DESIGN DATA				
Traffic	Average Daily			
Current 2020	Pass: 15,875	Trucks: 310	Total: 16,185	
Forecast 2040	Pass: 19,370	Trucks: 425	Total: 19,795	
Clear Zone Distance: N/A		Design Speed: N/A		
Minimum Sight Dist. for Stopping: N/A		Bridges: N/A		
Sight Dist. for No Passing Zone: N/A				
Pavement Design Life N/A				
Design Accumulated One-way flexible ESALs: N/A				

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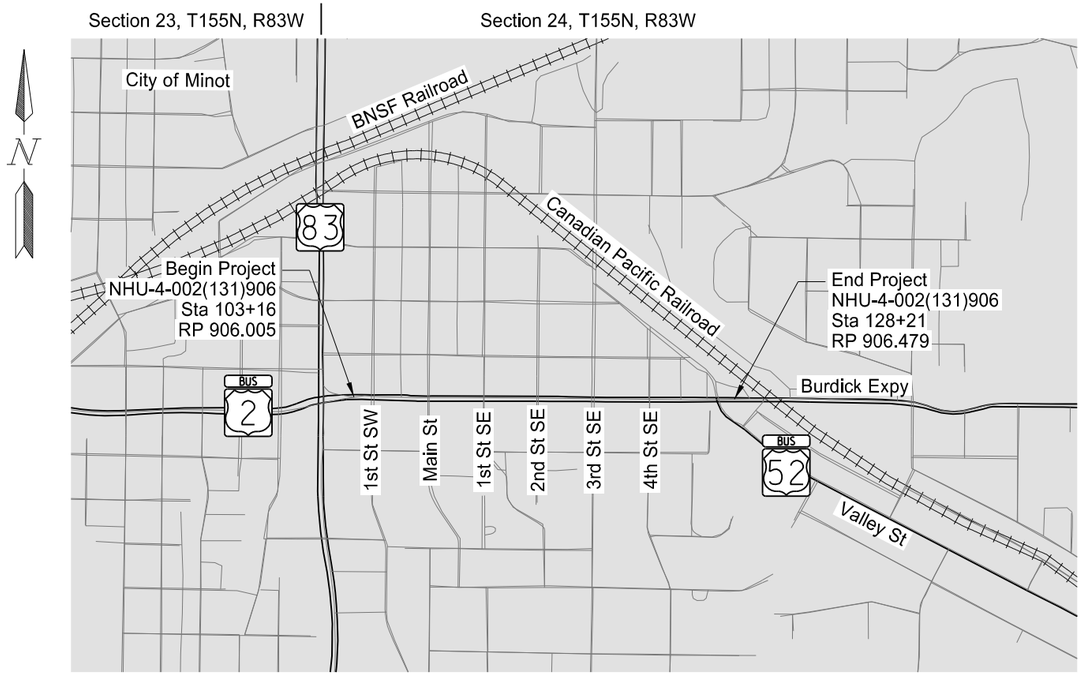
JOB # 26
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

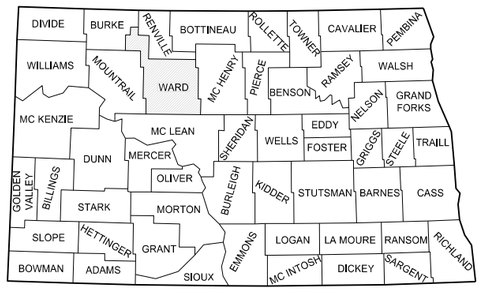
NHU-4-002(131)906

Ward County
City of Minot
Burdick Expy / US 2B - 1st St SW to Valley Street
HMA, Milling, ADA Curb Ramps
Signals & Lighting

GOVERNING SPECIFICATIONS:
2020 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NHU-4-002(131)906	0.474	0.474





STATE COUNTY MAP

DESIGNER
Alex Ausk, PE

DESIGNER
Dawn Michel, PE

DESIGNER
Dalton Dryburgh, EI

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Approval Name	Date Signed
Chad M. Orn /s/	8/31/2020

Apex Engineering Group, Inc.

This document was originally issued and sealed by Matthew T. Kinsella, Registration Number PE- 5692 , on 8/25/2020 and the original document is stored at the North Dakota Department of Transportation

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PLAN SECTIONS

SPECIAL PROVISIONS

Number	Description
SP 17(20)	Utility Coordination
SP 75(20)	Temporary Pedestrian Facilities
SSP 1	Temporary Erosion and Sediment Best Management Practices
SSP 4	Longitudinal Joint Density

LIST OF STANDARD DRAWINGS

Number	Description
D-101-1, 2, 3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32	Symbols
D-261-1	Erosion Control - Fiber Roll Placement Details
D-704-2	Traffic Control For Coring Of Hot Bituminous Pavement
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, 11A	Construction Sign Details - Warning Signs
D-704-12	Shoulder Closure Tapers
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-25	Lane Closures On Urban Streets Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Mobile Operation (Pavement Marking)
D-704-34	Sign Layout For One Lane Closure
D-704-50	Portable Sign Support Assembly
D-706-1	Bituminous Laboratory
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D-724-1	Waterworks
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D-750-3	Curb Ramp Details
D-754-23	Perforated Tube Assembly Details
D-754-24, 25	Mounting Details Perforated Tube
D-754-26, 27, 28	Sign Punching, Stringer, and Support Location Details Regulatory, Warning and Guide Signs
D-754-80	Light Standard, Signal Standard, And Span Wire Mounted Sign Assembly Detail
D-754-86	911 Sign Support Information And Sign Details
D-754-87	Sign Punching, Stringer And Support Location Details For Street Name Signs And 911 Signs
D-762-1	Pavement Marking Message Details
D-762-4	Pavement Marking
D-770-1	Concrete Foundations (Traffic Signals & Highway Lighting)
D-770-5	Light Standard Details

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N

83

Improvement Area
1st St SE
NW, NE, SW & SE Corners

Improvement Area
2nd St SE
NW, SW & SE Corners

Improvement Area
3rd St SE
NW, NE, SW & SE Corners

Improvement Area
4th St SE
NW, NE, SW & SE Corners

Improvement Area
Valley St
NW, NE, SW & SE Corners

Improvement Area
1st St SW
NW, NE, SW & SE Corners

Improvement Area
Main St
NW, NE, SW & SE Corners

Begin Project
NHU-4-002(131)906
Sta 103+16
RP 906.005

End Project
NHU-4-002(131)906
Sta 128+21
RP 906.479

BUS
2

100 105 110 115 120 125 128

Burdick Expy W \ US 2 B

Burdick Expy E \ US 2 B

5th St SW
Park St SW
4th St SW
3rd St SW
S Broadway
1st St SW
Main St
1st St SE
2nd St SE
3rd St SE
4th St SE

Valley St \ US 52 B

End 2" Mill & Overlay
NHU-4-002(131)906
Sta 128+05
150' Rt

Legend

2" Mill & HMA Overlay

ADA Ramp Improvement

This document was originally issued and sealed by Derek Anderson, Registration Number PE- 7107 , on 8/11/2020 and the original document is stored at the North Dakota Department of Transportation

Scope of Work

US 2 Business / Burdick Expy

8/11/2020 7:56:40 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\001\004SW_001_SCOPE.dgn

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100-P01 TIED PROJECT: This project is tied to project NH-4-002(125)905 PCN 22216 – Burdick Expy from 16th St SW to US 83 (Broadway) and 16th St SE to 27th St SE. Coordinate traffic control between the two projects where appropriate.

100-P02 COORDINATION OF PROJECTS: Another project in the vicinity of this project is under contract during the 2021 construction season. This project is replacing watermain for the City of Minot along Burdick from 1st St SW to Main St. This project is scheduled to be complete prior to July 23rd.

100-P03 PROJECT SCHEDULE: No work is to take place on the project until after July 31st, the last day of the North Dakota State Fair, unless approved by the Engineer.

100-P04 TRINITY HOSPITAL EMERGENCY TRAUMA CENTER: Trinity Hospital Emergency / Trauma Center parking is located near the SW ramp quadrant of S Main St. Burdick Expressway is a main corridor that is used by the hospital for emergency response. Trinity Hospital will need to be notified of construction phasing due to the impact of emergency response for the duration of this project. Emergency entrance along Burdick to remain open at all times for the duration of the project.

100-P05 CONTRACTOR PARKING/STAGING AREA RESTRICTIONS: Parking of personal vehicles, construction equipment, storage of construction materials, or work area on private property is prohibited without written permission by the property owner.

Staging of construction materials, storing of personal vehicles or construction equipment in the City's right of way outside of the constriction work zone is prohibited.

105-200 UTILITY COORDINATION: A utility coordination meeting is required.

107-500 PAVEMENT SWEEPING: Sweep the roadway adjacent to the construction area at the end of each day. Utilize a vacuum or pickup type sweeper.

107-P01 ACCESS FOR BUSINESSES: Provide an access plan that maintains access to all businesses for review by the Engineer and the City of Minot at least one week prior to the preconstruction meeting. This plan is subject to approval by the Engineer and the City.

107-P02 UTILITIES: Notify all utility owners of the project schedule as specified in Section 105.03, "Cooperation with Utility Owners".

108-P01 WEEKLY PLANNING & REPORTING MEETING: A weekly planning and reporting meeting is required. Provide a suitable meeting facility. Have a room approved by the Engineer.

Organize a biweekly meeting with the business owners and residents along Burdick Expressway corridor including side streets. The meeting will follow the same requirements of the weekly planning meeting.

202-P01 REMOVAL OF CONCRETE: Concrete roadway, concrete sidewalk, curb, and curb and gutter designated for removal may vary in thickness. There will be no additional compensation for the removal of extra thickness. Include the removal of aggregate or embankment beneath the roadway, sidewalk, curb and curb and gutter in the costs of "Removal of Concrete Pavement" or "Removal of Curb & Gutter" bid items.

202-P02 REMOVAL OF BITUMINOUS SURFACING: Bituminous surfacing designated for full depth removal may vary in thickness. There will be no additional compensation for the removal of extra thickness. Include any costs for the removal of aggregate or embankment beneath the pavement in the "Removal of Bituminous Surfacing" bid item.

202-P03 REMOVE AND RESET CONCRETE PARKING BLOCKS: Remove and reset existing concrete parking blocks to their original position. Include all labor and equipment to remove and reset concrete parking blocks in the costs of "Removal of Concrete Pavement" or "Removal of Bituminous Surfacing".

411-P01 TEMPORARY ASPHALT WEDGES: After milling, place temporary asphalt wedges at drop off locations open to traffic.

411-P02 MILLING: Remove surfacing to form a straight vertical line at intersecting streets. Place the pavement overlay within 4 working days of milling the pavement surface.

430-P01 CONTRACTOR CORING: Before placing bituminous material into core holes, apply a tack coat on all sides of the core holes as specified in Section 401.

430-P02 PATCHING: Submit a mix design that meets FAA 43 for approval. The Hot Mix Asphalt used for patching will be accepted by one random aggregate and mix sample representing the plan quantity for the project.

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

This document was originally issued and sealed by Derek Anderson, Registration Number PE-7107, on 8/11/2020 and the original document is stored at the North Dakota Department of Transportation.

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704-P01 TRAFFIC CONTROL PHASING: The traffic control details, as indicated on the plans, have been developed on the basis that this project will be constructed in phases as described below. The work zone traffic control summary lists include the required number of devices for each phase of work. Devices will be moved as required for each phase. The following traffic control phasing for the construction of pedestrian ramps, new curb and gutter, signals, lighting, and mill & overlay has been developed for this project:

Phase 1: Construct proposed ADA Ramps on South Side of Burdick Expressway.

- Work area is restricted to a maximum of two quadrants of an intersection at one time. Multiple intersections can be worked on concurrently, no more than three intersections can be worked on concurrently. No two consecutive signalized intersections can be worked on concurrently.
- (1) Lane closure adjacent to the curb and gutter.
- Maintain two lanes of traffic at all times.
- Provide temporary curb ramps, pedestrian channelization, and temporary pedestrian surfacing.
- Construct proposed pedestrian ADA ramps at all intersections, including new curb and gutter, ramps, landings (upper and lower landings), signal foundations (where applicable), and full depth pavement replacement (where applicable).
- Provide temporary pedestrian surfacing to transition proposed sidewalk into existing sidewalk. If the cross slope of the existing sidewalk exceeds 2%, transition the temporary pedestrian surfacing at a maximum rate of 0.5% per 1 linear foot of surfacing.

Phase 2: Construct proposed ADA Ramps on North Side of Burdick Expressway using the same requirements as Phase 1.

Phase 3: Mill and overlay pavement on Burdick Expressway, install permanent pavement markings, signals, and lighting utilizing lane closures and flagging.

- Complete Phase 1 & 2 prior to starting Phase 3.
- Work area limited to exterior lanes adjacent to curbs.
- Two lanes closures are provided in this phase.

Phase 4: Mill and overlay pavement on Burdick Expressway and install permanent pavement markings utilizing lane closures and flagging.

- Work area limited to interior (2) middle lanes.
- Two lanes closures are provided in this phase.

704-P02 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the layouts shown in the plans and the following layouts shown on the Standard Drawings:

D-704-25 Type X,
D-704-34 Lane closure

704-P03 TRAFFIC CONTROL DEVICES: Traffic control devices have been provided for a single full lane closure of 3 separate sites simultaneously. A site is defined as a work zone of half of an intersection. Closure of the outside driving lane will be permitted during daylight hours while construction within the intersection is active. Remove temporary lane closures at the end of each working day if possible. Lane closures must remain at all times if there are drop offs within the work zone. If ordinary operation is not restored, provide 24-hour flagger operations until normal traffic operation can be restored. No additional payments will be made for flagging if ordinary traffic operation is not restored at the end of each working day.

The following devices remain in place for the duration a construction site is active:

1. W20-1-48 – Road Work Ahead
2. G20-2-48 – End Road Work
3. All pedestrian signing devices – See Section 100
4. All lane narrowing devices
5. Temporary safety fence and devices adjacent to active work zones
6. Pedestrian temporary railings and curb ramps – See Section 100

Supply and maintain temporary ramps and pedestrian rail system as shown in the plans. Include all costs associated with supplying and maintaining devices in the price bid for “Traffic Control Signs”.

706-P01 LABORATORY: Supply a copy machine, with reduction capabilities, and toner for the Bituminous Laboratory. Include the cost for these items in the contract unit price bid for “Bituminous Laboratory”.

708-P01 INLET PROTECTION: Furnish, install and maintain (clean) drainage inlet filter assemblies to collect sediment in surface storm water runoff. Dispose of debris or silt that has accumulated in the bag. Periodic cleaning of the filter is needed as necessary. Remove drainage inlet filter when vegetation has established.

Provide Wimco, Lange IPD, Flexstorm, Danady Curbsack, or an approved equal.

Keep filter in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris. Include all costs related to the material, installation, maintenance, replacement and removal in the price bid for “Inlet Protection-Special”.

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722-P01 ADJUST GATE VALVE: Install debris plugs into all gate valve boxes when they are adjusted. Include all labor, equipment and materials required to install the plugs in the price bid for “Adjust Gate Valve”.

722-P02 INLET CASTING TYPE 1: All costs associated with the removal of the existing castings and installation of new Neenah R-3065 Type L, EJ 7010 Type M4, or approved equal casting and grates and including a 2 inch radius curb box will be included in the price bid for “Inlet Casting Type-1”.

722-P03 INLET CASTING TYPE 2: All costs associated with the removal of the existing castings and installation of new Neenah R-3067 Type L, EJ 7030 Type M6, or approved equal casting and grates and including a 2 inch radius curb box will be included in the price bid for “Inlet Casting Type-2”.

748-P01 CURB & GUTTER: The standard curb and gutter will be 6 inches; however, the height may need to be adjusted to match the height of the existing curb and gutter (up to 9”). The height adjustment and all other costs when matching the existing curb height will be included in the costs of “Curb & Gutter”.

748-P02 CURB-TYPE 1: The height of the “Curb-Type 1” will vary depending on the existing locations and will need to match the existing elevations at tie in locations.

750-P01 DETECTABLE WARNING PANELS: Panels may need to be cut or modified in the field to fit the proposed design.

750-P02 DETECTABLE WARNING PANELS: Install unpainted, cast iron plates manufactured by East Jordan Iron Works, Neenah Foundry, or approved equal.

750-P03 PIGMENTED IMPRINTED CONCRETE: The concrete boulevard will be a colored and stamped 4” sidewalk with a brick running bond pattern and colored release agent/color hardener. Include an integral concrete color mix, either dry or liquid and include a colored stamp release agent to be selected upon approved color choice below. Develop a mix design using any size coarse aggregate specified in Section 802.01 C.2, "Coarse Aggregate" and with a 60-40 fine aggregate-coarse aggregate ratio. Provide a dark gray pigmenting that meets the requirements of ASTM C 979 and that matches the adjacent pigmented imprinted concrete.

Use the same supplier for all colored concrete placed under contract. The color is to be uniform throughout the project.

Cure and seal concrete using a curing compound that meets the requirements of ASTM C 309, Type 1 and include slip resistant additive. Include all costs in the price bid for “Pigmented Imprinted Concrete”.

750-P04 SIDEWALK AGGREGATE: Provide aggregate needed to grade sidewalk meeting specifications of “Aggregate Base Course CL 5”. Include all costs associated with aggregate in the price bid for “Sidewalk Concrete 4In.”

750-P05 ADA RAMPS AND LANDINGS: 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.

The designated ADA turning spaces as designated in Section 80 per the legend as “Landing Area” are to be placed separately and installed prior to adjacent ADA ramps and/or sidewalks allowing for a minimum of 24 hours of cure time.

754-P01 PEDESTRIAN/SCHOOL CROSSING SIGNS: The pedestrian, school crossing sign, and associated auxiliary signs shall have a fluorescent yellow green background with black letters and border.

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

970-P01 LANDSCAPE PREPARATION: Minimal grading will be required adjacent to the locations designated 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. Any excess topsoil will become property of the Contractor and must be removed from the project site. Any needed topsoil must be imported to the project if necessary. Include all costs associated with topsoil in the contract price for “Landscape Preparation”.

There are existing wood timbers adjacent to the sidewalk in the SE quadrant of 2nd St SE and Burdick Expressway. Replace disturbed timbers with like new timbers. Replace topsoil in this quadrant, no seeding is required in flower bed areas. Include all costs associated with the timbers and topsoil in the contract price for “Landscape Preparation”.

Use sod as specified in Section 252 of the NDDOT Standard Specifications for all grass areas.

Areas sodded after September 15 will not be accepted until they show evidence of established growth after May 15 of the following year. Water sodded areas a minimum of 4 weeks after placement in order to provide sufficient moisture for growth. Prevent runoff or puddling. Do not drive water trucks over turf areas.

Perform maintenance on sodded areas for 4 weeks after completion of sodding over the entire disturbed area. Maintenance of the sodded areas includes eradicating weeds, maintaining erosion control devices, protecting installed areas from traffic, mowing, watering & post fertilization. Repair and re-establish areas that are rutted, damaged or destroyed at the Contractor’s expense. Mow sodded areas 24 hours prior to final inspection. Sodded areas will be rejected if they contain weeds or bald spots larger than 3” in diameter. Include the cost for materials, equipment, labor, maintenance and incidentals in the contract price for “Landscape Preparation”.

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SECTION 140

770-P01 LIGHT STANDARD 6FT MA 40FT MT HT FESTOON BREAKAWAY: The light standard is of the davit type constructed of galvanized steel. Festoon GFCI receptacle with in-use weatherproof cover. Contractor to verify receptacle mounting orientation and height to match existing during shop drawing submittals. Provide breakaway transformer base.

770-P02 LED LUMINAIRE: Provide LED luminaires with the following specifications:
Light Output: Minimum of 23,037 delivered lumens.
Color Temperature: 3000K.
Wattage: 177 watts maximum.
Voltage: Multi-voltage operation from 120 to 277 volts. Project voltage: 240V.
Housing: Diecast aluminum with tool-less entry. Gray finish.
Surge Suppression Rating: ANSI/IEEE C62.41 Cat C
Operating Range: -40°C to 40°C

LED Luminaire basis of design and approved for use on this project is American Electric Lighting, Model ATB2 80BLED70 MVOLT R2 3K NR.

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SECTION 150

772-009 PADLOCKS: Obtain padlocks for feed points from the City of Minot.

772-P01 TRAFFIC SIGNAL SYSTEM: Include in the price bid for “Traffic Signal System – Site _” all labor and equipment necessary for the signal system to be fully operational as shown in the plans upon construction completion. This includes but is not limited to, the installation of the following features where applicable; traffic signal standards and foundation, vehicular heads, video detection system, traffic signal controller and all ancillary hardware (conflict monitor, load switch, flasher, etc.), controller cabinet and foundation, and all cable, conduit, junction boxes, and appurtenances to install the traffic signal system completely.

772-P02 SIGNAL POLES AND COMBINATION LIGHT AND SIGNAL STANDARDS: Provide signal poles with rotatable mast arms.

772-P03 TRAFFIC SIGNAL STANDARDS BASE: Provide traffic signal standards with “T” transformer base type standards. Include all costs, labor, materials and equipment necessary for furnishing and installing this item in the price bid for “Traffic Signal System – Site _”.

772-P04 TRAFFIC SIGNAL CONTROLLER: Provide Econolite ATC Cobalt G controllers for all intersections. The controllers will be NEMA Standard ATC volume density controllers with the traffic counting capability operational. This also includes any programming and data entry (i.e. signal timing plans) necessary to provide fully functional traffic signal controllers. Coordinate with the City of Minot Traffic Engineer, Stephen Joersz, at 701-857-4100 for signal timing plans to be programmed into the controllers. Include all costs, labor, materials and equipment necessary for programming installing this item in the price bid for “Traffic Signal System – Site _”.

772-P05 TRAFFIC SIGNAL CABINET: Provide Econolite Super R 65 cabinet for all intersections. Provide all equipment required to install a fully functioning operational cabinet. This includes but is not limited to the cabinet, battery back-up, detector amplifiers (furnished and installed), other ancillary signal components (such as load switches, conflict monitors, etc.), concrete foundation, and controller cabinet components connected as required to make the new controller equipment operational with the proposed signal equipment. Provide a GFCI receptacle in each controller cabinet. Include all costs, labor, materials and equipment necessary for programming installing this item in the price bid for “Traffic Signal System – Site _”.

772-P06 BATTERY BACK-UP: Equip the traffic signal cabinets with an “on-line” type Uninterruptible Power Supply (UPS) that provides power conditioning in both normal and backup mode. Provide UPS that are ethernet capable. Size the UPS to provide backup power to the system for a minimum of 8 hours in full signalized operation with a 450-watt load. Provide aux contacts to put the system into flash operation. The UPS will incorporate full power management and diagnostic function. The UPS will automatically provide battery back-up power to the controller system with no interruption when the electric utility power supply de-energizes. The UPS will operate such that it does not provide power to the de-energized incoming electric utility service conductors.

Install the UPS in a temperature and humidity controlled environment. Install the UPS in a separate enclosure on the same pad as the signal controller cabinet., Include all materials, labor and equipment necessary to furnish and install the battery back-up in the price bid for “Traffic Signal System – Site _”.

772-P07 TRAFFIC SIGNAL CABINET FOUNDATION: Construct a concrete foundation as shown on standard drawing D770-1 along with three spare 2” conduit sweeps. Extend the controller cabinet pad mount foundation so there is a minimum of 3” of clearance from the outside edge of the cabinets to the outside edge of the foundation on any side.

When setting traffic signal cabinet enclosures directly on the concrete foundation, sealant is to be placed on the concrete foundation prior to setting the enclosure. Also, caulk the concrete/enclosure interface both inside and outside of the enclosure.

Furnishing and installing the cabinet foundation is included in the price bid for “Traffic Signal System – Site _”.

772-P08 CONTROLLER WORKING SLAB: Install 4” thick controller working slabs that are 6 feet wide and extend a minimum of 4 feet from the face of the controller foundations. Reinforce the slabs with 6" x 6" x 10 GA welded wire fabric and tie the slabs to the controller foundations with 18-inch long #3 rebar spaced 18 inches on center. Provide a slope of .25 inches per foot away from the controller cabinet foundations. Install the slabs to be 2” higher than the closest point of the top of the slab to finished grade. Furnishing and installing the working slabs is included in the price bid for “Traffic Signal System – Site _”.

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772-P09 SIGNAL EQUIPMENT:

A. Provide steel signal plumbizer and pedestal adapters/collars.
B. Provide 12-inch vehicle heads comprised of polycarbonate, colored black. Provide stainless steel
C. fasteners and use anti-seize lubricant on all threaded components.
D. Provide signal visors comprised of polycarbonate, colored black, tunnel.
E. Provide 5-inch backplate with 1-inch wide yellow retroreflective Type IX border. Material is to aluminum and backplate is to be louvered.
F. Provide two-point mounting system such as Astro Brackets, Sky Brackets or approved equal for all mast arm mounted signals. Colored black.
G. Provide 16-inch pedestrian heads with countdown displays, constructed of aluminum alloy die cast, 16-inch tunnel visor. Provide stainless steel fasteners and use anti-seize lubricant on all threaded components.
H. Provide LED indications on all new signal heads.

Furnishing and installing signal equipment is included in the price bid for “Traffic Signal System – Site _”.

772-P10 SIGNAL COMPONENT COLOR: Paint all traffic signal system components black.

772-P11 EMERGENCY VEHICLE PRE-EMPTION: Notify the Fire Chief, 701-857-4740, when the EVP systems are tested and operable. Provide Opticom EVP equipment that is fully compatible the current City of Minot system. The City of Minot Fire Department will set the range of the system.

772-P12 WIFI PANEL: Provide a Wi-Fi Panel as shown in Section 150. Install the Wi-Fi Panel in the traffic signal cabinet at the intersection of Site 1 - Burdick Expwy and Main St S, Site 2 - E Burdick Expwy at 3rd St SE, and Site 3 - E Burdick Expwy and Valley St. Include all costs for the Wi-Fi Panel in the price bid for “Traffic Signal System – Site _”.

772-P13 VIDEO DETECTION SYSTEM: Provide Autoscope Vision Video Detection Equipment for each signalized intersection. Provide all cable connections, camera aiming and system set-up, including programming detection zones and verification of reliable operation by the manufacturer’s representative. The location of cameras in the plans are for reference only. Include an extra camera / processor, interface panel and detector port master for each Video Detection System. Provide a supplier warranty for the video detection system that is for a minimum of three years after final inspection and acceptance. Provide ongoing software support by the supplier and include updates of the MVP sensor and application software. Provide these updates free of charge for one year after final inspection and acceptance.

Provide all labor and equipment necessary for the video detection system to be fully operational. Include all costs, labor, materials and equipment necessary for furnishing and installing the video detection systems in the price bid for “Traffic Signal System – Site _”

772-P14 CONDUIT: Seal all conduits with duct seal at the controller cabinet and at the traffic signal standard foundations. Install three spare 2” conduit sweeps in the controller cabinet foundation and one spare 2” conduit sweep in each traffic signal standard base. Cap spare conduits with an oil-tight plug with wing nut and labeled as to which direction they face.

772-P15 LABEL ALL FIELD CABLES: Provide labeling materials as approved by the City. Install the labels so they are readable without moving the cables. Label all field cables with the cable designations:

Type	Label	Label Location
Communication Card	Comm./address of other end	Within 12" of conduit
Pedestrian Pushbutton	Phase/Location (i.e. NW, SW, etc.)	Within 6" of terminal
Video Detection Cable	Approach Detection (i.e. NW, SW, etc.)	Within 6" of terminal
Control Cable	Cable Number & Location (i.e. NW, SW, etc.)	Within 12" of conduit
EVP Cable	Pre-Empt Number/Location (i.e. NW, SW, etc.)	Within 6" of terminal

Cost to be included in the price bid for “Traffic Signal System – Site _”.

772-P16 CONTROLLER CABINET WIRING DIAGRAM: Label the following items on the cabinet wiring diagram, in addition to information required by NDDOT Standard Specification.

A. The camera number (i.e., D2-1) from the plan shall be labeled on the detector panel drawing adjacent to the point for termination.
B. The field wire terminals for the vehicle/pedestrian head control cables shall be labeled with the phase number and direction (i.e., Ø2, SB).
C. The field wire terminals for the Opticom cable shall be labeled with the pre-empt number (i.e., P.E. #1).
D. The field wire terminal for the pre-empt indicator lamps shall be labeled with the preempt number and direction (i.e., P.E. #1, NB).
E. The field wire terminals for the pedestrian push-button cables shall be labeled with the phase number (i.e., Ø8 PED).
F. Provide an intersection diagram on cabinet door showing phasing of intersection and camera numbering and detection zone numbering
G. Provide a CAD drawing file of the as-built cabinet wiring diagram.

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NOTES

772-P17 TRAFFIC SIGNAL PULL BOXES: Provide polymer concrete type pull boxes for the traffic signal systems. Clearly mark the cover as “Signal” as required. See standard drawing D770-3 for details. Duct seal all conduits entering and exiting pull boxes. Provide the style as shown on the standard drawings and include the stackable bottom extension with knockouts. Include all costs, labor, materials and equipment necessary for furnishing and installing this item in the price bid for “Traffic Signal System – Site _”.

772-P18 ACCESSIBLE PEDESTRIAN SIGNALS (APS) PUSHBUTTON AND SIGN: Shall include the features, installation procedures, and be compliant with the following:

A. Features:
   1. Rapid tick WALK indication, no more than 2–5dBA above ambient sound
   2. Vibrotactile WALK indication
   3. Speaker and vibrotactile indication located at pushbutton
   4. Pushbutton locator tone
   5. Tactile arrow on each device aligned in direction of travel on the crosswalk

B. Installation Procedures
   1. APS should be reachable from the level landing of the curb ramp for the crossing or from a level surface with an accessible path to the ramp (MUTCD Section 4E.08 and Proposed and Draft PROWAG).
   2. APS should be within 5 feet of the crosswalk line furthest from the center of the intersection and within 10 feet of the curb (MUTCD Section 4E.08).
   3. Tactile arrow shall be aligned with parallel to the direction of travel on the crosswalk (MUTCD Section 4E.12, P1).
   4. Pushbutton required to be located within reach range for wheelchair users (Proposed PROWAG, R406).

C. Code Compliance:
   1. Functionality: MUTCD 2009 - 4E
   2. Temperature and Humidity: NEMA TS 2
   3. Transient Voltage Protection: NEMA TS 2
   4. Transient Suppression: IEC 61000-4-4, IEC 61000-4-5
   5. Electronic Noise: FCC Title 47, Part 15, Class A
   6. Mechanical Shock and Vibration: NEMA TS 2
   7. EN4 PBS Enclosure: NEMA 250 - Type 4X
   8. Electrical Reliability: NEMA TS 4

The cost for the accessible pedestrian signals pushbutton and sign shall not be bid separately but shall be included in the item " Traffic Signal System – Site _”.

772-P19 REMOVE TRAFFIC SIGNAL SYSTEM: Remove the existing traffic signal systems and deliver to the City of Minot Traffic Department all the items in which the City deems salvageable. Contact Dave Rodman in Minot Traffic Division at 701-857-4100 a minimum of 24 hours prior to delivery. The remaining items become the property of the Contractor. Include all costs for removal of the traffic signal systems in the price bid for “Traffic Signal System – Site _”.

772-P20 REPAINT TRAFFIC SIGNAL STANDARDS PROCESS: For "TRAFFIC SIGNAL SYSTEM - SITE 1", the Contractor shall repaint the northwest (NW) and southeast (SE) existing traffic signal standards. The Contractor shall complete the following, but not limited, steps to provide traffic signal standards up to date with the most current City of Minot Specifications.

A. Signal standards (post, mast arm, luminaire and luminaire extension) are to be taken down and coated off site. Remove all mounting material, signs, signals and pedestrian pushbuttons.
   1. For areas that are currently painted, solvent clean and remove all contaminants using SSPC-SP-1 (Solvent Cleaning) measures.
   2. Solvent Cleaning (SSPC-SP1) refers to surface preparation to remove soluble substances from steel. Before a paint or other protective coating is applied, a solvent is used to remove all visible oil, grease, dirt, drawing or cutting compounds or other soluble contaminants. Solvents may include steam, emulsifying agents or other cleaning compounds.
      A. Painted locations only: Additionally, abrasive brush blast to remove loosely adhered coating, provide a uniform 1.5 mil profile across existing tightly adhered coating and galvanizing.
      B. Galvanized locations only: surfaces are to be prepared in accordance to ASTMD 6386. Surfaces shall be clean, dry and free of contamination.
   3. Before the primers and paint are applied, the signal standards are to be inspected by the City of Minot to ensure that the signal standards are properly solvent cleaned and free of contaminates. Signal standards may need additional cleaning at the Engineers discretion.
   4. Use Spot Primer: Series 90-97 Tnemec-Zinc as needed to repair damaged galvanizing.
   5. Apply Tie-Coat/Primer: Series 161 Tnemec-Fascure between 3.0 mils to 5.0 mils DFT as per manufactures recommendations. Tnemec color code is to be 35GR. Tnemec color code 35GR is a match to the Color Black and No. 17038 of Aerospace Material Specification Standard No. 595, per City of Minot Specification 3800-2.07.
   6. Apply Finish Coat: Series 740 UVX between 3.0 mils to 5.0 mils DFT as per manufactures recommendations.
   7. Application of all materials shall follow the manufacturer’s directions for use.
   8. Clean all debris off terminal boards with compressed air or still bristle broom. Apply coating of approved red insulation varnish to terminal block.

B. The Contractor shall guarantee all materials, work, and equipment for a period of at least five years from the date of final acceptance. Contractor is required to get a certified warranty from the paint applicator to the City of Minot covering all labor and materials if the paint fails. Cost of warranty shall be included with the price bid for “Traffic Signal System-Site 1”.

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NOTES

772-P21 FATIGUE CATEGORY: The contractor is to provide traffic signal standards that meet or exceed the fatigue categories listed below for each traffic signal standard. Include all costs associated with fatigue categories in the price bid for “Traffic Signal System – Site _”.

Location of Signal Standard	**Fatigue Category**
Site 1 – Burdick Expwy and S Main St	
- Northeast Signal	Category I
- Southwest Signal	Category I
Site 2 – E Burdick Expwy and 3rd St SE	
- Northwest Signal	Category II
- Southeast Signal	Category II
- Northeast Signal	Category II
- Southwest Signal	Category II
Site 3 – E Burdick Expwy and Valley St/Front St	
- Northwest Signal	Category II
- Southeast Signal	Category II
- Northeast Signal	Category I
- Southwest Signal	Category III

772-P22 PROTECTIVE BOLLARDS: The contractor is to provide and install hour (4) protective bollards near the E Burdick and 3rd Street SE traffic signal cabinet. The protective bollard is to follow the detail shown on Section 150 Sheet 11. Include all labor and materials associated with the protective bollards in the price bid for “Traffic Signal System – Site 2”.

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NOTES

772-P23 FLASHING BEACON-MA MOUNTED: Provide all components for a complete and functioning Rectangular Rapid Flashing Beacon (RRFB) warning system meeting the conditions set by FHWA for MUTCD interim approval IA-21 as well as all current FHWA interpretations.

The system will be 120VAC wired, not wireless, and include all foundations, poles, cables, conduit, LED light bars, pedestrian pushbuttons, controller, cabinet, power supply, mounting hardware, and any other equipment required for operation. Mount and wire all equipment according to the manufacturers' recommendations.

Reuse the existing flashing beacon electrical service. Disconnect and remove the existing flasher cabinet including timer used to operate the existing flashing beacons. Keep the existing meter socket in place. Provide a new 30 amp fused main disconnect switch rated for service entrance. Provide new grounding as required by the NEC and State Electrical Code. Provide in-line fuseholder, fused at 10 amps at base of pole. Use enclosures and equipment that are outdoor rated with a minimum NEMA 3R rating.

Provide RRFB light bars with the following features:
- Black powder coated aluminum housings
- Each light bar containing two SAE J595 class 1 certified, rectangular array, yellow LED light sources with side-mounted LEDs for indication to pedestrians
- Auto-dimming capable. Dimming to be turned off for initial programming
- Adjustable flashing duration. Set the light bars to flash for 20 seconds when activated for initial programming

Provide pedestrian pushbuttons and signs according to 772-P18.

Paint the RRFB signal standards, mast arms, and pushbutton housings black to match traffic signal system components. Use only steel plumbizer and adapters/collars.

Include all costs associated with supplying and installing a complete and functioning system in the bid item "FLASHING BEACON-MA MOUNTED"

772-P24 PROTECTIVE BOLLARDS: The contractor is to provide and install hour (4) protective bollards near the E Burdick and 3rd Street SE traffic signal cabinet. The protective bollard is to follow the detail shown on Section 150 Sheet 11. Include all labor and materials associated with the protective bollards in the price bid for "Traffic Signal System – Site 2".

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ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): There were no environmental commitments required to secure approval of this project.

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	NH-4-002(125)905		

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU Funding	City Funding			TOTAL
103	0100	CONTRACT BOND	L SUM	0.7				0.7
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	854				854
202	0130	REMOVAL OF CURB & GUTTER	LF	1032				1032
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	957				957
261	0200	WEIGHTED FIBER ROLLS	LF	130				130
261	0201	REMOVE WEIGHTED FIBER ROLLS	LF	130				130
302	0121	AGGREGATE BASE COURSE CL 5	CY	10				10
401	0050	TACK COAT	GAL	720				720
411	0114	MILLING PAVEMENT SURFACE - 2 INCH	SY	14434				14434
430	0045	SUPERPAVE FAA 45	TON	1603				1603
430	1000	CORED SAMPLE	EA	14				14
430	2000	PATCHING	TON	311				311
430	5806	PG 58H-28 ASPHALT CEMENT	TON	97				97
550	0113	8IN REINF CONCRETE PAVEMENT CL AE	SY	60				60
624	0121	RESET PEDESTRIAN RAILING	LF	12				12
702	0100	MOBILIZATION	L SUM	0.7				0.7
704	0100	FLAGGING	MHR	150				150
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1622				1622
704	1058	PEDESTRIAN WALKWAY	LF	450				450
704	1060	DELINEATOR DRUMS	EA	270				270
704	1067	TUBULAR MARKERS	EA	130				130
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2				2
704	2108	TEMPORARY CURB RAMP	EA	12				12
706	0550	BITUMINOUS LABORATORY	EA	1				1
706	0600	CONTRACTOR'S LABORATORY	EA	1				1
708	1540	INLET PROTECTION-SPECIAL	EA	26				26
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	26				26
722	3455	CASTING INLET-TYPE 1	EA		15			15
722	3460	CASTING INLET-TYPE 2	EA		6			6
722	6140	ADJUST GATE VALVE BOX	EA	19				19
722	6200	ADJUST MANHOLE	EA	21				21
724	0270	REMOVE GATE VALVE & BOX	EA	1				1
724	0300	GATE VALVE & BOX 6IN	EA	1				1
724	0411	6IN HYDRANT	EA	1				1
724	0430	REMOVE HYDRANT	EA	1				1
748	0100	CURB & GUTTER	LF	1031				1031
748	0520	CURB-TYPE I	LF	190				190
750	0030	PIGMENTED IMPRINTED CONCRETE	SY	12				12
750	0115	SIDEWALK CONCRETE 4IN	SY	832				832
750	2115	DETECTABLE WARNING PANELS	SF	322				322
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	235				235
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	242				242
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	138				138
754	0592	RESET SIGN PANEL	EA	9				9
754	0593	RESET SIGN SUPPORT	EA	1				1
762	0110	EPOXY PVMT MK 4IN LINE-GROOVED	LF	5285				5285
762	0112	EPOXY PVMT MK MESSAGE	SF	128				128

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	NH-4-002(125)905		

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU Funding	City Funding			TOTAL
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	5285				5285
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE-GROOVED	LF	2015				2015
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	268				268
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED	LF	517				517
770	4525	REVISE LIGHTING SYSTEM	EA		1			1
772	2145	FLASHING BEACON-MA MOUNTED	EA	1				1
772	3150	REMOVE FLASHING BEACON SYSTEM	EA	1				1
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
970	0008	LANDSCAPE PREPARATION	SY	114				114

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MATERIALS

Superpave FAA 45 @ 2.0 Ton/CY
PG 58H-28 Asphalt Cement @ 6.0%
Tack Coat @ 0.05 Gal/SY

Patching (FAA 43) @ 2.0 Ton/CY
Includes: PG 58S-28 Asphalt Cement @ 6.0%
Tack Coat @ 0.05 Gal/SY

SHORT TERM 4IN LINE-TYPE NR

1 Application of 4 inch line at skip
and double barrier locations. 5,285 LF

Coring

430 1000 CORED SAMPLE								
Specification Section	Location	Begin Station	End Station	A	B	C	D	
				Distance (Ft)÷2000	Lanes	Lifts	Sublots	Quantity (EA)
							(A × B × C)	(D × 2)
430.04 I.2.b(1), "General"	Burdick Expy Mainline	103+46	128+21	1	4	1	4	8
SSP 4 Longitudinal Joint Density	Burdick Expy Mainline	103+46	128+21	1	3	1	3	6
							Total:	14 EA

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Basis of Estimate

US 2 Business / Burdick Expy

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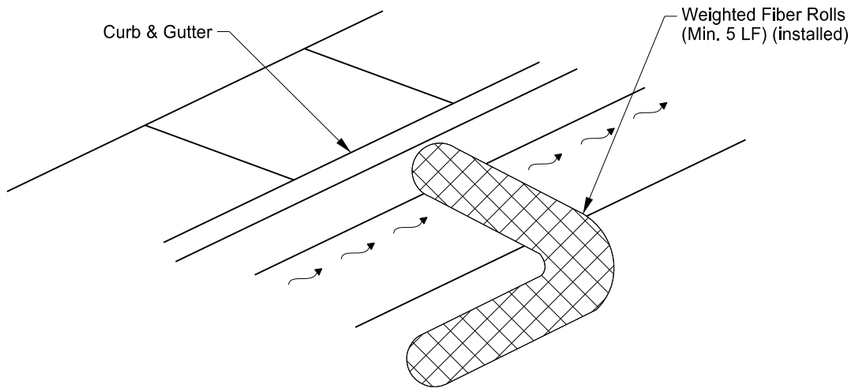

Weighted Fiber Roll Detail

Notes:

1. Provide materials that meet the following specifications:
   Netting tube filled with wood curled
   excelsior and weighted inner core.
   Roll Diameter: 6 Inches
   Weight: 8.33 Pounds per Lineal Foot

2. Place weighted fiber rolls down slope from unprotected downstream areas, tight against and along the curb and gutters, to provide complete protection.

3. Remove and properly dispose of accumulated silt and debris to allow for proper function of device after every rain event, or as necessary for proper function.

4. Price includes weighted fiber roll, placement, and maintenance after each rain event. All cost related to this work shall be included in the price bid for "Weighted Fiber Rolls".

5. Removal of weighted fiber rolls shall be done after the up gradient surfaces are stabilized and surrounding streets and gutters are clean of debris.

6. Fiber Roll should be placed to avoid being in drinving lane.

Weighted Fiber Rolls Detail

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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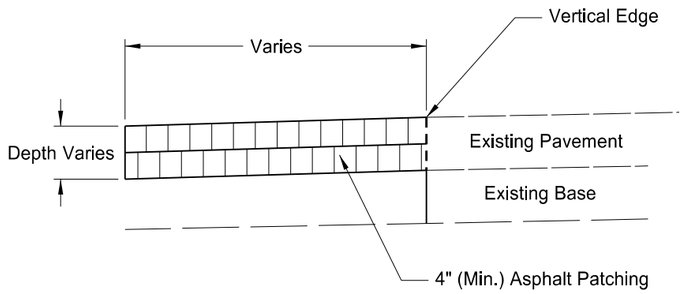
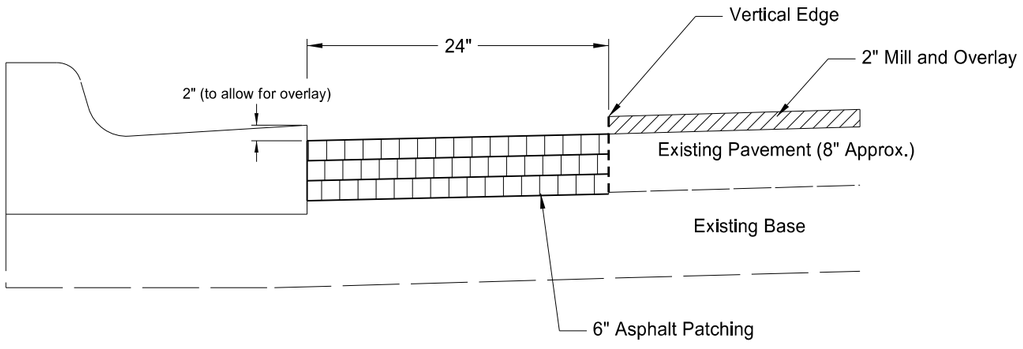
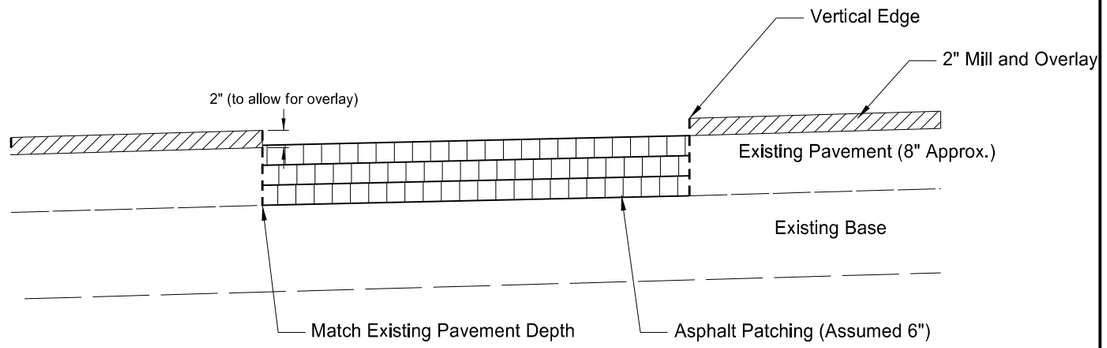


Pavement Patching Areas (Parking Lots)
(Locations Vary)



Pavement Patching Areas (Against Curb)
(Locations Vary)



Discretionary Patching (Mainline)
To be used at the discretion of the Engineer.

SPEC	CODE	BID ITEM	QTY	UNIT
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		Discretionary Locations	750	SY
430	2000	PATCHING		
		Discretionary Locations	250	TON

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Patching Detail

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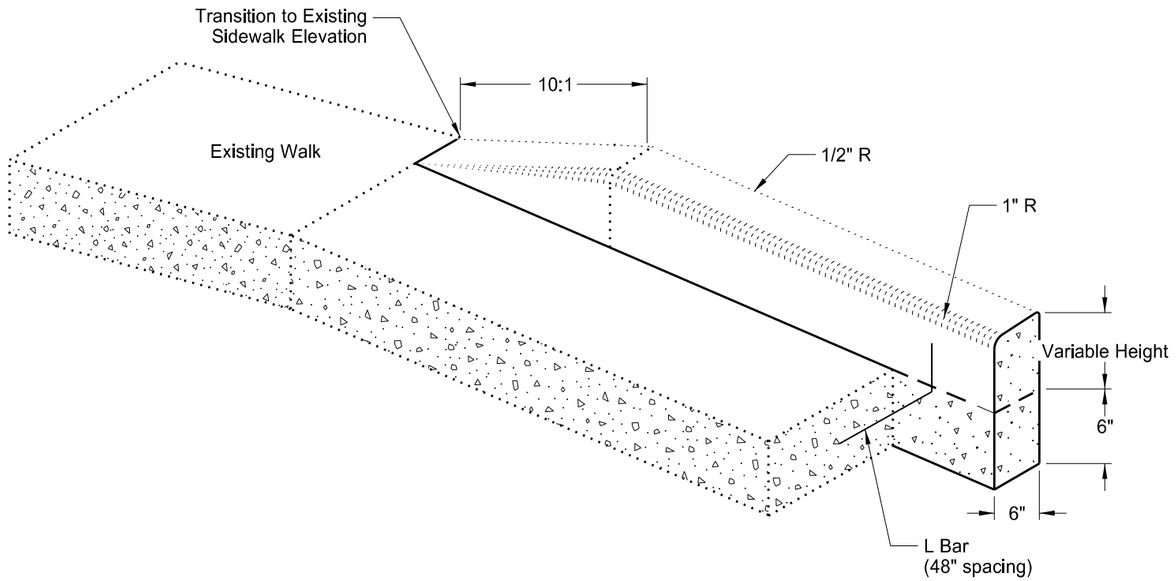
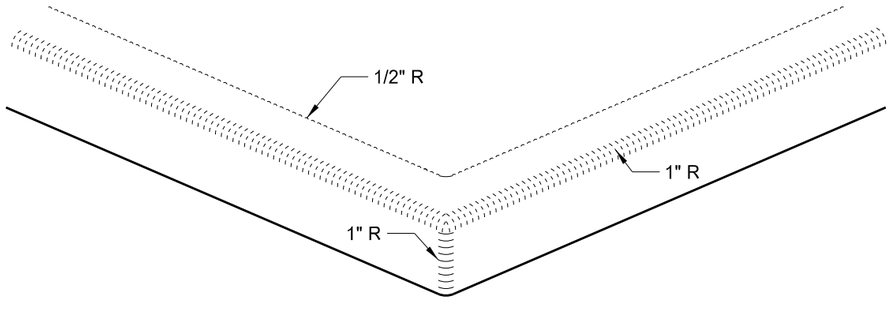
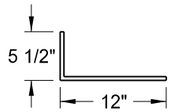


Curb-Type I Adjacent to Landscape



Curb-Type I Intersection



#3 "L" Bar

Notes:

All Curb-Type I contraction joints to match concrete walk joints.

End tapers at transition section to match inplace sidewalk grades.

All Curb-Type I to match bottom of adjacent walk.

See curb ramp details of Curb-Type I.

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Curb - Type I Detail

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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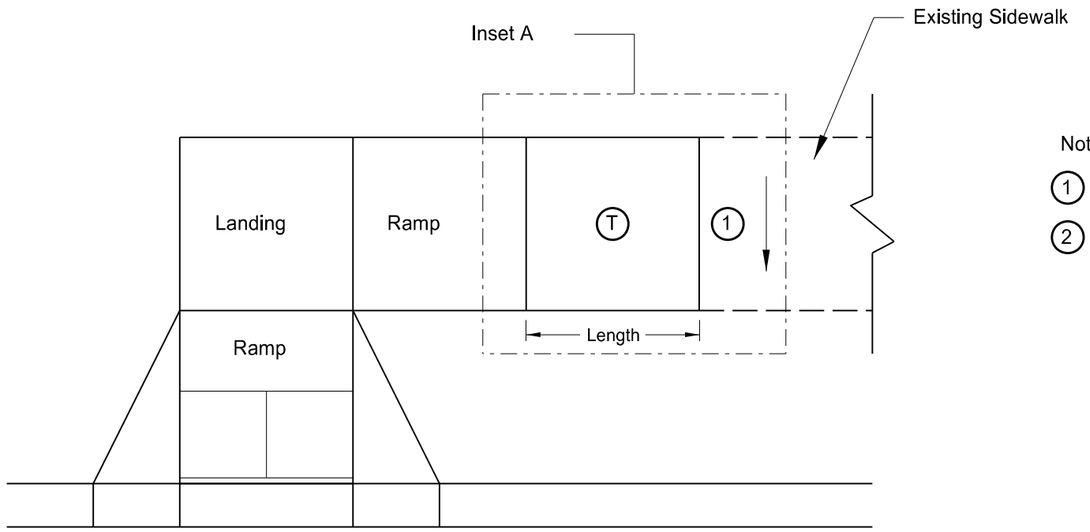

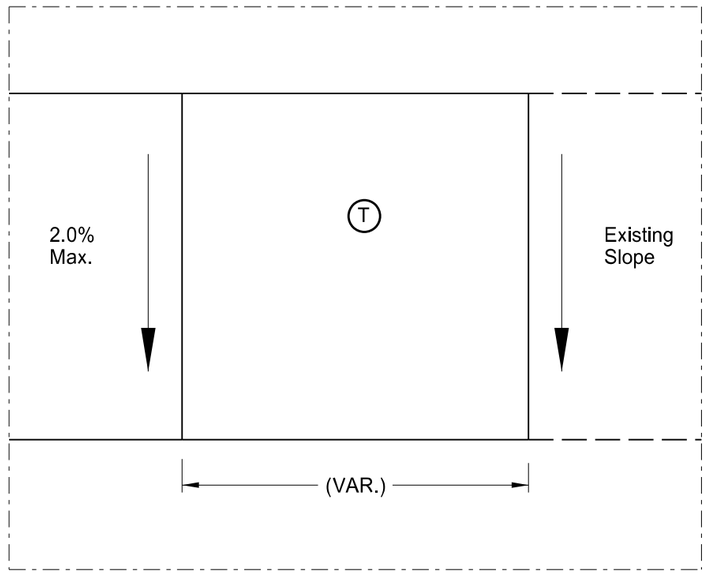

Inset A
Transition Panel (2)

Notes:

(1) Existing cross-slope greater than 2%.

(2) When PAR width is greater than 6' or the running slope is greater than 5% double the calculated transition length.

LEGEND

(T) Transition panel(s) - To be used for transitioning the cross-slope of a ramp to the existing walk cross-slope. Rate of transition should be 0.5% per 1 linear foot of walk

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Transition Panel Detail

US 2 Business / Burdick Expy

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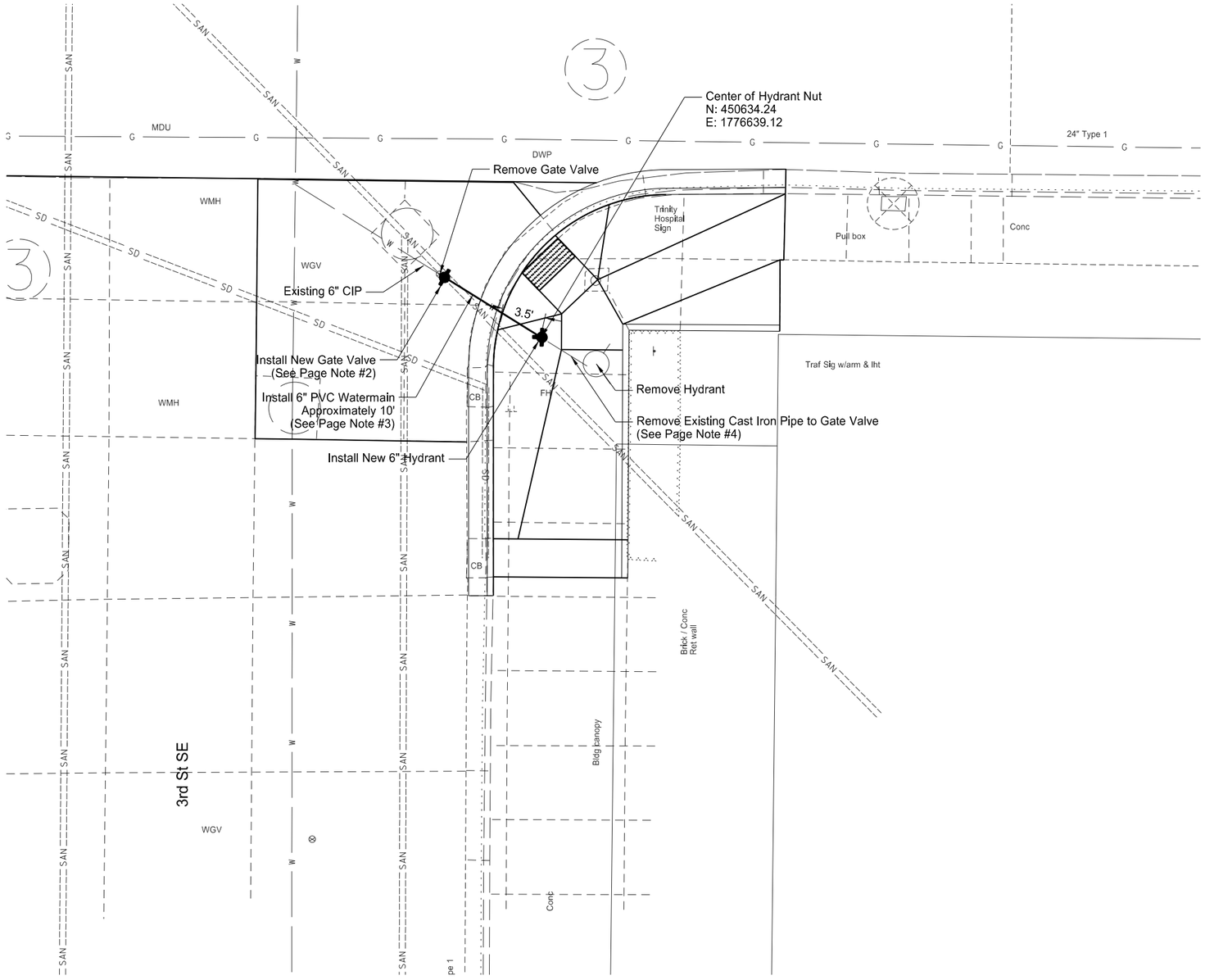
SPEC	CODE	BID ITEM	QTY	UNIT
724	0270	REMOVE GAVE VALVE & BOX		
		SE Quad	1	EA
724	0300	GATE VALVE & BOX 6IN		
		SE Quad	1	EA
724	0411	6IN HYDRANT		
		SE Quad	1	EA
724	0430	REMOVE HYDRANT		
		SE Quad	1	EA



Notes:
1. Include costs for ductile iron fittings in bid price for "Gate Valve & Box 6IN" and "6IN Hydrant".

2. Use MJ x MJ gate valve.

3. Include costs for 6" PVC Watermain in bid price for "Gate Valve & Box 6IN" and "6IN Hydrant".

4. Include costs for removing the existing cast iron pipe in bid price for "Remove Gate Valve & Box" and "Remove Hydrant".

5. Contractor is responsible for removing/importing embankment as needed for the gate valve and hydrant replacement. Include all costs in bid price for "Gate Valve & Box 6IN" and "6IN Hydrant".

N

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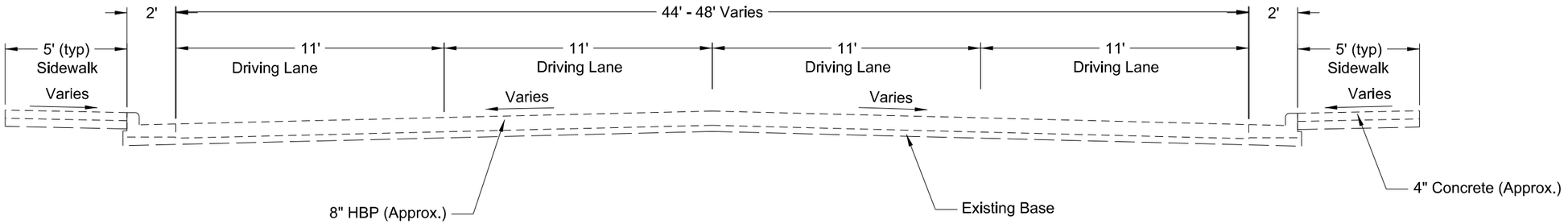
Hydrant Replacement

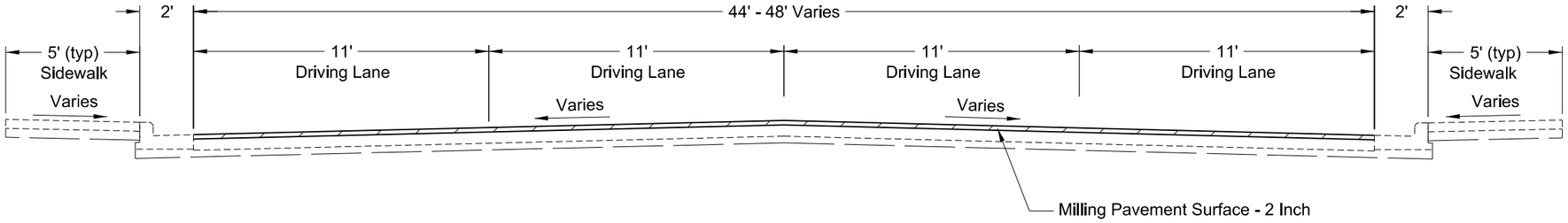
US 2 Business / Burdick Expy

3rd St SE

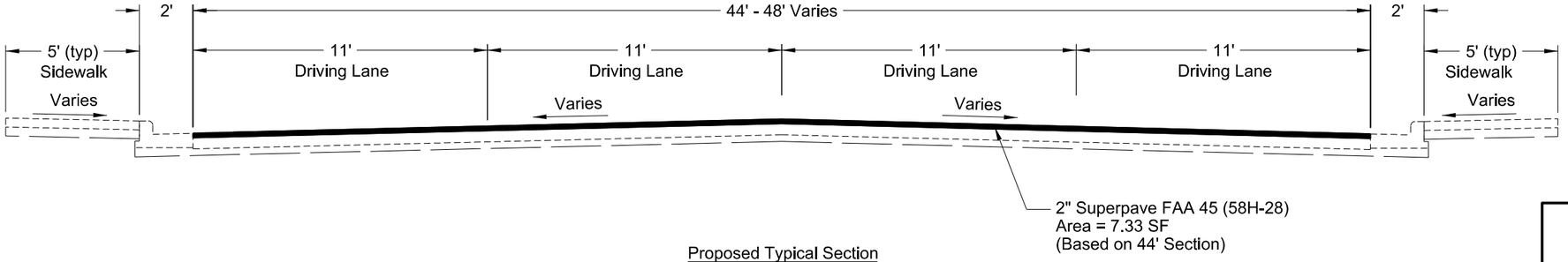
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	30	1



Existing Typical Section
Sta 103+46 to 128+21



Milling Typical Section
Sta 103+46 to 128+21



Proposed Typical Section
Sta 103+46 to 128+21

Note: There is concrete underneath the asphalt wear course in the 3rd St SE intersection. Mill existing asphalt off of roadway in this location, asphalt is less than 2 inches.

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Existing & Proposed Typical Sections

US 2 Business / Burdick Expy

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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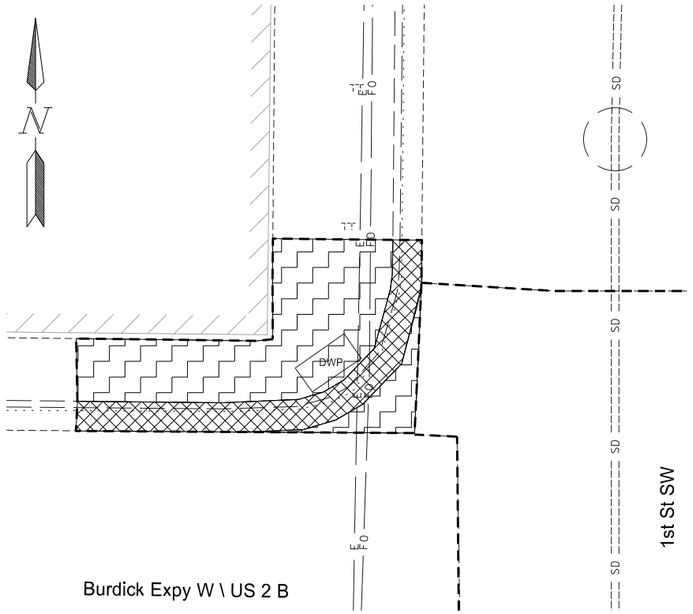
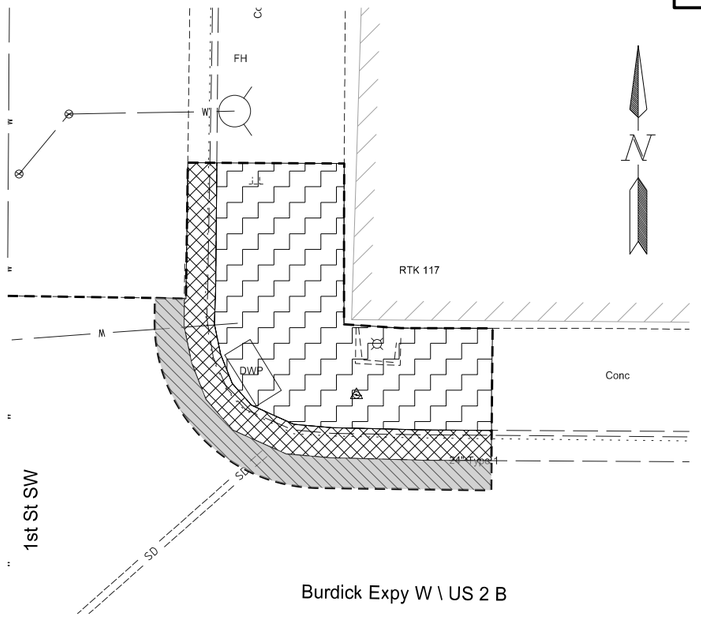
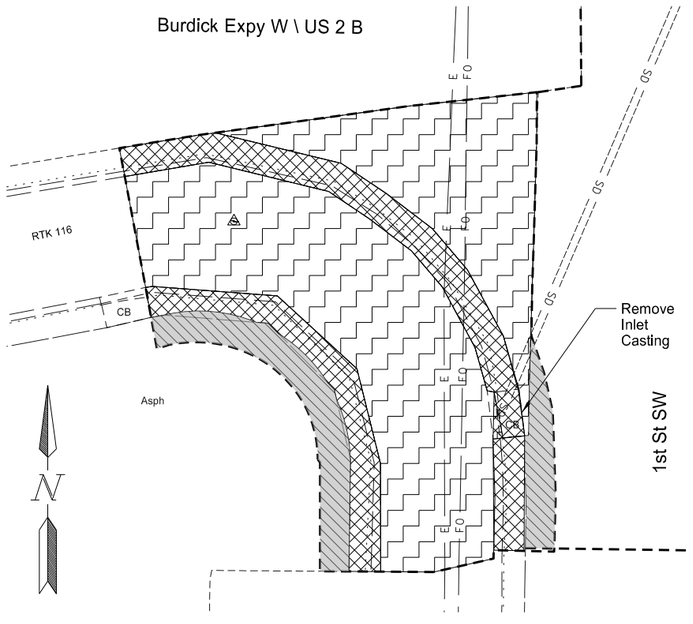
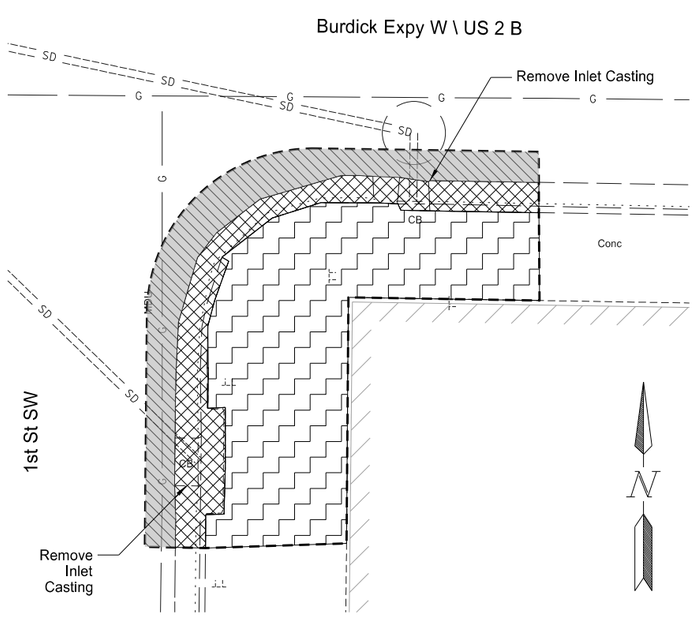




SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	16	SY
	NE Quad	23	SY
	SW Quad	47	SY
	SE Quad	29	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	29	LF
	NE Quad	34	LF
	SW Quad	70	LF
	SE Quad	42	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NE Quad	6	SY
	SW Quad	8	SY
	SE Quad	11	SY





Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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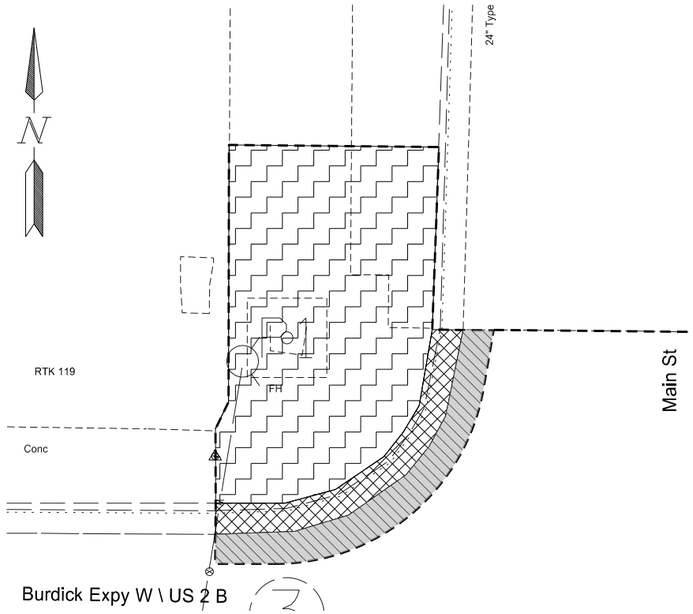
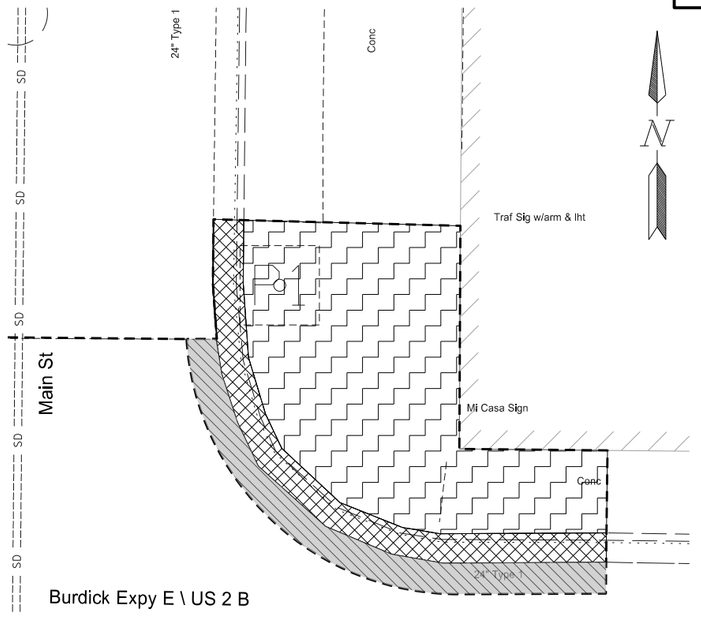
Removals

US 2 Business / Burdick Expy

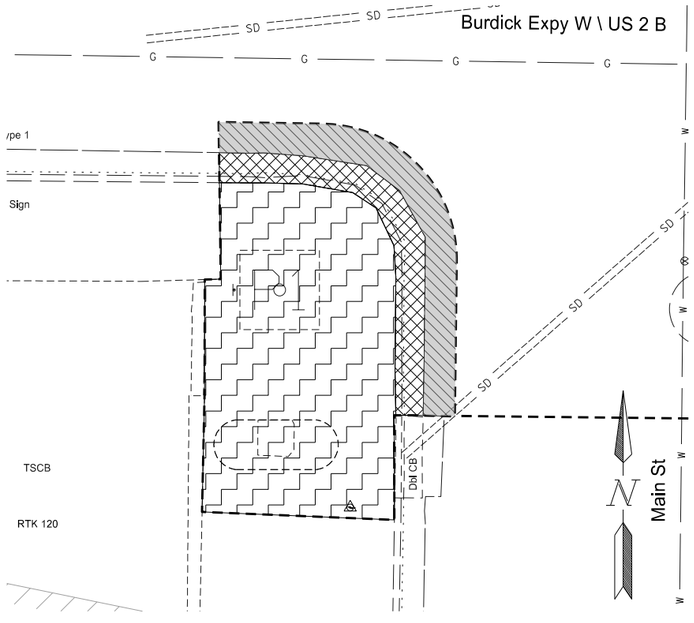
1st St SW

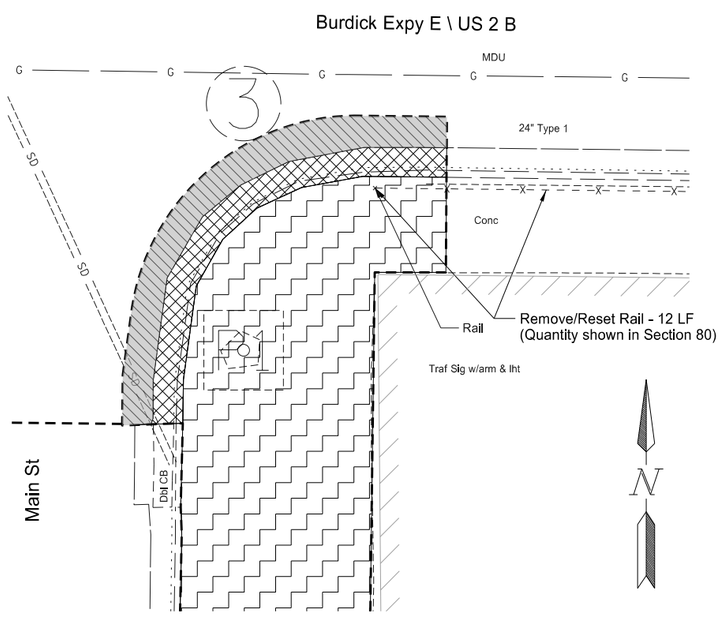
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	2





SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	33	SY
	NE Quad	34	SY
	SW Quad	29	SY
	SE Quad	41	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	22	LF
	NE Quad	39	LF
	SW Quad	26	LF
	SE Quad	29	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NW Quad	6	SY
	NE Quad	8	SY
	SW Quad	7	SY
	SE Quad	8	SY





Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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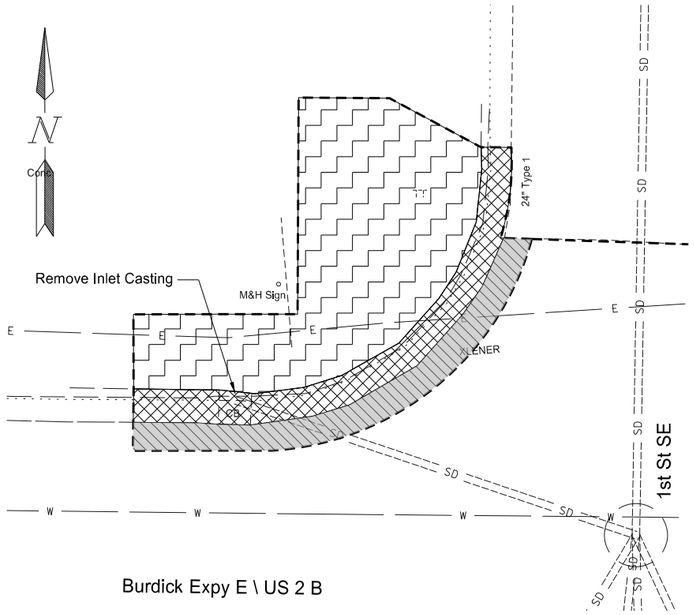
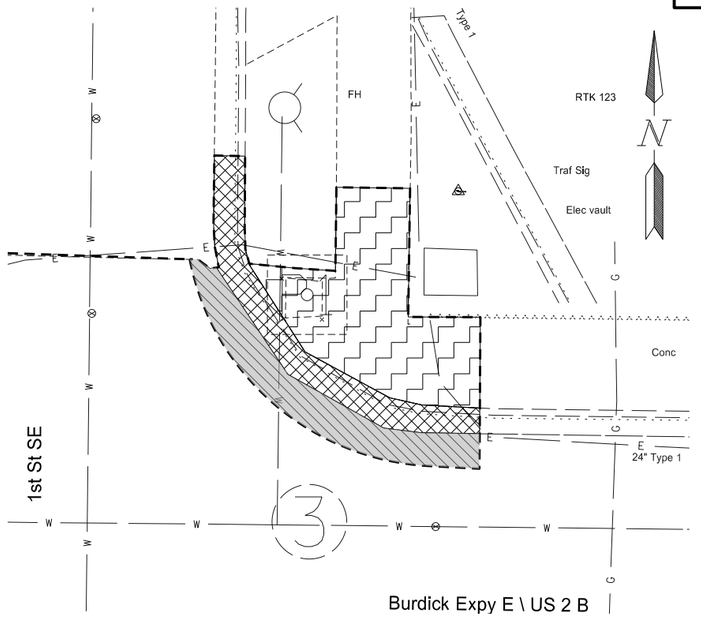
Removals

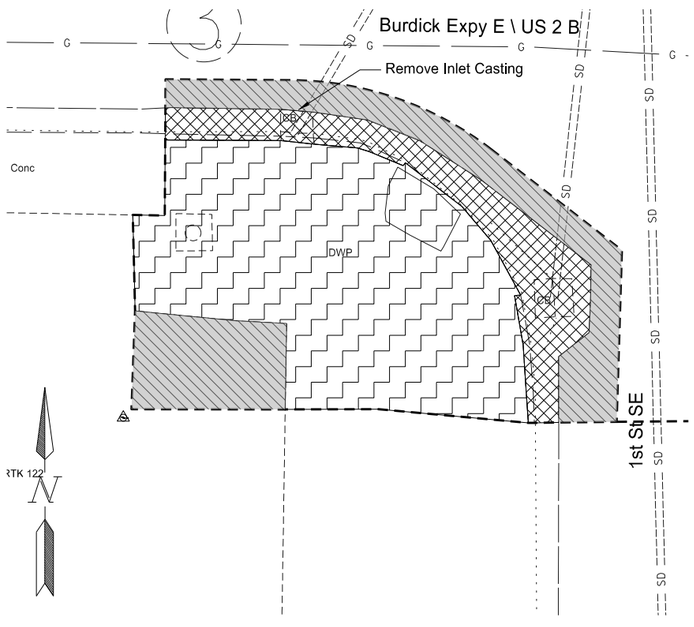
US 2 Business / Burdick Expy

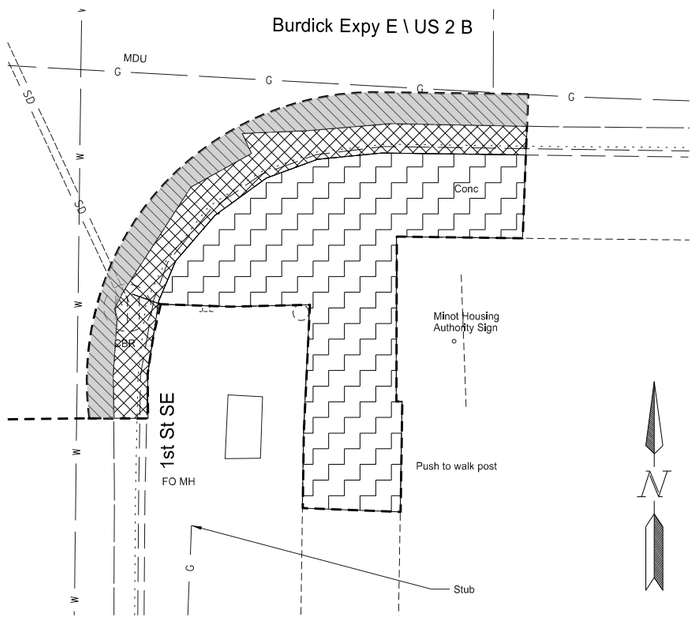
Main St

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	3









SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	26	SY
	NE Quad	13	SY
	SW Quad	38	SY
	SE Quad	28	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	33	LF
	NE Quad	27	LF
	SW Quad	36	LF
	SE Quad	37	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NW Quad	7	SY
	NE Quad	6	SY
	SW Quad	17	SY
	SE Quad	9	SY

Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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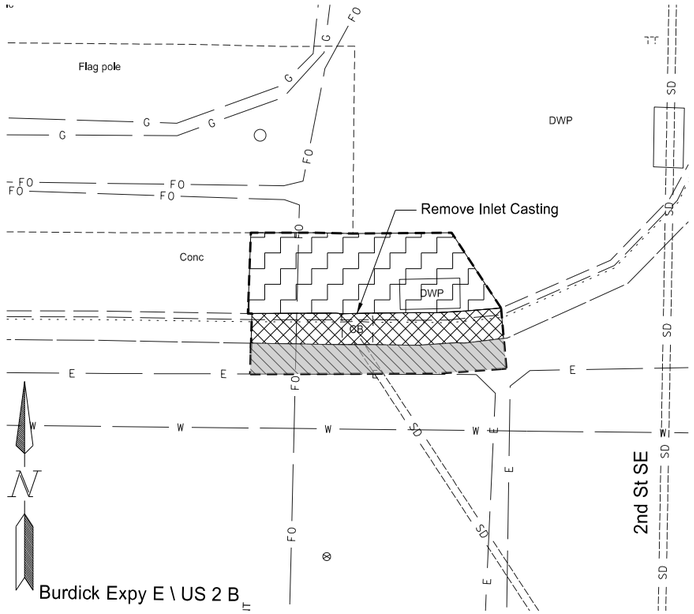
Removals

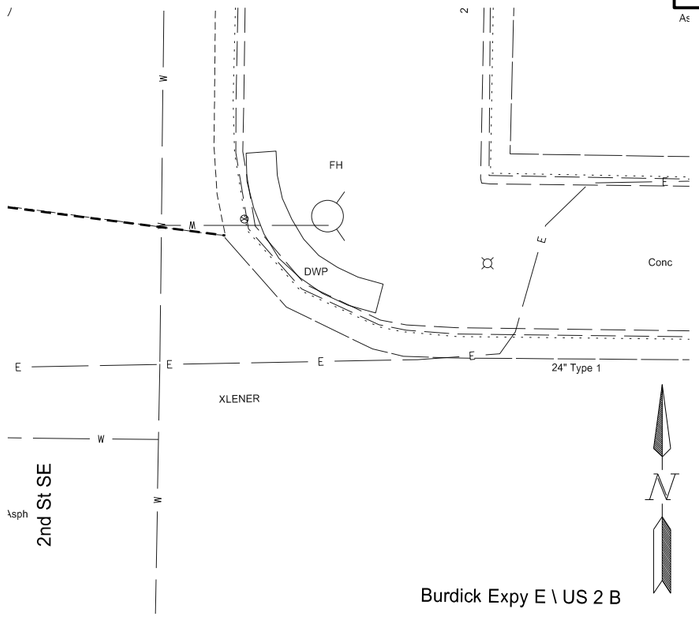
US 2 Business / Burdick Expy

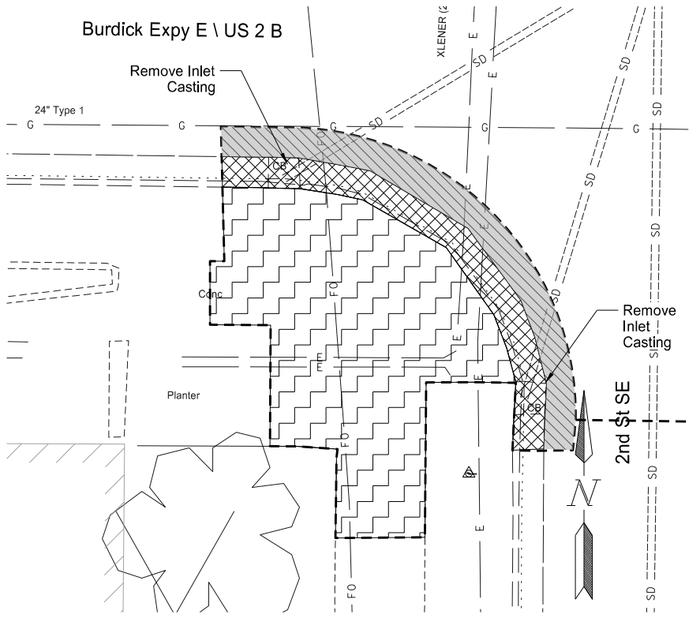
1st St SE

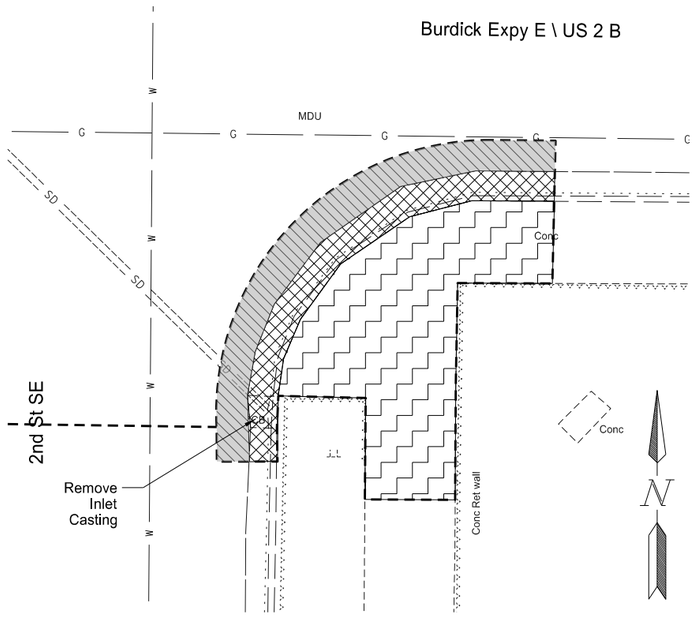
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	4

SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	9	SY
	SW Quad	30	SY
	SE Quad	20	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	17	LF
	SW Quad	31	LF
	SE Quad	30	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NW Quad	4	SY
	SW Quad	8	SY
	SE Quad	8	SY









Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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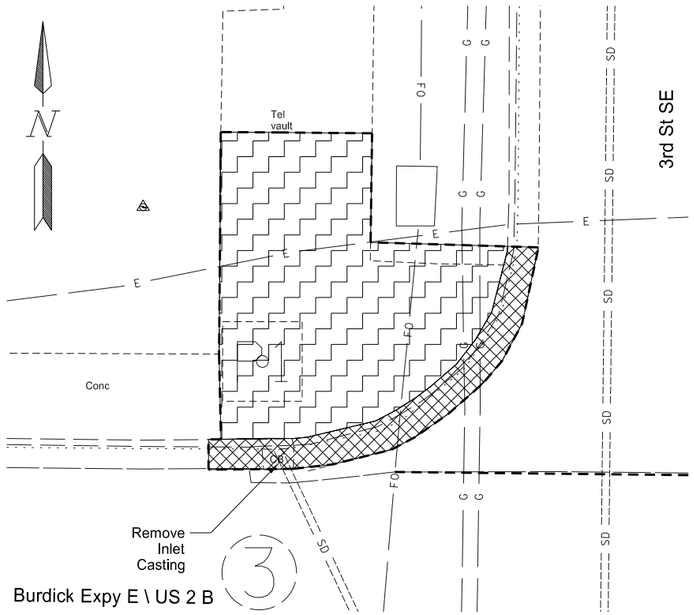
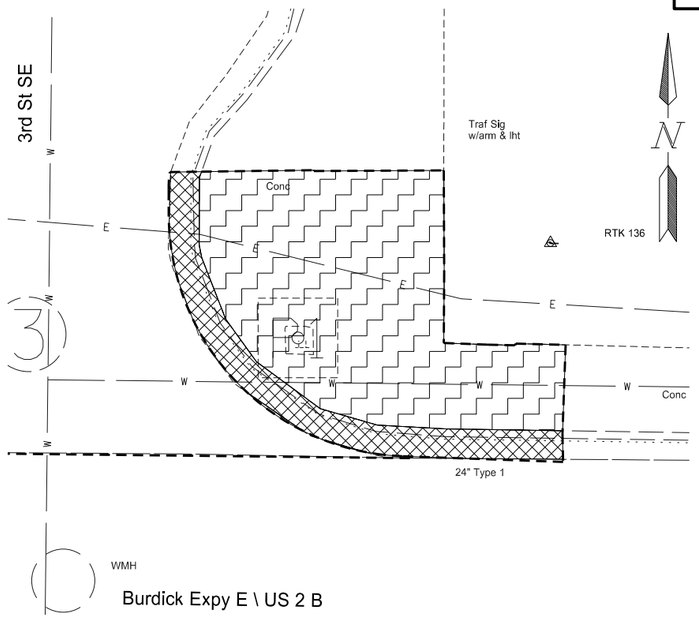
Removals

US 2 Business / Burdick Expy

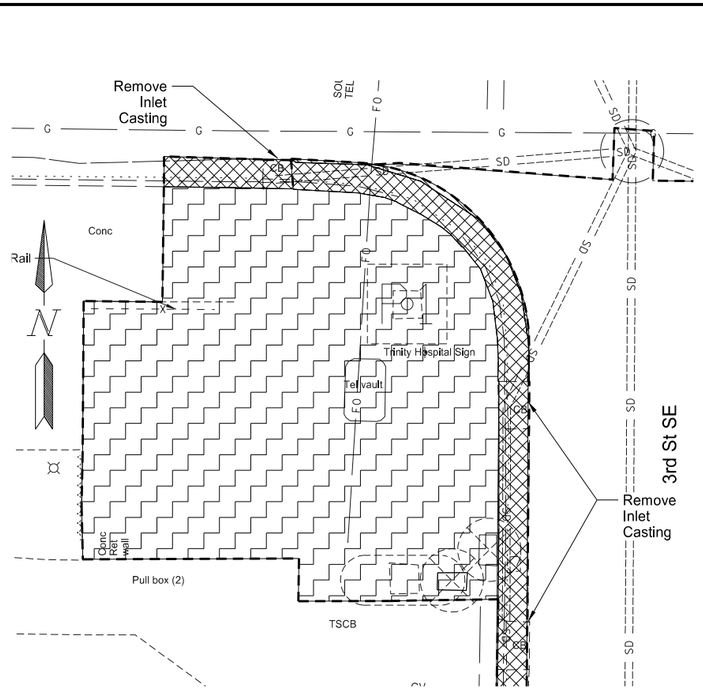
2nd St SE

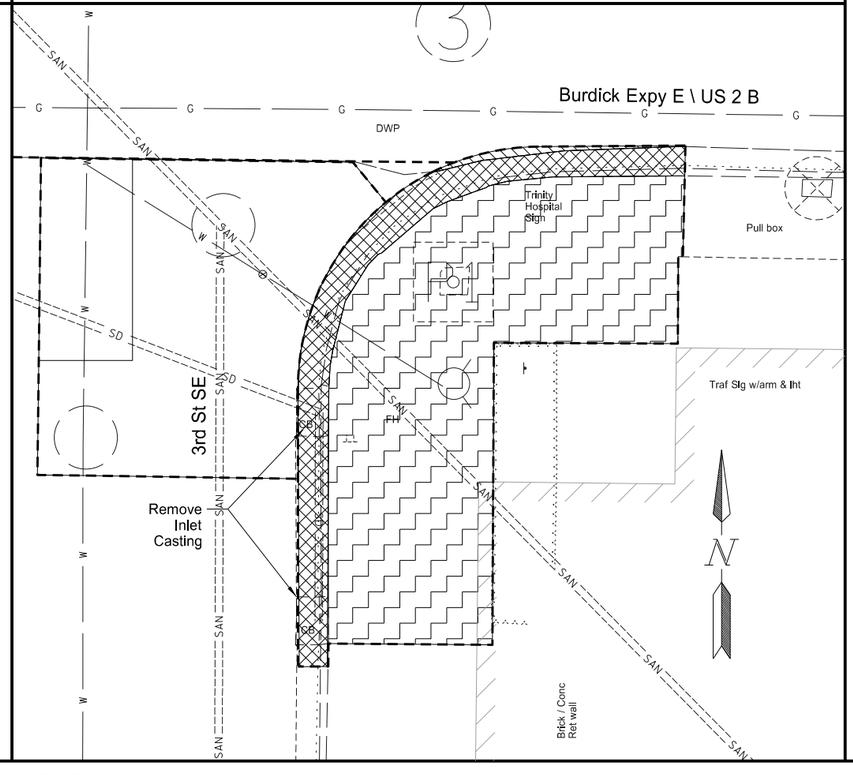
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	5





SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	30	SY
	NE Quad	31	SY
	SW Quad	71	SY
	SE Quad	47	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	27	LF
	NE Quad	37	LF
	SW Quad	55	LF
	SE Quad	50	LF





Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

Note: There is concrete underneath the asphalt wear course in the 3rd St SE intersection.

