

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2010	Pass: 22,200	Trucks: 1,800	Total: 24,000	1,547
Forecast 2035	Pass: 32,190	Trucks: 2,610	Total: 34,800	1,856
Clear Zone Distance: 14 Feet		Design Speed: 40		
Minimum Sight Dist. for Stopping: 305 Feet		Bridges: N/A		
Sight Dist. for No Passing Zone: N/A				
Pavement Design Life 30 (years)		Design ESALs: 9,980,000		

JOB # 8 CITY OF GRAND FORKS NORTH DAKOTA

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	18978	1	1

FEDERAL AID PROJECT NHU-6-986(105)109 CITY PROJECT #6623

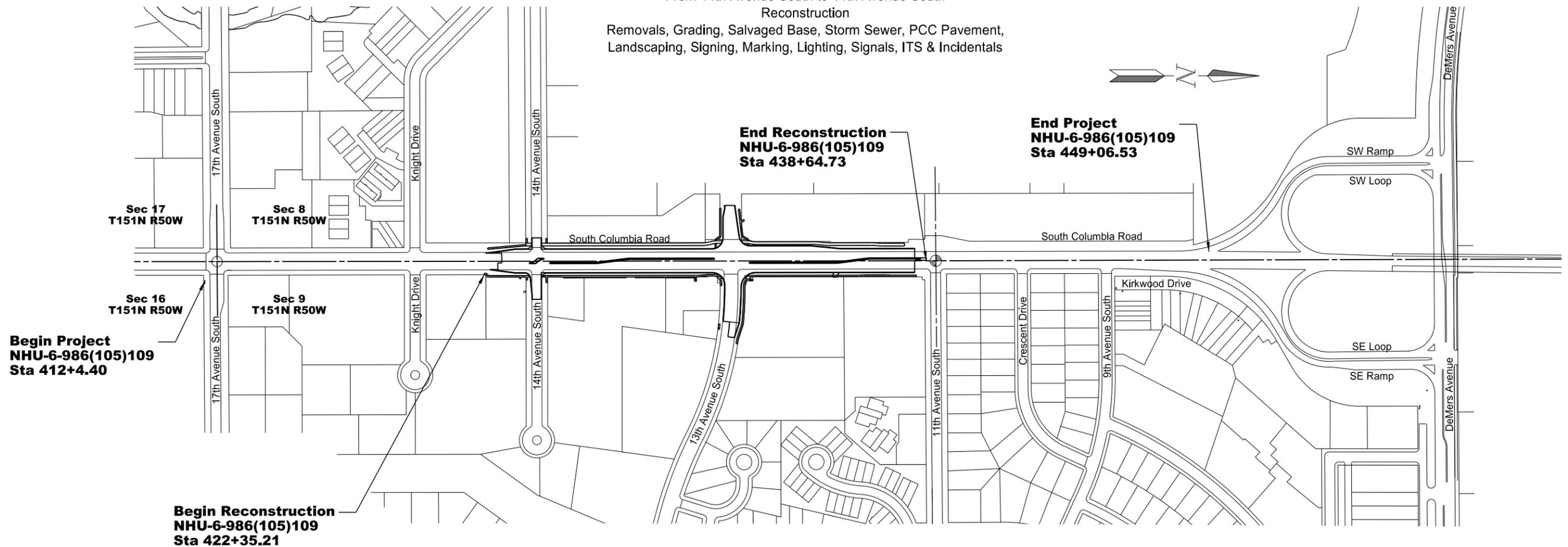
Grand Forks County
South Columbia Road
From 14th Avenue South to 11th Avenue South
Reconstruction

Removals, Grading, Salvaged Base, Storm Sewer, PCC Pavement,
Landscaping, Signing, Marking, Lighting, Signals, ITS & Incidentals

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.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NHU-6-986(105)109 - Reconstruction	0.309	0.309



STATE COUNTY MAP

DESIGNERS
Deon Wawrzyniak
John Schlieman
G. Kelby Laxdal
Jacob Nordick / Nicholas Erpelding
W. Brian Poykko

APPROVED DATE November 17, 2015

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 November 17, 2015

Deon D. Wawrzyniak /s/
CPS, Ltd.

This document was originally issued and sealed by Deon D. Wawrzyniak, Registration Number PE- 4622, on 11/17/15 and the original document is stored at the office of CPS, Ltd. Grand Forks, ND

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LIST OF STANDARD DRAWINGS

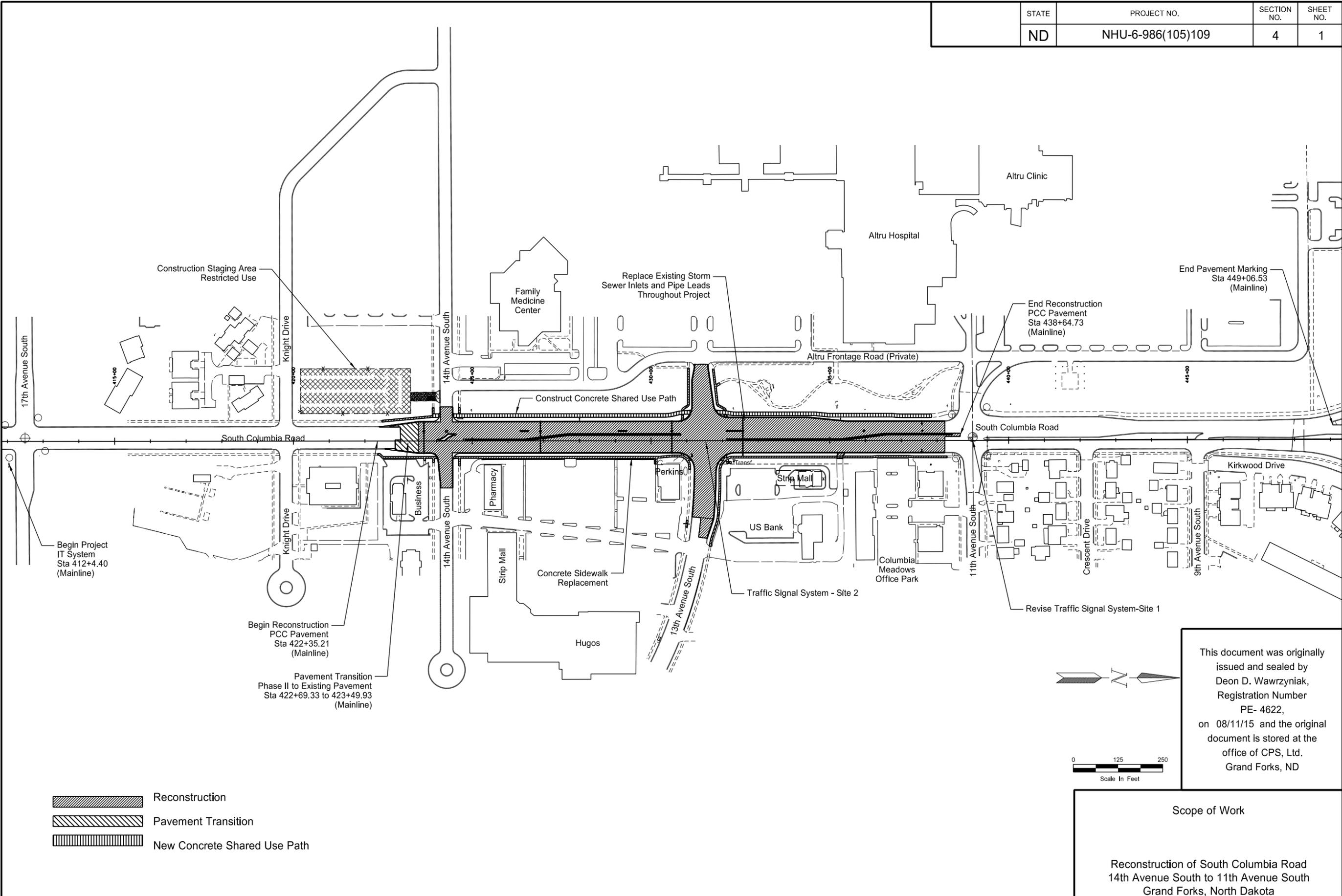
<u>Standard No.</u>	<u>Description</u>
D-101-1, 2, 3	NDDOT Abbreviations
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D-704-7	Breakaway Systems for Construction Zone Signs
D-704-8	Breakaway Systems for Construction Zone Signs
D-704-9	Construction Sign Details – Terminal and Guide Signs
D-704-10	Construction Sign Details – Regulatory Signs
D-704-11	Construction Sign Details – Warning Signs
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
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D-754-9	Letter and Arrow Details For Variable Length Signs
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D-754-87	Sign Punching, Stringer and Support Location Details for Street Name Signs and 911 Signs
D-762-1	Pavement Marking Message Details
D-770-1	Concrete Foundations (Traffic Signals and Highway Lighting)
D-770-3	Pull Box Details
D-772-2	Traffic Signal Standards
D-772-3	Traffic Signal Standards (Mast Arm Type)
D-772-4	Traffic Signal Head Mounting

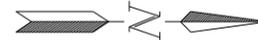
LIST OF SPECIAL PROVISIONS (SP)

<u>SP #</u>	<u>Description</u>
SP 0003(14)	Temporary Erosion and Sediment Best Management Practices
SP 0008(14)	Video Vehicle Detection System
SP 0009(14)	Interconnect Cable

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-  Reconstruction
-  Pavement Transition
-  New Concrete Shared Use Path



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Scope of Work

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

NOTES

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GENERAL NOTES

100-P01 WEEKLY PLANNING/REPORTING MEETING:

1. Purpose of Weekly Meeting.
 - A. The Contractor shall organize the weekly meeting to coordinate the efforts between subcontractors, utilities, local authorities and others.
2. Public Relations Coordinator: Planning and Reporting.
 - A. The Contractor will be responsible for sending a knowledgeable representative to conduct a weekly Reporting/Planning meeting. It will be the Contractor's responsibility to prepare minutes for each meeting and to make the appropriate distribution of the minutes.
 - B. The Contractor will be required to provide a written schedule of the next weeks work and a tentative schedule of the following week.
 - C. Reporting/Planning meeting will include discussion of problems encountered during the current week: information of interest to local authorities, subcontractors, utilities and next week's prospective schedule.
 - D. The Contractor shall organize the weekly meeting by contacting interested agencies. These agencies include, but are not limited to, the following:
 1. North Dakota Department of Transportation
 2. City Engineer's Representative
 3. Public Works Representative
 4. Police Department
 5. Fire Department
 6. Altru EMS (Ambulance Service)
 7. Century Link (Telephone Company)
 8. Xcel Energy (Power Company)
 9. Midcontinent Communications (Cable Television Company)
 10. Xcel Energy (Natural Gas Company)
 11. Subcontractors
 12. Altru Health System

100-P02 ACP WATERMAIN / PCCP SANITARY FORCEMAIN PROTECTION AREAS:

Contractor shall implement necessary precautions appropriate for his operations so not to disturb the integrity of the 8", 12", and 16" ACP watermains and 24" PCCP sanitary forcemains when working above and adjacent to these utilities. Contractor shall provide adequate protection of these areas as designated on the Plans. Contractor shall not use any concrete breaking equipment within these areas. The Contractor shall provide and maintain suitable cover or bridging following the removal of existing pavement within these areas until the final concrete pavement is placed. Contractor shall be responsible for damage occurring to the ACP watermain and PCCP forcemain and any other related damage or claims resulting from his construction operations. These areas are generally located at:

- 24" PCCP Sanitary Forcemain: Sta 422+55 to 438+50 (5' Rt to 20' Rt);
- 8" ACP Watermain: Along 14th Avenue South, Sta 424+57 centerline crossing;
- 12" ACP Watermain: Along 13th Avenue South, Sta 431+15 centerline crossing;
- 16" ACP Watermain: Along South Columbia Road, Sta 423+50 to Sta 438+22 (56' Lt).

100-P03 NOISE RESTRICTIONS: The Contractor shall be required to comply with the City of Grand Forks noise ordinance. The Contractor shall schedule his operations between the hours of 6:30 AM and 10:00 PM, Monday through Sunday. Should work need to be done outside this range, the Contractor shall make a written request to the Grand Forks Public Health Department at 151 South 4th Street, Suite N-301, Grand Forks, ND 58201-4735.

Contractor may not request one permit to cover all work for the entire project duration. All requests shall be made 72 hours in advance, stating the specific nature of the work, additional hours required and the number of days needed to complete the specified work. The Contractor shall obtain approval from the Health Department 24 hours prior to beginning work. The Contractor shall also 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 them of the days and hours planned for work under this permit.

Additionally, the Contractor shall follow procedures as stated Standard Specification 108.05, including obtaining written permission from the Engineer to perform work on Sundays, Holidays or at night.

100-P04 PUBLIC NOTIFICATION: The Contractor shall provide written notices in person 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. At a minimum, all entities located in the Office Meadows Office Park, within 600 feet of South Columbia Road along 13th Avenue South, Med Park Mall and along 14th Avenue South, east of South Columbia Road shall be included in the notices. The Contractor shall provide 5 business days of advance written notice to the Engineer of scheduled street or shared use path closings in order to allow media relations sufficient time to notify the public of closures and alternate routes. The Contractor shall notify the City Public Works Department a minimum of 5 business days in advance of street closures. The Contractor shall notify the City Water Department a minimum of 2 business days in advance of water main work requiring shutting off of mains.

100-P06 CONSTRUCTION LIMITS: The Contractor's operation is limited to the construction work limits; easements; temporary construction or permanent; and right of way lines as shown in the Plans. Any damage or disturbance of private property beyond those identified easement or right-of-way lines shall be restored to pre-construction conditions or better. Any compensation due the property owner shall be agreed to between the property owner and the Contractor and paid by the Contractor. The Contractor shall obtain a written release from the property owner and furnish the Engineer with a copy. The Contractor shall be prohibited from any type of use (e.g. material or equipment storage, staging, employee parking) on Altru Health System property and parking lots (excluding designated restricted use construction staging area) and any adjacent business properties unless written permission has been obtained from the property owner.

100-P07 DEWATERING: Consists of removing water as required to facilitate construction of underground utilities. Dewatering may require intermittent or continuous operation of dewatering equipment until the impacted work in the dewatered area is complete. All dewatering discharge shall be performed in accordance with the Storm Water Permit. All costs for dewatering shall be included in the price bid for the respective manhole, storm sewer pipe or utility bid item.

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105-P01 PAVEMENT SWEEPING: The Contractor shall sweep new pavements before opening to traffic and for final acceptance. Additionally, the Contractor shall sweep existing paved surfaces due to construction equipment tracking. For all sweeping activities, the Contractor shall furnish and utilize a vacuum type sweeper to control the dust. All costs for this work shall be included in the bid item "Mobilization."

105-P02 CONSTRUCTION STAGING AREA: A designated construction staging area is shown on the Plans and generally located from 14th Avenue South to Knight Drive along the west side of South Columbia Road. Contractor shall not store or stockpile aggregate materials, concrete debris or construct a concrete washout within the staging area. Use of the staging area is restricted to storage of non-aggregate materials (i.e. pipe, hydrants, manhole sections, inlet barrel sections and castings), equipment and employee parking. The staging area shall be protected with a 48" high orange supported silt fence, which shall also serve as a safety fence for the area. Contractor shall be paid for restoration of the staging area as described in Section 76, including the silt fence and stabilized construction access. All work necessary to prepare the site for use by the Contractor, including topsoil removal, salvaging and replacement shall be included in the bid items "Temporary Cover Crop", "Seeding Class III" and "Hydraulic Mulch". Restoration of the construction staging area shall provide positive drainage and restored to pre-construction conditions, including a minimum of 4" of topsoil cover.

107-P01 HAUL ROAD RESTRICTION: Prior to preparing the bid, the Contractor shall contact the appropriate State, County, Township and City officials to determine if there are any roads classified as "No Haul Routes". Streets within the proximity of the project including; 11th Avenue South, 13th Avenue South, 14th Avenue South, Knight Drive, South 20th Street, South 30th Street and Columbia Road Overpass shall not be used by the Contractor for haul road use or construction activities. For unloaded truck use only, the Contractor is permitted to use southbound South 42nd Street to eastbound 17th Avenue South to northbound South Columbia Road and eastbound/westbound 32nd Avenue South to/from northbound/southbound South Columbia Road. All loaded trucks shall use DeMers Avenue and South Columbia Road to and from the work area.

108-P01 SOUTH COLUMBIA ROAD SCHEDULE: Any work on the project that adversely impacts traffic, including lane closures or detours, shall not commence prior to May 4, 2016. Work on Phases 1A, 1B, 1C, 2A, 2B, 2C, 2D, and 3 which includes South Columbia Road, 13th Avenue South, Altru Health System approach and 14th Avenue South; including all structures; utilities; roadway, turn lane and median paving; curb and gutter; concrete shared use path and sidewalk; finished topsoil grading; signing; pavement marking; roadway lighting; traffic signal system; and all other safety appurtenances; shall be completed prior to reopening South Columbia Road to all lanes of traffic on the northbound and southbound lanes and before the substantial completion date. All final seeding and sodding shall be completed by the final completion date. For each calendar day beyond the substantial and final completion dates where the Work is not completed as specified; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor. The damage amount for each construction phase shall be based on the total original contract amount.

108-P02 CONSTRUCTION SCHEDULE: Contractor shall schedule construction activities such that from the date a specific construction phase begins until a specific construction phase ends; the Contractor shall complete all structures, utilities, storm sewer, roadway and

intersection paving, curb and gutter and roadway lighting. All construction phases shall be done in numerical order. Simultaneous construction of multiple phases shall occur as follows: Phases 1B or 1C may be completed with Phase 1A; however, Phase 1B and 1C shall not be worked on simultaneously. Phases 2B, 2C or 2D may be completed with Phase 2A; however, any combination of Phase 2B, 2C and 2D with Phase 2A shall not be worked on simultaneously.

108-P03 PHASE 1 (A, B & C) - SOUTH BOUND LANES SCHEDULE: Contractor shall schedule construction activities such that from the date the existing roadway is closed to traffic utilizing the south bound lanes of South Columbia Road until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete shared use path and roadway lighting prior to work commencing on Phase 2 (A, B, C & D).

108-P04 PHASE 1B - 14TH AVENUE SOUTH INTERSECTION (WEST APPROACH) SCHEDULE: Contractor shall schedule construction activities such that from the date the west approach is closed to traffic until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete shared use path and sidewalk and roadway lighting within **25** consecutive calendar days after closure. For each calendar day beyond the specified calendar days where traffic is not restored; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P05 PHASE 1C - 13TH AVENUE SOUTH INTERSECTION (WEST APPROACH) SCHEDULE: Contractor shall schedule construction activities such that from the date the west approach is closed to traffic until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete shared use path and sidewalk and roadway lighting within **21** consecutive calendar days after closure. For each calendar day beyond the specified calendar days where traffic is not restored; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P06 PHASE 2 (A, B, C & D) - NORTH BOUND LANES SCHEDULE: Contractor shall schedule construction activities such that from the date the existing roadway is closed to traffic utilizing the north bound lanes of South Columbia Road until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, sidewalk and roadway lighting prior to the intermediate completion date. For each calendar day beyond the intermediate completion date where Phase 2 (A, B, C & D) is not completed; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P07 PHASE 2B - 14TH AVENUE SOUTH INTERSECTION (EAST APPROACH) SCHEDULE: Contractor shall schedule construction activities such that from the date the east approach is closed to traffic until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete sidewalk and roadway lighting within **18** consecutive calendar days after closure. For each calendar day beyond the specified calendar days where traffic is not restored; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

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108-P08 PHASE 2C – 13TH AVENUE SOUTH INTERSECTION (EAST APPROACH, NORTH SIDE) SCHEDULE: Contractor shall schedule construction activities such that from the date the east approach, north side, is closed to traffic until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete sidewalk and roadway lighting within **21** consecutive calendar days after closure. For each calendar day beyond the specified calendar days where traffic is not restored; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P09 PHASE 2D – 13TH AVENUE SOUTH INTERSECTION (EAST APPROACH, SOUTH SIDE) SCHEDULE: Contractor shall schedule construction activities such that from the date the east approach, south side, is closed to traffic until traffic is restored; the Contractor shall complete all structures, utilities, storm sewer, roadway and intersection paving, curb and gutter, concrete sidewalk and roadway lighting within **16** consecutive calendar days after closure. For each calendar day beyond the specified calendar days where traffic is not restored; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P10 PHASE 3 – MEDIAN & TURN LANE SCHEDULE: Contractor shall schedule construction activities such that from the date that one-lane traffic on the northbound and southbound lanes has been restored; the Contractor shall complete turn lane and median paving, curb and gutter adjacent to median, grading, signing, and pavement marking prior to the substantial completion date. For each calendar day beyond the substantial completion date where Phase 3 is not completed; damages stated in Standard Specification Section 108.07 B. shall be deducted from payment due to the Contractor.

108-P11 TRAFFIC SIGNALS SYSTEM AND REVISE TRAFFIC SIGNAL SYSTEM SCHEDULE: Contractor shall schedule construction activities such that upon completion of Phase 2 (A, B, C & D), the permanent traffic signal system at the South Columbia Road and 13th Avenue South intersection and revised traffic signal system at the South Columbia Road and 11th Avenue South intersection shall be fully operational to control traffic during Phase 3 construction. This shall include, but not limited to, the installation of the following features: traffic signal foundations and standards; mast arms; signal pole and mast arm traffic signs; pedestrian pushbutton posts, pushbuttons and signs; vehicular and pedestrian heads; video detection system (calibrated and functional); street light extensions and luminaries; cabinet; controller; controller battery back-up; foundations; feed point installation; removal or revisions; emergency vehicle pre-emption system (GPS system calibrated and functional); along with all cable, conduit, junction boxes and appurtenances to install the traffic signal system completely. Includes the removal of the existing wiring and any other abandoned existing features that may conflict with the proposed traffic signal system improvements. No additional roadway or lane closures shall be permitted for traffic signal system removal or installation. For each calendar day beyond completion of Phase 2 (A, B, C & D) where the traffic signal system is not operational; damages in the amount stated in Standard Specification Section 108.07 B. shall be deducted from the payment due to the Contractor.

202-P01 SAWING: The bid items “Saw Concrete” and “Saw Bituminous Surfacing-Full Depth” shall include all labor, materials and equipment necessary to saw existing concrete or bituminous materials, concrete sidewalks, curb and gutter, driveways, or any other existing concrete or bituminous items. Contractor shall saw a clean, vertical full depth cut necessary to facilitate the removal of the material sawed. This item shall be measured by the linear foot on a one-time basis. No measurement shall be made for re-sawing.

202-P02 REMOVAL OF PAVEMENT: The bid item “Removal of Pavement” shall consist of the removal of all bituminous and concrete material: sidewalks, driveways, pavement, curb and gutter, medians and all other bituminous and concrete materials. Measurement and payment shall be on a square yard basis. Removed bituminous and concrete shall be incorporated into the salvaged base course in accordance with Section 817 of the Standard Specifications. All bituminous and concrete materials paid for as removal have been deducted from the excavation quantity.

202-P03 REMOVAL OF PIPE: The bid item “Removal of Pipe All Types and Sizes” shall include all labor, materials and equipment associated with the excavation, removal, clay backfill and compaction of pipe trench and disposal of all pipe sections as indicated on the Plans.

202-P04 REMOVAL OF MANHOLES AND INLETS: The bid items “Removal of Manhole” and “Removal of Inlets” shall consist of removing the castings, covers, rings, barrel sections, bases, insulation, clay backfill and compaction. The existing structure excavation shall be compacted to 98% of the Standard Proctor maximum density as determined by AASHTO T-99. The Contractor shall exercise care during removal operations to salvage the castings, lids and grates. The Contractor shall deliver all castings, lids and grates to the City of Grand Forks maintenance shop located at 724 North 47th Street. Contractor shall coordinate delivery with Mr. Dave Kressel. Mr. Kressel may be reached at 701-740-0812. All rings, barrel sections, base slabs, concrete covers, concrete, brick and non-salvageable items shall become the property of the Contractor. All labor, materials and equipment associated with the removal of manholes and inlets as stated above shall be included in the bid item “Removal of Manholes” or “Removal of Inlets”.

203-P01 TOPSOIL: Contractor shall be responsible for protecting topsoil from contamination during removal, salvaging and stockpiling and replacement. In-place topsoil stockpiled off-site and redelivered to the project site shall not be considered imported topsoil. Topsoil contaminated due to Contractor’s operations shall not be reused and topsoil shall be imported at Contractor’s expense. In the event an adequate quantity of in-place topsoil cannot be salvaged or existing in-place topsoil is not suitable, imported topsoil shall be paid for as “Topsoil-Imported”.

The bid item shall include the placement of 6" of topsoil on all disturbed areas behind the proposed curb and gutter; along sidewalk and shared use path.

203-P02 EXCAVATION FOR PROPOSED PAVEMENT SECTION: Perform excavation of the roadway section in accordance with Section 203.04 C. of the Standard Specifications to the proposed elevations. Slope subgrade from the centerline or median to the edges of the excavation. Transitions shall be constructed as shown on the Plans. The Contractor shall verify the vertical edge of the excavation is constructed as shown on the Plans.

Contractor shall install the subsequent pavement section with construction methods that maintain the integrity of the subgrade during aggregate base and concrete pavement placement. In order to maintain the integrity of the subgrade during subsequent operations, the Contractor shall determine the extent of his efforts that will be necessary to maintain the subgrade integrity. These efforts, if necessary, shall be performed at no additional compensation, and shall be included in the bid item “Common Excavation-Subcut”.

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NOTES

203-P03 EXCAVATION AND EMBANKMENT: Excavation quantities are based on the neat lines and grades as shown on the cross sections. Excavation quantities are in-place volume and calculated by the average end area method and do not include topsoil removal, pavement removal or curb and gutter removal quantities. The bid item "Common Excavation-Subcut" shall be paid for at plan quantity based on the dimensions shown on the Plans. Additional measurement and payment shall be made for changes made in the field to the Plan elevations. No allowance for over excavation shall be made.

The existing ground surface within temporary construction easements shall be restored to the condition existing prior to construction operations. Existing topsoil depths within the temporary construction easements shall be restored to original depths. The restored surface shall consist of topsoil material only. Any foreign material, including clay, aggregate, concrete, stones, rocks, etc. not considered topsoil shall be removed by the Contractor prior to final acceptance.

203-P04 COMPACTION AND DENSITY CONTROL: Compaction control of embankments, trench backfill and cut areas shall be Type A as specified in Section 203.04 E.2. of the Standard Specifications to the maximum dry density as determined by the Standard Proctor density test (ND T-99). Density requirements are stated on the bedding and backfill details in Section 20 of the Plans.

203-P05 LIME TREATED SUBGRADE: The existing subgrade was originally constructed with lime treatment. This material shall not be permissible for utility trench backfill and embankment. The Contractor shall remove and dispose the upper 18" of the subgrade material off the project site.

251-P01 SEEDING CLASS III: The final topsoil surface shall be raked smooth to provide positive drainage with mechanical power raking equipment and hand raking in inaccessible areas to power raking. Disturbed areas as designated on the Plans shall be seeded with a Class III seed mixture as specified below. Areas disturbed by Contractor's operations outside the designated areas shall be seeded and mulched at Contractor's expense, unless areas are approved by the Engineer for payment.

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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Fertilizer shall be a mixture of 19-19-20 applied at a rate of 100 pounds per acre. Fertilizer shall not be mixed with the seed, but may be applied at the same time as the seed if a suitable fertilizer attachment on the drill is used.

Following placement of seed mixture, Contractor shall make 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 shall not be accepted until it shows evidence of established growth after May 20 of the following year.

The seed shall be watered for a minimum of four weeks after placement in order to provide sufficient moisture for growth as determined by the Engineer. Runoff and puddling shall be prevented. Watering trucks shall not be driven over turf areas.

Maintenance of the seeded areas shall include eradicating weeds, maintaining erosion control devices and mulch, protecting installed areas from traffic, mowing, watering and post-fertilization. If any portion of the surface becomes rutted, damaged or destroyed, that portion shall be repaired and re-established at the Contractor's expense. The Contractor shall control erosion during the maintenance period by using acceptable BMP's until a proper stand of turf is established. The maintenance activities shall continue for minimum of four weeks after completion of the permanent seeding on the entire project.

Mowing shall be done as needed to maintain lawn areas at a normal height of 3 inches until final acceptance, except that not more than 1/3 of the grass leaf shall be removed by each cutting. Clippings shall be removed when the amount of cut turf is heavy enough to damage the turfed areas. Seeded areas shall be mowed immediately prior to final inspection. Mowing shall continue for a minimum of 4 cuttings after completion of the permanent seeding on the entire project, unless desired growth is established and shortening the period of the Contractor's responsibility for acceptably established areas is authorized by the Engineer.

At acceptance, the turf shall be free of weeds and have no bald spots larger than 3". All costs for labor, materials and equipment necessary to complete the work and provide maintenance shall be included in the bid item "Seeding Class III".

251-P02 TEMPORARY COVER CROP: The following seed mixture shall be used for Temporary Cover Crop applications:

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

Seed Application Rate	80 lbs/acre
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252-P01 SOD: The final topsoil surface shall be raked smooth to provide positive drainage with mechanical power raking equipment or hand raking in inaccessible areas to power raking. Disturbed areas as designated on the Plans shall be sodded. Areas disturbed by Contractor's operations outside the designated areas shall be seeded and mulched at Contractor's expense, unless areas are approved by the Engineer for payment.

Areas sodded after September 15 shall be maintained until June 1 of the following year.

Maintenance of the sodded areas shall include eradicating weeds, maintaining erosion control devices, protecting installed areas from traffic, mowing, watering and post-fertilization. If any portion of the surface becomes rutted, damaged or destroyed, that portion shall be repaired and re-established at the Contractor's expense. The Contractor shall control erosion during the maintenance period by using acceptable BMP's until a proper establishment of sod. The maintenance activities shall continue for minimum of four weeks after completion of sodding on the entire project.

Mowing shall be done as needed to maintain lawn areas at a normal height of 3 inches until final acceptance, except that not more than 1/3 of the grass leaf shall be removed by each cutting. Clippings shall be removed when the amount of cut turf is heavy enough to damage the sodded areas. Sodded areas shall be mowed immediately prior to final inspection. Mowing shall continue for a minimum of 4 cuttings after completion of the sodding on the entire project, unless desired growth is established and shortening the period of the Contractor's responsibility for acceptably established areas is authorized by the Engineer.

All costs for labor, materials and equipment necessary to complete the work and provide maintenance shall be included in the bid item "Sod".

253-P01 HYDRAULIC MULCH: The hydraulic mulch material shall be as specified in the NDDOT specification 253.03 B. The application rate shall be 1.3 tons/acre. The hydraulic mulch shall be applied after the seed is drilled into the topsoil and dragged.

265-P01 STABILIZED CONSTRUCTION ACCESS: All costs for labor, materials and equipment necessary to construct the stabilized construction access as shown in the Plans including: sawcut, remove curb and gutter and sidewalk, construct temporary curb and gutter and driveway, sawcut, remove temporary curb and gutter and driveway and reconstruct curb and gutter and sidewalk shall be included in the bid items "Stabilized Construction Access" and "Remove Stabilized Construction Access".

302-P01 AGGREGATE BASE COURSE CL 3 AND SALVAGED BASE COURSE: Payment for Aggregate Base Course Cl 3 and Salvaged Base Course shall be made by the cubic yard in-place (compacted volume) for material placed beneath curb and gutter, pavements, shared use paths and driveways based on the dimensions shown on the Plans. Additional measurement and payment shall be made for changes made in the field. No allowance for over excavation, subgrade settlement, compaction or waste shall be made.

Aggregate Base Course Cl 3 shall be placed by pushing material with low ground pressure equipment onto the geotextile fabric. Aggregate Base Course Cl 3 shall be placed in two lifts and compacted to 100% of the Standard Proctor maximum density as

determined by AASHTO T-99. Maximum loose lift thickness of Aggregate Base Course Cl 3 shall be 12". Contractor shall use caution with means and methods of aggregate placement and compaction within the ACP Watermain / PCCP Sanitary Forcemain Protection Areas. Salvaged Base Course shall be placed in maximum loose lift thicknesses of 6". The Salvaged Base Course material shall be compacted until no further evidence of consolidation is visible.

Surface tolerance Type B or C shall be used with the type selected by the Contractor.

430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: Contractor shall tack all surfaces which abut the hot bituminous pavement being placed. Tack material shall be MS-1, SS-1H or CSS-1H Emulsified Asphalt with an application rate of 0.05 Gal/SY per application. The costs for asphalt cement and tack coat, including labor, materials and equipment, shall not be measured separately but shall be included in the bid item "Commercial Grade Hot Mix Asphalt". No additional compensation shall be made for the removal of the HBP patching transitions constructed on top of existing pavement as part of this project relating to the transitions between construction phases. The removal shall be included in the bid item "Removal of Pavement".

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

550-P02 TYPE A WATER REDUCER: A type A water-reducing admixture shall be used for all concrete pavement Class AE.

550-P03 REINFORCEMENT: All costs for labor, materials and equipment required for placing, tying and supporting steel reinforcement, tie bars and contraction joint dowel assemblies as shown in Section 20 and Section 90 of the Plans for concrete pavements shall be included in the respective concrete pavement bid items. All reinforcing steel shall be epoxy coated Grade 60. All reinforcing shall have a minimum lap length of 24 inches and shall be tied.

550-P04 TIE BARS (NO. 4 AND NO. 5): All tie bars shall be epoxy coated Grade 60 and placed according to the joint details as shown on the Plans. All tie bars required for installation into the edge of new or existing concrete pavements shall be grouted into a pre-drilled hole with an approved epoxy grout. Prior to grouting bar in place, the pre-drilled hole shall be cleaned with compressed air and prepared as recommended by the epoxy grout manufacturer. Placement of tie bars into the edge of plastic concrete is not an acceptable installation method. All costs for tie bar installation shall be included in the respective concrete pavement bid items.

550-P05 9IN REINF CONCRETE PAVEMENT CL AE: The bid item "9IN Reinf Concrete Pavement CL AE" includes the reinforced concrete panels [R], individually reinforced concrete panels [IRP], contraction joint dowel assemblies and doweled expansion joint assemblies for these panels as shown on the Plans.

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550-P06 REINFORCED CONCRETE PANELS [R] and [IRP]: Prior to initiating paving operations, the Contractor shall provide necessary supports to restrict movement of the reinforcement panels beyond a ½” tolerance. Vertical supports shall be positioned to provide 3” cover. Any movement of the reinforcement panels which exceeds the tolerance shall be corrected immediately by the Contractor. Paving operations shall not continue until the movement is within tolerance.

The Engineer may suspend paving operations until corrective action is completed by the Contractor to control movement of the reinforcement panels.

550-P07 CONCRETE MIX DESIGNS: Prior to the beginning of work, the Contractor shall submit to the Engineer the proposed concrete mix designs for:

1. CI AE Well-Graded (Mainline, Curb & Gutter, Median Nose Paving, Driveway, Shared Use Path)
2. CI AE-3 (Concrete Median, Sidewalk)
3. CI AE Well Graded-High Early

If the Contractor elects to use a High Early concrete mix, the mix design shall attain a 72 hour flexural strength of 450 psi or greater. The Engineer shall approve the use of High Early concrete prior to placement. No additional compensation shall be made to the Contractor for the use of any High Early concrete mix.

550-P08 CONCRETE JOINT TECHNIQUES: When placing concrete adjacent to existing working joints, Contractor shall use jointing techniques that will prevent random cracking of new pavement surfaces. Techniques may include soft sawing, placing pre-molded strips, or other approved methods. Regardless of technique used, joint shall be sawed to the dimensions shown on the standard filled joint detail in Section 20 to allow proper placement of backer rod and joint sealant material.

550-P09 CONCRETE JOINTS: Saw cut joints in newly installed pavement shall follow the joint alignments and locations as shown in the Plans. Saw cuts shall be either longitudinal or transverse to the center-line of the pavement unless otherwise shown on the Plans. In all cases, the initial relief saw cut and the subsequent widening saw cut shall follow the same alignment. Except for curved sections of street pavement, saw cut joints shall be straight without misalignments, undulations, meanders, or waivers. Panels in which the Engineer determines to be significantly varying from this standard shall be removed and replaced at no additional cost to Owner. Removal limits shall be determined by the Engineer and replaced in accordance with Plan details and specifications. At Engineer's discretion, panels on both sides of a misaligned saw joint may be allowed to remain in place and paid for at 75% of the contract unit price for the affected concrete pavement bid item for "9IN Non-Reinf Concrete Pavement CI AE", "9IN Reinf Concrete Pavement CI AE", and "9IN Non-Reinf Concrete Pvmt CI AE-Doweled".

704-016 TRAFFIC CONTROL SUPERVISOR: Traffic control supervisor shall be provided on this project.

704-P01 TRAFFIC CONTROL PHASING: The quantities have been based on simultaneous, multiple-phase closure. If the Contractor chooses to set up the traffic control by means of an alternative phasing method, all costs to develop the alternative plan(s) shall be the Contractor's expense. The Contractor shall submit the alternative plan(s) to the Engineer for approval at least one week in advance of the proposed implementation.

The Contractor shall schedule their construction activities to assure that all work and related work specified is complete within each phase, prior to advancing to the next phase of construction.

704-P02 PEDESTRIAN AND BICYCLE TRAFFIC DETOUR: Pedestrian and bicycle traffic along the existing shared-use path on the west side of South Columbia Road between DeMers Avenue and 17th Avenue South shall utilize the sidewalk detour as shown in the Traffic Control Plan. The detour starts/ends at the north approach of 11th Ave South and South Columbia Road and directs pedestrians and bicycle traffic east to the shared-use path south of 11th Avenue South, east of Westward Drive, then south along the shared-use path to 17th Avenue South, then west to South Columbia Road. This detour route shall apply for pedestrian and bicycle traffic heading NB and SB on South Columbia Road. The existing sidewalk and pedestrian access on 13th Avenue South and the shared-use path east of the 14th Avenue South cul-de-sac shall be maintained throughout the duration of the project.

A paved ADA surface shall be maintained on all pedestrian routes to the satisfaction of the Engineer. The cost of providing and removing any temporary paved ADA surface for pedestrian routes shall not be bid separately, but shall be included in the other traffic control items.

704-P03 WORK ZONE TRAFFIC CONTROL PHASING: The traffic control details, as indicated on the Plans, have been developed on the basis that this project will be constructed in eight Phases (1A, 1B, 1C, 2A, 2B, 2C, 2D & 3). Detour routes are provided for Phase 1B and 2C. The traffic control devices list includes the required number of devices for each Phase of each described work area. Traffic control devices and signing has been provided as shown for each phase in the Work Zone Traffic Control plan sheets.

Phase 1A: Shall consist of the closure of both existing SB lanes and center turn-lane of South Columbia Road, south of the intersection of 11th Avenue South to north of the intersection of 13th Avenue South and south of the intersection of 13th Avenue South to 250 feet north of the intersection of 14th Avenue South.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The existing traffic signal system at 13th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 13th Avenue South. No vehicular detour routes will be provided during Phase 1A. Access to Altru

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Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 1A construction includes the reconstruction of SB South Columbia Road from south of 11th Avenue South to north of 13th Avenue South and south of 13th Avenue South to 250 feet north of 14th Avenue South, construction of a shared-use path on the west side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and construction of the roadway lighting system on the west side of South Columbia Road.

Phase 1B: Shall consist of the closure of the west half of the intersection between 14th Avenue South and South Columbia Road in addition to the closure of Phase 1A. The Contractor will be allowed to construct portions of Phase 1A and 1B concurrently and will not be required to complete Phase 1A in its entirety prior to moving to Phase 1B. Phase 1A construction signage shall be left in-place according to the Work Zone Traffic Control plan and Phase 1B construction signage shall be added as shown on the Work Zone Traffic Control supplement plan. No turning movements will be permitted to and/or from the west half of the 14th Avenue South intersection.

A detour route has been established and will be in effect for Phase 1B as shown in the Work Zone Traffic Control plans for vehicles utilizing 14th Avenue South between South Columbia Road and Knight Drive. SB South Columbia Road and WB 14th Avenue South traffic is detoured on South Columbia Road to Knight Drive, then Knight Drive to 14th Avenue South. NB South Columbia Road traffic is detoured on Knight Drive, then to 14th Avenue South. EB 14th Avenue South traffic is detoured on Knight Drive, then to South Columbia Road, then to 14th Avenue South. The Phase 1B detour will be removed upon completion of Phase 1B.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The existing traffic signal system at 13th Avenue South will be taken offline and a temporary traffic signal system will be installed. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 1B construction includes the reconstruction of SB South Columbia Road from 250 feet north of 14th Avenue South to 200 feet south of 14th Avenue South, reconstruction of the west half of the intersection of 14th Avenue South and South Columbia Road, construction of a shared-use path along the west side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and construction of the roadway lighting system on the west side of South Columbia Road.

Phase 1C: Shall consist of the closure of both existing SB lanes and center turn-lane of South Columbia Road from 50 feet south of 13th Avenue South to 50 feet north of 13th Avenue South in addition to the closure of Phase 1A. The Contractor will be allowed to construct portions of Phase 1A and 1C concurrently and will not be required to complete Phase 1A in its entirety prior to working on Phase 1C. Phase 1A construction signage shall be left in-place according to the Work Zone Traffic Control plan and Phase 1C construction signage shall be added as shown on the Work Zone Traffic Control supplement plan.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left,

thru, and right) will be permitted from all directions at 11th Avenue South. The existing traffic signal system at 13th Avenue South will be taken offline and a temporary traffic signal system will be installed. All turning movements will be restricted to NB, SB, or EB at 13th Avenue South. No turning movements will be permitted to and/or from the west approach of the 13th Avenue South intersection. Full access to Altru Hospital will be maintained at 11th Avenue South only with traffic able to exit onto/from 14th Avenue South from/onto SB South Columbia Road.

Phase 1C construction includes partial removal of the existing traffic signal system at 13th Avenue South, reconstruction of the west half of the intersection of 13th Avenue South and South Columbia Road, construction of a shared-use path along the west side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, partial installation of a new traffic signal system, and construction of the roadway lighting system on the west side of South Columbia Road. Additional work directly related to the new traffic signal system at the intersection of 13th Avenue South and South Columbia Road can be completed during multiple phases (those in Phase 1 and 2 only) as long as it does not interfere with one-lane traffic along South Columbia Road or 13th Avenue South.

Phase 2A: Shall consist of the closure of both existing NB lanes and center turn-lane of South Columbia Road, from south of 11th Avenue South to 50 feet north of 13th Avenue South and from 50 feet south of 13th Avenue South to 50 north of 14th Avenue South. The Contractor will be required to complete construction of Phase 2 (A, B, C & D) in its entirety prior to working on Phase 3. The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South.

The existing traffic signal system at 13th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 13th Avenue South. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 2A construction includes the reconstruction of NB South Columbia Road from south of 11th Avenue South to 50 feet north of 13th Avenue South and from 50 feet south of 13th Avenue South to 50 north of 14th Avenue South, construction of sidewalk along the east side of South Columbia Road, partial construction of the new traffic signal at the 13th Avenue South intersection, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and construction of the roadway lighting system on the east side of South Columbia Road. Additional work directly related to the new traffic signal system at the intersection of 13th Avenue South and South Columbia Road can be completed during Phase 2B, 2C or 2D as long as it does not interfere with one-lane traffic and pedestrian access to the shared-use paths and sidewalks along South Columbia Road or 13th Avenue South.

Phase 2B: Shall consist of the closure of the east half of the intersection between 14th Avenue South and South Columbia Road in addition to the closure of Phase 2A. The Contractor will be allowed to construct portions of Phase 2A and 2B concurrently and will not be required to complete Phase 2A in its entirety prior to working on Phase 2B. Phase 2A construction signage shall be left in-place according to the

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Work Zone Traffic Control plan and Phase 2B construction signage shall be added as shown on the Work Zone Traffic Control supplement plan. The Contractor will be required to complete construction of Phase 2B in its entirety prior to moving to Phase 2C or 2D, with the exception of the new traffic signal system at 13th Avenue South.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The new traffic signal system at 13th Avenue South will be inactive and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 13th Avenue South. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 2B construction includes the reconstruction of NB South Columbia Road from 200 feet south of 14th Avenue South to 50 feet north of 14th Avenue South, reconstruction of the east half of the intersection of 14th Avenue South and South Columbia Road, construction of sidewalks on the east side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and construction of the roadway lighting system on the east side of South Columbia Road.

Phase 2C: Shall consist of the closure of both existing NB lanes and center turn-lane of South Columbia Road, from the centerline of 13th Avenue South to 50 feet north of 13th Avenue South and the closure of the NE quadrant of the intersection at 13th Avenue South, including work along 13th Avenue South in addition to the closure of Phase 2A. The Contractor will be allowed to construct portions of Phase 2A and 2C concurrently and will not be required to complete Phase 2A in its entirety prior to working on Phase 2C. Phase 2A construction signage shall be left in-place according to the Work Zone Traffic Control plan and Phase 2C construction signage shall be added as shown on the Work Zone Traffic Control supplement plan. The Contractor will be required to complete construction of Phase 2C in its entirety prior to working on Phase 2D, with the exception of the new traffic signal system at 13th Avenue South. Phase 2C detour route shall be established as shown in the Work Zone Traffic Control plans. WB 13th Avenue South traffic entering SB South Columbia Road will detour on SB South 20th Street, to WB 17th Avenue South, to SB South Columbia Road. WB 13th Avenue South traffic entering NB Columbia Road will detour on NB South 20th Street, to WB DeMers Avenue, to NB South Columbia Road. WB 13th Avenue South traffic entering Altru Hospital will detour on NB South 20th Street to WB 11th Avenue South. The Phase 2C detour shall be removed upon completion of Phase 2C.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The new traffic signal system at 13th Avenue South will be inactive and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from NB South Columbia Road, SB South Columbia Road and EB 13th Avenue South. WB 13th Avenue South will be detoured prior to the intersection with South Columbia Road. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 2C construction includes the reconstruction of the NE quadrant of the 13th Avenue South intersection, construction of sidewalks on the east side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and

construction of the roadway lighting system on the east side of South Columbia Road and along 13th Avenue South.

Phase 2D: Shall consist of the closure of both existing NB lanes and center turn-lane of South Columbia Road, from the centerline of 13th Avenue South to 50 feet south of 13th Avenue South and the closure of the SE quadrant of the intersection at 13th Avenue South, including work along 13th Avenue South in addition to the closure of Phase 2A. The Contractor will be allowed to construct portions of Phase 2A and 2D concurrently and will not be required to complete Phase 2A in its entirety prior to working on Phase 2D. Phase 2A construction signage shall be left in-place according to the Work Zone Traffic Control plan and Phase 2D construction signage shall be added as shown on the Work Zone Traffic Control supplement plan. The Contractor shall be required to complete construction of Phase 2D in its entirety prior to the completion of Phase 2A.

The existing traffic signal system at 11th Avenue South will be taken offline and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The new traffic signal system at 13th Avenue South will be inactive and a temporary traffic signal system will be installed. All standard turning movements (left, thru, and right) will be permitted from NB South Columbia Road, SB South Columbia Road and 13th Avenue South. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South.

Phase 2D construction includes the reconstruction of the SE quadrant of the 13th Avenue South intersection, construction of sidewalks on the east side of South Columbia Road, construction of public utilities such as sanitary sewer, watermain, and storm sewer, and construction of the roadway lighting system on the east side of South Columbia Road and along 13th Avenue South.

Phase 3: Shall consist of opening South Columbia Road to one-lane traffic on each of the NB and SB lanes (no head-to-head traffic). The roadway lighting system shall be fully functional prior to opening South Columbia Road to one-lane traffic. No vehicular detour routes shall be used during Phase 3. The existing traffic signal system at 11th Avenue South will be returned to uninterrupted service. All standard turning movements (left, thru, and right) will be permitted from all directions at 11th Avenue South. The new traffic signal system at 13th Avenue South shall be fully functional prior to commencing Phase 3. All standard turning movements (left, thru, and right) will be permitted from all directions at 13th Avenue South. No temporary traffic signal systems will be allowed. Access to Altru Hospital will be maintained at 11th Avenue South and 13th Avenue South with traffic able to exit South Columbia Road to 14th Avenue South and enter South Columbia Road from 14th Avenue South.

Phase 3 construction includes construction of turn lane and median paving, median curb and gutter, finished topsoil grading, signing, and pavement marking along South Columbia Road, 13th Avenue South, and 14th Avenue South.

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TEMPORARY TRAFFIC SIGNALS: Temporary traffic signals shall be installed during Phases 1A, 1B, 1C, 2A, 2B, 2C and 2D of construction at the intersection between South Columbia Road and 13th Avenue South and South Columbia Road and 11th Avenue South. Supplementary traffic control devices including but not limited to signs and delineator drums shall be

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in place before the temporary traffic signal system is activated. The proposed sign and delineator drum locations for this site may vary from the Plans based upon traffic control configurations at adjacent intersections. The temporary traffic signal system shall consist of a minimum of four (4) portable traffic signals per intersection. Each device shall be complaint to all applicable MUTCD standards and guidance. These signals shall include, at minimum, two (2) vehicle signal heads for each approach and one (1) pedestrian signal as applicable to the existing crosswalks (South Columbia Road and 11th Avenue South intersection only, see Section 100). The configuration of the temporary traffic signal system may include more than four (4) portable signals as long as all of the devices are fully integrated together. Communication between each portable device shall be accomplished via wireless radio link. The temporary signal system shall include a signal controller that is NEMA compliant and capable of manual signal timing entry. The signal control shall also include a conflict monitor. Prior to removing power to the permanent signal system at this site, the Contractor shall sync and troubleshoot all of the portable devices to ensure proper signal coordination between portable devices. Permanent vehicle signal heads shall be covered at any time that the temporary traffic signal is active. The temporary traffic signal system shall be removed immediately upon permanent signal activation. The Contractor shall be responsible for obtaining the electrical source to operate the portable traffic signals. The Contractor shall arrange with the utility company or provide generators for electrical service. Solar powered traffic signals may be used. The Contractor shall be responsible for all costs of providing the electrical source and any costs required to operate and maintain the traffic signals. If the Contractor chooses to use the utility company, all equipment shall be placed outside the roadway. All labor and equipment necessary to furnish, install, maintain and remove the temporary traffic signal system shall be included in the price bid item "TEMPORARY TRAFFIC SIGNALS".

Temporary Traffic Signal Timing & Sequencing									
Heads 1 & 2 (Northbound)	Green	Yellow	Red						
Heads 3 & 4 (Southbound)	Red		Green	Yellow	Red				
Heads 5, 6, 7, & 8 (East/Westbound)	Red						Green	Yellow	Red
Time Cycle = 120 Seconds	40	4.5	3	40	4.5	3	17.5	4.5	3
Percent of Cycle	33.3	3.8	2.5	33.3	3.8	2.5	14.6	3.8	2.5

704-P05 CHANGING WORK ZONE TRAFFIC PATTERNS: Changing work zone traffic patterns between Phase 1 (A, B & C) to Phase 2 (A, B, C & D) shall be completed between the hours of 8:00 p.m. and 6:00 a.m. All work must meet the requirements of Plan Note 100-P03 – NOISE RESTRICTIONS.

704-P06 MAINTAINING ACCESS: The Contractor shall be responsible for providing continuous access to all residential dwellings and business establishments adjacent to this project. The Contractor shall be responsible for coordinating and communicating with adjacent landowners and residents regarding access control and road closures at the site that directly affect the property owners.

704-P07 DETOURS: The Contractor shall maintain the streets used for detours (as identified on the Traffic Control Plans) and repair areas damaged by the detoured traffic. Upon completion of the project, the Contractor shall restore the streets to a condition at least equal to that which existed at the time traffic was routed over them. Work shall be as deemed necessary by the Engineer. The repair and maintenance of the detours will be paid for in accordance with Section 107.08 C. of the Standard Specifications. A pre-detour inspection of each route will be required. A joint-inspection of the detour route will be made by the Engineer, Contractor, and City of Grand Forks. The existing condition of the route, including type and width of surfacing material in place will be determined and recorded.

704-P08 PORTABLE CHANGEABLE MESSAGE SIGN: Portable Changeable Message Signs (PCMS) shall be staged 2 weeks prior to the placement of the traffic control devices. PCMS will be used to display information prior to and throughout the project duration. The Contractor shall be trained in the operation of a PCMS. The PCMS shall conform to the requirements of the MUTCD, Part 6 and specifications. The following messages are to be displayed according to the construction schedule:

Two weeks prior to placement of traffic control devices:
ROAD WORK | S COLUMBIA RD | BEGINS MM/DD (example MAY 1)

72 hours prior to new traffic pattern for each phase:
NEW TRAF PATTERN | BEGINS MM/DD (example JULY 15)

All other times during construction:
ROAD WORK | 11TH TO 14TH (vice/versa) | EXPECT DELAYS (followed by USE ALT RT)

If the Engineer determines that additional messages shall be displayed on a PCMS during construction, the Contractor shall have the message displayed on all effected PCMS within one hour of the Engineer's request. Upon completion of the project, the Contractor shall retain ownership of all PCMS.

709-P01 GEOSYNTHETIC (TYPE R): The geotextile fabric shall extend up the vertical side of the aggregate base. The Contractor shall properly secure fabric to vertical wall as required. The extra fabric for the vertical side, including overlap shall be included in the bid item "Geosynthetic Material Type R1".

714-P01 STORM SEWER BEDDING: Bedding for reinforced concrete pipe (RCP) shall be Aggregate Base Course CI 3 or CI 5. All costs for bedding shall be included in the bid items "Pipe Conc Reinf 12IN CI III", "Pipe Conc Reinf 15IN CI III" and "Pipe Conc Reinf 27IN CI III".

714-P02 UNDERDRAIN PIPE PVC PERFORATED 4IN: Underdrain pipe shall be 4" perforated PVC wrapped with D3 or D4 geotextile fabric and shall be installed in accordance with the Plans on the Geosynthetic Material Type R1, without a trench section. All underdrain pipe runs not terminating in a catch basin shall require a proper cap as recommended by the

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manufacturer. Longitudinal pipe run under northbound lane shall follow the graded subgrade profile and provide positive drainage to inlet connection(s). All costs for labor, materials and equipment necessary to complete the work shall be included in the bid item "Underdrain Pipe PVC Perforated 4IN".

714-P03 STORM SEWER INSPECTION: During construction the Contractor shall keep dirt and debris out of the storm drain lines, underdrain pipe, manholes, and storm drain inlets. As part of the Contractor's SWPP Plan, routine inspection of these items should be performed; however, an inspection by the Engineer and the City of Grand Forks will also be conducted prior to final acceptance. If dirt and debris are found during the inspection, it will be the Contractor's responsibility to clean these lines, manholes, and inlets to the satisfaction of both the Engineer and City of Grand Forks. All costs associated with cleaning the storm drain lines, manholes, and storm drain inlets shall be included in the bid items "Pipe Conc Reinf __XIN CI III", "Manhole __IN" and "Inlet-Type 1".

714-P04 STORM SEWER AT UTILITY CROSSINGS: The Contractor shall visually expose (i.e. pothole) all existing underground utilities, including sanitary and storm sewer forcemains, water mains, electrical, communication and natural gas mains located at proposed storm sewer crossings prior to excavation of storm sewer pipe trench. All costs associated with visually exposing shall be included in the bid item "Pipe Conc Reinf __IN CI III".

722-P01 CHIMNEY SEALS: New external chimney seals shall be installed on all existing sanitary sewer manholes, existing and new storm sewer manholes and new Inlet-Type 1 located within paved areas. The sleeve and extension shall be extruded from a high-grade rubber compound conforming to the applicable requirements of ASTM C923. The bands used for compressing the sleeve and extension against the inlet shall be fabricated from 16-gauge stainless steel conforming to ASTM A240, Type 304. Screws, bolts and nuts used on this band shall be stainless steel conforming to ASTM F593 and 594, Type 304. The chimney seals shall not be paid for separately but shall be included in the bid items "Manhole 48IN", "Inlet-Type 1" and "Adjust Manhole".

722-P02 INLETS AND MANHOLES: Contractor shall verify build heights of all structures prior to installation. Contractor shall be aware the top of riser elevation and top of barrel elevation control the final casting elevation and adjustment of the structure base slab during installation may be necessary to achieve top of structure design elevation. Contractor shall provide Engineer as-built elevations of top of riser elevation and top of barrel. The flow line at the bottom of an inlet or manhole shall be filled and smooth troweled with concrete to form smooth flow line invert and then sloped to structure wall. All costs associated with this work shall be included in the price bid for the respective inlet or manhole item.

722-P03 MANHOLES: All new manholes will be paid for by the unit. All costs associated with the manhole; including bedding and backfill material, base slab, inverts, steps, casting, adjusting rings, chimney seal, poly wrap and other miscellaneous items; shall be included in the price bid for the respective manhole item. Manhole riser shall be paid for separately. Manhole riser pay height shall be the distance from the top of the barrel to the lowest invert of the manhole.

722-P04 INLETS: All new inlets will be paid for by the unit. All costs associated with the inlet including insulation, bedding and backfill material, base slab, barrel sections, inverts,

casting, adjusting rings, chimney seal, poly wrap, reinforcing of curb section and other miscellaneous items shall be included in the price bid for the respective inlet item.

722-P05 FIELD VERIFICATION OF PROPOSED INLET LOCATIONS: The Contractor shall visually expose (i.e. pothole) the existing watermain at the location of Inlets 1A, 4A, 6A, 8A, and 10A prior to installation of inlet in order to maximize the depth of each inlet. The Contractor shall provide inlets with a minimum barrel length of 5 feet and shall field cut the barrel to the appropriate length as determined by the actual location of the watermain to provide separation as it relates to the inlet location. All costs associated with visually exposing the watermain and field cutting of concrete inlet barrel shall be included in the bid item "Inlet-Type 1".

722-P06 ADJUST GATE VALVE BOX: Gate valve boxes shall be adjusted to finished grade of the pavement surface or lawn areas, plumbed and the ability to get a wrench on the operating nut of the gate valve shall be verified by the Contractor. Adjustment shall be made by rotating the valve box or adding an additional valve box section. All labor, materials and equipment necessary to adjust gate valves shall be included in the bid item "Adjust Gate Valve Box".

722-P07 ADJUST MANHOLE: Existing utility manhole and sanitary sewer manhole castings shall be adjusted to meet finished grade. The bid item "Adjust Manhole" shall include removal of existing casting, removal of existing adjustment rings, removal of existing cone and/or barrel section(s). The Contractor shall deliver all castings and covers to the City of Grand Forks maintenance shop located at 724 North 47th Street. Contractor shall coordinate delivery with Mr. Dave Kressel. Mr. Kressel may be reached at 701-740-0812. Contractor shall install new barrel section/adapter, new cone section, new adjustment rings, new chimney seal and new casting unless otherwise noted. Castings shall be set to finished grade. Refer to Existing Structure Adjustment Schedule in Section 50 for detailed description of work proposed for each structure. Contractor shall field verify grades, structure configuration and dimensions prior to adjustment work and following adjustment.

Contractor shall prevent debris from falling into manholes and promptly remove any falling debris. Contractor shall provide protective wrapping over manhole covers prior to placement of concrete. Any manhole cover coated with concrete shall be cleaned by the Contractor.

724-P01 WATERMAIN: All products that may come in contact with potable water shall meet American National Standards Institute (ANSI) and National Sanitation Foundation International (NSF) Standard 61. A product will be considered as meeting this standard if so certified by NSF, the Underwriters Laboratories, or other organizations accredited by ANSI to test and certify such products.

All PVC C-900 pipe shall be DR18 and all PVC C-905 pipe shall be DR25.

All ductile iron watermain fittings including bends, tees, reducers, plugs and adapters, shall be restrained Class 350 fittings. Fittings shall be as manufactured by Tyler Pipe, American Cast Iron Pipe Company or approved equal. All

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watermain fittings shall be installed with stainless steel bolts and nuts and anti-seize material shall be used on the threads.

724-P02 WATERMAIN TAPS: Only City of Grand Forks Water Distribution Personnel shall perform watermain taps on an existing watermain.

The Contractor shall acquire a water tapping permit from the City of Grand Forks for each tap location. The permit fee shall be waived; however payment of the tapping fee shall be the responsibility of the Contractor and shall be included in the bid item "6IN Hydrant". The Water Department requires a 24 hour advance notice for all tapping requests.

724-P03 TAPPING SLEEVE AND VALVE: Tapping sleeves and valves shall be designed to operate at a working pressure of 200 psi. The sleeves shall have mechanical joints and shall be of the full sleeve type. The sleeve shall be constructed entirely of 304 stainless steel, including the flange and shall be fully lined with a rubber gasket. Contractor shall provide longest length sleeve available from manufacturer for use on ACP watermain.

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

724-P04 WATERMAIN TRANSITION COUPLINGS: All transition couplings necessary to connect new watermains to existing watermains shall be included in the bid item "6IN Hydrant". Transition couplings shall be Hymax as manufactured by Total Piping Solutions, Inc., Romac, Power Seal, Ford or approved equal. Transition couplings shall be fabricated of cast iron or carbon steel and shall be coated inside and out with fusion bonded epoxy or nylon. All transition couplings shall be installed with stainless steel bolts and nuts and anti-seize material shall be used on the threads, and then completely wrapped with polyethylene. Wrap-around type sleeves shall not be allowed. Contractor shall provide longest length transition coupling available from manufacturer for use on ACP watermain.

724-P05 OPERATION OF EXISTING VALVE AND HYDRANTS: Only City Water Distribution personnel shall operate existing valves and hydrants. New valves that are installed by the Contractor shall not be opened adjacent to an existing main unless the following conditions have been met:

1. Water Distribution personnel have been notified and are available to operate the valve, and flush adjacent mains in the area, if necessary.
2. All testing is complete and approved (hydrostatic testing and sterilization).
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 labor, material 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-P06 REMOVE HYDRANT: The Contractor shall coordinate with the City of Grand Forks Water Department for shut down of the watermain. The Contractor shall remove existing hydrant assemblies. Upon removal, the Contractor shall either remove the existing connecting tee or install the new hydrant to existing main, as indicated on the Plans. The bid item "Remove Hydrant" shall include all labor, materials and equipment necessary for the following work as shown on the Plans:

1. Excavation and dewatering.
2. Removal of existing hydrant lead, gate valve and box, and hydrant.
3. Where indicated on the Plans, remove existing connecting tee and install a new 10' length of PVC watermain with 2 new transition couplings.
4. Fittings, gate valve, valve box and cover and hydrant removed shall be delivered to the City of Grand Forks Water Department located at 724 North 47th Street. The delivery shall be coordinated with Mr. Dave Kratochvil. Mr. Kratochvil may be reached at 701-738-8772.

724-P07 6IN HYDRANT: Bid item "6IN Hydrant" shall include all components required for complete hydrant installation as shown on the Plans and described below.

Fire hydrants shall be of the compression type 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. Upper standpipe length shall be 22 inches resulting in a top nut 36"-38" above finished ground, or to the elevation indicated on the plans. Bury depth shall be measured from the bottom of the branch pipe connection to the finished ground line at the hydrant and shall be as shown on the Plans.
6. Hydrant Tag – Required for each hydrant or extension. Tag shall correspond to the hydrant number as shown on the plans, if indicated.
7. AWWA Standard – C-502.
8. Working Pressure – 250 psig.

Finished grade elevations at new hydrant locations are shown on the Plans. Contractor can either provide hydrants meeting the required elevations or provide hydrants with hydrant extensions (extensions shall be included in the bid item "6IN Hydrant"). If extensions are used, Contractor shall install them as directed by the Engineer.

Valves shall be resilient seated wedge type and conform to the following:

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

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4. AWWA Standard – C-515 with latest revision, ductile iron (ASTM A536) resilient wedge.
5. Coating: AWWA C550. All internal and external surfaces of the body and bonnet shall have a fusion-bonded-epoxy coating, applied electrostatically. The wedge shall be totally encapsulated with rubber complying with ASTM D-2000. Epoxy coating shall be NSF 61 approved.
6. Working Pressure – 250 psig and 100% leak-tight.
7. Seals – O-rings at all pressure retaining joints. Flat gaskets shall not be allowed.
8. Joint – Restrained mechanical joint, including joints for tapping valves.

Prior to installation, all hydrant components that will come into contact with potable water shall be thoroughly cleaned of any dirt or foreign material and sterilized. Installation shall be to the location and elevations indicated on the Plans. Unless otherwise indicated, all hydrants shall be installed using tapping tees with a gate valve. Hole for tapping tee shall be neatly sawed in watermain pipe prior to lowering into trench.

Hydrant shall be plumb and have the pumper nozzle facing the curb, and installed per the typical detail. The hydrant shall be set on either cast in place or precast concrete blocks, and shall be well-braced against unexcavated earth. Upon completion of the installation, the trench shall be backfilled around the hydrant with Size 2 aggregate to 6 inches above the drain hole. Minimum volume per hydrant is 0.75 cubic yards. Drain holes shall be left open upon construction. Size 2 aggregate shall meet the following gradation requirement:

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

The break-off flange shall be installed within 0-2 inches above finished ground. The center of the pumper nozzle shall be 28 to 30 inches above the surrounding finished grade. Hydrants that are not within these specified tolerances shall be adjusted by the Contractor.

Gate valves shall be set on precast concrete blocks.

Valve boxes shall be manufactured by Tyler Pipe, Star Pipe Products or approved equal. Valve boxes shall be cast iron, 3 piece units with lids and shall accommodate 3 through 20 inch valves. Shaft shall be 5-1/4" screw type. Plastic valve boxes shall not be allowed. The cover shall be appropriately marked "WATER". Valve box shall be plumb and installed onto a gate valve adaptor. Gate valve adaptor shall be 1/4" steel with UV polyurethane protective coating and a 3/4" rubber gasket attached to the gate valve adaptor. Adaptors shall be manufactured for the exact size and brand of the valve

All labor, materials and equipment 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 shall be included in the bid item "6IN Hydrant". All joints shall

be restrained. Measurement shall be by the each for a complete hydrant installation as shown on the Plans.

724-P08

TEMPORARY WATER SERVICE: The Contractor shall provide temporary water service by hosing Grand Forks City water customers when the work performed by the Contractor requires the water service to be shut-off. All labor, materials and equipment necessary for installation of temporary water service to residential and/or businesses shall be included in the bid item "6IN Hydrant".

724-P09

WATERMAIN HYDROSTATIC TESTING: A hydrostatic test of the completed watermain repair and hydrant relocation work shall be performed under City water pressure prior to backfilling. The duration of this test shall be a minimum of 2 hours.

During the hydrostatic test, the completed installation shall be examined for any leaks. If leakage occurs, the Contractor shall locate the defects and repair the line at his own expense until the leakage is eliminated.

All testing shall be performed in the presence of the Engineer.

All exposed pipe, fittings, valves, and joints will be carefully examined during the test. Any visible leaks shall be stopped by repair or replacement of the deficient joint or pipes.

All costs shall be included in the bid item "6IN Hydrant".

724-P10

WATERMAIN STERILIZATION: Chlorination applications shall be made under the supervision of the Engineer.

All sections of the new PVC and ductile iron watermain, couplings, pipe plug, gate valves, hydrants and existing ductile iron watermain shall be swabbed with a chlorine solution prior to installation as directed by the Engineer. The Contractor shall 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.

The Contractor shall furnish all tools, equipment and material necessary to sterilize the system. All costs shall be included in the price bid for related hydrant bid items.

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

724-P11

IRRIGATION SYSTEMS: Prior to construction, the Contractor shall coordinate with adjacent property owners in determining the location of existing irrigation systems located within the project limits. The location of known existing irrigation systems is noted in the Plans. The Contractor shall be responsible for relocation of any irrigation system discovered within the project limits. The relocation of any irrigation system shall be completed by an irrigation contractor with adequate knowledge of irrigations systems and replumbing as required to fully restore the existing irrigation system to pre-construction

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condition. Contractor shall install equipment of same manufacturer of existing system. Existing irrigation systems shall be relocated onto private property within the noted construction easement. All costs for labor, materials, and equipment necessary to relocate and restore operation of existing irrigation systems shall be included in the bid item "Underground Irrigation System".

748-P01 **RANDOM CRACKING OF CURB AND GUTTER:** All Portland cement concrete curb and gutter which exhibits random cracking prior to project acceptance shall be removed and replaced at no additional cost to the Owner. Removal and replacement shall be performed in full lengths between joints. This requirement shall apply to all curb and gutter. Routing and sealing of random cracks shall not be an acceptable method of repair.

748-P02 **TIE BARS (NO. 4):** All tie bars shall be epoxy coated and placed according to the joint details as shown on the Plans. All tie bars required for installation into new or existing concrete curb and gutter shall be grouted into a pre-drilled hole with an approved epoxy grout. Prior to grouting bar in place, the pre-drilled hole shall be cleaned with compressed air and prepared as recommended by the epoxy grout manufacturer. Placement of tie bars into plastic concrete is not an acceptable installation method. All costs for tie bar installation shall be included in the respective curb and gutter bid items.

748-P03 **REINFORCEMENT:** All costs for labor, materials and equipment required for placing, tying and supporting steel reinforcement as shown in Section 20 and Section 90 of the Plans for curb & gutter shall be included in the respective curb and gutter bid items. All reinforcing steel shall be epoxy coated. All reinforcing shall have a minimum lap length of 24 inches and shall be tied.

748-P04 **CURB & GUTTER TRANSITION:** At all locations where newly placed 24" curb & gutter is to abut to existing 30" curb & gutter, a transition from 24" curb & gutter to 30" curb & gutter shall be installed as shown on the Plans. All costs for labor, materials, and equipment for the curb & gutter width transition shall be included in the bid item "Curb & Gutter-Type I".

750-P01 **REINFORCEMENT:** All costs for labor, materials and equipment required for placing, tying and supporting steel reinforcement as shown in Section 20 and Section 90 of the Plans shall be included in the respective bid items "Sidewalk Concrete Bikeway", "Concrete Median Nose Paving" and "Driveway Concrete". All reinforcing steel shall be epoxy coated Grade 60. All reinforcing shall have a minimum lap length of 24 inches and shall be tied.

750-P02 **CONCRETE MEDIAN NOSE PAVING:** The bid item "Concrete Median Nose Paving" shall be measured and paid for by the square yard. Measurement will be from the beginning of the curb radius to the end of the curb radius at street intersections, including the triangular area between the curb face and the main line paving.

