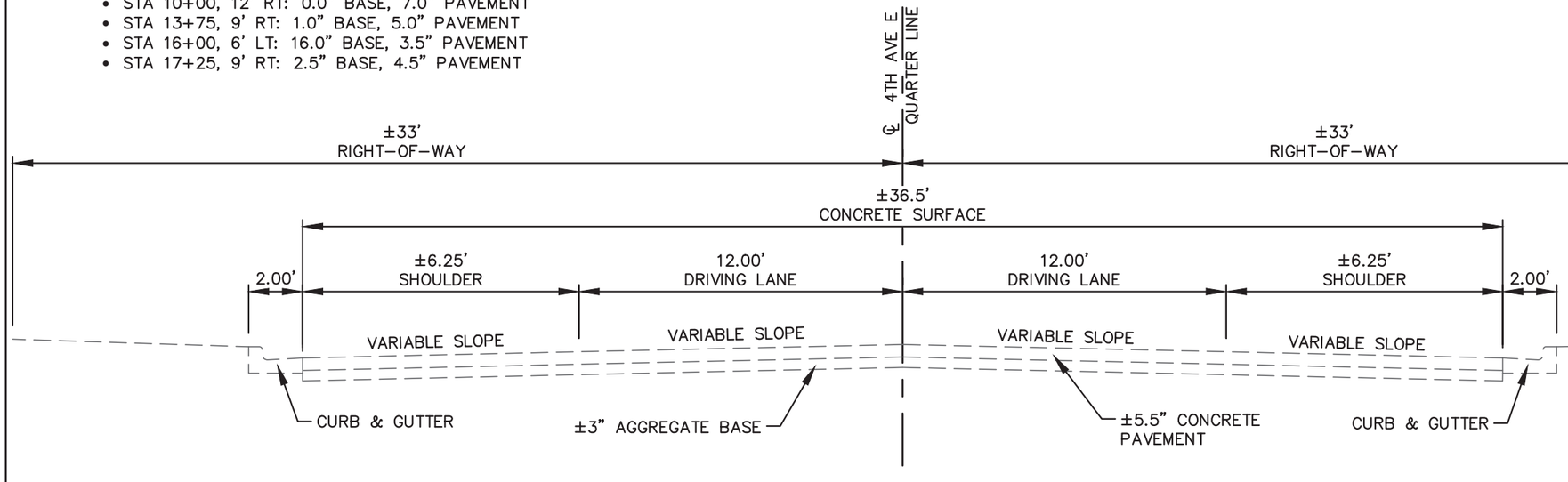
TYPICAL EXISTING ROADWAY SECTION

(NOT TO SCALE)

STA. 1+11 TO STA. 17+57

① EXISTING SIDEWALK IS NOT PRESENT AT THE FOLLOWING LOCATIONS:
- STA 1+11 TO STA 43+99 LT
- STA 6+18 TO STA 10+20 LT

② THE FOLLOWING APPROXIMATE AGGREGATE BASE AND BITUMINOUS PAVEMENT THICKNESSES WERE MEASURED THROUGHOUT THE PROJECT AT THE APPROXIMATE LOCATION SHOWN:
- STA 4+75, 6' LT: 5.5" BASE, 6.0" PAVEMENT
- STA 5+00, 12' RT: 4.0" BASE, 5.0" PAVEMENT
- STA 7+25, 6' LT: 4.0" BASE, 5.0" PAVEMENT
- STA 10+00, 12' RT: 0.0" BASE, 7.0" PAVEMENT
- STA 13+75, 9' RT: 1.0" BASE, 5.0" PAVEMENT
- STA 16+00, 6' LT: 16.0" BASE, 3.5" PAVEMENT
- STA 17+25, 9' RT: 2.5" BASE, 4.5" PAVEMENT



TYPICAL EXISTING ROADWAY SECTION

(NOT TO SCALE)

STA. 17+57 TO STA. 18+10

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

TYPICAL SECTIONS
Existing

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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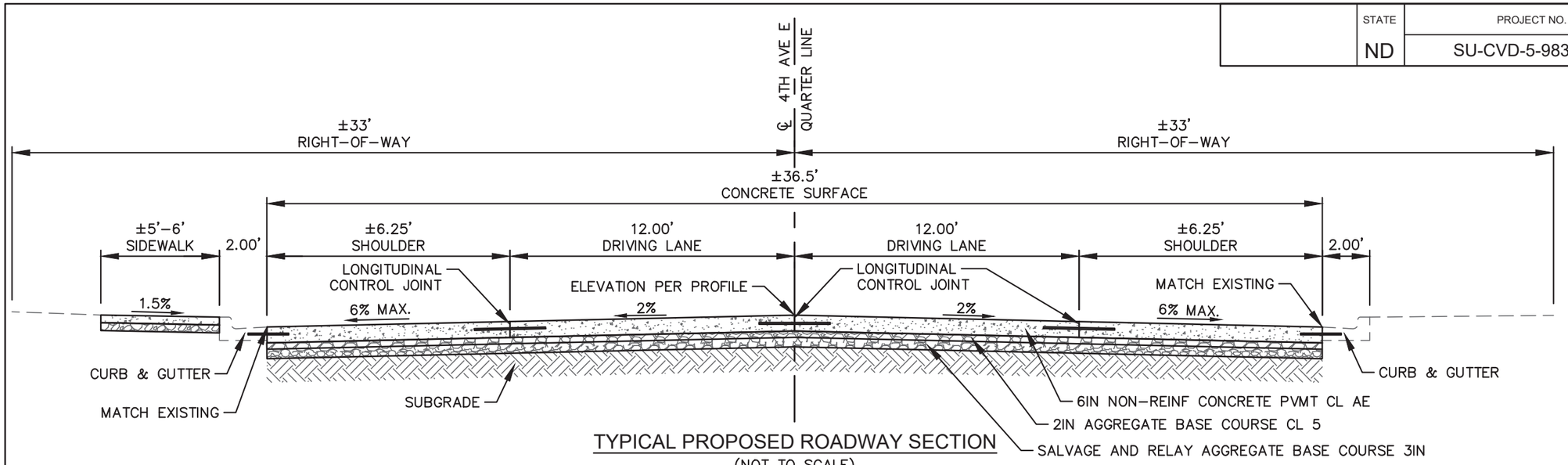
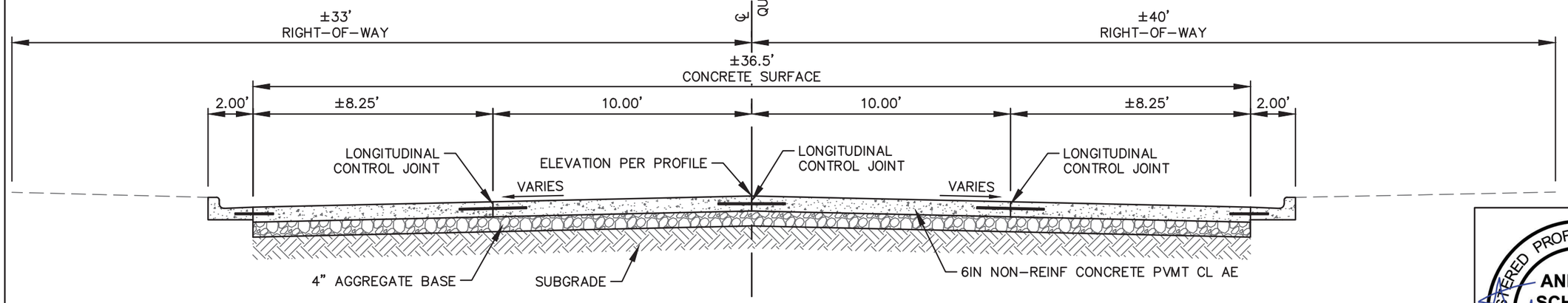
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	30	2



TYPICAL PROPOSED ROADWAY SECTION
(NOT TO SCALE)
STA. 1+11 TO STA. 17+75



TYPICAL PROPOSED ROADWAY SECTION
(NOT TO SCALE)
STA. 17+75 TO STA. 18+10

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

TYPICAL SECTIONS
Proposed

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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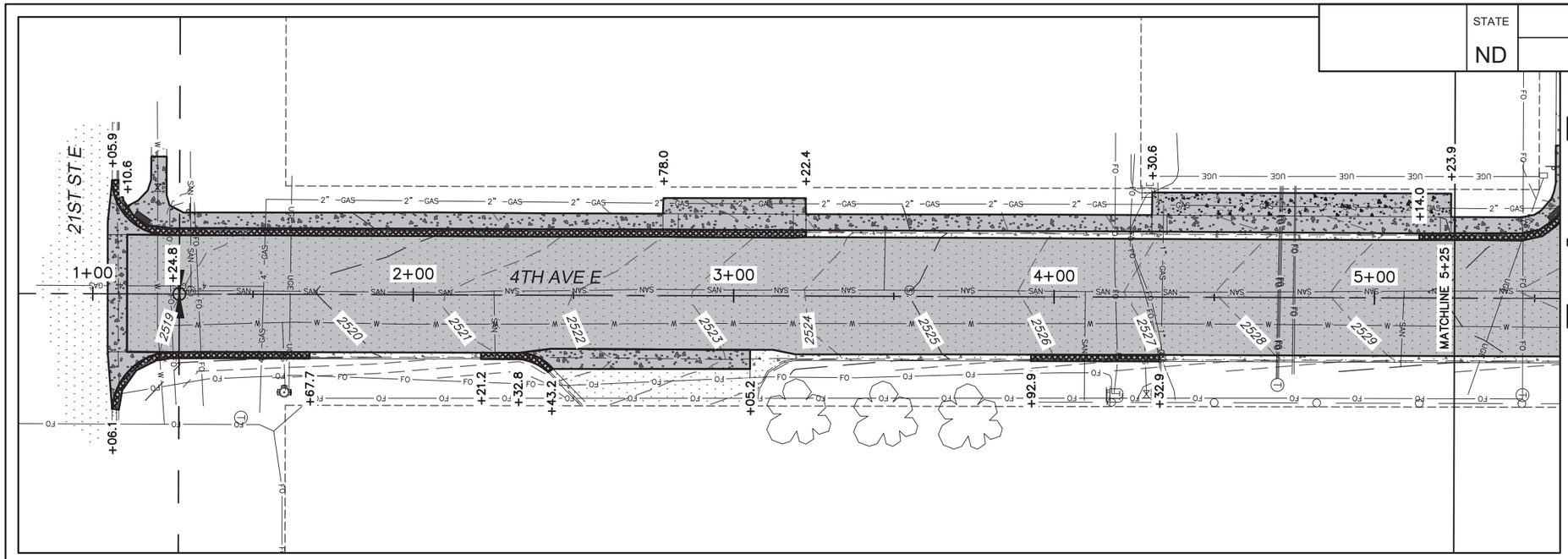
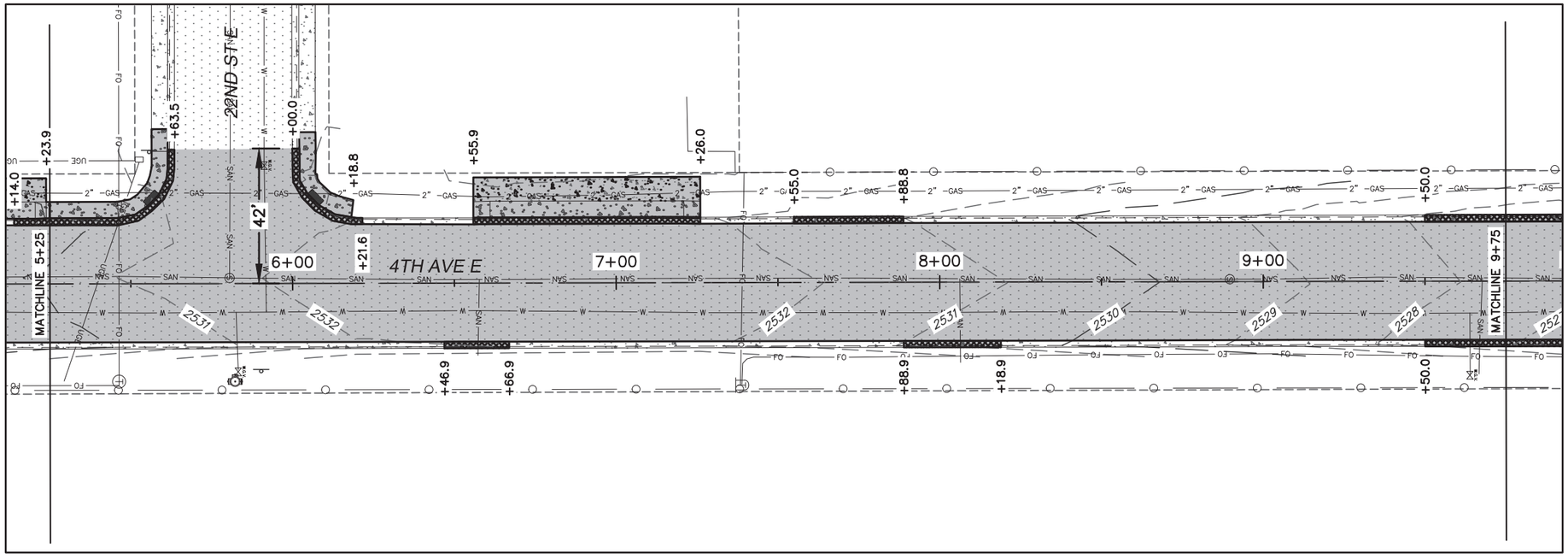
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	40	1





LEGEND

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB & GUTTER

REMOVAL OF BITUMINOUS SURFACING

QUANTITIES THIS SHEET

REMOVAL OF CONCRETE PAVEMENT

SIDEWALK	
Sta 0+00 to 5+25	344 SY
Sta 5+25 to 9+75	144 SY
	488 SY

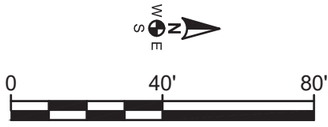
VALLEY GUTTER	
Sta 0+00 to 5+25	88 SY
	88 SY

REMOVAL OF CURB & GUTTER

Sta 0+00 to 5+25	367 LF
Sta 5+25 to 9+75	290 LF
	657 LF

REMOVAL OF BITUMINOUS SURFACING

Sta 0+00 to 5+25	14,960 SF
Sta 5+25 to 9+75	17,365 SF
	32,325 SF



SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

REMOVALS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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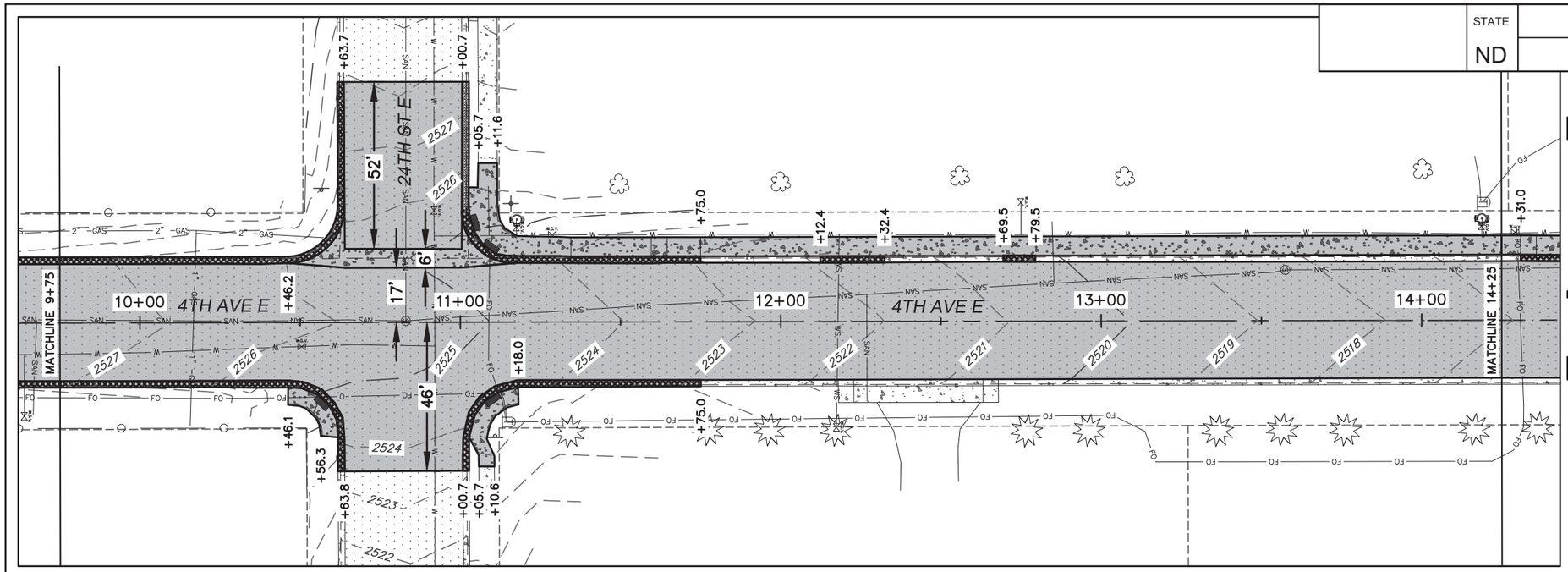
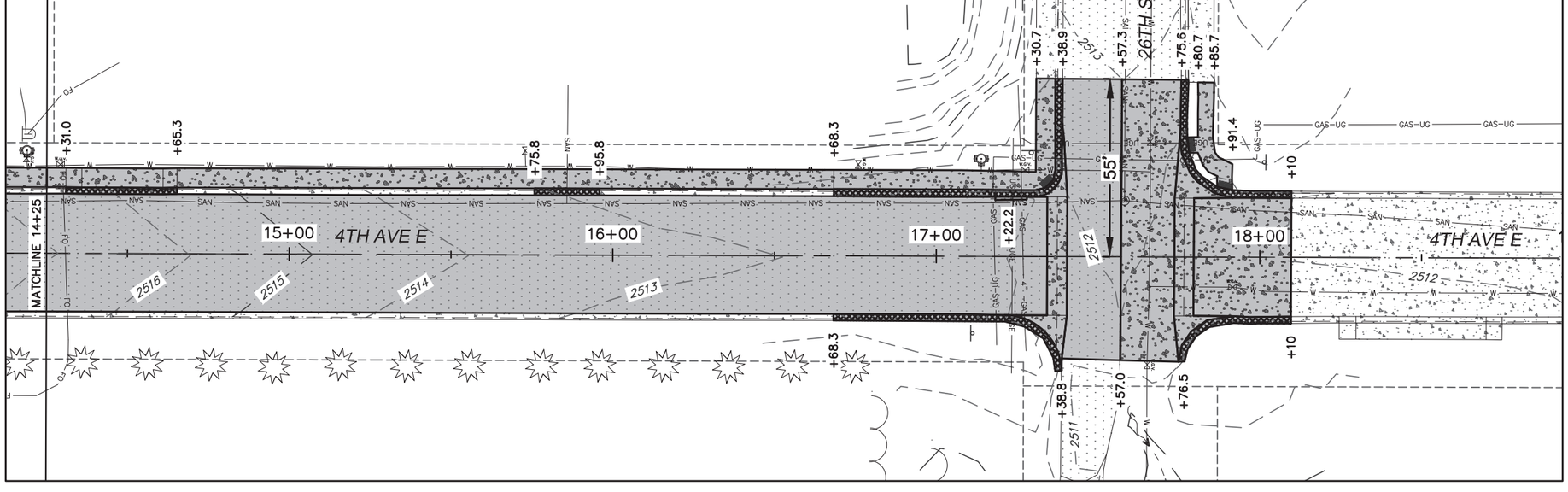
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	40	2





LEGEND

QUANTITIES THIS SHEET

REMOVAL OF CONCRETE PAVEMENT

SIDEWALK

Sta 9+75 to 14+25	262 SY
Sta 14+25 to 18+10	246 SY
	508 SY

VALLEY GUTTER

Sta 9+75 to 14+25	40 SY
Sta 14+25 to 18+10	79 SY
	119 SY

MAINLINE

Sta 14+25 to 18+10	289 SY
	289 SY

REMOVAL OF CURB & GUTTER

Sta 9+75 to 14+25	488 LF
Sta 14+25 to 18+10	334 LF
	822 SF

REMOVAL OF BITUMINOUS SURFACING

Sta 9+75 to 14+25	19,445 SF
Sta 14+25 to 18+10	12,743 SF
	32,188 SF

0 40' 80'

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

REMOVALS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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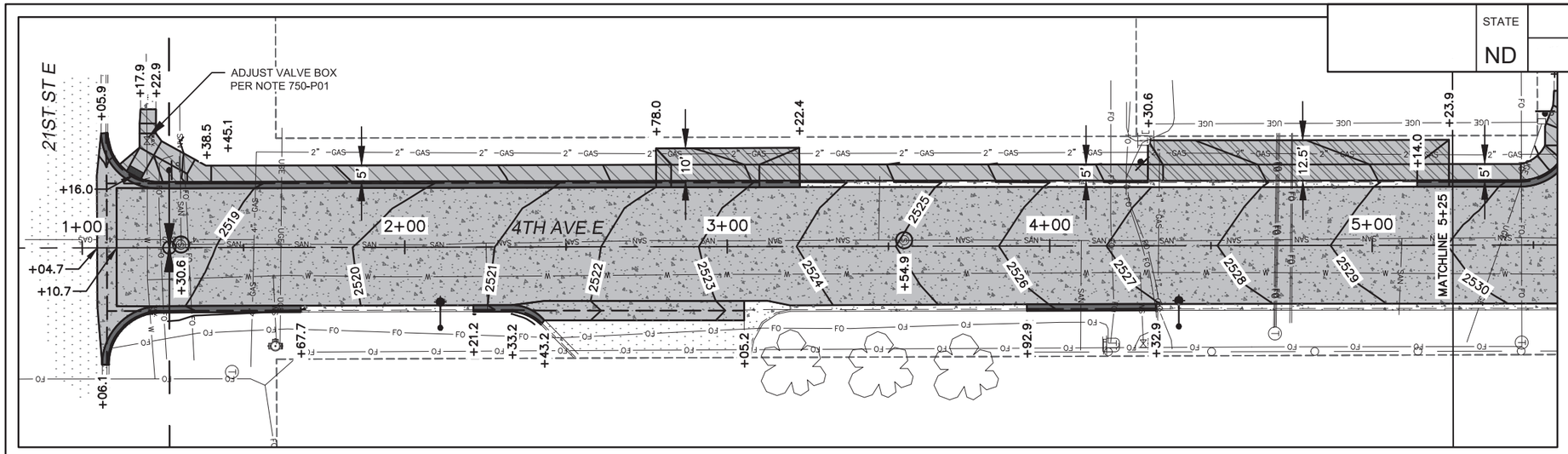
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	60	1



LEGEND

QUANTITIES THIS SHEET

6IN NON-REINF CONCRETE PAVEMENT CL AE
- Sta 1+10 to 5+25 — 1,657 SY
- 1,657 SY

ADJUST MANHOLE
- Sta 1+31 — 1 EA
- Sta 3+55 — 1 EA
- 2 EA

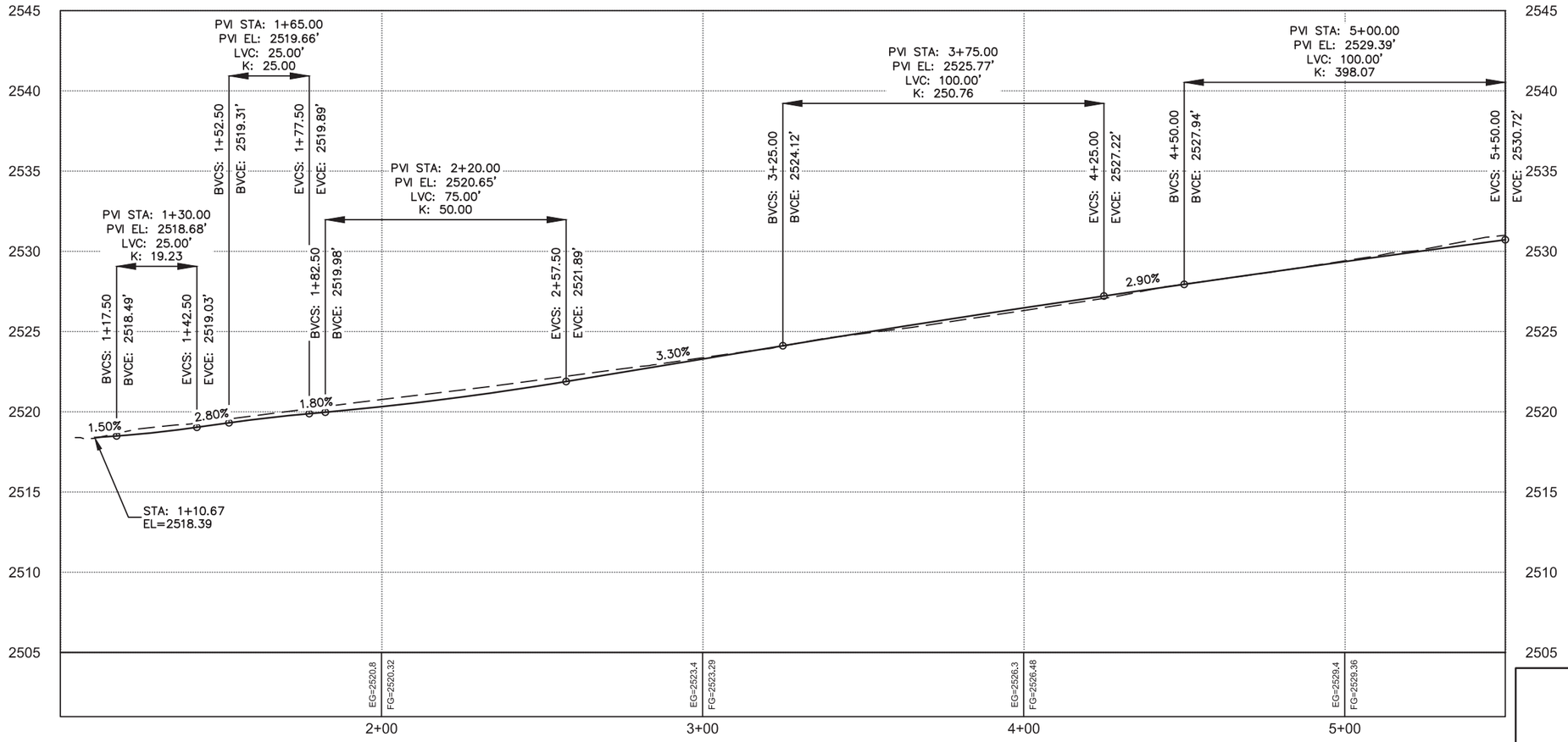
CURB & GUTTER
- Sta 1+06 to 1+68 Rt — 70 LF
- Sta 1+06 to 3+22 Lt — 224 LF
- Sta 2+21 to 2+43 Rt — 22 LF
- Sta 3+93 to 4+33 Rt — 40 LF
- Sta 5+14 to 5+25 Lt — 11 LF
- 367 LF

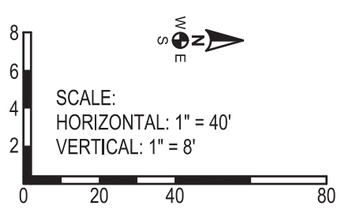
SIDEWALK CONCRETE
- Sta 1+06 to 2+78 Lt — 110 SY
- Sta 3+22 to 4+31 Lt — 60 SY
- Sta 5+24 to 5+25 Lt — 1 SY
- 171 SY

DRIVEWAY CONCRETE
- Sta 2+78 to 3+22 Lt — 50 SY
- Sta 4+31 to 5+24 Lt — 130 SY
- 180 SY

VALLEY GUTTER 72IN
- Sta 1+05 to 1+24 — 43 SY
- Sta 2+33 to 3+05 Rt — 44 SY
- 87 SY

DETECTABLE WARNING PANELS
- Sta 1+16 Lt — 10 SF
- 10 SF





REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PLAN & PROFILE

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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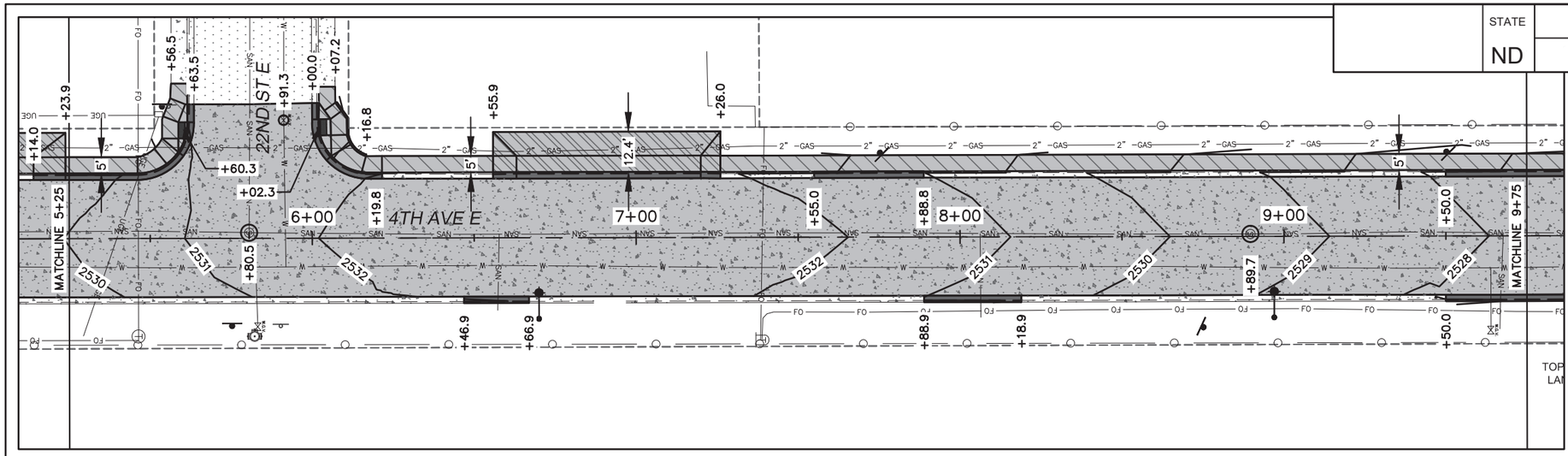
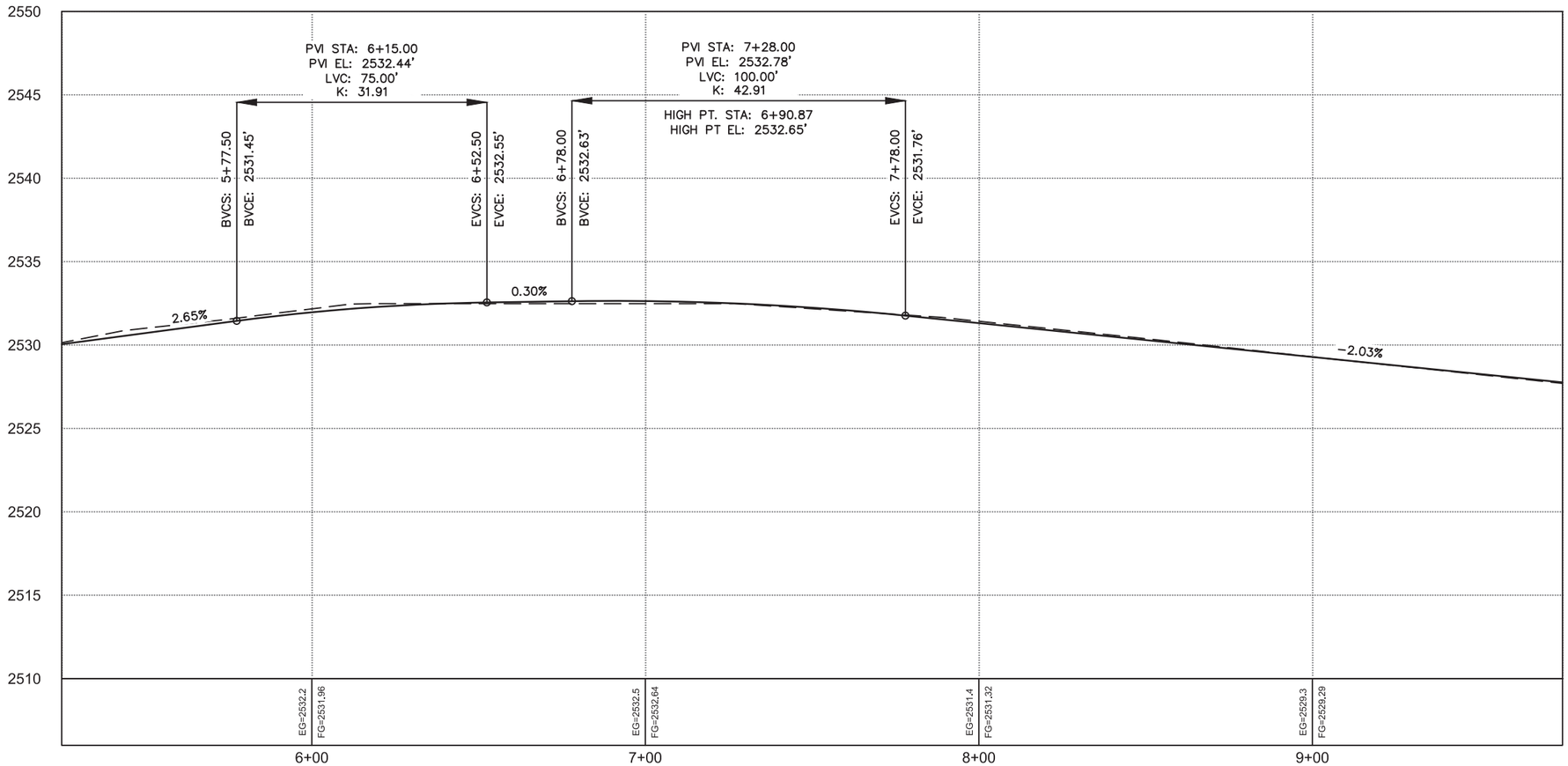
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	60	2





LEGEND

QUANTITIES THIS SHEET

6IN NON-REINF CONCRETE PAVEMENT CL AE
- Sta 5+25 to 9+75 — 1,920 SY
- 1,920 SY

ADJUST GATE VALVE BOX
- Sta 5+91 Lt — 1 EA
- 1 EA

ADJUST MANHOLE
- Sta 5+81 — 1 EA
- Sta 8+90 — 1 EA
- 2 EA

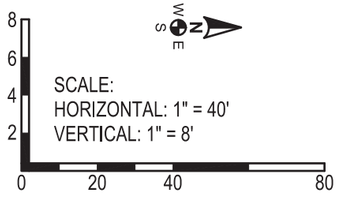
CRUB - TYPE I
- Sta 6+07 to 6+17 — 20 LF
- 20 LF

CURB & GUTTER
- Sta 5+25 to 5+64 Lt — 51 LF
- Sta 6+00 to 6+20 Lt — 33 LF
- Sta 6+47 to 6+67 Rt — 20 LF
- Sta 6+56 to 7+26 Lt — 70 LF
- Sta 7+55 to 7+89 Lt — 34 LF
- Sta 7+89 to 8+19 Rt — 30 LF
- Sta 9+50 to 9+75 Lt — 25 LF
- Sta 9+50 to 9+75 Rt — 25 LF
- 288 LF

SIDEWALK CONCRETE
- Sta 5+25 to 5+64 Lt — 34 SY
- Sta 6+00 to 6+56 Lt — 44 SY
- Sta 7+26 to 9+75 Lt — 138 SY
- 216 SY

DRIVEWAY CONCRETE
- Sta 6+56 to 7+26 Lt — 97 SY
- 97 SY

DETECTABLE WARNING PANELS
- Sta 5+60 Lt — 10 SF
- Sta 6+02 Lt — 10 SF
- 20 SF



REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PLAN & PROFILE

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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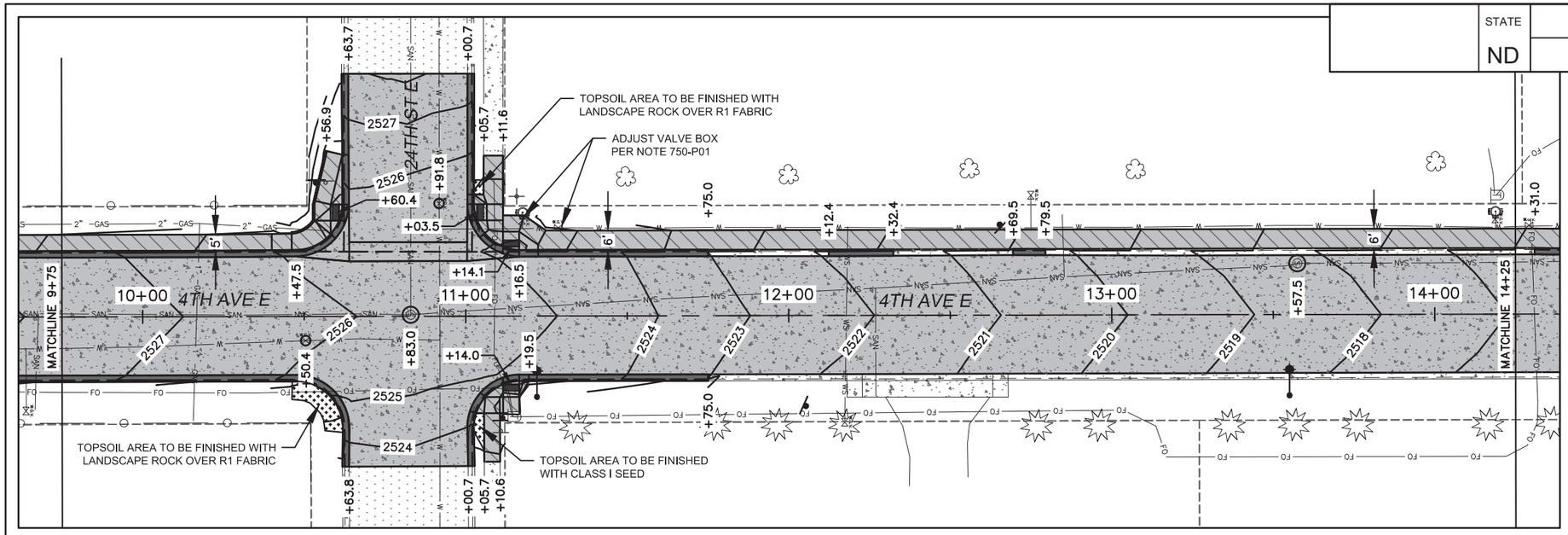
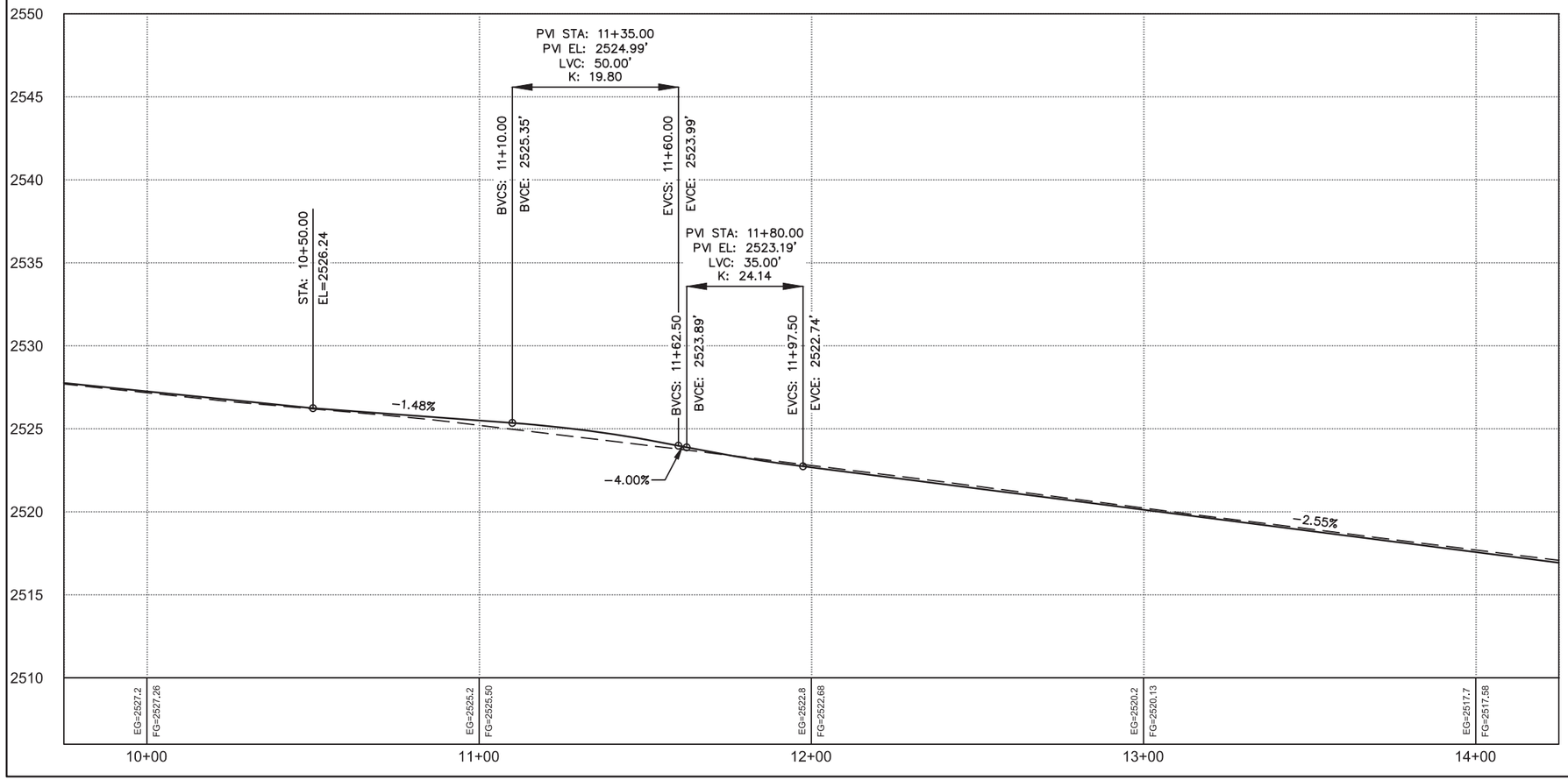
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	60	3





LEGEND

QUANTITIES THIS SHEET

6IN NON-REINF CONCRETE PAVEMENT CL AE
- Sta 9+75 to 14+25 — 2,150 SY
- 2,150 SY

ADJUST GATE VALVE BOX
- Sta 10+50 Rt — 1 EA
- Sta 10+92 Lt — 1 EA
- 2 EA

ADJUST MANHOLE
- Sta 10+83 — 1 EA
- Sta 13+58 — 1 EA
- 2 EA

CRUB - TYPE I
- Sta 10+48 to 10+57 — 29 LF
- 29 LF

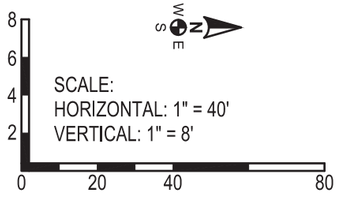
CURB & GUTTER
- Sta 9+75 to 10+64 Lt — 136 LF
- Sta 9+75 to 10+64 Rt — 108 LF
- Sta 11+01 to 11+75 Lt — 122 LF
- Sta 11+01 to 11+75 Rt — 93 LF
- Sta 12+12 to 12+32 Lt — 20 LF
- Sta 12+70 to 12+80 Lt — 10 LF
- 489 LF

SIDEWALK CONCRETE
- Sta 9+75 to 10+61 Lt — 65 SY
- Sta 11+03 to 14+25 Lt — 234 SY
- Sta 11+03 to 11+20 Rt — 20 SY
- 319 SY

VALLEY GUTTER 72IN
- Sta 10+48 to 11+17 Lt — 40 SY
- 40 SY

DETECTABLE WARNING PANELS
- Sta 10+60 Lt — 10 SF
- Sta 11+04 Lt — 10 SF
- Sta 11+14 Lt — 10 SF
- Sta 11+14 Rt — 10 SF
- 40 SF

TOPSOIL
- Sta 10+47 to 10+63 Rt — 1 CY
- Sta 11+00 to 11+06 Lt — 1 CY
- Sta 11+00 to 11+06 Rt — 1 CY
- 3 CY



REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PLAN & PROFILE

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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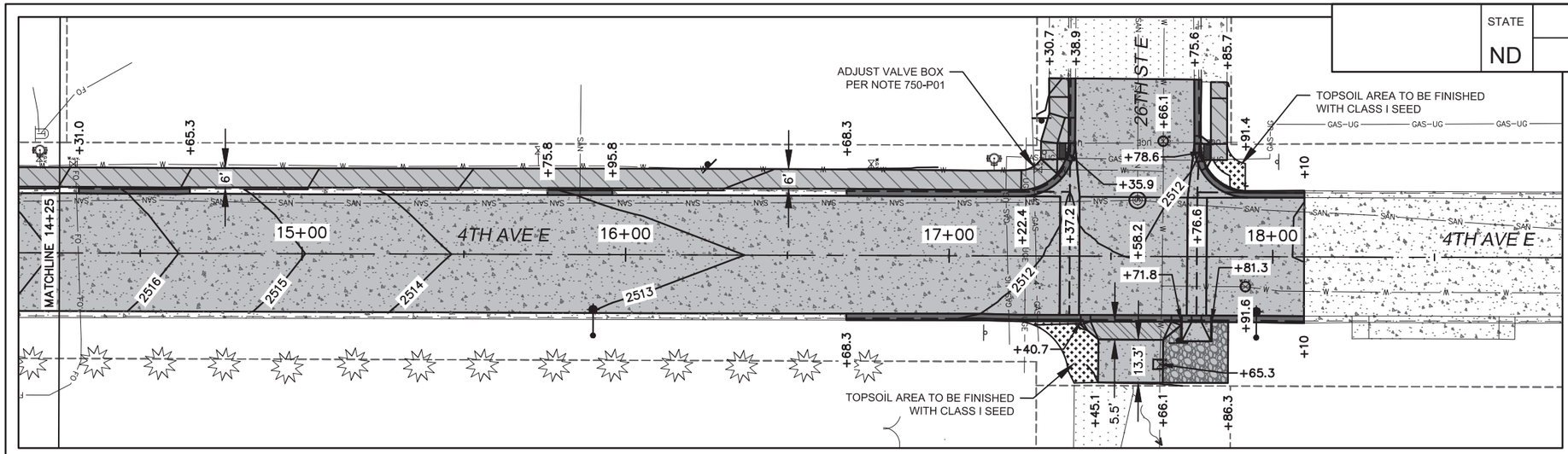
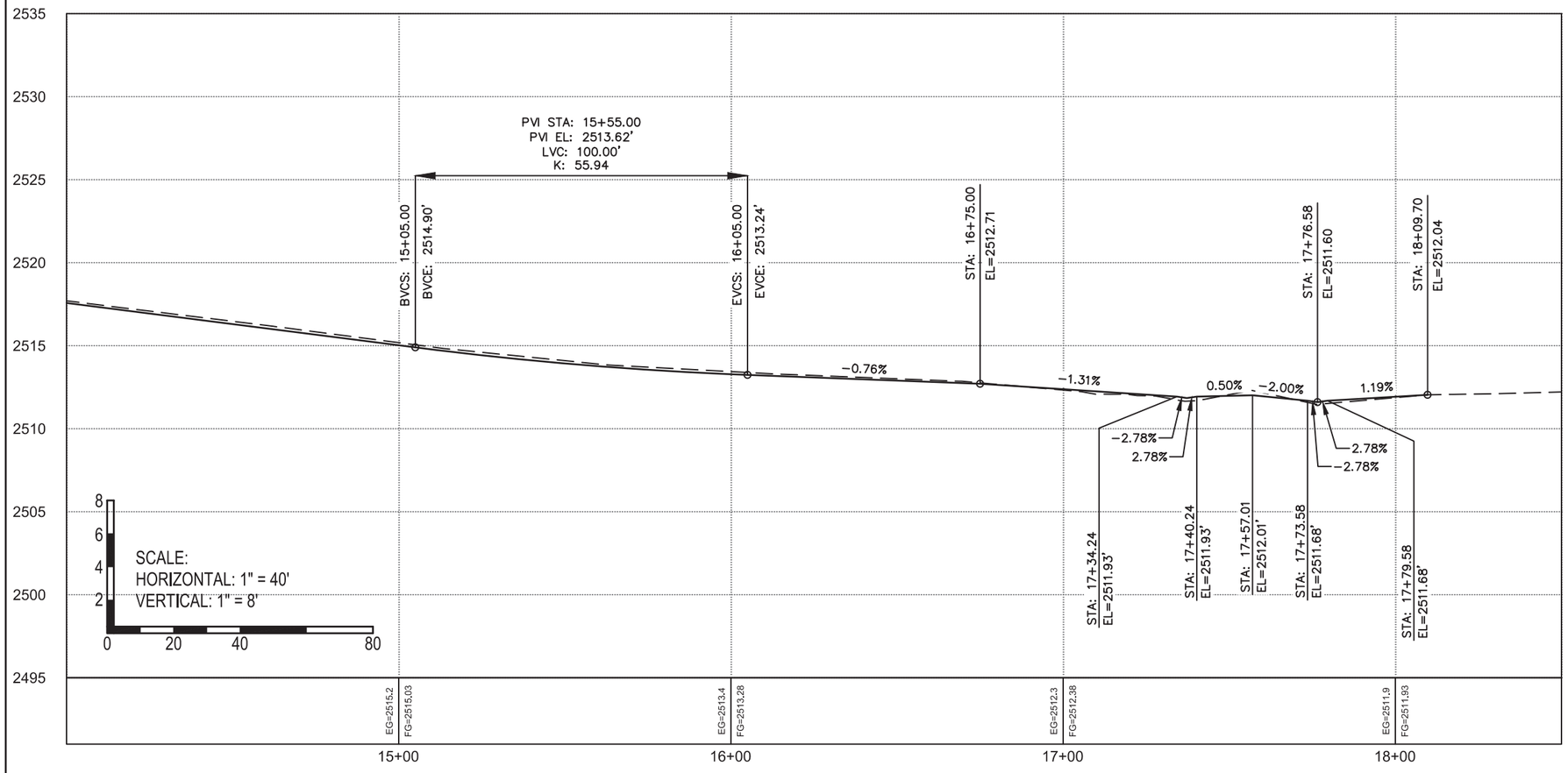
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	60	4





