

DESIGN DATA			
Traffic	Average Daily		
Current 2013	Pass: 5,079	Trucks: 521	Total: 5,600
Forecast 2040	Pass: 22,312	Trucks: 2,288	Total: 24,600
Clear Zone Distance: 14 Feet	Design Speed: 40 mph		
Minimum Sight Dist. for Stopping: 305 Feet	Bridges: N/A		
Limited Access Control			
Pavement Design Life 30 (years)			
Design Accumulated One-way Rigid ESALs: 3,303,683			

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20734	1	1

# JOB # 16 CITY OF GRAND FORKS NORTH DAKOTA

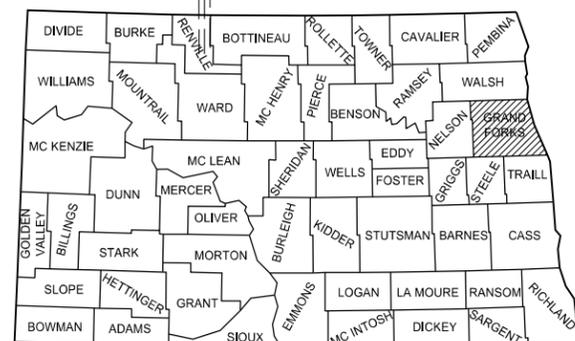
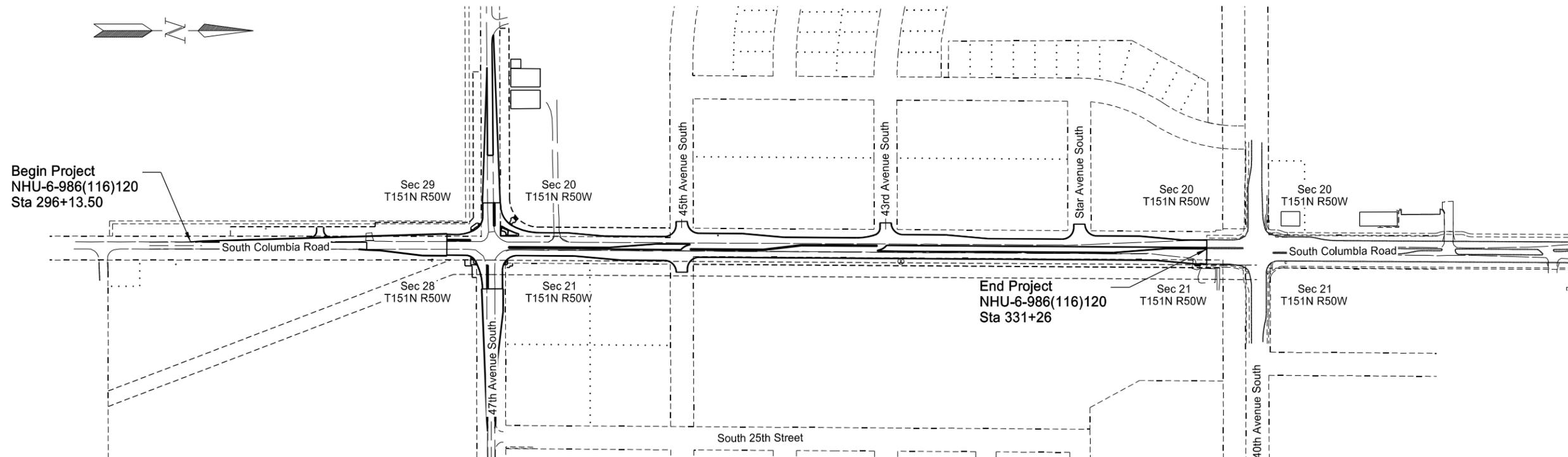
FEDERAL AID PROJECT NHU-6-986(116)120  
CITY PROJECT #7143

**GOVERNING SPECIFICATIONS:**

2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

Grand Forks County  
South Columbia Road  
40th Avenue South to 47th Avenue South  
Reconstruction  
Removals, Grading, Salvaged Base, Storm Sewer, PCC Pavement,  
Landscaping, Signing, Marking, Lighting, Signals, ITS & Incidentals

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NHU-6-986(116)120	0.665	0.665



STATE COUNTY MAP

DESIGNERS
Deon D. Wawrzyniak
G. Kelby Laxdal
Alex Zikmund
W. Brian Poykko
Nick Erpelding

APPROVED DATE 08/22/16  
  
 Allen R. Grasser /s/  
 Grand Forks City Engineer  
 Office of Grand Forks Engineering Department

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.  
  
 APPROVED DATE 08/19/16  
  
 Deon D. Wawrzyniak /s/  
 CPS, Ltd.

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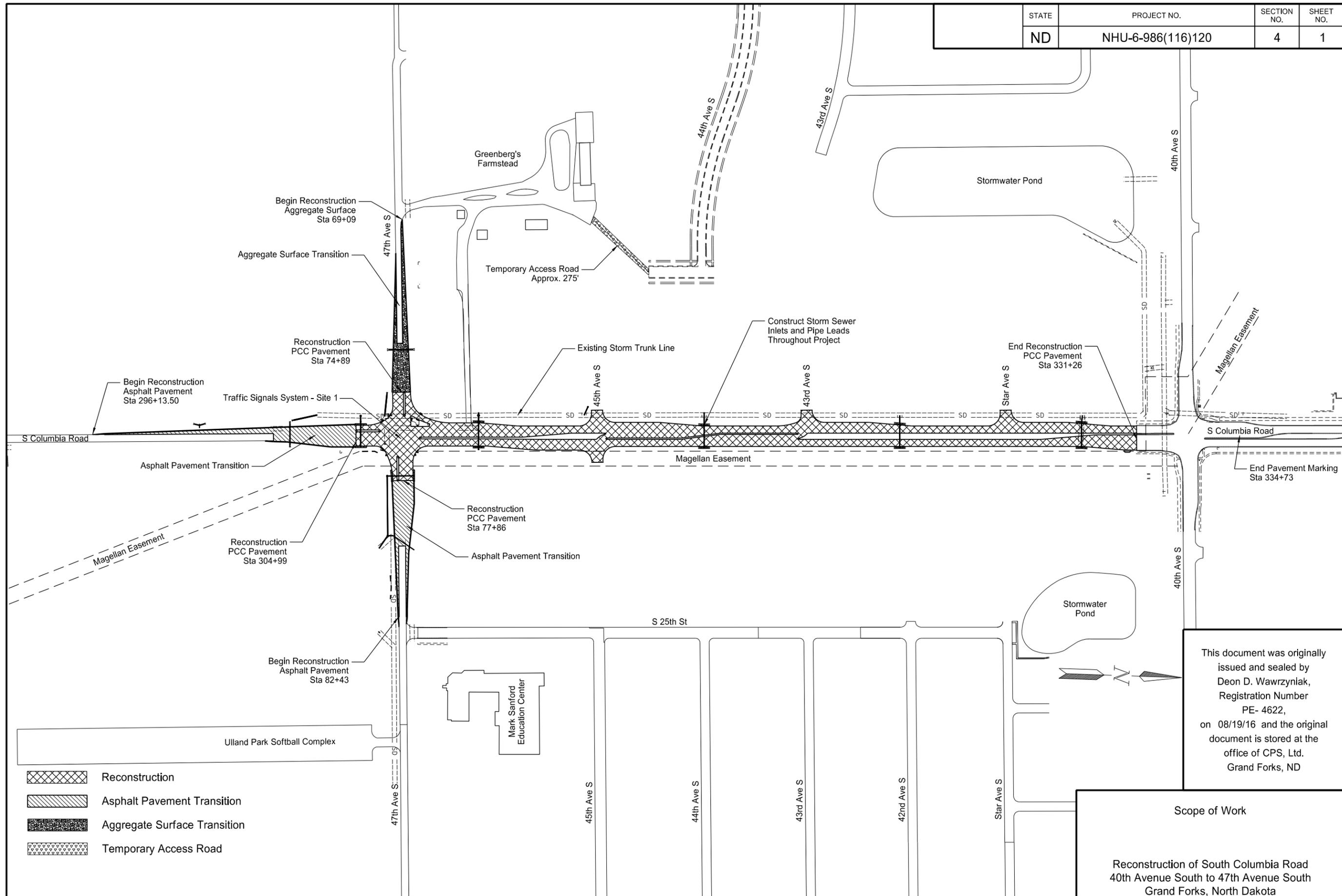
**SPECIAL PROVISIONS**

Number	Description
SP 0003(14)	Temporary Erosion and Sediment Best Management Practices
SP 0350(14)	Video Vehicle Detection System
SP 0351(14)	Interconnect Cable
SP 5125(14)	Permits and Environmental Consideration

**LIST OF STANDARD DRAWINGS**

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D-101-1, 2,3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32	Symbols
D-203-8	Standard Rural Approaches
D-261-1	Erosion Control - Fiber Roll Placement Details
D-550-2	Longitudinal Joint Details
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D-550-4	Transverse Expansion Joint Detail
D-704-4	Work Zone Business Sign Details
D-704-7	Breakaway Systems for Construction Zone Signs - Perforated Tube
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D-704-9	Construction Sign Details - Terminal and Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
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D-704-13	Barricade and Channelizing Device Details
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D-704-32	Sign Layout for One Lane Closure Divided Highway Moving Operation
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D-770-3	Pull Box Details
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D-772-4	Traffic Signal Head Mounting

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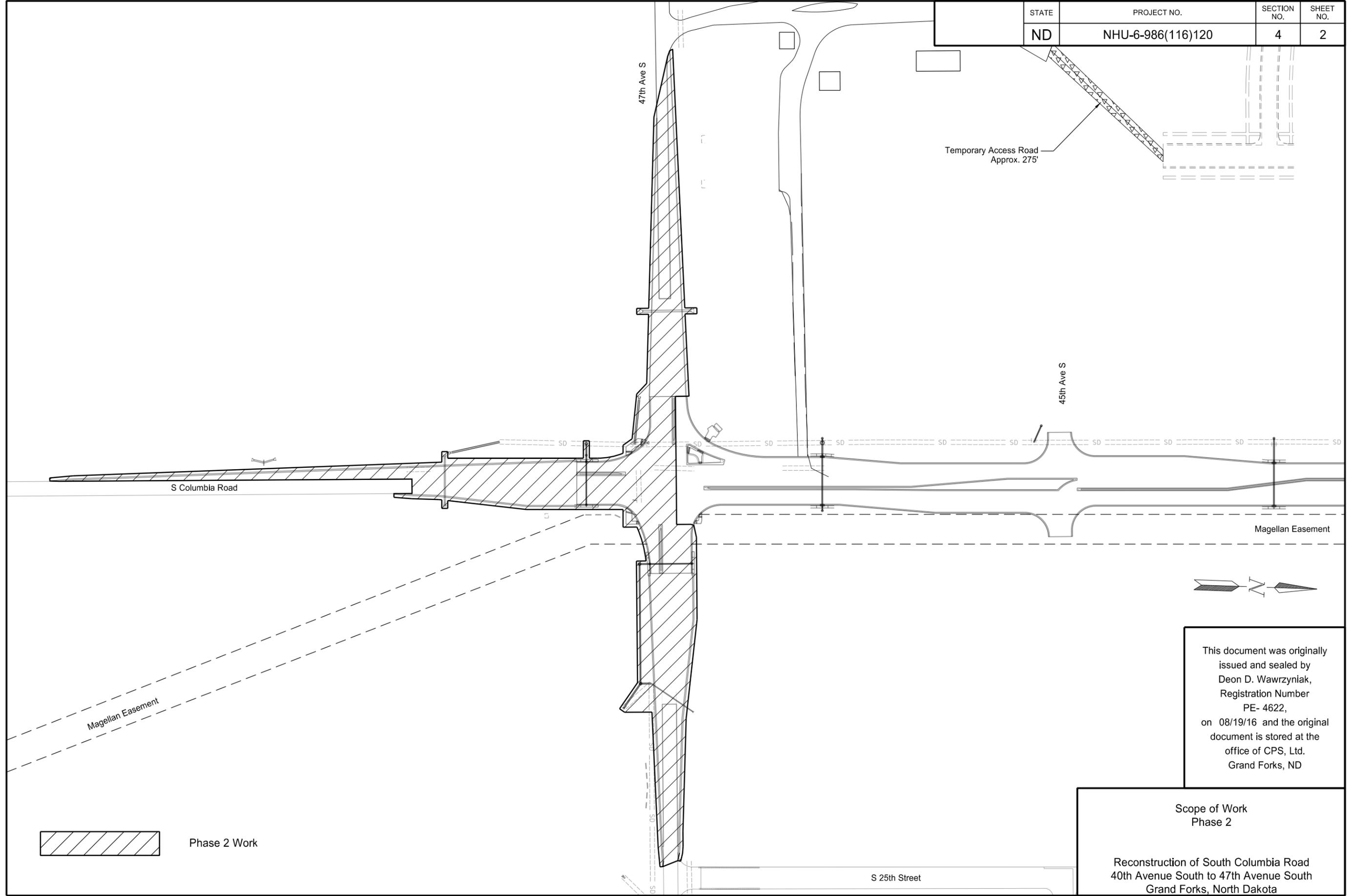


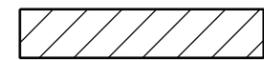
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**Scope of Work**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

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 Phase 2 Work

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Scope of Work  
Phase 2  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

**NOTES**

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**GENERAL NOTES**

100-P01 **NOISE RESTRICTIONS:** Comply with the City of Grand Forks noise ordinance by scheduling operations between the hours of 6:00 AM and 10:00 PM. Submit written request to the Grand Forks Public Health Department at 151 South 4<sup>th</sup> Street, Suite N-301, Grand Forks, ND 58201-4735 for each occurrence to work outside these hours. Follow procedures in Standard Specification 108.05 "Limitation of Operations" to perform work on holidays.

Submit requests 72 hours prior to beginning work, stating the specific nature of the work, additional hours required and the number of days needed to complete the specified work. Obtain approval from the Health Department 24 hours prior to beginning work.

Furnish a copy of the approved permit to the Grand Forks Police Department a minimum of 24 hours prior to beginning of work and notify the department of the days and hours planned for work under the permit.

100-P02 **PUBLIC NOTIFICATION:** Provide written notices to each entity (including all property and business owners) a minimum of 7 days in advance of scheduled work that would affect access to their property or facility.

105-P01 **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.

Sweep paved surfaces due to construction vehicle tracking of sediment from site.

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

105-P02 **RIGHT OF WAY:** Restore topsoil depths and existing ground surface within temporary construction easements to pre-construction condition.

107-710 **HAUL ROADS:** Before submitting a proposal, contact the appropriate State, County, Township, or City officials to determine if there are any roadways that will be designated as "no haul routes".

107-P01 **HAUL ROADS:** Streets within the proximity of the project including; 40<sup>th</sup> Avenue South, 62<sup>nd</sup> Avenue South, South 25<sup>th</sup> Street, and South 20<sup>th</sup> Street are not permitted for haul road use or construction activities, unless approved by the Engineer.

107-P02 **DETOURS:** The Engineer, Contractor, and the City of Grand Forks will perform a joint inspection of the detour route before the route is signed. The joint inspection will determine the existing condition of the detour route, including the type and width of the surfacing material. The group will record the results in an inspection report. The inspection report will set forth any special conditions for use, maintenance, and restoration of the route. The Contractor, the Engineer, and the City of Grand Forks shall review and sign the report.

After use of the detour route, the Engineer will order the type and amount of maintenance and restoration work and the requirements for performing this work.

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

108-P01 **CONSTRUCTION SCHEDULE:** Commence work that adversely impacts traffic, including lane closures or detours after May 7, 2017.

108-P02 **CONSTRUCTION SCHEDULE:** Perform Phase 2 - 47<sup>th</sup> Avenue South Intersection work between July 8, 2017 and August 19, 2017, unless otherwise directed by the Engineer. Schedule construction activities to complete specified work within 30 consecutive calendar days after closure.

155-100 **CONCRETE EQUIPMENT:** Provide a NRMCA Certified plant for concrete used in Sections 550, "Concrete Pavement", 570 "Concrete Pavement Repair", 602 "Concrete Structures", and 622 "Pavings".

202-P01 **REMOVAL OF BITUMINOUS SURFACING:** Reclaim bituminous surfacing and equivalent thickness of existing aggregate base, where accessible with reclamation equipment.

202-P02 **REMOVAL OF MANHOLES:** Include the cost of removing the castings, covers, rings, barrel sections, bases, insulation, clay backfill and compaction in the contract unit price for "Removal of Manholes".

Exercise care during removal operations to salvage the castings, covers and grates and deliver items to the City of Grand Forks maintenance shop located at 724 North 47<sup>th</sup> Street. Coordinate delivery with Ms. Melanie Parvey. Ms. Parvey may be reached at 701-738-8740.

203-P01 **COMMON EXCAVATION-TYPE A AND COMMON EXCAVATION-WASTE:** Use an excavator with a smooth cutting edge to minimize disturbance of underlying soils. Do not scarify the bottom of the excavation. Do not operate construction equipment in the cut areas.

No allowance for over excavation will be made, unless directed by the Engineer.

Compact embankment material as specified in Section 203.04 E.2.b "ND T 99".

Compaction requirements for trench and utility construction are specified in Section 20.

The bid items "Common Excavation-Type A" and "Common Excavation-Waste" will be paid for at plan quantity.

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**NOTES**

251-P01 SEEDING CLASS III: Rake smooth the final topsoil surface to provide positive drainage with mechanical power raking equipment and hand raking in inaccessible areas to power raking. Seed disturbed areas with the following Class III seed mixture.

Grass Species	Percentage Pure Live Seed
Creeping Red Fescue	40%
Kentucky Bluegrass	25%
Perennial Rye Grass	20%
Southport Chewings Fescue	15%
Total	100%

Seed Application Rate	260 lbs/acre
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Following placement of seed mixture, perform two passes; one at 45° and second at 135° to drill marks; pulling a "screen" type drag (i.e. chain link fence).

Areas seeded after September 20 will not be accepted until they show evidence of established growth after May 20 of the following year.

Water seeded areas a minimum of four weeks after placement in order to provide sufficient moisture for growth as determined by the Engineer. Prevent runoff and puddling. Do not drive watering trucks over turf areas.

Perform maintenance on seeded areas for four weeks after completion of seeding over the entire disturbed area. Maintenance of the seeded areas includes eradicating weeds, maintaining erosion control devices and mulch, protecting installed areas from traffic, mowing, watering and post-fertilization.

Repair and re-establish areas that are rutted, damaged or destroyed at the Contractor's expense.

Mow seeded areas to height of 3 inches with cutting no more than 1/3 of the grass leaf. Mow seeded areas 24 hours prior to final inspection.

Seeded areas will be rejected if they contain weeds or bald spots larger than 3" in diameter.

Include costs for materials, equipment, labor, maintenance, and incidentals in the contract unit price for "Seeding Class III".

251-P02 TEMPORARY COVER CROP: Provide the following seed mixture:

Species	Percentage Pure Live Seed
Oats	50%
Perennial Rye Grass	50%
Total	100%

Seed Application Rate	80 lbs/acre
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253-P01 HYDRAULIC MULCH: Apply mulch after the seed is drilled into the topsoil and dragged at a rate of 1.3 tons/acre.

302-P01 SALVAGE AGGREGATE BASE COURSE: Excavate reclaimed bituminous and aggregate base material in addition to depth of remaining aggregate base as indicated in Section 11, Salvage Aggregate Base Course - Removal.

Material will be accepted as specified in Section 817. Blend materials to meet Section 817.01 B. "Salvaged Base Course Gradation". The bid item "Salvage Aggregate Base Course" will be paid for at plan quantity.

302-P02 AGGREGATE BASE COURSE CL 3: Compact Aggregate Base Course CI 3 to 100% of the Standard Proctor maximum density as determined by NDDOT T 99.

Substitution of Salvaged Base Course for Aggregate Base Course CI 3 will not be allowed.

Bid item "Aggregate Base Course CI 3" and will be paid for at plan quantity.

302-P03 SALVAGED BASE COURSE: Trim as specified in Section 3.04 C.1 "Surface Tolerance Type B".

Bid item "Salvaged Base Course" and will be paid for at plan quantity.

430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: Provide a mix design with requirements meeting a minimum Superpave Mix of FAA 43.

430-P02 COMMERCIAL GRADE HOT MIX ASPHALT: Perform sampling and testing of the mix for each day's production. The results will be given to the Engineer for determining "Calculated Density" for the lot. Conduct tests in accordance to ND T 312, ND T 166, and ND T 209 as found in Table 430-7 in the Field and Sampling Testing Manual.

Calculated Density is required on the South Columbia Road transition section. Obtain 1 core in each lane at locations designated by the Engineer.

550-P01 CONCRETE PAVEMENT: Delete Section 550.04 H.1.e. of the Standard Specifications.

550-P02 CONCRETE PAVEMENT: Provide epoxy coated Grade 60 reinforcing steel and tie bars. Install reinforcing steel with a minimum tied lap length of 24 inches.

Place tie bars into pre-drilled hole, cleaned with compressed air, and grouted with an approved epoxy grout. Placement of tie bars into plastic concrete will not be allowed.

550-P03 CONCRETE PAVEMENT: Except for curved sections of pavement, saw joints without misalignments. At Engineer's discretion, concrete panels varying significantly from this standard may be removed and replaced. Removal limits will be determined by the Engineer and replaced in accordance. At Engineer's discretion, panels on both sides of a misaligned joint may remain in place and paid for at 75% of the contract unit price for the related bid item "9IN Non-Reinf Concrete Pavement CI AE", "9IN Reinf Concrete Pavement CI AE", or "9IN Non-Reinf Concrete Pvmt CI AE-Doweled".

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## NOTES

550-P04	9IN REINF CONCRETE PAVEMENT CL AE: Support reinforcement panels in a manner that restricts movement beyond a 1/2" tolerance. Position vertical supports to provide 3" of concrete cover.		wide butyl mastic to the inside top and bottom of the seal to provide bonding to the structure and over the flange on the casting frame. Use aerosol primer to improve bonding strength of the seal. Include the cost of the rubber seals in the contract unit price for "Inlet-Type 2" and "Inlet-Type 2 Double".								
704-P01	<p>TEMPORARY TRAFFIC CONTROL: The traffic control details, as indicated on the Plans, have been developed on the basis that this project will be constructed in 3 phases. Detour routes have been provided for all Phases.</p> <p>Phase 1: Consists of the closure of South Columbia Road from the south approach at 40th Avenue South to the north edge of 47th Avenue South. The traffic signal system at 40th Avenue South will operate as normal. The intersection of 47th Avenue South will remain open to traffic.</p> <p>Phase 2: Consists of the closure of the South Columbia Road and 47th Avenue South Intersection, including transition work extending 1000 feet south, 600 feet east and 700 feet west of the intersection. The intersection of 47th Avenue South will be closed to traffic. A temporary access road will be constructed for private access to the property in the northwest quadrant of the intersection.</p> <p>Phase 2 includes work necessary to reopen the intersection to traffic as shown on the Plans. Complete all work within the outer perimeter of the finished roadway prior to reopening. This work includes excavation, roadway inlets and storm sewer, centerline culverts, hydrant work, aggregate base, pavement transitions, paving, curb and gutter, medians, and all foundations, conduits, and pull box work related to the intersection traffic signal and roadway lighting systems.</p> <p>Phase 3: Consists of continuation of work on Phase 1 with the addition of intersection traffic control devices. The intersection of 47th Avenue South will be open to traffic and the temporary access road will be removed.</p>	722-P03	<p>MANHOLES, CATCH BASINS, AND INLETS: The top of riser elevation and top of barrel elevation control the final casting elevation. Install structures as necessary to achieve top of structure design elevation.</p> <p>Provide smooth troweled flow line invert and slope to structure wall.</p>								
		722-P04	<p>DRAINAGE STRUCTURE BACKFILL: Controlled density fill may be placed as shown in Section 20, backfill and utility details. Provide a fill composed of a blend of cement, water, pozzolanic materials and fillers. Provide a fluid material that will flow around and fill voids around pipes. Provide material capable of supporting normal loads after 6 hours and a compressive strength ranging from 75 psi to 125 psi at 28 days. Provide material easily removable with a tractor loader/backhoe. If the mix design shown is used, no further testing will be required.</p> <p>Mix design yields approximately one cubic yard of flowable material, consisting of:</p> <table border="0"> <tr> <td>Cement</td> <td>100 lbs</td> </tr> <tr> <td>Flyash</td> <td>300 lbs</td> </tr> <tr> <td>Fine Aggr</td> <td>2600 lbs</td> </tr> <tr> <td>Water</td> <td>70 gals</td> </tr> </table>	Cement	100 lbs	Flyash	300 lbs	Fine Aggr	2600 lbs	Water	70 gals
Cement	100 lbs										
Flyash	300 lbs										
Fine Aggr	2600 lbs										
Water	70 gals										
		722-P05	ADJUST GATE VALVE BOX: Adjust gate valve boxes plumb and to finished surface by rotating the valve box or adding an additional valve box section. Include the costs of all materials, equipment, labor, and incidentals in the contract unit price for "Adjust Gate Valve Box".								
709-P01	GEOSYNTHETIC MATERIAL TYPE R1: Extend geotextile fabric up the vertical side of the aggregate base and secure fabric to vertical wall. No measurement will be made for the vertical fabric.	722-P06	ADJUST MANHOLE: Adjust existing manhole castings to finished surface.								
714-P01	PIPE CONC REINF __IN CL III: Visually expose (i.e. pothole) existing underground utilities, including sanitary, storm sewer, water main, electrical, communication, and natural gas mains located at proposed storm sewer crossings prior to excavation of storm sewer pipe trench. Include the cost of visually exposing utilities in the contract unit price for "Pipe Conc Reinf __IN Cl III".		Prevent debris from falling into manholes and promptly remove any falling debris. Provide protective wrapping over manhole covers prior to placement of concrete. Clean any manhole cover coated with concrete.								
			Deliver removed castings and covers to the City of Grand Forks maintenance shop located at 724 North 47th Street. Coordinate delivery with Ms. Melanie Parvey. Ms. Parvey may be reached at 701-738-8740.								
722-P01	CHIMNEY SEALS: Provide external chimney seals on manholes and inlets (Inlet-Type 1 only) located within paved areas. Provide sleeve and extension extruded from a high-grade rubber compound conforming to the applicable requirements of ASTM C923. Use bands for compressing the sleeve and extension against the inlet fabricated from 16-gauge stainless steel conforming to ASTM A240, Type 304. Use stainless steel screws, bolts and nuts conforming to ASTM F593 and 594, Type 304. Include the cost of the chimney seals in the contract unit price for "Manhole __IN", "Inlet-Type 1" and "Adjust Manhole".	722-P07	ADJUST UTILITY APPURTENANCE: Adjust existing manhole castings to finished surface.								
			Prevent debris from falling into manholes and promptly remove any falling debris. Provide protective wrapping over manhole covers prior to placement of concrete. Clean any manhole cover coated with concrete.								
722-P02	RUBBER SEAL: Provide external rubber seals on Inlet-Type 2 and Inlet-Type 2 Double structures. Provide seals extruded from a continuous seamless band of high-quality Ethylene Propylene Diene Monomer (EPDM) rubber with a minimum thickness of 65 mils and with molded preformed L shaped corners. Provide seals with attached minimum 2"		Deliver removed castings and covers to the City of Grand Forks maintenance shop located at 724 North 47th Street. Coordinate delivery with Ms. Melanie Parvey. Ms. Parvey may be reached at 701-738-8740.								

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724-P01 WATERMAIN: Use potable water products meeting American National Standards Institute (ANSI) and National Sanitation Foundation International (NSF) Standard 61. Provide product certification by NSF, the Underwriters Laboratories, or other organizations accredited by ANSI.

Use PVC C-900 pipe, DR18 and PVC C-905, DR25.

Provide restrained Class 350 ductile iron fittings including bends, tees, reducers, plugs and adapters. Provide fittings manufactured by Tyler Pipe, American Cast Iron Pipe Company. Install watermain fittings with stainless steel bolts and nuts and anti-seize material placed on the threads.

724-P02 OPERATION OF EXISTING VALVE AND HYDRANTS: Coordinate with City Water Department to operate existing valves and hydrants. Open new valves adjacent to an existing main only after the following conditions have been met:

1. Notify Water Distribution personnel to operate the valve and flush adjacent mains in the area, if necessary.
2. Hydrostatic testing and sterilization is complete and approved.
3. Confirm that the connection point is not to a "dead-end" line. If so, make provisions to back flush the existing main to ensure water quality of the new connection.

Unauthorized valve operation resulting in a material, labor, or water cost to the City will be either invoiced or deducted from the payment due the Contractor. Charges to the Contractor in either case will be calculated at the employee's direct wage rates with a 2.0 multiplier.

New valves external to the existing distribution system may be opened and closed as necessary for installation and testing during construction.

724-P03 REMOVE HYDRANT: Coordinate with the City of Grand Forks Water Department for shut down of the watermain. Remove existing hydrant assemblies as indicated on the Plans. Include all materials, equipment, labor, and incidentals in the contract unit price for "Remove Hydrant" to perform the following work:

1. Excavation and dewatering.
2. Removal of existing hydrant, pipe lead, gate valve (where noted), and valve box (where noted).
3. Install new gasket (where noted) or new flange (where noted). Secure with stainless steel hardware.
4. Place thrust blocking in accordance with the Plans.
5. Backfill in accordance with Section 20.
6. Upon observation of existing tapping sleeve by the City Water Department, additional work may be directed by the Engineer to remove the tapping sleeve and a section of watermain and install a new 10' length of 16" PVC C905 watermain with 2 new transition couplings. This additional work would be paid for by change order.
7. Deliver fittings, gate valve, valve box and cover, and hydrant removed to the City of Grand Forks Water Department located at 724 North 47<sup>th</sup> Street. Coordinate delivery with Mr. Dan Hanson. Mr. Hanson may be reached at 701-738-8772.

724-P04 6IN HYDRANT: Provide the City Water Department 24 hour advance notice for Water Distribution personnel to install watermain tap.

724-P05 6IN HYDRANT: Provide tapping sleeves and valves designed to operate at a working pressure of 200 psi, have mechanical joints and are of the full sleeve type. Use sleeves constructed of stainless steel, Type 304, including the flange and be fully lined with a rubber gasket. Provide longest length available from manufacturer.

Provide valve with a bronze non-rising stem, O-rings seals, bronze two-inch operation nut and opens counterclockwise. Provide valve manufactured in excess of full compliance with AWWA C500 for gate valves and AWWA C515 for wedge valves. Use wedge valves having a cast iron gate having a vulcanized synthetic rubber coating or a rubber seat mechanically retained on the gate.

724-P06 6IN HYDRANT: Use transition couplings fabricated of cast iron or carbon steel and coated inside and out with fusion bonded epoxy or nylon. Provide transition couplings manufactured by Hymax - Total Piping Solutions, Inc., Romac, Power Seal, Ford.

Install transition couplings with stainless steel bolts and nuts and anti-seize material place on the threads, and then completely wrapped with polyethylene. Wrap-around type sleeves will not be allowed. Provide longest length transition coupling available from manufacturer for use on watermain pipe material.

Include the cost of transition couplings necessary to connect new watermains to existing watermains in the contract unit price for "6IN Hydrant".

724-P07 6IN HYDRANT: Include all components required for complete hydrant installation as shown on the Plans and described below.

Provide compression type fire hydrants with five inch valves and conform to the following:

1. Bottom Connection: 6 Inch
2. Open: Left
3. Color: Yellow
4. Hose Nozzles: Two 2-1/2 Inch and One 4-1/2 Inch Pumper Nozzle with NST Sizes 7532 and 40518 respectively.
5. Manufacturer and Model: American Flow Control (Waterous Company) Pacer Traffic Model WB-67-250, American Darling Model B-62-B or American AVK Company Series 2700 Modern. Provide 22" upper standpipe length resulting in a top nut 36"-38" above finished surface, or to the elevation indicated on the Plans. Measure bury depth from the bottom of the branch pipe connection to the finished surface at the hydrant.
6. Hydrant Tag: Required for each hydrant or extension.
7. AWWA Standard: C-502.
8. Working Pressure: 250 psig.
9. Joint: Restrained mechanical joint, including joints for tapping valves.

Provide hydrants meeting the finished surface or provide hydrants with hydrant extensions (include cost of extensions in the bid item "6IN Hydrant"). If extensions are used, install extensions as directed by the Engineer.

Provide resilient seated wedge type valves and conform to the following:

1. Open: Counterclockwise
2. Manufacturer and Model: American Flow Control (American Darling Valve Series 2500 Resilient Wedge Gate Valve),

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**NOTES**

Clow Valve Company (Resilient Wedge Valve with Clow Cleantrack Technology), Mueller (2360 & 2361 Series), American AVK Company Series 65 or M&H Valve Company (Style 7000 12" or smaller).

3. Bolting Materials: Stainless steel with hex heads and nuts in accordance with ASTM A-307 and A-563 respectively.
4. AWWA Standard: C-515 with latest revision, ductile iron (ASTM A536) resilient wedge.
5. Coating: AWWA C550. Provide electrostatically applied fusion-bonded-epoxy coating on internal and external surfaces of the body and bonnet. Provide wedges totally encapsulated with rubber complying with ASTM D-2000. Use NSF 61 approved epoxy coating.
6. Working Pressure: 250 psig and 100% leak-tight.
7. Seals: O-rings at all pressure retaining joints. Flat gaskets will not be allowed.
8. Joint: Restrained mechanical joint, including joints for tapping valves.

Thoroughly clean all hydrant components that will come into contact with potable water and sterilize. Unless otherwise indicated, install hydrants with tapping tees with a gate valve. Saw hole for tapping tee prior to lowering pipe into trench.

Install hydrant plumb and position the pumper nozzle facing the curb. Set the hydrant on either cast-in-place or precast concrete blocks, and brace against unexcavated earth. Upon completion of the installation, backfill the trench around the hydrant with Size 2 aggregate. Leave drain holes open upon installation.

Provide Size 2 aggregate meeting the following gradation:

Sieve Size (Inches)	Percent Passing by Weight
2"	100
1 1/2"	90-100
1"	20-55
3/4"	0-15

Install the break-off flange within 0-2 inches above the finished surface. Set the center of the pumper nozzle to 28 to 30 inches above the surrounding finished surface. Adjust hydrants that are not within these specified tolerances.

Place gate valves on precast concrete blocks.

Provide valve boxes manufactured by Tyler Pipe or Star Pipe Products. Provide cast iron, 3 piece units with lids marked "WATER", and 5-1/4" screw type shafts. Set valve box plumb and on a gate valve adaptor. Provide 1/4" steel gate valve adaptor with UV polyurethane protective coating and a 3/4" rubber gasket attached to the gate valve adaptor. Use adaptors manufactured for the exact size and brand of valve

Include all materials, equipment, labor, and incidentals necessary for installation of 6" hydrants, including tapping tee and valve, gate valve, valve box adaptor, box and riser, fittings, PVC watermain, hydrant, concrete base, pipe bedding, sterilizing, testing, flushing, backfill and other miscellaneous work in the contract unit price for "6IN Hydrant". Measurement will be by the each complete hydrant installation.

724-P08 WATERMAIN TESTING: Perform a hydrostatic test of the completed watermain repair and hydrant relocation work under City water pressure prior to backfilling. Conduct test for a minimum of 2 hours.

Examine the exposed pipe, fittings, valves, and joints for any leaks during test. Locate defects and repair the line at the Contractor's expense and retest until the leakage is eliminated.

Conduct testing in the presence of the Engineer.

Include the cost of hydrostatic testing in the contract unit price for "6IN Hydrant".

724-P09 WATERMAIN TESTING: Swab sections of the new watermain pipe, fittings, pipe flange/plug, gate valves, hydrants and existing watermain with a chlorine solution prior to installation as directed by the Engineer. Protect the watermain from becoming contaminated. If the Engineer is not satisfied with the Contractor's protection of the existing watermain, the Contractor will be required to chlorinate the entire watermain as per the City's standard procedures at no cost to the Owner.

Conduct chlorination applications in the presence of the Engineer.

After the watermain and related items have been tested, flush until all foreign material has been removed and chlorine levels are consistent with normal water system chlorine levels.

Include the cost for material, equipment, labor, tools, and incidentals necessary to sterilize the system in the contract unit price for "6IN Hydrant".

748-P01 CURB AND GUTTER-TYPE I: Provide epoxy coated Grade 60 reinforcing steel and tie bars. Install reinforcing steel with a minimum tied lap length of 24 inches.

Place tie bars into pre-drilled hole, cleaned with compressed air, and grouted with an approved epoxy grout. Placement of tie bars into plastic concrete will not be allowed.

748-P02 CURB AND GUTTER-TYPE I: Remove and replace Portland cement concrete curb and gutter which exhibits random cracking prior to project acceptance. Remove and replace full length sections between joints.

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## NOTES

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750-P01 PIGMENTED CONCRETE: Develop a mix design using any size coarse aggregate specified in Section 802.01 C.2, "Coarse Aggregate" and with a 60-40 fine aggregate-coarse aggregate ratio.

Provide a pigment from the list below or provide an approved equal. To be considered an approved equal, pigments must meet the requirements of ASTM C 979.

1. Number 413 Terra Cotta, produced by Soloman Colors, Inc.  
<http://www.solomoncolors.com/>;
2. Terra Cotta pigment Number 10134, produced by Davis Colors  
<http://www.daviscolors.com/>; or

Use the same supplier for all colored concrete placed under the contract.

Add pigment at the ratio recommended by the manufacturer directly into the mixer along with the aggregate, cement, and water. Add pigment while the mixer is operating at mixing speed. Continue mixing for 5 to 10 minutes or between 50 and 100 revolutions.

Cure concrete using curing compound that meets the requirements of ASTM C 309, Type 1.

750-P02 SIDEWALK CONCRETE: Provide epoxy coated Grade 60 reinforcing steel and tie bars. Install reinforcing steel with a minimum tied lap length of 24 inches.

750-P03 SIDEWALK CONCRETE: Construct contraction joints to divide the concrete into square slabs. The greatest longitudinal or transverse dimension not to exceed 6 feet.

750-P04 SIDEWALK CONCRETE: Remove and replace Portland cement concrete sidewalk which exhibits random cracking prior to project acceptance. Remove and replace full panels between joints.

750-P05 CONCRETE MEDIAN NOSE PAVING: Measurement will be from the curb joint to the end of the median nose, excluding the area beyond the top of the median taper.

754-P01 FLAT SHEET FOR SIGNS-TYPE IX REFL SHEETING: Provide Type IX reflective sheeting for street name signs.

754-P02 SIGN REMOVAL: Deliver signs and supports that are not to be reset to the City Sign Shop at 714 South 47<sup>th</sup> Street, Grand Forks, ND. Coordinate delivery with Mr. Mark Aubol. Mr. Aubol may be reached at 701-738-8757.

762-P01 EPOXY PVMT MK CURB TOP & FACE: Include costs for materials, equipment, labor, and incidentals to paint the median and median nose paving in the contract unit price for "Epoxy Pvmt Mk Curb Top & Face".

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SECTION 140

770-P01 RELOCATE LIGHT STANDARD: Include the cost to remove designated light standard, luminaire, and base, protect removed items and reinstall light standard and luminaire on a new base in the contract unit price for "Relocated Light Standard".

Remove or abandon existing underground conductors that are direct buried. Cut off abandoned conductors at a depth of at least 12 inches below finished grade. Remove conductors in conduit. Deliver removed screw-in bases to the City Electrician at 714 South 47<sup>th</sup> Street. Grand Forks, ND. Coordinate deliveries with Mr. Rick Hanson, 701 746-2690.

770-P02 \_\_\_IN DIAMETER RIGID CONDUIT: Install street lighting circuits in a continuous conduit system. Use NRTL (UL or US equivalent) listed rigid heavy wall PVC-90 degrees C rated conduit or high density polyethylene (HDPE) conduit with smooth inner bore. Install duct seal on all conduits containing cables at light standard bases and feed point cabinets.

Install conduit approximately 42" behind the back of curb unless noted otherwise on the Plans.

Horizontal directional bore conduit under paved surfaces. Install conduit in other areas by horizontal directional bore or vibratory plow methods.

Provide a plastic cable-marking warning strip with the installation of the conduit by vibratory plow method. Warning strip to have black letters on a red background and located 3 inches above conduit.

770-P03 UNDERGROUND CONDUCTOR NO\_\_-TYPE \_\_: Use individual single conductor or multiple single conductor twisted without overall armor or jacket. Provide RHW-USE conductor for ungrounded and neutral cable types.

Provide one red and one black ungrounded cables, one white grounded neutral cable, and one green equipment grounding cable.

Use SEO 14/3 stranded copper with ground cable conductors in light standards. Provide separate cables for receptacles and luminaires. Use cable rated for use from -50 degrees C to +105 degrees C. Cable to be supported by Kellems grip attached to one of the luminaire pole stops as approved by the Engineer.

Extend leads at least 12" beyond the hand hole. Tie splice assemblies together with plastic tape or cord and a tag end left under the hand hole cover to facilitate retrieving splices for future service. Use Polaris IT-4, Burndy, ILSCO insulated splices or approved equal.

Provide in-line fuse holders on all ungrounded conductors in light standards. Use Bussman Tron HEB-AA, Littelfuse, Gould-Shawmut, or approved equal fuse holders. Provide 3 amp fuses. Fuse festoon receptacle outlets separately.

Underground splices in pull boxes will not be allowed, unless approved by the Engineer in writing. If approved, use 3M Scotchcast 90-B1, TNB, Birkett splicing kits or approved equal.

770-P04 UNDERGROUND CONDUCTOR NO\_\_-TYPE \_\_: Prior to beginning new work, megohm test the existing circuit segments to be reused. Megohm test new work as soon as it is completed. Complete megohm testing in the presence of the Engineer prior to connection to circuit power. Conduct final megohm test of each circuit in the presence of the Engineer and Owner.

Test underground street lighting circuits with a megohmmeter at a minimum of 5,000 volts. Replace conductors with readings on new circuits below 50 Meg ohms. Include the cost of megohm testing in the contract unit price for "Underground Conductor No\_\_ Type RHW".

770-P05 LT STD 6FT MA \_\_ FT BREAKAWAY: Provide octagonal tapered galvanized steel pole light standards with truss arms, breakaway transformer bases, and 120 volt festoon receptacle outlet. Install signal standard mounted luminaires and pole extensions on non-breakaway poles designed for the indicated mounting height. Include cost for signal standard mounted light standards and luminaries in the contract unit price for "Traffic Signal System – Site 1".

770-P06 LED LUMINAIRE: Provide LED luminaires with distributions and wattages as shown on the Plans. Provide Holophane Autobahn ATB2, GE or Cree equivalent (matching or exceeding performance of the Holophane Autobahn ATB2 with the same or fewer watts) luminaries. Provide multi-volt luminaires able to operate at 120 or 240 volt, nominally operated on 240 volts. Provide gray enamel finish.

Submit 5 foot grid point-by-point photometric reports using actual roadway designs with shop drawings submittals. Reports to include average footcandles, maximum values, and average to minimum values.

770-P07 PULL BOX: Provide traffic resistant cast iron cover casting. Use 4' deep pull boxes.

770-P08 FEED POINT-TYPE IV-PAD MOUNTED: Contact local utility company (Xcel Energy) to obtain electrical source necessary to operate the lighting system. Include costs for electric service, including three 3/0 copper service cables in 3" PVC rigid conduit and grounding as required by the NEC in the contract unit price for "Feed Point-Type IV-Pad Mounted".

Include costs to operate and maintain the lighting system until final acceptance of the lighting system in the contract unit price for "Feed Point-Type IV-Pad Mounted".

770-P09 FEED POINT-TYPE IV-PAD MOUNTED: Provide 14 gauge #304 stainless steel cabinet of adequate size to house the specified number of circuits and equipment shown on the feed point detail. Tie transformer ground into cabinet grounding lug and neutral lug.

Provide enclosures with a subpanel for complete dead-front access to all, main disconnect handles, circuit breaker handles and toggle test switches. Use plug in type breakers with specified amperage, 10,000 AIC.

Mount photoelectric (PE) cells externally on the feed point cabinet, facing east or north. Use EEI/NEMA type PE sockets. Provide PE control with a time delay of at least 15 seconds and rated for 240 volt.

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**NOTES**

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Light standards #1 through #5 will be powered from the existing Type IV feed point (EF FP 1) located at Station 333+37 121' Lt.

770-P10 ROADWAY LIGHTING SYSTEM: The roadway lighting system will be considered a safety appurtenance as referenced in Section 108.07 B.

770-P11 TEMPORARY LIGHTING: Provide lighting at the South Columbia Road and 47<sup>th</sup> Avenue South intersection when open to traffic. During closure of the intersection, the existing light will be removed. Prior to reopening the intersection, provide lighting from either new light standards or install temporary poles and luminaires.

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- 772-P01 FIELD VERIFICATION: Verify all features labeled "Existing" are approximately located. Verify the location of all proposed signal and lighting features including all proposed conduit to avoid conflict with any utilities or any other features potentially encountered in the field.
- 772-P02 TRAFFIC SIGNAL CONTROLLER: Furnish the controller cabinet and auxiliary control equipment furnished from a manufacturer whose Econolite Cobalt RM with Transit Key/2M Series NEMA TS2/NTCIP operates on Centracs Software which has been approved by the City of Grand Forks. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all labor, materials and equipment required to install the new controller, including but not limited to the emergency vehicle pre-emption unit, cabinet, new detector amplifiers (furnished and installed), other ancillary signal components (such as load switches, conflict monitors, etc.) and controller cabinet components connected as required to make the new controller equipment operational with the existing and proposed signal equipment.
- 772-P03 SIGNAL TIMING AND COORDINATION: Deliver the controller and cabinet for Site 1 to the City Electrician, Rick Hanson (701-738-8796), at the Public Works Department located at 724 N 47<sup>th</sup> Street. The City Electrician will program the controllers and conduct operational tests. Operate the controller for a test period of 30 consecutive days at the Public Works Department shop without any malfunctions of the controllers. Any controller that does not operate satisfactorily for the 30 days will be rejected and replaced. After the controllers have operated satisfactorily for the 30 days, they will be approved by the City of Grand Forks. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all labor, materials and equipment necessary for furnishing and installing the controllers, as well as delivery to City Electrician.
- 772-P04 GRAND FORKS TRAFFIC SIGNAL CABINET: Use Econolite 332D, pre-wired with ancillary components including a RENO A&E Traffic Signal Conflict Monitor with Ethernet port. Adhere to the City of Grand Forks Cabinet Specifications at Traffic Control Corporation. The price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the cabinet.
- 772-P05 CONCRETE CONTROLLER CABINET PAD: The price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes a new concrete pad to mount the proposed traffic signal cabinet. Size the concrete pad for a Type 332D cabinet as specified in the plans.
- 772-P06 PADLOCKS: The City of Grand Forks will provide padlocks for the Traffic Signal System.
- 772-P07 BATTERY BACKUP SYSTEM: Provide a battery backup system for the traffic signal system. The price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the battery backup system. Include the following minimum requirements:
  - Provides full battery backup for the traffic controller in normal or flash operation
  - Flash activation contacts to ensure the longest possible battery life

- Rack mountable for installation in a 332D Cabinet or NEMA rated outdoor pad mounted enclosure, as required
- 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
- Suitable for operation from -40°F to 120°F
- Battery backup for a minimum of 3 hours of flash operation
- Capable of running the intersection for 30 minutes at 1000 watts and then switch to flash operation to conserve power
- The UPS includes an external bypass switch rated at 30 amp 250 VAC and use 30 amp relays.

772-P08 EMERGENCY VEHICLE PREEMPTION: Use GTT Global GPS Vehicle Preemption; model 764 phase selector, Model 1010 GPS Radio Unit containing a GPS receiver with Antenna and a 2.4 Ghz Spread Spectrum Transceiver with Antenna and Model 1070 GPS Installation Cable.

The location of the GPS EVP detector as denoted in the plans may vary based upon GPS signal availability. No splices are allowed between the controller cabinet and the EVP Equipment on the pole/arm. All indicator lamps are LED.

Compatible with the other EVP equipment used within the City of Grand Forks. Provide all labor and equipment necessary for the emergency vehicle preemption system to be fully operational. Notify the City of Grand Forks Fire Chief Peter O'Neill (701-746-2566) and city electrician Rick Hanson (701-738-8796) when the proposed signalized intersection EVP system is tested and operable. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the EVP system.

772-P09 MALFUNCTION MANAGEMENT UNIT: Use RENO A&E model with an Ethernet port. Perform a complete controller malfunction management unit test prior to unveiling the traffic heads. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all materials, labor and equipment necessary to furnish and install the unit and to conduct the malfunction management unit testing.

772-P10 SHOP DRAWINGS: Furnish shop drawings and a complete listing of materials proposed for installation. Provide two copies to the City of Grand Forks Traffic Engineer, plus any additional sets that need approval and that are to be returned for the Contractor's use. Provide the Engineer with proof of purchase, and delivery and manufacturing schedules for traffic signal materials indicating that acquisition of these materials is consistent with progress and completion requirements of this contract.

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- 772-P11 VEHICULAR TRAFFIC SIGNAL HEADS: Use 12 inch vehicular signal heads with aluminum housings for each section. Equip all sections with General Electric GTx LED illuminating elements conforming to the Institute of Transportation Engineers Equipment and Materials Standards and Specifications. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the vehicular traffic signal heads.
- 772-P12 PEDESTRIAN SIGNAL HEADS: Equip with LED illuminating elements displaying the pedestrian signals as shown. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the pedestrian signal heads.
- 772-P13 PEDESTRIAN PUSH BUTTON POST: Use SMP2 with breakaway tabs per TIP indications with anodized natural gray finish. Paint pedestrian pushbutton housing black (use #27038 of Federal Standard No. 595B). Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the pedestrian push button posts.
- 772-P14 PEDESTRIAN PUSHBUTTON UNITS: Install Advisor Advanced Accessible Pedestrian System (AAPS) pedestrian push buttons. Mount each pedestrian sign and pushbutton on one framed enclosure to the signal pole or bolt directly to the pedestrian pushbutton post. Bandit is not be permitted. Do not extend the top of the pushbutton signs above the top of the pedestrian pushbutton post. Include the Advisor Advanced APC Pedestrian Controller and compatibility of remote network ether connection for real time monitoring and control of operating parameters. SMP2 High Visibility Pedestrian Station for standalone push button posts. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the pedestrian pushbutton units.
- 772-P15 TRAFFIC SIGNAL HEAD MOUNTINGS: Furnish piping to mount the vehicle and signal heads to the side of the poles. Do not mount heads directly to the pole or on the face of the pole directly adjacent to the street. No banding permitted. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for installing traffic signal heads.
- 772-P16 TRAFFIC SIGNAL STANDARDS - TRANSFORMER BASES: Use "T" transformer base type standards. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for furnishing and installing the "T" transformer bases.
- 772-P17 SIGNAL STANDARD PAINT COLOR: Paint all traffic signal system components in accordance with the following:
- Transformer base – black
  - Mast arm – black
  - Signal head mounting hardware – black
  - Shaft – black
  - Signal housing – black

Use #27038 of Federal Standard No. 595B for the color black.

- 772-P18 PULL BOXES: Follow the specification outlined in the NDDOT standard drawing D770-3 and be PVC with steel casting including a traffic resistant cast iron cover.
- 772-P19 CONDUIT: Install conduit at the locations shown on the plans. Bore conduit under existing pavement. Dig potholes to verify that the conduit avoids the existing utility as necessary. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" and "IT SYSTEM" include furnishing and installing conduit, pushing and boring conduit, digging potholes and restoring the potholes with new material that ties into the existing surround material. Seal all conduits with duct seal at the controller cabinet and at the traffic signal standard foundations. Conduit types may be either schedule 40 PVC or HDPE conduit with a wall thickness equivalent to schedule 40 (Refer to NDDOT specification). HDPE conduit must be UL listed.
- 772-P20 ADDITIONAL CONDUIT: Install one additional 4-inch diameter conduit in the controller cabinet/feedpoint foundation. The direction of the conduit will be determined in the field by the engineer. Cap all conduit. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" include all costs to supply and install the additional conduit.
- 772-P21 EXCAVATION AND RESTORATION: Any excavation required to install conduit, connect conduit to existing conduit sweeps, install pull boxes, foundations or any other feature proposed in the plans is included in the prices bid "TRAFFIC SIGNAL SYSTEM – SITE 1" and "IT SYSTEM". This includes restoring the excavated area with the appropriate fill material. The fill material shall match the surrounding surface material. At locations where the surrounding material is earth, include earth fill with 6" of topsoil and seed or sod. At locations where the surround material is concrete, tie into the existing concrete. All removed material whether concrete or earth is the property of the Contractor and be disposed of accordingly. Compaction and density controls are in accordance with Section 203.04 E.2 of the Standard Specifications AASHTO T-99.
- 772-P22 FOUNDATION REMOVAL: All removed foundations are the property of the Contractor and be disposed of accordingly. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for removing and disposing of concrete foundations.
- 772-P23 CONDUCTOR COLOR CONTINUITY: Maintain conductor color continuity where any 14 AWG 12 conductor cables are connected to 14 AWG 5 and/or 14 AWG 3 conductor cables within the terminal block of a traffic signal standard.
- 772-P24 WIRE SPLICING: No splicing will be allowed in pull boxes. Splicing may only take place in the signal base.
- 772-P25 LABEL ALL FIELD CABLES: All labeling materials must be approved by the City. Labels must be readable without moving the cables. When installing cable bundles in conduit, bundles will not be taped. Label all field cables with the cable designations:

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**NOTES**

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 Camera Cables	Detection zone (i.e. D2-1, D2-2, etc.)	Within 6" of terminals
Control Cable	Cable number & location (i.e. NW, SW, etc.)	Within 12" of conduit
Opticom Cable	Preempt number/location (i.e. NW, SW, etc.)	Within 6" of terminal

Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" and "IT SYSTEM" includes all costs, labor, materials and equipment necessary for labeling field cables.

772-P26 FEED POINT: Connect the traffic signal controller to the new feed point. Install a new 50 amp breaker Type BR at the feed point for traffic control signal purposes.

The feed point (by ONE) will have one meter and one meter socket for Roadway Lighting (for a future meter) and Traffic Signals. Xcel Energy will provide new transformer; contact Deb Thompson (701-795-5229). Coordinate with the utility company to establish the service connection to ensure a fully operational traffic signal controller feed point at this location.

All utility company costs for the new feed point shall be paid by the Contractor. Furnish and install new conduit from the new controller cabinet to the new feed point. Furnish and install #6 U.S.E. cable between the new controller and the new feed point. Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment required for feed point connections.

772-P27 IT SYSTEM: The price bid for "IT SYSTEM" includes all labor and equipment necessary to interconnect all of the traffic signals within the project limits as shown in the IT plans. This includes, but is not be limited to, all fiber optic cable, pull boxes, conduit, future conduit, conduit sweeps into existing pull boxes and connections required for the interconnected system to be fully operational, furnishing and installing Ethernet switches and fiber splice boxes/enclosures sized for all fibers at each signalized intersection, and removing a portion of the existing fiber optic cable, protecting it and salvaging it for reinstallation as shown in the plans.

772-P28 ETHERNET SWITCH: Produced by RuggedCom, be model type RuggedSwitch RS-900G-2L, contain dual fiber optic Gigabit Ethernet ports, and have two (2) single-mode fibers with LC connectors in and out included for the connections. Price bid for "IT SYSTEM" includes all costs, labor, materials and equipment necessary for furnishing and installing the Ethernet switch.

772-P29 IP ADDRESS: Coordinate with the City of Grand Forks to obtain any required IP addresses during installation.

772-P30 INTERCONNECT TRACER CONDUCTOR: Install and label a tracer conductor in each controller cabinet. Use a No. 14 AWG - Type THW single conductor as specified in

Standard Specification section 895.03A1. Continuously unsplice the conductor from control cabinet to control cabinet. The price bid for "IT SYSTEM" includes furnishing and installing the conductor.

772-P31 MAXIMUM TENSILE PULL STRENGTH: Do not exceed a maximum tensile strength of 600 pounds when pulling the fiber optic interconnect cable.

772-P32 RED LIGHT RUNNING ENFORCEMENT LIGHTS: Furnish and install four red light running enforcement lights ("blue lights"). Price bid for "TRAFFIC SIGNAL SYSTEM – SITE 1" includes all costs, labor, materials and equipment necessary for installing the enforcement lights.

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- 802-P01 CONCRETE MIX DESIGNS: If a High Early concrete mix is requested for use, submit a mix design that will attain a flexural strength of 450 psi after 72 hours. No additional compensation will be made for the use of a High Early concrete mix.
  
- 808-P01 CONCRETE ADMIXTURES: Include a water reducing admixture in Class AE pavement as specified in Section 808.02 "Chemical Admixtures".

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ESTIMATE OF QUANTITIES					
SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-6-986(116)120	100% CITY FUNDS
103	0100	CONTRACT BOND	L SUM	1	
201	0330	CLEARING & GRUBBING	L SUM	1	
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	4	
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	11394	
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	407	
202	0210	REMOVAL OF MANHOLES	EA	1	
203	0101	COMMON EXCAVATION-TYPE A	CY	11069	
203	0109	TOPSOIL	CY	7753	
203	0113	COMMON EXCAVATION-WASTE	CY	6218	
216	0100	WATER	MGAL	1459	
251	0300	SEEDING CLASS III	ACRE	6.33	
251	2000	TEMPORARY COVER CROP	ACRE	6.33	
253	0201	HYDRAULIC MULCH	ACRE	12.66	
255	0103	ECB TYPE 3	SY	204	
261	0112	FIBER ROLLS 12 IN	LF	580	
261	0113	REMOVE FIBER ROLLS 12 IN	LF	220	
265	0100	STABILIZED CONSTRUCTION ACCESS	EA	1	
265	0101	REMOVE STABILIZED CONSTRUCTION ACCESS	EA	1	
302	0099	SALVAGE AGGREGATE BASE COURSE	CY	8091	
302	0101	SALVAGED BASE COURSE	CY	9110	
302	0114	AGGREGATE BASE COURSE CL 3	CY	8401	
302	0161	AGGREGATE BASE COURSE CL 13	CY	248	
302	0405	SALVAGE & RELAY AGGREGATE SURFACE COURSE	CY	49	
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	1520	
550	0117	9IN NON-REINF CONCRETE PAVEMENT CL AE	SY	3050	
550	0131	9IN REINF CONCRETE PAVEMENT CL AE	SY	1199	
550	0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	17618	
702	0100	MOBILIZATION	L SUM	1	
704	0100	FLAGGING	MHR	600	
704	1000	TRAFFIC CONTROL SIGNS	UNIT	4194	
704	1052	TYPE III BARRICADE	EA	32	
704	1060	DELINEATOR DRUMS	EA	106	
704	1067	TUBULAR MARKERS	EA	18	
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	298	
708	1540	INLET PROTECTION-SPECIAL	EA	8	
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	8	
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	32253	
714	0110	PIPE CONC REINF 12IN CL III	LF	197	
714	0205	PIPE CONC REINF 15IN CL III	LF	614	
714	0310	PIPE CONC REINF 18IN CL III	LF	77	
714	0615	PIPE CONC REINF 24IN CL III	LF	231	
714	3020	END SECT-CONC REINF 24IN	EA	4	
714	5000	PIPE CORR STEEL .064IN 12IN	LF	84	
714	5035	PIPE CORR STEEL .064IN 24IN	LF	35	
714	5215	PIPE CORR STEEL .079IN 36IN	LF	81	
714	5724	24IN GRATES FOR REINF CONC END SECTION	EA	4	
714	5800	END SECT CORR STEEL .064IN 12IN	EA	1	
714	5820	END SECT CORR STEEL .064IN 24IN	EA	2	
714	5830	END SECT CORR STEEL .079IN 36IN	EA	2	
714	9659	REMOVE & RELAY PIPE-ALL TYPES & SIZES	LF	57	
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	1	
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN	LF	480	
722	0100	MANHOLE 48IN	EA	3	
722	0120	MANHOLE 72IN	EA	1	

Estimate of Quantities

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	8	2

ESTIMATE OF QUANTITIES					
SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-6-986(116)120	100% CITY FUNDS
722	1100	MANHOLE RISER 48IN	LF	14.7	
722	1120	MANHOLE RISER 72IN	LF	8.4	
722	3500	INLET-TYPE 1	EA	4	
722	3510	INLET-TYPE 2	EA	1	
722	3520	INLET-TYPE 2 DOUBLE	EA	7	
722	4010	INLET CATCH BASIN 6IN BEEHIVE	EA	5	
722	6140	ADJUST GATE VALVE BOX	EA	16	
722	6200	ADJUST MANHOLE	EA	5	
722	6240	ADJUST UTILITY APPURTENANCE	EA	4	
722	6248	ADJUST 3IN WATERMAIN	EA	1	
724	0411	6IN HYDRANT	EA		6
724	0430	REMOVE HYDRANT	EA		9
744	0100	POLYSTYRENE INSULATION BOARD	BD FT	310	
748	0140	CURB & GUTTER-TYPE I	LF	10765	
750	0020	PIGMENTED CONCRETE	SY	381	
750	0210	CONCRETE MEDIAN NOSE PAVING	SY	64	
750	2115	DETECTABLE WARNING PANELS	SF	160	
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	260	
754	0115	FLAT SHEET FOR SIGNS-TYPE IX REFL SHEETING	SF	62	
754	0150	DELINEATORS-TYPE A	EA	4	
754	0162	REMOVE & RESET DELINEATORS	EA	20	
754	0170	FLEXIBLE DELINEATORS	EA	10	
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	268	
754	0592	RESET SIGN PANEL	EA	8	
762	0103	PVMT MK PAINTED-MESSAGE	SF	64	
762	0112	EPOXY PVMT MK MESSAGE	SF	150	
762	0113	EPOXY PVMT MK 4IN LINE	LF	4881	
762	0115	EPOXY PVMT MK 8IN LINE	LF	2166	
762	0118	EPOXY PVMT MK CURB TOP & FACE	LF	413	
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	304	
762	0131	EPOXY PVMT MK 6IN LINE-GROOVED	LF	665	
762	0135	EPOXY PVMT MK 24IN LINE-GROOVED	LF	215	
762	1104	PVMT MK PAINTED 4IN LINE	LF	2640	
762	1108	PVMT MK PAINTED 8IN LINE	LF	656	
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	1398	
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	2740	
770	0025	SCREW IN BASE FOUNDATION	EA	28	
770	0100	PULL BOX	EA	3	
770	0320	1.5IN DIAMETER RIGID CONDUIT	LF	5474	
770	0330	2IN DIAMETER RIGID CONDUIT	LF	1635	
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	23847	
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	7596	
770	0745	FEED POINT-TYPE IV-PAD MOUNTED	EA	1	
770	1660	LT STD 6FT MA 25FT MT HT BREAKAWAY	EA	8	
770	1666	LT STD 6FT MA 30FT MT HT BREAKAWAY	EA	17	
770	1676	LT STD 6FT MA 40FT MT HT BREAKAWAY	EA	2	
770	4210	LED LUMINAIRE	EA	27	
770	4540	RELOCATE LIGHT STANDARD	EA	1	
770	4560	REMOVE LIGHT STANDARD	EA	1	
772	9200	IT SYSTEM	EA	1	
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1	EA	1	
990	0230	TEMPORARY ACCESS	L SUM	1	

Estimate of Quantities

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

## BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	10	1

HBP Cored Samples							
	A	B	C	D			
Specification Section	Distance (Ft)+2000	Lanes	Lifts	Sublots (A × B × C)	Quantity (D × 2)	Quantity (1 per mile)	Unit
430.04 I.2.b(1), "General"	1	2	3	6	12	N/A	EA
430.04 I.2.b(2), "Pavement Thickness Determination Cores"					N/A	1	EA
				Total	12	1	EA

**Water**

25 MGal/Mile for Dust Palliative  
 40 Gal/Ton for Aggregates  
 10 Gal/CY for Embankment

**Common Excavation-Type A, Common Excavation-Waste, and Salvage Aggregate Base Course**

Excavation quantities are based upon in-place volume and calculated by the average end area method. The total excavation quantity is broken into three distinct quantities: "Salvage Aggregate Base Course," "Common Excavation-Type A," and "Common Excavation-Waste." These three quantities are shown in the Earthwork Summary table in Section 11 and include excavation of all existing material except Topsoil; this includes the existing asphalt and base materials. The "Salvage Aggregate Base Course" is the existing asphalt and base to be removed and salvaged as shown in the Plans. The table, Salvage Aggregate Base Course – Removal, identifies the basis of estimate for this quantity. "Common Excavation-Type A" is the common excavation that will be placed on site as embankment. "Common Excavation-Waste" is the remaining quantity of the total excavation not being salvaged as "Salvage Aggregate Base Course" or used as "Common Excavation-Type A."

**Commercial Grade Hot Mix Asphalt**

2.0 Ton/CY

**Manhole Riser**

Length determined by the following calculation (example MH 2 shown below):

Top Elev	836.00
Castings/ Rings/ Cover Adj.	- 0.92 (Includes Float)
Invert (Lowest Inv Elv)	- <u>826.65</u>
Riser Pay Length	8.4 LF

**Pavement Marking**

4" Centerline Skip: 1320 LF/Mile

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	11	1

Earthwork Summary								
Location	*Salvage Aggregate Base Course (Pay Item)	Common Excavation-Type A (Pay Item)	Common Excavation-Waste (Pay Item)	**Embankment	Balance (Waste)	Topsoil (Pay Item)	**Topsoil Required	*Topsoil Excess
	CY	CY	CY	CY	CY	CY	CY	CY
	A	B	C	D	E = B + C - D	F	G	H = F - G
South Columbia Road	7350	7829	7755	7829	7755	6335	4552	1783
47th Ave S - West Approach	0	2371	-1215	2371	-1215	843	751	92
47th Ave S - East Approach	741	869	-323	869	-323	576	415	160
	8091	11069	6218	11069	6218	7753	5718	2035

\*Excess to be placed as directed by the Engineer  
\*\*30% volume was added to allow for loss/shrinkage

Salvage Aggregate Base Course - Removal				
Station Range	Length	Width	Depth	*Salvage Aggregate Base Course (Pay Item)
	LF	LF	IN	CY
Sta 302+50 - 306+00	350	28	32	968
Sta 306+00 - 316+00	1000	28	26	2247
Sta 316+00 - 326+35	1035	28	32	2862
Sta 326+35 - 331+26	491	40	21	1273
Sta 76+70 - 80+00	330	28	26	741
				8091

\*Excess to be placed as directed by the Engineer

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Earthwork Summary  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	11	2

South Columbia Road				
Station	Common Excavation-Type A	Common Excavation-Waste	Embankment	Topsoil
	CY	CY	CY	CY
296+52.95	0	0	0	0
296+75	19	-7	19	9
297+00	22	-8	22	12
297+25	22	-7	22	14
297+50	23	-6	23	15
297+75	26	-7	26	16
298+00	28	-4	28	18
298+25	28	-2	28	18
298+50	29	-2	29	19
298+75	32	-4	32	19
299+00	35	-6	35	20
299+25	38	-6	38	21
299+50	38	-5	38	21
299+75	47	-25	47	19
300+00	50	-27	50	20
300+25	43	-7	43	22
300+50	41	-3	41	23
300+75	41	-4	41	23
301+00	42	-7	42	23
301+25	42	-9	42	23
301+50	41	-8	41	24
301+75	38	-5	38	24
302+00	36	0	36	24
302+25	28	68	28	29
302+50	22	77	22	34
302+75	30	63	30	38
303+00	41	49	41	38
303+25	39	50	39	34
303+50	33	65	33	32
303+75	25	86	25	31
304+00	16	106	16	31
304+25	9	122	9	31
304+50	5	135	5	31
304+75	4	141	4	31
305+00	16	132	16	33
305+25	36	111	36	39
305+50	45	100	45	45
305+75	53	94	53	46
306+00	30	44	30	23
306+25	6	127	6	21
306+50	0	424	0	52
306+75	0	583	0	67
307+00	13	402	13	66
307+25	20	151	20	64
307+50	39	128	39	62
307+75	47	111	47	59
308+00	58	94	58	58
308+25	68	83	68	60
308+50	80	83	80	60
308+75	43	44	43	30
309+00	18	88	18	27
309+25	36	154	36	58
309+50	37	124	37	62
309+75	42	106	42	61
310+00	50	89	50	61

South Columbia Road				
Station	Common Excavation-Type A	Common Excavation-Waste	Embankment	Topsoil
	CY	CY	CY	CY
310+25	65	67	65	60
310+50	70	60	70	60
310+75	61	66	61	60
311+00	65	52	65	60
311+25	71	35	71	60
311+50	69	27	69	59
311+75	76	9	76	59
312+00	84	-12	84	58
312+25	94	-31	94	58
312+50	107	-52	107	58
312+75	56	11	56	46
313+00	5	73	5	35
313+25	9	171	9	69
313+50	4	98	4	35
313+75	67	33	67	46
314+00	130	-31	130	57
314+25	99	5	99	55
314+50	78	35	78	54
314+75	69	52	69	53
315+00	65	65	65	53
315+25	60	77	60	53
315+50	58	84	58	53
315+75	60	86	60	54
316+00	63	87	63	54
316+25	59	95	59	54
316+50	47	109	47	54
316+75	35	123	35	53
317+00	28	129	28	53
317+25	31	123	31	53
317+50	38	112	38	52
317+75	43	102	43	51
318+00	48	89	48	51
318+25	54	75	54	51
318+50	62	59	62	53
318+75	74	42	74	54
319+00	88	22	88	54
319+25	98	3	98	54
319+50	103	-8	103	54
319+75	69	16	69	43
320+00	35	41	35	31
320+25	70	80	70	63
320+50	35	40	35	31
320+75	63	28	63	44
321+00	91	16	91	56
321+25	96	17	96	58
321+50	101	19	101	58
321+75	91	34	91	58
322+00	71	61	71	58
322+25	57	81	57	58
322+50	49	92	49	58
322+75	49	94	49	57
323+00	46	100	46	57
323+25	39	108	39	57
323+50	40	104	40	57
323+75	49	87	49	57

South Columbia Road				
Station	Common Excavation-Type A	Common Excavation-Waste	Embankment	Topsoil
	CY	CY	CY	CY
324+00	63	67	63	57
324+25	73	52	73	57
324+50	84	35	84	57
324+75	99	15	99	57
325+00	111	-3	111	58
325+25	126	-42	126	58
325+50	137	-77	137	58
325+75	137	-81	137	58
326+00	139	-87	139	58
326+25	148	-101	148	58
326+50	97	-48	97	45
326+75	45	5	45	31
327+00	90	10	90	62
327+25	108	-26	108	61
327+50	108	-33	108	58
327+75	107	-40	107	56
328+00	89	-12	89	55
328+25	75	10	75	54
328+50	68	27	68	53
328+75	54	54	54	53
329+00	36	85	36	52
329+25	34	95	34	51
329+50	46	90	46	50
329+75	57	89	57	48
330+00	67	84	67	46
330+25	82	69	82	45
330+50	97	53	97	43
330+75	104	45	104	42
331+00	88	71	88	32
331+26	63	112	63	33
Total	7829	7755	7829	6335

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Earthwork Details  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	11	3

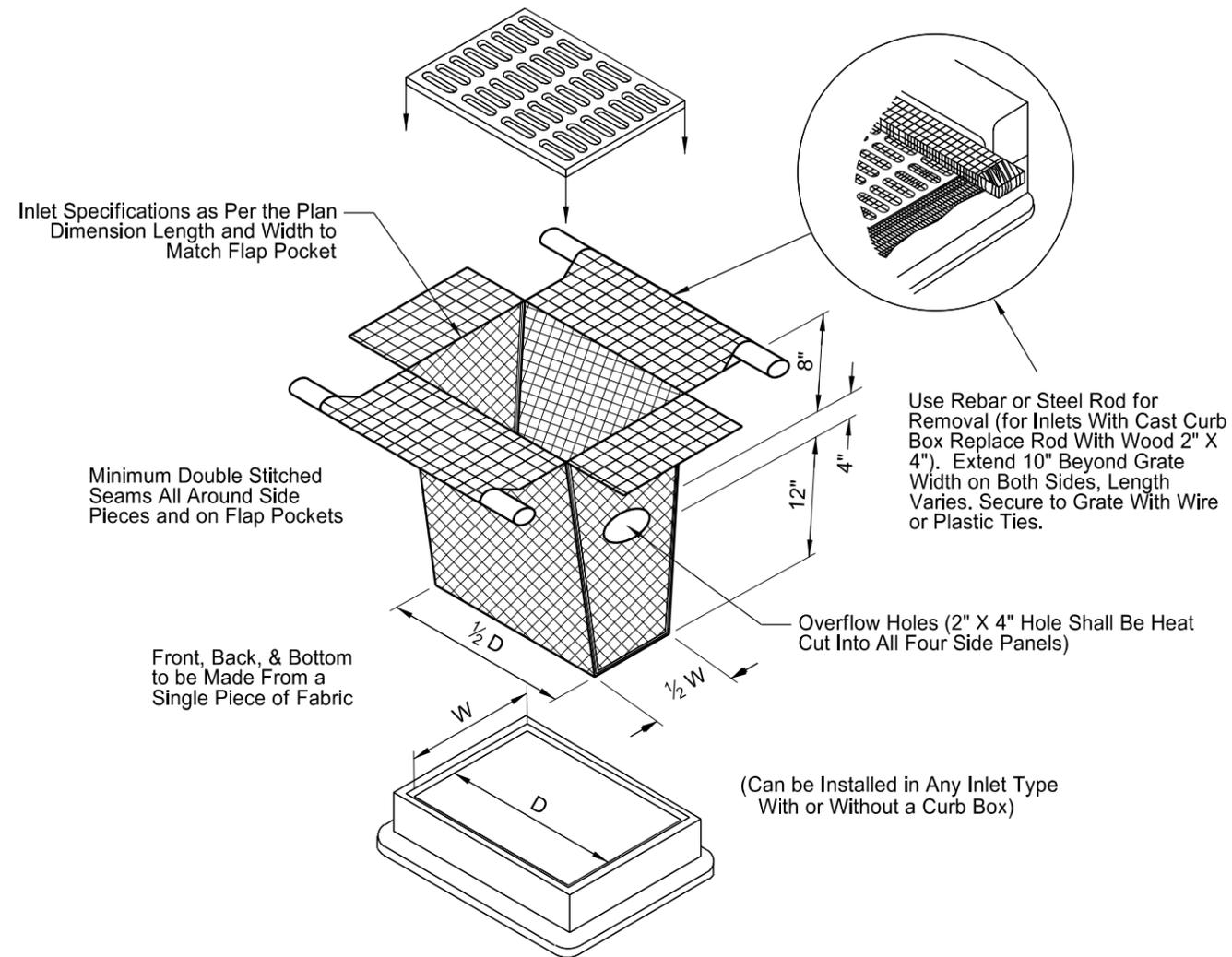
47th Ave S - West Approach					
Station	Common Excavation-Type A	Common Excavation-Waste	Embankment	Topsoil	Topsoil Required
	CY	CY			
69+09.12	0	0	0	0	0
69+25	8	-8	8	5	6
69+50	20	-19	20	8	9
69+75	30	-30	30	9	9
70+00	43	-42	43	10	10
70+25	55	-53	55	19	20
70+50	67	-62	67	29	31
70+75	80	-73	80	31	32
71+00	96	-86	96	32	34
71+25	108	-96	108	35	35
71+50	118	-102	118	36	37
71+75	125	-105	125	38	37
72+00	130	-105	130	39	38
72+25	138	-110	138	40	38
72+50	149	-121	149	41	38
72+75	159	-130	159	42	38
73+00	167	-137	167	43	38
73+25	175	-144	175	44	38
73+50	165	-119	165	45	39
73+75	136	-75	136	44	37
74+00	106	-37	106	42	34
74+25	79	6	79	42	32
74+50	57	48	57	41	31
74+75	43	80	43	40	29
75+00	47	123	47	40	28
75+29.54	70	182	70	50	33
Total	2371	-1215	2371	843	751

47th Ave S - East Approach					
Station	Common Excavation-Type A	Common Excavation-Waste	Embankment	Topsoil	Topsoil Required
	CY	CY			
77+31.45	0	0	0	0	0
77+50	26	46	26	30	17
77+75	37	59	37	37	20
78+00	29	45	29	33	13
78+25	22	25	22	31	7
78+50	27	17	27	30	7
78+75	31	8	31	30	9
79+00	38	-4	38	29	13
79+25	47	-19	47	30	17
79+50	63	-38	63	32	22
79+75	77	-55	77	33	27
80+00	74	-54	74	32	27
80+25	63	-51	63	30	27
80+50	60	-55	60	30	28
80+75	58	-54	58	28	28
81+00	55	-51	55	26	26
81+25	49	-45	49	24	25
81+50	40	-37	40	23	24
81+75	30	-27	30	21	23
82+00	19	-16	19	19	22
82+25	13	-10	13	17	19
82+43.28	10	-8	10	11	13
Total	869	-323	869	576	415

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Earthwork Details  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

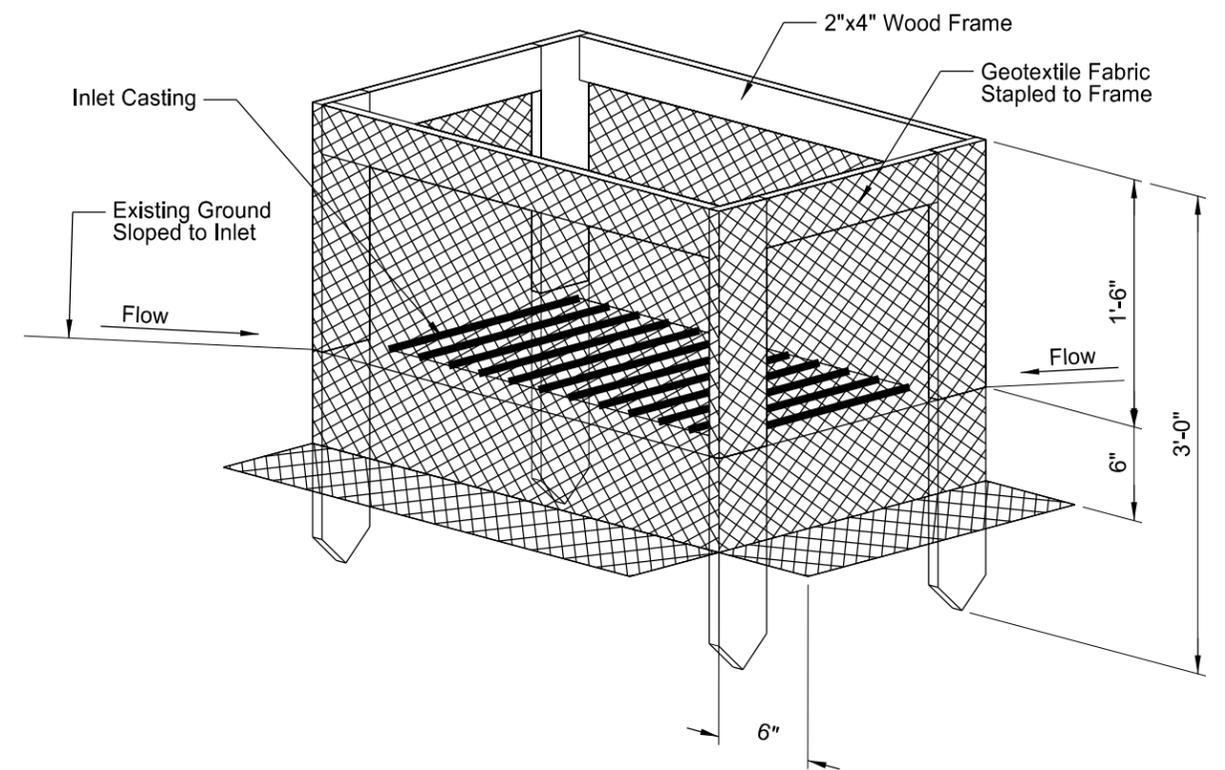
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	1



**Notes:**

1. All Geotextile Material Used for Inlet Protection Shall be Monofilament in Both Directions.
2. Finished Size, Including Pockets Where Required, Shall Extend a Minimum of 10 Inches Around the Perimeter to Facilitate Maintenance or Removal.
3. The Installed Filter Bag Shall Have a Minimum Side Clearance of 3 Inches Between the Inlet Walls and the Bag, Measured at the Bottom of the Overflow Holes. Where Necessary, the Contractor Shall Clinch the Bag Using Plastic Zip Ties to Achieve the 3 Inch Side Clearance.
4. Flap Pockets Shall be Large Enough to Accept Wood 2 Inch x 4 Inch. Rock Sock or Straw Wattle May be Used in Place of the Flap Pockets.