750-P03 **CONCRETE PAVING COLORED:** The bid item "Concrete Paving Colored" shall be measured and paid for by the square yard. This bid item shall apply to the 5" concrete median paving from back of curb to back of curb. Color shall be Terra Cotta.

750-P04 **SHARED USE PATH/SIDEWALK:** Over excavated areas beneath the sidewalk removal areas shall be filled with aggregate base and compacted. All costs for labor, materials and equipment for the aggregate base shall be included in the bid item "Sidewalk

Concrete 4IN". Salvage base course beneath the concrete shared use path shall be paid for separately.

Contraction joints shall be constructed so as to divide the sidewalk into square slabs, the greatest longitudinal or transverse dimension of which shall not exceed 5 feet.

Expansion joints on sidewalks shall be placed at intervals as shown on the Plans. Shared use path expansion joints shall be placed at intervals no greater than 300 feet, at construction joints and as shown on the Plans. All transverse and longitudinal joints on the shared use path shall be sawed.

All costs for reinforcement as shown on the Plans shall be included in the bid item "Sidewalk Concrete Bikeway".

750-P05 **RANDOM CRACKING OF SHARED USE PATH/SIDEWALK:** All Portland cement concrete shared use path and concrete sidewalk which exhibits random cracking prior to project acceptance shall be removed and replaced at no additional cost to the Owner. Removal and replacement shall be performed in full panels between joints. This requirement shall apply to all concrete shared use path and concrete sidewalk. Routing and sealing of random cracks shall not be an acceptable method of repair.

754-P01 **SIGN REFLECTIVITY:** The street name signs shall be Type IX reflective sheeting.

754-P02 **SIGNING:** All signs and supports removed from the project which will not be reset shall become the property of the City of Grand Forks and be delivered to the City Sign Shop at 714 South 47th Street, Grand Forks, ND. Contractor shall coordinate delivery with Mr. Mark Aubol. Mr. Aubol may be reached at 701-738-8757. All costs for delivery shall be included in the bid item "Flat Sheet For Signs-Type XI Refl Sheeting".

762-P01 **PREFORMED PATTERNED PAVEMENT MARKING:** The Contractor shall provide Preformed Patterned Pavement Marking for longitudinal lines, transverse lines and messages. These materials shall be measured and paid for as "Preformed Patterned Pvmt MK-Message(Grooved)" and "Preformed Patterned Pvmt MK __IN Line-Grooved". All markings and messages shall be dry grooved. A handheld or backpack type leaf blower will not be acceptable to clean the grooved slot.

762-P02 **EPOXY PVMT MK CURB TOP & FACE:** All costs for labor, material and equipment to paint the median and median nose paving as shown in the Plans shall be included in the bid item "Epoxy Pvmt Mk Curb Top & Face".

762-P03 **PAVEMENT MARKING REMOVAL:** Pavement markings shall be removed prior to placement of permanent pavement marking shown in Section 120 of the Plans. All costs for removal of existing markings shall be included in the bid item "Obliteration of Pvmt Mk".

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770-P01 REMOVALS: Existing light poles and transformer bases (excluding fixture) shown to be removed shall be removed, salvaged, and delivered to the City Electrician at 714 South 47th Street, Grand Forks, ND. The Contractor shall coordinate deliveries with Mr. Rick Hanson, 701-738-8796. Contractor shall be responsible for disposal of light fixtures.

Existing concrete light standard foundations shall be removed and disposed of off-site. Removal of existing foundations shall be included in the bid item "Remove Light Standard". Existing underground conductors may be cut off and abandoned no less than 12" below grade.

770-P02 CONDUIT: All street lighting circuits shall be installed in a continuous conduit system. Conduit shall be 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. Conduit shall be installed as shown in the Plans. All conduit installed shall have each end closed by inserting a loose stopped plug of Oakum or similar material to keep soil or sand from entering conduit. The bid items "1.5IN Diameter Rigid Conduit" and "2IN Diameter Rigid Conduit" shall include all labor, materials and equipment required to perform the conduit installation, including any jacking, boring, or trenching.

The conduit specified shall be installed approximately 36" behind the back of curb unless noted otherwise on the Plans.

Conduit under new pavement and/or curb and gutter may be installed by open trenching methods through (on or into) pavement subgrade or by directional boring at Contractor's option. Conduit under existing pavement and/or existing curb and gutter shall be installed by directional boring method. Plowing methods will not be permitted for installing any type of conductor or conduit. In no case shall new pavement at final grade be allowed to be cut to install conduit or conductors.

Installation of all directional bored conduit shall include visually exposing (i.e. pot-holing) existing utilities regardless of type, size or depth prior to installation of conduit. Contractor shall record position and depth of all located utilities on record drawings. All costs for labor, materials, and equipment to complete the pot-holing and utility verification shall be included in the bid items "1.5IN Diameter Rigid Conduit" and "2IN Diameter Rigid Conduit".

770-P03 CONDUCTOR: All underground cables and underground conductors required for connection to light standards and feed points shall be multiple single conductor assemblies, without overall armor or jacket. Insulation shall be color coded with one red and one black for ungrounded cables, one white for grounded neutral cables, and one green equipment grounding cable. Ungrounded and neutral cable types shall be RHW-USE. Equipment ground cables shall be RHW-USE or THW. The quantities shown in the Plans for the bid item "UNDERGROUND CONDUCTOR NO__ TYPE (RHW)(THW)" are based on the length of each single conductor.

Conductors in Lighting Standards shall be SEO 14/3 stranded copper with ground cable, Electrical Conductors, Inc. or approved equal. Receptacles and luminaires shall have separate cables. Cable shall be 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. Also see Plan details.

All splicing shall be in pole bases. All leads shall be brought out at least 12" beyond the hand hole. Splice assemblies shall be tied together with plastic tape or cord and a tag end left under the hand hole cover to facilitate retrieving splices for future service. Splices shall be Polaris IT-4, Burndy, ILSCO insulated splice or equal.

All poles shall have in-line fuse holders on all ungrounded conductors. Fuse holders shall be Bussman Tron HEB-AA, Littelfuse, Gould-Shawmut, or equal. Fuses shall be 3 amp. Festoon receptacle outlets shall be separately fused.

Underground splices in pull boxes are prohibited, unless approved by the Engineer in writing. If pre-approved, splices shall be made up with 3M Scotchcast 90-B1, TNB, Birkett splicing kits or equal.

770-P04 CONDUIT AND CONDUCTOR: Payment for conduit and conductors will be at plan quantity unless changes are directed by the Engineer due to field changes. Contractor shall coordinate his work so as to provide the least amount of conflict to the roadway construction.

A plastic cable-marking warning strip shall be installed in trenches as shown on the Plans. The strip shall have black letters on a red background. This strip shall be included with the conductor pay items.

770-P05 LIGHT POLE FOUNDATION: The Contractor shall provide screw in base foundations. Installation of all foundations shall include visually exposing (ie. pothole) existing utilities regardless of type, size or depth prior to installing the screw in foundation. Contractor shall record position and depth of all located utilities on record drawings. All costs for labor, materials and equipment to complete the potholing and utility verification shall be included in the bid item "Screw In Base Foundation".

770-P06 LIGHT STANDARDS: Light standards shall be octagonal tapered galvanized steel pole with truss arms, breakaway transformer bases, and festoon receptacle outlet. Mounting heights shall be as noted on the Plans.

770-P07 LUMINAIRES: The 400 watt high pressure sodium vapor luminaires shall be internal ballast constant wattage, 120x240 volt, operated on 240 volts. The finish shall be gray enamel.

Where noted on the drawings, provide LED luminaires with the following specifications:

1. UL listed or USA NRTL listed.
2. Multi-volt 120-277 V power supply.
3. 4000K, 70 CRI minimum.
4. Rated for -40°C to 40°C ambient.
5. Die-cast aluminum powder-coated gray painted housing.
6. IP66 rated.
7. Die-cast trigger latch door frame for tool-less entry.
8. Minimum of 5 year warranty.

Type II distribution LED fixtures shall deliver 11,400 minimum lumens between 0 and 60 degrees and have a maximum wattage of 216 watts. Type III distribution LED fixtures shall

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deliver 14,450 minimum lumens between 0 and 60 degrees and have a maximum wattage of 284 watts.

770-P08 PULL BOX: Pull boxes shall meet the specification outlined in the NDDOT standard drawing D-770-3. All proposed pull boxes shall be made of PVC with steel casting and shall include a traffic resistance cast iron cover. Pull boxes shall be 4' deep.

770-P09 LIGHTING SYSTEM POWER SOURCE: The Contractor shall be responsible for obtaining the electrical source necessary to operate the lighting system. The Contractor shall make the necessary arrangements with the utility to provide for the electric service, which may come from the existing pad mounted transformer or a new transformer in the same location. The electric utility is Xcel Energy. Costs for electric service, including three 3/0 copper service cables in 3" PVC conduit and grounding as required by the NEC, shall be included in the bid item "Feed Point-Type IV-Pad Mounted". The Contractor shall also be responsible for all costs required to operate and maintain the lighting system until final acceptance of the lighting system. These costs shall be included in the bid item "Feed Point-Type IV-Pad Mounted".

770-P10 FEED POINT: The bid item "Feed Point-Type IV-Pad Mounted" shall include all labor, materials, equipment and utility fees to provide one new feed point to be located at Station 432+23.58 O/s 62.56' Rt (FP 1). All street lighting luminaires shall be operated on 240 volt. Festoon receptacles will require 120 volt. Feed point components shall be furnished and installed in accordance with the Plans.

The cabinet shall be of adequate size to house the specified number of circuits and equipment shown on the feed point detail. Transformer ground shall be tied into cabinet grounding lug and neutral lug. Enclosures shall include a subpanel for complete deadfront access to all, main disconnect handles, circuit breaker handles and toggle test switches. Breakers shall be specified amperage, plug in type, 10,000 AIC.

Photoelectric (PE) cells shall be externally mounted on the feed point cabinet. PE sockets shall be EEI/NEMA type. PE control shall have a time delay of at least 15 seconds and rated for 240 volt or equal. PE cells shall face east or north.

The existing Type 2 feed point located at Station 432+10 O/s 30' Rt shall be removed, salvaged and delivered to the City Electrician at 714 South 47th Street, Grand Forks, ND. The Contractor shall coordinate their delivery with Mr. Rick Hanson. Mr. Rick Hanson may be reached at 701-746-2690. All costs associated with removal and salvaging existing feed point shall be included in the bid item "Feed Point-Type IV-Pad Mounted".

770-P11 LIGHTING CIRCUIT TESTING: Existing circuit segments to be reused, if any, shall be megohm tested before new work is started. New work shall be megohm tested as soon as it is completed. Megohm testing shall be in the presence of the Engineer prior to connection to circuit power. A final megohm test of each circuit shall be conducted in the presence of the Engineer and City representatives.

All underground street lighting circuits shall be tested with a megohmmeter at a minimum of 5,000 volts with no readings on new circuits below 50 Meg ohms. Any conductors failing this test shall be replaced. The cost of this testing shall not be bid separately, but shall be include in the price bid for "UNDERGROUND CONDUCTOR NO__ TYPE RHW".

770-P12 ROADWAY LIGHTING SYSTEM: The roadway lighting system shall be considered a safety appurtenance as referenced in Section 108.07 B. of the Standard Specifications.

770-P13 TEMPORARY LIGHTING: The Contractor shall maintain the existing lighting (scheduled to be removed) on the east side of South Columbia Road until temporary or new permanent lighting on the west side of South Columbia Road is operational. Contractor shall provide temporary circuit wiring to maintain existing lighting shown south of the construction limits (five light standards not scheduled to be removed) until their permanent feeder is installed and operational.

770-P14 TEMPORARY STREET LIGHTING: All existing and new street lights shall operate dusk to dawn. If new permanent lighting is not operational on the west side of South Columbia Road before the start of construction on Phase 2, provide temporary street lighting as shown on the Plans and herein described:

1. Relocate existing feed point cabinet near location of proposed new feed point location. Temporarily extend service conductors, re-feed existing street lights and add temporary circuits for temporary street lighting as required for a complete operational lighting system acceptable to the Engineer.
2. Overhead cables shall be triplex #4 or #6 aluminum ASCR neutral – messenger cable (Paludina, Voluta, Whelk, Periwinkle).
3. Poles shall be treated Class 5 or better utility grade wood poles. Guying and guy anchors shall be provided as shown on the drawings to meet support conditions. Provide high visibility guy covers in areas accessible to the public.
4. Luminaires shall be 250 watt HPS roadway luminaires with Type III distribution. Provide 2 foot to 5 foot single mast arm for wood pole mounting with each luminaire.
5. Maintain luminaires for nighttime operation as required by the project schedule.
6. All costs for labor, materials, and equipment to install, maintain, and remove the temporary street lighting shall be included in the bid item "Temporary Street Lighting".

This document was originally issued and sealed by
W. Brian Poykko
Registration Number PE-2666,
on 11/18/15 and the original document is stored at the
office of CPS, Ltd.
Grand Forks, ND

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772-P01 TRAFFIC SIGNAL STANDARDS: The design of the Traffic Signal Standards shall meet the requirements of AASHTO publication, Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (5th Edition 2010 Interim). A wind velocity of 90 mph with the necessary coefficient of height correction factor shall be used in the calculations. Each structure component shall be designed using the requirements of Table 11-1, "Fatigue Importance Factor, IF" Fatigue Category III shall be used for Traffic Signal Standards with mast arm lengths less than 40 feet, Fatigue Category II shall be used for Traffic Signal Standards with mast arm lengths greater than or equal to 40 feet. All the necessary calculations and drawings used in the design of the Traffic Signal Standards shall be furnished with the shop drawing submittal. Calculations and work drawings used in the design of the Traffic Signal Standards shall be signed, sealed, and dated by a Professional Engineer duly registered in the State of North Dakota.

772-P02 FIELD VERIFICATION: All features labeled "Existing" are approximately located, Contractor shall verify in field. The Contractor shall field 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-P03 SITES 1 AND 2: This plan covers work at two signalized intersection sites as follows:
 Site 1: South Columbia Road and 11th Avenue South.
 Site 2: South Columbia Road and 13th Avenue South.

772-P04 REVISE TRAFFIC SIGNAL SYSTEM-SITE 1: The price bid for "Revise Traffic Signal System-Site 1" shall include all labor and equipment necessary for the signal system revision to be fully operational as shown in the plans upon construction completion. This includes, but is not limited to, the installation of the following features: vehicular head removal or revisions, along with all appurtenances to install the traffic signal completely. This also includes the removal of existing wiring or any other abandoned existing features that may conflict with the proposed traffic signal system improvements. Additionally, the Contractor shall coordinate with the traffic signal system cabinet and equipment supplier to have the supplier complete the necessary modifications to accommodate the flashing yellow arrows, wiring and programming.

772-P05 TRAFFIC SIGNAL SYSTEM - SITE 2: The price bid for "Traffic Signal System – Site 2" shall include all labor and equipment necessary for the signal system to be fully operational as shown in the plans upon construction completion. This includes, but is not limited to, the installation of the following features: traffic signal standards, mast arms, pedestrian pushbuttons, pushbutton posts and signs, vehicular and pedestrian heads, video detection system, street light extensions, luminaires, controller, controller battery back-up, cabinet, foundations, feed point installation, removal or revisions, emergency vehicle pre-emption system, along with all cable, conduit, junction boxes and appurtenances to install the traffic signal completely. Also includes the removal of the existing wiring or any other abandoned existing features that may conflict with the proposed traffic signal system improvements. The existing traffic signal shall remain operational throughout the construction staging until the new signal is operational.

772-P06 IT SYSTEM: The price bid for "IT SYSTEM" shall include all labor and equipment necessary to interconnect all of the traffic signals within the project limits as shown in the IT plans. This shall include but not be limited to all fiber optic cable, pull boxes, conduit, conduit sweeps into existing pull boxes and connections required for the interconnected system to be fully operational. This also includes furnishing and installing Ethernet switches and fiber splice boxes/enclosures sized for all fibers at each signalized intersection. It also includes removing a portion of the existing fiber optic cable, protecting it and salvaging it for reinstallation as shown in the plans.

772-P07 TRAFFIC SIGNAL CONTROLLER (SITE 2): The proposed volume density controller shall be an Econolite Cobalt RM with Transit Key/2M Series NEMA TS2/NTCIP. The controller cabinet and auxiliary control equipment furnished shall be from a manufacturer whose Econolite Cobalt RM with Transit Key/2M Series NEMA TS2/NTCIP operates on Centrac Software which has been approved by the City of Grand Forks. 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 shall be included in the price bid for "Traffic Signal System – Site 2."

772-P08 SIGNAL TIMING AND COORDINATION (SITE 2): The contractor shall deliver the controller and cabinet for Site 2 to the City Electrician, Rick Hanson (701-738-8796), at the Public Works Department located at 724 N 47th Street. The City Electrician will program the controllers and conduct operational tests. The controller shall operate 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 shall be rejected. The contractor shall replace any rejected controller. The replaced controller shall meet the requirements as stated above. After the controllers have operated satisfactorily for the 30 days, they will be approved by the City of Grand Forks and the contractor shall install the approved controllers and cabinet at the intersections. All labor, materials and equipment necessary for furnishing and installing the controllers, as well as delivery to City Electrician, shall be included in the price bid for "Traffic Signal System – Site 2."

772-P09 GRAND FORKS TRAFFIC SIGNAL CABINET (SITE 2): The proposed traffic signal cabinet shall be Econolite 332D, pre-wired with ancillary components including a RENO A&E Traffic Signal Conflict Monitor with Ethernet port. Cabinet shall adhere to the City of Grand Forks Cabinet Specifications at Traffic Control Corporation. The traffic signal cabinet is included to the price bid for the traffic signal controller. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for "Traffic Signal System – Site 2."

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772-P10 CONCRETE CONTROLLER CABINET PAD (SITE 2): The price bid for “Traffic Signal System – Site 2” includes a new concrete pad to mount the proposed traffic signal cabinet. The concrete pad shall be appropriately sized for a Type 332D cabinet as specified in the plans.

772-P11 PADLOCKS (SITE 2): The City of Grand Forks shall provide padlocks for the new traffic signal system at Site 2.

772-P12 BATTERY BACKUP SYSTEM (SITE 2): The Contractor shall provide a battery backup system for the traffic signal system. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for “Traffic Signal System – Site 2.” The battery backup system shall have 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
- The battery backup system shall be capable of running the intersection for 30 minutes at 1000 watts and then switch to flash operation to conserve power
- The UPS shall include an external bypass switch rated at 30 amp 250 VAC and shall use 30 amp relays.

772-P13 EMERGENCY VEHICLE PREEMPTION (SITE 2): The emergency vehicle preemption system shall be 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 shall be LED.

The EVP equipment shall be fully compatible with the other EVP equipment used within the City of Grand Forks. The Contractor shall provide all labor and equipment necessary for the emergency vehicle preemption system to be fully operational. The Contractor shall notify 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. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for “Traffic Signal System – Site 2.”

772-P14 MALFUNCTION MANAGEMENT UNIT (SITE 2): The traffic signal controller malfunction management unit shall be a RENO A&E model with an Ethernet port. A complete controller malfunction management unit test shall be performed by the Contractor prior to unveiling the traffic heads. All materials, labor and equipment necessary to conduct the malfunction management unit testing shall be included in the price bid “Traffic Signal System – Site 2.”

772-P15 SHOP DRAWINGS (SITES 1 AND 2): The Contractor shall furnish shop drawings and a complete listing of materials proposed for installation. Two copies shall be utilized by 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. The Contractor shall 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.

772-P16 VEHICULAR TRAFFIC SIGNAL HEADS (SITES 1 AND 2): The vehicular signal heads shall be 12 inch heads with aluminum housings for each section. All sections shall be equipped with General Electric GTx LED illuminating elements. All LED traffic signal sections shall conform to the Institute of Transportation Engineers Equipment and Materials Standards and Specifications. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the prices bid for “Revise Traffic Signal System–Site 1,” and “Traffic Signal System – Site 2.”

772-P17 PEDESTRIAN SIGNAL HEADS (SITE 2): The countdown pedestrian signal heads shall be equipped with LED illuminating elements displaying the pedestrian signals as shown. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for “Traffic Signal System – Site 2.”

772-P18 PEDESTRIAN PUSH BUTTON POSTS (SITE 2): Pedestrian push button posts shall be SMP2 with breakaway tabs per TIP indications. The mounting posts shall be aluminum with anodized natural gray finish. All costs, labor, materials and equipment necessary for furnishing and installing shall be included in the price bid for “Traffic Signal System – Site 2.”

772-P19 PEDESTRIAN PUSHBUTTON UNITS (SITE 2): Contractor shall furnish and install Advanced Accessible Pedestrian System (AAPS) pedestrian push buttons. Each pedestrian sign and pushbutton shall be on one framed enclosure mounted on the signal pole or bolted directly to the pedestrian pushbutton post. Bandit shall not be permitted. The top of the pushbutton signs shall not extend above the top of the pedestrian pushbutton post. Each installation shall include the Advisor Advanced APC Pedestrian Controller and shall be capable of remote network ether connection for real time monitoring and control of operating parameters. Standalone pushbutton posts shall be the Priosk SMP2 High Visibility Pedestrian Station. All costs, labor, materials and

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equipment necessary for furnishing and installing this item shall be included in the price bid for "Traffic Signal System – Site 2."

772-P20 TRAFFIC SIGNAL HEAD MOUNTINGS (SITES 1 AND 2): Piping shall be furnished to mount the vehicle and signal heads to the side of the poles. Heads shall not be mounted directly to the pole or on the face of the pole directly adjacent to the street. All costs, labor, materials and equipment necessary for installing traffic signal heads shall be included in the prices bid for "Revise Traffic Signal System–Site 1," and "Traffic Signal System – Site 2."

772-P21 TRAFFIC SIGNAL STANDARDS - TRANSFORMER BASES (SITE 2): All proposed traffic signal standards shall be "T" transformer base type standards. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for "Traffic Signal System – Site 2."

772-P22 SIGNAL STANDARD PAINT COLOR: All traffic signal system components shall be painted in accordance with the following:

- Transformer base – black
- Mast arm – black
- Signal head mounting hardware – black
- Shaft – black
- Signal housing – black
- Pedestrian pushbutton post – black
- Pedestrian pushbutton housing – black

The color black shall be #27038 of Federal Standard No. 595B.

772-P23 PULL BOXES: Pull boxes shall meet the specification outlined in the NDDOT standard drawing D770-3. All proposed pull boxes shall be made of PVC with steel casting and shall include a traffic resistant cast iron cover.

772-P24 CONDUIT: Conduit shall be installed at the locations shown on the plans. Conduit shall be bored under existing pavement. At specific locations, the contractor may need to dig potholes to verify that the conduit avoids the existing utility. Pushing conduit, digging potholes and restoring the potholes with new material that ties into the existing surround material shall be included in the prices bid for new and revised traffic signal systems and IT system. All conduits shall be sealed 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 shall be UL listed.

772-P25 ADDITIONAL CONDUIT (SITE 2): The Contractor shall 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. The conduit shall be capped. All costs to supply and install this additional conduit shall be included in the price bid for "Traffic Signal System – Site 2."

772-P26 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 shall be included in the prices bid for new and revised traffic signal systems and IT system. This shall include 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, the Contractor shall include earth fill with 6" of topsoil and seed. At locations where the surround material is concrete, the Contractor shall tie into the existing concrete. All removed material whether concrete or earth is the property of the Contractor and shall be disposed of accordingly. Compaction and density controls shall be in accordance with Section 203.04 E.2 of the Standard Specifications AASHTO T-99.

772-P27 FOUNDATION REMOVAL (SITE 2): All removed foundations are the property of the Contractor and shall be disposed of accordingly. All costs, labor, materials and equipment necessary for removing and disposing of concrete foundations shall be included in the price bid for "Traffic Signal System – Site 2."

772-P28 CONDUCTOR COLOR CONTINUITY: Conductor color continuity shall be maintained 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-P29 WIRE SPLICING: No splicing will be allowed in pull boxes. Splicing may only take place in the signal base.

772-P30 LABEL ALL FIELD CABLES: All labeling materials shall be approved by the City. Labels shall be readable without moving the cables. When installing cable bundles in conduit, bundles will not be taped. All field cables installed by the Contractor shall be labeled with the cable designations:

TYPE	LABEL	LABEL LOCATION
Communication Cable	Comm./address of other end	Within 12" of conduit
Pedestrian Push Button	Phase/location (i.e. NW, SW, etc.)	Within 6" of terminals
Video 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

Labeling field cables is not a separate pay item; its cost shall be included in the prices bid for "Revise Traffic Signal System–Site 1" and "Traffic Signal System – Site 2."

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772-P31 FEED POINT (SITE 2): The Contractor shall be responsible for connecting the traffic signal controller to the new feed point. This shall include, but not be limited to, installation of a new 50 amp breaker Type BR at the feed point for traffic control signal purposes.

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

All costs incurred by the utility company for the new feed point shall be directly billable to the Contractor. The Contractor shall furnish and install new conduit from the new controller cabinet to the new feed point. The Contractor shall furnish and install #6 U.S.E. cable between the new controller and the new feed point. All costs, labor, materials and equipment required for feed point shall be included in the price bid for "Traffic Signal System – Site 2."

772-P32 REMOVALS AND SALVAGING: The Contractor is responsible for removing and salvaging existing traffic signal equipment as shown on the plans. This equipment includes but is not limited to signal standards, foundations, traffic signal controller and cabinet, vehicle heads, pedestrian heads, cable and conduit. All removed equipment to be salvaged (including vehicular and pedestrian signal heads, signal standards, signal controller and cabinet) shall be delivered to the City of Grand Forks at 714 South 47th Street, Grand Forks, ND. The Contractor shall coordinate delivery with City Electrician Rick Hanson (701-738-8796). All other removed equipment shall become the property of the contractor and disposed of properly. All costs, labor, materials and equipment necessary for removing and salvaging these items shall be included in the prices bid for "Revise Traffic Signal System–Site 1" and "Traffic Signal System – Site 2."

772-P33 ETHERNET SWITCH (SITE 2): Ethernet Switch shall be produced by RuggedCom and shall be model type RuggedSwitch RS-900G-2L. Switch shall have dual fiber optic Gigabit Ethernet ports. Connections shall include two (2) single-mode fibers with LC connectors in and out. All costs, labor, materials and equipment necessary for furnishing and installing this item shall be included in the price bid for "IT SYSTEM."

772-P34 IP ADDRESS: The Contractor shall coordinate with the City of Grand Forks to obtain any required IP addresses during IT system installation.

772-P35 TRACER CONDUCTOR: The interconnect cable conduit shall have a tracer conductor installed and labeled in each controller cabinet. The tracer conductor shall consist of a No. 14 AWG - Type THW single conductor as specified in Standard Specification section 895.03A1. The conductor shall be continuously unspliced from control cabinet to control cabinet. The cost of furnishing and installing this conductor shall not be bid separately but shall be included in the price bid for "IT SYSTEM."

772-P36 MAXIMUM TENSILE PULL STRENGTH: The contractor shall not exceed a maximum tensile strength of 600 pounds when pulling the fiber optic interconnect cable.

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910-P01

CONTROLLED DENSITY FILL (CDF): Controlled density fill shall be used to fill under pipes at manholes and inlets as shown on the Plans and at other locations as shown on the Plans or described in the specifications. The properties of the fill shall be a blend of cement, water, pozzolanic materials and fillers. The material shall be fluid on placement to flow around and fill voids around pipes. The material shall be able to support normal loads after six hours and shall have a compressive strength in the range of 75 psi to 125 psi at 28 days. The material shall be such that it lends itself to easy removal with a tractor backhoe. If the mix design shown is used, no further testing will be required. The mix design yields approximately one cubic yard of flowable mortar.

Mix Design

Cement	100 lbs
Flyash	300 lbs
Fine Aggr	2600 lbs
Water	70 gals

Controlled density fill will not be measured separately but shall be included in the price bid for the respective manhole, inlet, storm sewer pipe and hydrant bid items.

This document was originally issued and sealed by Deon D. Wawrzyniak Registration Number PE-4622, on 08/11/15 and the original document is stored at the office of CPS, Ltd. Grand Forks, ND

ENVIRONMENTAL COMMITMENTS

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ENVIRONMENTAL COMMITMENTS (EC): The City of Grand Forks, the North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The environmental commitments are as follows:

EC-1: Based on the NEPA documentation, no additional permits or environmental commitments have been identified beyond what is covered by the NDDOT's Standard Specification of Road and Bridge Construction.

Wetland Number	Location	LAT/LONG (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Feature	Wetland Size (acres)	Wetlands Protected Under E.O.11990	USACE Jurisdictional Wetlands	Impacts to Wetlands		
									Temp.	Perm.	
NO WETLANDS PRESENT											
TOTALS:									0.00	0.00	

* A wetland Jurisdictional Determination was issued by the USACE on 12/15/2010; NWO-2010-02728-BIS.

EC-2: Impacted urban trees within the project right-of-way and easements must be mitigated for.

ACTION TAKEN/REQUIRED: There are 56 urban trees within the project right-of-way and easements. Approximately 46 of these trees will be impacted during construction and will be mitigated for. The City of Grand Forks planted 39 trees at the South 48th Street Storm Water Pond site where which a portion of the impacted trees would be mitigated. 27 of these trees were utilized for mitigation purposes on Phase 1 Reconstruction of South Columbia Road. The balance of 12 trees will be utilized for tree mitigation from this project. There would remain an additional 34 trees to be mitigated for this project. In cooperation with the Grand Forks Park District Forestry Department, the remaining tree mitigation would be completed at a 1:1 ratio as part of the City Wide tree planting program in existing and newly develop areas of the City of Grand Forks.

EC-3: The Contractor shall obtain a permit from the City of Grand Forks as part of the NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit obligation.

NOTIFICATIONS TO BE FILED BY CONTRACTOR:

- Federal Aviation Administration Notice of Proposed Construction or Alteration Form 7460-1 (online at <http://oeaaa.faa.gov>)

ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-6-986(105)109	100% City Funds	TOTAL
103	0100	CONTRACT BOND	L SUM	1		1
201	0352	REMOVAL OF TREES & BRUSH	L SUM	1		1
202	0119	SAW CONCRETE	LF	3026		3026
202	0130	REMOVAL OF CURB & GUTTER	LF	4454		4454
202	0137	REMOVAL OF PAVEMENT	SY	15554		15554
202	0153	SAW BITUMINOUS SURFACING-FULL DEPTH	LF	113		113
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	414		414
202	0210	REMOVAL OF MANHOLES	EA	6		6
202	0230	REMOVAL OF INLETS	EA	7		7
202	0285	REMOVAL OF FOUNDATIONS-ALL SIZES	EA	2		2
203	0109	TOPSOIL	CY	1944		1944
203	0119	TOPSOIL-IMPORTED	CY	700		700
203	0138	COMMON EXCAVATION-SUBCUT	CY	15756		15756
216	0100	WATER	MGAL	769		769
251	0300	SEEDING CLASS III	ACRE	0.930		0.930
251	2000	TEMPORARY COVER CROP	ACRE	0.930		0.930
252	0100	SOD	SY	6105		6105
253	0201	HYDRAULIC MULCH	ACRE	1.860		1.860
260	0200	SILT FENCE SUPPORTED	LF	1000		1000
260	0201	REMOVE SILT FENCE SUPPORTED	LF	1000		1000
265	0100	STABILIZED CONSTRUCTION ACCESS	EA	1		1
265	0101	REMOVE STABILIZED CONSTRUCTION ACCESS	EA	1		1
302	0101	SALVAGED BASE COURSE	CY	6572		6572
302	0114	AGGREGATE BASE COURSE CL 3	CY	8092		8092
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	176		176
550	0117	9IN NON-REINF CONCRETE PAVEMENT CL AE	SY	2898		2898
550	0131	9IN REINF CONCRETE PAVEMENT CL AE	SY	4881		4881
550	0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	9521		9521
702	0100	MOBILIZATION	L SUM	1		1
704	0100	FLAGGING	MHR	6624		6624
704	1000	TRAFFIC CONTROL SIGNS	UNIT	4276		4276
704	1052	TYPE III BARRICADE	EA	67		67
704	1060	DELINEATOR DRUMS	EA	298		298
704	1067	TUBULAR MARKERS	EA	71		71
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2		2
704	4011	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2		2
708	1540	INLET PROTECTION-SPECIAL	EA	24		24
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	24		24
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	20498		20498
710	0250	TEMPORARY BYPASS DRAINAGE SYSTEM	EA	2		2

Estimate of Quantities

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-6-986(105)109	100% City Funds	TOTAL
714	0110	PIPE CONC REINF 12IN CL III	LF	379		379
714	0205	PIPE CONC REINF 15IN CL III	LF	22		22
714	0705	PIPE CONC REINF 27IN CL III	LF	100		100
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN	LF	2018		2018
722	0110	MANHOLE 60IN	EA	5		5
722	0120	MANHOLE 72IN	EA	1		1
722	1110	MANHOLE RISER 60IN	LF	25.9		25.9
722	1120	MANHOLE RISER 72IN	LF	6.8		6.8
722	3500	INLET-TYPE 1	EA	10		10
722	6140	ADJUST GATE VALVE BOX	EA	6		6
722	6200	ADJUST MANHOLE	EA	6		6
724	0411	6IN HYDRANT	EA		4	4
724	0430	REMOVE HYDRANT	EA		4	4
724	1025	UNDERGROUND IRRIGATION SYSTEM	L SUM	1		1
748	0100	CURB & GUTTER	LF	465		465
748	0140	CURB & GUTTER-TYPE I	LF	6325		6325
750	0105	SIDEWALK CONCRETE BIKEWAY	SY	1532		1532
750	0115	SIDEWALK CONCRETE 4IN	SY	1317		1317
750	0210	CONCRETE MEDIAN NOSE PAVING	SY	88		88
750	0245	CONCRETE PAVING COLORED	SY	213		213
750	1000	DRIVEWAY CONCRETE	SY	27		27
750	2115	DETECTABLE WARNING PANELS	SF	164		164
752	0911	TEMPORARY SAFETY FENCE	LF	500		500
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	402		402
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	37		37
754	0115	FLAT SHEET FOR SIGNS-TYPE IX REFL SHEETING	SF	83		83
754	0170	FLEXIBLE DELINEATORS	EA	6		6
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	424		424
754	0592	RESET SIGN PANEL	EA	1		1
762	0112	EPOXY PVMT MK MESSAGE	SF	128		128
762	0113	EPOXY PVMT MK 4IN LINE	LF	1386		1386
762	0115	EPOXY PVMT MK 8IN LINE	LF	853		853
762	0118	EPOXY PVMT MK CURB TOP & FACE	LF	195		195
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	528		528
762	0420	SHORT TERM 4IN LINE-TYPE R	LF	246		246
762	0425	SHORT TERM 16IN LINE-TYPE R	LF	88		88
762	0440	SHORT TERM MESSAGE-TYPE R	SF	33		33
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	2300		2300
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE-GROOVED	LF	1092		1092
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	3880		3880

Estimate of Quantities

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	8	3

ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-6-986(105)109	100% City Funds	TOTAL
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED	LF	288		288
762	1500	OBLITERATION OF PVMT MK	SF	757		757
770	0025	SCREW IN BASE FOUNDATION	EA	12		12
770	0060	CONCRETE FOUNDATION-FEED POINT-TYPE B	EA	1		1
770	0100	PULL BOX	EA	3		3
770	0320	1.5IN DIAMETER RIGID CONDUIT	LF	3824		3824
770	0330	2IN DIAMETER RIGID CONDUIT	LF	527		527
770	0503	UNDERGROUND CONDUCTOR NO2-TYPE RHW	LF	3618		3618
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	12192		12192
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	3662		3662
770	0745	FEED POINT-TYPE IV-PAD MOUNTED	EA	1		1
770	1676	LT STD 6FT MA 40FT MT HT BREAKAWAY	EA	12		12
770	4170	HP SODIUM VAPOR LUMINAIRE-400 WATT	EA	9		9
770	4210	LED LUMINAIRE	EA	3		3
770	4501	TEMPORARY LIGHTING SYSTEM	EA	1		1
770	4560	REMOVE LIGHT STANDARD	EA	8		8
772	2810	TEMPORARY TRAFFIC SIGNALS	EA	2		2
772	2906	REVISE TRAFFIC SIGNAL SYSTEM-SITE 1	EA	1		1
772	9200	IT SYSTEM	EA	1		1
772	9812	TRAFFIC SIGNAL SYSTEM - SITE 2	EA	1		1

Estimate of Quantities

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	10	1

Topsoil

Topsoil quantity based on a 6" removal depth. Topsoil will be measured as an in-place volume at plan quantity.

Topsoil-Imported

An allowance of "Topsoil-Imported" based on a 6" depth has been included in the Plans which may be used as directed by Engineer in areas requiring sensitive landscaping restoration.

Water

10 Gal/CY of Embankment
40 Gal/CY of Salvaged Base Course and Aggregate Base Course Class 3
25 MGal for Dust Palliative

Common Excavation-Subcut

Excavation of roadway section, shared used path and driveways shall extend 1' outside the limits of the concrete pavement or curb and gutter.

Commercial Grade Hot Mix Asphalt

2.0 Ton/CY

Seeding, Sod and Mulching

Section 76: Disturbed areas within the Construction Staging Area shall be seeded with a temporary cover crop and hydraulically mulched during the construction season with permanent seeding to be completed during subsequent growing season, unless conditions allow for permanent seeding to be completed.

Section 77: Disturbed areas within the construction limits as shown in the Plans shall be seeded and hydraulically mulched or sodded, unless otherwise noted on the Plans or adjusted by the Engineer in the field.

Manhole Riser

Length determined by the following calculation (example MH 1 shown below):

Top Elev	831.82
Castings/Rings/Cover Adj.	- 1.92 (Includes Float)
Invert (Lowest Inv Elev)	<u>- 824.39</u>
Riser Pay Length	5.5 LF

Flagging

Phase 1: 11 weeks x 6 days/week x 12 hours/day x 4 flaggers = 3168 flagger-hours
Phase 2: 11 weeks x 6 days/week x 12 hours/day x 4 flaggers = 3168 flagger-hours
Phase 3: 4 weeks x 6 days/week x 6 hours/day x 2 flaggers = 288 flagger-hours
Total: = 6624 flagger-hours

Pavement Marking

4" Centerline Skip: 1320 LF/Mile

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	11	1

Location	Common Excavation	Embankment		Balance
	Type A	Roadway	Adjusted	Waste
	Pay Item			
	CY	CY	CY	CY
A	B	C = B*	D = A - C	
Columbia Road	14447	213	277	14170
14th Ave S West Approach	42	7	9	33
14th Ave S East Approach	149	13	17	132
13th Ave S West Approach	392	53	69	323
13th Ave S East Approach	726	26	34	692
Totals	15756	312	406	15350

Location	Topsoil	Topsoil	Balance
	Pay Item	Embankment	
		CY	CY
	E	F	G = E - F
Columbia Road	1721	846	875
14th Ave S West Approach	12	12	0
14th Ave S East Approach	35	33	2
13th Ave S West Approach	88	69	19
13th Ave S East Approach	88	72	16
Totals	1944	1032	912

Pay Items		
Common Excavation - Type A	15756	CY
Topsoil	1944	CY

Note: 6387 CY of the Common Excavation - Type A is the upper 18" Lime Treated Subgrade and shall not be used as Embankment

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Earthwork Summary
 Project Totals
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

* An additional 30% has been added for shrinkage

South Columbia Road				
Station	Common Ex.	Embankment*	Topsoil	Topsoil
	Type A		Excavation	Embankment
	CY		CY	CY
422+99.53	0	0	0	0
423+00.00	4	0	1	0
423+25.00	213	4	27	19
423+50.00	230	4	29	18
423+75.00	234	5	31	19
424+00.00	232	5	33	18
424+25.00	249	1	17	9
424+50.00	237	1	14	6
424+75.00	199	4	28	13
425+00.00	189	8	29	14
425+25.00	195	7	29	14
425+50.00	198	7	28	13
425+75.00	200	5	26	11
426+00.00	203	4	27	11
426+25.00	206	4	27	11
426+50.00	210	4	27	11
426+75.00	222	3	27	11
427+00.00	237	1	27	11
427+25.00	244	1	26	11
427+50.00	247	1	26	11
427+75.00	247	1	30	15
428+00.00	240	3	30	15
428+25.00	237	3	26	11
428+50.00	239	3	27	11
428+75.00	238	4	27	11
429+00.00	241	5	30	15
429+25.00	244	7	30	15
429+50.00	242	9	26	11
429+75.00	240	10	26	11
430+00.00	242	12	26	11
430+25.00	245	14	28	13
430+50.00	245	20	32	18
430+75.00	242	13	35	22
431+00.00	250	3	36	23
431+25.00	307	1	19	12
431+50.00	340	0	0	0
431+75.00	357	0	22	0
432+00.00	310	0	34	4
432+25.00	224	3	29	14
432+50.00	230	3	31	17
432+75.00	250	3	28	14
433+00.00	254	1	28	14

South Columbia Road				
Station	Common Ex.	Embankment*	Topsoil	Topsoil
	Type A		Excavation	Embankment
	CY		CY	CY
433+25.00	252	1	28	14
433+50.00	253	1	28	14
433+75.00	256	1	29	14
434+00.00	261	1	30	14
434+25.00	266	1	32	14
434+50.00	262	1	33	14
434+75.00	252	1	33	15
435+00.00	238	1	33	16
435+25.00	220	1	33	17
435+50.00	211	3	33	18
435+75.00	200	7	34	19
436+00.00	194	10	34	19
436+25.00	204	10	34	19
436+50.00	209	9	34	19
436+75.00	211	8	34	19
437+00.00	217	8	34	19
437+25.00	232	5	34	19
437+50.00	243	5	33	19
437+75.00	237	5	28	15
438+00.00	227	7	22	14
438+21.75	189	4	9	7
Totals	14447	277	1721	846

* An additional 30% has been added for shrinkage.

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Earthwork Summary
 South Columbia Road
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	11	3

14th Avenue South				
Station	Common Ex.	Embankment*	Topsoil	Topsoil
	Type A		Excavation	Embankment
	CY	CY	CY	CY
West Approach				
11+48.86	0	0	0	0
11+69.35	42	9	12	12
Sub Total	42	9	12	12
East Approach				
13+09.08	0	0	0	0
13+25.00	41	3	9	8
13+50.00	57	7	15	14
13+75.00	51	7	11	11
Sub Total	149	17	35	33
Totals	191	26	47	45

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Earthwork Summary
 14th Avenue South
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

* An additional 30% has been added for shrinkage.

13th Avenue South				
Station	Common Ex.	Embankment*	Topsoil Excavation	Topsoil Embankment
	Type A			
	CY	CY	CY	CY
West Approach				
11+07.65	0	0	0	0
11+20.00	15	1	3	4
11+25.00	13	0	3	3
11+50.00	64	10	17	15
11+75.00	72	17	16	13
12+00.00	83	18	16	13
12+25.00	93	16	20	12
12+36.98	52	7	13	9
Sub Total	392	69	88	69
East Approach				
14+07.47	0	0	0	0
14+25.00	89	3	11	8
14+50.00	125	7	16	11
14+75.00	119	7	16	11
15+00.00	114	7	16	11
15+25.00	113	5	15	11
15+36.19	43	1	5	4
15+50.00	41	0	2	4
15+75.00	57	1	3	7
15+90.87	25	3	4	5
Sub Total	726	34	88	72
Totals	1118	103	176	141

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Earthwork Summary
 13th Avenue South
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

* An additional 30% has been added for shrinkage.

Salvaged Base Course Summary

Location	Removal of HBP (CY)	Removal of Concrete (CY)	Removal of Curb & Gutter (CY)	Removal of Sidewalk (CY)	Material (Aggr., Bit., Conc. & Curb) to be Removed & Salvaged (CY)	Salvaged Base Course Required (CY) Pay Item
	A	B	C	D	E = A + B + C + D	F
South Columbia Road Mainline	146	2342	213	175	2876	5963
14th Avenue South	0	90	15	7	112	123
13th Avenue South	19	264	34	29	346	487
Total	165	2696	262	211	3334	6573

Basis of Quantities

Mainline Pavement: 8 Inches	Hot Bituminous ML Transition: 8 Inches
Sidewalk Thickness: 4 Inches	Hot Bituminous Parking Lot: 4 Inches
Side Streets: 7 Inches	Concrete Driveways: 6 Inches
Curb & Gutter: 0.06 CY per Foot	

<u>Salvaged Material Available</u>	<u>Removal Qty</u>	<u>5% Handling Loss</u>	<u>Available</u>	<u>Unit</u>
Bituminous (A)	165	8	157	CY
Concrete (B+C+D)	3169	158	3011	CY
Material Available for Salvaged Base Course (F)			3167	CY

	Estimated Total	
Salvaged Base Course Required (E)	6573	CY
Material Available for Salvaged Base Course (F)	- 3167	CY
Additional Material Required (G)	3406	CY

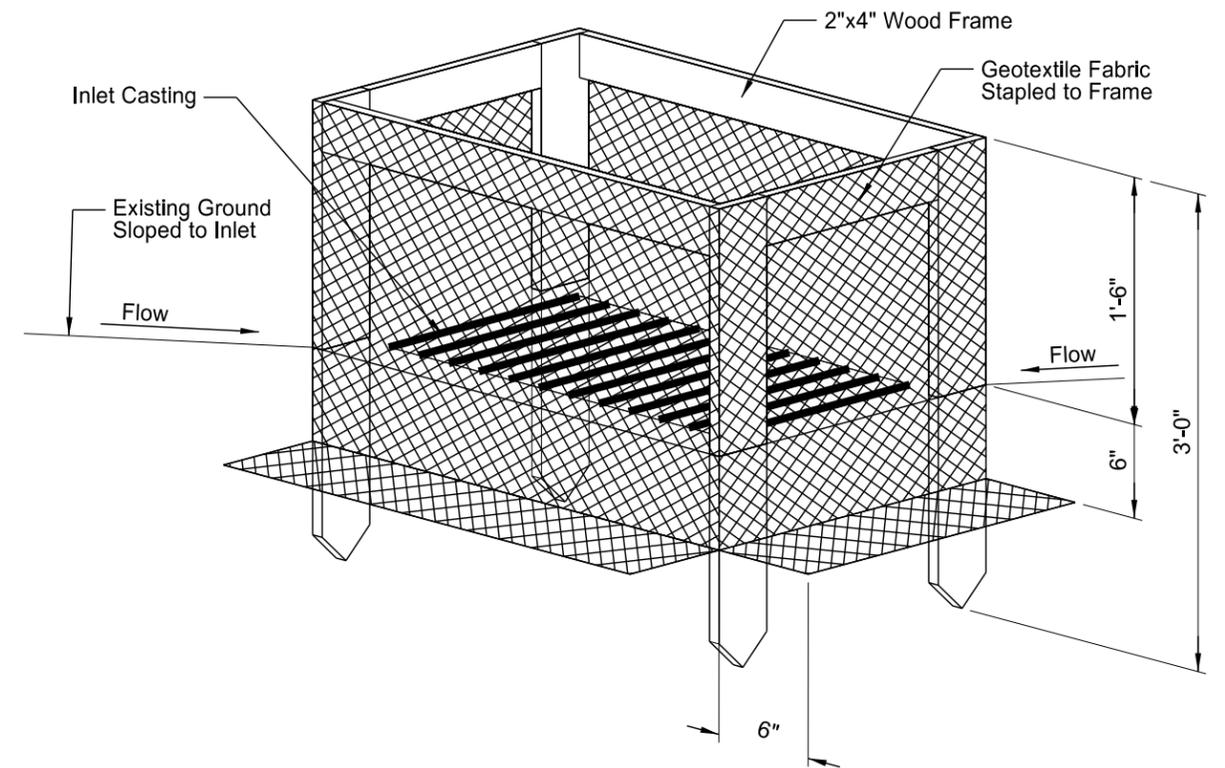
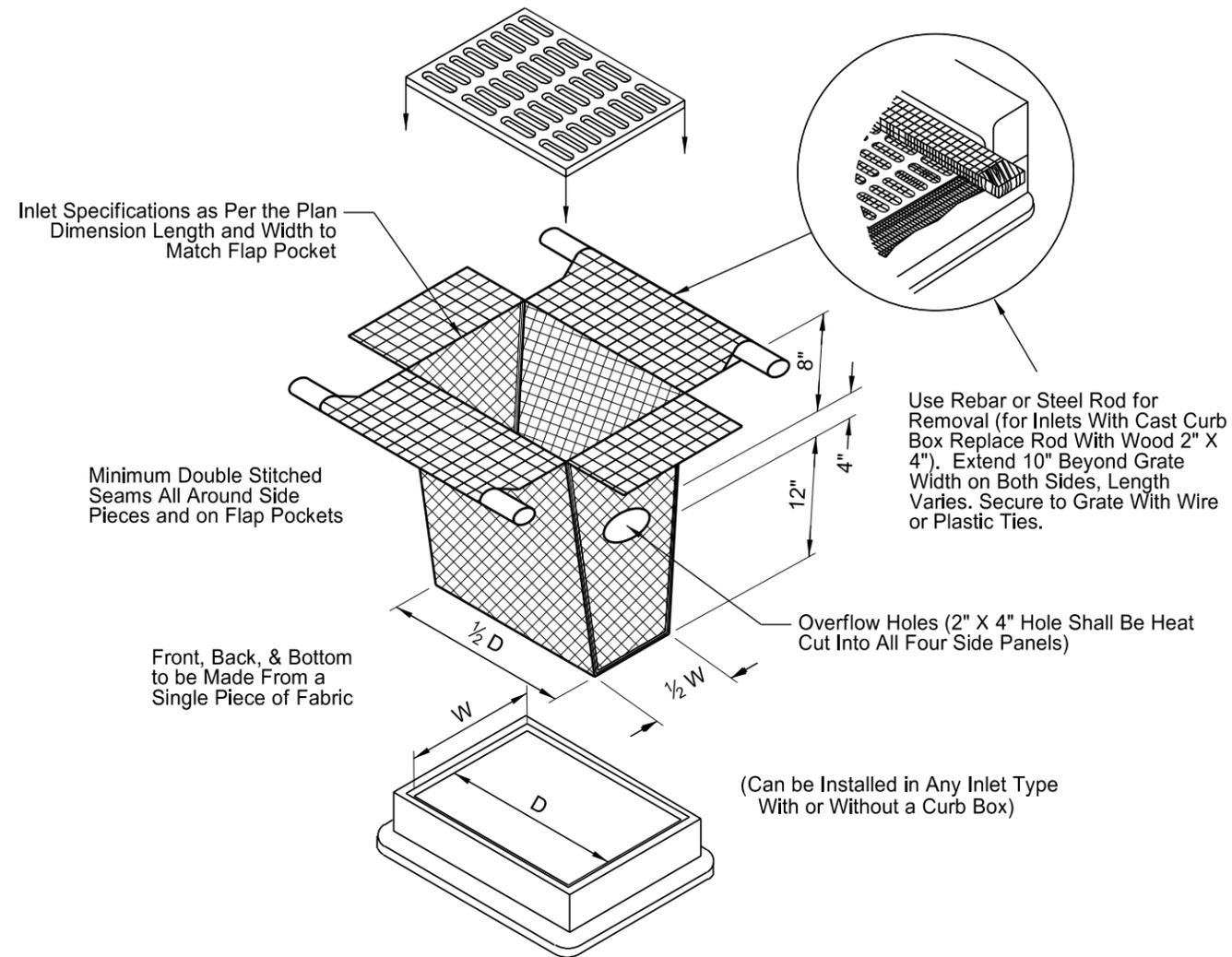
Note: Sidewalk base to be included with Sidewalk Bid Item

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Salvaged Base Course Summary

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	1



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

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.

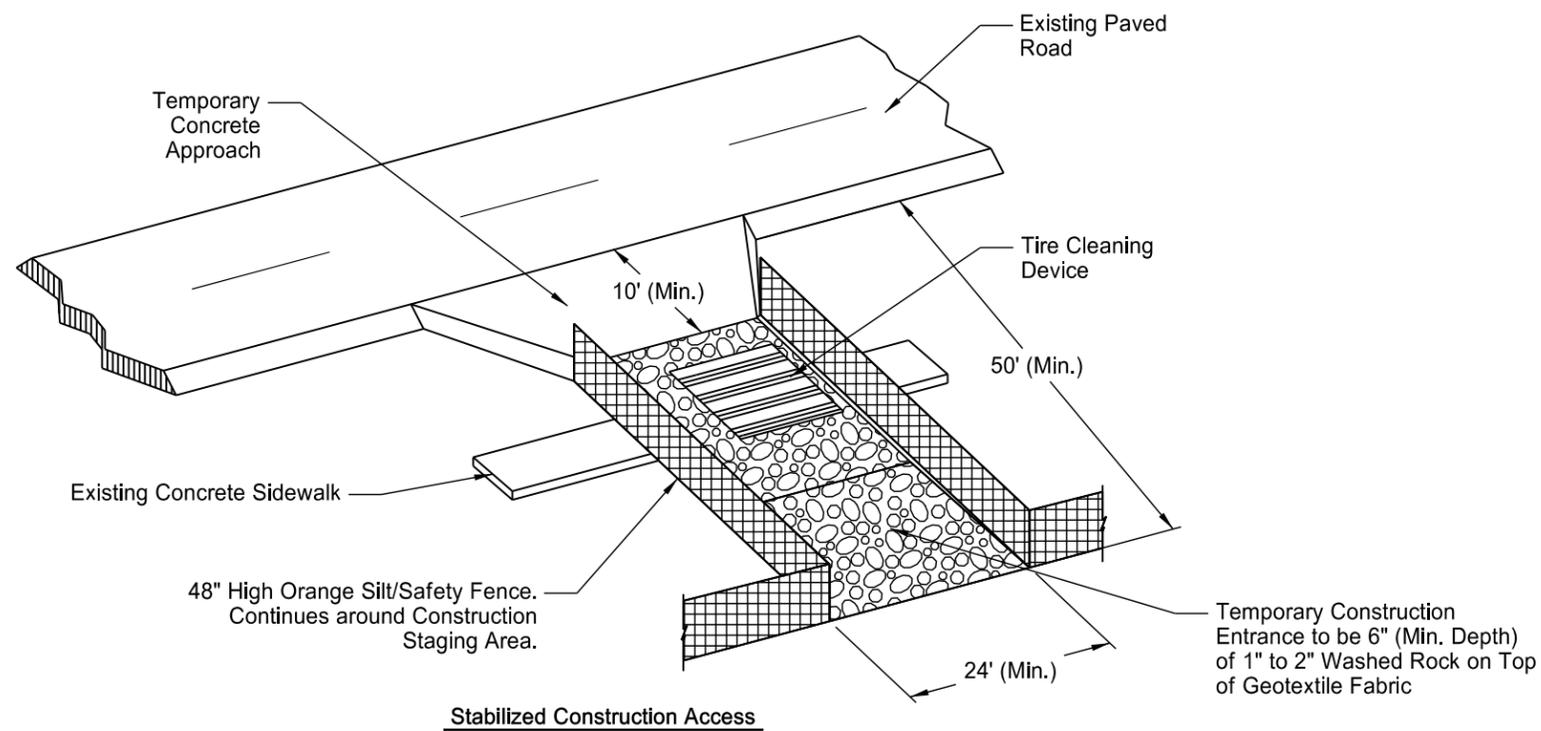
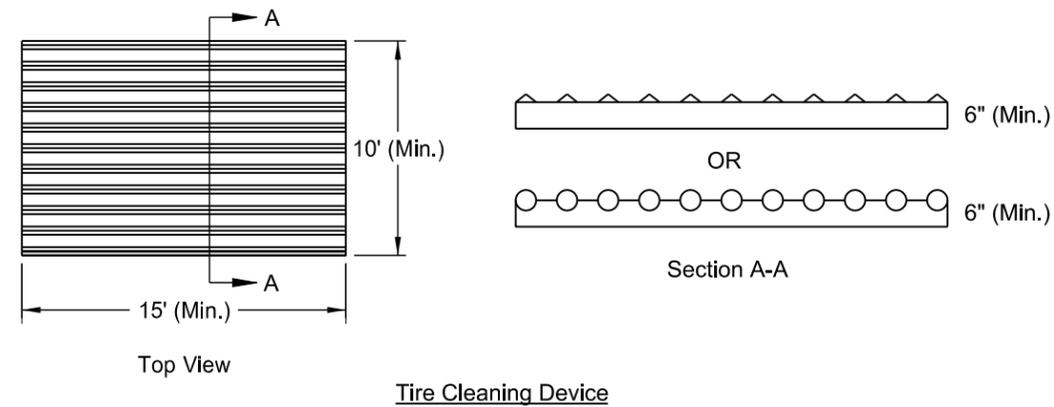
Inlet Protection - Existing and New Inlets

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Inlet Protection Details (BMP'S)

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	2



Notes:

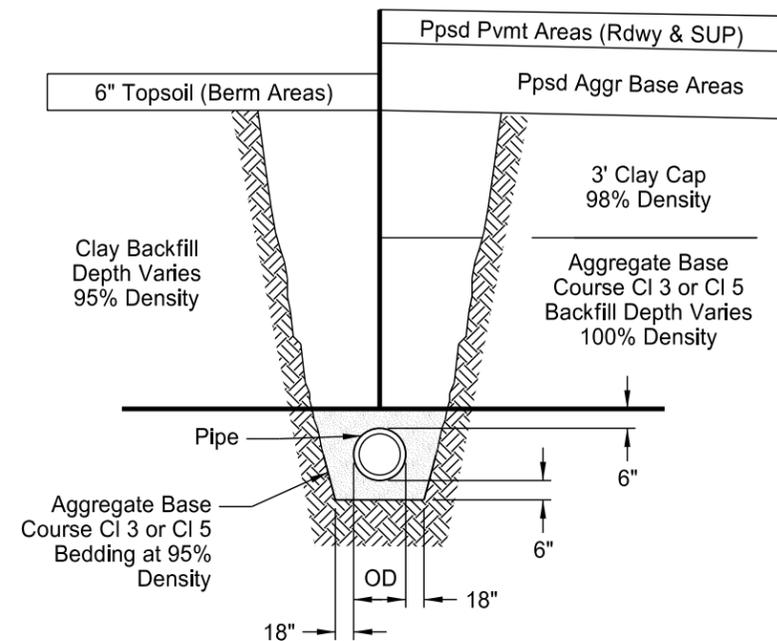
1. A stabilized construction access shall be constructed as shown on Plans. Field location shall be coordinated and verified with the Engineer.
2. Existing curb & gutter and sidewalk shall be removed and temporary curb & gutter and a concrete approach shall be installed as shown. Concrete approach shall be sloped to match proposed site grades or minimum 2% towards the existing street.
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. This shall include reconstruction of the curb & gutter and sidewalk.
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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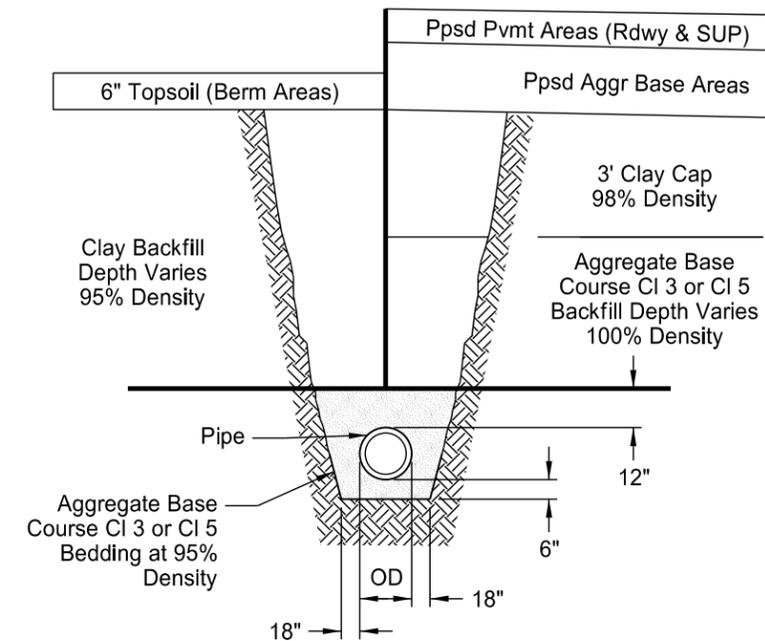
Stabilized Construction Access

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	3



Backfill Details for RCP Pipe



Backfill Details for All Watermain Pipe Types

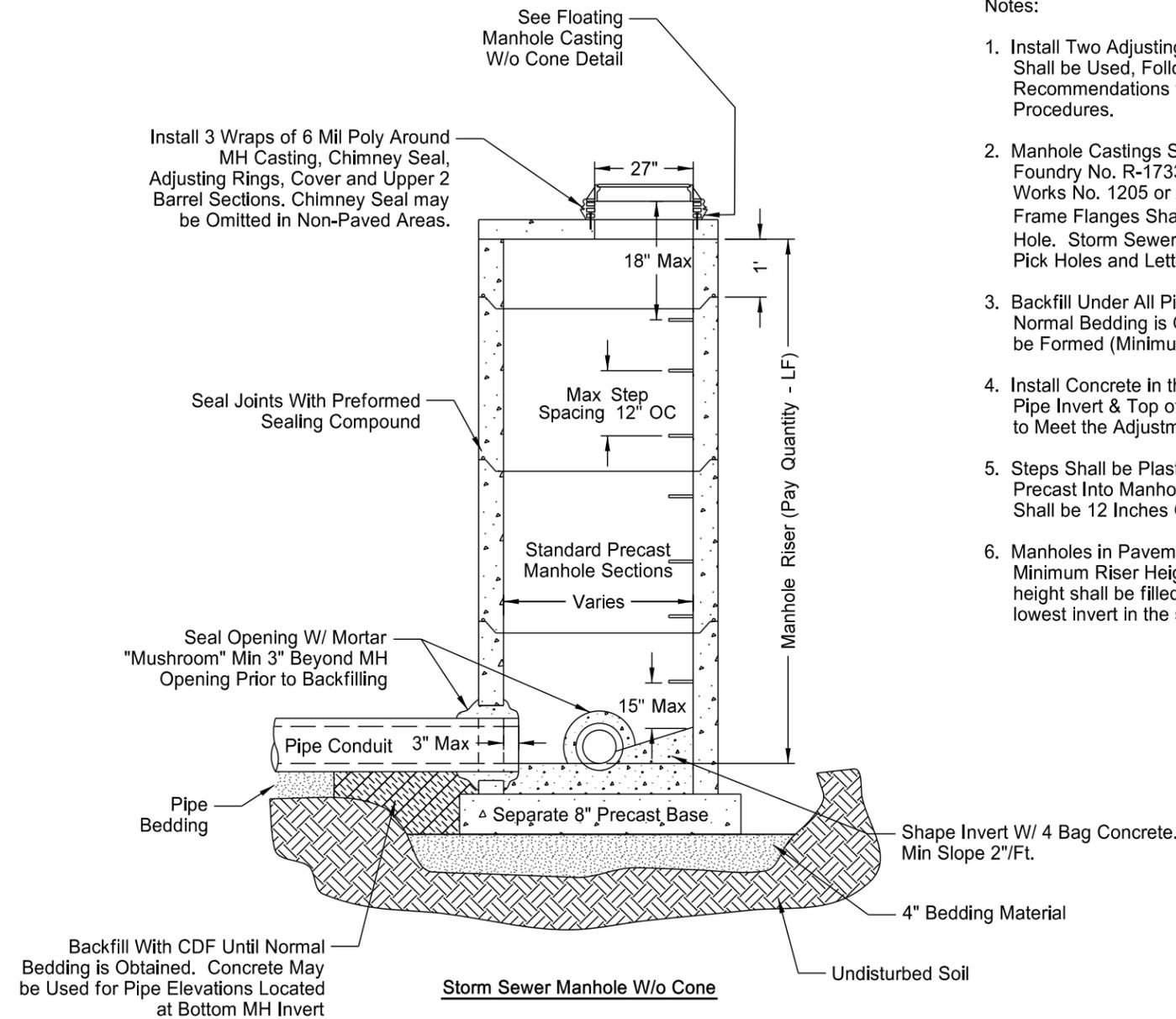
Notes:

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 (AASHTO T-99)
5. All Existing Trenches Backfilled with Clay Under Proposed Roadways and Shared Use Path Locations Shall be Compacted to 98% Density (Similar to Clay Cap Specifications).

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Bedding & Backfill Details
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	20	4



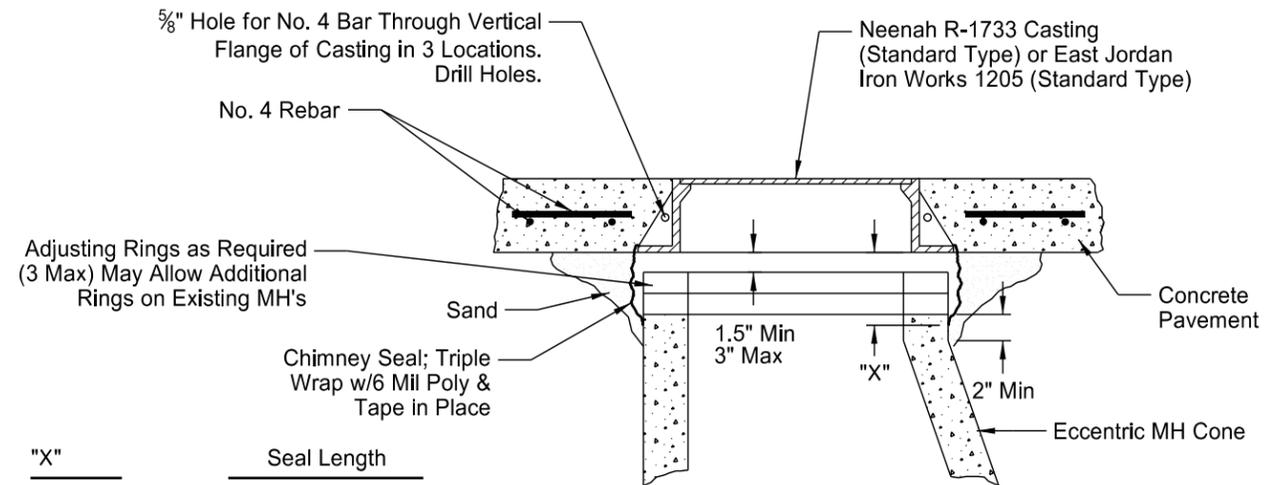
Notes:

1. Install Two Adjusting Rings. Plastic Rings Shall be Used, Follow Manufacturers Recommendations for Installation Procedures.
2. Manhole Castings Shall be Neenah Foundry No. R-1733, East Jordan Iron Works No. 1205 or Approved Equal. Frame Flanges Shall Have $\frac{5}{8}$ " Drilled Hole. Storm Sewer Lids Shall Have Open Pick Holes and Lettered "Storm Sewer".
3. Backfill Under All Pipes With CDF Until Normal Bedding is Obtained. Sides May be Formed (Minimum Width - 12 Inches).
4. Install Concrete in the Area Between the Pipe Invert & Top of Base as Necessary to Meet the Adjustment Ring Requirement.
5. Steps Shall be Plastic and Shall be Precast Into Manhole Sections. Steps Shall be 12 Inches Overall Width.
6. Manholes in Pavement Shall have a Minimum Riser Height of 5 Feet; Excess height shall be filled with concrete to the lowest invert in the structure.