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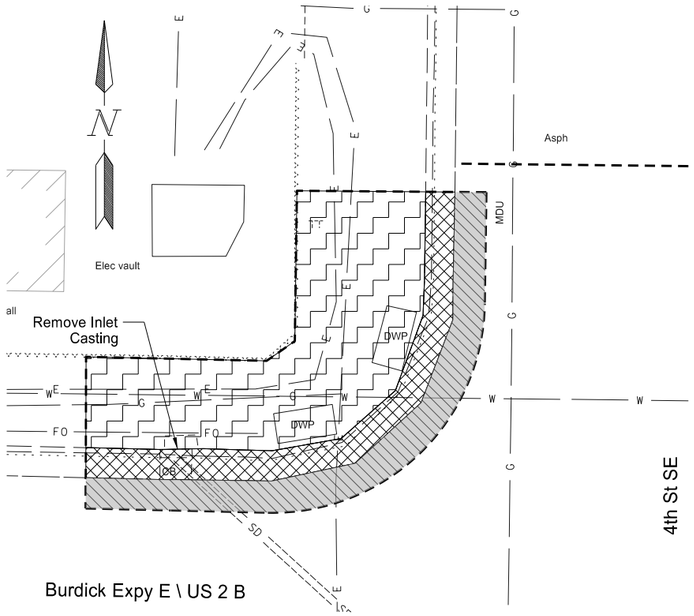
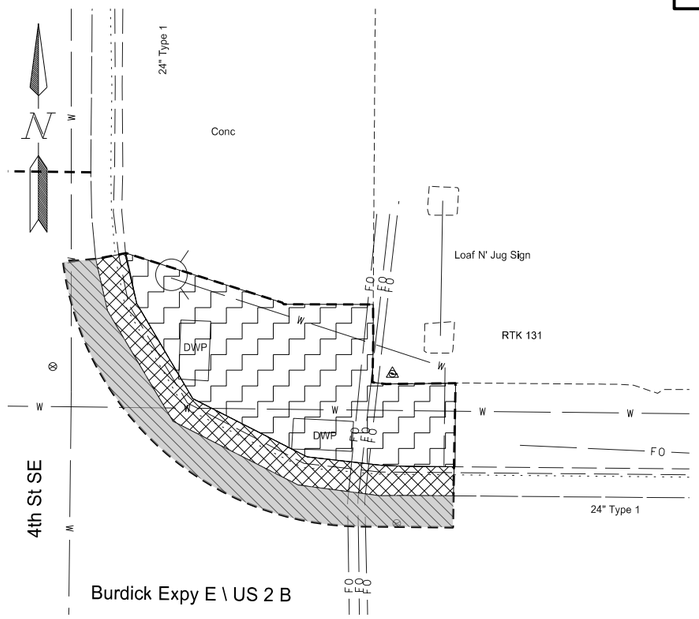
Removals

US 2 Business / Burdick Expy

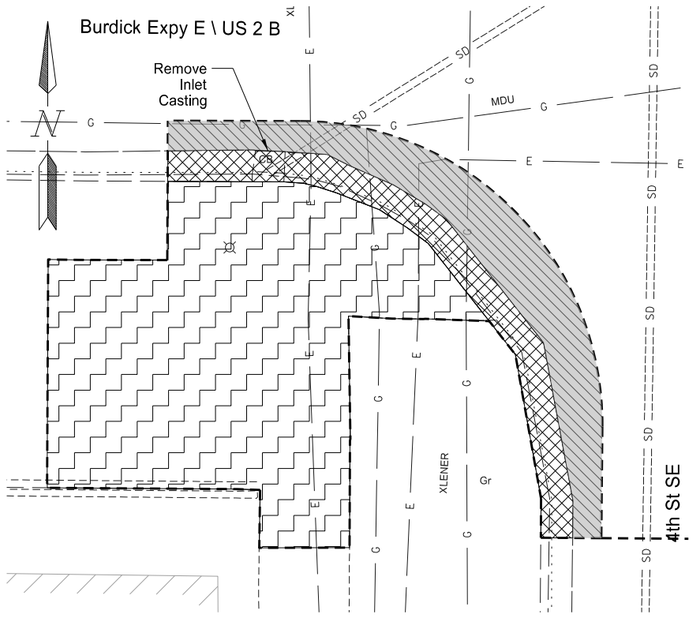
3rd St SE

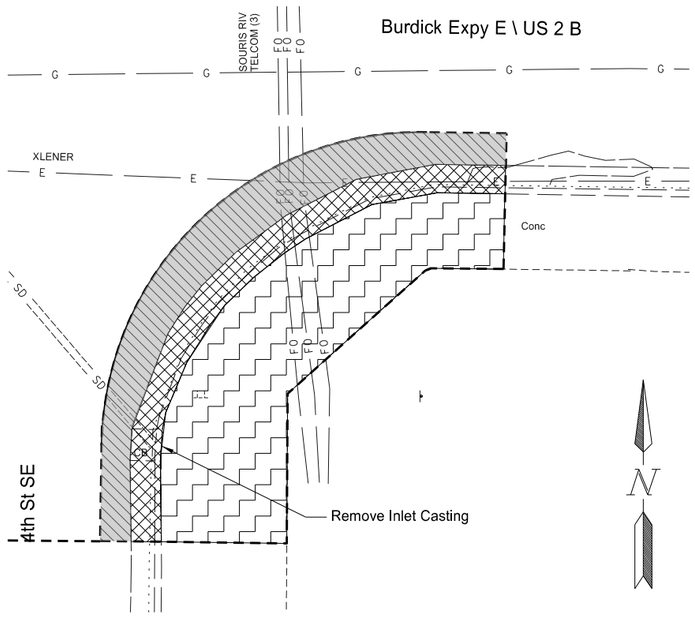
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	6





SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	23	SY
	NE Quad	18	SY
	SW Quad	48	SY
	SE Quad	24	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	36	LF
	NE Quad	30	LF
	SW Quad	42	LF
	SE Quad	39	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NW Quad	10	SY
	NE Quad	8	SY
	SW Quad	14	SY
	SE Quad	12	SY





Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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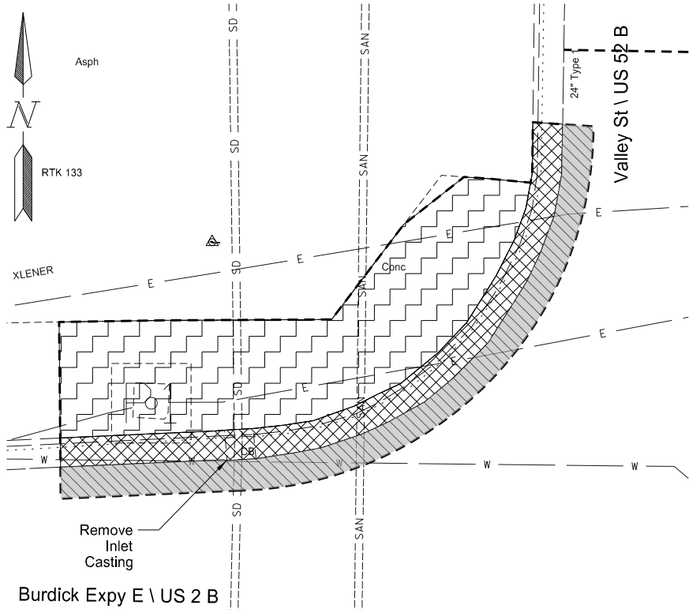
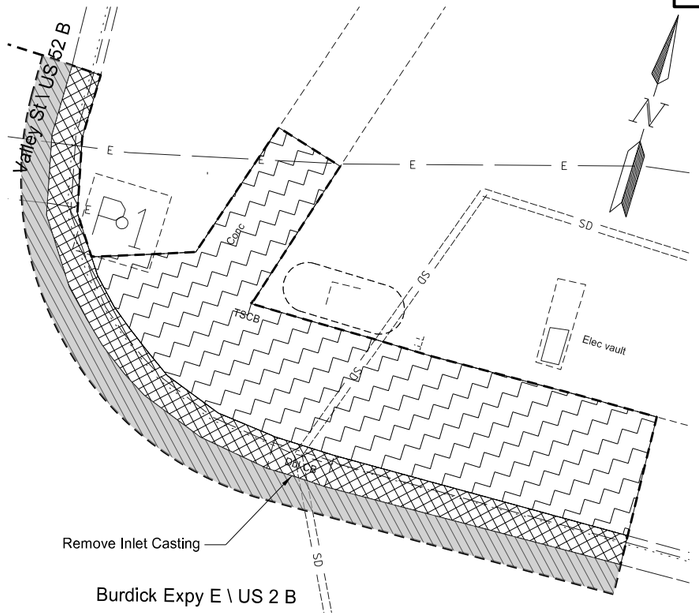
Removals

US 2 Business / Burdick Expy

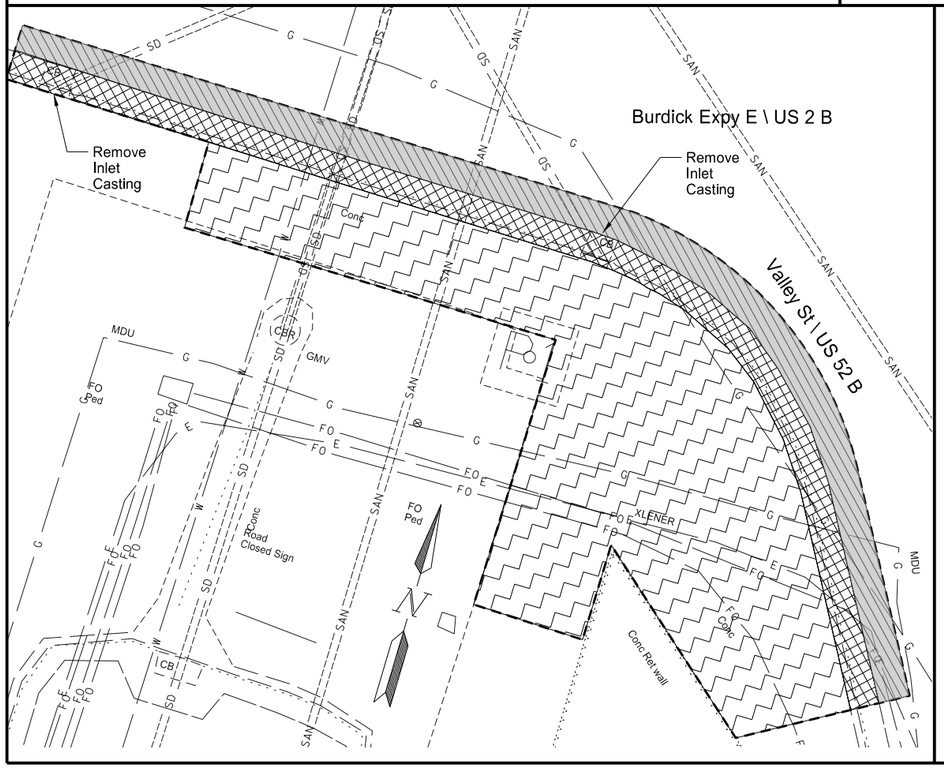
4th St SE

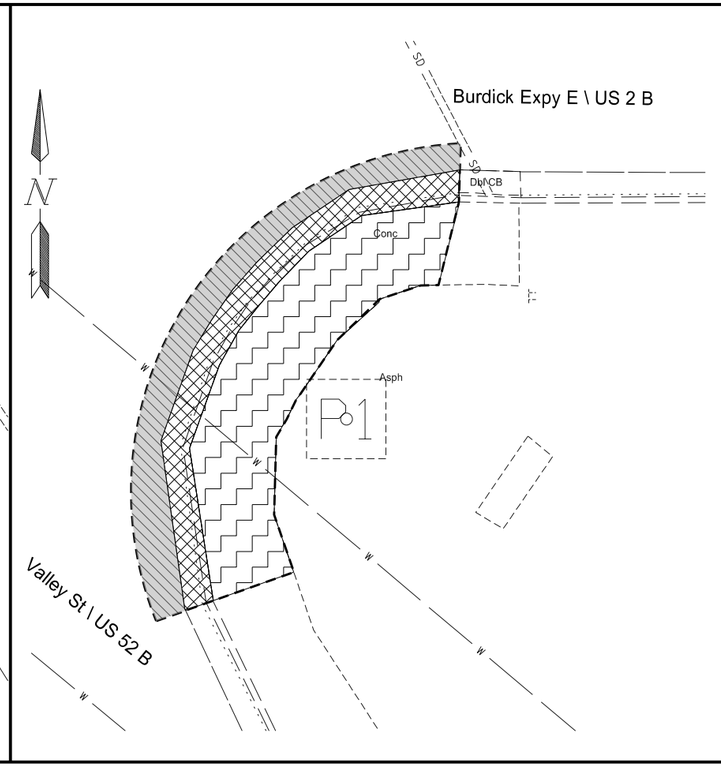
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	40	7





SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT		
	NW Quad	26	SY
	NE Quad	38	SY
	SW Quad	64	SY
	SE Quad	18	SY
202 0130	REMOVAL OF CURB & GUTTER		
	NW Quad	44	LF
	NE Quad	55	LF
	SW Quad	77	LF
	SE Quad	38	LF
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	NW Quad	10	SY
	NE Quad	13	SY
	SW Quad	18	SY
	SE Quad	9	SY





Legend

- Removal Limits
- Removal of Bituminous Surfacing
- Removal of Curb & Gutter
- Removal of Concrete Pavement

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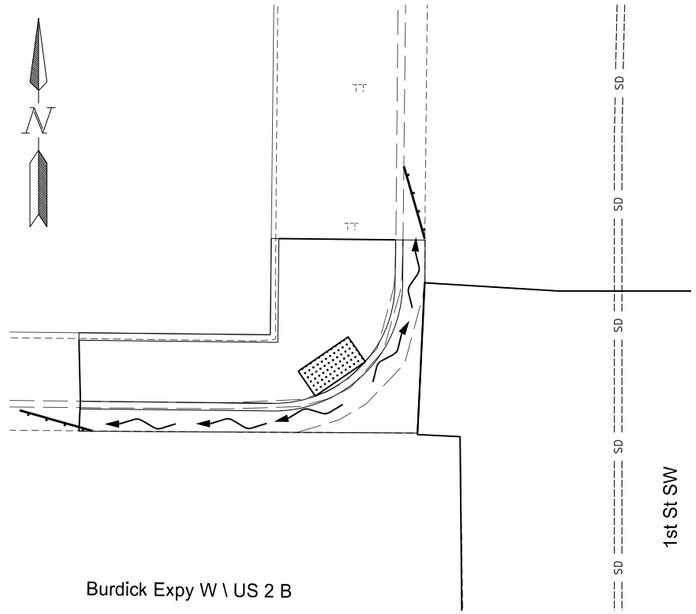
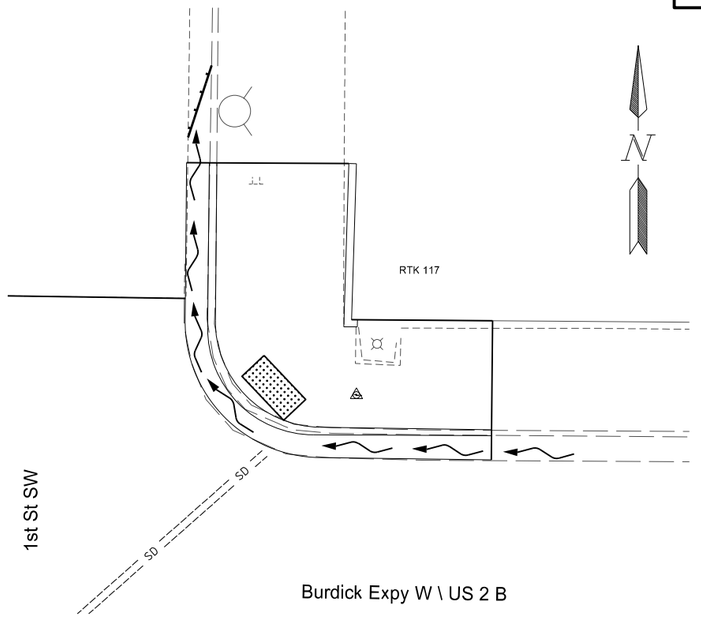
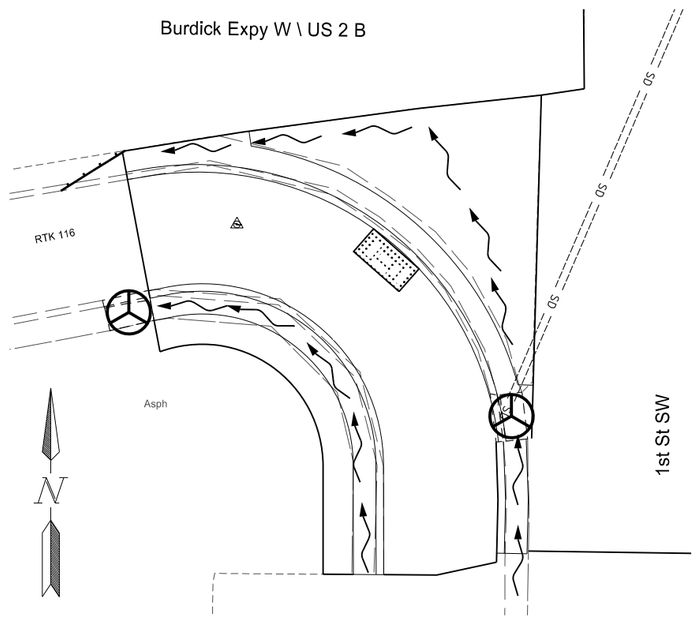
Removals

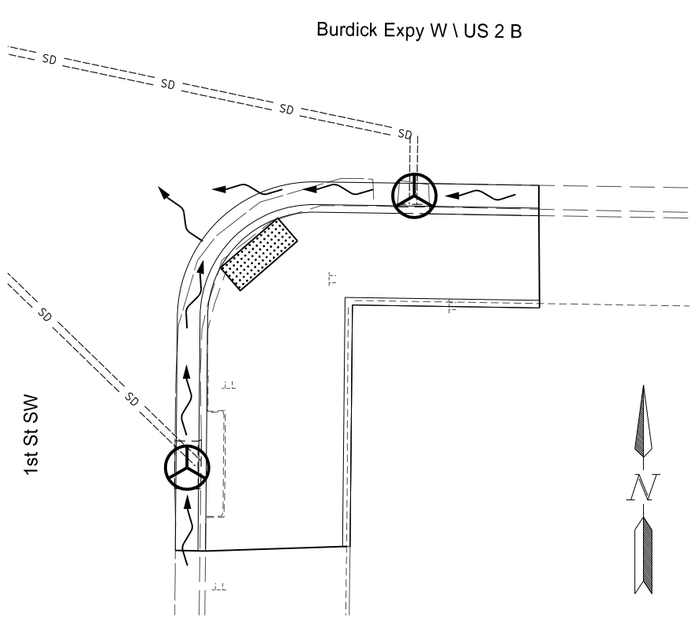
US 2 Business / Burdick Expy

Valley St









STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	1

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	10	LF
		NE Quad	5	LF
		SW Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	10	LF
		NE Quad	5	LF
		SW Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		SW Quad	2	EA
		SE Quad	2	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		SW Quad	2	EA
		SE Quad	2	EA

LEGEND

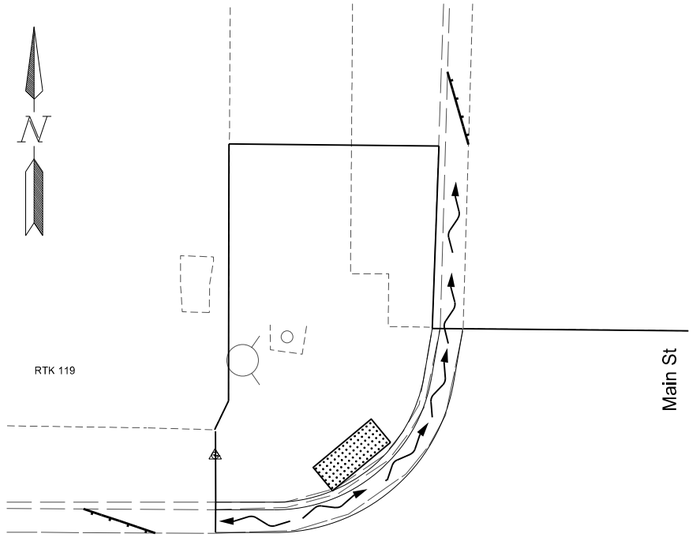
Inlet Protection-Special

Weighted Fiber Rolls

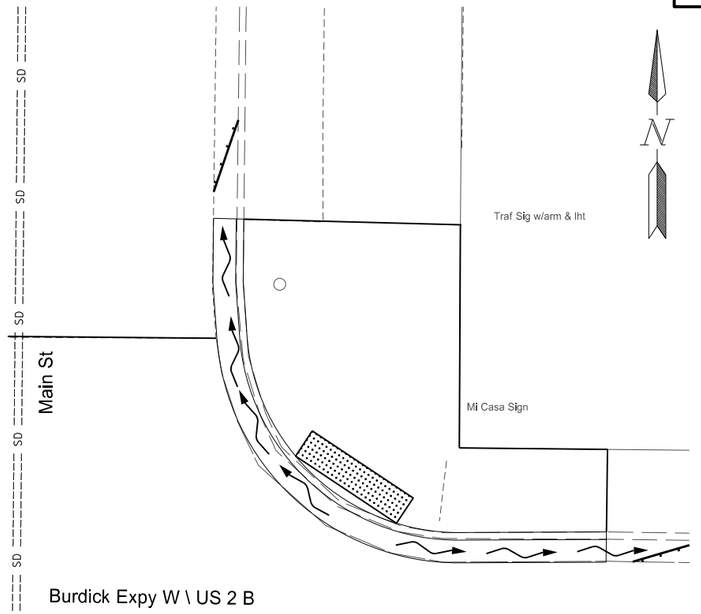
Temporary Erosion Control

US 2 Business / Burdick Expy

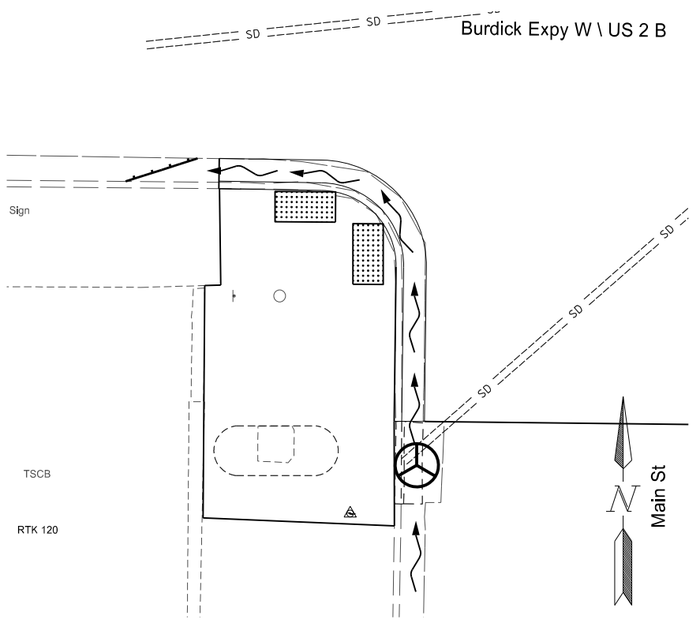
1st St SW



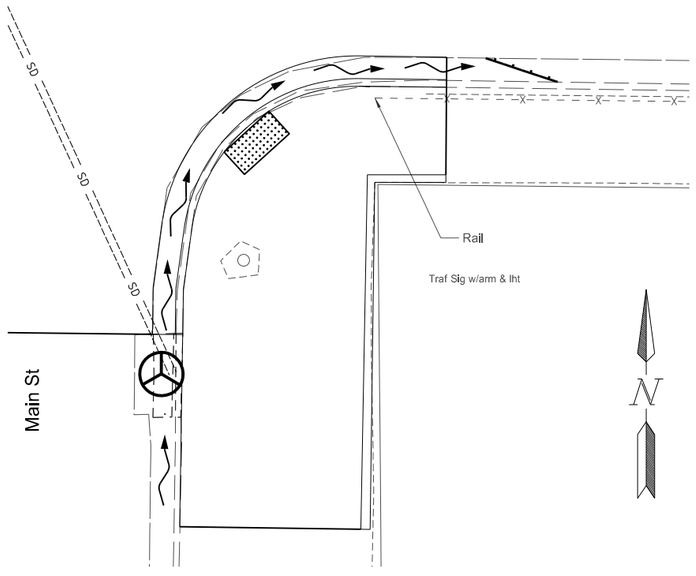
Burdick Expy W \ US 2 B



Burdick Expy W \ US 2 B



Burdick Expy W \ US 2 B



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	2

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	10	LF
		NE Quad	10	LF
		SW Quad	5	LF
		SE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	10	LF
		NE Quad	10	LF
		SW Quad	5	LF
		SE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		SW Quad	1	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		SW Quad	1	EA
		SE Quad	1	EA

LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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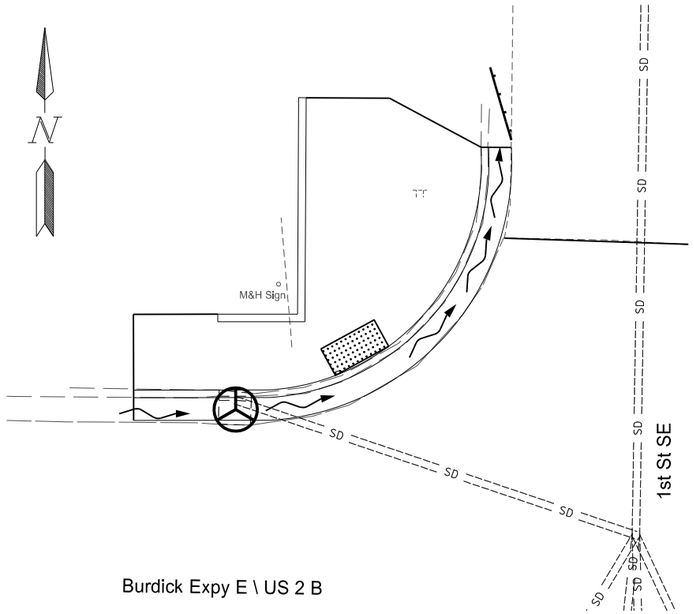
Temporary Erosion Control

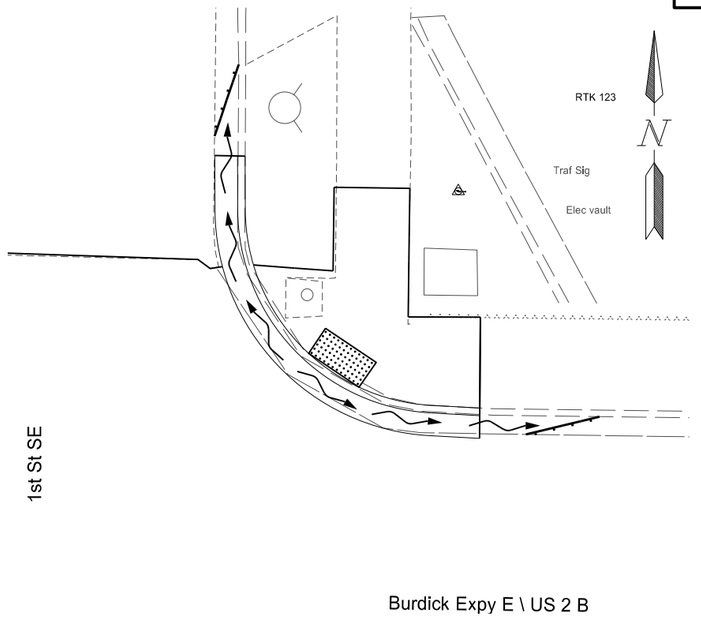
US 2 Business / Burdick Expy

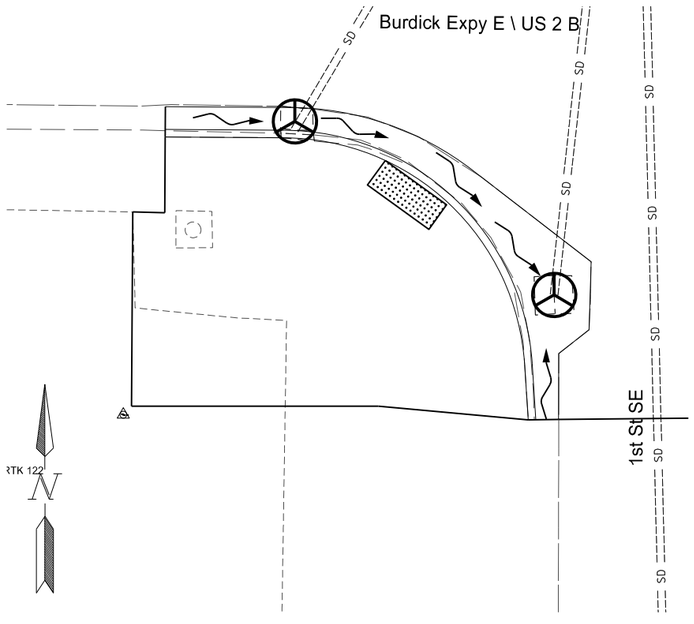
Main St

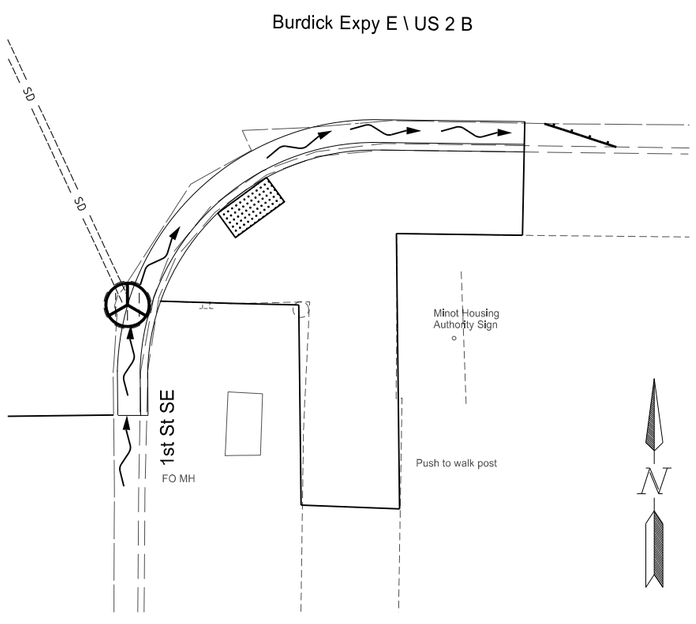
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	3

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA









LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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Temporary Erosion Control

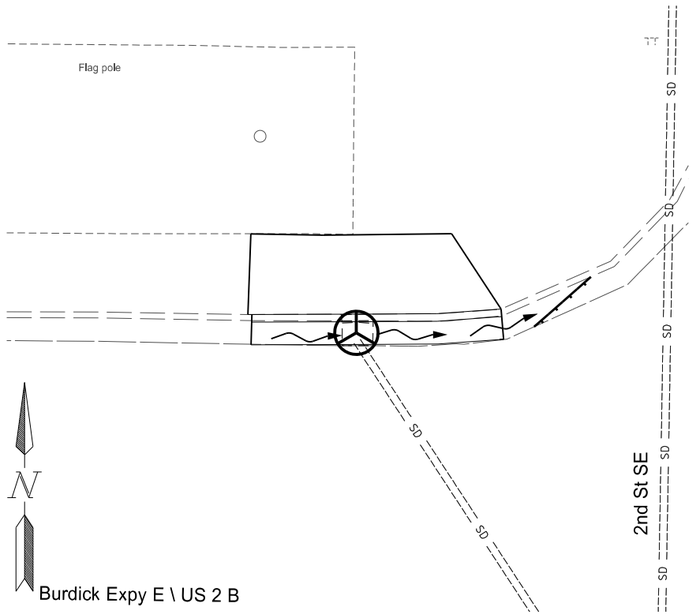
US 2 Business / Burdick Expy

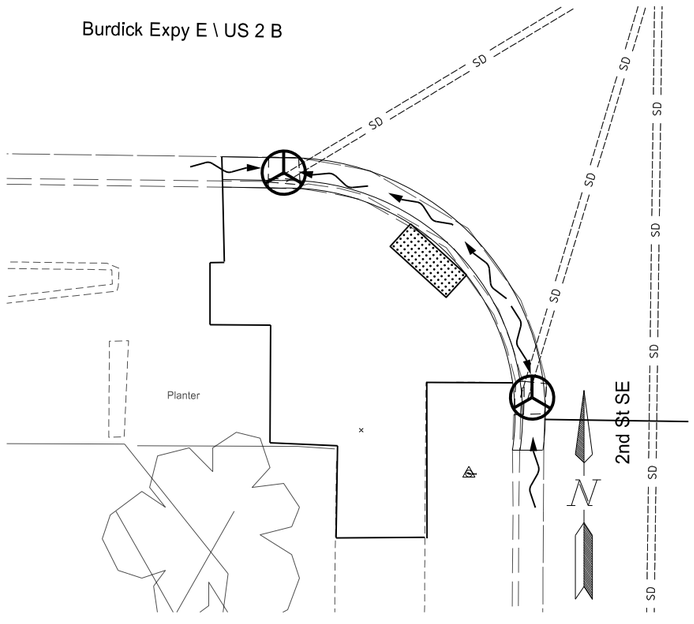
1st St SE

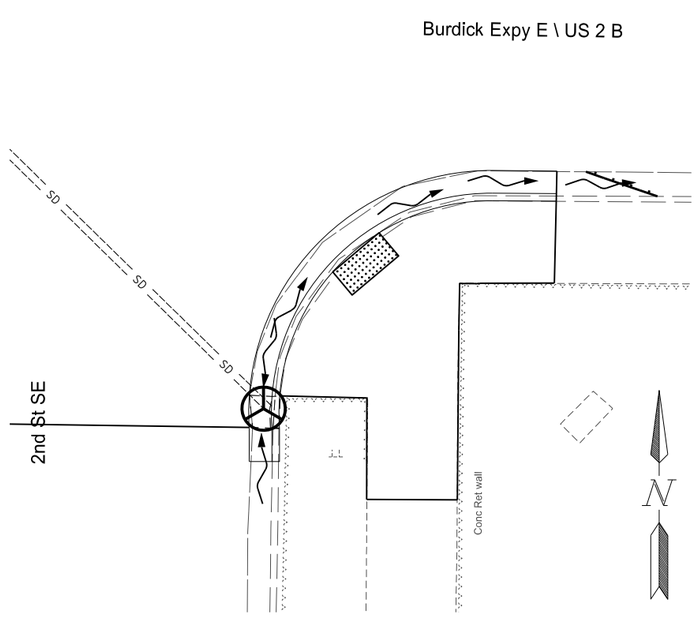
8/11/2020 10:17:32 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\076\076TE_003.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	4

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		SE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		SE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA







LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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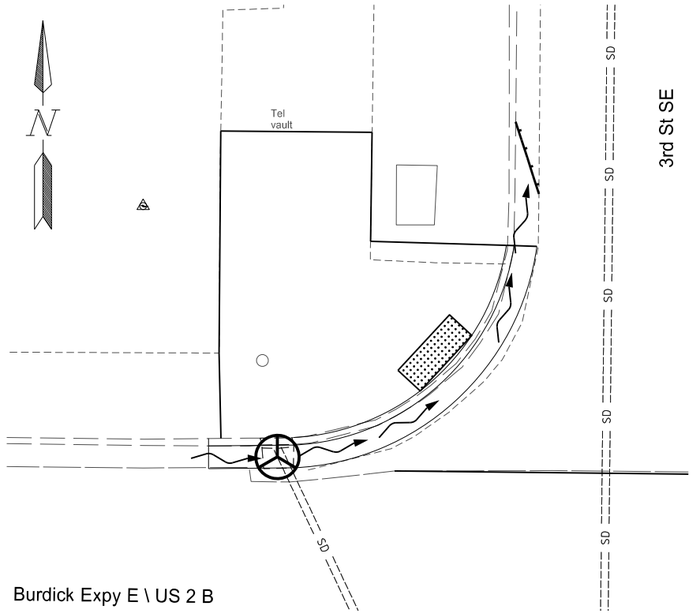
Temporary Erosion Control

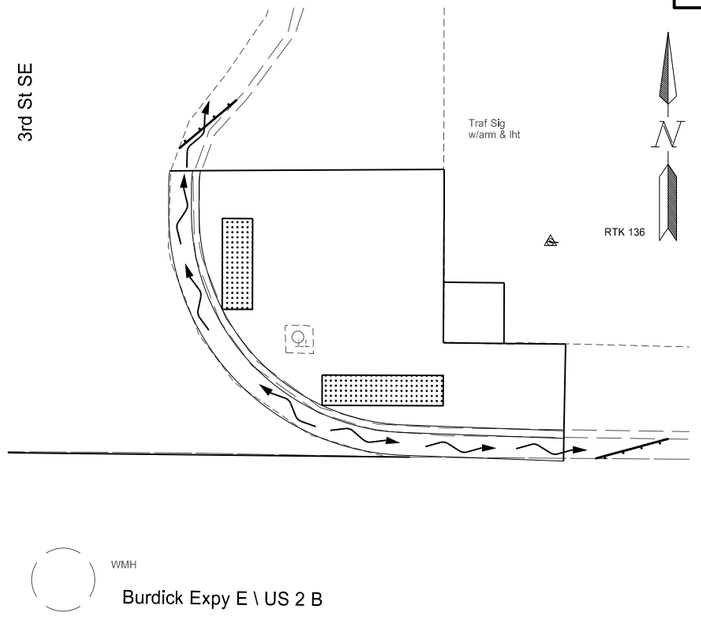
US 2 Business / Burdick Expy

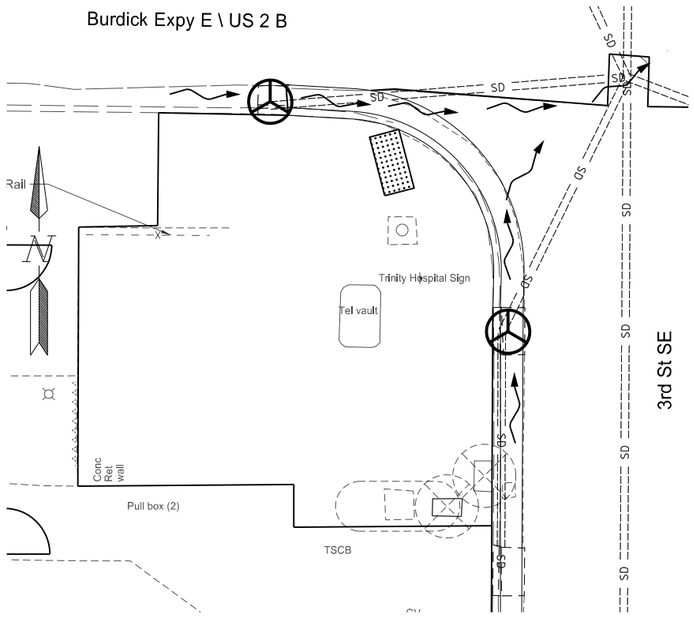
2nd St SE

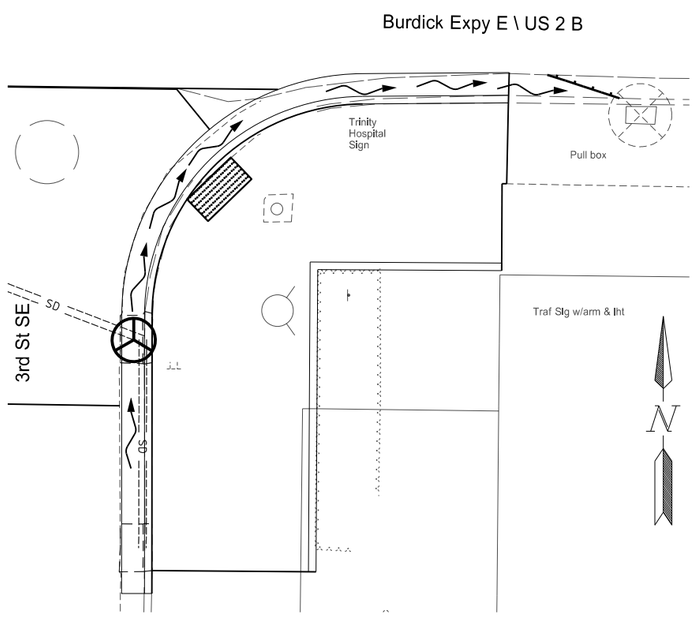
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	5

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA









LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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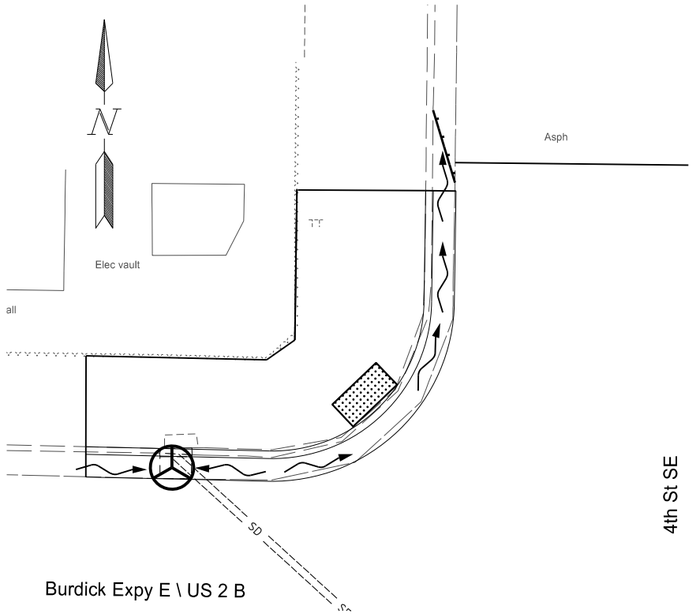
Temporary Erosion Control

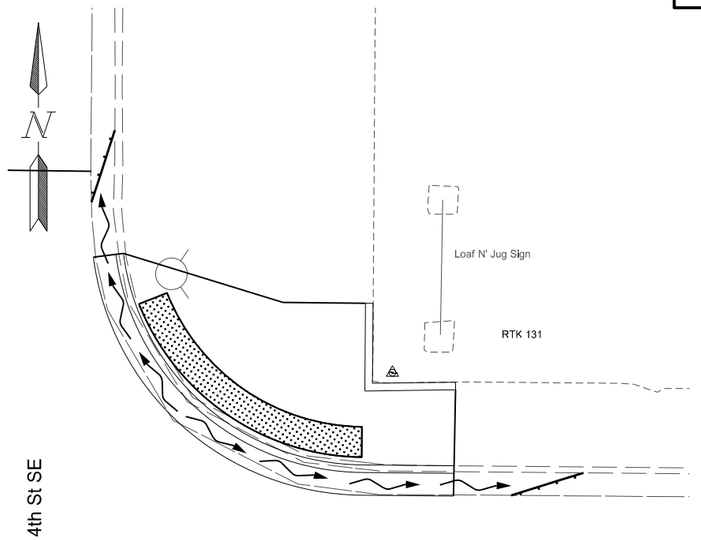
US 2 Business / Burdick Expy

3rd St SE

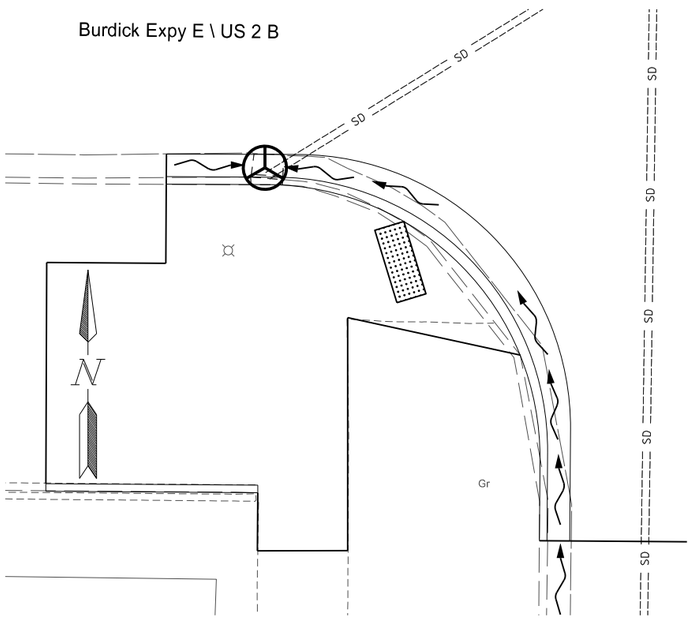
8/11/2020 10:17:36 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\076\076TE_005.dgn



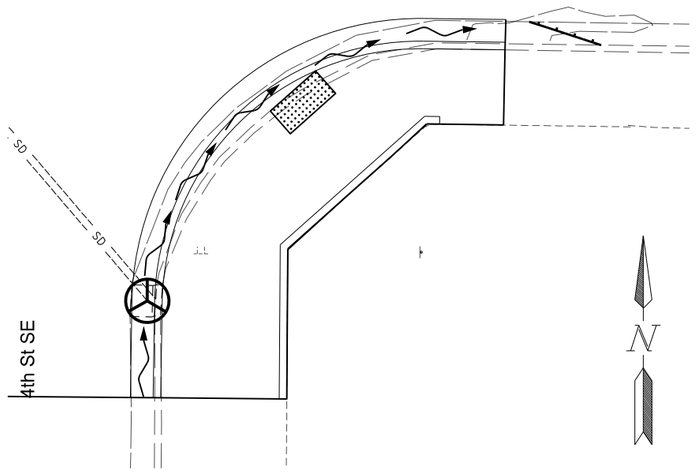
Burdick Expy E \ US 2 B



Burdick Expy E \ US 2 B



Burdick Expy E \ US 2 B



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	6

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	10	LF
		SE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	1	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		SW Quad	1	EA
		SE Quad	1	EA

LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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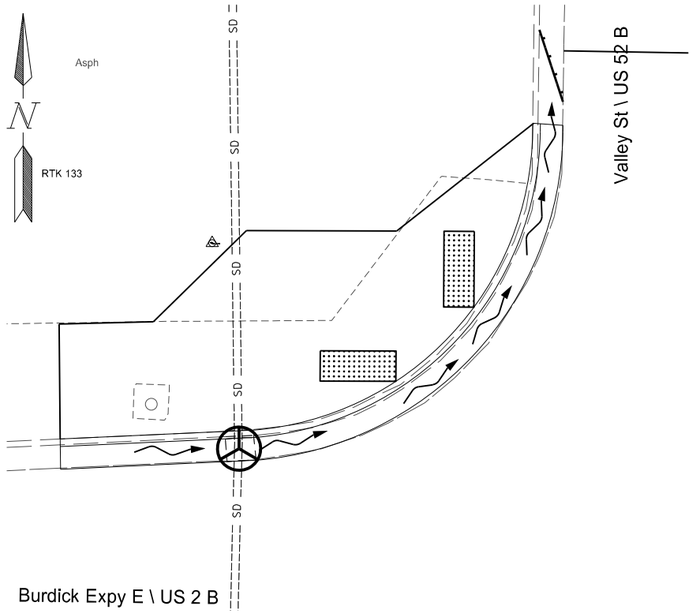
Temporary Erosion Control

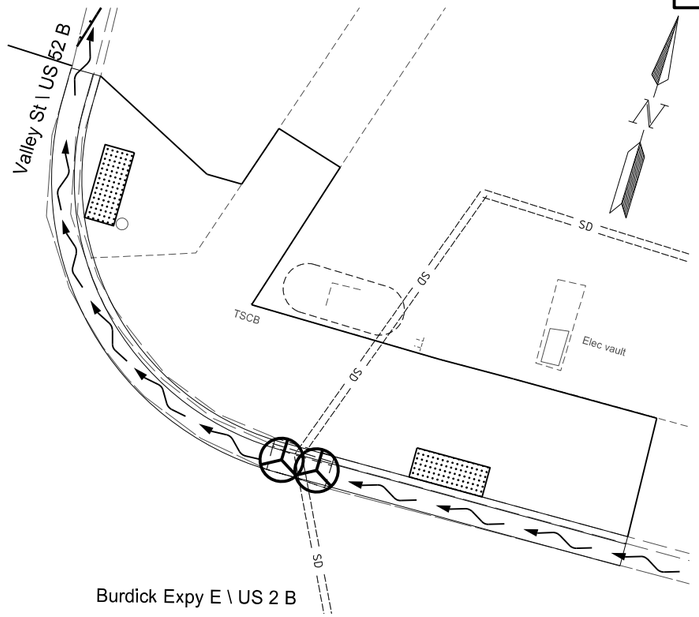
US 2 Business / Burdick Expy

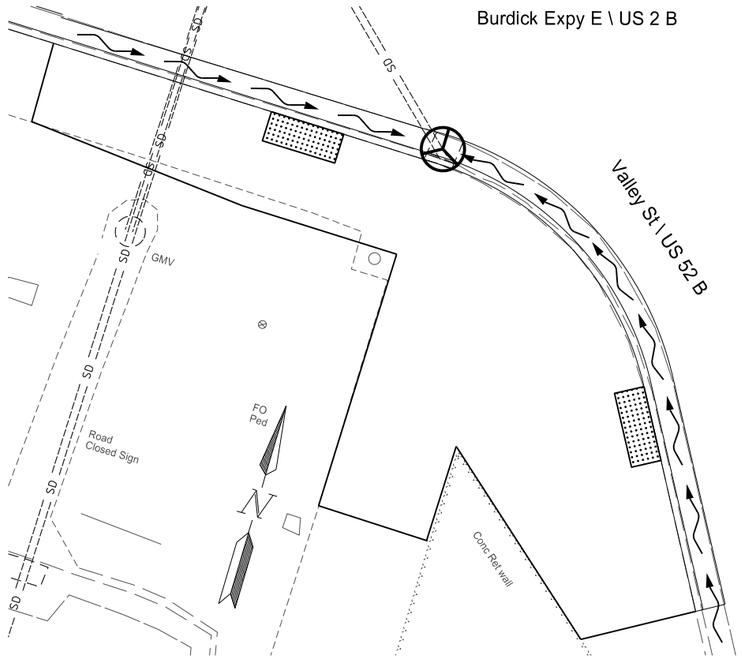
4th St SE

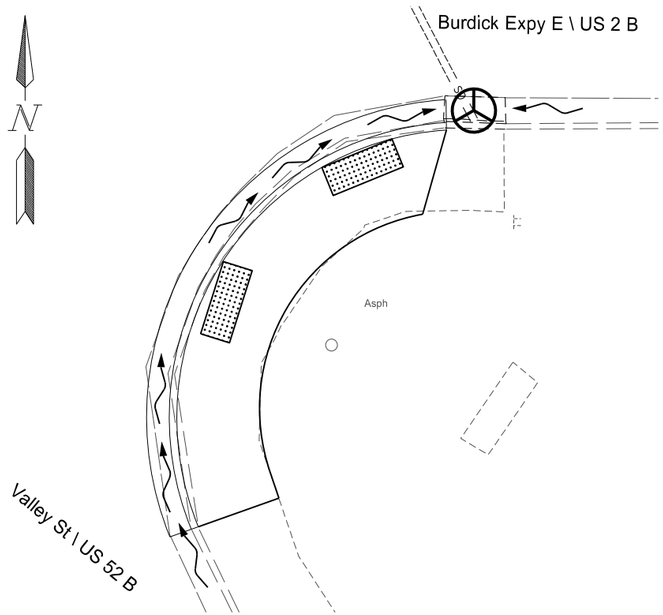
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	76	7

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	5	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		NW Quad	5	LF
		NE Quad	5	LF
708	1540	INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		NE Quad	2	EA
		SW Quad	1	EA
		SE Quad	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		NW Quad	1	EA
		NE Quad	2	EA
		SW Quad	1	EA
		SE Quad	1	EA









LEGEND

Inlet Protection-Special

Weighted Fiber Rolls

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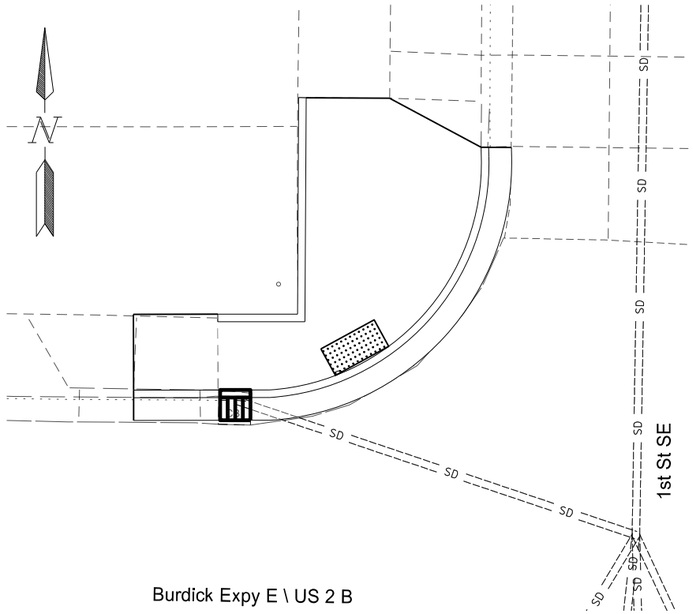
Temporary Erosion Control

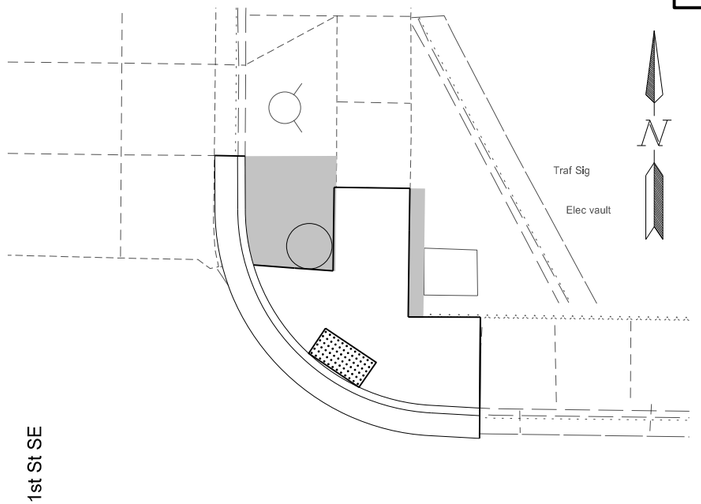
US 2 Business / Burdick Expy

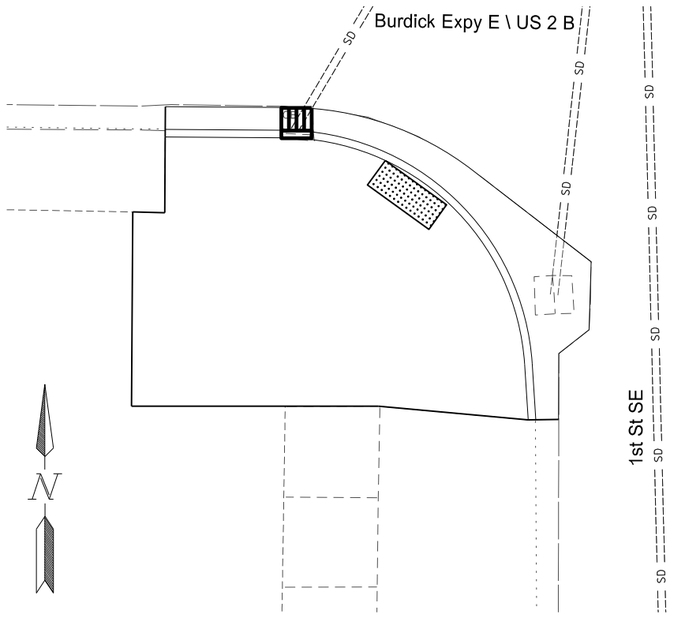
Valley St

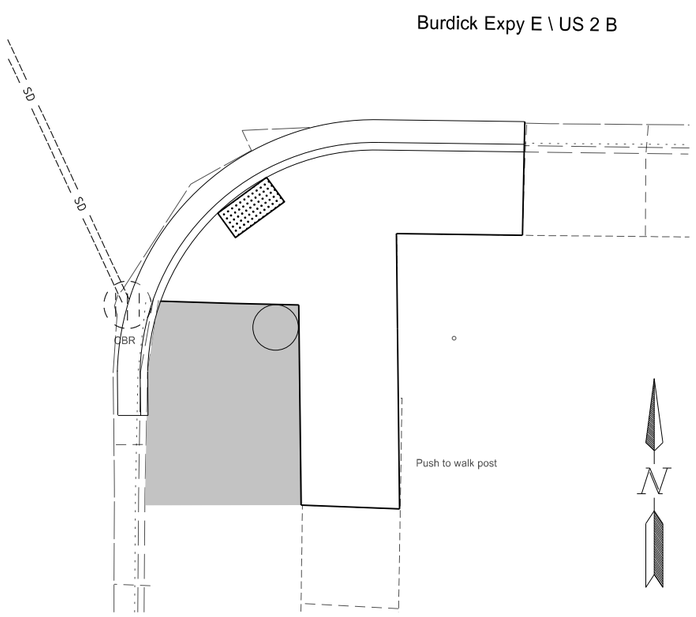
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	77	1

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		NE Quad	6	SY
		SE Quad	15	SY









Note: No Work between 1st St NE and 1st St SE

LEGEND

Landscape Preparation

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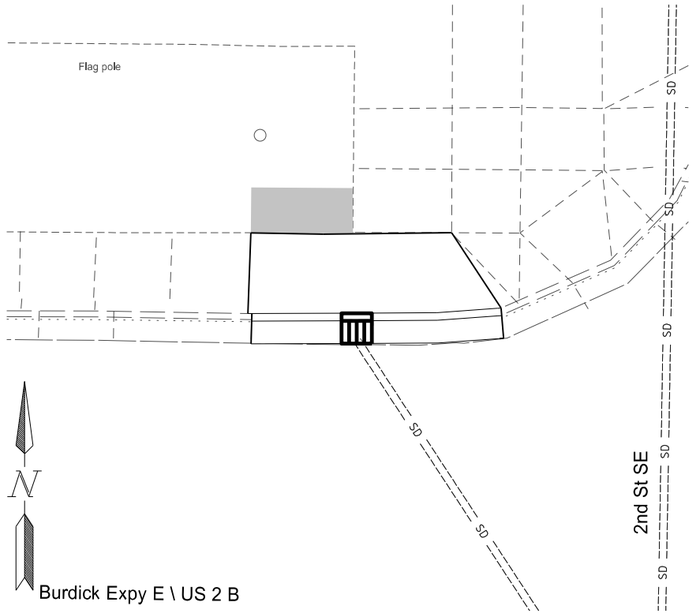
Permanent Erosion Control

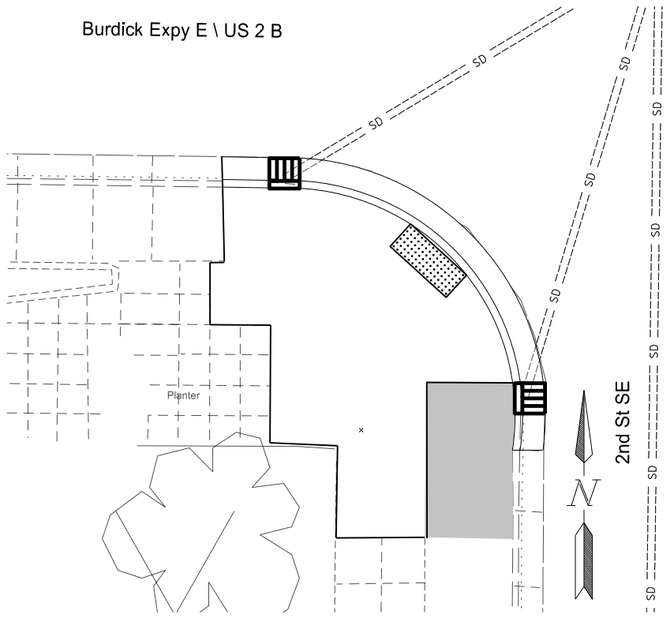
US 2 Business / Burdick Expy

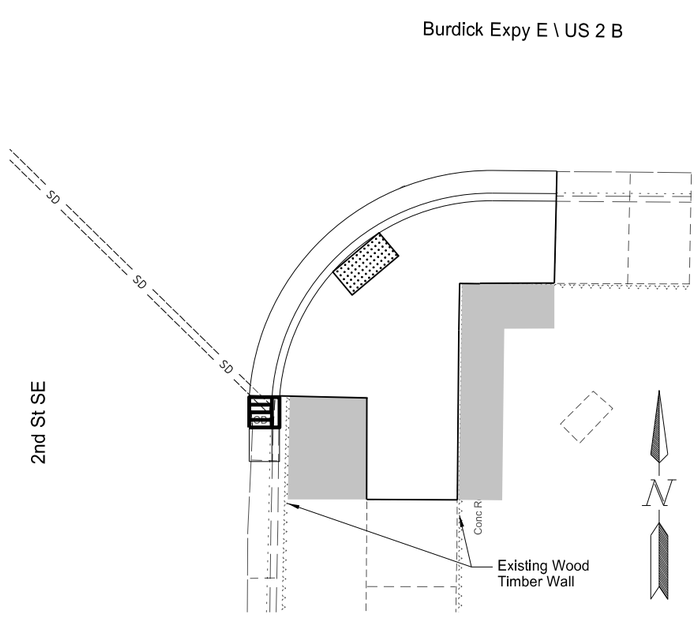
1st St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	77	2

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		NW Quad	2	SY
		SW Quad	7	SY
		SE Quad	9	SY







LEGEND

Landscape Preparation

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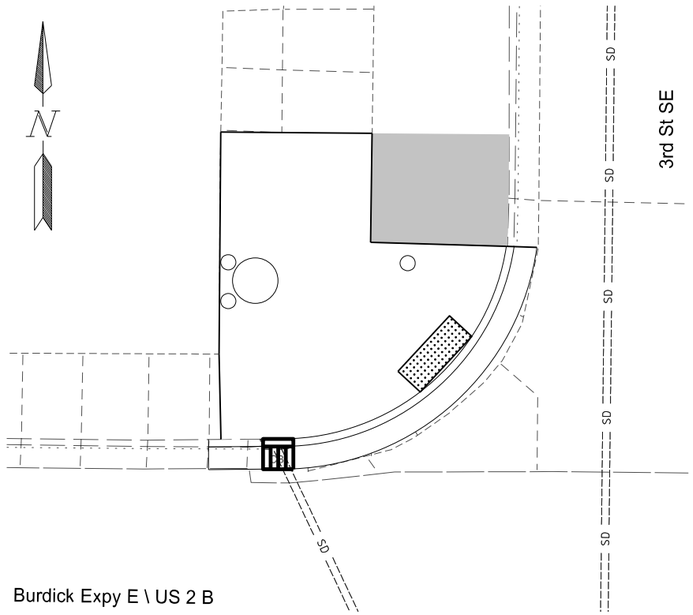
Permanent Erosion Control

US 2 Business / Burdick Expy

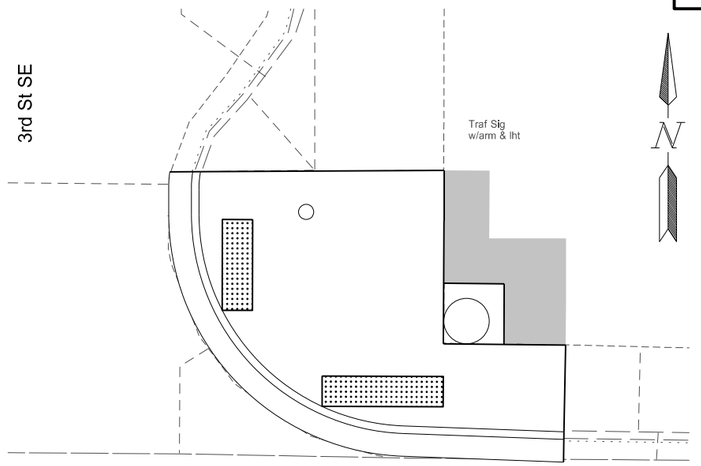
2nd St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	77	3

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		NW Quad	7	SY
		NE Quad	6	SY
		SE Quad	3	SY

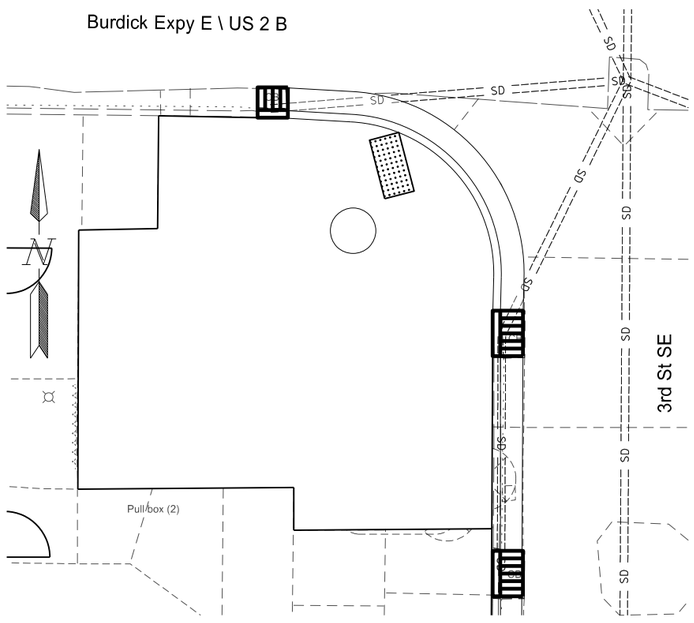


Burdick Expy E \ US 2 B



Burdick Expy E \ US 2 B

Burdick Expy E \ US 2 B



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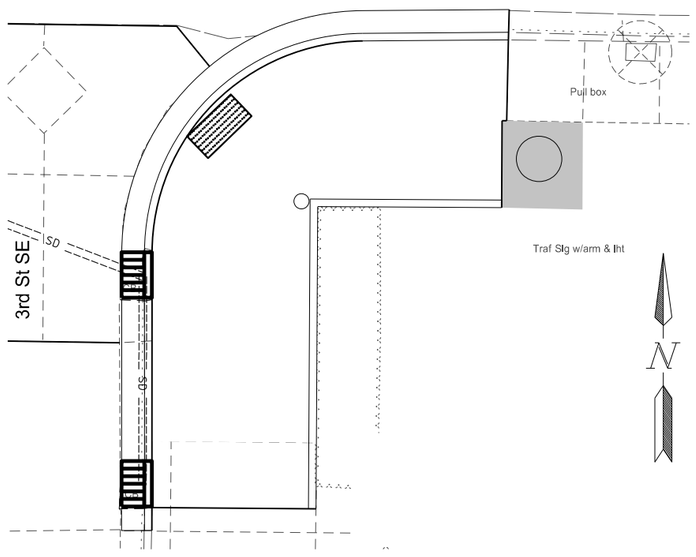

LEGEND

Landscape Preparation

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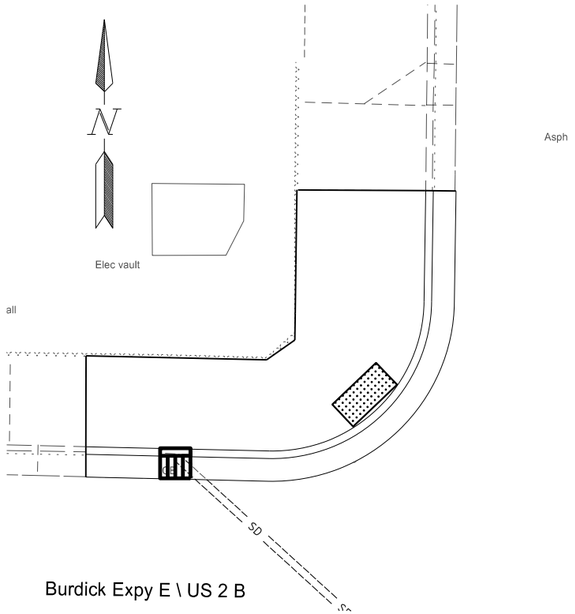
Permanent Erosion Control

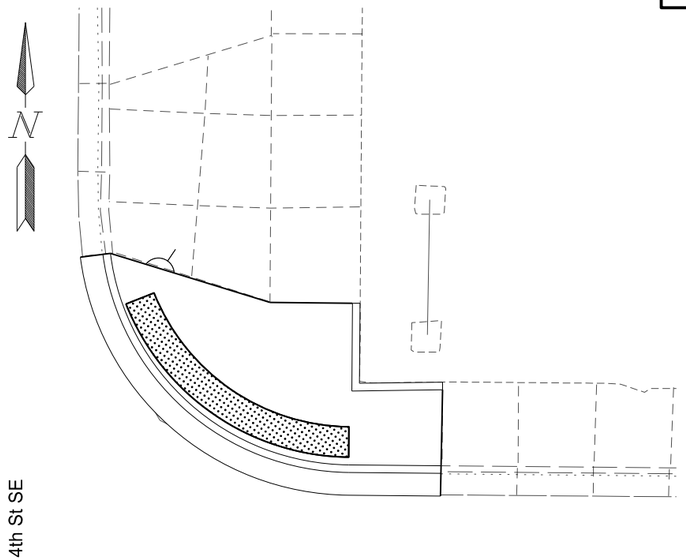
US 2 Business / Burdick Expy

3rd St SE

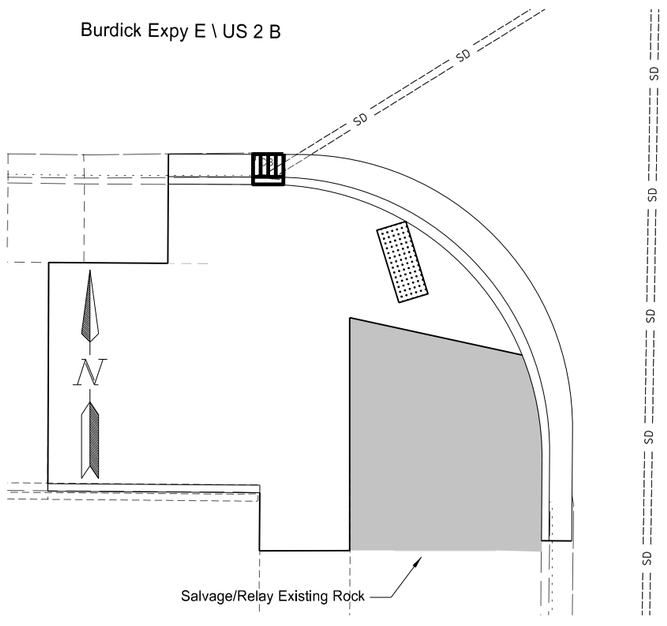
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	77	4

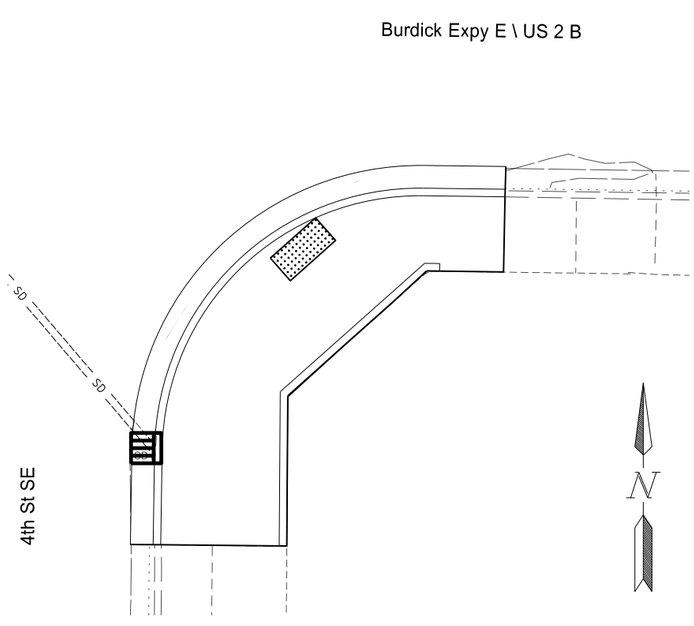
SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		SW Quad	19	SY





NOTE: There is existing rock in place in the SW quadrant of 4th St SE. Salvage existing rock and relay rock after completion of concrete work. Install landscape fabric underneath relayed rock. Include all costs in bid item "Landscape Preparation".





LEGEND

Landscape Preparation

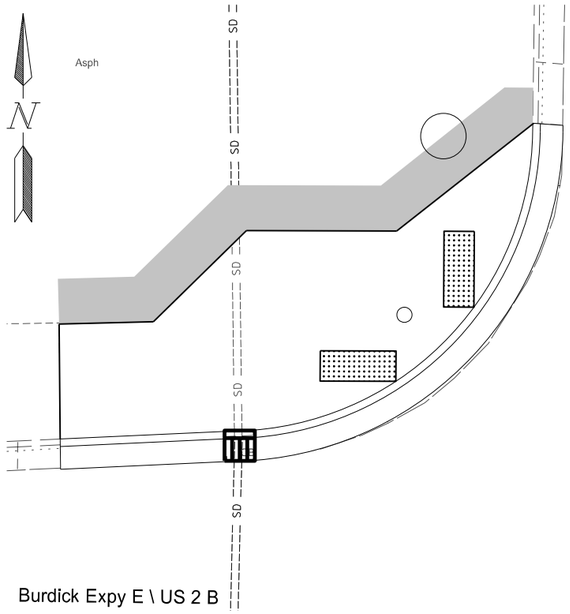
Permanent Erosion Control

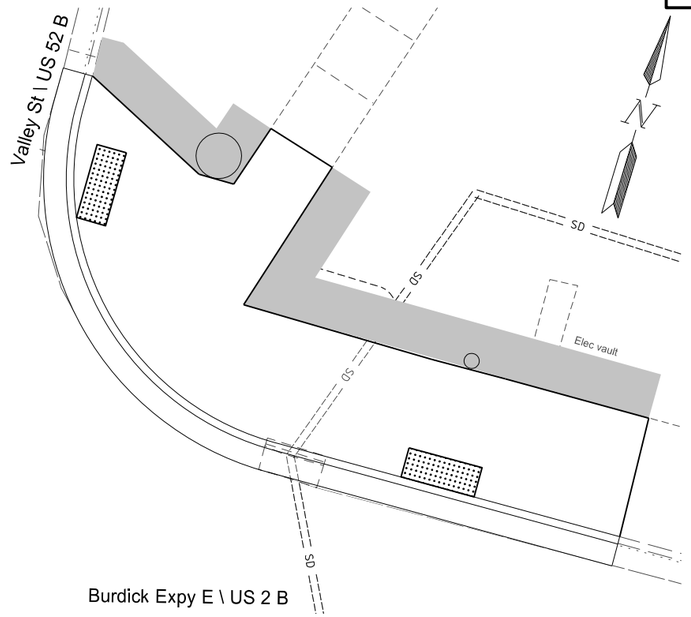
US 2 Business / Burdick Expy

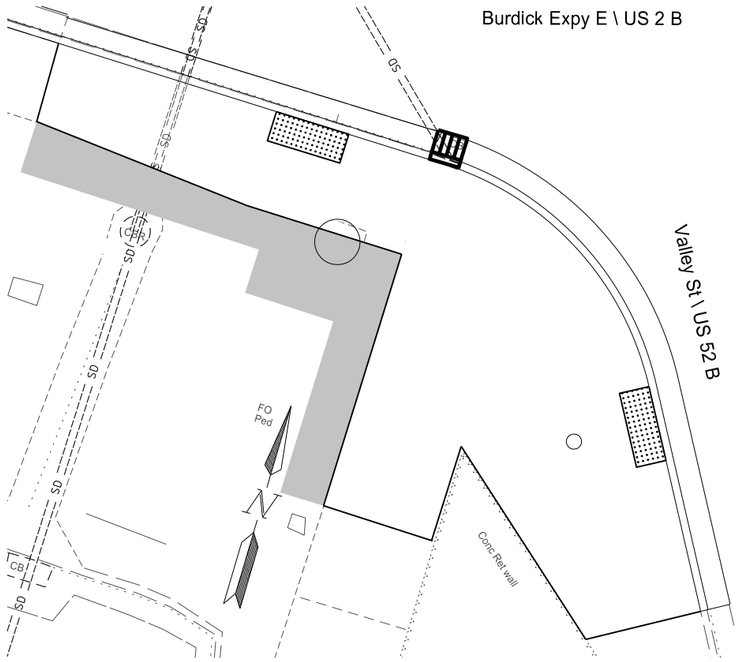
4th St SE

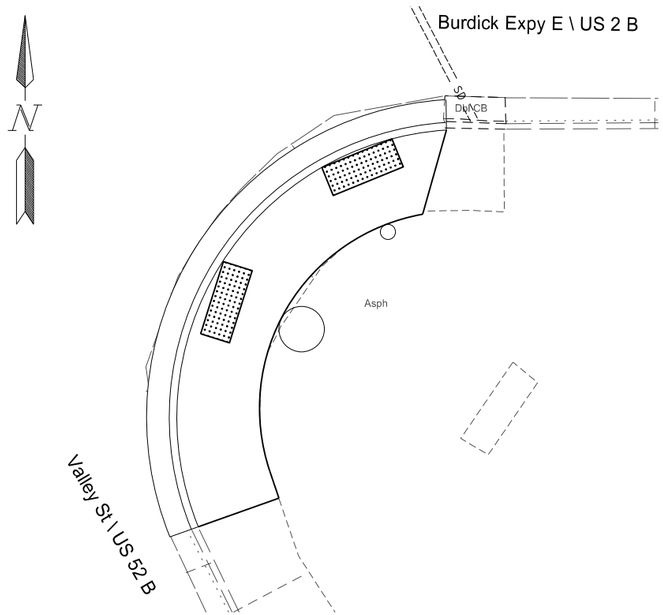
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	77	5

SPEC	CODE	BID ITEM	QTY	UNIT
970	0008	LANDSCAPE PREPARATION		
		NW Quad	12	SY
		NE Quad	16	SY
		SW Quad	16	SY









LEGEND

Landscape Preparation

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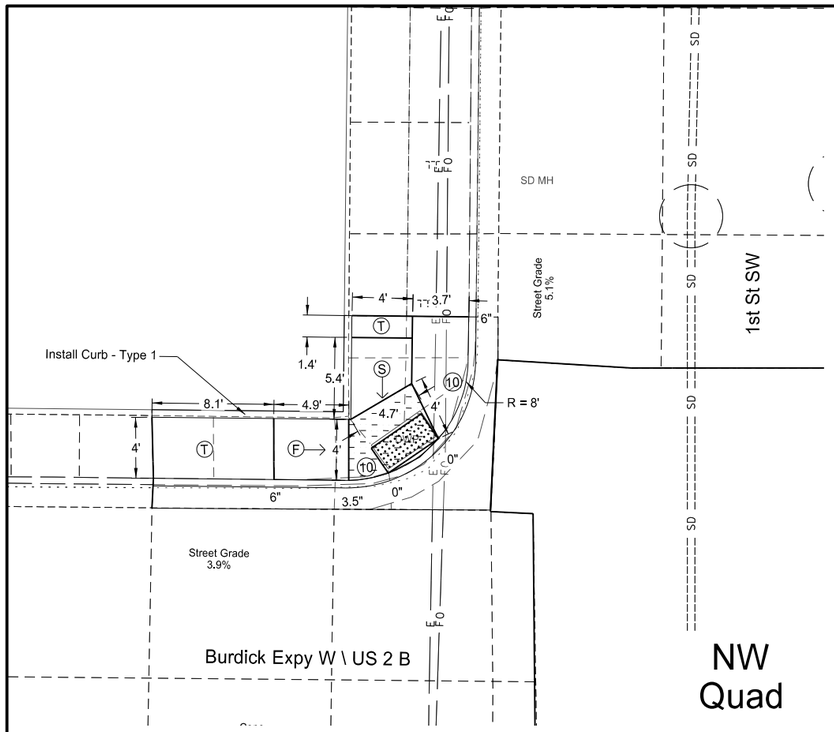
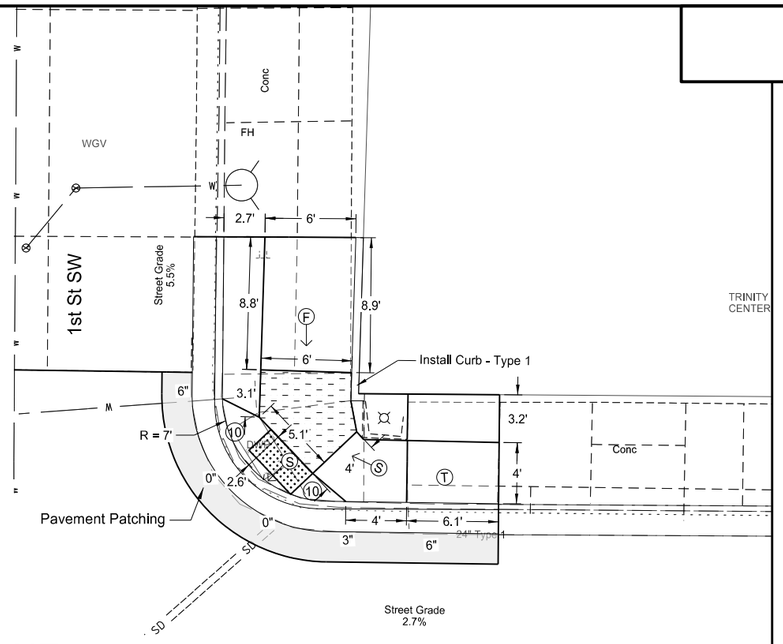
Permanent Erosion Control

US 2 Business / Burdick Expy

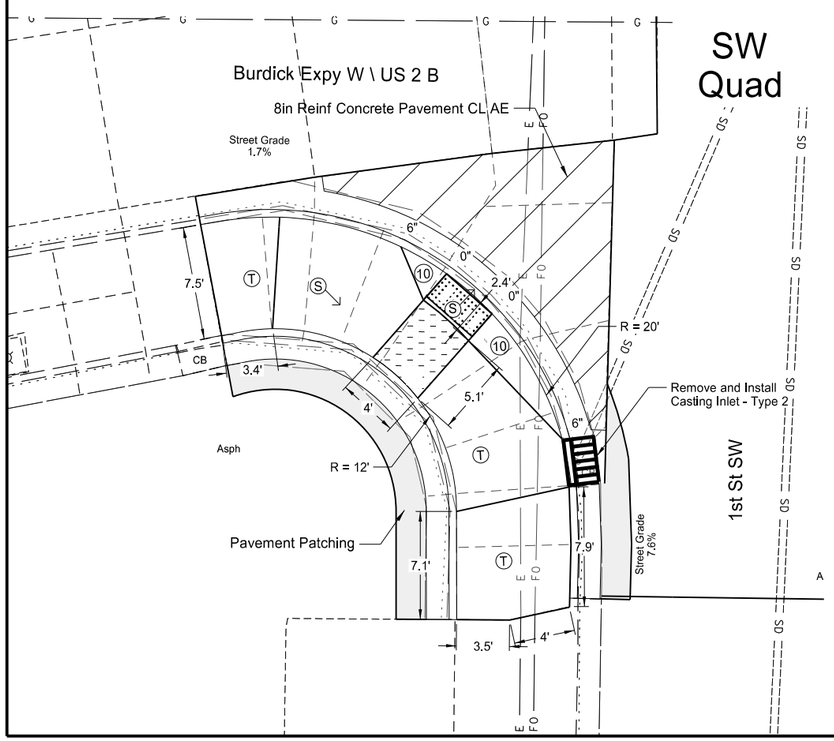
Valley St



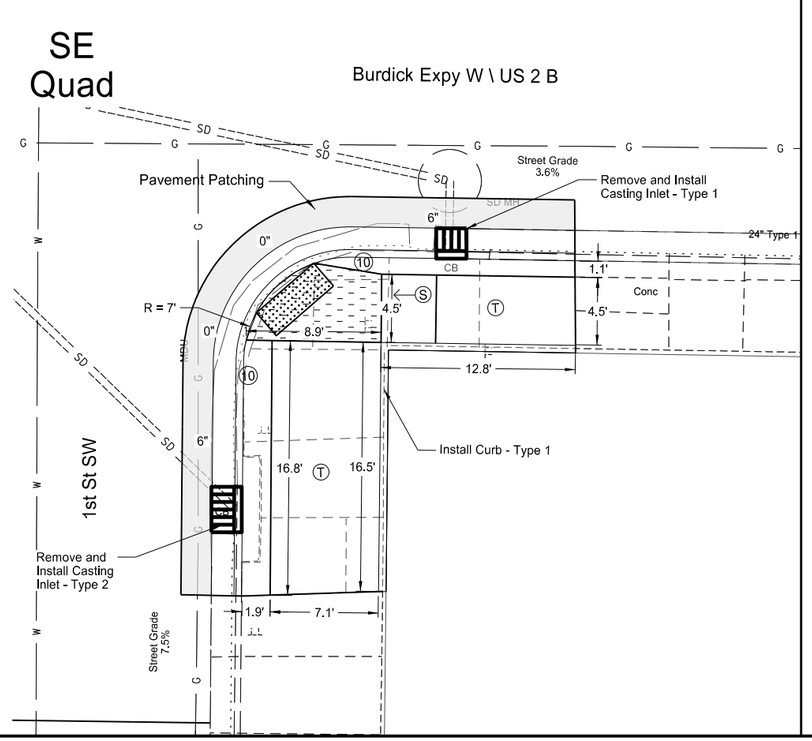
NW Quad



NE Quad



SW Quad



SE Quad

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	1

SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NE Quad	2	TON
		SW Quad	3	TON
		SE Quad	3	TON
550	0113	8IN REINF CONCRETE PAVEMENT CL AE		
		SW Quad	16	SY
748	0100	CURB & GUTTER		
		NW Quad	29	LF
		NE Quad	34	LF
		SW Quad	70	LF
		SE Quad	42	LF
748	0520	CURB-TYPE I		
		NW Quad	20	LF
		NE Quad	12	LF
		SE Quad	29	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	14	SY
		NE Quad	23	SY
		SW Quad	30	SY
		SE Quad	29	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	8	SF
		NE Quad	8	SF
		SW Quad	8	SF
		SE Quad	10	SF
100% City Participation				
722	3455	CASTING INLET - TYPE 1		
		SE Quad	1	EA
722	3460	CASTING INLET - TYPE 2		
		SW Quad	1	EA
		SE Quad	1	EA

LEGEND

- (S) Steep Ramp
  -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (F) Flat Ramp
  -Running Slope Less Than 5.0%
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (T) Transition Panel Slope, PAR width, and Cross Slope Will Vary
- (10) Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  -Slope Maximum of 2.0% / 1.5% Preferred
  -All Directions
- Detectable Warning Panel
- Pavement Patching
- 8IN Reinf Concrete Pavement - 2' x 2' Grid

Notes:
1. Any ramp found to be in noncompliance will be removed and replaced by the contractor at their own expense.
2. See Standard Drawing D-750-3 for more details.
3. See Curb - Type I detail in section 20.

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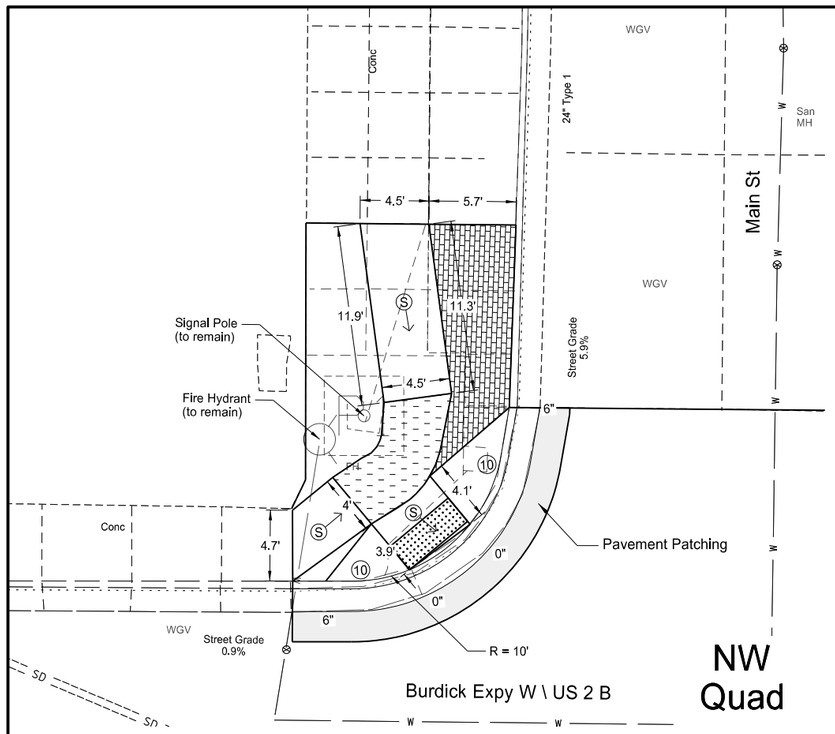
N

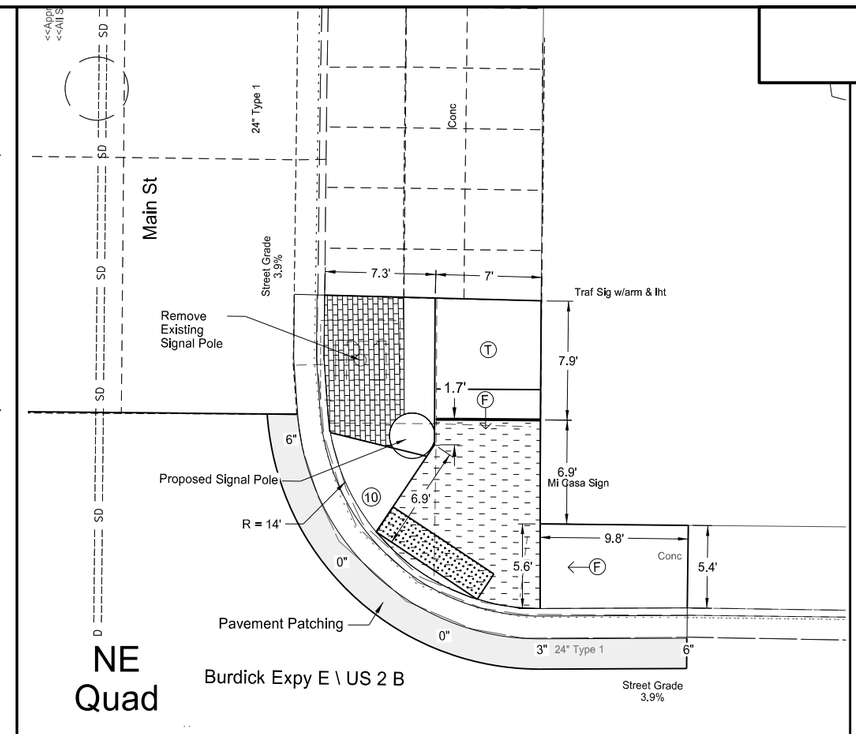
ADA Curb Ramp Improvements

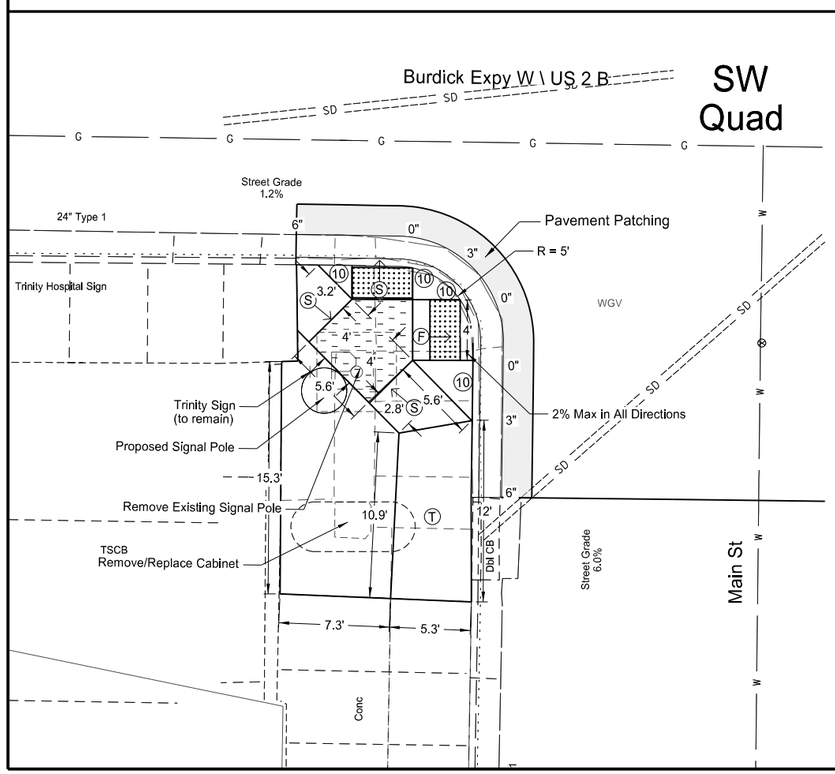
US 2 Business / Burdick Expy

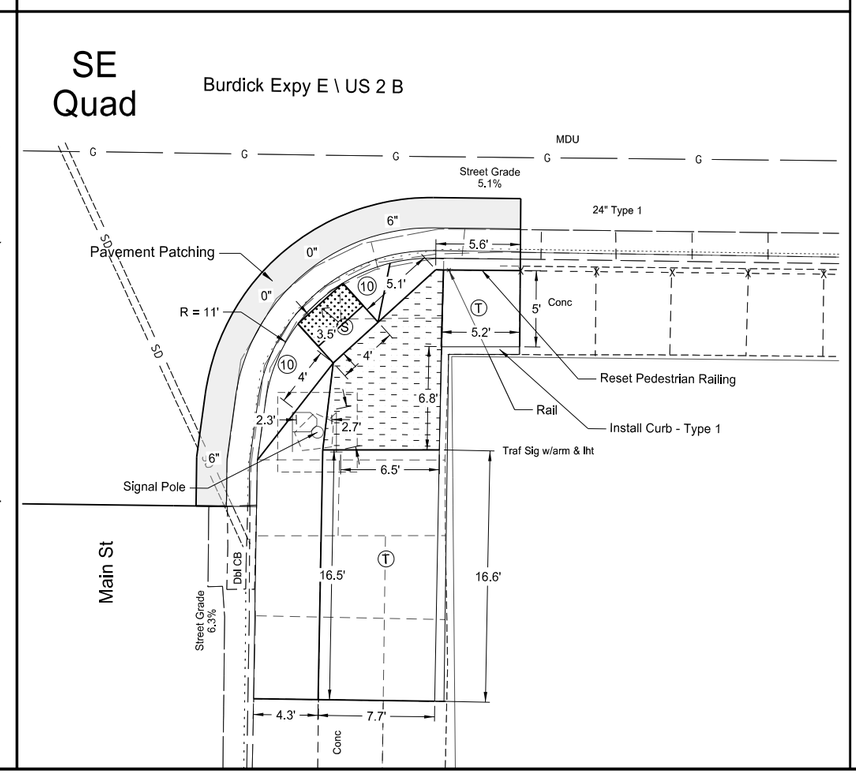
1st St SW

8/11/2020 10:19:23 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\080\080LO_001.dgn









STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	2

SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NW Quad	2	TON
		NE Quad	3	TON
		SW Quad	2	TON
		SE Quad	2	TON
624	0121	RESET PEDESTRIAN RAILING		
		SE Quad	12	LF
748	0100	CURB & GUTTER		
		NW Quad	22	LF
		NE Quad	39	LF
		SW Quad	26	LF
		SE Quad	29	LF
748	0520	CURB-TYPE I		
		SE Quad	29	LF
750	030	PIGMENTED IMPRINTED CONCRETE		
		NW Quad	7	SY
		NE Quad	5	SY
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	26	SY
		NE Quad	29	SY
		SW Quad	29	SY
		SE Quad	41	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	10	SF
		NE Quad	16	SF
		SW Quad	16	SF
		SE Quad	8	SF

LEGEND

- ←(S) Steep Ramp
  -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- ←(F) Flat Ramp
  -Running Slope Less Than 5.0%
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (T) Transition Panel Slope, PAR width, and Cross Slope Will Vary
- (10) Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  -Slope Maximum of 2.0% / 1.5% Preferred
  -All Directions
- Detectable Warning Panel
- Pavement Patching

Notes:
1. Any ramp found to be in noncompliance will be removed and replaced by the contractor at their own expense.
2. See Standard Drawing D-750-3 for more details.
3. See Curb - Type I detail in section 20.

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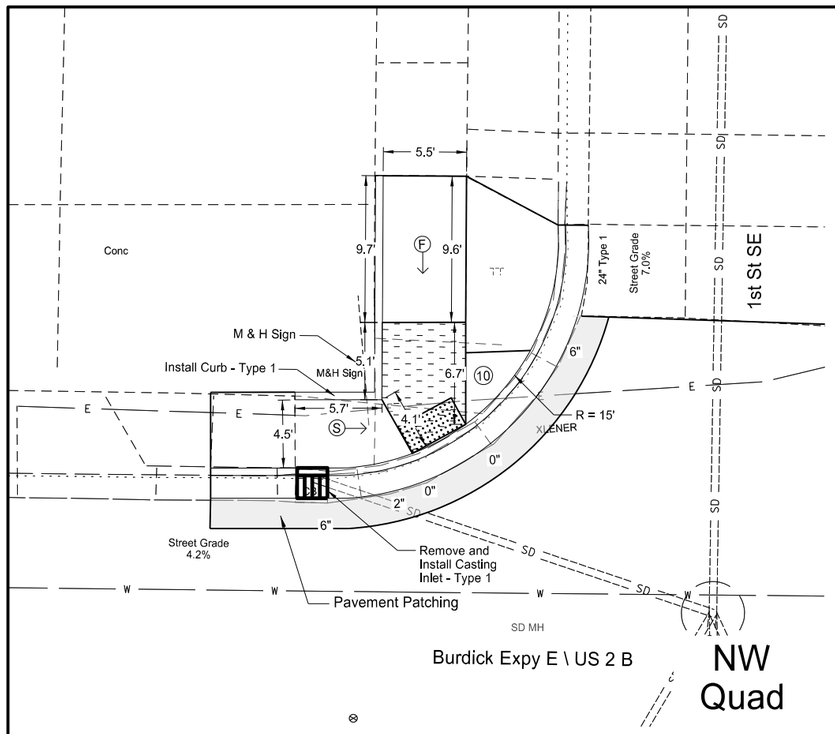
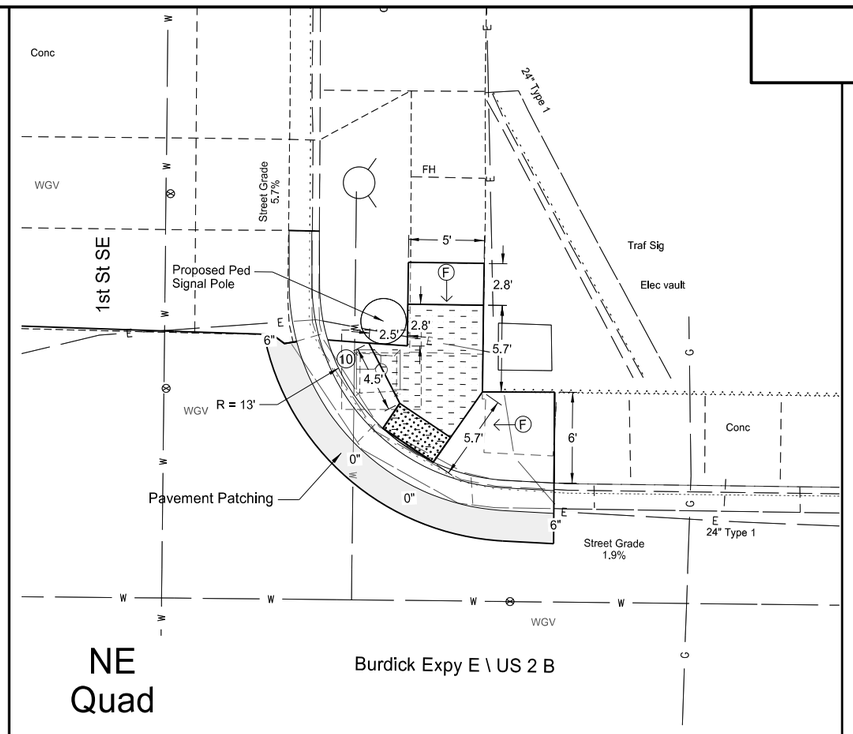
N

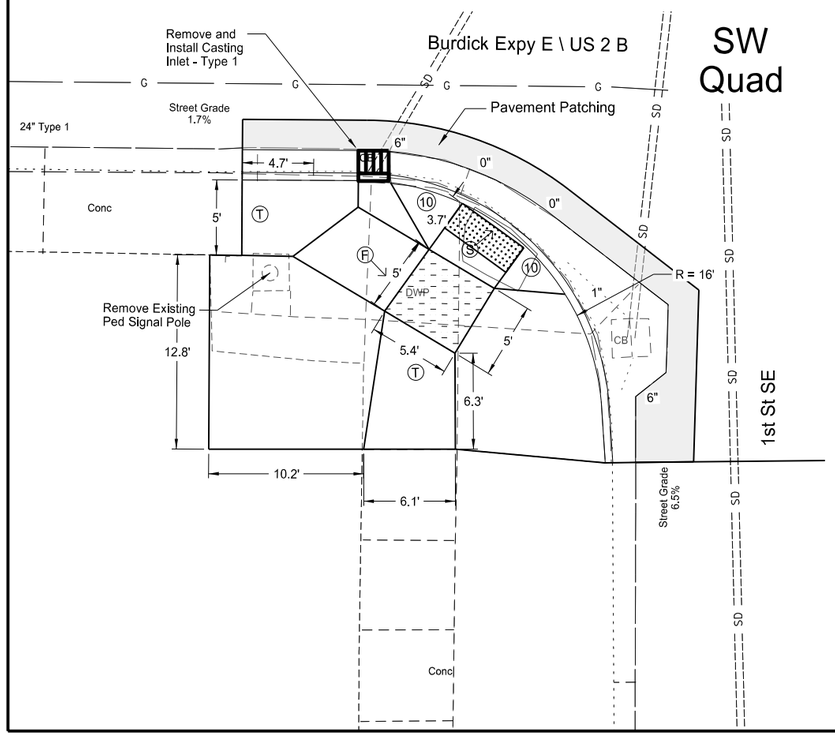
ADA Curb Ramp Improvements

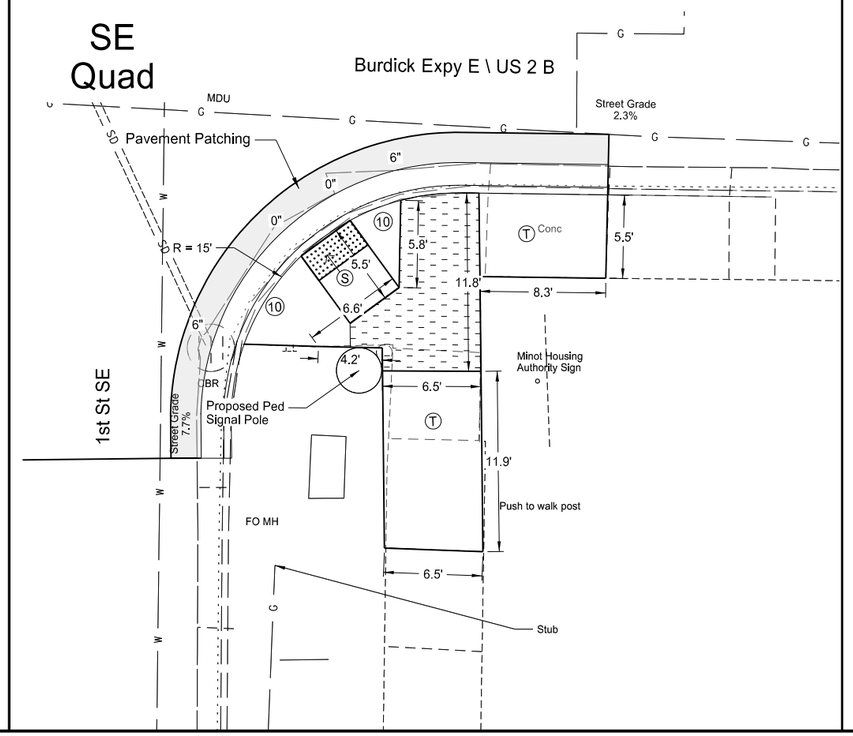
US 2 Business / Burdick Expy

Main St









STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	3

SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NW Quad	2	TON
		NE Quad	2	TON
		SW Quad	4	TON
		SE Quad	3	TON
748	0100	CURB & GUTTER		
		NW Quad	33	LF
		NE Quad	27	LF
		SW Quad	36	LF
		SE Quad	37	LF
748	0520	CURB-TYPE I		
		NW Quad	21	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	24	SY
		NE Quad	13	SY
		SW Quad	38	SY
		SE Quad	28	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	8	SF
		NE Quad	8	SF
		SW Quad	10	SF
		SE Quad	8	SF

100% City Participation

SPEC	CODE	BID ITEM	QTY	UNIT
722	3455	CASTING INLET - TYPE 1		
		NW Quad	1	EA
		SW Quad	1	EA

LEGEND

- (S) Steep Ramp
  -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (F) Flat Ramp
  -Running Slope Less Than 5.0%
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (T) Transition Panel Slope, PAR width, and Cross Slope Will Vary
- (10) Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  -Slope Maximum of 2.0% / 1.5% Preferred
  -All Directions
- Detectable Warning Panel
- Pavement Patching

Notes:
1. Any ramp found to be in noncompliance will be removed and replaced by the contractor at their own expense.
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3. See Curb - Type I detail in section 20.

N

ADA Curb Ramp Improvements

US 2 Business / Burdick Expy

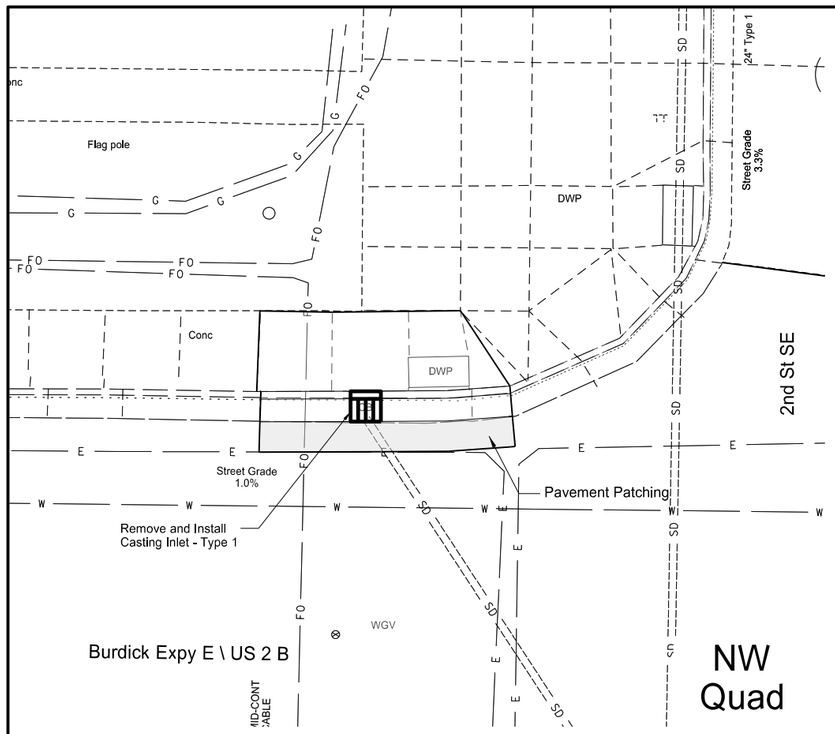
1st St SE

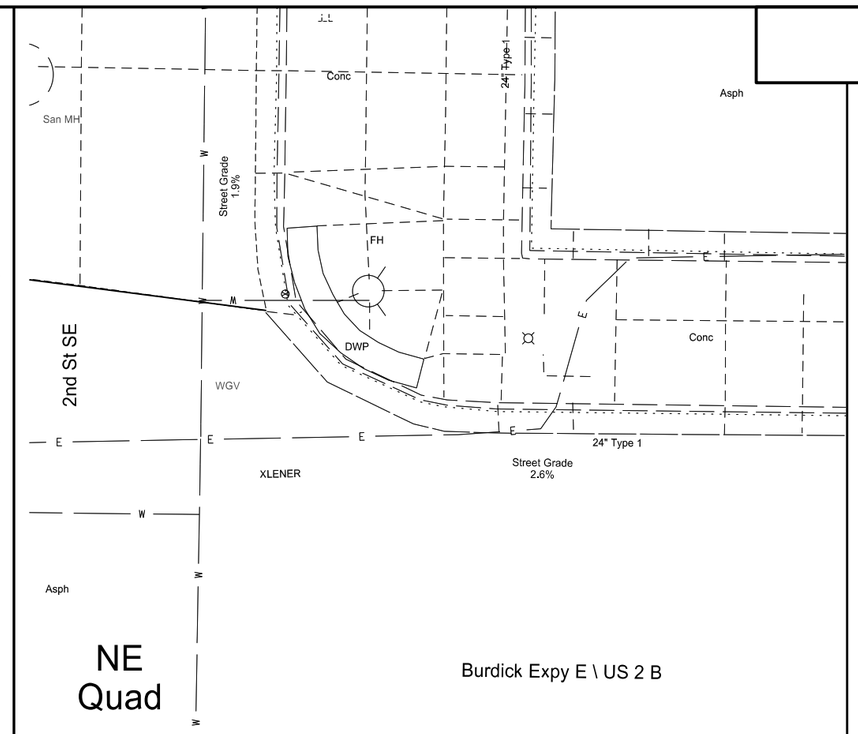
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	4

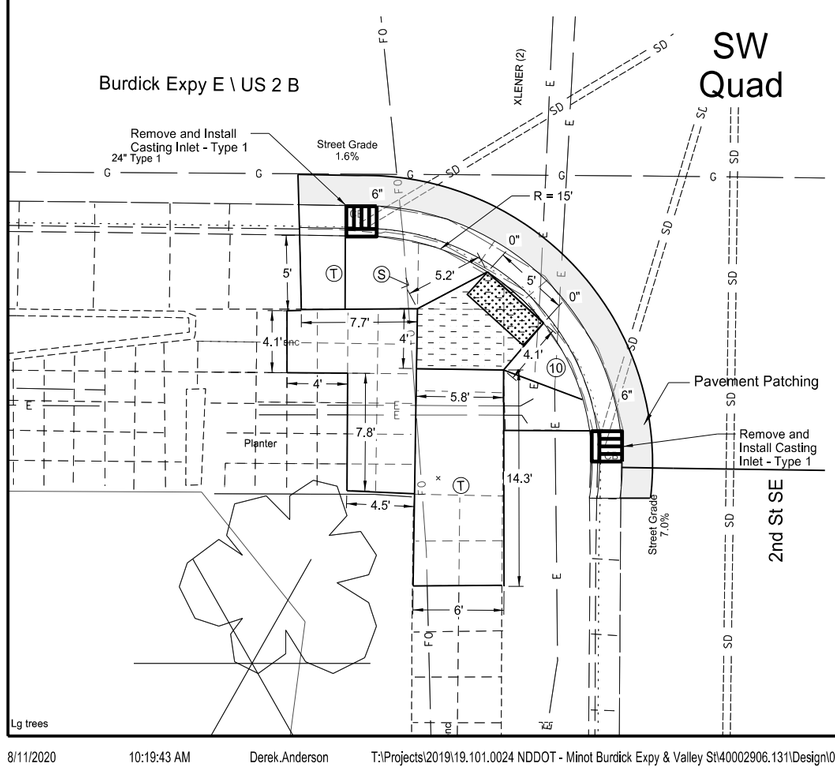
SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NW Quad	1	TON
		SW Quad	2	TON
		SE Quad	2	TON
748	0100	CURB & GUTTER		
		NW Quad	17	LF
		SW Quad	31	LF
		SE Quad	30	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	9	SY
		SW Quad	30	SY
		SE Quad	20	SY
750	2115	DETECTABLE WARNING PANELS		
		SW Quad	10	SF
		SE Quad	8	SF

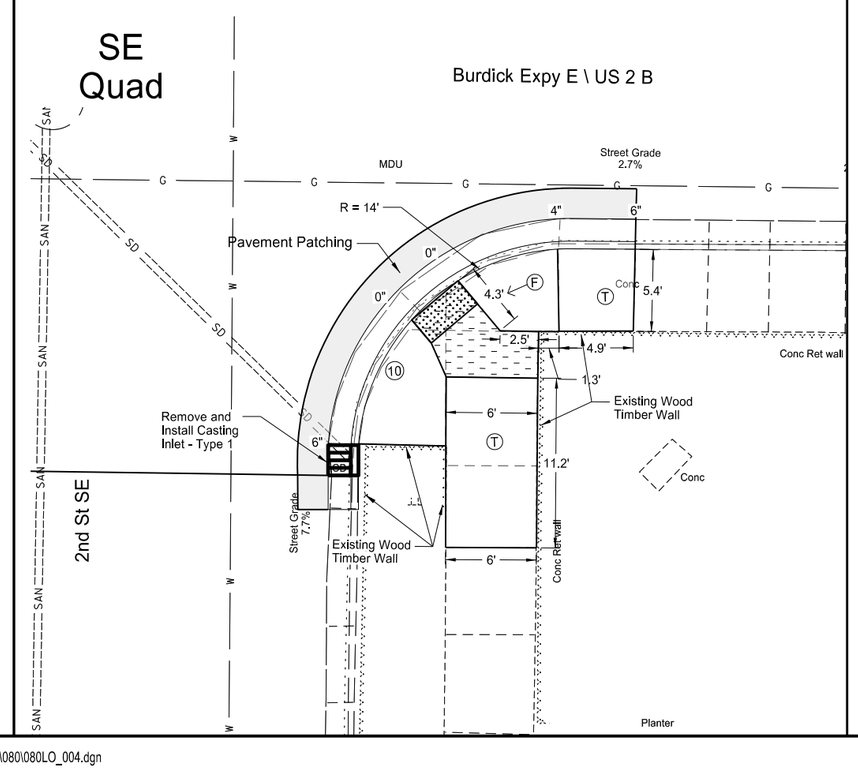
100% City Participation

SPEC	CODE	BID ITEM	QTY	UNIT
722	3455	CASTING INLET - TYPE 1		
		NW Quad	1	EA
		SW Quad	2	EA
		SE Quad	1	EA









LEGEND

- Steep Ramp
  - -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Flat Ramp
  - -Running Slope Less Than 5.0%
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Transition Panel Slope, PAR width, and Cross Slope Will Vary
- Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  - -Slope Maximum of 2.0% / 1.5% Preferred
  - -All Directions
- Detectable Warning Panel
- Pavement Patching

Notes:
1. Any ramp found to be in noncompliance will be removed and replaced by the contractor at their own expense.
2. See Standard Drawing D-750-3 for more details.
3. See Curb - Type I detail in section 20.