**Inlet Protection - Existing and New Inlets**



**Notes:**

1. Premanufactured Frames May be Used Instead of Constructing Wood Frames, Provided that Adequate Support for the Geotextile Fabric is Furnished.

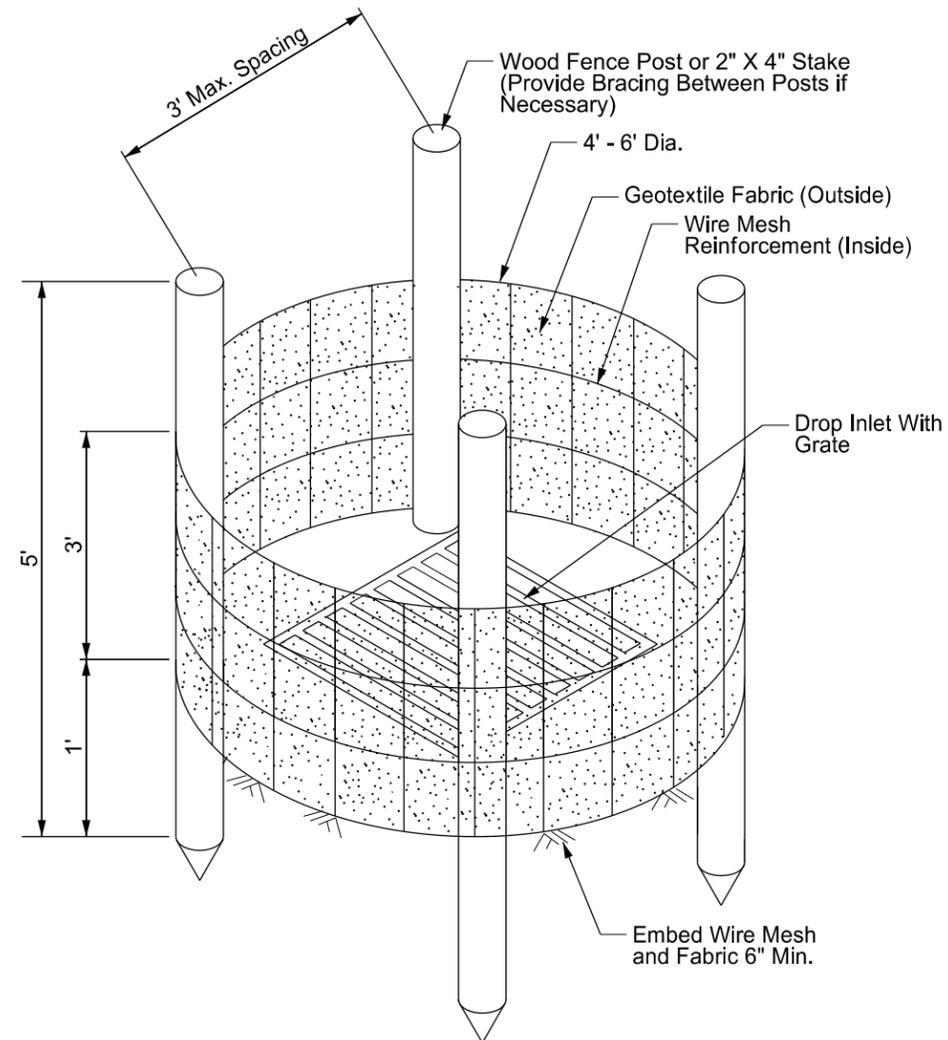
**Inlet Protection - Before Concrete Pavement Construction**

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**Erosion Control Details**

Reconstruction of South Columbia Road  
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	2



**Notes:**

1. Inlet protection devices shall be maintained or replaced at the direction of the engineer.
2. Manufactured alternatives may be substituted, subject to the engineer's approval.
3. When removing or maintaining inlet protection, care shall be taken so that the sediment trapped on the geotextile fabric does not fall into the inlet. Any material falling into the inlet shall be removed immediately.

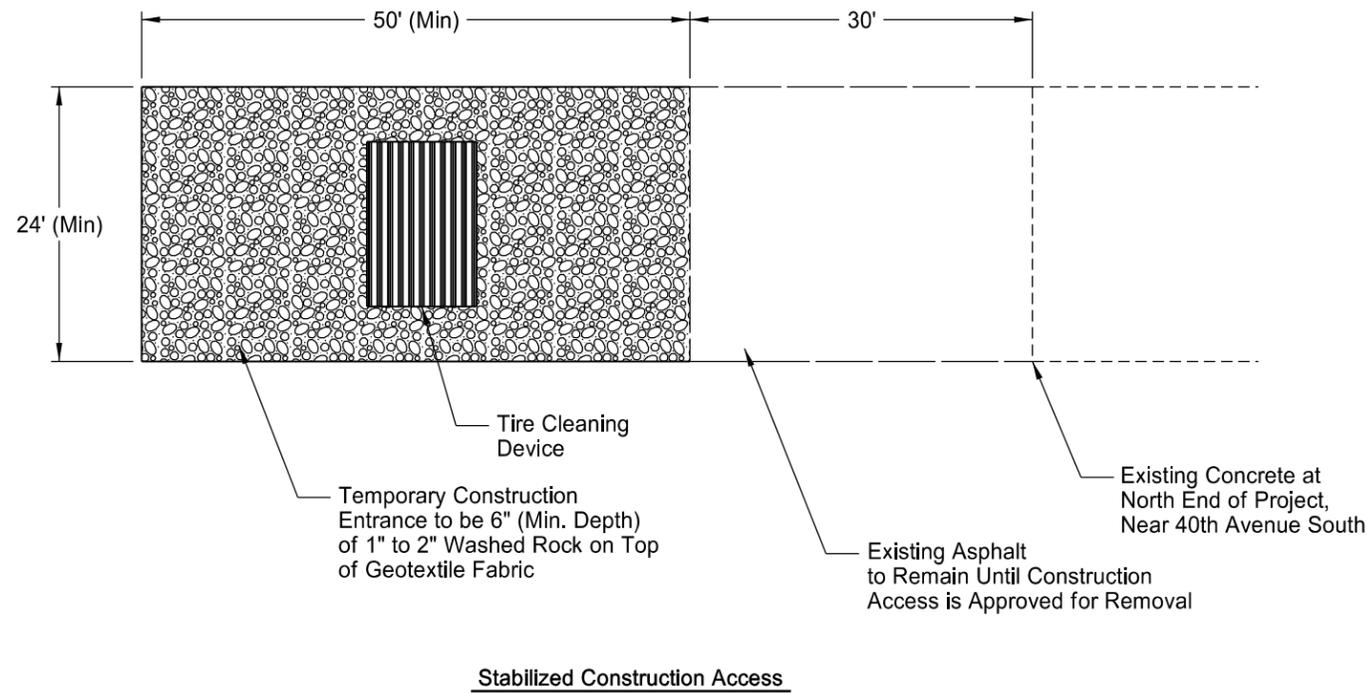
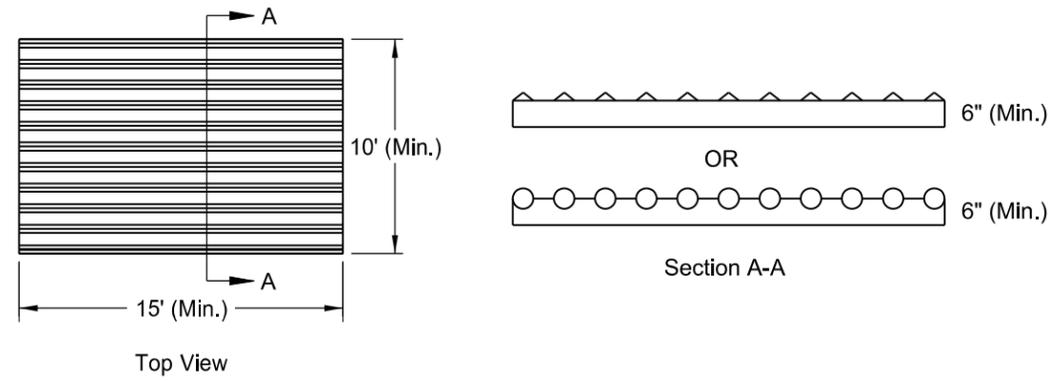
**Inlet Protection - Area Inlets**

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Erosion Control Details

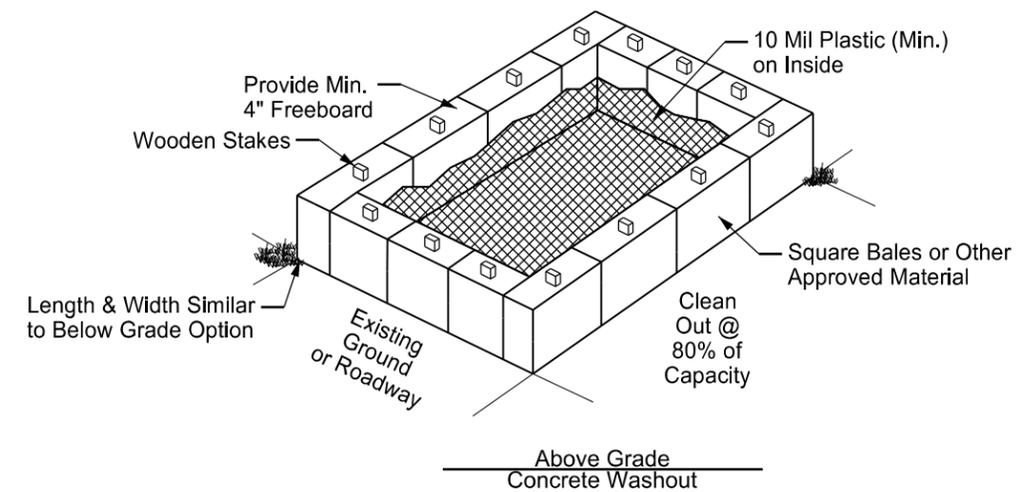
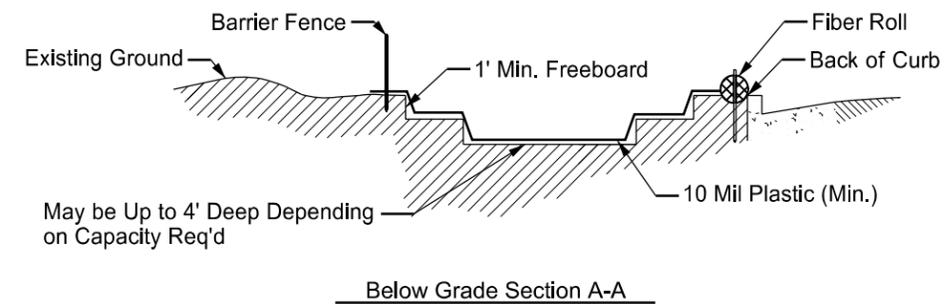
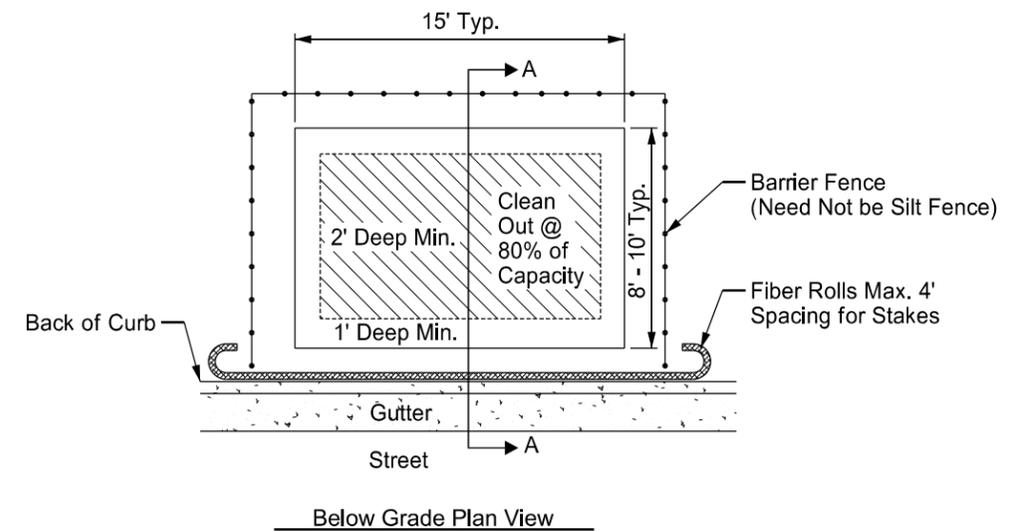
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	20	3



**Notes:**

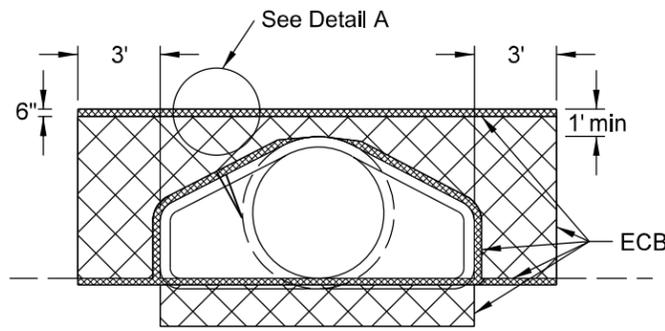
1. A stabilized construction access shall be constructed as shown on Plans. Field location shall be coordinated and verified with the Engineer.
3. Upon completion of the project, the Contractor shall remove the stabilized construction access unless noted otherwise, and the site shall be restored to preconstruction condition or better.
4. Exits shall be maintained in a manner to minimize the tracking of sediment onto paved surfaces. Contractor shall remove tracked sediment immediately.
5. Tire cleaning device shall be installed for all outbound traffic. Minimum size shall be 15' wide and 10' long. Several devices may be acceptable; including Cattle Guards, Rumble Plates and Wash Racks.



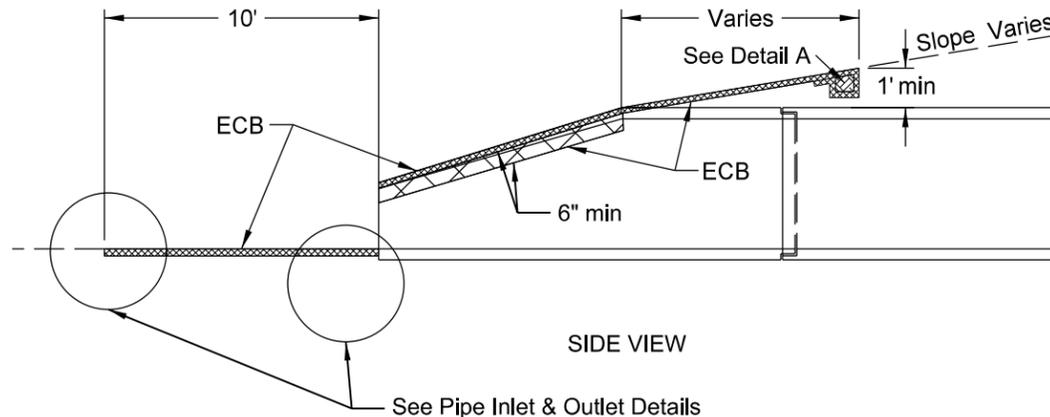
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**Erosion Control Details**

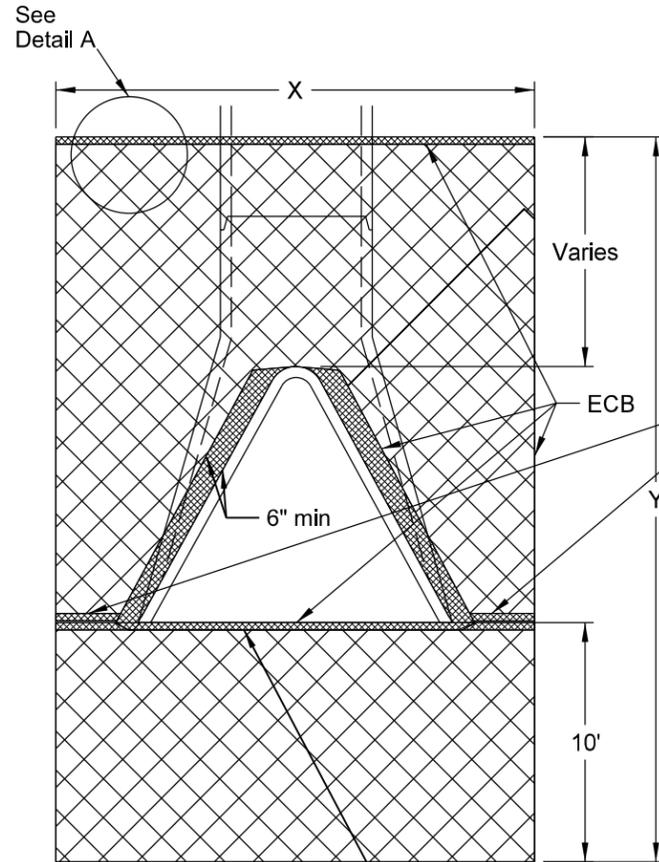
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



FRONT VIEW



SIDE VIEW



TOP VIEW

Tuck this end a minimum of 6" into the embankment.

Inlet side - see applicable detail for pipe inlet.  
Outlet side - see applicable detail for pipe outlet.

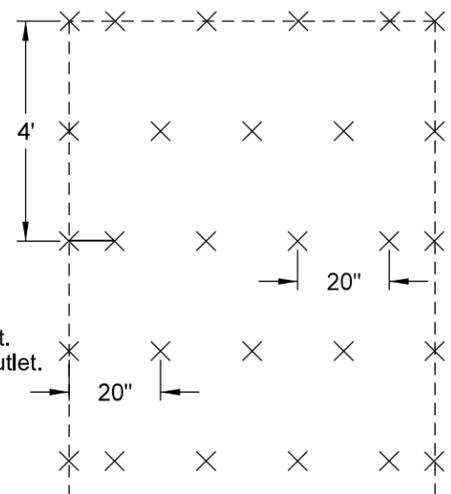
Erosion Control Blanket (ECB)							
Location of Surface to be Protected Station	Pipe Dia (Inch)	No.	Unit Quantity (SY)	Total Quantity			
				Type 1 (SY)	Type 2 (SY)	Type 3 (SY)	Type 4 (SY)
299+53.27 52.67' Lt	24	1	24			24	
299+93.27 53.44' Lt	24	2	24			24	
302+77.30 59.05' Lt	24	3	24			20	
302+77.30 26.82' Rt	24	4	24			20	
302+83.66 62.51' Lt	24	5	24			24	
73+47.98 45.28' Lt	36	6	24			24	
73+43.04 46.20' Rt	36	7	24			24	
74+88.78 45.50' Rt	24	8	24			24	
80+18.21 40.66' Lt	12	9	20			20	
Total (SY)				204			

Centerline Culverts					
DIA	X	Y	Surface area to be protected	ECB	
In	Ft	Ft	SF	SY	
24	10.5	27.6	172.1	20	
27	11.0	18.0	182.3	21	
30	11.6	18.5	195.1	22	
36	12.7	19.2	216.7	24	

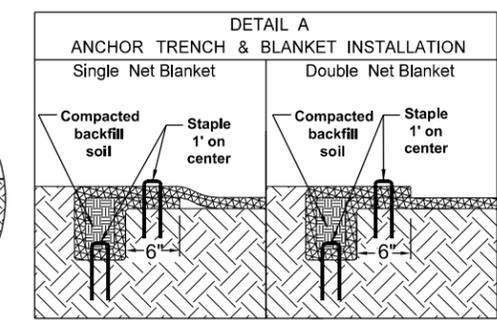
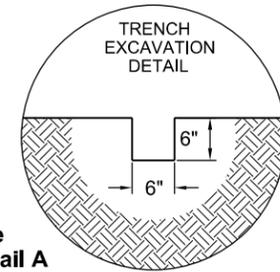
Note: Quantities based on 4:1 Slope.

Embankment Culverts					
DIA	X	Y	Surface area to be protected	ECB	
In	Ft	Ft	SF	SY	
12	9.0	20.0	176.0	20	
15	9.0	20.0	176.0	20	
18	9.5	20.7	190.7	22	
21	9.5	21.0	190.9	22	
24	10.5	21.6	214.1	24	
30	11.6	22.5	241.5	27	
36	12.7	23.3	268.8	30	

Note: Quantities based on 8:1 Slope.



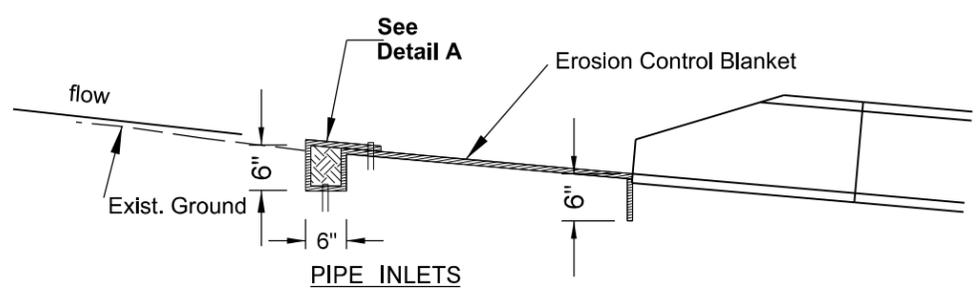
STAPLE PATTERN



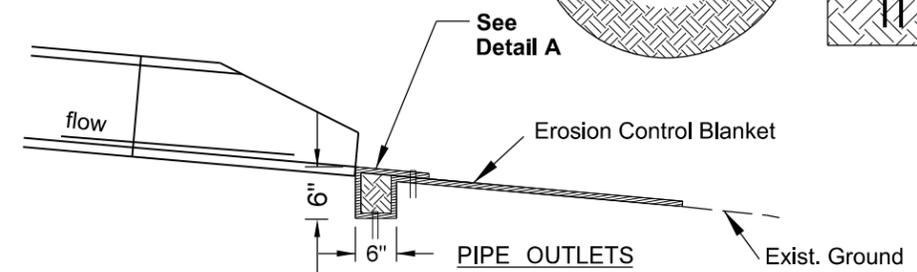
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Notes:

- The ECB Shall Be Tucked a Minimum of 1' into the Embankment above the Flared End Section, a Minimum of 6" into the Embankment (against the Flared End Section) around the Opening of the Flared End Section, and 2' into the Ground at the End of the Flared End Section.



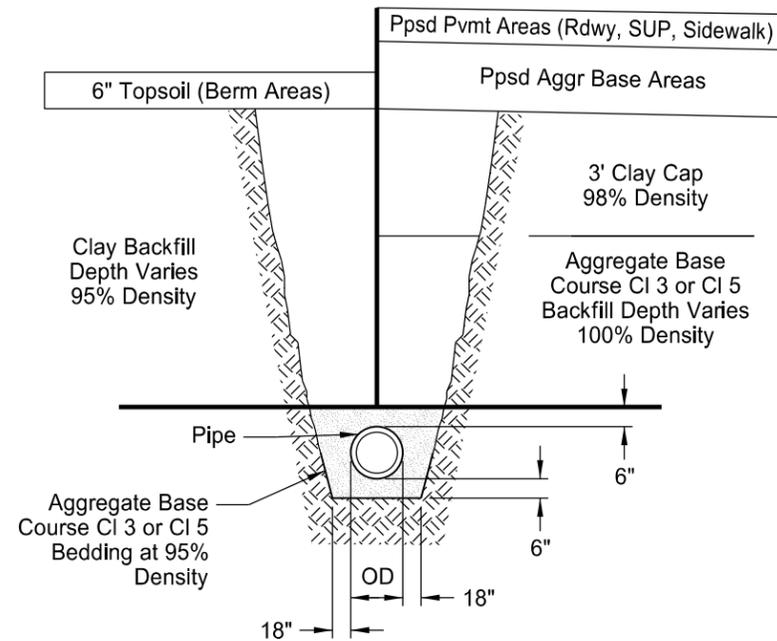
PIPE INLETS



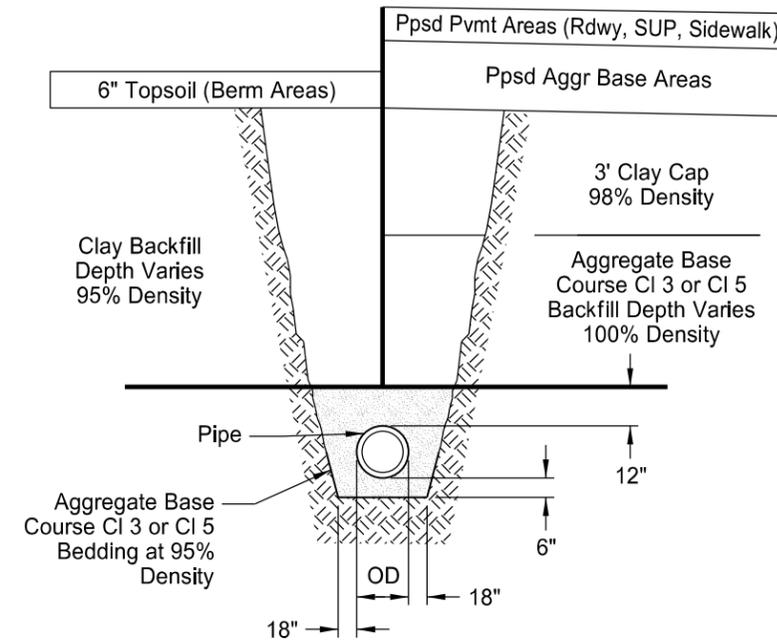
PIPE OUTLETS

Erosion Control Blanket Details  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Backfill Details for RCP Pipe



Backfill Details for PVC and CSP Pipe Types

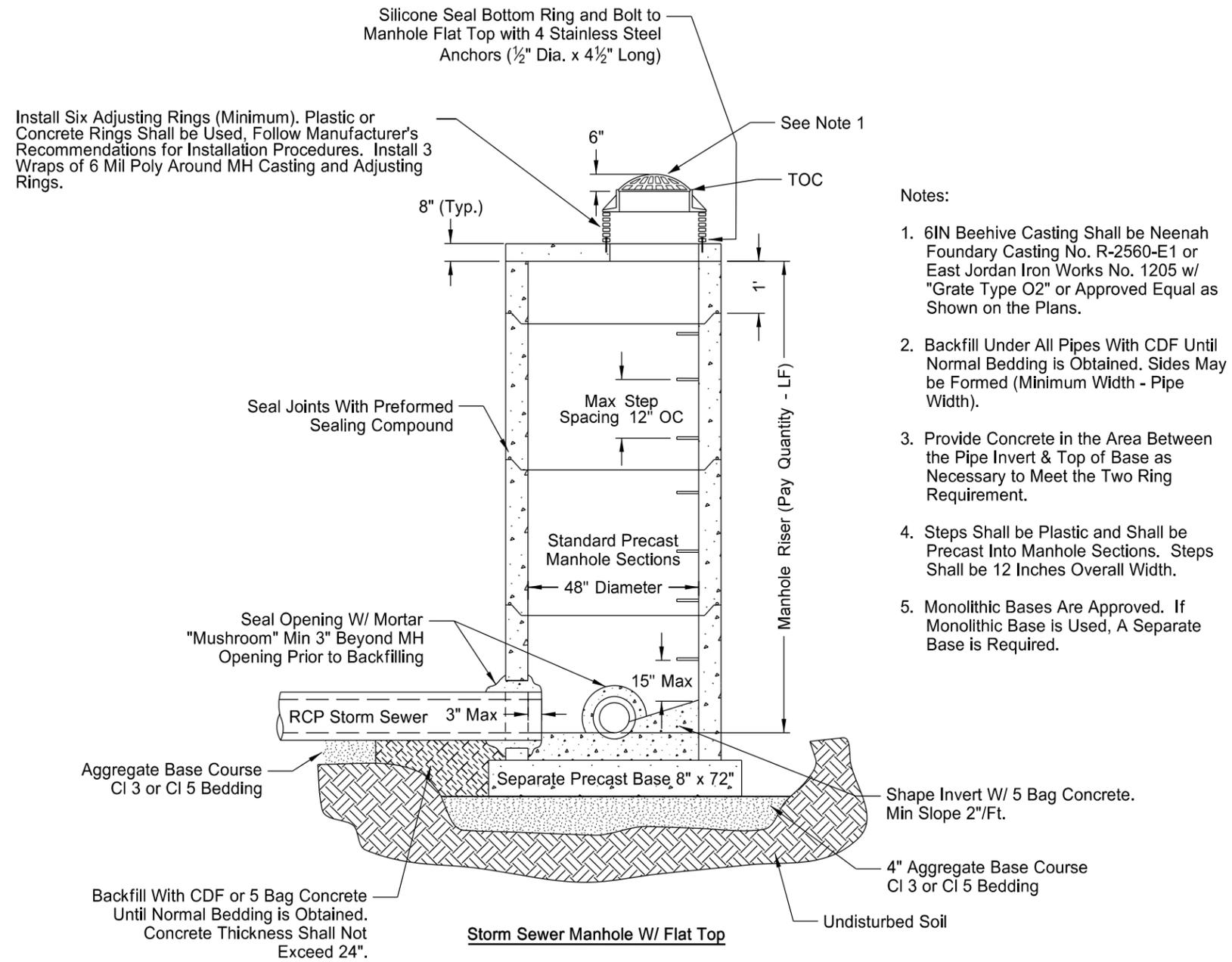
Notes:

1. Maximum Thickness of Any One Lift Shall not Exceed 8 Inches Loose Material.
2. Clay Backfill and Clay Cap Shall be Compacted to Specified Density at 3% +/- of Optimum Moisture Content.
3. Trench Side slopes Shown are for Illustrative Purposes Only, Contractor Shall Excavate Trench in Accordance With OSHA and Other Applicable Requirements.
4. All Compaction Testing Shall be Determined by the Standard Proctor Density Test (NDDOT T 99)
5. Trenches Backfilled with Clay Under Proposed Roadways, Shared Use Path and Sidewalk Locations Shall be Compacted to 98% Density (Clay Cap Specifications).
6. Remove Aggregate Class AA Backfill from Existing Trenches Encountered During Excavtion and Construct 3' Clay Cap.
7. Trench/Utility Structure Backfill Testing Shall be taken for Each Layer of Compacted Aggregate or Clay Backfill. A Layer of Compacted Aggregate or Clay Backfill is Defined by a Thickness of 12 Inches (placed and compacted in 6" lifts) and a Maximum Length of 200 Lineal Feet. Each side of the Pipe Shall be Tested and Considered its Own Compacted Layer. The Engineer may Revise these Requirements to Suit Field Conditions.

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Bedding & Backfill Details  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	6

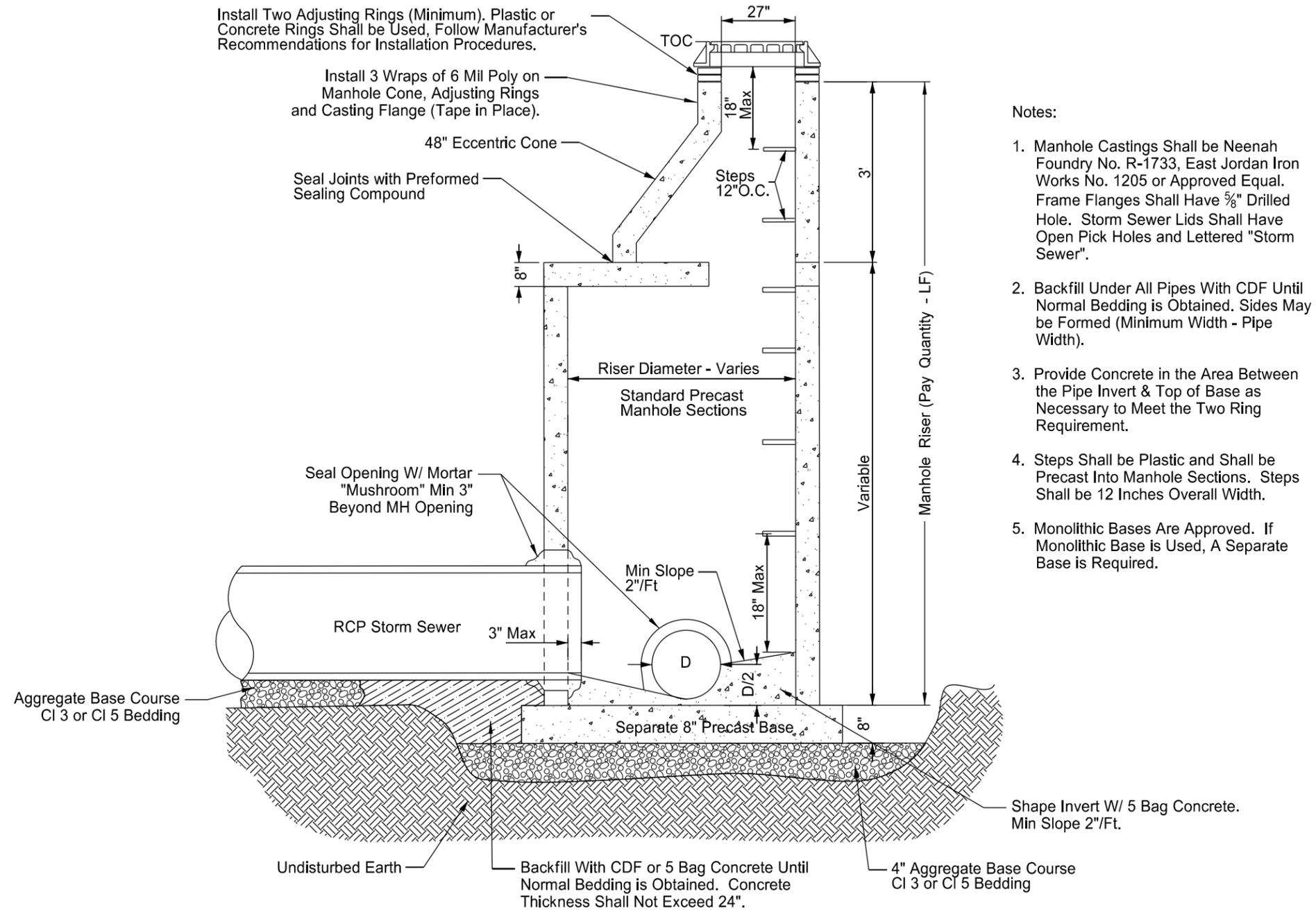


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Storm Sewer Manhole Details

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	7



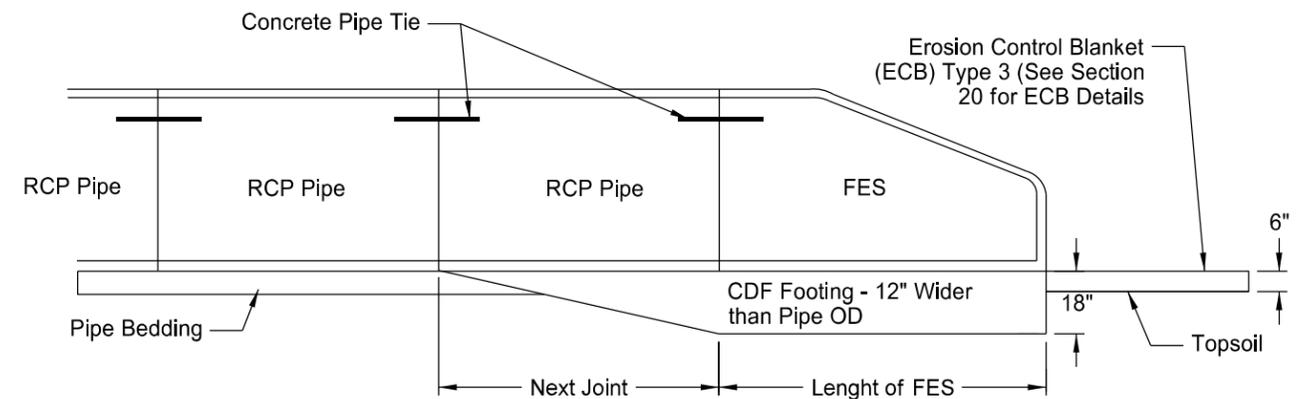
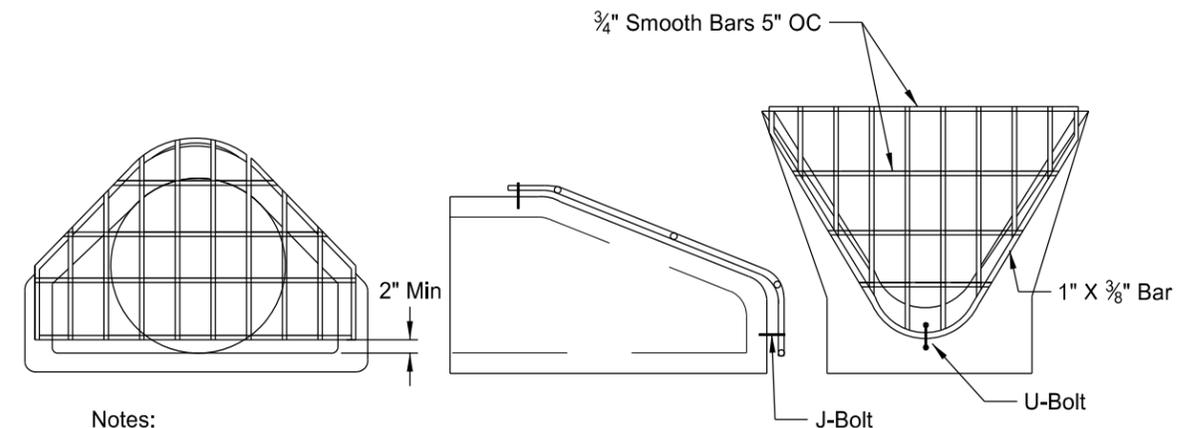
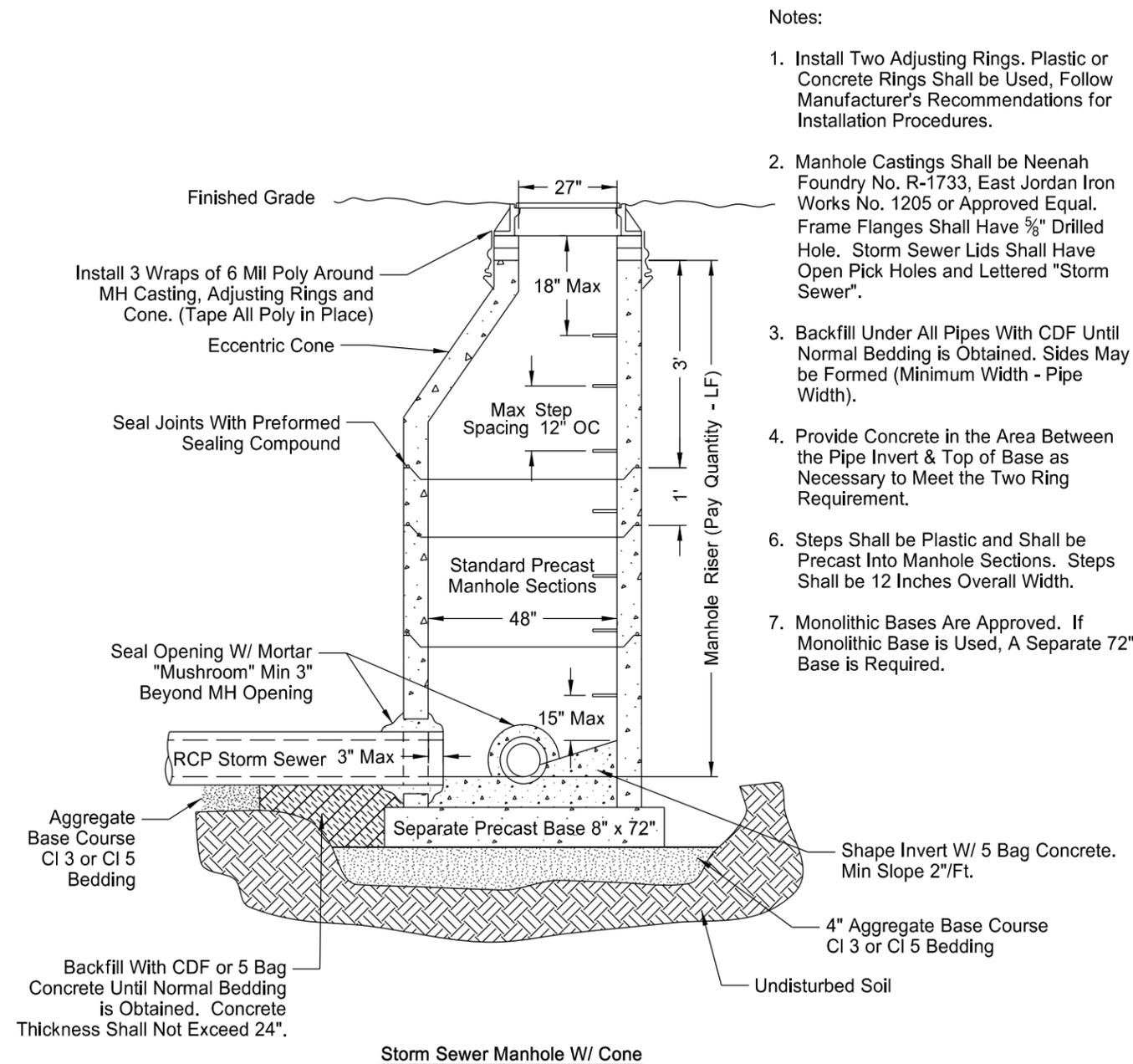
**Storm Sewer Manhole - 54" Or Greater W/ Cone**

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**Storm Sewer Manhole Details**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	8



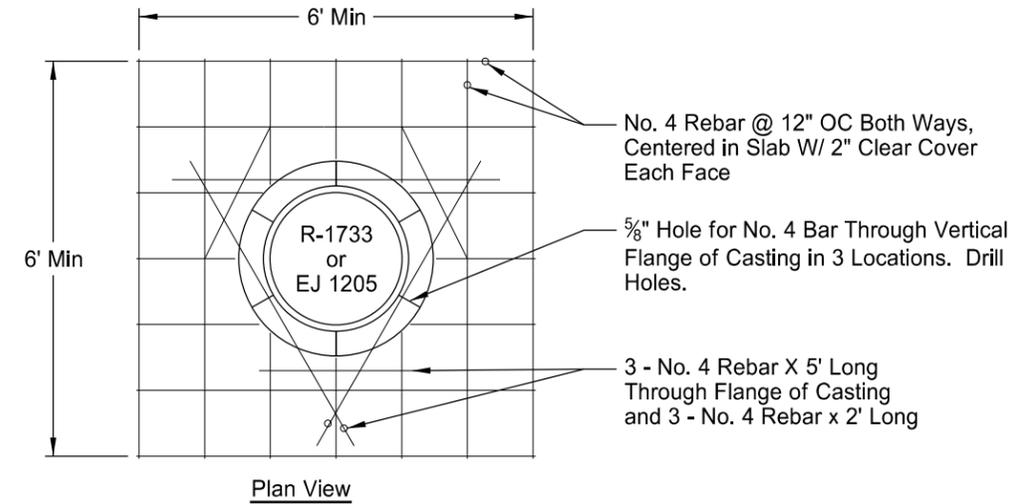
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**Storm Sewer Manhole Details**

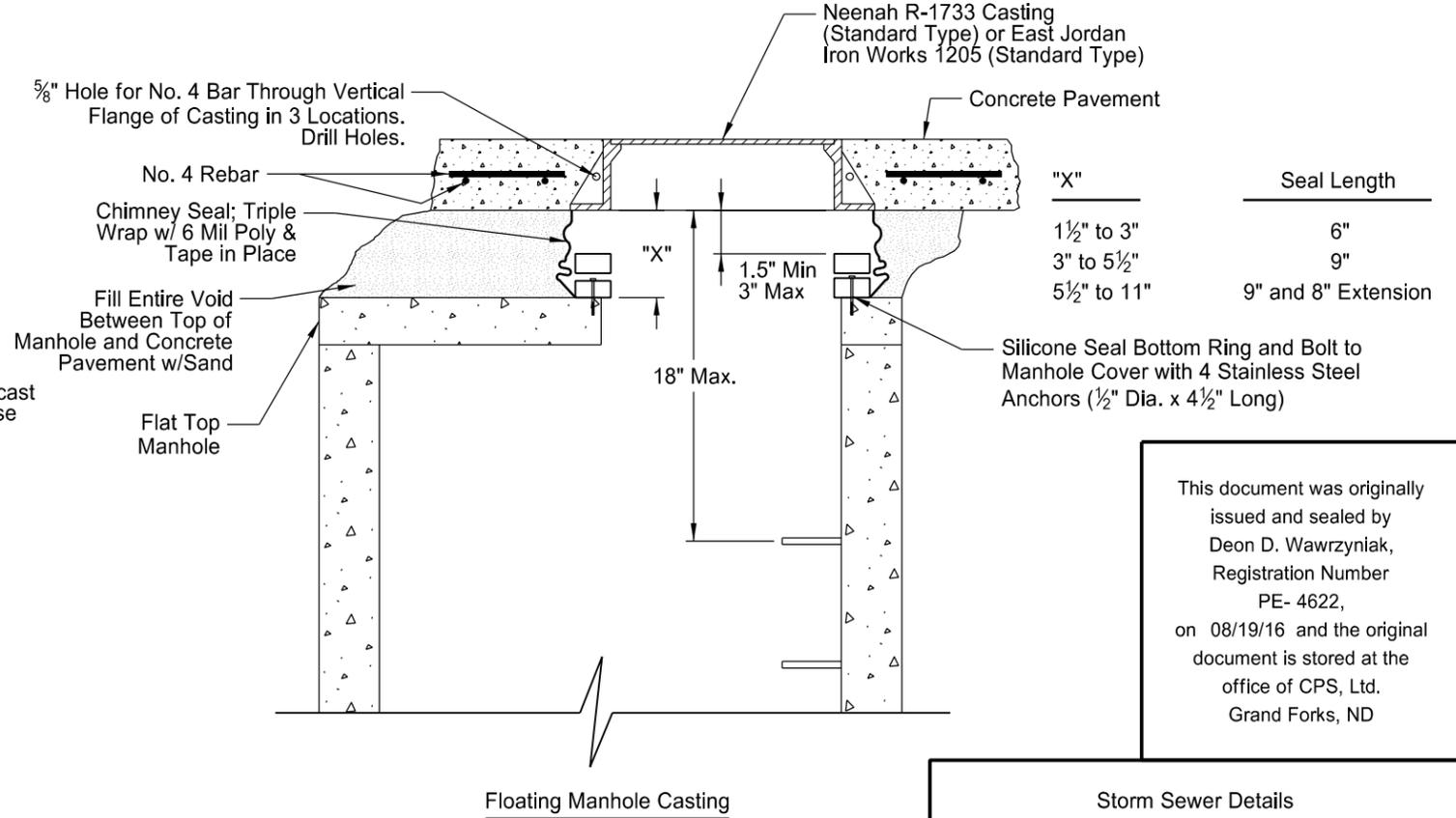
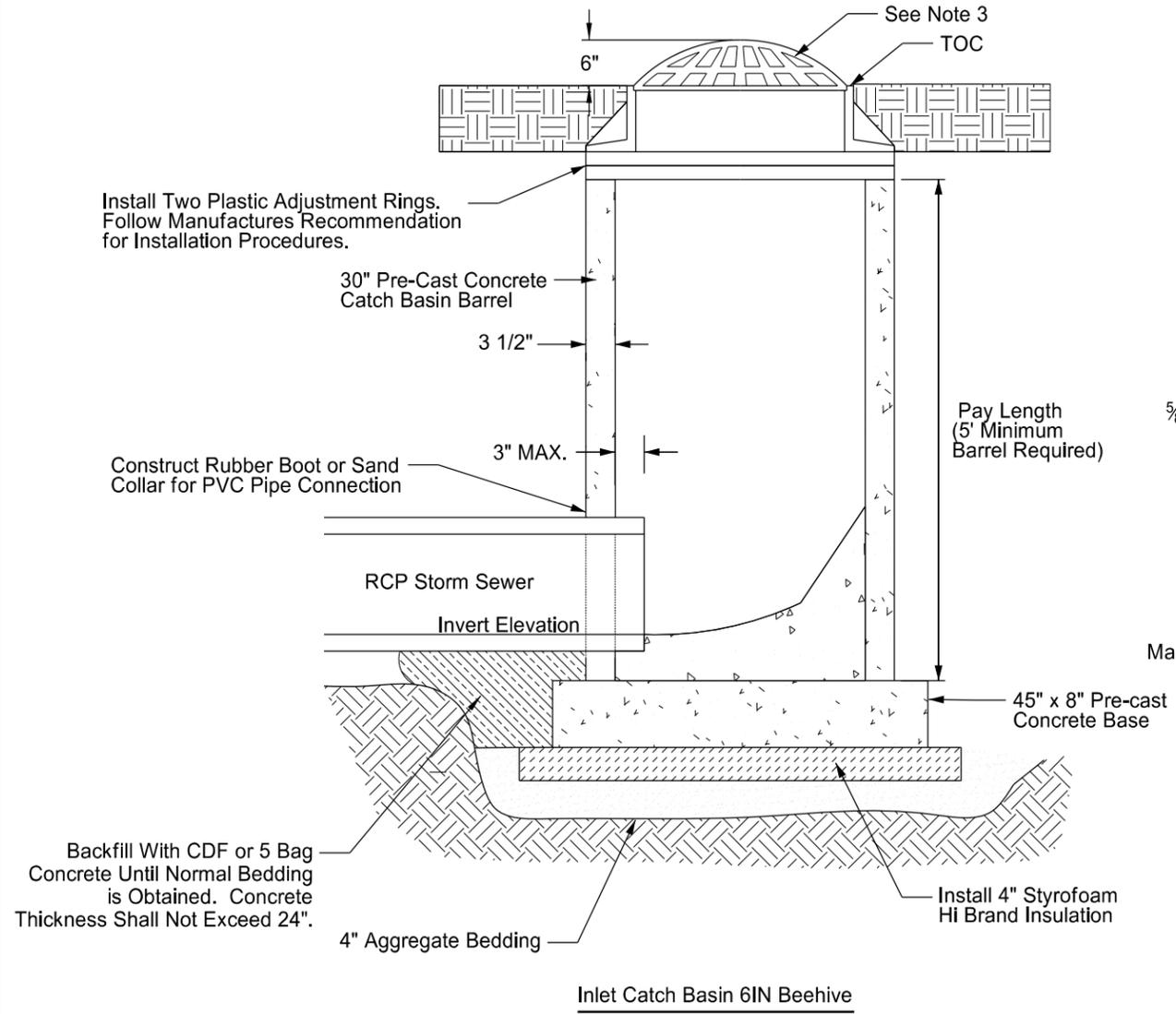
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

Notes:

1. Area Drain Casting, Adjusting Rings and Barrel Shall be Double Wrapped with 6-Mil Poly.
2. Fill Invert to Design Grade with 5 bag Concrete Mix.
3. 6IN Beehive Casting Shall be Neenah Foundary Casting No. R-2560-E1 or East Jordan Iron Works No. 1205 w/ "Grate Type O2" or Approved Equal as Shown on the Plans.



- Notes:
1. Floating Manhole Casting Detail for Paved Areas Using Casting, Neenah R-1733 Standard, East Jordan Iron Works 1205 Standard or an Approved Equal.
  2. Install 3 Wraps of 6 Mil Poly around Chimney Seal and Tape in Place.

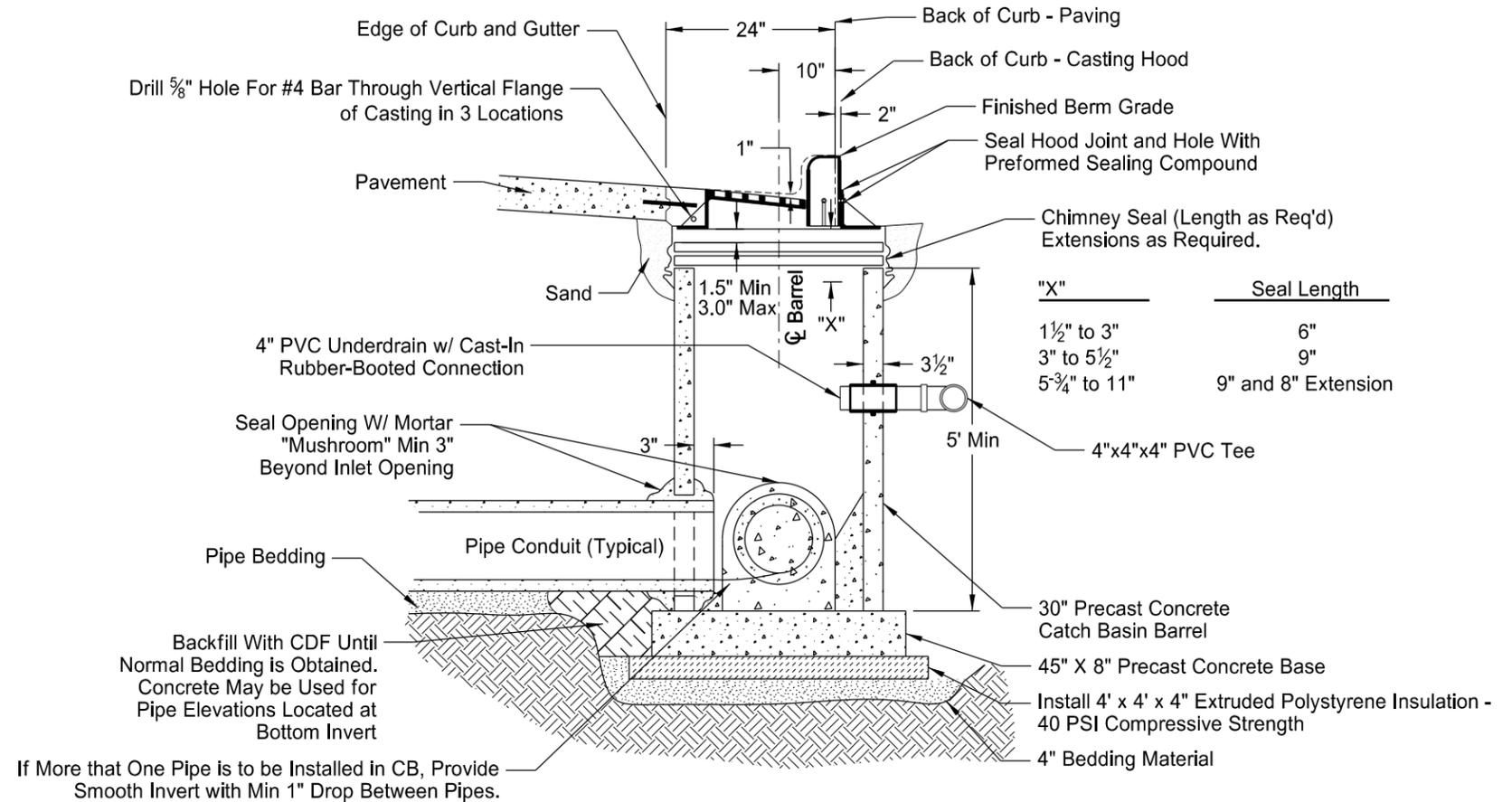


Note:  
See Existing Manhole Adjustment Summary in Section 50 of Plans.

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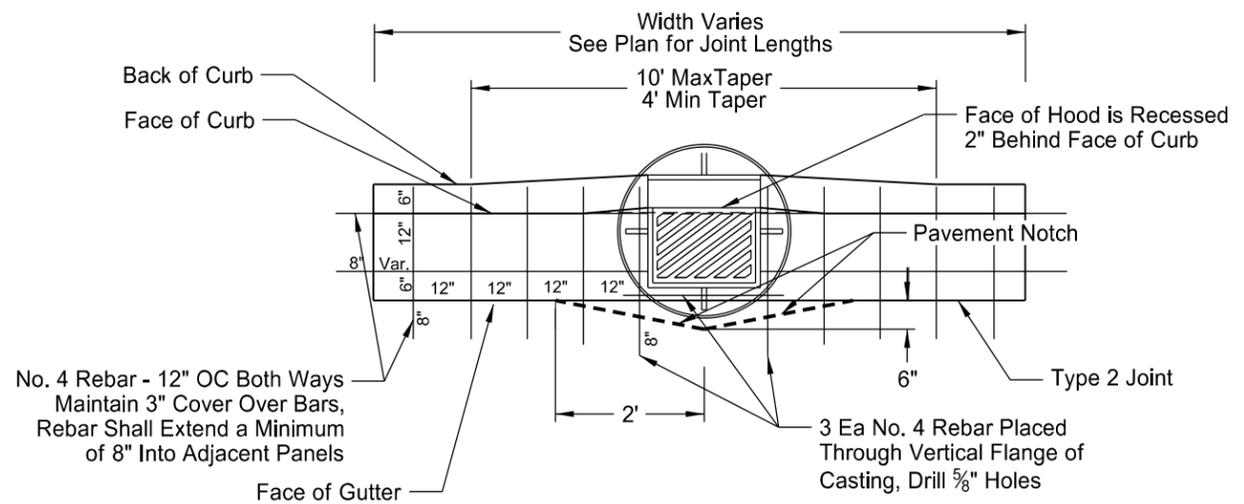
**Storm Sewer Details**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



- Notes:
1. Inlet Casting, Chimney Seal and Barrel Shall be Double Wrapped With 6 Mil Poly.
  2. Fill Invert to Design Grade With 5 Bag Concrete Mix. Min Slope 2"/Ft.
  3. Use Inlet Casting Neenah R-3065 With Type R Grate or East Jordan Iron Works No. 7010 With M5 Diag. Bar Grate or Approved Equal.
  4. Plastic Rings Shall be Required. Follow Manufacturers Recommendation for Installation Procedures.
  5. Backfill With Aggregate Base Course CI 3 or CI 5 to 100% Density (NDDOT T 99) Around Inlet Barrel.
  6. Construct 3' Clay Cap beneath Roadway Aggregate Base Section (as shown in the Backfill Details) Around Inlet Barrel.
  7. Provide Connections for Drain Tile.

Inlet-Type 1



Inlet-Type 1 Reinforcement

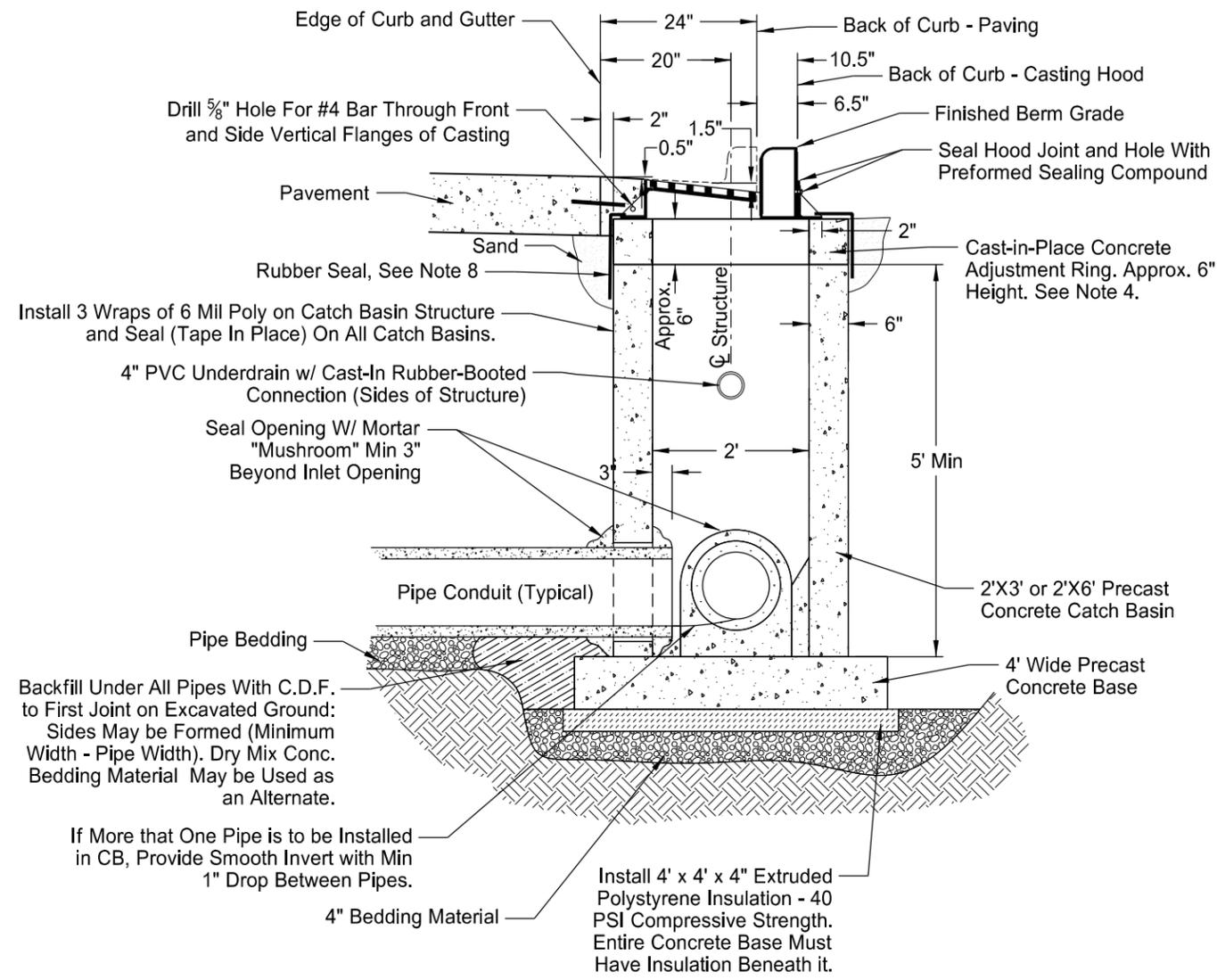
- Notes:
1. No Part of Inlet Barrel Section Shall be Located Beneath Pavement.
  2. Notch Pavement when Required

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Inlet Details Type 1

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

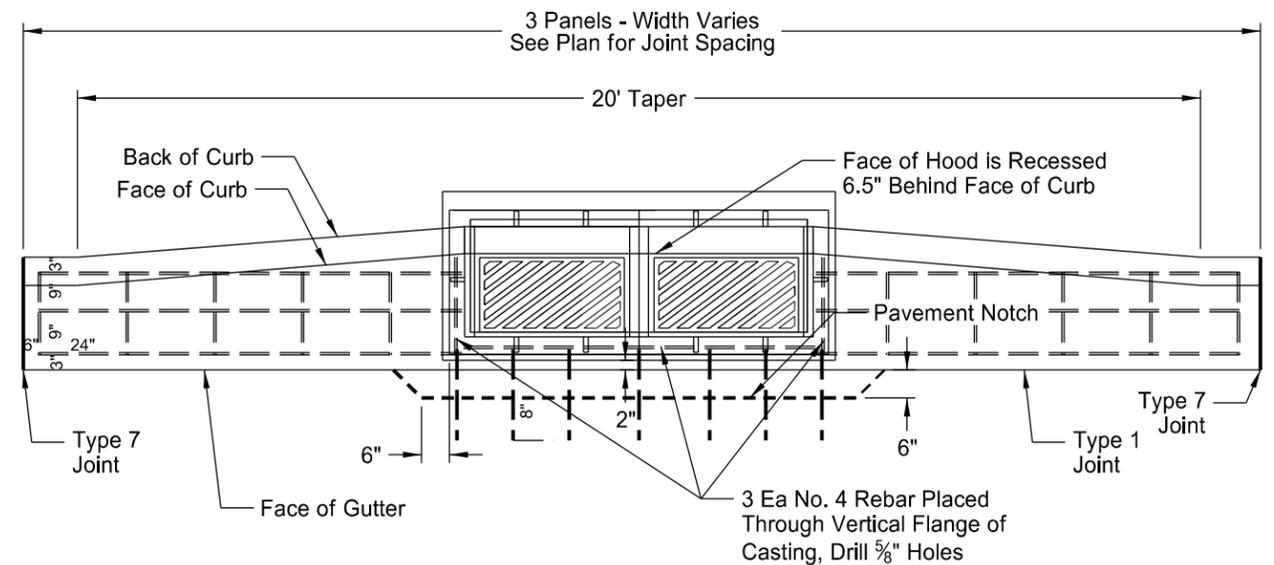
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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**Inlet-Type 2 and Inlet-Type 2 Double (Typical Section View)**

**Notes:**

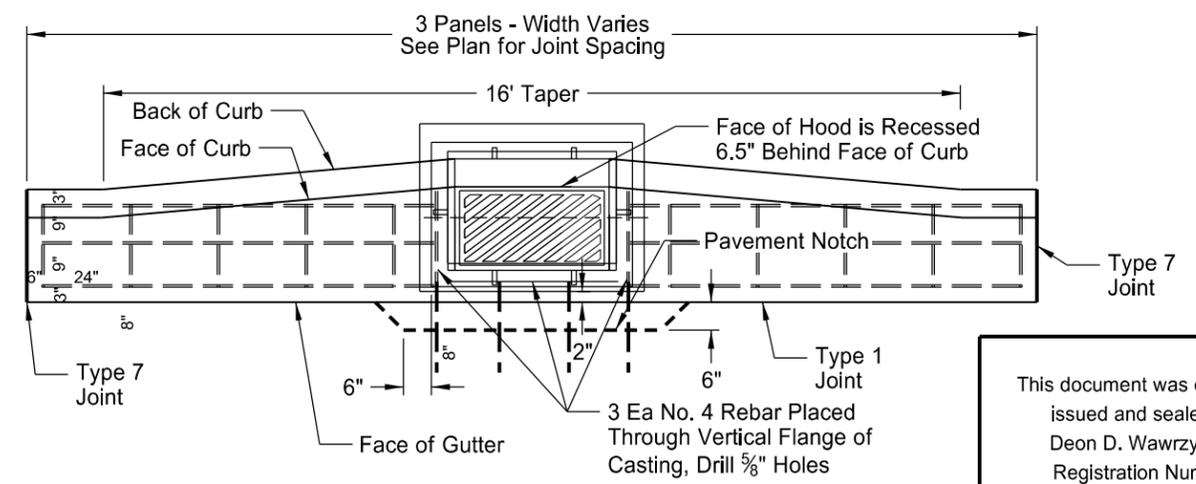
1. Inlet Casting and Barrel Shall be Double Wrapped With 6 Mil Poly.
2. Fill Invert to Design Grade With 5 Bag Concrete Mix. Min Slope 2"/Ft.
3. Use Inlet Casting Neenah R-3067 With Type R Grate for "Inlet-Type II" and Inlet Casting Neenah R-3295-2 With Type R Grate for "Inlet-Type 2 Double".
4. Concrete or Plastic Adjustment Rings May be Used In Lieu of Cast-in-Place Concrete Adjustment Ring. Follow Manufacturers Recommendation for Installation Procedures.
5. Backfill With Aggregate Base Course CI 3 or CI 5 to 100% Density (NDDOT T 99) Around Inlet Barrel.
6. Construct 3' Clay Cap beneath Roadway Aggregate Base Section (as shown in the Backfill Details) Around Inlet Barrel.
7. Provide Connections for Drain Tile.
8. Rubber Seal for "Inlet-Type II" Shall be Made of High Quality Ethylene Propylene Diene Monomer Rubber with a Minimum Thickness of 65 Mils. There Shall be a Preformed "L" Shaped Corner Molded into the Top of the Seal for Wrap Around Edge of Casting Flange. There Shall be a 2" - 3" Wide Strip of Butyl Mastic Attached to the Inside of the Side Section at the Bottom of the Seal for Seal to Catch Basin Structure and at Top for Seal to Casting Flange. Install Rubber Seal on the Outside Surface of the Adjustment Rings and Provide Coverage of all Adjustment Rings.



**Inlet-Type 2 Double Reinforcement**

**Notes:**

1. No Part of Precast Inlet Structure Shall be Located Beneath Pavement.
2. Notch Pavement when Required. Extend Rebar in Gussets into the Adjacent Pavement and Provide Additional Rebar as Shown.
3. No Rebar Splicing Shall be Permitted.



**Inlet-Type 2 Reinforcement**

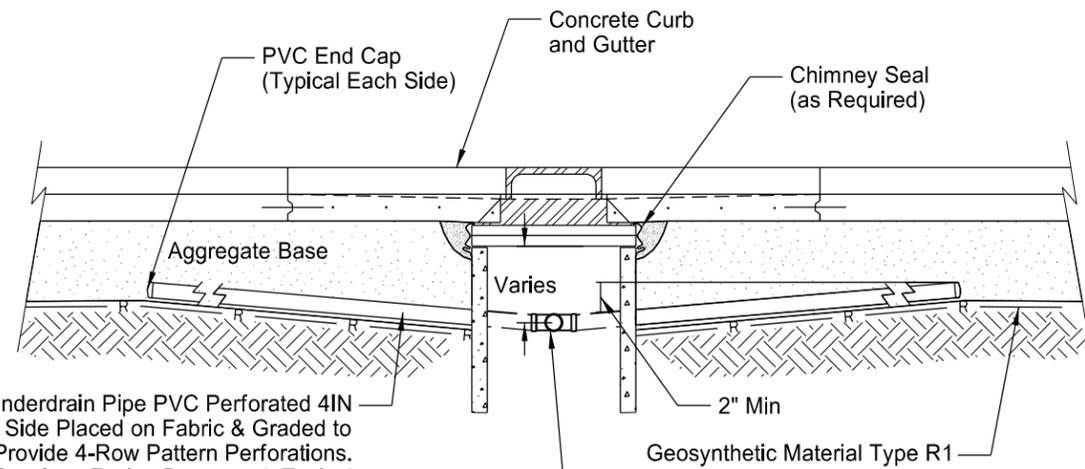
**Notes:**

1. No Part of Precast Inlet Structure Shall be Located Beneath Pavement.
2. Notch Pavement when Required. Extend Rebar in Gussets into the Adjacent Pavement and Provide Additional Rebar as Shown.
3. No Rebar Splicing Shall be Permitted.

