

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	1	1

# CITY OF BISMARCK

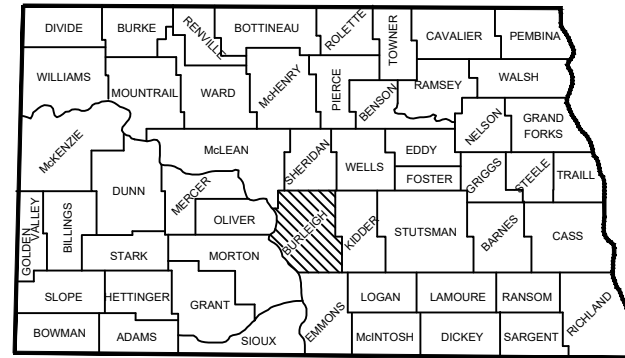
## HEU-1-981(134) Century Avenue & 19th Street City Project HC-164

Burleigh County, North Dakota

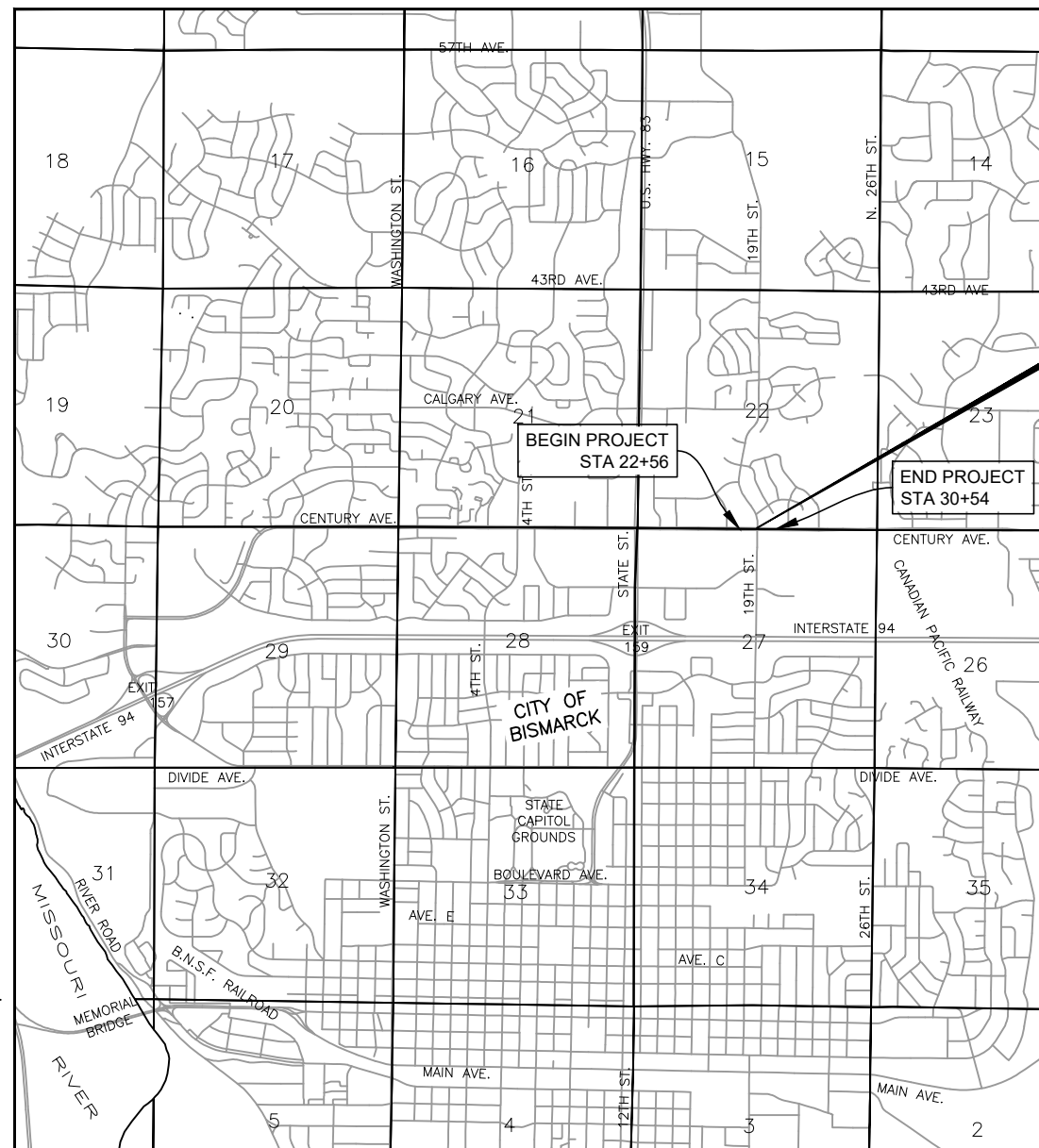
PCC Pavement, Curb & Gutter, Curb Ramps, Street Lighting,  
Traffic Signal, Signing, and Pavement Marking

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
CENTURY AVENUE & 19TH STREET	0.150	0.150



STATE OF NORTH DAKOTA



PROJECT  
LOCATION

BEGIN PROJECT  
STA 22+56

END PROJECT  
STA 30+54



DESIGNER Gabe Schell
DESIGNER Aaron Schmidt
DESIGNER Jessica Davis

I, Gabriel J. Schell, City Engineer for the City of Bismarck, North Dakota, hereby approve these plans.

*Gabe Schell*

DATE: 8/21/25

CITY OF BISMARCK

DATE 8/21/25

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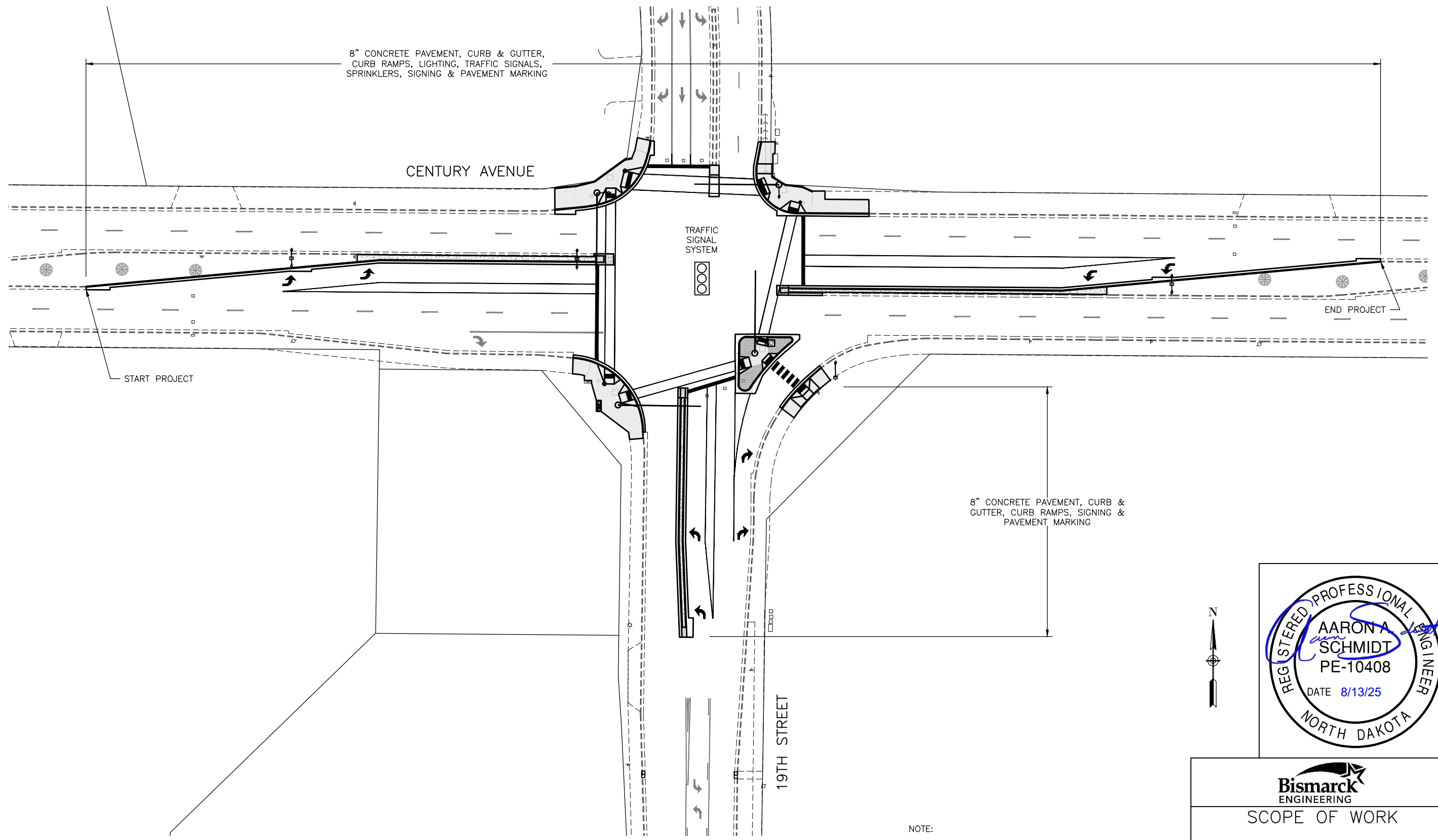
**LIST OF STANDARD DRAWINGS**

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D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
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D-772-2	Traffic Signal Standards
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D-772-4	Traffic Signal Head Mounting

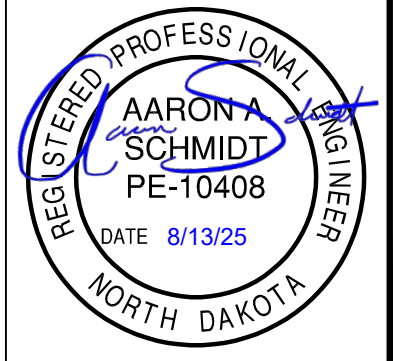
**SPECIAL PROVISIONS**

Number	Description
SP 555(24)	Utility Coordination
SP 600(24)	Temporary Pedestrian Facilities
SP 648(24)	Drilled Shaft Foundations
SSP 3	Local Agency Contracts
SSP 8	Federal Prohibition on Certain Technological Hardware

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NOTE:  
 1. CURB RAMPS TO BE DESIGNED TO THE LATEST REVISION OF PROWAG AND ADA STANDARDS.



**Bismarck**  
ENGINEERING

**SCOPE OF WORK**

CENTURY AVENUE & 19TH STREET

**NOTES**

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100-P01 **COMPLETION DATES:**  
Substantial Completion Date: October 23<sup>rd</sup>, 2026. Complete all work required in the contract except for landscaping and surface restoration. Liquidated damages will be assessed per Section 108.07 B for each calendar day that expires after October 23<sup>rd</sup>, 2026.

Final Completion Date: November 6, 2026. Complete all landscaping and surface restoration. Liquidated damages will be assessed per Section 108.07 B for each calendar day that expires after November 6, 2026.

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

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

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

107-P01 **MAINTAINING TRAFFIC DROP-OFFS:** If, at the end of the workday, drop-offs greater than 2 inches and less than 18 inches steeper than 4:1 existing between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

- Construct a traversable wedge in the area of the drop-off or steep slope; or
- Close the lane adjacent to the drop-off or steep slope

When constructing a wedge, construct a wedge composed of aggregate materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 E.4, "Compaction Control Type C".

Install stackable vertical panels that meet the requirements of Section 704.03 H, "Stackable Vertical Panels", along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, "Method of Measurement" and will pay for panels as specified in Section 704.06, "Basis of Payment".

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for aggregate pay items.

The requirements of Section 704.04 O, "Traffic Control for Uneven Pavement" apply to drop-offs created by milling or paving operations.

107-P02 **NOISE ORDINANCE:** Construction activities are not permitted between the hours of 11:00 p.m. to 7:00 a.m. unless the Contractor obtains written permission from the Engineer. Request permission a minimum of 30 days prior to the work taking place.

The Contractor is allowed to green saw the concrete without written permission from the Engineer if the following stipulations are met:

Prior to the start of construction provide one written notice to all residential dwellings within 500 feet of the project site. Include in the notice increased noise levels may be experienced at night. Use best practices to minimize the sawing of concrete pavement between the hours of 11:00 p.m. to 7:00 a.m.

107-P03 **ACCESS:** Provide access to all businesses and homeowners at all times and maintain access to driveways at all times.

107-P04 **LANDSCAPING PRECAUTIONS:** Use care when working near landscaping and trees. Protect the trees and the root zone during construction.

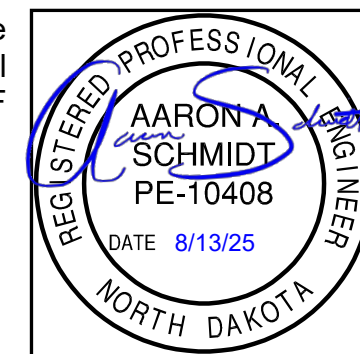
- Minimize equipment on the boulevards and in the medians. Use common access points when possible.
- Roots over 2" diameter that are to be cut will require an inspection by a City Forestry Department Arborist or the Engineer.
- Cut, clean, and backfill exposed tree roots as quickly as possible to avoid drying out.
- Avoid unnecessary grading.
- Mitigate any project related impacts as identified by the City Forestry Department at no extra cost.

108-100 **WEEKLY PLANNING & REPORTING MEETING:** A weekly planning and reporting meeting is required.

202-P01 **REMOVAL OF CONCRETE:** Removal of concrete pavement consists of removing concrete pavements and sidewalks. The depth of concrete pavement and sidewalks may vary in thickness. Include common excavation and removal and disposal of aggregate base in "REMOVAL OF CONCRETE PAVEMENT". There will be no additional compensation for removal of extra thickness. Include all costs for removal and disposal of existing concrete in the bid price for "Removal of Concrete pavement".

202-P02 **REMOVAL OF CURB & GUTTER:** Curb and gutter designated for removal may vary in thickness. There will be no additional compensation for removal of extra thickness. Include all costs for removal and disposal of existing curb and gutter, aggregate, and common excavation in the bid price for "REMOVAL OF CURB & GUTTER".

202-P03 **REMOVAL OF CONCRETE BOLLARDS:** Remove concrete bollards to full depth. Include all costs for removal and disposal of existing concrete bollards in the bid price for "REMOVAL OF CONCRETE PAVEMENT".



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**NOTES**

251-P01 SEEDING CLASS III: Provide seeding in all disturbed areas, except the medians, with the following:

Use: Boulevards and other areas requiring salt resistance Application Rate: 6 PLS/1000 sf		
Variety and Species of Seed	% by Weight	% Pure Live Seed
Fairway Crested	50	85
Sheep Fescue	30	85
Perennial Ryegrass	20	85

Include all costs, labor, materials, and equipment necessary for seeding in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

302-P01 WATER: Include the equipment, labor, and water used to control dust and to compact aggregate bases in the cost for "AGGREGATE BASE COURSE CL 5".

550-P01 CONCRETE PAVEMENT AND CURB & GUTTER: Keyways will only be allowed when placing concrete forms.

Pour curb & gutter separate from adjacent concrete pavement.

Jointing, rebar, dowels, and sealing are to be included in the price bid for "CONCRETE PAVEMENT" and "CURB & GUTTER".

704-100 TRAFFIC CONTROL SUPERVISOR: Provide a traffic control supervisor.

704-P01 TRAFFIC CONTROL: Maintain one through lane of traffic in all directions at all times. The basis of estimate and work zone traffic control plans are shown in Section 100. Should the Contractor elect to proceed in a manner other than as shown in Section 100, approval is needed by the Engineer and no additional compensation will be made for addition traffic control devices.

It may be necessary for the existing traffic signal system to be powered down during different phases of the work (conversion to the new signal system, etc.). During these times, provide all-way stop control at the intersection. Limit down time of existing traffic signal operation / all-way stop control to 3 days per instance.

Coordinate with the Engineer and Bismarck Public Works Electrical Department (Paul Lies 701-391-1698) for video detection changes during different phases of traffic control during the work.

708-P01 INLET PROTECTION SPECIAL: Place inlet protection into inlets prior to the start of construction. Inlet Protection Special to be Top Guard by ERTEC, Flexstorm, Dandy Curb Sack, or approved equivalent. Include all costs for furnishing, installing, maintaining (cleaning), and removal of a drainage inlet filter assembly to collect sediment in surface storm water runoff. The item also includes the disposal of debris

or silt that has accumulated in the bag. Include periodic cleaning of the filter in the bid price.

Keep the 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".

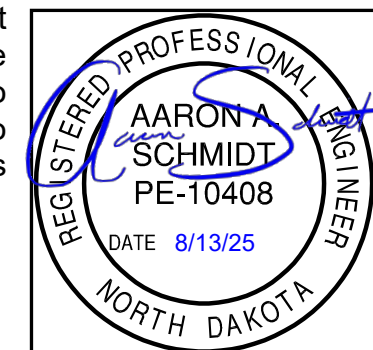
722-P01 ADJUST MANHOLE: This bid item provides for the adjustment of various existing castings to the proper grade. A maximum of six rings will be allowed. "ADJUST MANHOLE" shall be used when adjustments can be made by adding or removing adjustment rings. Replace castings with new castings as stated in note 722-P02. Include all labor, materials, and equipment necessary to complete the adjustment in the price bid for "ADJUST MANHOLE".

722-P02 MANHOLE CASTINGS: Provide Neenah Foundry Company R-1955-1 floating castings or East Jordan Iron Works Number 3025 with concealed pick holes and self-sealing platen lid, or approved equivalent. Place flush all castings to within 1/8 inch below the pavement that lie within the roadway. See Standard Drawing D-722-5A Floating Manhole Casting.

722-P03 MEDIAN SPRINKLER SYSTEM: The medians have existing underground irrigation systems that will be impacted by the project. Locations are shown in Section 40 & 85. The installation of the new concrete medians requires the existing sprinkler systems to be adjusted, relocated, removed, reconfigured, and/or repaired. Include in the price bid for "ADJUST SPRINKLER SYSTEM" all labor, materials, and equipment necessary for the median sprinkler systems to be fully operational as shown on the plans upon construction completion. This includes, but is not limited to, system shutdown, removal of existing components, salvaging materials, connections, capping ends, lowering lines, installation of new waterlines and components, fittings, sprinkler heads, trenching, backfilling, electrical wiring, electrical configuration, and testing of the system as identified in the plans and by the Engineer.

Provide new system components and materials that are compatible with existing systems and materials. Repair any sprinklers damaged during construction operations at the Contractor's expense. Materials and quantities listed are approximate and for guidance only. Determine and furnish total materials, accessories, equipment, and items necessary to conform to the intent and purpose outlined in the plans.

Coordinate with the City of Bismarck Public Works Department (Chad Schiermeister 701-400-6314) to determine the components of the system that will be impacted prior to construction. Notify Public Works Department 48 hours prior to needing the irrigation system(s) shut off. The components removed shall be salvaged to the City of Bismarck.



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Provide work drawings to the Engineer for approval prior to installation. Acceptable irrigation manufacturers are Hunter, Toro, RainBird, or approved equivalent. Installation methods, procedures, and materials shall be in accordance with manufacturer's recommendations. Test the completed system under full line pressure and repair any leaks or faulty components prior to acceptance. Include all costs for this work in the price bid for "ADJUST SPRINKLER SYSTEM".

748-P01 CURB & GUTTER: Construct curb & gutter separate from adjacent concrete pavement unless shown otherwise on the plans. Match existing curb height when connecting to existing curb & gutter. Include jointing, rebar, dowels, and sealing in the price bid for "CURB & GUTTER-TYPE 1".

748-P02 CONCRETE MEDIAN NOSE PAVING: Drill and epoxy tie bars and dowel bars where existing pavement abuts new pavement and curb & gutter. Clean the holes with compressed air before injecting the epoxy resin. Rotate bars 180 degrees to 360 degrees during insertion. Match the placement of proposed joints with the location of existing joints where possible.

Include all costs for labor, materials, and equipment necessary for drilling and installing tie bars, jointing, rebar, dowels, and joint sealing in the price bid for "CONCRETE MEDIAN NOSE PAVING".

750-P01 PIGMENTED IMPRINTED CONCRETE: Install pigmented and imprinted concrete at locations shown in the plans. 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.

Form a pattern in the concrete using platform stamping pads or rollers to obtain the brick pattern. Stamp the surface after it is troweled and floated, and while the concrete is still in the plastic state. Do not trowel the surface more than once. Provide a 6-inch by 12-inch brick pattern. Other brick dimensions require approval. Use a form release agent on the equipment used to stamp the concrete. Match sawed joints to the adjacent sidewalk.

Provide a pigment to the concrete at the ratio recommended by the manufacturer and add the pigment directly into the mixer along with the aggregate, cement, and water. Add pigment while the mixer is operating at mixing speed. Continue mixing between 50 and 100 revolutions. Cure and seal concrete using slip and fade resistant curing compound. Apply two coats per manufacturers recommendations. Provide a pigment from the list below.

- Number 413 Terra Cotta, produced by Soloman Colors, Inc.
- Number 1117 Tile Red, produced by Davis Colors

Include all labor, equipment, and materials required to complete this work in the price bid for "PIGMENTED IMPRINTED CONCRETE".

750-P02 DETECTABLE WARNING PANELS: Provide unpainted, cast iron detectable warning panels as specified in Section 885 of the Specifications manufactured by EJ Iron Works, Neenah Foundry, or approved equivalent.

754-P01 FLEXIBLE DELINEATORS-TYPE D: Provide and install yellow Omega Post High Speed Delineator from Impact Recovery Systems or approved equal, with surface mount base and 36" height.

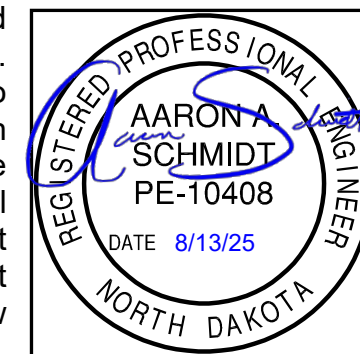
754-P02 SIGN SLEEVE: Install 3" PVC sign sleeve, at the thickness of the concrete to be placed in the sidewalk or median concrete, for the installation of permanent signs at locations shown on the plans. Include all costs for and material and labor in the bid price for "SIDEWALK CONCRETE ( )IN", "PIGMENTED IMPRINTED CONCRETE", and "CONCRETE MEDIAN PAVING".

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

762-P01 TEMPORARY ROADWAY PAVEMENT MARKING: If permanent markings are unable to be placed because of weather conditions in the late fall, use temporary painted markings. Place temporary painted markings in such a manner that they will not be under plastic pavement markings, except when grooved markings are specified. When grooving is specified, place temporary markings in the same location, as the grooving will remove the painted markings. Permanent pavement marking that may be subject to temporary painted marking will not be paid for separately. Include all costs in the price bid for "PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)", "PREFORMED THERMO PLASTIC PVMT MK ( ) IN LINE-GROOVED" or "PREFORMED PATTERNED PVMT MK ( )IN LINE-GROOVED".

770-P01 REVISE LIGHTING SYSTEM: Include in the price bid for "REVISE LIGHTING SYSTEM" all labor, materials, and equipment necessary for the revised lighting system to be fully operational as shown in the plans upon construction completion. This includes but is not limited to, removal of select existing components, removing and relocating light standards, light standards, light foundations, connections, pull boxes, conduit, and underground conductors as identified in the plans and by the Engineer.

Remove street light standards from their present locations and install at new locations where specifically shown in the plans. Disconnect the conductor to the luminaire at the fuses, remove and salvage the light standard and luminaire. Remove and dispose of existing concrete foundations, anchor bolts, and ground rods. Backfill and compact after removing existing light standard foundation. Restore the surface to match adjacent areas. Install new concrete foundation and anchor bolts according to the plans and Standard Drawing D-770-1. Foundation depth shall be per the "Lighting Foundation Table" as shown on the plans in Section 140. New anchor bolt dimensions and material grade to match existing anchor bolts (field verify). Reset existing light standard on new foundation and reconnect relocated light standard to the existing light circuit using new



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connectors. Relocated light standards do not need to be repainted. Include a breakaway transformer base for each relocated light standard.

Remove existing conductor and abandon in place existing conduit not otherwise re-used unless otherwise shown on the plans. Remove conduit to a point two feet below grade, fill with grout, and cap. Provide new underground conductors as shown on the plans.

Remove light standard, concrete foundation, and luminaires at Sta 27+24. Salvage light standard and luminaires and coordinate delivery with the City of Bismarck Public Works, Paul Lies at 701-355-1700. Include all costs for labor, materials, and necessary equipment for removal, salvaging, delivery, and all other work in the price bid for "REVISE LIGHTING SYSTEM".

770-P02 EXISTING LIGHTING SYSTEM: Maintain the existing lighting system during the work. Include all costs to keep the existing lighting system operational in the price bid for "REVISE LIGHTING SYSTEM".

770-P03 LIGHT STANDARD 40FT MOUNTING HEIGHT BREAKAWAY: Provide a one-piece, 40-foot davit type steel pole with aluminum breakaway transformer base and 6-foot mast arm. Mast arm to have tenon adaptor to mount specific luminaire. Pole and mast arm to have a galvanized finish. Anchor bolts are to conform to ASTM F1554 Grade 55. Provide anchor bolt templates for foundations. Each foundation, rebar, conduit stub-ins, anchor bolts and ground rods are required to be inspected by the Engineer prior to pouring concrete. Transformer base handhole fasteners to have anti-seize applied prior to installation.

Manufacturer and model number:

- Millerbernd Manufacturing, RLDA6-400ND
- Valmont Industries, Inc. DS90 RTS

770-P04 PULL BOXES: Duct seal all conduits entering and exiting pull boxes. New circuit conductors shall be looped and unspliced if no junction is required.

770-P05 MARKER TAPE: Marker tape shall be installed 5" below finished grade in cable trenches above underground conductors. Marker tape shall be 6-inch wide red plastic tape marked "Caution – Buried Electric Cable."

770-P06 SPLICE CONNECTORS: Use Homac, Type RAB-X-URD-BUSS submersible insulated subsurface terminal for copper conductor or approved equivalent for splice connectors within pull boxes for multiple connections.

Use ILSCO PBTS, or approved equivalent (with 3/16 hex size) for splice connectors at pole handholes.

770-P07 UNDERGROUND SPLICES: Underground splices are not permitted unless approved by the Engineer.

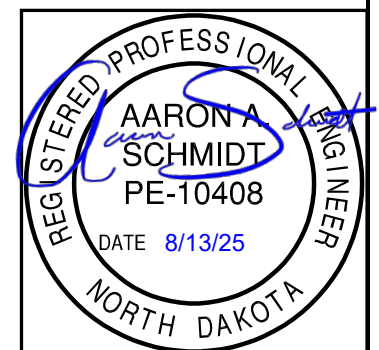
770-P08 IN-LINE FUSE AND FUSE HOLDER: The fuse holder shall be FEB, Ferraz Shawmut, rated for 600Vac and 30 amps, or approved equivalent. Provide a fuse that is a fast-acting midget fuse with an interrupt rating of 10kA at 600Vac, 5 amp by Busmann, Littelfuse or approved equivalent.

772-P01 EXISTING TRAFFIC SIGNAL SYSTEM: Keep the existing traffic signal system operational during the work. Remove all existing traffic signal equipment as shown on the plans including:

- Traffic signal cabinet, foundation, and internal components
- Disconnect and transfer switch assembly (relocate to new location)
- Traffic signal poles, mast arms, heads, pushbuttons, signs, combo light standards, extensions, and luminaires
- Traffic signal foundations, anchor bolt assemblies, rebar, and ground rod to a minimum depth of 3.5-feet below surrounding grade. Backfill and compact after removing existing signal standard foundation. Restore the surface to match adjacent areas.
- Conductor in conduits. Abandon in place existing conduit not otherwise re-used, remove conduit to a point two feet below grade and plugged/capped
- Pull boxes

Salvage all existing traffic signal equipment that is deemed salvageable by the Engineer to the City of Bismarck Public Works Building at 601 26<sup>th</sup> Street. Coordinate delivery with City of Bismarck Signal Shop Foreman, Paul Lies at 701-355-1719 a minimum of 24 hours in advance of delivery. The remaining equipment becomes the property of the Contractor. Include all costs to keep the existing traffic signal system operational and for the removal, salvage, and delivery of the existing traffic signal system equipment in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

772-P02 TRAFFIC SIGNAL SYSTEM: Replace the existing traffic signal system with a new traffic signal system as part of the work. Include in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" all labor and equipment necessary for the revised 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; controller cabinet and all necessary internal components including traffic signal controller, battery backup system, transformer base galvanized traffic signal standards and foundations, vehicular and pedestrian heads, pedestrian pushbuttons, pedestrian pushbutton signs, law enforcement confirmation lights, video detection system, emergency vehicle pre-emption system including confirmation lights, wiring, testing, programming, troubleshooting, and all cable, conduit, pull boxes, and appurtenances to install the traffic signal system completely.



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772-P03 TRAFFIC SIGNAL CABINET: Furnish and install traffic signal cabinet as specified in Standard Specifications Section 896.10 and the following:

- Econolite A-Type P65 cabinet (65”H x 44”W x 27”D) or approved equivalent.
- Document drawer (mounted on the lowest shelf)
- A minimum of three removable shelves that are a minimum of 10-inches deep
- GPS timeclock
- LED cabinet lighting
- Two quad-outlets (positioned toward the top, one on each side of the inside of the cabinet)
- Emerson Brand type (plug and go) surge protection with green and red LED confirmation lights
- RENO/EDI brand type switches and load switch flasher (with input & output LEDs on each channel of the switches)
- LED indicators for the flash transfer relay
- Cabinet door with:
  - a) Filter/heater mounting assembly with a spring-loaded flip latch or twist leaver latch
  - b) Threaded bolt/nut types are not acceptable
  - c) Separate thermostats for fan and heater
- Arc flash plexiglass cover over AC components

Install cabinet on concrete foundation and provide concrete working slab as shown on the plans. Orientate the cabinet door to open as shown on the plans. Install a minimum of three spare conduits into the cabinet and label with direction. Seal all conduits inside the cabinet. Seal spare conduits with mechanical duct plugs.

Fasten the disconnect and transfer switch assembly with Unistrut or approved equivalent.

Include all costs for labor, materials, and equipment necessary for furnishing and installing the traffic signal cabinet in the contract price for “TRAFFIC SIGNAL SYSTEM – SITE 1”.

772-P04 TRAFFIC SIGNAL CONTROLLER: Furnish and install an Econolite EOS Cobalt C Series Type 1 controller that operates with Centracs Software. The controller will be a NEMA Standard ATC volume density controller with the traffic counting capability operational.

The price bid for “TRAFFIC SIGNAL SYSTEM – SITE 1” includes all labor, materials, and equipment necessary for furnishing and installing the new controller, load switches, malfunction management unit, BUS interface units, emergency vehicle pre-emption equipment, video detection equipment, signal timing plans, programming, support, and other ancillary equipment as required to provide a fully functional traffic signal controller.

772-P05 BATTERY BACKUP SYSTEM: Provide a battery backup system for the traffic signal system in a separate cabinet located on the new traffic signal cabinet foundation, and include the following:

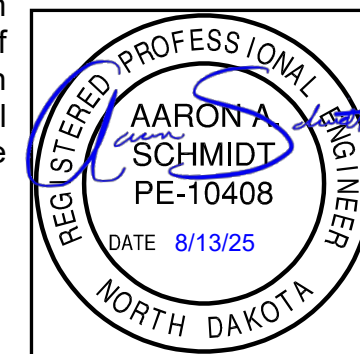
- Full battery backup for the traffic signal controller under normal and flash operation
- Flash activation contacts to ensure the longest battery life possible
- Power conditioning and transient filtering
- True Sine wave output with ±2% voltage regulation
- Power management and diagnostic functions
- Ethernet port with software to monitor or download data logs of the battery backup system
- Ethernet cable run from the battery backup ethernet port into the traffic signal cabinet fiber Optic Moxa switch and ready for future use
- System suitable for operation in -40°F to 120°F conditions
- Battery backup for a minimum of 2 hours in full signalization mode and 8 hours in flash operation
- Uninterruptible power supply (UPS) to include an external bypass switch rated at 30 amps 250 Vac and use 30 amp relays
- Generator hookups (confirm connection type with City of Bismarck Electrical Department)

Include all costs for labor, materials, and equipment necessary for furnishing and installing the battery backup system in the contract price for “TRAFFIC SIGNAL SYSTEM – SITE 1”.

772-P06 TRAFFIC SIGNAL POLES: Provide galvanized steel traffic signal poles, transformer bases, mast arms, luminaire extensions, and pedestrian pushbutton poles as shown on the plans and in accordance with Standard Specification 896.05. Provide traffic signal poles with rotatable mast arms, 6 anchor bolt mounting type, and galvanized “T” transformer bases manufactured by Millerbernd, Valmont Industries, or pre-approved equivalent.

Provide rodent protection in the transformer base using wire mesh. Place wire mesh continuously around the anchor bolts to protect rodents from entering the base. Provide steel signal pedestal adapters/collars for Type II signal standards.

Mount a terminal strip on a ½” thick white plastic backing material and provide a terminal strip protection pipe within the transformer base. Provide a 3” to 3 ½” PVC protection pipe with a minimum length of 12” to cover the entire terminal strip. Cap one end of the PVC pipe. Place the terminal strip within the PVC pipe with the cap side facing up inside the T base. The conductor shall chamfer/smooth the edges of the terminal strip tubes that are required inside the signal poles.



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## NOTES

772-P07 TRAFFIC SIGNAL FOUNDATIONS: Provide traffic signal foundations in accordance with NDDOT Standard Specifications. Foundation depth shall be per the "Traffic Signal Foundation Table" as shown on the plans in Section 150. The foundation diameter shall be the largest of either the anchor bolt circle diameter plus 12" or 24". See Standard Drawing D-770-1 for additional information.

772-P08 SIGNAL COMPONENT COLOR: Provide traffic signal system components with the following colors:

Vehicle and pedestrian signal head housing – black

Signal head mounting hardware – unpainted

Pedestrian pushbutton housing – black

772-P09 VEHICULAR TRAFFIC SIGNAL HEADS & BACK PLATES: Provide vehicular traffic signal heads with 12-inch polycarbonate housings and doors and aluminum 12-inch cap-style visors. Provide stainless steel fasteners and use anti-seize lubricant on all threaded components.

Mount mast arm mounted vehicular heads with a two-point system using Astro Brackets, Sky Brackets, or approved equivalent. Plumbizer mounting will not be allowed.

Provide louvered aluminum traffic signal head back plates with a yellow Type XI retroreflective border. Install a 1-inch yellow border around the perimeter of the face of the backplate. Install backplates with stainless steel fasteners including a washer. Apply anti-seize lubricant to the threads.

Include all costs for labor, materials, and equipment necessary for furnishing and installing vehicular traffic signal heads and back plates in the contract price for "TRAFFIC SIGNAL SYSTEM – SITE 1".

772-P10 COUNTDOWN PEDESTRIAN SIGNAL HEADS: Provide single piece countdown pedestrian signal heads with 16" x 18" polycarbonate housings and doors and aluminum tunnel-style visors. Side mount pedestrian signal heads to Type II signal standards. Top mounting will not be allowed.

Include all costs for labor, materials, and equipment necessary for furnishing and installing pedestrian signal heads in the contract price for "TRAFFIC SIGNAL SYSTEM – SITE 1".

772-P11 LED INDICATIONS: Provide LED indications for all traffic signal and pedestrian heads with a minimum 15-year warranty. The external lens of the traffic signal modules shall be curved and smooth on the outside to prevent excessive dirt/dust/snow buildup and to minimize sun phantom reflections and shall be UV stabilized polycarbonate. Use anti-capillary type wire for all external wiring utilized in the LED traffic signal modules to prevent wicking of moisture to the interior of the module or equip them with mounting lugs that are molded into the back of the housing to prevent moisture entering the unit.

The module shall not protrude more than 4-inches between the inside flange to the back of the module housing, allowing more space to clear cables and terminal blocks.

772-P12 VIDEO DETECTION SYSTEM: Provide Autoscope Vision for video detection equipment, or approved equivalent, with the following requirements:

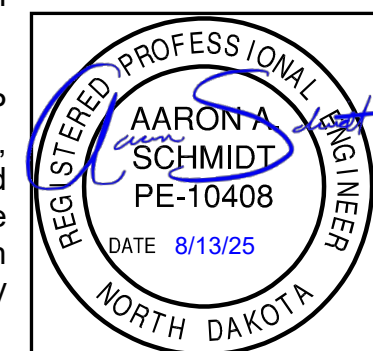
- Thermostatically controlled indium tin oxide (ITO) heater applied directly on the interior surface to keep the faceplate clear of condensation, snow, ice, and frost.
- Include management software for configuration, monitoring, and data collection purposes.
- 100% compatible with Centrac's Traffic Management Software System with all communications to the video detection system from the traffic management software being to a single IP address. An Ethernet port shall also be provided to connect to a remote traffic management center.
- 802.11g Wi-Fi access point shall allow wireless connection to the video detection system at the cabinet for setup and maintenance purposes. All communications to the video detection system through the Wi-Fi access point shall be to a single IP Address. The Wi-Fi access point shall turn itself off automatically after a period of inactivity from connected devices. In addition to the ability to view video streams in the traffic management software, it shall be possible to view video, from individual sensors or to view the quad-view, from the communications interface panel using a third-party video player application on a tablet, smartphone or laptop computer with a wireless connection.
- Program for technical support and software updates from the manufacturer, following the expiration of the warranty period, at no additional cost to the City.

Provide an extra camera for the video detection system and deliver to City of Bismarck Public Works Department (601 South 26<sup>th</sup> Street, 701-355-1700).

Install cable between the cameras and the controller cabinet, aim cameras and setup the video detection system. Provide presence detection zones behind the stop bars for all actuated traffic movements. Program detection zones and verify the reliability of operation. The location of the cameras in the plans is for reference only. The cameras should be installed on the mast arm as recommended by the manufacturer for optimal detection.

Include all costs for labor, material, and equipment necessary for the video detection system to be fully operational, including technical support and software updates for at least 5-years, in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

772-P13 EMERGENCY VEHICLE PRE-EMPTION (EVP): Provide EVP phase selector with four-channel dual priority, multimode, encoded signal device designed for use with both infrared system emitters and GPS radio/GPS intersection units. Phase selector to include Ethernet port on the front panel. Furnish and install 4 receivers and 4 confirmation lights for 4-way emergency vehicle pre-emption.



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## NOTES

Provide EVP equipment fully compatible with controllers and pre-emption equipment used in the City of Bismarck. Place the confirmation light at the same location on the mast arm as the EVP detectors. No splices are allowed between the controller cabinet and the EVP equipment. Provide LED indicator lamps.

Notify the fire chief Joel Boespflug (701-355-1400) when the EVP systems are tested and operable. The City of Bismarck is responsible for setting the range of the system.

Include all costs for labor, material, and equipment necessary for furnishing and installing the EVP system in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

**772-P14 LAW ENFORCEMENT CONFIRMATION LIGHTS:** Provide blue omni-directional LED law enforcement confirmation lights which must be visible from 360° when mounted on the signal heads. Provide a lens for the confirmation light in which the blue tint is integrated into the lens. Blue coating is not allowed. Provide law enforcement confirmation lights that are manufactured specifically for use as law enforcement confirmation lights and have been used for the sole purpose. Required temperature rating is -40°C to 60°C. Furnish Keystone KT-LED12HID-E26-840-D lamp for each confirmation light.

Mount the law enforcement confirmation lights on a riser to the traffic signal heads as shown in the plans. Provide un-brushed aluminum risers that are capable of adjusting the height and angle of the confirmation lights. The confirmation lights must be visible above or below the signal head backplate as indicated in the Section 150 details. The riser must not protrude or be visible above or below the signal head backplate. Provide a waterproof connection between the riser and traffic signal head that is weather proof and will not allow moisture into the traffic signal head. Connect the law enforcement confirmation lights to the red indication in the corresponding traffic signal head. Place anti-seize compound on all threaded components.

Include all costs for labor, material, and equipment necessary for furnishing and installing law enforcement confirmation lights in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

**772-P15 ACCESSIBLE PEDESTRIAN SIGNAL (APS) PUSHBUTTON & SIGN:** Provide Polara EZ Comm APS pedestrian pushbuttons meeting the requirements of accessible pedestrian signal (APS) pushbuttons.

Include the cost for the accessible pedestrian pushbutton and sign in the bid item "TRAFFIC SIGNAL SYSTEM – SITE 1".

**772-P16 PEDESTRIAN PUSHBUTTON POSTS:** Provide 2" intermediate metal pedestrian pushbutton post consisting of an above grade section of pipe with threaded bottom inserted into a 2" coupling set 1/8" above the surrounding concrete or grade. Connect the coupling to a 2" rigid steel sweep underground. The design intent is to replace the upper portion if hit by a vehicle without impacting the 2" coupling or sweep embedded in the concrete and earth below. Submit work drawings prior to ordering materials.

Include all labor, materials, and equipment necessary to provide and install the pushbutton post in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

**772-P17 CONDUIT:** Install new conduit and re-use existing conduit, as shown on the plans. Use UL listed HDPE conduit when boring. Seal all conduit with duct seal at the controller cabinet, pull boxes, and at the traffic signal standard foundations. Install one spare 2-inch conduit sweep in each traffic signal foundation. Cap spare conduits with a mechanical plug and label as to which direction they face.

Include all costs for labor, material, and equipment necessary for furnishing and installing conduit in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

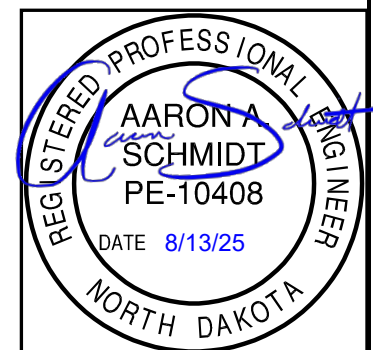
**772-P18 TRAFFIC SIGNAL PULL BOXES:** Provide pull boxes that are made of lightweight, high-density polymer concrete, UL listed, and are resistant to sunlight, weathering, chemicals, and unaffected by freeze-thaw cycles to -50°F. Provide a cover with stainless steel hex bolts and nuts that is clearly marked as "Traffic Signal". See standard drawing D-770-3 for details. Duct seal all conduits entering and exiting pull boxes. No splicing is allowed in pull boxes. Plug spare conduits with mechanical duct plugs.

Re-use existing pull boxes as shown on the plans

Include all costs for labor, material, and equipment necessary for furnishing and installing pull boxes in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

**772-P19 WIRE SPLICING:** No splicing is allowed in pull boxes. Splicing may only take place at the signal transformer base terminal strip, controller cabinet terminal blocks, and traffic signal head terminal blocks.

**772-P20 TRAFFIC SIGNAL TRACER WIRE:** Install tracer wires directly from the traffic signal cabinet to each of the traffic signal standards. Use a single, yellow, 14 AWG TW/THW solid wire and run each tracer wire continuously from the traffic signal cabinet to each of the traffic signal standards separately, with no splices. Ground each tracer wire at each traffic signal (end of the run).



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**NOTES**

772-P21 LABEL ALL FIELD CABLES: Provide labeling materials that are plastic and printed on both sides that are readable without moving the cables. Label field cables with the signal field terminal number as shown in the wiring diagram supplied by the signal equipment supplier and laced with the following cable designations:

TYPE	LABEL	LABEL LOCATION
Communication cable	Comm./address of other end	Within 12" of conduit
Pedestrian push button	Phase/location (i.e. NW, SW, etc.)	Within 6" of terminals
Video detection cable	Approach Detection (i.e. NW, SW, etc.)	Within 6" of terminals
Control cable (Main cable)	Terminal number & location (i.e. NW, SW, etc.)	Within 12" of conduit
Control cable (Individual strands)	Terminal number (i.e. 1G, 1Y, etc.)	Within 6" of terminals
Opticom cable	Pre-empt number/location (i.e. NW, SW, etc.)	Within 6" of terminals

- Tracer wire to be labeled in the controller cabinet

Not a separate pay item, cost to be included in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

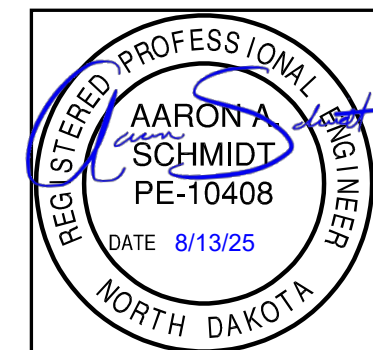
772-P22 CONTROLLER CABINET WIRING DIAGRAM: Label the following items on the cabinet wiring diagram, in addition to information required by NDDOT Standard Specification.

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

Use a heat-shrink labeling system. Do not strip the cables back from the connection more than 12 to 18 inches. This work is not a separate pay item and include the cost in the price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1".