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N

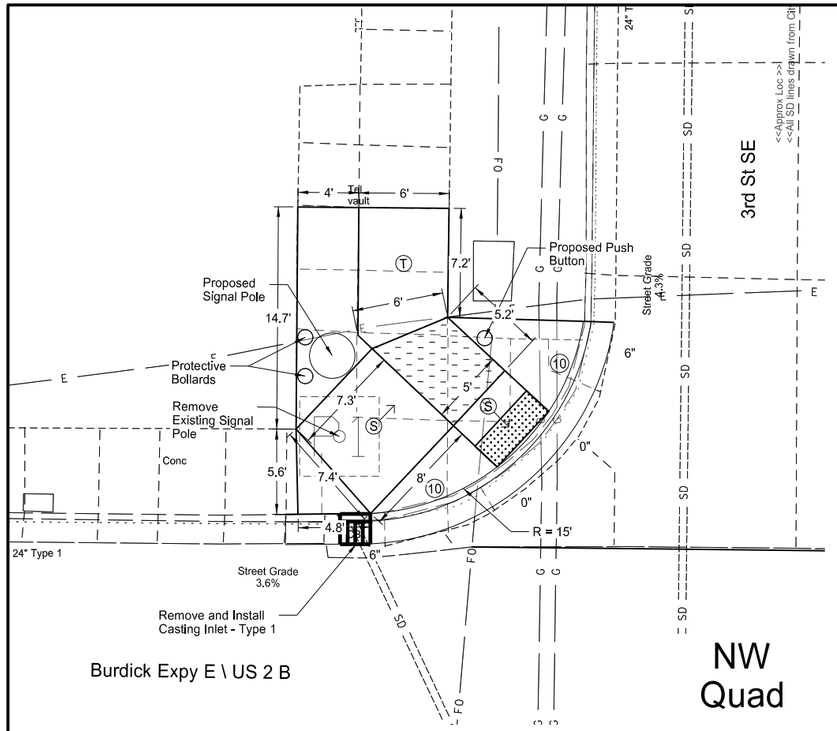
ADA Curb Ramp Improvements

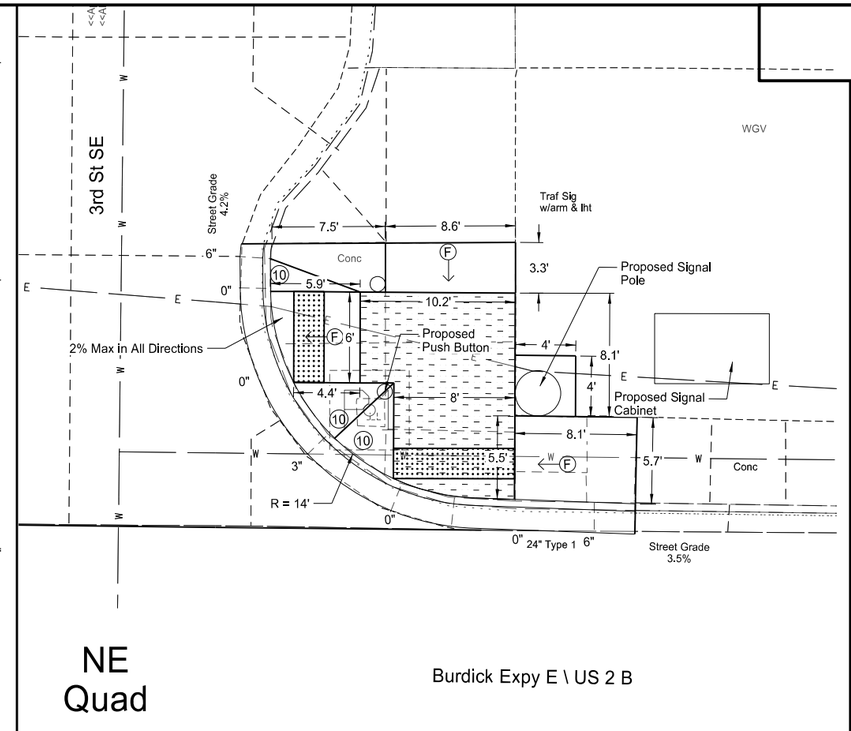
US 2 Business / Burdick Expy

2nd St SE

8/11/2020 10:19:43 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\080\080LO_004.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	5

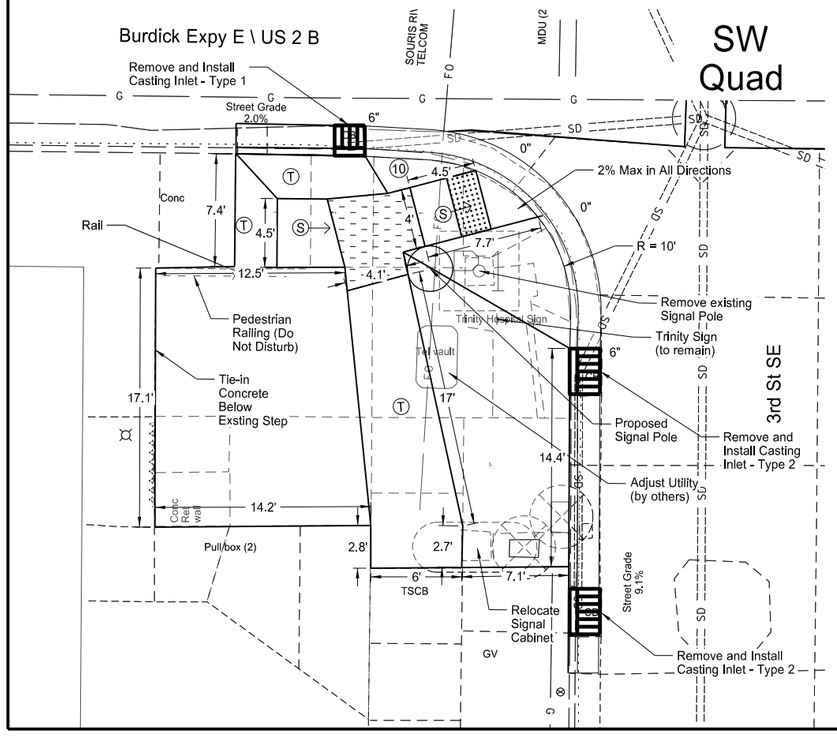


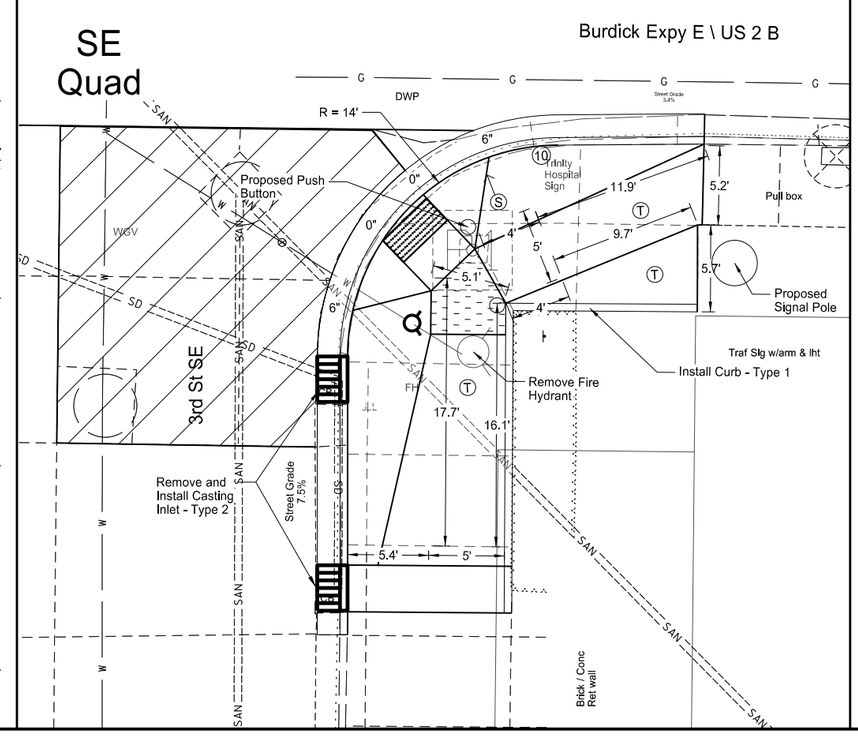


SPEC	CODE	BID ITEM	QTY	UNIT
302	0121	AGGREGATE BASE COURSE CL 5		
		8" under "8IN Reinf Concrete Pavement CL AE"	10	CY
550	0113	8IN REINF CONCRETE PAVEMENT CL AE		
		SE Quad	44	SY
748	0100	CURB & GUTTER		
		NW Quad	27	LF
		NE Quad	37	LF
		SW Quad	55	LF
		SE Quad	50	LF
748	0520	CURB-TYPE I		
		SE Quad	29	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	30	SY
		NE Quad	31	SY
		SW Quad	71	SY
		SE Quad	47	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	10	SF
		NE Quad	28	SF
		SW Quad	8	SF
		SE Quad	8	SF
100% City Partidpation				
722	3455	CASTING INLET - TYPE 1		
		NW Quad	1	EA
		SW Quad	1	EA
722	3460	CASTING INLET - TYPE 2		
		SW Quad	2	EA
		SE Quad	2	EA

LEGEND

- (S) Steep Ramp
  -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (F) Flat Ramp
  -Running Slope Less Than 5.0%
  -Cross Slope Maximum of 2.0% / 1.5% Preferred
- (T) Transition Panel Slope, PAR width, and Cross Slope Will Vary
- (10) Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  -Slope Maximum of 2.0% / 1.5% Preferred
  -All Directions
- Detectable Warning Panel
- Pavement Patching
- 8IN Reinf Concrete Pavement - 2' x 2' Grid





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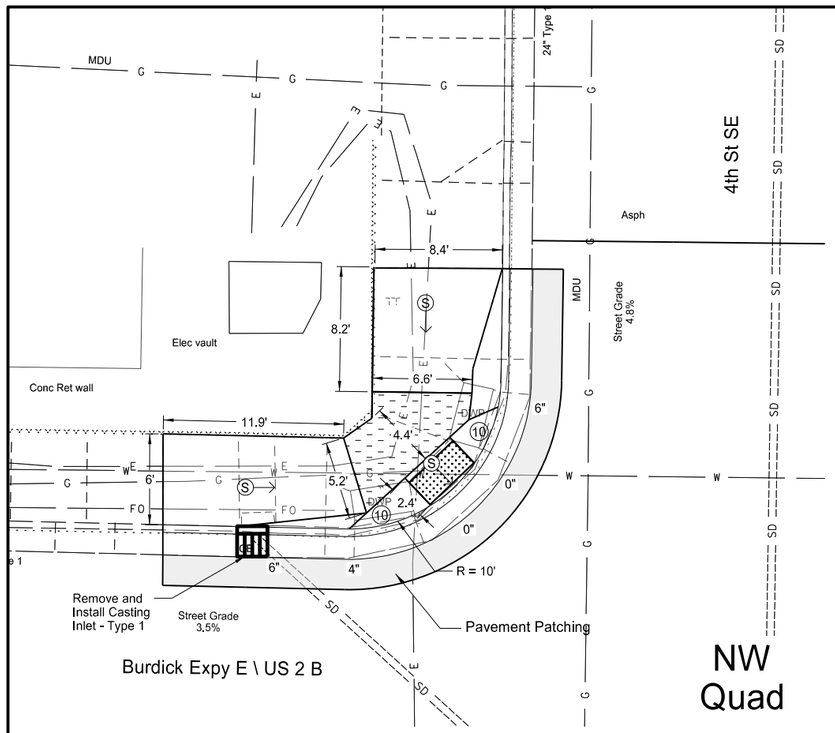
3. See Curb - Type I detail in section 20.

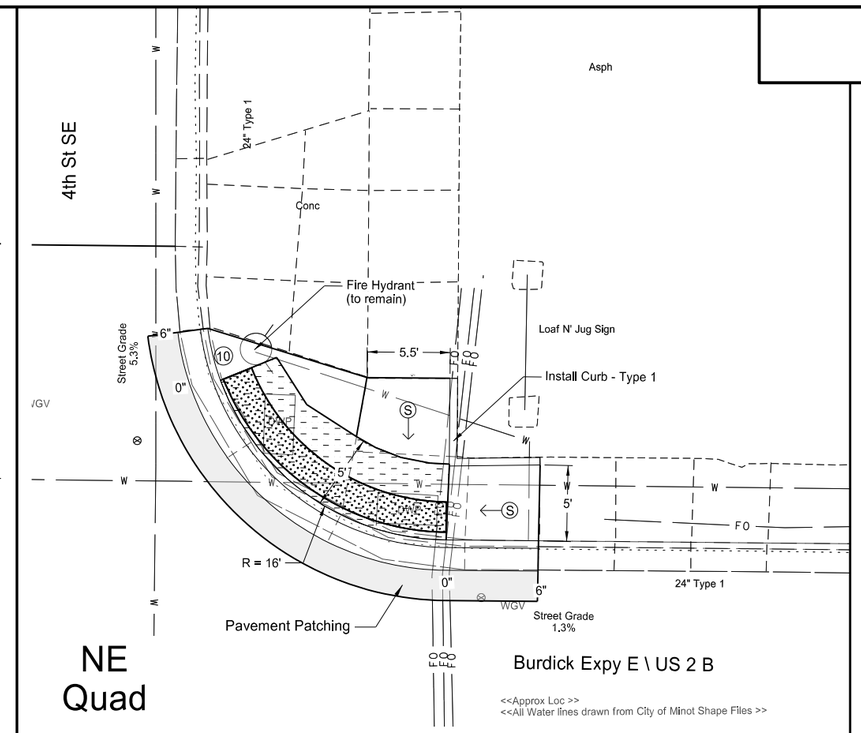
N

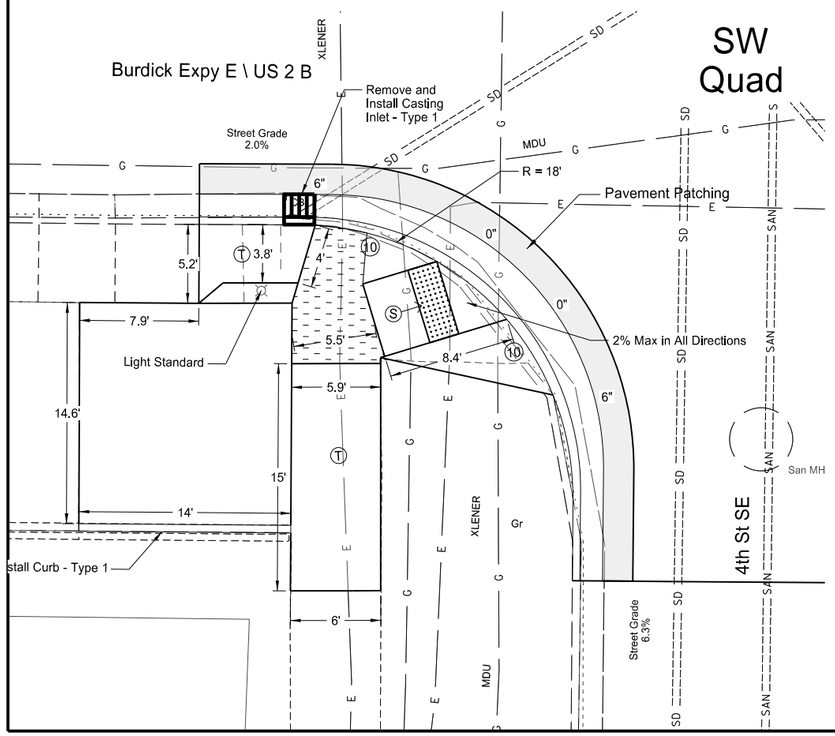
ADA Curb Ramp Improvements

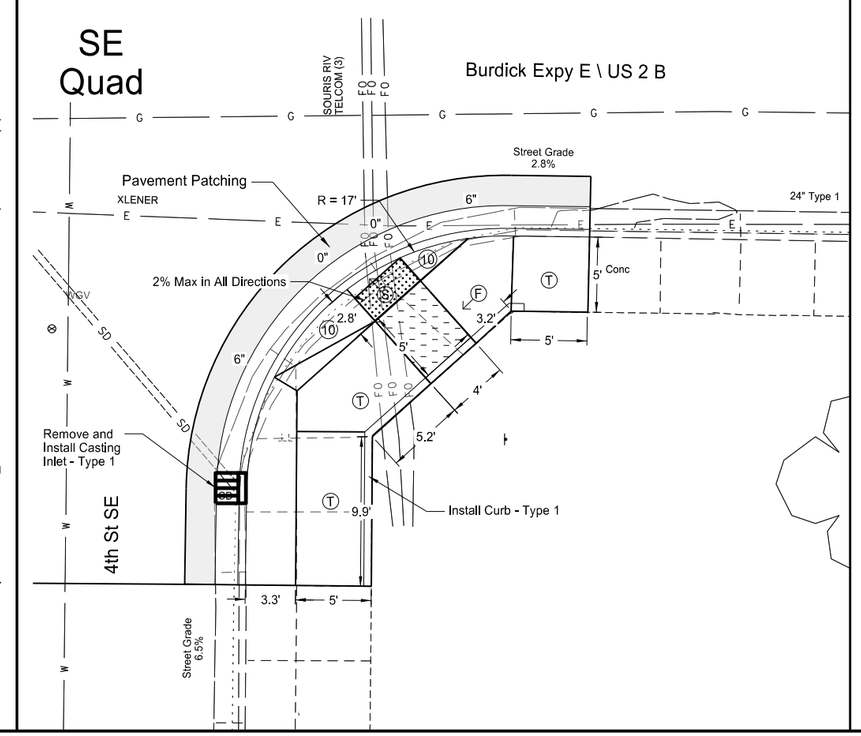
US 2 Business / Burdick Expy

3rd St SE









STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	6

SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NW Quad	3	TON
		NE Quad	2	TON
		SW Quad	3	TON
		SE Quad	3	TON
748	0100	CURB & GUTTER		
		NW Quad	36	LF
		NE Quad	30	LF
		SW Quad	42	LF
		SE Quad	39	LF
748	0520	CURB-TYPE I		
		NE Quad	12	LF
		SW Quad	14	LF
		SE Quad	24	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	23	SY
		NE Quad	18	SY
		SW Quad	48	SY
		SE Quad	24	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	8	SF
		NE Quad	36	SF
		SW Quad	10	SF
		SE Quad	8	SF

100% City Participation

SPEC	CODE	BID ITEM	QTY	UNIT
722	3455	CASTING INLET - TYPE 1		
		NW Quad	1	EA
		SW Quad	1	EA
		SE Quad	1	EA

LEGEND

- Steep Ramp
  - -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Flat Ramp
  - -Running Slope Less Than 5.0%
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Transition Panel Slope, PAR width, and Cross Slope Will Vary
- Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  - -Slope Maximum of 2.0% / 1.5% Preferred
  - -All Directions
- Detectable Warning Panel
- Pavement Patching

Notes:
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2. See Standard Drawing D-750-3 for more details.
3. See Curb - Type I detail in section 20.

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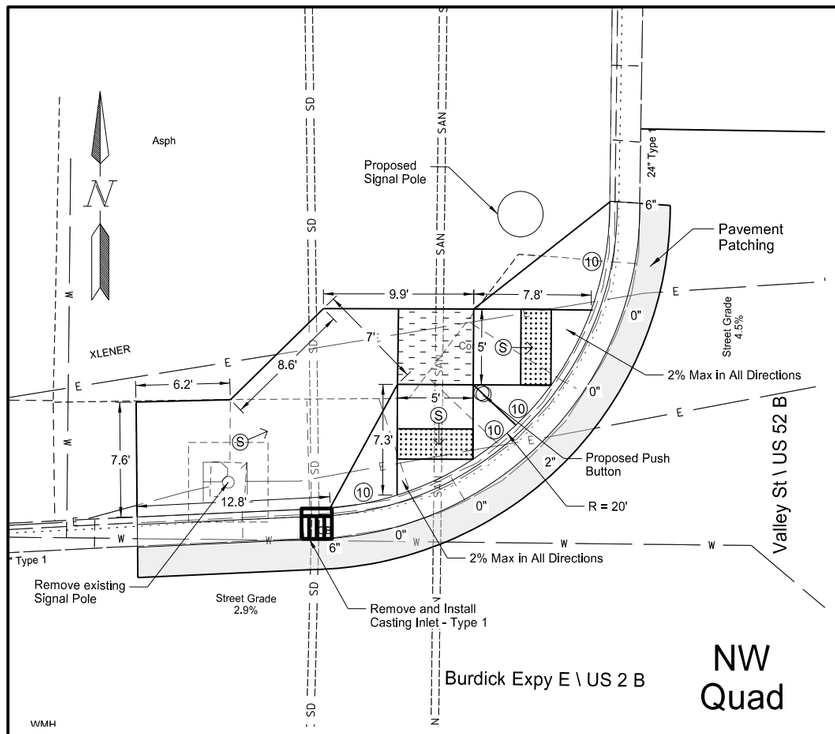
ADA Curb Ramp Improvements

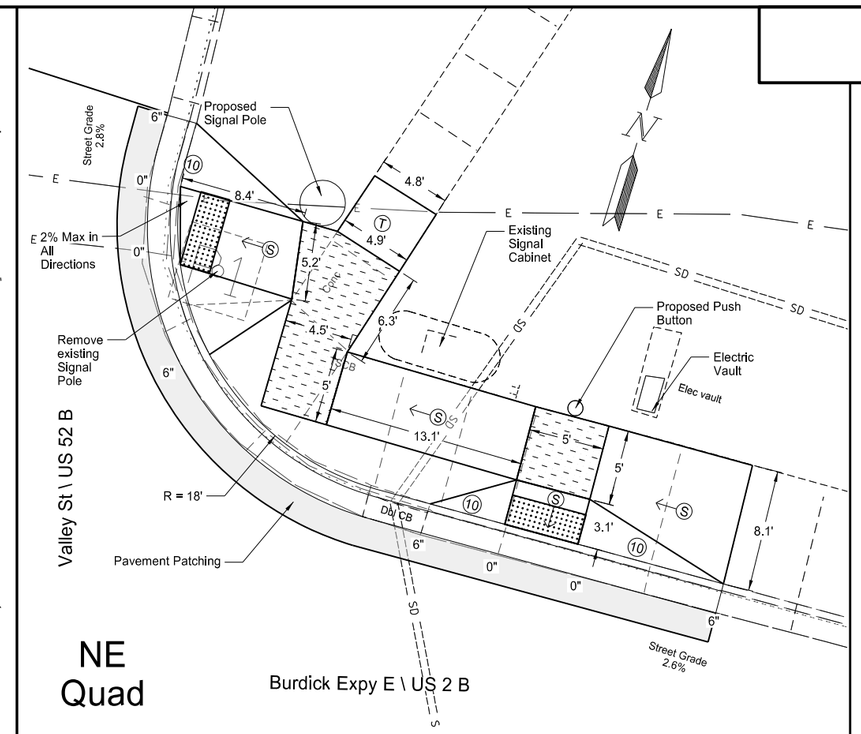
US 2 Business / Burdick Expy

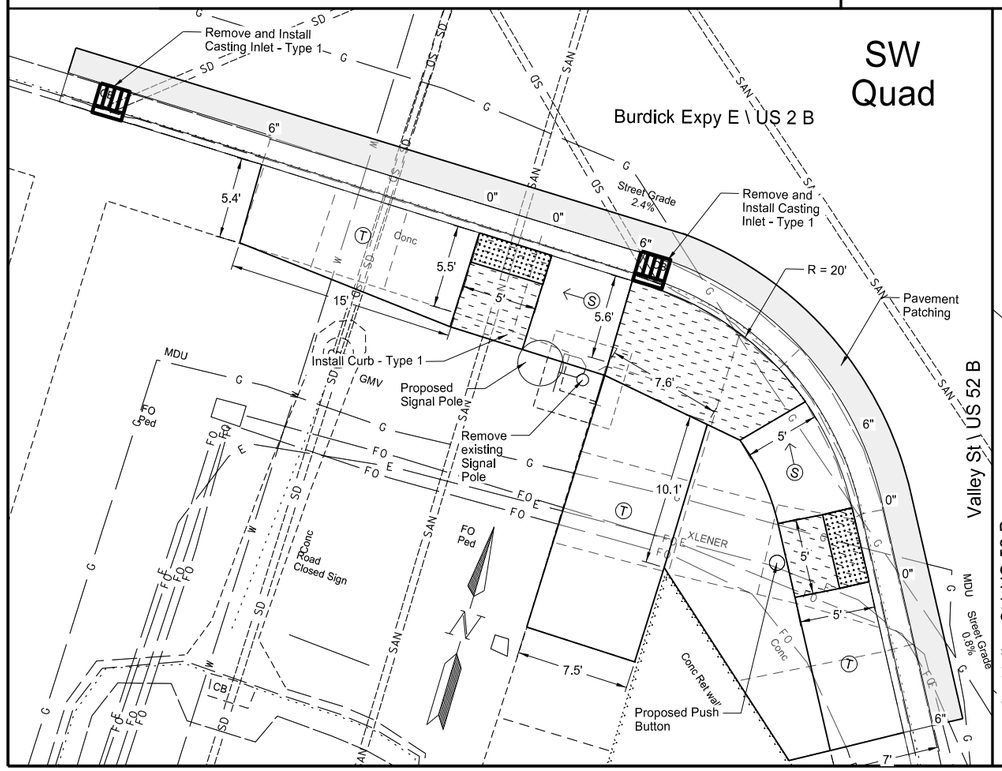
4th St SE

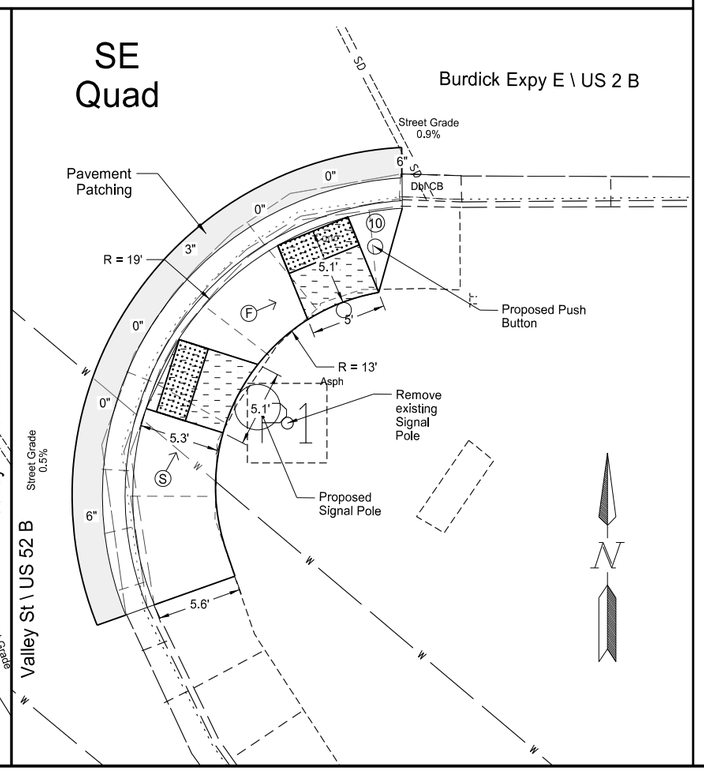
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	80	7

SPEC	CODE	BID ITEM	QTY	UNIT
430	2000	PATCHING		
		NW Quad	4	TON
		NE Quad	4	TON
		SW Quad	6	TON
		SE Quad	4	TON
748	0100	CURB & GUTTER		
		NW Quad	44	LF
		NE Quad	55	LF
		SW Quad	77	LF
		SE Quad	38	LF
750	0115	SIDEWALK CONCRETE 4IN		
		NW Quad	34	SY
		NE Quad	46	SY
		SW Quad	64	SY
		SE Quad	18	SY
750	2115	DETECTABLE WARNING PANELS		
		NW Quad	20	SF
		NE Quad	20	SF
		SW Quad	20	SF
		SE Quad	20	SF
100% City Participation				
722	3455	CASTING INLET - TYPE 1		
		NW Quad	1	EA
		SW Quad	2	EA









LEGEND

- Steep Ramp
  - -Running Slope Between 5.0% & 8.3% Max / 7.7% Preferred
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Flat Ramp
  - -Running Slope Less Than 5.0%
  - -Cross Slope Maximum of 2.0% / 1.5% Preferred
- Transition Panel Slope, PAR width, and Cross Slope Will Vary
- Flare Slope Maximum of 10:1
- Pigmented Imprinted Concrete
- Landing Area
  - -Slope Maximum of 2.0% / 1.5% Preferred
  - -All Directions
- Detectable Warning Panel
- Pavement Patching

Notes:
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ADA Curb Ramp Improvements

US 2 Business / Burdick Expy

Valley St

8/11/2020 10:20:07 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\080\080LO_007.dgn

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - Minot Burdick Expy and Valley St.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Burdick Expressway Office Location (Chain: OL_2)			
Begin	100+00.00	450693.03	1774752.12
2001	125+92.63	450661.17	1777344.55
2002	127+35.41	450671.42	1777486.97
End	128+56.00	450669.94	1777607.54

CURVE DATA

ARC DEFINITION

US PUBLIC LAND SURVEY DATA

CORNER	IRN	NORTHING	EASTING

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
MONUMENT DESCRIPTION					
PRIMARY CONTROL					
GPS 2-1	450704.14	1778544.14	1553.40	N/A	N/A
#5 Rebar w/Alum cap stamped "GPS 2-1"					
GPS 2-2	450673.56	1780813.48	1552.19	N/A	N/A
#5 Rebar w/Alum cap stamped "GPS 2-2"					
SECONDARY CONTROL					
116	450654.41	1775075.41	1614.83	103+24	35 Rt
117	450714.16	1775151.39	1615.05	103+99	26 Lt
118	450714.34	1775277.04	1619.95	105+25	28 Lt
119	450711.86	1775450.99	1621.29	106+99	28 Lt
120	450637.41	1775459.90	1624.39	107+08	47 Rt
121	450654.67	1775662.38	1616.24	109+11	27 Rt
122	450637.39	1775820.31	1610.45	110+69	43 Rt
123	450716.85	1775899.01	1607.01	111+47	38 Lt
124	450705.03	1776130.25	1602.06	113+78	29 Lt
125	450732.50	1776196.25	1599.41	114+44	57 Lt
126	450632.42	1776205.32	1602.28	114+54	43 Rt
127	450646.55	1776341.61	1598.23	115+90	27 Rt
128	450710.28	1776554.76	1590.87	118+02	39 Lt
129	450571.76	1776557.76	1598.59	118+07	99 Rt
130	450704.79	1776775.47	1585.80	120+23	37 Lt
131	450695.21	1777012.95	1579.40	122+61	30 Lt
132	450697.58	1777162.10	1577.46	124+10	34 Lt
133	450703.05	1777390.65	1573.20	126+42	38 Lt
134	450563.63	1777443.21	1578.41	126+84	104 Rt
135	450703.06	1776416.59	1594.95	116+64	30 Lt
136	450706.20	1776653.19	1588.97	119+01	37 Lt
141	450637.93	1776868.38	1584.93	121+17	29 Rt
142	450611.07	1777015.48	1583.60	122+64	54 Rt
143	450613.05	1777162.97	1590.22	124+12	50 Rt
144	450710.42	1777513.06	1573.15	127+61	39 Lt

NOTES: Sheet 1 of 1

Date Survey Completed 07/30/2019

☐ Assumed Coordinates

☒ All coordinates on this sheet are Ward County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998530

All coordinates and measurements on this document derived from the International Foot definition.

INITIALIZING BENCH MARK
NDGPS Station (OPUS)

☒ NAVD-88

☐ _____

☐ GEOID12B ☒ GEOID 12A

☐ GEOID18

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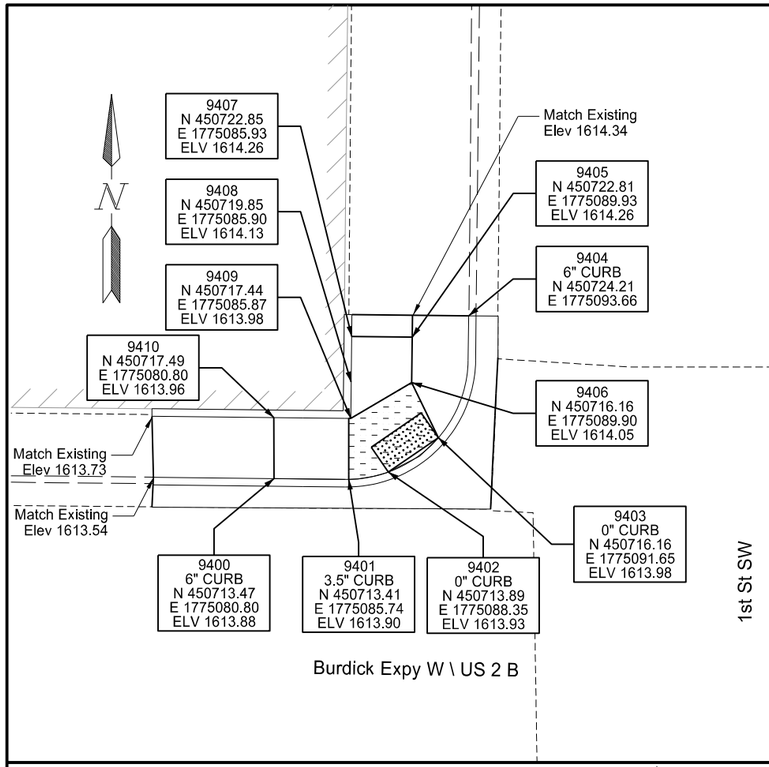
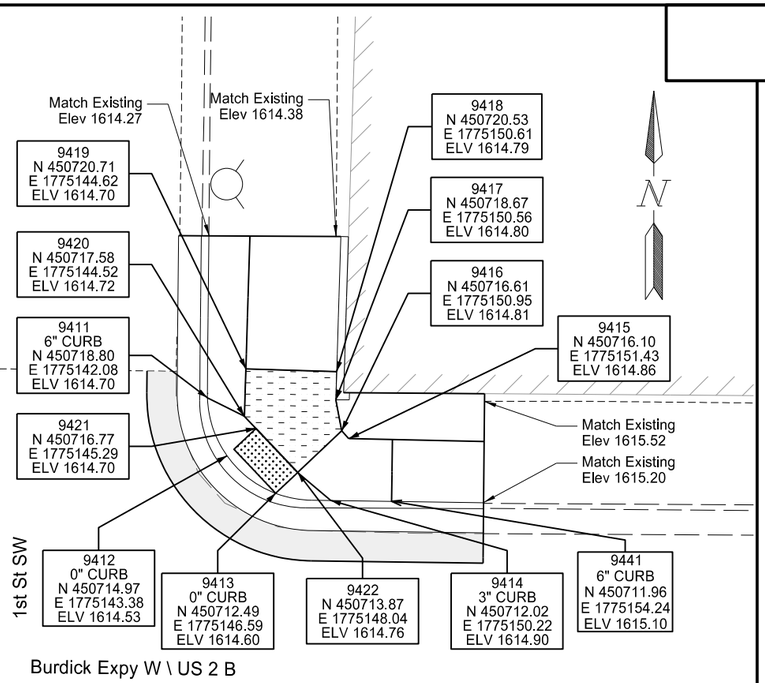
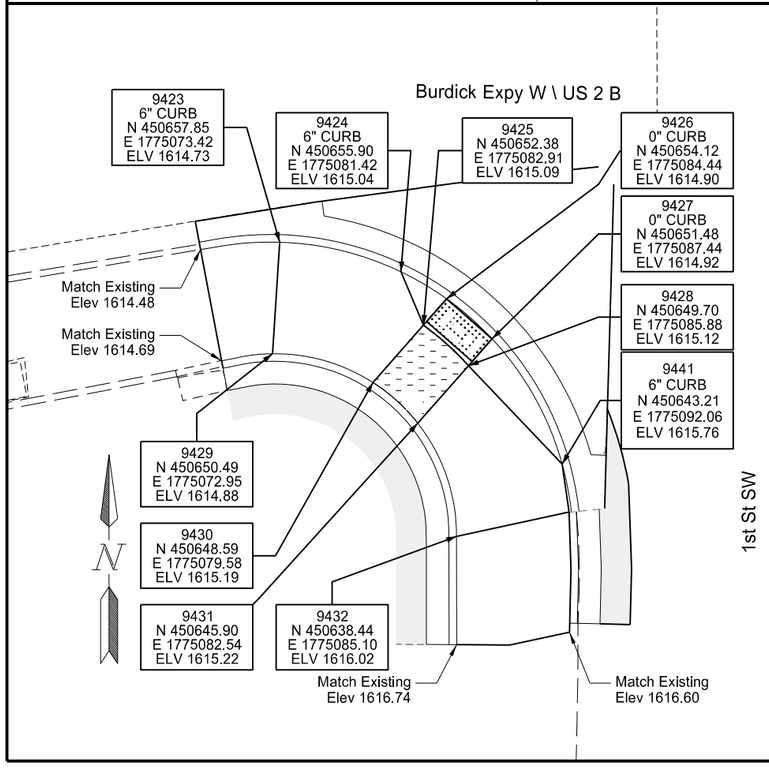
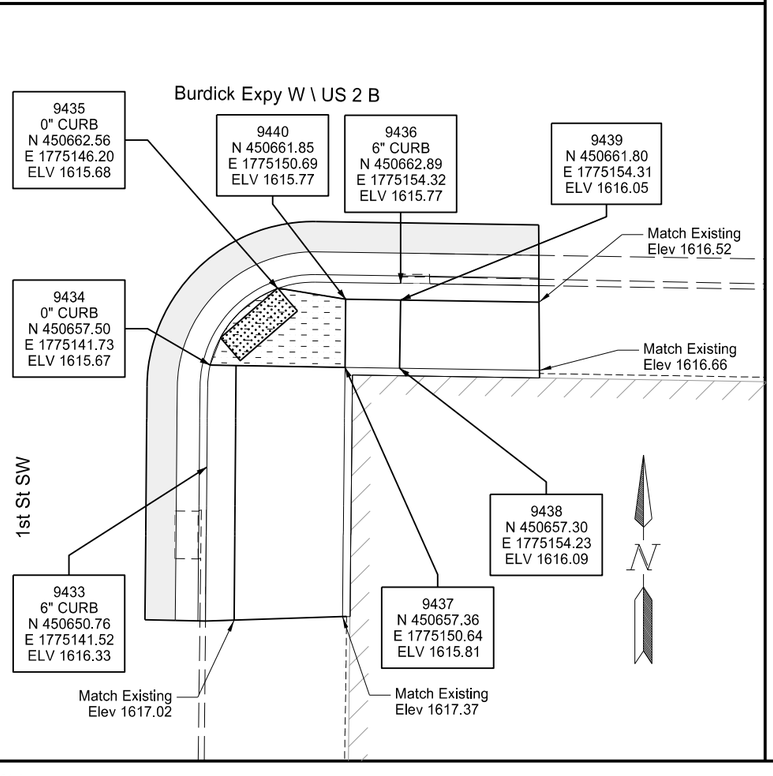
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	1









LEGEND

- Pigmented Imprinted Concrete
- Landing Area
- Detectable Warning Panel
- Pavement Patching

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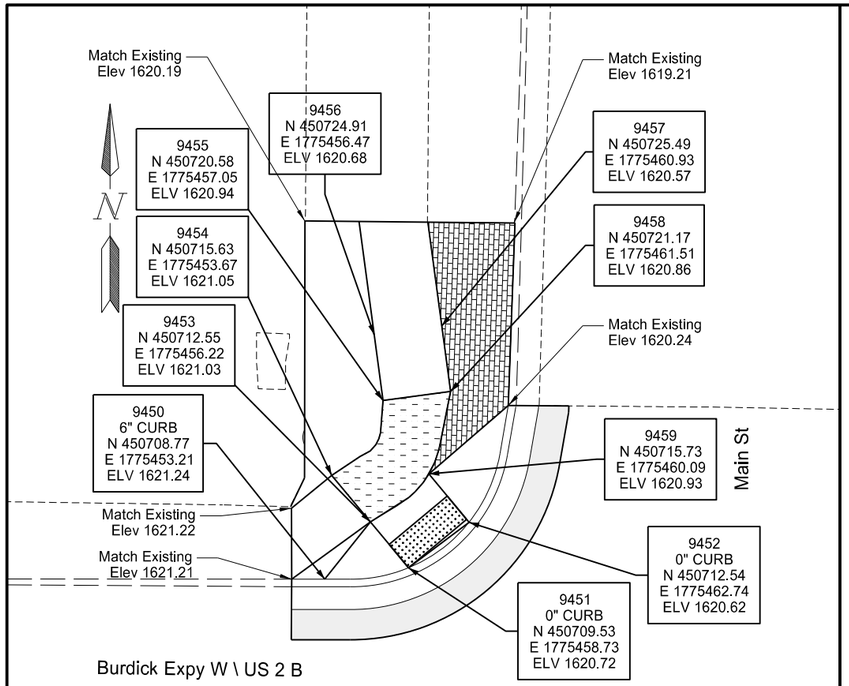
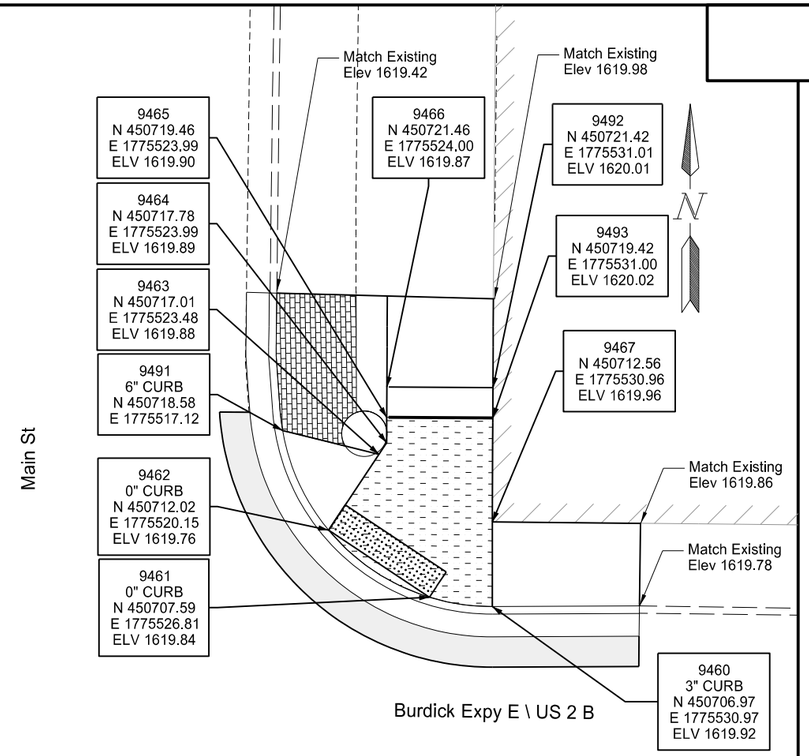
Survey Data Layout

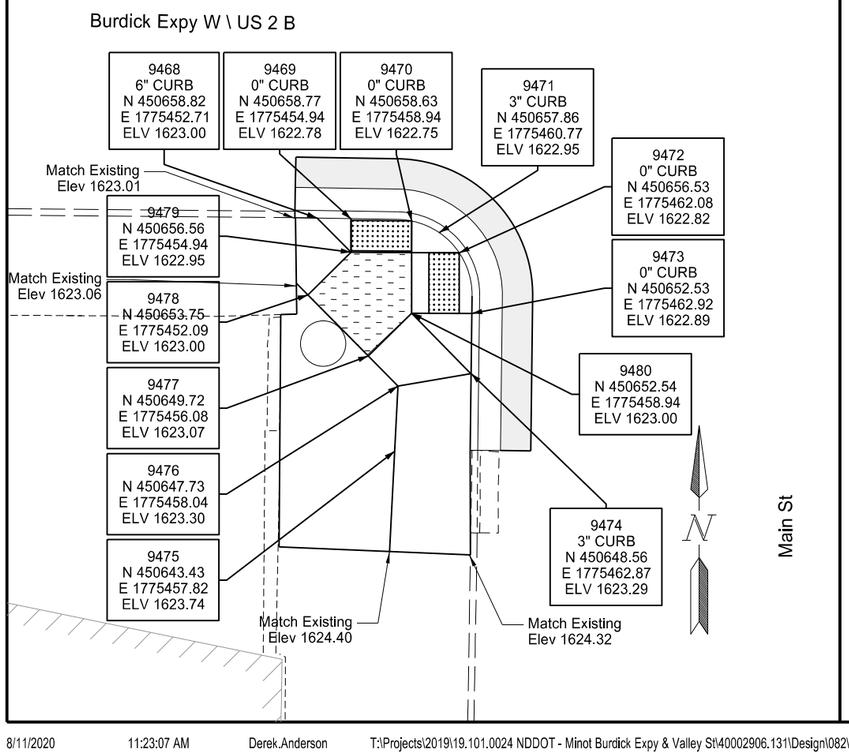
US 2 Business / Burdick Expy

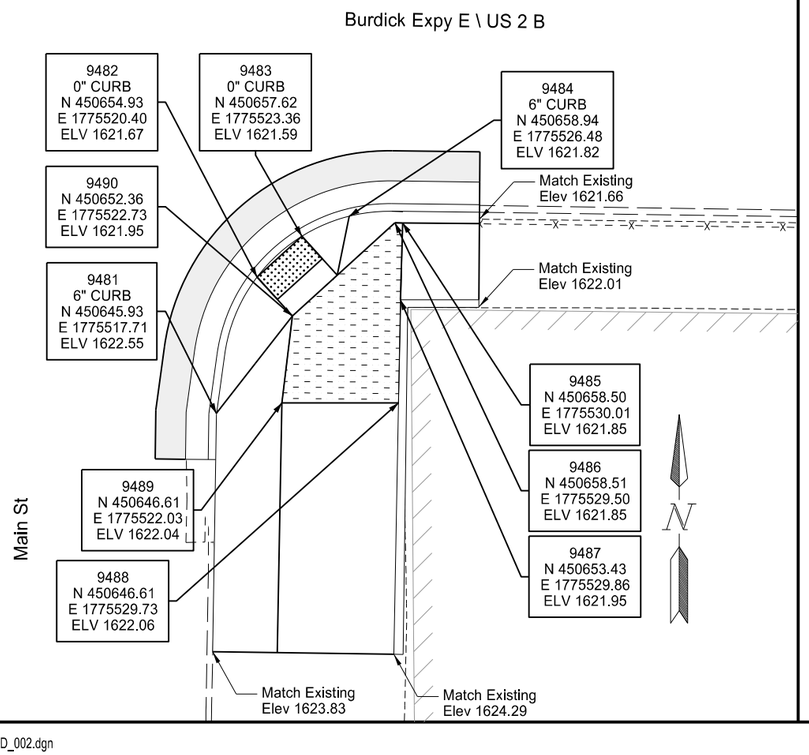
1st St SW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	2









LEGEND

- Pigmented Imprinted Concrete
- Landing Area
- Detectable Warning Panel
- Pavement Patching

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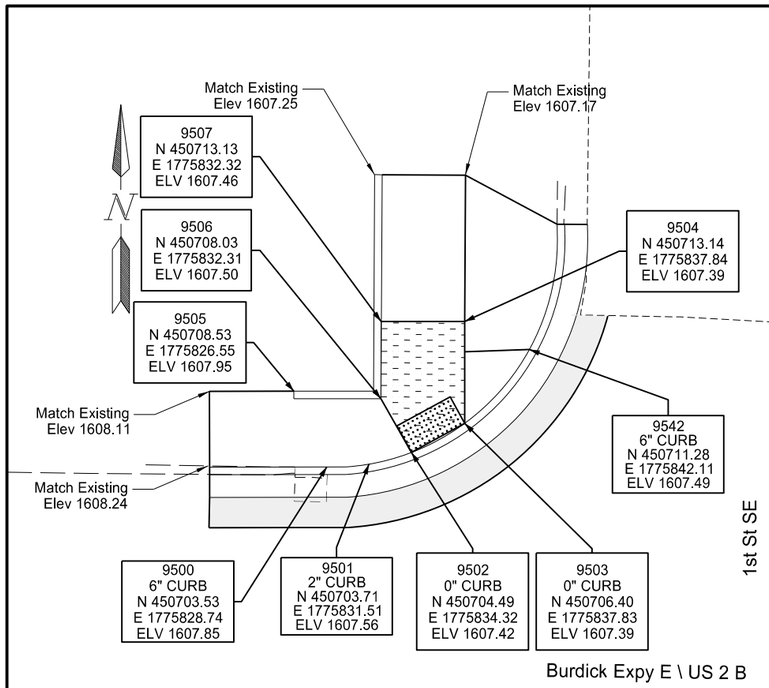
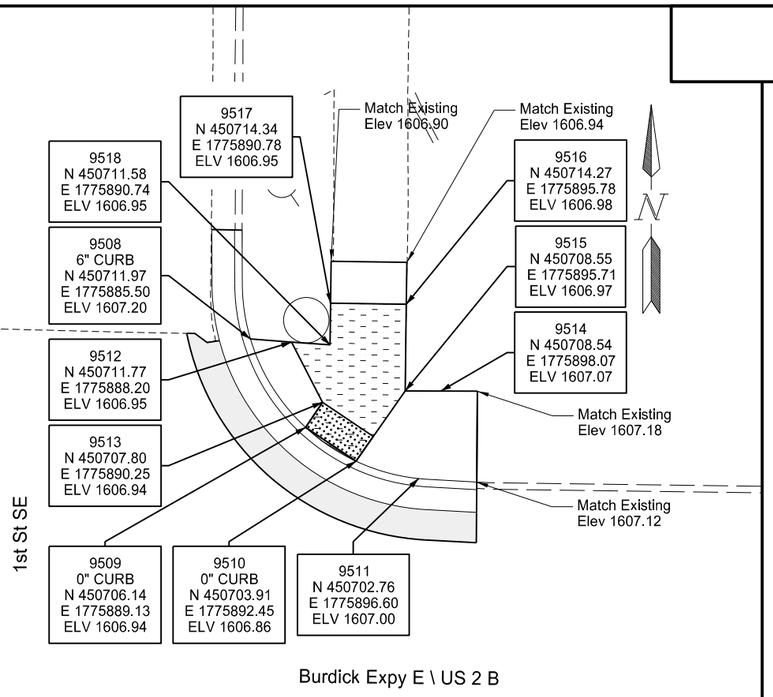
Survey Data Layout

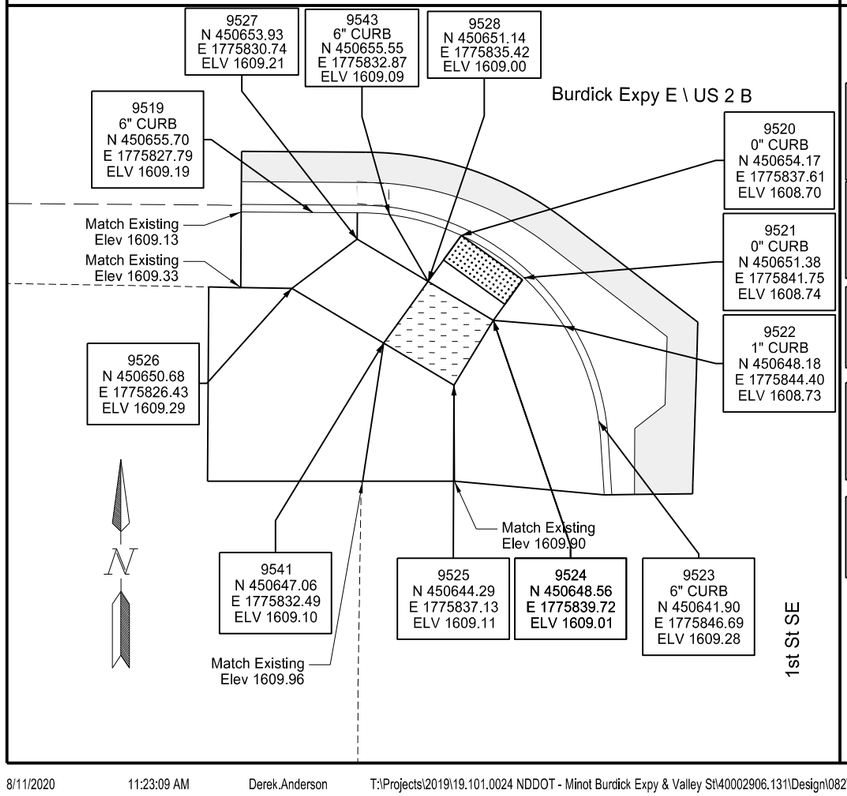
US 2 Business / Burdick Expy

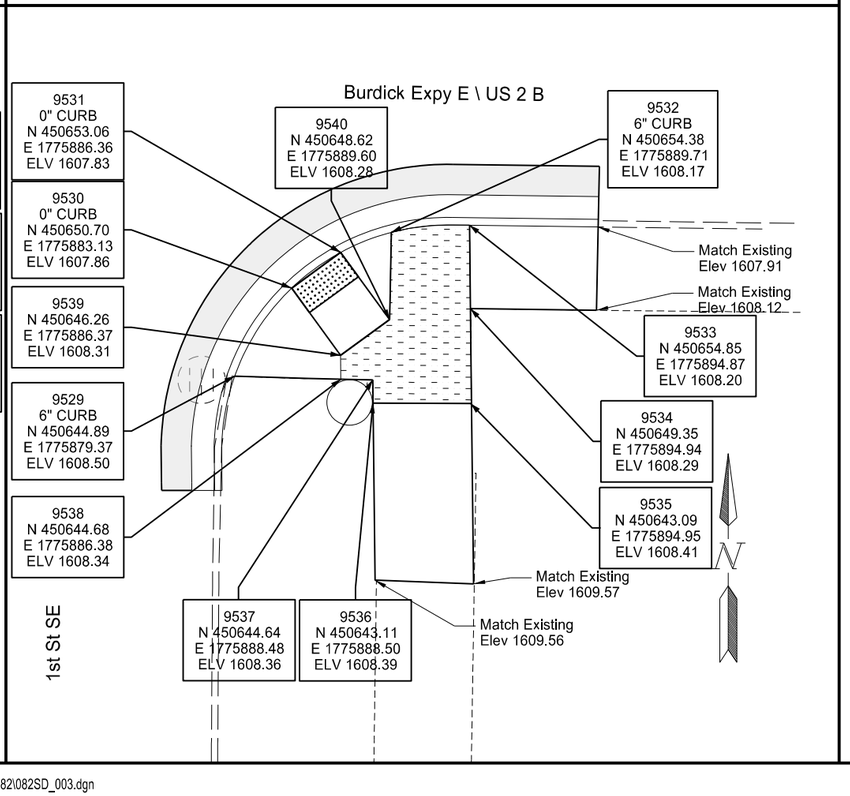
Main St

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	3









LEGEND

- Pigmented Imprinted Concrete
- Landing Area
- Detectable Warning Panel
- Pavement Patching

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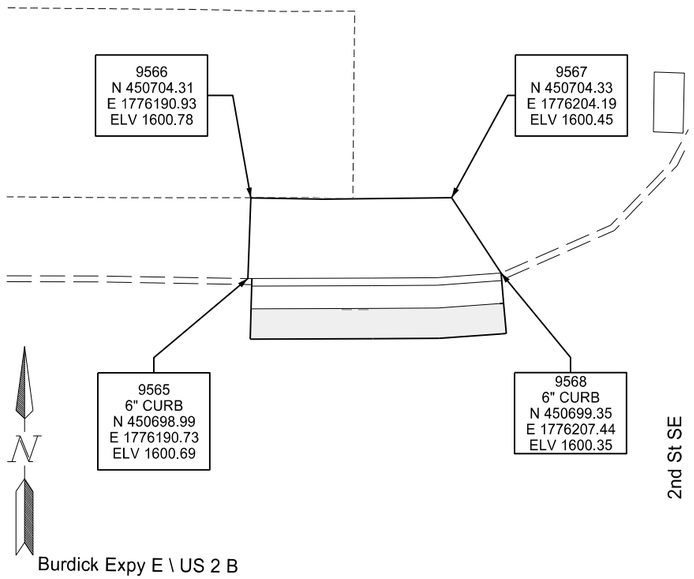
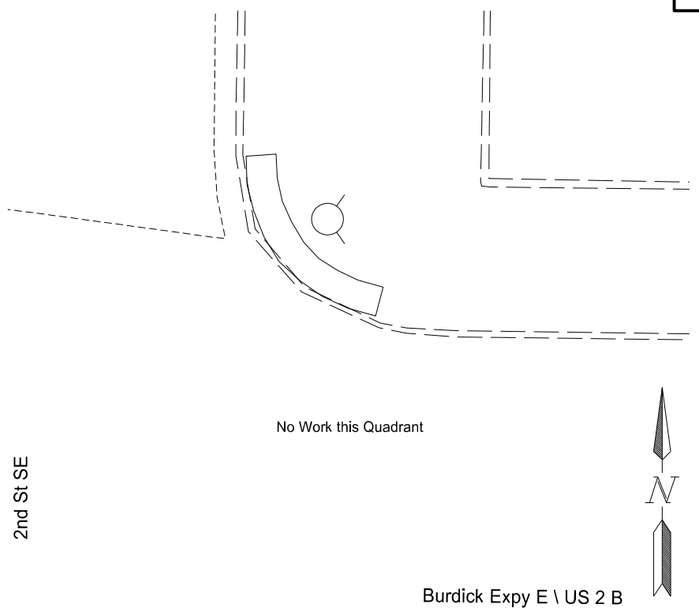
Survey Data Layout

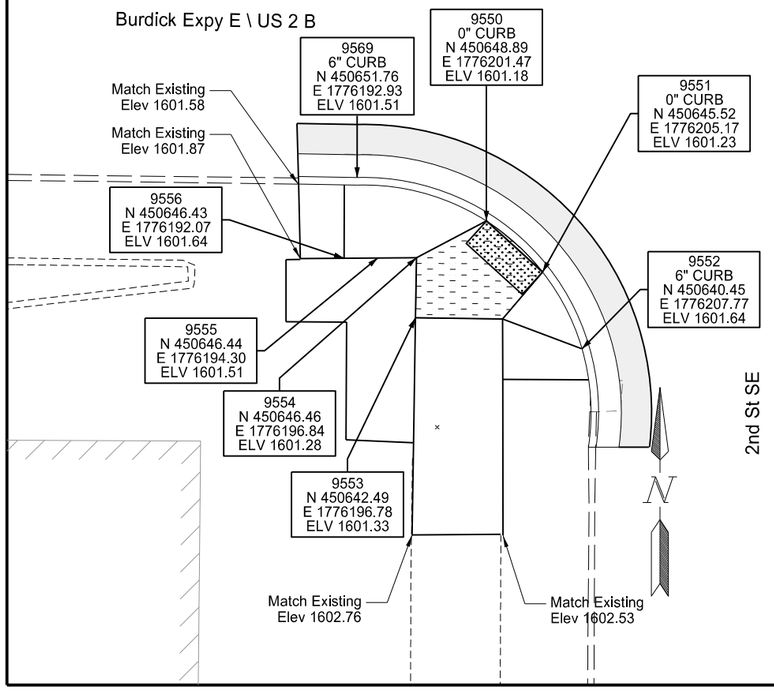
US 2 Business / Burdick Expy

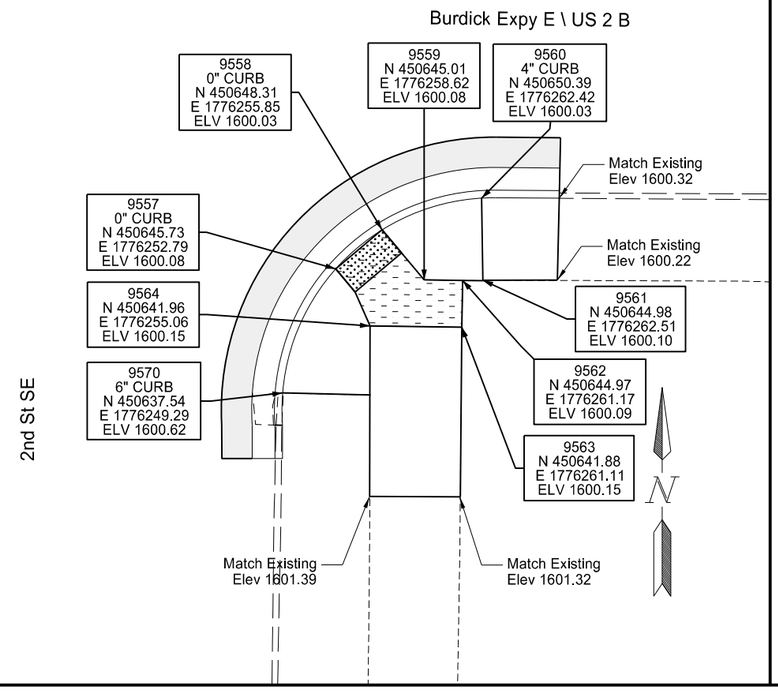
1st St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	4









LEGEND

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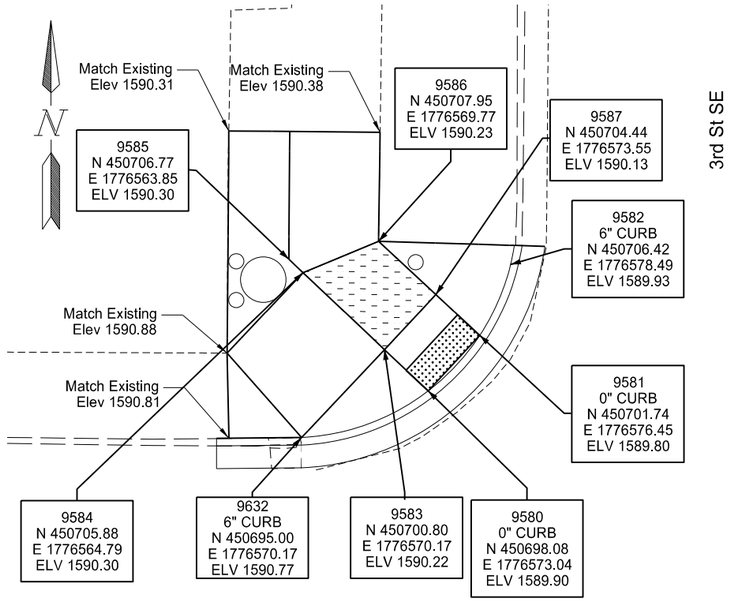
Survey Data Layout

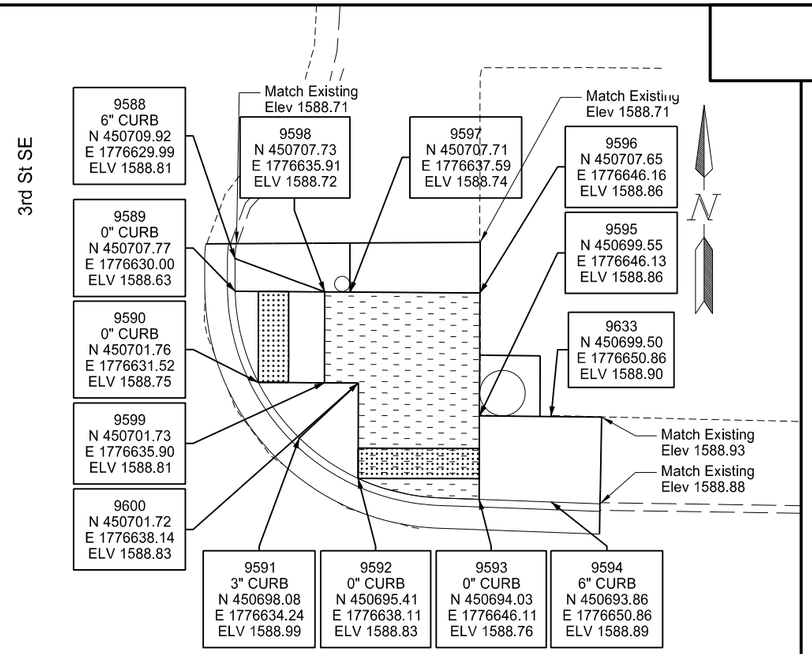
US 2 Business / Burdick Expy

2nd St SE

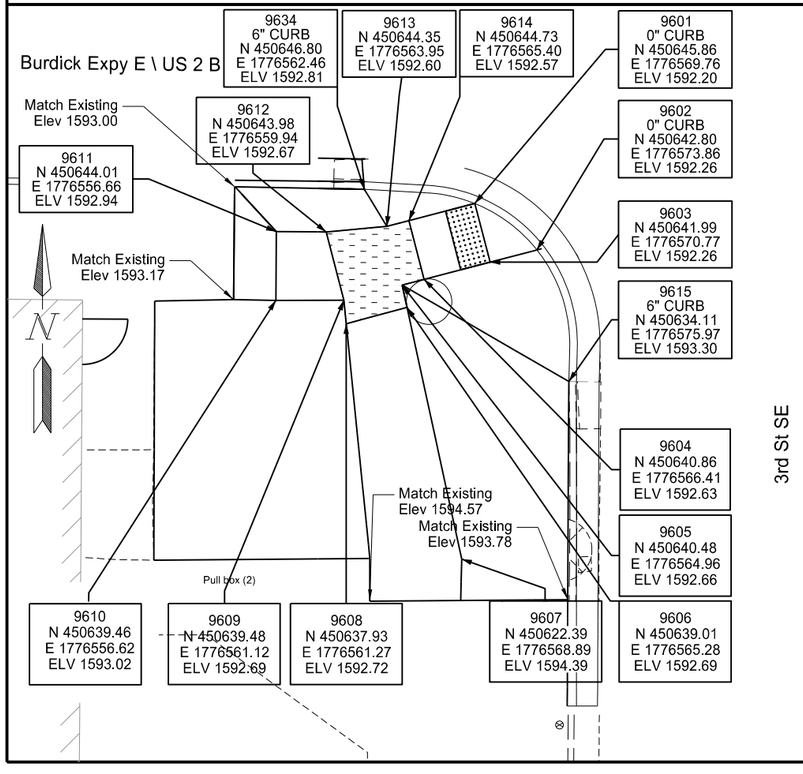
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	5

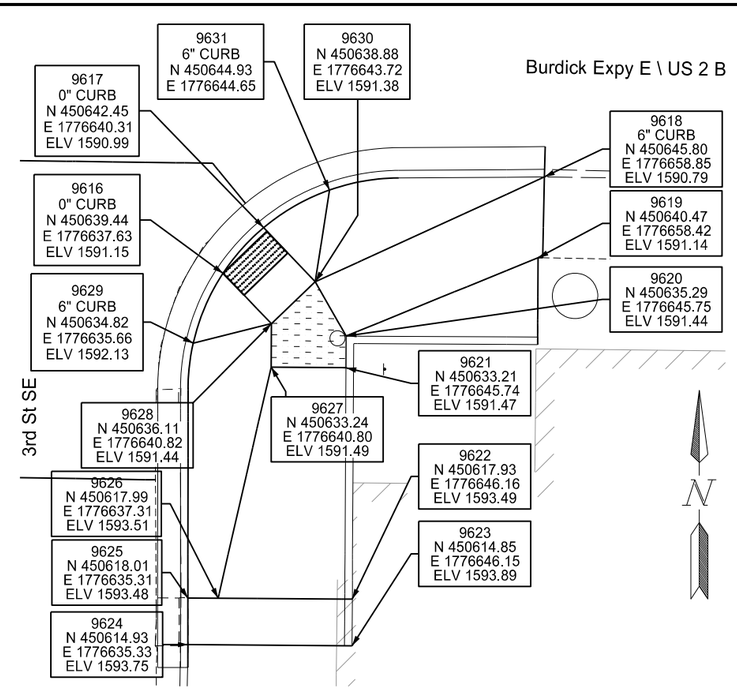


Burdick Expy E \ US 2 B



Burdick Expy E \ US 2 B





LEGEND

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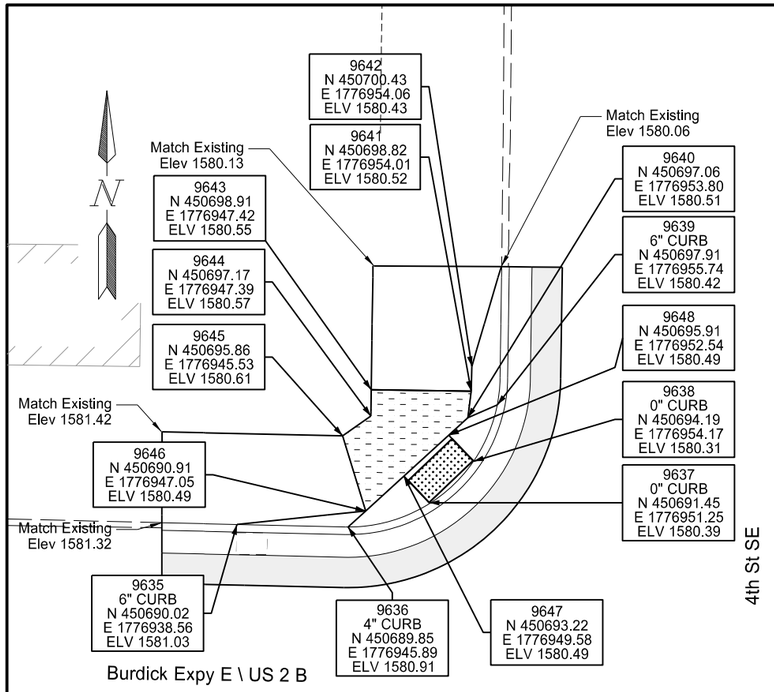
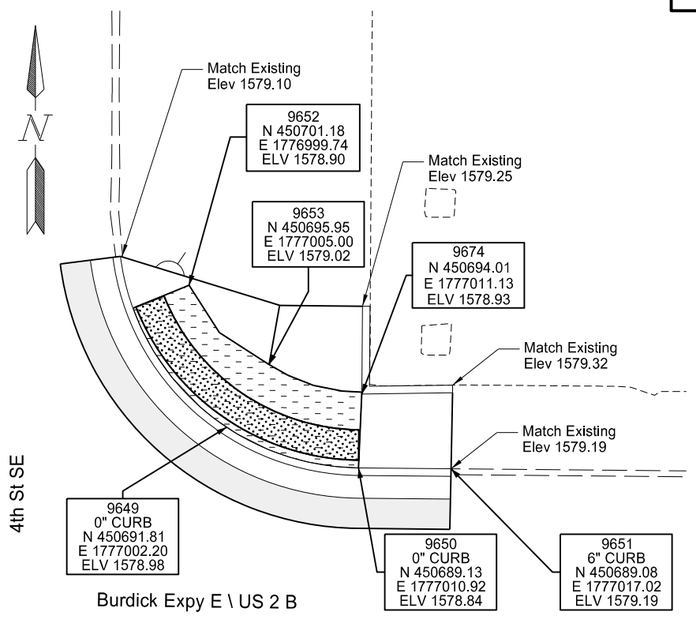
Survey Data Layout

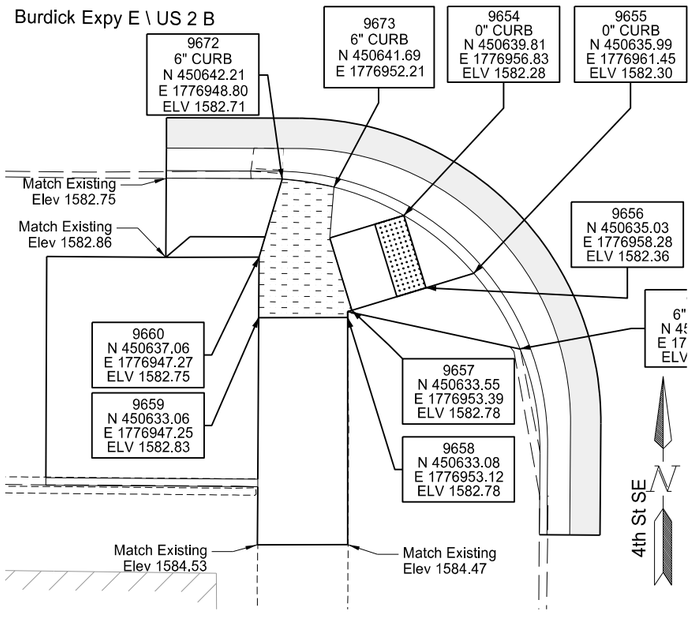
US 2 Business / Burdick Expy

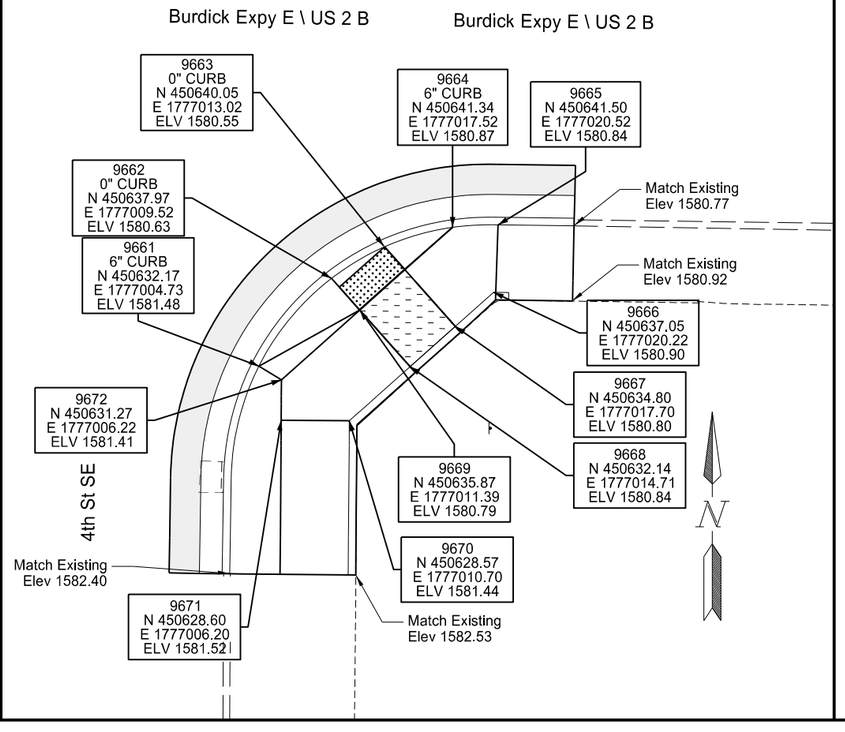
3rd St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	6









LEGEND

- Pigmented Imprinted Concrete
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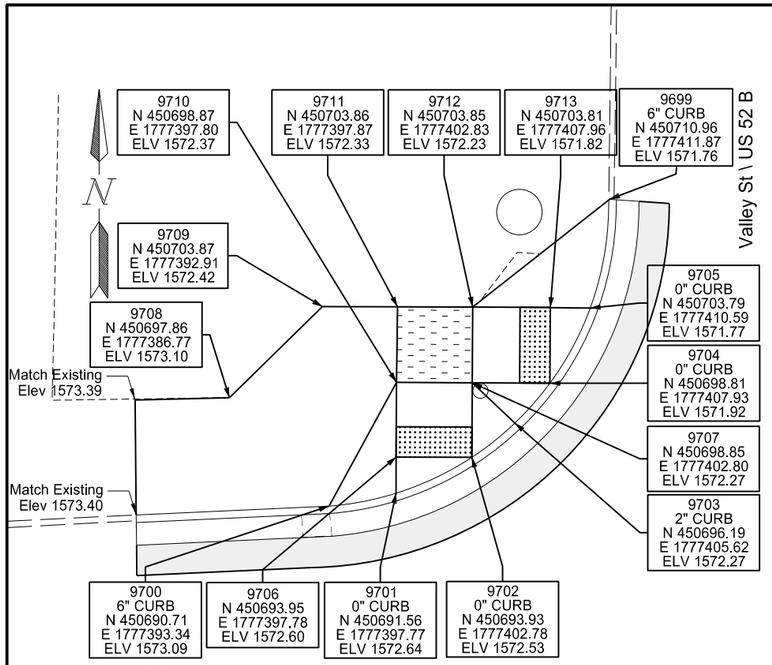
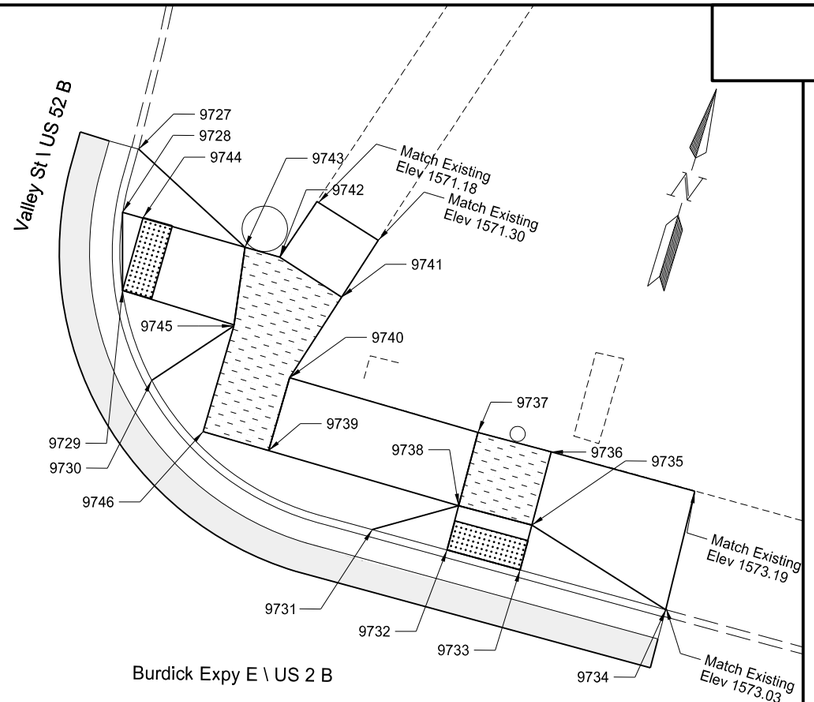
Survey Data Layout

US 2 Business / Burdick Expy

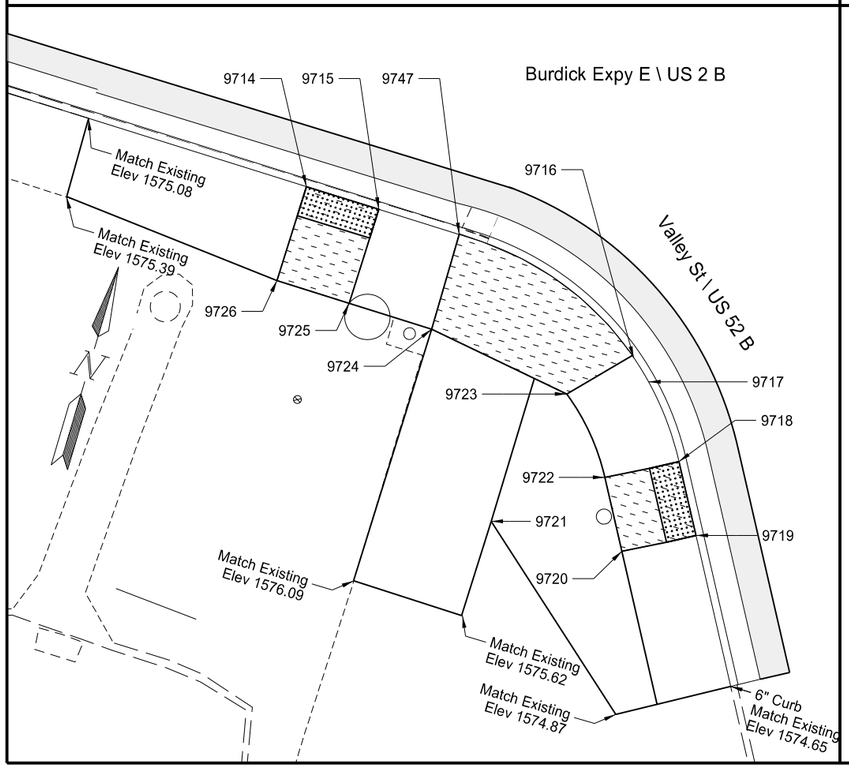
4th St SE

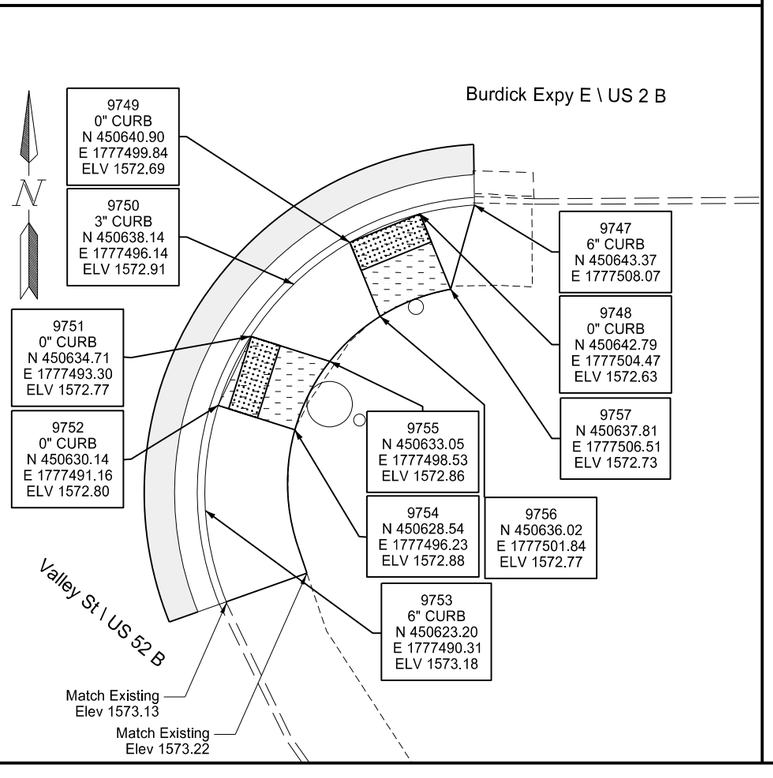
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	82	7





Point	North	East	Elevation	Description
9714	450637.21	1777397.61	1573.85	0" CURB
9715	450637.14	1777402.61	1573.75	0" CURB
9716	450632.65	1777421.42	1574.06	6" CURB
9717	450631.27	1777422.93	1574.09	6" CURB
9718	450626.79	1777426.34	1573.68	0" CURB
9719	450622.43	1777428.80	1573.75	0" CURB
9720	450620.05	1777424.40	1573.81	CON
9721	450619.49	1777415.57	1575.06	CON
9722	450624.40	1777421.95	1573.78	CON
9723	450628.96	1777417.98	1574.16	CON
9724	450630.54	1777408.21	1574.28	CON
9725	450630.63	1777402.51	1573.86	CON
9726	450630.72	1777397.51	1573.89	CON
9727	450714.86	1777463.79	1571.18	6" CURB
9728	450710.56	1777463.98	1570.96	0" CURB
9729	450705.63	1777465.47	1571.06	0" CURB
9730	450700.51	1777469.04	1571.92	6" CURB
9731	450695.31	1777485.84	1572.39	6" CURB
9732	450695.46	1777490.95	1572.11	0" CURB
9733	450695.60	1777495.95	1572.21	0" CURB
9734	450695.89	1777505.91	1573.03	6" CURB
9735	450698.65	1777495.83	1572.45	CON
9736	450703.65	1777495.64	1572.49	CON
9737	450703.48	1777490.65	1572.45	CON
9738	450698.48	1777490.84	1572.35	CON
9739	450698.31	1777477.76	1571.50	CON
9740	450703.31	1777477.70	1571.55	CON
9741	450709.41	1777479.44	1571.45	CON
9742	450710.75	1777474.76	1571.40	CON
9743	450710.71	1777472.38	1571.36	CON
9744	450710.59	1777465.38	1570.98	CON
9745	450705.59	1777473.17	1571.45	CON
9746	450698.26	1777473.27	1571.49	CON
9747	450637.04	1777408.18	1574.15	6" CURB





LEGEND

- Pigmented Imprinted Concrete
- Landing Area
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- Pavement Patching

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Survey Data Layout

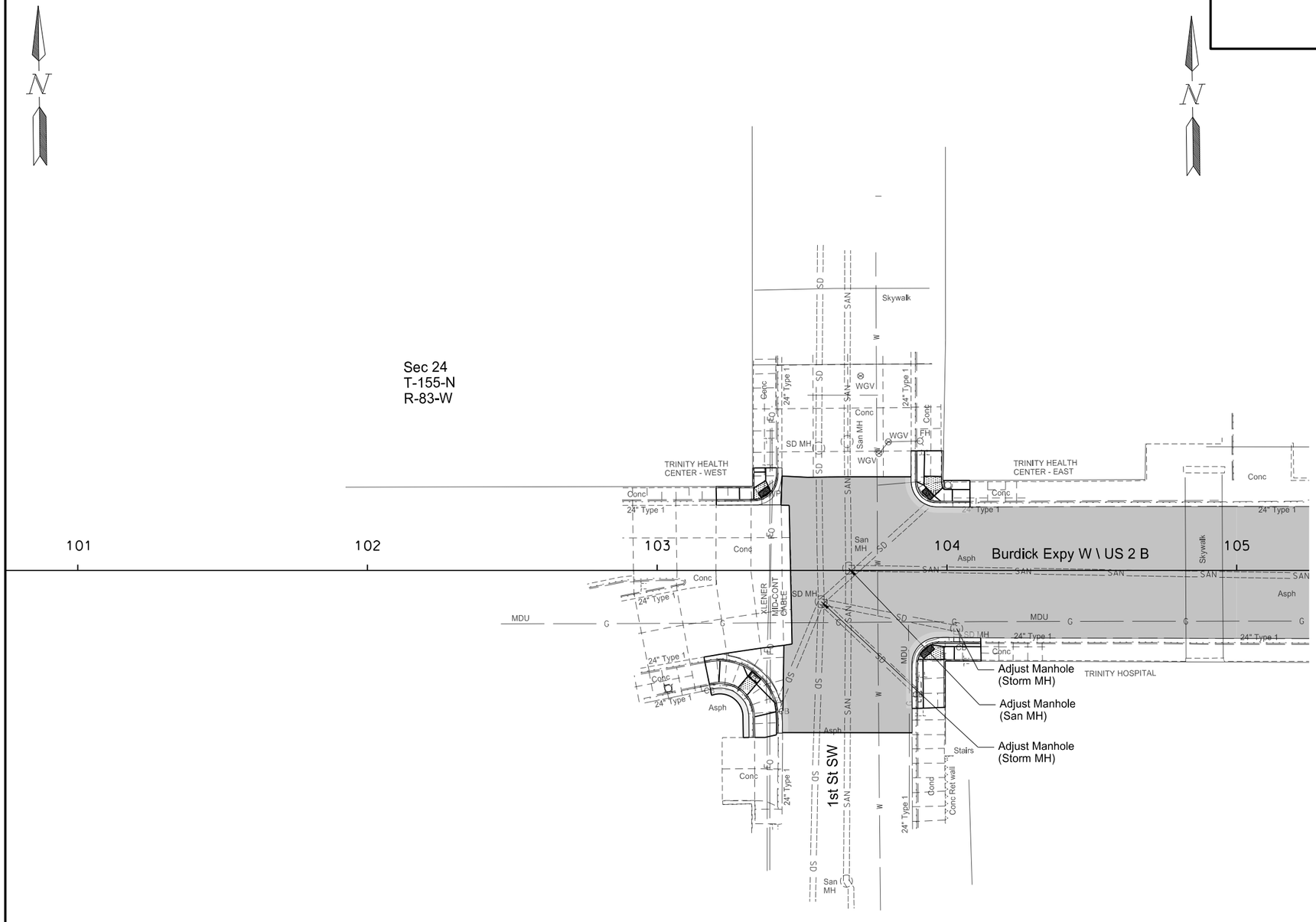
US 2 Business / Burdick Expy

Valley St

8/11/2020 11:23:19 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\082\082SD_007.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	1

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 103+16 to 105+00	49	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 103+16 to 105+00	989	SY
430	0045	SUPERPAVE FAA 45		
		Sta 103+16 to 105+00	110	TON
430	5806	PG 58H-28 ASPHALT CEMENT		
		Sta 103+16 to 105+00	7	TON
722	6200	ADJUST MANHOLE		
		Sta 103+16 to 105+00	3	EA



Legend

2" Milling/Superpave FAA 45

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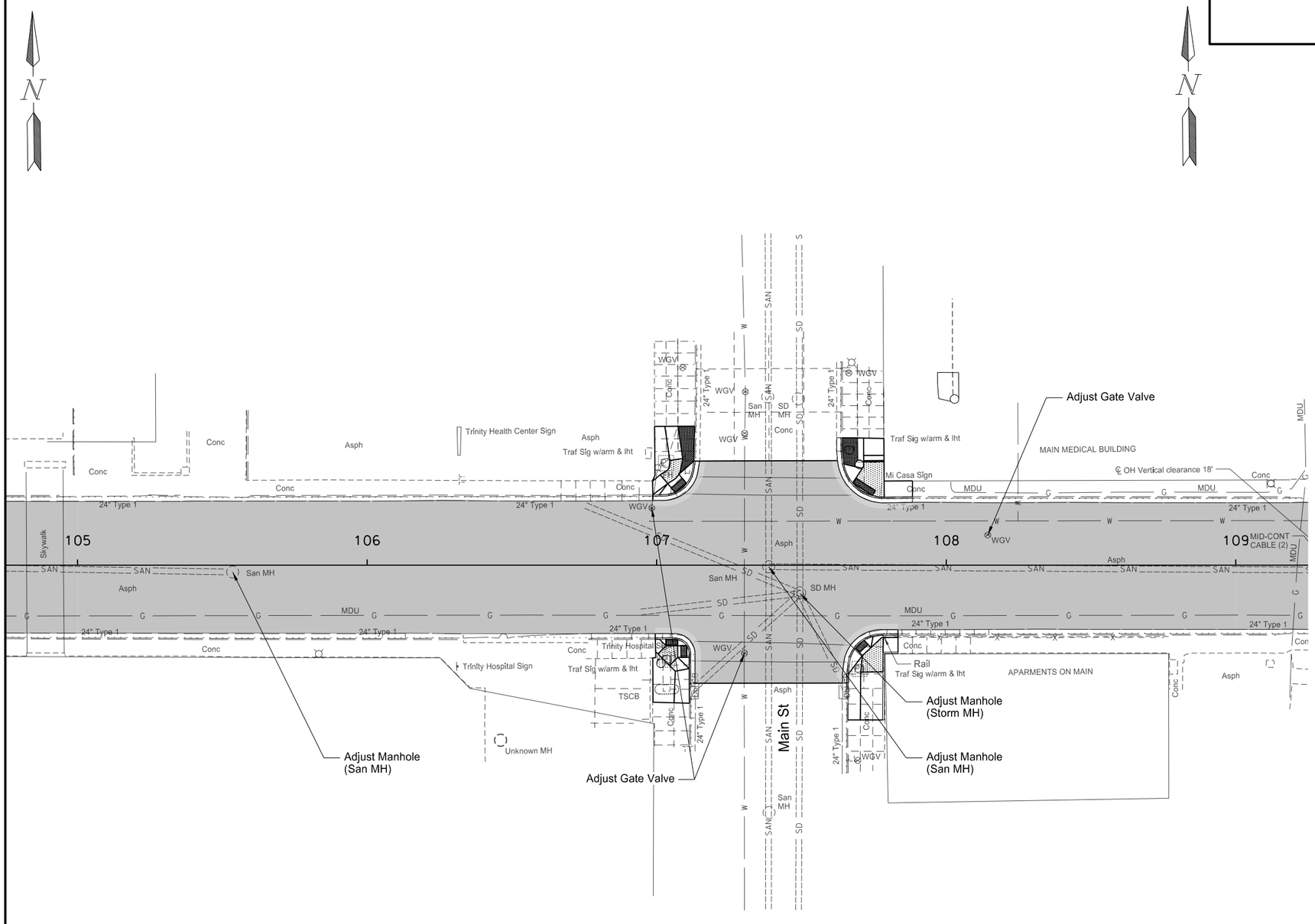
Paving Layout

US 2 Business / Burdick Expy

Sta 103+16 to 105+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	90	2

SPEC CODE	BID ITEM	QTY	UNIT
401 0050	TACK COAT		
	Sta 105+00 to 109+00	109	GAL
411 0114	MILLING PAVEMENT SURFACE - 2 INCH		
	Sta 105+00 to 109+00	2188	SY
430 0045	SUPERPAVE FAA 45		
	Sta 105+00 to 109+00	243	TON
430 5806	PG 58H-28 ASPHALT CEMENT		
	Sta 105+00 to 109+00	15	TON
722 6140	ADJUST GATE VALVE BOX		
	Sta 105+00 to 109+00	3	EA
722 6200	ADJUST MANHOLE		
	Sta 105+00 to 109+00	3	EA



Legend

2" Milling/Superpave FAA 45

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Paving Layout

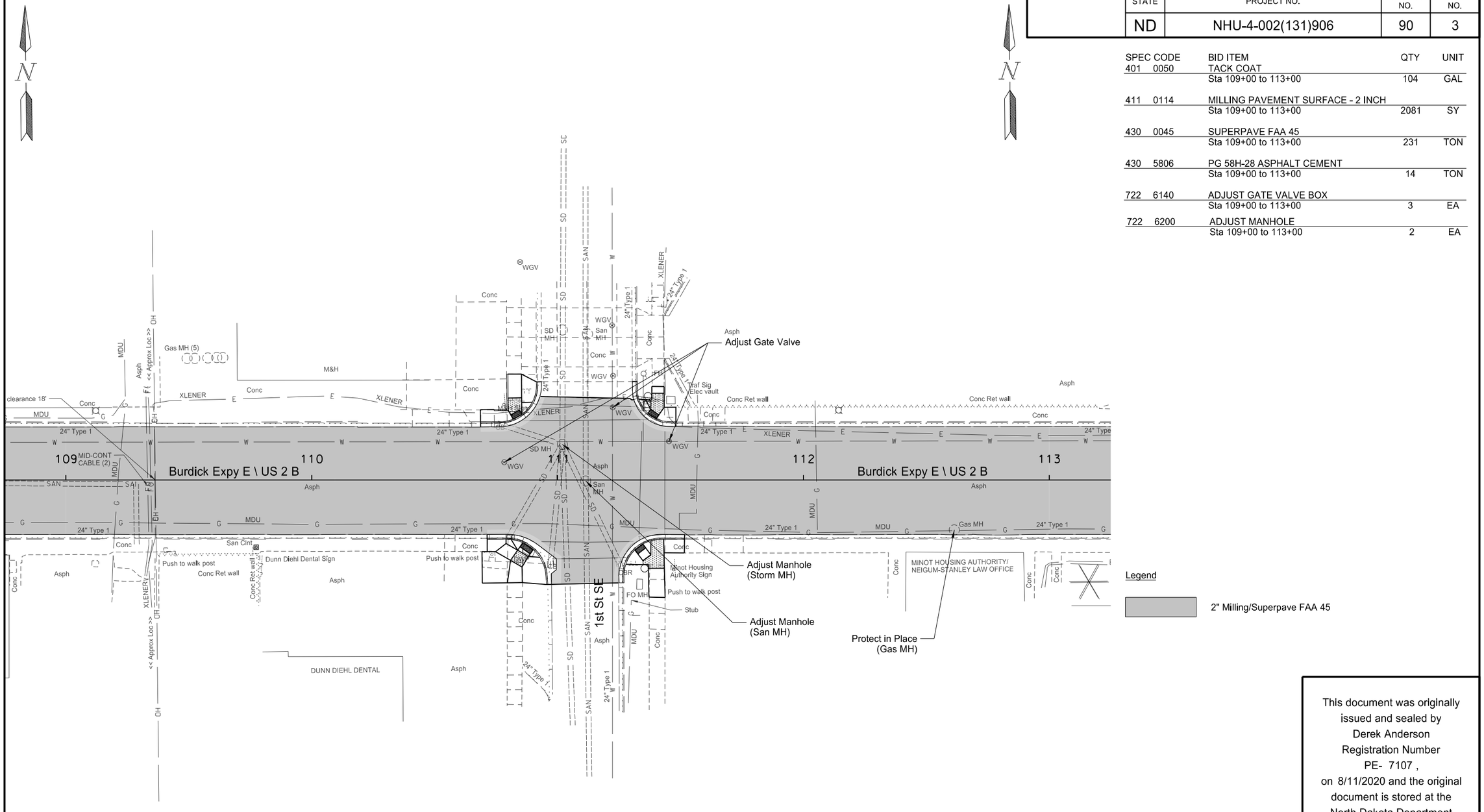
US 2 Business / Burdick Expy

Sta 105+00 to 109+00

8/11/2020 10:21:32 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Design\090\090PL_002.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	3

SPEC CODE	BID ITEM	QTY	UNIT
401 0050	TACK COAT		
	Sta 109+00 to 113+00	104	GAL
411 0114	MILLING PAVEMENT SURFACE - 2 INCH		
	Sta 109+00 to 113+00	2081	SY
430 0045	SUPERPAVE FAA 45		
	Sta 109+00 to 113+00	231	TON
430 5806	PG 58H-28 ASPHALT CEMENT		
	Sta 109+00 to 113+00	14	TON
722 6140	ADJUST GATE VALVE BOX		
	Sta 109+00 to 113+00	3	EA
722 6200	ADJUST MANHOLE		
	Sta 109+00 to 113+00	2	EA



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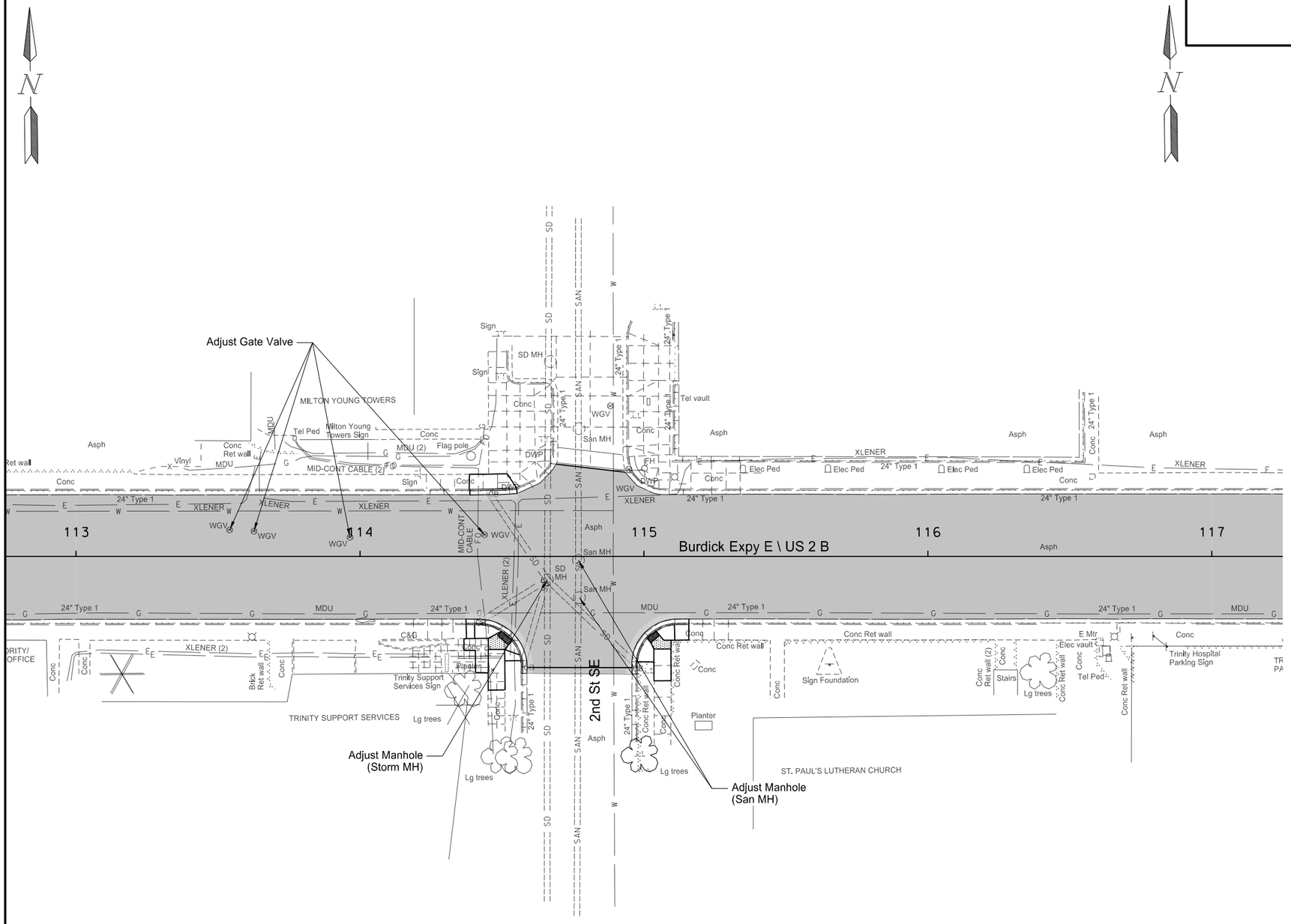
Paving Layout

US 2 Business / Burdick Expy

Sta 109+00 to 113+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	4

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 113+00 to 117+00	103	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 113+00 to 117+00	2069	SY
430	0045	SUPERPAVE FAA 45		
		Sta 113+00 to 117+00	230	TON
430	5806	PG 58H-28 ASPHALT CEMENT		
		Sta 113+00 to 117+00	14	TON
722	6140	ADJUST GATE VALVE BOX		
		Sta 113+00 to 117+00	4	EA
722	6200	ADJUST MANHOLE		
		Sta 113+00 to 117+00	3	EA



Legend

2" Milling/Superpave FAA 45

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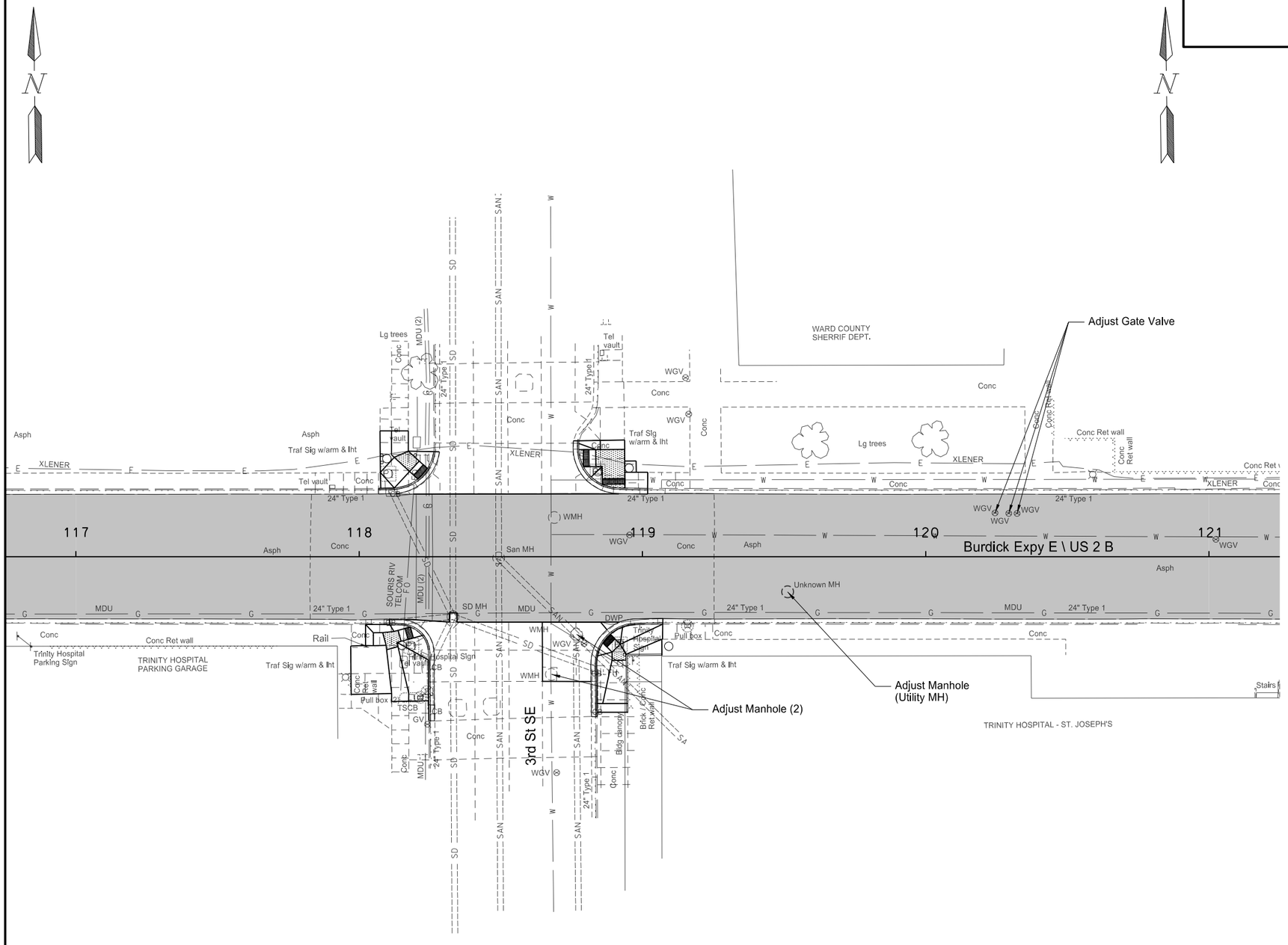
Paving Layout

US 2 Business / Burdick Expy

Sta 113+00 to 117+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	5

SPEC CODE	BID ITEM	QTY	UNIT
401 0050	TACK COAT		
	Sta 117+00 to 121+00	98	GAL
411 0114	MILLING PAVEMENT SURFACE - 2 INCH		
	Sta 117+00 to 121+00	1969	SY
430 0045	SUPERPAVE FAA 45		
	Sta 117+00 to 121+00	218	TON
430 5806	PG 58H-28 ASPHALT CEMENT		
	Sta 117+00 to 121+00	13	TON
722 6140	ADJUST GATE VALVE BOX		
	Sta 117+00 to 121+00	3	EA
722 6200	ADJUST MANHOLE		
	Sta 117+00 to 121+00	3	EA