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**Inlet Details**  
Type 2 and Type 2 Double  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

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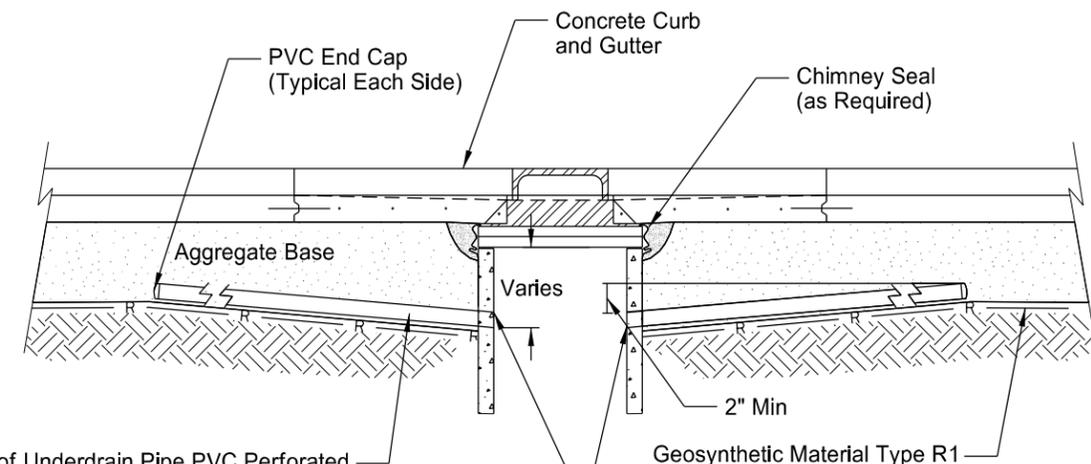


20 LF of Underdrain Pipe PVC Perforated 4IN on Each Side Placed on Fabric & Graded to Inlet. Provide 4-Row Pattern Perforations. Place Perforations Facing Downward. Typical of all inlets. Wrap W/D3 or D4 Geotextile Fabric as Specified by NDDOT Standard Specifications Section 858.01A.

Provide Cast-In Rubber-Booted Connection for Underdrain. If Connection is not Furnished, Contractor to Core Drill Structure and Provide PVC to Concrete Adapter (See Detail Below).

See Plans for Concrete, Granular and Subcut Depths

**Inlet-Type 1 Drain tile**

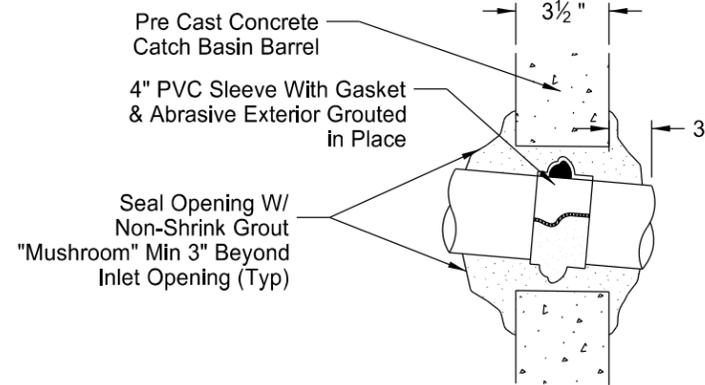


20 LF of Underdrain Pipe PVC Perforated 4IN on Each Side Placed on Fabric & Graded to Inlet. Provide 4-Row Pattern Perforations. Place Perforations Facing Downward. Typical of all inlets. Wrap W/D3 or D4 Geotextile Fabric as Specified by NDDOT Standard Specifications Section 858.01A.

Provide Cast-In Rubber-Booted Connection for Underdrain(s) (For Rear or Side Connections if Necessary). If Connection is not Furnished, Contractor to Core Drill Structure and Provide PVC to Concrete Adapter (See Detail Below).

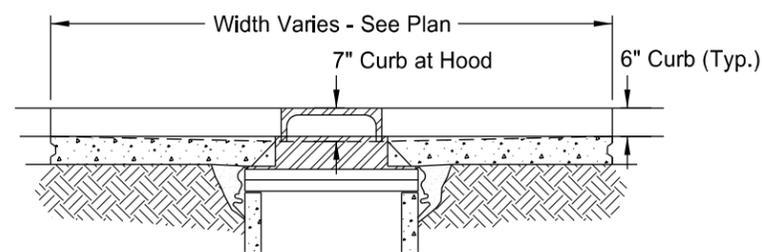
See Plans for Concrete, Granular and Subcut Depths

**Inlet-Type 2 and Inlet-Type 2 Double Drain tile**

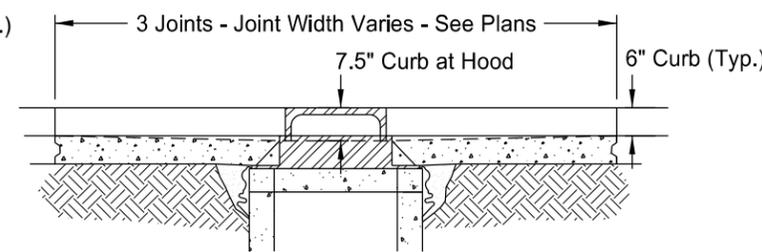


Lubricate Gasket and Slip Over PVC Pipe. Position Adapter Sleeve in Center of CB Barrel Wall and Grout Into Place With a Non-Shrink Grout.

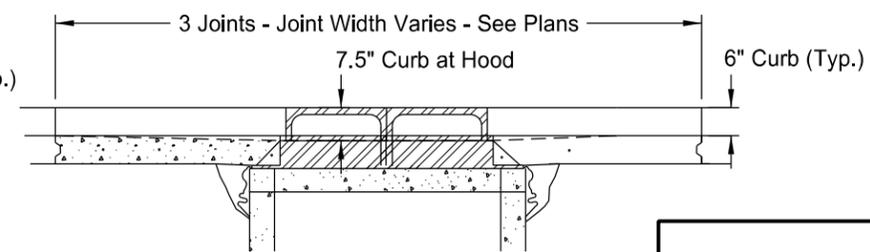
**PVC to Concrete Adapter**



**Inlet-Type 1 - Front View**



**Inlet-Type 2 - Front View**

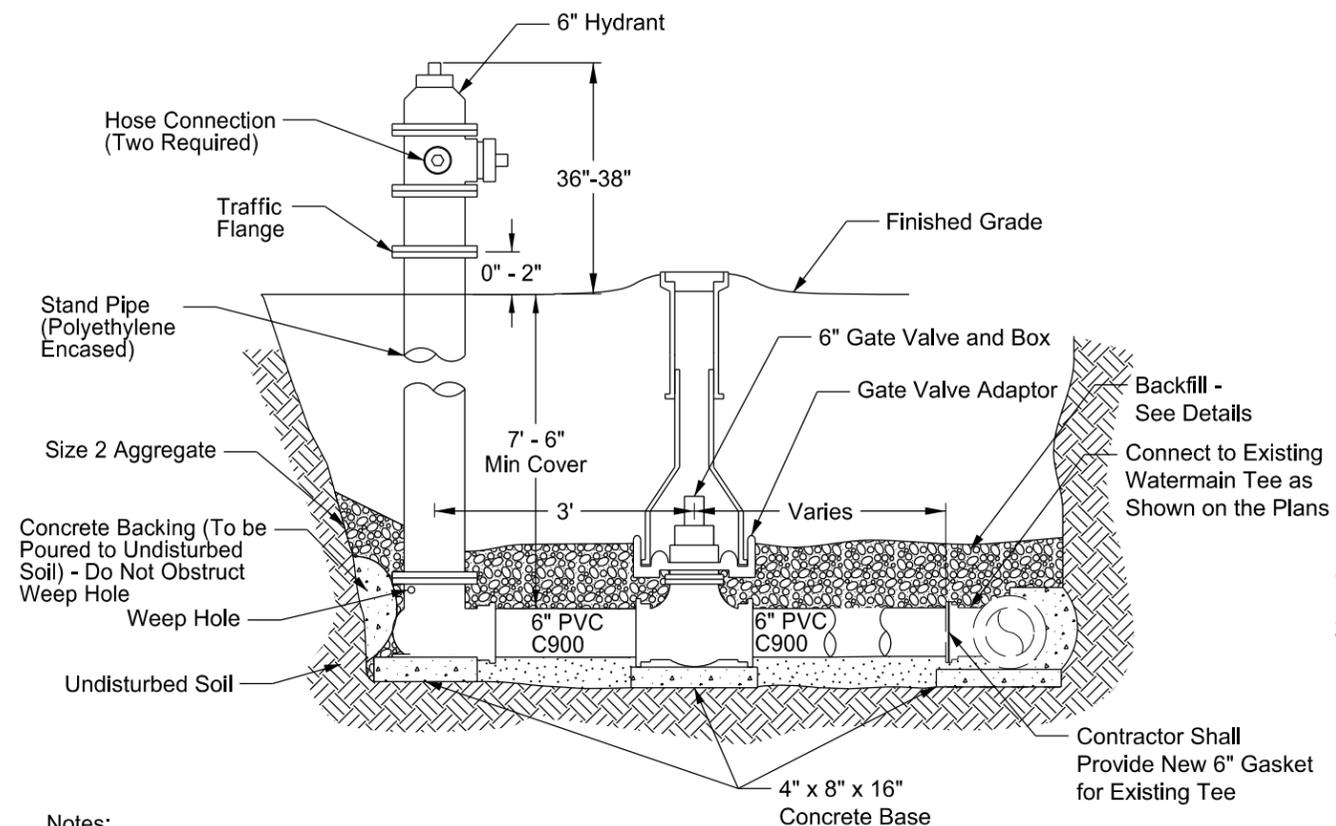


**Inlet-Type 2 Double - Front View**

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**Inlet Details**

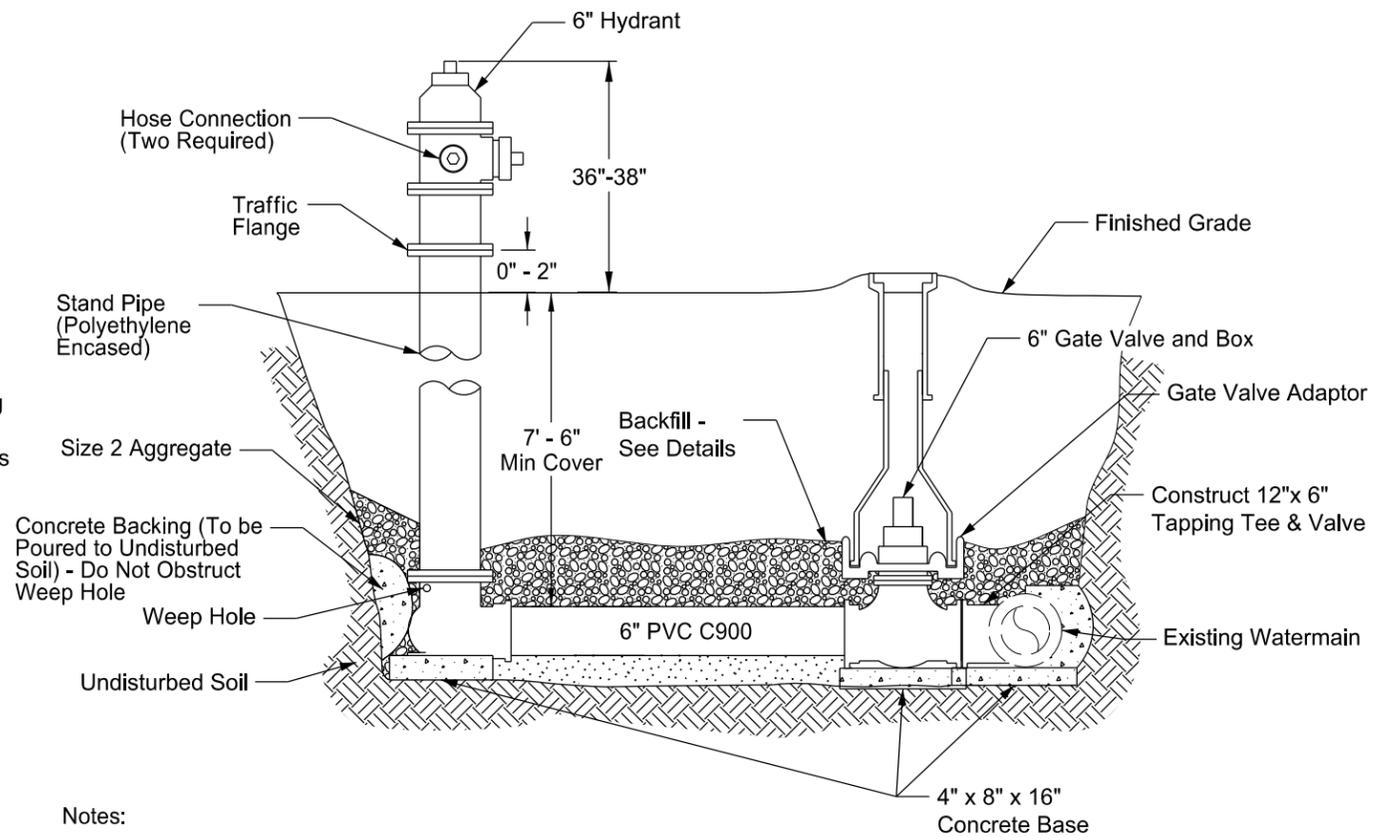
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



Notes:

1. Place Size 2 Aggregate to 6" Above Weep Hole With a Min 30" Width and 5' Along Hydrant Lead (Min 3/4 CY).
2. Wrap Hydrant up to Ground Line With 2 Layers of 6 Mil Poly, Tape Ends & Seams.
3. All Joints Shall be Restrained Mechanical Joint.

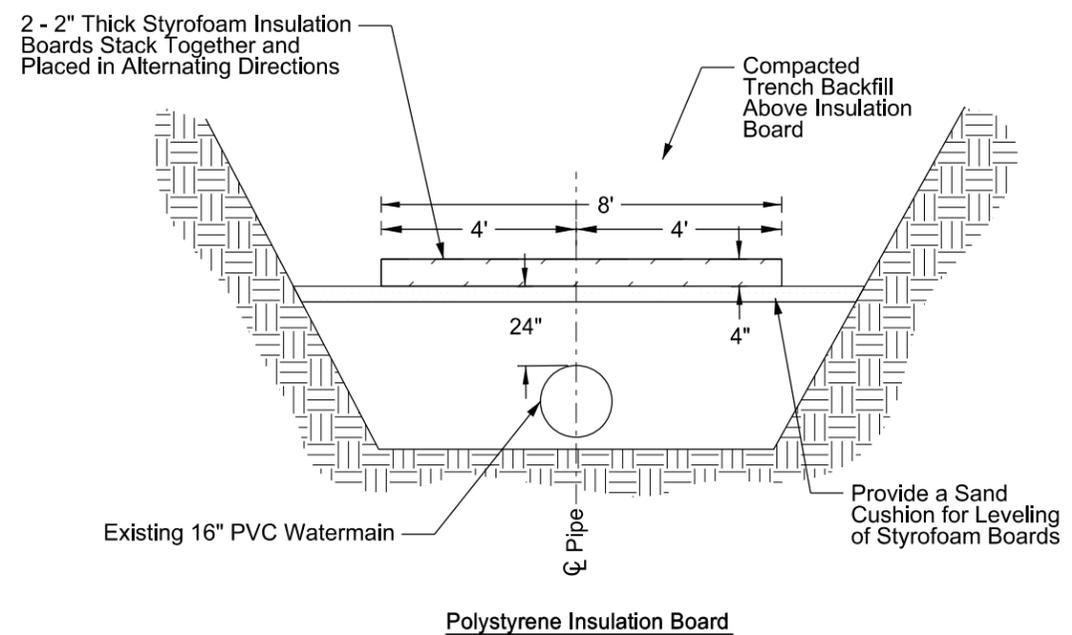
**6IN Hydrant -  
Use Existing Tee**



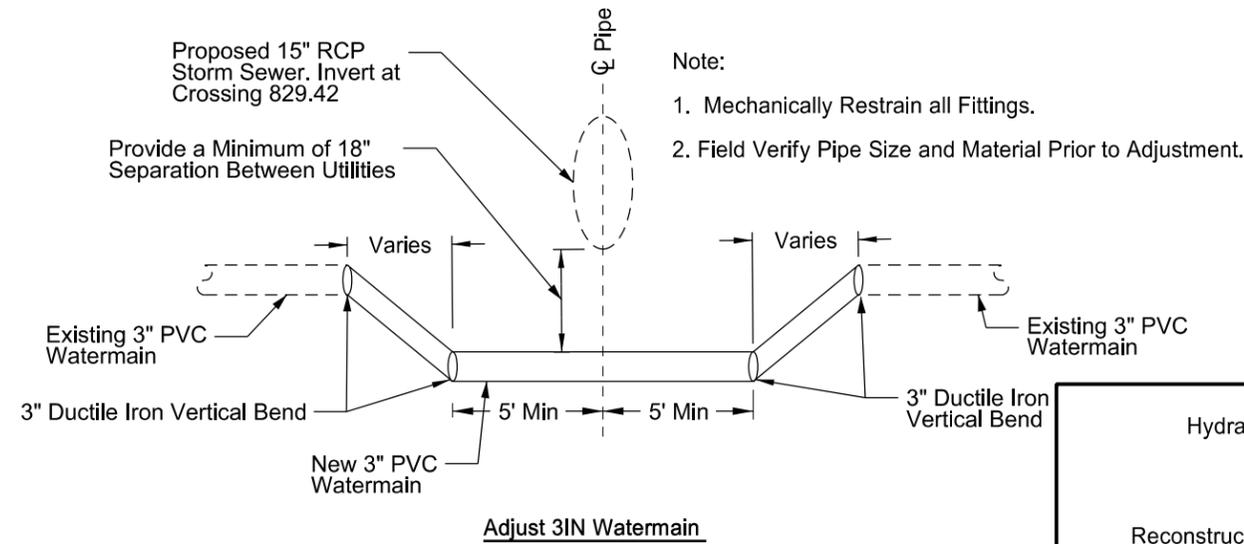
Notes:

1. Outer Edge of Tapping Tee Shall be Located a Minimum of 12" From an Existing Watermain Joint.
2. Place Size 2 Aggregate to 6" Above Weep Hole With a Min 30" Width and 5' Along Hydrant Lead (Min 3/4 CY).
3. Wrap Hydrant up to Ground Line With 2 Layers of 6 Mil Poly, Tape Ends & Seams.
4. All Joints Shall be Restrained Mechanical Joints.

**6IN Hydrant -  
With New Tapping Tee**



**Polystyrene Insulation Board**



**Adjust 3IN Watermain**

Note:

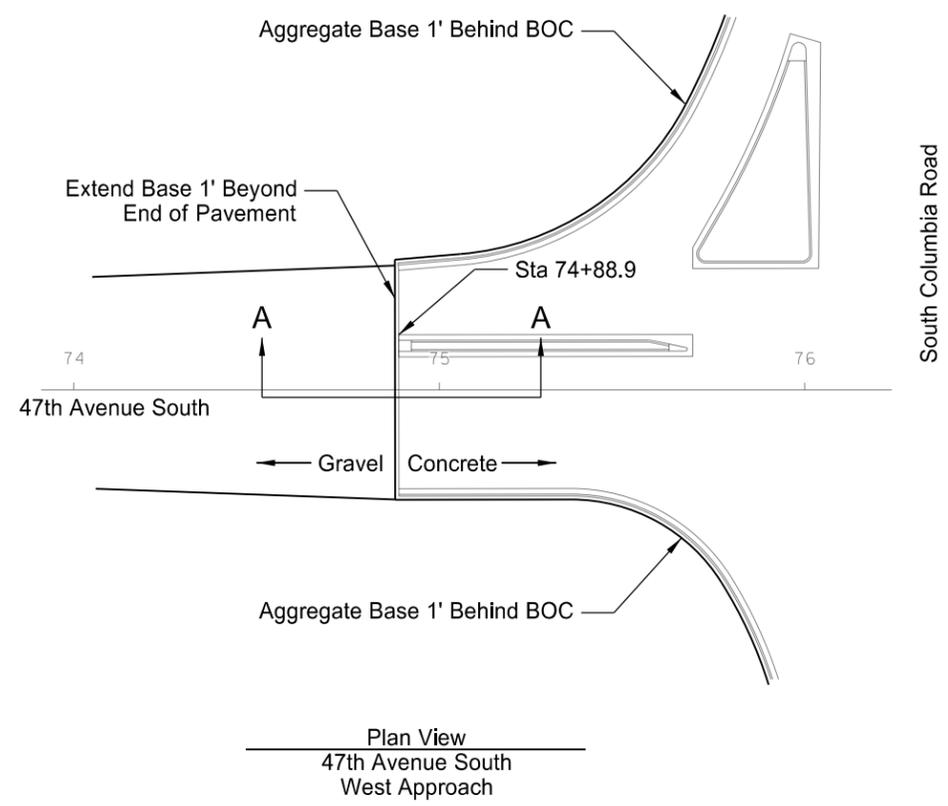
1. Mechanically Restrain all Fittings.
2. Field Verify Pipe Size and Material Prior to Adjustment.

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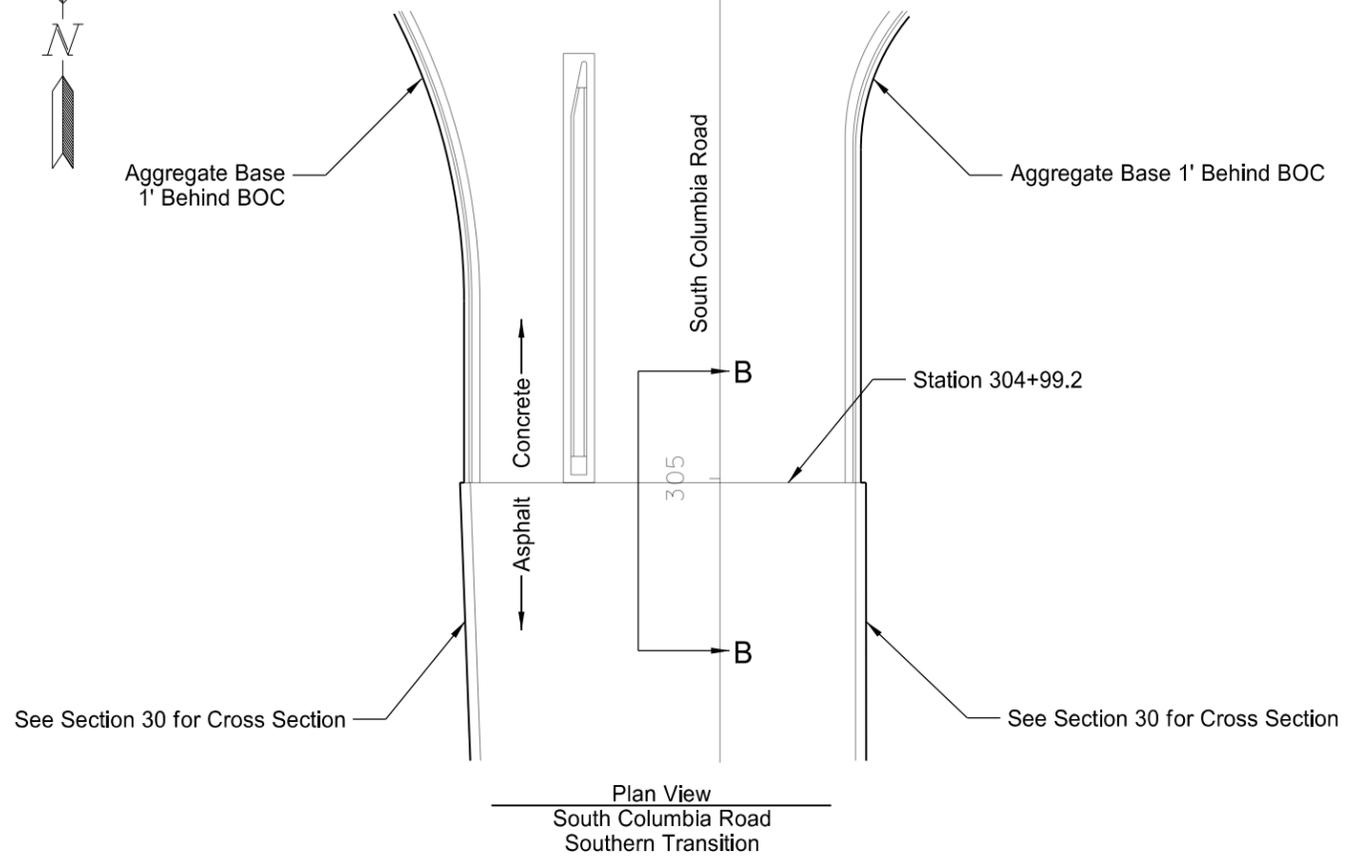
**Hydrant & Watermain Details**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

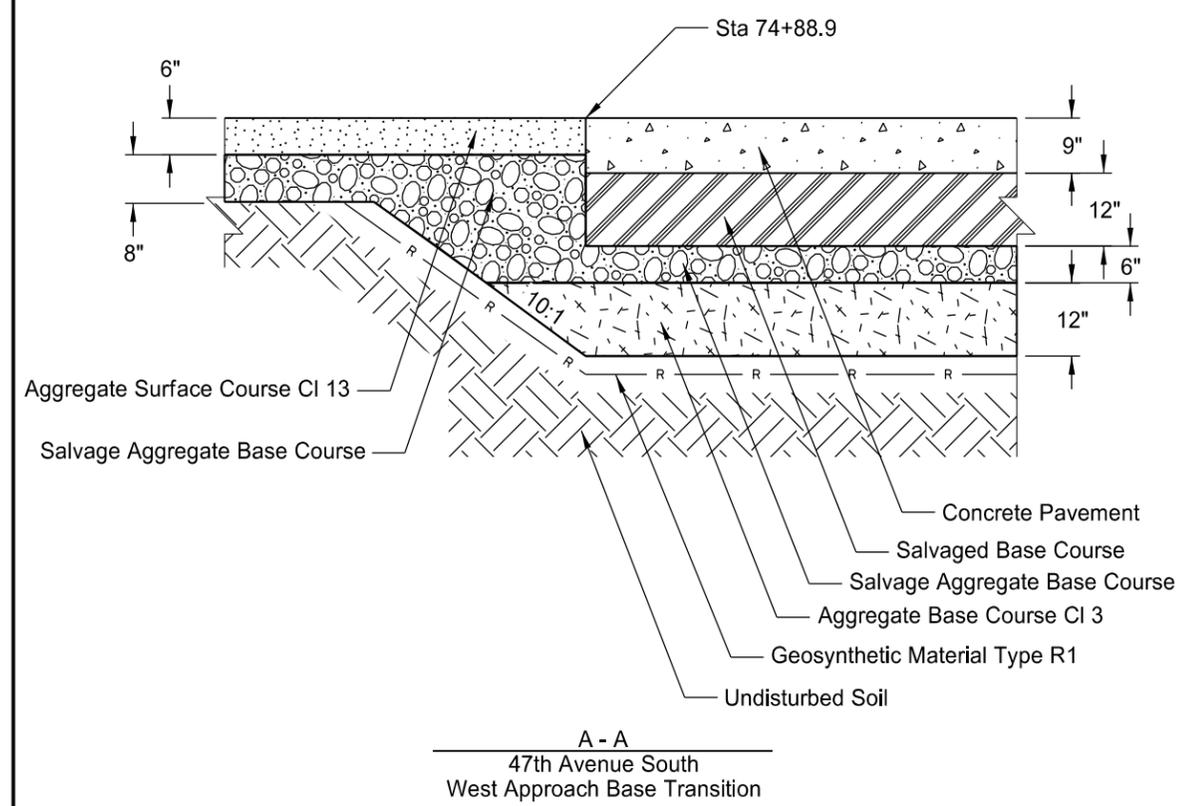
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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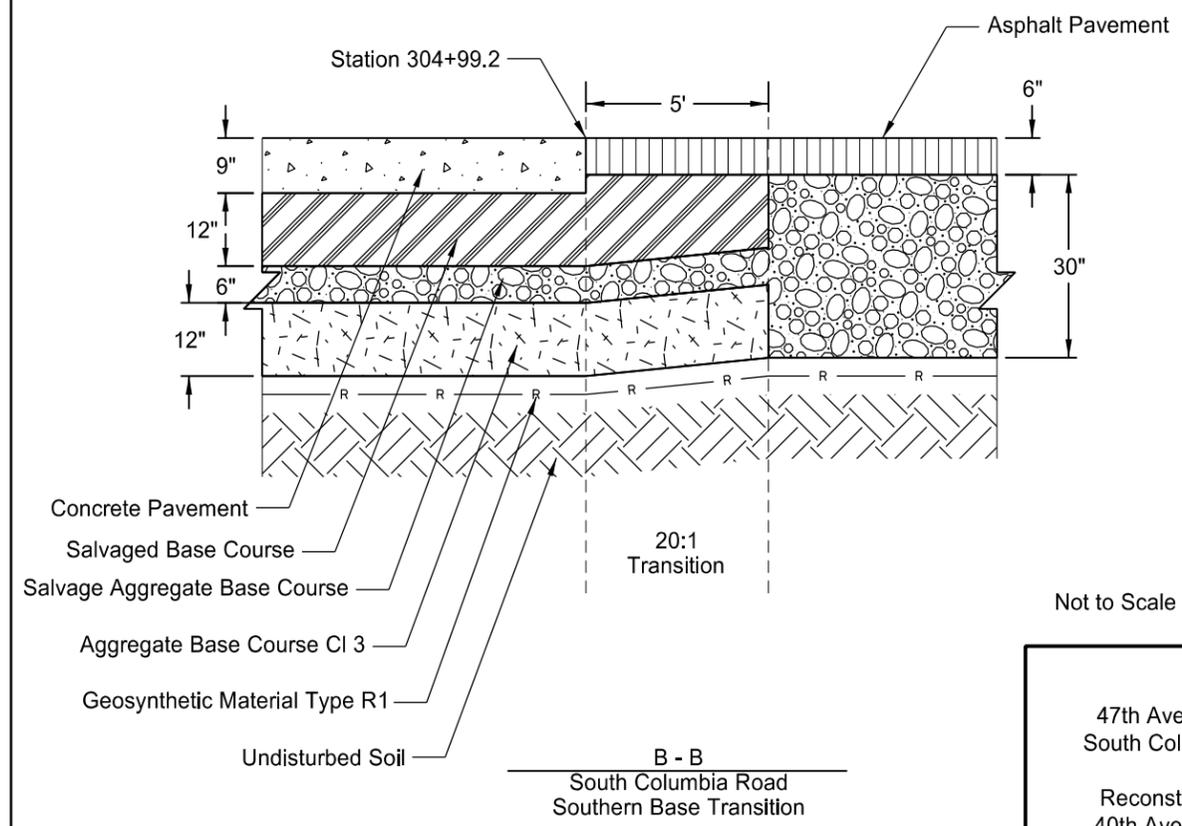
Plan View  
47th Avenue South  
West Approach



Plan View  
South Columbia Road  
Southern Transition



A - A  
47th Avenue South  
West Approach Base Transition



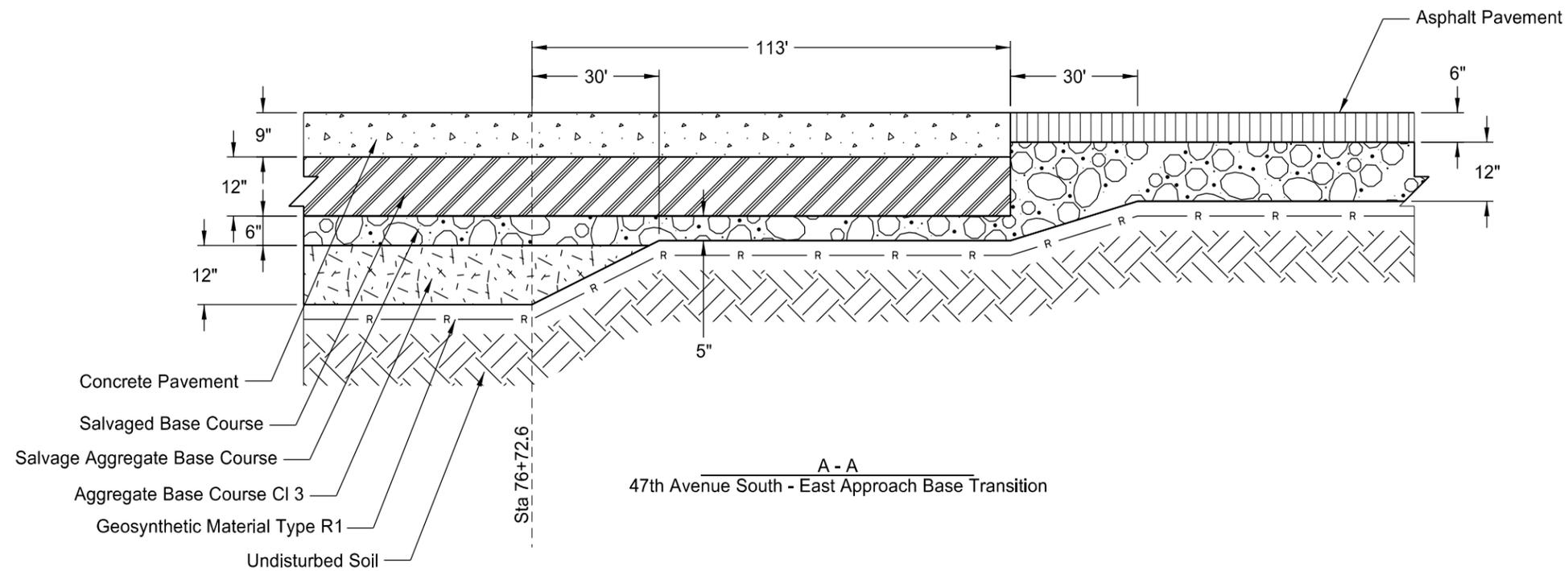
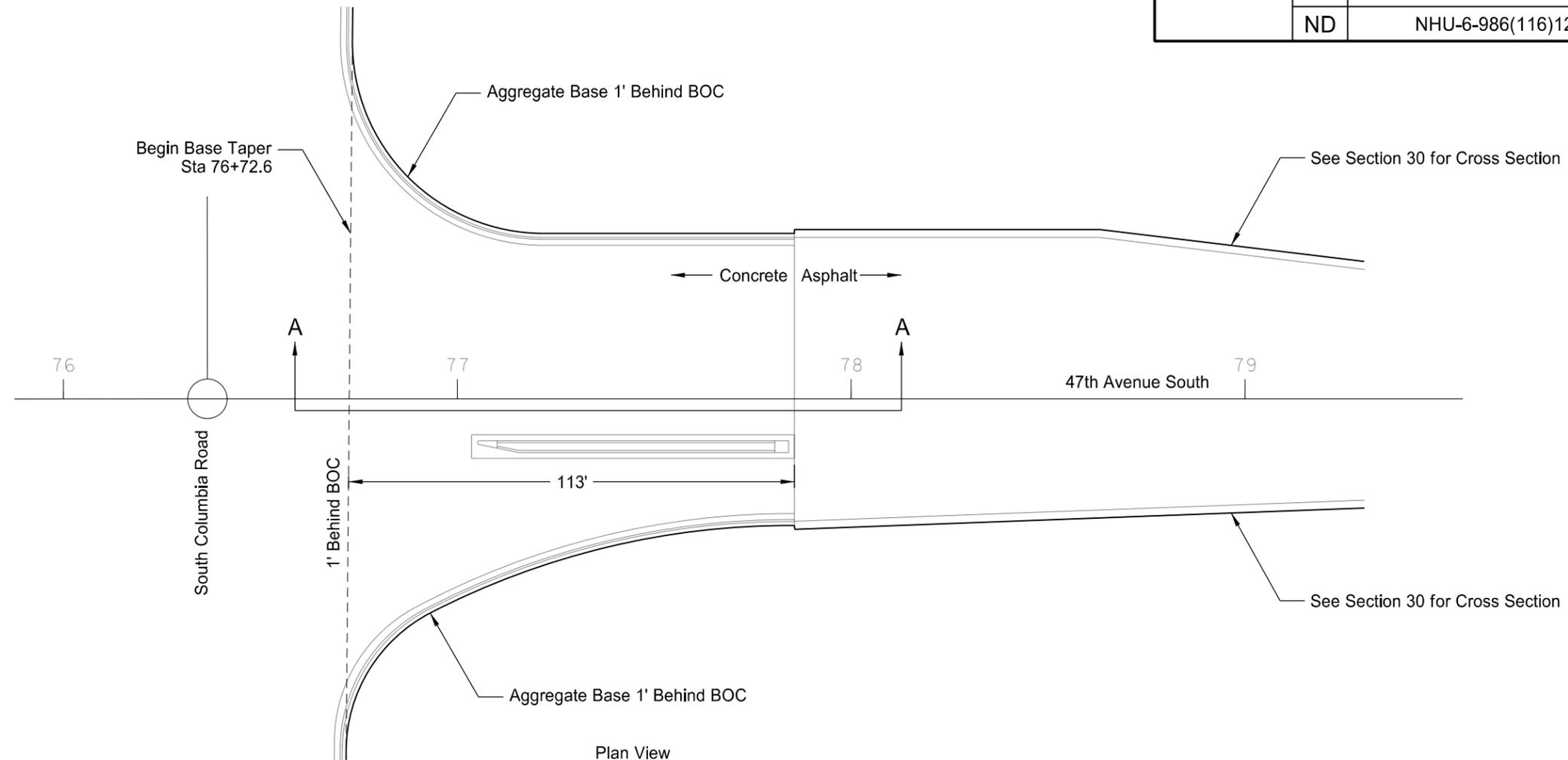
B - B  
South Columbia Road  
Southern Base Transition

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Not to Scale

Transition Details  
47th Avenue South - West Approach and  
South Columbia Road - Southern Transition  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	15



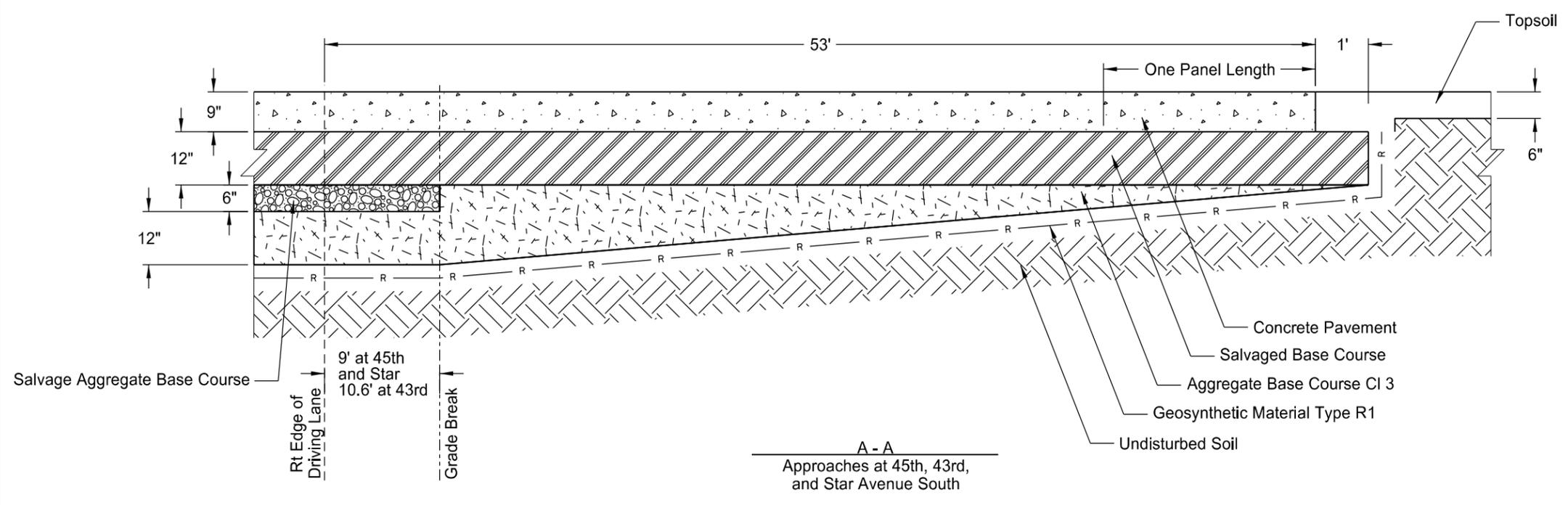
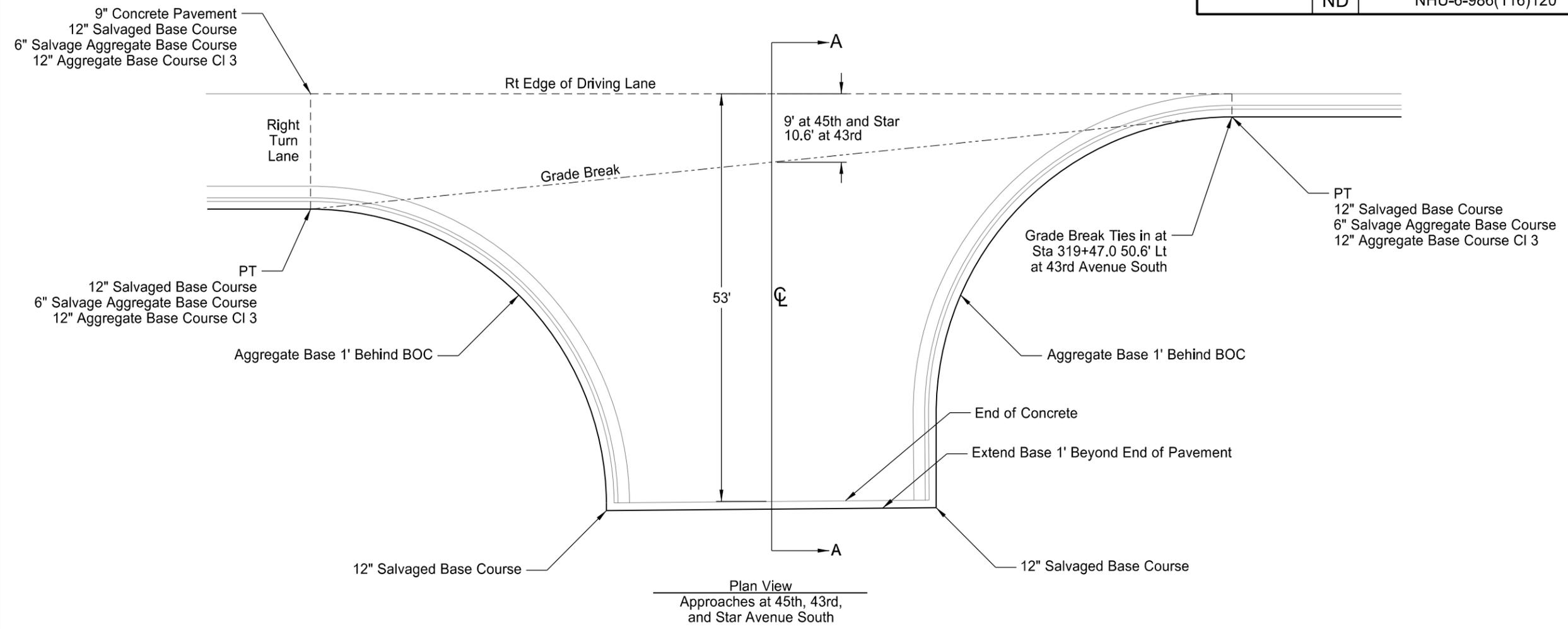
Not to Scale

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Transition Details  
47th Avenue South - East Approach

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	16

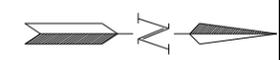
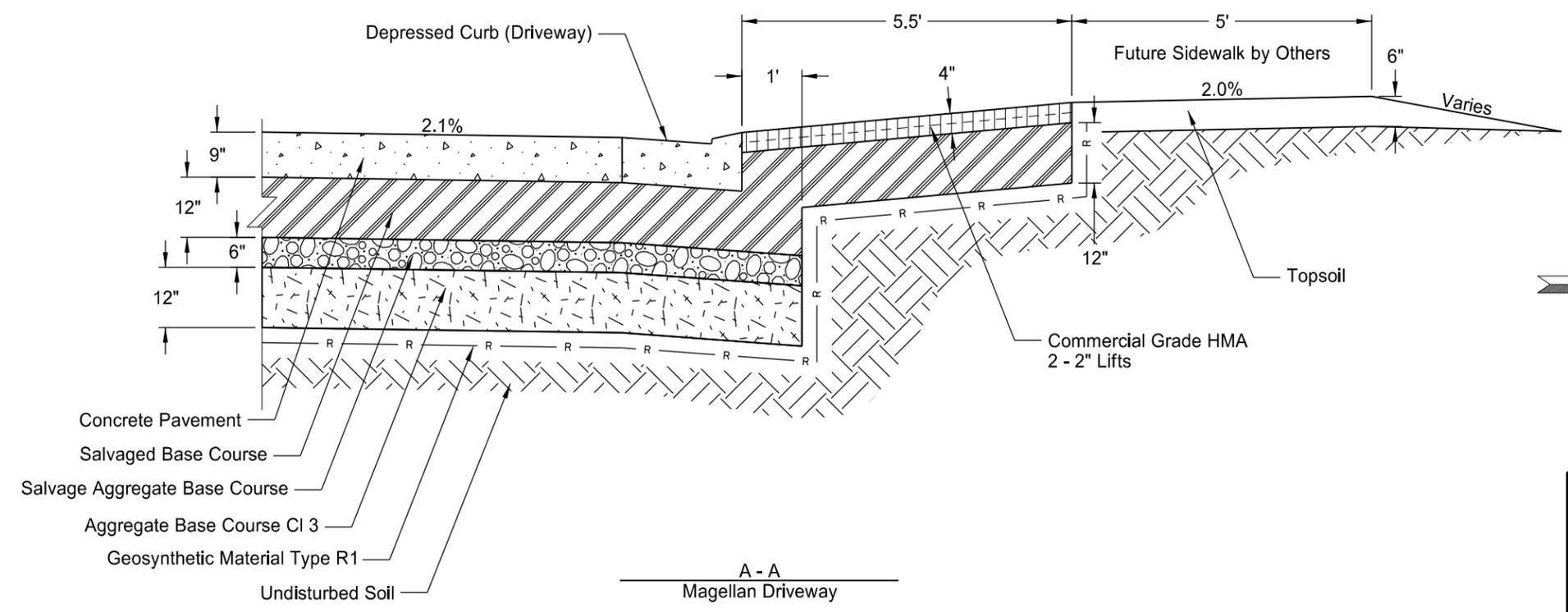
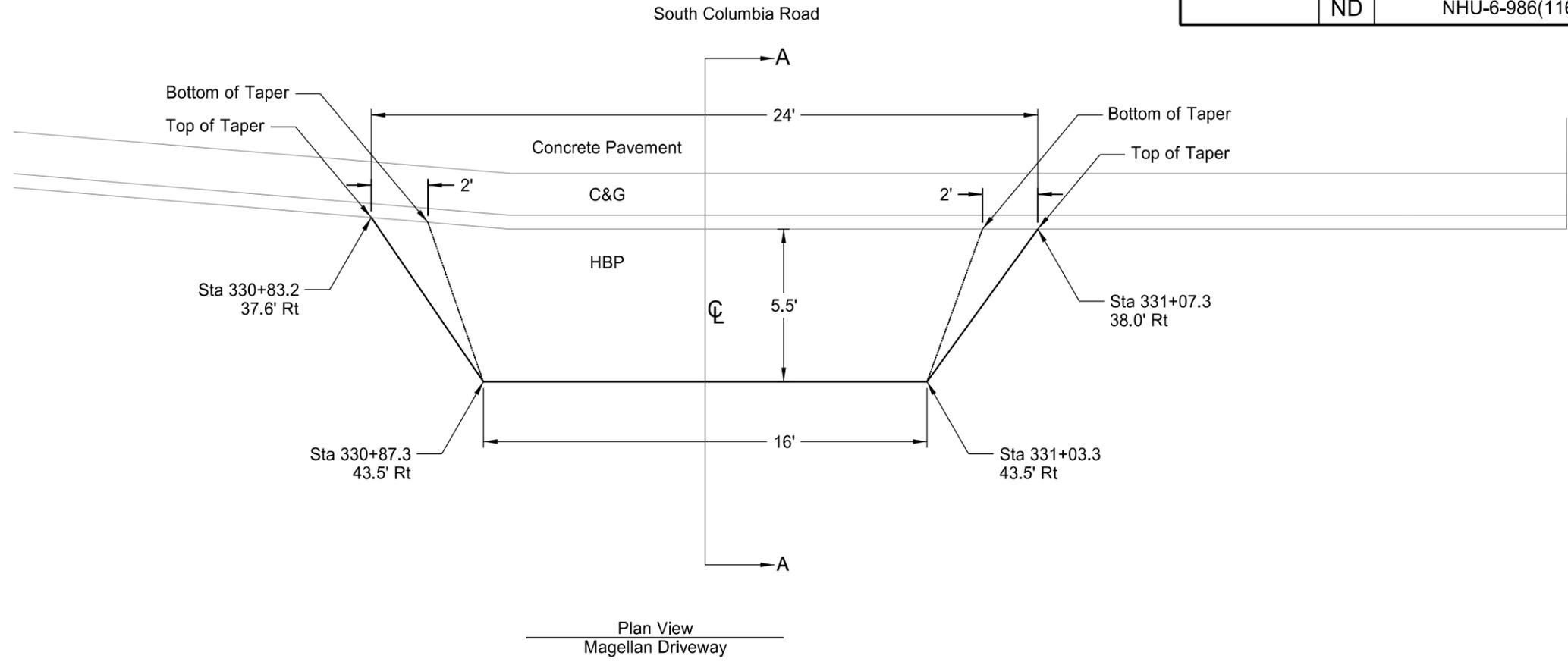


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Not to Scale

Transition Details  
45th, 43rd, & Star Avenue South  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	17



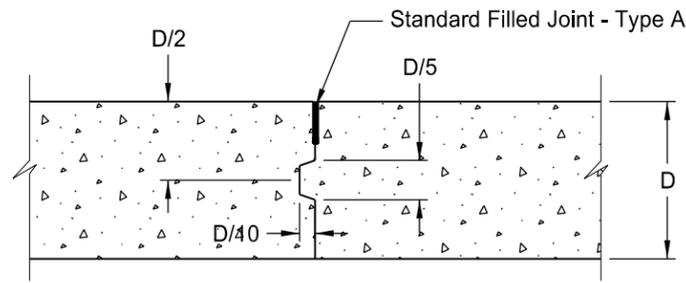
Not to Scale

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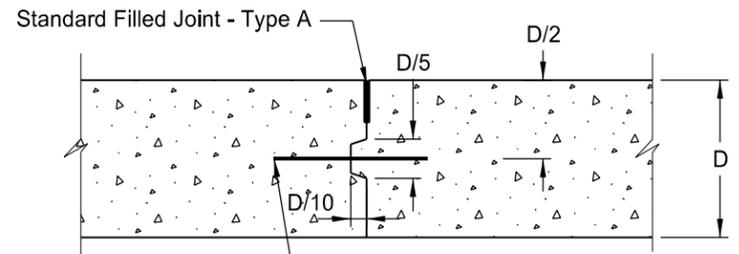
Transition Details  
Magellan Driveway

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

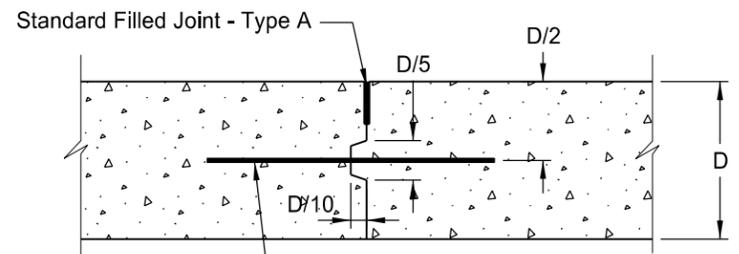
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	18



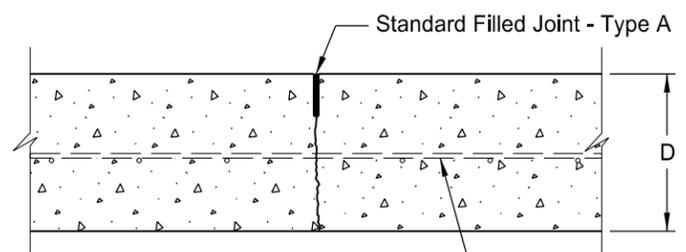
**Type 1**



**Type 2**



**Type 3**

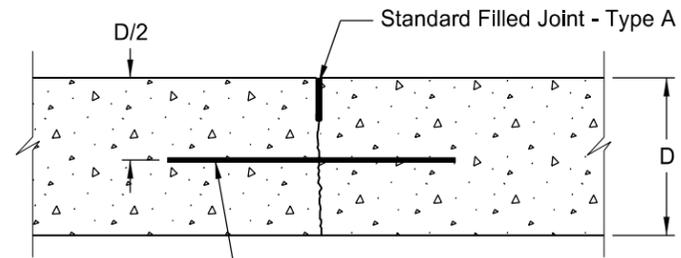


**Type 4**

Reinforcement at **R** Locations

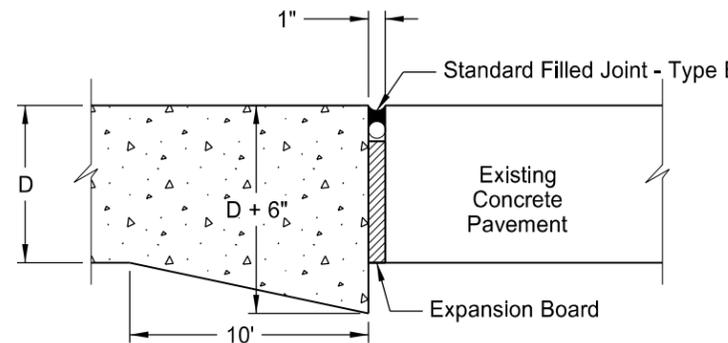
Note:

1. All Tie Bars Shall be Centered on Joint Unless Otherwise Noted.
2. See Section 90 - Jointing Layout for Panel Lengths.
3. Dowels Bars Shall be 1/4" x 18" for D = 10" or Less.
4. Dowel Bars Shall be 1/2" x 18" for D Greater Than 10".
5. Tie Bars Shall Not be Placed Within 15 Inches of the Intersection of the Longitudinal Joint and Transverse Joint.
6. Minimum of 4 Tie Bars per Panel Shall be Used with a Maximum Spacing of 36" OC

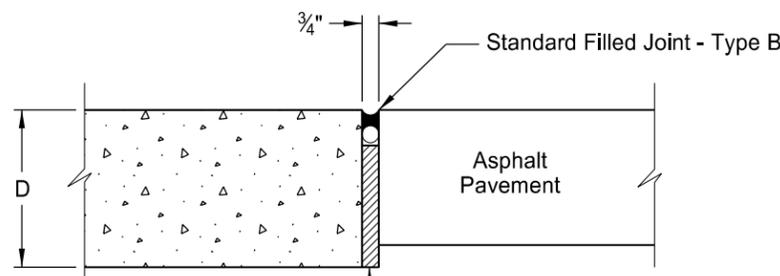


**Type 5**

No. 5 x 30" Deformed Tie Bar @ 30" OC

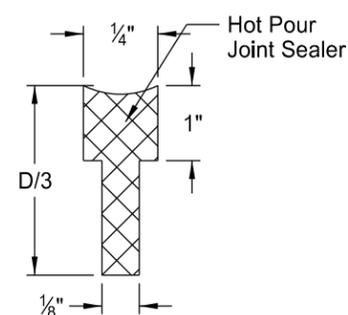


**Type 6**

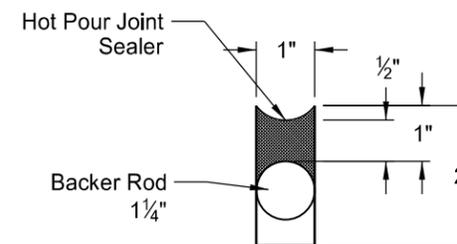


**Type 7**

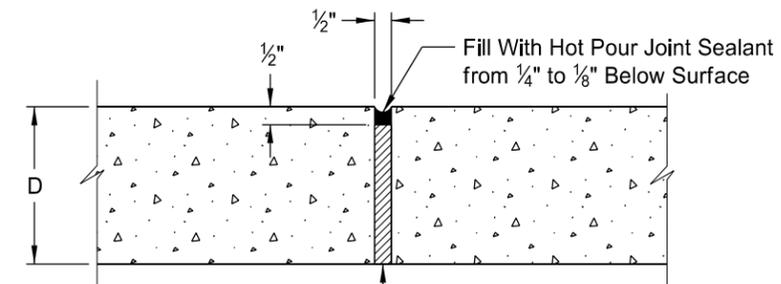
Expansion Board



**Standard Filled Joint - Type A**



**Standard Filled Joint - Type B**



**Type 8**

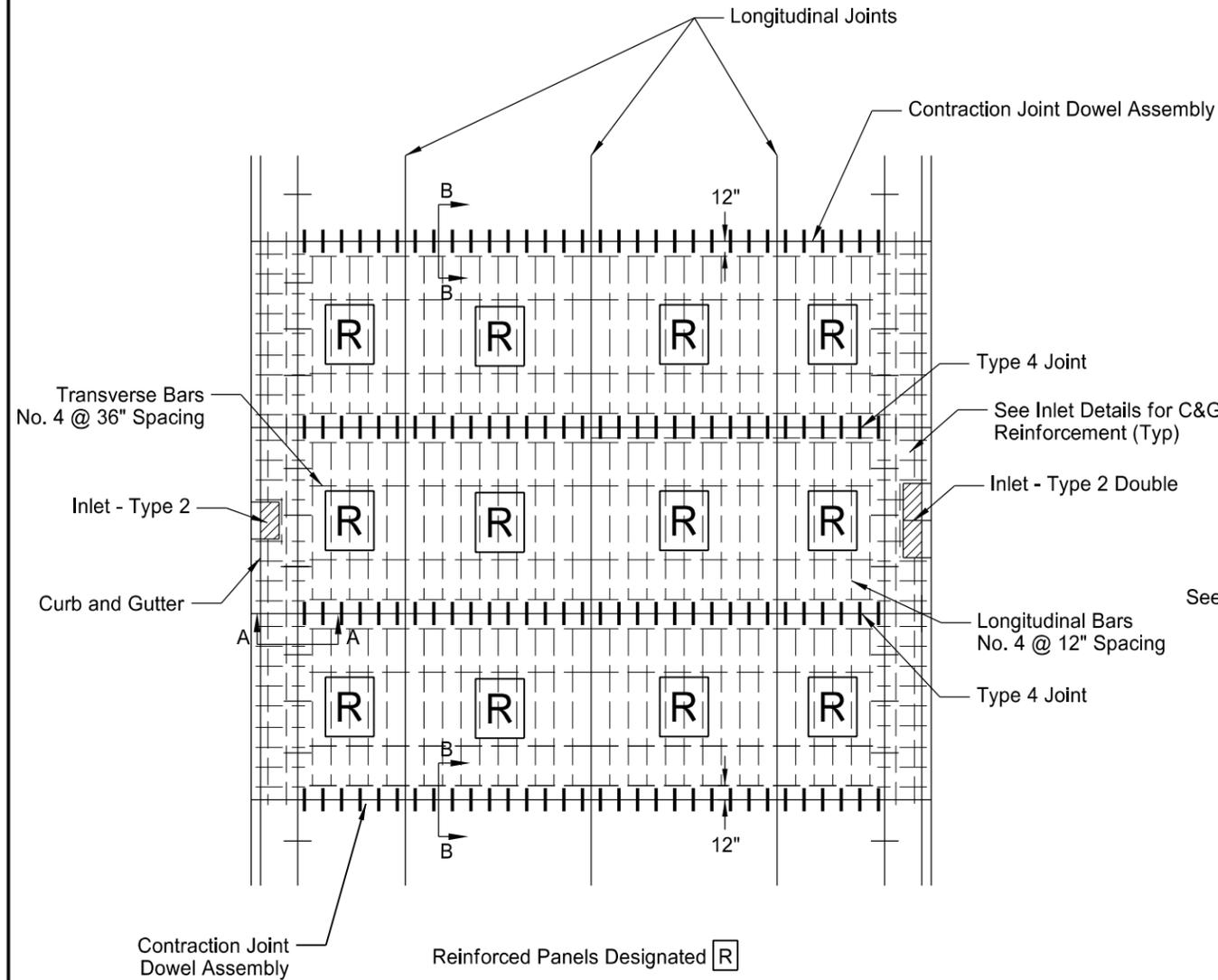
Expansion Board

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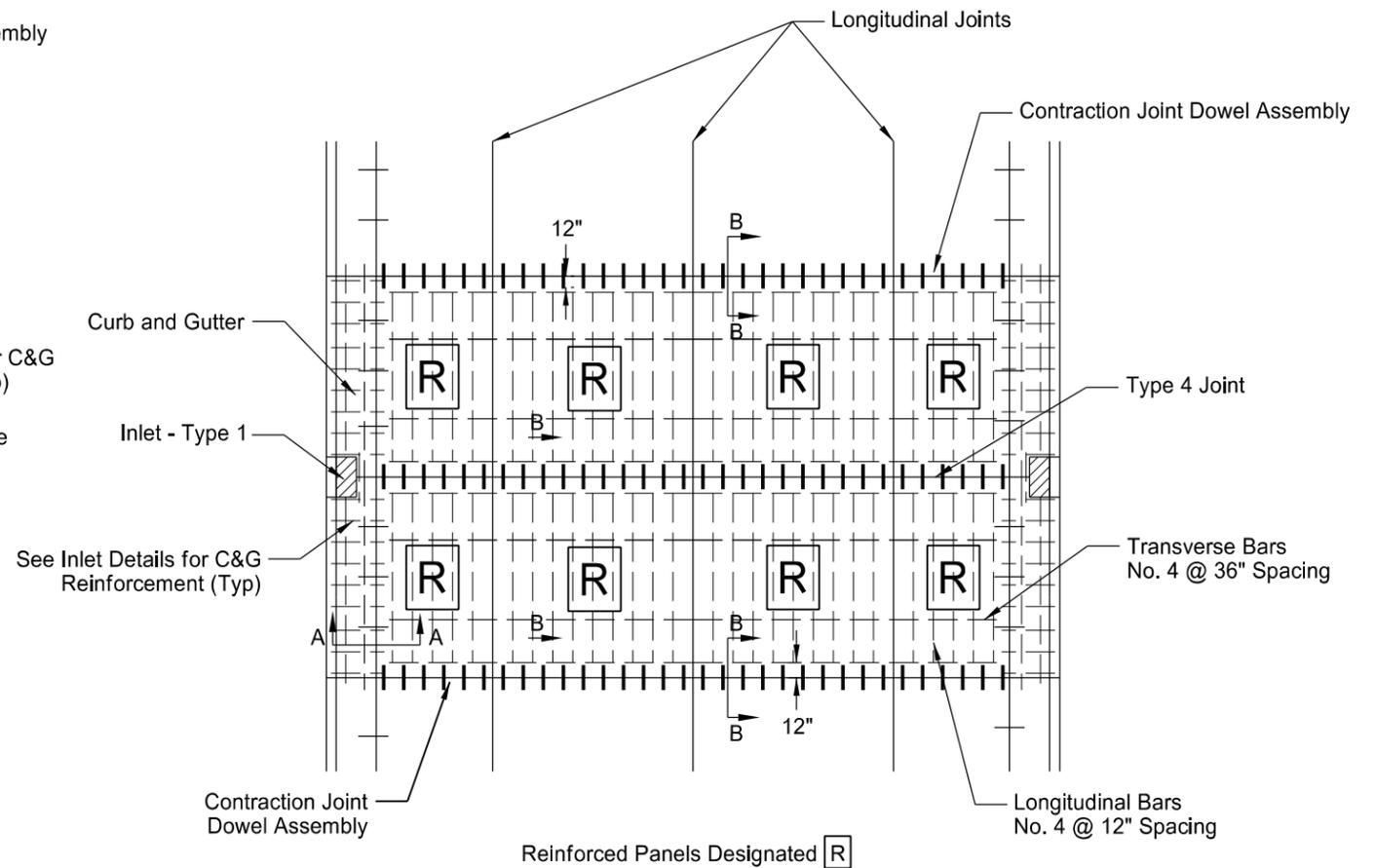
Pavement Joint Details

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

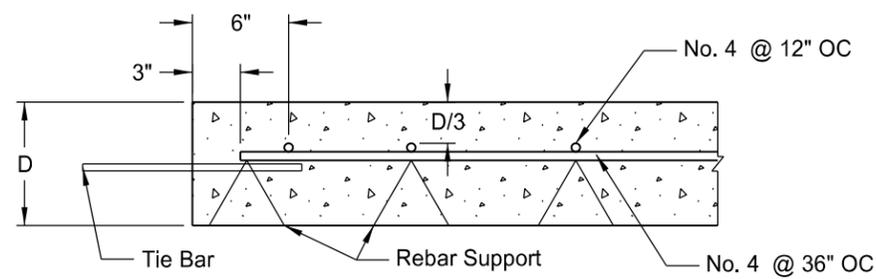
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	19



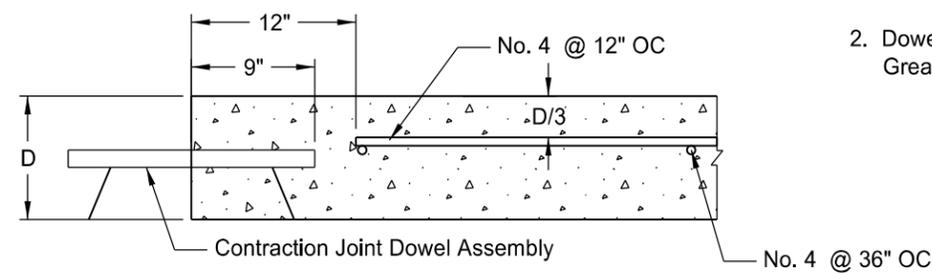
Pavement Reinforcing (Catch Basin Centered on Panel)



Pavement Reinforcing (Catch Basin Centered on Joint)



Longitudinal Joint Section A-A



Transverse Joint Section B-B

Note:

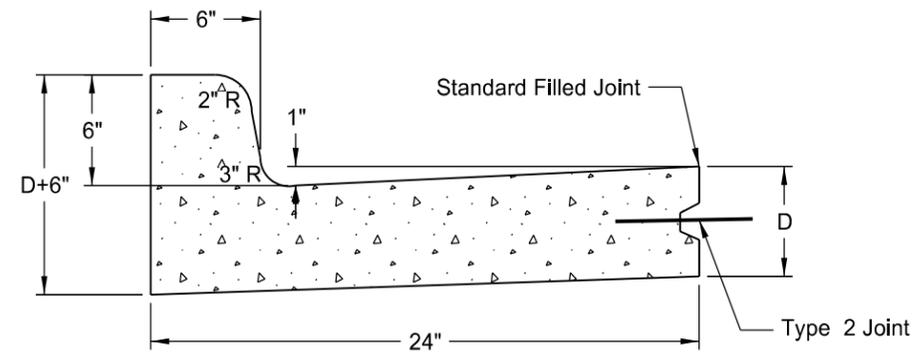
1. Dowels Bars Shall be 1¼" x 18" for D = 10" or Less.
2. Dowel Bars Shall be 1½" x 18" for D Greater Than 10".

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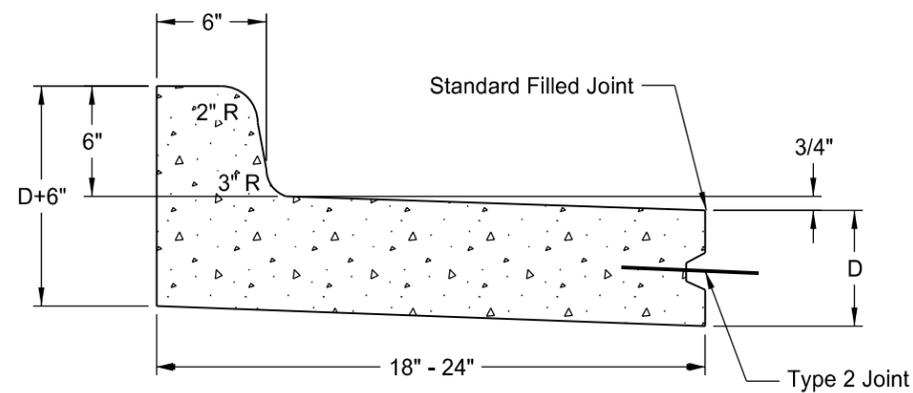
**Pavement Reinforcement Details**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

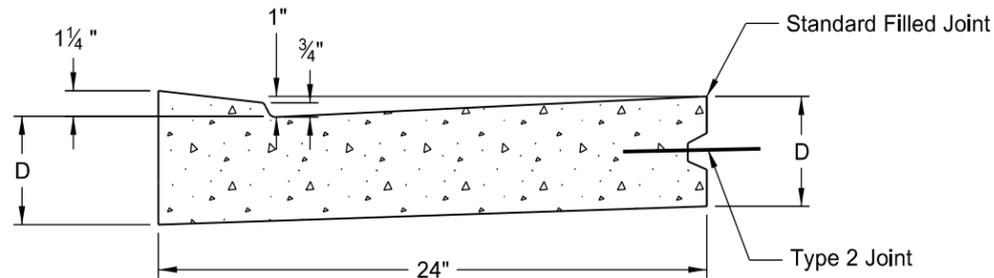
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	20



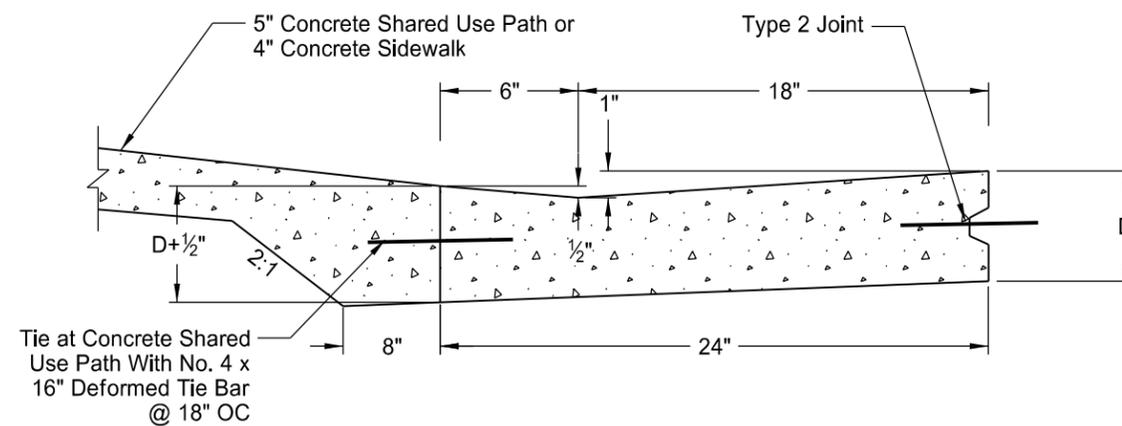
**Inflow Curb and Gutter**  
Section A-A



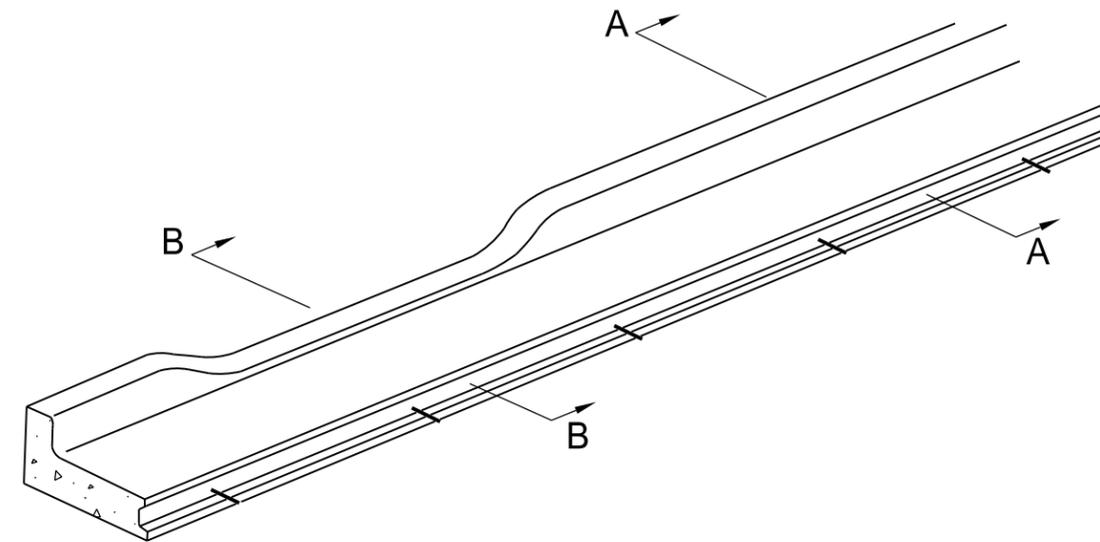
**Outflow Curb and Gutter**  
Section A-A



**Depressed Curb**  
(Typical For Driveway or Median Nose)  
Section B-B



**Depressed Curb**  
(Typical For ADA Ramp Locations)  
Section B-B



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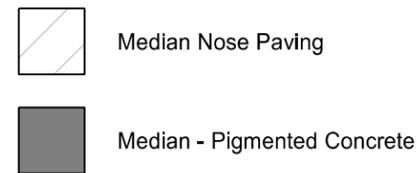
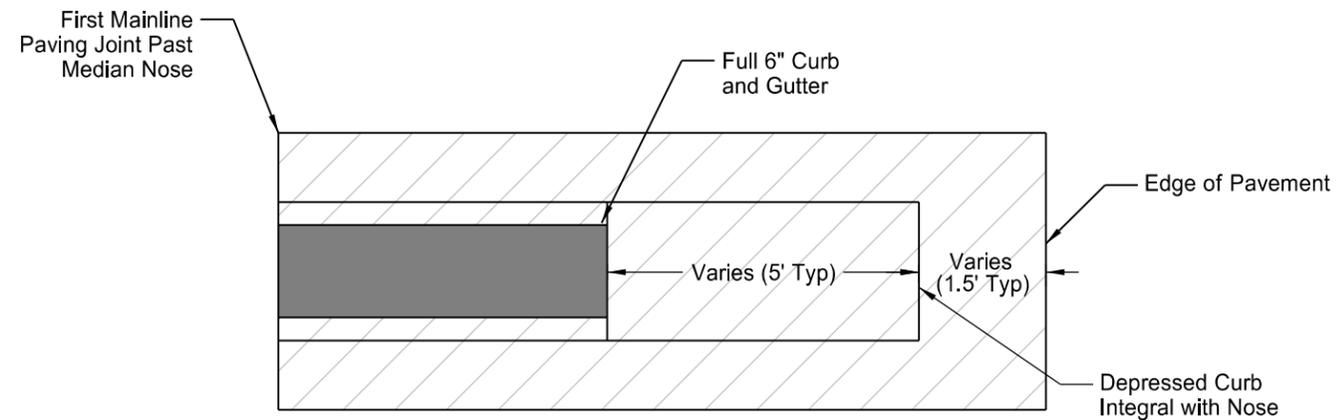
Curb & Gutter Details  
Type 1

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

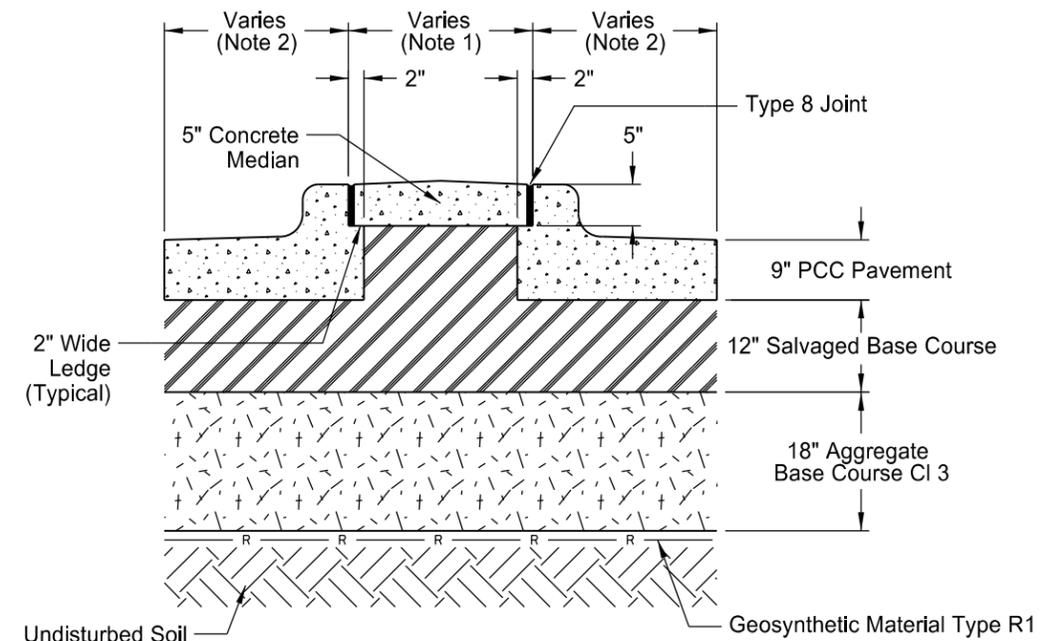
Notes:

1. The Depth "D" Shall be the Thickness of the Adjacent Pavement.
2. Curb & Gutter Type I Transitions to Curb & Gutter-Type I 18 IN at Several Locations. All Costs For Labor, Materials and Equipment Necessary to Transition to 18 Inch Wide Curb and Gutter Shall be Included in the Price Bid For "Curb & Gutter-Type I". See Section 30 for C&G Transition Locations.
3. Tie Bars Shall Not be Placed Within 15 Inches of the Intersection of the Longitudinal Joint and Transverse Joint.
4. See Section 20 for Depressed Curb/Sidewalk Base Transition Detail.