LEGEND

QUANTITIES THIS SHEET

6IN NON-REINF CONCRETE PAVEMENT CL AE

Sta 14+25 to 17+75	1,532 SY
Sta 17+45 to 17+66 Rt	29 SY
Sta 17+80 to 18+10	122 SY
Sta 17+72 to 17+81	6 SY
	1,689 SY

ADJUST GATE VALVE BOX

Sta 17+65 Rt	1 EA
Sta 17+66 Lt	1 EA
Sta 18+92 Rt	1 EA
	3 EA

ADJUST MANHOLE

Sta 17+58	1 EA
	1 EA

CURB & GUTTER

Sta 14+31 to 14+65 Lt	34 LF
Sta 15+76 to 15+96 Lt	20 LF
Sta 16+68 to 17+39 Lt	98 LF
Sta 16+68 to 18+10 Rt	141 LF
Sta 17+76 to 18+10 Lt	61 LF
	354 LF

SIDEWALK CONCRETE

Sta 14+25 to 17+37 Lt	226 SY
Sta 17+77 to 17+86 Lt	16 SY
	242 SY

DRIVEWAY CONCRETE

Sta 17+41 to 17+72 Lt	16 SY
	16 SY

VALLEY GUTTER 72IN

Sta 17+22 to 17+40	32 SY
Sta 17+74 to 17+92	33 SY
	65 SY

DETECTABLE WARNING PANELS

Sta 17+36 Lt	10 SF
Sta 17+79 Lt	10 SF
	20 SF

RIPRAP GRADE I

Sta 17+66 to 17+86 Rt	33 TON
	33 TON

GEOSYNTHETIC MATERIAL TYPE RR

Sta 17+66 to 17+86 Rt	33 SY
	33 SY

TOPSOIL

Sta 17+22 to 17+45 Rt	4 CY
Sta 17+78 to 17+91 Lt	2 CY
	6 CY

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PLAN & PROFILE

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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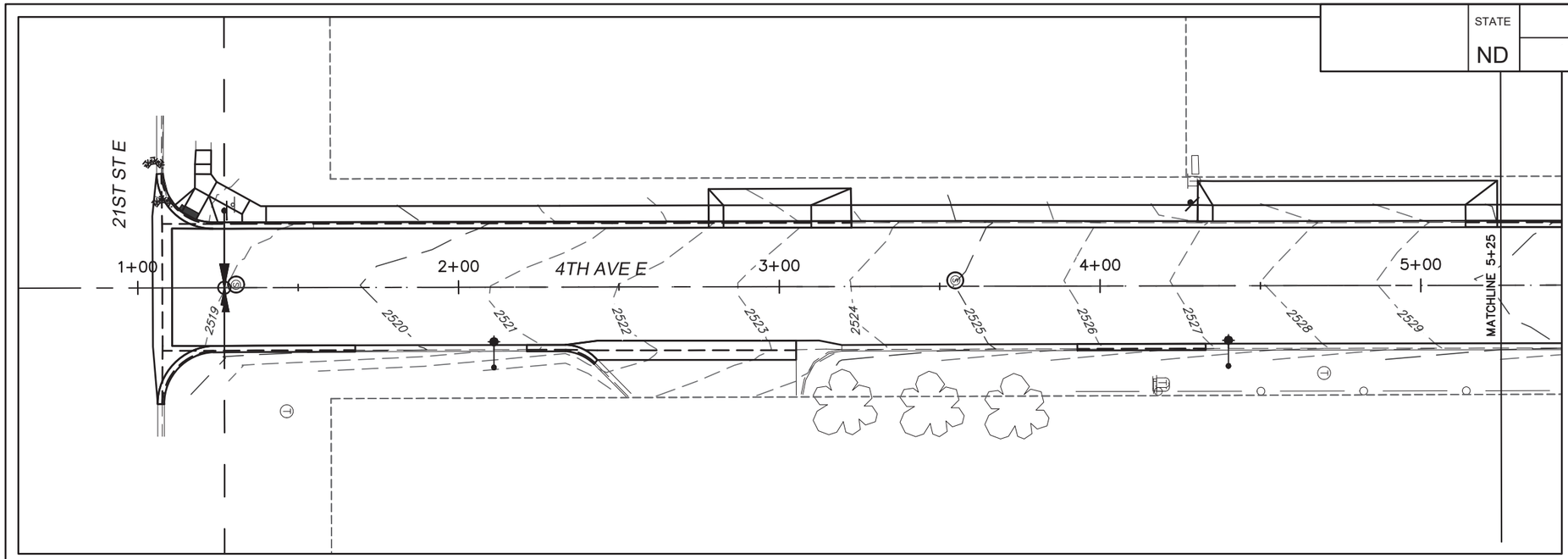
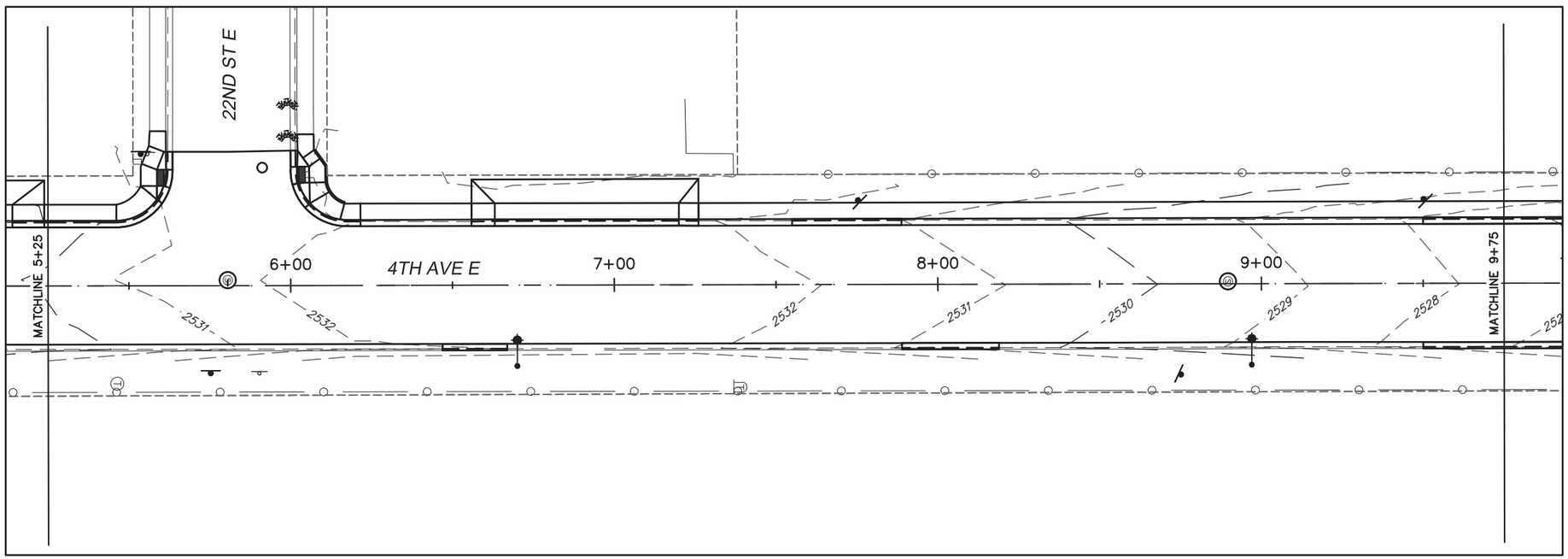
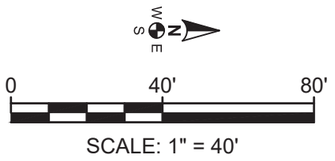
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	76	1





WEIGHTED FIBER ROLLS

Sta 1+05 Lt	16 LF
Sta 6+00 Lt	16 LF
	32 LF



LEGEND

WEIGHTED FIBER ROLLS

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

TEMPORARY EROSION CONTROLS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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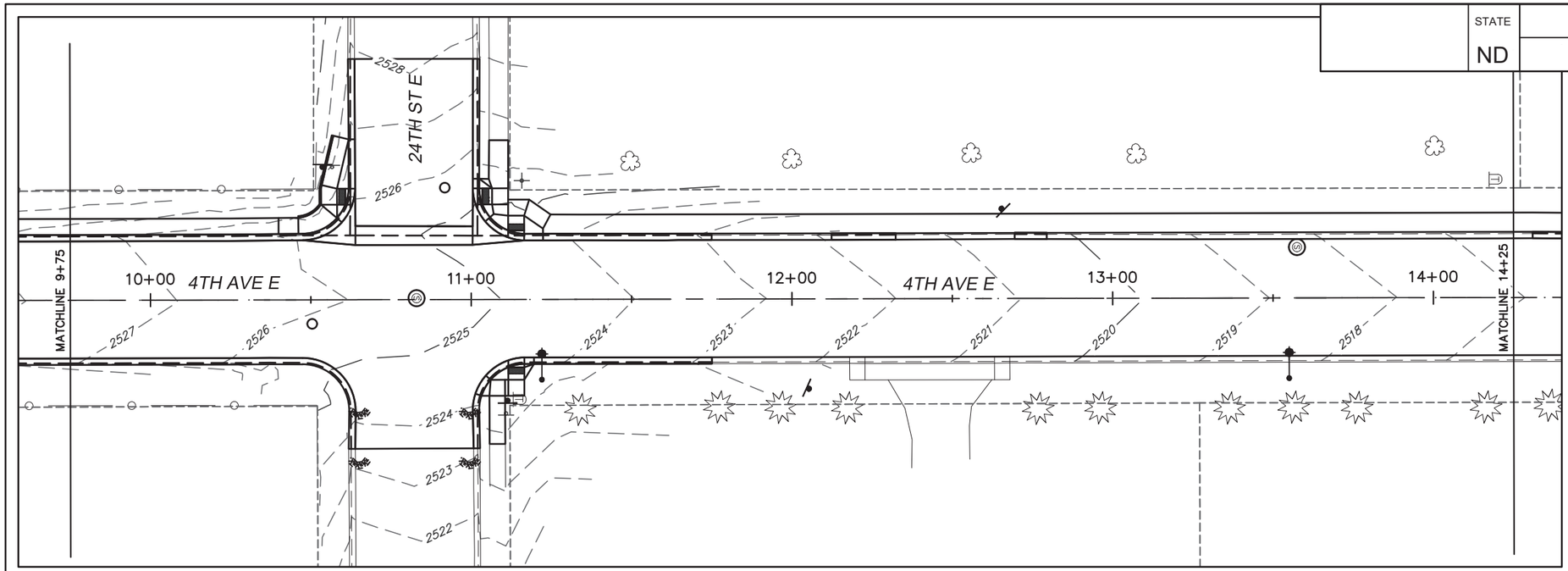
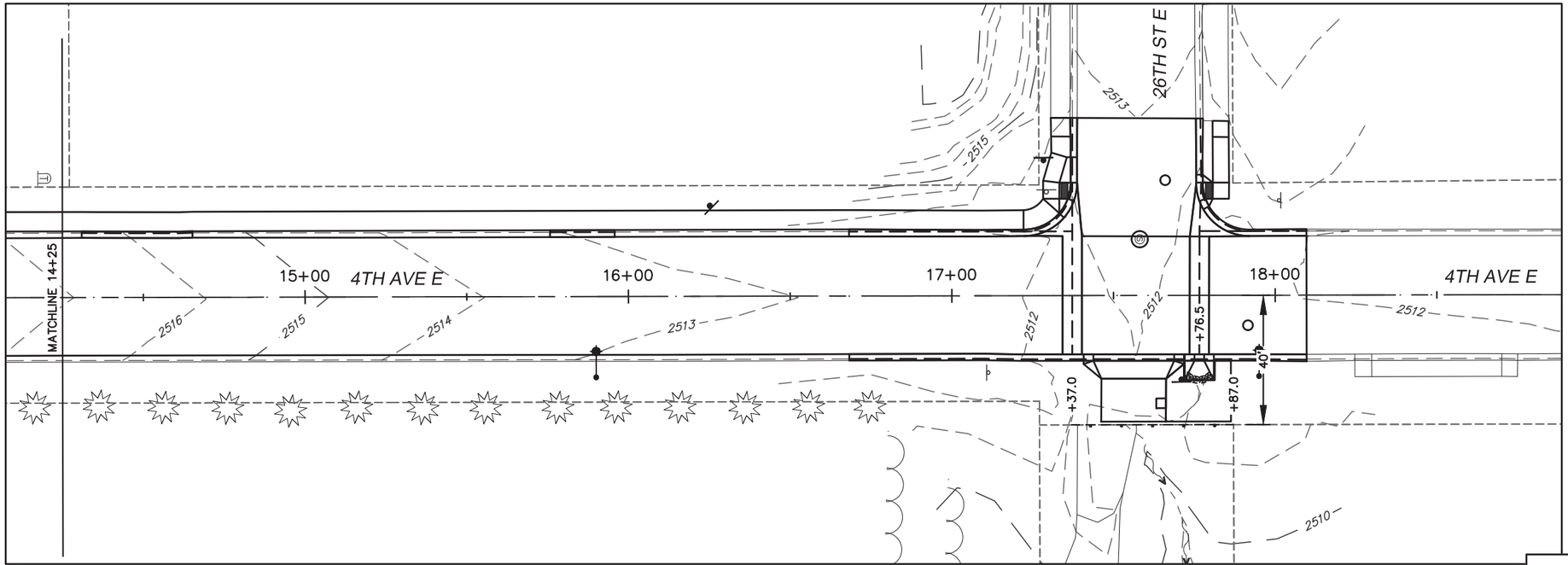
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	76	2



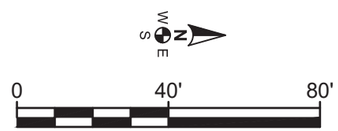


WEIGHTED FIBER ROLLS

Sta 10+65 Rt	16 LF
Sta 11+00 Rt	16 LF
Sta 17+77 Rt	8 LF
	40 LF

SILT FENCE

Sta 17+37 to 17+87 Rt	50 LF
	50 LF



SCALE: 1" = 40'

LEGEND

WEIGHTED FIBER ROLLS

SILT FENCE

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

TEMPORARY EROSION CONTROLS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	81	1

SURVEY COORDINATE DATA

HORIZONTAL ALIGNMENT			
Point	**Station**	**Northing**	**Easting**
POT-1	0+00.00	115,648.18	102,720.21
POT-2	53+99.00	121,074.57	102,709.59

SURVEY CONTROL POINTS					
Point	**Northing**	**Easting**	**Elevation**	**Station**	**Offset**
CP-1	116,291.11	102,748.09	2533.23	6+42.87	29.14' RT
CP-2	117,932.79	102,741.88	2424.91	22+84.65	26.17' RT
SQCOR-S27-T140N-R96W	115,775.18	102,719.96	2518.87	1+27.00	0.00'

REGISTERED PROFESSIONAL ENGINEER
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PE-9814
DATE 03/04/22
NORTH DAKOTA

NOTES:

Hoizontal Data: All coordinates are assumed coordinates derived from a local coordinate system. All coordinates and measurements are ground distances, international foot definition.

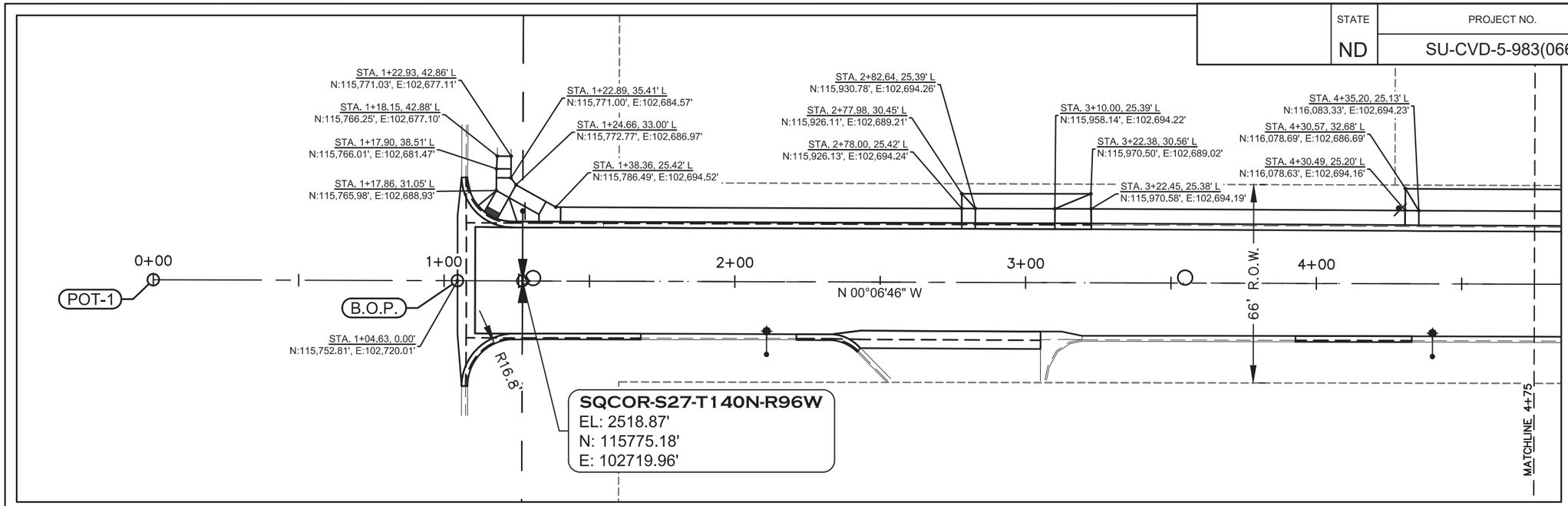
Vertical Data: NAVD-88, GEOID03 (CONUS)

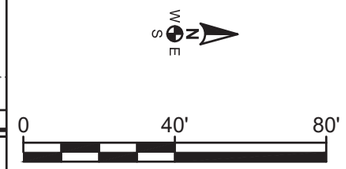
Date Survey Completed: January, 2021

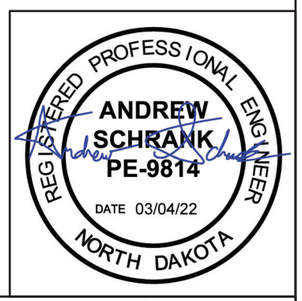
SURVEY COORDINATE DATA

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	82	1







SYMBOLS

CONTROL POINT

QUARTER CORNER

LEGEND

SECTION LINE

QUARTER LINE

PROPERTY LINE

ROADWAY CL ALIGNMENT

SURVEY DATA LAYOUT

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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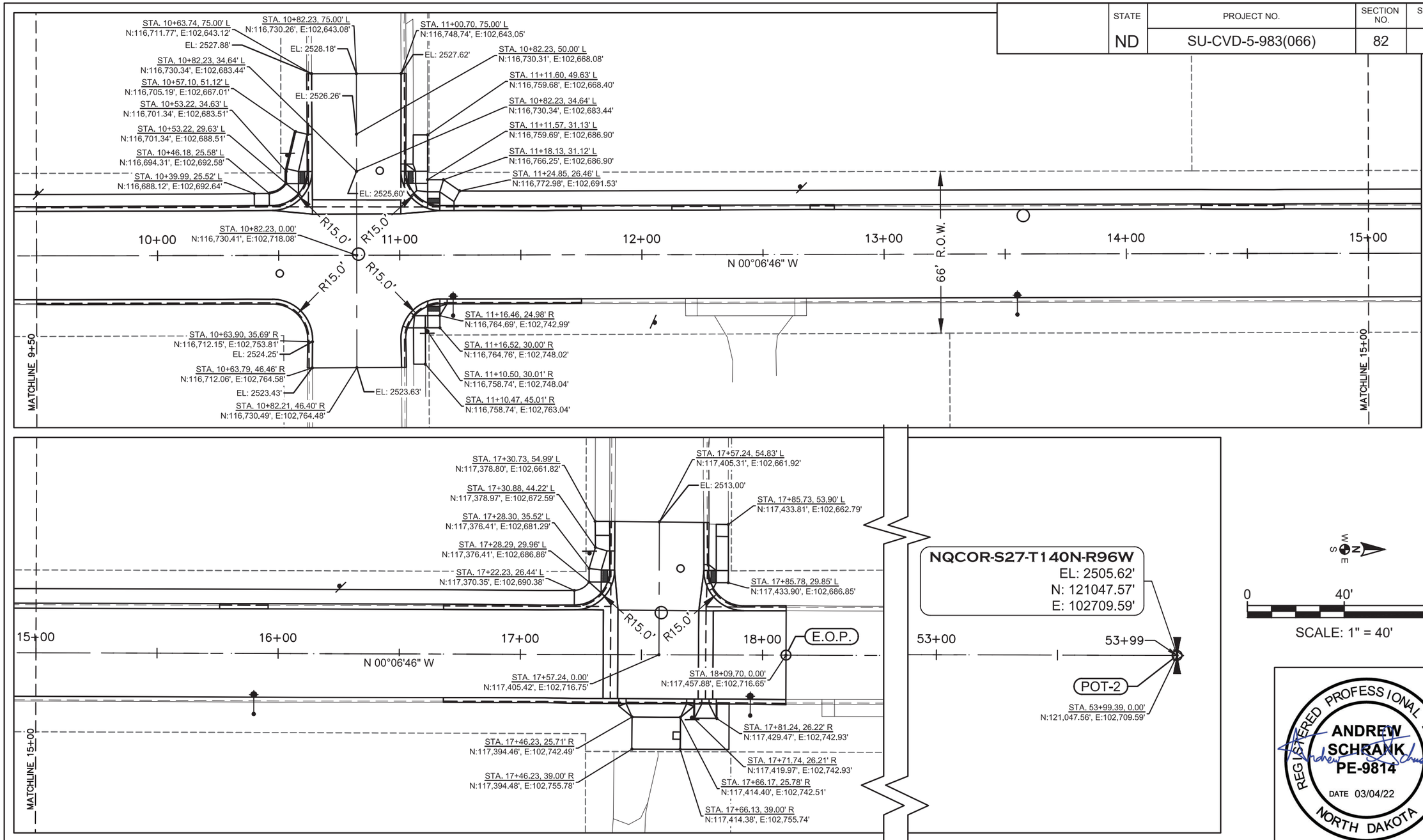
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	82	2



SYMBOLS

CONTROL POINT

QUARTER CORNER

LEGEND

SECTION LINE

QUARTER LINE

PROPERTY LINE

ROADWAY CL ALIGNMENT

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

SURVEY DATA LAYOUT

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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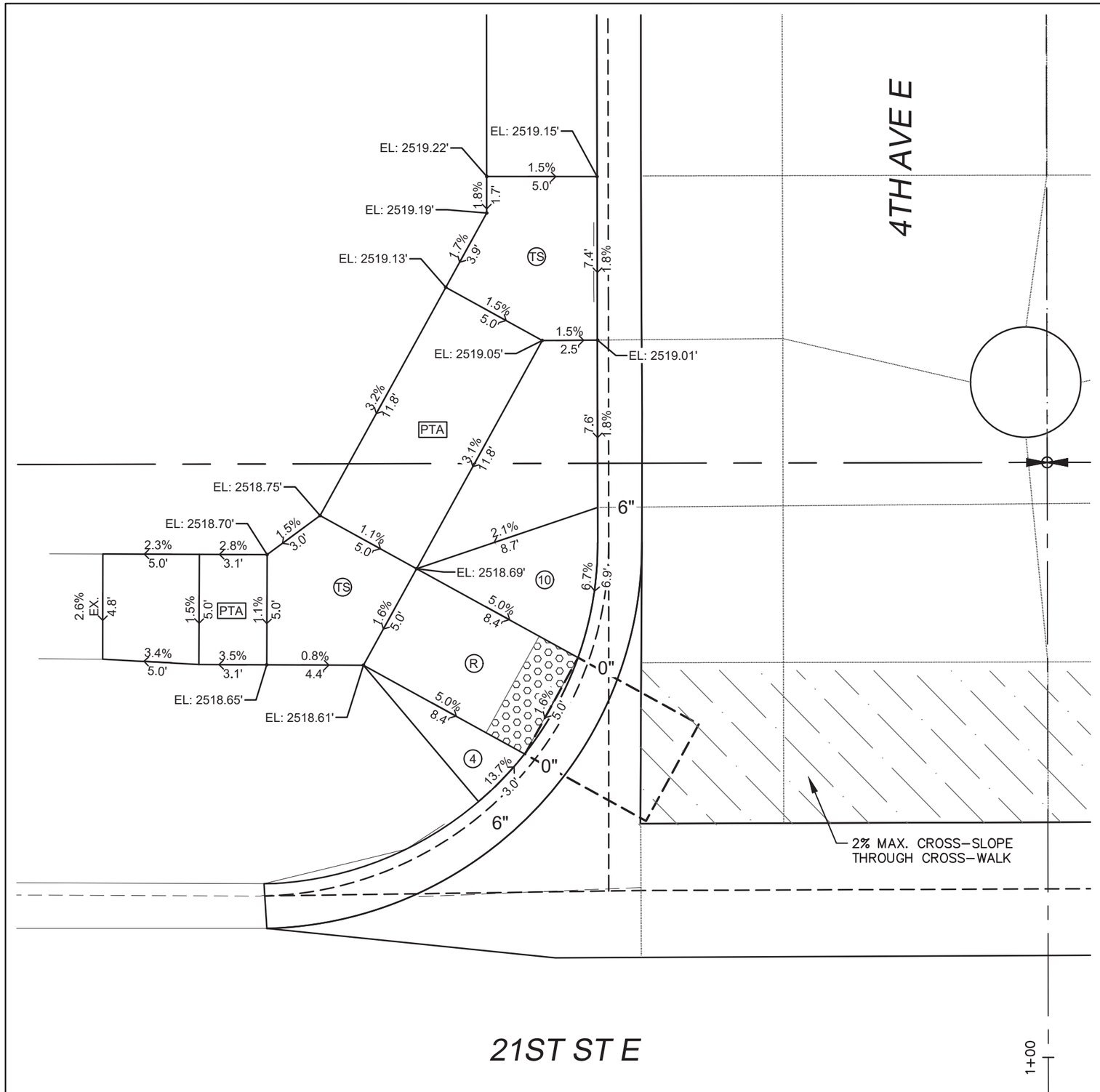
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	90	1



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- (TS) — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- (R) — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- (10) — 10:1 MAXIMUM CONSTRUCTED SLOPE
- (4) — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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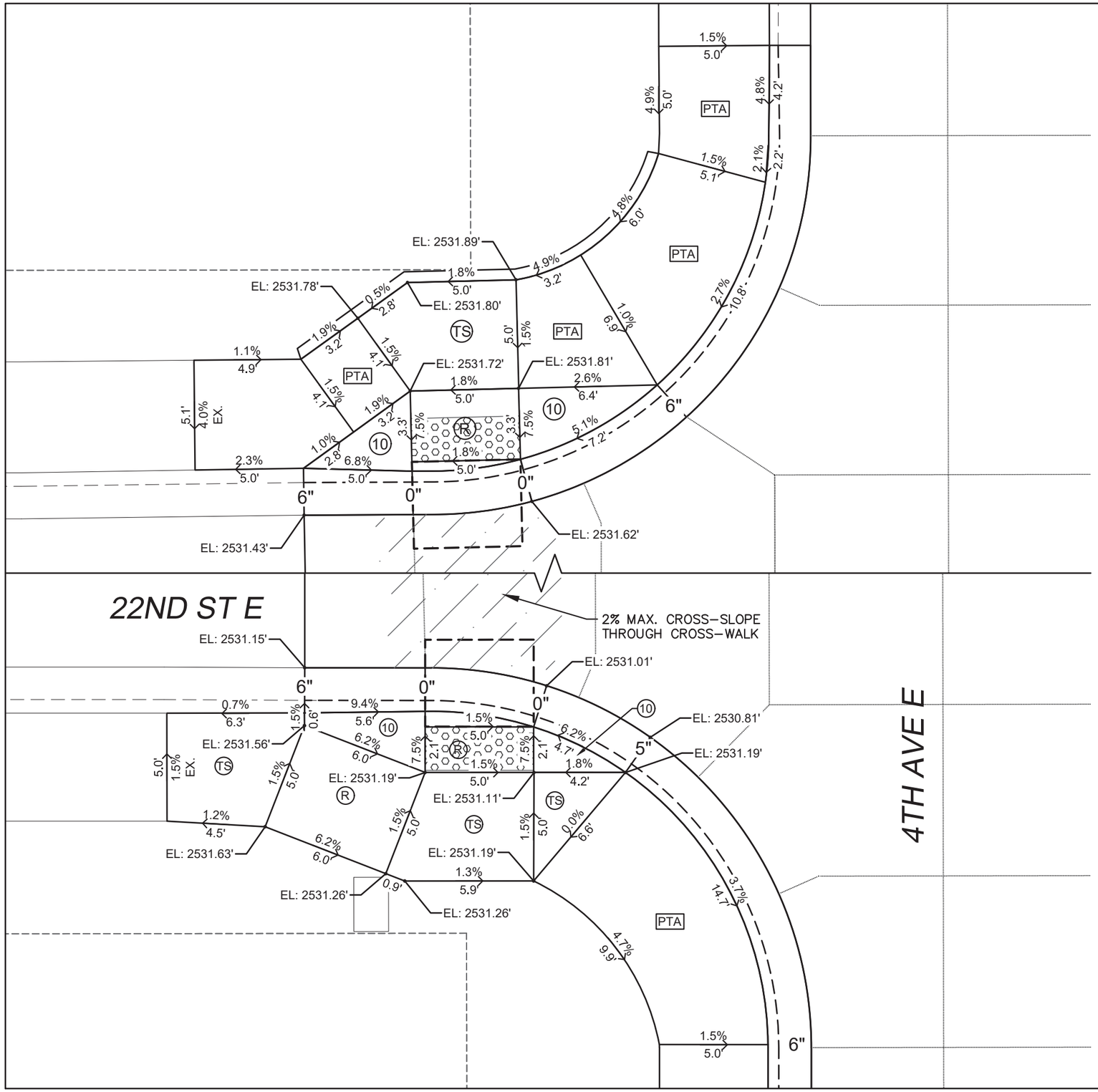
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	90	2



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- (TS) TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- (R) RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- (10) 10:1 MAXIMUM CONSTRUCTED SLOPE
- (4) 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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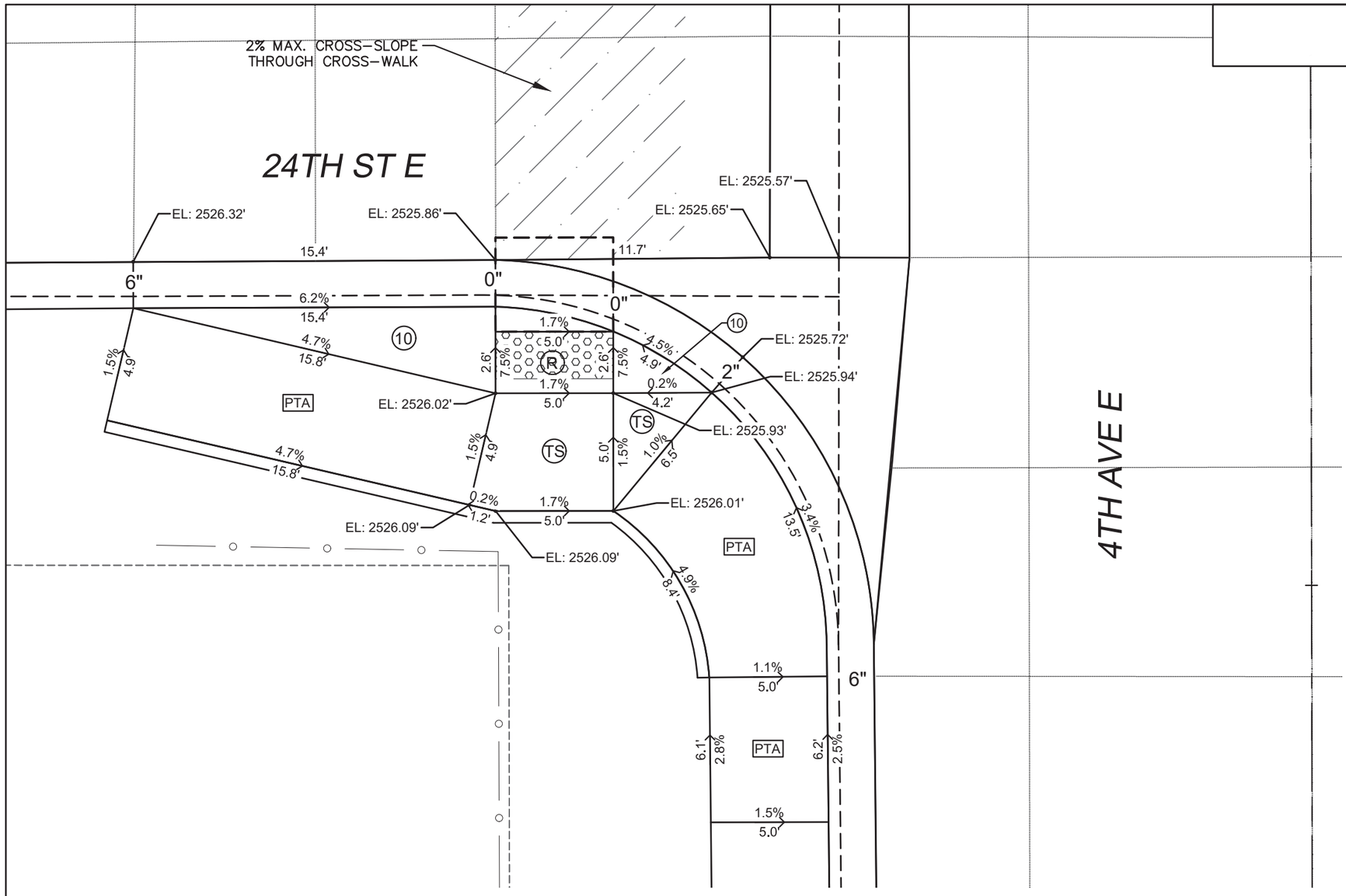
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	3



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- TS — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- R — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- 10 — 10:1 MAXIMUM CONSTRUCTED SLOPE
- 4 — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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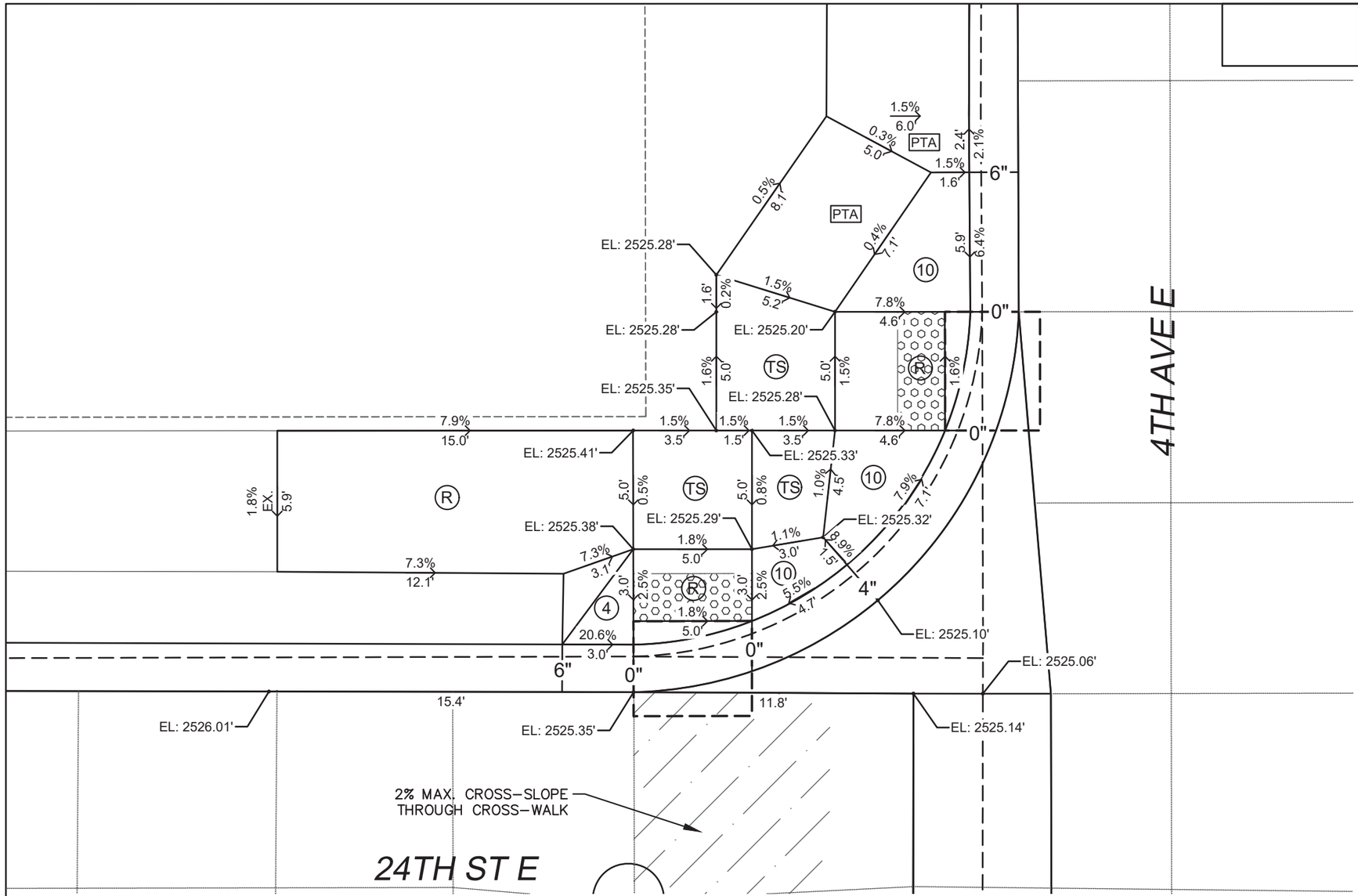
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	4



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- TS — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- R — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- (10) — 10:1 MAXIMUM CONSTRUCTED SLOPE
- (4) — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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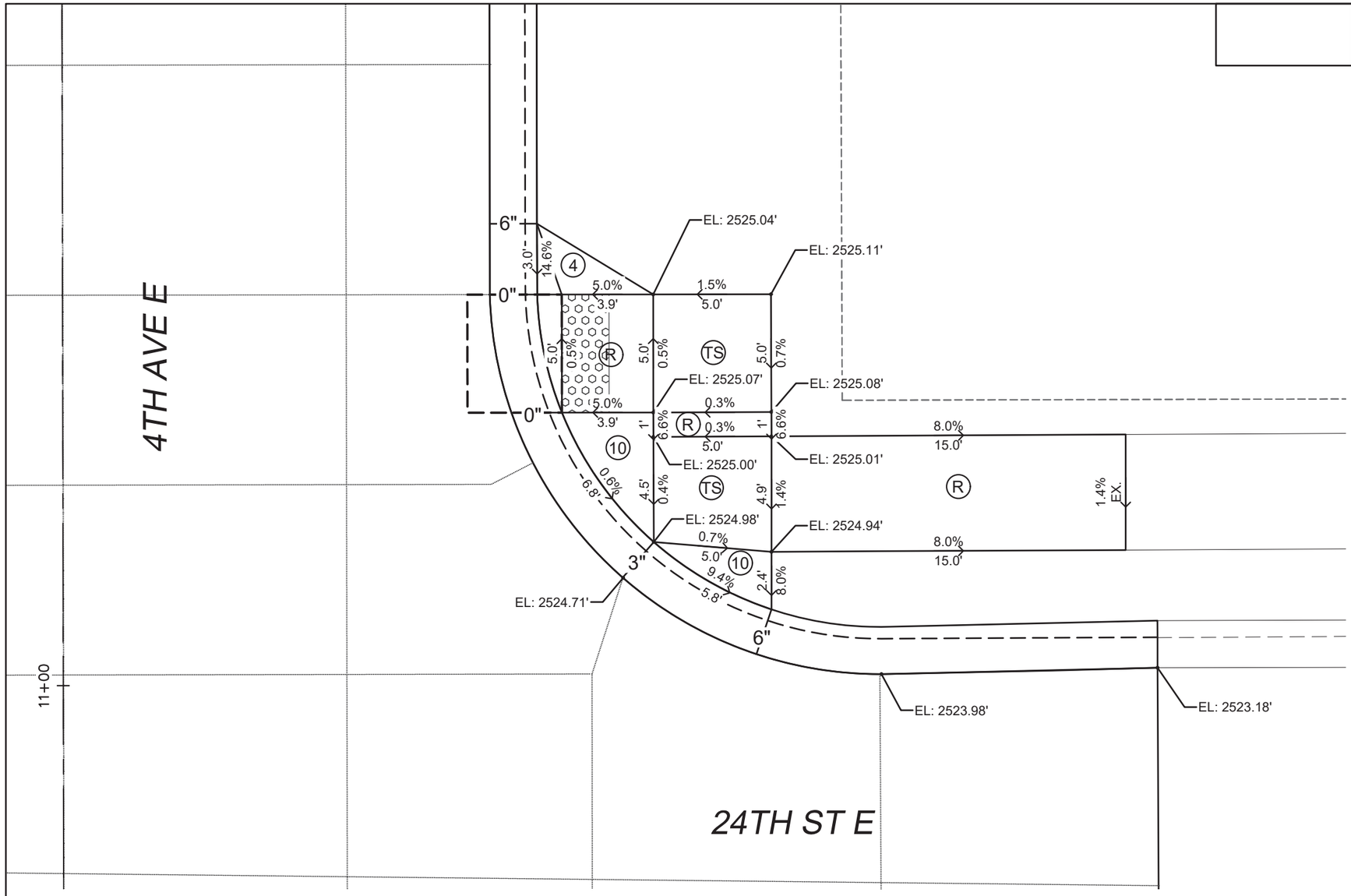
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	5



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- (TS) — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- (R) — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- (10) — 10:1 MAXIMUM CONSTRUCTED SLOPE
- (4) — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

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4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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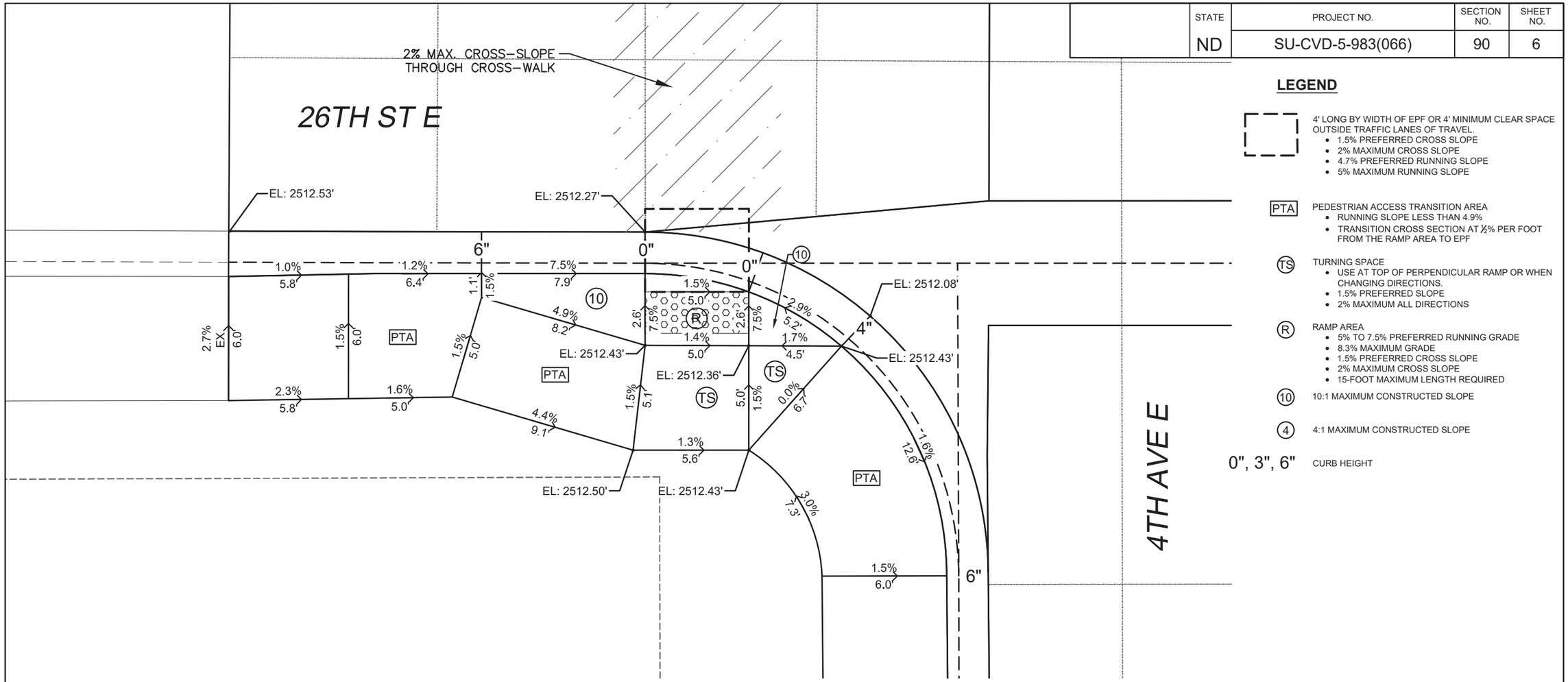
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	6



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- TS — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- R — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- 10 — 10:1 MAXIMUM CONSTRUCTED SLOPE
- 4 — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

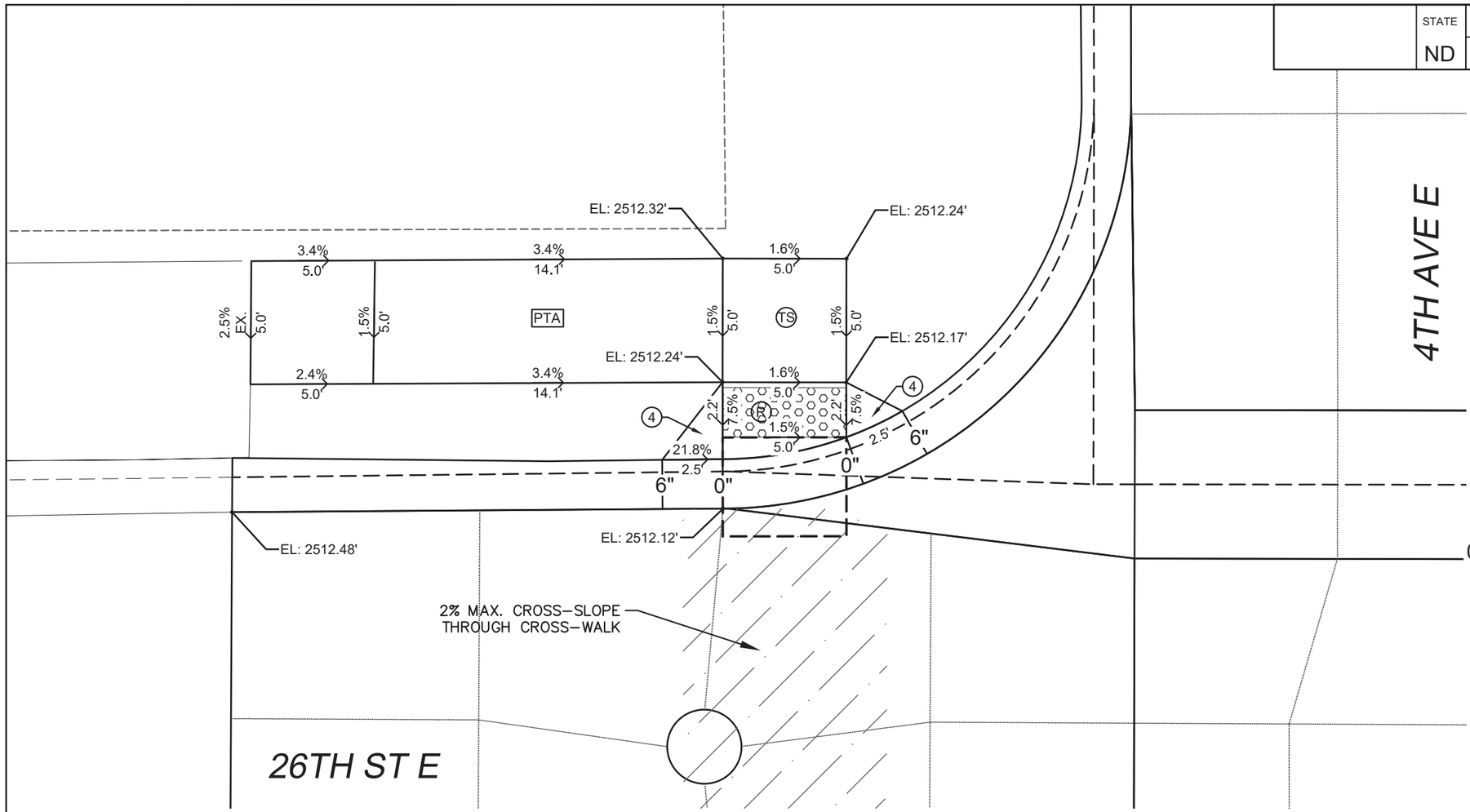
SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	7