Legend

2" Milling/Superpave FAA 45

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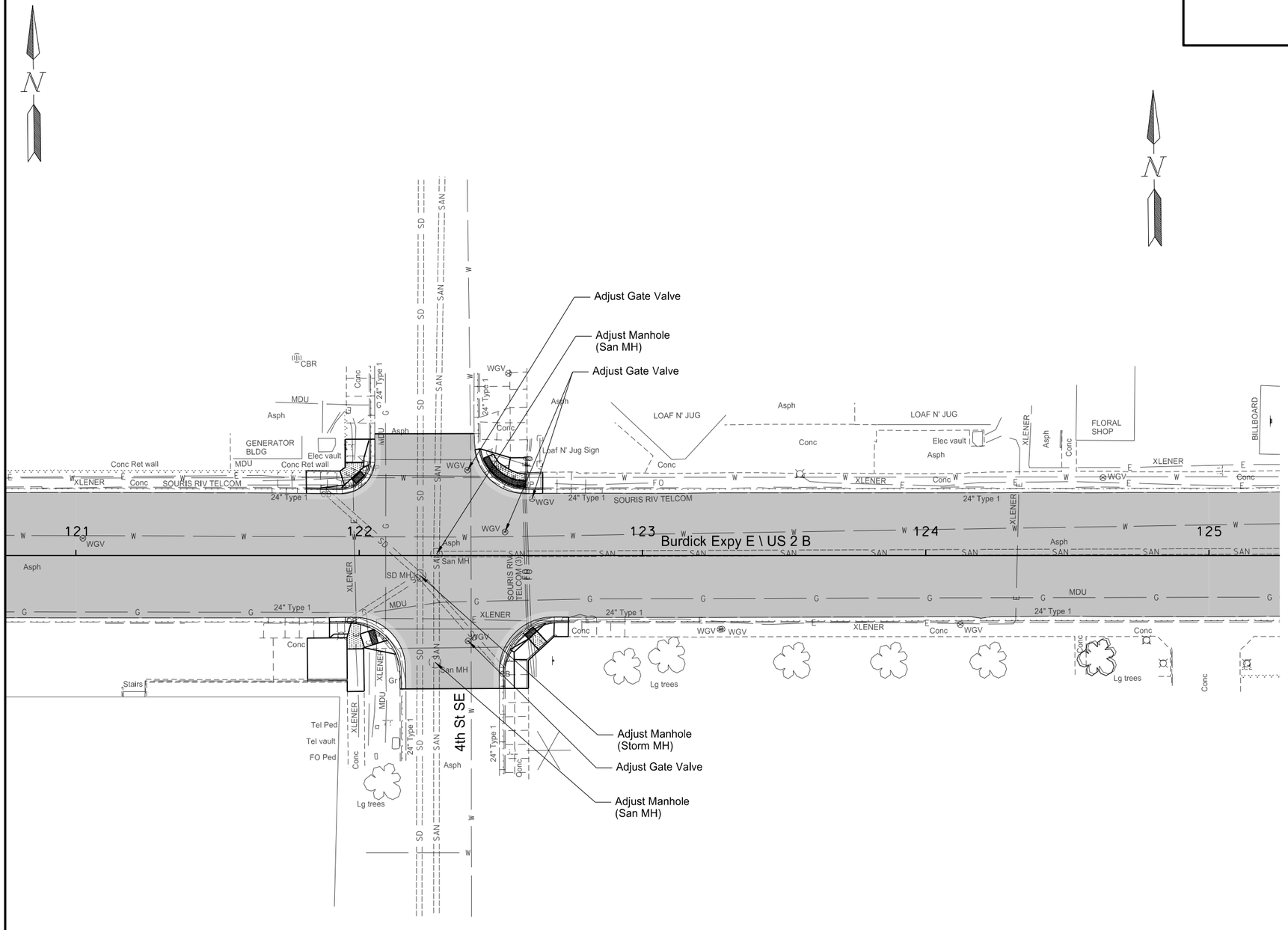
Paving Layout

US 2 Business / Burdick Expy

Sta 117+00 to 121+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	6

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 121+00 to 125+00	107	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 121+00 to 125+00	2141	SY
430	0045	SUPERPAVE FAA 45		
		Sta 121+00 to 125+00	238	TON
430	5806	PG 58H-28 ASPHALT CEMENT		
		Sta 121+00 to 125+00	14	TON
722	6140	ADJUST GATE VALVE BOX		
		Sta 121+00 to 125+00	4	EA
722	6200	ADJUST MANHOLE		
		Sta 121+00 to 125+00	3	EA



Legend

2" Milling/Superpave FAA 45

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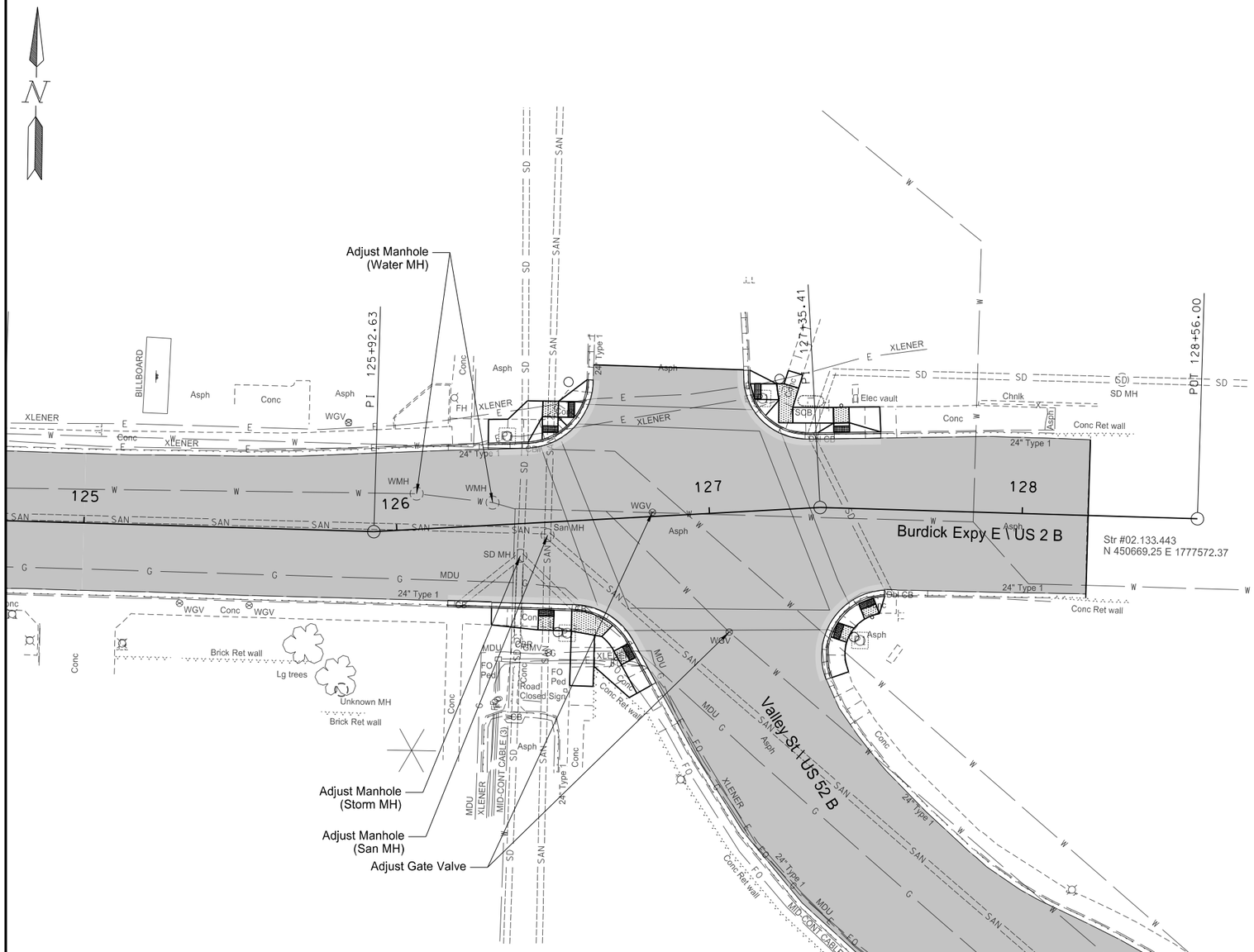
Paving Layout

US 2 Business / Burdick Expy

Sta 121+00 to 125+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	90	7

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 125+00 to 128+21	150	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 125+00 to 128+21	2997	SY
430	0045	SUPERPAVE FAA 45		
		Sta 125+00 to 128+21	333	TON
430	5806	PG 58H-28 ASPHALT CEMENT		
		Sta 125+00 to 128+21	20	TON
722	6140	ADJUST GATE VALVE BOX		
		Sta 125+00 to 128+21	2	EA
722	6200	ADJUST MANHOLE		
		Sta 125+00 to 128+21	4	EA



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Paving Layout

US 2 Business / Burdick Expy

Sta 125+00 to 128+21

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	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**	**1**	**1**	**2**	**2**		**2**	**26**	**52**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)							18	
G20-10-108	108"x48"	CONTRACTOR SIGN							70	
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**2**	**2**	**2**	**2**		**2**	**43**	**86**
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW							36	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT							59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)							10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)							10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)							10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)							7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)							7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)							7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)							7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)							7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT							15	
M4-10-48	48"x18"	DETOUR (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)							7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)							9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)							7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)							9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)							7	
R1-1-48	**48"x48"**	**STOP**	**14**	**14**	**14**	**14**		**14**	**32**	**448**
R1-2-60	60"x60"	YIELD							29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)							30	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**2**	**2**	**4**	**4**		**4**	**39**	**156**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**1**	**1**	**2**	**2**		**2**	**10**	**20**
R3-2-48	48"x48"	NO LEFT TURN							35	
R4-1-48	48"x60"	DO NOT PASS							39	
R4-7-48	48"x60"	KEEP RIGHT							39	
R5-1-48	48"x48"	DO NOT ENTER							35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)							14	
R7-1-12	12"x18"	NO PARKING ANY TIME							11	
R10-6-24	24"x36"	STOP HERE ON RED							16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)							12	
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							35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT							35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW							26	
W3-1-48	48"x48"	STOP AHEAD							35	
W3-3-48	48"x48"	SIGNAL AHEAD							35	
W3-4-48	48"x48"	BE PREPARED TO STOP							35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**1**	**1**	**2**	**2**		**2**	**35**	**70**
W4-2-48	**48"x48"**	**LANE ENDS RIGHT or LEFT**	**1**	**1**	**2**	**2**		**2**	**35**	**70**
W5-1-48	48"x48"	ROAD NARROWS							35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE							35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW							35	
W6-3-48	48"x48"	TWO WAY TRAFFIC							35	
W8-1-48	48"x48"	BUMP							35	
W8-3-48	48"x48"	PAVEMENT ENDS							35	
W8-7-48	48"x48"	LOOSE GRAVEL							35	
W8-11-48	48"x48"	UNEVEN LANES							35	
W8-12-48	48"x48"	NO CENTER LINE							35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL							35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY							35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE							35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE							35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY							35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL							35	
W12-2-48	48"x48"	LOW CLEARANCE							35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)							14	
W14-3-64	64"x48"	NO PASSING ZONE							28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)							10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**16**	**16**	**16**	**16**		**16**	**35**	**560**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE							35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE							35	
W20-4-48	**48"x48"**	**ONE LANE ROAD AHEAD or __ FT or _ MILE**			**2**	**2**		**2**	**35**	**70**
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE							35	
W20-7-48	**48"x48"**	**FLAGGER**	**2**	**2**	**2**	**2**		**2**	**35**	**70**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**4**	**4**	**4**	**4**		**4**	**5**	**20**
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)							12	
W21-1-48	48"x48"	WORKERS							35	
W21-2-48	48"x48"	FRESH OIL							35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE							35	
W21-5-48	48"x48"	SHOULDER WORK							35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE							35	
W21-6-48	48"x48"	SURVEY CREW							35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT							35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY							35	
W21-52-48	48"x48"	PAVEMENT BREAKS							35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD							35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK							35	

SPECIAL SIGNS

SPEC & CODE

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**						**1622**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR			**100**	**50**		**150**
704-1048	PORTABLE RUMBLE STRIPS	EACH						
704-1050	TYPE I BARRICADES	EACH						
704-1052	TYPE III BARRICADES	EACH						
704-1058	**PEDESTRIAN WALKWAY**	LF	**450**	**450**				**450**
704-1060	**DELINEATOR DRUMS**	EACH	**195**	**195**	**270**	**145**		**270**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH	**65**	**65**	**130**	**130**		**130**
704-1070	DELINEATOR	EACH						
704-1072	FLEXIBLE DELINEATORS	EACH						
704-1080	STACKABLE VERTICAL PANELS	EACH						
704-1081	VERTICAL PANELS - BACK TO BACK	EACH						
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH						
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH						
704-1087	**SEQUENCING ARROW PANEL - TYPE C**	EACH	**1**	**1**	**2**	**2**		**2**
704-1500	OBLITERATION OF PVMT MK	SF						
704-2108	**TEMPORARY CURB RAMP**	EA	**12**	**12**				**12**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF						
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH						
762-0200	RAISED PAVEMENT MARKERS	EACH						
762-0420	SHORT TERM 4IN LINE - TYPE R	LF						
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF						

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

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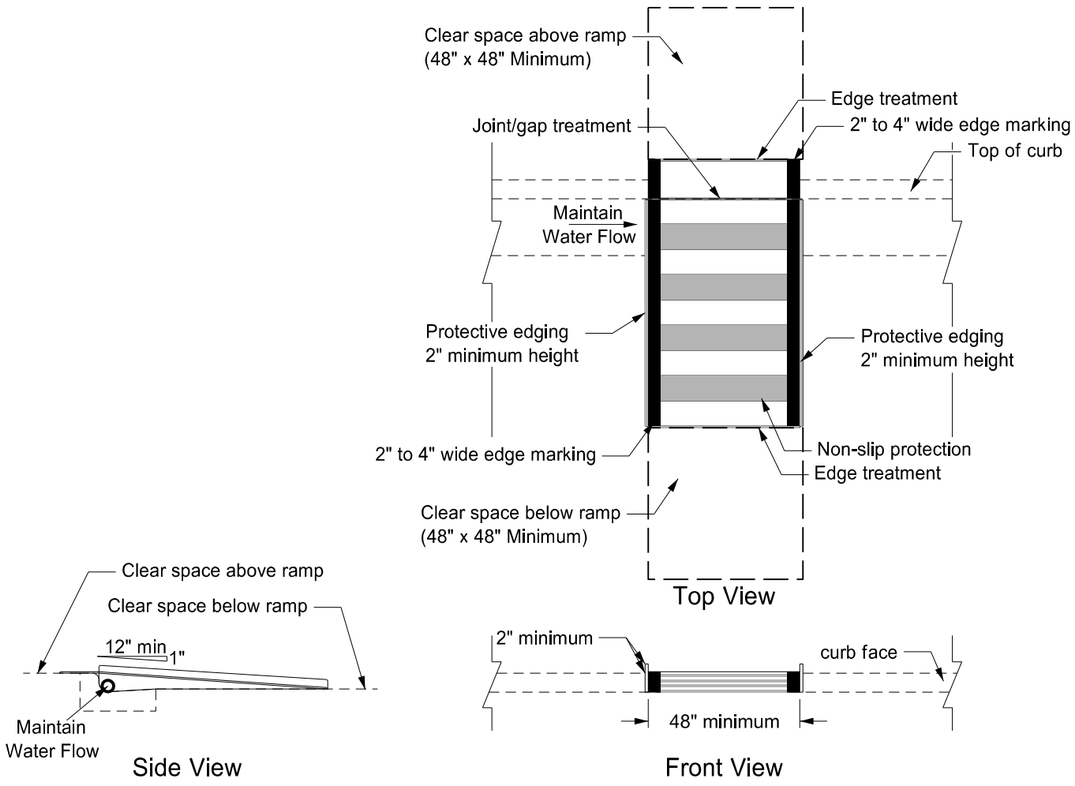
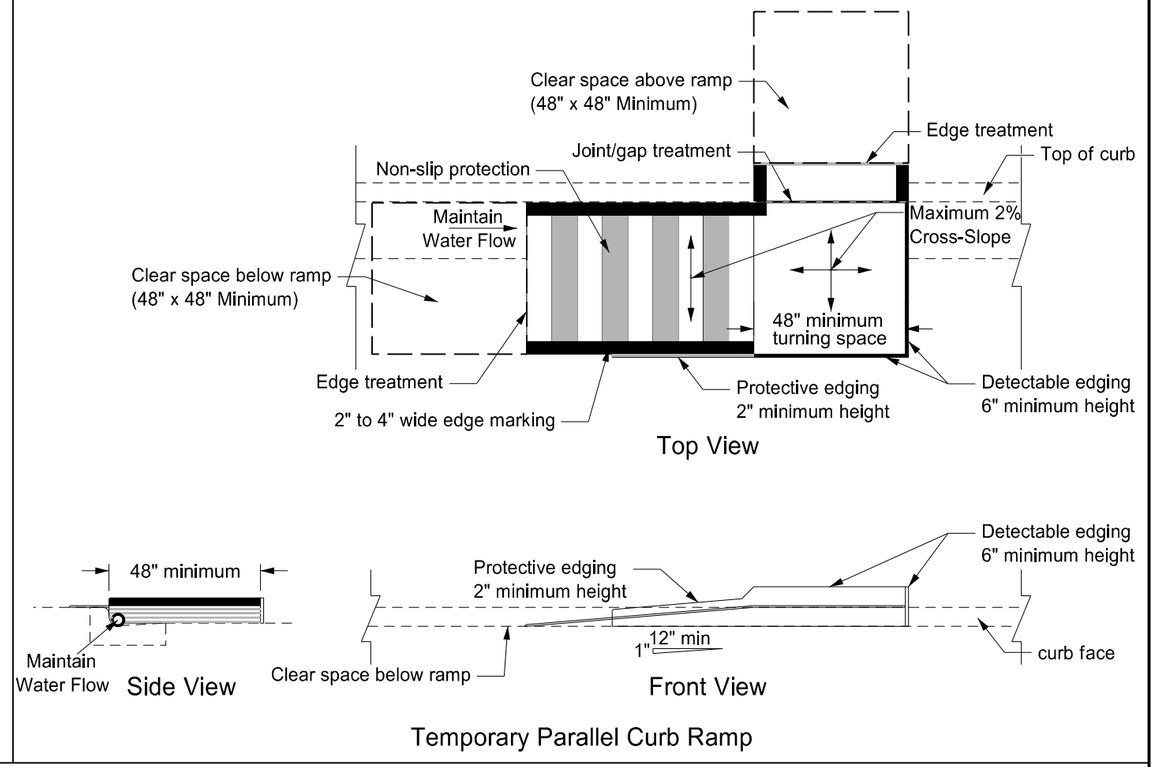
Traffic Control Devices List

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	100	2

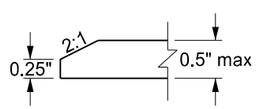


Temporary Perpendicular Curb Ramp



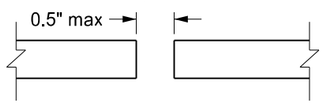
Temporary Parallel Curb Ramp

Edge Treatment



Maximum Surface
Height Change Detail

Joint/Gap Treatment



Maximum Width
Lateral Joints or Gaps

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Temporary Pedestrian Curb Ramp Details

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	100	3

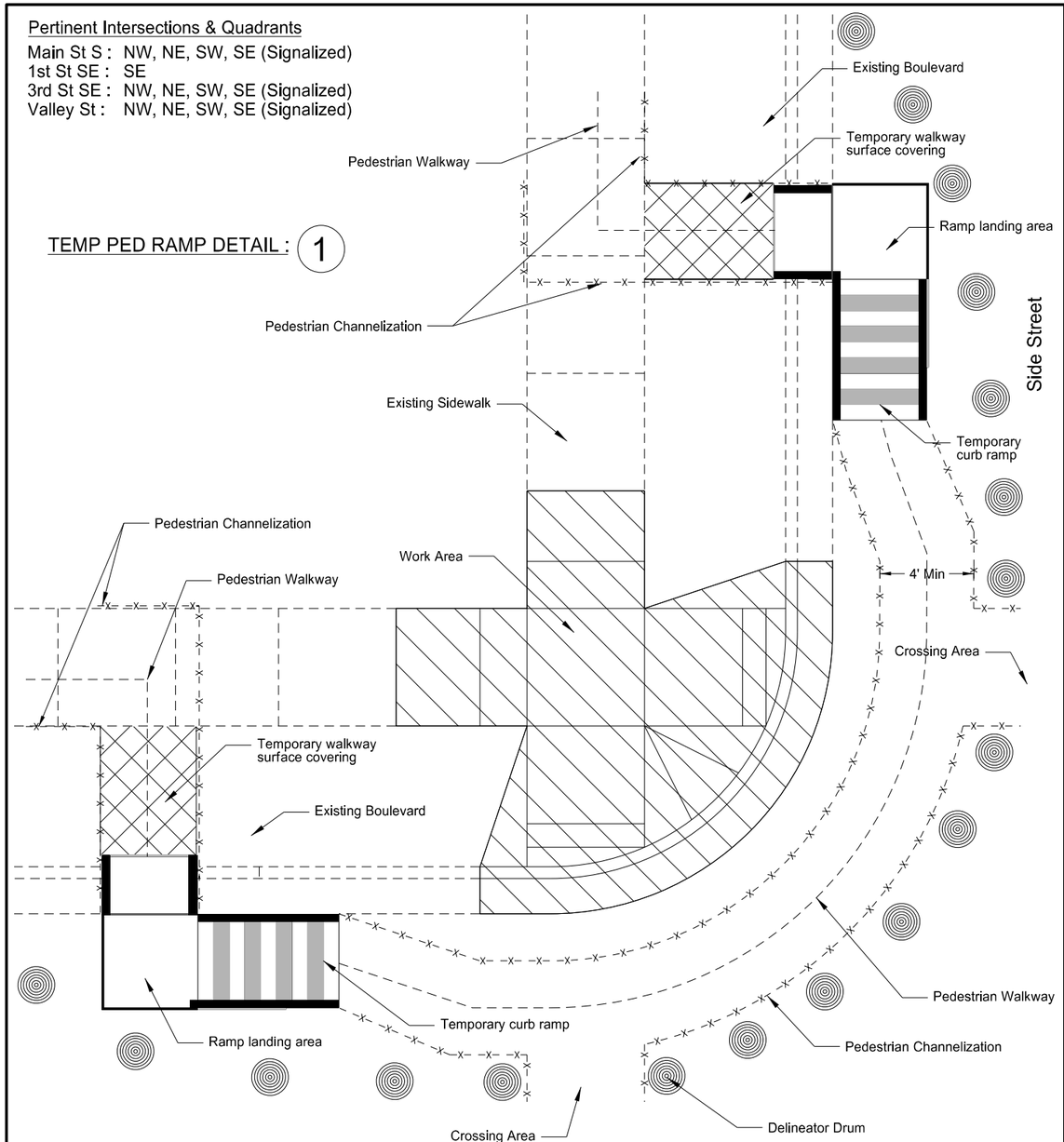
Pertinent Intersections & Quadrants

Main St S : NW, NE, SW, SE (Signalized)
1st St SE : SE
3rd St SE : NW, NE, SW, SE (Signalized)
Valley St : NW, NE, SW, SE (Signalized)

Traffic Control Devices (Quantities per Quadrant)

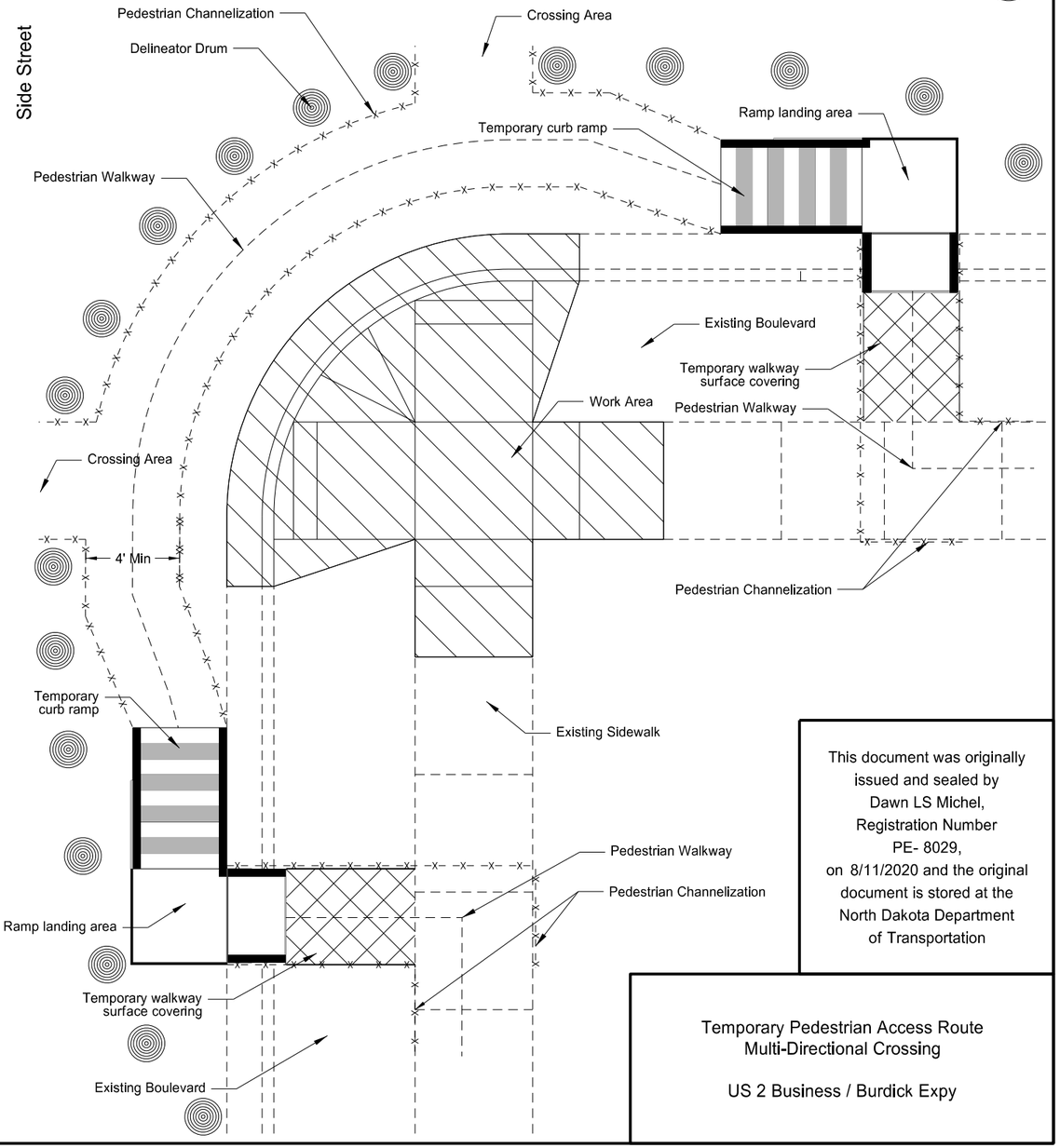
Temporary Curb Ramps : 2 EA
Delineator Drums : 20 EA
Pedestrian Walkway*: 75 LF
*Includes Pedestrian Channelization (Both Sides)

TEMP PED RAMP DETAIL : 1



Burdick Expressway

TEMP PED RAMP DETAIL : 2



Burdick Expressway

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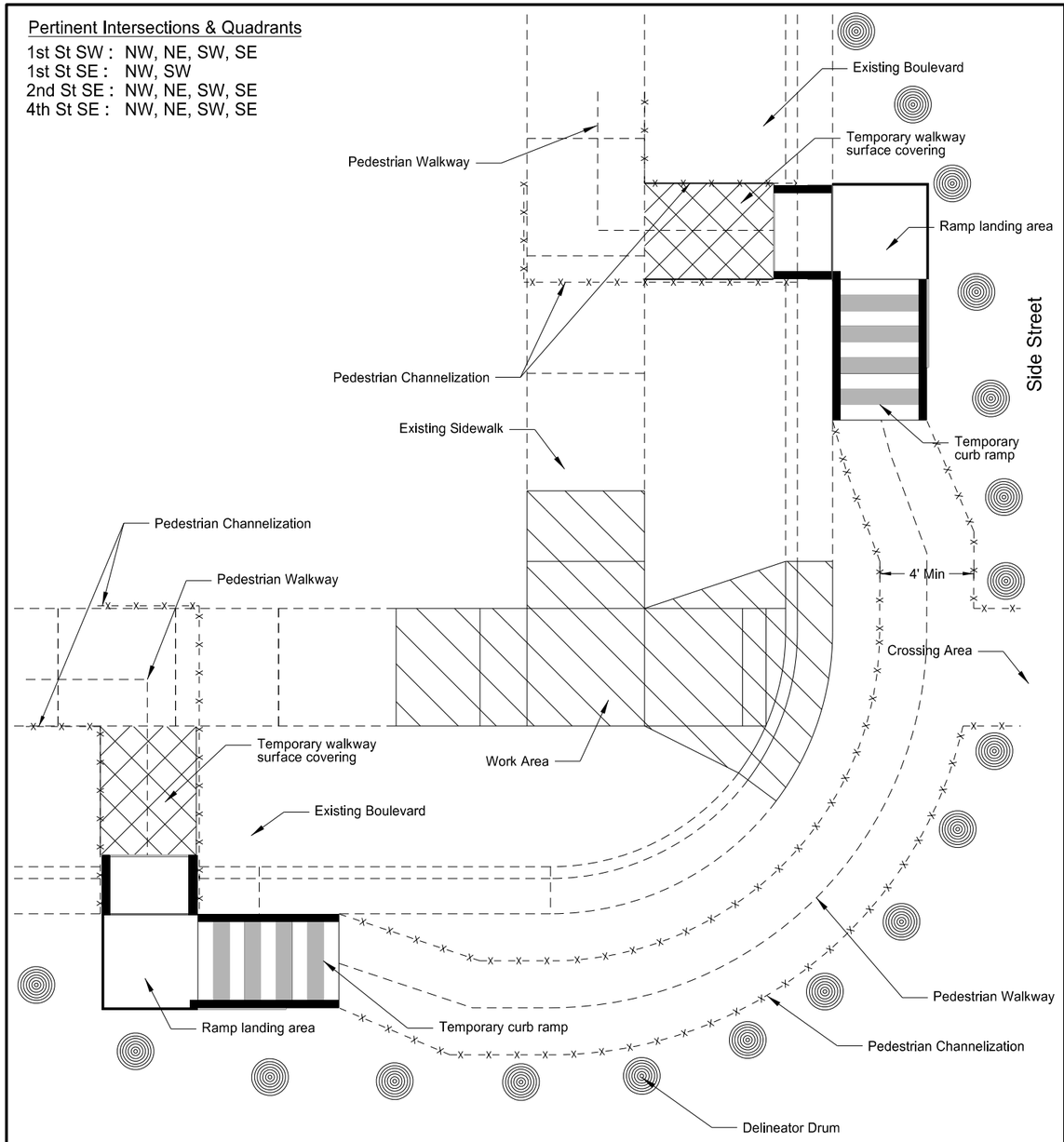
Temporary Pedestrian Access Route
Multi-Directional Crossing

US 2 Business / Burdick Expy

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	100	4

Pertinent Intersections & Quadrants

1st St SW : NW, NE, SW, SE
1st St SE : NW, SW
2nd St SE : NW, NE, SW, SE
4th St SE : NW, NE, SW, SE



TEMP PED RAMP DETAIL : 3

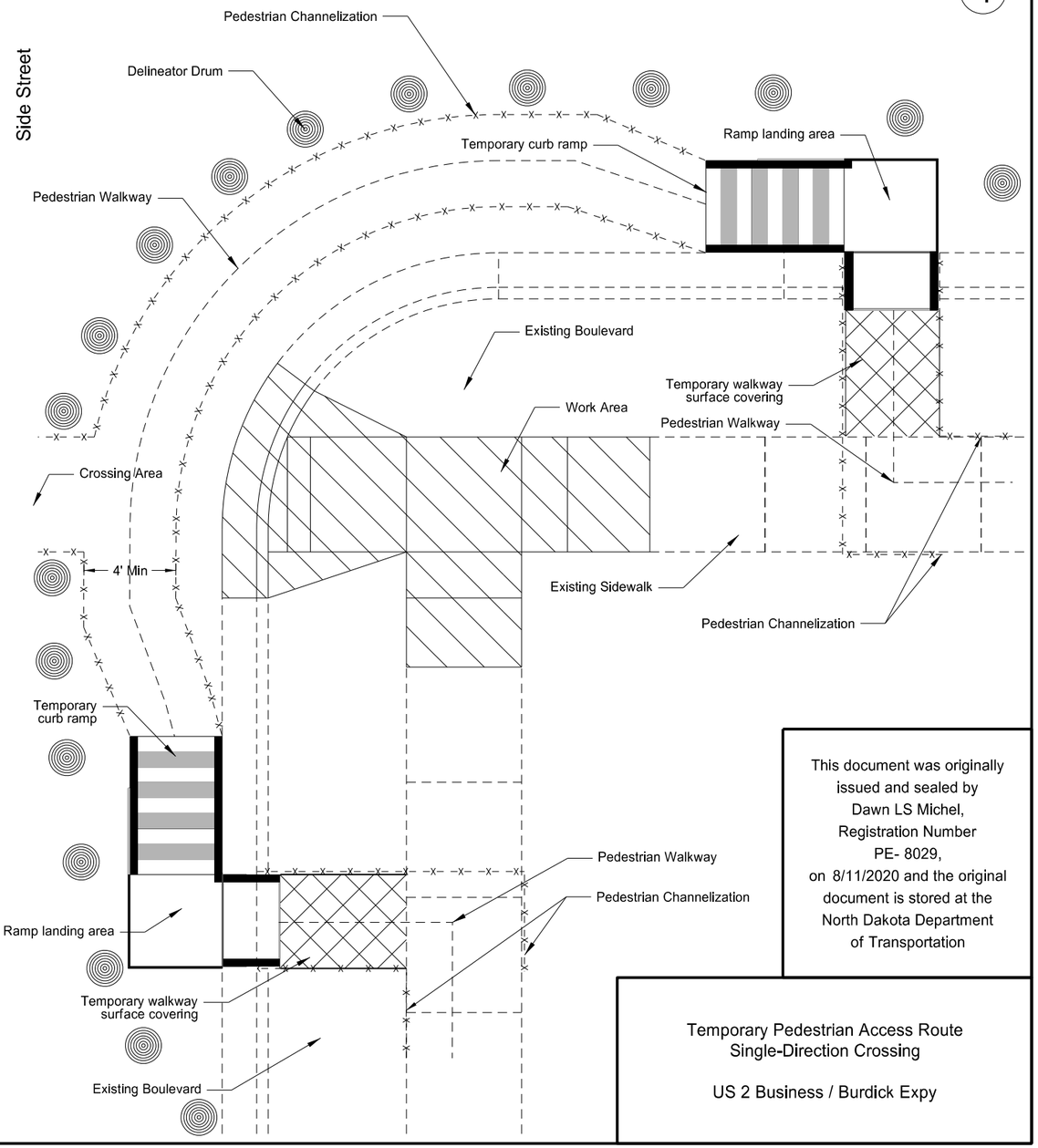
Burdick Expressway

Traffic Control Devices (Quantities per Quadrant)

Temporary Curb Ramps : 2 EA
Delineator Drums : 20 EA
Pedestrian Walkway*: 75 LF
*Includes Pedestrian Channelization (Both Sides)

Burdick Expressway

TEMP PED RAMP DETAIL : 4



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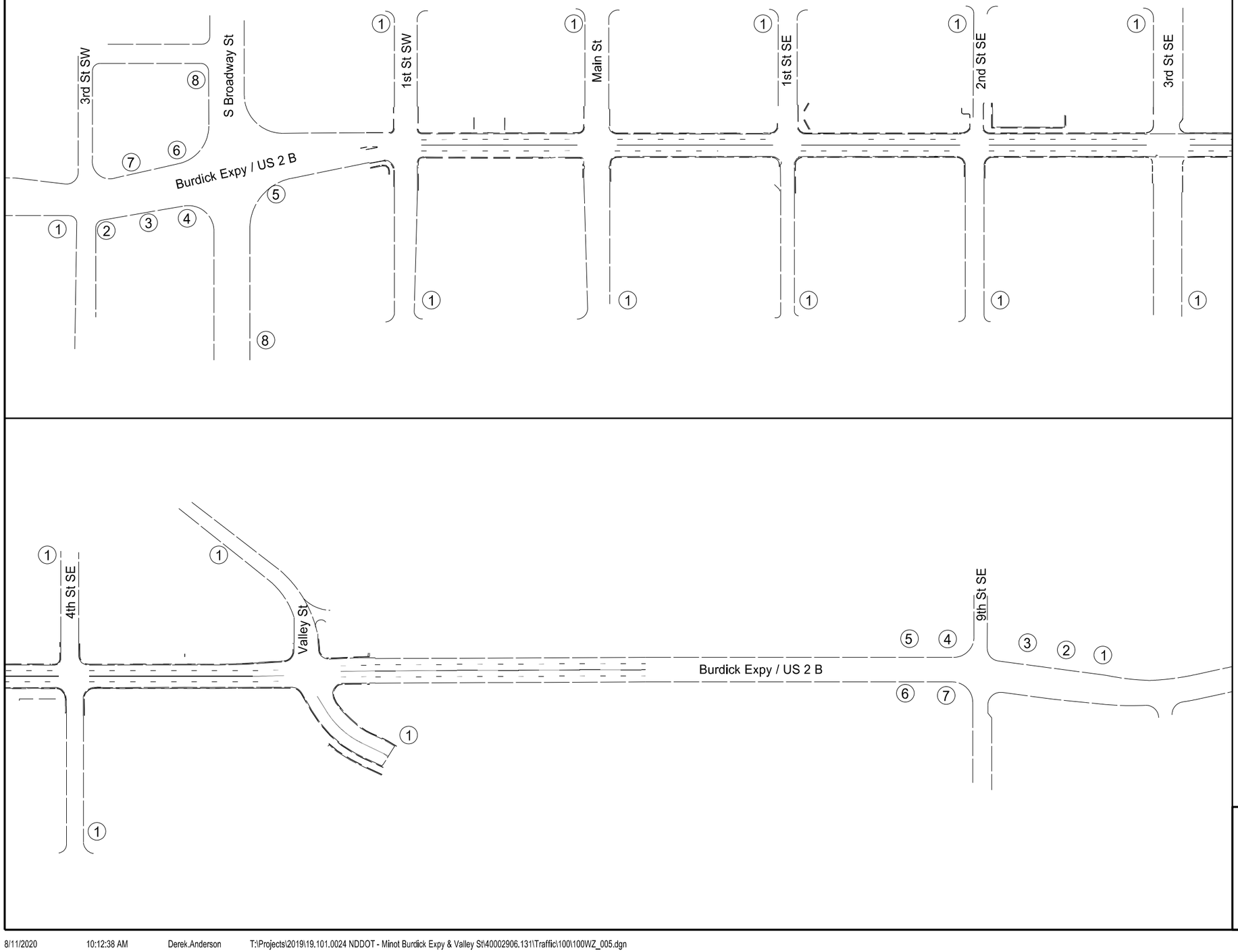
Temporary Pedestrian Access Route
Single-Direction Crossing

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	100	5



1 G20-1-60

2 W3-5-48

3 W20-5-48 (when needed)

4 R2-1-36 R2-1aP-24

5 W4-2-48 (when needed)

6 R2-1-36

7 G20-2-48

8 G20-52A-72

N

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Traffic Control Phasing

US 2 Business / Burdick Expy

Phase 3

8/11/2020 10:12:38 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Traffic\100\100WZ_005.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NHU-4-002(131)906	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
103+91 Rt	SA 2E				11.2				7.0	2.25 x 2.25 12 ga	11.6						1	4	2.5 x 2.5 12 ga	1			
103+92 Lt	SA A								7.0	2 x 2 12 ga										1	1		
107+00	SN 2		15.0																				Mount on Mast Arm
107+30	SN 1		22.0																				Mount on Mast Arm
107+50	SN 1		22.0																				Mount on Mast Arm
107+75	SN 2		15.0																				Mount on Mast Arm
110+80 Rt	R1-5	16		9.0	9.9				7.0	2.5 x 2.5 12 ga	10.5						1	4	3 x 3 7 ga				
110+87 Lt	R1-1	1			9.7				7.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga	1			
111+30 Rt	R7-1	7			8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga	1			
111+31 Rt	SA 2E				11.2				7.0	2.25 x 2.25 12 ga	11.6						1	4	2.5 x 2.5 12 ga	1			
111+33	W11-2			16.0																			Mount on Signal Standard
111+33	W16-7PL			3.8																			Mount on Signal Standard
111+34	W16-7PR			3.8																			Mount on Signal Standard
111+34	W11-2			16.0																			Mount on Signal Standard
111+35	W11-2			16.0																			Install on Mast Arm
111+35	R1-9			24.0																			Mount on Mast Arm
111+37	R1-9			15.0																			Mount on Mast Arm
111+37	W11-2			16.0																			Install on Mast Arm
111+39	W11-2			16.0																			Mount on Signal Standard
111+39	W16-7PR			3.8																			Mount on Signal Standard
111+40	W16-7PL			3.8																			Mount on Signal Standard
111+40	W11-2			16.0																			Mount on Signal Standard
111+60 Lt	R1-5	16		9.0	9.9				7.0	2.5 x 2.5 12 ga	10.5						1	4	3 x 3 7 ga				
118+20	SN 3,4		16.0	16.0																			Mount on Mast Arm
118+40	SN 7		25.0																				Mount on Mast Arm
118+70	SN 7		25.0																				Mount on Mast Arm
118+85 Rt	R7-1	7			8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga	1			
118+90	SN 3,4		16.0	16.0																			Mount on Mast Arm
118+92	R10-11a			3.0																			Mount on Signal Standard
121+96 Lt	R1-1	1			9.7				7.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga	1			
122+54 Rt	R1-1	1			9.7				7.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga	1			
126+45	SN 8		42.0																				Mount on Mast Arm
126+95	SN 6,7		25.0	15.8																			Mount on Mast Arm
127+05	SN 6,7		25.0	15.8																			Mount on Mast Arm

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Sign Summary
Perforated Tube

US 2 Business / Burdick Expy

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NHU-4-002(131)906	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
127+37 Lt	R7-1	7			8.7				7.0	2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga	1			
127+50	SN 5		42.0																				Mount on Mast Arm
Sub Total			290.0	234.8		**Total**	97.4										**Total**	40.0		9	1	0	
Grand Total			**290.0**	**234.8**		**Total**	**97.4**										**Total**	**40**	**0**	**9**	**1**	**0**	

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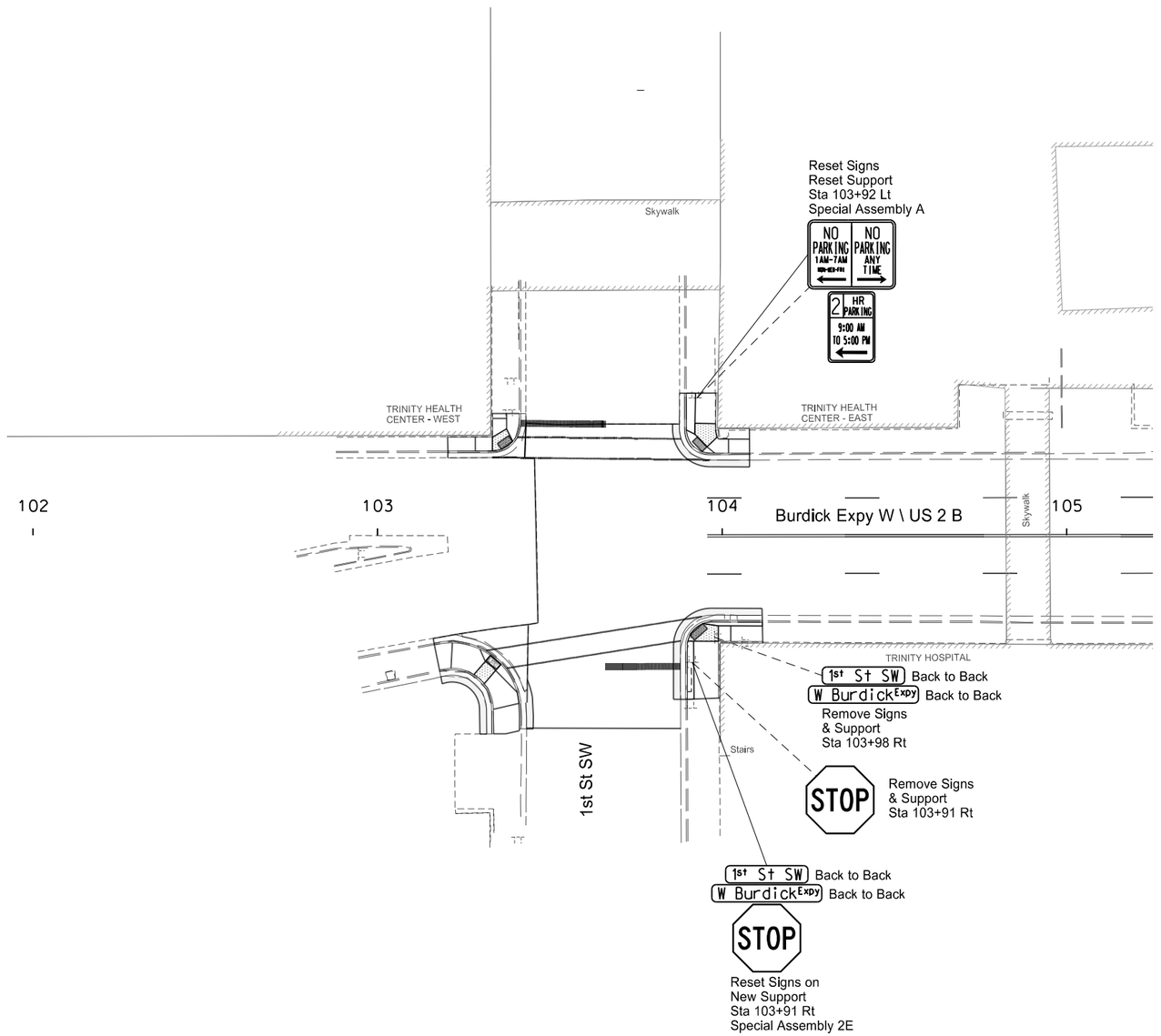
Sign Summary
Perforated Tube

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	3

NORTH DAKOTA
CITY OF MINOT
WARD COUNTY

Sec 24
T-155-N
R-83-W



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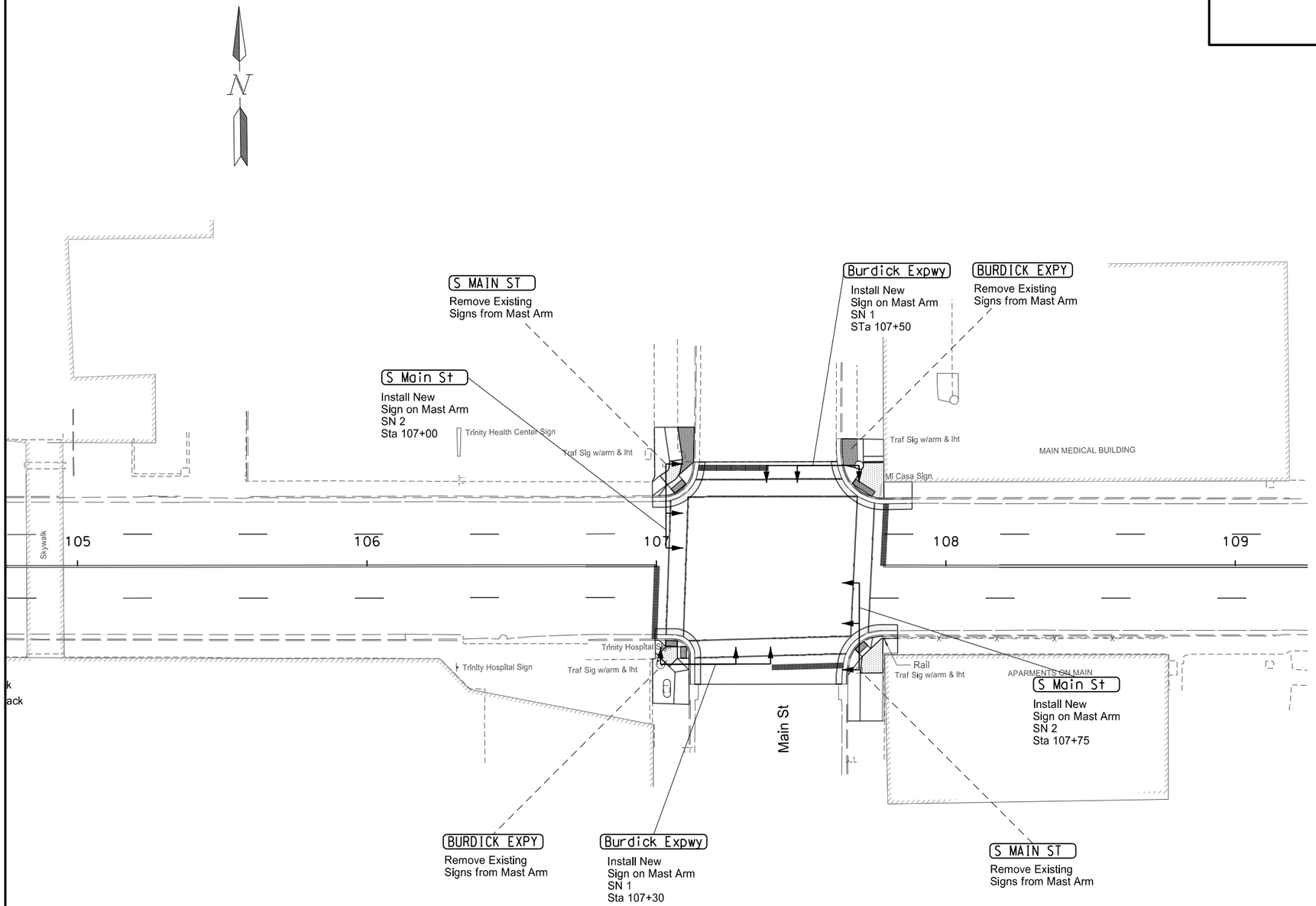
Signing

US 2 Business / Burdick Expy

Sta 101+00 to 105+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	4



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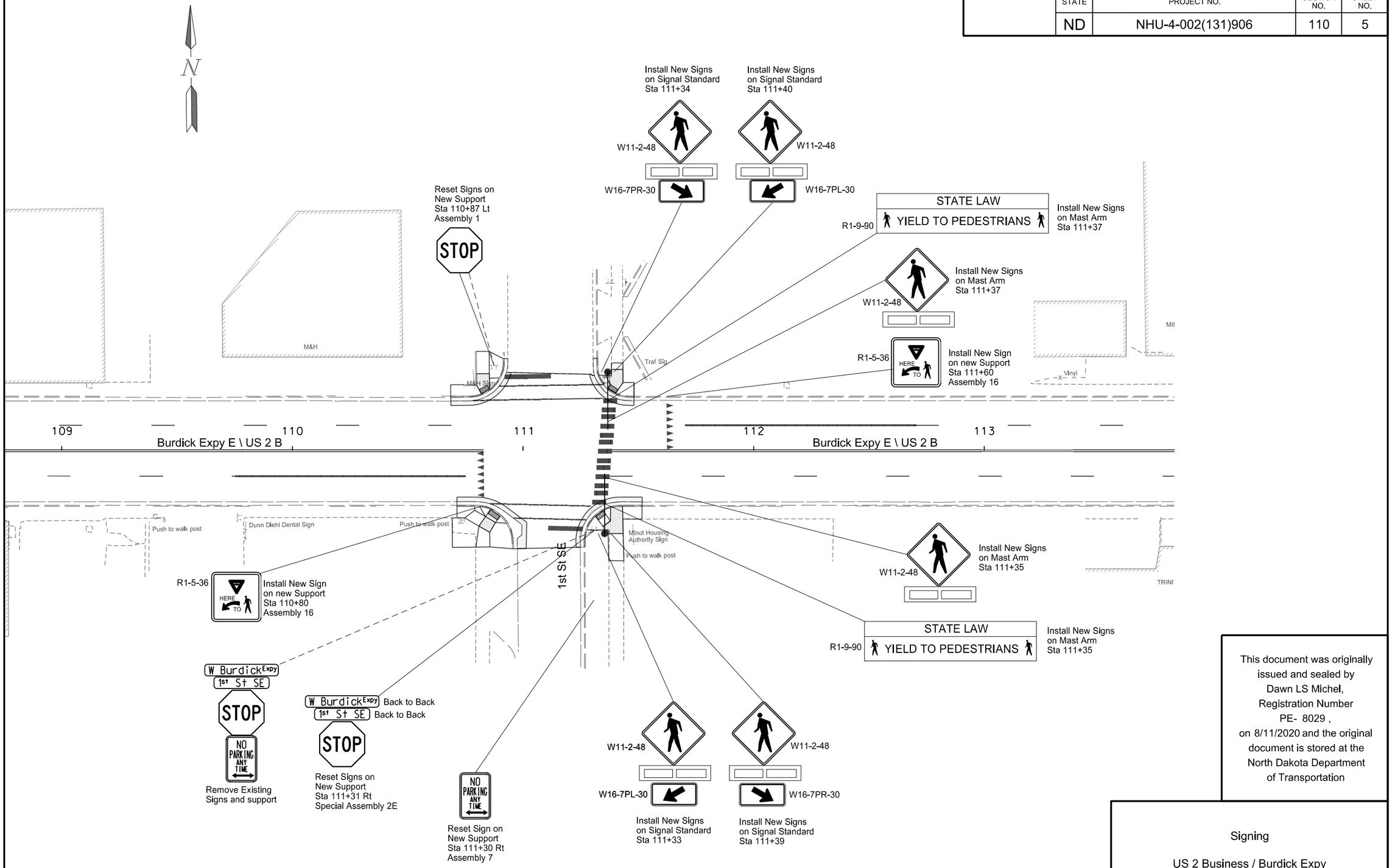
Signing

US 2 Business / Burdick Expy

Sta 105+00 to 109+00

8/11/2020 8:32:07 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Traffic\110\110SN_004_LSIGN.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	5



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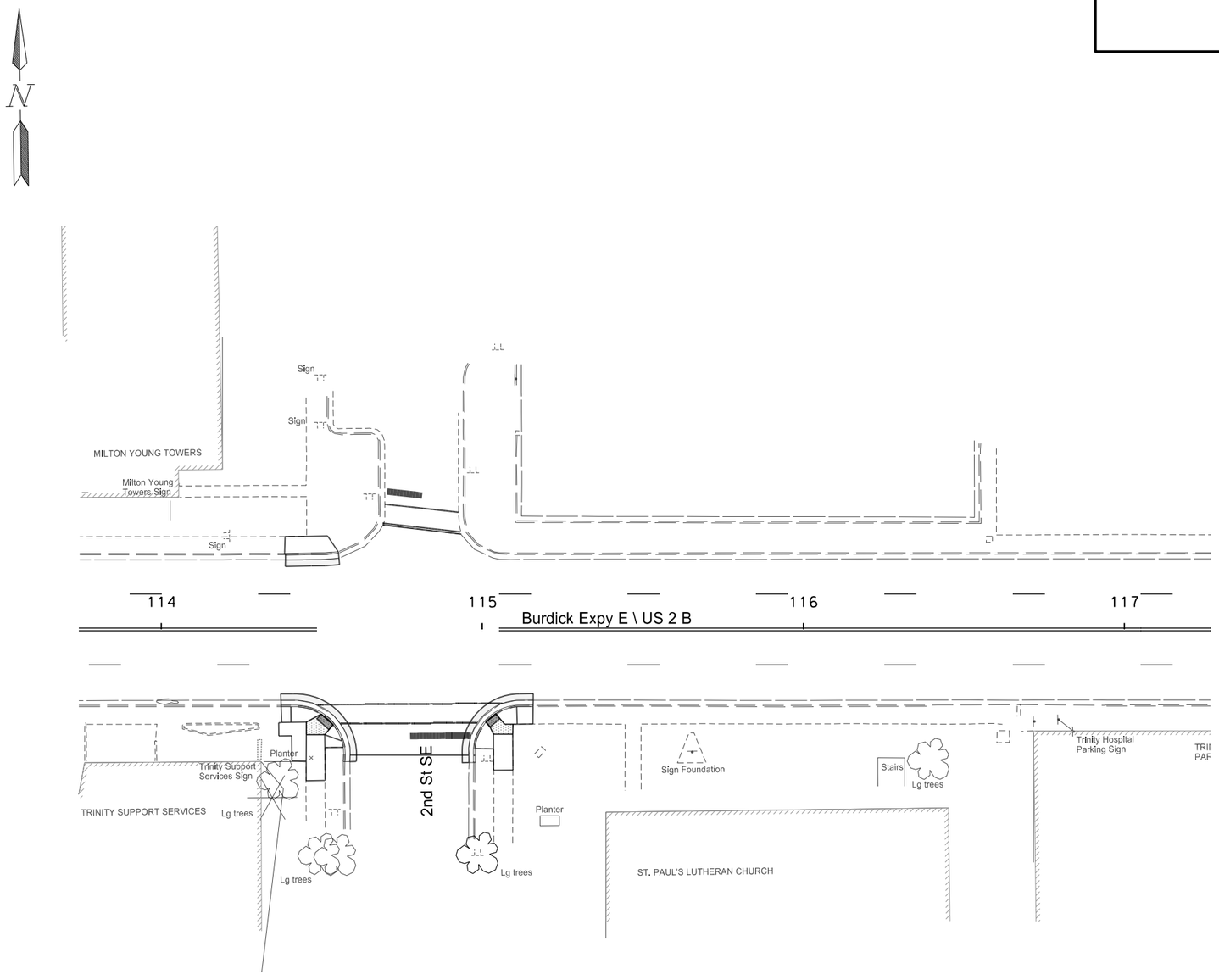
Signing

US 2 Business / Burdick Expy

Sta 109+00 to 113+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	6



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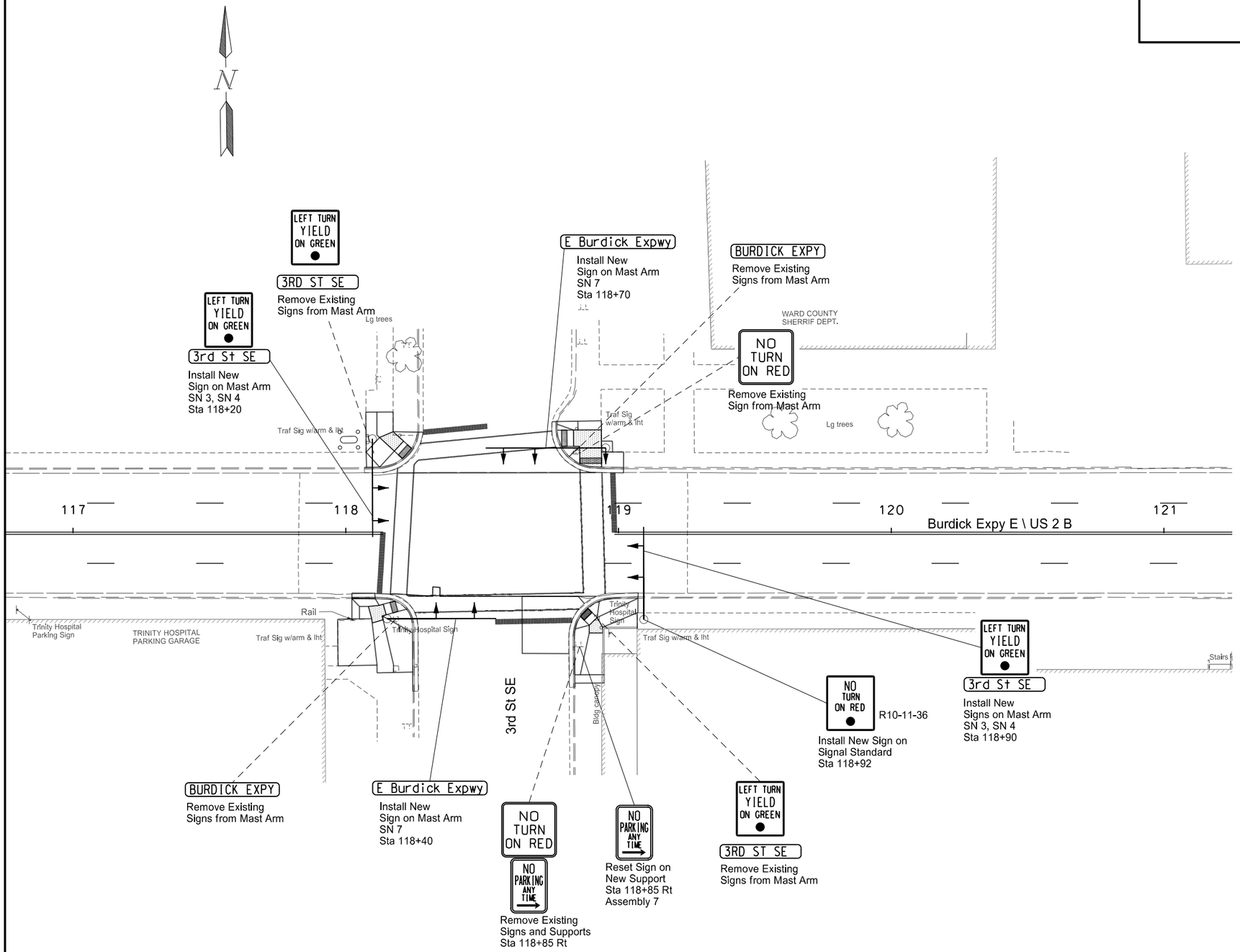
Signing

US 2 Business / Burdick Expy

Sta 113+00 to 117+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	7



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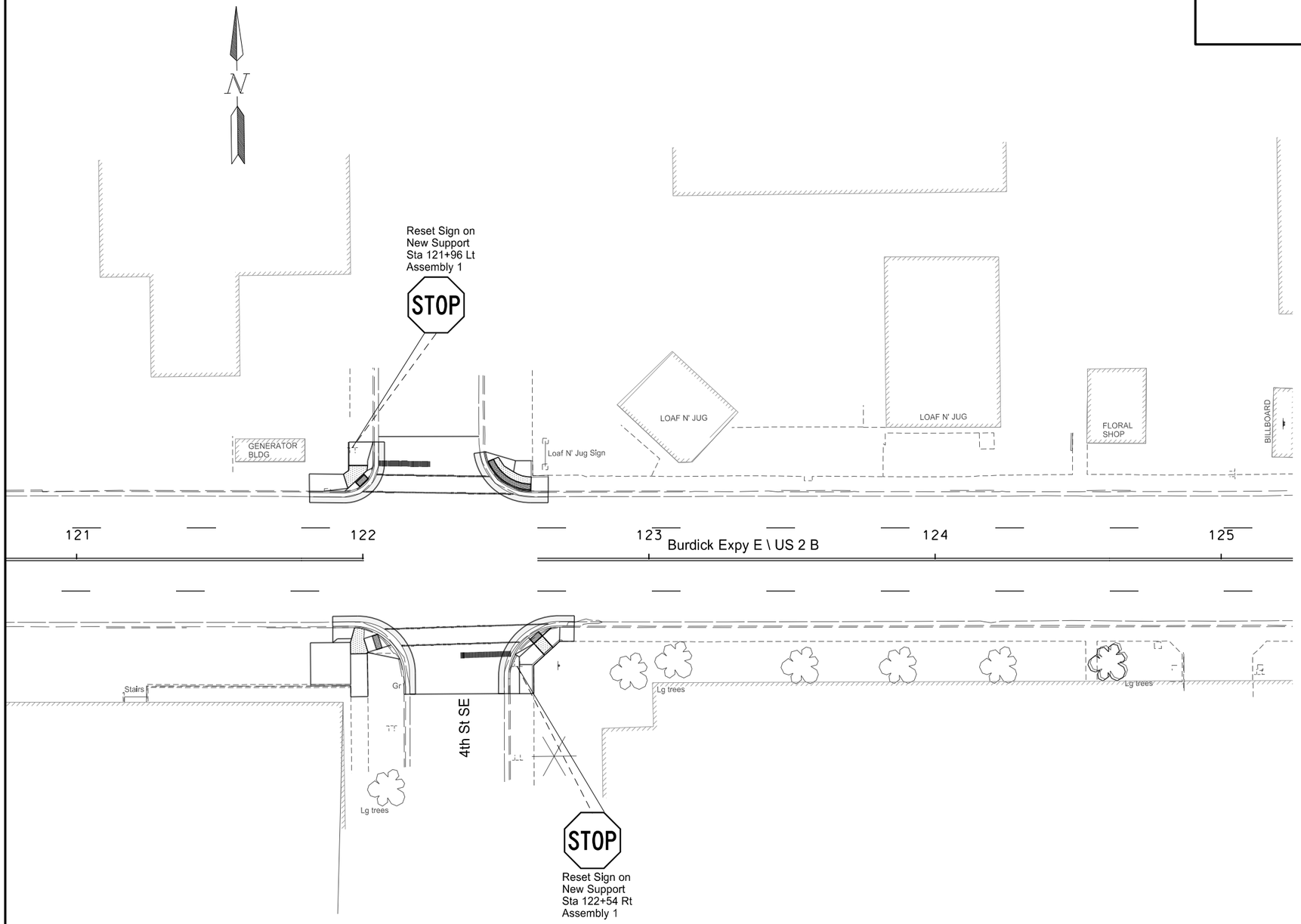
Signing

US 2 Business / Burdick Expy

Sta 117+00 to 121+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	8



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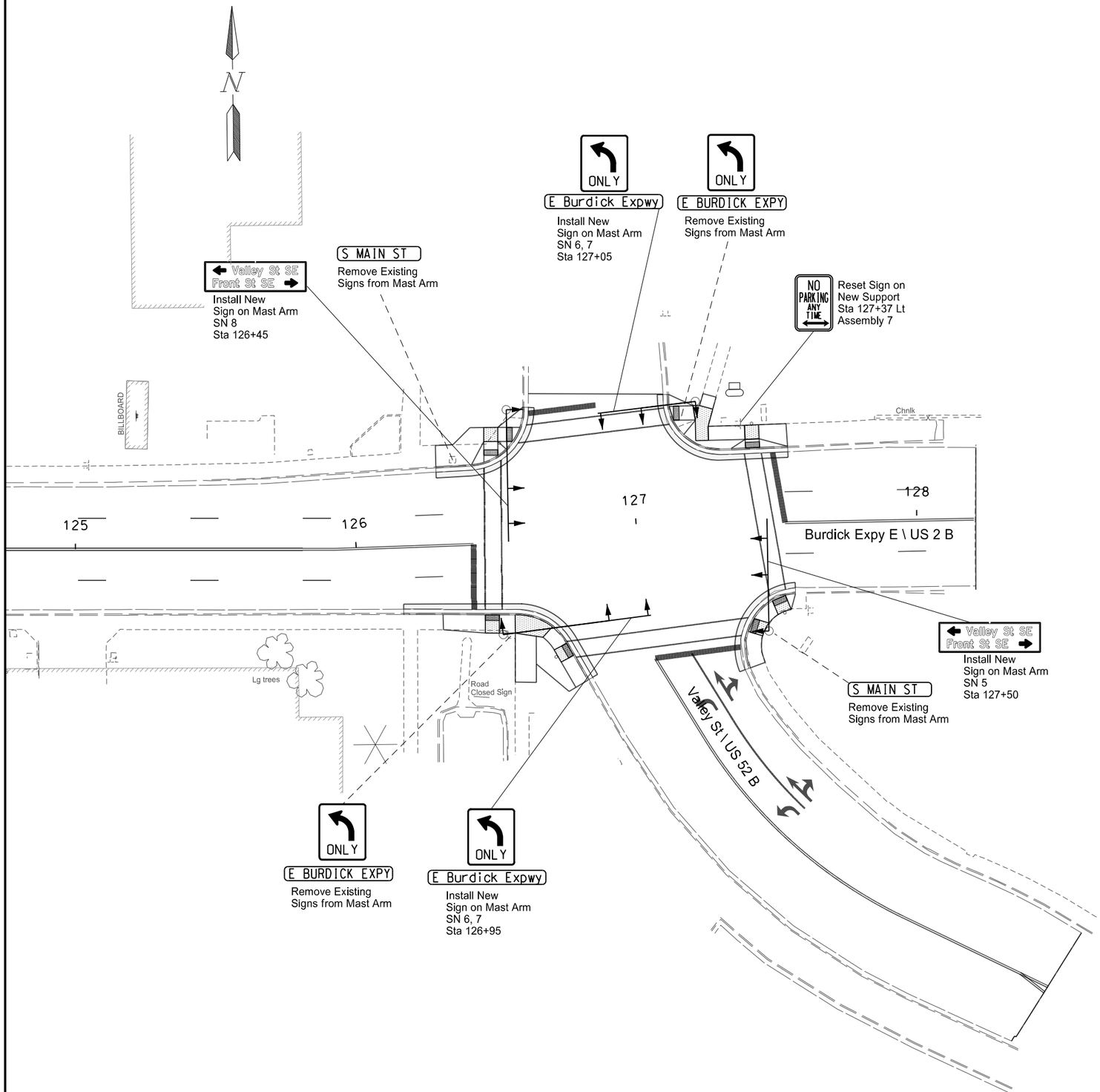
Signing

US 2 Business / Burdick Expy

Sta 121+00 to 125+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	9



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Signing

US 2 Business / Burdick Expy

Sta 125+00 to 128+21

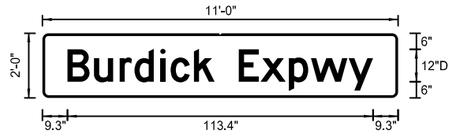
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	110	10

SIGN NUMBER	Sign 1
WIDTH X HEIGHT	11'-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):
107+30
107+50

AREA: 22.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.sst

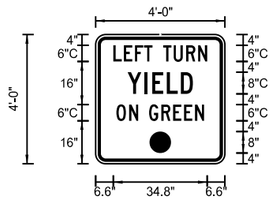
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
B	u	r	d	i	c	k		E	x	p	w	y							113.4	12/9	D 2000
9.3	19.1	28.6	34.1	43.7	47.6	56.2	63.9	72.9	80.9	91.5	99.7	113.7									

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

SYMBOL	X	Y	WID	HT	ANGLE
ND_BALL_GREEN	20	4	8	8	0

STATION(S):
118+20
118+90

AREA: 16.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_48_Large.ssl

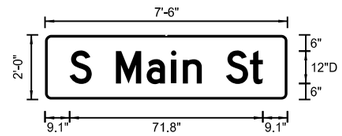
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	E	F	T	T	U	R	N												34.8	6	C 2000
6.6	10.5	14.6	18	25.1	29	33.7	38														
Y	I	E	L	D															24.2	8	C 2000
11.9	18.1	21	26.4	31.6																	
O	N	G	R	E	E	N													32.6	6	C 2000
7.7	12.5	19.8	24.4	28.8	32.8	36.9															

SIGN NUMBER	Sign 2
WIDTH X HEIGHT	7'-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):
107+00
107+75

AREA: 15.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.ssl

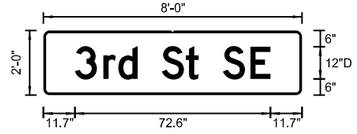
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
S		M	a	i	n		S	t											71.8	12/9	D 2000
9.1	17.3	26.3	37.7	46.8	51.1	58.2	67.2	76.1													

SIGN NUMBER	Sign 4
WIDTH X HEIGHT	8'-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):
118+20
118+90

AREA: 16.0 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
3	r	d		S	t		S	E											72.6	12/9	D 2000
11.7	22.3	27.8	35	44	52.9	57.7	66.7	76.9													

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US 2 Business / Burdick Expy

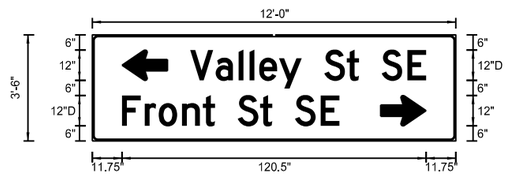
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	11

SIGN NUMBER	Sign 5
WIDTH X HEIGHT	12'-0" x 3'-6"
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
ND_12IN_TYPE D	11.8	24	12	18	90
ND_12IN_TYPE D	114.2	6	12	18	270

STATION(S):
127+50

AREA: 42.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Expwy_Street Name_Overhead.ssl

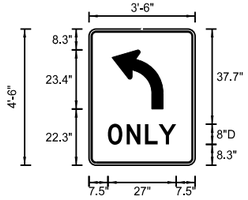
LETTER POSITION (X)																				LENGTH	SIZE	SERIES
V	a	l	l	e	y		S	t		S	E									93.5	12/9	D 2000
38.8	48.8	58	62.3	66.1	73.9	82.9	91.9	100.8	105.6	114.6	124.8											
F	r	o	n	t		S	t		S	E										86.2	12/9	D 2000
11.8	20.8	26.3	35.5	43.8	48.6	57.6	66.5	71.3	80.3	90.5												

SIGN NUMBER	Sign 6
WIDTH X HEIGHT	3'-6" x 4'-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_4.5IN_LT	9.1	22.3	20.2	23.4	0

STATION(S):
126+95
127+05

AREA: 15.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_36_Med.ssl

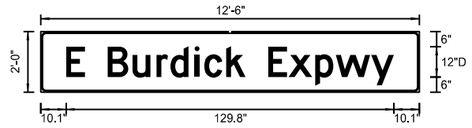
LETTER POSITION (X)																				LENGTH	SIZE	SERIES
O	N	L	Y																	27	8	D 2000
7.5	14.9	22.2	27.6																			

SIGN NUMBER	Sign 7
WIDTH X HEIGHT	12'-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):
118+40
118+70
126+95
127+05

AREA: 25.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Street Name_Overhead.ssl

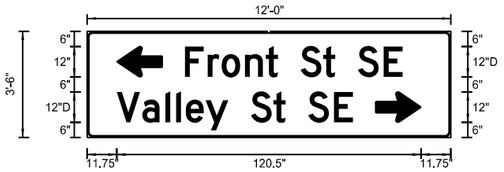
LETTER POSITION (X)																				LENGTH	SIZE	SERIES
E		B	u	r	d	i	c	k		E	x	p	w	y						129.8	12/9	D 2000
10.1	17.5	26.5	36.4	45.8	51.4	61	64.8	73.4	81.1	90.1	98.2	108.7	116.9	130.9								

SIGN NUMBER	Sign 8
WIDTH X HEIGHT	12'-0" x 3'-6"
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
ND_12IN_TYPE D	11.8	24	12	18	90
ND_12IN_TYPE D	114.2	6	12	18	270

STATION(S):
126+45

AREA: 42.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Expwy_Street Name_Overhead.ssl

LETTER POSITION (X)																				LENGTH	SIZE	SERIES
F	r	o	n	t		S	t		S	E										86.2	12/9	D 2000
38.8	47.8	53.3	62.5	70.8	75.6	84.6	93.5	98.3	107.3	117.5												
V	a	l	l	e	y		S	t		S	E									93.5	12/9	D 2000
11.8	21.8	31	35.3	39.1	46.9	55.9	64.9	73.8	78.6	87.6	97.8											

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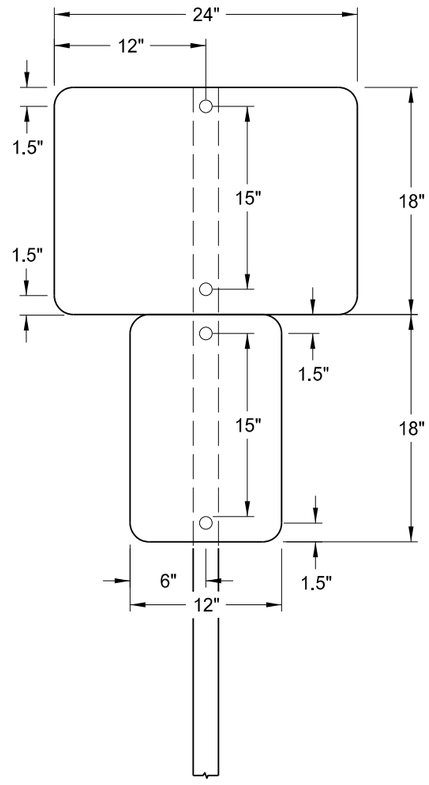
US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	110	12



Special Assembly A

Area = 4.5 SF

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Special Assembly Signing

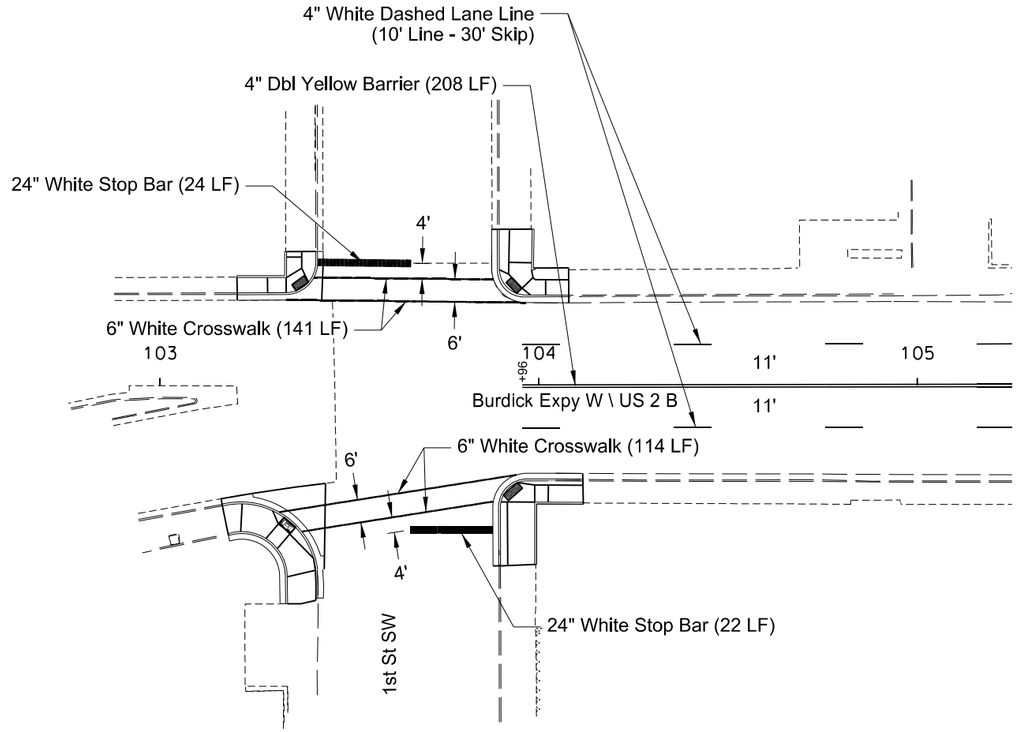
US 2 Business / Burdick Expy

NORTH DAKOTA
CITY OF MINOT
WARD COUNTY

Sec 24
T-155-N
R-83-W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	1

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	1st St SW & Burdick Expressway	260	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	1st St SW & Burdick Expressway	255	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	1st St SW & Burdick Expressway	46	LF



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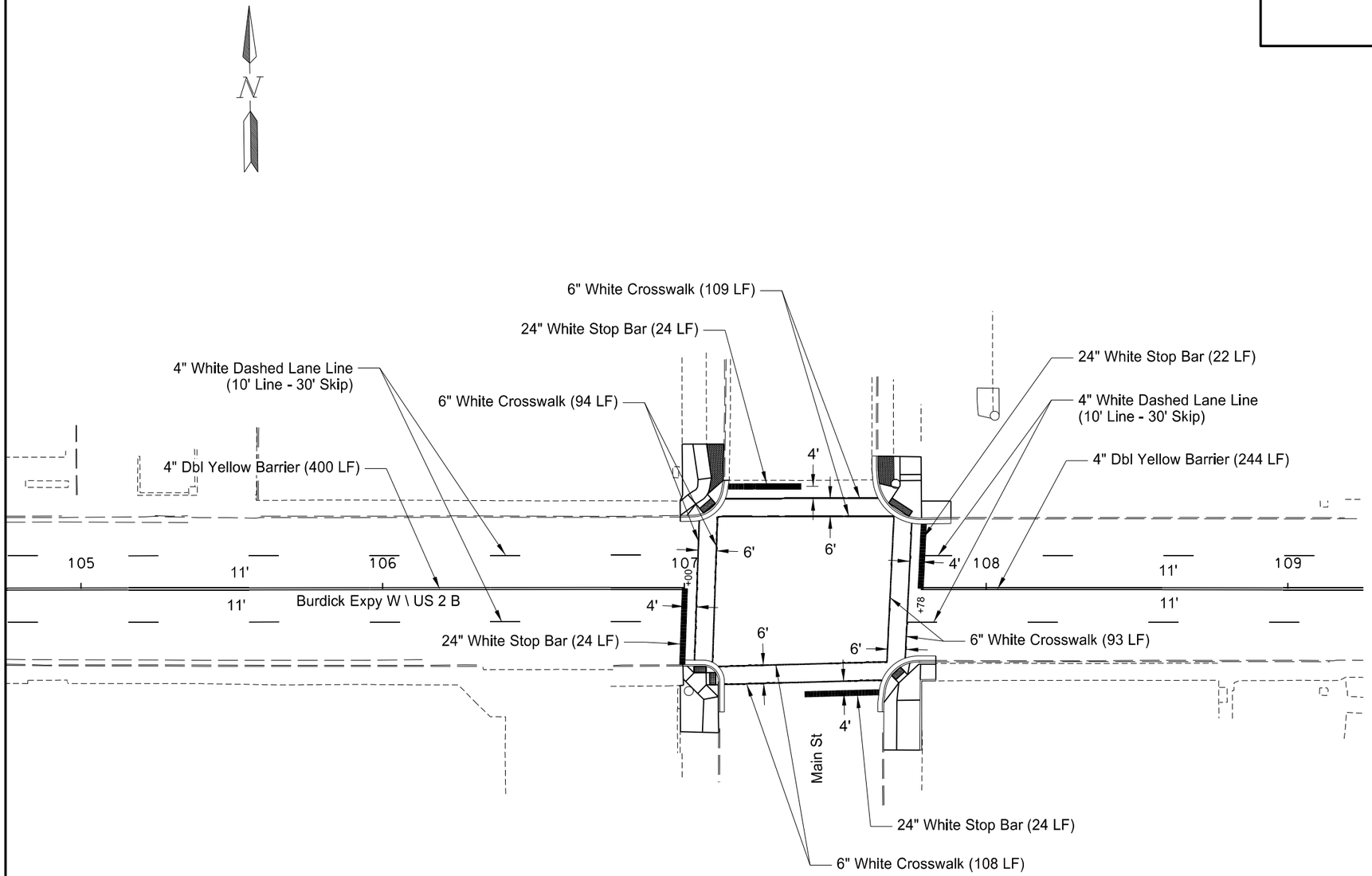
Pavement Marking

US 2 Business / Burdick Expy

Sta 101+00 to 105+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	2

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	Main St & Burdick Expressway	805	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	Main St & Burdick Expressway	404	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	Main St & Burdick Expressway	94	LF



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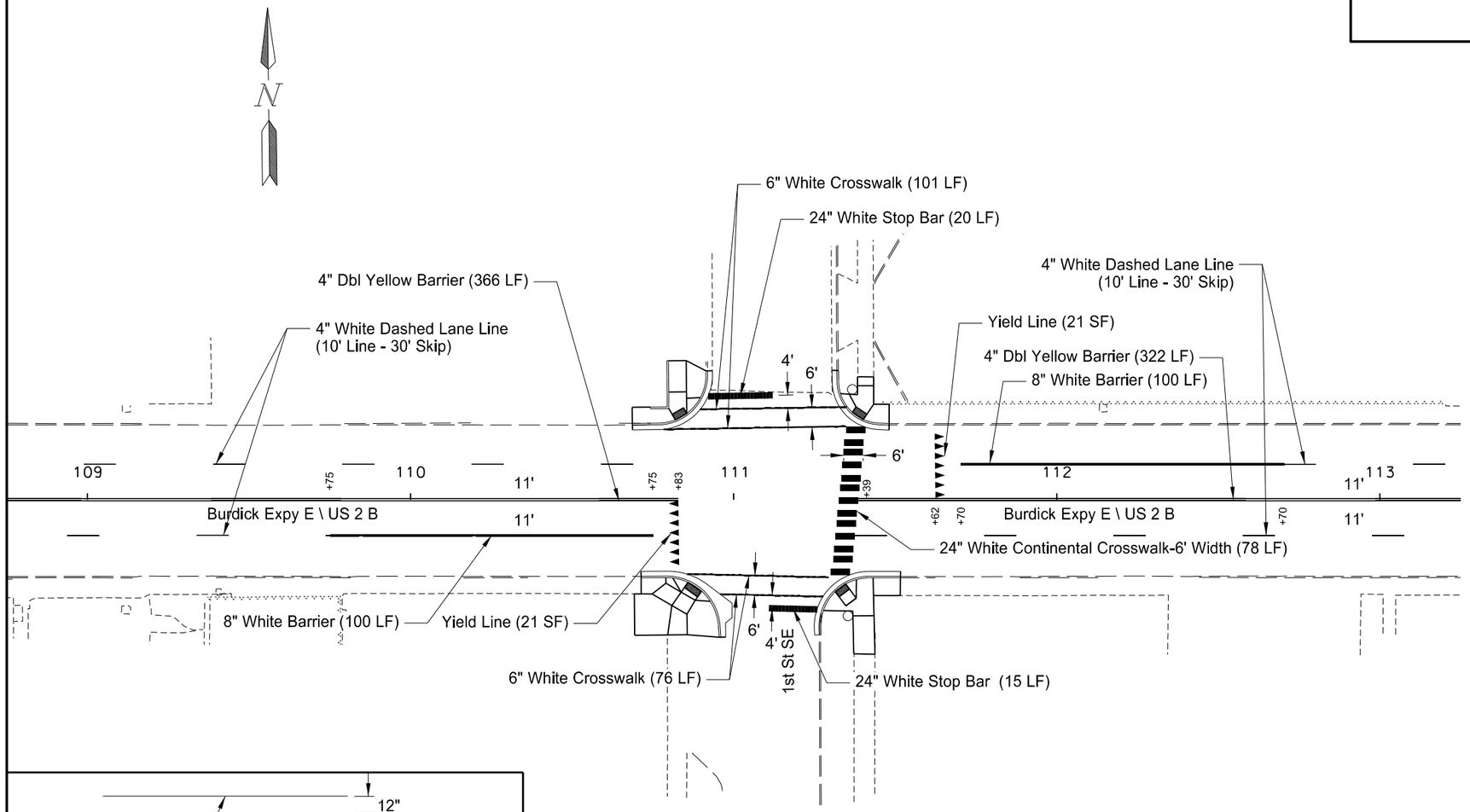
Pavement Marking

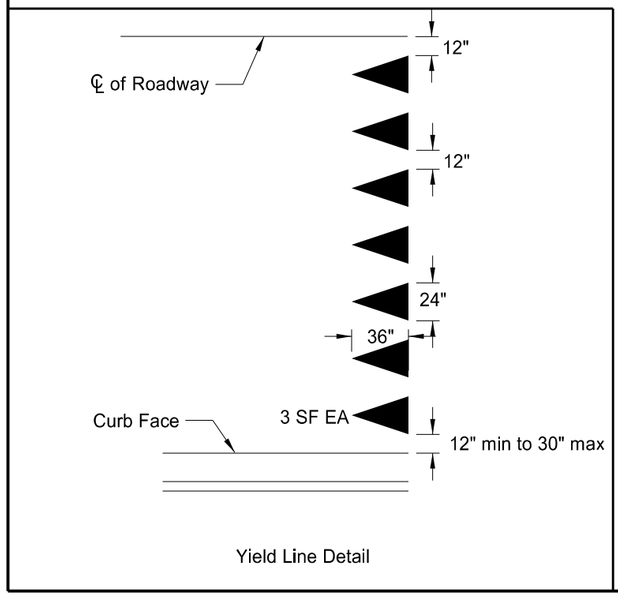
US 2 Business / Burdick Expy

Sta 105+00 to 109+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	3

SPEC CODE	BID ITEM	QTY	UNIT
762 0112	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)		
	Yield Line	42	SF
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	1st St SE & Burdick Expressway	803	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	1st St SE & Burdick Expressway	177	LF
762 1309	PREFORMED PATTERNED PVMT MK 8IN LINE - GROOVED		
	1st St SE & Burdick Expressway	200	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	1st St SE & Burdick Expressway	35	LF
	Continental Crosswalk	78	LF





Yield Line Detail

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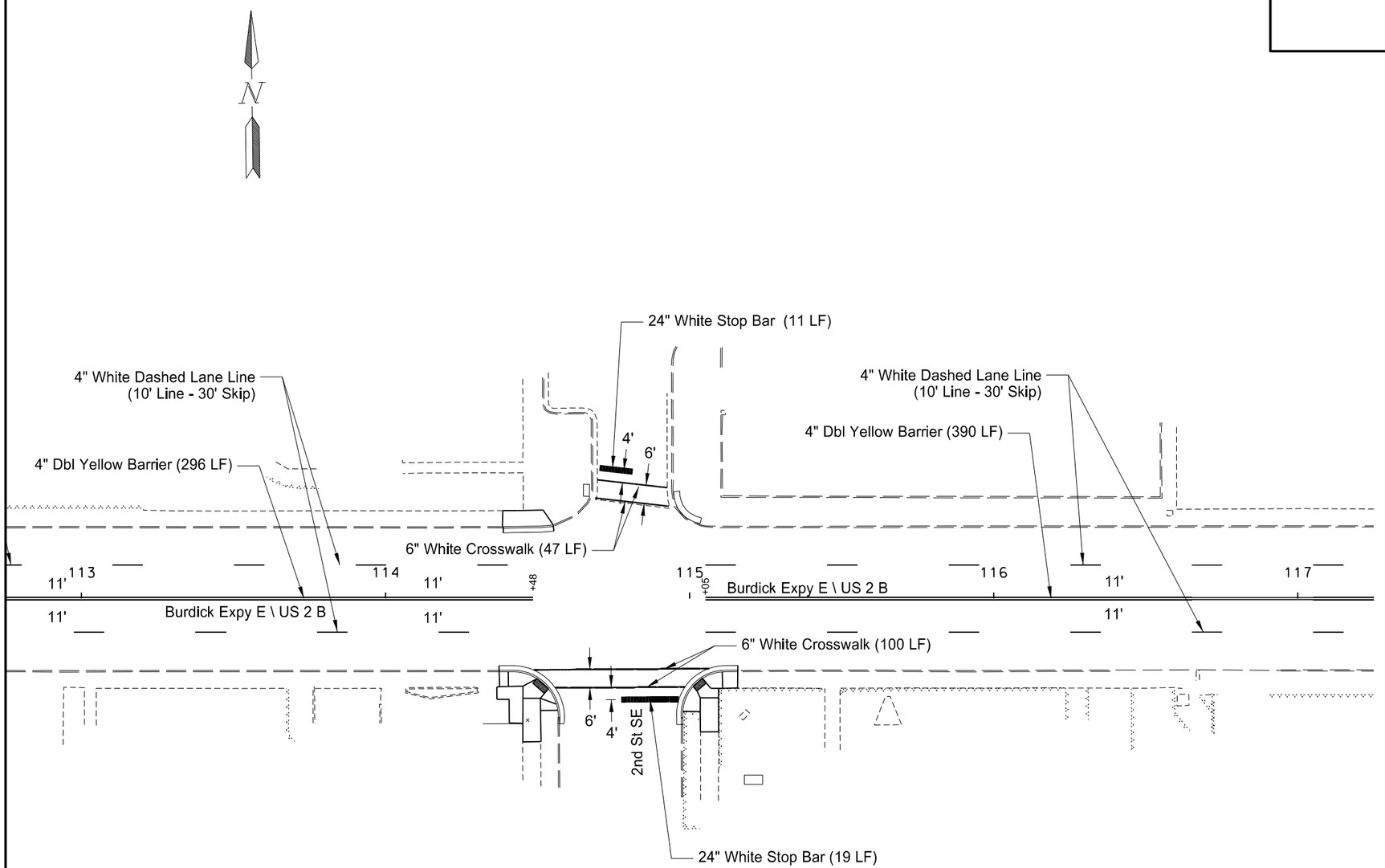
US 2 Business / Burdick Expy

Sta 109+00 to 113+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	4

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	2nd St SE & Burdick Expressway	858	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	2nd St SE & Burdick Expressway	147	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	2nd St SE & Burdick Expressway	30	LF



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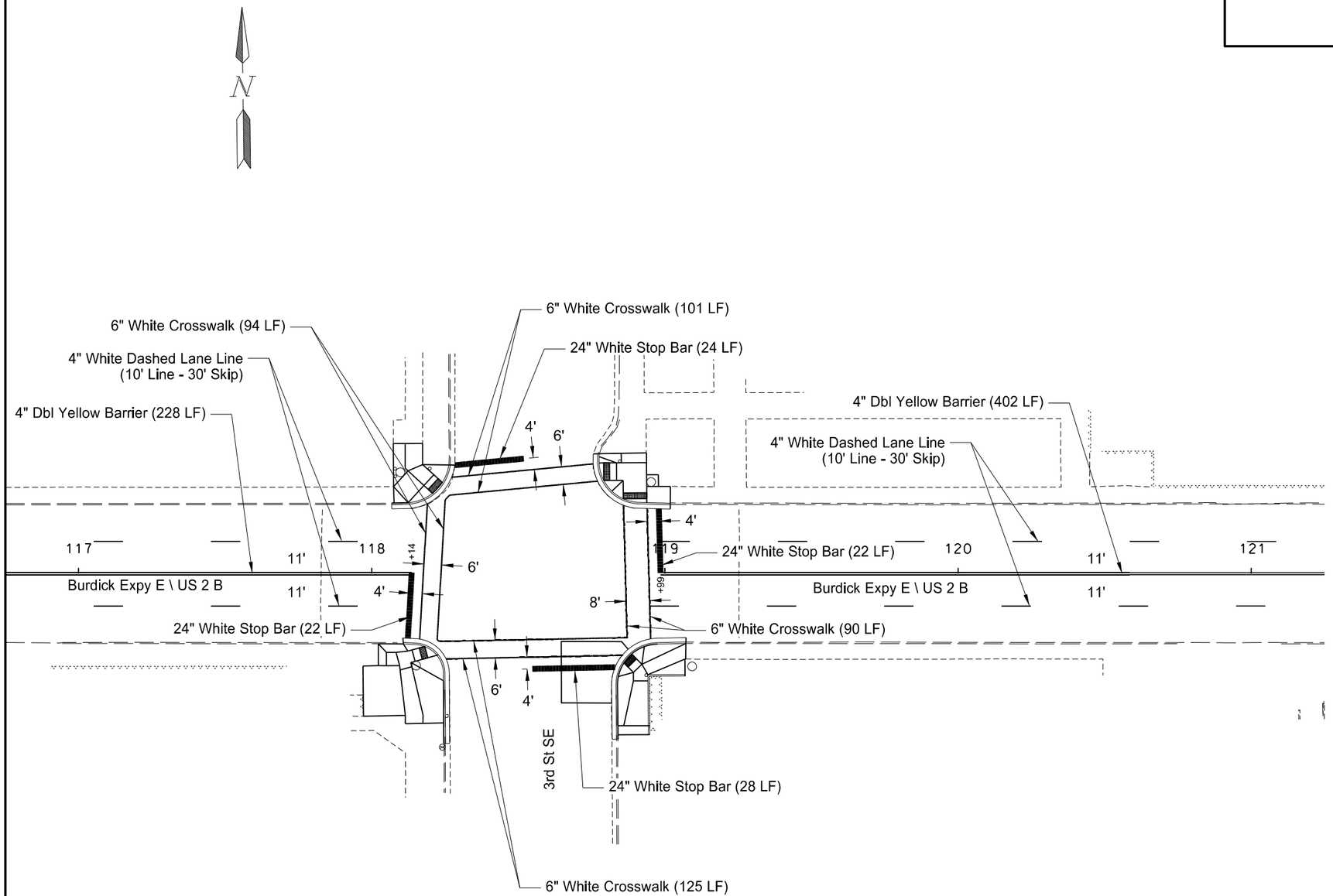
Pavement Marking

US 2 Business / Burdick Expy

Sta 113+00 to 117+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	5

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	3rd St SE & Burdick Expressway	788	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	3rd St SE & Burdick Expressway	410	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	3rd St SE & Burdick Expressway	96	LF



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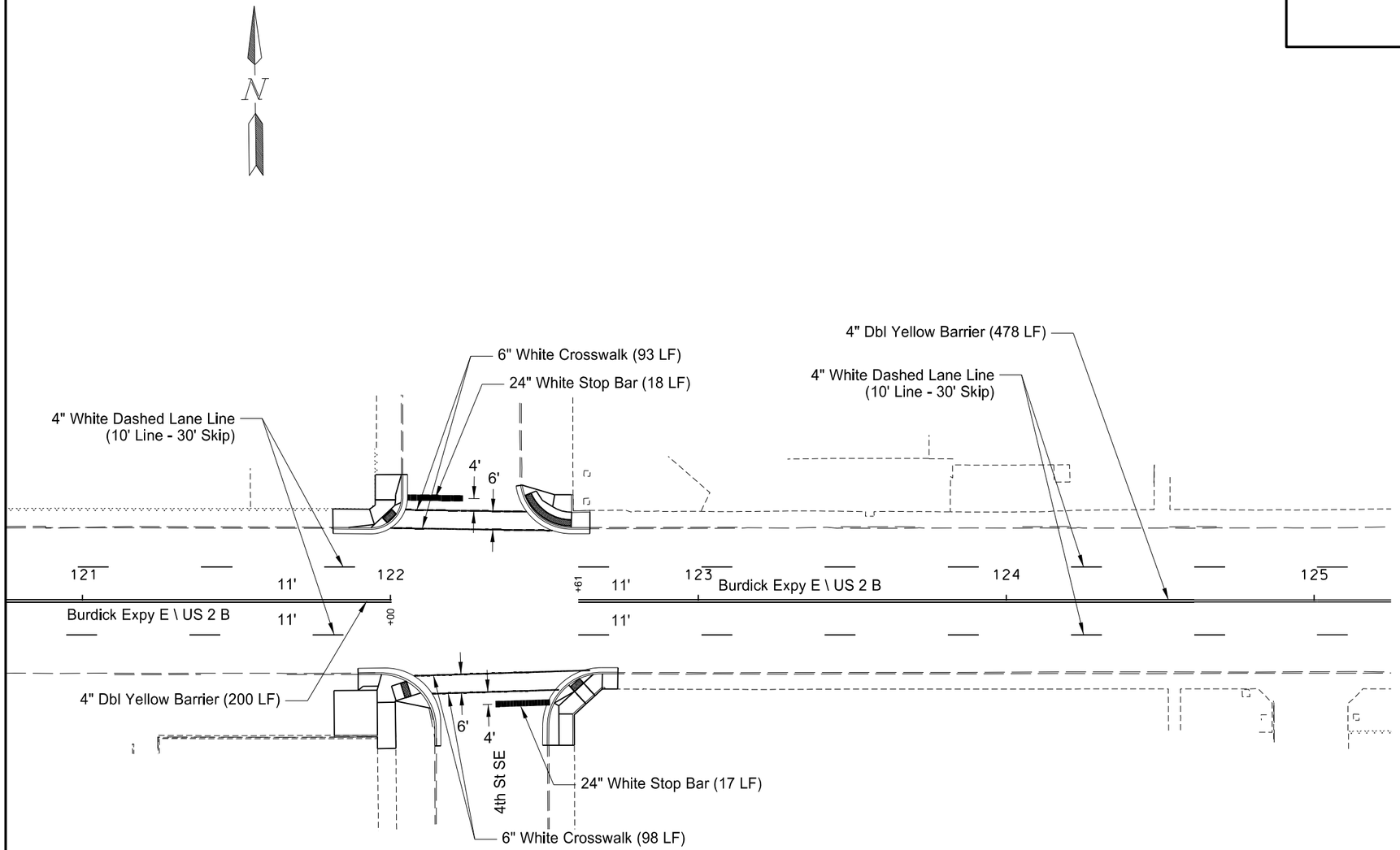
Pavement Marking

US 2 Business / Burdick Expy

Sta 117+00 to 121+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	6

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	4th St SE & Burdick Expressway	848	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	4th St SE & Burdick Expressway	191	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	4th St SE & Burdick Expressway	35	LF



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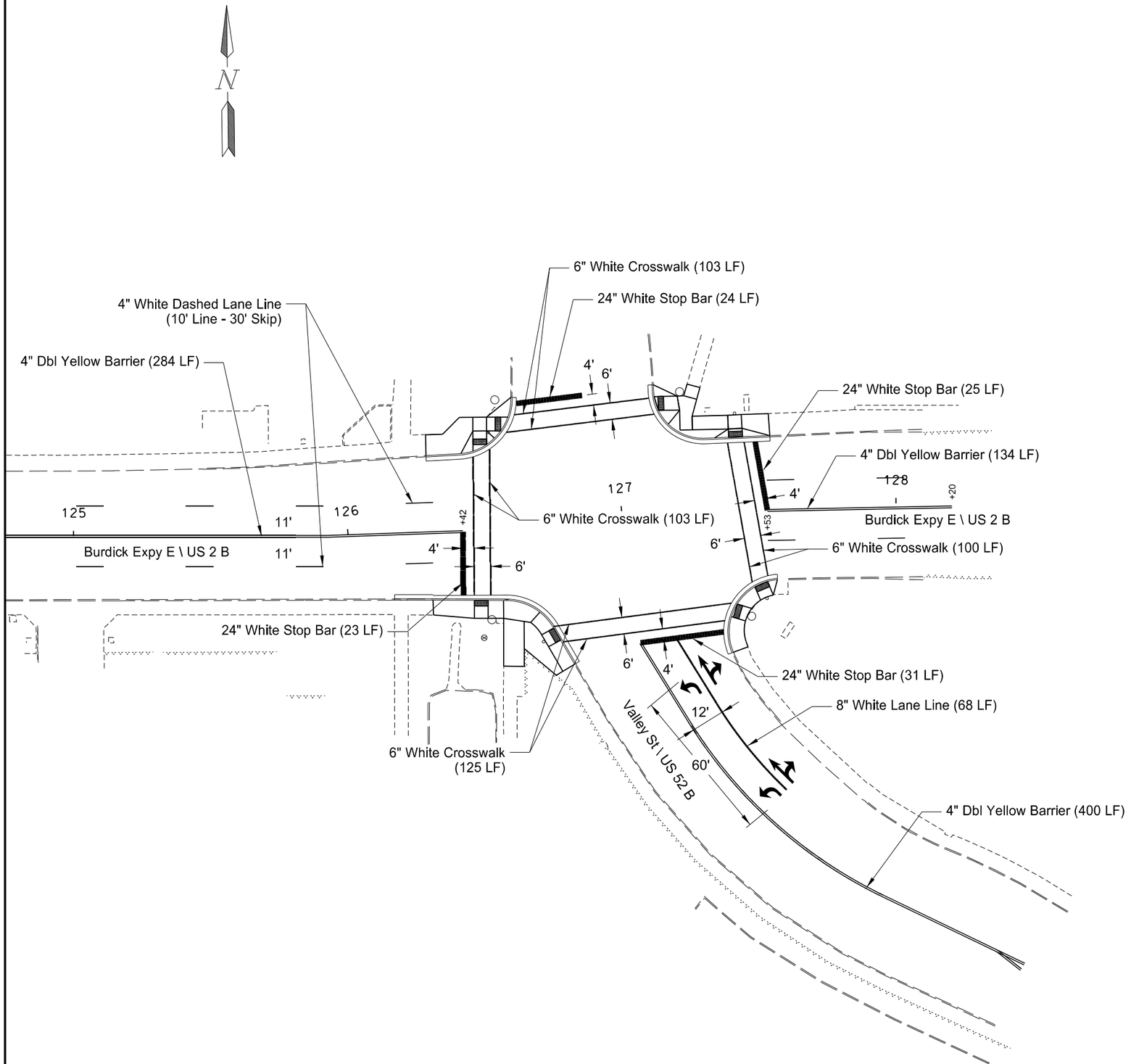
Pavement Marking

US 2 Business / Burdick Expy

Sta 121+00 to 125+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	120	7

SPEC CODE	BID ITEM	QTY	UNIT
762 0110	EPOXY PVMT MK 4IN LINE-GROOVED		
	Valley St \ US 52 B & Burdick Expressway	923	LF
762 0112	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)		
	Valley St \ US 52 B & Burdick Expressway	86	LF
762 1307	PREFORMED PATTERNED PVMT MK 6IN LINE - GROOVED		
	Valley St \ US 52 B & Burdick Expressway	431	LF
762 1309	PREFORMED PATTERNED PVMT MK 8IN LINE - GROOVED		
	Valley St \ US 52 B & Burdick Expressway	68	LF
762 1325	PREFORMED PATTERNED PVMT MK 24IN LINE - GROOVED		
	Valley St \ US 52 B & Burdick Expressway	103	LF



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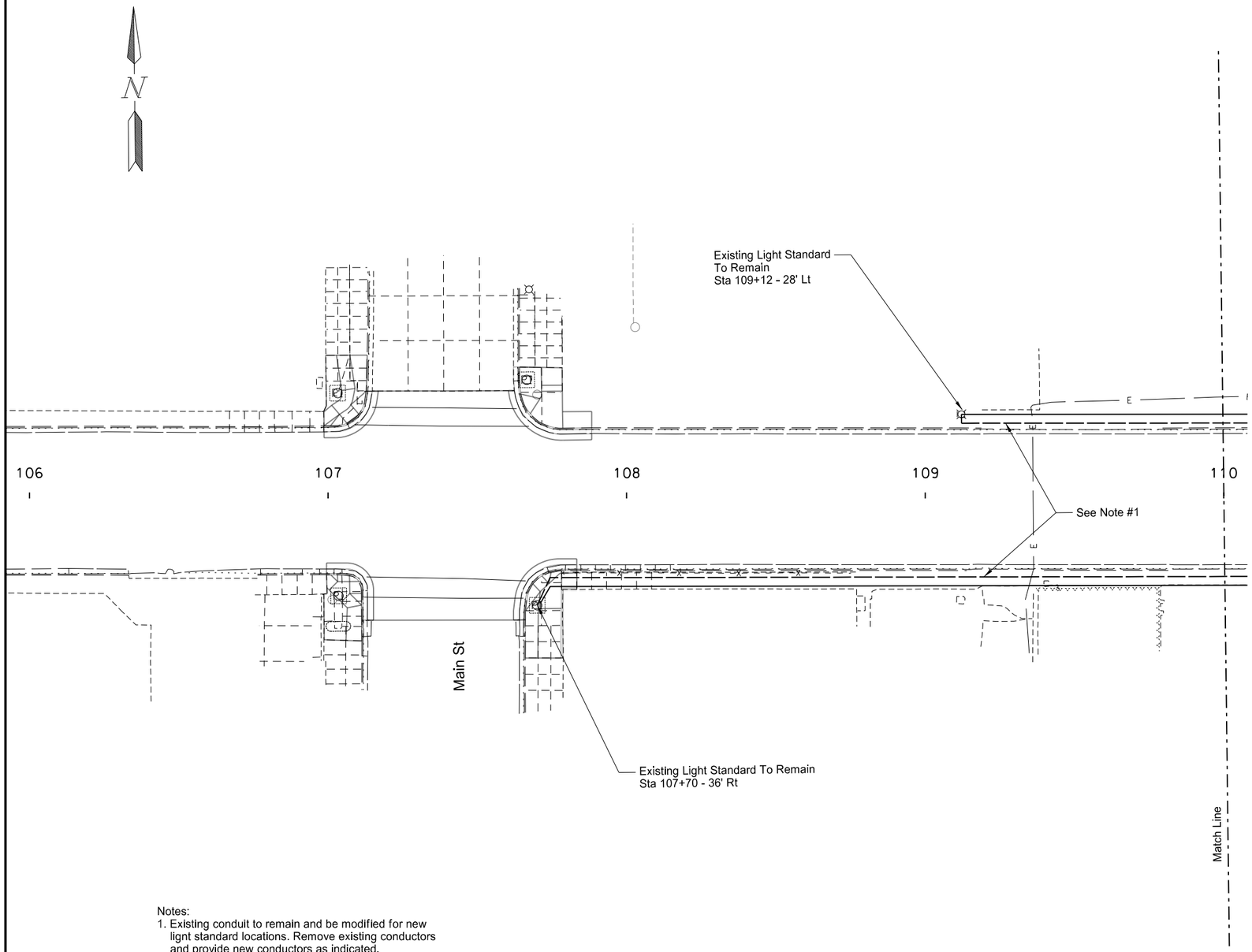
Pavement Marking

US 2 Business / Burdick Expy

Sta 125+50 to 128+20

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	140	1



Notes:
1. Existing conduit to remain and be modified for new lignt standard locations. Remove existing conductors and provide new conductors as indicated.