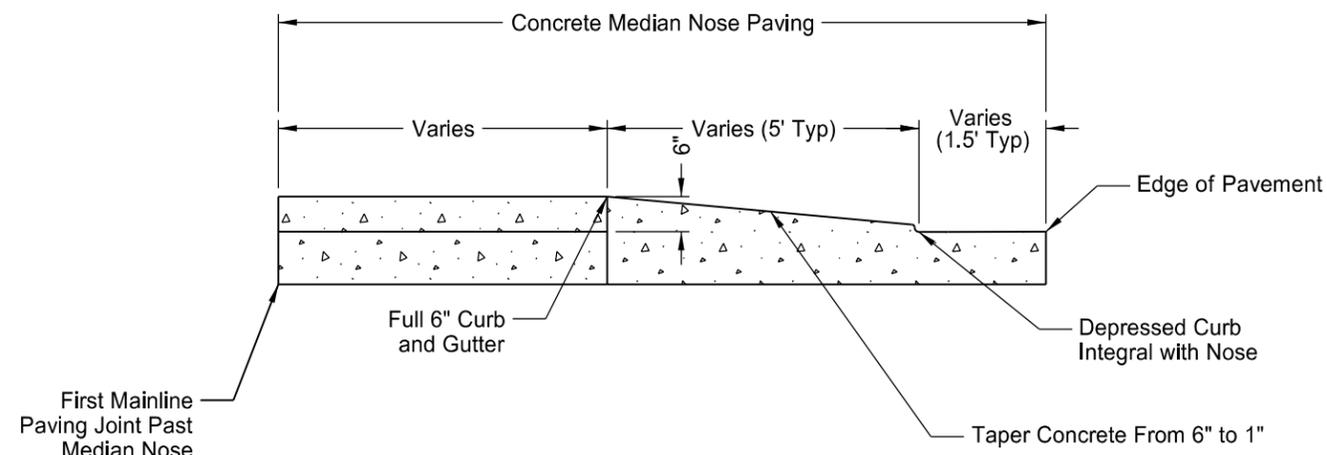
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	21



Median Nose Detail - Plan View



Concrete Median Paving - Cross Section View



Median Nose Detail - Profile View

Notes:

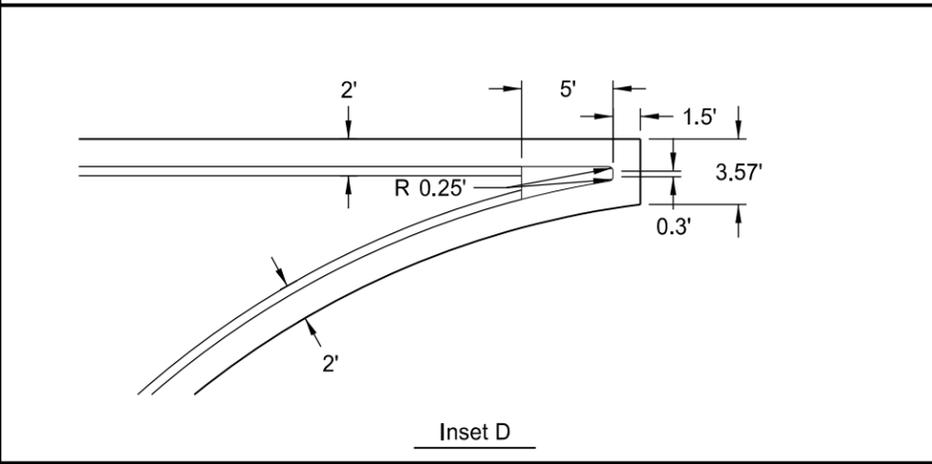
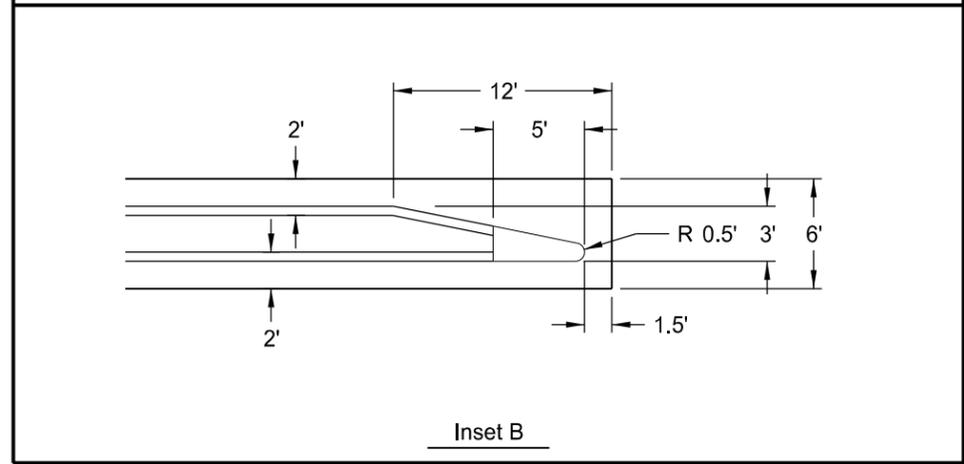
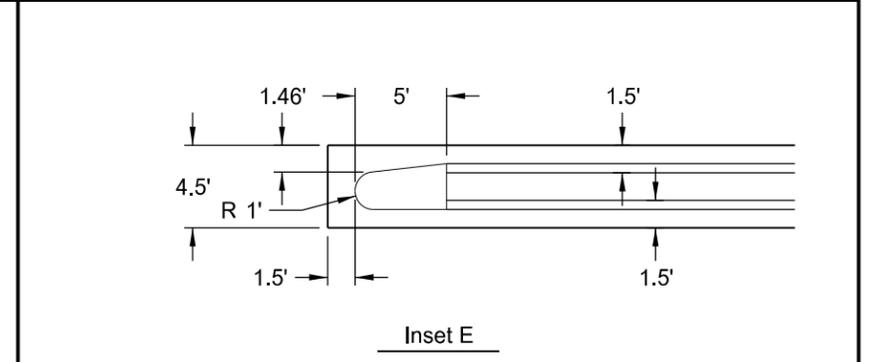
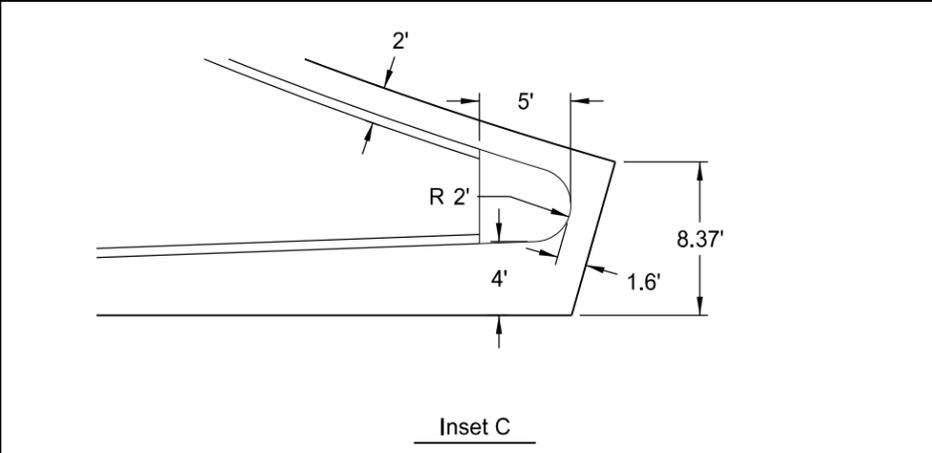
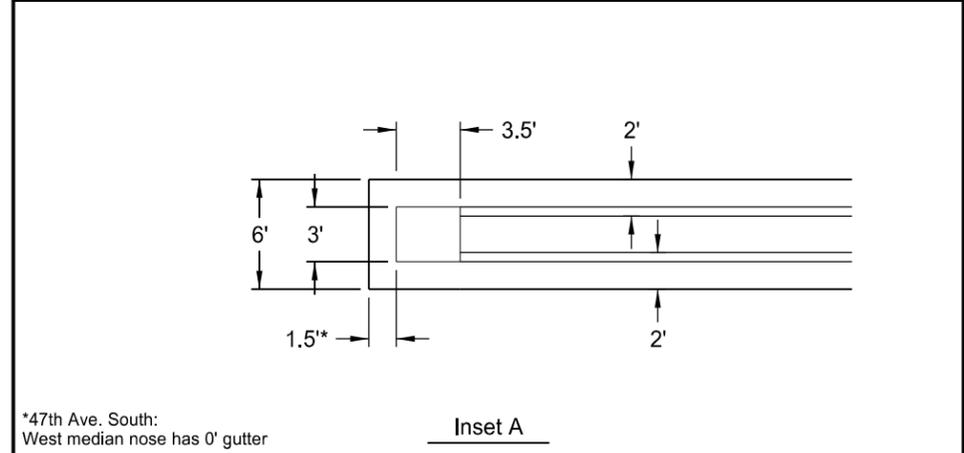
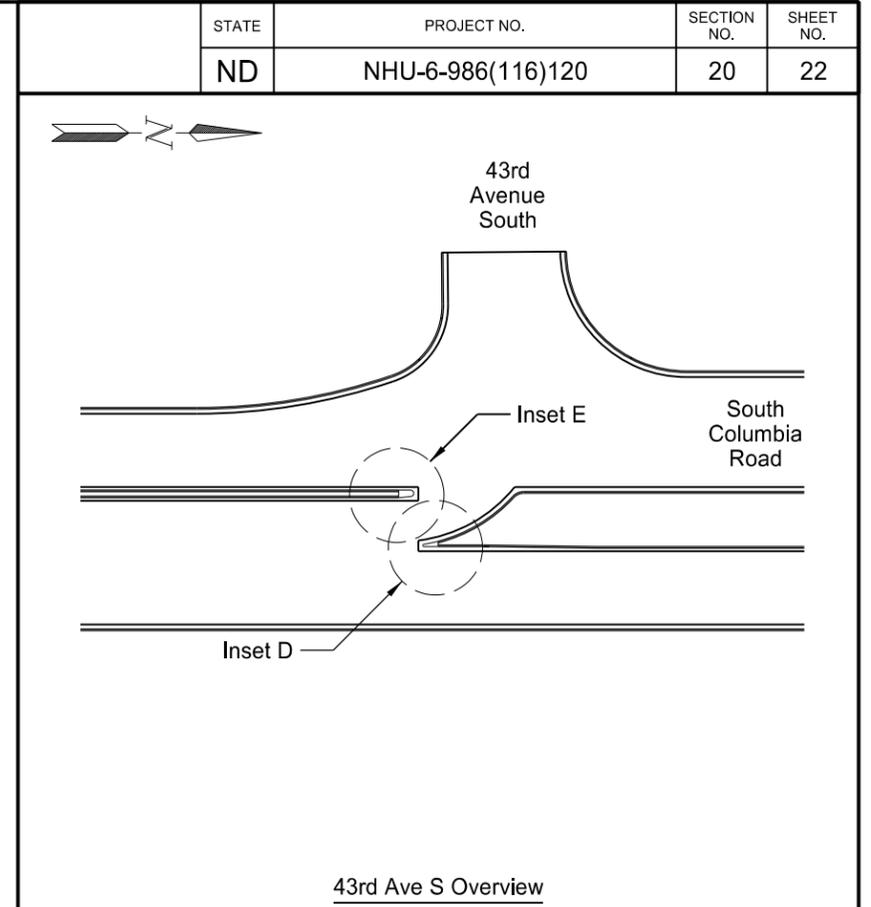
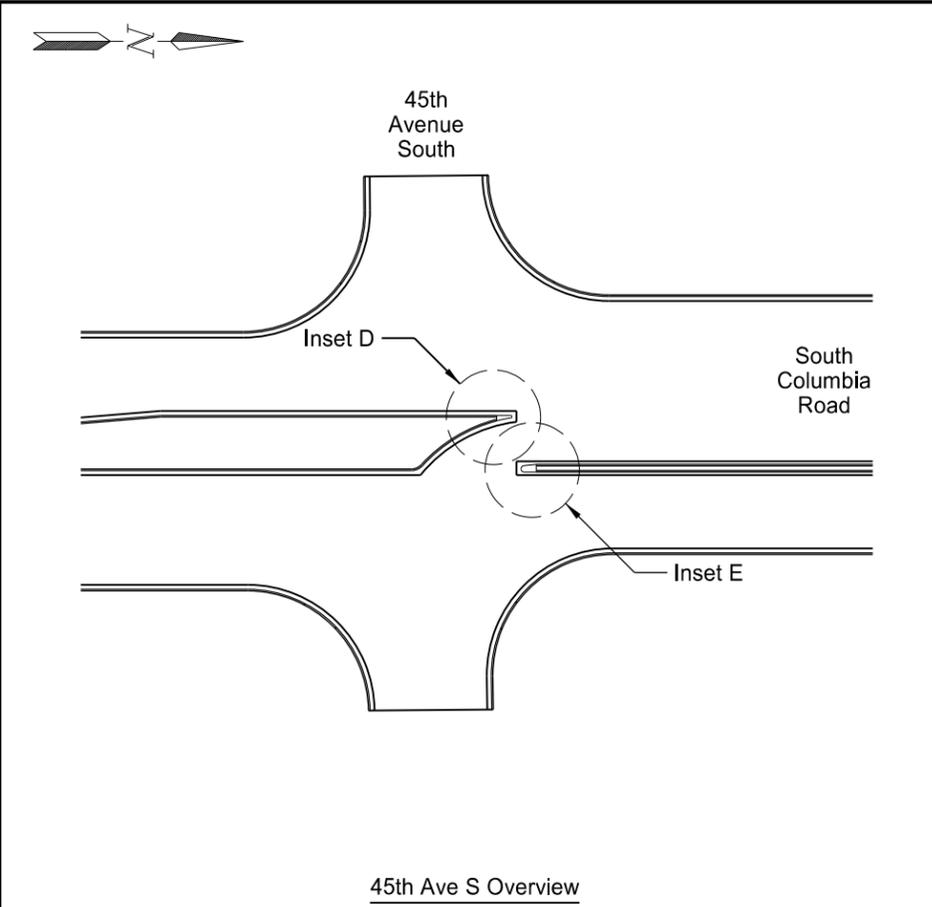
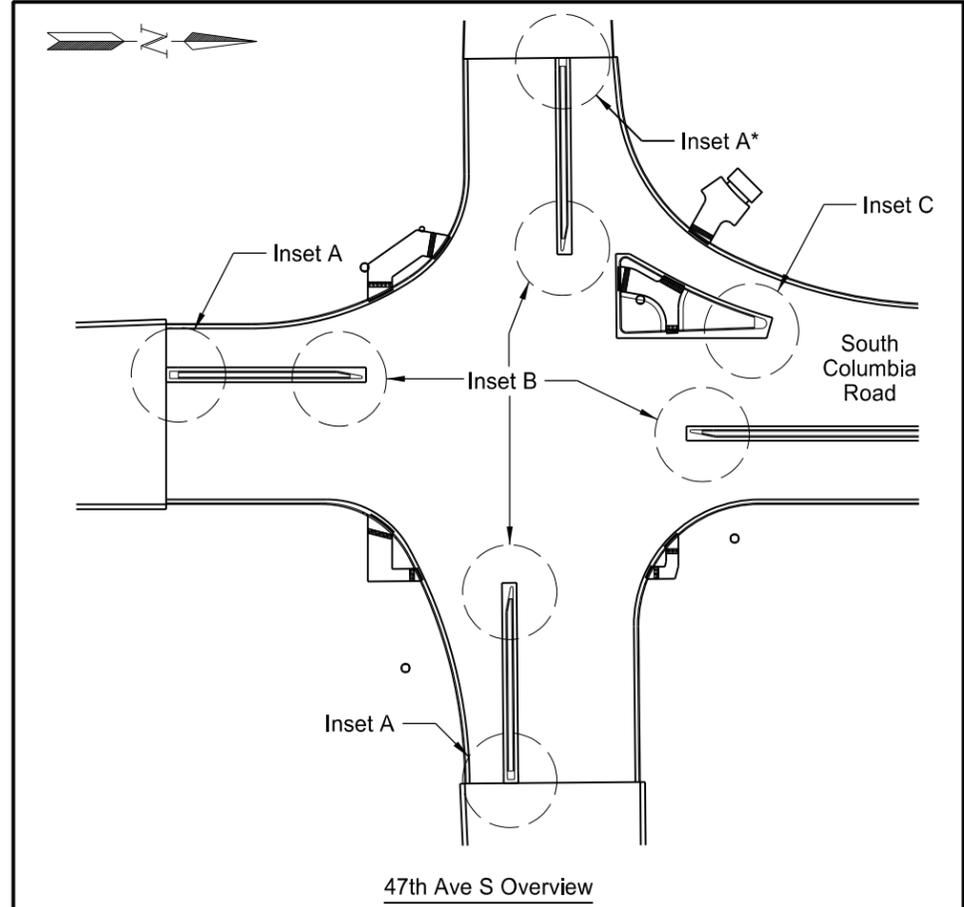
1. Construct Median with Positive Drainage.
2. Curb Width Varies, See Typical Sections for Locations and Dimensions.
3. Construction of 2" Wide Ledge Shall be Included in the Price Bid For "Curb & Gutter-Type I".
4. Median Joints Shall be  $\frac{1}{8}$ " Wide x  $1\frac{1}{4}$ " Deep. Saw Transverse @ 2.75' OC (Typ.).
5. Expansion Joints - Type 8 Shall be Constructed in 55' Intervals Along Median.

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Median and Median Nose Paving Details

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	22



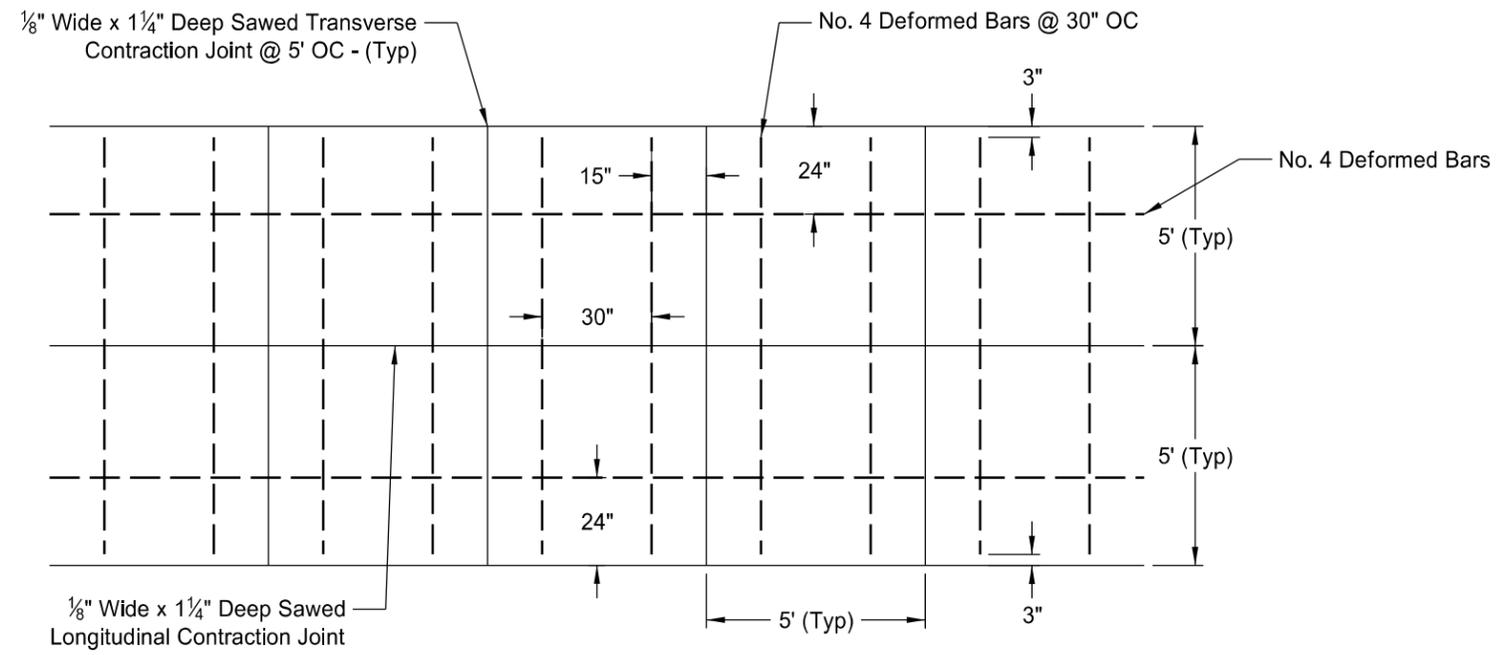
- Notes:
1. The Engineer Shall Approve All Form Grades Prior to Placement of Concrete.
  2. Any Median Nose Found to be in Noncompliance Shall Be Removed and Replaced by the Contractor at Their Own Expense.
  3. Dimensions Shown May Vary From Actual. Contractor Shall Field Adjust if Maximum Slopes Cannot be met with Dimensions Shown.

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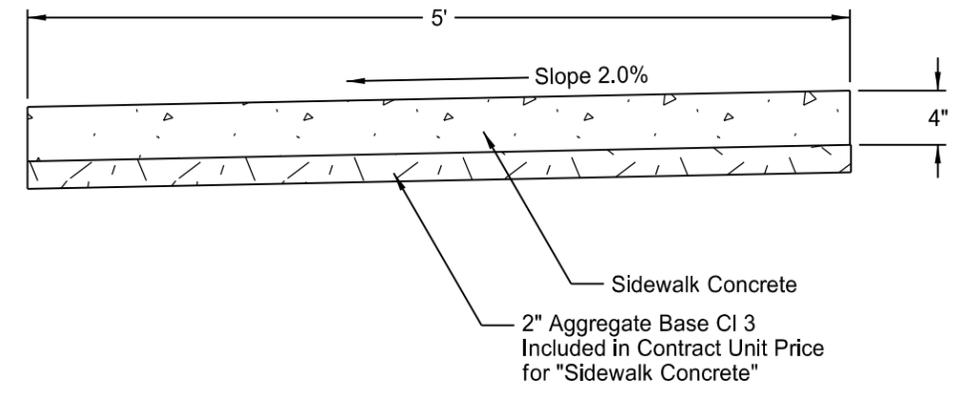
Paving Details  
 Concrete Median Nose Details

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

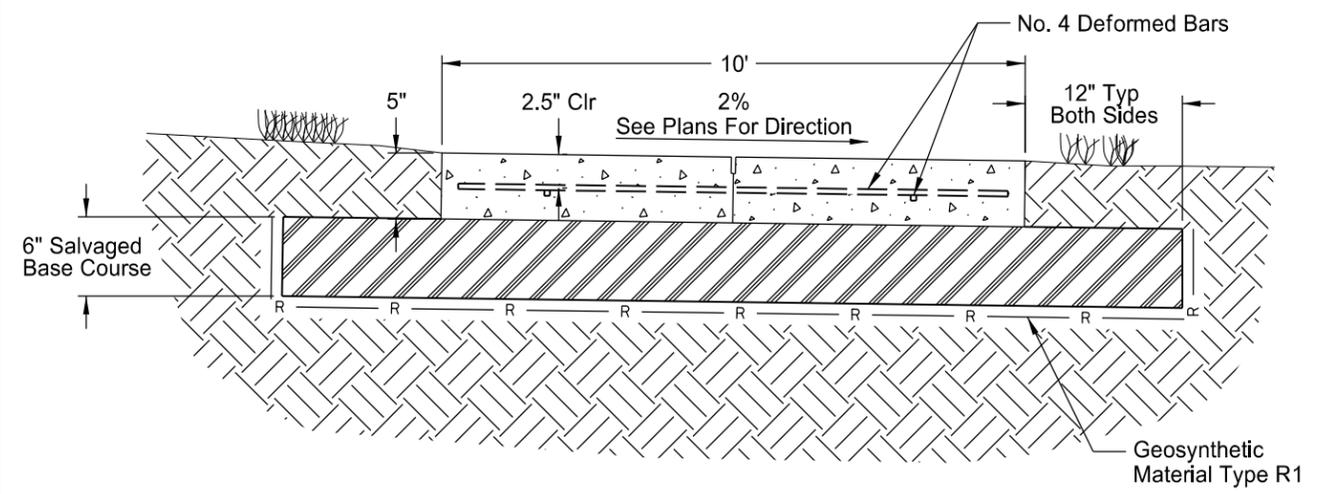
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	23



**Sidewalk Concrete - Plan View**



**Sidewalk Concrete**



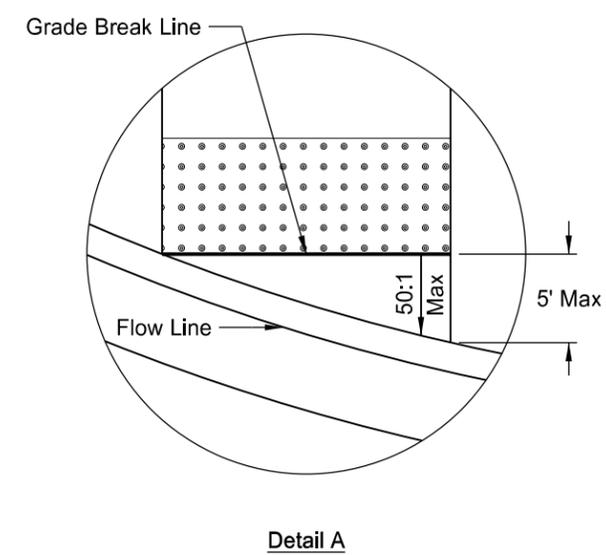
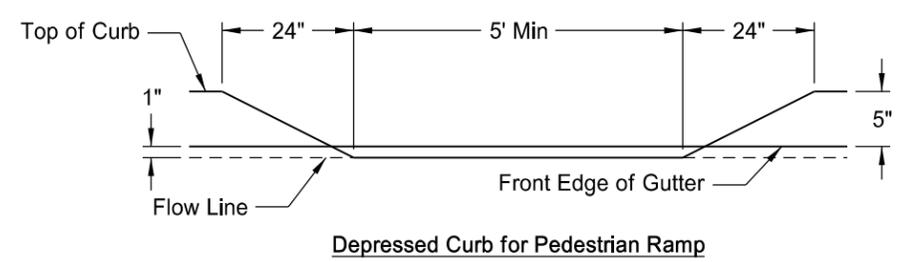
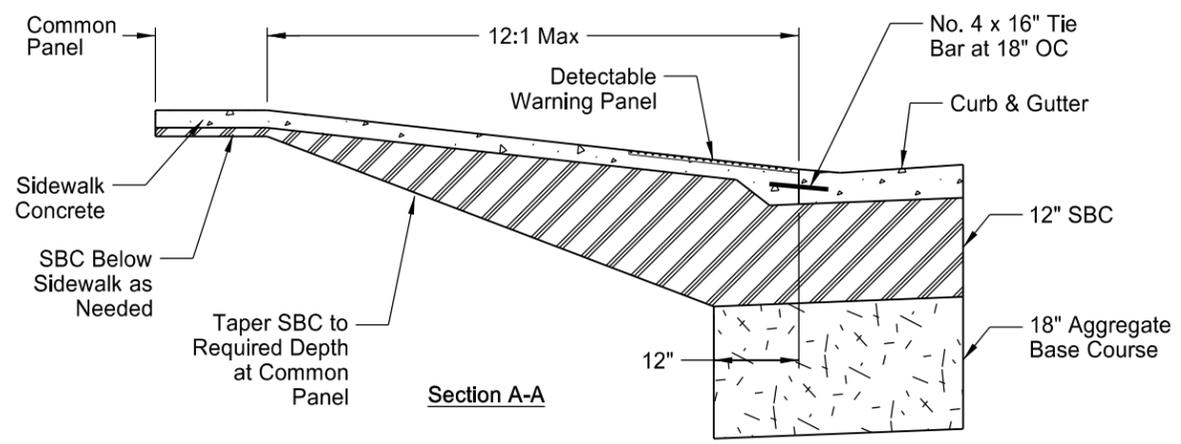
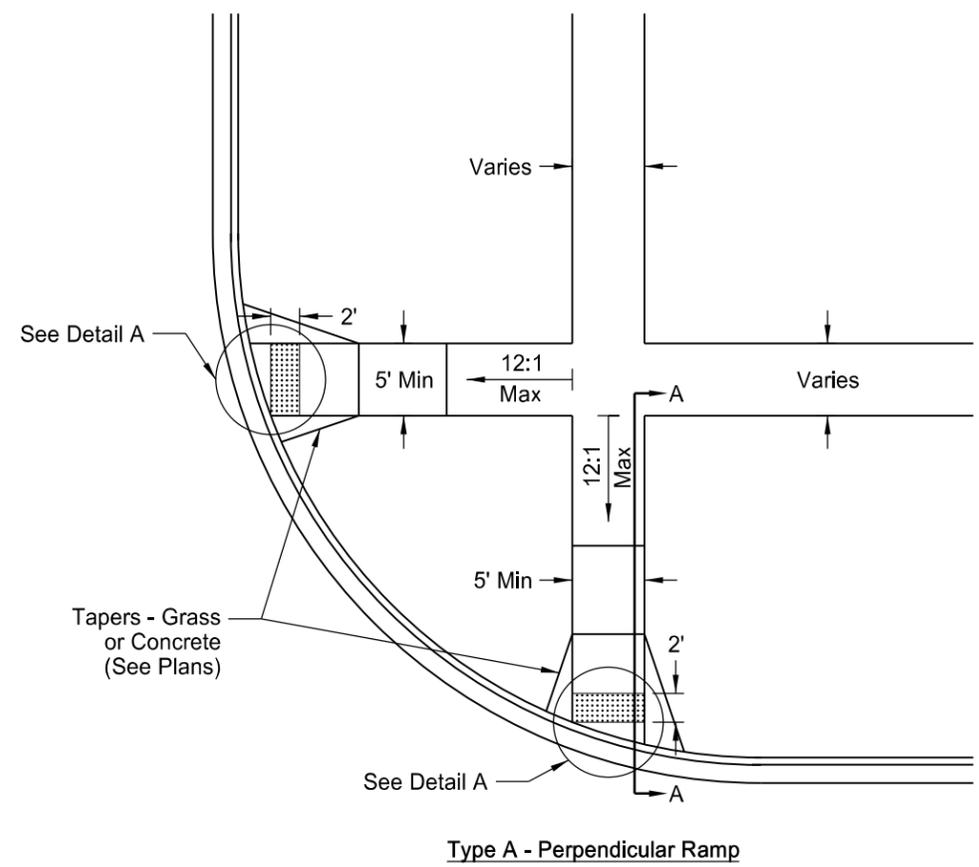
**Sidewalk Concrete - Profile View**

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Shared Use Path Details

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	24



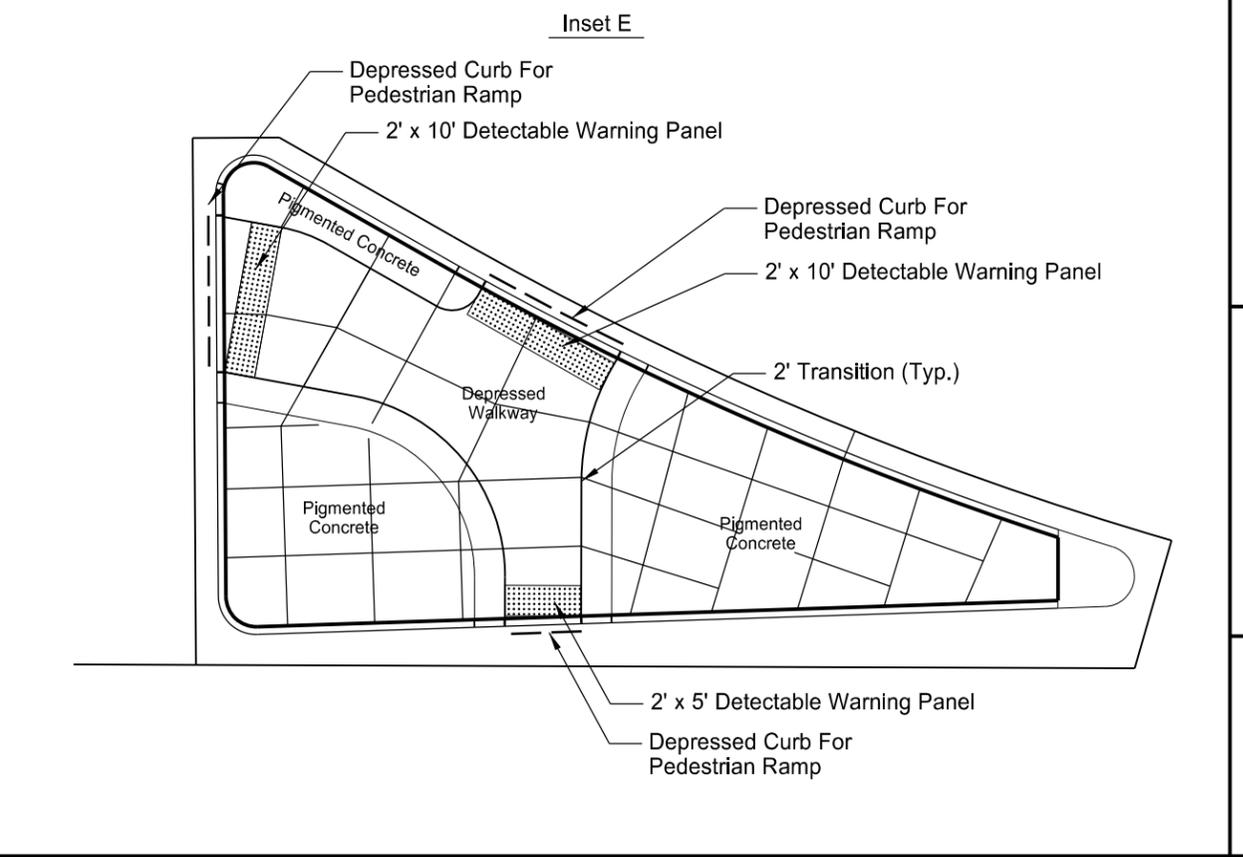
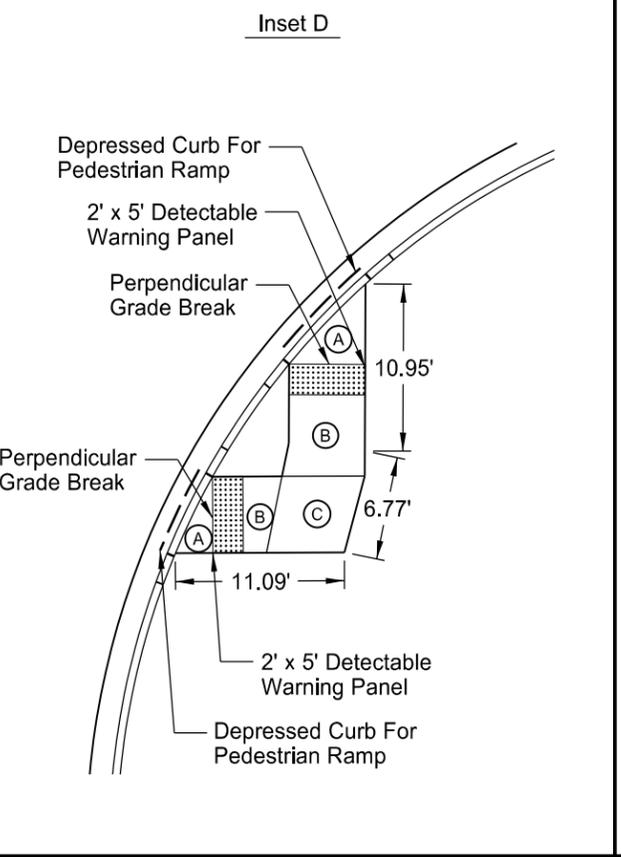
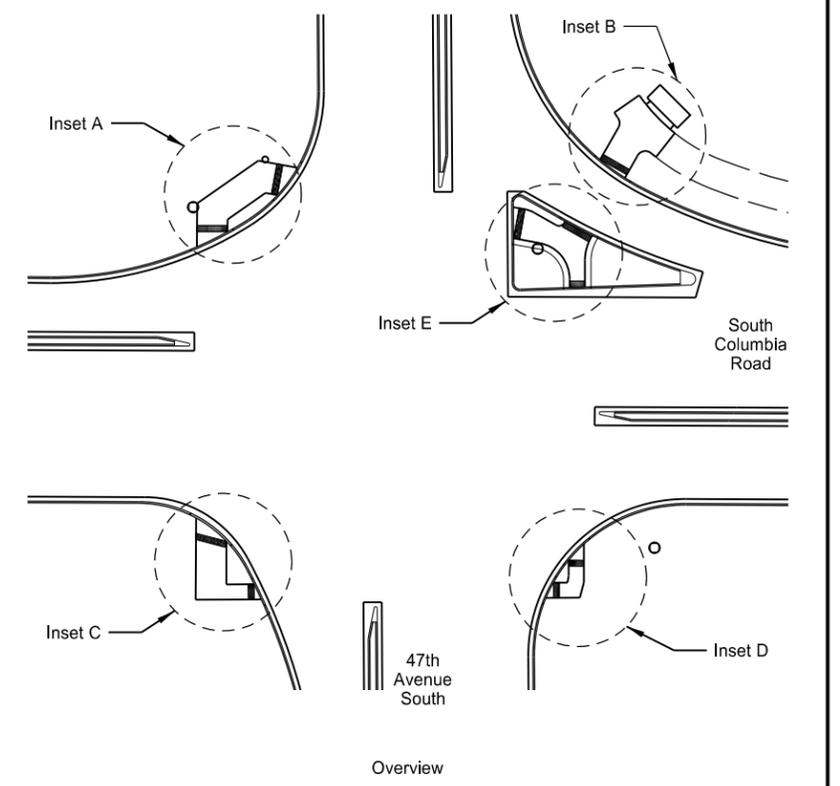
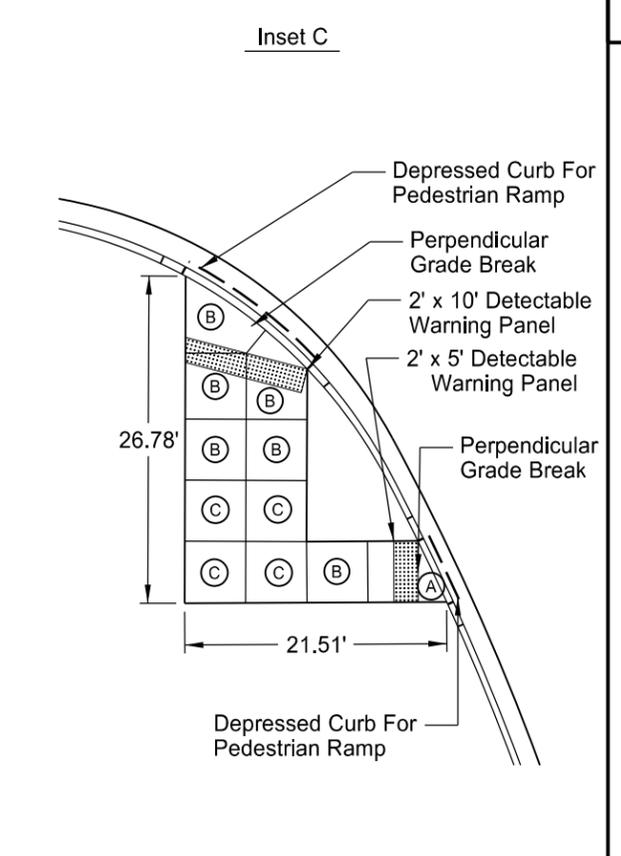
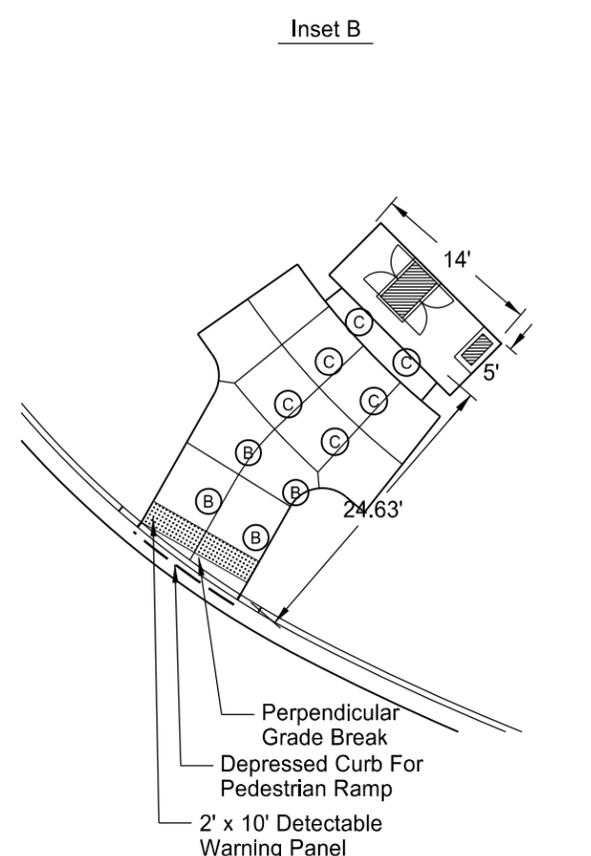
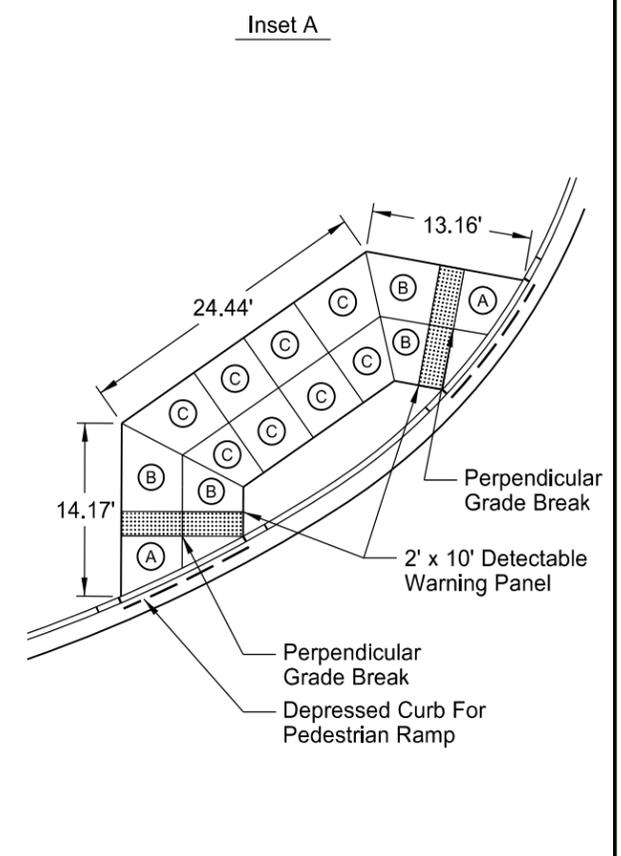
- Notes:
1. For Sidewalk Installations, a 5' Min Ramp Width Shall Be Used. Detectable Warning Panels Shall Be Installed to Match the Ramp Width.
  2. Where Ramps are Installed for Shared Use Paths, the Ramp Width and Detectable Warning Panel Width Shall Be Equal to the Width of the Shared Use Path.

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Sidewalk and Curb Ramp Details

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

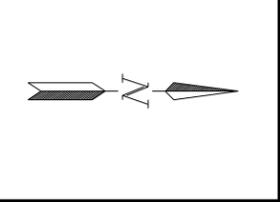
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	25



- Notes:
1. The Engineer Shall Approve All Form Grades Prior to Placement of Concrete.
  2. Any Ramp Found to be in Noncompliance Shall Be Removed and Replaced by the Contractor at Their Own Expense.
  3. Dimensions Shown May Vary From Actual. Contractor Shall Field Adjust if Maximum Slopes Cannot be met with Dimensions Shown.
  4. Stations and Offsets Given are to the Center of the Detectable Warning Panel.
  5. All Curb Ramp Flares are Grass Unless Otherwise Noted.

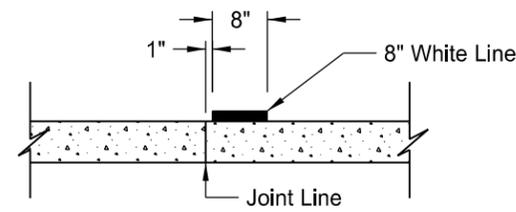
- (A) Initial Landing  
5' Max. Length  
1:50 Maximum Running Slope  
1:50 Maximum Cross Slope
- (B) Curb Ramp  
1:12 Maximum Running Slope  
1:50 Maximum Cross Slope
- (C) Landing  
5' x 5' Minimum  
1:50 Maximum Running Slope  
1:50 Maximum Cross Slope

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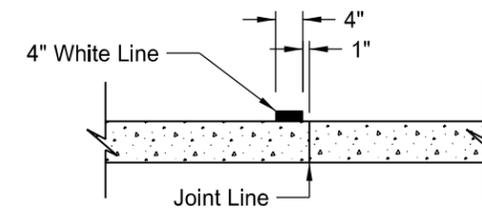


ADA Ramp Details Location  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

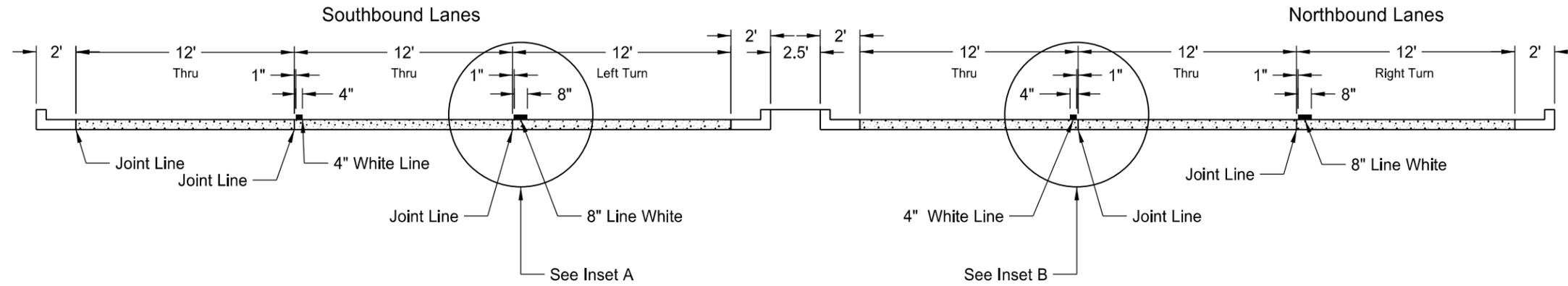
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	26



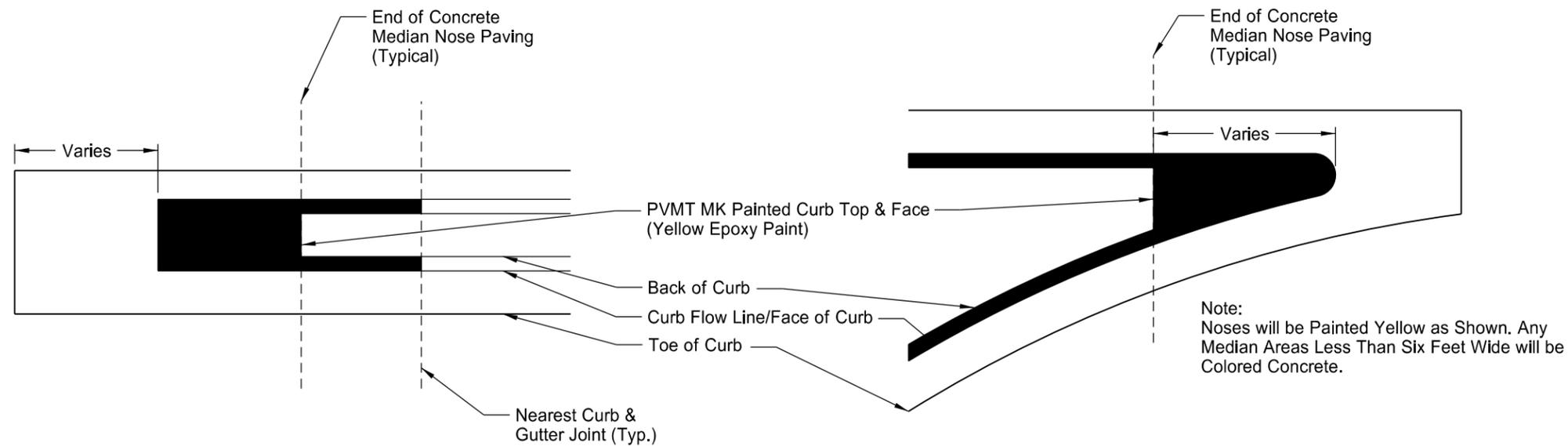
**Inset A**



**Inset B**



**Typical Pavement Marking Position**

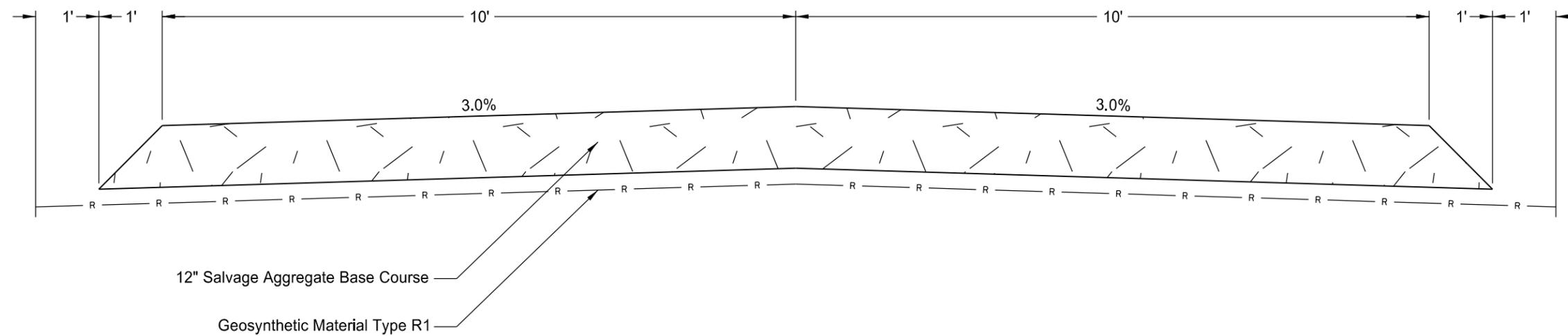


**Typical Median Nose and Curb & Gutter Marking**

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**Pavement Marking Details**  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	20	27



Temporary Access Road  
Typical Section

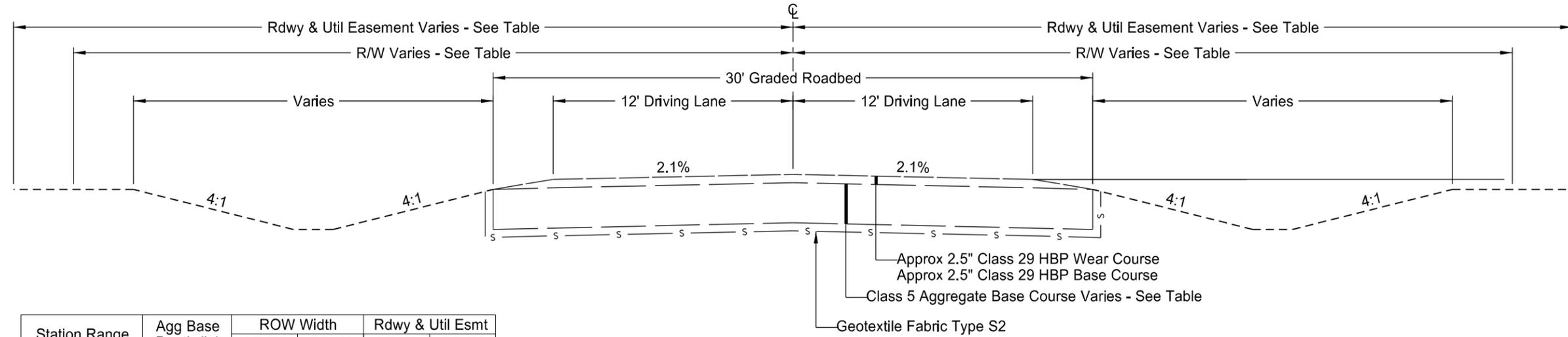
Notes:

1. See section 100 for approximate roadway location
2. Length of road is approximately 275'
3. Include the costs to construct and remove the Temporary Access Road in the contract unit price for "TEMPORARY ACCESS"

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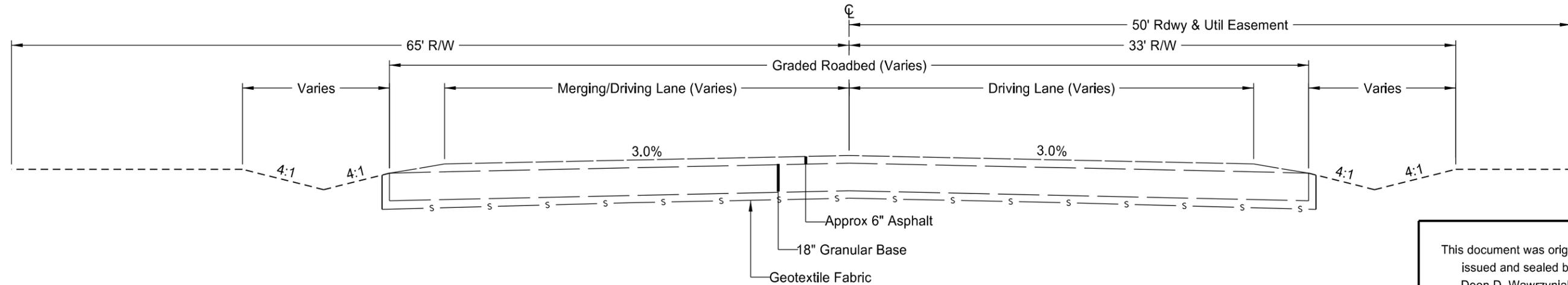
Temporary Access Road  
Typical Section

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



Station Range	Agg Base Depth (in)	ROW Width		Rdwy & Util Esmt	
		LT (ft)	RT (ft)	LT (ft)	RT (ft)
296+50 - 306+00	30	33	50	65	-
307+00 - 312+70	24	33	60	65	-
313+50 - 316+10	24	65	33	-	50
316+10 - 318+10	33	65	33	-	50
318+10 - 326+35	30	65	33	-	50

**South Columbia Road**  
 Sta 296+50 to Sta 326+35

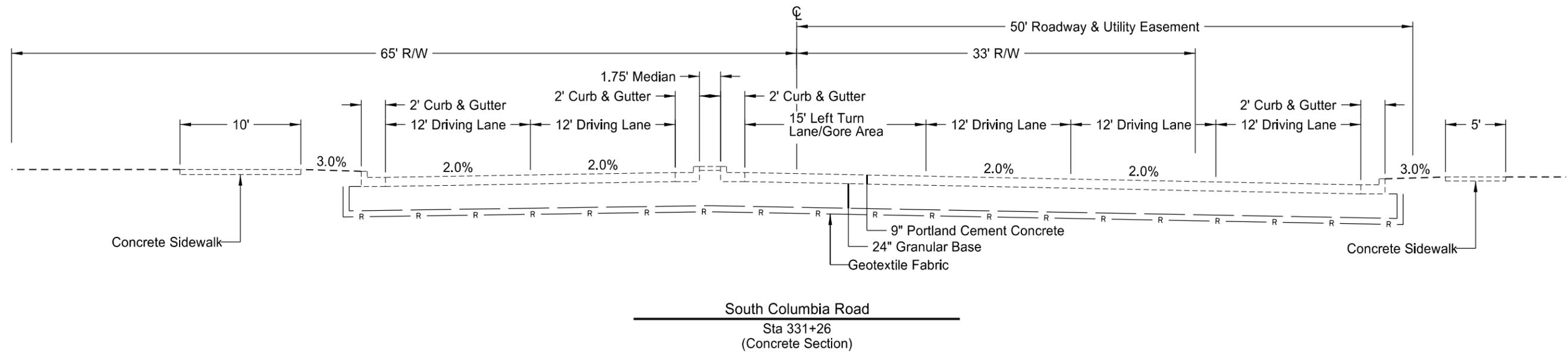


**South Columbia Road**  
 Sta 326+35 to Sta 331+26  
 (Asphalt Taper Section)

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**Existing Typical Sections**  
**South Columbia Road**  
  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	30	2

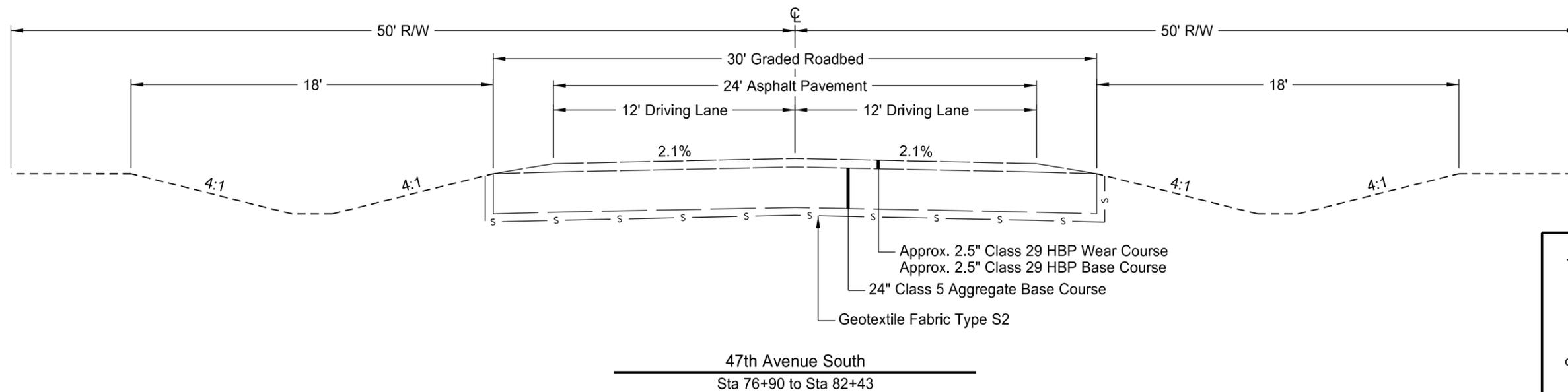
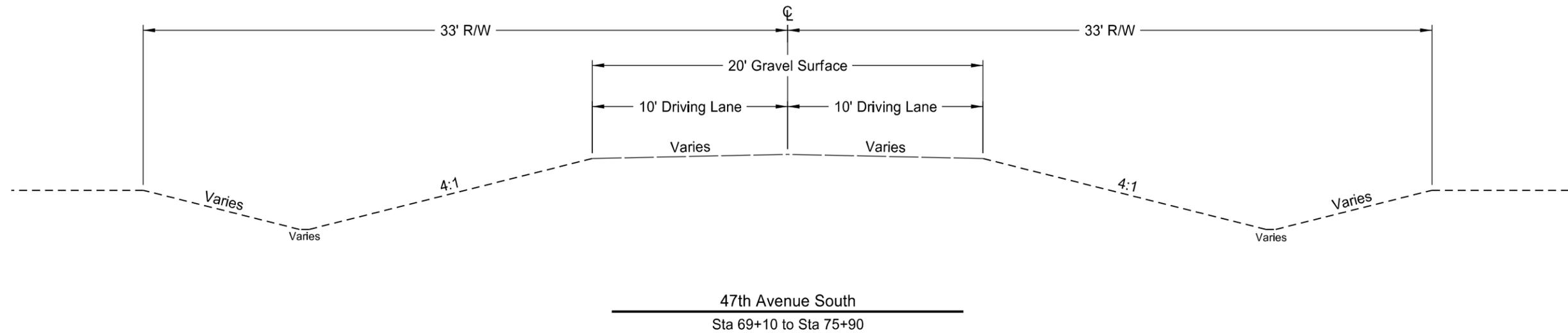


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Existing Typical Sections  
South Columbia Road

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	30	3

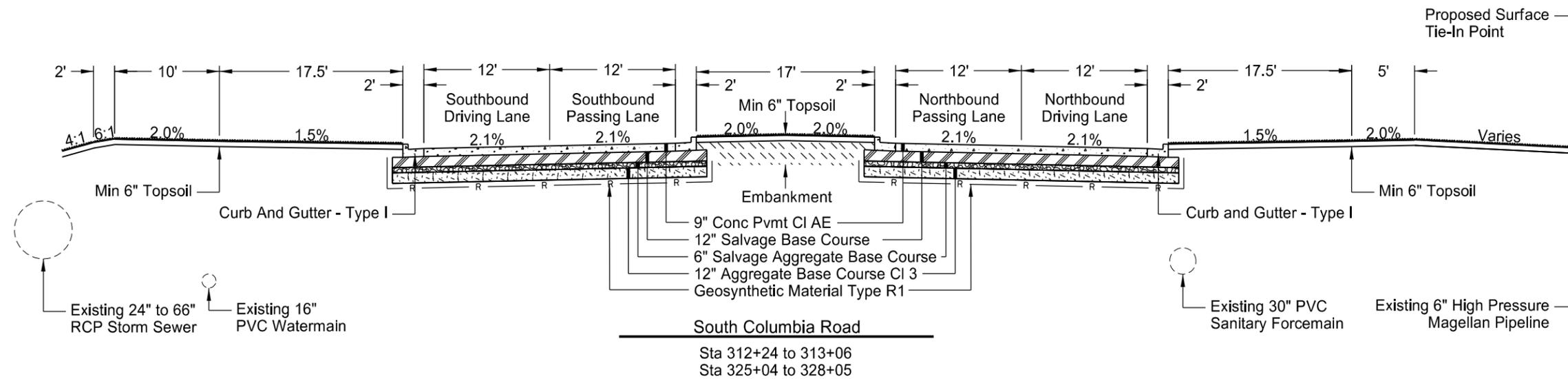
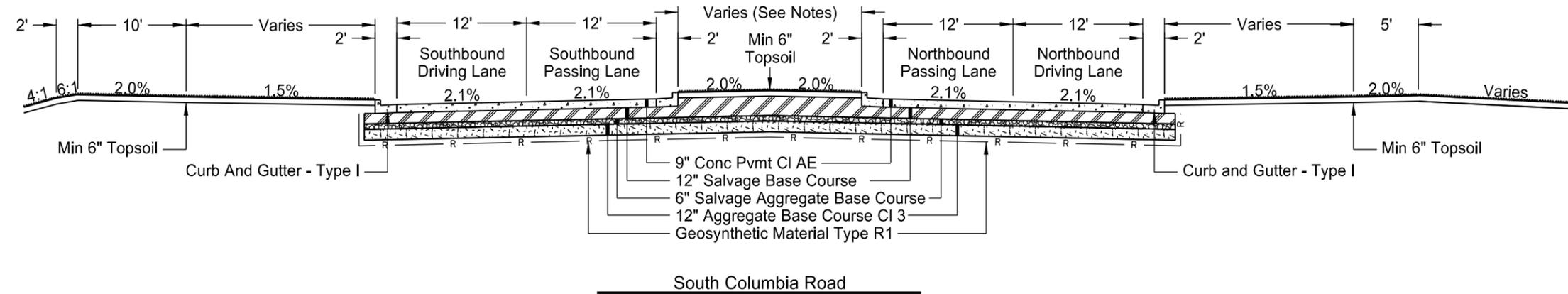


Approx. 2.5" Class 29 HBP Wear Course  
 Approx. 2.5" Class 29 HBP Base Course  
 24" Class 5 Aggregate Base Course  
 Geotextile Fabric Type S2

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Existing Typical Sections  
 47th Avenue South  
  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	30	4

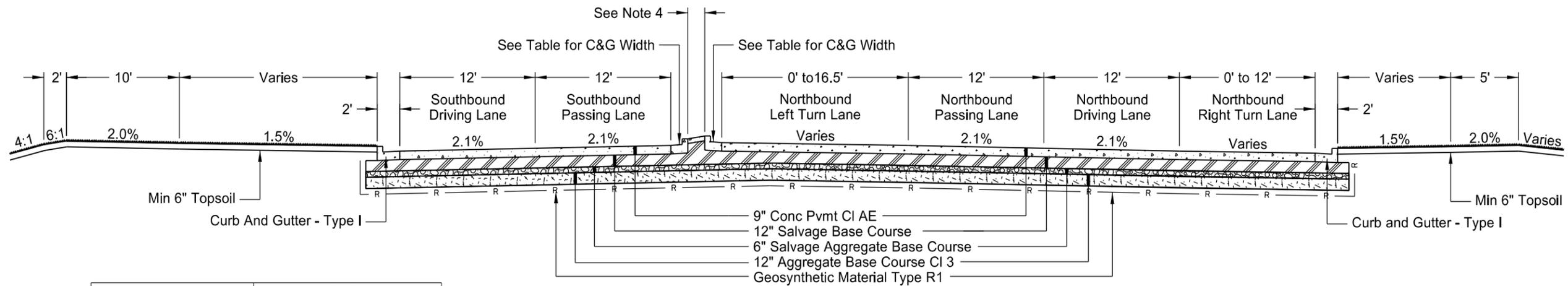


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Proposed Typical Sections  
South Columbia Road

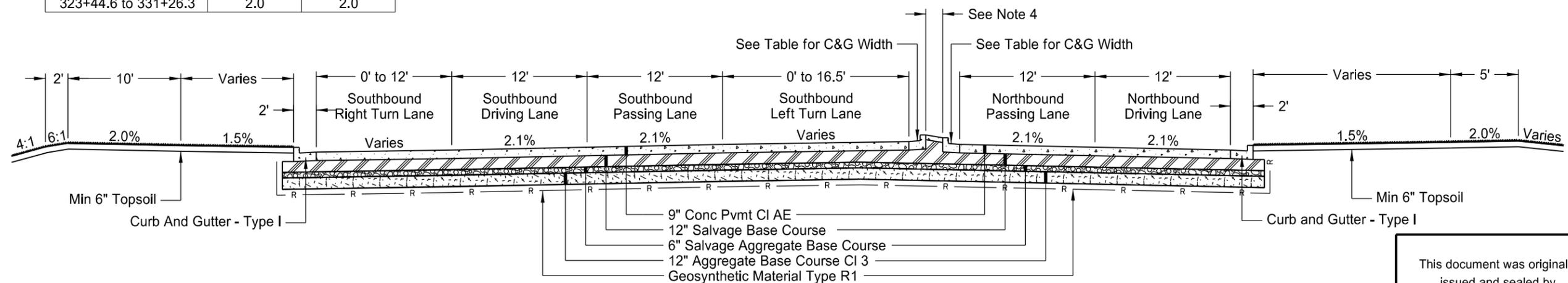
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

- Notes:
1. Baseline Location for Horizontal and Vertical Datum is Located Along the Inside Edge of the Northbound Driving Lanes.
  2. Extend Base Course 1' Behind Back of Curb (BOC) Unless Plans Show Otherwise.
  3. See Section 60 for Width of Base Under Median
  4. Where the Median (BOC to BOC) is Narrower than 6'; the Embankment, Topsoil and Seeding Shall be Replaced with the Concrete Median Detailed in Section 20.



Station Range	Median C&G Width (ft)	
	NB Median	SB Median
304+99.2 to 313+40.2	2.0	2.0
313+40.2 to 319+87.5	1.5	1.5
319+87.5 to 320+08.9	2.0	2.0
320+08.9 to 320+46.0	Taper	2.0
320+46.0 to 323+11.6	1.5	2.0
323+11.6 to 323+44.6	Taper	2.0
323+44.6 to 331+26.3	2.0	2.0

South Columbia Road  
Northbound Turn Lanes



South Columbia Road  
Southbound Turn Lanes

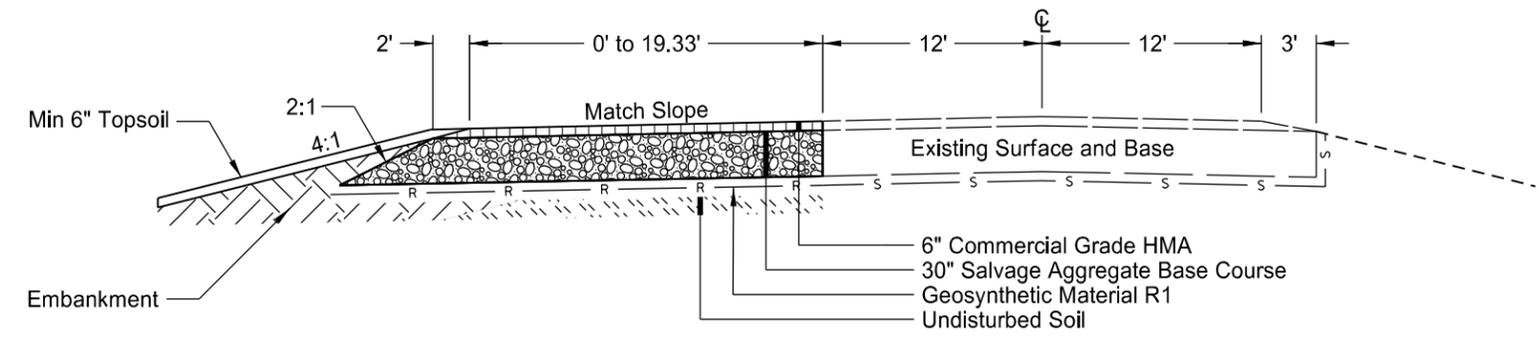
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Notes:

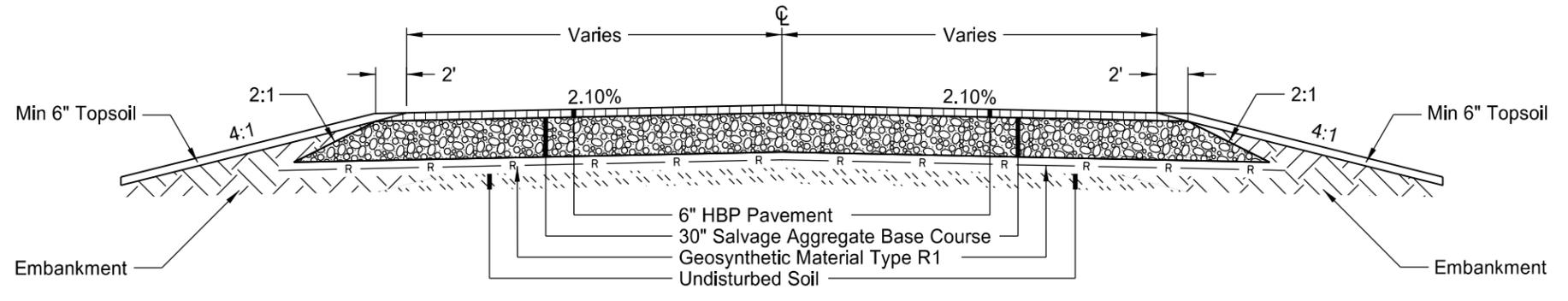
1. Baseline Location for Horizontal and Vertical Datum is Located Along the Inside Edge of the Northbound Driving Lanes.
2. Extend Base Course 1' Behind Back of Curb (BOC) Unless Plan Show Otherwise.
3. See Section 90 for Turn Lane Widths and Slopes.
4. Where the Median (BOC to BOC) is Narrower than 6'; the Embankment, Topsoil and Seeding Shall be Replaced with the Concrete Median Detailed in Section 20.

