Docusign Envelope ID: BDE570EE-6EA1-4B50-85EF-DE9CAAECA098

DESIGN DATA				
Traffic	Average Daily			
Current: 2023	Pass: 23,800	Trucks: 350	Total: 24,150	
Forecast: 2045	Pass: 33,000	Trucks: 485	Total: 33,485	
Preventive Maintenance				
Bridges: #0002-145.343				

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NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

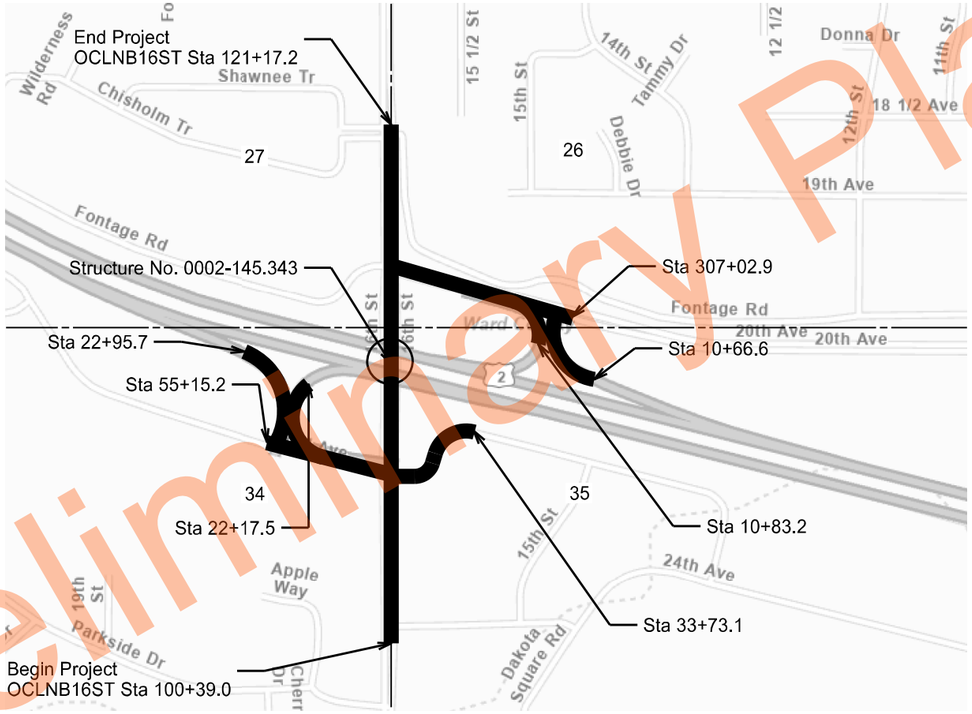
SU-4-989(132)
City of Minot #4753
Ward County
16th St. Interchange

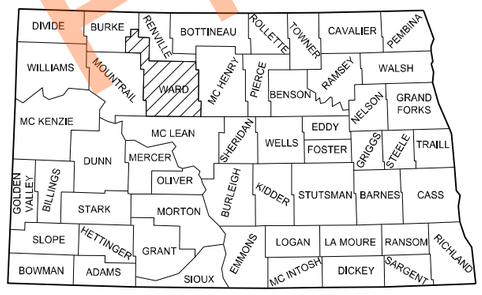
Concrete Pavement Repair (CPR), Signals, Bridge Deck Overlay
Approach Panels, ADA Curb Ramp Revisions

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2024
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SU-4-989(132)	0.39	0.39

T 155 N
R 83 W





STATE COUNTY MAP

BASIS OF SURVEY
All contours, elevations, and coordinates for the project are based on state Plan Coordinate System NAVD-83(2011)

DESIGNER
Stacy Johnson
Brian Meyers
Ryan Rykowsky
Hannah Mueller
Michael Salwei

CITY OF MINOT
Lance Meyer
Lance Meyer 08/15/25

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT
Jon Ketterling
Jon Ketterling 08/15/25

SRF Consulting Group

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

Preliminary Plans

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90	1 - 6	Paving Layouts
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110	1 - 6	Signing
120	1 - 6	Pavement Marking
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150	1 - 24	Signals
170	1 - 9	Bridges and Box Culverts

SPECIAL PROVISIONS

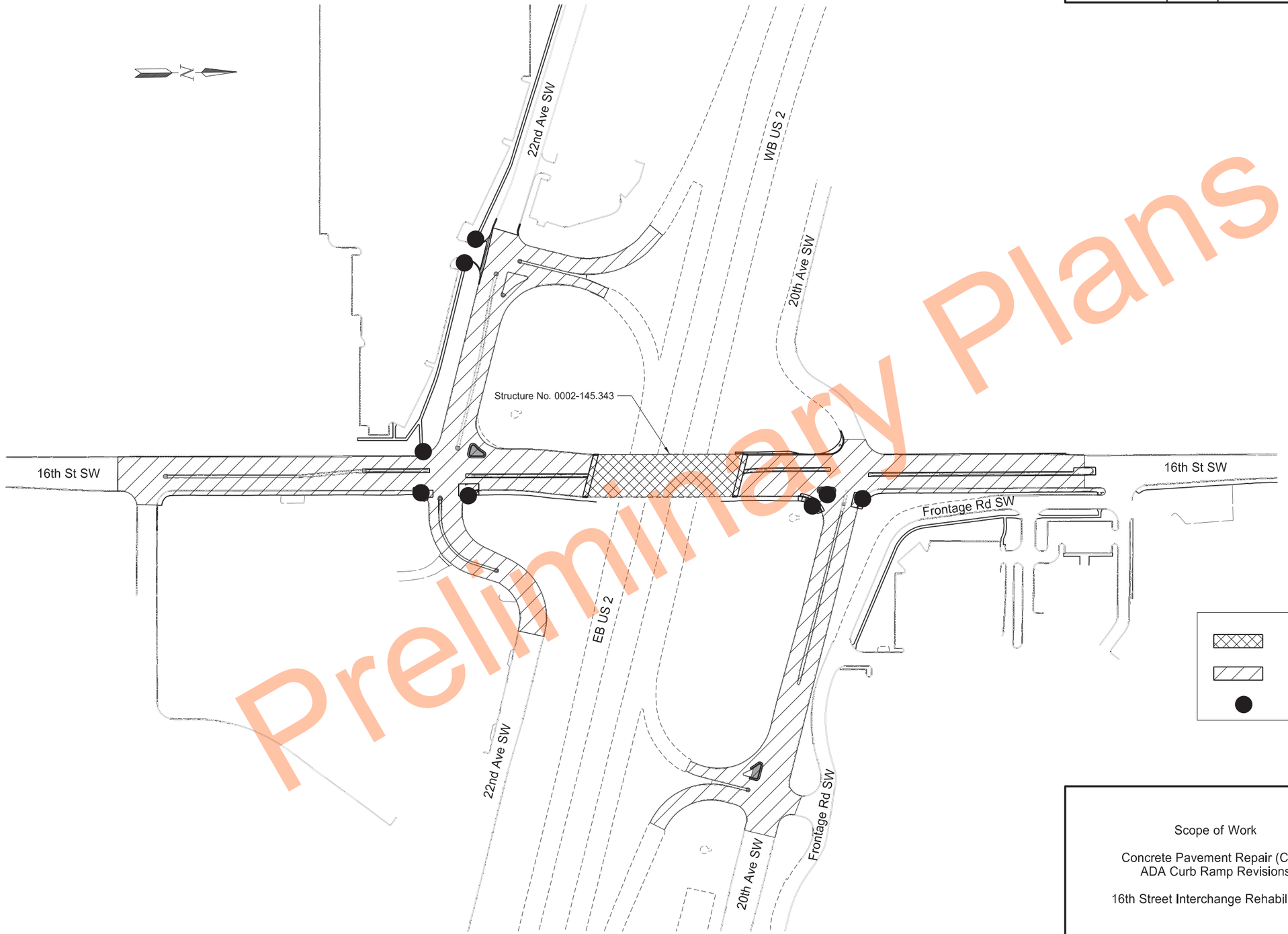
Number	Description
SSP 2	Federal Migratory Bird Treaty Act
SP 337(24)	Hydrodemoliation and Overlay of Concrete Bridge Decks
SP 338(24)	Utility Coordination
SP 482(24)	City of Minot Standard Specifications
SP 483(24)	Temporary Pedestrian Facilities
SP 484(24)	Drilled Shafts
SP 511(24)	Commercial Grade Asphalt

LIST OF STANDARD DRAWINGS

Number	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-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11	Construction Sign Details - Warning Signs
D-704-11A	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal And Seal Coat Sign Layouts
D-704-23	Short Term Urban Detour And Lane Closure On A Divided Highway Layouts
D-704-27	Mobile Operation (Pavement Marking)
D-704-34	Sign Layout For One Lane Closure
D-748-1	Curb & Gutter And Valley Gutter
D-750-2	Sidewalk
D-750-3	Curb Ramp Retrofit Details
D-750-4	Curb Ramp Retrofit Transitional Area Details
D-762-1	Pavement Marking Message Details
D-762-4	Pavement Marking
D-764-40	MGS W-Beam Guardrail General Details
D-764-48	Typical Grading at Bridge Ends with MGS W-Beam Guardrail
D-764-50	MASH SoftStop End Terminal - Steel Post
D-764-51	MASH Sequential Kinking Terminal - Wood Post
D-764-60	MGS W-Beam Transition with Approach Curb to Concrete Single Slope or Jersey Barrier
D-764-62	Jersey Barrier to Thrie Beam Connector Plate Details
D-770-1	Concrete Foundations (Traffic Signals & Highway Lighting)
D-770-2	Feed Points (Roadway Lighting)
D-772-1	Feed Point - Traffic Signals
D-772-2	Traffic Signal Standards
D-772-3	Traffic Signal Standards (Mast Arm Type)
D-772-4	Traffic Signal Head Mounting

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Scope of Work

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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DATE: 4/15/25
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

GENERAL NOTES

100-P01 COORDINATION OF PROJECTS: Coordinate all work and traffic control with the contractor of the Storm Sewer District 121 Puppy Dog Coulee Project 4087, which takes places on 16th St between 24th Ave and 31st Ave.

100-P02 NOISE RESTRICTIONS: Limit all construction activities to the hours of 7:00 am to 9:00 pm unless written permission is obtained from the Engineer. Request permission a minimum of 7 days prior to the work taking place.

105-110 PAVEMENT SWEEPING: Sweep paved areas before opening to traffic and for final acceptance. Additionally, the Contractor will sweep existing paved surfaces due to construction equipment tracking. Use a vacuum or pick-up type sweeper to perform this work.

108-100 WEEKLY PLANNING/REPORTING MEETING: A weekly planning and reporting meeting is required. Invite the City of Minot Engineer staff Lance Meyer and Stephen Joersz (via email), and City of Minot Public Works Bryan Banfill at 701-857-4140.

202-P01 REMOVALS (ADA CURB RAMP REVISIONS): Removal of concrete pavement includes removing concrete pavement, sidewalk, aggregate base, and common excavation - waste. Existing pavement thicknesses shown on the existing typical sections are based on old plans. Include cost for materials, equipment, and labor to perform this work in the contract unit price for “Removal of Concrete Pavement”.

203-010 SHRINKAGE: 25% percent additional volume is included for shrinkage in earth embankment.

550-P01 PCC PAVEMENT GRINDING: Widen, clean and reseal any existing transverse and longitudinal joints that are impacted by the pavement grinding operation. Include cost for materials, equipment and labor to form, saw, clean and seal these described joints in the contract unit price for “PCC Pavement Grinding”.

570-P01 CONCRETE PAVEMENT REPAIR: An additional 25% has been added to the quantities for “Spall Repair-Partial Depth”, “Concrete Pavement Repair-Full Depth-Doweled”, “Doweled Contraction Joint Assembly”, “Dowel Bars”, “Epoxy Coated Deformed Bars” to be used as directed by the Engineer.

570-P02 TRANSVERSE AND LONGITUDINAL JOINTS CLEANING AND SEALING: All concrete joints within the Concrete Pavement Repairs (CPR) limits are to be sawed, cleaned and sealed will not be paid for separately. Include cost for materials, equipment, and labor to form, saw, clean, and seal smooth doweled transverse, epoxy coated deformed bars, and longitudinal joints within the repair areas in the contract unit price for “Concrete Pavement Repair-Full Depth-Doweled” and “Spall Repair-Partial Depth”.

570-P03 CONCRETE PAVEMENT REPAIR: After removal of concrete is completed and prior to installation of new concrete, the Engineer will determine if additional aggregate base course class 5 is required to be placed and recompacted.

Payment for this material to be made at the unit price bid for “Concrete Pavement Repair-Full Depth-Doweled”.

704-100 TRAFFIC CONTROL SUPERVISOR: Provide a Traffic Control Supervisor.

704-200 STATE FURNISHED MEDIAN BARRIER: Obtain (78) 22.5” x 12.5’ concrete barriers. They can be picked up and returned to the New Salem yard. Contact the Bismarck District office at 701-328-6950 to facilitate the exchanges.

If returning barriers with connection components, coordinate the delivery location for the connecting components with the Engineer. Some 4 inch x 4 inch boards are available at the return location. Provide any additional 4 inch x 4 inch boards necessary to stack barriers. The boards will become property of the Department.

Include all costs associated with median barriers in the contract unit price for “State Furnished Median Barrier”.

704-510 OBLITERATION OF PAVEMENT MARKINGS: Masking of pavement markings designated for obliteration is allowed. Choose to remove marking as specified in Section 704.04 N, "Obliteration of Pavement Markings" or mask markings. Mask markings using removable, non-reflective preformed tape that is approximately the same color as the pavement surface and that overlaps the marking a minimum of 1 inch on each side.

704-P01 TRAFFIC CONTROL FOR CONCRETE PAVEMENT REPAIR: Provide traffic control consisting of a temporary lane closure and flagging.

Place Type III barricades at the beginning and end of each block with corresponding phase lane closure. Position barricades so that they do not encroach into the traffic lane or impact property access.

The traffic control device list is based on the maximum work zone and the following list:

- D-704-15, Layout C
- D-704-20, Layout G
- D-704-21
- D-704-23
- D-704-34

Remove or shorten lane closures after new concrete has reached the required strength for opening to traffic specified in Section 570.04 A.1.b “Full Depth Repairs”.



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Traffic control phasing is to be followed in order when constructing the project unless an alternate traffic control phasing plan is submitted to the Engineer for review and approved at least one week in advance of the proposed work.

704-P02 TRAFFIC CONTROL PHASING: Traffic control Phasing is as follows:

Intersections to be partially constructed to keep roadways open to traffic at all times.

Phase 1 – 16th St SW, from 24th Ave SW to Frontage Rd SW - Concrete Pavement Repair (CPR) for the middle thru and left turn lane, Curb and Gutter, bridge overlay, median and ADA improvements.

Phase 2 – 16th St SW, from 24th Ave SW to Frontage Rd SW – Concrete Pavement Repair (CPR) for outermost driving lanes, Curb and Gutter, bridge overlay, and ADA improvements.
Phase 3 – 16th St SW, from 24th Ave SW to Frontage Rd SW – Concrete Pavement Repair (CPR) for the easterly driving lane for NB traffic, Curb and Gutter, bridge overlay, and ADA improvements.

Phase 4 – Median work to be completed for gaps necessary to maintain traffic at all times.

Phase 5 – 16th St SW, from 24th Ave SW to Frontage Rd SW for Grinding and Striping.

704-P03 PORTABLE CHANGEABLE MESSAGE SIGN: Install two Portable Changeable Message Signs (PCMS) 2 weeks prior to the placement of the traffic control devices. Use the PCMS to display information prior to and throughout the project duration. Relocate the PCMS as directed by the Engineer.

The Engineer will determine the locations for the PCMS's and messages to be displayed. Provide trained individuals to operate the PCMS. Display the message(s) on the sign within one hour of the Engineer's request. Use PCMS conforming to the requirements of the MUTCD, part 6

708-P01 INLET PROTECTION-SPECIAL: Place inlet protection as needed throughout the project limits. Clean and dispose of debris or silt that has accumulated in the device, as necessary. Include all costs to furnish, install, maintain and replace inlet protection-special in the contract unit price for "Inlet Protection-Special".

722-P01 ADJUST MANHOLE: Remove existing casting and install new adjustment rings (minimum of two) and casting. Include all costs for removal of existing casting, replacing adjustment rings and resetting the existing casting in the cost for materials, equipment, labor, and incidentals in contract unit price for "Adjust Manhole".

750-P01 SIDEWALK CONCRETE 4IN: Construct sidewalk and ADA ramps as per Standard Drawings D-750-2 and D-750-3. At replacement areas, excavate material to accommodate the proposed aggregate base and dispose of excess excavation.

Saw all longitudinal and transverse contraction joints. Saw joints in a timely manner to prevent any uncontrolled random cracking. If random cracking occurs, remove, and replace all damaged panels.

Provide aggregate base course for new sidewalk locations. Utilize the existing aggregate base in existing sidewalk locations and provide additional aggregate base course as necessary, or as directed by the Engineer.

Include the cost of materials, equipment, and labor to perform the above referenced work in the contract unit price for "Sidewalk Concrete 4IN".

748-P01 CURB & GUTTER TYPE I: Curb & Gutter Type I called out in section 90 of the plans will be Sec A or Sec B in accordance with standard drawing D-748-1. Verify existing curb and gutter type prior to removal and replace with Sec A or Sec B appropriately.

Include the cost of materials, equipment, and labor to perform the above referenced work in the contract unit price for "Curb & Gutter Type I".

750-P02 CURB RAMPS AND LANDINGS: Install concrete landings labeled "TS" in Section 80, prior to adjacent ramps or sidewalk. Construct sidewalk, curb ramps and landings in accordance with D-750-3, and the details shown in Section 80 of these plans.

Dimensions shown in Section 80 are approximate. Adjustments may be required so maximum grades are not exceeded. Flatter grades or slopes may be used as directed by the Engineer.

750-P03 DETECTABLE WARNING PANELS: Supply cast iron detectable warning panels.

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

772-P01 TRAFFIC SIGNAL SYSTEM: Install in accordance with the 2025 edition of the City of Minot Standard Specification 3800 and Standard Traffic Details, unless otherwise noted. Include all costs, labor and materials for installing fully operational traffic signals in the price bid for "Traffic Signal System – Site 1; Traffic Signal System – Site 2; and Traffic Signal System – Site 3". This includes, but is not limited to, existing signal system demolition, signal standards & foundations, traffic and pedestrian signal heads, pedestrian pushbuttons, traffic signal controller & foundation, all ancillary controller equipment, video detection system, EVP system, pull boxes, conduit and wire, for each of the three sites.

772-P02 REMOVE SIGNAL EQUIPMENT: Deliver, as directed by the City of Minot Traffic Department, all existing traffic signal equipment deemed salvageable by the City of Minot Traffic Department. Contact City of Minot Traffic Division at 701-

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

NOTES

857-4100 twenty-four hours prior to delivery. Properly dispose of all items not deemed salvageable.

772-P03 TRAFFIC SIGNAL STANDARDS: Provide signal standards that comply with City of Minot Standard Specification 3800 -2025 edition.

- Signal Standards finish as per 3800-2.07-A2.
- Mount signal standard pole on transformer base with integral hand hole. Orientate hand hole to face away from the roadway.
- Include a hand hole in the signal standard pole that is a minimum of 24” long and starts at 8” above the pole base plate. Hand hole to include grounding lug, terminal strip, sealant gasket, cover and other needed items. Orientate hand hole to face the downstream end of the roadway.
- Signal Standard mast lengths as indicated on the drawings. Masts to include ability to be rotated.
- Include signal standard pole extension to mount video detection cameras at 30’. Extension finish to match the Signal Standards.

772-P04 WIRE SPLICING: No permanent splicing is allowed between the traffic signal cabinet and signal standard transformer bases (unless otherwise specifically noted). Permanent wiring termination will be allowed at terminal blocks in the controller cabinet, signal transformer base and signal pole.

All wire connections in the transformer base are to utilize Wago Lever Nuts-Series 222. Dielectric grease is to be installed in all openings on all lever nuts before wires are installed. Cables are to be spliced in a neat matter, so no wire group/phases are intertwined with each other. Provide an indication label (neutral, V1, 1R, 1Y, 1G, etc). Electrical tape each splice group and strap all splice groups

772-P05 CONTROLLER WORKING SLAB: Install a cabinet working slab, the same width as the controller cabinet foundation that extends a minimum of 4-feet from the face of the controller cabinet foundation. Provide a slab that is 4-inches think and reinforced with 6" x 10 GA welded wire fabric and tied to the controller foundation with 18-inch long #3 rebar spaced 18-inches on center. Provide a cabinet working slab that has a slope of 0.25-inches per foot away from the controller cabinet foundation. Closest point of the top of the slab to finish grade to be 2-inches above grade, except where it matches the sidewalk. Pour the slab in place with no voids. Include all costs for controller working slab in the price bid for "Traffic Signal System"

772-P06 TRAFFIC SIGNAL CONTROLLER: Provide a controller in accordance with City of Minot Standard Specification 3800 - 2025 edition.

- NEMA TS2-1 controller cabinet sized per City of Minot Standard Specification 3800-2.11-A2(b).
- Battery Backup System in accordance with City of Minot Standard Specification 3800 -2.13 except this equipment to be provided in a separate cabinet, similar to the controller cabinet, but sized accordingly.
- Orientation and door hinge configurations for both cabinets as described on the Drawings.
- Label the following items on the cabinet wiring diagram, in addition to information required by City of Minot Standard Specification 3800.
  - The camera number (i.e. D2-1) from the plan is to be labeled on the detector panel drawing adjacent to the point of termination.
  - The field wire terminals for the vehicle/pedestrian head control cables is to be labeled with the phase number and direction (i.e. Ø2, SB).
  - The field wire terminals for the Opticom cable are to be labeled with the pre-empt number (i.e. P.E. #1).
  - The field wire terminal for the pre-empt indicator lamps are to be labeled with the pre-empt number and direction (i.e. P.E. #1, NB).
  - The field wire terminals for the pedestrian push-button cables are to be labeled with the phase number (i.e. Ø8 PED).
- Provide an intersection diagram on cabinet door showing phasing of intersection and camera numbering and detection zone numbering.
- Provide a CAD drawing file of the as-built cabinet wiring diagram.

772-P07 VIDEO DETECTION SYSTEM: Provide Autoscope Vision Video Detection Equipment in accordance with City of Minot Standard Specification 3800-2.15. Provide all cable connections, camera aiming and system set-up, including programming detection zones and verification of reliable operation by the manufacturer's representative. Include one extra camera, processor, interface panel, and detector port master per Traffic Singal System Site. Include three year warranty period from the supplier. Warranty period begins at the date of final inspection and acceptance by the City of Minot. Supplier to provide on-going software support and updates of the MVP sensor and application software, free of charge, for a period of one year after the final inspection and acceptance by the City of Minot.

772-P08 NETWORK EQUIPMENT: Provide a DSL modem installed in the controller cabinet. Modem to be compatible with SRT, who is the City of Minot's network service provider. The contractor is responsible to make all arrangements with the local telephone company, SRT, to install a fiber optic communications line to the controller.

Include a hardened Ethernet switch in the controller cabinet. Switch to include eight 10/100megabit copper ports and two gigabit fiber optic ports. The switch is specifically designed to operate in the environment intended. Moxa #EDS-510E-3GTXSFP-T or approved equal.

All cost, labor, and materials for providing and installing network equipment and all costs associated with SRT providing fiber optic service to each of the three sites are to be included in price bid for their respective "Traffic Signal System".

772-P09 EMERGENCY VEHICLE PRE-EMPTION SYSTEM: Install the EVP system equal to and compatible with the existing "Opticom" equipment used by the City of Minot in accordance with City of Minot Standard Specification 3800-2.14.

REGISTERED PROFESSIONAL ENGINEER
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DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

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Detectors are single direction, one channel, with White indicator light assembly. Notify the Fire Chief, 701-857-4740, when the EVP systems are tested and operable. The City of Minot Fire Department will set the range of the system.

772-P10 ACCESSIBLE PEDESTRIAN SIGNALS (APS) PUSHBUTTON & SIGN: Provide APS pushbuttons and signs that include the following features, installation procedures and code compliance.

- Brand: Polara or approved equal.
- Model: iNavigator S 2-Wire Pushbutton with iDetect IDS2 Option.
- Mobil app programming with Bluetooth communication.
  - Custom messages as directed by City of Minot Traffic Division.
- Align direction of arrow parallel to direction of travel on the crosswalk and mounting height to comply with ADA wheelchair requirements.
- Include 800H-135 sign. Braille not required.
- Provide Pelco SE-2186 bracket extender for each pushbutton that is mounted on a sign standard. Include 6” nipple, powder coated gloss black (color code P33).
- Complete assembly finish is Black to match Signal Standards.

970-P01 LANDSCAPE PREPARATION: Provide minimal grading and hydraulic mulch adjacent to the locations for sidewalk and curb & gutter replacement. Blend the existing topsoil adjacent to the sidewalk and / or curb & gutter to eliminate any steep slopes or vertical edges. Remove excess topsoil from the project site. Import topsoil if needed. Provide Class 1 seed mix as specified in Section 251.03D, “Seed Class”.

Use hydraulic mulch material as specified in Section 253.04 B, “Hydraulic Mulch” of the NDDOT Standard Specifications. Apply the hydraulic mulch after the seed is incorporated into the topsoil. Apply fertilizer at a rate of 100 pounds per acre with a mixture of 5-10-5. Include work necessary to restore landscaping, topsoil areas, imported topsoil, seeding, mulching, and fertilizer in the unit price bid for “LANDSCAPE PREPARATION”.

Preliminary Plans



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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline	100% City			TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
202	0111	REMOVAL OF CONCRETE	L SUM	1				1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	937				937
202	0130	REMOVAL OF CURB & GUTTER	LF	2889				2889
203	0102	COMMON EXCAVATION-TYPE B	CY	89				89
203	0113	COMMON EXCAVATION-WASTE	CY	74				74
302	0121	AGGREGATE BASE COURSE CL 5	CY	8				8
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	5				5
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE	SY	1336				1336
550	0210	PCC PAVEMENT GRINDING	SY	23397				23397
550	0240	DOWELED CONTRACTION JOINT ASSEMBLY	LF	1035				1035
570	0424	DOWEL BARS	EA	1626				1626
570	0650	CONCRETE PAVEMENT REPAIR-FULL DEPTH-DOWELED	SY	2553				2553
570	1512	SPALL REPAIR-PARTIAL DEPTH	SF	893				893
570	1600	EPOXY COATED DEFORMED BARS	EA	2790				2790
602	1133	CONCRETE BRIDGE APPROACH SLAB	SY	380.6				380.6
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	2872				2872
602	7000	SPECIAL SURFACE FINISH	SF	8346				8346
624	0126	PEDESTRIAN CANOPY	LF		240.5			240.5
650	0704	OVERLAY CONCRETE	CY	125				125
650	0707	DECK CONCRETE	CY	12				12
650	0710	CLASS 1-H REMOVAL	SY	2264				2264
650	0720	CLASS 1 REMOVAL	SY	2155				2155
650	0723	CLASS 3 REMOVAL	SY	70				70
650	0724	CLASS 4 REMOVAL	SY	20				20
702	0100	MOBILIZATION	L SUM	1				1
704	0100	FLAGGING	MHR	320				320
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3330				3330
704	1052	TYPE III BARRICADE	EA	38				38
704	1054	SIDEWALK BARRICADE	EA	9				9
704	1058	PEDESTRIAN WALKWAY	LF	1300				1300
704	1060	DELINEATOR DRUMS	EA	192				192
704	1067	TUBULAR MARKERS	EA	478				478
704	1072	FLEXIBLE DELINEATORS	EA	25				25
704	2108	TEMPORARY CURB RAMP	EA	10				10
704	3510	PRECAST CONCRETE MED BARRIER-STATE FURNISHED	EA	78				78
704	4011	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4				4
708	1540	INLET PROTECTION-SPECIAL	EA	19				19
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	19				19
722	6160	ADJUST INLET	EA	4				4
722	6200	ADJUST MANHOLE	EA	10				10
748	0140	CURB & GUTTER-TYPE I	LF	630				630
748	0141	CURB & GUTTER-TYPE 1 SPECIAL	LF	176				176
748	0150	MOUNTABLE CURB & GUTTER-TYPE 1 SEC A	LF	176				176
750	0115	SIDEWALK CONCRETE 4IN	SY	158				158
750	0210	CONCRETE MEDIAN NOSE PAVING	SY	136				136
750	2115	DETECTABLE WARNING PANELS	SF	112				112

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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline	100% City			TOTAL
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	188				188
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	175				175
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	63				63
754	0592	RESET SIGN PANEL	EA	2				2
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE	LF	6433				6433
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE	LF	637				637
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE	LF	5583				5583
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE	LF	513				513
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE	SF	1012				1012
764	0131	W-BEAM GUARDRAIL	LF	52				52
764	0145	W-BEAM GUARDRAIL END TERMINAL	EA	1				1
772	2810	TEMPORARY TRAFFIC SIGNALS	EA	3				3
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1	EA	1				1
772	9812	TRAFFIC SIGNAL SYSTEM - SITE 2	EA	1				1
772	9813	TRAFFIC SIGNAL SYSTEM - SITE 3	EA	1				1
930	7012	ROADWAY CANOPY	L SUM	1				1
930	9639	APPROACH SLAB LIP REPAIR	LF	177.4				177.4
970	0008	LANDSCAPE PREPARATION	SY	519				519

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	11	1

16th Street Concrete Pavement Repair Locations (S Direction)

Reference Point	Station	Location	Concrete Pavement Repair							Spall Repair Length x Width			Curb & Gutter (LF)
			L (ft)	W (ft)	SY	Doweled Contraction Joint Assembly (LF)	Bar Type			L (ft)	W (ft)	SF	
							Dowel	Deformed	Tie				
1003a	109+52.9	NB RT Lane	9	12	12		7	7	5			0	
1003b		NB RT Turn Lane	9	12	12		7	7	5			0	
1003c		NB RT/RT Turn Lane	3	24	8		1	1	1			0	
1004	109+23.0	NB RT Lane			0					3	3	9	
1005	108+93.8	NB RT/RT Turn Lane			0					4	4	16	
1006	108+65.8	NB RT/RT Turn Lane			0					3	3	9	
1007	108+41.4	NB RT/RT Turn Lane	7	15	12		5	5	4			0	
1008	108+03.0	NB RT Lane	4	12	6		2	2	2			0	
1009	107+76.5	NB RT Lane	4	14	7		2	2	2			0	
1010	107+64.0	NB RT Lane	4	12	6		2	2	2			0	
1011	107+54.3	NB RT Lane	4	3	2		2	2	2			0	15
1012	107+50.8	NB RT Lane	6	12	8		4	4	3			0	
1013	107+43.4	ADA	9	8	8		7	7	5			0	
1014	107+31.2	22nd Ave Radius (NE Quad)	5	4	3		3	3	2			0	
1015	106+81.9	NB RT Lane			0					3	3	9	
1016	106+55.6	NB RT Lane/22nd Ave	4	4	2		2	2	2			0	
1017	106+29.8	NB RT Lane			0					2	2	4	
1018	106+30.1	NB RT/LT Lane	4	4	2		2	2	2			0	
1019	106+21.1	NB RT Lane	5	12	7		3	3	2			0	
1020	106+07.4	NB RT/LT Lane			0					2	3	6	
1022	104+98.1	Spot Shot			0							0	
1023	104+69.4	NB RT Lane	5	12	7		3	3	2			0	
1024	103+98.4	Spot Shot			0							0	
1025	103+83.3	NB RT Lane	4	12	6		2	2	2			0	
1026	103+55.3	NB RT Lane	4	12	6		2	2	2			0	
1027	102+98.0	Spot Shot			0							0	
1028	102+43.4	NB RT Lane			0					6	2	12	
1029	101+98.1	Spot Shot			0							0	
1030	101+28.4	NB RT Lane	15	4	7		13	13	9			0	
1031	100+58.5	NB RT Lane	4	12	6		2	2	2			0	
1032	112+98.3	Spot Shot			0							0	
1033	112+90.9	NB RT Lane			0					2	3	6	
1034	113+21.1	NB RT Lane	4	6	3		2	2	2			0	
1035	113+35.9	NB RT/RT Turn Lane	4	12	6		2	2	2			0	
1036	113+48.0	NB RT Lane	4	12	6		2	2	2			0	
1037	113+64.6	NB RT Lane	4	12	6		2	2	2			0	
1038	113+78.1	NB RT Lane			0					2	3	6	
1039	113+91.9	NB RT Lane	4	6	3		2	2	2			0	
1040a	114+23.8	NB RT Lane/Gore	2	10	3		0	0	0			0	
1040b		NB RT Lane/Gore	2	10	3		0	0	0			0	
1040c		NB RT Lane/Gore	4	4	2		2	2	2			0	
1041	114+53.9	NB RT Lane	4	8	4		2	2	2			0	
1042	114+66.8	NB RT Lane	4	12	6		2	2	2			0	
1043	114+82.1	NB RT Lane	4	4	2		2	2	2			0	
1044	115+24.0	NB RT Lane			0					2	2	4	
1045	115+40.2	NB RT Lane	4	4	2		2	2	2			0	
1046	116+09.4	NB RT Lane	4	6	3		2	2	2			0	
1047	116+23.4	NB RT Lane			0					2	2	4	
1048	117+35.5	NB RT Lane			0					2	2	4	
1049	117+95.7	NB RT Lane	45	12	60	45	43	43	29			0	
1050	118+65.2	NB RT Lane	75	12	100	75	73	73	49			0	
1051	218+59.2	SB RT Lane	192	12	256	192	190	190	127			0	
1052	217+70.0	SB RT Lane			0					2	2	4	
1053	217+42.1	SB RT/LT Lane			0					3	2	6	
1054	216+01.0	SB RT Lane			0					2	12	24	
1055a	214+84.3	20th Ave West Leg	3	4	2		1	1	1			0	
1055b		20th Ave West Leg	6	9	6		4	4	3			0	
1056	214+53.3	SB RT Lane			0					2	2	4	
1057	214+28.0	SB RT Lane	4	12	6		2	2	2			0	
1058	213+85.9	SB RT Lane			0					4	4	16	
1059a	213+70.0	SB RT Lane	12	6	8		10	10	7			0	
1059b		SB RT Lane	4	6	3		2	2	2			0	
1060	213+27.5	SB RT Lane	4	6	3		2	2	2			0	
1061	210+00.3	SB RT Lane	3	14	5		1	1	1			0	19
1062	209+59.5	SB RT Turn Lane			0					2	2	4	
1063	209+47.1	SB RT Lane			0					2	2	4	
1064	208+67.1	SB RT Turn Lane			0					2	2	4	
1065	208+66.4	SB RT Lane	4	4	2		2	2	2			0	
1066	207+95.3	SB RT Turn Lane	12	12	16		10	10	7			0	
1067	207+65.8	SB RT Lane	4	12	6		2	2	2			0	14
1068	207+41.9	SB RT Lane			0					2	2	4	
1069	207+21.7	22nd Ave W Leg			0					6	2	12	
1070	207+12.4	22nd Ave W Leg			0					2	2	4	
1071	206+90.5	22nd Ave W Leg			0					2	2	4	
1072	206+78.6	22nd Ave W Leg			0					2	2	4	

Preliminary Plans

Quantities

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	11	2

16th Street Concrete Pavement Repair Locations (S Direction)

Reference Point	Station	Location	Concrete Pavement Repair							Spall Repair Length x Width			Curb & Gutter (LF)
			L (ft)	W (ft)	SY	Doweled Contraction Joint Assembly (LF)	Bar Type			L (ft)	W (ft)	SF	
							Dowel	Deformed	Tie				
1073	206+29.5	SB RT Lane			0					2	2	4	
1074	205+03.2	SB RT Lane			0					2	2	4	
1075	205+03.3	SB RT Lane			0					2	3	6	
1076	204+64.9	SB RT/LT Lane	8	8	8		6	6	4			0	
1077	204+40.7	SB RT/LT Lane	4	12	6		2	2	2			0	
1078	203+76.6	SB RT/LT Lane			0					2	2	4	
1079	203+76.9	SB RT/LT Lane			0					2	2	4	
1080	201+23.3	SB RT/LT Lane			0					2	8	16	
1081	100+87.4	NB LT Lane			0					2	2	4	
1082	101+35.6	NB Median (LT)			0					2	11	22	
1083	101+58.3	NB LT Lane			0							0	
1084	101+74.0	NB LT Lane			0					2	3	6	
1085	103+26.7	NB LT Lane			0					2	2	4	
1086a	103+54.7	NB LT Lane	4	12	6		2	2	2			0	
1086b		NB LT Lane	9	6	6		7	7	5			0	
1087	104+33.4	NB LT Lane	6	16	11		4	4	3			0	
1088	104+68.0	NB LT/LT Turn Lane	5	17	10		3	3	2			0	
1089	106+21.5	NB LT Lane	4	12	6		2	2	2			0	
1090	106+26.3	NB LT Turn Lane	12	30	40		10	10	7			0	
1091	106+69.1	NB LT/LT Turn Lane			0					3	3	9	
1092		NB/SB/22nd Ave			0					2	2	4	
1093		NB/SB/22nd Ave			0					2	2	4	
1094		NB/SB/22nd Ave			0					2	2	4	
1095	107+38.3	NB/SB Median	8	12	11		6	6	4			0	
1096	107+50.7	NB LT Lane	6	12	8		4	4	3			0	
1097	107+90.1	NB LT Lane			0					3	2	6	
1098	108+03.8	NB LT Lane	4	12	6		2	2	2			0	
1099	108+67.2	NB LT Lane			0					2	2	4	
1100	112+75.3	NB LT Lane	12	3	4		10	10	7			0	
1101	112+77.8	NB LT Turn Lane	7	3	2		5	5	4			0	
1102	112+91.5	NB LT Turn Lane			0					2	8	16	
1103	113+06.4	NB LT Lane			0					2	3	6	
1104	113+20.9	NB LT Lane			0					2	2	4	
1105	113+21.0	NB LT Lane			0					2	2	4	
1106	113+65.2	NB LT Lane	4	12	6		2	2	2			0	
1107	114+83.0	NB RT Lane			0					2	2	4	
1108		NB RT Lane			0					2	2	4	
1110					0							0	
1111	117+67.1	NB RT Lane	45	12	60	45	43	43	29			0	
1112	119+14.8	NB RT Lane	36	12	48	36	34	34	23			0	
1113	219+65.0	SB LT Lane	8	12	11		6	6	4			0	
1114	219+55.0	SB LT Turn Lane	5	4	3		3	3	2			0	
1115	218+24.5	SB LT/LT Turn Lane	45	24	120	45	43	43	29			0	
1116	217+70.3	SB LT Lane			0					2	2	4	
1117	217+14.5	SB LT Lane			0					12	3	36	
1118	216+72.6	SB LT Turn Lane			0					2	2	4	
1119	216+58.1	SB LT Lane			0					2	2	4	
1120	215+74.6	SB LT Lane	4	4	2		2	2	2			0	
1121	215+62.9	SB LT Lane	4	6	3		2	2	2			0	
1122	215+48.0	SB LT Turn Median Nose	9	6	6		7	7	5			0	
1123	215+47.1	SB LT/LT Turn Lane	105	4	47	105	103	103	69			0	
1124	214+77.7	SB LT Lane	4	4	2		2	2	2			0	
1125	214+53.4	SB LT Lane			0					2	6	12	
1126	214+27.9	SB LT Lane	4	12	6		2	2	2			0	
1127	213+87.1	SB LT Lane			0					2	10	20	
1128	213+70.2	SB LT Lane	4	12	6		2	2	2			0	
1129	213+58.3	SB LT Lane	4	7	4		2	2	2			0	
1130	213+28.4	SB LT Lane			0					2	6	12	
1131	209+96.0	SB LT Lane/LT Turn	7	24	19		5	5	4			0	
1132	209+86.0	SB LT Turn Lane			0					2	2	4	
1133	208+92.3	SB LT Lane			0					2	2	4	
1134	208+65.8	SB LT Lane			0					2	2	4	
1135	208+65.4	SB LT Turn Lane			0					2	2	4	
1136	208+40.2	SB LT Lane			0					2	2	4	
1137	208+40.3	SB LT Lane			0					2	2	4	
1138a	207+86.3	SB LT Turn Lane	4	12	6		2	2	2			0	
1138b		SB LT Turn Lane	4	4	2		2	2	2			0	
1139	207+86.4	SB LT Lane			0					2	7	14	
1140	207+55.1	SB LT Lane	4	14	7		2	2	2			0	
1141	207+52.0	SB LT/LT Turn Lane	25	4	12	25	23	23	16			0	
1142	205+87.7	SB LT Lane			0					2	2	4	
1143	205+73.5	SB LT Lane			0					2	2	4	
1144	205+35.0	SB LT Lane	35	6	24	35	33	33	22			0	
1145	204+55.8	SB LT Turn Lane	8	8	8		6	6	4			0	
1146	203+73.8	SB LT Lane			0					2	2	4	

Preliminary Plans

Quantities

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	11	3

16th Street Concrete Pavement Repair Locations (S Direction)

Reference Point	Station	Location	Concrete Pavement Repair							Spall Repair Length x Width			Curb & Gutter (LF)
			L (ft)	W (ft)	SY	Doweled Contraction Joint Assembly (LF)	Bar Type			L (ft)	W (ft)	SF	
							Dowel	Deformed	Tie				
1147	102+49.9	SB LT Turn Lane			0					6	6	36	
1148	102+18.4	SB LT Turn Lane			0					2	6	12	
1149	201+23.0	SB LT Lane			0					2	12	24	
1150	200+95.2	SB LT Lane	25	12	34	25	23	23	16			0	
1200	20+32.5	US2 EB Off Ramp (L/R)	4	32	15		2	2	2			0	
1201	20+18.9	US2 EB Off Ramp (R)	4	9	4		2	2	2			0	
1202	22+65.0	US2 EB Off Ramp (R)	19	8	17	19	17	17	12			0	
1203	21+02.8	US2 EB On Ramp (R)	5	16	9		3	3	2			0	
1204	20+71.3	US2 EB On Ramp (R Loop)	6	45	30		4	4	3			0	
1205	20+60.7	US2 EB On Ramp (R Loop)	4	6	3		2	2	2			0	
1206	20+60.4	US2 EB On Ramp (L)			0					2	2	4	
1207	20+24.1	US2 EB On Ramp (R/L)	4	8	4		2	2	2			0	
1208	20+24.0	US2 EB On Ramp (L)			0					2	4	8	
1300	55+26.0	22nd Ave WB			0					2	2	4	
1301	55+82.6	22nd Ave WB	4	16	8		2	2	2			0	
1302	55+94.0	22nd Ave WB			0					3	2	6	
1303	56+17.6	22nd Ave WB	6	16	11		4	4	3			0	
1304	56+39.2	22nd Ave WB	4	4	2		2	2	2			0	
1305	56+73.8	22nd Ave WB	4	4	2		2	2	2			0	
1306	57+30.2	22nd Ave WB	4	47	21		2	2	2			0	
1307	57+37.0	22nd Ave WB			0					2	2	4	
1308	58+46.5	22nd Ave WB	4	58	26		2	2	2			0	
1309	58+78.9	22nd Ave WB	4	6	3		2	2	2			0	
1310	59+05.6	22nd Ave WB	6	10	7		4	4	3			0	
1311	59+06.4	22nd Ave WB	4	7	4		2	2	2			0	
1312	207+80.4	22nd Ave WB/SB RT Ramp			0					3	3	9	
1313	207+65.7	22nd Ave WB/SB RT Ramp	4	4	2		2	2	2			0	
1314	207+33.9	22nd Ave EB/Nose	8	12	11		6	6	4			0	
1315	59+22.5	22nd Ave EB RT	4	6	3		2	2	2			0	
1316		22nd Ave EB RT			0					2	2	4	
1317	58+94.7	22nd Ave EB RT	4	12	6		2	2	2			0	
1318	58+09.2	22nd Ave EB LT/Turn			0					6	2	12	
1319	57+67.6	22nd Ave EB RT			0					3	4	12	
1320	56+69.3	22nd Ave EB LT/RT			0					3	3	9	
1321	55+76.1	22nd Ave EB LT	9	6	6		7	7	5			0	
1322	55+61.2	22nd Ave EB LT/RT			0					2	2	4	
1400	30+35.2	22nd Ave WB LT	4	4	2		2	2	2			0	
1401	30+31.9	22nd Ave WB LT	10	7	8		8	8	6			0	
1402	30+73.4	22nd Ave WB LT	4	14	7		2	2	2			0	
1403	30+35.2	22nd Ave WB LT								2	2	4	
1404	31+76.7	22nd Ave WB LT								2	2	4	
1405	31+90.2	22nd Ave WB LT								2	2	4	
1406	32+38.1	22nd Ave WB RT								2	2	4	
1407	32+64.7	22nd Ave WB RT	15	4	7		13	13	9			0	
1408	32+73.6	22nd Ave WB LT	12	6	8		10	10	7			0	
1409	32+80.7	22nd Ave WB RT	15	4	7		13	13	9			0	
1410	32+99.3	22nd Ave WB RT	15	4	7		13	13	9			0	
1411	33+40.0	22nd Ave WB LT								2	2	4	
1412	33+28.0	22nd Ave WB LT								2	2	4	
1413	33+54.3	22nd Ave EB	2	6	2		0	0	0			0	
1414	32+32.0	22nd Ave EB								2	4	8	
1415	32+20.9	22nd Ave EB								2	2	4	
1416	32+17.1	22nd Ave EB	6	7	5		4	4	3			0	
1417	106+68.9	22nd Ave EB	4	14	7		2	2	2			0	
1600	11+87.5	US2 WB Off Ramp RT	15	48	80		13	13	9			0	
1601	11+53.0	US2 WB Off Ramp LT	15	9	15		13	13	9			0	
1602	11+34.3	US2 WB Off Ramp RT/LT	30	4	14	30	28	28	19			0	
1603	10+39.7	US2 WB Off Ramp LT	16	6	11		14	14	10			0	
1604	10+80.0	US2 WB On Ramp LT	10	5	6		8	8	6			0	
1605	11+64.1	US2 WB On Ramp LT/RT	75	18	150	75	73	73	49			0	
1606	305+62.9	20th Ave EB	2	2	1		0	0	0			0	
1500	306+46.3	20th Ave WB Radius Carpet Garage	31	12	42	31	29	29	20			0	
1501	305+63.6	20th Ave EB	14	43	67		12	12	8			0	
1502	306+00.6	20th Ave EB	4	4	2		2	2	2			0	
1503a	305+96.8	20th Ave EB	11	4	5		9	9	6			0	
1503b		20th Ave EB	25	16	45	25	23	23	16			0	
1504	305+51.1	20th Ave EB	4	7	4		2	2	2			0	
1505	305+37.0	20th Ave EB			0					2	4	8	
1506	305+21.1	20th Ave EB			0					2	2	4	
1507	305+62.9	20th Ave EB			0					2	2	4	
1508	305+62.6	20th Ave EB			0					2	2	4	
1509	304+66.3	20th Ave EB LT			0					2	3	6	
1510	304+38.1	20th Ave EB LT			0					2	8	16	
1511	304+23.7	20th Ave EB RT	4	4	2		2	2	2			0	
1512	303+96.2	20th Ave EB RT			0					2	2	4	

Preliminary Plans

Quantities

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	11	4

16th Street Concrete Pavement Repair Locations (S Direction)

Reference Point	Station	Location	Concrete Pavement Repair							Spall Repair Length x Width			Curb & Gutter (LF)
			L (ft)	W (ft)	SY	Doweled Contraction Joint Assembly (LF)	Bar Type			L (ft)	W (ft)	SF	
							Dowel	Deformed	Tie				
1513	303+11.6	20th Ave EB			0							0	6
1514	302+98.5	20th Ave EB LT			0					2	3	6	
1515	114+46.9	20th Ave EB LT	16	6	11		14	14	10			0	
1516	114+35.7	20th Ave EB LT	11	9	11		9	9	6			0	
1517	300+49.7	20th Ave WB RT	4	4	2		2	2	2			0	
1518	302+84.4	20th Ave WB RT	4	4	2		2	2	2			0	
1519	302+98.6	20th Ave WB RT			0					3	2	6	
1520	302+98.4	20th Ave WB LT			0					2	2	4	
1521	304+52.4	20th Ave WB Middle Lane	4	7	4		2	2	2			0	
1522	305+95.2	20th Ave WB RT	15	3	5		13	13	9			0	
1523	306+24.1	20th Ave/US2 WB On/Off Ramp	14	18	28		12	12	8			0	
1524	306+92.6	20th Ave/US2 WB On/Off Ramp	10	16	18		8	8	6			0	
1525	306+71.5	20th Ave/US2 WB On/Off Ramp	20	20	45	20	18	18	12			0	
1526	306+73.3	20th Ave/US2 WB On/Off Ramp	4	12	6		2	2	2			0	
1527	306+62.8	20th Ave/US2 WB On/Off Ramp	6	4	3		4	4	3			0	
					0							0	
Total:					2042	828	1301	1301	931			714	54

Item Description	Spall		Concrete Pavement Repair				
	SF	Curb & Gutter	SY	Dowel Jt Assembly	Bar Type		
					Dowel	Deformed	Tie
Spall Totals	714						
Curb and Gutter Totals		54					
CPR Total			2042	828	1301	1301	931
Spall Repair + 25% =	893						
CPR + 25% =			2553	1035	1626	2790	

Earthwork Summary

Location	Common Excavation - Type B (CY) (Pay Item)	Embankment (1) (CY)	Common Excavation - Waste (CY) (Pay Item)
	A	B	C = A-B
Truck Apron	24	1	23
Guardrail Pad	65	14	51
Total	89	15	74

(1) Shrinkage: 25% additional volume is included for shrinkage in earth embankment

Preliminary Plans

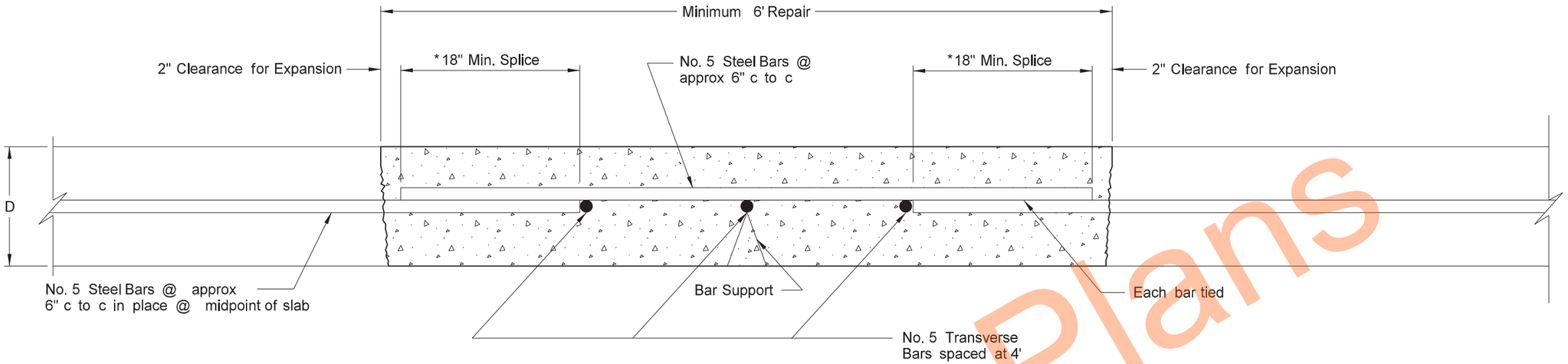
Quantities

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

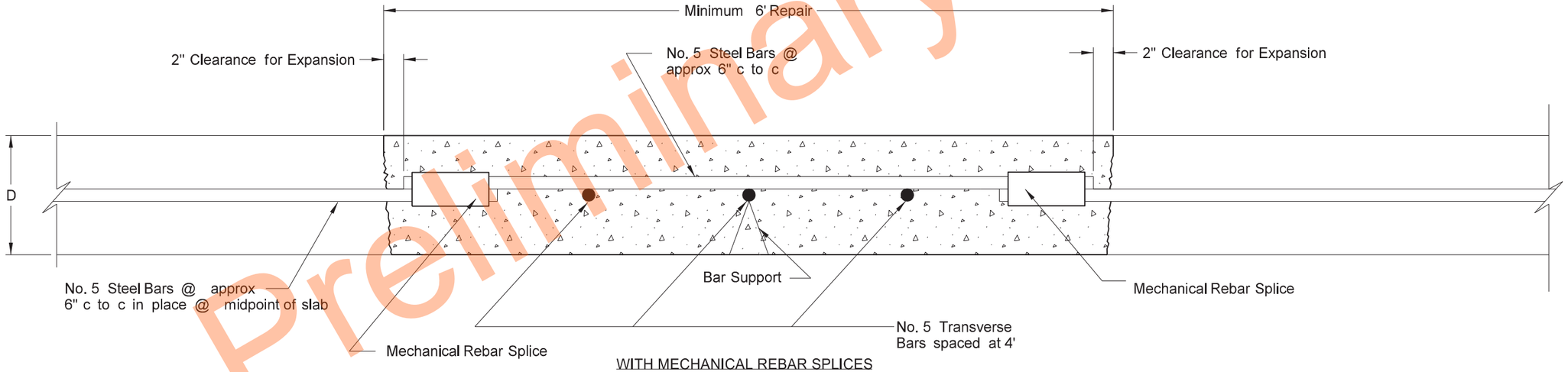
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/24/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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WITHOUT MECHANICAL REBAR SPLICES



WITH MECHANICAL REBAR SPLICES

NOTE: Repair the passing lane first when repair area includes both lanes.

*Transverse and Longitudinal Bars minimum splice length may be reduced when using Mechanical Rebar Splices.

D = PCC pavement depth

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

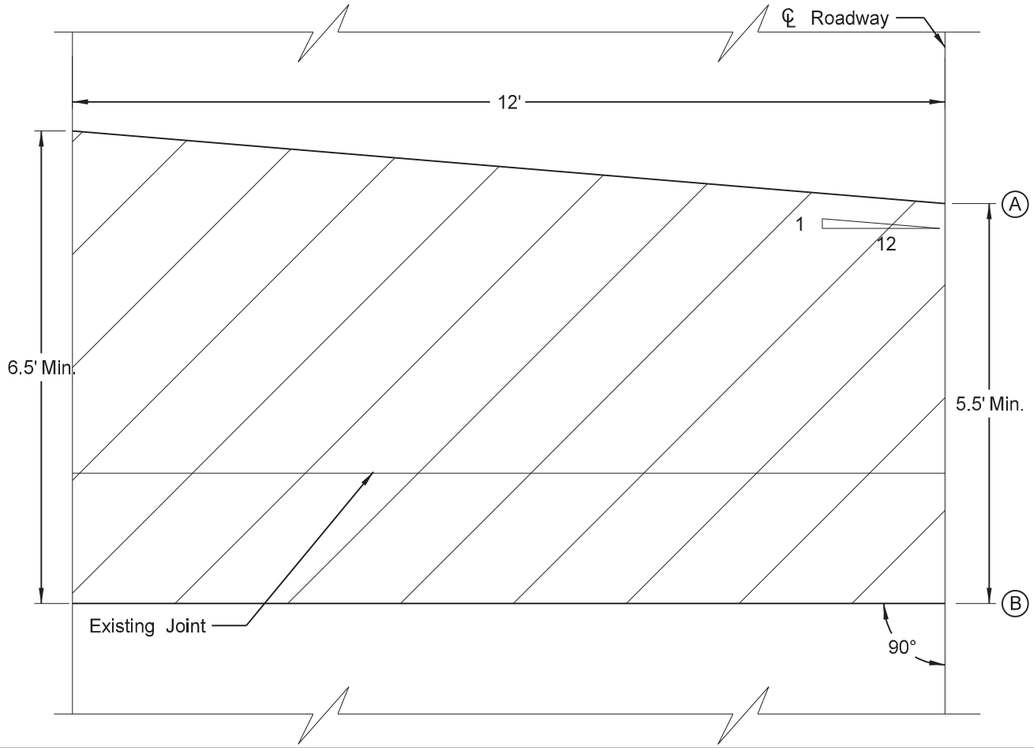
16th Street Interchange Rehabilitation

Jointed Non-Reinforced PCC Pavement
Spall Repair Detail

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	20	2



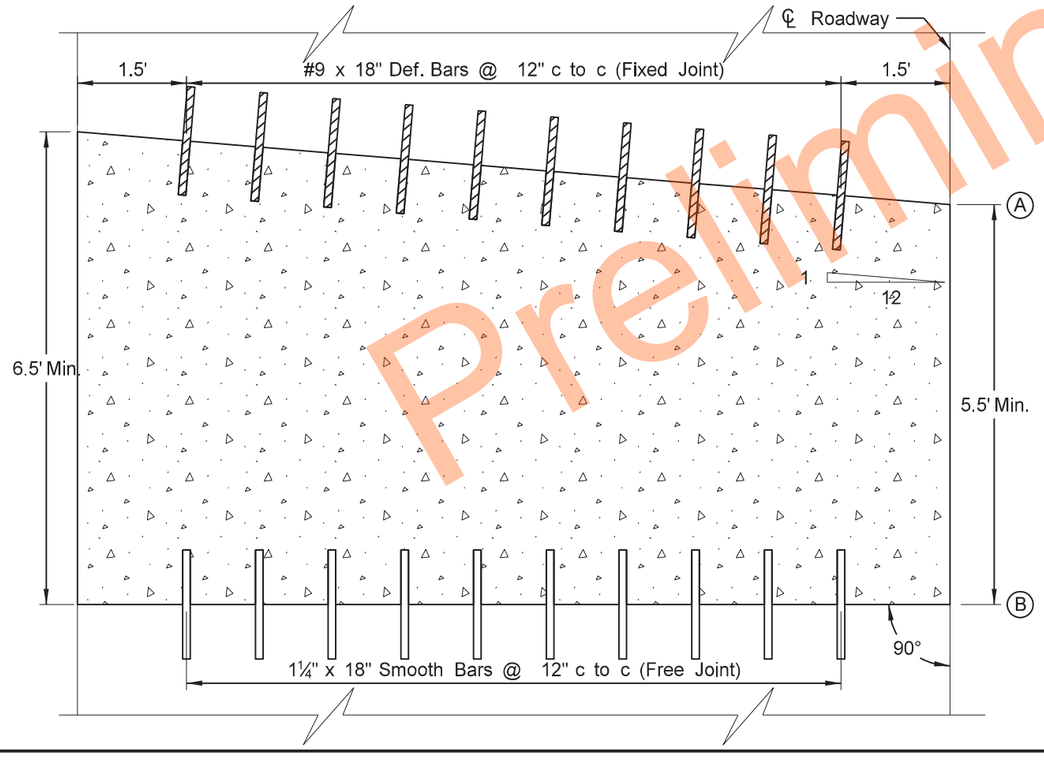
PCC Pavement Removal

Notes

1. Joint Ⓐ (Fixed Joint) shall be the new joint with the shortest distance to the next transverse joint or working random crack. Place deformed bars perpendicular to the face of the saw cut.

2. Joint Ⓑ (Free Joint) shall be the new joint with the greatest distance to the next transverse joint or working random crack. Install smooth bars within the tolerances shown on the "Dowel Bar Placement - Full Depth Repair" detail sheet.

3. Place free joint (JointⒷ) on the approach side of the repair when the distance to the next transverse joint or working random crack is equal for both new joints.



PCC Pavement Placement

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

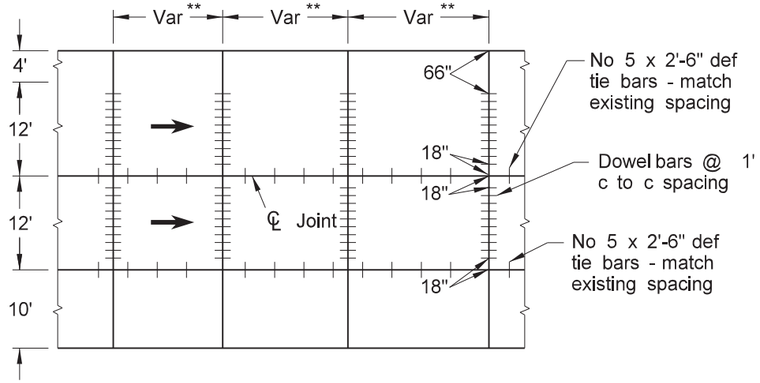
16th Street Interchange Rehabilitation

Jointed Concrete Pavement Repair
Full-Depth, Non-Reinforced PCC Pavement
(Longitudinatl Length Less than One Panel)

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

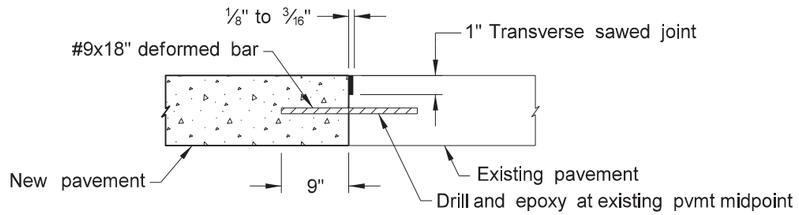
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	20	3



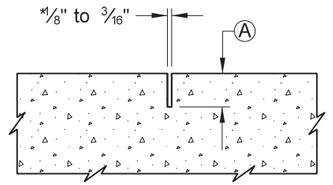
TRANSVERSE JOINTS

** Joint Spacing to match existing (Varies from 14' to 18')



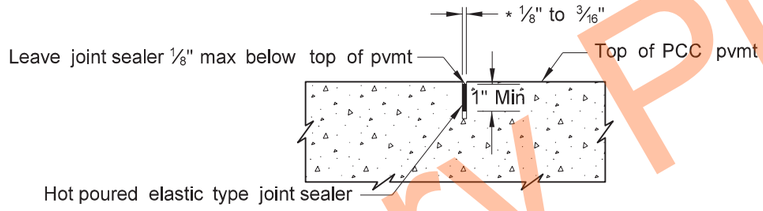
DEFORMED BAR INSTALLATION

(Spaced at 2'-0" C to C)



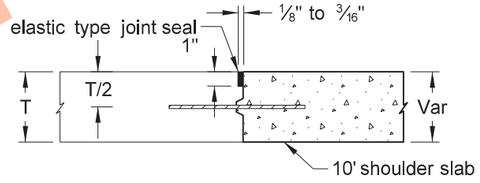
SAWED, TIED LONGITUDINAL JOINTS

(Mainline and ramps)



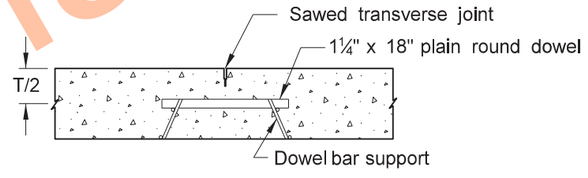
(All sawed and tied joints)

JOINT SEALING DETAIL

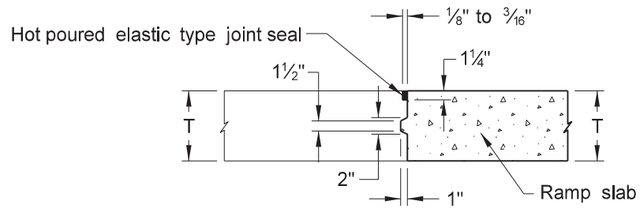


LONGITUDINAL CONSTRUCTION JOINT

(10' shoulder - keyed & tied)

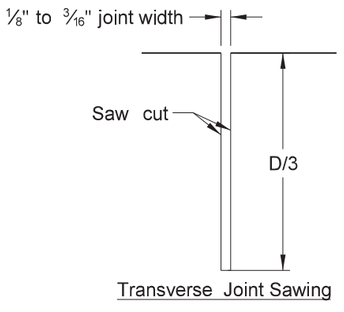


DOWELED TRANSVERSE JOINT

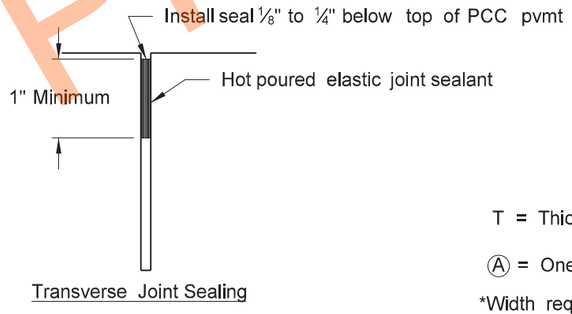


LONGITUDINAL CONSTRUCTION JOINT

(at Ramps - Keyed)



Transverse Joint Sawing



Transverse Joint Sealing

T = Thickness of PCC Pvmt

Ⓐ = One-Third thickness of PCC Pavement

*Width requirement for top 1" only, bottom portion of sawcut may be narrower.

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

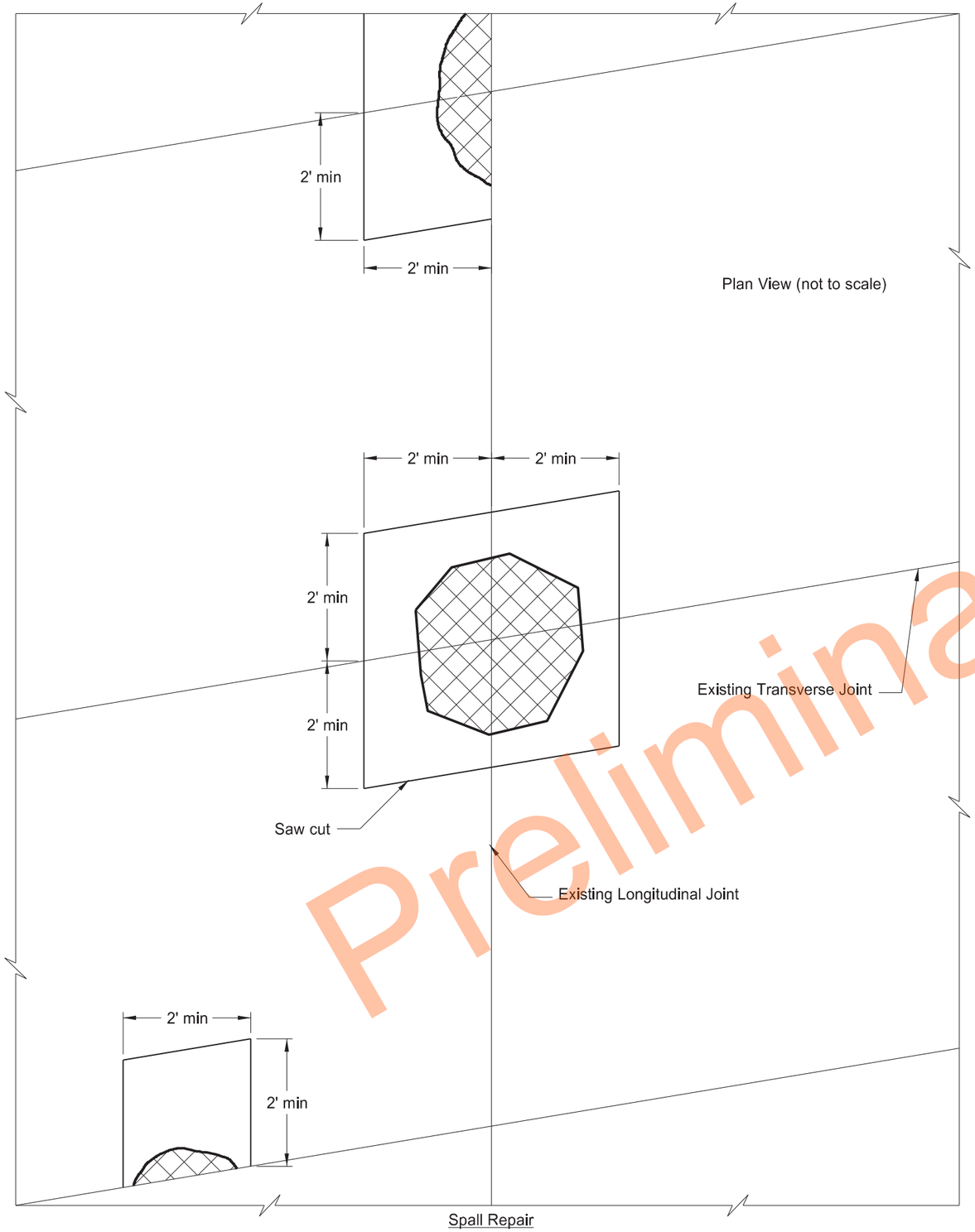
16th Street Interchange Rehabilitation

Joint Details for Repairs 1 Panel or More in Length

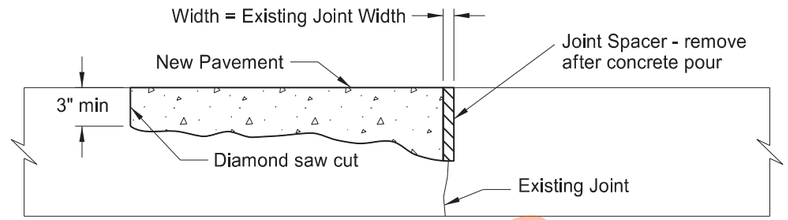
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STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

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Spall Repair

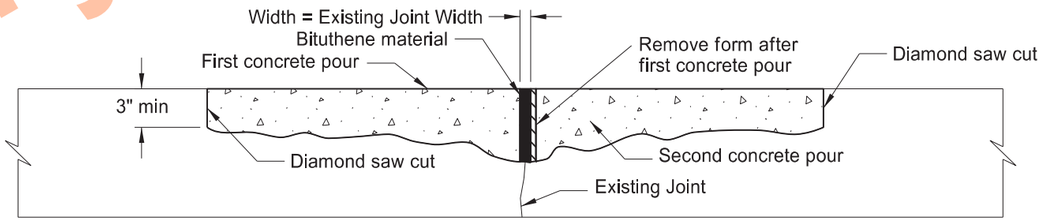


Cross Section - "Repair Area on One Side of Transverse Joint"

Notes:

1. Place a spacer material, that is easily removable after the pour, on the transverse joint face to maintain the width of the existing transverse joint during repair. A bituthene waterproofing material a minimum 260 mil (approximately ¼") thick or equal to the width of the existing joint, whichever is greater, may be used for this purpose. Cut it to fit over the entire face of the existing joint to provide for expansion and prevent water from entering the existing joint through the sides or bottom. Press it into place to conform to the face of the existing joint.

2. Diamond saw cut not mandatory when using milling machine for spall repair removals.



Cross Section - "Repair on Both Sides of Transverse Joint"

Spall

Concrete Removal Area limits

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

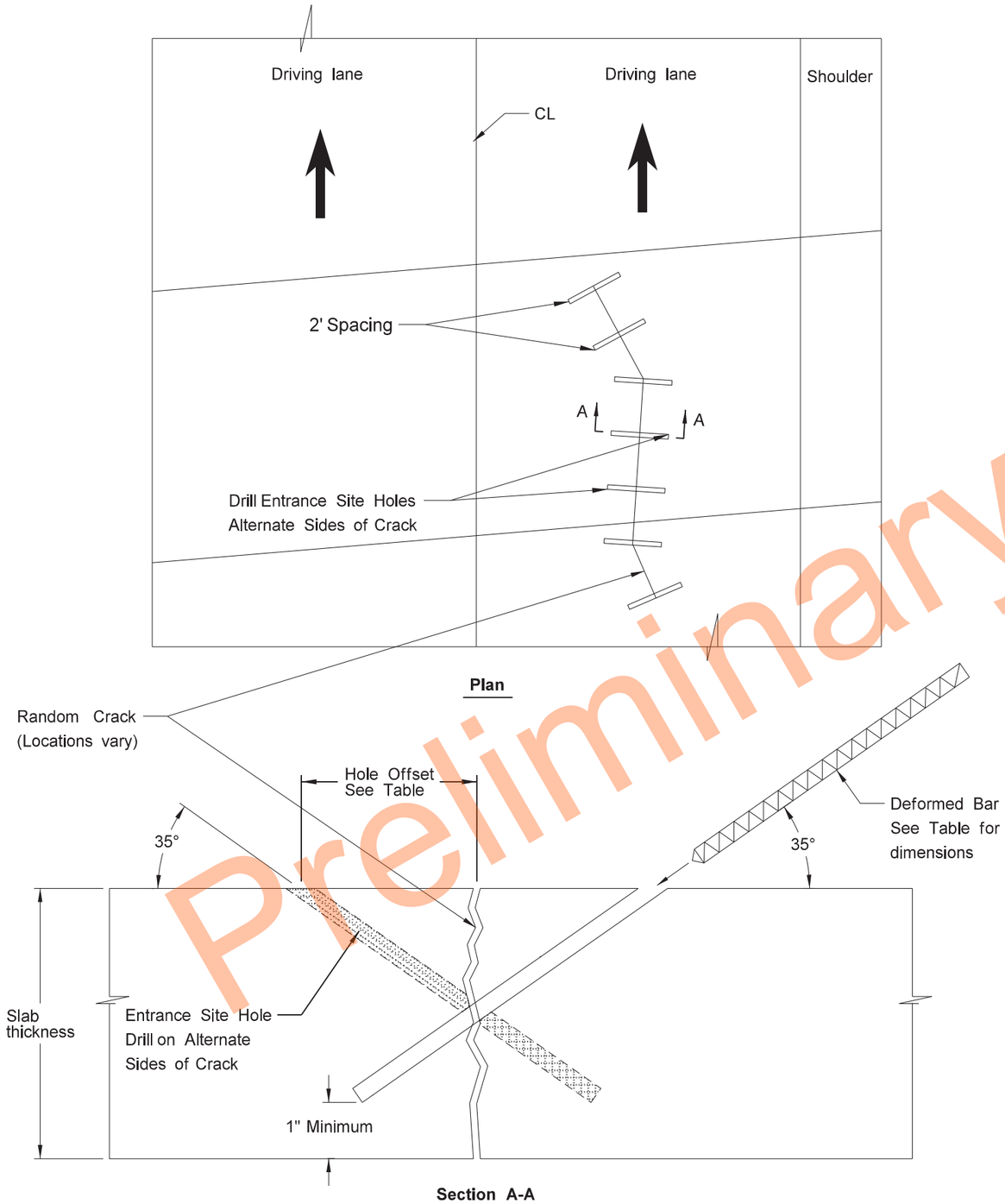
16th Street Interchange Rehabilitation

Jointed Non-Reinforced PCC Pavement
Spall Repair Details

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STACY JOHNSON
PE-27174
DATE: 4/15/25
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Cross Stitching Bar Dimensions & Hole Locations (No 6 Bars)		
Slab Thickness (inches)	Hole Offset (inches)	Bar Length (inches)
8	5.75	9.50

Notes:

1. Epoxy deformed bar into hole. Length shown in table provides 1-inch cover at surface and assume drilling per note 2.
2. Do not drill hole completely through slab. Stop drilling so epoxy/grout will not run out of the bottom when filling.

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

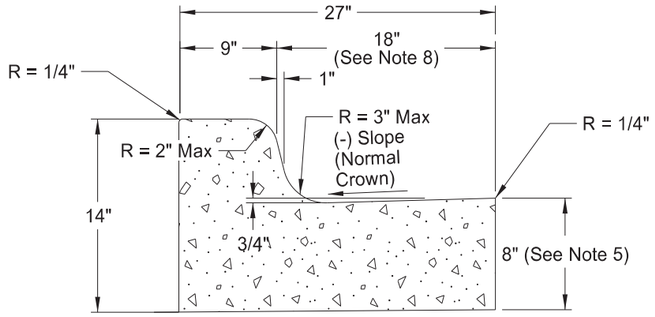
16th Street Interchange Rehabilitation

Random Crack Stitching Detail

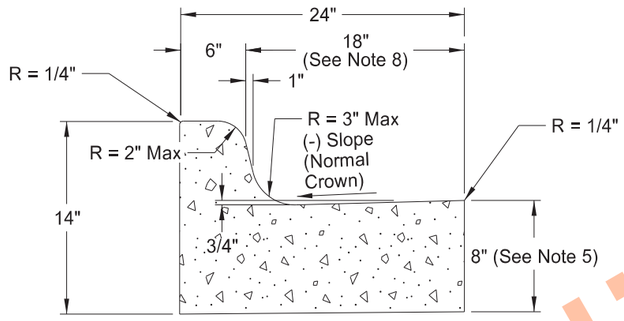
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STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

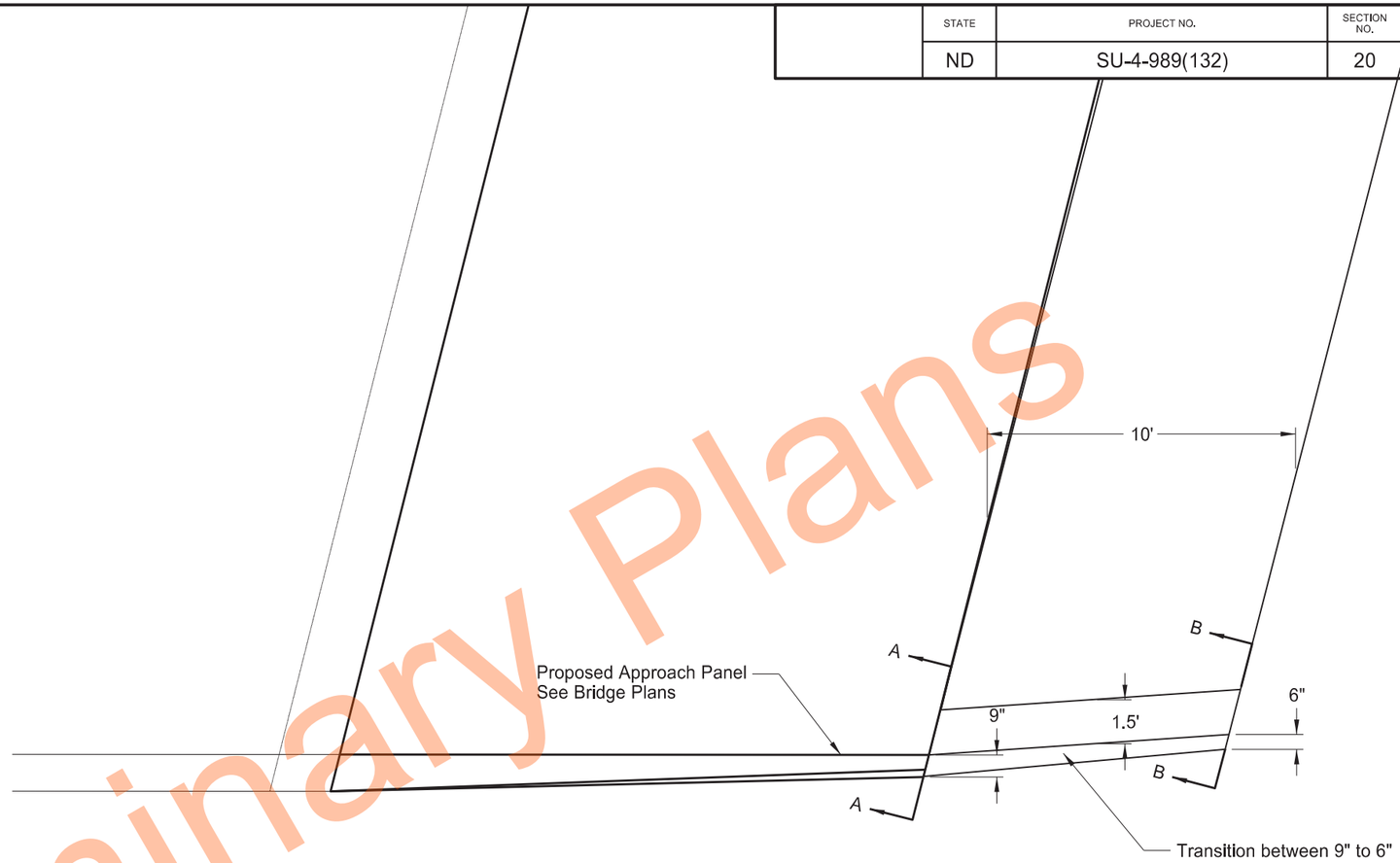
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Curb & Gutter - Type I Special (Sec. A)



Curb & Gutter - Type I Special (Sec. B)



PLAN VIEW

NOT TO SCALE

Notes:

1. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.

2. Isolation Joints: Use 3/4" 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 dowled in the cold joint for the second pour.

3. Joint Spacing: match the joint spacing for the curb and gutter to the pavement joint on PCC pavement (approximately 12' spacing).

4. Joint Sealing: Seal contraction and isolation joints as shown in the details. Use joint sealant for contraction joints that conform 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.

5. Face of Gutter Depth: Match the gutter depth to the depth of adjacent PCC pavement.

6. Tie curb and gutter when abutting PCC pavement with No. 3 bars, 1'-6" in length, spaced at 4" centers.

7. Refer to Standard Drawing D-748-01 for Curb & Gutter Reinforcing and Joint Details at Inlets.

8. Contractor has option to pour curb monolithically with slab.

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

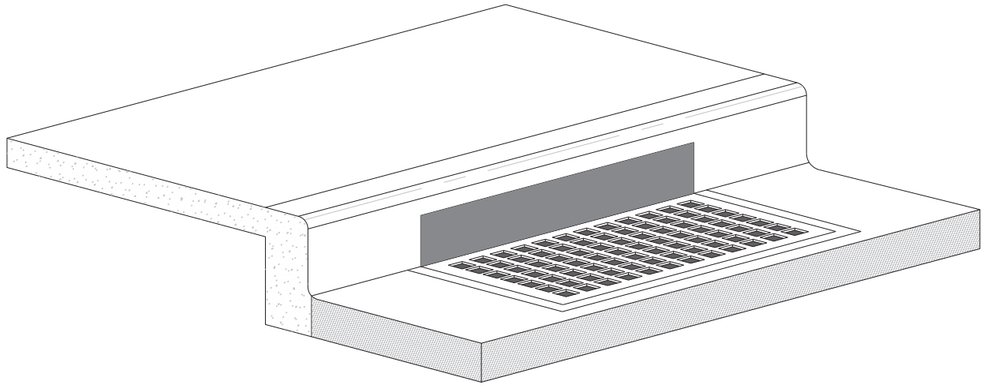
16th Street Interchange Rehabilitation

Curb & Gutter Detail

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
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Preliminary Plans

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Inlet Protection Device

Installation Notes:

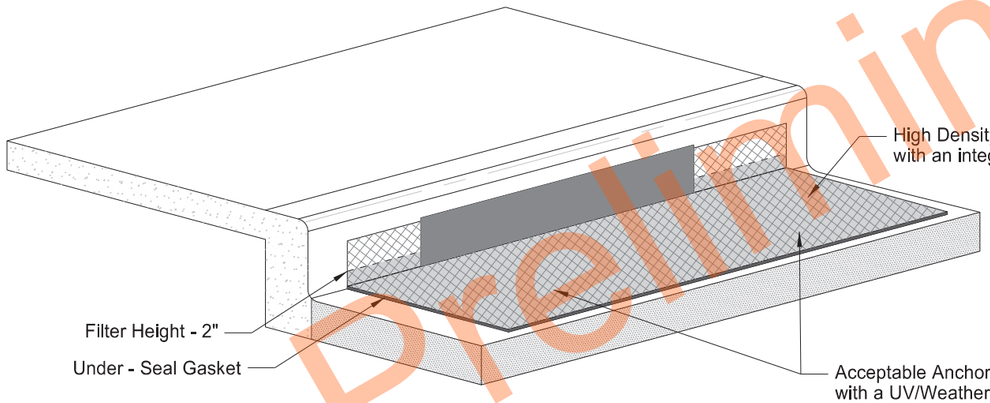
1. Place device tightly against drain opening and cover entire grate. Extend the device at least 2 inches past the grate toward the street.