772-P23 CONFLICT MONITOR TESTING: Perform a complete controller conflict monitor test prior to unveiling the traffic heads. Supply the conflict monitor maintenance record test form along with instructions that must be followed completely before the signals are

put into operation. Include all materials, labor and equipment necessary to conduct the conflict monitor testing in the price bid "TRAFFIC SIGNAL SYSTEM – SITE 1".



Estimated Quantities

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SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
201	0352	REMOVAL OF TREES & BRUSH	L SUM	1	1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	859	859
202	0130	REMOVAL OF CURB & GUTTER	LF	1343	1343
252	0100	SOD	SY	408	408
302	0120	AGGREGATE BASE COURSE CL 5	TON	1728	1728
550	0300	8IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	883	883
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	15	15
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1343	1343
704	1054	SIDEWALK BARRICADE	EA	7	7
704	1058	PEDESTRIAN WALKWAY	LF	362	362
704	1060	DELINEATOR DRUMS	EA	20	20
704	1067	TUBULAR MARKERS	EA	111	111
704	1085	SEQUENCING ARROW PANEL-TYPE A	EA	2	2
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	599	599
704	2108	TEMPORARY CURB RAMP	EA	6	6
708	1540	INLET PROTECTION-SPECIAL	EA	8	8
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	1289	1289
722	6140	ADJUST GATE VALVE BOX	EA	2	2
722	6200	ADJUST MANHOLE	EA	2	2
722	6240	ADJUST UTILITY APPURTENANCE	EA	2	2
722	6241	ADJUST SPRINKLER SYSTEM	L SUM	1	1
748	0140	CURB & GUTTER-TYPE I	LF	1394	1394
748	0520	CURB-TYPE I	LF	105	105
750	0030	PIGMENTED IMPRINTED CONCRETE	SY	37	37
750	0115	SIDEWALK CONCRETE 4IN	SY	115	115
750	0140	SIDEWALK CONCRETE 6IN	SY	265	265
750	0200	CONCRETE MEDIAN PAVING	SY	137	137
750	0210	CONCRETE MEDIAN NOSE PAVING	SY	21	21
750	2115	DETECTABLE WARNING PANELS	SF	134	134
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	42	42
754	0193	FLEXIBLE DELINEATORS-TYPE D	EA	13	13
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	56	56
754	0592	RESET SIGN PANEL	EA	6	6
754	0593	RESET SIGN SUPPORT	EA	2	2
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	128	128
762	0424	SHORT TERM 8IN LINE-TYPE R	LF	307	307
762	0440	SHORT TERM MESSAGE-TYPE R	SF	144	144
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE	LF	626	626
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE	LF	202	202
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	1526	1526
770	4525	REVISE LIGHTING SYSTEM	EA	1	1
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1	EA	1	1

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## BASIS OF ESTIMATE

AGGREGATE BASE COURSE CL 5

@ 1.875 TON/CY

### TOPSOIL

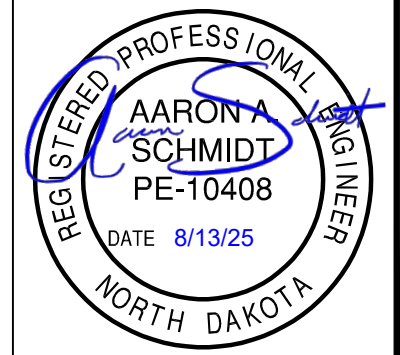
Topsoil shall be removed from excavation and embankment areas at an assumed depth of 4 inches. Replace topsoil at a depth of 4 inches in all disturbed areas excluding hard surfaced areas.

### SEEDING

All disturbed areas excluding hard surfaced areas and medians that are to receive sod.

### MULCHING

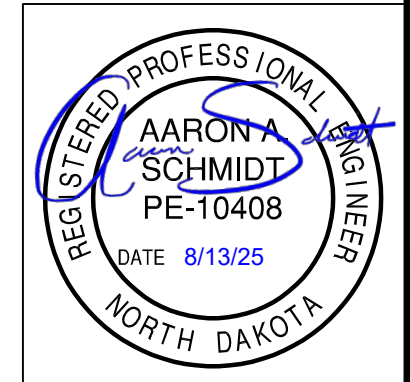
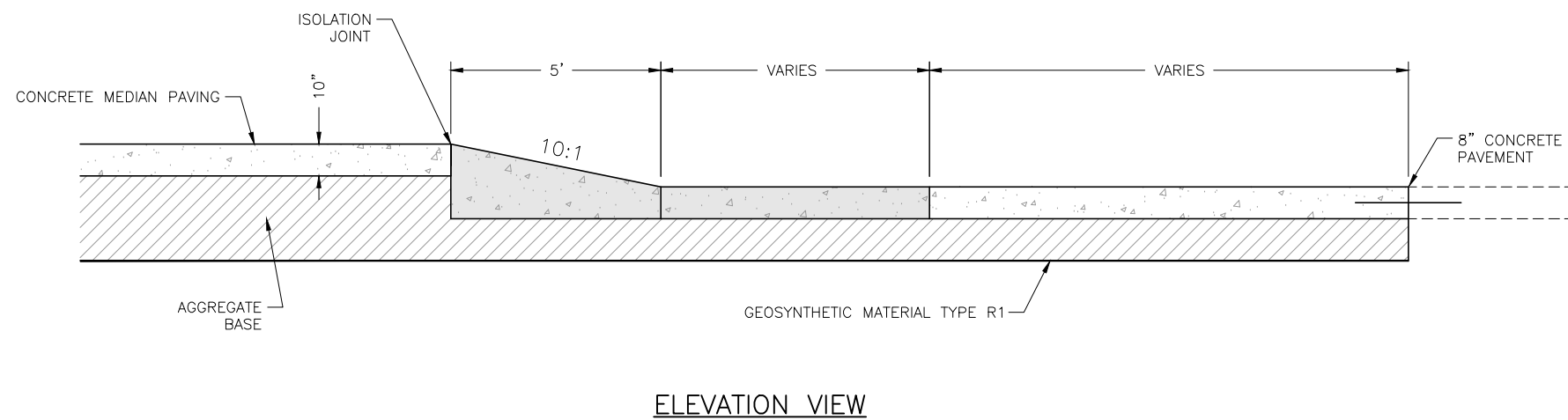
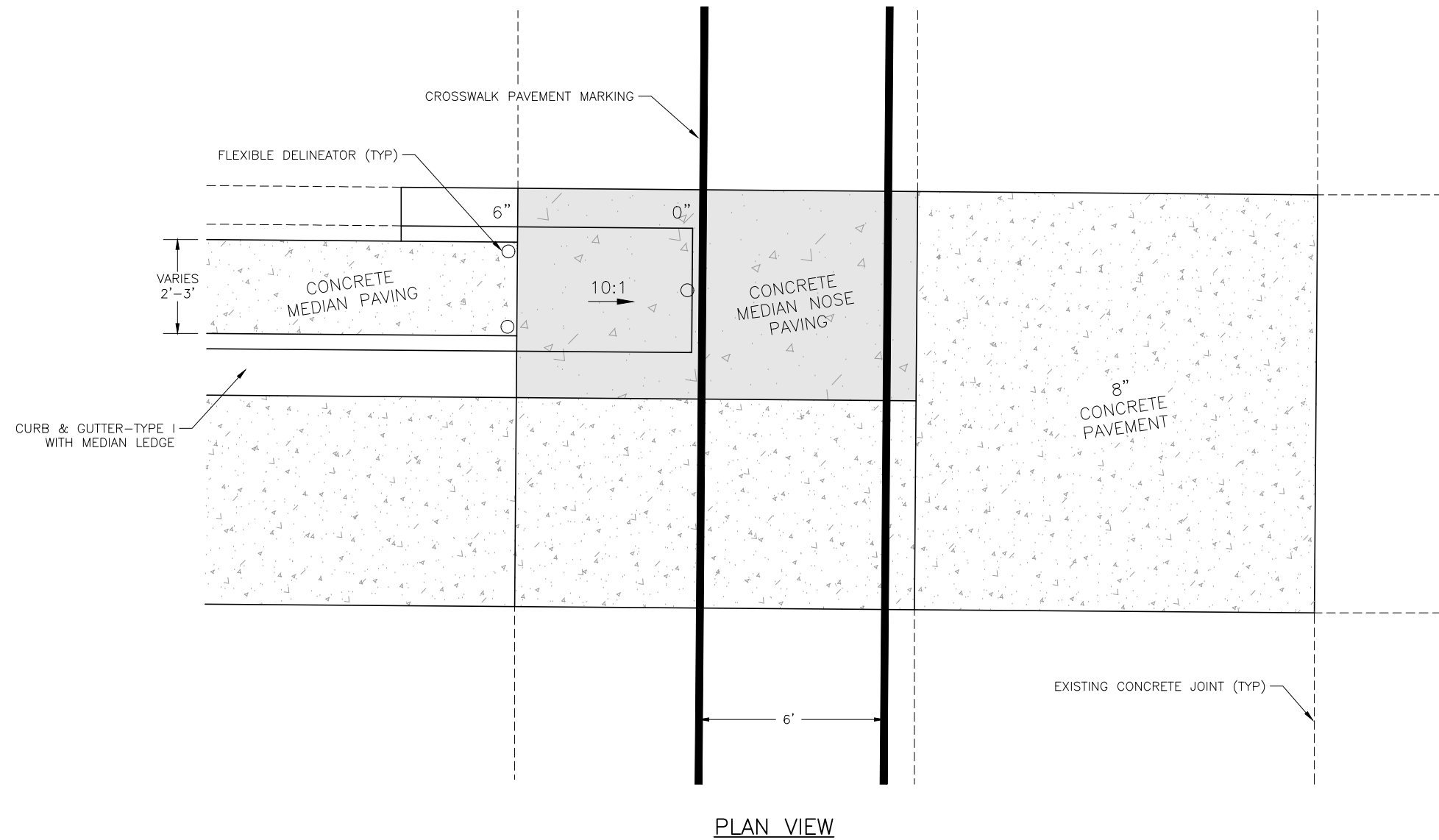
All disturbed areas excluding hard surfaced areas and medians that are to receive sod.



BASIS OF ESTIMATE

CENTURY AVENUE & 19TH STREET

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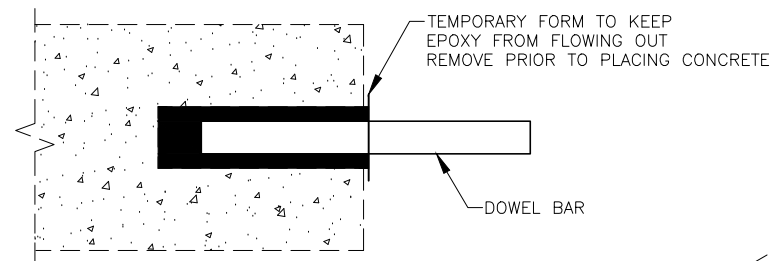
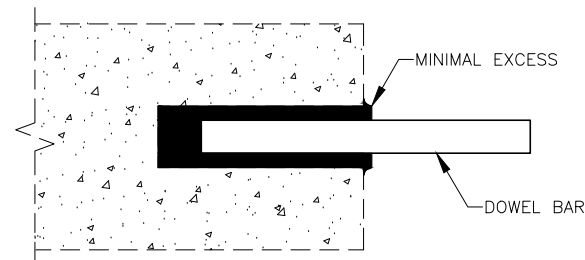
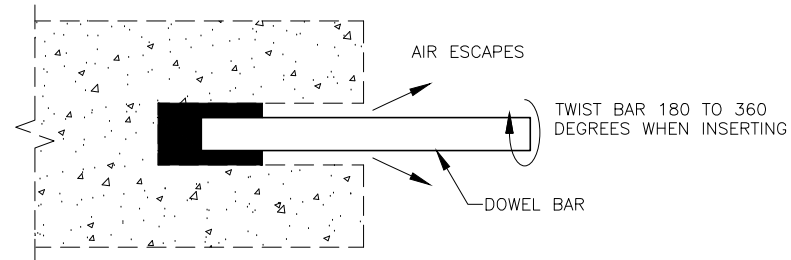
DETAILS

TYPICAL MEDIAN NOSE ISLAND  
CENTURY AVENUE & 19TH STREET

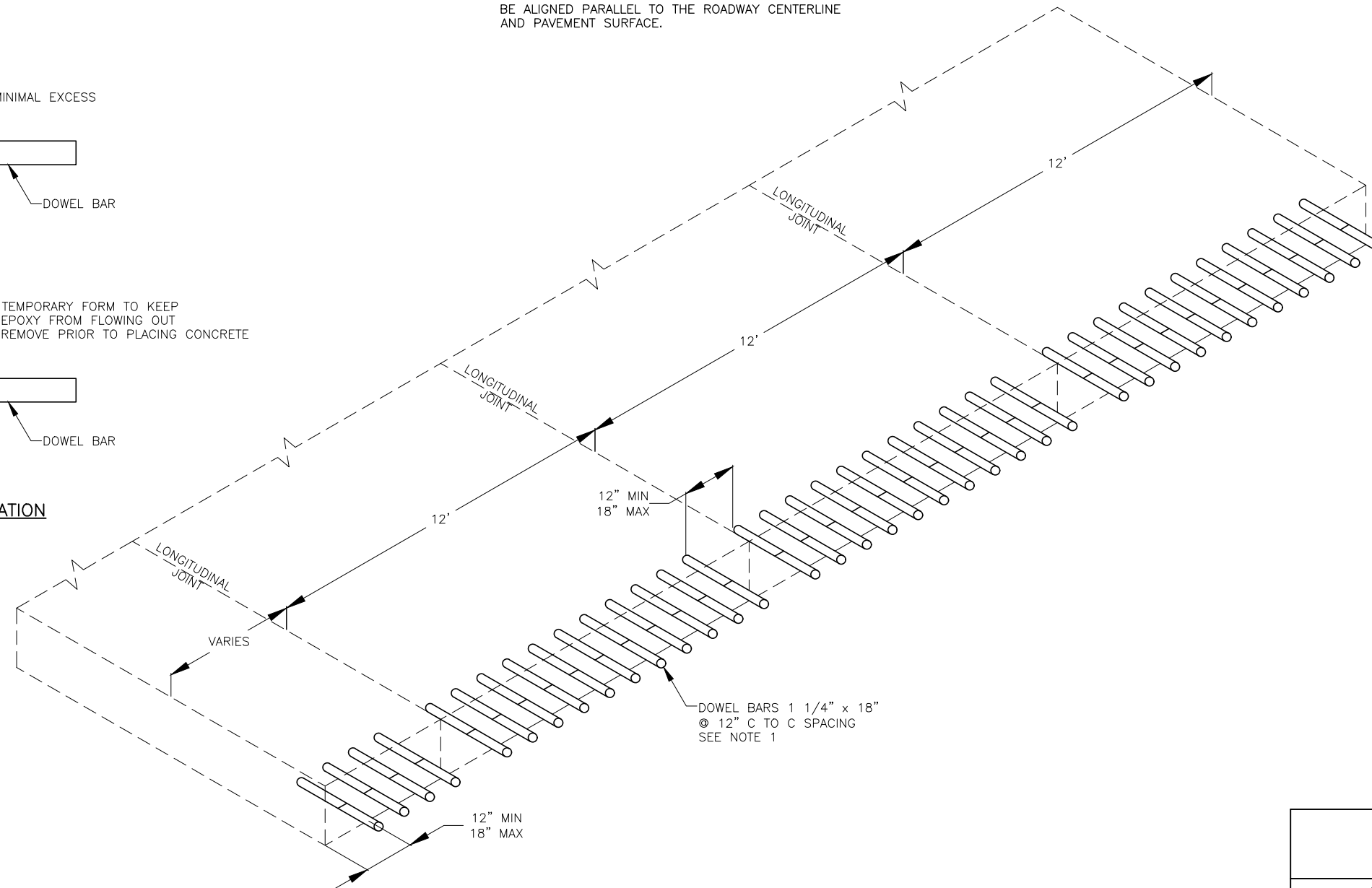
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
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**NOTES**

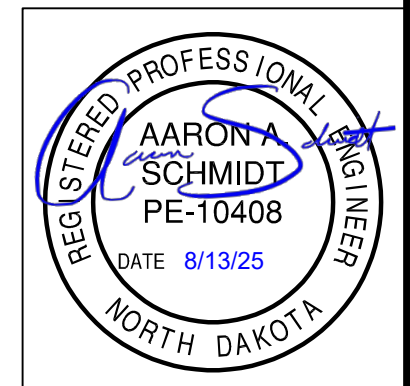
- DOWEL BARS SHALL BE SPACED AT 12" O.C.
  - DOWEL BARS SHALL BE PLACED NO LESS THAN 12" OR MORE THAN 18" FROM LONGITUDINAL JOINT.
  - IF EXISTING SAW CUT DOWEL BARS ARE PRESENT, DRILLED IN DOWEL BARS SHALL BE PLACED AT THE HORIZONTAL MIDPOINT BETWEEN EXISTING SAW CUT DOWEL BARS.
- DOWEL BARS SHALL BE PLACED AT THE VERTICAL MIDPOINT OF THE EXISTING PCC PAVEMENT.
- SMOOTH BARS AND DOWEL BAR ASSEMBLIES SHALL BE ALIGNED PARALLEL TO THE ROADWAY CENTERLINE AND PAVEMENT SURFACE.



**DOWEL BAR & EPOXY INSTALLATION**



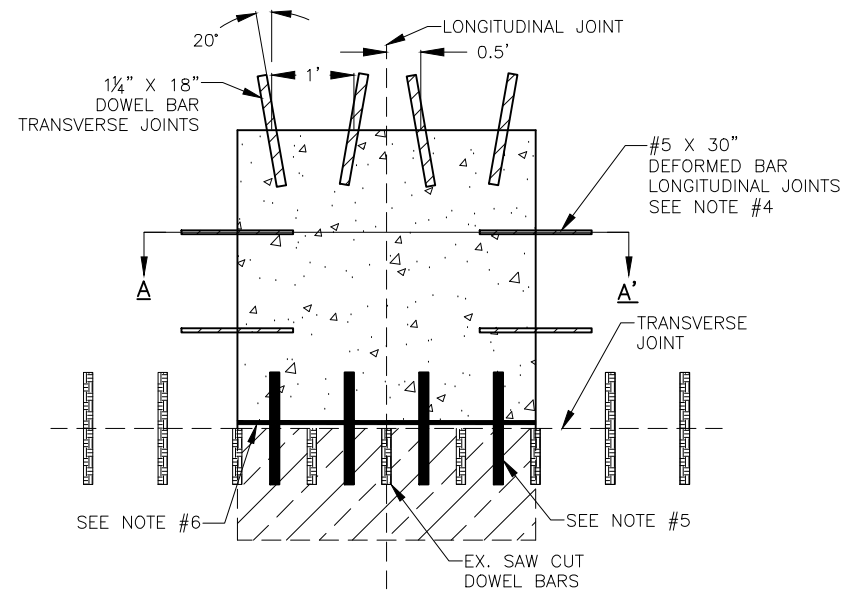
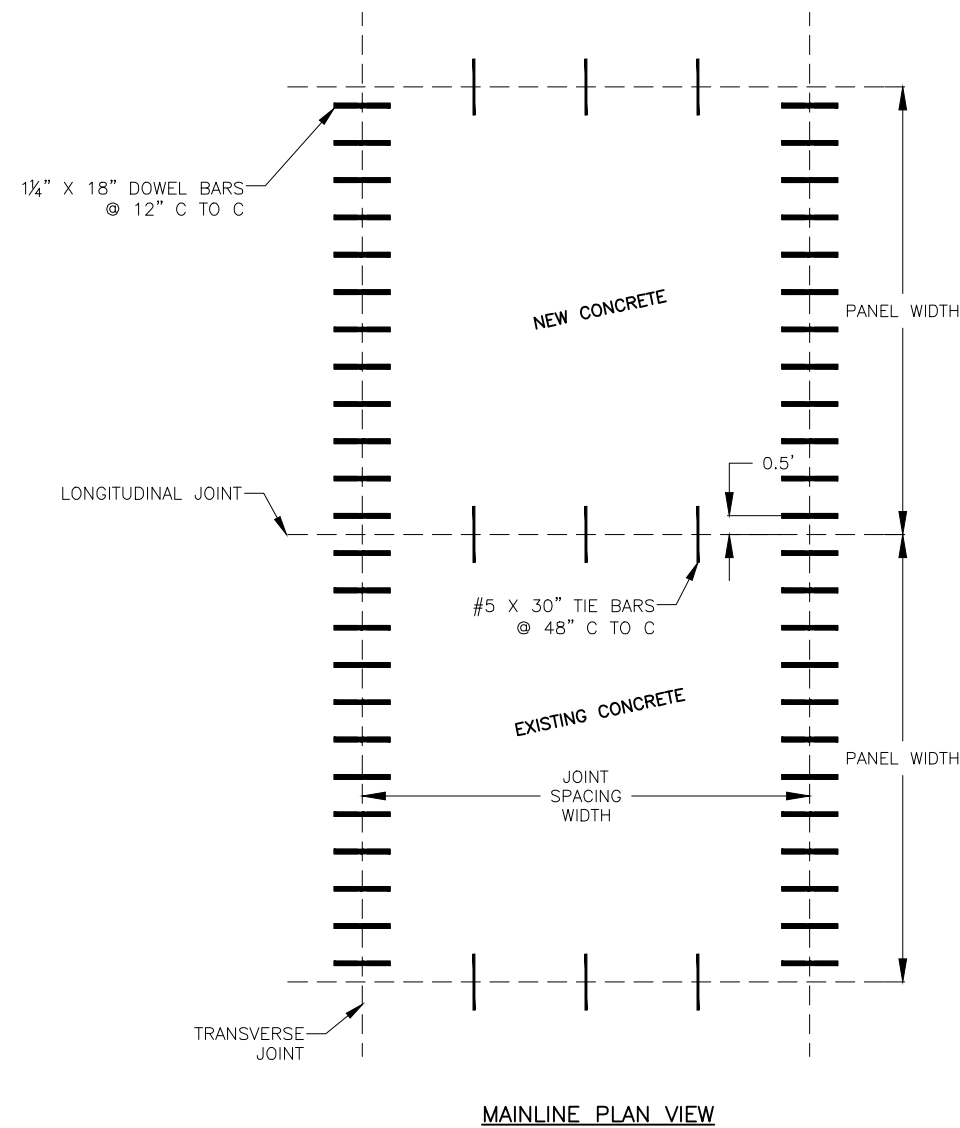
**DOWEL BAR PLACEMENT**



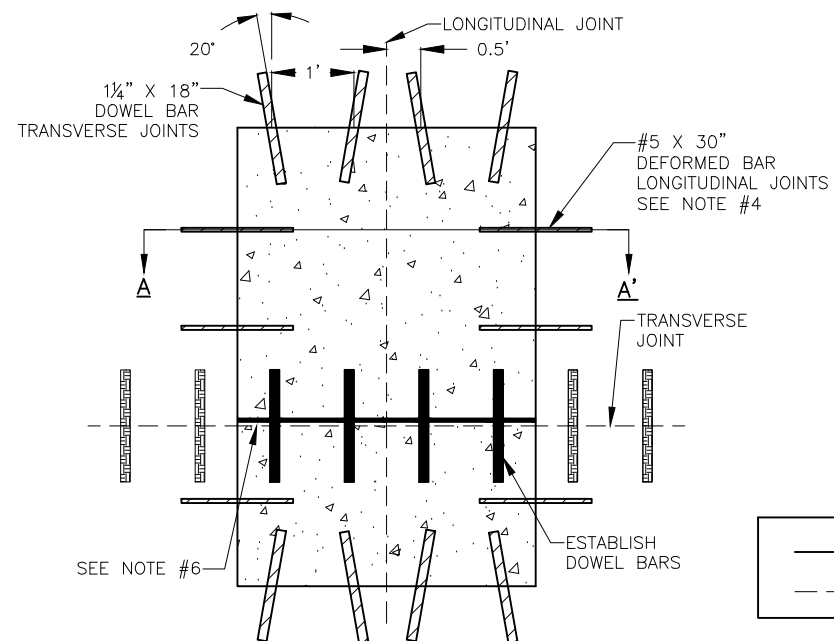
GENERAL DETAILS

PAVEMENT JOINTING DETAILS

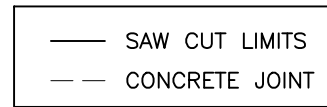
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BAR PLACEMENT  
EXISTING TO NEW CONCRETE PAVEMENT



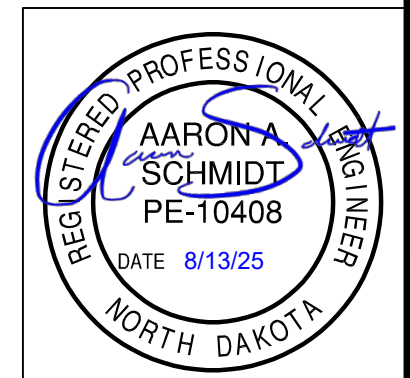
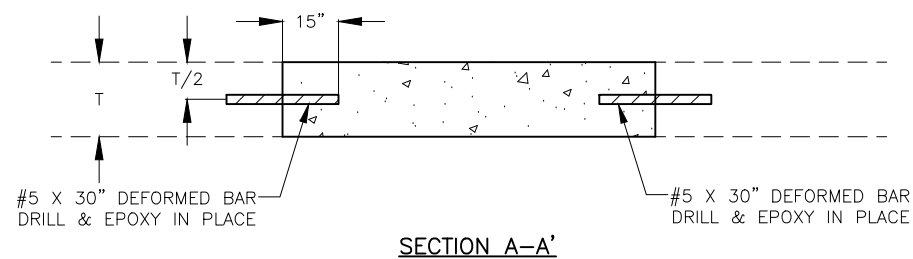
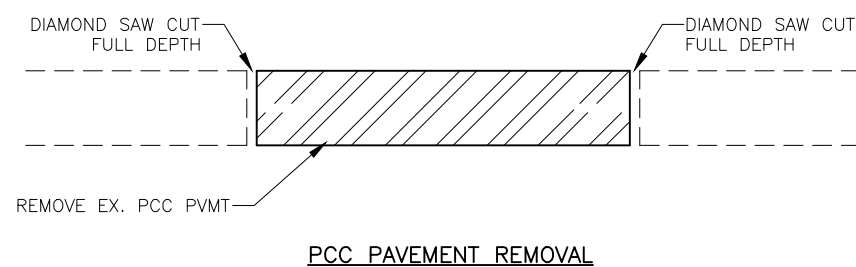
BAR PLACEMENT  
NEW TO NEW CONCRETE PAVEMENT



**NOTES**

**WORK TO BE PERFORMED**

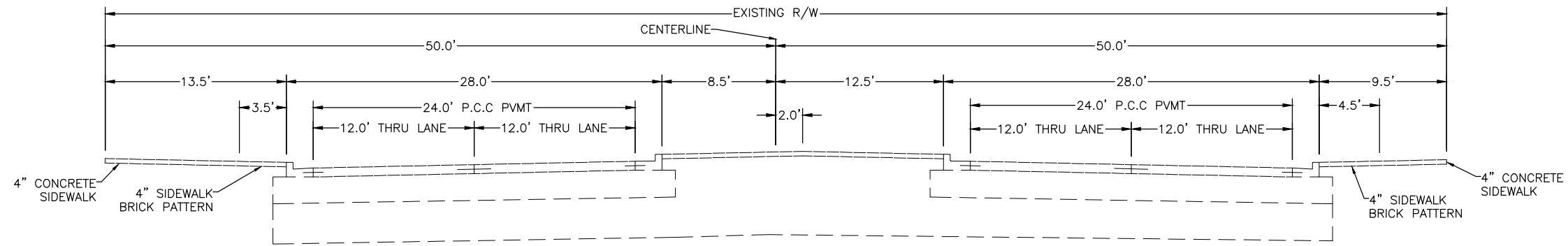
- FULL DEPTH SAW CUT THE MARKED REMOVAL AREA.
- REMOVE CONCRETE FULL DEPTH, RESTORE IN PLACE BASE IF DISTURBED.
- FURNISH AND INSTALL 18" LONG 1 1/4" DOWEL BARS. THE SPACING FOR TRANSVERSE EDGES SHALL BE 12" O.C. AND SKEWED 20° FROM THE FACE OF THE JOINT. TRANSVERSE BARS SHALL BE PLACED NO LESS THAN 6" FROM ANY JOINT OR REPAIR EDGE.
- FURNISH AND INSTALL 30" LONG NO. 5 DEFORMED BARS. THE SPACING FOR LONGITUDINAL EDGES SHALL BE PARALLEL TO THE JOINT. IF JOINT IS LESS THAN 4' IN LENGTH, USE TWO BARS EVENLY SPACED, IF LONGER THAN 4' SPACE AT 48" O.C. LONGITUDINAL BARS SHALL BE PLACED NO LESS THAN 6" FROM END OF TRANSVERSE BARS.
- RESTORE DOWEL BARS WHICH SHALL BE DRILLED MID POINT BETWEEN EXISTING SAWED DOWEL BARS, SPACED 12" O.C.
- CLEAN EXPOSED SURFACE OF INPLACE CONCRETE. COAT EXPOSED SURFACES OF THE DOWEL BARS, IF ANY, WITH GREASE.
- PLACE, CONSOLIDATE, FINISH, AND CURE CONCRETE.
  - IF DEEMED NECESSARY BY THE ENGINEER, PLACE 260 MIL THICKNESS OF BITUTHENE MEMBRANE OR EQUAL (APPROX. 1/4") AT TRANSVERSE JOINT.
- RESTORE TRANSVERSE AND LONGITUDINAL JOINTS.
- CLEAN AND SEAL RESTORED TRANSVERSE AND LONGITUDINAL JOINTS.



GENERAL DETAILS

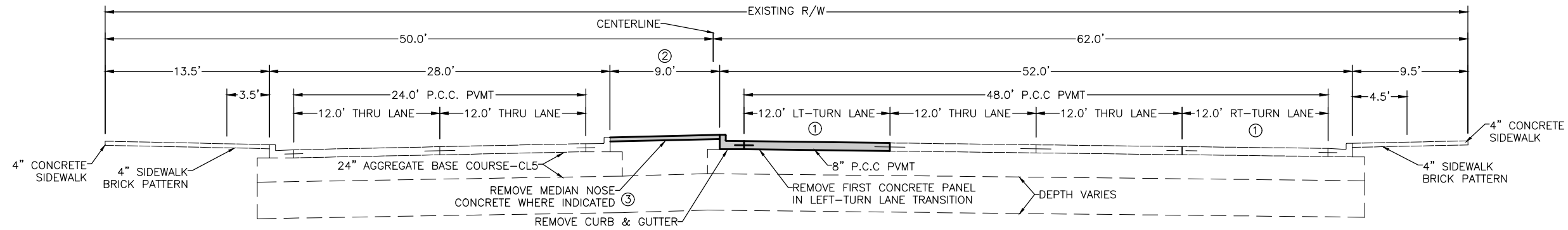
PAVEMENT JOINTING DETAILS

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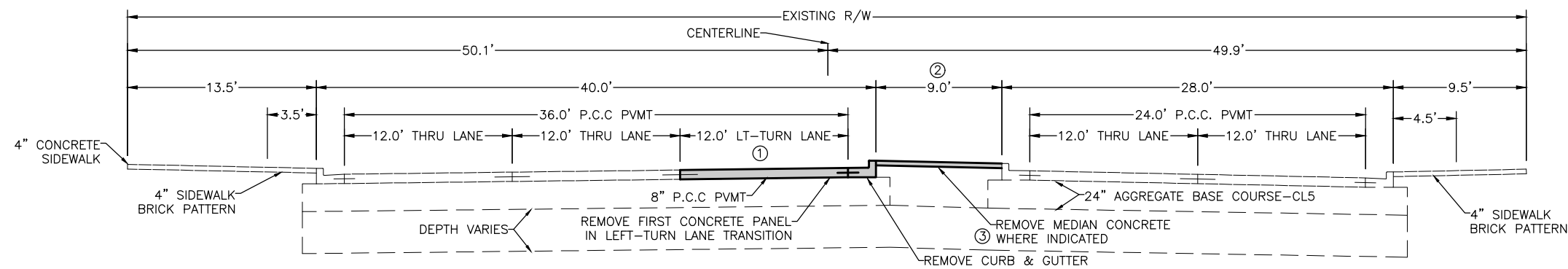


STA. 22+56 TO 23+40  
STA. 29+84 TO 30+54  
CENTURY AVENUE  
(MAINLINE)

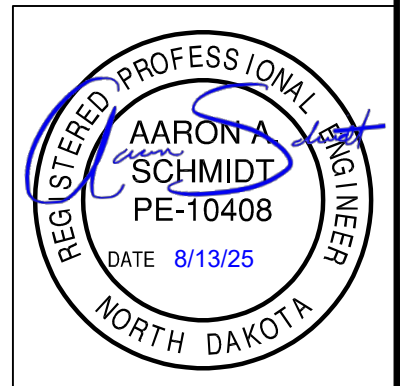
- ① LANE WIDTH VARIES IN TRANSITION AREA
- ② MEDIAN WIDTH VARIES IN TRANSITION AREA
- ③ GRASS MEDIAN EXISTS EXCEPT FOR MEDIAN NOSE



STA. 23+40 TO 26+38  
CENTURY AVENUE  
(EASTBOUND TURN LANES)



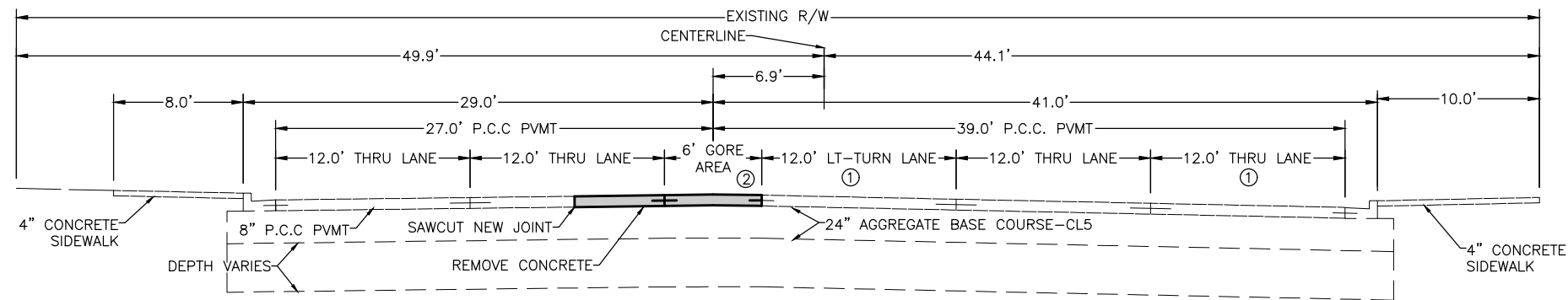
STA. 26+38 TO 29+84  
CENTURY AVENUE  
(WESTBOUND TURN LANE)



TYPICAL SECTIONS

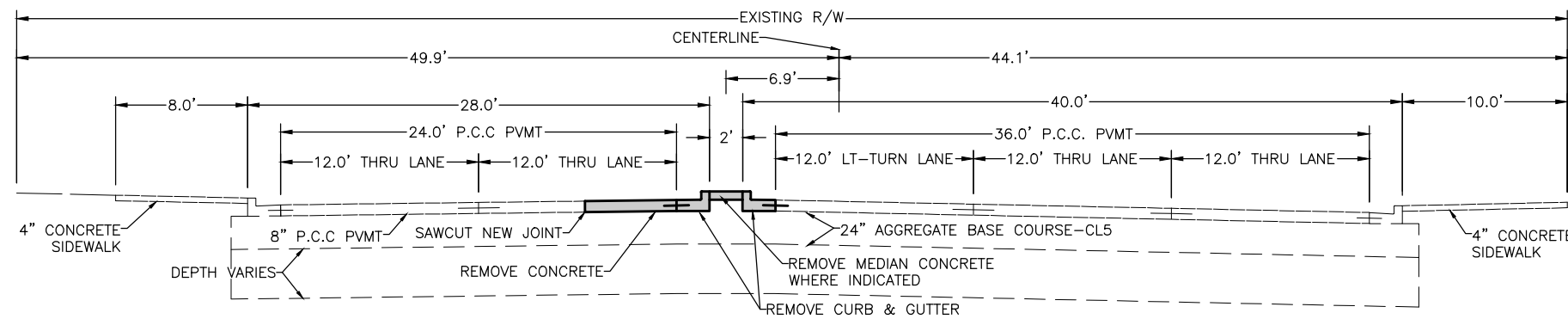
EXISTING TYPICAL SECTIONS  
CENTURY AVENUE & 19TH STREET

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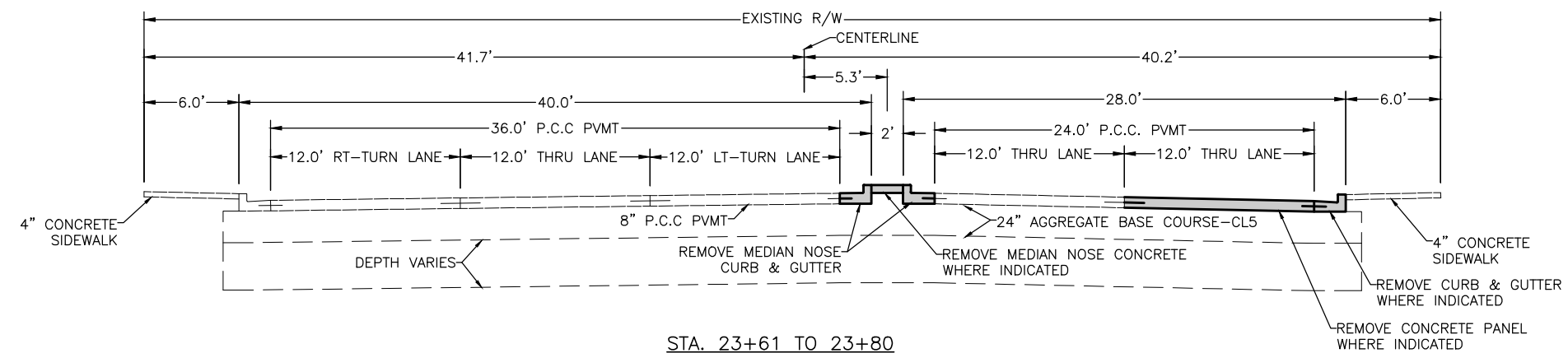


STA. 20+81 TO 21+48  
19TH STREET  
(NORTHBOUND PRE-TURN LANE)

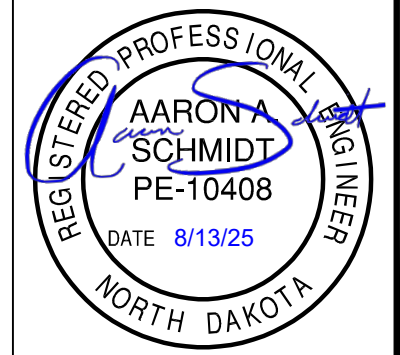
- ① LANE WIDTH VARIES IN TRANSITION AREA
- ② GORE AREA WIDTH VARIES IN TRANSITION AREA



STA. 21+48 TO 22+52  
19TH STREET  
(NORTHBOUND TURN LANE)



STA. 23+61 TO 23+80  
19TH STREET  
(SOUTHBOUND TURN LANE)

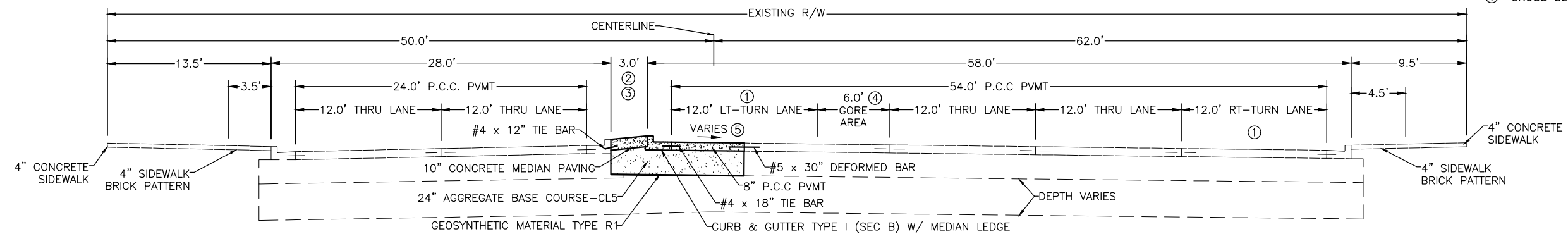


TYPICAL SECTIONS

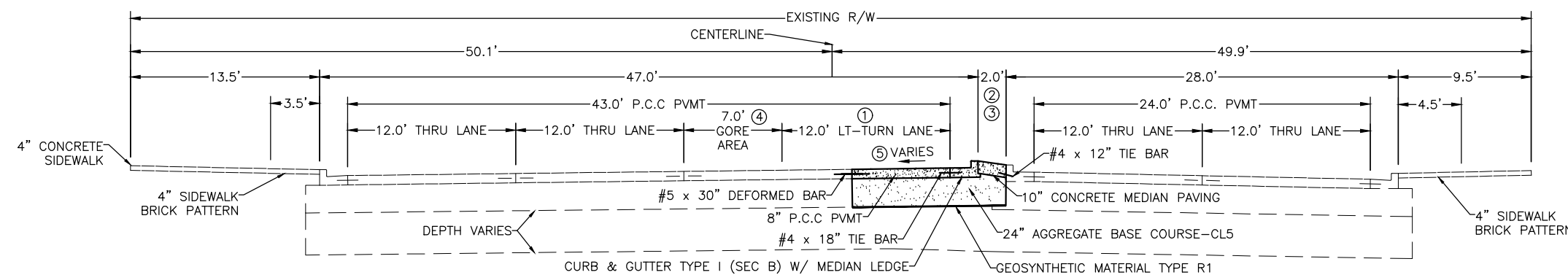
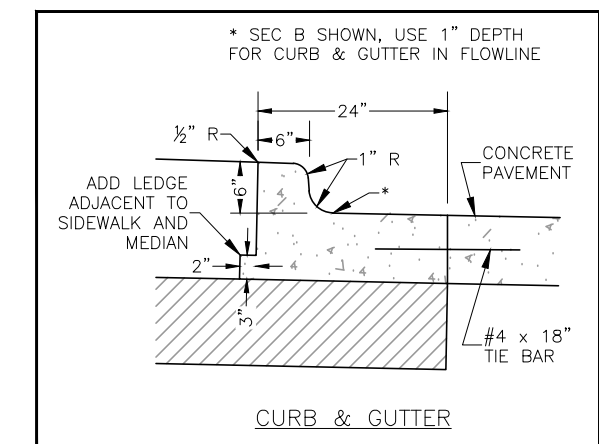
EXISTING TYPICAL SECTIONS  
CENTURY AVENUE & 19TH STREET

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	30	3

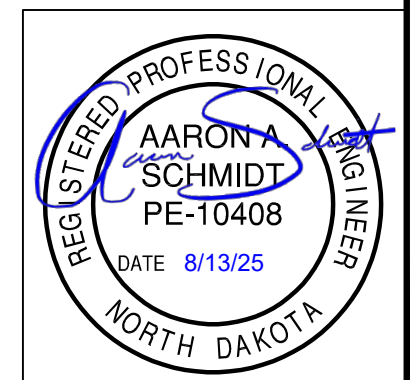
- ① LANE WIDTH VARIES IN TRANSITION AREA
- ② MEDIAN WIDTH VARIES IN TRANSITION AREA
- ③ PROPOSED GRASS MEDIAN IN TRANSITION AREA
- ④ GORE AREA WIDTH VARIES IN TRANSITION AREA
- ⑤ CROSS SLOPE TO MATCH EX. ADJACENT PANEL



STA. 22+56 TO 26+38  
CENTURY AVENUE  
(EASTBOUND TURN LANES)



STA. 26+38 TO 30+54  
CENTURY AVENUE  
(WESTBOUND TURN LANE)