Proposed Typical Sections  
South Columbia Road  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

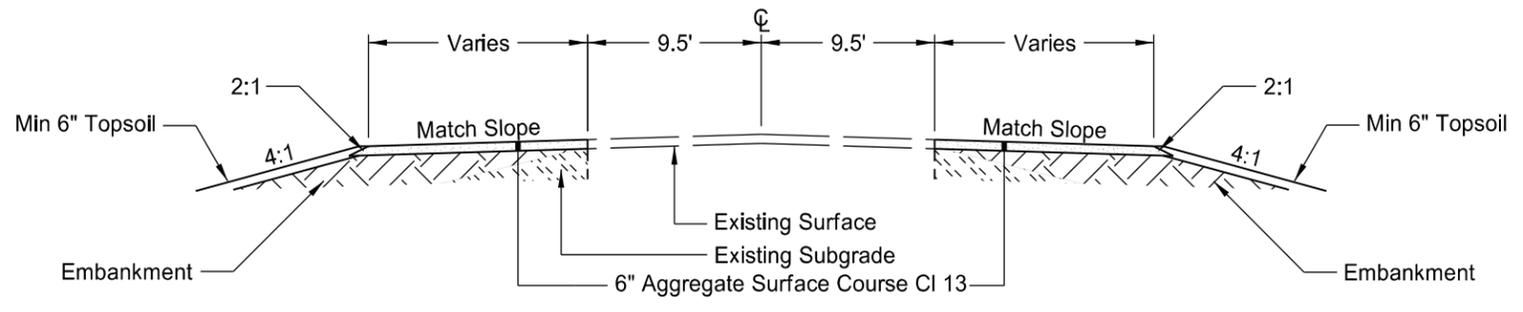
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	30	6



**South Columbia Road HMA Widening**  
Sta 296+52.9 to 302+22.1



**South Columbia Road HMA Full Width**  
Sta 302+22.1 to 304+99.2

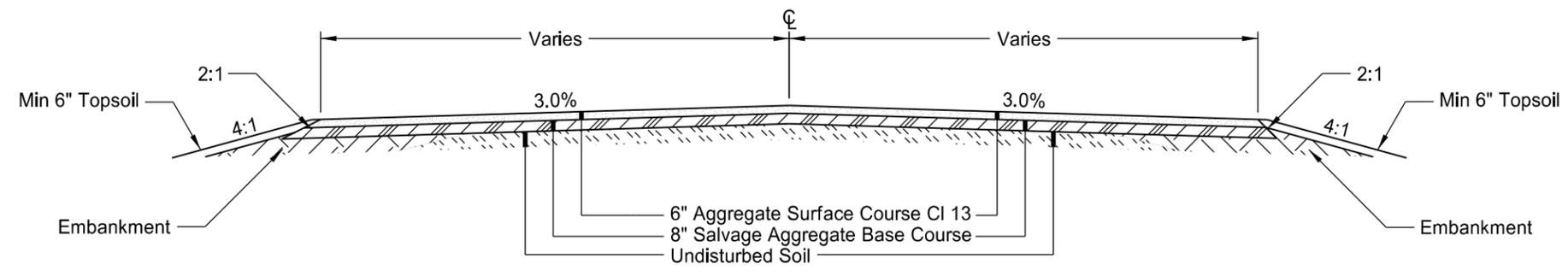


**47th Avenue South Gravel Widening**  
Sta 69+9.1 to 73+25.0

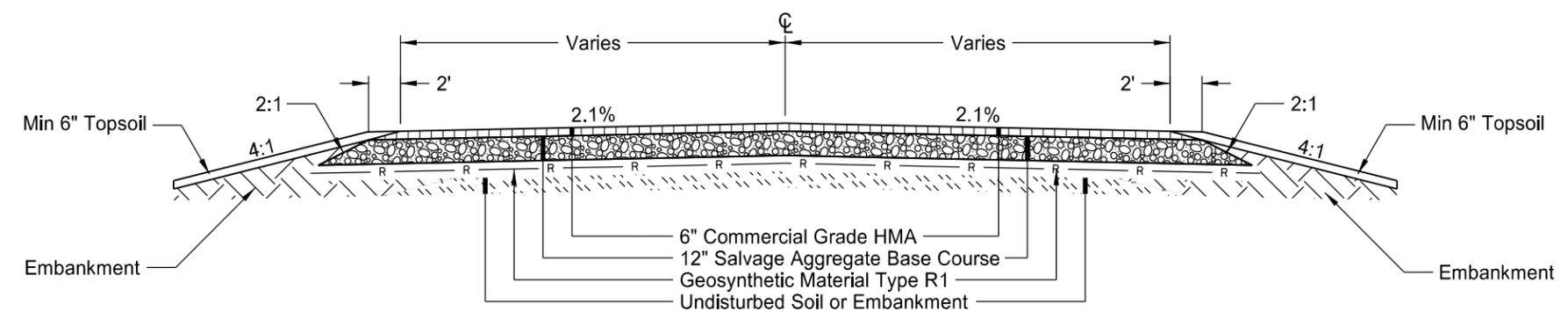
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Proposed Typical Sections  
South Columbia Road & 47th Avenue South  
East Approach  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

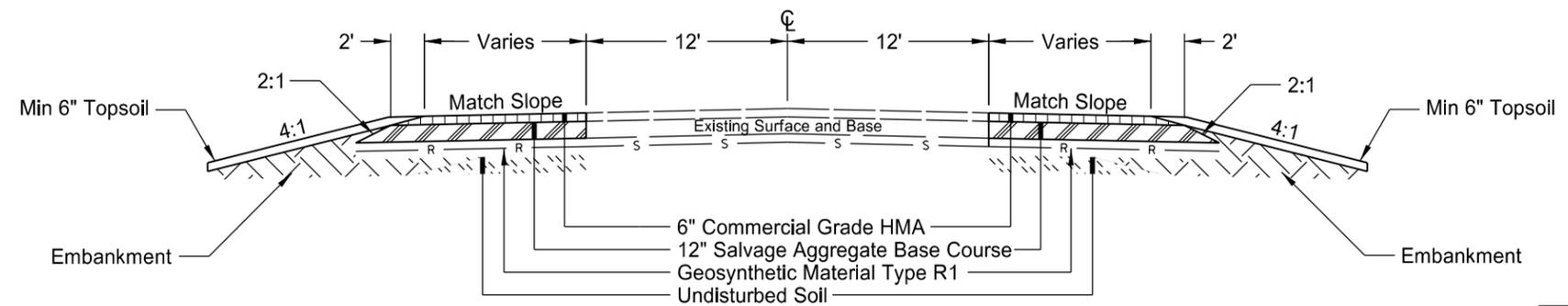
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	30	7



**47th Avenue South Gravel Full Width**  
Sta 73+25.0 to 74+88.9



**47th Avenue South HMA Full Width**  
Sta 77+85.6 to 80+05.0



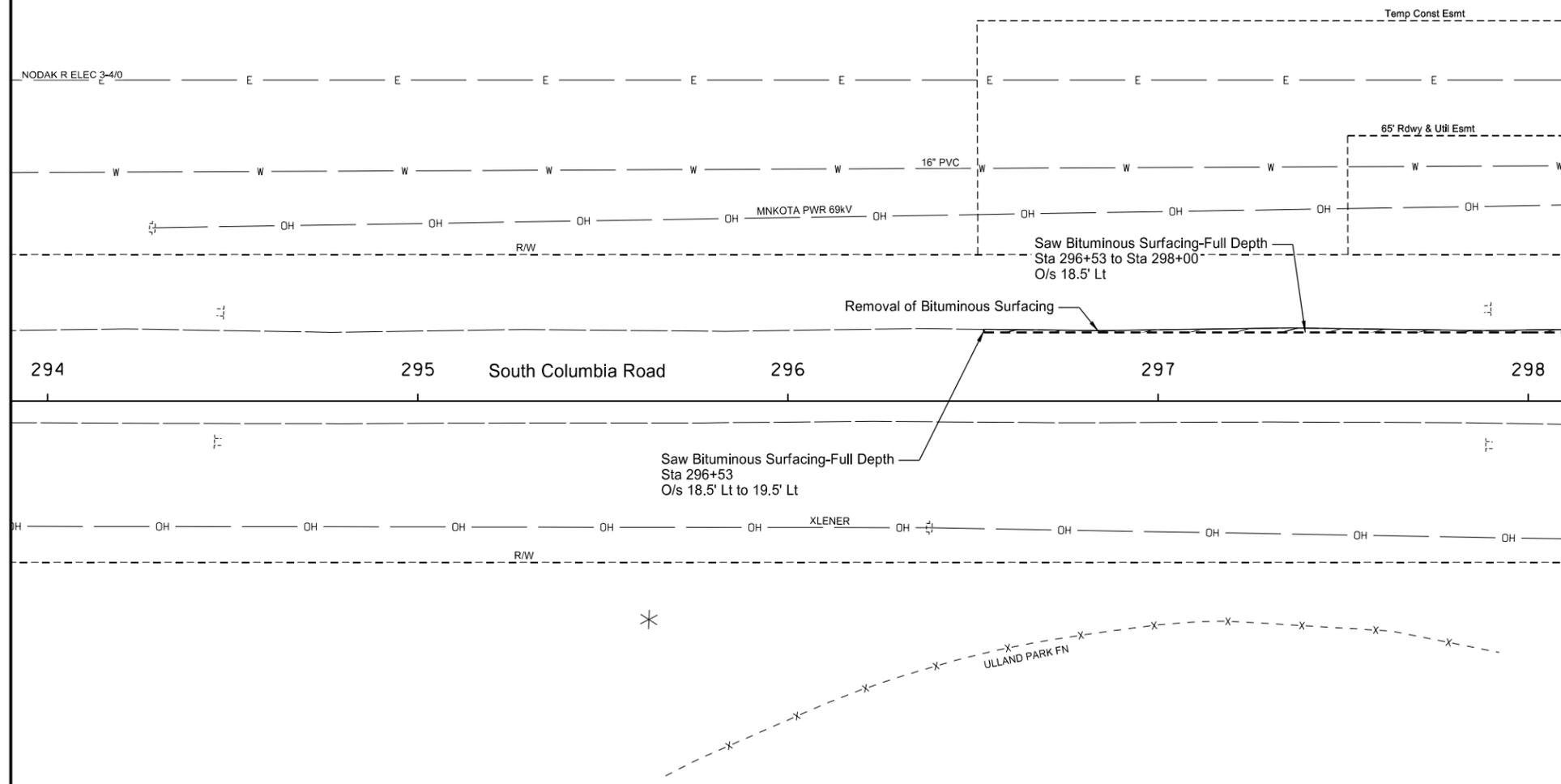
**47th Avenue South HMA Widening**  
Sta 80+05.0 to 82+43.3

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Proposed Typical Sections  
47th Avenue South Asphalt and Gravel Sections  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	1

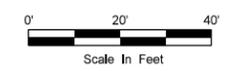
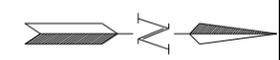
SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 296+53 to Sta 298+00	12	SY



**WARNING**  
**HIGH-PRESSURE PIPELINE(S)**  
 Excavation and/or Construction Prohibited  
 Without compliance with State One-Call, AND  
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**MAGELLAN PIPELINE COMPANY, L.P.**  
**A MAGELLAN REPRESENTATIVE MUST BE**  
**PRESENT DURING WORK AROUND PIPELINE(S)**

**Legend**

	Saw Bituminous Surfacing-Full Depth
	Removal of Pavement



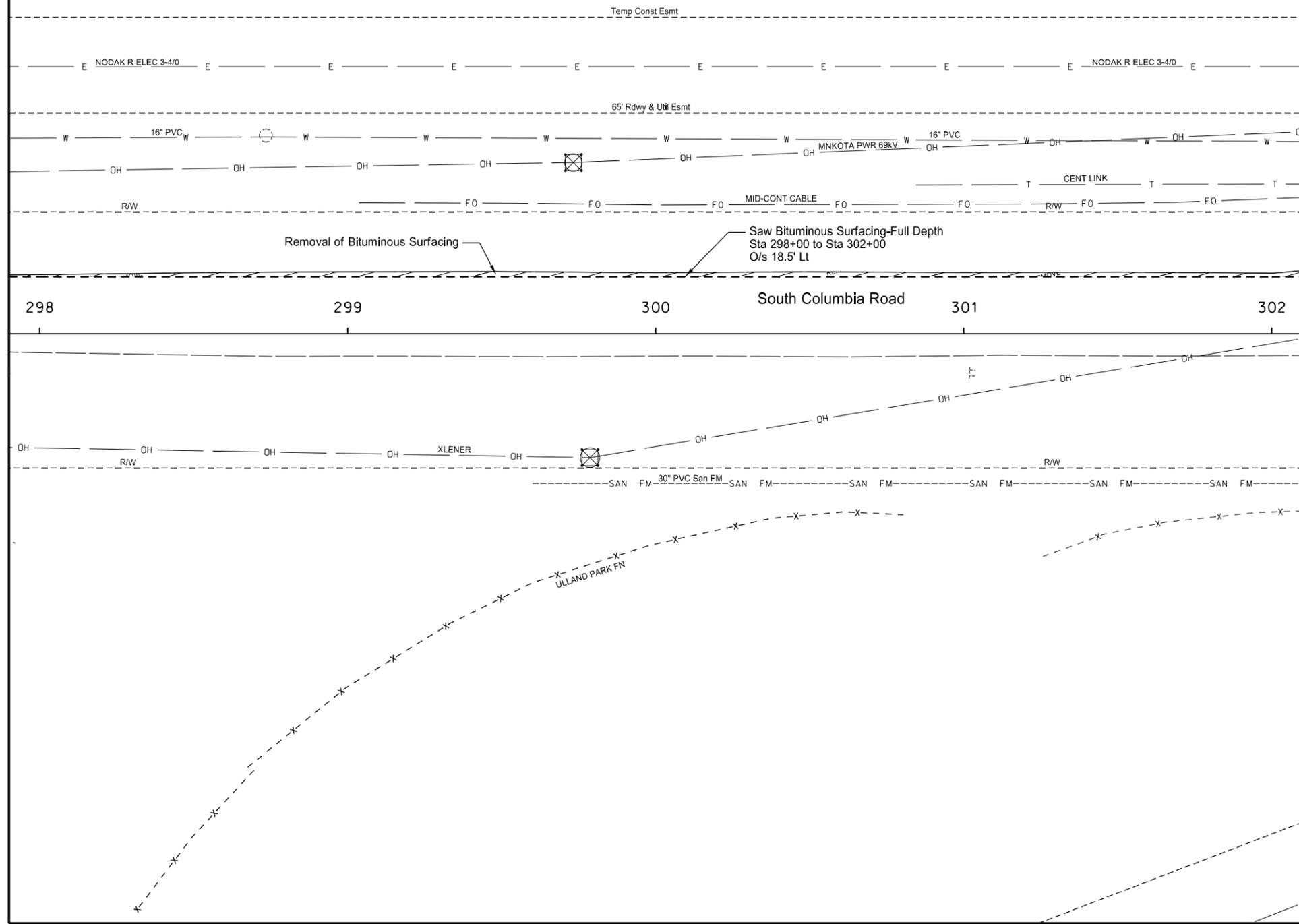
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Removals  
 Sta 294+00 to 298+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	2

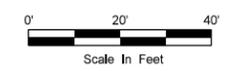
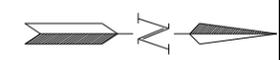
SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 298+00 to Sta 302+00	61	SY



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**Legend**

- Saw Bituminous Surfacing-Full Depth
- Removal of Pavement



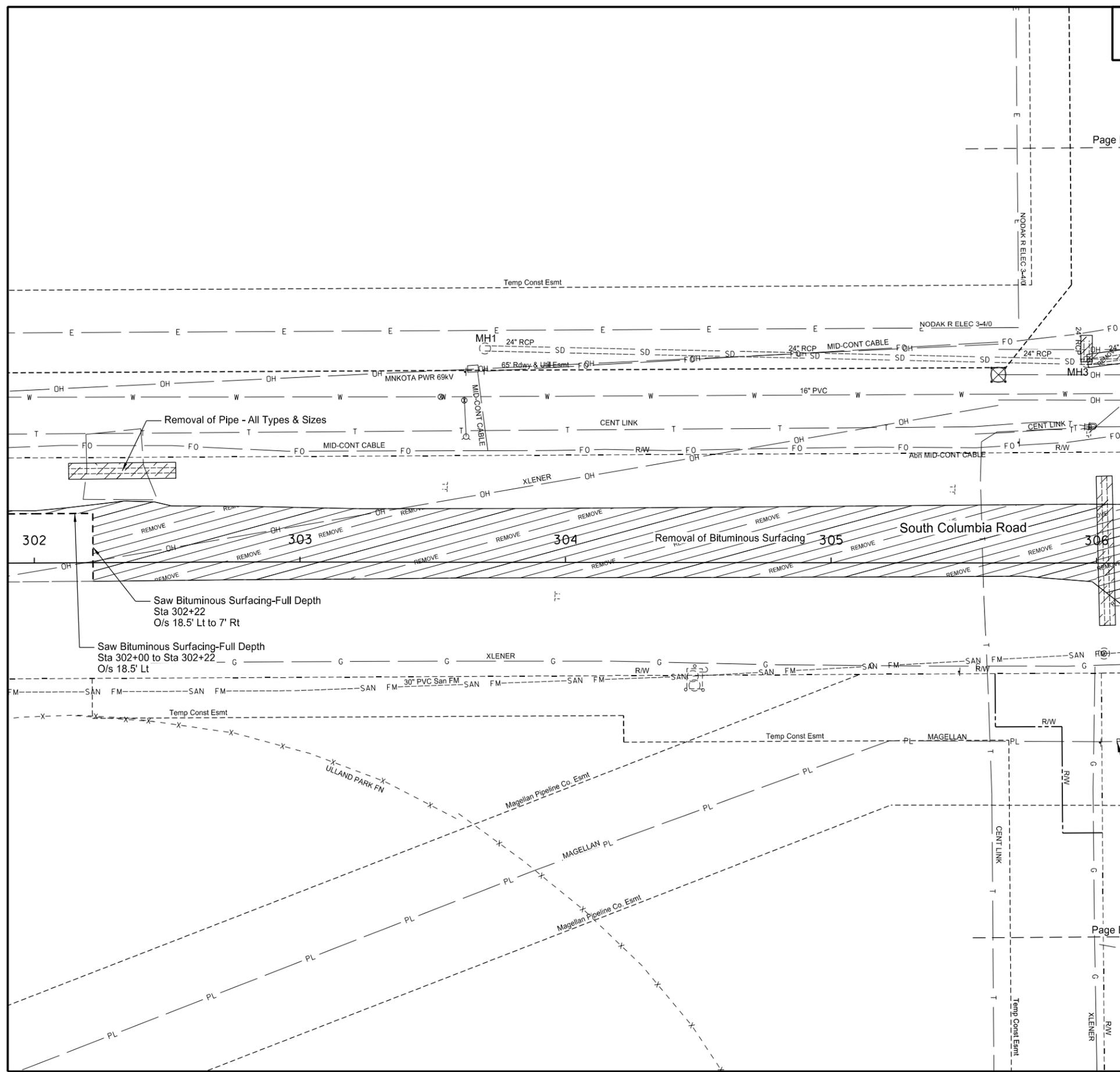
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**Removals**  
 Sta 298+00 to 302+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	3

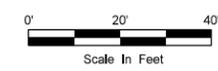
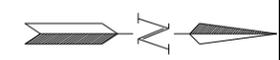
SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 302+00 to Sta 306+00	1136	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES Sta 302+33 34.5' Lt	40	LF



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**Legend**

- Saw Bituminous Surfacing-Full Depth
- Removal of Pavement
- Removal of Pipe All Types



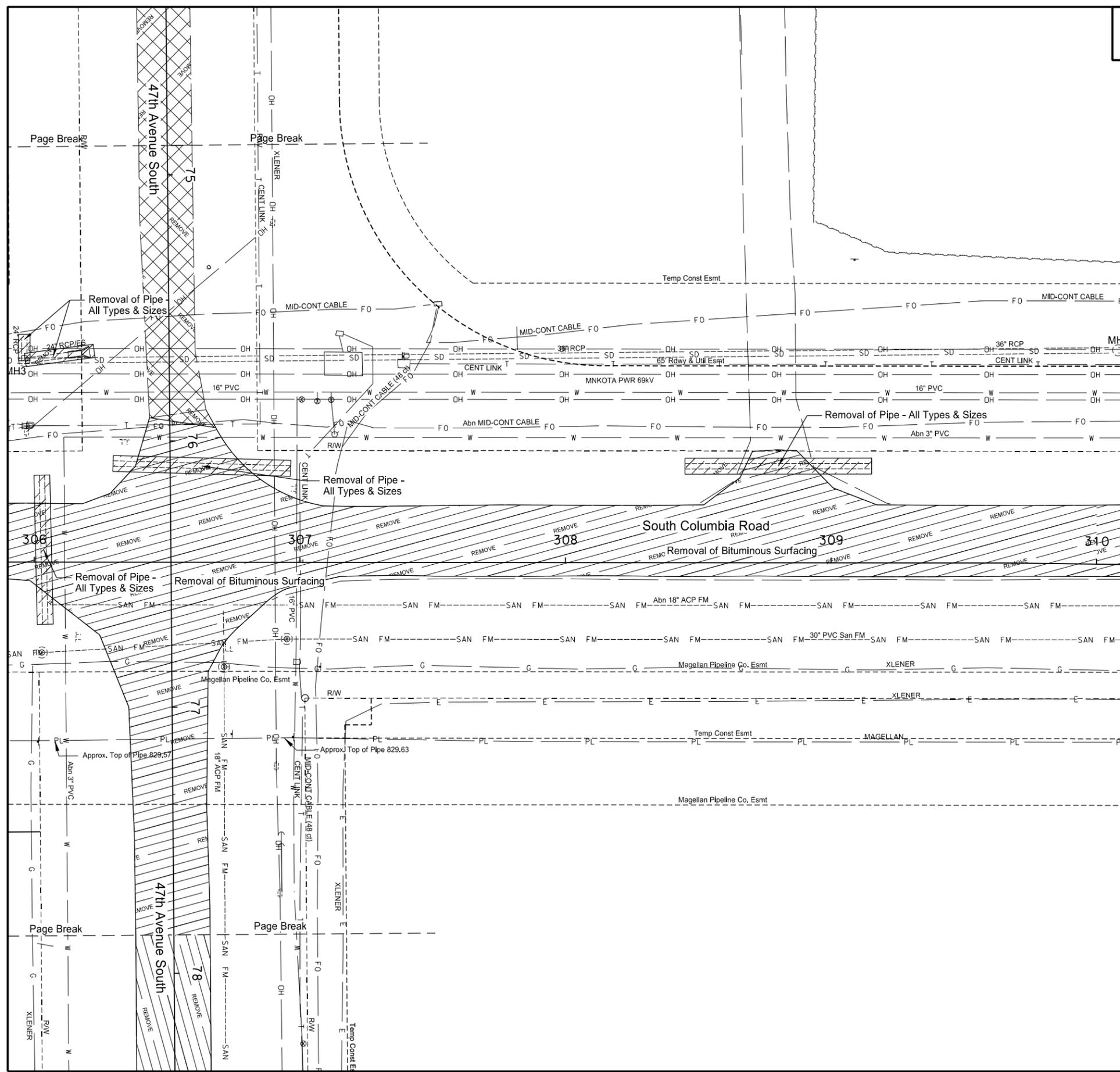
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**Removals**  
 Sta 302+00 to Sta 306+00

**Reconstruction of South Columbia Road**  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	4

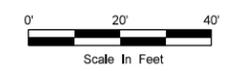
SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 306+00 to Sta 310+00	1993	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES Sta 305+96 79.6 Lt Sta 306+03 @ CL Sta 306+07 77.1 Lt Sta 306+63 36.2 Lt Sta 308+80 36.3 Lt	8 56 22 67 70	LF LF LF LF LF
302 0405	SALVAGE & RELAY AGGREGATE SURFACE COURSE Sta 306+43 to Sta 306+68	19	CY



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- Legend**
- Removal of Pavement
  - Removal of Pipe All Types
  - Remove & Salvage Aggregate Base

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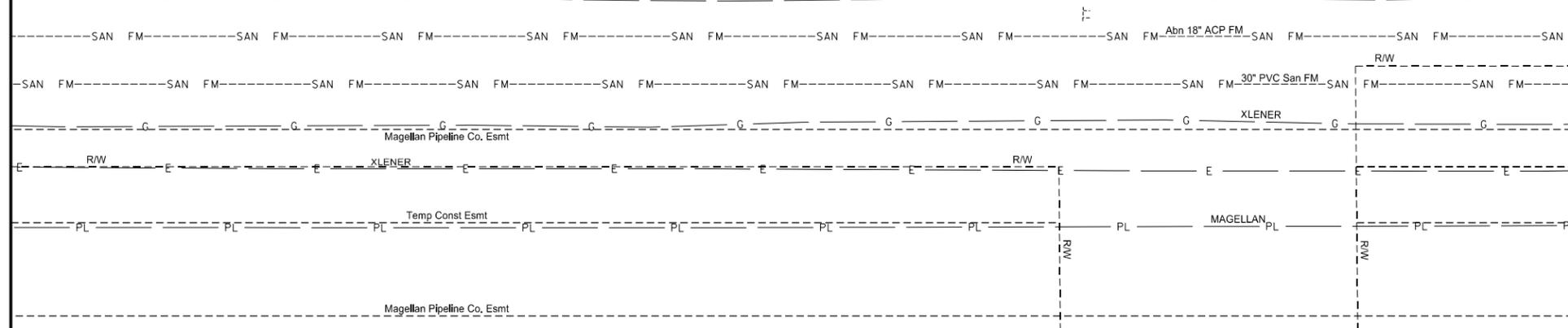
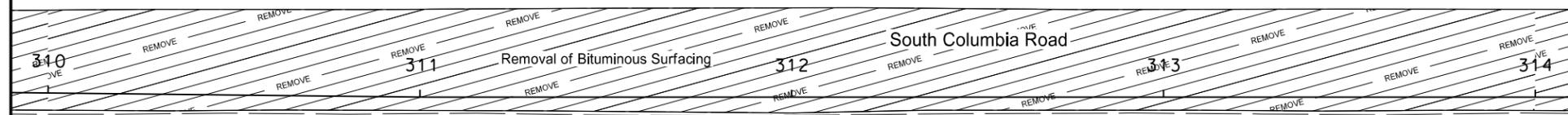
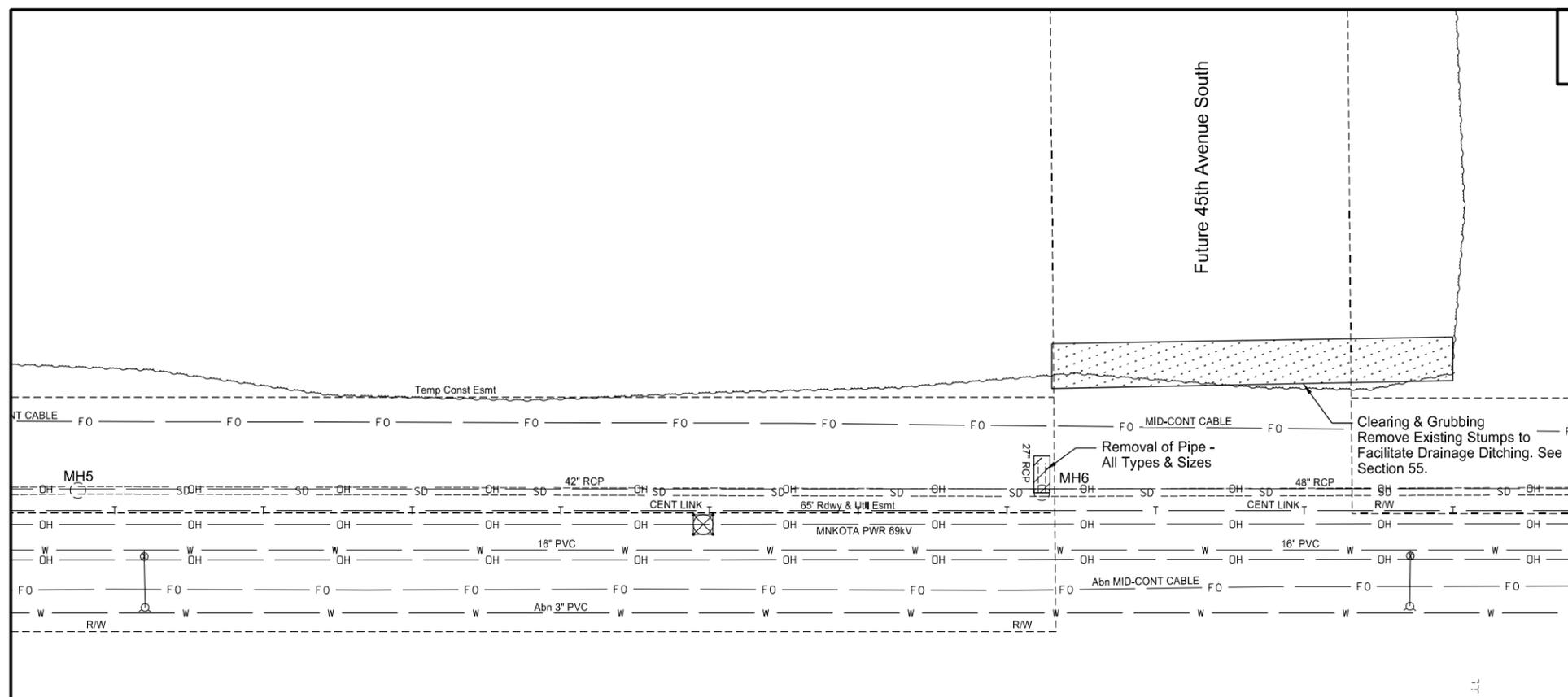
Removals  
 Sta 306+00 to Sta 310+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	5

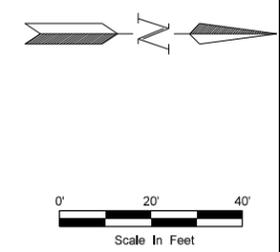
SPEC CODE	BID ITEM	QTY	UNIT
201 0330	CLEARING & GRUBBING		
	Sta 312+69.9 to Sta 313+77.8 Lt	1	L SUM
202 0132	REMOVAL OF BITUMINOUS SURFACING		
	Sta 310+00 to Sta 314+00	1212	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES		
	312+67.29 80.85' Lt	8	LF

Future 45th Avenue South



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- Legend**
- Removal of Pavement
  - Removal of Pipe All Types
  - Clearing & Grubbing



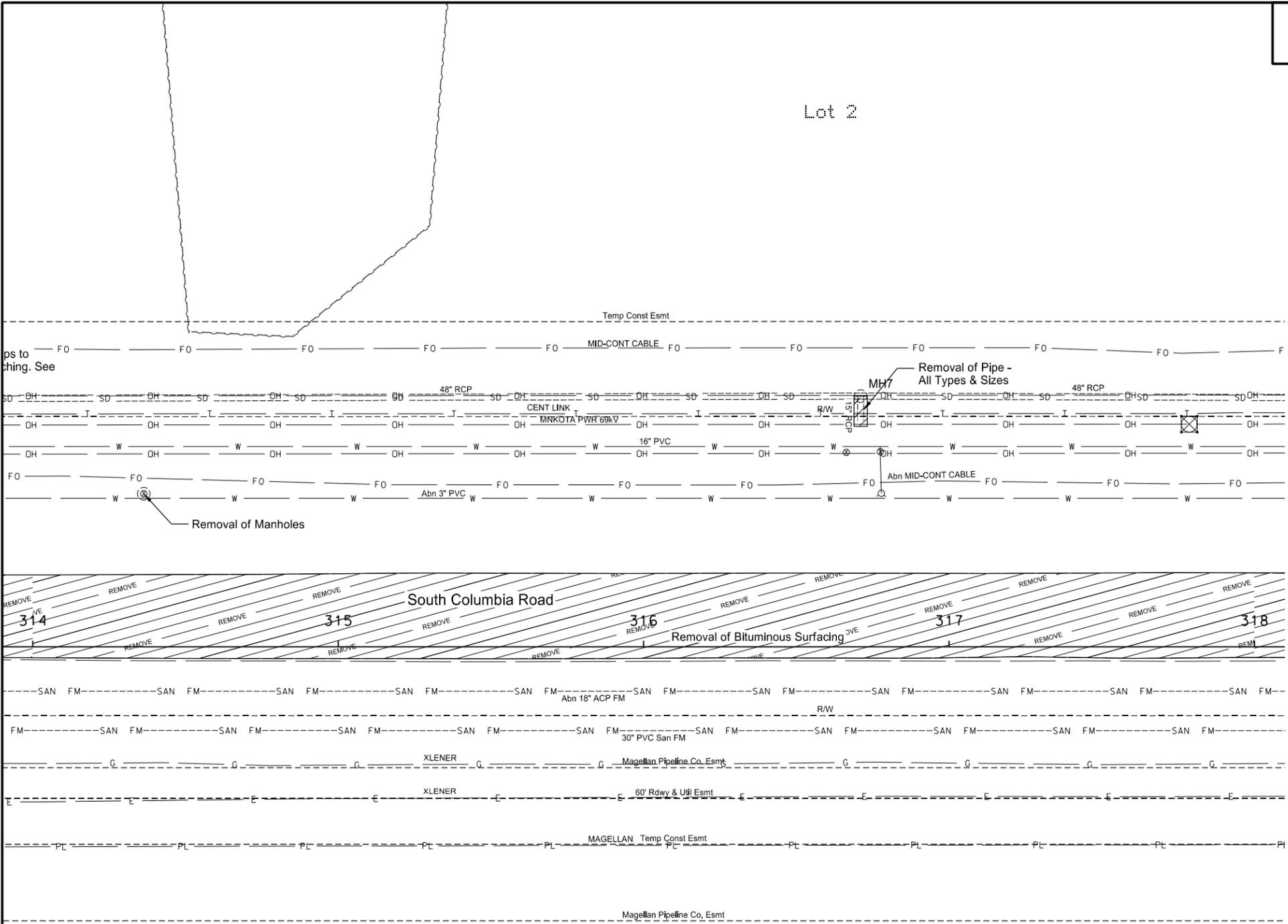
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Removals  
 Sta 310+00 to Sta 314+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

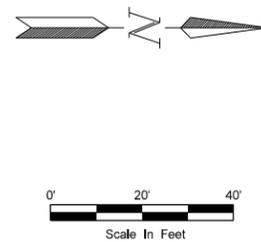
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	6

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 314+00 to Sta 318+00	1230	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES Sta 316+71 77.9 Lt	8	LF
202 0210	REMOVAL OF MANHOLES Sta 314+36 49' Lt	1	EA



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**Legend**  
 Removal of Pavement



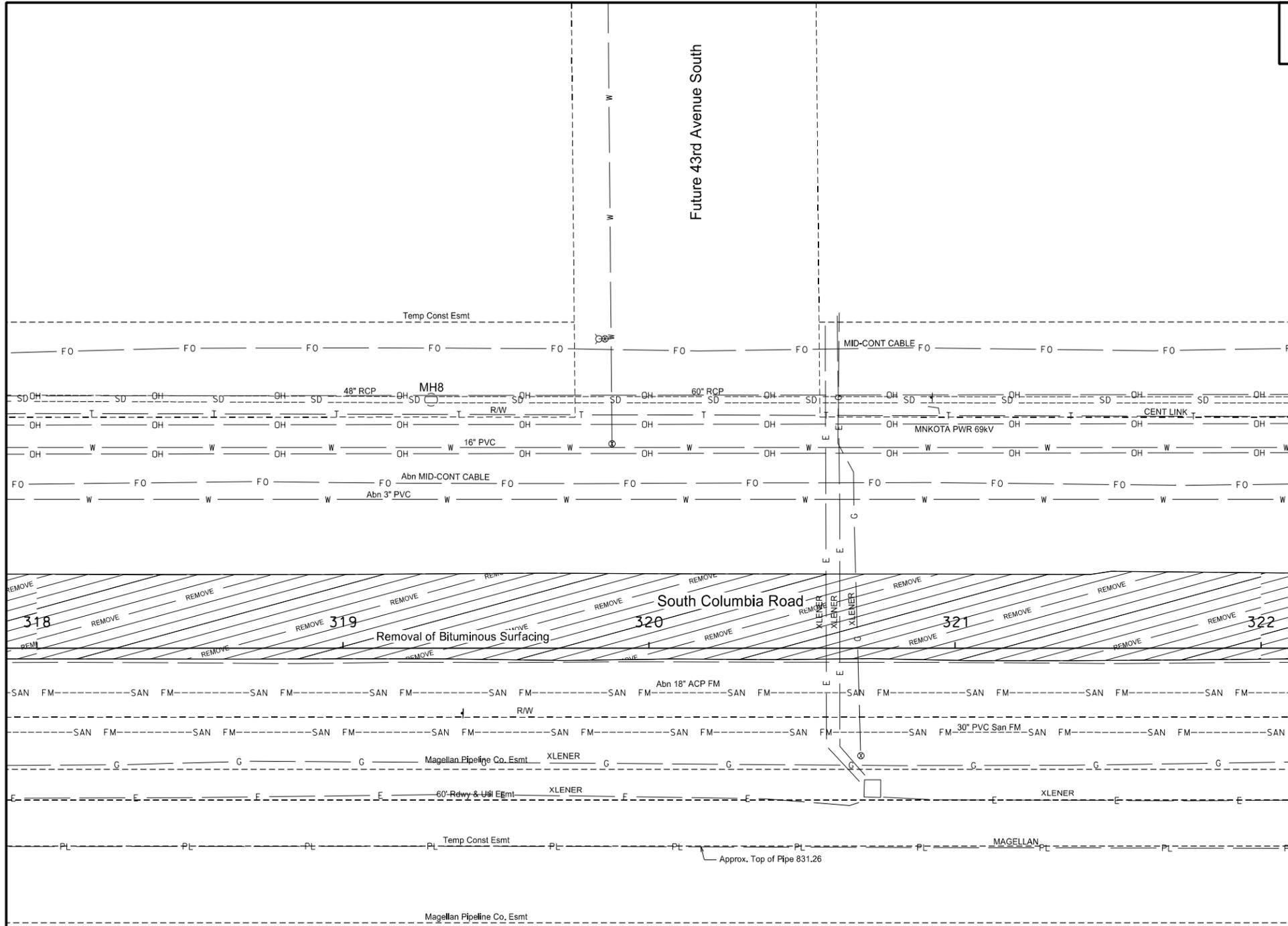
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**Removals**  
 Sta 314+00 to Sta 318+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

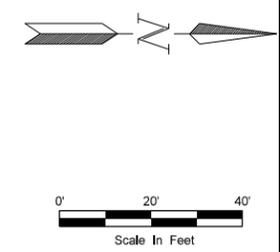
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	7

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 318+00 to Sta 322+00	1242	SY



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**Legend**  
 Removal of Pavement



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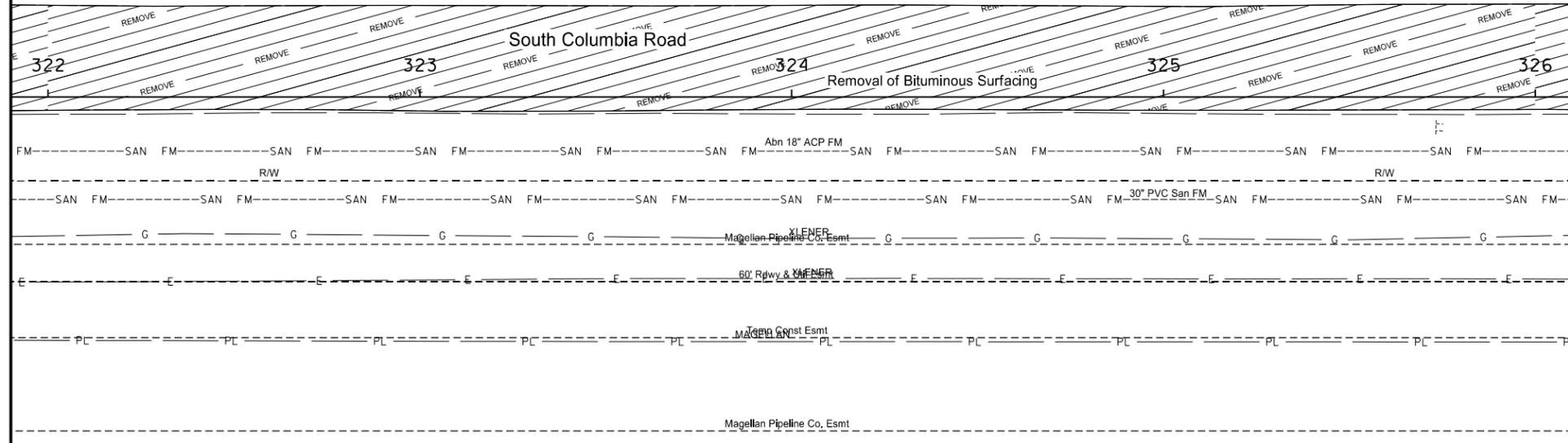
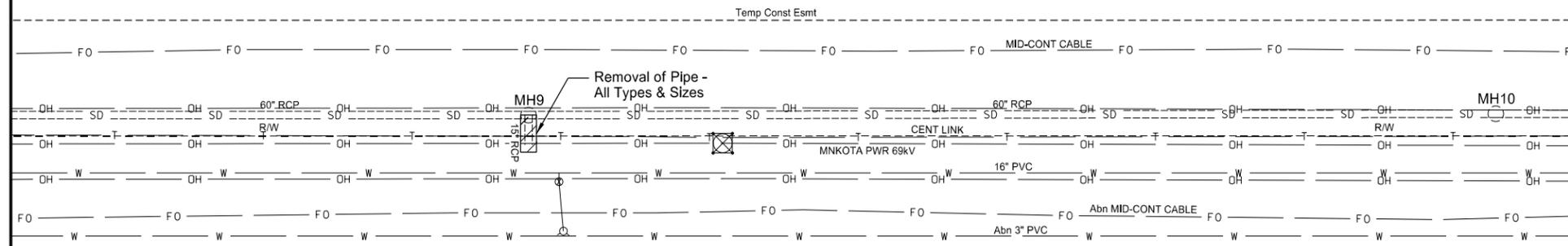
**Removals**  
 Sta 318+00 to Sta 322+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

Lot 2

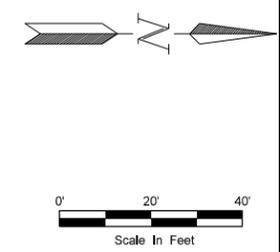
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	8

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 322+00 to Sta 326+00	1246	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES Sta 323+29 77.0 Lt	8	LF



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**Legend**  
 Removal of Pavement



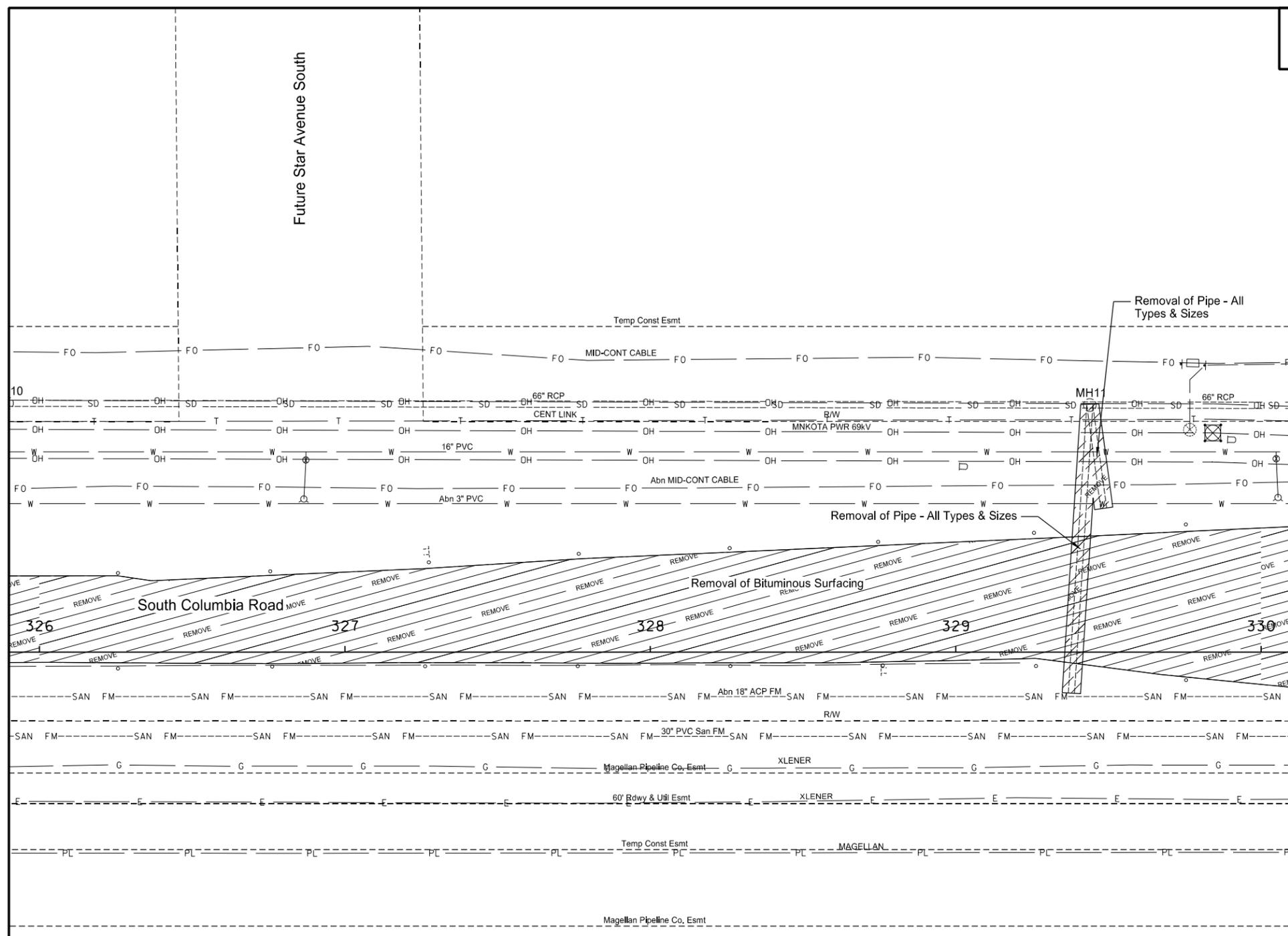
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**Removals**  
 Sta 322+00 to Sta 326+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	9

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 326+00 to Sta 330+00	1572	SY
202 0174	REMOVAL OF PIPE-ALL TYPES & SIZES Sta 329+41 @ CL	94	LF
	Sta 329+46 63.9 Lt	34	LF

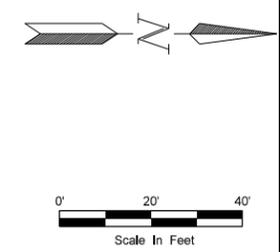


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**Legend**

Removal of Pavement

Removal of Pipe All Types



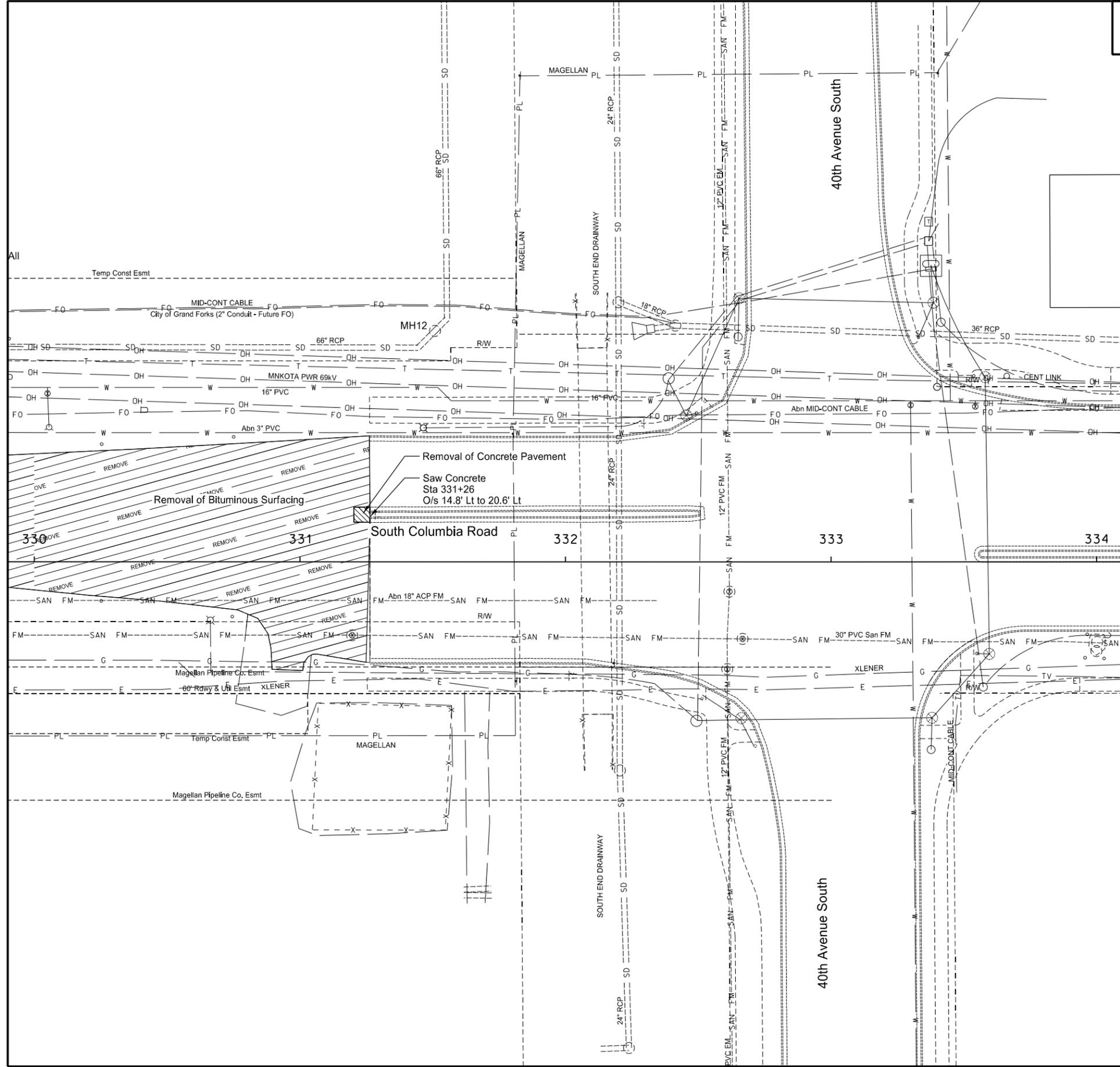
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Removals  
 Sta 326+00 to Sta 330+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	10

SPEC CODE	BID ITEM	QTY	UNIT
202 0114	REMOVAL OF CONCRETE PAVEMENT Sta 330+00 to Sta 331+26.4	4	SY
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 330+00 to Sta 331+26.4	913	SY

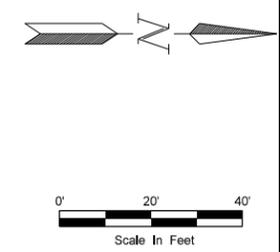


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**Legend**

--- Saw Concrete

Removal of Pavement



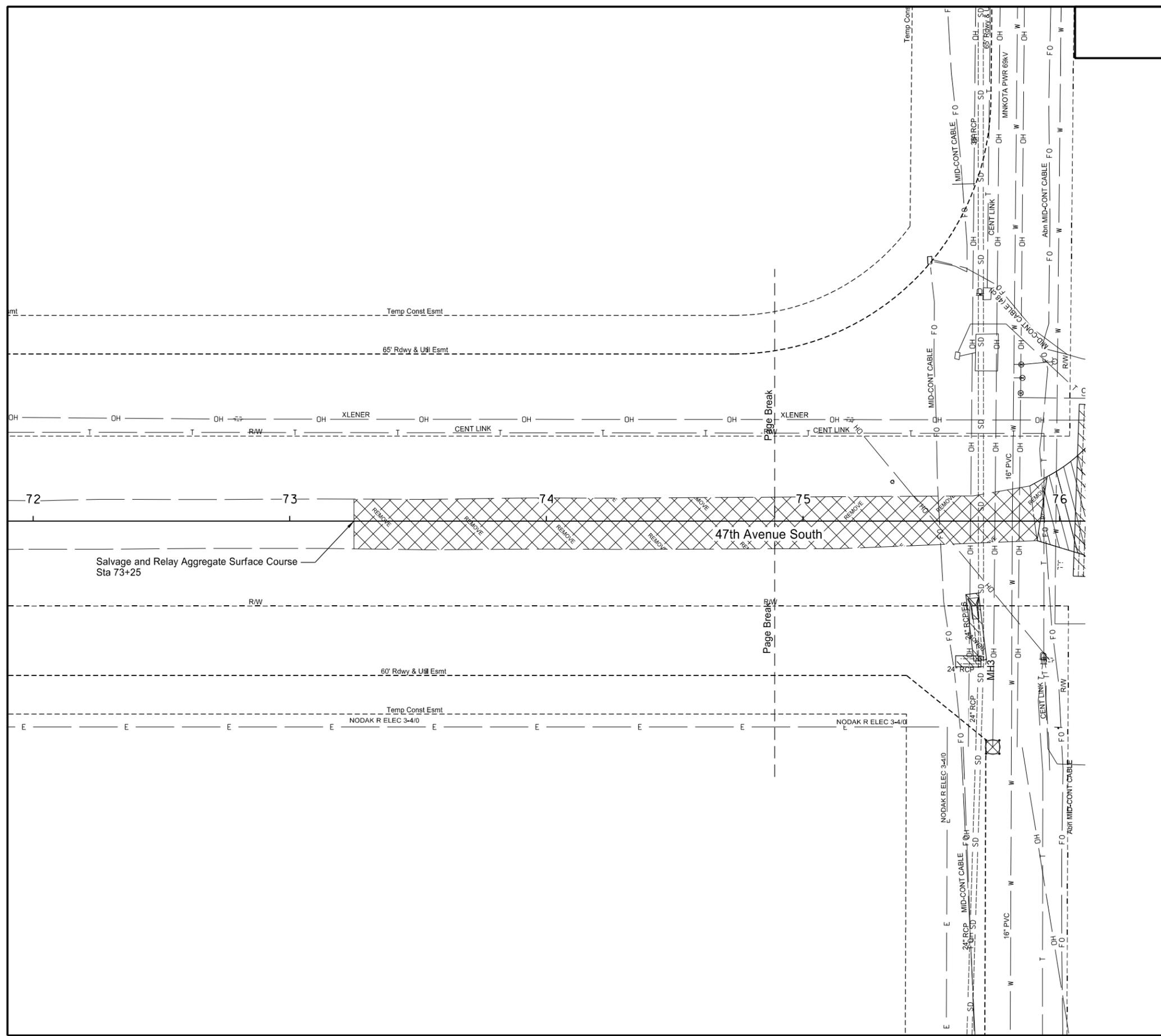
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Removals  
 Sta 330+00 to Sta 334+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	11

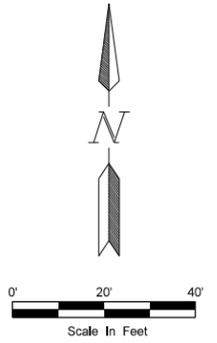
SPEC CODE	BID ITEM	QTY	UNIT
302 0405	SALVAGE & RELAY AGGREGATE SURFACE COURSE		
	Sta 73+25 to Sta 74+94	30	CY



**WARNING**  
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**Legend**

	Salvage & Relay Aggregate Surface Course
	Removal of Pavement
	Removal of Pipe All Types



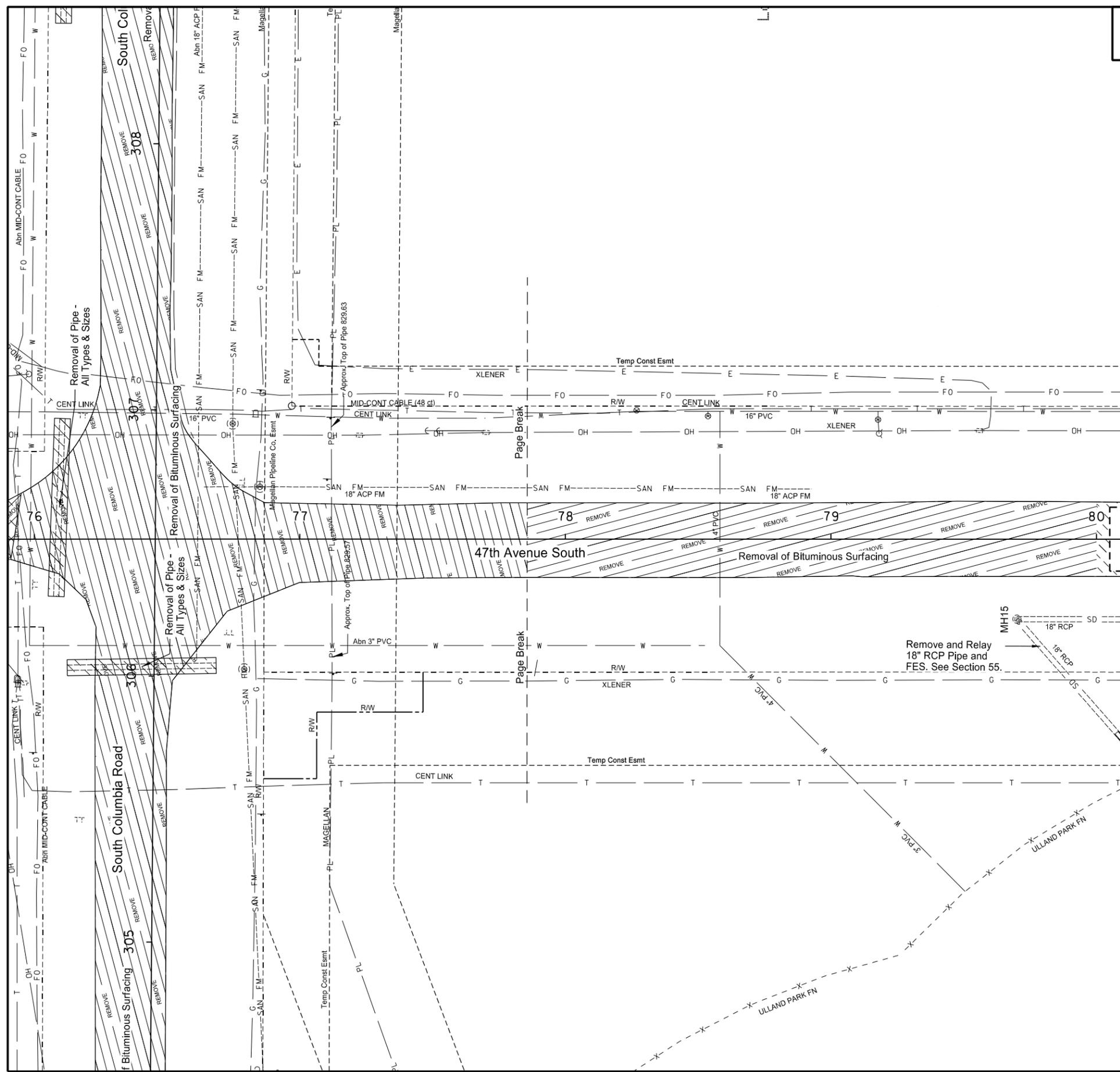
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 Registration Number  
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 Grand Forks, ND

**Removals**  
 Sta 72+00 to 74+94

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

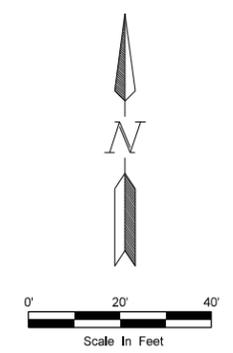
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	12

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 77+84 to Sta 80+00	667	SY



**WARNING**  
**HIGH-PRESSURE PIPELINE(S)**  
 Excavation and/or Construction Prohibited  
 Without compliance with State One-Call, AND  
 Without Written Permission From  
**MAGELLAN PIPELINE COMPANY, L.P.**  
 A MAGELLAN REPRESENTATIVE MUST BE  
 PRESENT DURING WORK AROUND PIPELINE(S)

- Legend**
- Saw Bituminous Surfacing-Full Depth
  - ▨ Removal of Pavement
  - ▩ Removal of Pipe All Types



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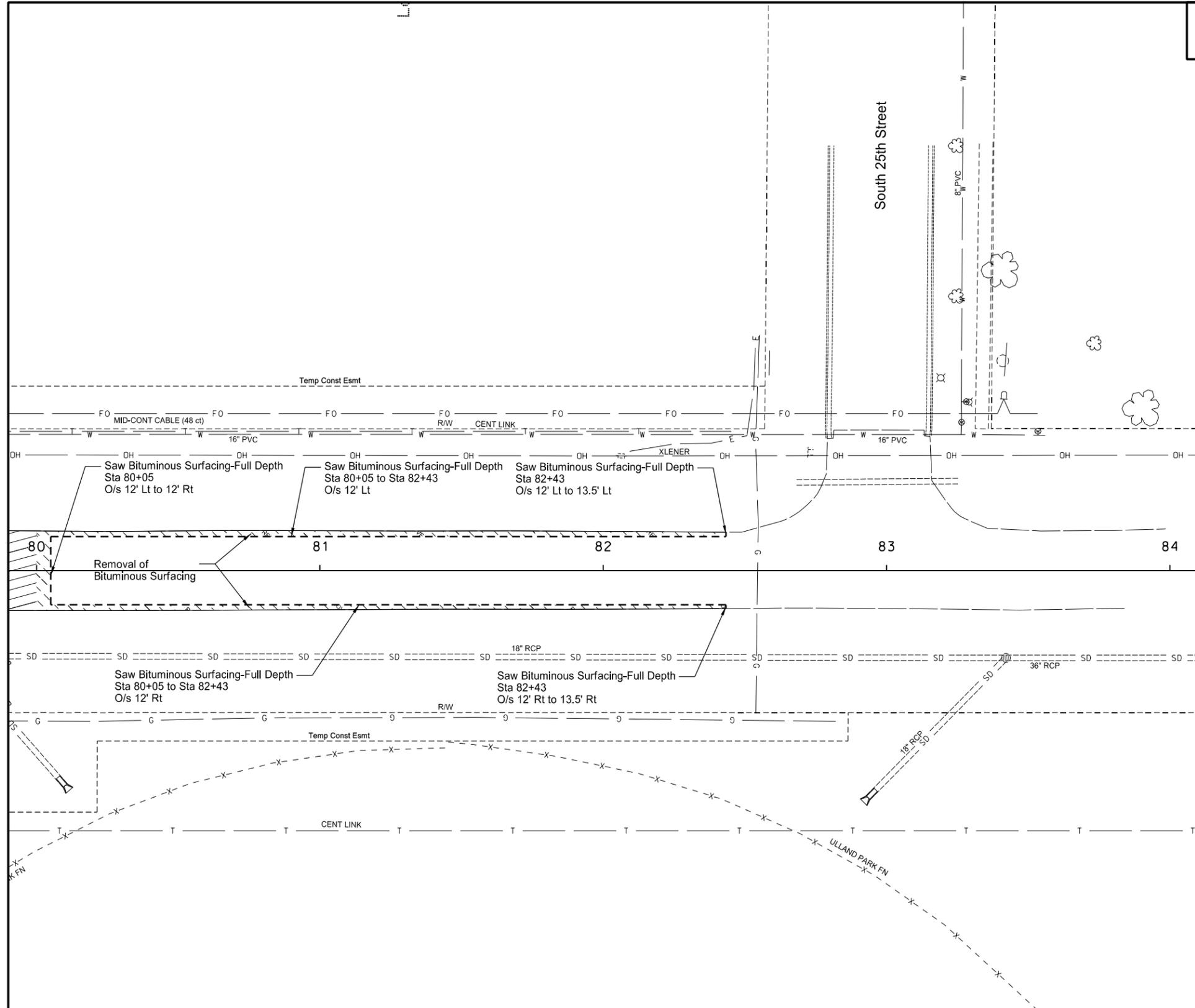
**Removals**  
 Sta 77+84 to Sta 80+00

**Reconstruction of South Columbia Road**  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	40	13

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING Sta 80+05 to Sta 82+43	112	SY

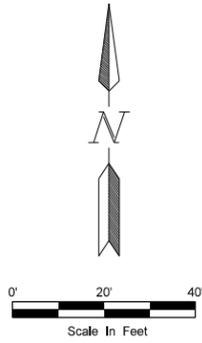
South 25th Street



**WARNING**  
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 Without compliance with State One-Call, AND  
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**Legend**

	Saw Bituminous Surfacing-Full Depth
	Removal of Pavement



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**Removals**  
 Sta 80+00 to Sta 84+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

MH No. 1  
 MH Type 48" Barrel w/Cone  
 Northing 337635.90  
 Easting 2810674.46  
 Station 303+69.59 80.38' Lt  
 Top Elev 836.88

Invert Elev 827.28

Existing 24 IN RCP N - 827.28  
 Existing 15 IN Stub E - 827.88  
 24 IN Conduit S - 830.50

End Section No. 1A  
 Type 24" RCP ES  
 Grate Style Trash Guard  
 Northing 337550.76  
 Easting 2810696.2  
 Station 302+83.74 61.62' Lt  
 Invert Elev 833.90

Northing, Easting, Station, and Invert Elev Refer to ES End

Schedule of Adjustment Values

Casting/Rings/Cover Adj. For Manhole w/ Cone & Inlet Catch Basin 6IN Beehive  
 Casting 7"  
 2 Rings 4"  
 Adjustment 11" or 0.92'

Casting & Ring Adj. For Inlet - Type 1  
 Casting 5"  
 2 Rings 4"  
 Float 2 1/2"  
 Adjustment 11 1/2" or 0.96'

Casting/Rings/Cover Adj. For Inlet - Type 2  
 Casting 4"  
 Rings 6"  
 Adjustment 10" or 0.83'

Casting/Rings/Cover Adj. For Manhole w/ Flat Top  
 Casting 7"  
 Rings 12"  
 Cover 8"  
 Adjustment 27" or 2.25'

MH No. 2 - 48" Barrel  
 MH Type 48" Barrel w/Cone  
 Northing 337781.49  
 Easting 2810672.45  
 Station 305+15.16 77.33' Lt  
 Top Elev 836.00  
 Casting/Rings/Cover Adj. 0.92'  
 Top of Cone Elev 835.08  
 Invert Elev 826.65  
 Riser Pay Length 8.4 LF

Existing 24 IN RCP N - 826.65  
 Existing 24 IN RCP S - 826.65  
 15 IN Conduit E - 829.50

Inlet No. 2A - 30" Barrel  
 Type Inlet Catch Basin 6" Beehive  
 Grate Style 6" Beehive  
 Northing 337782.16  
 Easting 2810691.78  
 Station 305+15.15 58.00' Lt  
 Rim Elev 834.75  
 Top of Barrel Elev 833.83  
 Top of Base Elev 828.83  
 Invert Elev 829.69

Inlet No. 2B - 30" Barrel  
 Type Inlet-Type 1  
 Grate Style Diagonal  
 Northing 337782.54  
 Easting 2810702.60  
 Station 305+15.15 47.17' Lt  
 Flowline Elev 836.15  
 Top of Barrel Elev 835.19  
 Top of Base Elev 829.69  
 Invert Elev 830.23  
 Dralntile Invert Elev 832.73

Inlet No. 2C - 30" Barrel  
 Type Inlet-Type 1  
 Grate Style Diagonal  
 Northing 337785.05  
 Easting 2810774.89  
 Station 305+15.15 25.17' Rt  
 Flowline Elev 836.04  
 Top of Barrel Elev 835.08  
 Top of Base Elev 830.08  
 Invert Elev 830.60  
 Dralntile Invert Elev 832.62

MH No. 3  
 MH Type 72" Barrel  
 Northing 337862.46  
 Easting 2810671.34  
 Station 305+96.12 75.64' Lt  
 Top Elev Existing 836.50  
 Top Elev Proposed 837.10

Invert Elev 826.30  
 See Manhole Adjustment Table

Existing 36 IN RCP N - 826.30  
 Existing 24 IN RCP S - 826.30  
 Existing 24 IN Stub W - 826.30  
 Existing 24 IN Stub NW - 832.00  
 24 IN Conduit W - 826.30

End Section No. 3A  
 Type 24" RCP ES  
 Grate Style Trash Guard  
 Northing 337867.91  
 Easting 2810590.42  
 Station 74+88.76 45.50' Rt  
 Invert Elev 833.35

Northing, Easting, Station, and Invert Elev Refer to ES End

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Inlet & Manhole Summary

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	50	2

**MH No.** 4 - 72" Barrel  
**MH Type** 72" Barrel w/ Cone  
**Northing** 338177.90  
**Easting** 2810657.04  
**Station** 309+11.86 78.98' Lt  
**Top Elev** 835.15  
**Casting/Rings/Cover Adj.** 0.92'  
**Top of Cone Elev** 834.23  
**Invert Elev** 825.88

**Riser Pay Length** 8.4 LF

Existing 36 IN RCP N - 825.88  
 Existing 36 IN RCP S - 825.88  
 18 IN Conduit E - 828.84  
 12 IN Conduit W - 828.84

**Inlet No.** 4A - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 338178.71  
**Easting** 2810680.34  
**Station** 309+11.86 55.67' Lt  
**Flowline Elev** 835.43  
**Top of Barrel Elev** 834.60  
**Top of Base Elev** 829.60  
**Invert Elev** W - 830.00  
 E - 830.10

**Draintile Invert Elev** 832.01

**Inlet No.** 4B - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 338181.53  
**Easting** 2810761.62  
**Station** 309+11.86 25.67' Lt  
**Flowline Elev** 835.61  
**Top of Barrel Elev** 834.78  
**Top of Base Elev** 829.78  
**Invert Elev** W - 830.51  
 E - 830.56

**Draintile Invert Elev** 832.19

**Inlet No.** 4C - 30" Barrel  
**Type** Inlet Catch Basin 6" Beehive  
**Grate Style** 6" Beehive  
**Northing** 338181.85  
**Easting** 2810770.95  
**Station** 309+11.86 35.00' Rt  
**Rim Elev** 834.70  
**Top of Barrel Elev** 833.78  
**Top of Base Elev** 828.78  
**Invert Elev** 830.65

**Inlet No.** 4D - 30" Barrel  
**Type** Inlet Catch Basin 6" Beehive  
**Grate Style** 6" Beehive  
**Northing** 338177.64  
**Easting** 2810649.52  
**Station** 309+11.86 86.50' Lt  
**Rim Elev** 834.38  
**Top of Barrel Elev** 833.46  
**Top of Base Elev** 828.46  
**Invert Elev** 828.88

**MH No.** 5  
**MH Type** 48" Tee MH w/Cone  
**Northing** 338273.96  
**Easting** 2810652.69  
**Station** 310+07.12 80.45' Lt  
**Top Elev** 835.95

**Invert Elev** 825.75

**See Manhole Adjustment Table**

Existing 42 IN RCP N - 825.75  
 Existing 36 IN RCP S - 825.75  
 Existing 15 IN Stub W - 826.45

**MH No.** 6  
**MH Type** 48" Tee MH w/Cone  
**Northing** 338533.10  
**Easting** 2810644.32  
**Station** 312+67.29 80.85' Lt  
**Top Elev Existing** 836.43  
**Top Elev Proposed** 837.43

**Invert Elev** 825.63

**See Manhole Adjustment Table**

Existing 48 IN RCP N - 825.63  
 Existing 42 IN RCP S - 825.63  
 Existing 27 IN Stub W - 825.63  
 12 IN Conduit W - 826.26

**Inlet No.** 6A - 30" Barrel  
**Type** Inlet Catch Basin 6" Beehive  
**Grate Style** 6" Beehive  
**Northing** 338544.70  
**Easting** 2810615.83  
**Station** 312+79.94 109.04' Lt  
**Rim Elev** 834.50  
**Top of Barrel Elev** 833.58  
**Top of Base Elev** 827.58  
**Invert Elev** 827.75

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**Inlet & Manhole Summary**

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	50	3

**MH No.** 7  
**MH Type** 48" Tee MH w/Cone  
**Northing** 338936.59  
**Easting** 2810629.23  
**Station** 316+71.07 81.93' Lt  
**Top Elev Existing** 836.21  
**Top Elev Proposed** 835.71

**Invert Elev** 825.51  
 See Manhole Adjustment Table

Existing 48 IN RCP N - 825.51  
 Existing 48 IN RCP S - 825.51  
 Existing 15 IN Stub E - 826.51  
 12 IN Conduit W - 827.01

**Inlet No.** 7A - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 338937.82  
**Easting** 2810664.47  
**Station** 316+71.07 46.67' Lt  
**Flowline Elev** 835.49  
**Top of Barrel Elev** 834.66  
**Top of Base Elev** 828.66  
**Invert Elev** W - 829.16  
 E - 829.66  
**Drain tile Invert Elev** 832.07

**Inlet No.** 7B - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 338940.33  
**Easting** 2810736.76  
**Station** 316+71.07 25.67' Rt  
**Flowline Elev** 835.49  
**Top of Barrel Elev** 834.66  
**Top of Base Elev** 829.66  
**Invert Elev** 830.16  
**Drain tile Invert Elev** 832.07

**Inlet No.** 7C - 30" Barrel  
**Type** Inlet Catch Basin 6" Beehive  
**Grate Style** 6" Beehive  
**Northing** 338936.38  
**Easting** 2810623.16  
**Station** 316+71.07 88.00' Lt  
**Rim Elev** 834.80  
**Top of Barrel Elev** 833.88  
**Top of Base Elev** 827.88  
**Invert Elev** 828.05

**MH No.** 8  
**MH Type** 60" x 48" Tee MH  
**Northing** 339194.18  
**Easting** 2810621.16  
**Station** 319+28.79 81.05' Lt  
**Top Elev Existing** 836.19  
**Top Elev Proposed** 836.36

**Invert Elev** 825.19  
 See Manhole Adjustment Table

Existing 60 IN RCP N - 825.19  
 Existing 48 IN RCP S - 825.19  
 Existing 27 IN Stub W - 825.29  
 Existing 27 IN Stub E - 825.39