2. Overlap the segments at longer openings.

3. Anchor the device so that water cannot flow behind it.

General Notes:

1. Remove material that falls into the inlet during maintenance or removal of the device.



Preliminary Plans

General Details

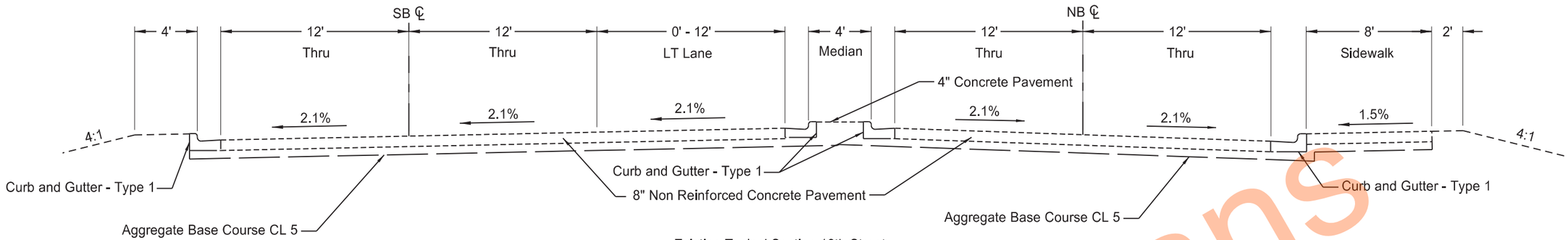
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

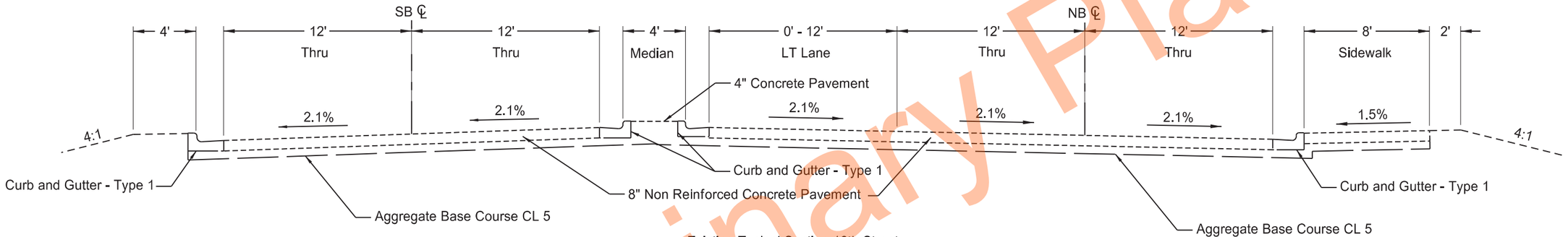
Inlet Protection Device

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STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

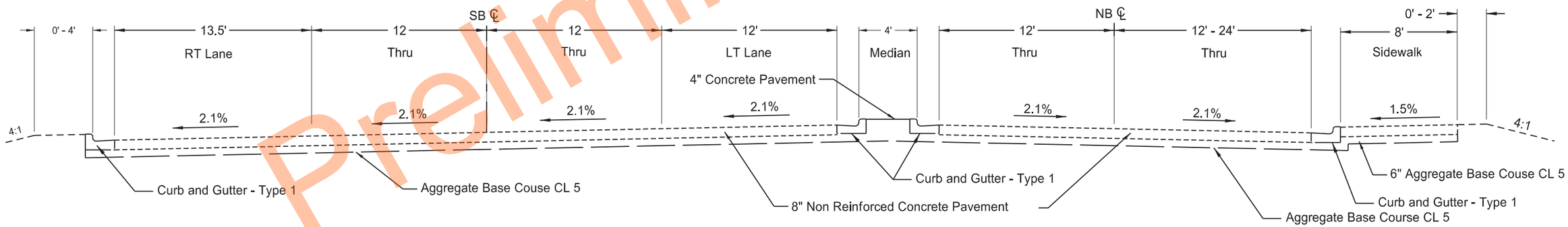
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Existing Typical Section 16th Street
Sta 101+50 to Sta 104+80
Sta 115+30 to Sta 119+70



Existing Typical Section 16th Street
Sta 104+80 to Sta 106+60



Existing Typical Section 16th Street
Sta 107+40 to Sta 109+70

Typical Sections

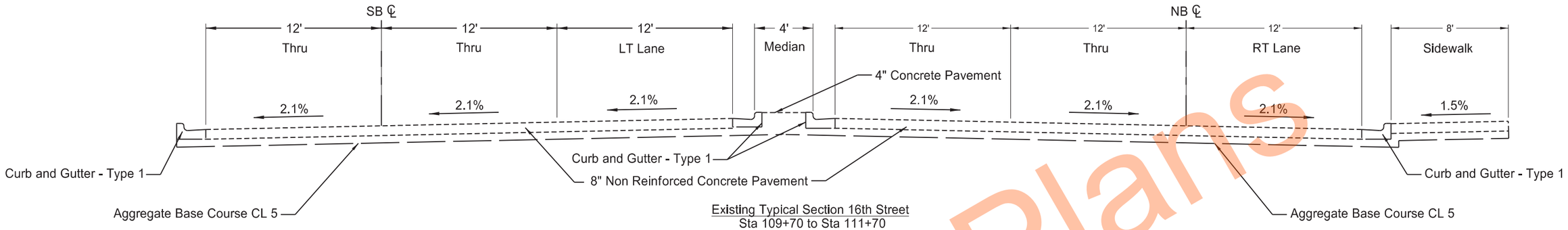
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

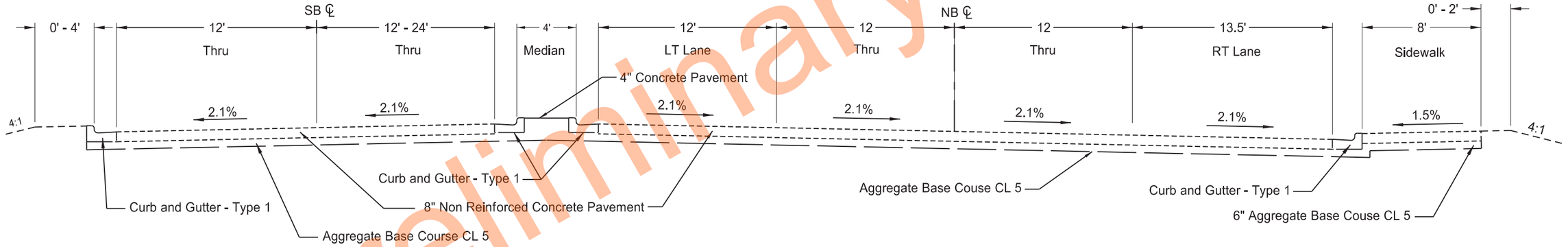
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

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Existing Typical Section 16th Street
Sta 109+70 to Sta 111+70



Existing Typical Section 16th Street
Sta 111+70 to Sta 114+50

Typical Sections

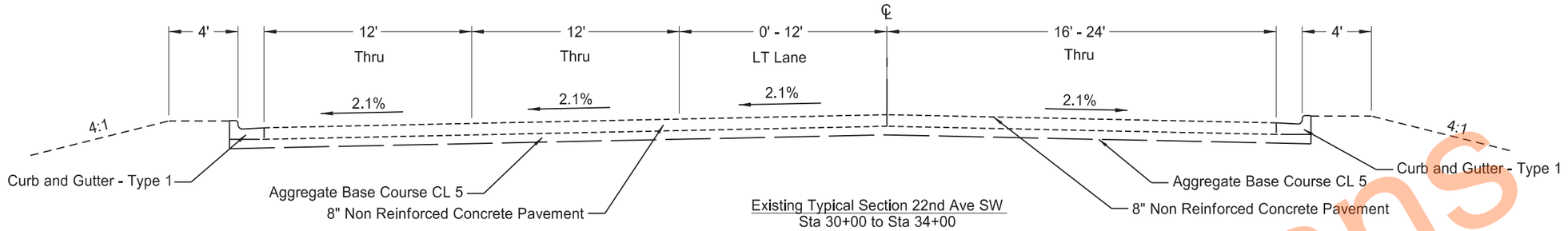
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

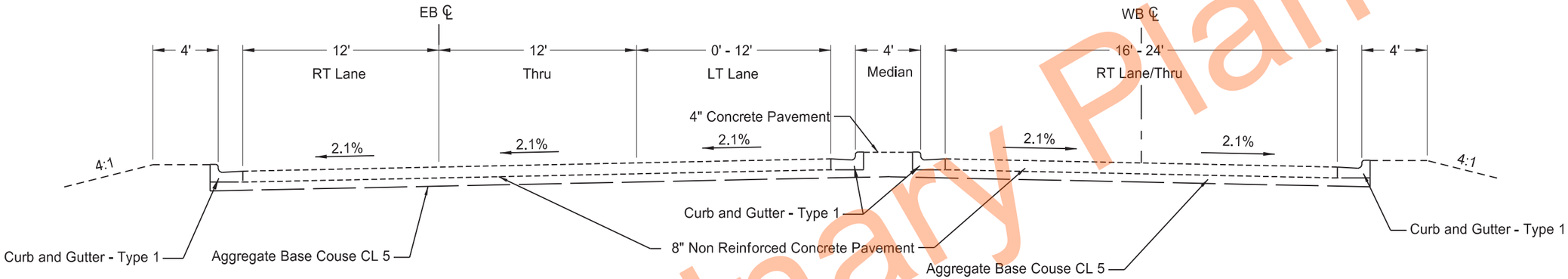
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
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DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

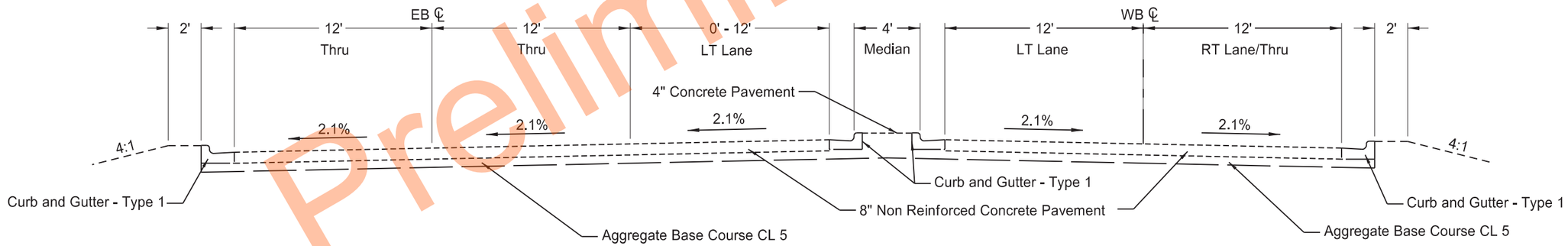
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Existing Typical Section 22nd Ave SW
Sta 30+00 to Sta 34+00



Existing Typical Section 22 Ave SW
Sta 55+10 to Sta 59+60



Existing Typical Section 20th Ave SW
Sta 300+00 to Sta 308+00

Typical Sections

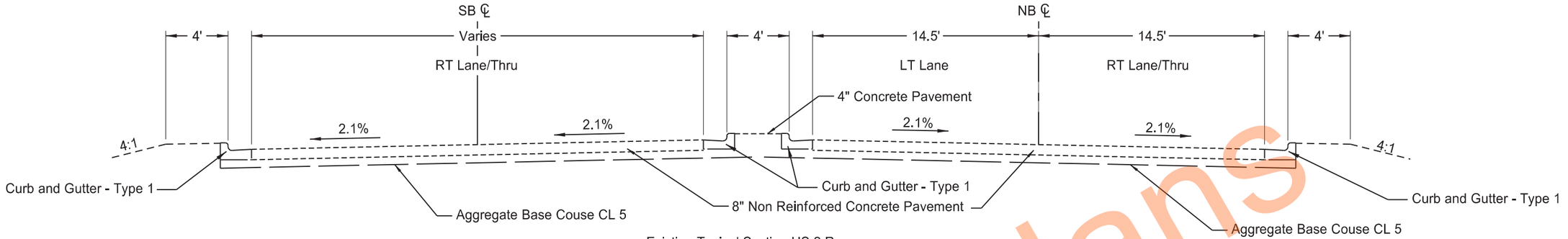
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

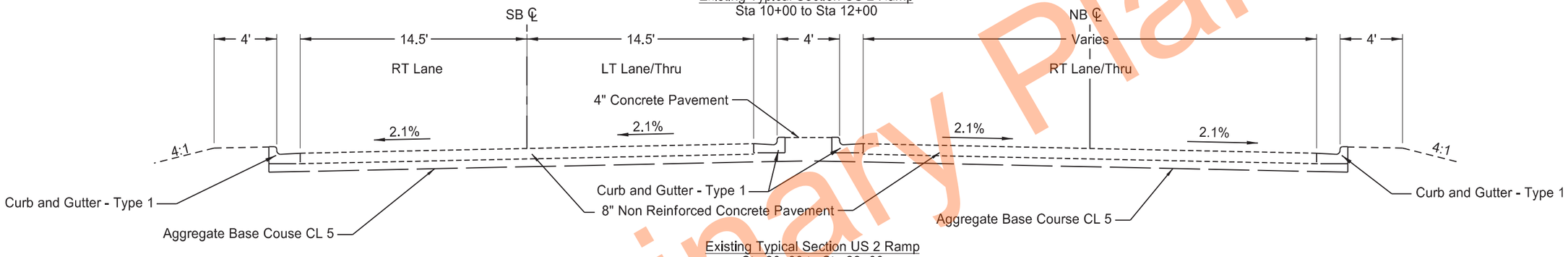
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
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DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

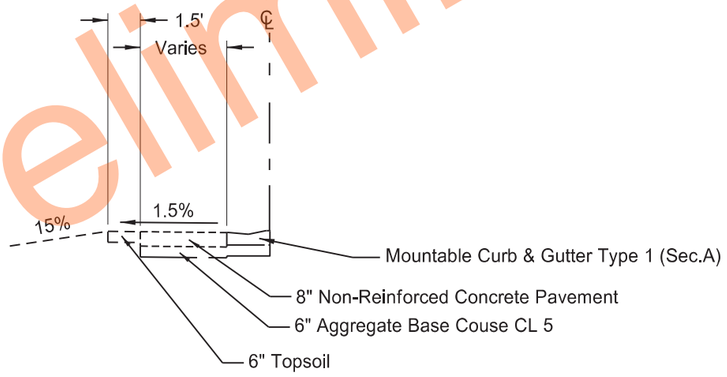
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Existing Typical Section US 2 Ramp
Sta 10+00 to Sta 12+00



Existing Typical Section US 2 Ramp
Sta 20+00 to Sta 22+00



Proposed Typical Section 16th St SW and 20th Ave SW
Truck Turn

Preliminary Plans

Typical Sections

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

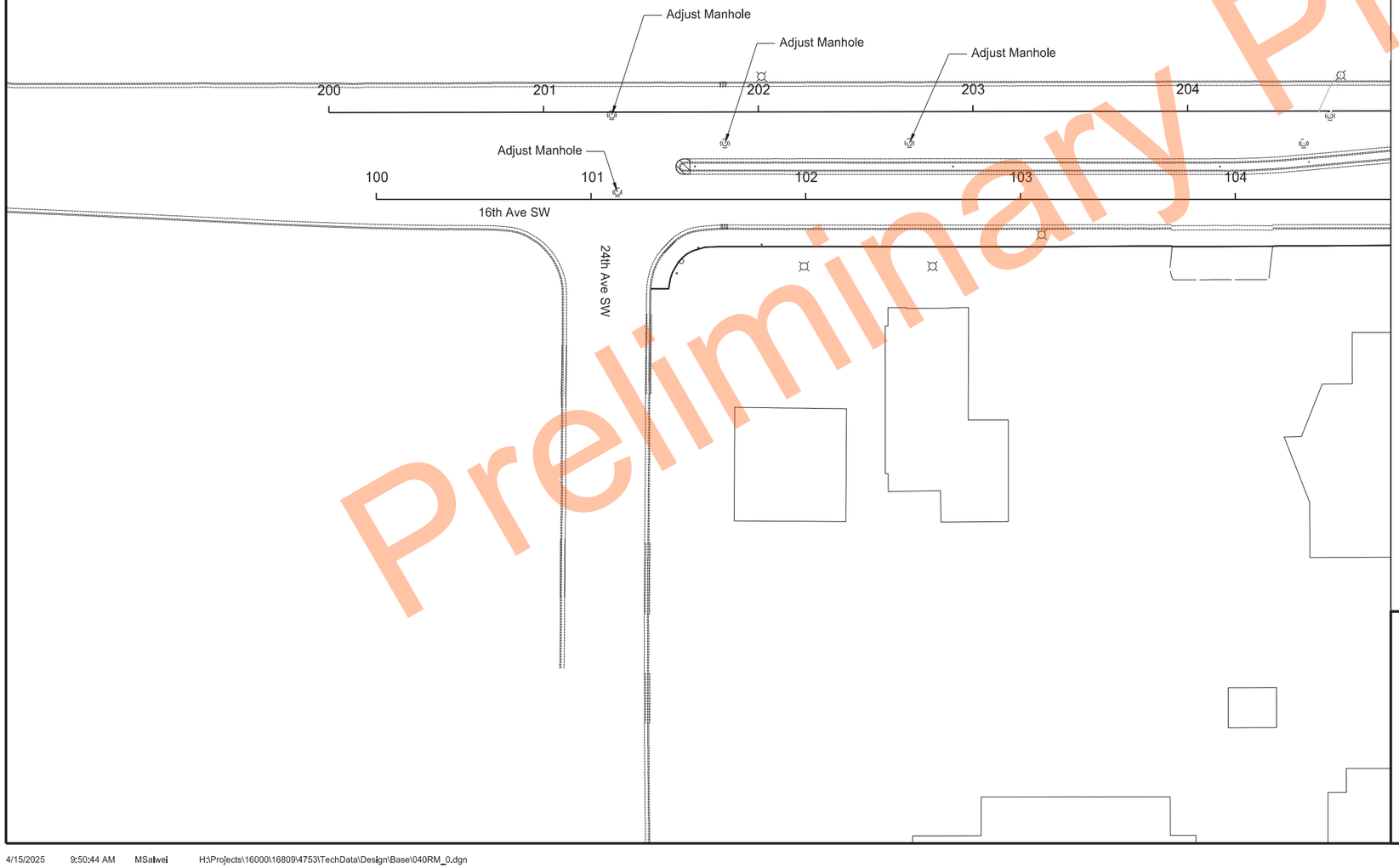
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 101+39.6 to Sta 101+46.1 LT (Median)	4	SY
722	6200	ADJUST MANHOLE		
		Sta 101+09.7 LT	1	EA
		Sta 101+12.1 LT	1	EA
		Sta 101+62.3 LT	1	EA
		Sta 102+48.3 LT	1	EA

Stationing is based off of NB 16th Street Alignment



Legend

- Removal of Concrete Pavement (4IN SIdewalk)
- Removal of Concrete Pavement (Median)
- Removal of Concrete Pavement (Roadway)
- REMOVE — Removal of Curb & Gutter
- Saw Concrete (Incidental)

Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
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PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	40	2

SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 105+30.8 to Sta 106+58.8 LT (Median)	47	SY
		Sta 106+35.8 to Sta 106+55.9 RT (Sidewalk)	13	SY
		Sta 106+45.4 to Sta 106+69.0 RT (Roadway)	36	SY
		Sta 106+40.4 to Sta 106+53.9 LT (Sidewalk)	16	SY
		Sta 106+44.1to Sta 106+56.9 LT (Roadway)	4	SY
		Sta 106+80.0 to Sta 106+86.4 RT (Median)	4	SY
		Sta 107+14.3 to Sta 107+21.5 LT (Median)	4	SY
		Sta 107+19.6 to Sta 107+59.1 RT (Roadway)	80	SY
		Sta 107+25.2 to Sta 107+59.1 RT (Sidewalk)	19	SY
		Sta 107+37.2 to Sta 107+72.9 LT (Roadway)	26	SY
		Sta107+42.1to Sta 107+68.5 LT (Median)	34	SY
		Sta 107+41.9 to Sta 109+73.4 LT (Median)	85	SY
202	0130	REMOVAL OF CURB & GUTTER		
		Sta 105+30.8 to Sta 106+58.8 LT (Median)	260	LF
		Sta 106+30.0 to Sta 106+58.0 RT	35	LF
		Sta 106+30.1to Sta 106+57.1 LT	28	LF
		Sta 107+28.8 to Sta 107+59.1 RT	39	LF
		Sta 107+39.8 to Sta 107+70.3 LT (Median)	87	LF
		Sta 107+41.9 to Sta 109+73.4 LT (Median)	467	LF
722	6160	ADJUST INLET		
		Sta 107+45.6 LT	1	EA
722	6200	ADJUST MANHOLE		
		Sta 104+31.9 LT	1	EA
		Sta 104+44.2 LT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

- Removal of Concrete Pavement (4IN Sldewalk)
- Removal of Concrete Pavement (Median)
- Removal of Concrete Pavement (Roadway)
- REMOVE — Removal of Curb & Gutter
- Saw Concrete (Incidental)

Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	40	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 112+78.9 to Sta 114+46.1 LT (Median)	61	SY
		Sta 113+86.9 to Sta 114+31.8 RT (Sidewalk)	43	SY
		Sta 113+92.0 to Sta 114+38.0 RT (Roadway)	29	SY
		Sta 114+24.2 to Sta 114+60.3 RT (Roadway)	27	SY
		Sta 114+28.7 to Sta 114+55.8 RT (Median)	37	SY
		Sta 114+73.2 to Sta 114+84.2 RT (Median)	10	SY
		Sta 114+90.2 to Sta 115+17.4 RT (Roadway)	52	SY
		Sta 115+09.3 to Sta 116+25.7 RT (Sidewalk)	18	SY
		Sta 115+28.9 to Sta 116+50.0 LT (Median)	35	SY
202	0130	REMOVAL OF CURB & GUTTER		
		Sta 112+78.9 to Sta 114+46.1 LT (Median)	340	LF
		Sta 113+86.9 to Sta 114+33.8 RT	60	LF
		Sta 112+57.7 to Sta 114+77.0 LT	237	LF
		Sta 114+26.8 to Sta 114+57.5 RT (Median)	90	LF
		Sta 114+73.2 to Sta 114+84.2 RT (Median)	67	LF
		Sta 115+01.9 to Sta 115+19.2 RT	33	LF
		Sta 115+28.9 to Sta 116+50.0 LT (Median)	204	LF
722	6160	ADJUST INLET		
		Sta 114+46.9 LT	1	EA
		Sta 114+53.4 RT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

- Removal of Concrete Pavement (4IN Sldewalk)
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- REMOVE — Removal of Curb & Gutter
- Saw Concrete (Incidental)

Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

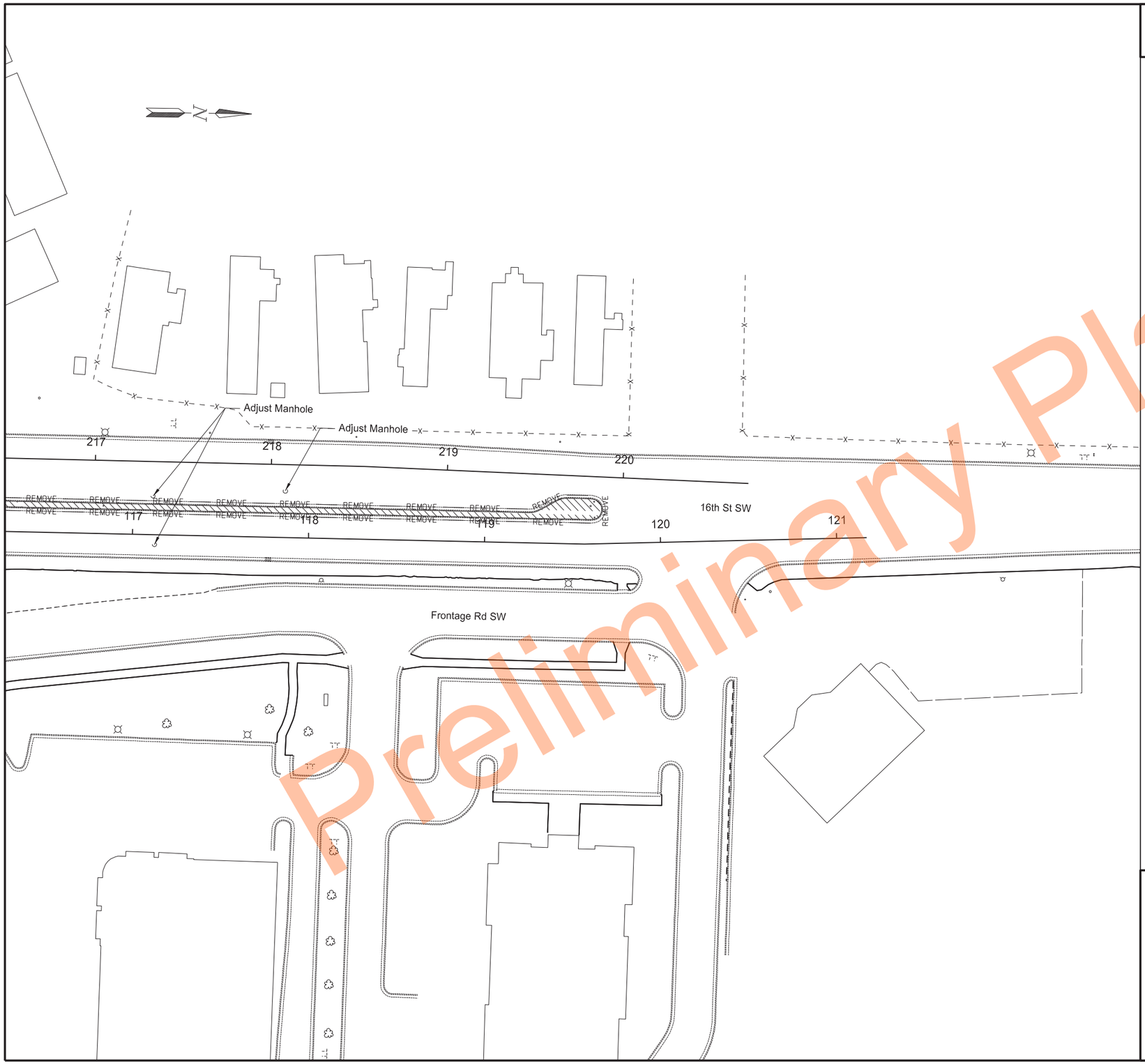
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	40	4

SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 116+50.0 to Sta 119+67.1 LT (Median)	150	SY
202	0130	REMOVAL OF CURB & GUTTER		
		Sta 116+50.0 to Sta 119+67.1 LT (Median)	693	LF
722	6200	ADJUST MANHOLE		
		Sta 117+11.2 LT	1	EA
		Sta 117+12.6 RT	1	EA
		Sta 117+86.3 LT	1	EA

Stationing is based off of NB 16th Street Alignment



Legend

- Removal of Concrete Pavement (4IN Sldewalk)
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- Saw Concrete (Incidental)

Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

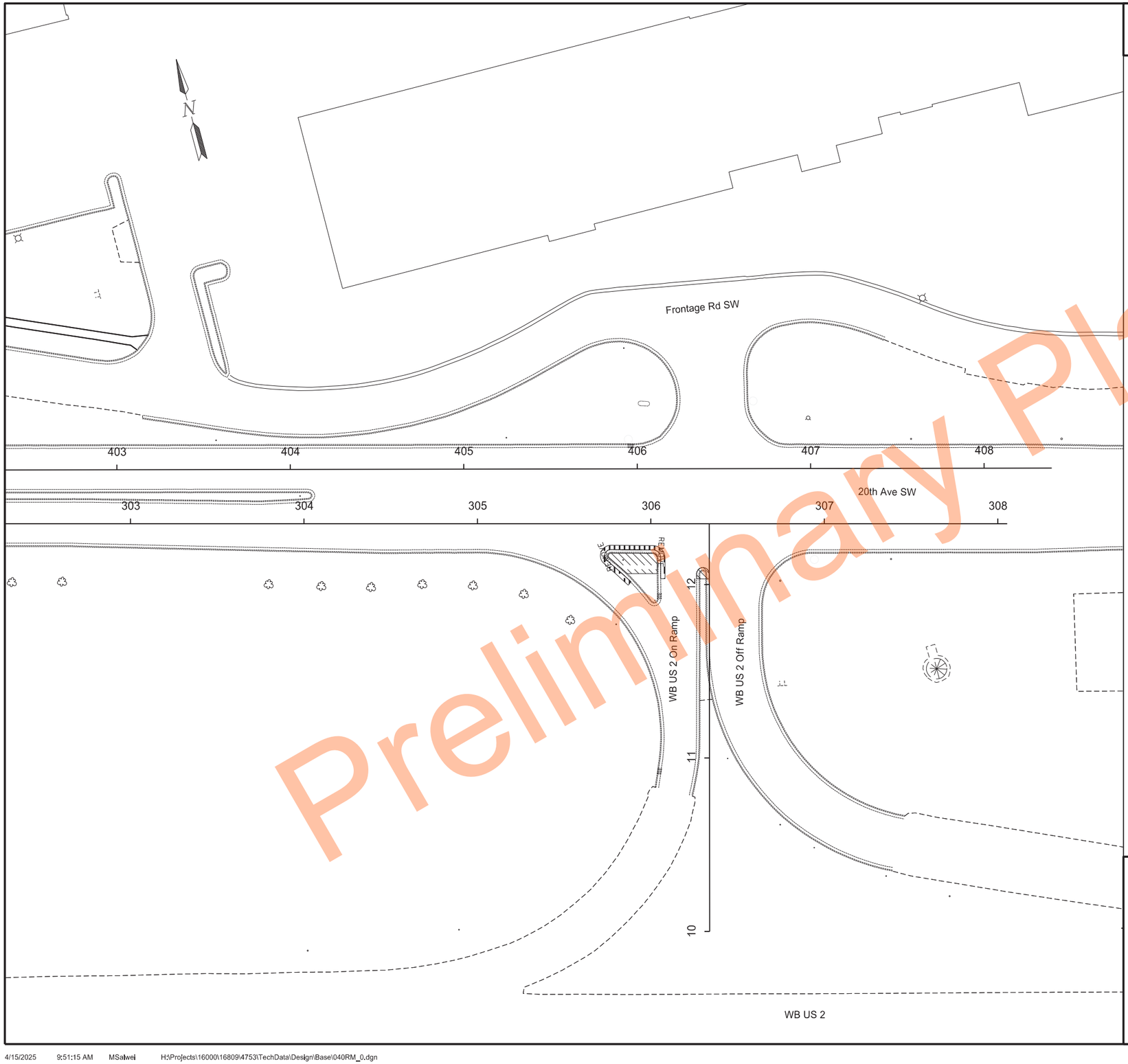
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(1320	40	5

SPEC	CODE	BID ITEM	QTY	UNIT
202	114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 305+75.4 to Sta 306+03.6 RT (Median)	31	SY
		Sta 306+26.5 to Sta 306+33.5 RT (Median)	4	SY
		Sta 305+20.9 to Sta 306+08.1 RT (Roadway)	20	SY
202	0130	REMOVAL OF CURB & GUTTER		
		Sta 305+74.9 to Sta 306+04.1 RT (Median)	72	LF

Stationing is based off of EB 20th Ave SW Alignment



Legend

- Removal of Concrete Pavement (4IN Sldewalk)
- Removal of Concrete Pavement (Median)
- Removal of Concrete Pavement (Roadway)
- REMOVE — Removal of Curb & Gutter
- Saw Concrete (Incidental)

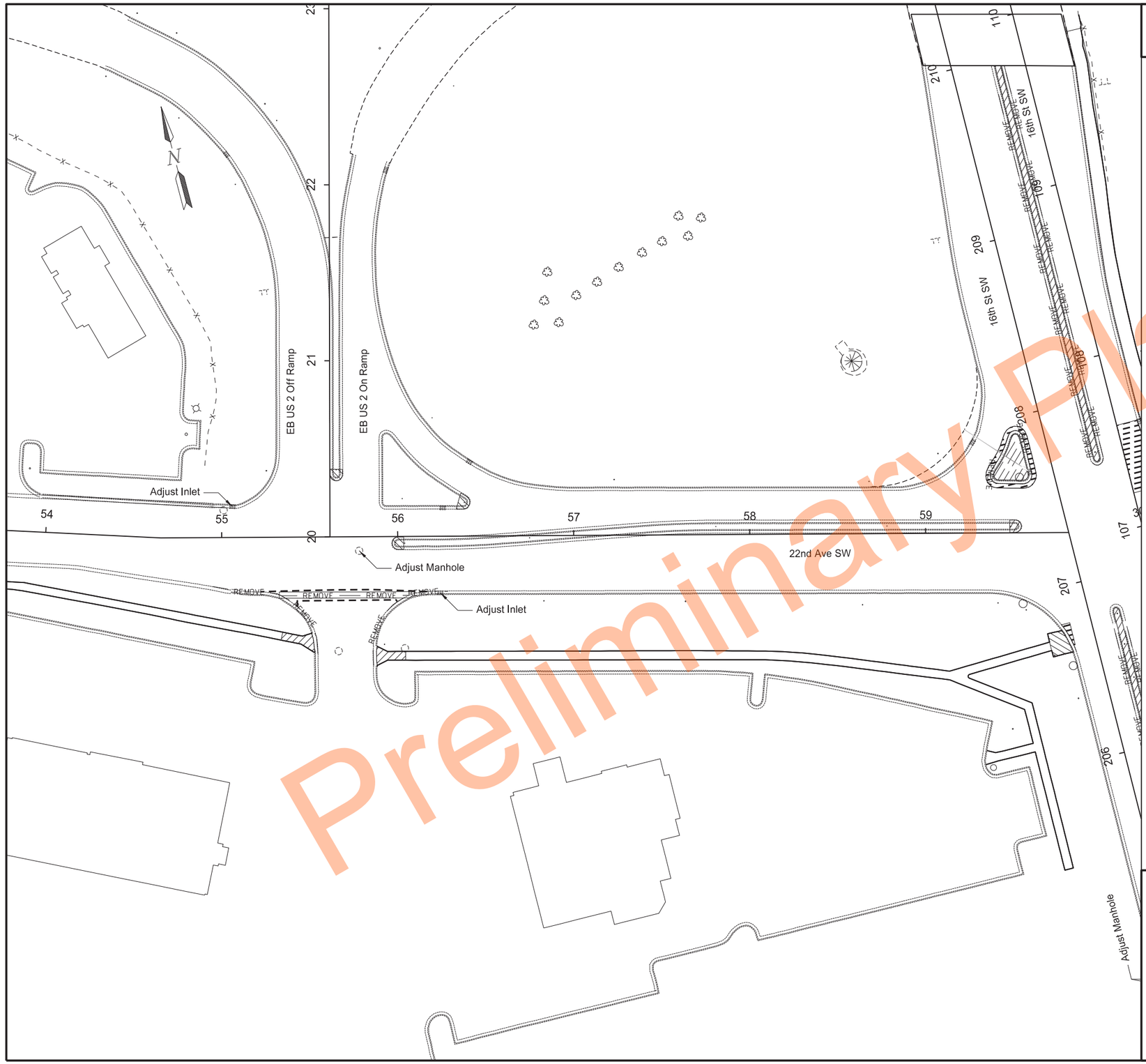
Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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STACY JOHNSON
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Preliminary Plans



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	40	6

SPEC	CODE	BID ITEM	QTY	UNIT
202	114	REMOVAL OF CONCRETE PAVEMENT		
		Sta 55+34.3 to Sta 55+52.7 RT (Sidewalk)	12	SY
		Sta 55+61.9 to Sta 55+68.9 LT (Median)	4	SY
		Sta 55+87.6 to Sta 56+04.4 RT (Sidewalk)	11	SY
		Sta 55+96.9 to Sta 56+03.4 RT (Median)	4	SY
		Sta 56+33.4 to Sta 56+40.9 LT (Median)	5	SY
202	0139	REMOVAL OF CURB & GUTTER		
		Sta 54+94.7 to Sta 55+54.3 RT	81	LF
		Sta 54+94.1to Sta 55+16.0 LT	24	LF
		Sta 55+33.7 to Sta 56+06.2 RT	72	LF
		Sta 55+85.1to Sta 56+28.3 LT	71	LF
722	6160	ADJUST INLET		
		Sta 55+06.2 LT	1	EA
		Sta 56+24.0 RT	1	EA
722	6200	ADJUST MANHOLE		
		Sta 55+78.0	1	EA

Stationing is based off of centerline 22nd Ave SW Alignment

Legend

- Removal of Concrete Pavement (4IN Sldewalk)
- Removal of Concrete Pavement (Median)
- Removal of Concrete Pavement (Roadway)
- REMOVE — Removal of Curb & Gutter
- Saw Concrete (Incidental)

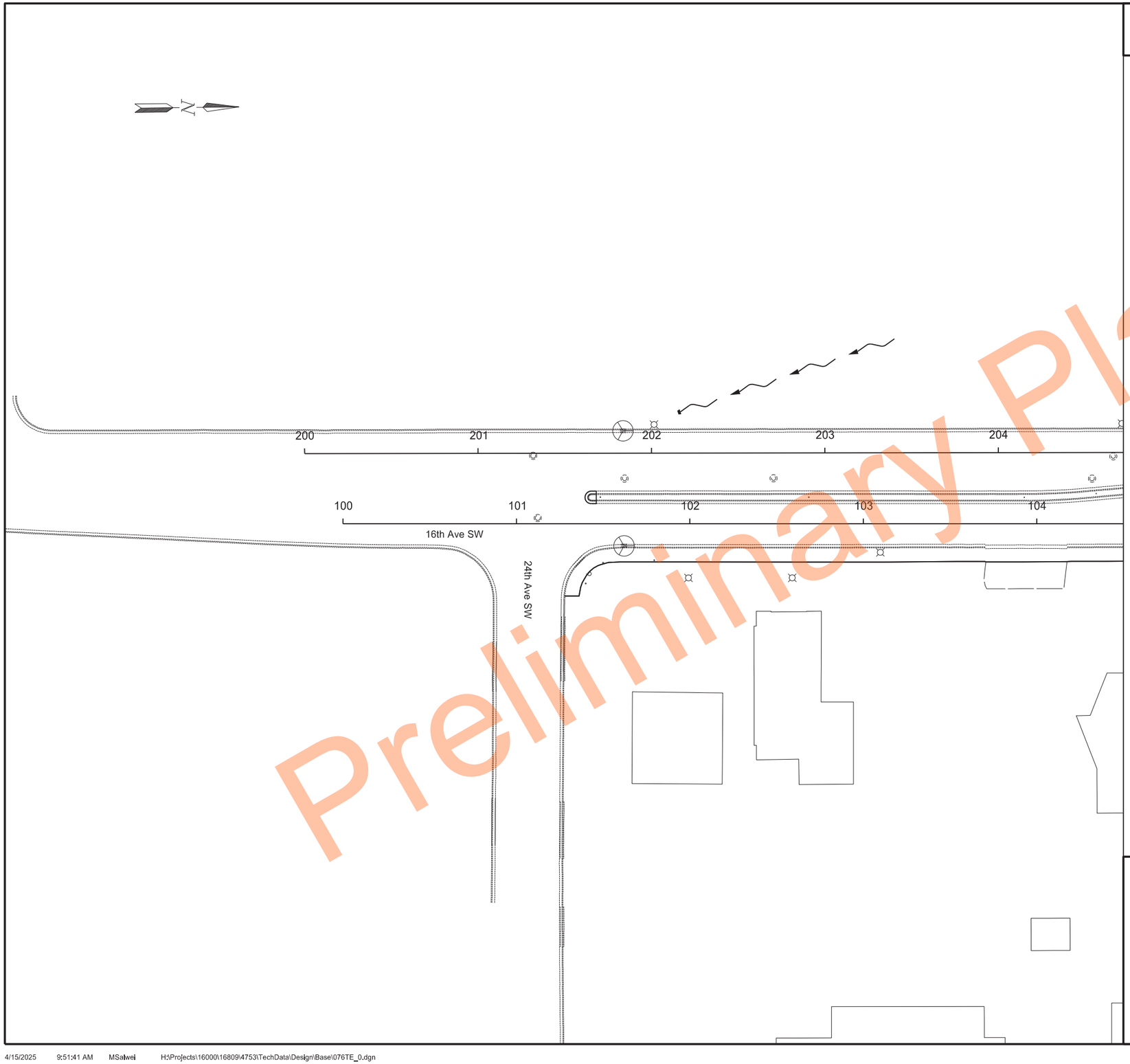
Removals

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	1

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 101+61.43 LT	1	EA
		Sta 101+62.07 RT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 101+61.43 LT	1	EA
		Sta 101+62.07 RT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

Inlet Protection

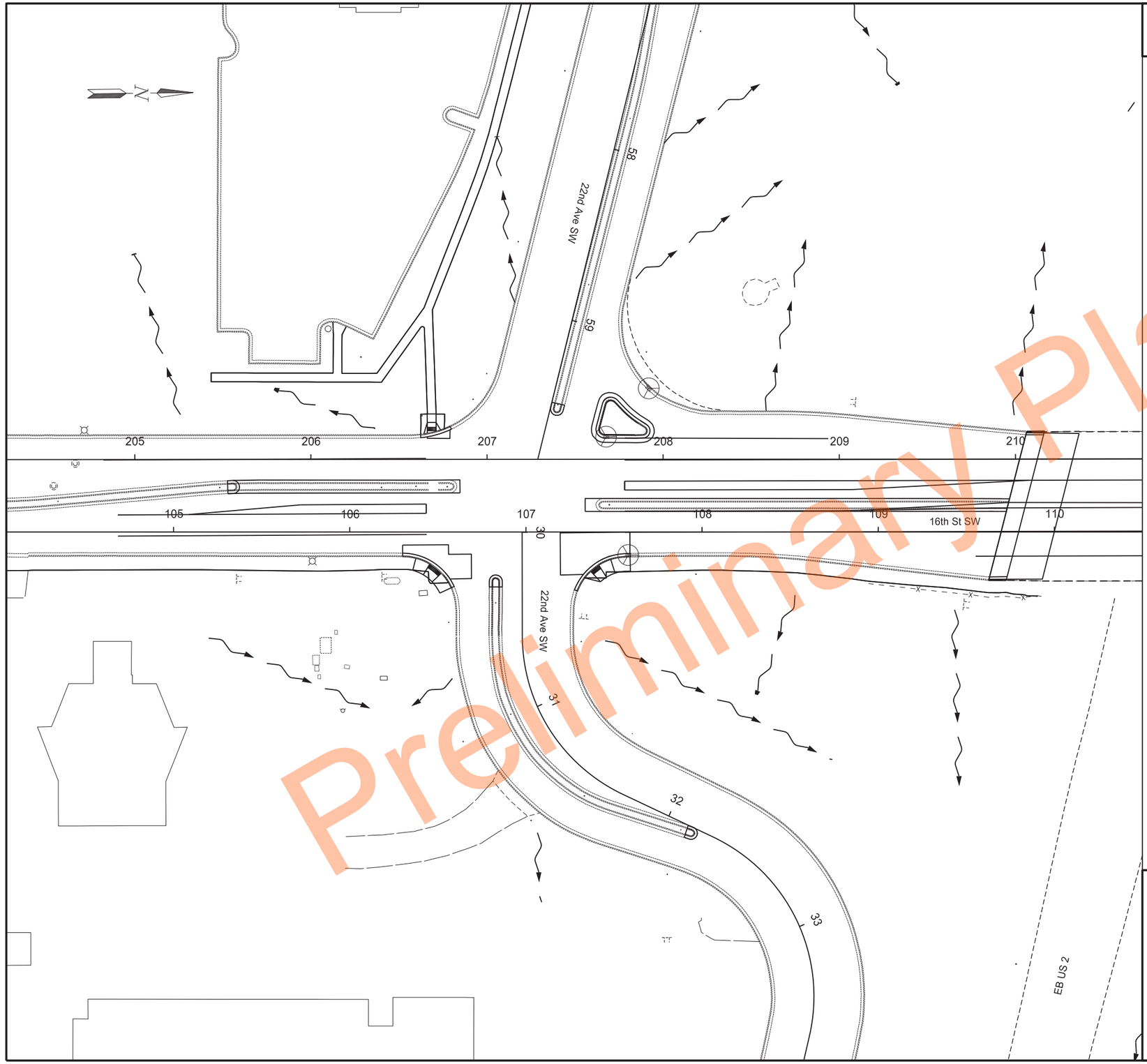
Temporary Erosion Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
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Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	2

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 107+45.55 LT	1	EA
		Sta 107+58.07 RT	1	EA
		Sta 107+69.79 LT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 107+45.55 LT	1	EA
		Sta 107+58.07 RT	1	EA
		Sta 107+69.79 LT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

Inlet Protection

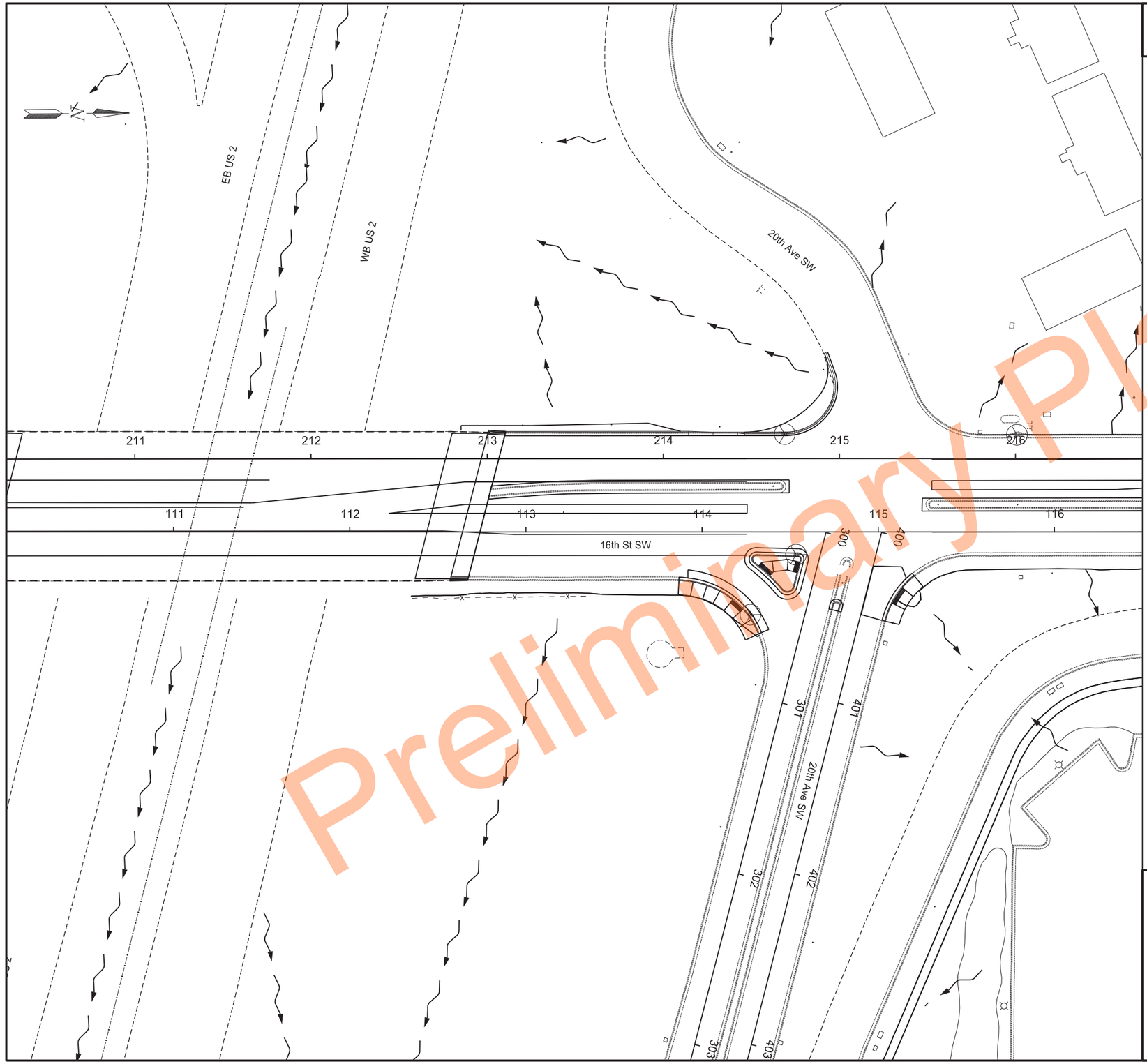
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16th Street Interchange Rehabilitation

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Preliminary Plans



Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	3

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 114+27.50 RT	1	EA
		Sta 114+46.89 LT	1	EA
		Sta 114+53.36 RT	1	EA
		Sta 115+78.89 LT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 114+27.50 RT	1	EA
		Sta 114+46.89 LT	1	EA
		Sta 114+53.36 RT	1	EA
		Sta 115+78.89 LT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

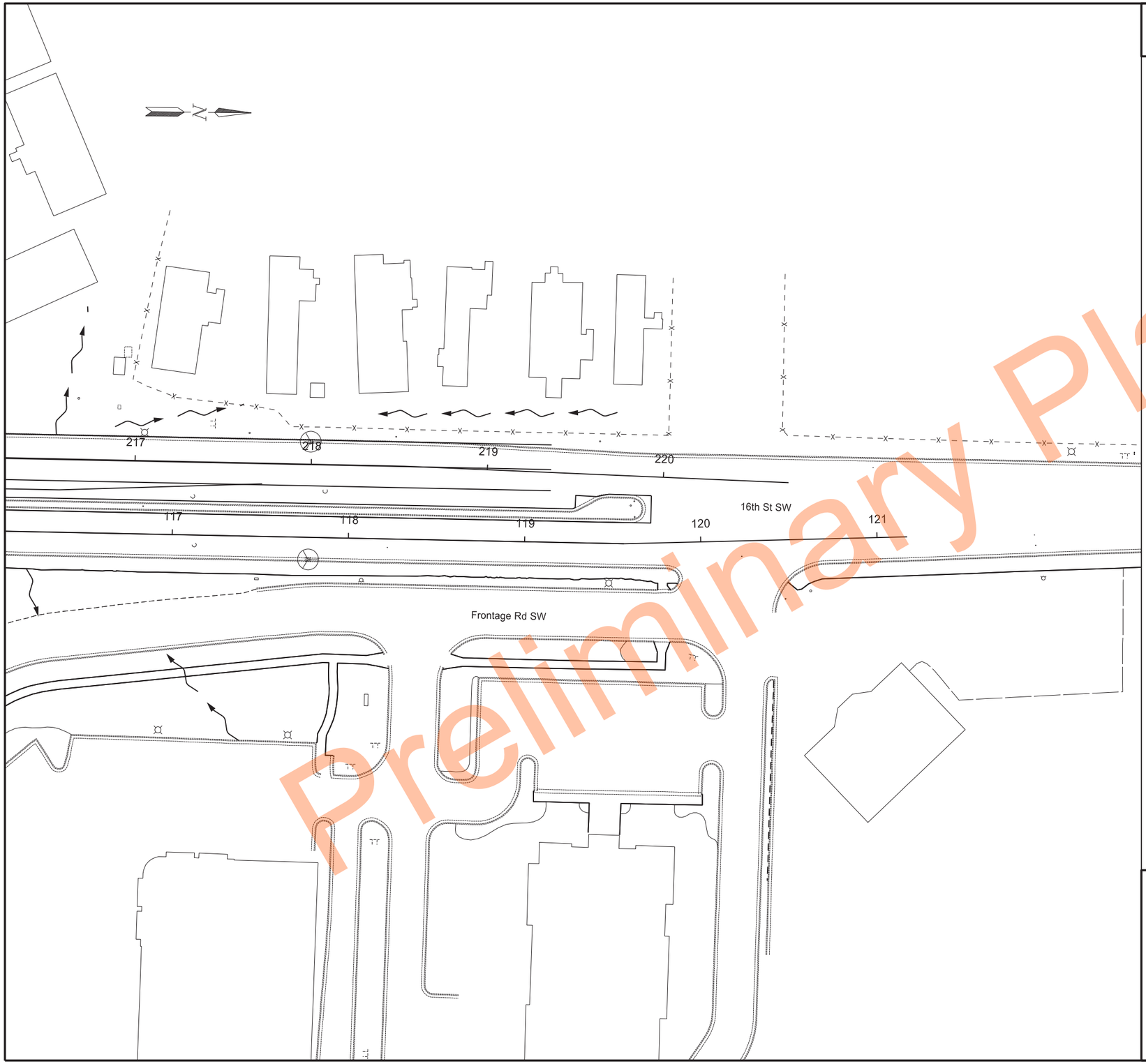
Inlet Protection

Temporary Erosion Control

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ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	4

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 117+77.49 LT	1	EA
		Sta 117+77.32 RT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 117+77.49 LT	1	EA
		Sta 117+77.32 RT	1	EA

Stationing is based off of NB 16th Street Alignment

Legend

Inlet Protection

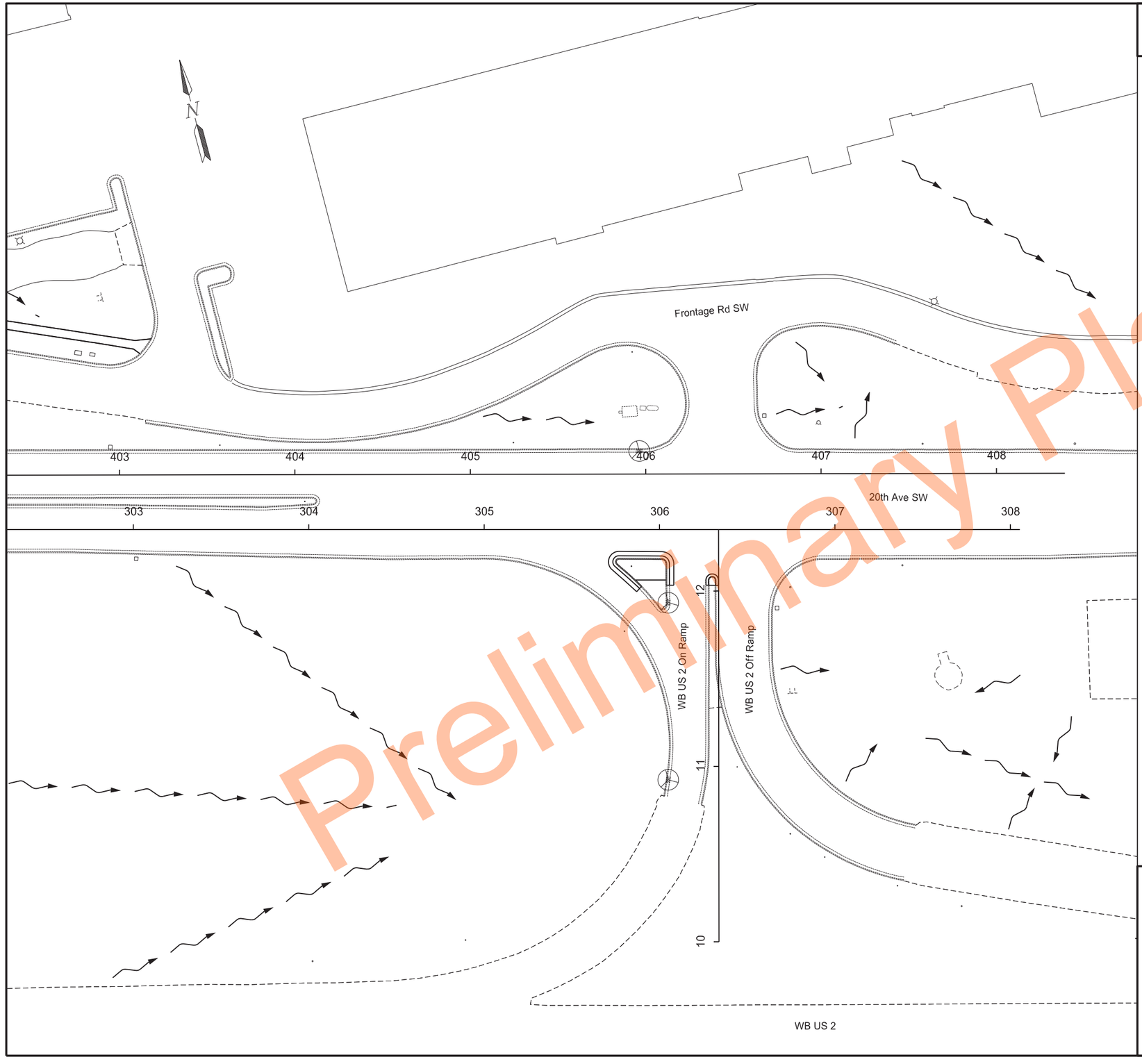
Temporary Erosion Control

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ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	5

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 306+04.97 RT	1	EA
		Sta 306+04.96 RT	1	EA
		Sta 305+88.40 LT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 306+04.97 RT	1	EA
		Sta 306+04.96 RT	1	EA
		Sta 305+88.40 LT	1	EA

Stationing is based off of EB 20th Ave SW Alignment

Legend

Inlet Protection

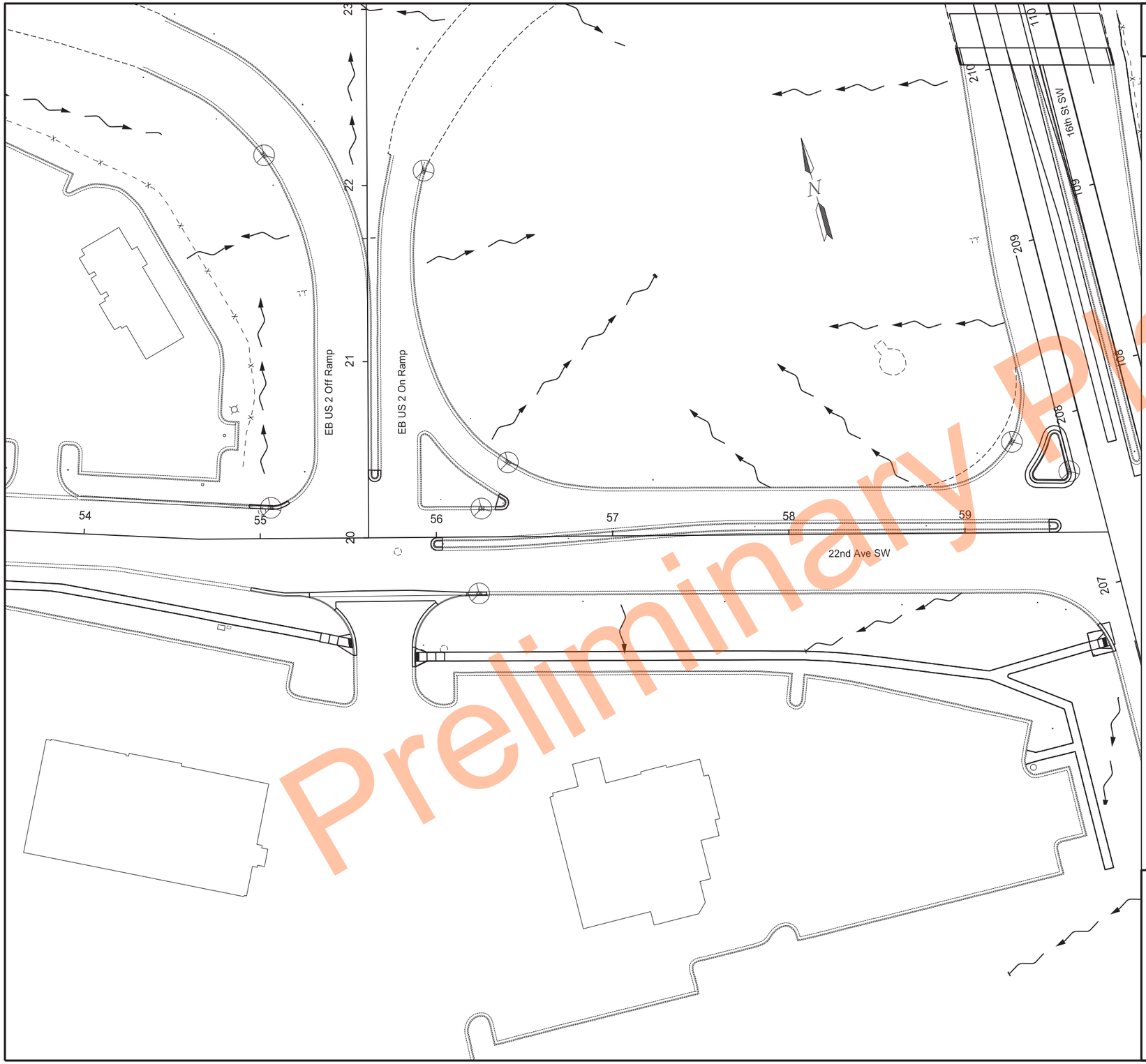
Temporary Erosion Control

Concrete Pavment Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	76	6

SPEC	CODE	BID ITEM	QTY	UNIT
708	1540	INLET PROTECTION-SPECIAL		
		Sta 55+03.93 LT	1	EA
		Sta 55+06.17 LT	1	EA
		Sta 55+94.39 LT	1	EA
		Sta 56+24.04 RT	1	EA
		Sta 56+26.67 LT	1	EA
		Sta 56+40.91LT	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		Sta 55+03.93 LT	1	EA
		Sta 55+06.17 LT	1	EA
		Sta 55+94.39 LT	1	EA
		Sta 56+24.04 RT	1	EA
		Sta 56+26.67 LT	1	EA
		Sta 56+40.91LT	1	EA

Stationing is based off of centerline 22nd Ave SW Alignment

Legend

Inlet Protection

Temporary Erosion Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

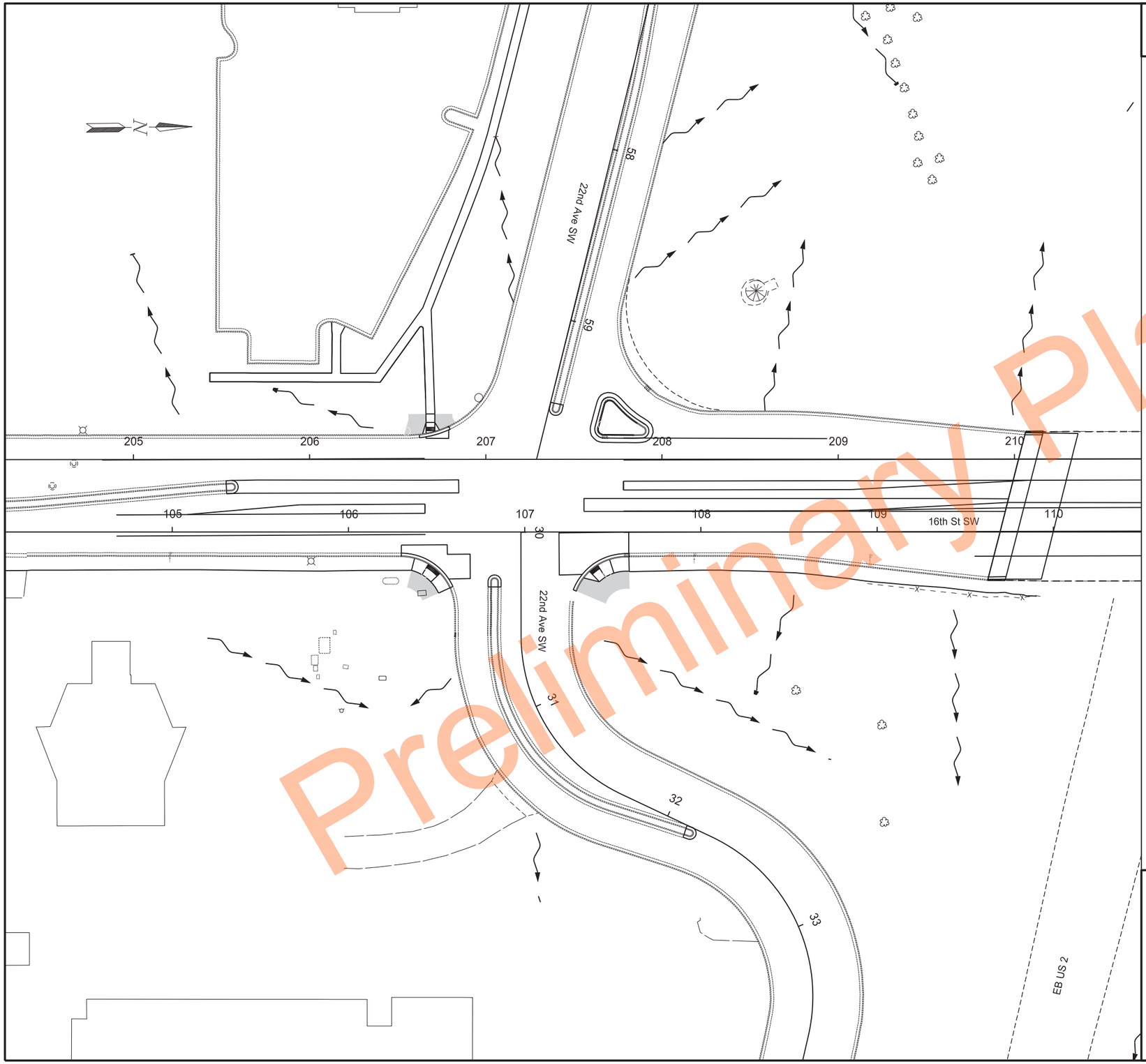
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NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	77	1

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		Sta 104+27.50 to Sta 110+27.50	74	SY

Stationing is based off of NB 16th Street Alignment



Legend

Landscape Peperation

Permanent Erosion Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

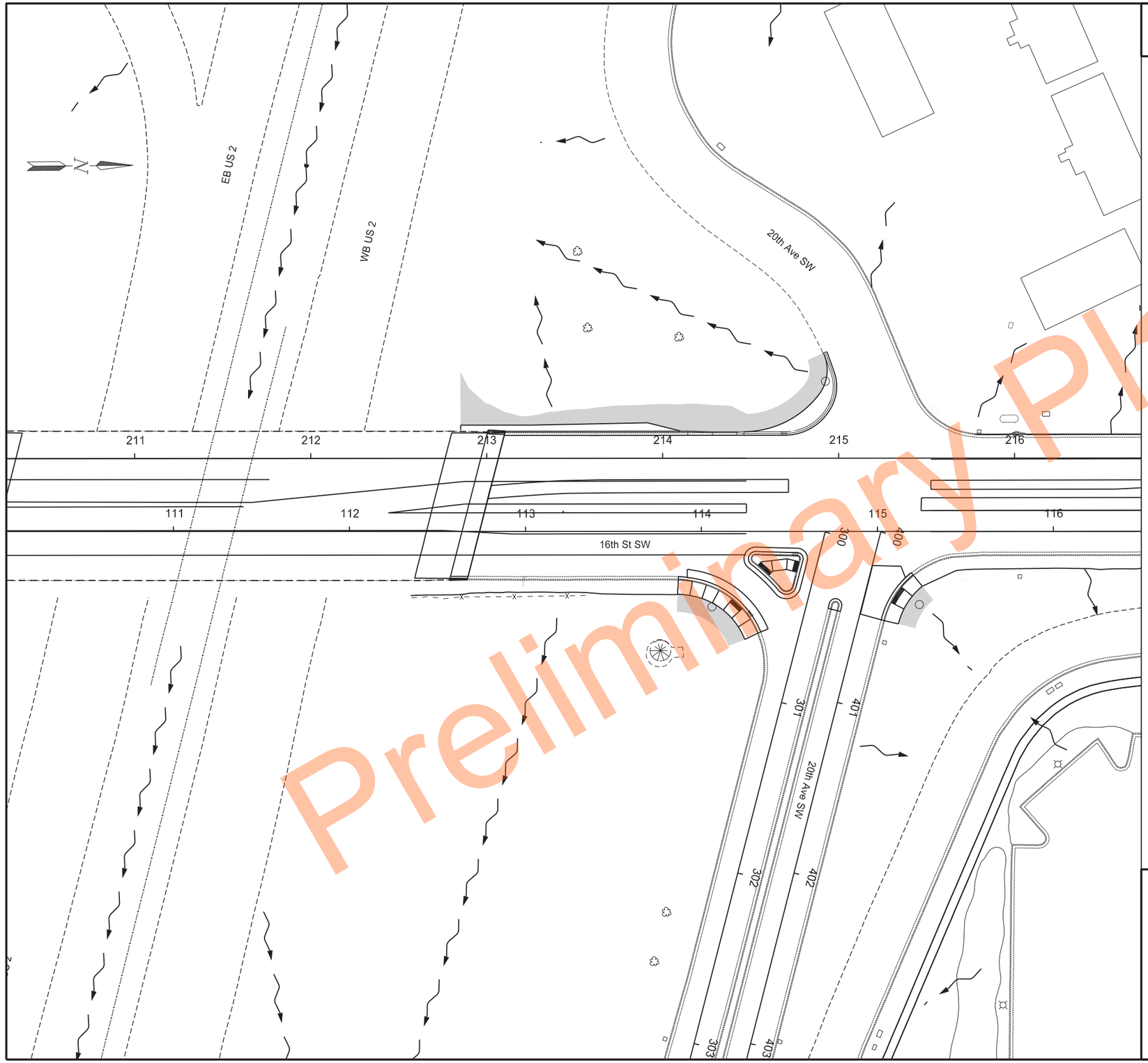
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	77	2

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION Sta 110+27.50 to Sta 116+27.50	348	SY

Stationing is based off of NB 16th Street Alignment



Legend

Landscape Peperation

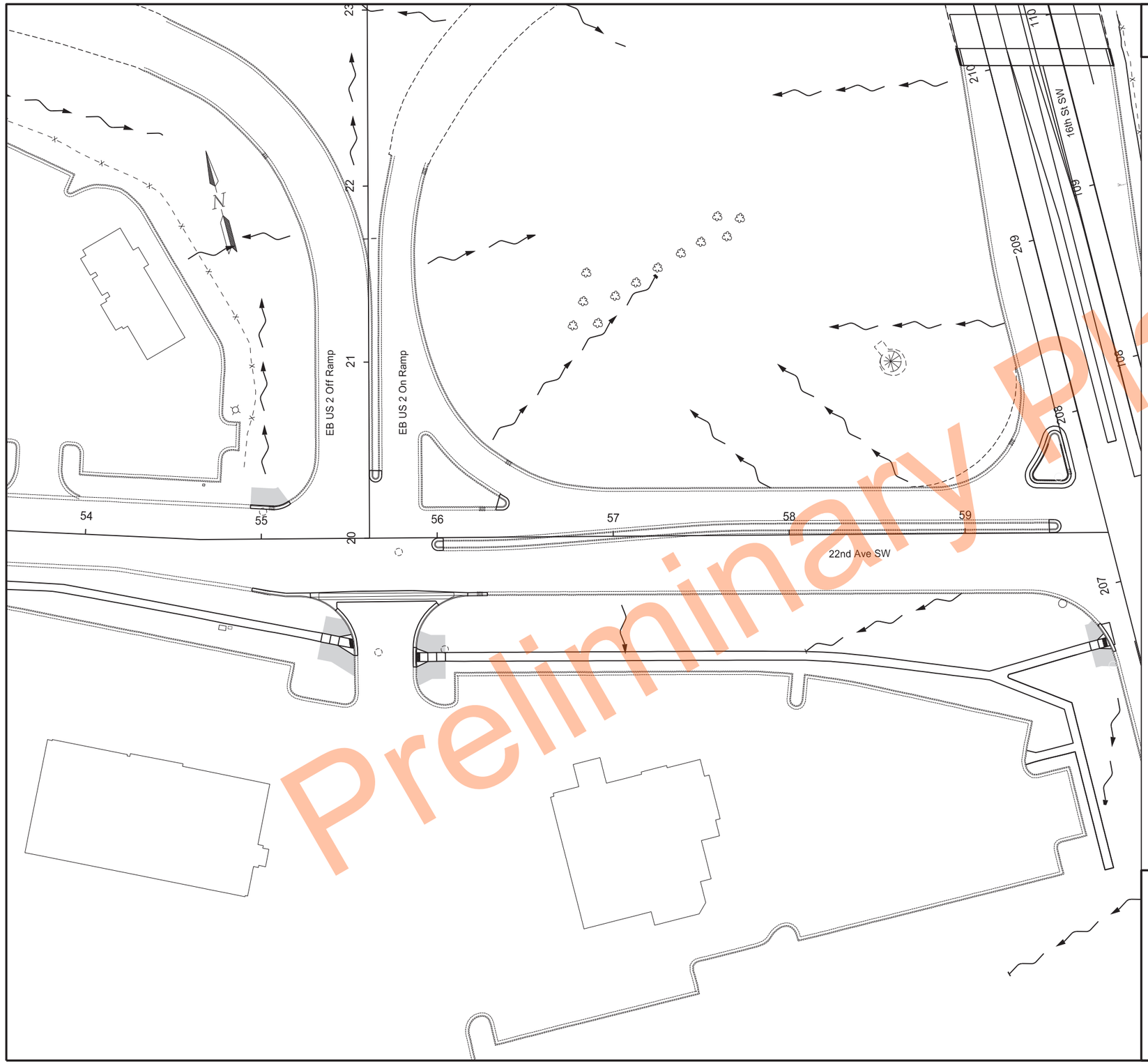
Permanent Erosion Control

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Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	77	3

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION Sta 53+77.50 to Sta 57+14.19	97	SY

Stationing is based off of centerline 22nd Ave SW Alignment

Legend

Landscape Peperation

Permanent Erosion Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

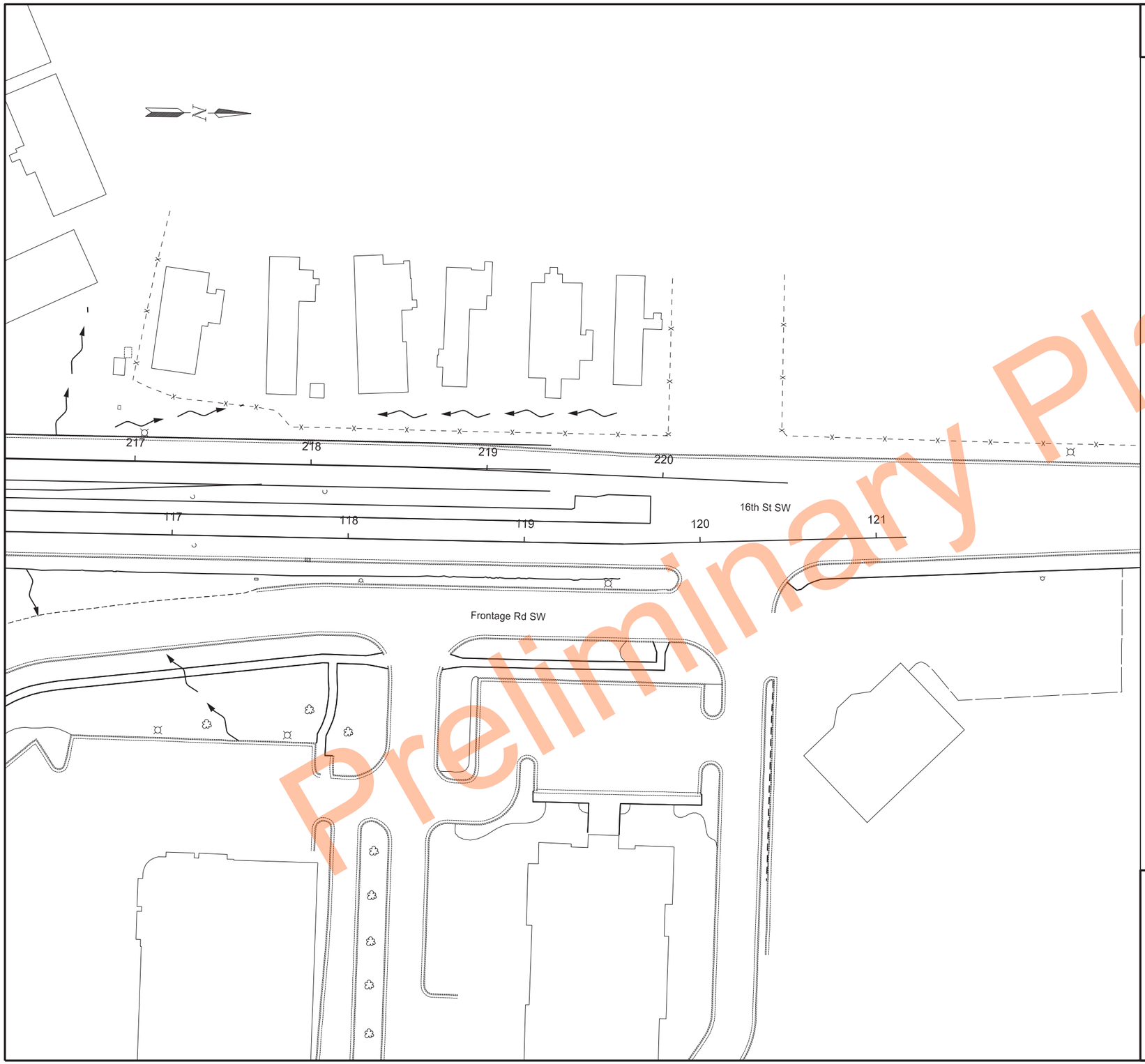
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	77	4

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		Sta 116+27.50 to Sta 122+50.00	0	SY

Stationing is based off of NB 16th Street Alignment



Legend

Landscape Peperation

Permanent Erosion Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

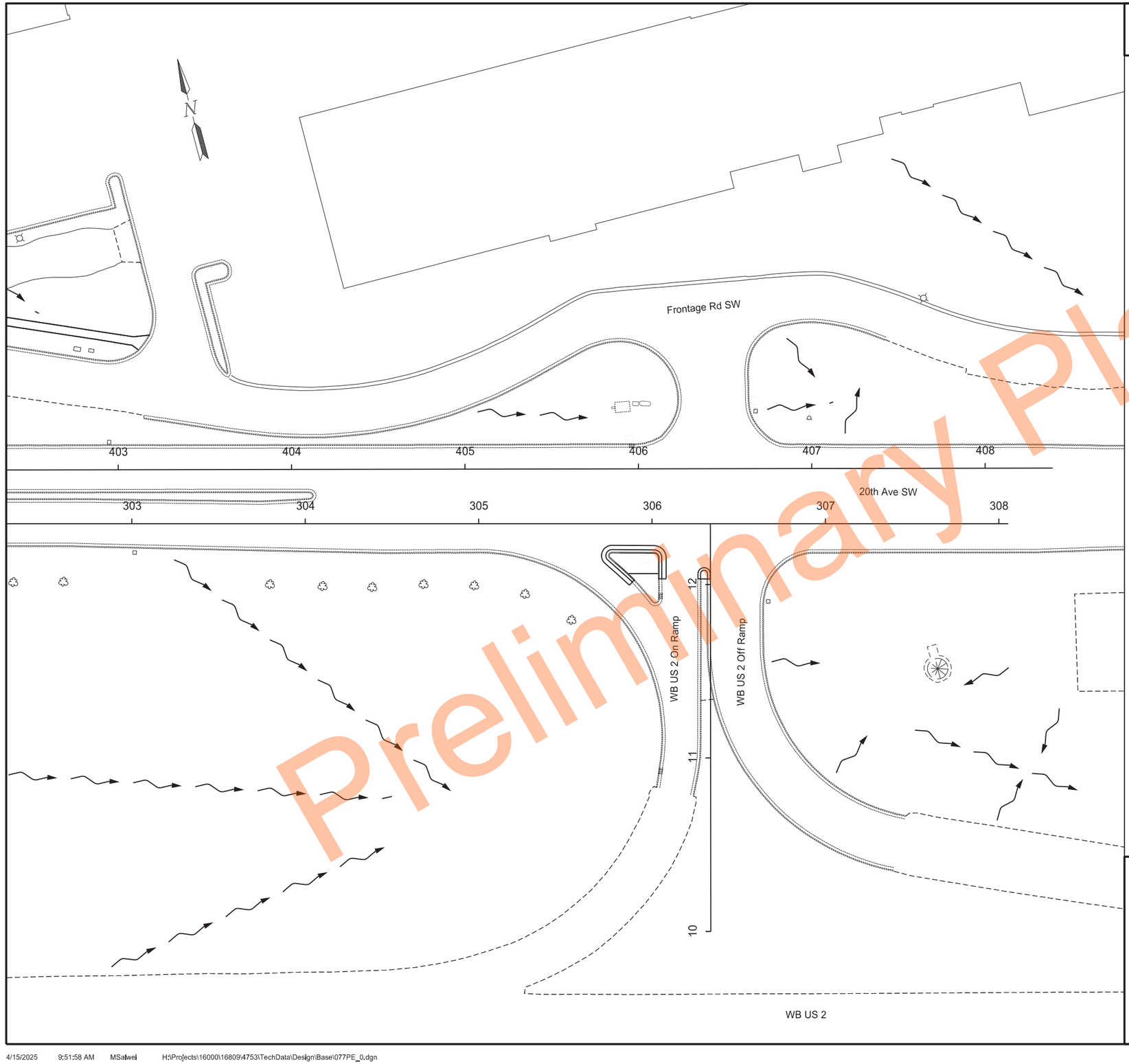
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NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	77	5

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		Sta 303+08.56 to Sta 308+72.50	0	SY

Stationing is based off of EB 20th Ave SW Alignment



Legend

Landscape Peperation

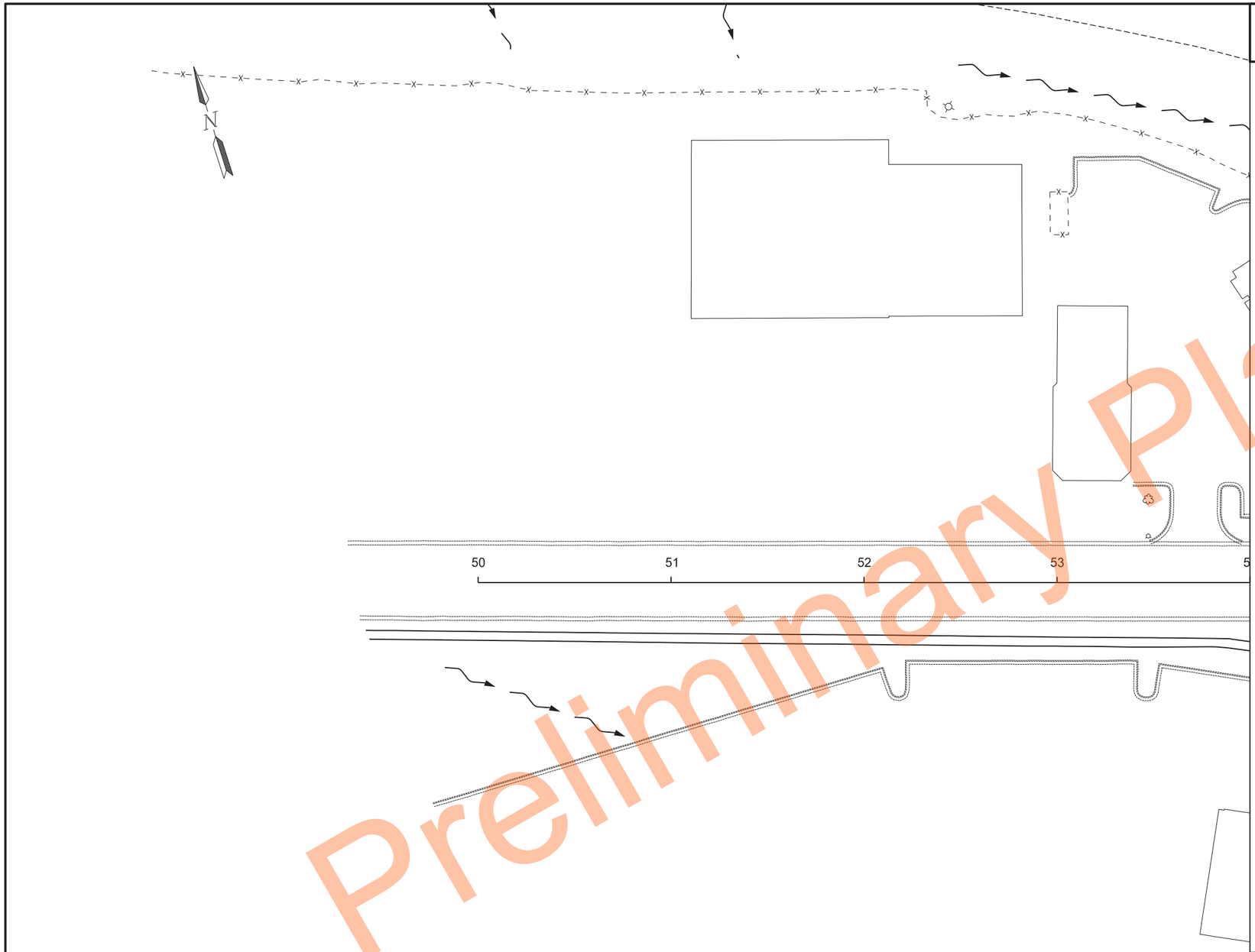
Permanent Erosion Control

Concrete Pavment Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	77	6

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		Sta 47+55.00 to Sta 53+77.50	0	SY

Stationing is based off of centerline 22nd Ave SW Alignment

Legend

Landscape Peperation

Permanent Erosion Control

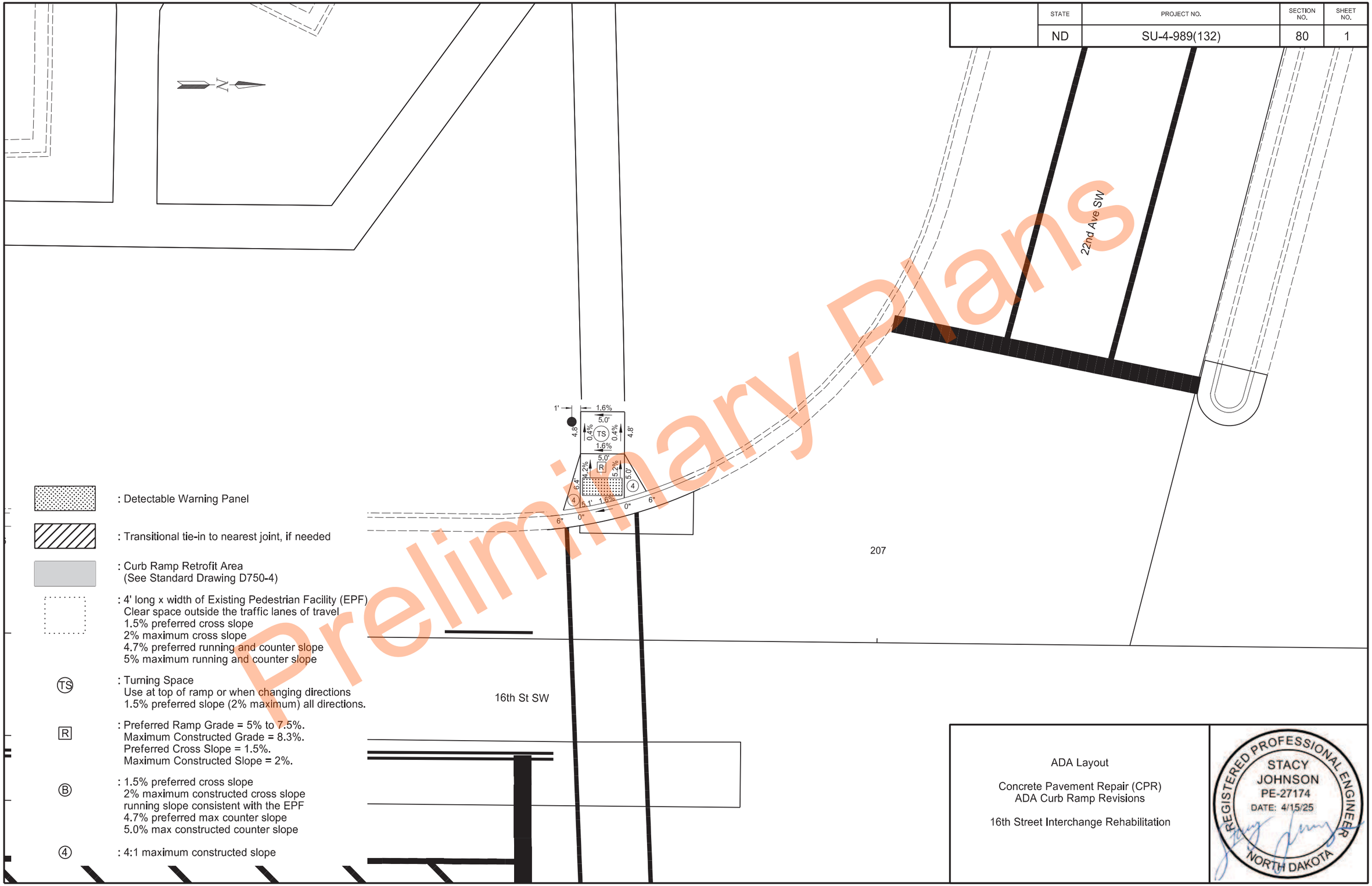
Concrete Pavement Repair (CPR)
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16th Street Interchange Rehabilitation

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	80	1



: Detectable Warning Panel

: Transitional tie-in to nearest joint, if needed

: Curb Ramp Retrofit Area
(See Standard Drawing D750-4)

: 4' long x width of Existing Pedestrian Facility (EPF)
Clear space outside the 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 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

(4) : 4:1 maximum constructed slope

Preliminary Plans

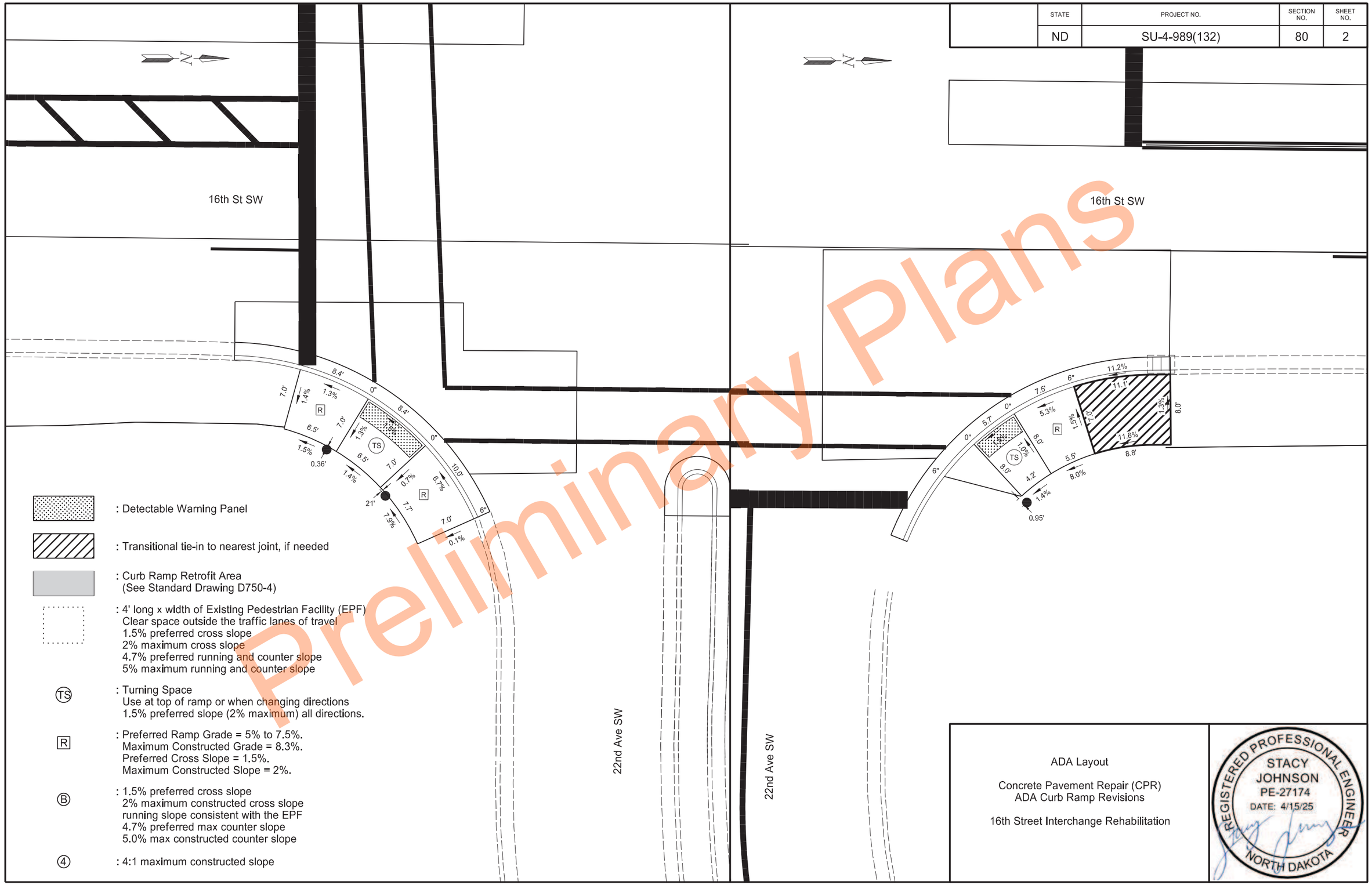
ADA Layout

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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STACY JOHNSON
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NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	80	2



: Detectable Warning Panel

: Transitional tie-in to nearest joint, if needed

: Curb Ramp Retrofit Area
(See Standard Drawing D750-4)

: 4' long x width of Existing Pedestrian Facility (EPF)
Clear space outside the 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 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

(4) : 4:1 maximum constructed slope

ADA Layout

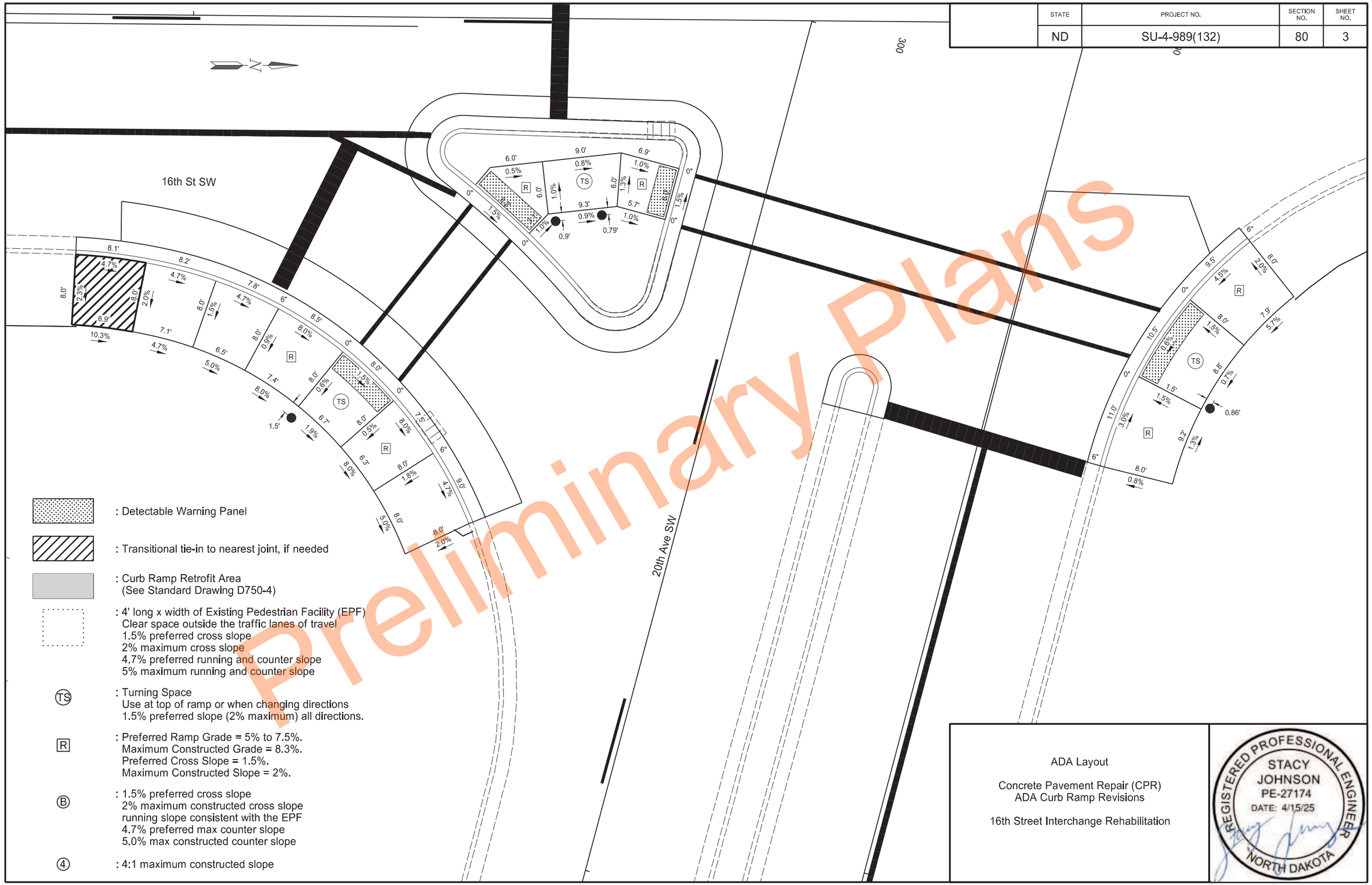
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	80	3



: Detectable Warning Panel

: Transitional tie-in to nearest joint, if needed

: Curb Ramp Retrofit Area
(See Standard Drawing D750-4)

: 4' long x width of Existing Pedestrian Facility (EPF)
Clear space outside the 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 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