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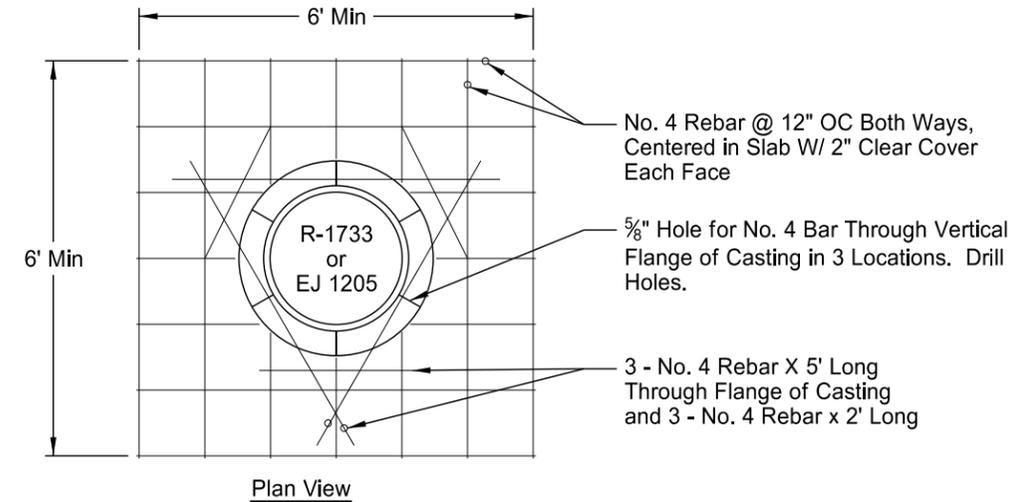
Storm Sewer Manhole Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

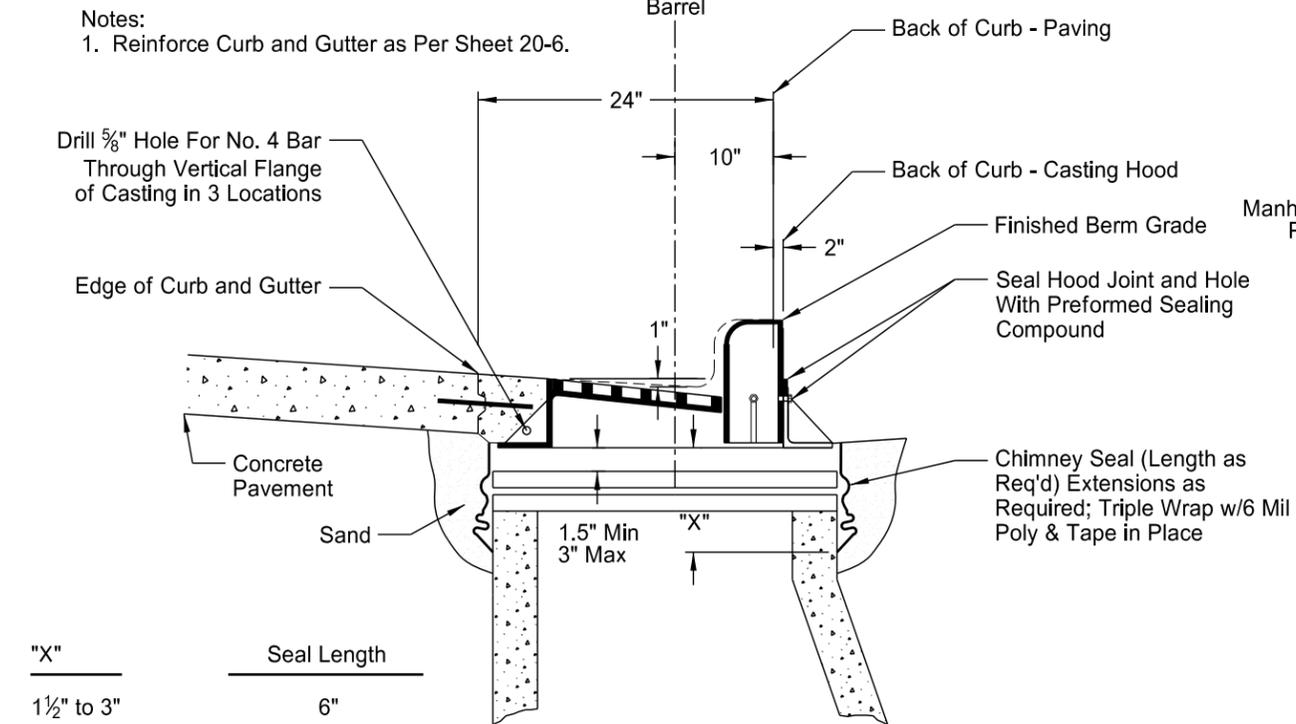


"X"	Seal Length
1 1/2" to 3"	6"
3" to 5 1/2"	9"
5 1/2" to 11"	9" and 8" Extension

Floating Manhole Casting W/ Cone

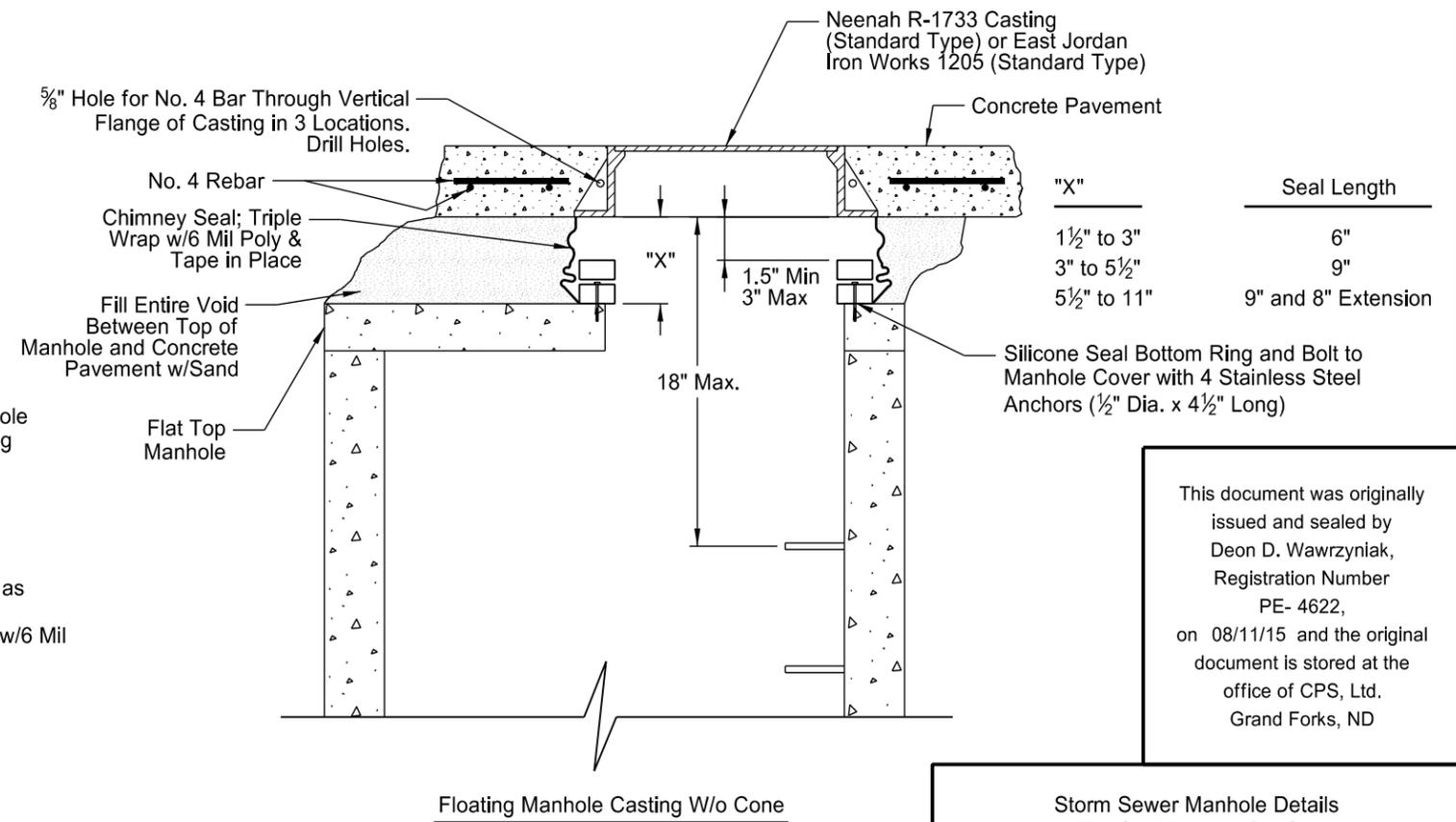


- Notes:
1. Floating Manhole Casting Detail for Paved Areas Using Casting, Neenah R-1733 Standard, East Jordan Iron Works 1205 Standard or an Approved Equal.
 2. Install 3 Wraps of 6 Mil Poly around Chimney Seal and Tape in Place.



"X"	Seal Length
1 1/2" to 3"	6"
3" to 5 1/2"	9"
5 3/4" to 11"	9" and 8" Extension

Floating Manhole Casting - Inlet Manhole W/ Cone



"X"	Seal Length
1 1/2" to 3"	6"
3" to 5 1/2"	9"
5 1/2" to 11"	9" and 8" Extension

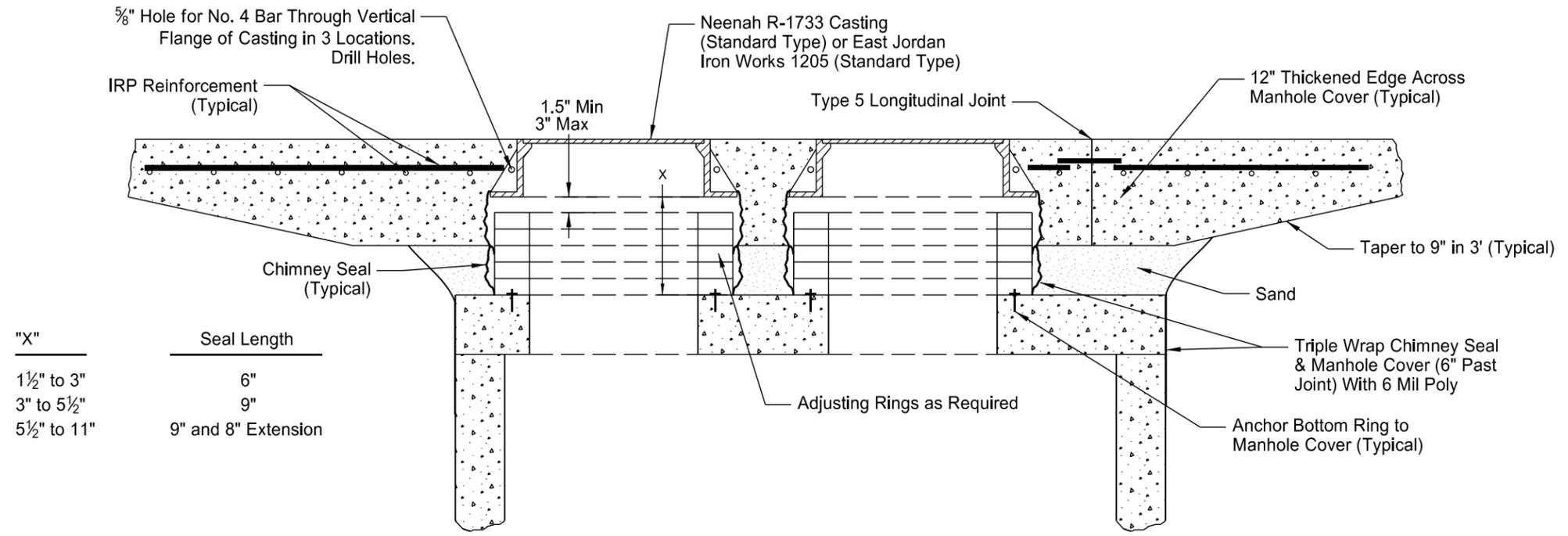
Floating Manhole Casting W/o Cone

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Storm Sewer Manhole Details
Floating Manhole Casting

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	6



"X"	Seal Length
1 1/2" to 3"	6"
3" to 5 1/2"	9"
5 1/2" to 11"	9" and 8" Extension

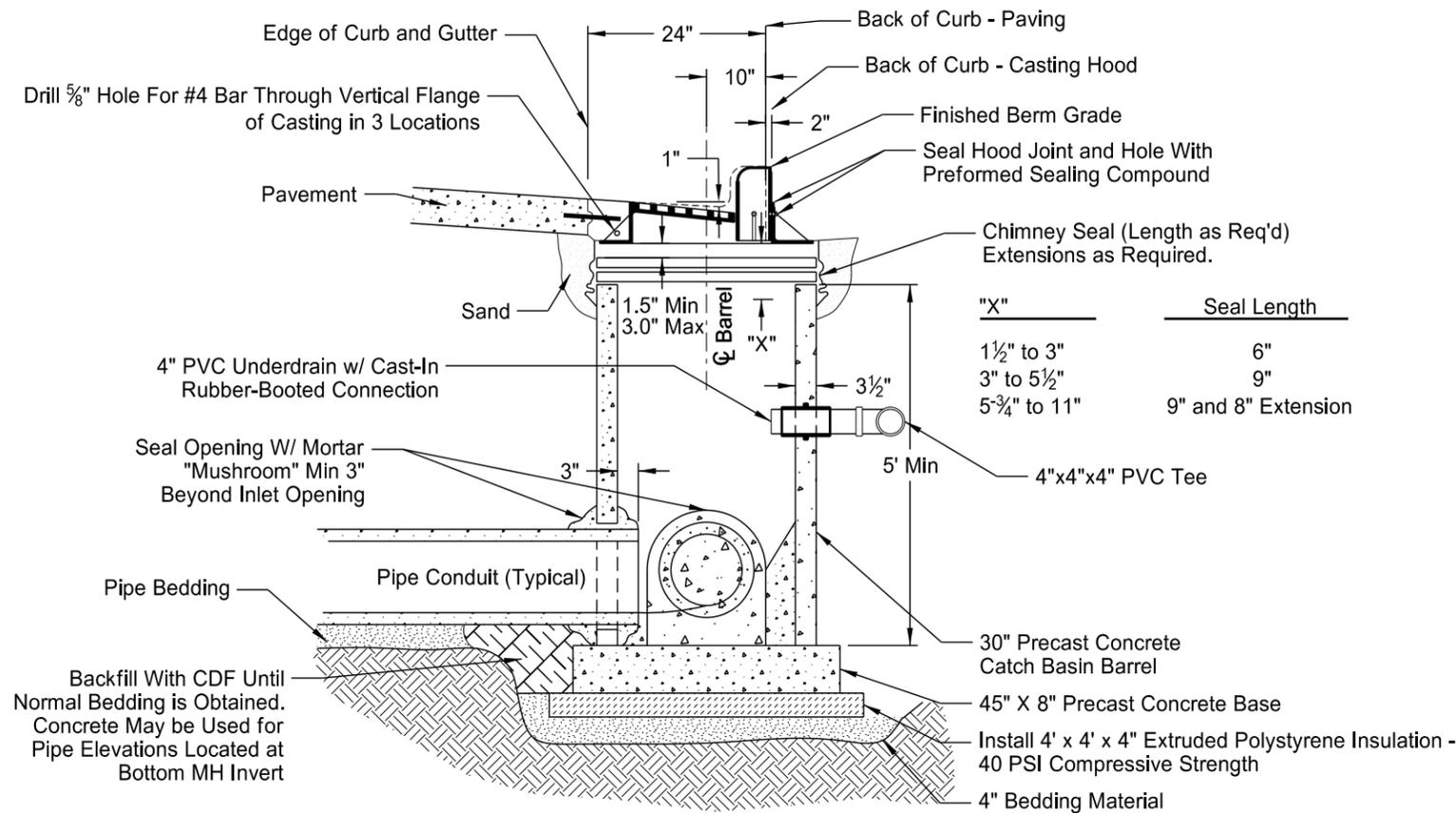
Floating Manhole Casting - ARV Manhole
Sta 436+45 O/s Rt

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Sanitary Sewer Manhole Details
ARV Manhole
Floating Manhole Casting

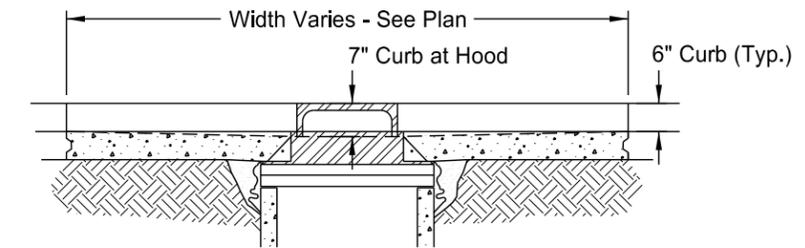
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	20	7

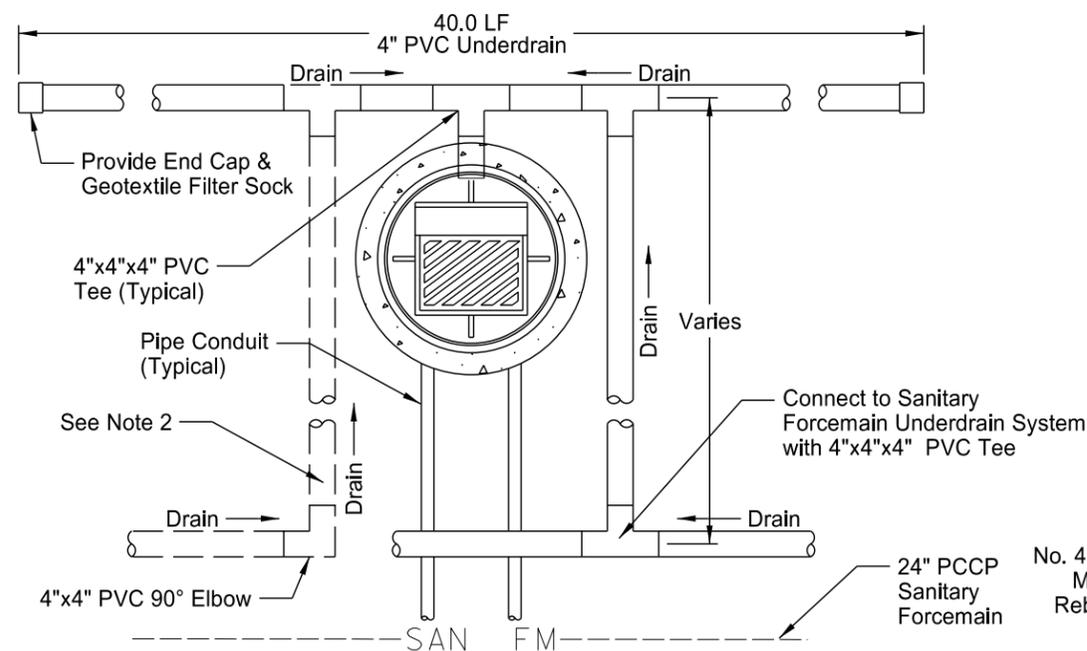


Notes:

1. Inlet Casting, Chimney Seal and Barrel Shall be Triple Wrapped With 6 Mil Poly.
2. Fill Invert to Design Grade With 4 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 (AASHTO 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.



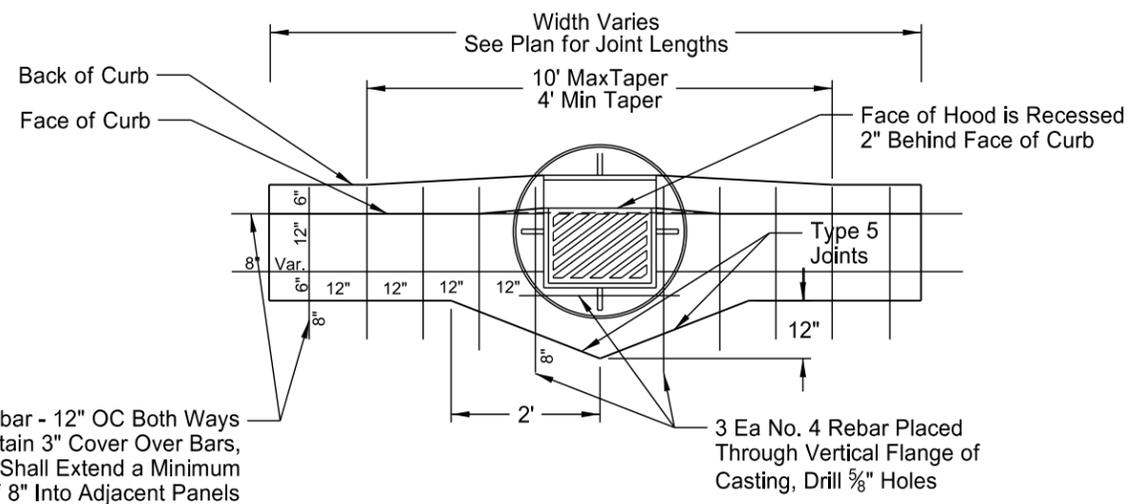
Front View



Inlet Type I - Plan View (Typical)

Notes:

1. Place Underdrain with Perforations Facing Downward.
2. Some Inlets May Require Two Connections to Sanitary Forcemain Underdrain System, see Section 55 for locations. Dashed Lines Typical for both Sides with Dual Connection.
3. Connections at Inlets 8B and 10B Shall Require Two Side Connections In Place of Rear Connection (Inlets have Rear Pipe Penetrations).



Pavement Notch - As Needed

Notes:

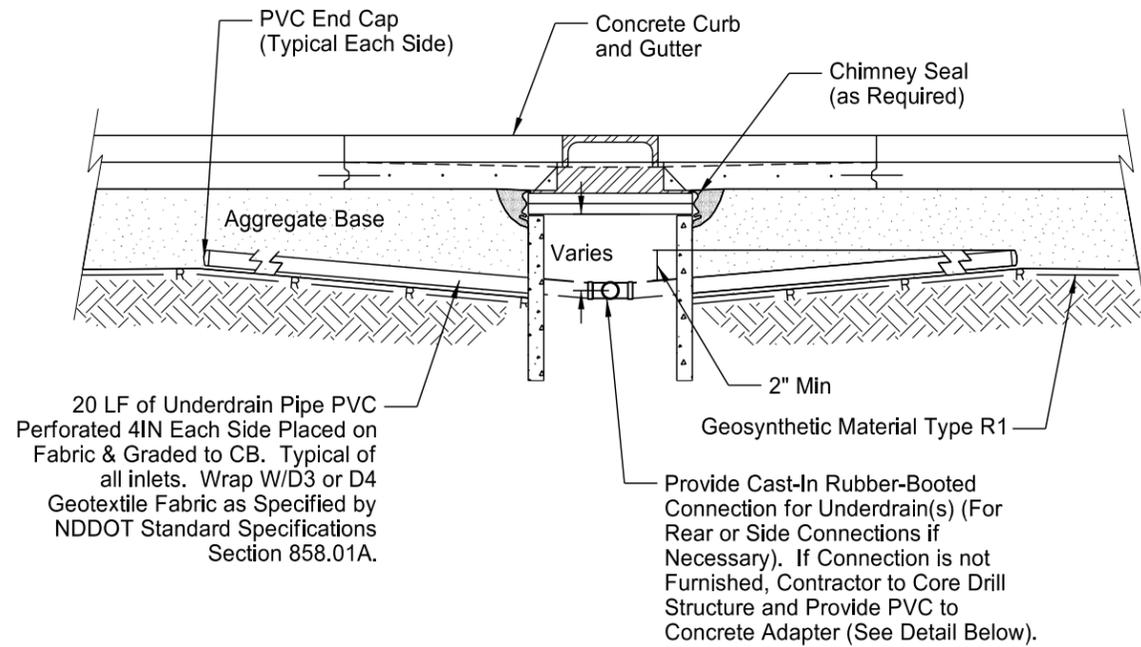
1. No Part of Inlet Barrel Section Shall be Located Beneath Pavement.

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Inlet Details

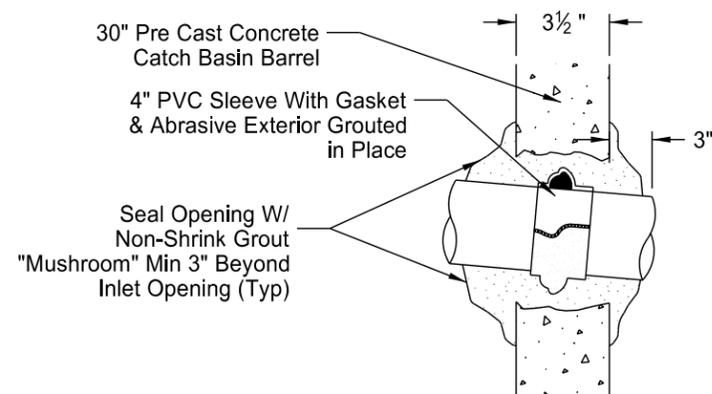
Reconstruction of South Columbia Road
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See Plans for Concrete, Granular and Subcut Depths

Front View



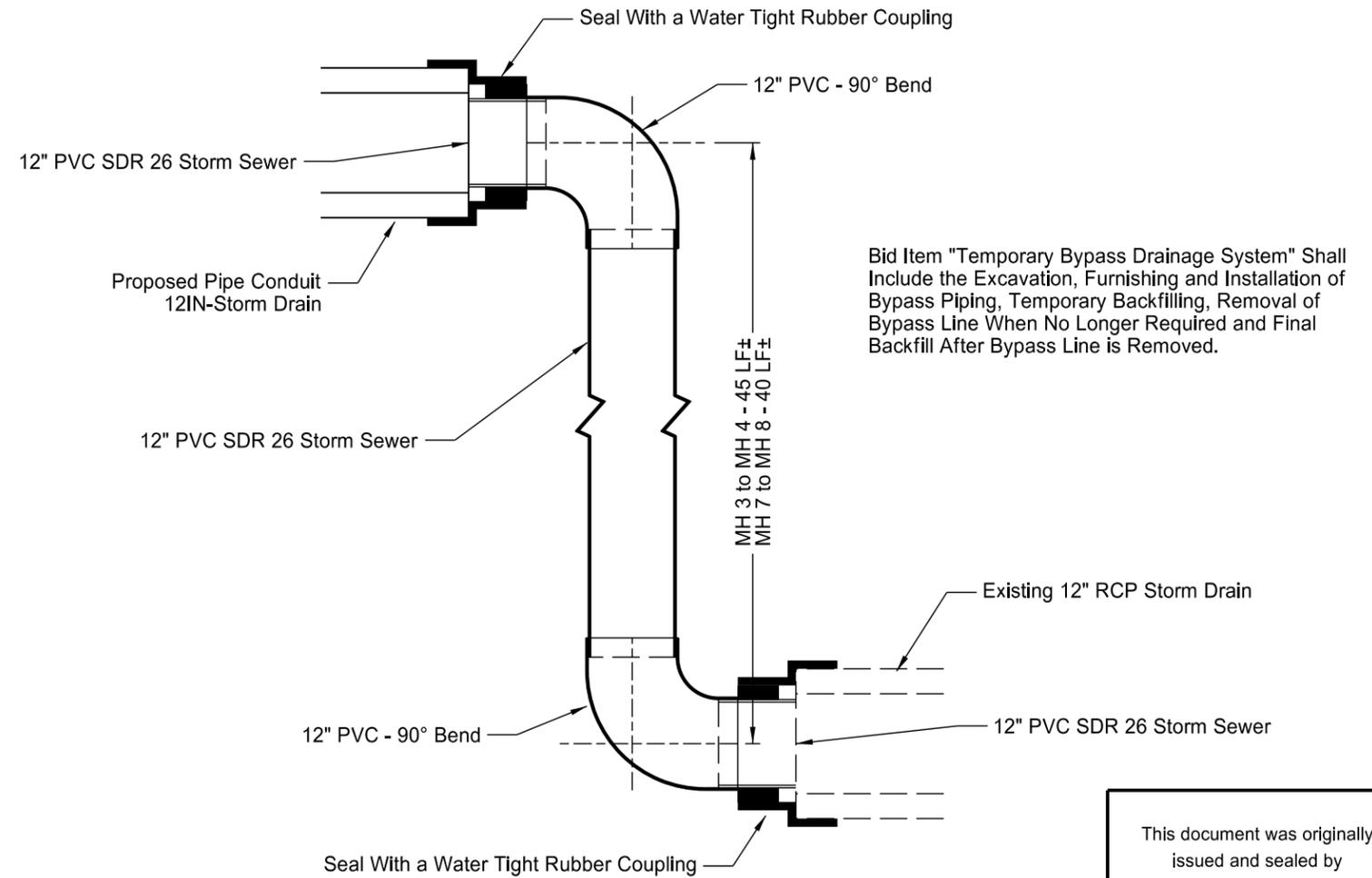
Lubricate Gasket and Slip Over PVC Pipe. Position Adapter Sleeve in Center of CB Barrel Wall and Grout Into Place With a Non-Shrink Grout.

PVC to Concrete Adapter

Construct Temporary Bypass Drainage System to Accommodate the Removal of Storm Water During Construction Phasing. Piping and Rubber Couplings May be Reused Between Locations.

Location No. 1 - Connect Existing 12" RCP Storm Sewer From Abandoned Manhole 3 to New Pipe Conduit 12IN-Storm Drain From Manhole 4.

Location No. 2 - Connect Existing 12" RCP Storm Sewer From New Manhole No. 7 to New Pipe Conduit 12IN-Storm Drain From Manhole 8.



Bid Item "Temporary Bypass Drainage System" Shall Include the Excavation, Furnishing and Installation of Bypass Piping, Temporary Backfilling, Removal of Bypass Line When No Longer Required and Final Backfill After Bypass Line is Removed.

Temporary Bypass Drainage System - Plan View

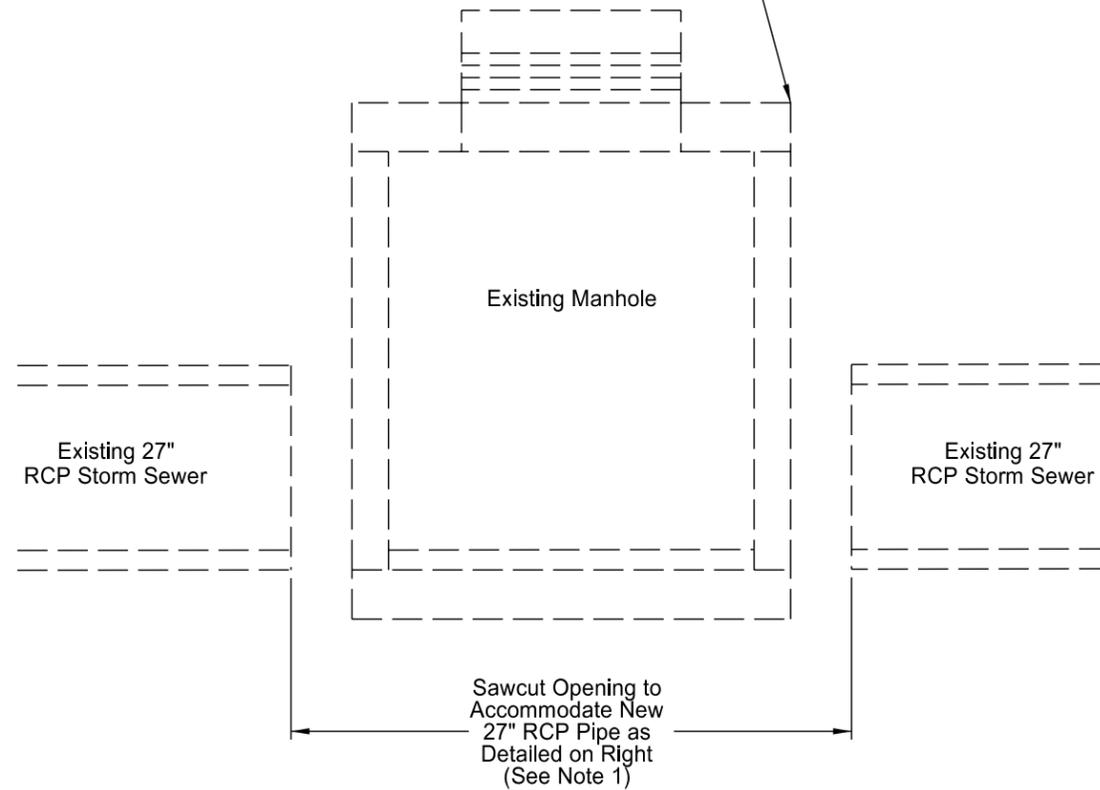
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Inlet & Drainage Details
Temporary Bypass Drainage System Details

Reconstruction of South Columbia Road
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Remove Manhole Casting, Rings, Cover, Barrel(s) and Base. Typical of Manhole No. 3 & 5



Storm Sewer Manhole Removal

Contractor Shall Furnish and Install 27" RCP Pipe. Pipe Shall Have Smooth Wall Joint Design. Sawcut and Remove Tongue & Groove From End of Old and New Pipes Prior to Placing Inline With Existing 27" RCP Pipe.

Seal Termination Joint With Water Tight Repair Coupling; Coupling to be Reinforced with Integral Stainless Steel Shield; Install Butyl Rope between Faces of New and Old Pipes; All Costs Associated with this Repair Shall be Incidental to the bid item "Pipe Conc 27IN CL III"

Construct Flowable Fill Collars Around Rubber Couplings

Existing 27" RCP Storm Sewer

Intermediate Pipe Joint

Varies

Install Butyl Rope (Typ.)

Existing 27" RCP Storm Sewer

Support Pipe Joint With 12" x 12" x 6" Concrete Blocks.

Construct Flowable Fill Bedding and Backfill From 6" Below Pipe to Centerline of Pipe. Width of Flowable Fill Shall be the Outside Pipe Diameter Plus 24". Extend Flowable Fill 2' Each Way From Joint to Support Existing Pipe.

Pipe Replacement

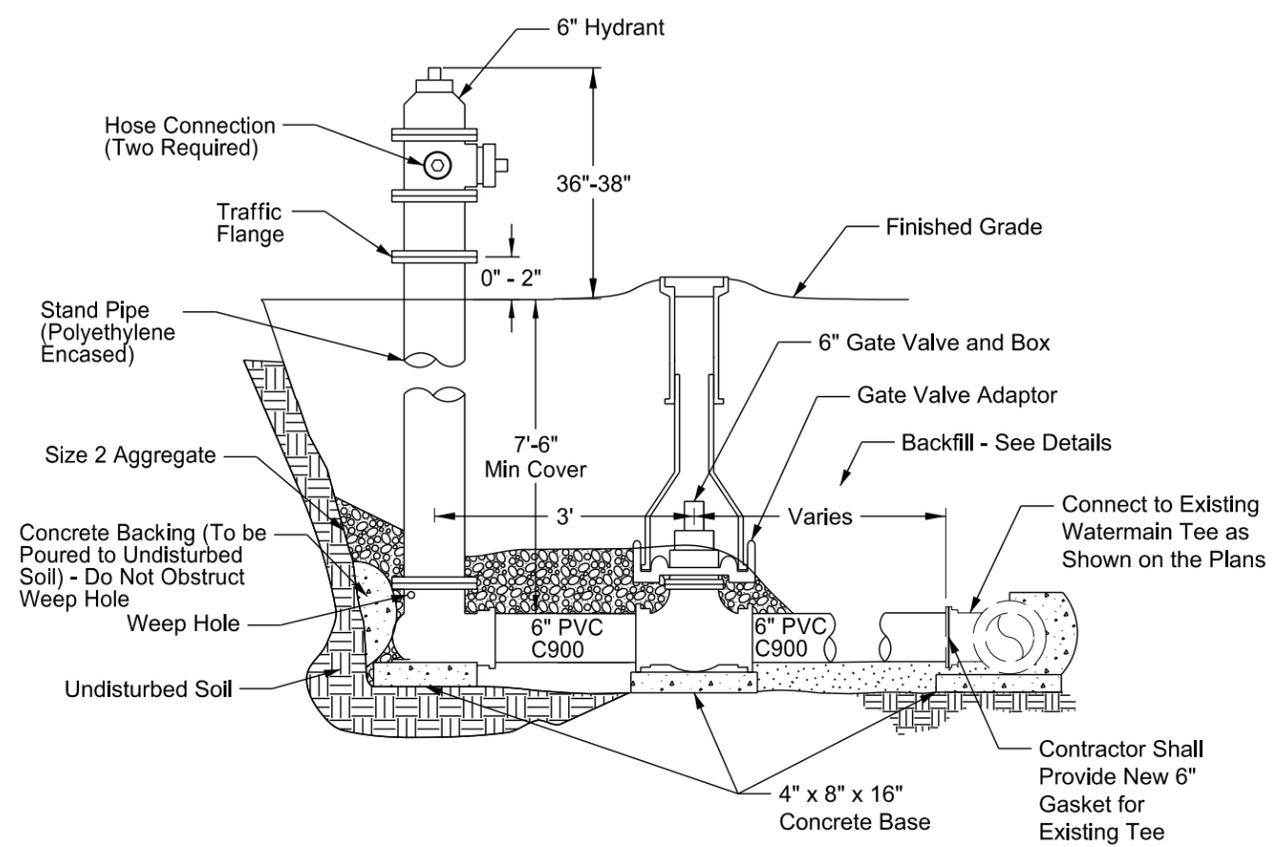
Note 1: Contractor Shall Remove the Pipe to the Existing Joint and Shall Saw Cut and Remove the Existing Tongue or Groove to Form a Straight Joint Wall. If 2 or More Sections of New RCP are Required, the Additional Joint(s) Shall be a Gasketed Joint by Pipe Manufacturer.

Note 2: The Bid Item "Removal of Manholes" Shall Include the Sawcutting and Removal of the Existing Pipe, Preparation of the New RCP Pipe and Installation of the New RCP Pipe as Shown on the Detail. The Length of the new 27" RCP may Vary Depending on the Placement of Existing Joints. The Price Bid for "Removal of Manholes" Shall Include All Materials and Labor Necessary to Construct the Connection as Detailed.

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Removal of Manhole & Pipe Replacement Detail
Storm Sewer Manhole No 3 and No 5
South Columbia Road

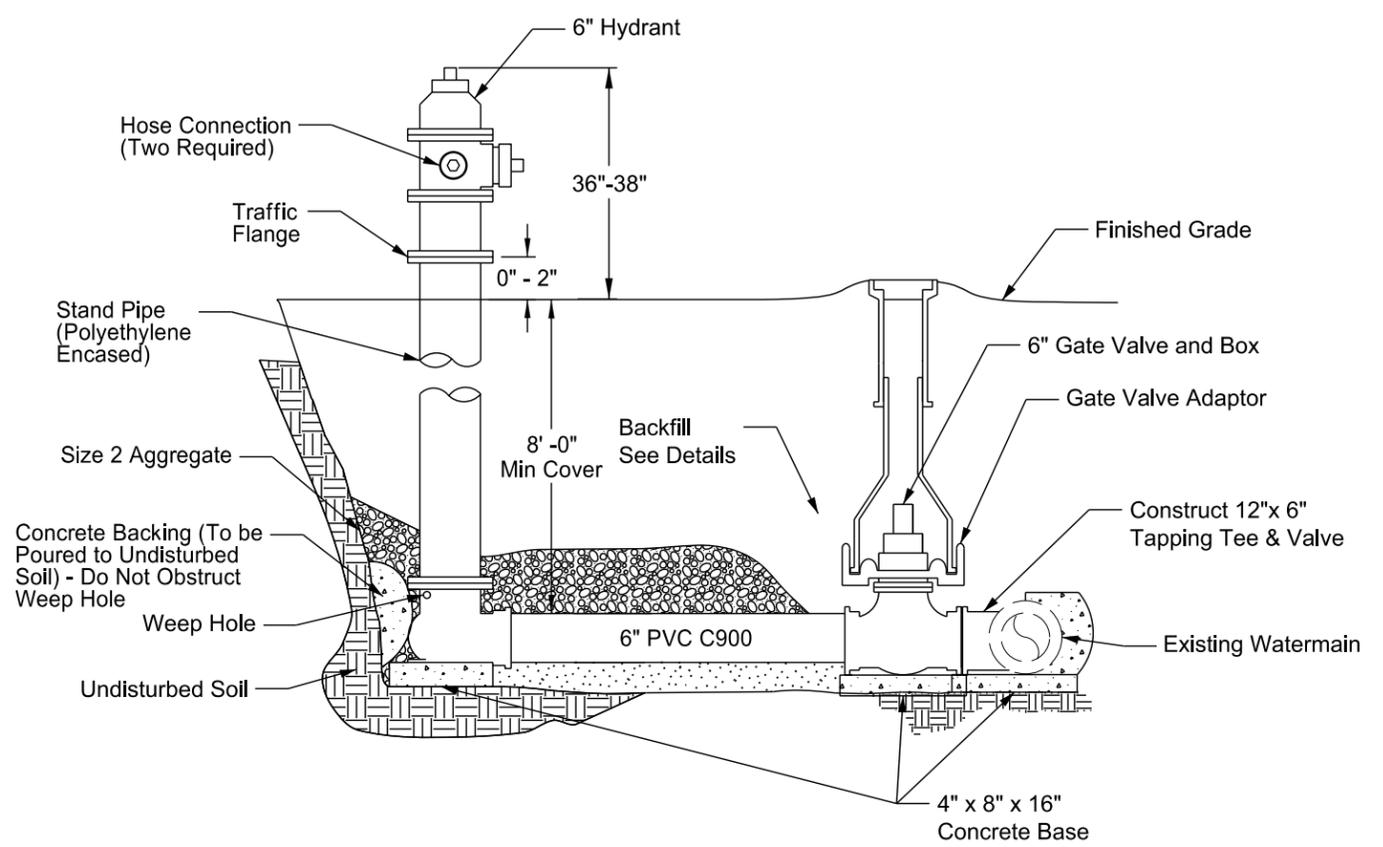
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
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Notes:

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.

**Fire Hydrant Lead
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.

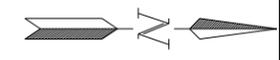
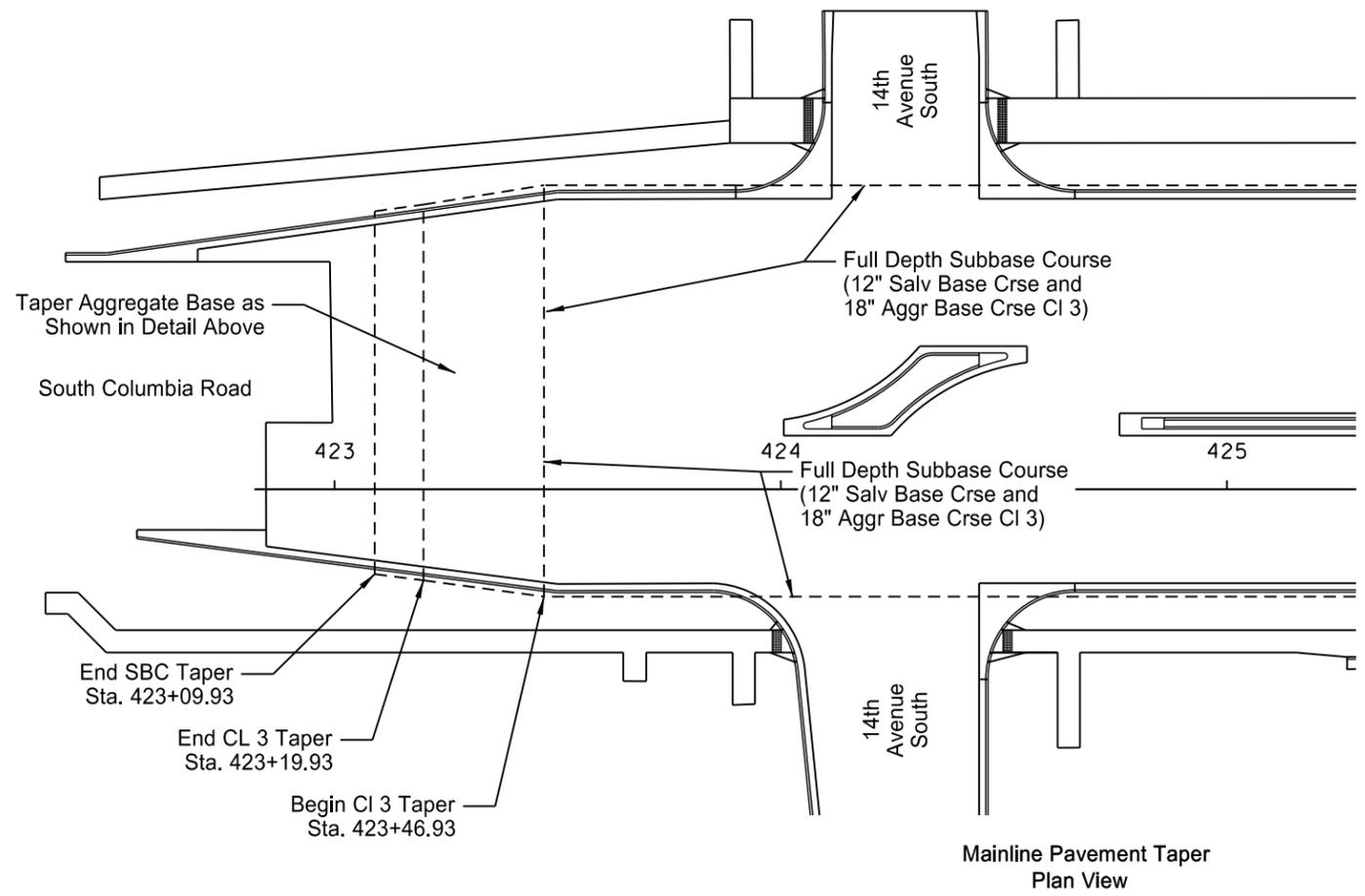
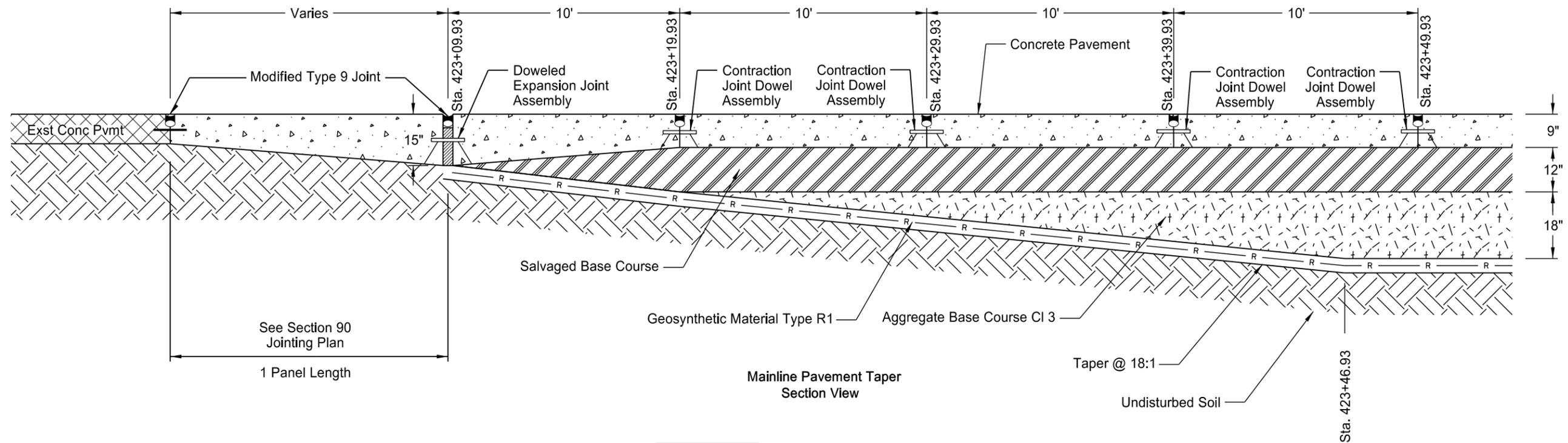
**Fire Hydrant Lead
With New Tapping Tee**

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Hydrant Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
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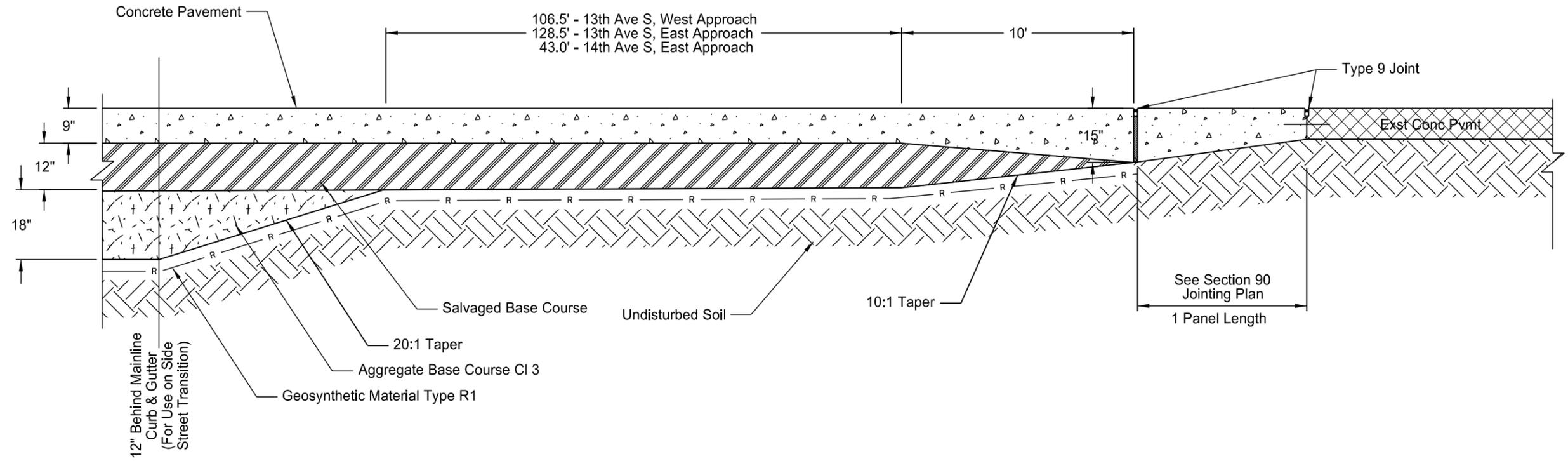
Not to Scale

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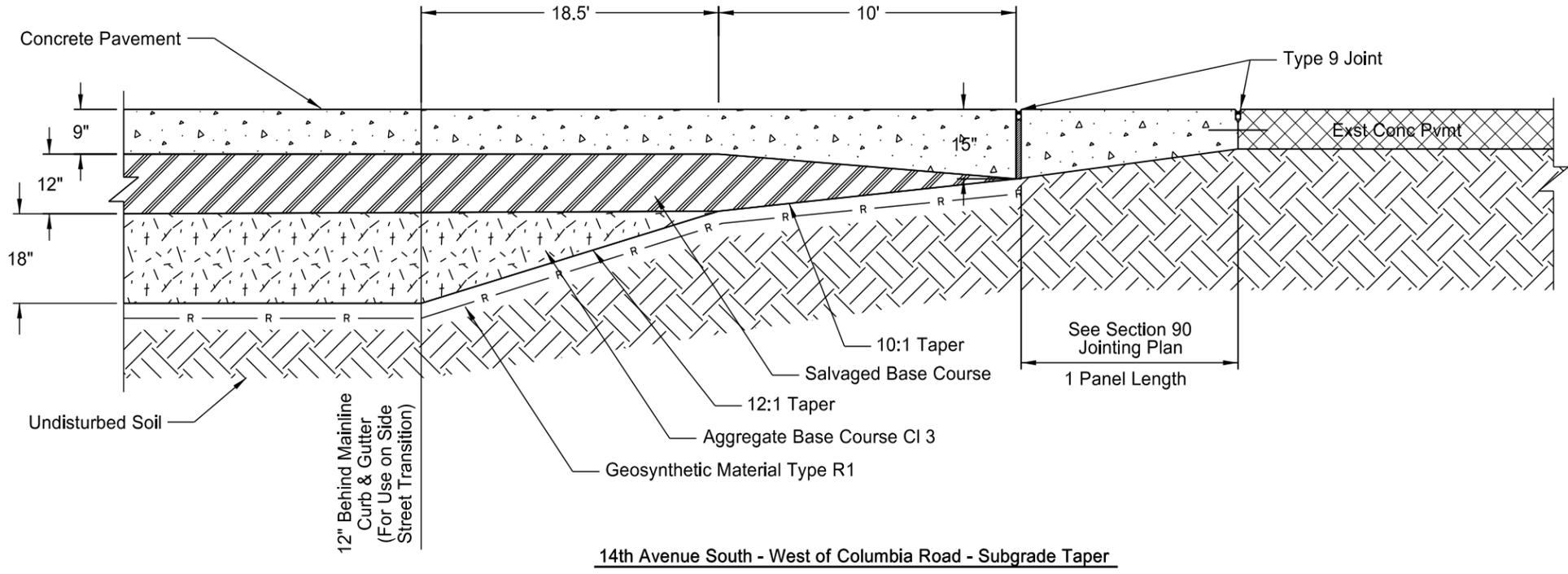
Paving Transition Details
 South Columbia Road South of 14th Avenue South

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

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13th Avenue South - East and West of Columbia Road and
14th Avenue South - East Side of Columbia Road - Subgrade Taper



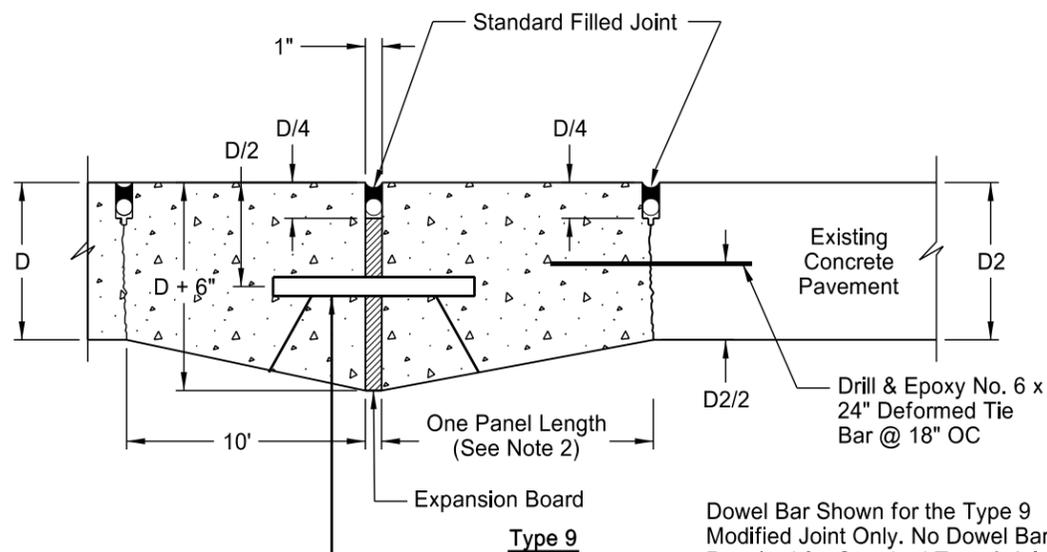
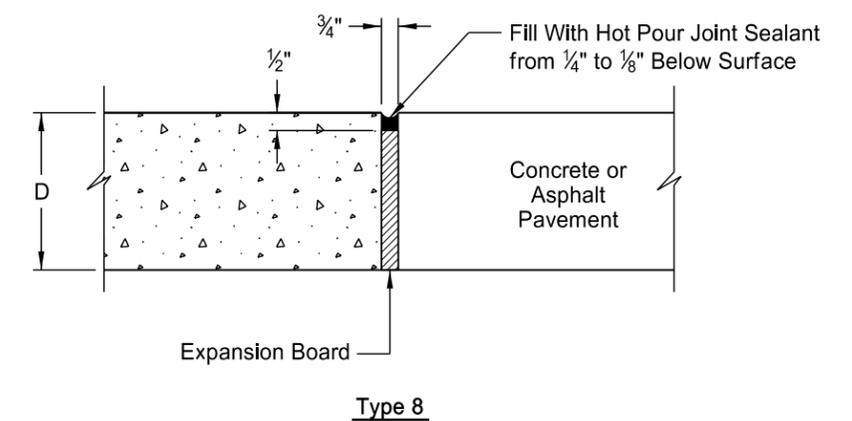
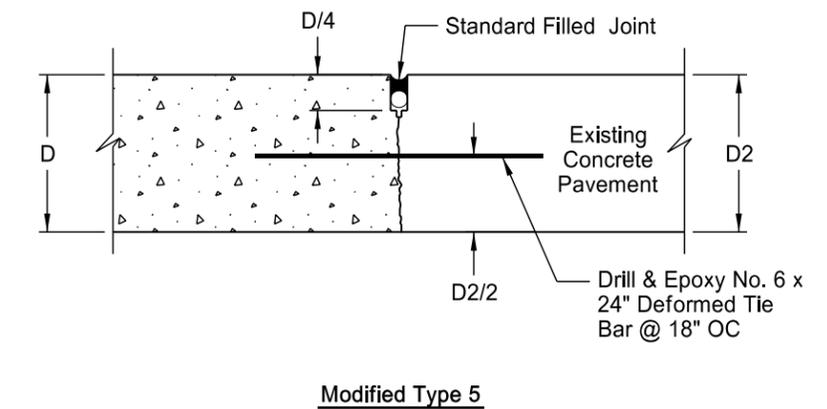
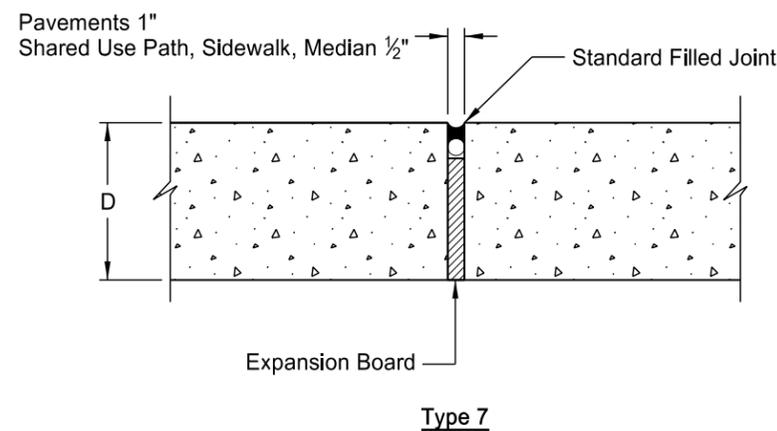
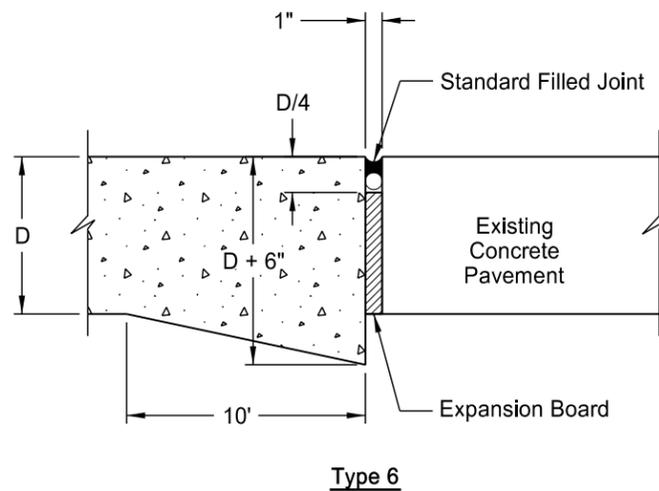
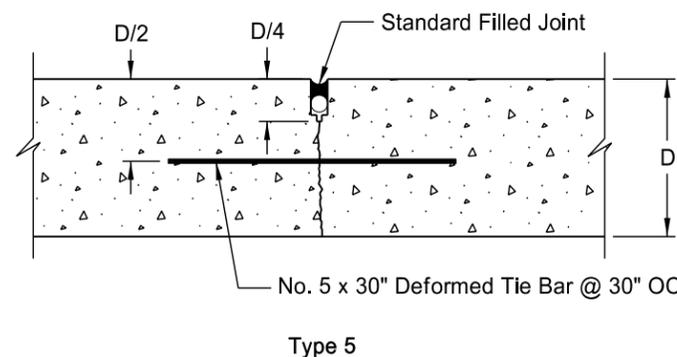
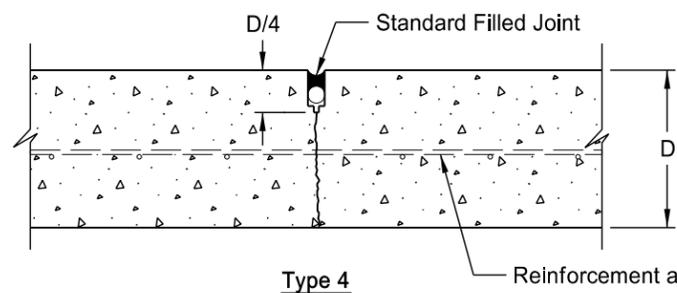
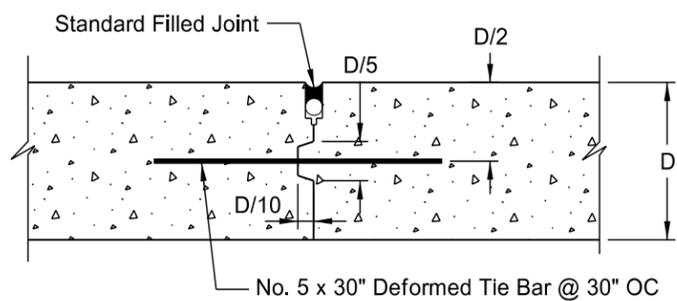
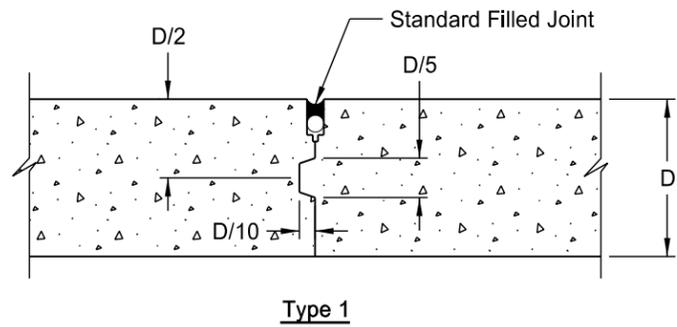
14th Avenue South - West of Columbia Road - Subgrade Taper

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Paving Transition Details
13th Avenue South and 14th Avenue South

Reconstruction of South Columbia Road
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Modified Type 9 (Doweled Expansion Joint Assembly)
Same Joint as Type 9 With Following Modification, Install Transverse Expansion Joint Assembly in Accordance with Standard Drawing D-550-4. Dowel Bar Shall be Plain Round 1 1/2" x 18".

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Pavement Joint Details
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

Note:

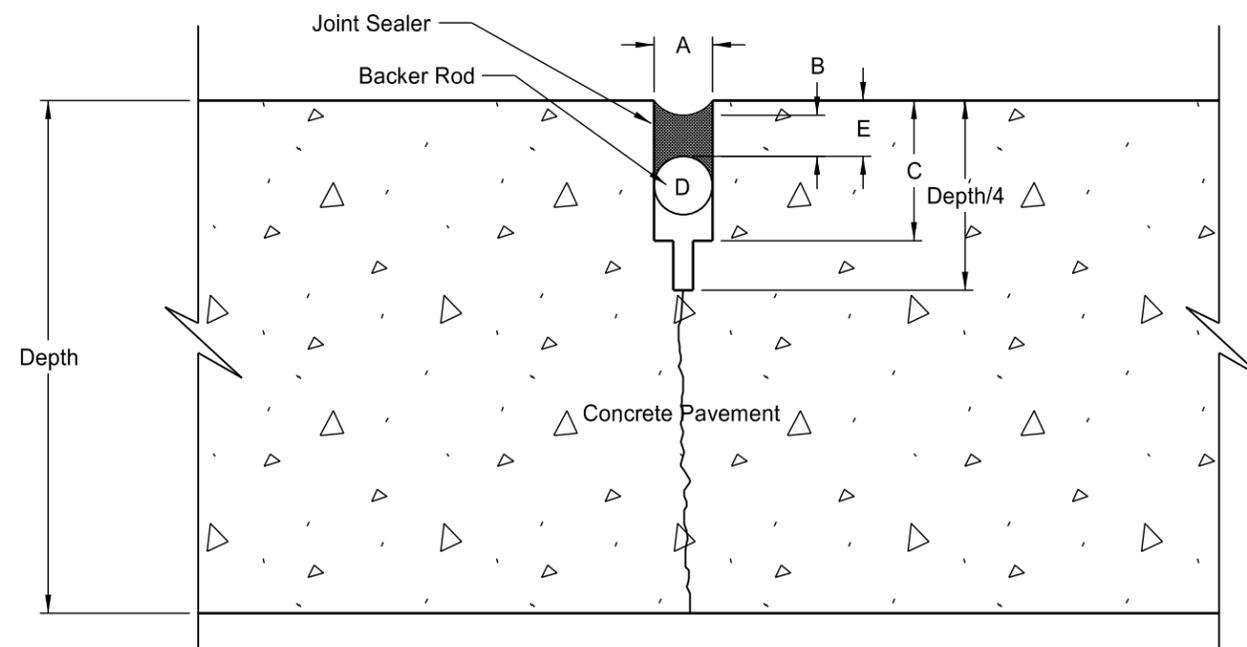
1. All Tie Bars Shall be Centered on Joint Unless Otherwise Noted.
2. See Section 90 - Jointing Layout for Panel Lengths.
3. Dowels Bars Shall be 1 1/4" x 18" for D = 10" or Less.
4. Dowel Bars Shall be 1 1/2" x 18" for D Greater Than 10".
5. Tie Bars Shall Not be Placed Within 15 Inches of the Intersection of the Longitudinal Joint and Transverse Joint.
6. Joint Sealer Shall be Low-Modulus Silicone and Shall be Used for All Joint Sealing Unless Otherwise Shown on the Plans.

A	B	C	D	E
Joint Width, Inches	Sealant Bead Thickness, Inches	Minimum Joint Depth, Inches	Backer Rod Diameter, Inches	Backer Rod Placement, Inches
*3/8	1/4	1 3/8	1/2	5/8
1/2	1/4	1 3/8	5/8	5/8
5/8	5/16	1 5/8	3/4	11/16
3/4	3/8	1 7/8	1	3/4
7/8	7/16	2	1	13/16
1	1/2	2 1/8	1 1/4	7/8

*Standard Joint Width Unless Otherwise Noted

Notes:

1. Joint Sealer Shall be Low-Modulus Silicone and Shall be Used for All Joint Sealing Unless Otherwise Shown on the Plans.