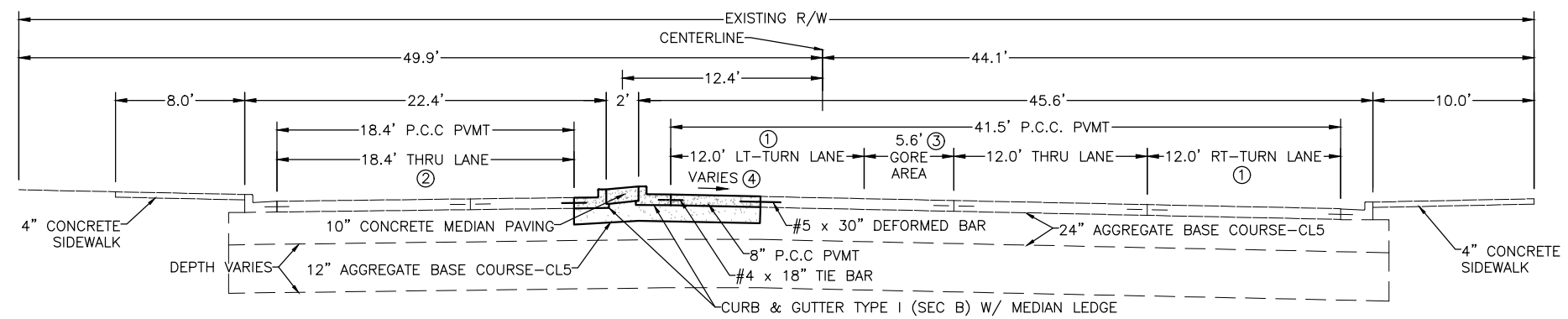


TYPICAL SECTIONS

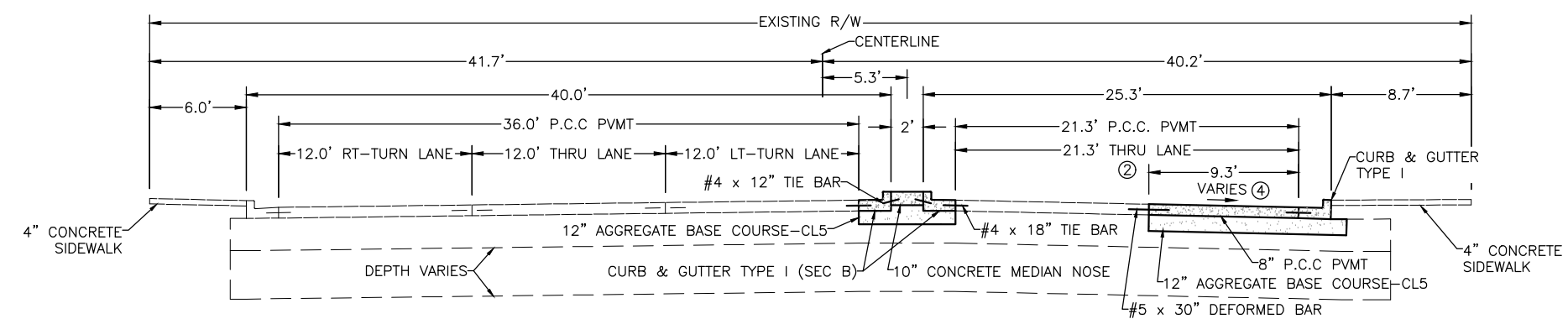
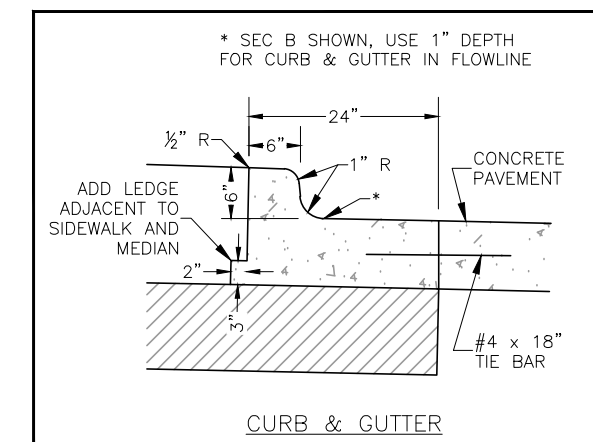
PROPOSED TYPICAL SECTIONS  
CENTURY AVENUE & 19TH STREET

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	30	4

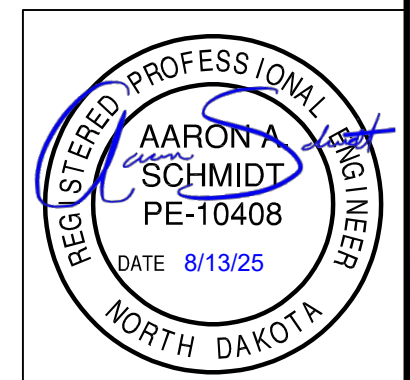
- ① LANE WIDTH VARIES IN TRANSITION AREA
- ② LANE WIDTH VARIES
- ③ GORE AREA WIDTH VARIES IN TRANSITION AREA
- ④ CROSS SLOPE TO MATCH EX. ADJACENT PANEL



STA. 20+89 TO 22+52  
19TH STREET  
(NORTHBOUND TURN LANE)



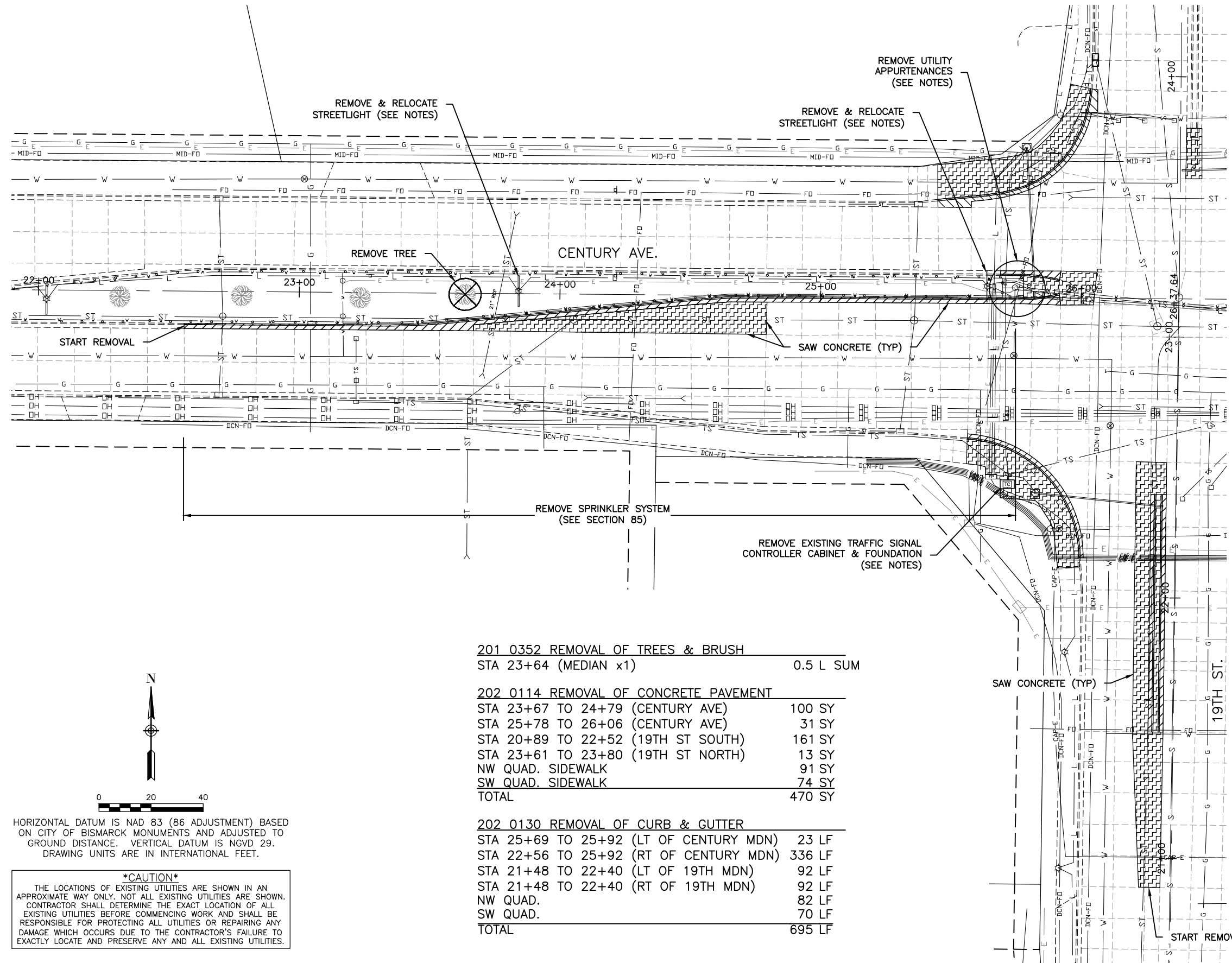
STA. 23+61 TO 23+80  
19TH STREET  
(SOUTHBOUND TURN LANE)



TYPICAL SECTIONS

PROPOSED TYPICAL SECTIONS  
CENTURY AVENUE & 19TH STREET

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	40	1



- NOTES:
1. INCLUDE REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM AND RELATED EQUIPMENT AS PART OF SIGNAL WORK (SEE SECTION 150).
  2. REMOVE EXISTING STREETLIGHT FOUNDATION. REMOVE & RELOCATE STREETLIGHT (SEE SECTION 140).
  3. REMOVE & RECONFIGURE EXISTING STREET LIGHT PULL BOXES IN MEDIAN NOSE AREA. SEE SECTION 140 FOR MORE INFORMATION.
  4. SEE SECTION 85 FOR SPRINKLER UTILITIES REMOVAL IN MEDIAN NOSE AREA.

**LEGEND**

	REMOVAL OF CONCRETE
	REMOVAL OF CURB & GUTTER
	REMOVAL OF TREE

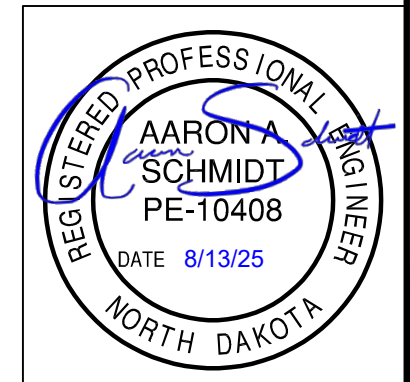
201 0352 REMOVAL OF TREES & BRUSH  
 STA 23+64 (MEDIAN x1) 0.5 L SUM

202 0114 REMOVAL OF CONCRETE PAVEMENT  
 STA 23+67 TO 24+79 (CENTURY AVE) 100 SY  
 STA 25+78 TO 26+06 (CENTURY AVE) 31 SY  
 STA 20+89 TO 22+52 (19TH ST SOUTH) 161 SY  
 STA 23+61 TO 23+80 (19TH ST NORTH) 13 SY  
 NW QUAD. SIDEWALK 91 SY  
 SW QUAD. SIDEWALK 74 SY  
 TOTAL 470 SY

202 0130 REMOVAL OF CURB & GUTTER  
 STA 25+69 TO 25+92 (LT OF CENTURY MDN) 23 LF  
 STA 22+56 TO 25+92 (RT OF CENTURY MDN) 336 LF  
 STA 21+48 TO 22+40 (LT OF 19TH MDN) 92 LF  
 STA 21+48 TO 22+40 (RT OF 19TH MDN) 92 LF  
 NW QUAD. 82 LF  
 SW QUAD. 70 LF  
 TOTAL 695 LF

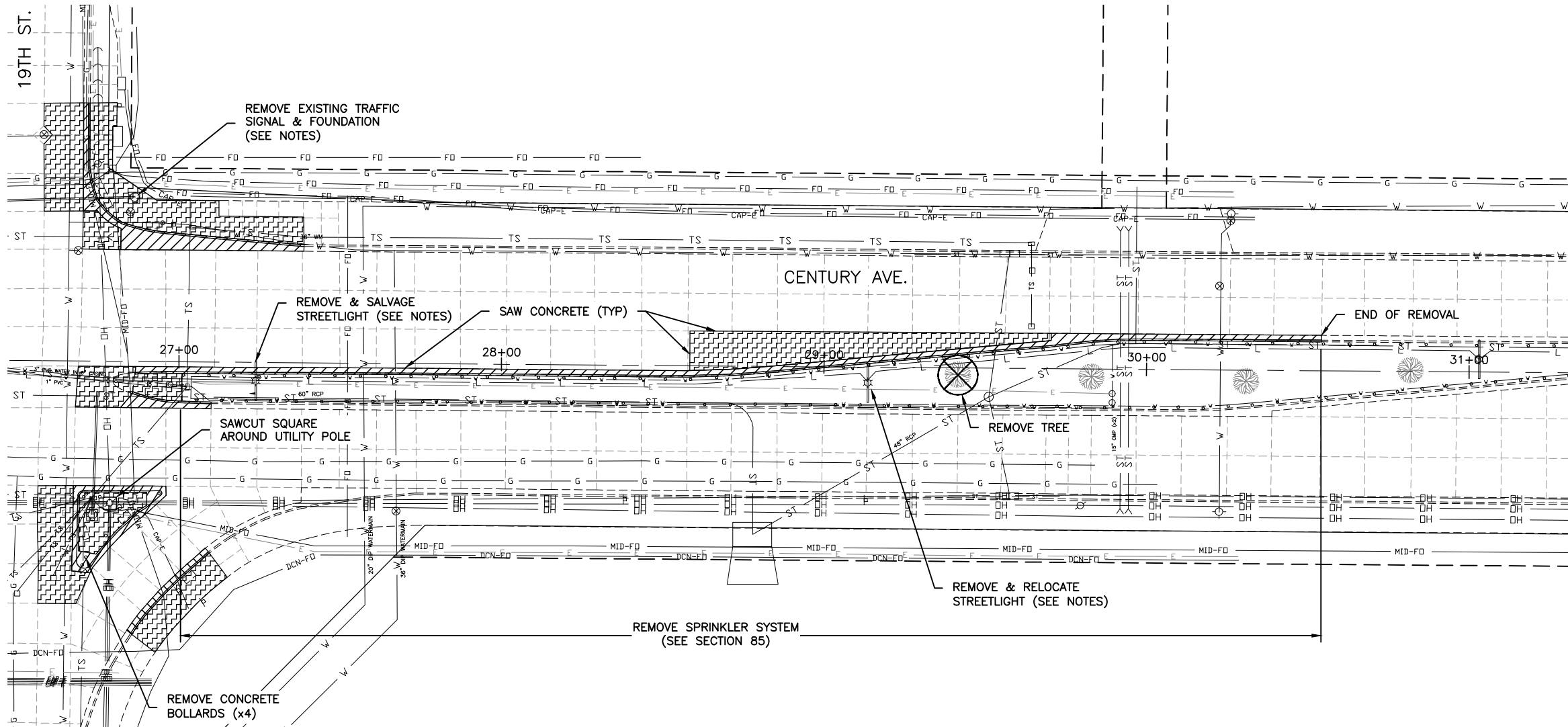
HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

**\*CAUTION\***  
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**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 REMOVALS  
 STA 22+70 - 26+50

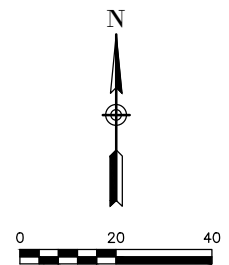
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	40	2



- NOTES:
1. INCLUDE REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM AND RELATED EQUIPMENT AS PART OF SIGNAL WORK (SEE SECTION 150).
  2. REMOVE EXISTING STREETLIGHT FOUNDATION. REMOVE & SALVAGE/RELOCATE STREETLIGHT (SEE SECTION 140).

**LEGEND**

	REMOVAL OF CONCRETE
	REMOVAL OF CURB & GUTTER
	REMOVAL OF TREE



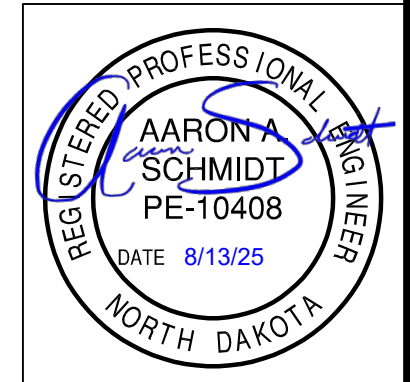
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201 0352 REMOVAL OF TREES & BRUSH  
 STA 29+42 (MEDIAN x1) 0.5 L SUM

<u>202 0114 REMOVAL OF CONCRETE PAVEMENT</u>	
STA 26+68 TO 27+01 (CENTURY AVE)	37 SY
STA 28+58 TO 29+71 (CENTURY AVE)	96 SY
SE ISLAND (PVMT)	48 SY
SE ISLAND (INTERIOR)	28 SY
NE QUAD. (PVMT)	58 SY
NE QUAD. (SIDEWALK)	88 SY
SE QUAD. (SIDEWALK)	34 SY
TOTAL	389 SY

<u>202 0130 REMOVAL OF CURB &amp; GUTTER</u>	
STA 26+86 TO 30+54 (LT OF CENTURY MDN)	396 LF
STA 26+82 TO 27+10 (RT OF CENTURY MDN)	18 LF
SE ISLAND (PERIMETER)	85 LF
NE QUAD.	114 LF
SE QUAD.	35 LF
TOTAL	648 LF

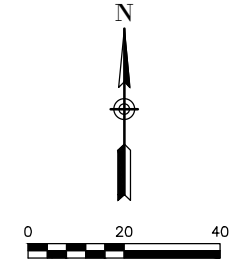


**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 REMOVALS  
 STA 26+50 - 30+40

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	77	1

NOTES:



1. INCLUDE ALL COSTS FOR SEEDING AND MULCHING IN THE PRICE BID FOR "TRAFFIC SIGNAL SYSTEM - SITE 1".

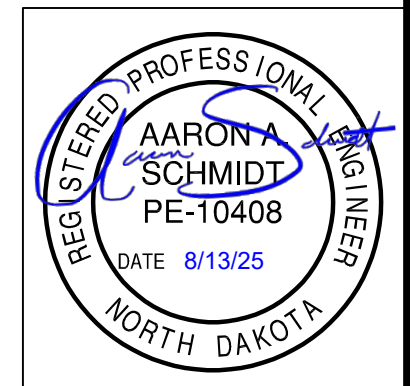



HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

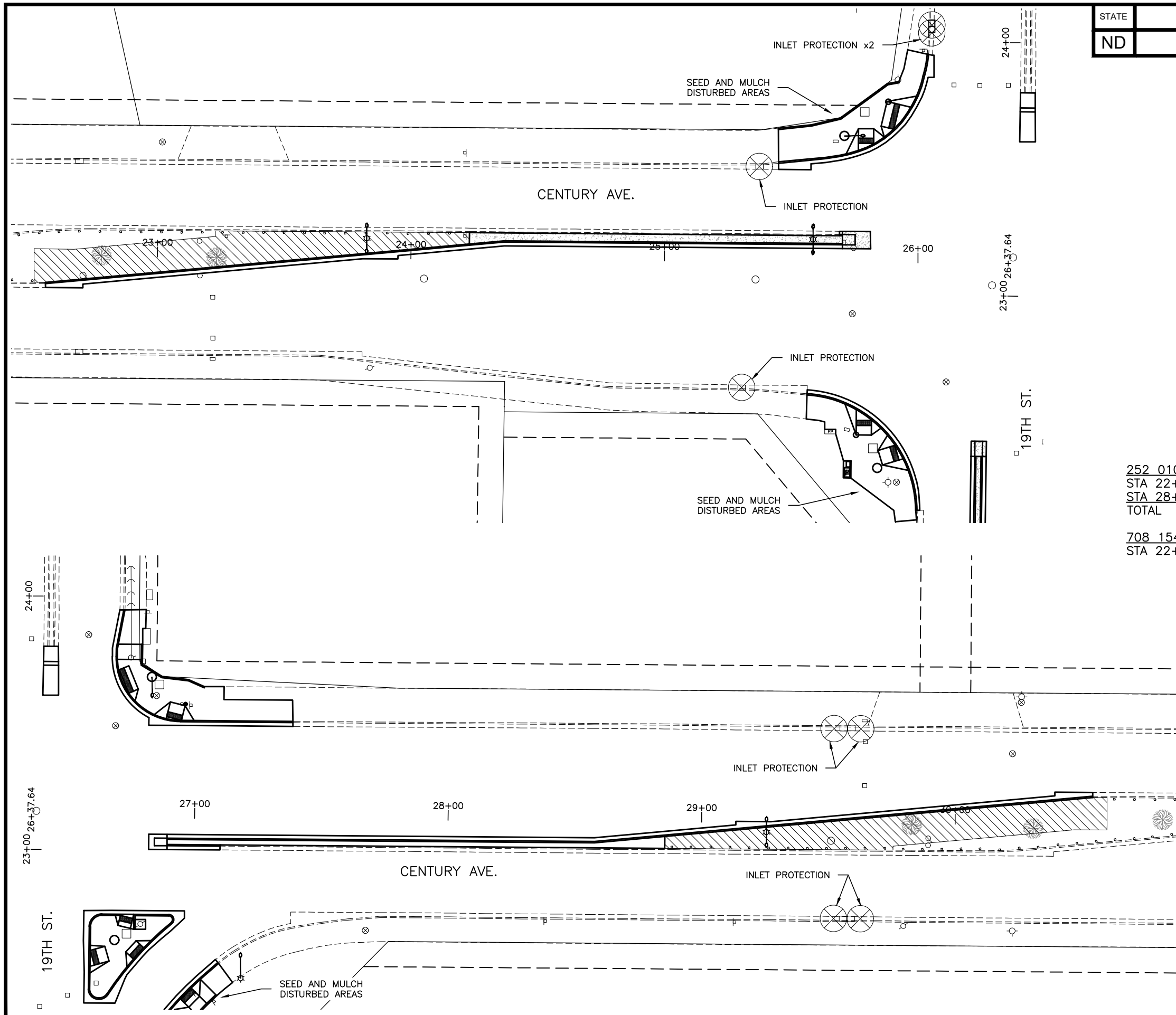
**\*CAUTION\***  
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252 0100 SOD	
STA 22+52 TO 24+23	202 SY
STA 28+86 TO 30+60	206 SY
<b>TOTAL</b>	<b>408 SY</b>
708 1540 INLET PROTECTION-SPECIAL	
STA 22+60 TO 30+50	8 EA

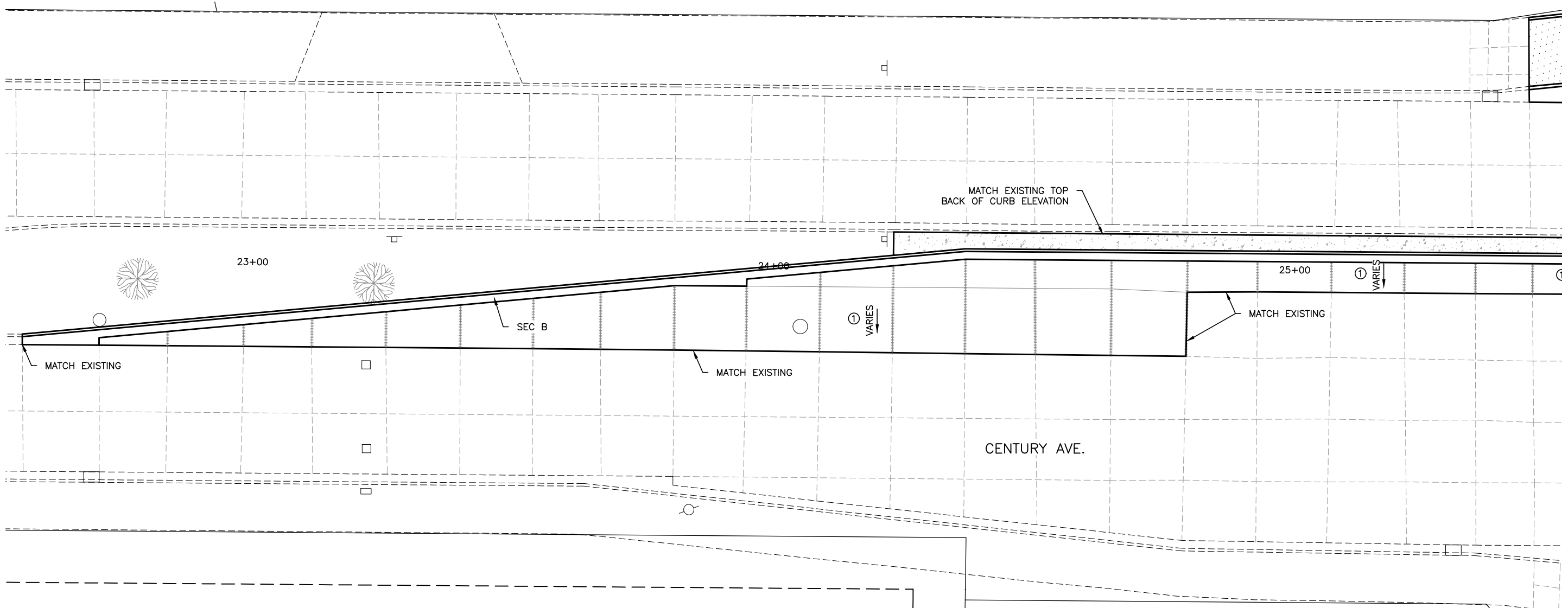
-  SOD
-  INLET PROTECTION




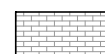

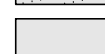



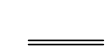
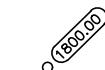
  
**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 EROSION CONTROL



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ND	HEU-1-981(134)	23645	80	1



**LEGEND**

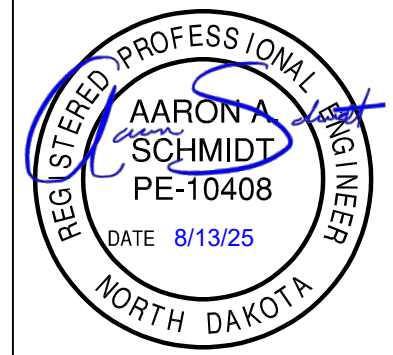
-  CONCRETE PAVEMENT 8IN
-  PIGMENTED IMPRINTED CONCRETE 6IN
-  SIDEWALK CONCRETE 4IN
-  SIDEWALK CONCRETE 6IN
-  CONCRETE MEDIAN NOSE PAVING
-  CONCRETE MEDIAN PAVEMENT
-  DETECTABLE WARNING PANEL
-  CURB AND GUTTER
-  FINISHED CONCRETE ELEVATION

① MATCH EXISTING ADJACENT CONCRETE PANEL CROSS SLOPE

N  
↑  
0 10 20

HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

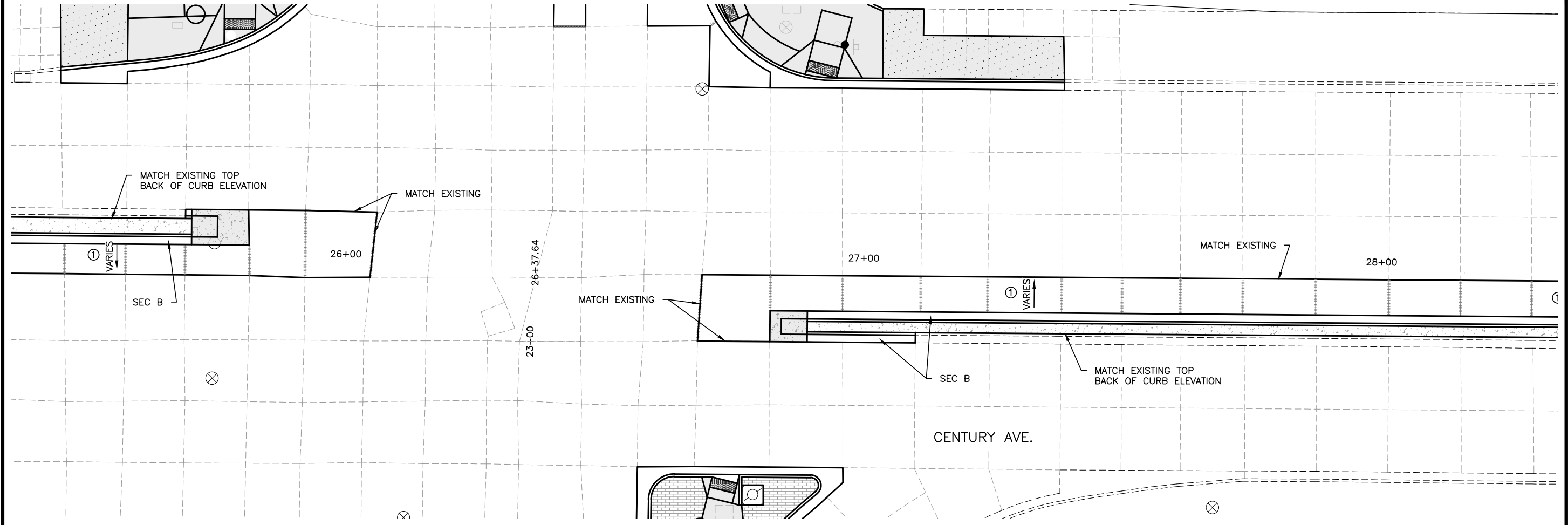
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**CENTURY AVENUE**

TURNING LANE LAYOUTS  
STA 22+70 - 25+50

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ND	HEU-1-981(134)	23645	80	2

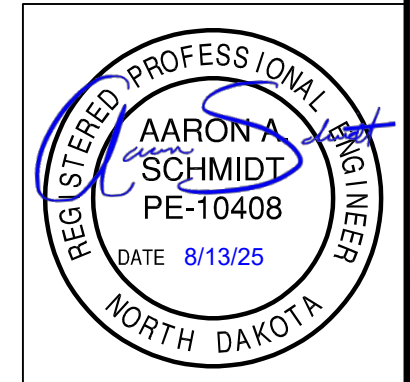


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↑  
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- LEGEND**
- CONCRETE PAVEMENT 8IN
  - PIGMENTED IMPRINTED CONCRETE 6IN
  - SIDEWALK CONCRETE 4IN
  - SIDEWALK CONCRETE 6IN
  - CONCRETE MEDIAN NOSE PAVING
  - CONCRETE MEDIAN PAVEMENT
  - DETECTABLE WARNING PANEL
  - CURB AND GUTTER
  - FINISHED CONCRETE ELEVATION
- ① MATCH EXISTING ADJACENT CONCRETE PANEL CROSS SLOPE

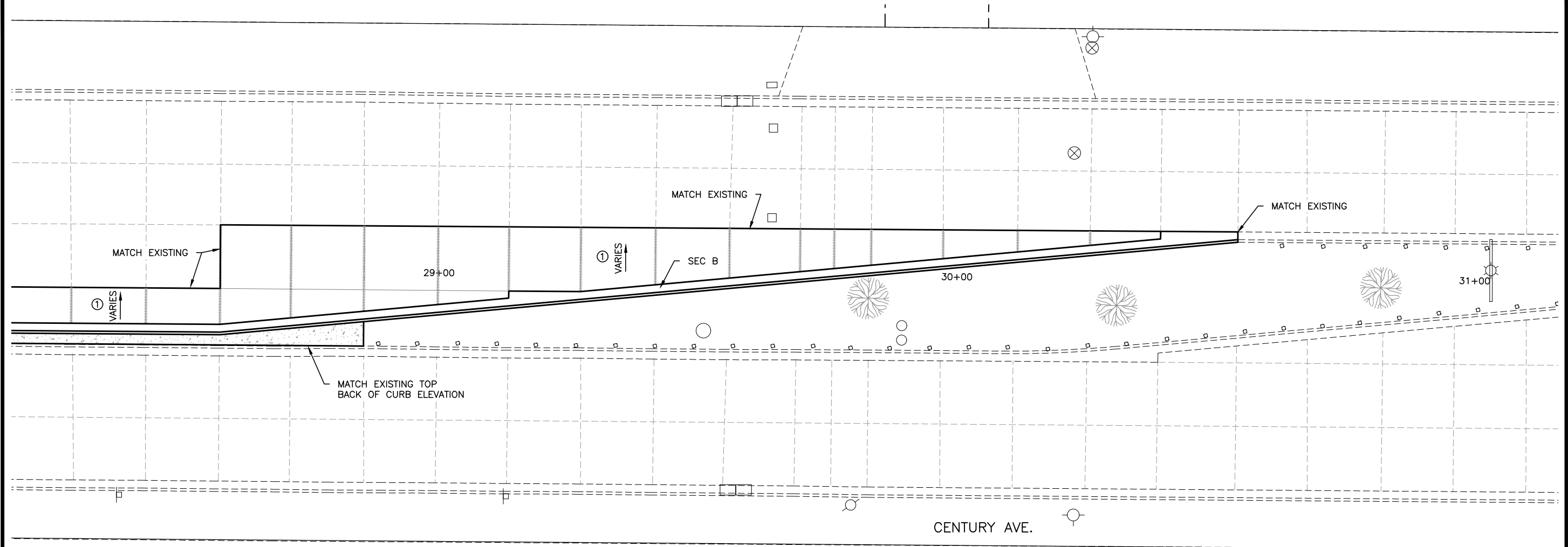


**Bismarck**  
ENGINEERING

**CENTURY AVENUE**

TURNING LANE LAYOUTS  
STA 25+50 - 28+30










STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	80	3

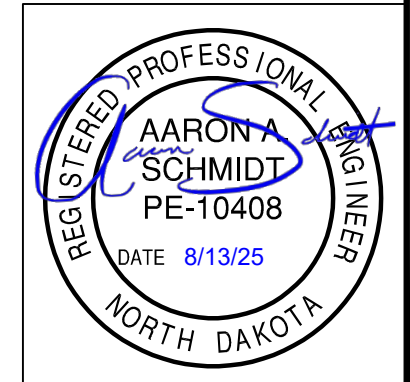


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0 10 20

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- LEGEND**
-  CONCRETE PAVEMENT 8IN
  -  PIGMENTED IMPRINTED CONCRETE 6IN
  -  SIDEWALK CONCRETE 4IN
  -  SIDEWALK CONCRETE 6IN
  -  CONCRETE MEDIAN NOSE PAVING
  -  CONCRETE MEDIAN PAVEMENT
  -  DETECTABLE WARNING PANEL
  -  CURB AND GUTTER
  -  FINISHED CONCRETE ELEVATION
- ① MATCH EXISTING ADJACENT CONCRETE PANEL CROSS SLOPE



**Bismarck**  
ENGINEERING

**CENTURY AVENUE**

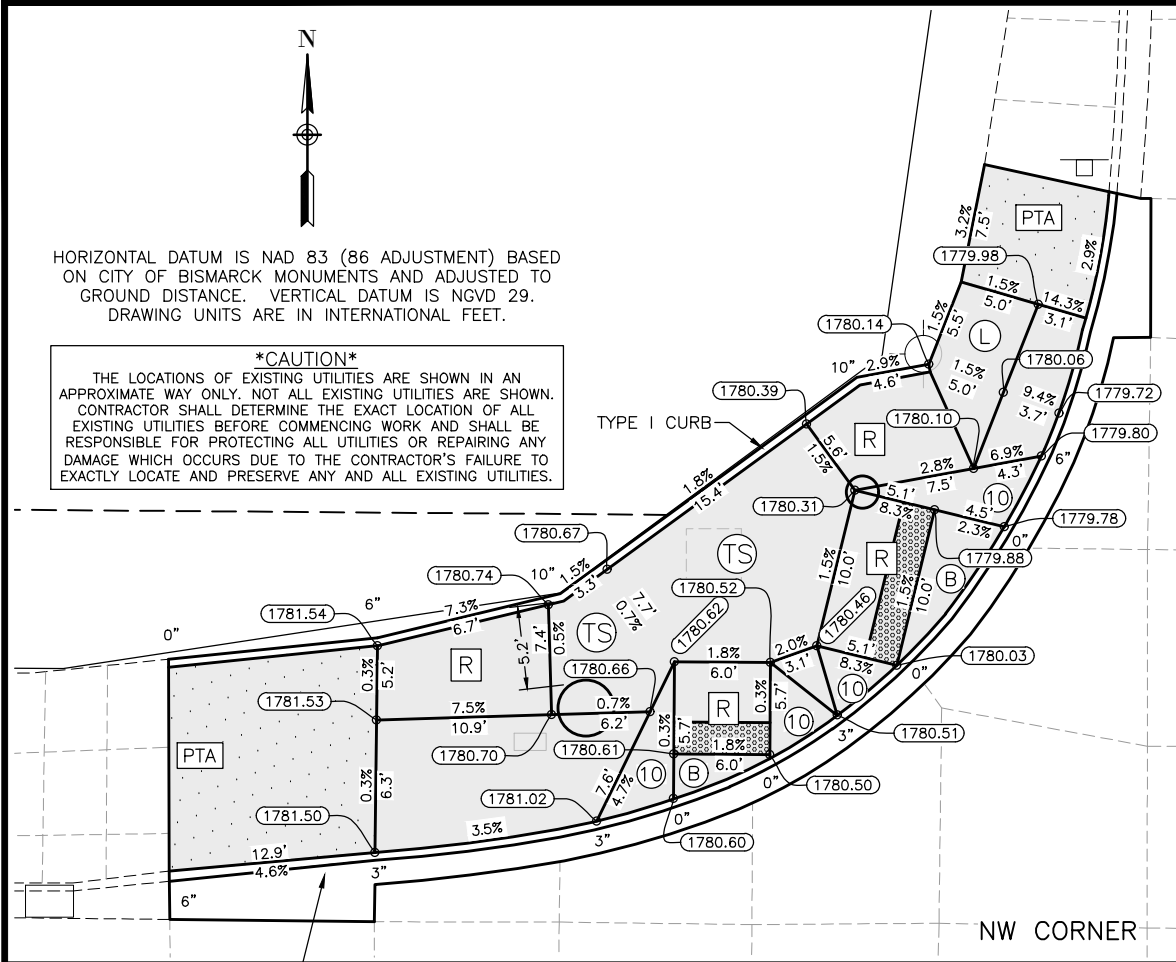
TURNING LANE LAYOUTS  
STA 28+30 - 30+40

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	80	4

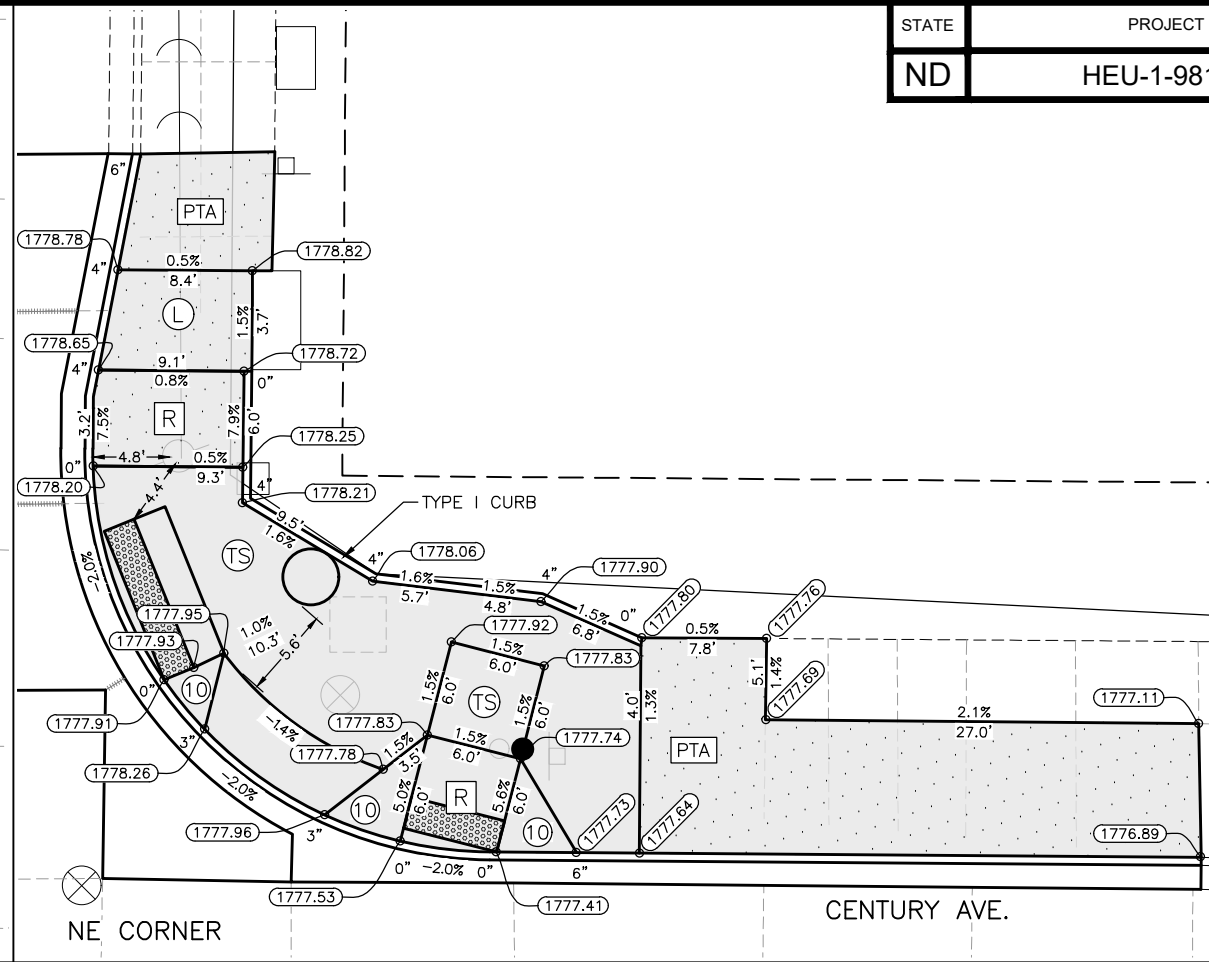


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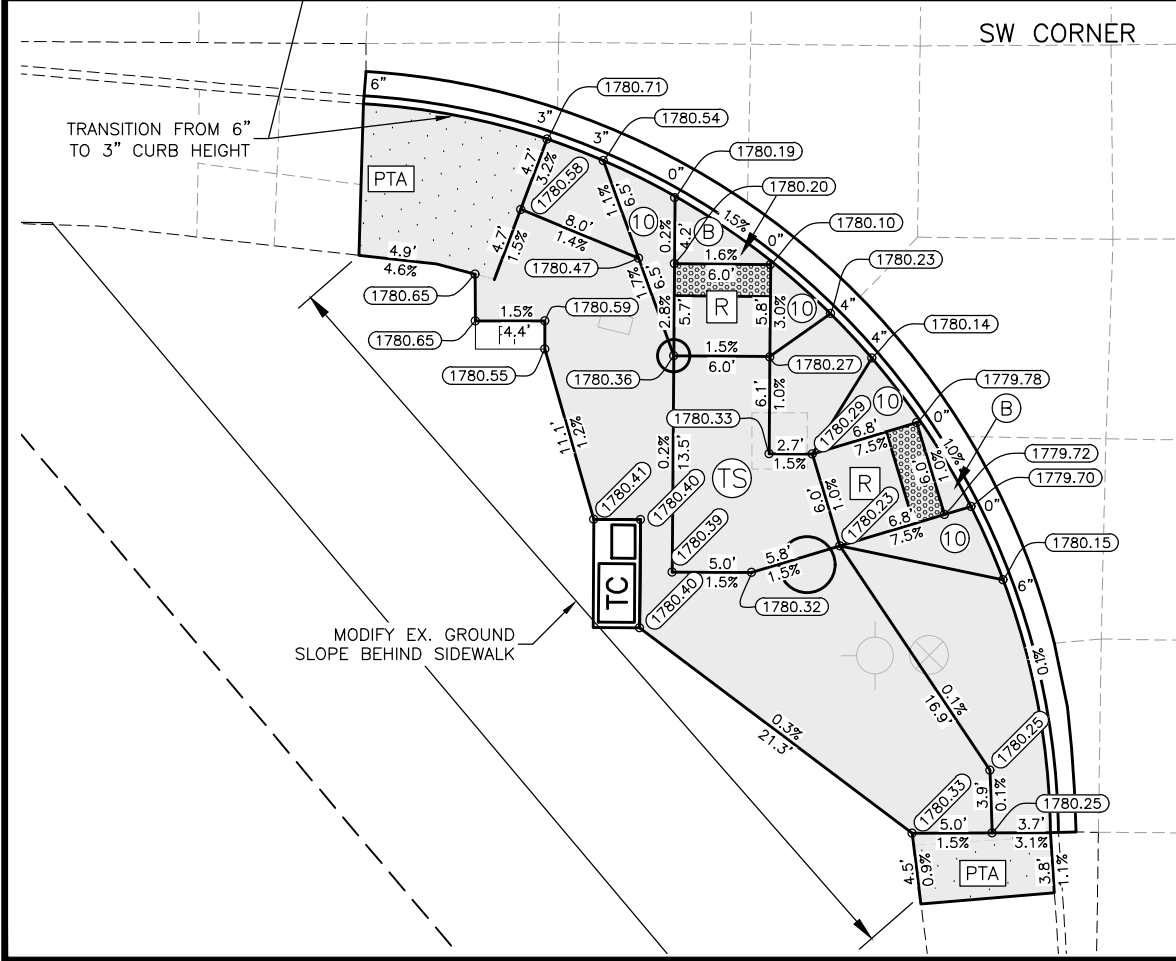


NW CORNER



NE CORNER

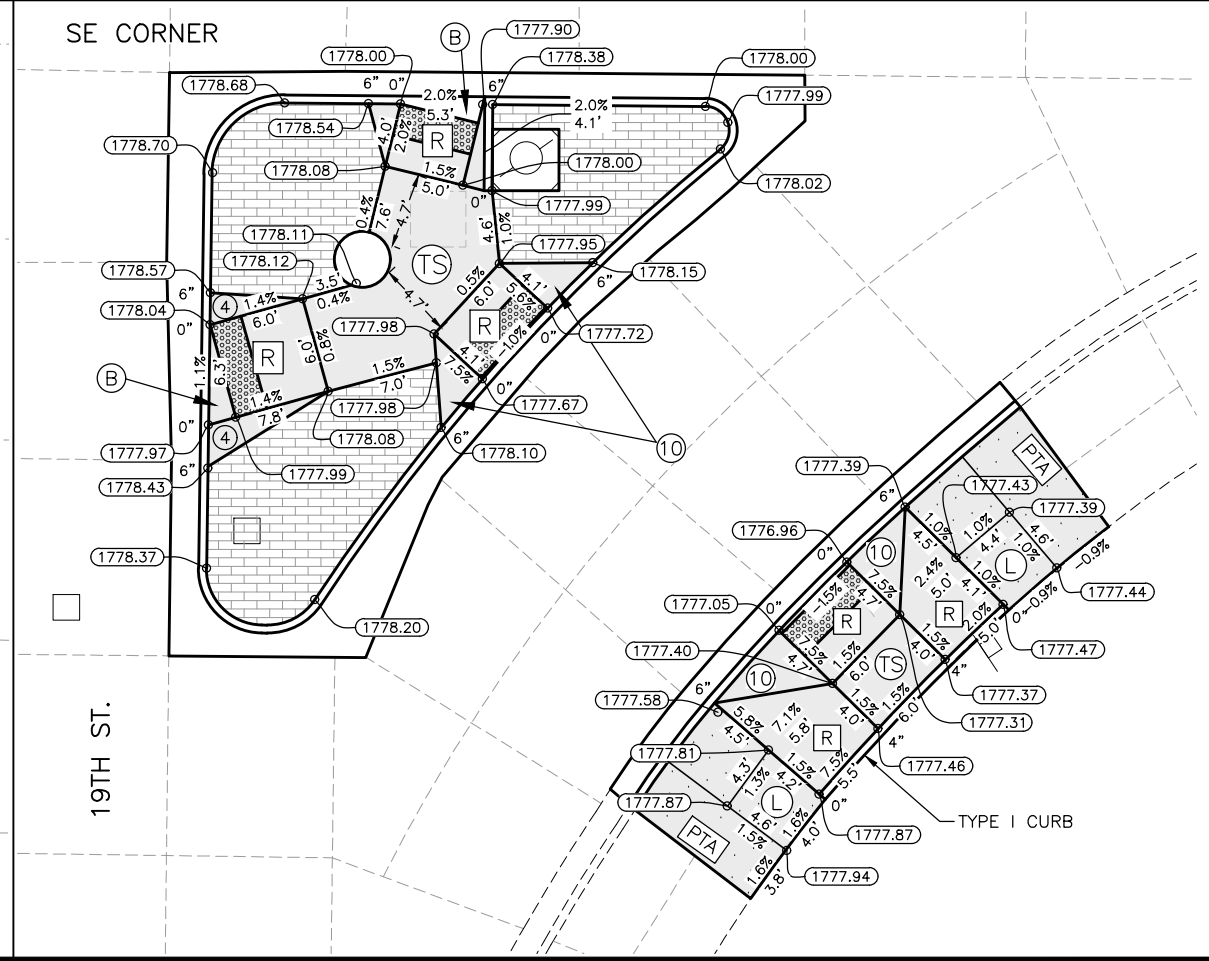
CENTURY AVE.