LEGEND

- 4' LONG BY WIDTH OF EPF OR 4' MINIMUM CLEAR SPACE OUTSIDE TRAFFIC LANES OF TRAVEL.
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 4.7% PREFERRED RUNNING SLOPE
  - 5% MAXIMUM RUNNING SLOPE
- PTA — PEDESTRIAN ACCESS TRANSITION AREA
  - RUNNING SLOPE LESS THAN 4.9%
  - TRANSITION CROSS SECTION AT ½% PER FOOT FROM THE RAMP AREA TO EPF
- TS — TURNING SPACE
  - USE AT TOP OF PERPENDICULAR RAMP OR WHEN CHANGING DIRECTIONS.
  - 1.5% PREFERRED SLOPE
  - 2% MAXIMUM ALL DIRECTIONS
- R — RAMP AREA
  - 5% TO 7.5% PREFERRED RUNNING GRADE
  - 8.3% MAXIMUM GRADE
  - 1.5% PREFERRED CROSS SLOPE
  - 2% MAXIMUM CROSS SLOPE
  - 15-FOOT MAXIMUM LENGTH REQUIRED
- 10 — 10:1 MAXIMUM CONSTRUCTED SLOPE
- 4 — 4:1 MAXIMUM CONSTRUCTED SLOPE
- 0", 3", 6" — CURB HEIGHT

N W E S

0 5' 10'

SCALE: 1" = 5'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
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DATE 03/04/22
NORTH DAKOTA

PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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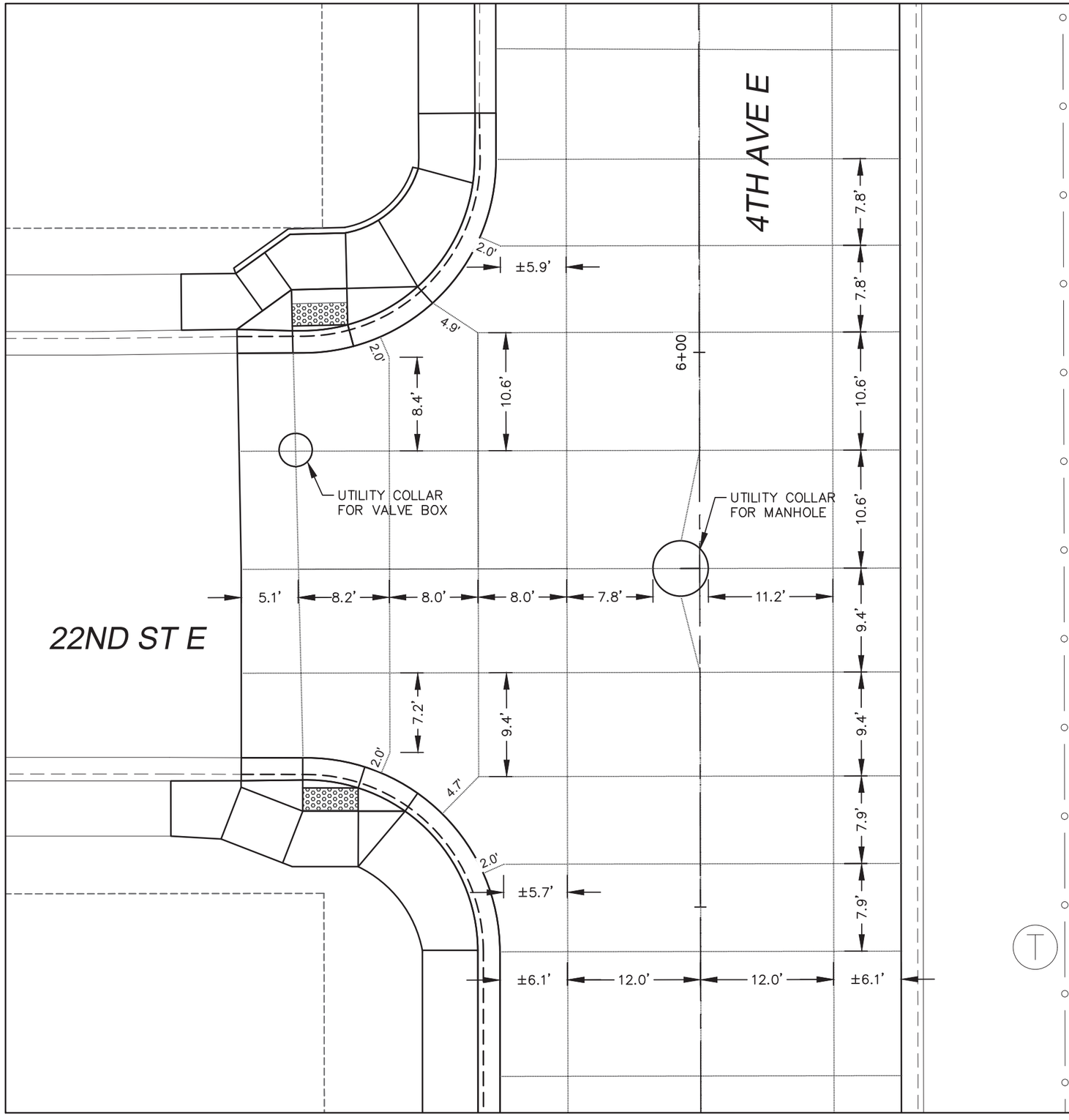
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	90	8



LEGEND

PCC PAVEMENT CONTROL JOINTS

N
W E
S

0 10' 20'

SCALE: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
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PAVING LAYOUTS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	9

LEGEND

PCC PAVEMENT CONTROL JOINTS

4TH AVE E

24TH ST E

11+00

±6.4'
±5.7'
±5.1'
±5.0'
±5.9'
±6.6'

8.4' 8.4' 8.4' 7.6' 7.6' 11.7'

12.0' 12.0'

8.0' 8.0' 8.6' 9.1' 9.6' 10.3' 12.3' 11.8' 9.2' 8.9' 8.9' ±6.1'

2.0' 4.3' 4.1' 2.0'

UTILITY COLLAR FOR VALVE BOX

UTILITY COLLAR FOR MANHOLE

UTILITY COLLAR FOR VALVE BOX

N W E S

0 10' 20'

SCALE: 1" = 10'

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4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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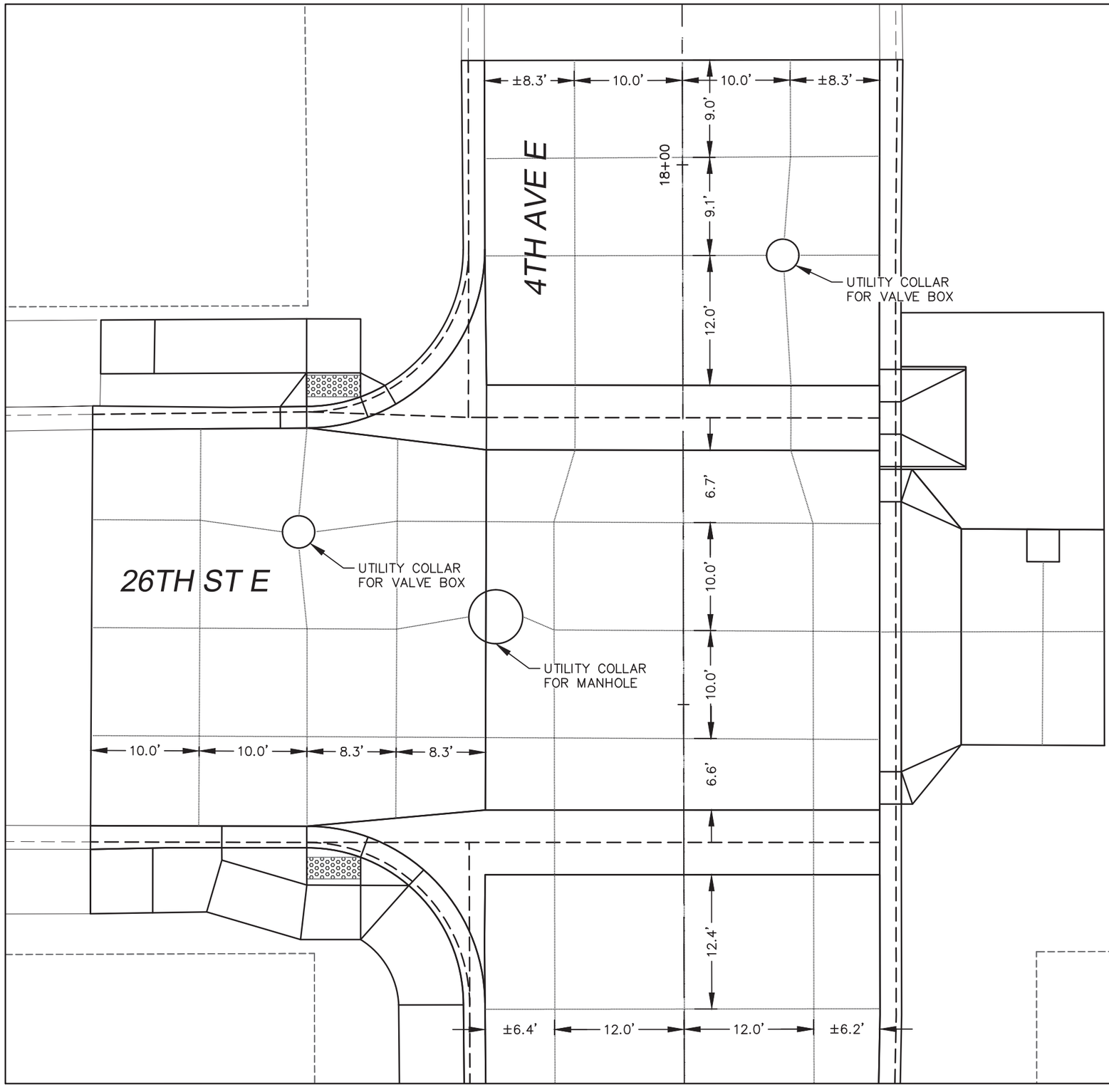
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	90	10



LEGEND

PCC PAVEMENT CONTROL JOINTS

N
W E
S

0 10' 20'

SCALE: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER
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DATE 03/04/22
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4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	**48"x48"**	**EXIT GORE**	**1**	**35**	**35**
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES		28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**26**	**52**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		70	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS		43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW		36	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT		59	
I2-5-96	**96"x48"**	**PROJECT FUNDING SIGN**	**3**	**59**	**177**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-8a-24	**24"x12"**	**END DETOUR**	**1**	**7**	**7**
M4-9-30	**30"x24"**	**DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT**	**8**	**15**	**120**
M4-10-48	**48"x18"**	**DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)**	**2**	**7**	**14**
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)		30	
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R9-9-24	**24"x12"**	**SIDEWALK CLOSED (Mounted on barricade)**	**2**	**3**	**6**
R9-11a-24	**24"x12"**	**SIDEWALK CLOSED CROSS HERE (Mounted on barricade)**	**10**	**3**	**30**
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on barricade)**	**7**	**12**	**84**
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	**60"x30"**	**STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)**	**7**	**15**	**105**
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		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"	LANE ENDS RIGHT or LEFT		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		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER LINE		35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE		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		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**2**	**35**	**70**
W20-2-48	**48"x48"**	**DETOUR AHEAD or __ FT or _ MILE**	**1**	**35**	**35**
W20-3-48	**48"x48"**	**ROAD or STREET CLOSED AHEAD or __ FT or _ MILE**	**1**	**35**	**35**
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	48"x48"	FLAGGER		35	
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back		5	
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		35	
W21-5-48	**48"x48"**	**SHOULDER WORK**	**2**	**35**	**70**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE		35	
W21-6-48	48"x48"	SURVEY CREW		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W21-52-48	48"x48"	PAVEMENT BREAKS		35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	

SPECIAL SIGNS

CONSIGN1	**30"x9"**	**4TH AVE E DETOUR SIGN**	**8**	**7**	**56**

SPEC & CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	896

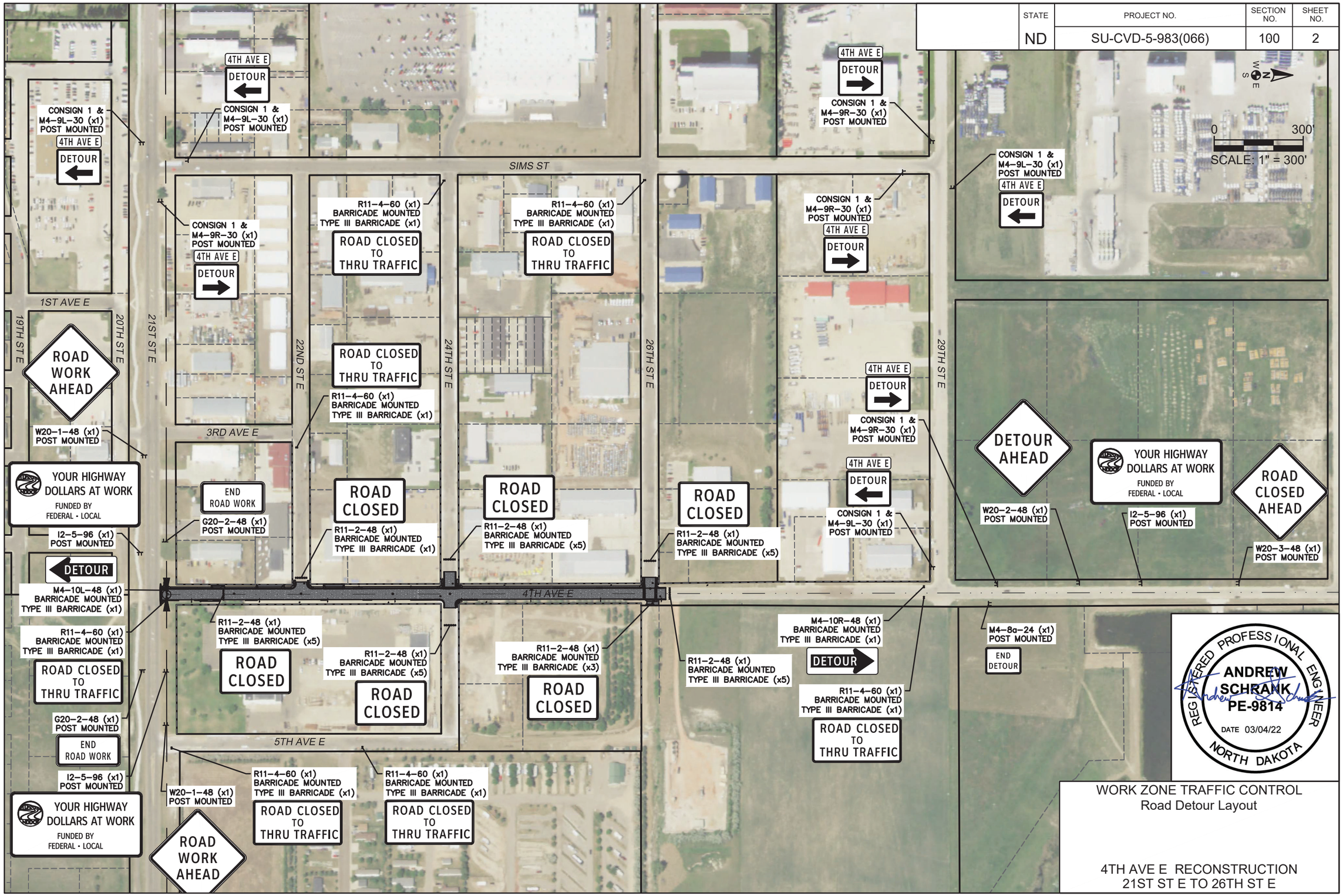
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
704-1048	PORTABLE RUMBLE STRIPS	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**42**
704-1054	**SIDEWALK BARRICADE**	**EA**	**12**
704-1058	**PEDESTRIAN WALKWAY**	**LF**	**681**
704-1060	**DELINEATOR DRUMS**	**EACH**	**6**
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**40**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	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	
704-1500	OBLITERATION OF PVMT MK	SF	
704-2108	**TEMPORARY CURB RAMP**	**EA**	**5**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
http://www.dot.nd.gov/

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

Traffic Control Devices List

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	100	2



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DATE 03/04/22
NORTH DAKOTA

WORK ZONE TRAFFIC CONTROL
Road Detour Layout

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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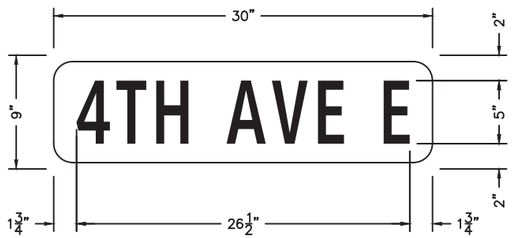
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	100	3

SIGN NUMBER	CONSIGN1
WIDTH x HEIGHT	30" x 9"
BORDER WIDTH	N/A
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: XI Reflective
	COLOR: Fluorescent Orange
LEGEND/BORDER	TYPE: Non-Reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

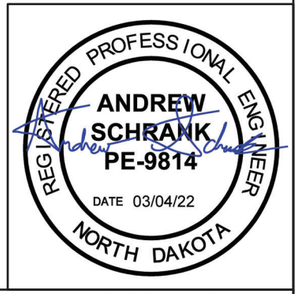
AREA: 1.9 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

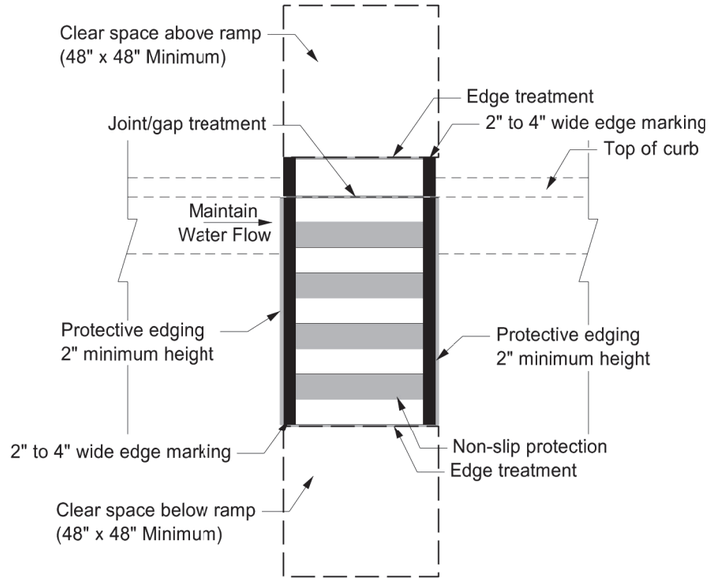
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
4	T	H	A	V	E	E												26.5	5	C 2000
1.8	5.0	8.1	13.7	17.3	20.9	26.1														



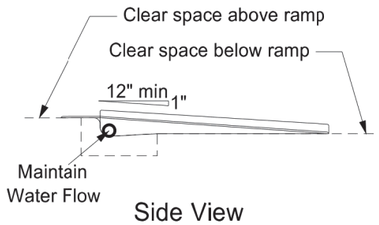
WORK ZONE TRAFFIC CONTROL
Road Detour Layout

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

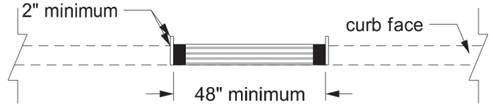
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	100	4



Top View

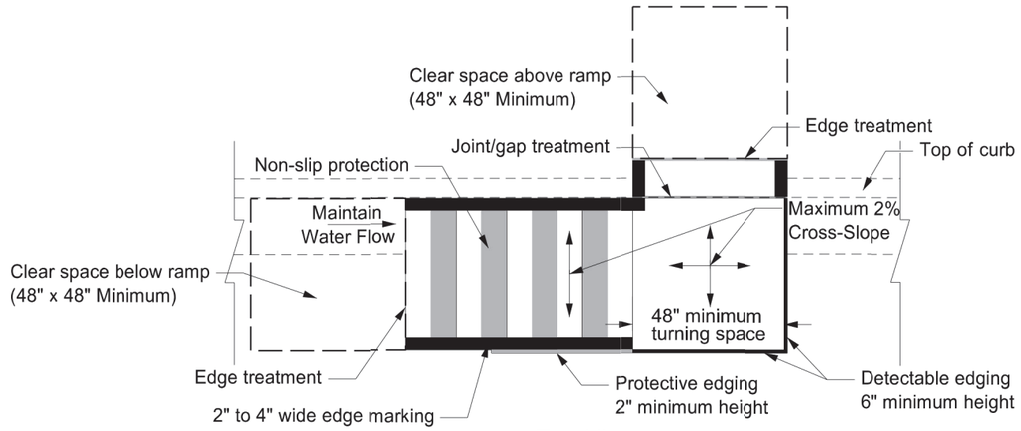


Side View

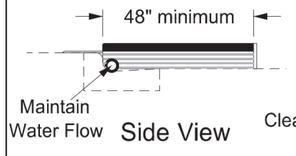


Front View

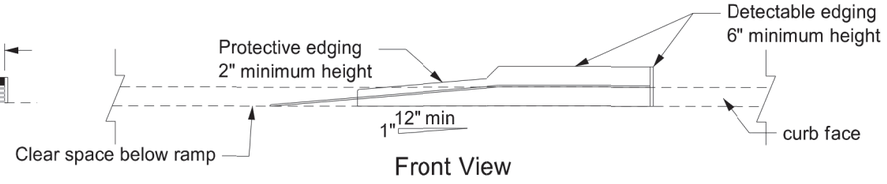
Temporary Perpendicular Curb Ramp



Top View



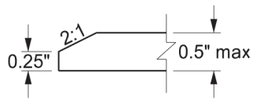
Side View



Front View

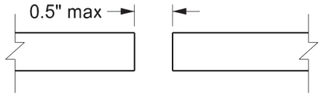
Temporary Parallel Curb Ramp

Edge Treatment



Maximum Surface
Height Change Detail

Joint/Gap Treatment



Maximum Width
Lateral Joints or Gaps

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

WORK ZONE TRAFFIC CONTROL
Temporary Pedestrian Curb Ramp Details

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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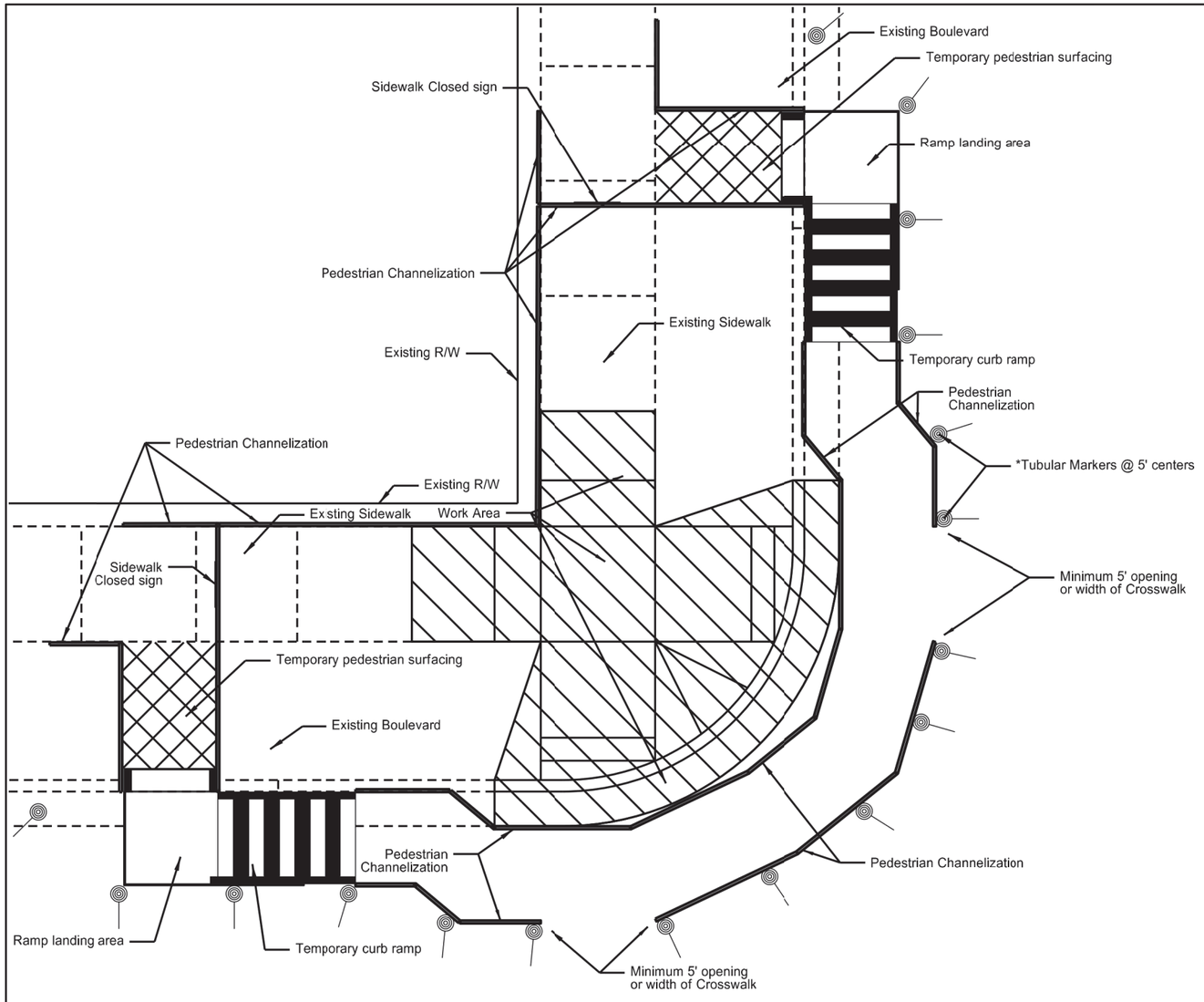
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	100	5

*NOTE: Eliminate tubular markers if pedestrian channelization is retro-reflective



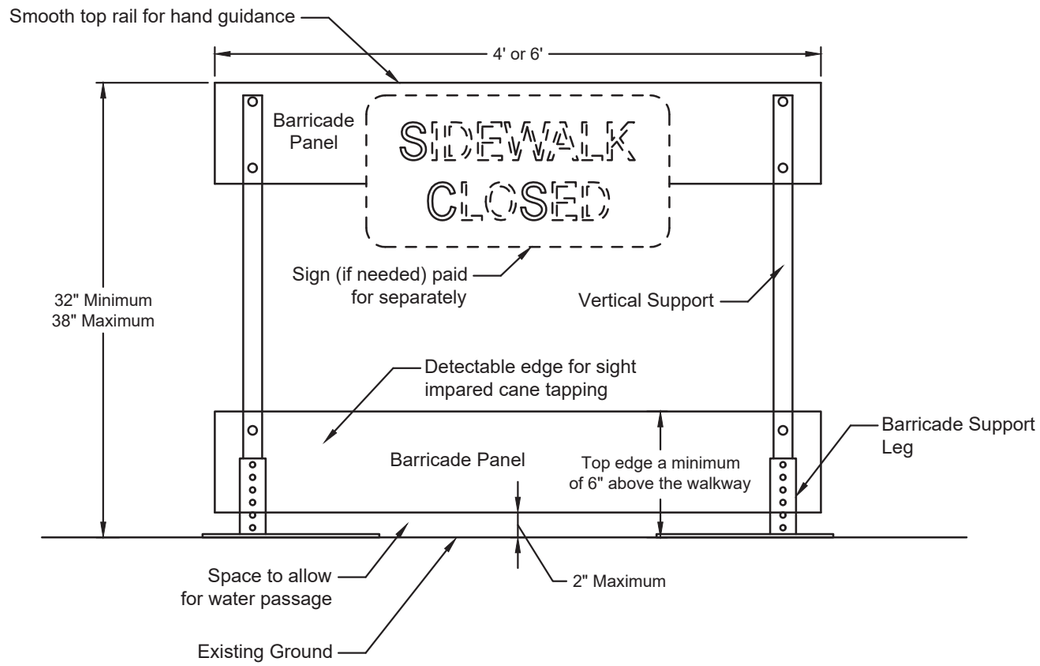
REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

WORK ZONE TRAFFIC CONTROL
Temporary Pedestrian Access Route Detail

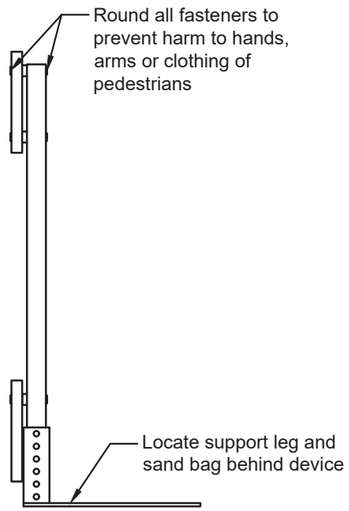
4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

3/4/2022 5:24:21 PM schrank H:\200156\PROJECT CAD\CURRENT\200156_100WZ_003_trafficctrl.dwg

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	100	6



Front View

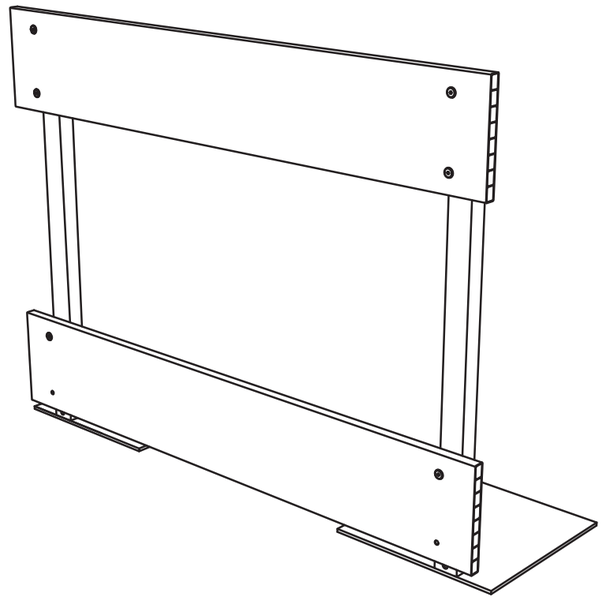


End View

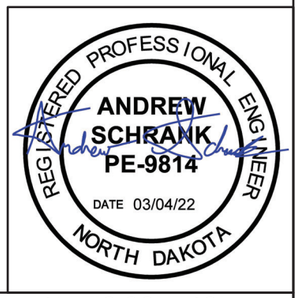
NOTES:

Sidewalk Barricades

1. Provide self standing sidewalk barricade with no supports extending into the pedestrians path.
2. Use orange or orange and white diagonal striped barricade panels contrasting with the walkway surface.
3. Provide ADA compliant and NCHRP 350 or Mash Test Level 3 (TL3) approved sidewalk barricades.
4. Include all costs to furnish, maintain and remove sidewalk barricades in the price bid for "Sidewalk Barricade".



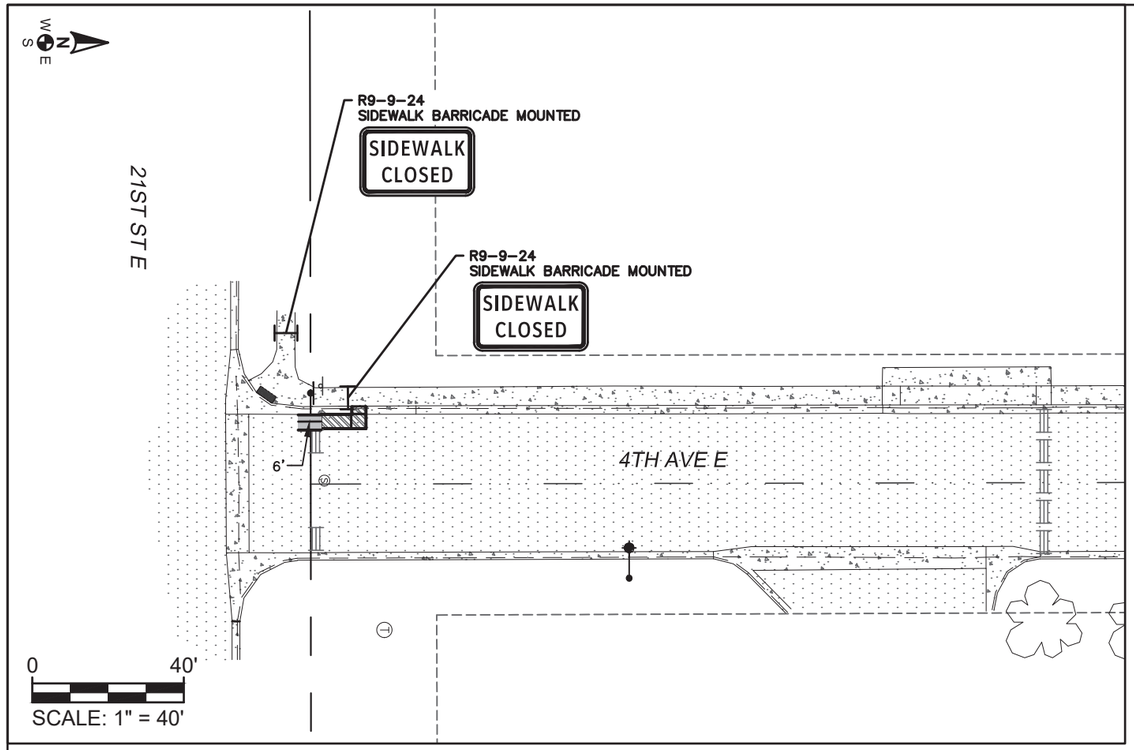
Perspective View

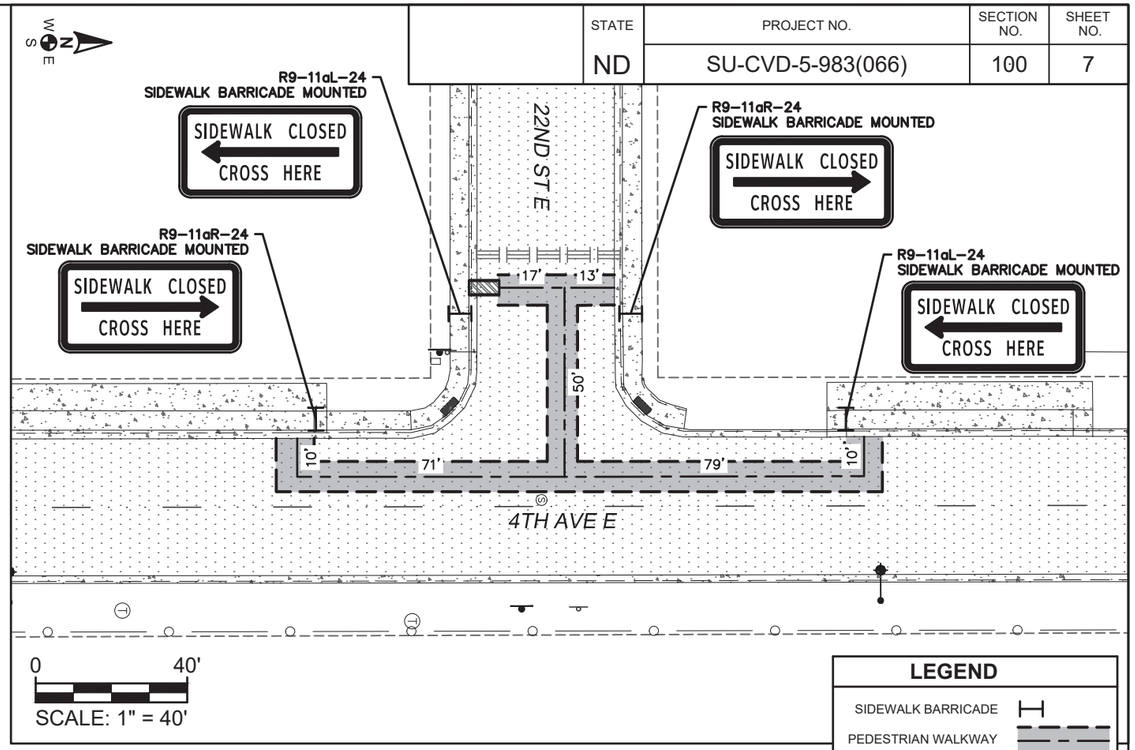


WORK ZONE TRAFFIC CONTROL
Sidewalk Barricade Detail

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-CVD-5-983(066)	100	7





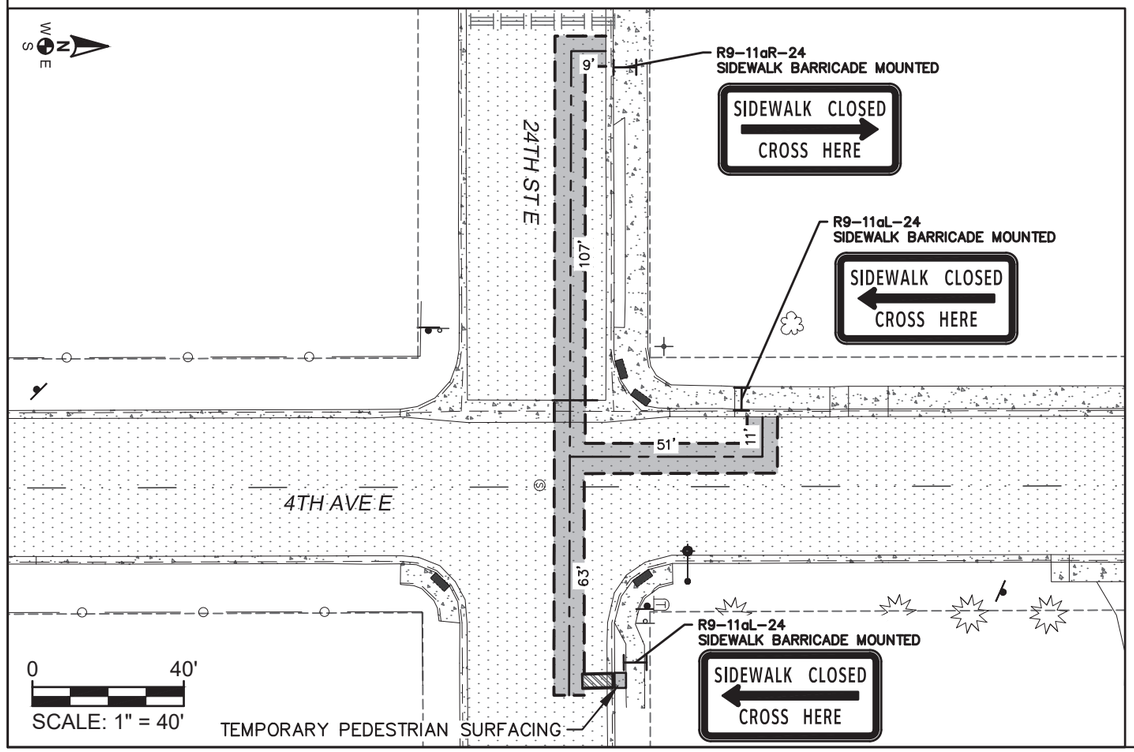
LEGEND

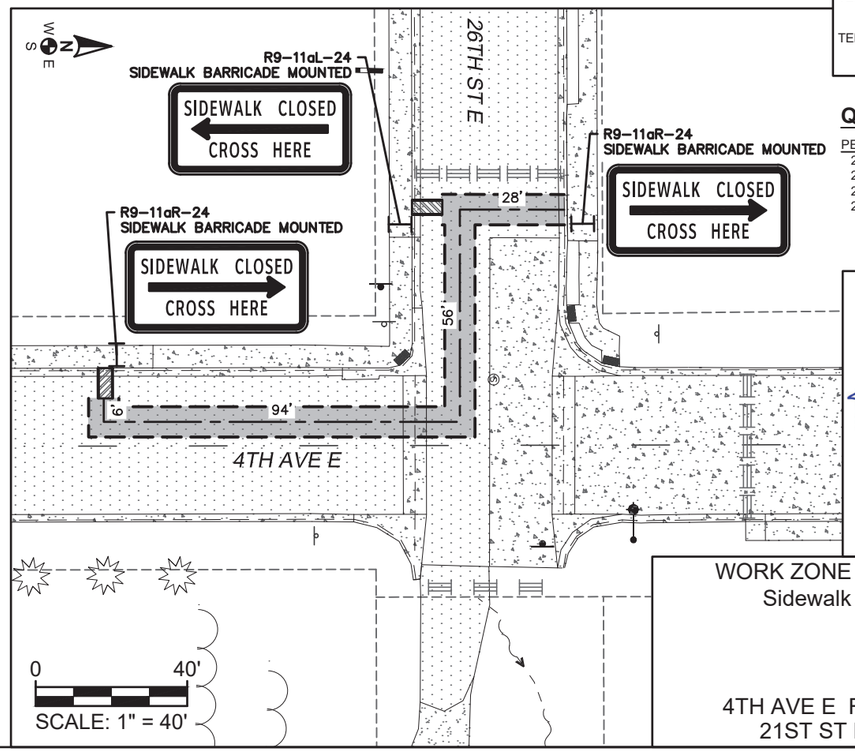
- SIDEWALK BARRICADE
- PEDESTRIAN WALKWAY
- TEMPORARY CURB RAMP - PERPENDICULAR
- TEMPORARY CURB RAMP - PARALLEL

QUANTITIES THIS SHEET

PEDESTRIAN WALKWAY

21ST ST E	6 LF
22ND ST E	250 LF
24TH ST E	241 LF
26TH ST E	184 LF
	681 LF





REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

WORK ZONE TRAFFIC CONTROL
Sidewalk Closure Layouts

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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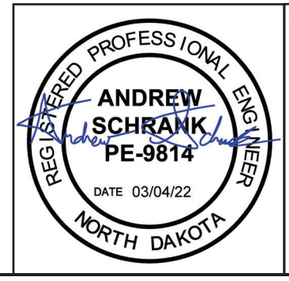
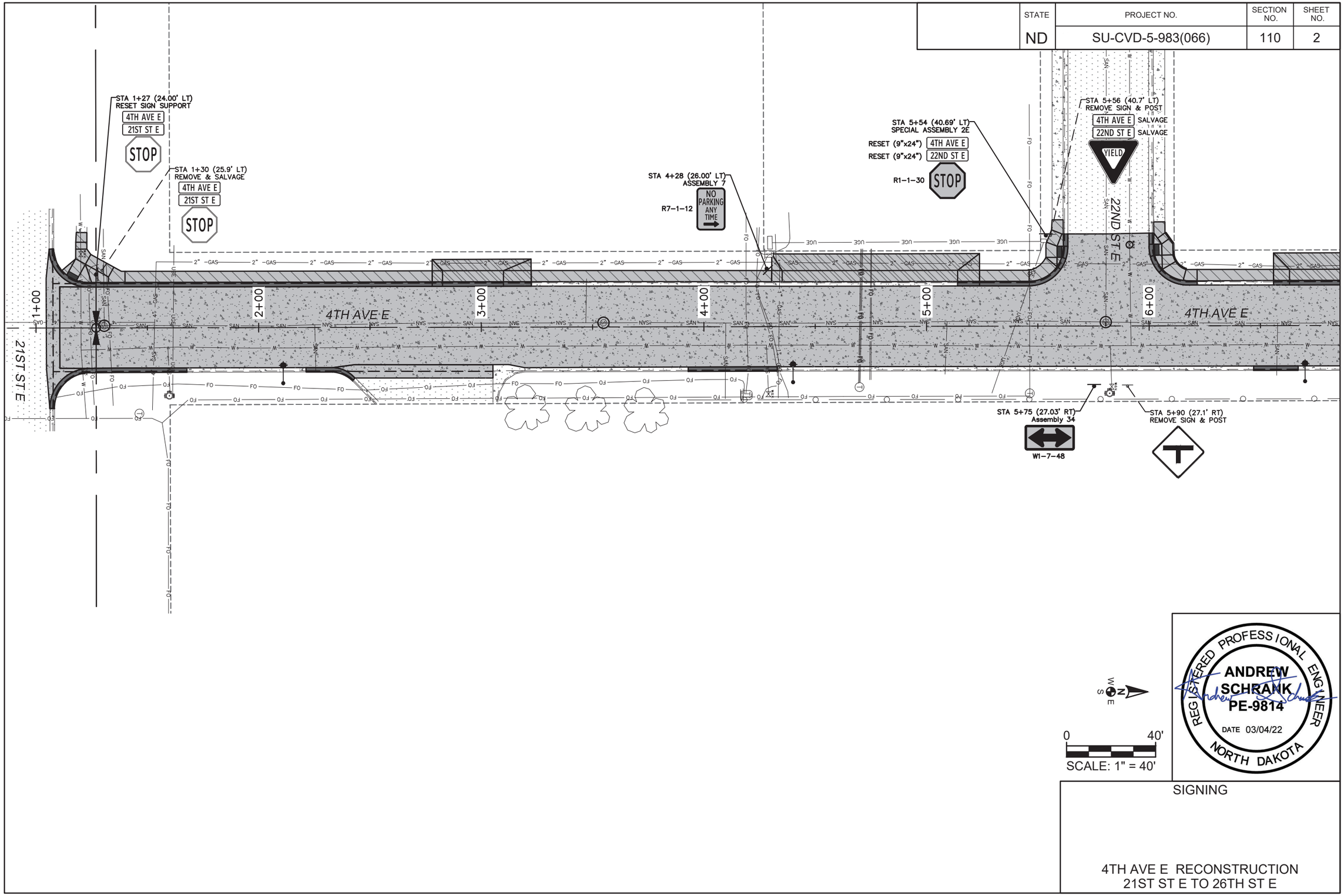
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	N.D.	SU-CVD-5-983(066)	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
1+27 Lt																					1		
4+28 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
5+54 Lt	SA2E			5.2	11.2				7.0	2.25 x 2.25 12 ga	12.2						1	4	2.5 x 2.5 12 ga	1			
5+75 Rt	W1-7-48	34		8.0	9.2				7.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
7+75 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
8+75 Rt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
9+50 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
10+54 Lt	SA2E			5.2	11.2				7.0	2.25 x 2.25 12 ga	12.2						1	4	2.5 x 2.5 12 ga	1			
11+11 Rt	R1-1-30	1		5.2	9.7				7.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga				
12+05 Rt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
12+65 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
16+25 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
17+28 Lt	SA2E			5.2	11.2				7.0	2.25 x 2.25 12 ga	12.2						1	4	2.5 x 2.5 12 ga	1			
17+71 Rt	R1-1-30	1		5.2	9.7				7.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga				
19+50 Lt	R7-1-12	7		1.5	8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
Sub Total			0.0	46.0		**Total**	131.6										**Total**	56.0		3	1	0	
Grand Total			**0.0**	**46.0**		**Total**	**131.6**										**Total**	**56**	**0**	**3**	**1**	**0**	



Sign Summary
Perforated Tube

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	110	2



N
W E
S

0 40'