Legend

Existing 2" Diameter Rigid Conduit

3 - #4 RHW & 1 - #6 THW

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Lighting System A

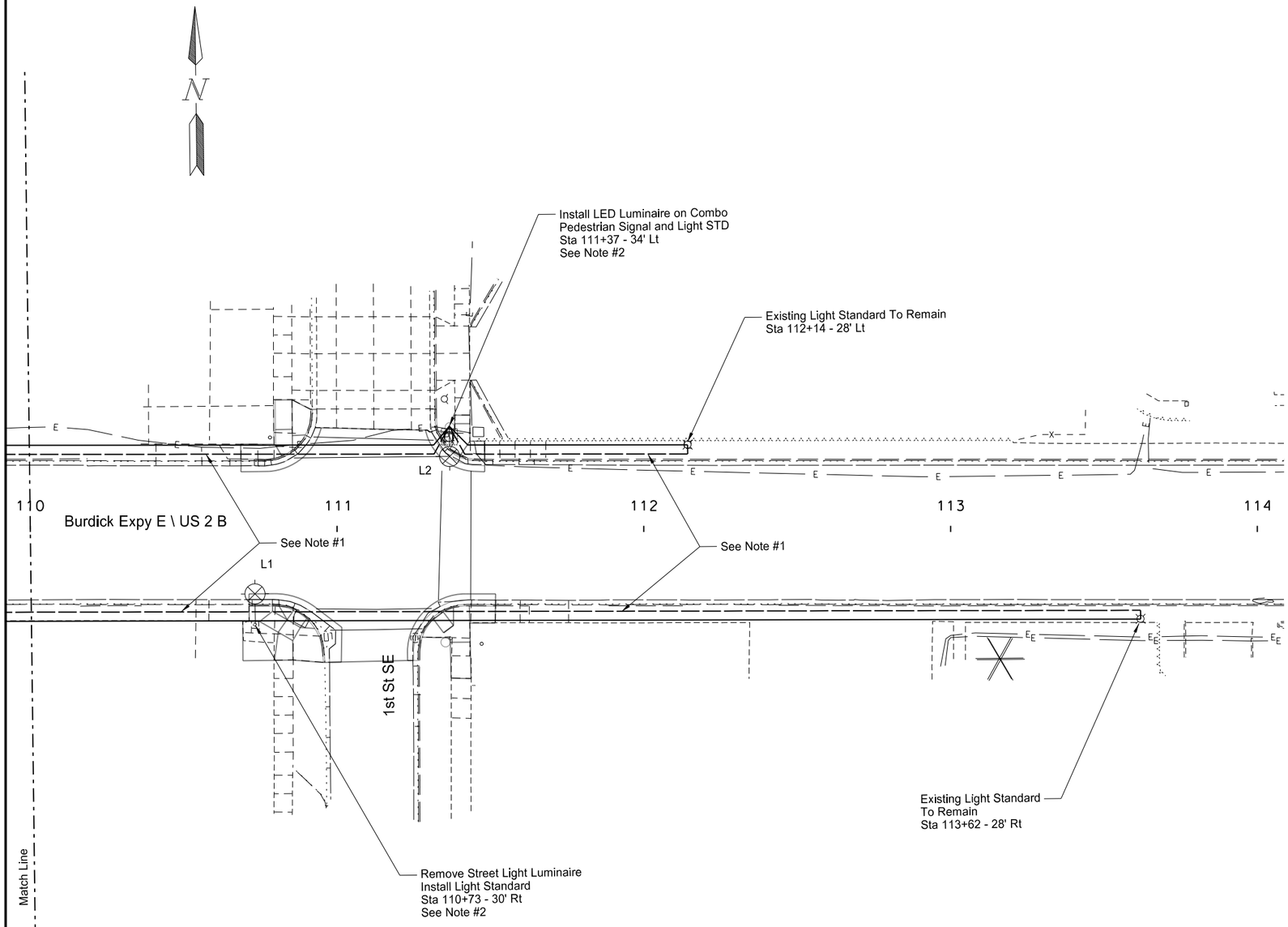
Lighting Layout

US 2 Business / Burdick Expy

Sta 106+00 to 110+00

8/11/2020 8:29:18 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Traffic\140\140LT_001.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	140	2



Notes:
1. Existing conduit to remain and be modified for new light standard locations. Remove existing conductors and provide new conductors as indicated.
2. Modify/extend existing 2" conduits to new light standard location. Provide new conductors as indicated.

Legend

Existing 2" Diameter Rigid Conduit

3 - #4 RHW & 1 - #6 THW

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Lighting System A

Lighting Layout

US 2 Business / Burdick Expy

Sta 110+00 to 114+00

8/11/2020 8:29:20 AM Derek.Anderson T:\Projects\2019\19.101.0024 NDDOT - Minot Burdick Expy & Valley St\40002906.131\Traffic\140\140LT_002.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	140	3

Lighting Quantities(A)								
Description	Concrete Foundation - Highway Lighting	2" Diameter Rigid Conduit	Underground Conductor No. 4 - Type RHW	Underground Conductor No. 6 - Type THW	Lt Std 6 ft MA 40 ft MT HT Festoon Breakaway	LED Luminaire	Remove Street Lighting Luminaire	Revise Lighting System
Unit	EA	LF	LF	LF	LF	EA	EA	EA
Quantity	1	12	2808	936	1	2	1	1

(A) Do not bid items separately, but include all items in the bid item "Revise Lighting System"

Light Standard Foundation Table		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
40' Pole	6'-0"	5'-0"

Light Standards							
No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	Sta 110+73 - 30' Rt	23,037 lumen, 3000K LED	A-1	II	40'	6'	New Light Standard, Foundation, and LED Luminaire
L2	Sta 111+37 - 34' Lt	23037 lumen, 3000K LED	A-3	II	40'	6'	Install on Combination Pedestrian Signal & Light Standard

Conduit / Conductor Run Tabulation								
Segment		Conduit Runs		Cable Trench	Cable Runs			
Station	Station	Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
Sta 107+70 - 36' Rt	Sta 110+00 - 30' Rt	--	2"	--	708	(3) #4 RHW	236	(1) #6 THW
Sta 110+00 - 30' Rt	Sta 110+73 - 30' Rt	--	2"	--	231	(3) #4 RHW	77	(1) #6 THW
Sta 110+73 - 30' Rt	Sta 113+62 - 28' Rt	--	2"	--	891	(3) #4 RHW	297	(1) #6 THW
Sta 109+12 - 28' Lt	Sta 110+00 - 28' Lt	--	2"	--	264	(3) #4 RHW	88	(1) #6 THW
Sta 110+00 - 28' Lt	Sta 111+37 - 34' Lt	6	2"	--	441	(3) #4 RHW	147	(1) #6 THW
Sta 111+37 - 34' Lt	Sta 112+14 - 28' Lt	6	2"	--	273	(3) #4 RHW	91	(1) #6 THW

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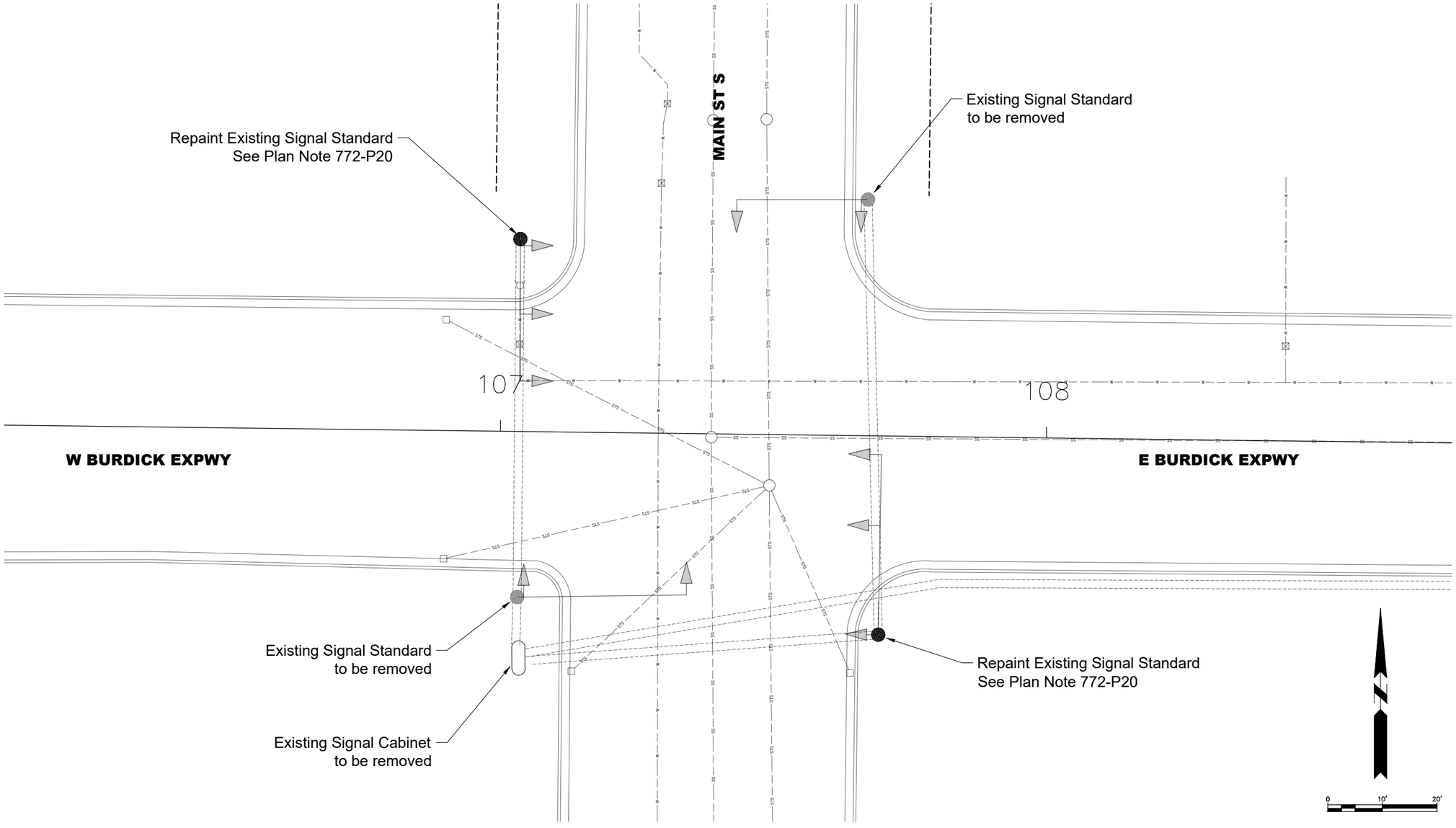
Lighting System A

Tabulation & Quantities

US 2 Business / Burdick Expy

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	1



Notes: 1. All existing conduit shall be abandoned in place, unless otherwise noted.

LEGEND

- Signal Pole/Foundation
- Signal controller

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

REMOVALS

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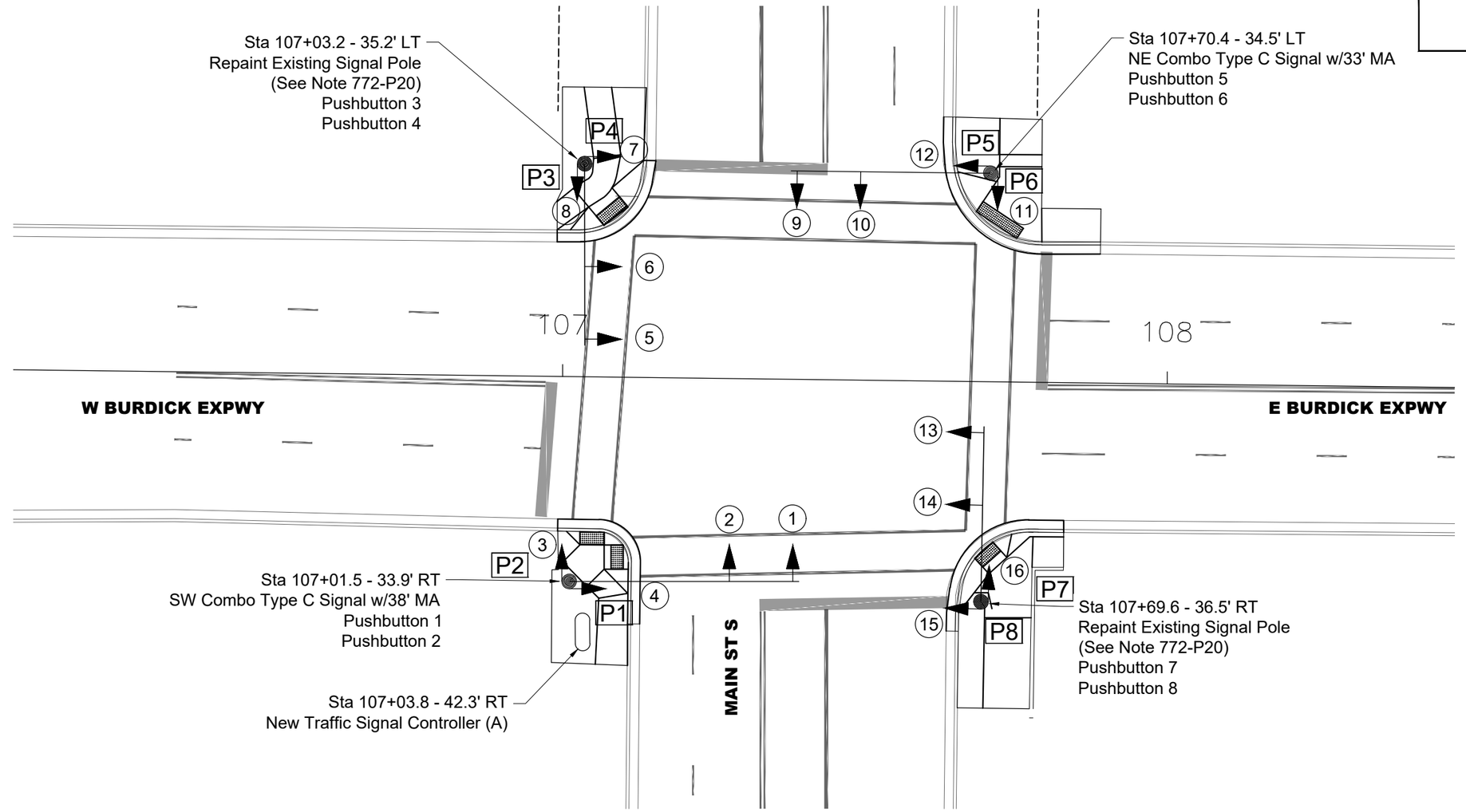
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	2

Sta 107+03.2 - 35.2' LT
Repaint Existing Signal Pole
(See Note 772-P20)
Pushbutton 3
Pushbutton 4

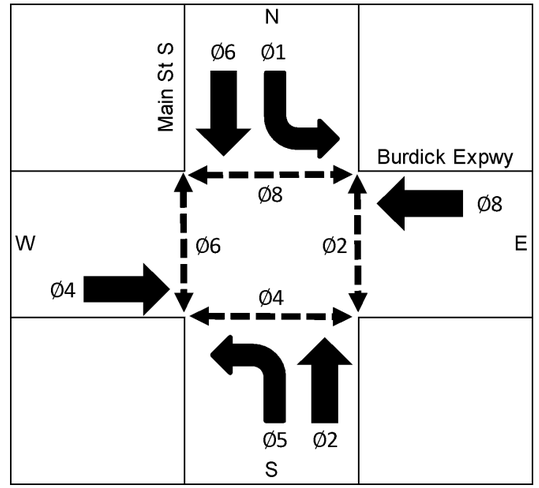
Sta 107+70.4 - 34.5' LT
NE Combo Type C Signal w/33' MA
Pushbutton 5
Pushbutton 6

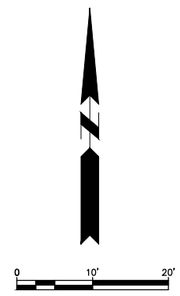


Sta 107+01.5 - 33.9' RT
SW Combo Type C Signal w/38' MA
Pushbutton 1
Pushbutton 2

Sta 107+03.8 - 42.3' RT
New Traffic Signal Controller (A)

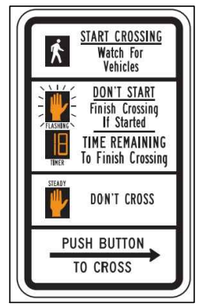
Sta 107+69.6 - 36.5' RT
Repaint Existing Signal Pole
(See Note 772-P20)
Pushbutton 7
Pushbutton 8





Pedestrian Pushbutton Schedule		
Location	Pushbutton & Sign Location on Pole	Direction of Arrow on Sign
Pushbutton 1	East	Right
Pushbutton 2	North	Left
Pushbutton 3	South	Right
Pushbutton 4	East	Left
Pushbutton 5	West	Left
Pushbutton 6	South	Left
Pushbutton 7	North	Right
Pushbutton 8	West	Right

Sign R10-3e



(A) Face Cabinet door East

LEGEND

- Signal Pole/Foundation
- Signal Controller
- Signal Head
- P1 Pedestrian Signal Head

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

TRAFFIC SIGNAL LAYOUT

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8/11/2020

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	3

NES1, NES2, NEV, ED25, EL16, PB5, PB6

Sta 107+10.9 - 41.1' LT
New Pull Box 2

NWS1, NWS2, NWV, ED4, EL8, PB3, PB4

Sta 107+03.2 - 35.2' LT
Existing Signal Pole

MAIN ST S

Sta 107+68.5 - 40.4' LT
New Pull Box 3

NES1, NES2, NEV, ED25, EL16, PB5, PB6

Sta 107+70.4 - 34.5' LT
NE Combo Type C Signal w/33' MA

SPARE

NWS1, NWS2, NES1, NES2, NWV, NEV, ED4, ED25, EL8, EL16, PB3, PB4, PB5, PB6

107

108

SPARE

W BURDICK EXPWY

E BURDICK EXPWY

Sta 107+01.5 - 33.9' RT
SW Combo Type C Signal w/38' MA

SWS1, SWS2, SWV, ED16, EL25, PB1, PB2, AC

SWS1, SWS2, SES1, SES2, SWV, SEV, ED16, ED8, EL25, EL4, PB1, PB2, PB7, PB8

SPARE

Sta 107+04.1 - 37.9' RT
New Pull Box 1

Sta 107+03.8 - 42.3' RT
New Traffic Signal Controller (A)

SPARE

Sta 107+69.6 - 36.5' RT
Existing Signal Pole

To Existing Feed Point

SES1, SES2, SEV, ED8, EL4, PB7, PB8

Sta 107+68.5 - 42.0' RT
New Pull Box 4

SES1, SES2, SEV, ED8, EL4, PB7, PB8

NWS1, NWS2, NES1, NES2, NWV, NEV, ED4, ED25, EL8, EL16, PB3, PB4, PB5, PB6

NWS1 = Northwest Combo Signal Standard 1
NWS2 = Northwest Combo Signal Standard 2
NES1 = Northeast Combo Signal Standard 1
NES2 = Northeast Combo Signal Standard 2
SES1 = Southeast Combo Signal Standard 1
SES2 = Southeast Combo Signal Standard 2
SWS1 = Southwest Combo Signal Standard 1
SWS2 = Southwest Combo Signal Standard 2
NWV = Northwest Video Detection Unit
NEV = Northeast Video Detection Unit
SEV = Southeast Video Detection Unit
SWV = Southwest Video Detection Unit
ED16 = Ø1 + Ø6 EVP Detection Unit
ED25 = Ø2 + Ø5 EVP Detection Unit
ED4 = Ø4 EVP Detection Unit
ED8 = Ø8 EVP Detection Unit
EL16 = Ø1 + Ø6 EVP Light
EL25 = Ø2 + Ø5 EVP Light
EL4 = Ø4 EVP Light
EL8 = Ø8 EVP Light
PB1 = Pushbutton 1
PB2 = Pushbutton 2
PB3 = Pushbutton 3
PB4 = Pushbutton 4
PB5 = Pushbutton 5
PB6 = Pushbutton 6
PB7 = Pushbutton 7
PB8 = Pushbutton 8
AC = Antenna Cable

LEGEND

- Signal Pole/Foundation
- Signal Controller
- Pullbox
- Conduit Run

0 10' 20'

City of Minot
Engineering Dept

BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

CONDUIT & CONDUCTOR LAYOUT

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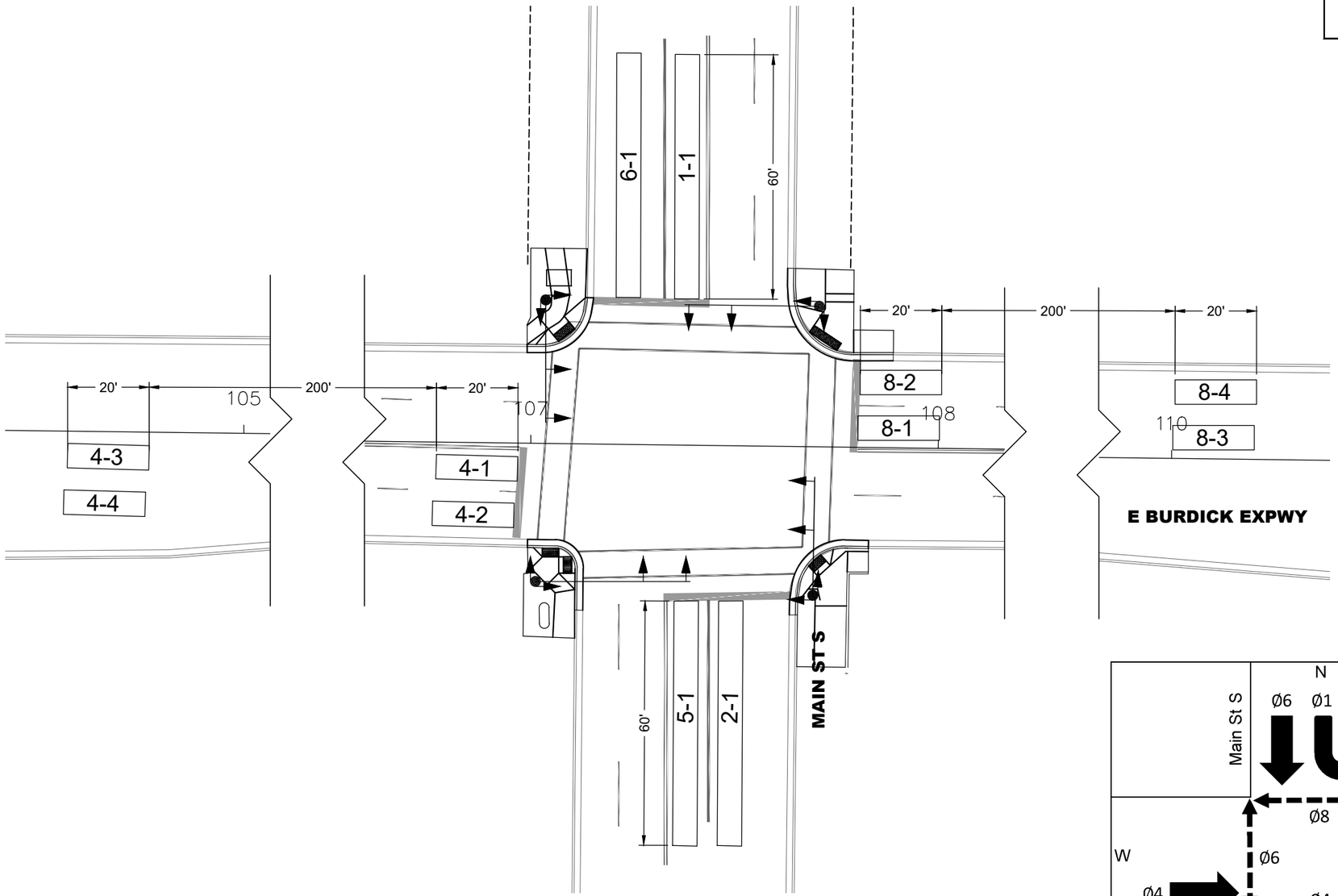
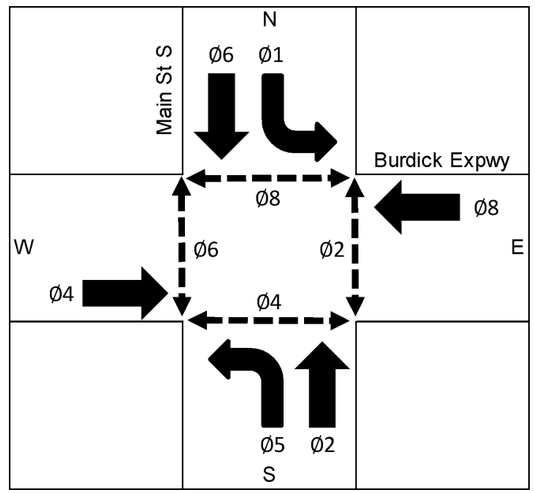
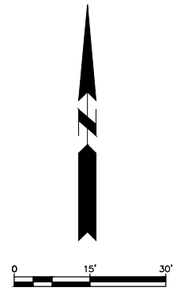
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	4



Phase Number	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
4-1	0	20			X		X
4-2	0	20			X		X
4-3	220	20		X		X	
4-4	220	20		X		X	
5-1	0	60	X				X
6-1	0	60			X		X
8-1	0	20			X		X
8-2	0	20			X		X
8-3	220	20		X		X	
8-4	220	20		X		X	





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Notes: 1. The final size of all detection zones shall be as recommended by the video detection manufacturer.

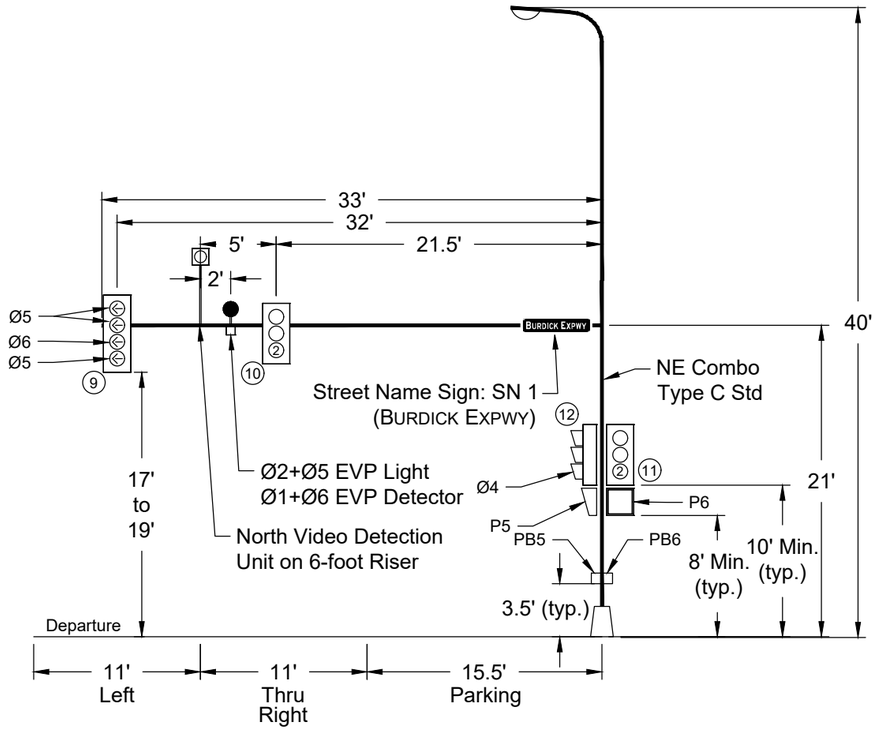
BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

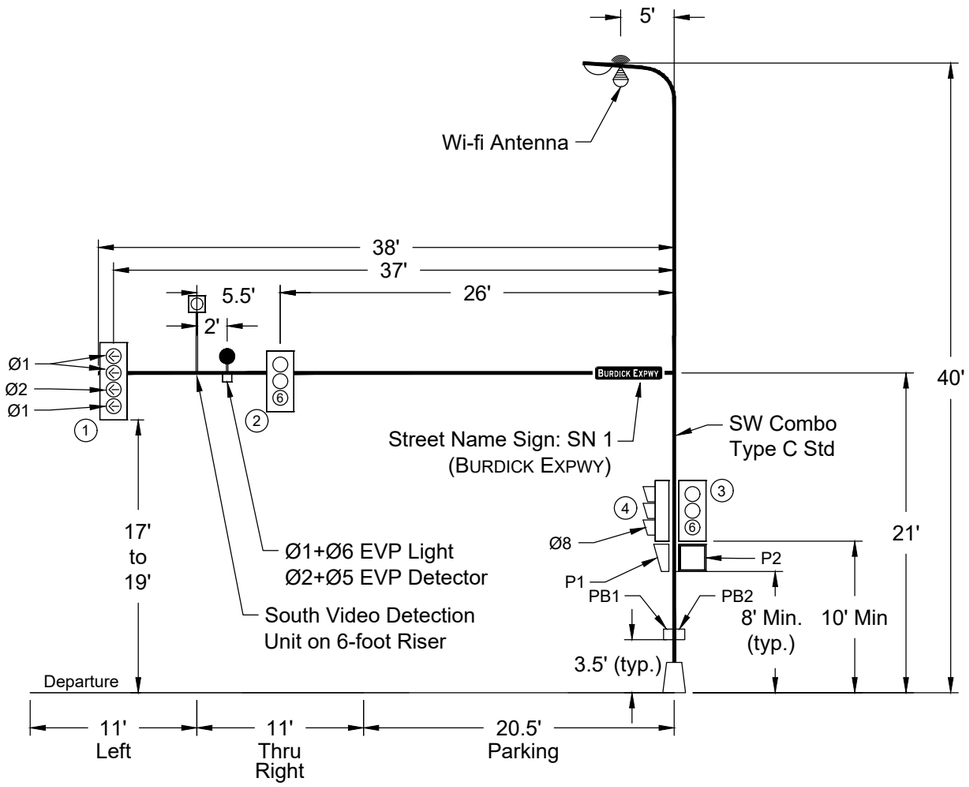
VIDEO DETECTION ZONE LAYOUT

8/11/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	5



Northbound



Southbound

LEGEND

- Wi-fi Antenna
- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- (1) Signal Head Number
- EVP Light
- EVP Detector

Note: Install Wi-fi equipment at 40' mounting height on the light standard.

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

SIGNAL STANDARDS & HEAD LOCATIONS

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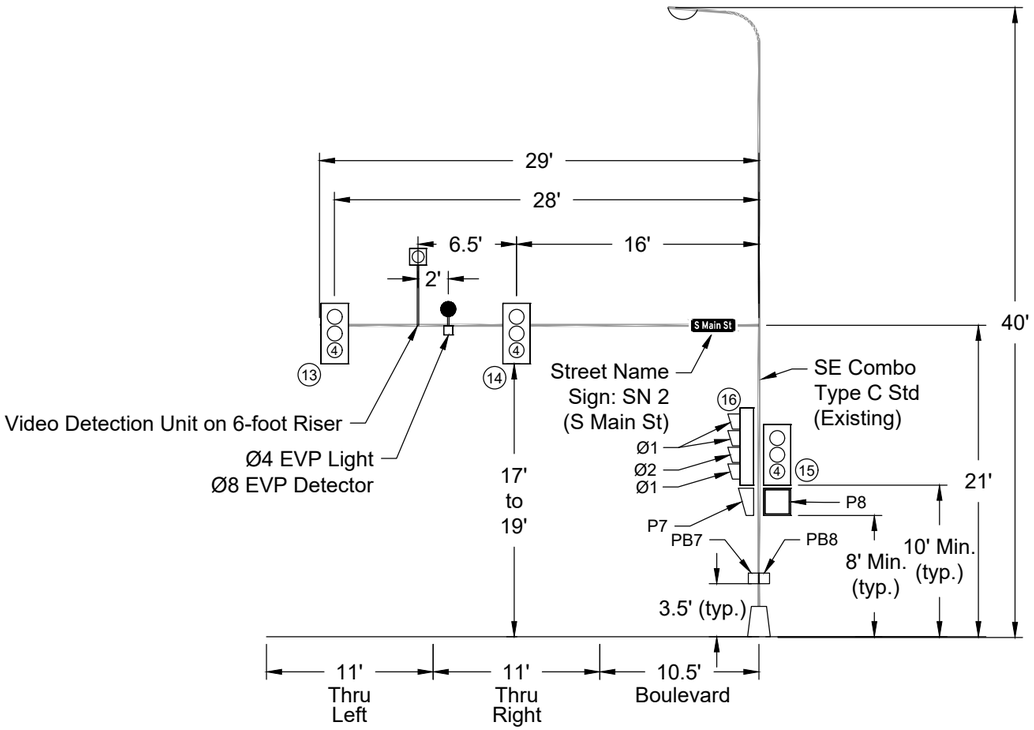
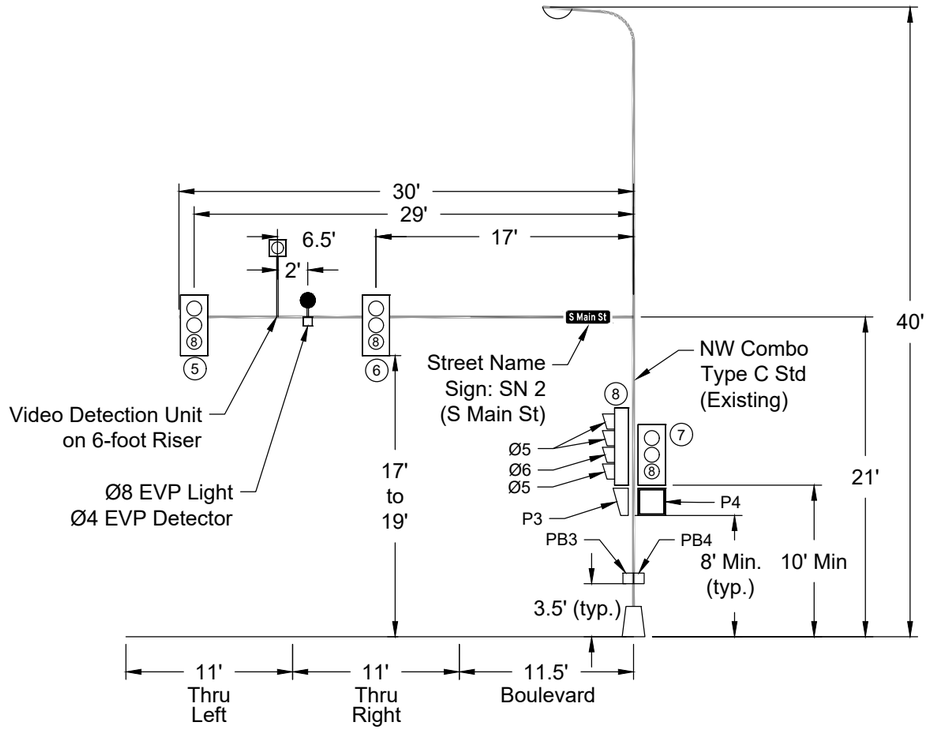
8/11/2020

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	6



Eastbound



Westbound

LEGEND

- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- (1) Signal Head Number
- EVP Light
- EVP Detector

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

SIGNAL STANDARDS & HEAD LOCATIONS

8/11/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	7

	Phase 1								Phase 2								Phase 3								Phase 4							
	Southbound Left								Northbound								Future								Eastbound							
Head	R	Clear to Phase							R	Clear to Phase							R	Clear to Phase							R	Clear to Phase						
Number	W	2	3	4	5	6	7	8	W	3	4	5	6	7	8	1	W	4	5	6	7	8	1	2	W	5	6	7	8	1	2	3
1	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10									G		Y	N	N		Y	Y																
11									G		Y	N	N		Y	Y																
12																									G	Y	Y		N	Y	Y	
13																									G	Y	Y		N	Y	Y	
14																									G	Y	Y		N	Y	Y	
15																									G	Y	Y		N	Y	Y	
16	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																

	Phase 5								Phase 6								Phase 7								Phase 8							
	Northbound Left								Southbound								Future								Westbound							
Head	R	Clear to Phase							R	Clear to Phase							R	Clear to Phase							R	Clear to Phase						
Number	W	6	7	8	1	2	3	4	W	7	8	1	2	3	4	5	W	8	1	2	3	4	5	6	W	1	2	3	4	5	6	7
1																																
2									G		Y	N	N		Y	Y																
3									G		Y	N	N		Y	Y																
4																									G	Y	Y		N	Y	Y	
5																									G	Y	Y		N	Y	Y	
6																									G	Y	Y		N	Y	Y	
7																									G	Y	Y		N	Y	Y	
8	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
9	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
10																																
11																																
12																																
13																																
14																																
15																																
16																																

Blank Spares Denote a 'Red" Indication
G = Green Ball Indication
Y = Yellow Ball Indication
GL = Green Left Arrow Indication
YL = Yellow Left Arrow Indication
GR = Green Right Arrow Indication
YR = Yellow Right Arrow Indication
FYA = Flashing Yellow Left Arrow Indication

N = Continue to Display Right-of-Way Indication. When any phase is on alone, any non-conflicting phase may start timing without a clearance interval. See Chart A.

Do not allow Flashing Yellow Arrow (FYA) during Emergency Vehicle Preemption for Phases 2, 4, 6 and 8.

Emergency Vehicle Preemption Controller Settings

	Phase 2								Phase 4								Phase 6								Phase 8							
	Northbound								Eastbound								Southbound								Westbound							
Head	R	Clear to Phase							R	Clear to Phase							R	Clear to Phase							R	Clear to Phase						
Number	W	3	4	5	6	7	8	1	W	5	6	7	8	1	2	3	W	7	8	1	2	3	4	5	W	1	2	3	4	5	6	7
1																	G		Y	N	N		Y	Y								
2																	G		Y	N	N		Y	Y								
3																	GL		YL	N	N		YL	YL								
4																									G	Y	Y		N	Y	Y	
5																									G	Y	Y		N	Y	Y	
6																									G	Y	Y		N	Y	Y	
7																									G	Y	Y		N	Y	Y	
8	GL		YL	N	N		YL	YL																								
9	GL		YL	N	N		YL	YL																								
10	G		Y	N	N		Y	Y																								
11	G		Y	N	N		Y	Y																								
12									G	Y	Y		N	Y	Y																	
13									G	Y	Y		N	Y	Y																	
14									G	Y	Y		N	Y	Y																	
15									G	Y	Y		N	Y	Y																	
16																	GL		YL	N	N		YL	YL								

Chart A	
Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	5, 6
2	5, 6
4	8
5	1, 2
6	1, 2
8	4

City of Minot
Engineering Dept

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

CONTROLLER PHASING

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	8

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Southwest Combo Signal Std Transformer Base	Vehicle Head 1	1	14 AWG 7 CONDUCTOR CABLE	66
	Vehicle Head 2	1	14 AWG 5 CONDUCTOR CABLE	55
	Vehicle Head 3	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 4	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 1	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 2	1	14 AWG 5 CONDUCTOR CABLE	17
Northwest Combo Signal Std Transformer Base	Vehicle Head 5	1	14 AWG 7 CONDUCTOR CABLE	58
	Vehicle Head 6	1	14 AWG 5 CONDUCTOR CABLE	46
	Vehicle Head 7	1	14 AWG 5 CONDUCTOR CABLE	20
	Pedestrian Head 3	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 4	1	14 AWG 5 CONDUCTOR CABLE	17

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Northeast Combo Signal Std Transformer Base	Vehicle Head 8	1	14 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 9	1	14 AWG 5 CONDUCTOR CABLE	61
	Vehicle Head 10	1	14 AWG 5 CONDUCTOR CABLE	51
	Vehicle Head 11	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 5	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 6	1	14 AWG 5 CONDUCTOR CABLE	17
Southeast Combo Signal Std Transformer Base	Vehicle Head 12	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 13	1	14 AWG 5 CONDUCTOR CABLE	57
	Vehicle Head 14	1	14 AWG 5 CONDUCTOR CABLE	45
	Pedestrian Head 7	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 8	1	14 AWG 5 CONDUCTOR CABLE	17

Conductor			Cable NES1 Northeast Combo Signal 12 No. 14 AWG		Cable NES2 Northeast Combo Signal 12 No. 14 AWG		Cable SES1 Southeast Combo Signal 12 No. 14 AWG		Cable SES2 Southeast Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P6	Ø2 Walk	P5	Ø8 Walk	P7	Ø2 Walk	P8	Ø4 Walk
2	White			Neutral	P5	Ø8 Don't Walk		Neutral	P8	Ø4 Don't Walk
3	Red		10, 11	Ø2 Red	12	Ø4 Red	13, 14, 15	Ø4 Red		Spare
4	Green			Ground		Spare		Ground		Spare
5	Orange		10, 11	Ø2 Yellow	12	Ø4 Yellow	13, 14, 15	Ø4 Yellow		Spare
6	Blue		10, 11	Ø2 Green	12	Ø4 Green	13, 14, 15	Ø4 Green		Spare
7	White	Black	P6	Ø2 Don't Walk		Spare	P7	Ø2 Don't Walk		Spare
8	Red	Black	9	Ø5 Red ←		Spare		Spare	16	Ø1 Red ←
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black	9	Ø5 Yellow ←		Spare		Spare	16	Ø1 Yellow ←
11	Blue	Black	9	Ø5 Green ←		Spare		Spare	16	Ø1 Green ←
12	Black	White	9	Ø6 FYA ←		Spare		Spare	16	Ø2 FYA ←

Conductor			Cable SWS1 Southwest Combo Signal 12 No. 14 AWG		Cable SWS2 Southwest Combo Signal 12 No. 14 AWG		Cable NWS1 Northwest Combo Signal 12 No. 14 AWG		Cable NWS2 Northwest Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P1	Ø4 Walk	P2	Ø6 Walk	P3	Ø6 Walk	P4	Ø8 Walk
2	White			Neutral	P2	Ø6 Don't Walk		Neutral	P4	Ø8 Don't Walk
3	Red		2, 3	Ø6 Red	4	Ø8 Red	5, 6, 7	Ø8 Red		Spare
4	Green			Ground		Spare		Ground		Spare
5	Orange		2, 3	Ø6 Yellow	4	Ø8 Yellow	5, 6, 7	Ø8 Yellow		Spare
6	Blue		2, 3	Ø6 Green	4	Ø8 Green	5, 6, 7	Ø8 Green		Spare
7	White	Black	P2	Ø4 Don't Walk		Spare	P3	Ø6 Don't Walk		Spare
8	Red	Black	1	Ø1 Red ←		Spare		Spare	16	Ø5 Red ←
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black	1	Ø1 Yellow ←		Spare		Spare	16	Ø5 Yellow ←
11	Blue	Black	1	Ø1 Green ←		Spare		Spare	16	Ø5 Green ←
12	Black	White	1	Ø2 FYA ←		Spare		Spare	16	Ø6 FYA ←

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

SIGNAL HEADS & CONDUCTORS

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SIGNAL CABLE & CONDUIT SCHEDULE

#	RUN ITEM		CONDUIT SIZE (IN)	CONDUIT LF	CABLE Origin	Destination	# of Cables	SIZE/TYPE	Total LF	TITLE
1	Origin Destination	Feed Point Traffic Signal Controller	2 Intercept Existing 2" Conduit	Existing	Feed Point Feed Point	Traffic Signal Controller Traffic Signal Controller	2 1	UNDERGROUND CONDUCTOR NO6-TYPE RHW UNDERGROUND CONDUCTOR NO6-TYPE THW	Existing Existing	
2	*Origin* *Destination*	Traffic Signal Controller Pull Box 1	3	5	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	4 2 2 2 4	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	80 40 40 40 80	SWS1, SWS2, SES1, SES2 SWV, SEV ED16, ED8 EL25, EL4 PB1, PB2, PB7, PB8
3	*Origin* *Destination*	Traffic Signal Controller Pull Box 1	3	5	Traffic Signal Controller	Pull Box 1		SPARE CONDUIT		
4	*Origin* *Destination*	Pull Box 1 Southwest Combo Signal Std	3	5	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	Southwest Combo Signal Std Transformer Base Southwest Video Detection Unit Southwest Emergency Preemption Detector Southwest Emergency Preemption Lamp Pushbutton 1 and Pushbutton 2 Wi-fi Antenna 5 GHz	2 1 1 1 2 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE ANTENNA CABLE	32 73 65 65 38 61	SWS1, SWS2 SWV ED16 EL25 PB1, PB2 AC
5	*Origin* *Destination*	Pull Box 1 Pull Box 4	3	65	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	154 77 77 77 154	SES1, SES2 SEV ED8 EL4 PB7, PB8
6	*Origin* *Destination*	Pull Box 1 Pull Box 4	3	65	Pull Box 1	Pull Box 4		SPARE CONDUIT		
7	*Origin* *Destination*	Pull Box 4 Southeast Combo Signal Std	3	6	Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4	Southeast Combo Signal Std Transformer Base Southeast Video Detection Unit Southeast Emergency Preemption Detector Southeast Emergency Preemption Lamp Pushbutton 7 and Pushbutton 8	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	34 65 57 57 40	SES1, SES2 SEV ED8 EL4 PB7, PB8
8	*Origin* *Destination*	Traffic Signal Controller Pull Box 1	3	5	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	4 2 2 2 4	14 AWG 12 CONDUCTOR CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	80 40 40 40 80	NWS1, NWS2, NES1, NES2 NWV, NEV ED4, ED25 EL8, EL16 PB3, PB4, PB5, PB6
9	*Origin* *Destination*	Pull Box 1 Pull Box 2	3	80	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2	4 2 2 2 4	14 AWG 12 CONDUCTOR CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	368 184 184 184 368	NWS1, NWS2, NES1, NES2 NWV, NEV ED4, ED25 EL8, EL16 PB3, PB4, PB5, PB6
10	*Origin* *Destination*	Pull Box 1 Pull Box 2	3	80	Pull Box 1	Pull Box 2		SPARE CONDUIT		
11	*Origin* *Destination*	Pull Box 2 Northwest Combo Signal Std	3	10	Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2	Northwest Combo Signal Std Transformer Base Northwest Video Detection Unit Northwest Emergency Preemption Detector Northwest Emergency Preemption Lamp Pushbutton 3 and Pushbutton 4	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	42 70 62 62 48	NWS1, NWS2 NWV ED4 EL8 PB3, PB4
12	*Origin* *Destination*	Pull Box 2 Pull Box 3	3	58	Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	140 70 70 70 140	NES1, NES2 NEV ED25 EL16 PB5, PB6
13	*Origin* *Destination*	Pull Box 2 Pull Box 3	3	58	Pull Box 2	Pull Box 3		SPARE CONDUIT		
14	*Origin* *Destination*	Pull Box 3 Northeast Combo Signal Std	3	7	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	Northeast Combo Signal Std Transformer Base Northeast Video Detection Unit Northeast Emergency Preemption Detector Northeast Emergency Preemption Lamp Pushbutton 5 and Pushbutton 6	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	36 70 62 62 42	NES1, NES2 NEV ED25 EL16 PB5, PB6

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BURDICK EXPY & VALLEY STREET

SITE 1
BURDICK EXPY & S MAIN ST

CABLE SCHEDULE

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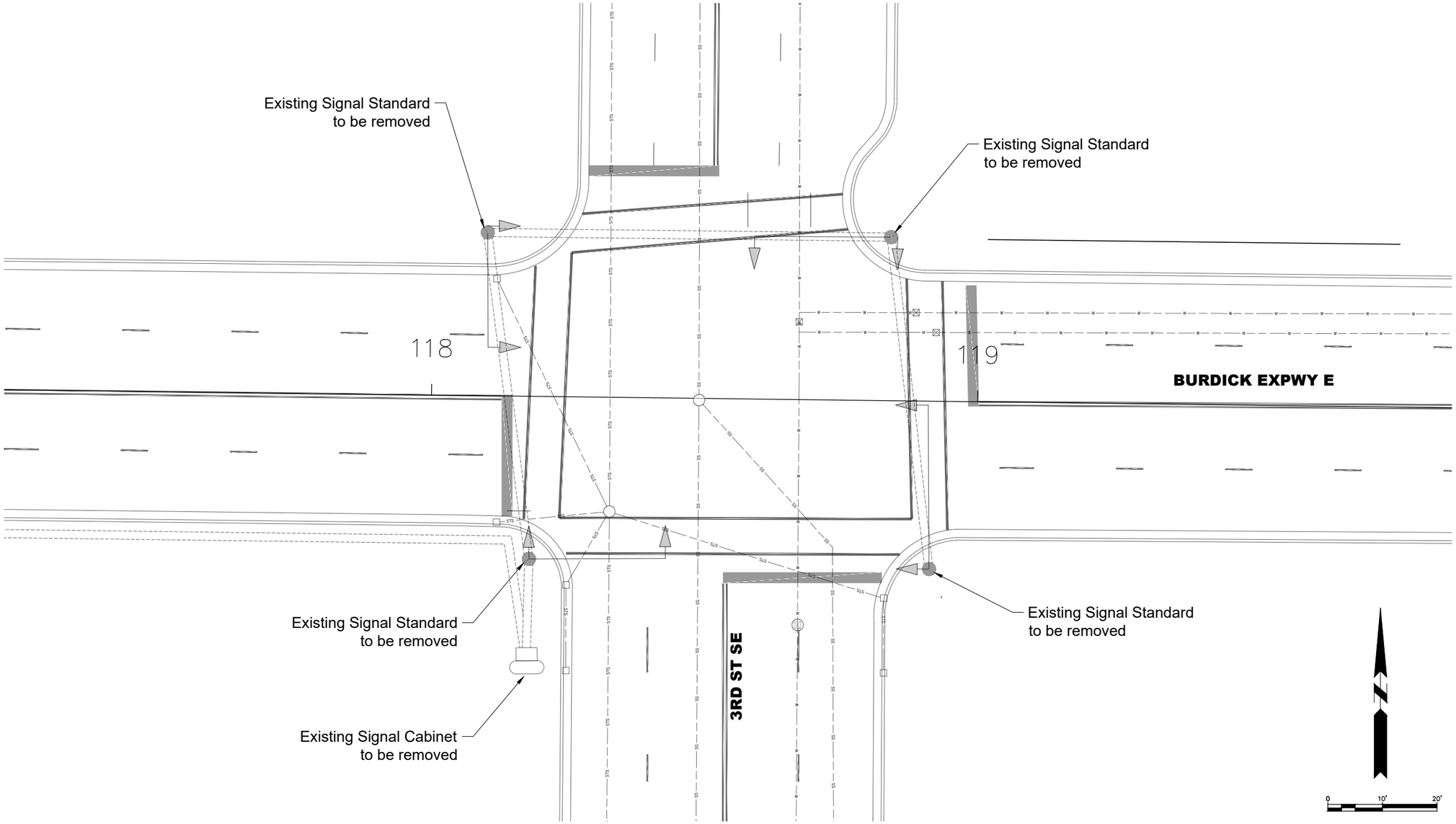

Notes: 1. All existing conduit shall be abandoned in place, unless otherwise noted.

LEGEND

- Signal Pole/Foundation
- Signal controller

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

REMOVALS

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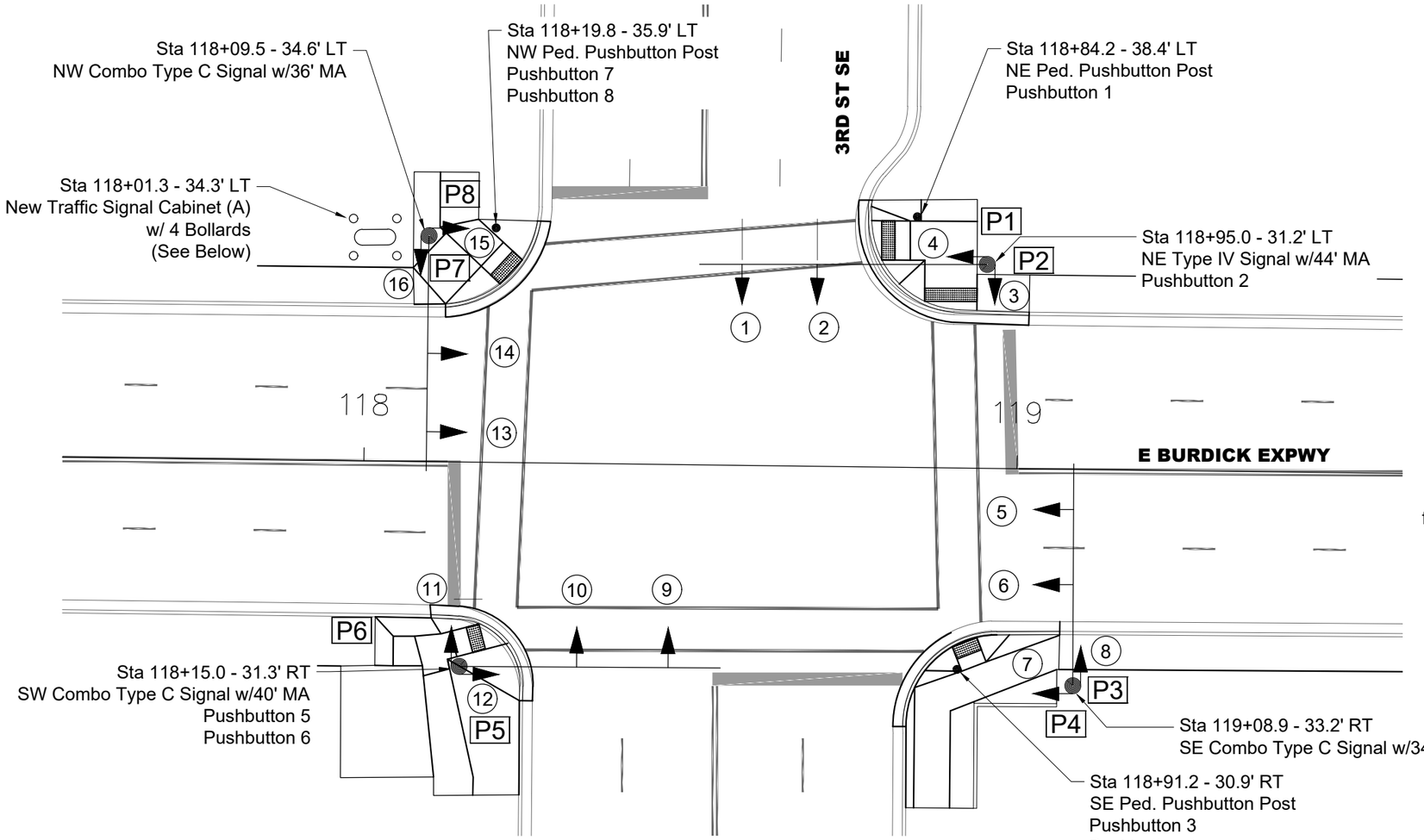
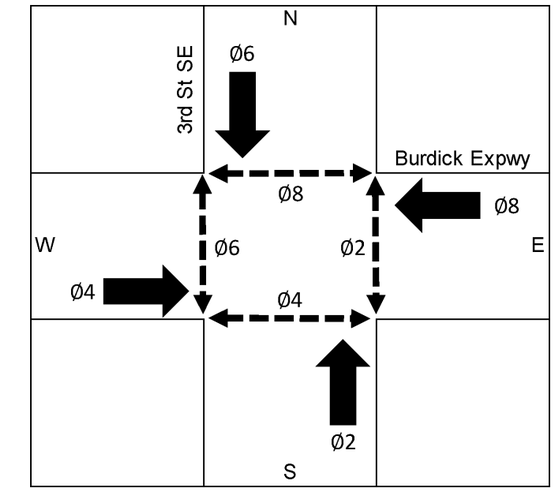
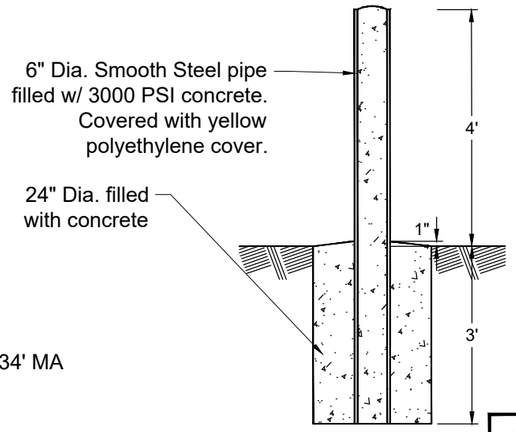
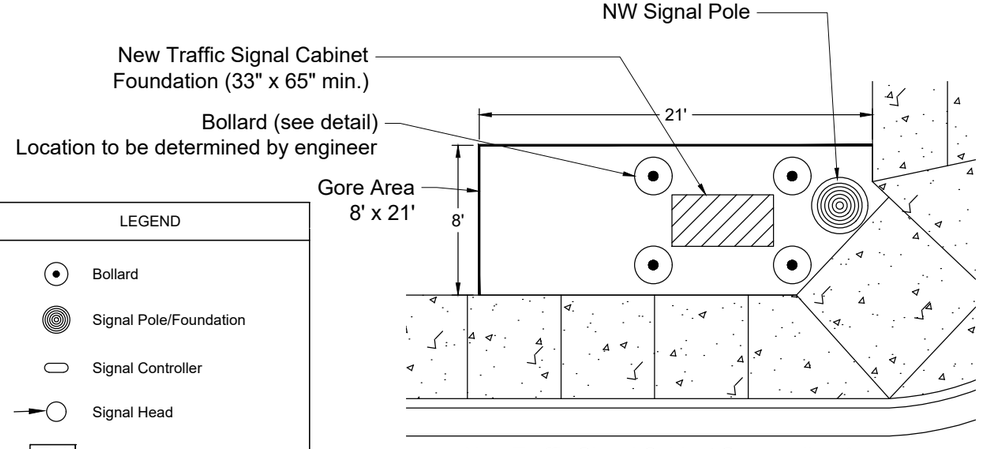






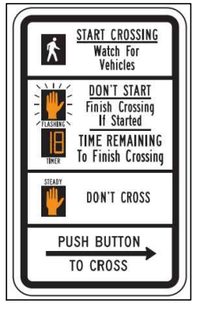
Bollard Post Detail



New Traffic Signal Cabinet Surrounding Area

Pedestrian Pushbutton Schedule		
Location	Pushbutton & Sign Location on Pole	Direction of Arrow on Sign
Pushbutton 1	South	Left
Pushbutton 2	West	Right
Pushbutton 3	East	Right
Pushbutton 4	South	Left
Pushbutton 5	West	Left
Pushbutton 6	North	Left
Pushbutton 7	West	Right
Pushbutton 8	South	Right

Sign R10-3e



(A) Face Cabinet door North

LEGEND

- Bollard
- Signal Pole/Foundation
- Signal Controller
- Signal Head
- P1 Pedestrian Signal Head

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

TRAFFIC SIGNAL LAYOUT

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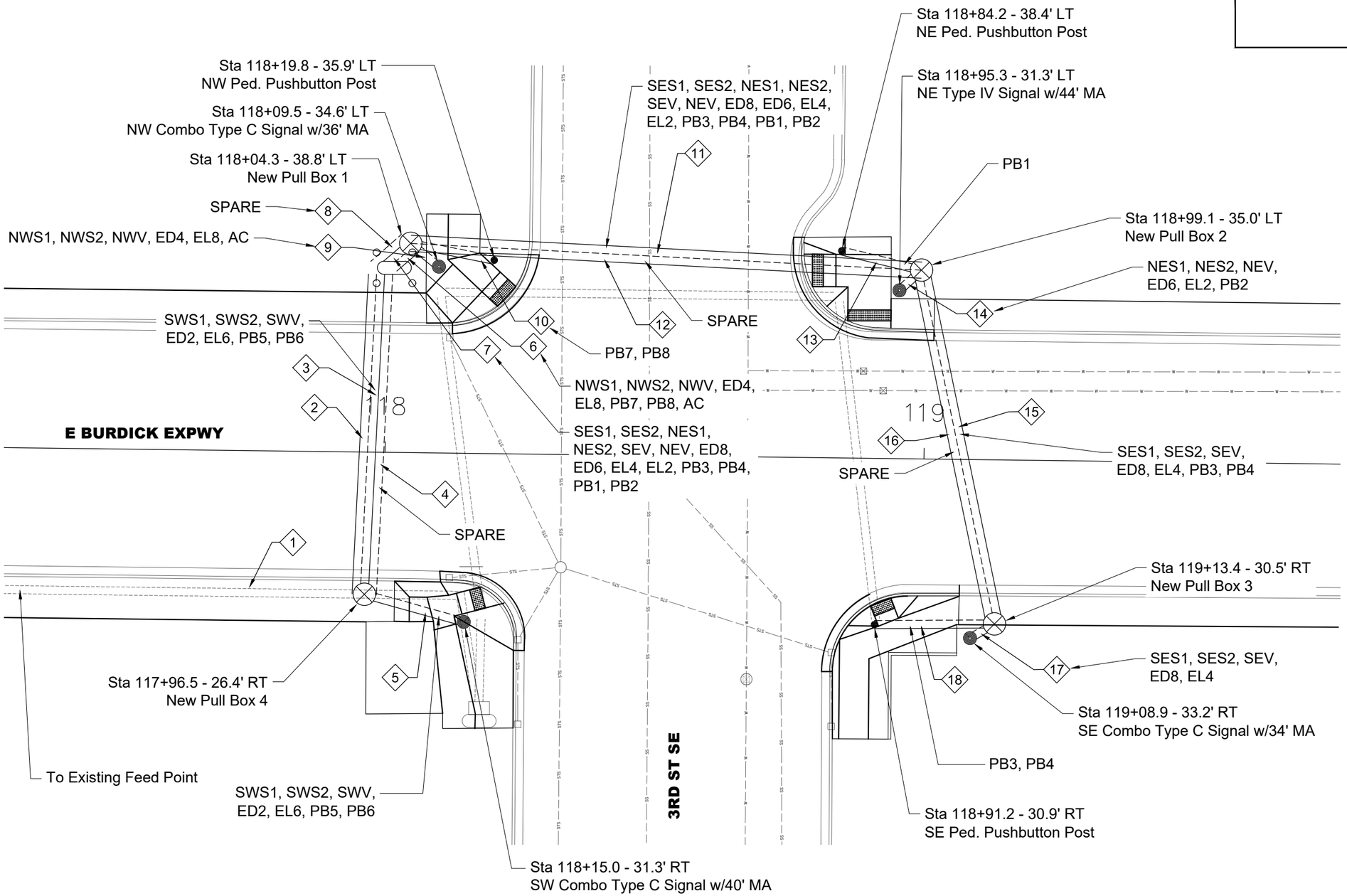

NWS1 = Northwest Combo Signal Standard 1
NWS2 = Northwest Combo Signal Standard 2
NES1 = Northeast Combo Signal Standard 1
NES2 = Northeast Combo Signal Standard 2
SES1 = Southeast Combo Signal Standard 1
SES2 = Southeast Combo Signal Standard 2
SWS1 = Southwest Combo Signal Standard 1
SWS2 = Southwest Combo Signal Standard 2
NWV = Northwest Video Detection Unit
NEV = Northeast Video Detection Unit
SEV = Southeast Video Detection Unit
SWV = Southwest Video Detection Unit
ED2 = Ø2 EVP Detection Unit
ED4 = Ø4 EVP Detection Unit
ED6 = Ø6 EVP Detection Unit
ED8 = Ø8 EVP Detection Unit
EL2 = Ø2 EVP Light
EL4 = Ø4 EVP Light
EL6 = Ø6 EVP Light
EL8 = Ø8 EVP Light
PB1 = Pushbutton 1
PB2 = Pushbutton 2
PB3 = Pushbutton 3
PB4 = Pushbutton 4
PB5 = Pushbutton 5
PB6 = Pushbutton 6
PB7 = Pushbutton 7
PB8 = Pushbutton 8
AC = Antenna Cable

LEGEND

- Signal Pole/Foundation
- Signal Controller
- Pullbox
- Conduit Run

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

CONDUIT & CONDUCTOR LAYOUT

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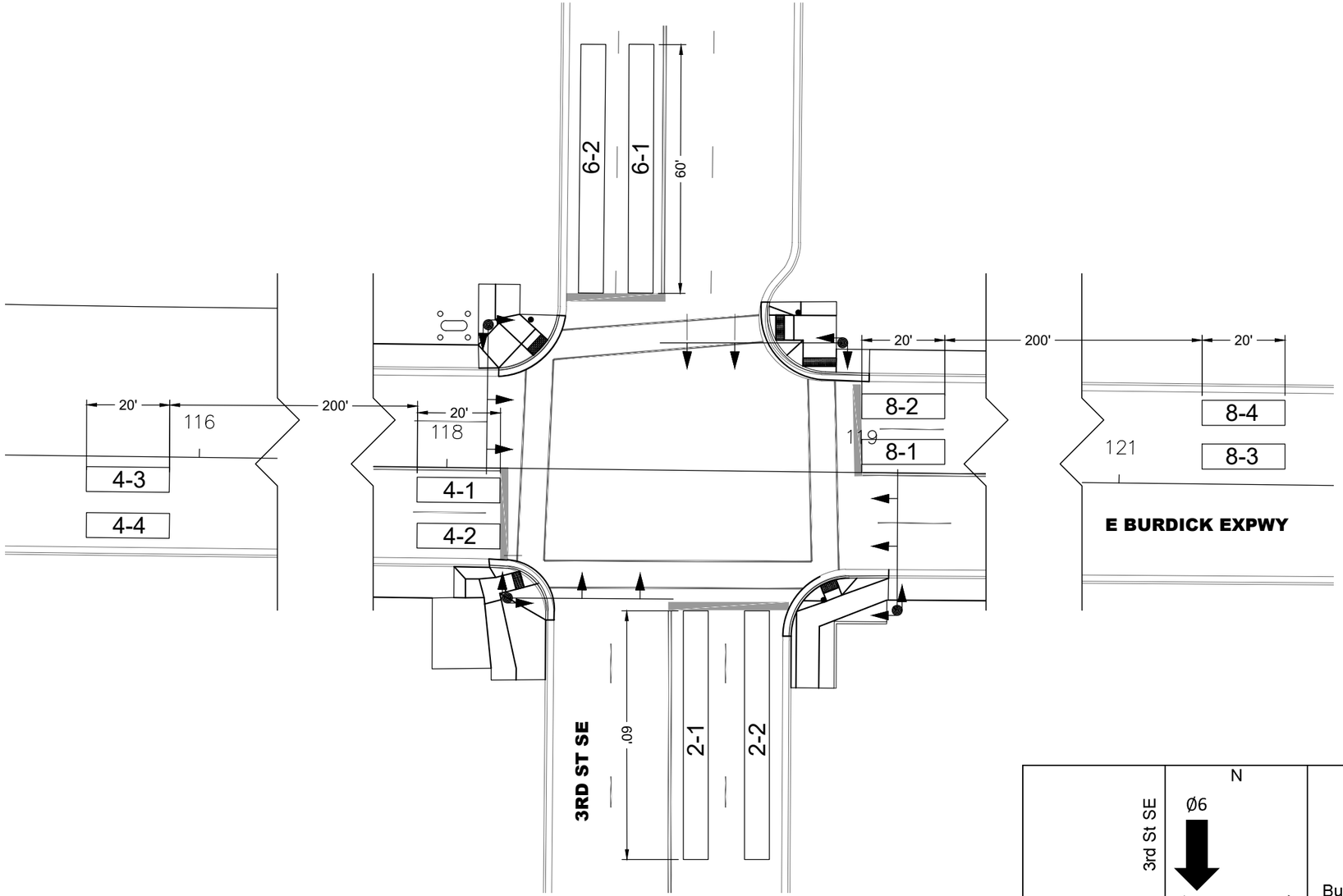
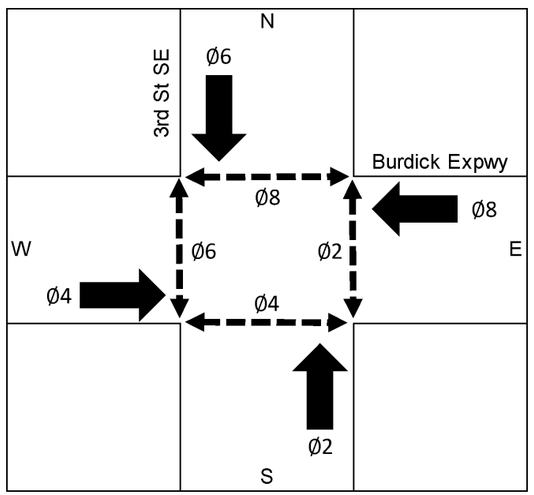
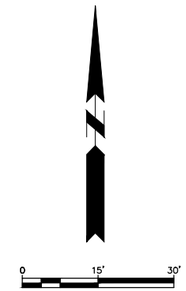


Phase Number	Distance from Stop Bar (Feet)	Length (Feet)	Presence/Counting	Passage/Counting	Queue/Counting	Locking Memory	Non-Locking Memory
2-1	0	60			X		X
2-2	0	60			X		X
4-1	0	20			X		X
4-2	0	20			X		X
4-3	220	20		X		X	
4-4	220	20		X		X	
6-1	0	60			X		X
6-2	0	60			X		X
8-1	0	20			X		X
8-2	0	20			X		X
8-3	220	20		X		X	
8-4	220	20		X		X	





Notes: 1. The final size of all detection zones shall be as recommended by the video detection manufacturer.

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

VIDEO DETECTION ZONE LAYOUT

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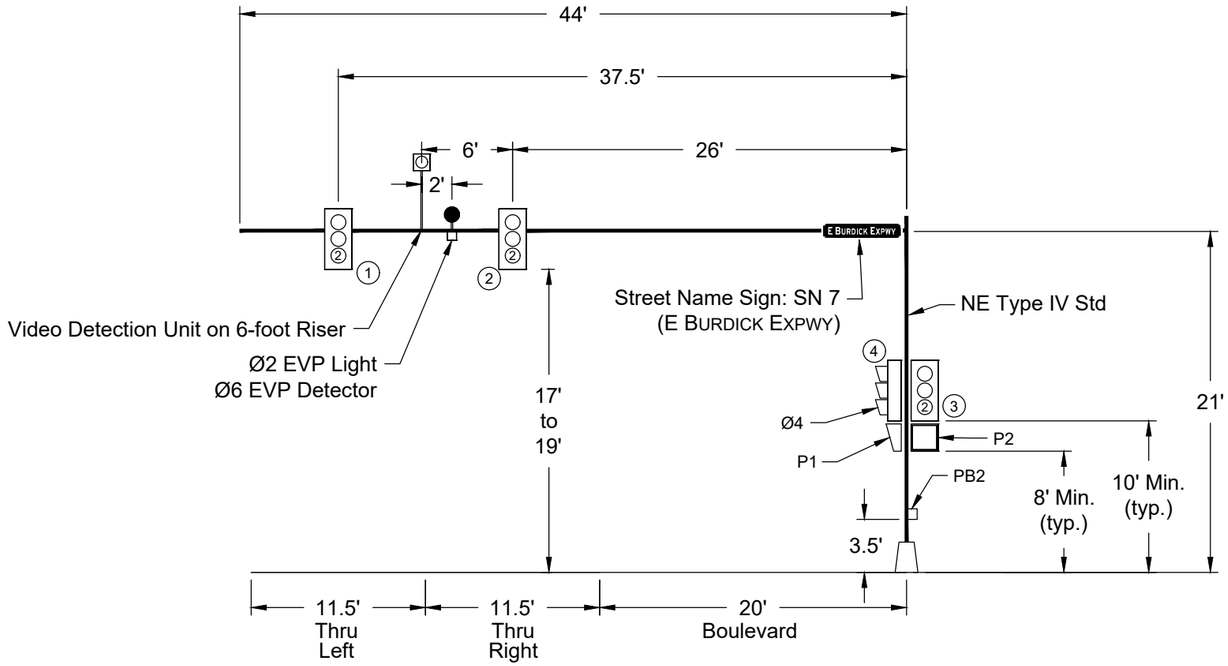
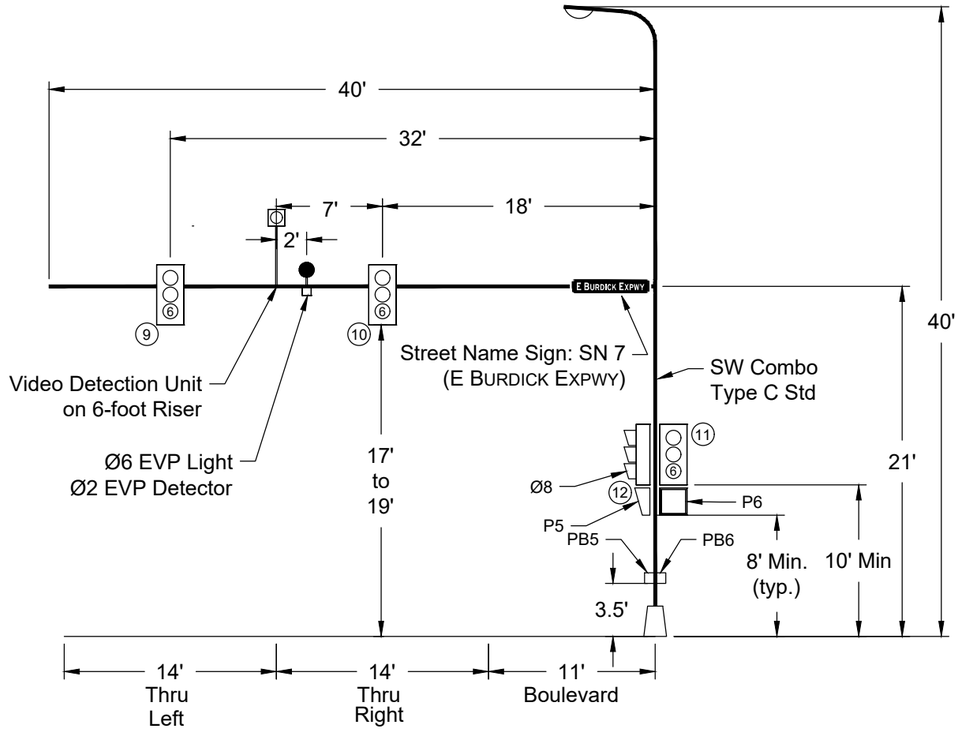


Northbound



Southbound

LEGEND

- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- Signal Head Number
- EVP Light
- EVP Detector

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

SIGNAL STANDARDS & HEAD LOCATIONS

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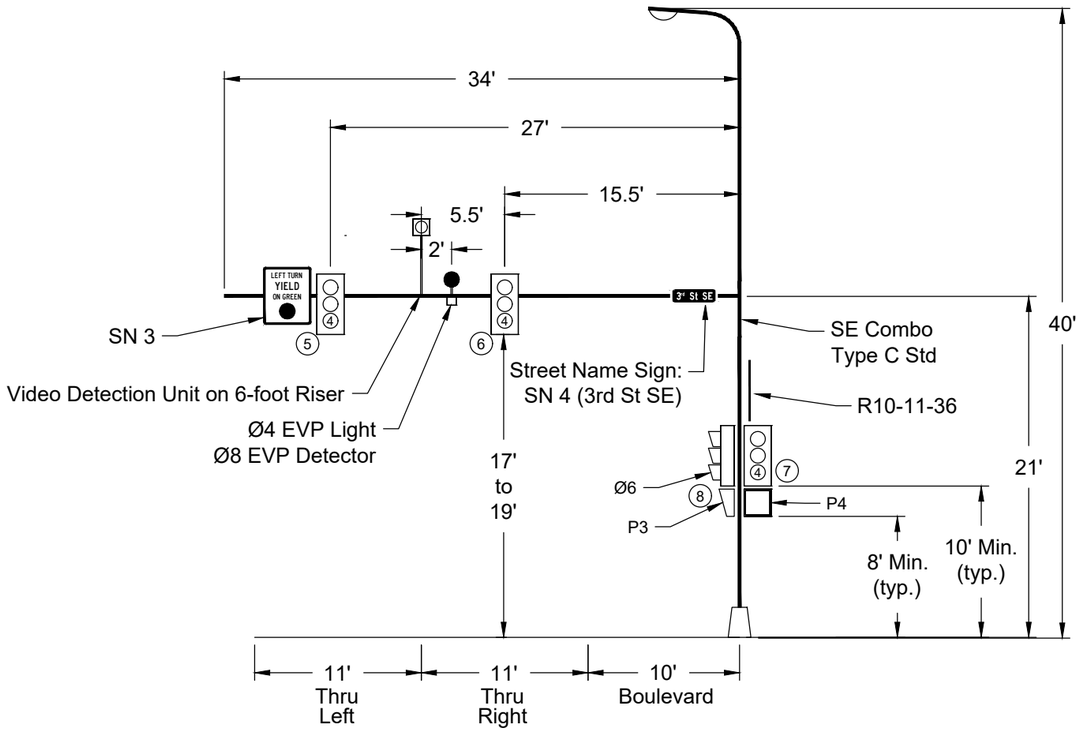
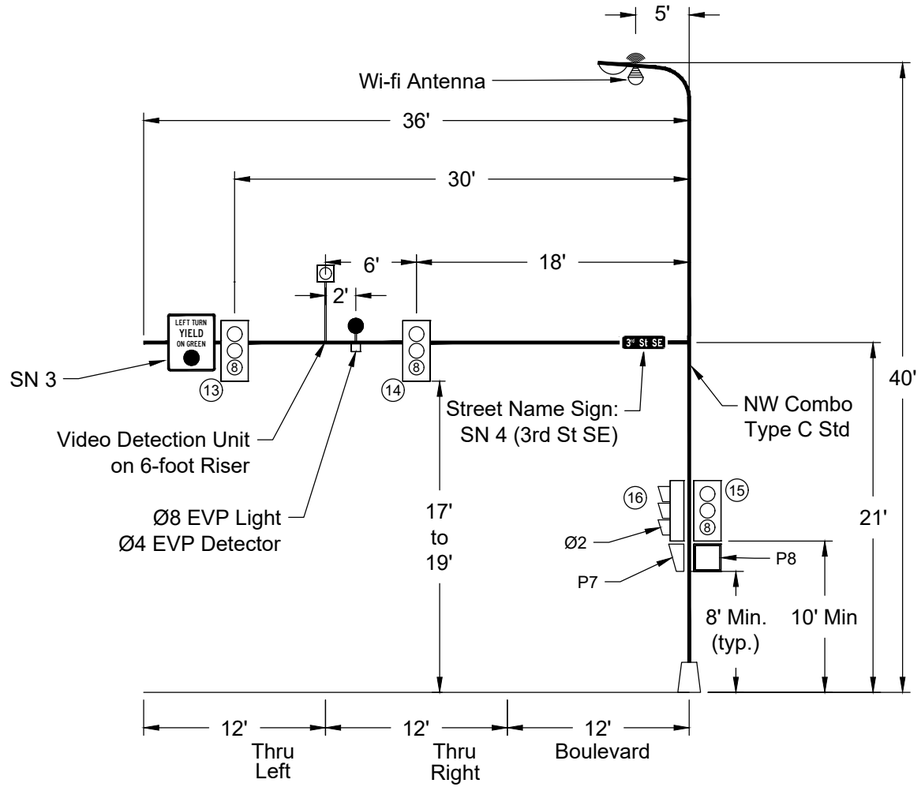
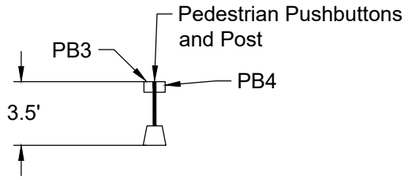
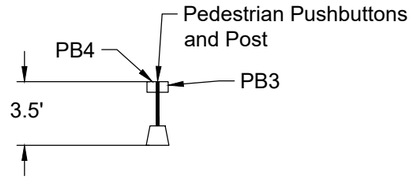


Eastbound



Westbound





Note: Install Wi-fi equipment at 40' mounting height on the light standard.

LEGEND

- Wi-fi Antenna
- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- (1) Signal Head Number
- EVP Light
- EVP Detector

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

SIGNAL STANDARDS & HEAD LOCATIONS

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	16

	Phase 1								Phase 2							Phase 3							
									↑														
	Future								Northbound							Future							
Head	R	Clear to Phase							R	Clear to Phase						R	Clear to Phase						
Number	W	2	3	4	5	6	7	8	W	3	4	5	6	7	8	1	W	4	5	6	7	8	1	2
1									G		Y		N		Y									
2									G		Y		N		Y									
3									G		Y		N		Y									
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16									G		Y		N		Y									

	Phase 4								Phase 5								Phase 6							
	→																↓							
	Eastbound								Future								Southbound							
Head	R	Clear to Phase							R	Clear to Phase							R	Clear to Phase						
Number	W	5	6	7	8	1	2	3	W	6	7	8	1	2	3	4	W	7	8	1	2	3	4	5
1																								
2																								
3																								
4	G		Y		N		Y																	
5	G		Y		N		Y																	
6	G		Y		N		Y																	
7	G		Y		N		Y																	
8																	G		Y		N		Y	
9																	G		Y		N		Y	
10																	G		Y		N		Y	
11																	G		Y		N		Y	
12																								
13																								
14																								
15																								
16																								

	Phase 7								Phase 8							
									←							
	Future								Westbound							
Head	R	Clear to Phase							R	Clear to Phase						
Number	W	8	1	2	3	4	5	6	W	1	2	3	4	5	6	7
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12									G		Y		N		Y	
13									G		Y		N		Y	
14									G		Y		N		Y	
15									G		Y		N		Y	
16																

Blank Spares Denote a 'Red" Indication
G = Green Ball Indication
Y = Yellow Ball Indication
GL = Green Left Arrow Indication
YL = Yellow Left Arrow Indication
GR = Green Right Arrow Indication
YR = Yellow Right Arrow Indication
FYA = Flashing Yellow Left Arrow Indication

N = Continue to Display Right-of-Way Indication. When any phase is on alone, any non-conflicting phase may start timing without a clearance interval. See Chart A.

Do not allow Flashing Yellow Arrow (FYA) during Emergency Vehicle Preemption for Phases 2, 4, 6 and 8.

Emergency Vehicle Preemption Controller Settings

	Phase 2								Phase 4								Phase 6							
	Northbound								Eastbound								Southbound							
Head	R	Clear to Phase							R	Clear to Phase							R	Clear to Phase						
Number	W	3	4	5	6	7	8	1	W	5	6	7	8	1	2	3	W	6	7	8	1	2	3	4
1	G		Y		N		Y																	
2	G		Y		N		Y																	
3	G		Y		N		Y																	
4									G		Y		N		Y									
5									G		Y		N		Y									
6									G		Y		N		Y									
7									G		Y		N		Y									
8																	G		Y		N		Y	
9																	G		Y		N		Y	
10																	G		Y		N		Y	
11																	G		Y		N		Y	
12																								
13																								
14																								
15																								
16	G		Y		N		Y																	

	Phase 8							
	Westbound							
Head	R	Clear to Phase						
Number	W	7	8	1	2	3	4	5
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12	G		Y		N		Y	
13	G		Y		N		Y	
14	G		Y		N		Y	
15	G		Y		N		Y	
16								

Chart A

Phase	Non-Conflicting Phase Allowed to Time Concurrently
2	6
4	8
6	2
8	4

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

CONTROLLER PHASING

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	17

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Northeast Type IV Signal Std Transformer Base	Vehicle Head 1	1	14 AWG 7 CONDUCTOR CABLE	67
	Vehicle Head 2	1	14 AWG 5 CONDUCTOR CABLE	55
	Vehicle Head 3	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 4	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 1	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 2	1	14 AWG 5 CONDUCTOR CABLE	17
Southeast Combo Signal Std Transformer Base	Vehicle Head 5	1	14 AWG 7 CONDUCTOR CABLE	56
	Vehicle Head 6	1	14 AWG 5 CONDUCTOR CABLE	45
	Vehicle Head 7	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 8	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 3	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 4	1	14 AWG 5 CONDUCTOR CABLE	17

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Southeast Combo Signal Std Transformer Base	Vehicle Head 9	1	14 AWG 7 CONDUCTOR CABLE	61
	Vehicle Head 10	1	14 AWG 5 CONDUCTOR CABLE	47
	Vehicle Head 11	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 12	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 5	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 6	1	14 AWG 5 CONDUCTOR CABLE	17
Northeast Combo Signal Std Transformer Base	Vehicle Head 13	1	14 AWG 7 CONDUCTOR CABLE	59
	Vehicle Head 14	1	14 AWG 5 CONDUCTOR CABLE	47
	Vehicle Head 15	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 16	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 7	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 8	1	14 AWG 5 CONDUCTOR CABLE	17

Conductor			Cable NES1 Northeast Combo Signal 12 No. 14 AWG		Cable NES2 Northeast Combo Signal 7 No. 14 AWG		Cable SES1 Southeast Combo Signal 12 No. 14 AWG		Cable SES2 Southeast Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P2	Ø2 Walk	P1	Ø8 Walk	P4	Ø4 Walk	P3	Ø2 Walk
2	White			Neutral		Neutral		Neutral		Neutral
3	Red		1, 2, 3	Ø2 Red	4	Ø4 Red	5, 6, 7	Ø4 Red	8	Ø6 Red
4	Green			Ground		Ground		Ground		Ground
5	Orange		1, 2, 3	Ø2 Yellow	4	Ø4 Yellow	5, 6, 7	Ø4 Yellow	8	Ø6 Yellow
6	Blue		1, 2, 3	Ø2 Green	4	Ø4 Green	5, 6, 7	Ø4 Green	8	Ø6 Green
7	White	Black	P2	Ø2 Don't Walk	P1	Ø8 Don't Walk	P4	Ø4 Don't Walk	P3	Ø2 Don't Walk
8	Red	Black		Spare		Spare		Spare		Spare
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black		Spare		Spare		Spare		Spare
11	Blue	Black		Spare		Spare		Spare		Spare
12	Black	White		Spare		Spare		Spare		Spare

Conductor			Cable SWS1 Southwest Combo Signal 12 No. 14 AWG		Cable SWS2 Southwest Combo Signal 12 No. 14 AWG		Cable NWS1 Northwest Combo Signal 12 No. 14 AWG		Cable NWS2 Northwest Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P6	Ø6 Walk	P5	Ø4 Walk	P8	Ø8 Walk	P7	Ø6 Walk
2	White			Neutral		Neutral		Neutral		Neutral
3	Red		9, 10, 11	Ø6 Red	12	Ø8 Red	13, 14, 15	Ø8 Red	16	Ø2 Red
4	Green			Ground		Ground		Ground		Ground
5	Orange		9, 10, 11	Ø6 Yellow	12	Ø8 Yellow	13, 14, 15	Ø8 Yellow	16	Ø2 Yellow
6	Blue		9, 10, 11	Ø6 Green	12	Ø8 Green	13, 14, 15	Ø8 Green	16	Ø2 Green
7	White	Black	P6	Ø6 Don't Walk	P5	Ø4 Don't Walk	P8	Ø8 Don't Walk	P7	Ø6 Don't Walk
8	Red	Black		Spare		Spare		Spare		Spare
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black		Spare		Spare		Spare		Spare
11	Blue	Black		Spare		Spare		Spare		Spare
12	Black	White		Spare		Spare		Spare		Spare

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

SIGNAL HEADS & CONDUCTORS

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	18

SIGNAL CABLE & CONDUIT SCHEDULE

#	RUN ITEM		CONDUIT SIZE (IN)	CONDUIT LF	CABLE Origin	CABLE Destination	# of Cables	CABLE SIZE/TYPE	Total LF	TITLE
1	Origin	Feed Point	2	Existing	Feed Point	Pull Box 4	2	UNDERGROUND CONDUCTOR NO6-TYPE RHW	340	
	Destination	Pull Box 4			Feed Point	Pull Box 4	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	170	
2	Origin	Pull Box 4	2	61	Pull Box 4	Traffic Signal Controller	2	UNDERGROUND CONDUCTOR NO6-TYPE RHW	152	
	Destination	Traffic Signal Controller			Pull Box 4	Traffic Signal Controller	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	76	
3	*Origin*	Traffic Signal Controller	3	61	Traffic Signal Controller	Pull Box 4	2	14 AWG 12 CONDUCTOR CABLE	172	SWS1, SWS2
	Destination	Pull Box 4			Traffic Signal Controller	Pull Box 4	1	VIDEO DETECTION CABLE	96	SWV
					Traffic Signal Controller	Pull Box 4	1	EMERGENCY VEHICLE DETECTOR CABLE	96	ED2
					Traffic Signal Controller	Pull Box 4	1	14 AWG 2 CONDUCTOR CABLE	96	EL6
					Traffic Signal Controller	Pull Box 4	2	16 AWG 2 CONDUCTOR CABLE	172	PB5, PB6
4	Origin	Pull Box 4	3	61	Pull Box 4	Traffic Signal Controller		SPARE CONDUIT		
	Destination	Traffic Signal Controller								
5	*Origin*	Pull Box 4	3	20	Pull Box 4	Southwest Combo Signal Std Transformer Base	1	14 AWG 12 CONDUCTOR CABLE	31	SWS1, SWS2
	Destination	Southwest Type IV Signal Std			Pull Box 4	Southwest Video Detection Unit	1	VIDEO DETECTION CABLE	81	SWV
					Pull Box 4	Southwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	73	ED2
					Pull Box 4	Southwest Emergency Preemption Lamp	1	14 AWG 2 CONDUCTOR CABLE	73	EL6
					Pull Box 4	Pushbutton 5 and Pushbutton 6	2	16 AWG 2 CONDUCTOR CABLE	68	PB5, PB6
6	*Origin*	Traffic Signal Controller	3	8	Traffic Signal Controller	Pull Box 1	1	14 AWG 12 CONDUCTOR CABLE	23	NWS1, NWS2
	Destination	Pull Box 1			Traffic Signal Controller	Pull Box 1	1	VIDEO DETECTION CABLE	23	NWV
					Traffic Signal Controller	Pull Box 1	1	EMERGENCY VEHICLE DETECTOR CABLE	23	ED4
					Traffic Signal Controller	Pull Box 1	1	14 AWG 2 CONDUCTOR CABLE	23	EL8
					Traffic Signal Controller	Pull Box 1	2	16 AWG 2 CONDUCTOR CABLE	46	PB7, PB8
					Traffic Signal Controller	Pull Box 1	1	ANTENNA CABLE	23	AC
7	*Origin*	Traffic Signal Controller	3	8	Traffic Signal Controller	Pull Box 1	4	14 AWG 12 CONDUCTOR CABLE	112	SES1, SES2, NES1, NES2
	Destination	Pull Box 1			Traffic Signal Controller	Pull Box 1	2	VIDEO DETECTION CABLE	66	SEV, NEV
					Traffic Signal Controller	Pull Box 1	2	EMERGENCY VEHICLE DETECTOR CABLE	66	ED8, ED6
					Traffic Signal Controller	Pull Box 1	2	14 AWG 2 CONDUCTOR CABLE	66	EL4, EL2
					Traffic Signal Controller	Pull Box 1	4	16 AWG 2 CONDUCTOR CABLE	112	PB3, PB4, PB1, PB2
8	*Origin*	Traffic Signal Controller	3	8	Traffic Signal Controller	Pull Box 1		SPARE CONDUIT		
	Destination	Pull Box 1								
9	*Origin*	Pull Box 1	3	7	Pull Box 1	Northwest Combo Signal Std Transformer Base	1	14 AWG 12 CONDUCTOR CABLE	18	NWS1, NWS2
	Destination	Northwest Type IV Signal Std			Pull Box 1	Northwest Video Detection Unit	1	VIDEO DETECTION CABLE	67	NWV
					Pull Box 1	Northwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	61	ED4
					Pull Box 1	Northwest Emergency Preemption Lamp	1	14 AWG 2 CONDUCTOR CABLE	61	EL8
					Pull Box 1	Wi-Fi Antenna 5 GHz	1	ANTENNA CABLE	63	AC
10	*Origin*	Pull Box 4	2	16	Pull Box 4	Pushbutton 7 and Pushbutton 8	2	16 AWG 2 CONDUCTOR CABLE	60	PB7, PB8
	Destination	Northwest Pushbutton Post								
11	*Origin*	Pull Box 1	3	95	Pull Box 1	Pull Box 2	4	14 AWG 12 CONDUCTOR CABLE	448	SES1, SES2, NES1, NES2
	Destination	Pull Box 2			Pull Box 1	Pull Box 2	2	VIDEO DETECTION CABLE	234	SEV, NEV
					Pull Box 1	Pull Box 2	2	EMERGENCY VEHICLE DETECTOR CABLE	234	ED8, ED6
					Pull Box 1	Pull Box 2	2	14 AWG 2 CONDUCTOR CABLE	234	EL4, EL2
					Pull Box 1	Pull Box 2	4	16 AWG 2 CONDUCTOR CABLE	448	PB3, PB4, PB1, PB2
12	*Origin*	Pull Box 1	3	95	Pull Box 1	Pull Box 2		SPARE CONDUIT		
	Destination	Pull Box 2								
13	*Origin*	Pull Box 2	2	16	Pull Box 2	Pushbutton 1	1	16 AWG 2 CONDUCTOR CABLE	30	PB1
	Destination	Northeast Pushbutton Post								
14	*Origin*	Pull Box 2	3	6	Pull Box 2	Northeast Combo Signal Std Transformer Base	1	14 AWG 12 CONDUCTOR CABLE	17	NES1, NES2
	Destination	Northeast Type IV Signal Std			Pull Box 2	Northeast Video Detection Unit	1	VIDEO DETECTION CABLE	74	NEV
					Pull Box 2	Northeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	66	ED6
					Pull Box 2	Northeast Emergency Preemption Lamp	1	14 AWG 2 CONDUCTOR CABLE	66	EL2
					Pull Box 2	Pushbutton 2	1	16 AWG 2 CONDUCTOR CABLE	20	PB2
15	*Origin*	Pull Box 2	3	68	Pull Box 2	Pull Box 3	2	14 AWG 12 CONDUCTOR CABLE	160	SES1, SES2
	Destination	Pull Box 3			Pull Box 2	Pull Box 3	1	VIDEO DETECTION CABLE	80	SEV
					Pull Box 2	Pull Box 3	1	EMERGENCY VEHICLE DETECTOR CABLE	80	ED8
					Pull Box 2	Pull Box 3	1	14 AWG 2 CONDUCTOR CABLE	80	EL4
					Pull Box 2	Pull Box 3	2	16 AWG 2 CONDUCTOR CABLE	160	PB3, PB4
16	Origin	Pull Box 2	3	68	Pull Box 2	Pull Box 3		SPARE CONDUIT		
	Destination	Pull Box 3			Pull Box 2	Pull Box 3				
17	*Origin*	Pull Box 3	3	6	Pull Box 3	Southeast Combo Signal Std Transformer Base	2	14 AWG 12 CONDUCTOR CABLE	34	SES1, SES2
	Destination	Southeast Combo Signal Std			Pull Box 3	Southeast Video Detection Unit	1	VIDEO DETECTION CABLE	63	SEV
					Pull Box 3	Southeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	55	ED8
					Pull Box 3	Southeast Emergency Preemption Lamp	1	14 AWG 2 CONDUCTOR CABLE	55	EL4
18	*Origin*	Pull Box 3	2	23	Pull Box 3	Pushbutton 3 and Pushbutton 4	2	16 AWG 2 CONDUCTOR CABLE	74	PB3, PB4
	Destination	Southeast Pushbutton Post								

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BURDICK EXPY & VALLEY STREET

SITE 2
BURDICK EXPY & 3RD ST SE

CABLE SCHEDULE

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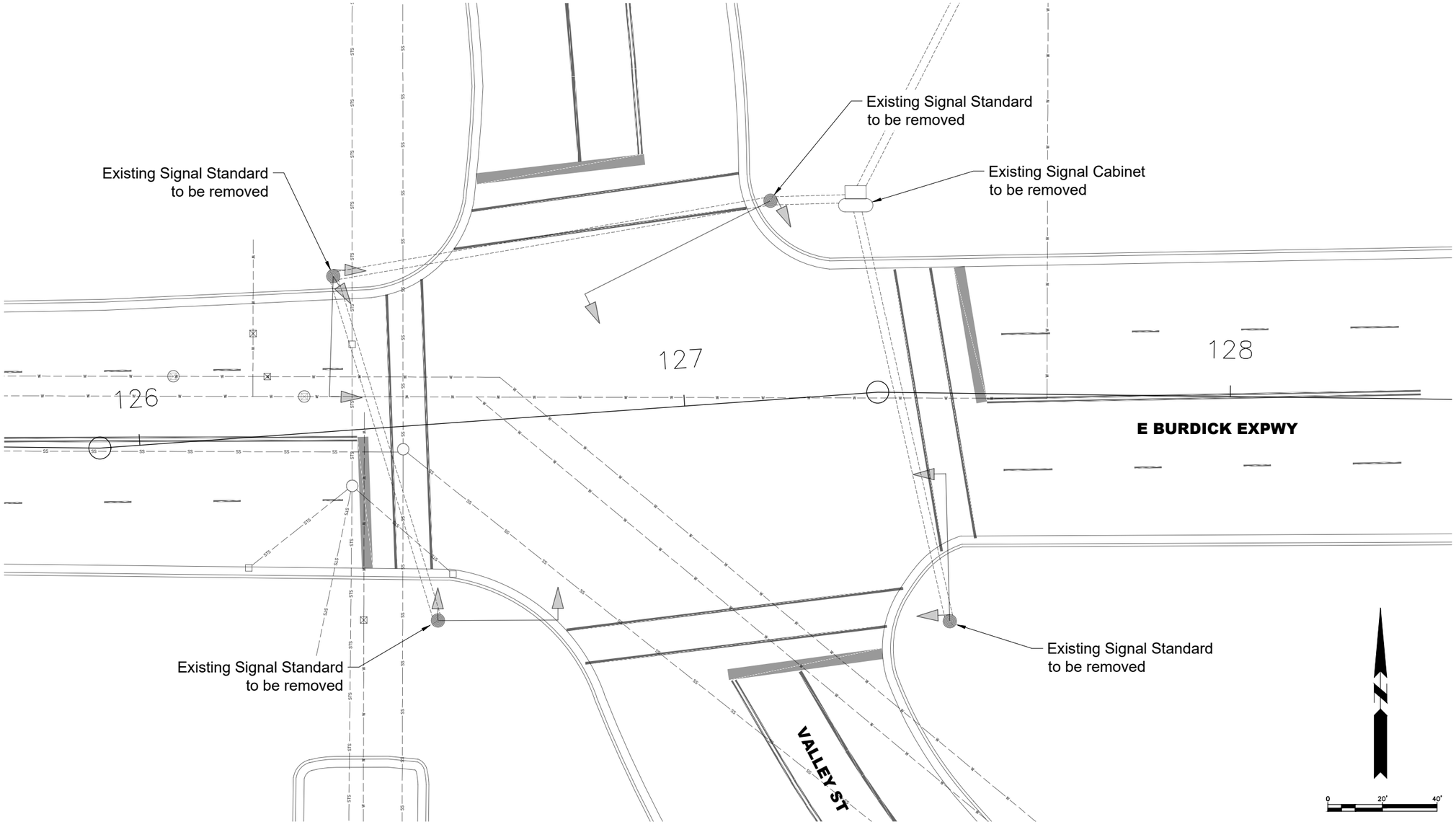
	ND	NHU-4-002(131)906	150	19



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8/11/2020

LEGEND

- Signal Pole/Foundation
- Signal controller

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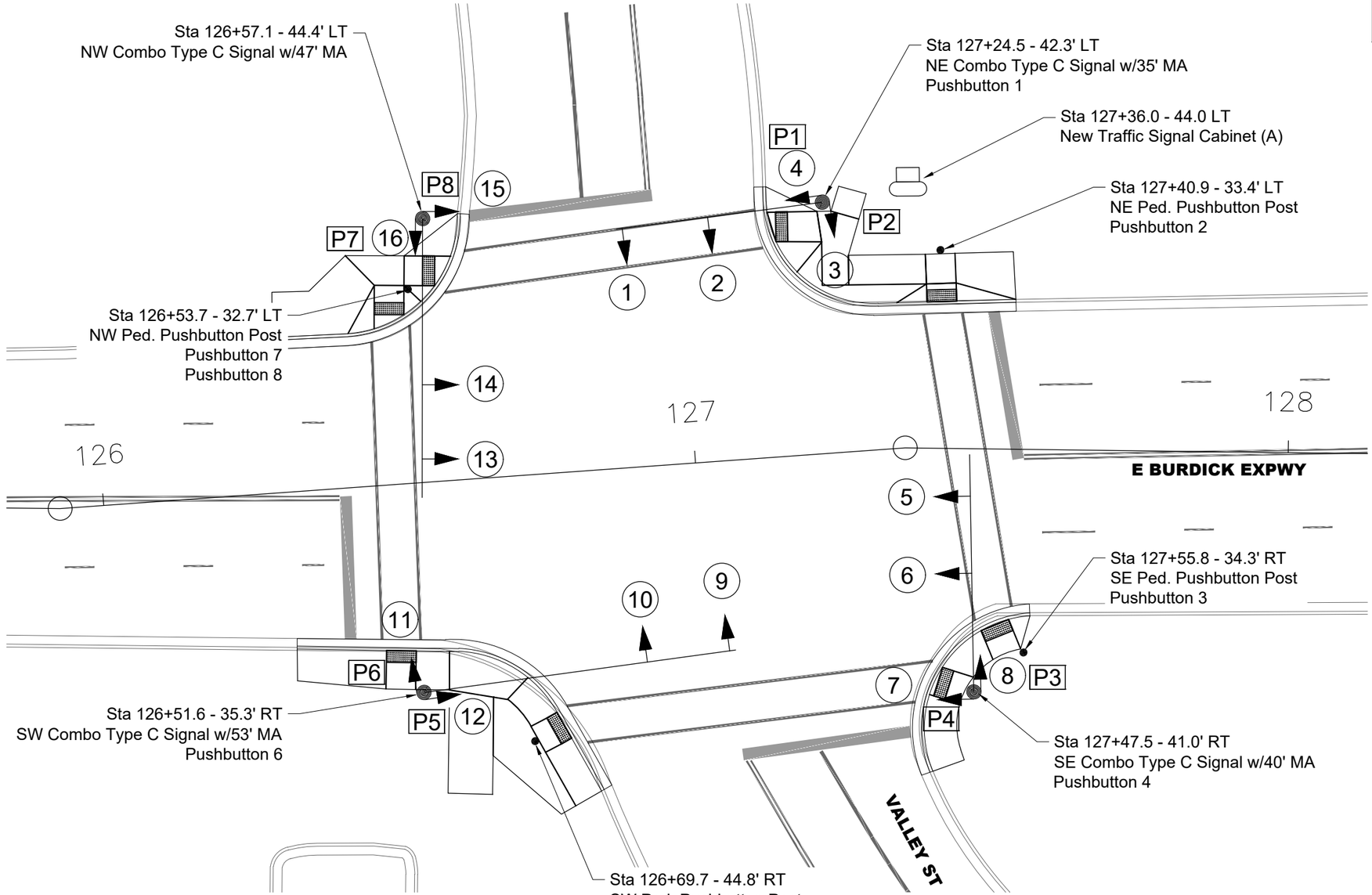
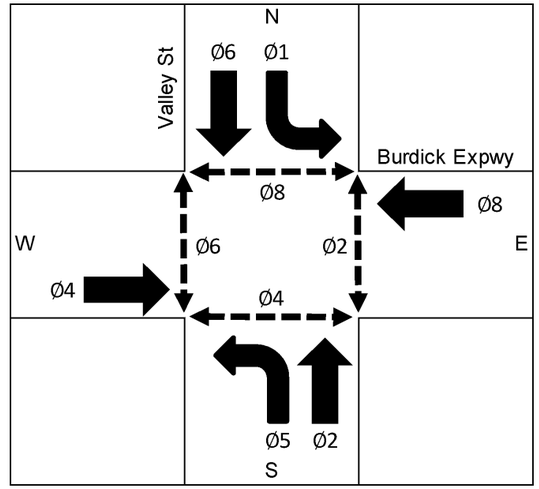
BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

REMOVALS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	20

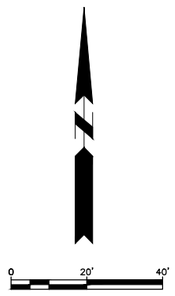




Pedestrian Pushbutton Schedule

Location	Pushbutton & Sign Location on Pole	Direction of Arrow on Sign
Pushbutton 1	South	Left
Pushbutton 2	West	Right
Pushbutton 3	West	Left
Pushbutton 4	North	Right
Pushbutton 5	North	Left
Pushbutton 6	West	Left
Pushbutton 7	West	Right
Pushbutton 8	North	Left

Sign R10-3e



(A) Face Cabinet door North

LEGEND

- Signal Pole/Foundation
- Signal Controller
- Signal Head
- P1 Pedestrian Signal Head

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

TRAFFIC SIGNAL LAYOUT

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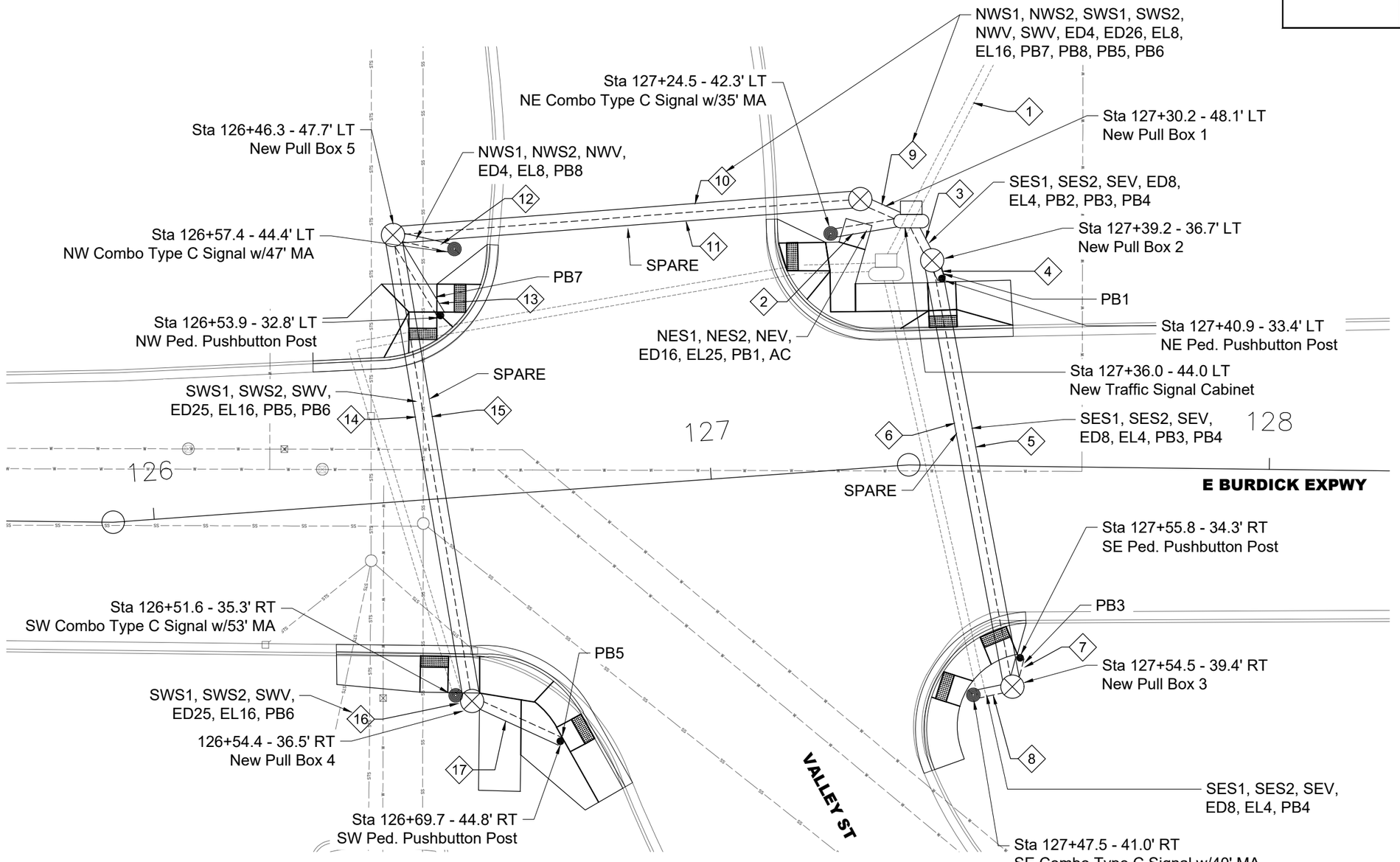
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	21



NWS1 = Northwest Combo Signal Standard 1
NWS2 = Northwest Combo Signal Standard 2
NES1 = Northeast Combo Signal Standard 1
NES2 = Northeast Combo Signal Standard 2
SES1 = Southeast Combo Signal Standard 1
SES2 = Southeast Combo Signal Standard 2
SWS1 = Southwest Combo Signal Standard 1
SWS2 = Southwest Combo Signal Standard 2
NWV = Northwest Video Detection Unit
NEV = Northeast Video Detection Unit
SEV = Southeast Video Detection Unit
SWV = Southwest Video Detection Unit
ED16 = Ø1 + Ø6 EVP Detection Unit
ED25 = Ø2 + Ø5 EVP Detection Unit
ED4 = Ø4 EVP Detection Unit
ED8 = Ø8 EVP Detection Unit
EL16 = Ø1 + Ø6 EVP Light
EL25 = Ø2 + Ø5 EVP Light
EL4 = Ø4 EVP Light
EL8 = Ø8 EVP Light
PB1 = Pushbutton 1
PB2 = Pushbutton 2
PB3 = Pushbutton 3
PB4 = Pushbutton 4
PB5 = Pushbutton 5
PB6 = Pushbutton 6
PB7 = Pushbutton 7
PB8 = Pushbutton 8
AC = Antenna Cable

LEGEND

- Signal Pole/Foundation
- Signal Controller
- Pullbox
- Conduit Run

0 20' 40'

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

CONDUIT & CONDUCTOR LAYOUT

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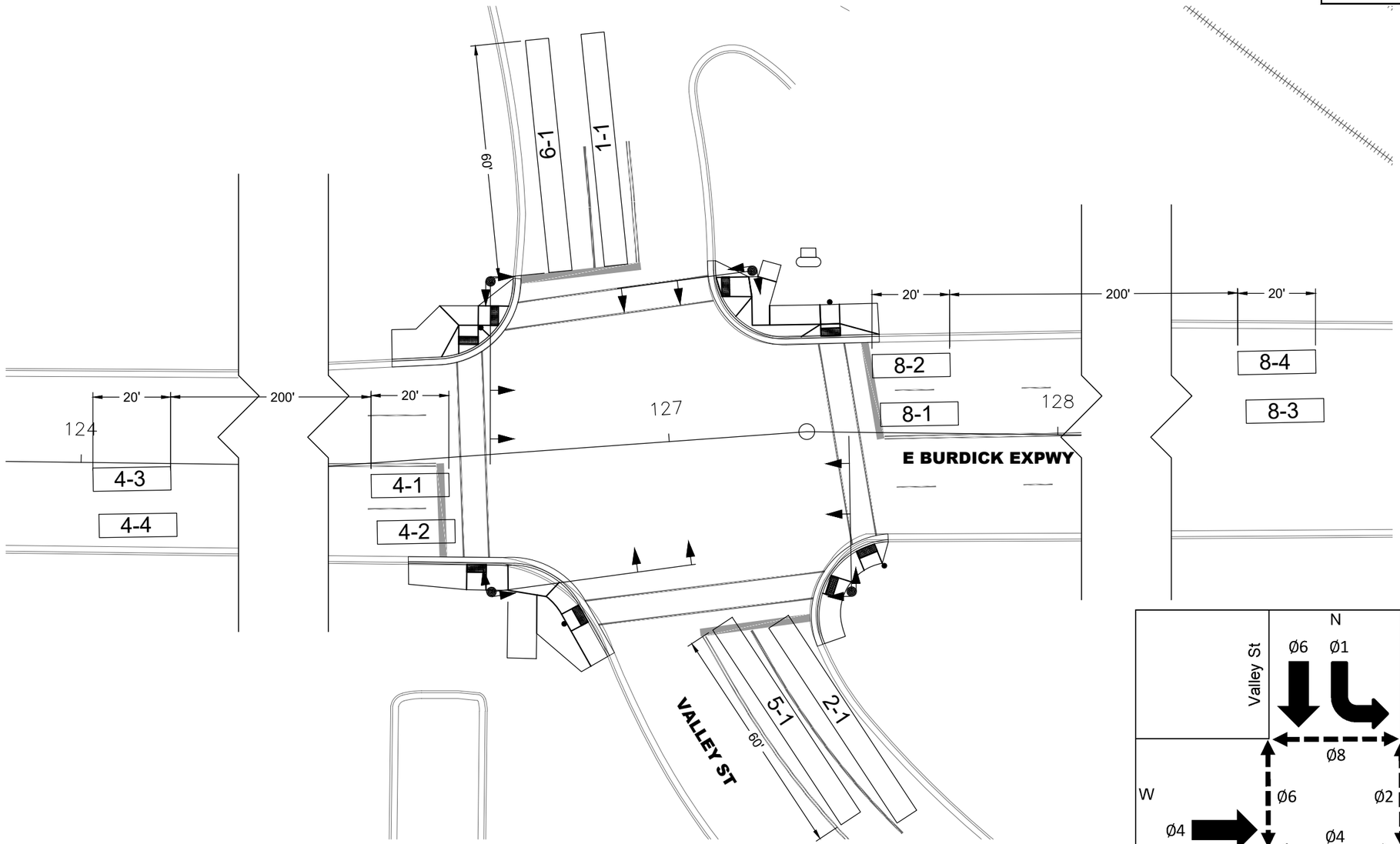
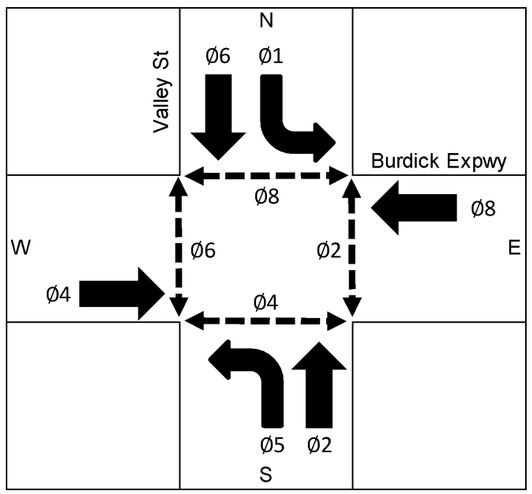
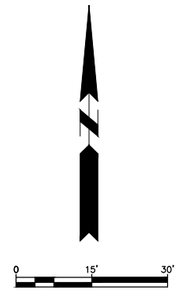
ND	NHU-4-002(131)906	150	22

Phase Number	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
4-1	0	20			X		X
4-2	0	20			X		X
4-3	220	20		X		X	
4-4	220	20		X		X	
5-1	0	60			X		X
6-1	0	60			X		X
8-1	0	20			X		X
8-2	0	20			X		X
8-3	220	20		X		X	
8-4	220	20		X		X	







Notes: 1. The final size of all detection zones shall be as recommended by the video detection manufacturer.