SW CORNER

TRANSITION FROM 6" TO 3" CURB HEIGHT

MODIFY EX. GROUND SLOPE BEHIND SIDEWALK



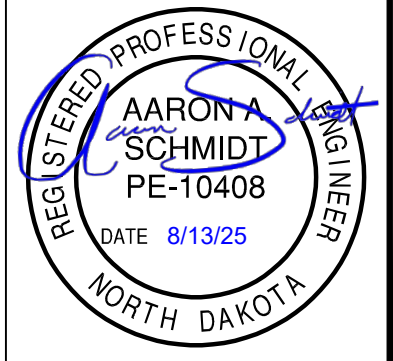
SE CORNER

19TH ST.

TYPE I CURB

**LEGEND**

- CONCRETE PAVEMENT 8IN
- PIGMENTED IMPRINTED CONCRETE 6IN
- SIDEWALK CONCRETE 4IN
- SIDEWALK CONCRETE 6IN
- DETECTABLE WARNING PANEL
- CURB AND GUTTER
- TURNING SPACE/LANDING
- 10:1 MAXIMUM SLOPE
- 4:1 MAXIMUM SLOPE
- 1.5% PREFERRED CROSS SLOPE  
2% MAX. CONSTRUCTED CROSS SLOPE RUNNING SLOPE CONSISTENT W/ EPF  
4.7% PREFERRED MAX COUNTER SLOPE  
5% MAX CONSTRUCTED COUNTER SLOPE
- PEDESTRIAN ACCESS TRANSITION AREA  
RUNNING SLOPE LESS THAN 4.9%  
TRANSITION CROSS SECTION AT 1/2 PERCENT PER FOOT FROM THE RAMP TO EXISTING PEDESTRIAN FACILITY
- PREFERRED RAMP GRADE 5% - 7.5%  
MAXIMUM RAMP GRADE 8.3%  
PREFERRED CROSS SLOPE 1.5%  
MAXIMUM CROSS SLOPE 2%  
MAXIMUM LENGTH 15'
- 0", 3", 4", 6" CURB/CONCRETE HEIGHT
- FINISHED CONCRETE ELEVATION



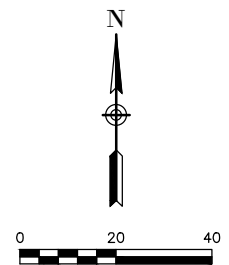
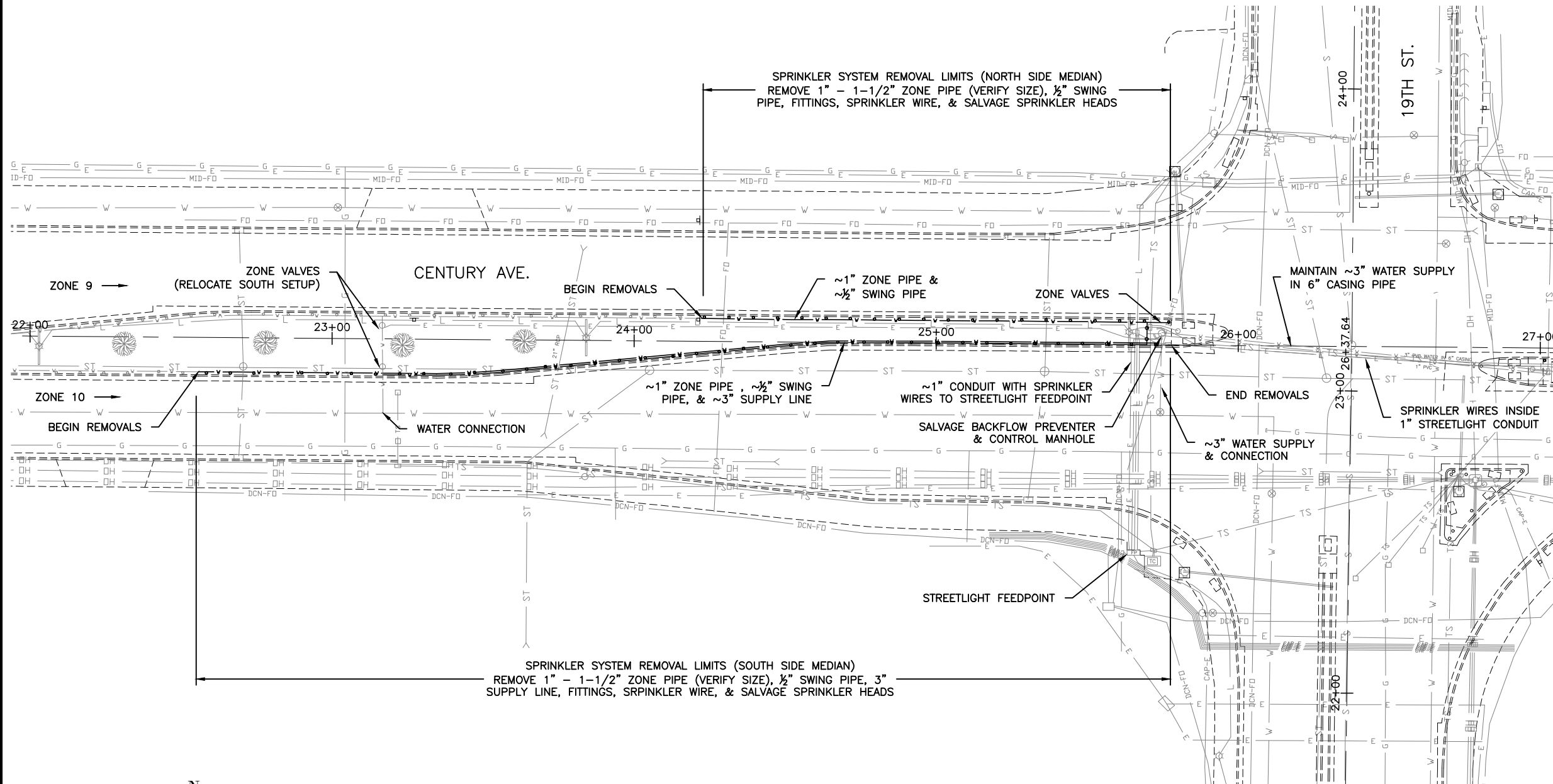
CENTURY AVENUE

CURB RAMP LAYOUTS

STA 22+70 - 30+40

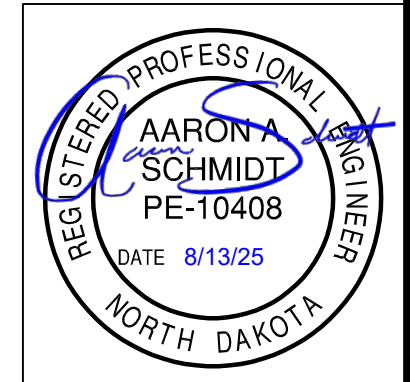


STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	85	1



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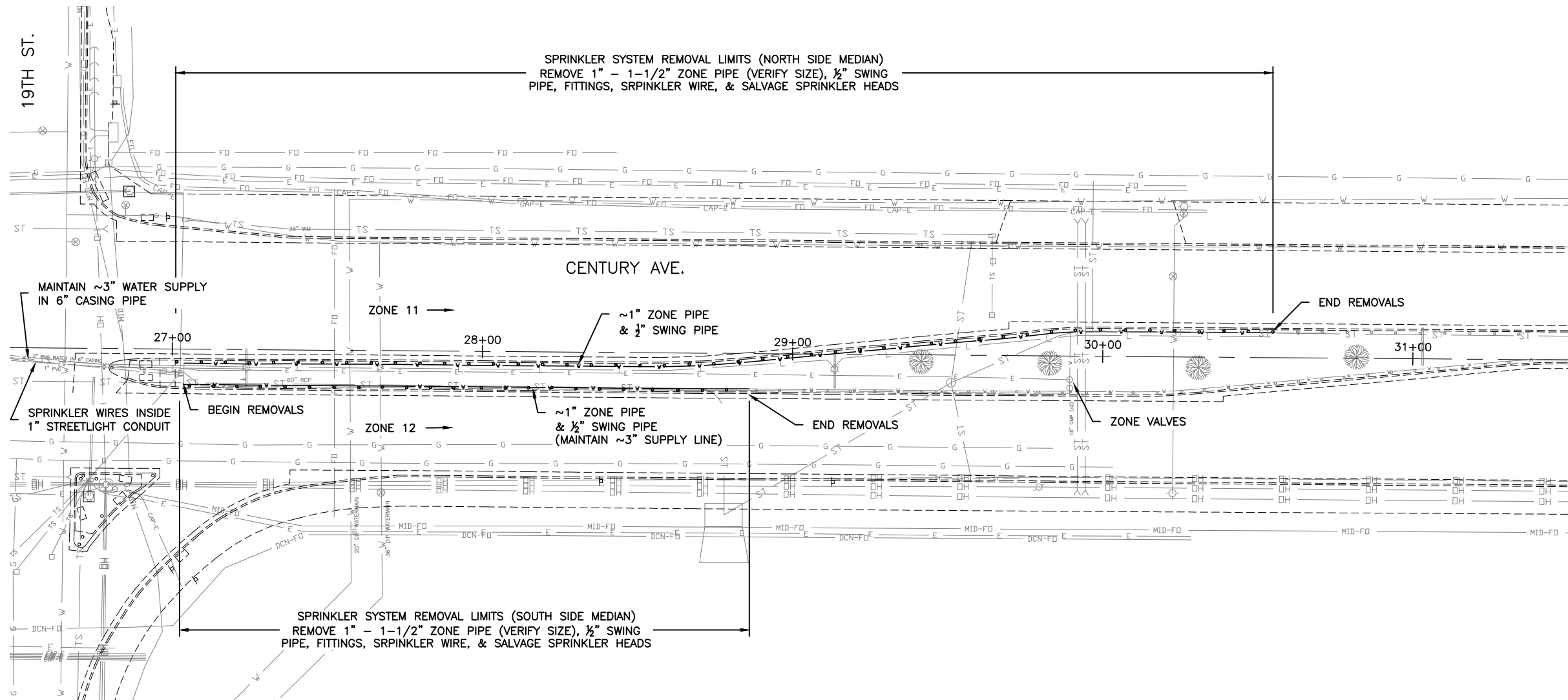


**Bismarck ENGINEERING**

**CENTURY AVENUE**

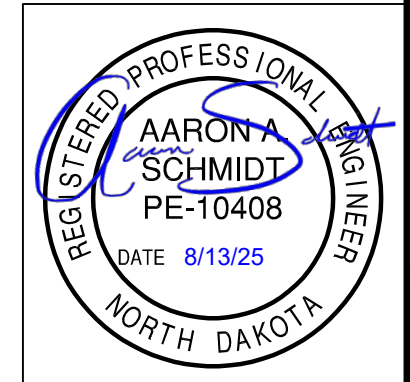
LANDSCAPING  
IRRIGATION REMOVALS  
STA 22+00 - 26+50

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	85	2



HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

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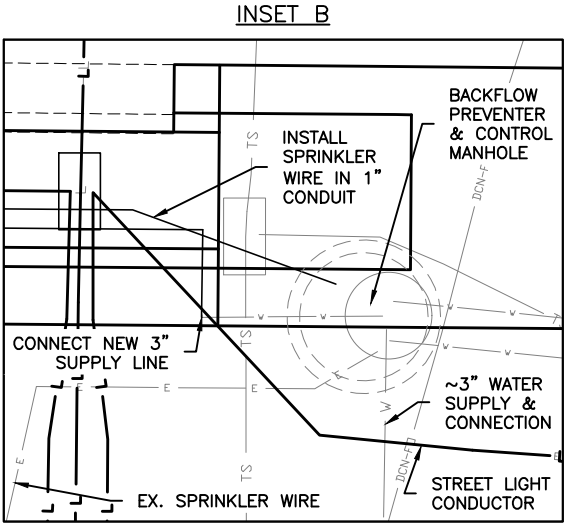
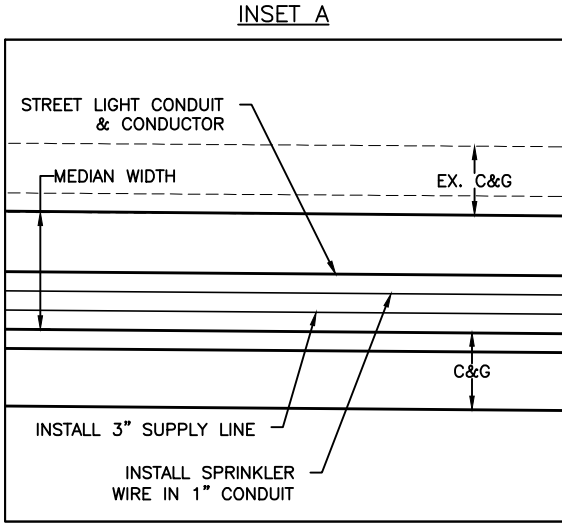
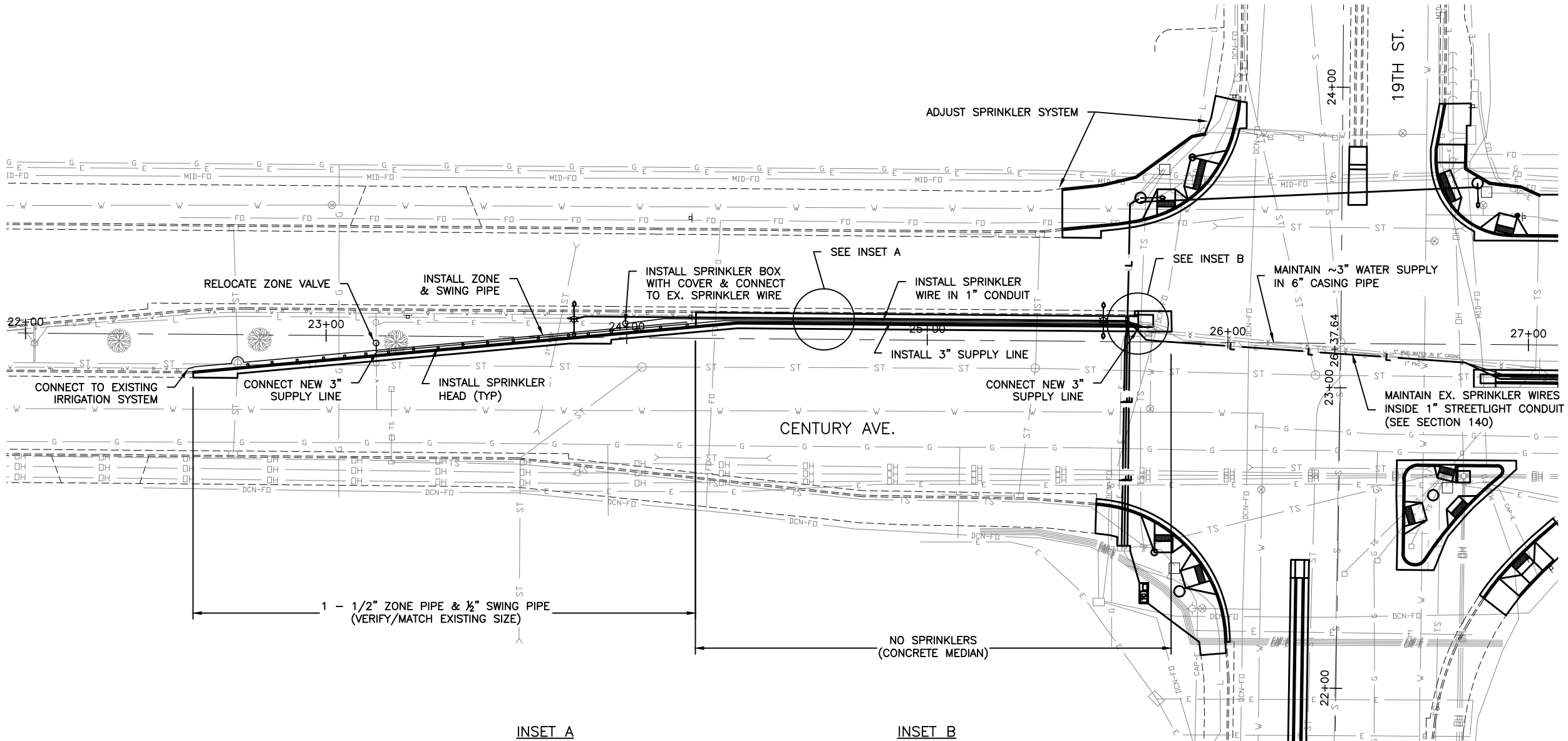


**Bismarck**  
ENGINEERING

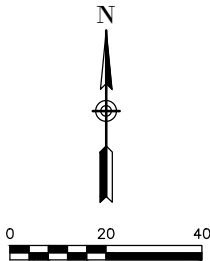
**CENTURY AVENUE**

LANDSCAPING  
IRRIGATION REMOVALS  
STA 26+50 - 31+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	85	3

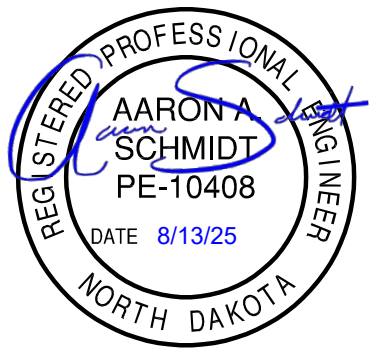


722 6241 ADJUST SPRINKLER SYSTEM  
Sta 22+70 to 26+50 0.50 L SUM



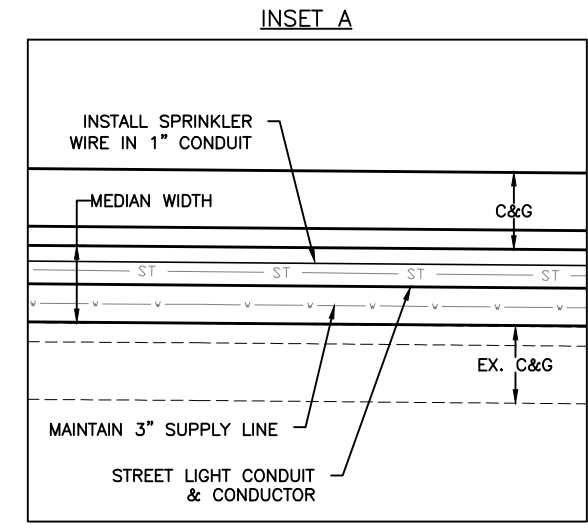
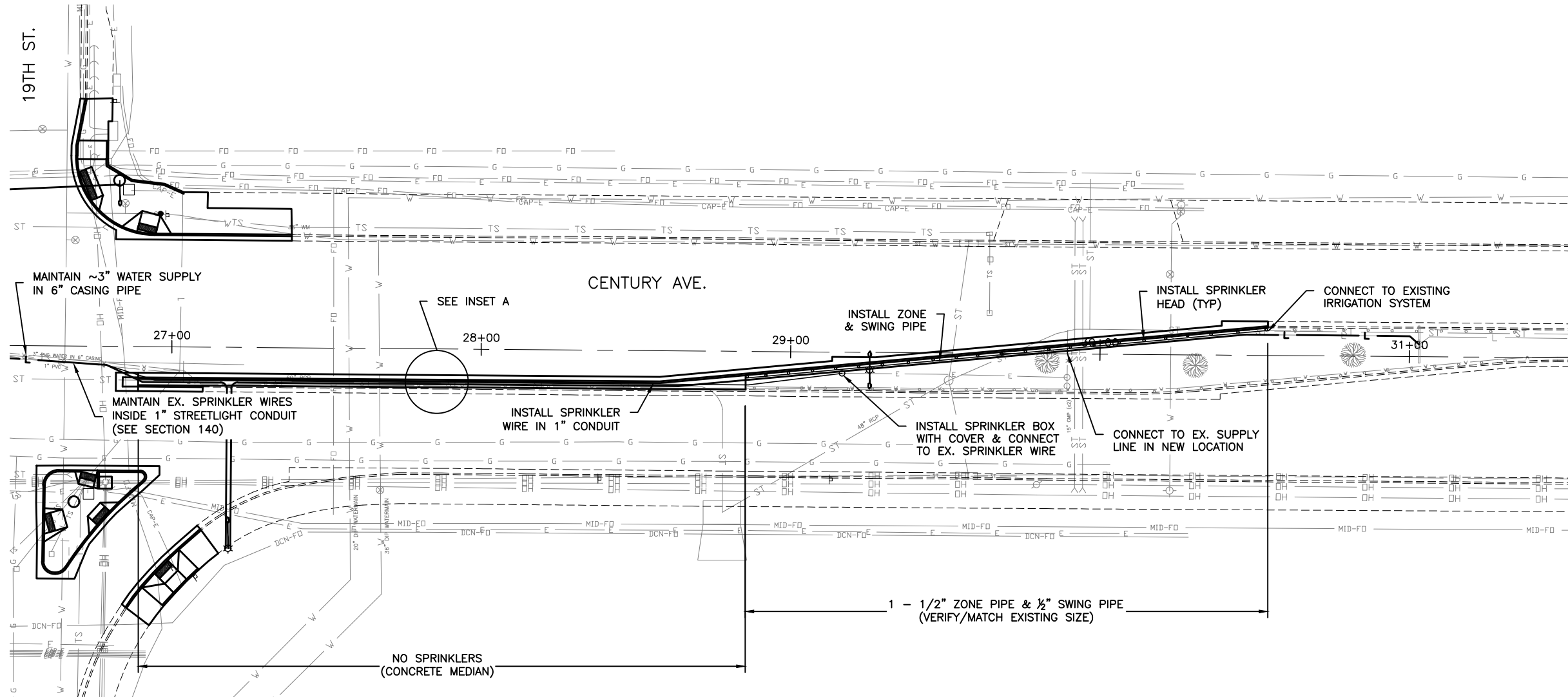
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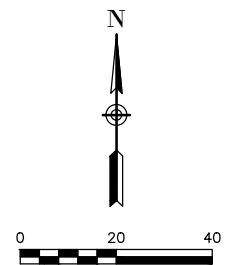


**Bismarck ENGINEERING**  
CENTURY AVENUE  
LANDSCAPING  
PROPOSED IRRIGATION LAYOUT  
STA 22+00 - 26+50

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	85	4

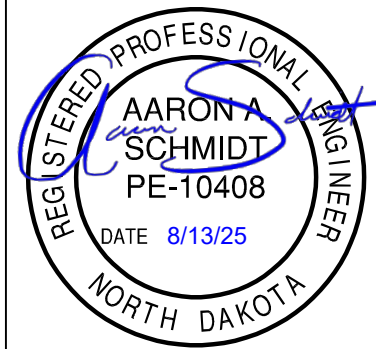


722 6241 ADJUST SPRINKLER SYSTEM  
Sta 26+50 to 30+40 0.50 L SUM



HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

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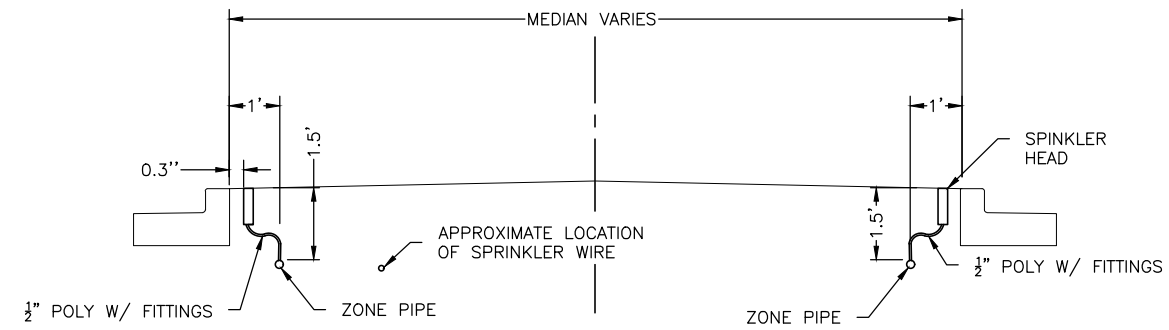


**Bismarck**  
ENGINEERING

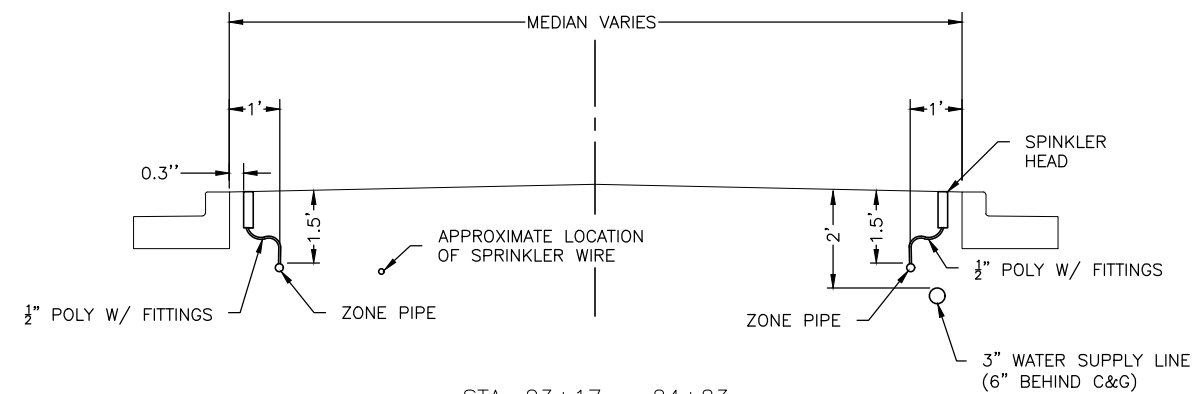
**CENTURY AVENUE**

LANDSCAPING  
PROPOSED IRRIGATION LAYOUT  
STA 26+50 - 31+00

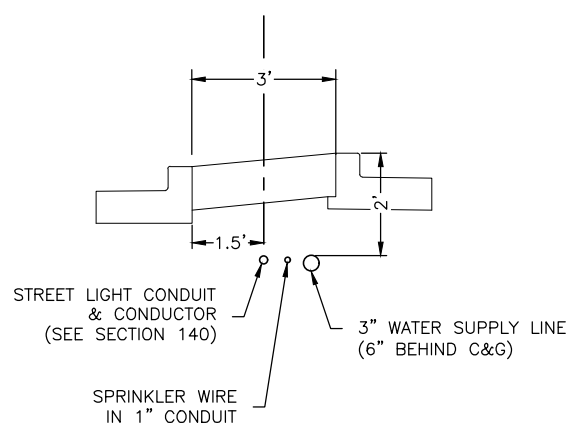
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	85	5



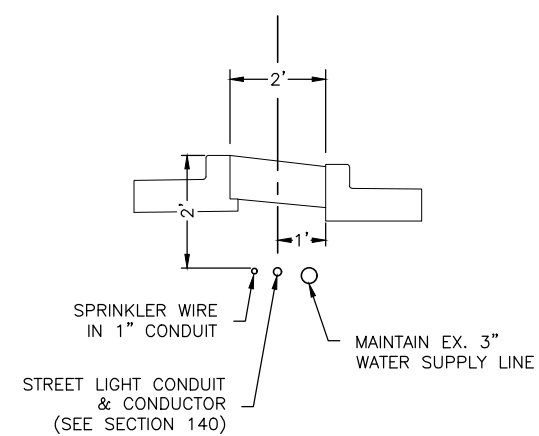
STA. 22+56 - 23+17  
 STA. 29+90 - 30+54



STA. 23+17 - 24+23  
 STA. 28+86 - 29+90

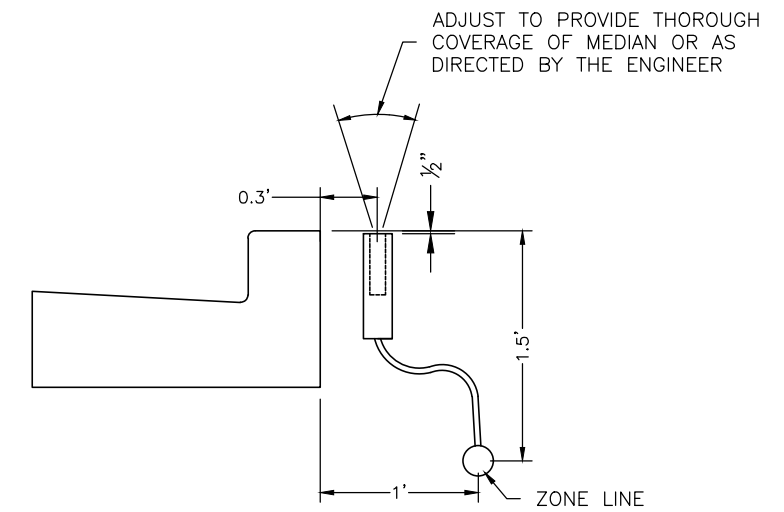


STA. 24+23 - 25+75

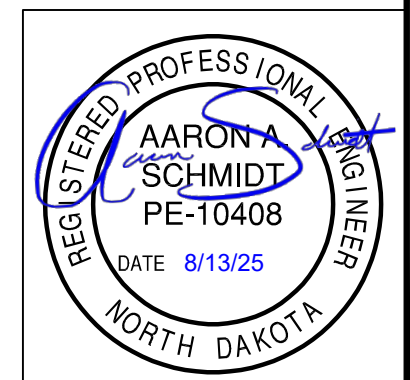


STA. 26+91 - 28+86

CENTURY AVENUE  
 MEDIAN IRRIGATION SYSTEM LAYOUTS  
 (NOT TO SCALE)



SPRINKLER HEAD ADJUSTMENT

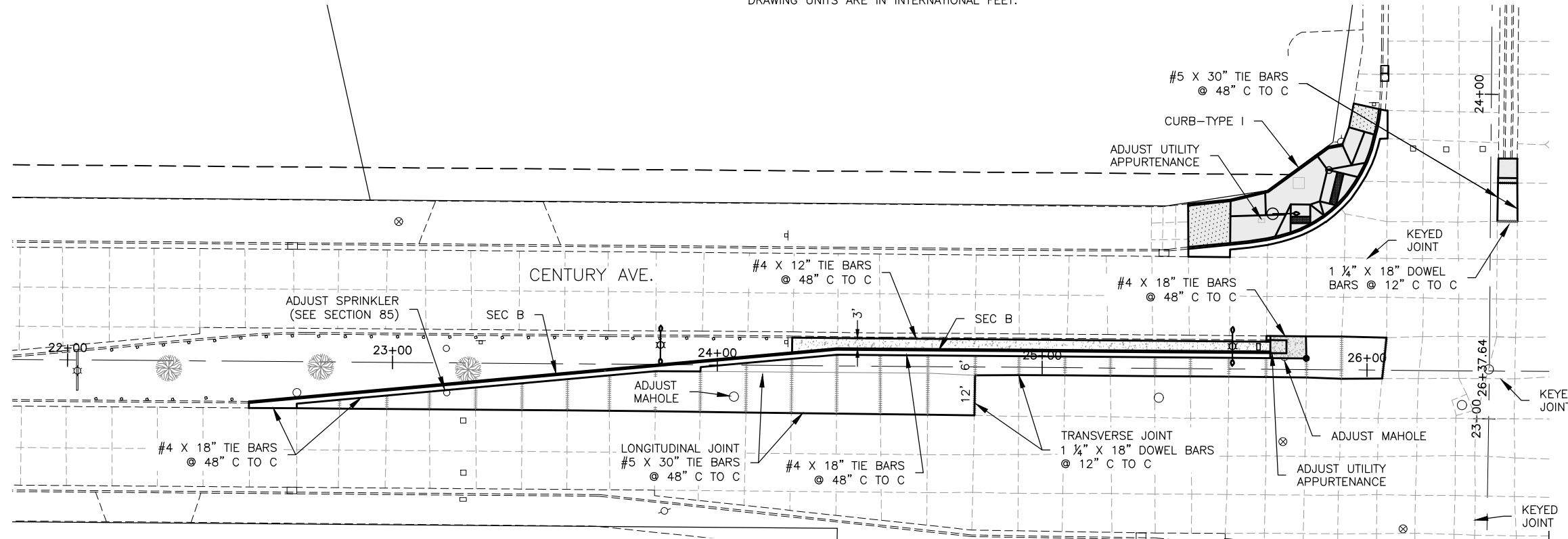


CENTURY AVENUE

LANDSCAPING  
 IRRIGATION SYSTEM DETAILS

HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	90	1



- NOTES:
1. MATCH EXISTING PAVEMENT DEPTH (MINIMUM 8").
  2. MATCH EXISTING JOINT SPACING.
  3. SEE SECTION 80 FOR CURB RAMP DETAILS.
  4. FOR MEDIAN ISLAND AND NOSE: SEE TYPICAL SECTIONS AND DETAILS FOR MORE INFORMATION.

LEGEND

	CONCRETE PAVEMENT 8IN
	PIGMENTED IMPRINTED CONCRETE 6IN
	SIDEWALK CONCRETE 4IN
	SIDEWALK CONCRETE 6IN
	CONCRETE MEDIAN NOSE PAVING
	CONCRETE MEDIAN PAVING
	DETECTABLE WARNING PANEL
	CURB AND GUTTER
	2" DIA CORE HOLE

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<u>302 0120 AGGREGATE BASE COURSE CL 5</u>	
STA 22+56 TO 26+06 (CENTURY PVMT/C&G)	575 TON
STA 24+23 TO 25+70 (CENTURY MDN)	64 TON
STA 25+70 TO 25+81 (CENTURY NOSE)	8 TON
STA 20+89 TO 22+52 (19TH PVMT SOUTH)	162 TON
STA 20+95 TO 22+37 (19TH MDN)	40 TON
STA 20+89 TO 22+43 (19TH NOSE SOUTH X2)	6 TON
STA 23+61 TO 23+80 (19TH PVMT & MDN N.)	16 TON
NW QUAD.	26 TON
SW QUAD.	24 TON
TOTAL	921 TON

<u>748 0140 CURB &amp; GUTTER-TYPE I</u>	
STA 22+56 TO 25+70 (RT OF CENTURY MDN)	315 LF
STA 25+69 TO 25+70 (LT OF CENTURY MDN)	1 LF
STA 20+95 TO 22+37 (RT OF 19TH MDN)	142 LF
STA 20+95 TO 22+37 (LT OF 19TH MDN)	142 LF
NW QUAD.	82 LF
SW QUAD.	70 LF
TOTAL	752 LF

<u>550 0300 8IN NON-REIN CONC PVMT CL AE-DOWELED</u>	
STA 22+71 TO 26+05 (CENTURY)	369 SY
STA 21+01 TO 22+52 (19TH SOUTH)	94 SY
STA 23+61 TO 23+73 (19TH NORTH)	8 SY
TOTAL	471 SY

<u>748 0520 CURB-TYPE I</u>	
NW QUAD.	53 LF

<u>709 0151 GEOSYNTHETIC MATERIAL TYPE R1</u>	
STA 22+71 TO 26+05 (CENTURY)	520 SY
STA 20+89 TO 22+52 (19TH SOUTH)	94 SY
STA 23+61 TO 23+80 (19TH NORTH)	8 SY
TOTAL	622 SY

<u>750 0115 SIDEWALK CONCRETE 4IN</u>	
NW QUAD.	26 SY
SW QUAD.	15 SY
TOTAL	41 SY

<u>722 6140 ADJUST GATE VALVE BOX</u>	
STA 25+92 (RT)	1 EA

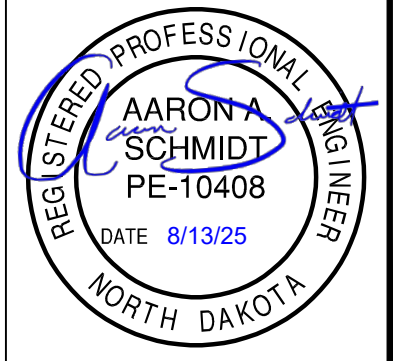
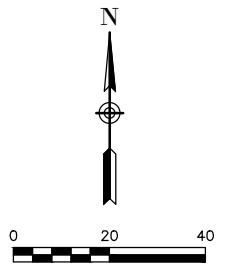
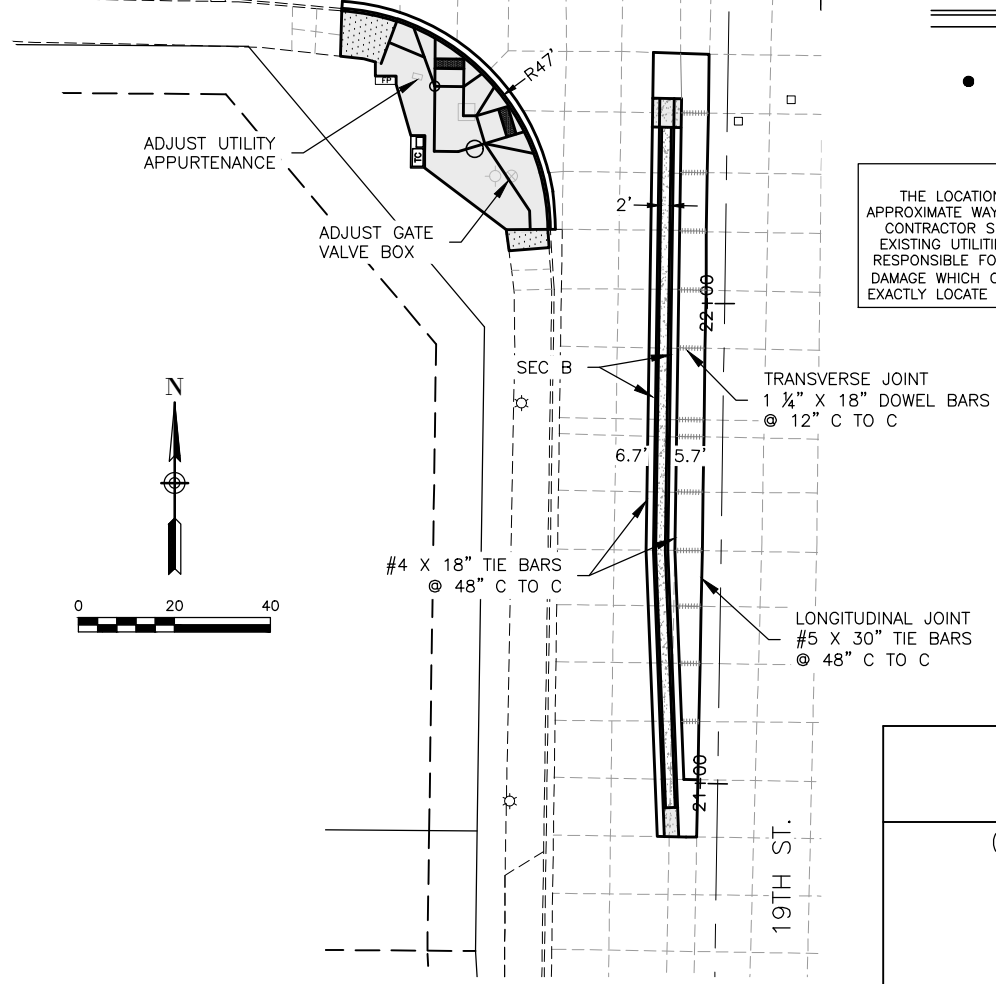
<u>750 0140 SIDEWALK CONCRETE 6IN</u>	
NW QUAD.	77 SY
SW QUAD.	87 SY
TOTAL	164 SY

<u>722 6200 ADJUST MANHOLE</u>	
STA 24+05 (RT)	1 EA
STA 25+75 (LT)	1 EA

<u>750 0200 CONCRETE MEDIAN PAVING</u>	
STA 24+23 TO 25+70 (CENTURY)	51 SY
STA 20+95 TO 22+37 (19TH)	32 SY
TOTAL	83 SY

<u>722 6240 ADJUST UTILITY APPURTENANCE</u>	
STA 25+67 (LT)	1 EA
STA 25+73 (RT)	1 EA

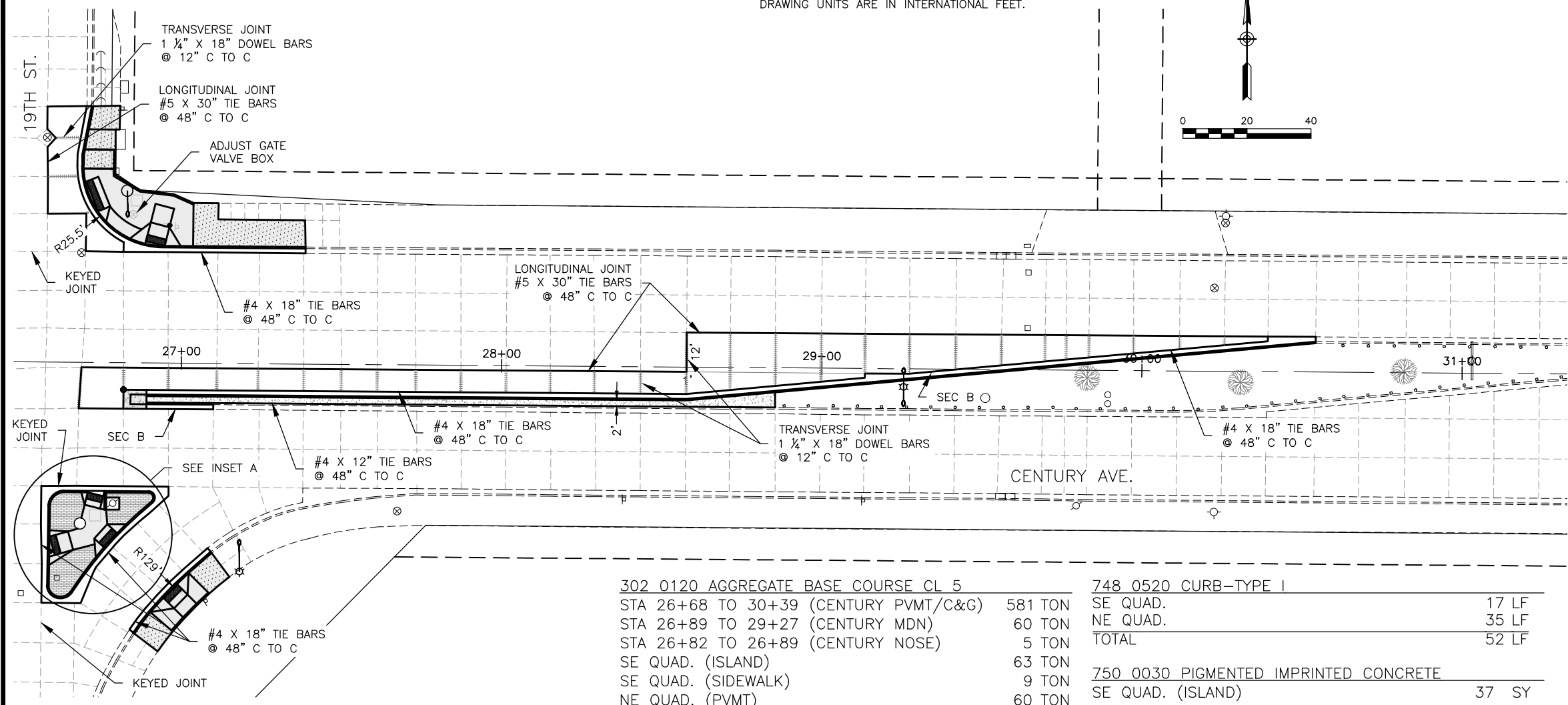
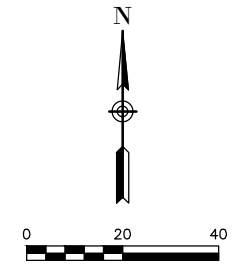
<u>750 0210 CONCRETE MEDIAN NOSE PAVING</u>	
STA 25+70 TO 25+81 (CENTURY)	8 SY
STA 20+89 TO 20+95 (19TH SOUTH)	2 SY
STA 22+37 TO 22+43 (19TH SOUTH)	2 SY
STA 23+73 TO 23+80 (19TH NORTH)	4 SY
TOTAL	16 SY



**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 PAVING LAYOUTS  
 STA 22+00 - 26+50

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	90	2

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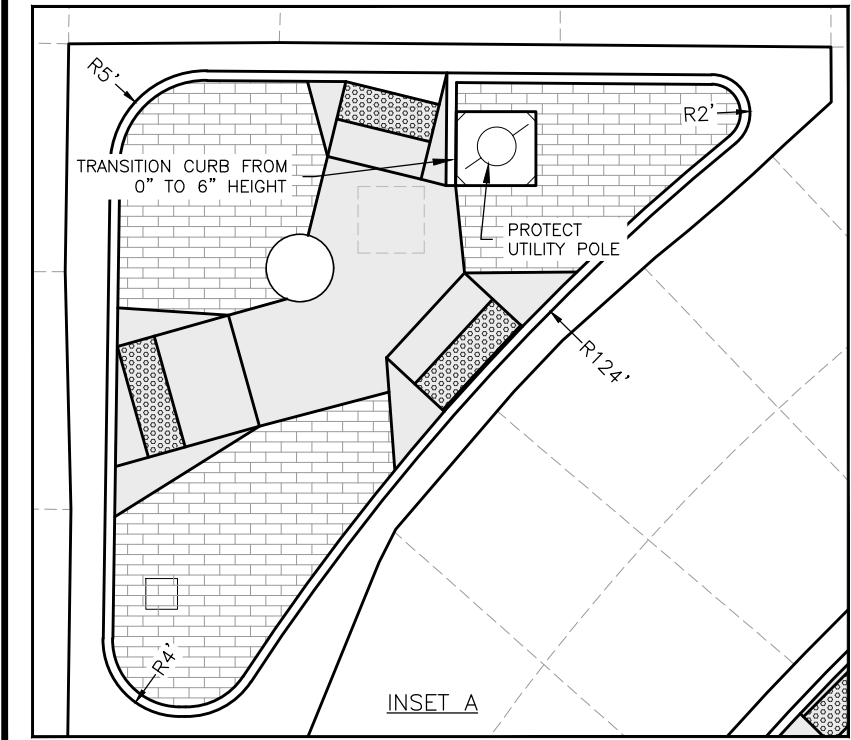


- NOTES:
1. MATCH EXISTING PAVEMENT DEPTH (MINIMUM 8").
  2. MATCH EXISTING JOINT SPACING.
  3. SEE SECTION 80 FOR CURB RAMP DETAILS.
  4. FOR MEDIAN ISLAND AND NOSE: SEE TYPICAL SECTIONS AND DETAILS FOR MORE INFORMATION.