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

SIGNING

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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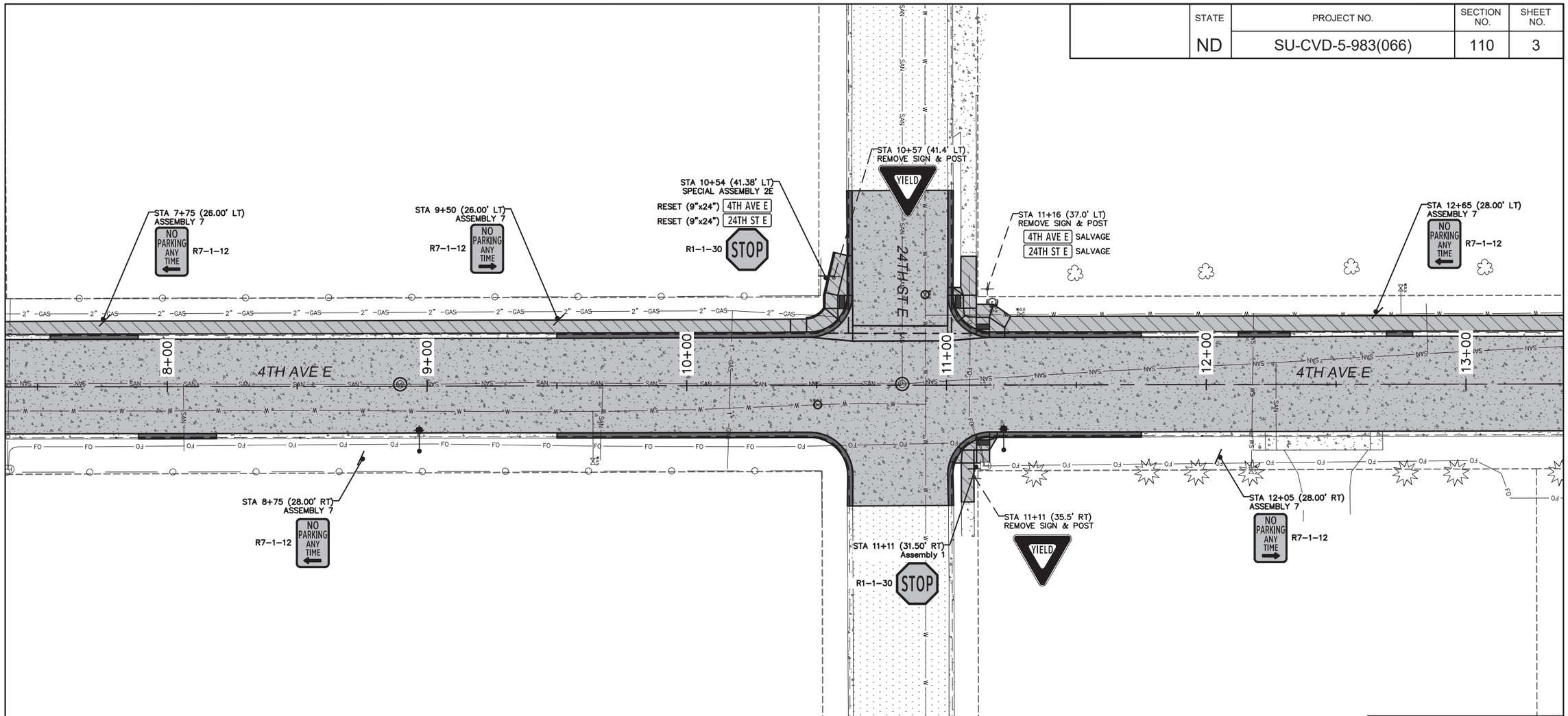
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	110	3



W E S N

0 40'

SCALE: 1" = 40'

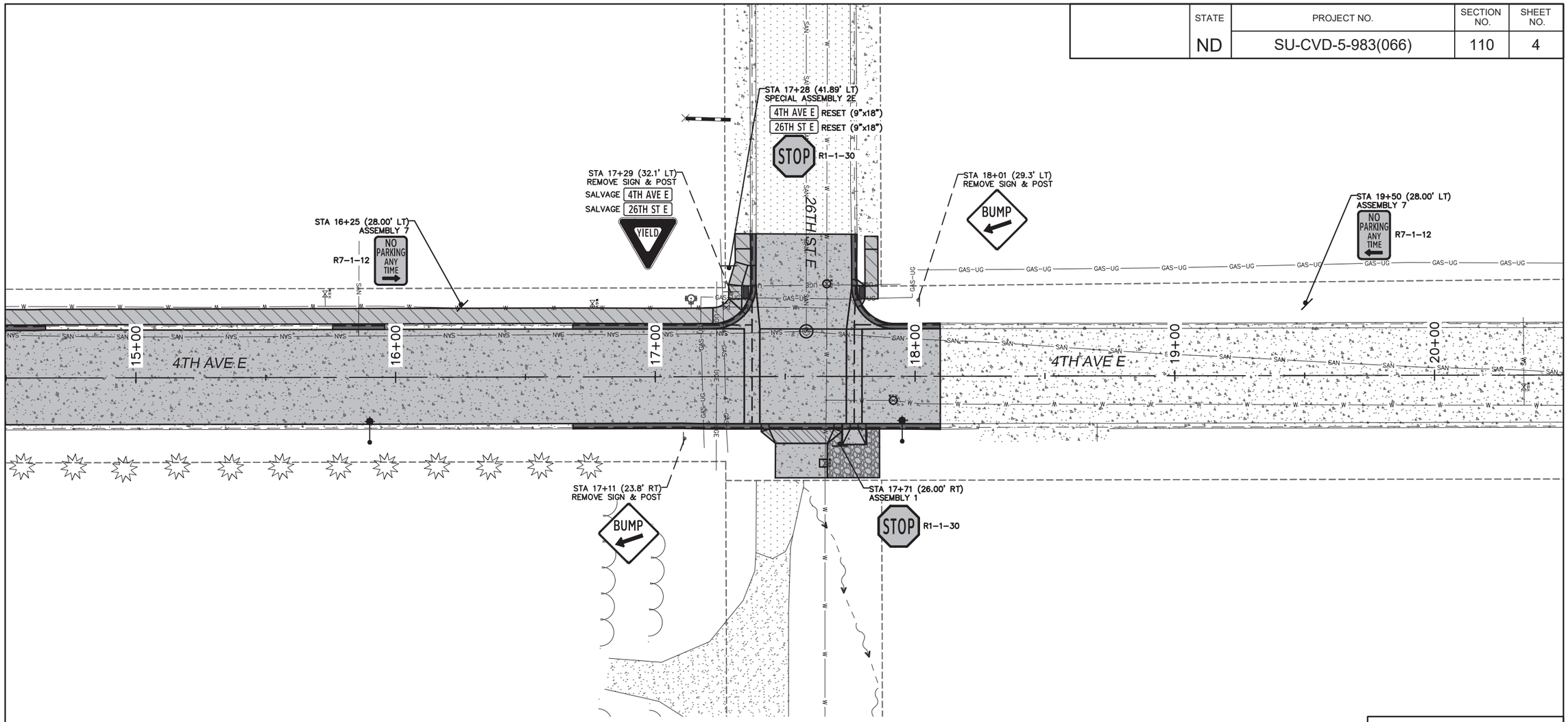
REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

SIGNING

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

3/4/2022 3:42:19 PM schrank H:\200156\PROJECT CAD\CURRENT\200156_110SN_002_signing.dwg

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	110	4



0 40'

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

SIGNING

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-5-983(066)	140	1

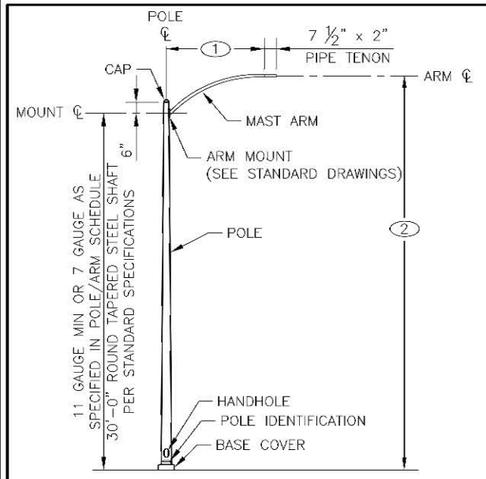
GENERAL NOTES

1. COORDINATE ROUTING OF UNDERGROUND CIRCUITRY FEEDERS WITH TREE PLACEMENT TO AVOID CONFLICT WITH TREE ROOT SYSTEMS.
2. LIGHT STANDARDS SHALL BE DESIGNED AND CONSTRUCTED AS SPECIFIED IN THE SPECIAL PROVISIONS. ALL THE NECESSARY CALCULATIONS AND DRAWINGS USED IN THE DESIGN OF THESE POLES SHALL BE FURNISHED WITH THE SHOP DRAWING SUBMITTAL. CALCULATIONS AND WORK DRAWINGS USED IN THE DESIGN OF THE LIGHT STANDARDS SHALL BE SIGNED, SEALED, AND DATED BY A PROFESSIONAL ENGINEER DULY REGISTERED IN THE STATE OF NORTH DAKOTA.

STREETLIGHT STANDARD AND LOCATION GENERAL NOTES

1. ALL STREETLIGHT STANDARDS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIAL PROVISION AND AS INDICATED ON THESE DRAWINGS.
2. ALL COMPONENTS OF THE STREETLIGHT STANDARD, INCLUDING THE POLE, ARM, HANDHOLE COVER, BASE COVER AND THE POLE CAP, SHALL BE FERROUS METAL AND HOT-DIP GALVANIZED AFTER CONSTRUCTION IN ACCORDANCE WITH ASTM A123. ALUMINUM OR ALUMINUM ALLOY IS NOT ACCEPTABLE. FLAWS IN THE APPEARANCE OF THESE GALVANIZED COMPONENTS (i.e. "TIGER STRIPED", "ZEBRA STRIPED"), SHALL BE CAUSE FOR REJECTION. NON-METALLIC TYPE BASE COVERS MAY BE ACCEPTABLE AND SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL. CONCRETE POLES SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
3. ALL FASTENING HARDWARE SHALL BE NON-CORROSIVE, CADMIUM PLATED OR EQUAL, APPROVED BY THE CITY ENGINEER. FASTENERS SHALL BE OF THE SIZE AND CONFIGURATION NOTED ON THE DRAWINGS.
4. CONCRETE POLE FOUNDATIONS SHOULD BE POURED AGAINST UNDISTURBED, NATURAL SOIL, OR IF FORMING MATERIAL IS USED, SHALL BE STRIPPED AWAY FROM THE FOUNDATION AT LEAST ONE (1) FOOT BELOW FINISHED GRADE.
5. POLES SHALL BE INSTALLED ON THE CONCRETE FOUNDATIONS WITH ANCHOR BOLTS. EACH BOLT SHALL BE INSTALLED WITH TWO 92) HEX NUTS AND TWO (2) FLAT WASHERS. THE ANCHOR BOLTS SHALL BE 1-1/8" X 40" X 4". THE ANCHOR BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED. THE POLE SHALL BE PLUMBED PRIOR TO PLACING THE GROUT OR CONCRETE CAP. CONCRETE FOR CAP SHALL BE DESIGNATED BY CITY ENGINEER. SHIMS OR WEDGES OF ANY KIND ARE NOT ACCEPTABLE TO PLUMB THE POLE AFTER THE CAP HAS BEEN PLACED.
6. ALL UNDERGROUND CONDUIT INSTALLED SHALL HAVE RED, CONTINUOUS MARKING TAPE INSTALLED IN THE TRENCH 12" BELOW FINISHED GRADE.
7. WHERE SIGNALS AND STANDARDS ARE INSTALLED UNDER OVERHEAD POWER LINES, CLEARANCES SHALL BE PER NATIONAL ELECTRICAL SAFETY CODE SECTION 234 REQUIREMENTS. INSTALL STRAIGHT ARM STREETLIGHT ASSEMBLIES WHERE ADDITIONAL CLEARANCE IS REQUIRED AND APPROVED BY THE CITY ENGINEER.
8. ALL STREETLIGHTS SHALL BE 240 VOLT SINGLE PHASE MULTIPLE CIRCUIT.

QUANTITIES-TOTAL PROJECT			
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	8 EA
770	0220	CABLE TRENCH - TYPE II	1239 LF
770	0330	2" DIAMETER RIGID CONDUIT	427 LF
770	0503	UNDERGROUND CONDUCTOR NO. 2 RHW	174 LF
770	0504	UNDERGROUND CONDUCTOR NO. 4 RHW	3455 LF
770	0505	UNDERGROUND CONDUCTOR NO. 6 RHW	1729 LF
770	0730	FEED POINT - TYPE 1 - PAD MOUNTED	1 EA
770	1718	LT STD 8FT MA 32FT POLE BREAKAWAY	8 EA
770	4210	LED LUMINAIRE	8 EA

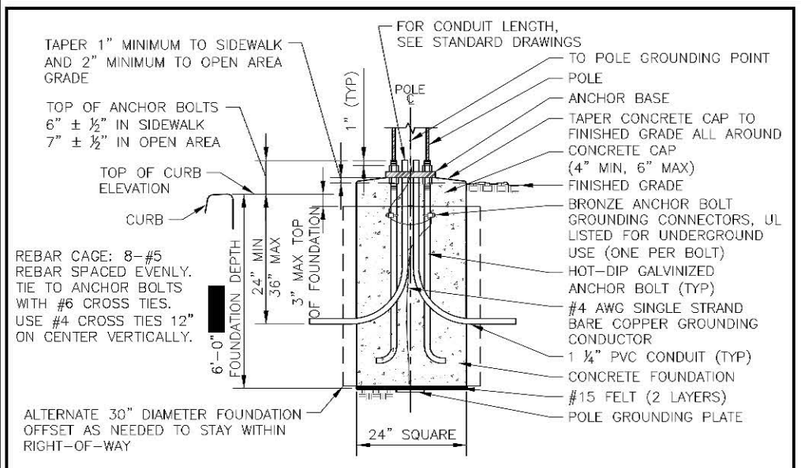


POLE/ARM SCHEDULE			
POLE GAUGE		(1)	(2)
SINGLE ARM	DOUBLE ARM		
11	11	8'-0"	32'-0"
11	11	10'-0"	32'-10"
11	11	12'-0"	33'-9"
11	7	15'-0"	34'-3"
7	7	18'-0"	35'-3"

NOTES:
1. SEE STREETLIGHT STANDARD GENERAL NOTES DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEE STREETLIGHT LOCATION GENERAL NOTES DETAIL FOR INSTALLATION LOCATION REQUIREMENTS.
3. SEE STANDARD DRAWINGS FOR POLE BASE, POLE CAP AND MAST ARM CONNECTION DETAILS.

1/1 TYPE L SERIES POLE DETAIL

NO SCALE



NOTES:
1. SEE STREETLIGHT STANDARD GENERAL NOTES DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEE STREETLIGHT LOCATION GENERAL NOTES DETAIL FOR INSTALLATION LOCATION REQUIREMENTS.
3. CONTINUOUS BARE COPPER GROUNDING CONDUCTOR SHALL BE LOOPED AROUND ANCHOR BOLTS ONE TIME AND CONNECTED TO EACH ANCHOR BOLT BEFORE CONTINUING DOWN TO THE POLE GROUNDING PLATE.
4. FOUNDATION CAP SHALL BE CONCRETE OR GROUT AS DESIGNATED BY THE CITY ENGINEER.

2/1 LIGHT BASE DETAIL

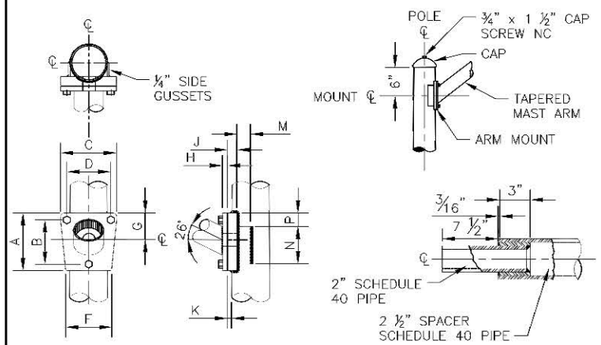
NO SCALE

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE 09/02/2021
NORTH DAKOTA

NOTES AND DETAILS

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-5-983(066)	140	2

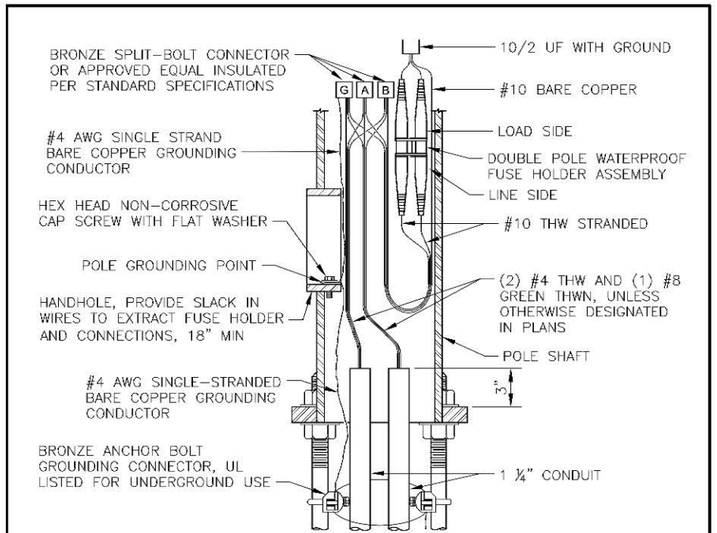


MAST ARM DIMENSIONS		
DIMENSION	8'–15' INCL.	15'–18' INCL.
A	7 ½"	9"
B	5 ¾"	7"
C	6 ⅜"	8"
D	4 ⅝"	6"
E	⅛"	1"
F	5"	6"
G	3 ⅜"	4"
H	½"	¾"
J	1"	1"
K	5/16"	5/16"
L	⅝"–11 x ½"	¾"–10 x 1 ¾"
M	1 ½"	2"
N	5"	5"
P	1 ⅝"	1 ¾"

NOTES:
1. SEE STREETLIGHT STANDARD GENERAL NOTES DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEE STREETLIGHT LOCATION GENERAL NOTES DETAIL FOR INSTALLATION LOCATION REQUIREMENTS.

1/2 POLE TOP AND ARM MOUNTING DETAILS

NO SCALE



2/2 LIGHTING STANDARD WIRING DIAGRAM

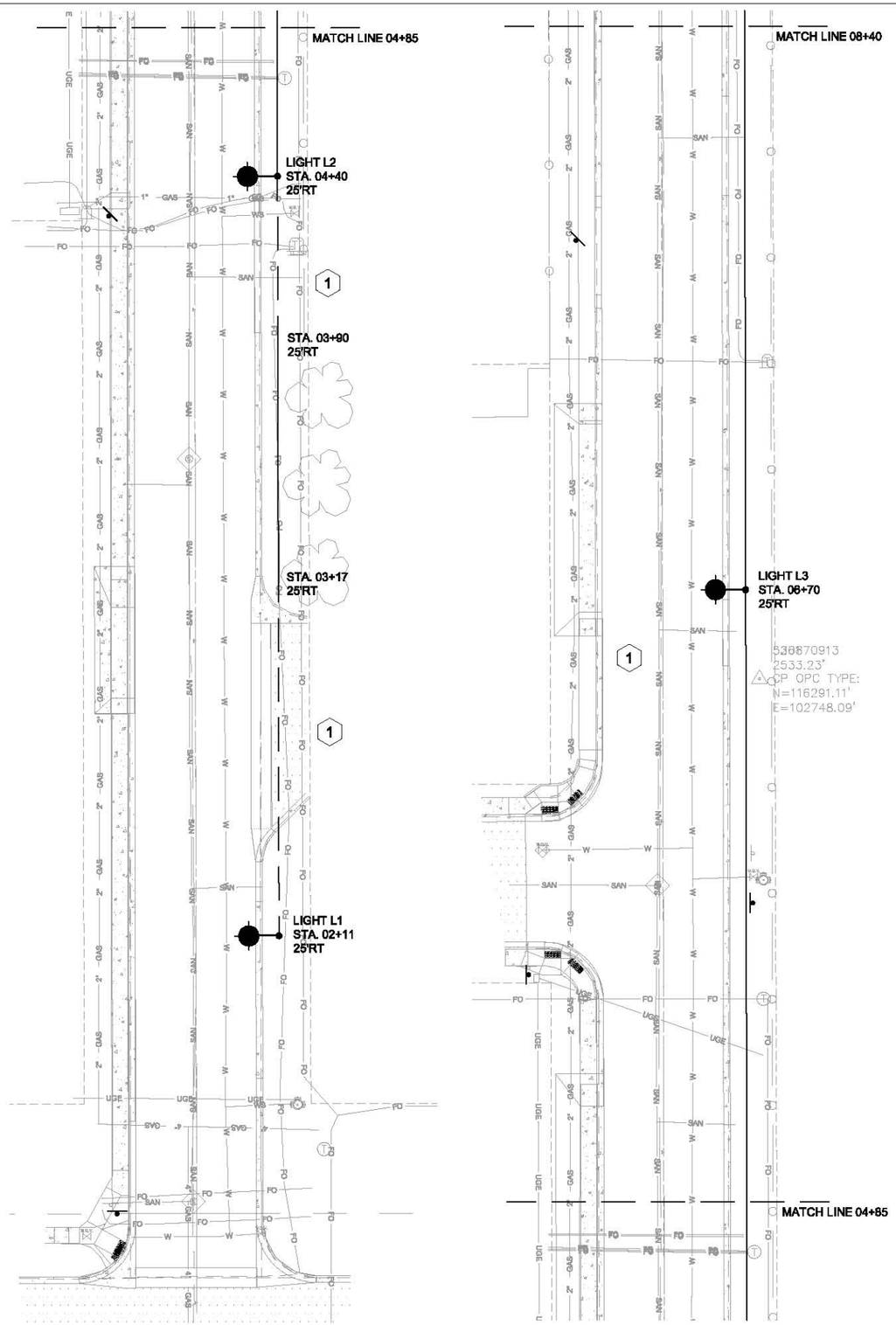
NO SCALE

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE 09/02/2021
NORTH DAKOTA

ELECTRICAL DETAILS

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-5-983(066)	140	3



NOTES

1. ALL NEW CIRCUITRY THAT PASSES UNDER EXISTING DRIVEWAYS OR ROADWAYS SHALL BE DIRECTIONAL BORED INTO PLACE.

ALL LUMINAIRES OPERATE AT 240-VOLTS.

ALL STREET LIGHT STATIONING BASED ON 4TH AVE E CENTER LINE.

FIXTURE NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	POLE HT.	MAST ARM
L1	02+11 25'RT	210 (LED)	M-S-II	32'	8'
L2	04+40 25'RT	210 (LED)	M-S-II	32'	8'
L3	06+70 25'RT	210 (LED)	M-S-II	32'	8'

ITEM	STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	(2) UNDERGROUND CONDUCTOR NO. 4 RHW	UNDERGROUND CONDUCTOR NO. 6 RHW
LIGHT L1 TO LIGHT L2	02+11 25'RT TO 03+17 25'RT	73 LF	106 LF	226 LF	114 LF
	03+17 25'RT TO 03+90 25'RT			146 LF	73 LF
	03+90 25'RT TO 04+40 25'RT		50 LF	116 LF	58 LF
LIGHT L2 TO LIGHT L3	04+40 25'RT TO 06+70 25'RT	230 LF		492 LF	246 LF

QUANTITIES-THIS SHEET			
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	3 EA
770	0220	CABLE TRENCH - TYPE II	303 LF
770	0330	2" DIAMETER RIGID CONDUIT	156 LF
770	0504	UNDERGROUND CONDUCTOR NO. 4 RHW	979 LF
770	0505	UNDERGROUND CONDUCTOR NO. 6 RHW	491 LF
770	1718	LT STD 8FT MA 32FT POLE BREAKAWAY	3 EA
770	4210	LED LUMINAIRE	3 EA

LEGEND

LED LUMINAIRE, 250W EQUIVALENT

N W E S

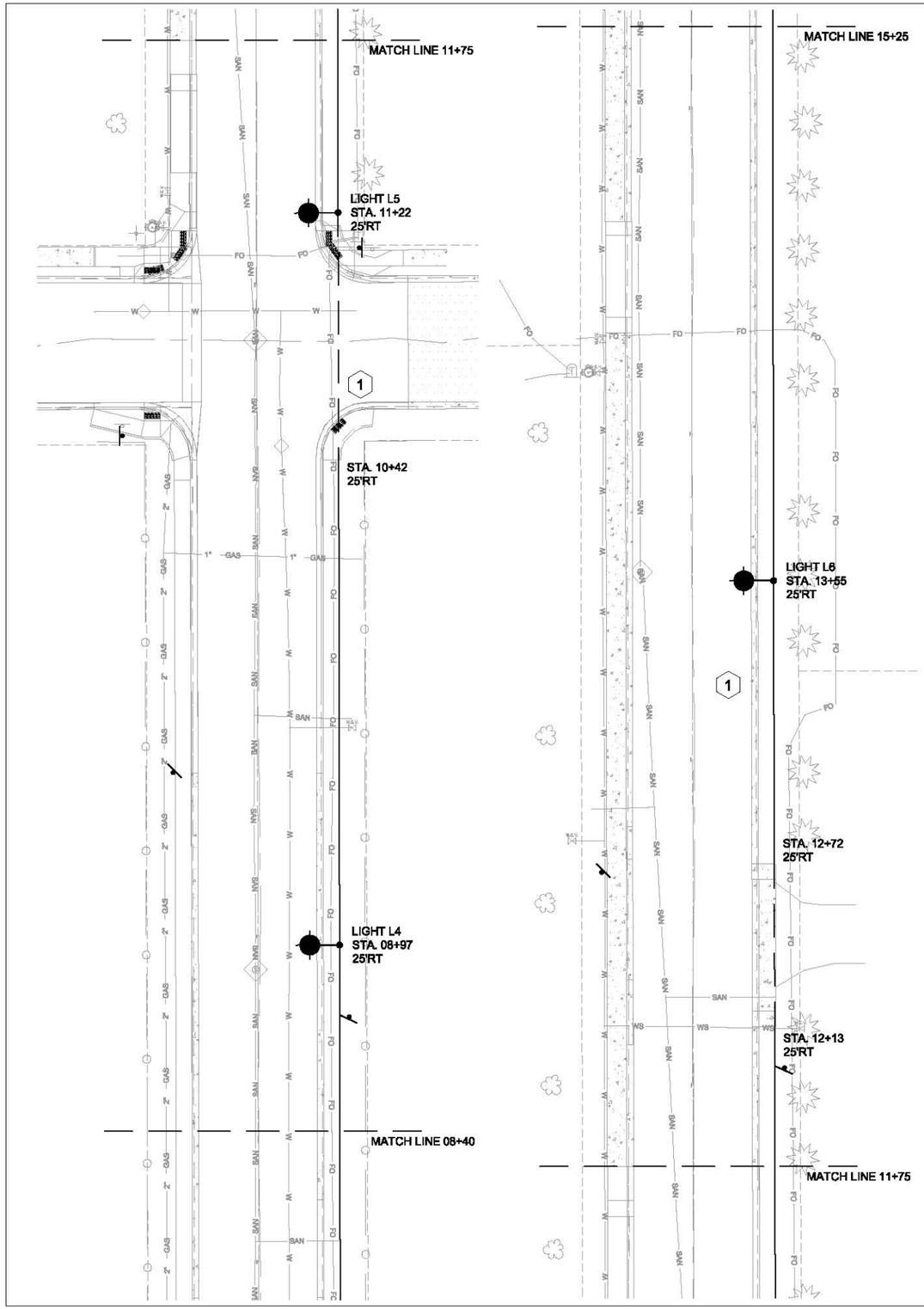
0 40'

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE 09/02/2021
NORTH DAKOTA

LIGHTING PLAN
STA. 01+00 TO 08+40

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-5-983(066)	140	4

NOTES

1. ALL NEW CIRCUITRY THAT PASSES UNDER EXISTING DRIVEWAYS OR ROADWAYS SHALL BE DIRECTIONAL BORED INTO PLACE.

ALL LUMINAIRES OPERATE AT 240-VOLTS.

ALL STREET LIGHT STATIONING BASED ON 4TH AVE E CENTER LINE.

FIXTURE NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	POLE HT.	MAST ARM
L4	08+97 25'RT	210 (LED)	M-S-II	32'	8'
L5	11+22 25'RT	210 (LED)	M-S-II	32'	8'
L6	13+55 25'RT	210 (LED)	M-S-II	32'	8'

ITEM	STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	(2) UNDERGROUND CONDUCTOR NO. 4 RHW	UNDERGROUND CONDUCTOR NO. 6 RHW
LIGHT L3 TO LIGHT L4	06+70 25'RT TO 08+97 25'RT	227 LF		484 LF	242 LF
LIGHT L4 TO LIGHT L5	08+97 25'RT TO 10+42 25'RT	145 LF		306 LF	153 LF
	10+42 25'RT TO 11+22 25'RT		80 LF	176 LF	88 LF
LIGHT L5 TO LIGHT L6	11+22 25'RT TO 12+13 25'RT	92 LF		200 LF	100 LF
	12+13 25'RT TO 12+72 25'RT		59 LF	118 LF	59 LF
	12+72 25'RT TO 13+55 25'RT	82 LF		180 LF	90LF

QUANTITIES-THIS SHEET			
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	3 EA
770	0220	CABLE TRENCH - TYPE II	546 LF
770	0330	2" DIAMETER RIGID CONDUIT	139 LF
770	0504	UNDERGROUND CONDUCTOR NO. 4 RHW	1464 LF
770	0505	UNDERGROUND CONDUCTOR NO. 6 RHW	732 LF
770	1718	LT STD 8FT MA 32FT POLE BREAKAWAY	3 EA
770	4210	LED LUMINAIRE	3 EA

LEGEND

LED LUMINAIRE, 250W EQUIVALENT

0 40'

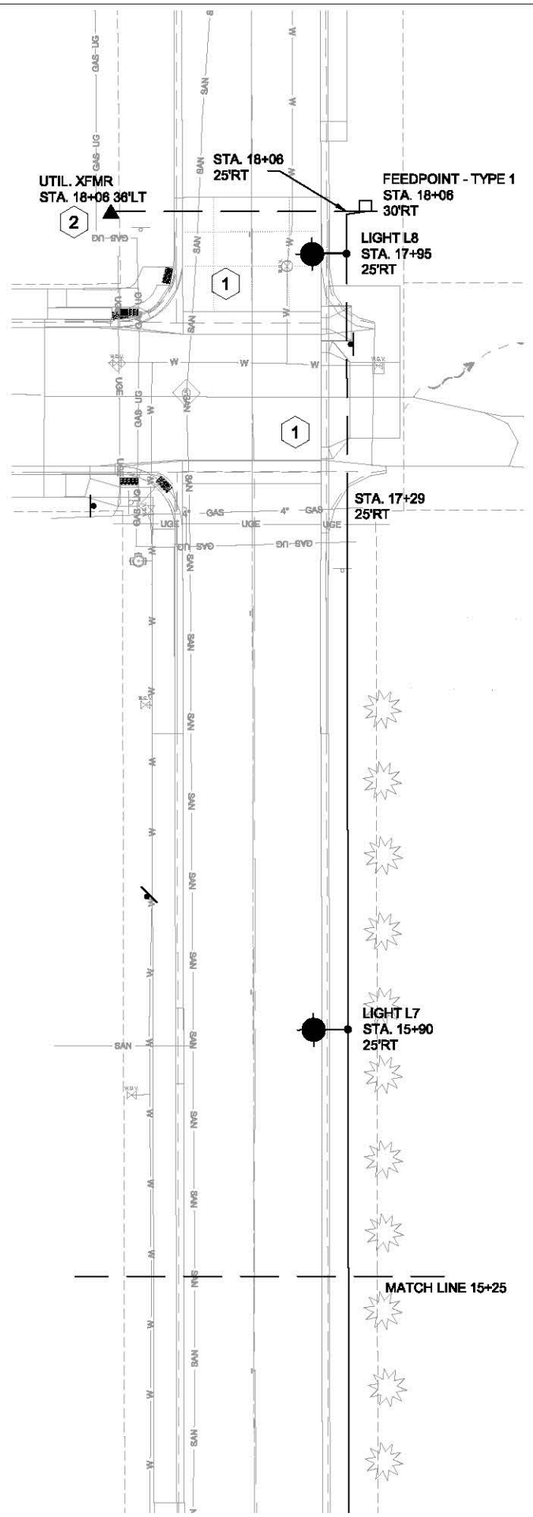
SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE
09/02/2021
NORTH DAKOTA

LIGHTING PLAN
STA. 08+40 TO 15+25

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-5-983(066)	140	5



NOTES

1. ALL NEW CIRCUITRY THAT PASSES UNDER EXISTING DRIVEWAYS OR ROADWAYS SHALL BE DIRECTIONAL BORED INTO PLACE.
2. APPROXIMATE LOCATION OF NEW UTILITY TRANSFORMER. COORDINATE EXACT INSTALLATION LOCATION WITH ROUGHRIDER ELECTRIC COOPERATIVE.

ALL LUMINAIRES OPERATE AT 240-VOLTS.

ALL STREET LIGHT STATIONING BASED ON 4TH AVE E CENTER LINE.

INSTALL FEED POINT - TYPE II - PAD MOUNTED

STA. 18+06 30'RT

FIXTURE NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	POLE HT.	MAST ARM
L7	15+90 25'RT	210 (LED)	M-S-II	32'	8'
L8	17+95 25'RT	210 (LED)	M-S-II	32'	8'

ITEM	STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	(2) UNDERGROUND CONDUCTOR NO. 4 RHW	UNDERGROUND CONDUCTOR NO. 6 RHW	(3) UNDERGROUND CONDUCTOR NO. 2 RHW
LIGHT L6 TO LIGHT L7	13+55 25'RT TO 15+90 25'RT	235 LF		502 LF	251 LF	
LIGHT L7 TO LIGHT L8	15+90 25'RT TO 17+29 25'RT 17+29 25'RT TO 17+95 25'RT	139 LF	 66 LF	294 LF 148 LF	147 LF 74 LF	
LIGHT L8 TO FEEDPOINT	17+95 25' RT TO 18+06 25'RT 18+06 25'RT TO 18+06 30'RT	11 LF 5 LF		38 LF 30 LF	19 LF 15 LF	
FEEDPOINT TO UTILITY XFMR	18+06 25'RT TO 18+06 36'LT		66 LF			174 LF

QUANTITIES-THIS SHEET			
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	2 EA
770	0220	CABLE TRENCH - TYPE II	390 LF
770	0330	2" DIAMETER RIGID CONDUIT	132 LF
770	0503	UNDERGROUND CONDUCTOR NO. 2 RHW	174 LF
770	0504	UNDERGROUND CONDUCTOR NO. 4 RHW	1012 LF
770	0505	UNDERGROUND CONDUCTOR NO. 6 RHW	506 LF
770	0730	FEED POINT - TYPE 1 - PAD MOUNTED	1 EA
770	1718	LT STD 8FT MA 32FT POLE BREAKAWAY	2 EA
770	4210	LED LUMINAIRE	2 EA

LEGEND

LED LUMINAIRE, 250W EQUIVALENT

N W E S

0 40'

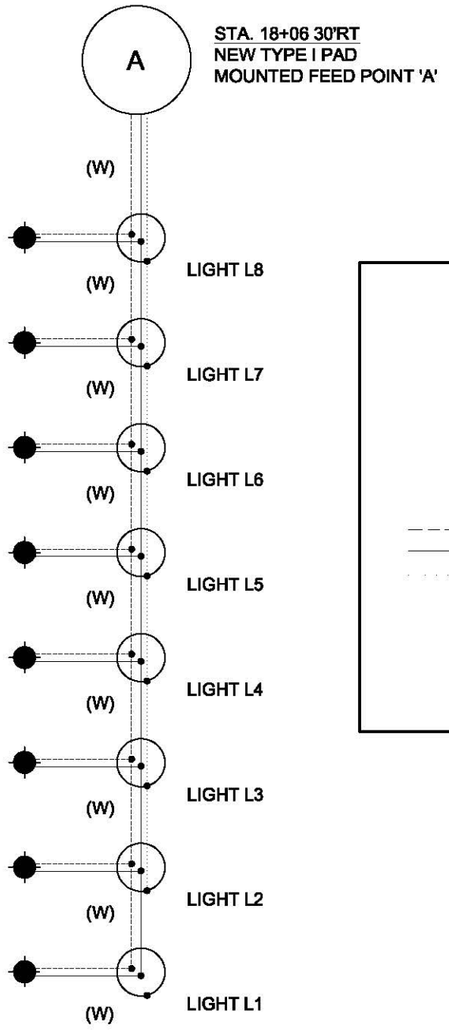
SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE 09/02/2021
NORTH DAKOTA

LIGHTING PLAN
STA. 15+25 TO 18+50

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-5-983(066)	140	6



SCHEMATIC LEGEND

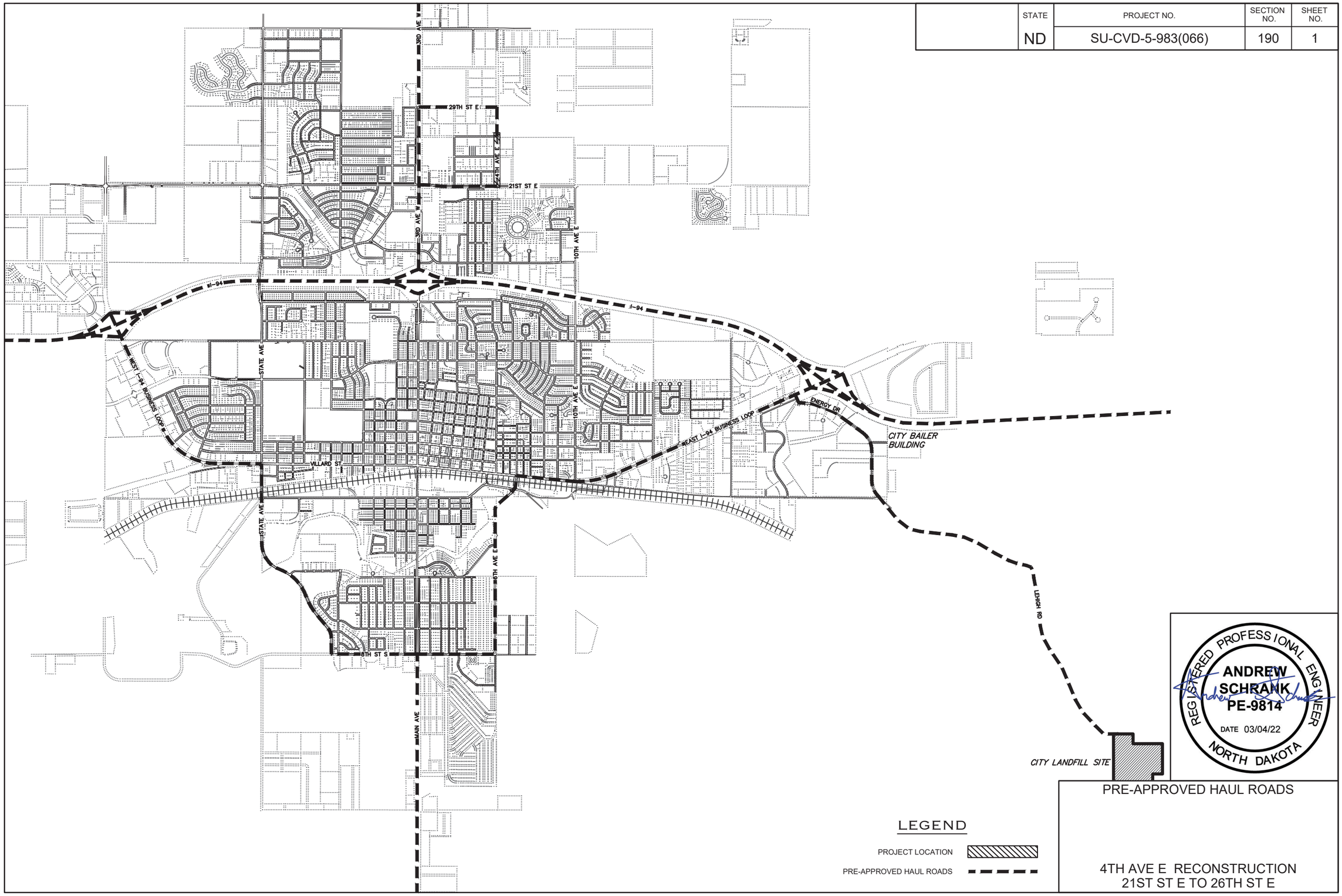
	210W LED LUMINAIRE (240-VOLT)
L1	LIGHT STANDARD: STRUCTURE 1
	LIGHTING CIRCUIT PHASE "A" CONDUCTOR
	LIGHTING CIRCUIT PHASE "B" CONDUCTOR
	GROUND CONDUCTOR
(W)	(2) UNDERGROUND CONDUCTOR NO. 4 RHW (1) UNDERGROUND CONDUCTOR NO. RHW IN 2" CONDUIT

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. BUTMAN
PE-5943
DATE 09/02/2021
NORTH DAKOTA

LIGHTING SCHEMATIC

4TH AVE E RECONSTRUCTION
21ST ST TO 26TH ST

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-CVD-5-983(066)	190	1



REGISTERED PROFESSIONAL ENGINEER
ANDREW SCHRANK
PE-9814
DATE 03/04/22
NORTH DAKOTA

PRE-APPROVED HAUL ROADS

LEGEND

PROJECT LOCATION

PRE-APPROVED HAUL ROADS

4TH AVE E RECONSTRUCTION
21ST ST E TO 26TH ST E

3/4/2022 3:37:51 PM schrank H:\200156\PROJECT CAD\CURRENT\200156_190HR_001_haulrd.dwg

NDDOT ABBREVIATIONS

D-101-1

?	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
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
ADA	Americans with Disabilities Act
&	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
Bk	back
BF	back face
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
BI	beehive inlet
Beg	begin
BG	below grade
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
BH	bore hole
Bot	bottom
Blvd	Boulevard
Bndry	boundary
Brkwy	breakaway
Br	bridge
Bldg	building
Bus.	business
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
CL or ℄	centerline
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
CECB	concrete erosion control blanket
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
CSFES	corrugated steel flared end section
CSP	corrugated steel pipe
CSTES	corrugated steel traversable end section
Co	County
Crse	course
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	crossroad
Crn	crown
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia or ø	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
DSDS	dynamic speed display sign
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
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
Fed	Federal
FP	feed point
Fn	fence
Fn P	fence post
FO	fiber optic
FD	field drive
F	fill
FAA	fine aggregate angularity
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
Fnd	found
Fdn	foundation
Frac	fractional
Frwy	freeway
Frt	front
FF	front face
F Disp	fuel dispenser
FFP	fuel filler pipes
FLS	fuel leak sensor
Furn	furnish/ed

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions

KIRK J. HOFF
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NORTH DAKOTA

12 18 2020

NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe
GV	gate valve
Ga	gauge
Gov	government
Grd	graded/grade
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ht	height
Hel	helical
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IP	iron pipe
Jt	joint
Jct	junction

Ln	lane
Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
MC	meander corner
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
MGS	Midwest Guardrail System
MM	mile marker
MP	mile post
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Neop	neoprene
Ntwk	network
N	North
NE	North East
NW	North West
NB	Northbound
No. or #	number

Obsc	obscure(d)
Ocpd	occupied
Ocpy	occupy
O/s	offset
OC	on center
C	one dimensional consolidation
OC	organic content
Orig	original
O To O	out to out
OD	outside diameter
OH	overhead
PMT	pad mounted transformer
Pg	pages
Pntd	painted
Pr	pair
Pnl	panel
Pk	park
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
Perm	permanent
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl or ℄	plate
Pt	point
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Prop Ln	property line
Ppsd	proposed
PB	pull box

Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RC	rapid curing
Rec	record
Rcy	recycle
RAP	recycled asphalt pavement
RPCC	recycled portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
RP	reference point
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCFES	reinforced concrete flared end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
RCTES	reinforced concrete traversable end section
Reinf	reinforcement
Res	reservation
Res	residence
Ret	retaining
Rev	reverse
Rt	right
R/W	right of way
Riv	river
Rd	road
Rdbd	road bed
Rdwy	roadway
RWIS	roadway weather information system
Rk	rock
Rt	route

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
08-03-15 04-23-18 12-18-20	General Revisions General Revisions General Revisions

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12 18 2020

NDDOT ABBREVIATIONS

Salv	salvage(d)
San	sanitary sewer line
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
SD	sight distance
SN	sign number
Sig	signal
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	South East
SW	South West
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	thinwall tube sample
Ts	topsoil
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VCP	vitrified clay pipe
Vol	volume
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
Wrng	wearing
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without
WC	witness corner

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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KIRK J. HOFF
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12 18 2020

NDDOT ABBREVIATIONS

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International
T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
07-01-14

REVISIONS

DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3

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12 18 2020

NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18 09-20-18 12-18-20	General Revisions General Revisions General Revisions

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12 18 2020

LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

- 3-Cable w Posts
- Flow
- Fence
- Remove Line
- Wall
- Retaining Wall (Plan View)
- W-Beam w Posts
- High Tension Cable Guardrail with Posts

Existing Utilities

- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Existing Culvert
- Existing Telephone Line
- Existing TV Line
- Existing Water or Steam Line
- Existing Under Drain
- Existing Slotted Drain
- Existing Conduit
- Existing Conductor
- Existing Down Guy Wire Down Guy
- Existing Underground Vault or Lift Station

Proposed Utilities

- 24 Inch Pipe
- Reinforced Concrete Pipe
- Under Drain
- Edge Drain

Traffic Utilities

- Conductor
- Fiber Optic
- Existing Loop Detector
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Micro Loop Detector
- Micro Loop Detector
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm

Sign Structures

- Existing Overhead Sign Structure
- Existing Overhead Sign Structure Cantilever
- Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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LINE STYLES

D-101-21

Right Of Way

- Easement
- Existing Easement
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Existing Right of Way Not State Owned
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines
- Sight Distance Triangle Line
- Dimension Leader

Boundary Control

- Existing City Corporate Limits or Reservation Boundary
- Existing State or International Line
- Existing Township
- Existing County
- Existing Section Line
- Existing Quarter Section Line
- Existing Sixteenth Section Line
- Existing Centerline
- Tangent Line

Cross Sections and Typicals

- Existing Ground
- Existing Topsoil (Cross Section View)
- Existing Ground Void (Not Surveyed) (void — void — void — v)
- Existing Concrete
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar

Geotechnical

- Geotextile Fabric Type D (D — D)
- Geogrid (Geo — Geo)
- Geotextile Fabric Type R (R — R)
- Geotextile Fabric Type R1 (R — R)
- Geotextile Fabric Type RR (RR — RR)
- Geotextile Fabric Type S (S — S)
- Subgrade Reinforcement
- Failure Line

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

- Centerline Pavement Marking
- Barrier with Centerline Pavement Marking
- Barrier Pavement Marking
- Stripe 4 IN Dotted Extension White
- Stripe 8 IN Dotted Extension White
- Stripe 8 IN Lane Drop

Pavement Joints

- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Tie Bar at Random Spacing

Bridge Details

- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Existing Conditions Object
- Centerline Main
- Centerline Secondary
- Excavation Limits
- Proposed Ground
- Sheet Piling

Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Floating Silt Curtain (S — S)
- Silt Fence (SF — SF)
- Excavation Limits
- Fiber Rolls

Environmental

- Wetland Mitigation
- Existing Wetland Easement USFWS
- Existing Wetland Jurisdictional
- Existing Wetland
- Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
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09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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SYMBOLS

D-101-30

North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

- Flexible Delineator
- Flexible Delineator Type A (Exst, Ppsd)
- Flexible Delineator Type B (Exst, Ppsd)
- Flexible Delineator Type C (Exst, Ppsd)
- Flexible Delineator Type D (Exst, Ppsd)
- Flexible Delineator Type E (Exst, Ppsd)
- Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type C (Exst, Ppsd, Diamond Grade)
- Delineator Type D (Exst, Ppsd, Diamond Grade)
- Delineator Type E (Exst, Ppsd, Diamond Grade)
- Barricade (Type I, Type II, Type III}
- Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)
- Attenuation Device
- Truck Mounted Attenuator
- Delineator Drums
- Flagger
- Tubular Marker
- Traffic Cone
- Back to Back Vertical Panel Sign

- Highway Sign (Exst, Ppsd)
- Mile Post Type A (Exst-Ppsd-Reset)
- Mile Post Type B (Exst, Ppsd)
- Mile Post Type C (Exst, Ppsd)
- Object Marker Type I (Exst, Ppsd)
- Object Marker Type II (Exst, Ppsd)
- Object Marker Type III (Exst, Ppsd)
- Existing Reference Marker
- Road Closure Gate 18 Ft (Exst, Ppsd)
- Road Closure Gate 28 Ft (Exst, Ppsd)
- Road Closure Gate 40 Ft (Exst, Ppsd)
- Existing Railroad Battery Box
- Existing RR Profile Spot
- Existing Railroad Crossbuck
- Existing Railroad Frog
- Existing Mailbox (Private, Federal)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-32

- Existing Luminaire
- Luminaire LED
- Existing Light Standard Luminaire
- Relocate Light Standard
- Light Standard Light LED Luminaire
- Light Standard 35 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 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 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 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Emergency Vehicle Detector
- Video Detection Camera

- High Mast Light Standard 3 Luminaire (Exst, Ppsd)
- High Mast Light Standard 4 Luminaire (Exst, Ppsd)
- High Mast Light Standard 5 Luminaire (Exst, Ppsd)
- High Mast Light Standard 6 Luminaire (Exst, Ppsd)
- High Mast Light Standard 7 Luminaire (Exst, Ppsd)
- High Mast Light Standard 8 Luminaire (Exst, Ppsd)
- High Mast Light Standard 9 Luminaire (Exst, Ppsd)
- High Mast Light Standard 10 Luminaire (Exst, Ppsd)
- Overhead Sign Structure Load Center (Exst, Ppsd)
- Traffic Signal Controller (Exst, Ppsd)
- Pad Mounted Traffic Signal Controller (Exst, Ppsd)
- Flashing Beacon (Exst, Ppsd)
- Concrete Foundation (Exst, Ppsd)
- Pipe Mounted Flasher (Exst, Ppsd)
- Pad Mounted Feed Point (Exst, Ppsd)
- Pipe Mounted Feed Point with Pad (Exst, Ppsd)
- Pole Mounted Feed Point (Exst, Ppsd)
- Junction Box (Exst, Ppsd)
- Existing Pedestrian Head with Number
- Existing Signal Head
- Pole Mounted Head
- Existing Lighting Standard Pole