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

VIDEO DETECTION ZONE LAYOUT

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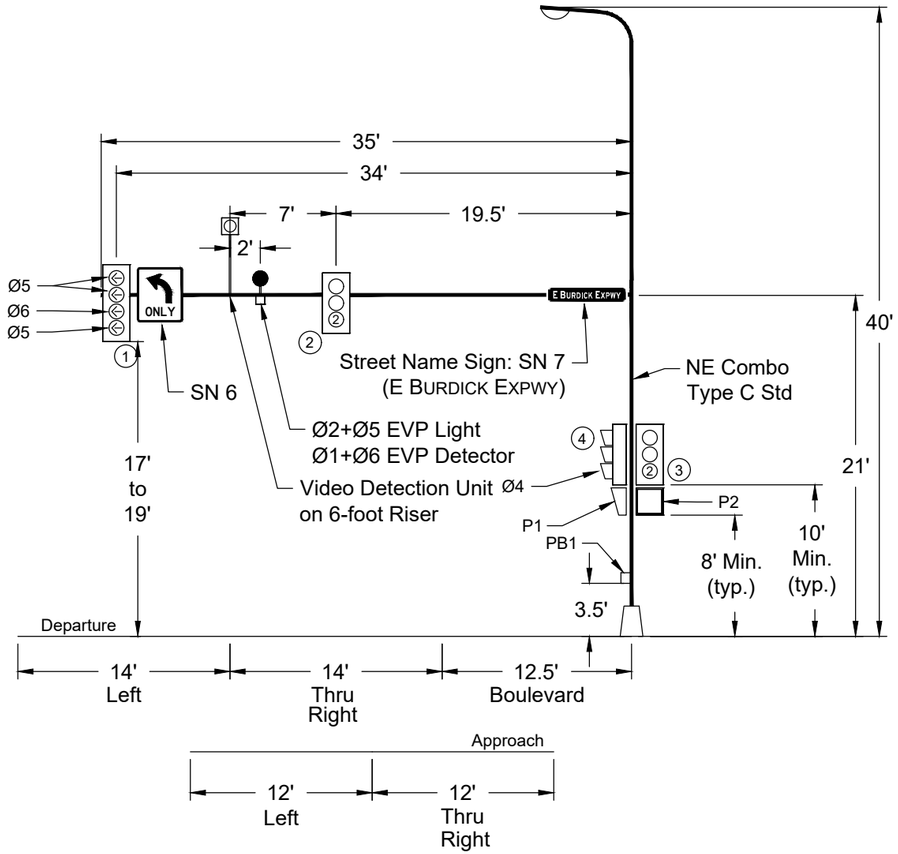
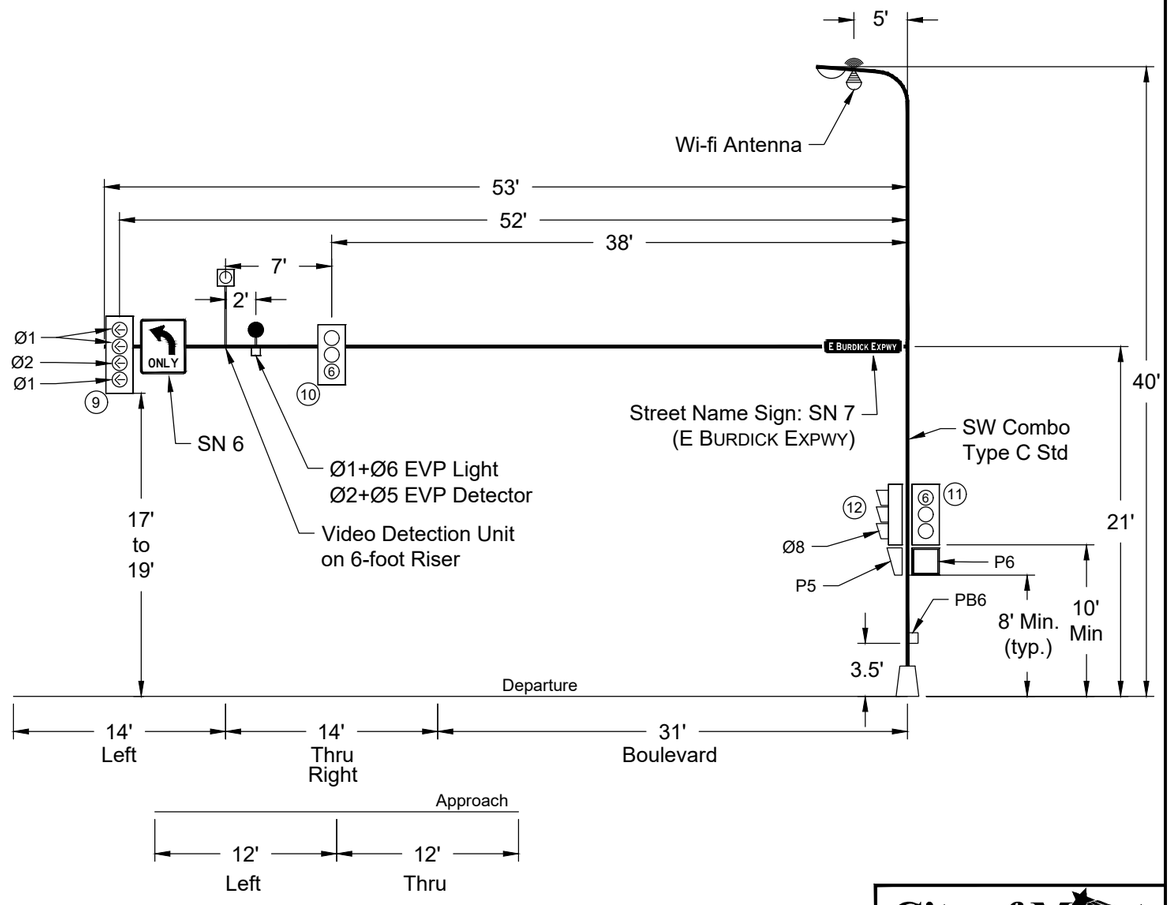
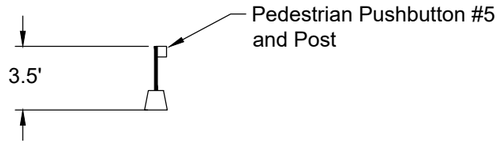
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	23



Northbound



Southbound



Note: Install Wi-fi equipment at 40' mounting height on the light standard.

LEGEND

- Wi-fi Antenna
- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- Signal Head Number
- EVP Light
- EVP Detector

0 10' 20'

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

SIGNAL STANDARDS & HEAD LOCATIONS

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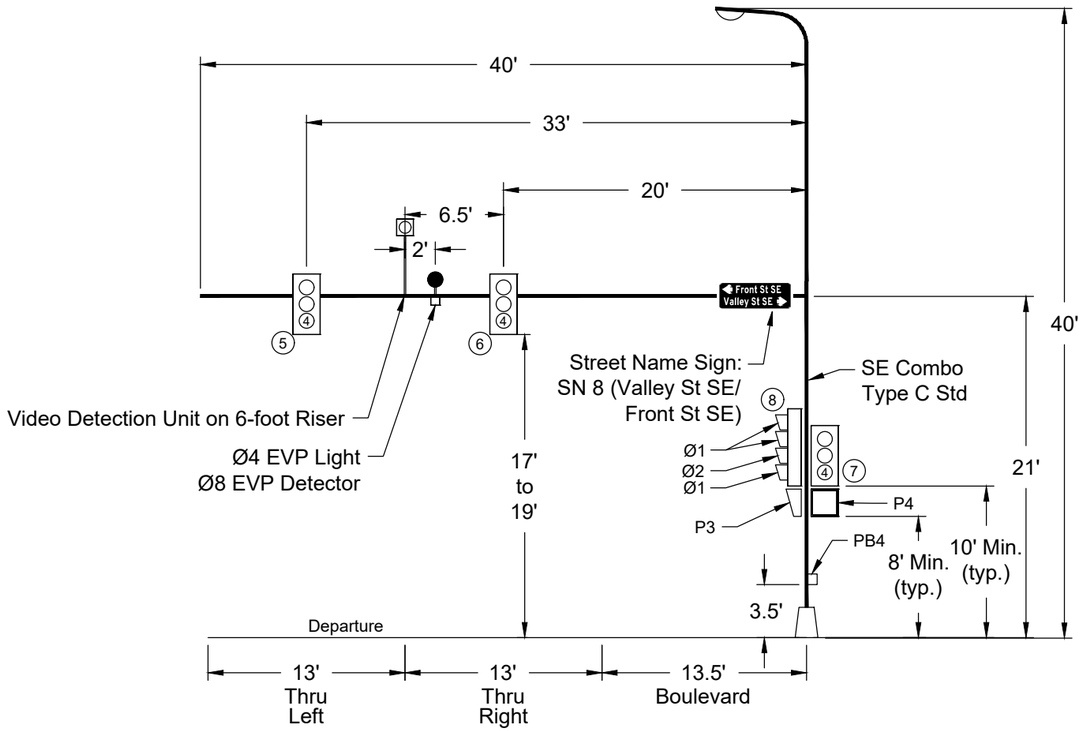
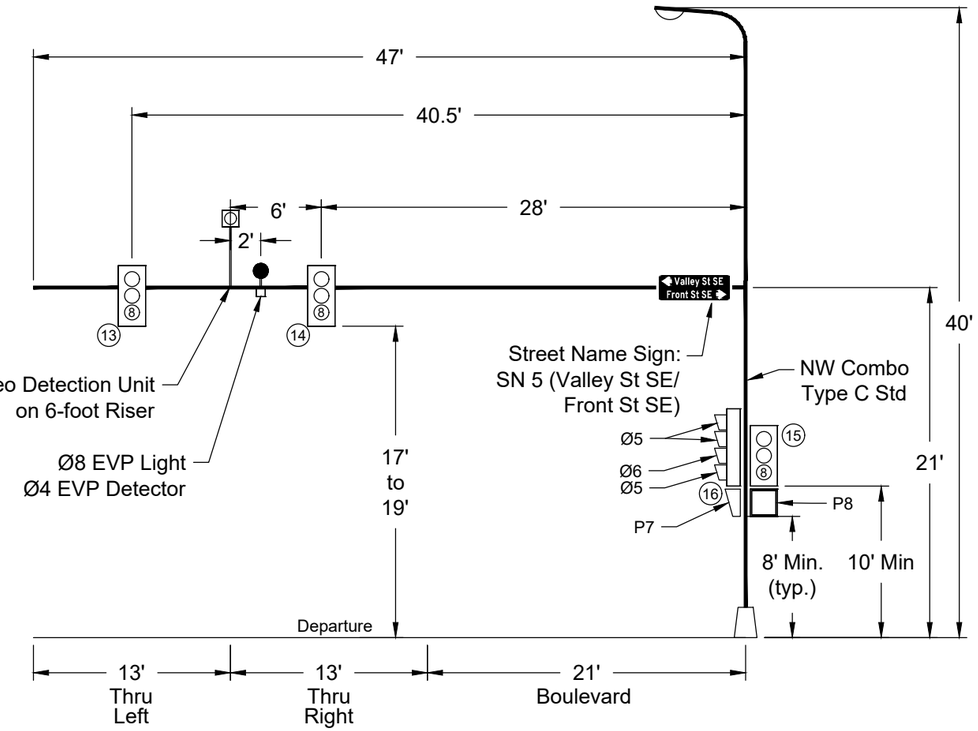
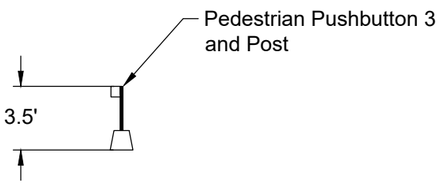
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	24

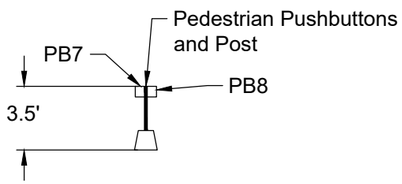


Eastbound



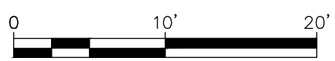
Westbound





LEGEND

- Video Detection Camera
- Traffic Signal Head w/associated phase
- Traffic Signal Head w/associated phase
- Signal Head Number
- EVP Light
- EVP Detector



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Engineering Dept

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

SIGNAL STANDARDS & HEAD LOCATIONS

P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg
8/11/2020

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	25

	Phase 1								Phase 2								Phase 3								Phase 4							
	Southbound Left								Northbound								Future								Eastbound							
Head Number	R W	Clear to Phase 2	3	4	5	6	7	8	R W	Clear to Phase 3	4	5	6	7	8	1	R W	Clear to Phase 4	5	6	7	8	1	2	R W	Clear to Phase 5	6	7	8	1	2	3
1																																
2									G		Y	N	N		Y	Y																
3									G		Y	N	N		Y	Y																
4																									G	Y	Y		N	Y	Y	
5																									G	Y	Y		N	Y	Y	
6																									G	Y	Y		N	Y	Y	
7																									G	Y	Y		N	Y	Y	
8	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
9	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
10																																
11																																
12																																
13																																
14																																
15																																
16																																

	Phase 5								Phase 6								Phase 7								Phase 8							
	Northbound Left								Southbound								Future								Westbound							
Head Number	R W	Clear to Phase 6	7	8	1	2	3	4	R W	Clear to Phase 7	8	1	2	3	4	5	R W	Clear to Phase 8	1	2	3	4	5	6	R W	Clear to Phase 1	2	3	4	5	6	7
1	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10									G		Y	N	N		Y	Y																
11									G		Y	N	N		Y	Y																
12																									G	Y	Y		N	Y	Y	
13																									G	Y	Y		N	Y	Y	
14																									G	Y	Y		N	Y	Y	
15																									G	Y	Y		N	Y	Y	
16	GL	YL		YL	N	N		YL	FYA		YL	N	N		YL	YL																

Blank Spares Denote a 'Red" Indication
G = Green Ball Indication
Y = Yellow Ball Indication
GL = Green Left Arrow Indication
YL = Yellow Left Arrow Indication
GR = Green Right Arrow Indication
YR = Yellow Right Arrow Indication
FYA = Flashing Yellow Left Arrow Indication

N = Continue to Display Right-of-Way Indication. When any phase is on alone, any non-conflicting phase may start timing without a clearance interval. See Chart A.

Do not allow Flashing Yellow Arrow (FYA) during Emergency Vehicle Preemption for Phases 2, 4, 6 and 8.

Emergency Vehicle Preemption Controller Settings

	Phase 2								Phase 4								Phase 6								Phase 8							
	Northbound								Eastbound								Southbound								Westbound							
Head Number	R W	Clear to Phase 3	4	5	6	7	8	1	R W	Clear to Phase 5	6	7	8	1	2	3	R W	Clear to Phase 7	8	1	2	3	4	5	R W	Clear to Phase 1	2	3	4	5	6	7
1	GL		YL	N	N		YL	YL																								
2	G		Y	N	N		Y	Y																								
3	G		Y	N	N		Y	Y																								
4									G	Y	Y		N	Y	Y														N	Y	Y	
5									G	Y	Y		N	Y	Y														N	Y	Y	
6									G	Y	Y		N	Y	Y														N	Y	Y	
7									G	Y	Y		N	Y	Y														N	Y	Y	
8																	GL		YL	N	N		YL	YL								
9																	GL		YL	N	N		YL	YL								
10																	G		Y	N	N		Y	Y								
11																	G		Y	N	N		Y	Y								
12																									G	Y	Y		N	Y	Y	
13																									G	Y	Y		N	Y	Y	
14																									G	Y	Y		N	Y	Y	
15																									G	Y	Y		N	Y	Y	
16	GL		YL	N	N		YL	YL																								

Chart A	
Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	5, 6
2	5, 6
4	8
5	1, 2
6	1, 2
8	4

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

CONTROLLER PHASING

8/11/2020 P:\PROJECTS\4394 — Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	26

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Northeast Combo Signal Std Transformer Base	Vehicle Head 1	1	14 AWG 7 CONDUCTOR CABLE	63
	Vehicle Head 2	1	14 AWG 5 CONDUCTOR CABLE	49
	Vehicle Head 3	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 4	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 1	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 2			
Southeast Type IV Signal Std Transformer Base	Vehicle Head 5	1	14 AWG 7 CONDUCTOR CABLE	62
	Vehicle Head 6	1	14 AWG 5 CONDUCTOR CABLE	49
	Vehicle Head 7	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 8	1	14 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 9	1	14 AWG 7 CONDUCTOR CABLE	81
	Pedestrian Head 2	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 3	1	14 AWG 5 CONDUCTOR CABLE	17

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Southeast Combo Signal Std Transformer Base	Vehicle Head 10	1	14 AWG 7 CONDUCTOR CABLE	67
	Vehicle Head 11	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 12	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 13	1	14 AWG 7 CONDUCTOR CABLE	70
	Pedestrian Head 4	1	14 AWG 5 CONDUCTOR CABLE	17
	Pedestrian Head 5	1	14 AWG 5 CONDUCTOR CABLE	17
Northeast Combo Signal Std Transformer Base	Vehicle Head 14	1	14 AWG 7 CONDUCTOR CABLE	57
	Vehicle Head 15	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 16	1	14 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 17	1	14 AWG 7 CONDUCTOR CABLE	5
	Vehicle Head 18	1	14 AWG 7 CONDUCTOR CABLE	5
	Pedestrian Head 6	1	14 AWG 5 CONDUCTOR CABLE	17

Conductor			Cable NES1 Northeast Combo Signal 12 No. 14 AWG		Cable NES2 Northeast Combo Signal 12 No. 14 AWG		Cable SES1 Southeast Combo Signal 12 No. 14 AWG		Cable SES2 Southeast Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P2	Ø2 Walk	P1	Ø8 Walk	P4	Ø4 Walk	P3	Ø2 Walk
2	White			Neutral		Spare		Neutral		Spare
3	Red		2, 3	Ø2 Red	4	Ø4 Red	5, 6, 7	Ø4 Red		Spare
4	Green			Ground		Spare		Ground		Spare
5	Orange		2, 3	Ø2 Yellow	4	Ø4 Yellow	5, 6, 7	Ø4 Yellow		Spare
6	Blue		2, 3	Ø2 Green	4	Ø4 Green	5, 6, 7	Ø4 Green		Spare
7	White	Black	P2	Ø2 Don't Walk	P1	Ø8 Don't Walk	P4	Ø4 Don't Walk	P3	Ø2 Don't Walk
8	Red	Black	1	Ø5 Red ←		Spare		Spare	8	Ø1 Red ←
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black	1	Ø5 Yellow ←		Spare		Spare	8	Ø1 Yellow ←
11	Blue	Black	1	Ø5 Green ←		Spare		Spare	8	Ø1 Green ←
12	Black	White	1	Ø6 FYA ←		Spare		Spare	8	Ø2 FYA ←

Conductor			Cable SWS1 Southwest Combo Signal 12 No. 14 AWG		Cable SWS2 Southwest Combo Signal 12 No. 14 AWG		Cable NWS1 Northwest Combo Signal 12 No. 14 AWG		Cable NWS2 Northwest Combo Signal 12 No. 14 AWG	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		P6	Ø6 Walk	P5	Ø4 Walk	P8	Ø8 Walk	P7	Ø6 Walk
2	White			Neutral		Spare		Neutral		Spare
3	Red		10, 11	Ø6 Red	12	Ø8 Red	13, 14, 15	Ø8 Red		Spare
4	Green			Ground		Spare		Ground		Spare
5	Orange		10, 11	Ø6 Yellow	12	Ø8 Yellow	13, 14, 15	Ø8 Yellow		Spare
6	Blue		10, 11	Ø6 Green	12	Ø8 Green	13, 14, 15	Ø8 Green		Spare
7	White	Black	P6	Ø6 Don't Walk	P5	Ø4 Don't Walk	P8	Ø8 Don't Walk	P7	Ø6 Don't Walk
8	Red	Black	9	Ø1 Red ←		Spare		Spare	16	Ø5 Red ←
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black	9	Ø1 Yellow ←		Spare		Spare	16	Ø5 Yellow ←
11	Blue	Black	9	Ø1 Green ←		Spare		Spare	16	Ø5 Green ←
12	Black	White	9	Ø2 FYA ←		Spare		Spare	16	Ø6 FYA ←

City of Minot
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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

SIGNAL HEADS & CONDUCTORS

8/11/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	27

SIGNAL CABLE & CONDUIT SCHEDULE

#	RUN ITEM		CONDUIT SIZE (IN)	CONDUIT LF	CABLE Origin	CABLE Destination	CABLE # of Cables	CABLE SIZE/TYPE	CABLE Total LF	CABLE TITLE
1	Origin Destination	Feed Point Traffic Signal Controller	2	Existing	Feed Point Feed Point	Traffic Signal Controller Traffic Signal Controller	2 1	UNDERGROUND CONDUCTOR NO6-TYPE RHW UNDERGROUND CONDUCTOR NO6-TYPE THW	Existing Existing	
2	*Origin* *Destination*	Traffic Signal Controller Northeast Type IV Signal Std	3	12	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Northeast Type IV Signal Std Transformer Base Northeast Video Detection Unit Northeast Emergency Preemption Detector Northeast Emergency Preemption Lamp Pushbutton 1 Wi-fi Antenna 5 GHz	2 1 1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE ANTENNA CABLE	52 77.5 69.5 69.5 29 71	NES1, NES2 NEV ED16 EL25 PB1 AC
3	*Origin* *Destination*	Traffic Signal Controller Pull Box 2	3	9	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2	2 1 1 1 3	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	48 24 24 24 72	SES1, SES2 SEV ED8 EL4 PB2, PB3, PB4
4	*Origin* *Destination*	Pull Box 2 Northeast Pushbutton Post	2	4	Pull Box 2	Pushbutton 2	1	16 AWG 2 CONDUCTOR CABLE	18	PB2
5	*Origin* *Destination*	Pull Box 2 Pull Box 3	3	88	Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2 Pull Box 2	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	200 100 100 100 200	SES1, SES2 SEV ED8 EL4 PB3, PB4
6	*Origin* *Destination*	Pull Box 2 Pull Box 3	3	88	Pull Box 2	Pull Box 3		SPARE CONDUIT		
7	*Origin* *Destination*	Pull Box 3 Southeast Pushbutton Post	2	6	Pull Box 3	Pushbutton 3	1	16 AWG 2 CONDUCTOR CABLE	20	PB3
8	*Origin* *Destination*	Pull Box 3 Southeast Combo Signal Std	3	8	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	Southeast Combo Signal Std Transformer Base Southeast Video Detection Unit Southeast Emergency Preemption Detector Southeast Emergency Preemption Lamp Pushbutton 4	2 1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	38 89 81 81 22	SES1, SES2 SEV ED8 EL4 PB4
9	*Origin* *Destination*	Traffic Signal Controller Pull Box 1	3	13	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	4 2 2 2 4	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	112 56 56 56 112	NWS1, NWS2, SWS1, SWS2 NWV, SWV ED4, ED26 EL8, EL16 PB7, PB8, PB5, PB6
10	*Origin* *Destination*	Pull Box 1 Pull Box 5	3	84	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5	4 2 2 2 4	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	384 192 192 192 384	NWS1, NWS2, SWS1, SWS2 NWV, SWV ED4, ED26 EL8, EL16 PB7, PB8, PB5, PB6
11	*Origin* *Destination*	Pull Box 1 Pull Box 5	3	84	Pull Box 1	Pull Box 5		SPARE CONDUIT		
12	*Origin* *Destination*	Pull Box 5 Northwest Combo Signal Std	3	12	Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5	Northwest Combo Signal Std Transformer Base Northwest Video Detection Unit Northwest Emergency Preemption Detector Northwest Emergency Preemption Lamp Pushbutton 8	2 1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	46 82 74 74 26	NWS1, NWS2 NWV ED4 EL8 PB8
13	*Origin* *Destination*	Pull Box 5 Northwest Pushbutton Post	2	12	Pull Box 5	Pushbutton 7	1	16 AWG 2 CONDUCTOR CABLE	26	PB3
14	*Origin* *Destination*	Pull Box 5 Pull Box 4	3	85	Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5	Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4 Pull Box 4	2 1 1 1 2	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	194 97 97 97 194	SWS1, SWS2 SWV ED25 EL16 PB5, PB6
15	*Origin* *Destination*	Pull Box 5 Pull Box 4	3	85	Pull Box 5	Pull Box 4		SPARE CONDUIT		
16	*Origin* *Destination*	Pull Box 5 Southwest Combo Signal Std	3	4	Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5 Pull Box 5	Southwest Combo Signal Std Transformer Base Southwest Video Detection Unit Southwest Emergency Preemption Detector Southwest Emergency Preemption Lamp Pushbutton 6	2 1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	30 62 61 61 18	SWS1, SWS2 SWV ED25 EL16 PB6
17	*Origin* *Destination*	Pull Box 4 Southwest Pushbutton Post	2	18	Pull Box 4	Pushbutton 5	1	16 AWG 2 CONDUCTOR CABLE	32	PB5

City of Minot
Engineering Dept

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BURDICK EXPY & VALLEY STREET

SITE 3
BURDICK EXPY & VALLEY ST

CABLE SCHEDULE

6/17/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

ITEM DESCRIPTION	UNIT	Site 1	Site 2	Site 3
CONCRETE FOUNDATION-TRAFFIC SIGNALS	EA	2	4	4
CONCRETE FOUNDATION-FEED POINT-TYPE B	EA	1	1	1
PULLBOX	EA	4	4	5
2IN DIAMETER RIGID CONDUIT	LF	-	116	40
3IN DIAMETER RIGID CONDUIT	LF	449	511	572
UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	-	492	-
UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	-	246	-
EMERGENCY VEHICLE DETECTOR CABLE	LF	655	754	755
NO16 AWG 2 CONDUCTOR CABLE	LF	990	1,190	1,153
NO14 AWG 2 CONDUCTOR CABLE	LF	949	754	755
NO14 AWG 5 CONDUCTOR CABLE	LF	511	410	320
NO14 AWG 7 CONDUCTOR CABLE	LF	184	323	450
NO14 AWG 12 CONDUCTOR CABLE	LF	966	1,015	1,104
TYPE IV SIGNAL STD 44FT MA	EA	-	1	-
COMBO 33FT MA SIG & LT STD-TYPE C	EA	1	-	-
COMBO 34FT MA SIG & LT STD-TYPE C	EA	-	1	-
COMBO 35FT MA SIG & LT STD-TYPE C	EA	-	-	1
COMBO 36FT MA SIG & LT STD-TYPE C	EA	-	1	-
COMBO 38FT MA SIG & LT STD-TYPE C	EA	1	-	-
COMBO 40FT MA SIG & LT STD-TYPE C	EA	-	1	1
COMBO 47FT MA SIG & LT STD-TYPE C	EA	-	-	1
COMBO 53FT MA SIG & LT STD-TYPE C	EA	-	-	1
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	6	8	6
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	6	8	6
1-WAY 4 SEC HEAD W/12IN LENS-POST MTD	EA	2	-	2
1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	EA	2	-	2
PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	EA	8	8	8
PEDESTRIAN PUSHBUTTON POST	EA	-	3	2
PEDESTRIAN PUSHBUTTON & SIGN	EA	8	8	8
STEEL ENCASED CONCRETE POST	EA	-	4	-
YELLOW POLYETHYLENE COVER-4'X6'	EA	-	4	-
VIDEO DETECTION CABLE	LF	393	784	780
VIDEO DETECTION SYSTEM (A)	EA	1	1	1
CONTROLLER TYPE 1 (B)	EA	1	1	1
BATTERY BACKUP SYSTEM	EA	1	1	1
EMERGENCY VEHICLE PRE-EMPTION UNIT (C)	EA	4	4	4
REMOVE COMBINATION SIGNAL & LIGHT STANDARDS	EA	2	3	3
REMOVE TRAFFIC SIGNAL STANDARD	EA	-	1	1
REMOVE TRAFFIC SIGNAL CONTROLLER	EA	1	1	1
REMOVE CONCRETE FOUNDATIONS	EA	2	4	4
PAINT COMBINATION MA SIGNAL & LIGHT STD	EA	2	-	-

(A) Includes cameras, video monitor, access point and all other equipment required for a fully operational video detection system.

(B) Includes cabinet, working slab, conflict monitor, load switches, flashers, bus interface units and all other equipment required for a fully operational traffic signal controller.

(C) Includes detectors, lights and all other equipment required for a fully operation preemption system.

Items shown above are for informational purposes, contractor shall provide all labor and equipment necessary for the signal systems to be fully operational as shown in the plans.

Items shall be included in the corresponding price bid "TRAFFIC SIGNAL SYSTEM - SITE ()"

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	28

772	9811	TRAFFIC SIGNAL SYSTEM-SITE 1	1 EA
772	9812	TRAFFIC SIGNAL SYSTEM-SITE 2	1 EA
772	9813	TRAFFIC SIGNAL SYSTEM-SITE 3	1 EA

City of Minot
Engineering Dept

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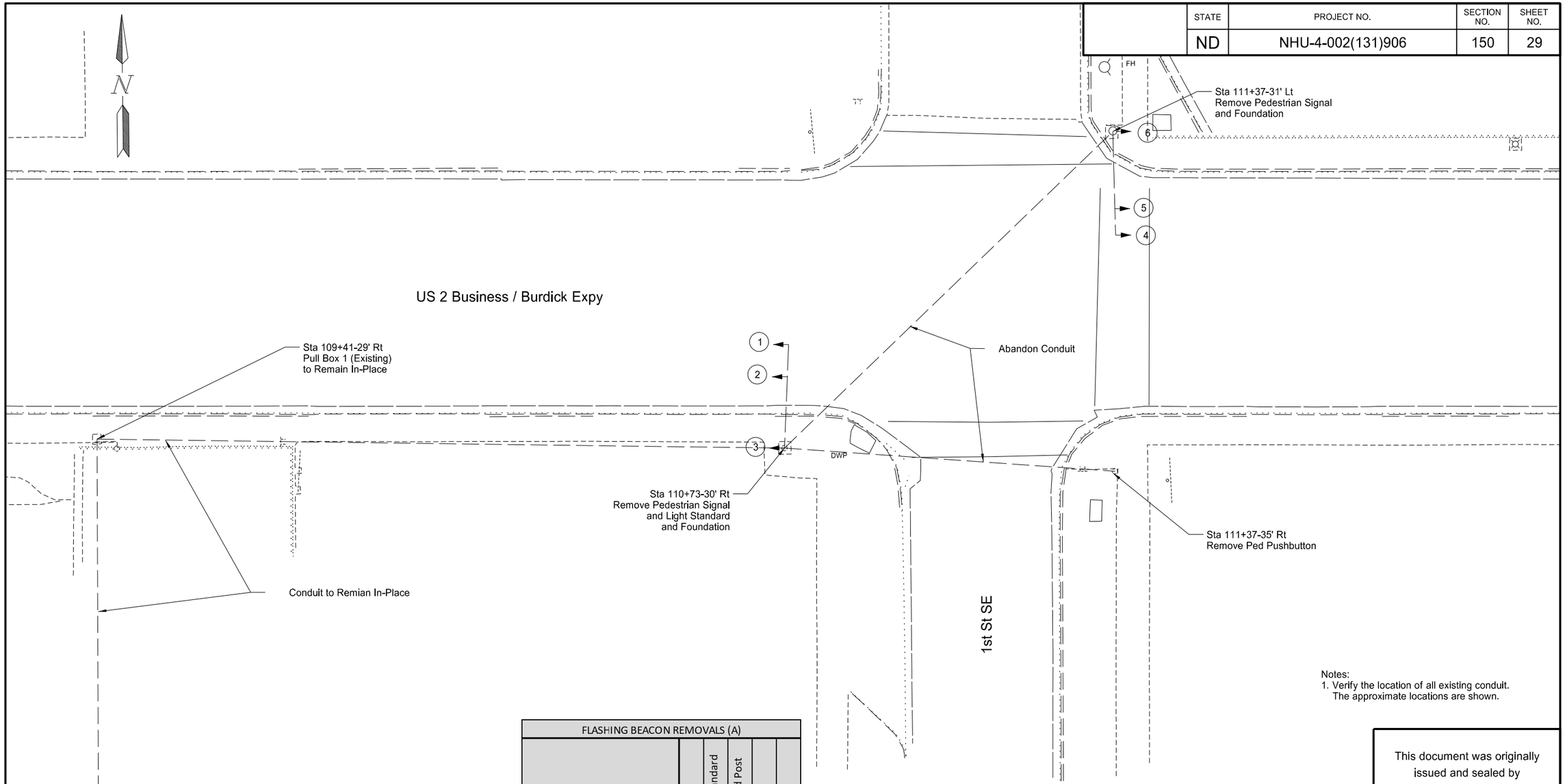
BURDICK EXPY & VALLEY STREET

ALL SITES

QUANTITY SUMMARY

8/11/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	29



FLASHING BEACON REMOVALS (A)					
LOCATION	Remove Type IV Signal Standard (EA)	Remove Combo Signal and Light Standard (EA)	Remove Pedestrian Pushbutton and Post (EA)	Abandon Conduit (LF)	Remove Flasher Cabinet (EA)
TOTAL	1	1	1	152	1

(A) Do not bid items seperately but include in the item "772 3150 REMOVE FLASHING BEACON SYSTEM"

Notes:
1. Verify the location of all existing conduit. The approximate locations are shown.

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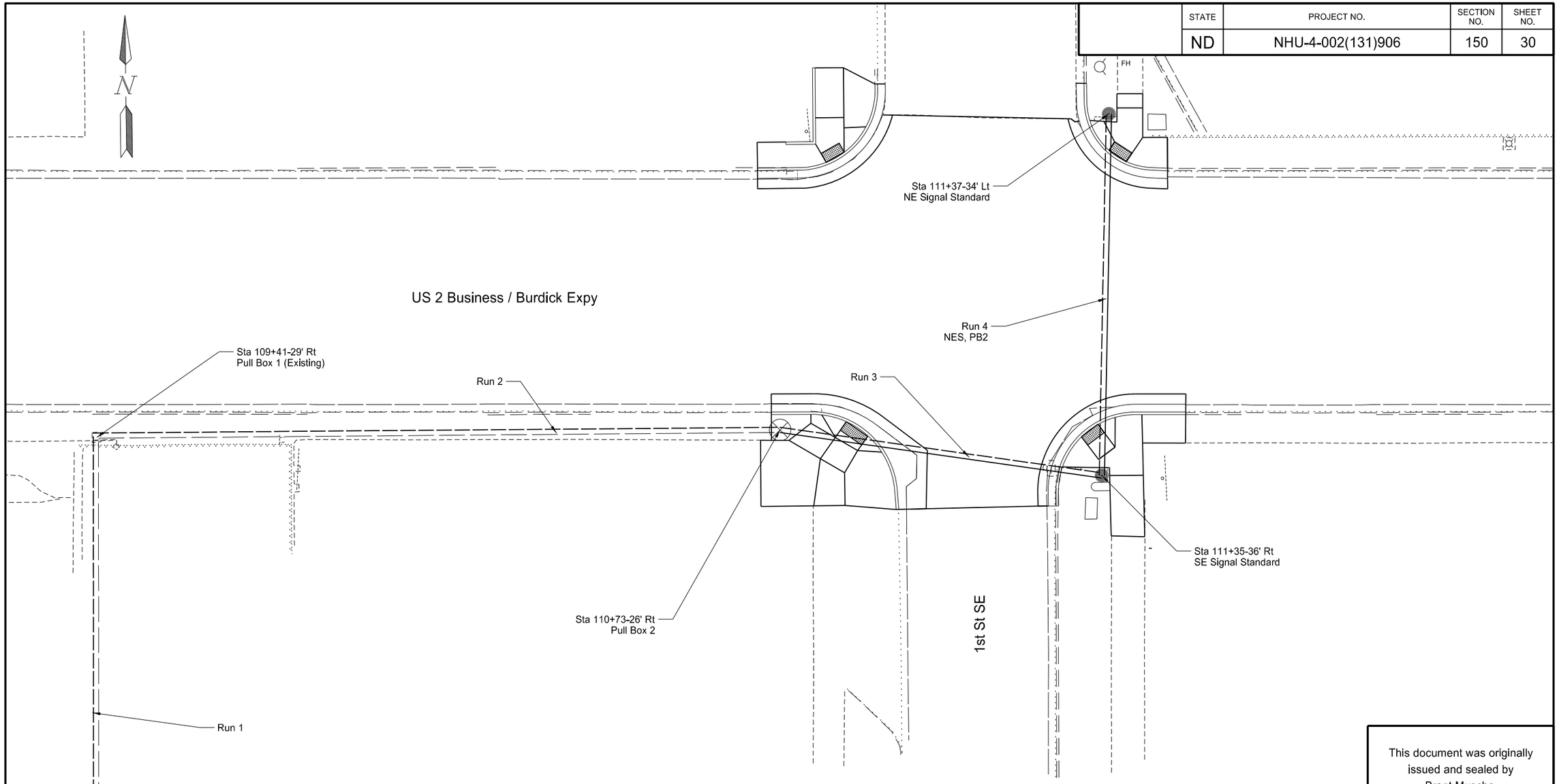
Flashing Beacon Removal

US 2 Business / Burdick Expy

1st St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	30



RRFB SYSTEM CONDUIT AND CABLE SCHEDULE									
RUN #	CONDUIT				CABLE				
	ORIGIN	DESTINATION	LF	DIA (IN)	ORIGIN	DESTINATION	TYPE	QTY	TOTAL LF
1	Feed Point	Pull Box 1 (Exist)	107	Exist	Feed Point	Pull Box 1 (Exist)	Underground No. 6 RHW	2	246
					Feed Point	Pull Box 1 (Exist)	Underground No. 6 THW	1	123
2	Pull Box 1 (Exist)	Pull Box 2	132	Exist	Pull Box 1 (Exist)	Pull Box 2	Underground No. 6 RHW	2	288
					Pull Box 1 (Exist)	Pull Box 2	Underground No. 6 THW	1	144
3	Pull Box 2	Controller	63	2 (Bored)	Pull Box 2	Controller	Underground No. 6 RHW	2	172
					Pull Box 2	Controller	Underground No. 6 THW	1	86
4	Controller	NE Standard	70	2 (Bored)	Controller	NE Standard	12 AWG 5 Conductor	1	92
					Controller	Ped Pushbutton 2	16 AWG 2 Conductor	1	100

RRFB CABLE LABLES
SES = Southeast Standard
NES = Northeast Standard
PB1 = Pedestrian Pushbutton 1
PB2 = Pedestrian Pushbutton 2

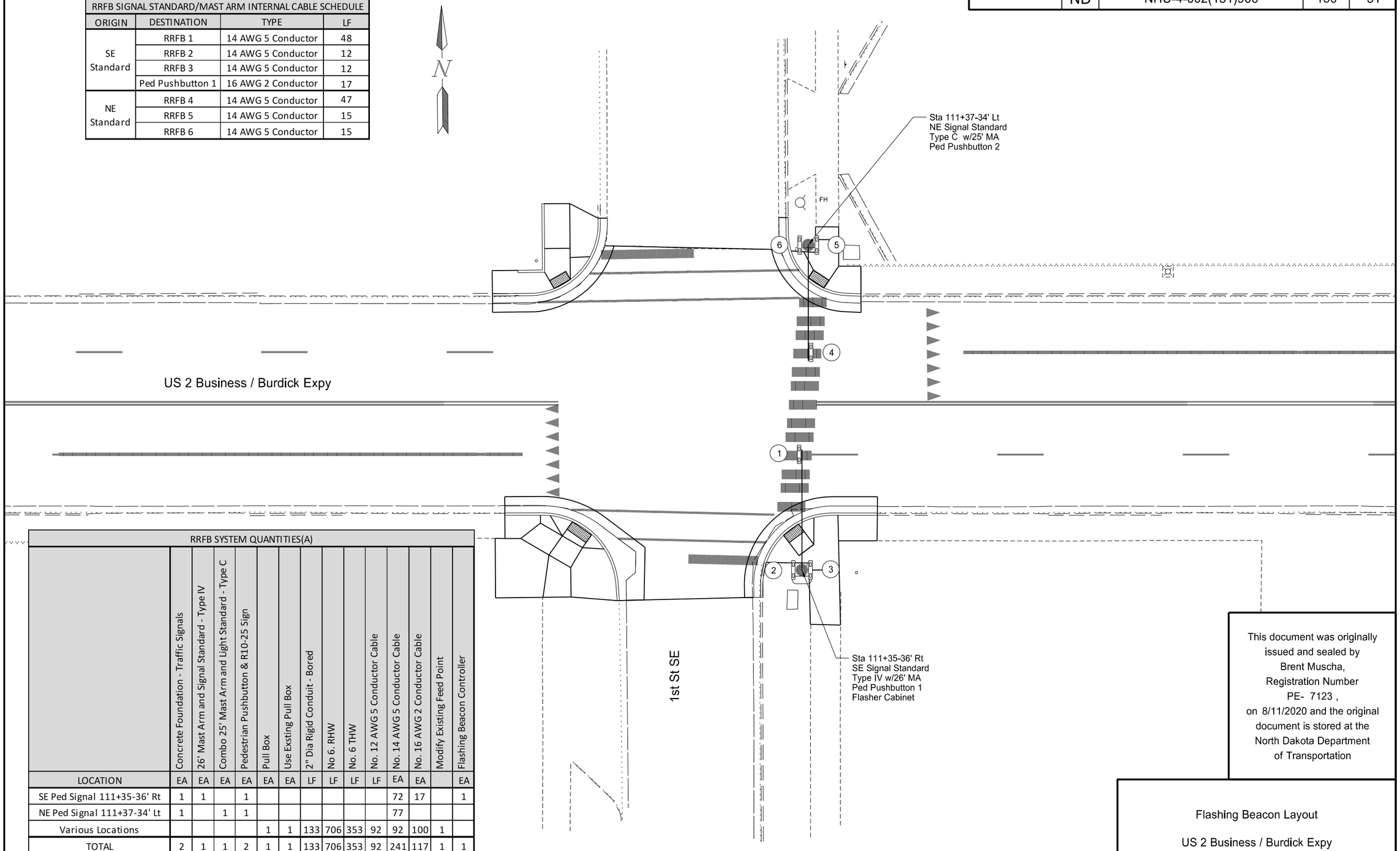
Conduit and Conductor Layout

US 2 Business / Burdick Expy

1st St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	31

RRFB SIGNAL STANDARD/MAST ARM INTERNAL CABLE SCHEDULE			
ORIGIN	DESTINATION	TYPE	LF
SE Standard	RRFB 1	14 AWG 5 Conductor	48
	RRFB 2	14 AWG 5 Conductor	12
	RRFB 3	14 AWG 5 Conductor	12
	Ped Pushbutton 1	16 AWG 2 Conductor	17
NE Standard	RRFB 4	14 AWG 5 Conductor	47
	RRFB 5	14 AWG 5 Conductor	15
	RRFB 6	14 AWG 5 Conductor	15



RRFB SYSTEM QUANTITIES(A)

LOCATION	Concrete Foundation - Traffic Signals	26' Mast Arm and Signal Standard - Type IV	Combo 25' Mast Arm and Light Standard - Type C	Pedestrian Pushbutton & R10-25 Sign	Pull Box	Use Exsting Pull Box	2" Dia Rigid Conduit - Bored	No 6. RHW	No. 6 THW	No. 12 AWG 5 Conductor Cable	No. 14 AWG 5 Conductor Cable	No. 16 AWG 2 Conductor Cable	Modify Existing Feed Point	Flashing Beacon Controller
	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	EA	EA		EA
SE Ped Signal 111+35-36' Rt	1	1		1							72	17		1
NE Ped Signal 111+37-34' Lt	1		1	1							77			
Various Locations					1	1	133	706	353	92	92	100	1	
TOTAL	2	1	1	2	1	1	133	706	353	92	241	117	1	1

(A) Do not bid items seperately but include in the item "772 2145 FLASHING BEACON-MA MOUNTED"

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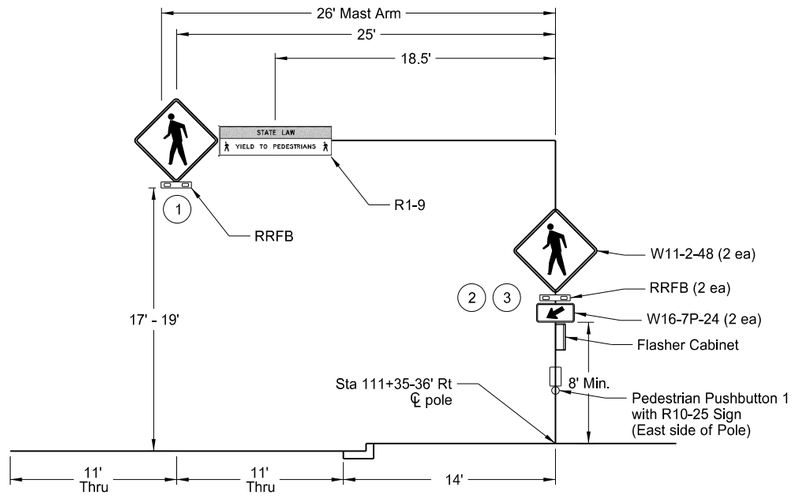
Flashing Beacon Layout

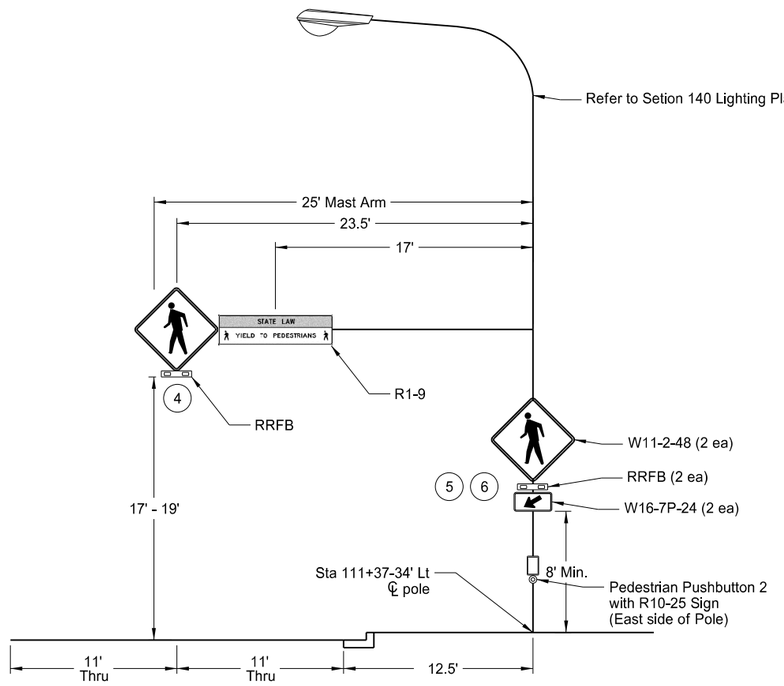
US 2 Business / Burdick Expy

1st St SE

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-4-002(131)906	150	32



Eastbound



Westbound

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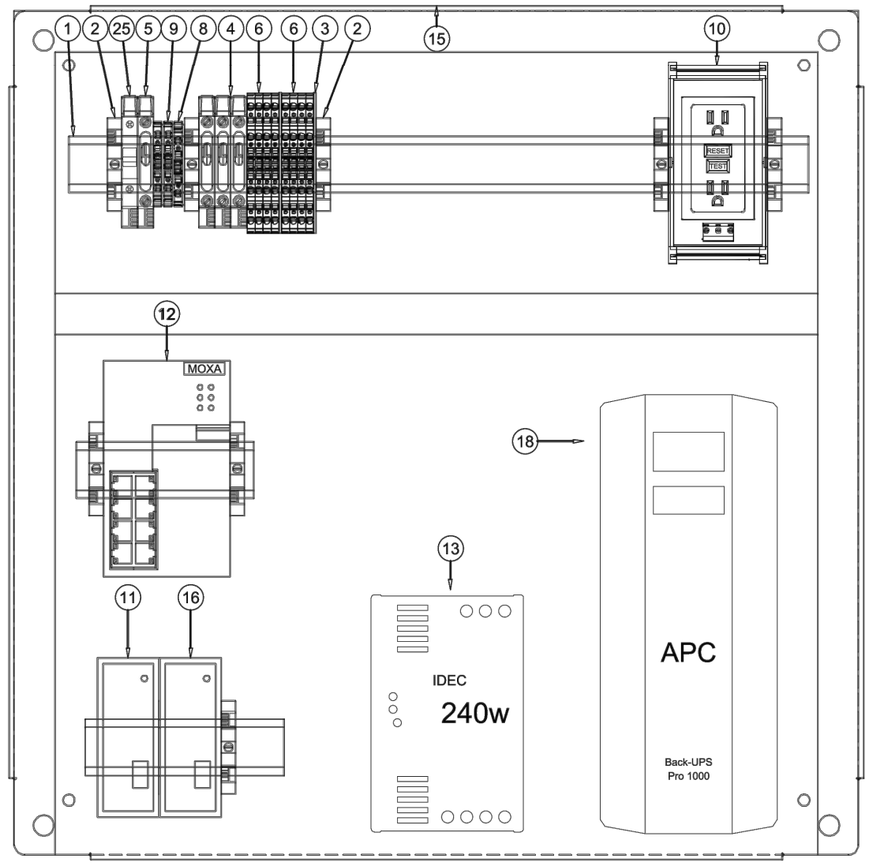
Signal Standards and Head Locations

US 2 Business / Burdick Expy

1st St SE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-4-002(131)906	150	33



NOTE: STAINLESS STEEL ENCLOSURE TO BE USED FOR OUTDOOR LOCATIONS

ITEM	QTY	CATALOG	DESCRIPTION	MFG
1	3	199-DR1	ZINC/STEEL DIN RAIL EN 50022 (35mm x 7.5mm X 1mm)	AB
2	9	DN-EB35	END BARRIER	AUTOMATION DIRECT
3	2	DN-QDEC12-2-2	END COVER	AUTOMATION DIRECT
4	3	DN-F6L24	1 POLE FUSE BLOCK - 3AG GLASS FUSE	AUTOMATION DIRECT
5	1	DN-F6L110	1 POLE FUSE BLOCK - 3AG GLASS FUSE	AUTOMATION DIRECT
6	8	DN-Q12-2-2-A	IEC SPRING CLAMP TERMINAL BLOCK, STANDARD FEED-THROUGH BLOCK, Q12	AUTOMATION DIRECT
7	3	DN-QEC12	END COVER	AUTOMATION DIRECT
8	1	DN-QG12	IEC SPRING CLAMP TERMINAL BLOCK, MULTI-CIRCUIT FEED-THROUGH BLOCK, Q12	AUTOMATION DIRECT
9	2	DN-Q12	IEC SPRING CLAMP TERMINAL BLOCK, MULTI-CIRCUIT FEED-THROUGH BLOCK, Q12	AUTOMATION DIRECT
10	1	IMACP02	DUPLEX OUTLET, DUAL, 15A/125V GFCI	AUTOMATION SYSTEM
11	1	PDCPOE1224DR	DC-DC CONVERTER WITH PoE INJECTOR 12 VDC IN AND 24VDC PoE OUT	AIR802
12	1	EDS-G508E	ETHERNET SWITCH MANAGED	MOXA
13	1	PS5R-SG24	IDEC 24VDC, 240W POWER SUPPLY	IDEC
14	1	SCE-24EL2408LP	WALL-MOUNT ENCLOSURE CONT HINGE, TYPE 4,12	SAGINAW CONTROL
15	1	SCE-24P24	ENCLOSURE BACK PANEL	SAGINAW CONTROL
16	1	PDCPOE1248DR	DC-DC CONVERTER WITH PoE INJECTOR 12 VDC IN AND 48VDC PoE OUT	AIR802
18	1	P-BR1000G	APC UPS BACK-UPS PRO 1000	APC
19	2	ETH-SP	ETHERNET SURGE PROTECTION	UBIQUITI
20	1	NBE-M5-19	NANOBEAM M5	UBIQUITI
21	1	UAP-AC OUTDOOR	UNIFI AP AC OUTDOOR	UBIQUITI
24	1	TC-PRO	CAT 5E CABLE	UBIQUITI
25	1	QOU110	10 AMP CIRCUIT BREAKER	SQUARE D

City Plate No.: W-02

Last Revision: 12/19/2016

File: W-02dwg

STANDARD DETAILS
WIFI PANEL
5 GHz

City of Minot
ENGINEERING DEPARTMENT

M:\Tom S\2016\Public Works\WIFI Details\5.dwg

City of Minot
Engineering Dept

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BURDICK EXPY & VALLEY STREET

STANDARD DETAIL

WI-FI PANEL 5 GHZ

8/11/2020 P:\PROJECTS\4394 - Burdick Expressway Major Rehabilitation Valley St To 1st St SW\Design\Plans\4394 Signals.dwg

NDDOT ABBREVIATIONS

D-101-1

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.
Abn	abandoned
Abut	abutment
Ac	acres
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
ADA	Americans with Disabilities Act
A	ampere
&	and
Appr	approach
Approx	approximate
ACP	asbestos cement pipe
Asph	asphalt
AC	asphalt cement
Assmd	assumed
@	at
Atten	attenuation
ATR	automatic traffic recorder
Ave	Avenue
Avg	average
ADT	average daily traffic
Az	azimuth
Bk	back
BF	back face
Bs	backsight
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
Brg	bearing
BI	beehive inlet
Beg	begin
BG	below grade
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
Bd Ft	board feet
BH	bore hole
BS	both sides
Bot	bottom
Blvd	Boulevard
Bndry	boundary
BC	brass cap
Brkwy	breakaway
Br	bridge
Bldg	building
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
Cd	candela
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
CI or ℄	centerline
Cm	centimeter
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
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
C	coulomb
Co	County
Crse	course
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	Crossroad
Crn	crown
CF	cubic feet
M3	cubic meter
M3/s	cubic meters per second
CY	cubic yard
Cy/mi	cubic yards per mile
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
CS	curve to spiral
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Deg or D	degree
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia or ø	diameter
Dir	direction
Dist	distance
DM	disturbed material
DB	ditch block
DG	ditch grade
Dbl	double
Dn	down
Dwg	drawing
Dr	drive
Drwy	driveway
DI	drop inlet
D	dry density
DSDS	dynamic speed display sign
Ea	each
Esmt	easement
E	East
EB	Eastbound
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
Elec	electric/al
EDM	electronic distance meter
Elev or El	elevation
Ellipt	elliptical
Emb	embankment
Emuls	emulsion/emulsified
ES	end section
Engr	engineer
ESS	environmental sensor station
Eq	equal
Eq	equation
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
F	Fahrenheit
FS	far side
F	farad
Fed	Federal
FP	feed point
Ft	feet/foot
Fn	fence
Fn P	fence post
FO	fiber optic
FB	field book
FD	field drive
F	fill
FAA	fine aggregate angularity
FS	fine sand
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section
F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
Fs	foresight

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

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NDDOT ABBREVIATIONS

D-101-2

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
Gal	gallon
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
Geod	geodetic
GIS	Geographical Information System
G	giga
GPS	Global Positioning System
Gov	government
Grd	graded/grade
Gr	gravel
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ha	hectare
Ht	height
HI	height of instrument
Hel	helical
H	henry
Hz	hertz
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hr	hour(s)
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
In or "	inch
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IM	iron monument
I Pn	Iron Pin
IP	iron Pipe
Jt	joint
J	joule
Jct	junction
K	kelvin
Kn	kilo newton
Kpa	kilo pascal
Kg	kilogram
Kg/m3	kilogram per cubic meter
Km	kilometer
K	Kip(s)
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
Ln	lane
Lg	large
Lat	latitude
Lt	left
L	length of curve
Lens	lenses
Lvl	level
LB	level book
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Lig Co	lignite coal
Lig Sl	lignite slack
LF	linear foot
Liq	liquid
LL	liquid limit
L	litre
Lm	loam
Loc	location
LC	long chord
Long.	longitude
Lp	loop
LD	loop detector
Lm	lumen
Lum	luminaire
L Sum	lump sum
Lx	lux
Mb	mailbox
ML	main line
M Hr	man hour
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
MC	meander corner
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
M	mega
Mer	meridian
M	meter
M/s	meters per second
M	mid ordinate of curve
MGS	Midwest Guardrail System
Mi	mile
MM	mile marker
MP	mile post
Ml	milliliter
Mm	millimeter
Mm/hr	millimeters per hour
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Mun	municipal
N	nano
NGS	National Geodetic Survey
NS	near side
Neop	neoprene
Ntwk	network
N	newton
N	North
NE	North East
NW	North West
NB	Northbound
No. or #	number
Obsc	obscure(d)
Obsn	observation
Ocpd	occupied
Ocpy	occupy
Off Loc	office location
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
PK	Parker-Kalon nail
Pa	pascal
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
P Cap	plastic cap
Pl or ℙ	plate
Pt	point
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
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
Lb or #	pounds
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure

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

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NDDOT ABBREVIATIONS

D-101-3

PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Prop Ln	property line
Ppsd	proposed
PB	pull box
Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RTP	random traverse point
Rge or R	range
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
RCTES	reinforced concrete traversable end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
Reinf	reinforcement
Res	reservation
Rs	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
Salv	salvage(d)
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
San	sanitary sewer line
Sc	scoria
Sec	seconds
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sh	shale
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
S	siemens
SD	sight distance
SN	sign number
Sig	signal
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	South East
SW	South West
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SC	spiral to curve
ST	spiral to tangent
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
SF	square feet
Km2	square kilometer
M2	square meter
SY	square yard
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Sta	station
Sta Yd	station yards
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
SE	superelevation
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical
SI	systems international
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	tesla
T	thinwall tube sample
T/mi	tons per mile
Ts	topsoil
Twp or T	township
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
TB	transit book
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trav	traverse
TP	traverse point
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
TP	turning point
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VC	vertical curve
VCP	vitrified clay pipe
V	volt
Vol	volume
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
W	watt
Wrng	wearing
Wb	weber
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without
WC	witness corner
WGS	world geodetic system
Z	zenith

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
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08-03-15	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 Incorporated
AGC	Assiociated General Contractors of America
All PI	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users Association
AMOCO PI	Amoco Pipeline Company
AMRDA HESS	Amerada Hess Corporation
AT&T	AT&T Corporation
B PAW	Bear Paw Energy Incorporated
BAKER ELEC	Baker Electric
BASIN ELEC	Basin Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative
BELLE PL	Belle Fourche Pipeline Company
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
BOEING	Boeing
BRNS RWD	Barnes Rural Water District
BURK-DIV ELEC	Burke-Divide Electric Cooperative
BURL WU	Burleigh Water Users
Cable One	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporat
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users Incorporated
CAV ELEC	Cavalier Rural Electric Cooperative
CBLCOM	Cablecom Of Fargo
CENEX PL	Cenex Pipeline
CENT PL WATER DIST	Central Pipe Line Water District
CENT PWR ELEC	Central Power Electric Cooperative
COE	Corps of Engineers
CONS TEL	Consolidated Telephone
CONT RES	Continental Resource Inc
CPR	Canadian Pacific Railway
D O E	Department Of Energy
DAK CARR	Dakota Carrier Network
DAK CENT TEL	Dakota Central Telephone
DAK RWD	Dakota Rural Water District
DGC	Dakota Gasification Company
DICKEY R NET	Dickey Rural Networks
DICKEY RWU	Dickey Rural Water Users Association
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
FALK MNG	Falkirk Mining Company
FHWA	Federal Highway Administration
G FKS-TRL WD	Grand Forks-traill Water District
GETTY TRD & TRAN	Getty Trading & Transportation
GLDN W ELEC	Golden West Electric Cooperative
GRGS CO TEL	Griggs County Telephone
GTR RAMSEY WD	Greater Ramsey Water District
GT PLNS NAT GAS	Great Plains Natural Gas Company
HALS TEL	Halstad Telephone Company
IDEA1	Idea1
INT-COMM TEL	Inter-Community Telephone Company
KANEB PL	Kaneb Pipeline Company
KEM ELEC	Kem Electric Cooperative Incorporated
KOCH GATH SYS	Koch Gathering Systems Incorporated
LKHD PL	Lakehead Pipeline Company
LNGDN RWU	Langdon Rural Water Users Incorporated
LWR YELL R ELEC	Lower Yellowstone Rural Electric
MCKNZ CON	McKenzie Consolidated Telcom
MCKNZ ELEC	McKenzie Electric Cooperative
MCKNZ WRD	McKenzie County Water Resource District
MCLEOD	McLeod USA
MCLN ELEC	McLean Electric Cooperative
MCLN-SHRDN R WAT	McLean-Sheridan Rural Water
MDU	Montana-dakota Utilities
MID-CONT CABLE	Mid-Continent Cable
MIDSTATE TEL	Midstate Telephone Company
MINOT CABLE	Minot Cable Television
MINOT TEL	Minot Telephone Company
MISS VALL COMM	Missouri Valley Communications
MISS W W S	Missouri West Water System
MNKOTA PWR	Minnkota Power
MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative
MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative
MRE LBTY TEL	Moore & Liberty Telephone
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N VALL W DIST	North Valley Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NDSU SOIL SCI DEPT	NDSU Soil Science Department
NEMONT TEL	Nemont Telephone
NODAK R ELEC	Nodak Rural Electric Cooperative
NOON FRMS TEL	Noonan Farmers Telephone Company
NPR	Northern Plains Railroad
NSP	Northern States Power
NTH PRAIR RW	Northern Prairie Rural Water Association
NTHN BRDR PL	Northern Border Pipeline
NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated
NTHWSTRN REF	Northwestern Refinery Company
NW COMM	Northwest Communication Cooperation
NWRWD	Northwest Rural Water District
ONEOK	Oneok gas
OSHA	Occupational Safety and Health Administration
OTTR TL PWR	Otter Tail Power Company
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T W SUPPLY	R & T Water Supply Association
RED RIV TEL	Red River Rural Telephone
RESVTN TEL	Reservation Telephone
ROBRTS TEL	Roberts Company Telephone
R-RIDER ELEC	Roughrider Electric Cooperative
RRVW	Red River Valley & Western Railroad
S CENT REG WD	South Central Regional Water District
S E W U	South East Water Users Incorporated
SCOTT CABLE	Scott Cable Television Dickinson
SHERDN ELEC	Sheridan Electric Cooperative
SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
SKYTECH	Skyland Technologies Incorporated
SLOPE ELEC	Slope Electric Cooperative Incorporated
SOURIS RIV TELCOM	Souris River Telecommunications
ST WAT COMM	State Water Commission
STATE LN WATER	State Line Water Cooperative
STER ENG	Sterling Energy
STUT RWU	Stutsman Rural Water Users
SW PL PRJ	Southwest Pipeline Project
T M C	Turtle Mountain Communications
TCI	TCI of North Dakota
TESORO HGH PLNS PL	Tesoro High Plains Pipeline
TRI-CNTY WU	Tri-County Water Users Incorporated
TRL CO RWU	Traill County Rural Water Users
UNTD TEL	United Telephone
UPPR SOUR WUA	Upper Souris Water Users Association
US SPRINT	U.S. Sprint
USAF MSL CABLE	U.S.A.F. Missile Cable
USFWS	US Fish and Wildlife Service
USW COMM	U.S. West Communications
VRNDRY ELEC	Verendrye Electric Cooperative
W RIV TEL	West River Telephone Incorporated
WEB	W. E. B. Water Development Association
WILLI RWA	Williams Rural Water Association
WILSTN BAS PL	Williston Basin Interstate Pipeline Company
WLSH RWD	Walsh Water Rural Water District
WOLVRTN TEL	Wolverton Telephone
XLENER	Xcel Energy
YSVR	Yellowstone Valley Railroad

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

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 09/20/18 and the original document is stored at the North Dakota Department of Transportation

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

Proposed Topography

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

Existing Utilities

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

Proposed Utilities

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

Traffic Utilities

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

Sign Structures

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16	Added and Revised Items, Organized by Functional Groups

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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

- Hidden Object
- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Centerline Main
- Centerline
- Existing Ground (Details)
- Existing Conditions
- Sheet Piling

Erosion Control

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

Environmental

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16	Added and Revised Items, Organized by Functional Groups

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Symbols

D-101-30

North Arrow (Half Scale)

Truck Mounted Attenuator

Type I Barricade

Type II Barricade

Type III Barricade

Catch Basin

Cairn or Stone Circle

Video Detection Camera

Storm Drain Cap or Stub

Corrugated Metal End Section 18 Inch

Corrugated Metal End Section 24 Inch

Corrugated Metal End Section 30 Inch

Corrugated Metal End Section 36 Inch

Corrugated Metal End Section 42 Inch

Corrugated Metal End Section 48 Inch

Concrete Foundation

Ground Connection Conductor

Neutral Connection Conductor

Phase 1 Connection Conductor

Phase 2 Connection Conductor

Traffic Cone

Signal Controller

Pad Mounted Signal Controller

Alignment Data Point

Emergency Vehicle Detector

Attenuation Device

Diamond Grade Delineator Type A

Diamond Grade Delineator Type B

Diamond Grade Delineator Type C

Diamond Grade Delineator Type D

Diamond Grade Delineator Type E

Flexible Delineator

Flexible Delineator Type A

Flexible Delineator Type B

Flexible Delineator Type C

Flexible Delineator Type D

Flexible Delineator Type E

Delineator Type A

Delineator Type A Reset

Delineator Type B

Delineator Type B Reset

Delineator Type C

Delineator Type D

Delineator Type E

Delineator Drums

Spot Elevation

Existing Access Control Arrow

Existing Artifact

Existing Flashing Beacon

Existing Benchmark

Existing Railroad Battery Box

Existing Bush or Shrub

Existing Gas Cap or Stub

Existing Sanitary Cap or Stub

Existing Storm Drain Cap or Stub

Existing Water Cap or Stub

Existing Sanitary Cleanout

Existing Concrete Foundation

Existing Traffic Signal Controller

Existing Pad Mounted Signal Controller

Existing Sixteenth Section Corner

Existing Quarter Section Corner

Existing Section Corner

Existing Railroad Crossbuck

Existing Satellite Dish

Existing Fuel Dispensers

Existing Flexible Delineator Type A

Existing Flexible Delineator Type B

Existing Flexible Delineator Type C

Existing Flexible Delineator Type D

Existing Flexible Delineator Type E

Existing Delineator Type A

Existing Delineator Type B

Existing Delineator Type C

Existing Delineator Type D

Existing Delineator Type E

Existing EFB Misc

Existing Flashing Beacon

Existing Pipe Mounted Flasher

Existing Pad Mounted Feed Point

Existing Pipe Mounted Feed Point with Pad

Existing Pole Mounted Feed Point

Existing Railroad Frog

Existing Snow Gate 18

Existing Snow Gate 28

Existing Snow Gate 40

Existing Headwall

Existing Pedestrian Head with Number

Existing Signal Head

Existing Sprinkler Head

Existing Fire Hydrant

Existing Catch Basin Drop Inlet

Existing Curb Inlet

Existing Manhole Inlet

Existing Junction Box

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

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Symbols

D-101-31

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

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

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Symbols

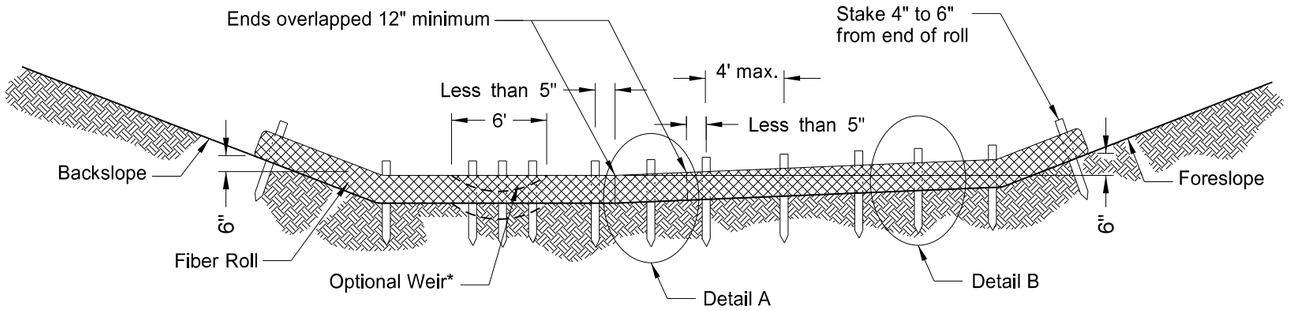
D-101-32

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

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

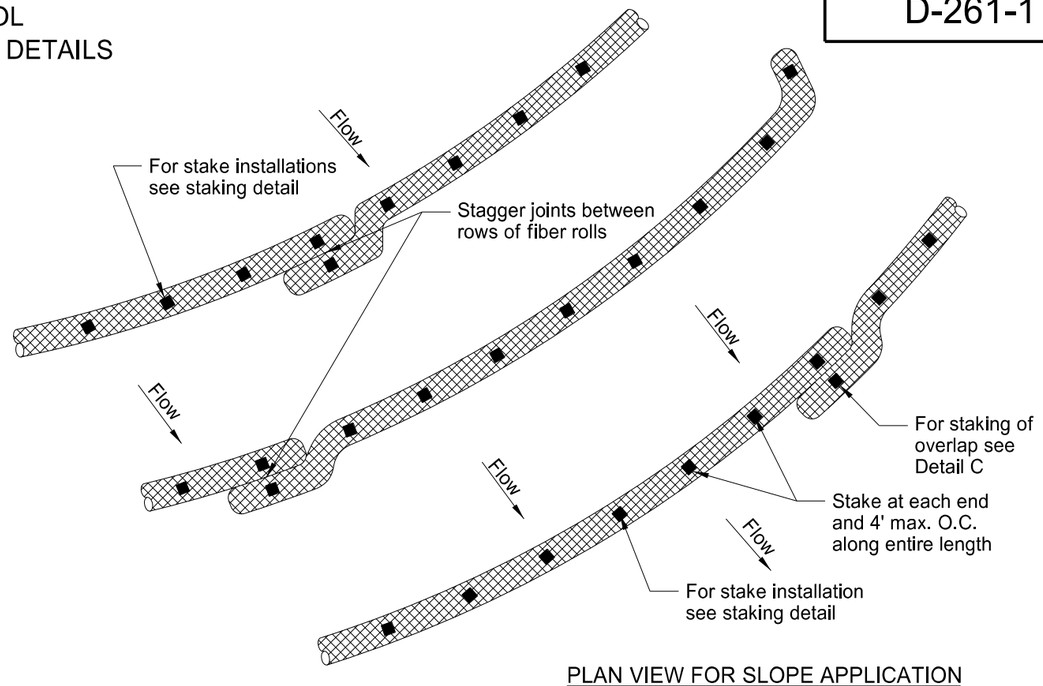
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

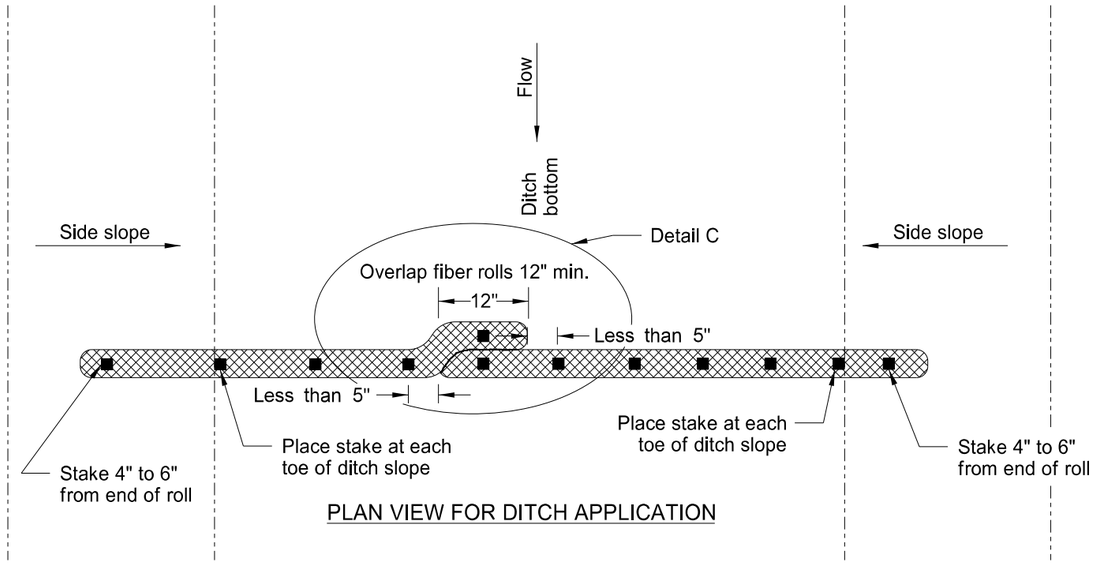


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up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

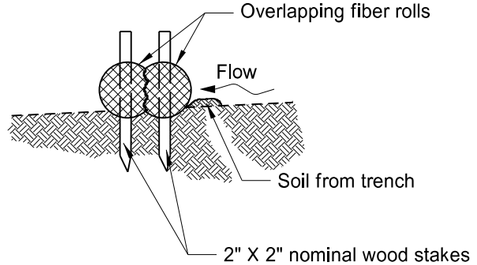
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



PLAN VIEW FOR SLOPE APPLICATION

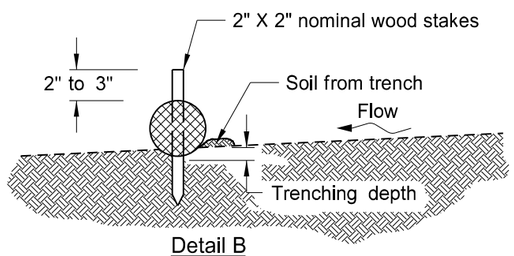


PLAN VIEW FOR DITCH APPLICATION



Detail A

Fiber Roll Overlapping Staking Detail



Detail B

Fiber Roll Staking Detail

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

11-18-10

REVISIONS

DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp

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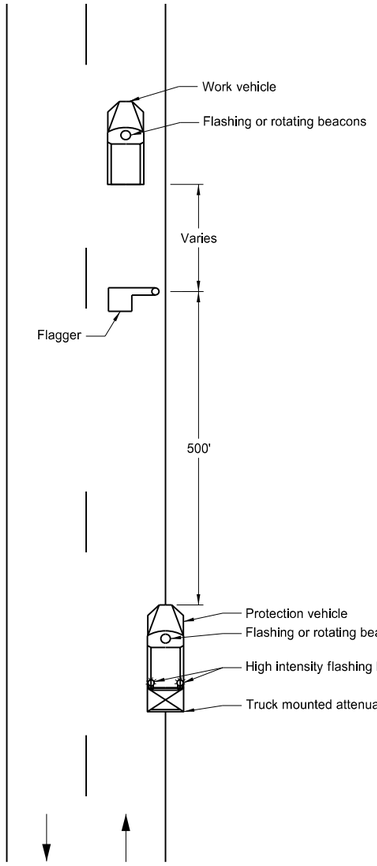
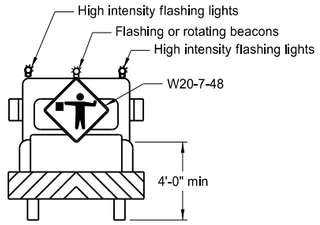
TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

D-704-2

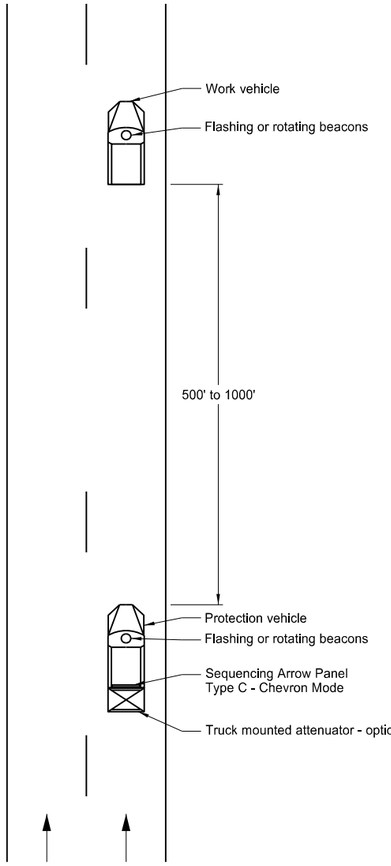
Two Lane, Two Way Roadways

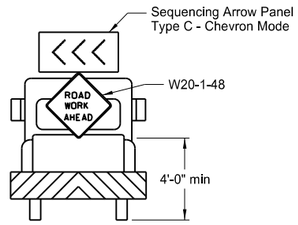




Typical Protection Vehicle

Multilane Roadways





Typical Protection Vehicle

Notes:

1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.

2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.

3. Use these layouts during daylight hours and in areas of good visibility only.

4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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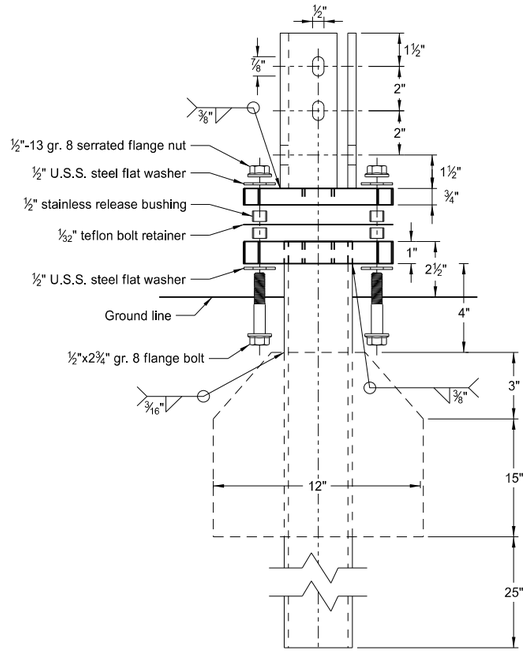
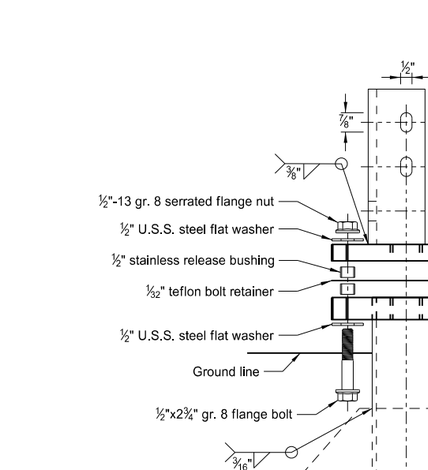
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

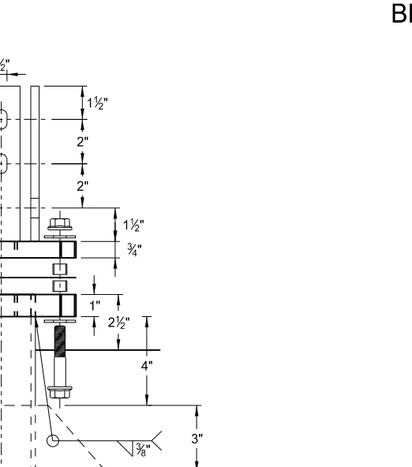
D-704-7



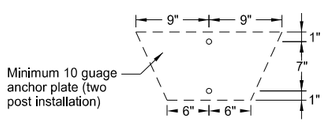
Multi-Directional
Slip Base Assembly



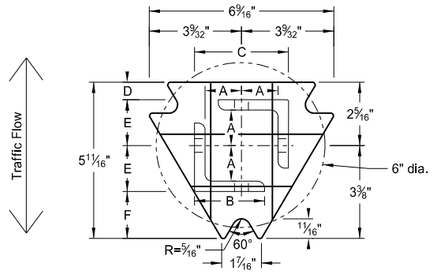
Anchor Unit and Post Assembly



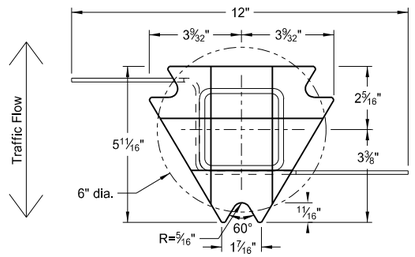
Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly



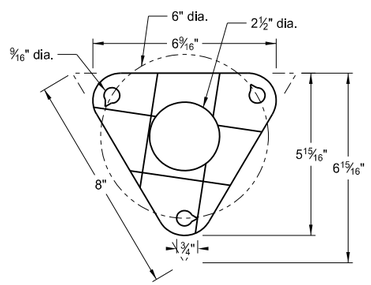
Perforated Tube



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



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



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

Notes:

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

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

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. Area in.²	Section Modulus in.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2³/16 x 2³/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

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

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

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

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

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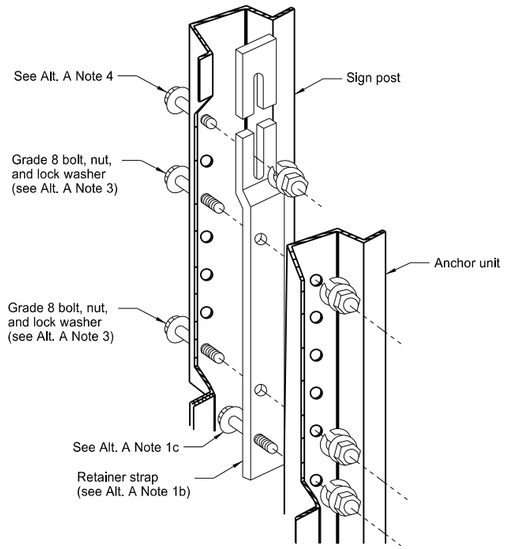
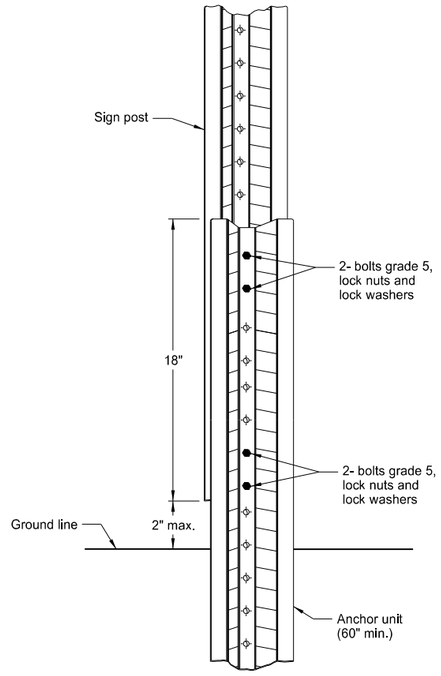
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

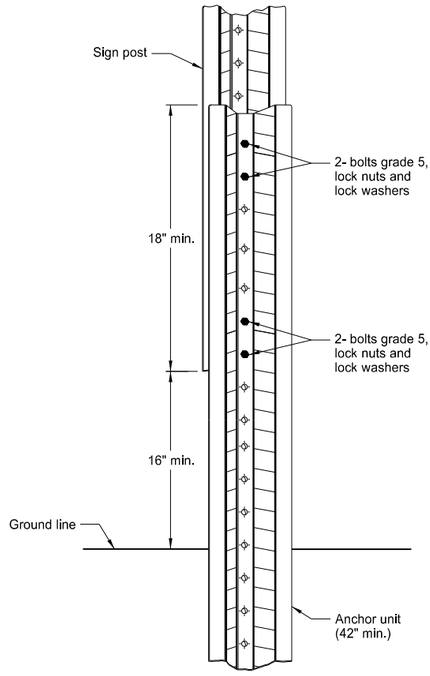


Detail A



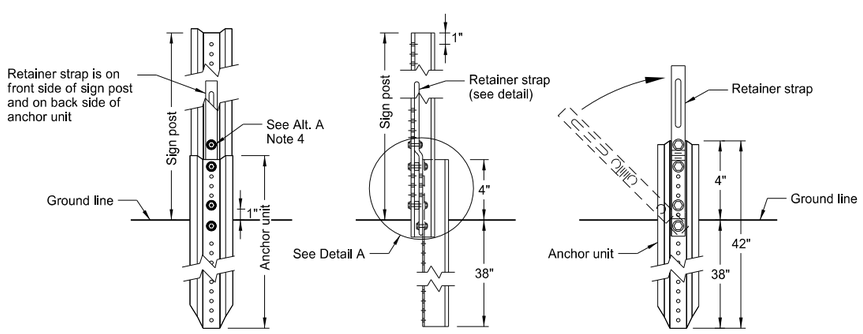
Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



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

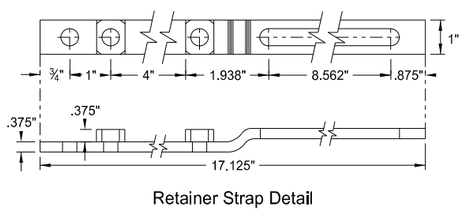
Install a maximum of 3 posts within 7'.



Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.