**LEGEND**

	CONCRETE PAVEMENT 8IN
	PIGMENTED IMPRINTED CONCRETE 6IN
	SIDEWALK CONCRETE 4IN
	SIDEWALK CONCRETE 6IN
	CONCRETE MEDIAN NOSE PAVING
	CONCRETE MEDIAN PAVING
	DETECTABLE WARNING PANEL
	CURB AND GUTTER
	2" DIA CORE HOLE

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<u>302 0120 AGGREGATE BASE COURSE CL 5</u>		<u>748 0520 CURB-TYPE I</u>	
STA 26+68 TO 30+39 (CENTURY PVMT/C&G)	581 TON	SE QUAD.	17 LF
STA 26+89 TO 29+27 (CENTURY MDN)	60 TON	NE QUAD.	35 LF
STA 26+82 TO 26+89 (CENTURY NOSE)	5 TON	TOTAL	52 LF
SE QUAD. (ISLAND)	63 TON		
SE QUAD. (SIDEWALK)	9 TON	<u>750 0030 PIGMENTED IMPRINTED CONCRETE</u>	
NE QUAD. (PVMT)	60 TON	SE QUAD. (ISLAND)	37 SY
NE QUAD. (SIDEWALK)	29 TON		
TOTAL	807 TON	<u>750 0115 SIDEWALK CONCRETE 4IN</u>	
		SE QUAD.	17 SY
<u>550 0300 8IN NON-REIN CONC PVMT CL AE-DOWELED</u>		NE QUAD.	57 SY
STA 26+68 TO 30+26 (CENTURY)	363 SY	TOTAL	74 SY
NE QUAD. (PVMT)	49 SY		
TOTAL	412 SY	<u>750 0140 SIDEWALK CONCRETE 6IN</u>	
		SE QUAD.	16 SY
<u>709 0151 GEOSYNTHETIC MATERIAL TYPE R1</u>		NE QUAD.	57 SY
STA 26+68 TO 30+26 (CENTURY)	518 SY	SE QUAD. (ISLAND)	28 SY
NE QUAD. (PVMT)	49 SY	TOTAL	101 SY
SE QUAD. (ISLAND)	100 SY		
TOTAL	667 SY	<u>750 0200 CONCRETE MEDIAN PAVING</u>	
		STA 26+89 TO 29+27 (CENTURY)	54 SY
<u>722 6140 ADJUST GATE VALVE BOX</u>			
STA 26+85 (LT)	1 EA	<u>750 0210 CONCRETE MEDIAN NOSE PAVING</u>	
		STA 26+82 TO 26+89 (CENTURY)	5 SY
<u>748 0140 CURB &amp; GUTTER-TYPE I</u>			
STA 26+89 TO 27+10 (RT OF CENTURY MDN)	21 LF	<u>750 2115 DETECTABLE WARNING PANELS</u>	
STA 26+89 TO 30+40 (LT OF CENTURY MDN)	366 LF	NE QUAD.	32 SF
SE QUAD. (ISLAND PERIMETER)	117 LF	SE QUAD.	46 SF
SE QUAD. (SIDEWALK)	35 LF		
NE QUAD. (SIDEWALK)	103 LF		
TOTAL	642 LF		



**Bismarck ENGINEERING**

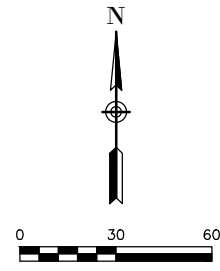
CENTURY AVENUE

PAVING LAYOUTS

STA 26+50 - 31+00

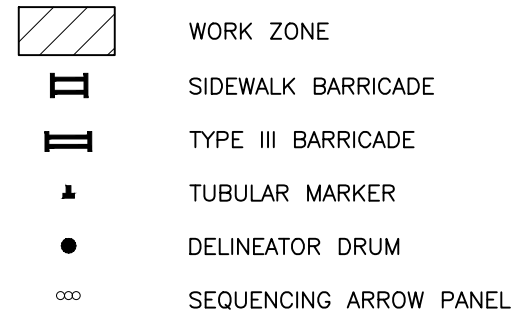
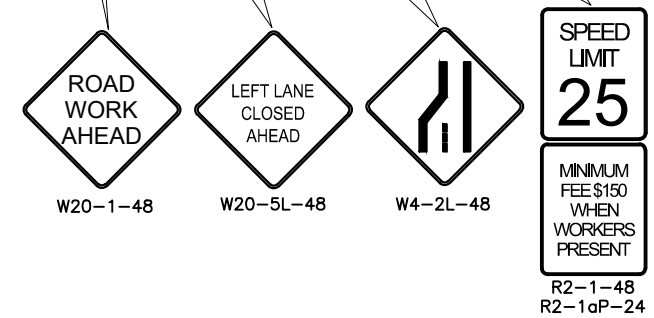
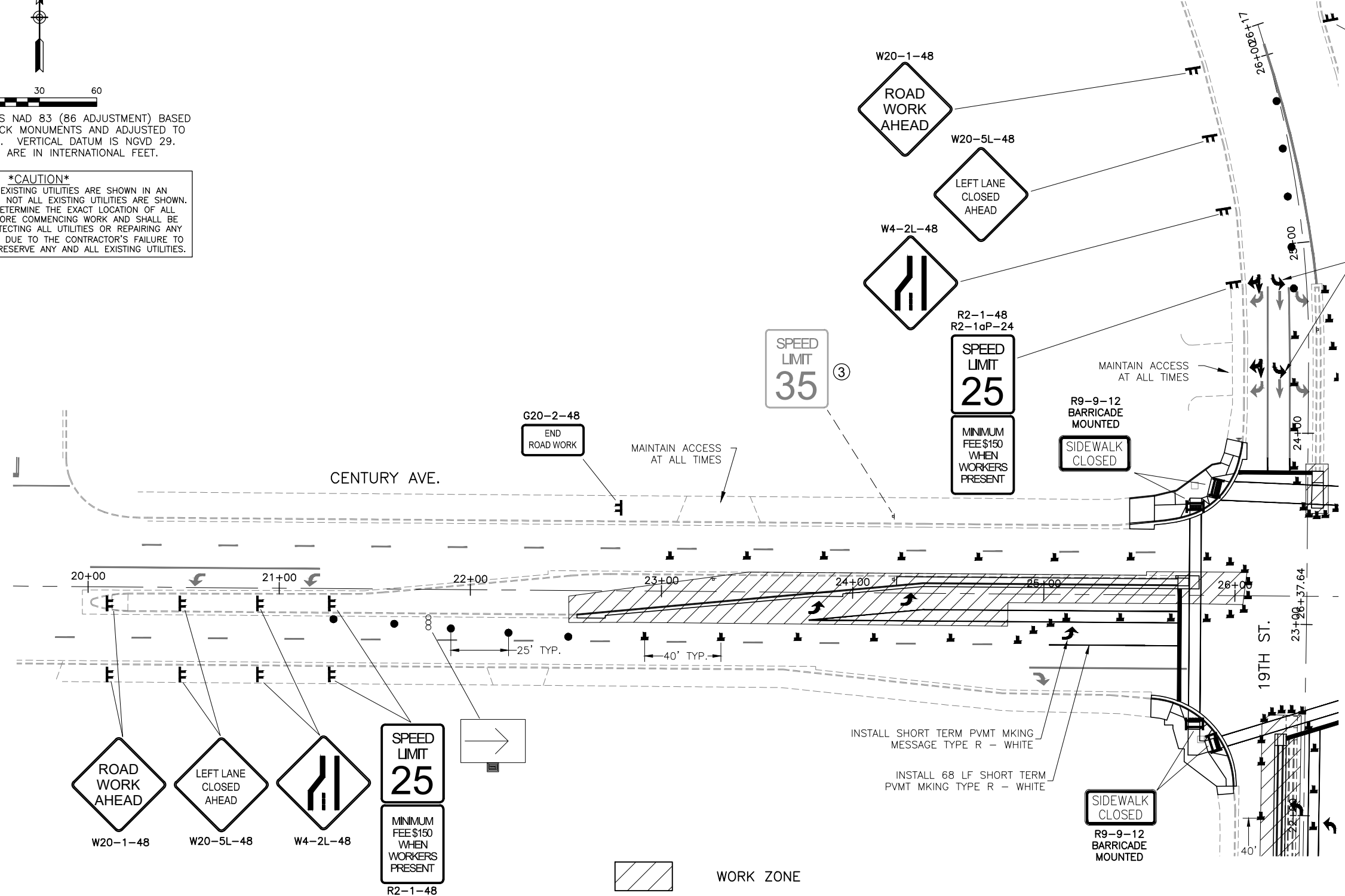


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ND	HEU-1-981(134)	23645	100	2

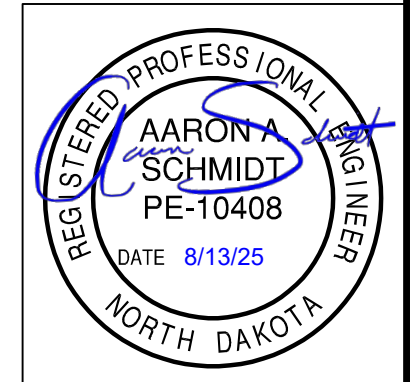


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- NOTE:**
- COORDINATE WITH BISMARCK PUBLIC WORKS ELECTRICAL DEPARTMENT FOR ADJUSTMENT OF TRAFFIC SIGNAL DETECTION AND OPERATIONS.
  - 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.
  - EXISTING SIGN, FOR REFERENCE ONLY.



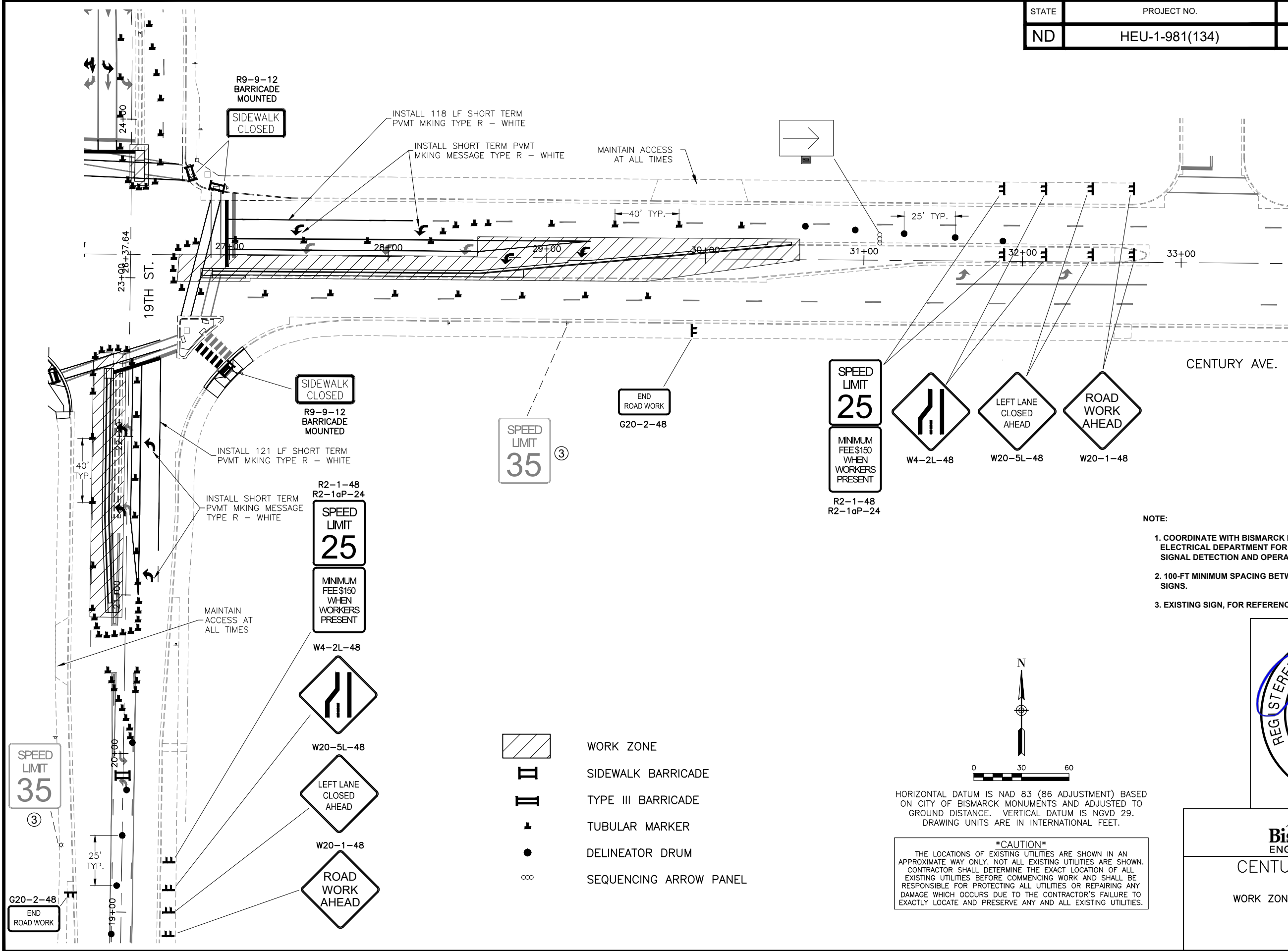
**Bismarck ENGINEERING**

CENTURY AVENUE

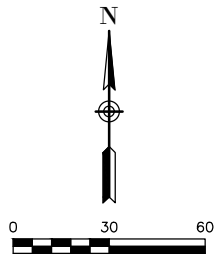
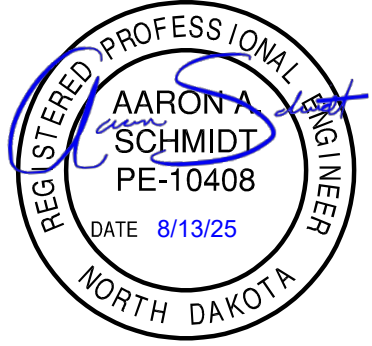
WORK ZONE TRAFFIC CONTROL

PHASE 1

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	3



- NOTE:
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  - 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.
  - EXISTING SIGN, FOR REFERENCE ONLY.



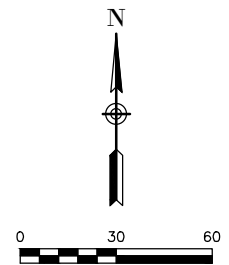
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- WORK ZONE
- SIDEWALK BARRICADE
- TYPE III BARRICADE
- TUBULAR MARKER
- DELINEATOR DRUM
- SEQUENCING ARROW PANEL

**Bismarck ENGINEERING**
  
 CENTURY AVENUE
   
 WORK ZONE TRAFFIC CONTROL
   
 PHASE 1

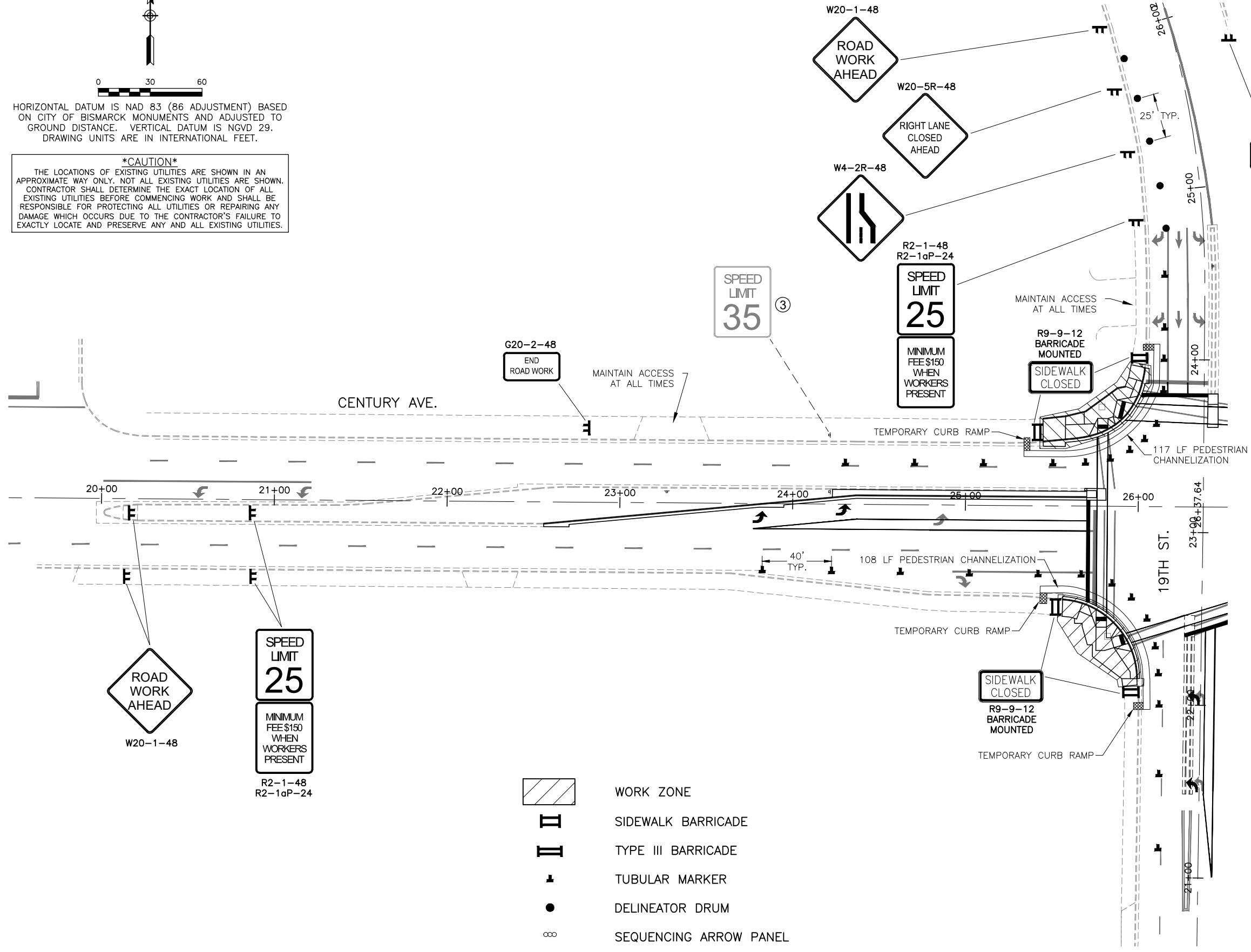
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	4



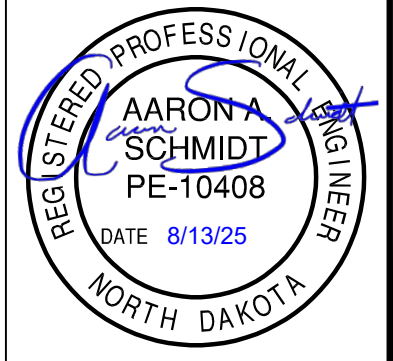
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- NOTE:**
1. COORDINATE WITH BISMARCK PUBLIC WORKS ELECTRICAL DEPARTMENT FOR ADJUSTMENT OF TRAFFIC SIGNAL DETECTION AND OPERATIONS.
  2. 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.
  3. EXISTING SIGN, FOR REFERENCE ONLY.

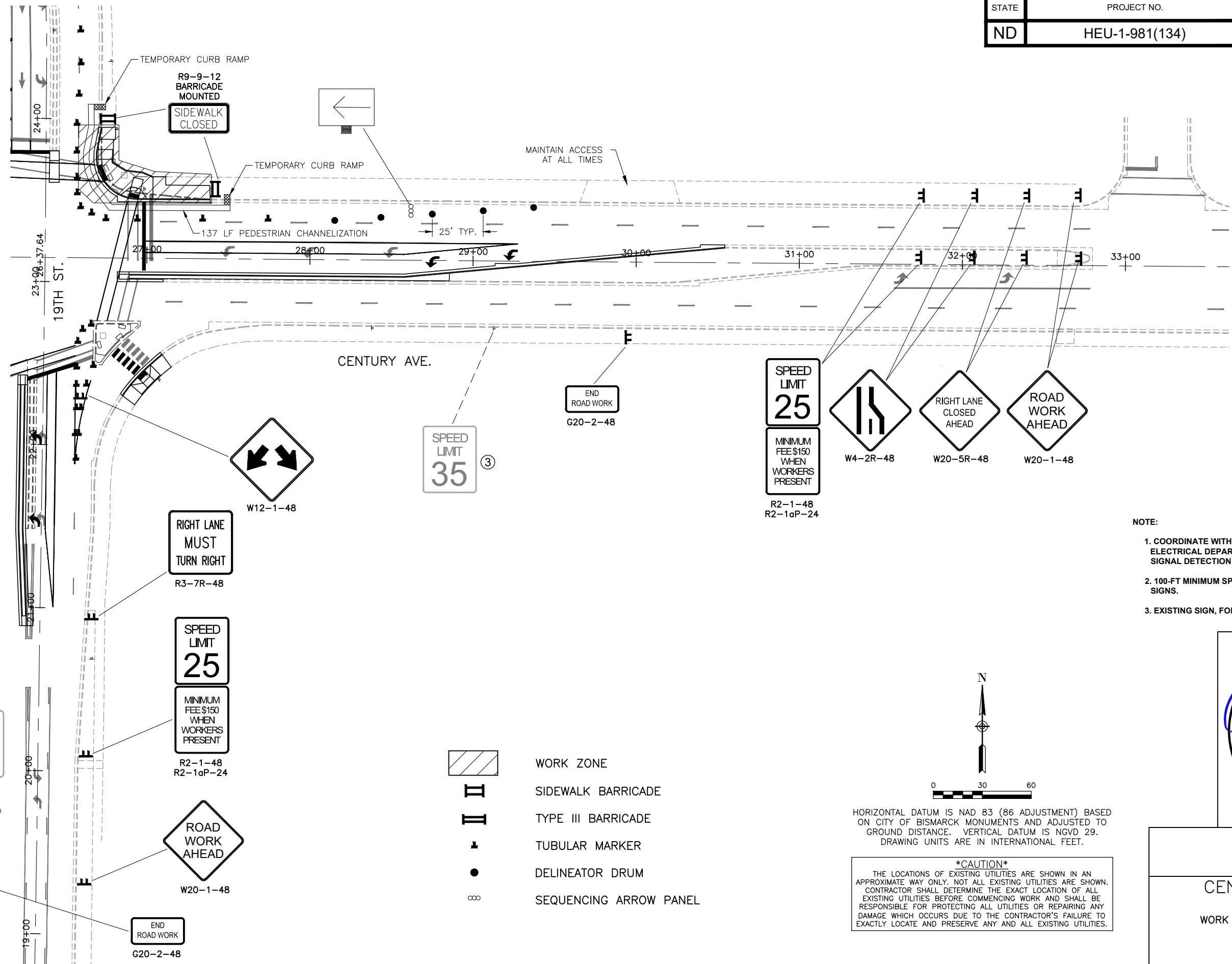


END ROAD WORK  
G20-2-48

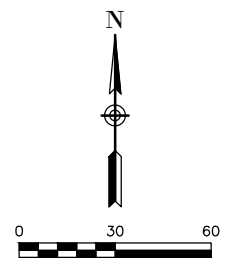
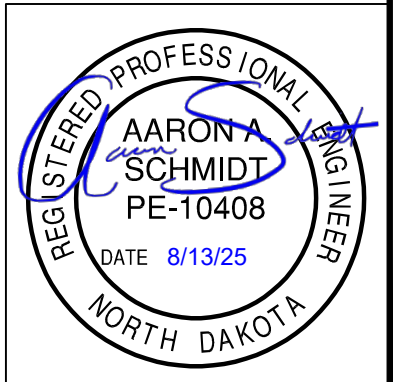


CENTURY AVENUE  
 WORK ZONE TRAFFIC CONTROL  
 PHASE 2

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	5



- NOTE:
1. COORDINATE WITH BISMARCK PUBLIC WORKS ELECTRICAL DEPARTMENT FOR ADJUSTMENT OF TRAFFIC SIGNAL DETECTION AND OPERATIONS.
  2. 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.
  3. EXISTING SIGN, FOR REFERENCE ONLY.



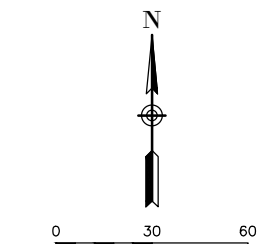
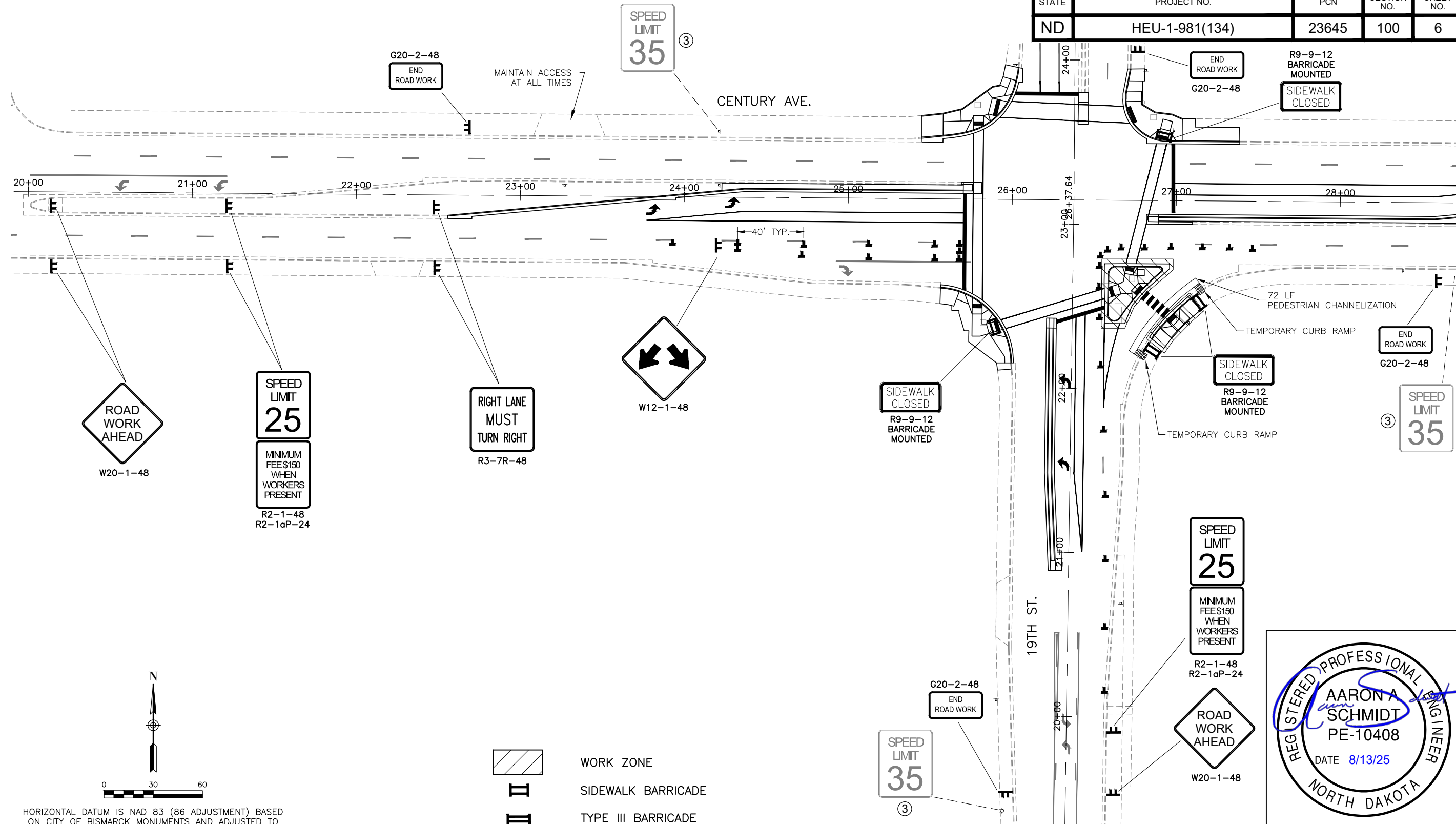
HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

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- WORK ZONE
- SIDEWALK BARRICADE
- TYPE III BARRICADE
- TUBULAR MARKER
- DELINEATOR DRUM
- SEQUENCING ARROW PANEL







**Bismarck ENGINEERING**  
**CENTURY AVENUE**  
 WORK ZONE TRAFFIC CONTROL  
 PHASE 2

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	6




HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

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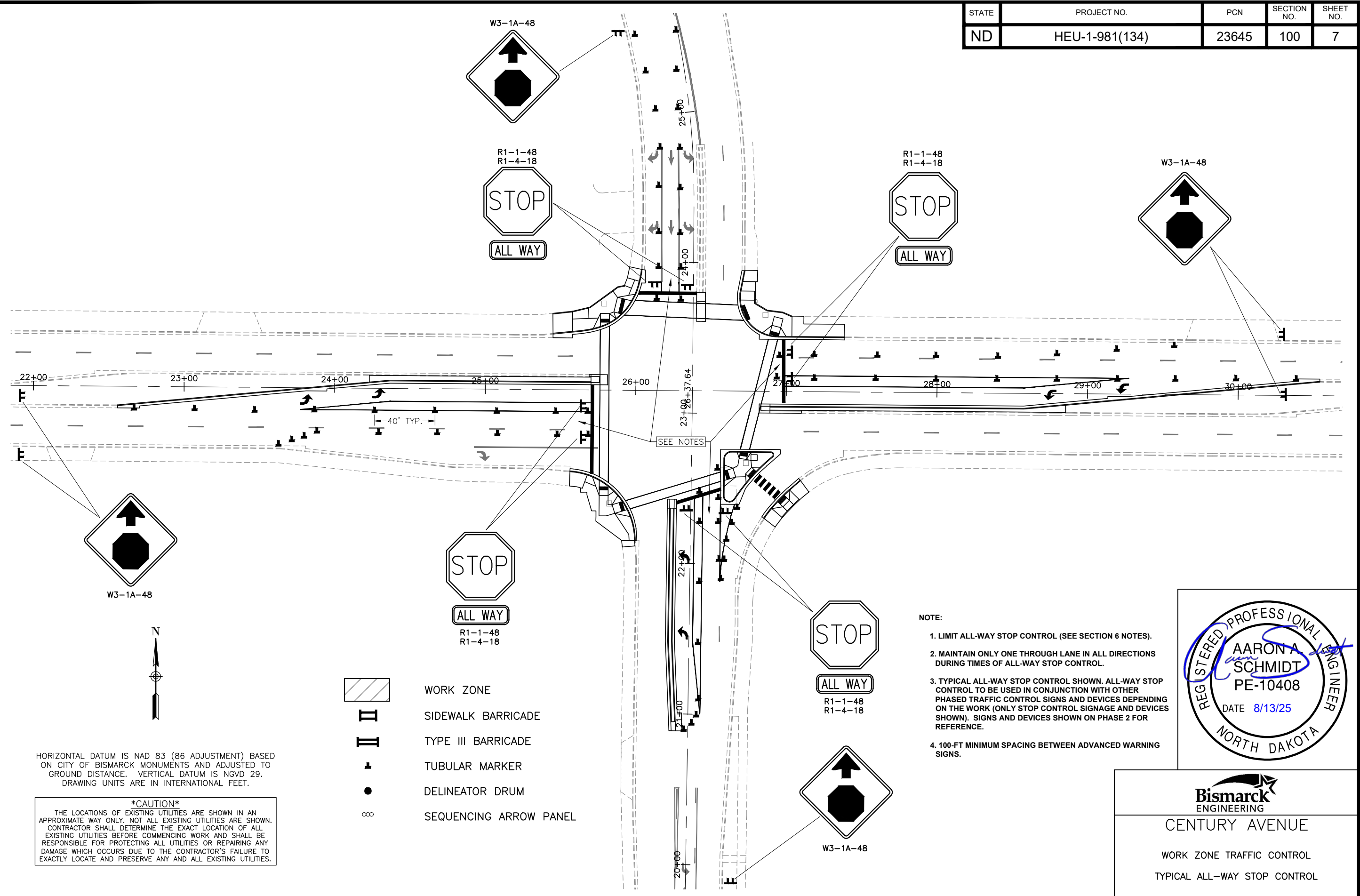
-  WORK ZONE
-  SIDEWALK BARRICADE
-  TYPE III BARRICADE
-  TUBULAR MARKER
-  DELINEATOR DRUM
-  SEQUENCING ARROW PANEL

- NOTE:**
- COORDINATE WITH BISMARCK PUBLIC WORKS ELECTRICAL DEPARTMENT FOR ADJUSTMENT OF TRAFFIC SIGNAL DETECTION AND OPERATIONS.
  - 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.
  - EXISTING SIGN, FOR REFERENCE ONLY.



  
**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 WORK ZONE TRAFFIC CONTROL  
 PHASE 3

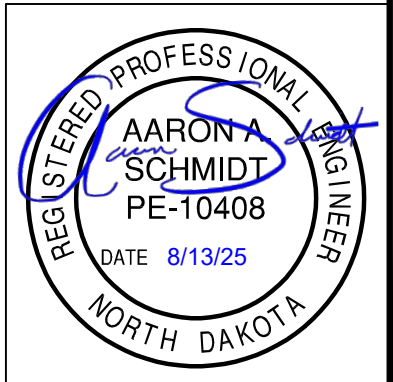
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	7



SEE NOTES

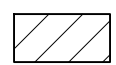

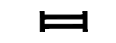


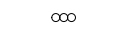
NOTE:

1. LIMIT ALL-WAY STOP CONTROL (SEE SECTION 6 NOTES).
2. MAINTAIN ONLY ONE THROUGH LANE IN ALL DIRECTIONS DURING TIMES OF ALL-WAY STOP CONTROL.
3. TYPICAL ALL-WAY STOP CONTROL SHOWN. ALL-WAY STOP CONTROL TO BE USED IN CONJUNCTION WITH OTHER PHASED TRAFFIC CONTROL SIGNS AND DEVICES DEPENDING ON THE WORK (ONLY STOP CONTROL SIGNAGE AND DEVICES SHOWN). SIGNS AND DEVICES SHOWN ON PHASE 2 FOR REFERENCE.
4. 100-FT MINIMUM SPACING BETWEEN ADVANCED WARNING SIGNS.