- Existing Traffic Signal Standard
- Pull Box (Exst-Ppsd-Undefined)
- Intelligent Transportation Pull Box (Exst, Ppsd)
- Transformer (Exst, Ppsd)
- Power Pole (Exst-Ppsd-with Transformer)
- Wood Pole (Exst, Ppsd)
- Pedestrian Push Button Post (Exst, Ppsd)
- Existing Pole
- Existing Telephone Pole
- Existing Post
- Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)

Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)

Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)

Force Main Storm Drain Manhole (Exst, Exst with Valve)

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

Catch Basin (Riser 30 Inch, Beehive, Type A)

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

Inlet Special (Catch Basin, Type 1, Type A)

Inlet (Tee, Type 1, Type 2, Type 2 Double)

Median Drain

Headwall (Exst, Ppsd, Ppsd Single with Vegitation Barrier, Ppsd Double with Vegitation Barrier)

Cap or Stub
Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water

Existing Pedestal
Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined

Existing Pipe Vent
Gas, Fuel, Sanitary, Storm Drain, Water, Undefined

Valve
Exst Gas, Exst Water, Ppsd Water, Exst Undefined

Pump
Sanitary, Storm Drain, Exst Water

Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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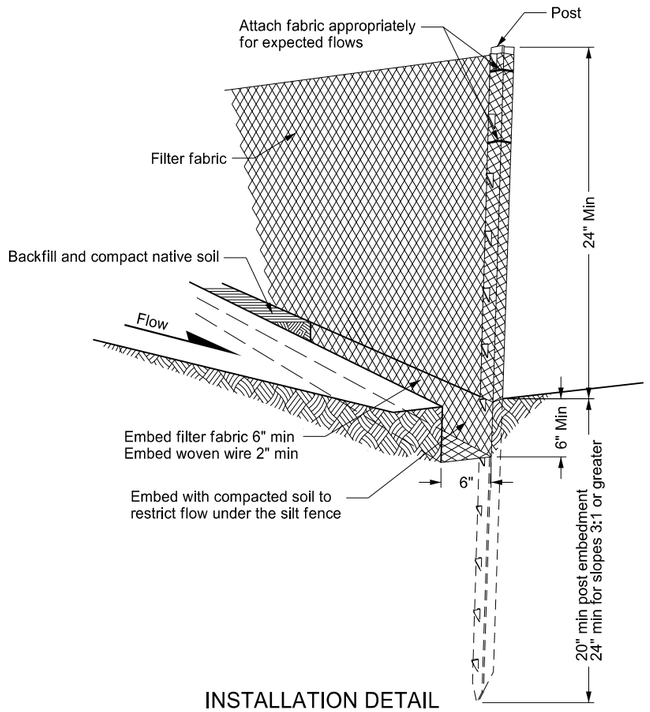
12 18 2020

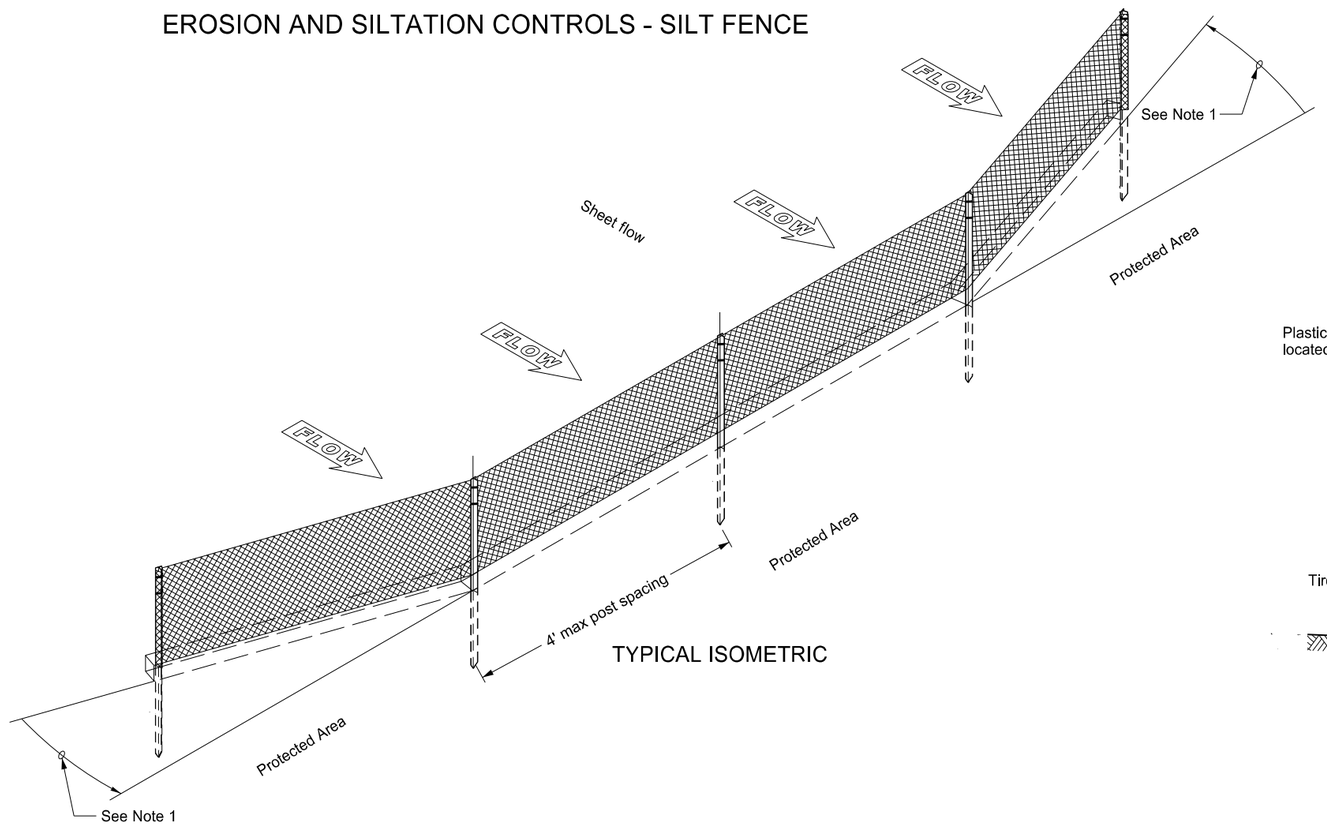
EROSION AND SILTATION CONTROLS - SILT FENCE

D-260-1

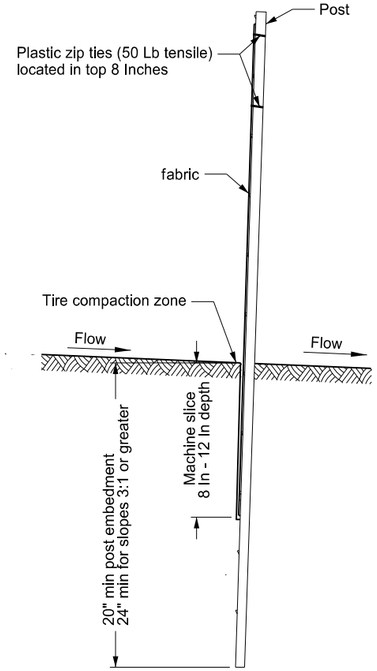


INSTALLATION DETAIL

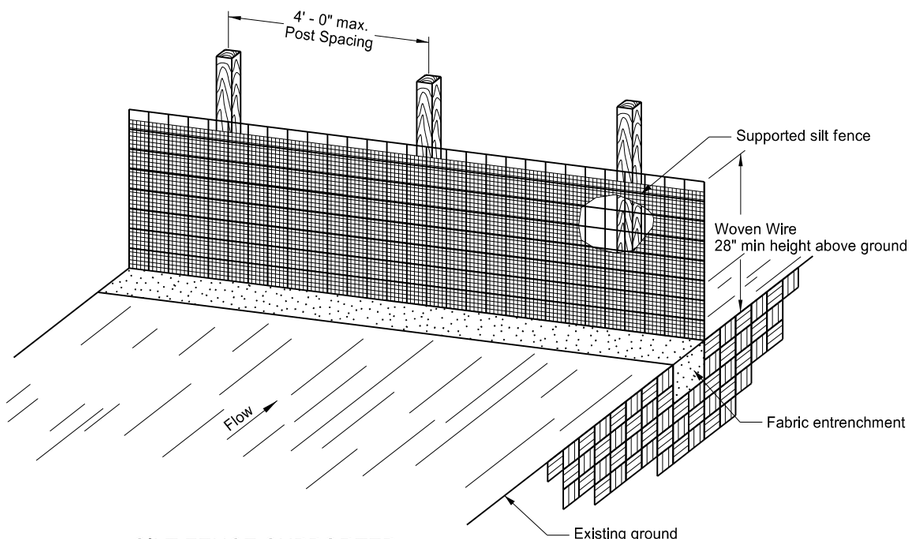
Minimize disturbance of ground around trench and smooth surface after excavation to avoid concentrating flows. Compact to prevent undercutting flows.



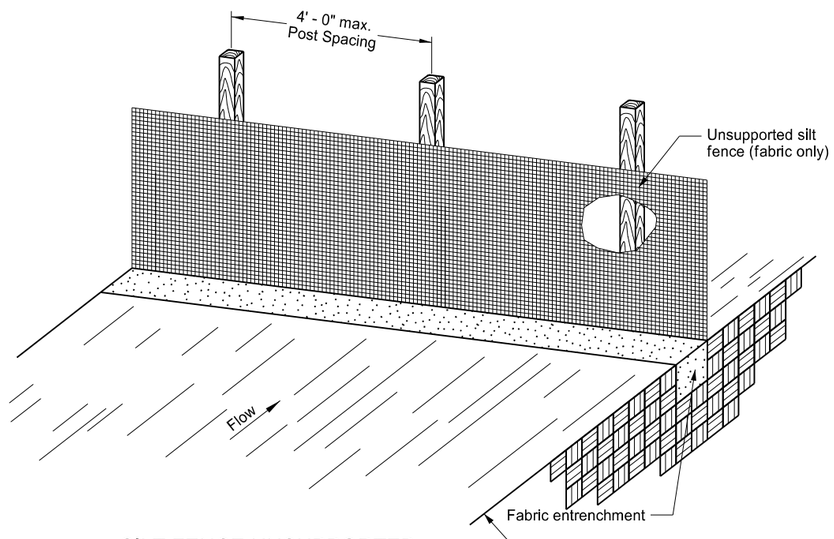
TYPICAL ISOMETRIC



MACHINE SLICED SILT FENCE



SILT FENCE SUPPORTED



SILT FENCE UNSUPPORTED

NOTES:
1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
2. Place splices outside low spots.
3. Install silt fencing parallel to contour lines.
4. Do not embed silt fence when placed in standing water.
5. Silt fence material does not need to reach the top of woven wire support.

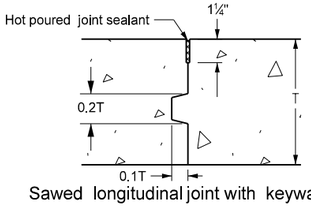
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.
06-27-16 08-27-19	Revised details & added new ones. New Design Engineer PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

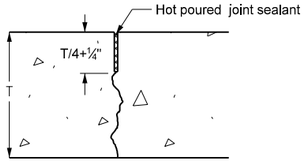
LONGITUDINAL JOINT DETAILS

D-550-2

UNTIED JOINTS

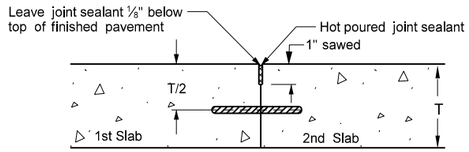


Sawed longitudinal joint with keyway



Sawed longitudinal joint without keyway

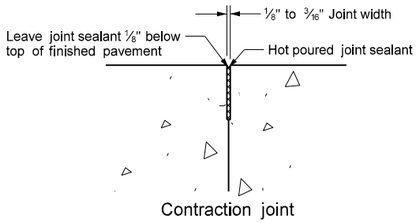
TIED JOINTS



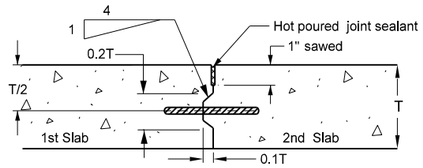
Longitudinal construction joint (tied butt joint)

Notes:

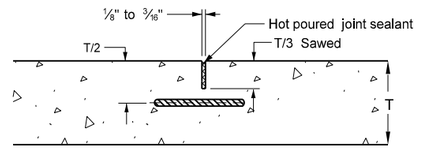
1. Provide hot poured joint sealant meeting the requirements of Section 826.02A.2 of the Standard Specifications.
2. Include all costs of the longitudinal joint and seal in the price bid for the PCC pavement.
3. Do not place tie bars within 18 inches of a transverse skewed joint.
4. Use Grade 40 steel for tie bars installed bent and later straightened.
5. Increase the tie bar spacing up to 10%, when necessary to facilitate construction.
6. Place tie Bars at a 48 inch maximum spacing.
7. A "Warp" joint is a sawed joint or a construction joint with a keyway.
8. A "Butt joint" is a construction joint with no keyway.



Contraction joint



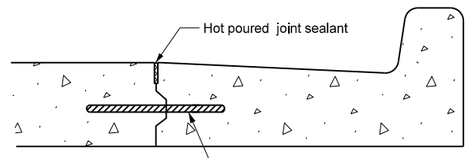
Longitudinal construction joint (tied keyed joint)



Sawed longitudinal joint

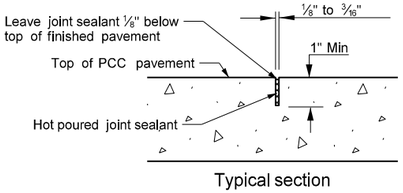
TIEBAR SPACINGS (In)

BAR SIZE / GRADE STEEL / BAR LENGTH / DIST TO FREE EDGE (FT) / JOINT TYPE / PVMT THICKNESS		# 3 BAR										# 4 BAR												# 5 BAR												# 6 BAR											
		GRADE 40				GRADE 60						GRADE 40					GRADE 60							GRADE 40						GRADE 60						GRADE 40						GRADE 60					
		24"				30"						24"					36"							30"						42"						36"						48"					
		4	6	8	10	4	6	8	10	12	14	8	10	12	14	16	8	10	12	14	16	22	24	10	12	14	16	22	24	10	12	14	16	22	24	10	12	14	16	19	22	24	10	12	14	16	19	22	24
6"	WARP		48	39			48	48				48					48																															
	BUTT		37	27			48	42				48					48																															
8"	WARP	48	39	29	24	48	48	44	35	29	25	48	42	35	30	26	48	48	48	45	39	28	26	48	48	47	41	30	27	48	48	48	48	45	41	48	48	48	48	48	43	39	48	48	48	48	48	48	48
	BUTT	42	27			48	42	31	25			37	29	24			48	44	37	32	27			46	39	33	29			48	48	48	43	32	29	48	48	48	48	35	30	27	48	48	48	48	48	45	41
8½"	WARP	48	37	28		48	48	42	33	28	24	48	39	33	28	24	48	48	48	42	37	27	24	48	48	44	38	28	25	48	48	48	48	42	38	48	48	48	48	47	40	37	48	48	48	48	48	48	48
	BUTT	39	26			44	39	29				35	27				48	42	35	29	26			44	36	31	27			48	48	47	41	30	27	48	48	45	39	33	28	26	48	48	48	48	48	42	39
9"	WARP	48	35	26		48	48	39	31	26		47	37	31	26		48	48	47	40	35	25		48	48	42	36	26	24	48	48	48	48	40	36	48	48	48	48	44	38	35	48	48	48	48	48	48	48
	BUTT	37	24			48	37	27				33	26				48	40	33	28	25			41	34	29	25			48	48	44	39	28	25	48	48	42	37	31	26	24	48	48	48	48	47	40	37
9½"	WARP	48	33	25		48	48	37	30	25		44	35	29	25		48	48	44	38	33	24		48	46	39	34	25		48	48	48	48	38	34	48	48	48	48	42	36	33	48	48	48	48	48	48	48
	BUTT	35				48	35	26				31	25				47	37	31	27				39	32	27	25			48	48	42	37	27	24	48	47	40	35	29	25		48	48	48	48	44	38	35
10"	WARP	47	31			48	47	35	28			42	34	28	24		48	48	42	36	31			48	44	37	33	24		48	48	48	48	36	33	48	48	48	48	40	34	31	48	48	48	48	48	48	47
	BUTT	33				48	33	25				29	24				45	36	29	25				37	31	26	24			48	46	40	35	25		48	45	38	33	28	24		48	48	48	48	42	36	33
10½"	WARP	45	30			48	45	34	27			40	32	26			48	48	40	34	30			48	42	36	31			48	48	48	47	34	31	48	48	48	48	45	38	33	30	48	48	48	48	48	48	45
	BUTT	32				48	32	24				28					42	34	28	24				35	29	25				48	44	38	33	24		48	42	36	32	27			48	48	48	48	40	34	31
11"	WARP	43	28			48	43	32	26			38	31	25			48	46	38	33	28			48	40	34	30			48	48	48	45	32	30	48	48	48	43	36	31	28	48	48	48	48	48	47	43
	BUTT	30				46	30					27					40	32	27					34	28	24				48	42	36	32			48	40	35	30	25			48	48	48	46	38	33	30
11½"	WARP	41	27			48	41	31	24			36	29	24			48	44	36	31	27			46	38	32	28			48	48	48	43	31	28	48	48	47	41	34	30	27	48	48	48	48	48	45	41
	BUTT	29				44	29					25					39	31	25					32	27					48	40	35	30			46	39	33	29	24			48	48	48	44	37	31	29
12"	WARP	39	26			48	39	29				35	28				48	42	35	30	26			44	36	31	28			48	48	47	41	30	27	48	48	45	40	33	28	26	48	48	48	48	48	43	39
	BUTT	27				42	27					25					37	30	25					31	25					46	39	33	29			45	37	32	28				48	48	48	42	35	30	27
12½"	WARP	38	25			48	38	28				33	27				48	40	33	29	25			42	35	30	26			48	48	45	39	28	26	48	48	43	38	32	27	25	48	48	48	48	48	41	38
	BUTT	27				40	27					25					35	28						29	25					44	37	32	27			42	35	30	27				48	48	45	40	34	29	26
13"	WARP	36	24			48	36	27				32	26				48	39	32	27	24			40	33	29	25			48	48	43	38	27	25	48	48	41	36	30	26	24	48	48	48	48	46	40	36
	BUTT	25				38	25					24					34	27						28						42	35	30	27			41	34	29	25				48	48	44	38	32	28	25
13½"	WARP	35				48	35	26				31	25				47	37	31	26				39	32	28	24			48	48	42	36	26	24	48	47	40	35	29	25		48	48	48	48	44	38	35
	BUTT	25				37	25					24					33	26						27						41	34	29	25			39	33	28	25				48	48	42	37	31	27	24
14"	WARP	34				48	34	25				30	24				45	36	30	25				37	31	27				48	47	40	35	25		48	45	38	34	28	24		48	48	48	48	43	37	34
	BUTT	24				35	24					23					32	25						26						39	33	28	25			38	32	27	24				48	47	40	35	30	26	
14½"	WARP	32				48	32	24				29					43	35	29	25				36	30	26				48	45	39	34	24		48	43	37	32	27			48	48	48	48	41	35	32
	BUTT					34						22					30	25						25						38	32	27	24			36	30	26					48	46	39	34	29	25	
15"	WARP	31				47	31					28					42	33	28	24				35	29	25				48	44	37	33	24		48	42	36	31	26			48	48	48	47	40	34	31
	BUTT					33						21					29							25						37	31	26				35	29	25					48	44	38	33	28	24	



Curb and gutter sections

JOINT SEALER DETAILS



Typical section

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-15-2010

REVISIONS

DATE	CHANGE
10/23/2012	Expanded Tie Bar Table
03/16/2016	Updated Jt Details & notes
10/25/2019	Corrected "Typo" in Note 3

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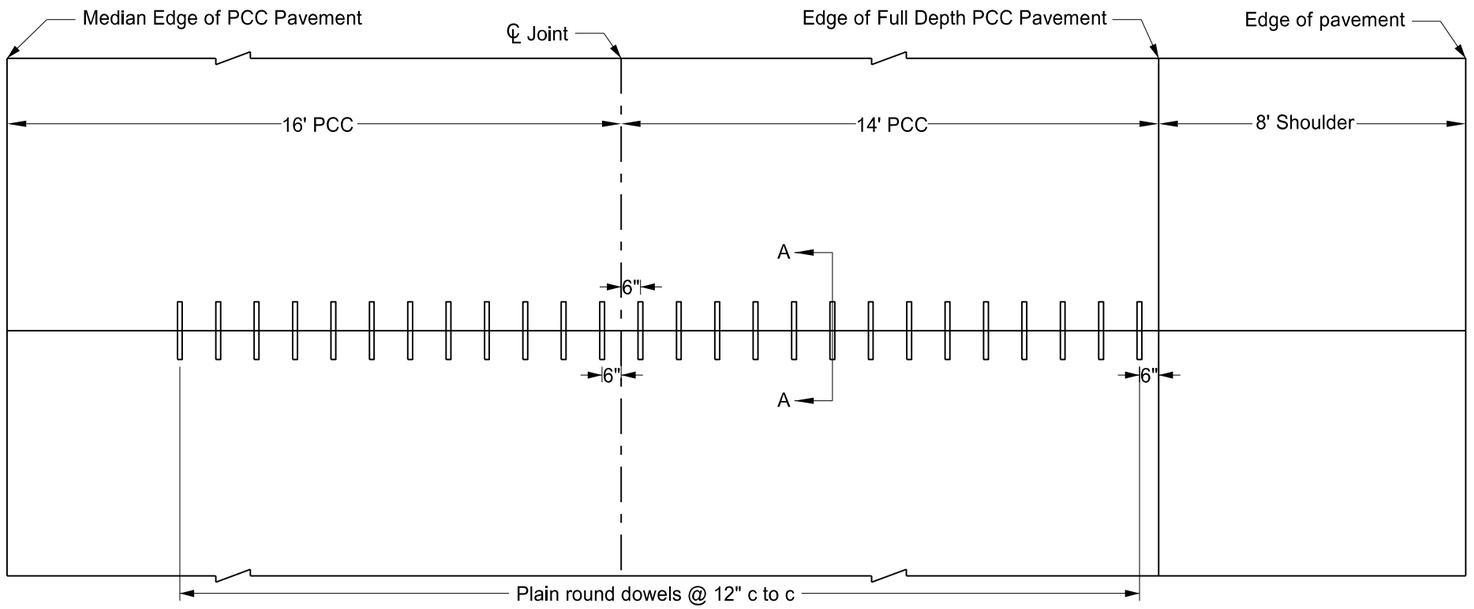
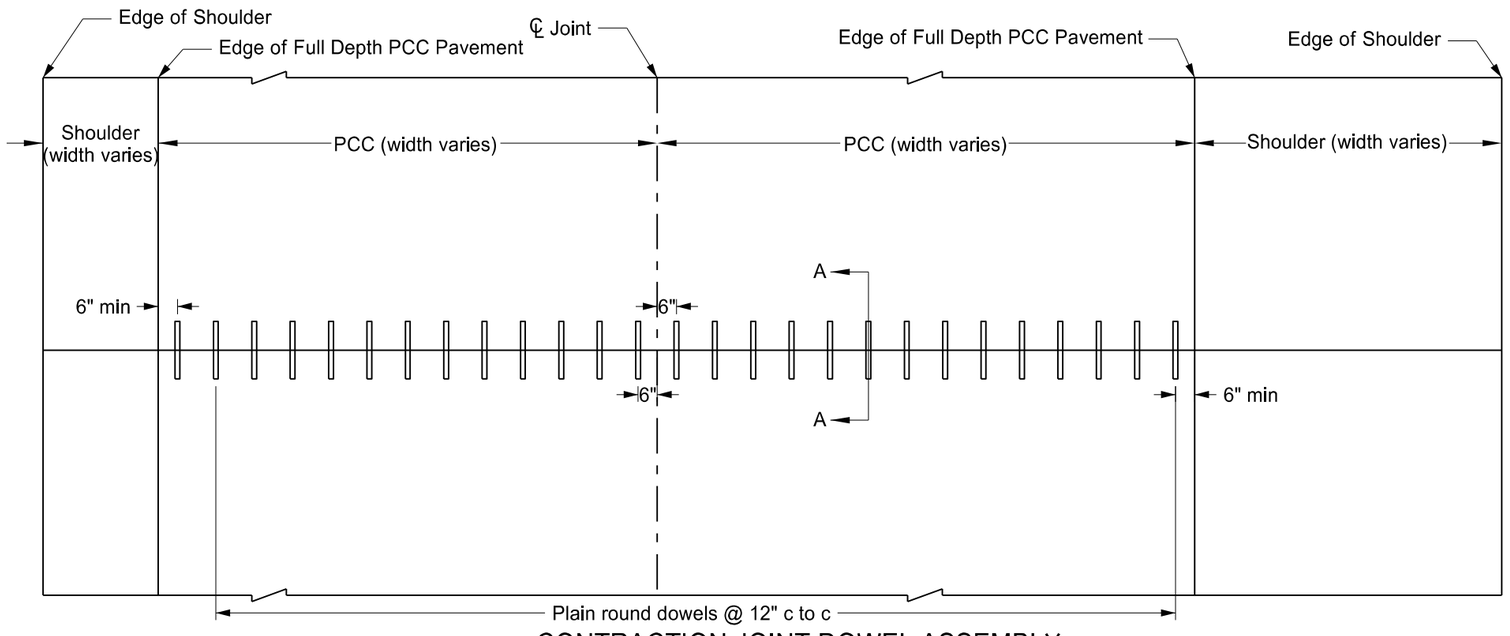
TRANSVERSE CONTRACTION JOINT DETAILS

D-550-3



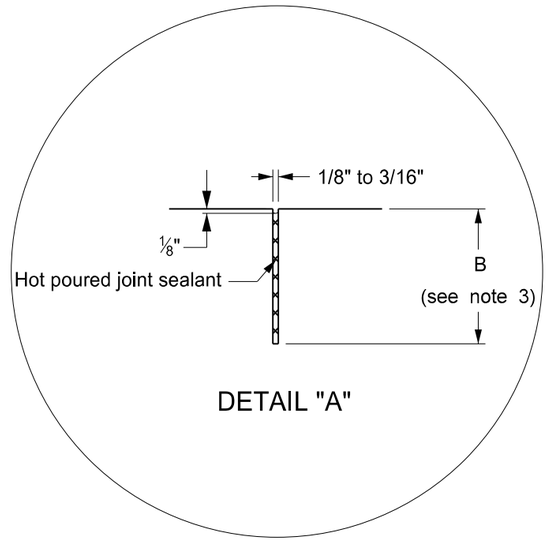
CONTRACTION JOINT DOWEL ASSEMBLY
INTERSTATE



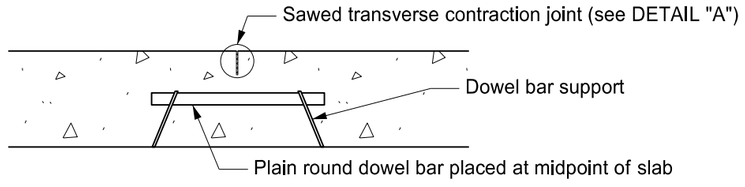
CONTRACTION JOINT DOWEL ASSEMBLY
NON-INTERSTATE

Notes

1. The joint seal details apply to both doweled and non-doweled (plain) transverse joints.
2. T = Thickness of pavement.
3. B = T/4 + ¼" for AE or YE for non-dowelled concrete pavement or
   B = T/3 for AAE or dowelled concrete pavement



DETAIL "A"



SECTION A-A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-10	
REVISIONS	
DATE	CHANGE
6/23/2014	Removed dowel size reference
3/16/2016	Revised Joint Details and notes
10/25/2019	Expanded Details for clarity

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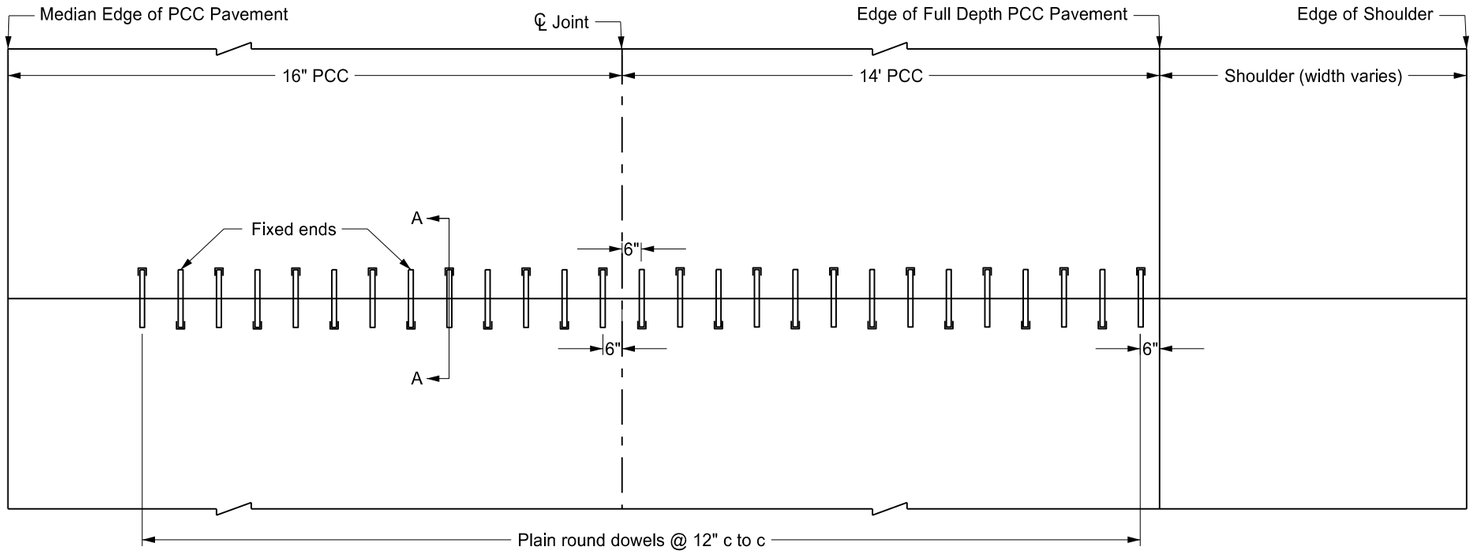
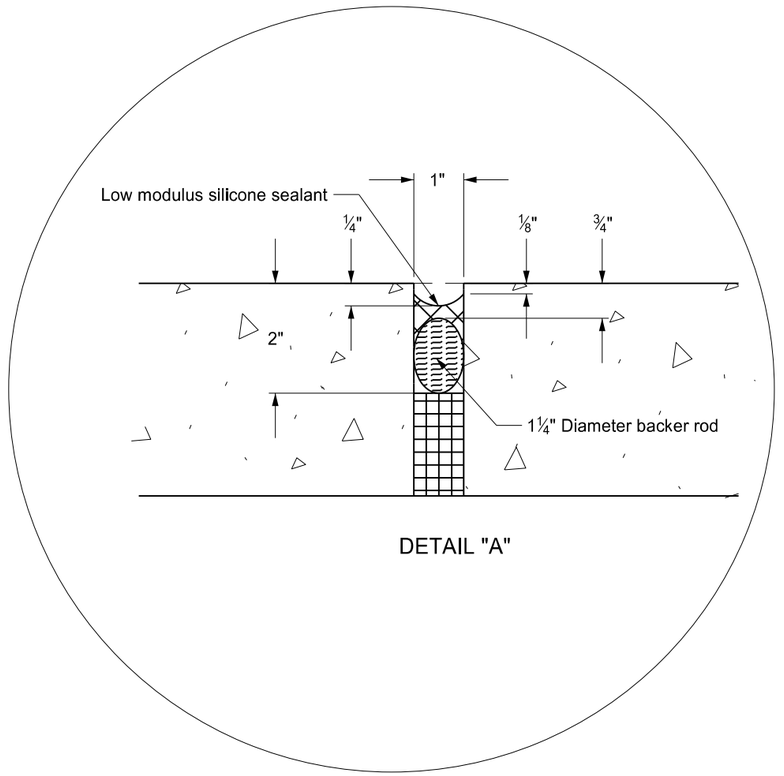
TRANSVERSE EXPANSION JOINT DETAIL

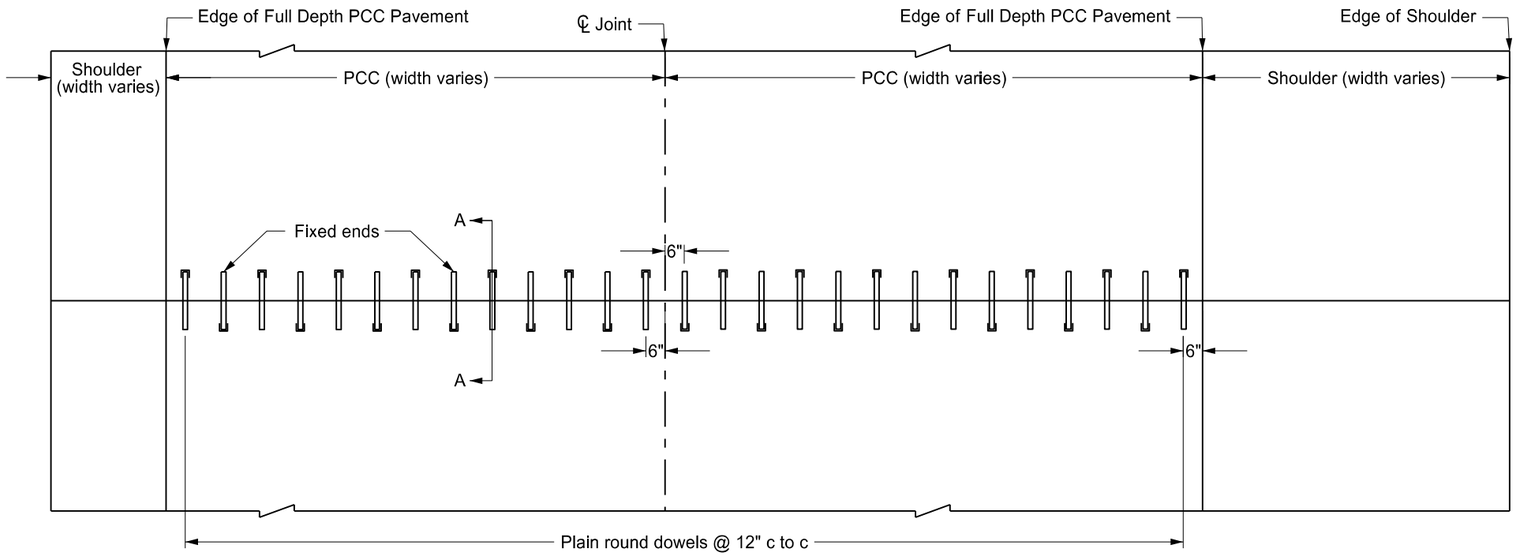
D-550-4



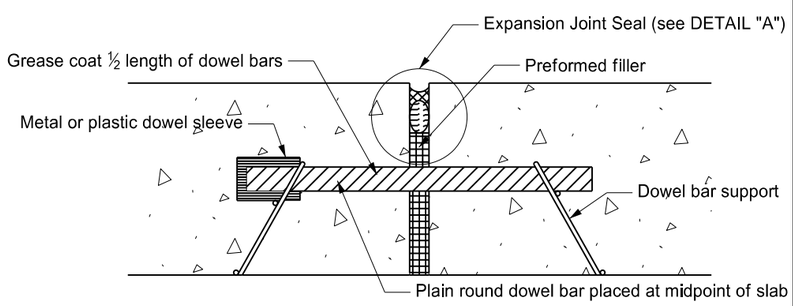
DOWELED EXPANSION JOINT ASSEMBLY
INTERSTATE



DETAIL "A"



DOWELED EXPANSION JOINT ASSEMBLY
NON-INTERSTATE



SECTION A-A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE
6/23/2014 10/25/2019	Removed dowel bar sizes Expanded details for clarity

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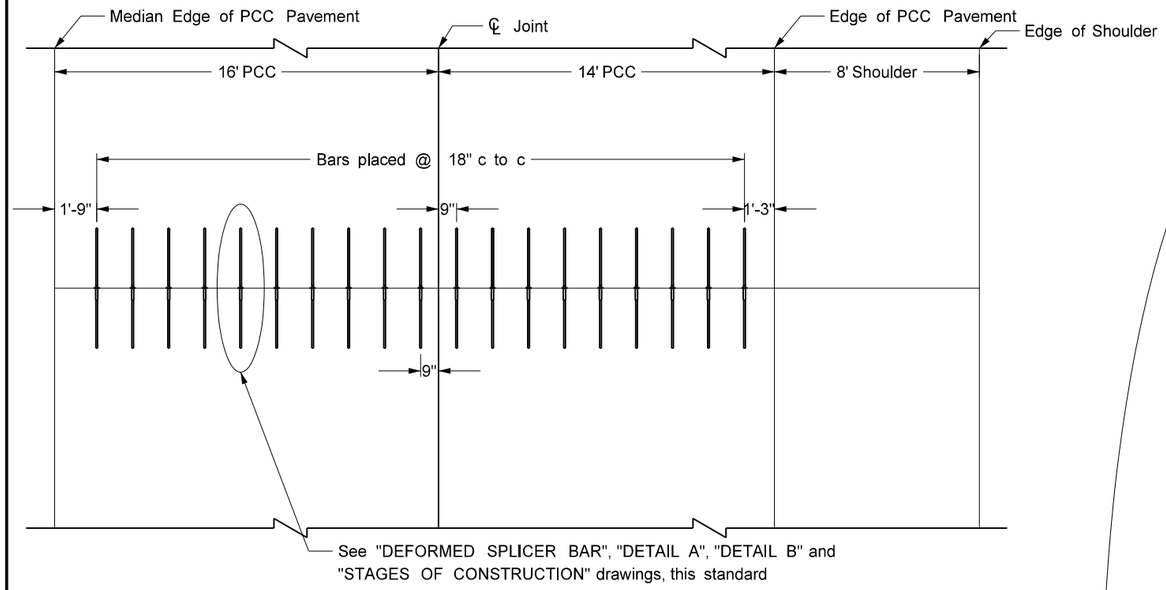
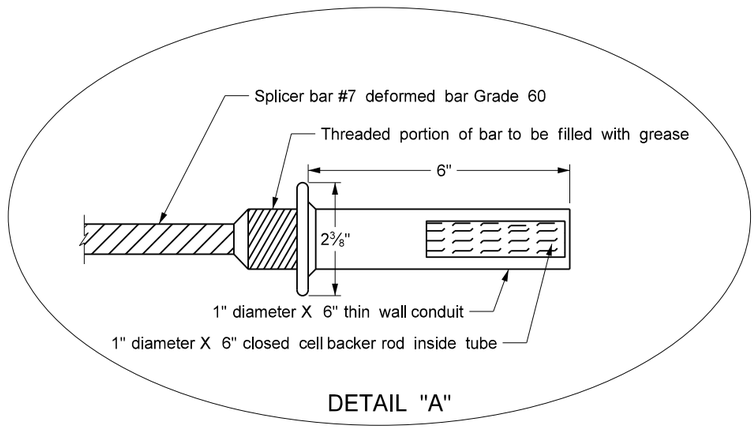
TRANSVERSE CONSTRUCTION JOINT

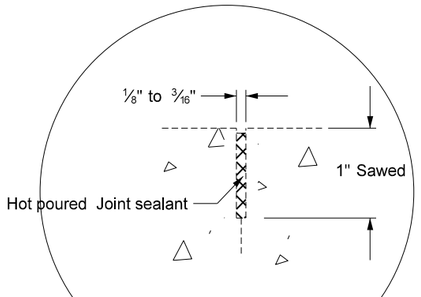
D-550-5



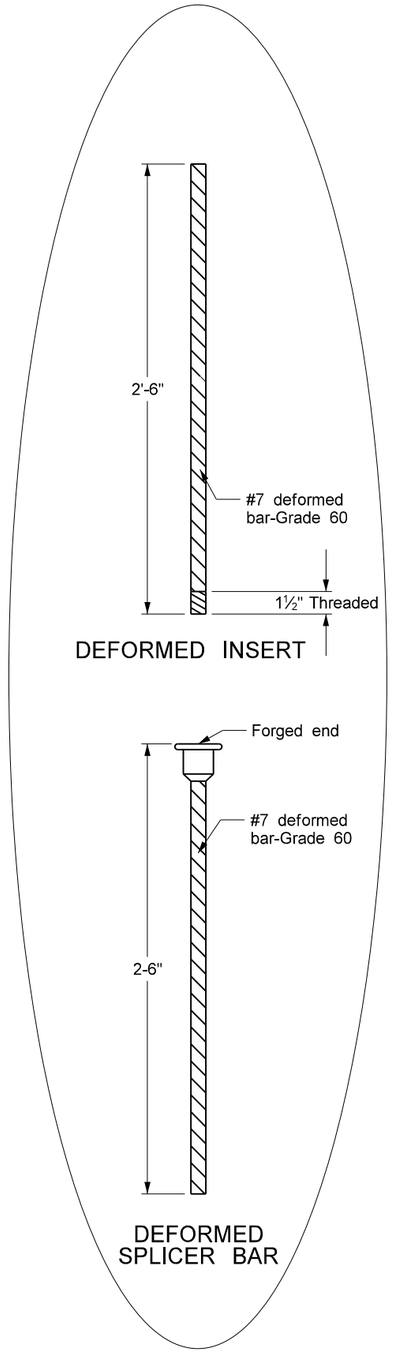
PLAN VIEW



DETAIL "A"



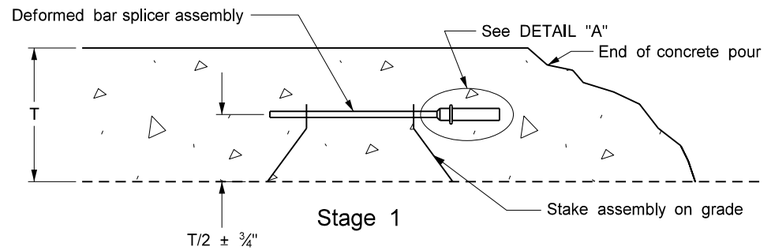
DETAIL "B"



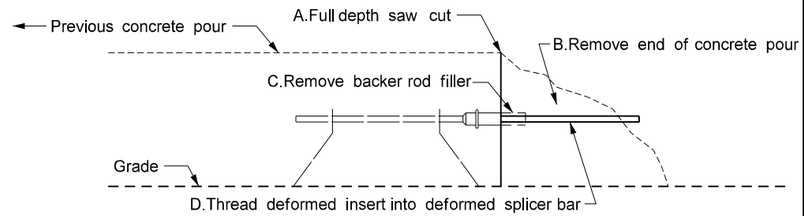
DEFORMED INSERT

DEFORMED SPLICER BAR

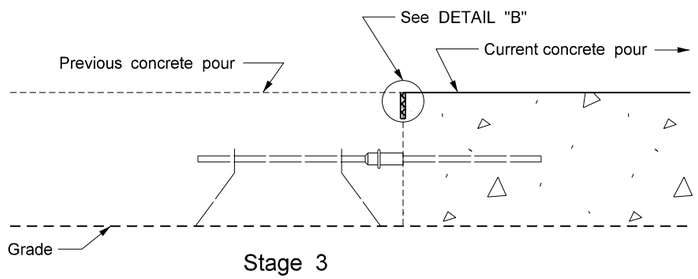
STAGES OF CONSTRUCTION



Stage 1



Stage 2



Stage 3

Notes

1. Saw and seal all construction joints.
2. Include all costs for transverse construction joints in the price bid for PCC pavement.
3. Do not saturate the subgrade during the sawing operation.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE
3-16-16 8-27-19	Revised Joint Details & notes. New Design Engr PE Stamp.

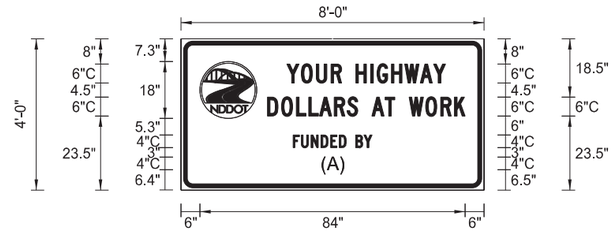
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/27/19 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN DETAILS
PROJECT FUNDING SIGN

SIGN NUMBER	I2-5-96
WIDTH X HEIGHT	8'-0" x 4'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_CIRCLE_LOGO	6	22.8	18	18	0
	44.2	4.2	7.5	8.6	0

STATION(S): AREA: 32.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_48_Large.ssi

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
Y	O	U	R	H	I	G	H	W	A	Y									50.3	6	C 2000
33.5	38.1	42.8	47.5	55.4	60.1	62.1	66.7	70.9	75.8	80											
D	O	L	L	A	R	S	A	T	W	O	R	K							62.6	6	C 2000
27.4	31.8	36.5	40.4	43.9	48.5	52.6	60.5	64.7	72.2	77.5	82.3	86.6									
F	U	N	D	E	D	B	Y												25	4	C 2000
35.5	38.1	41.2	44.3	47.4	50.1	55.3	57.9														

(A)

FUNDING SOURCE MESSAGE VARIATIONS
FEDERAL
STATE
FEDERAL - STATE
FEDERAL - LOCAL
FEDERAL - STATE - LOCAL
STATE - LOCAL

Use a horizontal spacing of 3" between words and hyphens. Center message horizontally in sign panel.

Notes:

1) Contact the Communications Division of the NDDOT to obtain a copy of the image for the NDDOT Logo.

2) Contact Project Engineer for funding source message.

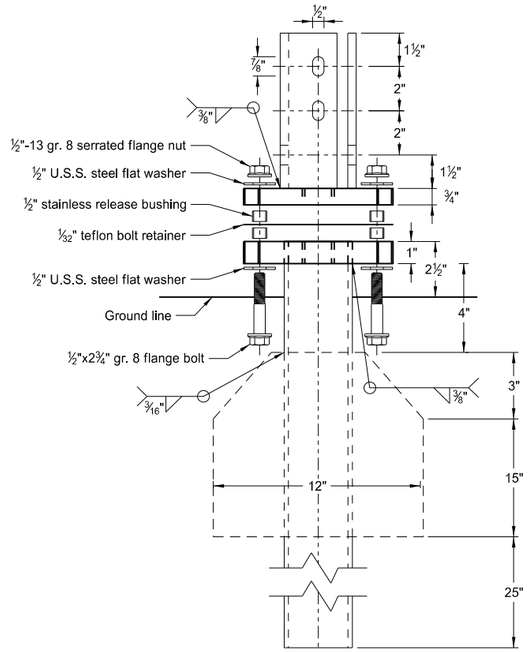
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-08-21	
REVISIONS	
DATE	CHANGE

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

12/08/21

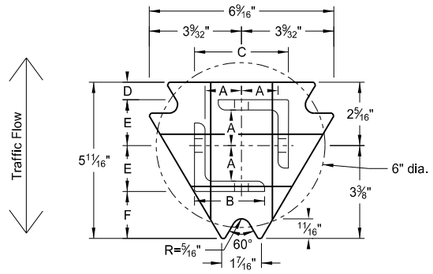
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

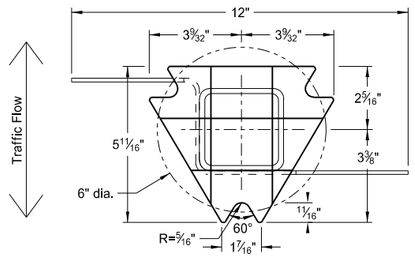


Multi-Directional
Slip Base Assembly

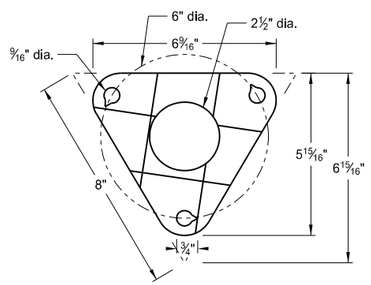
Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



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



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

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

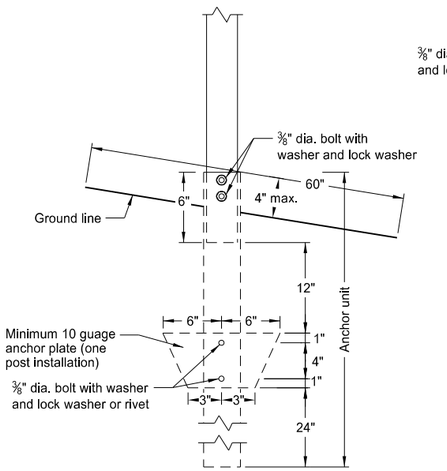
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thick-ness Gauge	Sleeve Size in.	Wall Thick-ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			(A)	3
1	2½	10			Yes	
1	2¼	12	2	12	Yes	
1	2½	12	2¼	12	Yes	
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	
2	2½	12			Yes	
2	2¼	10	2	12	Yes	
2	2½	12	2¼	12	Yes	
3 & 4	2½	12			Yes	
3 & 4	2½	10			Yes	
3 & 4	2½	12	2¼	12	Yes	
3 & 4	2¼	12	2	12	Yes	
3 & 4	2½	10	2³/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. Area in.²	Section Modulus in.³
1½ x 1½	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
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2³/16 x 2³/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

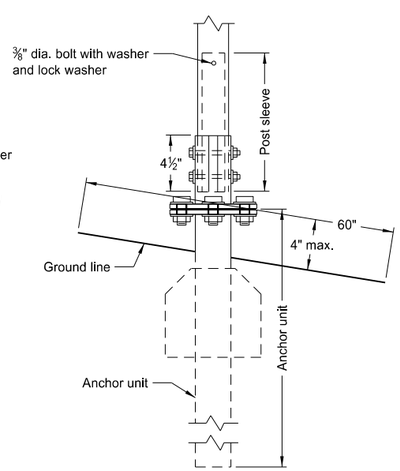
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2³/16"x10 ga.	1⁹/64"	2½"	3¹/32"	2⁵/32"	1³³/64"	1⅞"
2½"x10 ga.	1⁹/32"	2½"	3⁵/16"	⅝"	1²¹/32"	1¾"

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

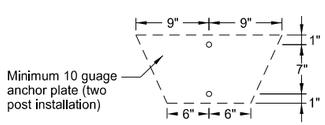
(B) For additional wind load, insert the 2³/16"x10 ga. into 2½"x10 ga.



Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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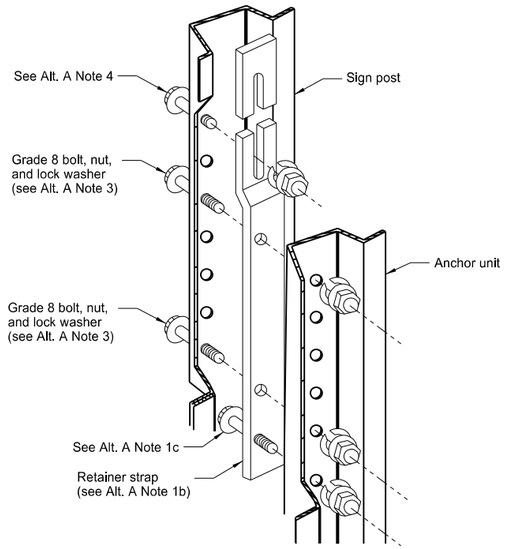
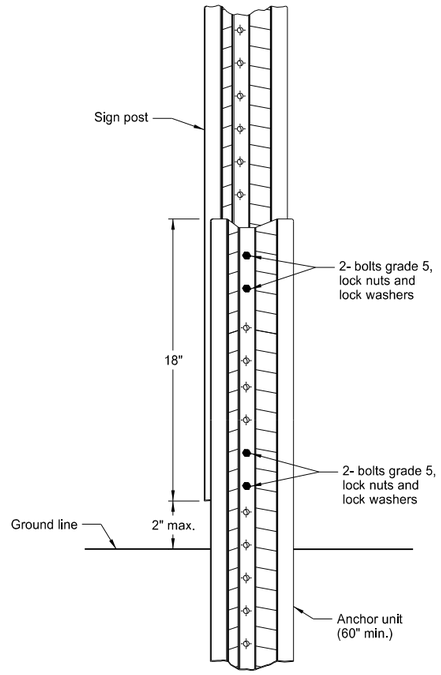
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

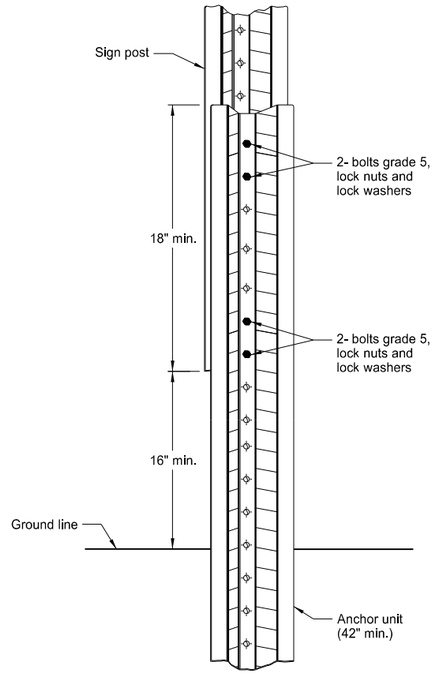


Detail A



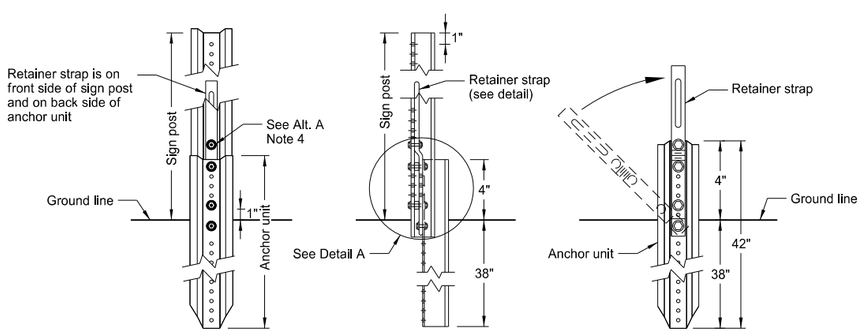
Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



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

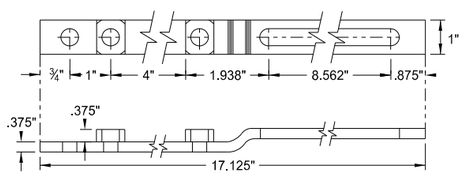
Install a maximum of 3 posts within 7'.



Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.



Retainer Strap Detail

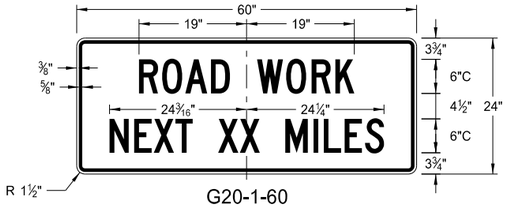
Alternate A Steps of Installation:

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

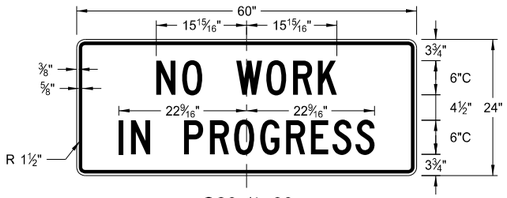
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

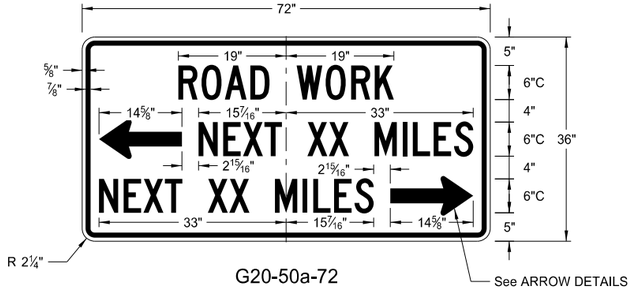
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



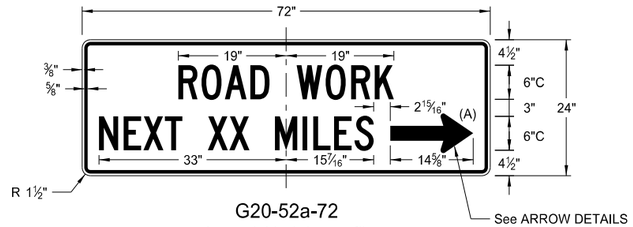
G20-1-60
Legend: black (non-refl)
Background: orange



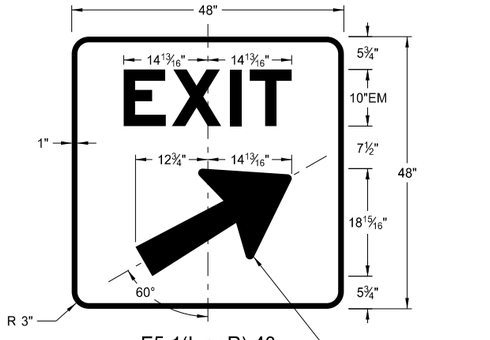
G20-1b-60
Legend: black (non-refl)
Background: orange



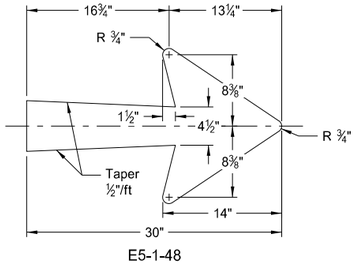
G20-50a-72
Legend: black (non-refl)
Background: orange



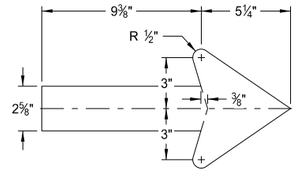
G20-52a-72
Legend: black (non-refl)
Background: orange



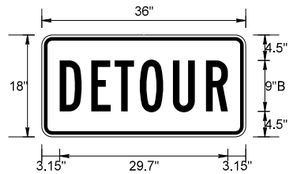
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



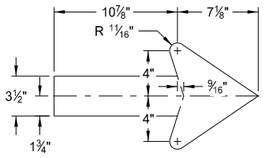
E5-1-48



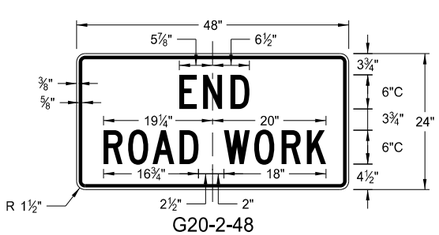
G20-50a-72
G20-52a-72



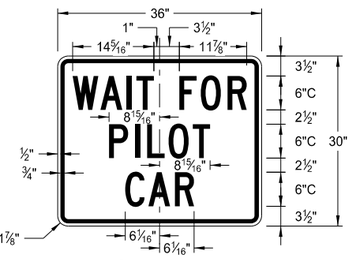
M4-8-36
Legend: black (non-refl)
Background: orange



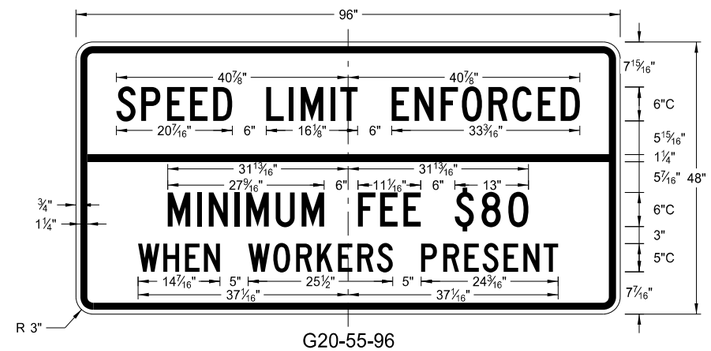
M4-9(L or R)-30
Right or Left



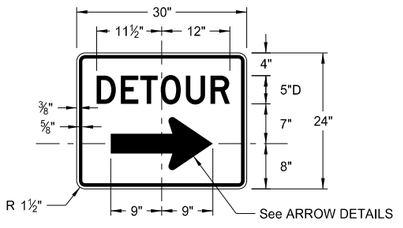
G20-2-48
Legend: black (non-refl)
Background: orange



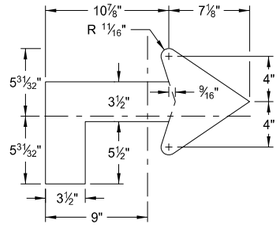
G20-4b-36
Legend: black (non-refl)
Background: orange



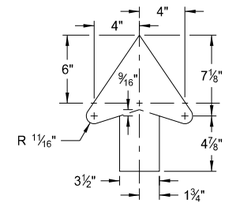
G20-55-96
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight

ARROW DETAILS

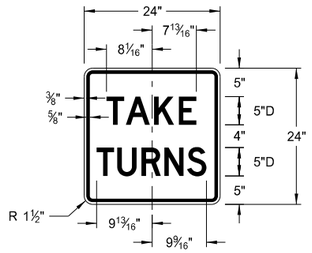
NOTES:

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

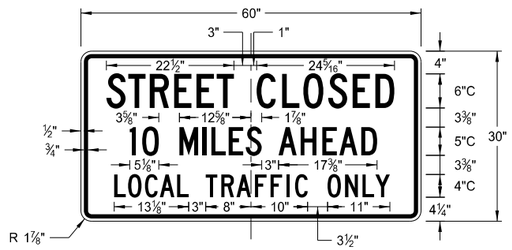
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

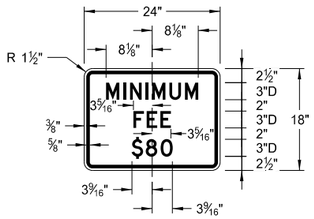
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



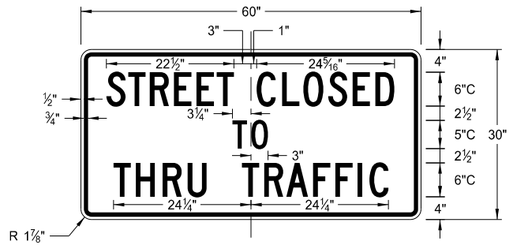
R1-50P-24
Legend: black (non-refl)
Background: white



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



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



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

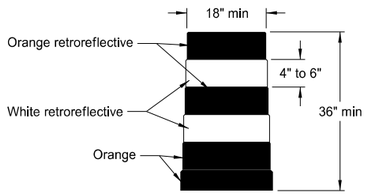
R11-2a-48
Legend: black (non-refl)
Background: white

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

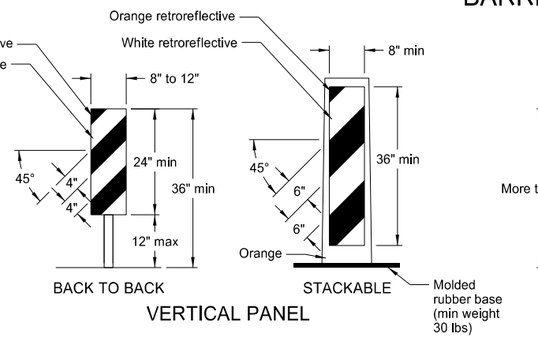
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



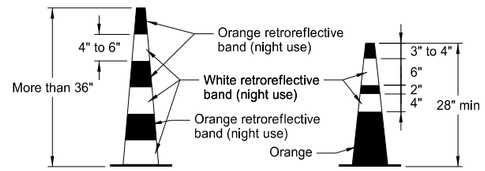
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



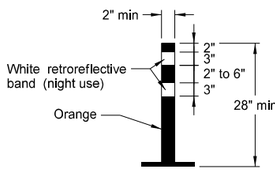
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with 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, use a stripe width of 6 inches.



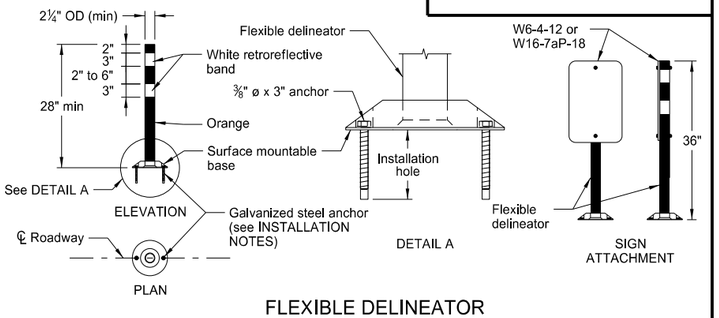
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

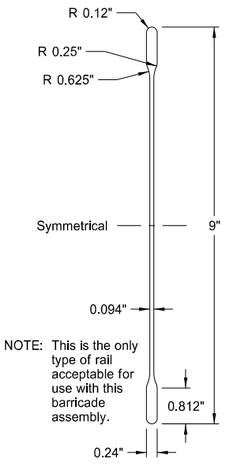
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

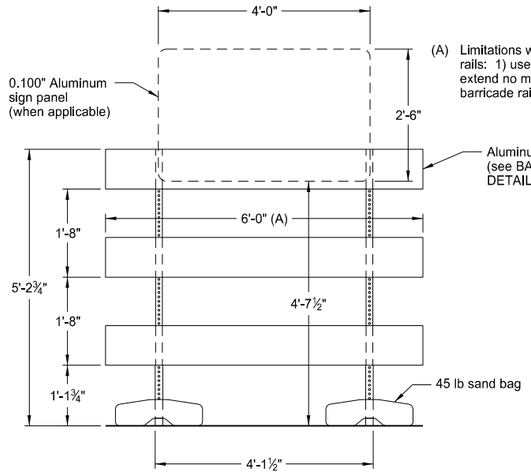
INSTALLATION NOTES:

1. Drill installation holes to diameter and depth 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, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.



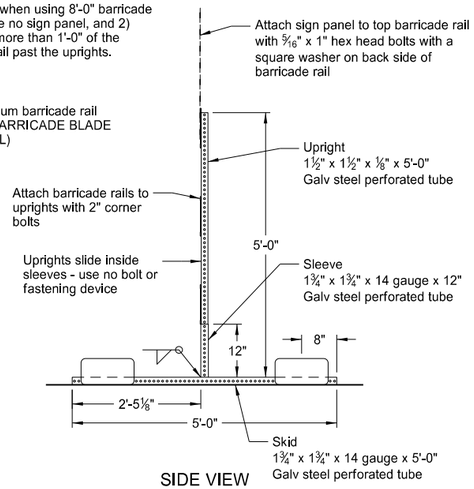
NOTE: This is the only type of rail acceptable for use with this barricade assembly.

BARRICADE BLADE DETAIL



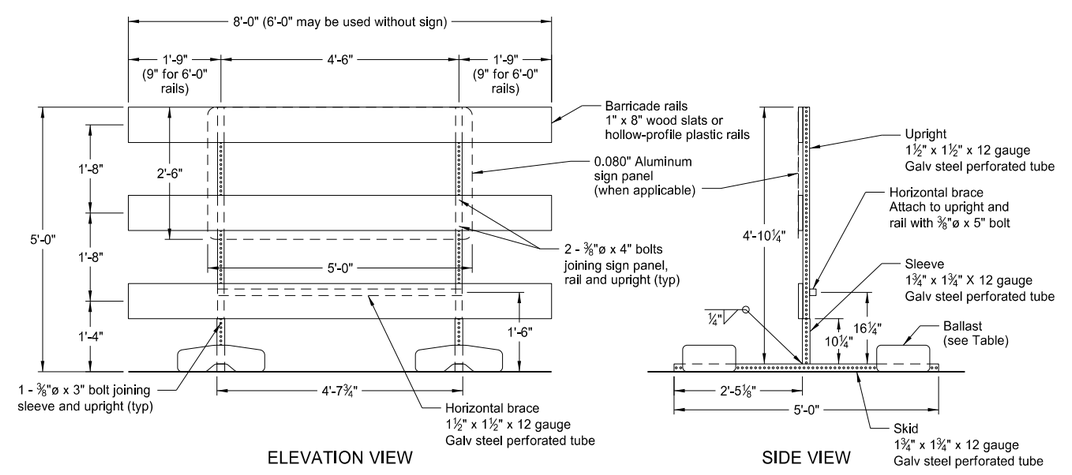
(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.

ELEVATION VIEW



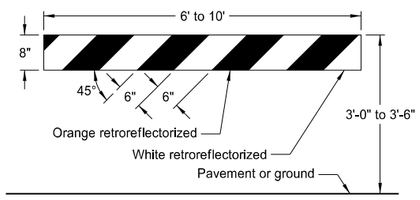
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

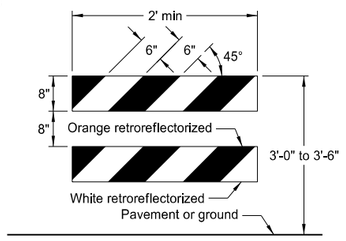


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

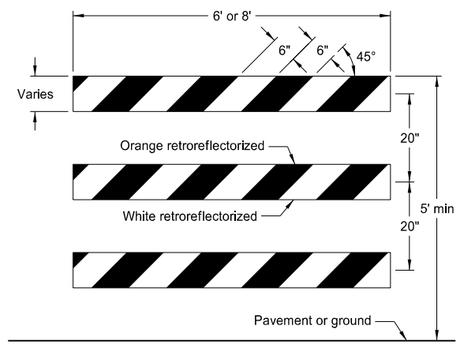
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



TYPE I BARRICADE

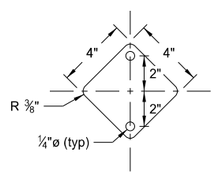


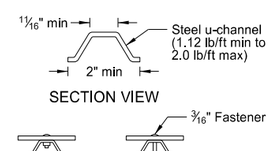
TYPE II BARRICADE

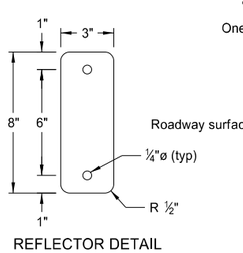


TYPE III BARRICADE

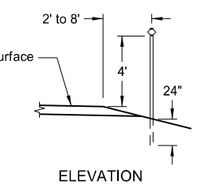
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

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

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

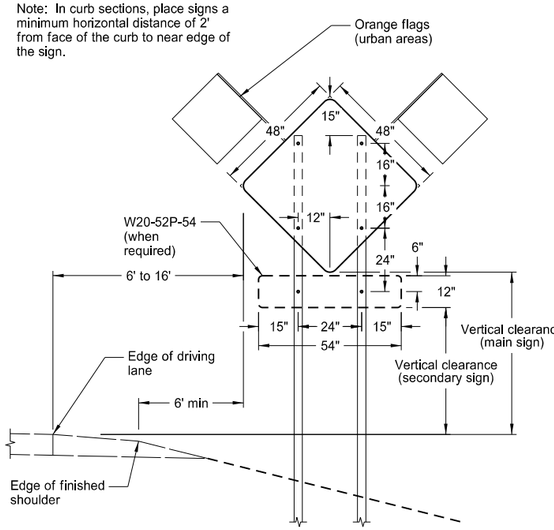
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17 11-01-19	Updated to active voice Revised details for Flexible Delineator

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

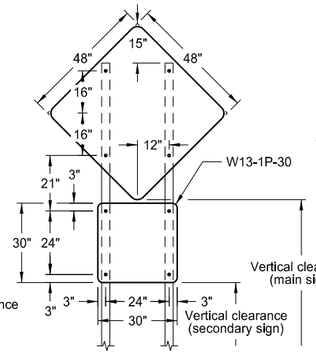
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

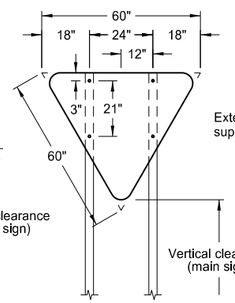
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



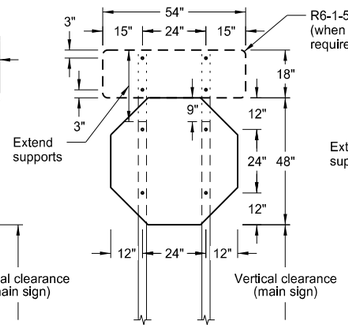
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



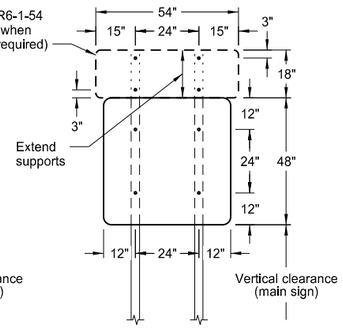
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



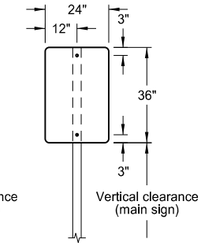
R1-2-60 - YIELD SIGN



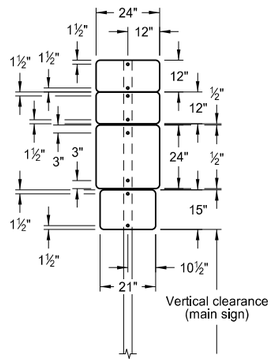
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



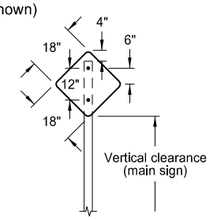
48" x 48" SIGN
(with R6-1-54 sign as required)



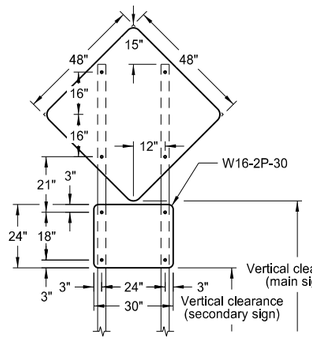
24" x 36" SIGN



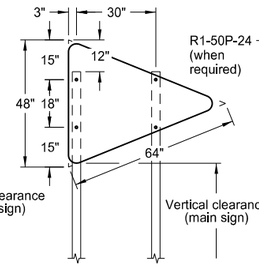
24" x 24"
ROUTE MARKER
ASSEMBLY



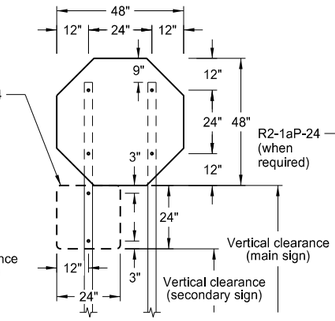
18" x 18"
DIAMOND SIGN



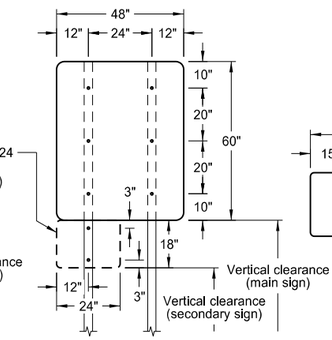
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



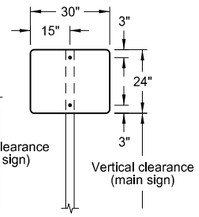
W14-3-64 - PENNANT SIGN



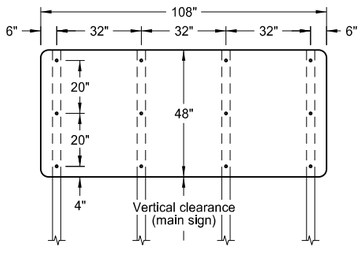
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



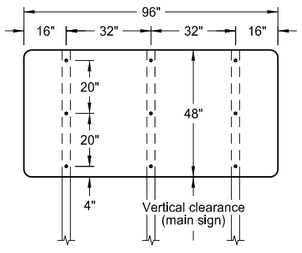
48" x 48" SIGN
(with R2-1aP-24 sign as required)



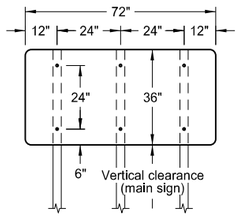
30" x 24" SIGN



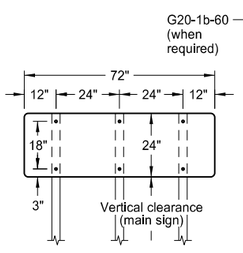
108" x 48" SIGN



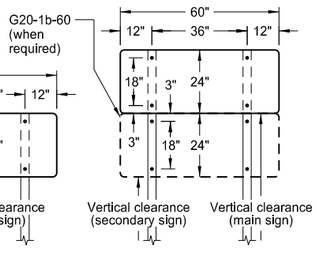
96" x 48" SIGN



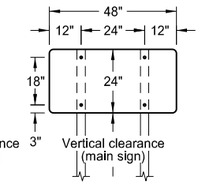
72" x 36" SIGN



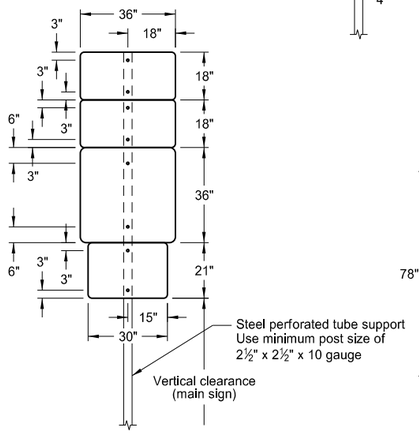
72" x 24" SIGN



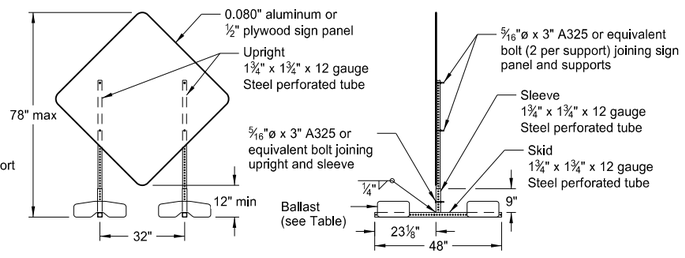
60" x 24" SIGN



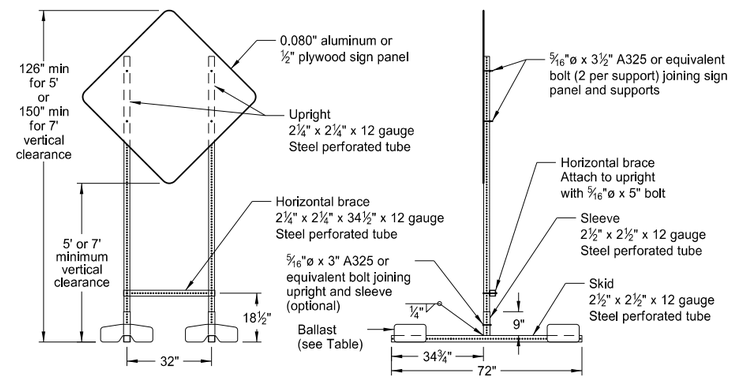
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. 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, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

   Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

   Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.

3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on 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 stated above.

   Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

   Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to 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

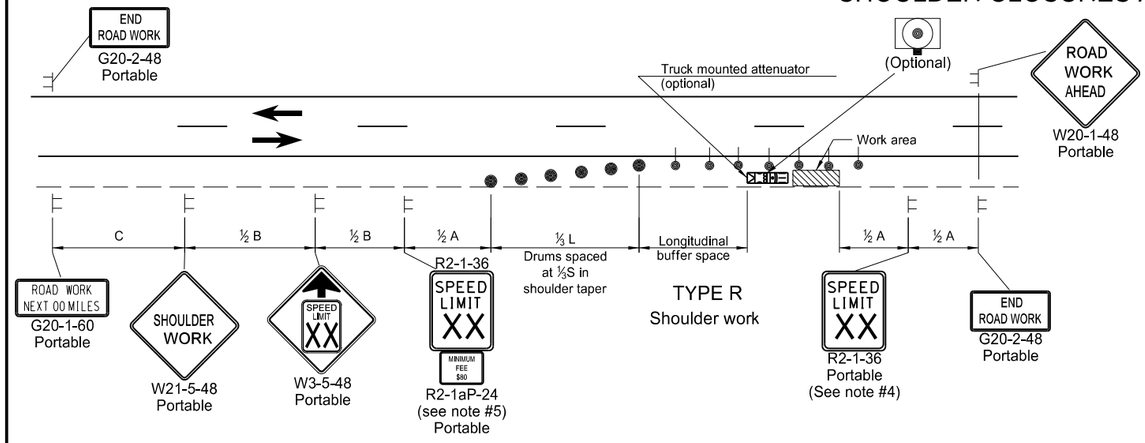
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail

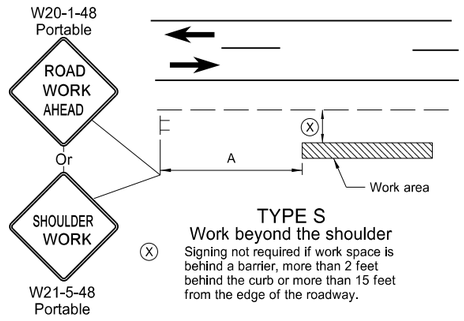
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

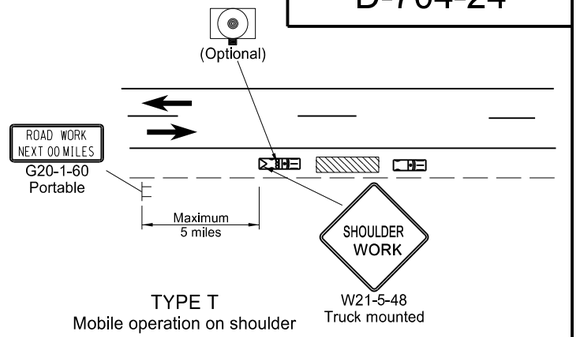
D-704-24



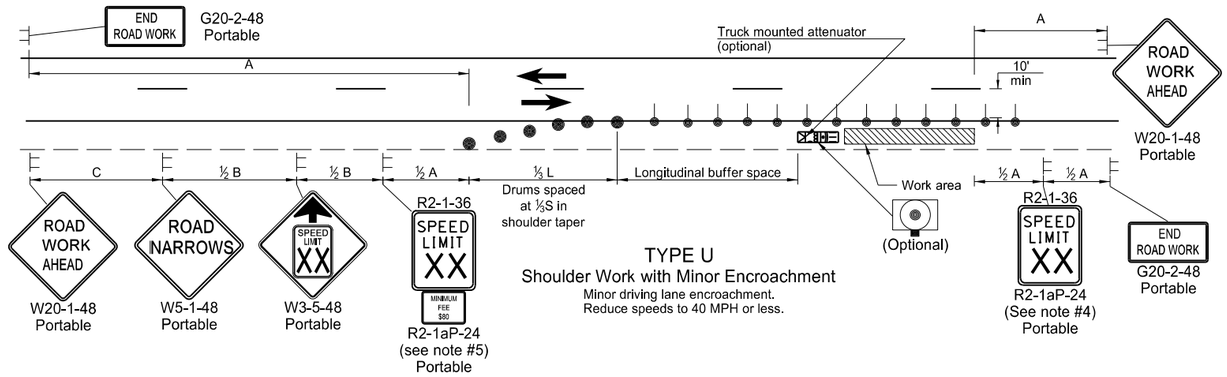
TYPE R
Shoulder work



TYPE S
Work beyond the shoulder
Signing not required if work space is behind a barrier, more than 2 feet behind the curb or more than 15 feet from the edge of the roadway.

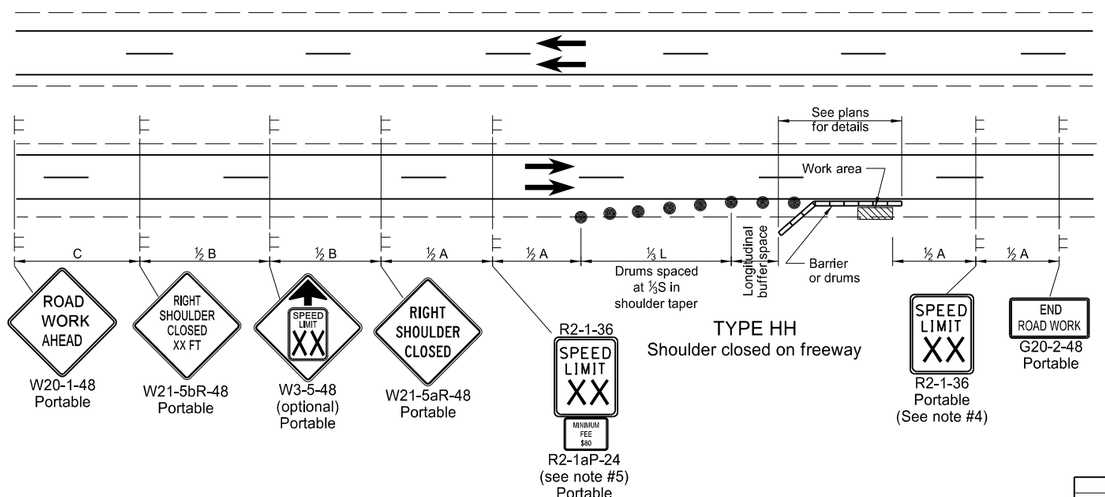


TYPE T
Mobile operation on shoulder

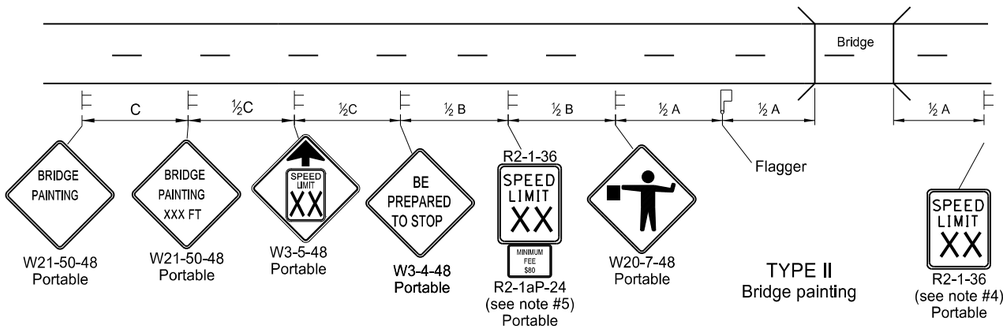


TYPE U
Shoulder Work with Minor Encroachment
Minor driving lane encroachment.
Reduce speeds to 40 MPH or less.

Notes
1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of the taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S^2 /60 for urban, residential, and other streets with speeds of 40 mph or less.
2. Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
3. Sequencing Arrow Panels
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   UseType B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within a reduced speed zone.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.



TYPE HH
Shoulder closed on freeway



TYPE II
Bridge painting

KEY

Sign	Work area
Delineator Drum	Tubular Marker
Sequencing Arrow Panel (Caution Mode)	

ADVANCE WARNING SIGN SPACING

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

Longitudinal Buffer Space

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

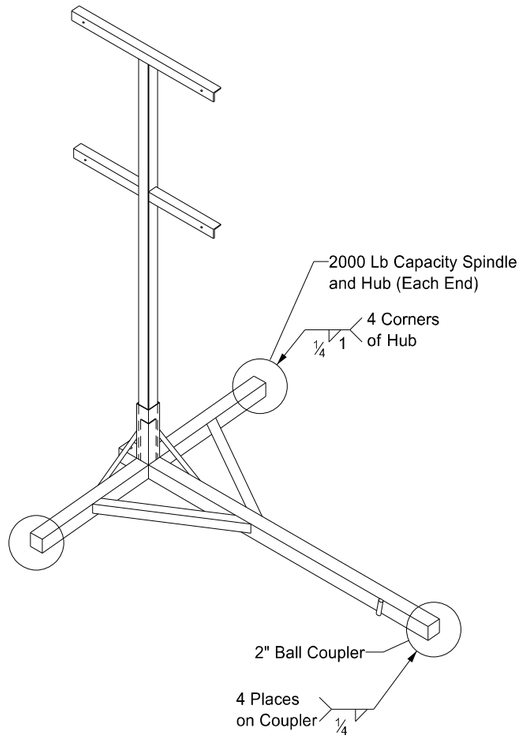
REVISIONS

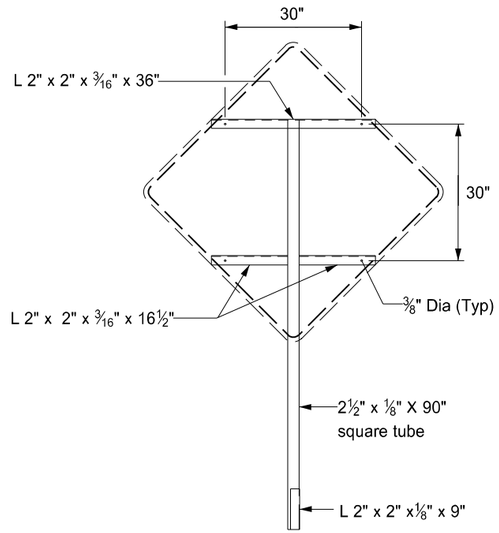
DATE	CHANGE
8-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

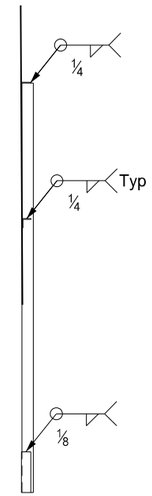
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

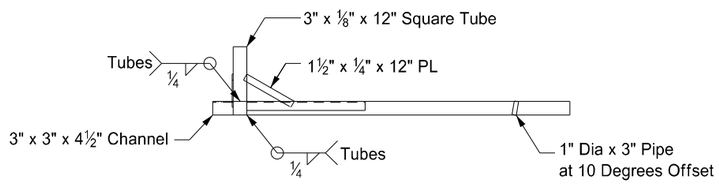


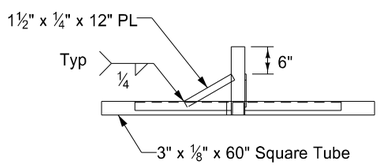
RIGHT

SIGN SUPPORT

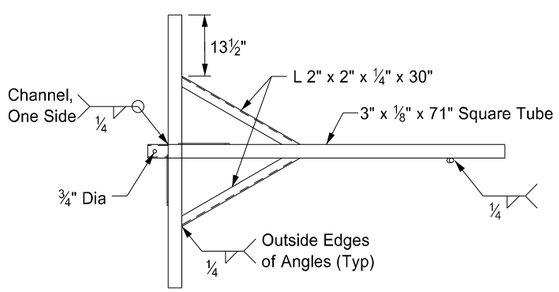
Notes:

1. Maximum 250 pound weight of assembly.
2. Use a 14" wheel and tire.
3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.





RIGHT



TOP

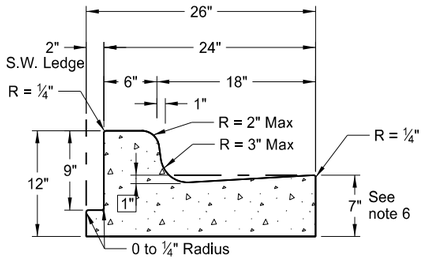
TRAILER

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

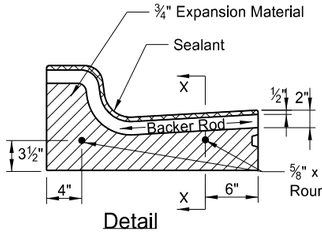
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
Kirk J Hoff
12 02 2020

Curb & Gutter and Valley Gutter

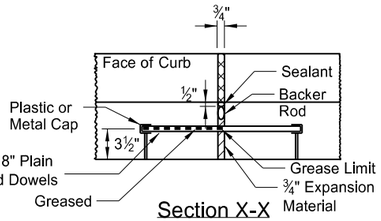
D-748-1



Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot.
(Sec. A shown. See Sec B for additional details.)

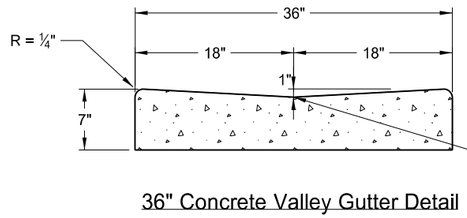


Detail

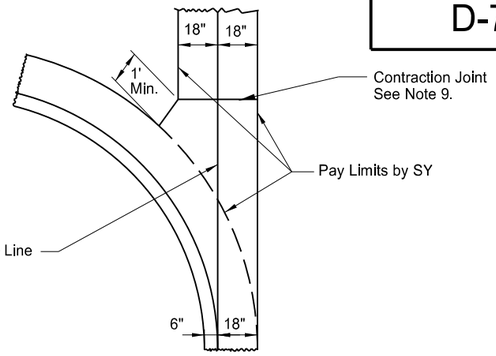


Section X-X

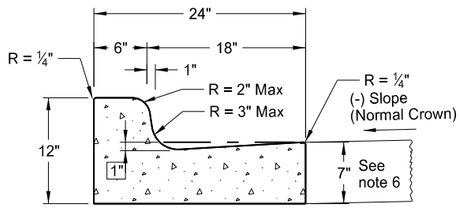
Isolation Joint



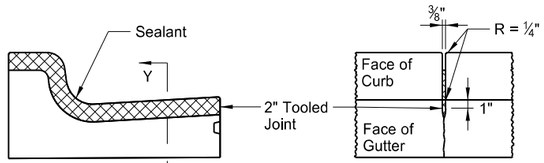
36" Concrete Valley Gutter Detail



36" Concrete Valley Gutter Plan



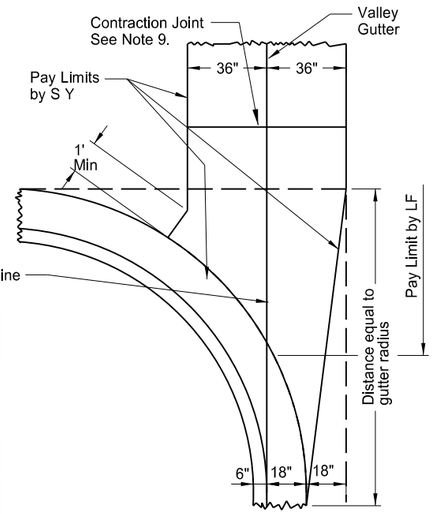
Curb & Gutter Type 1 (Sec. A)



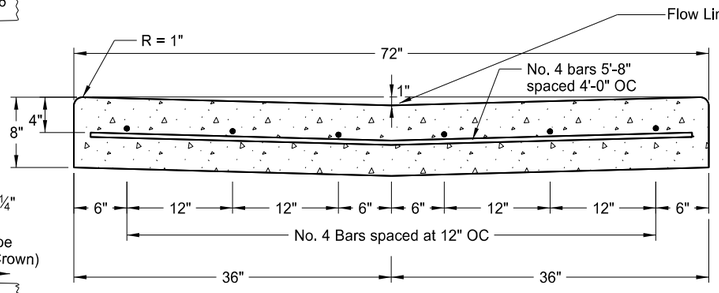
Detail
(10' Max Spacing)

Section Y-Y

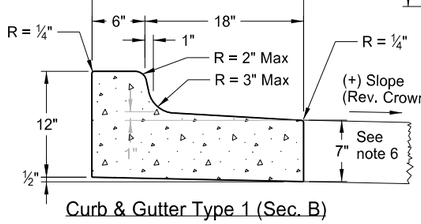
Contraction Joint



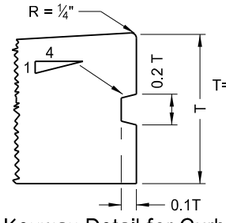
72" Concrete Valley Gutter Plan



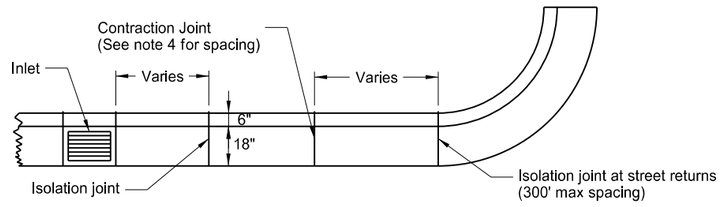
72" Concrete Valley Gutter Detail



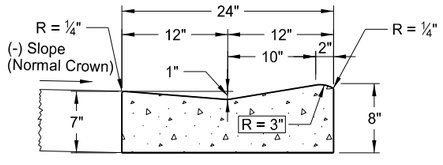
Curb & Gutter Type 1 (Sec. B)



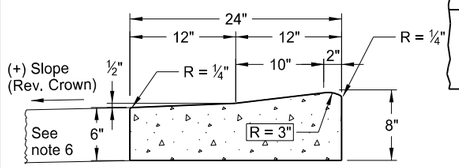
Keyway Detail for Curb & Gutter
(To be used with PCC Pavement and Drives)



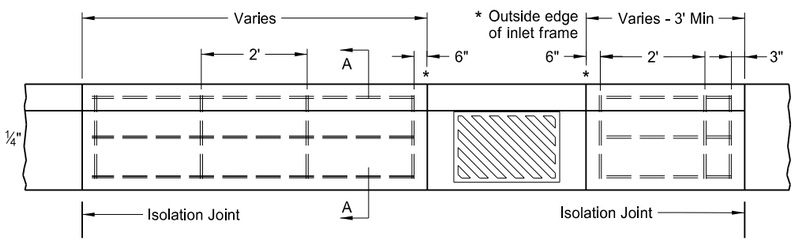
Joint Location Detail



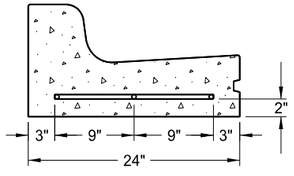
Mountable Curb & Gutter Type 1 (Sec. A)



Mountable Curb & Gutter Type 1 (Sec. B)



Curb & Gutter Reinforcing at Inlets



Section A-A

NOTE: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlet locations (even inlets located on radii) in the price bid for "Curb and Gutter - Type 1." Extend reinforcement to the second joint (rebar placed through the first joint) in cases where the 3' min. panel length cannot be obtained.