Retainer Strap Detail

Alternate A Steps of Installation:

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

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

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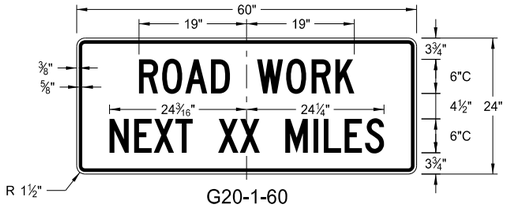
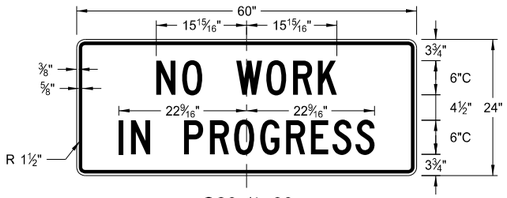
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



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



G20-1b-60
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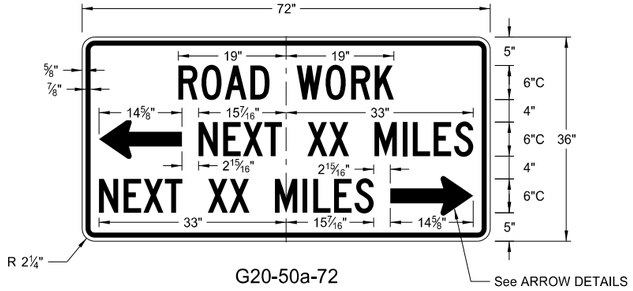
Background: orange



G20-50a-72
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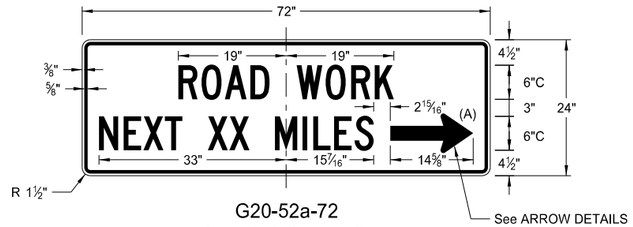
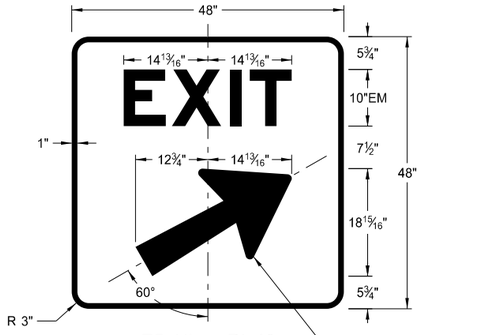
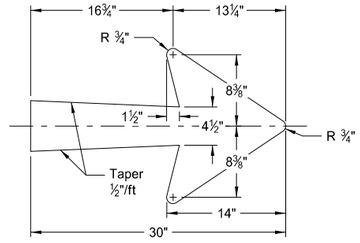
Background: orange



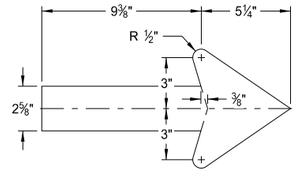
G20-52a-72
Legend: black (non-refl)
Background: orange



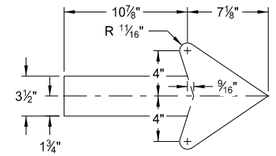
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



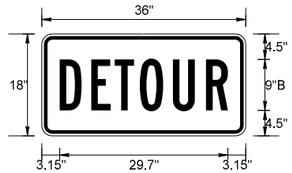
E5-1-48



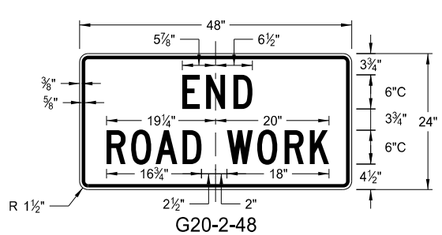
G20-50a-72
G20-52a-72



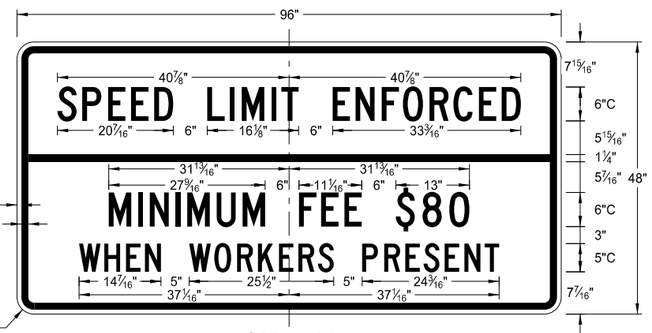
M4-9(L or R)-30
Right or Left



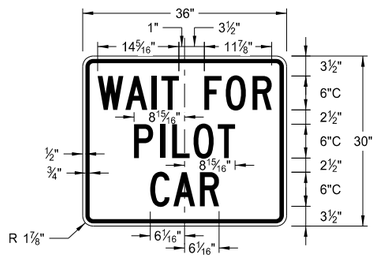
M4-8-36
Legend: black (non-refl)
Background: orange



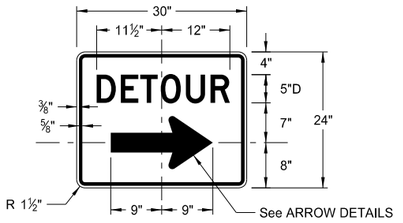
G20-2-48
Legend: black (non-refl)
Background: orange



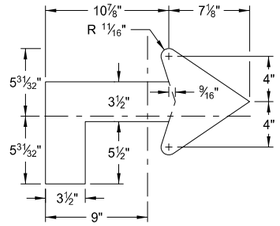
G20-55-96
Legend: black (non-refl)
Background: orange



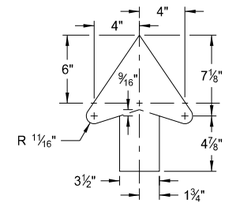
G20-4b-36
Legend: black (non-refl)
Background: orange



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



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



M4-9-30
Straight

ARROW DETAILS

NOTES:

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

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

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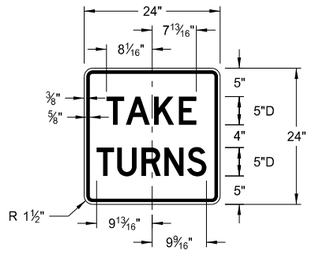
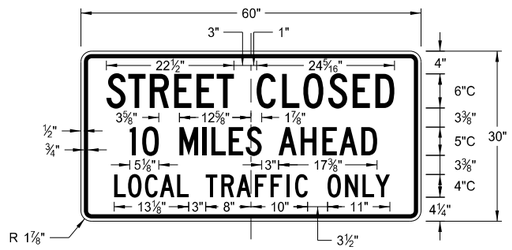
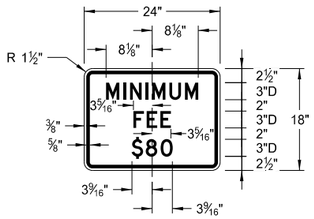
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



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



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



R2-1aP-24
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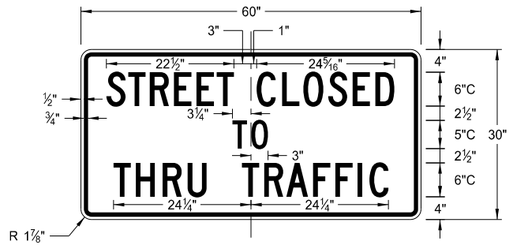
Background: white



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

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

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

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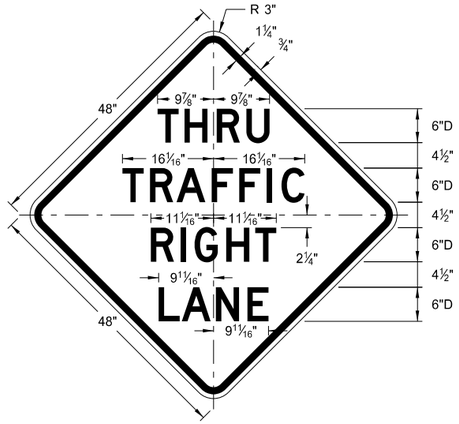
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W5-8-48
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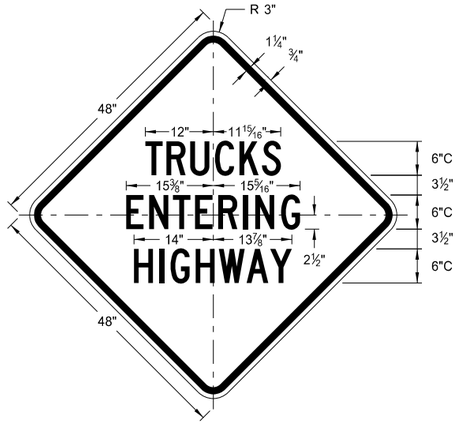
Background: orange



W8-53-48
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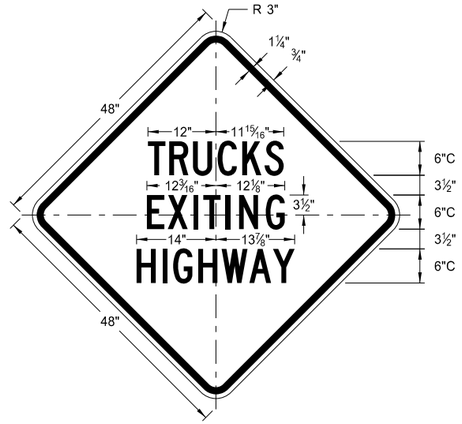
Background: orange



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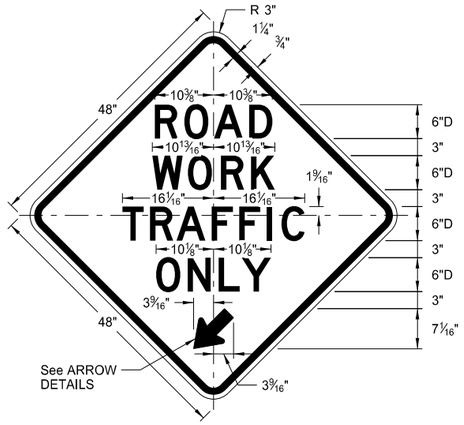

W5-9-48
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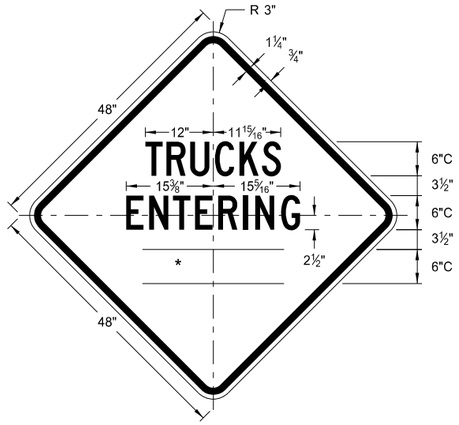
Background: orange



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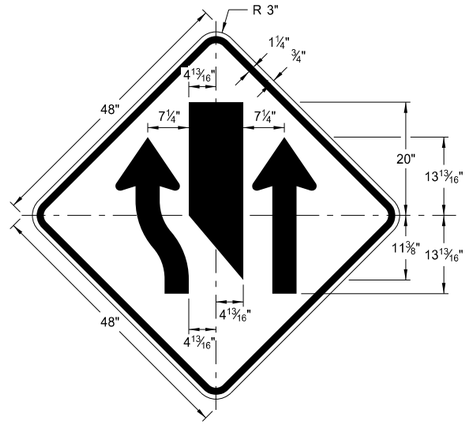

W9-3a-48
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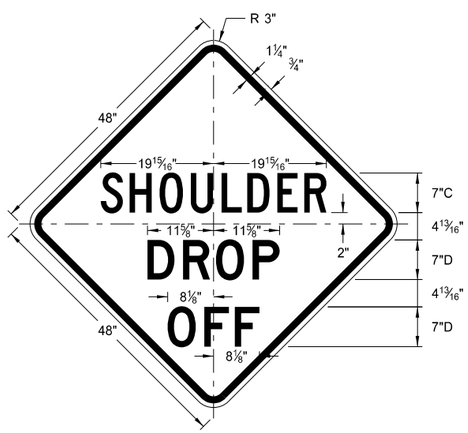
Background: orange



W8-9a-48
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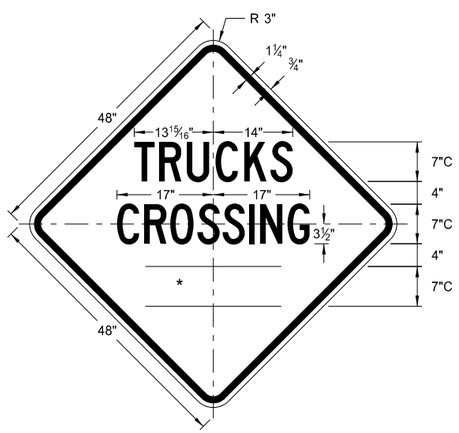
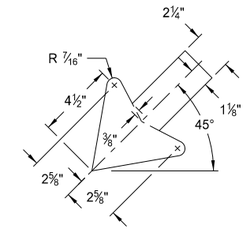
Background: orange



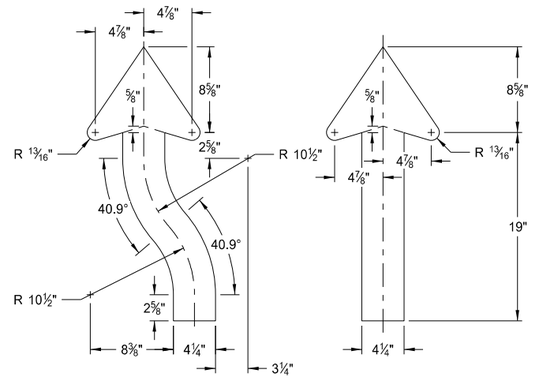
W8-55-48
Legend: black (non-refl)
Background: orange

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



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

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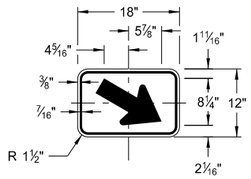
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W16-7aP-18
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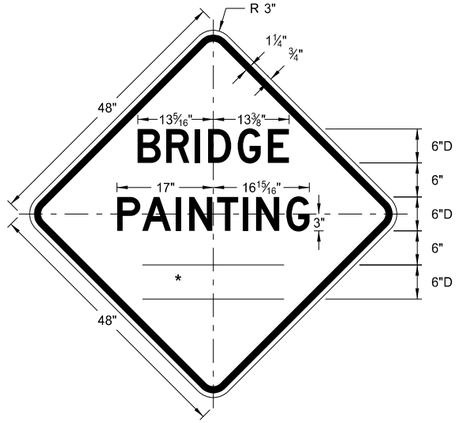
Background: orange



W21-50-48
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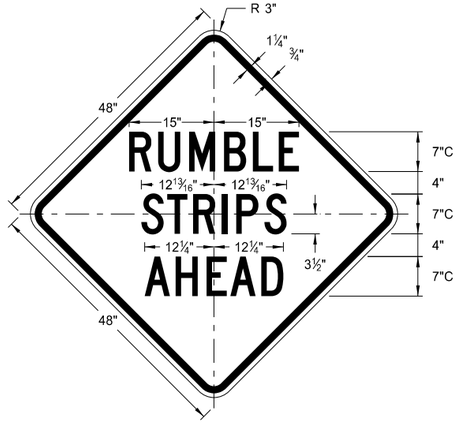
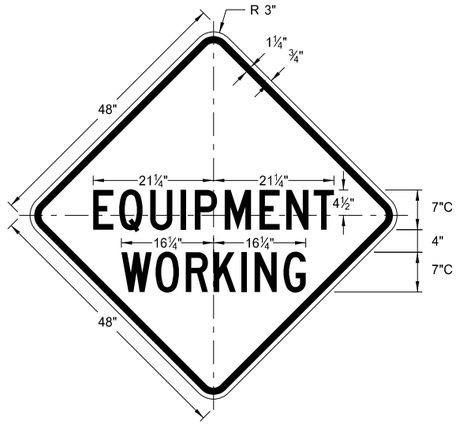
Background: orange



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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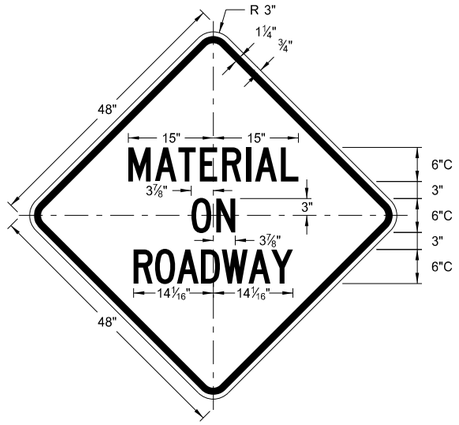
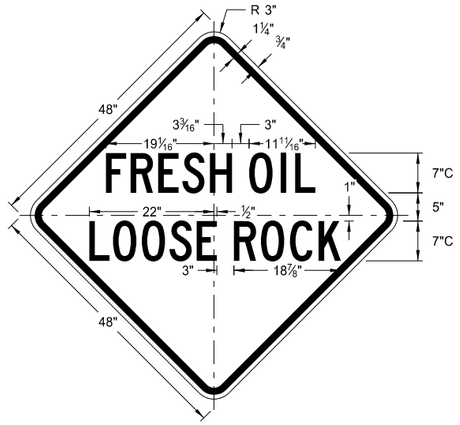
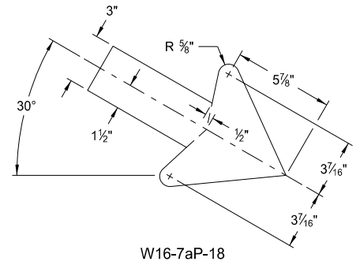


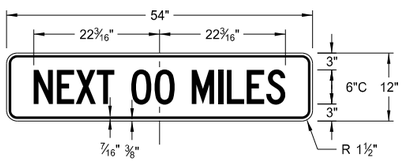
W21-51-48
Legend: black (non-refl)
Background: orange



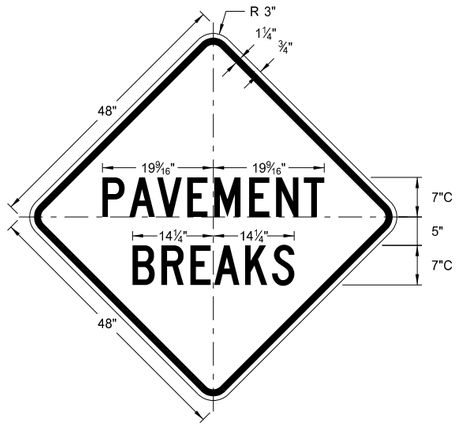
W22-8-48
Legend: black (non-refl)
Background: orange



W16-7aP-18



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



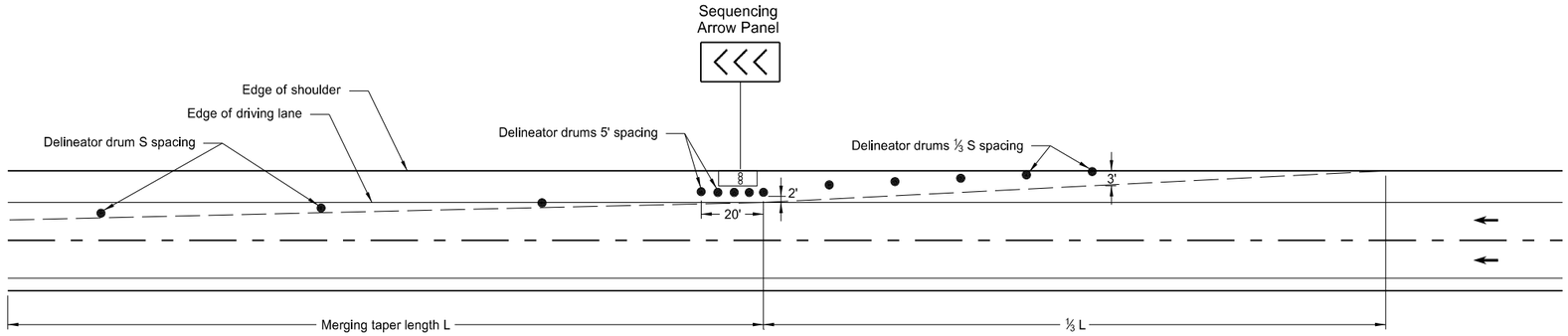
W21-52-48
Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.

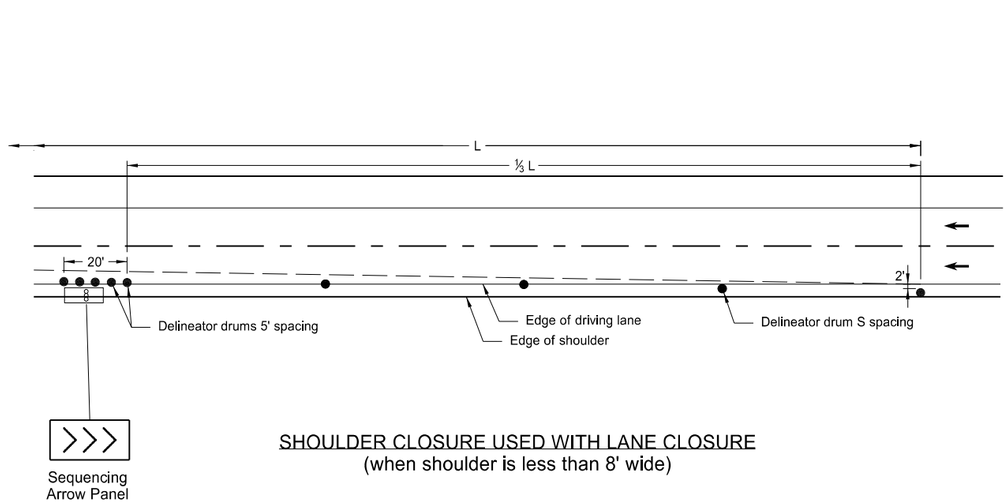
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

SHOULDER CLOSURE TAPERS

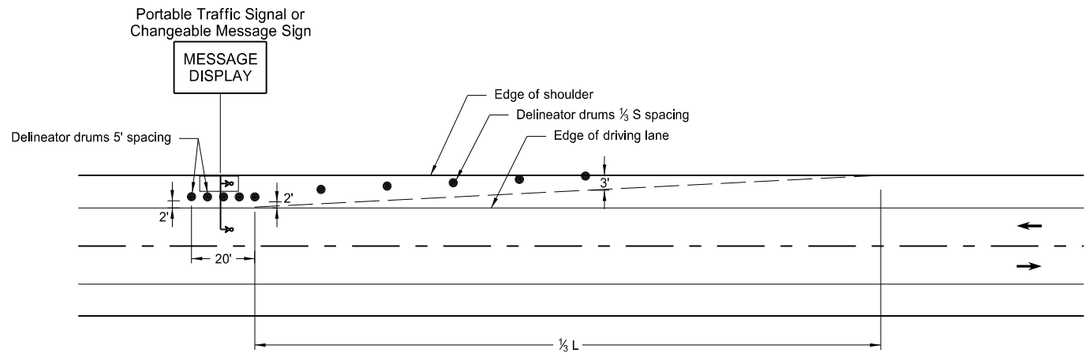
D-704-12



SHOULDER CLOSURE WITH LANE CLOSURE
(when shoulder is 8' or wider)



SHOULDER CLOSURE USED WITH LANE CLOSURE
(when shoulder is less than 8' wide)



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY

● Delineator Drum	∞ Sequencing Arrow Panel
° Message Display	Portable Traffic Signal

Notes:

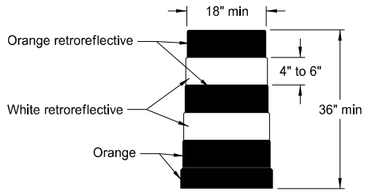
1. S = Posted Speed Limit in mph
   W = Width of offset in feet
   L = Taper length in feet
   L = $WS^2/60$ (40mph or less)
   L = WS (45mph or more)
2. If a shoulder taper is used, use a length of approximately ⅓L. If a shoulder is used as a travel lane, use a normal merging or shifting taper.
3. When paved shoulders of 8 foot width or more are closed, use channelizing devices to close shoulder in advance, to delineate beginning of work space, and to direct vehicular traffic to remain within the traveled way.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-25-19	Added L dimension to detail

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

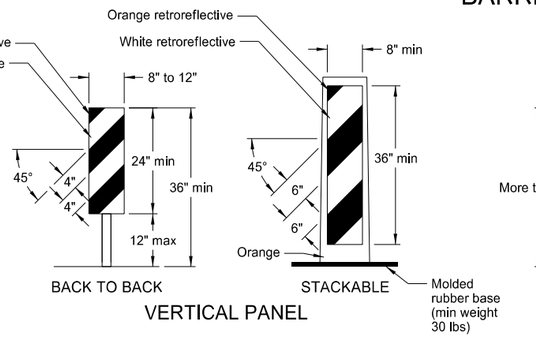
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



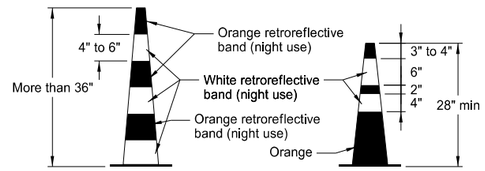
DELINEATOR DRUM

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.



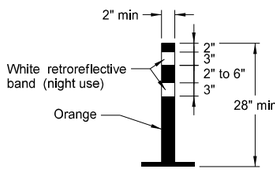
VERTICAL PANEL

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.



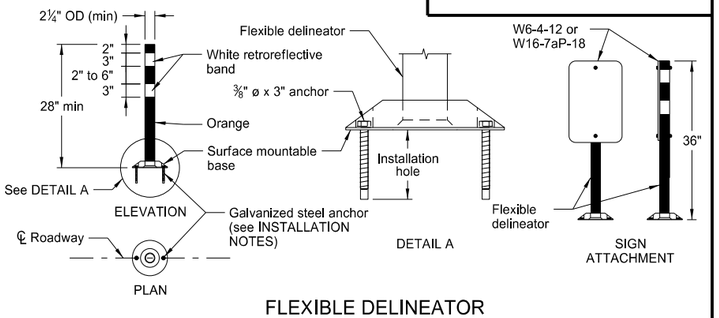
TRAFFIC CONE

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

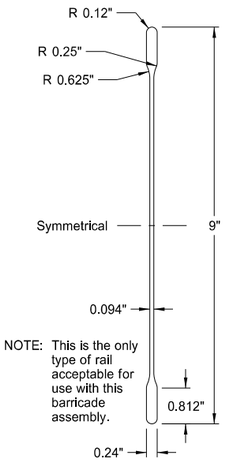
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



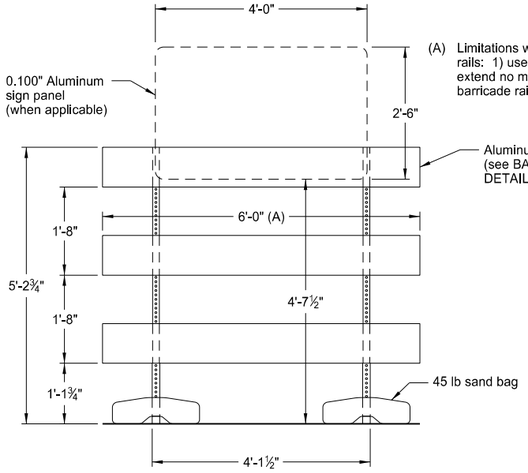
FLEXIBLE DELINEATOR

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.

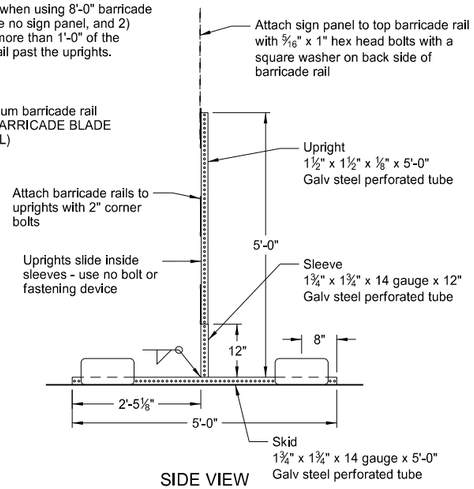


BARRICADE BLADE DETAIL



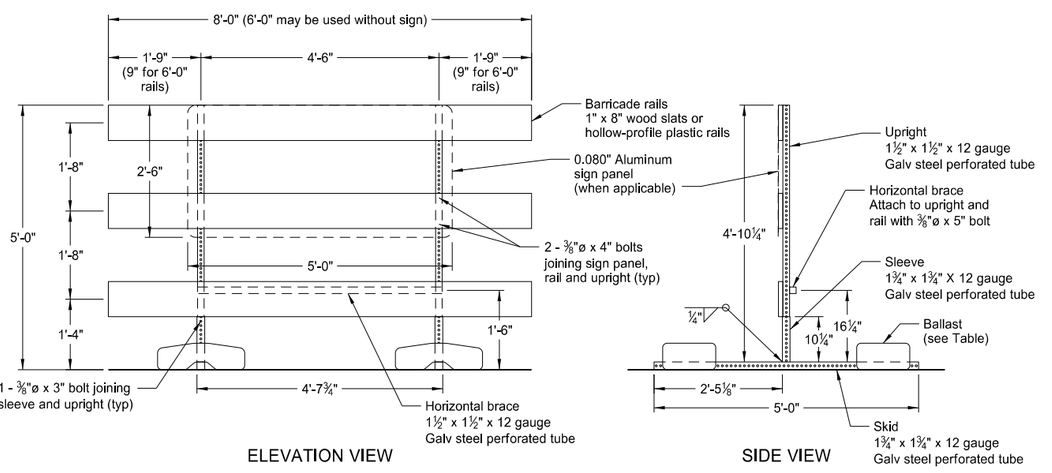
ELEVATION VIEW

(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.



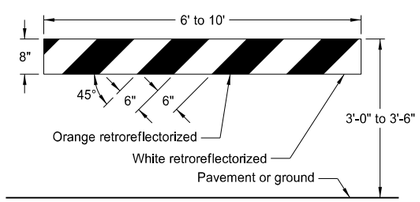
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

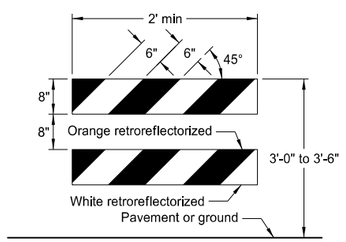


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

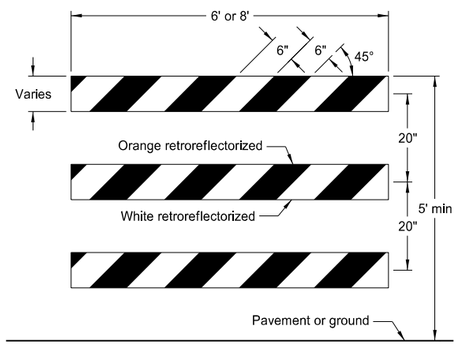
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the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



TYPE I BARRICADE

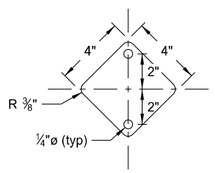


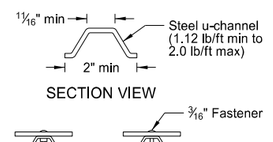
TYPE II BARRICADE

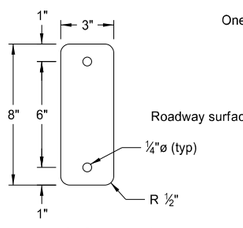


TYPE III BARRICADE

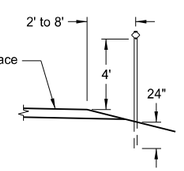
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

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

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

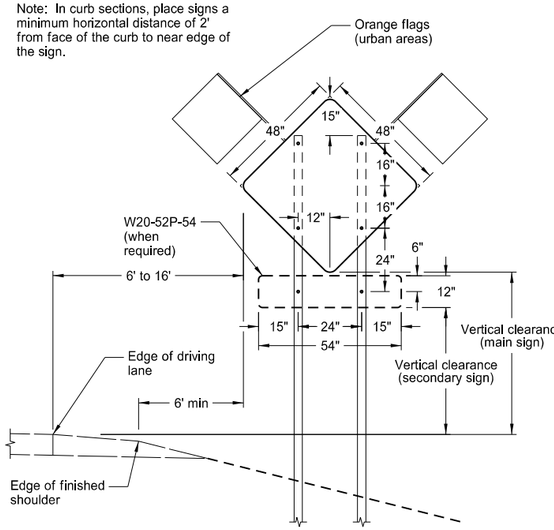
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17 11-01-19	Updated to active voice Revised details for Flexible Delineator

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

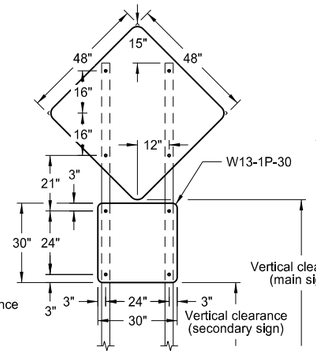
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

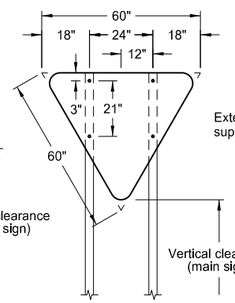
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



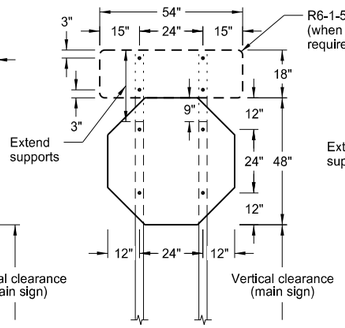
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



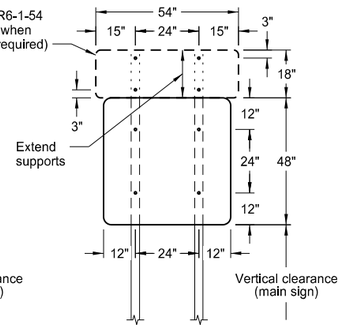
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



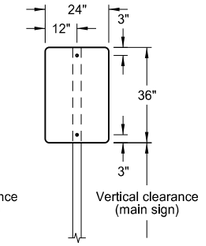
R1-2-60 - YIELD SIGN



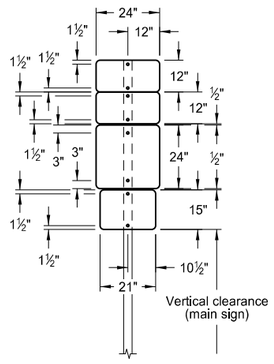
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



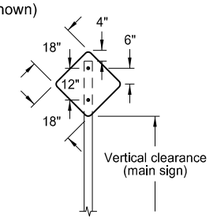
48" x 48" SIGN
(with R6-1-54 sign as required)



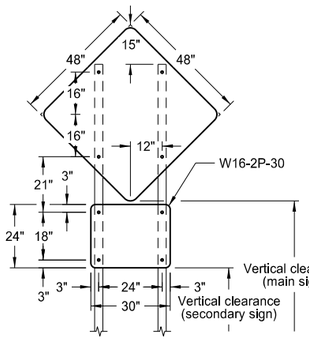
24" x 36" SIGN



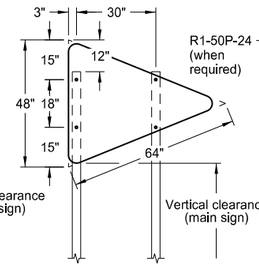
24" x 24"
ROUTE MARKER
ASSEMBLY



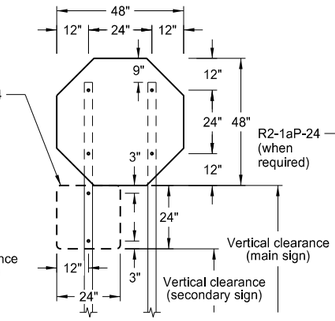
18" x 18"
DIAMOND SIGN



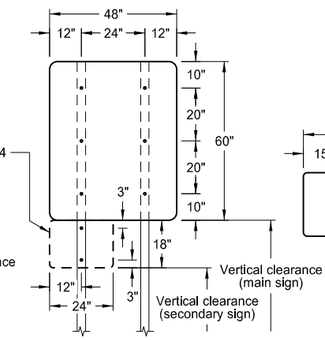
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



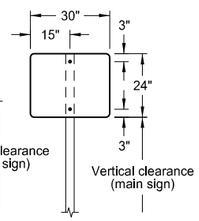
W14-3-64 - PENNANT SIGN



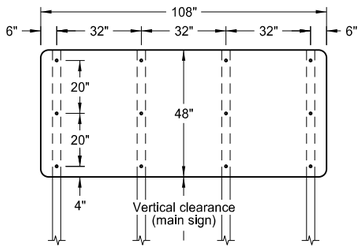
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



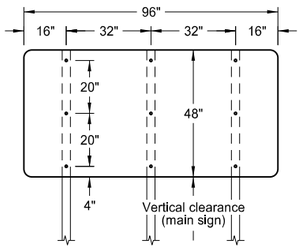
48" x 48" SIGN
(with R2-1aP-24 sign as required)



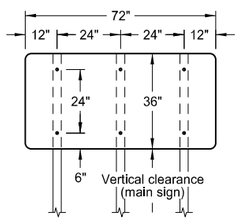
30" x 24" SIGN



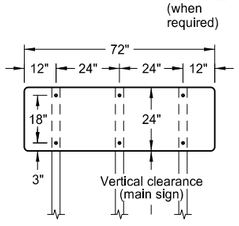
108" x 48" SIGN



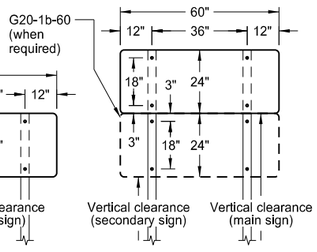
96" x 48" SIGN



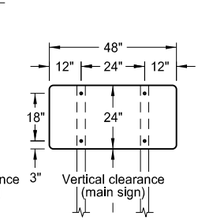
72" x 36" SIGN



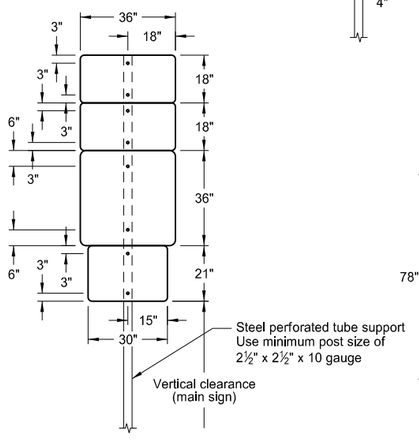
72" x 24" SIGN



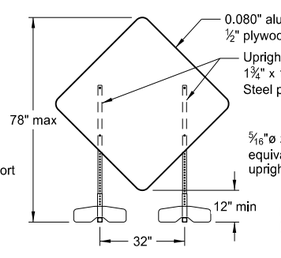
60" x 24" SIGN



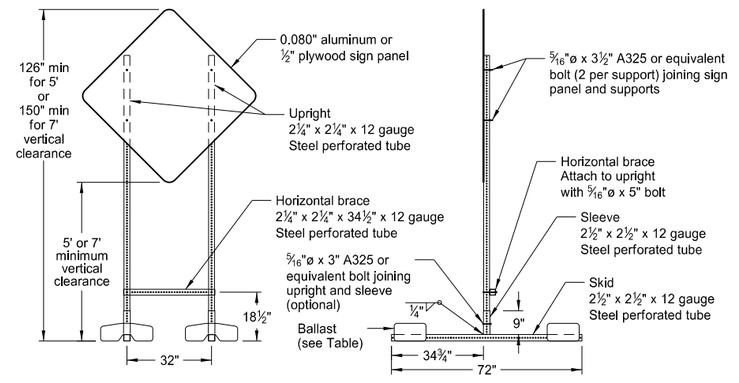
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

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

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

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

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

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

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

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

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

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

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

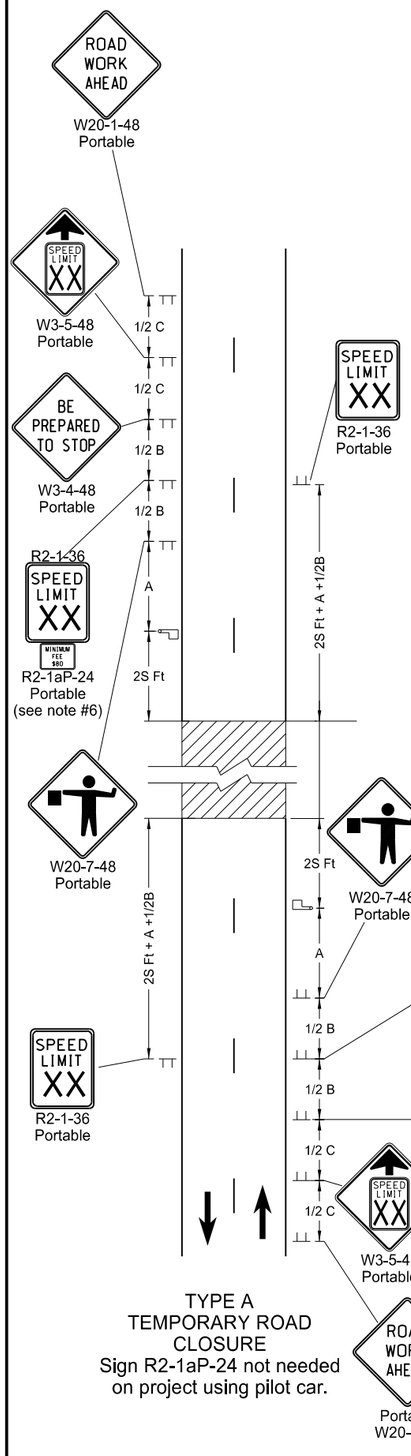
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

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

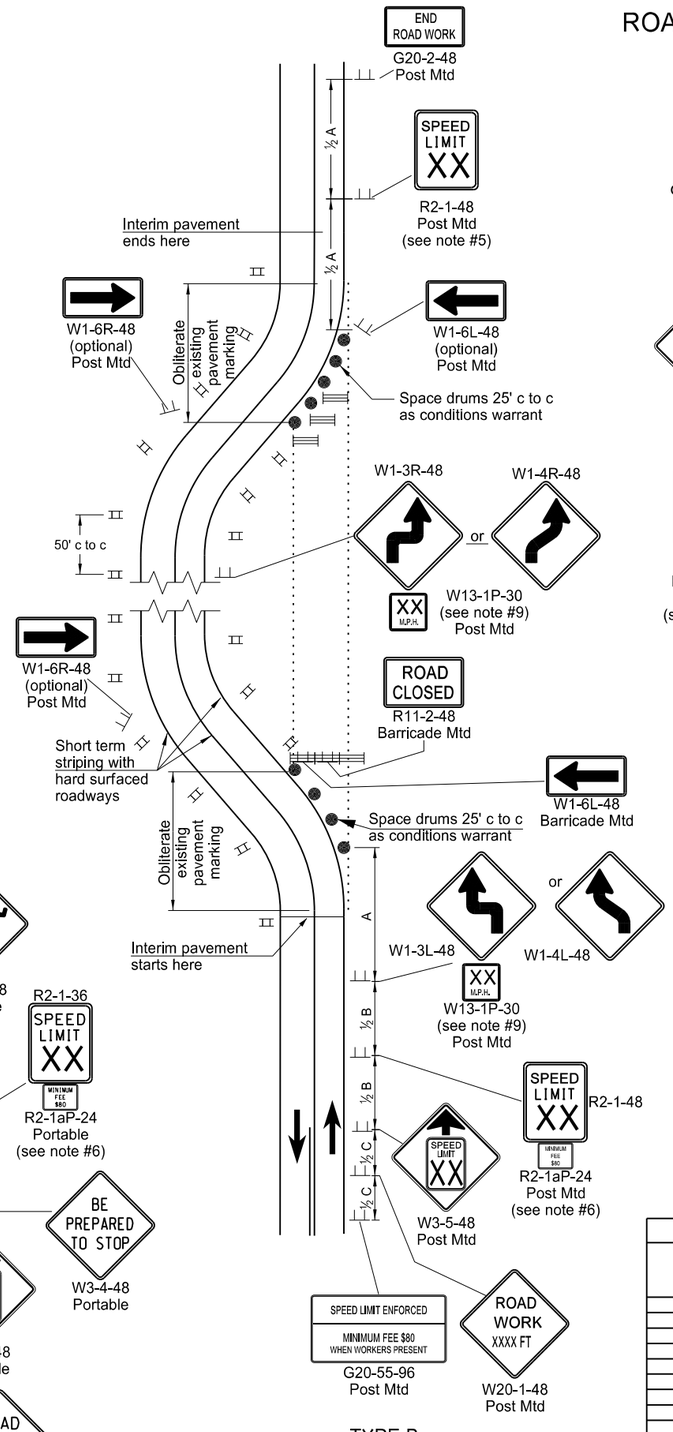
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

D-704-15

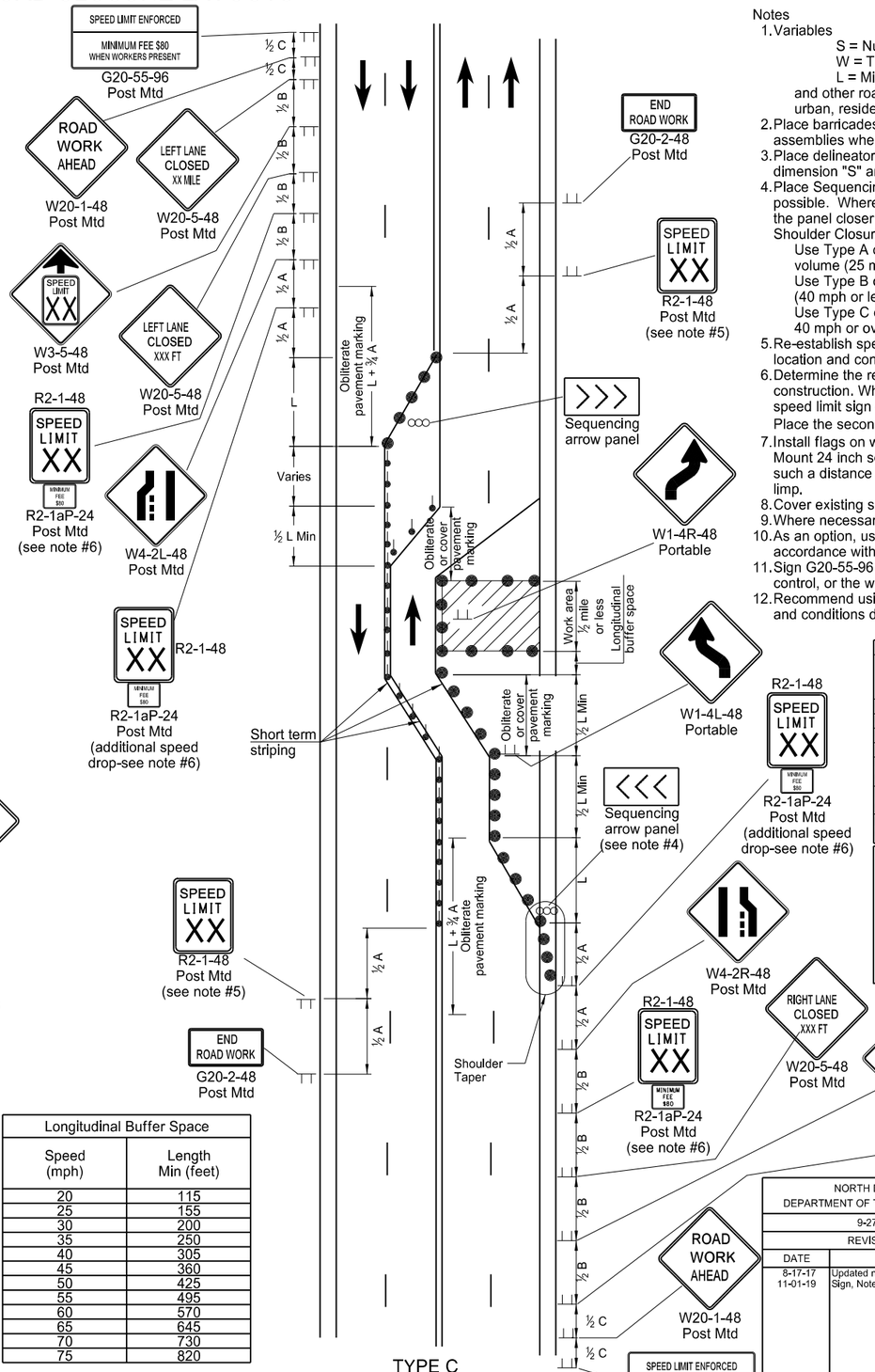


TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.



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



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 standard is part of other traffic control, 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 75 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

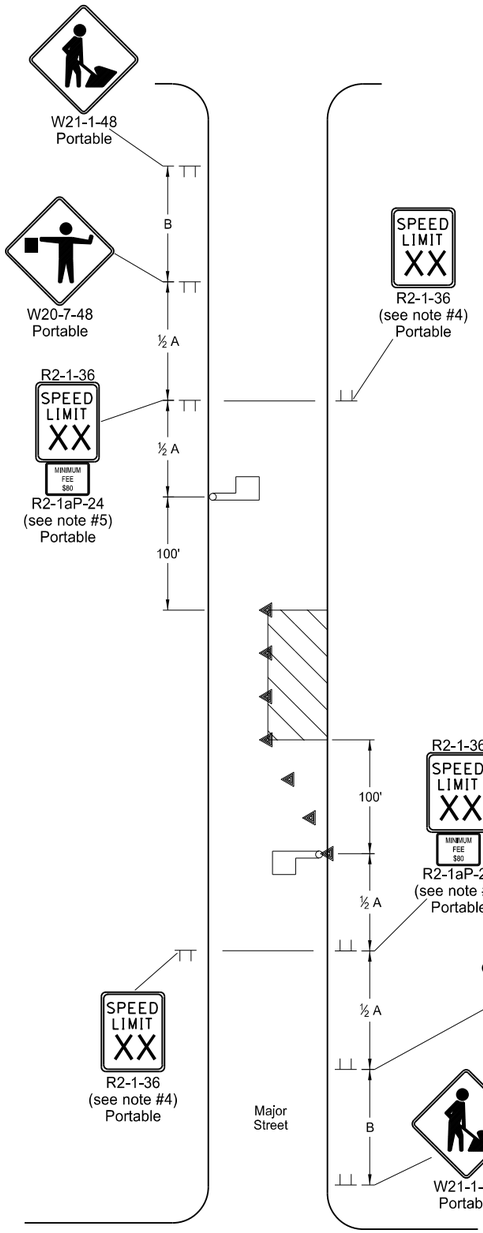
REVISIONS

DATE	CHANGE
8-17-17	Updated notes & Speed Limit signs
11-01-19	Sign, Notes, and Pvmt Mkg updates

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/01/19 and the original document is stored at the North Dakota Department of Transportation

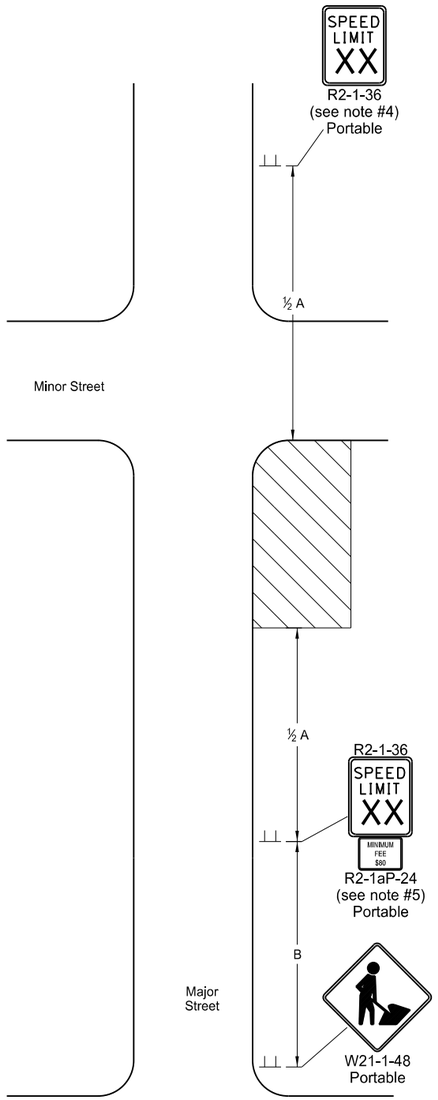
LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25



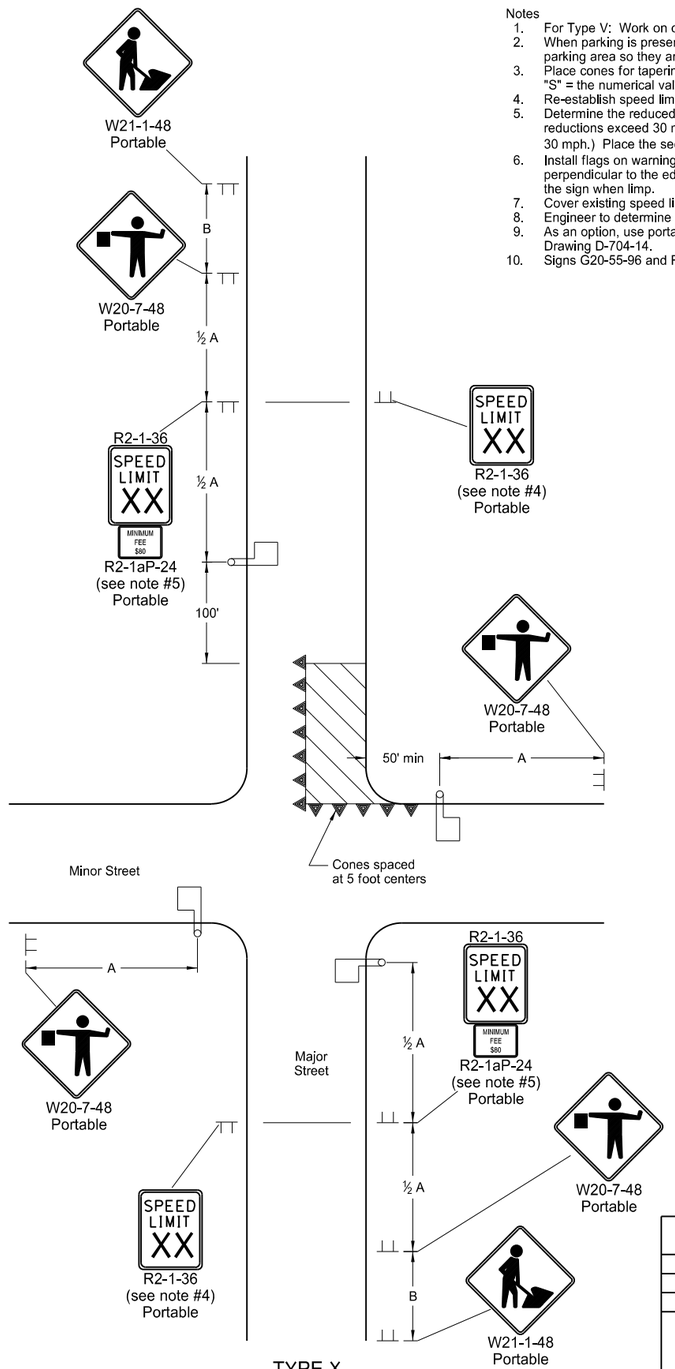
TYPE V
LANE CLOSURE ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (mid block location).



TYPE W
WORK BEYOND CURB ON URBAN STREET

Work area outside driving lane and no closure necessary.



TYPE X
LANE CLOSURE NEAR INTERSECTION ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (end block location).

Notes

1. For Type V: Work on one side of roadway at a time so as not to block off more than one lane of traffic.
2. 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. Place signs on portable mounts when located on roadway.
3. Place cones for tapering traffic at 3 equal spaces and cones for tangents at dimension "S".
   "S" = the numerical value of speed limit.
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within reduced speed zones.
8. Engineer to determine safe speed, when necessary.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
10. Signs G20-55-96 and R2-1aP-24 are not required for urban projects.

ADVANCE WARNING SIGN SPACING

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

KEY

Sign | Work area | Cones | Flagger

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Updated notes & removed signs
11-01-19	Revised note & added Min Fee sign

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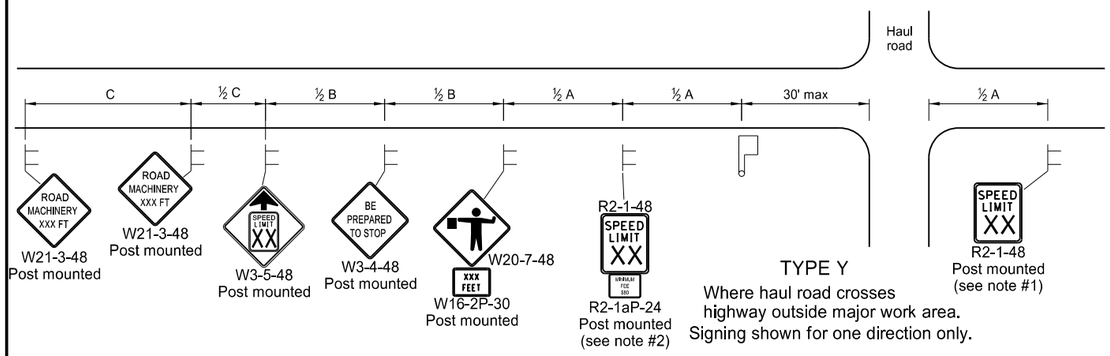
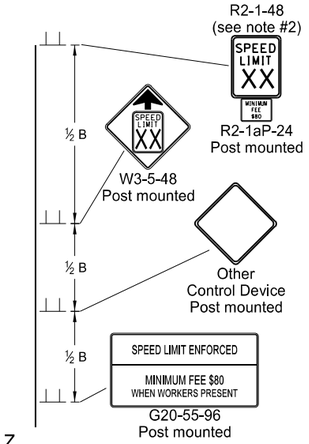
MISCELLANEOUS SIGN LAYOUTS

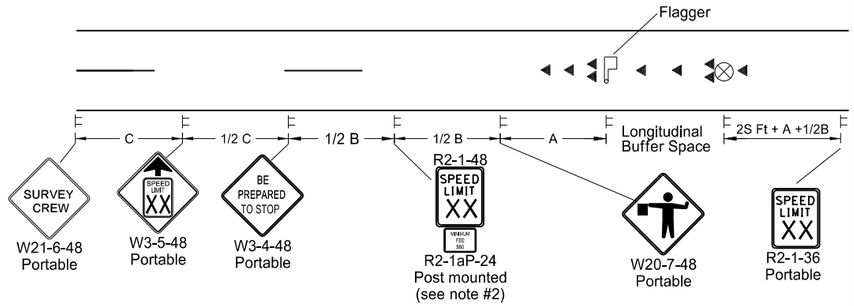
D-704-26



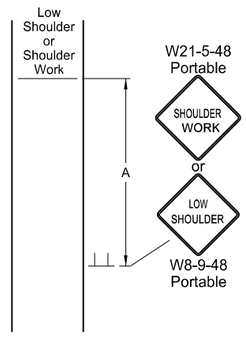
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



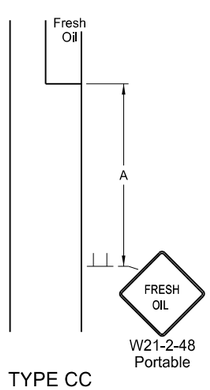
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



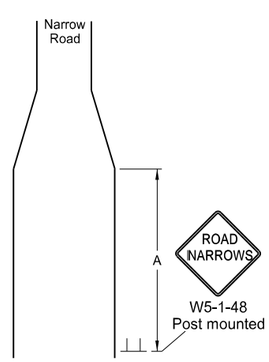
TYPE AA
Where survey crew is used
Signing shown for one direction only.



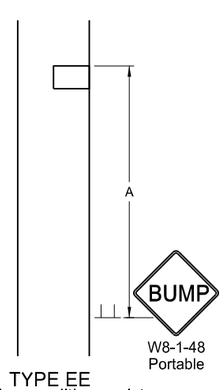
TYPE BB
Within major work area where sign conditions exist



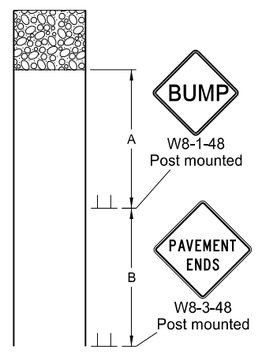
TYPE CC
Where sign conditions exist



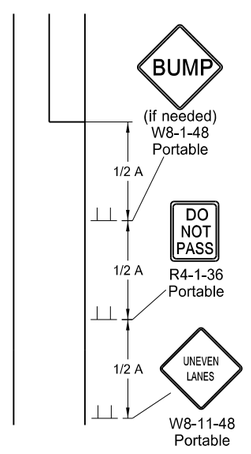
TYPE DD
Where sign conditions exist



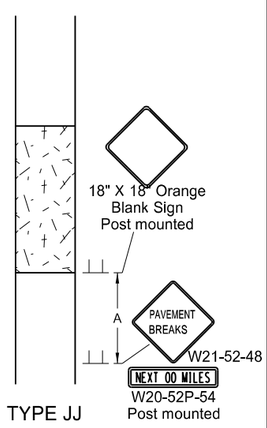
TYPE EE
Where sign conditions exist



TYPE FF
Where sign conditions exist
Signing shown for one direction only.



TYPE GG
Where elevation difference exists between lanes

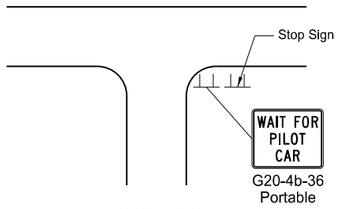


TYPE JJ
For break in pavement.
Install signs when conditions exist and remove when not applicable.
Signing shown for one direction only.

KEY

Flagger	Sign
Cones	Survey Equipment

S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
3. 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.
4. Cover existing speed limit signs within reduced speed zones.
5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING

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

Longitudinal Buffer Space

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers

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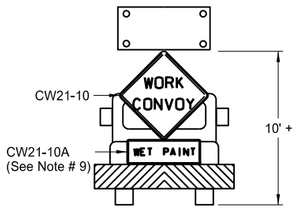
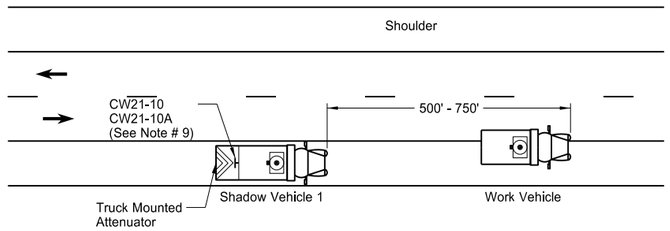
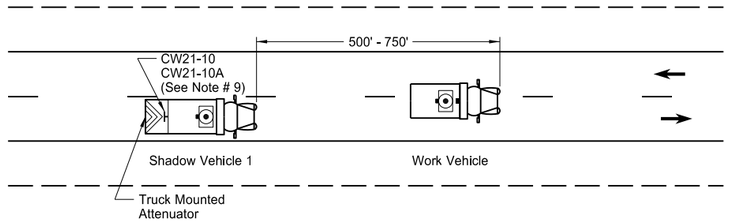
MOBILE OPERATION
(PAVEMENT MARKING)



Typical Shadow Vehicle 1
Two-Way Roaday

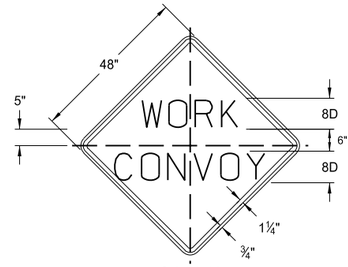


Two-Way Roadway with Paved Shoulders

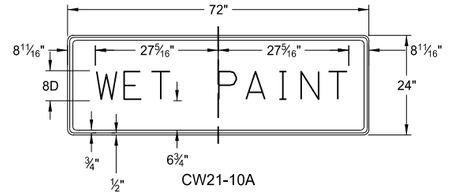


Two-Way Roadway without Paved Shoulders

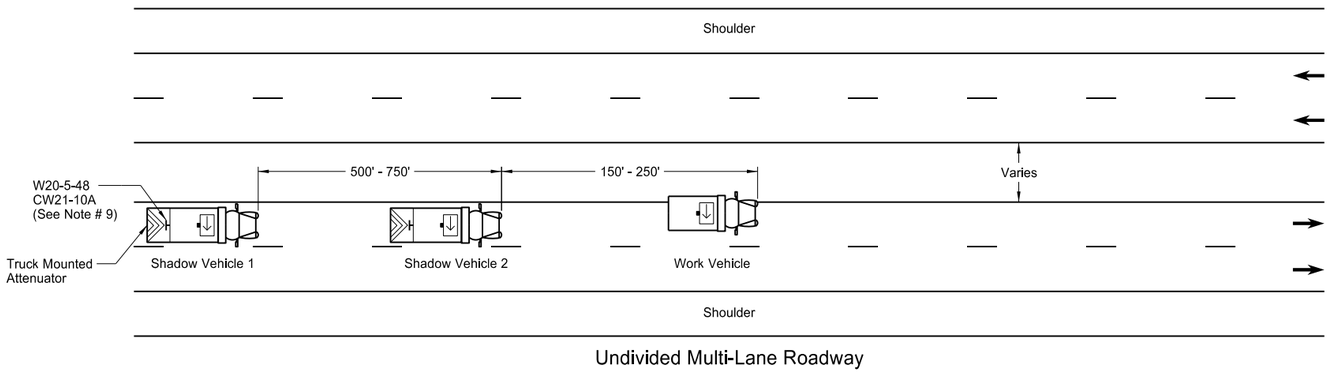
Sign Details



CW21-10

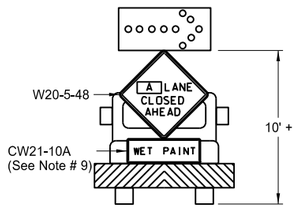


CW21-10A



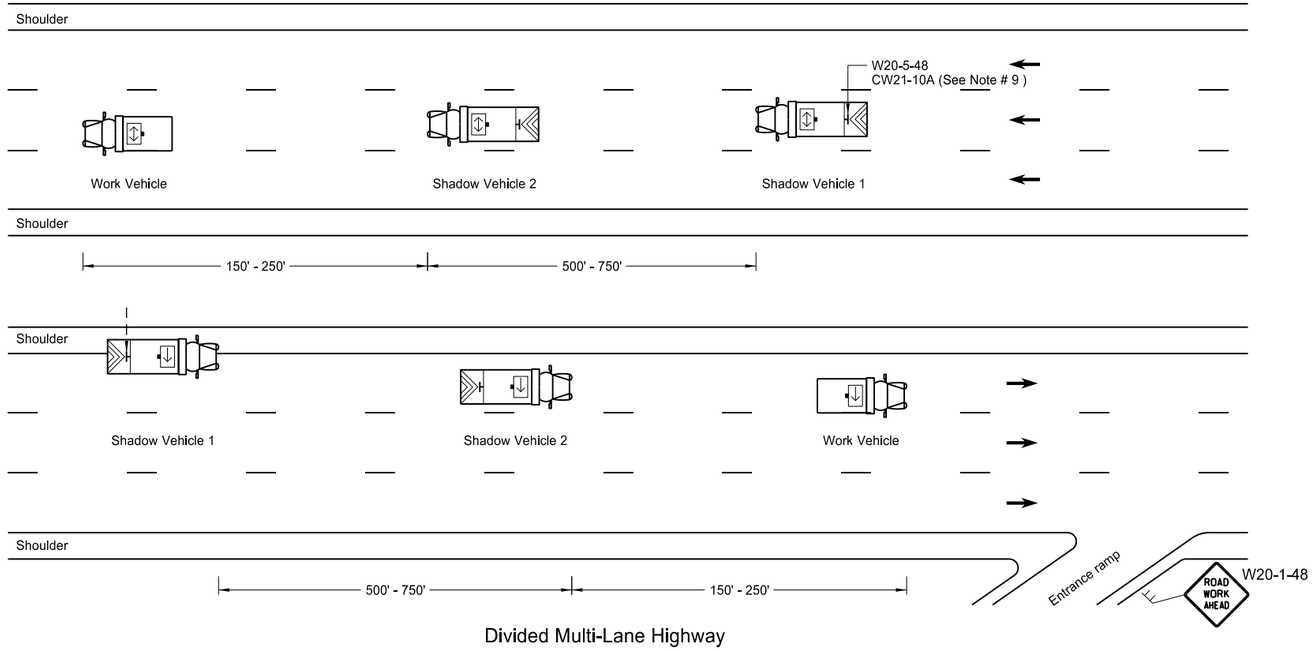
Undivided Multi-Lane Roadway

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.



Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center



Divided Multi-Lane Highway

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

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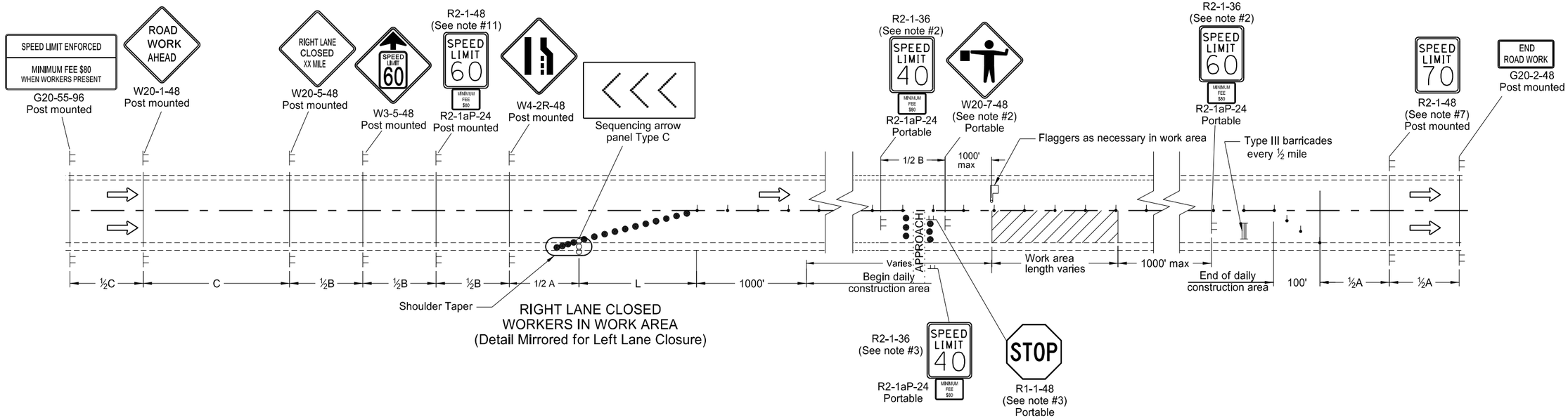
SIGN LAYOUT FOR ONE LANE CLOSURE



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 $80 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 standard is part of other traffic control layouts 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	

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

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-26-2012

REVISIONS

DATE	CHANGE
3-15-16	Removed Do Not Pass signs and updated notes.
8-17-17	Updated notes & sign nos. & moved Speed Limit signs.
11-01-19	Removed shldr taper details & revised tubular mkr symbol

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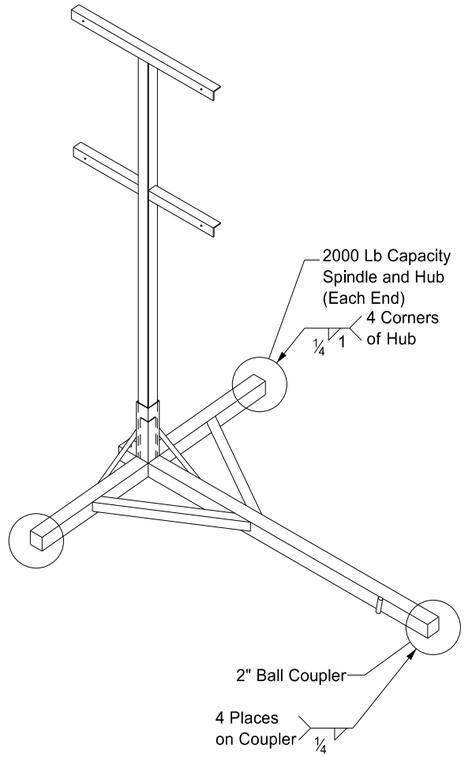
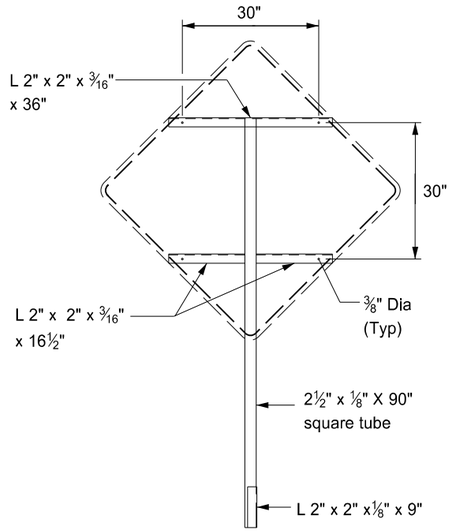
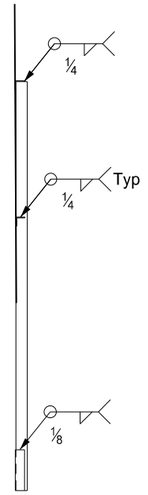
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



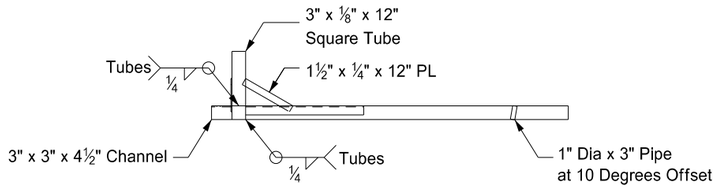


FRONT



RIGHT

SIGN SUPPORT



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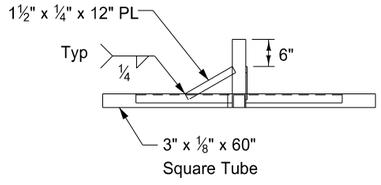

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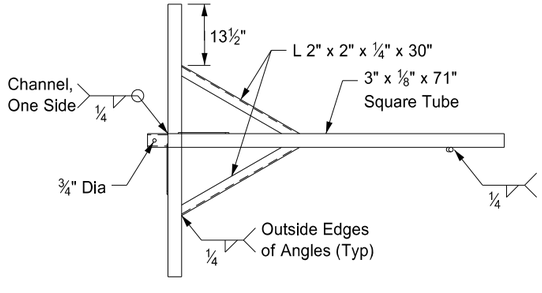


TOP

TRAILER

Notes:

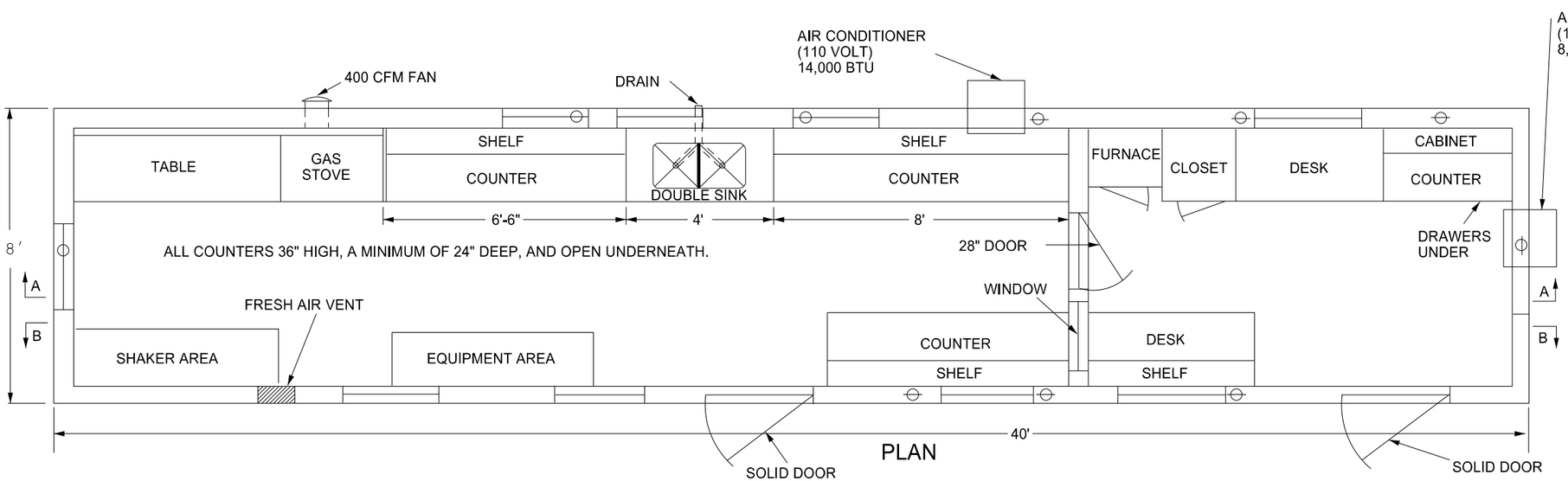
1. The maximum weight of the assembly is 250 pounds.
2. Use a 14" wheel and tire.
3. Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
4. Other NCHRP 350 crash tested assemblies are acceptable.

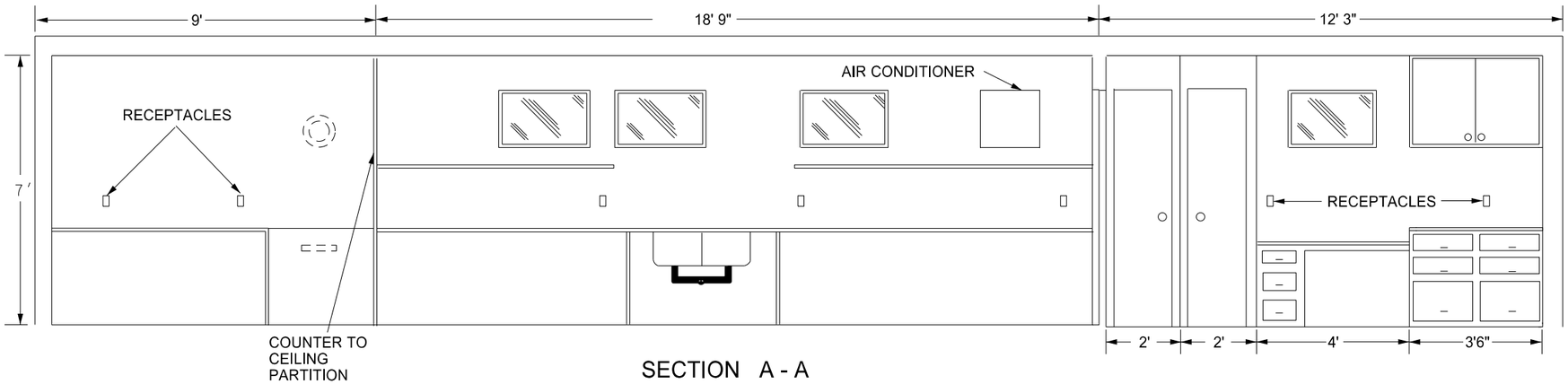
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel Registration Number PE- 2930 , on 11/23/10 and the original document is stored at the North Dakota Department of Transportation

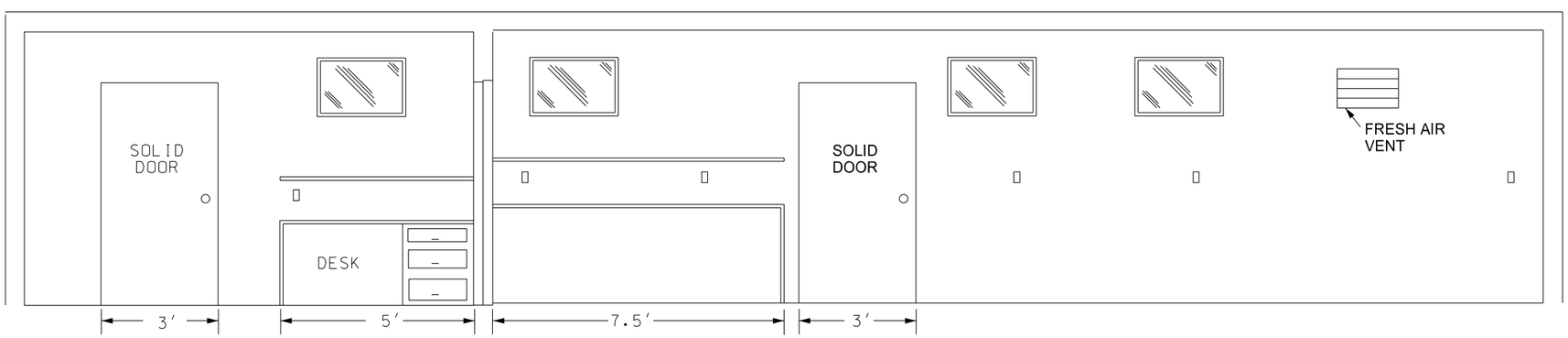
BITUMINOUS LABORATORY

D-706-1





SECTION A - A



SECTION B - B

Provide a laboratory with the following:

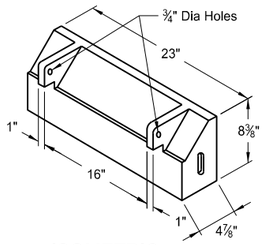
1. A 1'x1' shelf at 36" above the regular countertop.
2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
4. Fresh air vent hinged to open or close manually.
5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
9. The steel cable tie downs and ground anchors at each corner of the lab.
10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp

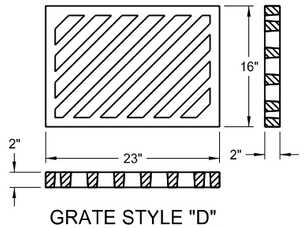
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

INLET - TYPE 1

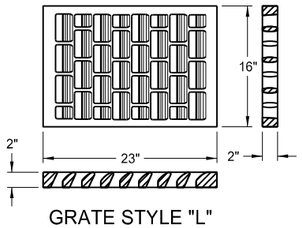
D-722-1



ISOMETRIC
(Grate Style "D" & "L")



GRATE STYLE "D"
(Waterway Area = 1.1 SF)



GRATE STYLE "L"
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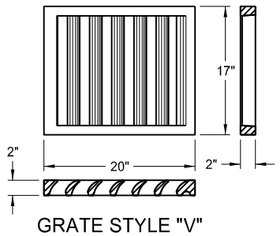
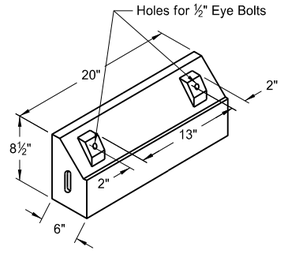
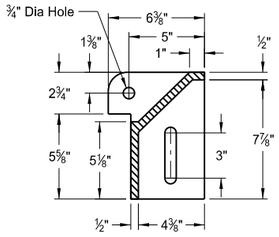


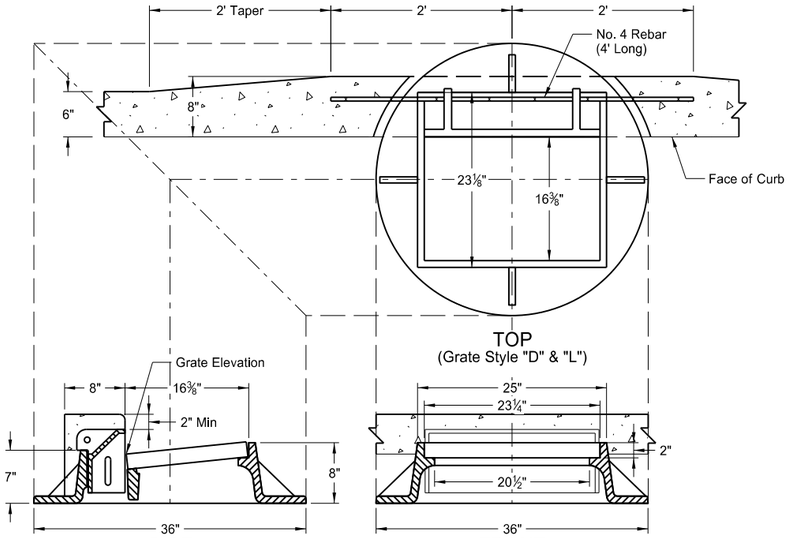
GRATE STYLE "V"
(Waterway Area = 1.3 SF)



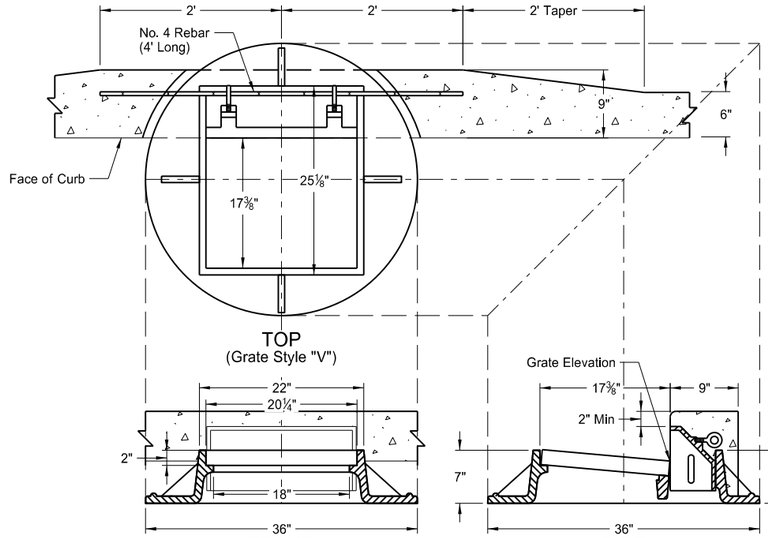
ISOMETRIC
(Grade Style "V")



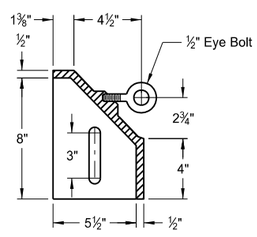
CURB BOX
(Grade Style "D" & "L")



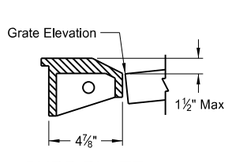
TOP
(Grade Style "D" & "L")



TOP
(Grade Style "V")



CURB BOX
(Grade Style "V")

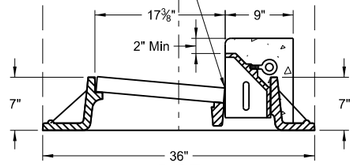


CURB PLATE
(Grade Style "D" & "L")

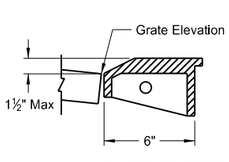
SIDE
(Grade Style "D" & "L")

FRONT
(Grade Style "D" & "L")

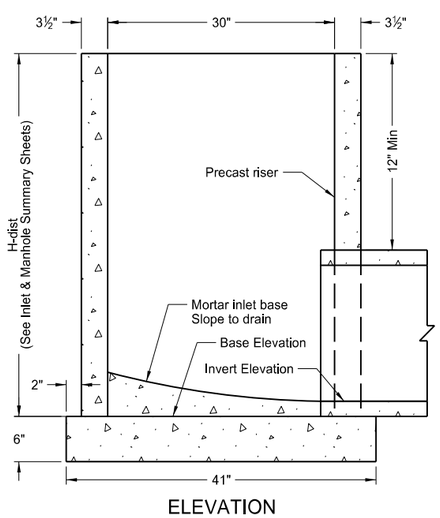
FRONT
(Grade Style "V")



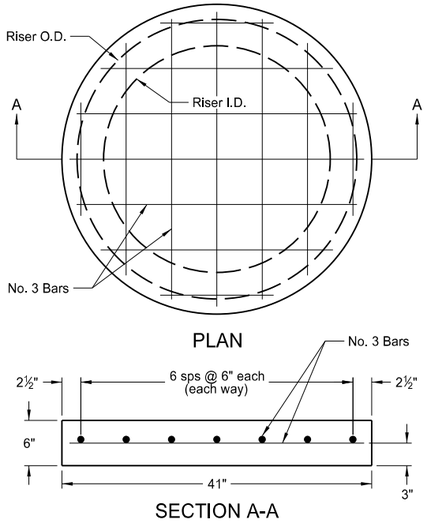
SIDE
(Grade Style "V")



CURB PLATE
(Grade Style "V")



ELEVATION



PLAN

SECTION A-A

NOTES:

1. Use of other castings, similar in dimension, is allowed if the casting conforms to the riser section and has a grate style specified in the plans, meeting or exceeding the waterway area listed. Modifications to the inlet to facilitate similar castings are only allowed with written approval from the Engineer.
2. Use castings manufactured in accordance with AASHTO M306-09. Use metal conforming to AASHTO M105 Class 35 B in the manufacture of castings.
3. Use class AE-3 concrete precast or cast-in-place bases constructed in accordance with NDDOT Standard Specifications.
4. Construct precast concrete risers in accordance with AASHTO M199.
5. On projects with PCC pavement, construct inlet risers 4 to 5 inches below final elevation and adjust to final grade with adjusting rings or cast-in-place concrete after paving. Include all costs for this adjustment in the price bid for the inlet.
6. Use Grade 60 reinforcing steel.
7. Use curb plates in lieu of curb boxes when curb height at inlet is 4" or less.

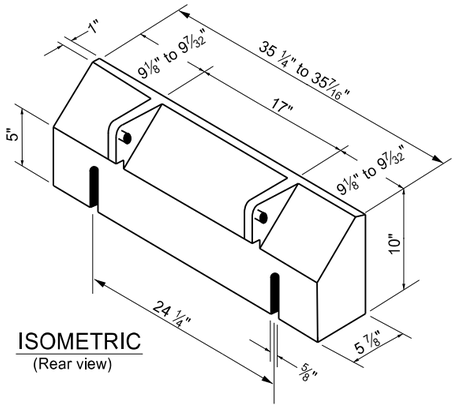
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-13	
REVISIONS	
DATE	CHANGE
11-27-13	Revised drawing title, notes & curb plate subtitle.
6-24-14	Revised Note 3.
10-17-17	Updated to active voice.

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 10-17-2017 and the original document is stored at the North Dakota Department of Transportation

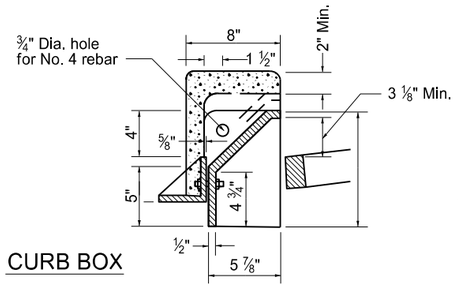
INLET - TYPE 2

D-722-2

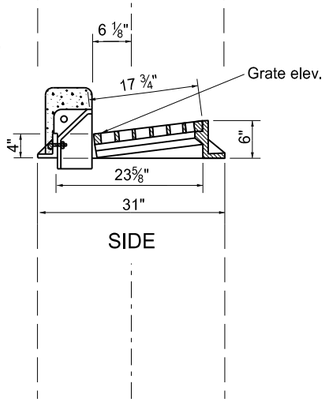
Pay Items
Inlet - Type 2 .....Ea.
Inlet - Type 2, Double.....Ea.



ISOMETRIC
(Rear view)

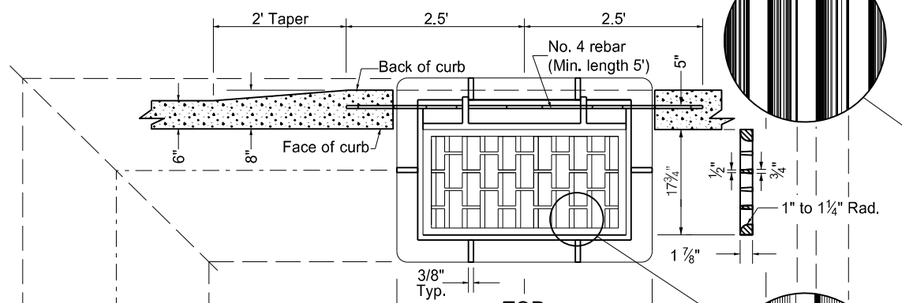


CURB BOX



SIDE

GRATE STYLE "L"
(Min. Waterway Area - 1.9 Sq. Ft.)



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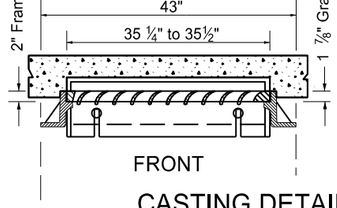

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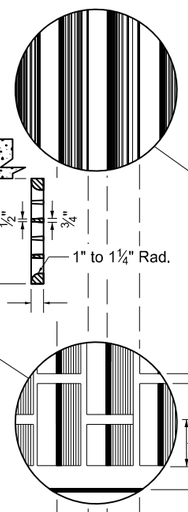
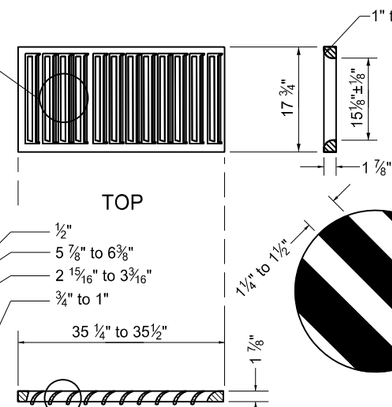


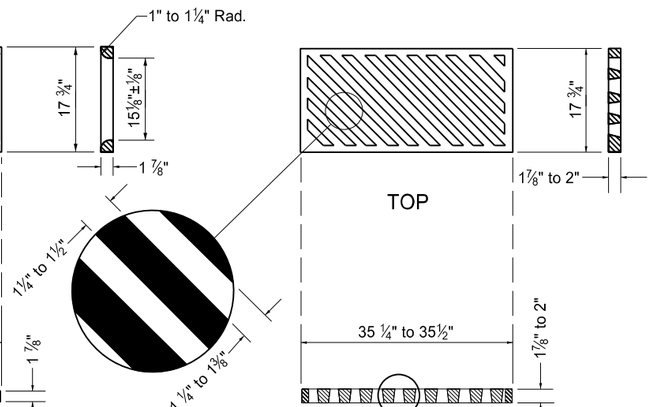
GRATE STYLE "V"
(Min. Waterway Area - 2.4 Sq. Ft.)



TOP

FRONT

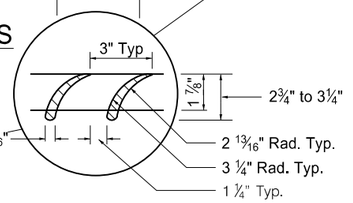
GRATE STYLE "D"
(Min. Waterway area - 1.6 Sq. Ft.)

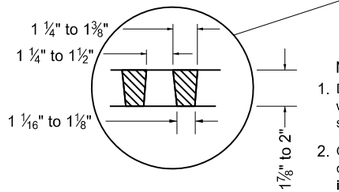


TOP

FRONT

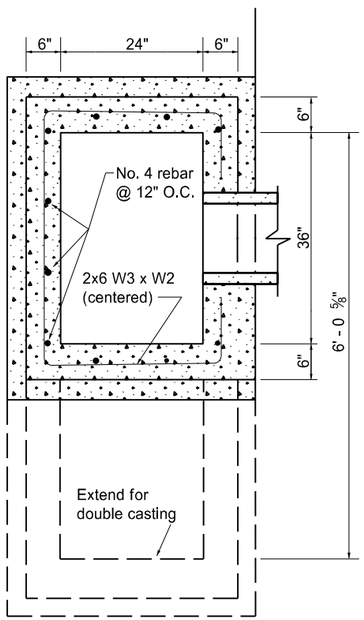
CASTING DETAILS



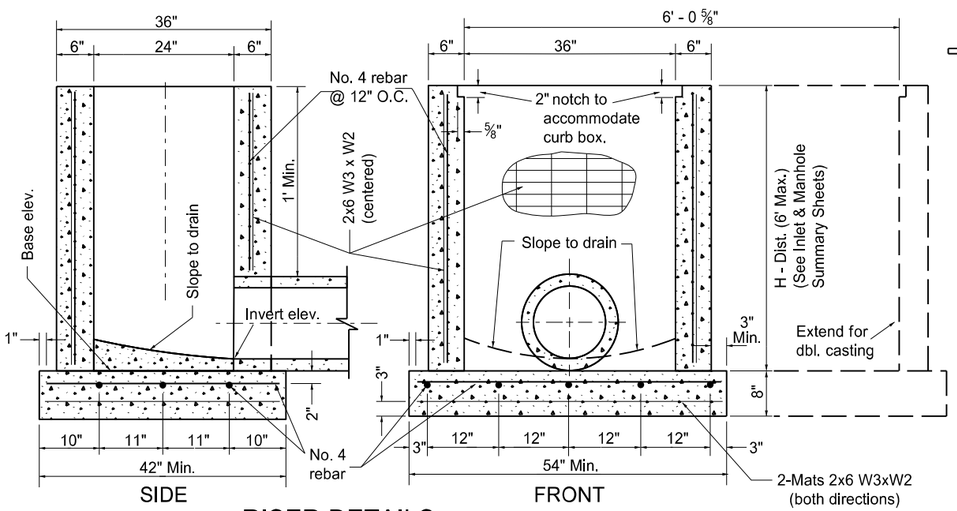


Notes:

1. Drainage structure castings shall be manufactured in accordance with AASHTO M306. Metal used in the manufacture of castings shall conform to AASHTO M105 Class 35B.
2. Other castings, similar in dimension, may be used if the casting conforms to the riser section and has the grate style as specified in the plans. If modifications to the inlet riser are required to accomodate similar castings, the contractor must receive written approval from the engineer.
3. Precast risers shall be constructed in accordance with ASTM C858.
4. The contractor shall have the option of using precast or poured in place bases. Cast in place concrete shall be Class AE-3. Construction shall be in accordance with section 722 of the Standard Specifications.
5. On projects with P.C.C. pavement, all inlet risers or barrels shall be constructed 4 to 5 inches below final elevation and adjusted to final grade after paving. Adjustment may be done with adjusting rings or cast-in-place concrete. All costs for this adjustment shall be included in the price bid for the inlet.
6. Welded wire reinforcing fabric shall conform to AASHTO M55 Grade 65.
7. The deformed reinforcing steel shall conform to AASHTO M31.



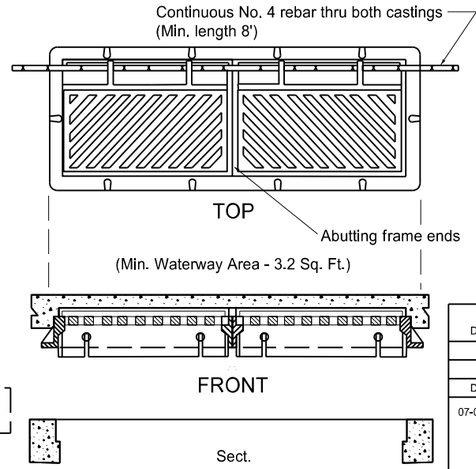
TOP



SIDE

FRONT

RISER DETAILS



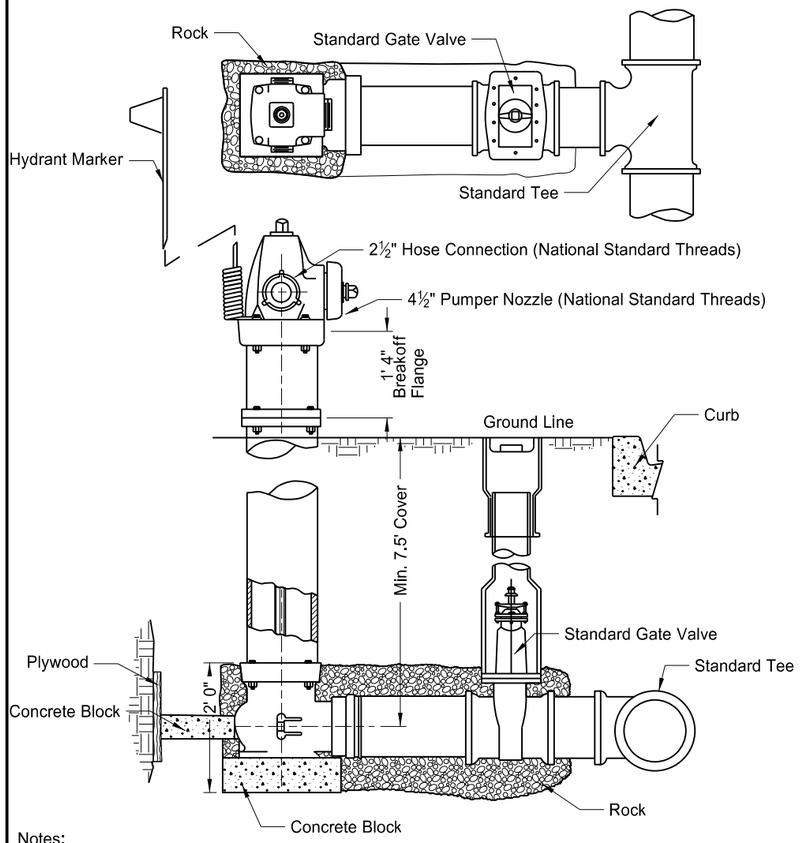
TOP

FRONT

INLET - TYPE 2 - DOUBLE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
07-07-14	Revised Note 4

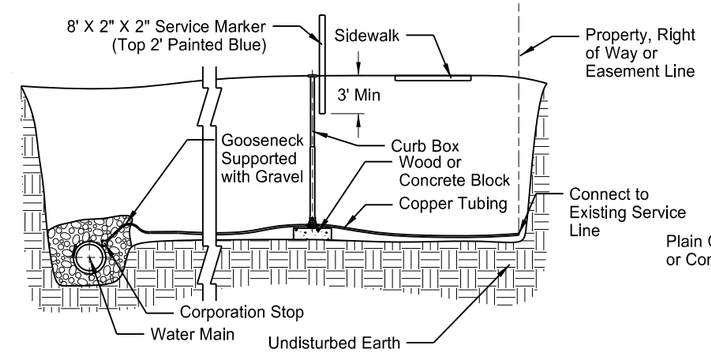
This document was originally issued and sealed by TERRENCE R. UDLAND Registration Number PE- 2674, on 07/07/14 and the original document is stored at the North Dakota Department of Transportation

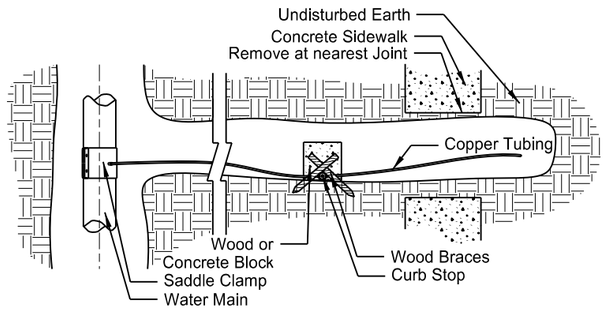


Notes:
1. Use City Standards for Operating & Cap Nuts.

2. Supply, furnish, and install hydrant marker. Include costs in the unit bid price for the hydrant. Place hydrant marker current with city standards or as approved by the Engineer.

STANDARD FIRE HYDRANT & CONNECTION

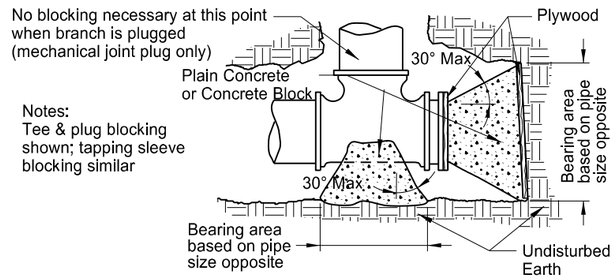




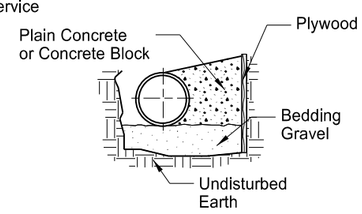
Notes:
1. Service clamp not required where small size service line connects to large cast iron or ductile iron pipe and three threads of the corporation stop make contact with the wall.

2. Gravel backfill trench from water main to back of curb line and under sidewalk areas or earth backfill with standard compaction where specified.

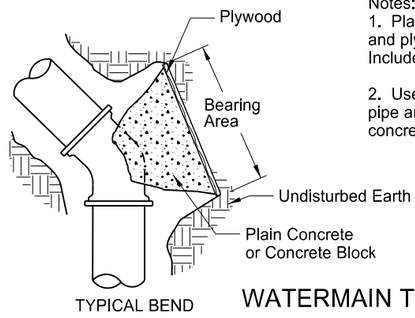
WATER CURB CONNECTION



Notes:
Tee & plug blocking shown; tapping sleeve blocking similar



TYPICAL SECTION



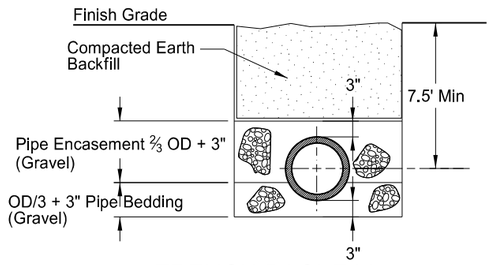
TYPICAL BEND

Table of Required Bearing Areas					
Size of Pipe	90° Bend	45° Bend	22.5° Bend	11.25° Bend	Tees, Plugs & Tapping Sleeves
4"	2' Sq	2' Sq	2' Sq	2' Sq	2' Sq
6"	3' Sq	2' Sq	2' Sq	2' Sq	3' Sq
8"	5' Sq	3' Sq	2' Sq	2' Sq	4' Sq
10"	8' Sq	4' Sq	3' Sq	2' Sq	6' Sq
12"	11' Sq	6' Sq	3' Sq	2' Sq	8' Sq
16"	20' Sq	11' Sq	6' Sq	4' Sq	15' Sq
18"	25' Sq	14' Sq	7' Sq	4' Sq	18' Sq

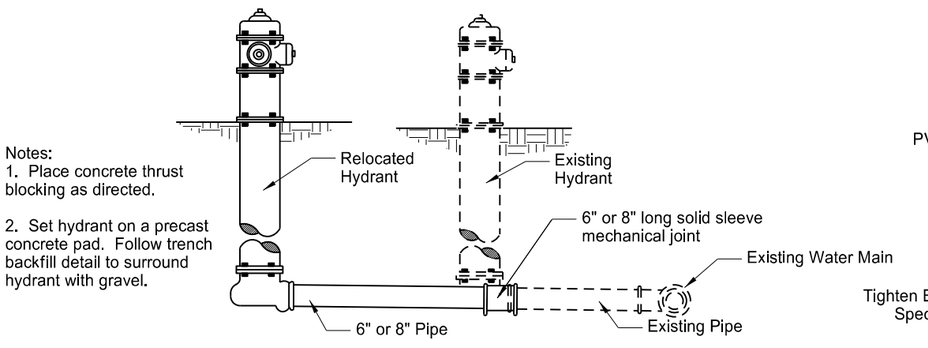
Notes:
1. Place concrete blocking against undisturbed earth and plywood. Keep bells and bolts free of concrete. Include placed concrete in price bid for water main.

2. Use solid concrete blocks for blocking on 8" Dia. pipe and below, if approved by the Engineer. Place concrete, as shown above, for 10" Dia. pipe and larger.

WATERMAIN THRUST BLOCK DETAILS



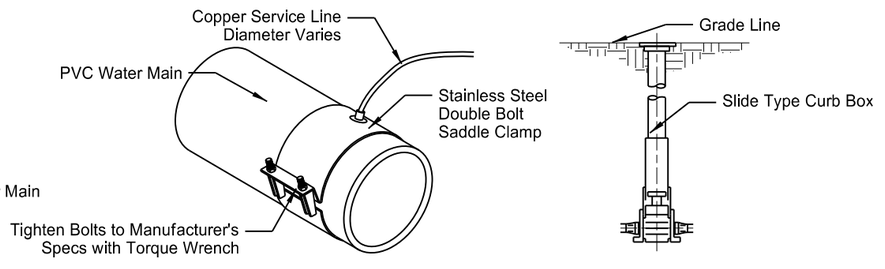
TRENCH BACKFILL



Notes:
1. Place concrete thrust blocking as directed.

2. Set hydrant on a precast concrete pad. Follow trench backfill detail to surround hydrant with gravel.

LAYOUT FOR RELOCATION OF HYDRANTS



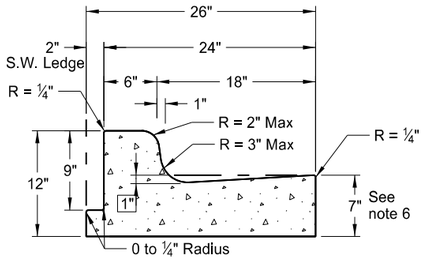
TYPICAL CORPORATION STOP AND CURB STOP

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-22-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
11-01-19	New Design Engineer PE Stamp.