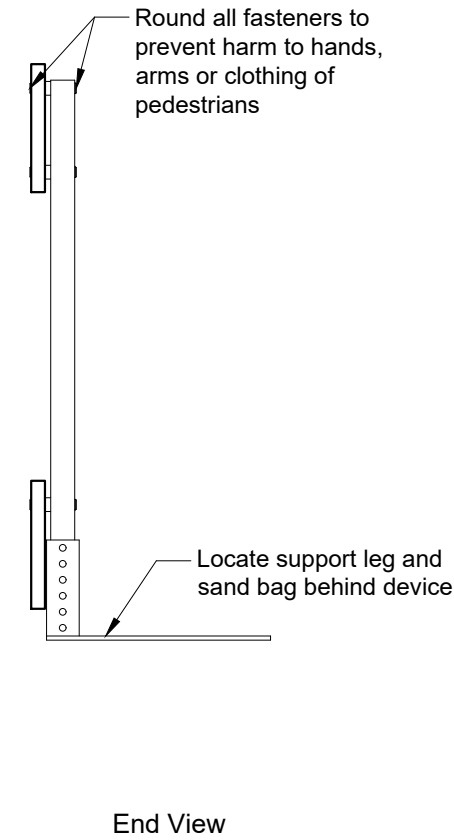
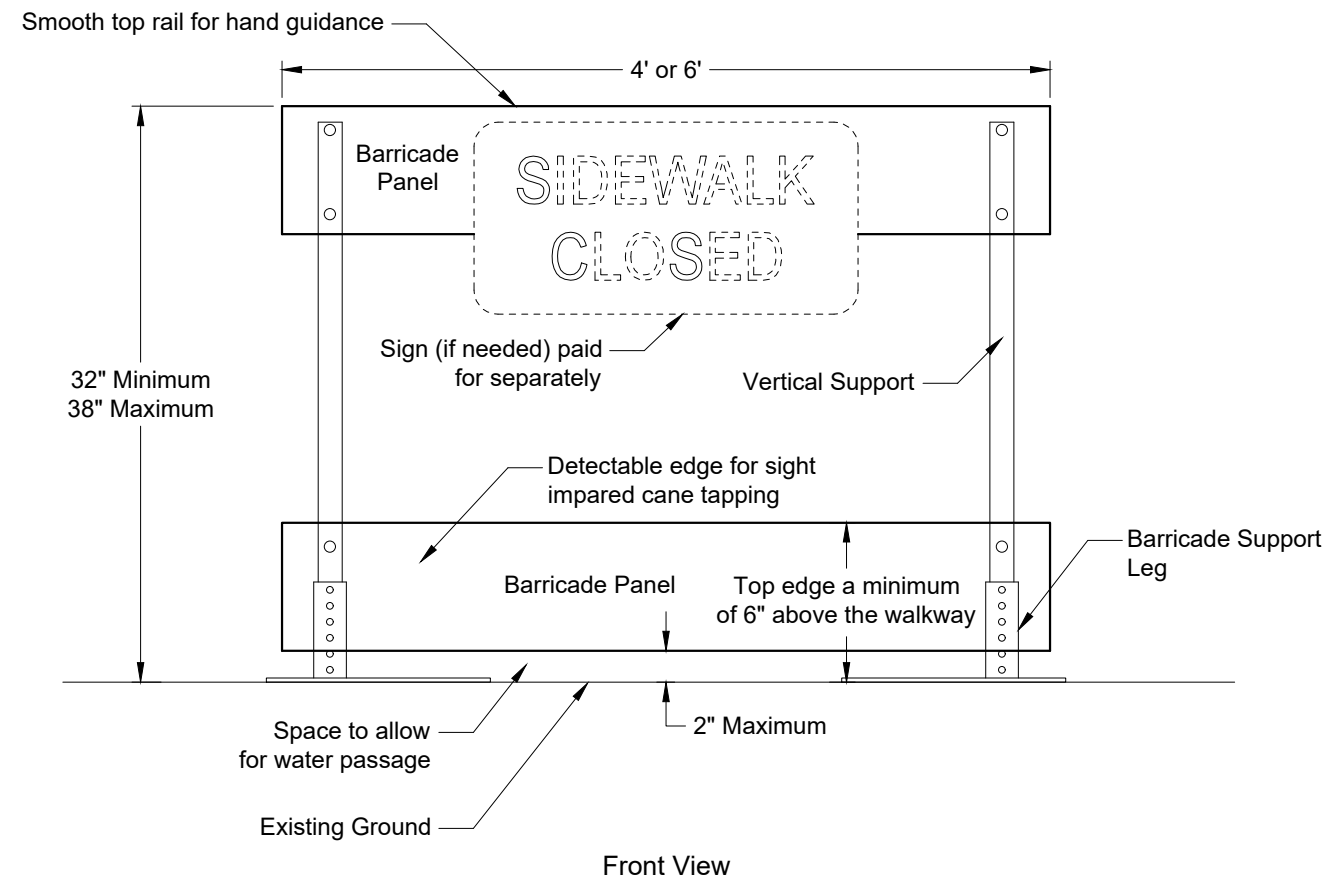
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-  SIDEWALK BARRICADE
-  TYPE III BARRICADE
-  TUBULAR MARKER
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-  SEQUENCING ARROW PANEL

**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 WORK ZONE TRAFFIC CONTROL  
 TYPICAL ALL-WAY STOP CONTROL

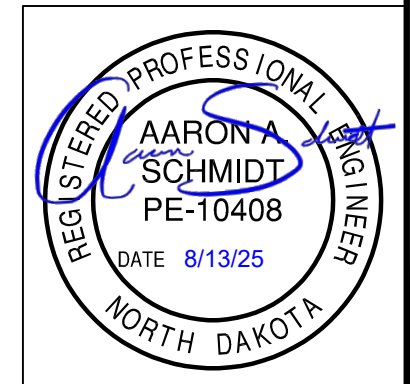
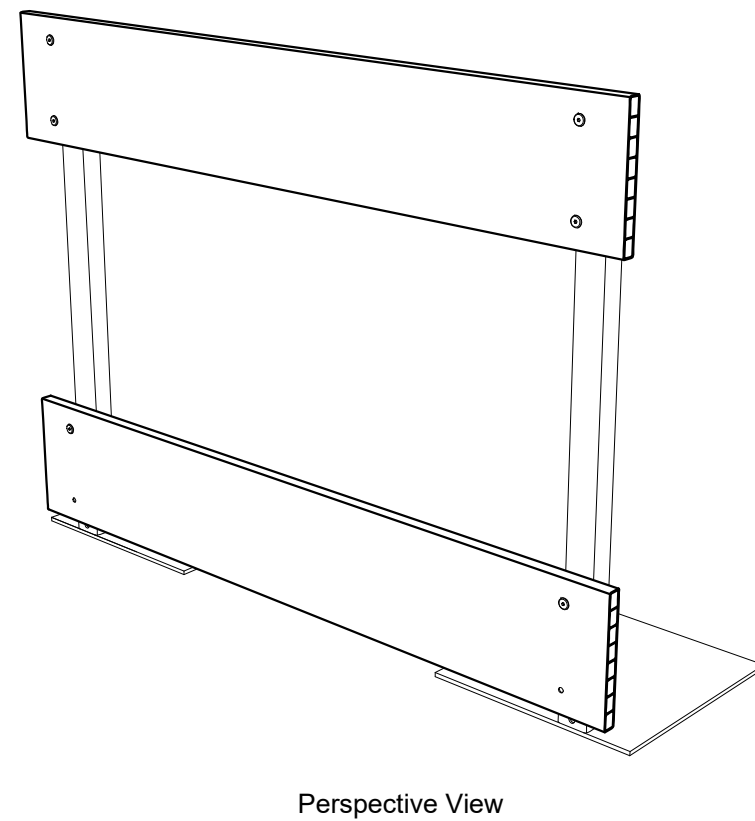
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	8



NOTES:

Sidewalk Barricades

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



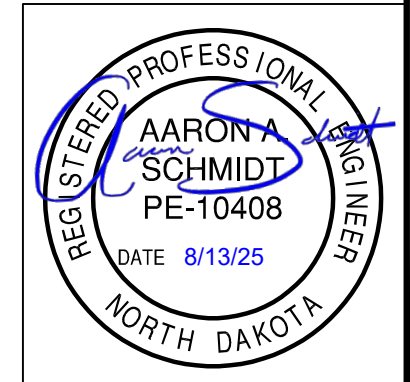
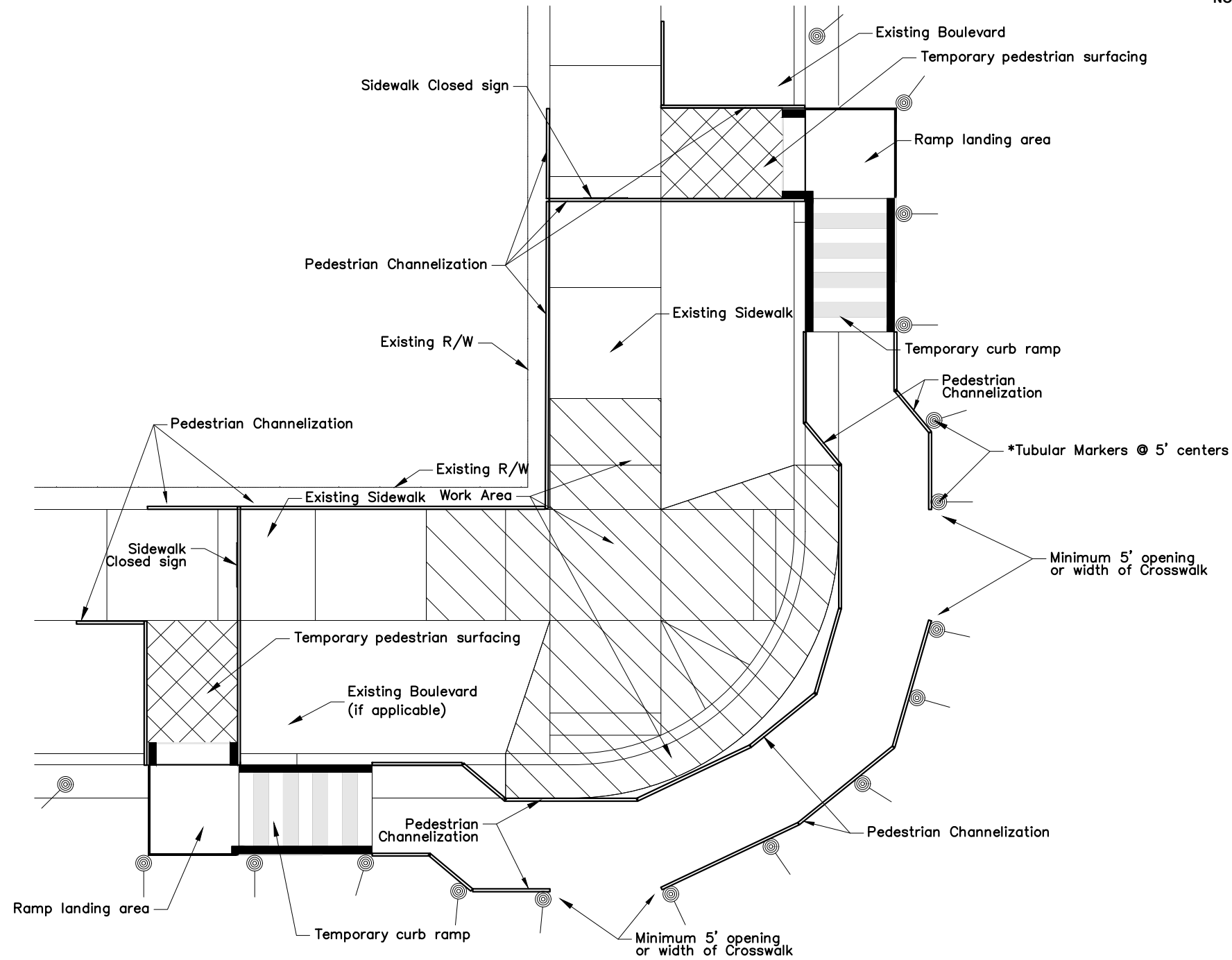
CENTURY AVENUE

WORK ZONE TRAFFIC CONTROL

SIDEWALK BARRICADE

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	9

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

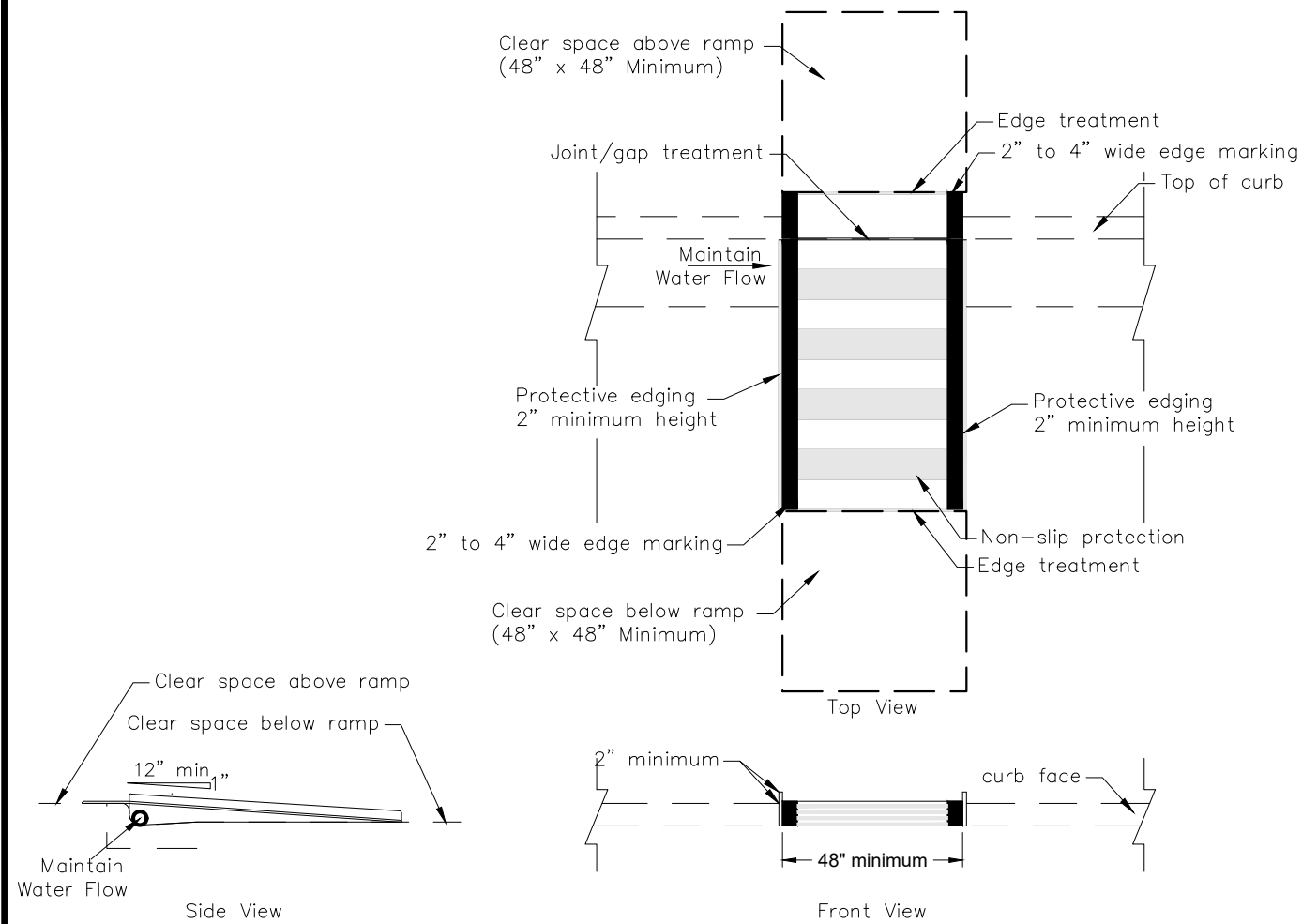


CENTURY AVENUE

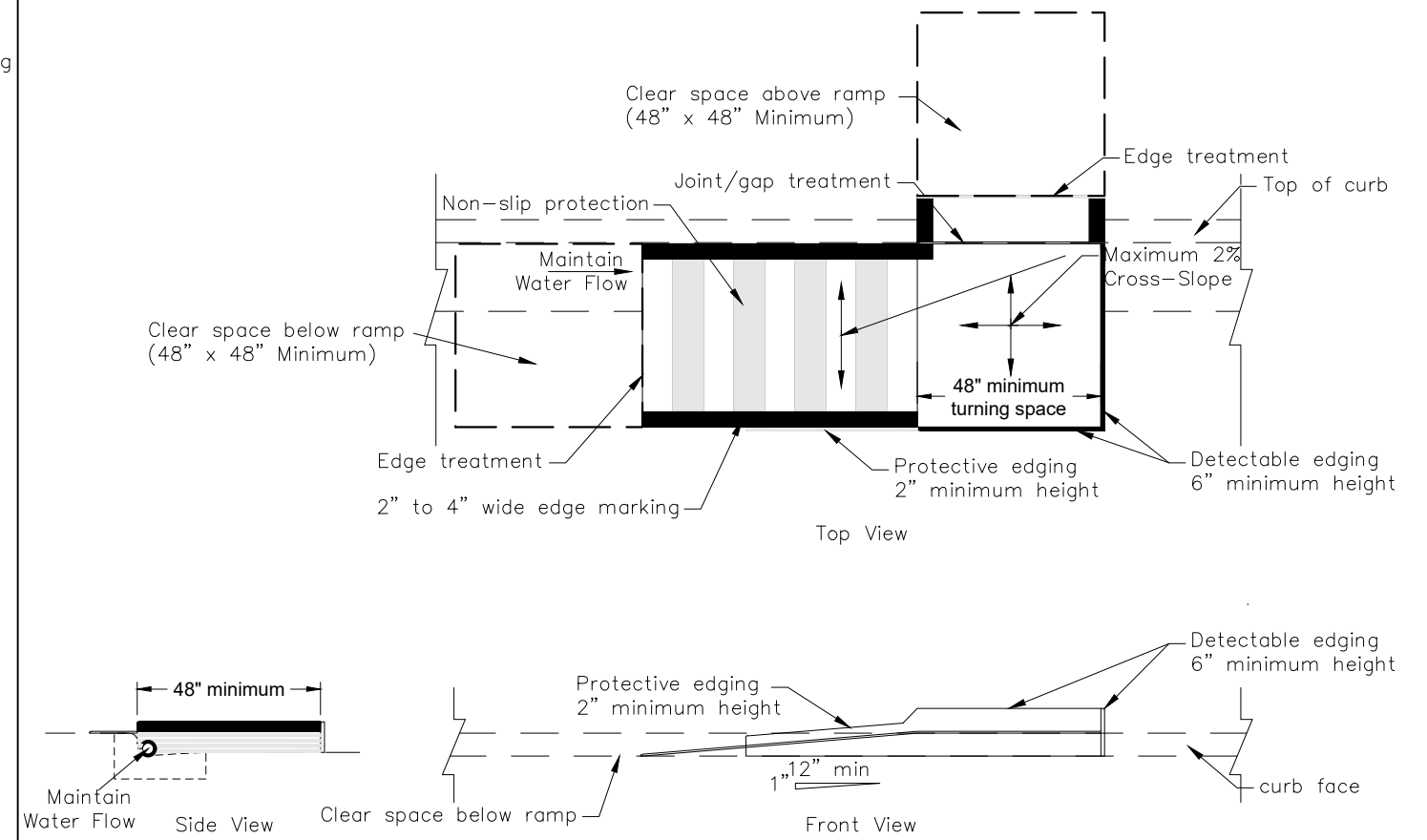
WORK ZONE TRAFFIC CONTROL

TYPICAL TEMPORARY PEDESTRIAN ACCESS ROUTE DETAIL

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	100	10

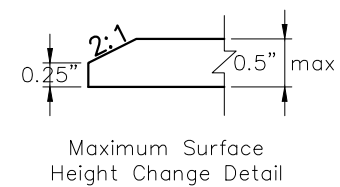


Temporary Perpendicular Curb Ramp

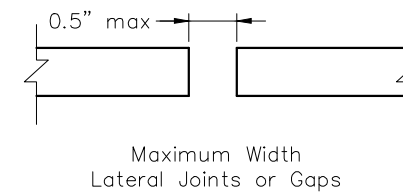


Temporary Parallel Curb Ramp

Edge Treatment



Joint/Gap Treatment

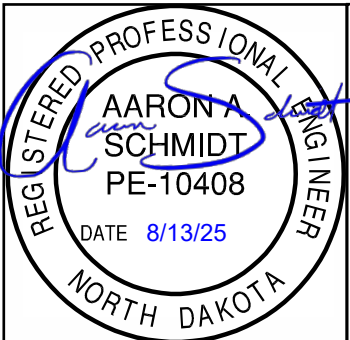


CENTURY AVENUE

WORK ZONE TRAFFIC CONTROL  
TYPICAL TEMPORARY PEDESTRIAN  
CURB RAMP DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	HEU-1-981(134)	110	1

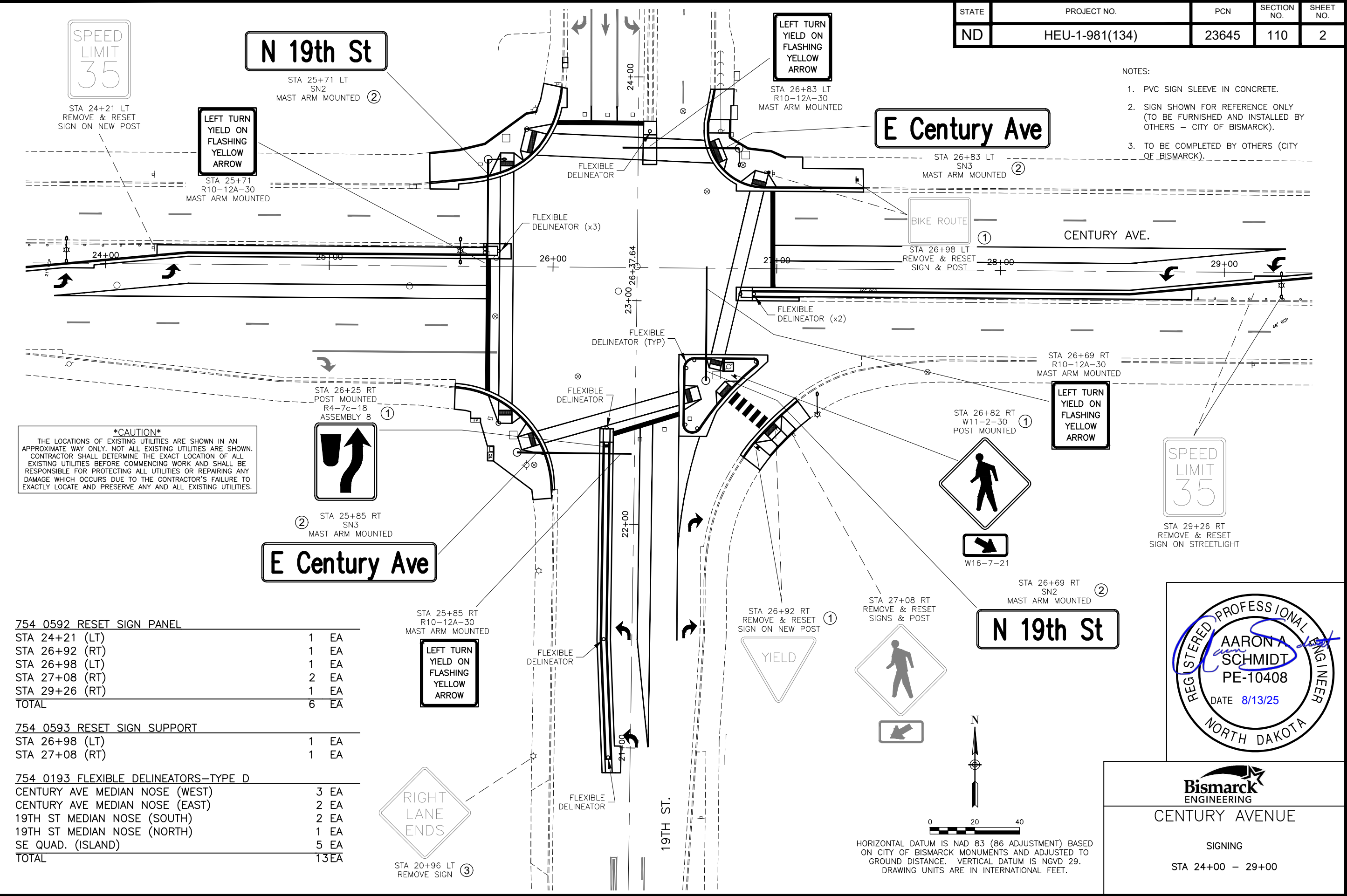
Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clearance FT	Support Size	Max Post Len LF	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF				1st LF	2nd LF	3rd LF	4th LF								
24+21 Lt	R2-1	9			9.7				7.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga	1			Speed Limit 35	
26+92 Rt	R1-2	4			9.8				7.0	2 x 2 12 ga	13.6					1	4	2.25 x 2.25 12 ga	1			Yield	
26+98 Lt	BIKE ROUTE	13							7.0	2 x 2 12 ga									1	1			
27+08 Rt	W11-2-30	56							7.0	2 x 2 12 ga									2	1		Pedestrian Crossing with Arrow	
29+26 Rt	R2-1	9							7.0	2 x 2 12 ga									1			Speed Limit 35	
<b>Sub Total</b>			0.0	0.0	<b>Total</b>	19.5									<b>Total</b>	8.0			6	2	0		
25+71 Lt	R10-12a-30				7.5																	Mount on Mast Arm	
25+85 Rt	R10-12a-30				7.5																	Mount on Mast Arm	
26+25 Rt	R4-7c-18	8			3.0	9.2			7.0	2 x 2 12 ga	14.6				1	4	2.25 x 2.25 12 ga						
26+69 Rt	R10-12a-30				7.5																	Mount on Mast Arm	
26+82 Rt	W11-2-30	56			9.3	11.2			7.0	2.5 x 2.5 10 ga	13.7				1	4	3 x 3 7 ga				1	Mount with W16-7-21	
26+83 Lt	R10-12a-30				7.5																	Mount on Mast Arm	
<b>Sub Total</b>			0.0	42.3	<b>Total</b>	20.4									<b>Total</b>	8.0			0	0	1		
<b>Grand Total</b>			<b>0.0</b>	<b>42.3</b>	<b>Total</b>	<b>39.9</b>									<b>Total</b>	<b>16</b>	<b>0</b>		<b>6</b>	<b>2</b>	<b>1</b>		



Sign Summary  
Perforated Tube

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	110	2

- NOTES:
- PVC SIGN SLEEVE IN CONCRETE.
  - SIGN SHOWN FOR REFERENCE ONLY (TO BE FURNISHED AND INSTALLED BY OTHERS - CITY OF BISMARCK).
  - TO BE COMPLETED BY OTHERS (CITY OF BISMARCK).

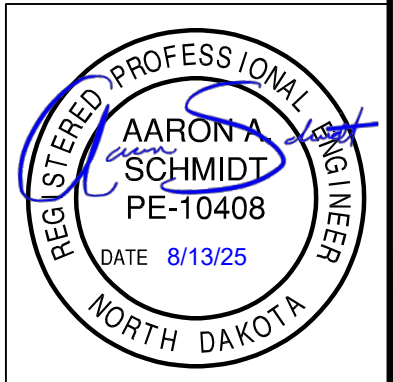


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754 0592 RESET SIGN PANEL		
STA 24+21 (LT)	1	EA
STA 26+92 (RT)	1	EA
STA 26+98 (LT)	1	EA
STA 27+08 (RT)	2	EA
STA 29+26 (RT)	1	EA
TOTAL	6	EA

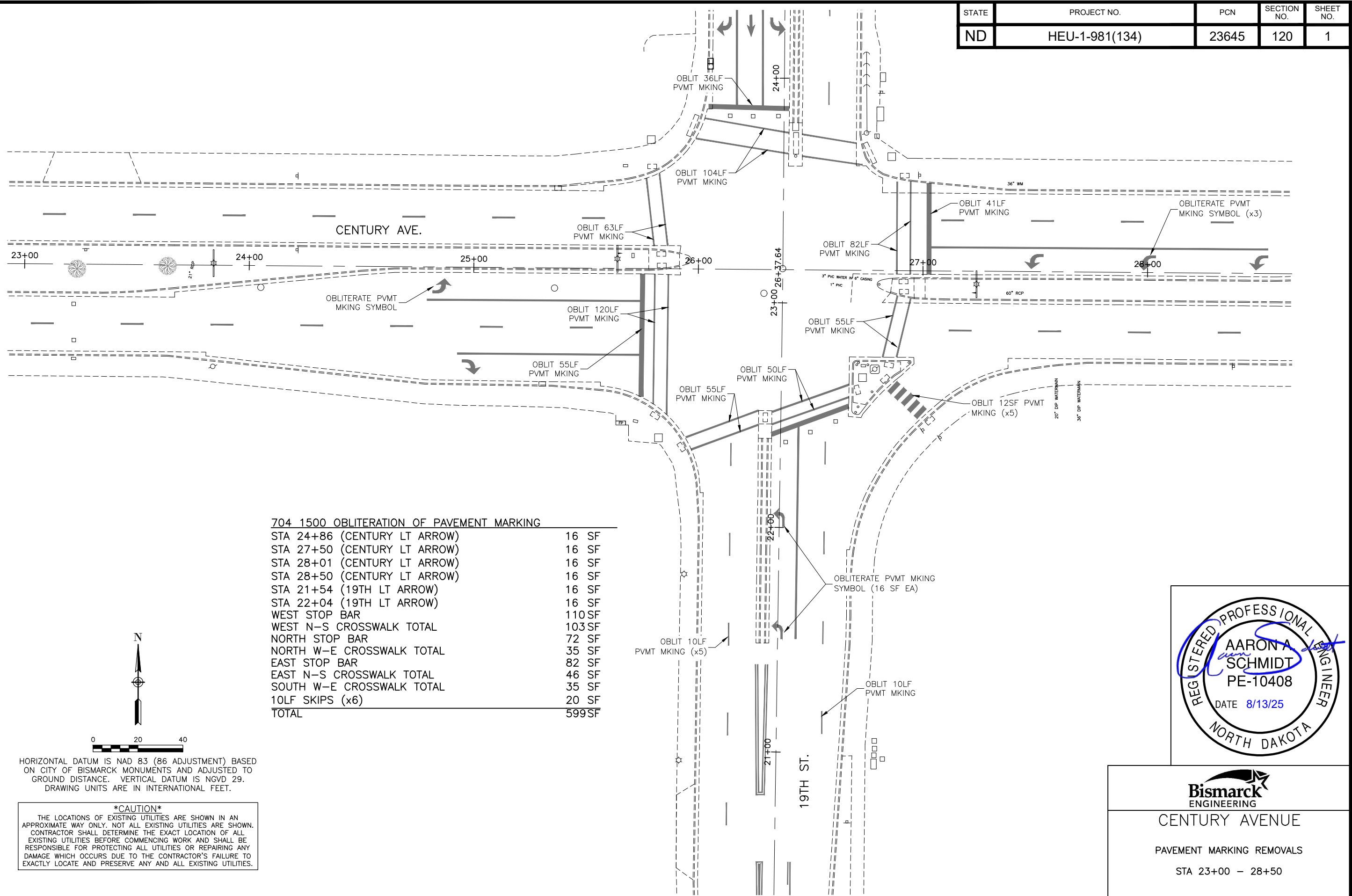
754 0593 RESET SIGN SUPPORT		
STA 26+98 (LT)	1	EA
STA 27+08 (RT)	1	EA

754 0193 FLEXIBLE DELINEATORS-TYPE D		
CENTURY AVE MEDIAN NOSE (WEST)	3	EA
CENTURY AVE MEDIAN NOSE (EAST)	2	EA
19TH ST MEDIAN NOSE (SOUTH)	2	EA
19TH ST MEDIAN NOSE (NORTH)	1	EA
SE QUAD. (ISLAND)	5	EA
TOTAL	13	EA



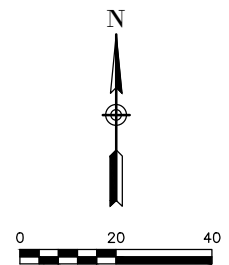
**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 SIGNING  
 STA 24+00 - 29+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	120	1



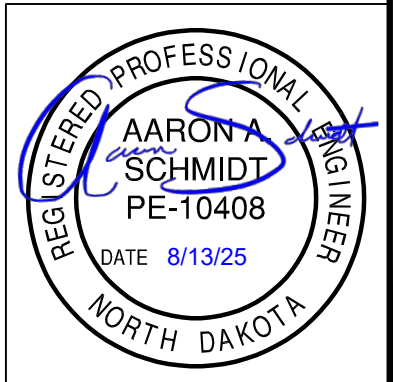
**704 1500 OBLITERATION OF PAVEMENT MARKING**

STA 24+86 (CENTURY LT ARROW)	16 SF
STA 27+50 (CENTURY LT ARROW)	16 SF
STA 28+01 (CENTURY LT ARROW)	16 SF
STA 28+50 (CENTURY LT ARROW)	16 SF
STA 21+54 (19TH LT ARROW)	16 SF
STA 22+04 (19TH LT ARROW)	16 SF
WEST STOP BAR	110 SF
WEST N-S CROSSWALK TOTAL	103 SF
NORTH STOP BAR	72 SF
NORTH W-E CROSSWALK TOTAL	35 SF
EAST STOP BAR	82 SF
EAST N-S CROSSWALK TOTAL	46 SF
SOUTH W-E CROSSWALK TOTAL	35 SF
10LF SKIPS (x6)	20 SF
<b>TOTAL</b>	<b>599 SF</b>



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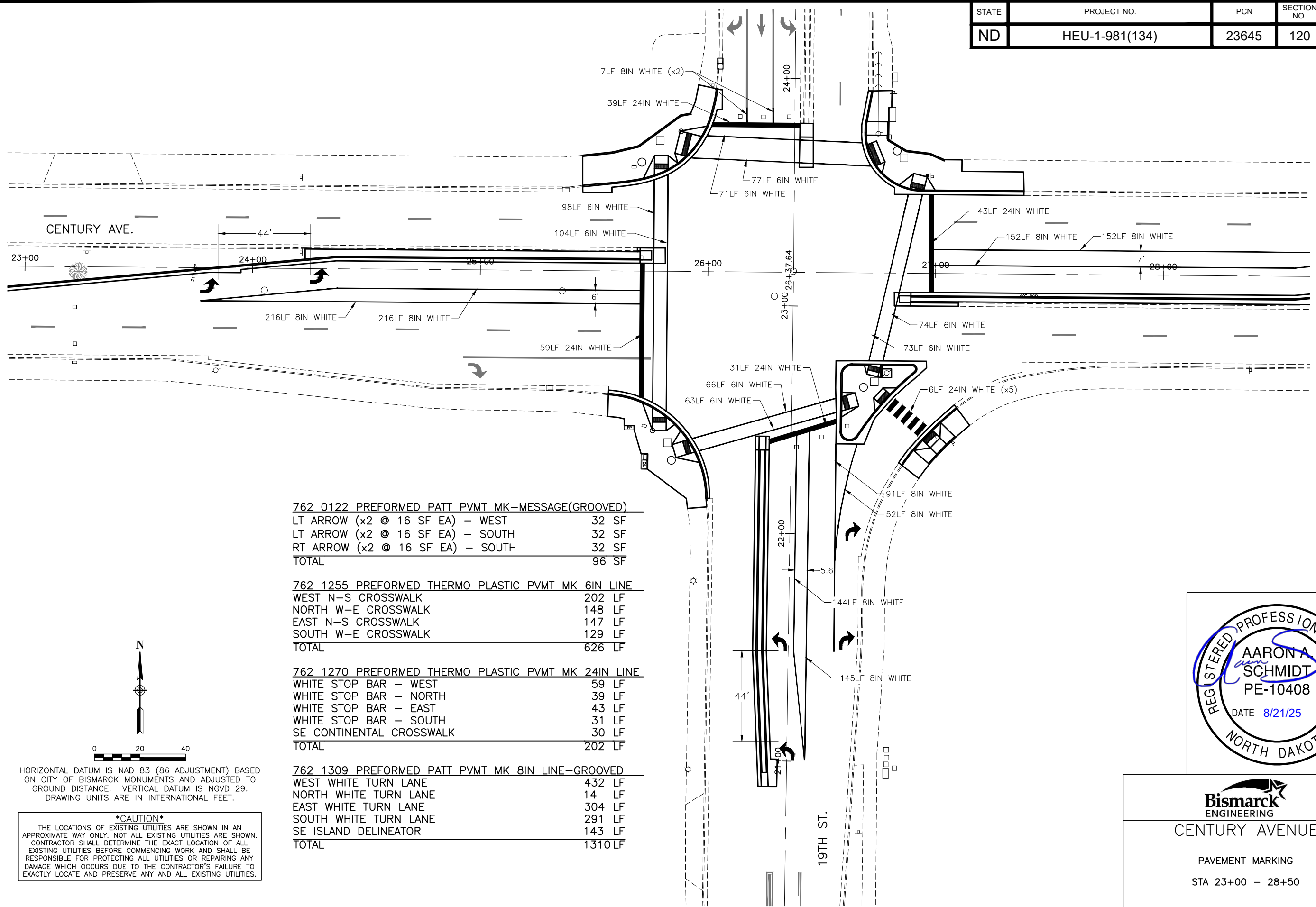
**Bismarck ENGINEERING**

**CENTURY AVENUE**

PAVEMENT MARKING REMOVALS

STA 23+00 - 28+50

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	120	2

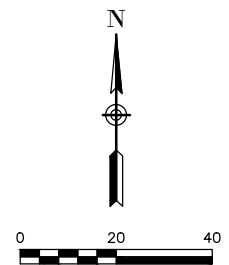


<u>762 0122 PREFORMED PATT PVMT MK-MESSAGE(GROOVED)</u>	
LT ARROW (x2 @ 16 SF EA) - WEST	32 SF
LT ARROW (x2 @ 16 SF EA) - SOUTH	32 SF
RT ARROW (x2 @ 16 SF EA) - SOUTH	32 SF
TOTAL	96 SF

<u>762 1255 PREFORMED THERMO PLASTIC PVMT MK 6IN LINE</u>	
WEST N-S CROSSWALK	202 LF
NORTH W-E CROSSWALK	148 LF
EAST N-S CROSSWALK	147 LF
SOUTH W-E CROSSWALK	129 LF
TOTAL	626 LF

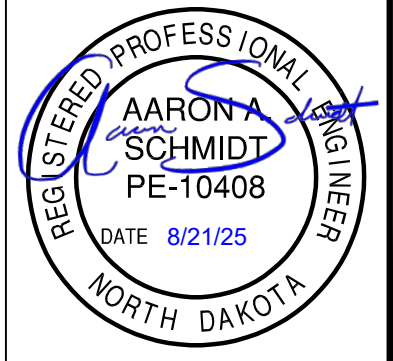
<u>762 1270 PREFORMED THERMO PLASTIC PVMT MK 24IN LINE</u>	
WHITE STOP BAR - WEST	59 LF
WHITE STOP BAR - NORTH	39 LF
WHITE STOP BAR - EAST	43 LF
WHITE STOP BAR - SOUTH	31 LF
SE CONTINENTAL CROSSWALK	30 LF
TOTAL	202 LF

<u>762 1309 PREFORMED PATT PVMT MK 8IN LINE-GROOVED</u>	
WEST WHITE TURN LANE	432 LF
NORTH WHITE TURN LANE	14 LF
EAST WHITE TURN LANE	304 LF
SOUTH WHITE TURN LANE	291 LF
SE ISLAND DELINEATOR	143 LF
TOTAL	1310 LF



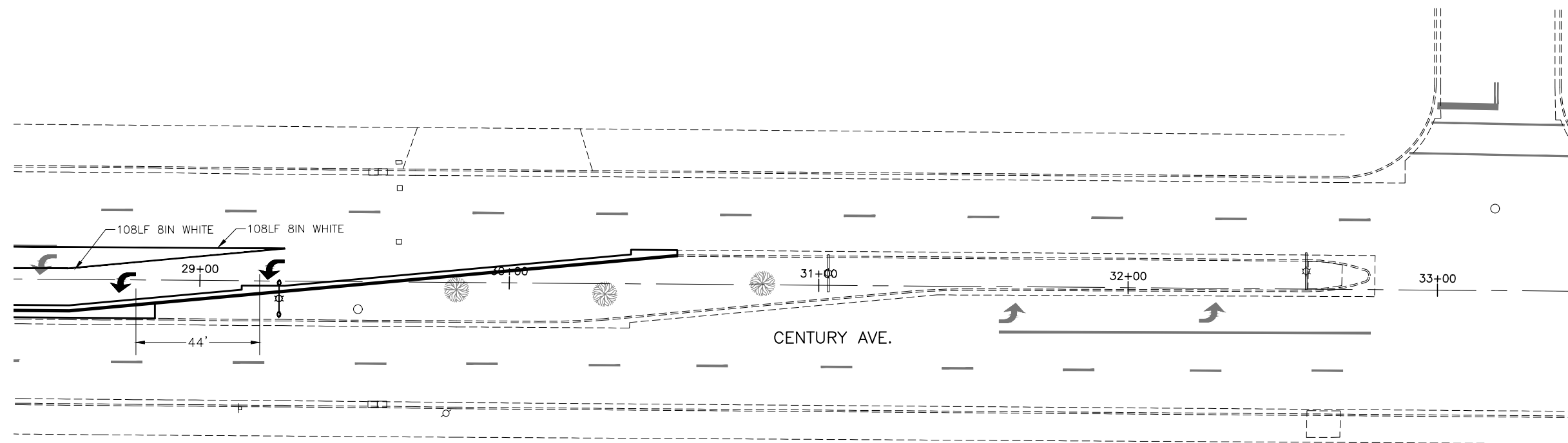
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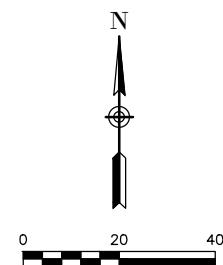


**Bismarck ENGINEERING**  
CENTURY AVENUE  
PAVEMENT MARKING  
STA 23+00 - 28+50

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	120	3



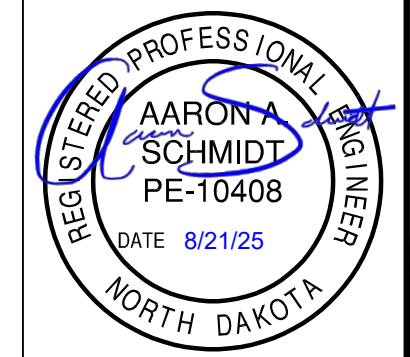
762_0122 PREFORMED PATT PVMT MK-MESSAGE(GROOVED)	
LT ARROW (x2 @ 16 SF EA) - EAST	32 SF
762_1309 PREFORMED PATT PVMT MK 8IN LINE-GROOVED	
WHITE TURN LANE	216 LF



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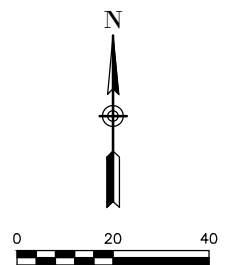
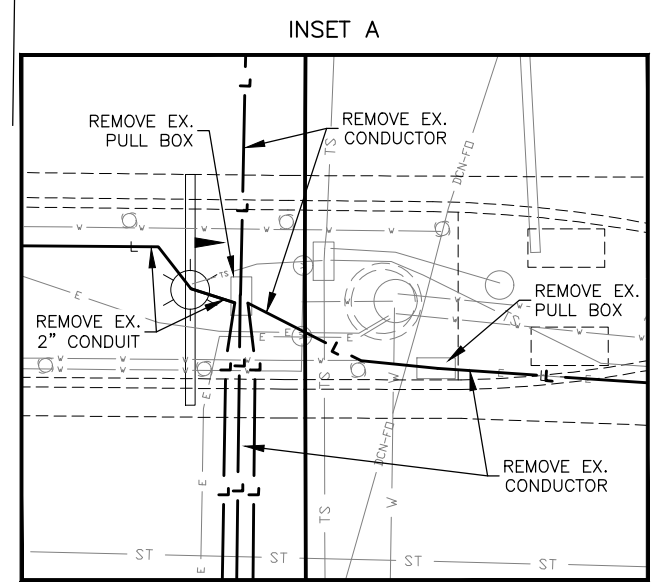
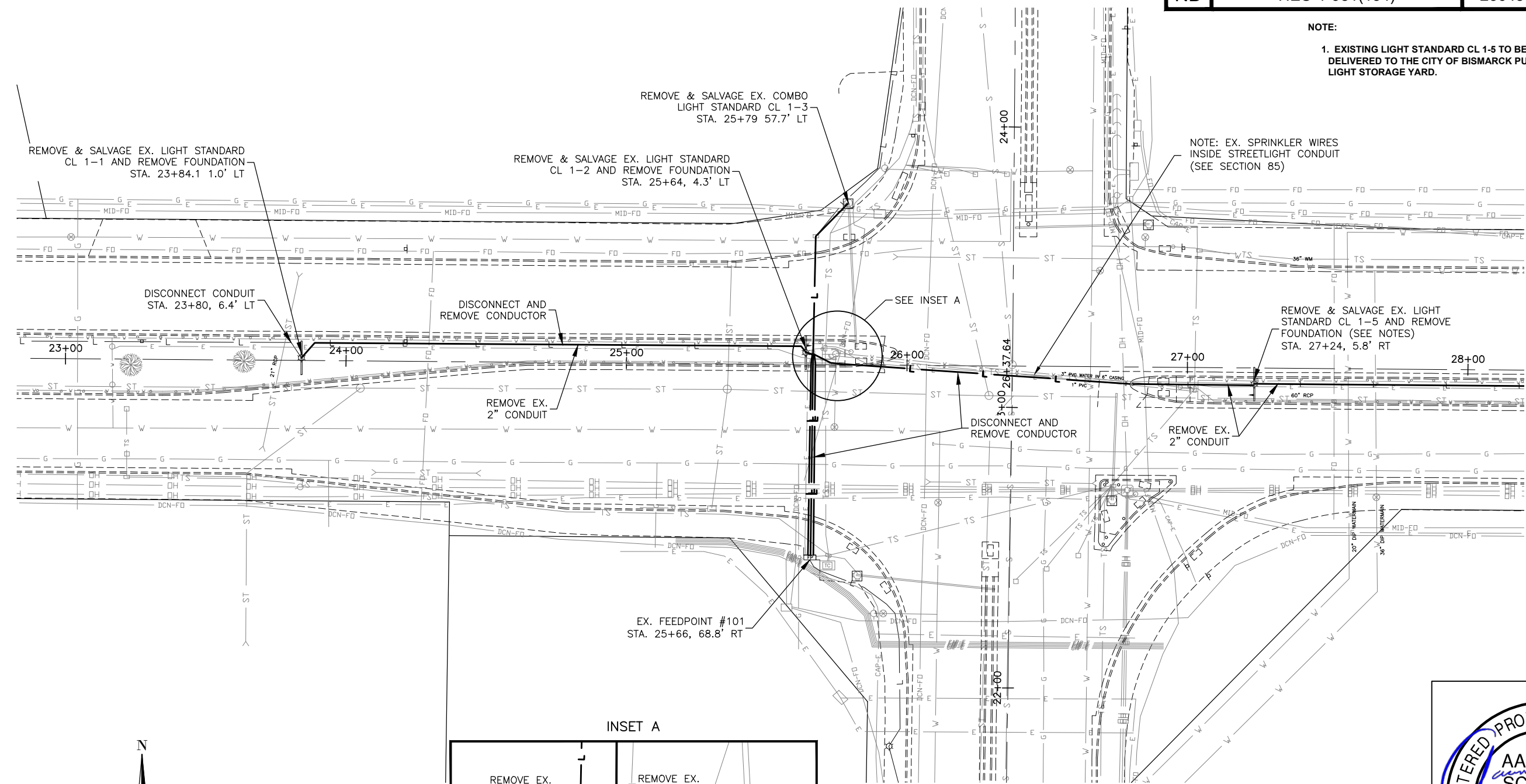


CENTURY AVENUE

PAVEMENT MARKING  
STA 28+50 - 33+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	140	1

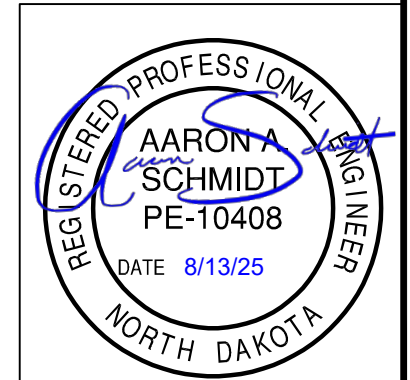
NOTE:  
 1. EXISTING LIGHT STANDARD CL 1-5 TO BE SALVAGED AND DELIVERED TO THE CITY OF BISMARCK PUBLIC WORKS LIGHT STORAGE YARD.