(4) : 4:1 maximum constructed slope

Preliminary Plans

ADA Layout

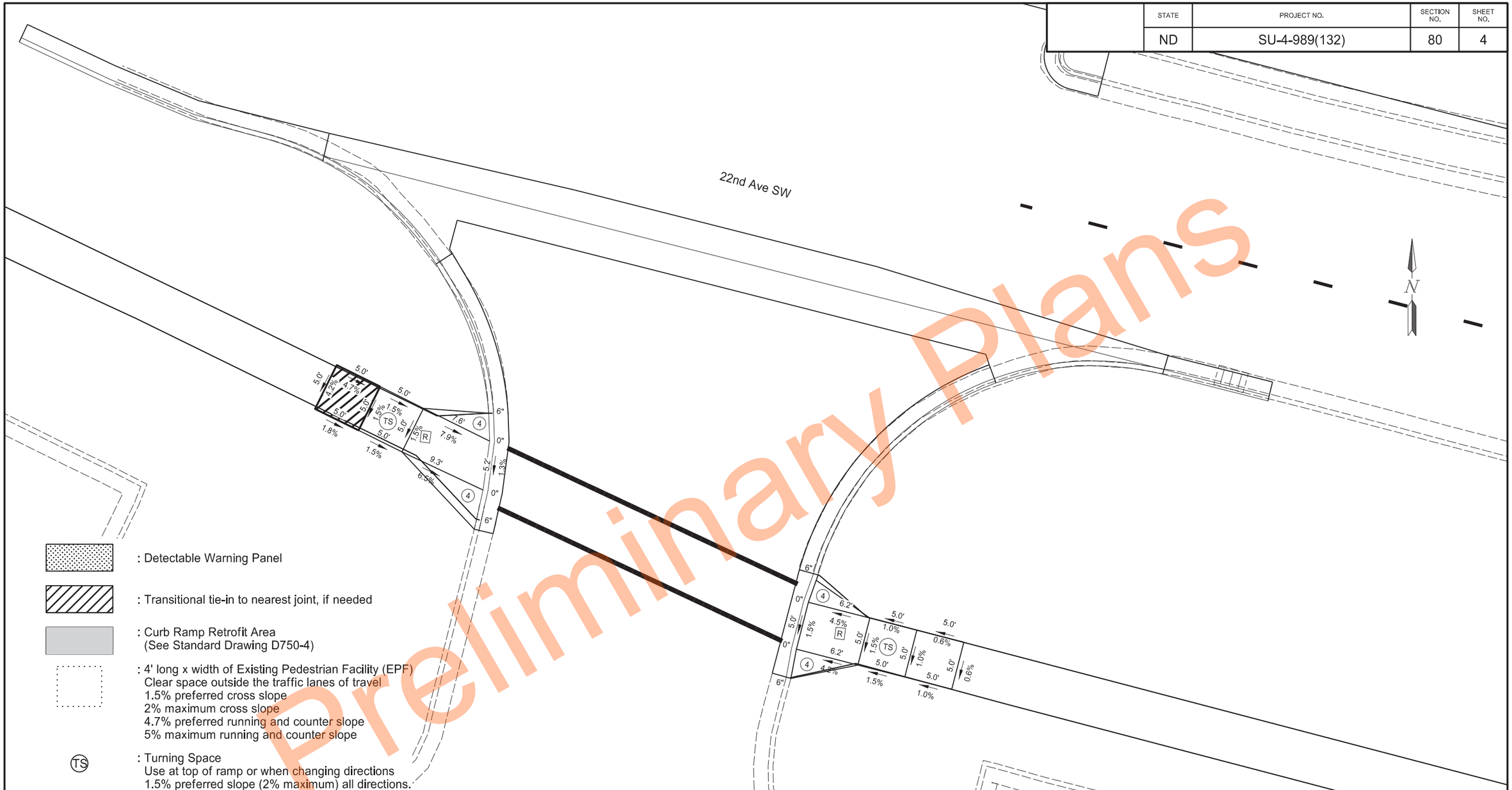
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16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
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PE-27174
DATE: 4/15/25
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	80	4



: Detectable Warning Panel

: Transitional tie-in to nearest joint, if needed

: Curb Ramp Retrofit Area
(See Standard Drawing D750-4)

: 4' long x width of Existing Pedestrian Facility (EPF)
Clear space outside the 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 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

(4) : 4:1 maximum constructed slope

Preliminary Plans

ADA Layout

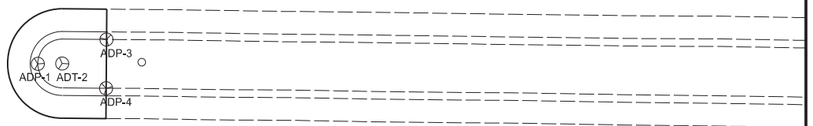
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	82	1

Point	Station	Offset	Northing	Easting
ADP-5	105+30.54	-29.277	442045.157	1769146.834
ADP-6	105+30.80	-21.941	442045.326	1769154.173
ADP-7	105+33.65	-25.703	442048.231	1769150.448
ADP-8	105+35.83	-25.771	442050.408	1769150.407

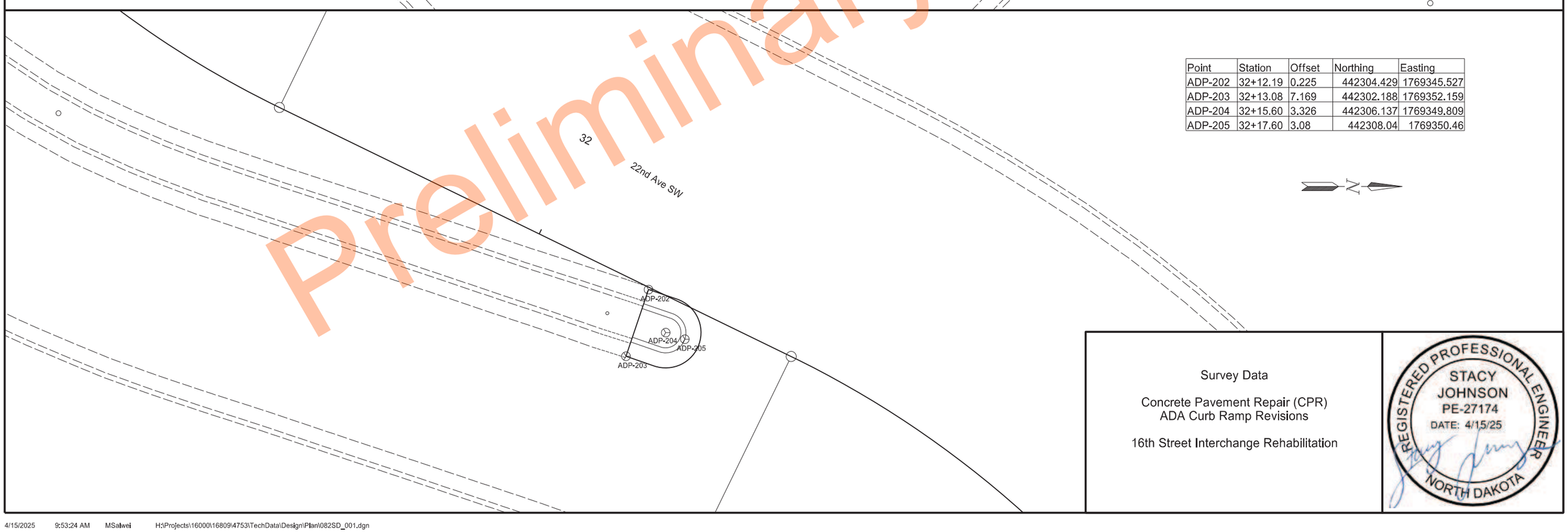


101

16th Ave SW

32

22nd Ave SW



Point	Station	Offset	Northing	Easting
ADP-202	32+12.19	0.225	442304.429	1769345.527
ADP-203	32+13.08	7.169	442302.188	1769352.159
ADP-204	32+15.60	3.326	442306.137	1769349.809
ADP-205	32+17.60	3.08	442308.04	1769350.46

Survey Data

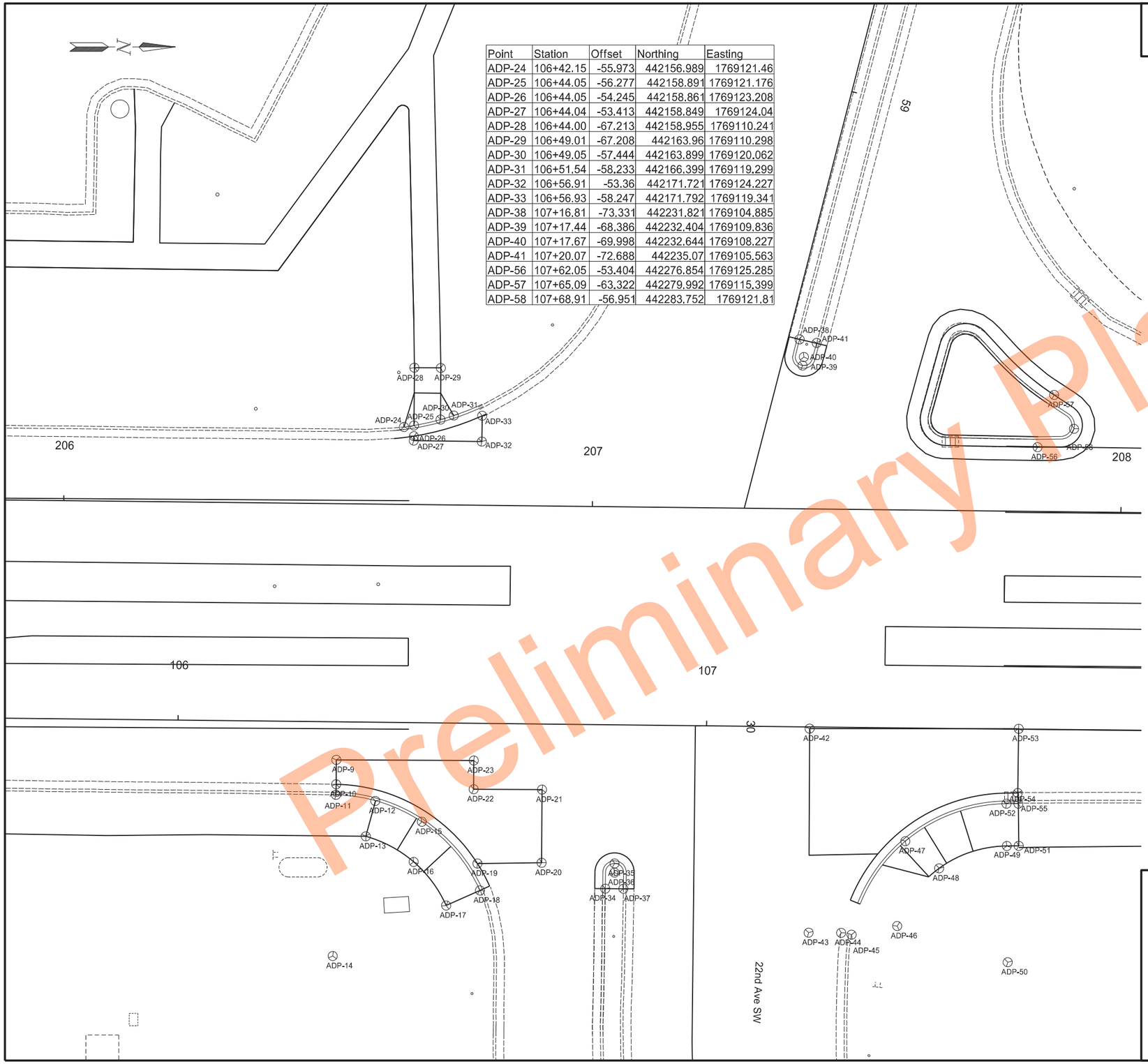
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	82	2



Point	Station	Offset	Northing	Easting
ADP-24	106+42.15	-55.973	442156.989	1769121.46
ADP-25	106+44.05	-56.277	442158.891	1769121.176
ADP-26	106+44.05	-54.245	442158.861	1769123.208
ADP-27	106+44.04	-53.413	442158.849	1769124.04
ADP-28	106+44.00	-67.213	442158.955	1769110.241
ADP-29	106+49.01	-67.208	442163.96	1769110.298
ADP-30	106+49.05	-57.444	442163.899	1769120.062
ADP-31	106+51.54	-58.233	442166.399	1769119.299
ADP-32	106+56.91	-53.36	442171.721	1769124.227
ADP-33	106+56.93	-58.247	442171.792	1769119.341
ADP-38	107+16.81	-73.331	442231.821	1769104.885
ADP-39	107+17.44	-68.386	442232.404	1769109.836
ADP-40	107+17.67	-69.998	442232.644	1769108.227
ADP-41	107+20.07	-72.688	442235.07	1769105.563
ADP-56	107+62.05	-53.404	442276.854	1769125.285
ADP-57	107+65.09	-63.322	442279.992	1769115.399
ADP-58	107+68.91	-56.951	442283.752	1769121.81

Point	Station	Offset	Northing	Easting
ADP-5	105+30.54	-29.277	442045.157	1769146.834
ADP-6	105+30.80	-21.941	442045.326	1769154.173
ADP-7	105+33.65	-25.703	442048.231	1769150.448
ADP-8	105+35.83	-25.771	442050.408	1769150.407
ADP-9	106+30.01	7.142	442144.184	1769184.445
ADP-10	106+30.03	11.77	442144.16	1769189.073
ADP-11	106+30.01	13.77	442144.119	1769191.073
ADP-12	106+37.47	14.843	442151.559	1769192.223
ADP-13	106+35.74	21.554	442149.763	1769198.916
ADP-14	106+29.72	44.269	442143.502	1769221.566
ADP-15	106+46.32	18.682	442160.368	1769196.155
ADP-16	106+44.86	26.299	442158.832	1769203.756
ADP-17	106+51.08	34.481	442164.968	1769212.003
ADP-18	106+57.45	31.566	442171.362	1769209.154
ADP-19	106+56.92	26.481	442170.886	1769204.064
ADP-20	106+69.05	26.208	442183.025	1769203.919
ADP-21	106+68.99	12.365	442183.102	1769190.075
ADP-22	106+56.05	12.428	442170.167	1769190.003
ADP-23	106+56.02	7.005	442170.197	1769184.58
ADP-34	106+81.15	30.981	442195.072	1769208.818
ADP-35	106+82.86	26.197	442196.83	1769204.052
ADP-36	106+82.87	27.918	442196.819	1769205.773
ADP-37	106+84.58	30.954	442198.499	1769208.827
ADP-42	107+19.49	0.291	442233.728	1769178.531
ADP-43	107+19.70	38.906	442233.539	1769217.147
ADP-44	107+25.86	38.872	442239.695	1769217.177
ADP-45	107+27.83	39.199	442241.665	1769217.525
ADP-46	107+36.45	37.469	442250.304	1769215.884
ADP-47	107+37.82	21.403	442251.837	1769199.834
ADP-48	107+44.27	26.476	442258.235	1769204.974
ADP-49	107+57.03	22.111	442271.042	1769200.743
ADP-50	107+57.43	44.107	442271.207	1769222.742
ADP-51	107+59.28	22.065	442273.295	1769200.72
ADP-52	107+56.88	14.112	442270.972	1769192.743
ADP-53	107+59.05	-0.086	442273.287	1769178.569
ADP-54	107+59.00	12.069	442273.111	1769190.722
ADP-55	107+59.12	14.067	442273.216	1769192.721

Preliminary Plans

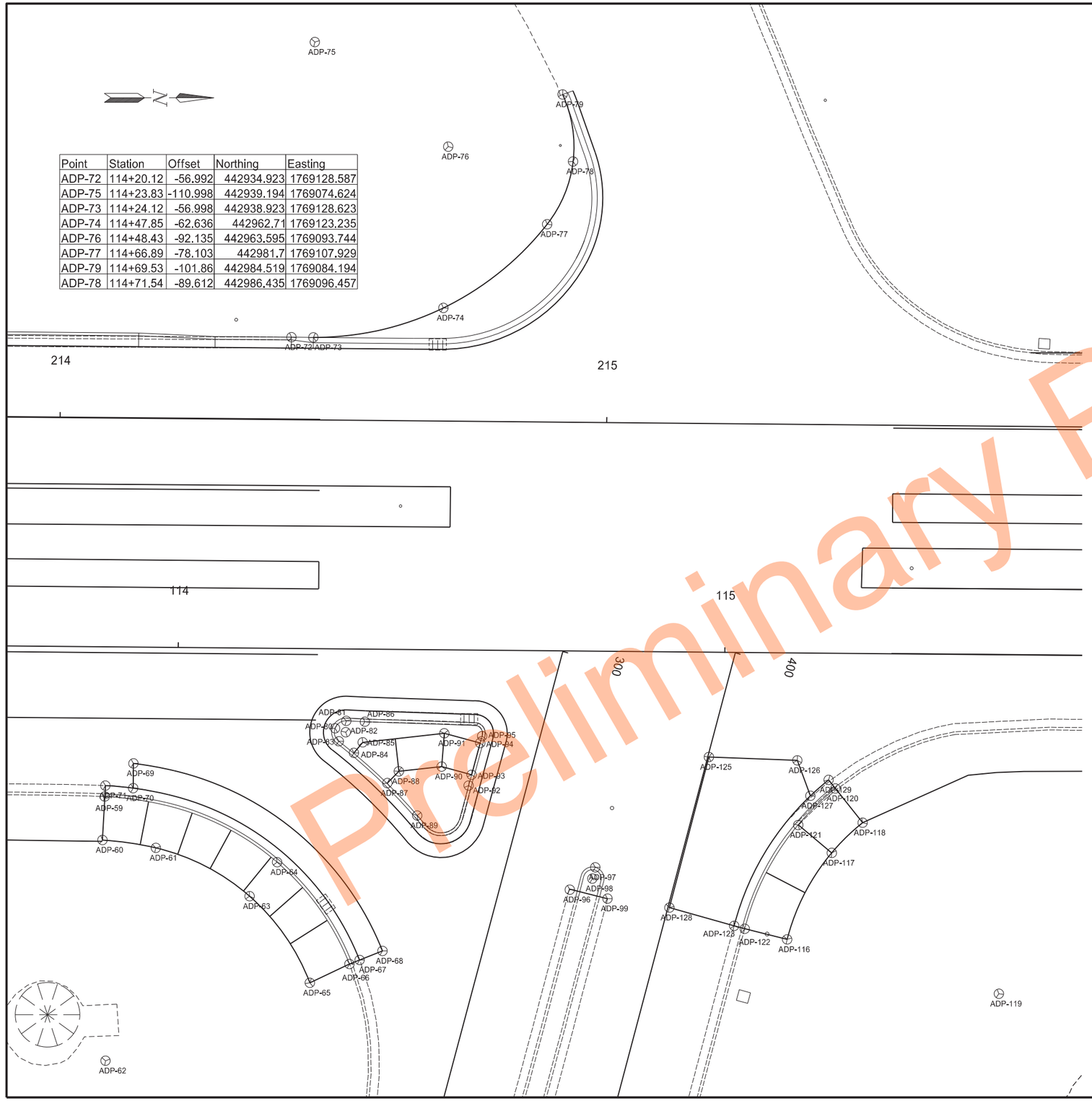
Survey Data

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	82	3



Point	Station	Offset	Northing	Easting
ADP-72	114+20.12	-56.992	442934.923	1769128.587
ADP-75	114+23.83	-110.998	442939.194	1769074.624
ADP-73	114+24.12	-56.998	442938.923	1769128.623
ADP-74	114+47.85	-62.636	442962.71	1769123.235
ADP-76	114+48.43	-92.135	442963.595	1769093.744
ADP-77	114+66.89	-78.103	442981.7	1769107.929
ADP-79	114+69.53	-101.86	442984.519	1769084.194
ADP-78	114+71.54	-89.612	442986.435	1769096.457

Point	Station	Offset	Northing	Easting
ADP-59	113+86.85	27.348	442900.769	1769212.575
ADP-60	113+86.51	35.3	442900.348	1769220.523
ADP-61	113+96.29	36.64	442910.114	1769221.965
ADP-62	113+87.49	75.66	442900.905	1769260.891
ADP-63	114+13.53	45.298	442927.263	1769230.804
ADP-64	114+18.50	39.021	442932.297	1769224.579
ADP-65	114+24.71	61.02	442938.281	1769246.641
ADP-66	114+31.92	57.505	442945.527	1769243.203
ADP-67	114+33.78	56.749	442947.386	1769242.466
ADP-68	114+37.94	55.047	442951.569	1769240.807
ADP-69	113+92.03	21.235	442906.011	1769206.517
ADP-70	113+92.03	25.766	442905.962	1769211.047
ADP-71	113+86.93	25.35	442900.875	1769210.578
ADP-80	114+28.84	14.432	442942.898	1769200.1
ADP-81	114+30.88	13.05	442944.949	1769198.738
ADP-82	114+30.81	15.133	442944.854	1769200.821
ADP-83	114+29.55	16.792	442943.574	1769202.467
ADP-84	114+32.34	18.889	442946.349	1769204.593
ADP-85	114+33.92	16.951	442947.952	1769202.671
ADP-86	114+34.29	13.17	442948.353	1769198.894
ADP-87	114+38.51	24.351	442952.455	1769210.119
ADP-88	114+40.59	22.184	442954.56	1769207.974
ADP-89	114+44.03	30.22	442957.918	1769216.045
ADP-90	114+48.42	21.231	442962.398	1769207.103
ADP-91	114+48.83	15.137	442962.873	1769201.013
ADP-92	114+53.39	24.642	442967.332	1769210.566
ADP-93	114+53.84	22.667	442967.87	1769208.596
ADP-94	114+55.38	16.867	442969.449	1769202.807
ADP-95	114+55.72	15.58	442969.799	1769201.523
ADP-96	114+71.97	43.542	442985.834	1769229.61
ADP-97	114+76.60	39.42	442990.498	1769225.525
ADP-98	114+76.09	41.48	442989.967	1769227.581
ADP-99	114+78.88	45.123	442992.728	1769231.245
ADP-116	115+11.80	52.327	443025.594	1769238.704
ADP-117	115+19.84	36.442	443033.763	1769222.883
ADP-118	115+25.45	30.875	443039.41	1769217.358
ADP-119	115+50.62	61.961	443064.34	1769248.639
ADP-120	115+20.41	24.657	443034.424	1769211.102
ADP-121	115+13.66	31.398	443027.621	1769217.79
ADP-122	115+04.02	50.444	443017.833	1769236.761
ADP-123	115+02.09	49.918	443015.907	1769236.22
ADP-125	114+97.23	19.084	443011.281	1769205.349
ADP-126	115+13.41	19.574	443027.464	1769205.965
ADP-127	115+15.84	26.037	443029.843	1769212.446
ADP-128	114+90.21	46.68	443004.053	1769232.89
ADP-129	115+19.16	23.103	443033.178	1769209.538

Survey Data

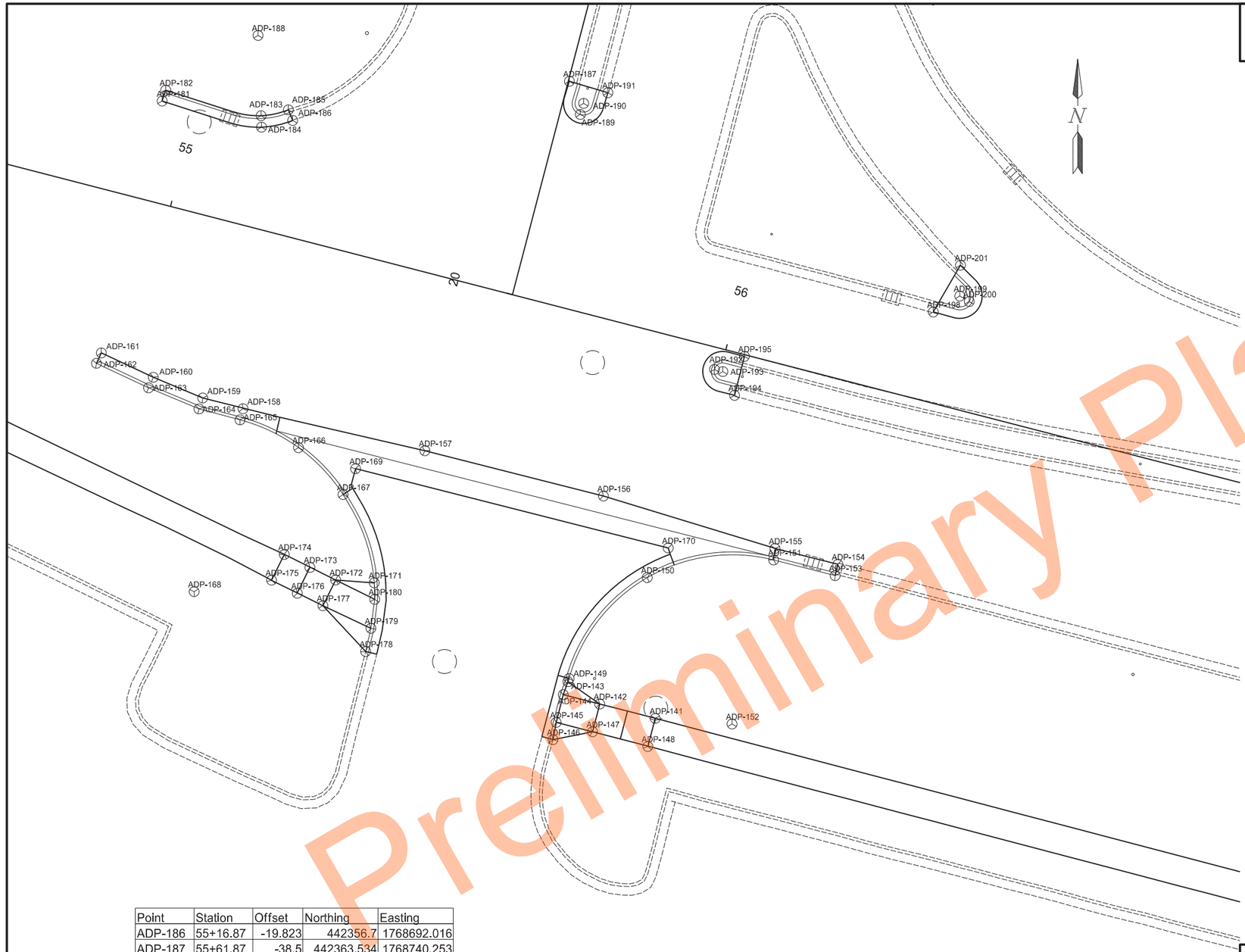
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
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DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	82	4



Point	Station	Offset	Northing	Easting
ADP-141	56+04.14	65.291	442252.471	1768755.229
ADP-142	55+94.13	65.284	442254.979	1768745.543
ADP-143	55+87.80	62.906	442258.865	1768740.004
ADP-144	55+87.591	R 65.291	442256.609	1768739.203
ADP-145	55+87.59	70.291	442251.766	1768737.958
ADP-146	55+87.80	73.339	442248.762	1768737.401
ADP-147	55+94.14	70.284	442250.136	1768744.298
ADP-148	56+04.11	70.352	442247.578	1768753.935
ADP-149	55+87.85	62.32	442259.419	1768740.201
ADP-150	55+96.64	41.876	442277.016	1768753.827
ADP-151	56+17.22	33.393	442280.084	1768775.87
ADP-152	56+17.35	62.893	442251.49	1768768.615
ADP-153	56+28.28	33.346	442277.365	1768786.586
ADP-154	56+28.25	31.327	442279.327	1768787.065
ADP-155	56+16.94	31.396	442282.088	1768776.101
ADP-156	55+85.71	30.027	442291.223	1768746.198
ADP-157	55+53.59	30.163	442299.121	1768715.069
ADP-158	55+21.05	31.002	442306.445	1768683.351
ADP-159	55+13.78	30.942	442308.32	1768676.331
ADP-160	55+04.54	29.609	442311.922	1768667.71
ADP-161	54+94.71	27.757	442316.173	1768658.659
ADP-162	54+94.34	29.722	442314.363	1768657.809
ADP-163	55+04.21	31.583	442310.094	1768666.899
ADP-164	55+13.63	32.941	442306.422	1768675.684
ADP-165	55+21.03	33.002	442304.513	1768682.835
ADP-166	55+32.11	35.148	442299.664	1768693.027
ADP-167	55+41.69	41.119	442291.489	1768700.808
ADP-168	55+20.781	R 64.001	442274.562	1768674.837
ADP-169	55+42.67	36.21	442295.997	1768702.982
ADP-170	55+98.91	35.971	442282.167	1768757.495
ADP-171	55+50.79	54.664	442276.099	1768706.23
ADP-172	55+44.15	55.866	442276.594	1768699.504
ADP-173	55+39.27	54.863	442278.785	1768695.031
ADP-174	55+34.38	53.803	442281.034	1768690.562
ADP-175	55+33.35	58.688	442276.563	1768688.343
ADP-176	55+38.27	59.778	442274.278	1768692.828
ADP-177	55+43.13	60.76	442272.112	1768697.288
ADP-178	55+52.33	66.616	442264.14	1768704.738
ADP-179	55+52.21	62.483	442268.172	1768705.655
ADP-180	55+51.60	57.422	442273.226	1768706.327
ADP-181	54+94.00	-17.402	442360.075	1768669.264
ADP-182	54+94.12	-19.399	442361.979	1768669.875
ADP-183	55+11.34	-19.248	442357.527	1768686.513
ADP-184	55+11.91	-17.332	442355.528	1768686.59
ADP-185	55+15.68	-21.427	442358.552	1768691.261

Point	Station	Offset	Northing	Easting
ADP-186	55+16.87	-19.823	442356.7	1768692.016
ADP-187	55+61.87	-38.5	442363.534	1768740.253
ADP-188	55+07.32	-32.659	442371.516	1768685.977
ADP-189	55+65.16	-33.375	442357.747	1768742.162
ADP-190	55+65.25	-35.384	442359.672	1768742.745
ADP-191	55+68.87	-38.241	442361.531	1768746.969
ADP-192	55+98.93	3.81	442313.302	1768765.556
ADP-193	56+00.44	3.81	442312.923	1768767.019
ADP-194	56+03.44	7.316	442308.779	1768769.049
ADP-195	56+03.42	0.308	442315.57	1768770.776
ADP-198	56+33.36	-15.42	442323.311	1768803.706
ADP-199	56+37.14	-19.267	442326.092	1768808.325
ADP-200	56+38.97	-18.757	442325.14	1768809.969
ADP-201	56+35.90	-24.497	442331.464	1768808.435

Survey Data

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

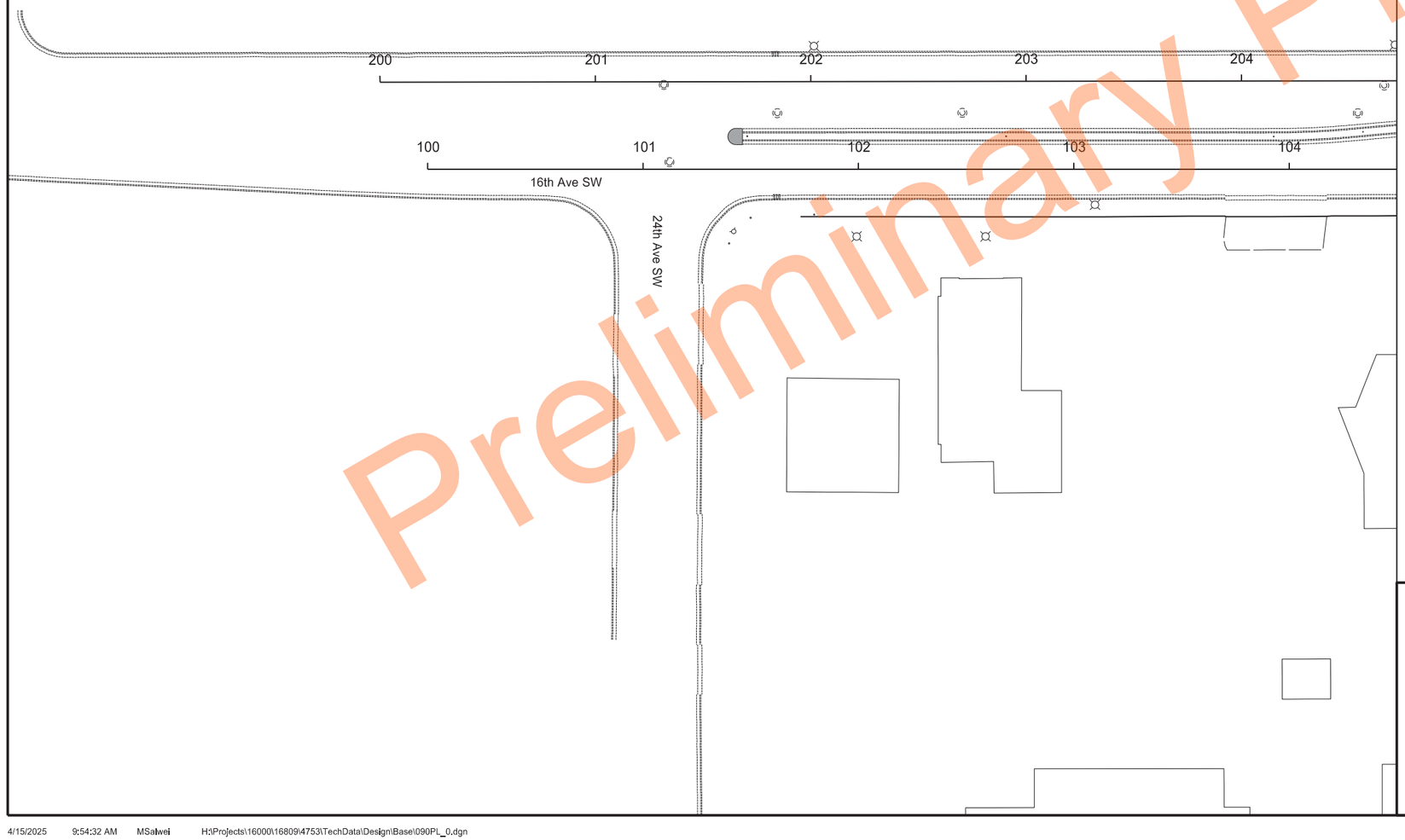
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	1

SPEC	CODE	BID ITEM	QTY	UNIT
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 101+42.44 MEDIAN	5	SY

Stationing is based off of NB 16th Street Alignment



Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

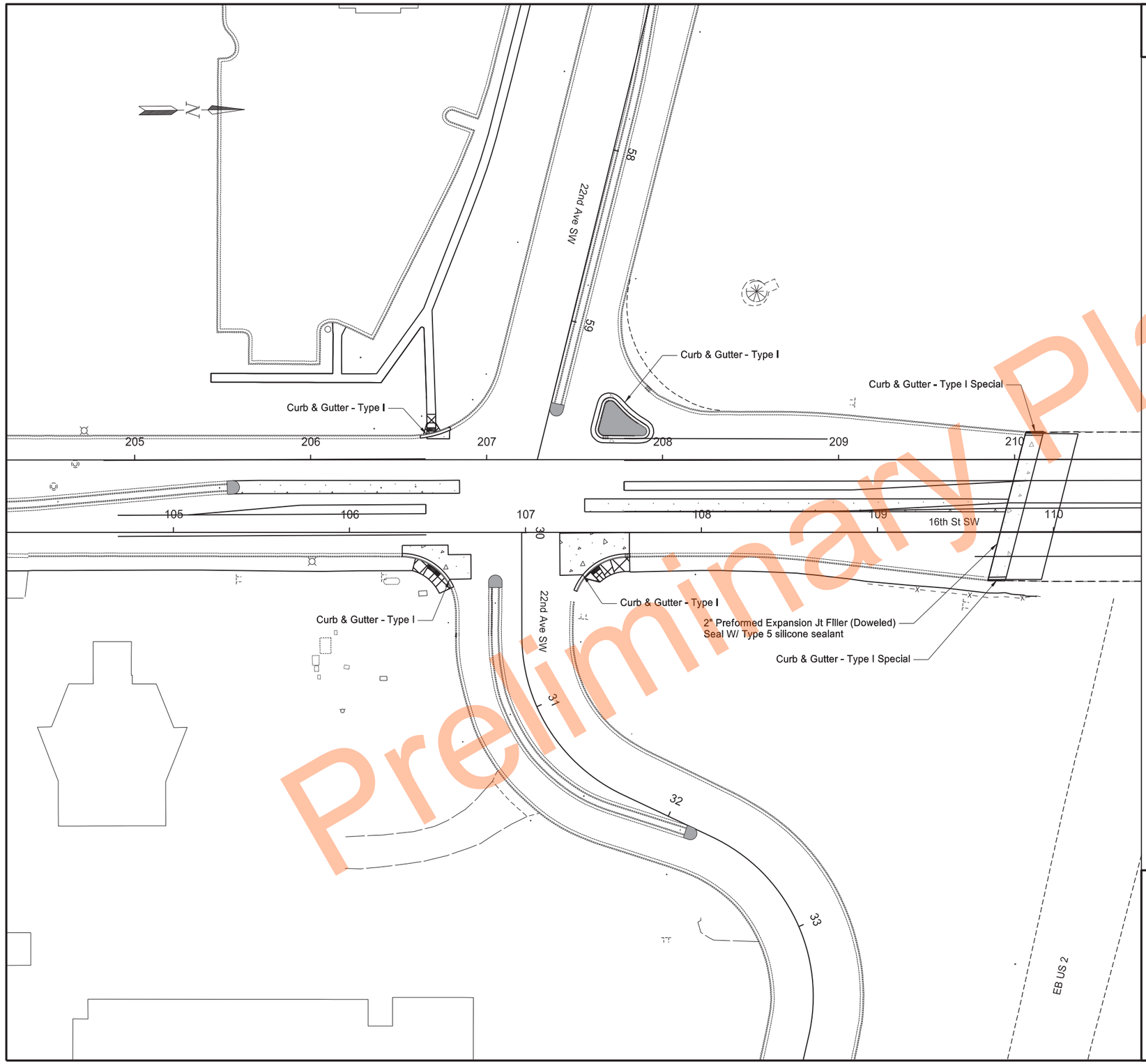
Pavement Layout

Concrete Pavement Repair (CPR)
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16th Street Interchange Rehabilitation

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Preliminary Plans



Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	2

SPEC	CODE	BID ITEM	QTY	UNIT
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE		
		Sta 105+33.8 to Sta 106+62.6 MEDIAN	103	SY
		Sta 106+30.0 to Sta 106+69.0 RT	45	SY
		Sta 106+44.1 to Sta 106+56.9 LT	4	SY
		Sta 107+19.5 to Sta 107+59.1 RT	80	SY
		Sta 107+33.6 to Sta 109+74.6 MEDIAN	195	SY
		Sta 107+37.2 to Sta 107+72.9 MEDIAN	27	SY
		Sta 109+69.8 to Sta 109+79.8	90	SY
748	0140	CURB AND GUTTER - TYPE 1		
		Sta 106+30.0 to Sta 106+57.9 RT	38	LF
		Sta 106+42.2 to Sta 106+56.3 LT	18	LF
		Sta 107+27.3 to Sta 107+56.9 RT	40	LF
		Sta 107+37.2 to Sta 107+72.9 LT	87	LF
748	0141	CURB & GUTTER - TYPE 1 SPECIAL		
		Sta 109+62.8 to Sta 109+72.6 RT	10	LF
		Sta 109+84.3 to Sta 109+94.1 LT	10	LF
750	0115	SIDEWALK CONCRETE 4IN		
		Sta 106+37.5 to Sta 106+57.5 RT	19	SY
		Sta 106+42.2 to Sta 106+51.6 LT	7	SY
		Sta 107+28.8 to Sta 107+59.1 RT	21	SY
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 105+34.3 MEDIAN	5	SY
		Sta 106+82.9 RT	5	SY
		Sta 107+17.7 LT	5	SY
		Sta 107+52.6 LT	34	SY
		Sta 107+91.6 RT	5	SY
750	2115	DETECTABLE WARNING PANEL		
		Sta 106+46.6 LT	9	SF
		Sta 106+47.9 RT	15	SF
		Sta 107+39.9 RT	10	SF

Stationing is based off of NB 16th Street Alignment

Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

Pavement Layout

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	3

SPEC	CODE	BID ITEM	QTY	UNIT
302	0113	AGGREGATE BASE COURSE CL 5		
		Sta 112+63.1 to Sta 113+87.8	8	CY
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT		
		Sta 112+63.1 to Sta 113+87.8	5	TON
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE		
		Sta 112+63.9 to Sta 112+73.9	89	SY
		Sta 112+78.6 to Sta 114+49.5 MEDIAN	139	SY
		Sta 113+92.0 to Sta 114+38.0 RT	29	SY
		Sta 114+24.1 to Sta 114+76.0 LT	39	SY
		Sta 114+24.2 to Sta 114+60.3 RT	27	SY
		Sta 114+90.2 to Sta 115+15.9 RT	51	SY
		Sta 115+24.9 to Sta 116+27.4 MEDIAN	83	SY
748	0140	CURB AND GUTTER - TYPE 1		
		Sta 113+86.9 to Sta 114+33.8 RT	60	LF
		Sta 114+26.8 to Sta 114+57.5 RT	90	LF
		Sta 115+03.6 to Sta 115+20.1 RT	32	LF
748	0141	CURB & GUTTER - TYPE 1 SPECIAL		
		Sta 112+56.9 to Sta 112+67.1 RT	10	LF
		Sta 112+78.5 to Sta 114+24.1 LT	146	LF
748	0150	MOUNTABLE CURB AND GUTTER - TYPE 1 SEC A		
		Sta 114+24.1 to Sta 144+77.0 LT	87	LF
750	0115	SIDEWALK CONCRETE 4IN		
		Sta 113+86.9 to Sta 114+31.9 RT	47	SY
		Sta 114+32.4 to Sta 114+55.4 RT	14	SY
		Sta 115+04.0 to Sta 115+25.5 RT	25	SY
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 114+50.4 RT	22	SY
		Sta 114+75.4 RT	5	SY
750	2115	DETECTABLE WARNING PANEL		
		Sta 114+19.5 RT	15	SF
		Sta 114+36.3 RT	16	SF
		Sta 114+53.5 RT	11	SF
		Sta 115+11.6 RT	20	SF

Stationing is based off of NB 16th Street Alignment

Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

Pavement Layout

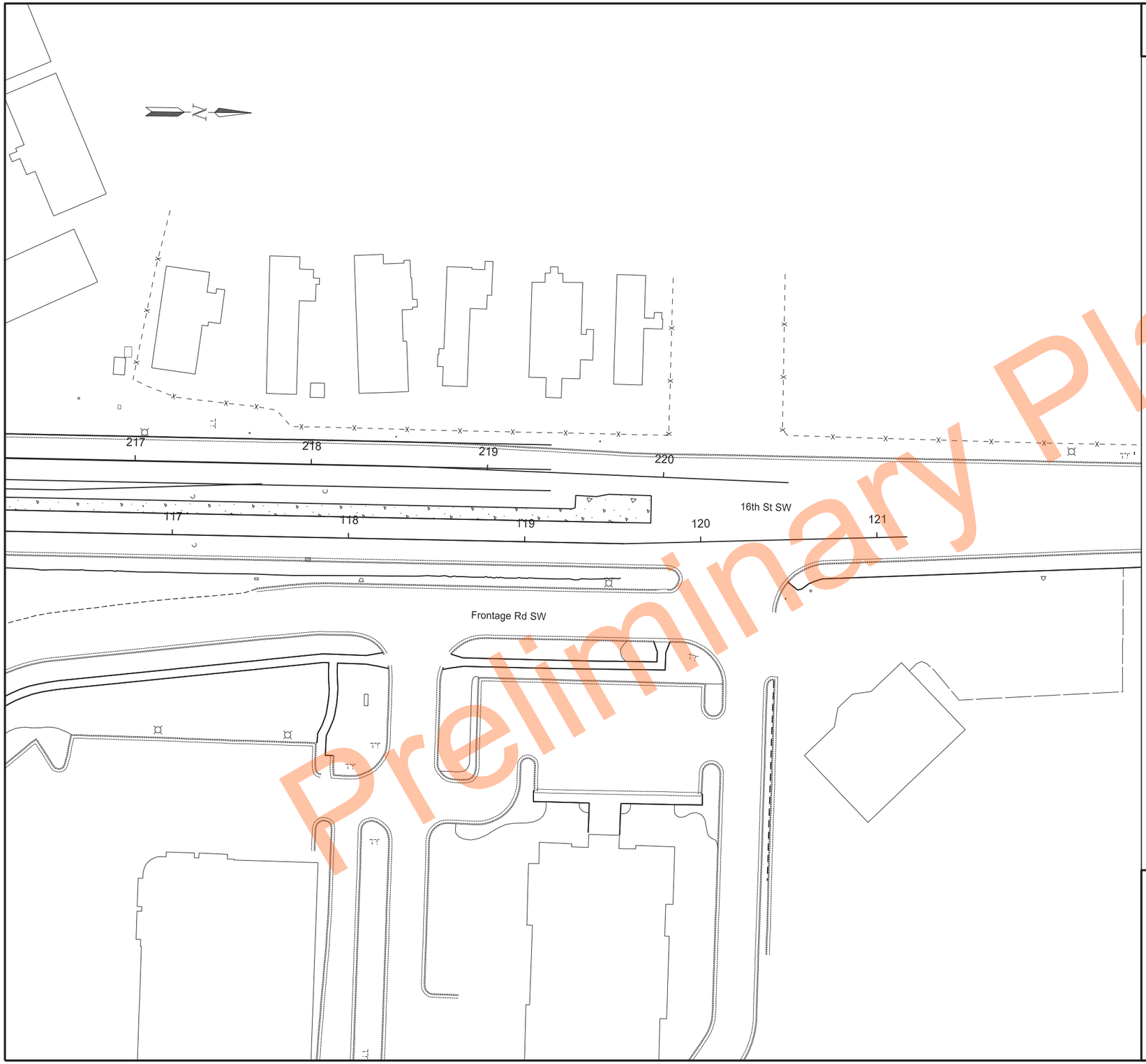
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	4

SPEC	CODE	BID ITEM	QTY	UNIT
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE Sta 116+27.4 to Sta 119+72.6 MEDIAN	315	SY

Stationing is based off of NB 16th Street Alignment

Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

Pavement Layout

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

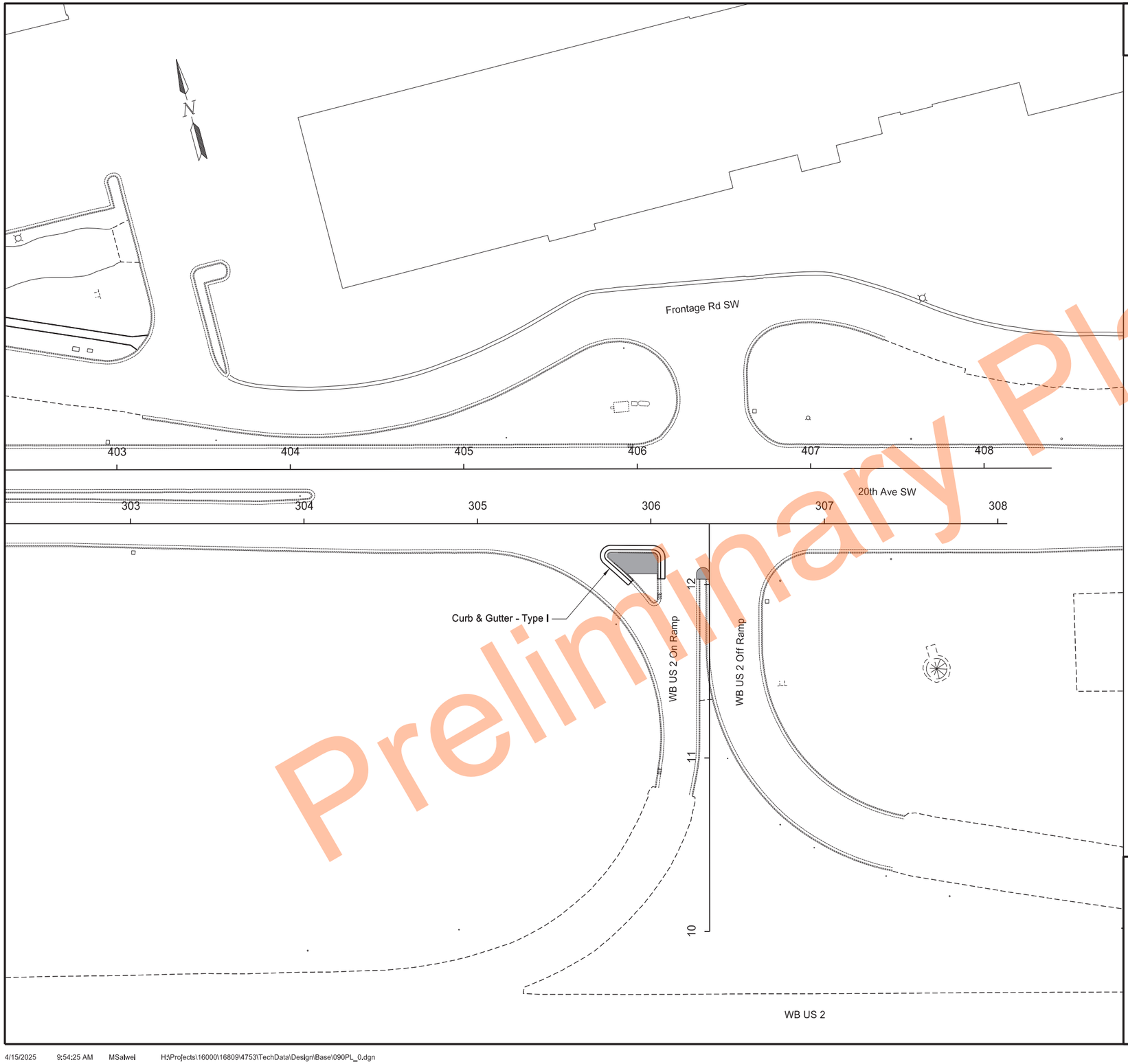
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DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	5

SPEC	CODE	BID ITEM	QTY	UNIT
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE		
		Sta 305+20.9 to Sta 306+08.1 RT	20	SY
748	0140	CURB AND GUTTER - TYPE 1		
		Sta 305+74.9 to Sta 306+04.1 RT	72	LF
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 305+76.6	31	SY
		Sta 306+30.0	4	SY

Stationing is based off of EB 20th Ave SW Alignment



Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

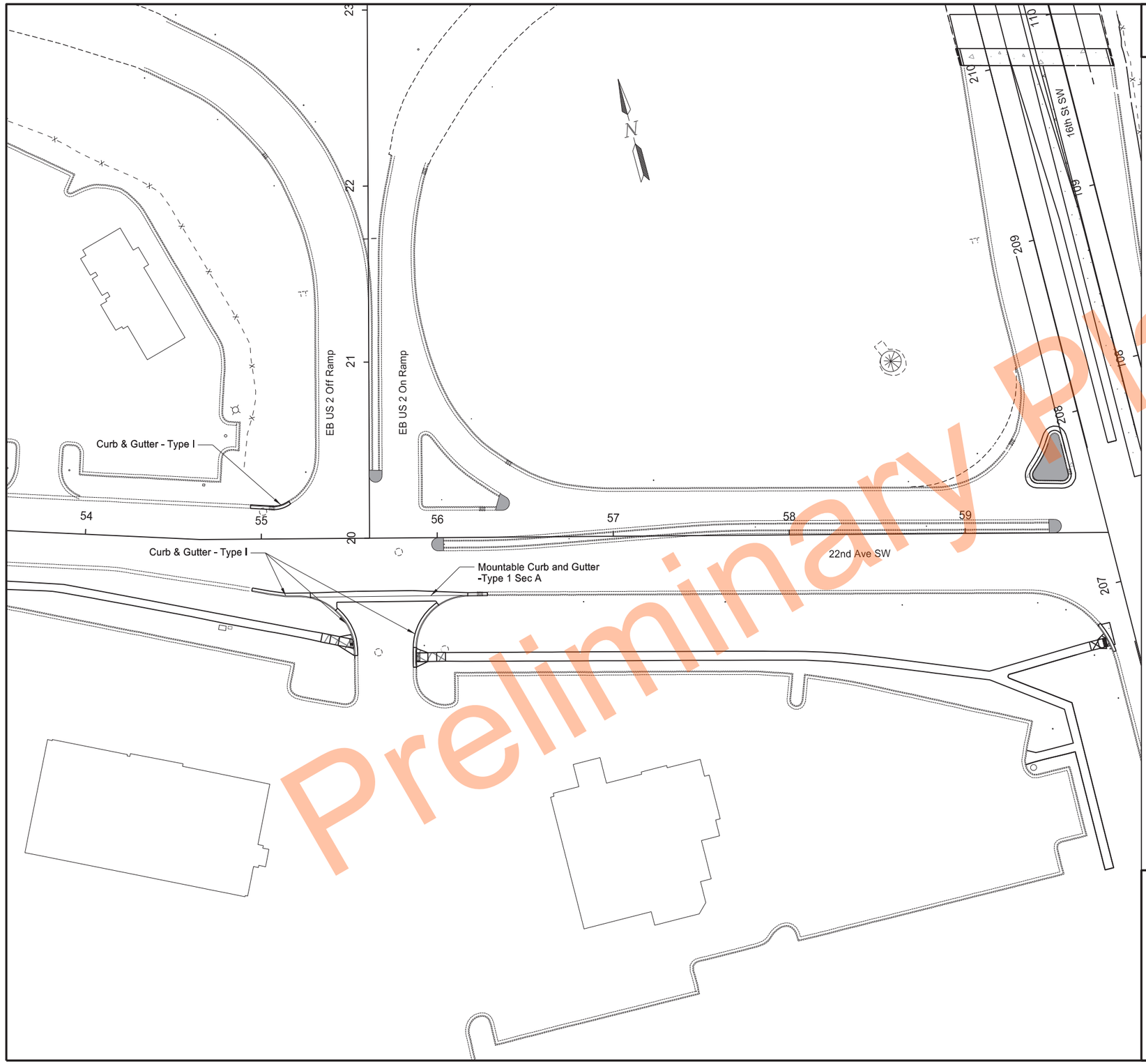
Pavment Layout

Concrete Pavment Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans



Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	90	6

SPEC	CODE	BID ITEM	QTY	UNIT
748	0140	CURB AND GUTTER - TYPE 1		
		Sta 54+94.1 to Sta 55+16.0 LT	24	LF
		Sta 54+94.7 to Sta 55+27.7 RT	33	LF
		Sta 55+42.1 to Sta 55+52.8 RT	30	LF
		Sta 55+87.3 to Sta 56+00.3 RT	41	LF
		Sta 56+17.2 to Sta 56+28.3 RT	11	LF
748	0150	MOUNTABLE CURB AND GUTTER - TYPE 1 SEC A		
		Sta 55+27.7 to Sta 56+17.2 RT	89	LF
750	0115	SIDEWALK CONCRETE 4IN		
		Sta 55+33.3 to Sta 55+52.3 RT	13	SY
		Sta 55+87.8 to Sta 56+04.1 RT	11	SY
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 55+65.8	5	SY
		Sta 56+00.4	5	SY
		Sta 56+37.2	5	SY
750	2115	DETECTABLE WARNING PANEL		
		Sta 55+50.8 RT	8	SF
		Sta 55+88.7 RT	8	SF

Stationing is based off of centerline 22nd Ave SW Alignment

Legend

- Concrete Pavement (4IN Sidewalk)
- Concrete Pavement (Median)
- Concrete Pavement (Roadway)
- Commercial Grade Asphalt

Pavement Layout

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE							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**	**6**	**6**	**6**	**6**		**6**	**26**	**156**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)							18	
G20-4b-36	36"x30"	WAIT FOR PILOT CAR							18	
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 $150 WHEN WORKERS PRESENT							59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)							11	
M1-4-24	**24"x24"**	**U.S. ROUTE MARKER (Post and installation only)**		**14**				**14**	**10**	**140**
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)**		**5**				**5**	**7**	**35**
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)							7	
M3-4-24	**24"x12"**	**WEST (Mounted on route marker post)**		**9**				**9**	**7**	**63**
M4-8-24	**24"x12"**	**DETOUR (Mounted on route marker post)**		**25**				**25**	**7**	**175**
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT							15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)							7	
M5-1-21	**21"x15"**	**ADVANCE TURN ARROW RT or LT(Mounted on route marker post)**		**1**				**1**	**7**	**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)**		**12**				**12**	**7**	**84**
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)							9	
M6-2(I)-21	**21"x15"**	**DIRECTIONAL ARROW DIAGONAL RT or LT (Mounted on route marker post)**		**1**				**1**	**7**	**7**
M6-3-21	**21"x15"**	**DIRECTIONAL ARROW UP (Mounted on route marker post)**		**11**				**11**	**7**	**77**
R1-1-48	48"x48"	STOP							32	
R1-2-60	60"x60"	YIELD							29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**3**	**3**	**2**	**2**		**3**	**30**	**90**
R2-1-48	**48"x60"**	**SPEED LIMIT __**			**2**	**2**		**2**	**39**	**78**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $150 (Mounted on Speed Limit post)**	**2**	**2**				**2**	**10**	**20**
R3-2-48	**48"x48"**	**NO LEFT TURN**	**3**	**1**	**4**	**8**		**8**	**35**	**280**
R3-5-30	**30"X36"**	**LEFT or RIGHT TURN ONLY**	**2**	**2**	**4**	**2**		**4**	**18**	**72**
R3-7-30	**30"x30"**	**LEFT or RIGHT LANE MUST TURN LEFT or RIGHT**	**1**	**2**	**5**	**8**		**8**	**17**	**136**
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**		**1**				**1**	**35**	**35**
R6-1-54	**54"x18"**	**ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)**	**3**		**2**			**3**	**14**	**42**
R7-1-12	12"x18"	NO PARKING ANY TIME							11	
R9-9-24	24"x12"	SIDEWALK CLOSED (Mounted on barricade)							3	
R10-6-24	24"x36"	STOP HERE ON RED							16	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on barricade)**		**2**				**2**	**12**	**24**
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)							15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT							35	
W1-4-48	**48"x48"**	**REVERSE CURVE RIGHT or LEFT**	**2**	**3**	**1**	**2**		**3**	**35**	**105**
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**	**2**	**2**	**2**	**2**		**2**	**35**	**70**
W4-2-48	**48"x48"**	**LANE ENDS RIGHT or LEFT**	**3**	**3**	**3**	**3**		**3**	**35**	**105**
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	
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	
W16-7p-18	**18"x12"**	**LEFT or RIGHT DIAGONAL ARROW (Mounted on delineator drum)**	**4**	**5**	**3**			**5**	**2**	**10**
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**12**	**11**	**9**	**9**		**12**	**35**	**420**
W20-2-48	**48"x48"**	**DETOUR AHEAD or __ FT or _ MILE**		**5**				**5**	**35**	**175**
W20-3-48	**48"x48"**	**ROAD or STREET CLOSED AHEAD or __ FT or _ MILE**	**1**	**6**				**6**	**35**	**210**
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**	**6**	**5**	**5**	**5**		**6**	**35**	**210**
W20-7-48	**48"x48"**	**FLAGGER**	**2**	**2**	**2**	**2**		**2**	**35**	**70**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**2**	**2**	**2**	**2**		**2**	**5**	**10**
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)							12	
W21-1-48	48"x48"	WORKERS							35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
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							35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT 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	
W24-1-48	48"x48"	DOUBLE REVERSE CURVE							35	

SPECIAL SIGNS

Consign 1	**48"x24"**	**Businesses W/ Rt Arrow**	**1**		**1**			**1**	**26**	**26**
Consign 2	**48"x24"**	**Businesses W/ Lt Arrow**	**1**		**1**			**1**	**26**	**26**
Consign 3	**48"x24"**	**Businesses W/ Up Arrow**	**1**		**1**			**1**	**26**	**26**
Consign 4	**72"x24"**	**16TH ST SW**		**10**				**10**	**30**	**300**
Consign 5	**36"x24"**	**Lt Only Rt Only**			**2**			**2**	**23**	**46**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 3330**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**80**	**80**	**80**	**80**		**320**
704-1048	PORTABLE RUMBLE STRIPS	EACH						
704-1050	TYPE I BARRICADES	EACH						
704-1052	**TYPE III BARRICADES**	EACH	**32**	**38**	**37**	**29**		**38**
704-1054	**SIDEWALK BARRICADE**	EA	**9**	**9**	**9**	**9**		**9**
704-1058	**PEDESTRIAN WALKWAY**	LF	**1300**	**1300**	**1300**	**1300**		**1300**
704-1060	**DELINEATOR DRUMS**	EACH	**82**	**140**	**163**	**192**		**192**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH	**385**	**478**	**367**	**392**		**478**
704-1070	DELINEATOR	EACH						
704-1072	**FLEXIBLE DELINEATORS**	EACH	**8**	**25**	**14**			**25**
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	**10**	**10**	**10**	**10**		**10**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF						
704-3510	**PRECAST CONCRETE MED BARRIER - STATE FURNISHED**	EACH	**78**	**69**				**78**
704-4011	**PORTABLE CHANGEABLE MESSAGE SIGN**	EA	**4**	**4**	**4**	**4**		**4**
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/

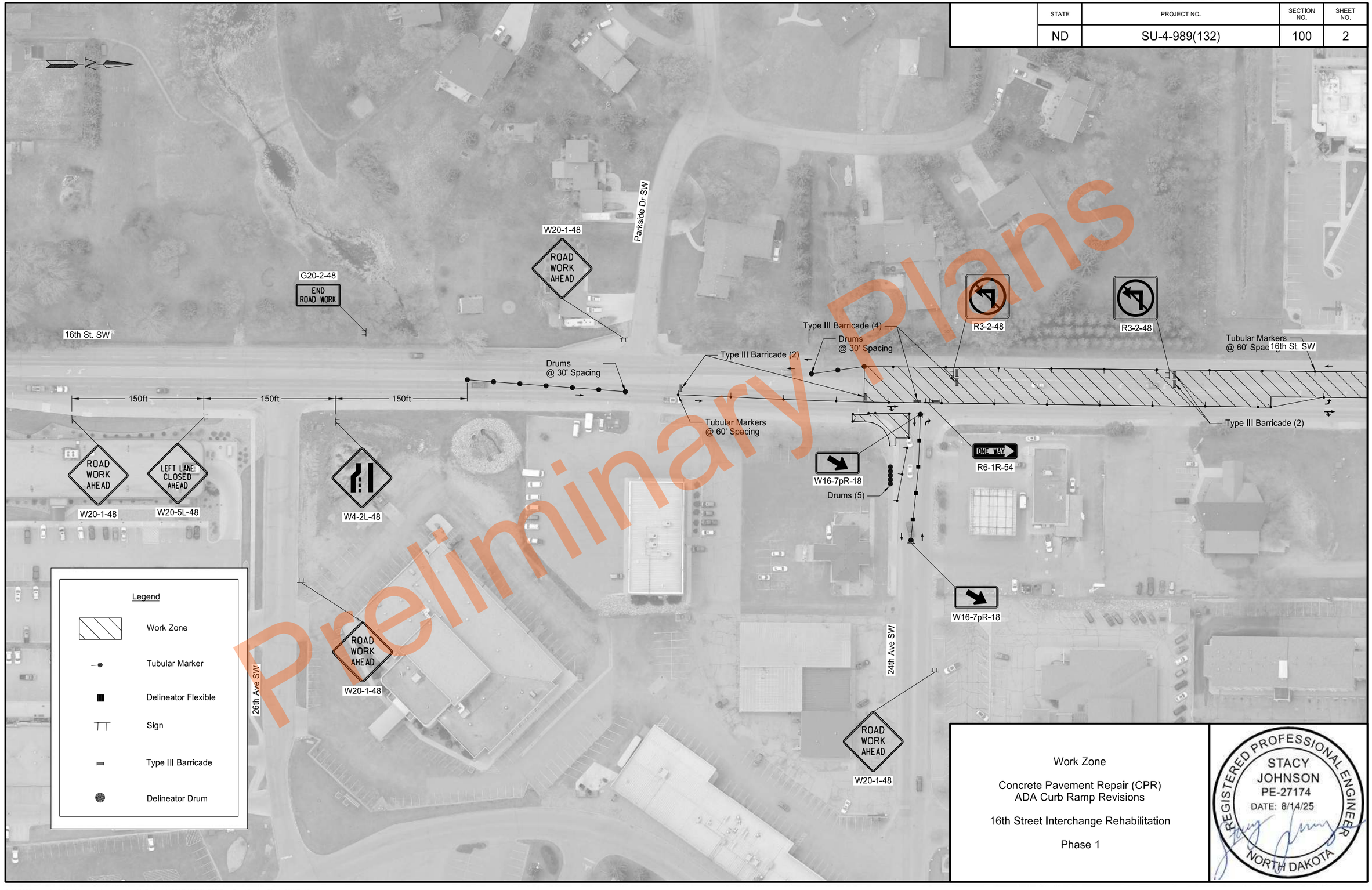


Traffic Control Devices List
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	2



Preliminary Plans

Work Zone

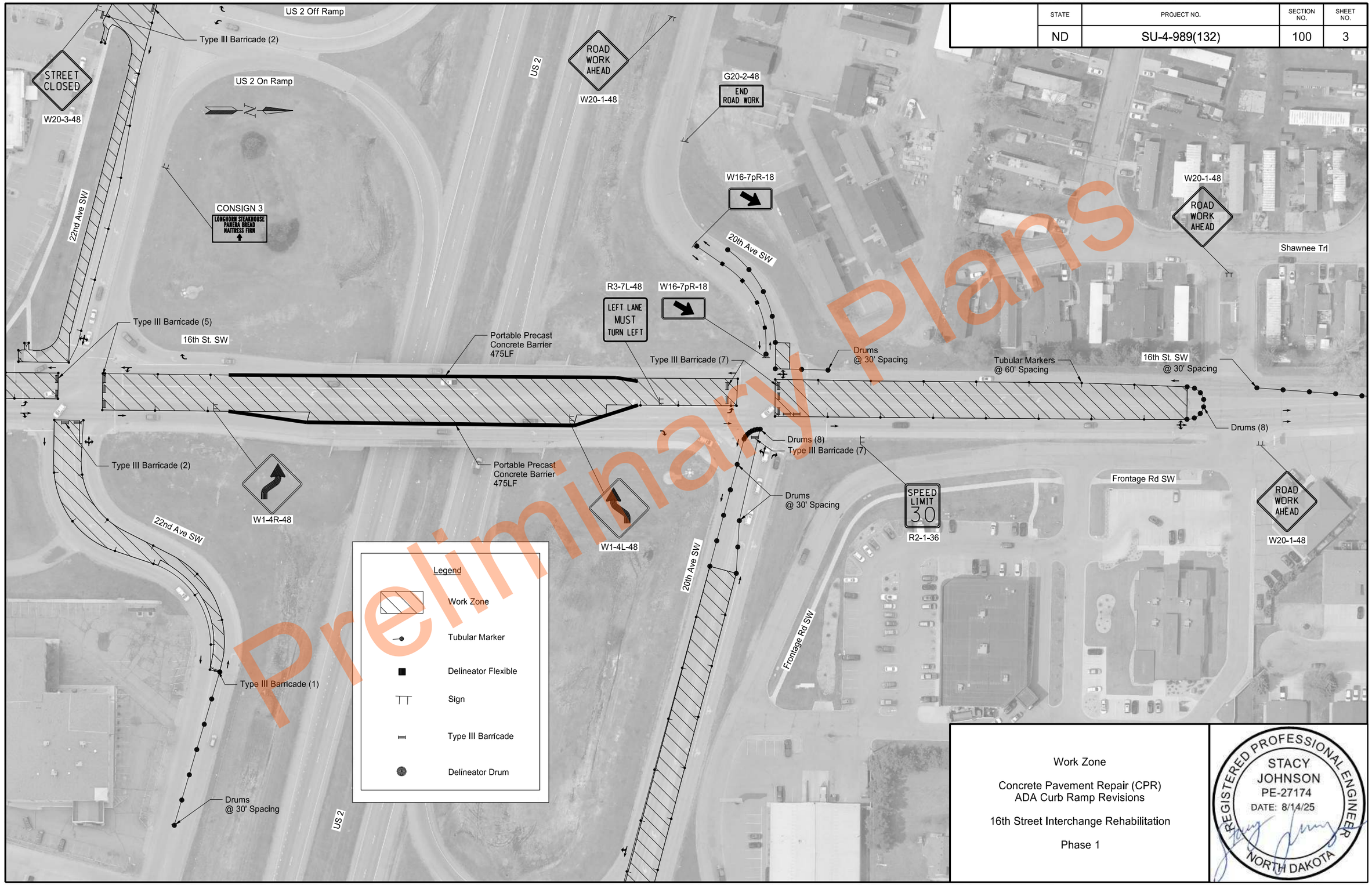
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 1

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	3



Preliminary Plans

Work Zone

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 1

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:19:14 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_102.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	4



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

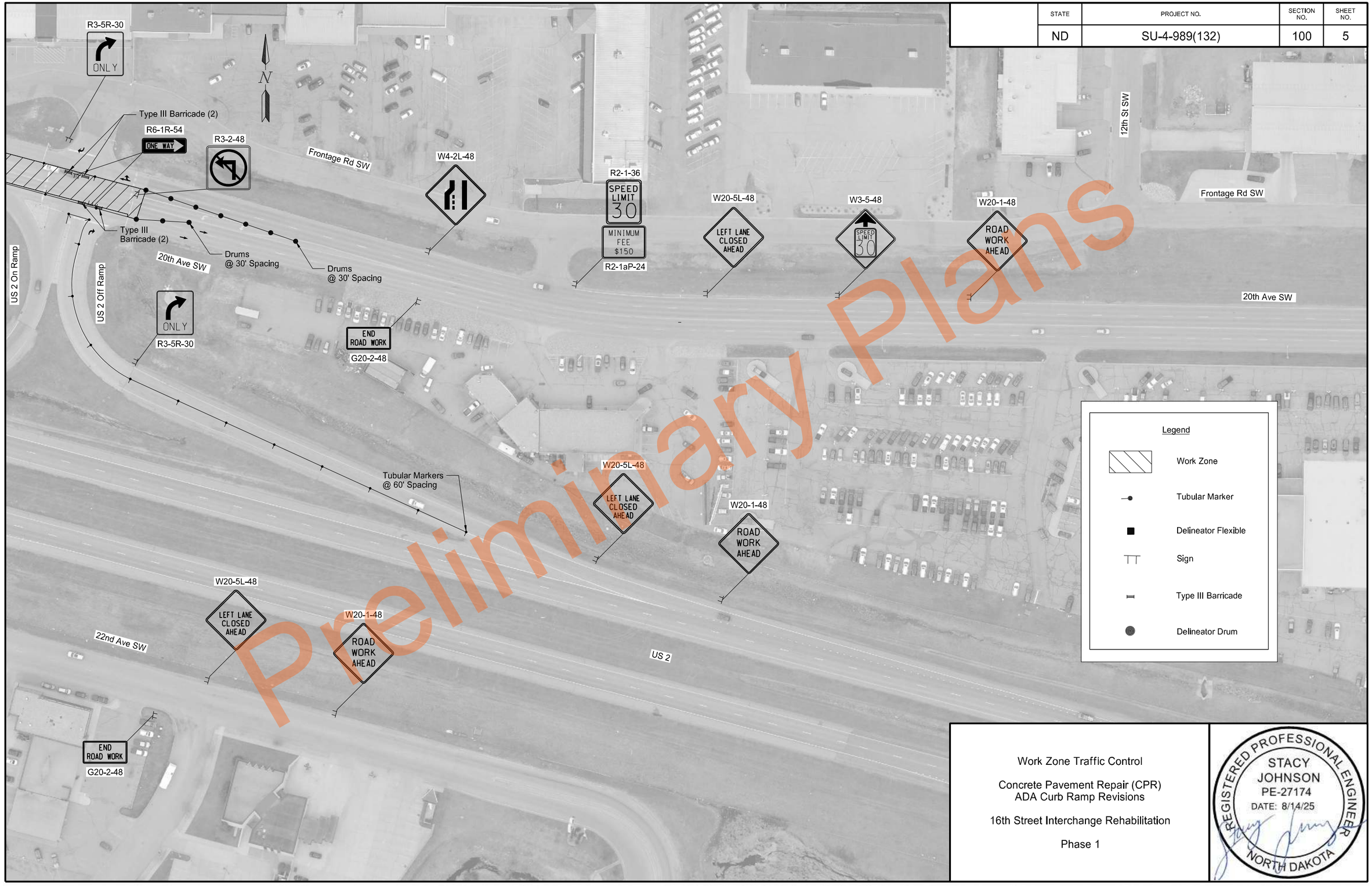
16th Street Interchange Rehabilitation

Phase 1

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:19:22 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_103.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	5



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 1

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	6



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

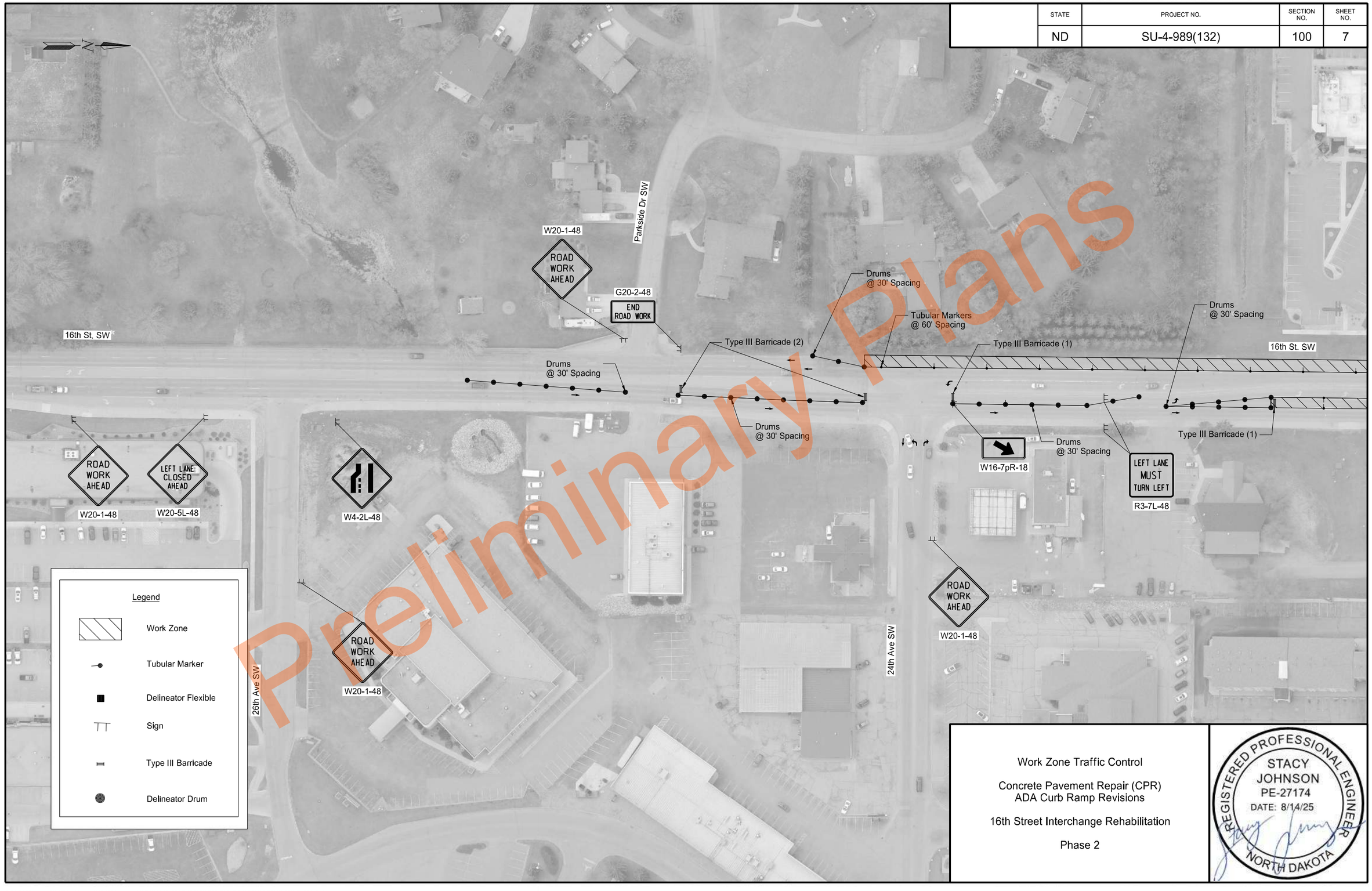
16th Street Interchange Rehabilitation

Phase 1

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:19:36 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_105.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	7



Preliminary Plans

Work Zone Traffic Control

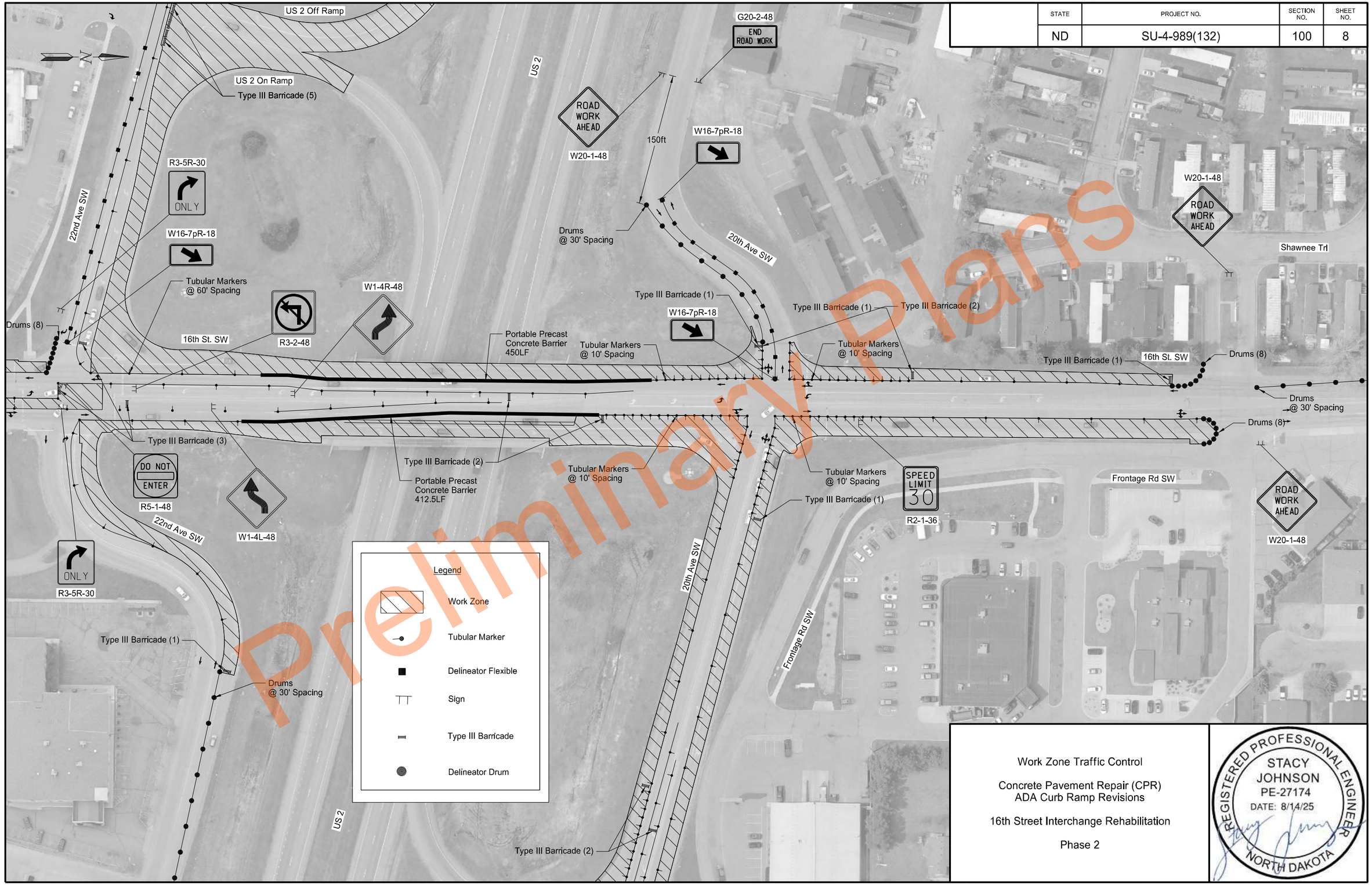
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 2

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	8



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 2

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	9



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

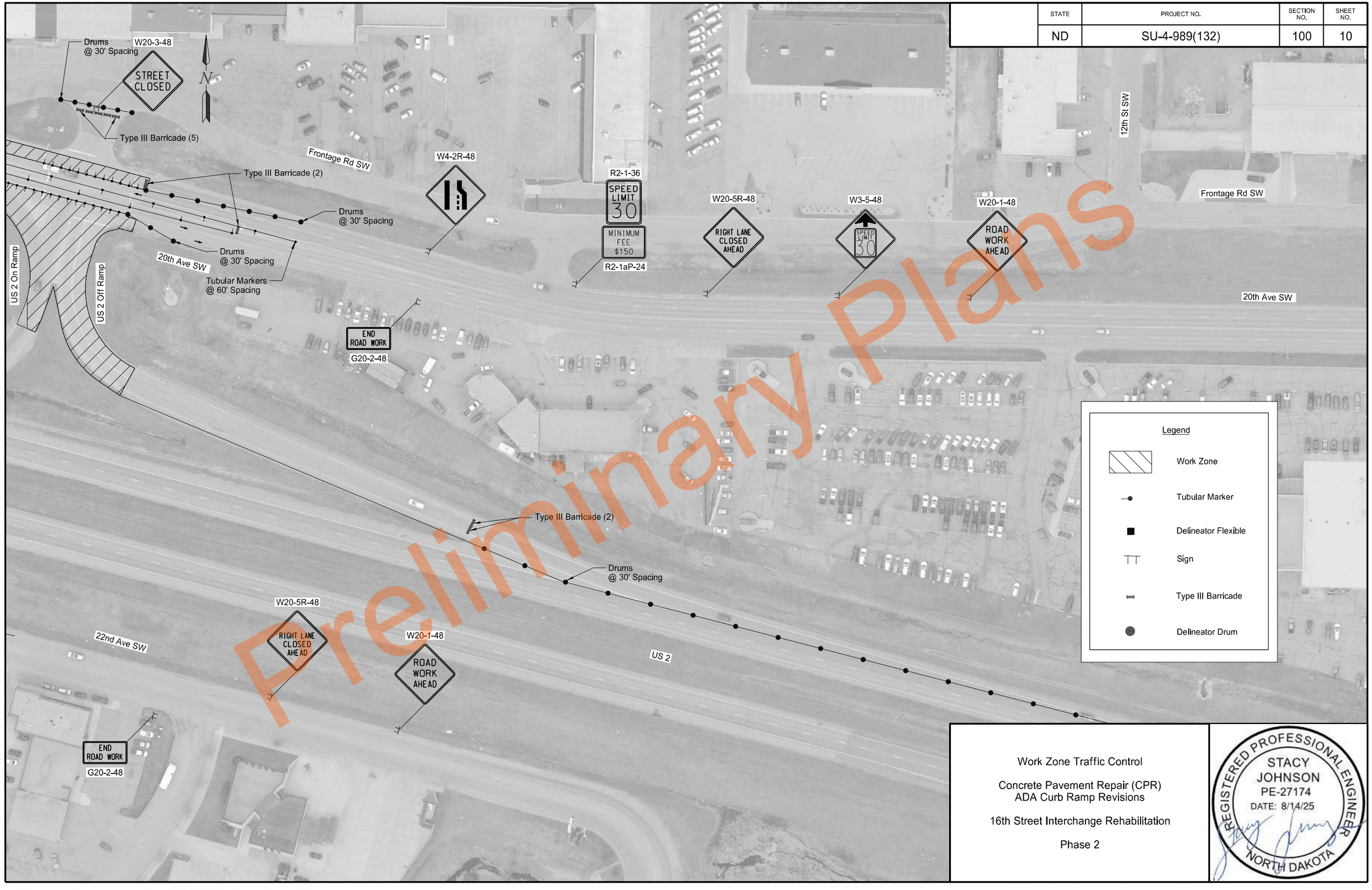
16th Street Interchange Rehabilitation

Phase 2

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:19:56 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_203.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	10



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

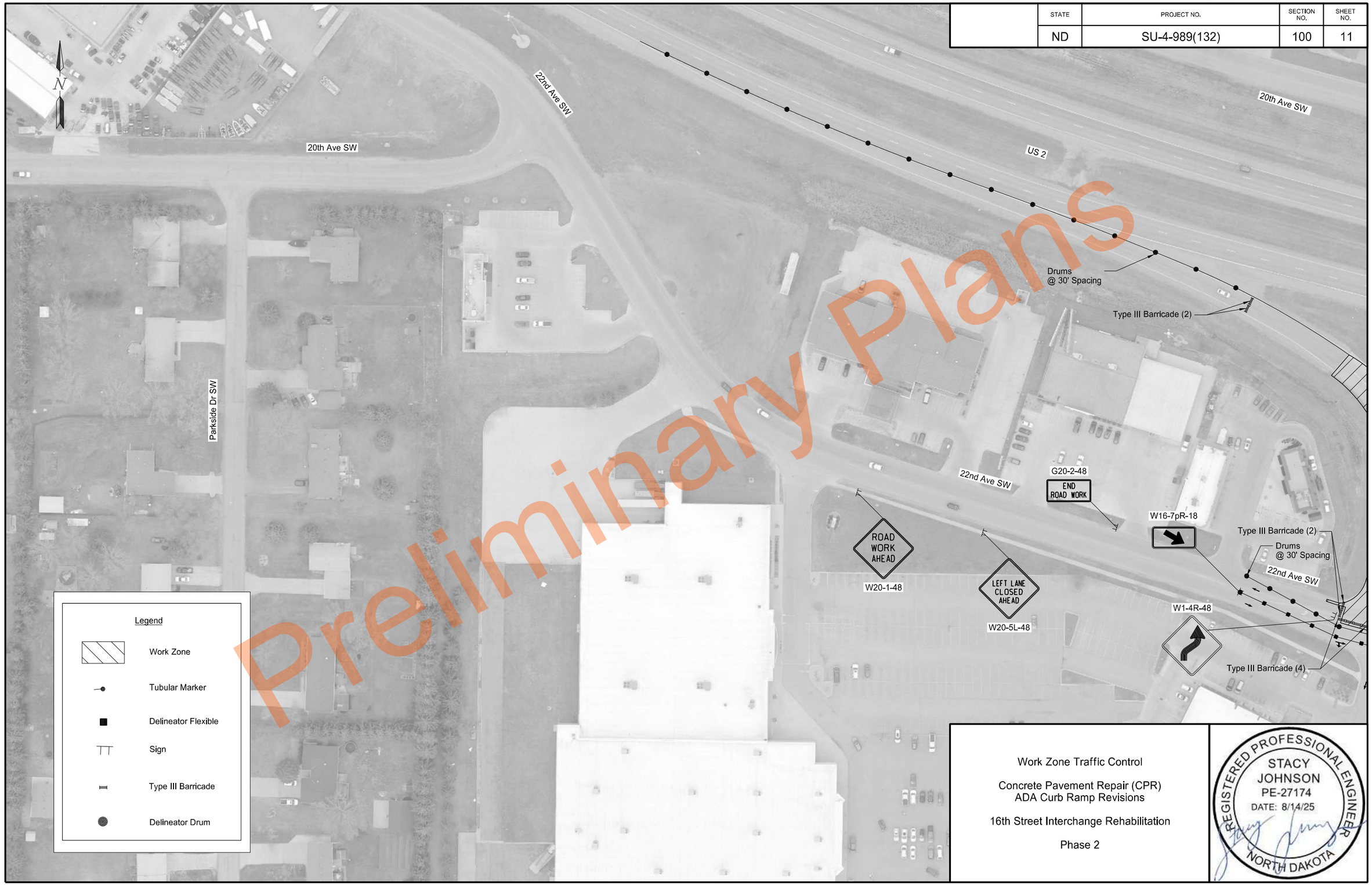
16th Street Interchange Rehabilitation

Phase 2

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:02 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_204.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	11



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 2

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:09 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_205.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	12



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

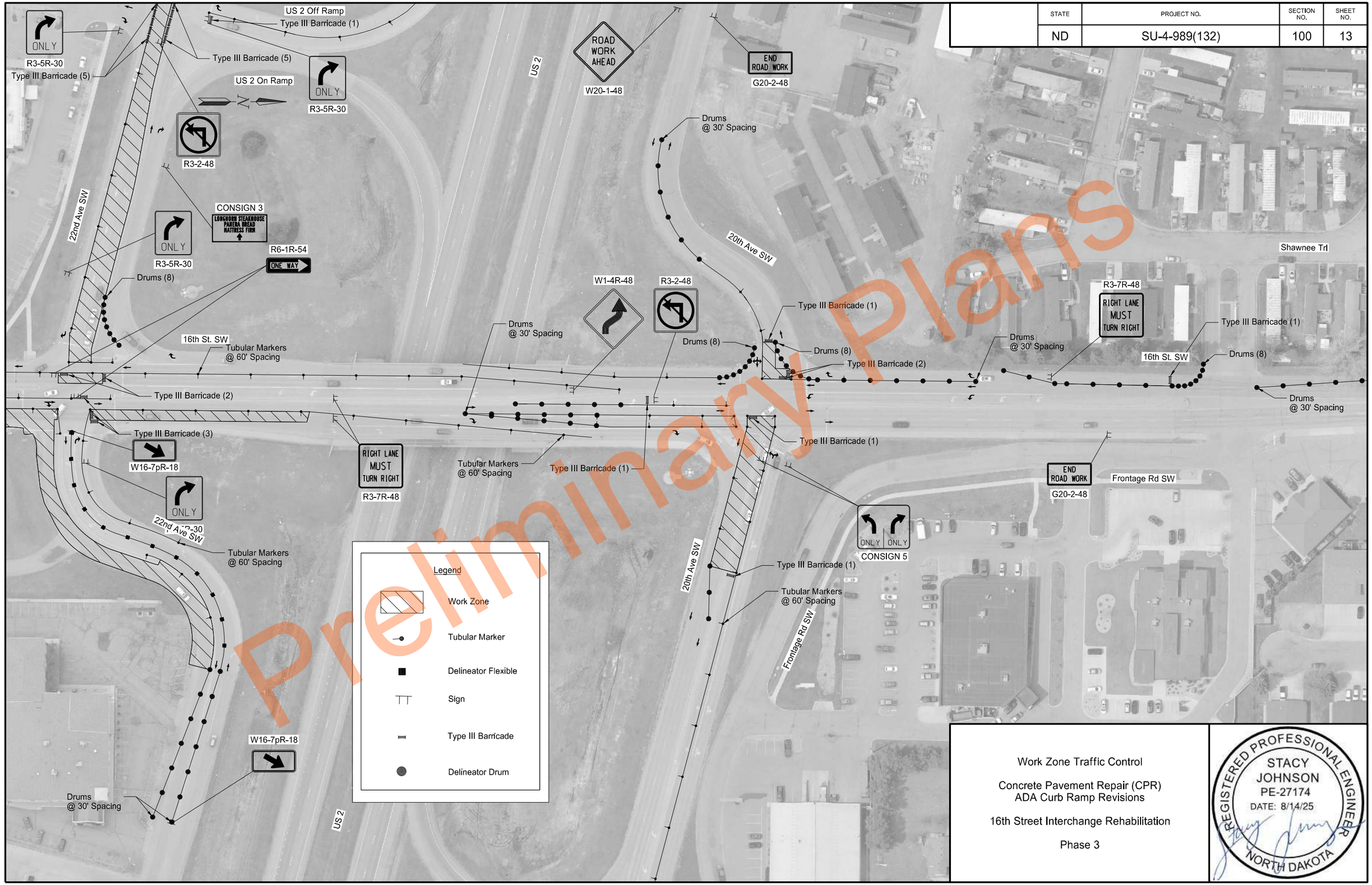
16th Street Interchange Rehabilitation

Phase 3

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:15 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_301.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	13



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 3

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:22 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_302.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	14