**MH No.** 9  
**MH Type** 60" x 48" Tee MH  
**Northing** 339594.38  
**Easting** 2810607.35  
**Station** 323+29.23 80.95' Lt  
**Top Elev Existing** 836.06  
**Top Elev Proposed** 834.90

**Invert Elev** 825.06  
 See Manhole Adjustment Table

Existing 60 IN RCP N - 825.06  
 Existing 60 IN RCP S - 825.06  
 Existing 15 IN Stub E - 826.76

**Inlet No.** 9A - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 339595.46  
**Easting** 2810638.25  
**Station** 323+29.23 50.04' Lt  
**Flowline Elev** 835.28  
**Top of Barrel Elev** 834.45  
**Top of Base Elev** 828.45  
**Invert Elev** W - 828.78  
 E - 829.28  
**Drain tile Invert Elev** 831.86

**Inlet No.** 9B - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 339598.08  
**Easting** 2810713.91  
**Station** 323+29.23 25.67' Rt  
**Flowline Elev** 835.33  
**Top of Barrel Elev** 834.50  
**Top of Base Elev** 829.50  
**Invert Elev** 830.00  
**Drain tile Invert Elev** 831.91

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**Inlet & Manhole Summary**  
  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	50	4

**MH No.** 10  
**MH Type** 66" x 48" Tee MH  
**Northing** 339854.36  
**Easting** 2810597.94  
**Station** 325+89.38 81.34' Lt  
**Top Elev Existing** 835.73  
**Top Elev Proposed** 836.56

**Invert Elev** 824.83  
**See Manhole Adjustment Table**

Existing 66 IN RCP N - 824.83  
 Existing 60 IN RCP S - 824.83  
 Existing 27 IN Stub W - 824.93  
 Existing 27 IN Stub E - 825.03

**MH No.** 11  
**MH Type** 66" x 48" Tee MH  
**Northing** 340208.70  
**Easting** 2810586.22  
**Station** 329+43.90 80.75' Lt  
**Top Elev Existing** 835.67  
**Top Elev Proposed** 834.83

**Invert Elev** 824.77  
**See Manhole Adjustment Table**

Existing 66 IN RCP N - 824.77  
 Existing 66 IN RCP S - 824.77  
 Existing 15 IN Stub E - 826.37  
 Existing 15 IN Stub E - 826.37

**Inlet No.** 11A - 2'x3' Rectangular Barrel  
**Type** Inlet-Type 2  
**Grate Style** Diagonal  
**Northing** 340206.48  
**Easting** 2810612.17  
**Station** 329+40.79 54.89' Lt  
**Flowline Elev** 835.03  
**Top of Barrel Elev** 834.20  
**Top of Base Elev** 828.20  
**Invert Elev** W - 828.50  
 E - 829.00  
**Drain tile Invert Elev** 831.61

**Inlet No.** 11B - 2'x6' Rectangular Barrel  
**Type** Inlet-Type 2 Double  
**Grate Style** Diagonal  
**Northing** 340209.28  
**Easting** 2810692.68  
**Station** 329+40.79 25.67' Rt  
**Flowline Elev** 835.15  
**Top of Barrel Elev** 834.32  
**Top of Base Elev** 829.32  
**Invert Elev** 829.82  
**Drain tile Invert Elev** 831.73

**MH No.** 12  
**MH Type** 66" x 48" Tee MH  
**Northing** 340415.31  
**Easting** 2810573.05  
**Station** 331+50.85 86.74' Lt  
**Top Elev** 835.90

**Invert Elev** 824.70

Existing 66 IN RCP NW - 824.70  
 Existing 66 IN RCP SE - 824.70

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**Inlet & Manhole Summary**

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	50	5

**MH No.** 13 - 48" Barrel  
**MH Type** 48" Barrel w/ Flat Top  
**Northing** 337877.82  
**Easting** 2810871.01  
**Station** 77+69.58 48.01' Rt  
**Top Elev** 834.50  
**Castng/Rings/Cover Adj.** 2.25'  
**Top of Riser Elev** 832.25  
**Invert Elev** 829.90  
**Riser Pay Length** 2.4 LF

15 IN Conduit N - 830.00  
 15 IN Conduit E - 829.90

**Inlet No.** 13A - 30" Barrel  
**Type** Inlet - Type 1  
**Grate Style** Diagonal  
**Northing** 337895.11  
**Easting** 2810870.26  
**Station** 77+69.85 30.71' Rt  
**Flowline Elev** 836.31  
**Top of Barrel Elev** 835.35  
**Top of Base Elev** 830.35  
**Invert Elev** N - 830.75  
 S - 830.65  
**Drain tile Invert Elev** 832.89

**Inlet No.** 13B - 30" Barrel  
**Type** Inlet - Type 1  
**Grate Style** Diagonal  
**Northing** 337965.92  
**Easting** 2810867.21  
**Station** 77+69.71 40.22' Lt  
**Flowline Elev** 836.18  
**Top of Barrel Elev** 835.22  
**Top of Base Elev** 830.22  
**Invert Elev** 831.00  
**Drain tile Invert Elev** 832.76

**MH No.** 14 - 48" Barrel  
**MH Type** 48" Barrel w/ Flat Top  
**Northing** 337886.58  
**Easting** 2811071.28  
**Station** 79+70.04 48.00' Rt  
**Top Elev** 834.90  
**Castng/Rings/Cover Adj.** 2.25'  
**Top of Riser Elev** 832.65  
**Invert Elev** 828.79  
**Riser Pay Length** 3.9 LF

18 IN Conduit N - 828.79  
 18 IN Conduit SE - 828.89  
 15 IN Conduit W - 828.89

**End Section No.** 14A  
**Type** 18" RCP ES  
**Northing** 337859.12  
**Easting** 2811114.06  
**Station** 80+11.58 77.29' Rt  
**Invert Elev** 833.94  
**Northing, Easting, Station, and Invert Elev Refer to ES End**

**MH No.** 15  
**MH Type** 48" Barrel  
**Northing** 337904.52  
**Easting** 2811070.49  
**Station** 79+70.03 30.04' Rt  
**Top Elev Existing** 835.07  
**Top Elev Proposed** 837.73  
**Invert Elev** 826.92

**See Manhole Adjustment Table**

Existing 18 IN RCP SE - 828.67  
 Existing 18 IN RCP E - 826.92  
 18 IN Conduit S - 828.67  
 12 IN Conduit NE - 830.75

**End Section No.** 15A  
**Type** 12" Corrugated ES  
**Northing** 337975.62  
**Easting** 2811114.98  
**Station** 80+17.58 39.06' Lt  
**Invert Elev** 834.50  
**Northing, Easting, Station, and Invert Elev Refer to End of CS Pipe**

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**Inlet & Manhole Summary**  
  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

MH No.	Station	Offset	Structure Type	Existing Casting Lid Type (Beehive /Solid Cover)	Existing Adjustment Rings	Existing Casting Elevation (field survey)	Existing Top of Structure Elevation (field estimated)	Proposed Casting Elevation	Proposed Casting Height (inches)	Rings Required (each)	Proposed Float (inches)	Chimney Seal Required	Proposed Top of Structure Elevation	Required Top of Structure Adjustment (inches)	Proposed Casting Lid Type (Beehive /Solid Cover)	Description of Work	Pay Item
3	305+96.12	75.64' Lt	72" MH	Solid Cover	3 - 2" Rings	836.50	835.42	837.10	7	2	3.16	Yes	835.92	6.00	Solid Cover	Remove 2.2' MH Riser Section. Install 2.7' MH Riser Section. Install Adjustment Rings, Chimney Seal, and Float.	"Adjust Manhole"
5	310+07.12	80.45' Lt	48" x 42" Tee MH	Solid Cover	4 - 2" Rings	836.45	835.20	835.95	7	1	0	No	835.20	0.00	Solid Cover	Remove Adjustment Rings	"Adjust Utility Appurtenance"
6	312+67.30	80.85' Lt	48" x 48" Tee MH	Solid Cover	4 - 2" Rings	836.43	835.18	837.43	7	4	0	No	836.18	12.00	Solid Cover	Install 12" MH Riser Section.	"Adjust Manhole"
7	316+71.07	81.93' Lt	48" x 48" Tee MH	Solid Cover	4 - 2" Rings	836.21	834.96	835.71	7	1	0	No	834.96	0.00	Solid Cover	Remove Adjustment Rings	"Adjust Utility Appurtenance"
8	319+28.79	81.05' Lt	60" x 48" Tee MH	Solid Cover	2 - 2" Rings	836.19	835.27	836.36	7	3	0	No	835.27	0.00	6" Beehive	Install Adjustment Rings and Replace Solid Cover with 6" Beehive.	"Adjust Utility Appurtenance"
9	323+29.23	80.95' Lt	60" x 48" Tee MH	Solid Cover	2 - 2" Rings	836.06	835.15	834.90	7	4	0	No	833.65	-18.00	6" Beehive	Remove 36" MH Riser Section. Install 18" MH Riser Section and Adjustment Rings. Replace Solid Cover with 6" Beehive.	"Adjust Manhole"
10	325+89.38	81.34' Lt	66" x 48" Tee MH	Solid Cover	1 - 2" Rings	835.73	834.98	836.56	7	6	0	No	834.98	0.00	Solid Cover	Install Adjustment Rings	"Adjust Utility Appurtenance"
11	329+43.90	80.75' Lt	66" x 48" Tee MH	Solid Cover	1 - 2" Ring	835.67	834.91	834.83	7	2	0	No	833.91	-12.00	6" Beehive	Remove 30" MH Riser Section. Install 18" MH Riser Section and Adjustment Rings. Replace Solid Cover with 6" Beehive.	"Adjust Manhole"
15	79+70.03	30.50' Rt	48" MH	6" Beehive	2 - 2" Ring	835.07	834.15	837.73	7	6	0	No	836.15	24.00	Solid Cover	Install 24" Riser Section and Adjustment Rings. Replace 6" Beehive with Solid Cover.	"Adjust Manhole"

**Work Required for Structures Included in Pay Item "Adjust Manhole"**

- Contractor Shall Verify Existing Structure Configuration Prior to Adjustment Work in Order to Provide Barrel Section/Adapter to Complete the Required Proposed Top of Structure Adjustment or Proposed Casting Elevation as Noted Above.
- Remove Existing Casting, Adjustment Rings and Riser Section or Cone Section as Necessary. Manhole Cones are Estimated to be 4' Tall.
- Furnish and Install New Barrel Section/Adapter, New 2" Plastic Adjustment Rings, New Chimney Seal, and New or Existing Casting Lid and Frame. Adjust to Proposed Elevation.
- Step(s) Shall be Included in New Barrel Sections w/ Spacing of 12" OC When Adequate Barrel Length Allows. Rotate New Barrel Section to Match Existing Structure Step Alignment.
- Reinstall Existing Casting Frames and/or Lids in Accordance with the Above Schedule. Where Necessary, Furnish New Casting Frames and/or Lids to Complete the Proposed Schedule. New Casting Frames and/or Lids Shall Meet the Requirements in Note f. Include Costs for New Casting Frames and/or Lids in the Price Bid for "Adjust Manhole"

**Work Required for Structures Included in Pay Item "Adjust Utility Appurtenance"**

- Contractor Shall Verify Existing Structure Configuration Prior to Adjustment Work in Order to Provide the Proposed Casting Elevation as Noted Above.
- Remove Existing Casting and Adjustment Rings.
- Furnish and Install New 2" Plastic Adjustment Rings, and New or Existing Casting Lid and Frame. Adjust to Proposed Elevation.
- Reinstall Existing Casting Frames and/or Lids in Accordance with the Above Schedule. Where Necessary, Furnish New Casting Frames and/or Lids to Complete the Proposed Schedule. New Casting Frames and/or Lids Shall Meet the Requirements in Note f. Include Costs for New Casting Frames and/or Lids in the Price Bid for "Adjust Utility Appurtenance"

**Notes**

- "Top of Structure" as Noted in this Table Refers to Either Top of Flat Top Cover or Top of Cone.
- All Existing Casting Frames are 7" in Height.
- Plastic Adjustment Rings are Required. Adjustment Rings shall be 2" in Height.
- Float Depth: Distance From Top of Adjusting Rings to Bottom of Casting. Distance Shall be 1 1/2" Min to 3" Max. Float Depth Space Shall Be Shimmed with Wood Shims Until Concrete has Cured Around Casting. Before Project is Open to Traffic, Contractor Shall Remove Wood Shims From Float Depth Space.
- Required Top of Structure adjustment is the Difference in Elevation Between Proposed Top of Structure Elevation and Existing Top of Structure.

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**Inlet & Manhole Summary**

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	(*) End Sections		Applicable Backfill				
				In	Bid Item	LF							In	Type		In	SY	Begin	End
																		EA	EA
296+56.6	51.8' Lt	299+90.0	52.5' Lt	24	Pipe Corr Steel .064IN 24IN	35	Corrugated Steel Pipe	12	A	2	0.064	-	FES	FES	Section 20				
73+45.8	42.5' Lt	73+45.8	38.5 Rt	36	Pipe Corr Steel .079IN 36IN	81	Corrugated Steel Pipe	24	A	2	0.064	-	FES	FES	Section 20				
79+70	30.0' Rt	80+17.6	39.0' Lt	12	Pipe Corr Steel .064IN 12IN	84	Corrugated Steel Pipe	36	A	2	0.079	-	-	FES	Section 20				

Coatings: Z = Zinc  
A = Aluminum  
P = Polymeric (over Aluminum)

Corrug 2 = 2-2/3"x1/2"  
3 = 3"x1"  
5 = 5"x1"

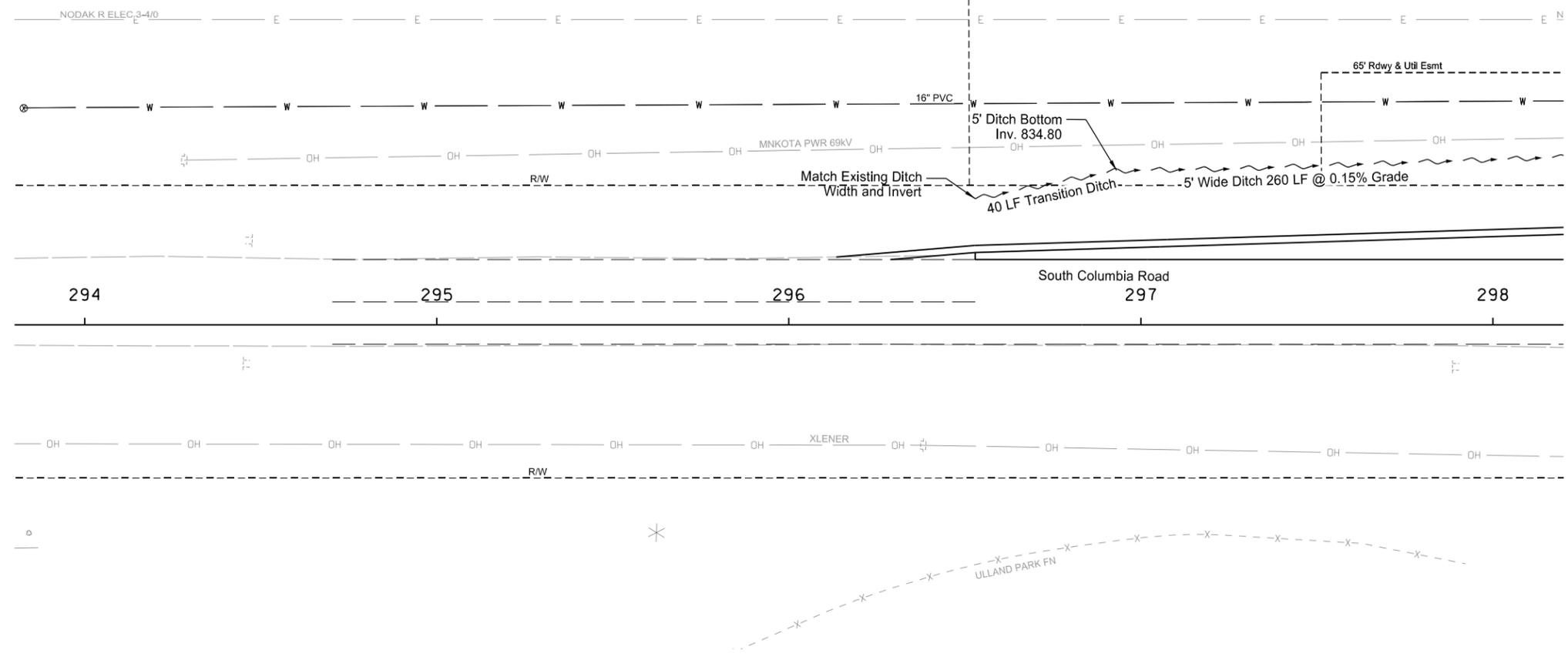
Spiral Ribs: 3/4 = 3/4"x3/4"@7-1/2"  
1 = 3/4"x1"@11-1/2"

FES = Flared End Section  
TES = Traversable End Section

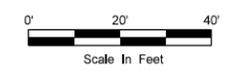
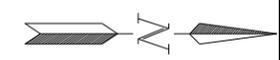
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Allowable Pipe List  
  
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	55	1



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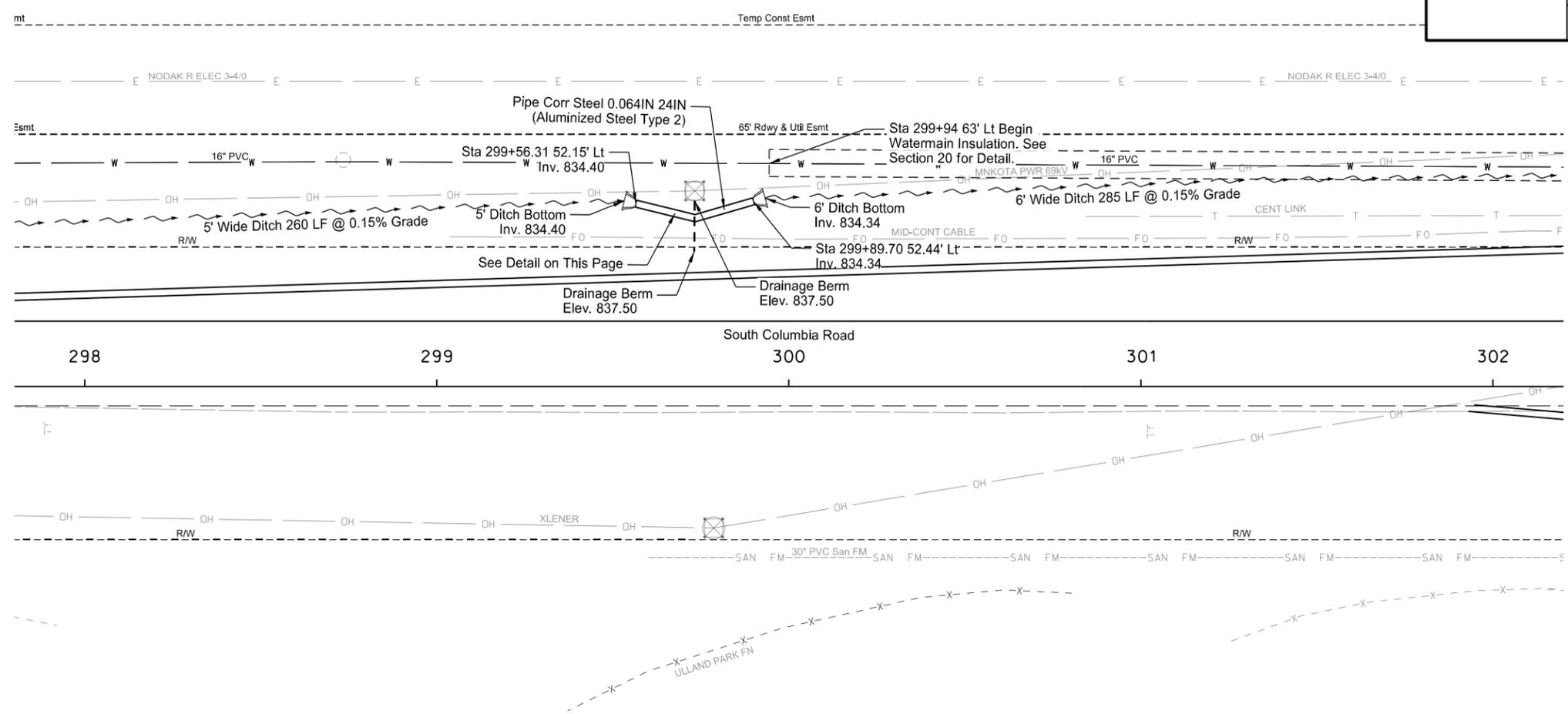


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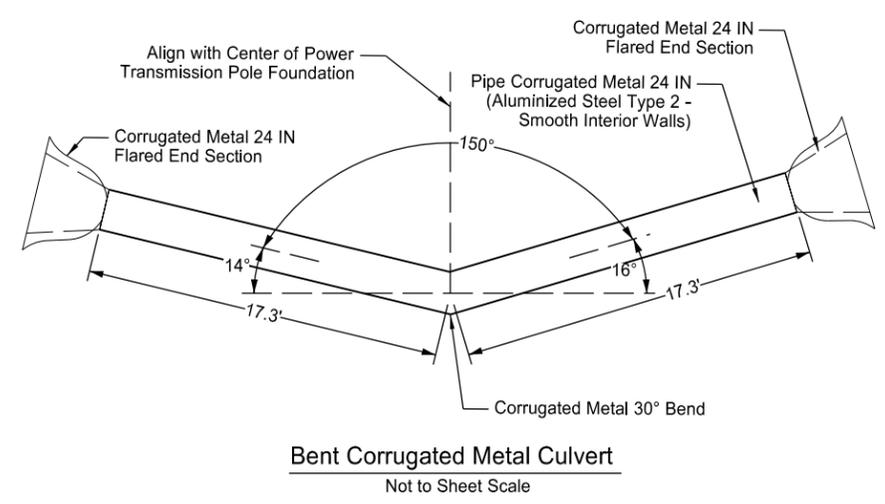
**Storm Sewer & Watermain**  
 Sta 294+00 to 298+00

**Reconstruction of South Columbia Road**  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	55	2

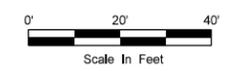
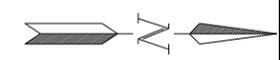


SPEC	CODE	BID ITEM	QTY	UNIT
714	5035	PIPE CORR STEEL .0641N 24IN		
		Sta 299+53.6 52.2' Lt to Sta 299+89.7 52.4	35	LF
714	5820	END SECT CORR STEEL .0641N 24IN		
		Sta 299+53.6 52.2' Lt	1	EA
		Sta 299+89.7 52.4' Lt	1	EA
744	0100	POLYSTYRENE INSULATION BOARD		
		Sta 299+94 63' Lt to Sta 302+00 62' Lt	206	BD FT



**Bent Corrugated Metal Culvert**  
Not to Sheet Scale

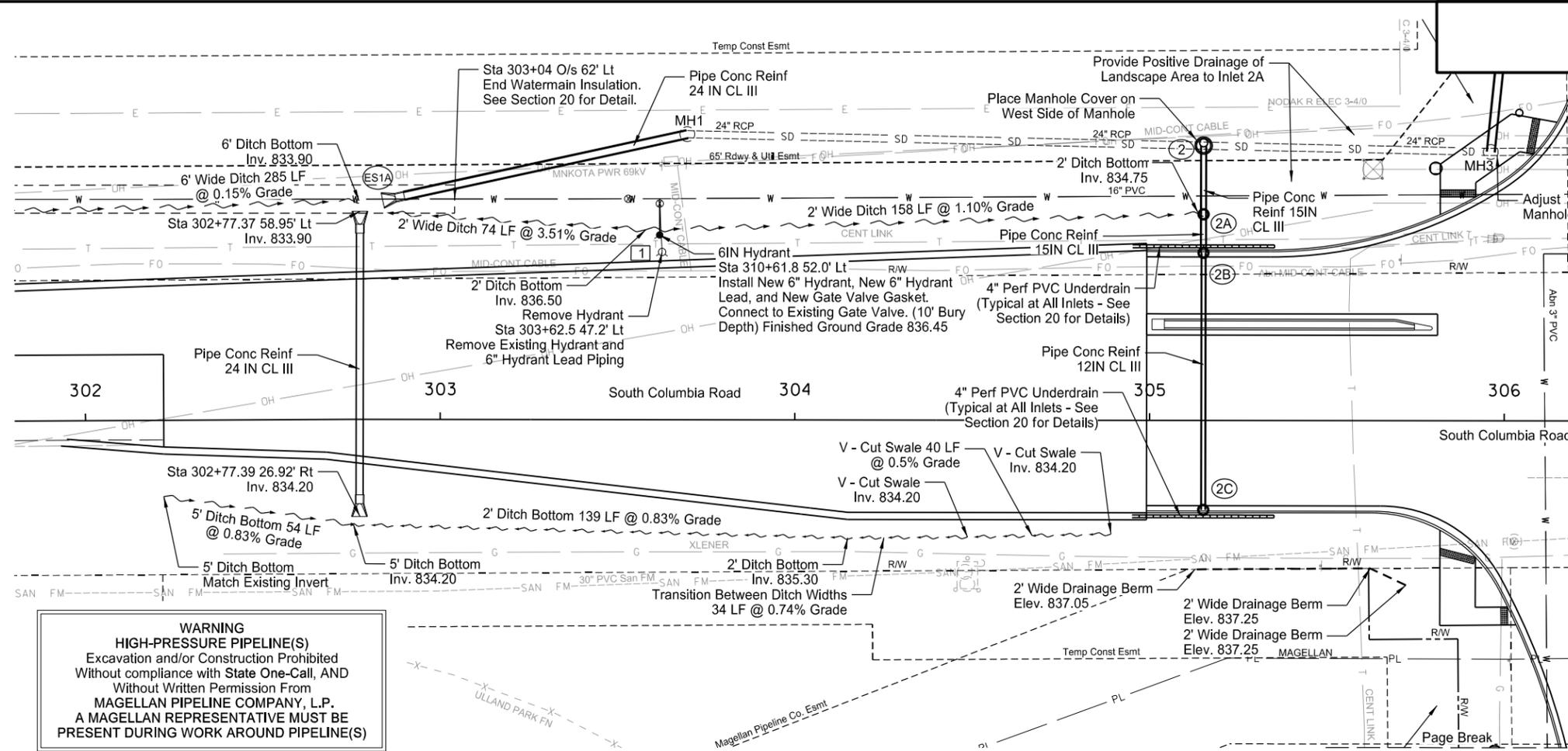
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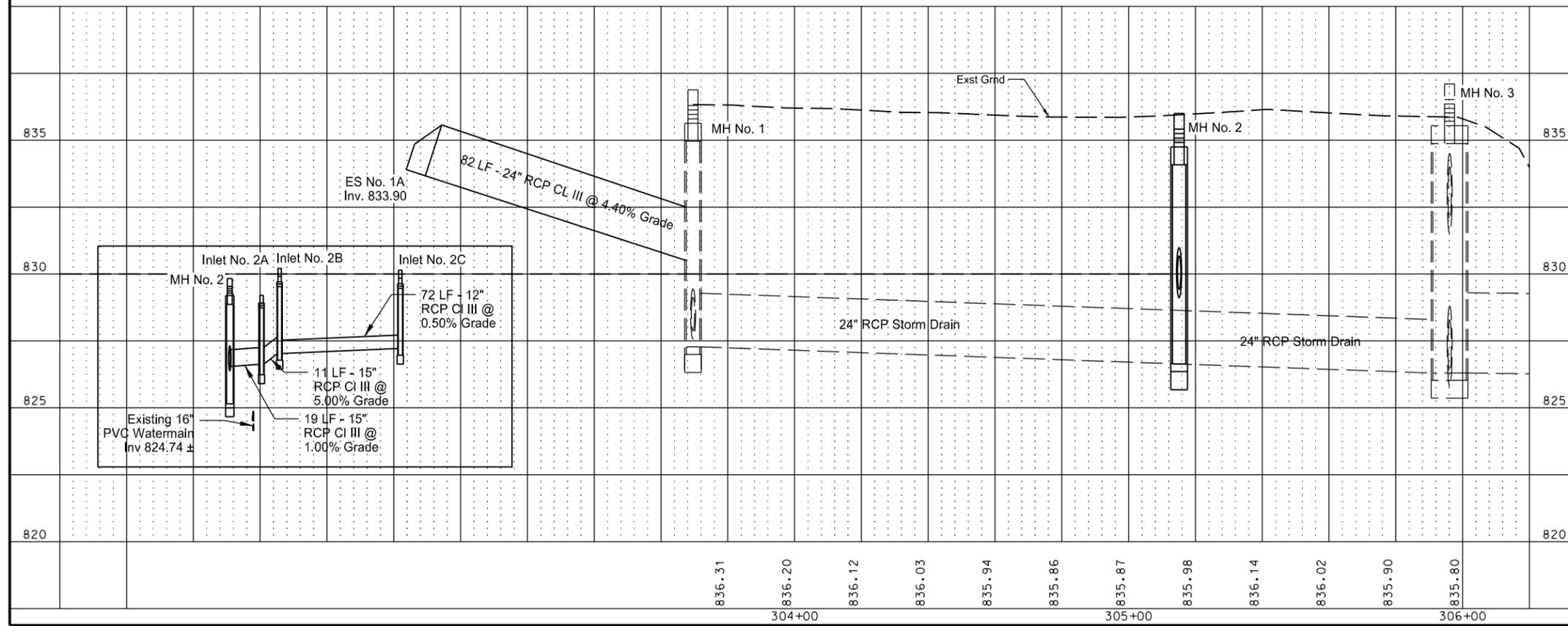
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Sta 298+00 to 302+00

**Reconstruction of South Columbia Road**  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



SPEC	CODE	BID ITEM	QTY	UNIT
714	0110	PIPE CONC REINF 12IN CL III		
		Inlet 2B to Inlet 2C	72	LF
714	0205	PIPE CONC REINF 15IN CL III		
		MH 2 to Inlet 2A	19	LF
		Inlet 2A to Inlet 2B	11	LF
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 302+77.3 Lt & Rt	74	LF
		MH 1 to ES 1A	82	LF
714	3020	END SECT-CONC REINF 24IN		
		Sta 302+77.4 26.9' Rt	1	EA
		Sta 302+77.4 59.0' Lt	1	EA
		ES 1A	1	EA
714	5724	24IN GRATES FOR REINF CONC END SECTION		
		Sta 302+77.4 26.9' Rt	1	EA
		Sta 302+77.4 59.0' Lt	1	EA
		ES 1A	1	EA
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN		
		Inlet 2B	40	LF
		Inlet 2C	40	LF
722	0100	MANHOLE 48IN		
		MH 2	1	EA
722	1100	MANHOLE RISER 48IN		
		MH 2	8.4	LF
722	3500	INLET-TYPE 1		
		Inlet 2B	1	EA
		Inlet 2C	1	EA
722	4010	INLET CATCH BASIN 6IN BEEHIVE		
		Inlet 2A	1	EA
722	6200	ADJUST MANHOLE		
		MH 3	1	EA
724	0411	6IN HYDRANT		
		Hyd 1	1	EA
724	0430	REMOVE HYDRANT		
		Sta 303+63 47' Lt	1	EA
744	0100	POLYSTYRENE INSULATION BOARD		
		Sta 302+00 62' Lt to Sta 303+04 62' Lt	104	BD FT



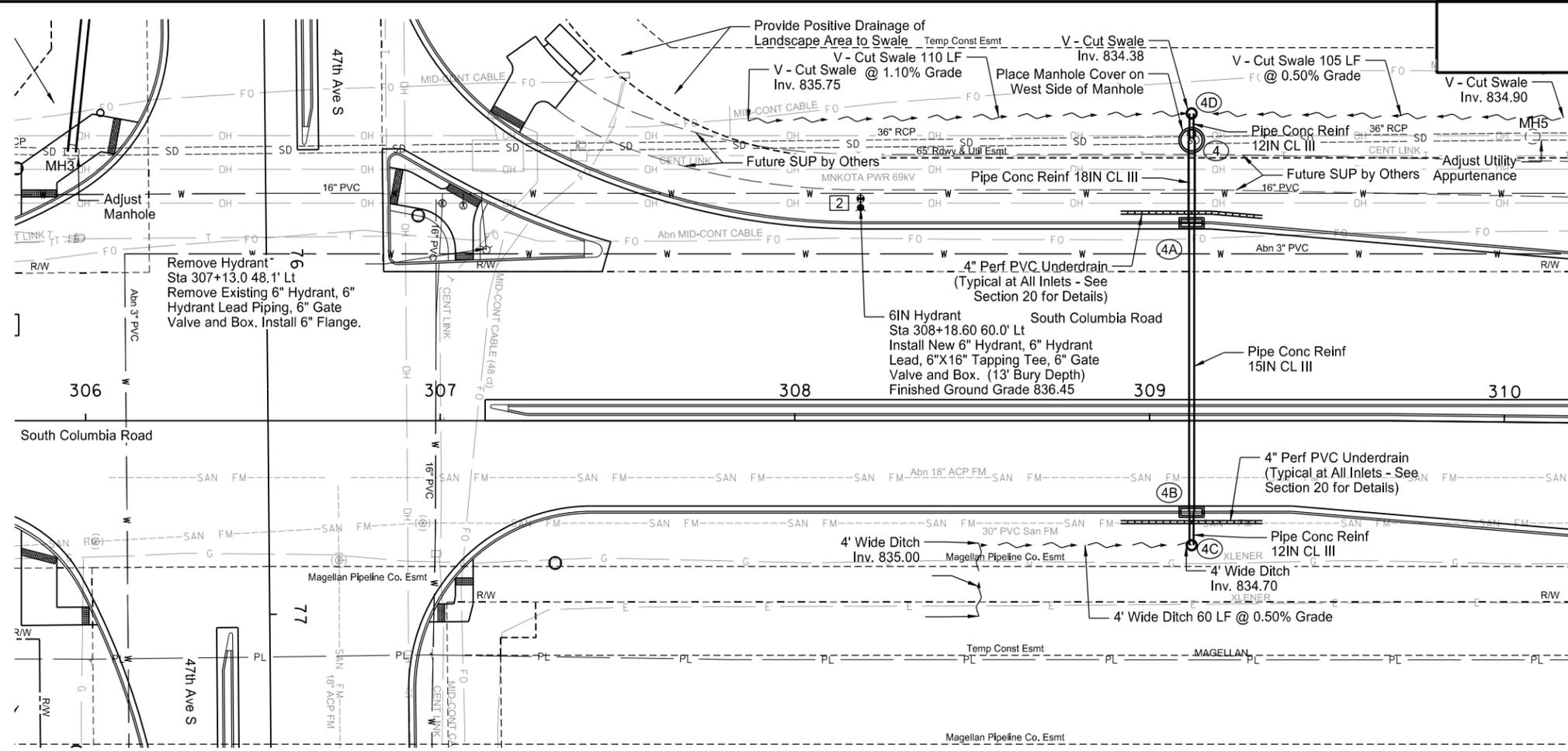
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Scale In Feet: 0' 20' 40'

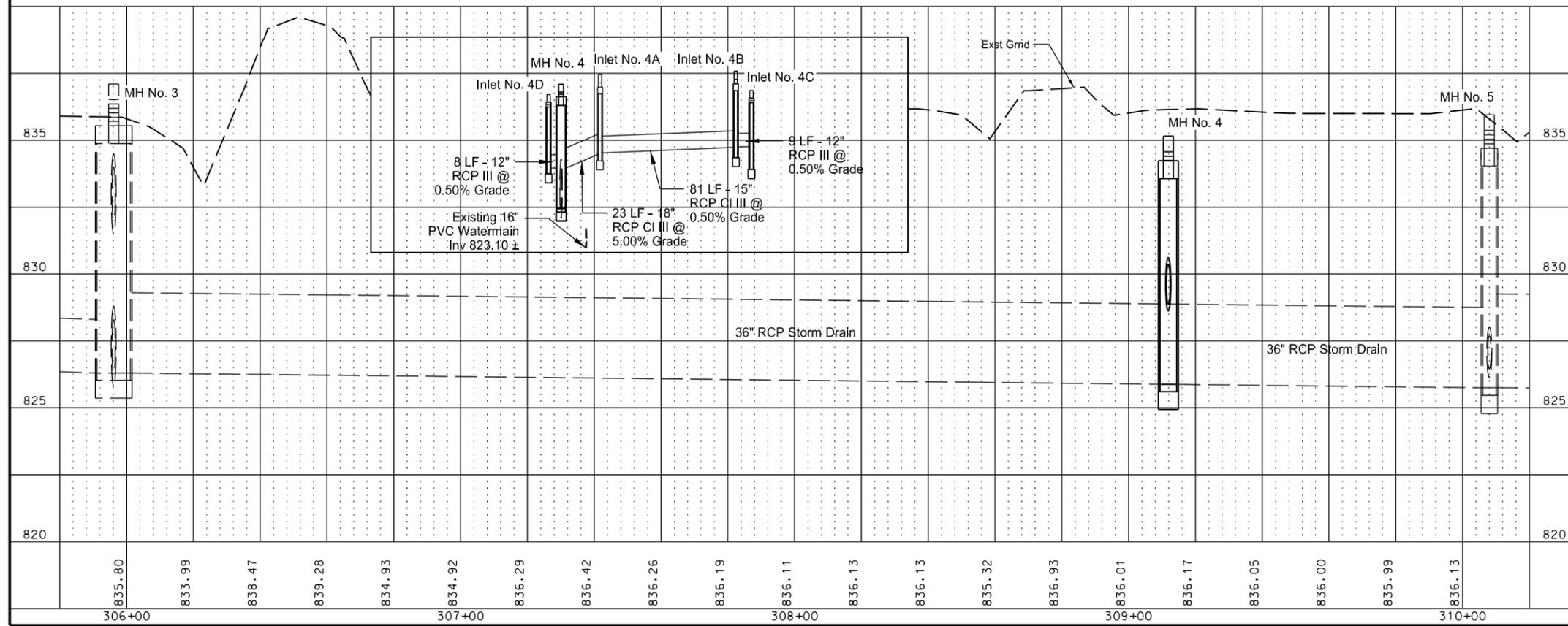
Storm Sewer & Watermain  
Sta 302+00 to 306+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	55	4

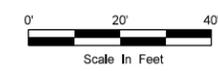


SPEC	CODE	BID ITEM	QTY	UNIT
714	0110	PIPE CONC REINF 12IN CL III		
		MH 4 to Inlet 4D	8	LF
		Inlet 4B to Inlet 4C	9	LF
714	0205	PIPE CONC REINF 15IN CL III		
		Inlet 4A to Inlet 4B	81	LF
714	0310	PIPE CONC REINF 18IN CL III		
		MH 4 to Inlet 4A	23	LF
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN		
		Inlet 4A	40	LF
		Inlet 4B	40	LF
722	0120	MANHOLE 72IN		
		MH 4	1	EA
722	1120	MANHOLE RISER 72IN		
		MH 4	8.4	LF
722	3520	INLET-TYPE 2 DOUBLE		
		Inlet 4A	1	EA
		Inlet 4B	1	EA
722	4010	INLET CATCH BASIN 6IN BEEHIVE		
		Inlet 4C	1	EA
		Inlet 4D	1	EA
724	0411	6IN HYDRANT		
		Hyd 2	1	EA
724	0430	REMOVE HYDRANT		
		Sta 307+13 48' Lt	1	EA



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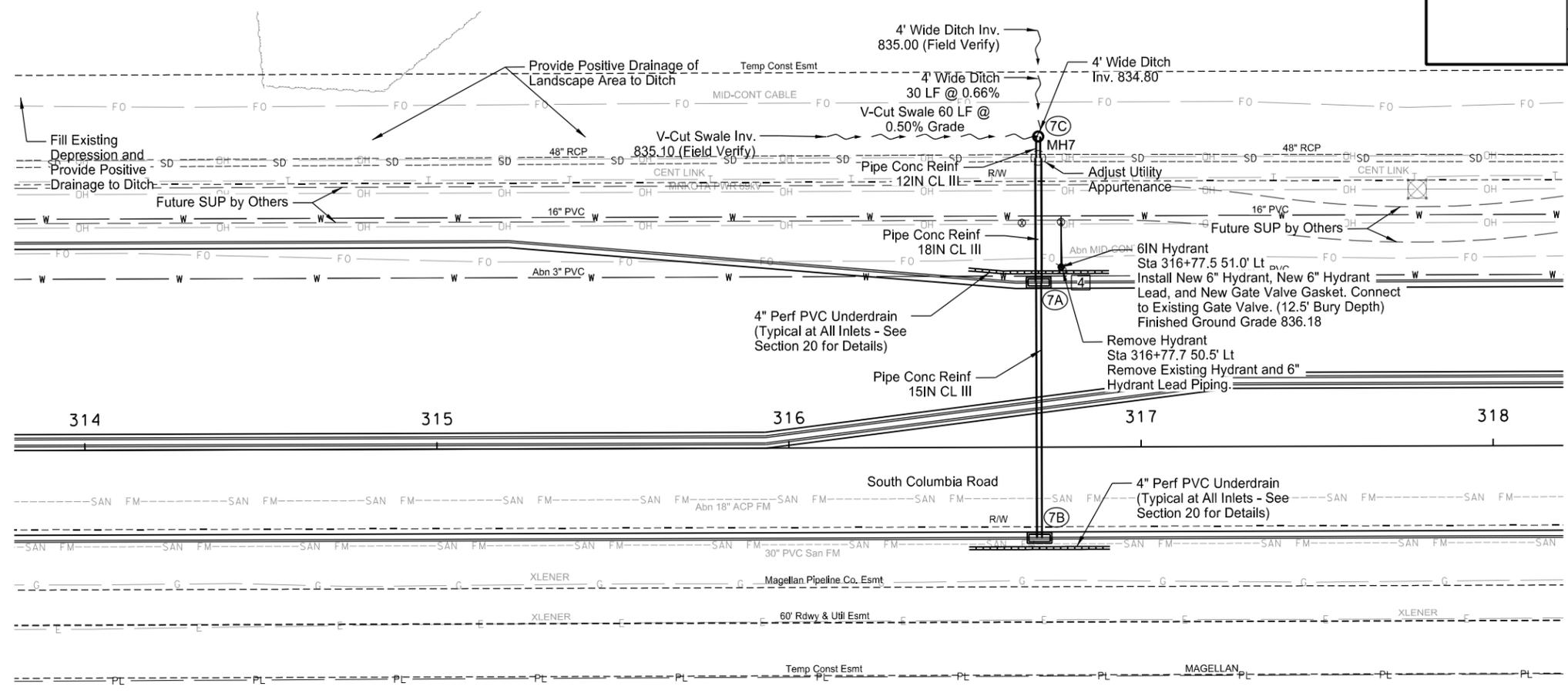


**Storm Sewer & Watermain**  
**Sta 306+00 to 310+00**

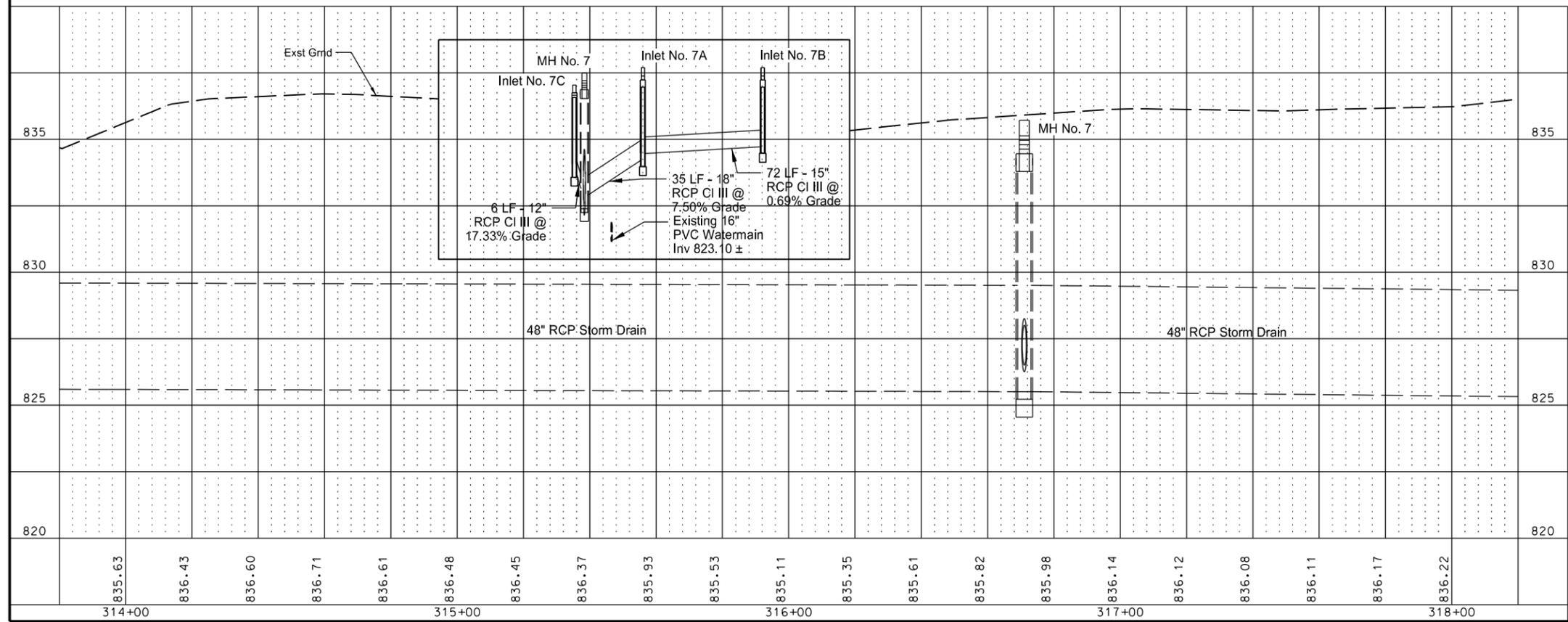
**Reconstruction of South Columbia Road**  
**40th Avenue South to 47th Avenue South**  
**Grand Forks, North Dakota**



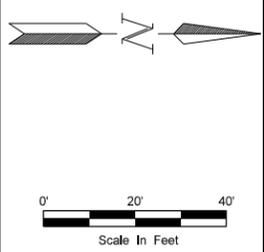
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	55	6



SPEC	CODE	BID ITEM	QTY	UNIT
714	0110	PIPE CONC REINF 12IN CL III		
		MH 7 to Inlet 7C	6	LF
714	0205	PIPE CONC REINF 15IN CL III		
		Inlet 7A to Inlet 7B	72	LF
714	0310	PIPE CONC REINF 18IN CL III		
		MH 7 to Inlet 7A	35	LF
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN		
		Inlet 7A	40	LF
		Inlet 7B	40	LF
722	3520	INLET-TYPE 2 DOUBLE		
		Inlet 7A	1	EA
		Inlet 7B	1	EA
722	4010	INLET CATCH BASIN 6IN BEEHIVE		
		Inlet 7C	1	EA
722	6240	ADJUST UTILITY APPURTENANCE		
		MH 7	1	EA
724	0411	6IN HYDRANT		
		Hyd 4	1	EA
724	0430	REMOVE HYDRANT		
		Sta 316+78 50' Lt	1	EA



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**Storm Sewer & Watermain**  
**Sta 314+00 to 318+00**

**Reconstruction of South Columbia Road**  
**40th Avenue South to 47th Avenue South**  
**Grand Forks, North Dakota**



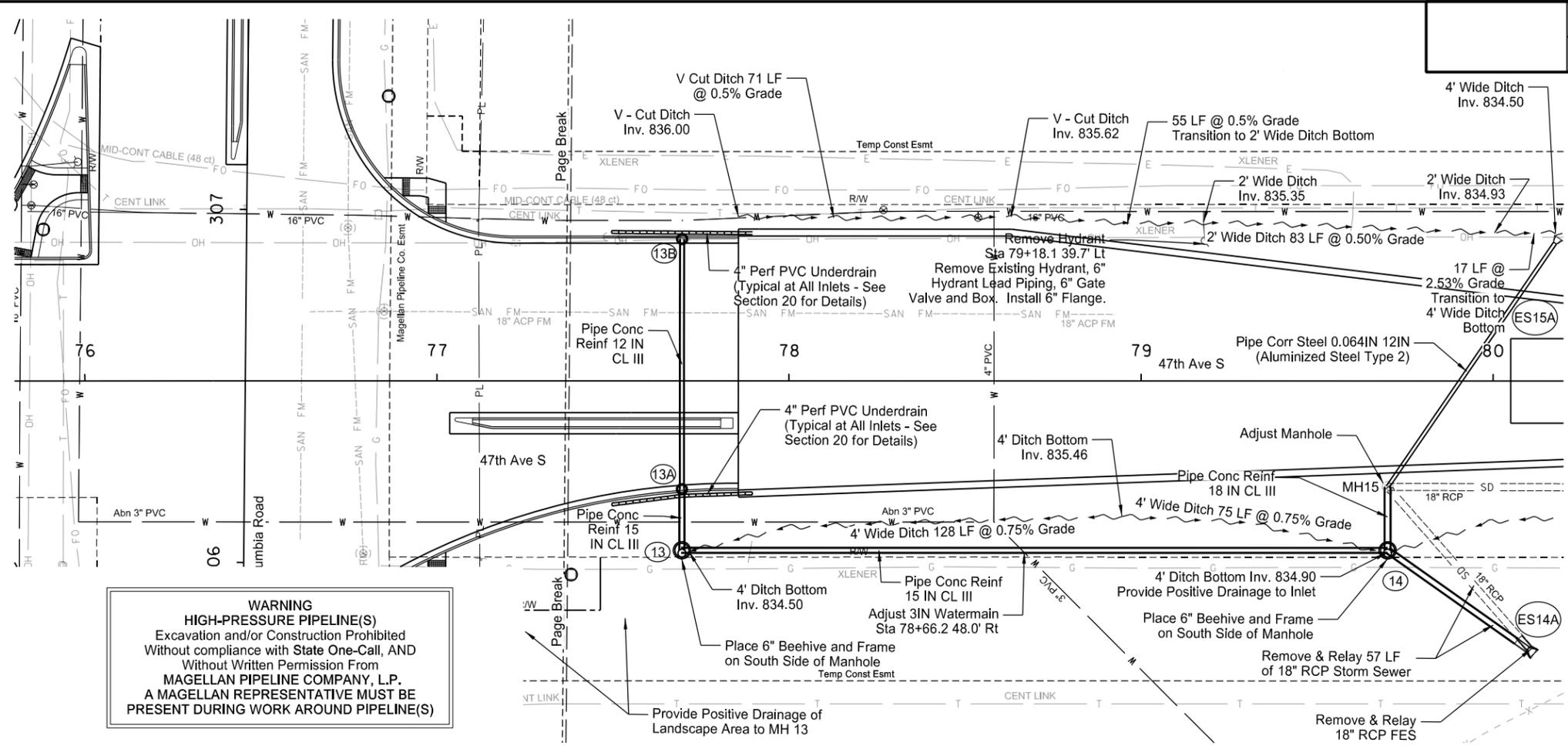






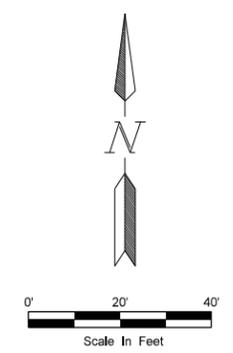
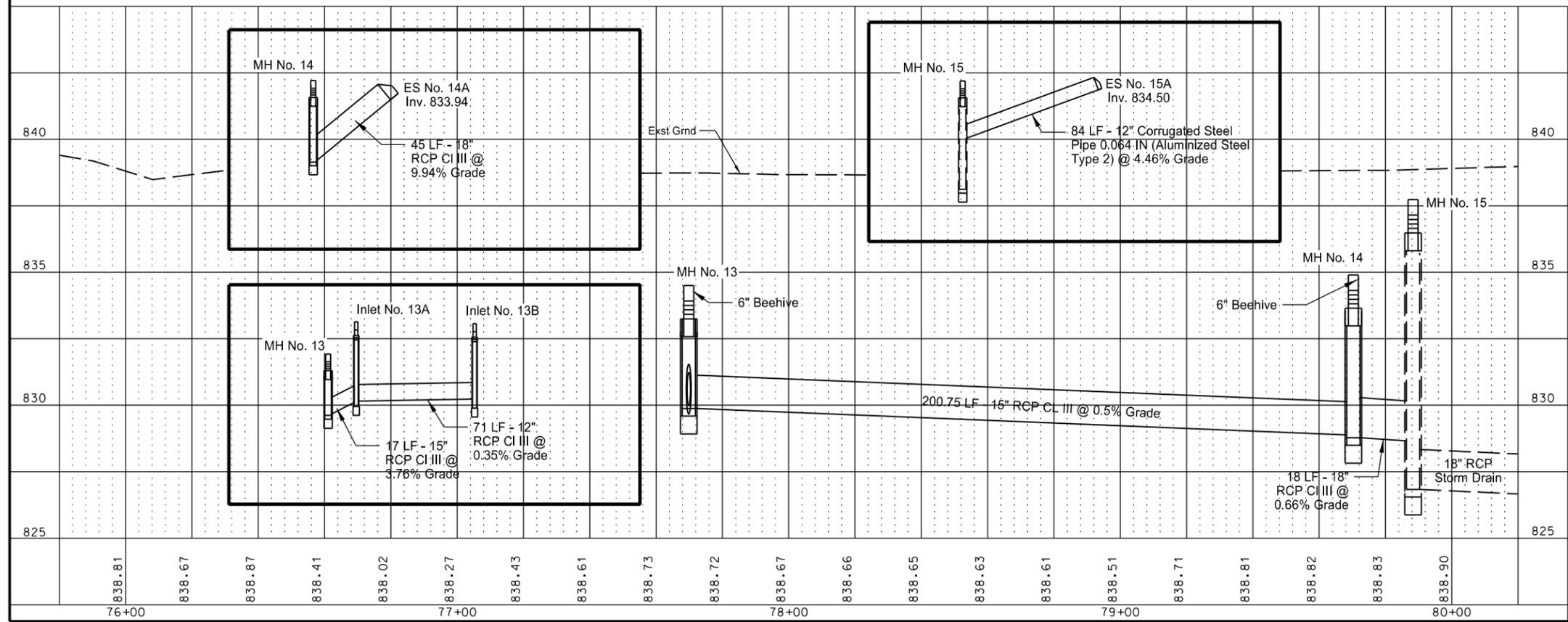






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SPEC	CODE	BID ITEM	QTY	UNIT
714	0110	PIPE CONC REINF 12IN CL III Inlet 13A to Inlet 13B	71	LF
714	0205	PIPE CONC REINF 15IN CL III MH 14 to MH 13 MH 13 to Inlet 13A	200 17	LF
714	0310	PIPE CONC REINF 18IN CL III MH 15 to MH 14	18	LF
714	5000	PIPE CORR STEEL .064IN 12IN MH 15 to ES15A	84	LF
714	9659	REMOVE & RELAY PIPE-ALL TYPES & SIZES MH 15 to ES14A	57	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES ES14A	1	EA
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN Inlet 13A Inlet 13B	40 40	LF
722	0100	MANHOLE 48IN MH 13 MH 14	1 1	EA
722	1100	MANHOLE RISER 48IN MH 13 MH 14	2.4 3.9	LF
722	3500	INLET-TYPE 1 Inlet 13A Inlet 13B	1 1	EA
722	6200	ADJUST MANHOLE MH 15	1	EA
722	6248	ADJUST 3IN WATERMAIN Sta 78+66.2 48.0' Rt	1	EA
724	0430	REMOVE HYDRANT Sta 79+18 40' Lt	1	EA



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 Sta 76+00 to 80+00

**Reconstruction of South Columbia Road**  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota











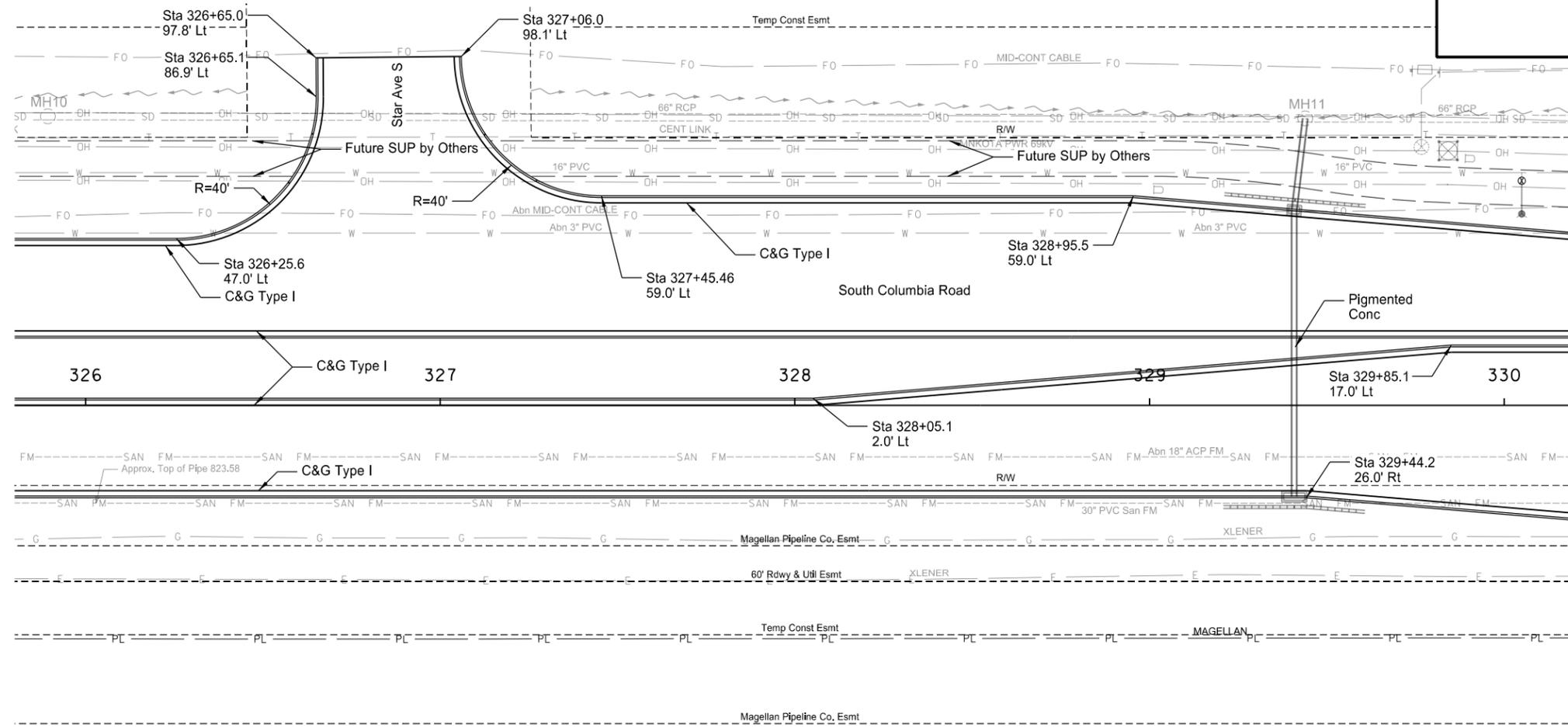




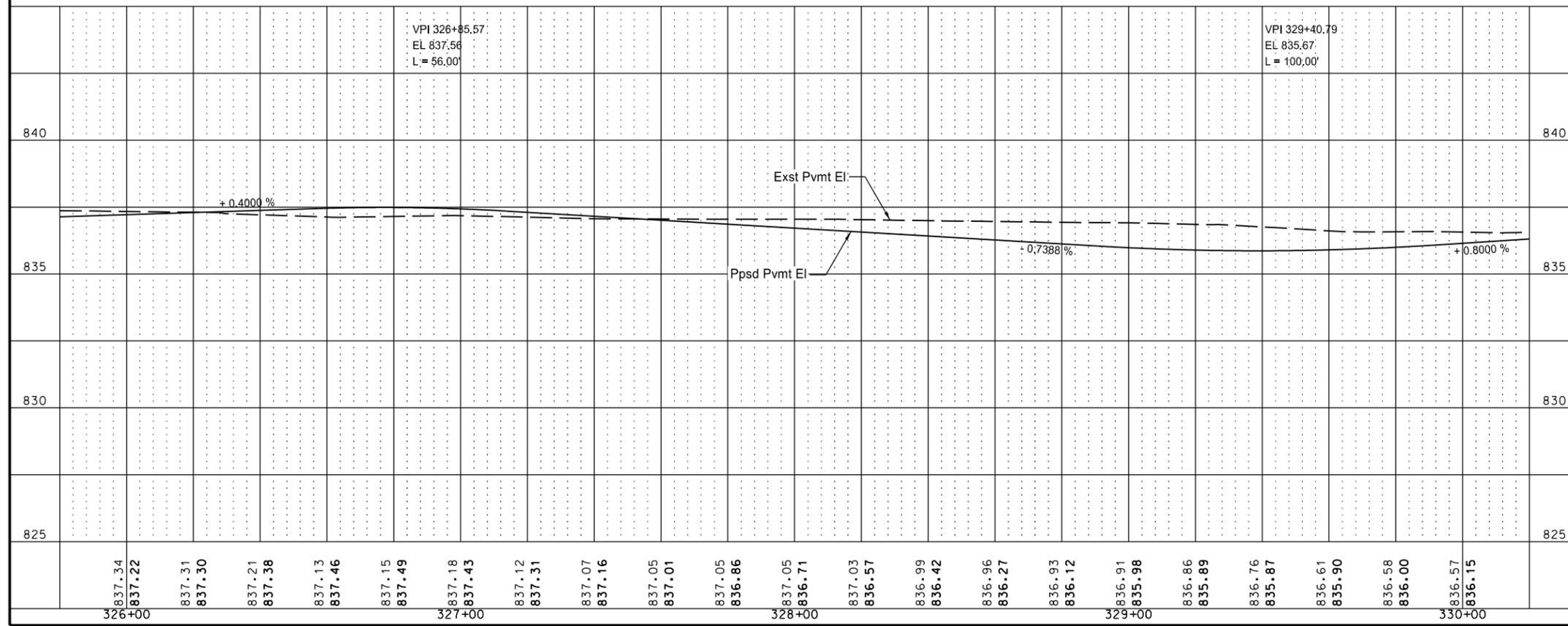




STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	60	9



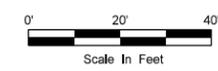
SPEC	CODE	BID ITEM	QTY	UNIT
302	0099	SALVAGE AGGREGATE BASE COURSE		
		Sta 318+00 to Sta 322+00	539	CY
302	0101	SALVAGED BASE COURSE		
		Sta 326+00 to Sta 330+00	1181	CY
302	0114	AGGREGATE BASE CLASS 3		
		Sta 326+00 to Sta 330+00	1163	CY
550	0117	9IN NON-REINF CONCRETE PAVEMENT CI AE		
		Sta 326+00 to Sta 330+00	283	SY
550	0131	9IN REINF CONCRETE PAVEMENT CI AE		
		Sta 326+00 to Sta 330+00	234	SY
550	0305	9IN NON-REINF CONCRETE PVMT CI AE-DOWELED		
		Sta 326+00 to Sta 330+00	2435	SY
709	0151	GEOSYNTHETIC MATERIAL TYPE R1		
		Sta 326+00 to Sta 330+00	3522	SY
748	0140	CURB & GUTTER-TYPE I		
		Sta 326+00 to Sta 330+00	1618	LF
750	0020	PIGMENTED CONCRETE		
		Sta 326+00 to Sta 330+00	26	SY



**Note:**  
All Radii Are Measured to the Face of Curb.

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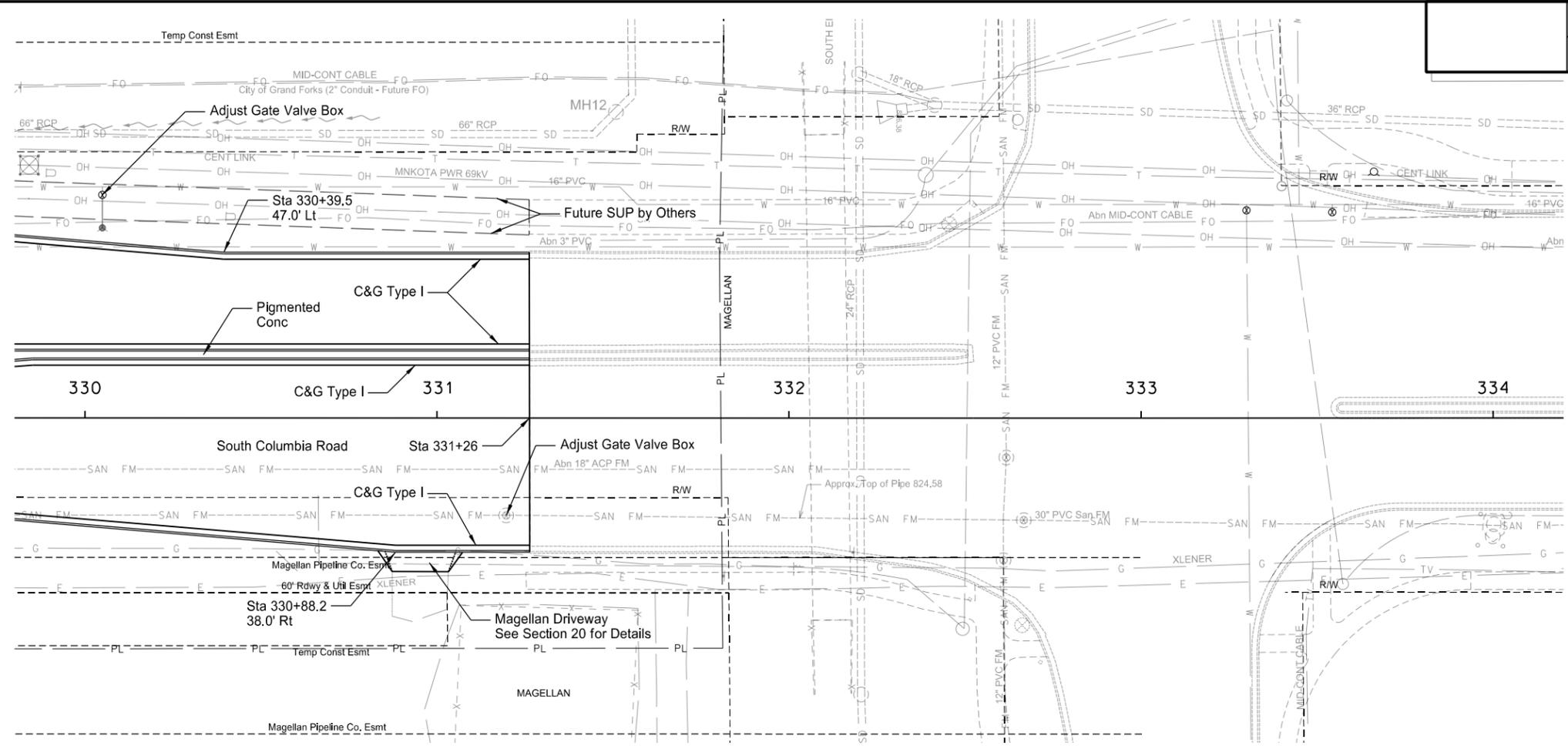
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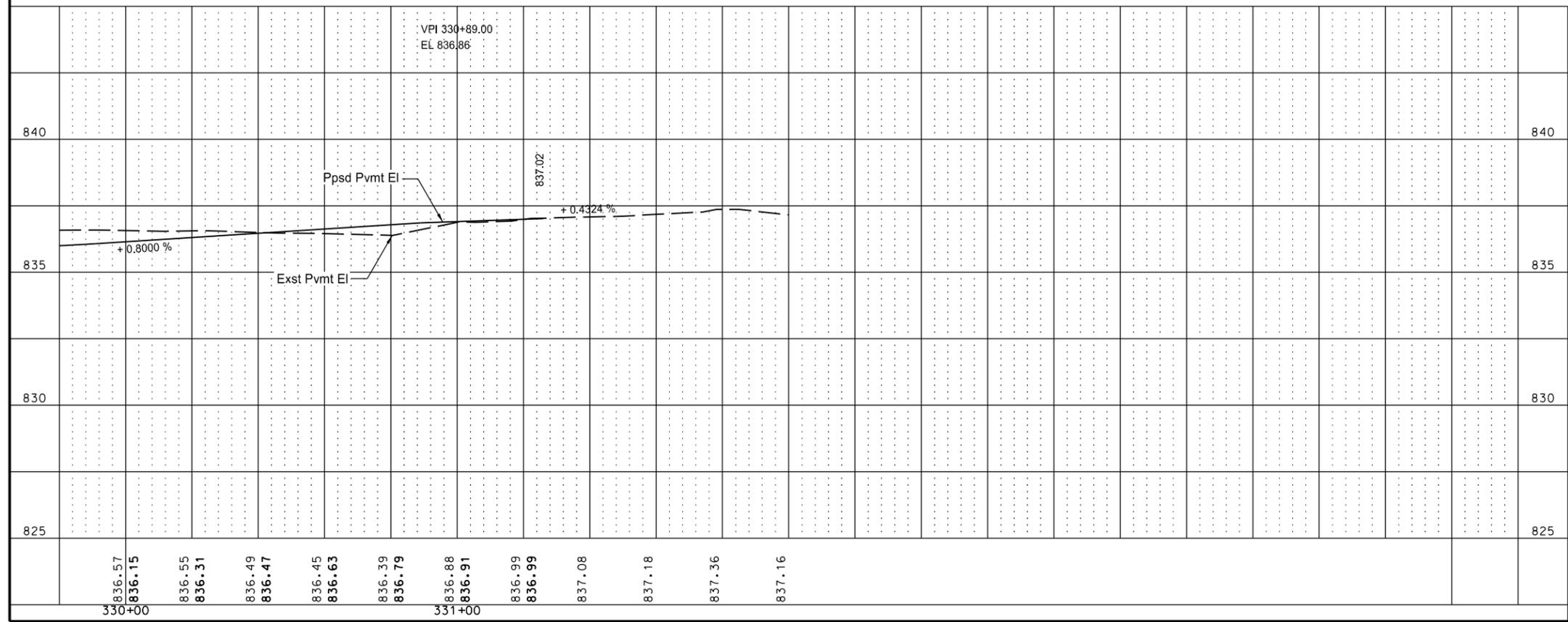
Plan & Profile  
Sta 326+00 330+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	60	10



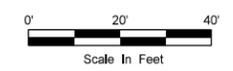
SPEC	CODE	BID ITEM	QTY	UNIT
302	0099	SALVAGE AGGREGATE BASE COURSE Sta 330+00 to Sta 334+00	199	CY
302	0101	SALVAGED BASE COURSE Sta 330+00 to Sta 334+00	409	CY
302	0114	AGGREGATE BASE CLASS 3 Sta 330+00 to Sta 334+00	397	CY
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT Sta 330+83.2 to Sta 331+7.3	3	TON
550	0305	9IN NON-REINF CONCRETE PVMT CI AE-DOWELED Sta 330+00 to Sta 334+00	1023	SY
709	0151	GEOSYNTHETIC MATERIAL TYPE R1 Sta 330+00 to Sta 334+00	1202	SY
722	6140	ADJUST GATE VALVE BOX Sta 330+06 63' Lt Sta 331+20 27' Rt	1 1	EA EA
748	0140	CURB & GUTTER-TYPE I Sta 330+00 to Sta 334+00	506	LF
750	0020	PIGMENTED CONCRETE Sta 330+00 to Sta 334+00	28	SY



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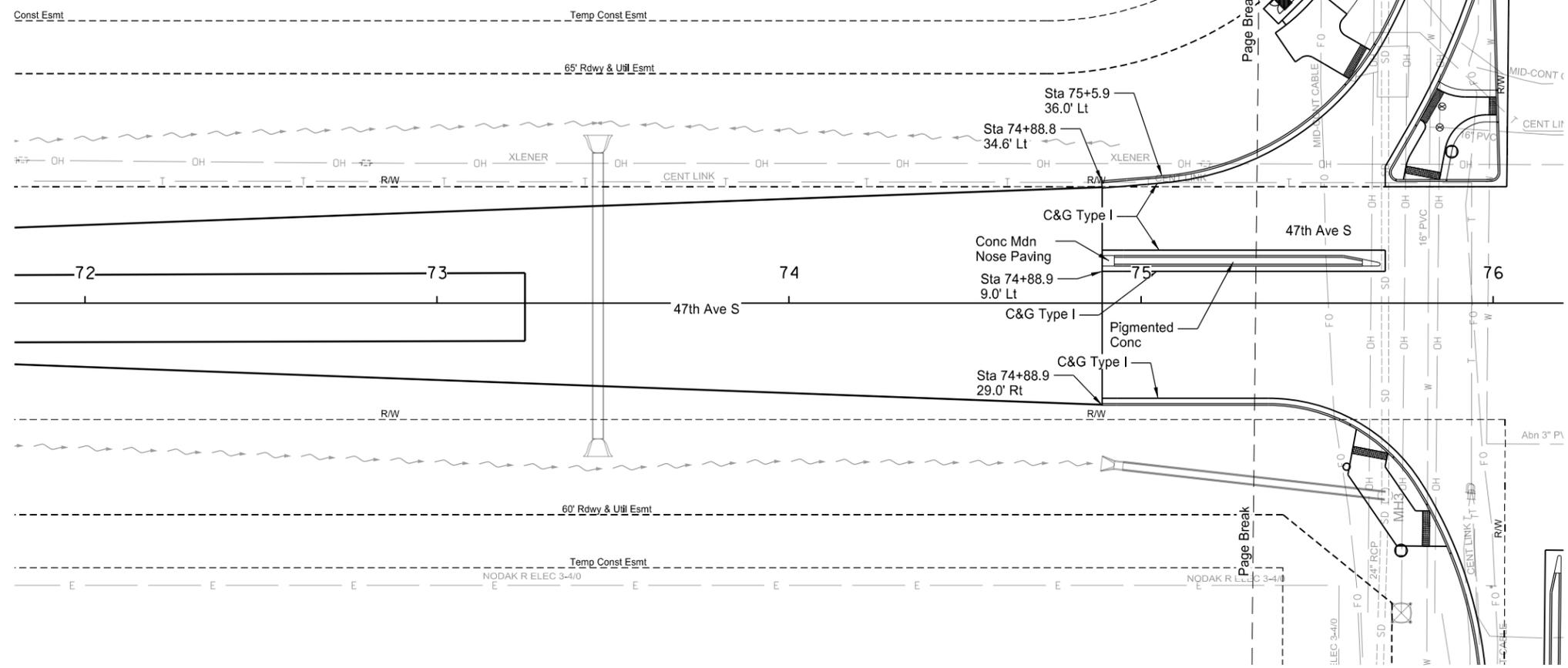


Plan & Profile  
Sta 330+00 to 334+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	60	12

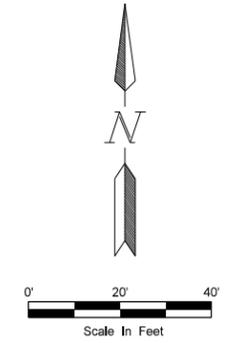


SPEC	CODE	BID ITEM	QTY	UNIT
302	0099	SALVAGE AGGREGATE BASE COURSE		
		Sta 72+00 to 75+33	270	CY
302	0101	SALVAGED BASE COURSE		
		Sta 72+00 to 75+33	113	CY
302	0114	AGGREGATE BASE CLASS 3		
		Sta 72+00 to 75+33	118	CY
302	0161	AGGREGATE BASE COURSE CL 13		
		Sta 72+00 to 75+33	194	CY
550	0117	9IN NON-REINF CONCRETE PAVEMENT CI AE		
		Sta 72+00 to 75+33	274	SY
709	0151	GEOSYNTHETIC MATERIAL TYPE R1		
		Sta 72+00 to 75+33	474	SY
748	0140	CURB & GUTTER-TYPE I		
		Sta 72+00 to 75+33	169	LF
750	0020	PIGMENTED CONCRETE		
		Sta 72+00 to 75+33	9	SY
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 72+00 to 75+33	2	SY

Station	Elevation	Notes
72+00	840.07	
73+00	839.78	
74+00	839.62	
75+00	839.61	
76+00	839.60	
72+00	839.53	
73+00	839.49	
74+00	839.46	
75+00	839.37	
76+00	839.15	
72+00	839.32	
73+00	838.64	
74+00	839.28	
75+00	838.13	
76+00	839.29	
72+00	837.62	
73+00	839.30	
74+00	837.11	
75+00	839.28	
76+00	836.60	
72+00	839.27	
73+00	836.53	
74+00	839.26	
75+00	839.25	
76+00	839.20	
72+00	839.47	
73+00	839.40	
74+00	838.81	
75+00	836.47	
76+00	836.47	

Note:  
All Radii Are Measured to the Face of Curb.