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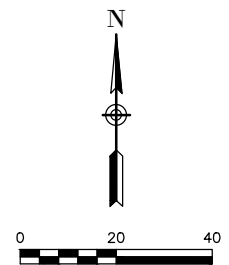
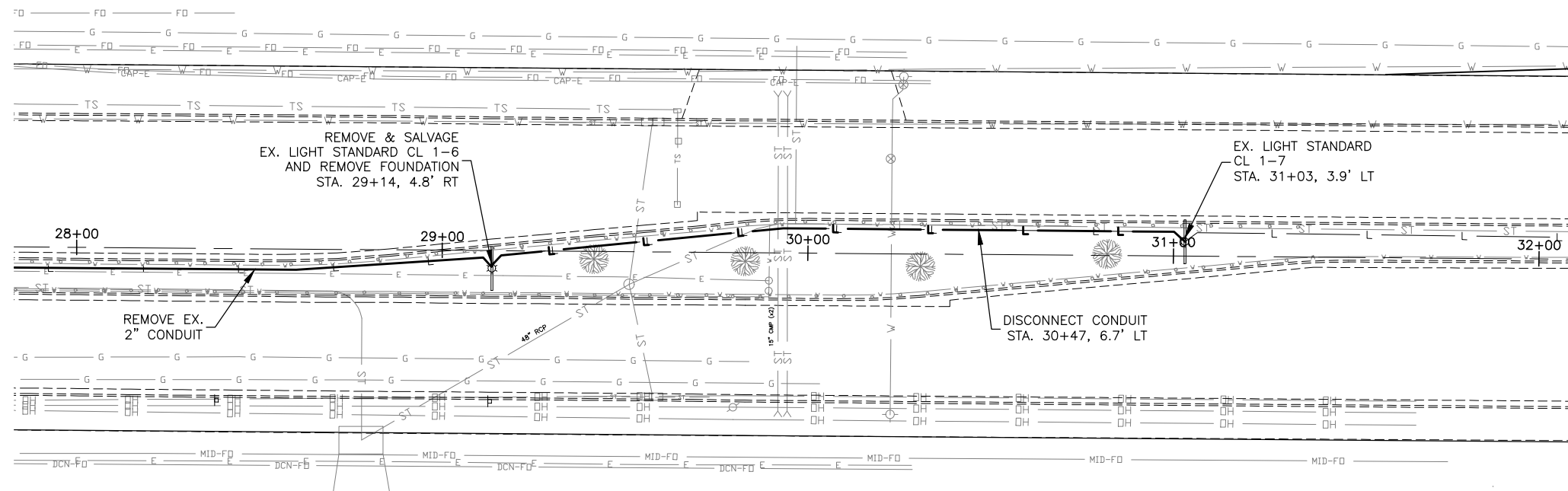
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- LEGEND**
- L — EXISTING CONDUCTOR & CONDUIT
  - L — REMOVAL OF CONDUCTOR, SALVAGE CONDUIT
  - L — REMOVAL OF CONDUCTOR & CONDUIT



**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 LIGHTING REMOVALS  
 STA 23+00 - 28+00

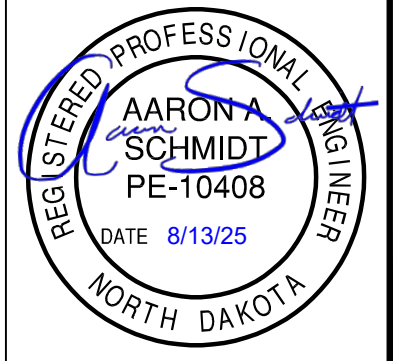
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(164)	23645	140	2



HORIZONTAL DATUM IS NAD 83 (86 ADJUSTMENT) BASED ON CITY OF BISMARCK MONUMENTS AND ADJUSTED TO GROUND DISTANCE. VERTICAL DATUM IS NGVD 29. DRAWING UNITS ARE IN INTERNATIONAL FEET.

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- LEGEND**
- L — EXISTING CONDUCTOR & CONDUIT
  - L — REMOVAL OF CONDUCTOR, SALVAGE CONDUIT
  - L — REMOVAL OF CONDUCTOR & CONDUIT



**Bismarck ENGINEERING**

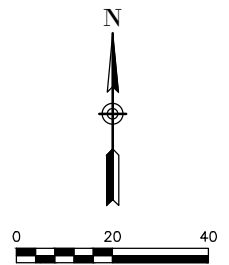
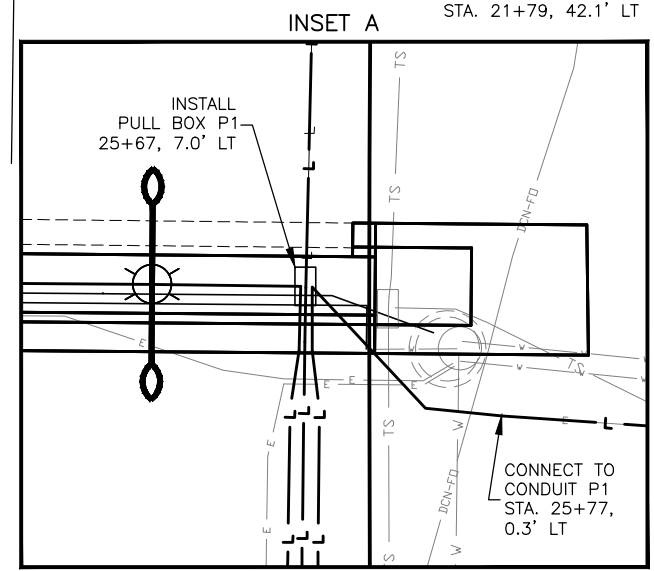
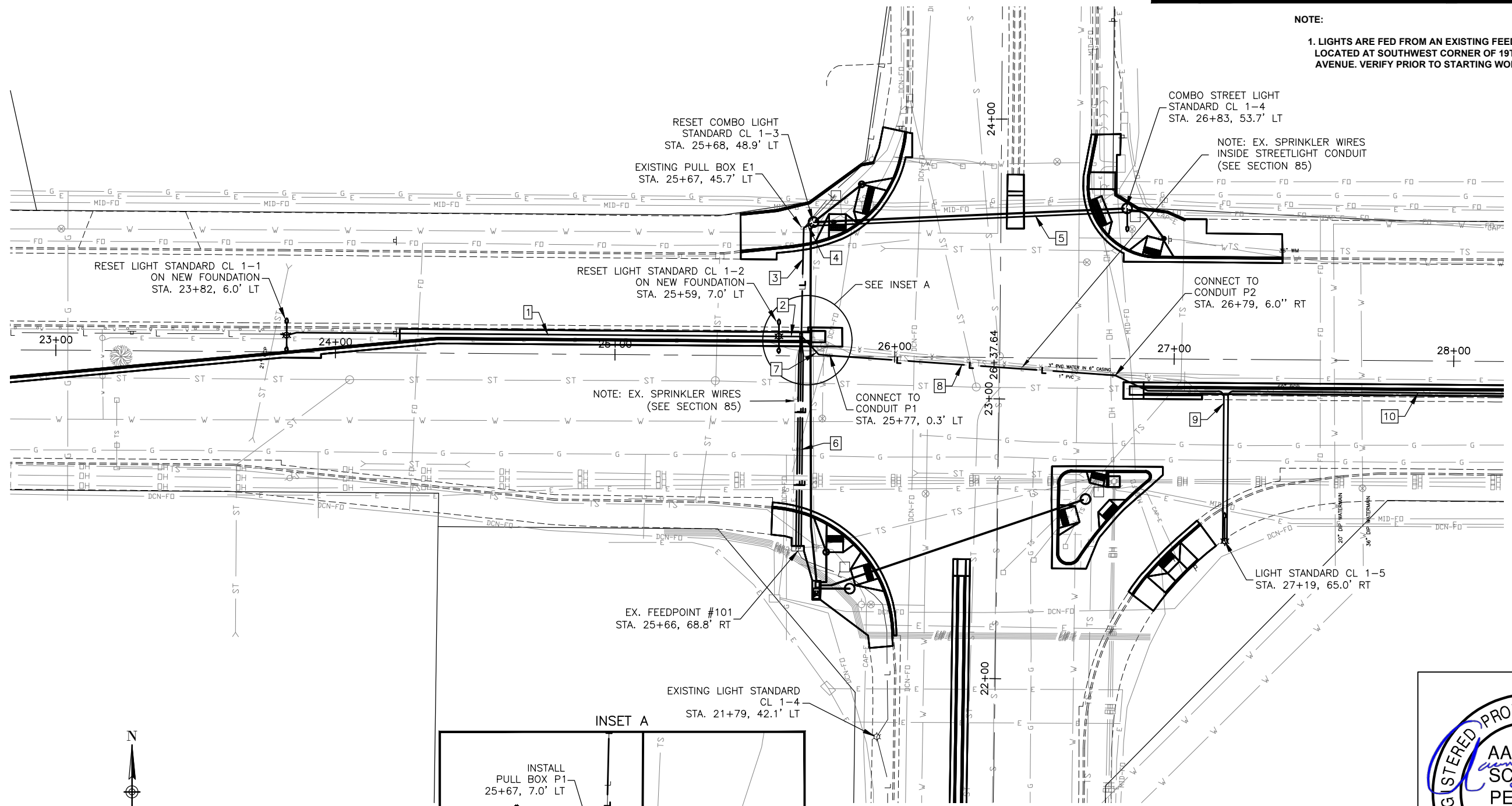
CENTURY AVENUE

LIGHTING REMOVALS

STA 28+00 - 32+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	140	3

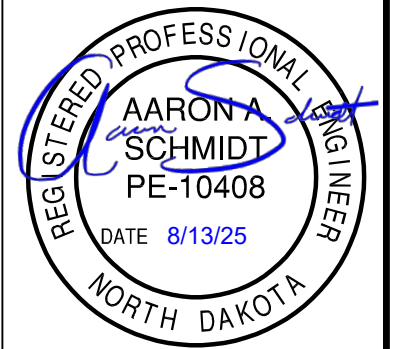
**NOTE:**  
 1. LIGHTS ARE FED FROM AN EXISTING FEEDPOINT NO. 101 LOCATED AT SOUTHWEST CORNER OF 19TH AND CENTURY AVENUE. VERIFY PRIOR TO STARTING WORK.



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- LEGEND**
- L — EXISTING CONDUCTOR & CONDUIT
  - L — EXISTING CONDUIT, NEW CONDUCTOR
  - L — NEW CONDUIT & CONDUCTOR

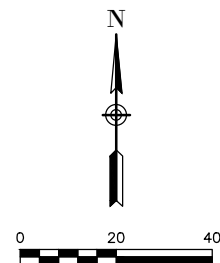
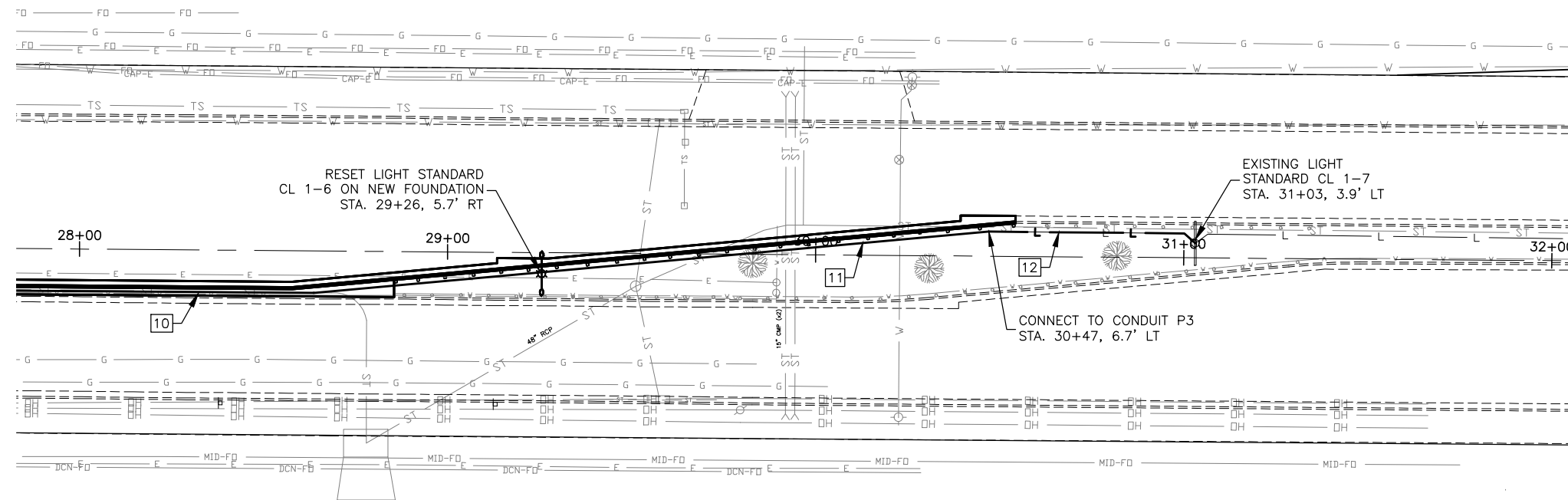


**Bismarck ENGINEERING**  
 CENTURY AVENUE  
 LIGHTING LAYOUT  
 STA 23+00 - 28+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	140	4

NOTE:

1. LIGHTS ARE FED FROM AN EXISTING FEEDPOINT NO. 101 LOCATED AT SOUTHWEST CORNER OF 19TH AND CENTURY AVENUE. VERIFY PRIOR TO STARTING WORK.



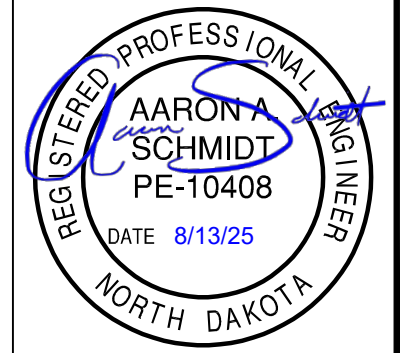
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**LEGEND**

- L — EXISTING CONDUCTOR & CONDUIT
- L — EXISTING CONDUIT, NEW CONDUCTOR
- L — NEW CONDUIT & CONDUCTOR



CENTURY AVENUE

LIGHTING LAYOUT

STA 28+00 - 32+00

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	140	5

**CABLE & CONDUIT SCHEDULE**

#	RUN			CONDUIT			CABLE					Total LF
	ITEM	STATION, OFFSET	SIZE (IN)	LF	NOTES	LF in Cond	Origin	Destination	# of Cables	SIZE/TYPE		
1	Origin	Streetlight CL 1-1	23+82, 6.0' LT	2	177		177	Streetlight CL 1-1	Streetlight CL 1-2	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	370
	Destination	Streetlight CL 1-2	25+59, 7.0' LT					Streetlight CL 1-1	Streetlight CL 1-2	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	185
2	Origin	Streetlight CL 1-2	25+59, 7.0' LT	2	8		8	Streetlight CL 1-2	Pull Box P1	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	24
	Destination	Pull Box P1	25+67, 7.0' LT					Streetlight CL 1-2	Pull Box P1	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	12
3	Origin	Pull Box P1	25+67, 7.0' LT	2	39	Existing	39	Pull Box P1	Pull Box E1	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	90
	Destination	Pull Box E1	25+67, 45.7' LT					Pull Box P1	Pull Box E1	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	45
4	Origin	Pull Box E1	25+67, 45.7' LT	2	4		4	Pull Box E1	Combo Streetlight Cl 1-3	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	28
	Destination	Combo Streetlight Cl 1-3	25+68, 48.9' LT					Pull Box E1	Combo Streetlight Cl 1-3	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	14
5	Origin	Combo Streetlight Cl 1-3	25+68, 48.9' LT	2	113		113	Combo Streetlight Cl 1-3	Combo Streetlight CL 1-4	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	242
	Destination	Combo Streetlight CL 1-4	26+83, 53.7' LT					Combo Streetlight Cl 1-3	Combo Streetlight CL 1-4	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	121
6	Origin	Existing Feedpoint #101	25+66, 68.8' RT	2	72	Existing	72	Existing Feedpoint #101	Pull Box P1	6	UNDERGROUND CONDUCTOR NO2-TYPE RHW	492
	Destination	Pull Box P1	25+67, 7.0' LT					Existing Feedpoint #101	Pull Box P1	3	UNDERGROUND CONDUCTOR NO6-TYPE THW	246
7	Origin	Pull Box P1	25+67, 7.0' LT	2	13		13	Pull Box P1	Connect to Conduit P1	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	26
	Destination	Connect to Conduit P1	25+77, 0.3' LT					Pull Box P1	Connect to Conduit P1	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	13
8	Origin	Connect to Conduit P1	25+77, 0.3' LT	2	103	Existing	103	Connect to Conduit P1	Connect to Conduit P2	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	206
	Destination	Connect to Conduit P2	26+79, 6.0' RT					Connect to Conduit P1	Connect to Conduit P2	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	103
9	Origin	Connect to Conduit P2	26+79, 6.0' RT	2	93		93	Connect to Conduit P2	Streetlight CL 1-5	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	194
	Destination	Streetlight CL 1-5	27+19, 65.0' RT					Connect to Conduit P2	Streetlight CL 1-5	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	97
10	Origin	Streetlight CL 1-5	27+19, 65.0' RT	2	260		260	Streetlight CL 1-5	Streetlight CL 1-6	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	536
	Destination	Streetlight CL 1-6	29+26, 5.7' RT					Streetlight CL 1-5	Streetlight CL 1-6	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	268
11	Origin	Streetlight CL 1-6	29+26, 5.7' RT	2	122		122	Streetlight CL 1-6	Connect to Conduit P3	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	252
	Destination	Connect to Conduit P3	30+47, 6.7' LT					Streetlight CL 1-6	Connect to Conduit P3	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	126
12	Origin	Connect to Conduit P3	30+47, 6.7' LT	2	58	Existing	58	Connect to Conduit P3	Existing Streetlight CL 1-7	2	UNDERGROUND CONDUCTOR NO2-TYPE RHW	124
	Destination	Existing Streetlight CL 1-7	31+03, 3.9' LT					Connect to Conduit P3	Existing Streetlight CL 1-7	1	UNDERGROUND CONDUCTOR NO6-TYPE THW	62

**Items shall be included in the corresponding price bid for "REVISE LIGHTING SYSTEM"**

ITEM DESCRIPTION	UNIT	QUANTITY
CONCRETE FOUNDATION-HIGHWAY LIGHTING	EA	4
PULL BOX	EA	1
2IN DIAMETER RIGID CONDUIT	LF	790
UNDERGROUND CONDUCTOR NO2-TYPE RHW	LF	2,584
UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	1,292
LT STD 6FT MA 40FT MT HT BREAKAWAY	EA	1
RELOCATE LIGHT STANDARD	EA	3
REMOVE CONDUIT	LF	429
REMOVE LIGHT STANDARD	EA	1
REMOVE PULL BOX	EA	2
REMOVE CONCRETE FOUNDATION	EA	4

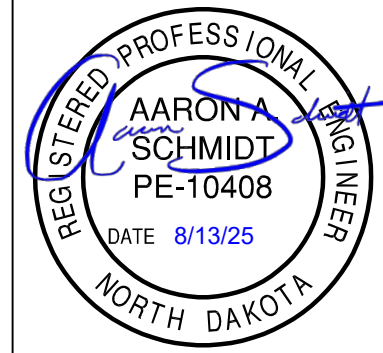
**Items shown above are approximate, not all inclusive, and for informational purposes, contractor shall provide all labor and equipment necessary for the lighting system to be fully operational as shown in the plans.**

**LIGHTING FOUNDATION TABLE**

Description	Footing Depth, "D" 24" & 30" Ø (ft)	Footing Depth, "D" 36" & 42" Ø (ft)
Light Standard		
36'-44' Mounting Height	6'	5'

**NOTES:**

- SEE STANDARD DRAWING D-770-1 FOR ADDITIONAL FOUNDATION INFORMATION.
- SEE SP 648(24) FOR LIGHT STANDARD FOUNDATION INFORMATION.



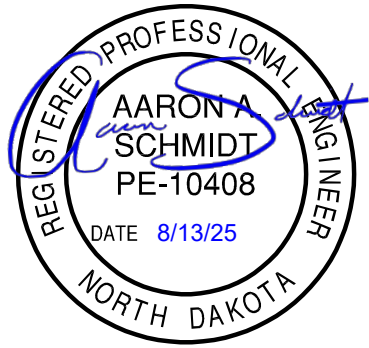
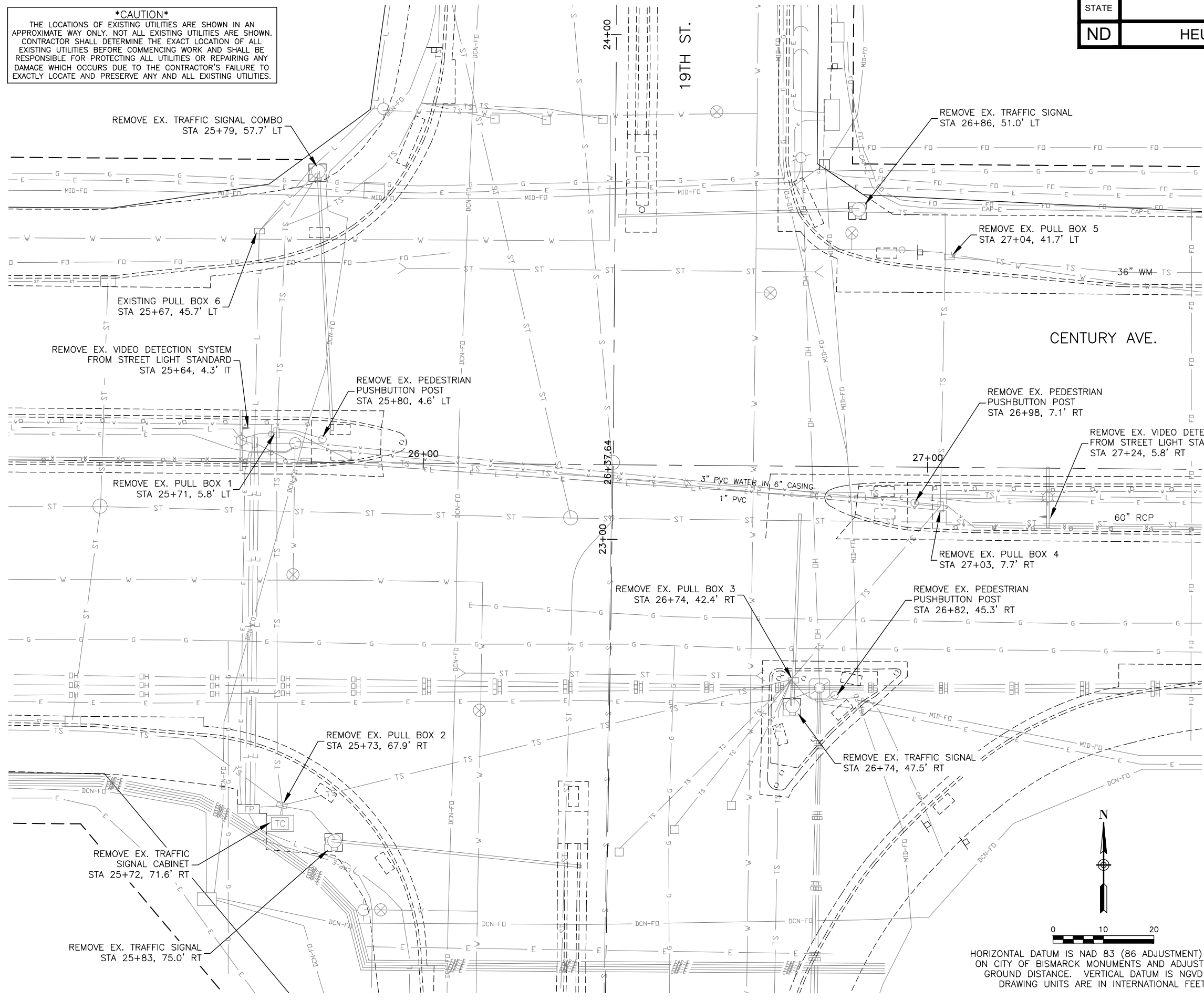
CENTURY AVENUE

LIGHTING  
CABLE & CONDUIT SCHEDULE &  
LIGHTING SYSTEM QUANTITIES

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	1

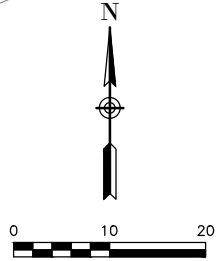
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- NOTE:**
1. STATIONING BASED OFF OF CENTURY AVENUE CENTERLINE ALIGNMENT.
  2. REMOVE EXISTING TRAFFIC SIGNAL FOUNDATIONS TO A MINIMUM DEPTH OF 3.5' BELOW SURROUNDING GRADE.



**CENTURY AVENUE**

SIGNALS  
 TRAFFIC SIGNAL REMOVALS  
 TRAFFIC SIGNAL SYSTEM

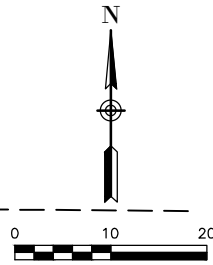


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ND	HEU-1-981(134)	23645	150	2

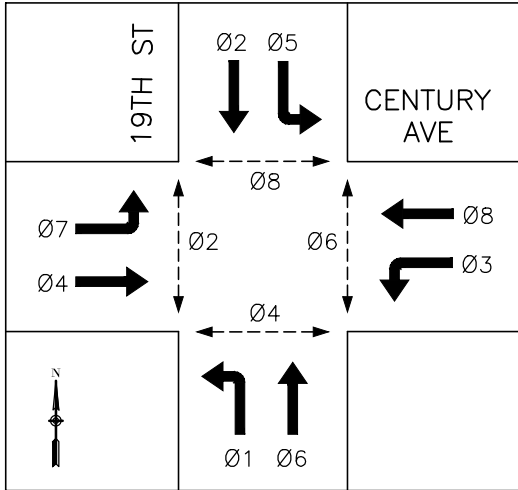
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**LEGEND**

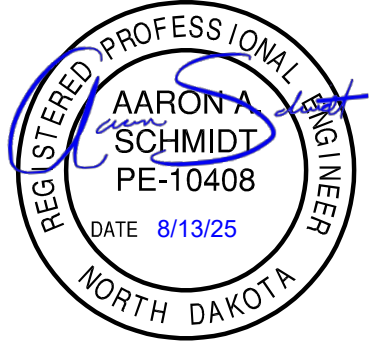
- EXISTING TRAFFIC SIGNAL FOUNDATION
- PROPOSED TRAFFIC SIGNAL POLE
- PROPOSED PEDESTRIAN PUSHBUTTON POST
- EXISTING PULL BOX
- PROPOSED PULL BOX
- PROPOSED TRAFFIC SIGNAL CONTROLLER CABINET
- SIGNAL HEAD NUMBER
- PEDESTRIAN HEAD NUMBER



**PEDESTRIAN PUSHBUTTON SCHEDULE**

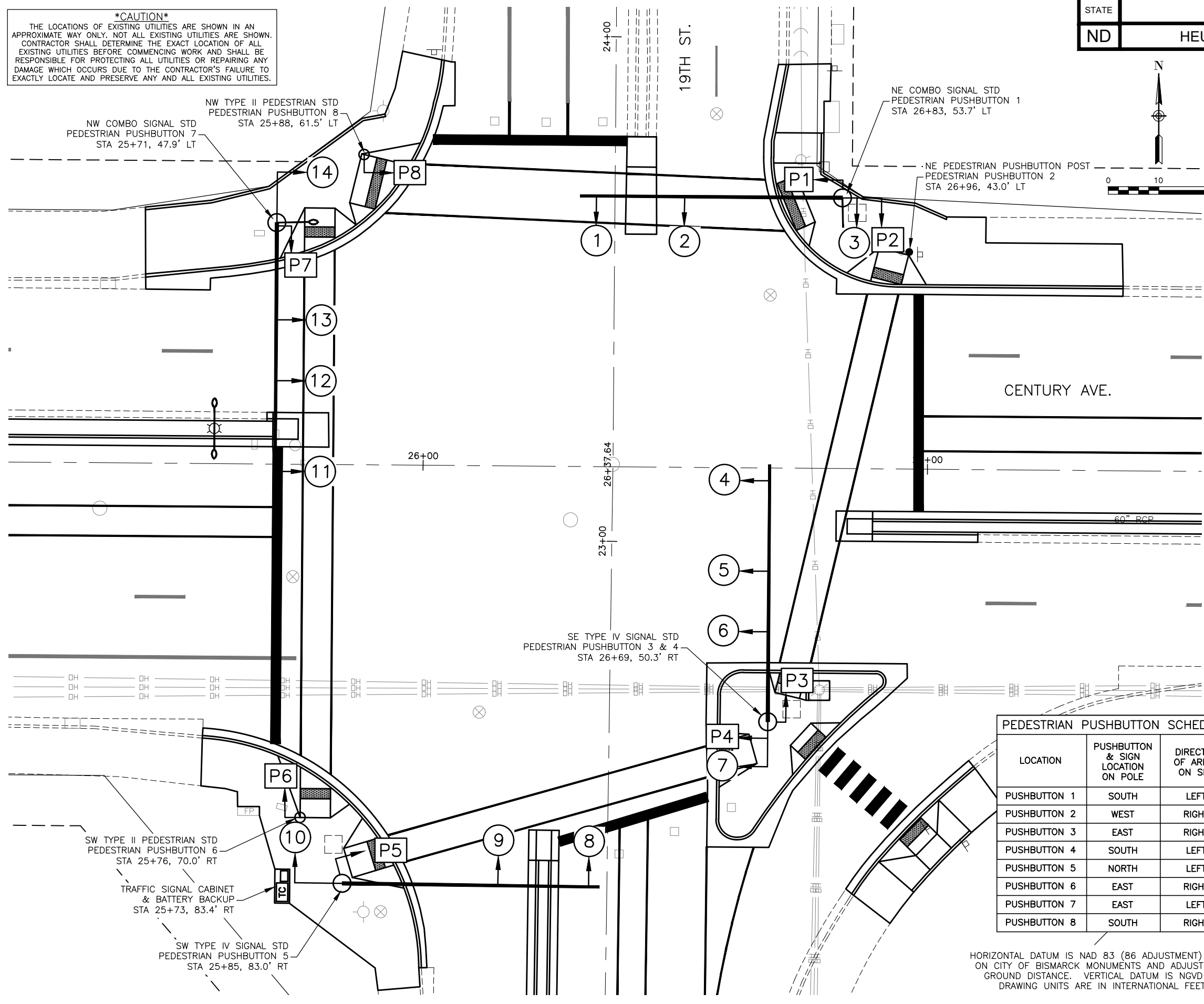
LOCATION	PUSHBUTTON & SIGN LOCATION ON POLE	DIRECTION OF ARROW ON SIGN
PUSHBUTTON 1	SOUTH	LEFT
PUSHBUTTON 2	WEST	RIGHT
PUSHBUTTON 3	EAST	RIGHT
PUSHBUTTON 4	SOUTH	LEFT
PUSHBUTTON 5	NORTH	LEFT
PUSHBUTTON 6	EAST	RIGHT
PUSHBUTTON 7	EAST	LEFT
PUSHBUTTON 8	SOUTH	RIGHT

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**CENTURY AVENUE**

SIGNALS  
 TRAFFIC SIGNAL LAYOUT  
 TRAFFIC SIGNAL SYSTEM



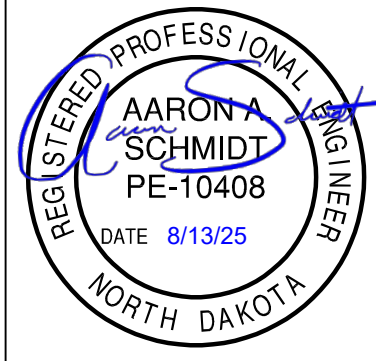
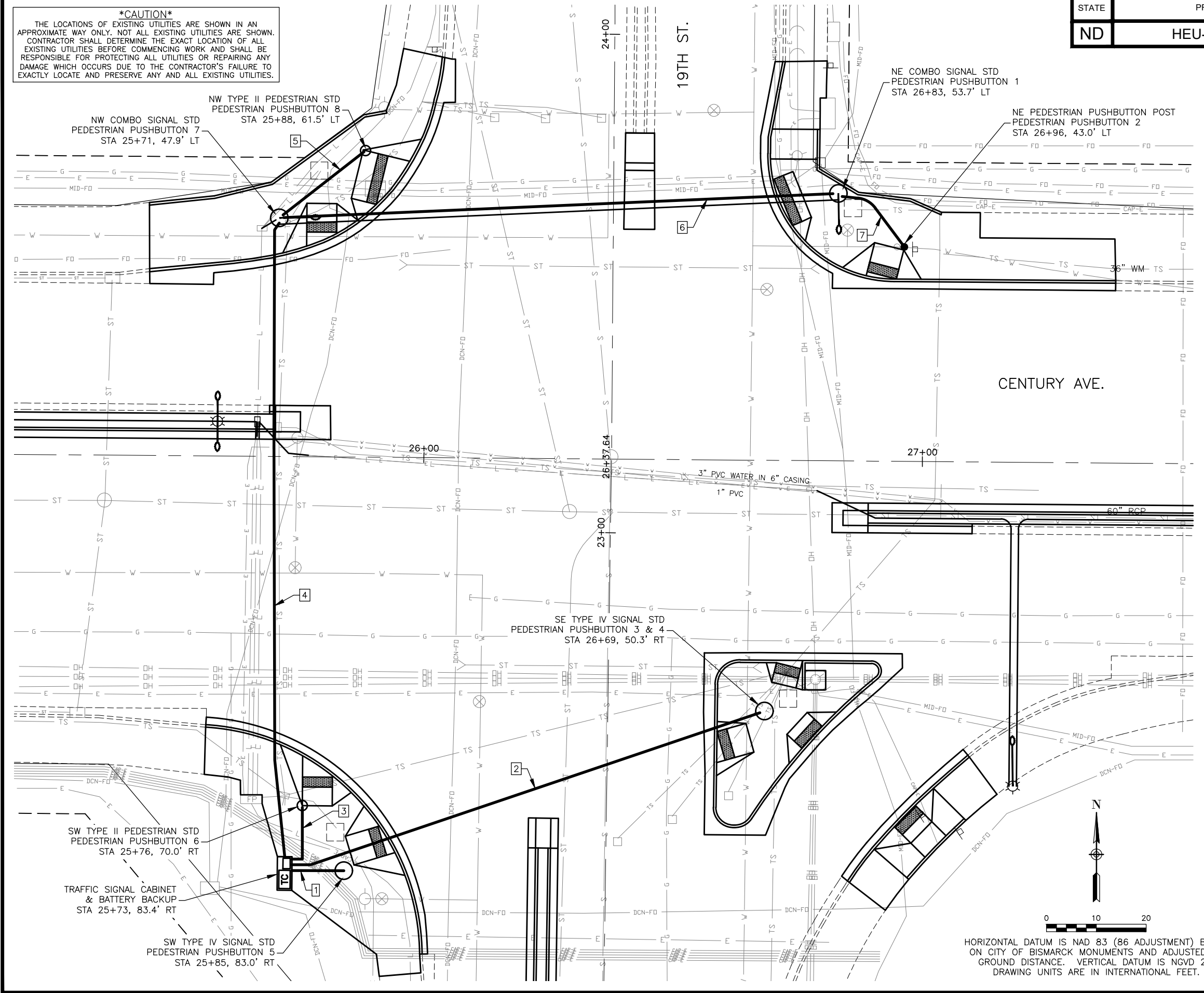
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	3

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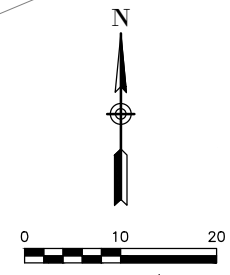
**LEGEND**

- PROPOSED TRAFFIC SIGNAL POLE
- PROPOSED PEDESTRIAN PUSHBUTTON POST
- EXISTING PULL BOX
- ▲ PROPOSED PULL BOX
- TC PROPOSED TRAFFIC SIGNAL CONTROLLER CABINET



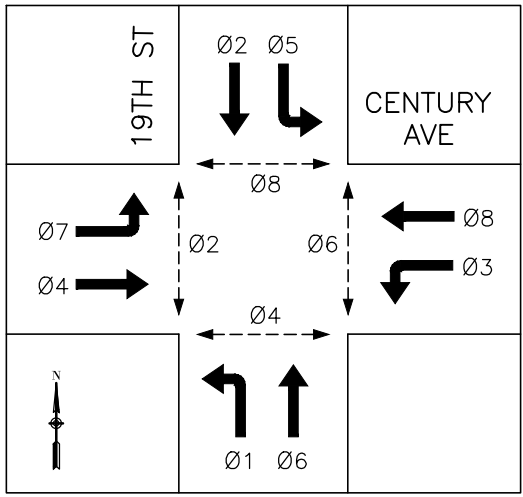
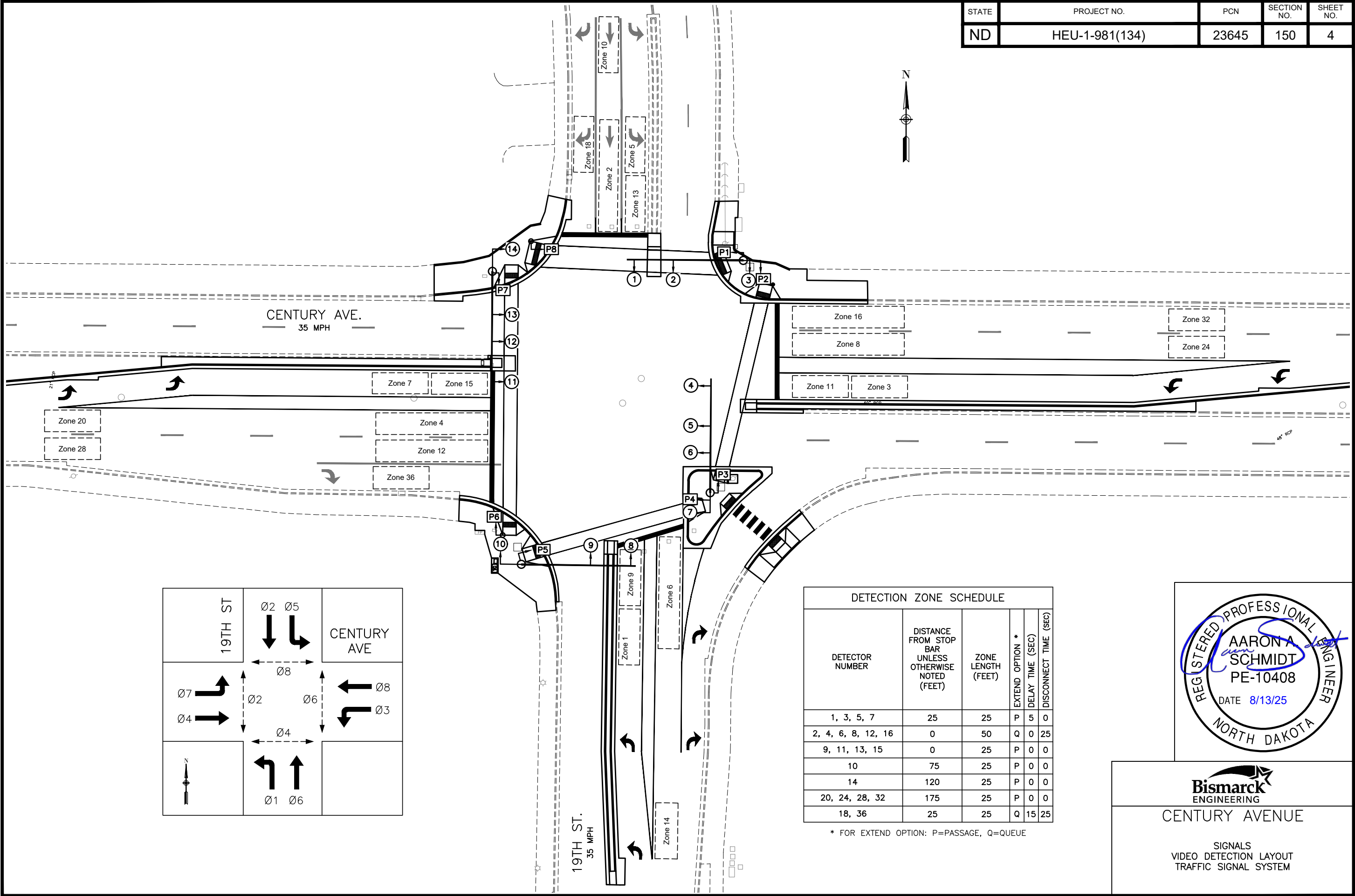
**CENTURY AVENUE**

SIGNALS  
 CONDUIT & CONDUCTOR LAYOUT  
 TRAFFIC SIGNAL SYSTEM



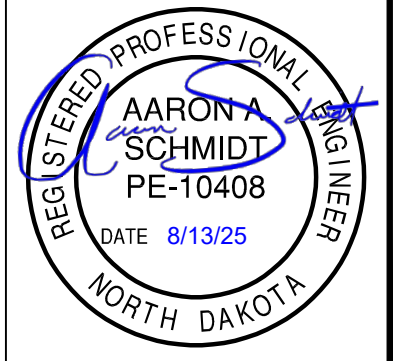
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ND	HEU-1-981(134)	23645	150	4



DETECTOR NUMBER	DISTANCE FROM STOP BAR UNLESS OTHERWISE NOTED (FEET)	ZONE LENGTH (FEET)	EXTEND OPTION *	DELAY TIME (SEC)	DISCONNECT TIME (SEC)
1, 3, 5, 7	25	25	P	5	0
2, 4, 6, 8, 12, 16	0	50	Q	0	25
9, 11, 13, 15	0	25	P	0	0
10	75	25	P	0	0
14	120	25	P	0	0
20, 24, 28, 32	175	25	P	0	0
18, 36	25	25	Q	15	25

\* FOR EXTEND OPTION: P=PASSAGE, Q=QUEUE

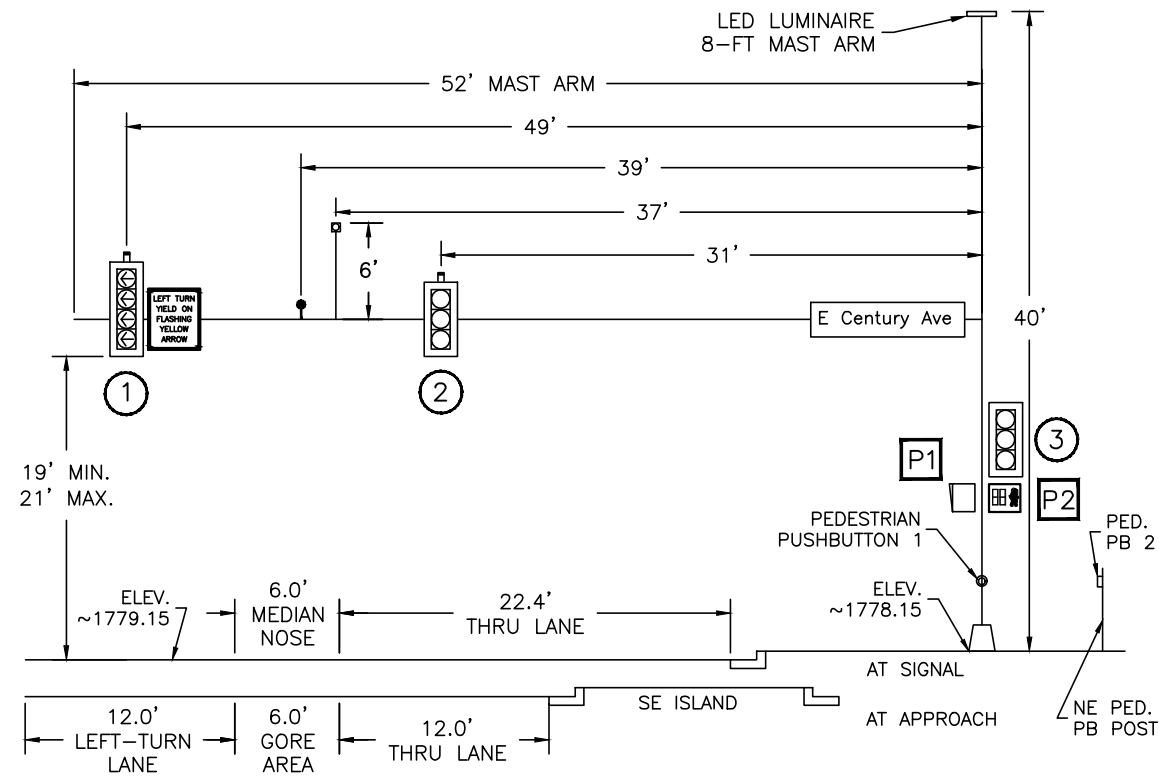


**Bismarck ENGINEERING**

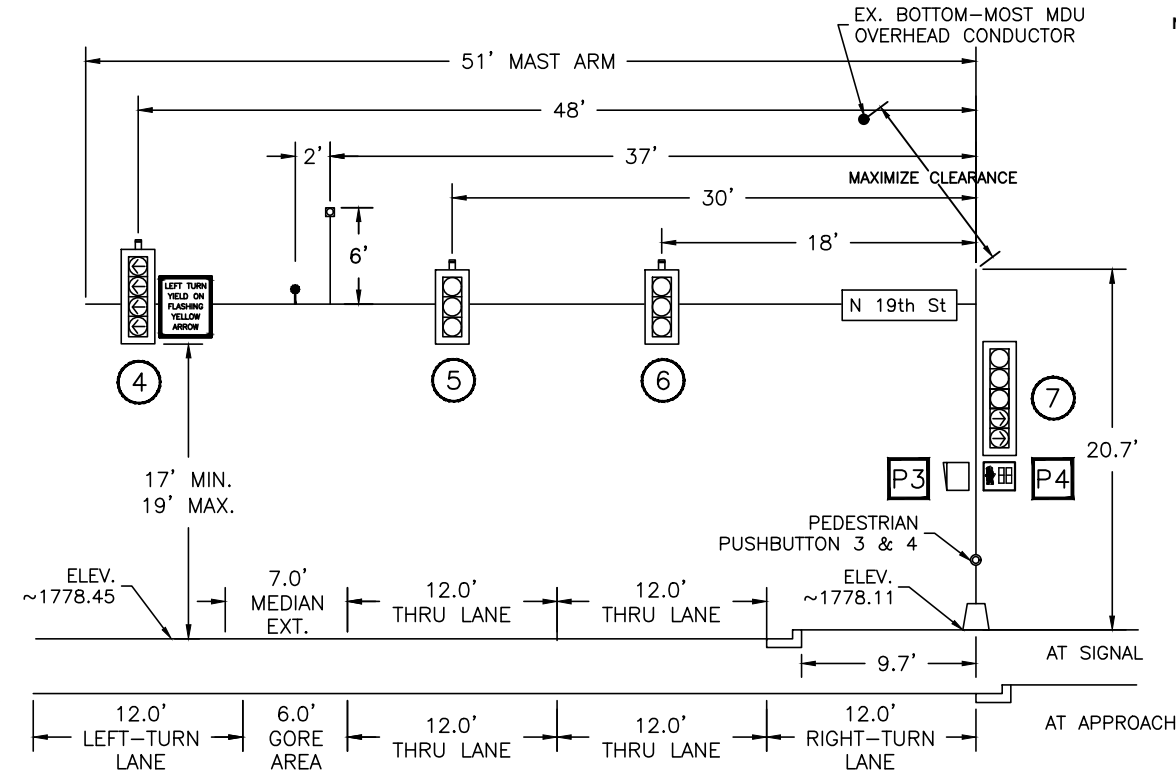
CENTURY AVENUE

SIGNALS  
VIDEO DETECTION LAYOUT  
TRAFFIC SIGNAL SYSTEM

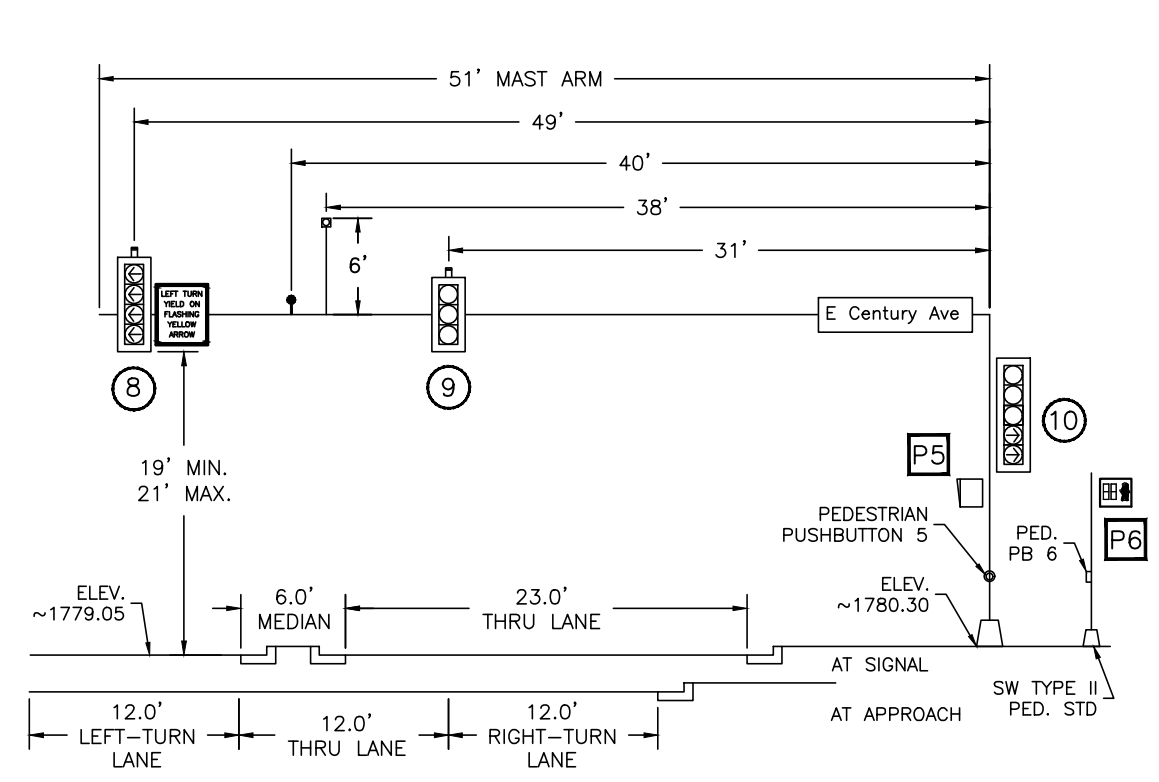
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	5