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

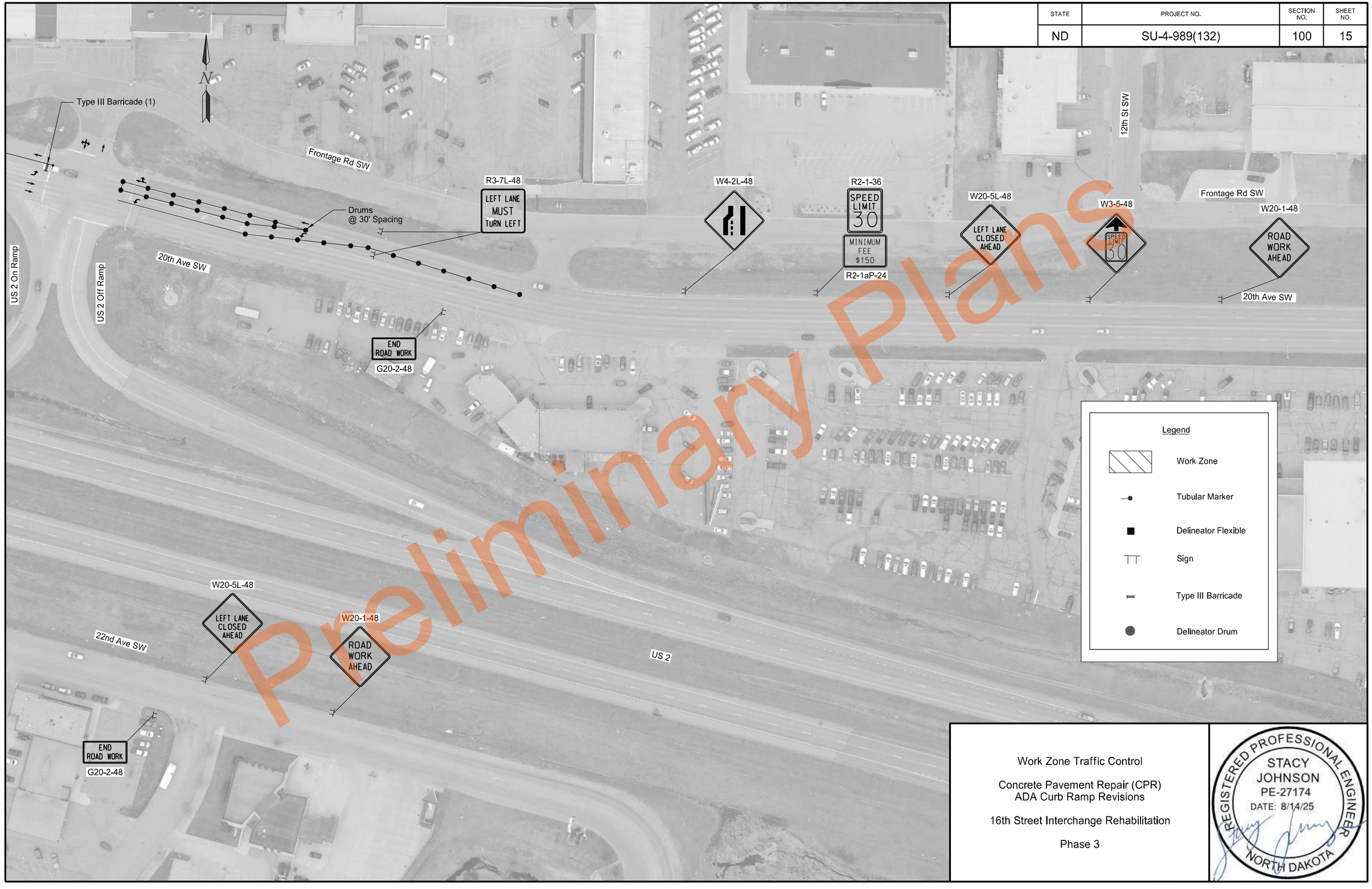
16th Street Interchange Rehabilitation

Phase 3

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:28 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_303.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	15



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 3

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:35 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_304.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	16



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 3

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	17



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

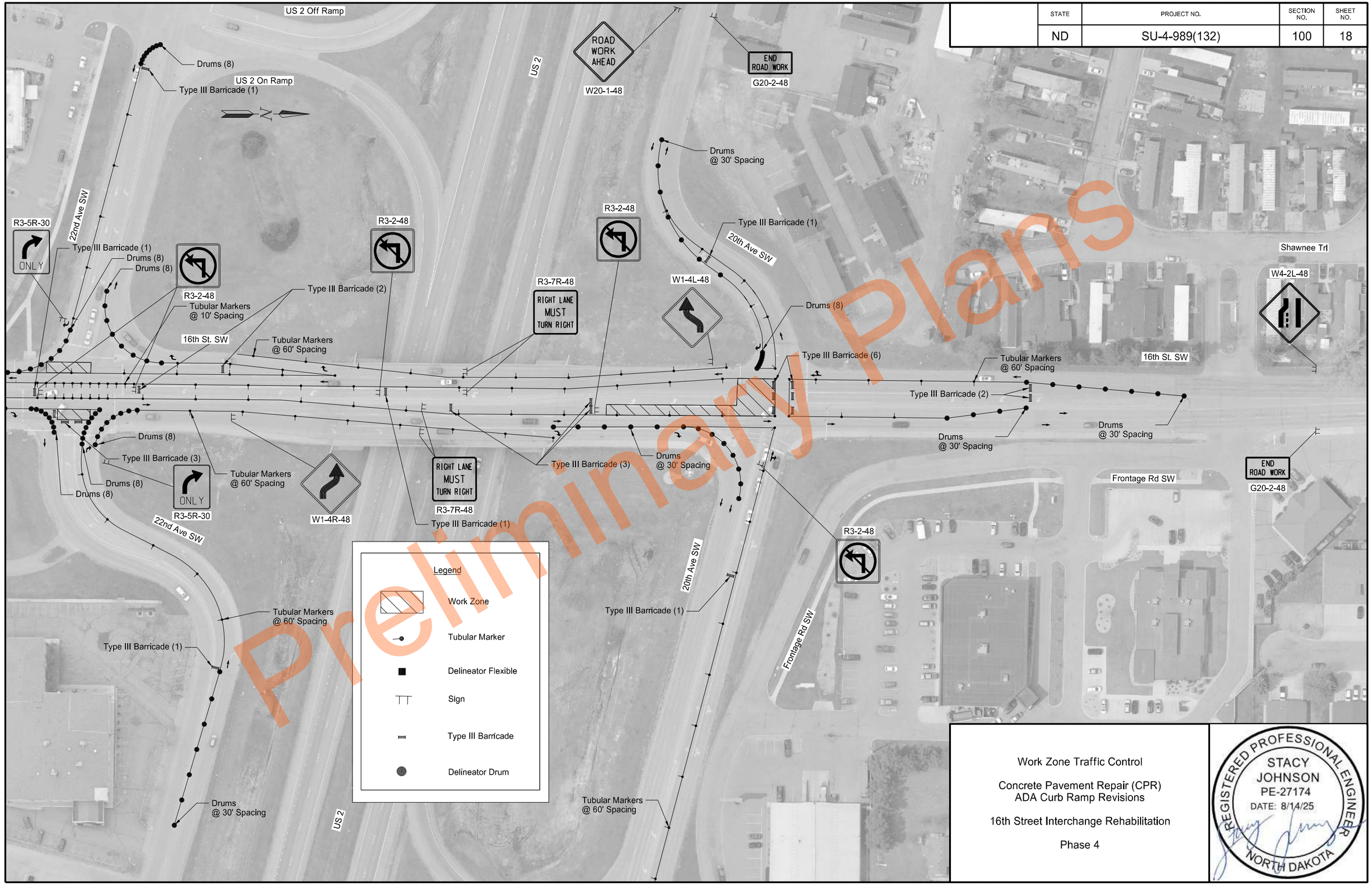
16th Street Interchange Rehabilitation

Phase 4

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:49 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_401.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	18



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 4

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:20:55 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_402.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	19



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

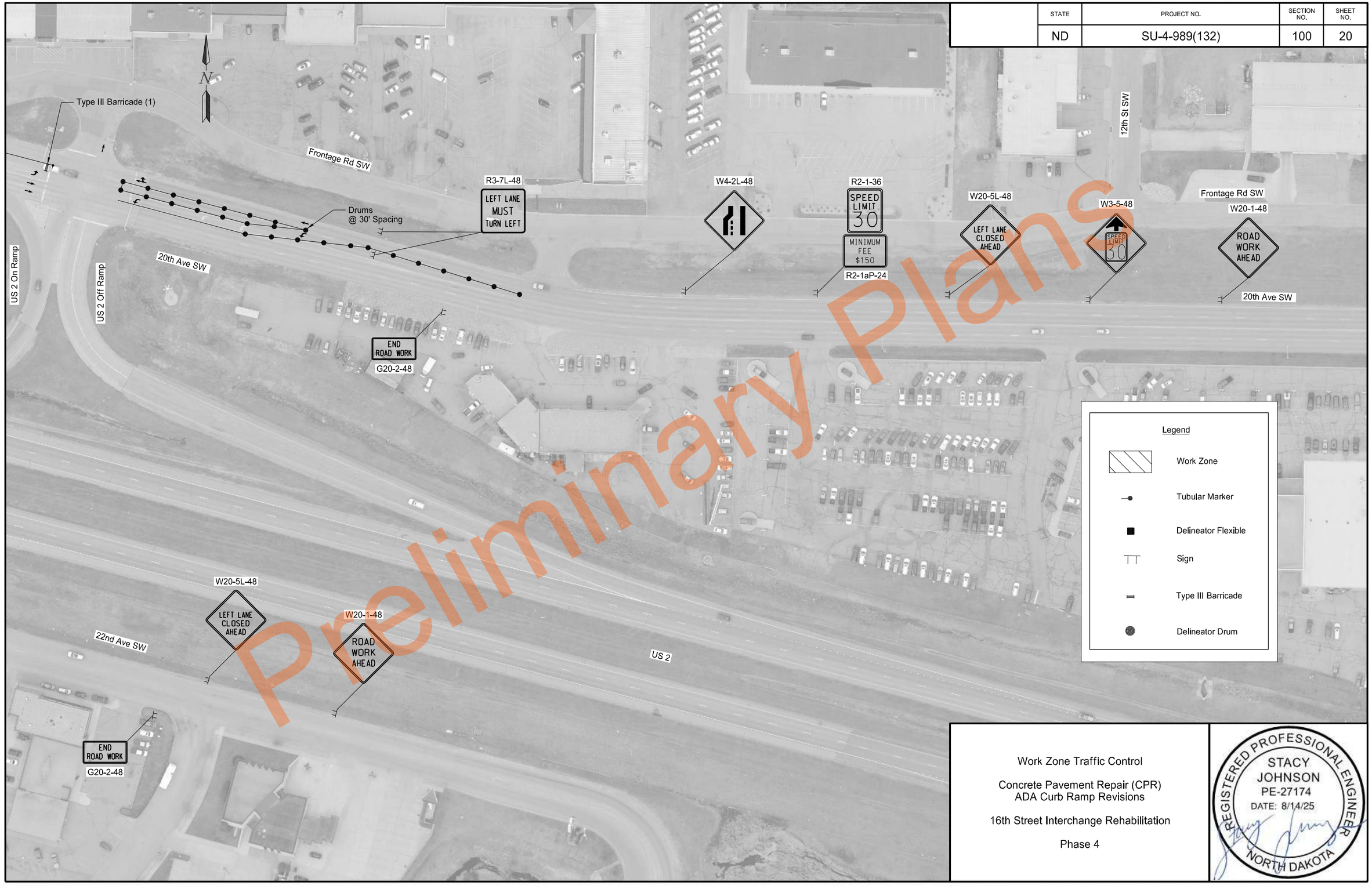
16th Street Interchange Rehabilitation

Phase 4

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	20



Preliminary Plans

Work Zone Traffic Control

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 4

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:21:09 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_404.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	21



Preliminary Plans

Work Zone Traffic Control

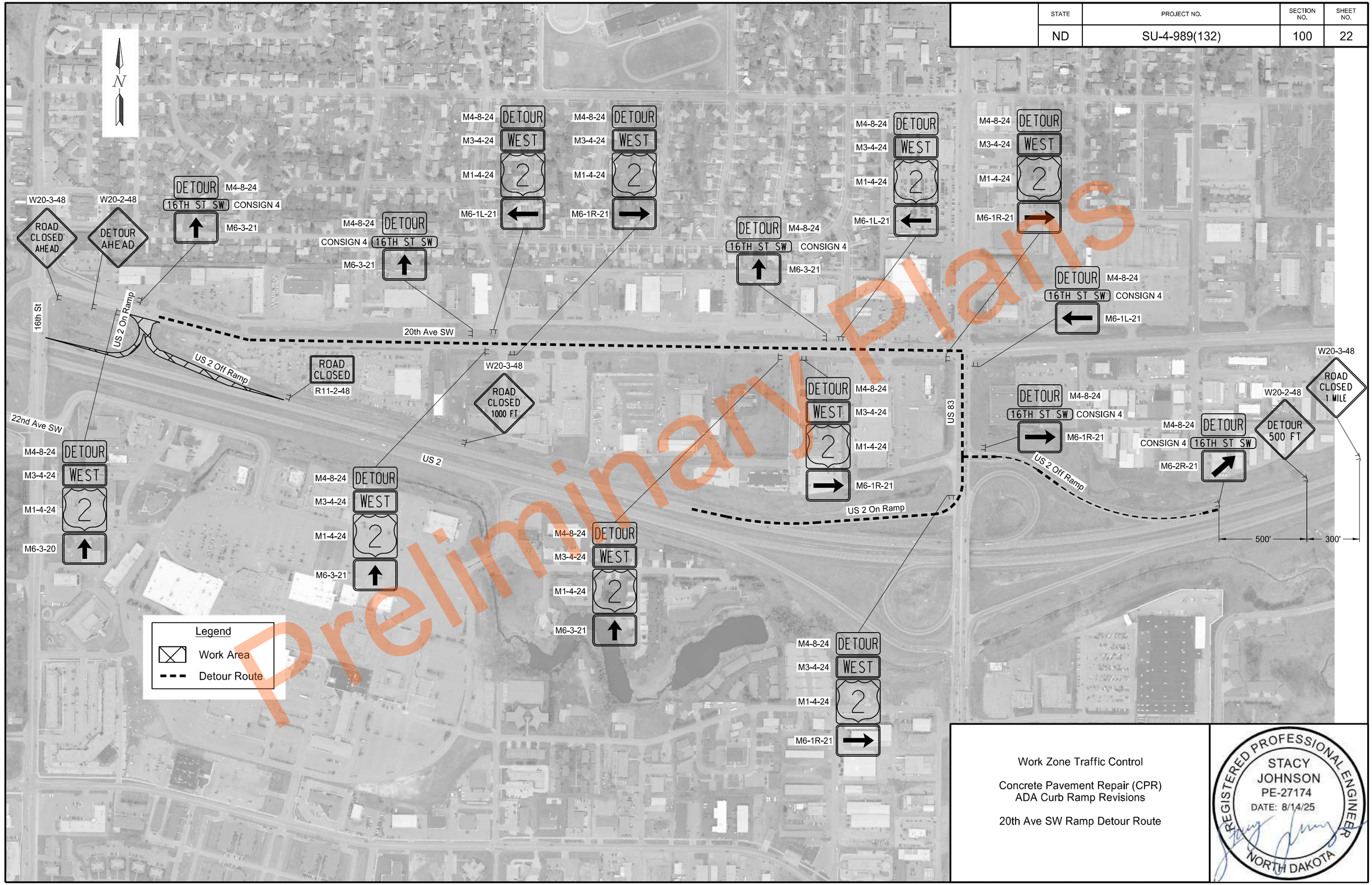
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Phase 4

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	22



Preliminary Plans

Work Zone Traffic Control

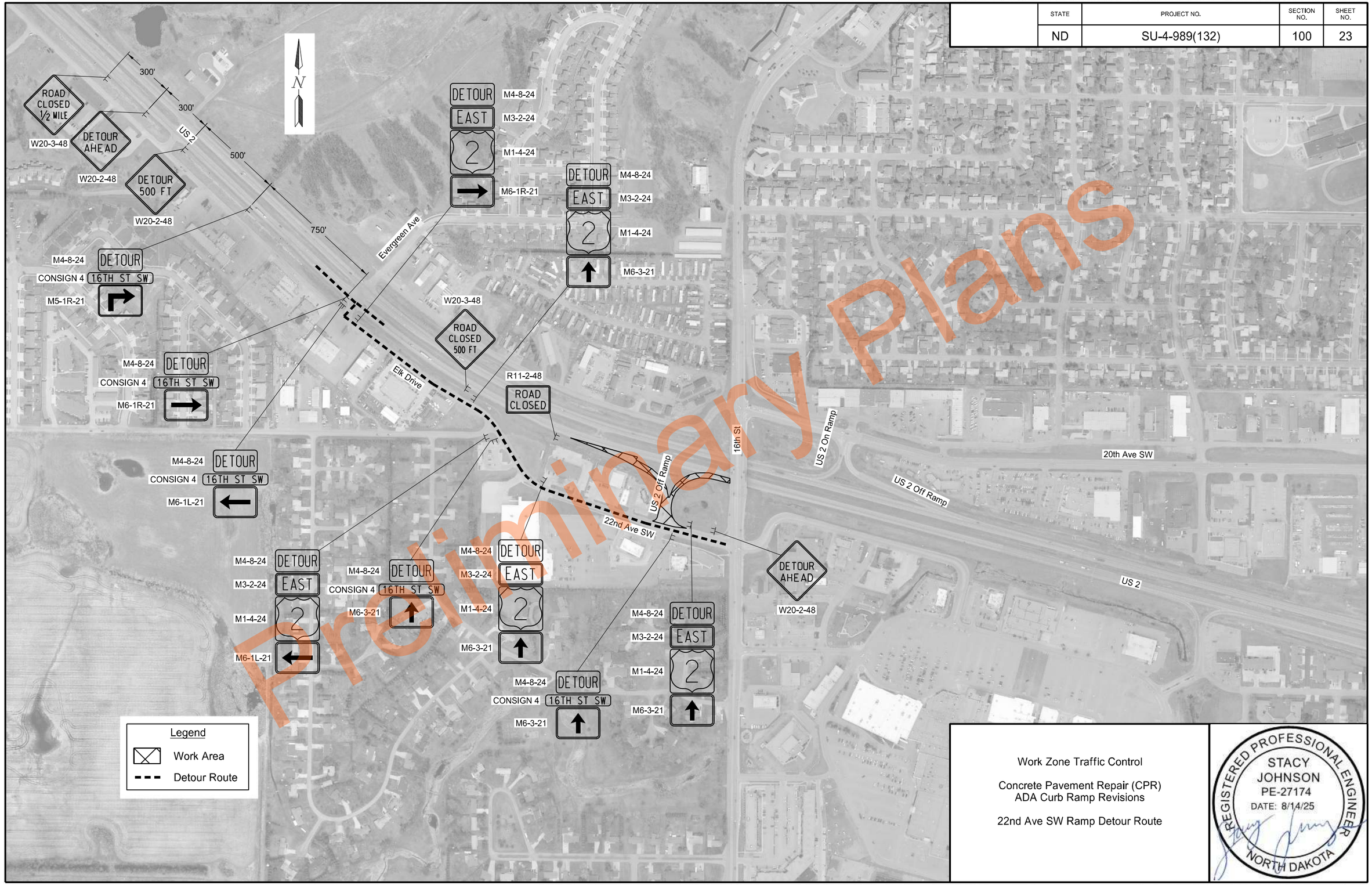
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

20th Ave SW Ramp Detour Route

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:22:54 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_501.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	23



Work Zone Traffic Control

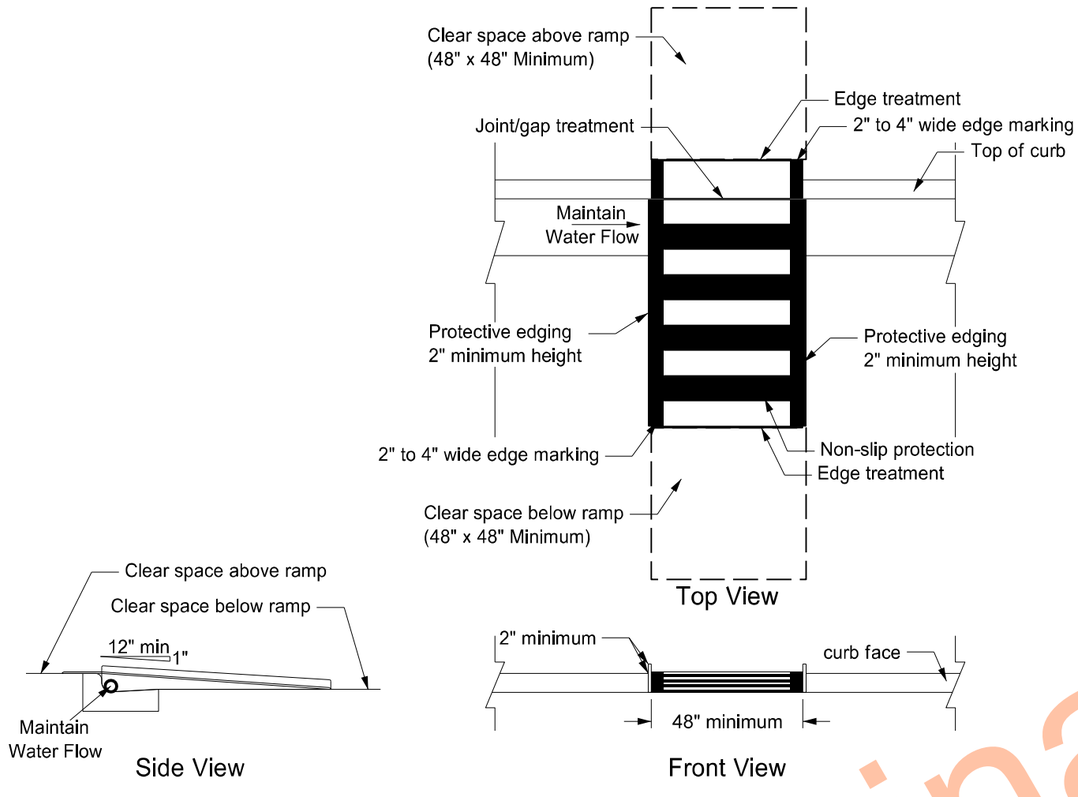
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

22nd Ave SW Ramp Detour Route

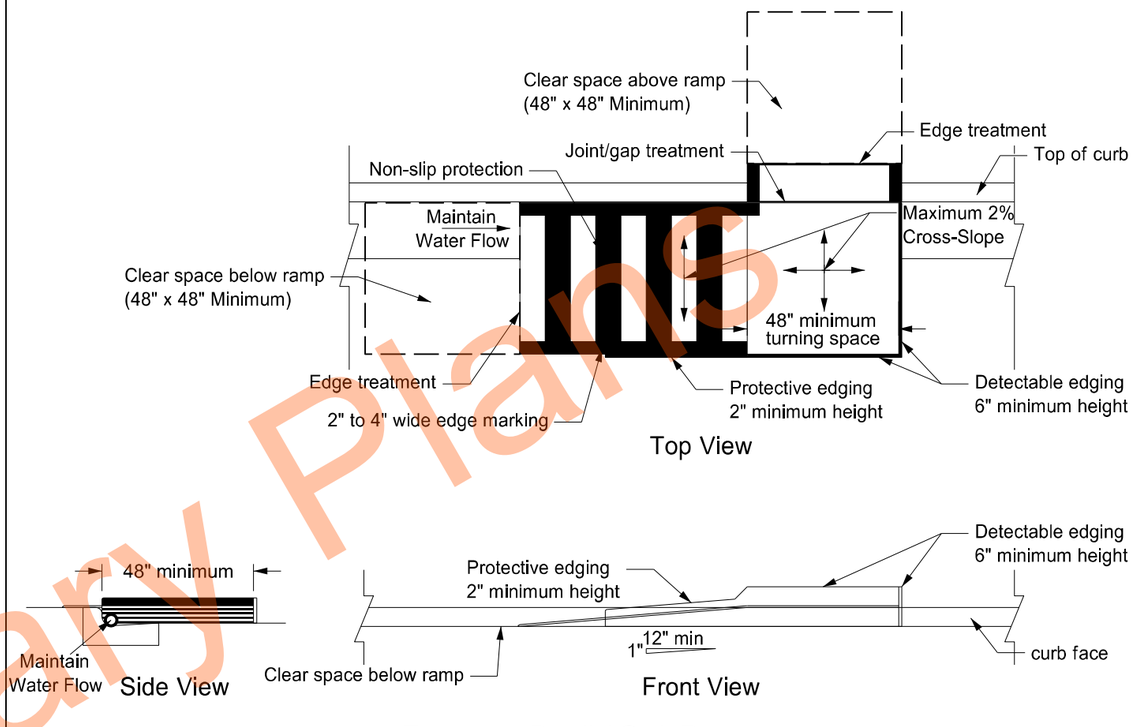
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

8/14/2025 9:23:12 AM sjohnson H:\Projects\16000\16809\4753\TechData\Design\Plan\100WZ_502.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	100	24

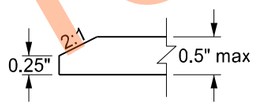


Temporary Perpendicular Curb Ramp



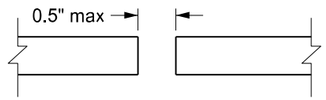
Temporary Parallel Curb Ramp

Edge Treatment



Maximum Surface
Height Change Detail

Joint/Gap Treatment



Maximum Width
Lateral Joints or Gaps

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

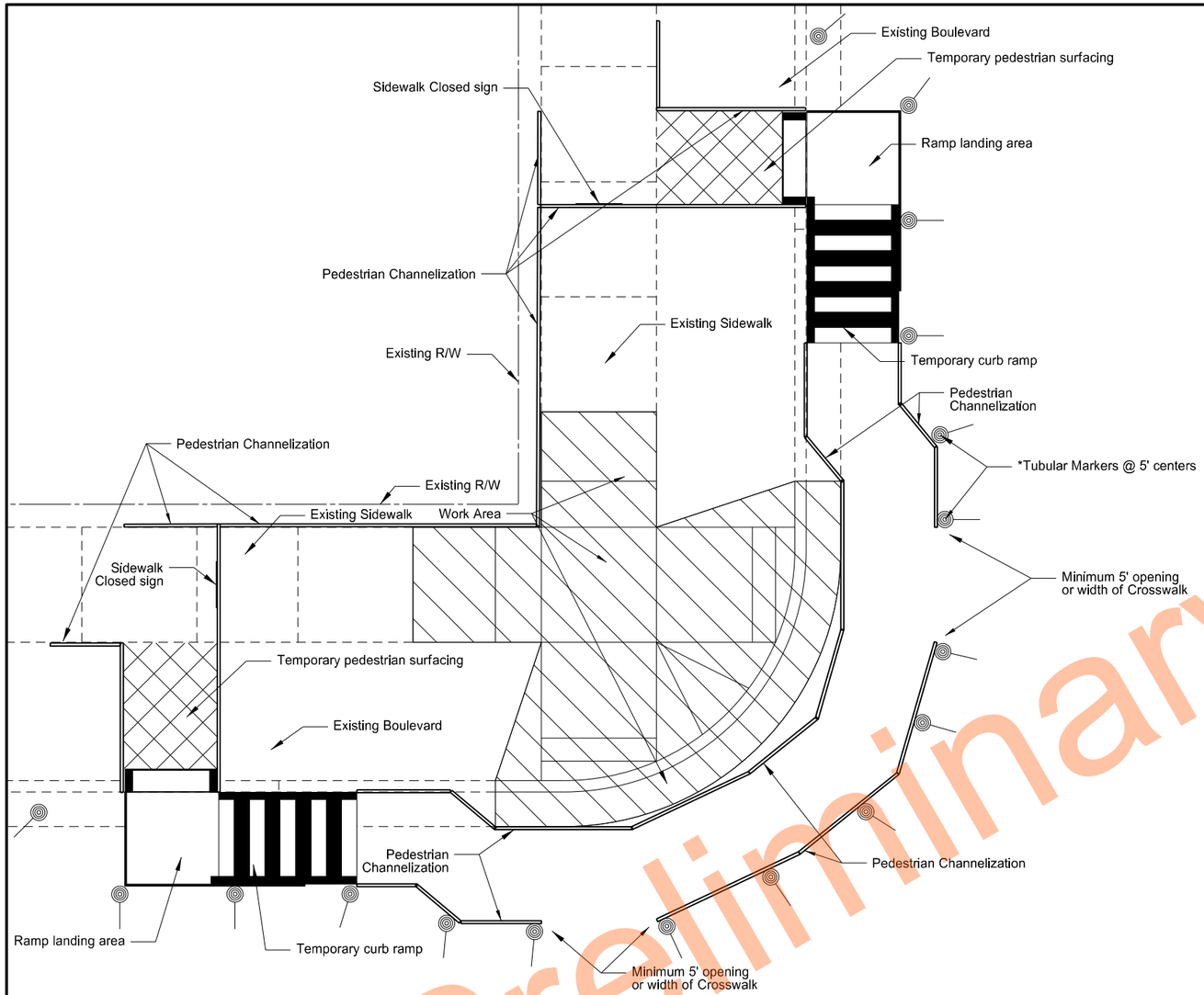
16th Street Interchange Rehabilitation

Temporary Pedestrian Curb Ramp

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	25



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

Preliminary Plans

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

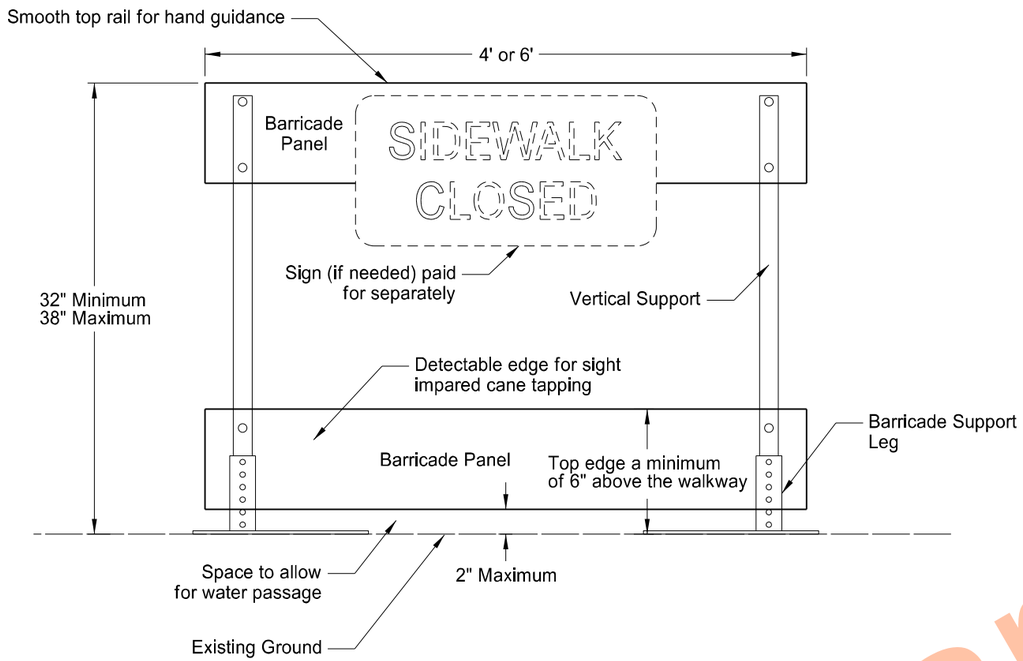
16th Street Interchange Rehabilitation

Temporary Pedestrian Routes

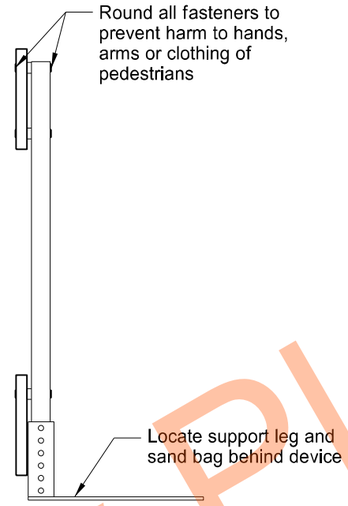
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

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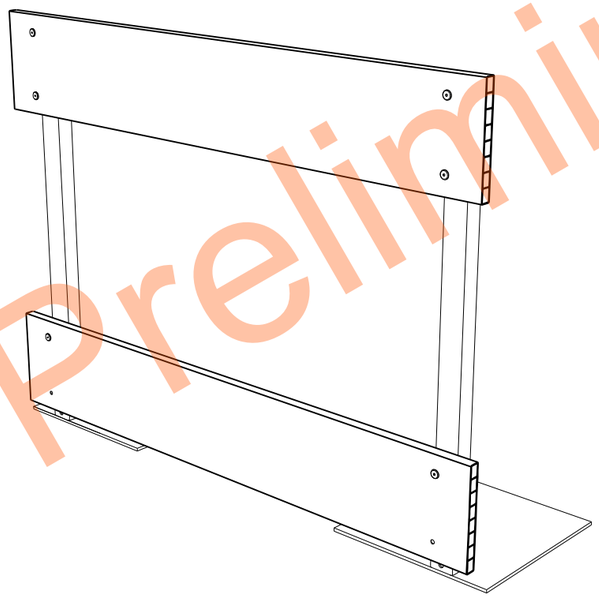
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	26



Front View



End View



Perspective 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".

Preliminary Plans

General Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

Sidewalk Barricade

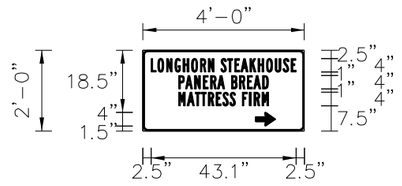
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	27

SIGN NUMBER	Consign 1
WIDTH X HEIGHT	4'-0" x 2'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_4IN_TYPE D	33.5	1.5	4	6	270

AREA: 8.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

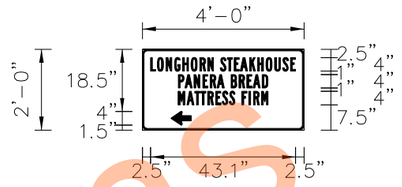
PANEL STYLE: ND_TTC_Business.sst

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	O	N	G	H	O	R	N		S	T	E	A	K	H	O	U	S	E	43.1	4	B 2000
2.5	4.4	7	9.5	12	14.5	17.1	19.4		23.1	25.2	27.3	29.1	31.8	34.2	36.7	39.3	41.7	44			
P	A	N	E	R	A		B	R	E	A	D								26.6	4	B 2000
10.7	12.6	15.4	18	20.1	22.2		26.3	28.7	31	32.9	35.6										
M	A	T	T	R	E	S	S		F	I	R	M							26.7	4	B 2000
10.7	13.2	15.6	17.3	19.4	21.8	23.7	25.8		29.5	31.6	33	35.4									

SIGN NUMBER	Consign 2
WIDTH X HEIGHT	4'-0" x 2'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_4IN_TYPE D	8.5	1.5	4	6	90

AREA: 8.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

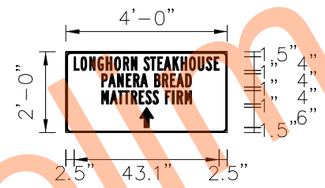
PANEL STYLE: ND_TTC_Business.sst

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	O	N	G	H	O	R	N		S	T	E	A	K	H	O	U	S	E	43.1	4	B 2000
2.5	4.4	7	9.5	12	14.5	17.1	19.4		23.1	25.2	27.3	29.1	31.8	34.2	36.7	39.3	41.7	44			
P	A	N	E	R	A		B	R	E	A	D								26.6	4	B 2000
10.7	12.6	15.4	18	20.1	22.2		26.3	28.7	31	32.9	35.6										
M	A	T	T	R	E	S	S		F	I	R	M							26.7	4	B 2000
10.7	13.2	15.6	17.3	19.4	21.8	23.7	25.8		29.5	31.6	33	35.4									

SIGN NUMBER	Consign 3
WIDTH X HEIGHT	4'-0" x 2'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_4IN_TYPE D	22	1.5	4	6	0

AREA: 8.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_TTC_Business.sst

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	O	N	G	H	O	R	N		S	T	E	A	K	H	O	U	S	E	43.1	4	B 2000
2.5	4.4	7	9.5	12	14.5	17.1	19.4		23.1	25.2	27.3	29.1	31.8	34.2	36.7	39.3	41.7	44			
P	A	N	E	R	A		B	R	E	A	D								26.6	4	B 2000
10.7	12.6	15.4	18	20.1	22.2		26.3	28.7	31	32.9	35.6										
M	A	T	T	R	E	S	S		F	I	R	M							26.7	4	B 2000
10.7	13.2	15.6	17.3	19.4	21.8	23.7	25.8		29.5	31.6	33	35.4									

Construction Sign Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

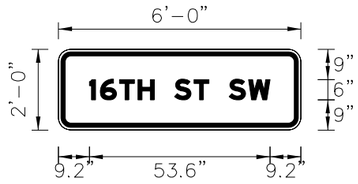
Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	100	28

SIGN NUMBER	Consign 4
WIDTH X HEIGHT	6'-0" x 2'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Orange
LEGEND/BORDER	TYPE: IV Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

AREA: 12.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

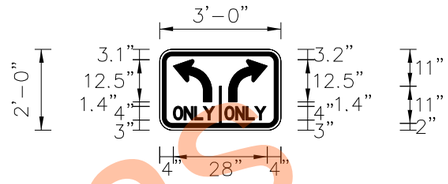
PANEL STYLE: ND_Const_Conv_Detour.ssl

LETTER POSITION (X)																					LENGTH	SIZE	SERIES
1	6	T	H		S	T		S	W												53.6	6	EM 2000
9.2	12.4	18.1	23.6		34.5	40.3		50.7	56.5														

SIGN NUMBER	Consign 5
WIDTH X HEIGHT	3'-0" x 2'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: XI Reflective
	COLOR: Orange
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_2.5IN_LT	4.1	8.4	11.5	12.5	0
ND_2.5IN_LT	20.5	8.4	11.5	12.5	180

AREA: 6.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Conv_Special.ssl

LETTER POSITION (X)																					LENGTH	SIZE	SERIES
O	N	L	Y																		12.3	4	D 2000
4.1	7.3	10.4	12.9																				
O	N	L	Y																		12.3	4	D 2000
19.3	22.5	25.6	28.2																				

Preliminary Plans

Construction Sign Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 8/14/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-4-989(132)	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
16th St SW																							
106+49 Rt	SN 1			7.5																			Mount on Mast Arm
106+49 Rt	SN 2		17.0																				Mount on Mast Arm
106+49 Rt	SN 5			24.0																			Mount on Mast Arm
106+52 Lt	SN 3		20.0																				Mount on Mast Arm
106+52 Lt	SN 1			7.5																			Mount on Mast Arm
107+50 Lt	SN 1			7.5																			Mount on Mast Arm
107+50 Lt	SN 2		17.0																				Mount on Mast Arm
107+50 Lt	SN 6			12.0																			Mount on Mast Arm
107+50 Lt	SN 7			12.0																			Mount on Mast Arm
107+54 Rt	SN 3		20.0																				Mount on Mast Arm
107+54 Rt	SN 1			7.5																			Mount on Mast Arm
112+98 Lt					16.1				7.0	2.25 x 2.25 12 ga	17.7	5.1				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga	1		1	
113+49 Lt					17.5	17.7			7.0	2.25 x 2.25 12 ga	23.7	2.8	3.0			2.5 x 2.5 12 ga	2	4	3 x 3 7 ga	1		2	
114+23 Lt	SN 1			7.5																			Mount on Mast Arm
114+23 Lt	SN 4		20.0																				Mount on Mast Arm
114+47 Rt	SN 2		17.0																				Mount on Mast Arm
114+47 Rt	SN 8			8.8																			Mount on Mast Arm
114+47 Rt	SN 9			8.8																			Mount on Mast Arm
115+31 Rt	SN 4		20.0																				Mount on Mast Arm
115+31 Rt	SN 1			7.5																			Mount on Mast Arm
115+36 Lt	SN 1			7.5																			Mount on Mast Arm
115+36 Lt	SN 2		17.0																				Mount on Mast Arm
115+36 Lt	SN 9			8.8																			Mount on Mast Arm
Sub Total			148.0	126.9	**Total**	51.3											**Total**	12.0		2	0	3		
26th Ave SW																							
305+88 Lt	SN 1			7.5																			Mount on Mast Arm
305+99 Rt	SN 1			7.5																			Mount on Mast Arm
305+99 Rt	SN 4		20.0																				Mount on Mast Arm
305+99 Rt	SN 9			8.8																			Mount on Mast Arm
306+66 Lt	SN 9			8.8																			Mount on Mast Arm
306+66 Lt	SN 4		20.0																				Mount on Mast Arm
306+66 Lt	SN 1			7.5																			Mount on Mast Arm
306+99 Rt	SN 1			7.5																			Mount on Mast Arm
Sub Total			40.0	47.6	**Total**	0.0											**Total**	0.0		0	0	0		

Preliminary Plans

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Sign Summary
Perforated Tube

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Rehabilitation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-4-989(132)	110	2

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
Grand Total			188.0	174.5	Total	51.3											Total	12	0	2	0	3	

Preliminary Plans

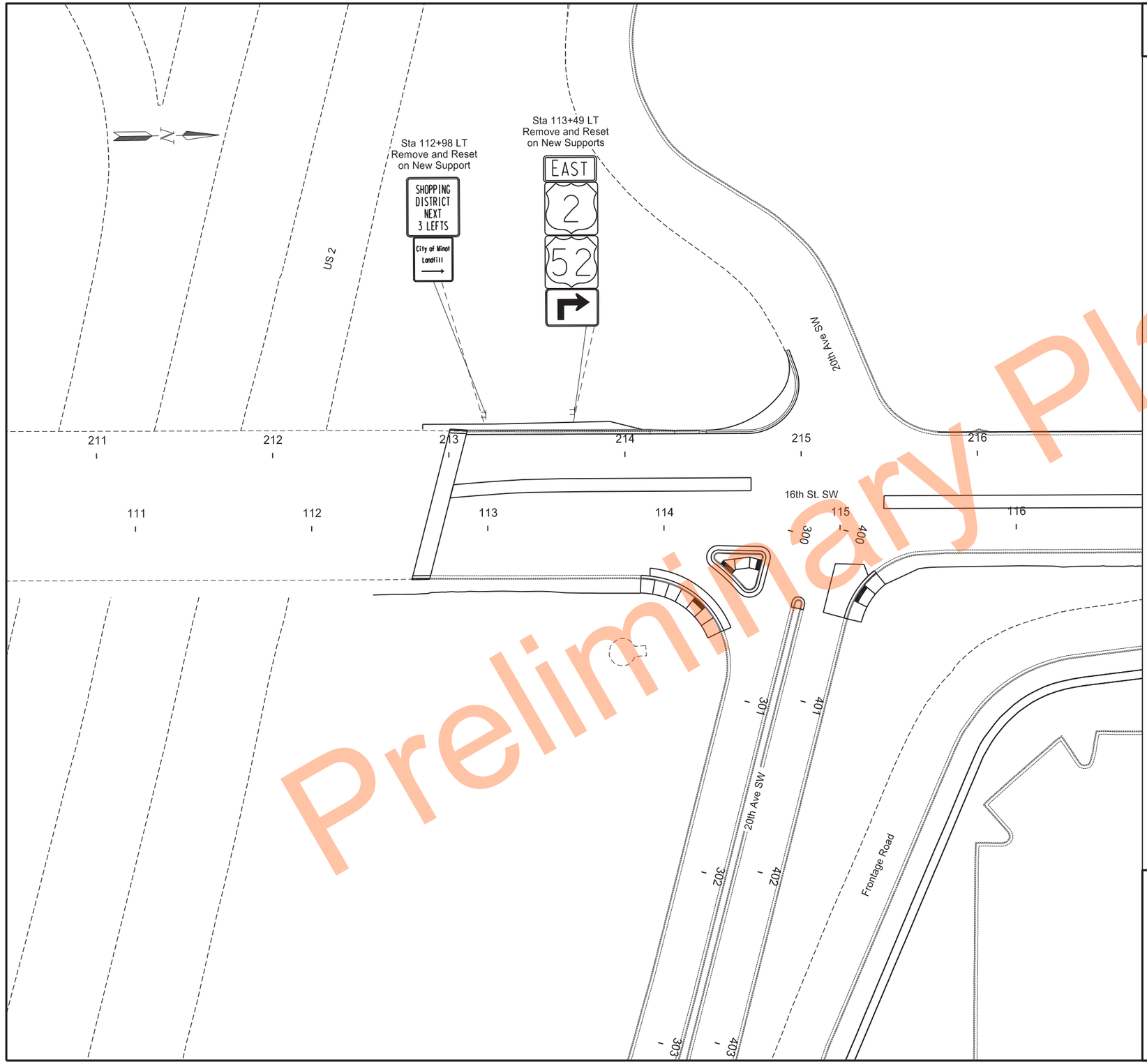
REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Sign Summary
Perforated Tube

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Rehabilitation

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	110	3



Preliminary Plans

Signing

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY
JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

4/15/2025 10:01:13 AM MSalwei H:\Projects\16000\16809\4753\TechData\Design\Plan\110SN_003.dgn

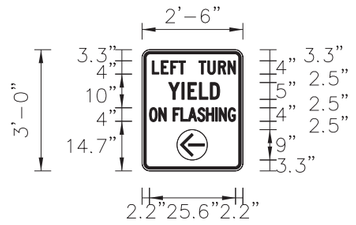
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	110	4

SIGN NUMBER	Sign 1
WIDTH X HEIGHT	2'-6" x 3'-0"
BORDER WIDTH	0.75" (inset 0.5")
CORNER RADIUS	1.88"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_FLSHNG ARW	10.4	3.3	9	9	0

STATION(S):
106+49 RT
106+52 LT
107+50 LT
107+54 RT
114+23 LT
115+31 RT
115+36 LT
305+88 LT
305+99 RT
306+66 LT
306+99 RT

AREA: 7.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_30_Med.ssl

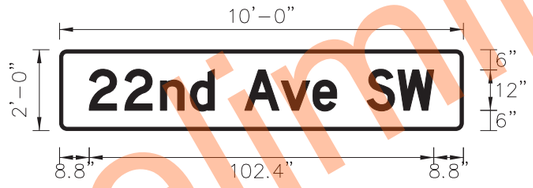
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
L	E	F	T															9.9	4	C 2000
3	5.7	8.6	10.9																	
T	U	R	N															10.9	4	C 2000
16.9	19.5	22.6	25.6																	
Y	I	E	L	D														15.2	5	C 2000
7.9	11.8	13.6	17	20.3																
O	N																	5	4	C 2000
2.2	5																			
F	L	A	S	H	I	N	G											18.6	4	C 2000
9.2	11.6	13.7	16.5	19.1	21.8	22.9	25.6													

SIGN NUMBER	Sign 3
WIDTH X HEIGHT	10'-0" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
106+52 LT
107+54 RT

AREA: 20.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.ssl

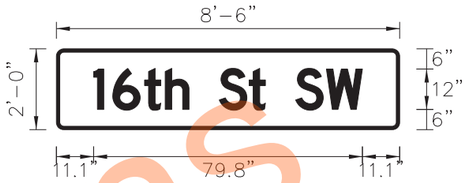
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
2	2	n	d		A	v	e		S	W								102.4	12/9	D 2000
8.8	19.4	29.9	38.8	46	55	65.8	75.3	82.4	91.4	100.5										

SIGN NUMBER	Sign 2
WIDTH X HEIGHT	8'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
106+49 RT
107+50 LT
114+47 RT
115+36 LT

AREA: 17.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.ssl

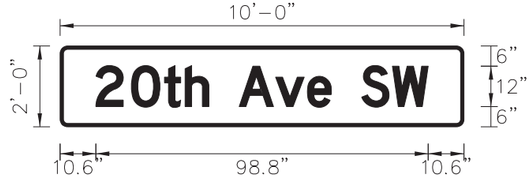
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
1	6	t	h		S	t		S	W									79.8	12/9	D 2000
11.1	16.7	26.2	32.3	39.4	48.4	57.3	62.1	71.1	80.2											

SIGN NUMBER	Sign 4
WIDTH X HEIGHT	10'-0" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
114+23 LT
115+31 RT
305+99 RT
306+66 LT

AREA: 20.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.ssl

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
2	0	t	h		A	v	e		S	W								98.8	12/9	D 2000
10.6	21.2	31	37.1	44.2	53.2	64	73.5	80.6	89.6	98.7										

Signing Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation



Preliminary Plans

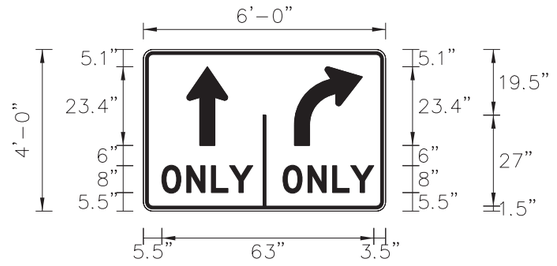
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	110	5

SIGN NUMBER	Sign 5
WIDTH X HEIGHT	6'-0" x 4'-0"
BORDER WIDTH	0.88" (inset 0.63")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_4.5IN_THRU	12.9	19.5	12.1	23.4	0
ND_4.5IN_RT	44.9	19.5	20.2	23.4	0

STATION(S):
106+49 RT

AREA: 24.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

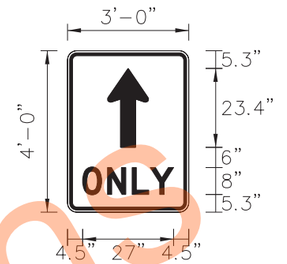
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
O	N	L	Y																27	8	D 2000
5.5	12.9	20.2	25.6																		
O	N	L	Y																27	8	D 2000
41.5	48.9	56.2	61.6																		

SIGN NUMBER	Sign 6
WIDTH X HEIGHT	3'-0" x 4'-0"
BORDER WIDTH	0.88" (inset 0.63")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_4.5IN_THRU	11.9	19.3	12.1	23.4	0

STATION(S):
107+50 LT

AREA: 12.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

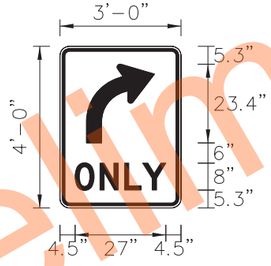
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
O	N	L	Y																27	8	D 2000
4.5	11.9	19.2	24.6																		

SIGN NUMBER	Sign 7
WIDTH X HEIGHT	3'-0" x 4'-0"
BORDER WIDTH	0.88" (inset 0.63")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_4.5IN_RT	7.9	19.3	20.2	23.4	0

STATION(S):
107+50 LT

AREA: 12.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
O	N	L	Y																27	8	D 2000
4.5	11.9	19.2	24.6																		

Signing Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans

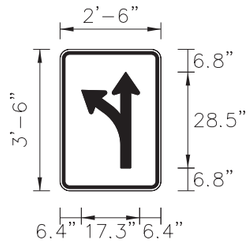
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	110	6

SIGN NUMBER	Sign 8
WIDTH X HEIGHT	2'-6" x 3'-6"
BORDER WIDTH	0.88" (inset 0.63")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_3IN_THRU_LT	6.4	6.8	17.3	28.5	0

STATION(S):
114+47 RT

AREA: 8.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

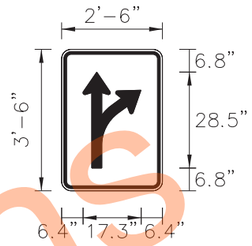
LETTER POSITION (X)	LENGTH	SIZE	SERIES

SIGN NUMBER	Sign 9
WIDTH X HEIGHT	2'-6" x 3'-6"
BORDER WIDTH	0.88" (inset 0.63")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
ND_3IN_THRU_RT	6.4	6.8	17.3	28.5	0

STATION(S):
114+47 RT
115+36 LT
305+99 RT
306+66 LT

AREA: 8.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

LETTER POSITION (X)	LENGTH	SIZE	SERIES

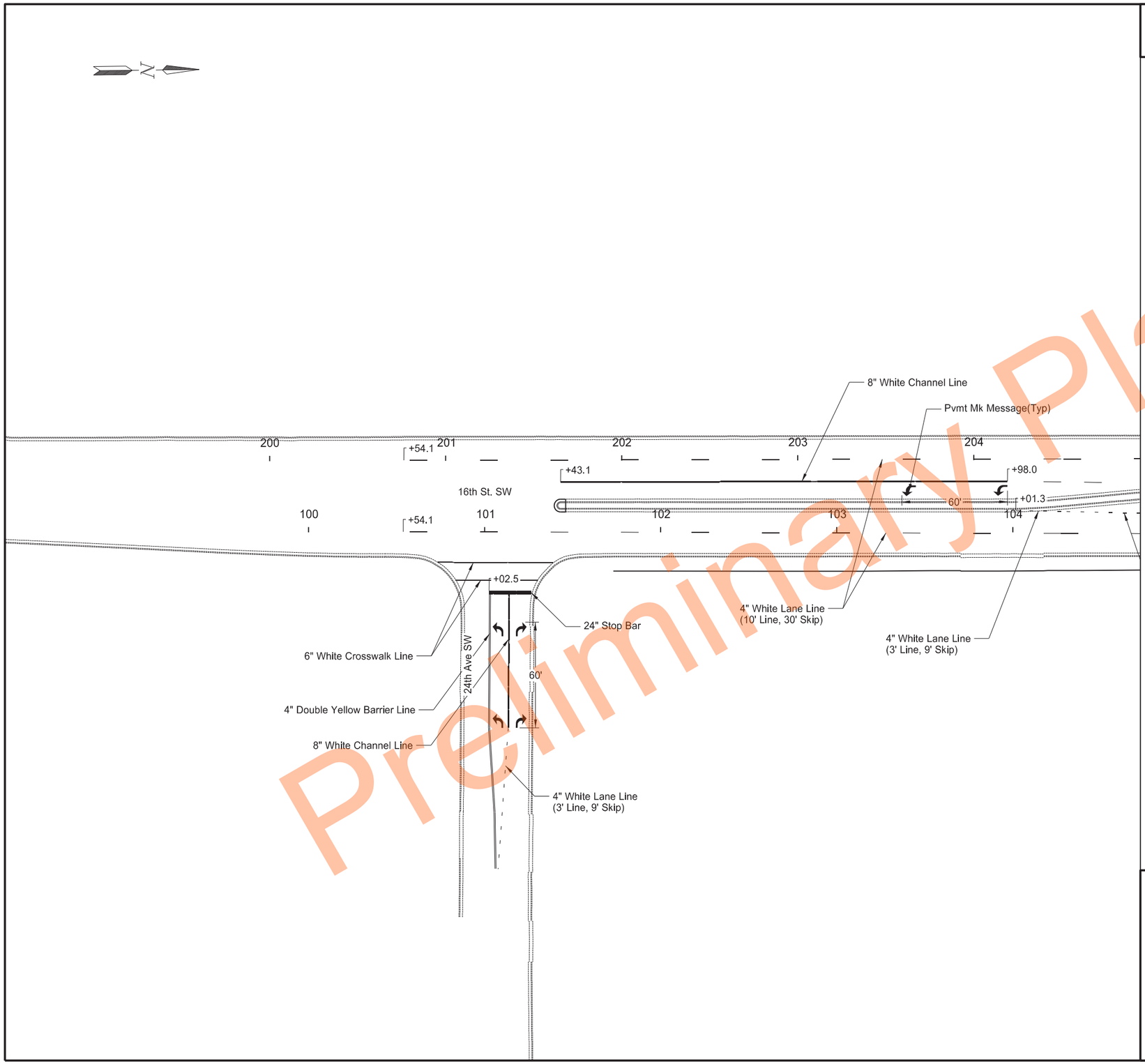
Preliminary Plans

Signing Details

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	1

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	221	LF
		4" Double Yellow Barrier Line	313	LF
		Total	534	LF
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE		
		6" White Crosswalk Line	112	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Channel Line	331	LF
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE		
		24" White Stop Bar	24	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	96	SF

* 4" White Lane Lines skips are to be constrast.

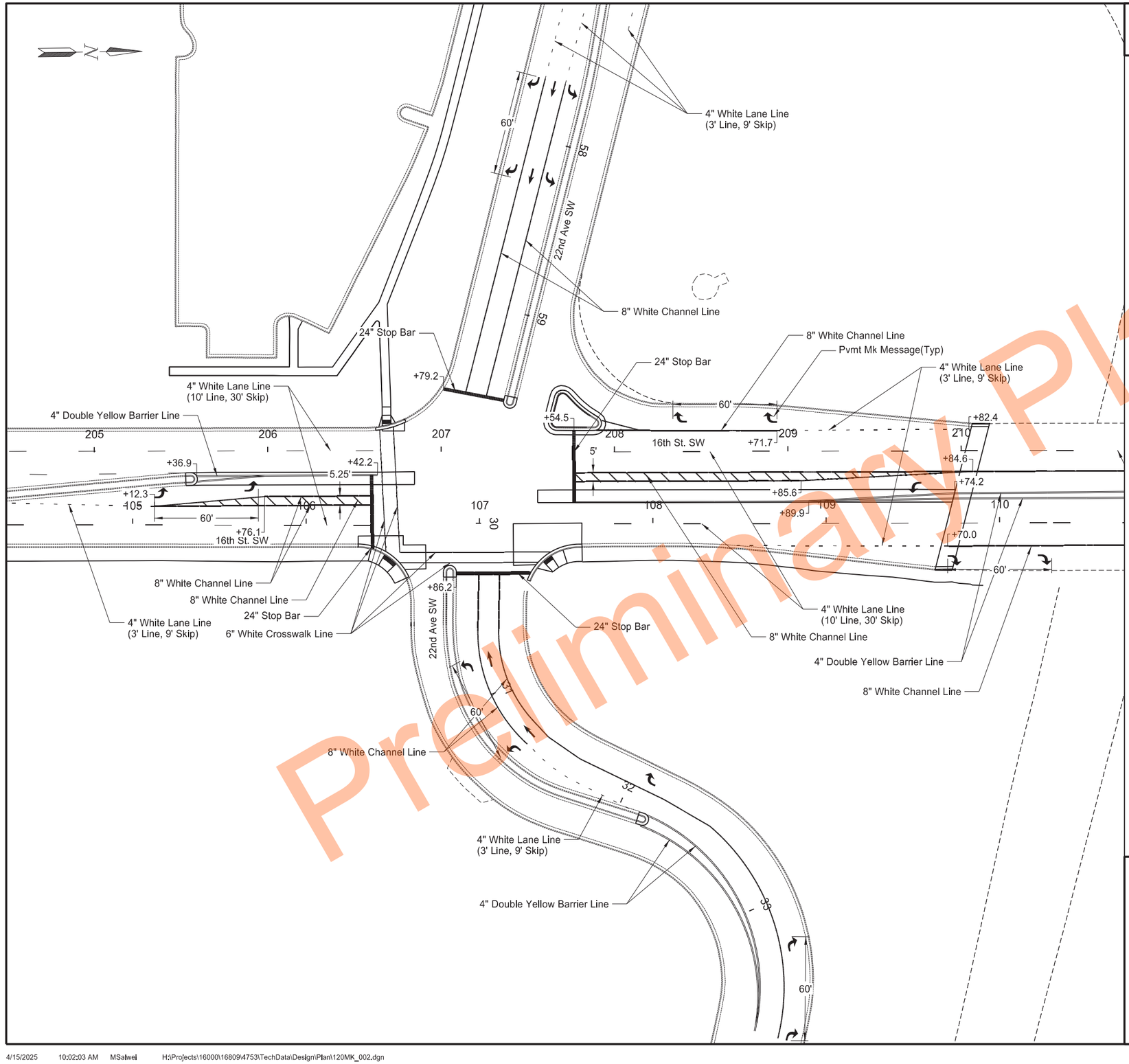
Pavement Markings

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	2

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	390	LF
		4" Double Yellow Barrier Line	1694	LF
		Total	2084	LF
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE		
		6" White Crosswalk Line	310	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Pattern Line	190	LF
		8" White Channel Line	1752	LF
		Total	1942	LF
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE		
		24" White Stop Bar	163	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	288	SF

* 4" White Lane Lines skips are to be constrast.

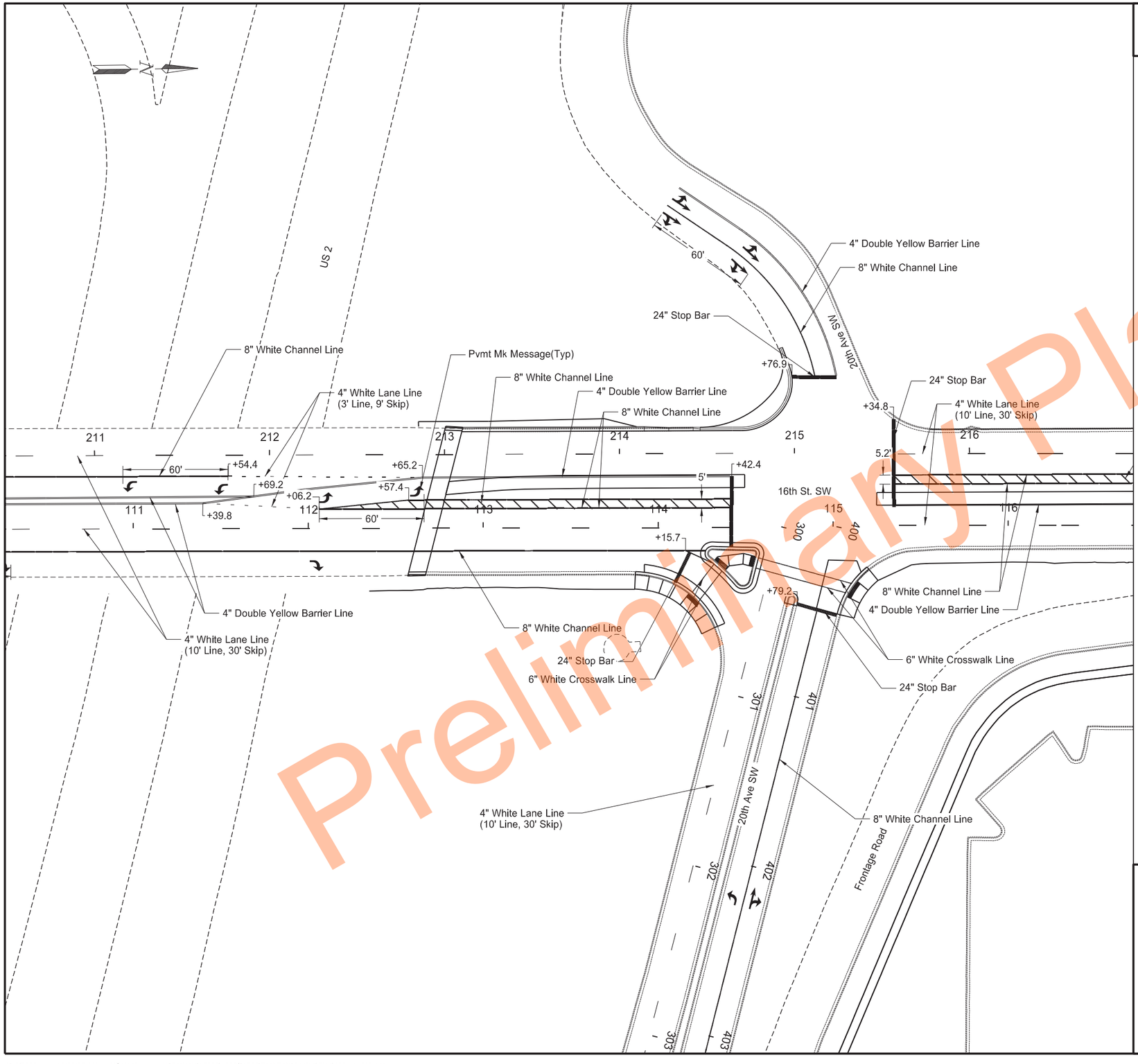
Pavement Markings

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA

Preliminary Plans



Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	3

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	366	LF
		4" Double Yellow Barrier Line	1585	LF
		Total	1951	LF
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE		
		6" White Crosswalk Line	149	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Pattern Line	216	LF
		8" White Channel Line	1697	LF
		Total	1913	LF
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE		
		24" White Stop Bar	157	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	247	SF

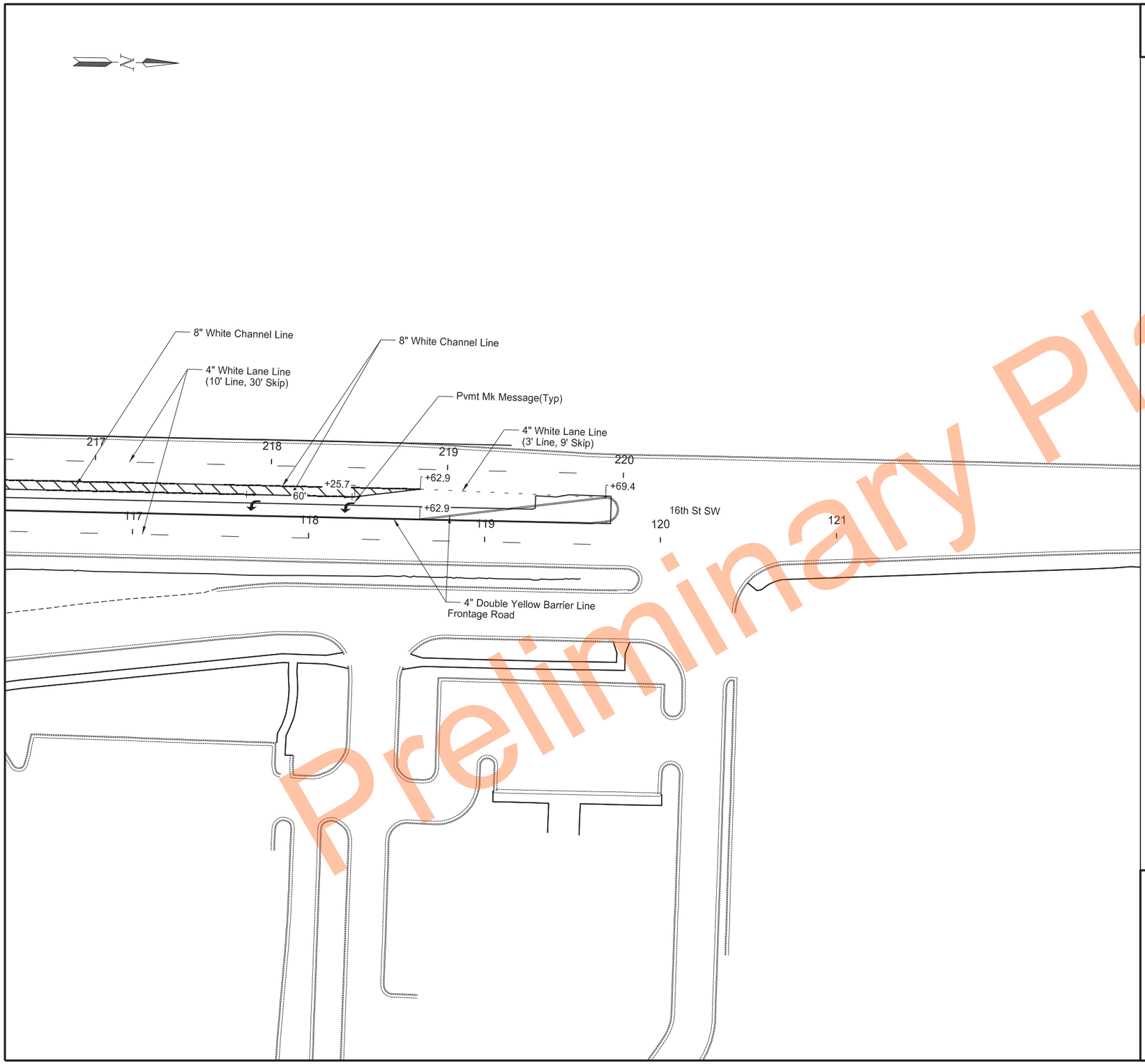
* 4" White Lane Lines skips are to be constrast.

Pavement Markings

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/15/25
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	4

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	191	LF
		4" Double Yellow Barrier Line	917	LF
		Total	1108	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Pattern Line	160	LF
		8" White Channel Line	472	LF
		Total	632	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	32	SF

* 4" White Lane Lines skips are to be constrast.

Pavement Markings

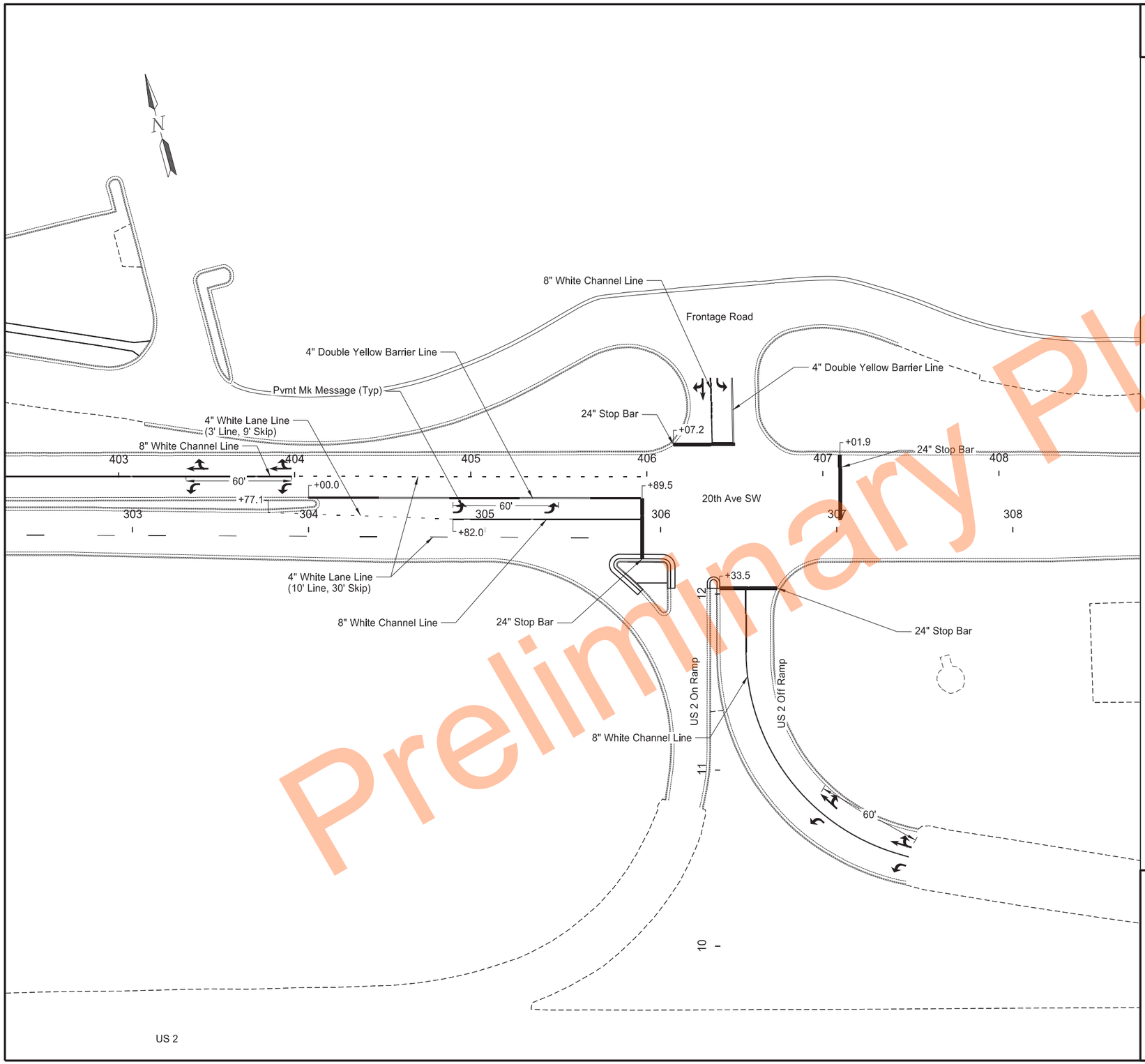
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ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

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DATE: 4/15/25
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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	5



Preliminary Plans

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	146	LF
		4" Double Yellow Barrier Line	451	LF
		Total	597	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Channel Line	430	LF
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE		
		24" White Stop Bar	138	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	247	SF

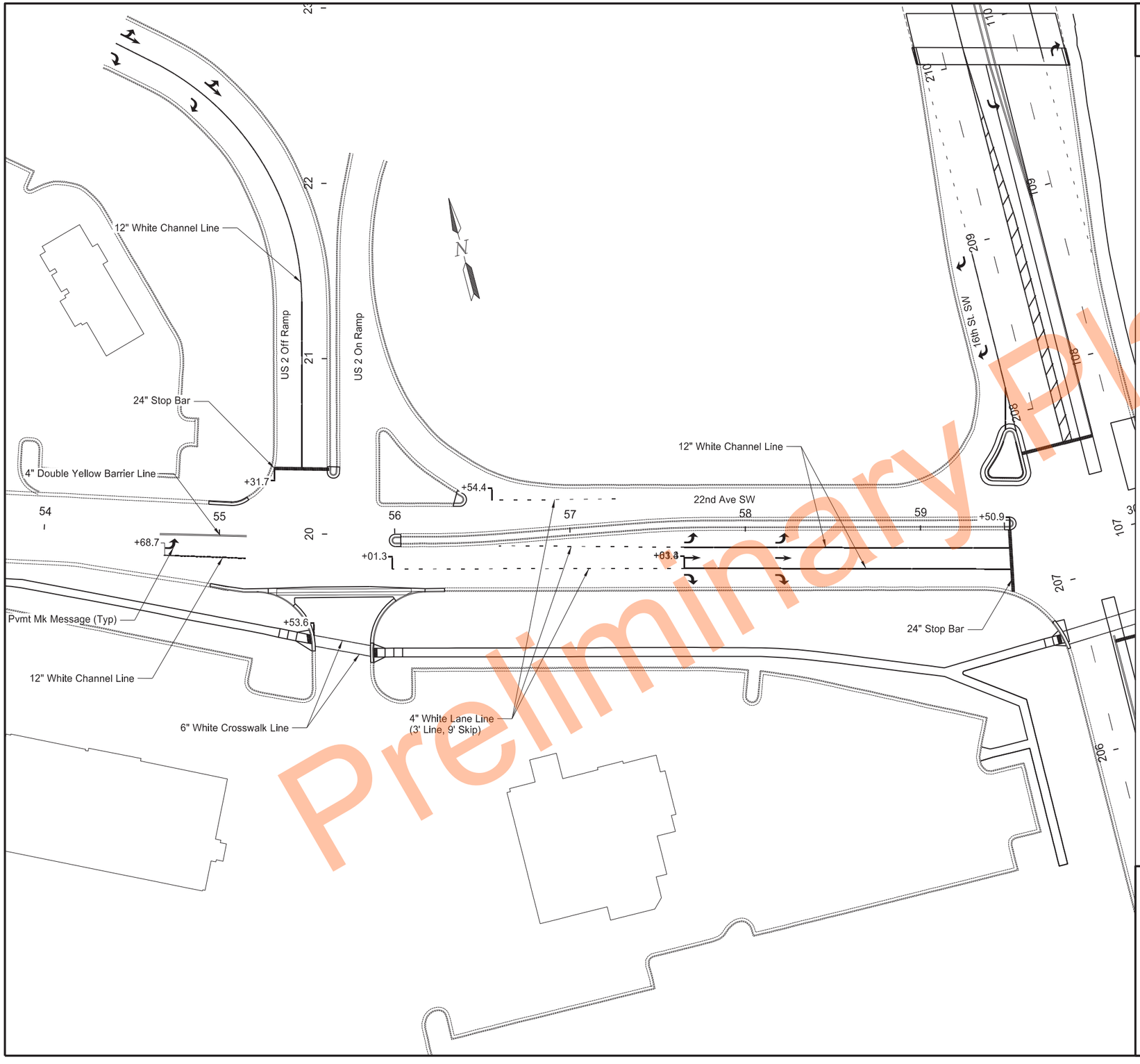
* 4" White Lane Lines skips are to be constrast.

Pavement Markings

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
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DATE: 4/15/25
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	120	6

SPEC	CODE	BID ITEM	QTY	UNIT
762	1250	PREFORMED THERMO PLASTIC PVMT MK 4IN LINE		
		4" White Lane Line *	59	LF
		4" Double Yellow Barrier Line	100	LF
		Total	159	LF
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE		
		6" White Crosswalk Line	66	LF
762	1260	PREFORMED THERMO PLASTIC PVMT MK 8IN LINE		
		8" White Channel Line	335	LF
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE		
		24" White Stop Bar	31	LF
762	1282	PREFORMED CONTRAST THERMO PLASTIC PVMT MK MESSAGE		
		Pvmt Mk Message	102	SF

* 4" White Lane Lines skips are to be constrast.

Pavement Markings

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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	130	1

23 USC § 407 Documents
NDDOT Reserves All Objections

(A) Thrie beam rail section (double thickness)

(B) W-Thrie beam transition section

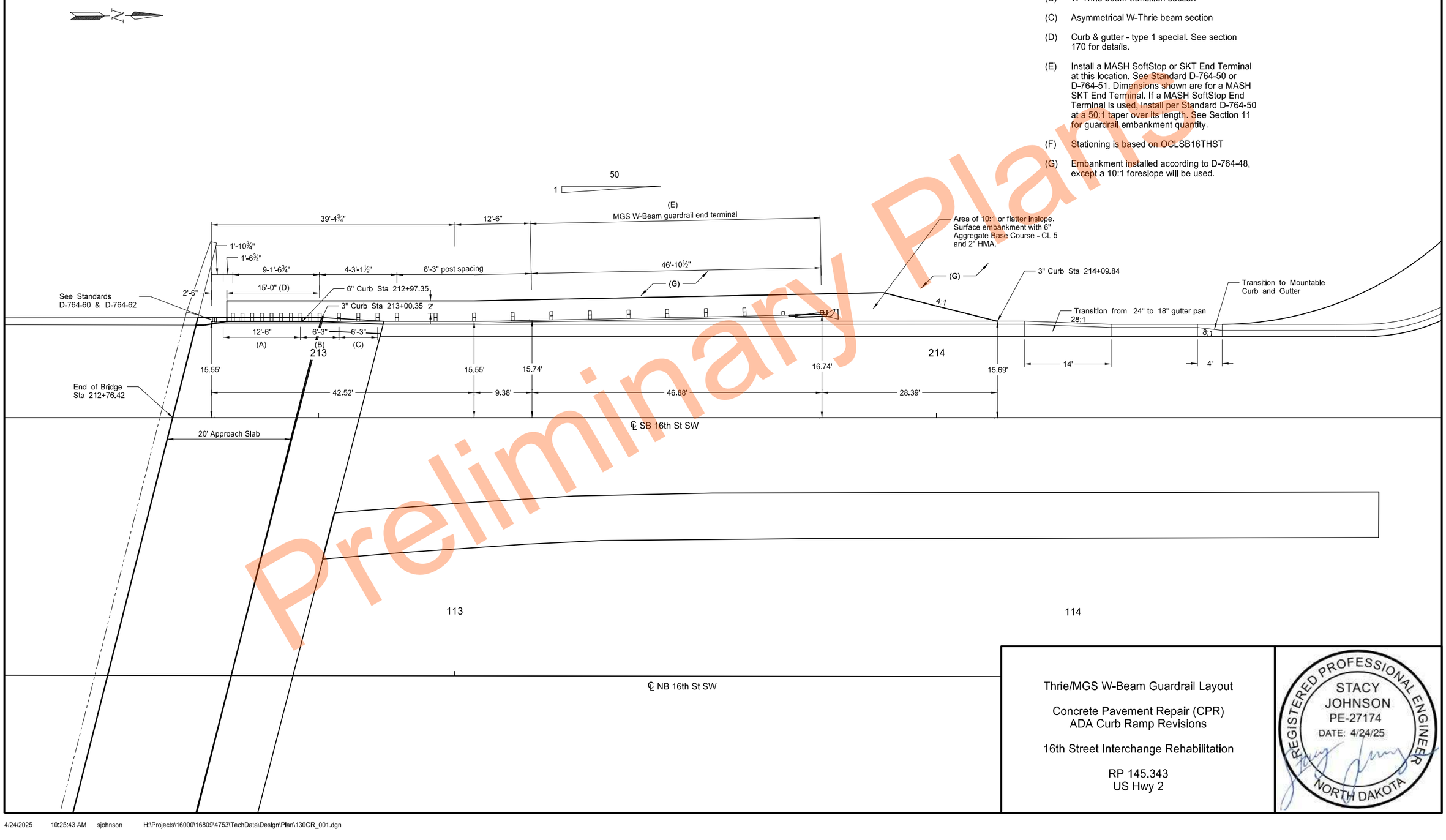
(C) Asymmetrical W-Thrie beam section

(D) Curb & gutter - type 1 special. See section 170 for details.

(E) Install a MASH SoftStop or SKT End Terminal at this location. See Standard D-764-50 or D-764-51. Dimensions shown are for a MASH SKT End Terminal. If a MASH SoftStop End Terminal is used, install per Standard D-764-50 at a 50:1 taper over its length. See Section 11 for guardrail embankment quantity.

(F) Stationing is based on OCLSB16THST

(G) Embankment installed according to D-764-48, except a 10:1 foreslope will be used.



Thrie/MGS W-Beam Guardrail Layout

Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

RP 145.343
US Hwy 2

REGISTERED PROFESSIONAL ENGINEER
STACY JOHNSON
PE-27174
DATE: 4/24/25
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	130	2

23 USC § 407 Documents
NDDOT Reserves All Objections

MGS W-BEAM GUARDRAIL SUMMARY OF QUANTITIES
THRIE/MGS W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION (B)	(A) 5/8" ø X 18" LONG GUARDRAIL BOLT EACH	(A) 6" X 8" X 6'-0" TIMBER POST EACH	(A) 6" X 8" X 14" TIMBER BLOCK EACH	(A) 5/8" ø X 1-1/4" LONG GUARDRAIL BOLT EACH	(A) 5/8" ø X 2" LONG GUARDRAIL BOLT EACH	(A) 12'-6" STRAIGHT W-BEAM RAIL SECTION EACH	(A) REFLECTORIZED PLATES EACH	(A) 6" X 8" X 7'-0" TIMBER POST EACH	(A) 6" X 8" X 19" TIMBER OFFSET BLOCK EACH	(A) 6'-3" W-THRIE BEAM TRANSITION SECTION EACH	(A) 6'-3" W-THRIE BEAM SECTION EACH	(A) 12'-6" DOUBLE THRIE BEAM SECTION EACH	(A) 2'-6" THRIE BEAM TERMINAL CONNECTOR EACH	(A) 7/8" ø X 15" LONG HEX HEAD BOLT EACH	(A) JERSEY BARRIER TO THRIE BEAM CONNECTOR PLATE EACH	(C) EMBANKMENT CY
Sta 212+82.70 to Sta 213+81.43 Lt	28	11	5	24	36	2	6	6	12	1	1	1	1	5	1	14
TOTAL	28	11	5	24	36	2	6	6	12	1	1	1	1	5	1	14

(A) Include these items in the contract unit price bid for "W-BEAM GUARDRAIL"

(B) Stationing is based on OCLSB16THST

(C) The volume of embankment (CY) is shown for informational purposes only. See Section 11 for details.

SPEC	CODE	BID ITEM	QTY	UNIT
764	0131	W-BEAM GUARDRAIL		
		Sta 212+82.70 to Sta 213+34.57 Lt	51.9	LF
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		Sta 213+34.57 to Sta 213+81.43 Lt	1	EA

Preliminary Plans

Thrie/MGS W-Beam Guardrail Quantities

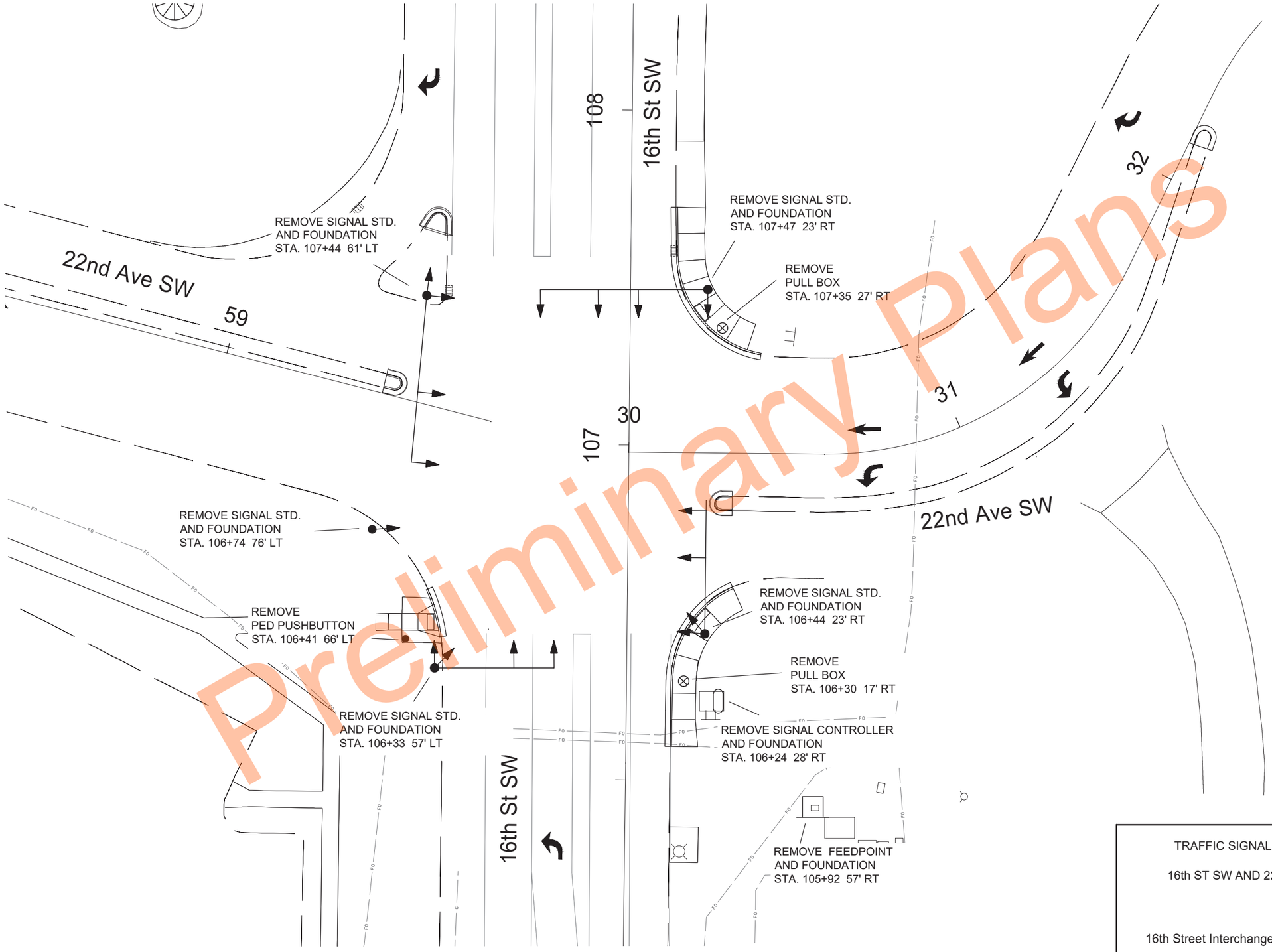
Concrete Pavement Repair (CPR)
ADA Curb Ramp Revisions

16th Street Interchange Rehabilitation

RP 145.343
US Hwy 2

REGISTERED PROFESSIONAL ENGINEER
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	1



Preliminary Plans

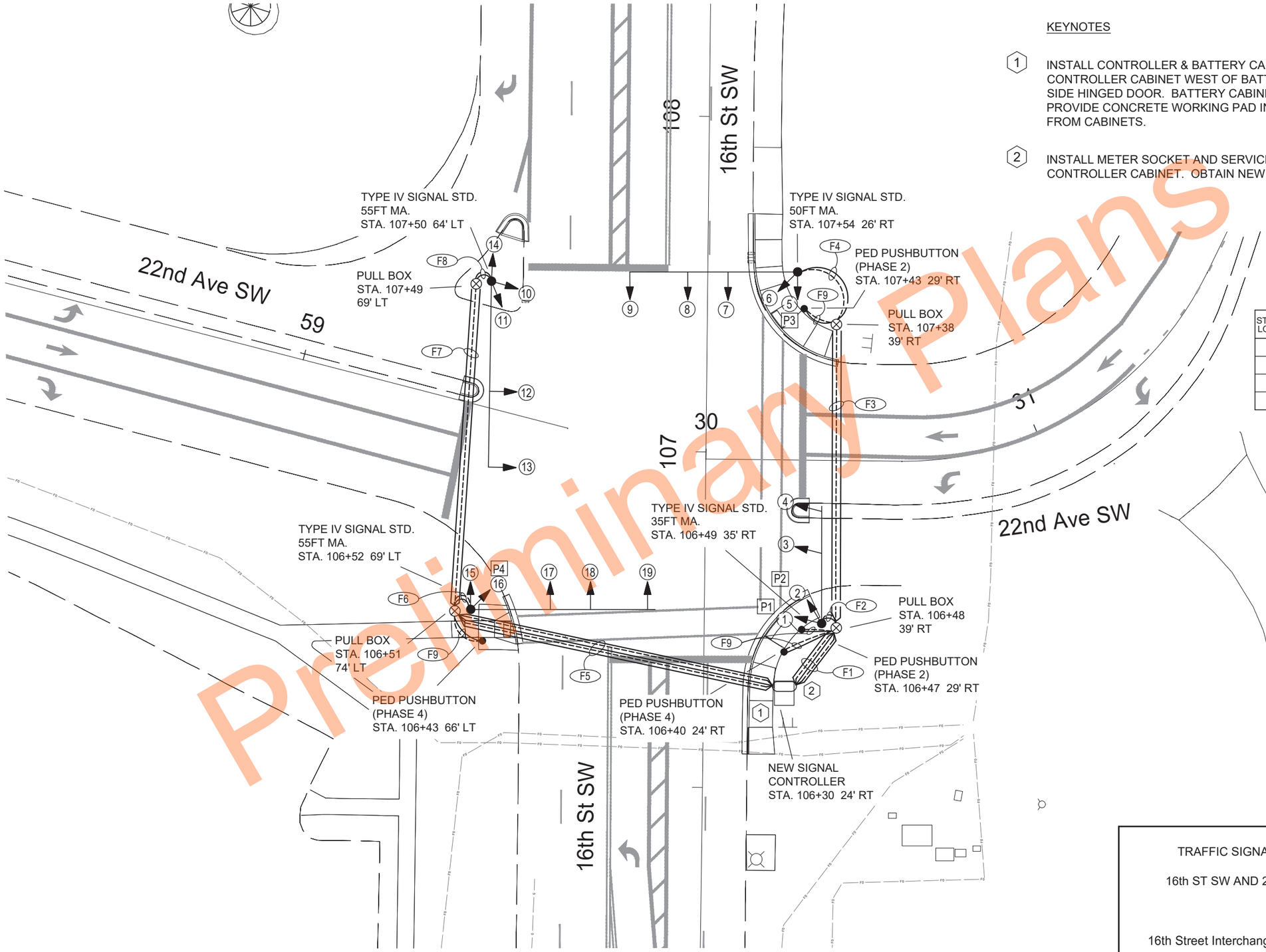
TRAFFIC SIGNAL REMOVAL

16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:49:24-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	2



KEYNOTES

1. INSTALL CONTROLLER & BATTERY CABINETS SO THE DOORS FACE SOUTH. INSTALL CONTROLLER CABINET WEST OF BATTERY CABINET. CONTROLLER TO HAVE LEFT SIDE HINGED DOOR. BATTERY CABINET TO HAVE RIGHT SIDE HINGED DOOR. PROVIDE CONCRETE WORKING PAD IN FRONT OF FOUNDATION THAT EXTENDS 4' FROM CABINETS.