NOTES:

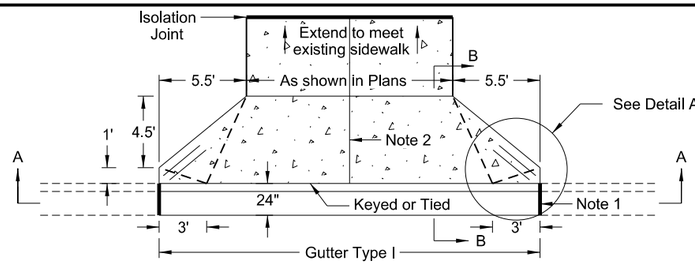
1. Use Curb and Gutter Type 1 (Sec. A & B). Use section "A" with (-) pavement slopes and section "B" with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Use ¾" expansion joint filler for isolation joint material. Form the backer rod and joint sealant opening with a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint. Install plastic or metal caps and greased dowels in the cold joint for the second pour.
4. Joint Spacing: For hot bituminous pavements use a 10' max joint spacing for the curb and gutter with panels on each side of the inlets. For concrete pavements match the joint spacing for the curb and gutter to the pavement joint on PCC Pavements (approximately 15' spacing.)
5. Joint sealing: Seal contraction and isolation joints as shown in the details. Use joint sealant for contraction joints that conforms to section 826.02B. Use sealant for expansion joints specified in note 3 above. Tool and install sealant in accordance with the manufacturer's recommendations.
6. Face of Gutter Depth: For hot bituminous pavement use 7" gutter depth as shown. For PCC pavements, match the gutter depth to the depth of adjacent PCC pavement or to construct a 7" depth as shown.
7. Tie curb and gutter to abutting PCC pavement with No. 3 bars, 1'-6" in length, spaced at 4' centers.
8. On street returns and other locations where new curb and gutter ends and does not abut existing curb and gutter, taper the last two (2) feet of the curb from 6" in height to 0". Install a 1/2" premolded full depth isolation joint, the same shape as the curb and gutter just ahead of the taper. Install an 18" tie bar across the joint.
9. Valley Gutter Joints: Form, saw, or score ⅛" min. to ⅜" max. width contraction joints (a minimum 2" depth) at approx 10' intervals. Seal the joints with hot poured elastic type joint sealer (Section 826.02A.2 of the Standard Specifications.) Include all costs for the joint and sealant in the price bid for Valley Gutter.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engr PE Stamp.

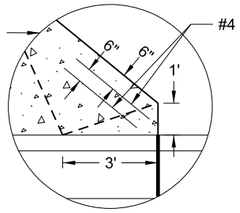
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-19 and the original document is stored at the North Dakota Department of Transportation

CONCRETE DRIVEWAY - URBAN

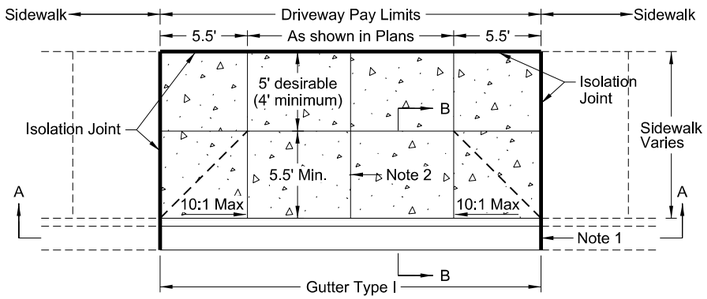
D-750-1



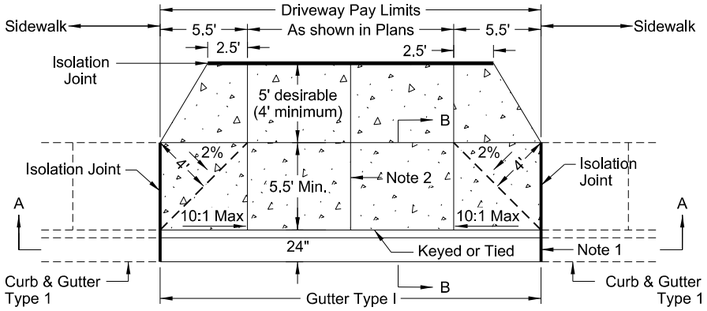
Driveway Type 1



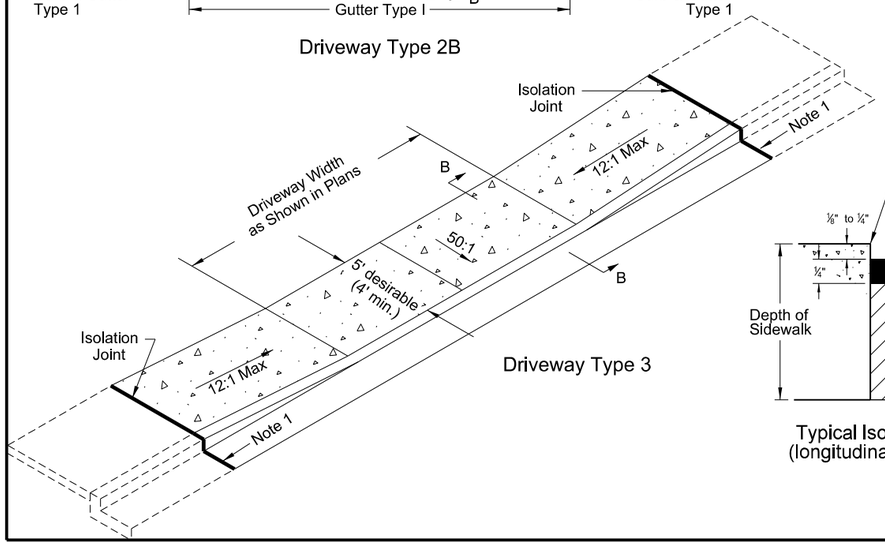
Detail A



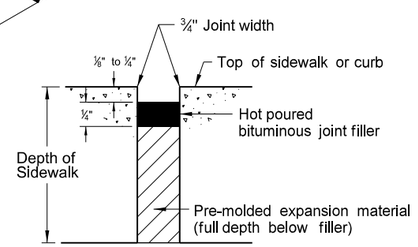
Driveway Type 2A



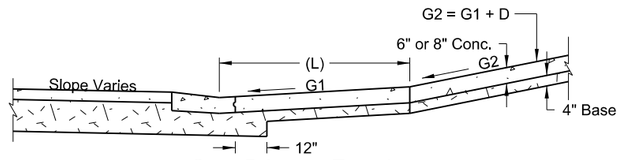
Driveway Type 2B



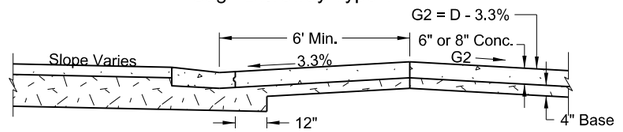
Driveway Type 3



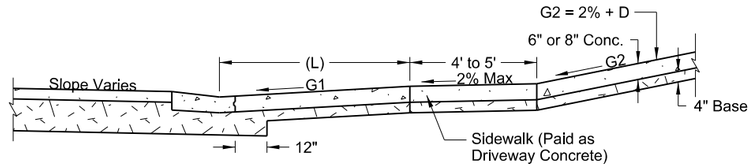
Typical Isolation Joint Seal
(longitudinal and transverse)



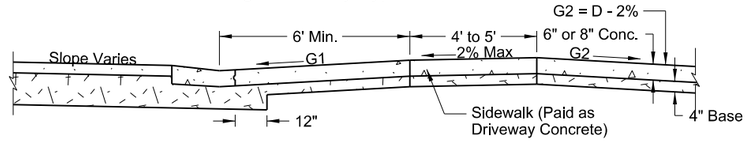
Sag - Driveway Type 1



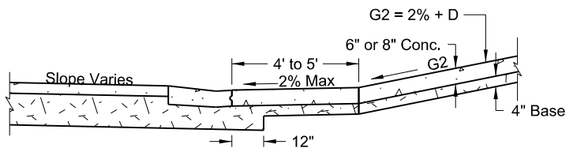
Summit - Driveway Type 1



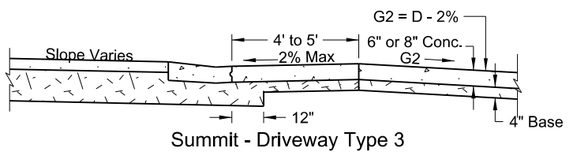
Sag - Driveway Types 2A & 2B



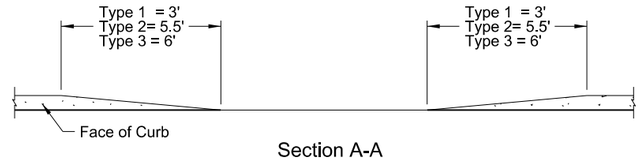
Summit - Driveway Types 2A & 2B



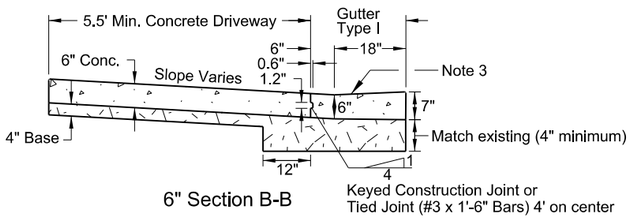
Sag - Driveway Type 3



Summit - Driveway Type 3

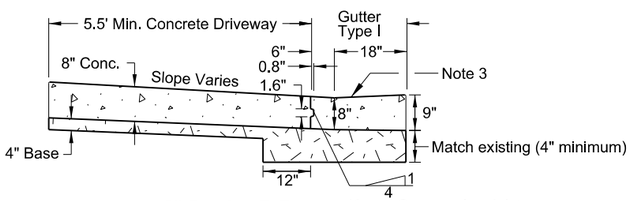


Section A-A



6" Section B-B

Keyed Construction Joint or Tied Joint (#3 x 1'-6" Bars) 4' on center



8" Section B-B

Keyed Construction Joint or Tied Joint (#3 x 1'-6" Bars) 4' on center

NOTES:

1. See Standard D-748-1 for curb and gutter isolation joint detail. On PCC roadways, match curb and gutter joints with pavement joints, as much as practical.
2. Joint Spacing: Use 1 center contraction joint on 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.

   Saw or groove contraction joints a minimum depth of 1/3 the depth of the concrete.

   Use isolatoin joints between separately poured concretes, or between old and new concrete.

   Seal joints with hot pour bituminous filler or low modulus silicone. Install and tool sealant according to manufacturer's recommendations.

   Include all costs for labor, equipment, and material to construct and seal joints in the price bid for the driveway.
3. Include all costs for gutter-Type 1 in the unit price bid for "Curb and Gutter-Type 1".
4. Use 6" driveway unless otherwise specified.
5. Place 4" base material under concrete driveway. Include all costs for labor and materials necessary to place the base material in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
6. Construct sidewalk behind a driveway to the same thickness as the driveway. The Engineer will measure it as driveway concrete.

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%

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

2-13-2014

REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.

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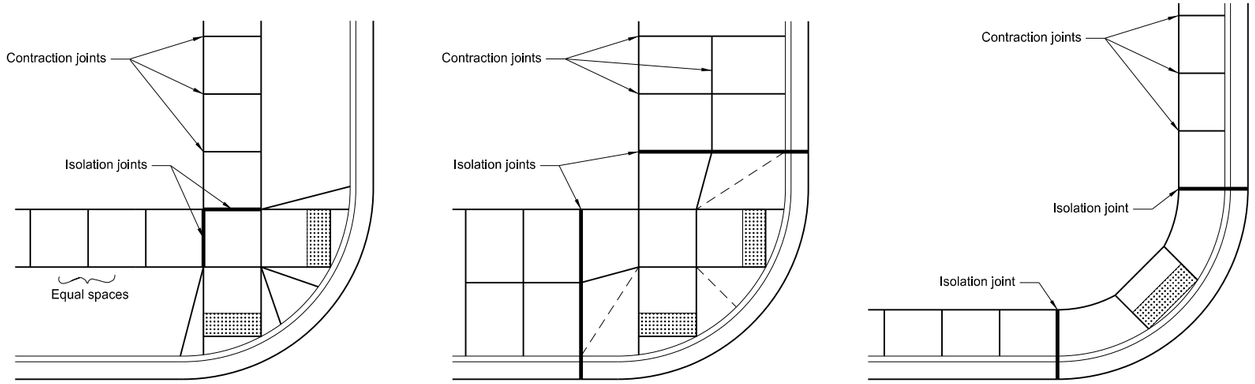
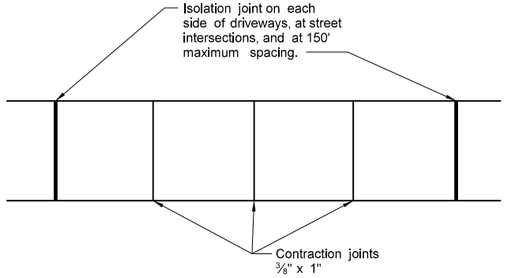
SIDEWALK

D-750-2



Typical Joint Layouts



NOTES:

1. Curb ramp and detectable warning panel layouts for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Vary transverse contraction joint spacing from 4' to 6' to create approximate square panels.

   Use longitudinal contraction joints when sidewalk width is 8' or greater, and space at half the sidewalk width.

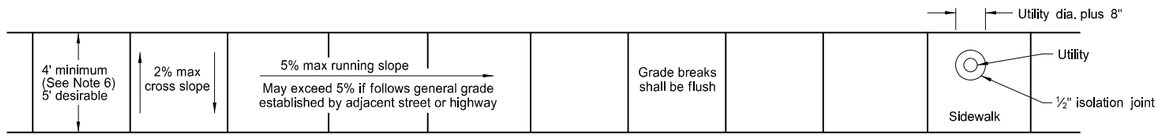
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

   Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
5. Use 4" base material thickness unless otherwise specified. Include all costs for labor and materials necessary to place the base material in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."

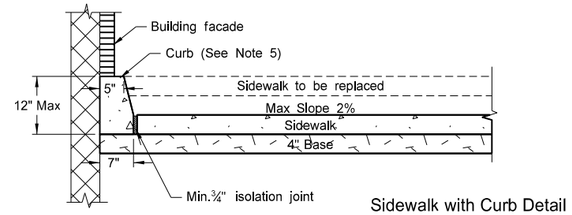
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear width pedestrian access route with max 2% concrete cross slope, excluding flares. The width of the curb cannot be counted as part of the pedestrian access route.

   When clear width of pedestrian access routes is less than 5.0', provide passing spaces at a maximum of 200' with a minimum size of 5.0' by 5.0'.

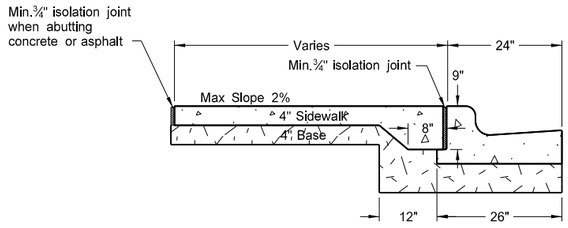


Sidewalk Width and Grade

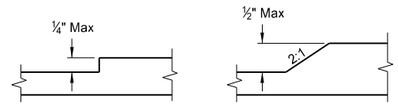
Utility Blockout



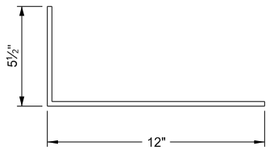
Sidewalk with Curb Detail
(Building face application)



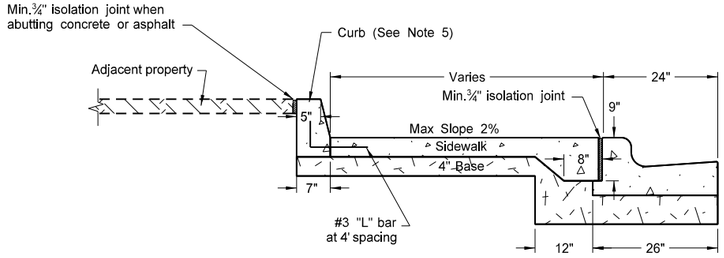
Sidewalk Detail
(Installed adjacent to curb and gutter)



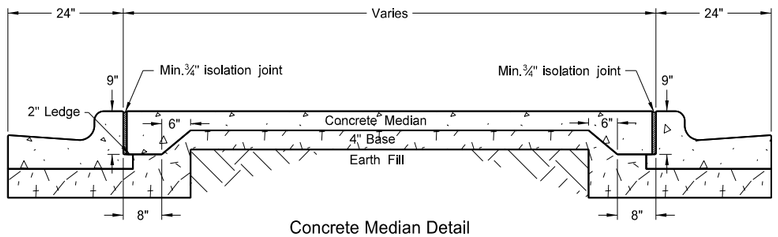
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



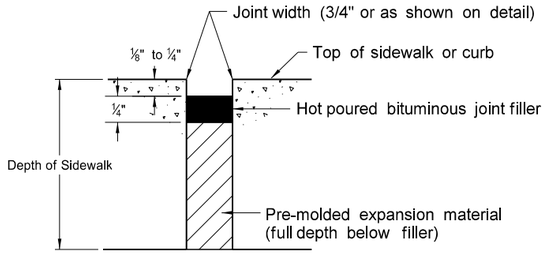
"L"Bar Detail
#3 Bar



Sidewalk with Curb Detail
(Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal
(longitudinal and transverse)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Added sidewalk details for width and grade and passing lane requirements.
08-27-19	New Design Engineer PE Stamp.

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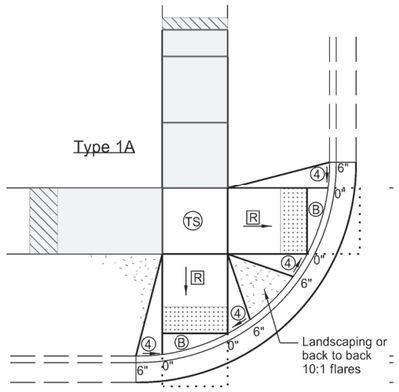
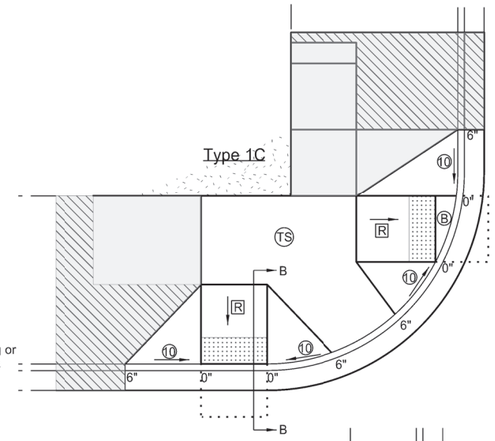
CURB RAMP RETROFIT DETAILS

D-750-3

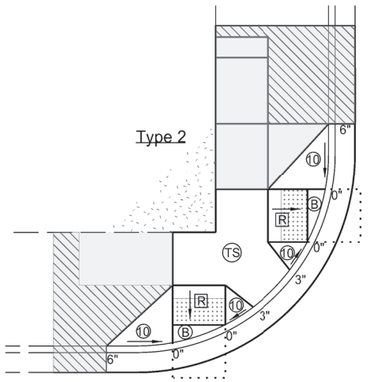
Type 1A



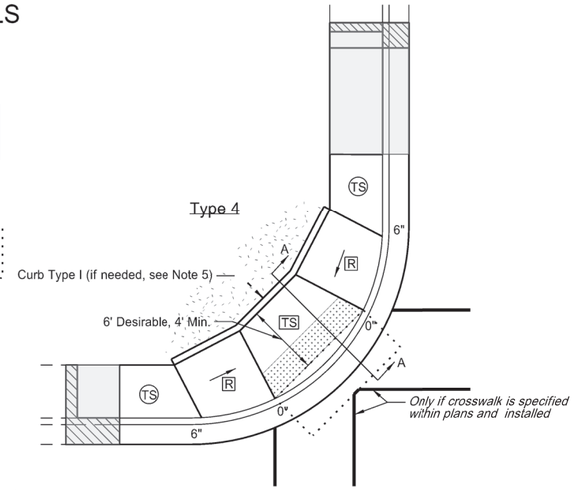
Type 1C



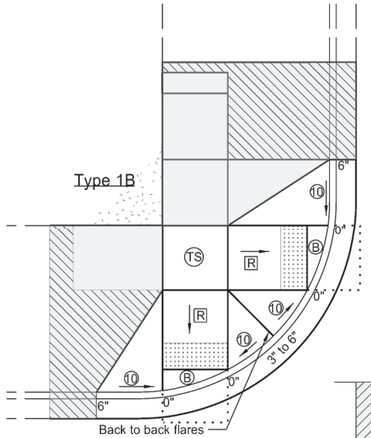
Type 2



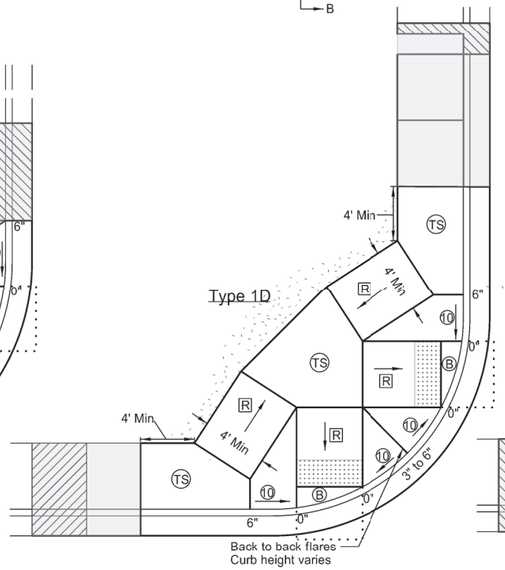
Type 4



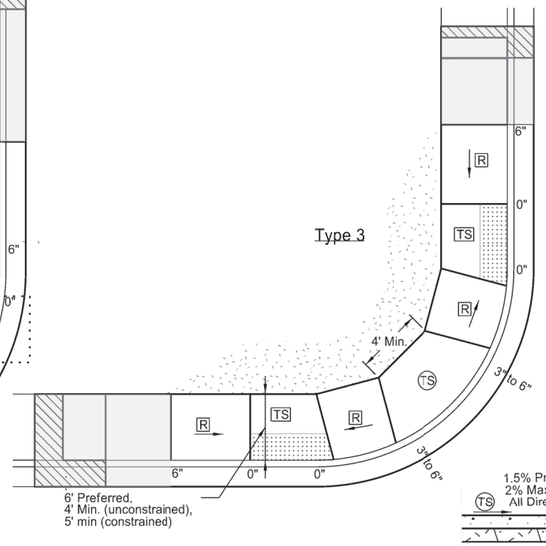
Type 1B



Type 1D



Type 3



5½"
12"
#3 "L" Bar

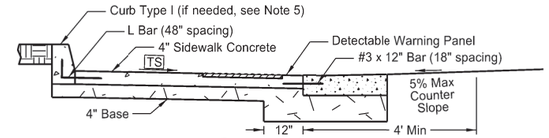
NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size or larger and minimum 4' x 4' unconstrained size, for any change of direction. Provide landing 5' long x width of path at the bottom and top of parallel ramps and at the top of perpendicular ramps. Turning spaces and Landings may overlap.
3. Match detectable warning panel width to ramp width. Radial panels are allowed. Place detectable warning panel within the lower turning space.
4. Provide a continuous 4' minimum width EPF with 1.5% preferred cross slope and max 2% constructed cross slope.
5. Modify existing ground slope with landscaping, as needed. If not possible, use a vertical curb as detailed on Standard D-750-2. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Islands: If the profile of the island curb ramp is 2% or less, provide a minimum distance of 2' between warning panels. If the profile of the island curb ramp is steeper than 2%, provide a turning space between the ramps.
7. Provide generally planar vertical alignments. Provide grade breaks, perpendicular to the direction of the pedestrian travel, at the top and bottom of curb ramps (1.5% preferred, 2% max constructed cross slope).
8. See Curb Ramp Retrofit Transition Details Standard D-750-4 for additional information. Also See PROWAG for full compliance in the curb ramp area.
9. Grade transitions shall be flush.

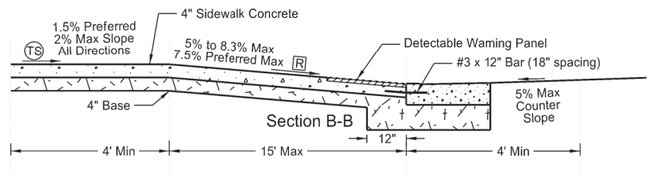
LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running and counter slope 5% maximum running and counter slope
- TS : Turning Space Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%.
- B : 1.5% preferred cross slope 2% maximum constructed cross slope running slope consistent with the EPF 4.7% preferred max counter slope 5.0% max constructed counter slope
- 10 : 10:1 maximum constructed slope.
- 4 : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

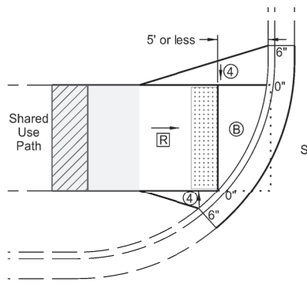


Section A-A



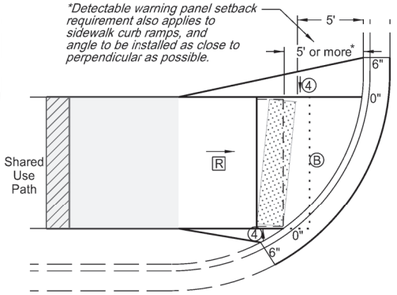
Section B-B

5' or less

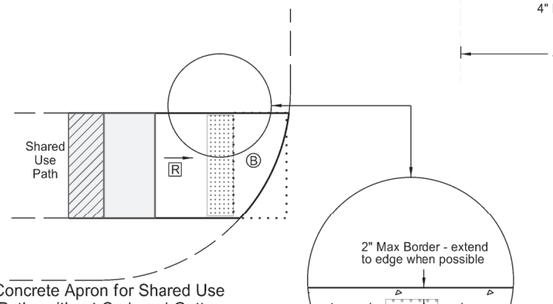


*Detectable warning panel setback requirement also applies to sidewalk curb ramps, and angle to be installed as close to perpendicular as possible.

5' or more*

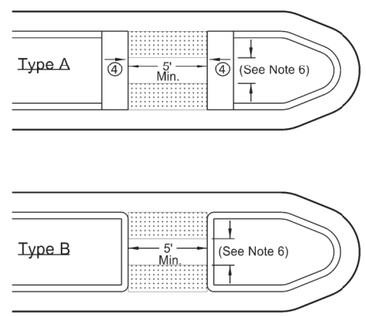


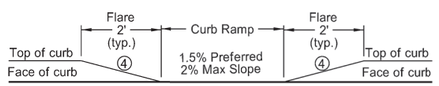
Concrete Apron for Shared Use Paths with Curb and Gutter



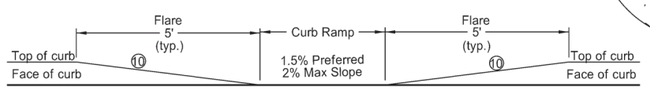
Concrete Apron for Shared Use Paths without Curb and Gutter

Median Refuge Islands (Cut-Through)





4:1 Flares
(To be used when flare is adjacent to landscaping)



10:1 Flares
(To be used when flare is adjacent to sidewalk)

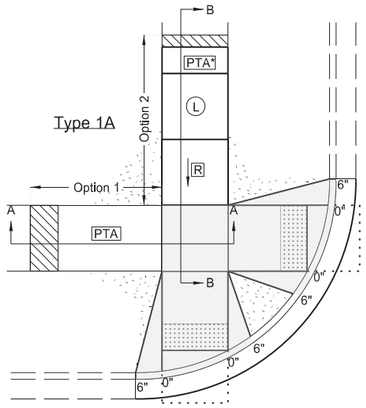
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

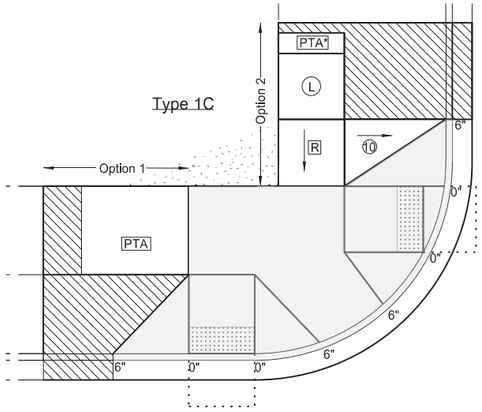
CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4

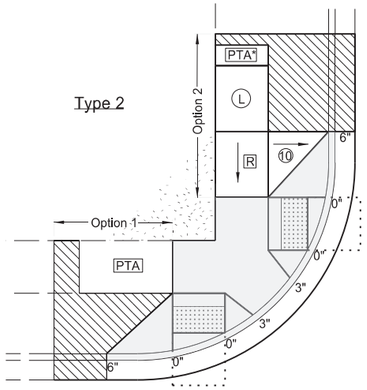
Type 1A



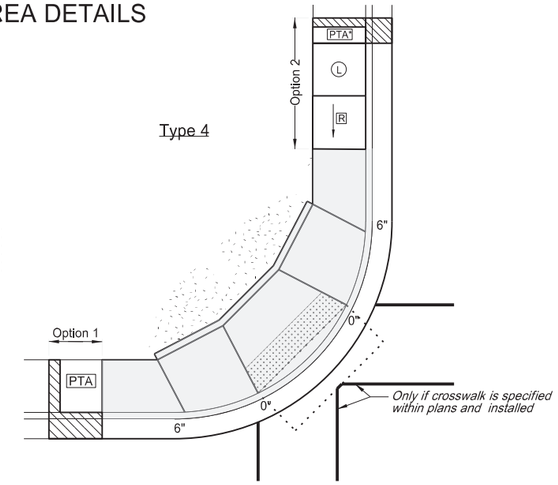
Type 1C



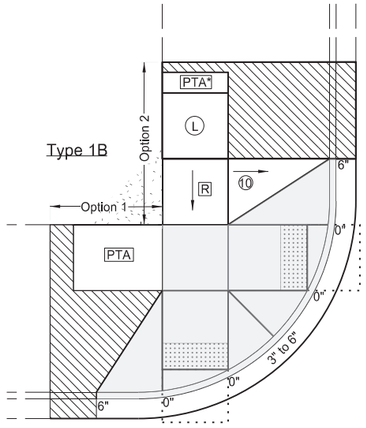
Type 2



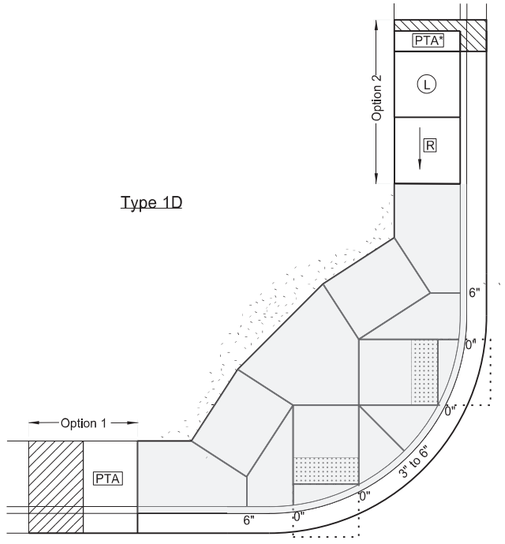
Type 4



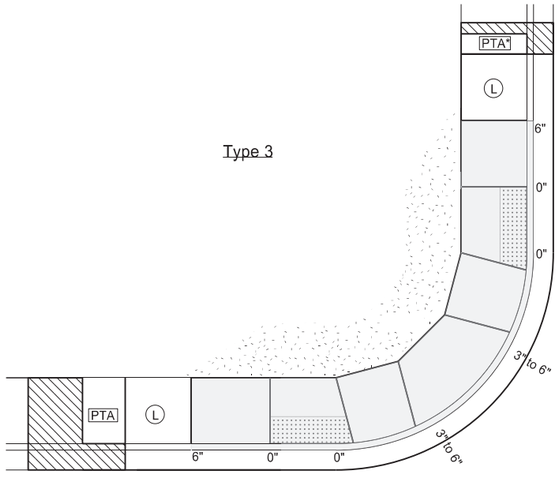
Type 1B

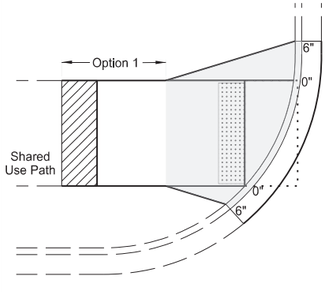


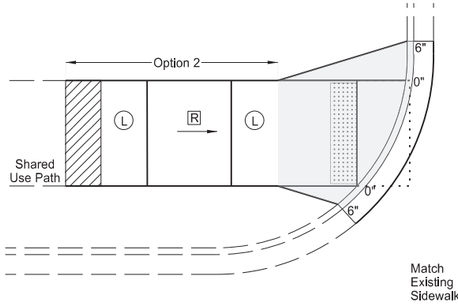
Type 1D



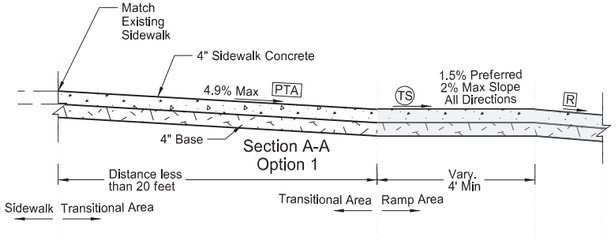
Type 3

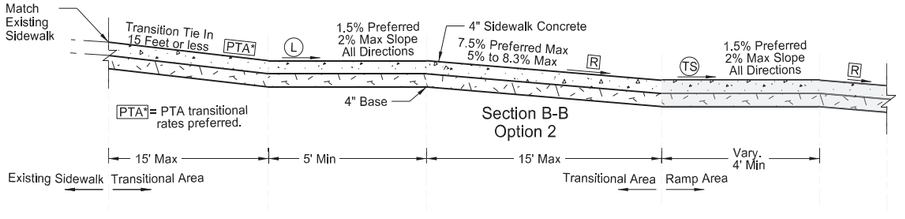






Transition Areas for Shared Use Paths





NOTES:

1. Curb Ramp Transitional Areas are to transition from the Curb Ramp area into the Existing Pedestrian Facility (EPF). Each layout shows example transitions. Use any combination for transitions from the Ramp Area into the EPF that allows for similar or gentler slopes to that of the existing condition, yet transitions in the shortest distance possible. In some cases, if grades allow, the Ramp area can immediately transition into the EPF and no transitional area is needed.
2. Option 1: Use this transition when existing running slope grades are less than 5%. Transition from the ramp area to the EPF using the Pedestrian Access Transition Area (PTA) transition rates and in less than 20 feet.
3. Option 2: Use this transition when existing running slopes are greater than 5% and option 1 is not able to be met.

   Add a ramp and a landing immediately after the ramp area. Then transition from the compliant landing into the EPF using the PTA rates (preferred), or in less than 15 feet (which ever is shorter).
4. Transitional Areas for Shared Use Paths can be concrete or asphalt.
5. See Curb Ramp Retrofit Details Standard D-750-3 for additional information.

LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running slope 5% maximum running slope
- PTA : Pedestrian Access Transition Area Running Slope less than 4.9%. Transition Cross Section at 1/2 percent per foot from the from Ramp Area to EPF.
- (L) (TS) : Turning Space/Landing Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R :Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2% Maximum Length = 15 feet
- (10) : 10:1 maximum constructed slope.
- (4) : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-19-21	
REVISIONS	
DATE	CHANGE

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05 19 2021

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

Notes:

1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.

2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.

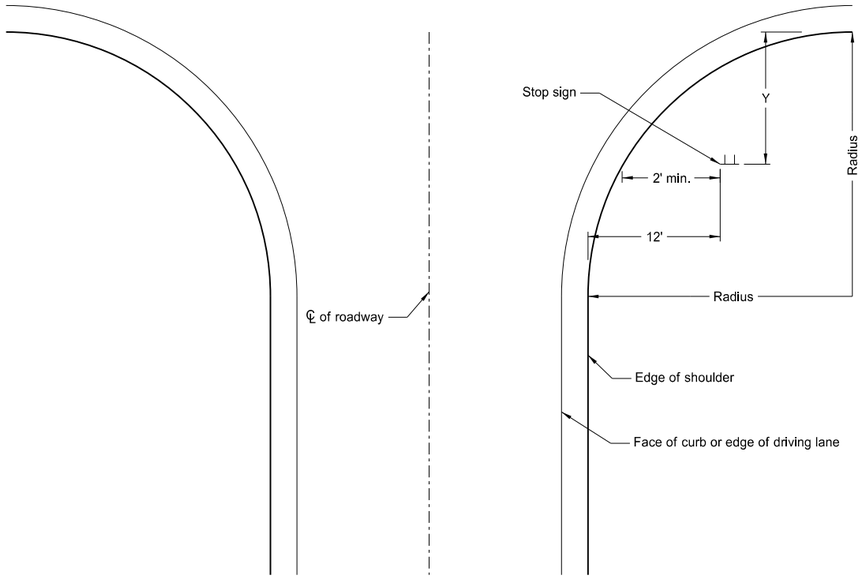
   Install signs on expressways a minimum height of 7'.

   Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.

   Maximum vertical clearance is 6" greater than the minimum vertical clearance.

3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.

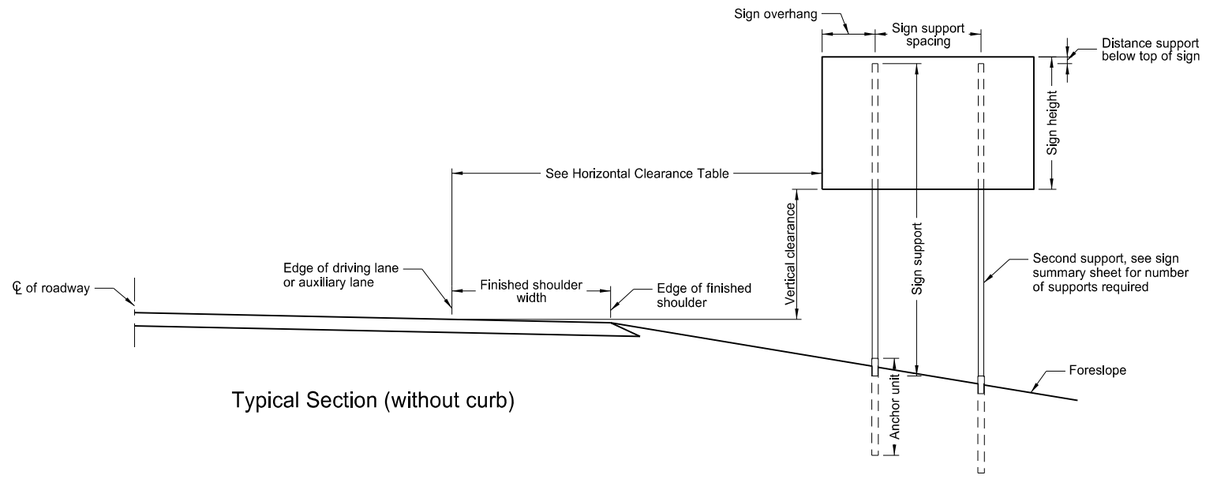
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.



Stop Sign Location
Wide Throat Intersection

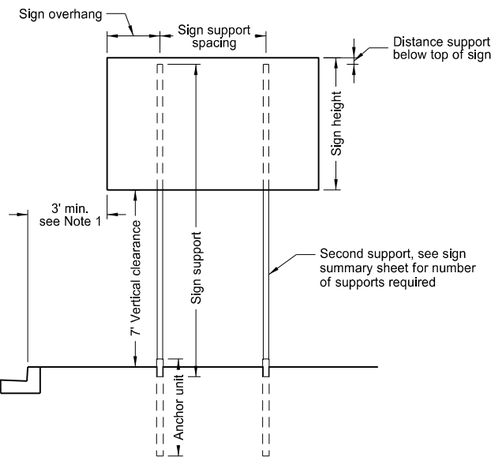
Use layout for the placement of "Stop" signs.

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



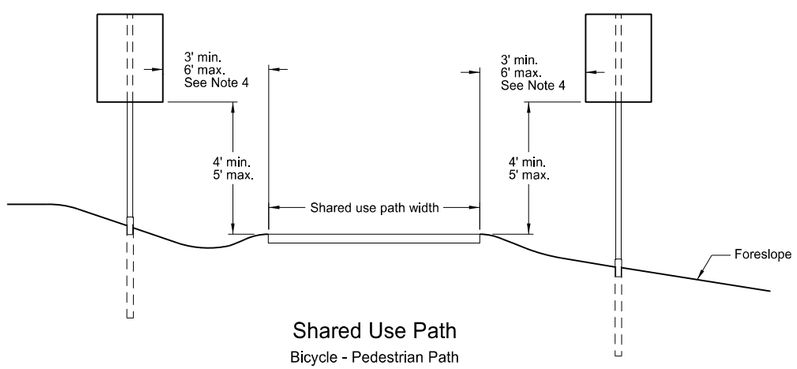
Typical Section (without curb)

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



Shared Use Path

Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.
8-30-18	Updated notes to active voice.
8-29-19	New Design Engineer PE Stamp.

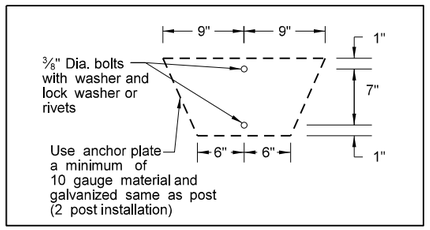
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/29/19 and the original document is stored at the North Dakota Department of Transportation

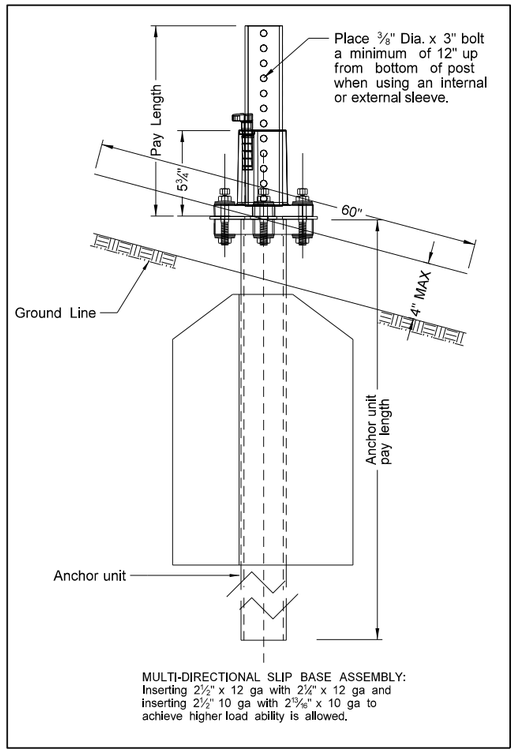
Mounting Details Perforated Tube

D-754-24

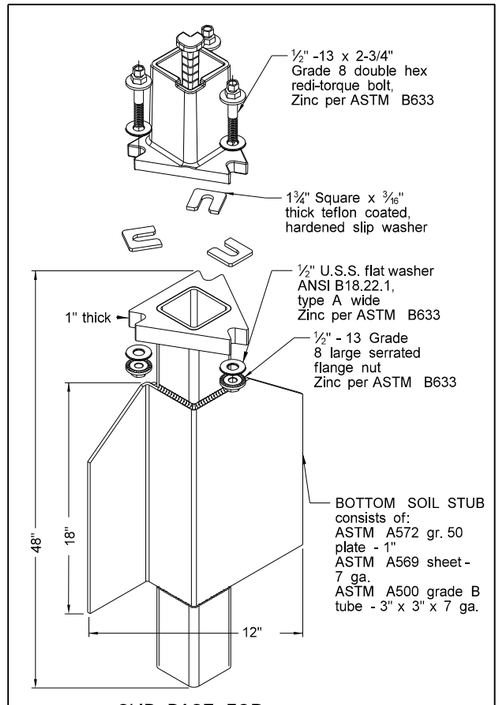
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2⅜16	10	Yes		7

(B) - Provide a shim as specified by the manufacturer when placing 2½", 12 gauge posts in standard soils without breakaway bases. Provide breakaway base when placing the support in weak soils. The Engineer will determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

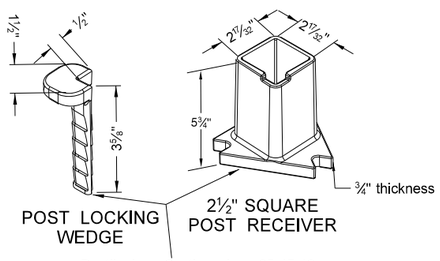




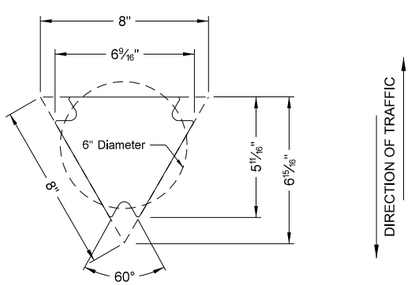
MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:
Inserting 2½" x 12 ga with 2¼" x 12 ga and inserting 2½" 10 ga with 2⅜16" x 10 ga to achieve higher load ability is allowed.



SLIP BASE FOR 2½" POST



Ductile Iron Casting class 65-45-12.
Hot Dip Galvanize ASTM A153



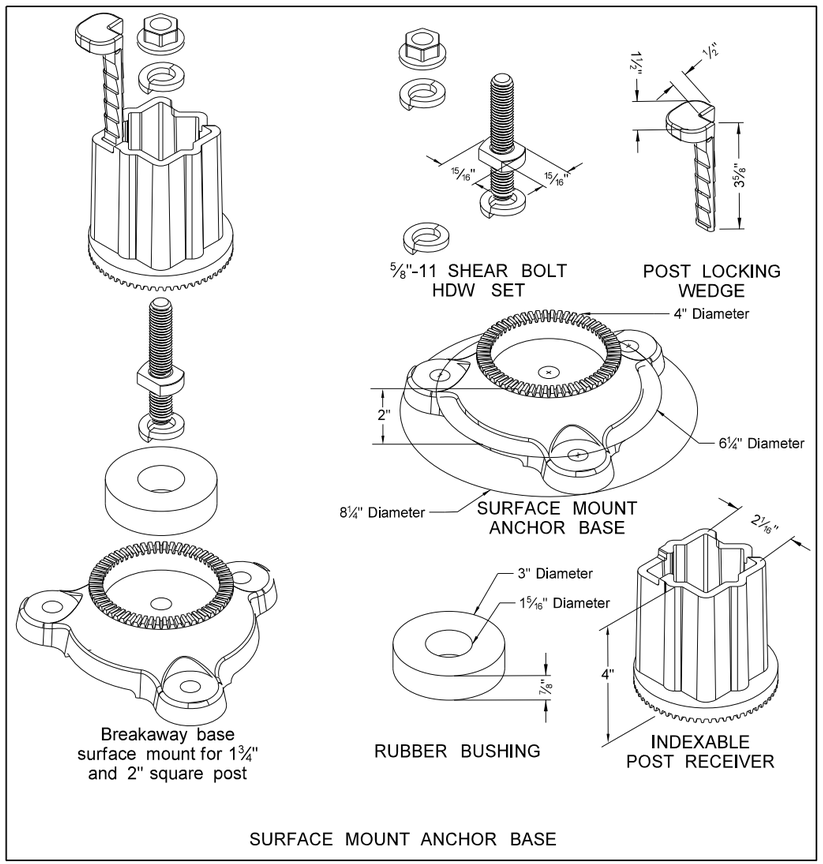
SLIP BASE DETAIL

Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.⁴	Cross Sect. Area In.²	Section Modulud In.³
1½ x 1½	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
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2⅜16 x 2⅜16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 ⅜16" size 10 gauge is shown as 2.19" size on the plans;
The 2½" size is shown as 2.51" size on the plans.

NOTE:

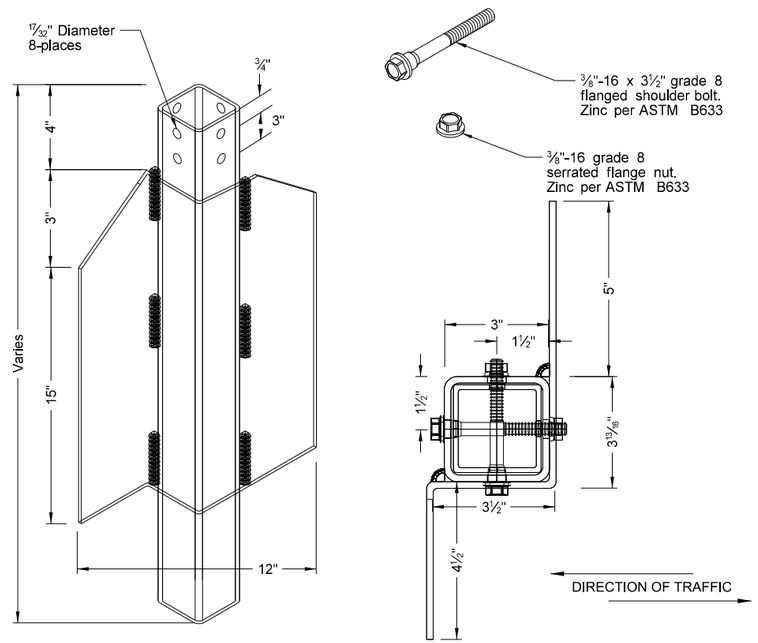
1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Provide 7 guage HRPO commmercial quality ASTM A569 and 3" x 3" x 7" guage ASTM A500 grade B anchor material with 43.9 KSI yield strength and 59.3 KSI tensile strength. Hot dip galvanize anchor per ASTM A123/153. Tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless ortherwise noted.
3. Eliminate wings when anchor is used in concrete sidewalk.
4. Provide a minimum 8' distance between the first and fourth post on four post signs.
5. Install in accordance with manufacturers recommendation.
6. Use a minimum ½" diameter x 4" grade 8 concrete fastener for surface mount breakaway base.