**WARNING**  
**HIGH-PRESSURE PIPELINE(S)**  
Excavation and/or Construction Prohibited  
Without compliance with State One-Call, AND  
Without Written Permission From  
**MAGELLAN PIPELINE COMPANY, L.P.**  
A MAGELLAN REPRESENTATIVE MUST BE  
PRESENT DURING WORK AROUND PIPELINE(S)



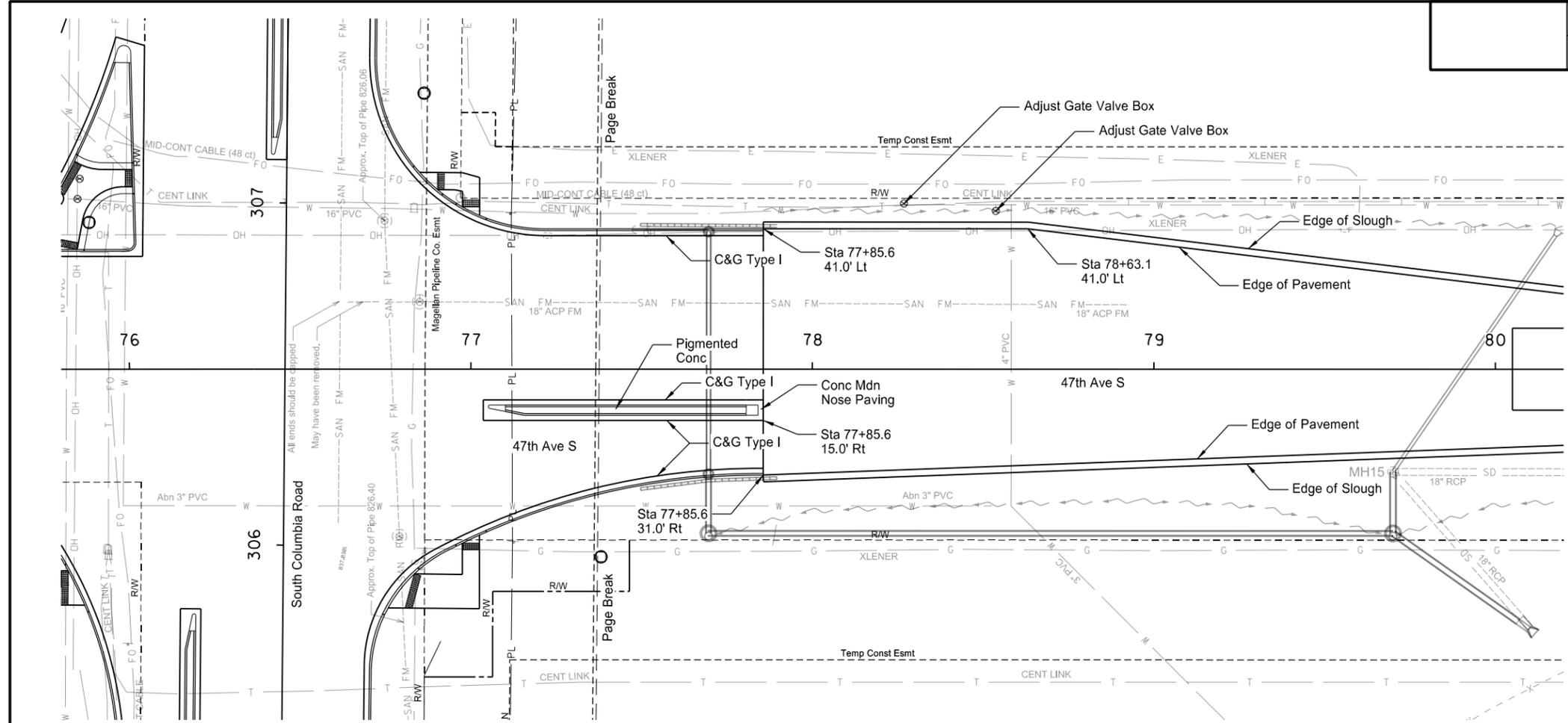
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Grand Forks, ND

Plan & Profile  
Sta 72+00 to 76+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	60	13

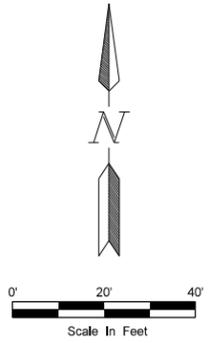
SPEC	CODE	BID ITEM	QTY	UNIT
302	0099	SALVAGE AGGREGATE BASE COURSE		
		Sta 77+38 to Sta 80+00	643	CY
302	0101	SALVAGED BASE COURSE		
		Sta 77+38 to Sta 80+00	136	CY
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT		
		Sta 77+38 to Sta 80+00	508	TON
550	0117	9IN NON-REINF CONCRETE PAVEMENT CI AE		
		Sta 77+38 to Sta 80+00	187	SY
550	0131	9IN REINF CONCRETE PAVEMENT CI AE		
		Sta 77+38 to Sta 80+00	153	SY
709	0151	GEOSYNTHETIC MATERIAL TYPE R1		
		Sta 77+38 to Sta 80+00	2089	SY
722	6140	ADJUST GATE VALVE BOX		
		Sta 78+27 48' Lt	1	EA
		Sta 78+53 47' Lt	1	EA
748	0140	CURB & GUTTER-TYPE I		
		Sta 77+38 to Sta 80+00	183	LF
750	0020	PIGMENTED CONCRETE		
		Sta 77+38 to Sta 80+00	10	SY
750	0210	CONCRETE MEDIAN NOSE PAVING		
		Sta 77+38 to Sta 80+00	3	SY



Station	838.81	838.67	838.87	838.41	838.02	838.27	838.43	838.61	838.73	838.72	838.67	836.89	838.66	836.93	838.65	837.04	838.63	837.21	838.61	837.45	838.51	837.74	838.71	838.04	838.81	838.34	838.82	838.60	838.83	838.76	838.90	838.84
76+00																																
77+00																																
78+00																																
79+00																																
80+00																																

Note:  
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**WARNING**  
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Grand Forks, ND

Plan & Profile  
Sta 76+00 to 80+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota



**Wetland Impact Table**

Wetland Number	Location	Wetland Feature	USACE Jurisdictional Wetlands <sup>1</sup>	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation																	
				Temp.	Perm.	Temp.	Perm.	Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite								
								EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)					
1a	Sec.29, T151N, R50W	Artificial	No		0.03			N	N	N															
1b	Sec.29, T151N, R50W	Artificial	No		0.02			N	N	N															
2	Sec. 28, T151N, R50W	Artificial	No		0.02			N	N	N															
3	Sec. 28, T151N, R50W	Artificial	No		0.01			N	N	N															
4a	Sec. 28, T151N, R50W	Artificial	No		0.03			N	N	N															
4b	Sec.29, T151N, R50W	Artificial	No		0.01			N	N	N															
4c	Sec.20, T151N, R50W	Artificial	No		0.01			N	N	N															
5	Sec.20, T151N, R50W	Artificial	No		0.02			N	N	N															
6	Sec.20, T151N, R50W	Artificial	No		0.01			N	N	N															
7	Sec.21, T151N, R50W	Artificial	No		0.01			N	N	N															
8	Sec.21, T151N, R50W	Artificial	No		0.03			N	N	N															

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Wetlands Mitigation and Environmental  
  
Reconstruction of South Columbia Road  
40<sup>th</sup> Avenue South to 47<sup>th</sup> Avenue South  
Grand Forks, North Dakota

Wetland Impact Table																				
Wetland Number	Location	Wetland Feature	USACE Jurisdictional Wetlands <sup>1</sup>	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation												
				Temp.	Perm.	Temp.	Perm.	Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite			
								EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)
9a	Sec.20, T151N, R50W	Artificial	No		0.01			N	N	N										
9b	Sec.20, T151N, R50W	Artificial	No		0.03			N	N	N										
10	Sec.21, T151N, R50W	Artificial	No		0.01			N	N	N										
11	Sec.20, T151N, R50W	Artificial	No		0.02			N	N	N										
				0.00	0.25	0.00	0.00				0		0		0		0		0	

<sup>1</sup> A wetland Jurisdictional Determination was issued by the USACE on 2/04/2015; NWO-2015-0179-BIS.

<sup>2</sup> 1199 Mitigation requirements - All impacts to natural wetlands (natural/jurisdictional and natural/non-jurisdictional), regardless of size, as well as impacts greater than 0.10 acre to wetlands require mitigation.

USACE Mitigation Requirements – All jurisdictional impacts greater than 0.10 acre to each resource (cumulative. eg 1a ,1b,1c..etc.) requires mitigation. Other Water impact greater than 300 linear feet requires mitigation.

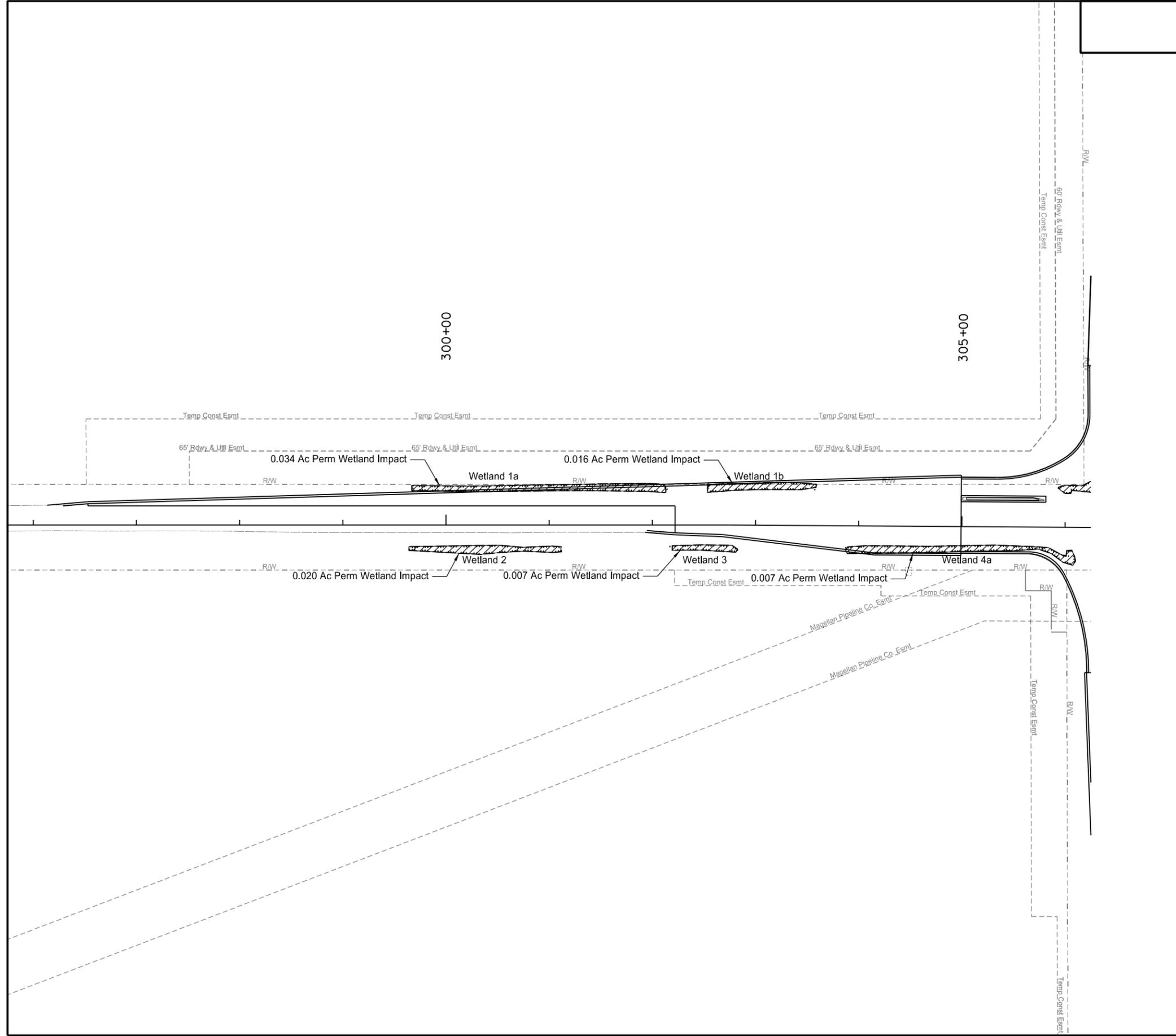
<sup>3</sup> All artificial/non-jurisdictional, deep water (impacts greater than 6.6 feet), Other Waters less than 300 linear feet (determined by the USACE on a case by case), and temporary impacts do not require mitigation.

Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.00	Temporary JD	0.00
Natural/Non-JD	0.00	Non-JD Temporary	0.00
Artificial/JD	0.00	Permanent JD > 0.10	0.00
Artificial /Non-JD	0.25	Permanent OW	0.00
<b>Total</b>	<b>0.25</b>	Temporary OW	0.00

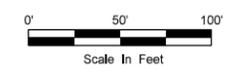
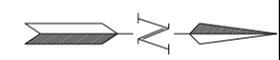
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Wetlands Mitigation and Environmental  
 Reconstruction of South Columbia Road  
 40<sup>th</sup> Avenue South to 47<sup>th</sup> Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	75	3



**Legend**  
 Permanent Wetland Impact

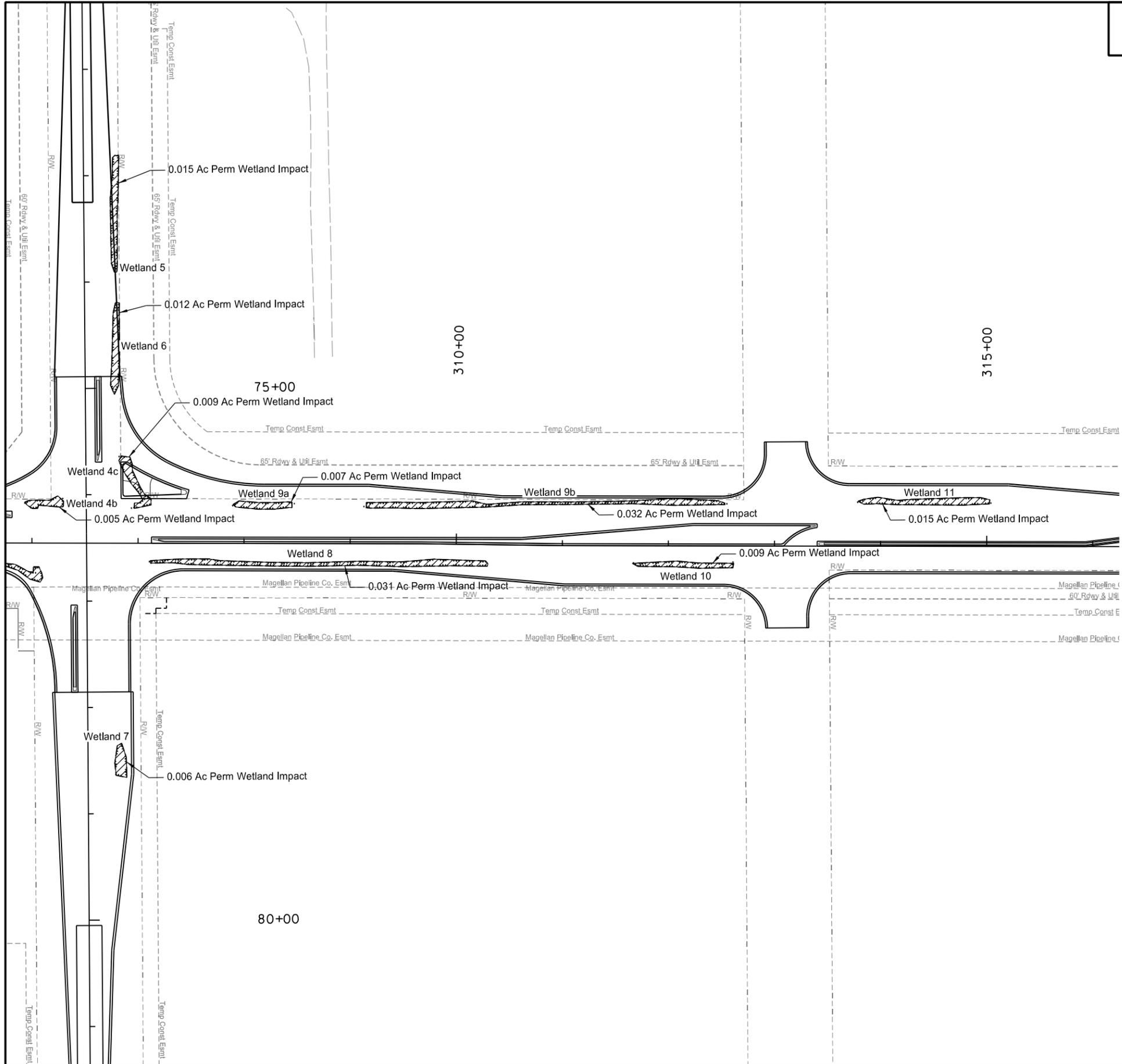


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**Wetland Impacts**  
 Sta. 299+00 to Sta. 306+00

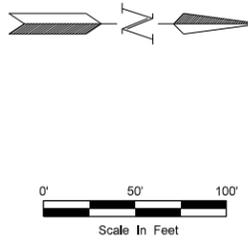
Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	75	4



**Legend**

Permanent Wetland Impact



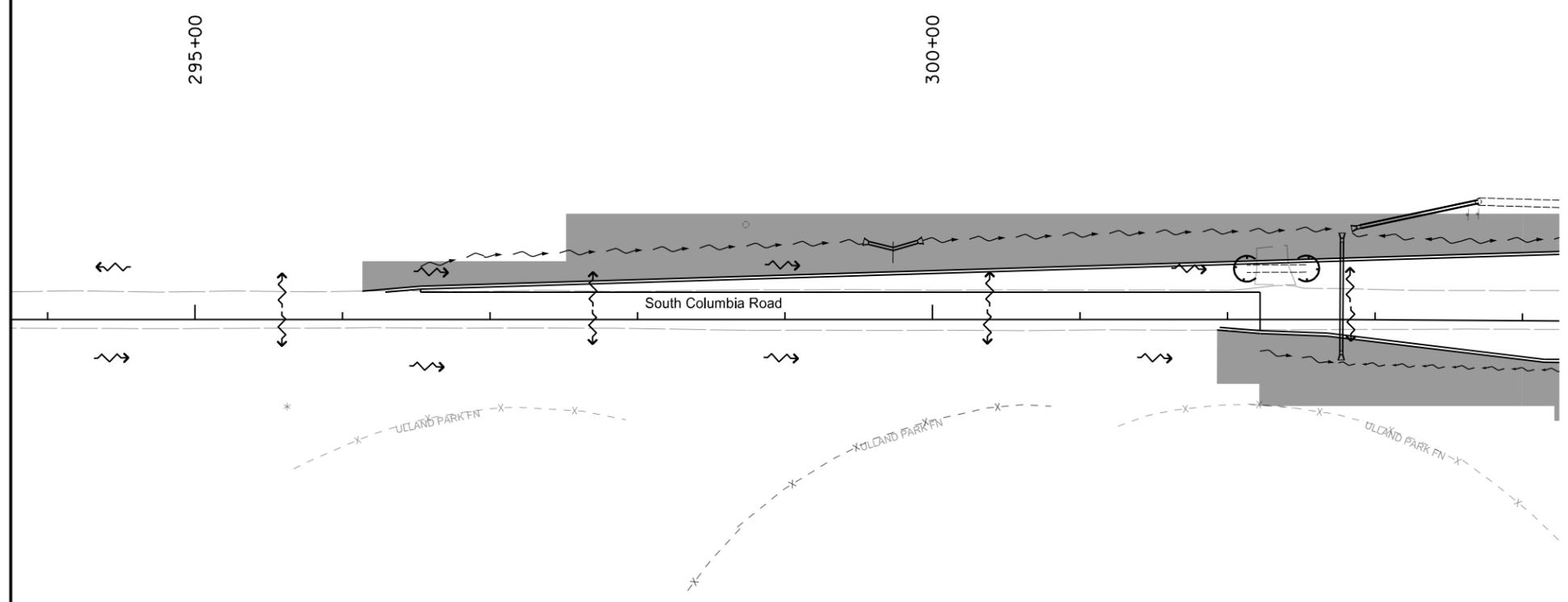
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**Wetland Impacts**  
Sta. 306+00 to Sta. 315+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

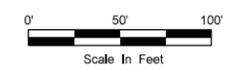
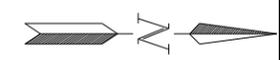
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	1

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP		
	Sta 294+00 to 304+00	0.783	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 294+00 to 304+00	0.783	ACRE
261 0112	FIBER ROLLS 12 IN		
	Sta 294+00 to 304+00	40	LF
261 0113	REMOVE FIBER ROLLS 12 IN		
	Sta 294+00 to 304+00	40	LF



**Legend**

	Temporary Cover Crop/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Storm Drain Line
	Surface Flow Direction
	Inlet Protection-Fiber Roll 12 Inch



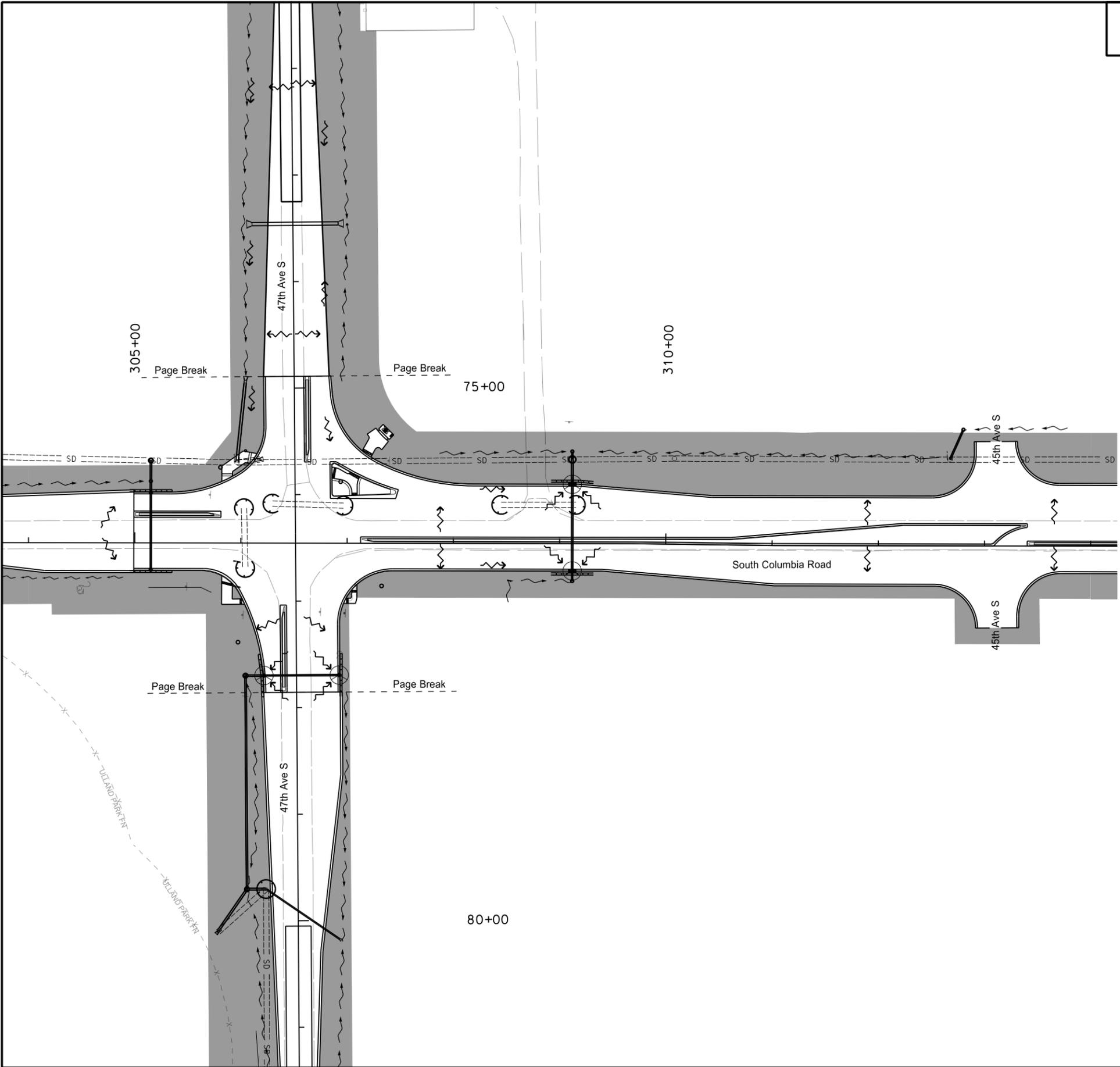
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Temporary Sediment and Erosion Control  
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

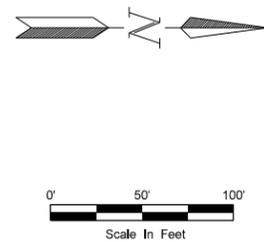
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	2

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP		
	Sta 304+00 to 314+00	1.577	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 304+00 to 314+00	1.577	ACRE
261 0112	FIBER ROLLS 12 IN		
	Sta 304+00 to 314+00	120	LF
261 0113	REMOVE FIBER ROLLS 12 IN		
	Sta 304+00 to 314+00	120	LF
708 1540	INLET PROTECTION-SPECIAL		
	Sta 304+00 to 314+00	2	EA
708 1541	REMOVE INLET PROTECTION-SPECIAL		
	Sta 304+00 to 314+00	2	EA



**Legend**

- Temporary Cover Crop/Hydraulic Mulch
- Existing Storm Drain Line
- Proposed Inlet
- Proposed Storm Drain Line
- Surface Flow Direction
- Inlet Protection-Special
- Inlet Protection-Fiber Roll 12 Inch



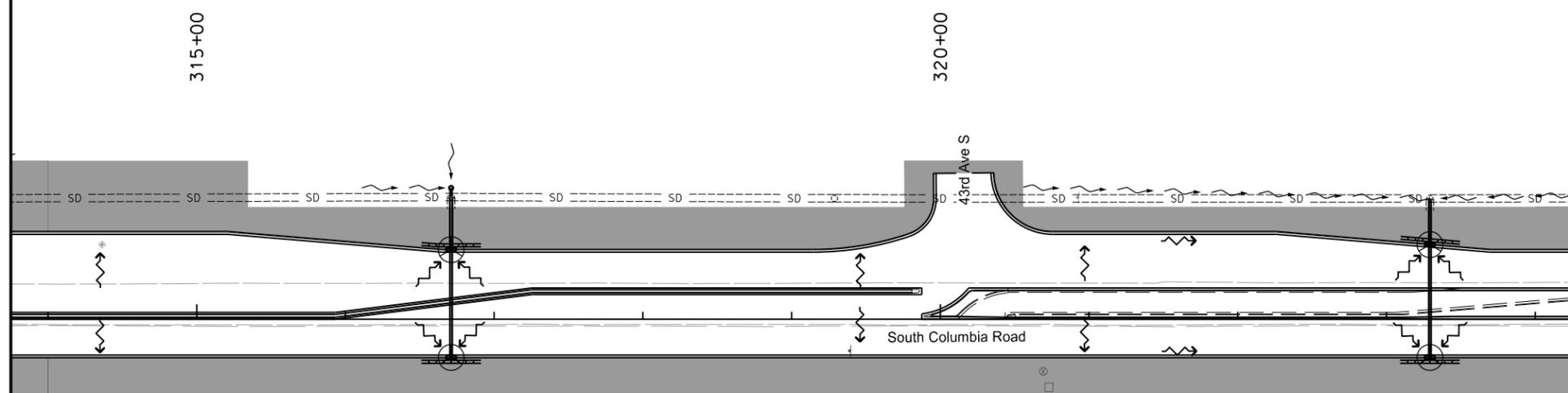
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Temporary Sediment and Erosion Control Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

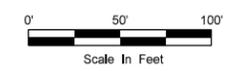
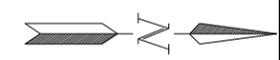
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	3

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP		
	Sta 314+00 to 324+00	1.150	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 314+00 to 324+00	1.150	ACRE
708 1540	INLET PROTECTION-SPECIAL		
	Sta 314+00 to 324+00	4	EA
708 1541	REMOVE INLET PROTECTION-SPECIAL		
	Sta 314+00 to 324+00	4	EA



**Legend**

	Temporary Cover Crop/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Storm Drain Line
	Surface Flow Direction
	Inlet Protection-Special



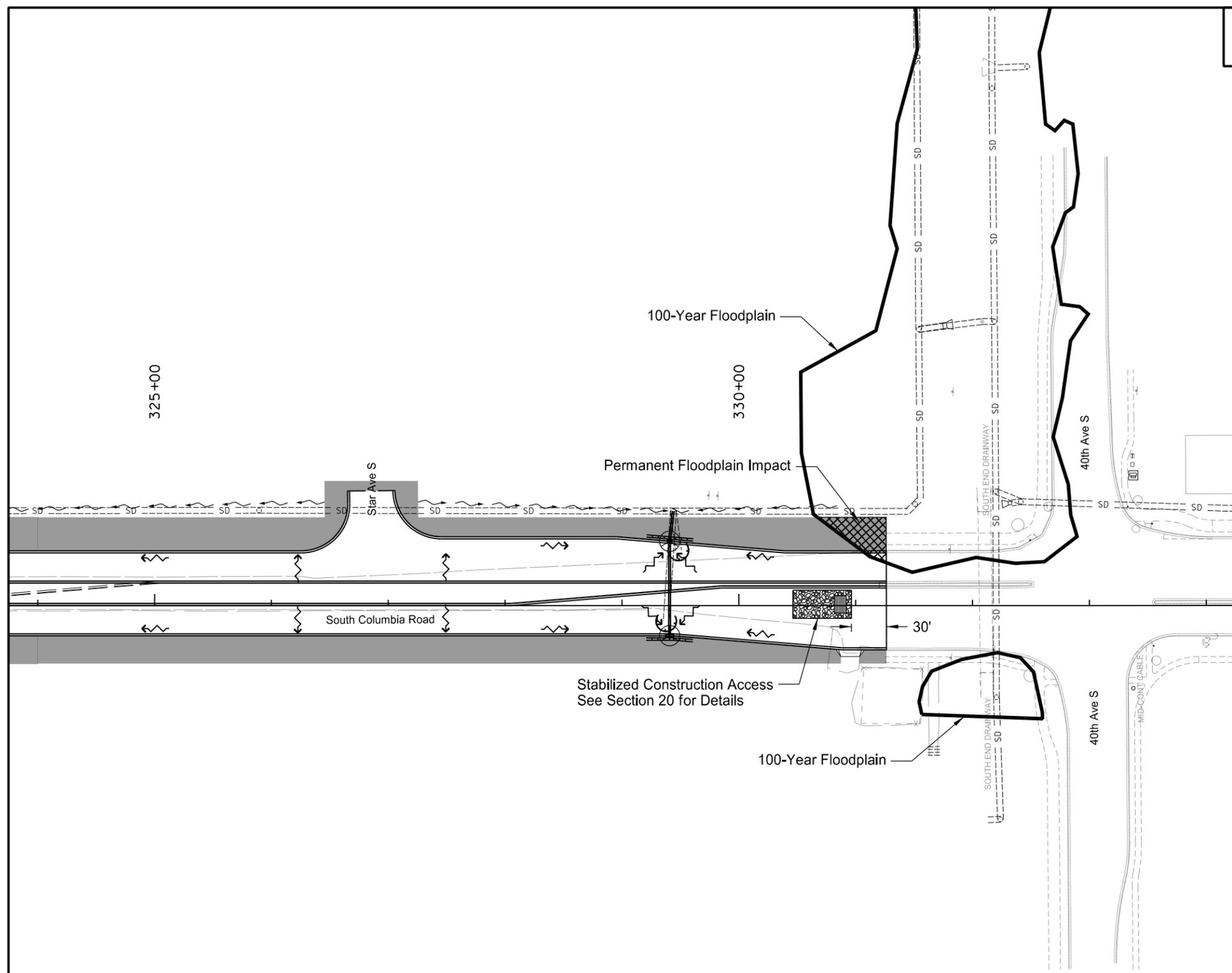
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Temporary Sediment and Erosion Control  
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

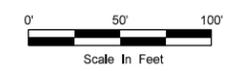
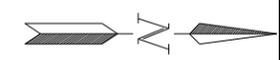
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	4

SPEC CODE	BID ITEM	QTY	UNIT
251	2000 TEMPORARY COVER CROP		
	Sta 324+00 to 331+26	0.752	ACRE
253	0201 HYDRAULIC MULCH		
	Sta 324+00 to 331+26	0.752	ACRE
261	0112 FIBER ROLLS 12 IN		
	Sta 324+00 to 331+26	40	LF
261	0113 REMOVE FIBER ROLLS 12 IN		
	Sta 324+00 to 331+26	40	LF
265	0100 STABILIZED CONSTRUCTION ACCESS		
	Sta 324+00 to 331+26	1	EA
265	0101 REMOVE STABILIZED CONSTRUCTION ACCESS		
	Sta 324+00 to 331+26	1	EA
708	1540 INLET PROTECTION-SPECIAL		
	Sta 324+00 to 331+26	2	EA
708	1541 REMOVE INLET PROTECTION-SPECIAL		
	Sta 324+00 to 331+26	2	EA



**Legend**

	Temporary Cover Crop/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Storm Drain Line
	Surface Flow Direction
	Inlet Protection-Special
	Inlet Protection-Fiber Roll 12 Inch



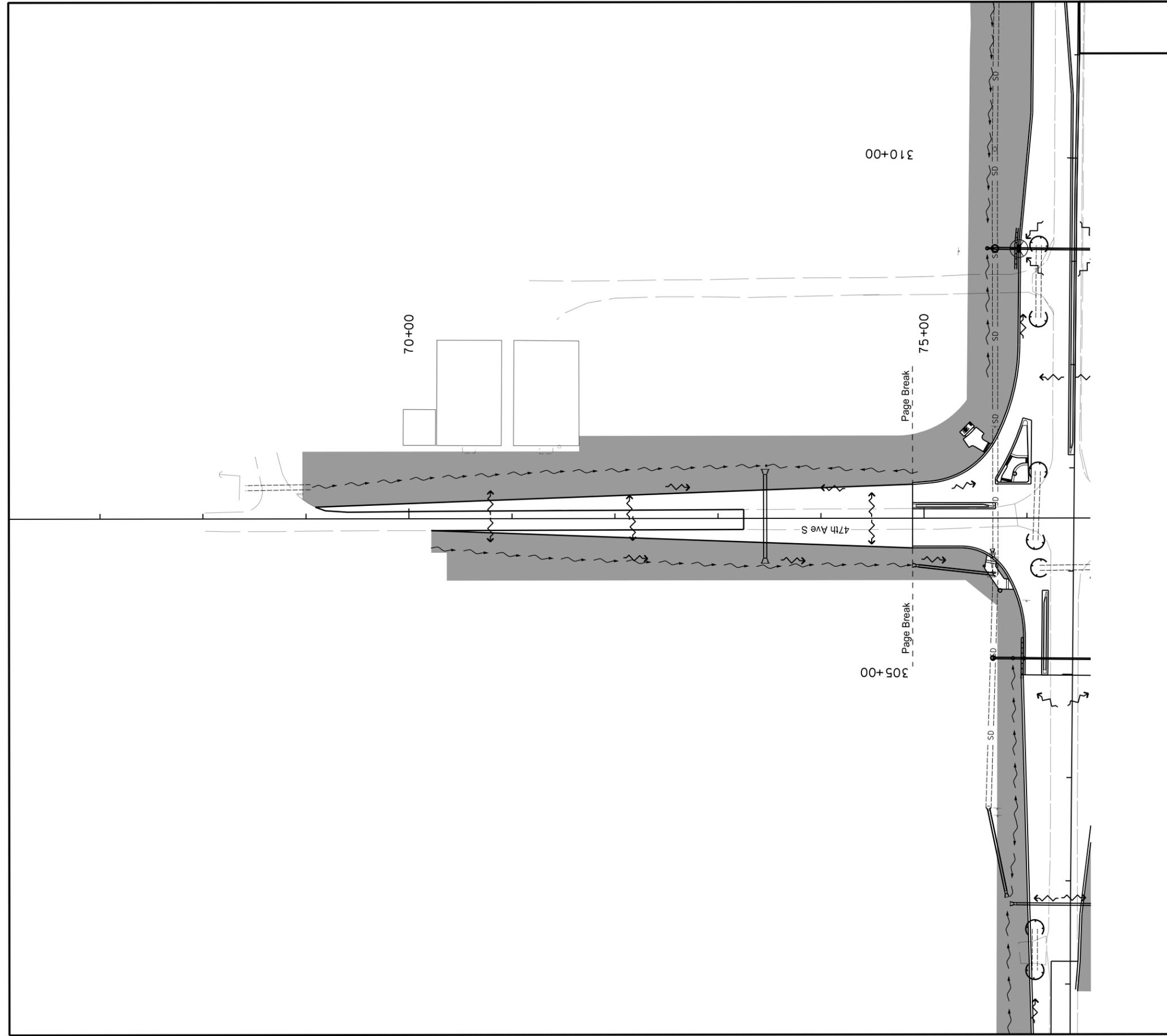
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Temporary Sediment and Erosion Control  
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

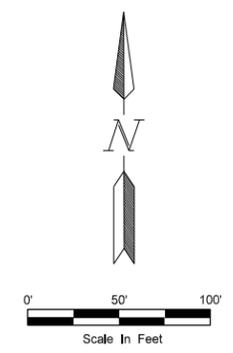
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	5

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP		
	Sta 67+00 to 77+00	1.115	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 67+00 to 77+00	1.115	ACRE



**Legend**

	Temporary Cover Crop/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Storm Drain Line
	Surface Flow Direction
	Inlet Protection-Fiber Roll 12 Inch



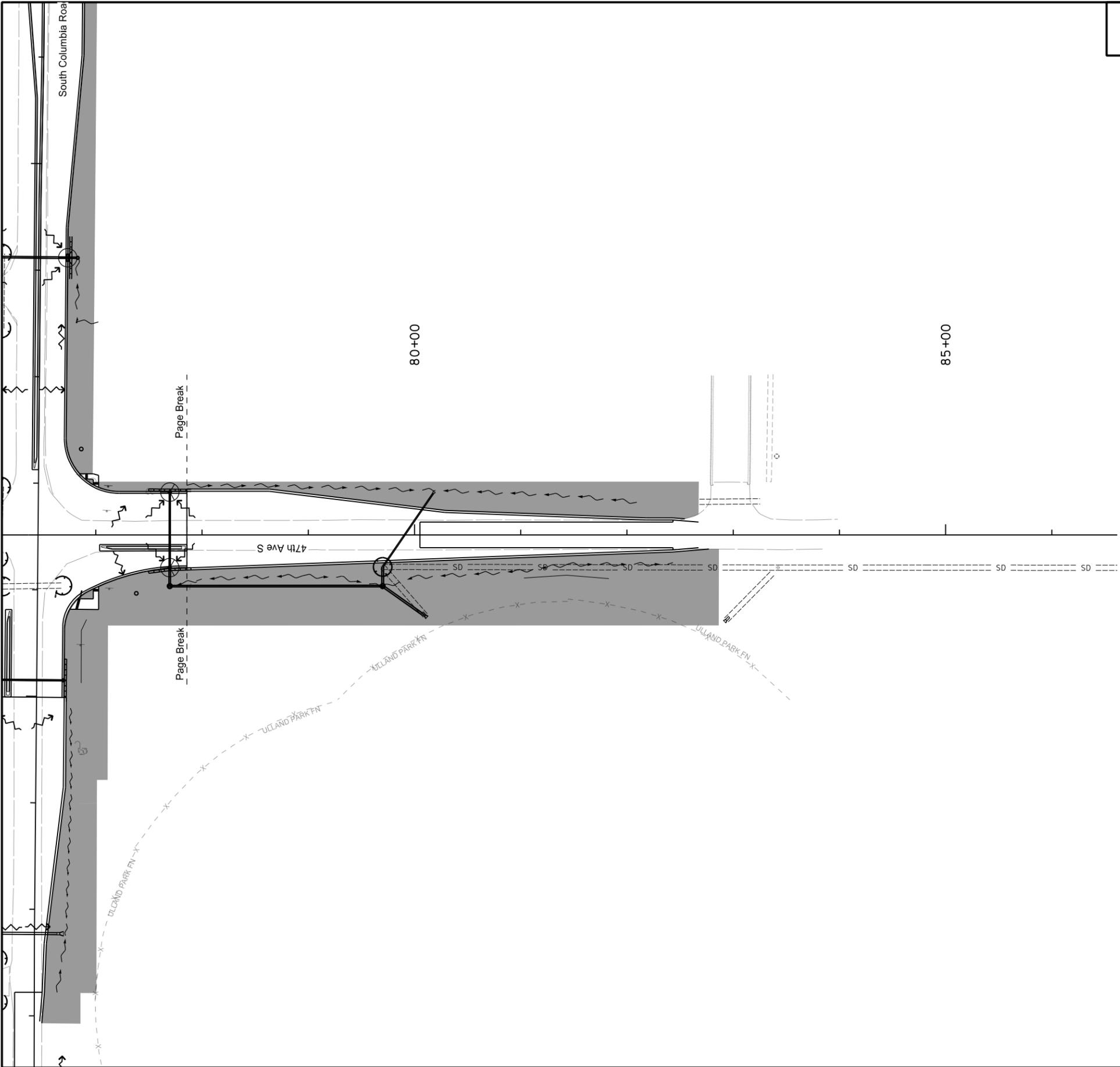
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Temporary Sediment and Erosion Control  
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

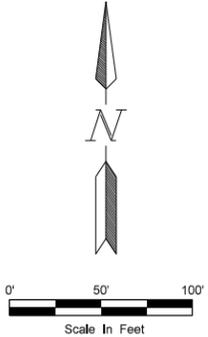
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	76	6

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP		
	Sta 77+00 to 87+00	0.953	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 77+00 to 87+00	0.953	ACRE
261 0112	FIBER ROLLS 12 IN		
	Sta 77+00 to 87+00	20	LF
261 0113	REMOVE FIBER ROLLS 12 IN		
	Sta 77+00 to 87+00	20	LF



**Legend**

	Temporary Cover Crop/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Storm Drain Line
	Surface Flow Direction
	Inlet Protection-Fiber Roll 12 Inch



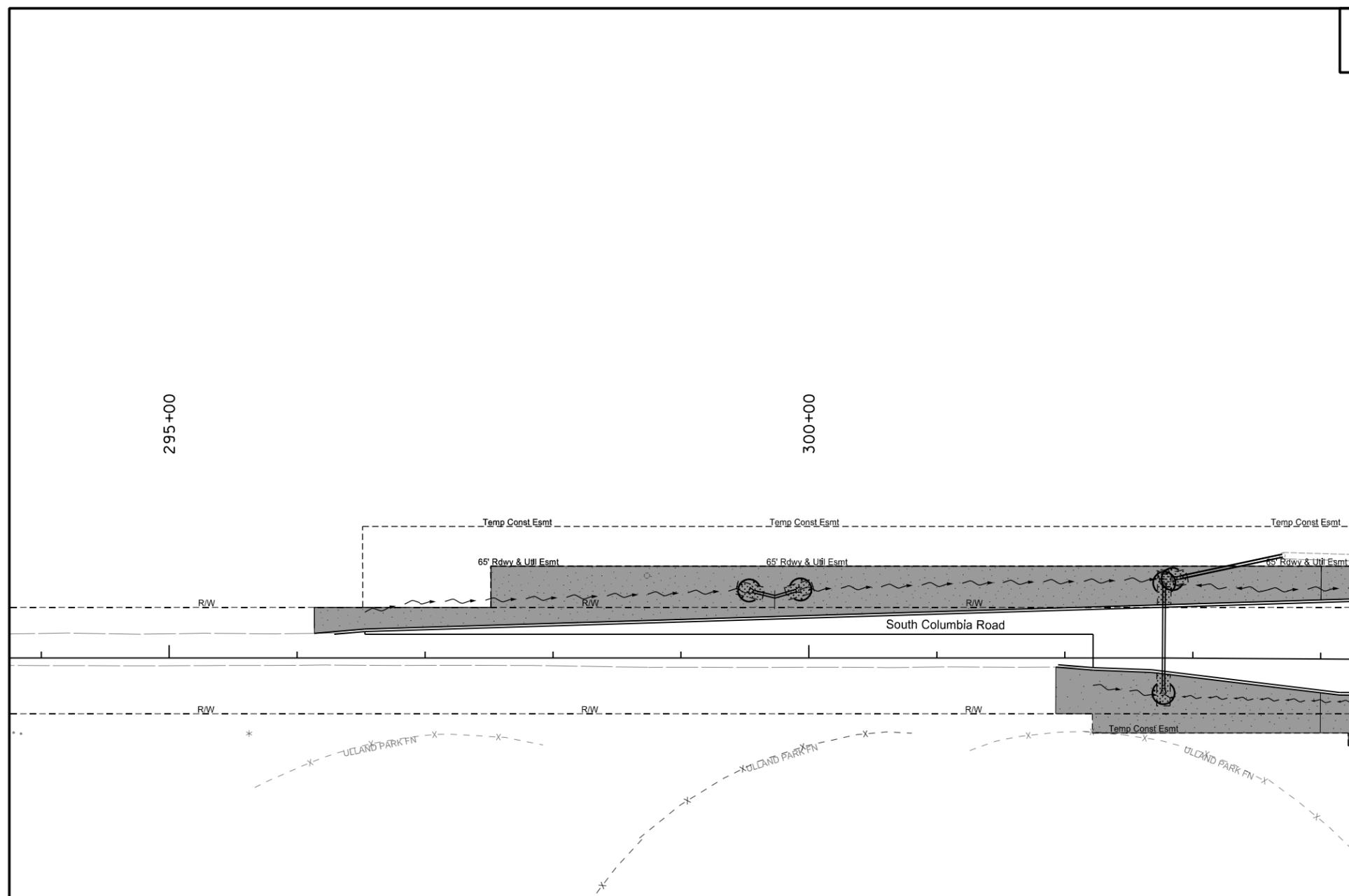
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Temporary Sediment and Erosion Control  
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

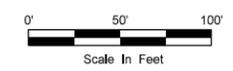
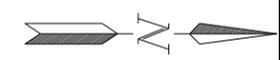
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	1

SPEC CODE	BID ITEM	QTY	UNIT
261 0112	FIBER ROLLS 12 IN Sta 294+00 to 304+00	100	LF
251 0300	SEEDING CLASS III Sta 294+00 to 304+00	0.783	ACRE
253 0201	HYDRAULIC MULCH Sta 294+00 to 304+00	0.783	ACRE
255 0103	ECB TYPE 3 Sta 294+00 to 304+00	112	SY



**Legend**

	Seeding Class III/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Flared End Section
	Proposed Storm Drain Line
	Inlet Protection-Fiber Roll 12 Inch
	ECB (Erosion Control Blanket) Type 3



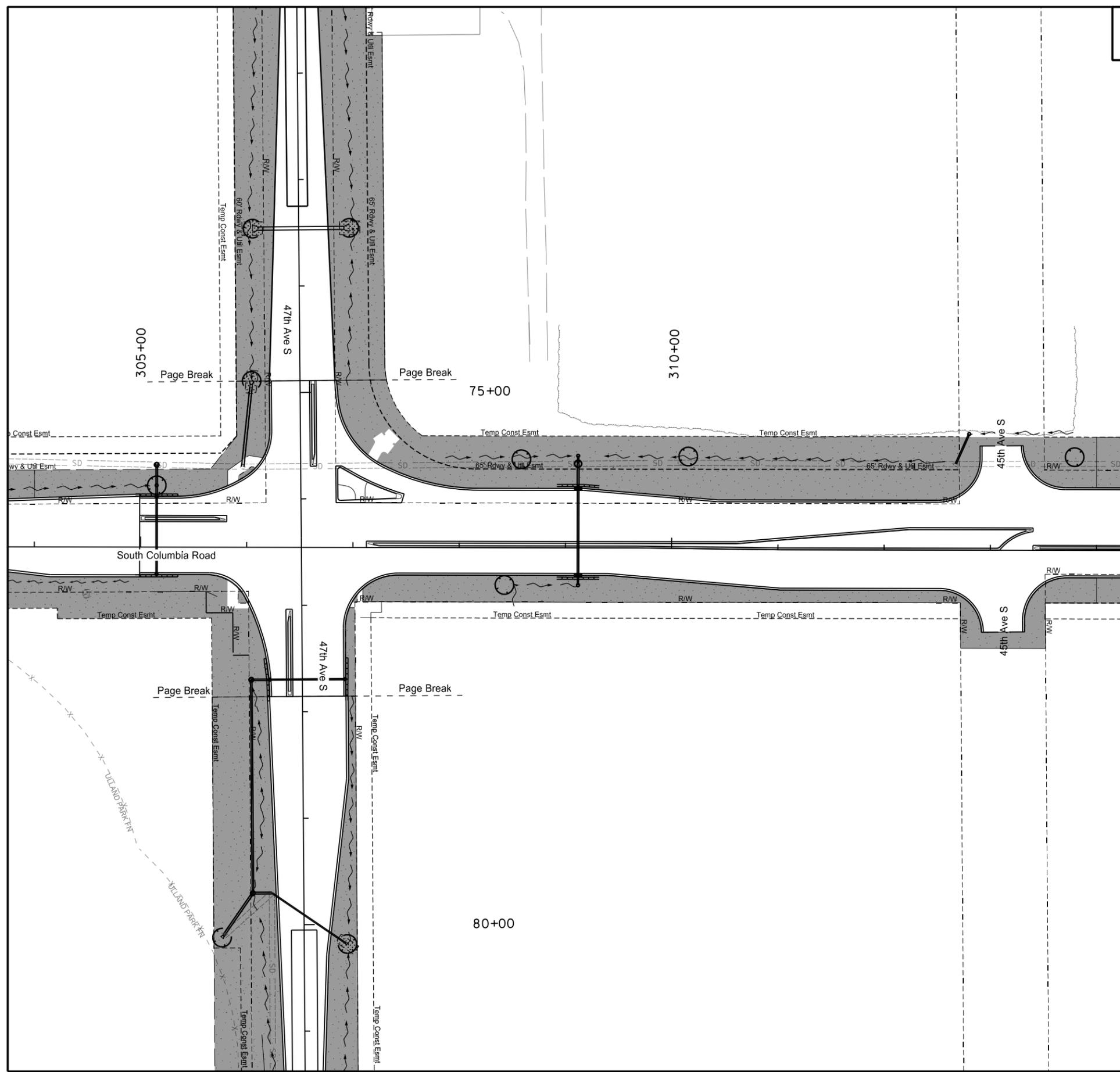
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 Registration Number  
 PE- 4622,  
 on 08/19/16 and the original document is stored at the office of CPS, Ltd.  
 Grand Forks, ND

Permanent Sediment and Erosion Control  
 Sta 294+00 to 304+00

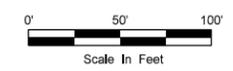
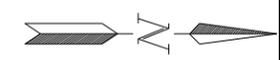
Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	2

SPEC CODE	BID ITEM	QTY	UNIT
261 0112	FIBER ROLLS 12 IN Sta 304+00 to 314+00	120	LF
251 0300	SEEDING CLASS III Sta 304+00 to 314+00	1.577	ACRE
253 0201	HYDRAULIC MULCH Sta 304+00 to 314+00	1.577	ACRE
255 0103	ECB TYPE 3 Sta 304+00 to 314+00	24	SY



- Legend**
- Seeding Class III/Hydraulic Mulch
  - Existing Storm Drain Line
  - Proposed Inlet
  - Proposed Flared End Section
  - Proposed Storm Drain Line
  - Inlet Protection-Fiber Roll 12 Inch
  - ECB (Erosion Control Blanket) Type 3



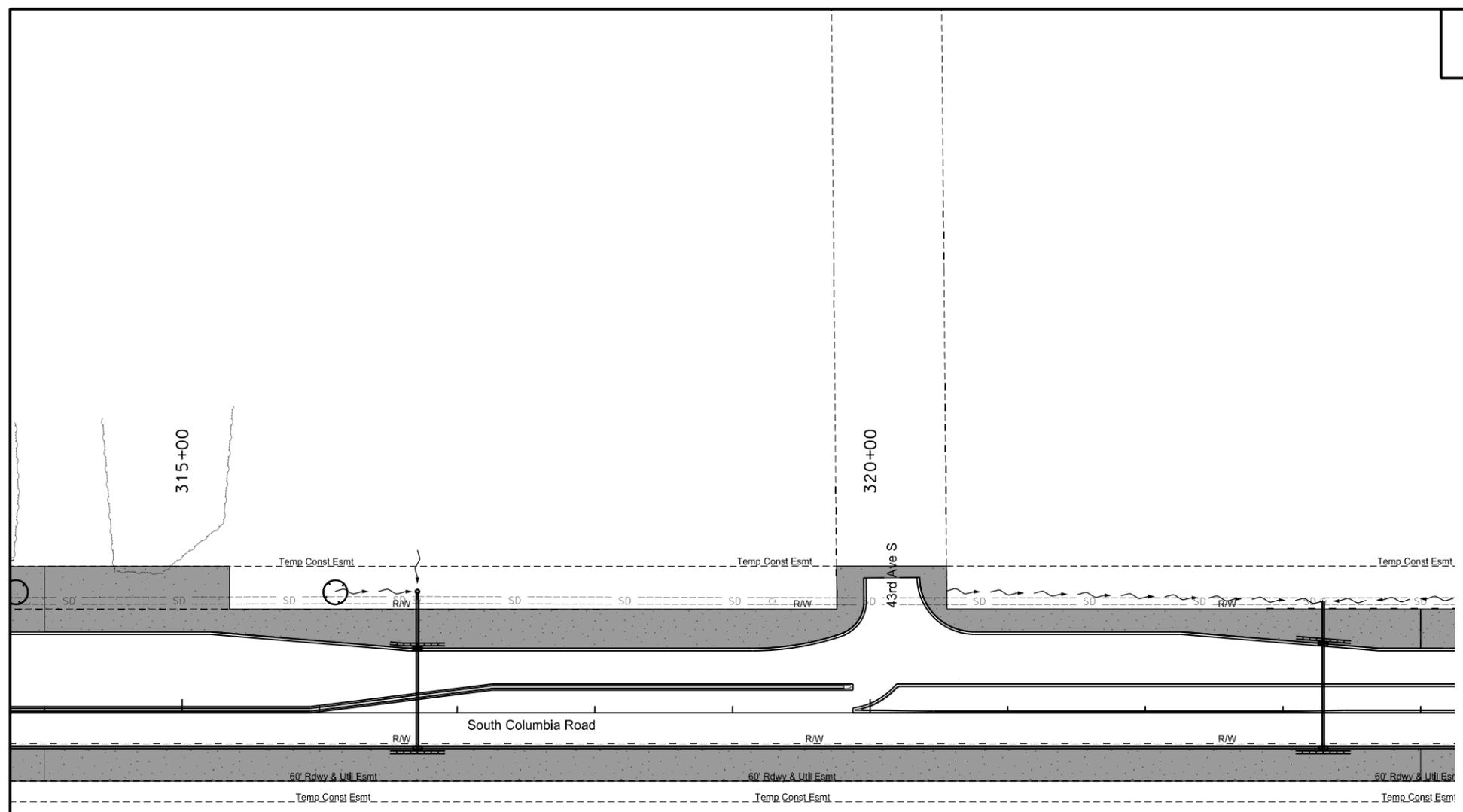
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Permanent Sediment and Erosion Control  
Sta 304+00 to 314+00

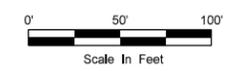
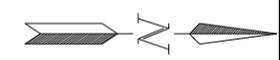
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	3

SPEC CODE	BID ITEM	QTY	UNIT
261 0112	FIBER ROLLS 12 IN		
	Sta 314+00 to 324+00	20	LF
251 0300	SEEDING CLASS III		
	Sta 314+00 to 324+00	1.150	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 314+00 to 324+00	1.150	ACRE



- Legend**
- Seeding Class III/Hydraulic Mulch
  - Existing Storm Drain Line
  - Proposed Inlet
  - Proposed Flared End Section
  - Proposed Storm Drain Line
  - Inlet Protection-Fiber Roll 12 Inch
  - ECB (Erosion Control Blanket) Type 3



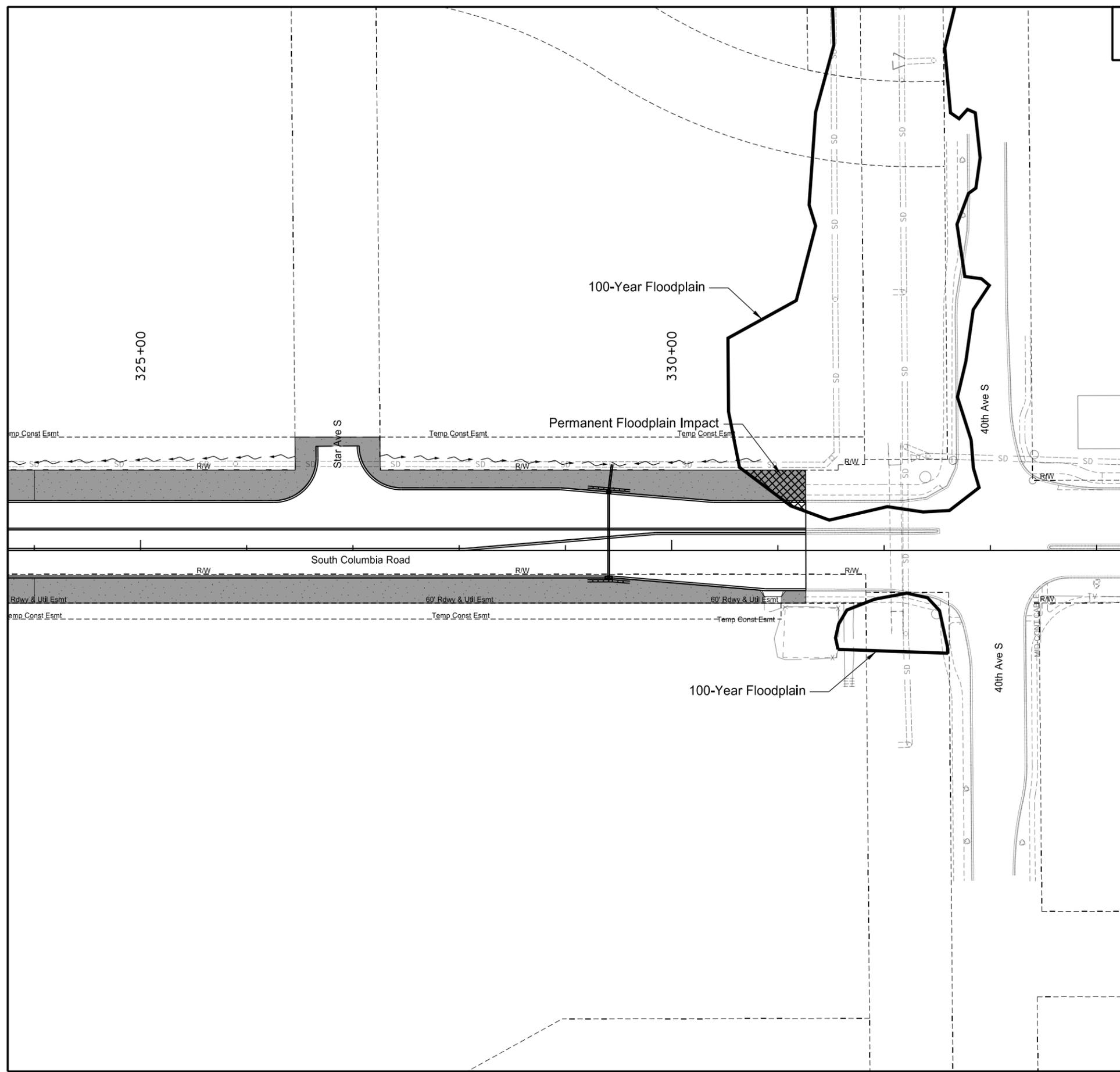
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Permanent Sediment and Erosion Control  
Sta 314+00 to 324+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

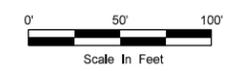
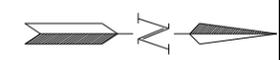
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	4

SPEC CODE	BID ITEM	QTY	UNIT
251 0300	SEEDING CLASS III		
	Sta 324+00 to 331+26	0.752	ACRE
253 0201	HYDRAULIC MULCH		
	Sta 324+00 to 331+26	0.752	ACRE



**Legend**

	Seeding Class III/Hydraulic Mulch
	Existing Storm Drain Line
	Proposed Inlet
	Proposed Flared End Section
	Proposed Storm Drain Line
	Inlet Protection-Fiber Roll 12 Inch
	ECB (Erosion Control Blanket) Type 3



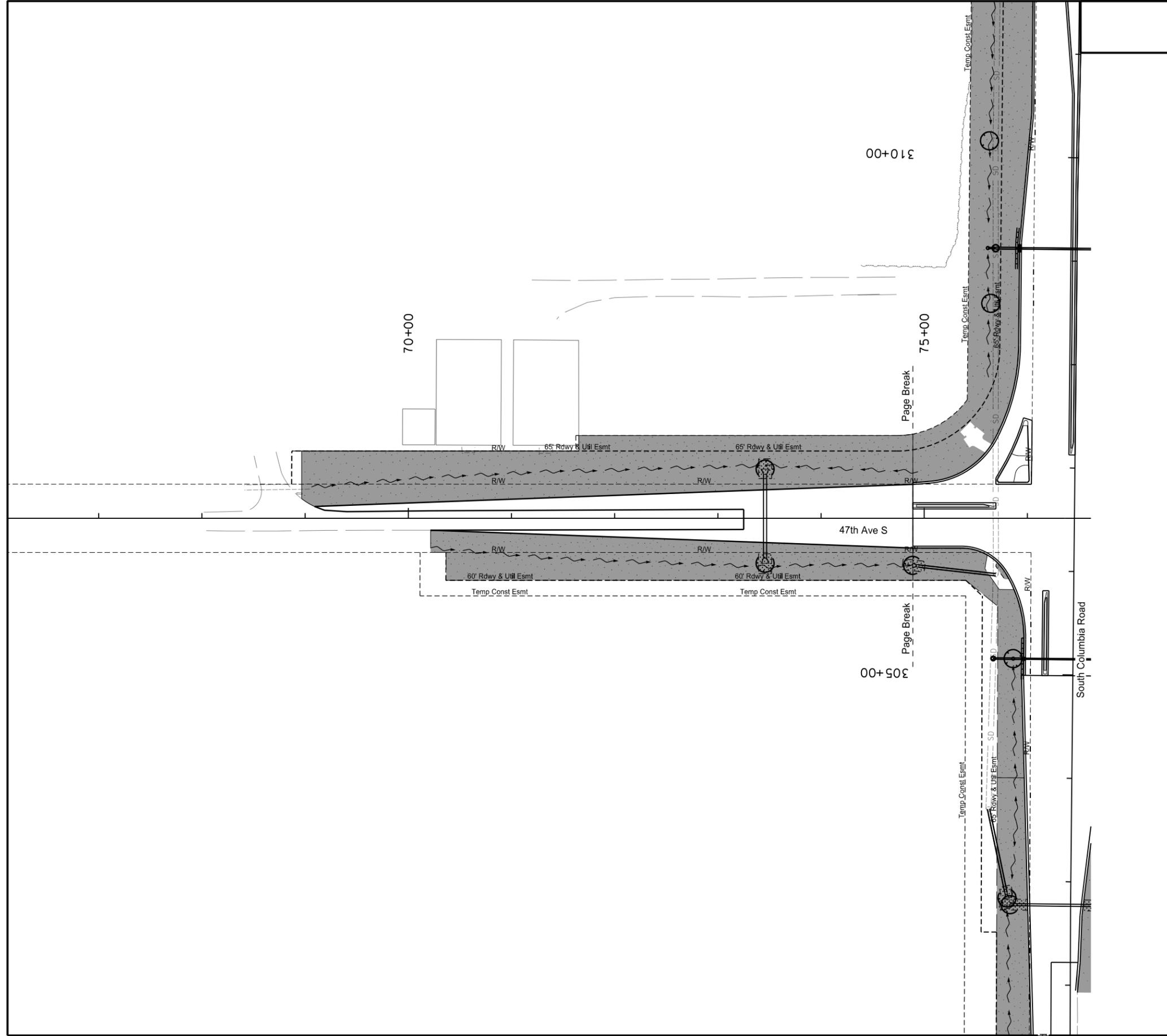
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Permanent Sediment and Erosion Control  
 Sta 324+00 to 331+26

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

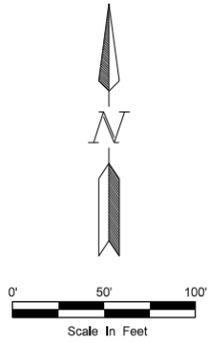
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	5

SPEC CODE	BID ITEM	QTY	UNIT
261 0112	FIBER ROLLS 12 IN Sta 67+00 to 77+00	40	LF
251 0300	SEEDING CLASS III Sta 67+00 to 77+00	1.115	ACRE
253 0201	HYDRAULIC MULCH Sta 67+00 to 77+00	1.115	ACRE
255 0103	ECB TYPE 3 Sta 67+00 to 77+00	48	SY



**Legend**

- Seeding Class III/Hydraulic Mulch
- Existing Storm Drain Line
- Proposed Inlet
- Proposed Flared End Section
- Proposed Storm Drain Line
- Inlet Protection-Fiber Roll 12 Inch
- ECB (Erosion Control Blanket) Type 3



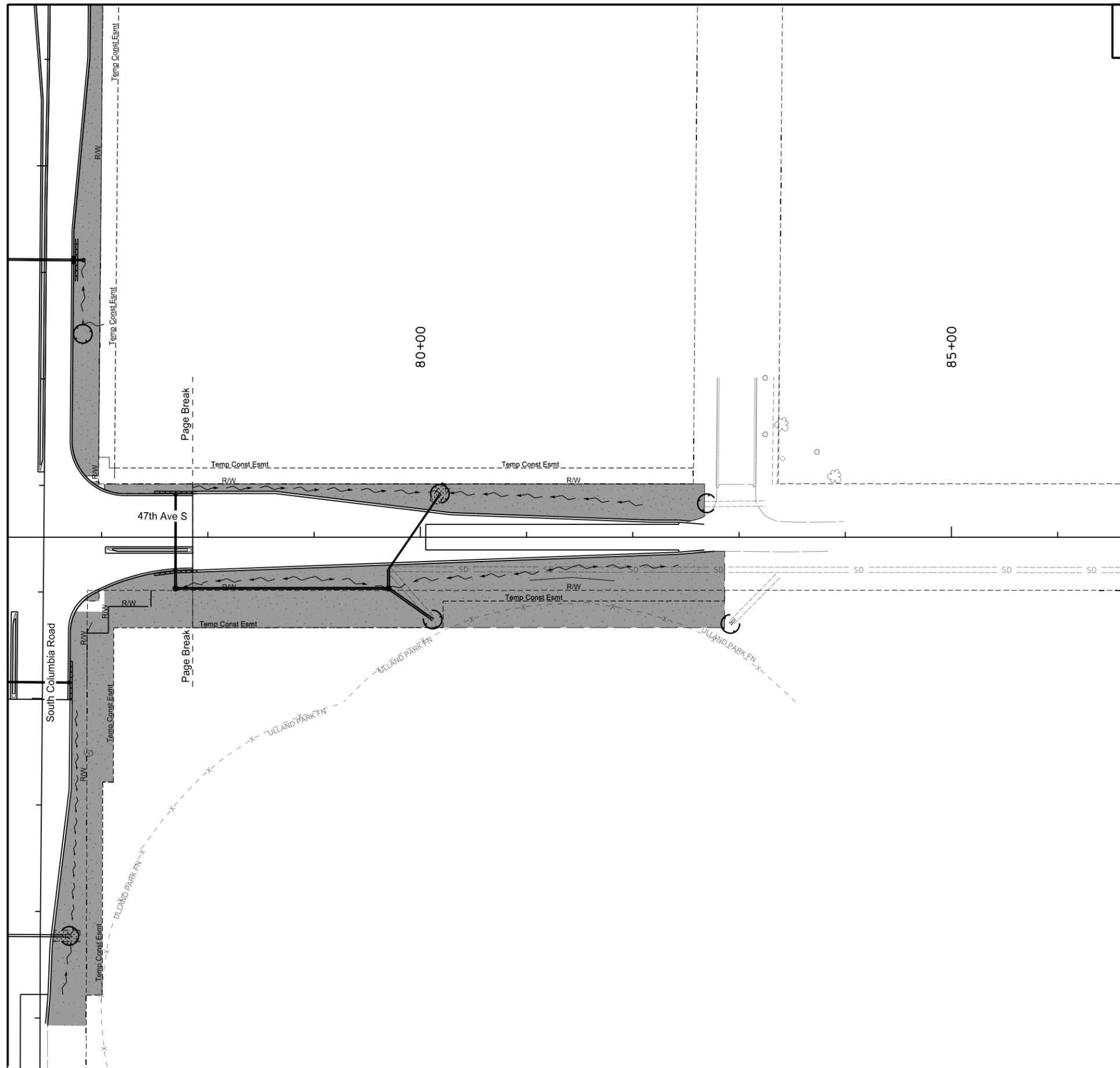
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Permanent Sediment and Erosion Control  
 Sta 67+00 to 74+89

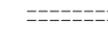
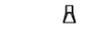
Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

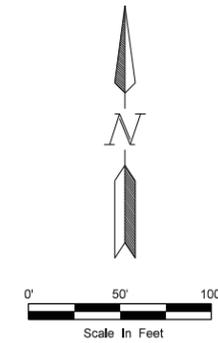
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	77	6

SPEC CODE	BID ITEM	QTY	UNIT
261 0112	FIBER ROLLS 12 IN Sta 77+00 to 87+00	80	LF
251 0300	SEEDING CLASS III Sta 77+00 to 87+00	0.953	ACRE
253 0201	HYDRAULIC MULCH Sta 77+00 to 87+00	0.953	ACRE
255 0103	ECB TYPE 3 Sta 77+00 to 87+00	20	SY



**Legend**

-  Seeding Class III/Hydraulic Mulch
-  Existing Storm Drain Line
-  Proposed Inlet
-  Proposed Flared End Section
-  Proposed Storm Drain Line
-  Inlet Protection-Fiber Roll 12 Inch
-  ECB (Erosion Control Blanket) Type 3

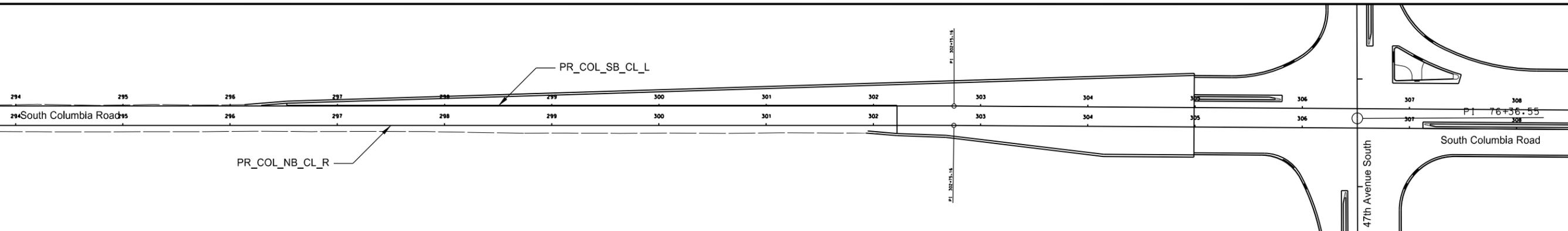
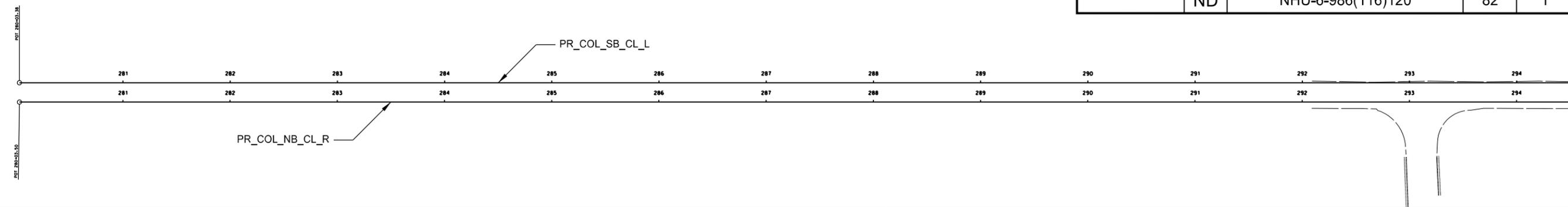