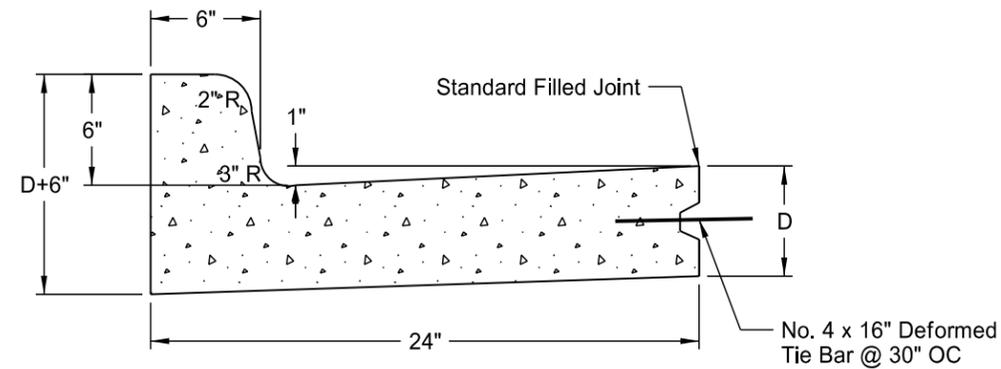
Standard Filled Joint

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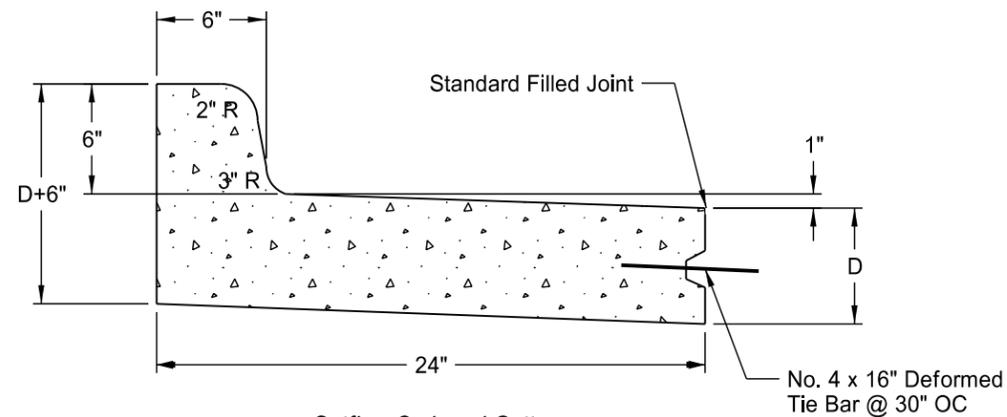
Pavement Joint Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

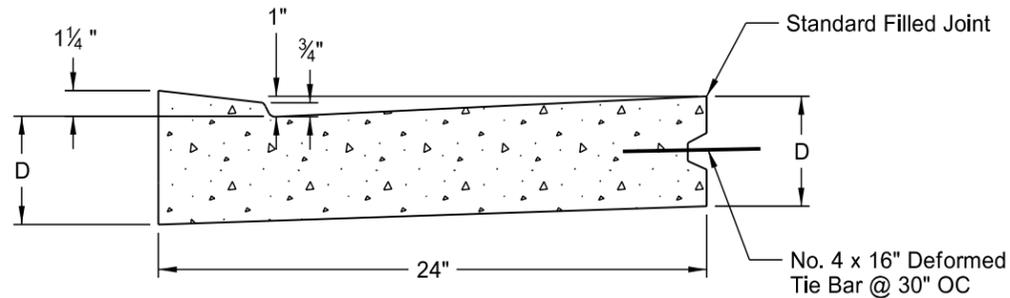
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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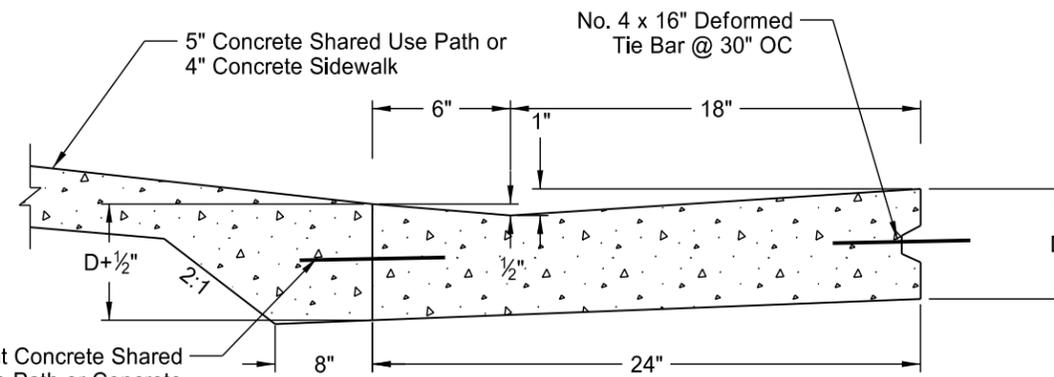
Inflow Curb and Gutter
Section A-A



Outflow Curb and Gutter
Section A-A

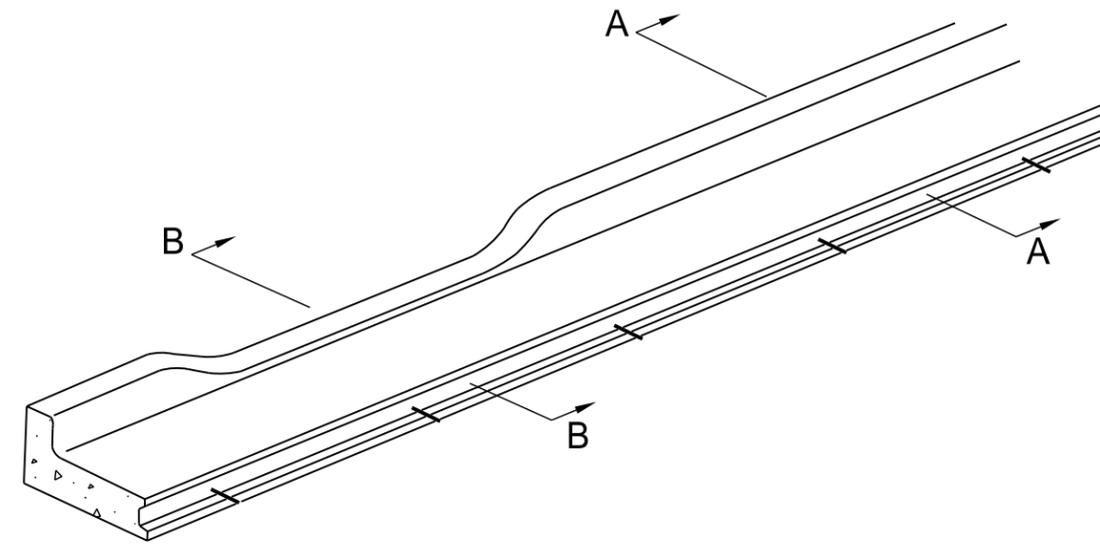


Depressed Curb
(Typical For Driveway or Median Nose)
Section B-B



Tie at Concrete Shared Use Path or Concrete Sidewalk With No. 4 x 16" Deformed Tie Bar @ 18" OC

Depressed Curb
(Typical For Concrete Shared Use Path and Concrete Sidewalk)
Section B-B



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Curb and Gutter Details
Type I

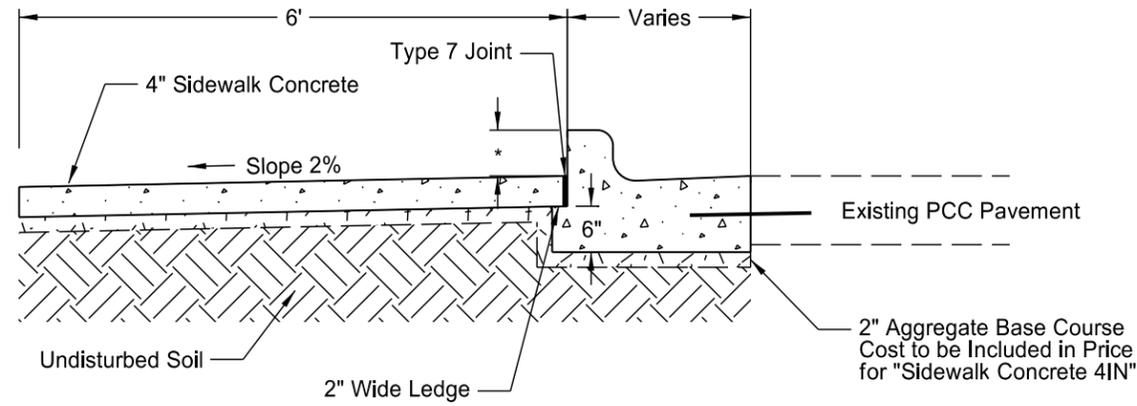
Reconstruction of South Columbia Road
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Grand Forks, North Dakota

Notes:

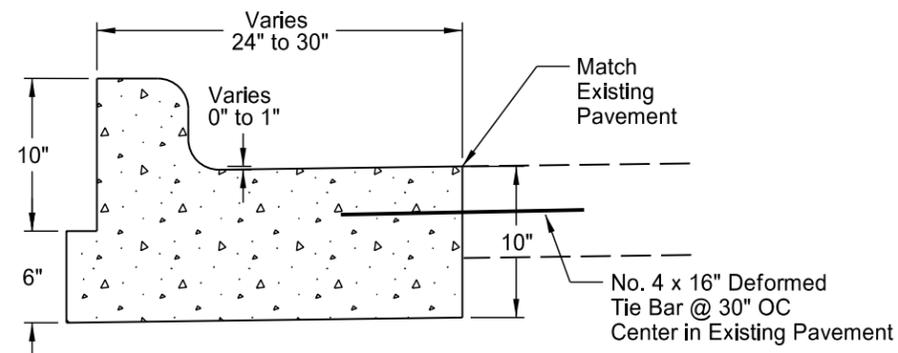
1. The Depth "D" Shall be the Thickness of the Adjacent Pavement.
2. Curb & Gutter Type I Transitions to Curb & Gutter-Type I 30 IN at Several Locations. All Costs For Labor, Materials and Equipment Necessary to Transition to 30 Inch Wide Curb and Gutter Shall be Included in the Price Bid For "Curb &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

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ND	NHU-6-986(105)109	20	16

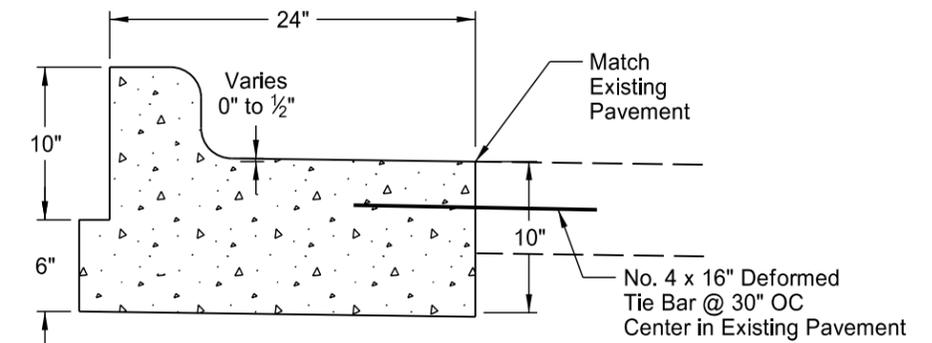
* Sta 425+26.9 to Sta 429+60 Height =0.50'
 Sta 429+60 to Sta 430+12.8 Height Varies From 0.50' to 0.80'
 Sta 430+12.8 O/s 50 to 65 Rt Height Varies From 0.80' to 0.00'



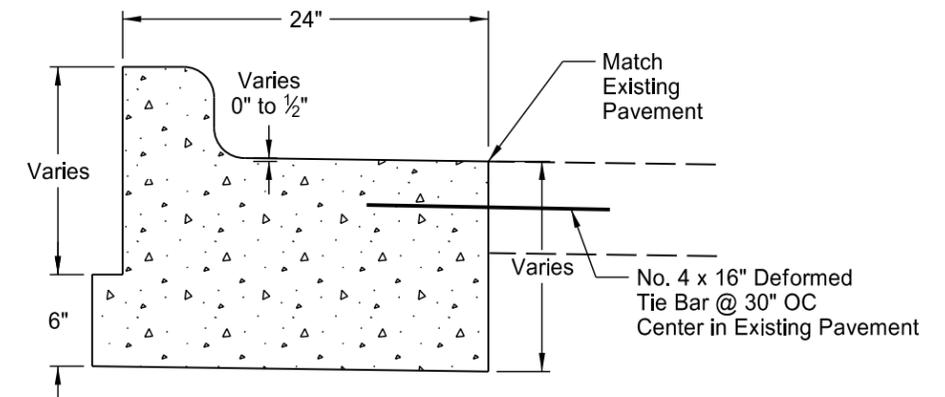
**Sidewalk Adjacent to Private Parking Lot
 Sta 425+26.9 to Sta 430+12.8 O/s Rt**



**Sidewalk Adjacent to Private Parking Lot
 Sta 425+26.9 to Sta 426+02.4 O/s Rt**



**Sidewalk Adjacent to Private Parking Lot
 Sta 426+02.4 to Sta 429+60 O/s Rt**



**Sidewalk Adjacent to Private Parking Lot
 Sta 429+60 to Sta 430+12.8 O/s 49.5 Rt
 Sta 430+12.8 O/s 49.5 to 64.5 Rt**

Notes:

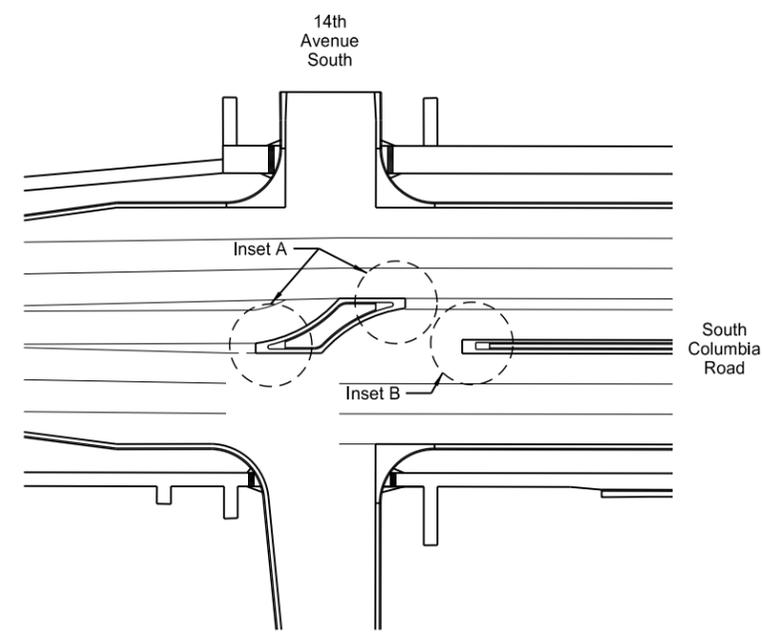
1. Joints in Curb & Gutter Adjacent to Private Parking Lot Shall be Sawed After Concrete has Set and Forms are Removed. Concrete Exposed Shall Have a Hand Rubbed Finish. Finish Shall be Placed on the Back of the Curb & Gutter Before Sidewalk is Poured. Saw Joints Shall be 1/4 the Thickness of the Curb and Gutter Poured.

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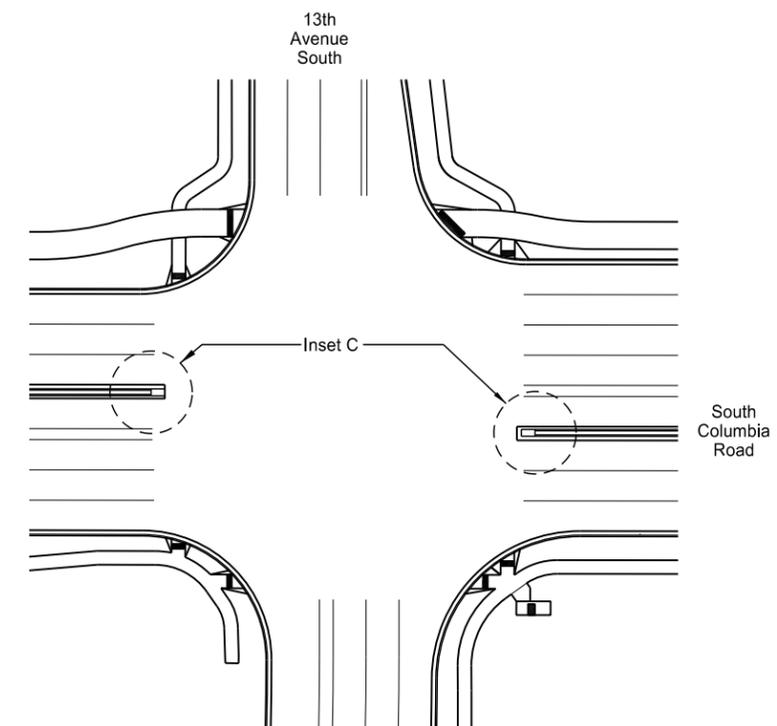
Curb and Gutter Details

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

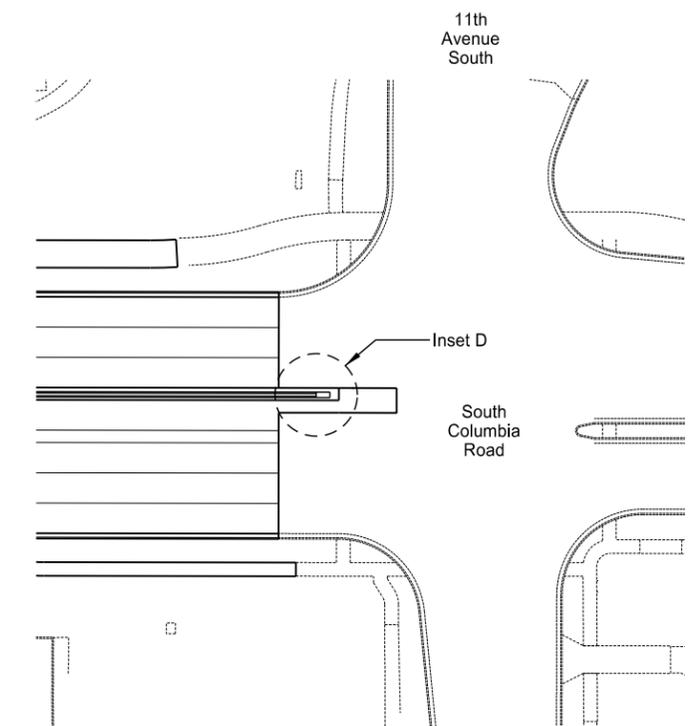
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	17



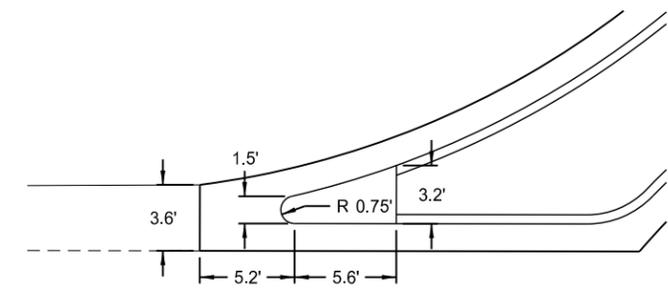
14th Ave S Overview



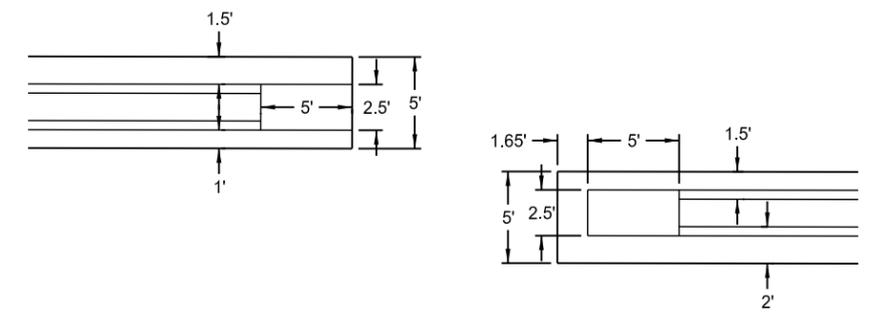
13th Ave S Overview



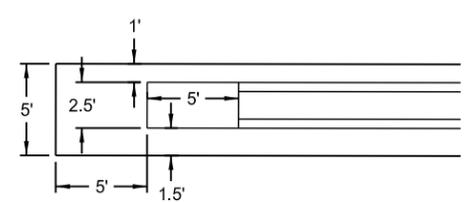
11th Ave S Overview



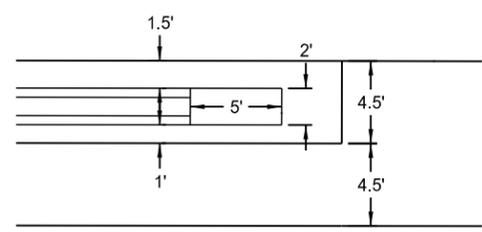
Inset A



Inset C



Inset B

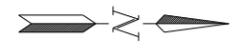


Inset D

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.

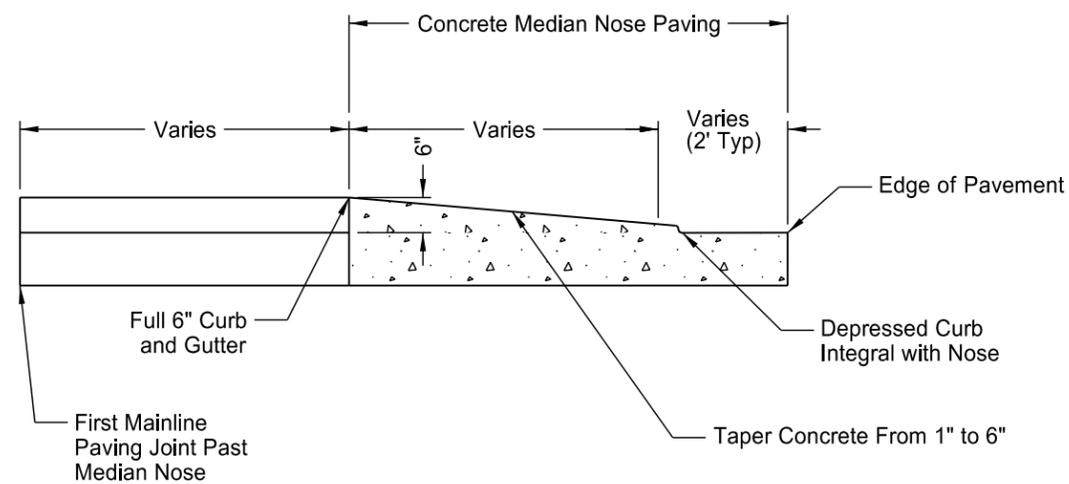
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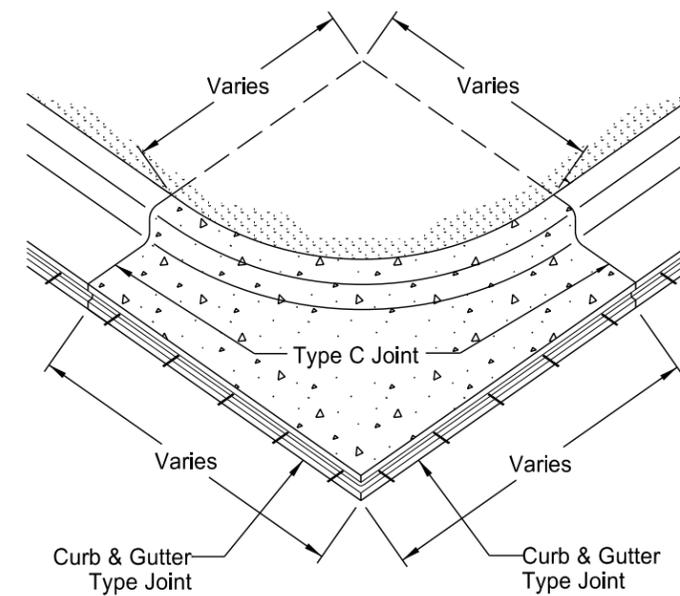
Paving Details
Concrete Median Nose Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
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Median Nose Detail - Profile View (Typical Construction)



Curb Return

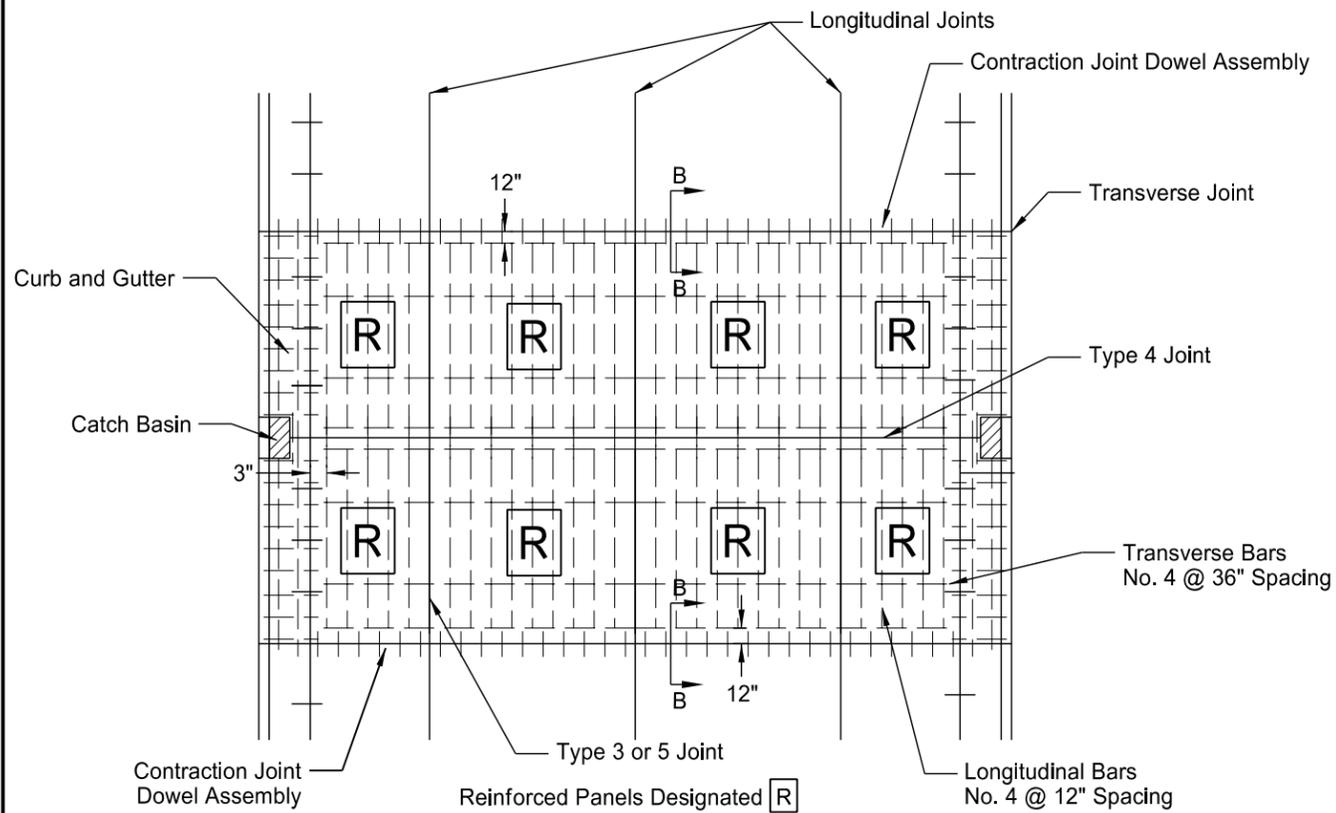
Concrete Median Nose Paving

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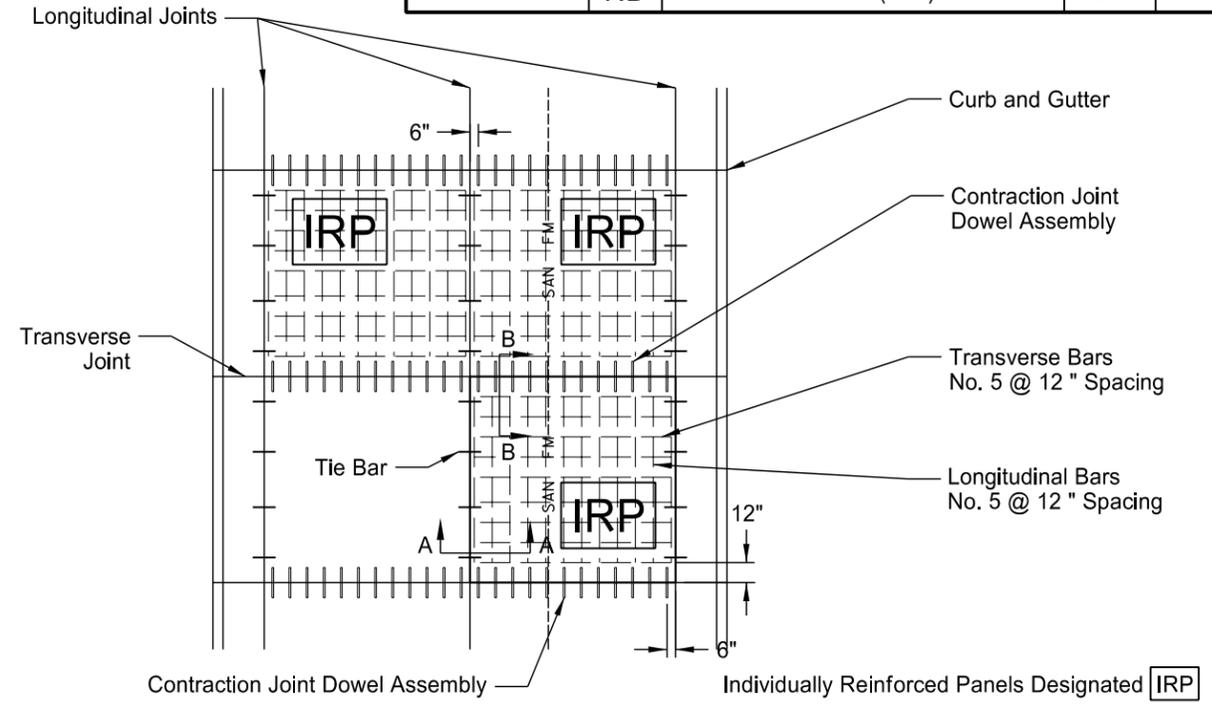
Paving Details

Reconstruction of South Columbia Road
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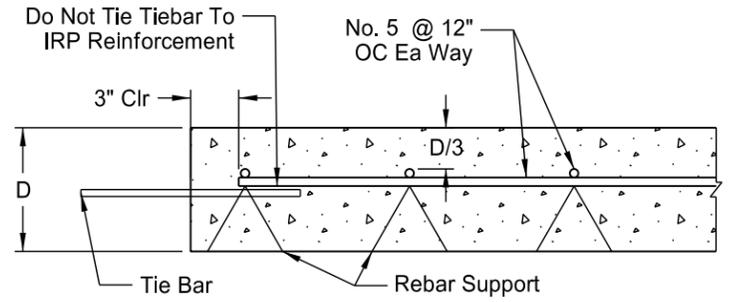
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	19



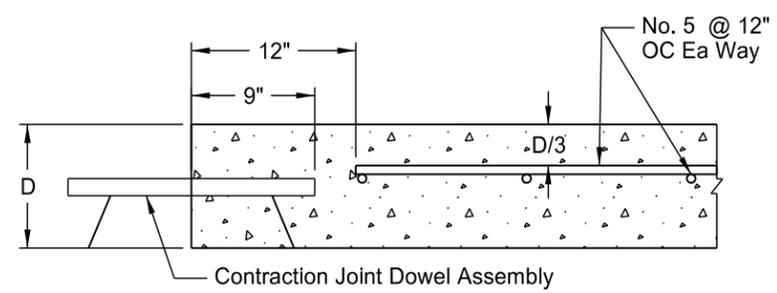
Pavement Reinforcing (Catch Basin Centered on Joint)



Individually Reinforced Panels Designated IRP



Longitudinal Joint Section A-A



Transverse Joint Section B-B

Individually Reinforced Panel

Note:

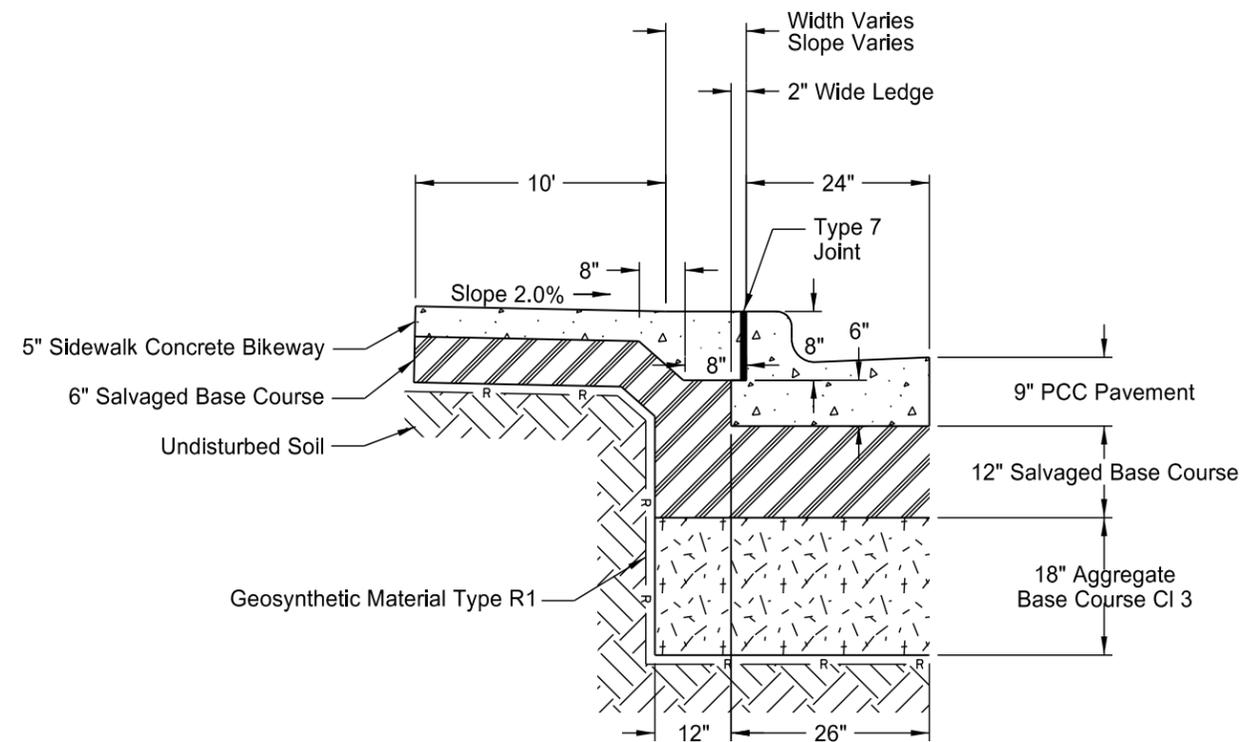
1. Contractor Shall Adequate Support IRP Reinforcement Prior to Commencing Paving Operations. Paving Operations Shall be Suspended at the Engineer's Discretion if Proper Support is not Provided, Resulting in Movement of IRP Panels During Paving Operations.
2. Dowels Bars Shall be 1 1/4" x 18" for D = 10" or Less.
3. Dowel Bars Shall be 1 1/2" x 18" for D Greater Than 10".

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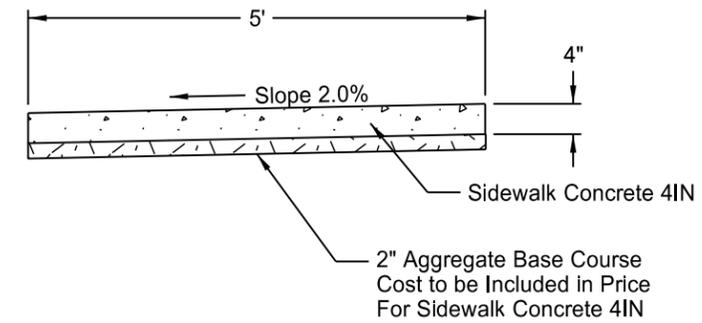
Paving Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

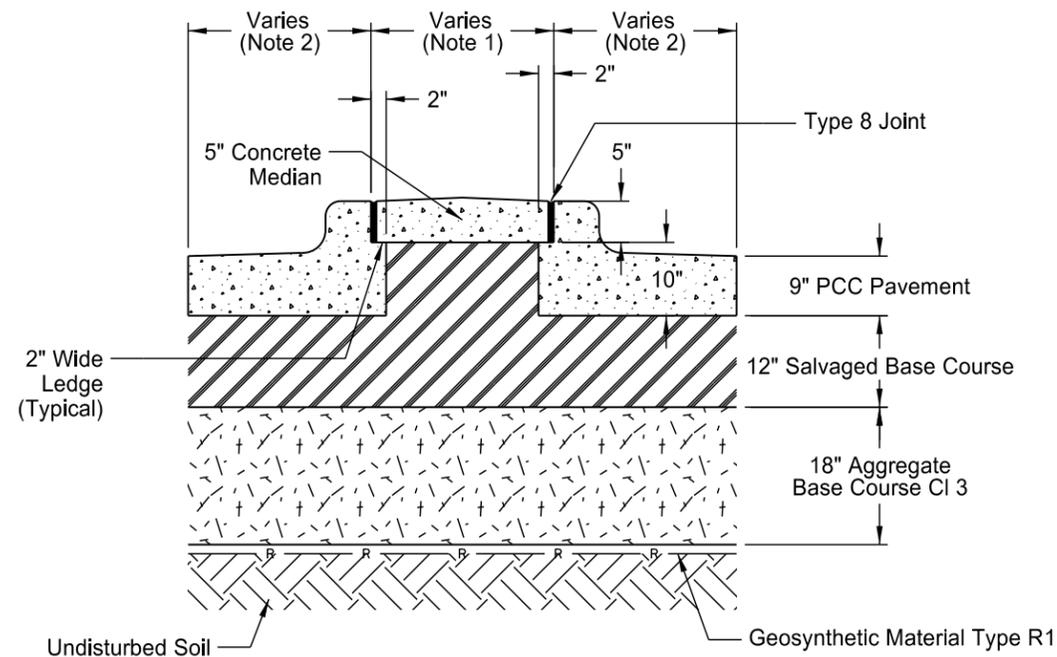
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	20	20



Shared Use Path Constructed Adjacent to Curb and Gutter



Sidewalk Concrete 4IN



Concrete Median Paving

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 1/8" wide x 1 1/4" Deep. Saw Transverse and Longitudinal Joints @ 5' OC (Typ.).
5. Expansion Joints - Type 7 Shall be Constructed in 50' Intervals Along Median.

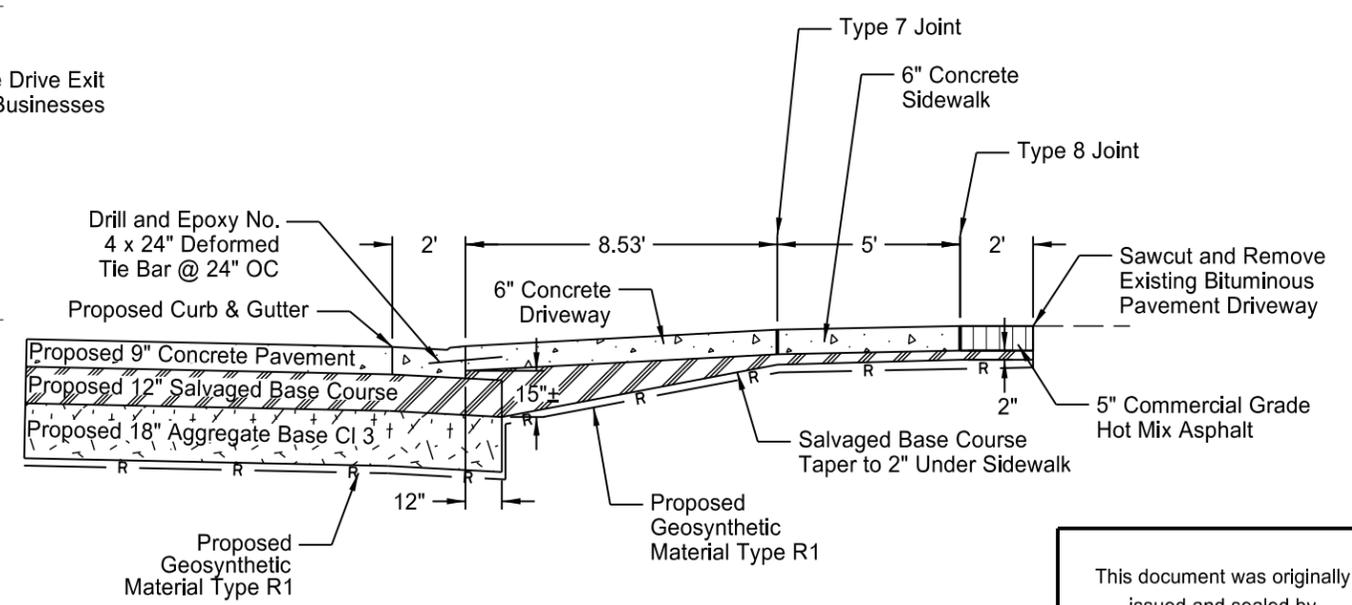
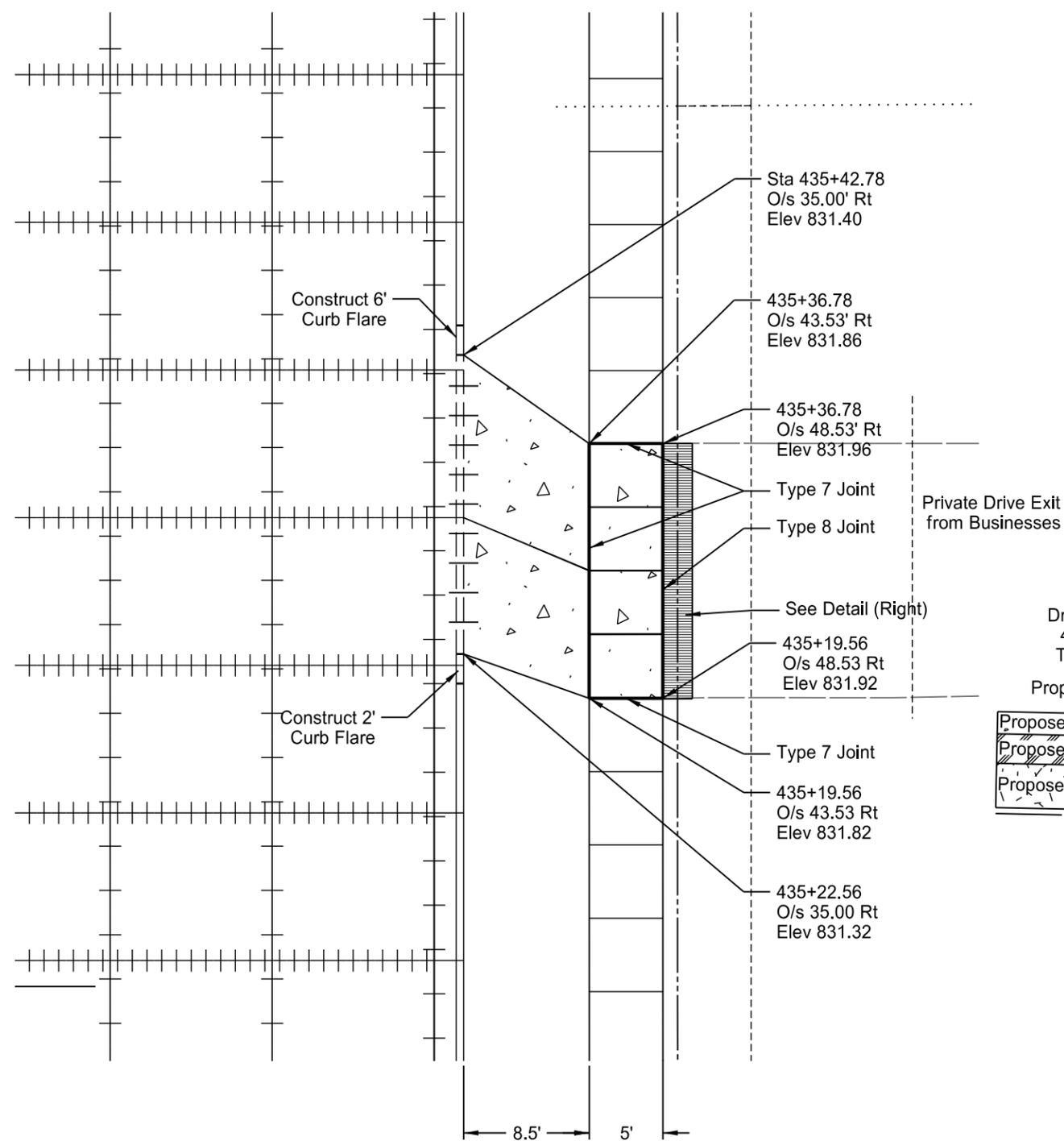
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Paving Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	21

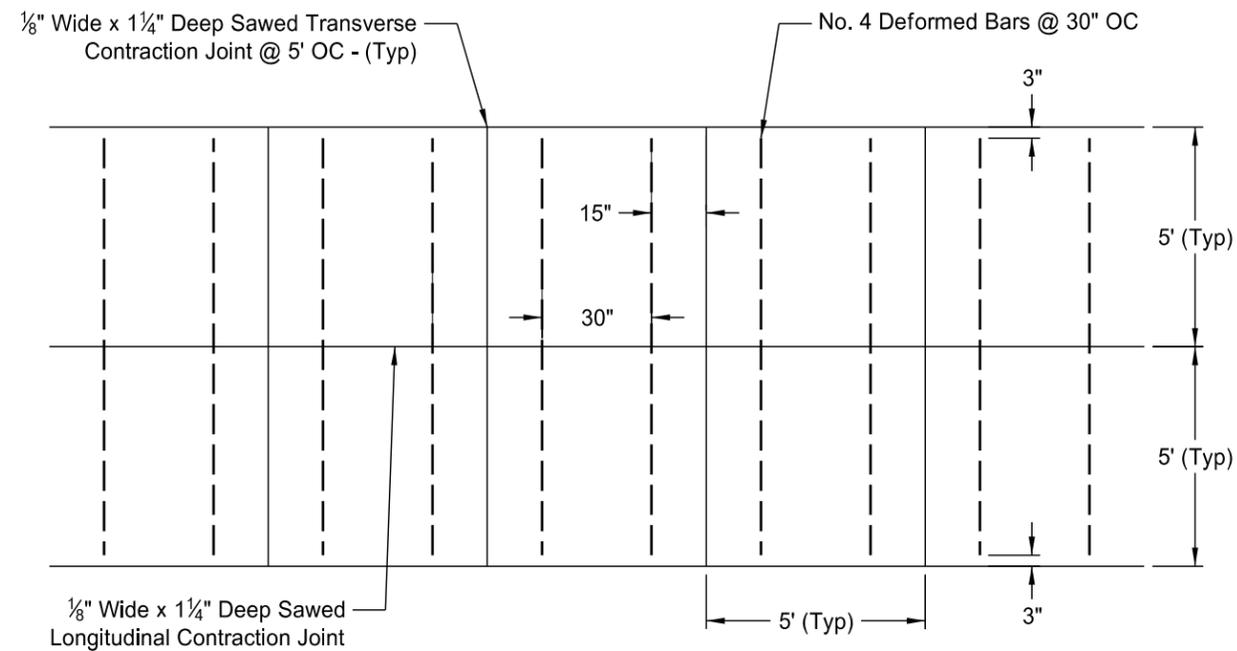
PAY ITEMS	
Salvaged Base Course	10 CY
Commercial Grade Hot Mix Asphalt	1 TON
Geosynthetic Material Type R1	25 SY
Driveway Concrete	27 SY



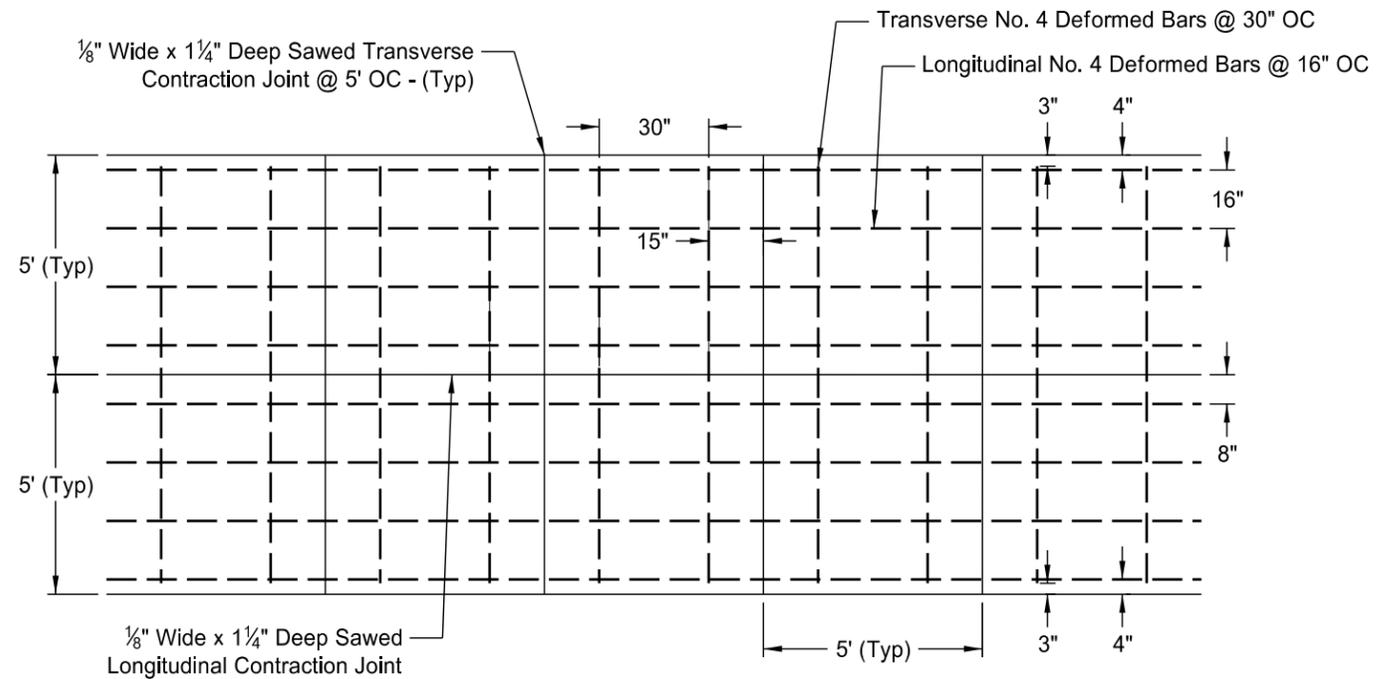
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Driveway Details
 US Bank Between
 11th Avenue and 13th Avenue South
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

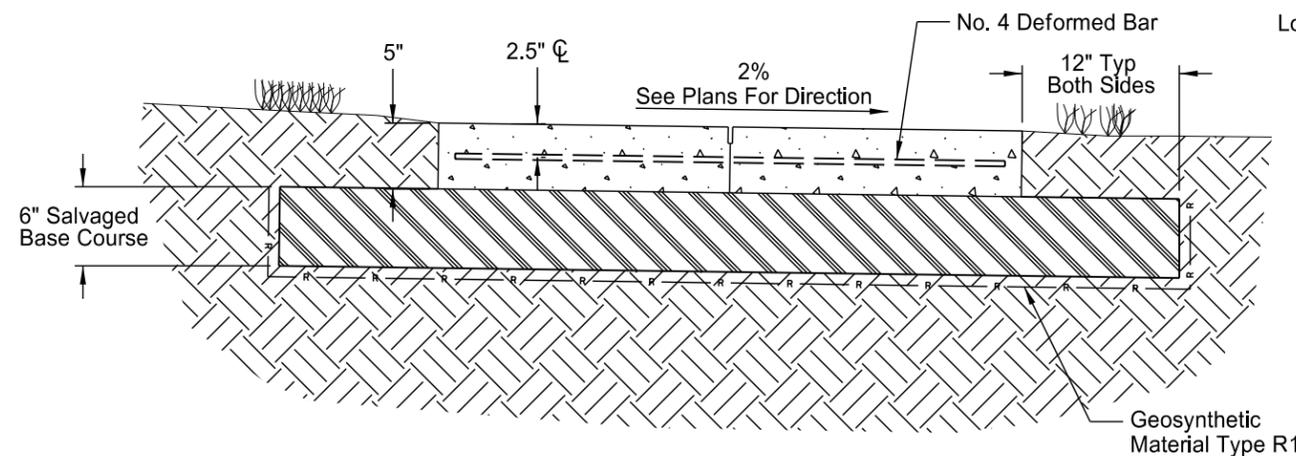
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	22



Shared Use Path - Plan View

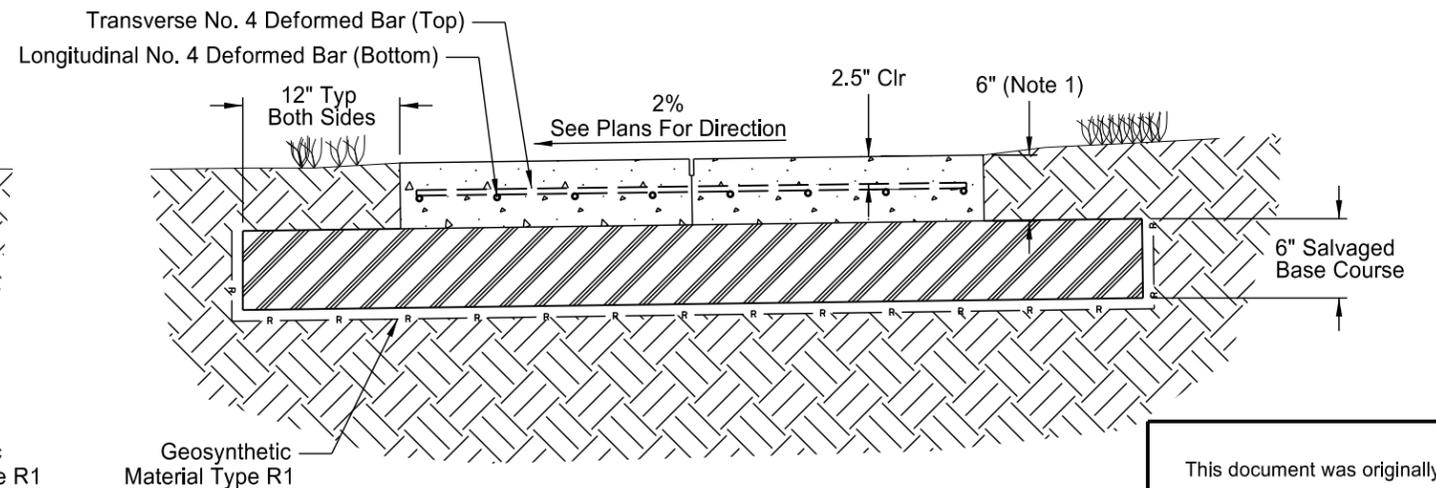


Shared Use Path - Plan View



Shared Use Path - Profile View

5" Shared Use Path
Typical Reinforcement



Shared Use Path - Profile View

6" Shared Use Path
Reinforcement Over Utility Trenches

Reinforced Shared Use Path Panels Designated SUP

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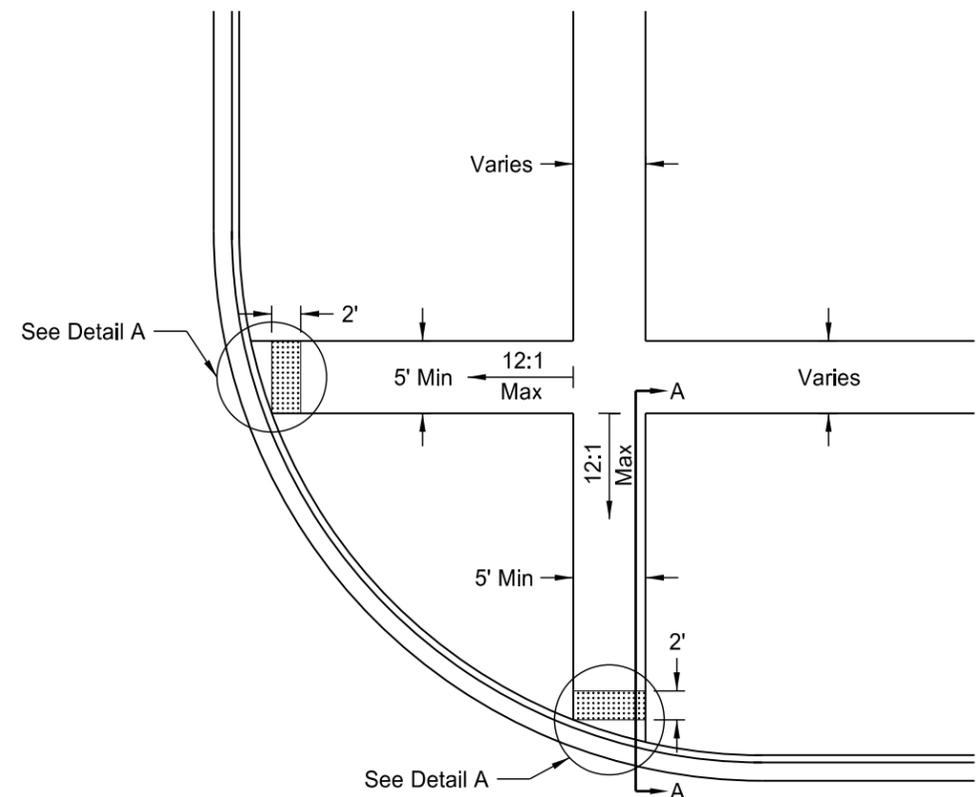
Shared Use Path Details

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

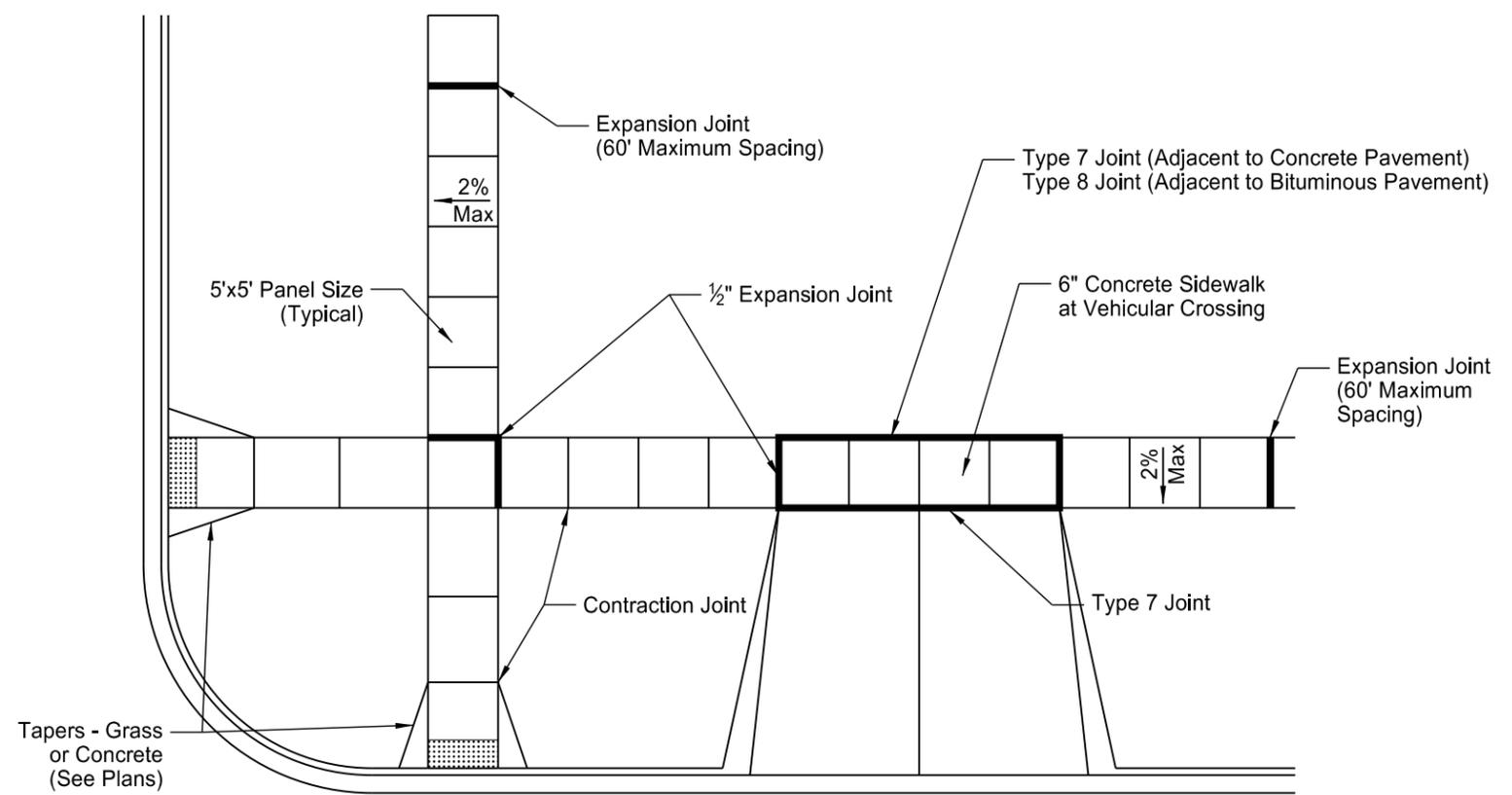
Note:

1. See Section 90 for Location of Reinforcement Over Utility Trenches.

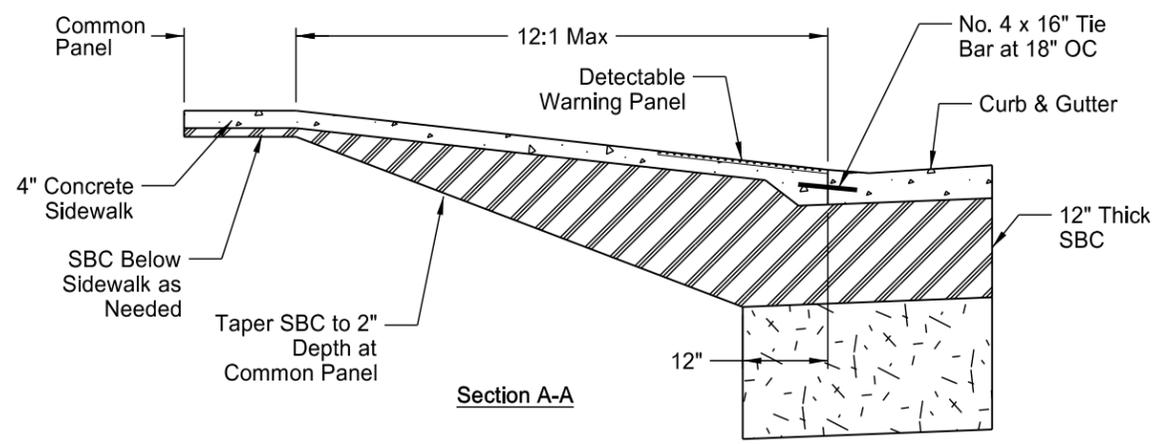
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	23



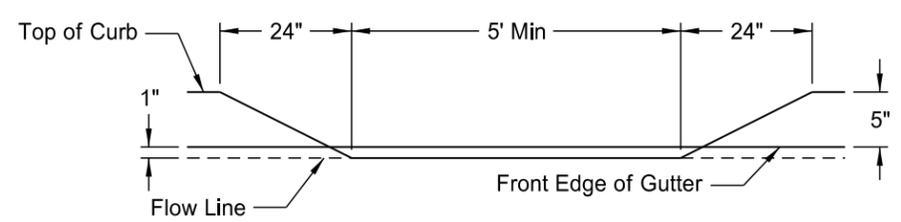
Type A - Perpendicular Ramp



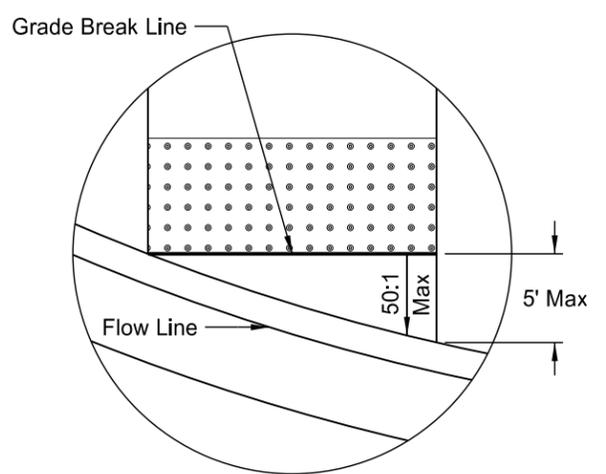
Sidewalk Joint Plan



Section A-A



Depressed Curb for Pedestrian Ramp



Detail A

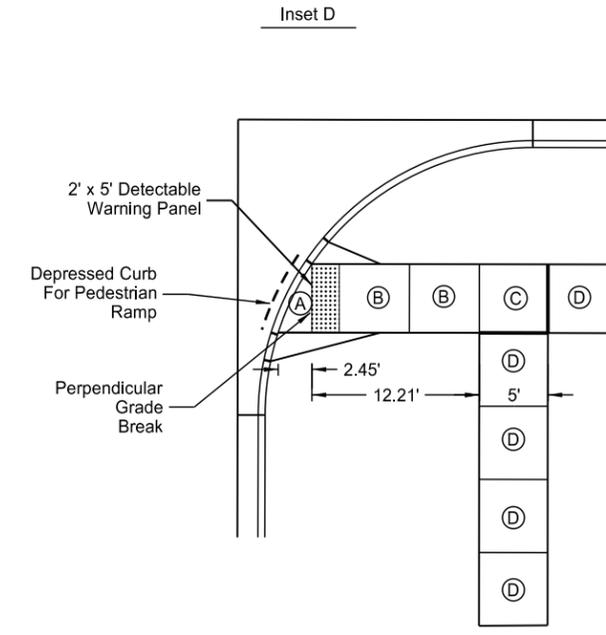
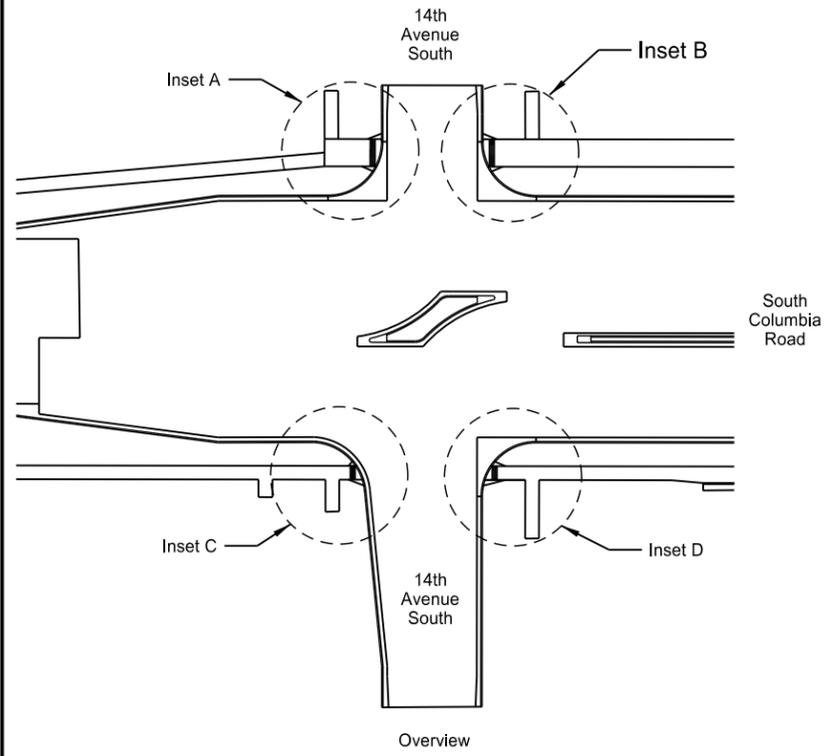
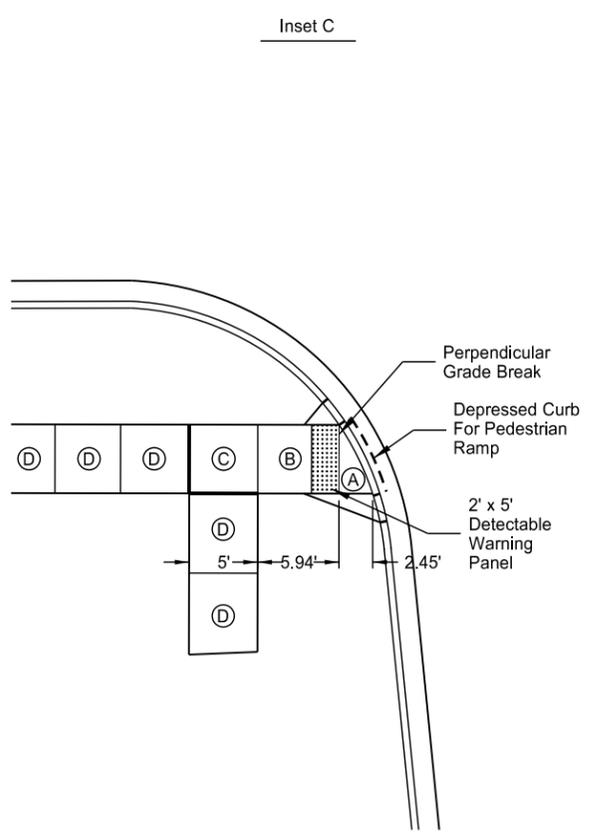
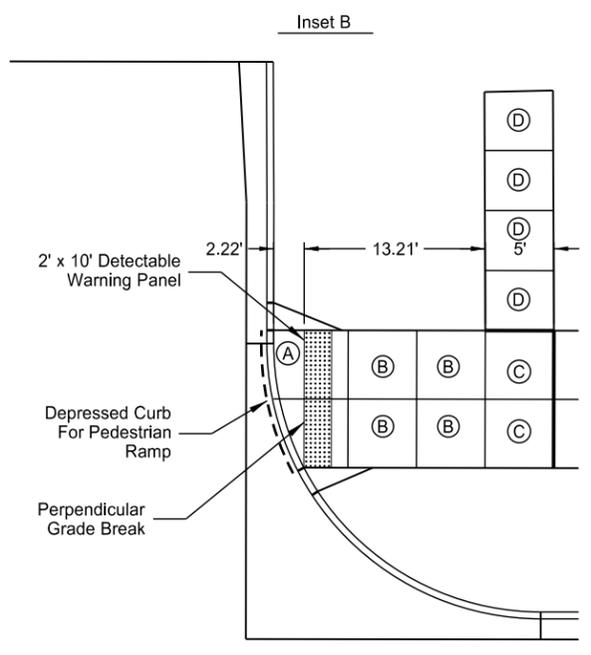
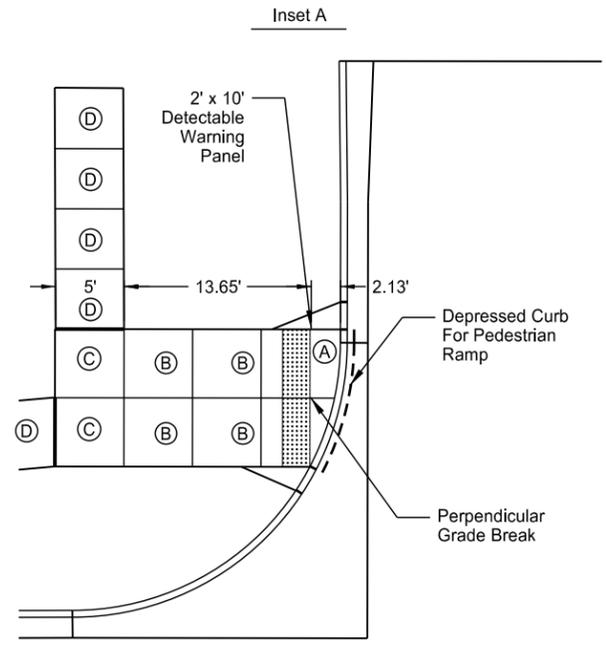
Notes:

1. For Sidewalk Installations, a 5' 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
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

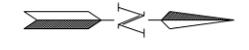
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	24



- 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.
 6. Cast Iron Detectable Warning Panels Shall be Provided When Installed at Face of Curb and Gutter.