SURFACE MOUNT ANCHOR BASE

SHOULDER BOLT

Shimming agent to reduce tolerance between 3" anchor unit and 2½" post.
(use standard ⅜" diameter grade 8 bolt with proper shim)



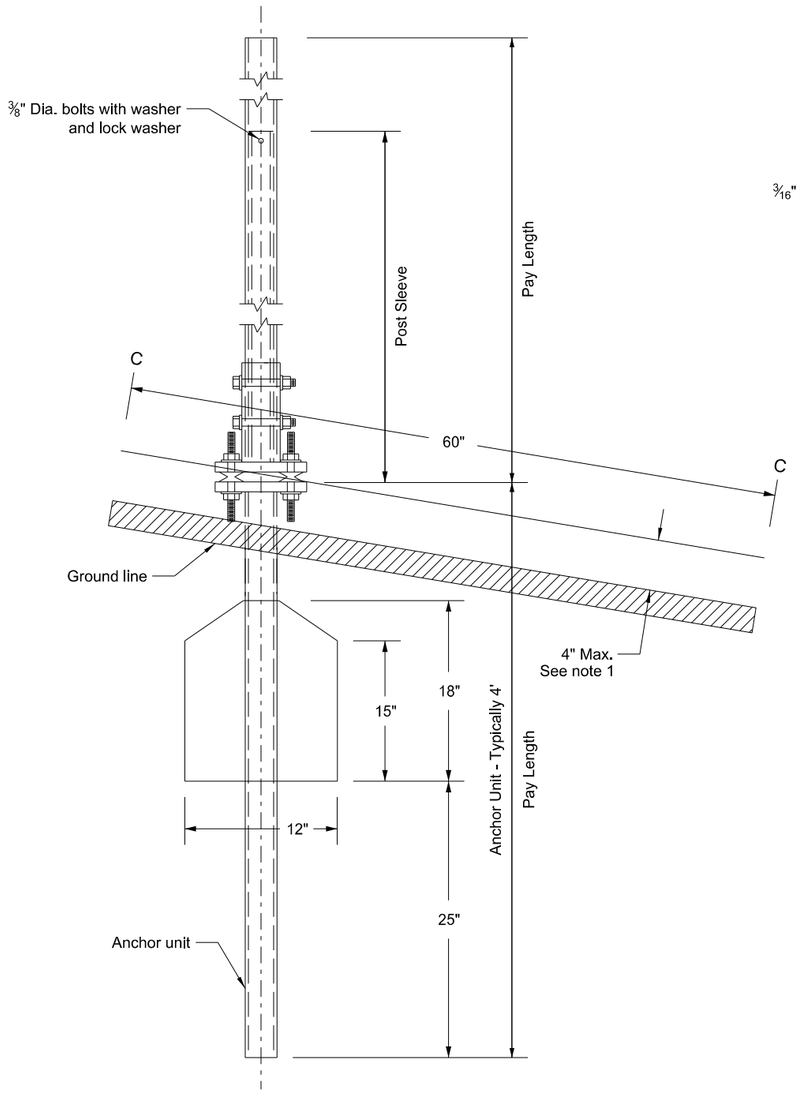
3" ANCHOR UNIT

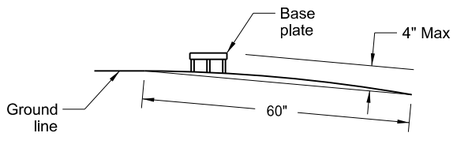
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice & corrected max height of base.
8-29-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683 on 8/29/19 and the original document is stored at the North Dakota Department of Transportation

Breakaway Coupler System for Perforated Tubes

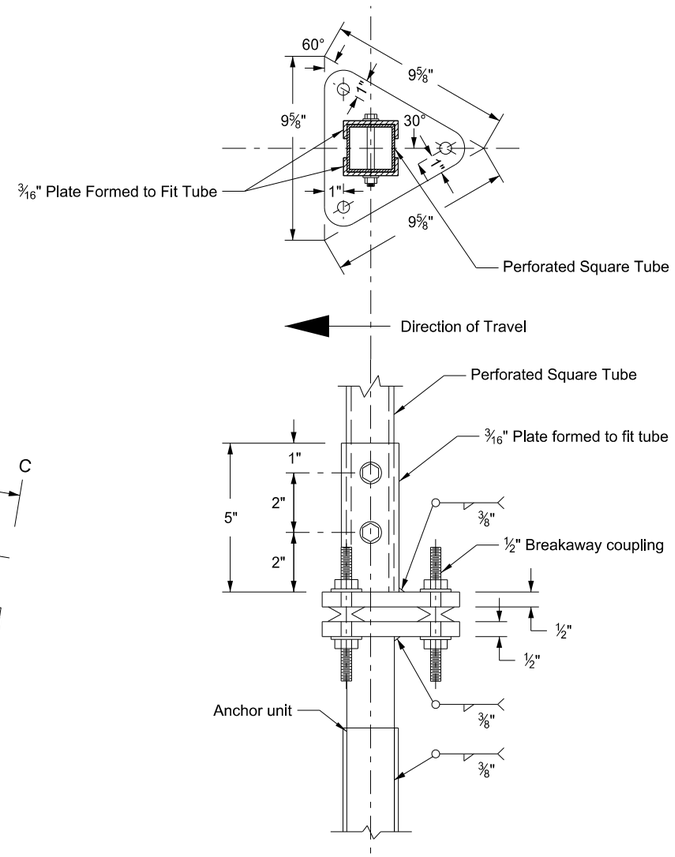
D-754-24A





Section C-C

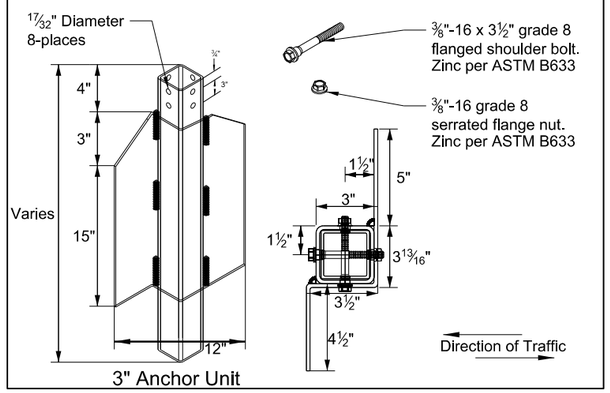
Max protection of the stub post is 4" above a 60" chord aligned radially to the center line of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point in the ground surface on the other side.



Base Plate with Breakaway Coupler

Shoulder Bolt

Shimming agent to reduce tolerance between 3" anchor unit with 2½" post. (use of standard ⅜" diameter grade 8 bolt allowed with proper shim)



3" Anchor Unit

Notes:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Use anchor unit of the same size and specification as the post.
3. Provide a minimum 8' distance between the first and fourth post on four post signs.
4. Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

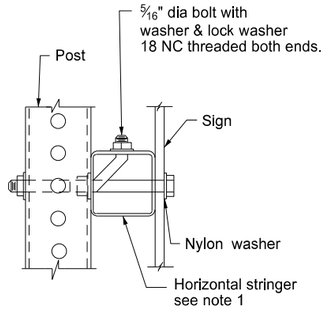
(C) - 3" anchor unit

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-2013	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engr PE Stamp.

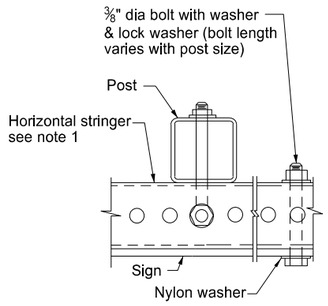
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/30/19 and the original document is stored at the North Dakota Department of Transportation

Mounting Details Perforated Tube

D-754-25

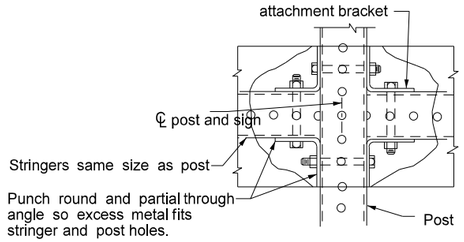


Side View



Top View

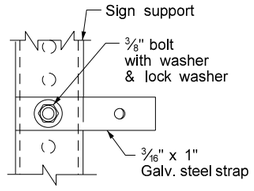
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



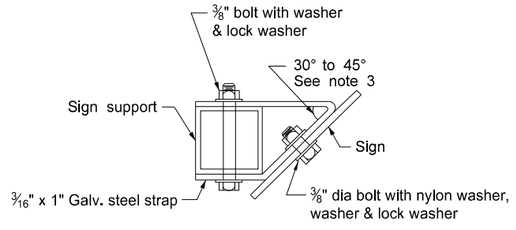
STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING

Note:

1. Horizontal stringers - Use perforated tubes or 1¾" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
2. Use minimum outside diameter 15/16" ±1/16" and 10 gauge thick metal washers on sign face.
3. Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
4. Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

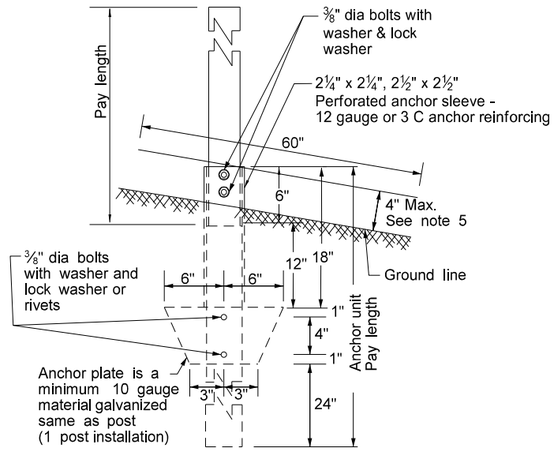


Side View



Top View

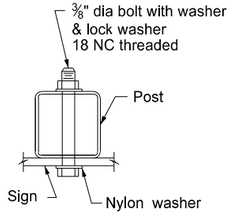
STRAP DETAIL



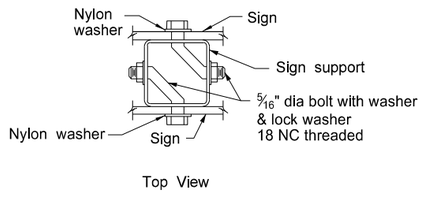
ANCHOR UNIT AND POST ASSEMBLY

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - When placing 2½", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

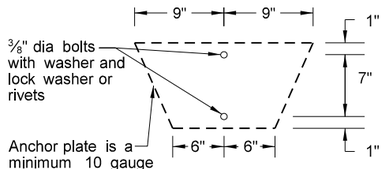


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



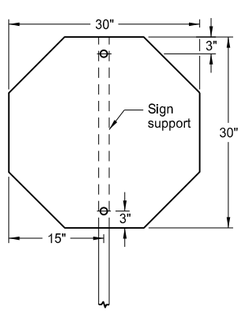
Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.4	Cross Sect. area In.2	Section Modulus In.3
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.
The 2½" size is shown as 2.51" size on the plans.

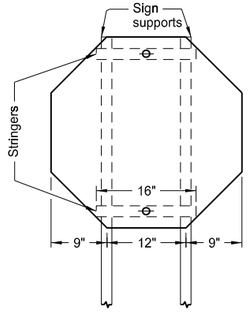
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE
7-8-14	Revised Note 3.
8-30-18	Updated notes to active voice.
8-30-19	New Design Engr PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683 , on 8/30/19 and the original document is stored at the North Dakota Department of Transportation

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

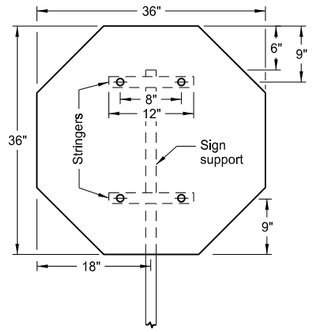


1 Post



2 Posts

Assembly No. 1



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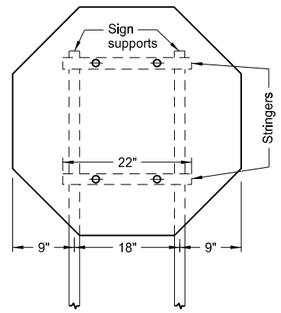
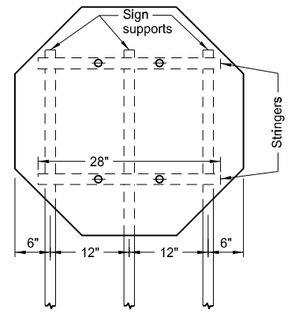


2 Posts

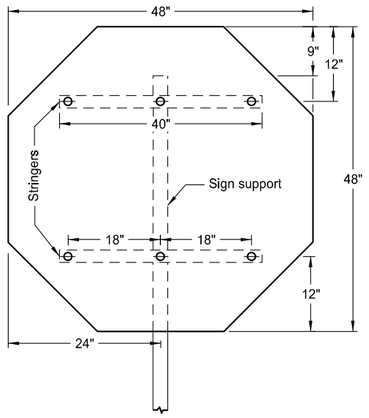


3 Posts

Assembly No. 2

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



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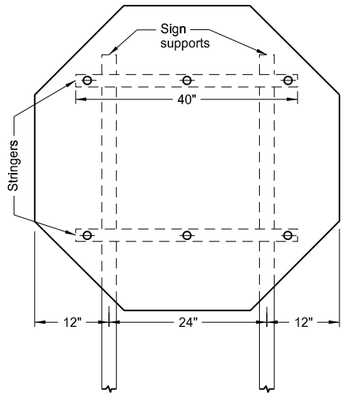
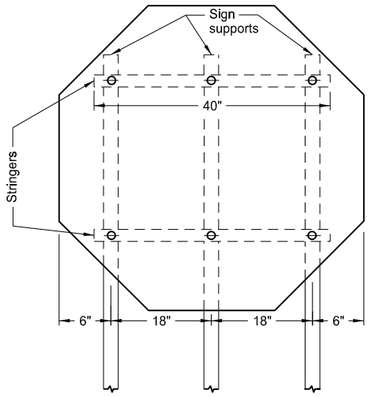
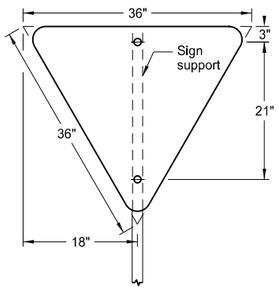


2 Posts

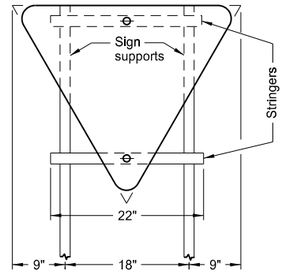


3 Posts

Assembly No. 3

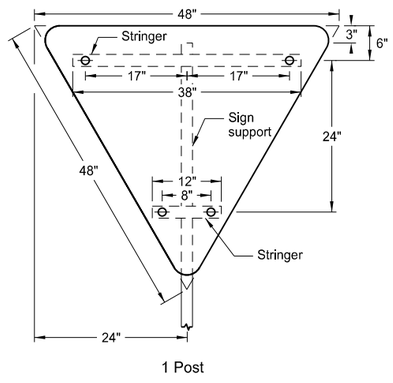


1 Post

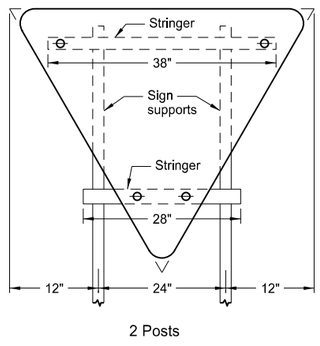


2 Posts

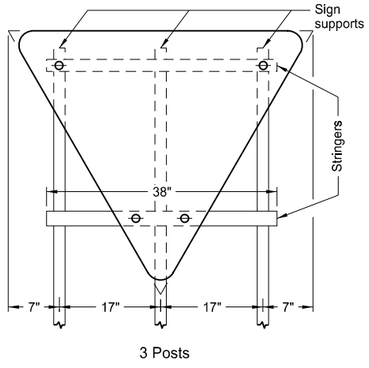
Assembly No. 4



1 Post



2 Posts



3 Posts

Assembly No. 5

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18 8-30-19	Updated notes to active voice. New Design Engineer PE Stamp.

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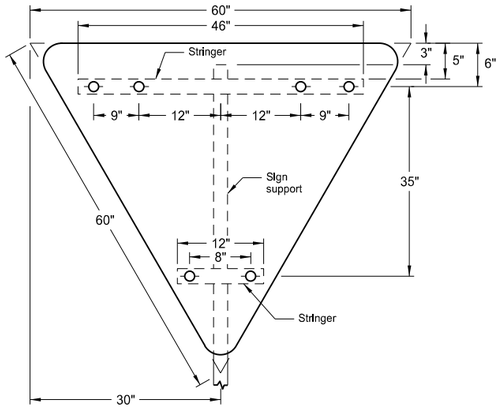
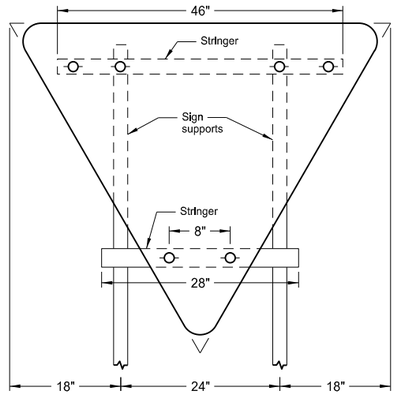
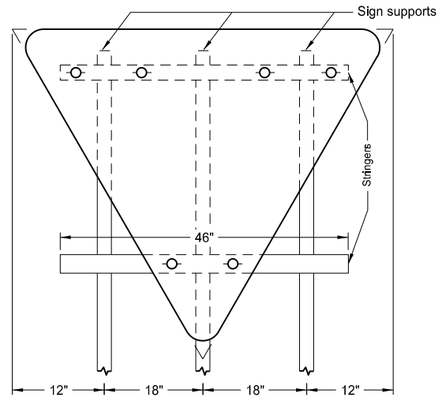
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post



2 Posts

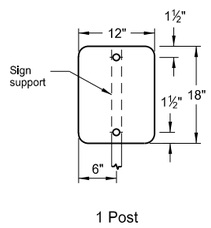


3 Posts

Assembly No. 6

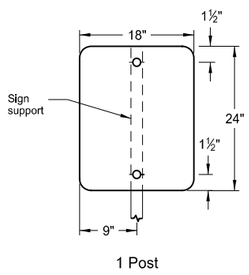
Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



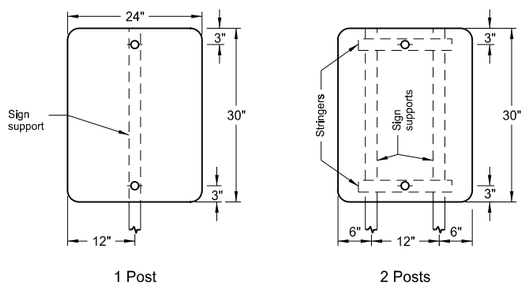
1 Post

Assembly No. 7



1 Post

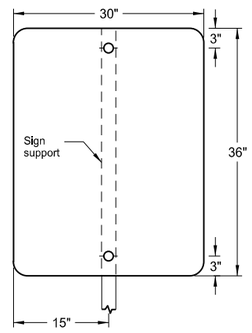
Assembly No. 8



1 Post

2 Posts

Assembly No. 9



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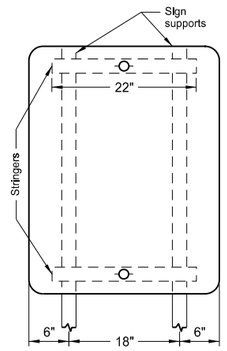
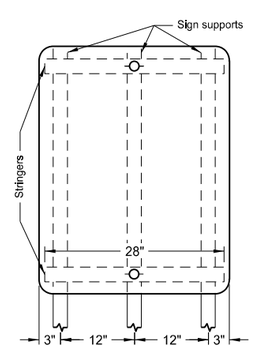
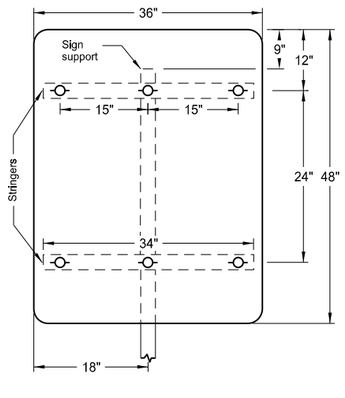


2 Posts

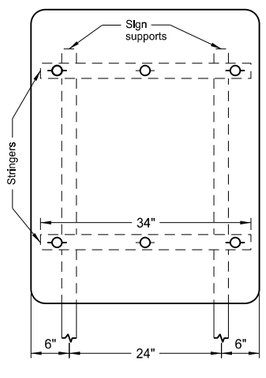


3 Posts

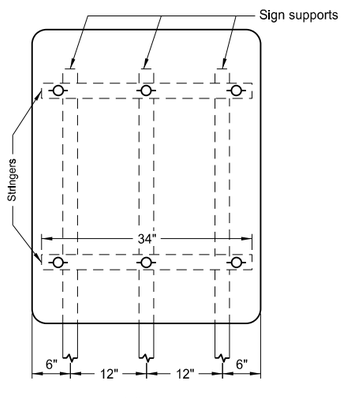
Assembly No. 10



1 Post



2 Posts



3 Posts

Assembly No. 11

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18 8-30-19	Updated notes to active voice. New Design Engineer PE Stamp.

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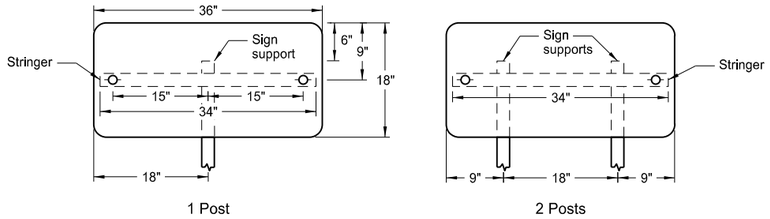
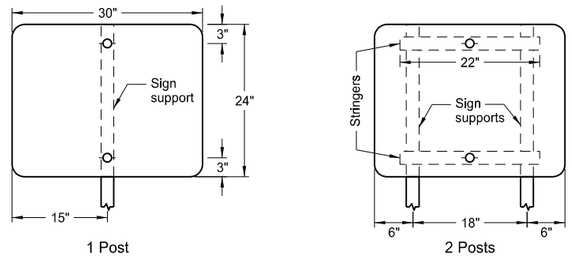
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post 2 Posts

Assembly No. 31

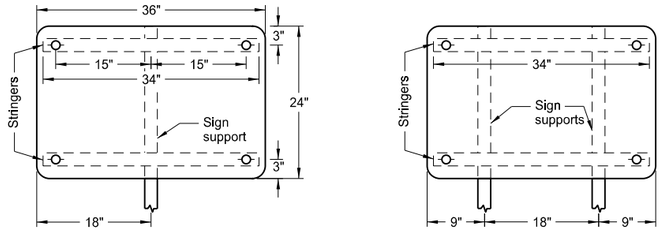


1 Post 2 Posts

Assembly No. 32

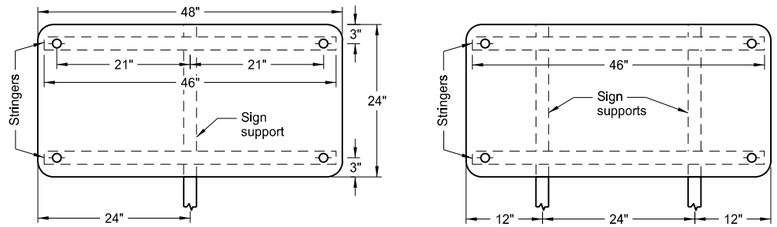
Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



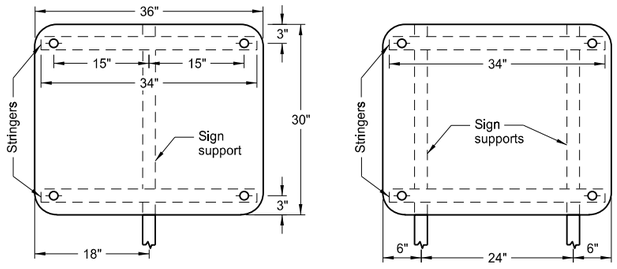
1 Post 2 Posts

Assembly No. 33



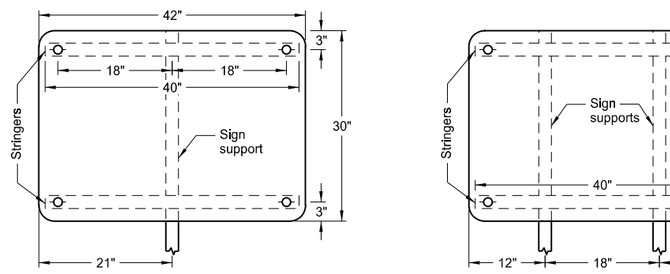
1 Post 2 Posts 3 Posts

Assembly No. 34



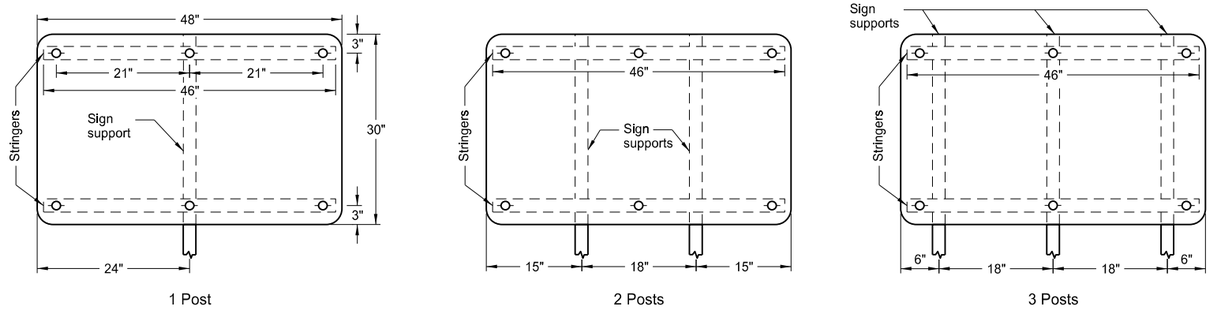
1 Post 2 Posts 3 Posts

Assembly No. 35



1 Post 2 Posts 3 Posts

Assembly No. 36



1 Post 2 Posts 3 Posts

Assembly No. 37

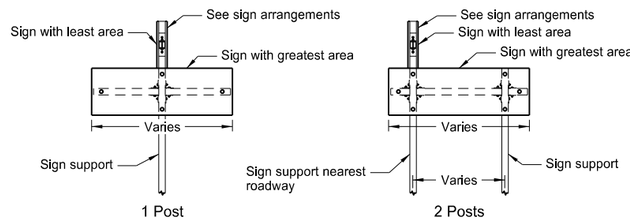
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/30/19 and the original document is stored at the North Dakota Department of Transportation

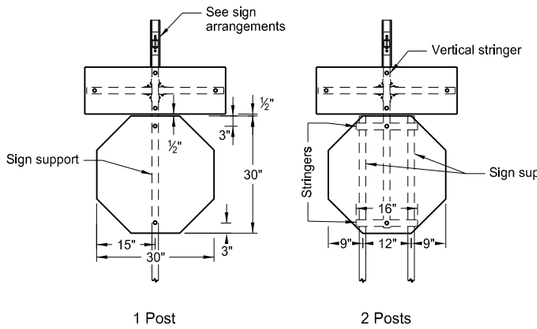
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR STREET NAME SIGNS AND 911 SIGNS

D-754-87

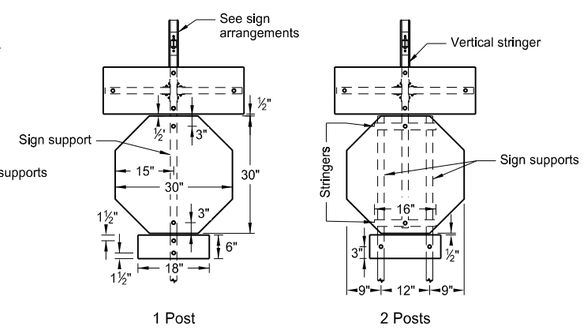
A - Single sign
B - Single sign back to back
C - Single sign each direction
D - Single sign one direction, back to back other direction
E - Back to back both directions



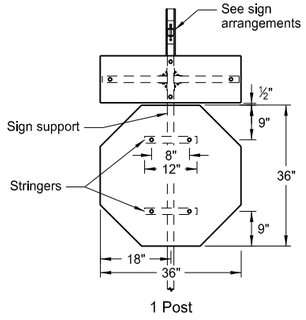
Special Assembly 1 (A, B, C, D or E)



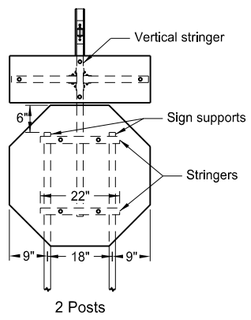
Special Assembly 2 (A, B, C, D or E)



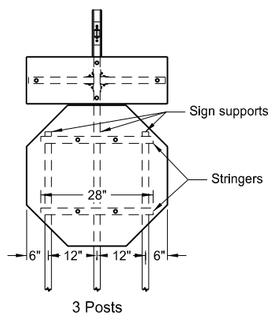
Special Assembly 3 (A, B, C, D or E)



1 Post

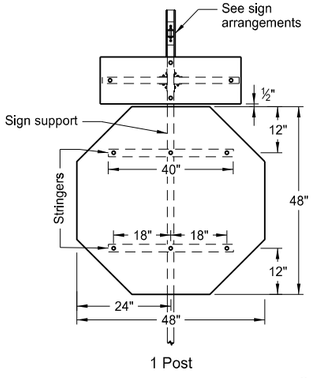


2 Posts

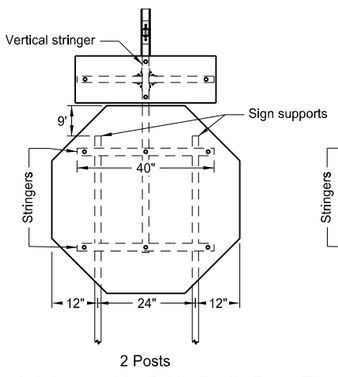


3 Posts

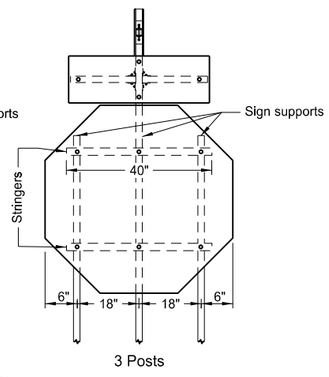
Special Assembly 4 (A, B, C, D or E)



1 Post

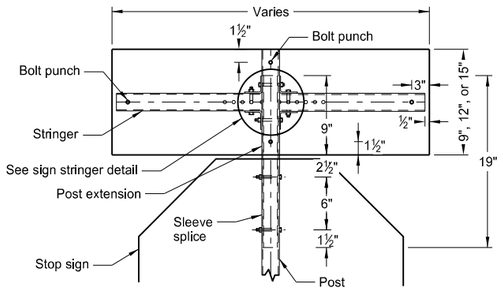


2 Posts



3 Posts

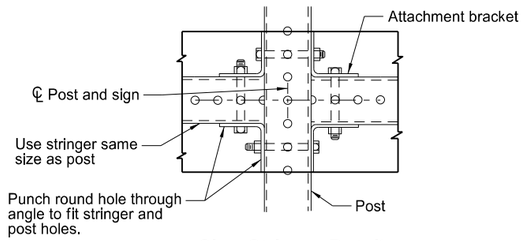
Special Assembly 5 (A, B, C, D or E)



Front View

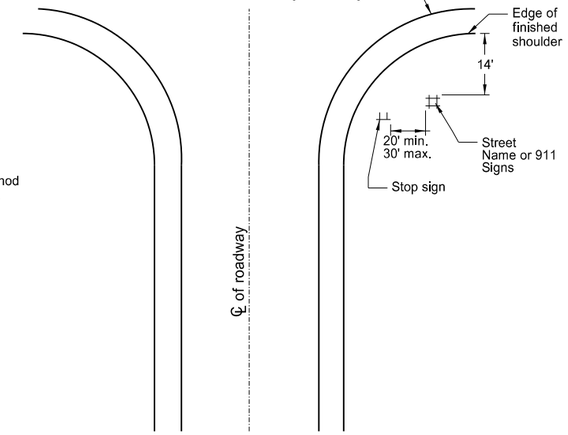
Sleeve Splice Detail

Note: Only use splice method with approval of engineer.



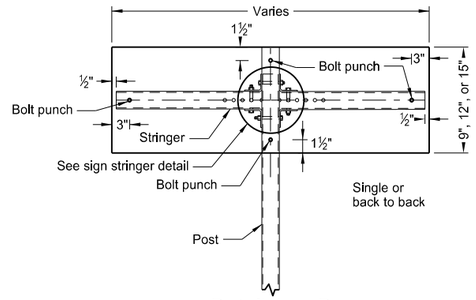
Sign Stringer Detail

Note: See Standard Drawing D-754-86 for 911 support information and sign layout details.

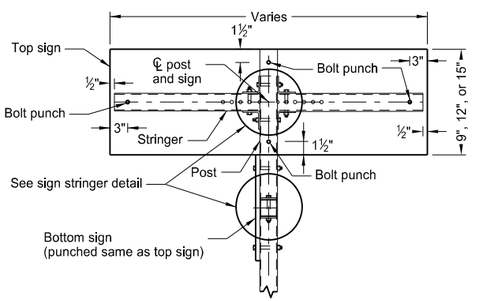


Intersection Layout

Note: Use layout for street name signs or 911 signs with Special Assembly 1 .

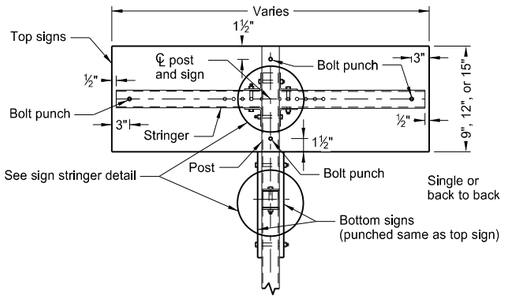


Detail A or B



Detail C

Sign Arrangements

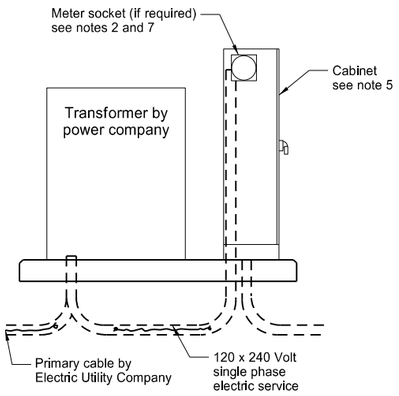


Detail D or E

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
8-30-18	Added 2 post layout for SA1 and Updated notes to active voice.
9-05-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 9/05/19 and the original document is stored at the North Dakota Department of Transportation

FEED POINTS
(ROADWAY LIGHTING)



Elevation

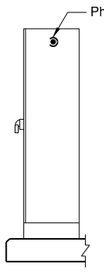
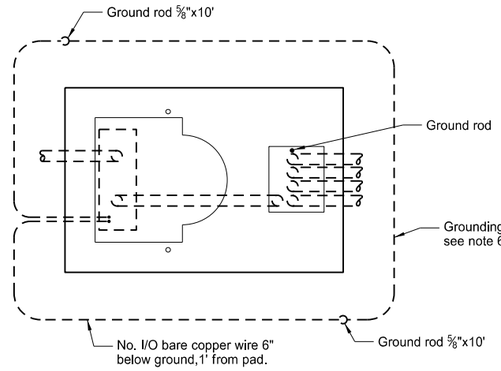
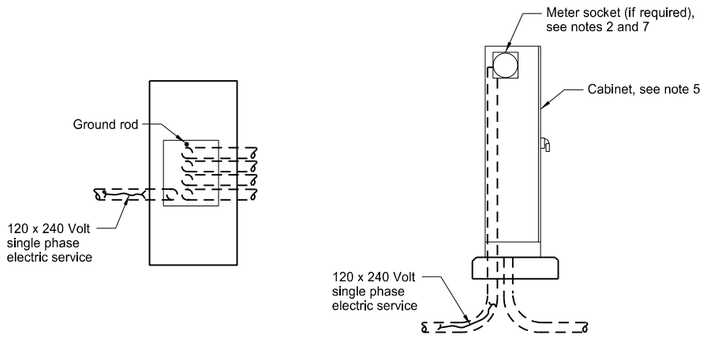


Photo Cell
Mounting Detail



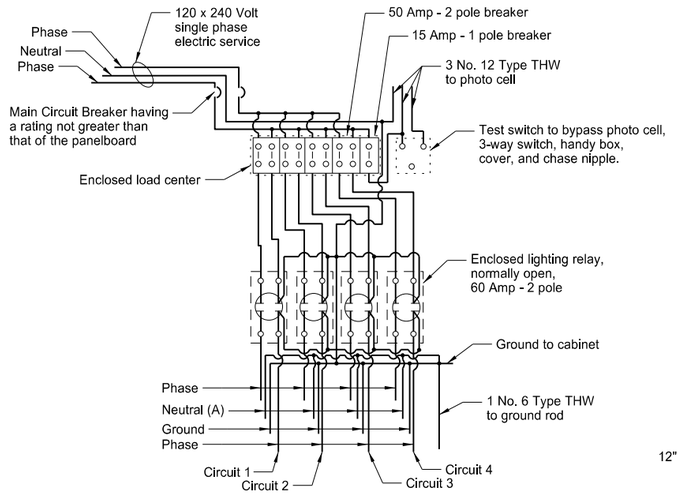
Plan

Transformer and Feed Point Cabinet Pad Mounted



Plan Elevation

Feed Point Cabinet Pad Mounted



Feed Point Type IV

Provide Type I feed point similar to Type IV, except with one electrical circuit, one 50 Amp - 2 pole breakers, and one lighting relay, normally open.

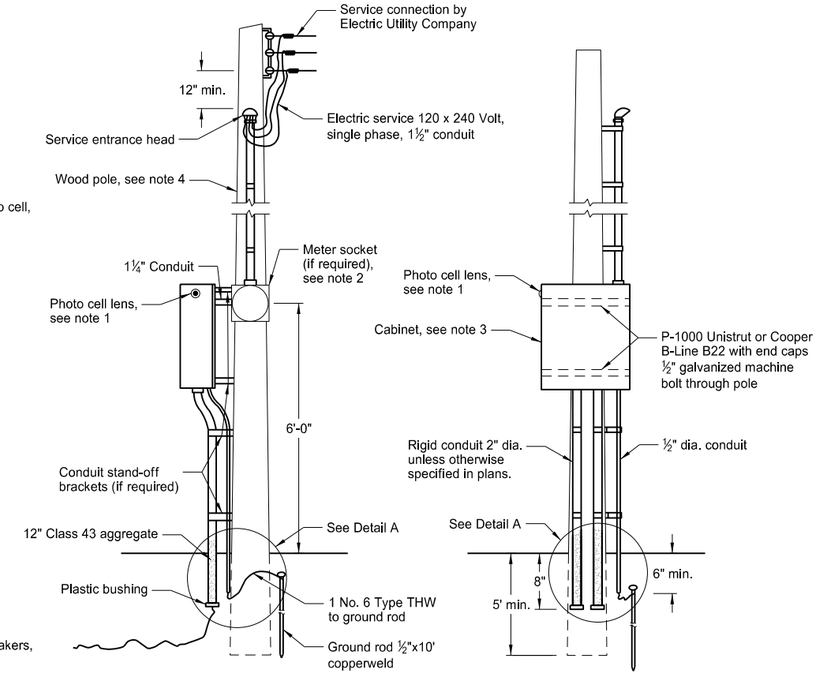
Provide Type II feed point similar to Type IV, except with two electrical circuit, two 50 Amp - 2 pole breakers, and two lighting relays, normally open.

Provide Type III feed point similar to Type IV, except with three electrical circuits, three 50 Amp - 2 pole breakers, and three lighting relays, normally open.

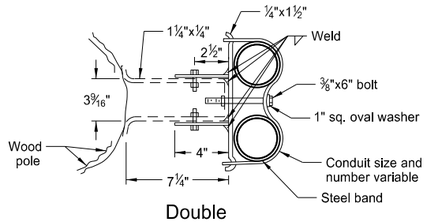
(A) Install when festoon circuit is required.

Detail A

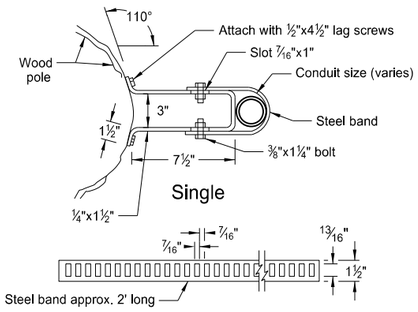
Use this detail for a continuous run of conduit from the feed point to the first light standard.



Feed Point Pole Mounted



Double



Single

Conduit Standoff Bracket

Omission of conduit standoff brackets allowed when not required by local utility company.

Notes:

1. Photo Cell: Furnish and install the photoelectric cell. Face photo lens north.
2. Meter Socket: Install meter socket and trim if the meter is required by local Utility Company. Meter furnished and installed by Utility Company.
3. Pole Mounted Cabinet: Provide cabinet with lock drip shield, factory installed steel backing, stainless steel hardware, and side hinge door. Shop coat cabinet with one coat of primer and two coats of exterior gray enamel.

   Provide 30" high x 24" wide x 8" deep Type I and II feed points. Provide 30" high x 42" wide x 10" deep or 36" high x 36" wide x 10" deep Type III and IV feed points.
4. Wood Pole: Provide minimum 20' Class VII full length penta pressure treated wood pole. (if required, see layout sheets)
5. Pad Mounted Cabinet: Provide 56" high x 26" wide x 14" deep weatherproof cabinet. Minimum 12 gauge steel or aluminum with provisions for padlock. Provide steel cabinet with one coat of primer and two coats of exterior dark green enamel.
6. Grounding Grid: Provide grounding grid with a maximum ground resistance of 25 ohms, using one or more ⅝"x10' copperweld ground rods in parallel or series at two corners. Provide a minimum distance between ground unit assemblies of 6'0".
7. Meter Location: Do not mount the meter (if required) on the same side of the cabinet as the photo cell.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
7-8-14 10-17-17 8-28-19	Revised note 3. Updated to active volce. New Design Engineer PE Stamp.

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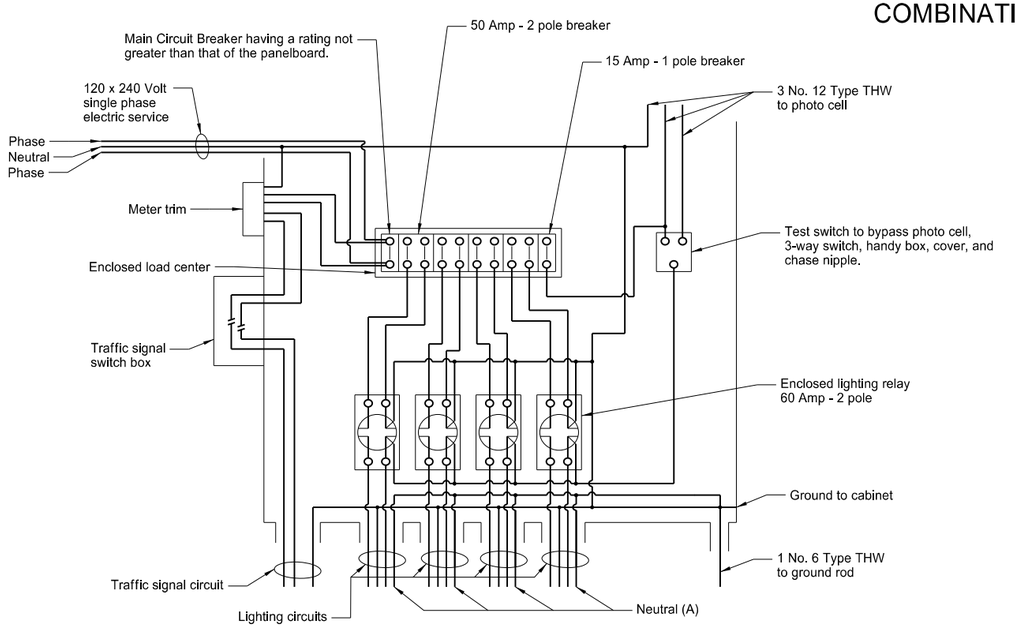
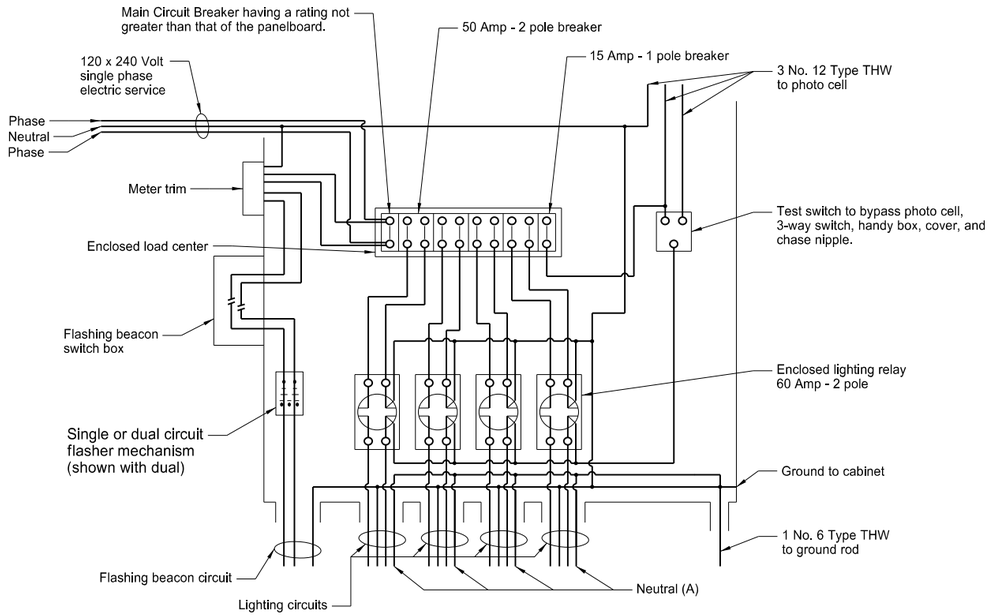
COMBINATION FEED POINT DETAILS

D-770-2A



Combination Lighting and Signal
Feed Point Type IV



Combination Lighting and Flashing Beacon
Feed Point Type IV

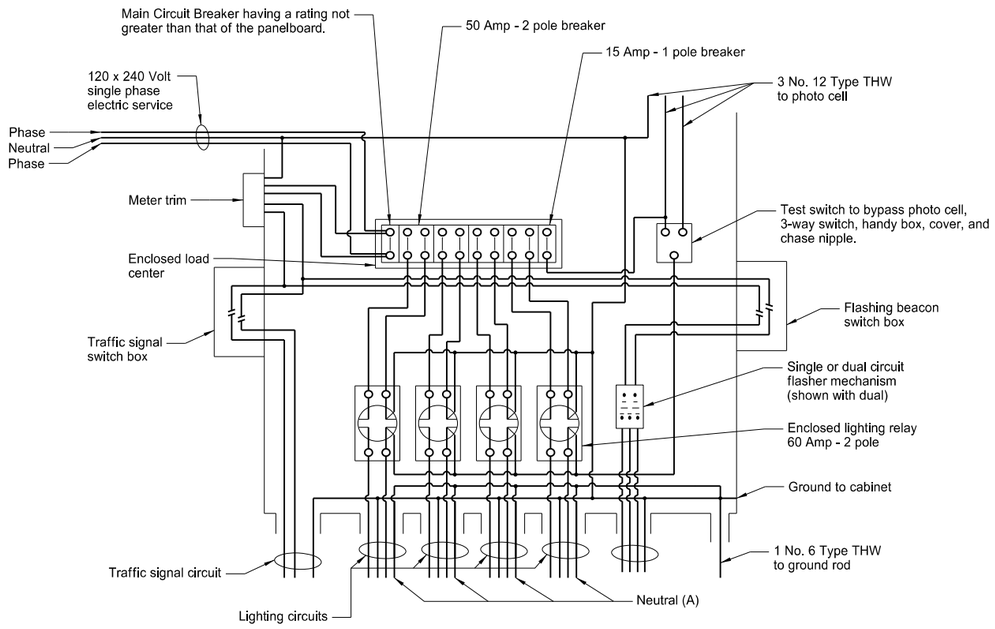
Notes:

Install Type I feed point similar to Type IV, except with one electrical circuit, one 50 Amp - 2 pole breaker, and one lighting relay, normally open.

Install Type II feed point similar to Type IV, except with two electrical circuits, two 50 Amp - 2 pole breakers, and two lighting relays, normally open.

Install Type III feed point similar to Type IV, except with three electrical circuits, three 50 Amp - 2 pole breakers, and three lighting relays, normally open.

(A) Install when festoon circuits are required



Combination Lighting, Signal, and Flashing Beacon
Feed Point Type IV

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
10-17-17 8-28-19	Updated to active voice. New Design Engineer PE Stamp.

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