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Permanent Sediment and Erosion Control  
 Sta 77+86 to 87+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	82	1



**Northbound Alignment**

Chain PR\_COL\_NB\_CL\_R contains:  
8000 8001 8002 8003 8004 8005

Beginning chain PR\_COL\_NB\_CL\_R description  
=====

Point 8000	N	335,274.5989 E	2,810,851.8763	Sta	280+03.50
Course from 8000 to 8001 N 2°21' 59.52" W Dist 2,271.6570					
Point 8001	N	337,544.3185 E	2,810,758.0749	Sta	302+75.16
Course from 8001 to 8002 N 1°59' 22.88" W Dist 691.9540					
Point 8002	N	338,235.8553 E	2,810,734.0505	Sta	309+67.11
Course from 8002 to 8003 N 1°21' 11.14" W Dist 135.0083					
Point 8003	N	338,370.8260 E	2,810,730.8624	Sta	311+02.12
Course from 8003 to 8004 N 1°59' 22.88" W Dist 2,198.2763					
Point 8004	N	340,567.7769 E	2,810,654.5391	Sta	333+00.40
Course from 8004 to 8005 N 2°01' 33.97" W Dist 2,651.0592					
Point 8005	N	343,217.1787 E	2,810,560.8114	Sta	359+51.45

Ending chain PR\_COL\_NB\_CL\_R description  
=====

**Southbound Alignment**

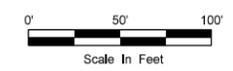
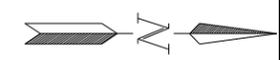
Chain PR\_COL\_SB\_CL\_L contains:  
8030 8031 8032 8033 8034

Beginning chain PR\_COL\_SB\_CL\_L description  
=====

Point 8030	N	335,273.8553 E	2,810,833.8920	Sta	280+03.38
Course from 8030 to 8031 N 2°21' 59.52" W Dist 2,271.7758					
Point 8031	N	337,543.6935 E	2,810,740.0857	Sta	302+75.16
Course from 8031 to 8032 N 1°59' 22.88" W Dist 691.9540					
Point 8032	N	338,235.2303 E	2,810,716.0613	Sta	309+67.11
Course from 8032 to 8033 N 2°37' 34.62" W Dist 135.0083					
Point 8033	N	338,370.0969 E	2,810,709.8751	Sta	311+02.12
Course from 8033 to 8034 N 1°59' 22.88" W Dist 2,097.8798					
Point 8034	N	340,466.7118 E	2,810,637.0374	Sta	332+00.00

Ending chain PR\_COL\_SB\_CL\_L description  
=====

Stationing and Offset Based on Alignment PR\_COL\_NB\_CL\_R

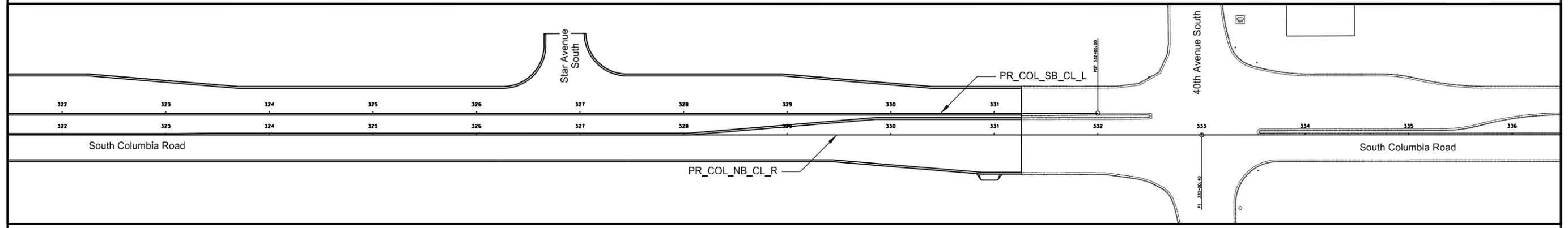
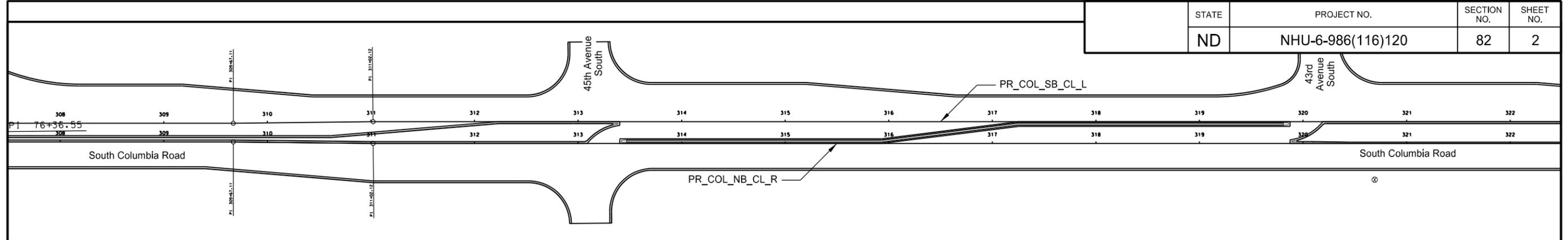


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Grand Forks, ND

Survey Data Layout  
Mainline - South Columbia Road

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	82	2



**Northbound Alignment**

Chain PR\_COL\_NB\_CL\_R contains:  
8000 8001 8002 8003 8004 8005

Beginning chain PR\_COL\_NB\_CL\_R description

Point 8000	N	335,274.5989 E	2,810,851.8763	Sta	280+03.50
Course from 8000 to 8001 N 2°21' 59.52" W Dist 2,271.6570					
Point 8001	N	337,544.3185 E	2,810,758.0749	Sta	302+75.16
Course from 8001 to 8002 N 1°59' 22.88" W Dist 691.9540					
Point 8002	N	338,235.8553 E	2,810,734.0505	Sta	309+67.11
Course from 8002 to 8003 N 1°21' 11.14" W Dist 135.0083					
Point 8003	N	338,370.8260 E	2,810,730.8624	Sta	311+02.12
Course from 8003 to 8004 N 1°59' 22.88" W Dist 2,198.2763					
Point 8004	N	340,567.7769 E	2,810,654.5391	Sta	333+00.40
Course from 8004 to 8005 N 2°01' 33.97" W Dist 2,651.0592					
Point 8005	N	343,217.1787 E	2,810,560.8114	Sta	359+51.45

Ending chain PR\_COL\_NB\_CL\_R description

**Southbound Alignment**

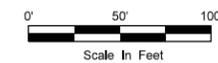
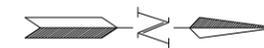
Chain PR\_COL\_SB\_CL\_L contains:  
8030 8031 8032 8033 8034

Beginning chain PR\_COL\_SB\_CL\_L description

Point 8030	N	335,273.8553 E	2,810,833.8920	Sta	280+03.38
Course from 8030 to 8031 N 2°21' 59.52" W Dist 2,271.7758					
Point 8031	N	337,543.6935 E	2,810,740.0857	Sta	302+75.16
Course from 8031 to 8032 N 1°59' 22.88" W Dist 691.9540					
Point 8032	N	338,235.2303 E	2,810,716.0613	Sta	309+67.11
Course from 8032 to 8033 N 2°37' 34.62" W Dist 135.0083					
Point 8033	N	338,370.0969 E	2,810,709.8751	Sta	311+02.12
Course from 8033 to 8034 N 1°59' 22.88" W Dist 2,097.8798					
Point 8034	N	340,466.7118 E	2,810,637.0374	Sta	332+00.00

Ending chain PR\_COL\_SB\_CL\_L description

Stationing and Offset Based on Alignment PR\_COL\_NB\_CL\_R

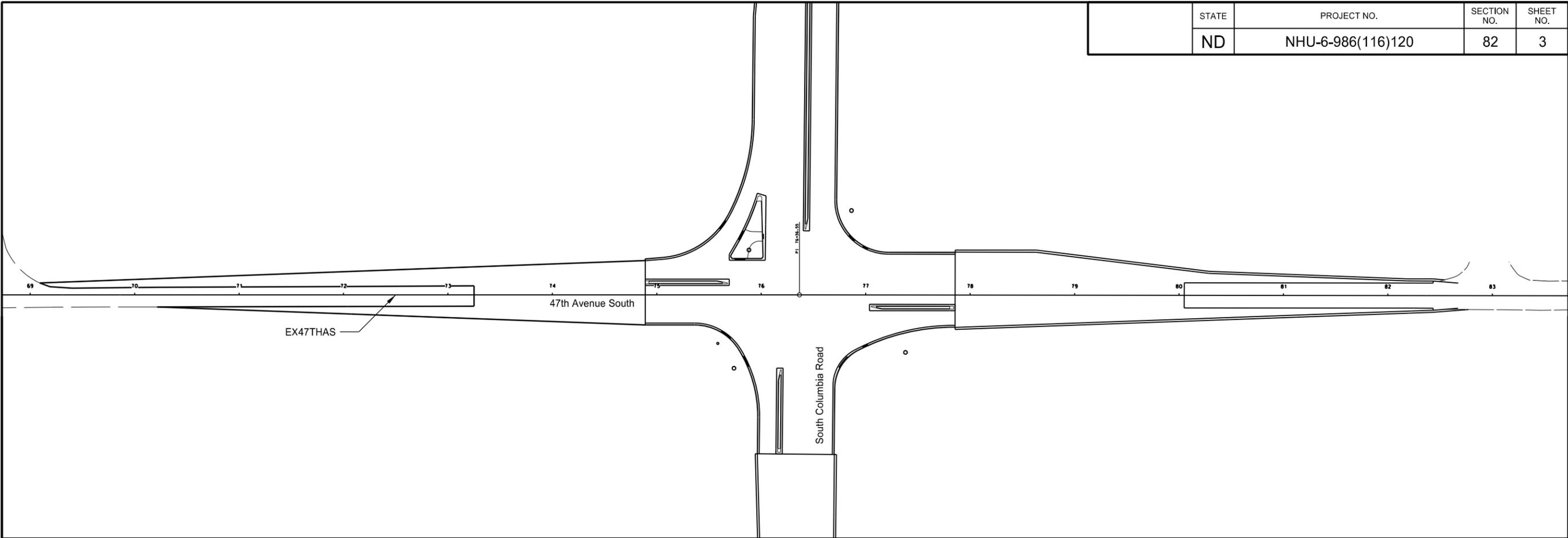


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Survey Data Layout  
Mainline - South Columbia Road

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	82	3



**47th Avenue South Alignment**

Stationing and Offset Based on Alignment EX47THAS, Where Shown on the Plans

Chain EX47THAS contains:  
20 21 22

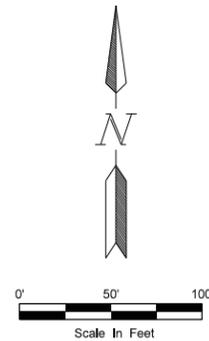
Beginning chain EX47THAS description

```

=====
Point 20      N  337,801.8270 E  2,808,102.1150 Sta  50+00.00
Course from 20 to 21 N 87° 25' 52.88" E Dist 2,636.5526
Point 21      N  337,919.9875 E  2,810,736.0185 Sta  76+36.55
Course from 21 to 22 N 87° 30' 02.28" E Dist 2,641.6400
Point 22      N  338,035.1850 E  2,813,375.1455 Sta  102+78.19
=====

```

Ending chain EX47THAS description

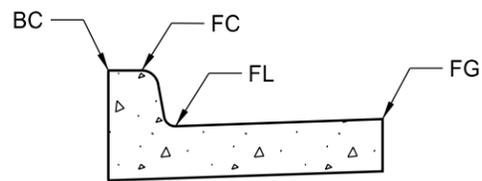
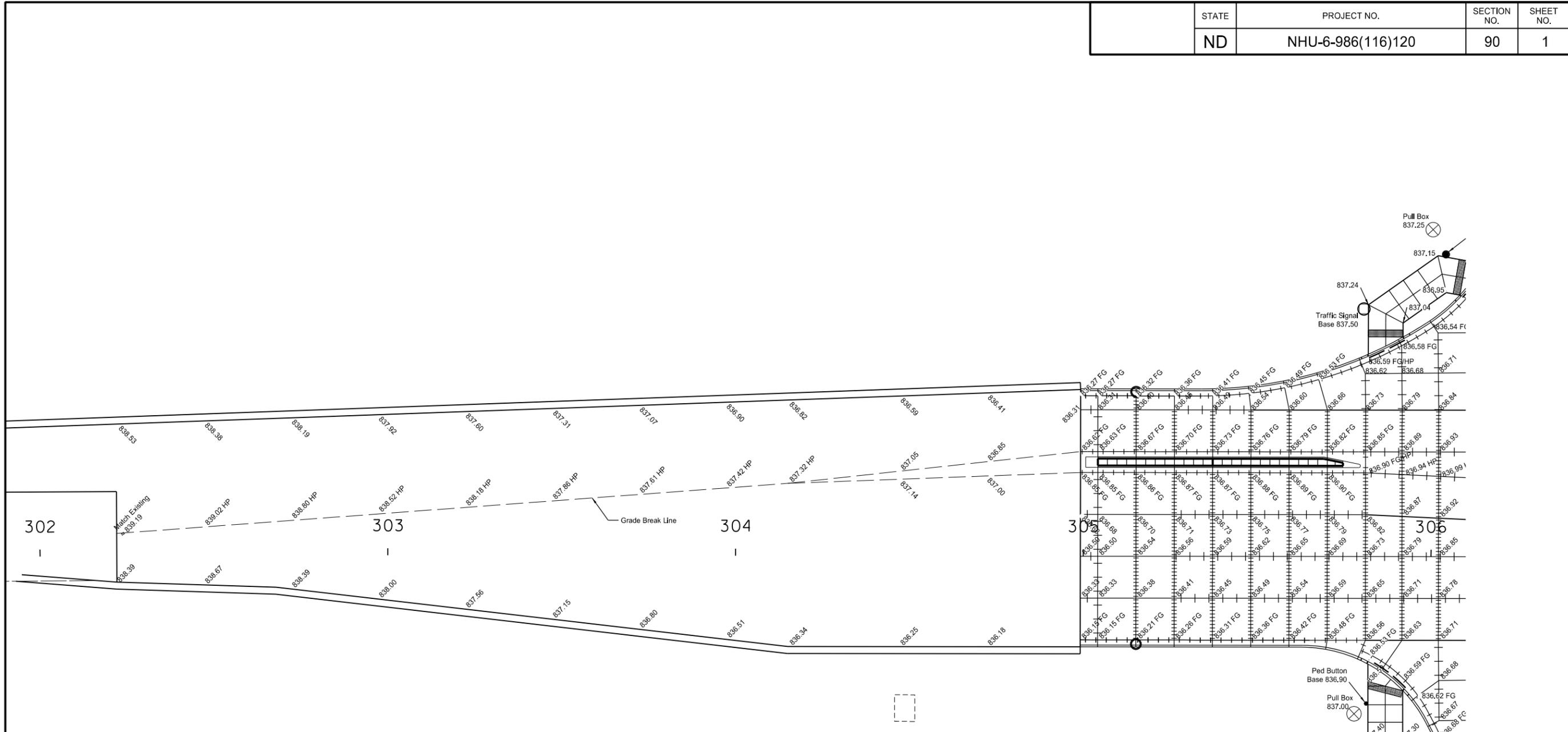


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Survey Data Layout  
47th Avenue South

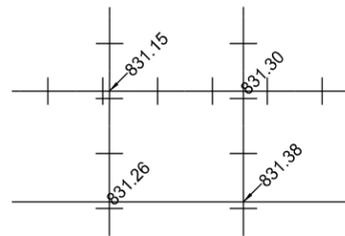
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	1

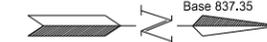


BC = Back of Curb  
FC = Front of Curb  
FL = Flow Line  
FG = Front of Gutter  
HP = High Point  
LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
Joint Intersections

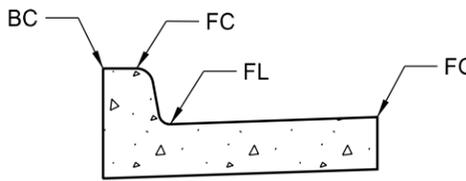
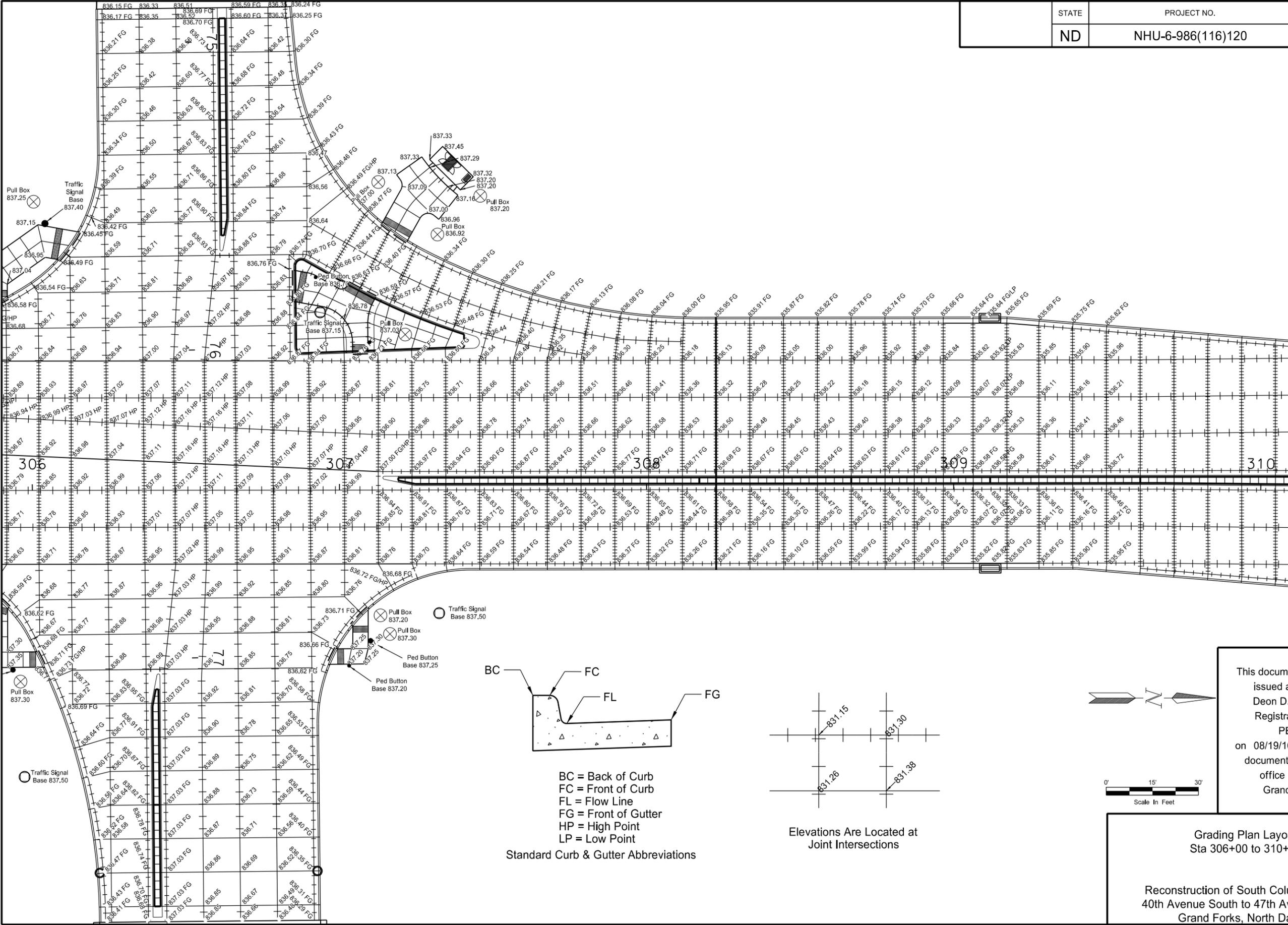


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Grading Plan Layout  
Sta 302+00 to 306+00

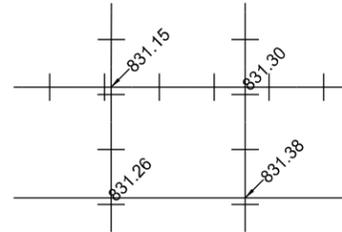
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	2

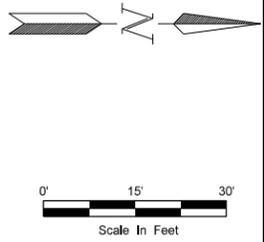


BC = Back of Curb  
FC = Front of Curb  
FL = Flow Line  
FG = Front of Gutter  
HP = High Point  
LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
Joint Intersections

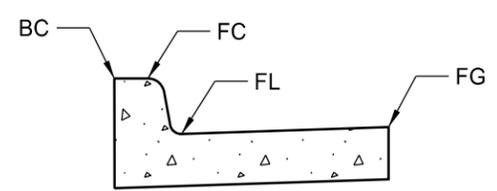
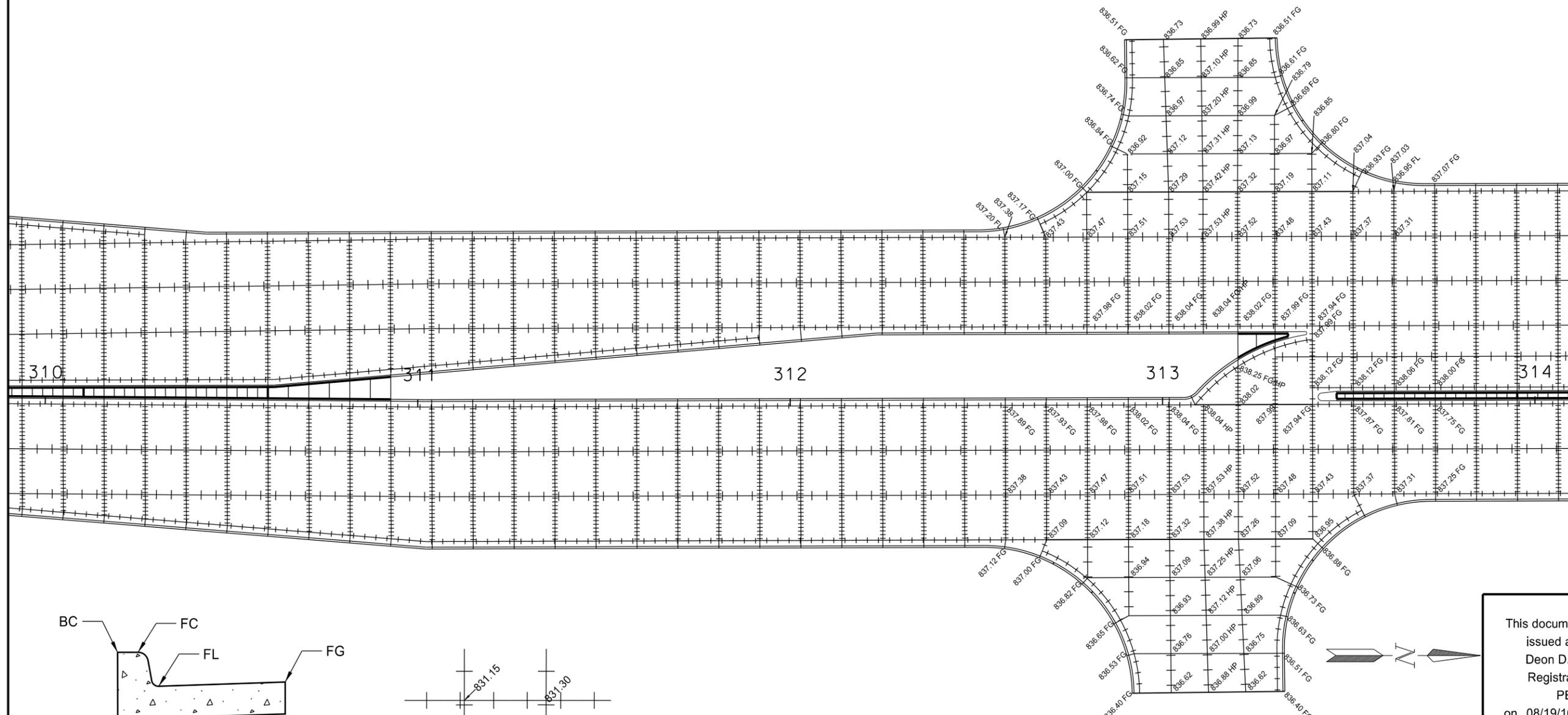


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Grading Plan Layout  
Sta 306+00 to 310+00

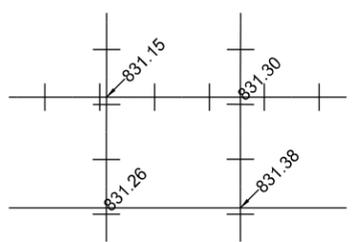
Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(116)120	90	3

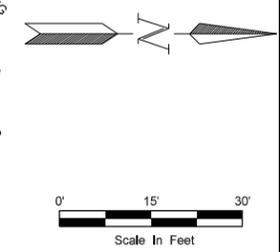


BC = Back of Curb  
 FC = Front of Curb  
 FL = Flow Line  
 FG = Front of Gutter  
 HP = High Point  
 LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
 Joint Intersections



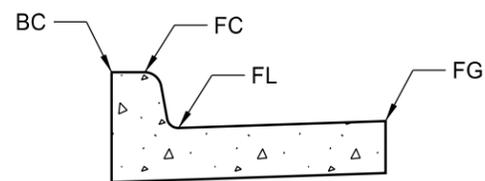
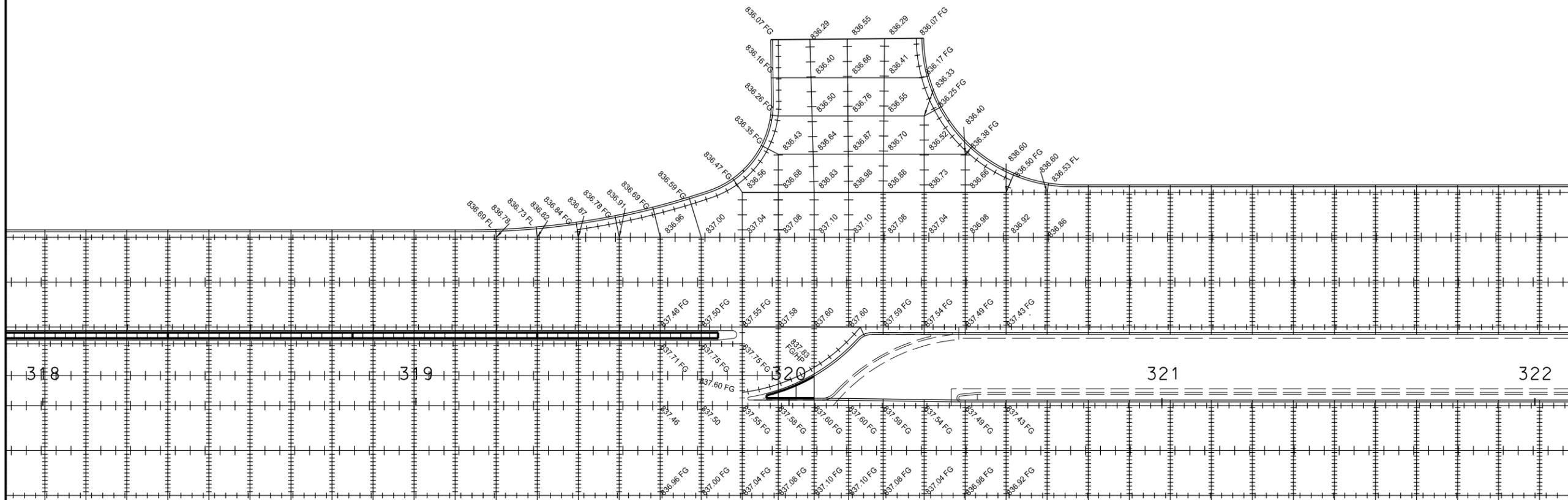
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Grading Plan Layout  
 Sta 310+00 to 314+00

Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

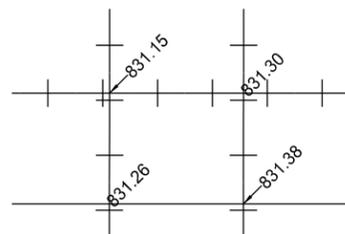


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	5

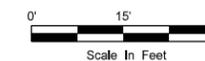
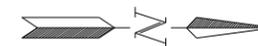


BC = Back of Curb  
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FG = Front of Gutter  
HP = High Point  
LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
Joint Intersections



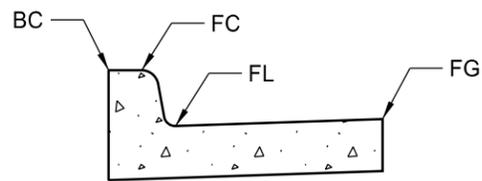
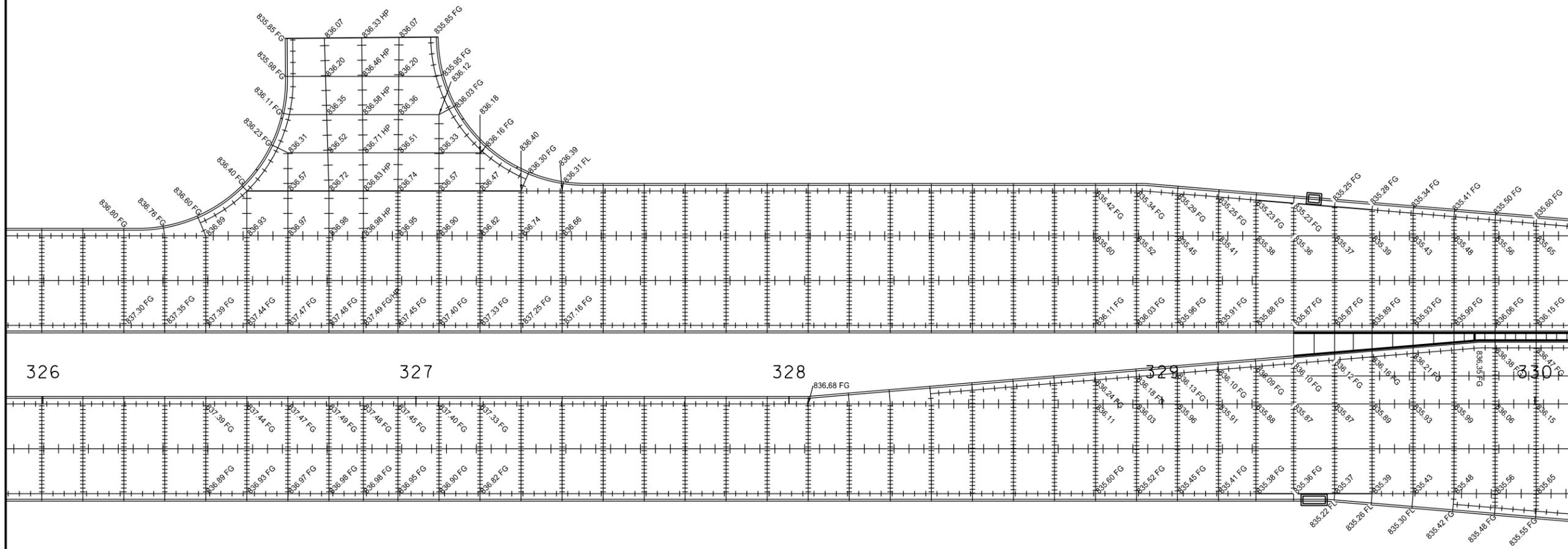
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Grading Plan Layout  
Sta 318+00 to 322+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

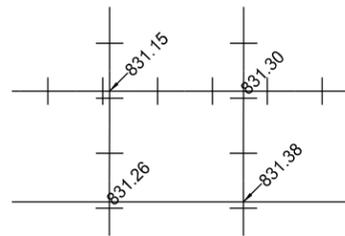


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	7

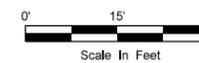
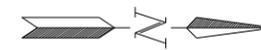


BC = Back of Curb  
 FC = Front of Curb  
 FL = Flow Line  
 FG = Front of Gutter  
 HP = High Point  
 LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
 Joint Intersections

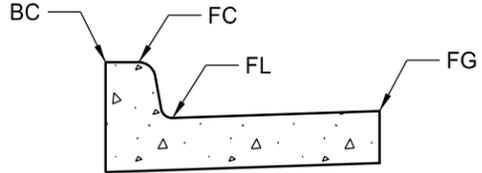
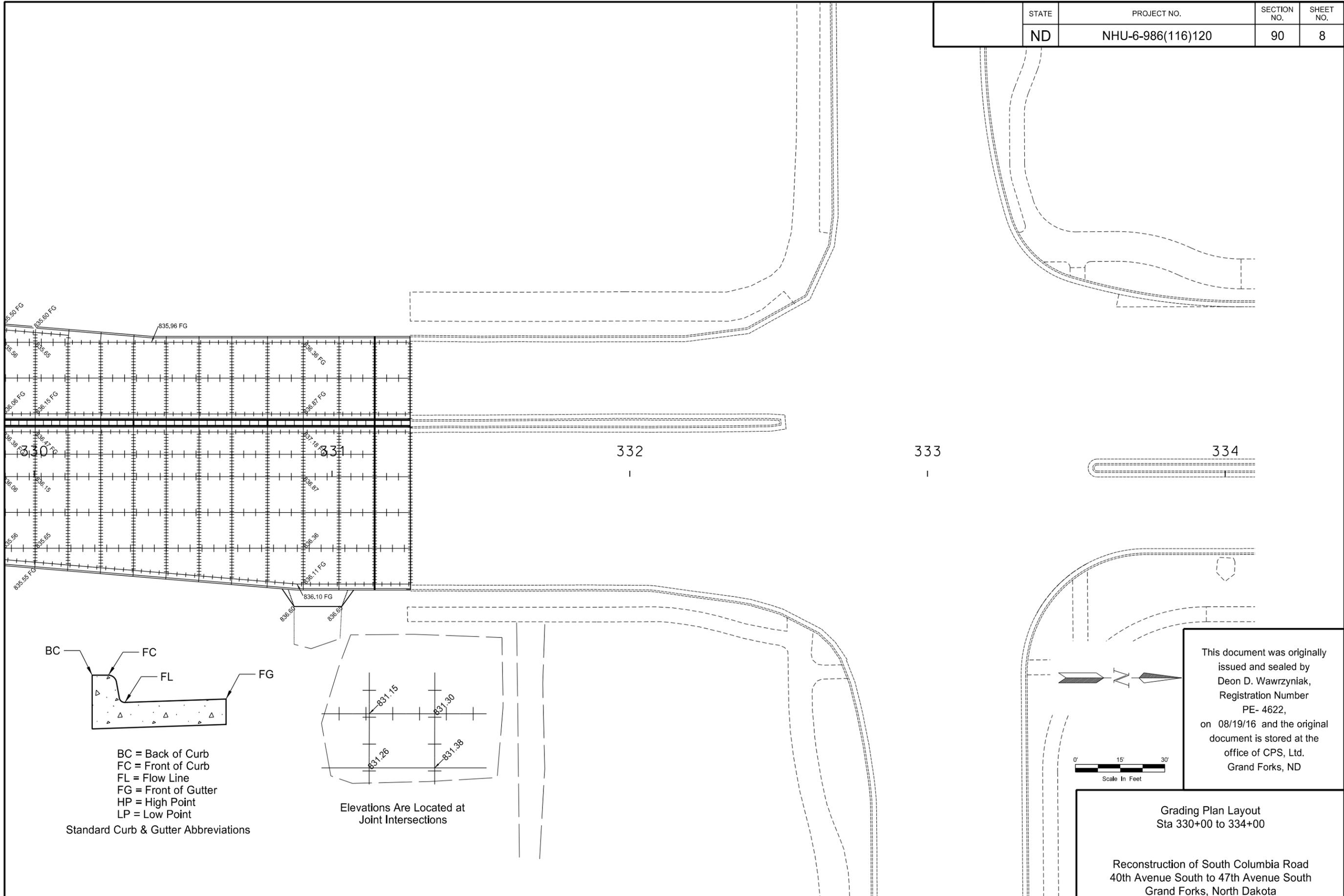


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Grading Plan Layout  
 Sta 326+00 to 330+00

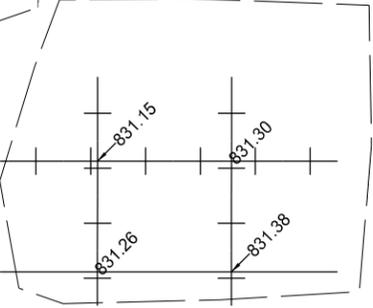
Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	8

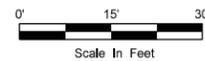
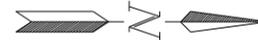


BC = Back of Curb  
FC = Front of Curb  
FL = Flow Line  
FG = Front of Gutter  
HP = High Point  
LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at  
Joint Intersections

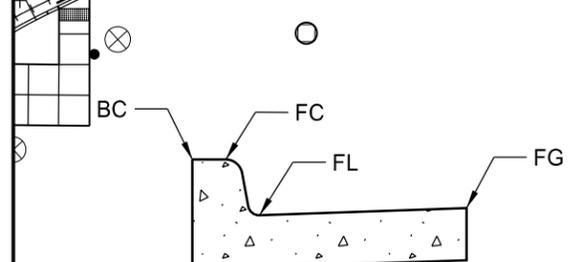
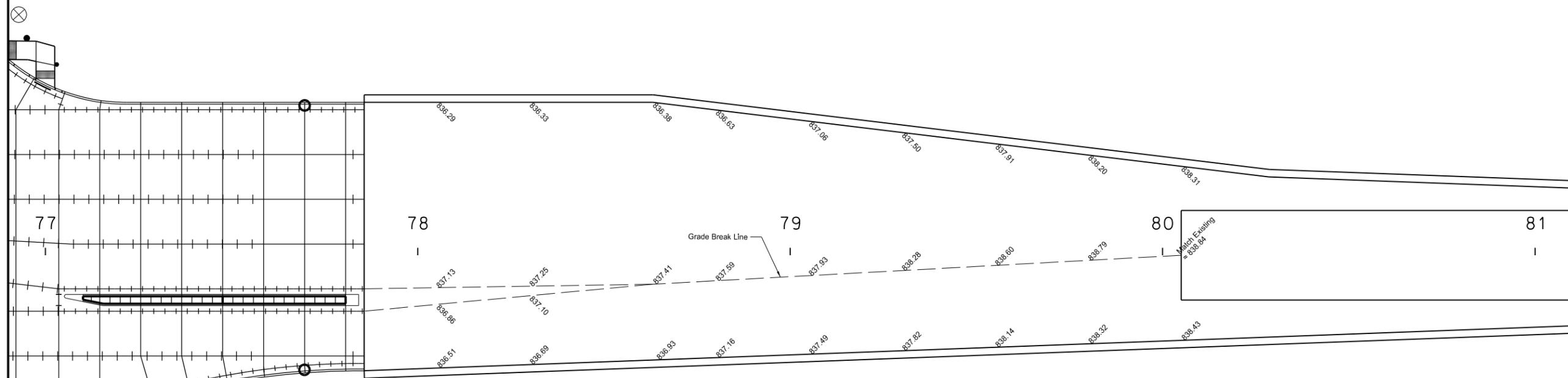


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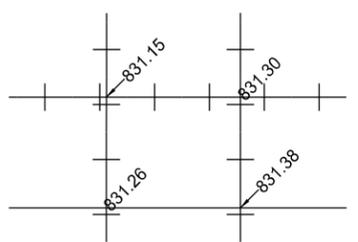
Grading Plan Layout  
Sta 330+00 to 334+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

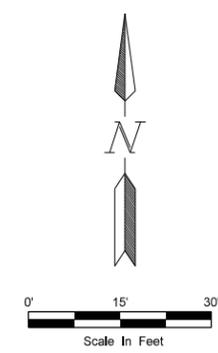
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	9



BC = Back of Curb  
 FC = Front of Curb  
 FL = Flow Line  
 FG = Front of Gutter  
 HP = High Point  
 LP = Low Point  
 Standard Curb & Gutter Abbreviations



Elevations Are Located at Joint Intersections

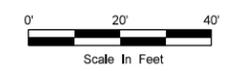
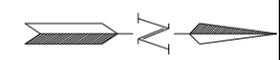
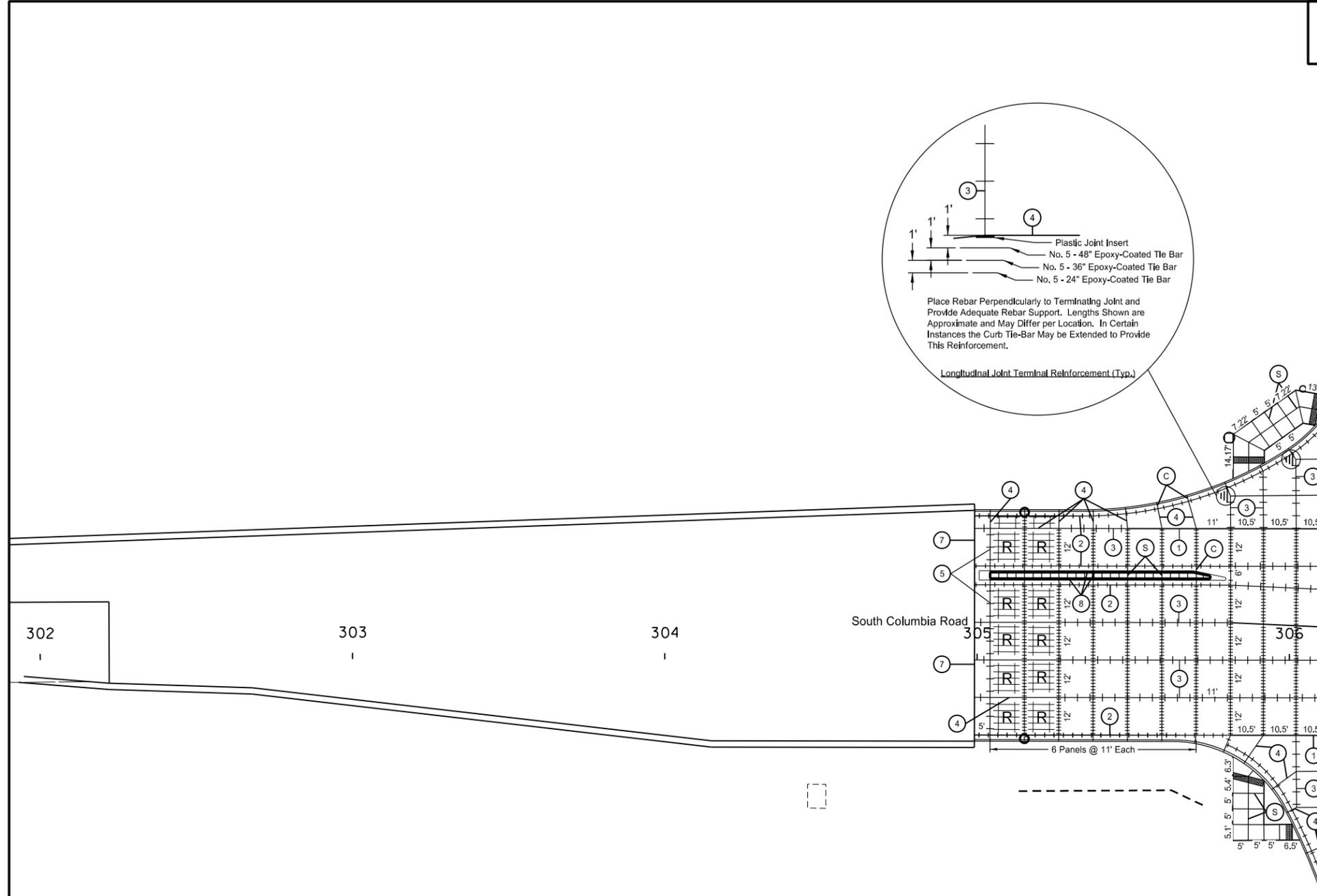
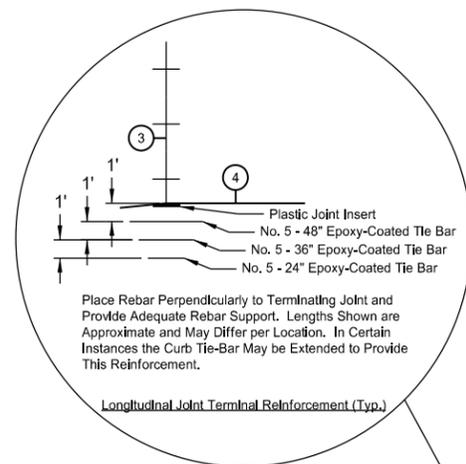


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Grading Plan Layout  
 47th Avenue South  
 Sta 77+86 to 81+00  
 Reconstruction of South Columbia Road  
 40th Avenue South to 47th Avenue South  
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	10

Key	Qty	Description
①	90	Type 1 Joint
②	490	Type 2 Joint
③	312	Type 3 or Type 5 Joint
④	156	Type 4 Joint
⑤	60	Type 5 Joint
⑦	74	Type 7 Joint
⑧	146	Type 8 Joint
C	71	Curb Contraction Joint
S	179	Sidewalk/Bikeway/Median Sawcut
	490	Contraction Joint Dowel Assembly
		Reinforced Panels
		Panel Dimension

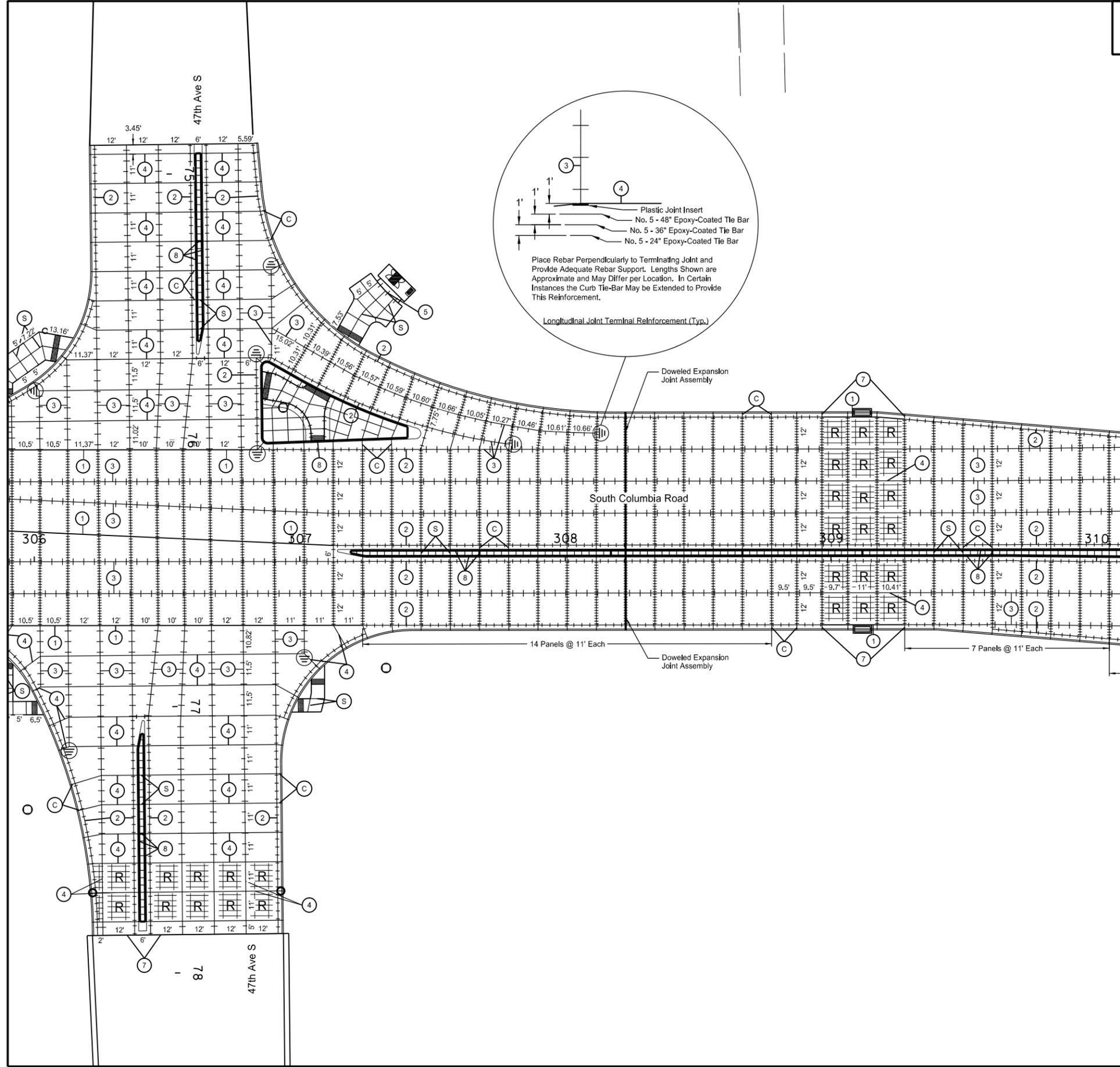


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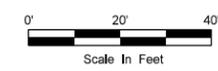
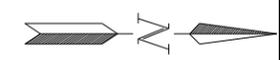
Joint Layout  
Sta 302+00 to 306+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	11



Key	Qty	Description
①	382	Type 1 Joint
②	2160	Type 2 Joint
③	2695	Type 3 or Type 5 Joint
④	1658	Type 4 Joint
⑤	12	Type 5 Joint
⑦	80	Type 7 Joint
⑧	1013	Type 8 Joint
C	374	Curb Contraction Joint
S	685	Sidewalk/Bikeway/Median Sawcut
	2584	Contraction Joint Dowel Assembly
	60	Doweled Expansion Joint Assembly
		Reinforced Panels
		Panel Dimension



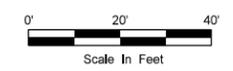
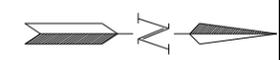
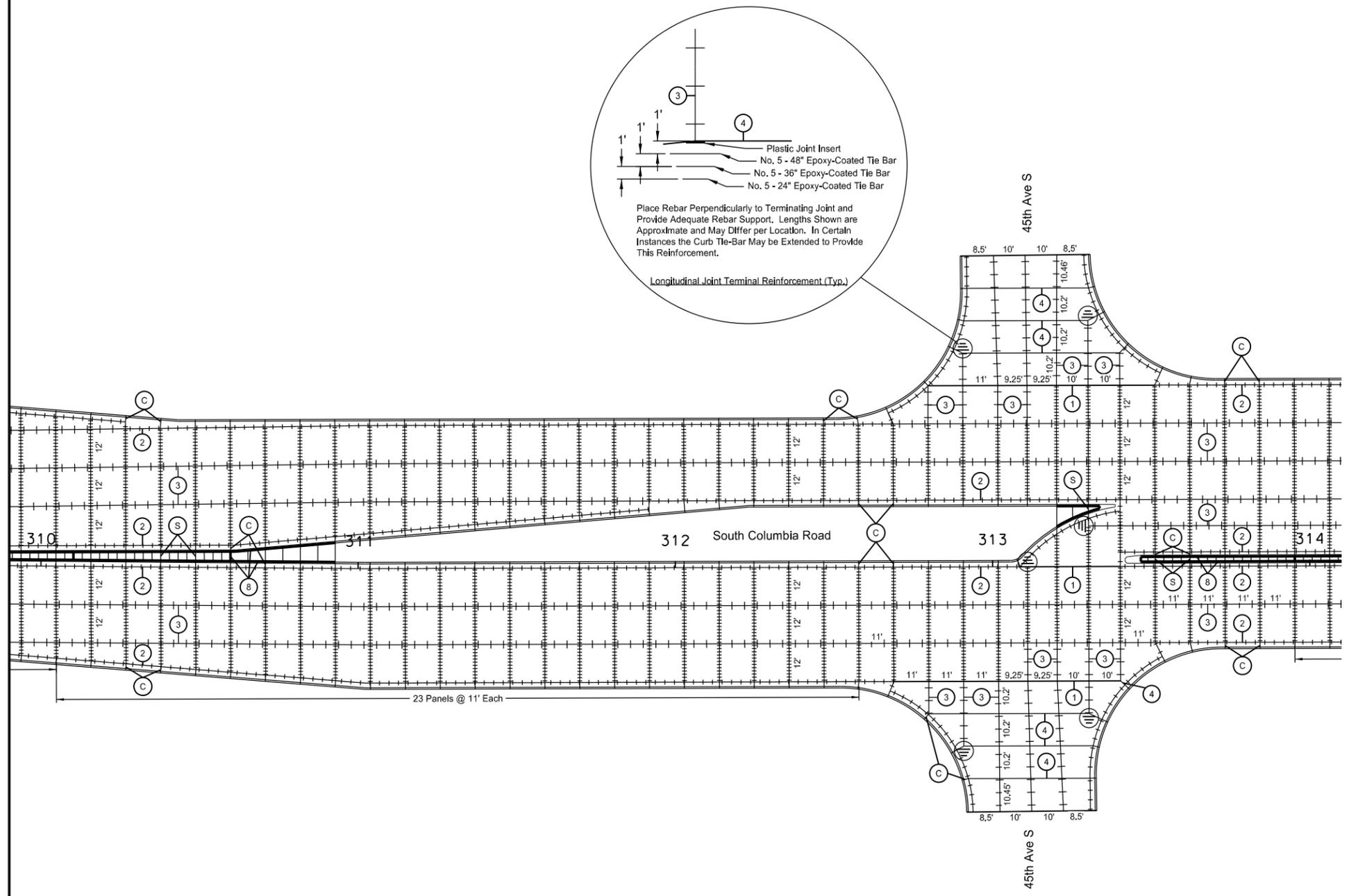
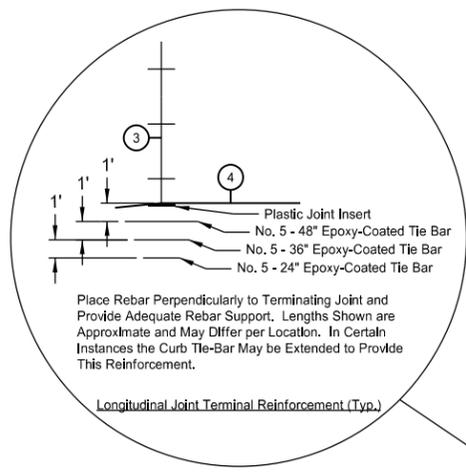
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Joint Layout  
Sta 306+00 to 310+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	12

Key	Qty	Description
①	175	Type 1 Joint
②	1681	Type 2 Joint
③	2052	Type 3 or Type 5 Joint
④	281	Type 4 Joint
⑤	0	Type 5 Joint
⑦	0	Type 7 Joint
⑧	330	Type 8 Joint
Ⓢ	296	Curb Contraction Joint
Ⓢ	109	Sidewalk/Bikeway/Median Sawcut
Ⓢ	2465	Contraction Joint Dowel Assembly
Ⓢ		Reinforced Panels
Ⓢ		Panel Dimension



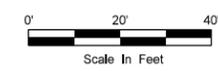
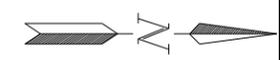
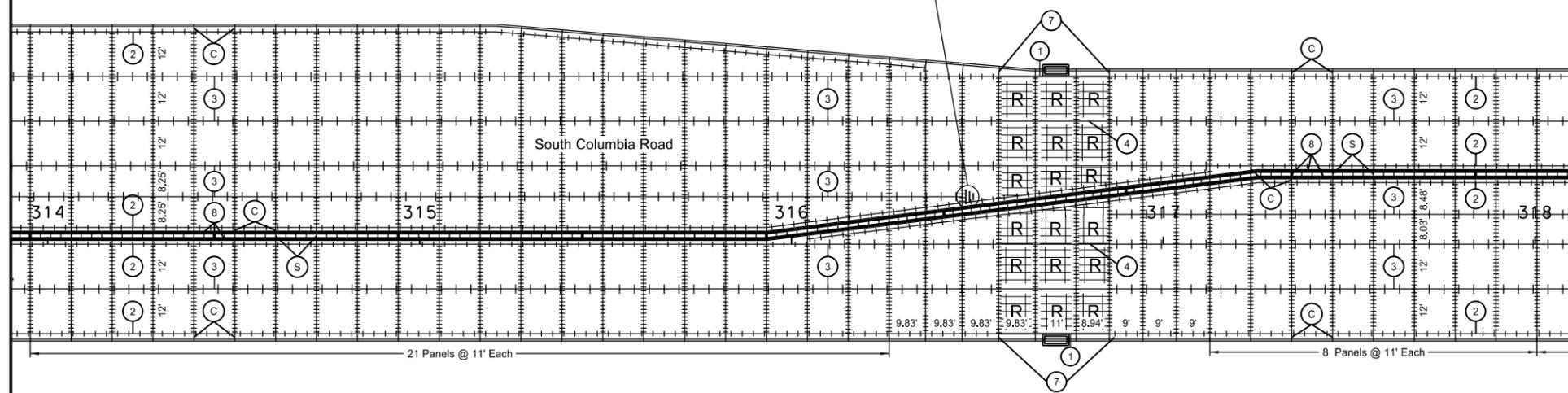
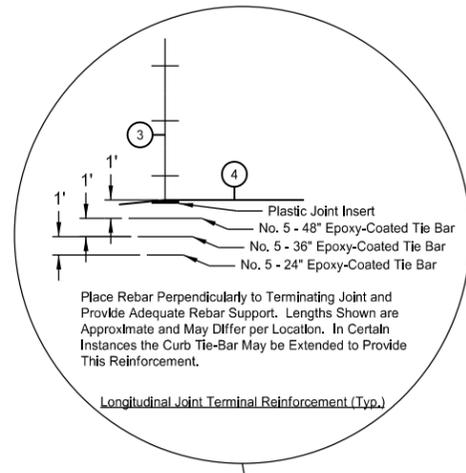
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Joint Layout  
Sta 310+00 to 314+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	13

Key	Qty	Description
①	60	Type 1 Joint
②	1610	Type 2 Joint
③	1729	Type 3 or Type 5 Joint
④	119	Type 4 Joint
⑤	0	Type 5 Joint
⑦	8	Type 7 Joint
⑧	815	Type 8 Joint
Ⓢ	253	Curb Contraction Joint
Ⓢ	222	Sidewalk/Bikeway/Median Sawcut
Ⓢ	2588	Contraction Joint Dowel Assembly
Ⓢ		Reinforced Panels
Ⓢ		Panel Dimension



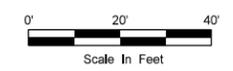
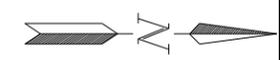
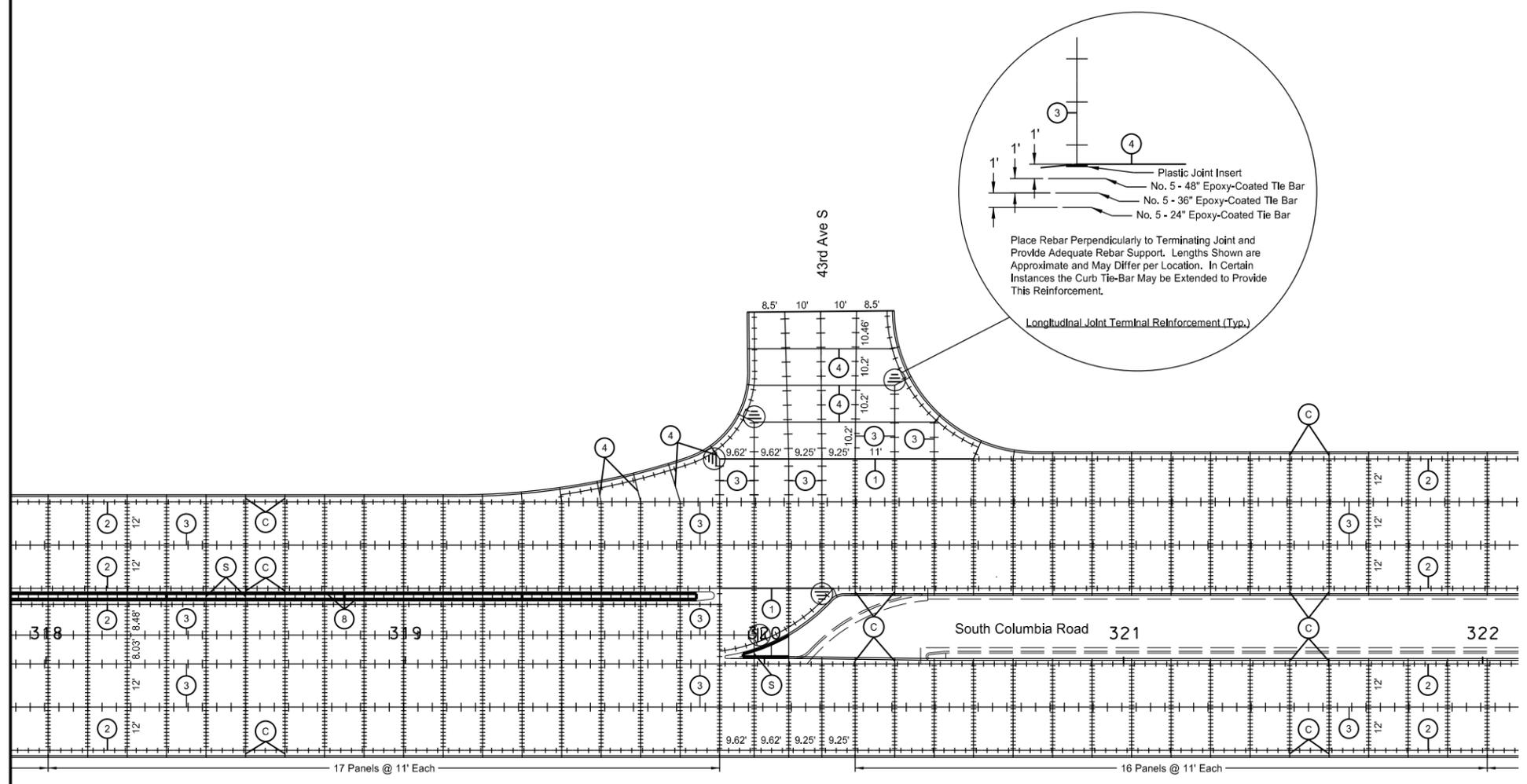
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Joint Layout  
Sta 314+00 to 318+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	14

Key	Qty	Description
①	102	Type 1 Joint
②	1640	Type 2 Joint
③	1665	Type 3 or Type 5 Joint
④	164	Type 4 Joint
⑤	0	Type 5 Joint
⑦	0	Type 7 Joint
⑧	395	Type 8 Joint
Ⓢ	269	Curb Contraction Joint
Ⓢ	100	Sidewalk/Bikeway/Median Sawcut
Ⓢ	2285	Contraction Joint Dowel Assembly
Ⓢ		Reinforced Panels
Ⓢ		Panel Dimension



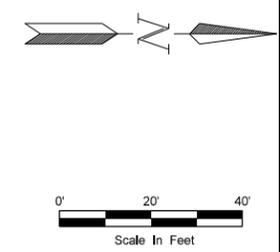
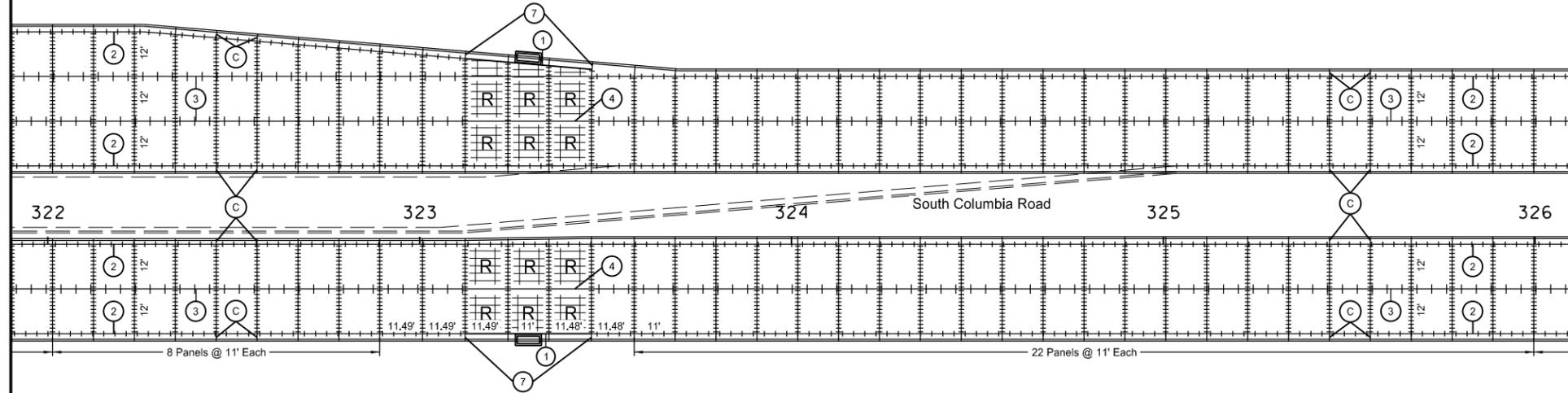
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Joint Layout  
Sta 318+00 to 322+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	15

Key	Qty	Description
①	68	Type 1 Joint
②	1602	Type 2 Joint
③	786	Type 3 or Type 5 Joint
④	102	Type 4 Joint
⑤	0	Type 5 Joint
⑦	8	Type 7 Joint
⑧	0	Type 8 Joint
Ⓢ	282	Curb Contraction Joint
Ⓢ	0	Sidewalk/Bikeway/Median Sawcut
	1883	Contraction Joint Dowel Assembly
		Reinforced Panels
		Panel Dimension

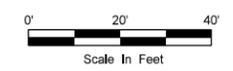
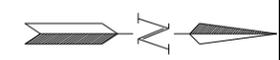
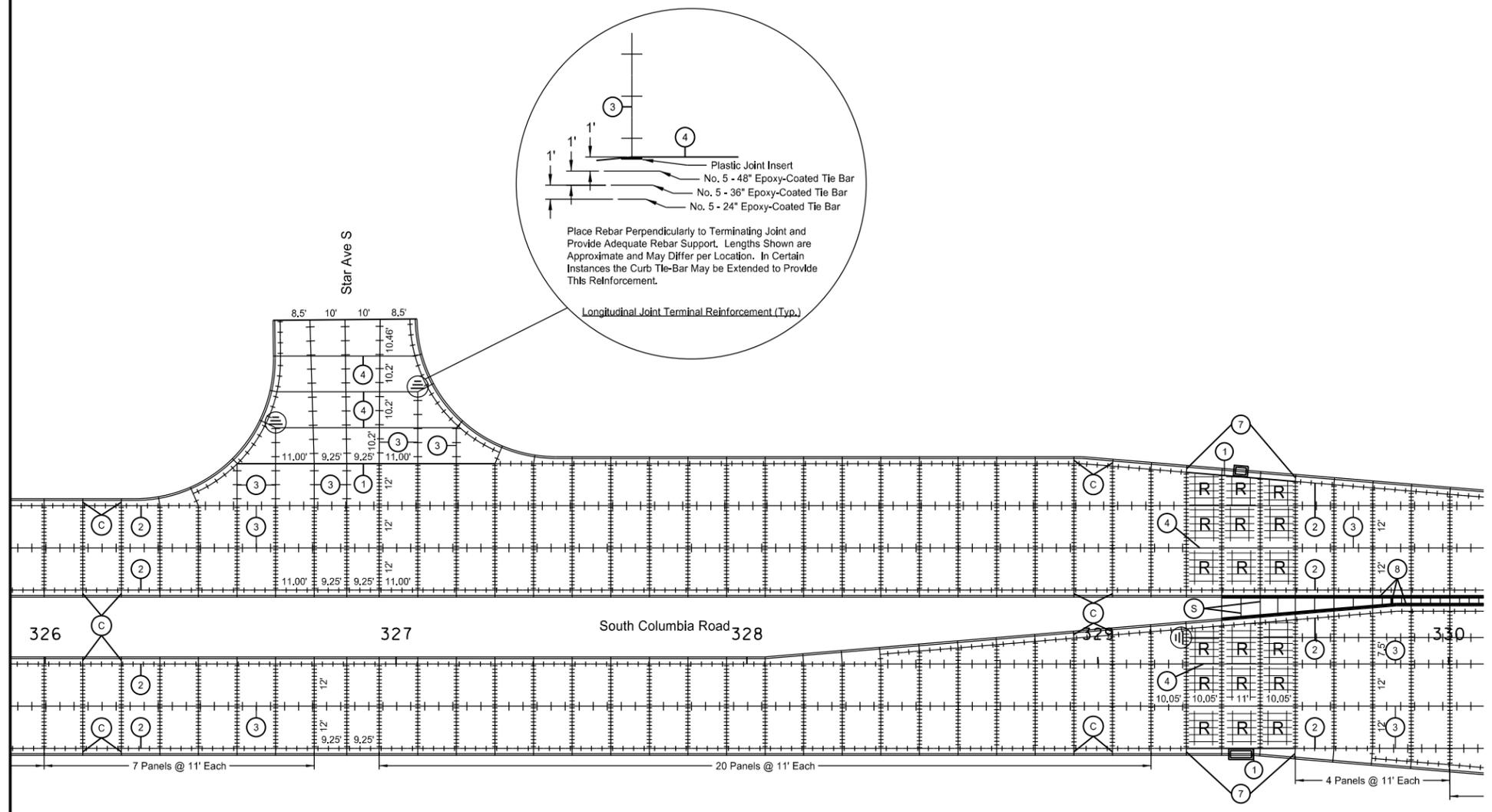


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Joint Layout  
Sta 322+00 to 326+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

Key	Qty	Description
①	135	Type 1 Joint
②	1638	Type 2 Joint
③	1409	Type 3 or Type 5 Joint
④	293	Type 4 Joint
⑤	0	Type 5 Joint
⑦	8	Type 7 Joint
⑧	132	Type 8 Joint
ⓐ	287	Curb Contraction Joint
Ⓢ	45	Sidewalk/Bikeway/Median Sawcut
	2163	Contraction Joint Dowel Assembly
		Reinforced Panels
		Panel Dimension



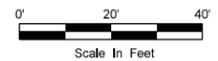
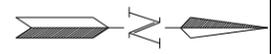
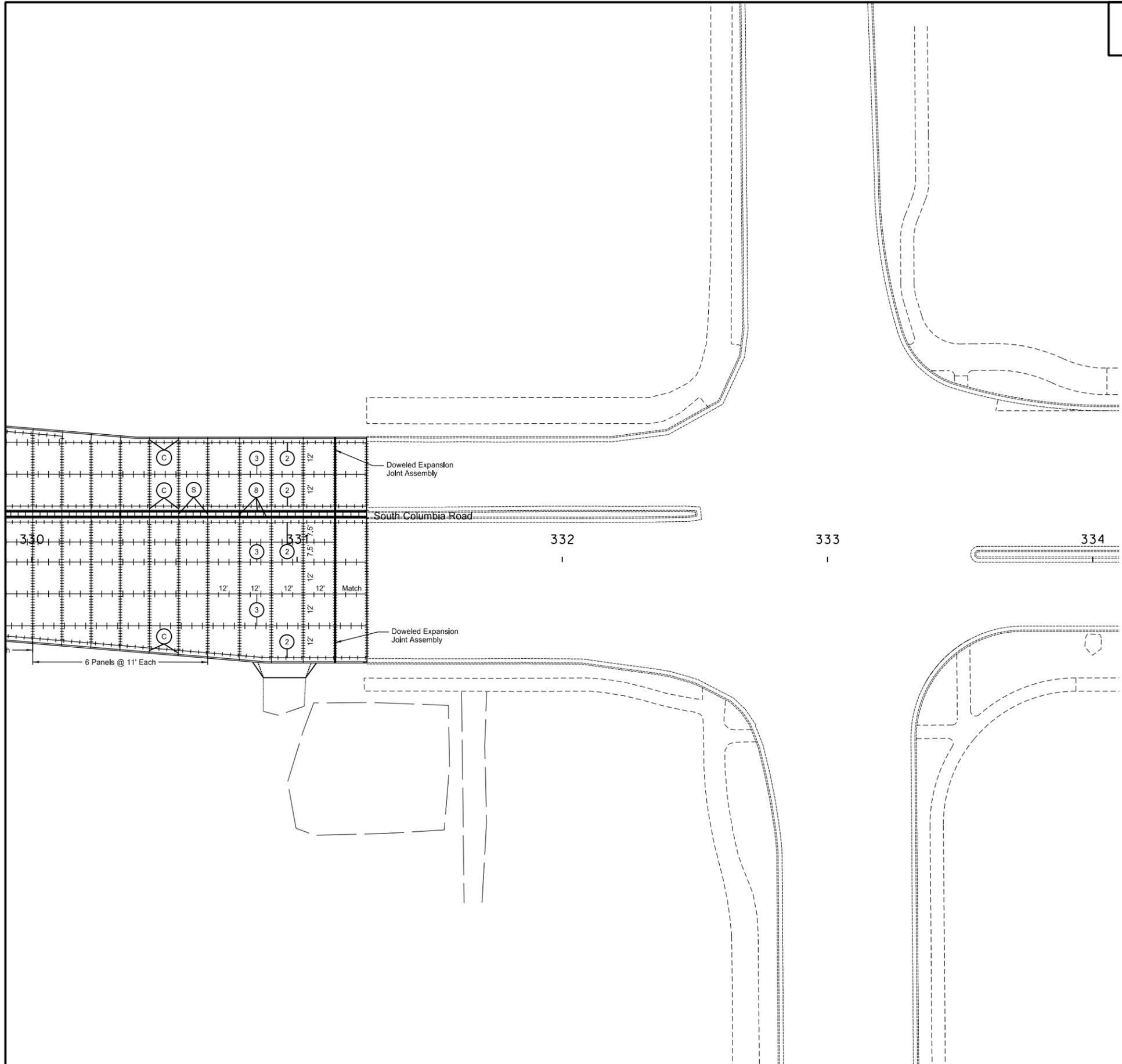
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Joint Layout  
Sta 326+00 to 330+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(116)120	90	17

Key	Qty	Description
①	0	Type 1 Joint
②	514	Type 2 Joint
③	631	Type 3 or Type 5 Joint
④	0	Type 4 Joint
⑤	0	Type 5 Joint
⑦	0	Type 7 Joint
⑧	256	Type 8 Joint
Ⓢ	88	Curb Contraction Joint
Ⓢ	84	Sidewalk/Bikeway/Median Sawcut
	795	Contraction Joint Dowel Assembly
	75	Doweled Expansion Joint Assembly
		Reinforced Panels
		Panel Dimension



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Joint Layout  
Sta 330+00 to 334+00

Reconstruction of South Columbia Road  
40th Avenue South to 47th Avenue South  
Grand Forks, North Dakota