- (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
- (D) Sidewalk or Shared Use Path
1:20 Maximum Running Slope
1:50 Maximum Cross Slope

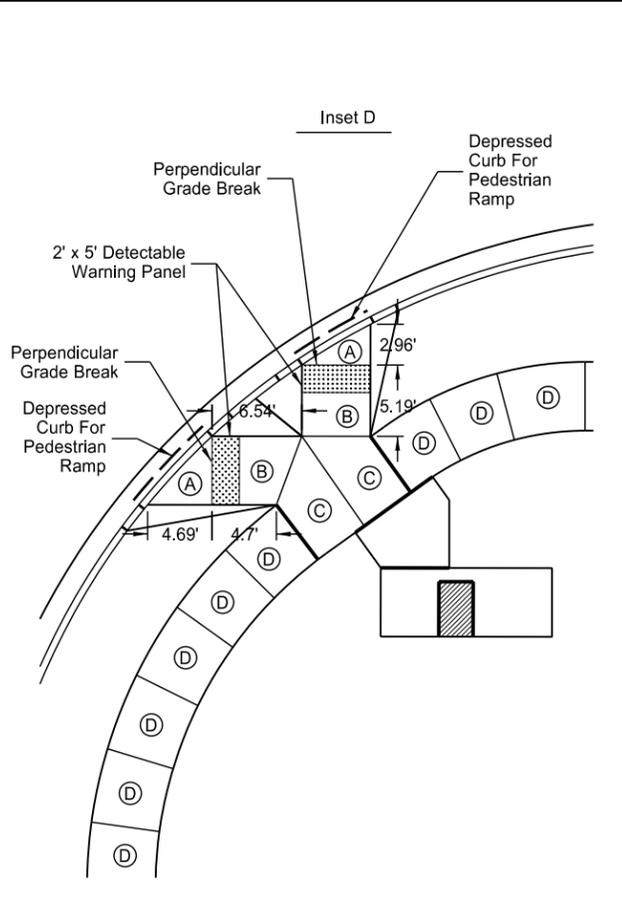
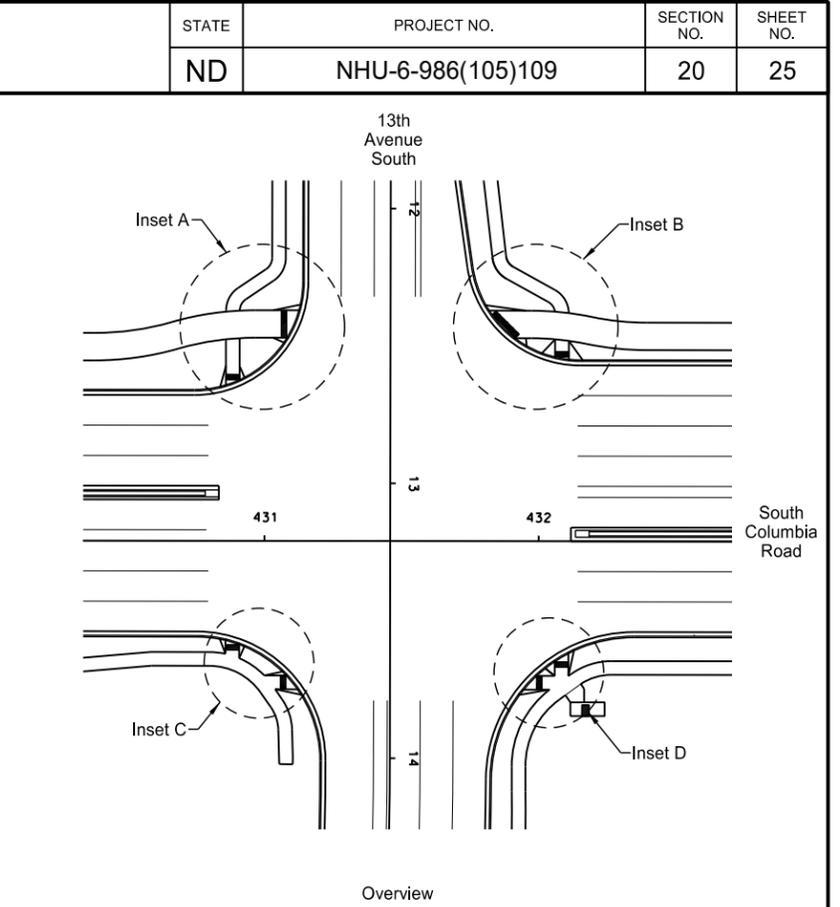
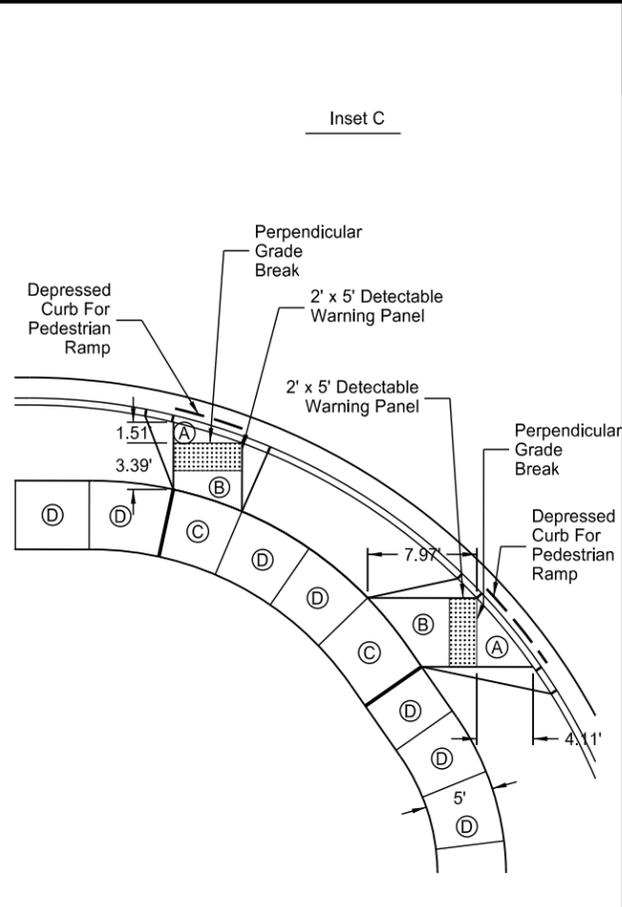
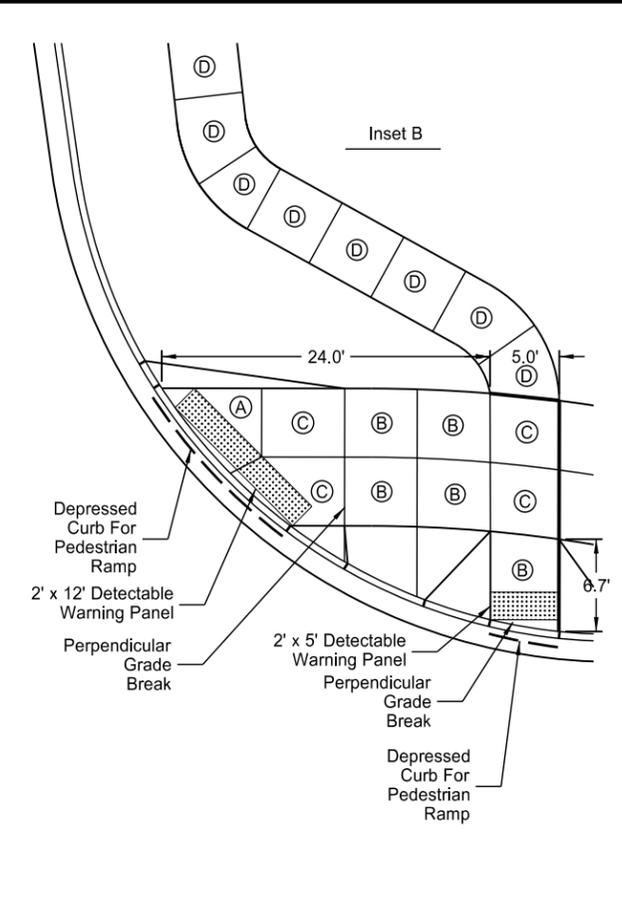
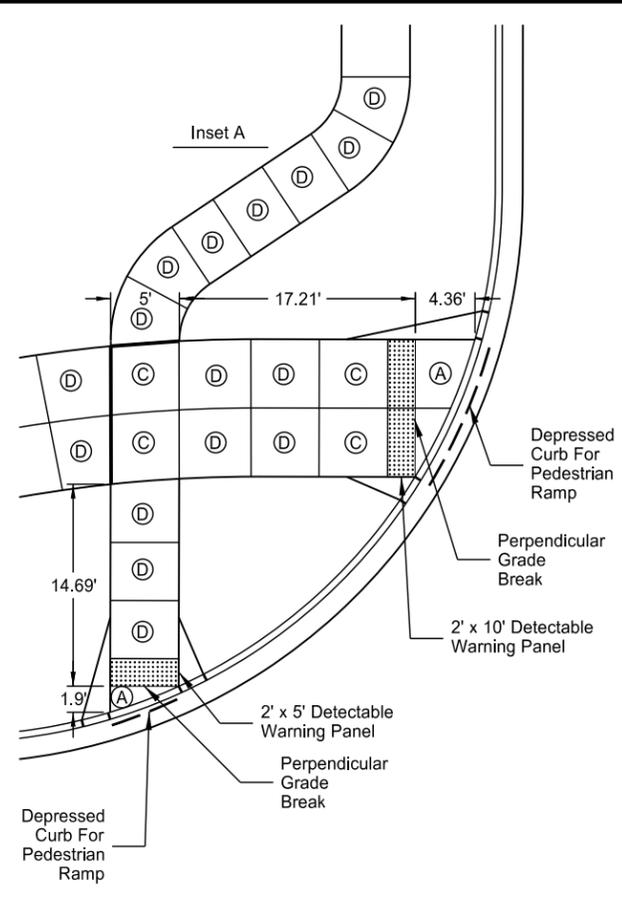
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ADA Ramp Details
South Columbia Road and 14th Avenue South

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

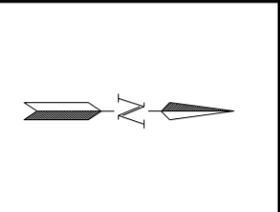
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	25



- 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.
 6. Cast Iron Detectable Warning Panels Shall be Provided When Installed at Face of Curb and Gutter.

- (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
- (D) Sidewalk or Shared Use Path
1:20 Maximum Running Slope
1:50 Maximum Cross Slope

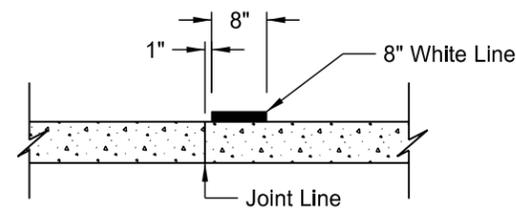
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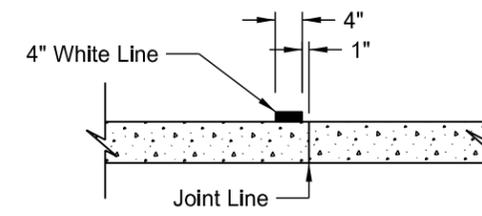
ADA Ramp Details
South Columbia Road and 13th Avenue South

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

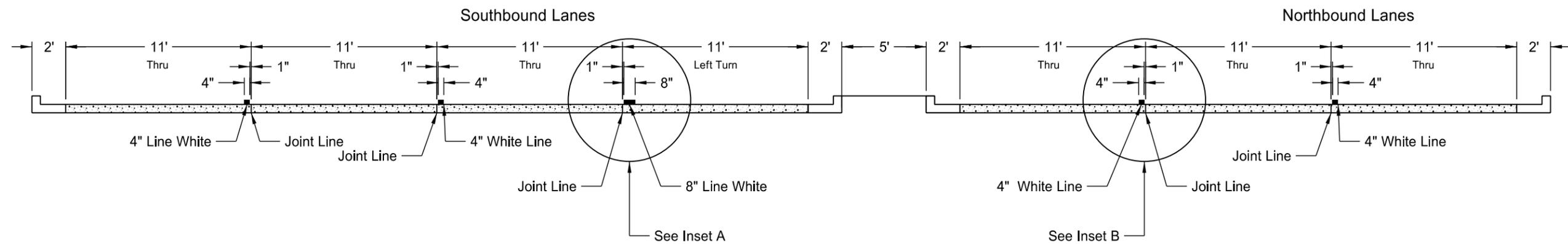
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	20	26



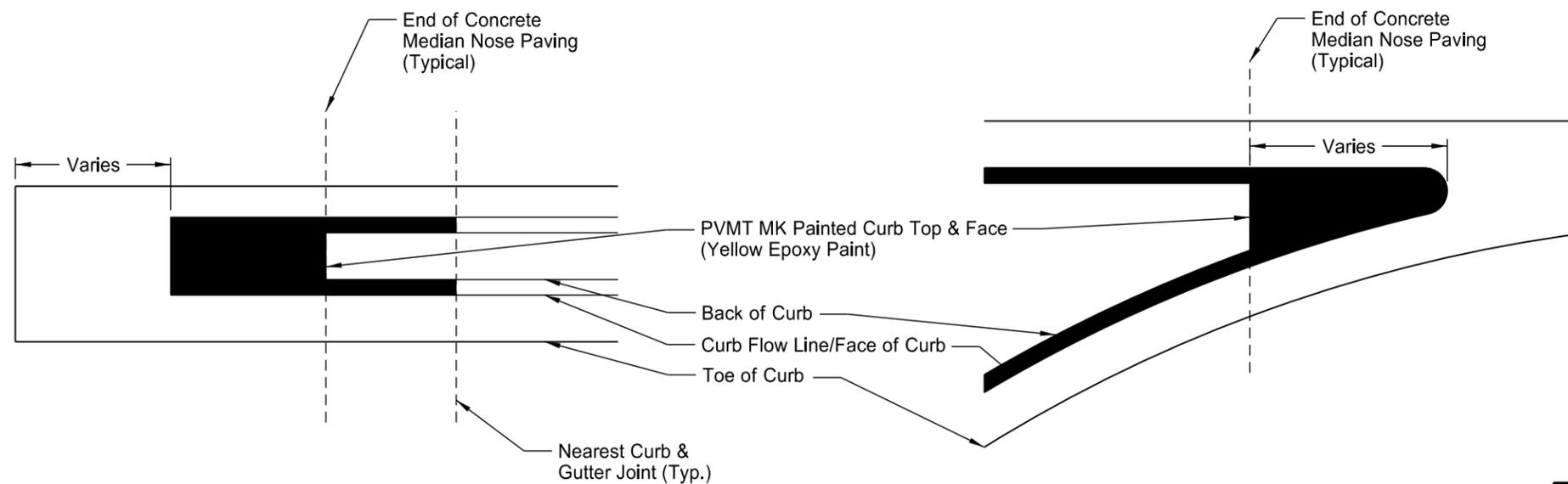
Inset A



Inset B



Typical Pavement Marking Position

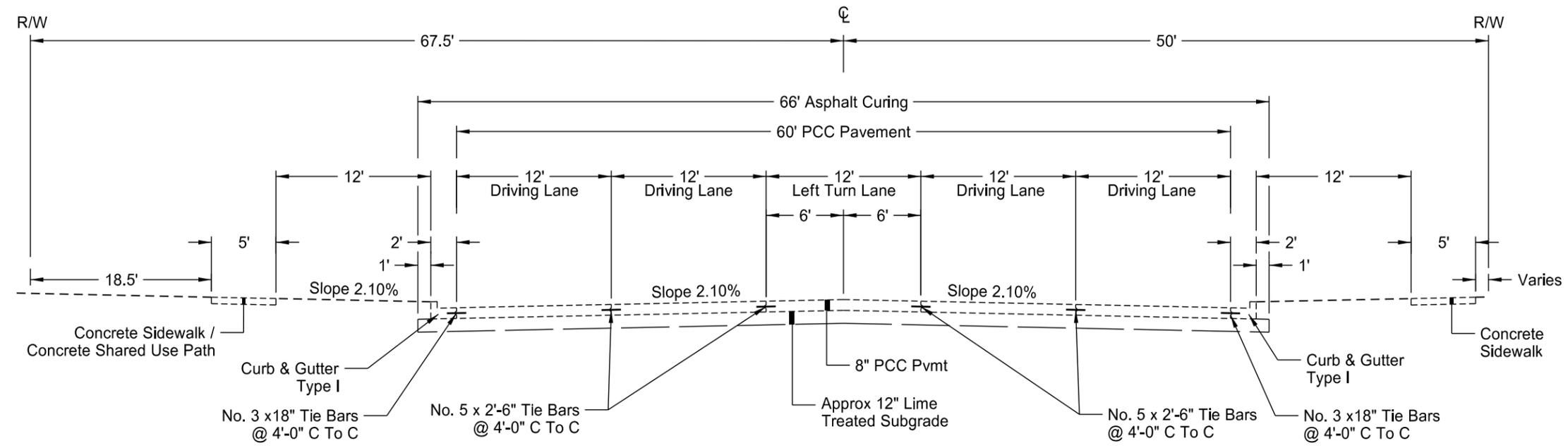


Typical Median Nose and Curb & Gutter Marking

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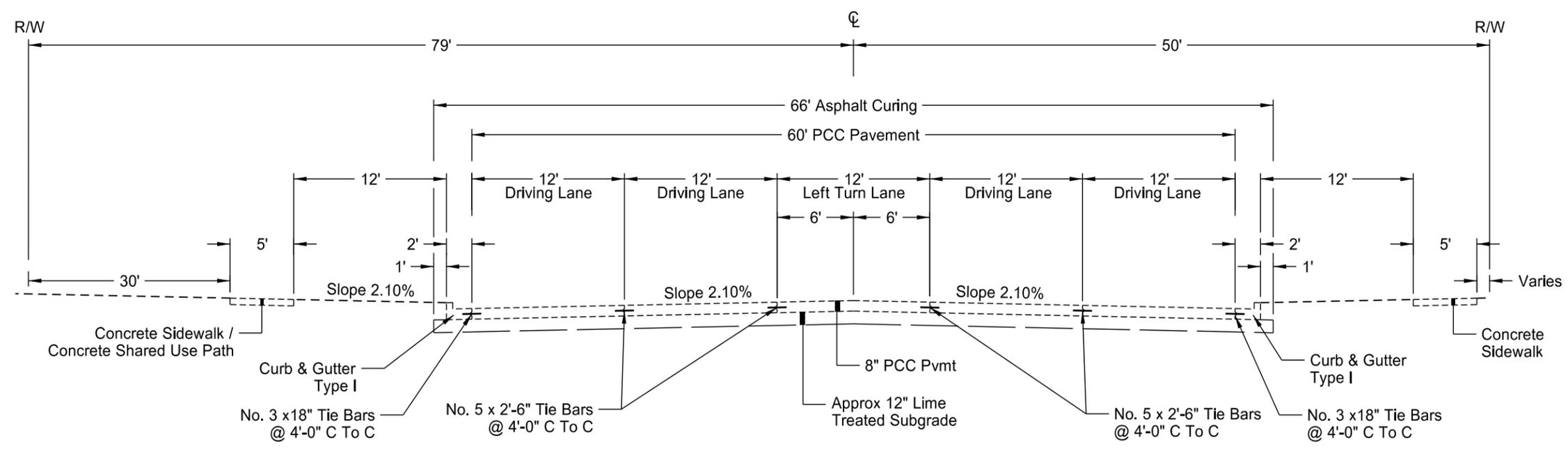
Pavement Marking Details
 Reconstruction of South Columbia Road
 11th Avenue South to DeMers Avenue
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	1



Sta 422+39.71 to Sta 430+49.70

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



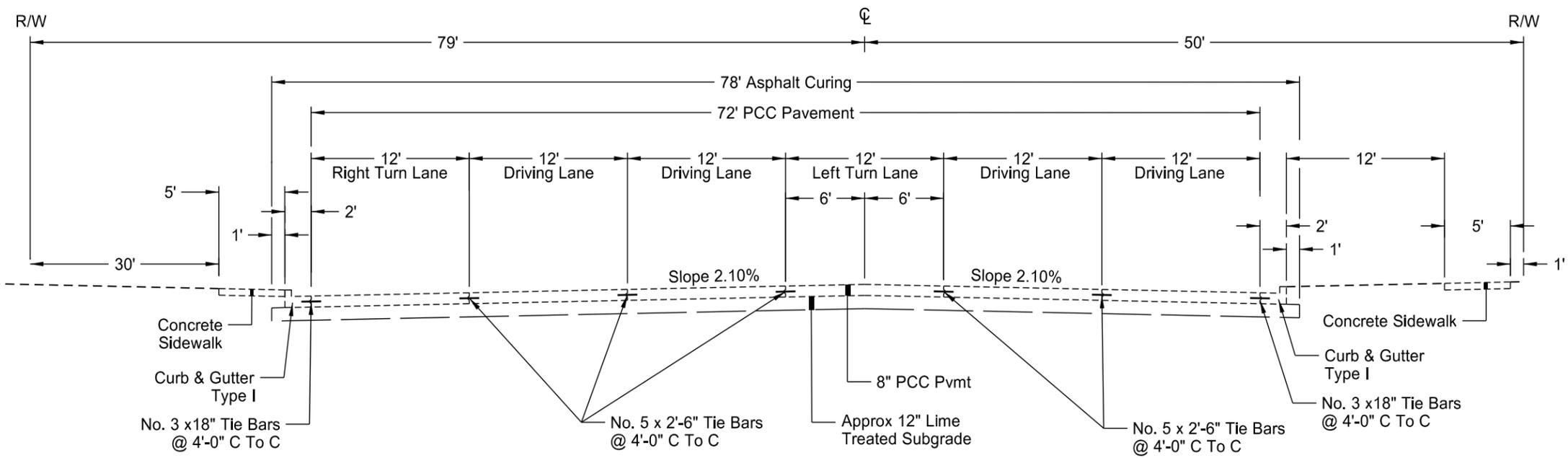
Sta 430+49.70 to Sta 431+45.87

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Existing Typical Sections
South Columbia Road

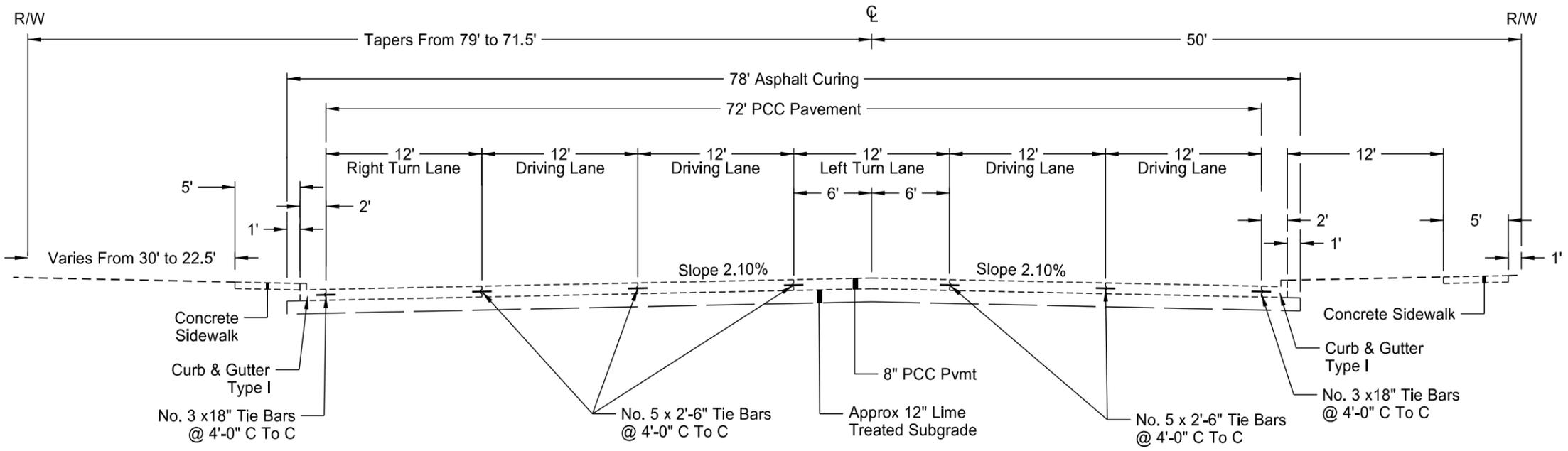
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	2



Sta 431+45.87 to Sta 432+01.71

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



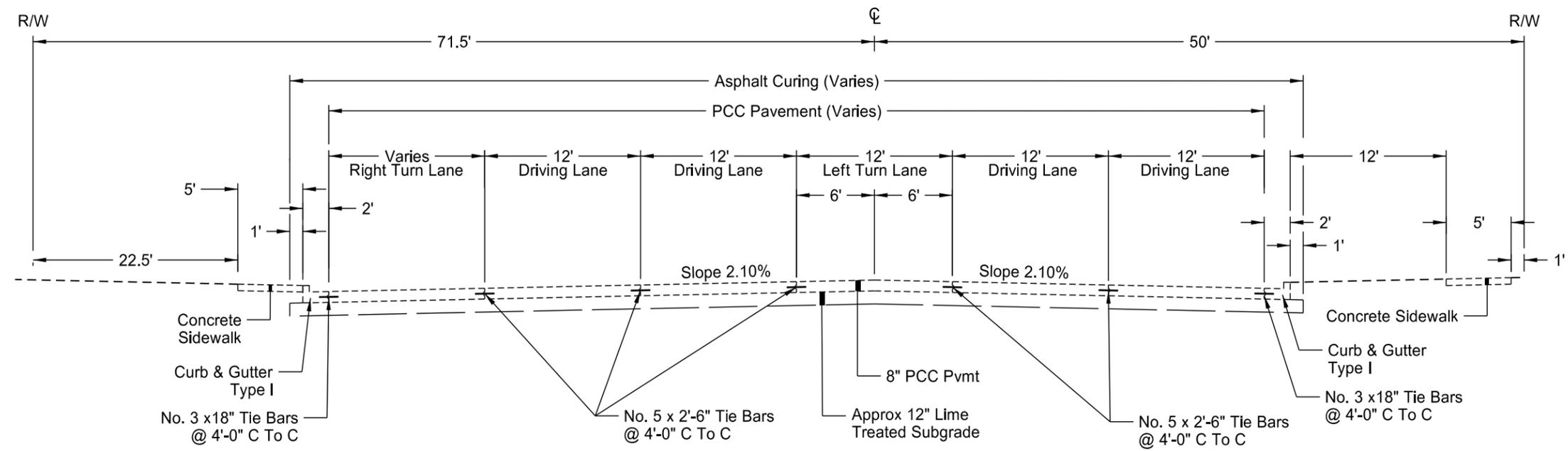
Sta 432+01.71 to Sta 432+29.70

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Existing Typical Sections
South Columbia Road

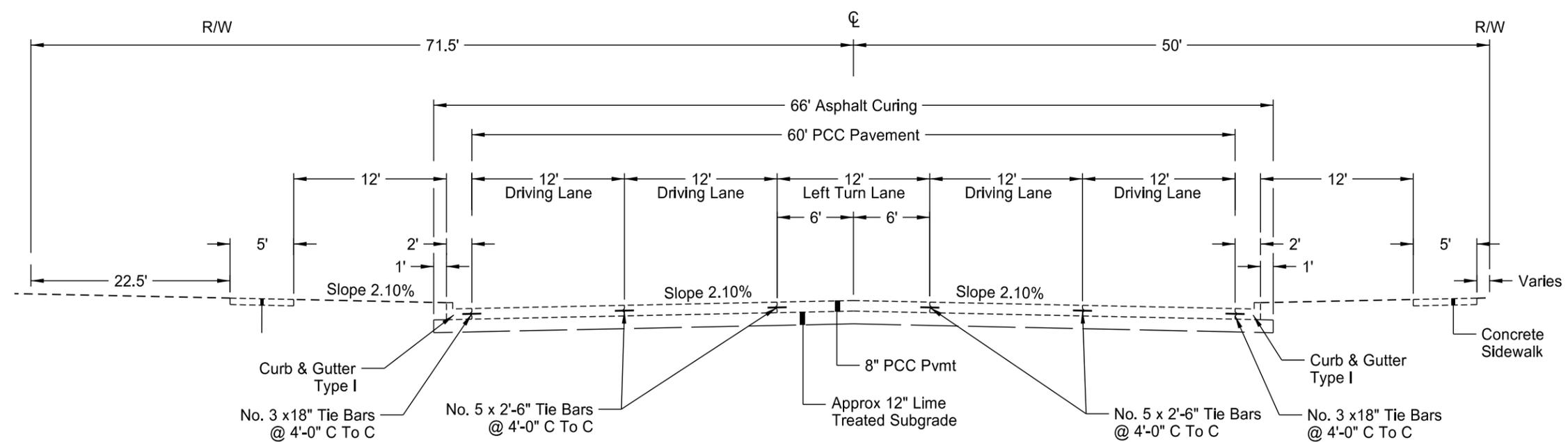
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	3



Sta 432+29.70 to Sta 434+48.95

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



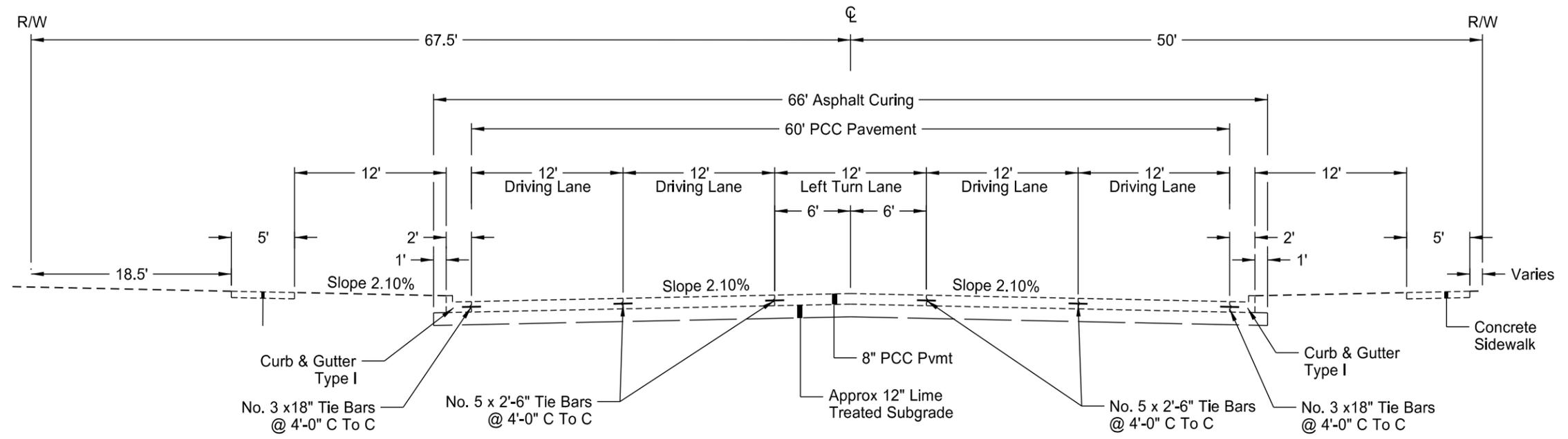
Sta 434+48.95 to Sta 435+09.66

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Existing Typical Sections
South Columbia Road

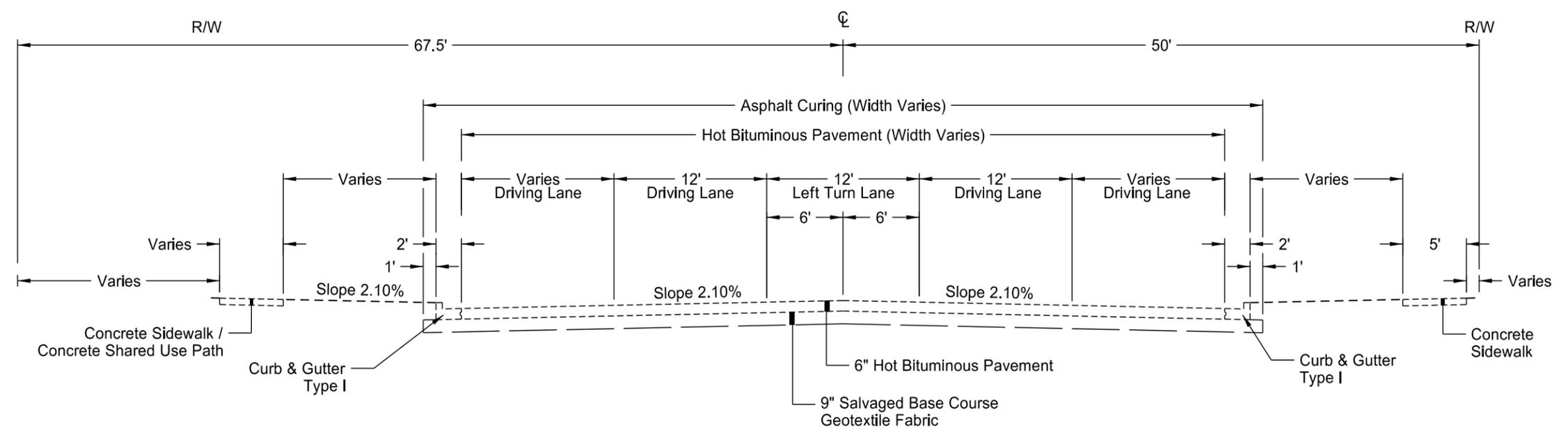
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	4



Sta 435+09.66 to Sta 437+46.74

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



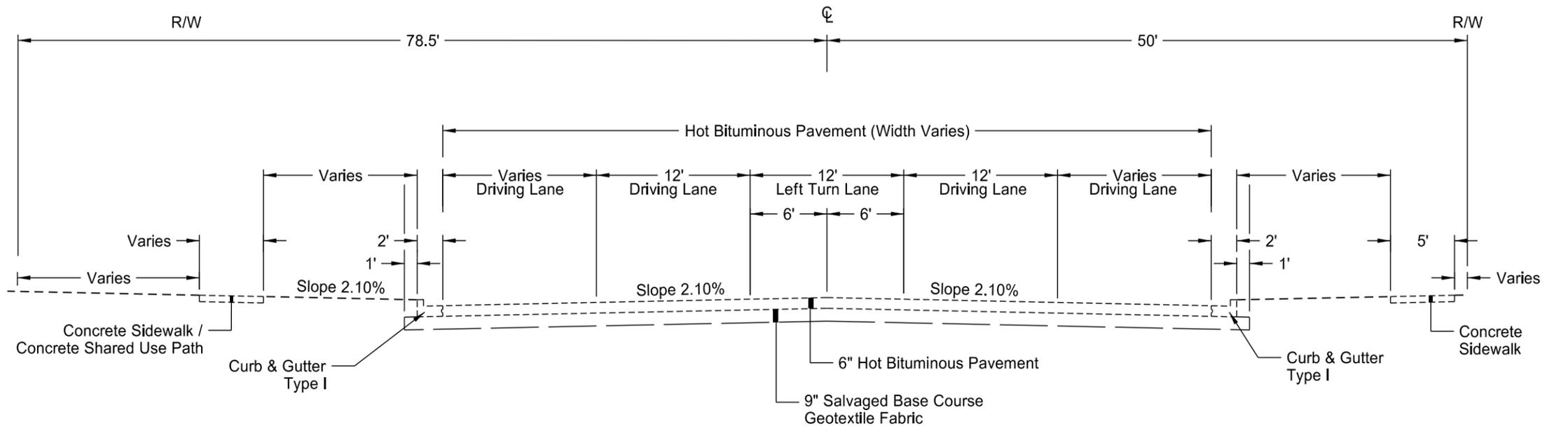
Sta 437+46.74 to Sta 437+98.54

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Existing Typical Sections
South Columbia Road

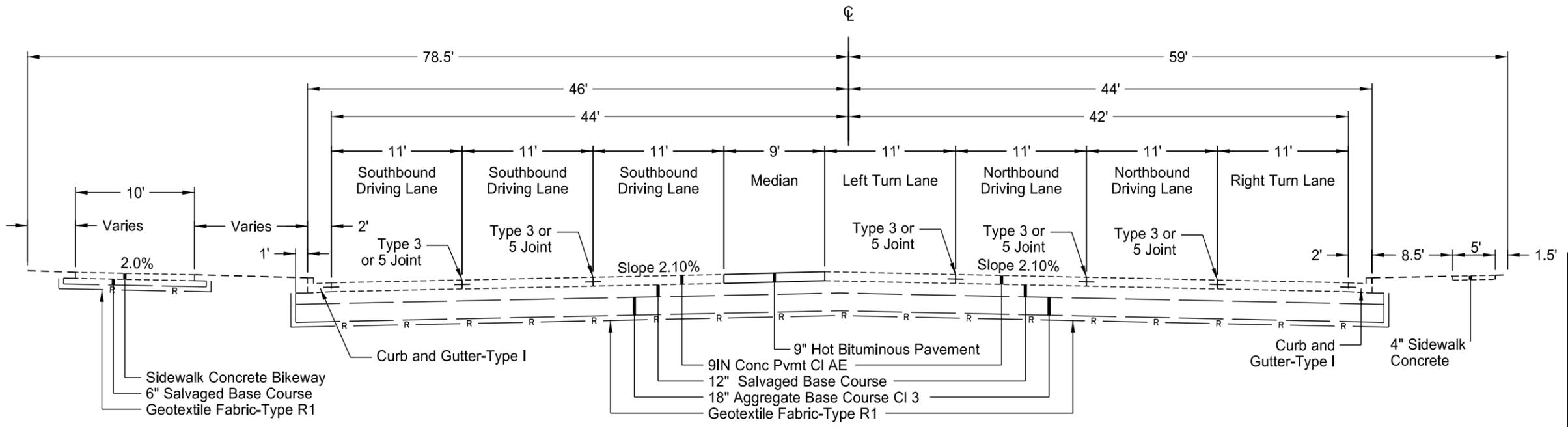
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	5



Sta 437+98.54 to Sta 438+21.75

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



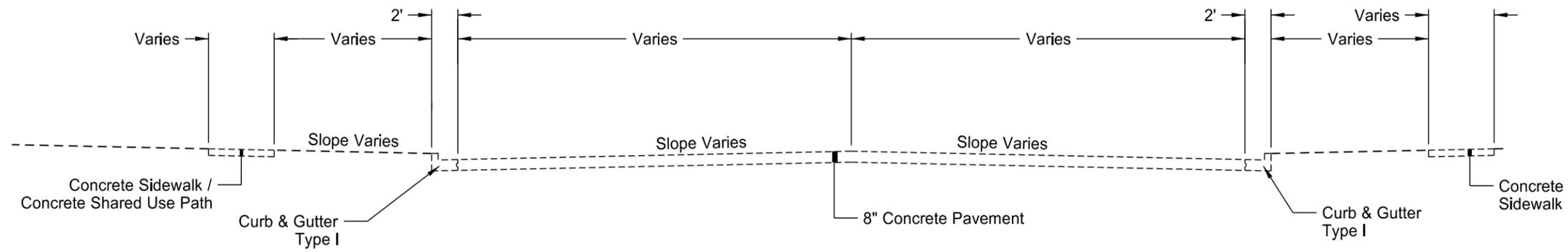
Sta 438+21.75 to Sta 438+64.73

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Existing Typical Sections
South Columbia Road

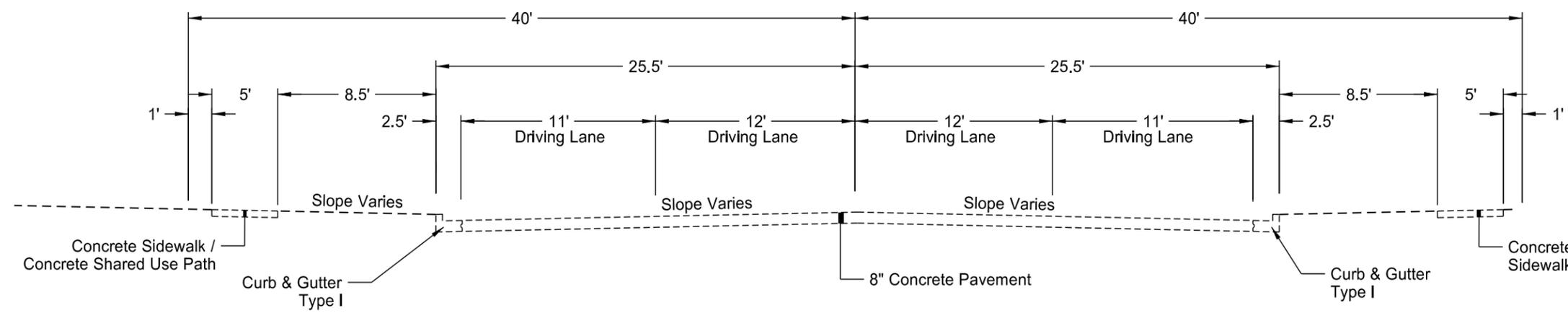
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	6



Sta 11+00 to Sta 12+50
13th Avenue South

Note: Numerous patching and repairs have been performed on the existing roadway. Reinforcement may be encountered.



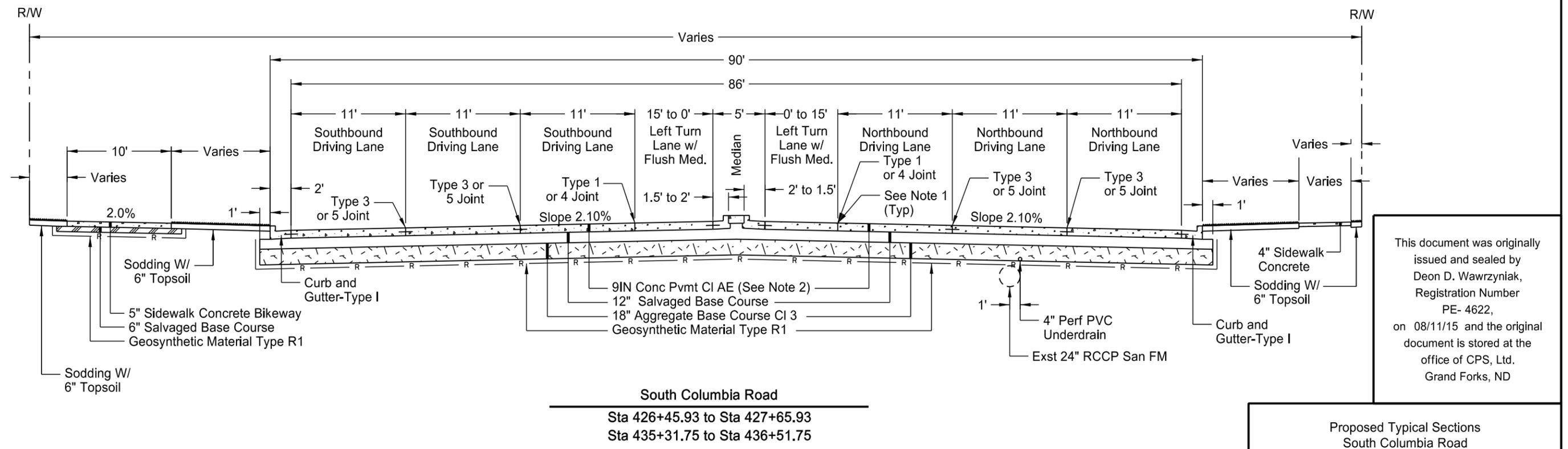
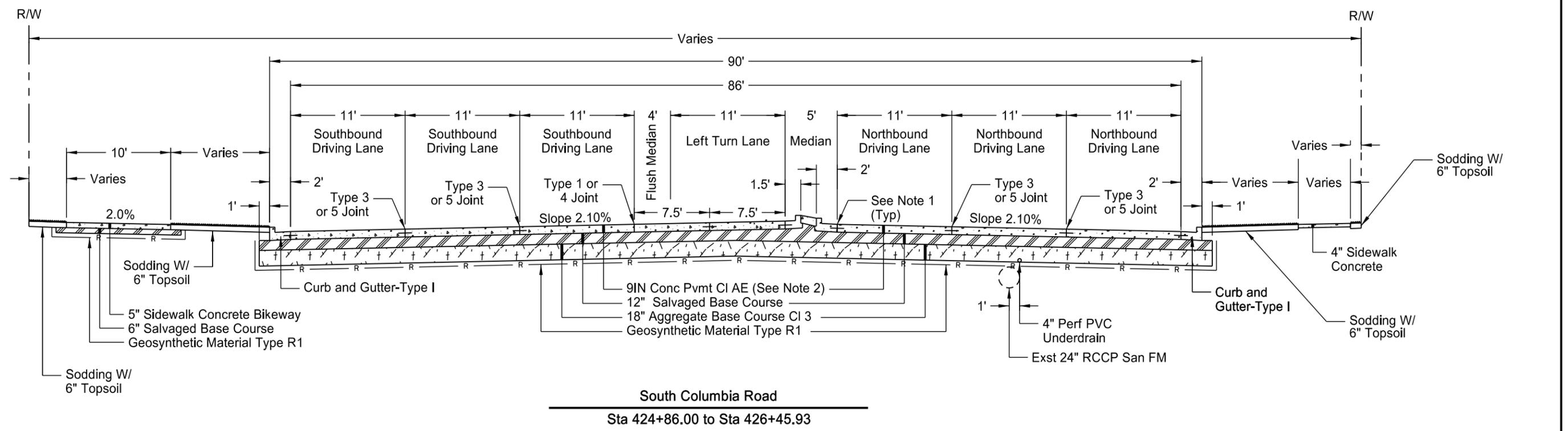
Sta 13+70 to Sta 16+85.5
13th Avenue South

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Existing Typical Sections
13th Avenue South

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	7



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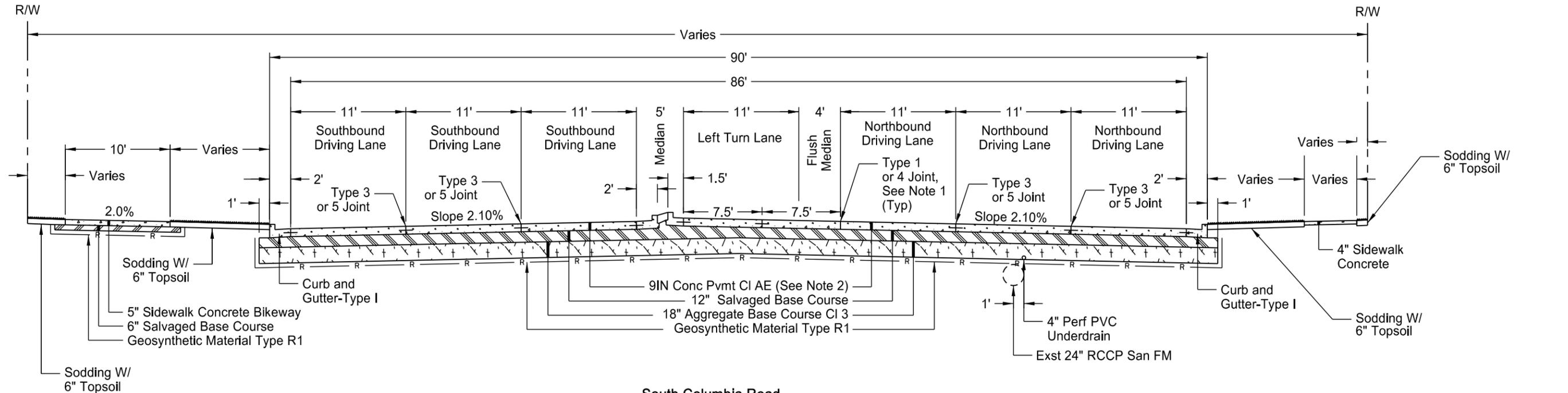
Proposed Typical Sections
South Columbia Road

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

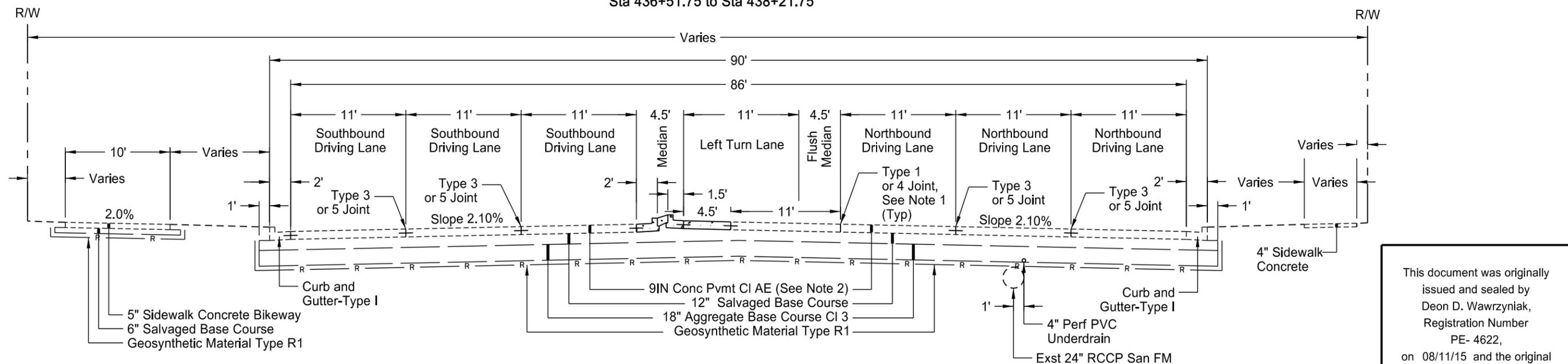
Notes:

1. Baseline Location for Horizontal and Vertical Datum.
2. 9IN Conc Pvmt CI AE may be "9IN Non-Reinf Concrete Pvmt CI AE-Doweled" or "9IN Reinf Concrete Pavement CI AE". See Section 90 for Reinforcement Locations.
3. See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	8



South Columbia Road
 Sta 427+65.93 to Sta 430+73.35
 Sta 436+51.75 to Sta 438+21.75



South Columbia Road
 Sta 438+21.75 to Sta 438+64.73

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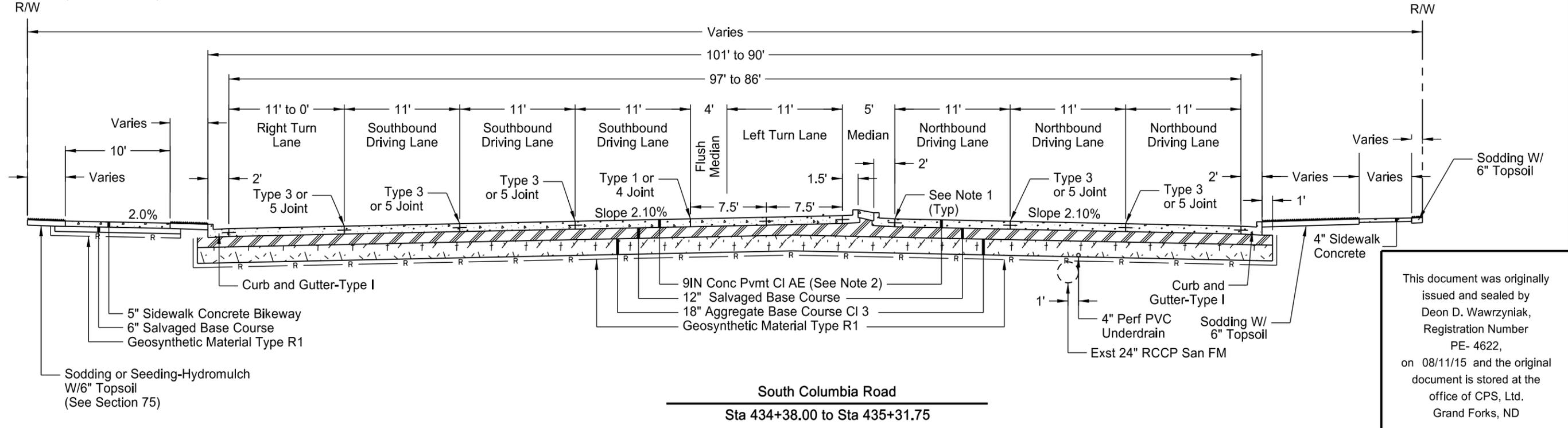
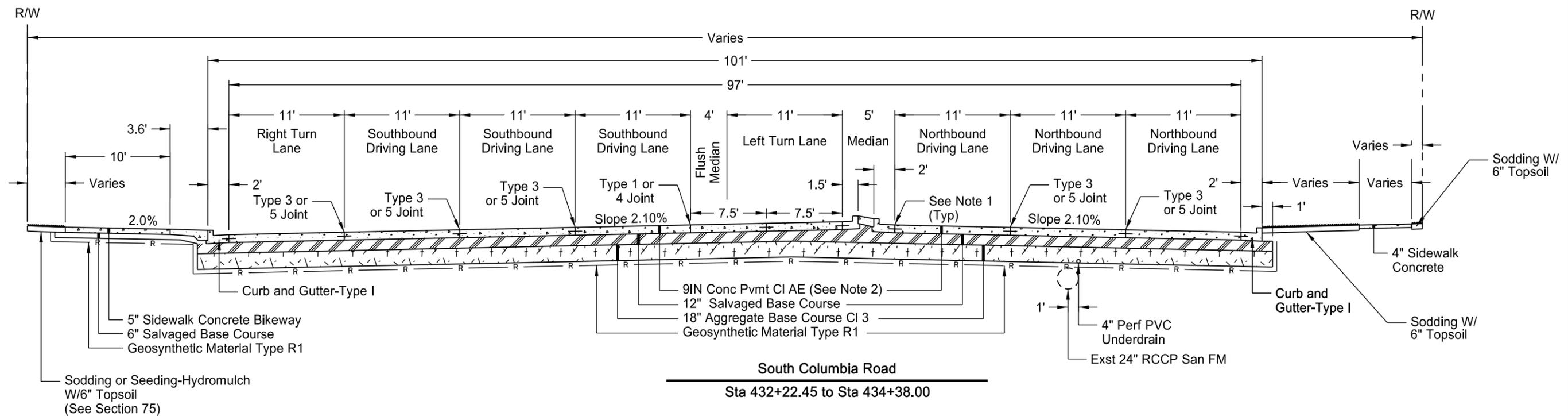
Proposed Typical Sections
 South Columbia Road

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

Notes:

1. Baseline Location for Horizontal and Vertical Datum.
2. 9IN Conc Pvmt CI AE may be 9IN Non-Reinf Concrete Pvmt CI AE-Doweled" or "9IN Reinf Concrete Pavement CI AE". See Section 90 for Reinforcement Locations.
3. See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	9



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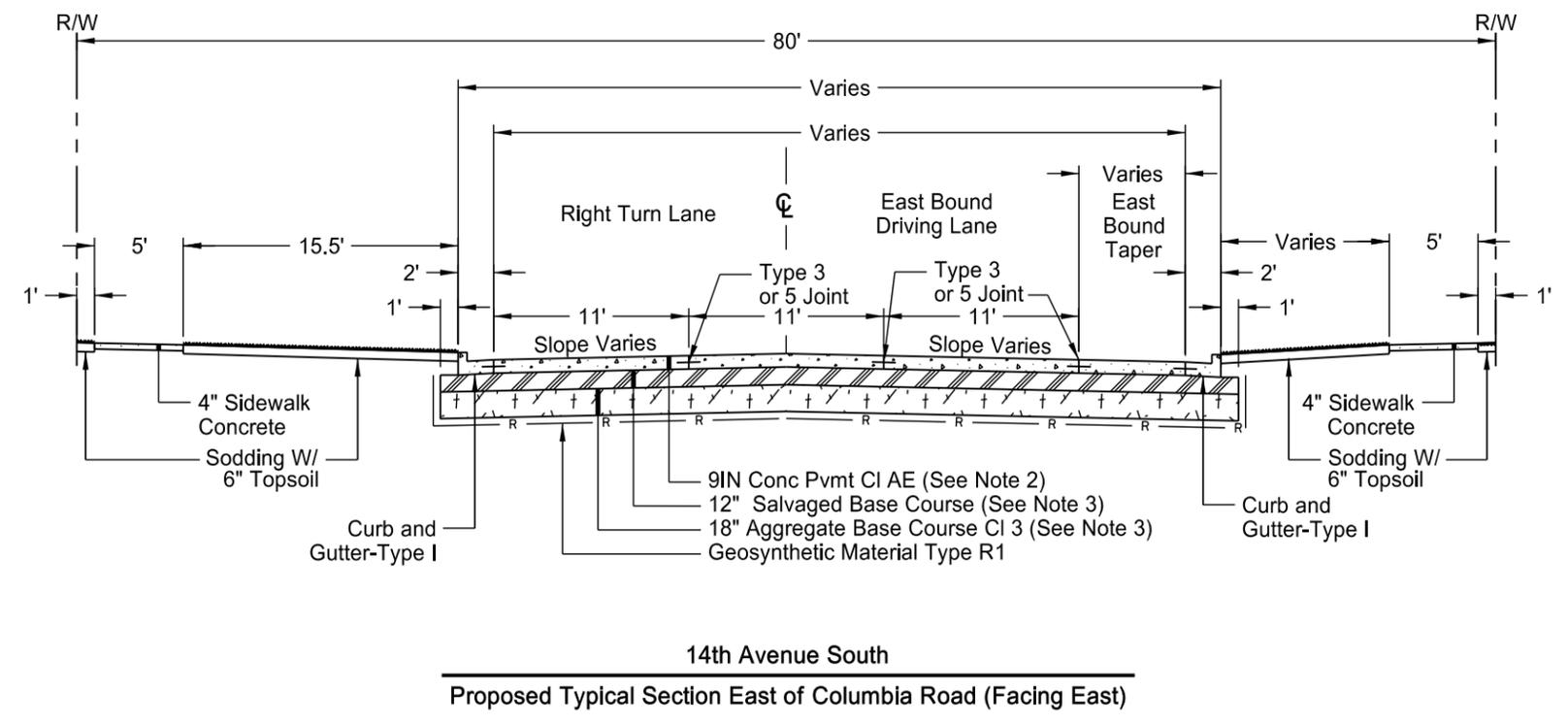
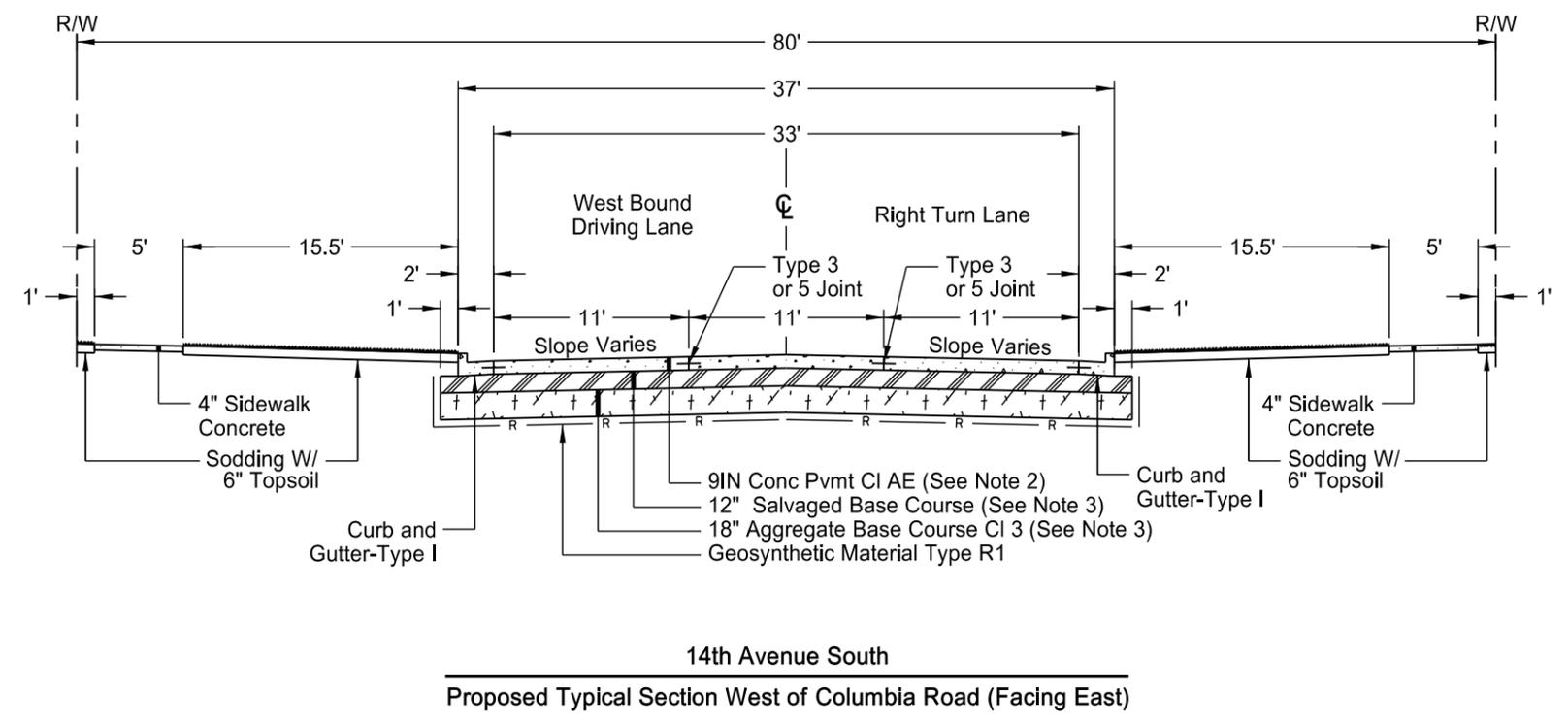
Proposed Typical Sections
South Columbia Road

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

Notes:

1. Baseline Location for Horizontal and Vertical Datum.
2. 9IN Conc Pvmt CI AE may be "9IN Non-Reinf Concrete Pvmt CI AE-Doweled" or "9IN Reinf Concrete Pavement CI AE". See Section 90 for Reinforcement Locations.
3. See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	10



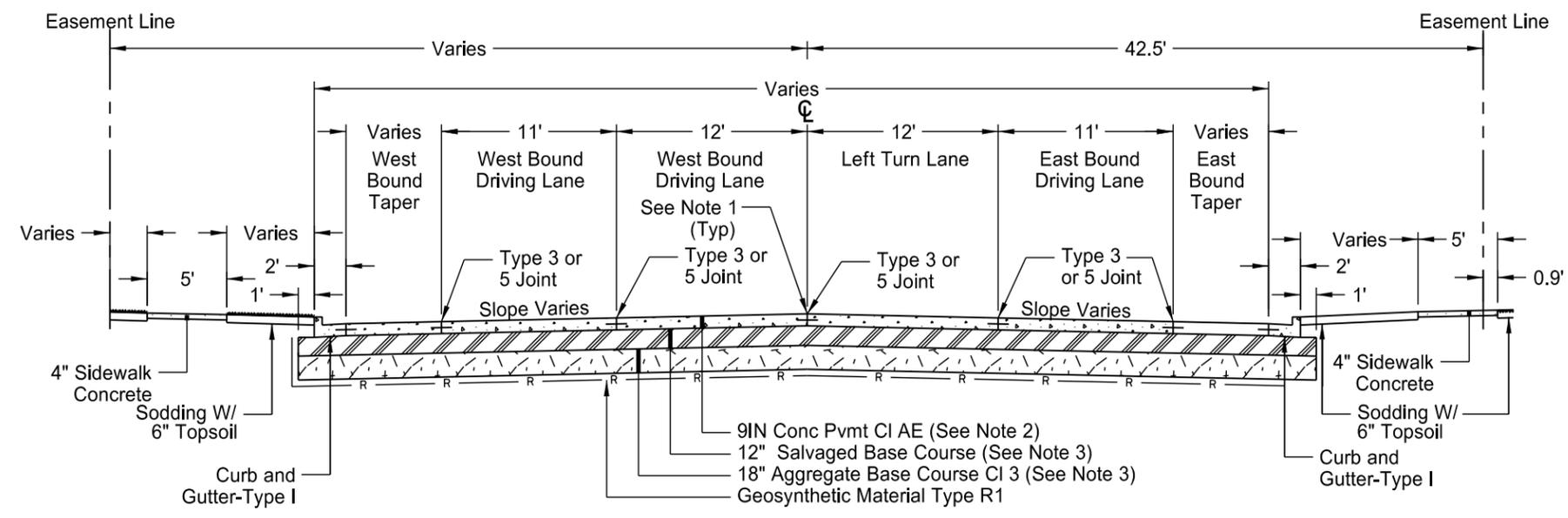
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Proposed Typical Sections
14th Avenue South

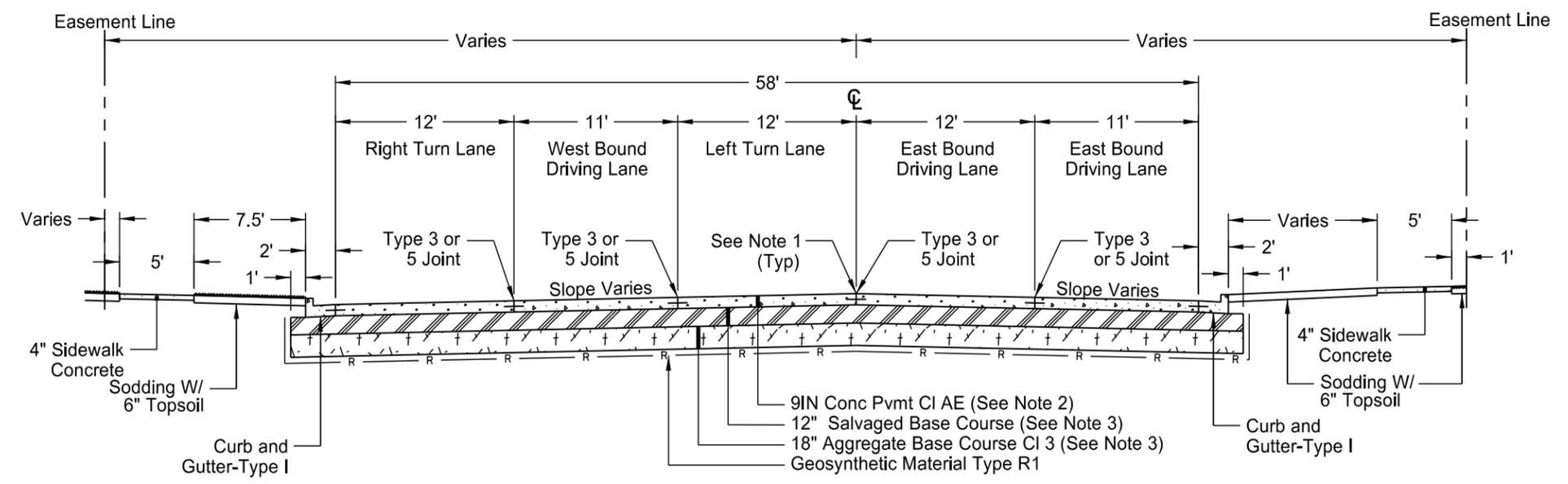
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

- Notes:
1. Baseline Location for Horizontal and Vertical Datum.
 2. 9IN Conc Pvmt CI AE may be "9IN Non-Reinf Concrete Pvmt CI AE-Doweled" or "9IN Reinf Concrete Pavement CI AE". See Section 90 for Reinforcement Locations.
 3. Aggregate Course Depths Vary, See Section 20 For Details.
 4. See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	11



13th Avenue South
Sta 11+07.65 to Sta 12+26.48



13th Avenue South
Sta 14+07.48 to Sta 15+36.06

Notes:

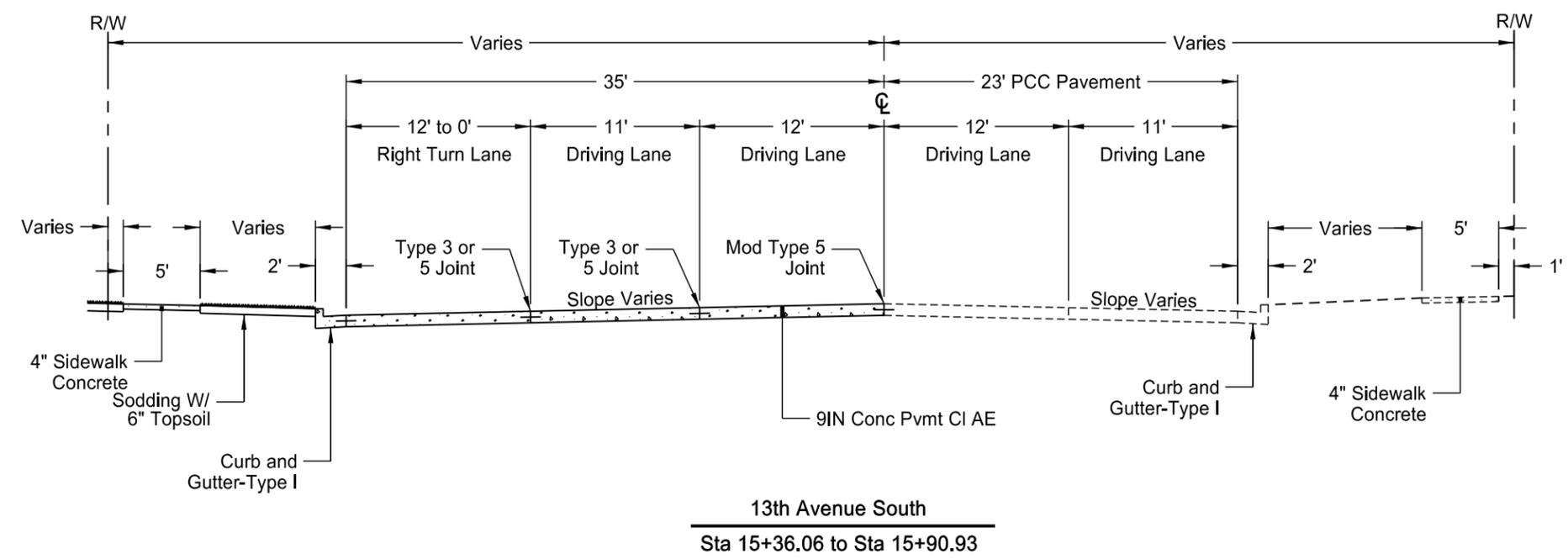
1. Baseline Location for Horizontal and Vertical Datum.
2. 9IN Conc Pvmt CI AE may be "9IN Non-Reinf Concrete Pvmt CI AE-Doweled" or "9IN Reinf Concrete Pavement CI AE". See Section 90 for Reinforcement Locations.
3. Aggregate Course Depths Vary, See Section 20 For Details.
4. See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

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Proposed Typical Sections
13th Avenue South

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	30	12



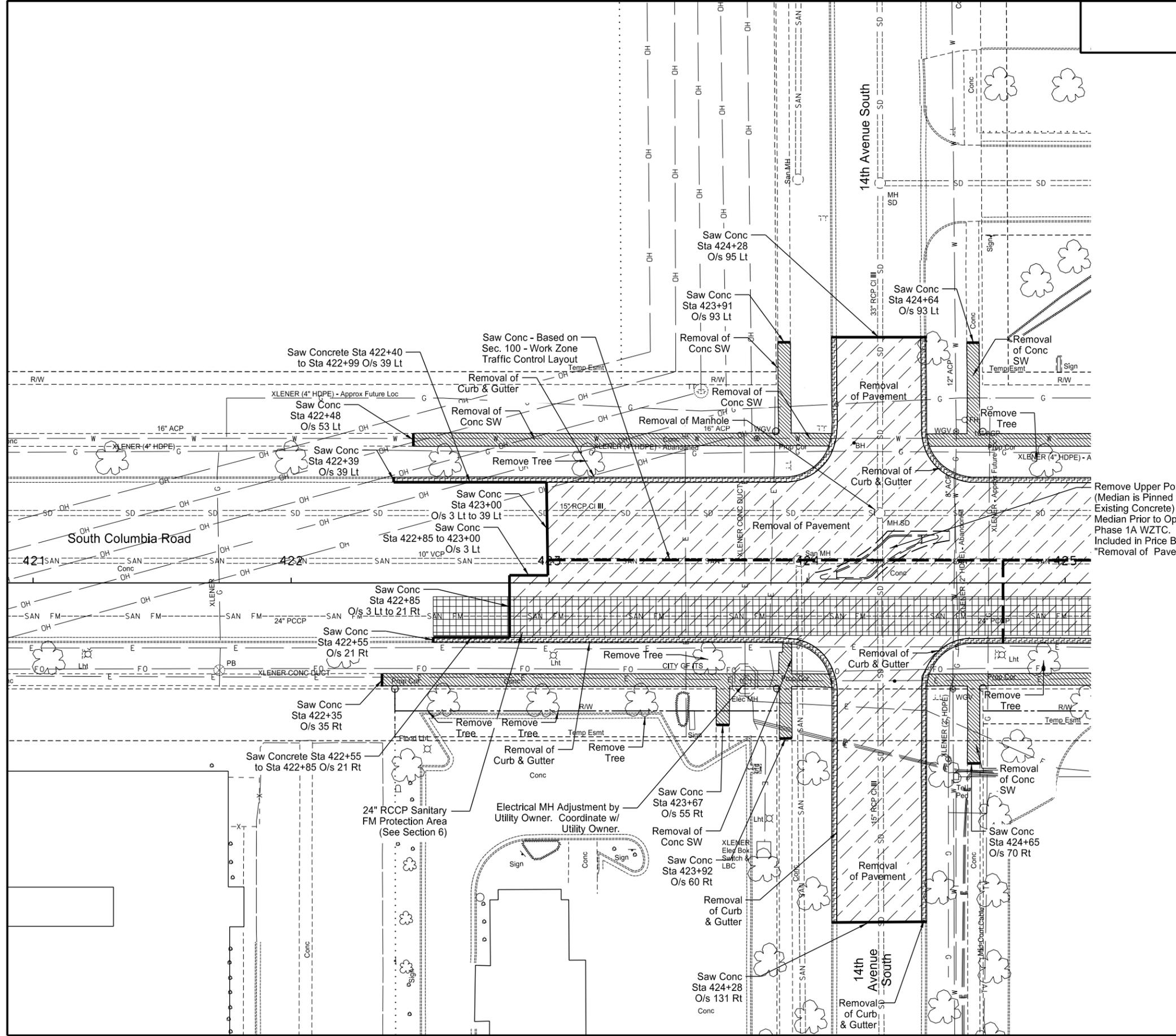
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Proposed Typical Sections
13th Avenue South