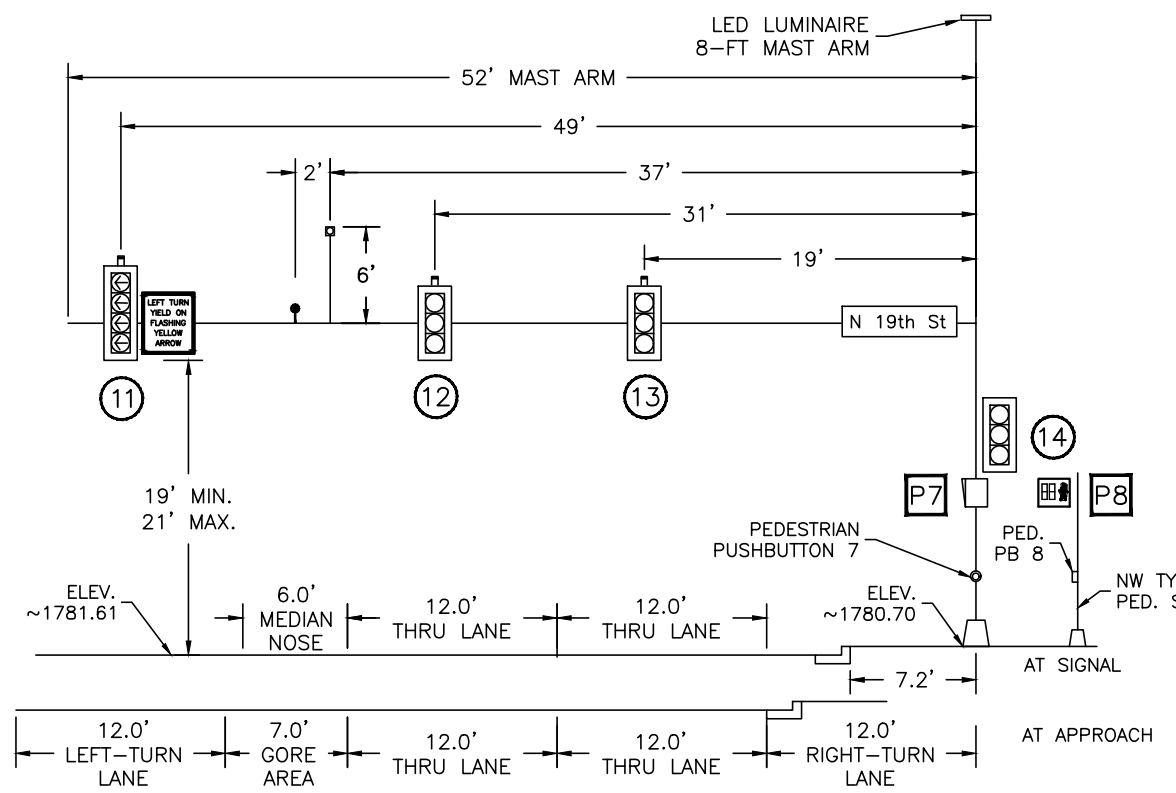
NE COMBO SIGNAL STD - NORTHBOUND



SE TYPE IV SIGNAL STD - EASTBOUND



SW TYPE IV SIGNAL STD - SOUTHBOUND



NW COMBO SIGNAL STD - WESTBOUND

- NOTES:
1. THE FINAL LOCATION OF THE VIDEO DETECTION CAMERAS SHALL BE DETERMINED BY THE CONTRACTOR TO PROVIDE A FUNCTIONAL SYSTEM.
  2. PROPOSED CONFIGURATION SHOWN FOR THE INSTALLATION OF THE TRAFFIC SIGNAL SYSTEM
  3. LOCATION OF SIGNALS IS BASED OFF OF CENTURY AVENUE CENTERLINE ALIGNMENT
  4. SIGNAL LAYOUTS ARE NOT TO SCALE.

**LEGEND**

- SIGNS
- SIGNAL HEADS
- LAW ENFORCEMENT CONFIRMATION LIGHT
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE DETECTION UNIT
- SIGNAL HEAD NUMBER
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN HEAD NUMBER
- PEDESTRIAN PUSHBUTTON



**Bismarck ENGINEERING**

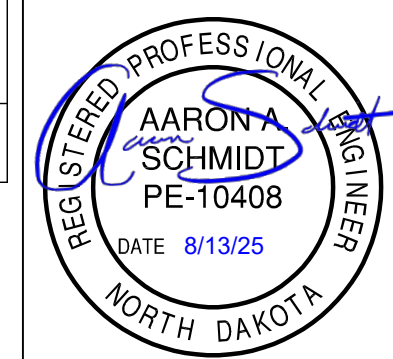
CENTURY AVENUE


SIGNALS  
TRAFFIC SIGNAL PROFILES  
TRAFFIC SIGNAL SYSTEM

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	6

**CABLE & CONDUIT SCHEDULE**

#	RUN			CONDUIT			CABLE						
	ITEM	STATION, OFFSET		SIZE (IN)	LF	NOTES	LF in Cond	Origin	Destination	# of Cables	SIZE/TYPE	Total LF	TITLE
1	Origin	Traffic Signal Cabinet	25+73, 83.4' RT	2	11		11	Traffic Signal Cabinet	Southwest Type IV Signal Std	1	14 AWG 12 CONDUCTOR CABLE	25	SWS Cable 1
	Destination	Southwest Type IV Signal Std	25+85, 83.0' RT					Traffic Signal Cabinet	Southwest Type IV Signal Std	1	14 AWG 12 CONDUCTOR CABLE	25	SWS Cable 2
								Traffic Signal Cabinet	Southwest Video Detection Unit	1	VIDEO DETECTION CABLE	87	Video
								Traffic Signal Cabinet	Southwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	88	EVP
								Traffic Signal Cabinet	Southwest Emergency Preemption Lamp	1	14 AWG 3 CONDUCTOR CABLE	88	EVP Lamp
								Traffic Signal Cabinet	Pedestrian Pushbutton 5	1	16 AWG 3 CONDUCTOR CABLE	28	PB4
								Traffic Signal Cabinet	Southwest Type IV Signal Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	25	Tracer Wire
2	Origin	Traffic Signal Cabinet	25+73, 83.4' RT	2	100		100	Traffic Signal Cabinet	Southeast Type IV Signal Std	1	14 AWG 12 CONDUCTOR CABLE	114	SES Cable 1
	Destination	Southeast Type IV Signal Std	26+69, 50.3' RT					Traffic Signal Cabinet	Southeast Type IV Signal Std	1	14 AWG 12 CONDUCTOR CABLE	114	SES Cable 2
								Traffic Signal Cabinet	Southeast Video Detection Unit	1	VIDEO DETECTION CABLE	175	Video
								Traffic Signal Cabinet	Southeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	176	EVP
								Traffic Signal Cabinet	Southeast Emergency Preemption Lamp	1	14 AWG 3 CONDUCTOR CABLE	176	EVP Lamp
								Traffic Signal Cabinet	Pedestrian Pushbuttons 3 & 4	2	16 AWG 3 CONDUCTOR CABLE	250	PB3 & PB4
								Traffic Signal Cabinet	Southeast Type IV Signal Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	114	Tracer wire
3	Origin	Traffic Signal Cabinet	25+73, 83.4' RT	2	13		13	Traffic Signal Cabinet	Southwest Type II Ped. Std	1	14 AWG 7 CONDUCTOR CABLE	37	SWS Cable 3
	Destination	Southwest Type II Ped. Std	25+76, 70.0' RT					Traffic Signal Cabinet	Pedestrian Pushbutton 6	1	16 AWG 3 CONDUCTOR CABLE	30	PB6
								Traffic Signal Cabinet	Southwest Type II Ped. Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	37	Tracer Wire
4	Origin	Traffic Signal Cabinet	25+73, 83.4' RT	3	128		128	Traffic Signal Cabinet	Northwest Combo Signal Std	2	14 AWG 12 CONDUCTOR CABLE	284	NWS Cable 1, NES Cable 1
	Destination	Northwest Combo Signal Std	25+71, 47.9' LT					Traffic Signal Cabinet	Northwest Combo Signal Std	2	14 AWG 7 CONDUCTOR CABLE	284	NWS Cable 2, NES Cable 2
								Traffic Signal Cabinet	Northwest Video Detection Unit	1	VIDEO DETECTION CABLE	203	Video NWS
								Traffic Signal Cabinet	Northwest Combo Signal Std	1	VIDEO DETECTION CABLE	142	Video NES
								Traffic Signal Cabinet	Northwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	204	EVP NWS
								Traffic Signal Cabinet	Northwest Combo Signal Std	1	EMERGENCY VEHICLE DETECTOR CABLE	142	EVP NES
								Traffic Signal Cabinet	Northwest Emergency Preemption Lamp	1	14 AWG 3 CONDUCTOR CABLE	204	EVP Lamp NWS
								Traffic Signal Cabinet	Northwest Combo Signal Std	1	14 AWG 3 CONDUCTOR CABLE	142	EVP lamp NES
								Traffic Signal Cabinet	Pedestrian Pushbuttons 1, 2, 7, & 8	4	16 AWG 3 CONDUCTOR CABLE	612	PB1, PB2, PB7, PB8
								Traffic Signal Cabinet	Northwest Combo Signal Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	142	Tracer wire
5	Origin	Northwest Combo Signal Std	25+71, 47.9' LT	2	21		21	Northwest Combo Signal Std	Northwest Type II Ped. Std	1	14 AWG 7 CONDUCTOR CABLE	41	NWS Cable 3
	Destination	Northwest Type II Ped. Std	25+88, 61.5' LT					Northwest Combo Signal Std	Pedestrian Pushbutton 8	1	16 AWG 3 CONDUCTOR CABLE	34	PB8
								Northwest Combo Signal Std	Northwest Type II Ped. Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	41	Tracer Wire
6	Origin	Northwest Combo Signal Std	25+71, 47.9' LT	2	111		111	Northwest Combo Signal Std	Northeast Combo Signal Std	1	14 AWG 12 CONDUCTOR CABLE	121	NES Cable 1
	Destination	Northeast Combo Signal Std	26+83, 53.7' LT					Northwest Combo Signal Std	Northeast Combo Signal Std	1	14 AWG 7 CONDUCTOR CABLE	121	NES Cable 2
								Northwest Combo Signal Std	Northeast Video Detection Unit	1	VIDEO DETECTION CABLE	182	Video
								Northwest Combo Signal Std	Northeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	183	EVP
								Northwest Combo Signal Std	Northeast Emergency Preemption Lamp	1	14 AWG 3 CONDUCTOR CABLE	183	EVP Lamp
								Northwest Combo Signal Std	Pedestrian Pushbuttons 1 & 2	2	16 AWG 3 CONDUCTOR CABLE	264	PB1 & PB2
								Northwest Combo Signal Std	Northeast Combo Signal Std	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	121	Tracer Wire
7	Origin	Northeast Combo Signal Std	26+83, 53.7' LT	2	17		17	Northeast Combo Signal Std	Northeast Pedestrian PB Post	1	16 AWG 3 CONDUCTOR CABLE	37	PB2
	Destination	Northeast Pedestrian PB Post	26+96, 43.0' LT					Northeast Combo Signal Std	Northeast Pedestrian PB Post	1	UNDERGROUND CONDUCTOR NO14-TYPE THW	37	Tracer Wire

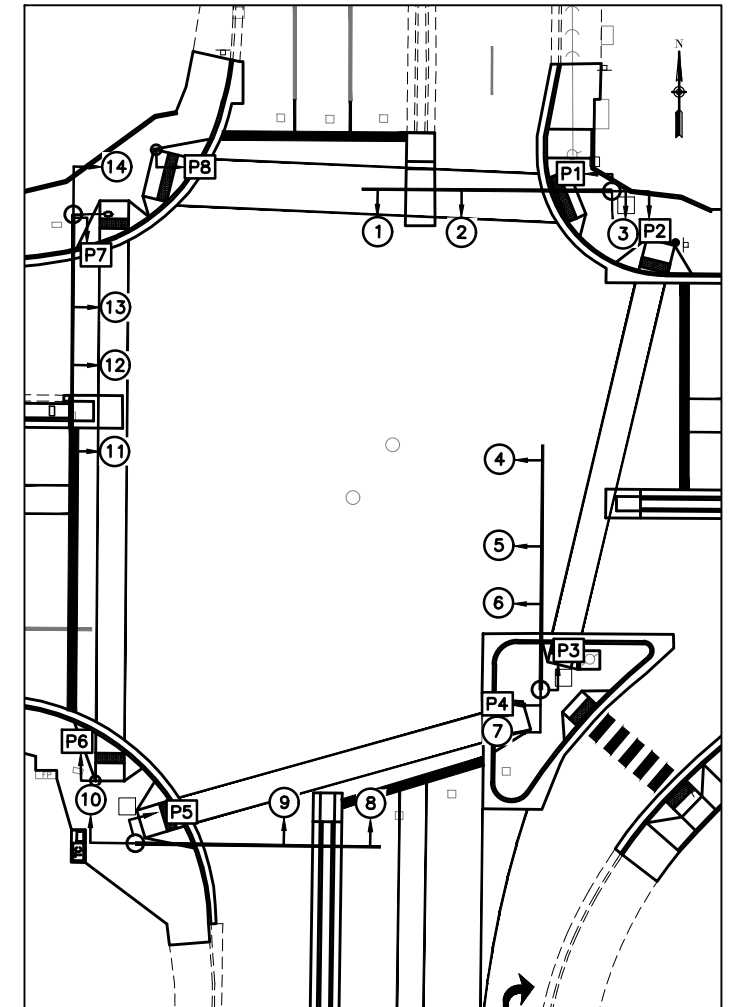


  
**Bismarck**  
 ENGINEERING  
 CENTURY AVENUE  
 SIGNALS  
 CABLE AND CONDUIT SCHEDULE  
 TRAFFIC SIGNAL SYSTEM

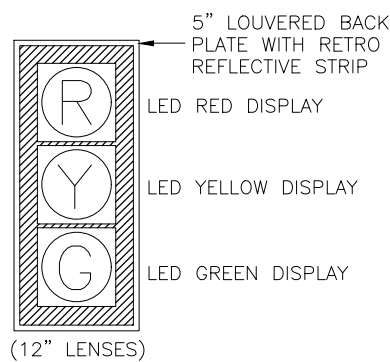
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	7

Conductor		SWS Cable 1 (Southwest Type IV Signal) (12 No. 14 AWG)		SWS Cable 2 (Southwest Type IV Signal) (12 No. 14 AWG)		SWS Cable 3 (Southwest Type II Ped Signal) (7 No. 14 AWG)		NWS Cable 1 (Northwest Combo Signal) (12 No. 14 AWG)		NWS Cable 2 (Northwest Type II Ped Signal) (12 No. 14 AWG)		NWS Cable 3 (Northwest Type II Ped Signal) (7 No. 14 AWG)		
Base	Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication	
1	Black		Spare	P5	Ø4 Walk		Spare		Spare	P7	Ø2 Walk		Spare	
2	White		Neutral		Neutral		Neutral		Neutral		Neutral		Neutral	
3	Red	9, 10	Ø2 Red	P5	Ø4 Don't Walk		Spare	12, 13, 14	Ø8 Red	P7	Ø2 Don't Walk		Spare	
4	Green		Ground		Ground		Ground		Ground		Ground		Ground	
5	Orange	9, 10	Ø2 Yellow		Spare	P6	Ø2 Walk	12, 13, 14	Ø8 Yellow		Spare	P8	Ø8 Walk	
6	Blue	9, 10	Ø2 Green		Spare	P6	Ø2 Don't Walk	12, 13, 14	Ø8 Green		Spare	P8	Ø8 Don't Walk	
7	White	Black	Spare		Spare		Spare		Spare		Spare		Spare	
8	Red	Black	Spare	8	Ø5 Red ←	X		11	Ø3 Red ←	X		X		
9	Green	Black	Spare		Spare			11	Ø3 Yellow ←					
10	Orange	Black	10	Ø7 Yellow →	8			Ø5 Yellow ←	11					Ø3 Green ←
11	Blue	Black	10	Ø7 Green →	8			Ø5 Green ←	11					Ø3 Green ←
12	Black	White	Spare	8	Ø6 FYA ←			11	Ø4 FYA ←					

Conductor		NES Cable 1 (Northeast Combo Signal) (12 No. 14 AWG)		NES Cable 2 (Northeast Combo Signal) (7 No. 14 AWG)		SES Cable 1 (Southeast Type IV Signal) (12 No. 14 AWG)		SES Cable 2 (Southeast Type IV Signal) (12 No. 14 AWG)		
Base	Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication	
1	Black		Spare	P1	Ø8 Walk		Spare	P4	Ø4 Walk	
2	White		Neutral		Neutral		Neutral		Neutral	
3	Red	2, 3	Ø6 Red	P1	Ø8 Don't Walk	5, 6, 7	Ø4 Red	P4	Ø4 Don't Walk	
4	Green		Ground		Ground		Ground		Ground	
5	Orange	2, 3	Ø6 Yellow	P2	Ø6 Walk	5, 6, 7	Ø4 Yellow	P3	Ø6 Walk	
6	Blue	2, 3	Ø6 Green	P2	Ø6 Don't Walk	5, 6, 7	Ø4 Green	P3	Ø6 Don't Walk	
7	White	Black	Spare		Spare		Spare		Spare	
8	Red	Black	1	Ø1 Red ←	X			4	Ø7 Red ←	
9	Green	Black	Spare				Spare		4	Ø7 Spare
10	Orange	Black	1	Ø1 Yellow ←			7	Ø1 Yellow →	4	Ø7 Yellow ←
11	Blue	Black	1	Ø1 Green ←			7	Ø1 Green →	4	Ø7 Green ←
12	Black	White	1	Ø2 FYA ←		Spare		4	Ø8 FYA ←	

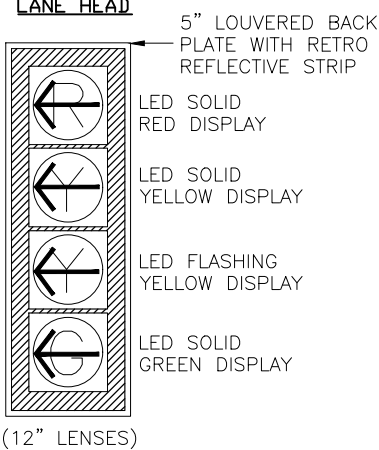


**3 SECTION HEAD**



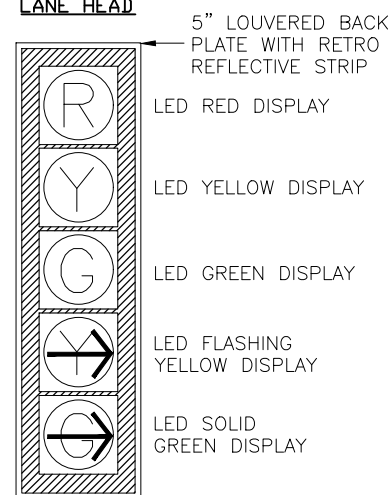
HEADS: 2, 3, 5, 6, 9, 12, 13, 14

**4 SECTION LEFT-TURN LANE HEAD**



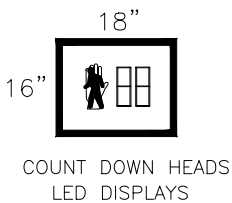
HEADS: 1, 4, 8, 11

**5 SECTION RIGHT-TURN LANE HEAD**

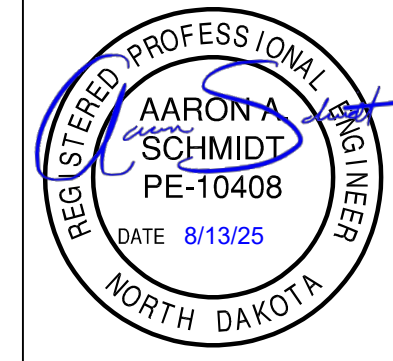
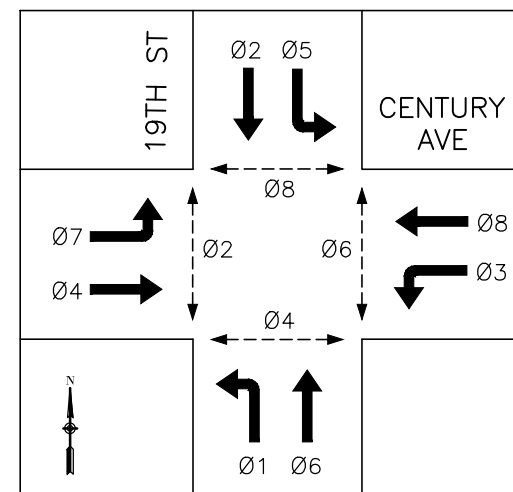


HEADS: 7, 10

**PEDESTRIAN HEAD**



HEADS: P1, P2, P3, P4, P5, P6, P7, P8



CENTURY AVENUE

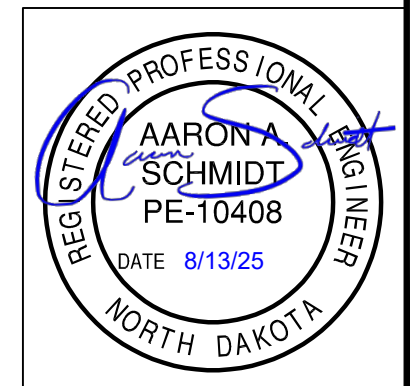
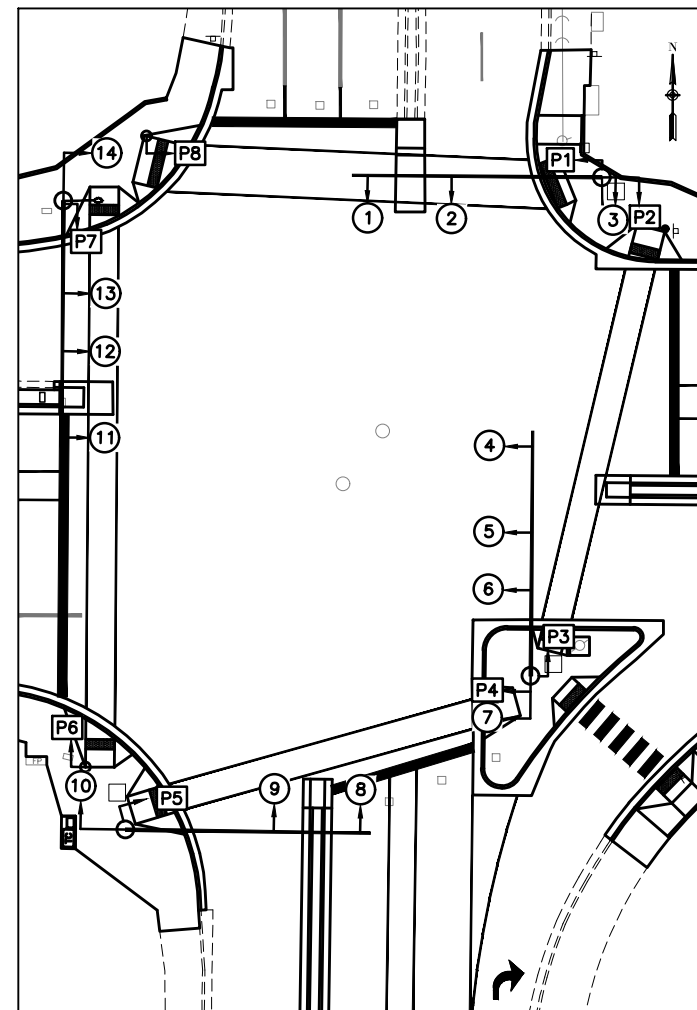
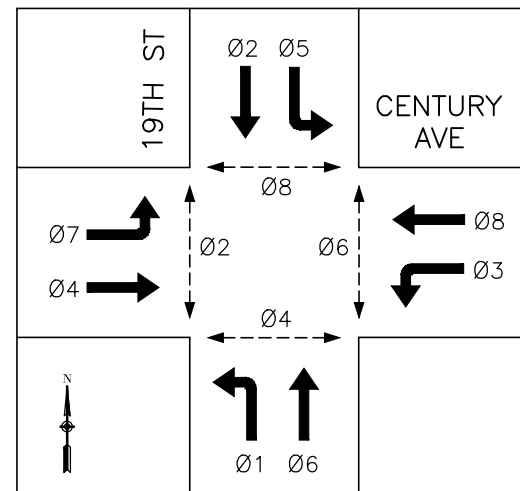
SIGNALS  
SIGNAL HEAD CABLE CONNECTIONS  
TRAFFIC SIGNAL SYSTEM

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	8

SIGNAL INDICATIONS & PHASING	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
	NB Left	SB Thru	WB Left	EB Thru	SB Left	NB Thru	EB Left	WB Thru
Concurrent Phase	5, 6	5, 6	7, 8	7, 8	1, 2	1, 2	3, 4	3, 4
<b>BASIC TIMINGS (seconds)</b>								
Minimum Green	5.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Vehicle Extension Time	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Maximum Green (Max1)	20.0	60.0	20.0	45.0	20.0	60.0	20.0	45.0
Yellow Change	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Red Clearance	3.0	3.0	2.9	2.9	3.0	3.0	2.9	2.9
Pedestrian Walk *		7.0		7.0		7.0		7.0
Pedestrian Clearance *		30.0		20.0		23.0		23.0
Emergency Vehicle Preemption	X	X	X	X	X	X	X	X

NB = Northbound (19th St)  
 SB = Southbound (19th St)  
 EB = Eastbound (Century Ave)  
 WB = Westbound (Century Ave)

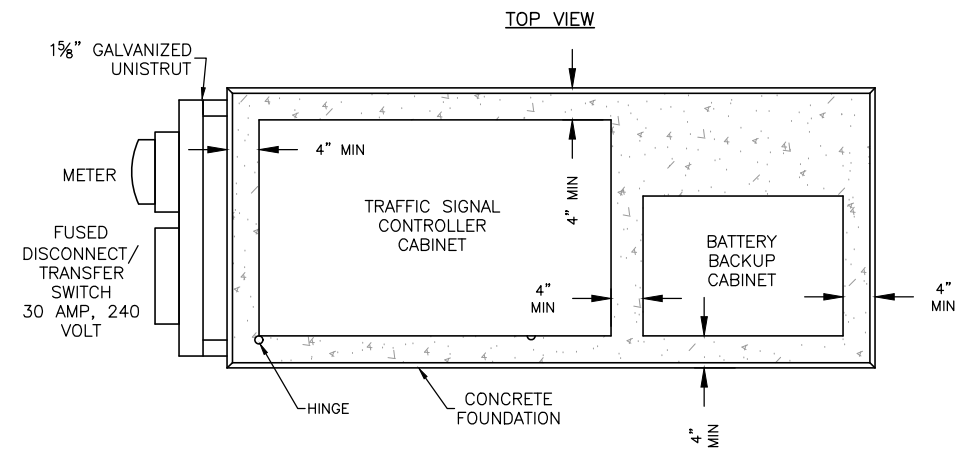
\* Upon pedestrian actuation only



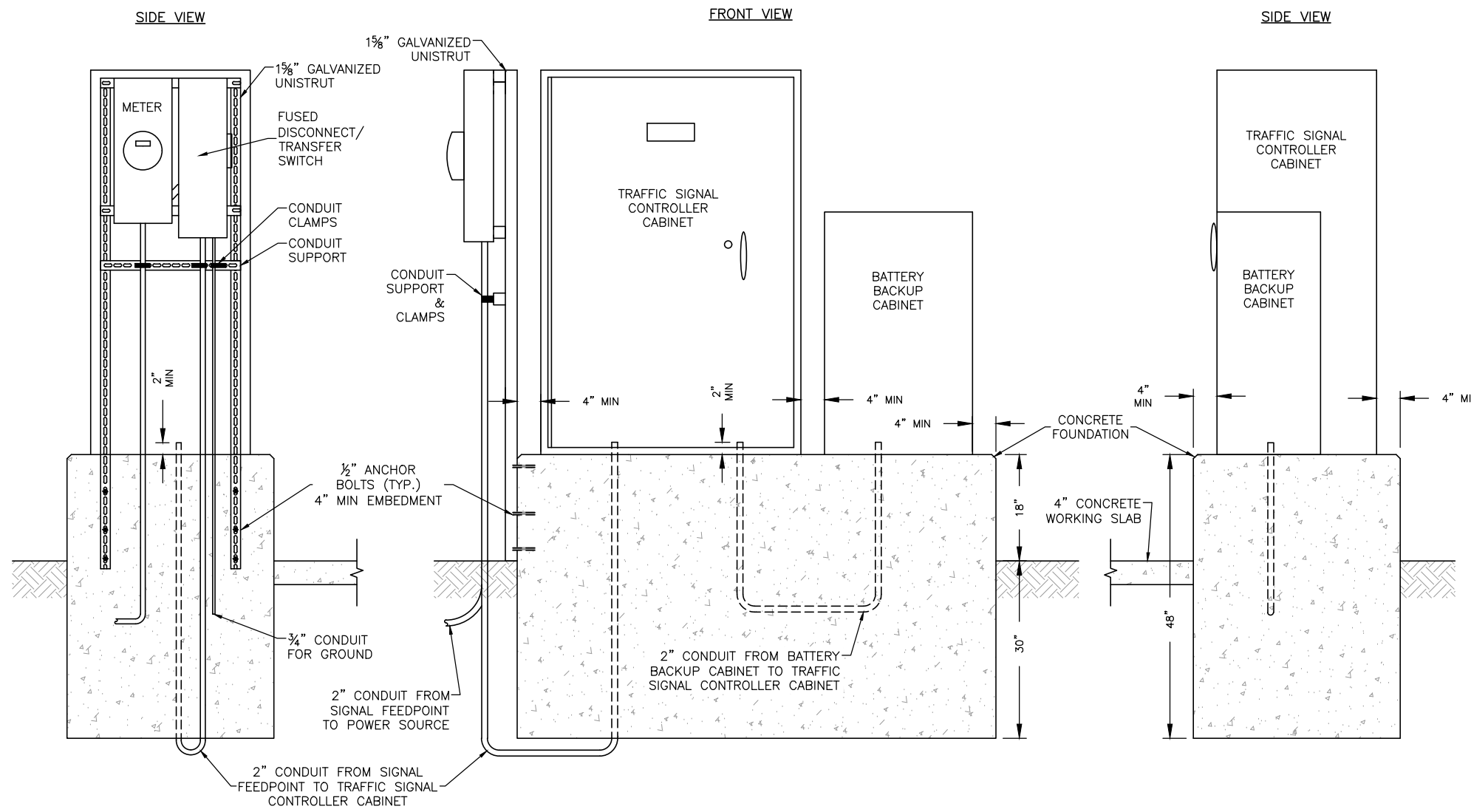
CENTURY AVENUE

SIGNALS  
 SIGNAL TIMING LAYOUT  
 TRAFFIC SIGNAL SYSTEM

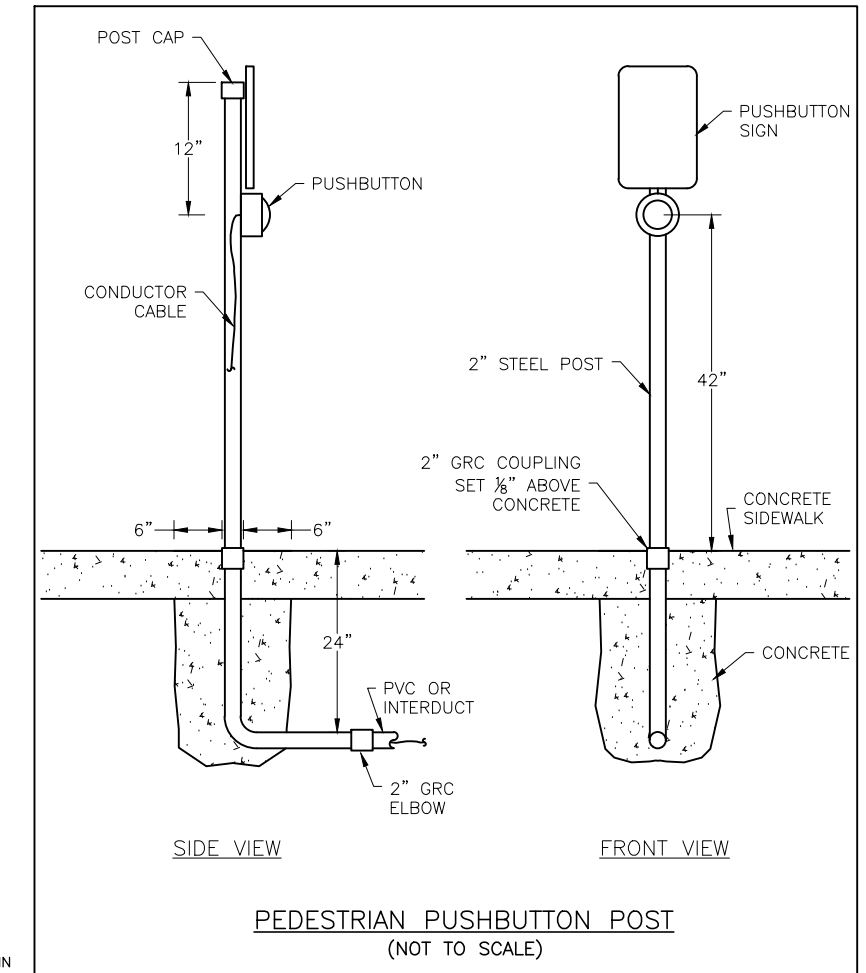
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	9



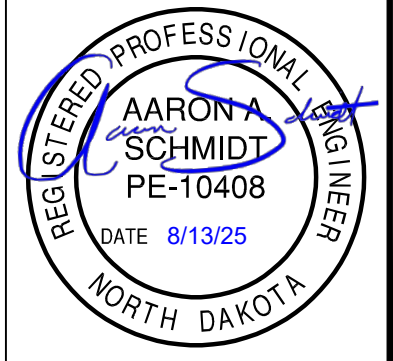
- NOTES:
1. RACK IS CONSTRUCTED FROM 1/8" UNISTRUT.
  2. RACK HAS A MINIMUM OF TWO CROSS BRACES.
  3. RACK SHALL BE ATTACHED TO THE CABINET CONCRETE FOOTING UTILIZING MINIMUM THREE - 1/2" GALVANIZED ANCHOR BOLTS PER LEG.
  4. CONDUIT ENTRANCE INTO CONTROLLER CABINET MUST BE COMPLETED UNDERGROUND (ENTRANCE INTO THE SIDE OF THE CONTROLLER CABINET IS NOT PERMITTED).
  5. METER AND TRANSFER SWITCH SHALL BE PLACED ON THE WEST SIDE AND SHALL NOT INHIBIT THE FULL OPERATION OF THE DOOR.
  6. PLACE THE HINGE ON THE LEFT SIDE OF THE CABINET.



TRAFFIC SIGNAL CONTROLLER CABINET (NOT TO SCALE)



PEDESTRIAN PUSHBUTTON POST (NOT TO SCALE)



**Bismarck ENGINEERING**  
CENTURY AVENUE  
SIGNALS CONTROLLER CABINET & PEDESTRIAN PUSHBUTTON POST DETAILS  
TRAFFIC SIGNAL SYSTEM

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	HEU-1-981(134)	23645	150	10

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	72
	Vehicle Head 2	1	14 AWG 5 CONDUCTOR CABLE	54
	Vehicle Head 3	1	14 AWG 5 CONDUCTOR CABLE	15
	Pedestrian Head P1	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Head P2	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbutton 1	1	16 AWG 3 CONDUCTOR CABLE	8
Northeast Pedestrian PB Post	Pedestrian Pushbutton 2	1	16 AWG 3 CONDUCTOR CABLE	8
Southeast Type IV Signal Std Transformer Base	Vehicle Head 4	1	14 AWG 7 CONDUCTOR CABLE	71
	Vehicle Head 5	1	14 AWG 5 CONDUCTOR CABLE	53
	Vehicle Head 6	1	14 AWG 5 CONDUCTOR CABLE	41
	Vehicle Head 7	1	14 AWG 7 CONDUCTOR CABLE	15
	Pedestrian Head P3	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Head P4	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbuttons 3 & 4	2	16 AWG 3 CONDUCTOR CABLE	32
Southwest Type IV Signal Std Transformer Base	Vehicle Head 8	1	14 AWG 7 CONDUCTOR CABLE	72
	Vehicle Head 9	1	14 AWG 5 CONDUCTOR CABLE	54
	Vehicle Head 10	1	14 AWG 7 CONDUCTOR CABLE	15
	Pedestrian Head P5	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbutton 5	1	16 AWG 3 CONDUCTOR CABLE	8
Southwest Type II Ped Std Transformer Base	Pedestrian Head P6	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbutton 6	1	16 AWG 3 CONDUCTOR CABLE	8
Northwest Combo Signal Std Transformer Base	Vehicle Head 11	1	14 AWG 7 CONDUCTOR CABLE	72
	Vehicle Head 12	1	14 AWG 5 CONDUCTOR CABLE	54
	Vehicle Head 13	1	14 AWG 5 CONDUCTOR CABLE	42
	Vehicle Head 14	1	14 AWG 5 CONDUCTOR CABLE	15
	Pedestrian Head P7	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbutton 7	1	16 AWG 3 CONDUCTOR CABLE	8
Northwest Type II Ped Std Transformer Base	Pedestrian Head P8	1	14 AWG 5 CONDUCTOR CABLE	12
	Pedestrian Pushbutton 8	1	16 AWG 3 CONDUCTOR CABLE	8

\*Approximate length shown is from Terminal Block in Hand Hole to Device

Items shall be included in the corresponding price bid for "TRAFFIC SIGNAL SYSTEM - SITE 1"

ITEM DESCRIPTION	UNIT	QUANTITY
CONCRETE FOUNDATION-TRAFFIC SIGNALS	EA	7
2-INCH CONDUIT	LF	273
3-INCH CONDUIT	LF	128
EMERGENCY VEHICLE DETECTOR CABLE	LF	801
NO14 AWG 5 CONDUCTOR CABLE	LF	418
NO14 AWG 7 CONDUCTOR CABLE	LF	812
NO14 AWG 12 CONDUCTOR CABLE	LF	683
NO16 AWG 3 CONDUCTOR CABLE	LF	1,335
NO14 AWG 3 CONDUCTOR CABLE	LF	746
UNDERGROUND CONDUCTOR NO14-TYPE THW	LF	517
TYPE II SIGNAL STD	EA	2
TYPE IV SIGNAL STD 51FT MA	EA	2
COMBO 52FT MA SIG & LT STD-TYPE C	EA	2
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	4
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	6
1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	EA	4
PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	EA	8
PEDESTRIAN PUSHBUTTON POST	EA	1
PEDESTRIAN PUSHBUTTON & SIGN	EA	8
LAW ENFORCEMENT CONFIRMATION LIGHT	EA	10
VIDEO DETECTION CABLE	LF	801
VIDEO DETECTION SYSTEM - 4 WAY	LS	1
TYPE B CONTROLLER & CABINET	EA	1
BATTERY BACKUP SYSTEM & CABINET	EA	1
EMERGENCY VEHICLE PRE-EMPTION UNIT SYSTEM	EA	1
UTILITY SERVICE & FEEDPOINT	EA	1
REMOVE PULL BOX	EA	5
REMOVE PEDESTRIAN PUSHBUTTON POST	EA	3
REMOVE TRAFFIC SIGNAL POLE & MA	EA	4
REMOVE CONCRETE FOUNDATION - SIGNALS & CABINET	EA	5

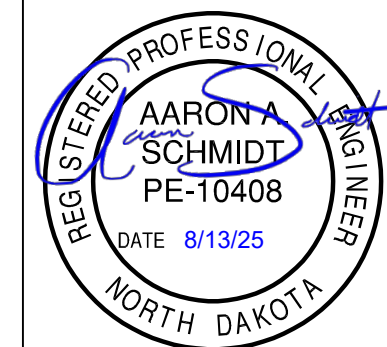
All quantities are approximate and shall be verified by the contractor.

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

TRAFFIC SIGNAL FOUNDATION TABLE (USE FOR SINGLE MAST ARMS ONLY)		
Description	Footing Depth, "D" 24" & 30" Ø (ft)	Footing Depth, "D" 36" & 42" Ø (ft)
Type I, II, V, VI, VII Signal Standard	4	3
Type IV Signal Standard		
51'-55' Signal Mast Arm	17, 16	16, 16
Combination 40' Mounting Height		
51'-55' Signal Mast Arm	18, 17	16, 16

NOTES:

- SEE STANDARD DRAWING D-770-1 FOR ADDITIONAL FOUNDATION INFORMATION.
- SEE SP 648(24) FOR SIGNAL STANDARD FOUNDATION INFORMATION.



CENTURY AVENUE

SIGNALS  
INTERNAL CABLE SCHEDULE &  
TRAFFIC SIGNAL SYSTEM QUANTITIES  
TRAFFIC SIGNAL SYSTEM