2. INSTALL METER SOCKET AND SERVICE DISCONNECT TO NORTH SIDE OF CONTROLLER CABINET. OBTAIN NEW SERVICE FROM VERENDRYE ELECTRIC.

STANDARD LOCATION	STATION & OFFSET	BASE DIM. DIA. x DEPTH	FATIGUE CATEGORY
NE	107+54 26'RT	36" x 16'	I
NW	107+50 64'LT	36" x 16'	I
SE	106+49 35'RT	36" x 13'	I
SW	106+52 69'LT	36" x 16'	I

N

0 30

Scale in Feet

Preliminary Plans

TRAFFIC SIGNAL LAYOUT

16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:49:57-05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	150	3

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.8		CABLE NO.9		CABLE NO.10	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		P1	WALK	6	FL YELLOW	P3	WALK
2	WHITE		P1,P2	NEUTRAL	6	NEUTRAL	P3	NEUTRAL
3	RED		P1	DON'T WALK	6	LT RED	P3	DON'T WALK
4	GREEN			GROUND		GROUND		GROUND
5	ORANGE		P2	DON'T WALK	6	LT YELLOW		SPARE
6	BLUE		P2	WALK	6	LT GREEN		SPARE
7	WHITE	BLACK		SPARE	6	FL YELLOW NEUTRAL		SPARE

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.11		CABLE NO.12	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		P4	WALK		SPARE
2	WHITE		P4	NEUTRAL	14	NEUTRAL
3	RED		P4	DON'T WALK	14	RED
4	GREEN			GROUND		GROUND
5	ORANGE			SPARE	14	YELLOW
6	BLUE			SPARE	14	GREEN
7	WHITE	BLACK		SPARE		SPARE

CABLE RUN DESIGNATION	CABLE RUN DESCRIPTION	1" DIAMETER RIGID CONDUIT	3" DIAMETER RIGID CONDUIT	CABLE NO. 1 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 2 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 3 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 4 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 5 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 6 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 7 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 8 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 9 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 10 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 11 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 12 NO14 AWG 7 CONDUCTOR CABLE	EMERG. VEH. DETECTOR CABLE (AS REQUIRED BY MANUFACTURER)	EMERG. VEH. INDICATOR LAMP NO14 AWG 4 CONDUCTOR CABLE	VIDEO DETECTION CABLE (AS REQUIRED BY MANUFACTURER)	PEDESTRIAN PUSH BUTTON NO16 AWG 3 CONDUCTOR CABLE
F1	CONTROLLER TO SE PULL BOX		X	X				X			X					X	X	X	X (2)
			X		X							X	X			X	X	X	X
			SPARE																
F2	SE PULL BOX TO SE SIGNAL		X	X				X			X					X	X	X	
F3	SE PULL BOX TO NE PULL BOX		X		X							X	X			X	X	X	X
			SPARE																
F4	NE PULL BOX TO NE SIGNAL		X		X							X	X			X	X	X	
F5	CONTROLLER TO SW PULL BOX		X			X			X					X		X	X	X	X
			X				X			X					X	X	X	X	
			SPARE																
F6	SW PULL BOX TO SW SIGNAL		X			X			X					X		X	X	X	
F7	SW PULL BOX TO NW PULL BOX		X				X			X					X	X	X	X	
			SPARE																
F8	NW PULL BOX TO NW SIGNAL		X				X			X					X	X	X	X	
F9	PULL BOX TO PED PUSH BTN	X																	X

NOTE: THE 4th CONDUCTOR (RED) OF THE EMERG. VEHICLE INDICATOR LAMP CABLE IS DESIGNATED AS A TRACER WIRE. GROUND THE TRACER WIRE TO EACH SIGNAL BASE. DO NOT SPLICE THE CABLE. AT THE CONTROLLER CABINET, LEAVE 18" SLACK WIRE UN-TERMINATED AND LABELED "TRACER".

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.1		CABLE NO.2		CABLE NO.3		CABLE NO.4		CABLE NO.5		CABLE NO.6		CABLE NO.7	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK			SPARE		SPARE		SPARE		SPARE	2	FL YELLOW	16	FL YELLOW	11	FL YELLOW
2	WHITE		1,3,DNRT	NEUTRAL	5,7,8,9,DNRT	NEUTRAL	15,17,18	NEUTRAL	10,12,DNRT	NEUTRAL	2,4	NEUTRAL	16,19	NEUTRAL	11,13	NEUTRAL
3	RED		1,3	RED	5,7,8	RED	15,17,18	RED	10,12	RED	2	LT RED	16	LT RED	11	LT RED
4	GREEN			GROUND		GROUND		GROUND		GROUND		GROUND		GROUND		GROUND
5	ORANGE		1,3	YELLOW	5,7,8	YELLOW	15,17,18	YELLOW	10,12	YELLOW	2	LT YELLOW	16	LT YELLOW	11	LT YELLOW
6	BLUE		1,3	GREEN	5,7,8	GREEN	15,17,18	GREEN	10,12	GREEN	2	LT GREEN	16	LT GREEN	11	LT GREEN
7	WHITE	BLACK		SPARE	9	FL YELLOW NEUTRAL		SPARE		SPARE	2	FL YELLOW NEUTRAL	16	FL YELLOW NEUTRAL	11	FL YELLOW NEUTRAL
8	RED	BLACK	DNRT	DYNAMIC NO RT	9	LT RED		SPARE	DNRT	DYNAMIC NO RT	4	LT RED	19	LT RED	13	LT RED
9	GREEN	BLACK		SPARE	9	FL YELLOW		SPARE		SPARE	4	FL YELLOW	19	FL YELLOW	13	FL YELLOW
10	ORANGE	BLACK	1	RT YELLOW	9	LT YELLOW		SPARE	10	RT YELLOW	4	LT YELLOW	19	LT YELLOW	13	LT YELLOW
11	BLUE	BLACK	1	RT GREEN	9	LT GREEN		SPARE	10	RT GREEN	4	LT GREEN	19	LT GREEN	13	LT GREEN
12	BLACK	WHITE		SPARE	DNRT	DYNAMIC NO RT		SPARE		SPARE	4	FL YELLOW NEUTRAL	19	FL YELLOW NEUTRAL	13	FL YELLOW NEUTRAL

CABLE SCHEDULES

16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:50:48-05'00'
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	4

QUANTITIES: INCLUDED IN ''TRAFFIC SIGNAL SITE 1''

CONCRETE FOUNDATION-TRAFFIC SIGNALS	4 EA
CONCRETE FOUNDATION-FEED POINT-TYPE B	1 EA
PULL BOX	4 EA
1IN DIAMETER RIGID CONDUIT	51 LF
3IN DIAMETER RIGID CONDUIT	825 LF
EMERGENCY VEHICLE DETECTOR CABLE	810 LF
NO16 AWG 3 CONDUCTOR CABLE	431 LF
NO14 AWG 3 CONDUCTOR CABLE	54 LF
NO14 AWG 4 CONDUCTOR CABLE	810 LF
NO14 AWG 5 CONDUCTOR CABLE	399 LF
NO14 AWG 7 CONDUCTOR CABLE	1119 LF
NO14 AWG 12 CONDUCTOR CABLE	997 LF
COMBO 35FT MA SIG & LT STD - TYPE A	1 EA
COMBO 50FT MA SIG & LT STD - TYPE A	1 EA
COMBO 55FT MA SIG & LT STD - TYPE A	2 EA
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	3 EA
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	6 EA
1-WAY 4 SEC HEAD W/12IN LENS-POST MTD	4 EA
1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	4 EA
1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	2 EA
1-WAY DYNAMIC NO RIGHT TURN-POST MTD	3 EA
PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	4 EA
PEDESTRIAN PUSHBUTTON POST	4 EA
PEDESTRIAN PUSHBUTTON & SIGN	4 EA
VIDEO DETECTION CABLE	743 LF
VIDEO DETECTION SYSTEM	1 EA
VOLUME DENSITY CONTR W/PED & EMER PRE-EMPTION	1 EA
BATTERY BACKUP SYSTEM	1 EA
EMERGENCY VEHICLE PRE-EMPTION UNIT	4 EA
TYPE B CONTROLLER AND CABINET	1 EA
NETWORK EQUIPMENT	1 EA
REMOVE TRAFFIC SIGNAL STANDARD	5 EA
REMOVE TRAFFIC SIGNAL CONTROLLER	1 EA
REMOVE FEEDPOINT	1 EA
REMOVE PEDISTRIAN PUSHBUTTON	1 EA
REMOVE PULL BOX	2 EA

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

SIGNAL	HEAD	CABLE TYPE	TOTAL LF
SE SIGNAL TRANSFORMER BASE	1	NO14 AWG 7 CONDUCTOR CABLE	15
	2	NO14 AWG 7 CONDUCTOR CABLE	15
	3	NO14 AWG 5 CONDUCTOR CABLE	44
	4	NO14 AWG 7 CONDUCTOR CABLE	56
	P1	NO14 AWG 5 CONDUCTOR CABLE	12
	P2	NO14 AWG 5 CONDUCTOR CABLE	12
	DNRT	NO14 AWG 3 CONDUCTOR CABLE	18
NE SIGNAL TRANSFORMER BASE	5	NO14 AWG 5 CONDUCTOR CABLE	15
	6	NO14 AWG 7 CONDUCTOR CABLE	15
	7	NO14 AWG 5 CONDUCTOR CABLE	44
	8	NO14 AWG 5 CONDUCTOR CABLE	56
	9	NO14 AWG 7 CONDUCTOR CABLE	73
	P3	NO14 AWG 5 CONDUCTOR CABLE	12
	DNRT	NO14 AWG 3 CONDUCTOR CABLE	18
NW SIGNAL TRANSFORMER BASE	10	NO14 AWG 7 CONDUCTOR CABLE	15
	11	NO14 AWG 7 CONDUCTOR CABLE	15
	12	NO14 AWG 5 CONDUCTOR CABLE	56
	13	NO14 AWG 7 CONDUCTOR CABLE	78
	14	NO14 AWG 5 CONDUCTOR CABLE	15
	DNRT	NO14 AWG 3 CONDUCTOR CABLE	18
SW SIGNAL TRANSFORMER BASE	15	NO14 AWG 5 CONDUCTOR CABLE	15
	16	NO14 AWG 7 CONDUCTOR CABLE	15
	17	NO14 AWG 5 CONDUCTOR CABLE	47
	18	NO14 AWG 5 CONDUCTOR CABLE	59
	19	NO14 AWG 7 CONDUCTOR CABLE	76
	P4	NO14 AWG 5 CONDUCTOR CABLE	12

Preliminary Plans

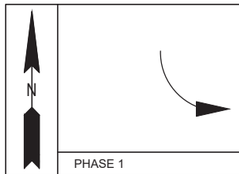
QUANTITIES

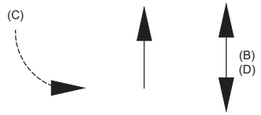
16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

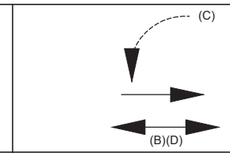
REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:51:04-05'00'
NORTH DAKOTA

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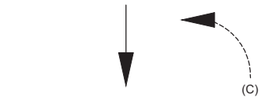
HEAD NO.	PHASE 1 R/W	PHASE 1 CLEAR TO Ø 2	3	4	5	6	7	8
1								
2	G	Y	Y	Y	(A)	(A)	Y	Y
3								
4								
5								
6								
7								
8								
9								
10	G	Y	Y	Y	(A)	(A)	Y	Y
11								
12								
13								
14								
15								
16								
17								
18								
19	G	Y	Y	Y	(A)	(A)	Y	Y

HEAD NO.	PHASE 2 R/W	PHASE 2 CLEAR TO Ø 3	4	5	6	7	8	1
1								
2	FY	Y	Y	(A)	(A)	Y	Y	Y
3								
4								
5	G	Y	Y	(A)	(A)	Y	Y	Y
6								
7	G	Y	Y	(A)	(A)	Y	Y	Y
8	G	Y	Y	(A)	(A)	Y	Y	Y
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19	FY	Y	Y	(A)	(A)	Y	Y	Y

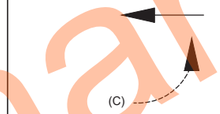
HEAD NO.	PHASE 3 R/W	PHASE 3 CLEAR TO Ø 4	5	6	7	8	1	2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13	G	Y	Y	Y	(A)	(A)	Y	Y
14								
15								
16	G	Y	Y	Y	(A)	(A)	Y	Y
17								
18								
19								

HEAD NO.	PHASE 4 R/W	PHASE 4 CLEAR TO Ø 5	6	7	8	1	2	3
1	G	Y	Y	(A)	(A)	Y	Y	Y
2								
3	G	Y	Y	(A)	(A)	Y	Y	Y
4								
5								
6								
7								
8								
9								
10								
11								
12								
13	FY	Y	Y	(A)	(A)	Y	Y	Y
14								
15								
16	FY	Y	Y	(A)	(A)	Y	Y	Y
17								
18								
19								









HEAD NO.	PHASE 5 R/W	PHASE 5 CLEAR TO Ø 6	7	8	1	2	3	4
1	G	Y	Y	Y	(A)	(A)	Y	Y
2								
3								
4								
5								
6								
7								
8								
9	G	Y	Y	Y	(A)	(A)	Y	Y
10								
11	G	Y	Y	Y	(A)	(A)	Y	Y
12								
13								
14								
15								
16								
17								
18								
19	G	Y	Y	Y	(A)	(A)	Y	Y

HEAD NO.	PHASE 6 R/W	PHASE 6 CLEAR TO Ø 7	8	1	2	3	4	5
1								
2								
3								
4								
5								
6								
7								
8								
9	FY	Y	Y	(A)	(A)	Y	Y	Y
10								
11	FY	Y	Y	(A)	(A)	Y	Y	Y
12								
13								
14	G	Y	Y	(A)	(A)	Y	Y	Y
15	G	Y	Y	(A)	(A)	Y	Y	Y
16								
17	G	Y	Y	(A)	(A)	Y	Y	Y
18	G	Y	Y	(A)	(A)	Y	Y	Y
19								

HEAD NO.	PHASE 7 R/W	PHASE 7 CLEAR TO Ø 8	1	2	3	4	5	6
1								
2								
3								
4	G	Y	Y	Y	(A)	(A)	Y	Y
5								
6	G	Y	Y	Y	(A)	(A)	Y	Y
7								
8								
9								
10								
11								
12								
13								
14								
15	G	Y	Y	Y	(A)	(A)	Y	Y
16								
17								
18								
19								

HEAD NO.	PHASE 8 R/W	PHASE 8 CLEAR TO Ø 1	2	3	4	5	6	7
1								
2								
3								
4	FY	Y	Y	(A)	(A)	Y	Y	Y
5								
6	FY	Y	Y	(A)	(A)	Y	Y	Y
7								
8								
9								
10	G	Y	Y	(A)	(A)	Y	Y	Y
11								
12	G	Y	Y	(A)	(A)	Y	Y	Y
13								
14								
15								
16								
17								
18								
19								

BLANK SQUARES DENOTE A RED INDICATION ◄ PROTECTED MOVEMENT ◄ PERMITTED MOVEMENT

(A) When one phase is on alone, any nonconflicting phase may start timing concurrently without a clearance interval. (See Chart A)

(B) Only upon pedestrian actuation.

(C) Flashing yellow arrow shall not operate during EVP.

(D) Program a logic statement to illuminate the Dynamic No Right Turn sign only during a conflicting pedestrian Walk indication.

EMERGENCY VEHICLE PRE-EMPTION PHASING

HEAD NO.	PHASE 2 R/W	PHASE 2 CLEAR TO Ø 3	4	5	6	7	8	1	PHASE 4 R/W	PHASE 4 CLEAR TO Ø 5	6	7	8	1	2	3
1									G	Y	Y	Y	Y	Y	Y	Y
2																
3									G	Y	Y	Y	Y	Y	Y	Y
4									G	Y	Y	Y	Y	Y	Y	Y
5	G	Y	Y	Y	Y	Y	Y	Y								
6									G	Y	Y	Y	Y	Y	Y	Y
7	G	Y	Y	Y	Y	Y	Y	Y								
8	G	Y	Y	Y	Y	Y	Y	Y								
9	G	Y	Y	Y	Y	Y	Y	Y								
10																
11	G	Y	Y	Y	Y	Y	Y	Y								
12																
13																
14																
15																
16																
17																
18																
19																

HEAD NO.	PHASE 6 R/W	PHASE 6 CLEAR TO Ø 7	8	1	2	3	4	5	PHASE 8 R/W	PHASE 8 CLEAR TO Ø 1	2	3	4	5	6	7
1																
2	G	Y	Y	Y	Y	Y	Y	Y								
3																
4																
5																
6																
7																
8																
9																
10									G	Y	Y	Y	Y	Y	Y	Y
11																
12									G	Y	Y	Y	Y	Y	Y	Y
13									G	Y	Y	Y	Y	Y	Y	Y
14	G	Y	Y	Y	Y	Y	Y	Y								
15	G	Y	Y	Y	Y	Y	Y	Y								
16									G	Y	Y	Y	Y	Y	Y	Y
17	G	Y	Y	Y	Y	Y	Y	Y								
18	G	Y	Y	Y	Y	Y	Y	Y								
19	G	Y	Y	Y	Y	Y	Y	Y								

CHART A

ON PHASE	NON-CONFLICTING PHASE ALLOWED TO OPERATE CONCURRENTLY
1	5 or 6
2	5 or 6
3	7 or 8
4	7 or 8
5	1 or 2
6	1 or 2
7	3 or 4
8	3 or 4

PHASING

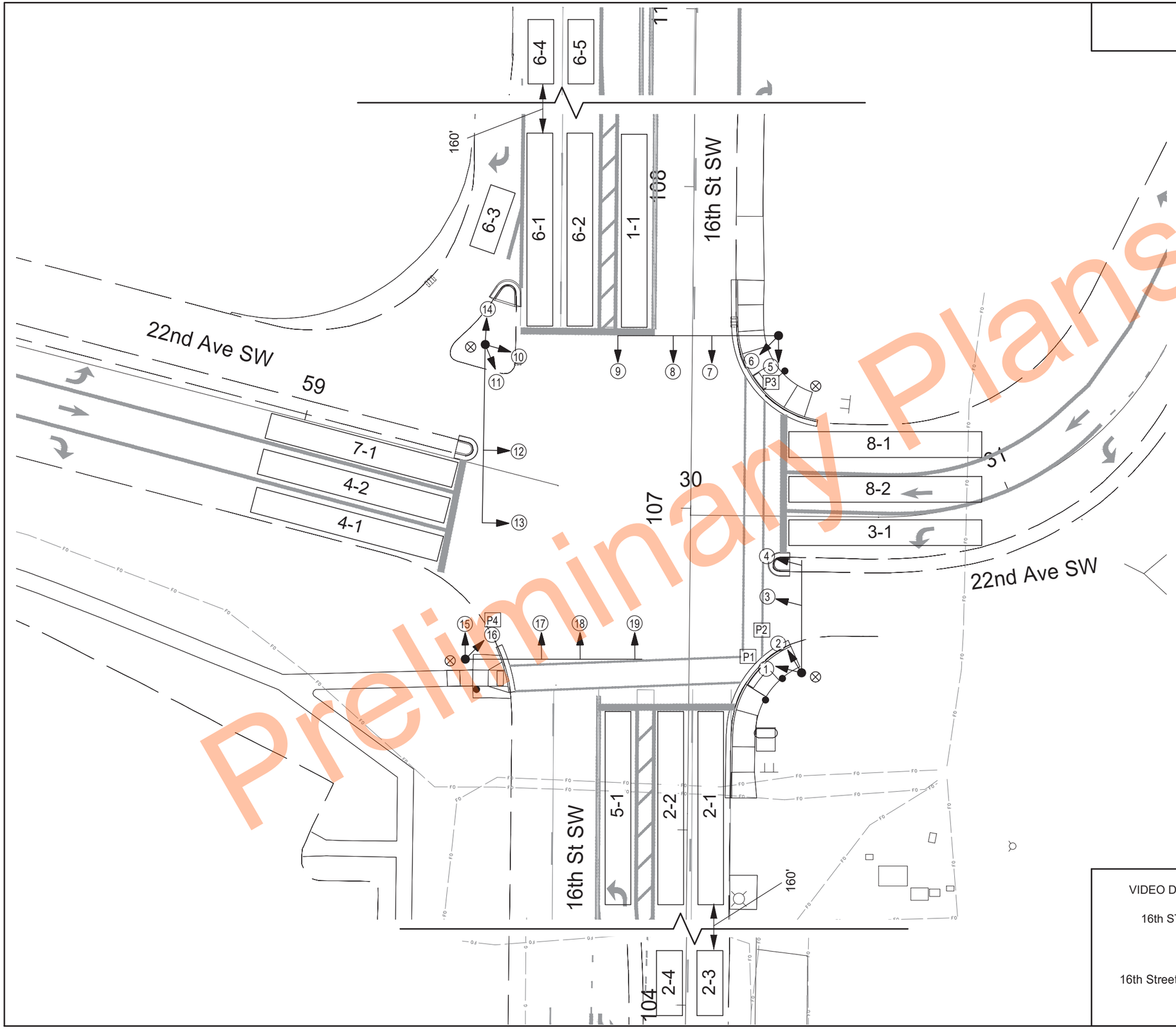
16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:51:20-05'00'
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	6



Preliminary Plans

PHASE NO.	DISTANCE FROM STOP BAR (FEET)	LENGTH (FEET)	Presence/Counting	Passage/Counting	Queue/Counting	Locking Memory	Non-Locking Memory
1-1	0	60	X				X
2-1	0	60			X		X
2-2	0	60			X		X
2-3	220	20		X		X	
2-4	220	20		X		X	
3-1	0	60	X				X
4-1	0	60			X		X
4-2	0	60			X		X
5-1	0	60	X				X
6-1	0	60			X		X
6-2	0	60			X		X
6-3	0	20			X		X
6-4	220	20		X		X	
6-5	220	20		X		X	
7-1	0	60	X				X
8-1	0	60			X		X
8-2	0	60			X		X

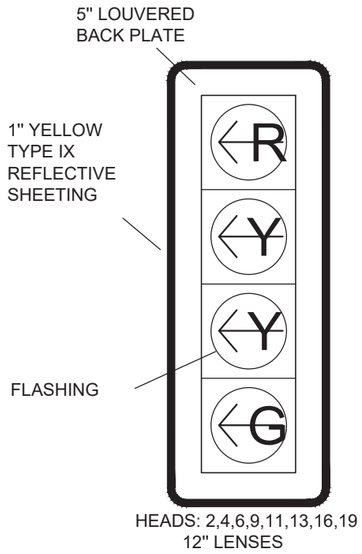
VIDEO DETECTION ZONE LAYOUT

16th ST SW AND 22nd AVE SW

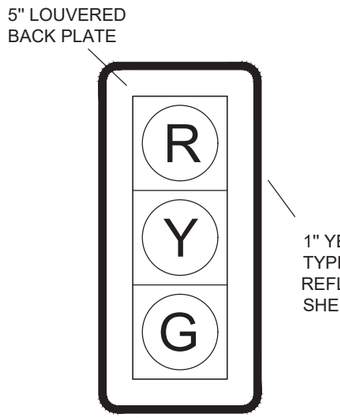
16th Street Interchange Rehabilitation

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4879
DATE 2025.04.15
08:51:35-05'00'
NORTH DAKOTA

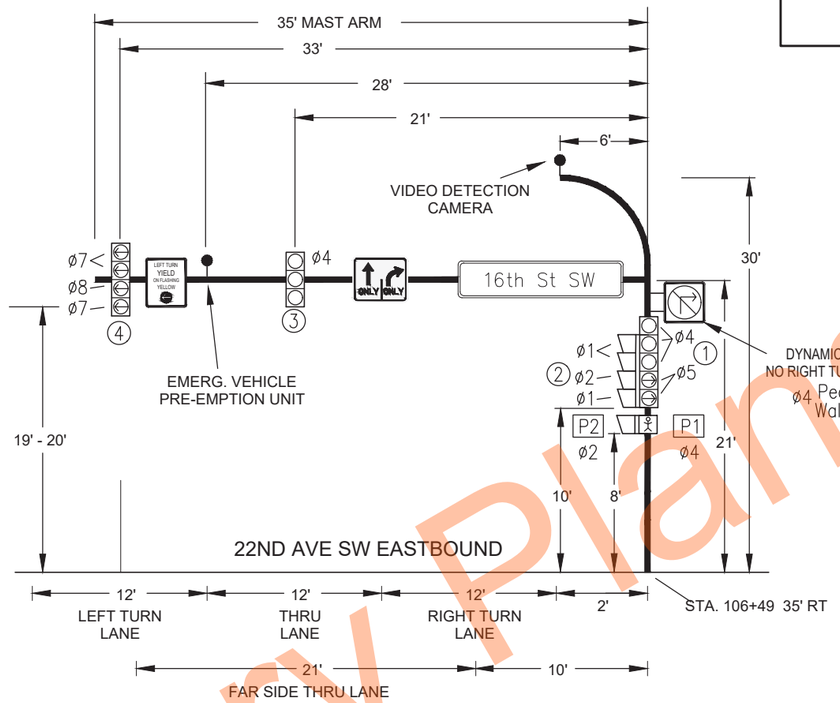
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	7

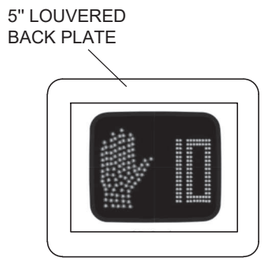


HEADS: 2,4,6,9,11,13,16,19
12" LENSES

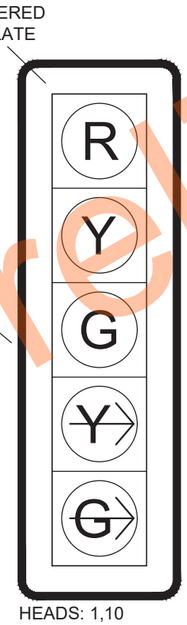


HEADS: 3,5,7,8,12,14,15,17,18
12" LENSES

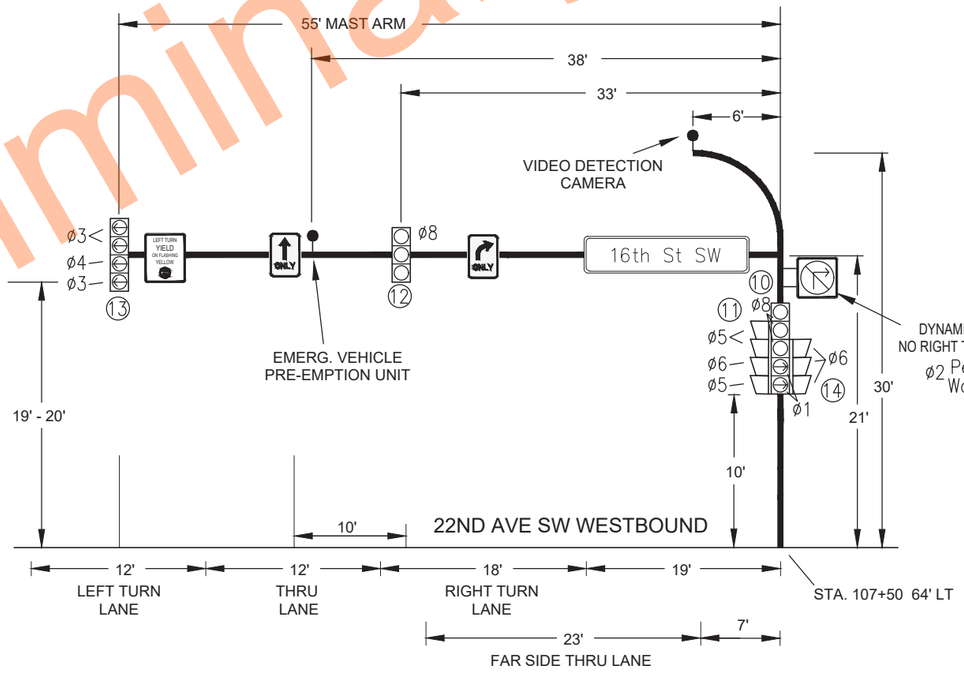




HEADS: P1 - P4



HEADS: 1,10
12" LENSES



TRAFFIC SIGNAL DETAILS

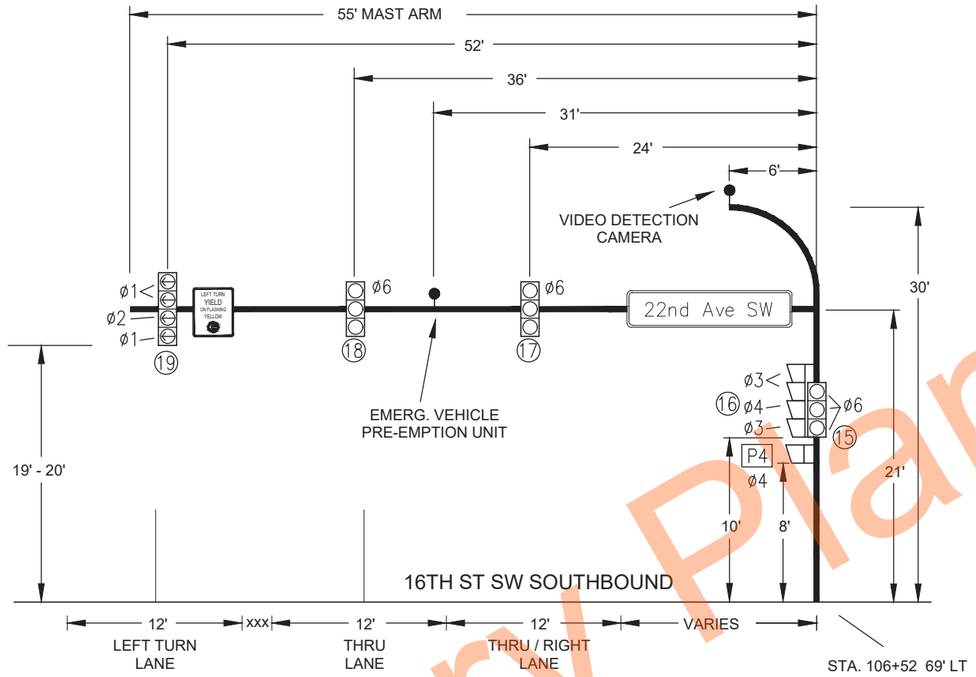
16th ST SW AND 22nd AVE SW

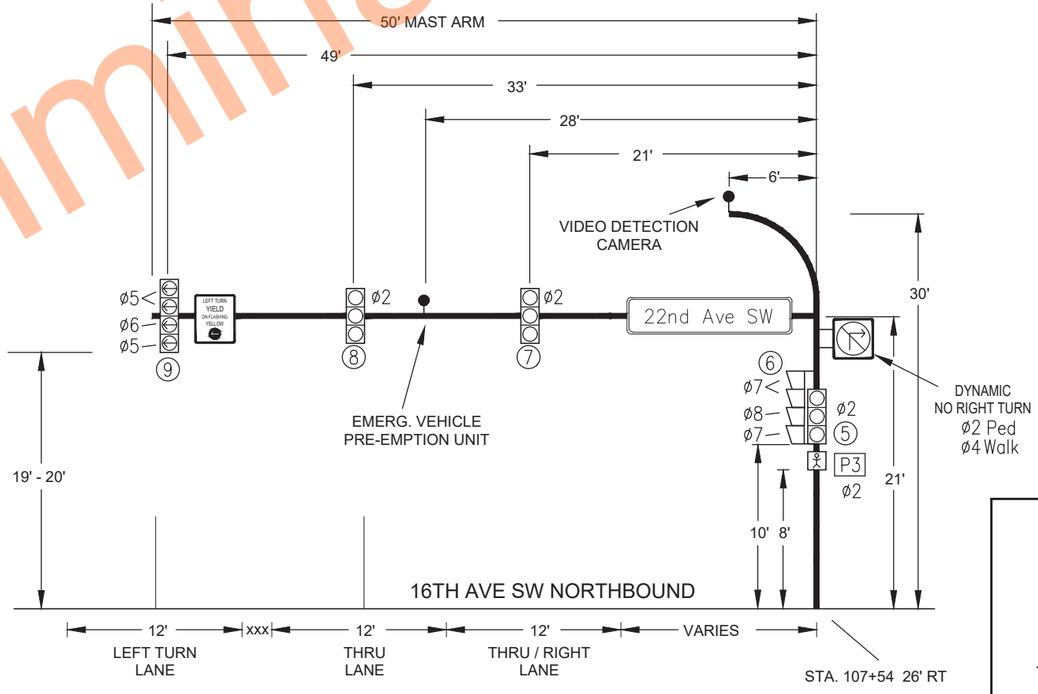
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
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DATE 2025.04.15 08:51:55-05'00'
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	8





Preliminary Plans

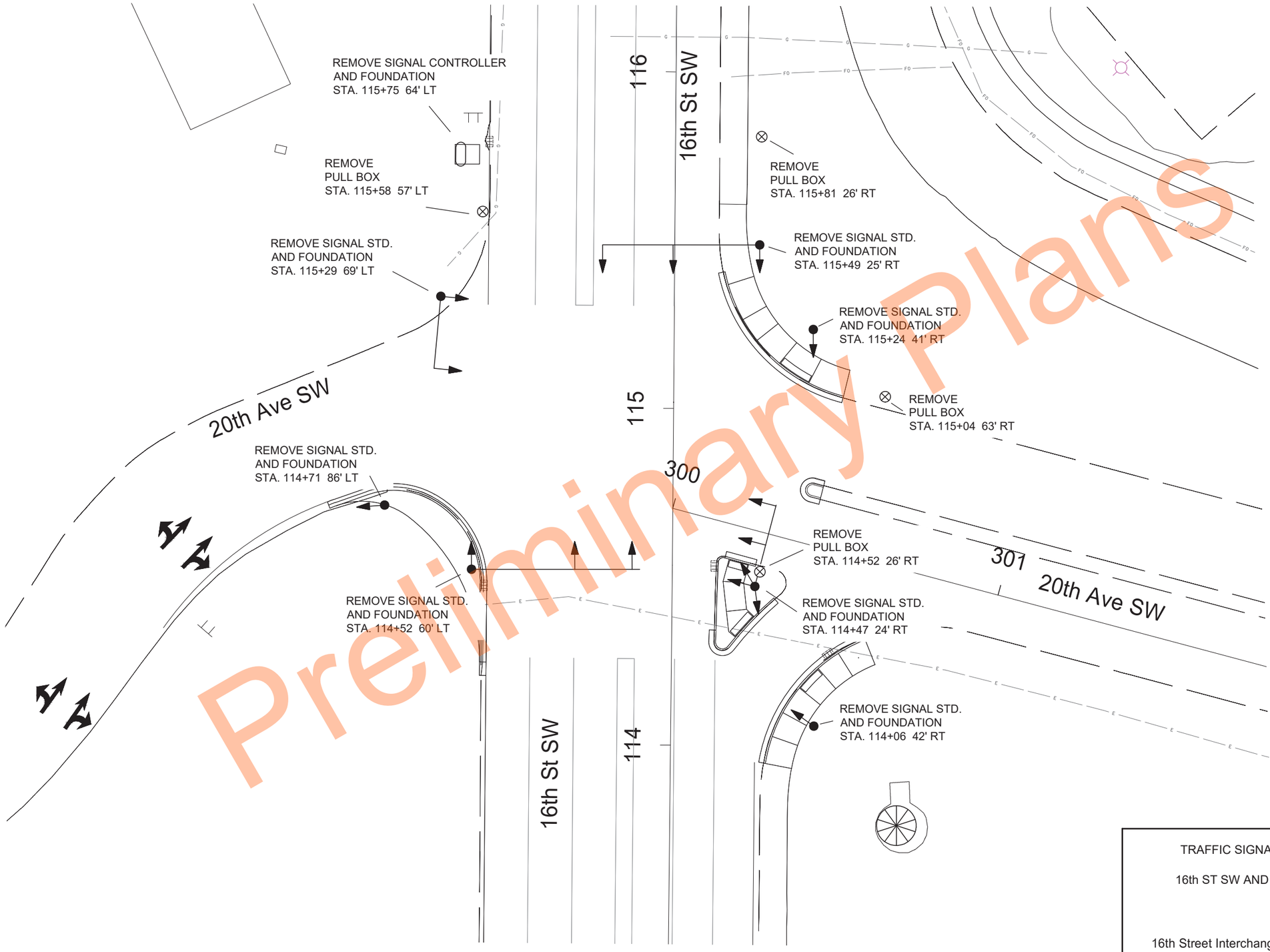
TRAFFIC SIGNAL DETAILS

16th ST SW AND 22nd AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:52:19-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	9



Preliminary Plans

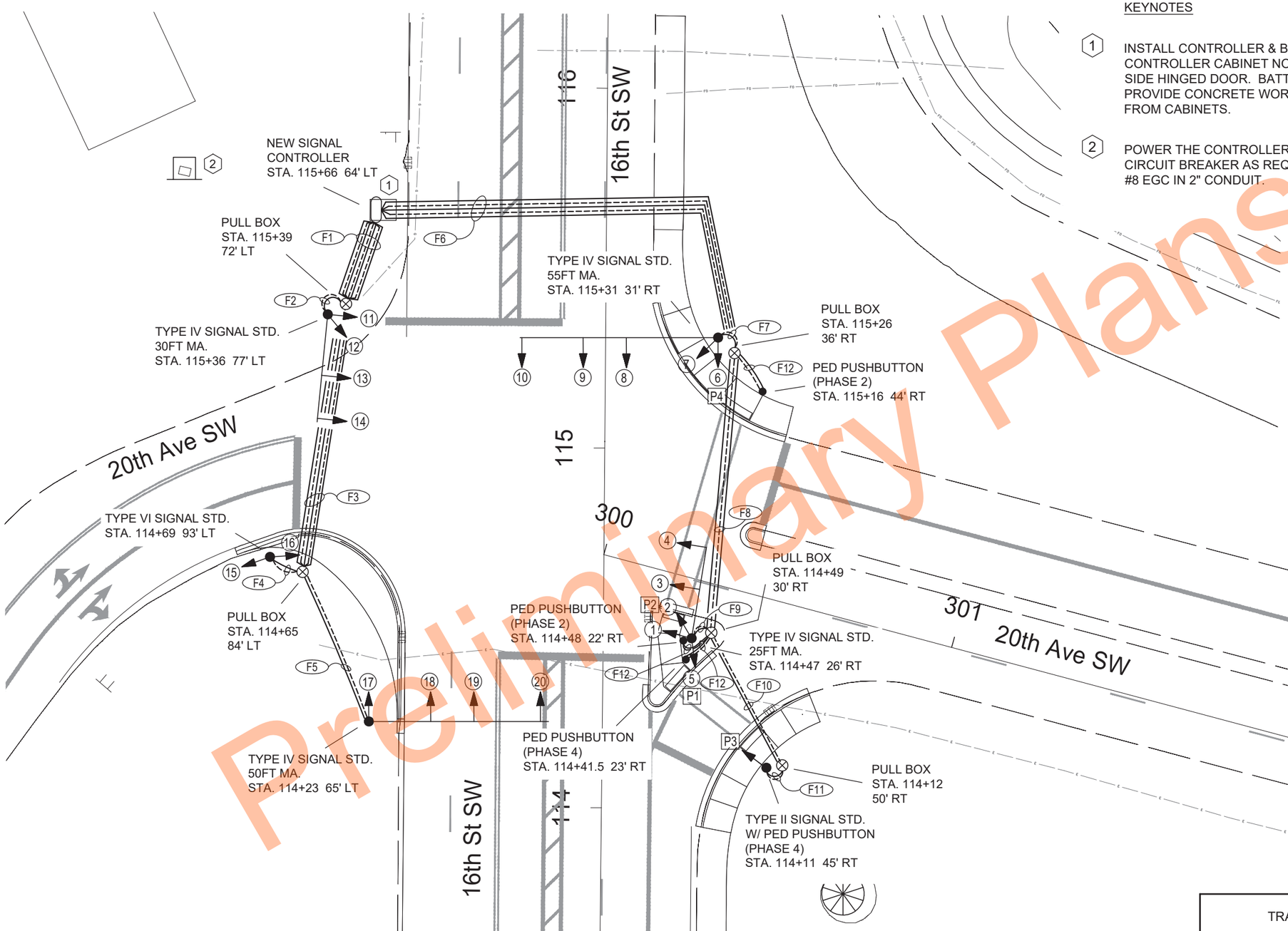
TRAFFIC SIGNAL REMOVAL

16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

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JASON L. HUNZE
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DATE 2025.04.15 08:52:35-05'00'
NORTH DAKOTA

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	ND	SU-4-989(132)	150	10



KEYNOTES

1. INSTALL CONTROLLER & BATTERY CABINETS SO THE DOORS FACE EAST. INSTALL CONTROLLER CABINET NORTH OF BATTERY CABINET. CONTROLLER TO HAVE RIGHT SIDE HINGED DOOR. BATTERY CABINET TO HAVE LEFT SIDE HINGED DOOR. PROVIDE CONCRETE WORKING PAD IN FRONT OF FOUNDATION THAT EXTENDS 4' FROM CABINETS.

2. POWER THE CONTROLLER CABINET FROM EXISTING FEEDPOINT. PROVIDE 60/2 CIRCUIT BREAKER AS REQUIRED. SERVICE FEEDER SHALL BE THREE #4 AWG AND #8 EGC IN 2" CONDUIT.

STANDARD LOCATION	STATION & OFFSET	BASE DIM. DIA. x DEPTH	FATIGUE CATEGORY
NE	115+31 31'RT	36" x 16'	I
NW	115+36 77'LT	36" x 12'	I
SE	114+47 26'RT	36" x 13'	I
SE	114+11 45'RT	24" x 6'	-
SW	114+23 65'LT	36" x 16'	I
SW	114+69 93'LT	24" x 6'	-

Preliminary Plans

TRAFFIC SIGNAL LAYOUT

16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

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NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	150	11

CABLE RUN DESIGNATION	CABLE RUN DESCRIPTION	1" DIAMETER RIGID CONDUIT	2" DIAMETER RIGID CONDUIT	3" DIAMETER RIGID CONDUIT	CABLE NO. 1 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 2 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 3 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 4 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 5 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 6 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 7 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 8 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 9 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 10 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 11 NO14 AWG 7 CONDUCTOR CABLE	CABLE NO. 12 NO14 AWG 7 CONDUCTOR CABLE	EMERG. VEH. DETECTOR CABLE (AS REQUIRED BY MANUFACTURER)	EMERG. VEH. INDICATOR LAMP NO14 AWG 4 CONDUCTOR CABLE	VIDEO DETECTION CABLE (AS REQUIRED BY MANUFACTURER)	PEDESTRIAN PUSH BUTTON NO16 AWG 3 CONDUCTOR CABLE
F1	CONTROLLER TO NW PULL BOX			X	X						X						X	X	X	
			X			X														
				X			X										X	X	X	
				SPARE																
F2	NW PULL BOX TO NW SIGNAL			X	X						X						X	X	X	
F3	NW PULL BOX TO SW PULL BOX		X			X														
				X			X										X	X	X	
				SPARE																
F4	SW PULL BOX TO WEST SIGNAL		X			X														
F5	SW PULL BOX TO SW SIGNAL			X			X										X	X	X	
F6	CONTROLLER TO NE PULL BOX			X				X	X			X					X	X	X	
				X						X			X	X	X	X	X	X	X	X (3)
				SPARE																
F7	NE PULL BOX TO NE SIGNAL			X				X	X			X					X	X	X	
F8	NE PULL BOX TO EAST PULL BOX			X						X			X	X	X	X	X	X	X	X (2)
				SPARE																
F9	EAST PULL BOX TO EAST SIGNAL			X						X			X	X	X		X	X	X	
F10	EAST PULL BOX TO SE PULL BOX		X													X				X
F11	SE PULL BOX TO SE SIGNAL		X													X				X
F12	PULL BOX TO PED PUSH BTN	X																		X

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.7		CABLE NO.8		CABLE NO.9	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		12	FL YELLOW	P4	WALK	2	FL YELLOW
2	WHITE		12	NEUTRAL	P4	NEUTRAL	2	NEUTRAL
3	RED		12	LT RED	P4	DON'T WALK	2	LT RED
4	GREEN			GROUND		GROUND		GROUND
5	ORANGE		12	LT YELLOW		SPARE	2	LT YELLOW
6	BLUE		12	LT GREEN		SPARE	2	LT GREEN
7	WHITE	BLACK	12	FL YELLOW NEUTRAL		SPARE	2	FL YELLOW NEUTRAL

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.10		CABLE NO.11		CABLE NO.12	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		P1	WALK	5	RT YELLOW	P3	WALK
2	WHITE		P1,P2	NEUTRAL	5	NEUTRAL	P3	NEUTRAL
3	RED		P1	DON'T WALK	5	RED	P3	DON'T WALK
4	GREEN			GROUND		GROUND		GROUND
5	ORANGE		P2	DON'T WALK	5	YELLOW		SPARE
6	BLUE		P2	WALK	5	GREEN		SPARE
7	WHITE	BLACK		SPARE	5	RT GREEN		SPARE

NOTE: THE 4th CONDUCTOR (RED) OF THE EMERG. VEHICLE INDICATOR LAMP CABLE IS DESIGNATED AS A TRACER WIRE. GROUND THE TRACER WIRE TO EACH SIGNAL BASE. DO NOT SPLICE THE CABLE. AT THE CONTROLLER CABINET, LEAVE 18" SLACK WIRE UN-TERMINATED AND LABELED "TRACER".

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.1		CABLE NO.2		CABLE NO.3		CABLE NO.4		CABLE NO.5		CABLE NO.6	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		14	FL YELLOW	16	FL YELLOW	20	FL YELLOW		SPARE	10	FL YELLOW		SPARE
2	WHITE		11,13,14	NEUTRAL	15,16	NEUTRAL	17,18,19,20	NEUTRAL	6,8,9,DNRT	NEUTRAL	7,10	NEUTRAL	1,3,4,DNRT	NEUTRAL
3	RED		11,13	RED	15	RED	17,18,19	RED	6,8,9	RED	7	RED	1,3,4	RED
4	GREEN			GROUND		GROUND		GROUND		GROUND		GROUND		GROUND
5	ORANGE		11,13	YELLOW	15	YELLOW	17,18,19	YELLOW	6,8,9	YELLOW	7	YELLOW	1,3,4	YELLOW
6	BLUE		11,13	GREEN	15	GREEN	17,18,19	GREEN	6,8,9	GREEN	7	GREEN	1,3,4	GREEN
7	WHITE	BLACK	14	FL YELLOW NEUTRAL	16	FL YELLOW NEUTRAL	20	FL YELLOW NEUTRAL		SPARE	10	FL YELLOW NEUTRAL		SPARE
8	RED	BLACK	14	LT RED	16	LT RED	20	LT RED		SPARE	10	LT RED	DNRT	DYNAMIC NO RT
9	GREEN	BLACK		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE
10	ORANGE	BLACK	14	LT YELLOW	16	LT YELLOW	20	LT YELLOW	6	RT YELLOW	10	LT YELLOW		SPARE
11	BLUE	BLACK	14	LT GREEN	16	LT GREEN	20	LT GREEN	6	RT GREEN	10	LT GREEN		SPARE
12	BLACK	WHITE		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE

CABLE SCHEDULES

16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

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DATE 2025.04.15 08:53:30-05'00'
NORTH DAKOTA

Preliminary Plans

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	ND	SU-4-989(132)	150	12

QUANTITIES: INCLUDED IN "TRAFFIC SIGNAL SITE 2"

CONCRETE FOUNDATION-TRAFFIC SIGNALS	6 EA
CONCRETE FOUNDATION-FEED POINT-TYPE B	1 EA
PULL BOX	5 EA
1IN DIAMETER RIGID CONDUIT	34 LF
2IN DIAMETER RIGID CONDUIT	161 LF
3IN DIAMETER RIGID CONDUIT	841 LF
EMERGENCY VEHICLE DETECTOR CABLE	812 LF
NO16 AWG 3 CONDUCTOR CABLE	716 LF
NO14 AWG 3 CONDUCTOR CABLE	18 LF
NO14 AWG 4 CONDUCTOR CABLE	812 LF
NO14 AWG 5 CONDUCTOR CABLE	454 LF
NO14 AWG 7 CONDUCTOR CABLE	1378 LF
NO14 AWG 12 CONDUCTOR CABLE	918 LF
COMBO 30FT MA SIG & LT STD - TYPE A	1 EA
COMBO 35FT MA SIG & LT STD - TYPE A	1 EA
COMBO 50FT MA SIG & LT STD - TYPE A	1 EA
COMBO 55FT MA SIG & LT STD - TYPE A	1 EA
TYPE II SIGNAL STANDARD	1 EA
TYPE VI SIGNAL STD	1 EA
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	5 EA
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	7 EA
1-WAY 4 SEC HEAD W/12IN LENS-POST MTD	3 EA
1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	3 EA
1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	2 EA
1-WAY DYNAMIC NO RIGHT TURN-POST MTD	1 EA
PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	4 EA
PEDESTRIAN PUSHBUTTON POST	3 EA
PEDESTRIAN PUSHBUTTON & SIGN	4 EA
VIDEO DETECTION CABLE	776 LF
VIDEO DETECTION SYSTEM	1 EA
VOLUME DENSITY CONTR W/PED & EMER PRE-EMPTION	1 EA
BATTERY BACKUP SYSTEM	1 EA
EMERGENCY VEHICLE PRE-EMPTION UNIT	4 EA
TYPE B CONTROLLER AND CABINET	1 EA
NETWORK EQUIPMENT	1 EA
REMOVE TRAFFIC SIGNAL STANDARD	7 EA
REMOVE TRAFFIC SIGNAL CONTROLLER	1 EA
REMOVE PULL BOX	4 EA

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

SIGNAL	HEAD	CABLE TYPE	TOTAL LF
EAST SIGNAL TRANSFORMER BASE	1	NO14 AWG 5 CONDUCTOR CABLE	15
	2	NO14 AWG 7 CONDUCTOR CABLE	15
	3	NO14 AWG 5 CONDUCTOR CABLE	36
	4	NO14 AWG 5 CONDUCTOR CABLE	48
	5	NO14 AWG 7 CONDUCTOR CABLE	15
	P1	NO14 AWG 5 CONDUCTOR CABLE	12
	P2	NO14 AWG 5 CONDUCTOR CABLE	12
	DNRT	NO14 AWG 3 CONDUCTOR CABLE	18
NE SIGNAL TRANSFORMER BASE	6	NO14 AWG 7 CONDUCTOR CABLE	15
	7	NO14 AWG 5 CONDUCTOR CABLE	15
	8	NO14 AWG 5 CONDUCTOR CABLE	48
	9	NO14 AWG 5 CONDUCTOR CABLE	65
	10	NO14 AWG 7 CONDUCTOR CABLE	78
	P4	NO14 AWG 5 CONDUCTOR CABLE	12
NW SIGNAL TRANSFORMER BASE	11	NO14 AWG 5 CONDUCTOR CABLE	15
	12	NO14 AWG 7 CONDUCTOR CABLE	15
	13	NO14 AWG 5 CONDUCTOR CABLE	40
	14	NO14 AWG 7 CONDUCTOR CABLE	54
WEST SIGNAL TRANSFORMER BASE	15	NO14 AWG 5 CONDUCTOR CABLE	15
	16	NO14 AWG 7 CONDUCTOR CABLE	15
SW SIGNAL TRANSFORMER BASE	17	NO14 AWG 5 CONDUCTOR CABLE	15
	18	NO14 AWG 5 CONDUCTOR CABLE	40
	19	NO14 AWG 5 CONDUCTOR CABLE	54
	20	NO14 AWG 7 CONDUCTOR CABLE	72
SE SIGNAL TRANSFORMER BASE	P3	NO14 AWG 5 CONDUCTOR CABLE	12

Preliminary Plans

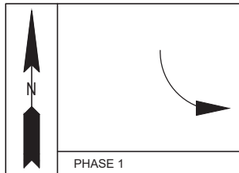
QUANTITIES

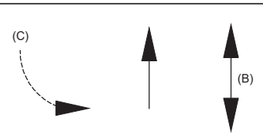
16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

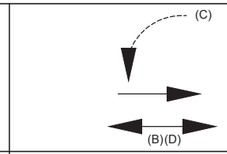
REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:54:51-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	13







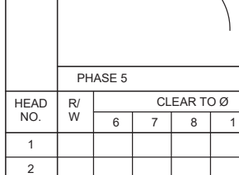


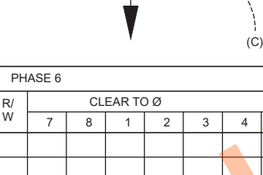
HEAD NO.	PHASE 1 R/W	2	3	4	5	6	7	8
1								
2	G	Y	Y	Y	(A)	(A)		Y
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	G	Y	Y	Y	(A)	(A)	Y	Y

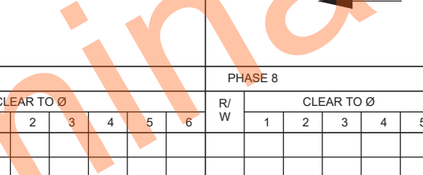
HEAD NO.	PHASE 2 R/W	3	4	5	6	7	8	1
1								
2	FY	Y	Y	(A)	(A)		Y	Y
3								
4								
5	G	Y	Y	(A)	(A)		Y	Y
6	G	Y	Y	(A)	(A)		Y	Y
7								
8	G	Y	Y	(A)	(A)		Y	Y
9	G	Y	Y	(A)	(A)		Y	Y
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	FY	Y	Y	(A)	(A)	Y	Y	Y

HEAD NO.	PHASE 3 R/W	4	5	6	7	8	1	2
1								
2								
3								
4								
5	G	Y	Y	Y		(A)	Y	Y
6	G	Y	Y	Y		(A)	Y	Y
7								
8								
9								
10								
11								
12								
13								
14	G	Y	Y	Y		(A)	Y	Y
15								
16	G	Y	Y	Y		(A)	Y	Y
17								
18								
19								
20								

HEAD NO.	PHASE 4 R/W	5	6	7	8	1	2	3
1	G	Y	Y		(A)	Y	Y	Y
2								
3	G	Y	Y		(A)	Y	Y	Y
4	G	Y	Y		(A)	Y	Y	Y
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15	FY	Y	Y		(A)	Y	Y	Y
16	FY	Y	Y		(A)	Y	Y	Y
17	G	Y	Y		(A)	Y	Y	Y
18								
19								
20								







HEAD NO.	PHASE 5 R/W	6	7	8	1	2	3	4
1								
2								
3								
4								
5								
6								
7								
8								
9								
10	G	Y		Y	(A)	(A)	Y	Y
11								
12	G	Y		Y	(A)	(A)	Y	Y
13								
14								
15								
16								
17								
18								
19								
20	G	Y	Y	Y	(A)	(A)	Y	Y

HEAD NO.	PHASE 6 R/W	7	8	1	2	3	4	5
1								
2								
3								
4								
5								
6								
7								
8								
9								
10	FY		Y	(A)	(A)	Y	Y	Y
11								
12	FY		Y	(A)	(A)	Y	Y	Y
13								
14								
15								
16								
17	G		Y	(A)	(A)	Y	Y	Y
18	G		Y	(A)	(A)	Y	Y	Y
19	G		Y	(A)	(A)	Y	Y	Y
20								

HEAD NO.	PHASE 7 R/W	8	1	2	3	4	5	6
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

HEAD NO.	PHASE 8 R/W	1	2	3	4	5	6	7
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13	G	Y	Y	(A)	(A)	Y	Y	
14								
15								
16								
17								
18								
19								
20								

BLANK SQUARES DENOTE A RED INDICATION ◄—— PROTECTED MOVEMENT ◄------ PERMITTED MOVEMENT

(A) When one phase is on alone, any nonconflicting phase may start timing concurrently without a clearance interval. (See Chart A)

(B) Only upon pedestrian actuation.

(C) Flashing yellow arrow shall not operate during EVP.

(D) Program a logic statement to illuminate the Dynamic No Right Turn sign only during a conflicting pedestrian Walk indication.

EMERGENCY VEHICLE PRE-EMPTION PHASING

HEAD NO.	PHASE 2 R/W	3	4	5	6	7	8	1
1								
2								
3								
4								
5	G	Y	Y	Y	Y		Y	Y
6	G	Y	Y	Y	Y		Y	Y
7								
8	G	Y	Y	Y	Y		Y	Y
9	G	Y	Y	Y	Y		Y	Y
10	G	Y	Y	Y	Y		Y	Y
11								
12	G	Y	Y	Y	Y		Y	Y
13								
14								
15								
16								
17								
18								
19								
20								

HEAD NO.	PHASE 4 R/W	5	6	7	8	1	2	3
1	G	Y	Y		Y	Y	Y	Y
2								
3	G	Y	Y		Y	Y	Y	Y
4	G	Y	Y		Y	Y	Y	Y
5								
6								
7	G	Y	Y		Y	Y	Y	Y
8								
9								
10								
11								
12								
13								
14								
15	G	Y	Y		Y	Y	Y	Y
16								
17								
18								
19								
20								

HEAD NO.	PHASE 6 R/W	7	8	1	2	3	4	5
1								
2	G		Y	Y	Y	Y	Y	Y
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17	G		Y	Y	Y	Y	Y	Y
18	G		Y	Y	Y	Y	Y	Y
19	G		Y	Y	Y	Y	Y	Y
20	G		Y	Y	Y	Y	Y	Y

HEAD NO.	PHASE 8 R/W	1	2	3	4	5	6	7
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	G	Y	Y	Y	Y	Y	Y	
12								
13	G	Y	Y	Y	Y	Y	Y	
14	G	Y	Y	Y	Y	Y	Y	
15								
16	G	Y	Y	Y	Y	Y	Y	
17								
18								
19								
20								

CHART A

ON PHASE	NON-CONFLICTING PHASE ALLOWED TO OPERATE CONCURRENTLY
1	5 or 6
2	5 or 6
3	8
4	8
5	1 or 2
6	1 or 2
7	--
8	3 or 4

PHASING

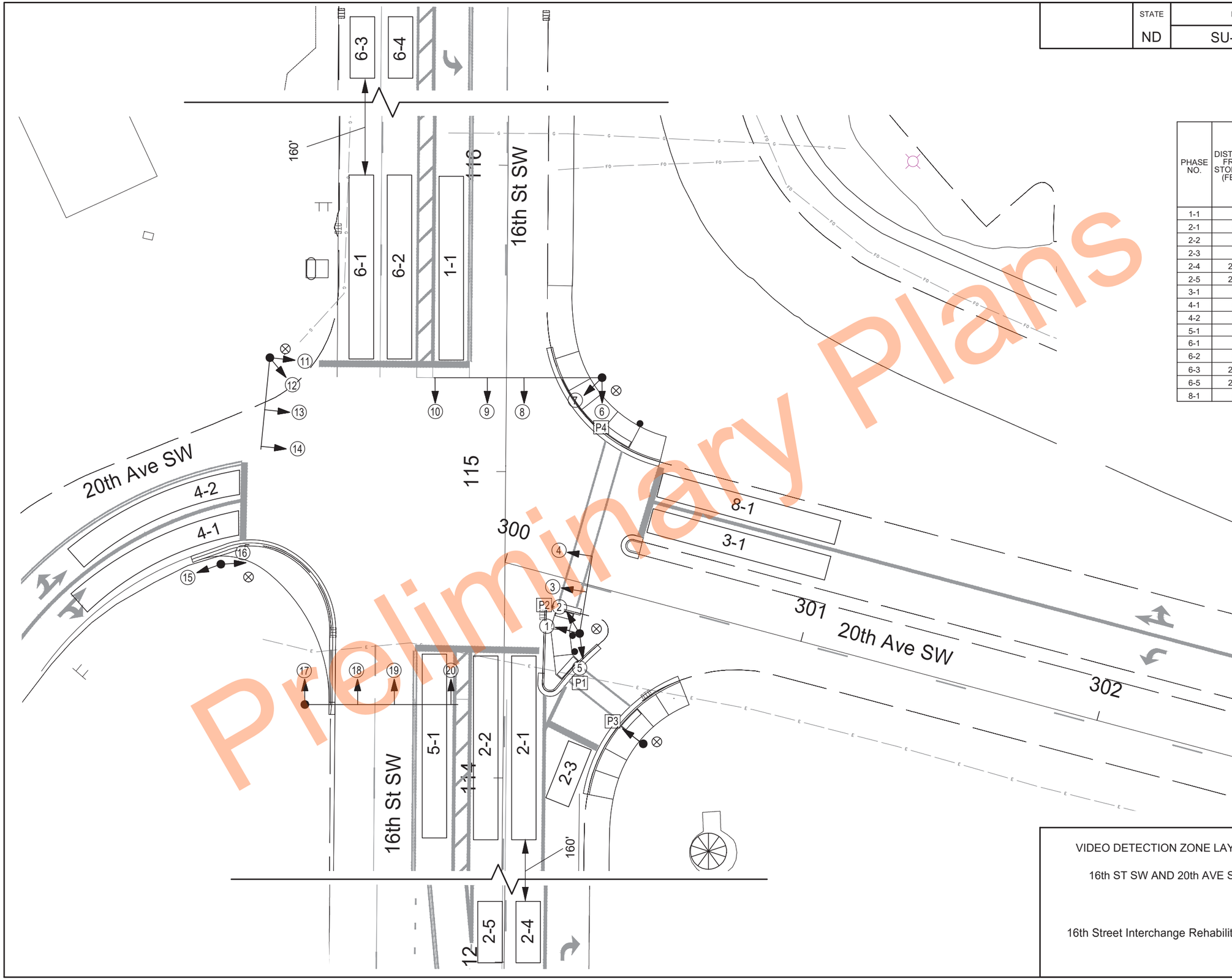
16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:55:05-05'00'
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	150	14



PHASE NO.	DISTANCE FROM STOP BAR (FEET)	LENGTH (FEET)	Presence/Counting	Passage/Counting	Queue/Counting	Locking Memory	Non-Locking Memory
1-1	0	60	X				X
2-1	0	60			X		X
2-2	0	60			X		X
2-3	0	20			X		X
2-4	220	20		X		X	
2-5	220	20		X		X	
3-1	0	60	X				X
4-1	0	60			X		X
4-2	0	60			X		X
5-1	0	60	X				X
6-1	0	60			X		X
6-2	0	60			X		X
6-3	220	20		X		X	
6-5	220	20		X		X	
8-1	0	60			X		X

Preliminary Plans

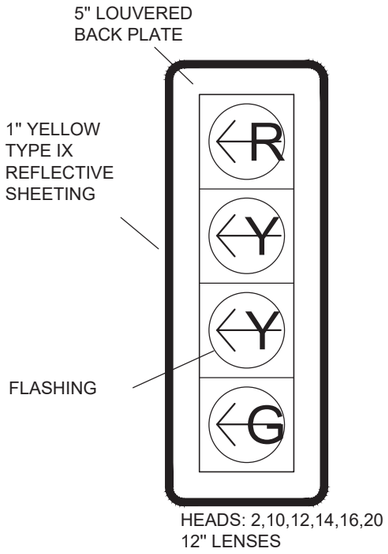
VIDEO DETECTION ZONE LAYOUT

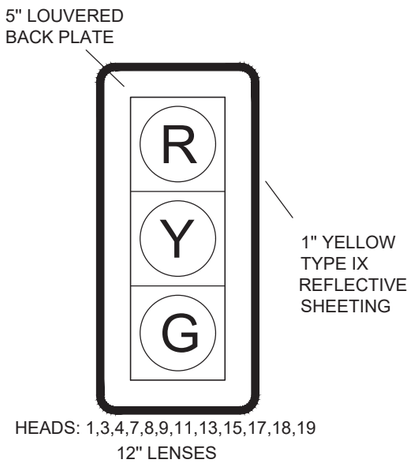
16th ST SW AND 20th AVE SW

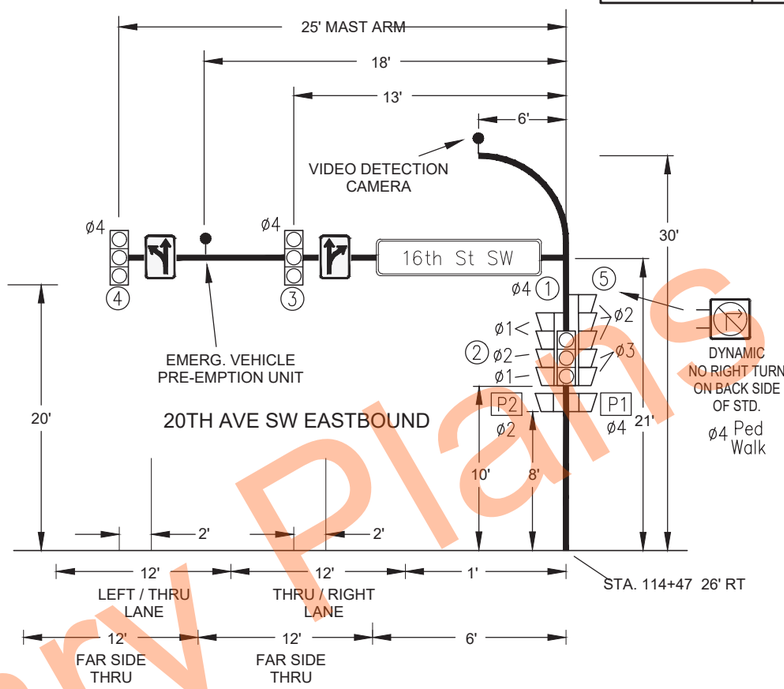
16th Street Interchange Rehabilitation

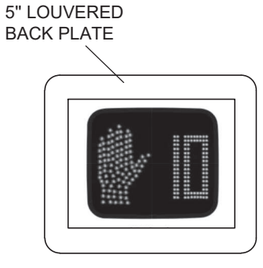
REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15
08:55:19-05'00'
NORTH DAKOTA

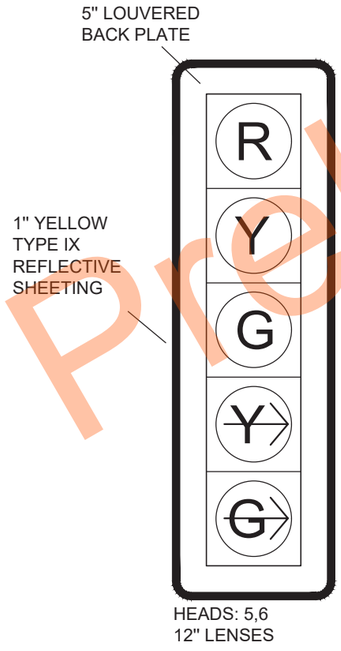
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	15

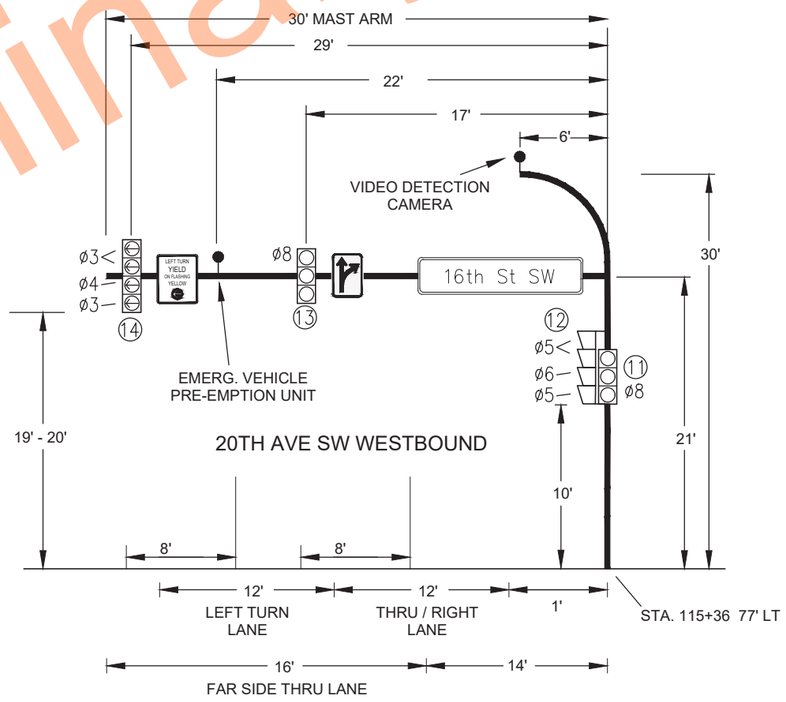












TRAFFIC SIGNAL DETAILS

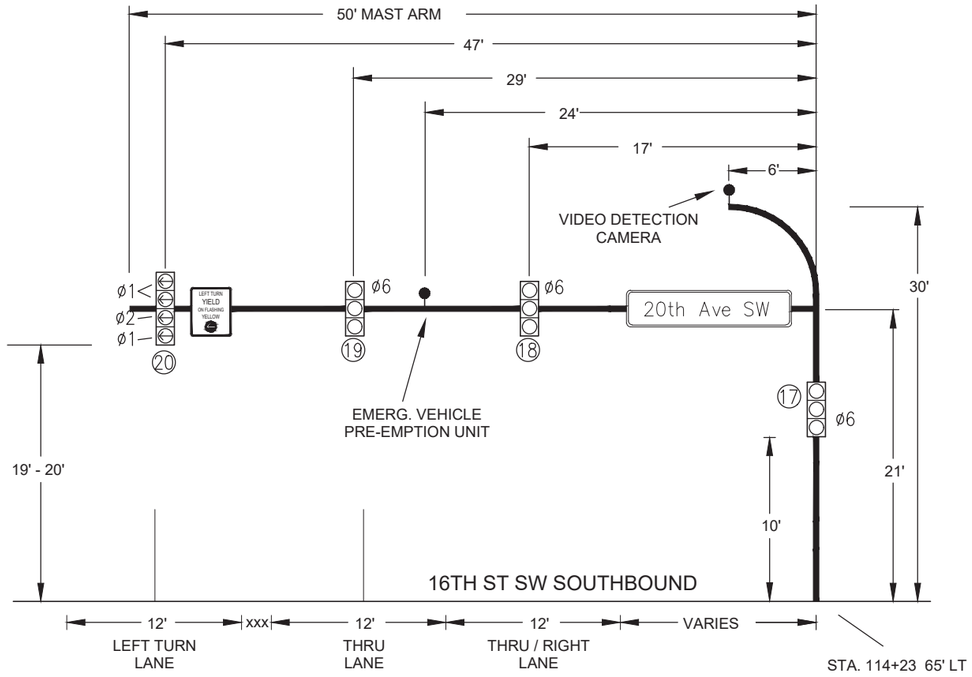
16th ST SW AND 20th AVE SW

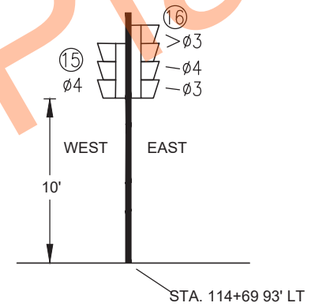
16th Street Interchange Rehabilitation

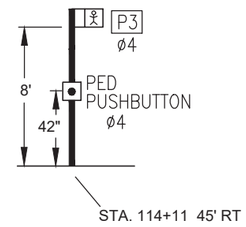
REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:55:33-05'00'
NORTH DAKOTA

Preliminary Plans

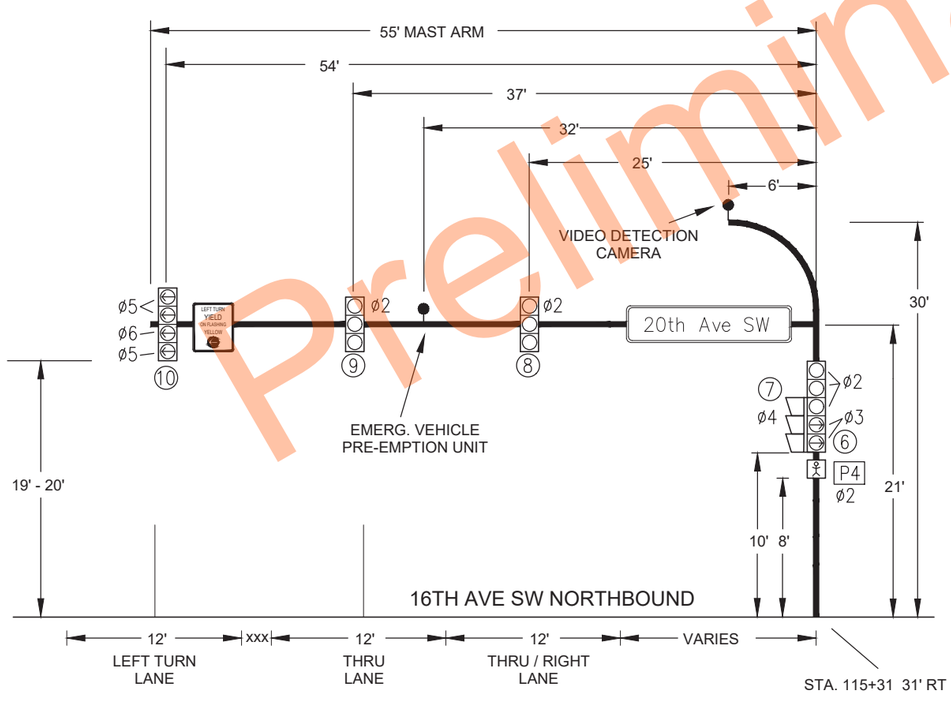
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	16







SOUTHEAST BOUND



Preliminary Plans

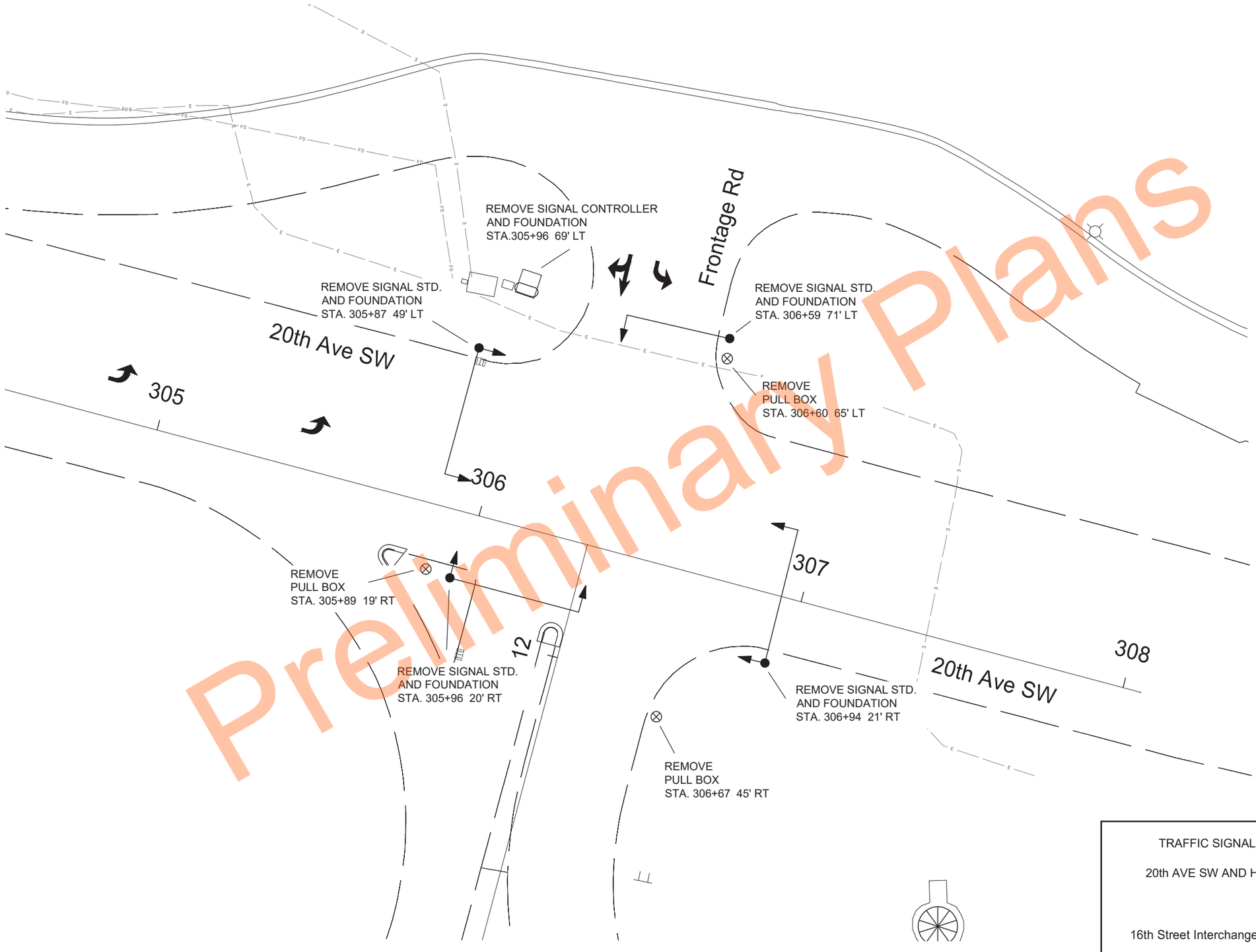
TRAFFIC SIGNAL DETAILS

16th ST SW AND 20th AVE SW

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:55:51-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	17



Preliminary Plans

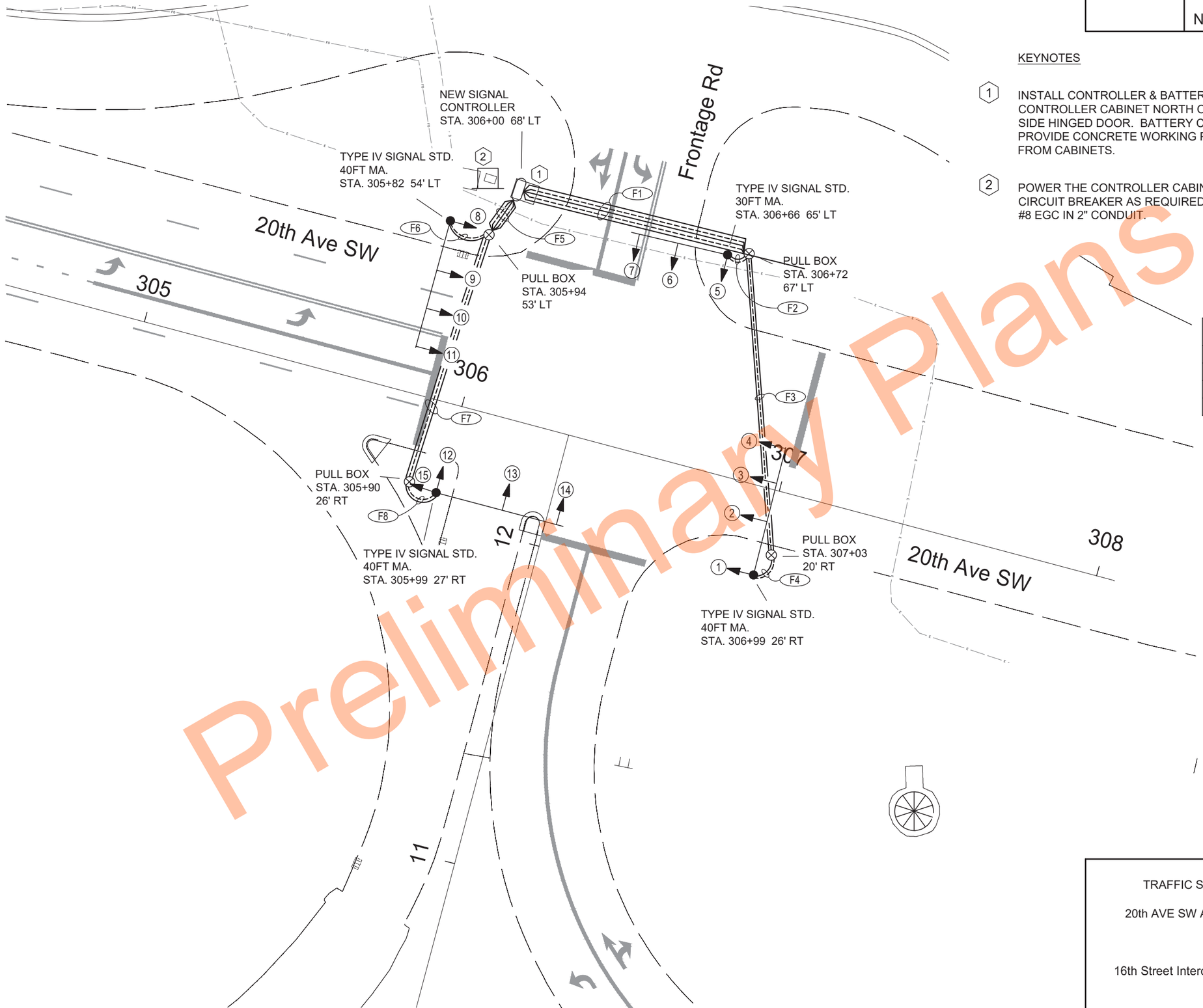
TRAFFIC SIGNAL REMOVAL

20th AVE SW AND HWY 2 RAMPS

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:56:05-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	18



KEYNOTES

1. INSTALL CONTROLLER & BATTERY CABINETS SO THE DOORS FACE EAST. INSTALL CONTROLLER CABINET NORTH OF BATTERY CABINET. CONTROLLER TO HAVE RIGHT SIDE HINGED DOOR. BATTERY CABINET TO HAVE LEFT SIDE HINGED DOOR. PROVIDE CONCRETE WORKING PAD IN FRONT OF FOUNDATION THAT EXTENDS 4' FROM CABINETS.

2. POWER THE CONTROLLER CABINET FROM EXISTING FEEDPOINT. PROVIDE 60/2 CIRCUIT BREAKER AS REQUIRED. SERVICE FEEDER SHALL BE THREE #4 AWG AND #8 EGC IN 2" CONDUIT.

STANDARD LOCATION	STATION & OFFSET	BASE DIM. DIA. x DEPTH	FATIGUE CATEGORY
NE	306+66 65'LT	36" x 12'	III
NW	305+82 54'LT	36" x 15'	II
SE	306+99 26'RT	36" x 15'	II
SW	305+90 26'RT	36" x 15'	II

N

0 30

Scale in Feet

Preliminary Plans

TRAFFIC SIGNAL LAYOUT

20th AVE SW AND HWY 2 RAMPS

16th Street Interchange Rehabilitation

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DATE 2025.04.15 08:56:22-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	19

CABLE RUN DESIGNATION	CABLE RUN DESCRIPTION	3" DIAMETER RIGID CONDUIT	CABLE NO. 1 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 2 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 3 NO14 AWG 5 CONDUCTOR CABLE	CABLE NO. 4 NO14 AWG 12 CONDUCTOR CABLE	CABLE NO. 5 NO14 AWG 7 CONDUCTOR CABLE	EMERG. VEH. DETECTOR CABLE (AS REQUIRED BY MANUFACTURER)	EMERG. VEH. INDICATOR LAMP NO14 AWG 4 CONDUCTOR CABLE	VIDEO DETECTION CABLE (AS REQUIRED BY MANUFACTURER)
F1	CONTROLLER TO NE PULL BOX	X	X					X	X	X
		X		X				X	X	X
		SPARE								
F2	NE PULL BOX TO NE SIGNAL	X	X					X	X	X
F3	NE PULL BOX TO SE PULL BOX	X		X				X	X	X
		SPARE								
F4	SE PULL BOX TO SE SIGNAL	X		X				X	X	X
F5	CONTROLLER TO NW PULL BOX	X			X			X	X	X
		X				X	X	X	X	X
		SPARE								
F6	NW PULL BOX TO NW SIGNAL	X			X			X	X	X
F7	NW PULL BOX TO SW PULL BOX	X				X	X	X	X	X
		SPARE								
F8	SW PULL BOX TO SW SIGNAL	X				X	X	X	X	X

NOTE: THE 4th CONDUCTOR (RED) OF THE EMERG. VEHICLE INDICATOR LAMP CABLE IS DESIGNATED AS A TRACER WIRE. GROUND THE TRACER WIRE TO EACH SIGNAL BASE. DO NOT SPLICE THE CABLE. AT THE CONTROLLER CABINET, LEAVE 18" SLACK WIRE UN-TERMINATED AND LABELED "TRACER".

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.1		CABLE NO.2		CABLE NO.3		CABLE NO.4	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		7	FL YELLOW	4	FL YELLOW	11	FL YELLOW	14	FL YELLOW
2	WHITE		5,6,7	NEUTRAL	1,2,3,4	NEUTRAL	8,9,10,11	NEUTRAL	12,13,14	NEUTRAL
3	RED		5,6	RED	1,2,3	RED	8,9,10	RED	12,13	RED
4	GREEN			GROUND		GROUND		GROUND		GROUND
5	ORANGE		5,6	YELLOW	1,2,3	YELLOW	8,9,10	YELLOW	12,13	YELLOW
6	BLUE		5,6	GREEN	1,2,3	GREEN	8,9,10	GREEN	12,13	GREEN
7	WHITE	BLACK	7	FL YELLOW NEUTRAL	4	FL YELLOW NEUTRAL	11	FL YELLOW NEUTRAL	14	FL YELLOW NEUTRAL
8	RED	BLACK	7	LT RED	4	LT RED	11	LT RED	14	LT RED
9	GREEN	BLACK		SPARE		SPARE		SPARE		SPARE
10	ORANGE	BLACK	7	LT YELLOW	4	LT YELLOW	11	LT YELLOW	14	LT YELLOW
11	BLUE	BLACK	7	LT GREEN	4	LT GREEN	11	LT GREEN	14	LT GREEN
12	BLACK	WHITE		SPARE		SPARE		SPARE		SPARE

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.5	
NO.	COLOR	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE		15	NEUTRAL
3	RED		15	RED
4	GREEN			GROUND
5	ORANGE		15	YELLOW
6	BLUE		15	GREEN
7	WHITE	BLACK		SPARE

CABLE SCHEDULES

20th AVE SW AND HWY 2 RAMPS

16th Street Interchange Rehabilitation

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NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	20

QUANTITIES: INCLUDED IN ''TRAFFIC SIGNAL SITE 3''	
CONCRETE FOUNDATION-TRAFFIC SIGNALS	4 EA
CONCRETE FOUNDATION-FEED POINT-TYPE B	1 EA
PULL BOX	4 EA
3IN DIAMETER RIGID CONDUIT	648 LF
EMERGENCY VEHICLE DETECTOR CABLE	665 LF
NO14 AWG 4 CONDUCTOR CABLE	665 LF
NO14 AWG 5 CONDUCTOR CABLE	339 LF
NO14 AWG 7 CONDUCTOR CABLE	369 LF
NO14 AWG 12 CONDUCTOR CABLE	479 LF
COMBO 30FT MA SIG & LT STD - TYPE A	1 EA
COMBO 40FT MA SIG & LT STD - TYPE A	3 EA
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	5 EA
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	6 EA
1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	4 EA
VIDEO DETECTION CABLE	633 LF
VIDEO DETECTION SYSTEM	1 EA
VOLUME DENSITY CONTR W/PED & EMER PRE-EMPTION	1 EA
BATTERY BACKUP SYSTEM	1 EA
EMERGENCY VEHICLE PRE-EMPTION UNIT	4 EA
TYPE B CONTROLLER AND CABINET	1 EA
NETWORK EQUIPMENT	1 EA
REMOVE TRAFFIC SIGNAL STANDARD	4 EA
REMOVE TRAFFIC SIGNAL CONTROLLER	1 EA
REMOVE PULL BOX	3 EA

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE			
SIGNAL	HEAD	CABLE TYPE	TOTAL LF
SE SIGNAL TRANSFORMER BASE	1	NO14 AWG 5 CONDUCTOR CABLE	15
	2	NO14 AWG 5 CONDUCTOR CABLE	39
	3	NO14 AWG 5 CONDUCTOR CABLE	52
	4	NO14 AWG 7 CONDUCTOR CABLE	63
NE SIGNAL TRANSFORMER BASE	5	NO14 AWG 5 CONDUCTOR CABLE	15
	6	NO14 AWG 5 CONDUCTOR CABLE	38
	7	NO14 AWG 7 CONDUCTOR CABLE	50
NW SIGNAL TRANSFORMER BASE	8	NO14 AWG 5 CONDUCTOR CABLE	15
	9	NO14 AWG 5 CONDUCTOR CABLE	39
	10	NO14 AWG 5 CONDUCTOR CABLE	52
	11	NO14 AWG 7 CONDUCTOR CABLE	63
SW SIGNAL TRANSFORMER BASE	12	NO14 AWG 5 CONDUCTOR CABLE	15
	13	NO14 AWG 5 CONDUCTOR CABLE	44
	14	NO14 AWG 7 CONDUCTOR CABLE	62
	15	NO14 AWG 5 CONDUCTOR CABLE	15

Preliminary Plans

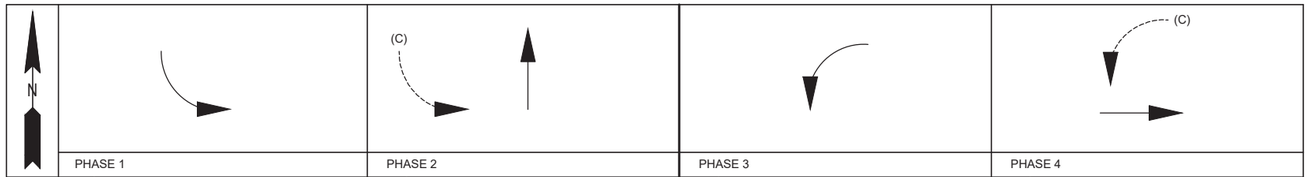
QUANTITIES

20th AVE SW AND HWY 2 RAMPS

16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:56:47-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	21



PHASE 1

HEAD NO.	R/W	CLEAR TO Ø						
		2	3	4	5	6	7	8
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14	◀ G	◀ Y	◀ Y	◀ Y	(A)	(A)	◀ Y	◀ Y
15								

PHASE 2

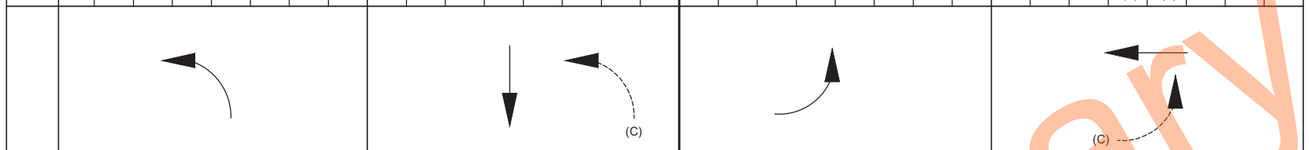
HEAD NO.	R/W	CLEAR TO Ø						
		3	4	5	6	7	8	1
1								
2								
3								
4								
5	G	Y	Y	(A)	(A)	Y	Y	Y
6	G	Y	Y	(A)	(A)	Y	Y	Y
7								
8								
9								
10								
11								
12								
13								
14	◀ FY	◀ Y	◀ Y	◀ (A)	◀ (A)	◀ Y	◀ Y	◀ Y
15								

PHASE 3

HEAD NO.	R/W	CLEAR TO Ø						
		4	5	6	7	8	1	2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	◀ G	◀ Y	◀ Y	◀ Y	(A)	(A)	◀ Y	◀ Y
12								
13								
14								
15								

PHASE 4

HEAD NO.	R/W	CLEAR TO Ø						
		5	6	7	8	1	2	3
1	G	Y	Y	(A)	(A)	Y	Y	Y
2	G	Y	Y	(A)	(A)	Y	Y	Y
3	G	Y	Y	(A)	(A)	Y	Y	Y
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15	◀ FY	◀ Y	◀ Y	◀ (A)	◀ (A)	◀ Y	◀ Y	◀ Y



PHASE 5

HEAD NO.	R/W	CLEAR TO Ø						
		6	7	8	1	2	3	4
1								
2								
3								
4								
5								
6								
7	◀ G	◀ Y	◀ Y	◀ Y	(A)	(A)	◀ Y	◀ Y
8								
9								
10								
11								
12								
13								
14								
15								

PHASE 6

HEAD NO.	R/W	CLEAR TO Ø						
		7	8	1	2	3	4	5
1								
2								
3								
4								
5								
6								
7	◀ FY	◀ Y	◀ Y	◀ (A)	◀ (A)	◀ Y	◀ Y	◀ Y
8								
9								
10								
11								
12	G	Y	Y	(A)	(A)	Y	Y	Y
13	G	Y	Y	(A)	(A)	Y	Y	Y
14								
15								

PHASE 7

HEAD NO.	R/W	CLEAR TO Ø						
		8	1	2	3	4	5	6
1								
2								
3								
4	◀ G	◀ Y	◀ Y	◀ Y	(A)	(A)	◀ Y	◀ Y
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

PHASE 8

HEAD NO.	R/W	CLEAR TO Ø						
		1	2	3	4	5	6	7
1								
2								
3								
4								
5								
6								
7								
8	G	Y	Y	(A)	(A)	Y	Y	Y
9	G	Y	Y	(A)	(A)	Y	Y	Y
10	G	Y	Y	(A)	(A)	Y	Y	Y
11								
12								
13								
14								
15								

BLANK SQUARES DENOTE A RED INDICATION

◀—— PROTECTED MOVEMENT

◀- - - - - PERMITTED MOVEMENT

(A) When one phase is on alone, any nonconflicting phase may start timing concurrently without a clearance interval. (See Chart A)

(B) Only upon pedestrian actuation.