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

- Notes:
- See Section 20 and Section 90 for Details on Joint Type and Spacing for Curb and Gutter, Shared Use Path, Sidewalk and Concrete Median.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	1

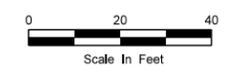
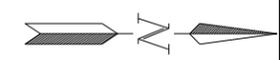


PAY ITEMS

Saw Concrete	
Sta 422+35 O/s 35 Rt	5.0 LF
Sta 422+39 O/s 39 Lt	2.0 LF
Sta 422+48 O/s 53 Lt	5.0 LF
Sta 422+55 O/s 21 Rt	2.0 LF
Sta 422+40 to Sta 422+99 O/s 39 Lt	59.0 LF
Sta 422+55 to Sta 422+85 O/s 21 Rt	30.0 LF
Sta 422+85 O/s 3 Lt to 21 Rt	24.0 LF
Sta 422+85 to Sta 423+00 O/s 3 Lt	15.0 LF
Sta 423+00 O/s 3 Lt to 39 Lt	36.0 LF
Sta 423+67 O/s 55 Rt	5.0 LF
Sta 423+91 O/s 93 Lt	5.0 LF
Sta 423+92 O/s 60 Rt	5.0 LF
Sta 424+28 O/s 95 Lt	37.0 LF
Sta 424+28 O/s 131 Rt	37.0 LF
Sta 424+64 O/s 93 Lt	5.0 LF
Sta 424+65 O/s 70 Rt	5.0 LF
Sta 422+99 to Sta 425+00 O/s 9 Lt (WZTC)	201 LF
Sta 424+66 O/s 9 Lt to 23 Rt (WZTC)	32 LF
Removal of Curb & Gutter	
Sta 422+39 to Sta 425+00 Lt	318 LF
Sta 422+55 to Sta 425+00 Rt	410 LF
Removal of Pavement	
Sta 422+48 to Sta 425+00 C	2023 SY
Sta 422+48 to Sta 424+09 O/s 58 Lt	108 SY
Sta 422+35 to Sta 424+10 O/s 40 Rt	117 SY
Sta 424+46 to Sta 425+00 O/s 58 Lt	47 SY
Sta 424+46 to Sta 425+00 O/s 40 Rt	44 SY
Removal of Manholes	
Sta 424+28.10 O/s 27 Lt	1 EA

Legend

- Saw Concrete / HBP
- Saw Concrete / HBP (WZTC Phasing Plan)
- Removal of Pavement
- Removal of Curb & Gutter
- Removal of Concrete Sidewalk/Shared Use Path
- Removal of Pipe All Types

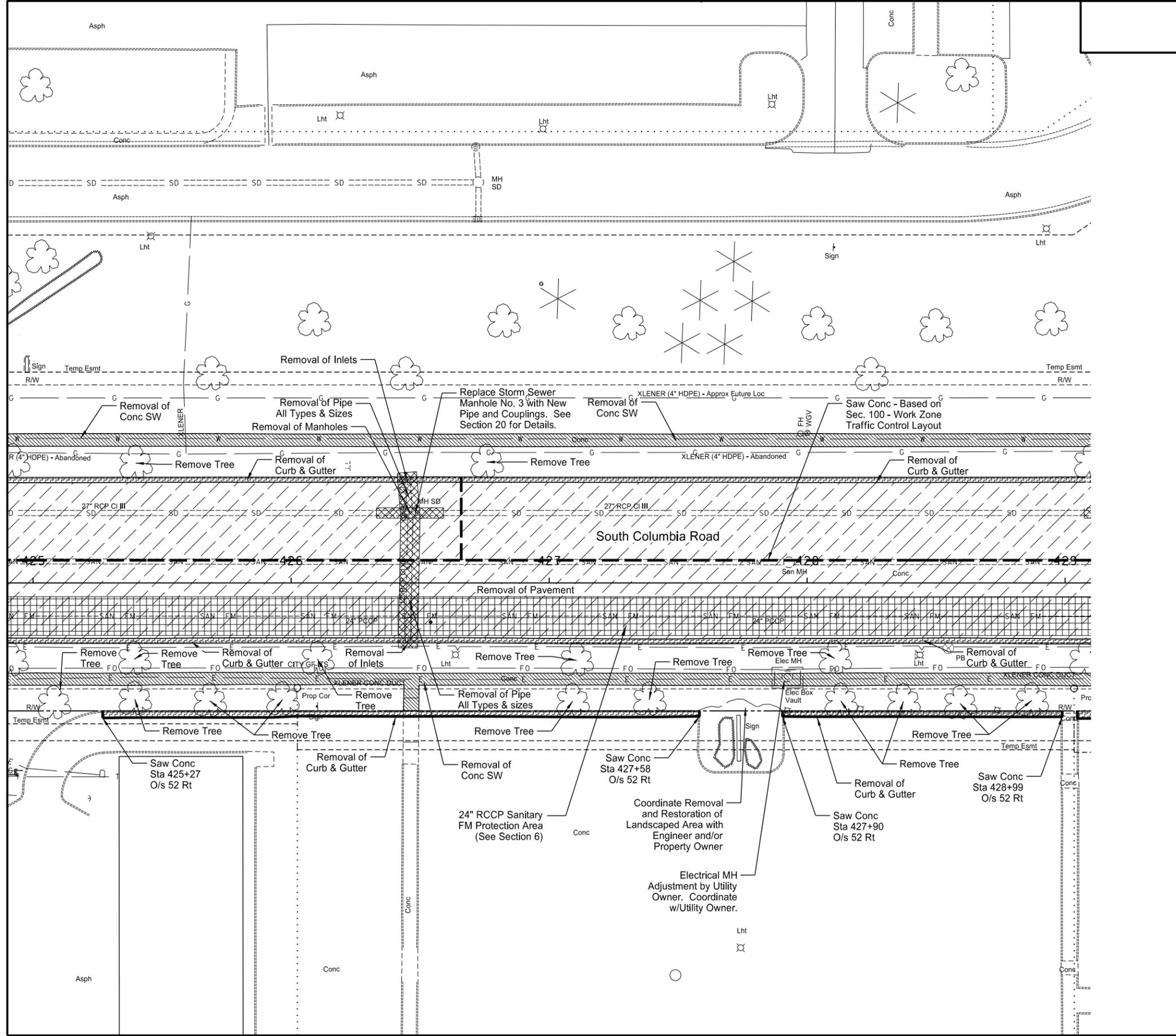


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Removals
Sta 421+00 to 425+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	2

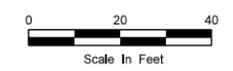
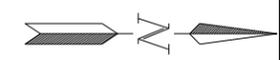


PAY ITEMS

Saw Concrete	
Sta 425+27 O/s 52 Rt	2.5 LF
Sta 425+27 to Sta 427+58 O/s 52 Rt	231.0 LF
Sta 427+90 to Sta 428+99 O/s 52 Rt	109.0 LF
Sta 428+99 O/s 52 Rt	2.5 LF
Sta 425+00 to Sta 429+00 O/s 9 LT (WZTC)	400 LF
Sta 426+66 O/s 8 to 41 Lt (WZTC)	32 LF
Removal of Curb & Gutter	
Sta 425+00 to Sta 429+00 Lt	400 LF
Sta 425+00 to Sta 429+00 Rt	400 LF
Sta 425+27 to Sta 427+58 O/s 52 Rt	231 LF
Sta 427+90 to Sta 428+99 O/s 52 Rt	109 LF
Removal of Pavement	
Sta 425+00 to Sta 429+00 C	2680 SY
Sta 425+00 to Sta 429+00 O/s 58 Lt	222 SY
Sta 425+00 to Sta 429+00 O/s 40 Rt	228 SY
Removal of Pipes All Types & Sizes	
Sta 426+33 O/s 27 Lt to Sta 426+59 O/s 27 Lt	26 LF
Sta 426+46 O/s 27 Lt to Sta 426+45 O/s 39 Lt	12 LF
Sta 426+46 O/s 27 Lt to Sta 426+46 O/s 22 Rt	49 LF
Removal of Manholes	
Sta 426+46 O/s 27 Lt	1 EA
Removal of Inlets	
Sta 426+45 O/s 39 Lt	1 EA
Sta 426+46 O/s 22 Rt	1 EA

Legend

-  Saw Concrete / HBP
-  Saw Concrete / HBP (WZTC Phasing Plan)
-  Removal of Pavement
-  Removal of Curb & Gutter
-  Removal of Concrete Sidewalk/Shared Use Path
-  Removal of Pipe All Types

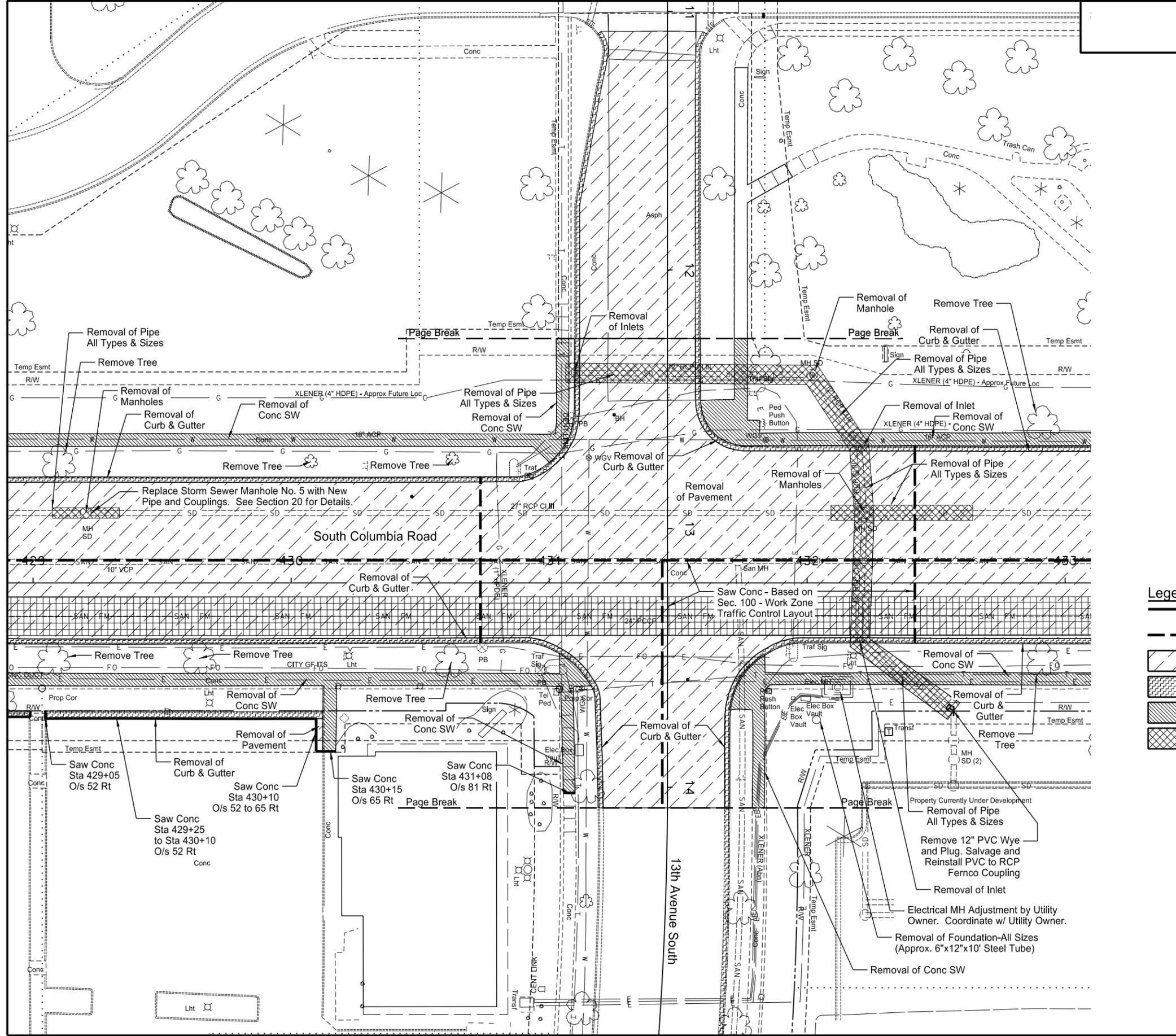


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Removals
Sta 425+00 to 429+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

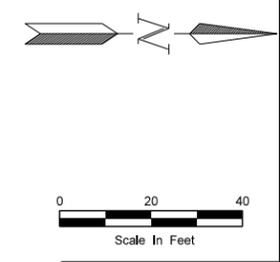
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	3



PAY ITEMS

Saw Concrete	
Sta 429+05 O/s 52 Rt	2.5 LF
Sta 429+05 to Sta 430+10 O/s 52 Rt	105.0 LF
Sta 430+10 O/s 52 to 65 Rt	13.0 LF
Sta 430+15 O/s 65 Rt	8.0 LF
Sta 431+08 O/s 81 Rt	5.0 LF
Sta 429+00 to Sta 433+00 O/s 9 Lt (WZTC)	400 LF
Sta 430+73 O/s 41 Lt to 23 Rt (WZTC)	65 LF
Sta 431+44 O/s 9 Lt to 87 Rt (WZTC)	96 LF
Sta 432+42 O/s 53 Lt to 23 Rt (WZTC)	77 LF
Removal of Curb & Gutter	
Sta 429+00 to Sta 433+00 Lt	429 LF
Sta 429+00 to Sta 433+00 Rt	453 LF
Sta 429+05 to Sta 430+13 O/s 52 Lt	108 LF
Removal of Pavement	
Sta 429+00 to Sta 433+00 C	3571 SY
Sta 429+00 to Sta 433+00 O/s 58 Lt	259 SY
Sta 429+00 to Sta 433+00 O/s 40 Rt	260 SY
Sta 430+10 O/s 52 Rt	4 SY
Removal of Pipe All Types and Sizes	
Sta 429+07 O/s 27 Lt to Sta 429+33 O/s 27 Lt	26 LF
Sta 431+10 O/s 81 Lt to Sta 432+02 O/s 81 Lt	92 LF
Sta 432+02 O/s 81 Lt to Sta 432+20 O/s 52 Lt	34 LF
Sta 432+09 to Sta 432+54 O/s 27 Lt	55 LF
Sta 432+20 O/s 52 Lt to Sta 432+22 O/s 27 Lt	25 LF
Sta 432+20 O/s 22 Rt to Sta 432+57 O/s 43 Rt	46 LF
Sta 432+22 O/s 27 Lt to Sta 432+20 O/s 22 Rt	49 LF
Removal of Manholes	
Sta 429+20.39 O/s 27 Lt	1 EA
Sta 432+01.96 O/s 80 Lt	1 EA
Sta 432+22.26 O/s 27 Lt	1 EA
Removal of Inlets	
Sta 431+10.20 O/s 81 Lt	1 EA
Sta 432+19.89 O/s 52 Lt	1 EA
Sta 432+20.42 O/s 22 Rt	1 EA
Removal of Foundation-All Sizes	
Sta 432+03.61 O/s 53 Rt	1 EA

- ### Legend
- Saw Concrete / HBP
 - Saw Concrete / HBP (WZTC Phasing Plan)
 - Removal of Pavement
 - Removal of Curb & Gutter
 - Removal of Concrete Sidewalk/Shared Use Path
 - Removal of Pipe All Types

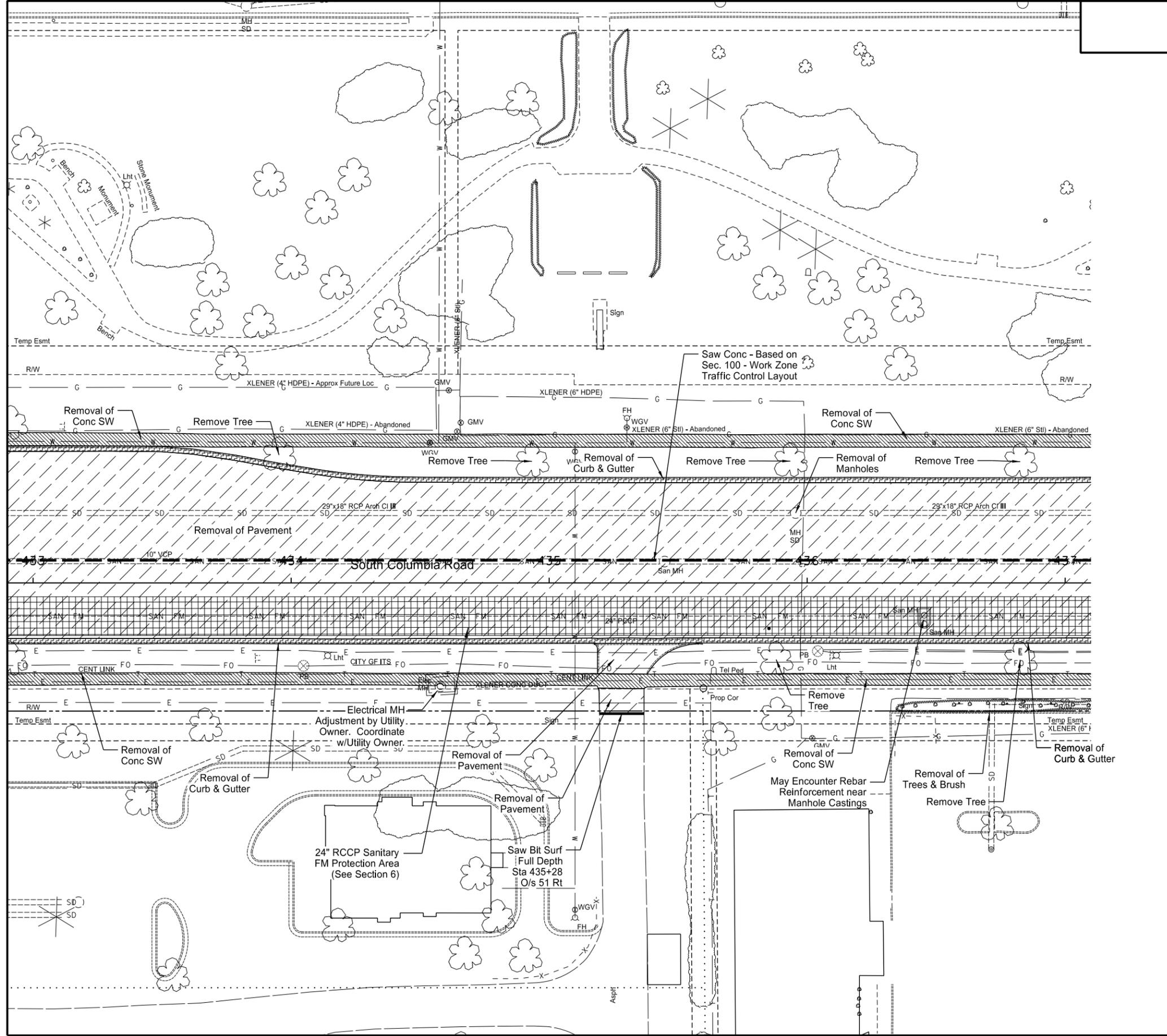


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Removals
 Sta 429+00 to 433+00

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	4

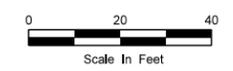
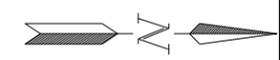


PAY ITEMS

Saw Concrete	
Sta 433+00 to Sta 437+00 O/s 9 LT (WZTC)	400 LF
Removal of Curb & Gutter	
Sta 433+00 to Sta 437+00 Lt	401 LF
Sta 433+00 to Sta 437+00 Rt	400 LF
Removal of Pavement	
Sta 433+00 to Sta 437+00 C	2803 SY
Sta 433+00 to Sta 437+00 O/s 58 Lt	222 SY
Sta 433+00 to Sta 437+00 O/s 40 Rt	222 SY
Sta 435+28 O/s 24 Rt	32 SY
Sta 435+28 O/s 41 Rt	15 SY
Saw Bituminous Surfacing Full Depth	
Sta 435+28 O/s 49 Rt	18 LF
Removal of Manholes	
Sta 435+95.53 O/s 27 Lt	1 EA

Legend

-  Saw Concrete / HBP
-  Saw Concrete / HBP (WZTC Phasing Plan)
-  Removal of Pavement
-  Removal of Curb & Gutter
-  Removal of Concrete Sidewalk/Shared Use Path
-  Removal of Pipe All Types

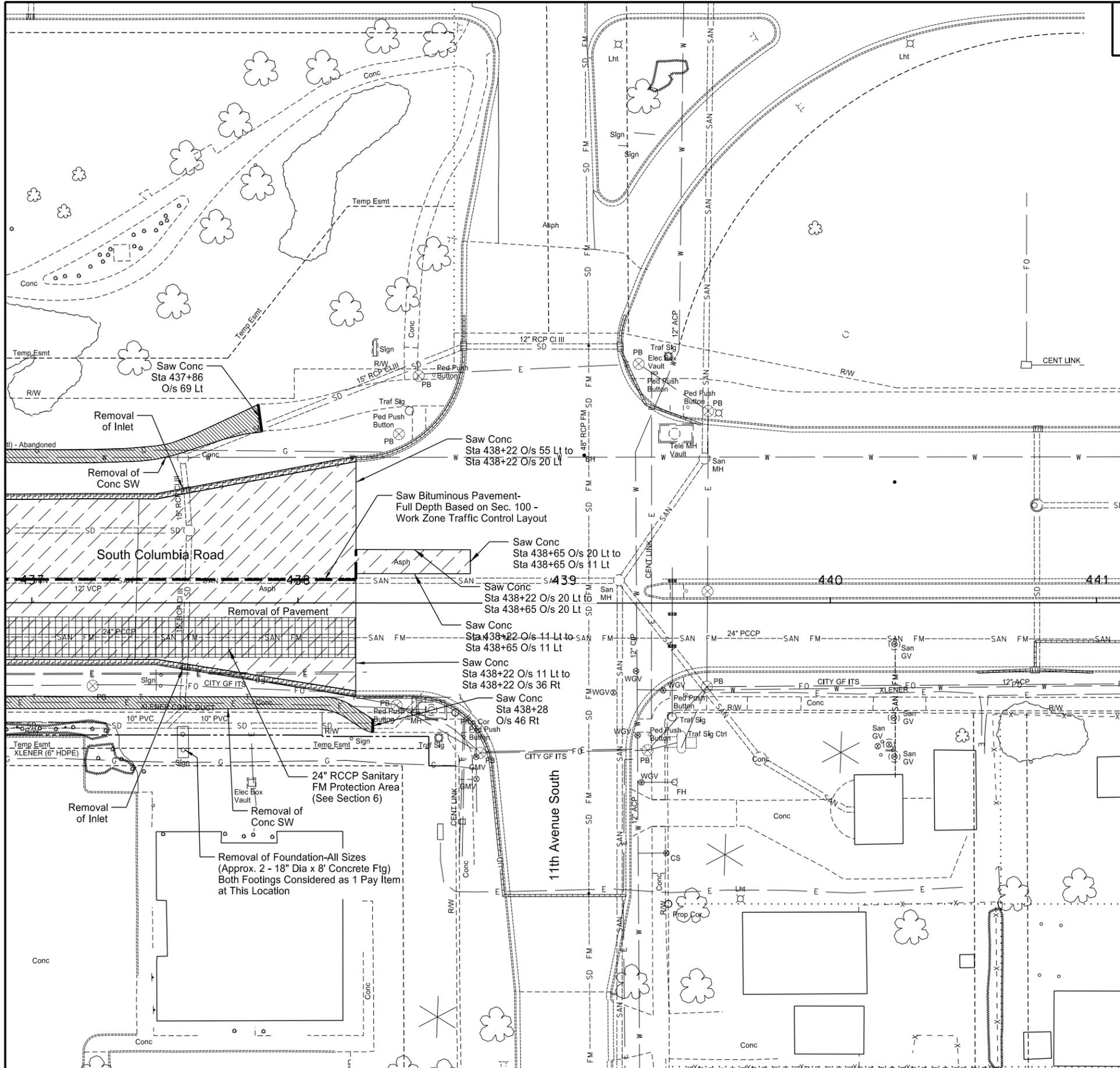


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Removals
Sta 433+00 to 437+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	5

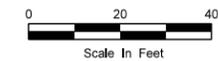
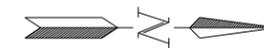


PAY ITEMS

Saw Concrete	
Sta 437+86 O/s 69 Lt	10 LF
Sta 438+22 O/s 55 Lt to Sta 438+22 O/s 20 Lt	35 LF
Sta 438+22 O/s 20 Lt to Sta 438+65 O/s 20 Lt	43 LF
Sta 438+65 O/s 20 Lt to Sta 438+65 O/s 11 Lt	9 LF
Sta 438+22 O/s 11 Lt to Sta 438+65 O/s 11 Lt	43 LF
Sta 438+22 O/s 11 Lt to Sta 438+22 O/s 36 Rt	46 LF
Sta 438+28 O/s 46 Rt	5 LF
Sta 437+00 to Sta 437+40 O/s 9 Lt (WZTC)	39 LF
Removal of Curb & Gutter	
Sta 437+00 to Sta 438+21.75 Lt	123 LF
Sta 437+00 to Sta 438+21.75 Rt	123 LF
Removal of Pavement	
Sta 437+00 to Sta 438+64.73 C	964 SY
Sta 437+00 to Sta 438+19 O/s Lt	54 SY
Sta 437+00 to Sta 438+28 O/s Rt	67 SY
Saw Bituminous Surfacing - Full Depth	
Sta 437+40 to Sta 438+22 O/s 9 Lt (WZTC)	83 LF
Sta 438+22 O/s 9 Lt to 20 Lt (WZTC)	12 LF
Removal of Inlets	
Sta 437+56.75 O/s 42 Lt	1 EA
Sta 437+56.75 O/s 24 Rt	1 EA
Removal of Foundations-All Sizes	
Sta 437+56.77 O/s 53 Rt	1 EA

Legend

- Saw Concrete / HBP
- Saw Concrete / HBP (WZTC Phasing Plan)
- Removal of Pavement
- Removal of Curb & Gutter
- Removal of Concrete Sidewalk/Shared Use Path
- Removal of Pipe All Types



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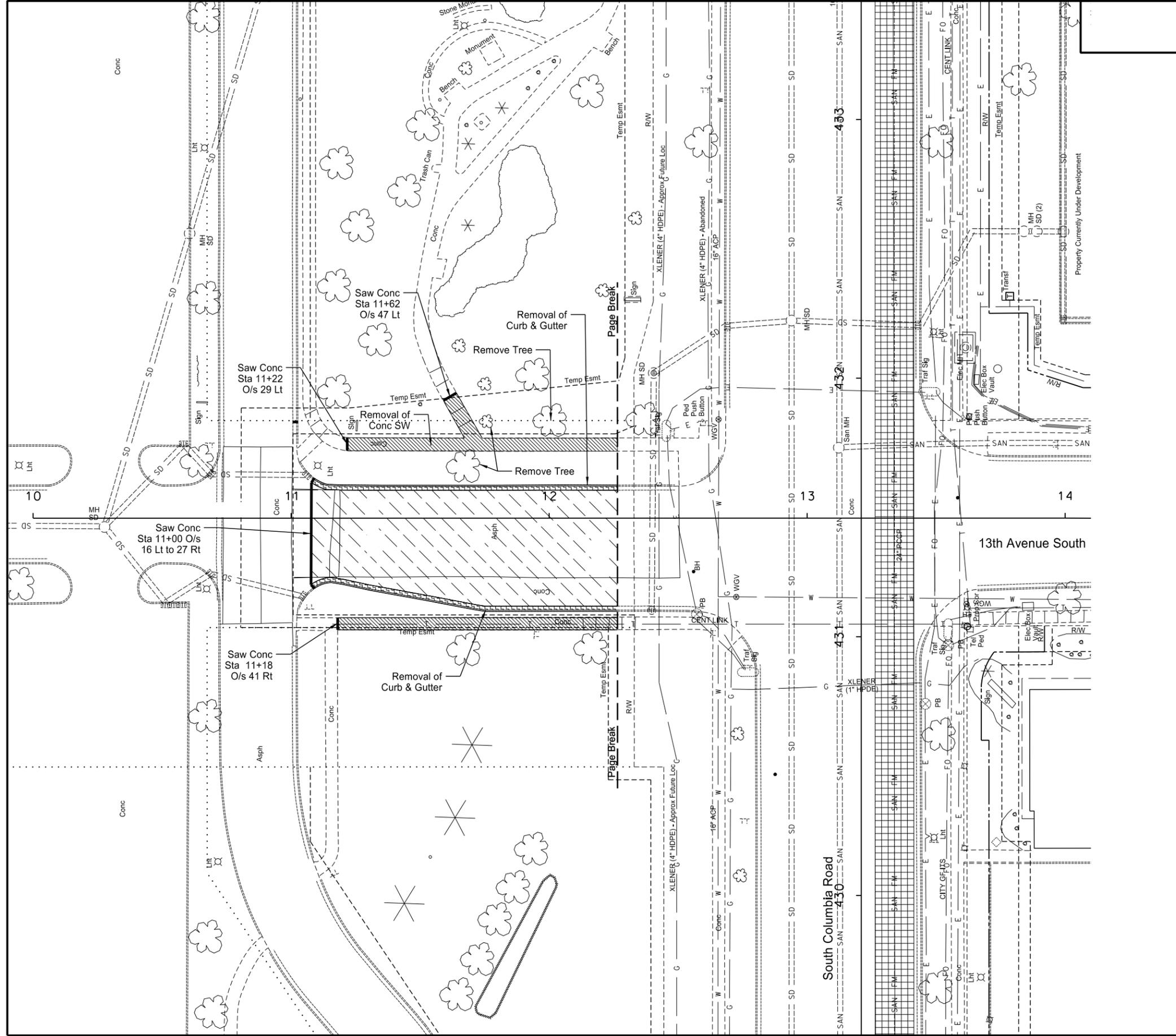
Removals
Sta 437+00 to 441+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	6

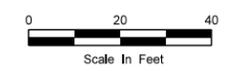
PAY ITEMS

Saw Concrete	
Sta 11+00 O/s 16 Lt to 27 Rt	44.0 LF
Sta 11+07 O/s 43 Lt	5.0 LF
Sta 11+62 O/s 47 Lt	6.0 LF
Sta 11+18 O/s 41 Rt	5.0 LF
Removal of Curb & Gutter	
Sta 11+09 to Sta 12+26.48 Lt	118 LF
Sta 11+09 to Sta 12+26.48 Rt	119 LF
Removal of Pavement	
Sta 11+09 to Sta 12+26.48 C	547 SY
Sta 11+22 to Sta 12+26.48 Lt	71 SY
Sta 12+18 to Sta 12+26.48 Rt	54 SY



Legend

- Saw Concrete / HBP
- Removal of Pavement
- Removal of Curb & Gutter
- Removal of Concrete Sidewalk/Shared Use Path
- Removal of Pipe All Types



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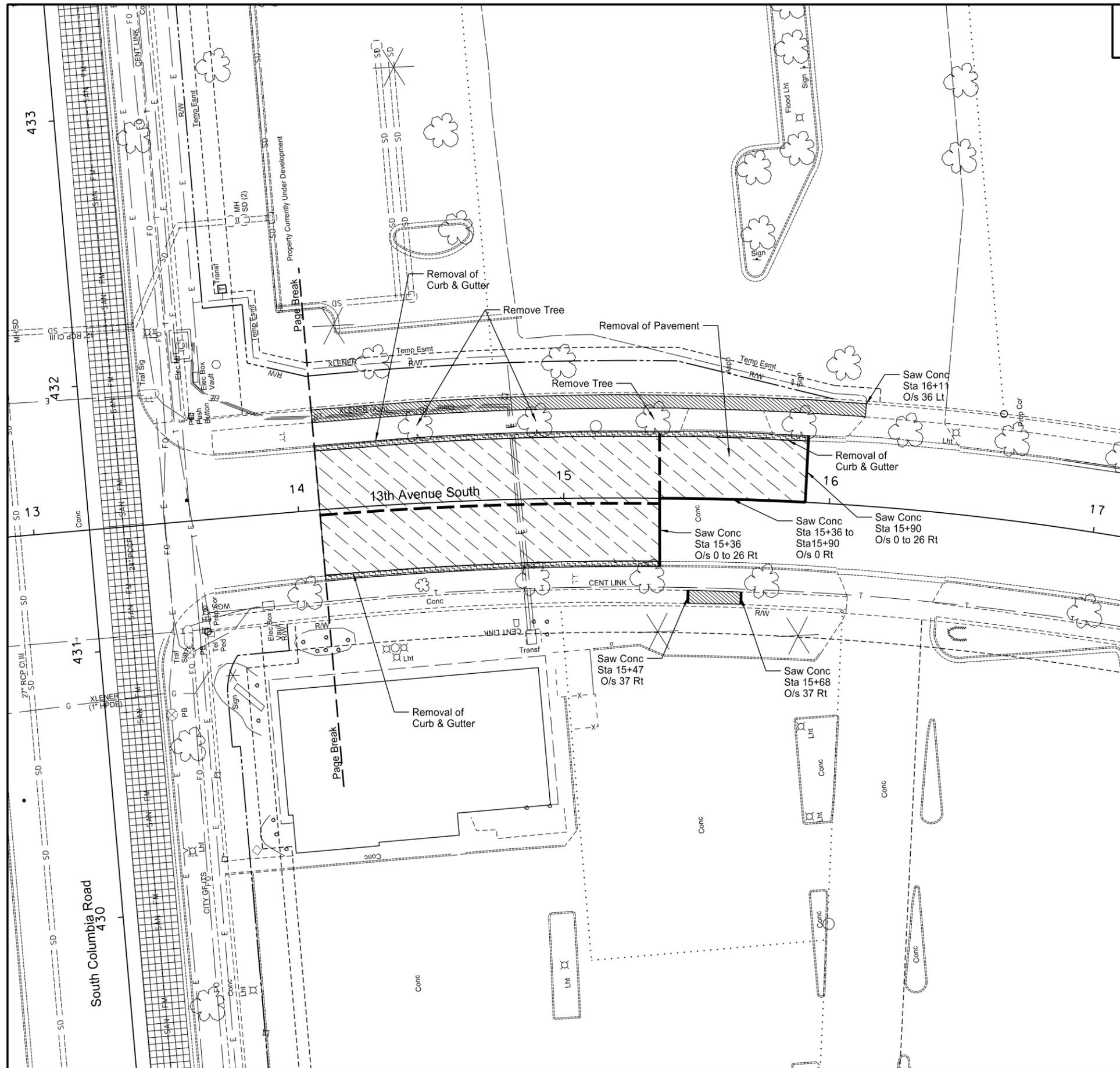
Removals
 13th Avenue South
 Sta 11+00 to 12+26.48

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	40	7

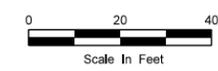
PAY ITEMS

Saw Concrete	
Sta 15+47 O/s 37 Rt	5.0 LF
Sta 15+68 O/s 37 Rt	5.0 LF
Sta 15+36 O/s 0 Rt to 26 Rt	26.0 LF
Sta 15+36 to 15+90 O/s 0 Rt	55.0 LF
Sta 15+90 O/s 0 to 25 Lt	26.0 LF
Sta 16+11 O/s 36 Lt	5.0 LF
Sta 14+08 to 15+36 O/s 2 Rt (WZTC)	155 LF
Removal of Curb & Gutter	
Sta 14+08 to Sta 15+90 Lt	186 LF
Sta 14+08 to Sta 15+36 Rt	126 LF
Removal of Pavement	
Sta 14+08 to Sta 16+86 C	815 SY
Sta 15+58 O/s 37 Rt	11 SY
Sta 14+08 O/s 36 Lt to Sta 16+72 O/s 36 Lt	114 SY



Legend

- Saw Concrete / HBP
- Saw Concrete / HBP (WZTC Phasing Plan)
- Removal of Pavement
- Removal of Curb & Gutter
- Removal of Concrete Sidewalk/Shared Use Path
- Removal of Pipe All Types



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Removals
 13th Avenue South
 Sta 14+08.12 to 16+85.50

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

MH No. 1 - 60" Barrel
Northing 349625.56
Easting 2810303.61
Station 423+64.93 NB O/s 27.00' Lt
Top Elev 831.82
Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 830.07
Invert Elev 824.39
Riser Pay Length 5.7 LF

MH No. 2 - 72" Barrel
Northing 349688.68
Easting 2810301.30
Station 424+28.10 NB O/s 27.00' Lt
Top Elev 832.13
Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 830.38
Invert Elev 823.63
Riser Pay Length 6.8 LF

MH No. 3 - 60" Barrel - **Remove MH**
Northing 349906.52
Easting 2810293.31
Station 426+46.08 NB O/s 27.00' Lt
Top Elev 831.23

Invert Elev 823.87

Existing 27 IN RCP N - 824.39
 Existing 15 IN RCP S - 824.39
 12 IN Conduit W - 826.38
 12 IN Conduit E - 827.03

Existing 27 IN RCP N & W - 823.63
 Existing 15 IN RCP S - 824.03
 Existing 12 IN RCP E - 828.18

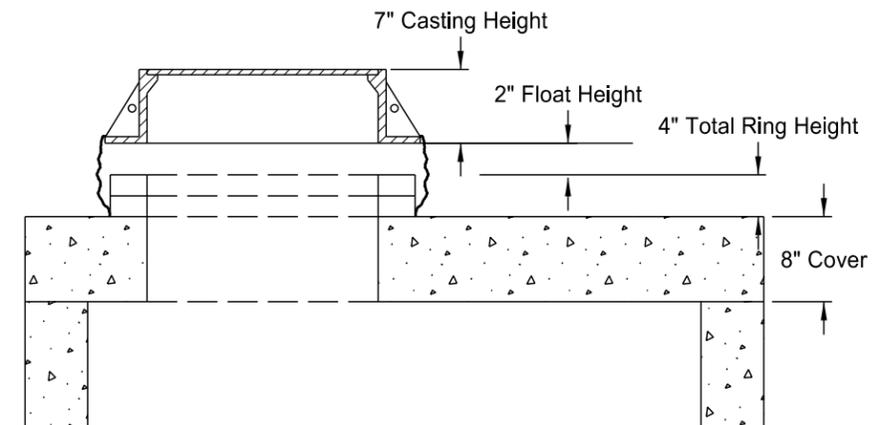
Existing 27 IN RCP N - 823.87
 Existing 27 IN RCP S - 823.87

Leave Existing Manhole Base in Place and Reuse
Verify Base Elevation Prior to Constructing Manhole

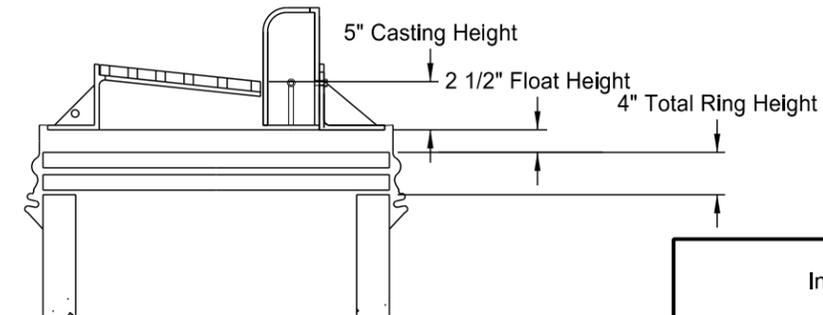
Inlet No. 1A - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 349624.66
Easting 2810278.96
Station 423+64.93 NB O/s 54.07' Lt
Flowline Elev 831.15
Top of Barrel Elev 830.19
Top of Base Elev 826.48
Invert Elev 826.65
Drain tile Invert Elev 827.72

Inlet No. 1B - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 349627.73
Easting 2810362.73
Station 423+64.93 NB O/s 34.30' Rt
Flowline Elev 831.16
Top of Barrel Elev 830.20
Top of Base Elev 825.20
Invert Elev 827.15
Drain tile Invert Elev 827.70

Schedule of Adjustment Values			
Casting/Rings/Cover Adj. For Manhole	Casting	7"	
	2 Rings	4"	
	Float	2"	
	Cover	8"	
	Adjustment 21" or 1.75'		
Casting & Ring Adj. For Catch Basin	Casting	5"	
	2 Rings	4"	
	Float	2 1/2"	
Adjustment 11 1/2" or 0.96'			



Typical Manhole w/Flat top Adjustment



Typical Inlet Adjustment

Note: See Section 20 for Casting Installation Details.

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Inlet and Manhole Summary

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	50	2

MH No. 4 - 60" Barrel
Northing 349951.34
Easting 2810291.67
Station 426+90.93 NB O/s 27.00' Lt
Top Elev 831.08
Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 829.33
Invert Elev 823.95
Riser Pay Length 5.4 LF

Existing 27 IN RCP N - 823.95
 Existing 27 IN RCP S - 823.95
 12 IN Conduit W - 826.38
 12 IN Conduit E - 827.03

Inlet No. 4A - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 349950.35
Easting 2810264.51
Station 426+90.93 NB O/s 54.17' Lt
Flowline Elev 830.38
Top of Barrel Elev 829.42
Top of Base Elev 826.48
Invert Elev 826.65
Drain tile Invert Elev 826.92

Inlet No. 4B - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 349953.58
Easting 2810352.79
Station 426+90.93 NB O/s 34.17' Rt
Flowline Elev 830.38
Top of Barrel Elev 829.42
Top of Base Elev 824.42
Invert Elev 827.15
Drain tile Invert Elev 827.15

MH No. 5 - 60" Barrel - **Remove MH**
Northing 350180.65
Easting 2810283.26
Station 429+20.39 NB O/s 27.00 Lt
Top Elev 831.26

Invert Elev 824.34

Existing 27 IN RCP N - 824.34
 Existing 27 IN RCP S - 824.34

MH No. 6 - 60" Barrel
Northing 350318.51
Easting 2810278.20
Station 430+58.35 NB O/s 27.00' Lt
Top Elev 830.95
Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 829.20
Invert Elev 824.60
Top of Base Elev 824.20
Riser Pay Length 5.0 LF

Existing 27 IN RCP N - 824.60
 Existing 27 IN RCP S - 824.60
 12 IN Conduit W - 826.03
 12 IN Conduit E - 827.03

Inlet No. 6A - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 350317.51
Easting 2810251.05
Station 430+58.35 NB O/s 54.17 Lt
Flowline Elev 830.26
Top of Barrel Elev 829.30
Top of Base Elev 826.13
Invert Elev 826.30
Drain tile Invert Elev 826.80

Inlet No. 6B - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 350320.75
Easting 2810339.33
Station 430+58.35 NB O/s 34.17' Rt
Flowline Elev 830.26
Top of Barrel Elev 829.30
Top of Base Elev 824.30
Invert Elev 827.15
Drain tile Invert Elev 827.15

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Inlet and Manhole Summary

 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	50	3

MH No. 7 - 60" Barrel - **Remove MH**
Northing 350493.05
Easting 2810271.8
Station 432+22.26 NB O/s 27.00' Lt
Top Elev 830.99

Invert Elev 824.91

Existing 29 x18 IN RCP N - 824.91
Existing 27 IN RCP S - 824.91

MH No. 8 - 60" Barrel
Northing 350521.77
Easting 2810270.75
Station 432+56.75 NB O/s 27.00' Lt
Top Elev 830.80

Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 829.05
Invert Elev 824.94
Top of Base Elev 824.05
Riser Pay Length 5.0 LF

Existing 29 x18 IN RCP N - 824.94
Existing 29 x18 IN RCP S - 824.94
12 IN Conduit W - 825.34
12 IN Conduit E - 827.03

Inlet No. 8A - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 350520.78
Easting 2810243.60
Station 432+56.75 NB O/s 65.17' Lt
Flowline Elev 829.88
Top of Barrel Elev 828.92
Top of Base Elev 823.92
Invert Elev 825.53
Drain tile Invert Elev 826.42

Inlet No. 8B - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 350524.01
Easting 2810331.88
Station 432+56.75 NB O/s 34.17' Rt
Flowline Elev 830.11
Top of Barrel Elev 829.15
Top of Base Elev 824.15
Invert Elev 827.15
Drain tile Invert Elev 827.15

MH No. 9 - 60" Barrel
Northing 350855.33
Easting 2810258.53
Station 435+95.53 NB O/s 27.00' Lt
Top Elev 832.00

Casting/Rings/Cover Adj. 1.75
Top of Riser Elev 830.25
Invert Elev 825.42
Riser Pay Length 4.8 LF

Existing 29 x18 IN RCP N - 825.47
Existing 29 x18 IN RCP S - 825.42

**Leave Existing Manhole Base in Place and Reuse
Verify Base Elevation Prior to Constructing Manhole**

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Inlet and Manhole Summary

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-6-986(105)109	50	4

MH No. 10 - 60" Existing
Northing 351016.44
Easting 2810252.61
Station 437+56.75 NB O/s 27.00' Lt
Top Elev Existing 831.12
Top Elev Proposed 831.33
Casting & Ring Adj. 1.25
Proposed Top of Cover 829.87
Actual Top of Cover 829.87
Adjustment 0.21

Adjustment Type Adjust Manhole

Inlet No. 10A - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 351015.45
Easting 2810225.46
Station 437+56.75 NB O/s 54.17 Lt
Flowline Elev 830.66
Top of Barrel Elev 829.70
Top of Base Elev 825.87
Invert Elev 826.04
Drain tile Invert Elev 827.20
15" RCP CL III Ivert Elev 826.04

Inlet No. 10B - 30" Barrel
Type Inlet - Type 1
Grate Style Diagonal
Northing 351018.68
Easting 2810313.74
Station 437+56.75 NB O/s 34.17 Rt
Flowline Elev 830.66
Top of Barrel Elev 829.70
Top of Base Elev 824.70
Invert Elev 826.10
Drain tile Invert Elev 827.53
10" PVC Invert Elev E - 826.30

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Inlet and Manhole Summary

 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

Station	MH No	O/s	Structure Type	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 Depth (inches)	Chimney Seal Required	Proposed Top of Structure Elevation	Required Proposed Top of Structure Adjustment (inches)	Pay Item
423+96.9	13	8.4 Lt	48" San MH	7 - 2" Rings	831.81	829.79	832.23	7	2	2.28	Yes	831.12	28.00 - See Note 1	"Adjust Manhole"
427+93.0	14	8.0 Lt	48" San MH	4 - 2 1/4" Rings	831.46	830.10	831.77	7	2	2.04	Yes	830.68	19.00 - See Note 1	"Adjust Manhole"
431+73.1	15	8.7 Lt	48" San MH	6 - 2" Rings	830.71	829.14	831.36	7	2	2.64	Yes	830.22	25.00 - See Note 1	"Adjust Manhole"
435+44.8	16	8.2 Lt	48" San MH	5 - 2 1/4" Rings	831.53	829.91	832.78	7	2	2.44	Yes	831.66	33.00 - See Note 1	"Adjust Manhole"
436+45.4	17	12.5 Rt 16.1 Rt	5' x 7' Precast ARV MH	2 - 2" Rings per Casting	831.00 - W 831.00 - E	830.00 - W 830.00 - E	831.66 - W 831.59 - E	7	5	2.92 - W 2.08 - E	Yes - W Yes - E	830.00	0.00 - See Note 2	"Adjust Manhole"
437+56.8	10	27.0 Lt	60" Storm MH	4 - 2" Rings	831.12	829.87	831.33	7	4	2.52	Yes	829.87	0.00 - See Note 2	"Adjust Manhole"

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

1. Remove Existing Casting, Adjustment Rings and Cone Section. Manhole Cones Are Estimated to be 4' Tall Based on Record Drawings.
2. 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 as Noted Above.
3. Furnish and Install New Barrel Section/Adapter, New 3' Cone Section, New 2" Plastic Adjustment Rings, New Chimney Seal and New Casting. Adjust to Proposed Elevation.
4. Castings Shall be Neenah Casting No. R-1733 or East Jordan Casting No. 1205, Unless Otherwise Noted in the Plans.
5. Sanitary Sewer Manhole Lids Shall be Self Sealing Lids with Concealed Lift Notches. Lids Shall be Lettered "Sanitary Sewer".
6. Step(s) Shall be Included in New Barrel Section w/ Spacing of 12" OC When Adequate Barrel Length Allows.

Notes

1. Adjustment Requires New Barrel Section/Adapter Installed on Existing Barrel to Achieve Proposed Top of Structure Elevation.

$$\begin{aligned} & \text{Proposed Top of Structure Elevation} \\ & \text{minus (-) Existing Top of Structure Elevation} \\ & \text{plus (+) } \underline{12 \text{ Inches (Difference Between Exst 4' Cone and Ppsd 3' Cone)}} \\ & \text{equals (=) Required Proposed Top of Structure Adjustment} \end{aligned}$$
2. Adjustment Shall Require New Rings to Achieve Proposed Top of Structure Elevation.

$$\begin{aligned} & \text{Proposed Top of Structure Elevation} \\ & \text{minus (-) } \underline{\text{Existing Top of Structure Elevation}} \\ & \text{equals (=) Required Proposed Top of Structure Adjustment} \end{aligned}$$
3. Float Depth: Distance From Top of Barrel, Manhole Cone or Adjusting Rings to Bottom of Casting. Distance Shall be 1 1/2" Min to 3" Max.
4. Float Depth Space Shall Be Shimmed with Wood Shims Until Concrete has Cured Around Casting.
5. Before Project is Open to Traffic, Contractor Shall Remove Wood Shims From Float Depth Space.

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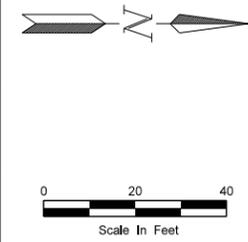
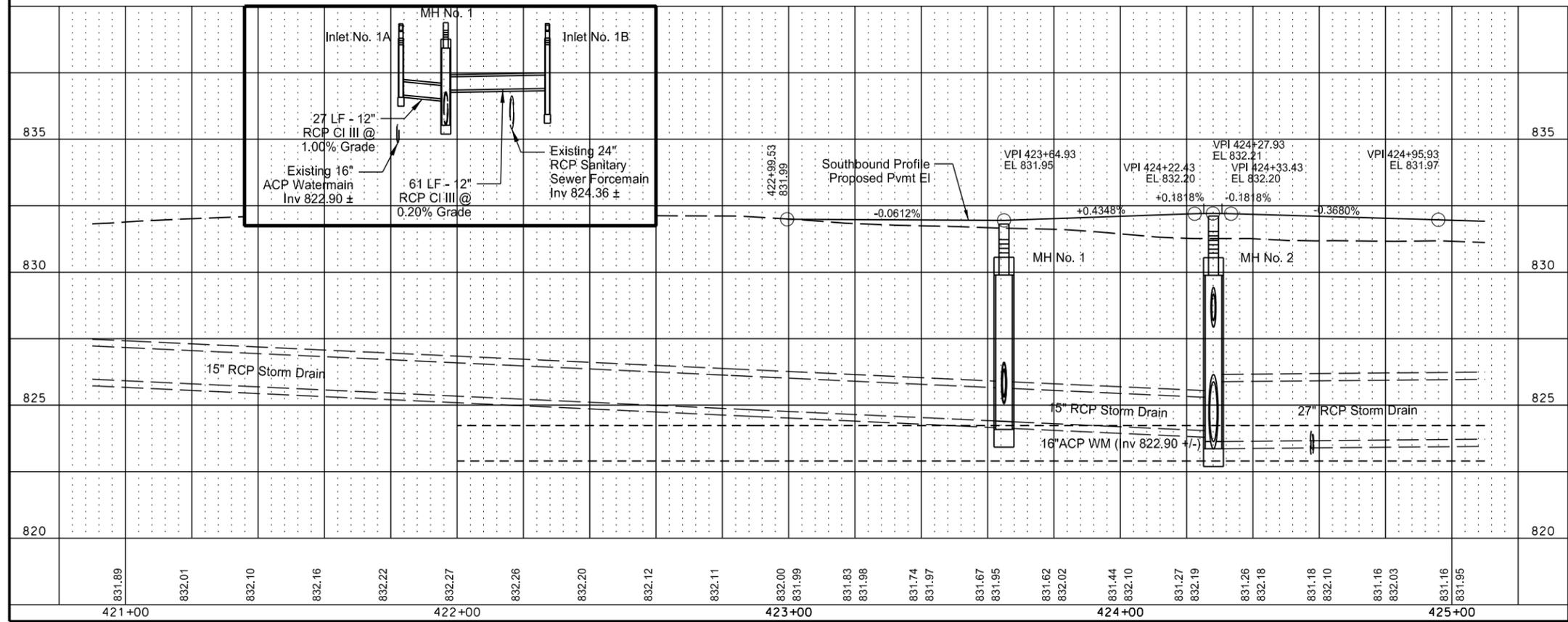
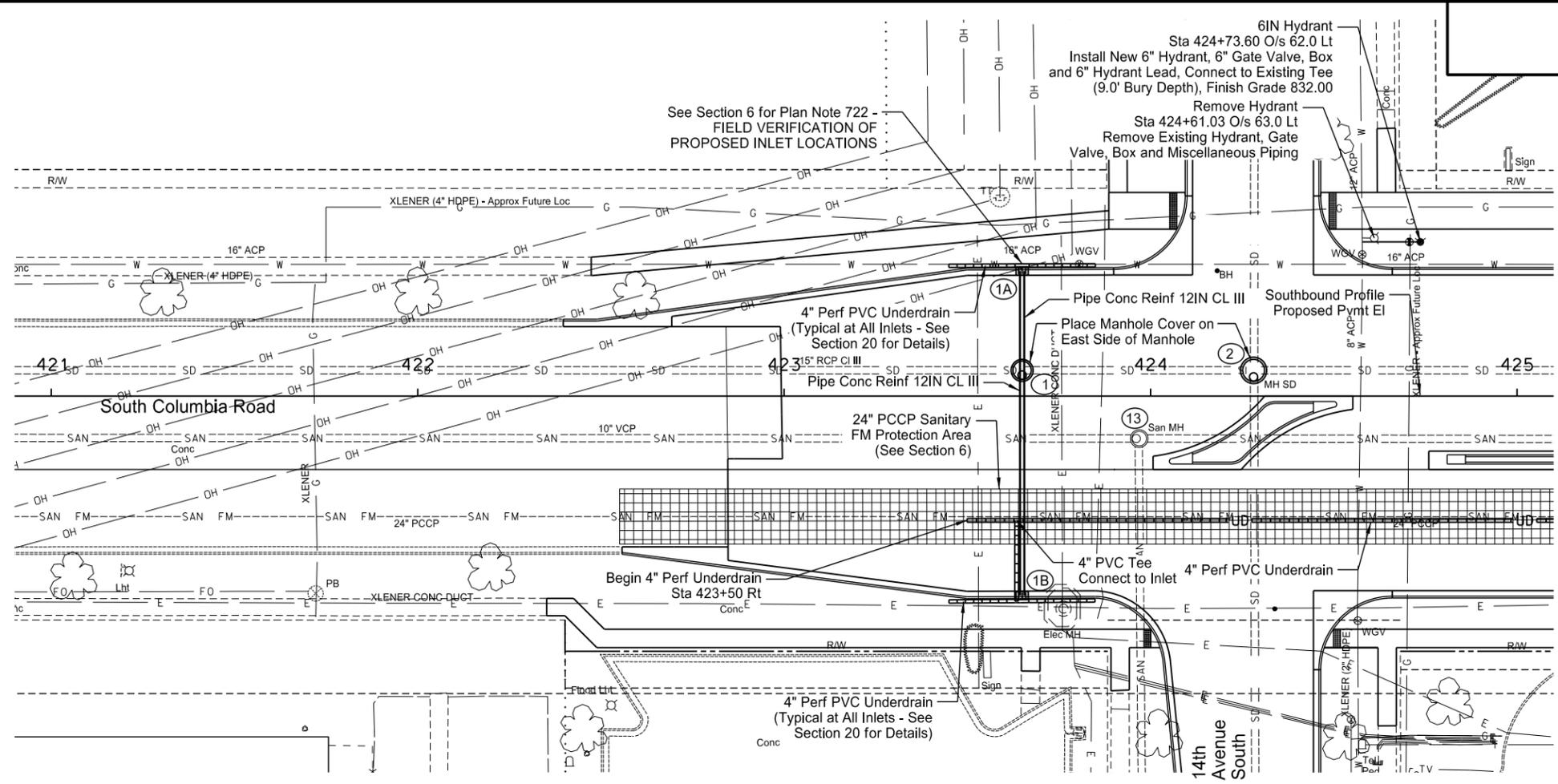
Inlet & Manhole Summary
Existing Structure Adjustment

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	55	1

PAY ITEMS

Pipe Conc Reinf 12IN CL III Sta 423+64.93 O/s Lt & Rt	88 LF
Underdrain Pipe PVC Perforated 4IN Sta 423+49.94 to Sta 425+00 O/s 17 Rt	150 LF
Sta 423+64.93 O/s 14 to 36 Rt	22 LF
Sta 423+64.93 O/s 34.30 Rt	40 LF
Sta 423+64.93 O/s 54.07 Lt	40 LF
Manhole 60IN Sta 423+64.93 O/s 27.00 Lt	1 EA
Manhole 72IN Sta 424+28.10 O/s 27.00 Lt	1 EA
Manhole Riser 60IN Sta 423+64.93 O/s 27.00 Lt	5.7 LF
Manhole Riser 72IN Sta 424+28.10 O/s 27.00 Lt	6.8 LF
Inlet - Type 1 Sta 423+64.93 O/s 54.07 Lt	1 EA
Sta 423+64.93 O/s 34.30 Rt	1 EA
6IN Hydrant Sta 424+73.61 O/s 62 Lt	1 EA
Remove Hydrant Sta 424+61.04 O/s 63 Lt	1 EA



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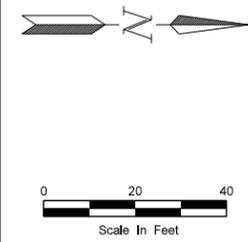
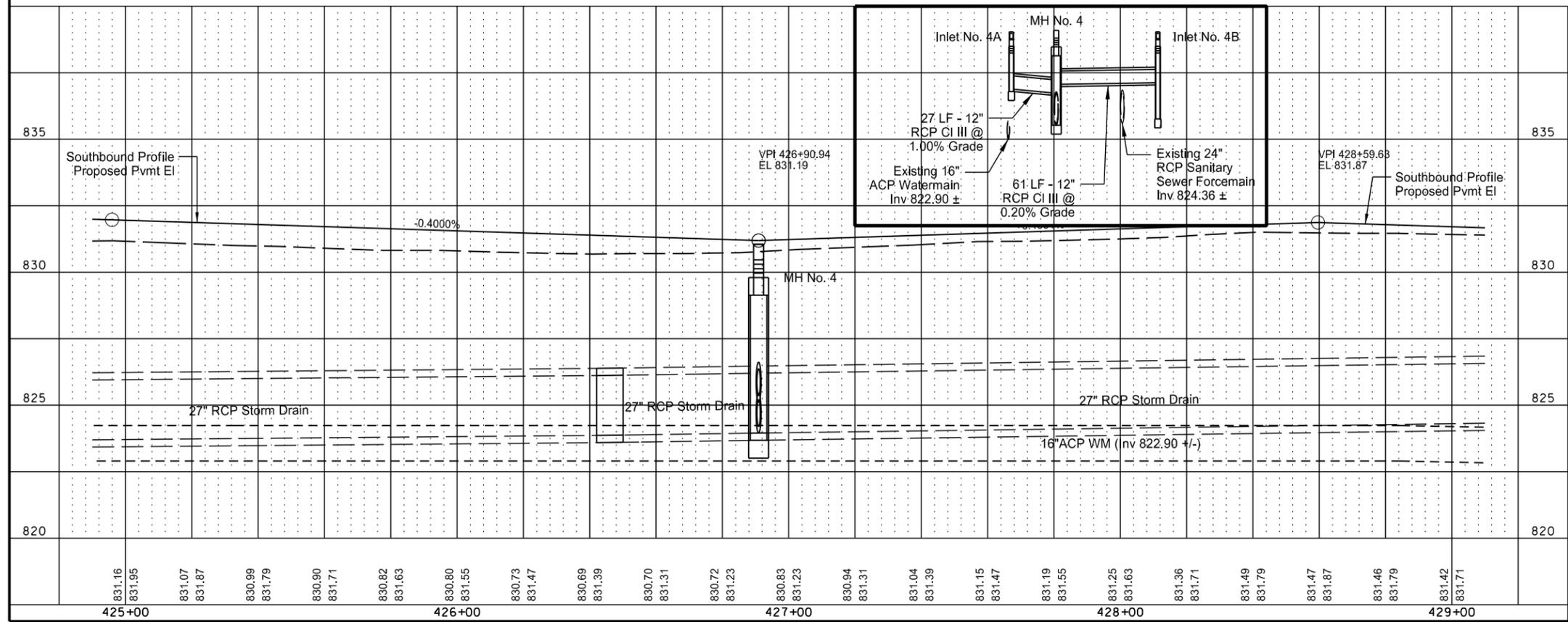
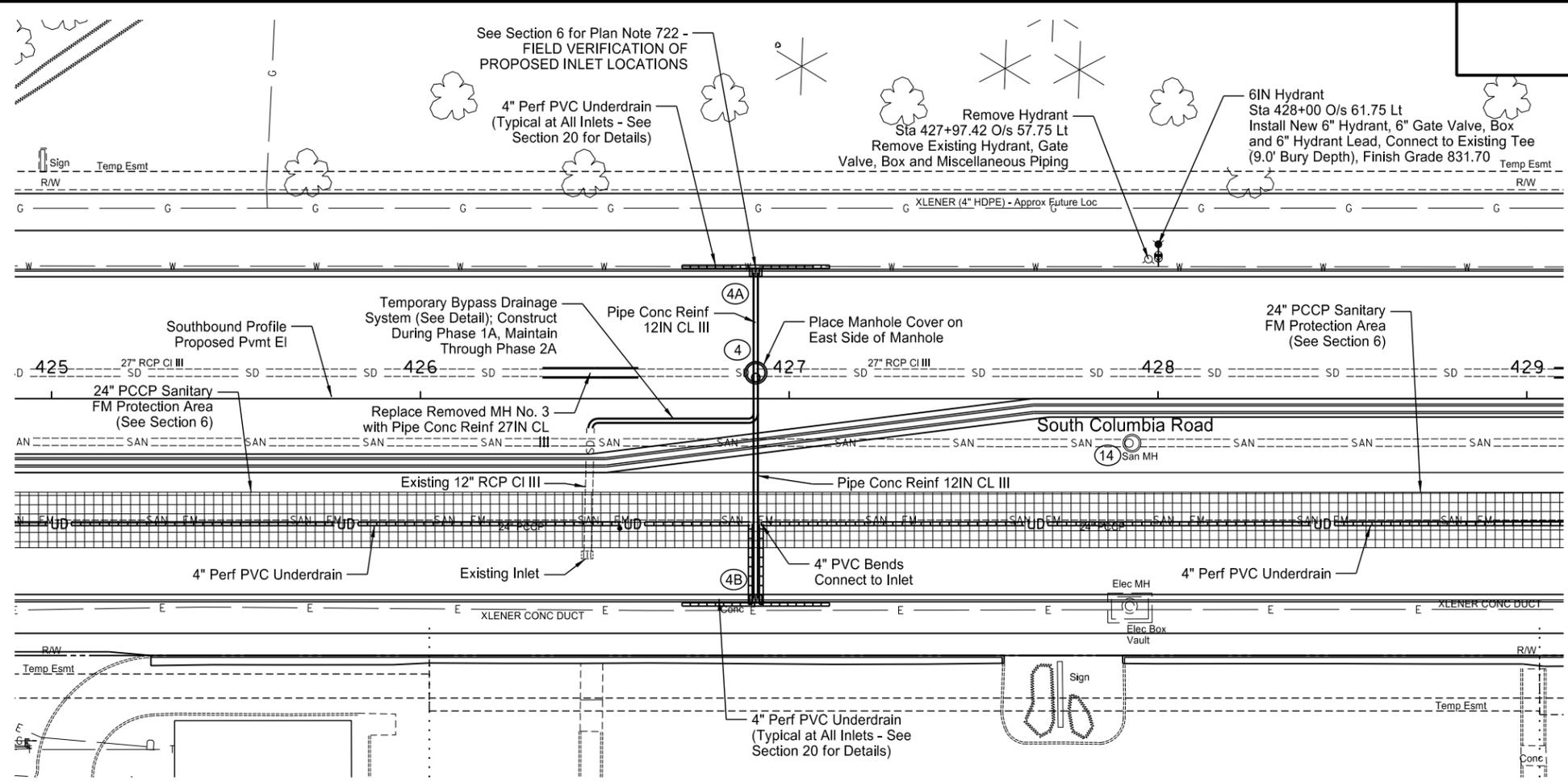
**Storm Sewer & Watermain
Sta 421+00 to 425+00**

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	55	2

PAY ITEMS

Temporary Bypass Drainage System Sta 426+46.1 to 426+90.9	1 EA
Pipe Conc Reinf 12IN CL III Sta 426+90.93 O/s Lt & Rt	88 LF
Pipe Conc Reinf 27IN CL III Sta 426+33 O/s 27 Lt to Sta 426+59 O/s 27 Lt	26 LF
Underdrain Pipe PVC Perforated 4IN Sta 425+00 to Sta 426+89.43 O/s 14 Rt	190 LF
Sta 426+89.43 O/s 14 to 36 Rt	22 LF
Sta 426+90.93 O/s 34.17 Rt	40 LF
Sta 426+92.43 O/s 14 to 36 Rt	22 LF
Sta 426+92.43 to Sta 429+00 O/s 14 Rt	208 LF
Sta 426+90.93 O/s 54.17 Lt	40 LF
Manhole 60IN Sta 426+90.93 O/s 27.00 Lt	1 EA
Manhole Riser 60IN Sta 426+90.93 O/s 27.00 Lt	5.4 LF
Inlet - Type 1 Sta 426+90.93 O/s 54.17 Lt	1 EA
Sta 426+90.93 O/s 34.17 Rt	1 EA
6IN Hydrant Sta 428+00 O/s 61.75 Lt	1EA
Remove Hydrant Sta 427+97.42 O/s 57.75 Lt	1 EA



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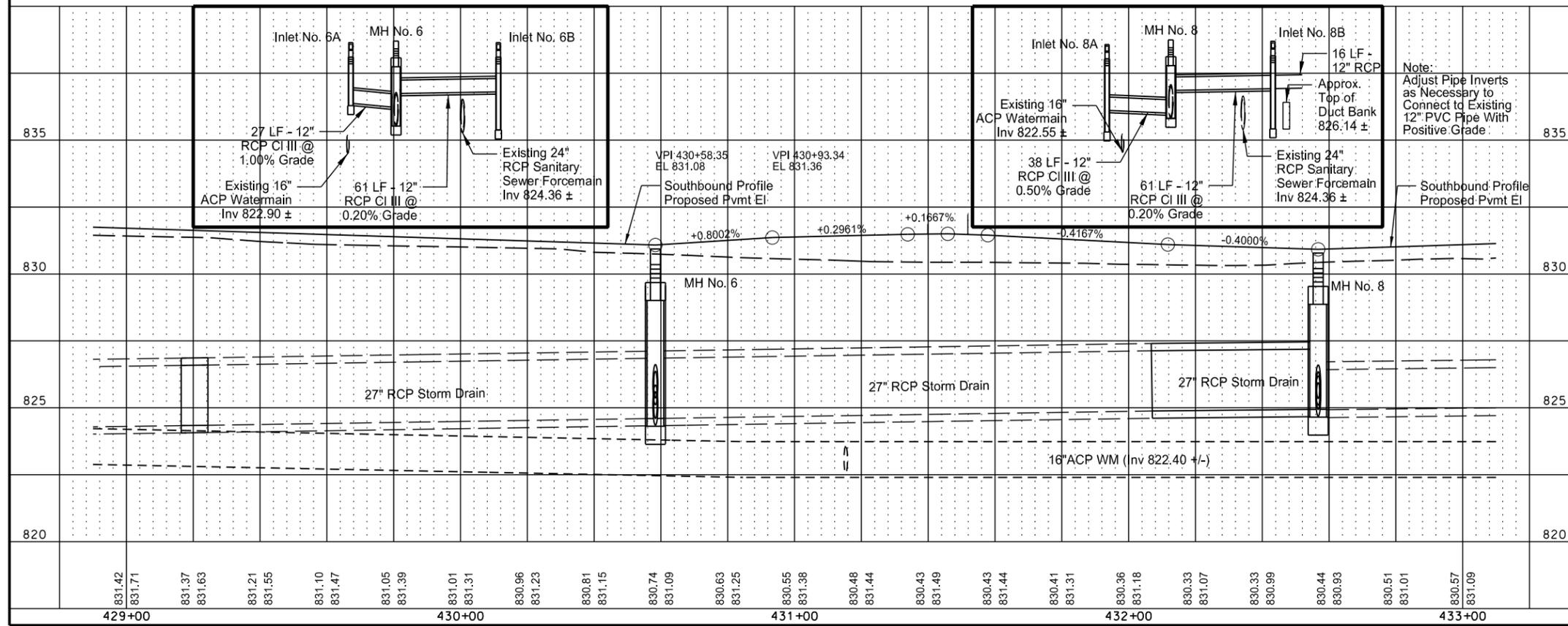
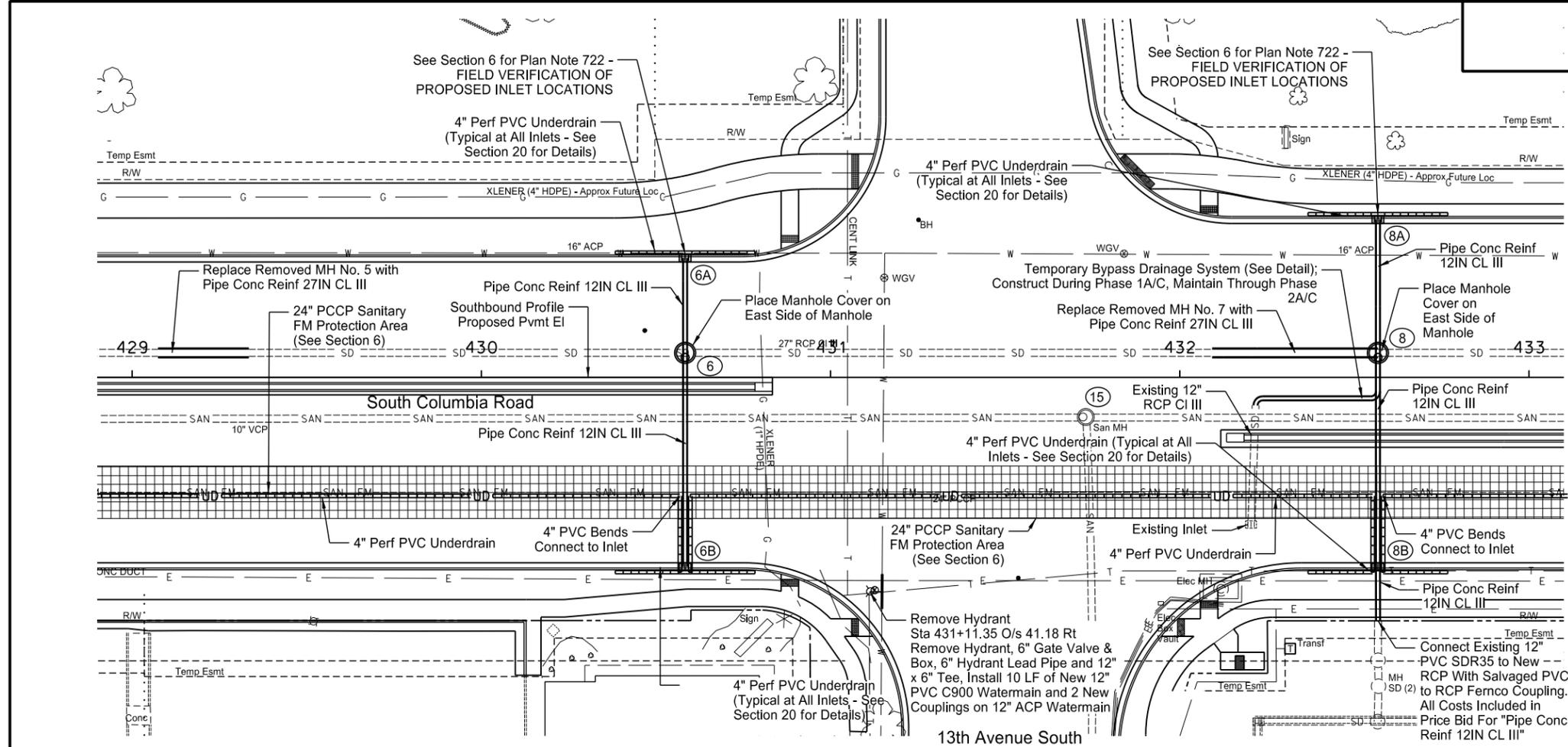
**Storm Sewer & Watermain
Sta 425+00 to 429+00**

**Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	55	3

PAY ITEMS

Temporary Bypass Drainage System Sta 432+21.7 to 432+61.7	1 EA
Pipe Conc Reinf 12IN CL III Sta 430+58.35 O/s Lt & Rt Sta 432+61.75 O/s Lt & Rt	88 LF 115 LF
Pipe Conc Reinf 27IN CL III Sta 429+07 O/s 27 Lt to Sta 429+33 O/s 27 Lt Sta 432+09 O/s 27 Lt to Sta 432+62 O/s 27 Lt	26 LF 48 LF
Underdrain Pipe PVC Perforated 4IN Sta 429+00 to Sta 430+56.85 O/s 14 Rt Sta 430+56.85 O/s 14 to 36 Rt Sta 430+58.35 O/s 34 Rt Sta 430+59.85 O/s 14 to 36 Rt Sta 430+59.85 to Sta 432+55.25 O/s 14 Rt Sta 432+55.25 O/s 14 to 36 Rt Sta 432+56.75 O/s 34 Rt Sta 432+58.25 O/s 14 to 36 Rt Sta 432+58.25 to Sta 433+00 O/s 14 Rt Sta 430+58.35 O/s 54.17 Lt Sta 432+56.75 O/s 65.17 Lt	157 LF 22 LF 40 LF 22 LF 195 LF 22 LF 40 LF 22 LF 42 LF 40 LF 40 LF
Manhole 60IN Sta 430+58.35 O/s 27.00 Lt Sta 432+56.75 O/s 27.00 Lt	1 EA 1 EA
Manhole Riser 60IN Sta 430+58.35 O/s 27.00 Lt Sta 432+56.75 O/s 27.00 Lt	5.0 LF 5.0 LF
Inlet - Type 1 Sta 430+58.35 O/s 54.17 Lt Sta 430+58.35 O/s 34.17 Rt Sta 432+61.75 O/s 54.17 Lt Sta 432+61.75 O/s 34.17 Rt	1 EA 1 EA 1 EA 1 EA
Remove Hydrant Sta 431+11.35 O/s 41.18 Rt	1 EA



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Grand Forks, ND



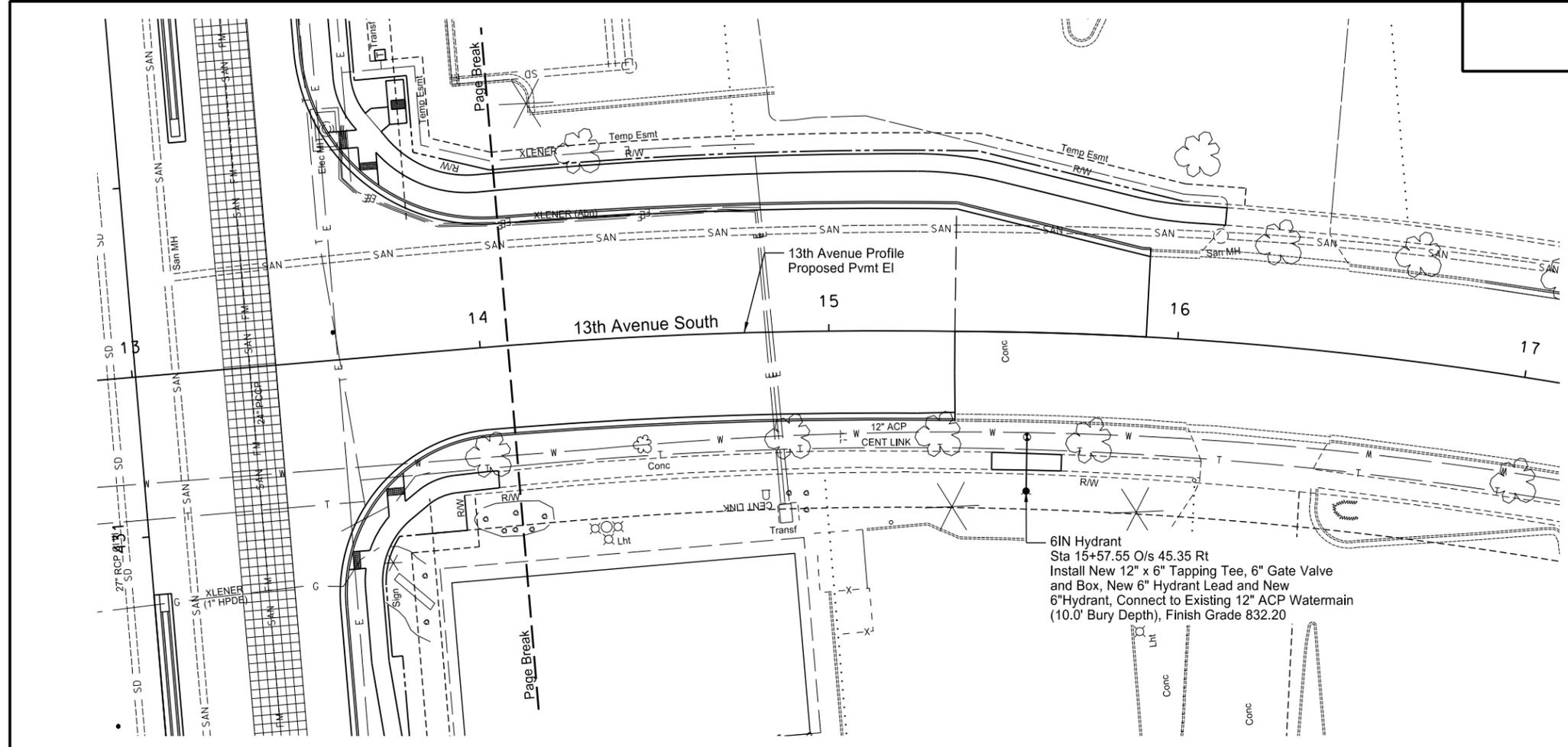
**Storm Sewer & Watermain
Sta 429+00 to 433+00**

**Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	55	6

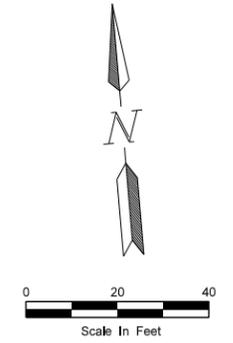
PAY ITEMS

6IN Hydrant Sta 15+57.55 O/s 45.35 Lt	1 EA
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6IN Hydrant
Sta 15+57.55 O/s 45.35 Rt
Install New 12" x 6" Tapping Tee, 6" Gate Valve and Box, New 6" Hydrant Lead and New 6" Hydrant, Connect to Existing 12" ACP Watermain (10.0' Bury Depth), Finish Grade 832.20

835	VPI 13+20.97 EL 831.48	VPI 14+07.48 EL 831.44	VPI 14+93.20 EL 831.80	835																
830	VPI 13+10.85 EL 831.58	13th Avenue Profile Proposed Pvmnt EI		830																
825	VPI 13+53.98 EL 831.05	VPI 15+36.06 EL 831.60	825																	
820	820																			
830.43 831.48	830.57 831.49	830.40 831.23	830.81 831.09	831.41 831.24	831.63 831.39	831.77 831.49	831.79 831.58	831.70 831.66	831.60 831.74	831.60 831.77	831.58 831.67	831.56 831.59	831.51 831.53	831.46 831.48	831.43	831.28	831.16	831.12	831.02	830.98
13+00		14+00		15+00		16+00		17+00												



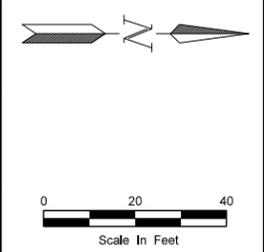
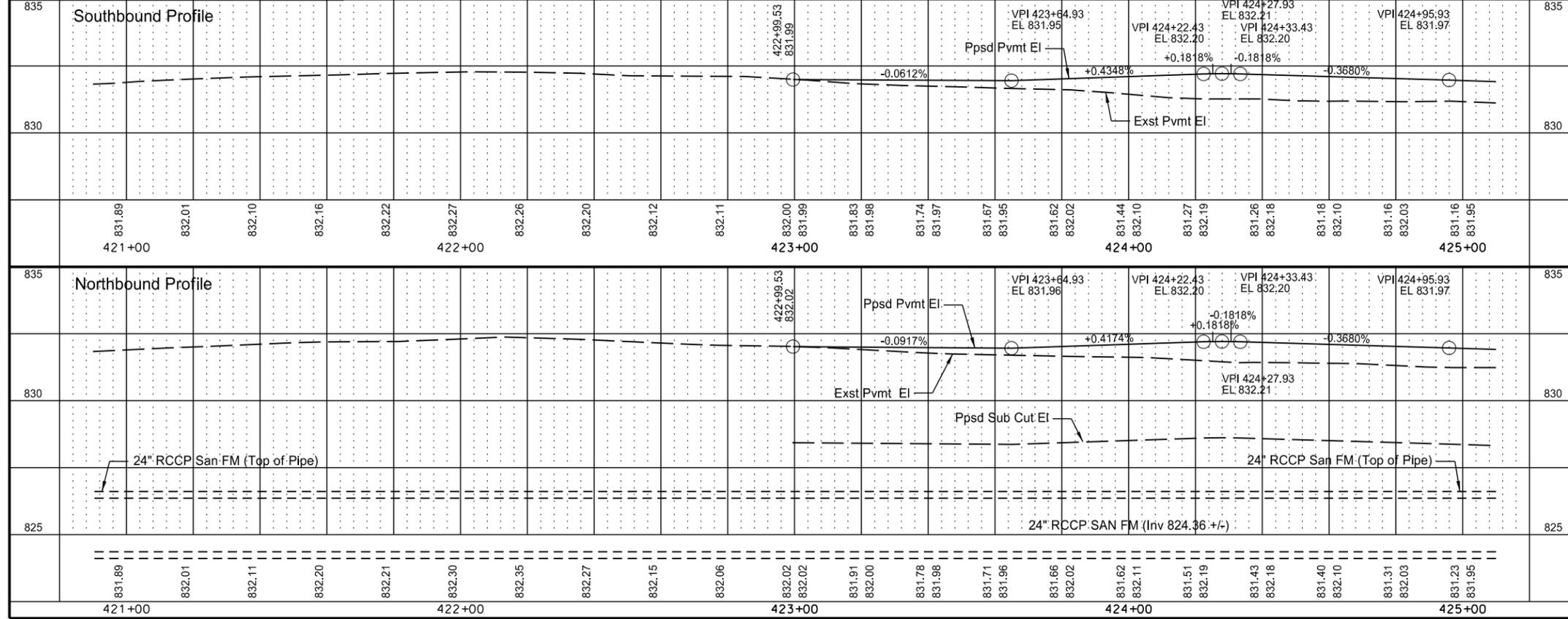
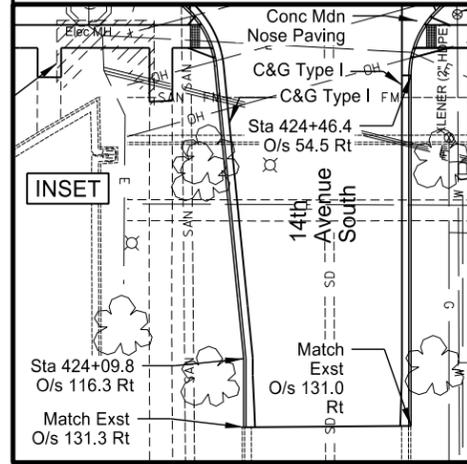
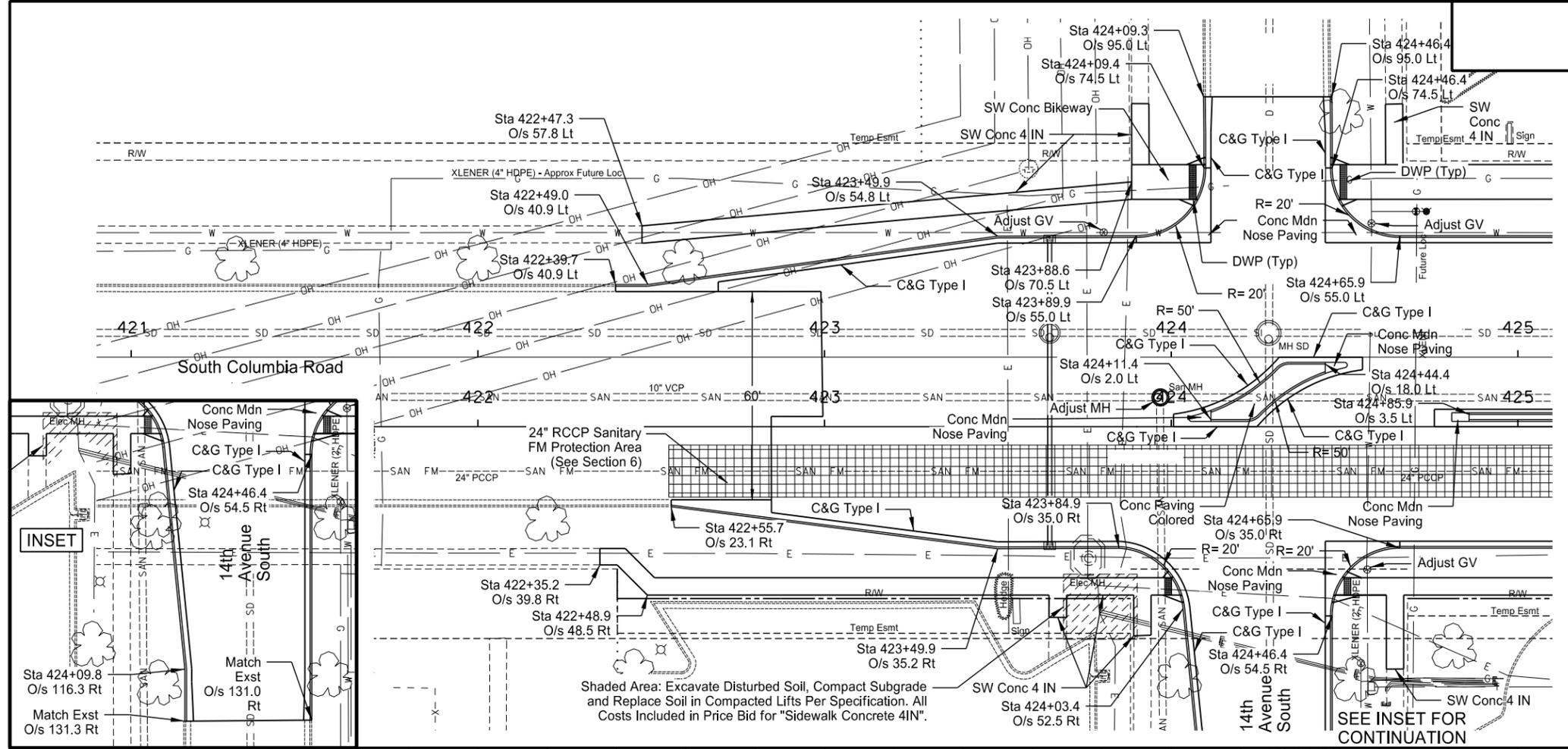
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Storm Sewer & Watermain
13th Avenue South
Sta 14+08.12 to 16+85.50

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

PAY ITEMS

Salvaged Base Course Sta 421+00 to Sta 425+00	819 CY
Aggregate Base Class 3 Sta 421+00 to Sta 425+00	949 CY
9IN Non-Reinf Concrete Pavement CI AE Sta 421+00 to Sta 425+00	621 SY
9IN Reinf Concrete Pavement CI AE Sta 421+00 to Sta 425+00	859 SY
9IN Non-Reinf Concrete Pvmnt CI AE-Doweled Sta 421+00 to Sta 425+00	950 SY
Geosynthetic Material Type R1 Sta 421+00 to Sta 425+00	2577 SY
Adjust Gate Valve Box Sta 423+80.6 O/s 55.9 Lt Sta 424+56.6 O/s 41.0 Rt Sta 424+57.8 O/s 58.5 Lt	1 EA 1 EA 1 EA
Adjust Manhole Sta 423+96.9 O/s 8.4 Lt	1 EA
Curb & Gutter-Type I Sta 421+00 to Sta 425+00	771 LF
Sidewalk Concrete Bikeway Sta 421+00 to Sta 425+00	81 SY
Sidewalk Concrete 4IN Sta 421+00 to Sta 425+00	243 SY
Concrete Median Nose Paving Sta 421+00 to Sta 425+00	71 SY
Concrete Paving Colored Sta 421+00 to Sta 425+00	24 SY
Detectable Warning Panels Sta 423+99.1 O/s 46 Rt Sta 424+06.3 O/s 71 Lt Sta 424+49.7 O/s 71 Lt Sta 424+50.8 O/s 46 Rt	10 SF 20 SF 20 SF 10 SF



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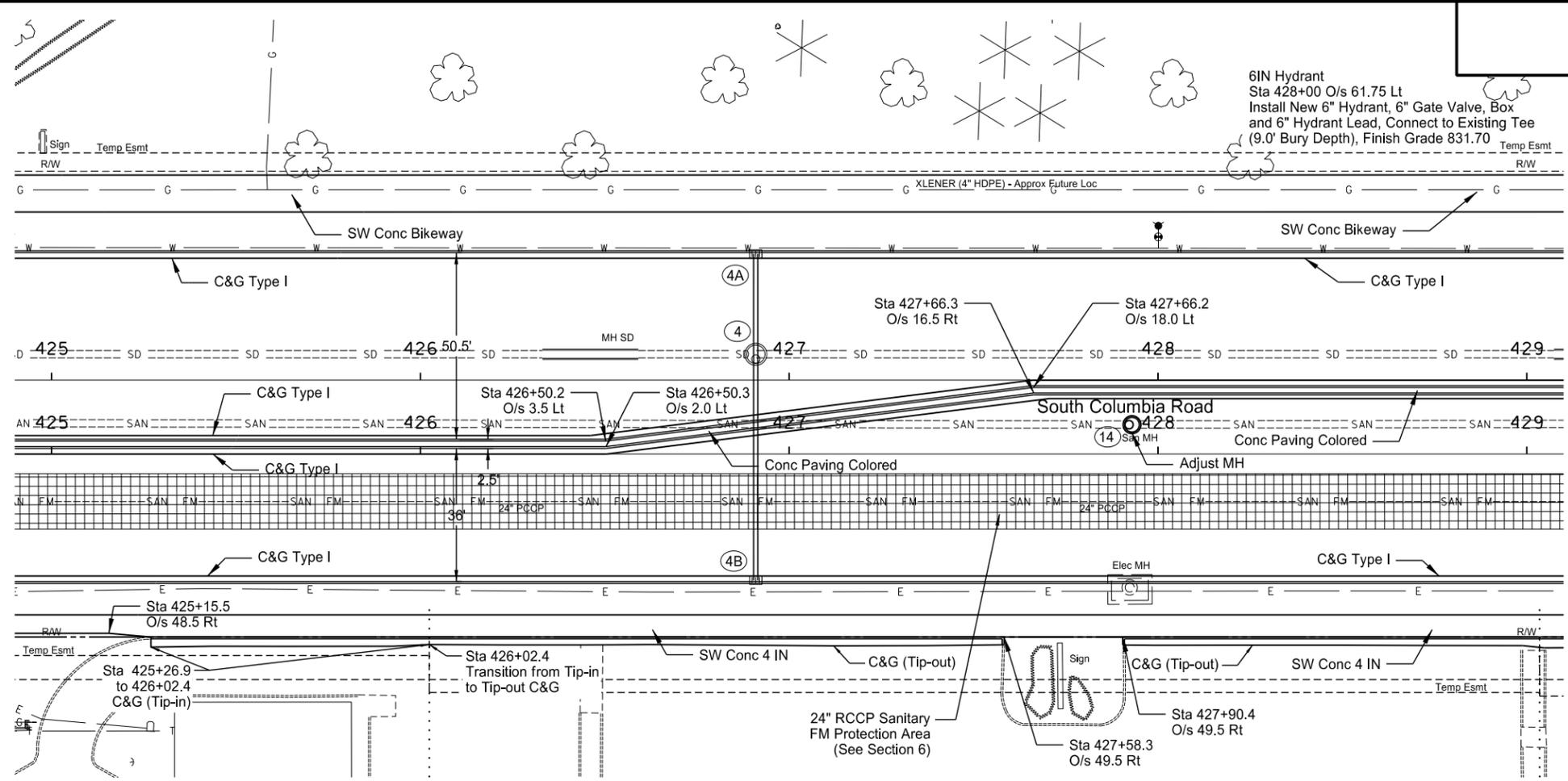
Plan and Profile
Sta 421+00 to 425+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

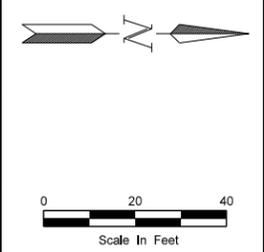
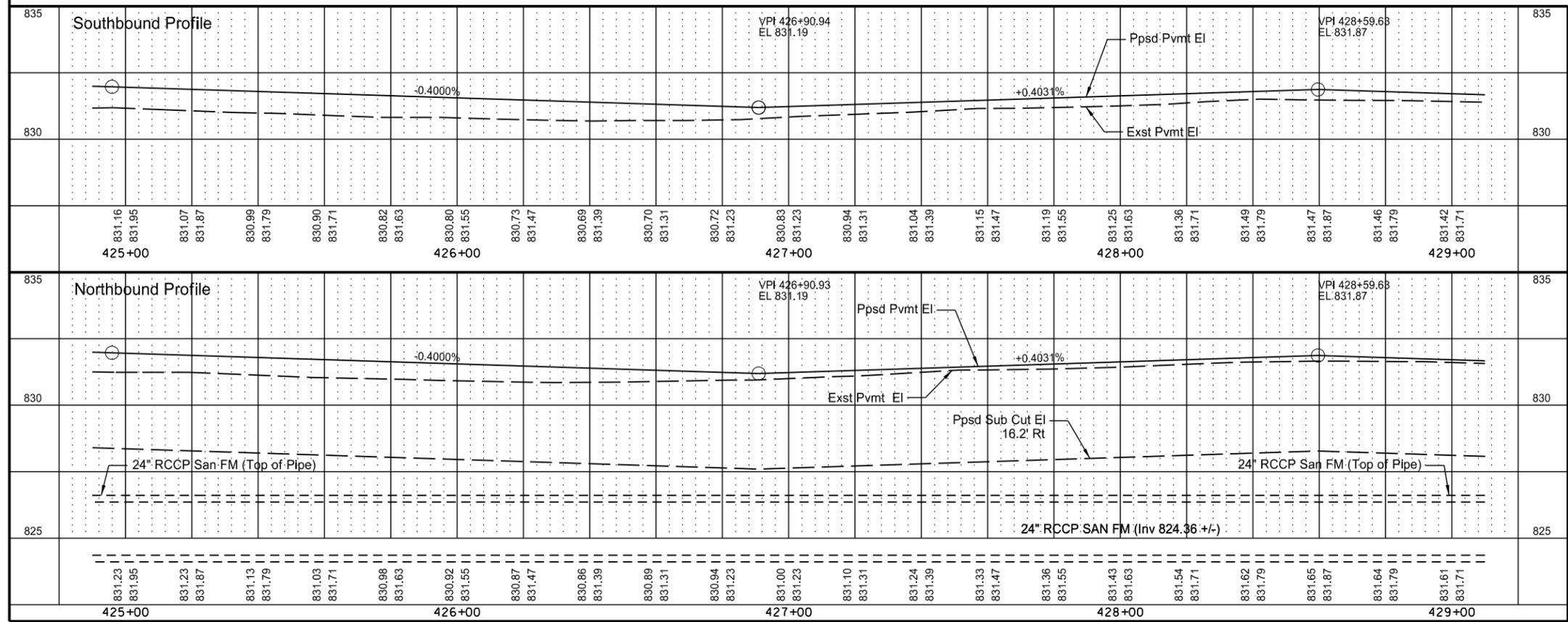
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	60	2

PAY ITEMS

Salvaged Base Course Sta 425+00 to Sta 429+00	1472 CY
Aggregate Base Class 3 Sta 425+00 to Sta 429+00	2044 CY
9IN Reinf Concrete Pavement CI AE Sta 425+00 to Sta 429+00	1134 SY
9IN Non-Reinf Concrete Pvmt CI AE-Doweled Sta 425+00 to Sta 429+00	2459 SY
Geosynthetic Material Type R1 Sta 425+00 to Sta 429+00	4622 SY
Adjust Manhole Sta 427+93.0 O/s 8.0 Lt	1 EA
Curb & Gutter Sta 425+26.9 to Sta 426+02.4 O/s 50 Rt	76 LF
Sta 426+02.4 to Sta 427+58.3 O/s 50 Rt	157 LF
Sta 427+90.4 to Sta 428+98.9 O/s 50 Rt	110 LF
Curb & Gutter-Type I Sta 425+00 to Sta 429+00	1602 LF
Sidewalk Concrete Bikeway Sta 425+00 to Sta 429+00	444 SY
Sidewalk Concrete 4IN Sta 425+00 to Sta 429+00	264 SY
Concrete Paving Colored Sta 425+00 to Sta 429+00	67 SY



6IN Hydrant
Sta 428+00 O/s 61.75 Lt
Install New 6" Hydrant, 6" Gate Valve, Box
and 6" Hydrant Lead, Connect to Existing Tee
(9.0' Bury Depth), Finish Grade 831.70



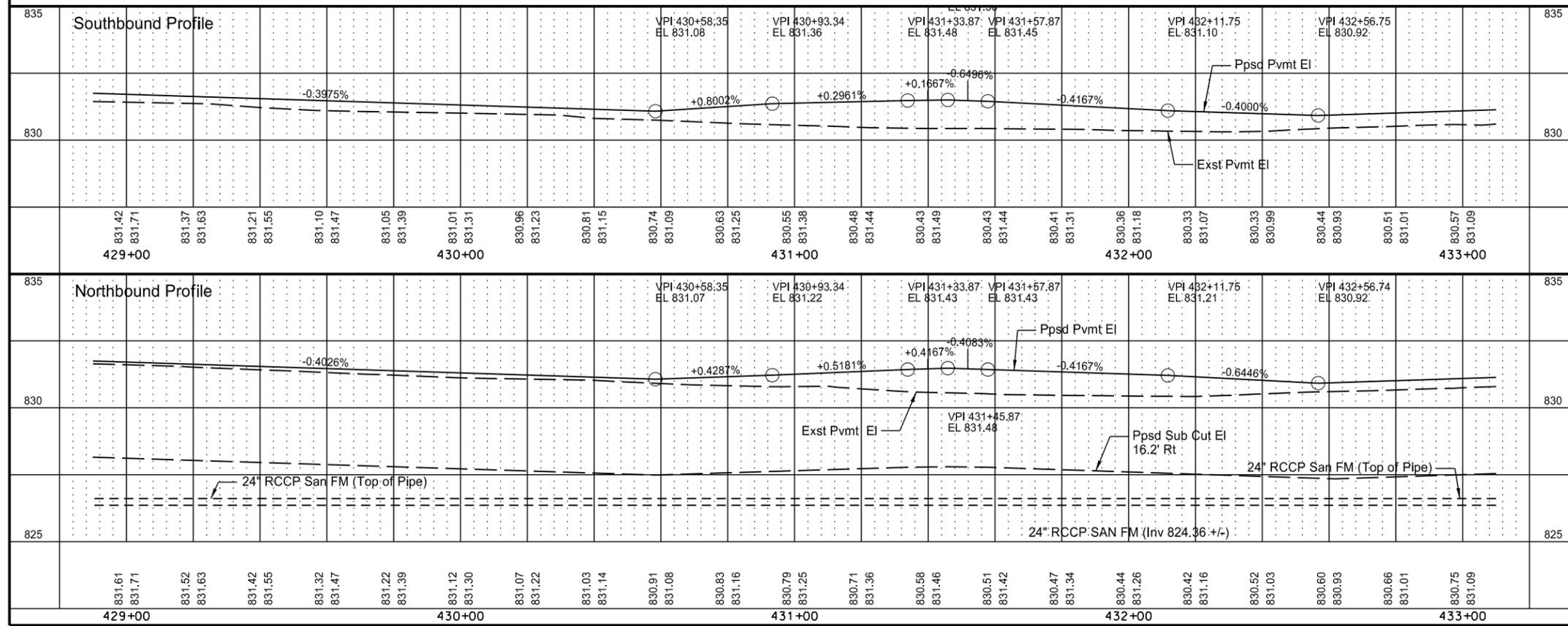
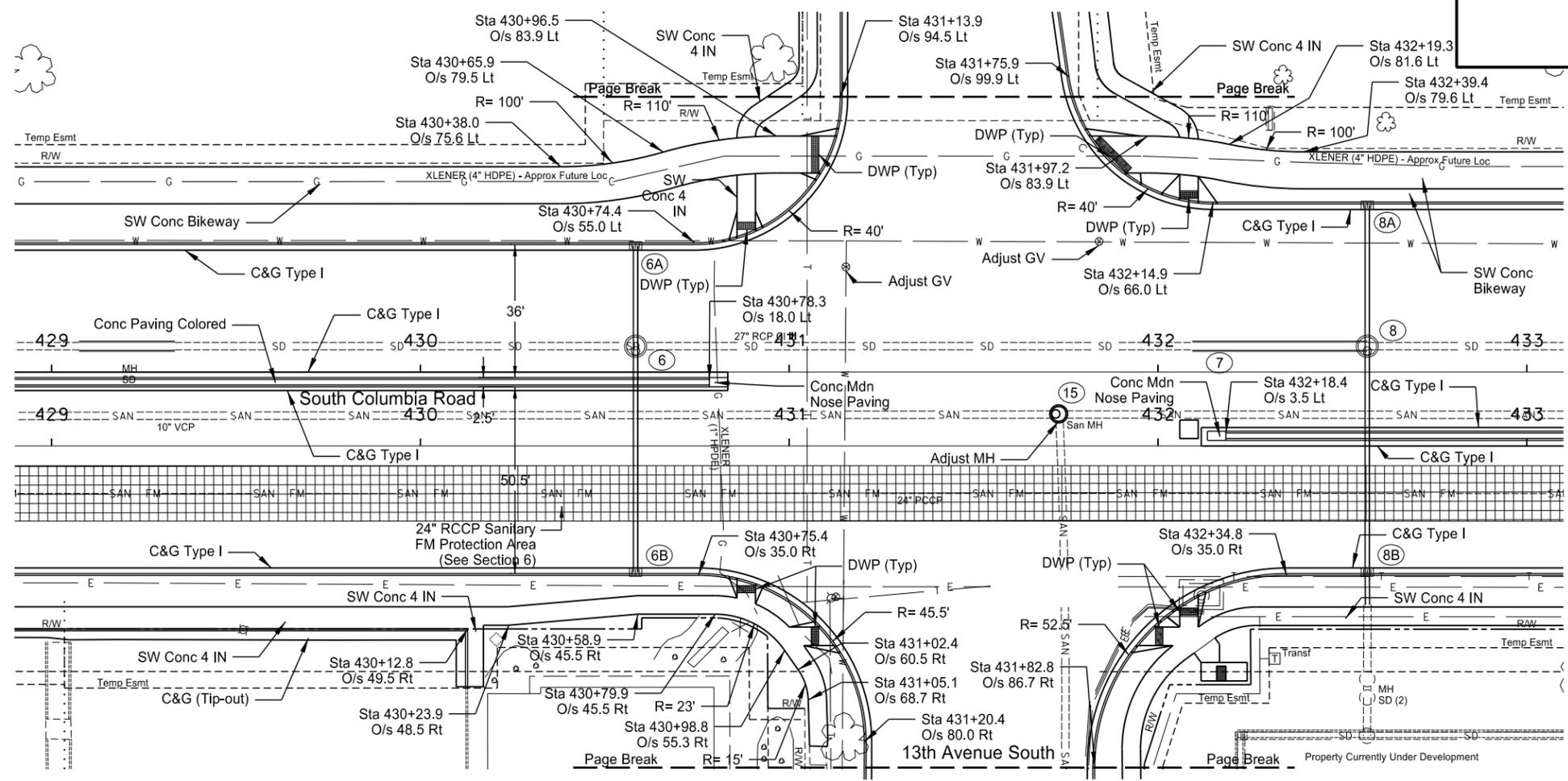
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Plan and Profile
Sta 425+00 to 429+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

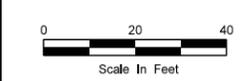
PAY ITEMS

Salvaged Base Course	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	1774 CY
Aggregate Base Class 3	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	2315 CY
9IN Non-Reinf Concrete Pavement CI AE	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	679 SY
9IN Reinf Concrete Pavement CI AE	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	1408 SY
9IN Non-Reinf Concrete Pvmnt CI AE-Doweled	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	2566 SY
Geosynthetic Material Type R1	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	5511 SY
Adjust Gate Valve Box	
Sta 431+15.4 O/s 48.5 Lt	1 EA
Sta 431+84.0 O/s 55.2 Lt	1 EA
Adjust Manhole	
Sta 431+73.1 O/s 8.7 Lt	1 EA
Curb & Gutter	
Sta 429+05.23 to Sta 430+12.32 O/s 49.5 Rt	107 LF
Sta 430+12.32 O/s 49.5 to 64.5 Rt	15 LF
Curb & Gutter-Type I	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	1295 LF
Sidewalk Concrete Bikeway	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	411 SY
Sidewalk Concrete 4IN	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	259 SY
Concrete Median Nose Paving	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	11 SY
Concrete Paving Colored	
Sta 429+00 to Sta 433+00 O/s 94.5 Lt to 87.0 Rt	43 SY



Detectable Warning Panels	
Sta 430+88.4 O/s 39 Rt	10 SF
Sta 430+88.3 O/s 60 Lt	10 SF
Sta 431+07.0 O/s 52 Rt	10 SF
Sta 431+07.1 O/s 79 Lt	20 SF
Sta 431+83.3 O/s 79 Lt	24 SF
Sta 432+00.4 O/s 52 Rt	10 SF
Sta 432+08.4 O/s 45 Rt	10 SF
Sta 432+06.7 O/s 58 Lt	10 SF

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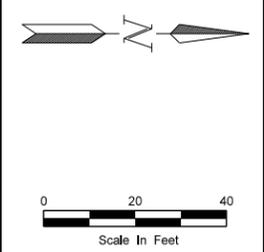
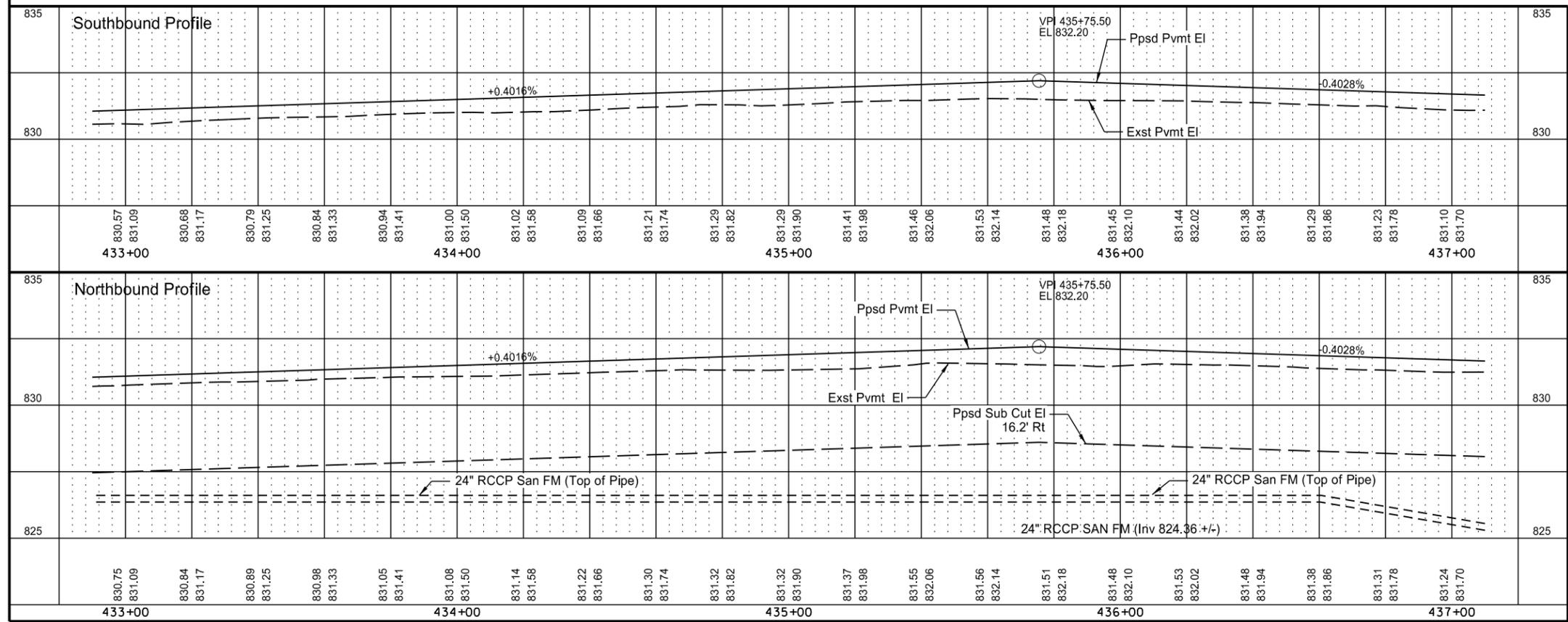
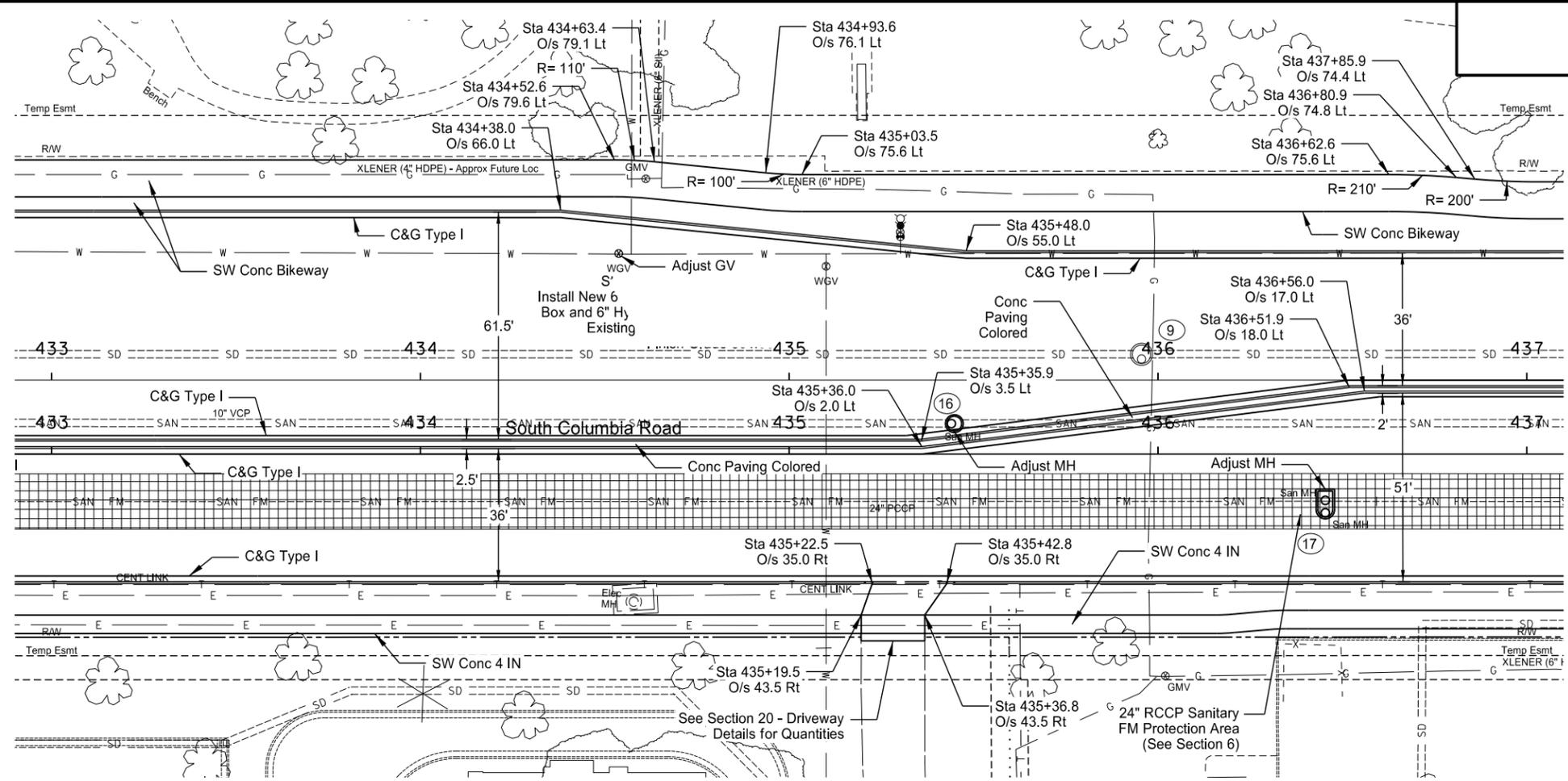
Plan and Profile
Sta 429+00 to 433+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	60	4

PAY ITEMS

Salvaged Base Course Sta 433+00 to Sta 437+00	1553 CY
Aggregate Base Class 3 Sta 433+00 to Sta 437+00	2162 CY
9IN Reinf Concrete Pavement CI AE Sta 433+00 to Sta 437+00	1056 SY
9IN Non-Reinf Concrete Pvmt CI AE-Doweled Sta 433+00 to Sta 437+00	2776 SY
Geosynthetic Material Type R1 Sta 433+00 to Sta 437+00	4884 SY
Adjust Gate Valve Box Sta 434+53.8 O/s 54.2 Lt	1 EA
Adjust Manhole Sta 435+44.8 O/s 8.2 Lt Sta 436+45.5 O/s 14.3 Rt	1 EA 1 EA
Curb & Gutter-Type I Sta 433+00 to Sta 437+00	1583 LF
Sidewalk Concrete Bikeway Sta 433+00 to Sta 437+00	502 SY
Sidewalk Concrete 4IN Sta 433+00 to Sta 437+00	222 SY
Concrete Paving Colored Sta 433+00 to Sta 437+00	64 SY



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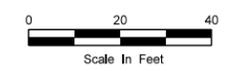
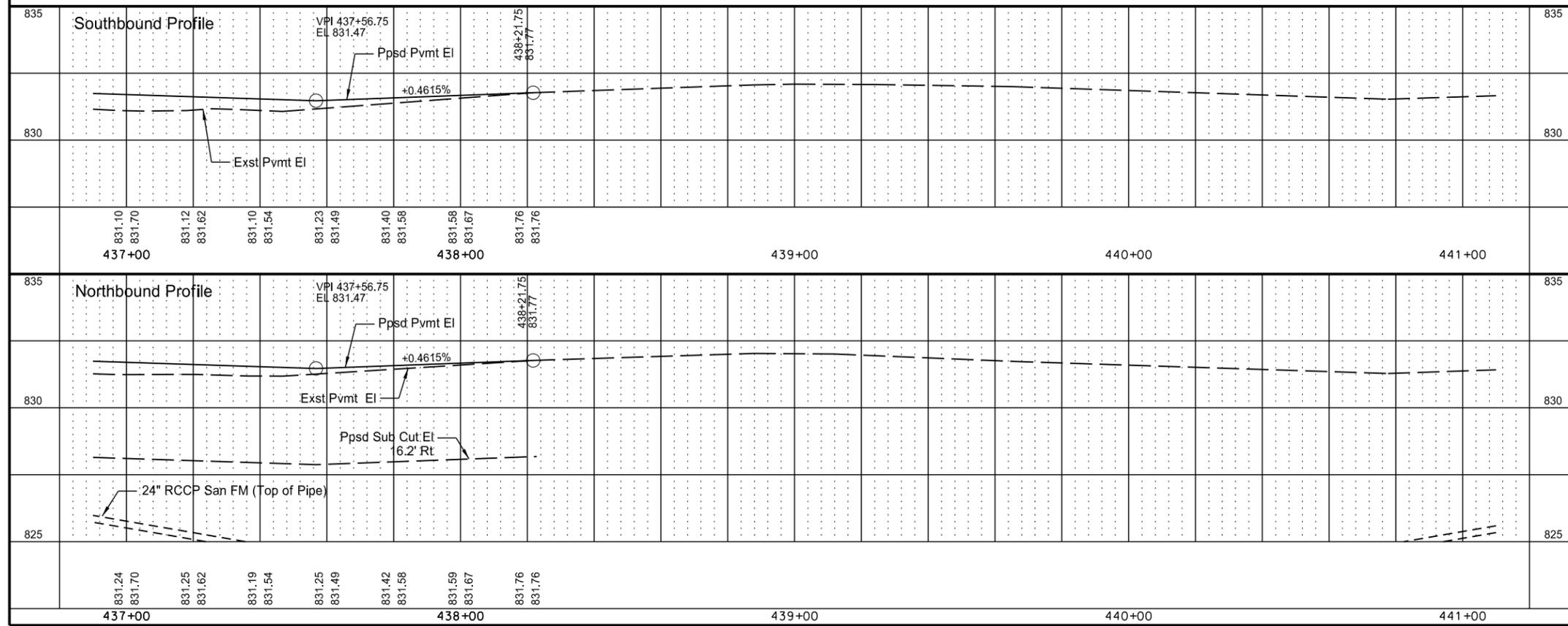
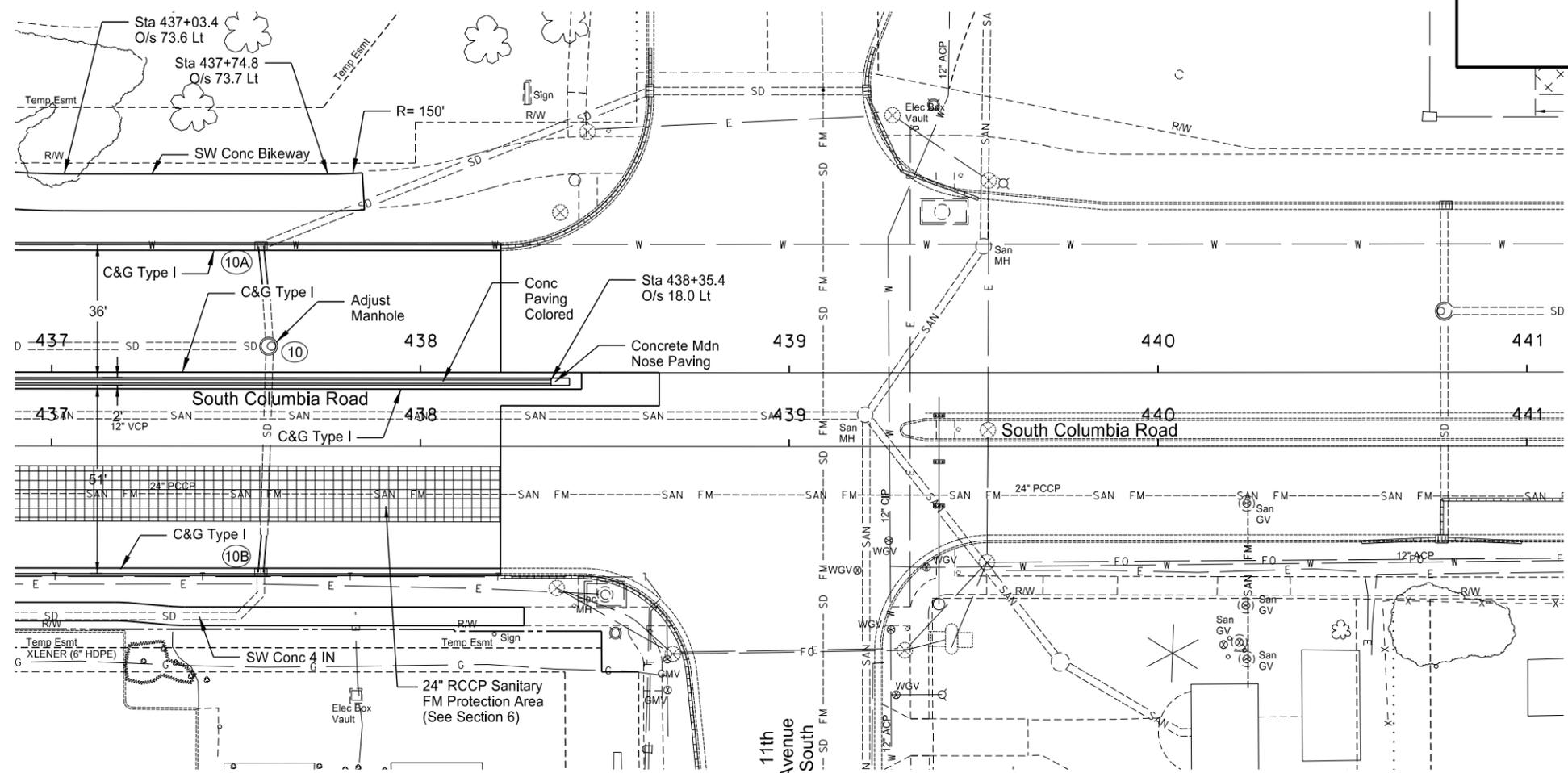
Plan and Profile
Sta 433+00 to 437+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	60	5

PAY ITEMS

Salvaged Base Course Sta 437+00 to Sta 441+00	437 CY
Aggregate Base Class 3 Sta 437+00 to Sta 441+00	622 CY
9IN Reinf Concrete Pavement CI AE Sta 437+00 to Sta 441+00	364 SY
9IN Non-Reinf Concrete Pvmt CI AE-Doweled Sta 437+00 to Sta 441+00	770 SY
Geosynthetic Material Type R1 Sta 437+00 to Sta 441+00	1357 SY
Adjust Manhole Sta 437+59.1 O/s 27.0 Lt	1 EA
Curb & Gutter-Type I Sta 437+00 to Sta 441+00	524 LF
Sidewalk Concrete Bikeway Sta 437+00 to Sta 441+00	94 SY
Sidewalk Concrete 4IN Sta 437+00 to Sta 441+00	71 SY
Concrete Median Nose Paving Sta 437+00 to Sta 441+00	6 SY
Concrete Paving Colored Sta 437+00 to Sta 441+00	15 SY



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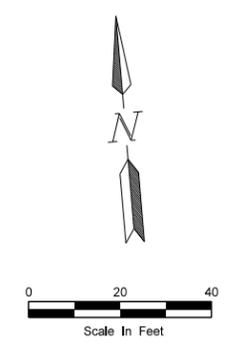
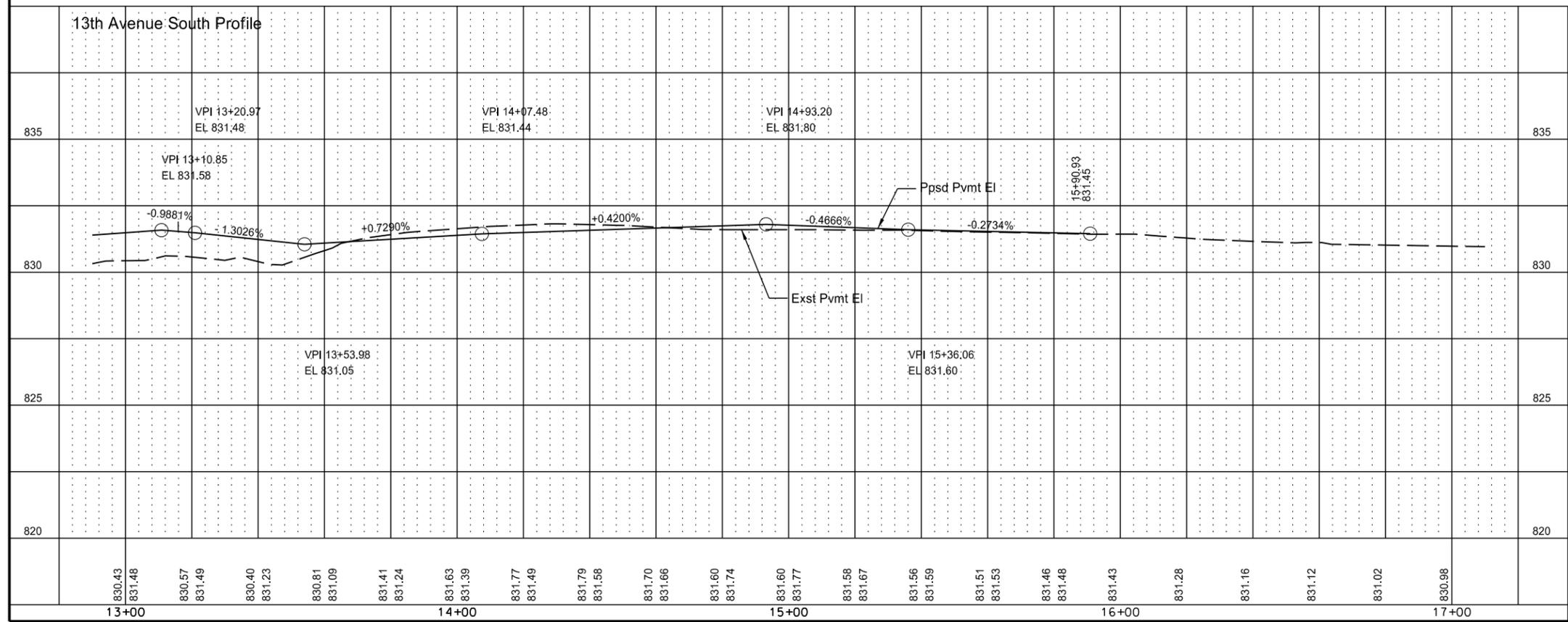
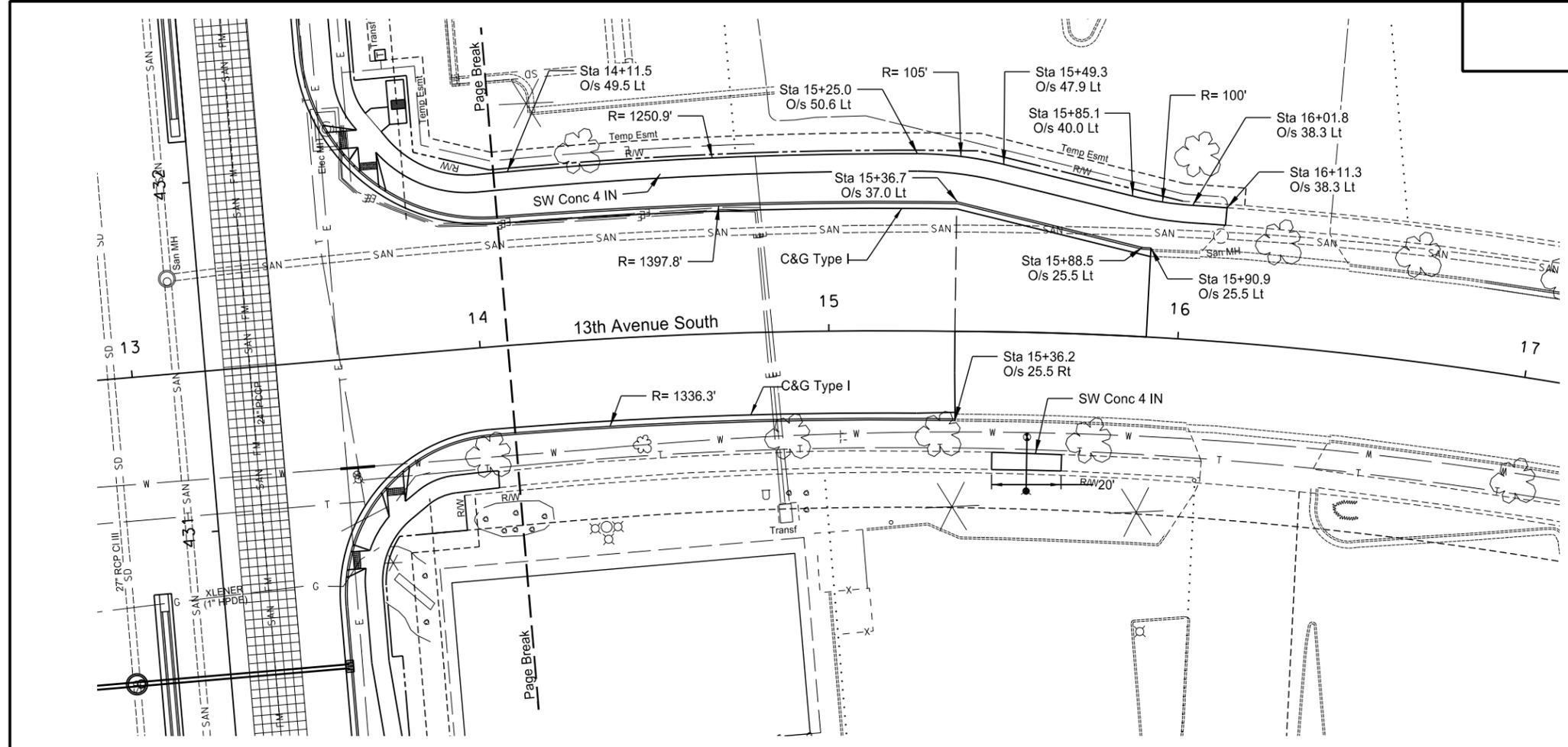
Plan and Profile
Sta 437+00 to 438+64.73

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	60	7

PAY ITEMS

Salvaged Base Course Sta 14+08.12 to Sta 16+85.50	269 CY
9IN Non-Reinf Concrete Pavement CI AE Sta 14+08.12 to Sta 16+85.50	1015 SY
Geosynthetic Material Type R1 Sta 14+08.12 to Sta 16+85.5	845 SY
Curb & Gutter-Type I Sta 14+08.12 to Sta 16+85.50	312 LF
Sidewalk Concrete 4IN Sta 14+08.12 to Sta 16+85.50	128 SY



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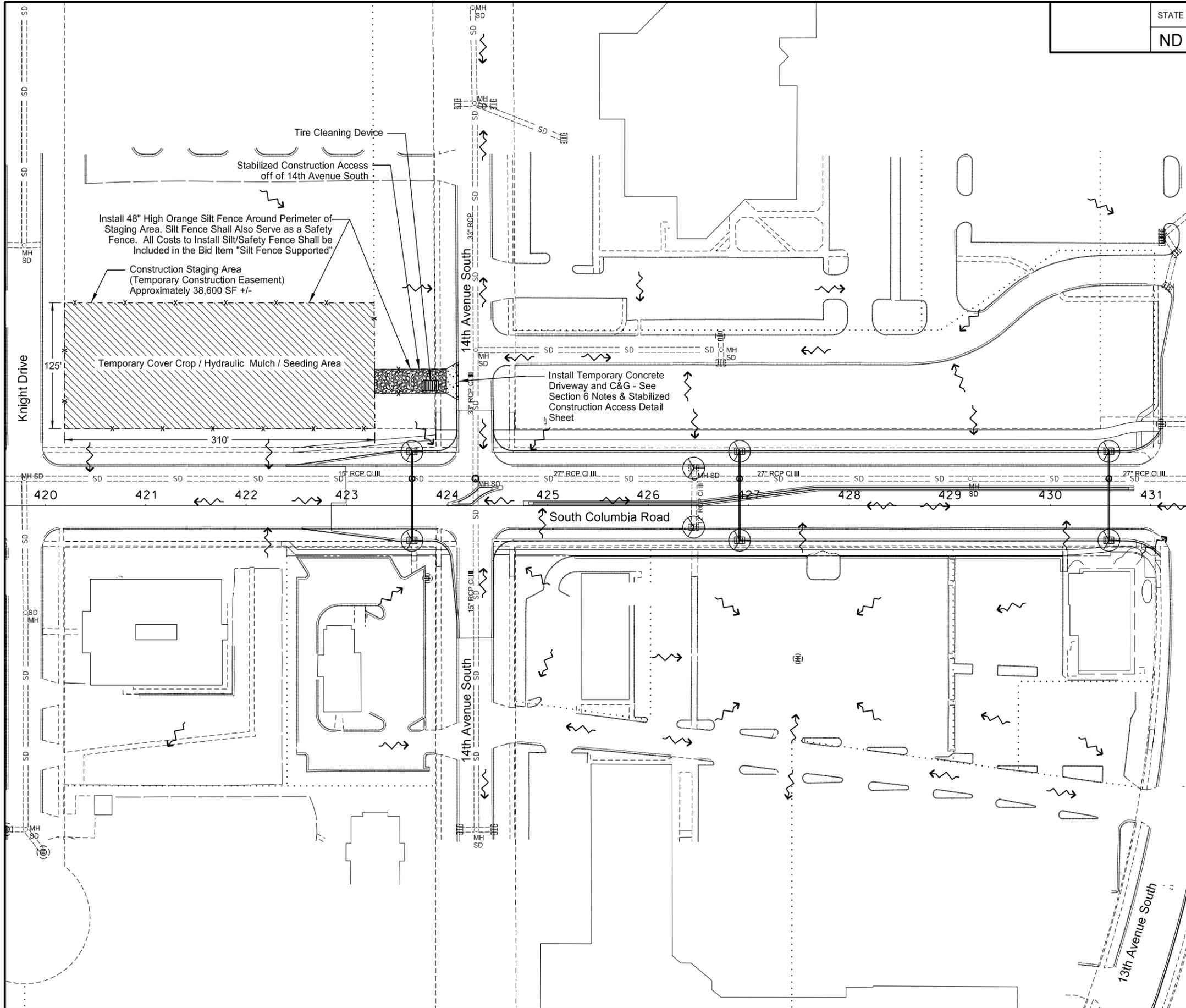
Plan and Profile
13th Avenue South
Sta 14+08.12 to 16+85.50

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	76	1

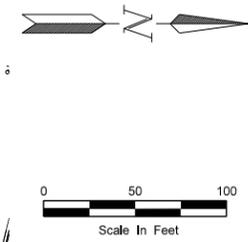
PAY ITEMS

Temporary Cover Crop Construction Staging Area	0.93 ACRE
Hydraulic Mulch Construction Staging Area	0.93 ACRE
Silt Fence Supported Construction Staging Area	1000 LF
Remove Silt Fence Supported Construction Staging Area	1000 LF
Stabilized Construction Access Construction Staging Area	1 EA
Remove Stabilized Construction Access Construction Staging Area	1 EA
Inlet Protection-Special Sta 420+00 to 431+00	8 EA
Remove Inlet Protection-Special Sta 420+00 to 431+00	8 EA



Legend

-x-x-	Proposed Silt/Safety Fence
III (E)	Existing Inlet
SD ---	Existing Storm Drain Line
III	Proposed Inlet
SD ———	Proposed Storm Drain Line
~>	Surface Flow Direction
⊗	Inlet Protection



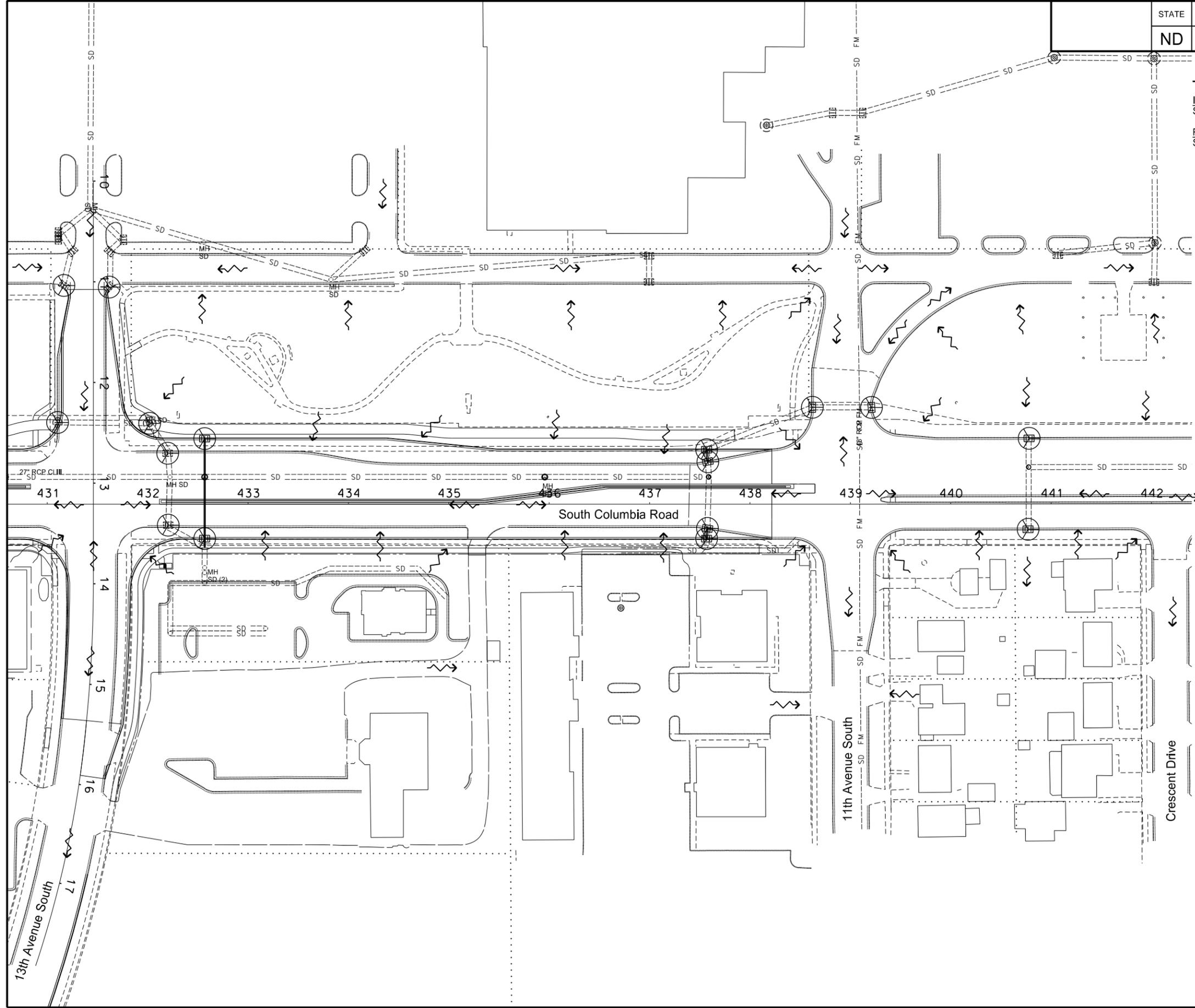
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Temporary Sediment and Erosion Control
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	76	2

PAY ITEMS	
Inlet Protection-Special Sta 420+00 to 431+00	16 EA
Remove Inlet Protection-Special Sta 420+00 to 431+00	16 EA



Legend

- Existing Inlet
- Existing Storm Drain Line
- Proposed Inlet
- Proposed Storm Drain Line
- Surface Flow Direction
- Inlet Protection