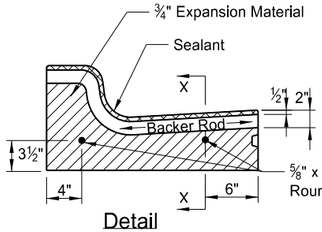
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

Curb & Gutter and Valley Gutter

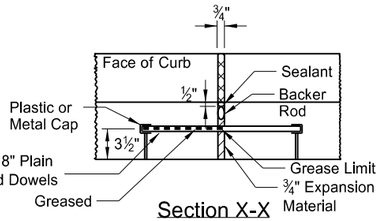
D-748-1



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

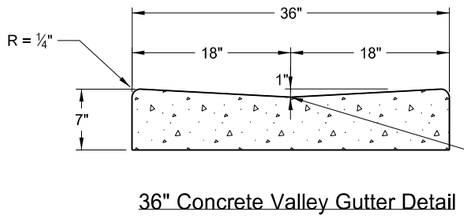


Detail

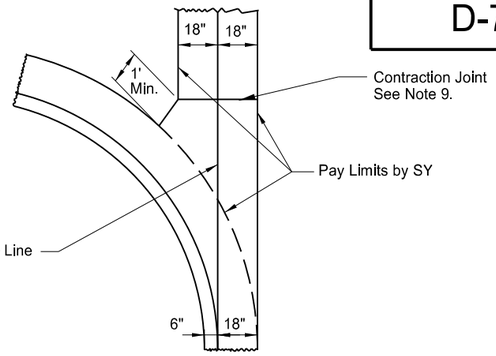


Section X-X

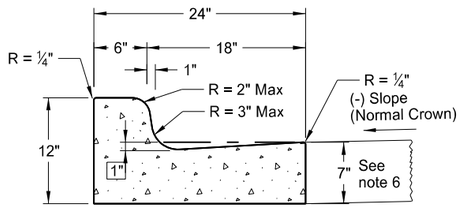
Isolation Joint



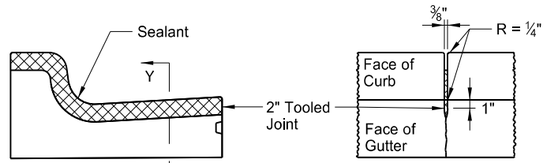
36" Concrete Valley Gutter Detail



36" Concrete Valley Gutter Plan



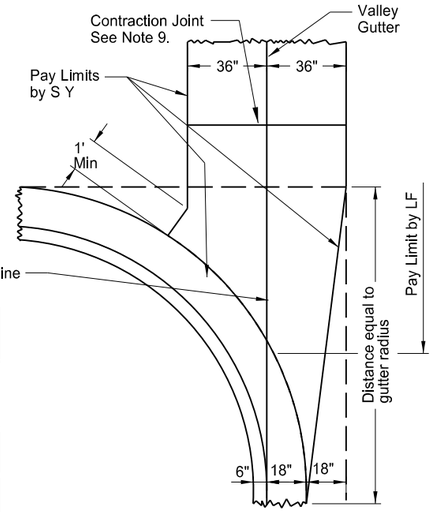
Curb & Gutter Type 1 (Sec. A)



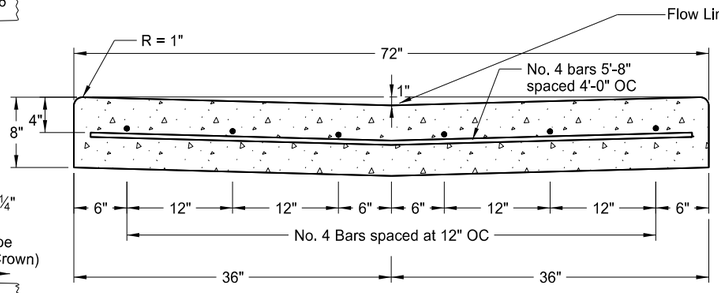
Detail

Section Y-Y

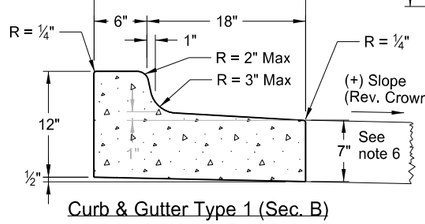
Contraction Joint



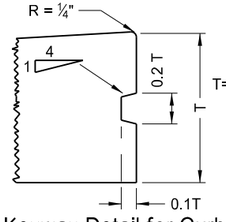
72" Concrete Valley Gutter Plan



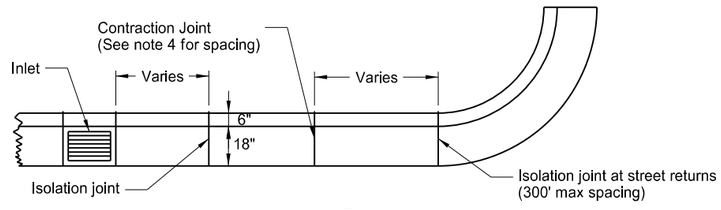
72" Concrete Valley Gutter Detail



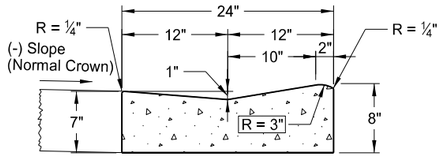
Curb & Gutter Type 1 (Sec. B)



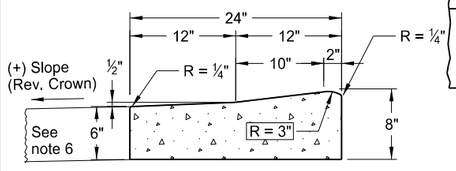
Keyway Detail for Curb & Gutter
(To be used with PCC Pavement and Drives)



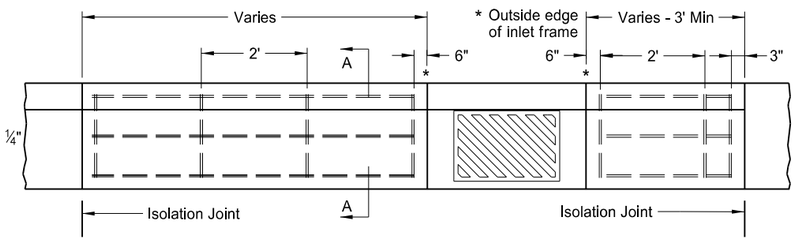
Joint Location Detail



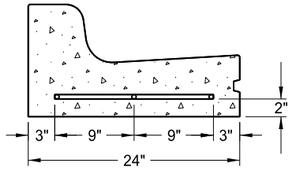
Mountable Curb & Gutter Type 1 (Sec. A)



Mountable Curb & Gutter Type 1 (Sec. B)



Curb & Gutter Reinforcing at Inlets



Section A-A

NOTES:

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

8-7-2013

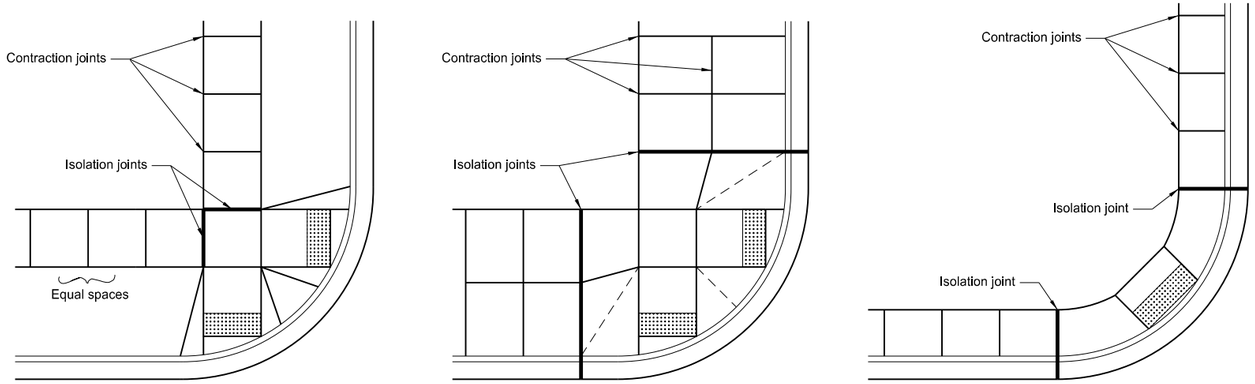
REVISIONS

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

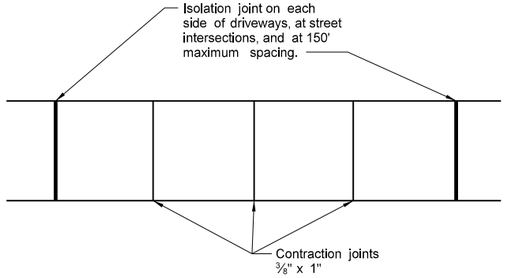
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-19 and the original document is stored at the North Dakota Department of Transportation

SIDEWALK

D-750-2



Typical Joint Layouts



NOTES:

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

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

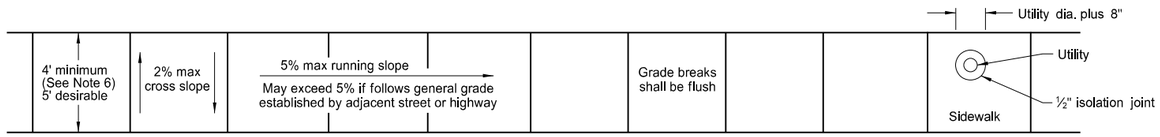
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

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

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

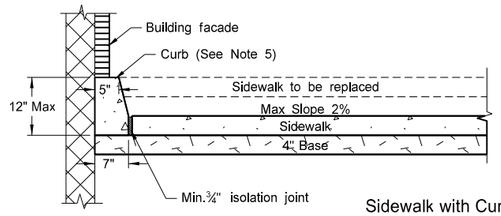
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear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

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

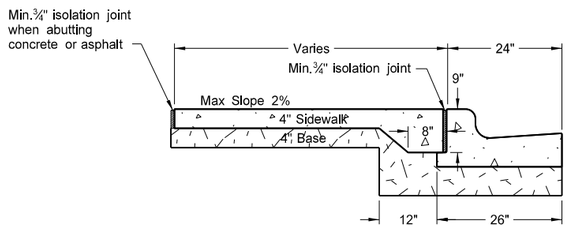


Sidewalk Width and Grade

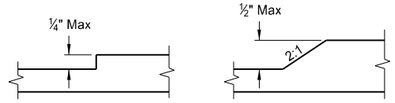
Utility Blockout



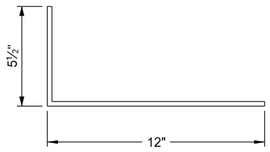
Sidewalk with Curb Detail
(Building face application)



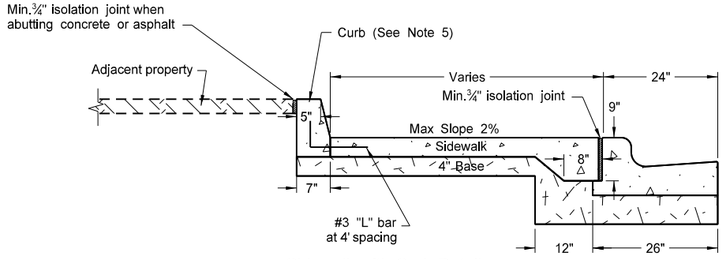
Sidewalk Detail
(Installed adjacent to curb and gutter)



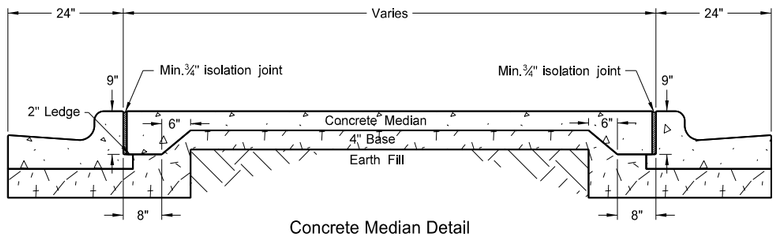
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



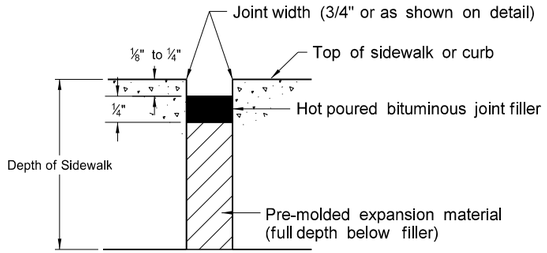
"L"Bar Detail
#3 Bar



Sidewalk with Curb Detail
(Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal
(longitudinal and transverse)

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

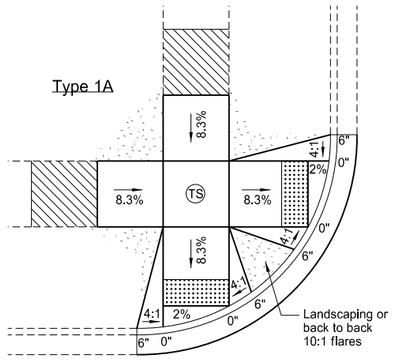
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

CURB RAMP DETAILS

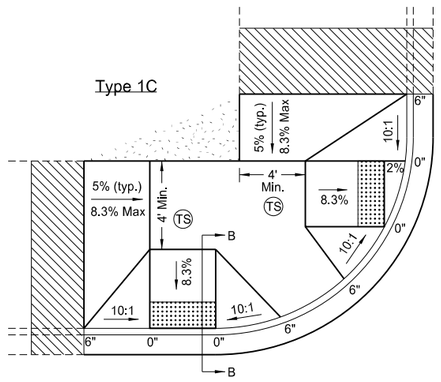
D-750-3

+More Right of Way — Less Right of Way-

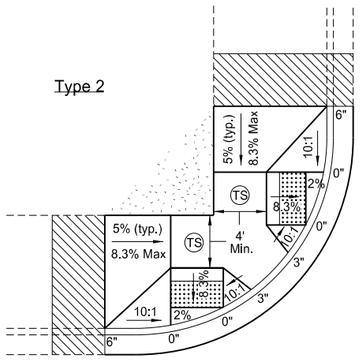
Type 1A



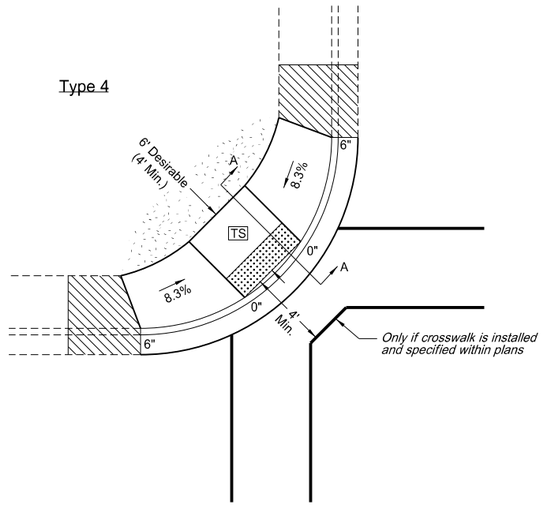
Type 1C



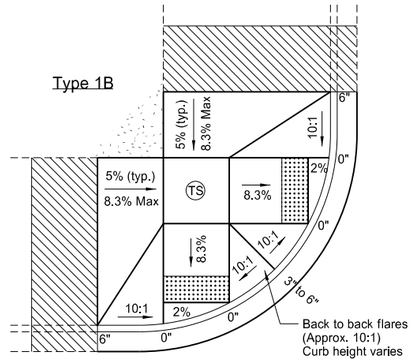
Type 2



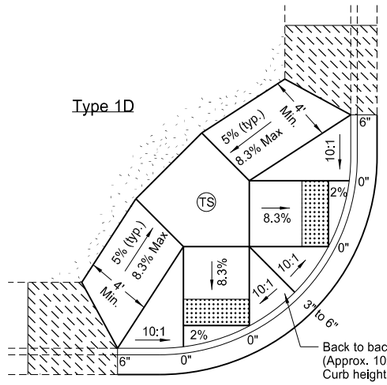
Type 4



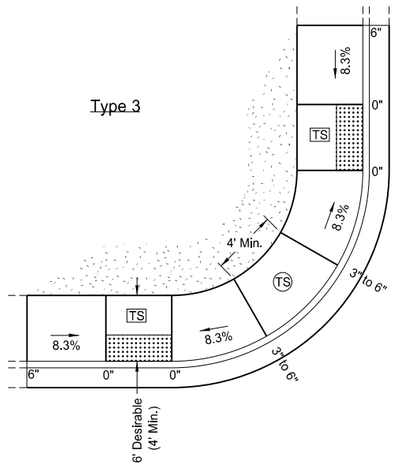
Type 1B



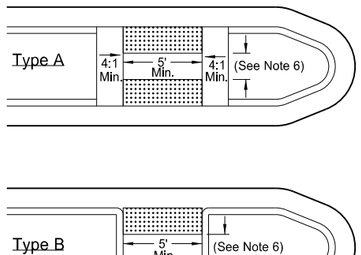
Type 1D

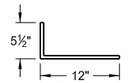


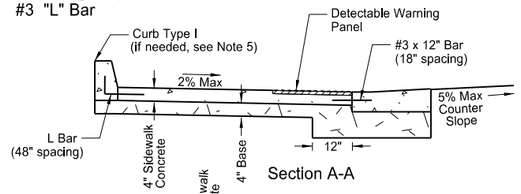
Type 3

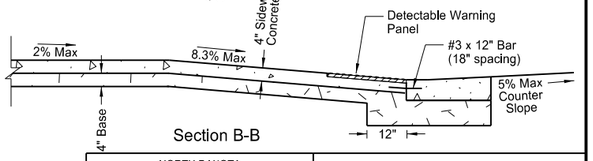


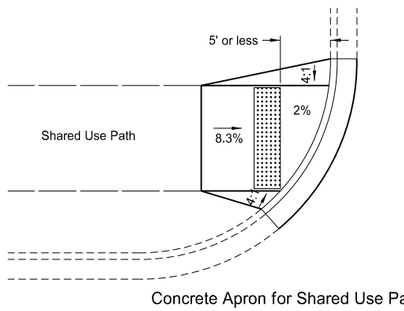
Median Refuge Islands (Cut-Through)

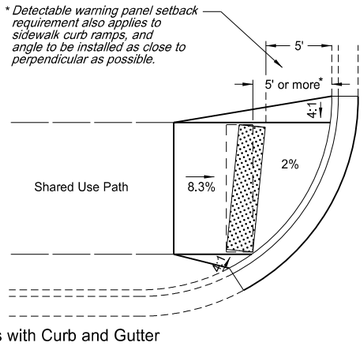




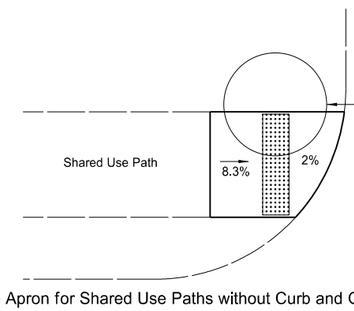




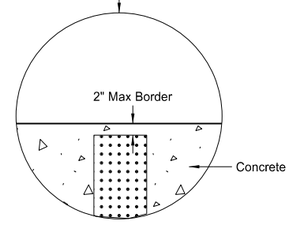


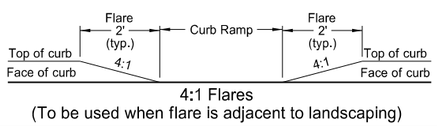


Concrete Apron for Shared Use Paths with Curb and Gutter

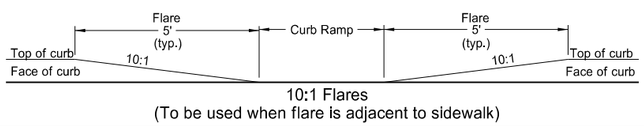


Concrete Apron for Shared Use Paths without Curb and Gutter





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



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

NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to existing sidewalk width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Desirable turning space size is 5' x 5' or larger with a minimum size of 4' x 4'. The maximum slope for turning spaces is 2% in any direction.
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 pedestrian access route with max 2% concrete cross slope, excluding flares.
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. Islands: If the grade of the island curb ramp is less than 2%, provide a minimum distance of 2' between warning panels. If the grade of the island curb ramp is steeper than 2%, provide a turning space between the ramps.

LEGEND:

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

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

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 09-05-2018 and the original document is stored at the North Dakota Department of Transportation

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

Notes:

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

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

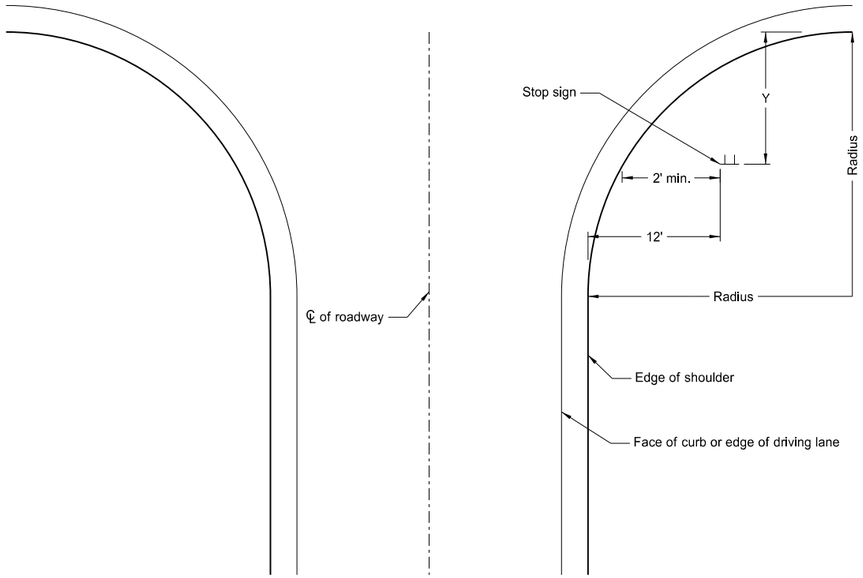
   Install signs on expressways a minimum height of 7'.

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

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

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

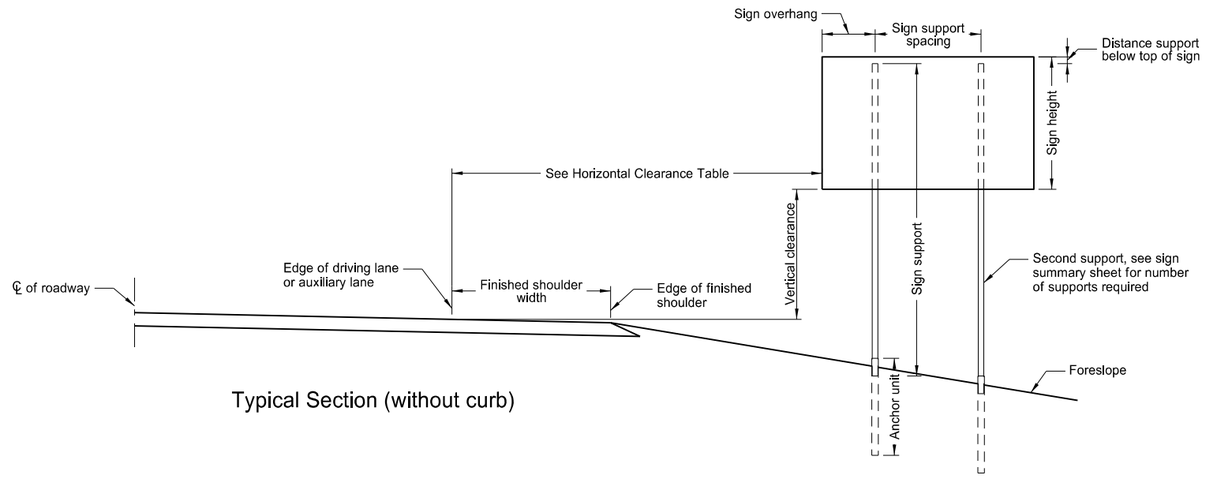
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.



Stop Sign Location
Wide Throat Intersection

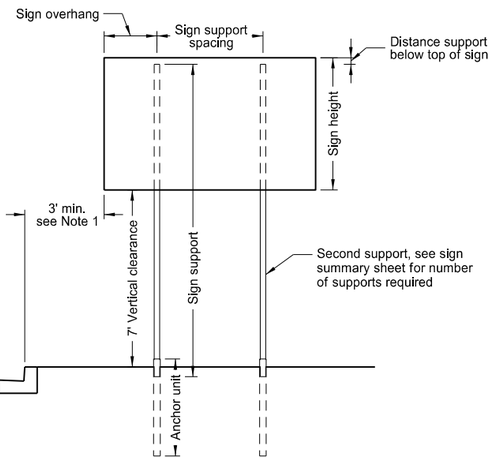
Use layout for the placement of "Stop" signs.

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



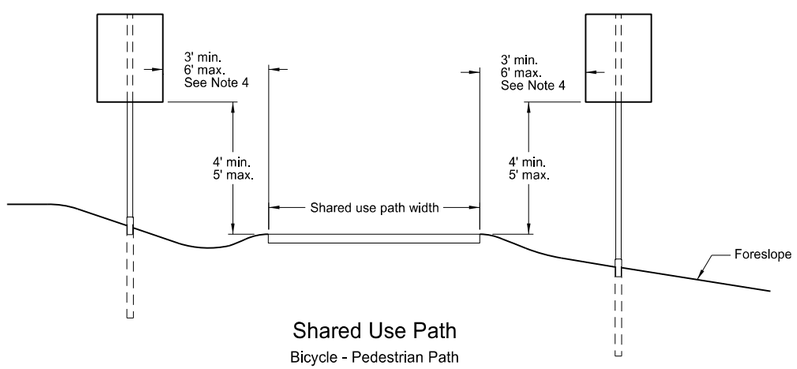
Typical Section (without curb)

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



Typical Section (with curb)

Residential or Business District



Shared Use Path

Bicycle - Pedestrian Path

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

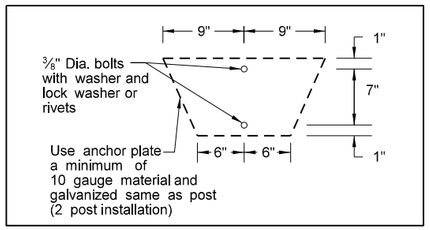
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/29/19 and the original document is stored at the North Dakota Department of Transportation

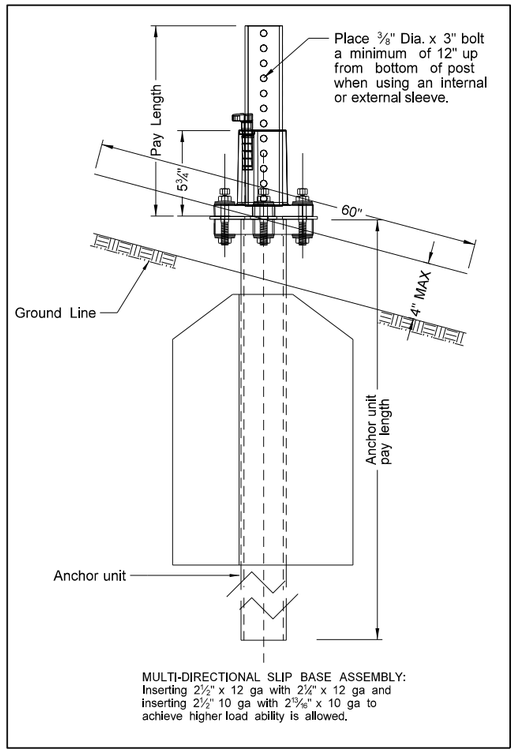
Mounting Details Perforated Tube

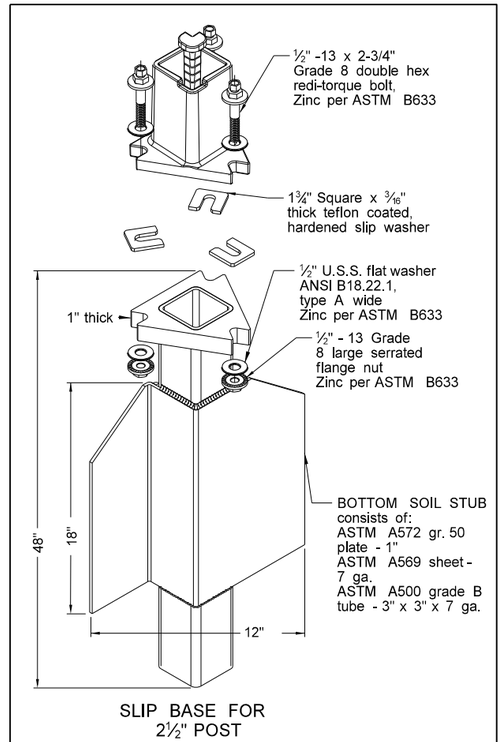
D-754-24

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

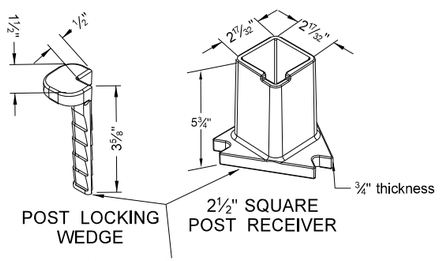
(B) - Provide a shim as specified by the manufacturer when placing 2½", 12 gauge posts in standard soils without breakaway bases. Provide breakaway base when placing the support in weak soils. The Engineer will determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.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

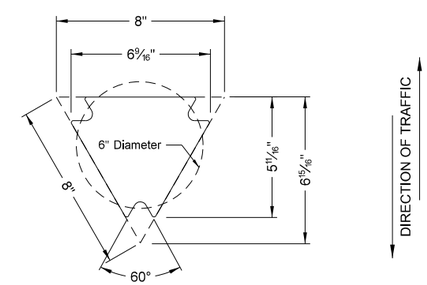






SLIP BASE FOR 2½" POST





SLIP BASE DETAIL

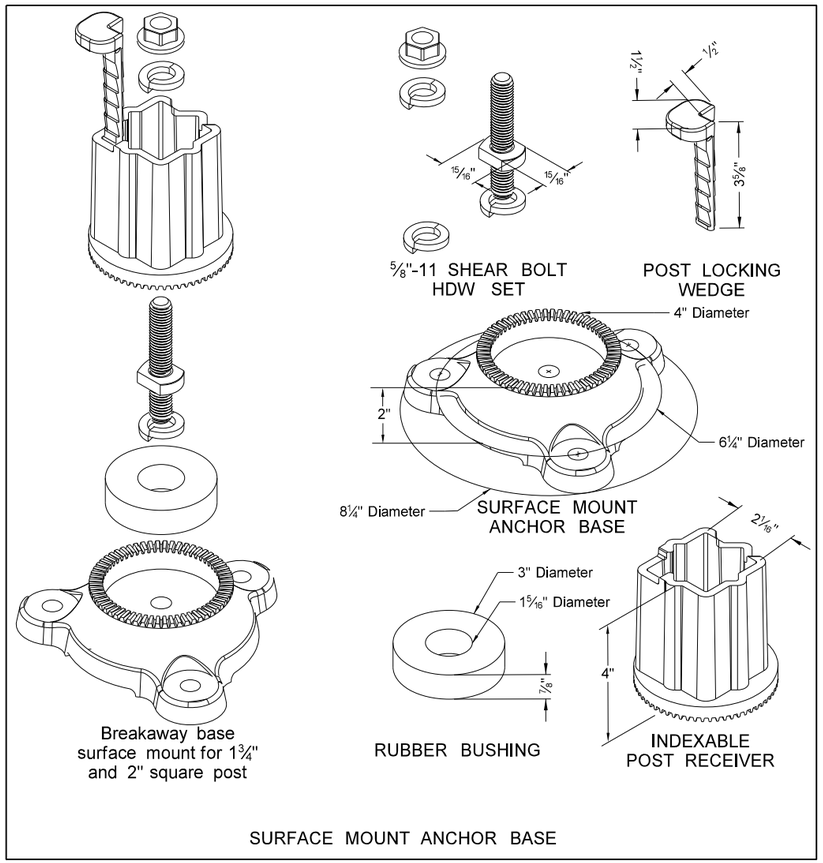
Properties of Telescoping Perforated Tubes

Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.⁴	Cross Sect. Area In.²	Section Modulud In.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2⅜16 x 2⅜16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

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

NOTE:

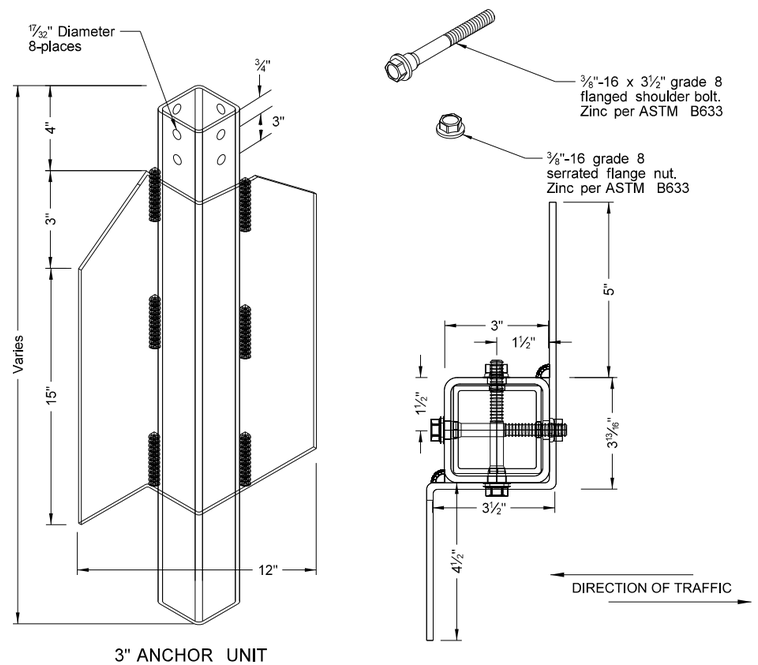
1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Provide 7 guage HRPO commmercial quality ASTM A569 and 3" x 3" x 7" guage ASTM A500 grade B anchor material with 43.9 KSI yield strength and 59.3 KSI tensile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



SURFACE MOUNT ANCHOR BASE

SHOULDER BOLT

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



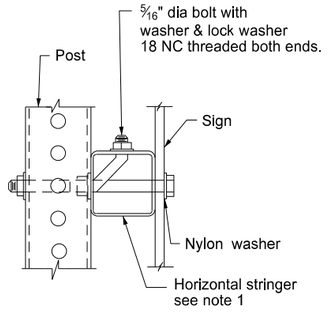
3" ANCHOR UNIT

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

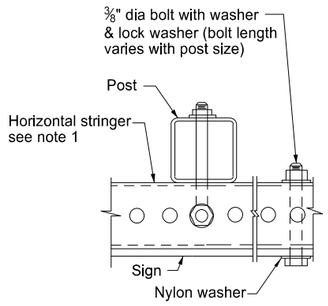
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683 on 8/29/19 and the original document is stored at the North Dakota Department of Transportation

Mounting Details Perforated Tube

D-754-25

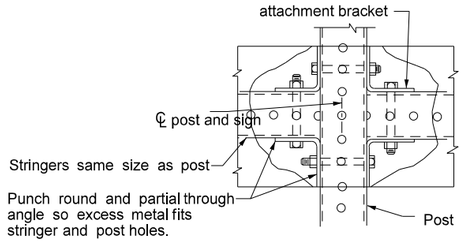


Side View



Top View

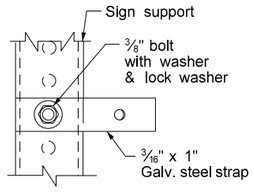
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



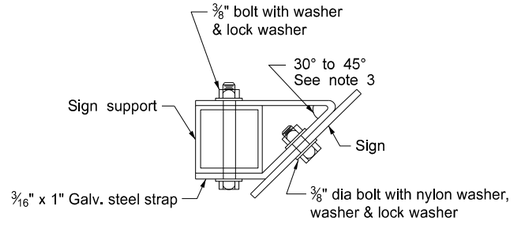
STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING

Note:

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

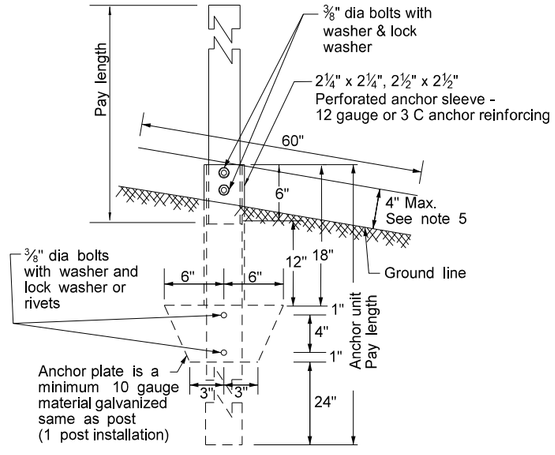


Side View



Top View

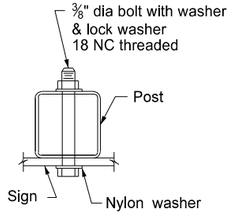
STRAP DETAIL



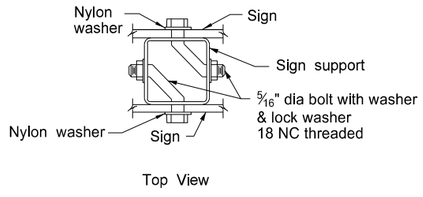
ANCHOR UNIT AND POST ASSEMBLY

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

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

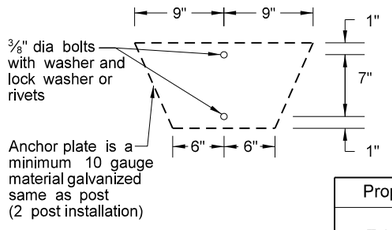


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



Properties of Telescoping Perforated Tubes						
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1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

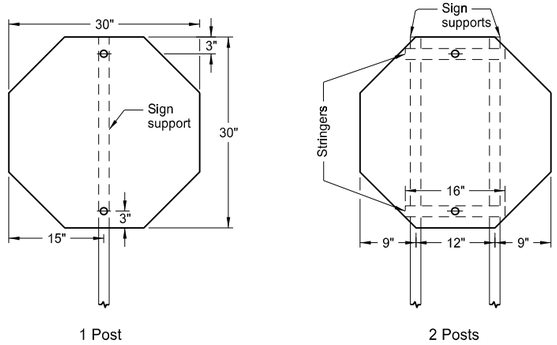
The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.
The 2½" size is shown as 2.51" size on the plans.

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

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

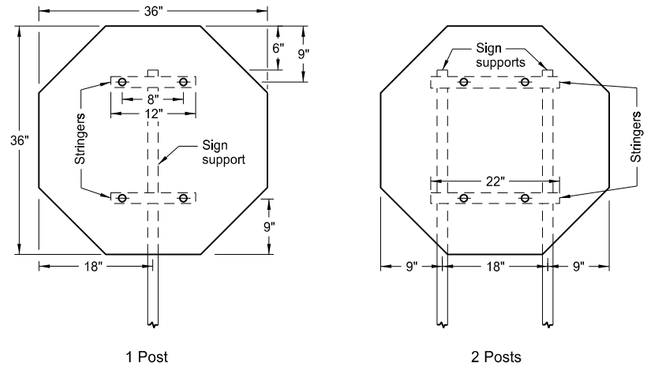
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-26



1 Post 2 Posts

Assembly No. 1

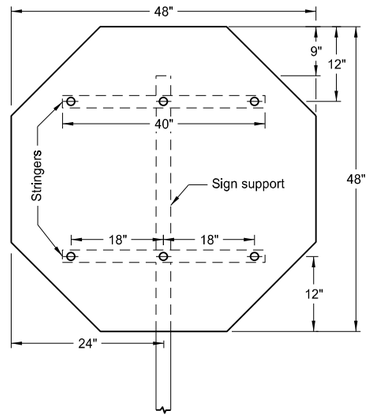


1 Post 2 Posts 3 Posts

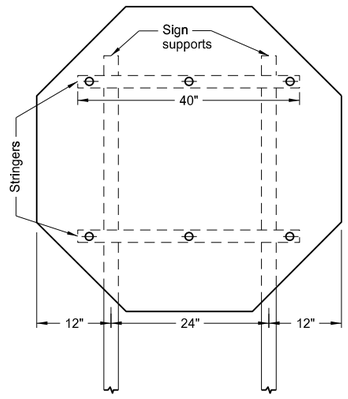
Assembly No. 2

Notes:

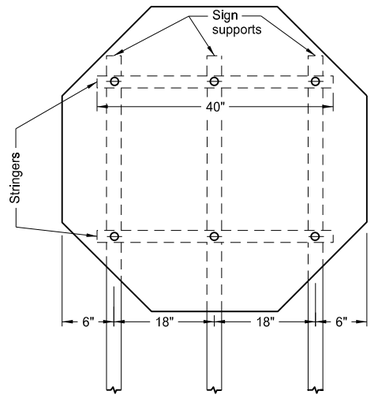
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



1 Post

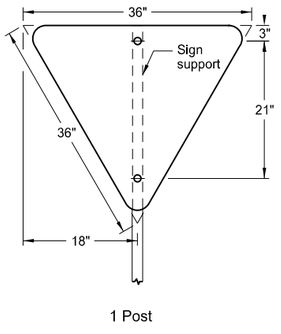


2 Posts

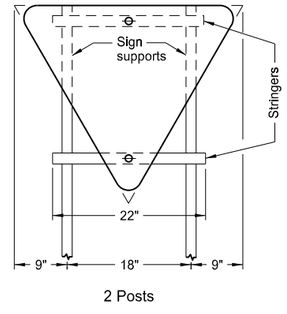


3 Posts

Assembly No. 3

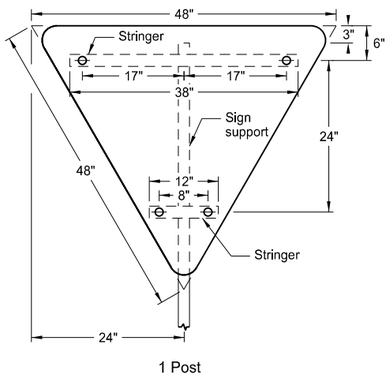


1 Post

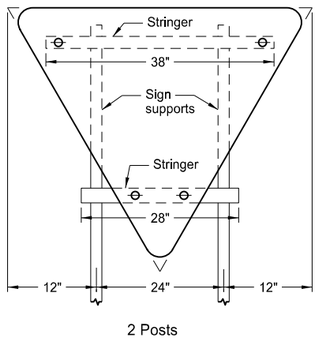


2 Posts

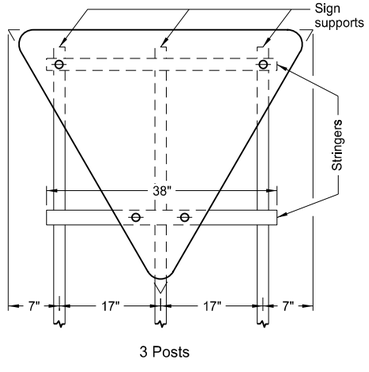
Assembly No. 4



1 Post



2 Posts



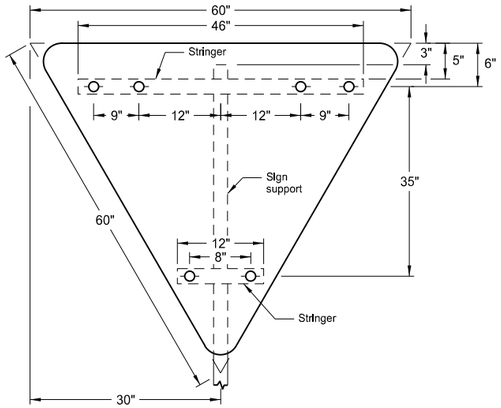
3 Posts

Assembly No. 5

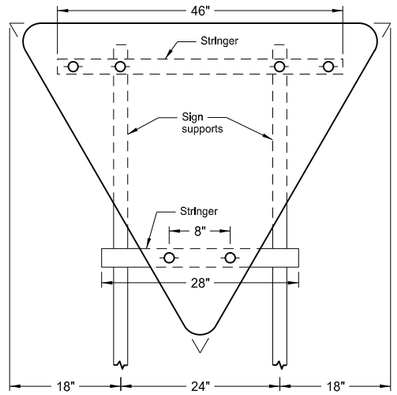
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18 8-30-19	Updated notes to active voice. New Design Engineer PE Stamp.

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

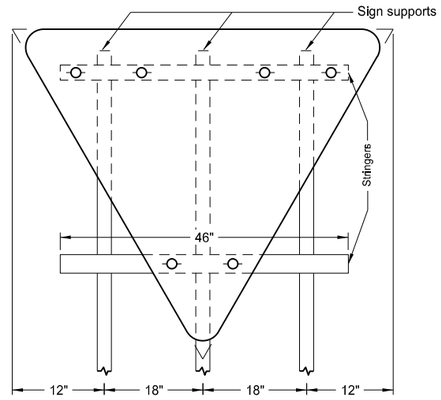
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post



2 Posts

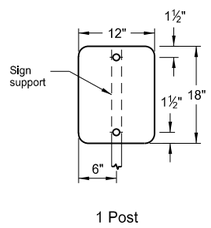


3 Posts

Assembly No. 6

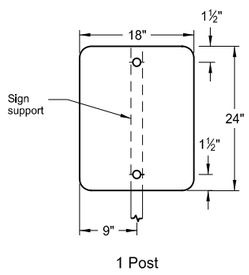
Notes:

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



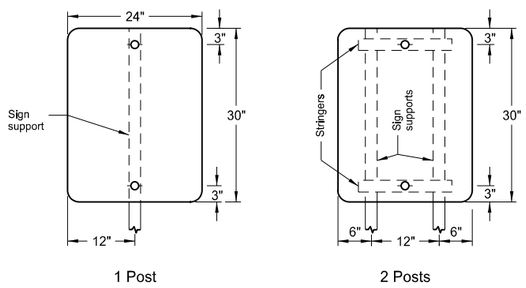
1 Post

Assembly No. 7



1 Post

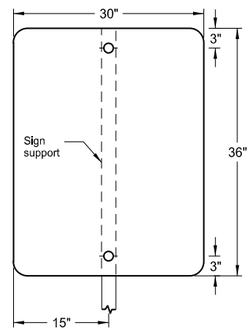
Assembly No. 8



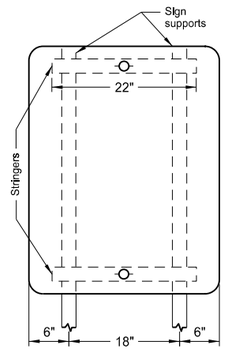
1 Post

2 Posts

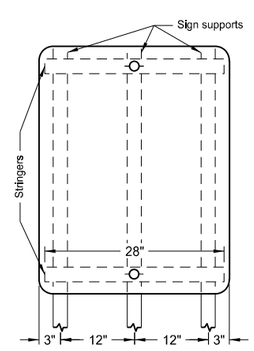
Assembly No. 9



1 Post

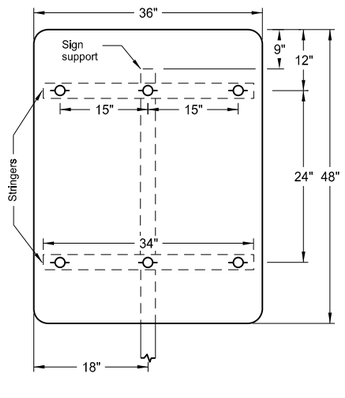


2 Posts

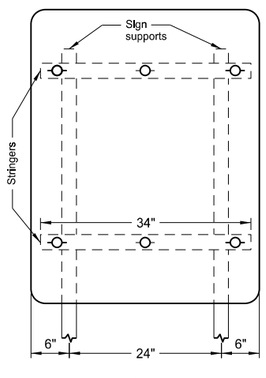


3 Posts

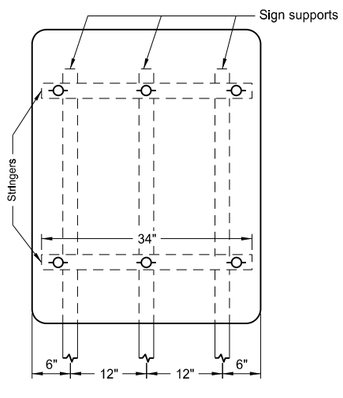
Assembly No. 10



1 Post



2 Posts



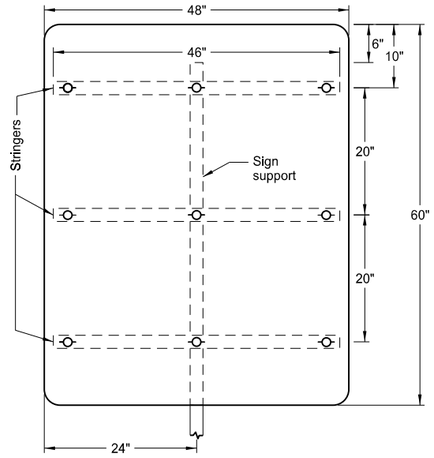
3 Posts

Assembly No. 11

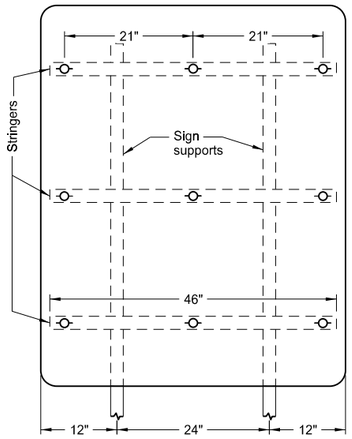
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18 8-30-19	Updated notes to active voice. New Design Engineer PE Stamp.

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

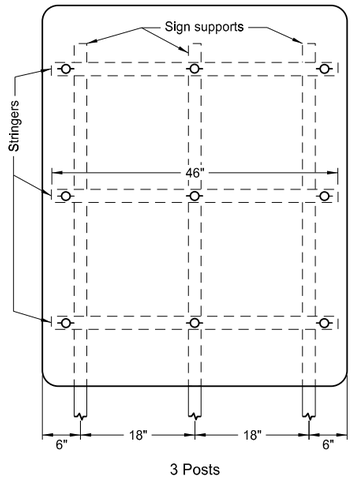
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post

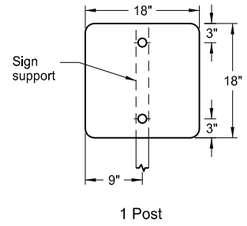


2 Posts



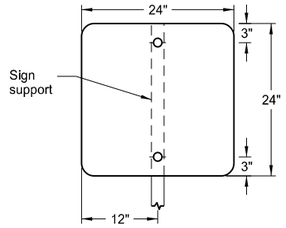
3 Posts

Assembly No. 12

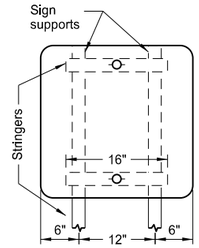


1 Post

Assembly No. 13

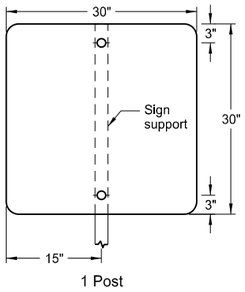


1 Post

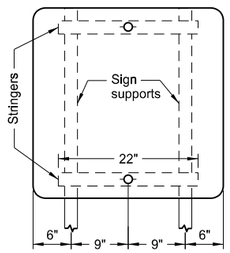


2 Posts

Assembly No. 14

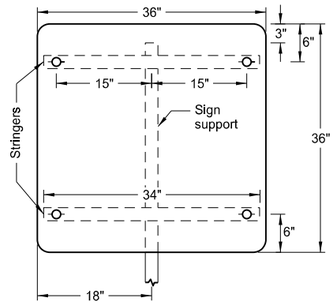


1 Post

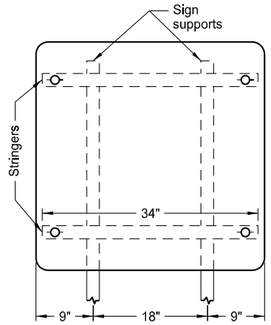


2 Posts

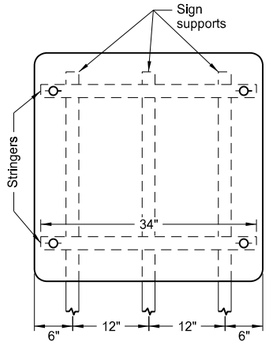
Assembly No. 15



1 Post

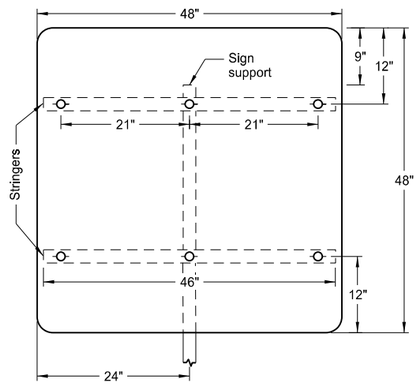


2 Posts

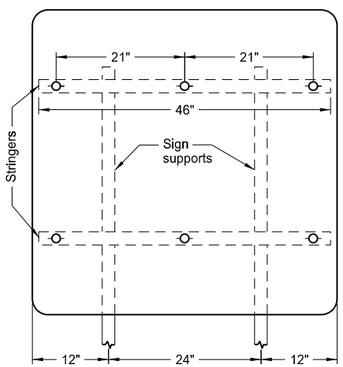


3 Posts

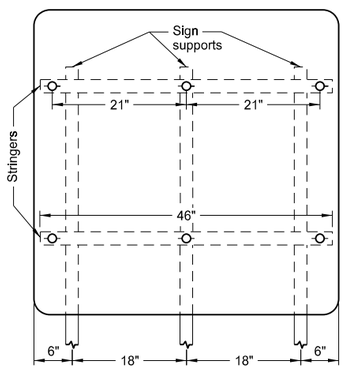
Assembly No. 16



1 Post



2 Posts



3 Posts

Assembly No. 17

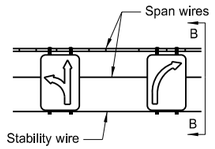
Notes:

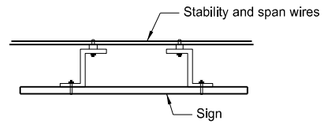
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated to active voice & changed Assembly 16 post spacing.
8-30-19	New Design Engineer PE Stamp.

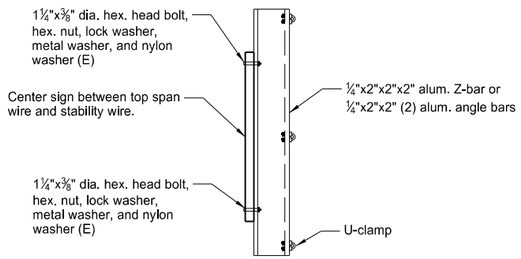
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8/30/19 and the original document is stored at the North Dakota Department of Transportation

LIGHT STANDARD, SIGNAL STANDARD, AND SPAN WIRE MOUNTED SIGN ASSEMBLY DETAIL



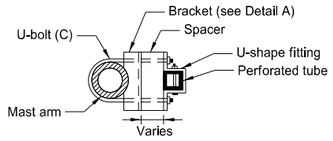


Plan

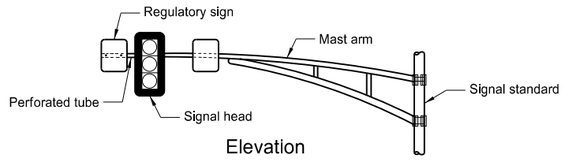


Section B-B

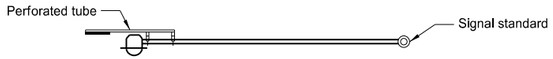
Span Wire Mounted Sign Detail



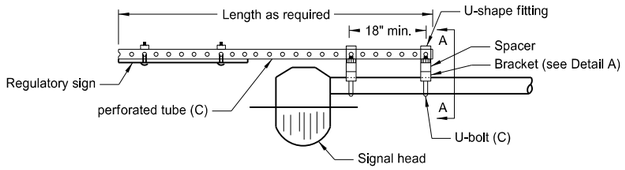
Section A-A



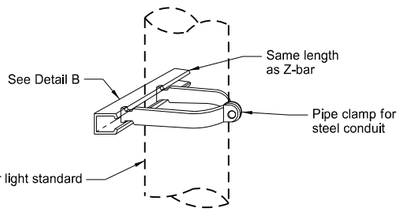
Elevation



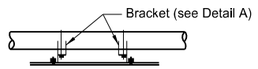
Plan



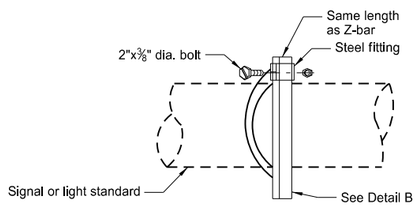
Sign Mounted Beyond End of Mast Arm Detail



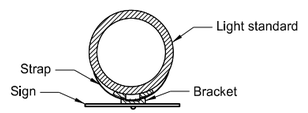
Vertical Mounting
(Use 2 clamps per sign)



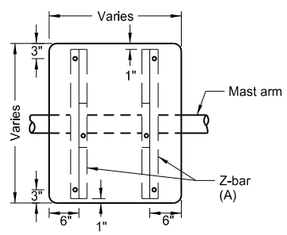
Plan



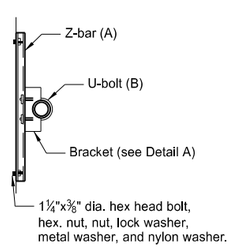
Horizontal Mounting
alternate clamp mounting
(Use 2 clamps per sign)



Light Standard Mounted Sign Bracket Detail
Max. 24"x30" signs (D)

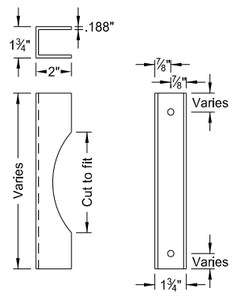


Elevation

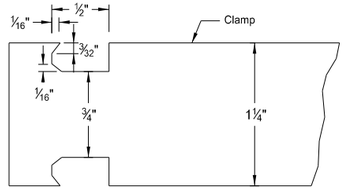


Side View

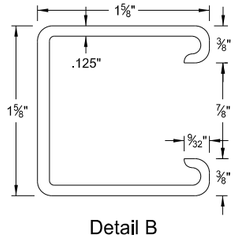
Mast Arm Mounted Regulatory Sign Detail



Detail A



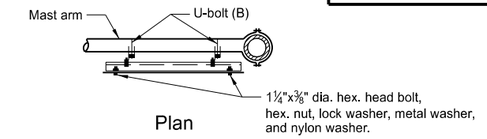
Clamp Detail



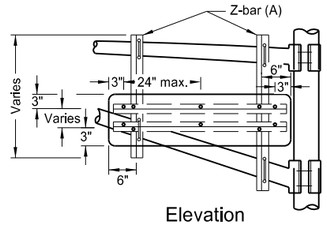
Detail B
Steel Channel

Post Size dia.	Clamp Gauge min.
3½" to 5"	11
6" to 12"	10

Clamp	
Post Size dia. in.	D in.
3½	3
4	3 3/16
5	5 1/8
6	7 7/16
8	13 1/16
10	20 3/4
12	29 5/8

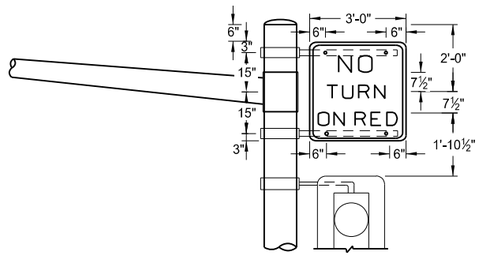


Plan



Elevation

Mast Arm Mounted Street Name Sign Detail



Signal Standard Mounted Sign Attachment Detail

Notes:

(A) Use 1¾"x3/16" thick 1.08 lb/ft aluminum alloy Z-bar. In place of Z-bar, use two 1¾"x1¾"x3/16" angles bolted together or a 1¾"x2"x.188" channel.

(B) ⅜" U-bolt, hex. nut, lock washer, and bracket (U-bolt length depends on dia. of mast arm.)

(C) ⅜" U-bolt, hex. nut, lock washer, and bracket (U-bolt length depends on dia. of mast arm.)

Maximum perforated tube lengths for mounting signs beyond end of mast arm:
2"x2" maximum support length 9.9'
2½"x2½" maximum support length 12.6'
2½"x2½" maximum support length 15.7'

(D) Use galv. steel strap and sign attachment bracket similar to the one shown in the detail. Include all costs of bracket assembly in the price bid for flat sheet signs. Punch as shown on Standard Drawings. Provide a 7' minimum vertical clearance to the bottom of signs mounted on light standards.

(E) Use metal washers and nylon washers with a minimum outside dia. of 15/16" ± 1/16" and 10 gauge thickness on sign face.

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

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

911 SIGN SUPPORT INFORMATION AND SIGN DETAILS

D-754-86

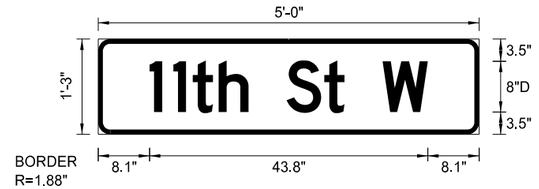
POST INFORMATION FOR VARIOUS SIGN CONFIGURATIONS

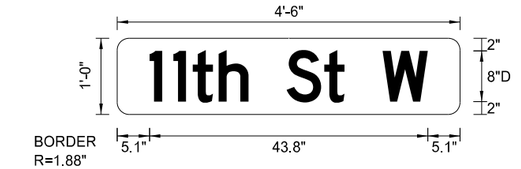
ASSEMBLY NUMBER	STREET NAME SIGN SIZE	VERTICAL CLEARANCE	MAXIMUM POST LENGTH	NUMBER OF POSTS	SUPPORT SIZE	SLEEVE LENGTH (A)			SLEEVE SIZE	ANCHOR			BREAKAWAY
						1st	2nd	3rd		NUMBER	LENGTH	SIZE	
	Inches	LF	LF			LF	LF	LF			LF		
Special Assembly 1	48"x15"	7	14.5	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	54"x15"	7	16.1	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	60"x15"	7	18.9	1	2.25 x 2.25 12 ga	2.6			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	66"x15"	7	15.8	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	72"x15"	7	14.6	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	78"x15"	7	17.6	2	2.5 x 2.5 12 ga					2	4.0	3 x 3 7 ga	2
	84"x15"	7	15.8	2	2.25 x 2.25 12 ga					2	4.0	2.5 x 2.5 12 ga	
	90"x15"	7	15.3	2	2.5 x 2.5 12 ga					2	4.0	3 x 3 7 ga	2
	96"x15"	7	17.4	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	48"x12"	7	17.5	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	54"x12"	7	15.2	1	2.25 x 2.25 12 ga					1	4.0	2.5 x 2.5 12 ga	
	60"x12"	7	14.2	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	66"x12"	7	15.9	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	72"x12"	7	14.7	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	78"x12"	7	15.7	2	2 x 2 12 ga					2	4.0	2.25 x 2.25 12 ga	
	84"x12"	7	15.6	2	2.25 x 2.25 12 ga					2	4.0	2.5 x 2.5 12 ga	
	90"x12"	7	18.6	2	2.5 x 2.5 12 ga					2	4.0	3 x 3 7 ga	2
	96"x12"	7	17.5	2	2.5 x 2.5 12 ga					2	4.0	3 x 3 7 ga	2
	24"x12"	5	20.3	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	30"x12"	5	16.4	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	36"x12"	5	13.8	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	42"x12"	5	14.7	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	48"x12"	5	12.9	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	54"x12"	5	15.2	1	2.25 x 2.25 12 ga					1	4.0	2.5 x 2.5 12 ga	
	60"x12"	5	13.8	1	2.25 x 2.25 12 ga					1	4.0	2.5 x 2.5 12 ga	
	24"x9"	5	24.1	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	30"x9"	5	21	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	36"x9"	5	17.3	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	42"x9"	5	15.4	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	48"x9"	5	13.5	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	54"x9"	5	14.8	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
	60"x9"	5	13.3	1	2 x 2 12 ga					1	4.0	2.25 x 2.25 12 ga	
Special Assembly 2	24"x12"	5	17.2	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	30"x12"	5	16.3	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	36"x12"	5	15.4	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	42"x12"	5	14.6	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	48"x12"	5	15.2	1	2.25 x 2.25 12 ga	4.5			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	54"x12"	5	20.6	1	2.5 x 2.5 10 ga	1.5			2.19 x 2.19 10 ga	1	4.0	3 x 3 7 ga	1
	60"x12"	5	16.7	1	2.5 x 2.5 12 ga	3.9			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	24"x9"	5	15.2	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	30"x9"	5	14.4	1	2.5 x 2.5 12 ga					1	4.0	3 x 3 7 ga	
	36"x9"	5	16.4	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	42"x9"	5	15.8	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	48"x9"	5	14.4	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	54"x9"	5	15.1	1	2.25 x 2.25 12 ga	4.2			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	60"x9"	5	14.5	1	2.25 x 2.25 12 ga	4.7			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1

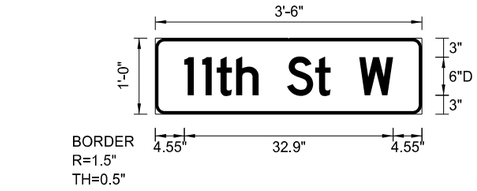
POST INFORMATION FOR VARIOUS SIGN CONFIGURATIONS

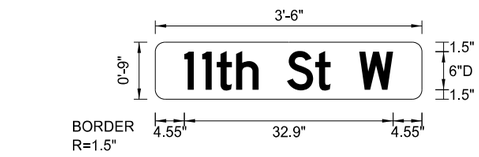
ASSEMBLY NUMBER	STREET NAME SIGN SIZE	VERTICAL CLEARANCE	MAXIMUM POST LENGTH	NUMBER OF POSTS	SUPPORT SIZE	SLEEVE LENGTH (A)			SLEEVE SIZE	ANCHOR			BREAKAWAY
						1st	2nd	3rd		NUMBER	LENGTH	SIZE	
	Inches	LF	LF			LF	LF	LF			LF		
Special Assembly 3	24"x12"	5	16.2	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	30"x12"	5	15.3	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	36"x12"	5	15.9	1	2.25 x 2.25 12 ga	4.3			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	42"x12"	5	15.2	1	2.25 x 2.25 12 ga	4.8			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	48"x12"	5	15.2	1	2.5 x 2.5 12 ga	5			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	54"x12"	5	20.6	1	2.5 x 2.5 10 ga	1.9			2.19 x 2.19 10 ga	1	4.0	3 x 3 7 ga	1
	60"x12"	5	16	1	2.5 x 2.5 12 ga	4.7			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	24"x9"	5	16.8	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	30"x9"	5	16.1	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	36"x9"	5	15.4	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	42"x9"	5	14.9	1	2.5 x 2.5 10 ga					1	4.0	3 x 3 7 ga	1
	48"x9"	5	15.7	1	2.25 x 2.25 12 ga	4.2			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	54"x9"	5	14.9	1	2.5 x 2.5 12 ga	4.8			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	60"x9"	5	20.5	1	2.5 x 2.5 10 ga	1.6			2.19 x 2.19 10 ga	1	4.0	3 x 3 7 ga	1
Special Assembly 4	24"x12"	5	15.1	1	2.25 x 2.25 12 ga	4.8			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	30"x12"	5	15.1	1	2.5 x 2.5 12 ga	5			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	36"x12"	5	17.4	1	2.5 x 2.5 12 ga	3.6			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	42"x12"	5	16.8	1	2.5 x 2.5 12 ga	4.1			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	48"x12"	5	16.1	1	2.5 x 2.5 12 ga	4.5			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	54"x12"	5	15.5	1	2.5 x 2.5 12 ga	4.9			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	60"x12"	5	16.7	1	2.5 x 2.5 10 ga	4.2			2.19 x 2.19 10 ga	1	4.0	3 x 3 7 ga	1
	24"x9"	5	15.5	1	2.25 x 2.25 12 ga	4.2			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	30"x9"	5	15	1	2.25 x 2.25 12 ga	4.5			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	36"x9"	5	14.5	1	2.25 x 2.25 12 ga	4.8			2 x 2 12 ga	1	4.0	3 x 3 7 ga	1
	42"x9"	5	14.7	1	2.5 x 2.5 12 ga	4.9			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	48"x9"	5	17.2	1	2.5 x 2.5 12 ga	3.5			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	54"x9"	5	15.8	1	2.5 x 2.5 12 ga	4.4			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
	60"x9"	5	15.3	1	2.5 x 2.5 12 ga	4.7			2.25 x 2.25 12 ga	1	4.0	3 x 3 7 ga	1
Special Assembly 5	24"x12"	5	17.1	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	30"x12"	5	16.7	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	36"x12"	5	17.7	2	2.25 x 2.25 12 ga	4	4.5		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2
	42"x12"	5	17.3	2	2.25 x 2.25 12 ga	4.3	4.8		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2
	48"x12"	5	16.8	2	2.25 x 2.25 12 ga	4.5	5		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2
	54"x12"	5	16.5	2	2.25 x 2.25 12 ga	4.8	5.3		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2
	60"x12"	5	17.5	3	2.5 x 2.5 12 ga					3	4.0	3 x 3 7 ga	3
	24"x9"	5	17.3	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	30"x9"	5	17	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	36"x9"	5	16.6	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	42"x9"	5	16.3	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	48"x9"	5	16	2	2.5 x 2.5 10 ga					2	4.0	3 x 3 7 ga	2
	54"x9"	5	17.1	2	2.25 x 2.25 12 ga	4	4.6		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2
	60"x9"	5	16.8	2	2.25 x 2.25 12 ga	4.2	4.8		2 x 2 12 ga	2	4.0	3 x 3 7 ga	2

(A) The sleeve length shown is for the maximum post length. The required sleeve length is the "sleeve length" minus the difference between the "maximum post length" and the post length required in the field.









Notes:
Use 6 inch legend except on multi-lane divided roads with speeds of 45 mph or greater.
On divided multi-lane roadways, do not place 911 signs on top of stop sign.

When installing signs on existing supports, check support and sleeve size to determine if they meet table requirements. Measure maximum post length from ground to top of street name sign. If calculated support length is greater than maximum post length shown, recalculate support size.

See Standard Drawing D-754-87 for sign punching, stringer and support location details.

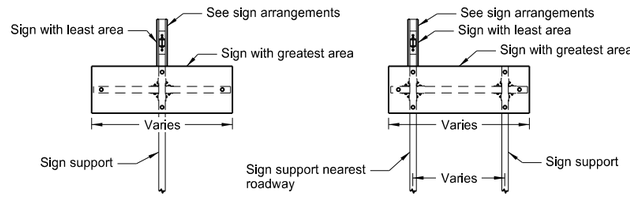
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-18-14	Revised street name sign layouts.
8-30-18	Revised tables, lettering, & signs and updated notes to active voice.
9-05-19	New Design Engineer PE Stamp.

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

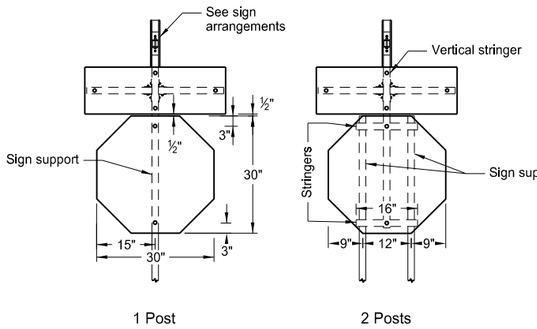
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR STREET NAME SIGNS AND 911 SIGNS

D-754-87

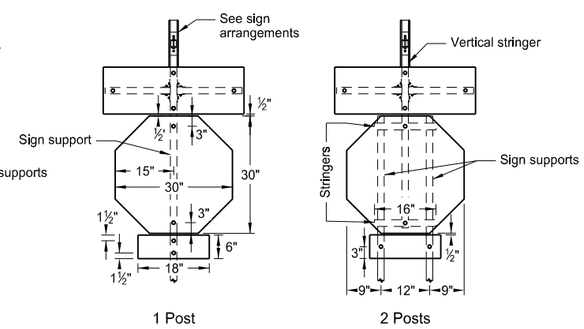
A - Single sign
B - Single sign back to back
C - Single sign each direction
D - Single sign one direction, back to back other direction
E - Back to back both directions



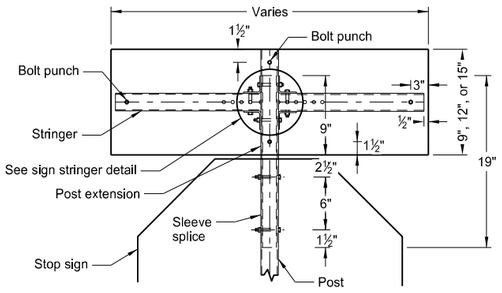
Special Assembly 1 (A, B, C, D or E)



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

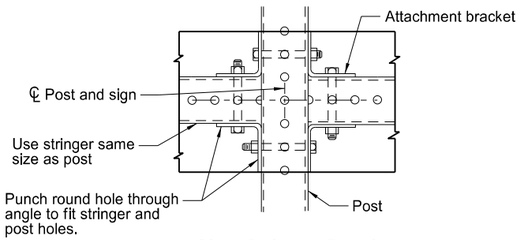


Special Assembly 3 (A, B, C, D or E)



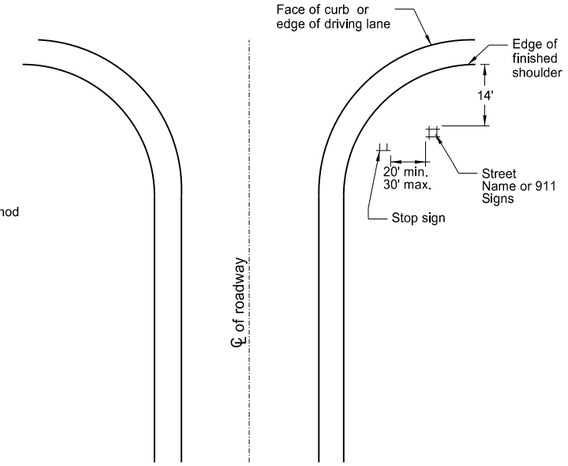
Sleeve Splice Detail

Note: Only use splice method with approval of engineer.



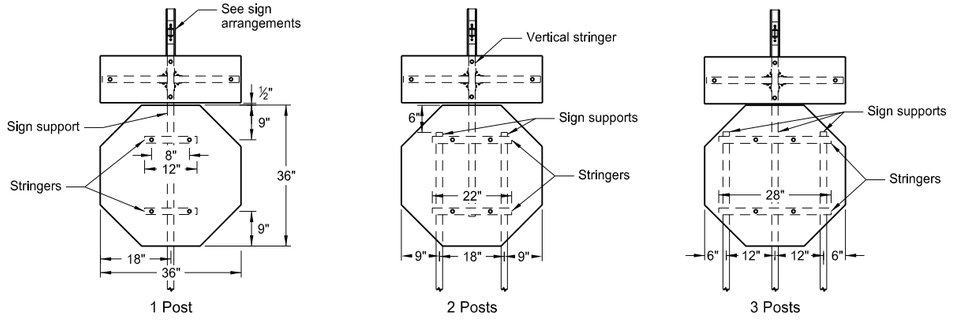
Sign Stringer Detail

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

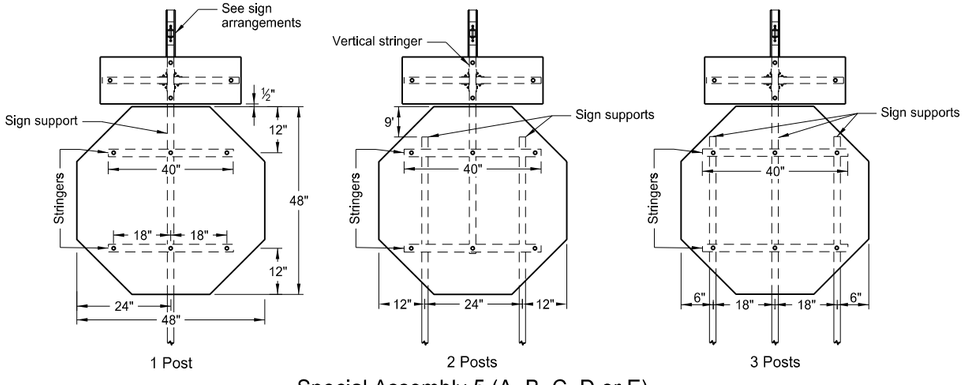


Intersection Layout

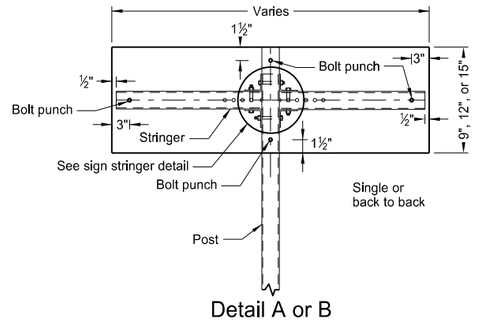
Note: Use layout for street name signs or 911 signs with Special Assembly 1 .



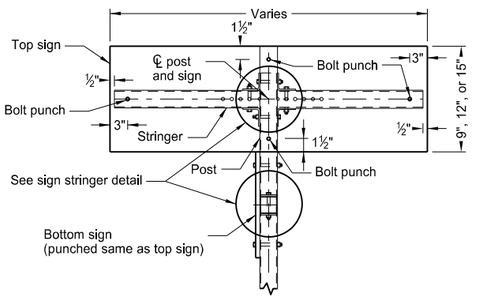
Special Assembly 4 (A, B, C, D or E)



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

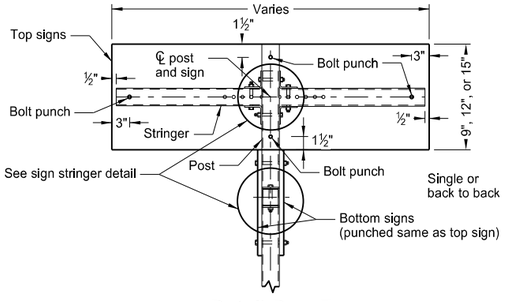


Detail A or B



Detail C

Sign Arrangements



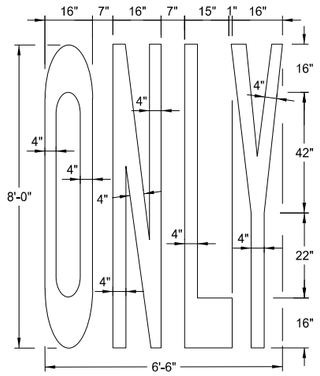
Detail D or E

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

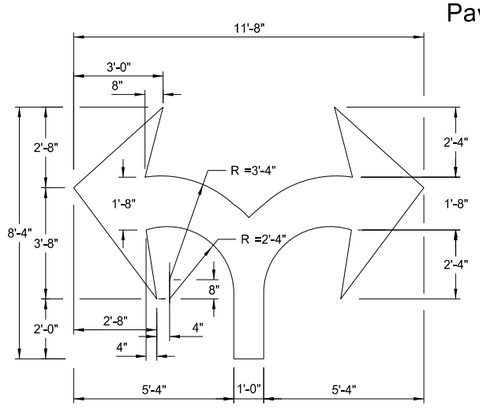
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 9/05/19 and the original document is stored at the North Dakota Department of Transportation

Pavement Marking Message Details

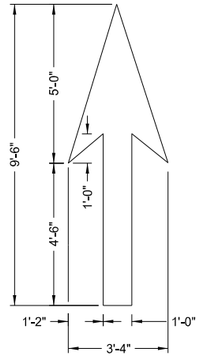
D-762-1



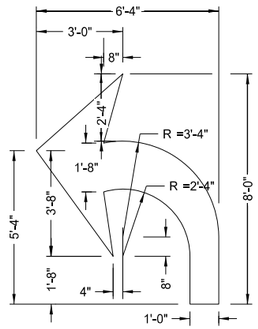
22 S. F.



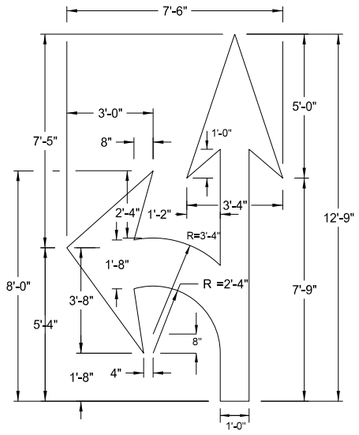
29 S. F.



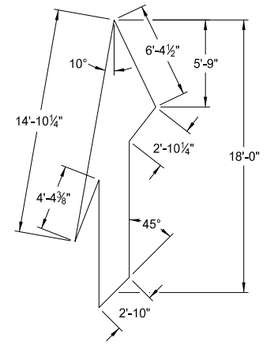
12 S. F.



16 S. F.

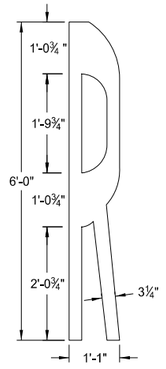


27 S. F.

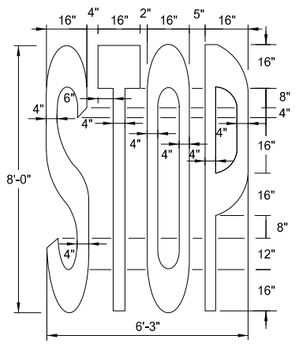


41 S. F.

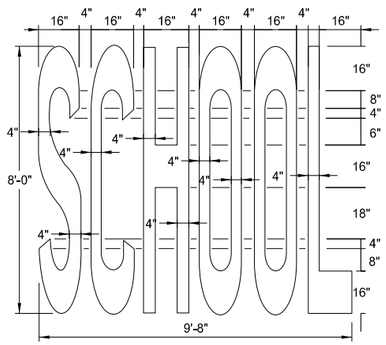
Note: Rotate merge arrow 20° from edge of roadway.



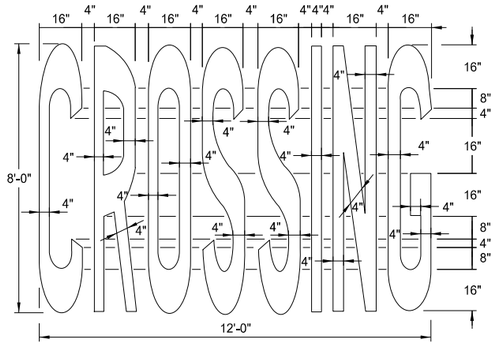
4 S. F.



22 S. F.



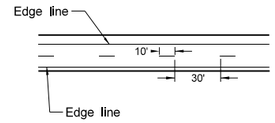
34.5 S. F.



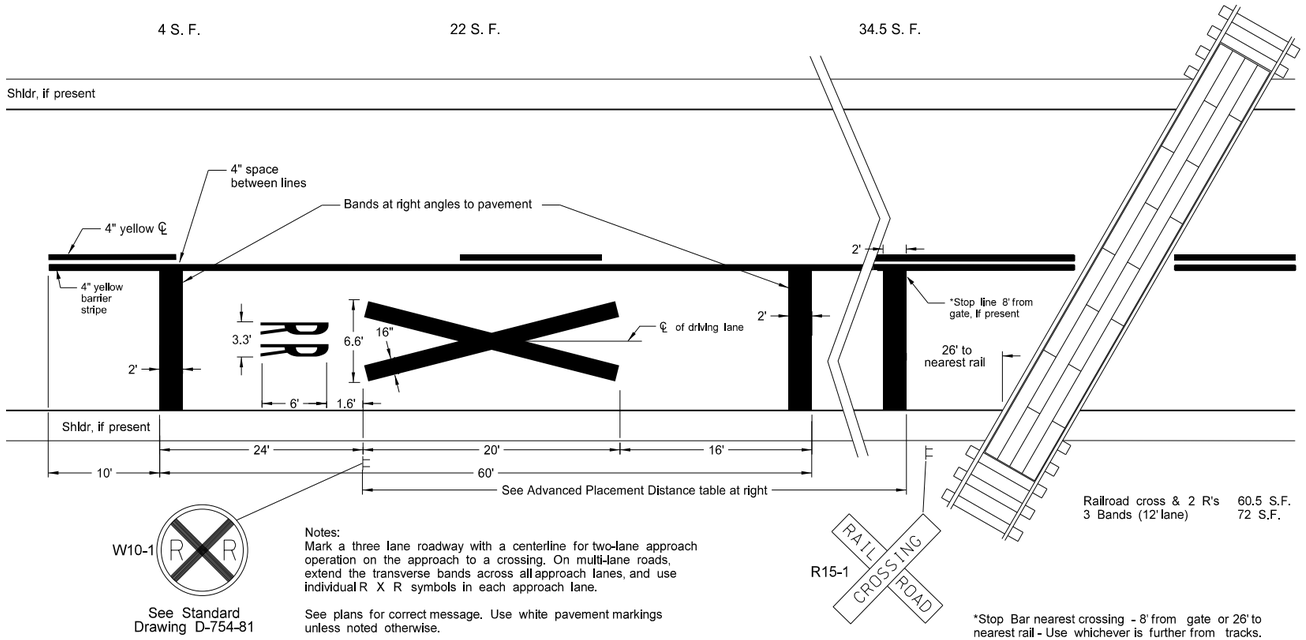
46 S. F.

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

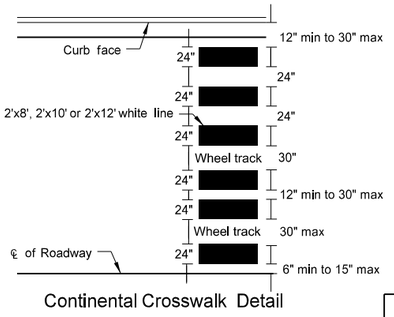


Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

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

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

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



Continental Crosswalk Detail

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

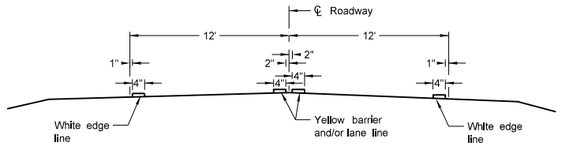
REVISIONS

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.

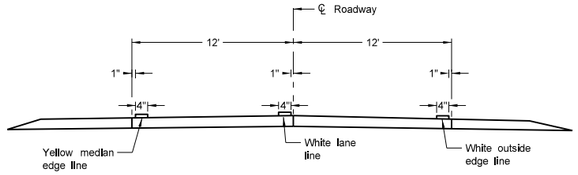
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 1/28/2020 and the original document is stored at the North Dakota Department of Transportation

PAVEMENT MARKING

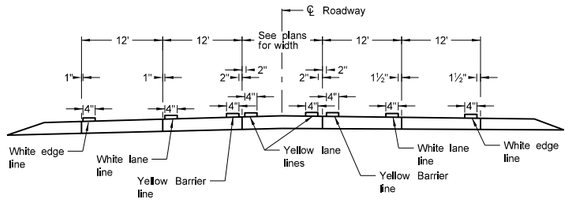
D-762-4



Two Lane Two Way
RURAL ROADWAY



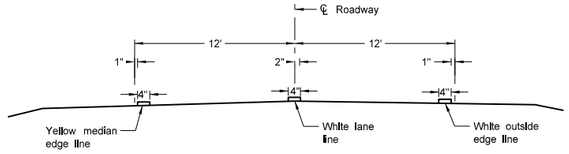
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



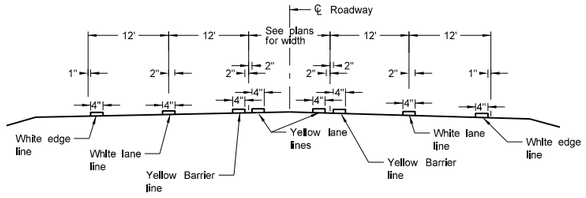
RURAL FIVE LANE ROADWAY
Concrete Section

NOTES:

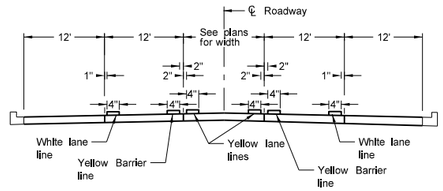
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.



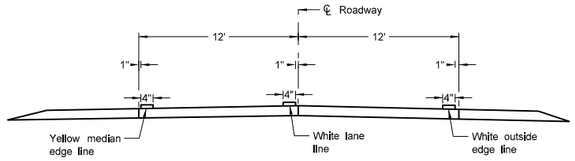
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



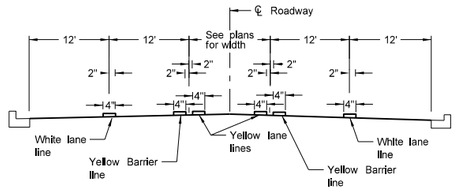
RURAL FIVE LANE ROADWAY
Asphalt Section



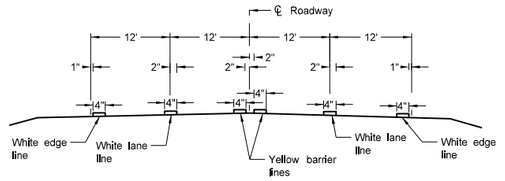
URBAN FIVE LANE SECTION
Concrete Section



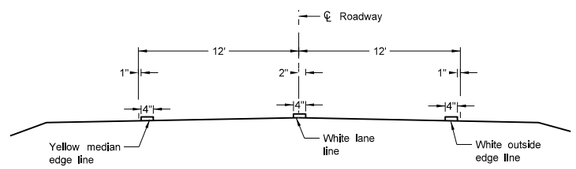
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



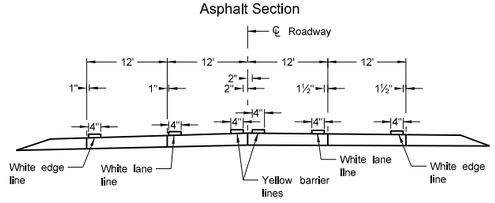
URBAN FIVE LANE SECTION
Asphalt Section



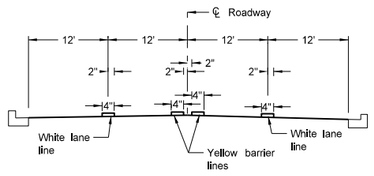
RURAL FOUR LANE ROADWAY
Asphalt Section



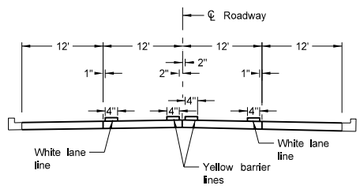
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



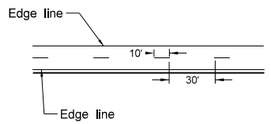
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17 08-27-19	Updated to active voice. New Design Engineer PE Stamp.

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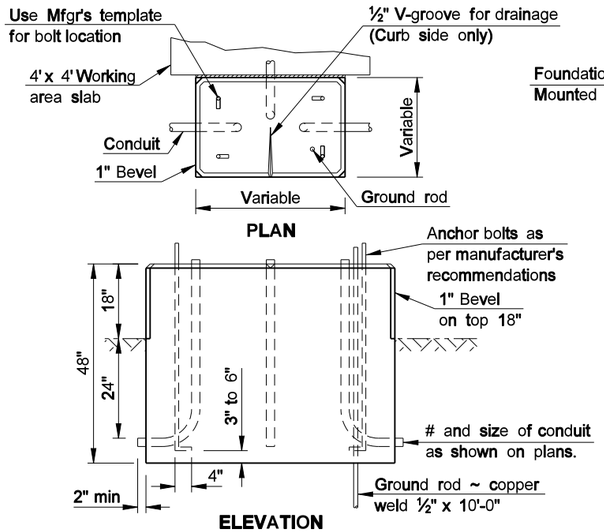
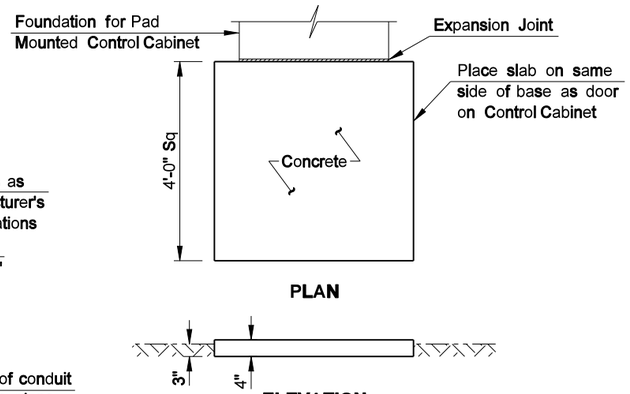
CONCRETE FOUNDATIONS
(TRAFFIC SIGNALS & HIGHWAY LIGHTING)

D-770-1



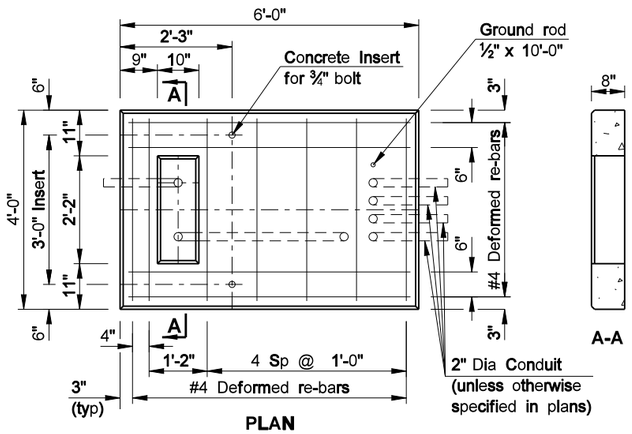
CONTROLLER CABINET FOUNDATION PAD MOUNT

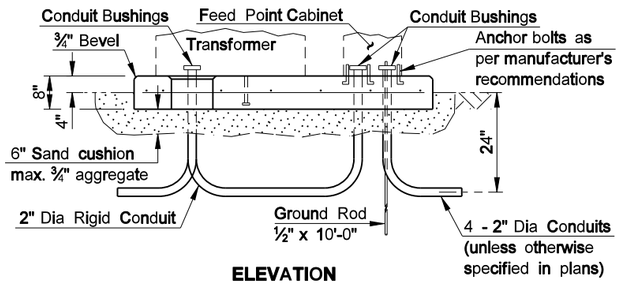
The Controller Cabinet Foundation shall be bid as Concrete Foundation - Traffic Signals.



WORKING AREA SLAB

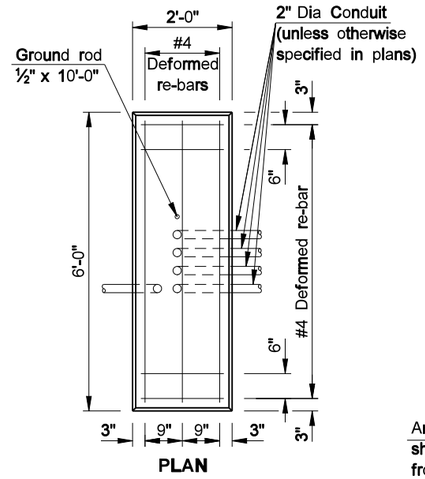
The Working Area Slab shall be installed where shown on the plans and shall not be bid separately but shall be included in the price bid for Concrete Foundation - Traffic Signals.

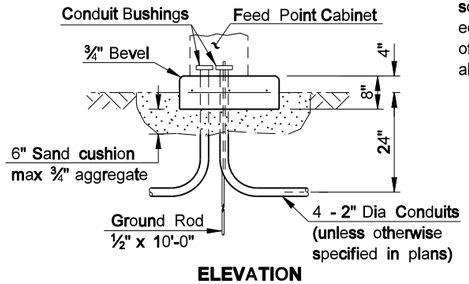




TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNT

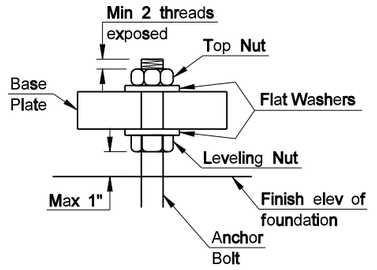
The Transformer & Feed Point Cabinet Foundation Pad Mount shall be bid as Concrete Foundation ~ Feed Point ~ Type A.



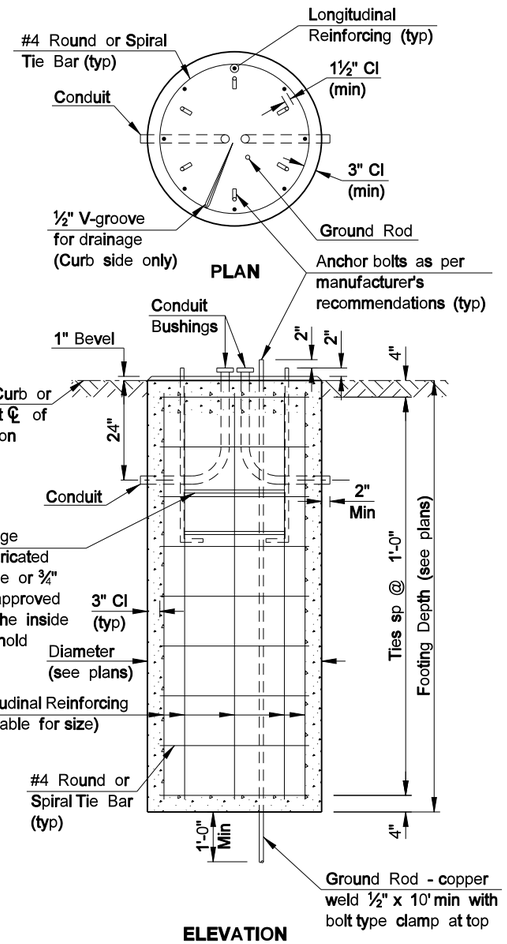


FEED POINT CABINET FOUNDATION PAD MOUNT

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



ANCHOR BOLT DETAIL



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

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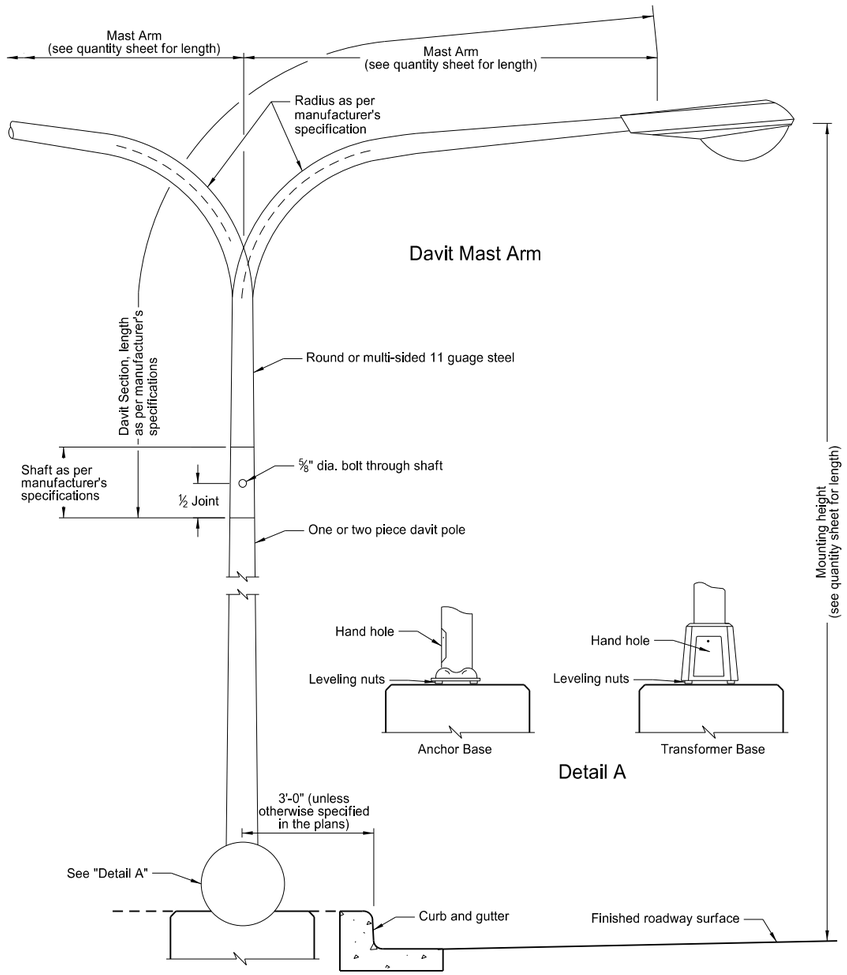
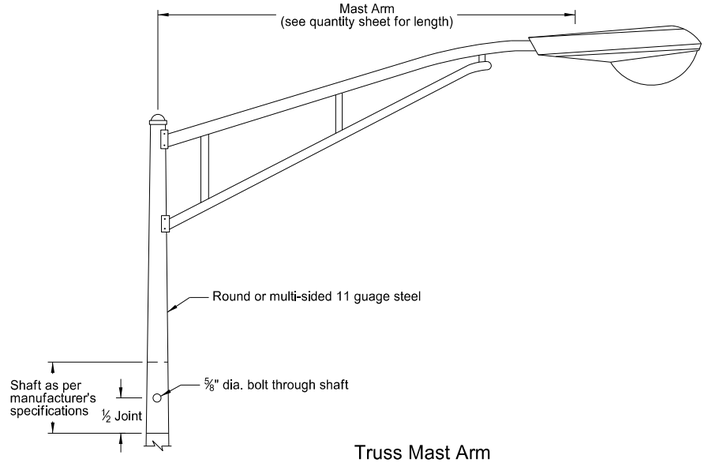
LIGHT STANDARD DETAILS



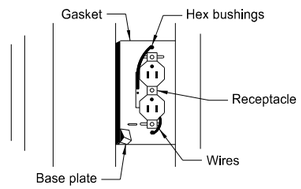
Davit Mast Arm

Detail A

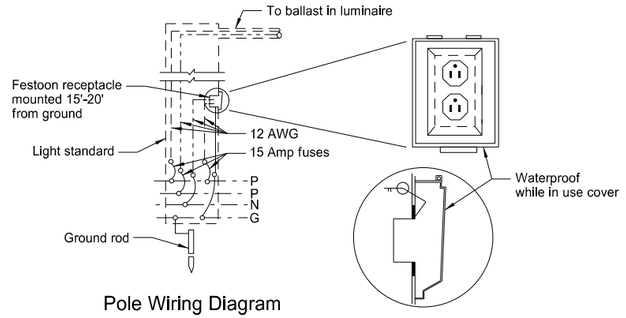
Light Standard Details



Truss Mast Arm



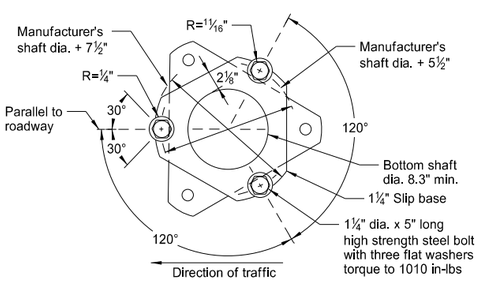
Optional: Festoon receptacle
mounted on multi-sided pole.



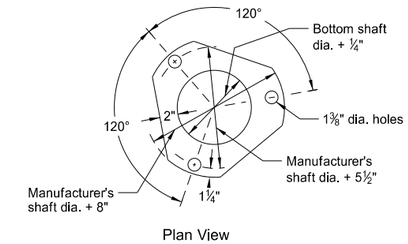
Pole Wiring Diagram

Receptacle Mounting Detail (B)

(B) Mount receptacle on side of pole that faces the street.
Install Festoon Receptacle only when specified in the plans.



Top View



Plan View

Keeper Plate Detail (A)

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

Notes:

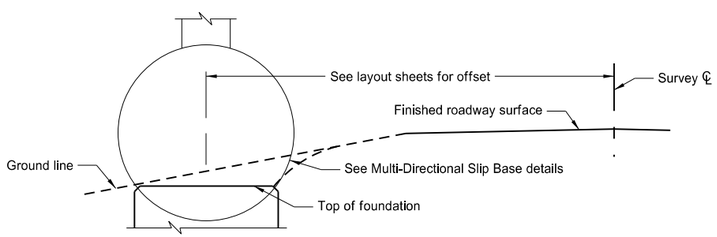
Light Standard Locations: The minimum offset distance from the curb face is 3 feet. Offset light standards at least 3 feet in urban areas and where speeds are less than 30 mph. Where speeds are 30 mph or more, place light standards at least 16 feet from the driving lane.

Steel Standards: Touch up marred or scratched areas after erection.

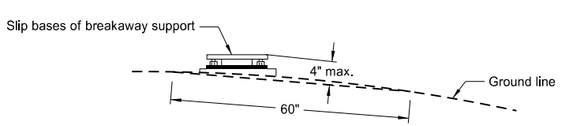
Luminaire: Use internal ballast-constant wattage 120x240 voltage. See layout sheets for type of luminaire, wattage, I.E.S. distribution, and operating system.

Fusing: Fusing in base, see specifications.

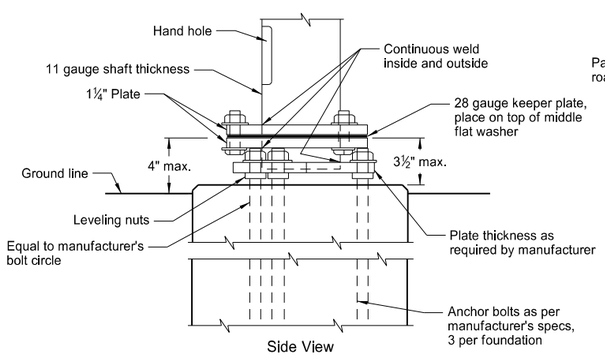
Slip Base Bolt Torque Procedure:
1. Tighten all bolts the maximum possible with 12" to 15" wrench to bed washers and to clean bolt threads, then loosen.
2. Retighten bolts with a systematic order to prescribed torque.
3. Loosen each bolt and retighten to prescribed torque in the same order as initial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



Concrete Foundation Location

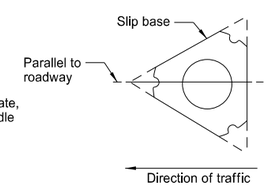


Breakaway Support Stub Clearance Diagram

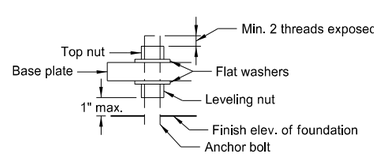


Side View

Steel Base Detail



Slip Base Placement Detail



Anchor Bolt Detail

Multi-Directional Slip Base

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10-8-13	
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10-17-17 8-28-19	Updated to active voice. New Design Engineer PE Stamp.

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