(C) Flashing yellow arrow shall not operate during EVP.

EMERGENCY VEHICLE PRE-EMPTION PHASING

PHASE 2

HEAD NO.	R/W	CLEAR TO Ø						
		3	4	5	6	7	8	1
1								
2								
3								
4								
5	G	Y	Y	Y	Y	Y	Y	Y
6	G	Y	Y	Y	Y	Y	Y	Y
7	◀ G	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y
8								
9								
10								
11								
12								
13								
14								
15								

PHASE 4

HEAD NO.	R/W	CLEAR TO Ø						
		5	6	7	8	1	2	3
1	G	Y	Y	Y	Y	Y	Y	Y
2	G	Y	Y	Y	Y	Y	Y	Y
3	G	Y	Y	Y	Y	Y	Y	Y
4	◀ G	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15	G	Y	Y	Y	Y	Y	Y	Y

PHASE 6

HEAD NO.	R/W	CLEAR TO Ø						
		7	8	1	2	3	4	5
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12	G	Y	Y	Y	Y	Y	Y	Y
13	G	Y	Y	Y	Y	Y	Y	Y
14	◀ G	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y
15								

PHASE 8

HEAD NO.	R/W	CLEAR TO Ø						
		1	2	3	4	5	6	7
1								
2								
3								
4								
5								
6								
7								
8	G	Y	Y	Y	Y	Y	Y	Y
9	G	Y	Y	Y	Y	Y	Y	Y
10	G	Y	Y	Y	Y	Y	Y	Y
11	◀ G	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y	◀ Y
12								
13								
14								
15								

CHART A

ON PHASE	NON-CONFLICTING PHASE ALLOWED TO OPERATE CONCURRENTLY
1	5 or 6
2	5 or 6
3	7 or 8
4	7 or 8
5	1 or 2
6	1 or 2
7	3 or 4
8	3 or 4

PHASING

20th AVE SW AND HWY 2 RAMPS

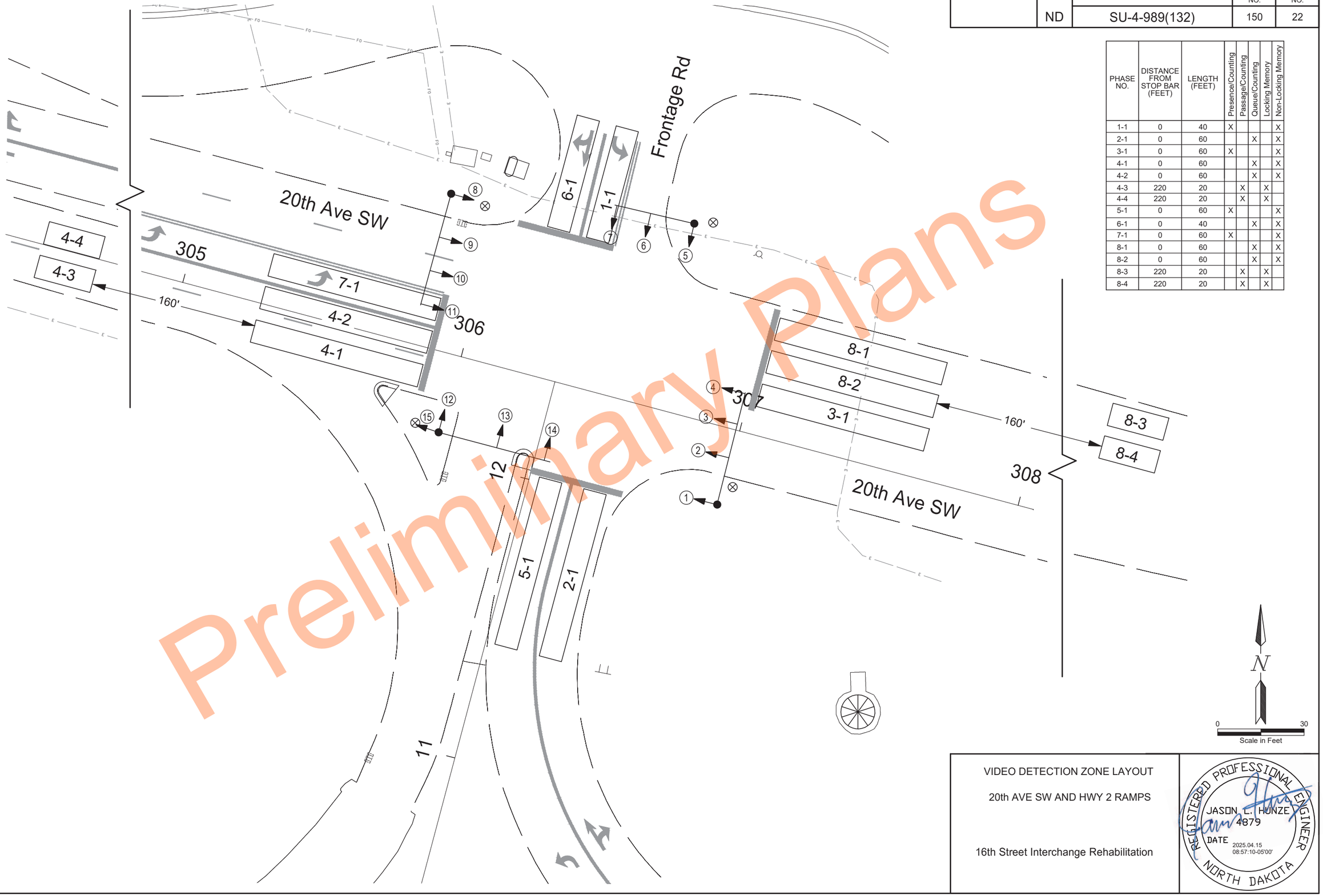
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:56:58-05'00'
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	22

PHASE NO.	DISTANCE FROM STOP BAR (FEET)	LENGTH (FEET)	Presence/Counting	Passage/Counting	Queue/Counting	Locking Memory	Non-Locking Memory
1-1	0	40	X				X
2-1	0	60			X		X
3-1	0	60	X				X
4-1	0	60			X		X
4-2	0	60			X		X
4-3	220	20		X		X	
4-4	220	20		X		X	
5-1	0	60	X				X
6-1	0	40			X		X
7-1	0	60	X				X
8-1	0	60			X		X
8-2	0	60			X		X
8-3	220	20		X		X	
8-4	220	20		X		X	



Preliminary Plans

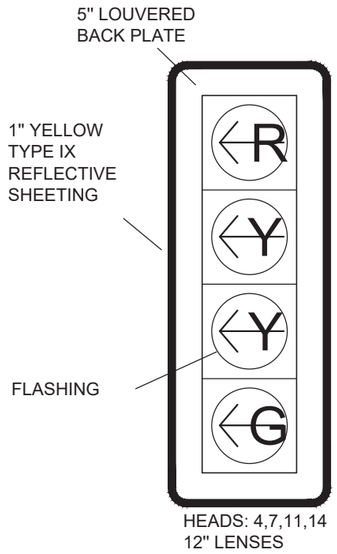
VIDEO DETECTION ZONE LAYOUT

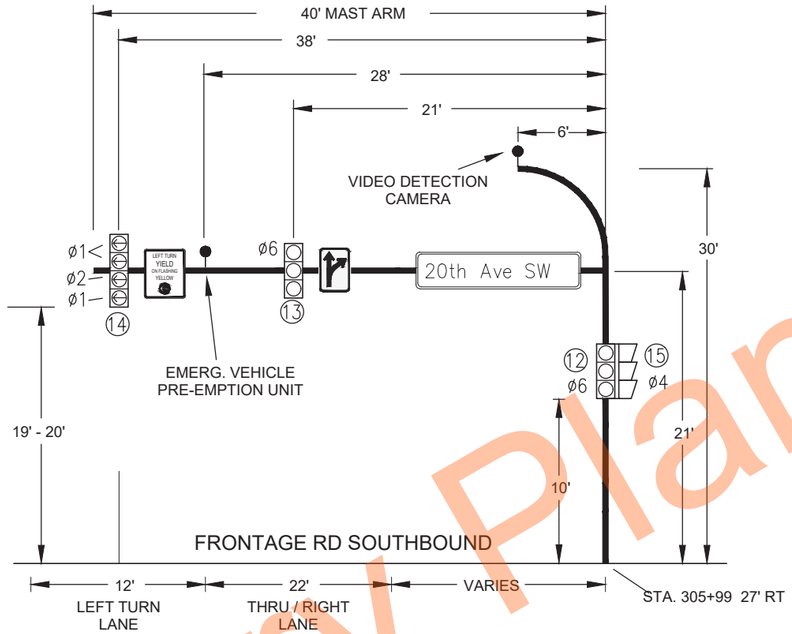
20th AVE SW AND HWY 2 RAMPS

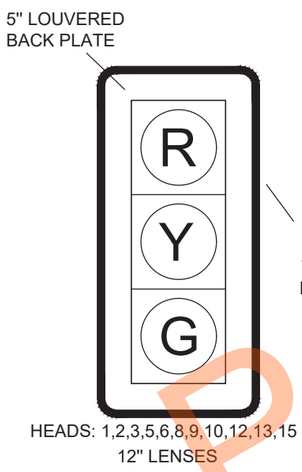
16th Street Interchange Rehabilitation

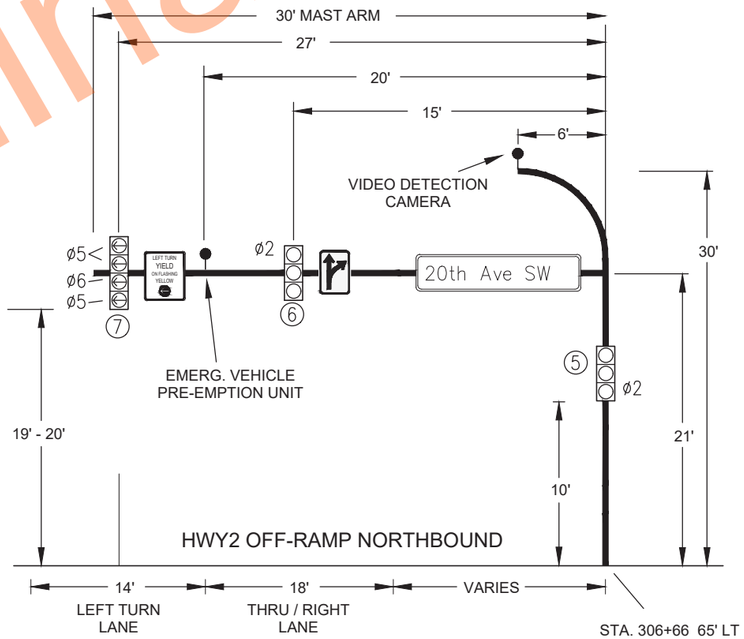
REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:57:10-05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	23









TRAFFIC SIGNAL DETAILS

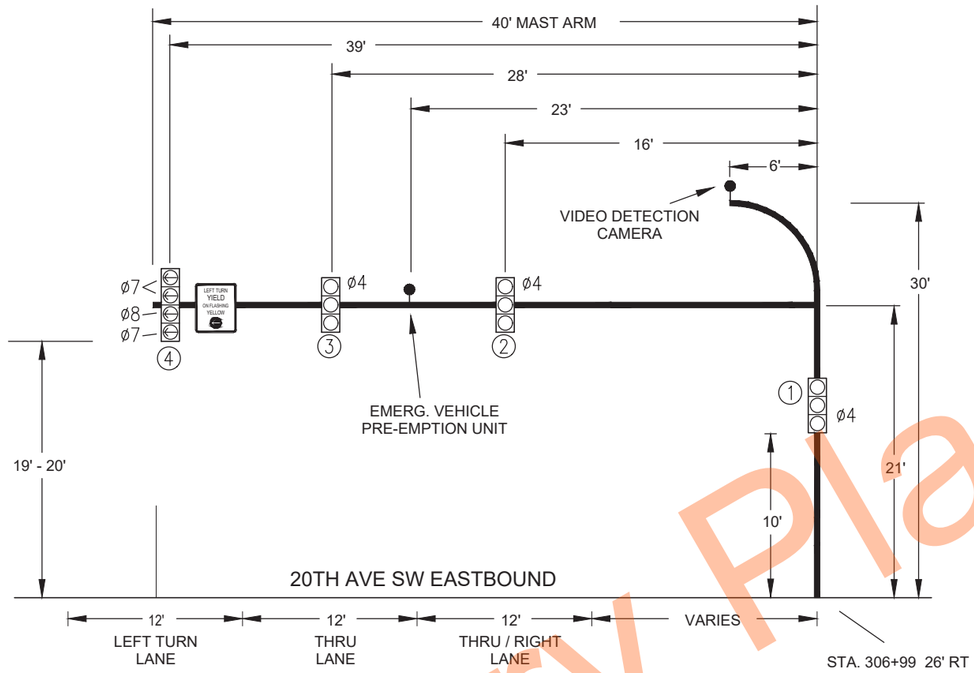
20th AVE SW AND HWY 2 RAMPS

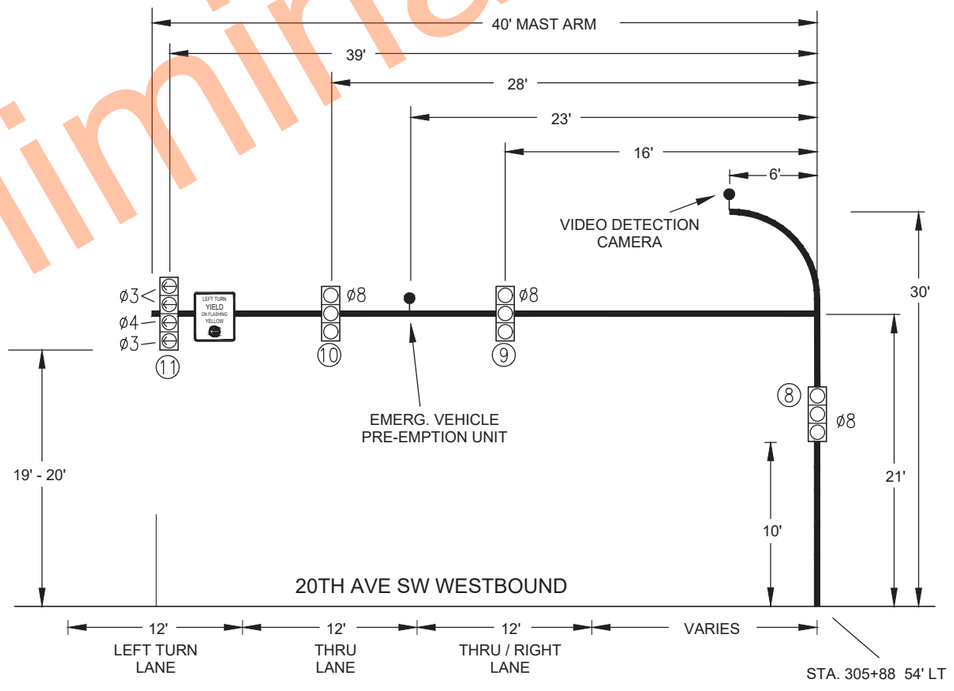
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:57:22-05'00'
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-4-989(132)	150	24





Preliminary Plans

TRAFFIC SIGNAL DETAILS

20th AVE SW AND HWY 2 RAMPS

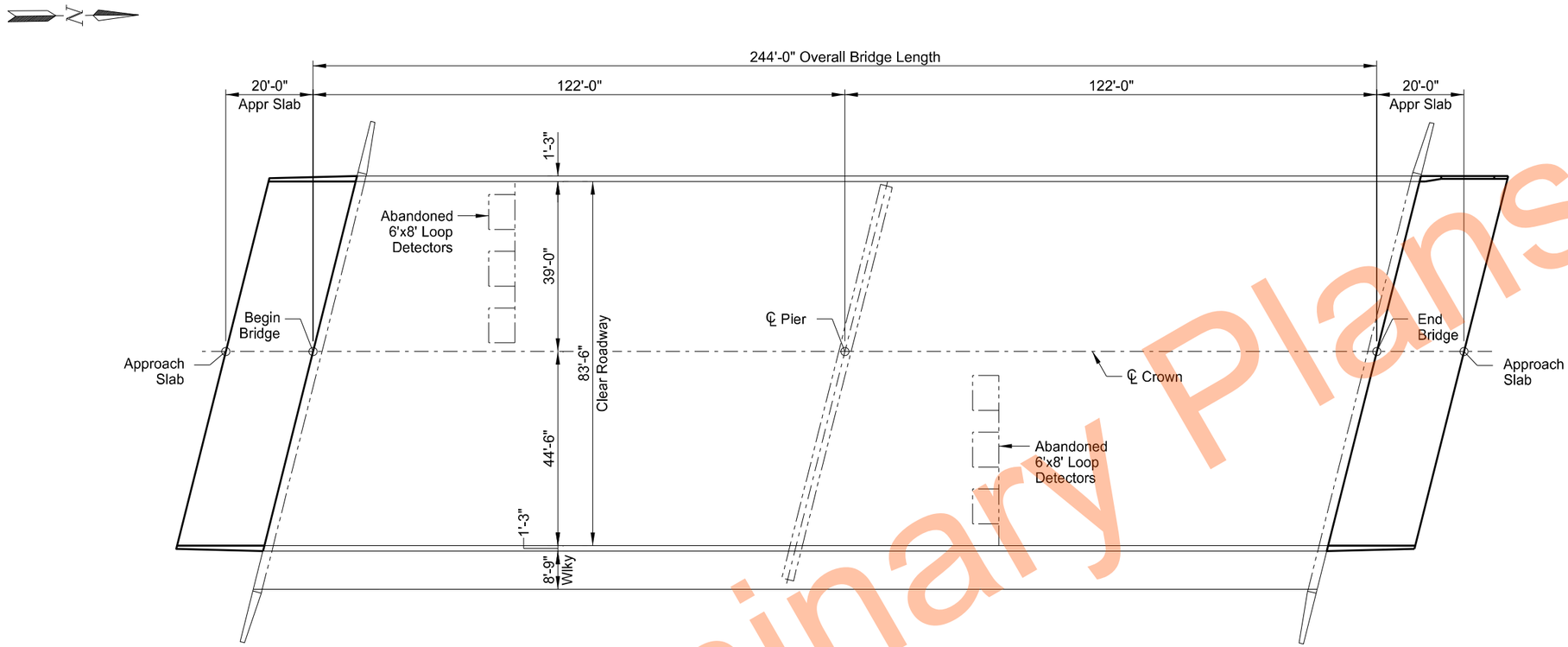
16th Street Interchange Rehabilitation

REGISTERED PROFESSIONAL ENGINEER
JASON L. HUNZE
4879
DATE 2025.04.15 08:57:36-05'00'
NORTH DAKOTA

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23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	1



PLAN

Preliminary Plans

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-9691
DATE: 04/16/25
NORTH DAKOTA

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0111	REMOVAL OF CONCRETE	L SUM	1
602	1133	CONCRETE BRIDGE APPROACH SLAB	SY	380.6
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	2,872
602	7000	SPECIAL SURFACE FINISH	SF	8,346
624	0126	PEDESTRIAN CANOPY	LF	240.5
650	0704	OVERLAY CONCRETE	CY	125
650	0707	DECK CONCRETE	CY	12
650	0710	CLASS 1-H REMOVAL	SY	2,264
650	0720	CLASS 1 REMOVAL	SY	2,155
650	0723	CLASS 3 REMOVAL	SY	70
650	0724	CLASS 4 REMOVAL	SY	20
930	7012	ROADWAY CANOPY	L SUM	1
930	9639	APPROACH SLAB LIP REPAIR	LF	177.4

SPECIAL PROVISIONS	
SP 337(24)	HYDRODEMO & DECK OVERLAY

16TH ST INTERCHANGE
MINOT, ND

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
04/16/25

Docusign Envelope ID: 5F0CF43E-8185-4344-B840-7C9AC77A6C66

NOTES

100 SCOPE OF WORK: Work at this site consists of removing the concrete median, placing a deck overlay, replacing approach lips, replacing approach slabs, crack sealing, applying penetrating water repellent treatment, applying special surface finish, and removing and replacing the pedestrian canopy.

202 REMOVAL OF CONCRETE: Include the costs for removing the existing 30’-0” long approach slabs at the bridge ends and the 4’-0” wide bridge median as detailed in the plans in the contract unit price for “Removal of Concrete.”

602 WATER WASHING EQUIPMENT: In addition to the water-washing equipment listed in Section 602.02 D, a cold water pressure washer that provides a minimum nozzle pressure of 3,000 psi may be used.

602 PENETRATING WATER REPELLENT TREATMENT: Apply penetrating water repellent solution to the top of the bridge deck overlay, bridge walkway, and approach slabs. Do not apply crack sealant, pavement marking, or allow traffic until the solution has completely penetrated and the entire driving surface is dry.

602 CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck overlay and approach slabs to determine the need for crack sealing. Mark and repair all visible cracks appearing on the top surface 0.02" or greater in width at its widest segment or as directed by the Engineer.

Immediately before applying the sealer, clean the cracks by removing all dust and debris with compressed air. Seal the cracks with a two-part epoxy in accordance with the manufacturer's recommendations. Chase crack with the sealant application to limits of crack, including those portions that are narrower than 0.02" wide. Use Paulco TE-2501 (Viking Paints, Inc.), Dural 50 LM (Euclid Chemical Co.), TK-9000 or TK-2110 (TK Products), or an approved equal epoxy sealer.

Include all labor, equipment, and materials associated with the bridge deck crack sealing in the bid item “Overlay Concrete,” and all costs to seal the approach slabs in the price bid for "Concrete Bridge Approach Slab."

602 SPECIAL SURFACE FINISH: Clean all exposed substructure surfaces, the outside edges of the deck, the underside of the deck overhangs, the exposed endwall areas outside of the exterior beams, and all bridge and approach slab barrier surfaces using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, laitance, and loose or flaking coatings. Fill cracks larger than 0.02” with Tex-Cote Skim Cote or an approved crack sealer compatible with Tex-Cote XL Bridge Cote.

Apply Tex-Cote XL 70 Bridge Cote with Silane to these surfaces with Tex-Cote “Antique Ivory T-108” standard decorative finish color and a medium textured finish.

650 OVERLAY CONCRETE: An additional ½” depth of overlay concrete was included in the overlay concrete quantities to account for the irregular surface profile from hydrodemolition.

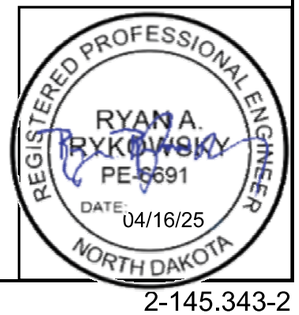
930 ROADWAY CANOPY: Construct a canopy above the traveled roadway under the existing structure to protect traffic from falling material from construction activities including deck overlay removals and the pedestrian canopy removal and replacement. The roadway canopy is an added safeguard and does not relieve the Contractor from any responsibility for the safety of the public.

Submit the canopy details, including materials that will be used, to the Engineer for review. Provide a canopy that does not reduce the vertical clearance above the traveled roadway. Extend the canopy a minimum distance of 4'-0" beyond the east outside edge of deck of the structure and a minimum distance of 5'-0" beyond the edge of the driving lanes beneath the structure.

Construct the roadway canopy before the deck overlay removals and prior to removing the existing pedestrian canopy. The roadway canopy must remain in place until the overlay removals are complete and the new pedestrian canopy is installed. Construct the roadway canopy between the hours of 10:00 p.m. and 6:00 a.m.

Include all costs for construction, maintenance, and removal of the canopy system for the existing structure and new structure in the contract unit price for “Roadway Canopy.”

Preliminary Plans

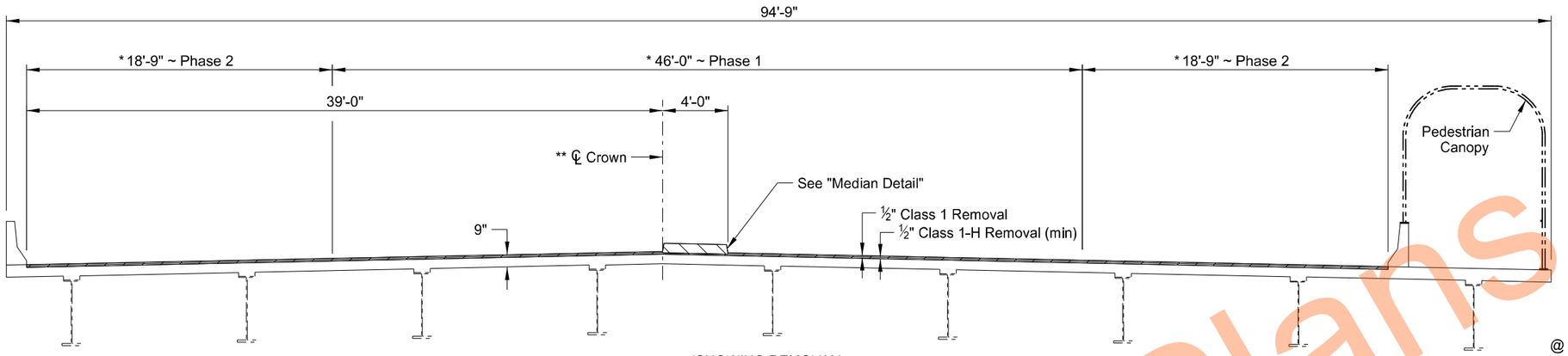


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* Match existing deck cross slope
** Match existing crown location

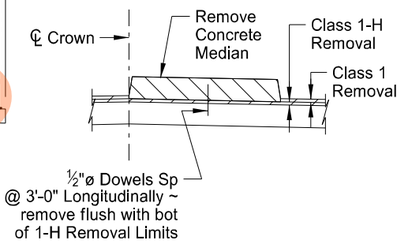
23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	3

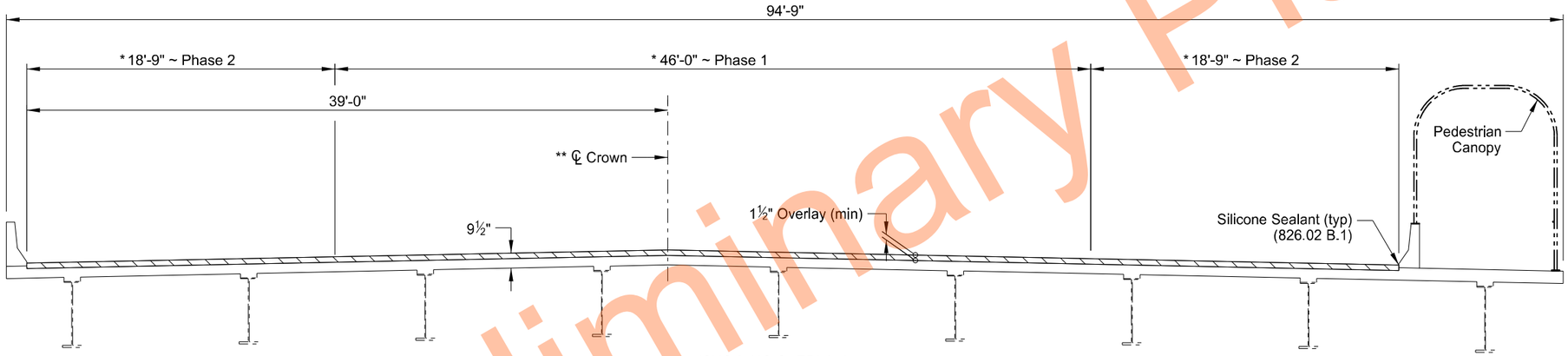


(SHOWING REMOVAL)

TYPICAL DECK SECTION

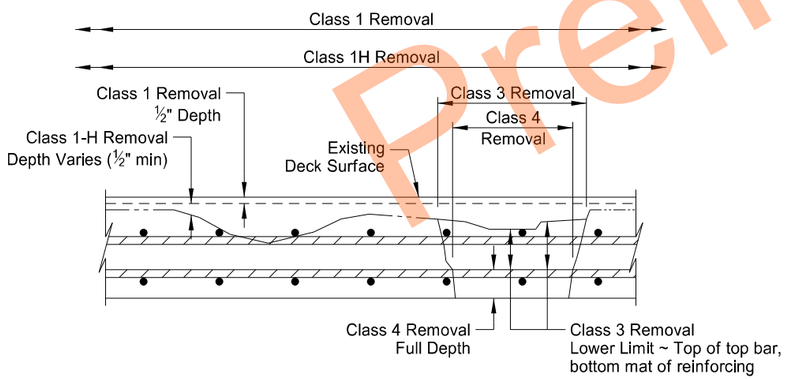


MEDIAN DETAIL



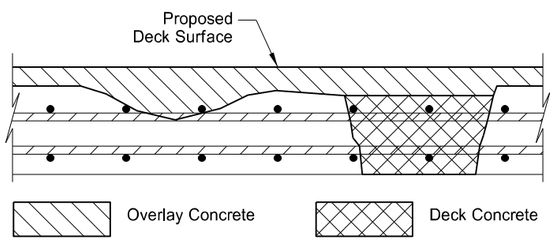
(SHOWING OVERLAY)

TYPICAL DECK SECTION



(SHOWING REMOVALS)

EXISTING BRIDGE DECK SECTION



(SHOWING DECK & OVERLAY CONCRETE)

PROPOSED BRIDGE DECK SECTION

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES	
OVERLAY CONCETE	125 CY
DECK CONCRETE	12 CY
CLASS 1-H REMOVAL	2,264 SY
CLASS 1 REMOVAL	2,155 SY
CLASS 3 REMOVAL	70 SY
CLASS 4 REMOVAL	20 SY

16TH ST INTERCHANGE
MINOT

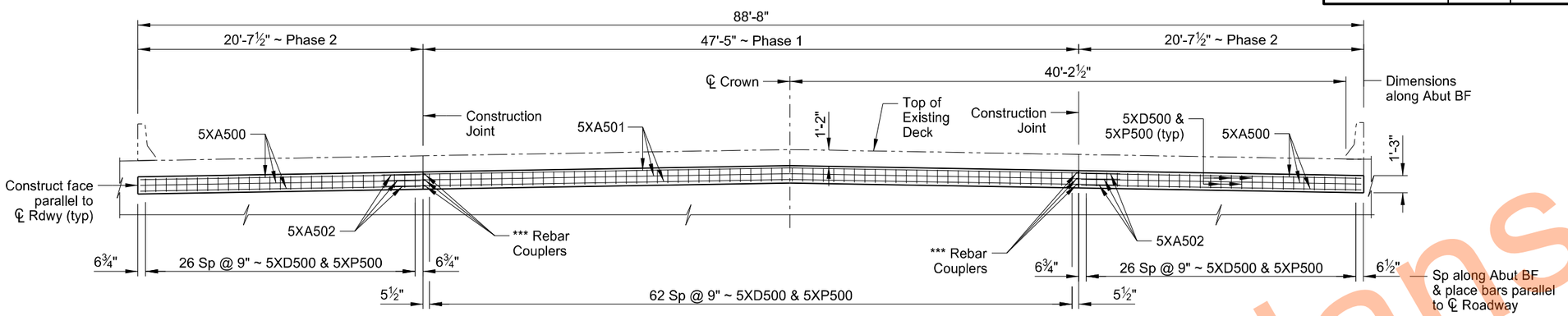
DECK OVERLAY DETAILS

Preliminary Plans

Docusign Envelope ID: 5F0CF43E-8185-4344-B840-7C9AC77A6C66

23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	4



(SHOWING ONLY NEW REINFORCING)

ELEVATION ALONG SKEW

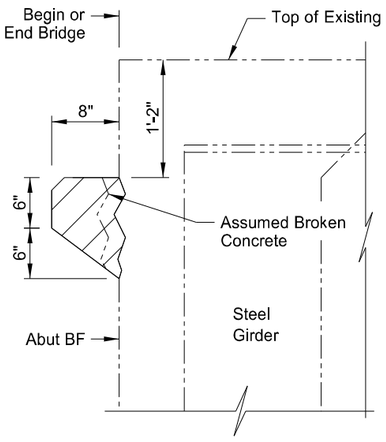
Hatched area indicates concrete to be removed.

NOMENCLATURE:

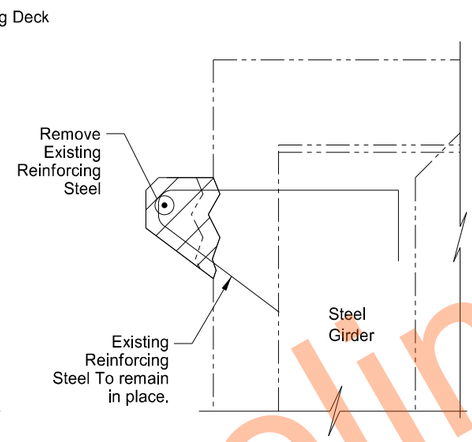
BF = Back Face

SKEW ANGLE = 14°5'42"			
BAR LIST - ONE APPROACH LIP			
SIZE	MARK	NO.	LENGTH
5	XA500	6	20'-4"
5	XA501	3	47'-5"
5	XA502	6	3'-0"
5	* XD500	117	1'-8"
5	* XP500	117	3'-0"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
864	3.2

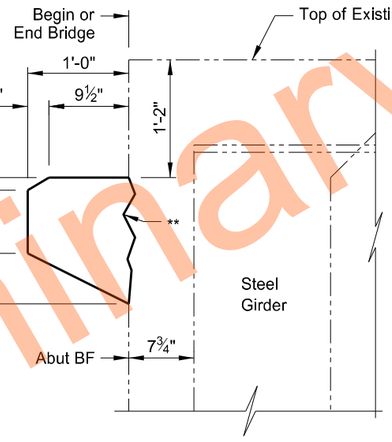


(SHOWING DIMENSIONS NORMAL TO ABUT BF)

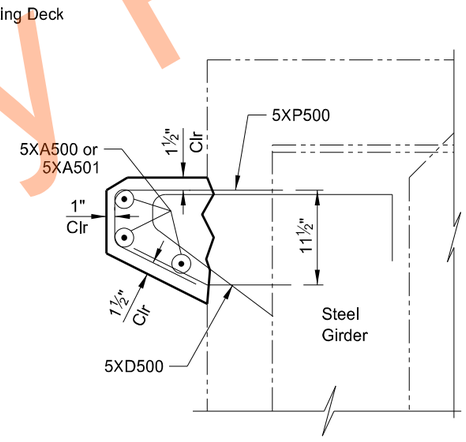


(SHOWING REINFORCING)

EXISTING APPROACH SLAB LIP

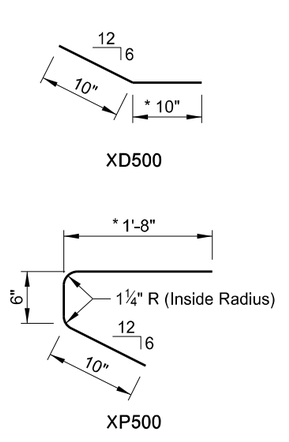


(SHOWING DIMENSIONS NORMAL TO ABUT BF)



(SHOWING REINFORCING)

NEW APPROACH SLAB LIP



(DIMENSIONS SHOWN ARE OUT TO OUT)

BENT BAR DETAILS

NOTES:

The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, labor and equipment required to build the approach slab lip in thebid item "Approach Slab Lip Repair". Use Class AAE-3 concrete in accordance with Section 602 and Grade 60 reinforcing steel that meets the requirements of Section 612.

The bar marks beginning with an "X" indicate an epoxy coated bar.

* Install according to manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage (16k min. ultimate pullout), and that meets the requirements of Section 806.02. Length may vary depending on manufacturer's recommendations for anchorage. Provide a minimum anchorage length of 9 inches.

** Bush Hammer Finish: Before any concrete is placed against the existing concrete, prepare surface with a bush hammer to produce a clean rough finish. After the bush hammer finish, prepare the conrete surface in accordance with Section 602.04 H "Construction Joints."

*** Use approved mechanical connectors for the couplers capable of developing 125% of the reinforcing steel specified yield strength.

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES	(ONE APPROACH LIP)
APPROACH SLAB LIP REPAIR	88.7 LF

16TH ST INTERCHANGE
MINOT

(SHOWING NORTH END, SOUTH END SIMILAR)

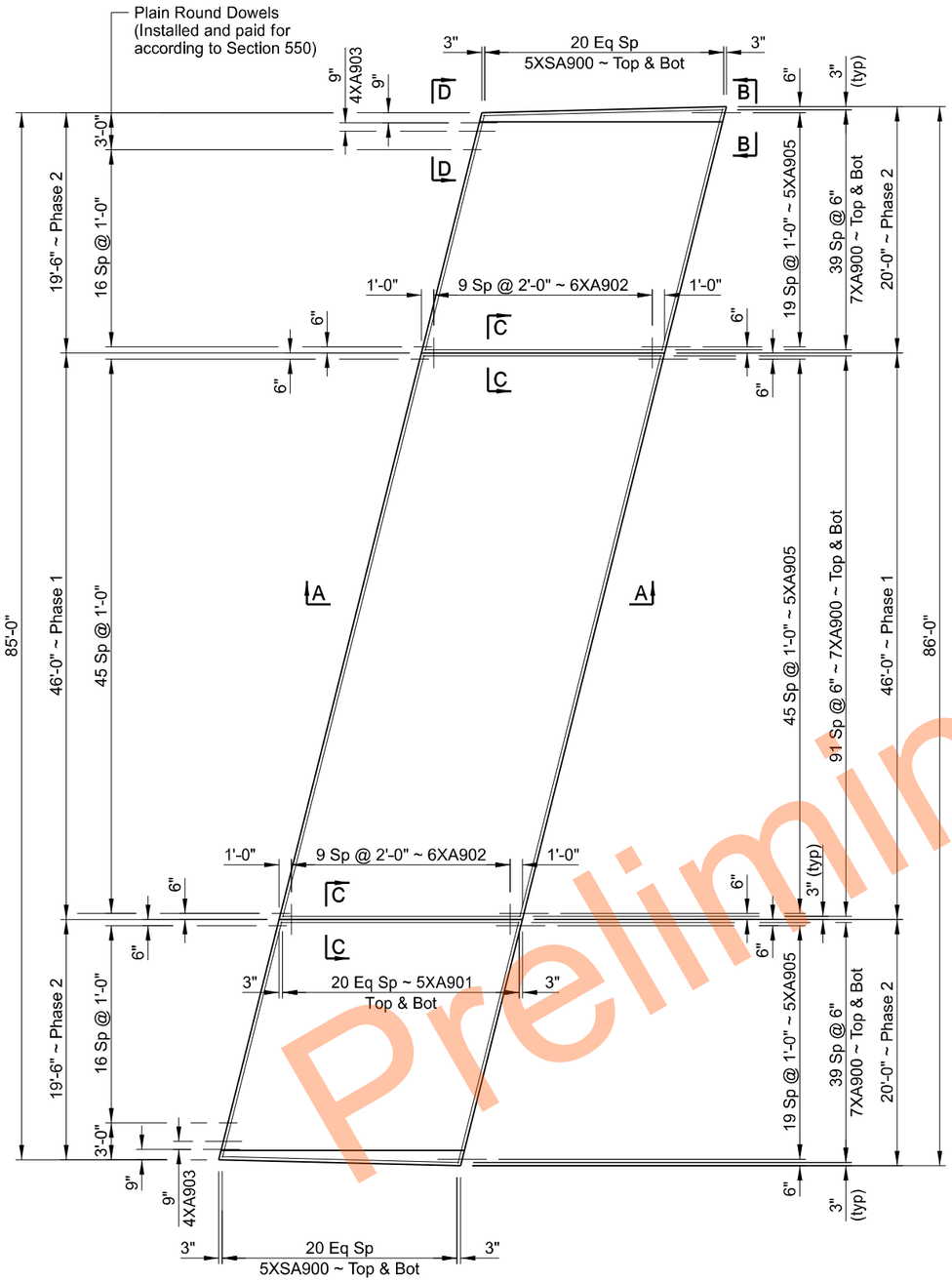
APPROACH SLAB LIP REPAIR DETAILS

Preliminary Plans

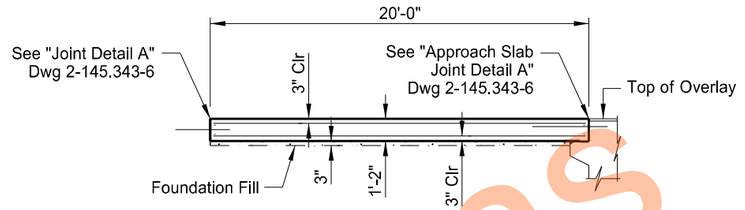
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23 U.S.C. 407
NDDOT Reserves All Objections

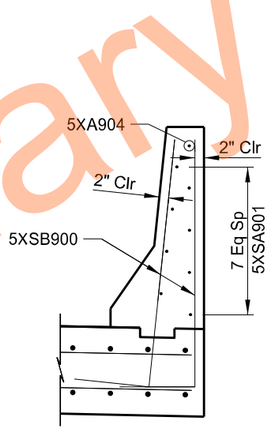
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	5



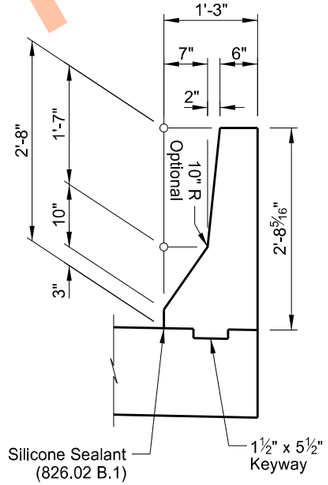
PLAN



A-A

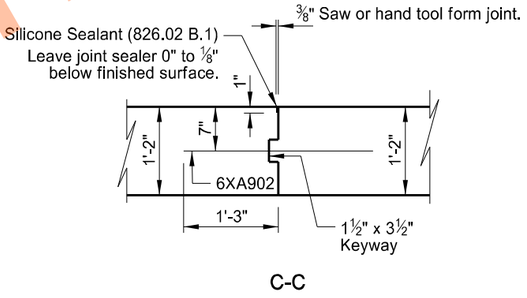


(SHOWING REINFORCING)

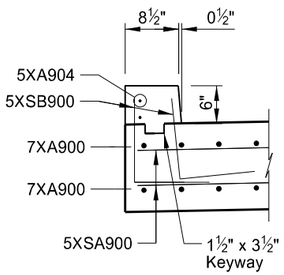


(SHOWING DIMENSIONS)

B-B



C-C



D-D

NOTE:

See Dwg 2-145.343-6 for
Appproach Slab East Elevation View

Preliminary Plans

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES
SEE DWG 2-145.343-6

16TH ST INTERCHANGE
MINOT

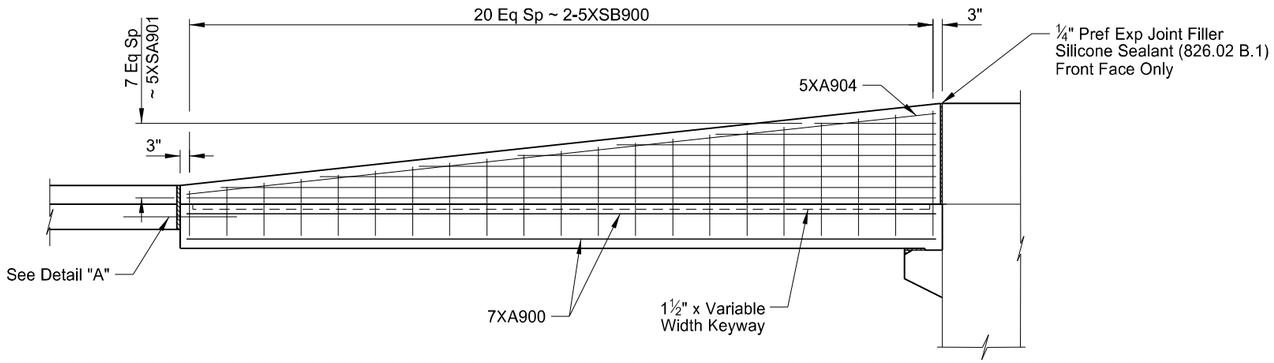
(SOUTH END)

APPROACH SLAB DETAILS

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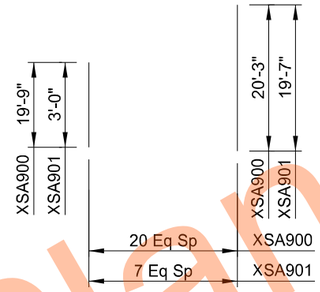
23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	6

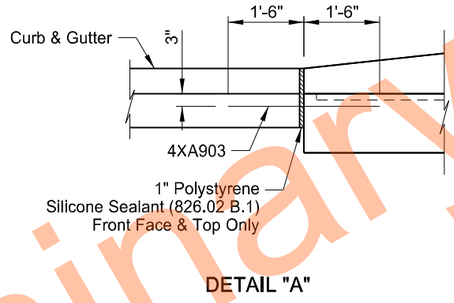


(WEST ELEVATION SIMILAR)

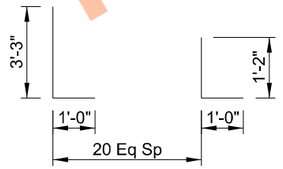
EAST ELEVATION



XSA900 & XSA901



DETAIL "A"



XSB900

BENT BAR DETAILS

SKEW ANGLE = 14°5'42"			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
7	XA900	344	19'-8"
5	XA901	42	47'-1"
6	XA902	20	2'-6"
4	XA903	4	3'-0"
5	XA904	2	19'-8"
5	*XA905	86	4'-0"
5	XSA900	4	420'-0"
5	XSA901	2	90'-4"
5	XSB900	4	67'-4½"

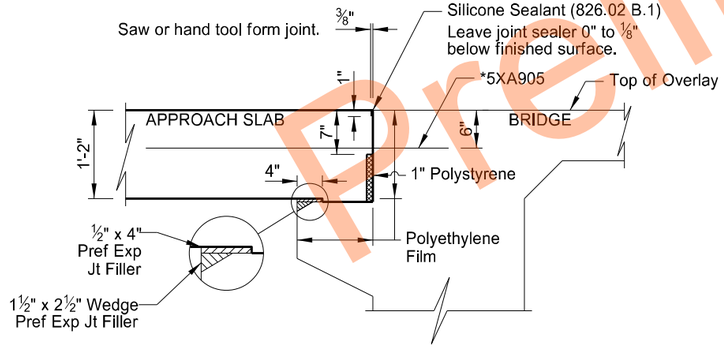
ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
18,596	76.0

NOTES:

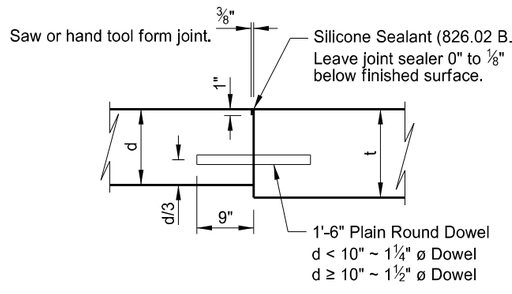
The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, polyethylene film, preformed joint filler, polystyrene, silicone sealant, foundation fill, and labor required to build the approach slabs and barriers in the pay item "Concrete Bridge Approach Slab." Use Class AAE-3 concrete and Grade 60 reinforcing steel. Provide reinforcing steel that meets the requirements of Section 612. Use polyethylene film that meets the requirements of ASTM C171.

The bar marks beginning with an "X" indicate an epoxy coated bar.

* Install 5XA905 bars according to manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage (16k min. ultimate pullout), and that meets the requirements of Section 806.02. Length may vary depending on manufacturer's recommendations for anchorage. Length based on 1 foot minimum anchorage length.



APPROACH SLAB JOINT DETAIL A



d = Pavement Thickness
t = Approach Slab Thickness

JOINT DETAIL A

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES	(ONE SLAB)
CONCRETE BRIDGE APPROACH SLAB	190.0 SY

16TH ST INTERCHANGE
MINOT

(SOUTH END)

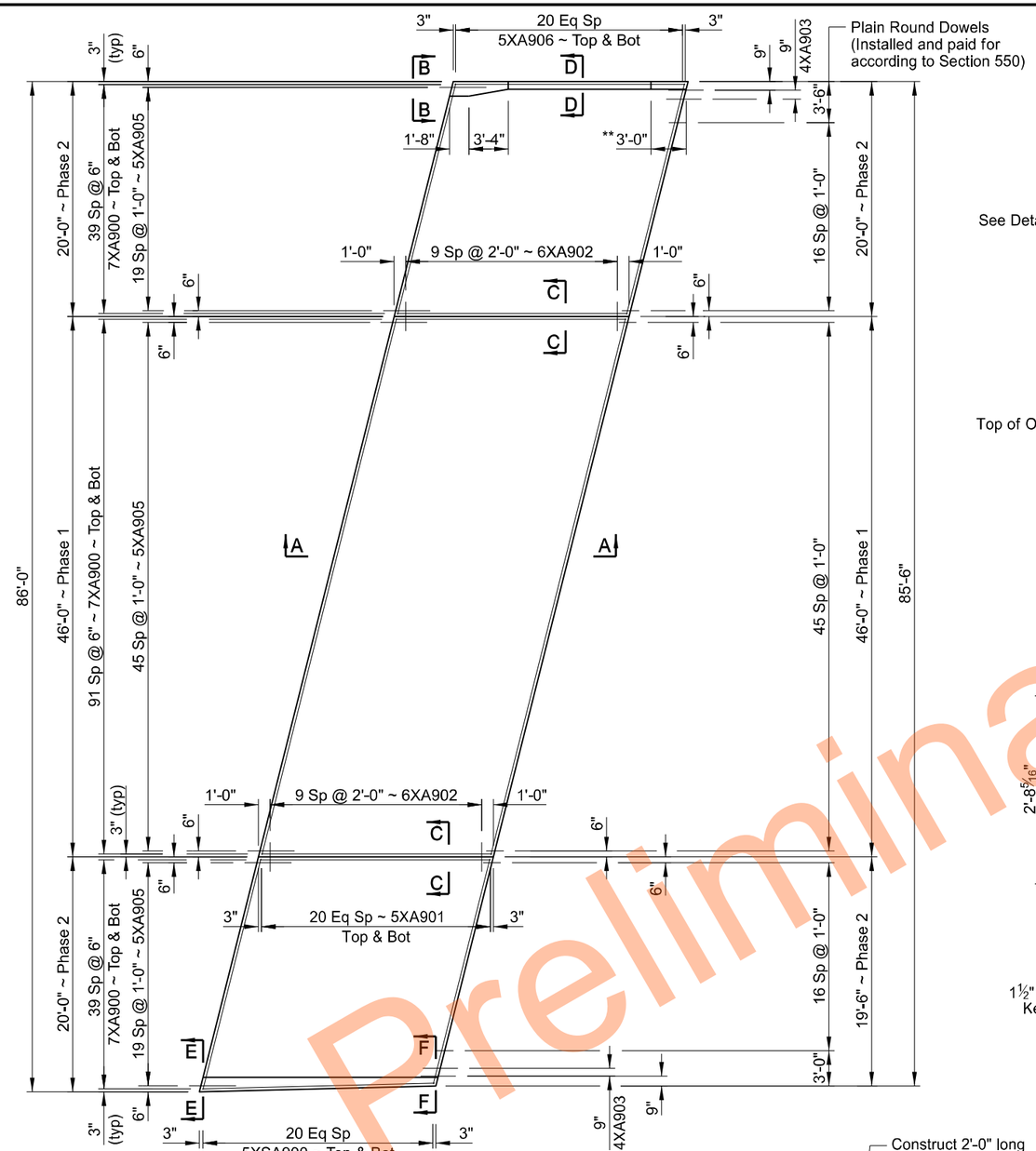
APPROACH SLAB DETAILS

Preliminary Plans

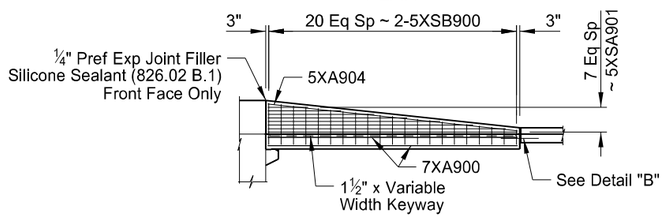
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23 U.S.C. 407
NDDOT Reserves All Objections

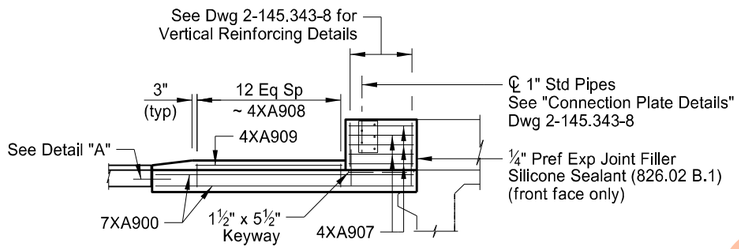
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	7



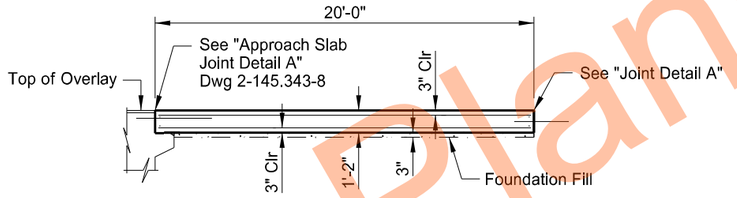
PLAN



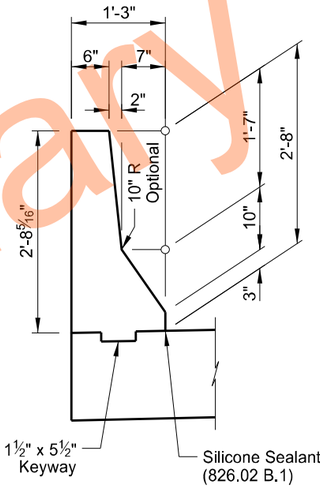
EAST ELEVATION



WEST ELEVATION

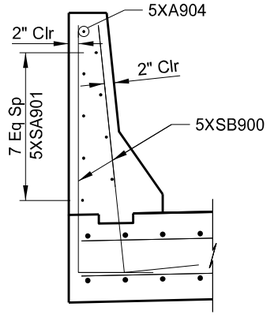


A-A



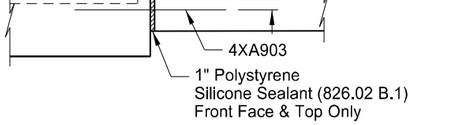
(SHOWING DIMENSIONS)

B-B & E-E

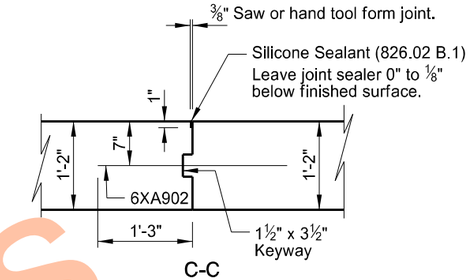


(SHOWING REINFORCING)

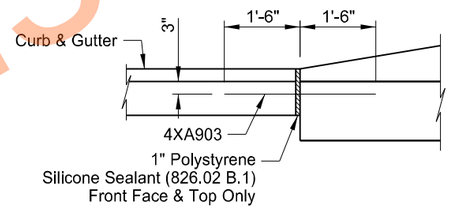
E-E



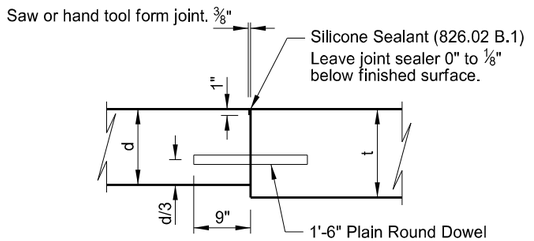
DETAIL "B"



C-C

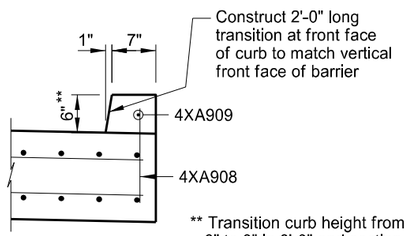


DETAIL "A"



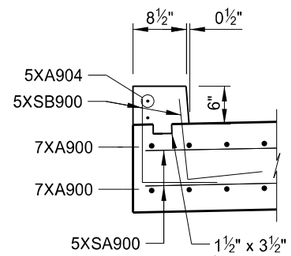
d = Pavement Thickness
t = Approach Slab Thickness

JOINT DETAIL A



** Transition curb height from 6" to 3" in 3'-0" end section to match roadway curb

D-D



F-F

QUANTITIES
SEE DWG 2-145.343-8

16TH ST INTERCHANGE
MINOT

(NORTH END)

APPROACH SLAB DETAILS

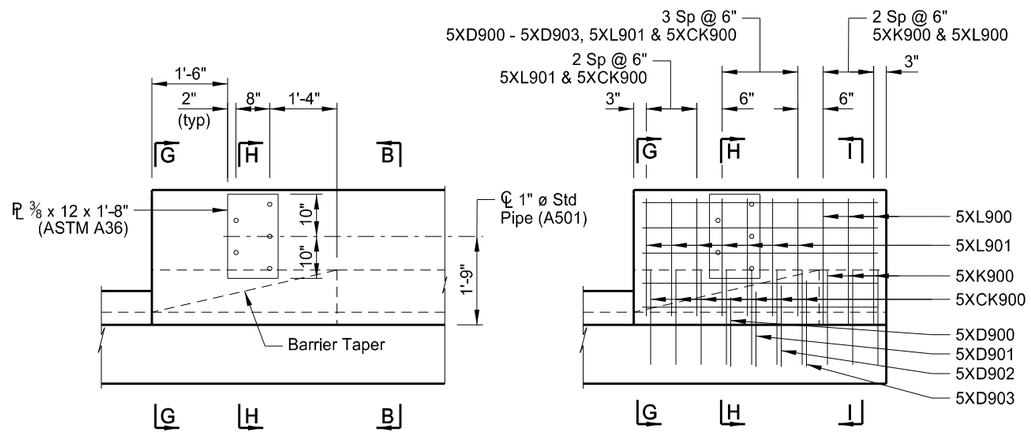
REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

Preliminary Plans

Docusign Envelope ID: 5F0CF43E-8185-4344-B840-7C9AC77A6C66

23 U.S.C. 407
NDDOT Reserves All Objections

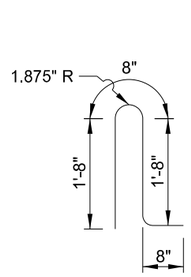
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	8



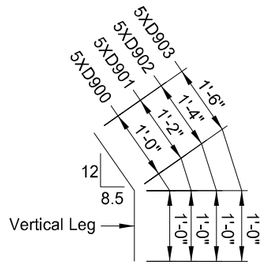
SHOWING DIMENSIONS — SHOWING REINFORCING

(SHOWING BACK FACE & JERSEY BARRIER TRANSITION)

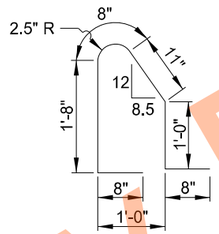
CONNECTION PLATE DETAILS



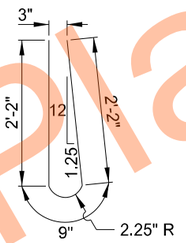
XCK900



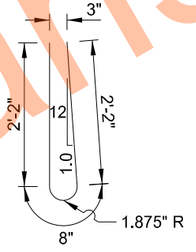
XD900 - XD903



XK900



XL900

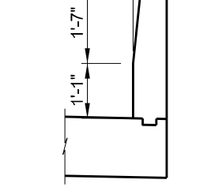


XL901

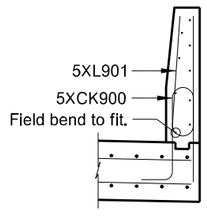
SKEW ANGLE = 14°5'42"			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
7	XA900	344	19'-8"
5	XA901	42	47'-1"
6	XA902	20	2'-6"
4	XA903	4	3'-0"
5	XA904	1	19'-8"
5	*XA905	86	4'-0"
5	XA906	42	20'-3"
4	XA907	9	4'-8"
4	XA908	13	1'-3"
4	XA909	1	11'-8"
5	XCK900	7	4'-8"
5	XD900	1	2'-0"
5	XD901	1	2'-2"
5	XD902	1	2'-4"
5	XD903	1	2'-6"
5	XK900	3	5'-7"
5	XL900	3	5'-1"
5	XL901	7	5'-0"
5	XSA900	2	420'-0"
5	XSA901	1	90'-4"
5	XSB900	2	67'-4½"

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (CY)
18,512	76.0

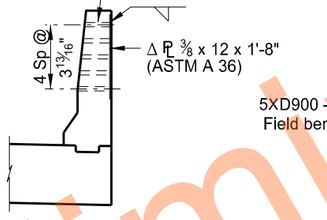


SHOWING DIMENSIONS

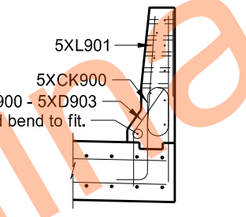


SHOWING REINFORCING

G-G

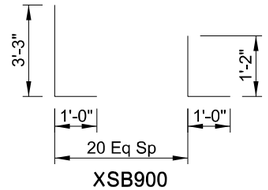


SHOWING CONNECTION PLATE

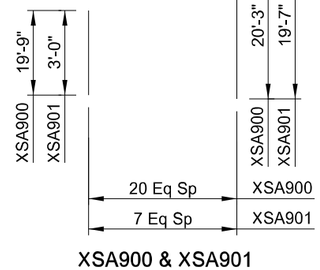


SHOWING REINFORCING

H-H

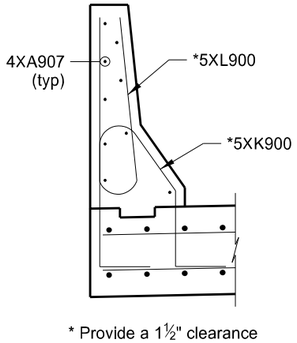


XSB900



XSA900 & XSA901

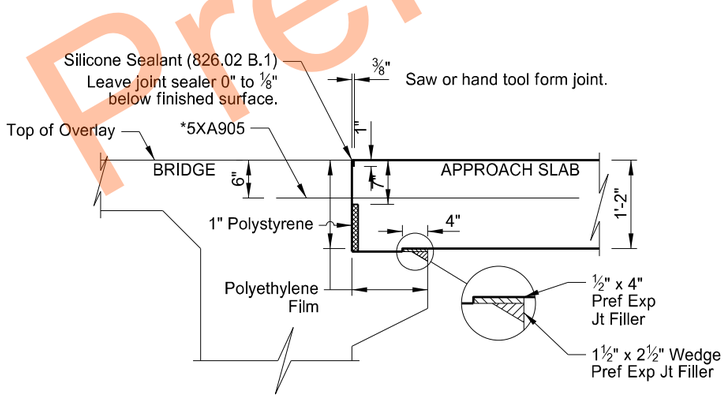
BENT BAR DETAILS



* Provide a 1½" clearance to the barrier reinforcing.

SHOWING REINFORCING

I-I



APPROACH SLAB JOINT DETAIL A

NOTES:

The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, polyethylene film, preformed joint filler, polystyrene, silicone sealant, foundation fill, and labor required to build the approach slabs and barriers in the pay item "Concrete Bridge Approach Slab." Use Class AAE-3 concrete and Grade 60 reinforcing steel. Provide reinforcing steel that meets the requirements of Section 612. Use polyethylene film that meets the requirements of ASTM C171.

The bar marks beginning with an "X" indicate an epoxy coated bar.

See Dwg 2-145.343-7 for Section B-B.

* Install 5XA905 bars according to manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage (16k min. ultimate pullout), and that meets the requirements of Section 806.02. Length may vary depending on manufacturer's recommendations for anchorage. Length based on 1 foot minimum anchorage length.

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES	(ONE SLAB)
CONCRETE BRIDGE APPROACH SLAB	190.6 SY

16TH ST INTERCHANGE
MINOT

(NORTH END)

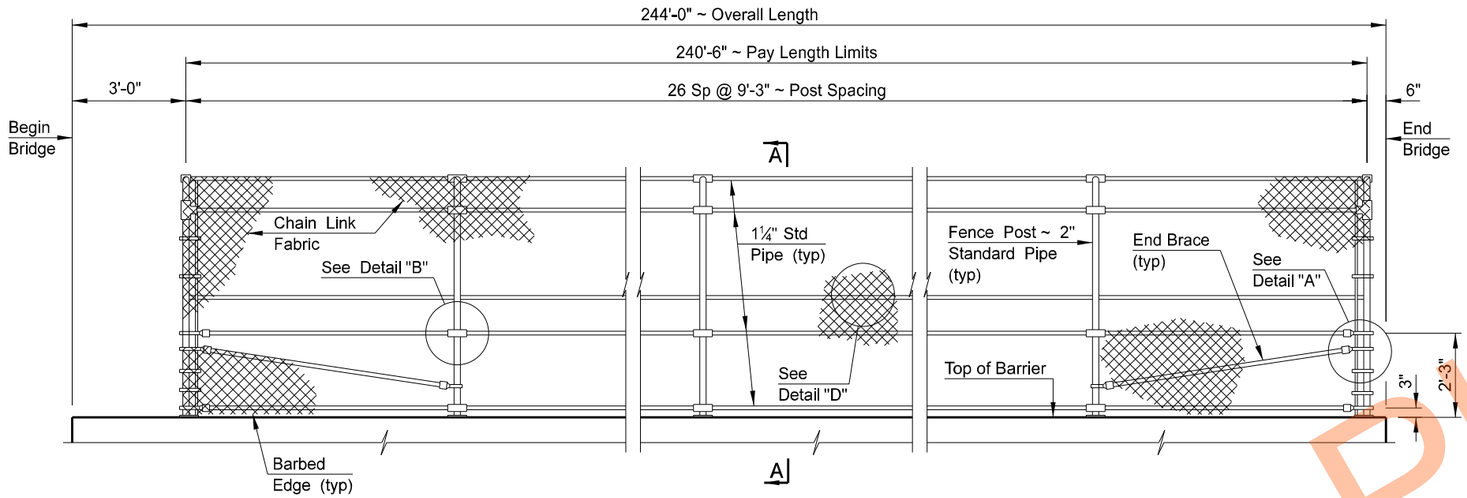
APPROACH SLAB DETAILS

Preliminary Plans

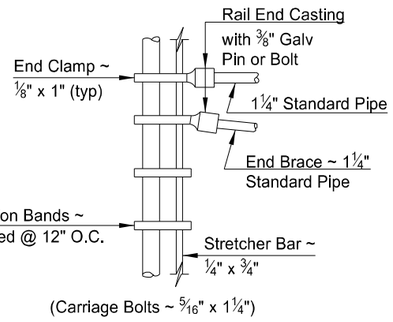
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23 U.S.C. 407
NDDOT Reserves All Objections

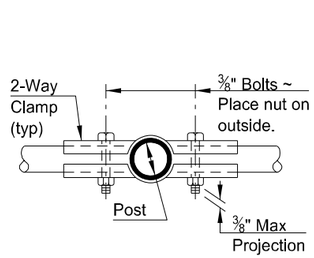
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-4-989(132)	170	9



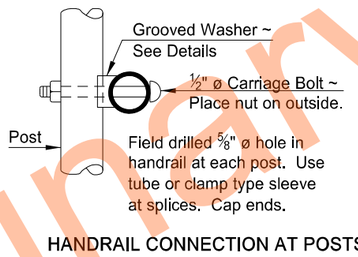
(LOOKING EAST)
CANOPY ELEVATION



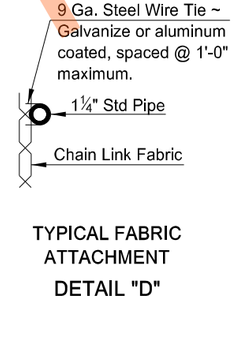
DETAIL "A"



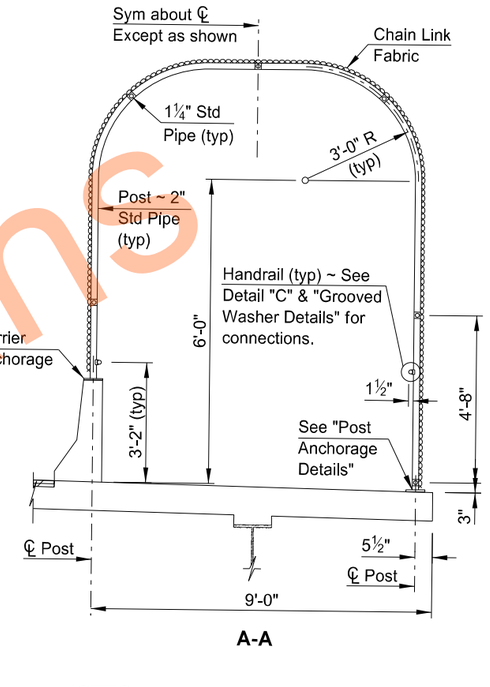
DETAIL "B"



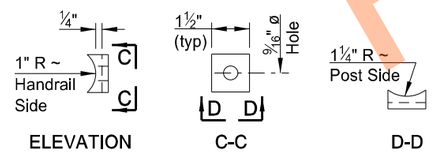
HANDRAIL CONNECTION AT POSTS
DETAIL "C"



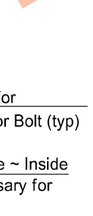
TYPICAL FABRIC ATTACHMENT
DETAIL "D"



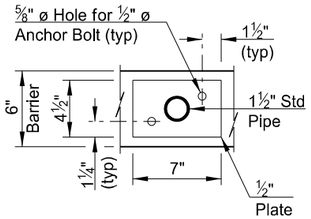
A-A



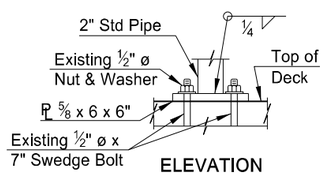
ELEVATION C-C D-D
GROOVED WASHER DETAILS



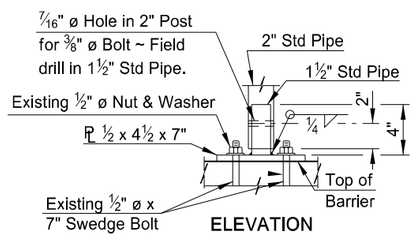
BASE PLATE PLAN



BASE PLATE PLAN



ELEVATION
POST ANCHORAGE DETAILS



ELEVATION
BARRIER POST ANCHORAGE DETAILS

NOTES:

Supply 100% bonded black vinyl coated fence fabric, pipe, posts, fittings, ties and hardware.

Install posts at the same location as the existing posts using the existing anchor bolts. Field verify all dimensions and incorporate them into the shop drawings.

Include the cost to remove and replace the existing pedestrian canopy in the price bid for "Pedestrian Canopy".

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 04/16/25
NORTH DAKOTA

QUANTITIES	
PEDESTRIAN CANOPY	240.5 LF

16TH ST INTERCHANGE
MINOT

PEDESTRIAN CANOPY DETAILS

Preliminary Plans

Docusign Envelope ID: 60E6D5C0-46BC-49CB-8E0F-CBA6AC9DB3C4

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
Ea	each
Esmt	easement
E	East
EB	Eastbound
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
EVSE	electric vehicle supply equipment
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

Preliminary Plans

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
08-16-22	General Revisions
04-14-25	General Revisions

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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
HTCG	high tension cable guardrail
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
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	Northeast
NW	Northwest
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
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

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NDDOT ABBREVIATIONS

D-101-3

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	Southeast
SW	Southwest
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
VSFS	vehicle speed feedback sign
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

Preliminary Plans

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NDDOT ABBREVIATIONS

D-101-4

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
CC	closing corner
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
MC	meander corner
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
SC	standard corner
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
WC	witness corner
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

Preliminary Plans

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3
4-14-25	General Revisions

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications
ACCENT	Accent Communications
AGASSIZ WU	Agassiz Water Users District
AGC	Associated General Contractors of America
ALL PL	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users District
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 WRD	Burleigh County Water Resource District
CABLE ONE	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporated
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users District
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 COMM	Consolidated Communications
CONS TELCOM	Consolidated Telcom
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 WRD	Dickey County Water Resource District
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
E CENT REG WD	East Central Water District
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
EQUINOR	Equinor Pipeline
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
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
LWR YELL R ELEC	Lower Yellowstone Rural Electric
LUMEN	Lumen Technologies Incorporated
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 District
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 Incorporated
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
MLGC	Moore & Liberty - Griggs County
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N PRAIR REG WD	North Prairie Regional Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NE REG WD	Northeast Regional Water District
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
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
PAAP	Plains All American Pipeline
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T REG WD	R & T Water District
RED RIV COMM	Red River 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
SE W U	Southeast 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 RWD	Stutsman Rural Water District
SW PL PRJ	Southwest Pipeline Project
SWWA	Southwest Water Authority
SUNOCO	Sunoco LP
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 WRD	Traill County Water Resource District
UNTD TEL	United Telephone
UPPR SOUR WD	Upper Souris Water District
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
WAWSA	Western Area Water Supply Authority
WEB	W. E. B. Water Development Association
WILLI WRD	Williams County Water Resource District
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

Preliminary Plans

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
08-16-22	General Revisions
04-14-25	General Revisions

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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

Preliminary Plans

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

Preliminary Plans

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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

Preliminary Plans

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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)

Preliminary Plans

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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12-18-20	General Revisions

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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)

Preliminary Plans

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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

Preliminary Plans

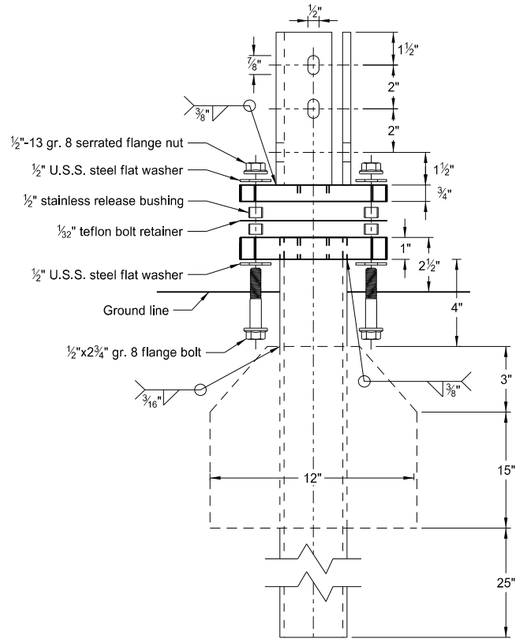
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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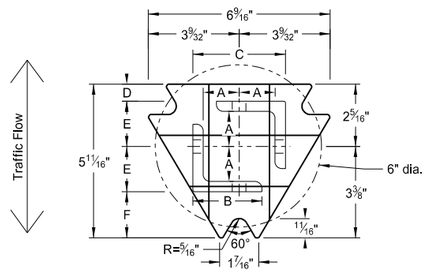
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

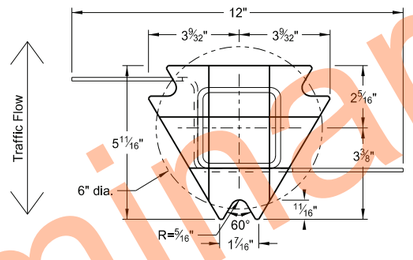


Multi-Directional
Slip Base Assembly

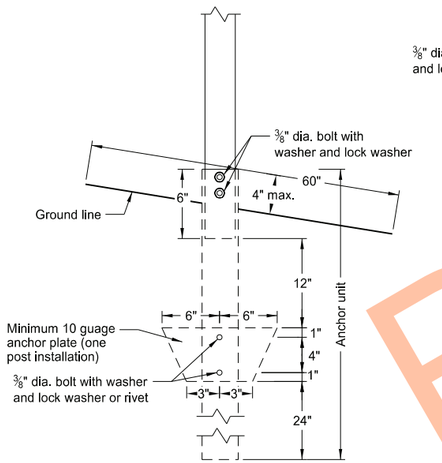
Perforated Tube



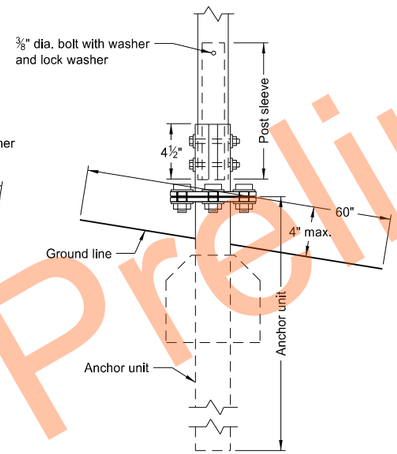
Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



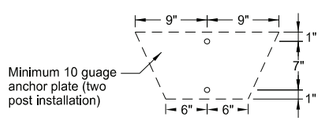
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

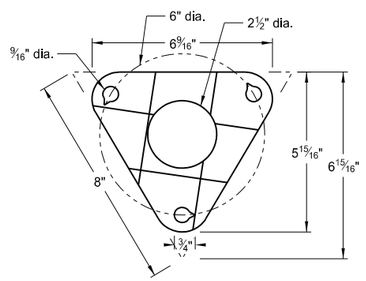


Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly





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

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	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube

Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.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
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	0.785

Top Post Receiver Data Table

Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2½"	3 1/32"	25/32"	1 33/64"	1 7/8"
2½"x10 ga.	1 9/32"	2½"	3 5/16"	⅝"	1 21/32"	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 2 3/16"x10 ga. into 2½"x10 ga.

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
8-01-24	Electronic Stamp/Signature

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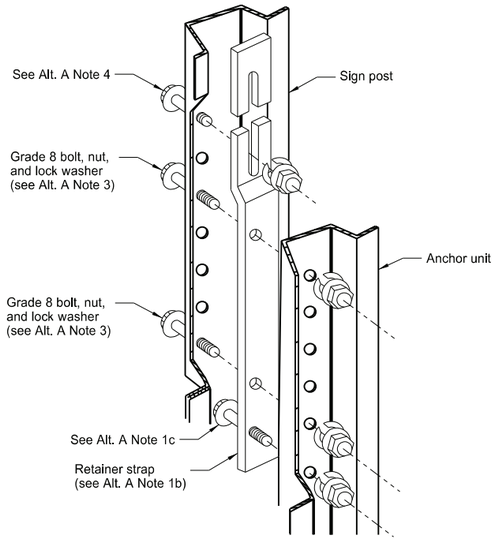
Preliminary Plans

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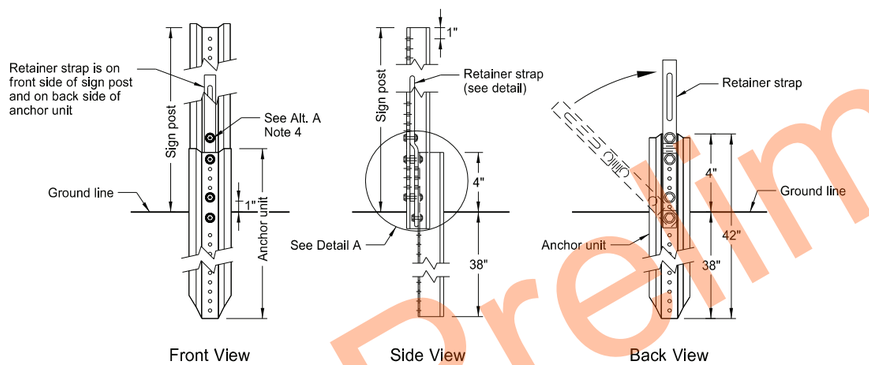
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



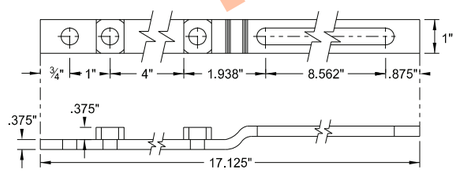
Detail A



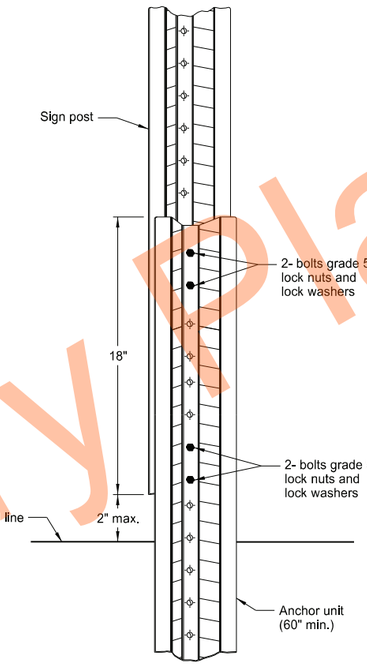
Front View | Side View | Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.

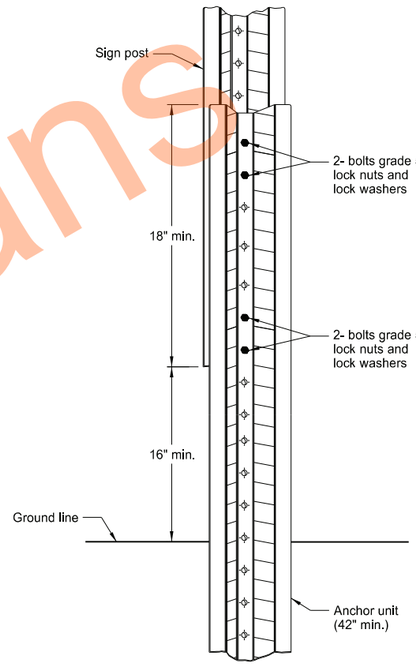


Retainer Strap Detail



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'.

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.

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9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

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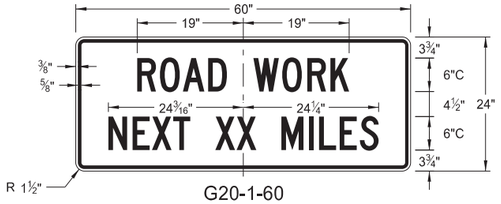
08/01/24

Preliminary Plans

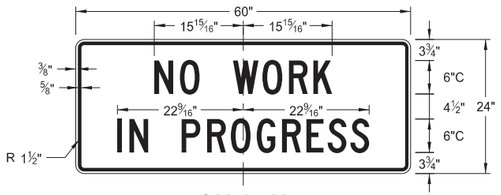
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CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

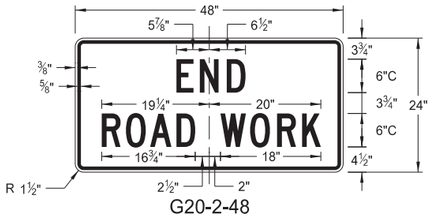
D-704-9



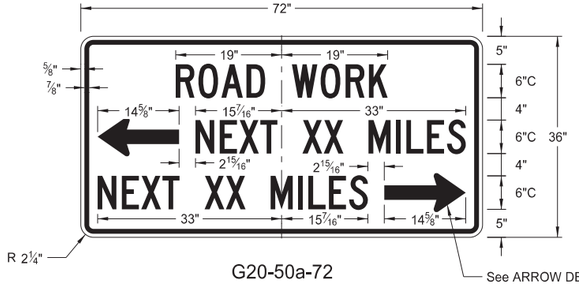
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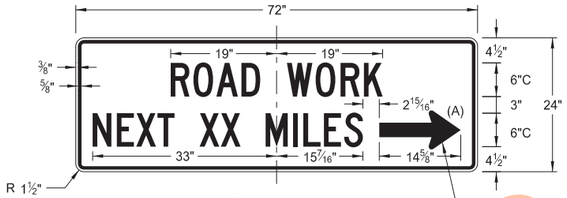
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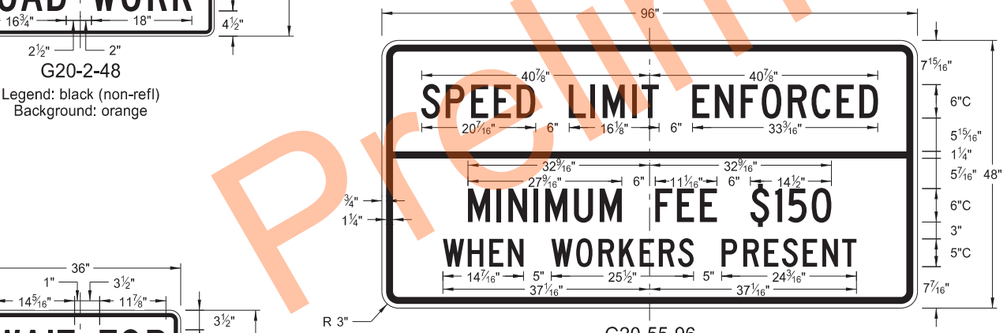
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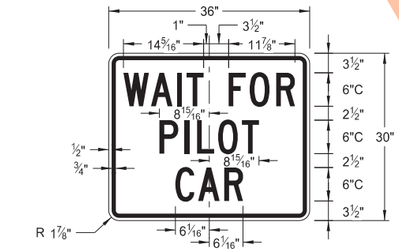
G20-50a-72
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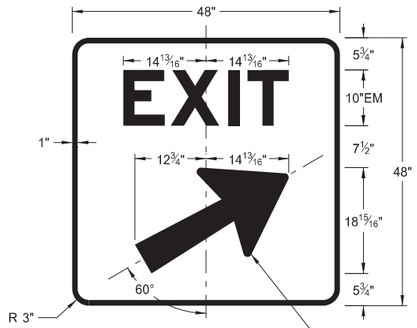
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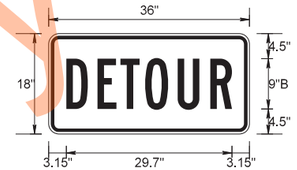
G20-55-96
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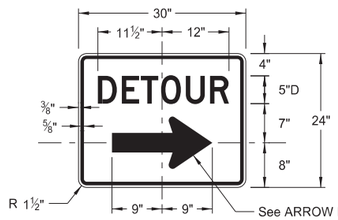
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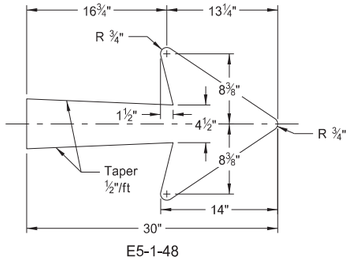
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



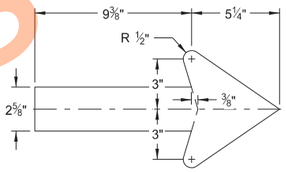
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Background: orange



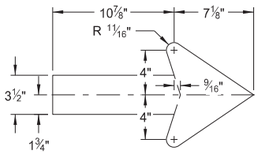
M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange



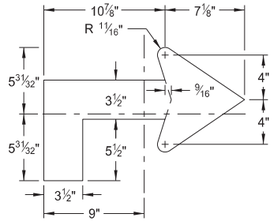
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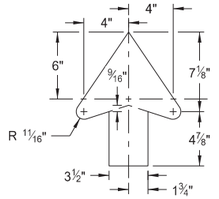
G20-50a-72
G20-52a-72



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



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.

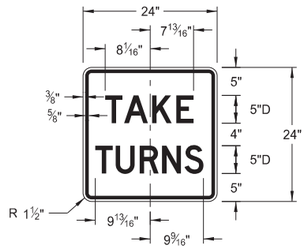
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

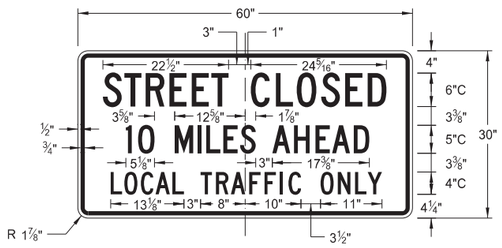
Preliminary Plans

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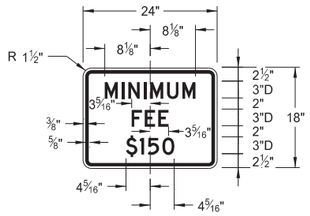
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



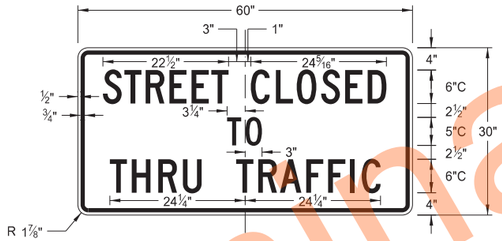
R1-50P-24
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Background: white



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

Preliminary Plans

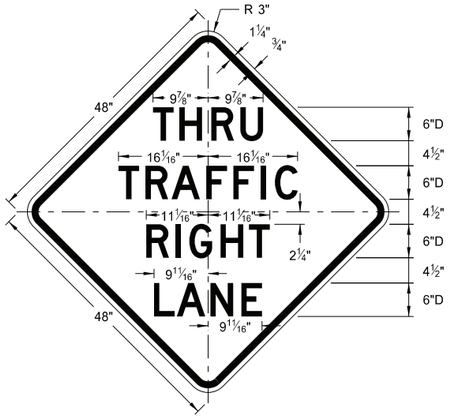
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



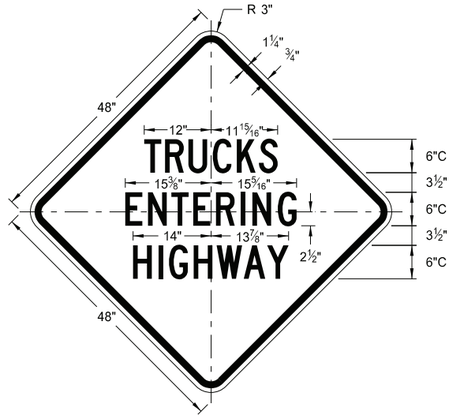
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

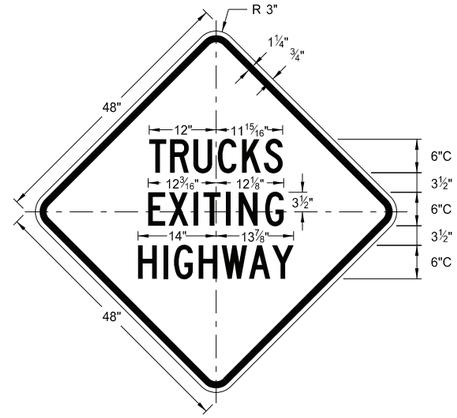
D-704-11



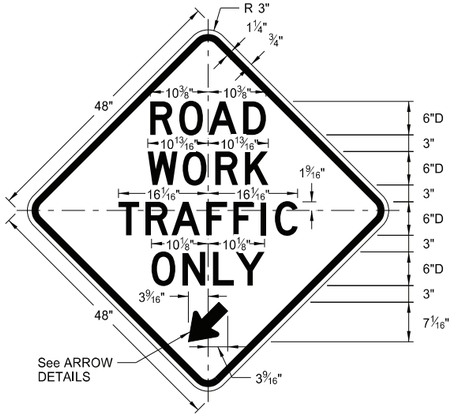
W5-8-48
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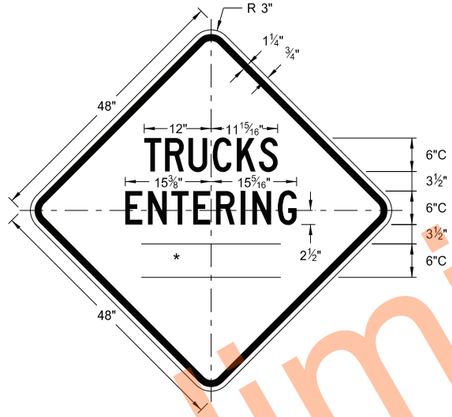
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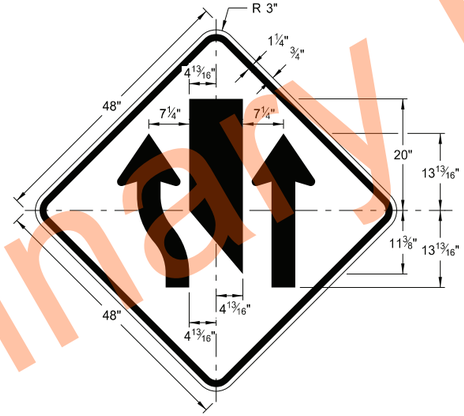
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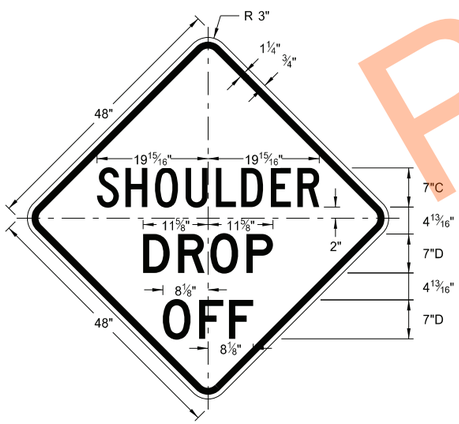
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Legend; black (non-refl)
Background: orange



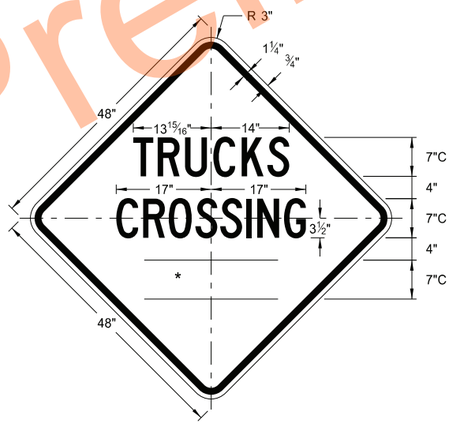
W8-54-48
Legend; black (non-refl)
Background: orange



W9-3a-48
Legend; black (non-refl)
Background: orange



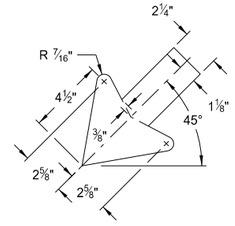
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Background: orange



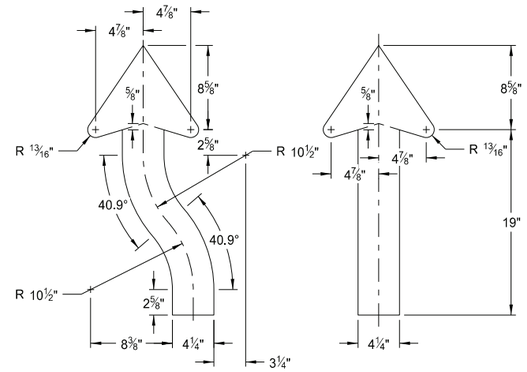
W8-55-48
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Background: orange

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

* DISTANCE MESSAGES



W5-9-48



W9-3a-48

ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

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

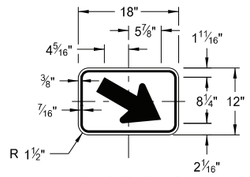
08/01/24

Preliminary Plans

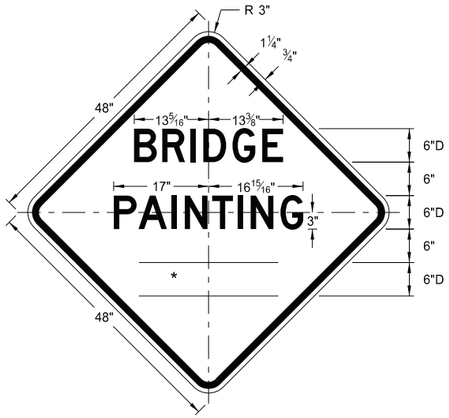
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

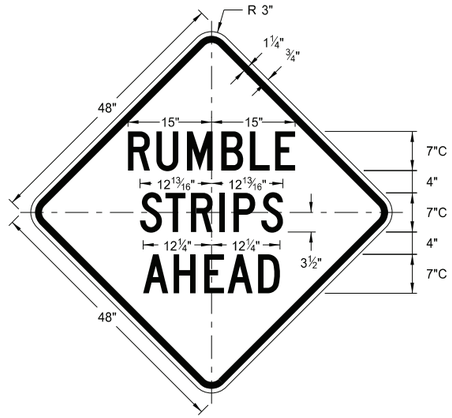
D-704-11A



W16-7aP-18
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Background: orange



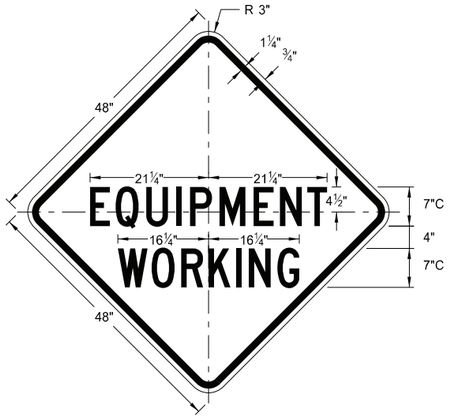
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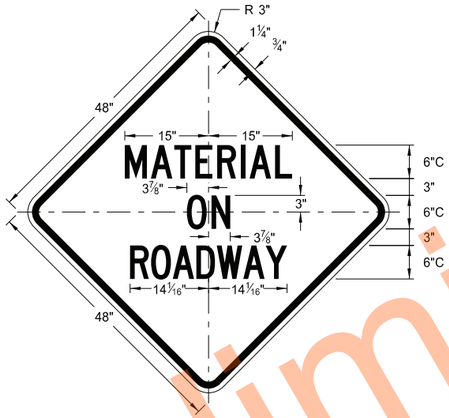
W21-53-48
Legend: black (non-refl)
Background: orange

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

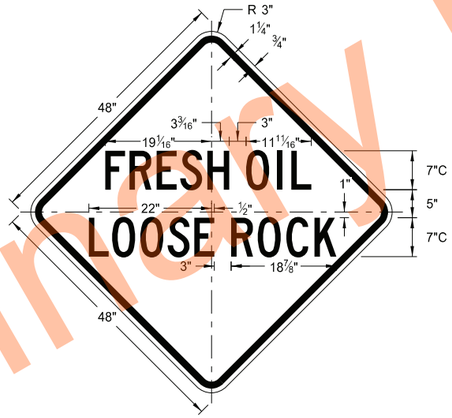
* DISTANCE MESSAGES



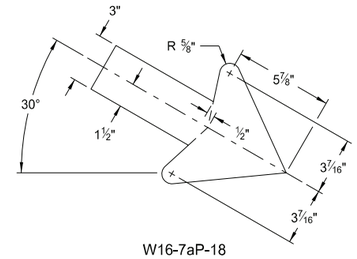
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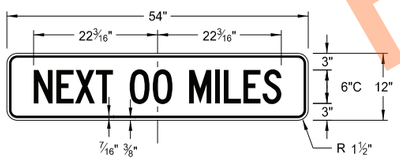
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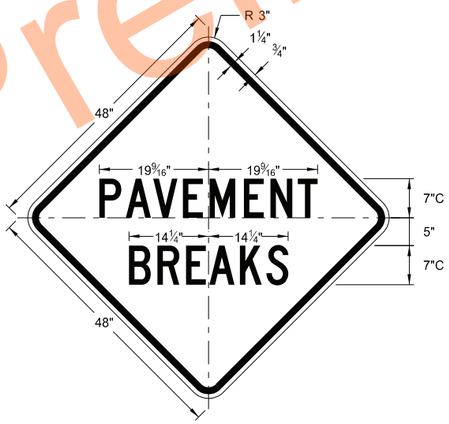
W22-8-48
Legend: black (non-refl)
Background: orange



W16-7aP-18



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



W21-52-48
Legend: black (non-refl)
Background: orange

Preliminary Plans

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.

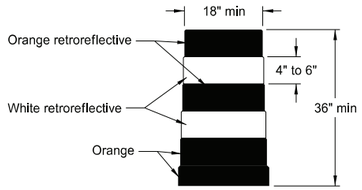
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

DocuSign Envelope ID: B6D1C72A-6E5E-4E5C-A02F-4D3D1C582775

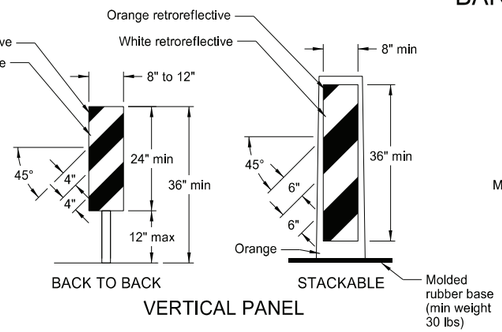
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



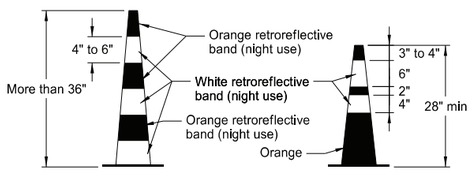
DELINEATOR DRUM

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.



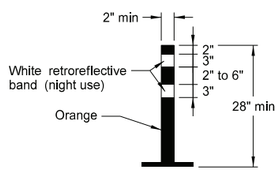
VERTICAL PANEL

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.



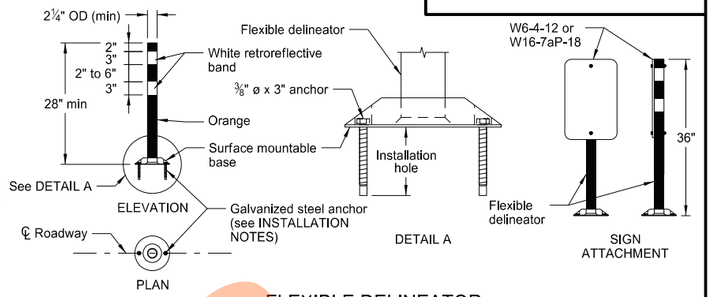
TRAFFIC CONE

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

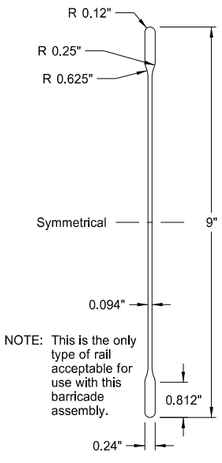
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

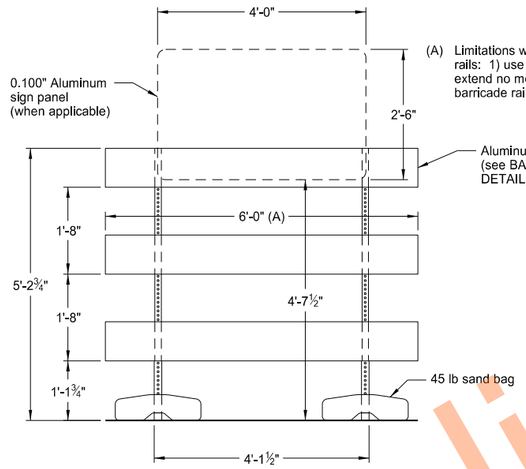
INSTALLATION NOTES:

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.



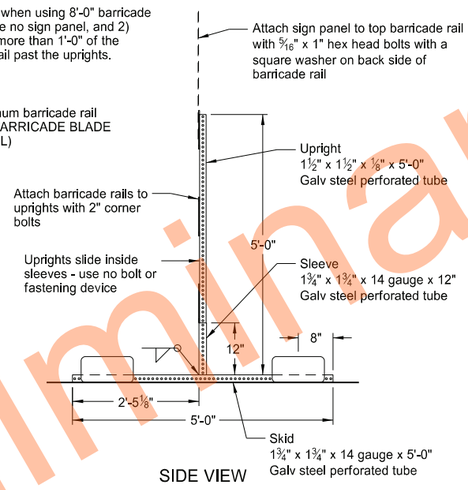
NOTE: This is the only type of rail acceptable for use with this barricade assembly.

BARRICADE BLADE DETAIL



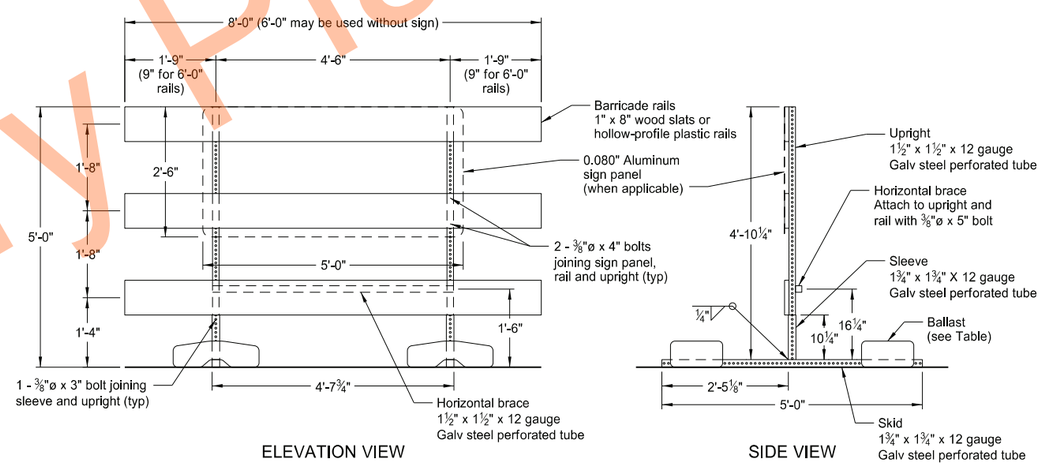
(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.

ELEVATION VIEW



SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

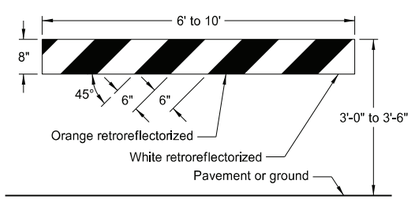


ELEVATION VIEW

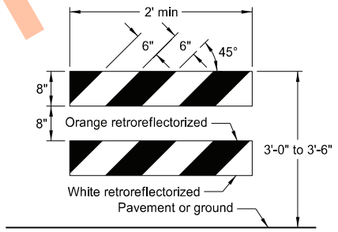
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

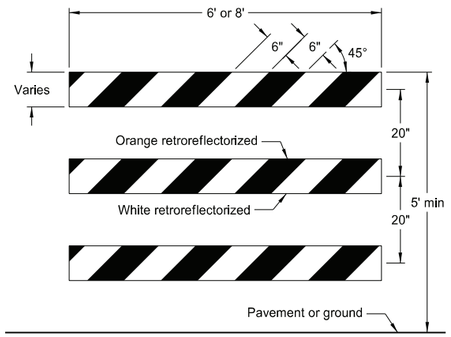
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the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



TYPE I BARRICADE

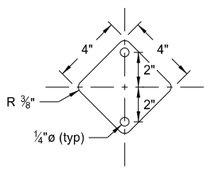


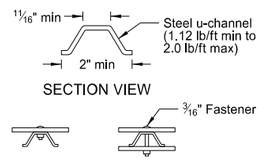
TYPE II BARRICADE

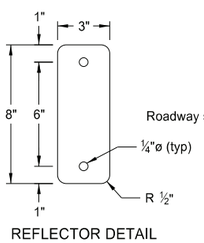


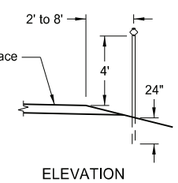
TYPE III BARRICADE

BARRICADE RAIL DETAILS









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	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature

KIRK J. HOFF
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PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

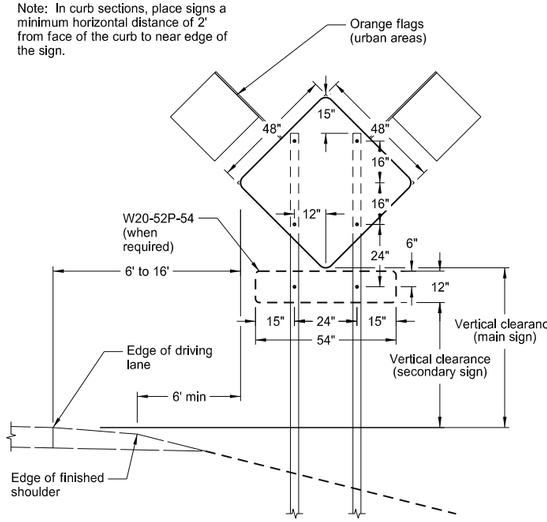
Preliminary Plans

DocuSign Envelope ID: B6D1C72A-6E5E-4E5C-A02F-4D3D1C582775

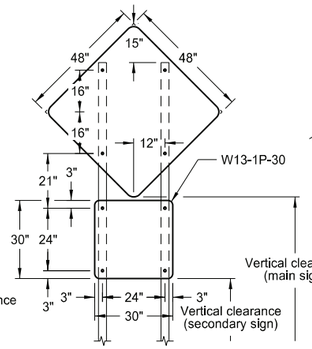
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

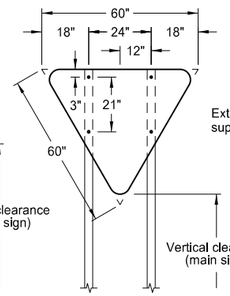
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



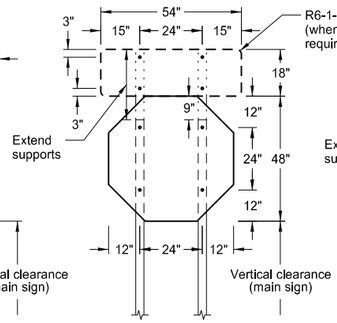
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



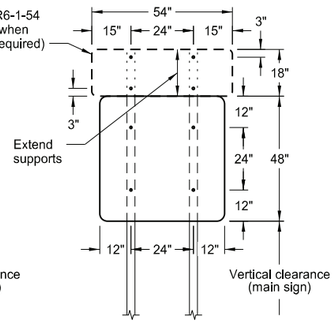
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



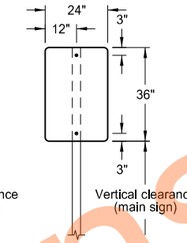
R1-2-60 - YIELD SIGN



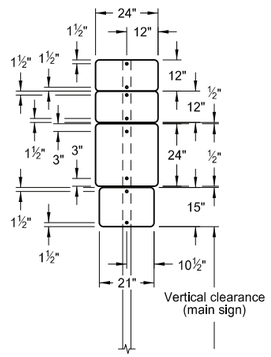
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



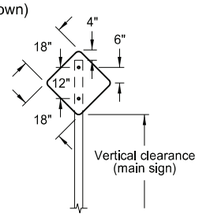
48" x 48" SIGN
(with R6-1-54 sign as required)



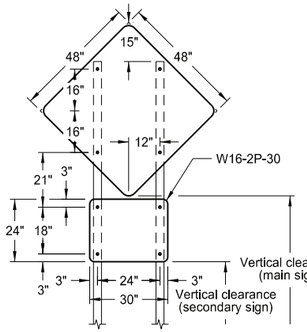
24" x 36" SIGN



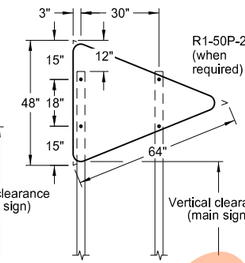
24" x 24"
ROUTE MARKER
ASSEMBLY



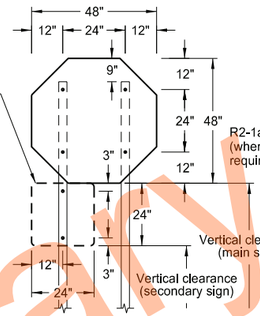
18" x 18"
DIAMOND SIGN



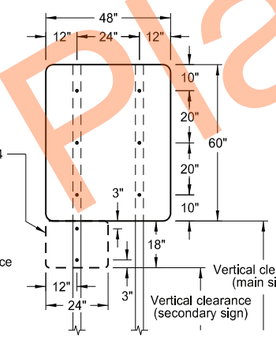
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



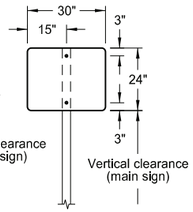
W14-3-64 - PENNANT SIGN



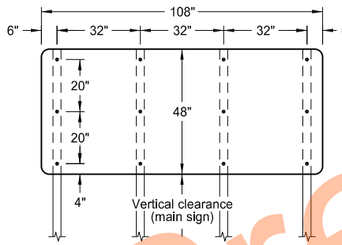
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



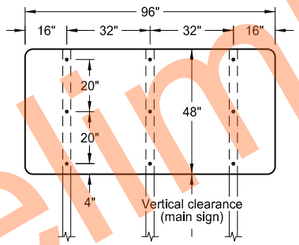
48" x 48" SIGN
(with R2-1aP-24 sign as required)



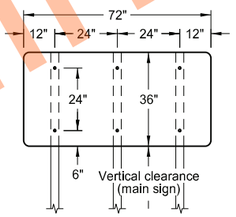
30" x 24" SIGN



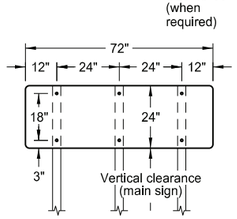
108" x 48" SIGN



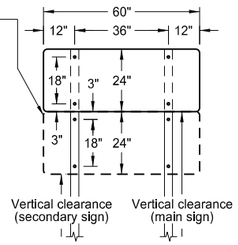
96" x 48" SIGN



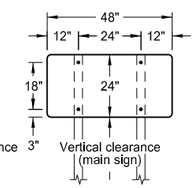
72" x 36" SIGN



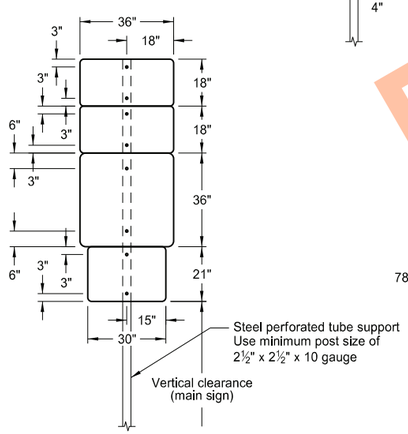
72" x 24" SIGN



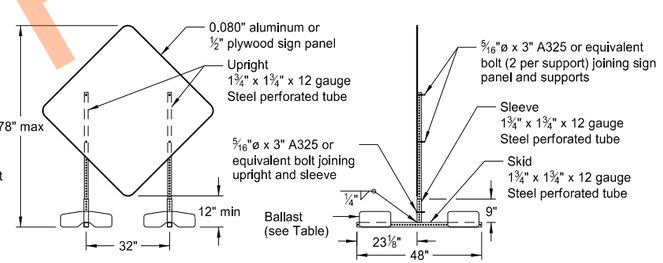
60" x 24" SIGN



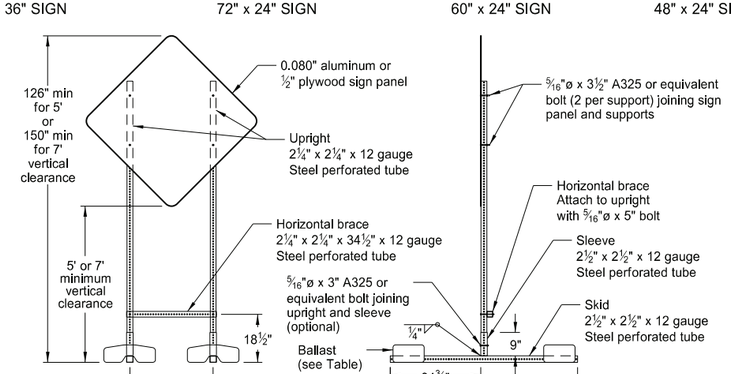
48" x 24" SIGN



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
8-01-24	Electronic Stamp/Signature

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

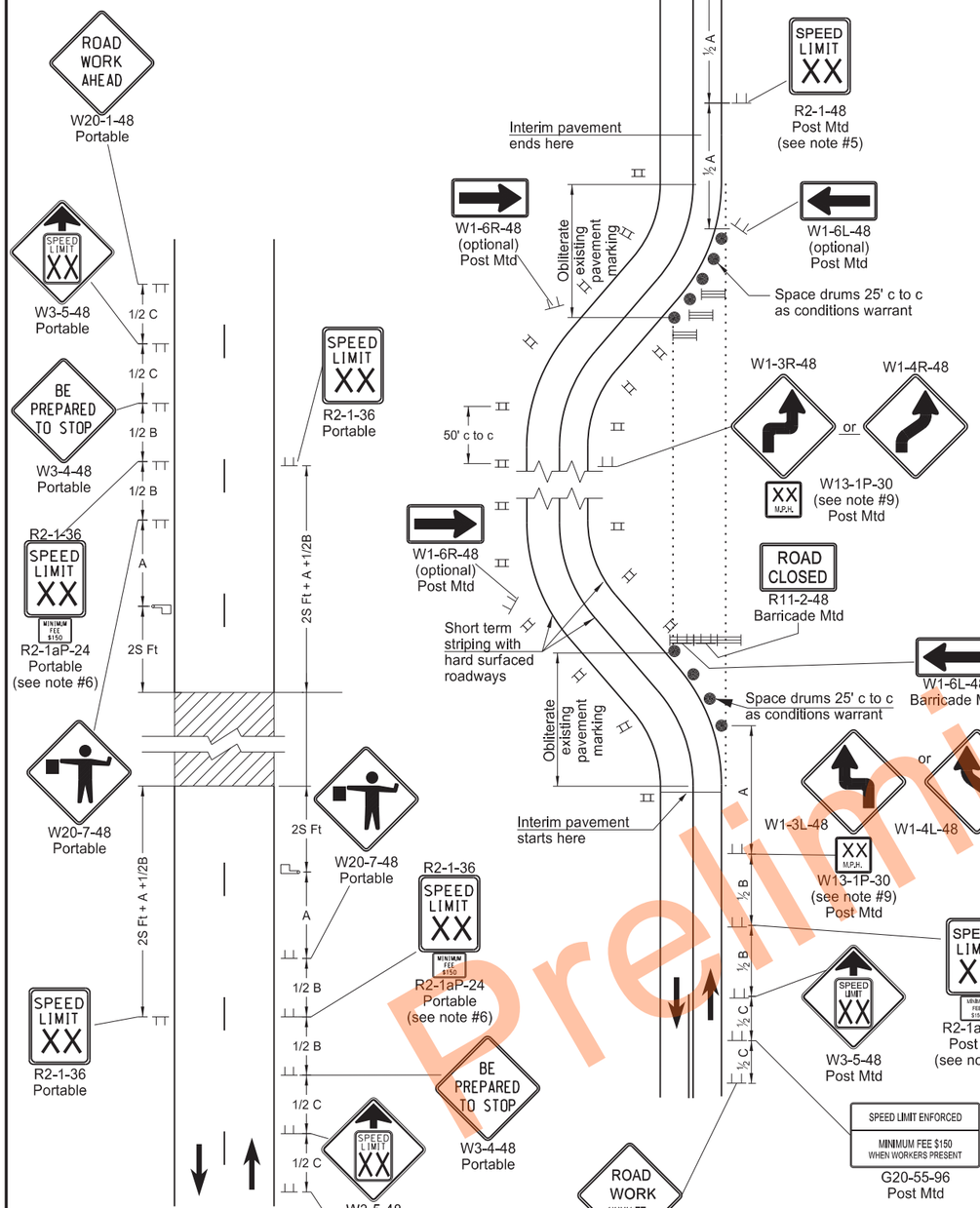
08/01/24

Preliminary Plans

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

ROAD CLOSURE LAYOUTS

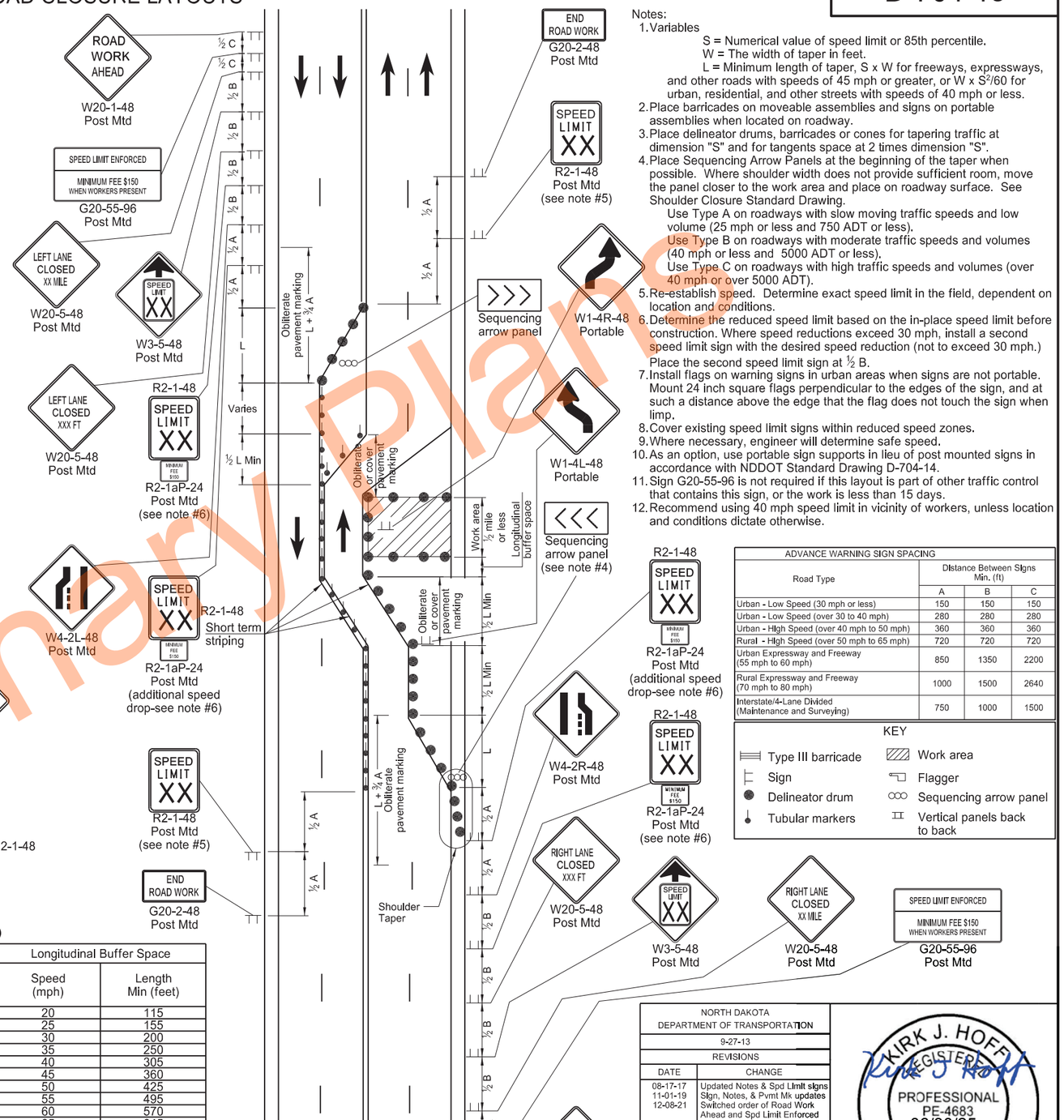
D-704-15



TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.

TYPE B
ROAD CLOSURE WITH A DIVERSION
Two lane highway where roadway is closed and detour provided (signing shown for one direction only). Use on bridge and culvert installation with ½ mile or less closure.

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
80	910



TYPE C
HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and 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. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type 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).
5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
6. 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 ½ B.
7. 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.
8. Cover existing speed limit signs within reduced speed zones.
9. Where necessary, engineer will determine safe speed.
10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

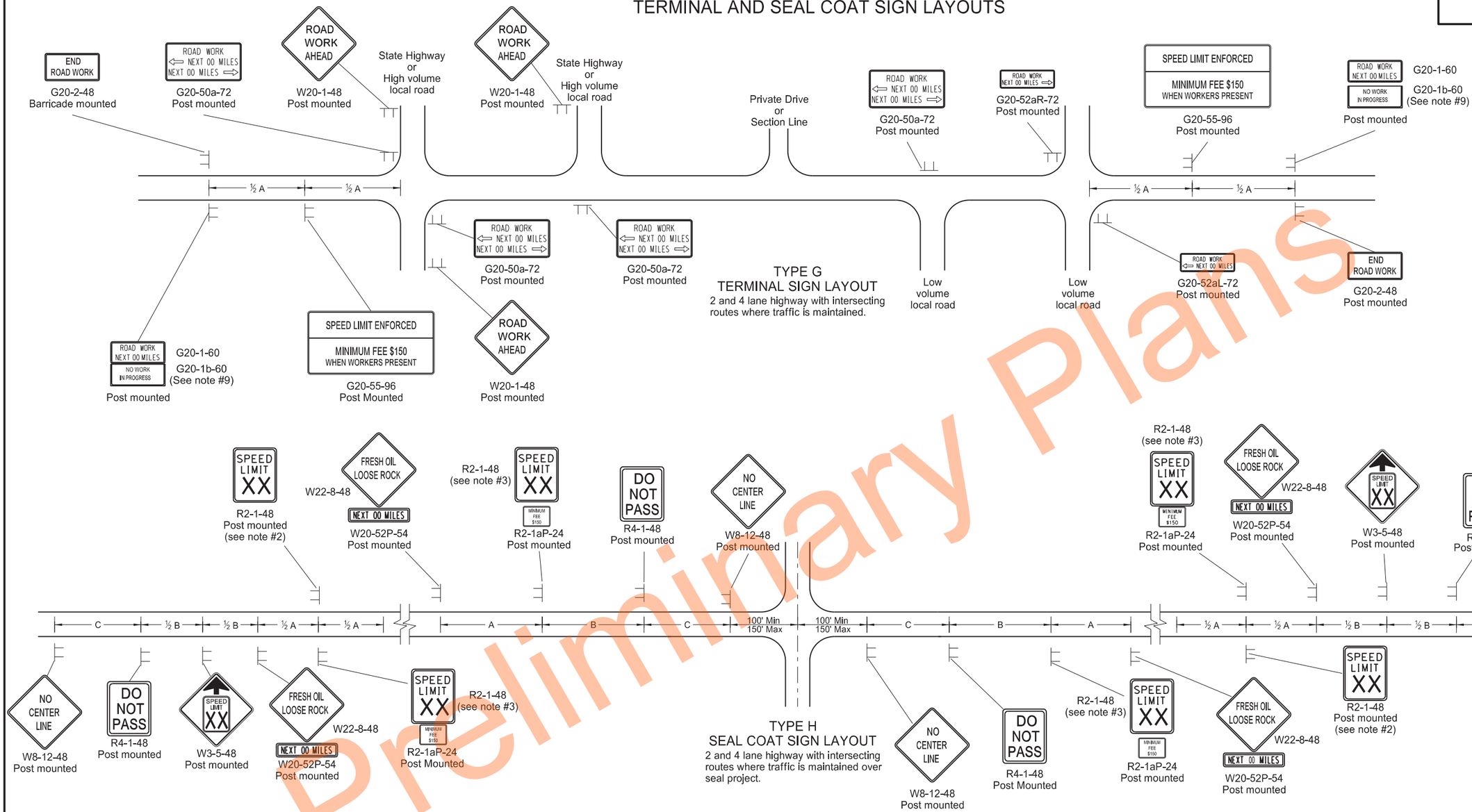
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

Preliminary Plans

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Preliminary Plans

Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Determine the exact speed limit in the field, based on location and conditions.
3. Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit 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 ½ B.
4. 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.
5. Cover existing speed limit signs within a reduced speed zone.
6. On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
8. Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
9. Install sign G20-1b-60 when work is suspended for winter.
10. Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

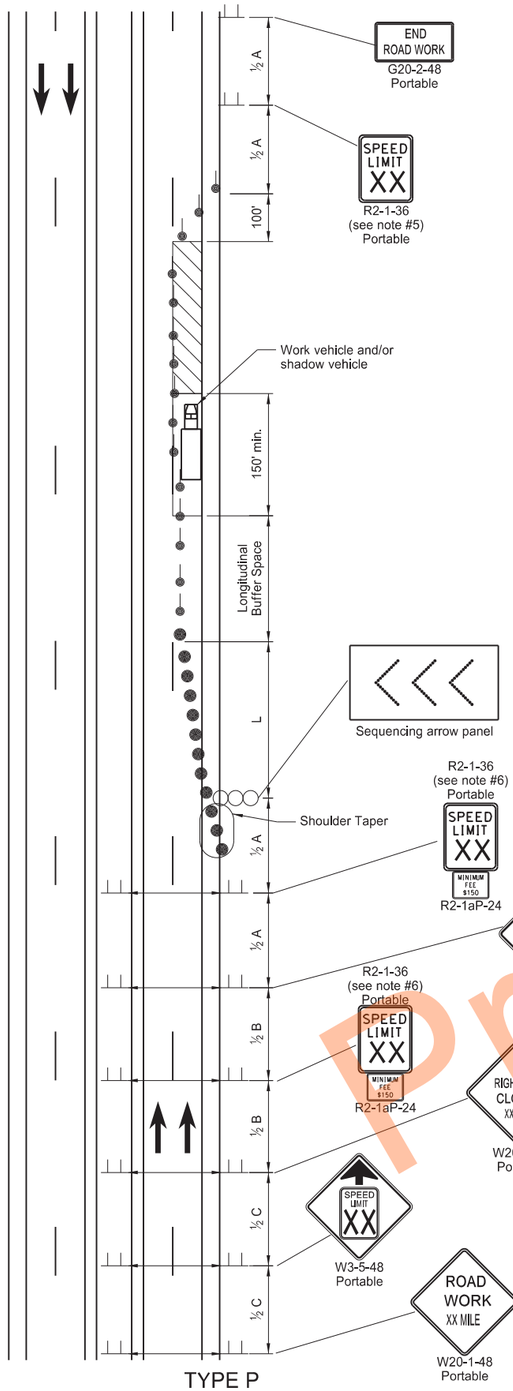
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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06/30/25
ENGINEER
NORTH DAKOTA

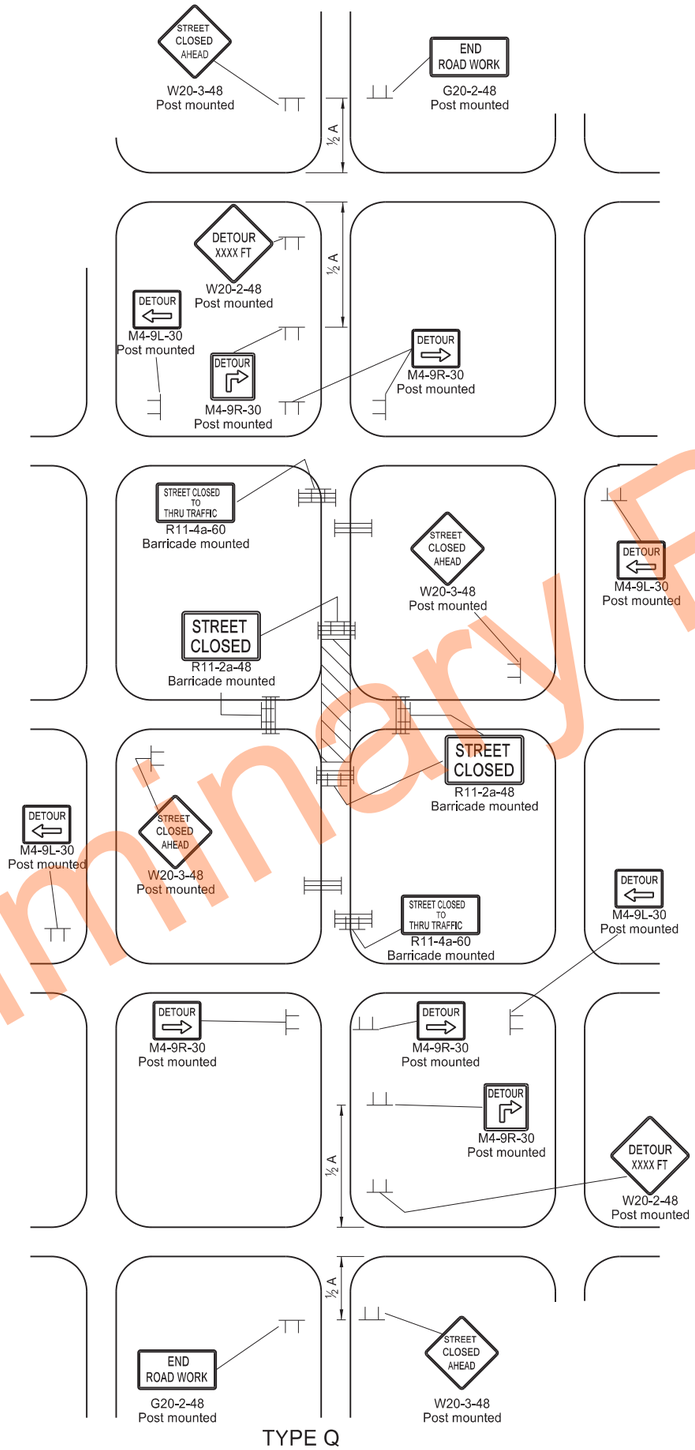
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SHORT TERM URBAN DETOUR AND LANE CLOSURE ON A DIVIDED HIGHWAY LAYOUTS

D-704-23



TYPE P
STATIONARY LANE CLOSURE ON A DIVIDED HIGHWAY
4 lane divided roadway where ½ of roadway is closed.
Short-term (more than 1 hour within a single daylight period.)



TYPE Q
DETOUR FOR A CLOSED STREET
Where city streets are used for detouring traffic.
Urban projects do not require the G20-55-96 and R2-1aP-24 signs.

Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of 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. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
4. Place Sequencing Arrow Panels at the beginning of taper. Where shoulder width does not provide sufficient room, move panel closer to the work area and place on roadway surface.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type 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).
5. Re-established speed limit. Determine exact speed limit in the field, dependent on location and conditions.
6. 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 ½ B.
7. 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.
8. Cover existing speed limit signs within a reduced speed zone.
9. Covered (when approved by engineer) or obliterated payment marking measured as as Obliteration of Pavement Marking.
10. Change intersection control on detour for Type Q when determined necessary by the engineer.
11. Engineer to determine safe speed where necessary. When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic.
12. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
13. Recommend using 40 mph speed limit in vicinity of workers for Layout Type P, unless location and conditions dictate otherwise.

KEY

Type III barricade	Work area
Sign	Sequencing arrow panel
Delineator Drum	Tubular Markers

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 80 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
80	910

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Removed speed limit signs, & updated notes & sign numbers
11-01-19	Revised sign numbers & note
12-08-21	Added Dollars At Work sign
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

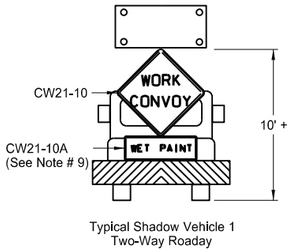
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NORTH DAKOTA

Preliminary

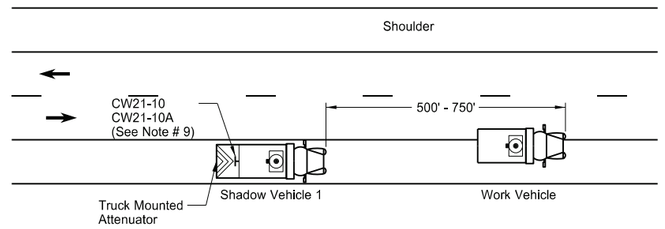
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MOBILE OPERATION
(PAVEMENT MARKING)

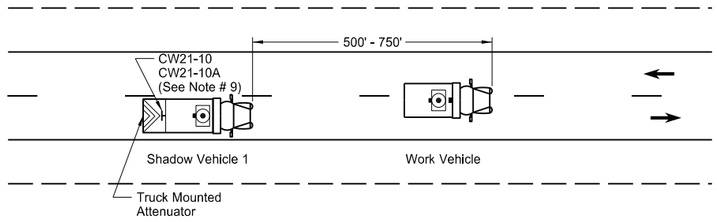
D-704-27



Typical Shadow Vehicle 1
Two-Way Roaday

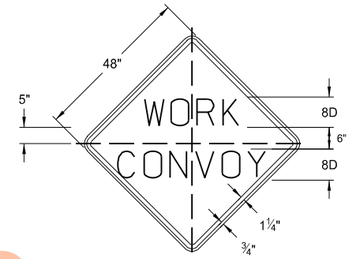


Two-Way Roadway with Paved Shoulders

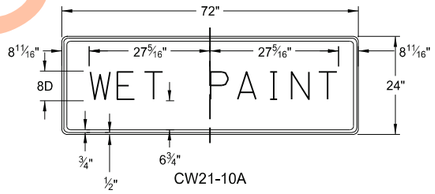


Two-Way Roadway without Paved Shoulders

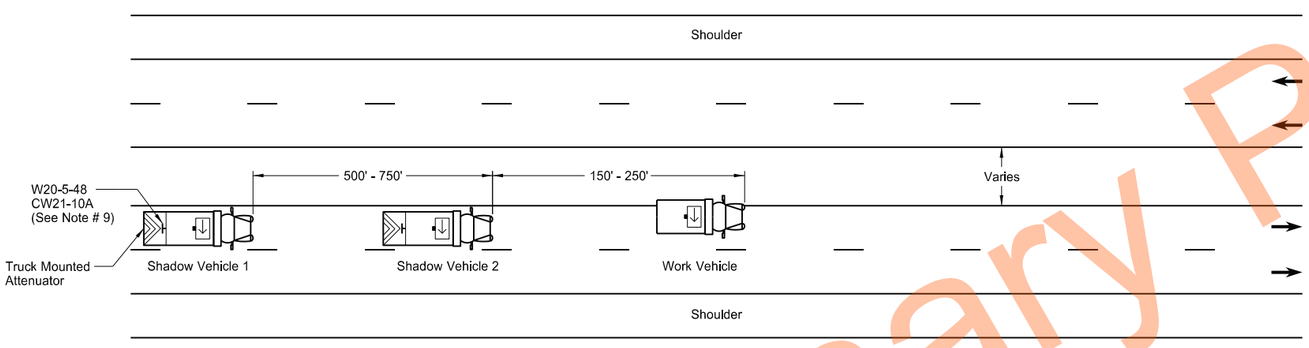
Sign Details



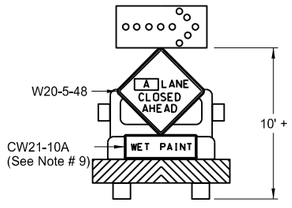
CW21-10



CW21-10A

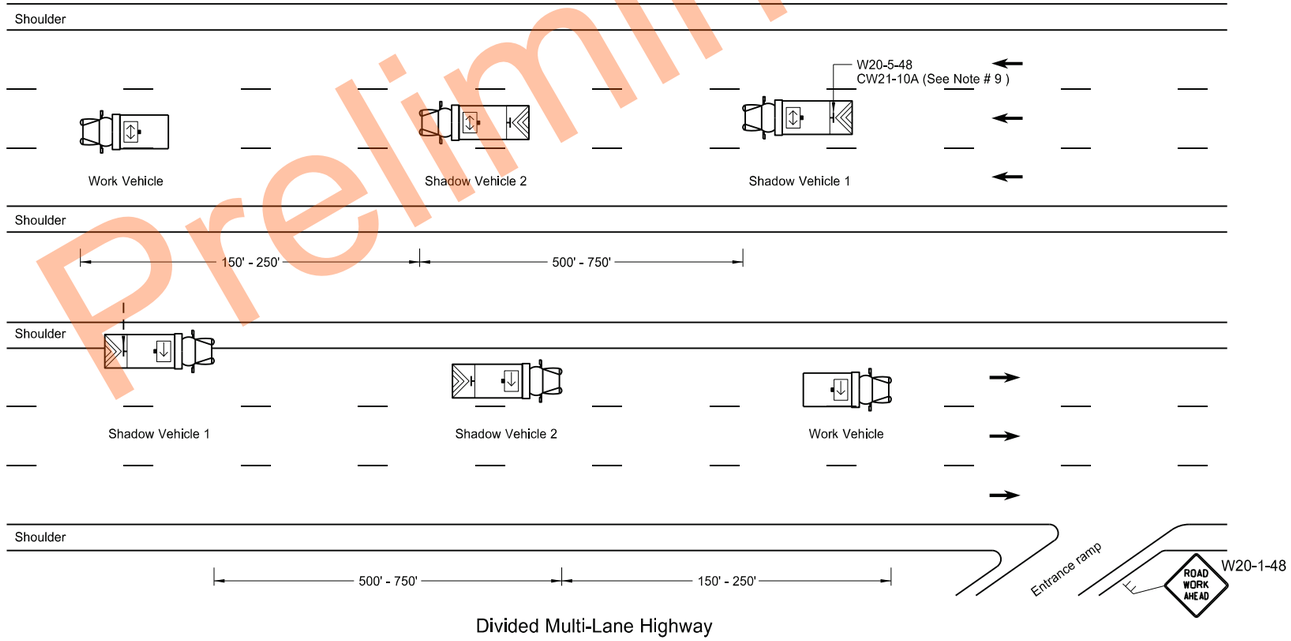


Undivided Multi-Lane Roadway



Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center



Divided Multi-Lane Highway

Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
2. Display yellow rotating beacons or stobe lights on shadow and work vehicles, unless otherwise stated in the plans.
3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
4. Provide each vehicle with two-way electronic communication capability.
5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
7. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange
8. As an option, use shadow vehicle 2 the paint tender vehicle.
9. Use sign CW21-10A only during painting operation.
10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.

KEY

- Sign
- Truck mounted attenuator
- Flashing arrow panels:
  - Right directional
  - Left directional
  - Double arrow directional
  - Caution Mode

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
8-02-24	Electronic Stamp/Signature.

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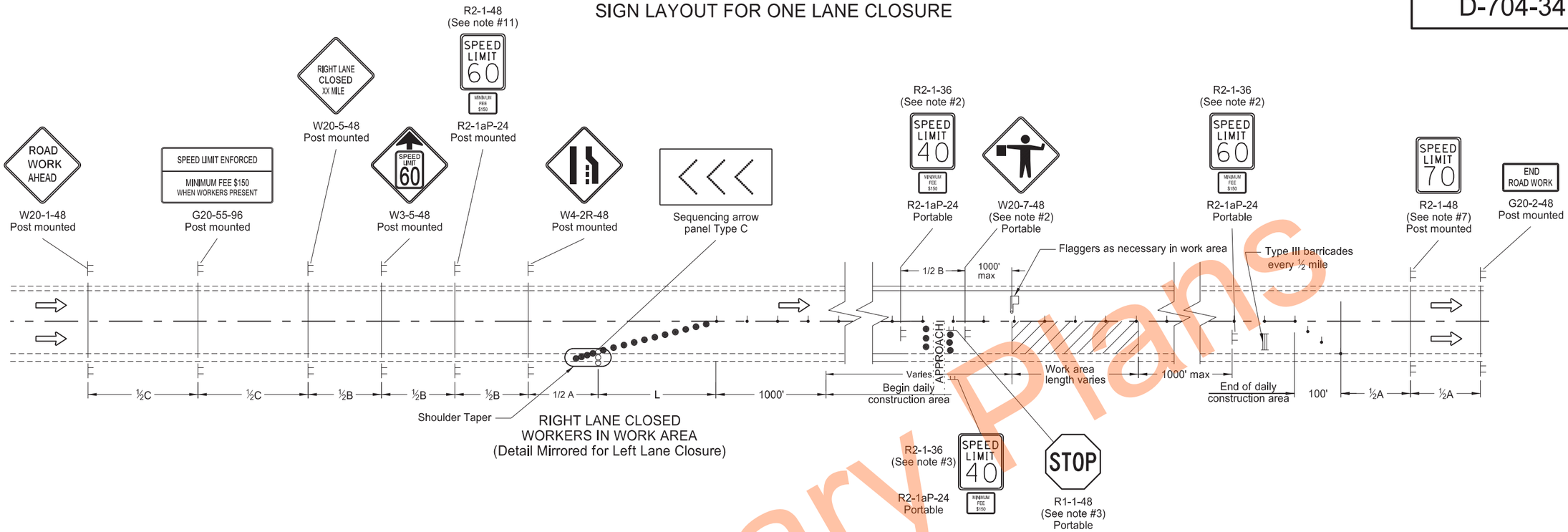
08/02/24

Preliminary Plans

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SIGN LAYOUT FOR ONE LANE CLOSURE

D-704-34



RIGHT LANE CLOSED
WORKERS IN WORK AREA
(Detail Mirrored for Left Lane Closure)

Notes:

1. Install advance signs for flagging when flaggers are flagging.

2. Move the advanced flagger sign and speed limit signs as the work area moves through the construction zone. When the work area is not visible from the flagger, move the flagger station so the work area is visible. Place the 40 mph speed limit sign at ½A in advance of the flagger sign and move the 60 mph speed limit sign. Cover or remove the 40 mph speed limit and the Minimum Fee $150 signs upon completion of the work day or when workers are not present. Determine the exact speed limit in the field, dependent on location and conditions.

3. Approaches: When the work area encompasses an approach, install a 40 mph speed limit sign to control the approach. Cover the existing stop sign and install a new portable stop sign when the approach is on the side of the lane closure. Remove the approach speed limit sign once the main line 40 mph speed zone is moved past the approach.

4. Variables:
   S=Numerical value of speed limit or 85th percentile
   W=The width of taper.
   L=Minimum length of taper, or SxW for freeways, expressways, and all other roads with speeds of 45 mph or greater, or
   (WxSxS)/60 for urban, residential, and other streets with speeds of 40 mph or less.

5. Space delineator drums for tapering traffic at the dimension "S". Space tubular markers used for tangents at 2 times dimension "S".

6. Place sequencing arrow panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on the roadway surface.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type 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).

7. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.

8. Cover existing speed limit signs within a reduced speed zone.

9. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the diamond sign, and at such a distance above the edge that the flag does not touch the sign when limp.

10. Determine the reduced speed limit dependent on the in place speed limit before construction. Where speed limits are to be reduced more than 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.

11. As an option use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.

12. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.

KEY

Type I barricade		Work area	
Type II barricade		Flagger	
Type III barricade		Sequencing arrow panel	
Sign		Tubular markers	
Delineator drum			

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-26-2012

REVISIONS

DATE	CHANGE
03-15-16	Removed Do Not Pass signs & updated notes
08-17-17	Updated notes & sign numbers & moved Speed Limit signs
11-01-19	Removed shldr taper details & revised tubular mkr symbol
12-08-21	Switched order of Road Work and Spd Limit Enforced, removed table, & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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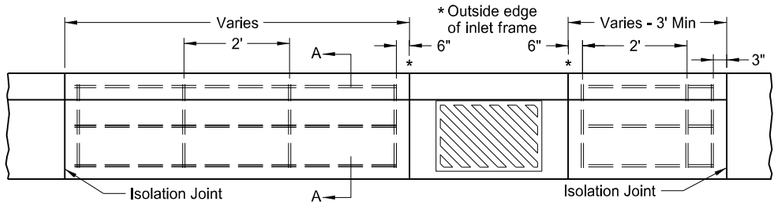
Kirk J Hoff

Preliminary Plans

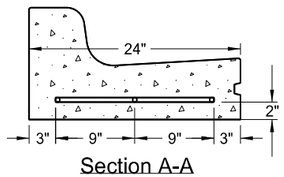
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Curb & Gutter and Valley Gutter

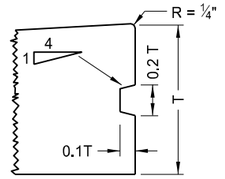
D-748-1



Curb & Gutter Reinforcing at Inlets



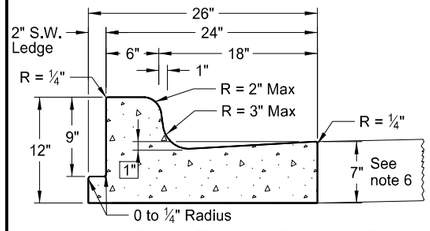
Section A-A



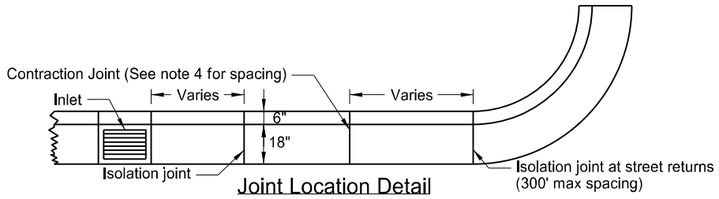
Keyway Detail for Curb & Gutter

(To be used with PCC Pavement and Drives)

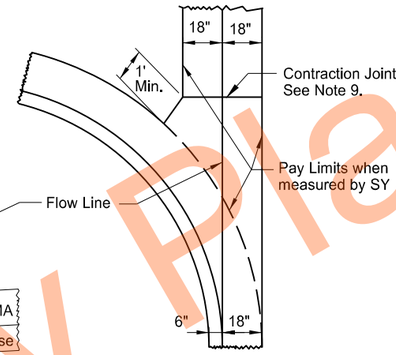
T= Thickness of pavement unless otherwise noted on plans.



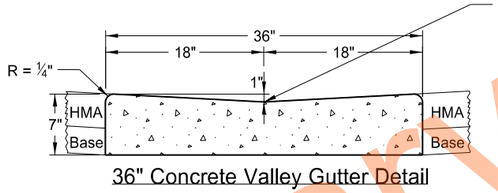
Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot. (Sec. A shown. See Sec B for additional details.)



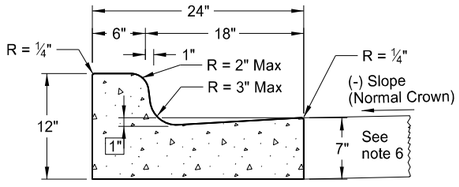
Joint Location Detail



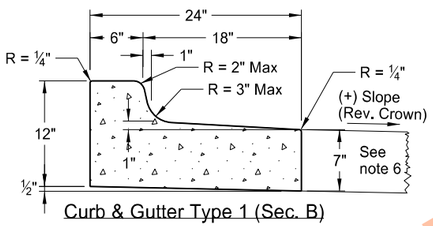
36" Concrete Valley Gutter Plan



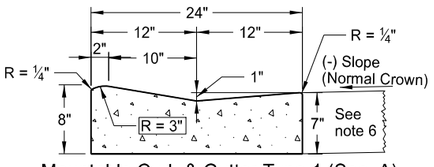
36" Concrete Valley Gutter Detail



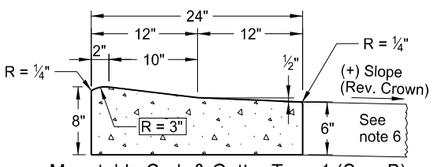
Curb & Gutter Type 1 (Sec. A)



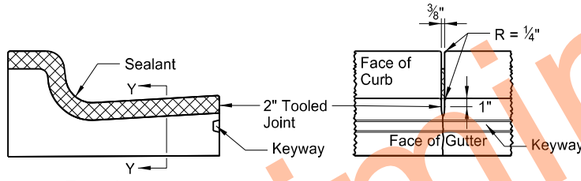
Curb & Gutter Type 1 (Sec. B)



Mountable Curb & Gutter Type 1 (Sec. A)



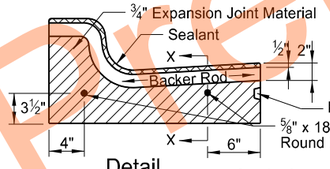
Mountable Curb & Gutter Type 1 (Sec. B)



Detail
(10' Max Spacing)

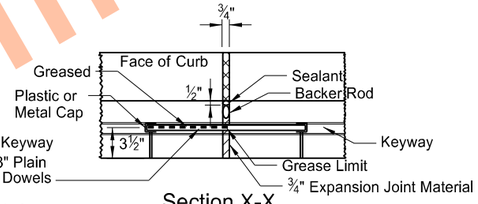
Section Y-Y

Contraction Joint

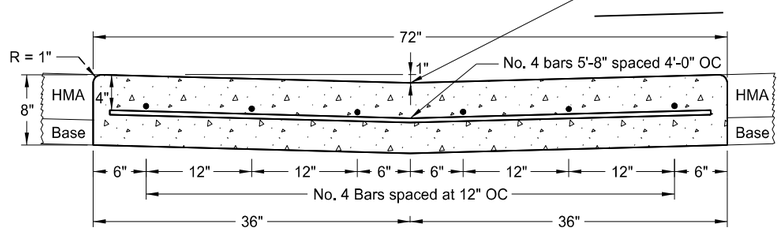


Detail

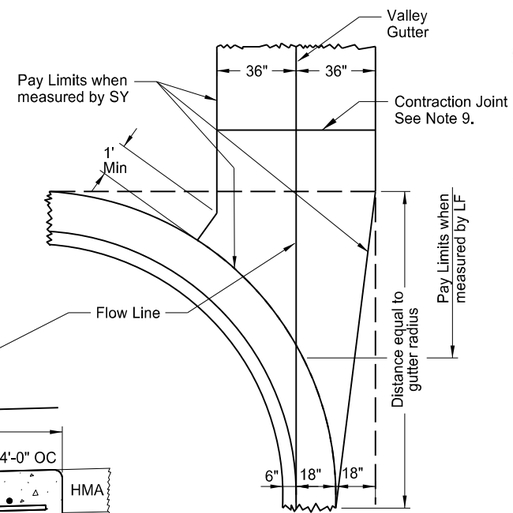
Isolation Joint



Section X-X



72" Concrete Valley Gutter Detail



72" Concrete Valley Gutter Plan

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 material for isolation joints. 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 mix asphalt 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: For contraction joint, use joint sealant 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. Curb & Gutter-Pavement Interface: For hot mix asphalt pavement use gutter depth shown. For PCC pavements, either match gutter depth to adjacent pavement depth or construct gutter depth shown.
7. Tie curb and gutter to abutting PCC pavement with No. 4 bars, 2'-0" in length, spaced at 3'-9" centers for 15' joint spacing (maximum spacing of 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) with an 18" plain round 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.
10. Reinforcing at Inlets: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlets (even inlets located on radii) in the price bid for "Curb & Gutter - Type 1" or "Curb & Gutter Mountable - Type 1." Extend reinforcement to the second joint (with rebar placed through the first joint) in cases where the 3' minimum panel length can't be obtained.

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.
10-30-24	Revised bar size & notes.

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

Kirk J Hoff

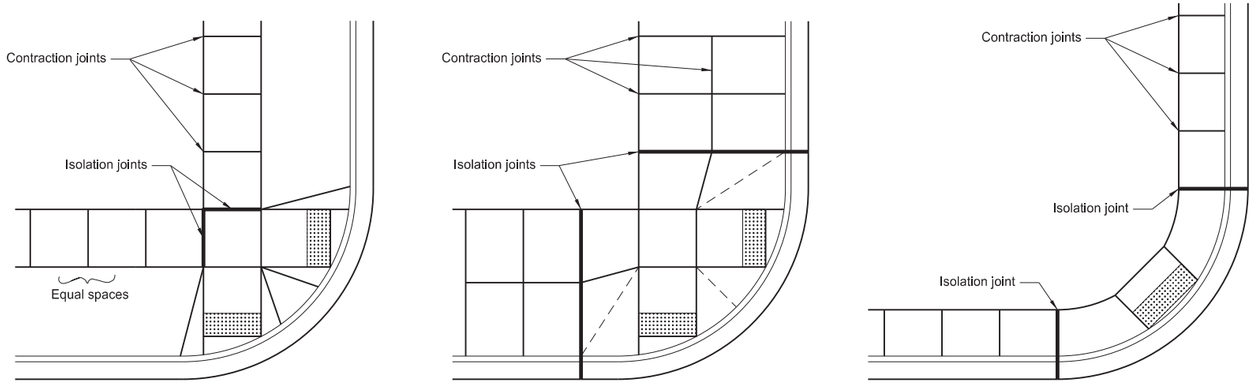
10/30/24

Preliminary Plans

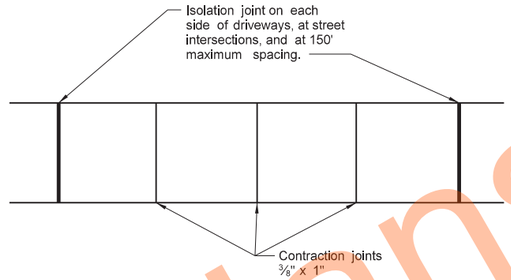
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SIDEWALK

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.

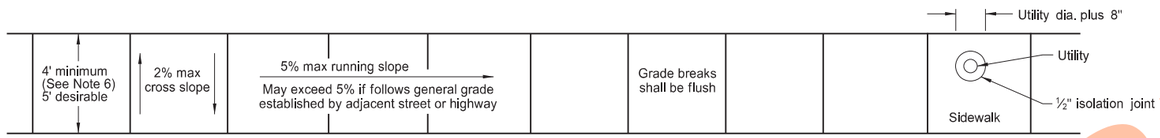
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   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."

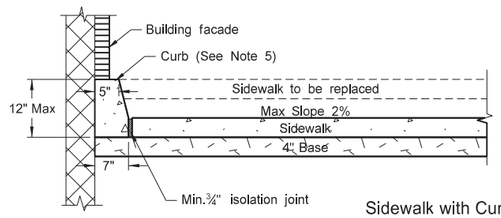
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear 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'.

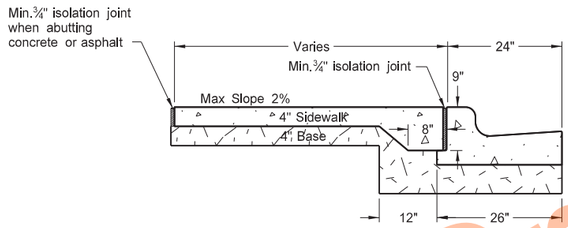


Sidewalk Width and Grade

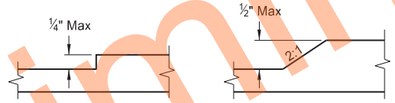
Utility Blockout



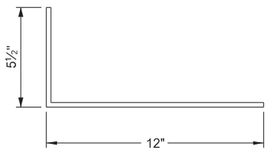
Sidewalk with Curb Detail
(Building face application)



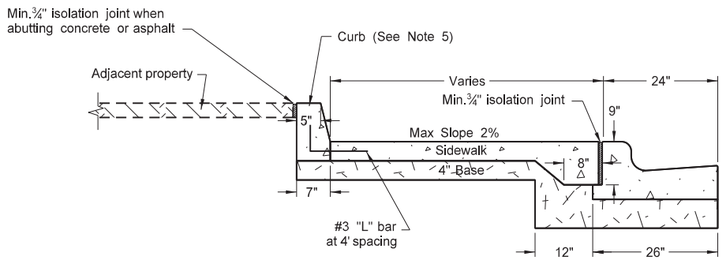
Sidewalk Detail
(Installed adjacent to curb and gutter)



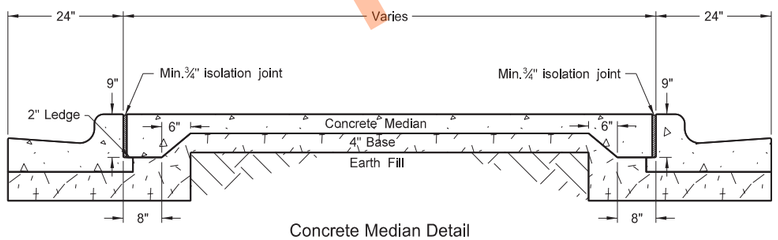
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



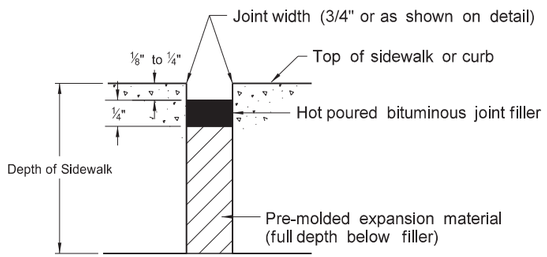
"L"Bar Detail
#3 Bar



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 & grade & passing lane requirements.
08-27-19	New Design Engineer PE Stamp.
08-09-24	Electronic Stamp/Signature.

KIRK J. HOFF
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PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

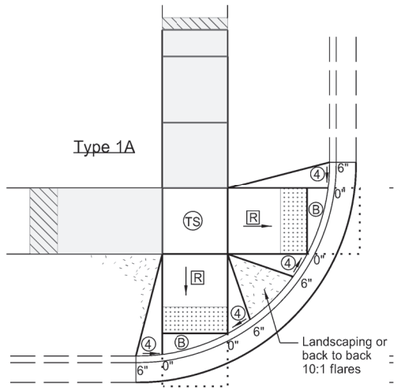
08/09/24

Preliminary Plans

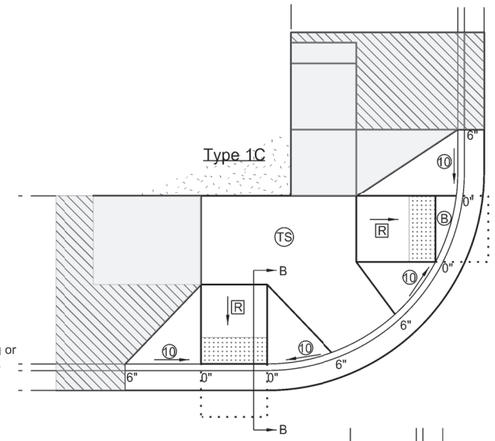
CURB RAMP RETROFIT DETAILS

D-750-3

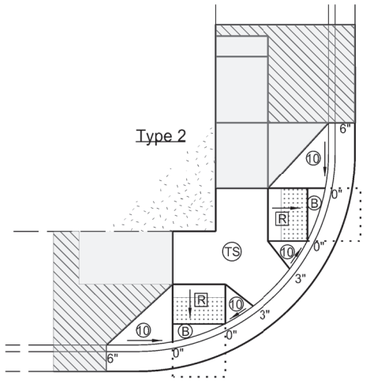
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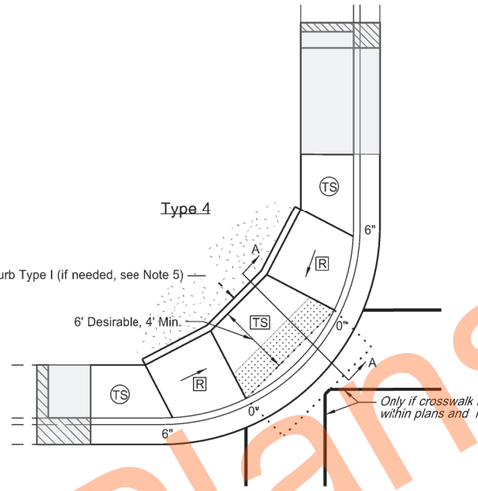
Type 1C



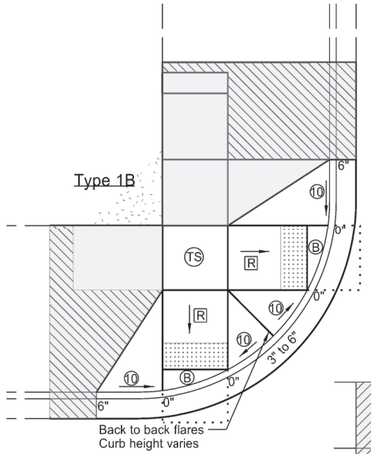
Type 2



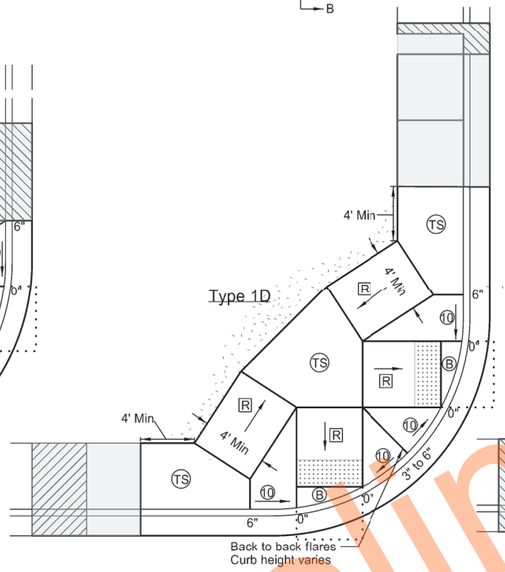
Type 4



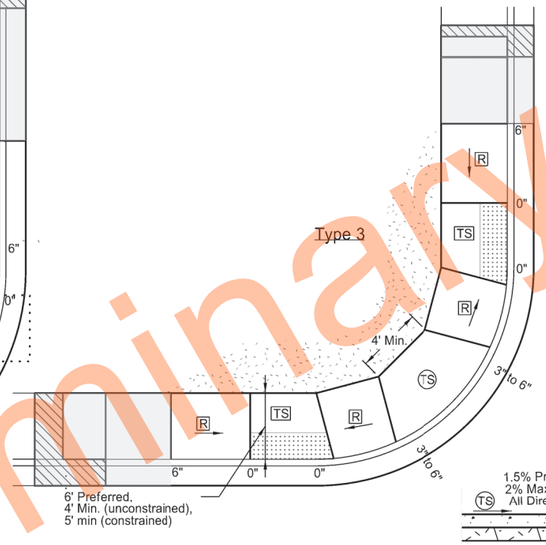
Type 1B

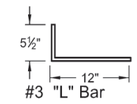


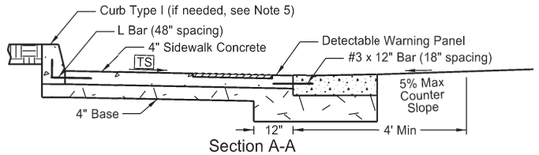
Type 1D



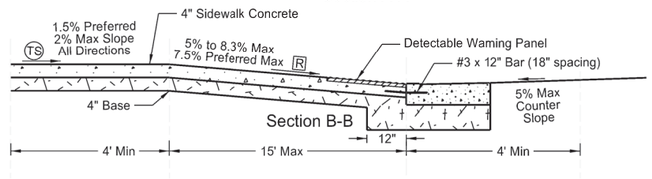
Type 3







Section A-A



Section B-B

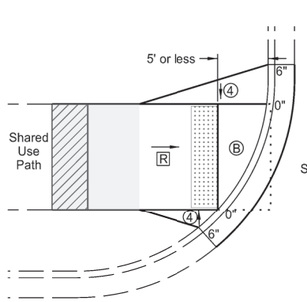
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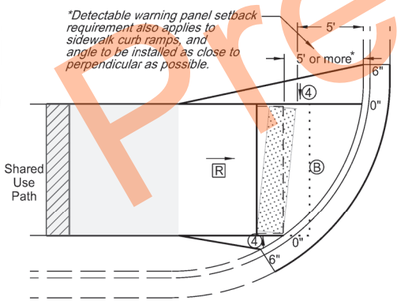
1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size 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:

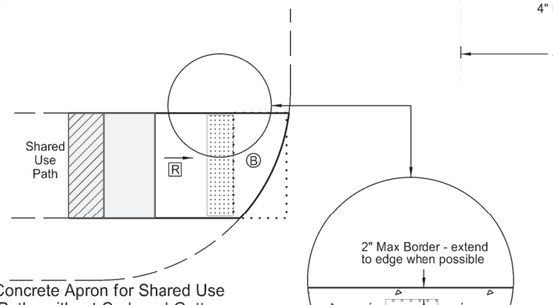
- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross 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.

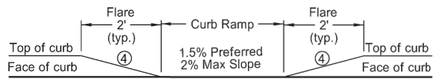




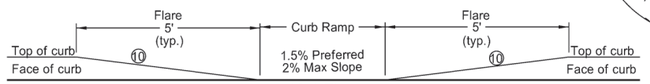
Concrete Apron for Shared Use Paths with Curb and Gutter



Concrete Apron for Shared Use Paths without Curb and Gutter

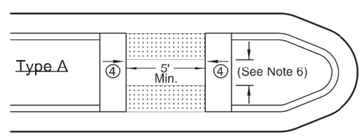


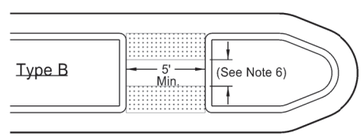
4:1 Flares
(To be used when flare is adjacent to landscaping)



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

Median Refuge Islands (Cut-Through)





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

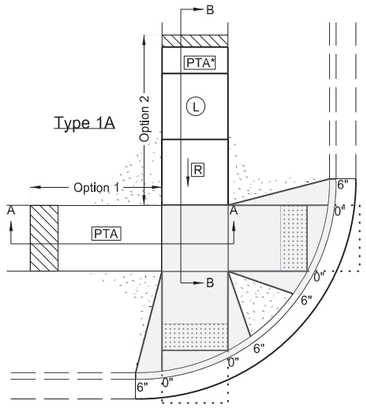
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

Preliminary Plans

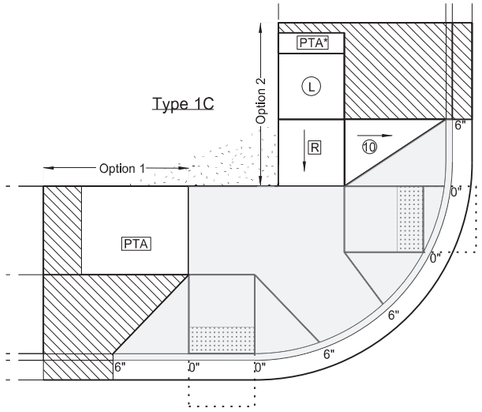
CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4

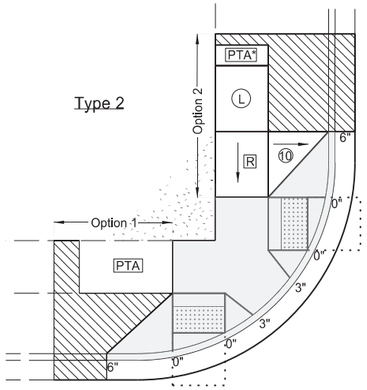
Type 1A



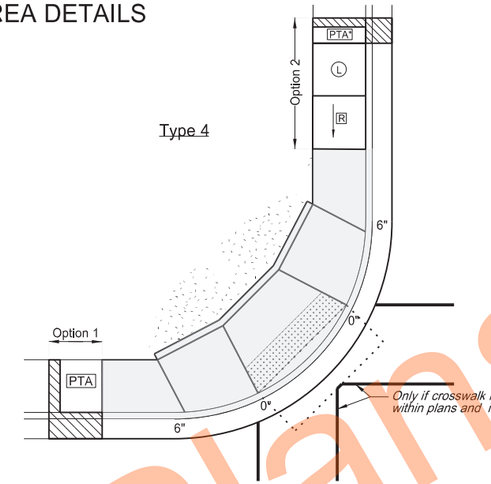
Type 1C



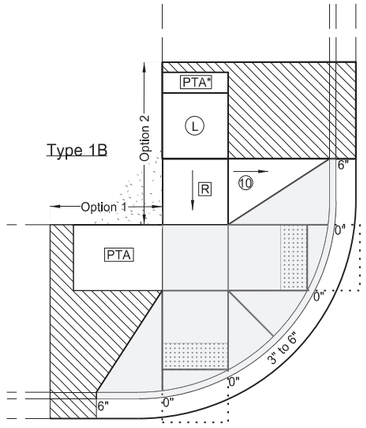
Type 2



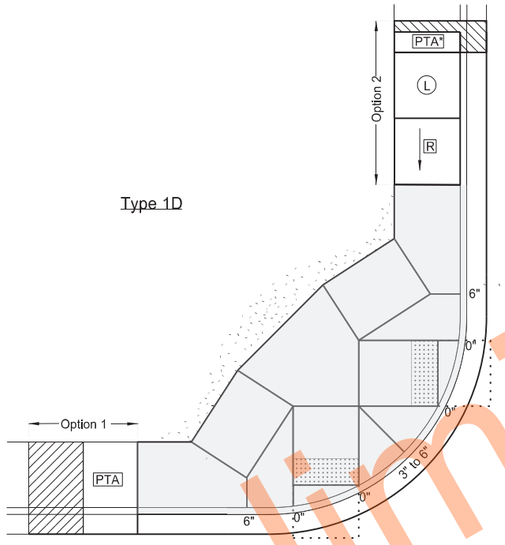
Type 4



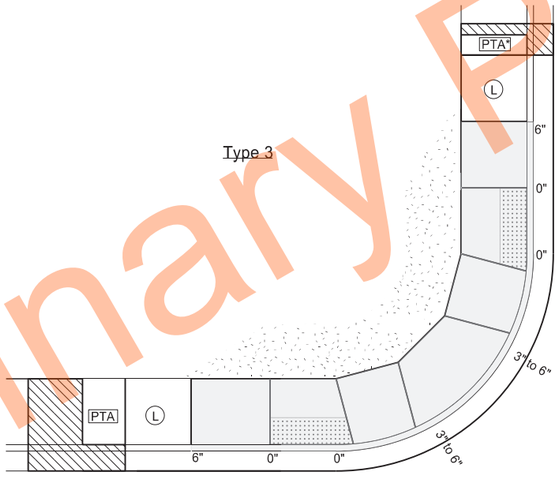
Type 1B

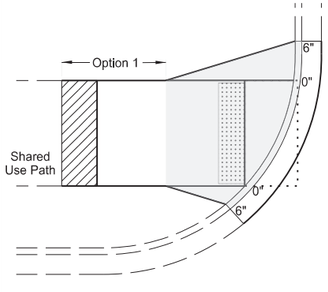


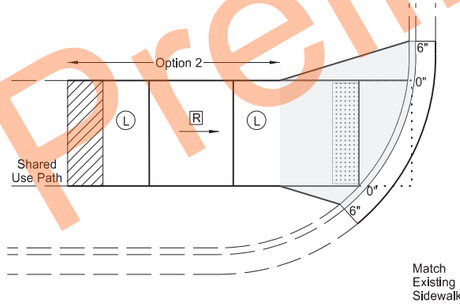
Type 1D



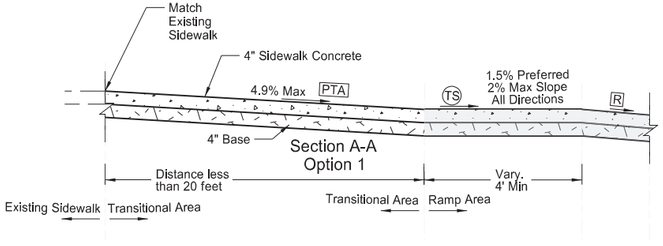
Type 3

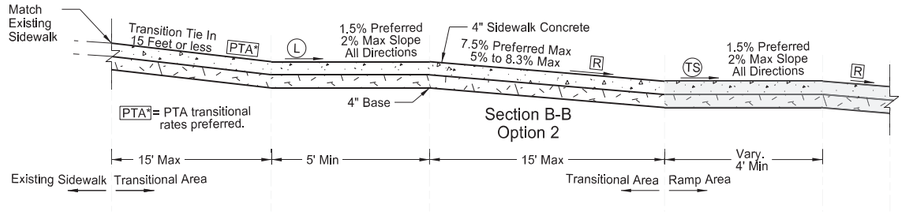






Transition Areas for
Shared Use Paths





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

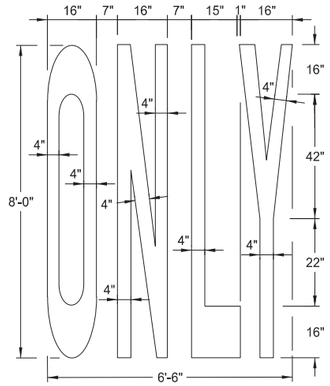
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

Preliminary Plans

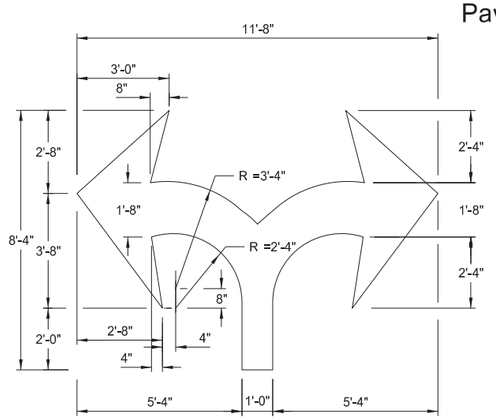
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Pavement Marking Message Details

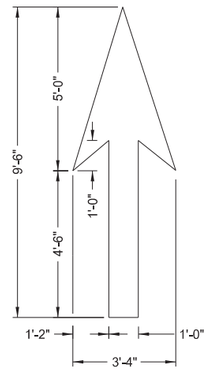
D-762-1



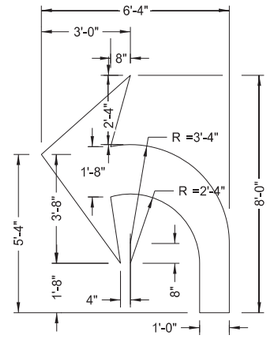
22 S. F.



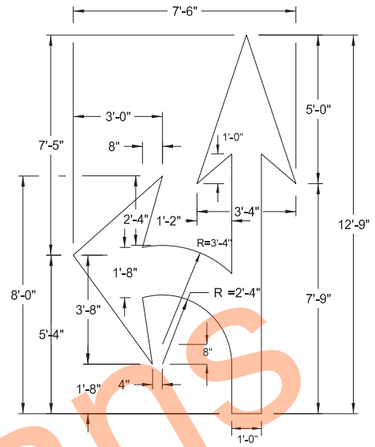
29 S. F.



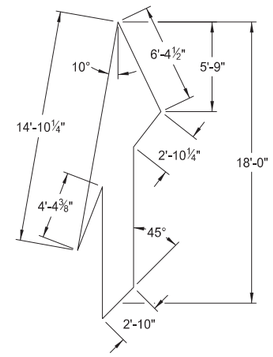
12 S. F.



16 S. F.

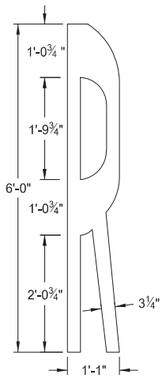


27 S. F.

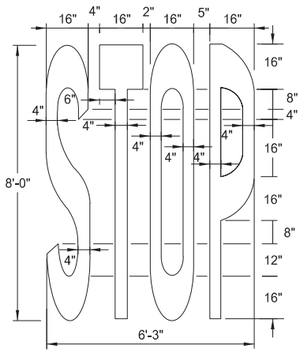


41 S. F.

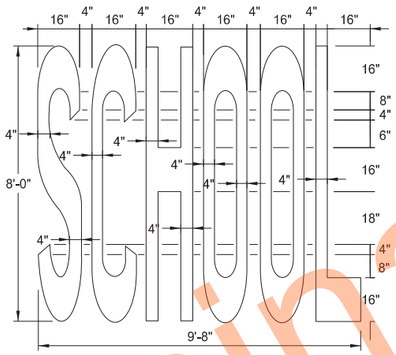
Note: Rotate merge arrow 20° from edge of roadway.



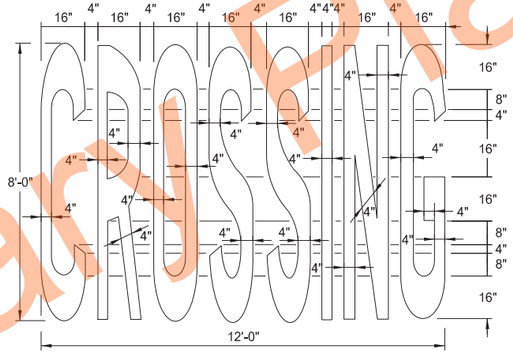
4 S. F.



22 S. F.



34.5 S. F.



46 S. F.

Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table

Centerline Pavement Marking Skip Spacing Detail

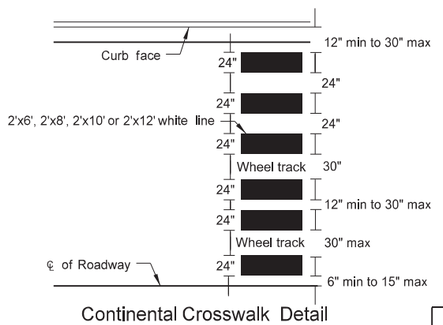
Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

See plans for correct message. Use white pavement markings unless noted otherwise.

Railroad cross & 2 R's 3 Bands (12' lane) 60.5 S.F. 72 S.F.

*Stop Bar nearest crossing - 8' from gate or 26' to nearest rail - Use whichever is further from tracks.

Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft



Continental Crosswalk Detail

NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

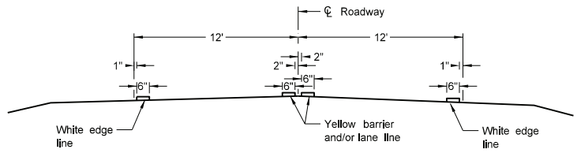
KIRK J. HOFFMANN REGISTERED PROFESSIONAL PE-4683 11/22/23 ENGINEER NORTH DAKOTA

Preliminary Plans

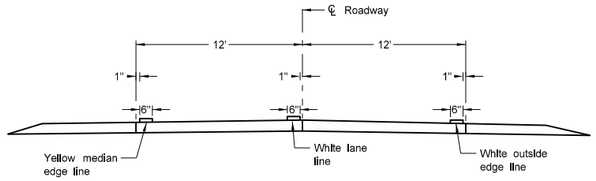
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PAVEMENT MARKING

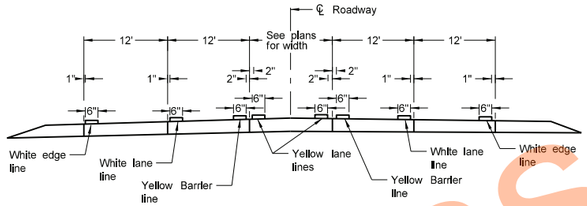
D-762-4



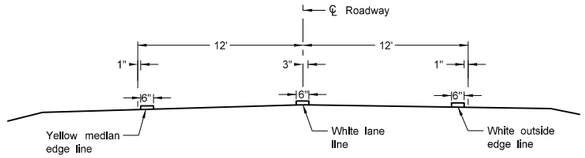
Two Lane Two Way
RURAL ROADWAY



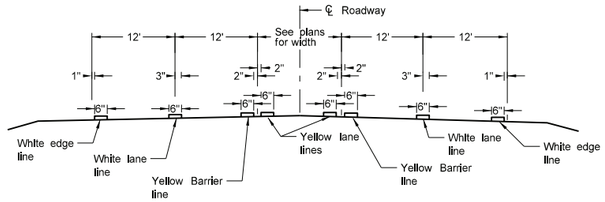
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



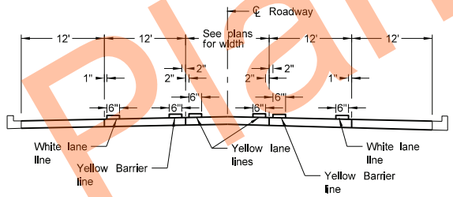
RURAL FIVE LANE ROADWAY
Concrete Section



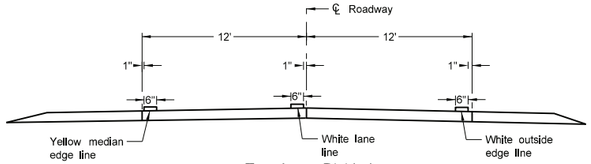
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



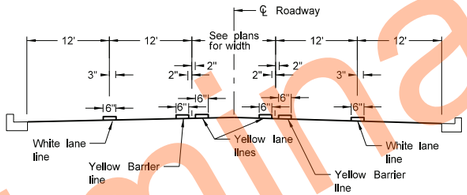
RURAL FIVE LANE ROADWAY
Asphalt Section



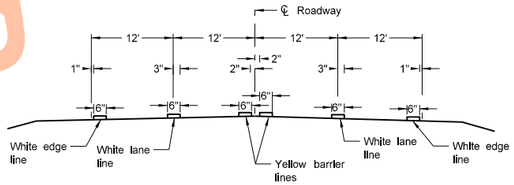
URBAN FIVE LANE SECTION
Concrete Section



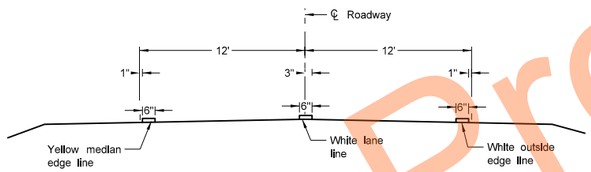
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



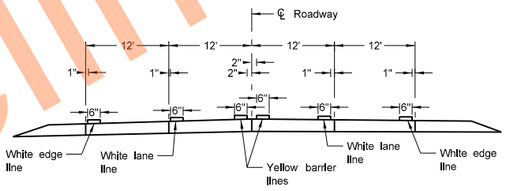
URBAN FIVE LANE SECTION
Asphalt Section



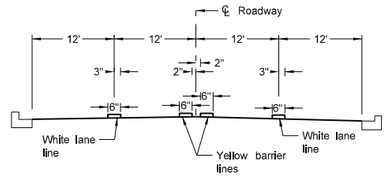
RURAL FOUR LANE ROADWAY
Asphalt Section



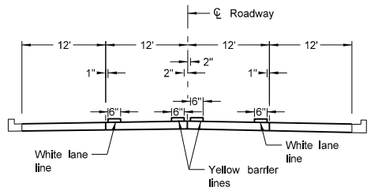
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



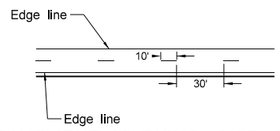
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NOTES:

1. Continue edge lines through private drives and field drives. Break edge lines for intersections.

   For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.

2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.

3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.

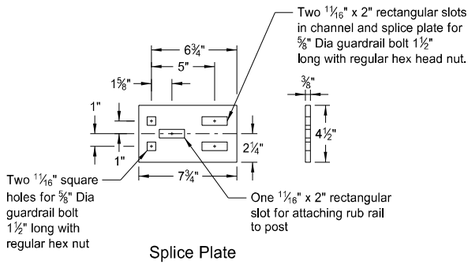
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
07/09/24
ENGINEER
NORTH DAKOTA

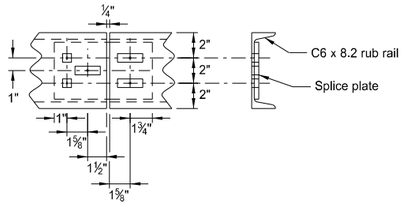
Preliminary Plans

MGS W-BEAM GUARDRAIL GENERAL DETAILS

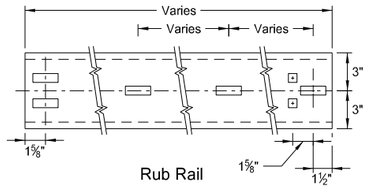
D-764-40



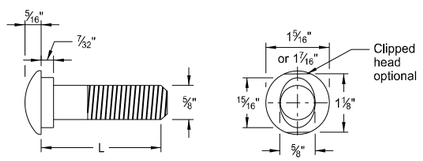
Splice Plate



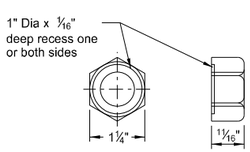
Splice Detail



C6x8.2 RUB RAIL AND SPLICE PLATE

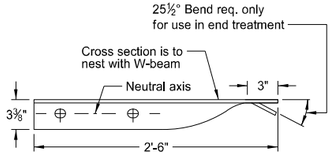


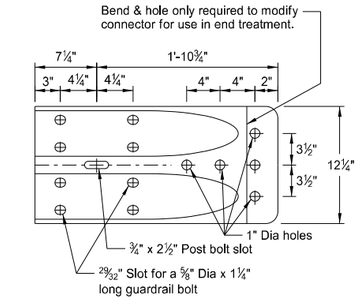
5/8" Diameter Guardrail Bolt	
L	Thread Length
1 1/4"	Full length thread
2"	1 3/4" Min thread length
9 1/2"	4" Min thread length
18"	4" Min thread length
20"	4" Min thread length
22"	4" Min thread length
25"	4" Min thread length



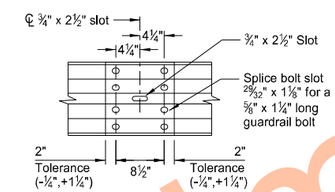
5/8" Dia recess nut

5/8" GUARDRAIL BOLT & RECESS NUT



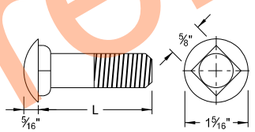


W BEAM TERMINAL CONNECTOR



SPLICE DETAIL

NOTE: Do not install center bolt in the 3/4" x 2 1/2" slot at mid span splices.

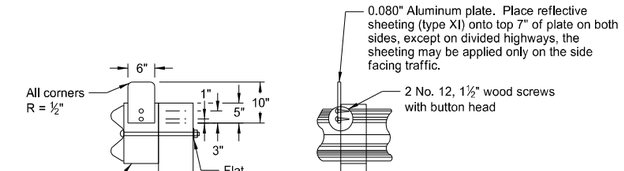


5/8" Diameter Carriage Bolt	
L	Thread Length
1 1/2"	Full length thread
3"	1 1/2" Min thread length
11"	1 3/4" Min thread length
13"	1 3/4" Min thread length



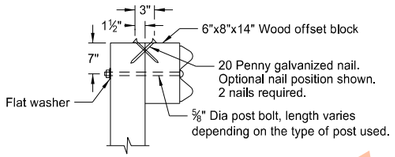
5/8" Dia hex nut

5/8" CARRIAGE BOLT & NUT

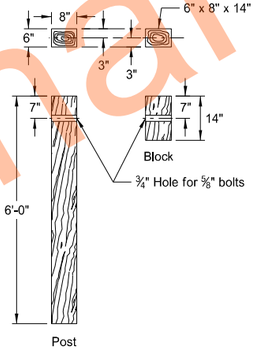


REFLECTORIZED PLATE DETAIL

NOTE: Additional reflectors are added to the W-beam guardrail quantities for placement on end treatment.

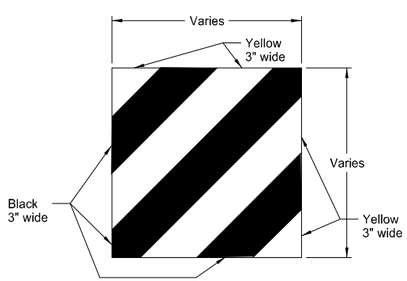


TYPICAL WOOD POST ATTACHMENT DETAIL

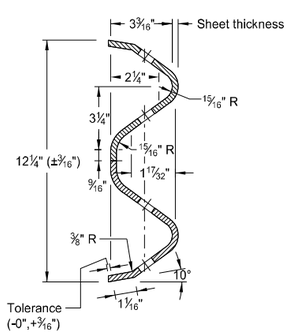


6" x 8" WOOD POST & BLOCK

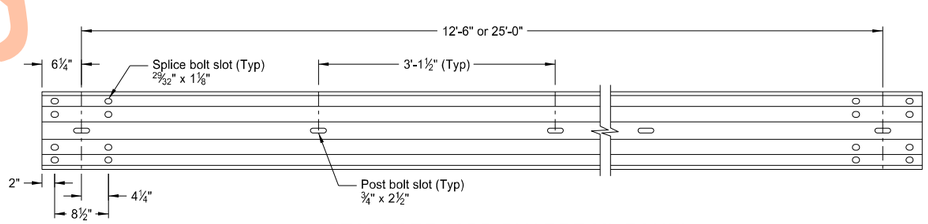
NOTE: Where soil conditions require, alternate lengths may be specified, in 6" increments.



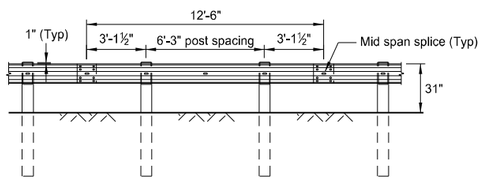
IMPACT HEAD OBJECT MARKER



W-BEAM CROSS SECTION



STANDARD MGS GUARDRAIL PANEL



STANDARD MGS GUARDRAIL SYSTEM

NOTES:

1. Begin reflector plates at the first post and space at 25' centers on guardrail less than 250' length and at 50' centers for guardrail over 250' length. Provide the reflector the same color as the pavement marking adjacent to it unless noted otherwise on the plans.
2. Replacing bituminous material at guardrail post: Dispose all excess earth from excavations for guard posts as directed by the engineer. Replace bituminous material wherever guardrail is installed after mat has been laid. Cost of excavation and replacing of bituminous material to be included in the price bid for other items.
3. Fit the Object Marker within the vertical edges of the Impact Plate. Provide type XI retroreflective sheeting meeting the requirements of Section 894.02.E of the standard specifications. Apply the sheeting to 0.100 Aluminum sheeting meeting the requirements of Section 894.01.A. Attach the Object Marker to the Impact Head Plate with rivets or other attachment device. Ensure the rivets or attachment device are non-rust. Slope the stripes downward toward the roadway side.
4. Guardrail installation height tolerance = ±1".

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-14-17	
REVISIONS	
DATE	CHANGE
12-02-20	Updated clipped head to optional

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

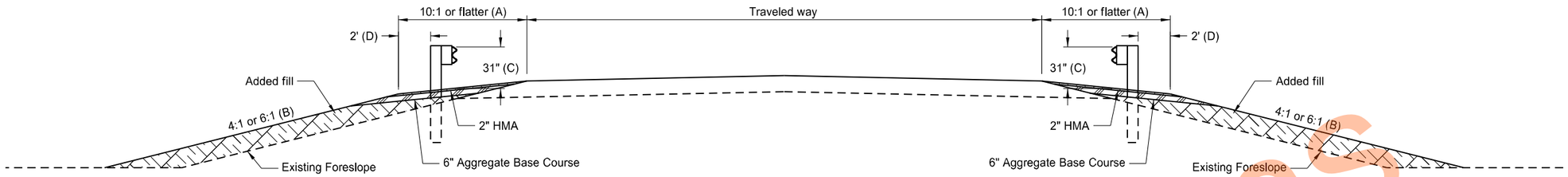
Kirk J Hoff

12 02 2020

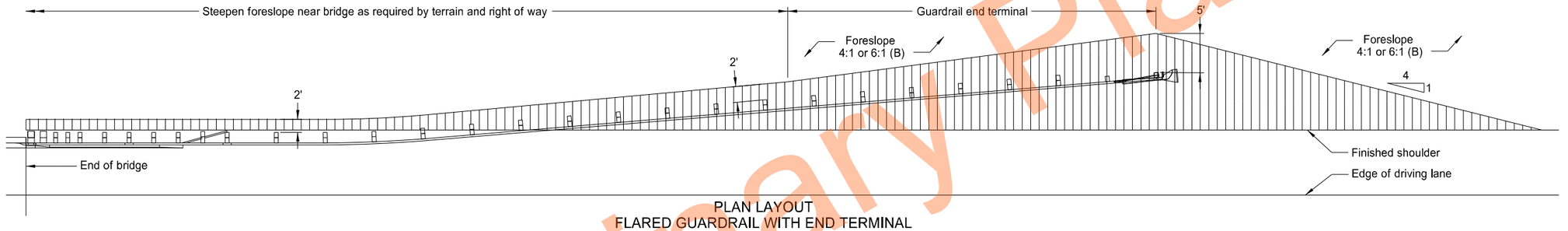
Preliminary Plans

D-764-48

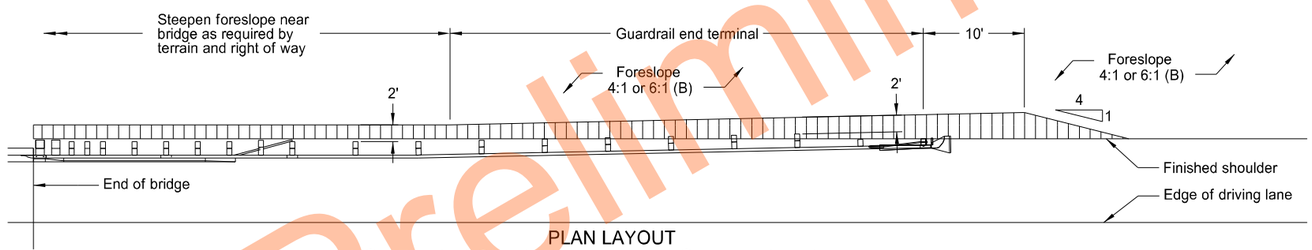
TYPICAL GRADING AT BRIDGE ENDS WITH MGS W-BEAM GUARDRAIL



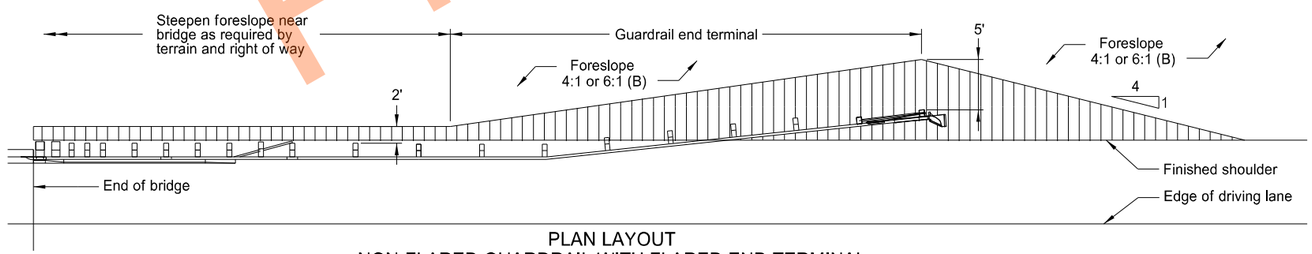
TYPICAL SECTION



PLAN LAYOUT
FLARED GUARDRAIL WITH END TERMINAL



PLAN LAYOUT
NON-FLARED GUARDRAIL WITH TANGENT END TERMINAL



PLAN LAYOUT
NON-FLARED GUARDRAIL WITH FLARED END TERMINAL

NOTES:

(A) Use slope flatter than 10:1 when required to provide proper guardrail height.

(B) When normal foreslope is 4:1, use added fill slope of 4:1. When normal foreslope is 6:1, use added fill slope of 6:1.

(C) Measure from top of guardrail to top of surfacing at front face of guardrail.

(D) Vary dimension at end terminals per Plan Layouts shown on this sheet.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-14-17	
REVISIONS	
DATE	CHANGE
12/02/20	Updated notes to active voice.

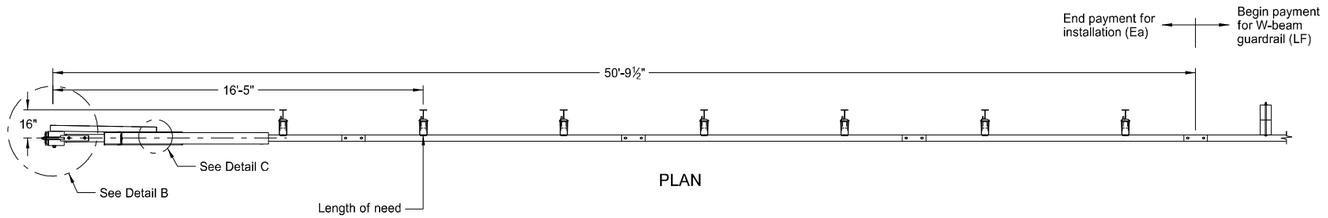
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

12 02 2020

Preliminary Plans

MASH SOFTSTOP END TERMINAL - STEEL POST

D-764-50

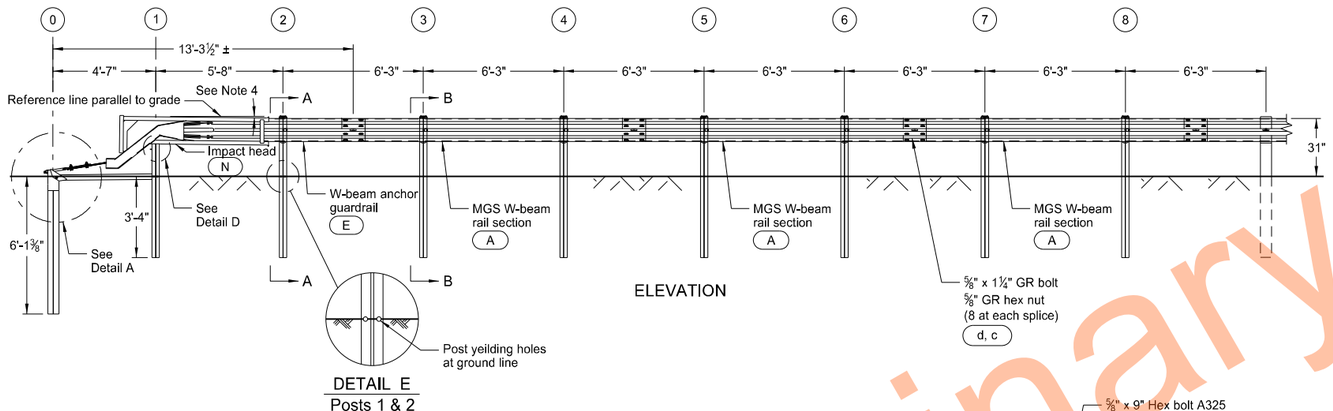


PLAN

GENERAL NOTES:

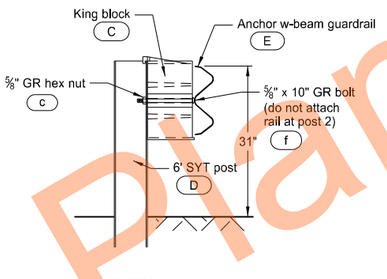
1. Galvanize all bolts, nuts, cable assemblies, cable anchors, and bearing plates.
2. Flare the SoftStop at a rate of 25:1 or flatter.
3. Do not curve the guardrail within the SoftStop under any circumstances.
4 If necessary, install the SoftStop impact head parallel to the grade line or with an upward tilt. See softstop assembly manual for specific details.

ITEM	ITEM NO.	BILL OF MATERIALS	QTY
A	000011	12 / 12'-6" / 3'-1½" / S MGS W-BEAM RAIL SECTION	3
B	000533	6'-0" STEEL POST W6 x 8,5	6
C	006777	KING BLOCK 4" X 7½" X 1'-2"	7
D	015000	6'-0" SYT POST / 8,5 / 31" GR HT	1
E	015200	SFST - ANCHOR GUARDRAIL 12'-6"	1
F	015201	SFST - ANCHOR ANGLE	2
G	015202	SFST - ANGLE STRUT	1
H	015203	SFST - POST #1 SYTP	1
J	015204	SFST - ANCHOR PADDLE	1
K	015205	SFST - POST #0	1
L	015206	SFST - PLATE WASHER	1
M	015207	SFST - KEEPER PLATE	1
N	015208	SFST - IMPACT HEAD	1
		HARDWARE	
a	003240	5/16" ROUND WASHER WIDE	6
b	003245	5/16" HEX NUT	3
c	003340	5/8" GR HEX NUT	41
d	003360	5/8" x 1¼" GR BOLT	32
e	003391	5/8" x 1¾" HEX BOLT A325	1
f	003500	5/8" x 10" GR BOLT A307	7
g	003701	¾" ROUND WASHER F436	4
h	003704	¾" HVY HEX NUT A563 DH	2
j	003717	¾" x 2½" HEX BOLT A325	2
k	003908	1" HVY HEX NUT A563 DH	1
l	004372	5/8" WASHER F436	4
m	004489	5/8" x 9" HEX BOLT A325	1
n	004902	1" ROUND WASHER F436	1
o	105285	5/16" x 2½" HEX BOLT GRD 5	2
p	105286	5/16" x 1½" HEX BOLT GRD 5	1

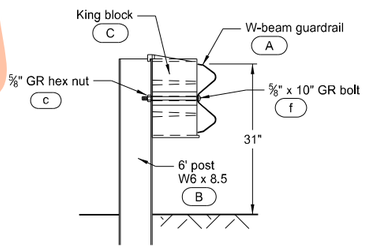


ELEVATION

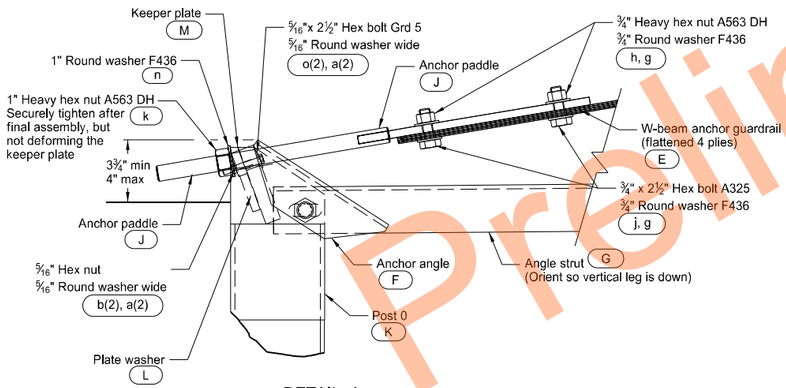
DETAIL E
Posts 1 & 2



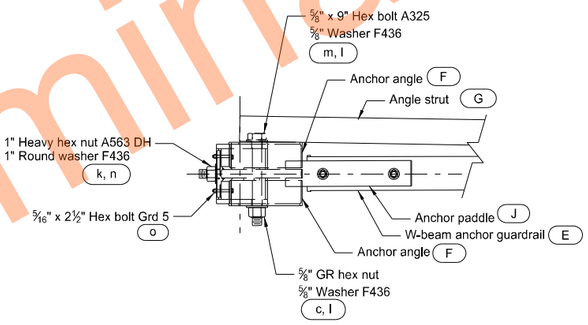
SECTION A-A
Post 2



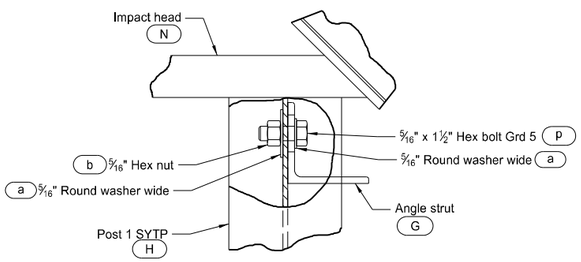
SECTION B-B
Posts 3 through 8



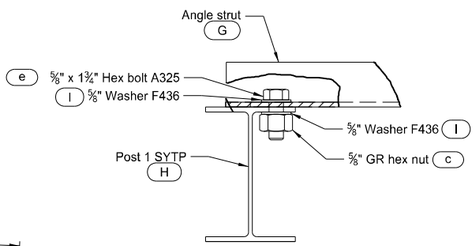
DETAIL A
Post 0



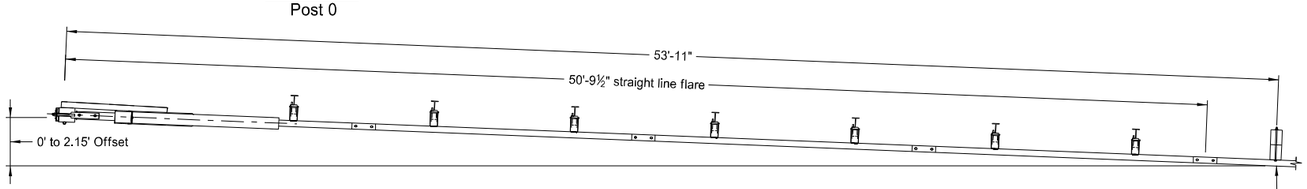
DETAIL B
Post 0



DETAIL D
Post 1



DETAIL C
Post 1
(shown near ground)



FLARED INSTALLATION
25:1 maximum flare rate

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-14-17	
REVISIONS	
DATE	CHANGE
12-02-20	Updated notes to active voice.

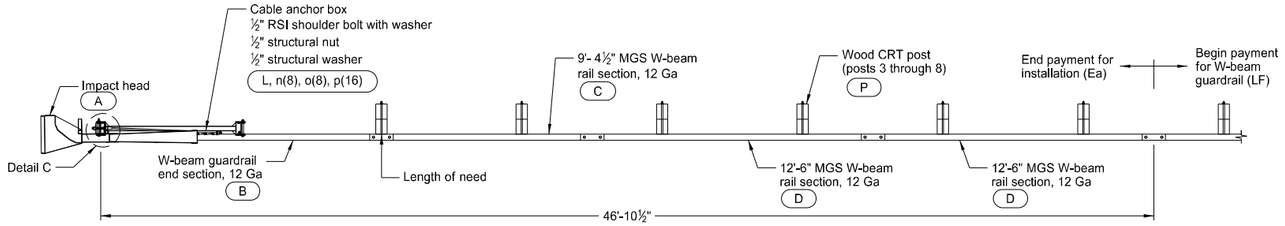
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12 02 2020

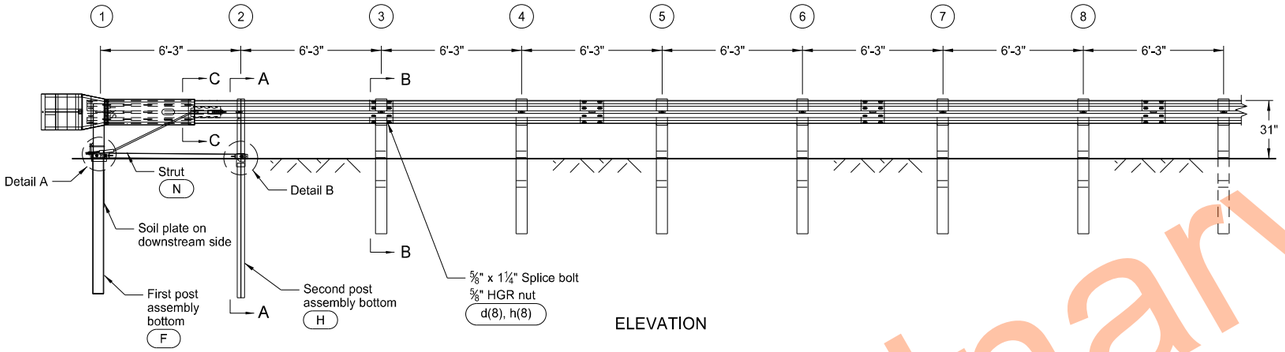
Preliminary Plans

MASH SEQUENTIAL KINKING TERMINAL - WOOD POST

D-764-51



PLAN

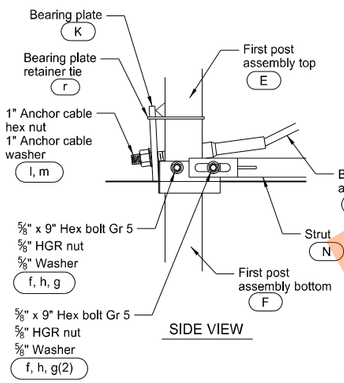


ELEVATION

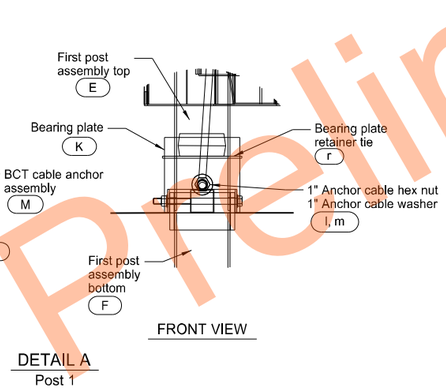
GENERAL NOTES:

1. Galvanize all bolts, nuts, cable assemblies, cable anchors, and bearing plates.
2. Flare the MSKT at a rate of up to 25:1, as needed to prevent the impact head from encroaching on the shoulder.
3. Site grade as necessary to ensure the lower sections of posts do not protrude more than 4" above the ground (measured along a 5' cord).
4. Install the lower section of the hinged posts without the upper post attached. If the post is placed in a drilled hole, compact the backfill material to prevent settlement.
5. Install breakaway cable assembly taut. Use a locking device (vice grips or channel lock pliers) to prevent the cable from twisting when tightening nuts.
6. "Toe nail" the wood blockouts to the rectangular wood posts at post 3 through post 8 with two 20 penny galvanized nails to prevent them from turning when the wood warps.

ITEM	ITEM NO.	BILL OF MATERIALS	QTY
A	MS3000	IMPACT HEAD	1
B	SF1303	W-BEAM GUARDRAIL END SECTION, 12 Ga	1
C	G12025	9'-4½" MGS W-BEAM RAIL SECTION, 12 Ga	1
D	G1203A	12'-6" MGS W-BEAM RAIL SECTION, 12 Ga	2
E	MTPHP1A	FIRST POST ASSEMBLY TOP (6" X 6" X⅛" Tube)	1
F	MTPHP1B	FIRST POST ASSEMBLY BOTTOM (6' W6X15)	1
G	UHP2A	SECOND POST ASSEMBLY TOP	1
H	HP2B	SECOND POST ASSEMBLY BOTTOM	1
K	E750	BEARING PLATE	1
L	S760	CABLE ANCHOR BOX	1
M	E770	BCT CABLE ANCHOR ASSEMBLY	1
N	MS785	STRUT	1
P	UP671	6' WOOD CRT POST	6
R	P675	WOOD BLOCKOUT OR RECYCLED EQUIVALENT	6
		HARDWARE	
a	B5160104A	5/16" x 1" HEX BOLT GR 5	2
b	W0516	5/16" WASHER	4
c	N0516	5/16" HEX NUT	2
d	B580122	⅝" Dia x 1¼" SPLICE BOLT	33
e	B581802	⅝" Dia x 18" HGR BOLT (POSTS 3 THRU 8)	6
f	B580904A	⅝" x 9" HEX BOLT GR 5	2
g	W050	⅝" WASHER	9
h	N050	⅝" Dia HGR NUT	35
j	B340854A	¾" Dia x 8½" HEX BOLT GRD A449	1
k	N030	¾" Dia HEX NUT	1
l	N100	1" ANCHOR CABLE HEX NUT	2
m	W100	1" ANCHOR CABLE WASHER	2
n	SB12A	½" RSI SHOULDER BOLT WITH WASHER	8
o	N012A	½" STRUCTURAL NUT	8
p	W012A	½" STRUCTURAL WASHER	8
r	CT-100ST	BEARING PLATE RETAINER TIE	1

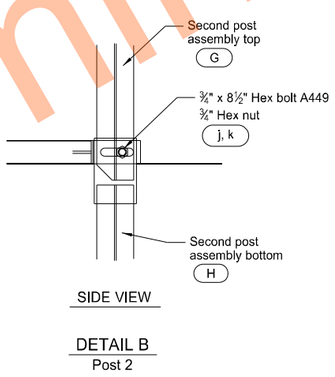


SIDE VIEW



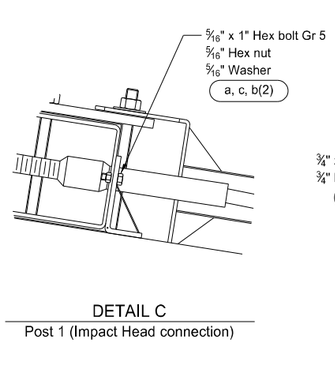
FRONT VIEW

DETAIL A
Post 1

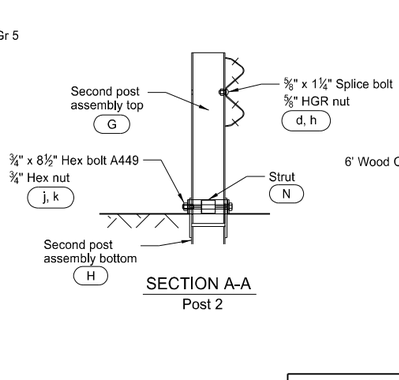


SIDE VIEW

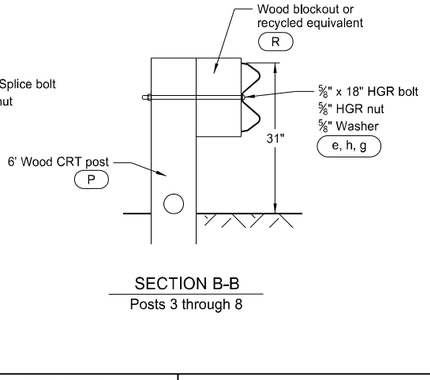
DETAIL B
Post 2



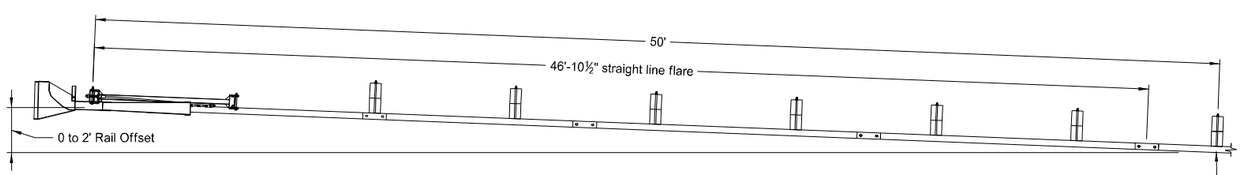
DETAIL C
Post 1 (Impact Head connection)



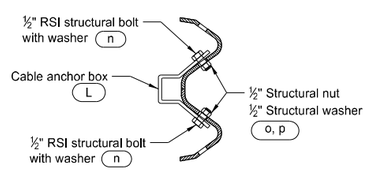
SECTION A-A
Post 2



SECTION B-B
Posts 3 through 8



FLARED INSTALLATION
25:1 maximum flare rate



SECTION C-C

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-14-17	
REVISIONS	
DATE	CHANGE
12-02-20	Updated notes to active voice.

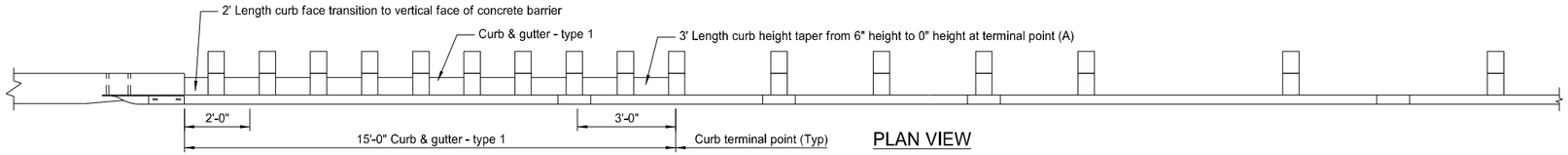
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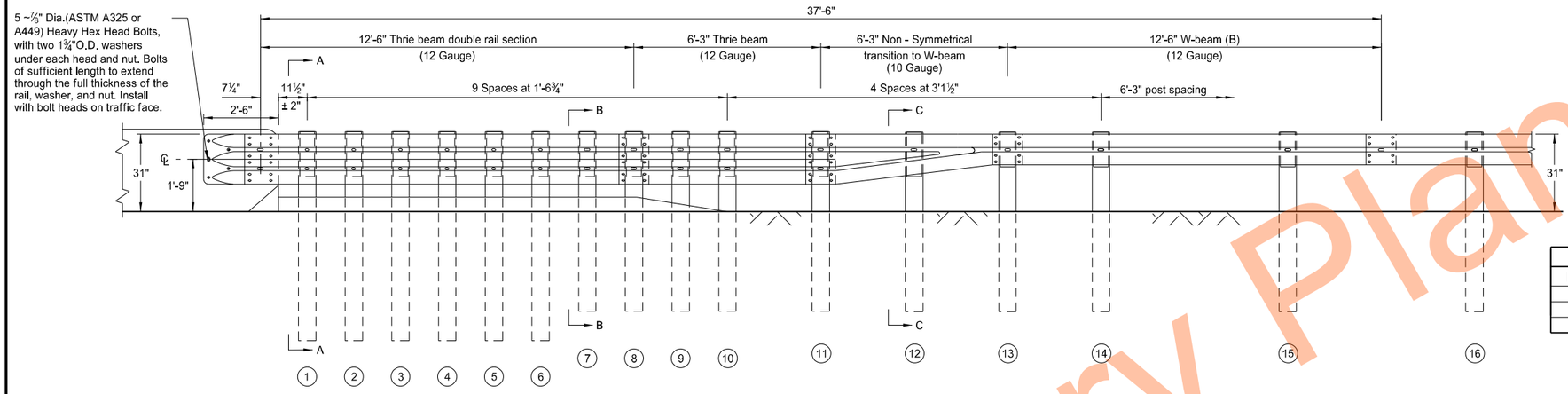
Preliminary Plans

MGS W-BEAM TRANSITION WITH APPROACH CURB TO CONCRETE SINGLE SLOPE OR JERSEY BARRIER

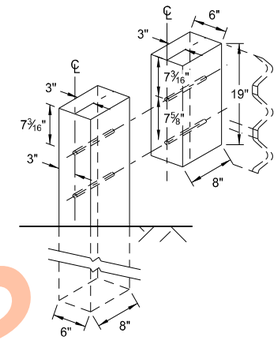
D-764-60



PLAN VIEW

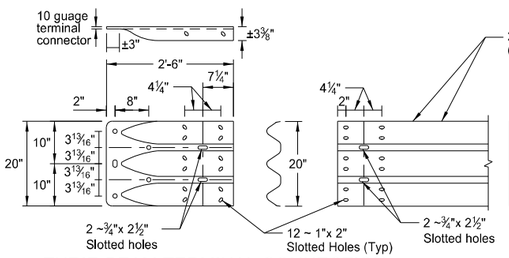


ELEVATION VIEW

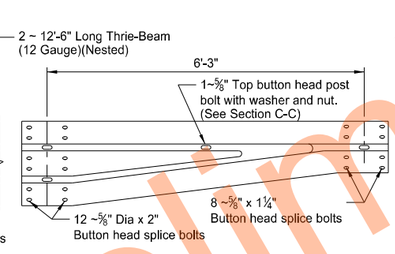


WOOD BLOCK
TO RECTANGULAR WOOD POST
(At posts 1 to 11)

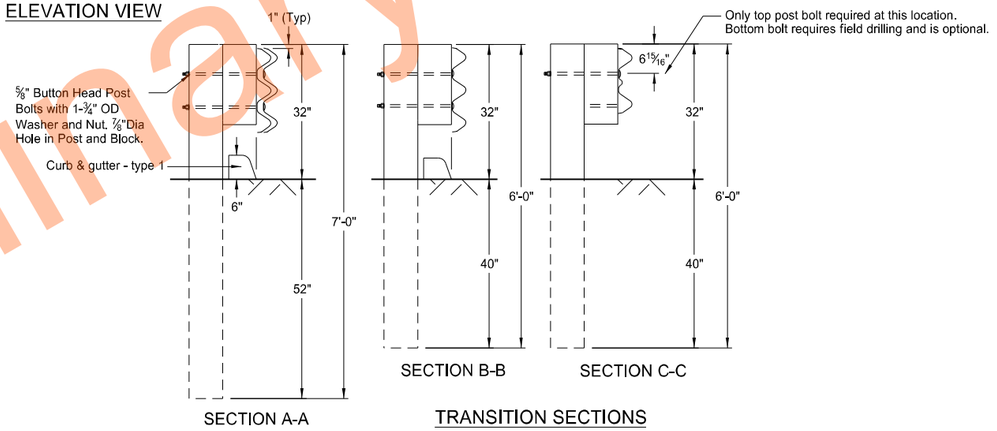
TRANSITION POST AND TIMBER BLOCKOUT SIZING		
POST NO.	POST SIZE	BLOCKOUT SIZE
1-6	6" X 8" X 7'-0" long	6" X 8" X 19"
7-12	6" X 8" X 6'-0" long	6" X 8" X 19"
13-16	6" X 8" X 6'-0" long	6" X 8" X 14"



THRIE-BEAM TERMINAL CONNECTION

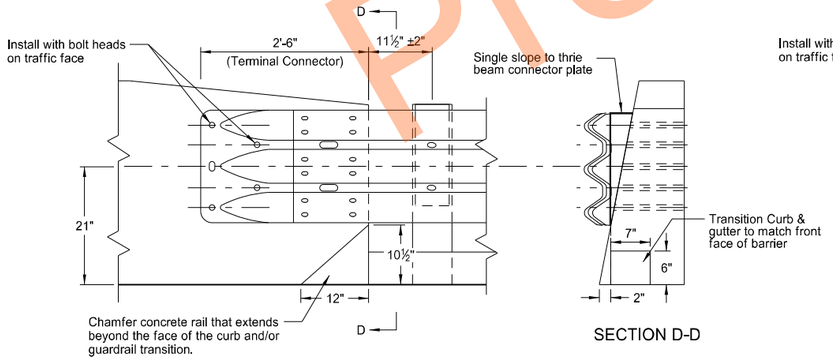


NON - SYMMETRICAL TRANSITION
TO W-BEAM (10 GAUGE)



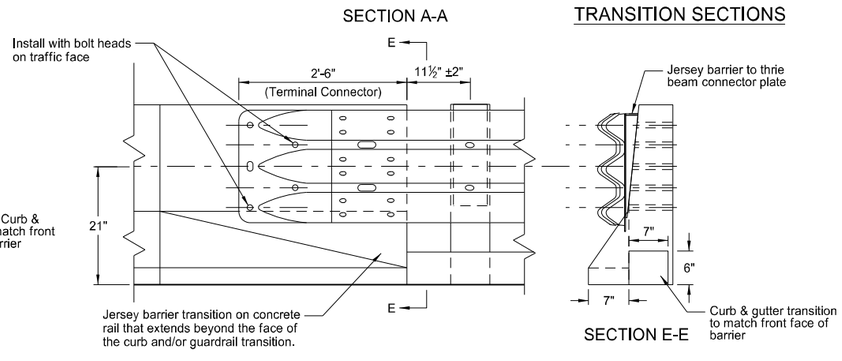
SECTION A-A
SECTION B-B
SECTION C-C

TRANSITION SECTIONS



SECTION D-D

CONNECTION TO CONCRETE SINGLE SLOPE BRIDGE RAIL AND TRAFFIC BARRIERS



SECTION E-E

CONNECTION TO CONCRETE JERSEY BARRIER BRIDGE RAIL AND TRAFFIC BARRIERS

(A) Where curb is required to continue past 15' length, taper the curb down to 3" height at the terminal point shown above, instead of 0" height. Use 3" height curb between posts 10 and 16.

(B) Install 12'-6" length W-beam double rail section at location where curb extends past 15' length.

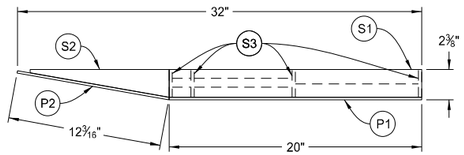
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-14-17	
REVISIONS	
DATE	CHANGE
12-02-20	Updated notes to active voice.

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Preliminary Plans

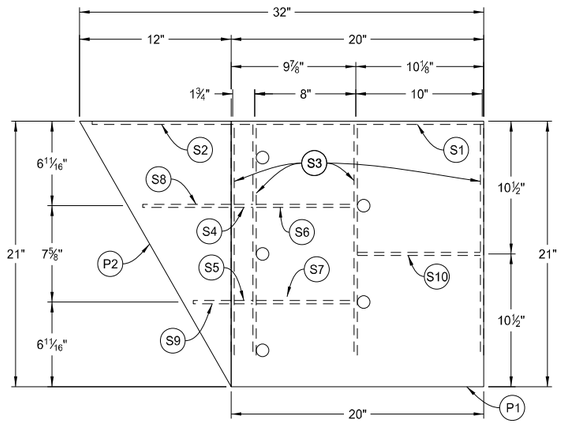
JERSEY BARRIER TO THRIE BEAM CONNECTOR PLATE DETAILS

D-764-62

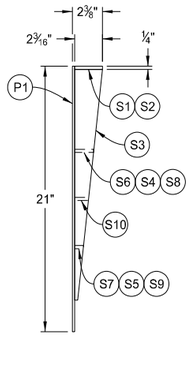


PLAN

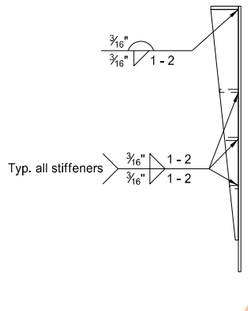
NOTE: Assembly Detail is shown for guardrail installation on right hand side of entrance end of bridge barrier. Mirror for opposite side installation.



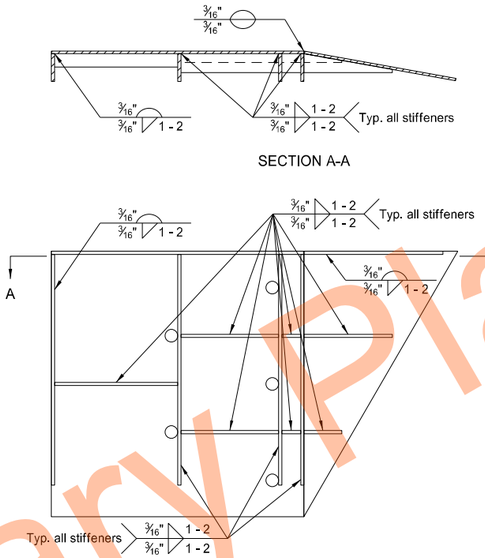
ELEVATION



END



END

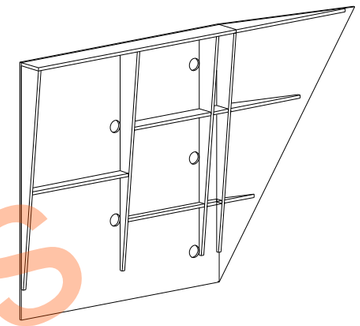


SECTION A-A

ELEVATION

ASSEMBLY DETAIL
(Front View)

WELDING DETAIL
(Back View)



PICTORIAL DRAWING
(Showing Back of Connector Plate)

WELDING INSTRUCTIONS:

(A) Weld stiffeners located on the outside edges of the cover plates as follows: 3⁄16" continuous back weld on exterior sides and 3⁄16" fillet weld 1" long spaced at 2" center-to-center on interior sides.

(B) Weld stiffeners located on the inside of the cover plates as follows: 3⁄16" fillet weld 1" long spaced at 2" center-to-center.

(C) Weld cover plates P1 and P2 together with a 3⁄16" continuous back weld on both sides.

(D) Weld components with E60 rod.

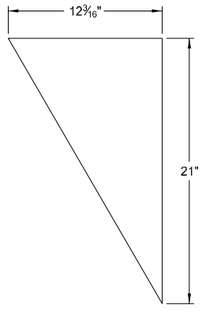


PLATE P2
Quantity: 1

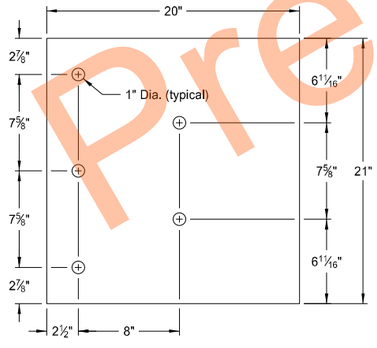
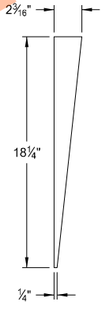


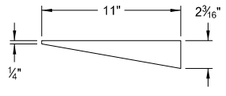
PLATE P1
Quantity: 1

COVER PLATES

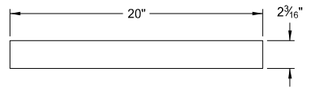


TYPE S3
Quantity: 4

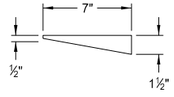
VERTICAL PLATES



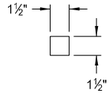
TYPE S2
Quantity: 1



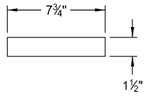
TYPE S1
Quantity: 1



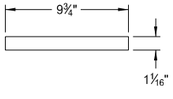
TYPE S8
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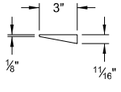
TYPE S4
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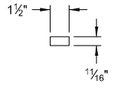
TYPE S6
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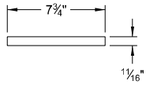
TYPE S10
Quantity: 1



TYPE S9
Quantity: 1



TYPE S5
Quantity: 1



TYPE S7
Quantity: 1

HORIZONTAL PLATES

STIFFENER PLATES

NOTES:

1. Fabricate cover plates P1 and P2 from 3⁄16" thick ASTM A36 Grade structural steel.
2. Fabricate stiffener plates from ¼" thick ASTM A36 Grade structural steel.
3. Galvanize connector plate in accordance with AASHTO M111.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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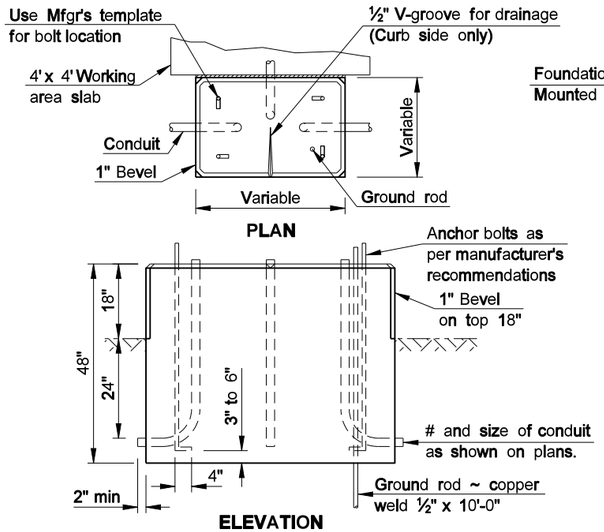
Kirk J Hoff

12 02 2020

Preliminary Plans

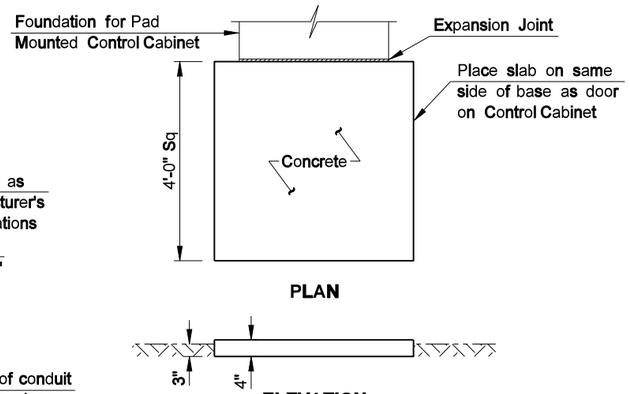
CONCRETE FOUNDATIONS
(TRAFFIC SIGNALS & HIGHWAY LIGHTING)

D-770-1



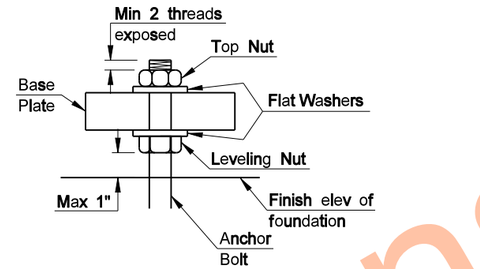
CONTROLLER CABINET FOUNDATION PAD MOUNT

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

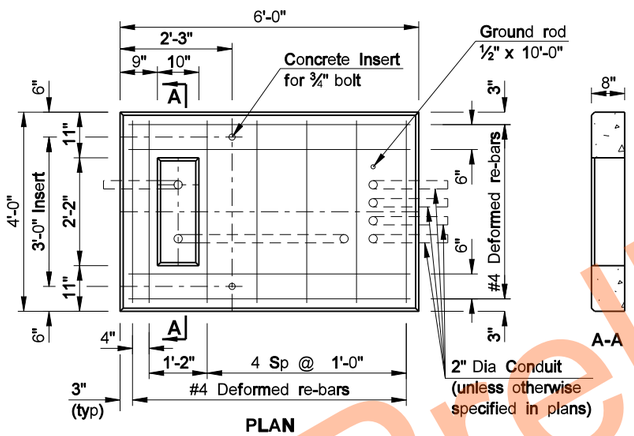


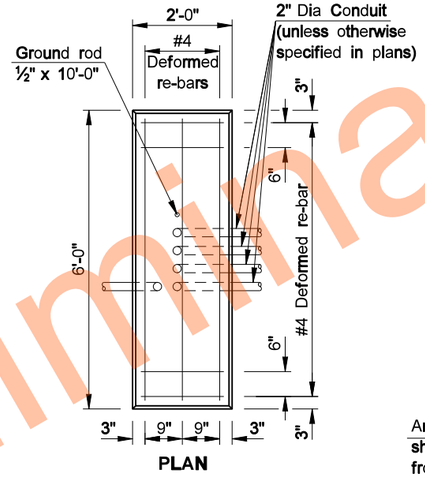
WORKING AREA SLAB

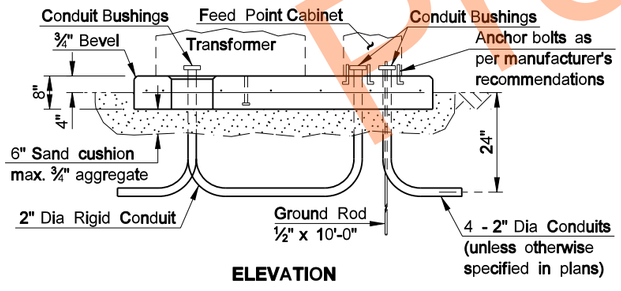
The Working Area Slab shall be installed where shown on the plans and shall not be bid separately but shall be included in the price bid for Concrete Foundation - Traffic Signals.



ANCHOR BOLT DETAIL

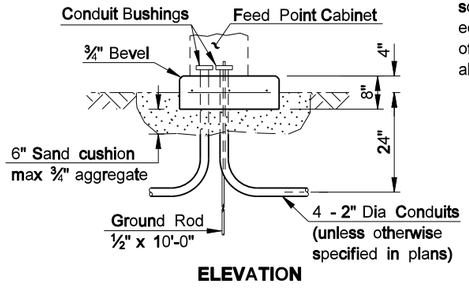






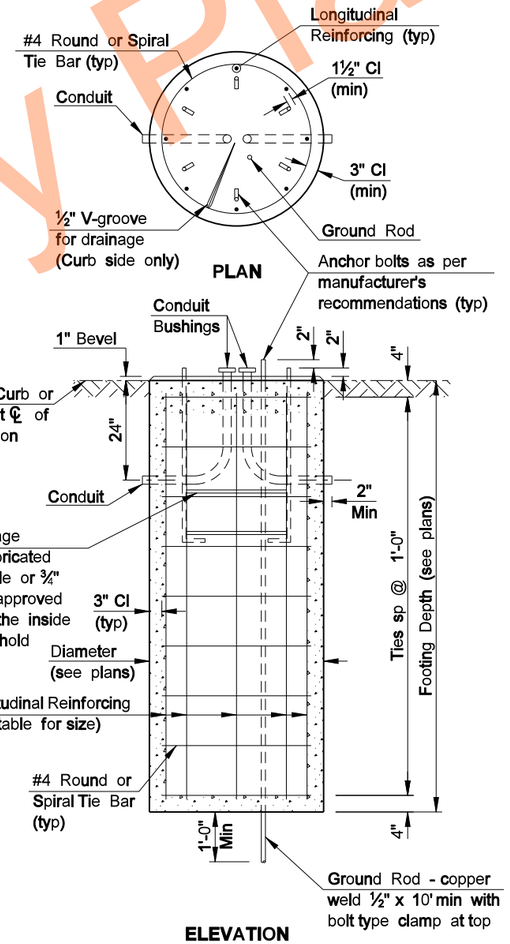
TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNT

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



FEED POINT CABINET FOUNDATION PAD MOUNT

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



LIGHT & SIGNAL STANDARD FOUNDATION

NOTES:

LIGHT & SIGNAL STANDARD FOUNDATIONS: See plans for conduit size, number of bends and correct position for each foundation. When conduit does not continue beyond the foundation, conduit with a 105° bend and bushings on both ends may be substituted for the 90° bends shown. See plans for correct size & location of foundations. The grade and exact location shall be established by the Engineer in the field. All reinforcing shall be Grade 60. Tie bars shall have a minimum of a 12" lap. Reinforcing may be omitted for Type I, II, V, VI & VII signal standard foundations if the anchor bolts extend to within 3" to 6" above the bottom of the foundation. A minimum of 6 anchor bolts shall be used for cantilevered structures.

CONTROLLER CABINET FOUNDATION PAD MOUNT FOUNDATION: See plans for the number of 90° bends per foundation and correct positioning. The foundation for Pad Mounted Controller Cabinet shall be of sufficient size so that there is a minimum of 3" of clearance from the outside edge of cabinet to the outside edge of the foundation on any side. The contractor shall ensure a water-tight seal between the controler cabinet and the foundation by caulking, except for V-groove.

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

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

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
6-15-10	
REVISIONS	
DATE	CHANGE

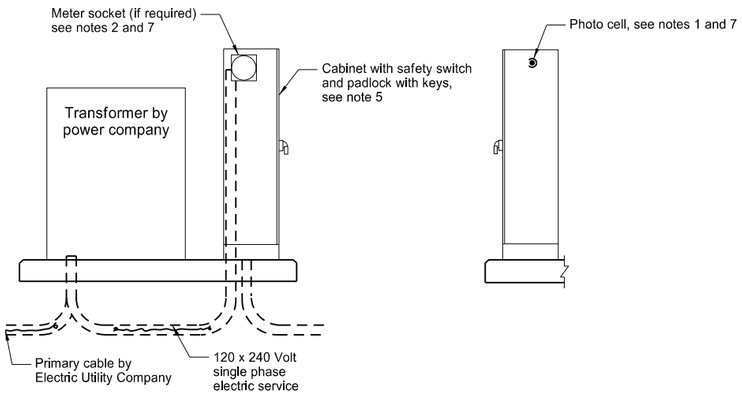
This document was originally issued and sealed by Terrence R. Udland Registration Number PE- 2674 , on 6/15/10 and the original document is stored at the North Dakota Department of Transportation

Preliminary Plans

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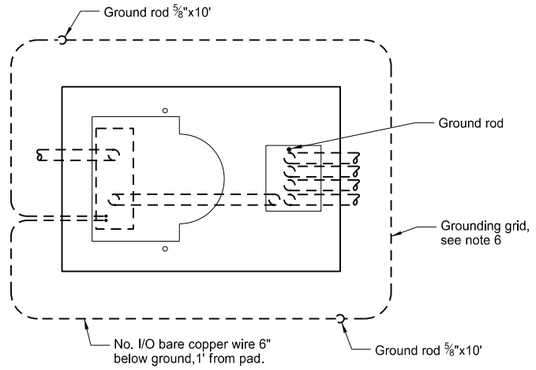
FEED POINTS
(ROADWAY LIGHTING)

D-770-2



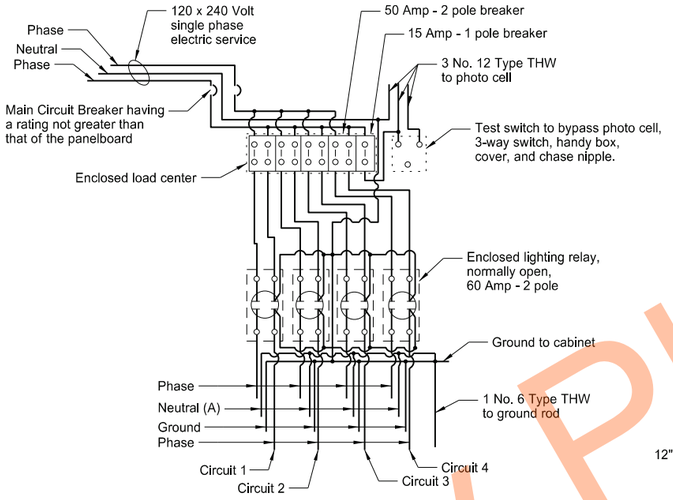
Elevation

Photo Cell
Mounting Detail



Plan

Transformer and Feed Point Cabinet Pad Mounted



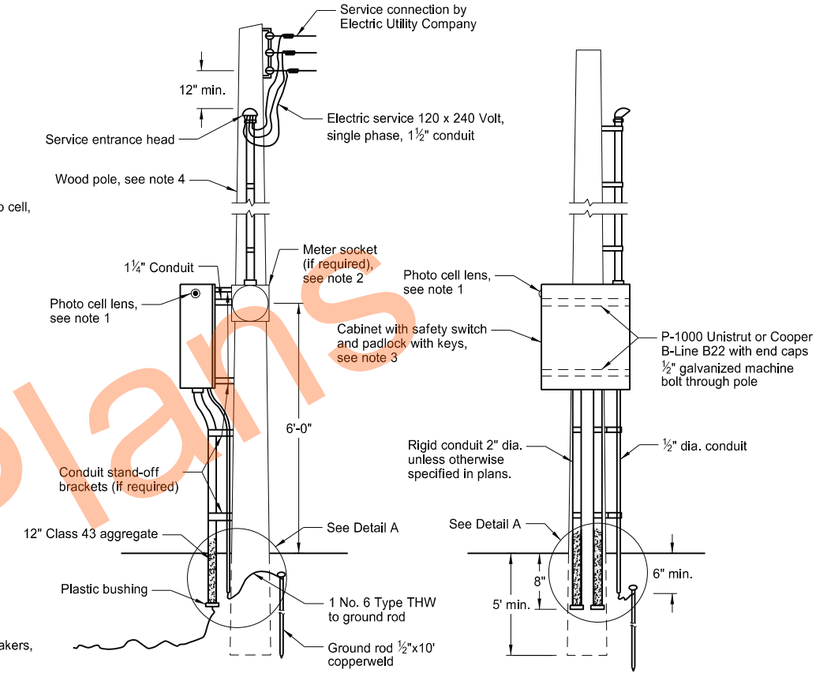
Feed Point Type IV

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.

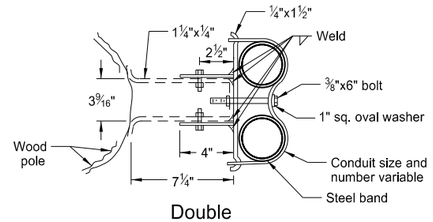
Provide Type II feed point similar to Type IV, except with two electrical circuit, two 50 Amp - 2 pole breakers, and two lighting relays, normally open.

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.

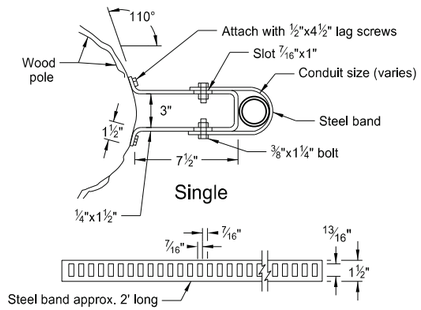
(A) Install when festoon circuit is required.



Feed Point Pole Mounted



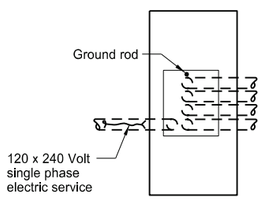
Double

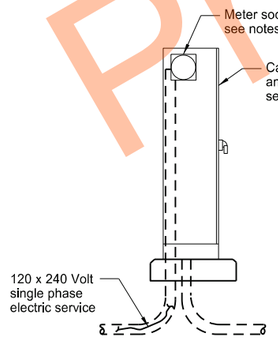


Single

Conduit Standoff Bracket

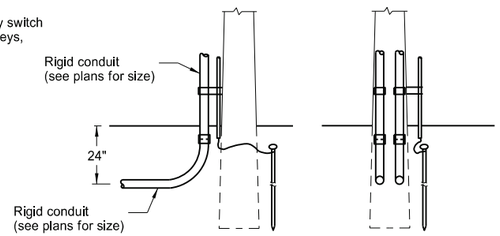
Omission of conduit standoff brackets allowed when not required by local utility company.





Plan Elevation

Feed Point Cabinet Pad Mounted



Detail A

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

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.
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
07-08-14	Revised note 3.
10-17-17	Updated to active voice.
08-28-19	New Design Engineer PE Stamp.
11-01-24	Revised note 5.

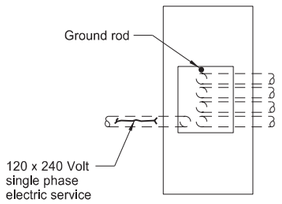
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
12/06/24
ENGINEER
NORTH DAKOTA

Preliminary Plans

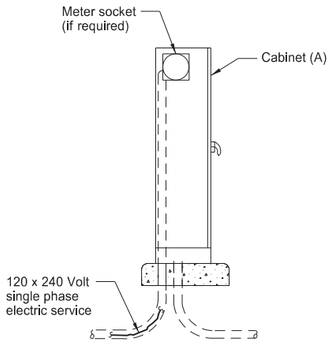
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FEED POINT - TRAFFIC SIGNALS

D-772-1



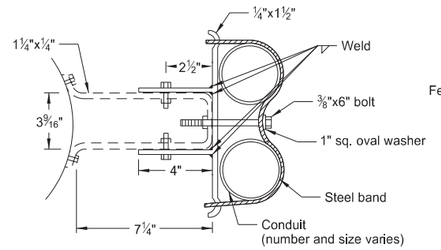
Plan

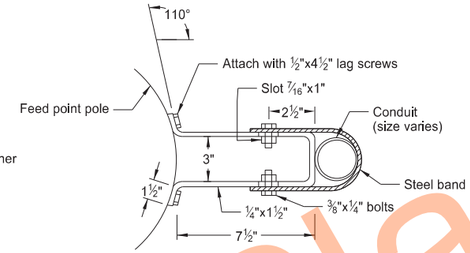


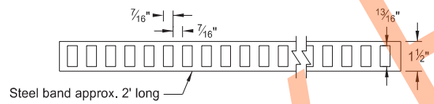
Elevation

Circuit Breaker Cabinet Pad Mounted

(A) Provide weatherproof cabinet, 56 in. high x 26 in. wide x 14 in. deep, 12 gauge steel (min.) or aluminum with provisions for padlock. Place one coat of primer and two coats of exterior dark green enamel on steel cabinet.

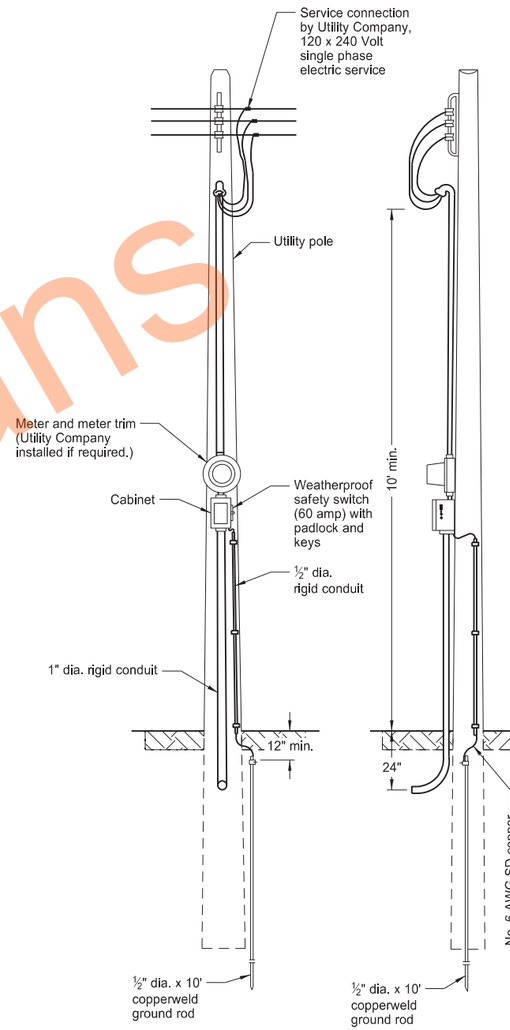






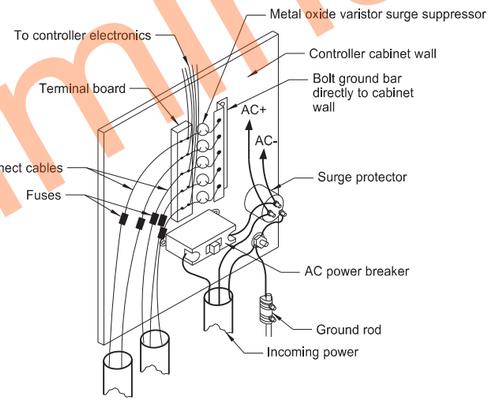
Conduit Standoff Bracket

Use when required by local Utility Company.

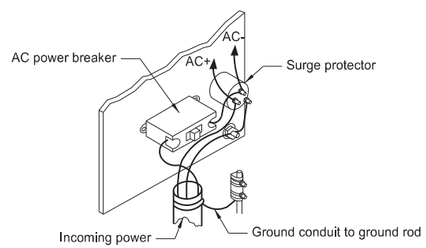


Front View

Side View



Controller Cabinet
Interconnect and Power Cable
Lightning Protection



Feed Point Cabinet
Lightning Protection

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-14-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
8-28-19	New Design Engineer PE Stamp.
8-09-24	Electronic Stamp/Signature.

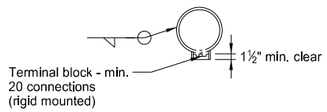
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/09/24

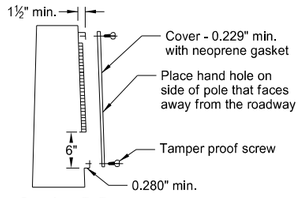
Preliminary Plans

TRAFFIC SIGNAL STANDARDS

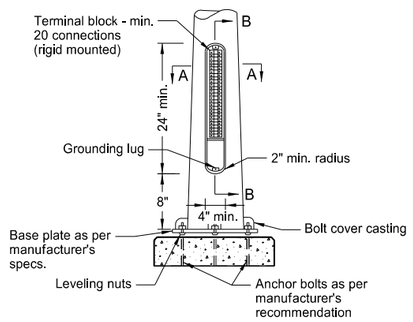
D-772-2



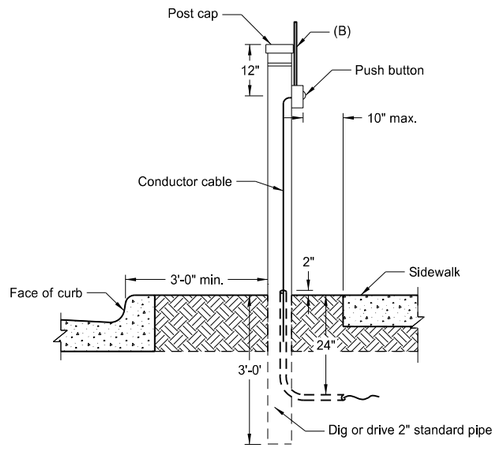
Section A-A



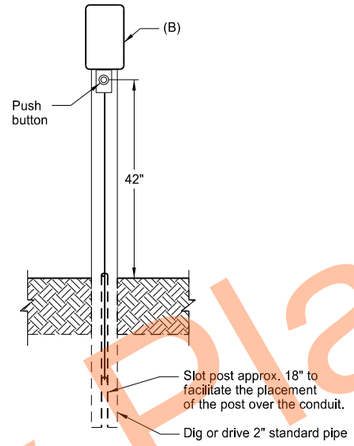
Section B-B



Alternate Signal Standard Base
For use only with Type V, VI, and VII signal standards.

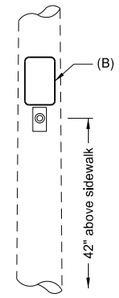


Side View

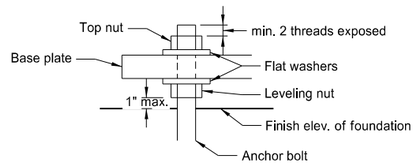


Front View

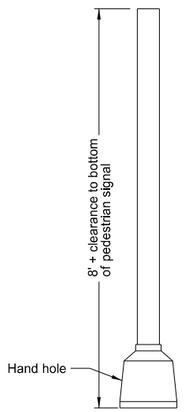
Pedestrian Push Button Post Details (A)



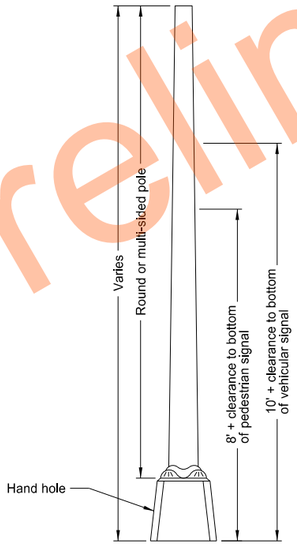
Signal Standard Mounted
Pedestrian Push Button Detail



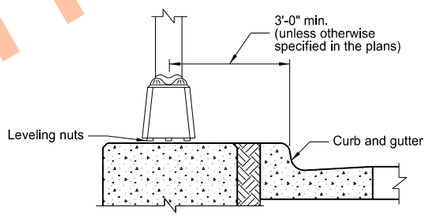
Anchor Bolt Detail

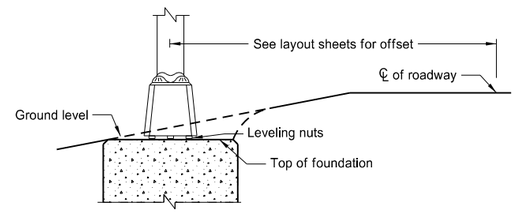


Type II



Type V, VI, VII





Signal Standard
Minimum Clearance Details

(A) Use positioning of the sign, pushbutton, and direction of arrow to clearly indicate which crosswalk is actuated by the push button. Place type of sign based on the jurisdiction in which placed.

(B) Attach sign to post using rust resistant 0.081 aluminum bracket and banding. See Standard Signs book for dimensions and legend series. See plans for type of sign.

Notes:

Signal Heads: See traffic signal layout for correct mounting position, number, size, and arrangement of lenses.

Steel Standards: Place signal standard a minimum of 3 ft. from the face of the curb to center of signal standard, unless shown otherwise on layout sheets.

Paint: See note sheet for required color of paint.

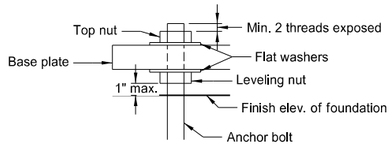
Transformer Base: In lieu of transformer base use alternate signal standard base.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-14-13	
REVISIONS	
DATE	CHANGE
10-17-17 10-25-19	Updated to active voice. Added 10" dim for ped pushbutton.

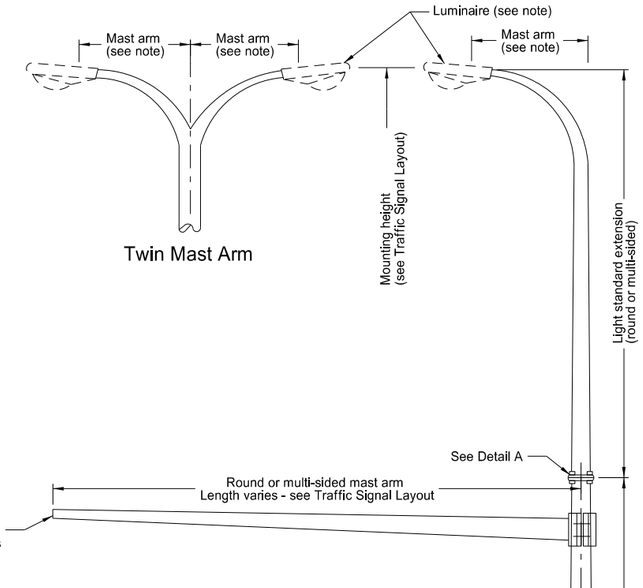
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/25/19 and the original document is stored at the North Dakota Department of Transportation

Preliminary Plans

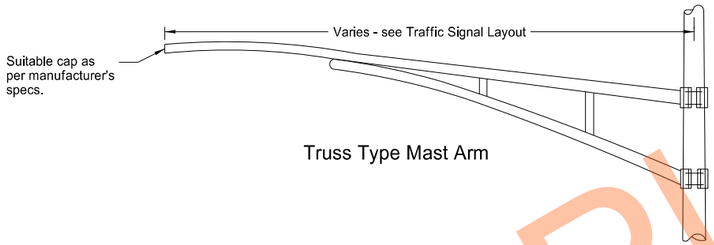
TRAFFIC SIGNAL STANDARDS
(MAST ARM TYPE)



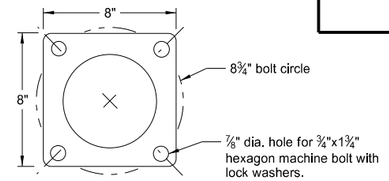
Anchor Bolt Detail



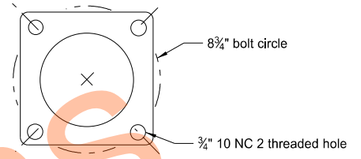
Twin Mast Arm



Truss Type Mast Arm



¾" Top Plate



¾" Bottom Plate

Detail A

Note: In lieu of the plate type connection, use a telescoping clamp type extension.

Combination Signal and Light Standard			
Signal Standard Type	Luminaire Mounting height (ft)	Install Light Standard Extension and Luminaire	Luminaire Mast Arm
A	30	yes	single
B	30	(A)	single
C	40	yes	single
D	40	(A)	single
E	30	yes	twin
F	30	(A)	twin
G	40	yes	twin
H	40	(A)	twin
I	50	yes	single
J	50	yes	twin

(A) Install the light standard extension for these signal standards at a later date under a separate contract.

Notes:

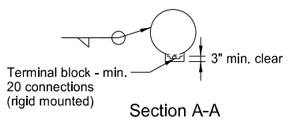
Light standard extension: Mast arm is 6 ft. unless otherwise noted on the plans. Use light standard extension galvanized in accordance with ASTM A 123.

Luminaire: Use internal ballast - constant wattage 120 x 240 voltage luminaires. See layout sheets for type of luminaire, wattage, and I.E.S. distribution.

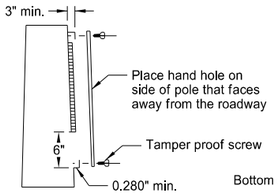
Signal head: See Traffic Signal Layout for correct mounting position, number, size, and arrangement of lenses. Place mast arm mounted signal heads with a clearance between 17 ft. and 19 ft. from the ℄ of the roadway to the bottom of signal heads.

Multi-sided poles: Provide a means, other than friction, that will not allow the mast arm to be rotated by wind forces. Fabricate the pole so the mast arm is rotatable. This feature to be as approved by the Engineer.

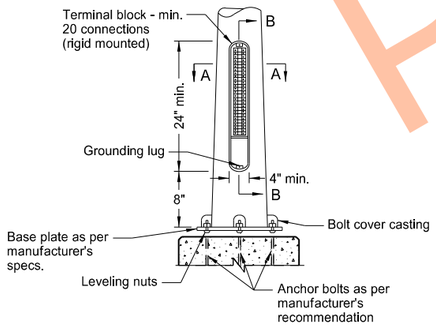
Transformer base: In lieu of the transformer base, use the alternate signal standard base.



Section A-A

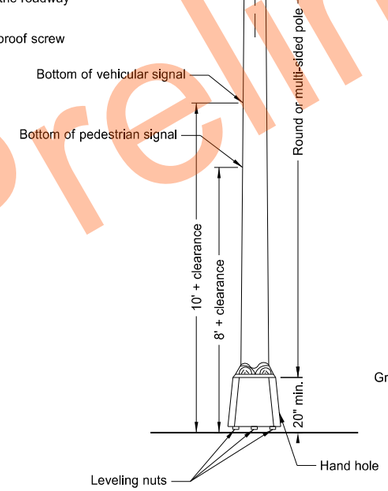


Section B-B

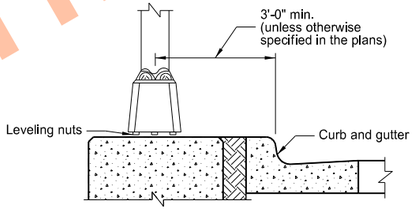


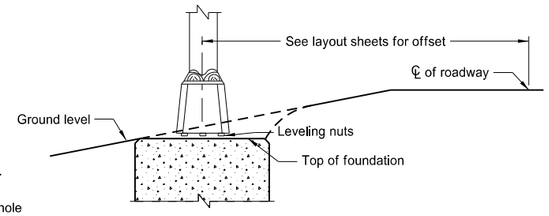
Alternate Signal Standard Base

Note: For use with Type IV and combination signal standards only

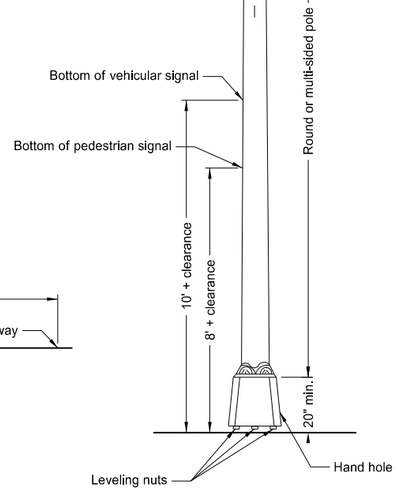


Combination Signal and Light Standard





Signal Standard Minimum Clearance Detail



Type IV Signal Standard

(B) On combination signal and light standards Type B, D, F, and H, and on all Type IV signal standards install a suitable pole cap as per manufacturer's specifications.

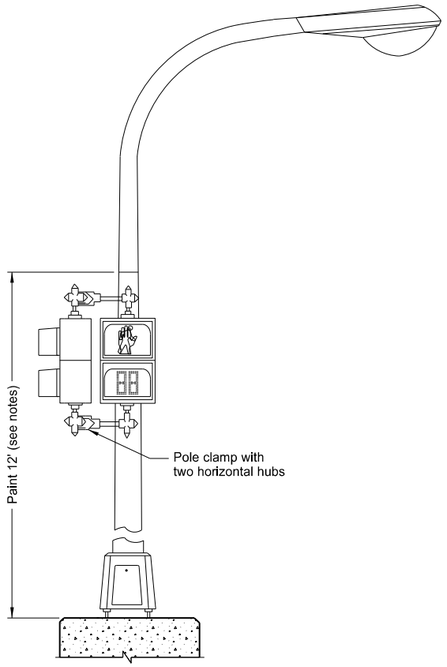
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-14-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-28-19	New Design Engineer PE Stamp.

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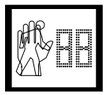
Preliminary Plans

TRAFFIC SIGNAL HEAD MOUNTING

D-772-4

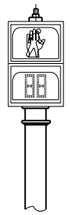


Light Standard Mounted
Pedestrian Signal Head (A)



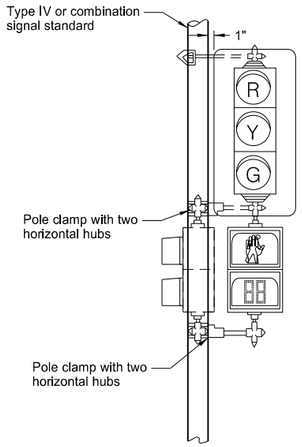
Pedestrian countdown timer

(A) See plans for the appropriate orientation and type of pedestrian signal head to use.



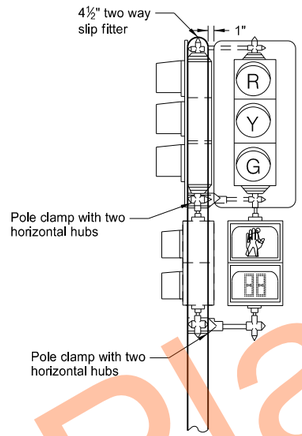
Type II

Pedestal Mounted - Pedestrian (A)



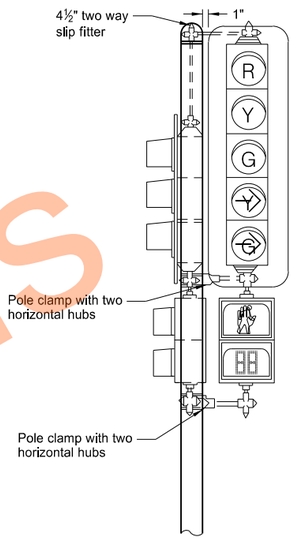
Type IV

Post Mounted - Vehicular
Post Mounted - Pedestrian (A)



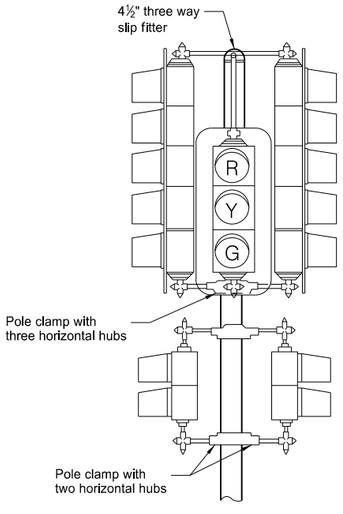
Type V

Post Mounted - Vehicular
Post Mounted - Pedestrian (A)



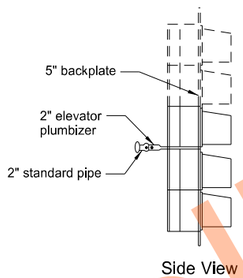
Type VI

Post Mounted - Vehicular
Post Mounted - Pedestrian (A)



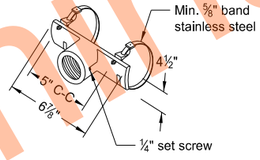
Type VII

Post Mounted - Vehicular
Post Mounted - Pedestrian (A)

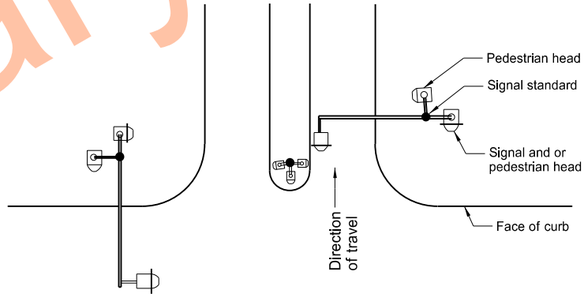


Side View

Mid-Span Mounted and
Mast Arm Rigid Mounted
Signal Heads

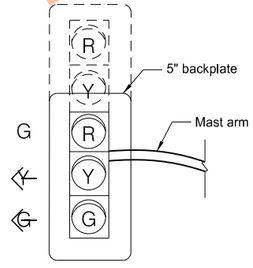


Mast Arm Signal
Head Bracket

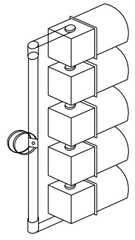


Plan Layout
(typical)

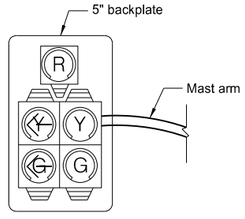
Note: Place signal heads behind the face of the curb.



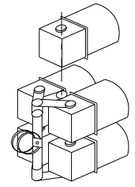
Front View



Isometric View



Front View



Isometric View

End Mounted and Mast Arm Rigid Mounted
Signal Heads

Notes:

Reinforcing Plates: Install reinforcing plates where mounting hardware attaches to signal heads when using polycarbonate signal heads. Where a plumbizer is used, place reinforcing plates on each side of the plumbizer.

Clearance: Place the bottom of post or pedestal mounted vehicular signal heads a minimum of 10 ft. and pedestrian signal heads a minimum of 8 ft. above the ground line or sidewalk.

Signal Heads: See traffic signal layout for correct mounting position, numbers, size, and arrangement of lenses.

Pole Clamps: A pole plate with suitable banding material, as approved by the Engineer, is allowed in place of pole clamps. Where traffic signal heads and pedestrian signal heads are mounted one above the other, one pole clamp assembly is allowed.

Paint: Paint signal housing yellow and backplates dull black. Paint pole clamps and signal head mounting hardware the same color as the signal standard shaft.

When pedestrian heads are light standard mounted, paint the lower 12 ft. the same color as the other traffic signal standards.

Mounting Details: All signal heads shown viewed from direction of travel.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-14-13	
REVISIONS	
DATE	CHANGE
7-8-14 10-17-17 8-28-19	Added reinforcing plate note Updated to active voice. New Design Engineer PE Stamp.

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Preliminary Plans