0 50 100
Scale In Feet

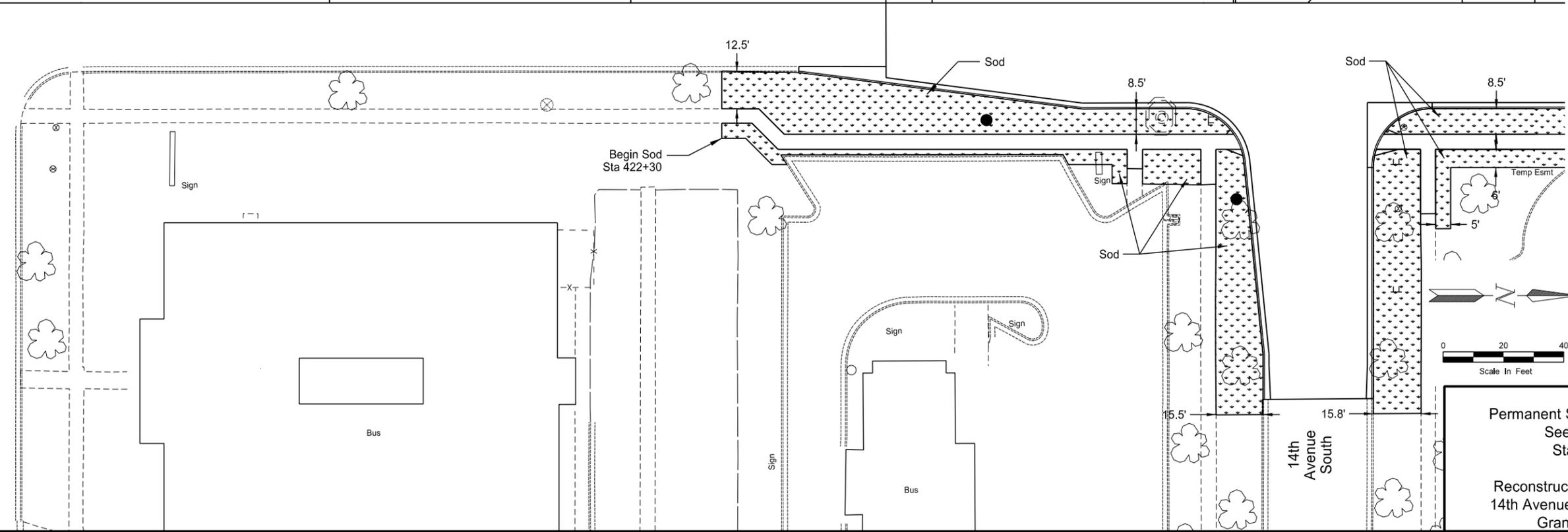
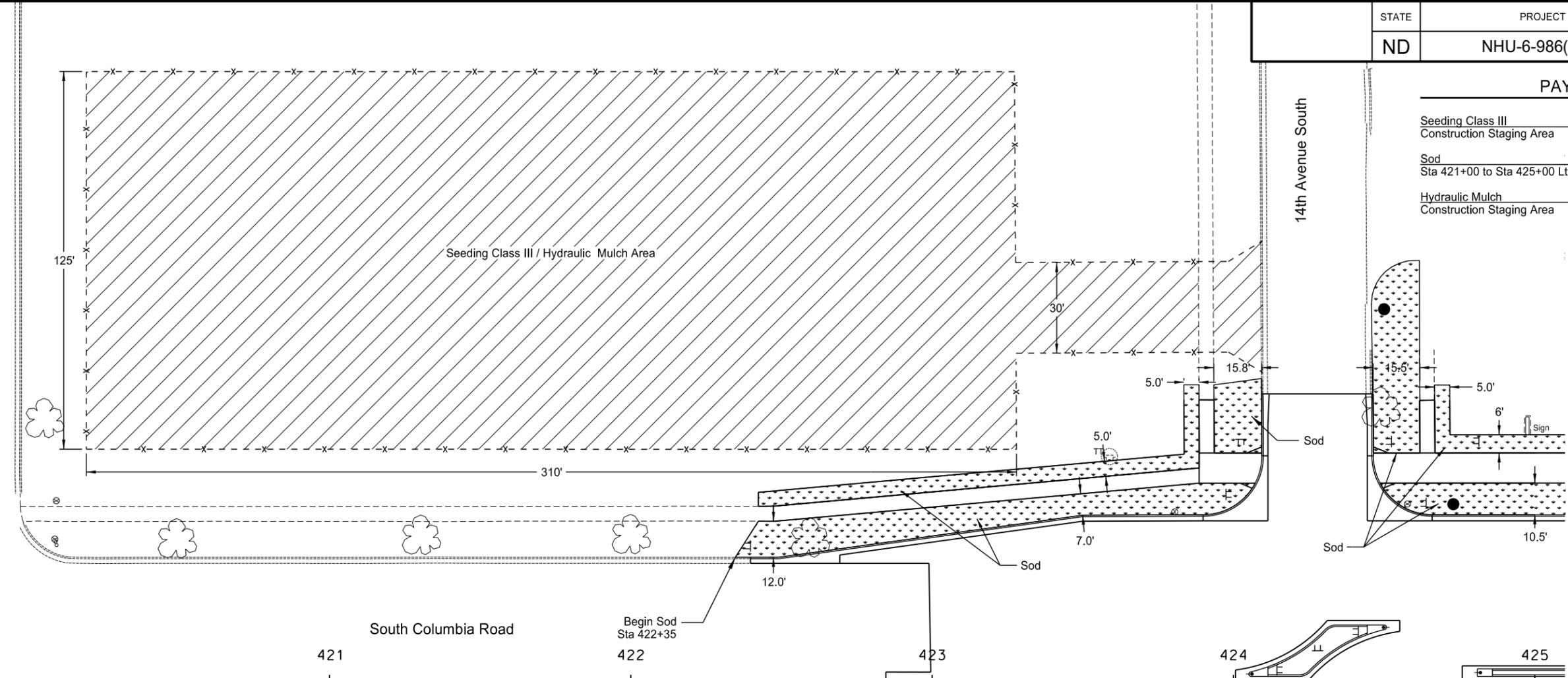
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Temporary Sediment and Erosion Control
Flow Delineation and Inlet Protection

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	1

PAY ITEMS	
Seeding Class III Construction Staging Area	0.93 ACRE
Sod Sta 421+00 to Sta 425+00 Lt & Rt	1164 SY
Hydraulic Mulch Construction Staging Area	0.93 ACRE



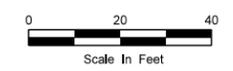
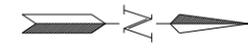
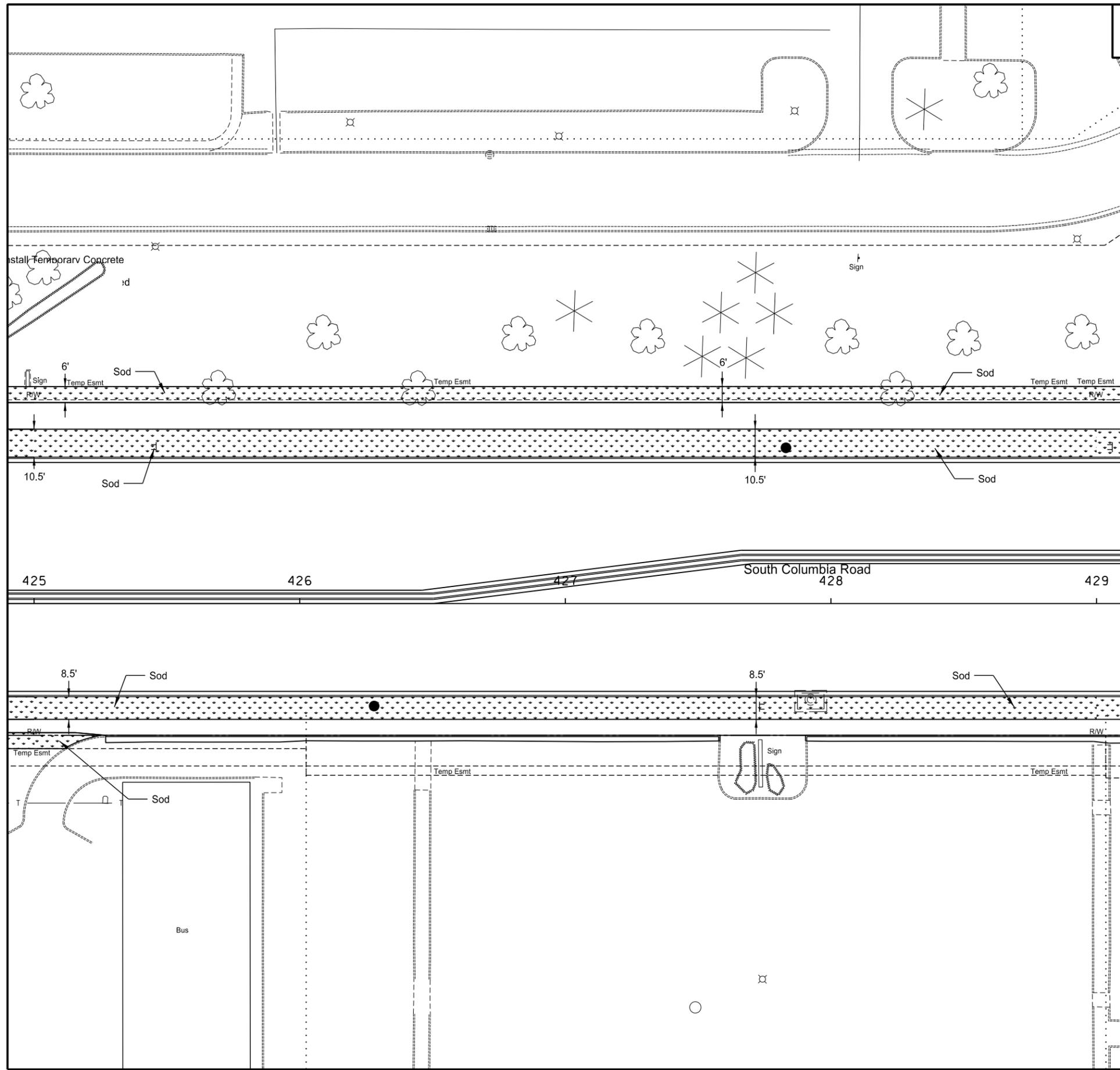
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Permanent Sediment and Erosion Control Seeding and Sod Layout Sta 420+00 to 425+00
Reconstruction of South Columbia Road 14th Avenue South to 11th Avenue South Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	2

PAY ITEMS

Sod
Sta 425+00 to Sta 429+00 Lt & Rt 1123 SY



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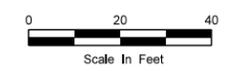
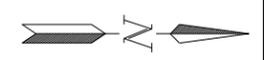
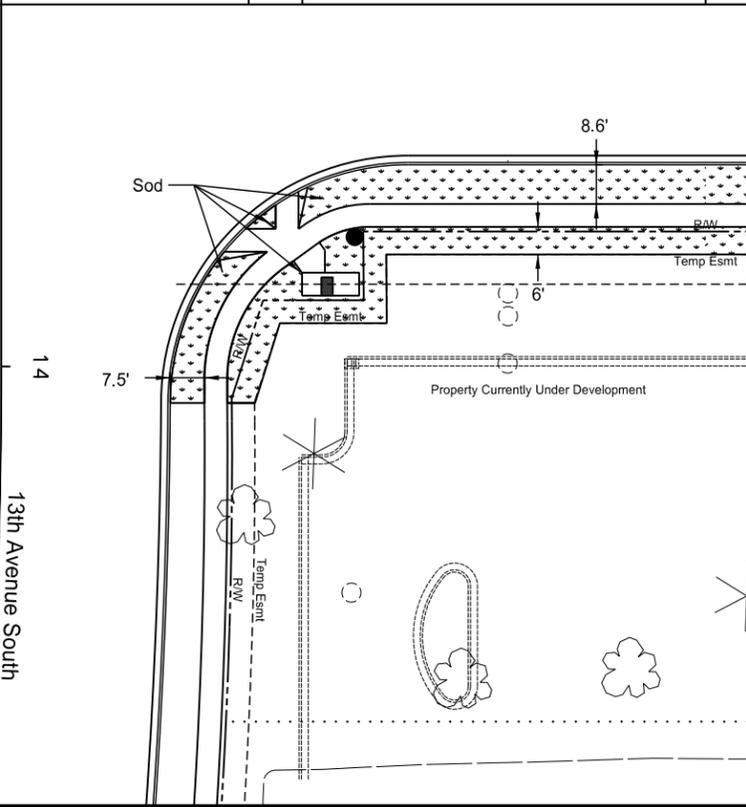
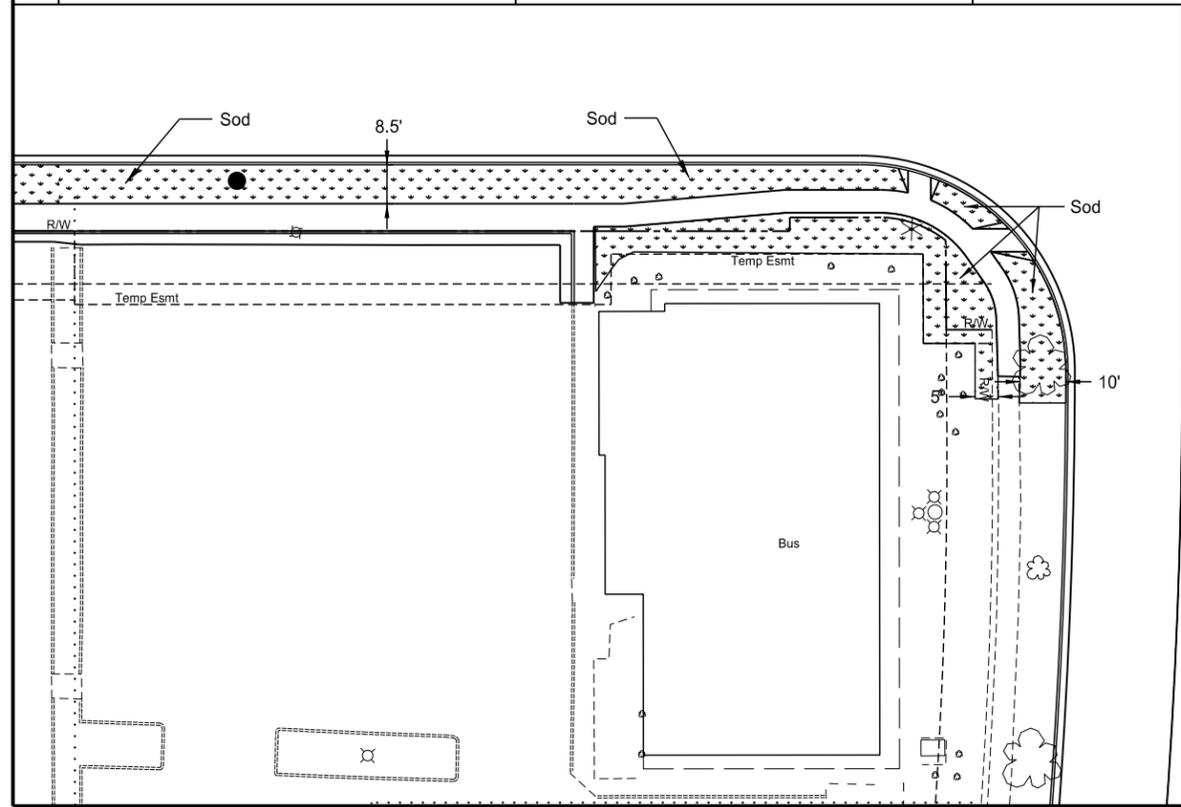
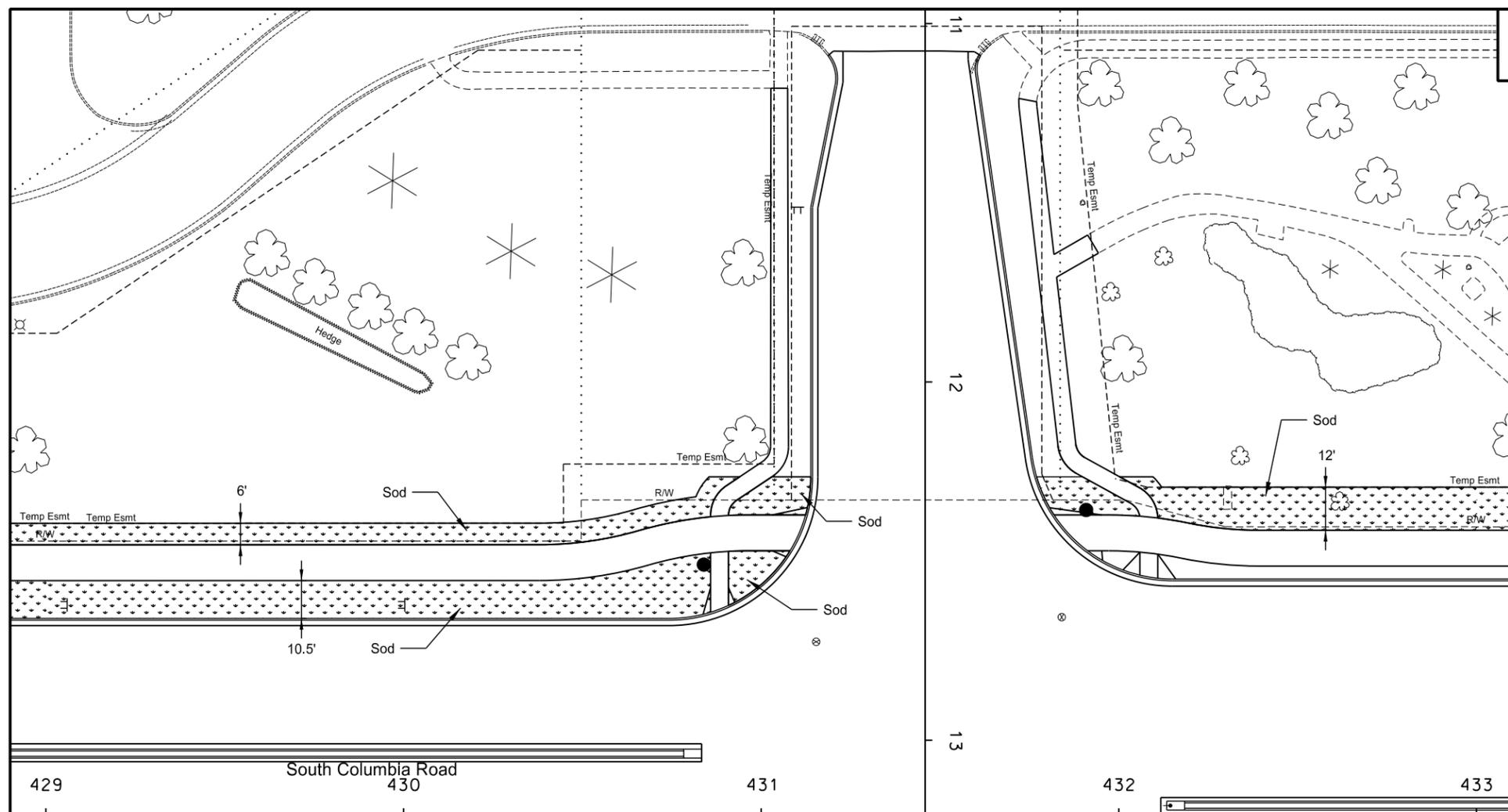
Permanent Sediment and Erosion Control
Sod Layout
Sta 425+00 to 429+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	3

PAY ITEMS

Sod	
Sta 429+00 to Sta 433+00 Lt & Rt	1068 SY



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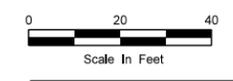
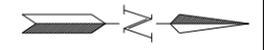
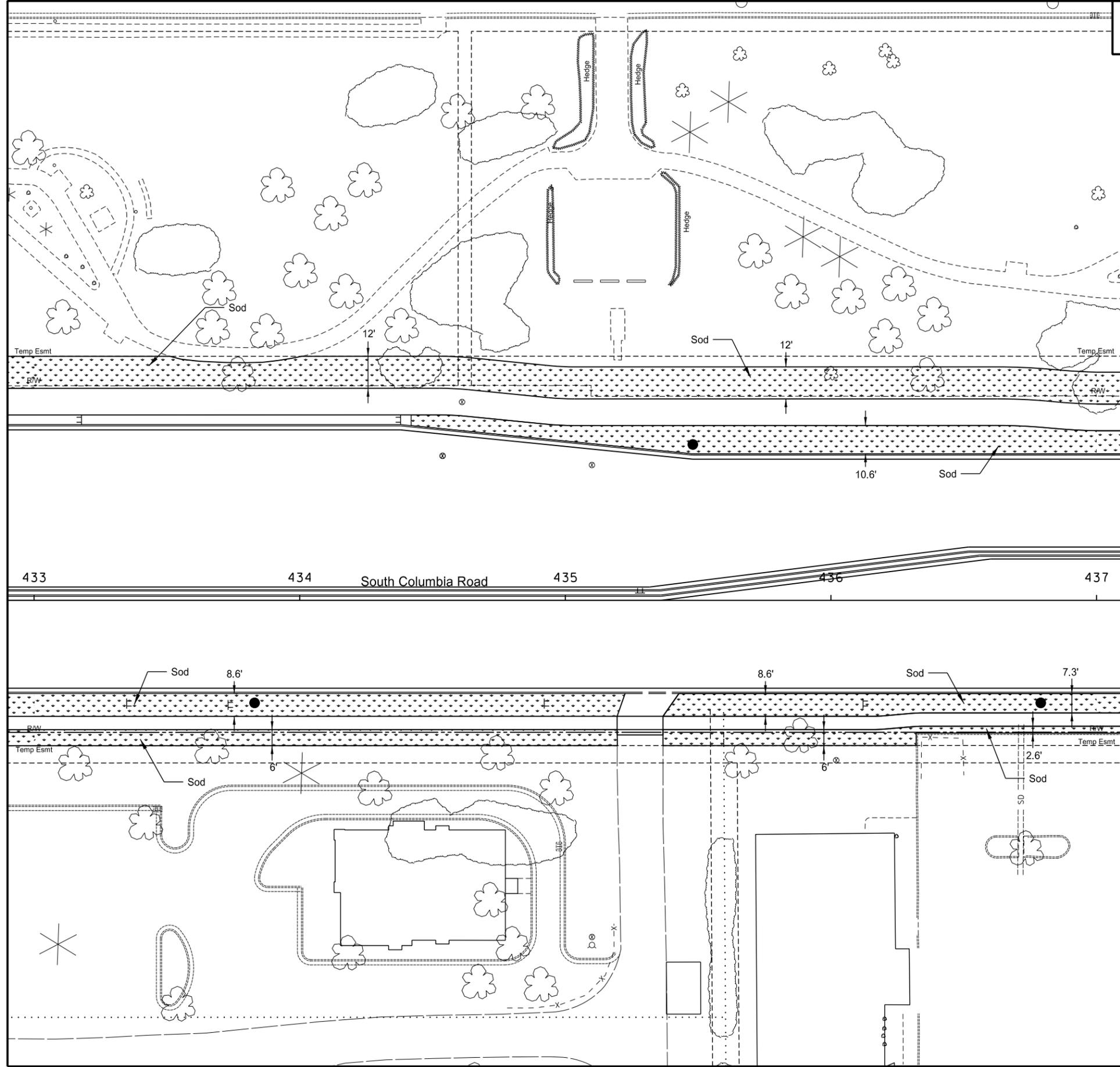
Permanent Sediment and Erosion Control Sod Layout
 Sta 429+00 to 433+00

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	4

PAY ITEMS

Sod
Sta 433+00 to Sta 437+00 Lt & Rt 1369 SY



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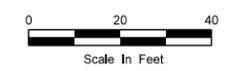
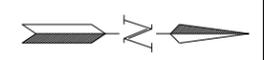
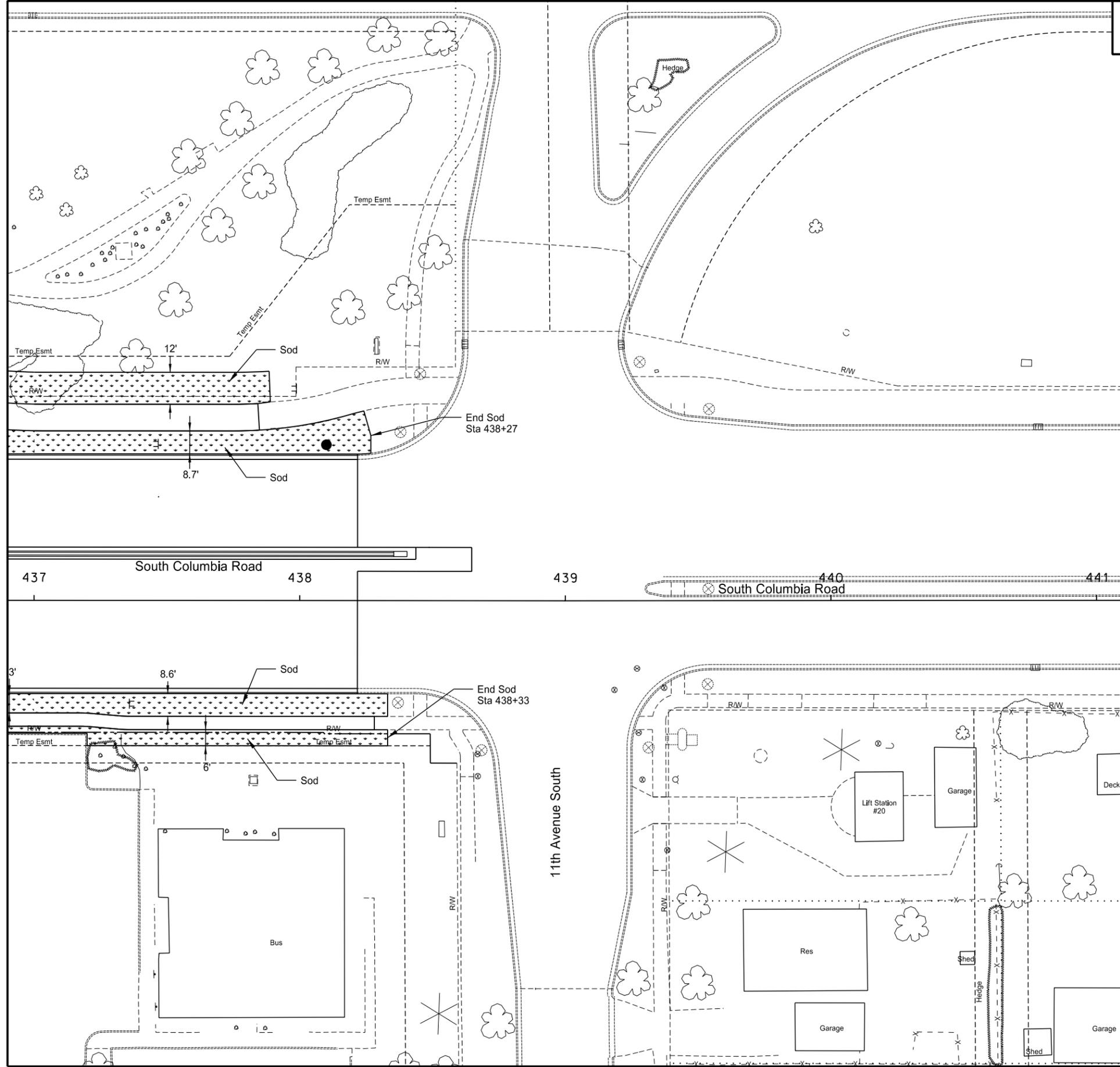
**Permanent Sediment and Erosion Control
Sod Layout
Sta 433+00 to 437+00**

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	5

PAY ITEMS

Sod
Sta 437+00 to Sta 441+00 Lt & Rt 459 SY



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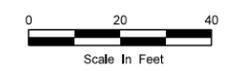
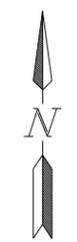
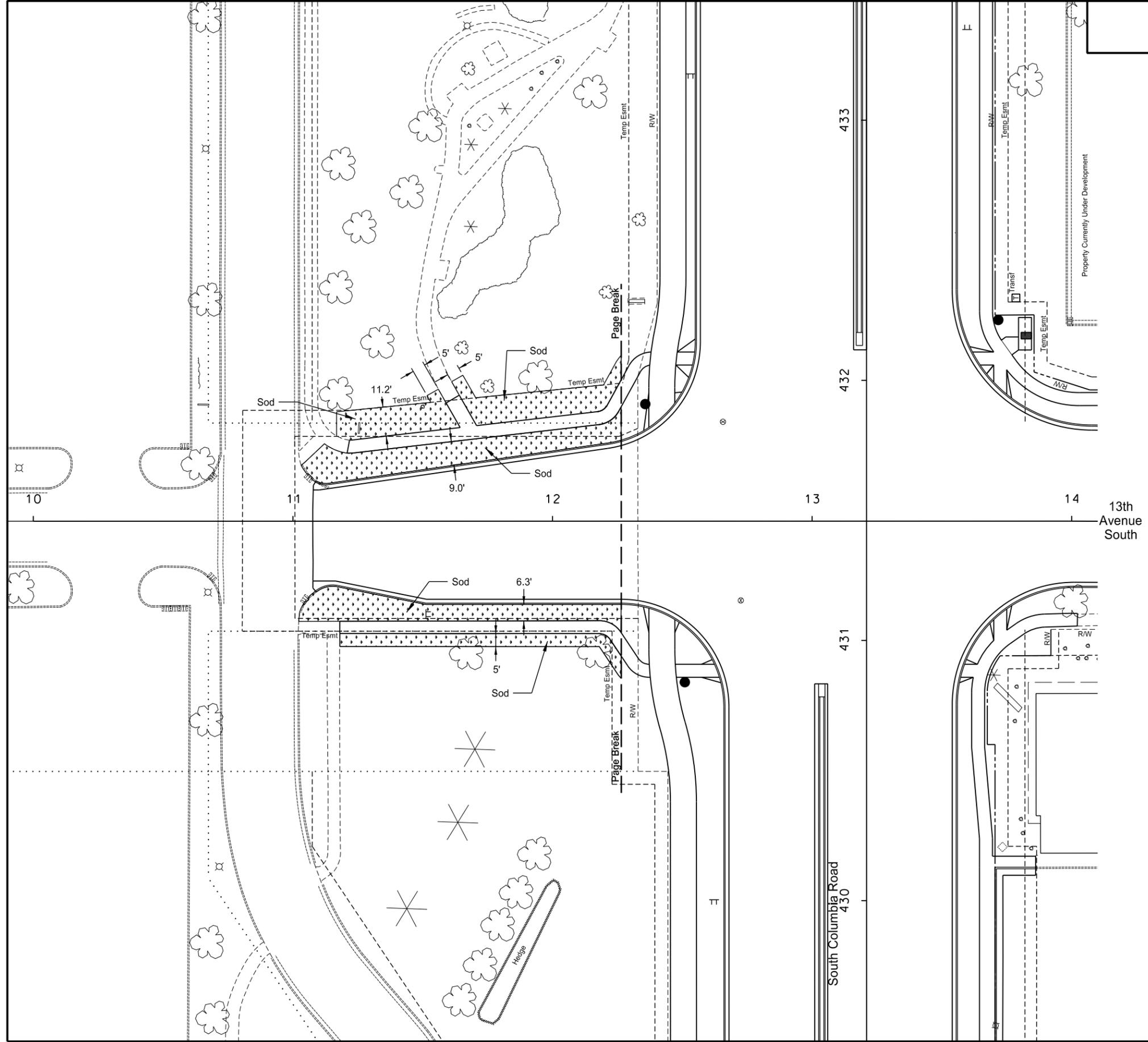
Permanent Sediment and Erosion Control Sod Layout
Sta 437+00 to 441+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	6

PAY ITEMS

Sod	
Sta 11+00 to Sta 12+26.48 Lt & Rt	428 SY



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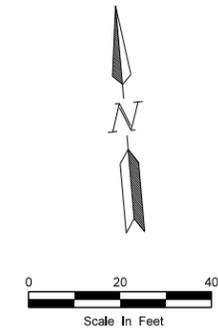
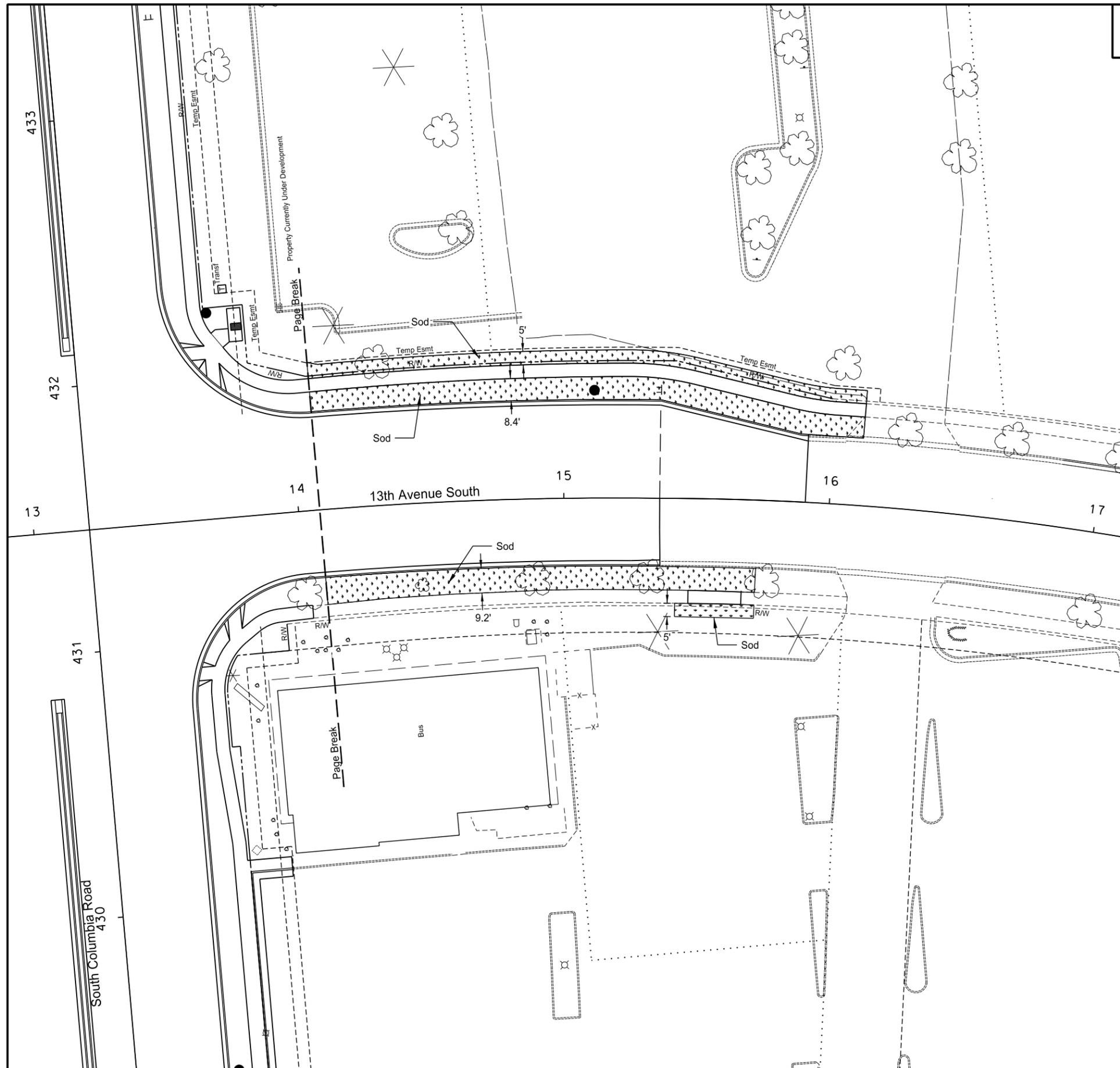
Permanent Sediment and Erosion Control Sod Layout
 13th Avenue South - Sta 11+00 to 12+26.48

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	77	7

PAY ITEMS

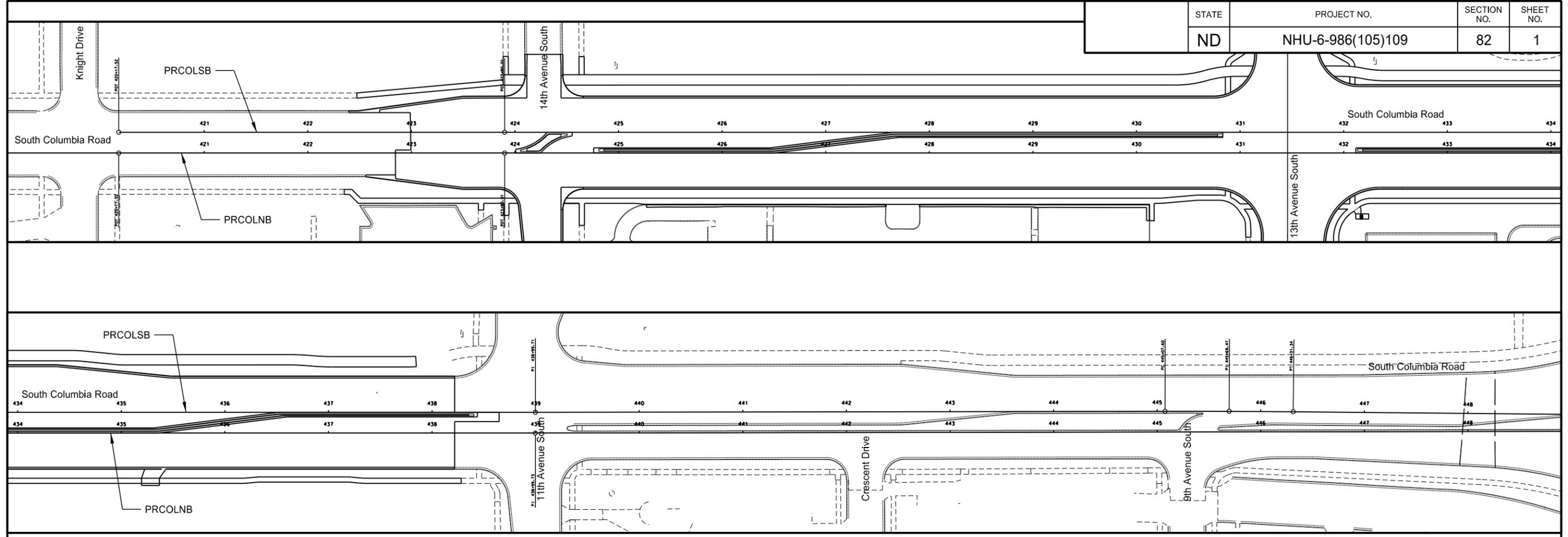
Sod
Sta 14+07.62 to Sta 16+85.50 Lt & Rt 493 SY



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Permanent Sediment and Erosion Control Sod Layout
13th Avenue South - Sta 14+07.62 to 16+85.50

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota



Northbound Alignment

Chain PRNBCOL contains: 7999 8005 8006 CUR 8007 8008

Beginning chain PRNBCOL description

=====
Point 7999 N 349,279.3685 E 2,810,343.3219 Sta 420+17.52
Course from 7999 to 8005 N 2° 05' 59.46" W Dist 372.4915
Point 8005 N 349,651.6099 E 2,810,329.6734 Sta 423+90.01
Course from 8005 to 8006 N 2° 05' 59.46" W Dist 1,509.7167
Point 8006 N 351,160.3128 E 2,810,274.3557 Sta 438+99.73
Course from 8006 to PC 8007 N 2° 11' 22.66" W Dist 1,256.4191
Curve Data - Curve 8007
P.I. Station 452+48.21 N 352,507.8134 E 2,810,222.8343
Delta = 0° 55' 14.06" (RT)
Degree = 0° 29' 59.87"
Tangent = 92.0661
Length = 184.1282
Radius = 11,460.0000
External = 0.3698
Long Chord = 184.1262
Mid. Ord. = 0.3698
P.C. Station 451+56.14 N 352,415.8146 E 2,810,226.3518
P.T. Station 453+40.27 N 352,599.8569 E 2,810,220.7953
C.C. N 352,853.6656 E 2,821,677.9843
Back = N 2° 11' 22.66" W
Ahead = N 1° 16' 08.59" W
Chord Bear = N 1° 43' 45.62" W
Course from PT 8007 to 8008 N 1° 16' 08.59" W Dist 446.7586
Point 8008 N 353,046.5060 E 2,810,210.9007 Sta 457+87.03
=====
Ending chain PRNBCOL description

Southbound Alignment

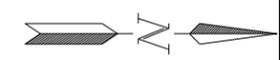
Chain PRSBCOL contains: 7998 8000 8001 CUR 8002 CUR 8003 8004

Beginning chain PRSBCOL description

=====
Point 7998 N 349,278.6357 E 2,810,323.3353 Sta 420+17.52
Course from 7998 to 8000 N 2° 05' 59.46" W Dist 372.4915
Point 8000 N 349,650.8771 E 2,810,309.6868 Sta 423+90.01
Course from 8000 to 8001 N 2° 05' 59.46" W Dist 1,509.7010
Point 8001 N 351,159.5643 E 2,810,254.3697 Sta 438+99.71
Course from 8001 to PC 8002 N 2° 11' 22.66" W Dist 607.8926
Curve Data - Curve 8002
P.I. Station 445+69.47 N 351,828.8360 E 2,810,228.7802
Delta = 0° 37' 07.07" (RT)
Degree = 0° 29' 59.87"
Tangent = 61.8682
Length = 123.7351
Radius = 11,460.0000
External = 0.1670
Long Chord = 123.7345
Mid. Ord. = 0.1670
P.C. Station 445+07.60 N 351,767.0130 E 2,810,231.1440
P.T. Station 446+31.34 N 351,890.6809 E 2,810,227.0841
C.C. N 352,204.8640 E 2,821,682.7765
Back = N 2° 11' 22.66" W
Ahead = N 1° 34' 15.59" W
Chord Bear = N 1° 52' 49.12" W
Course from PT 8002 to PC 8003 N 1° 34' 15.59" W Dist 366.2480

Curve Data - Curve 8003
P.I. Station 451+93.28 N 352,452.4074 E 2,810,211.6782
Delta = 1° 57' 23.62" (RT)
Degree = 0° 29' 59.87"
Tangent = 195.6897
Length = 391.3413
Radius = 11,460.0000
External = 1.6707
Long Chord = 391.3223
Mid. Ord. = 1.6704
P.C. Station 449+97.59 N 352,256.7913 E 2,810,217.0432
P.T. Station 453+88.93 N 352,648.0926 E 2,810,212.9951
C.C. N 352,570.9744 E 2,821,672.7356
Back = N 1° 34' 15.59" W
Ahead = N 0° 23' 08.04" E
Chord Bear = N 0° 35' 33.78" W
Course from PT 8003 to 8004 N 0° 23' 08.04" E Dist 198.4174
Point 8004 N 352,846.5055 E 2,810,214.3303 Sta 455+87.34
=====
Ending chain PRSBCOL description

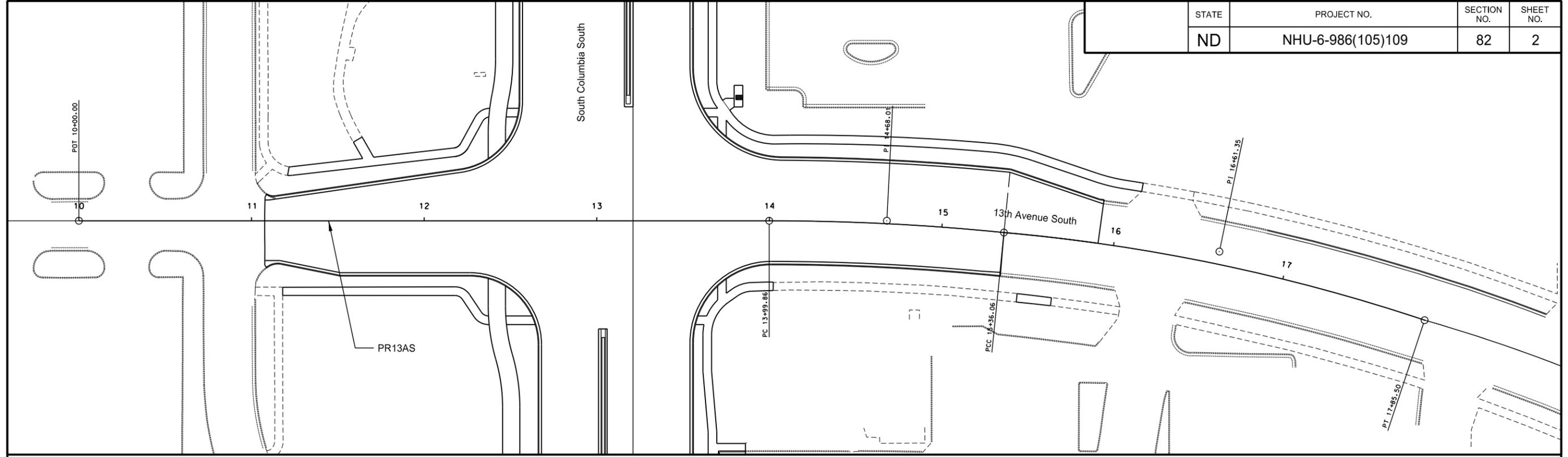
Stationing and Offset Based on Alignment PRCOLNB.



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Survey Data Layout
Mainline - Northbound and Southbound
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	82	2



13th Avenue South Alignment

Chain PR13AS contains: 8020 CUR PR13AS-1 CUR PR13AS-2

Beginning chain PR13AS description

Point 8020 N 350,395.2028 E 2,809,981.2179 Sta 10+00.00

Course from 8020 to PC PR13AS-1 N 87° 54' 00.54" E Dist 399.8570

Curve Data - Curve PR13AS-1

P.I. Station 14+68.01 N 350,412.3513 E 2,810,448.9173
Delta = 5° 43' 56.98" (RT)
Degree = 4° 12' 32.02"
Tangent = 68.1566
Length = 136.1995
Radius = 1,361.3024
External = 1.7051
Long Chord = 136.1427
Mid. Ord. = 1.7030
P.C. Station 13+99.86 N 350,409.8540 E 2,810,380.8064
P.T. Station 15+36.06 N 350,408.0330 E 2,810,516.9370
C.C. N 349,049.4657 E 2,810,430.6861
Back = N 87° 54' 00.54" E
Ahead = S 86° 22' 02.48" E
Chord Bear = S 89° 14' 00.97" E

Curve Data - Curve PR13AS-2

P.I. Station 16+61.35 N 350,401.5910 E 2,810,642.0659
Delta = 13° 24' 24.82" (RT)
Degree = 5° 22' 28.89"
Tangent = 125.2947
Length = 249.4449
Radius = 1,066.0292
External = 7.3379
Long Chord = 248.8762
Mid. Ord. = 7.2878
P.C. Station 15+36.06 N 350,408.0330 E 2,810,516.9370
P.T. Station 17+85.50 N 350,366.3116 E 2,810,762.2912
C.C. N 349,343.4137 E 2,810,462.1277
Back = S 87° 03' 10.33" E
Ahead = S 73° 38' 45.51" E
Chord Bear = S 80° 20' 57.92" E

Ending chain PR13AS description

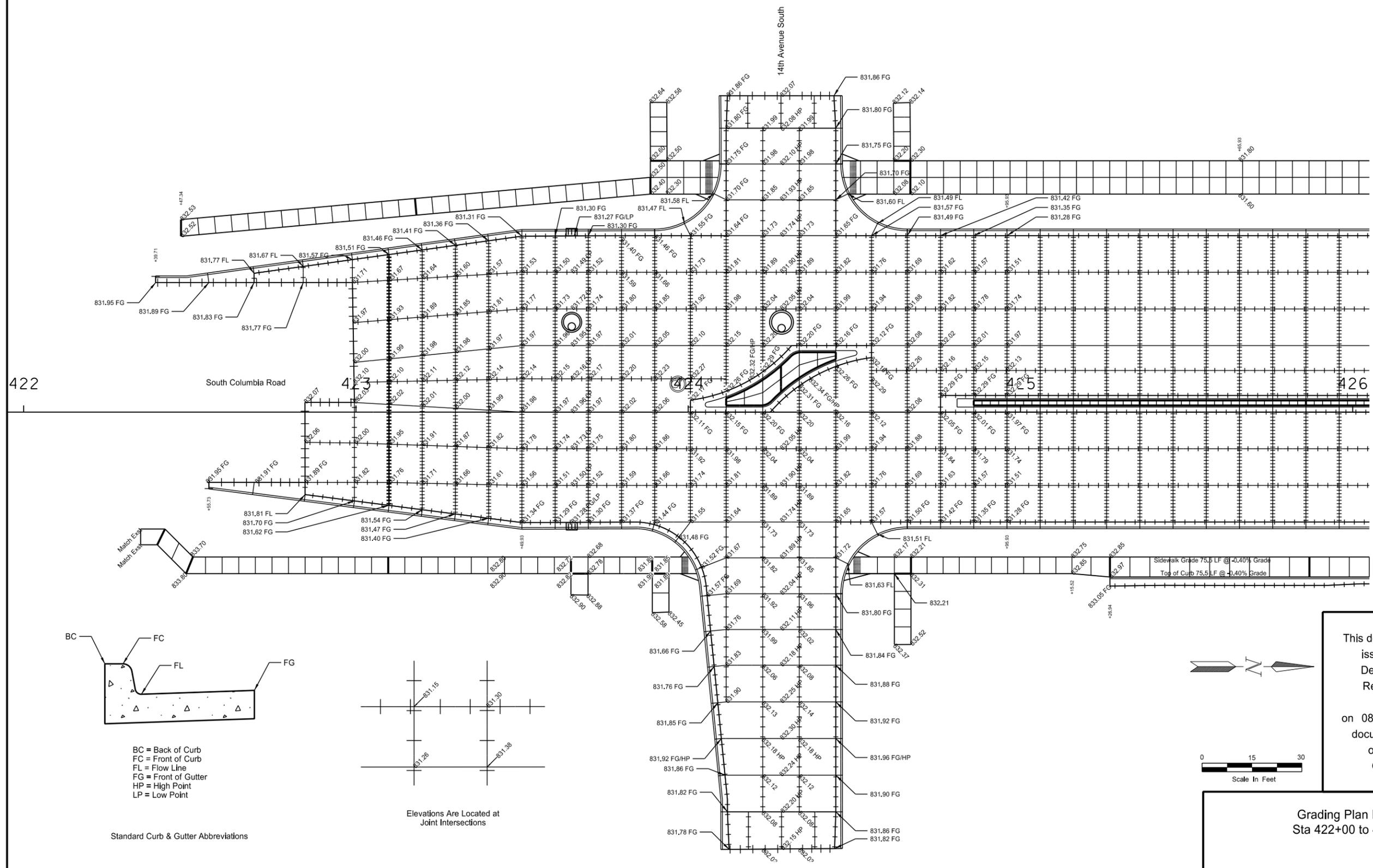
Stationing and Offset Based on Alignment PR13AS, Where Shown on the Plans.



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Survey Data Layout
13th Avenue South
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	1

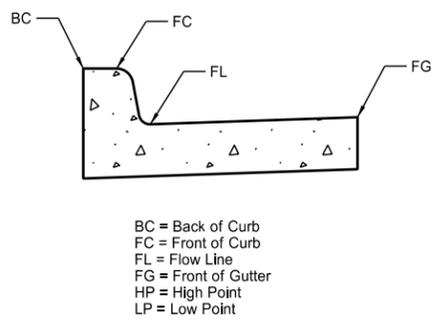


422

South Columbia Road

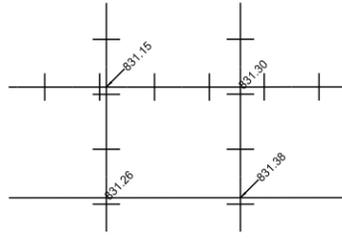
14th Avenue South

426

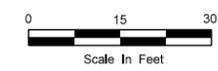


BC = Back of Curb
 FC = Front of Curb
 FL = Flow Line
 FG = Front of Gutter
 HP = High Point
 LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at Joint Intersections



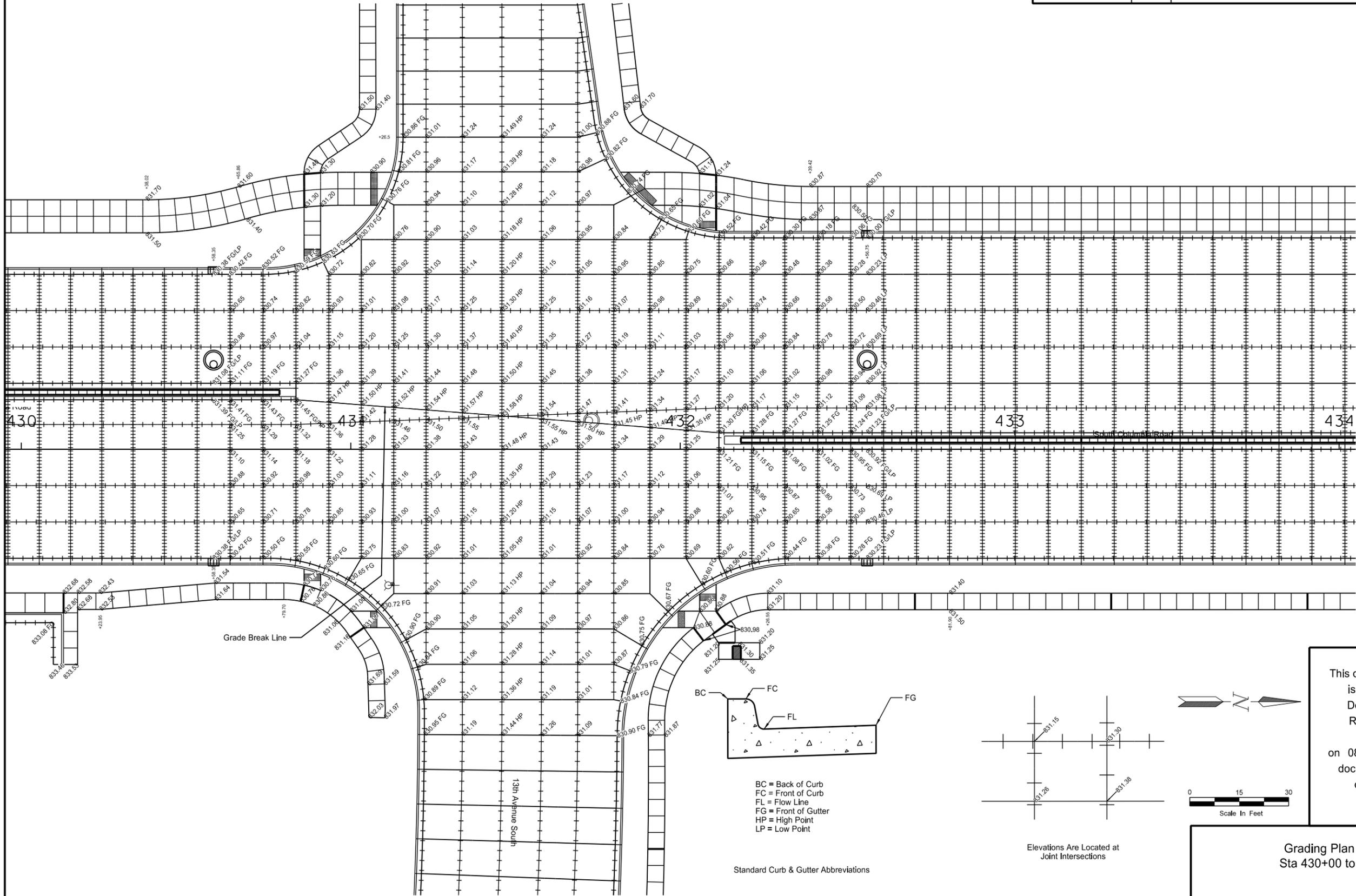
Scale In Feet

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Grading Plan Layout
 Sta 422+00 to 426+00

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	3

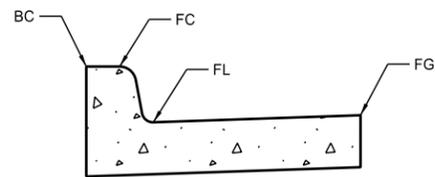
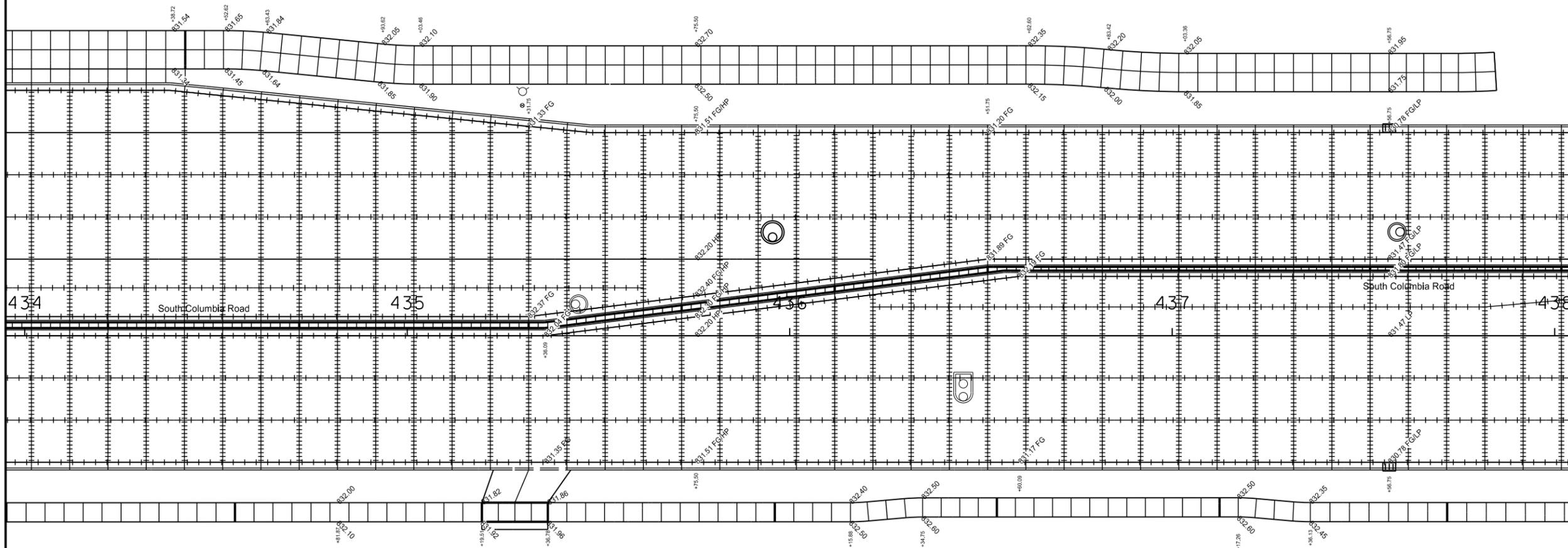


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Grading Plan Layout
Sta 430+00 to 434+00

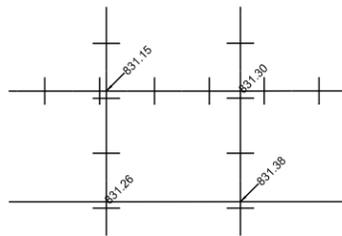
Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	4

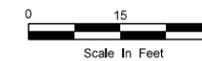
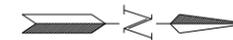


BC = Back of Curb
 FC = Front of Curb
 FL = Flow Line
 FG = Front of Gutter
 HP = High Point
 LP = Low Point

Standard Curb & Gutter Abbreviations



Elevations Are Located at Joint Intersections

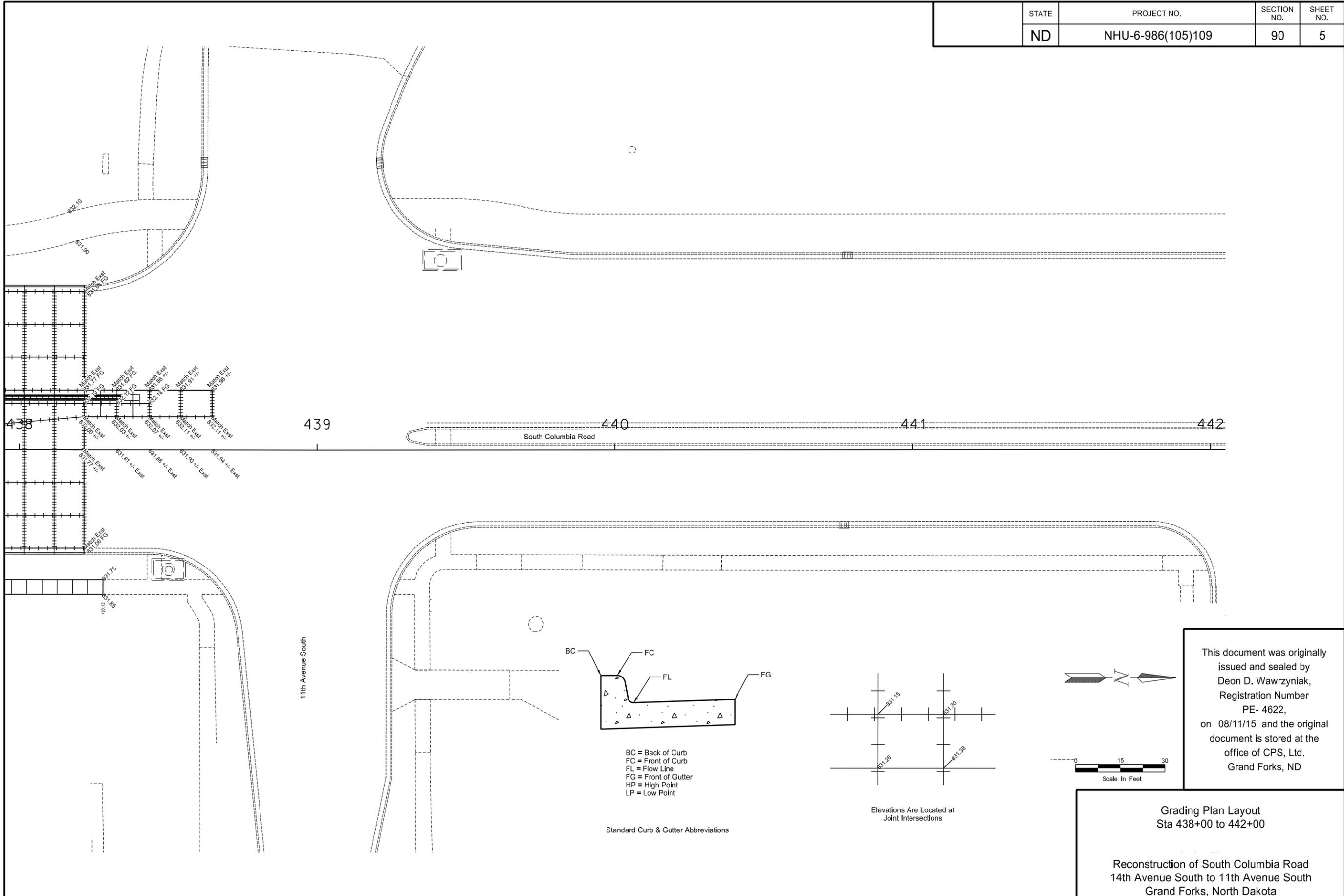


Scale In Feet

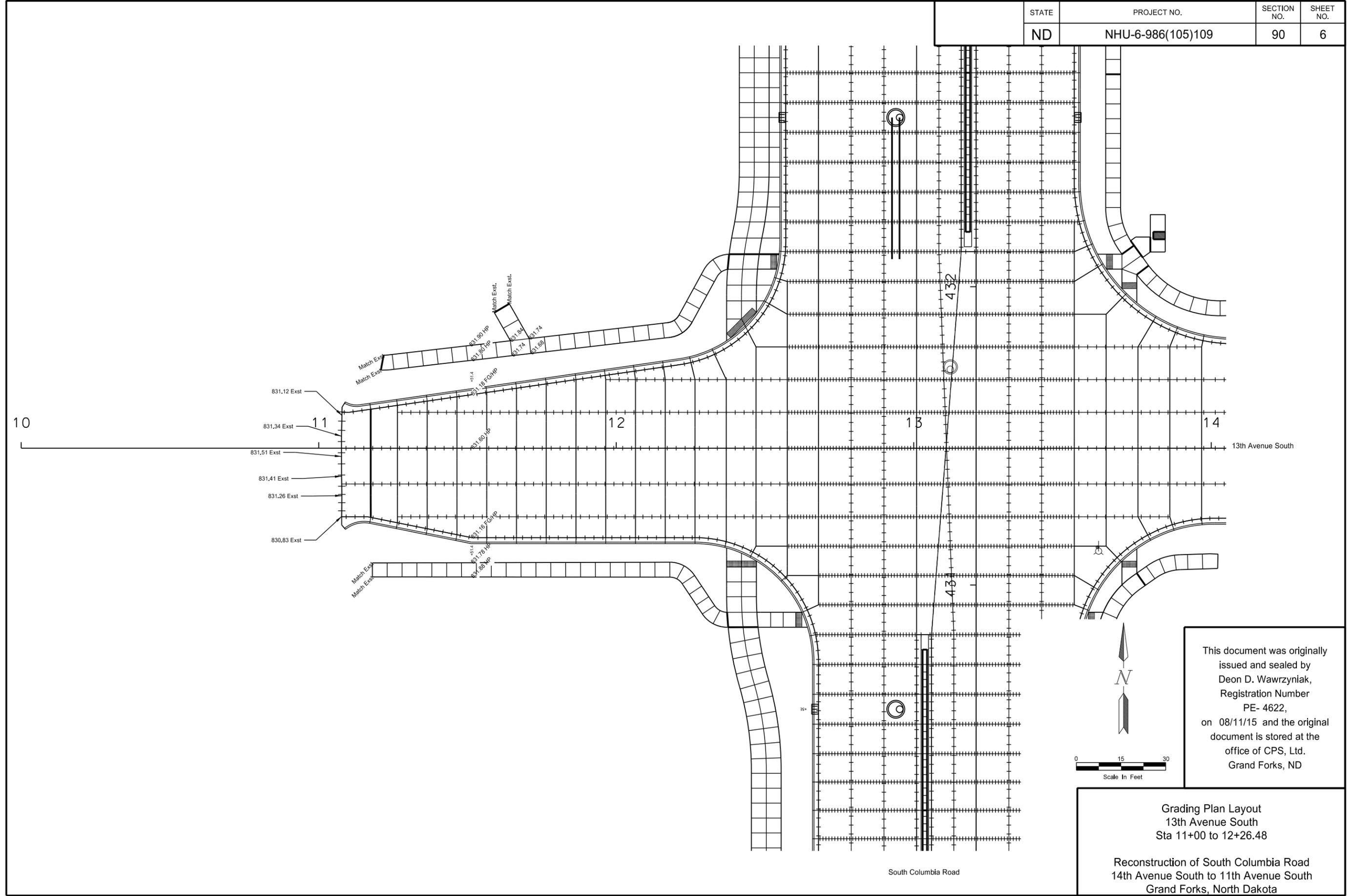
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Grading Plan Layout
 Sta 434+00 to 438+00
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	5



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	6

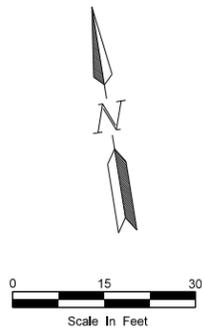
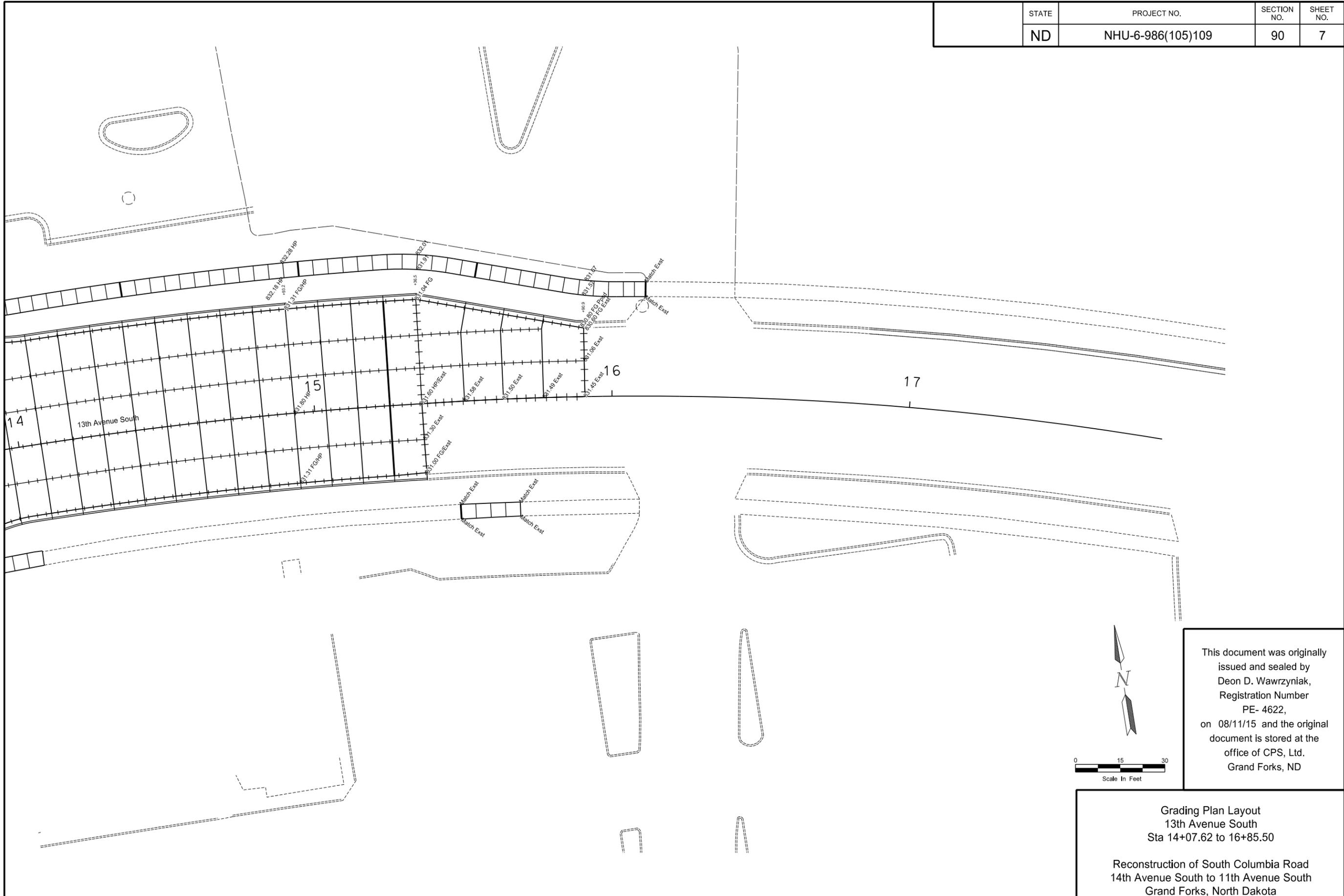


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Grading Plan Layout
 13th Avenue South
 Sta 11+00 to 12+26.48

Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	7

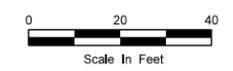
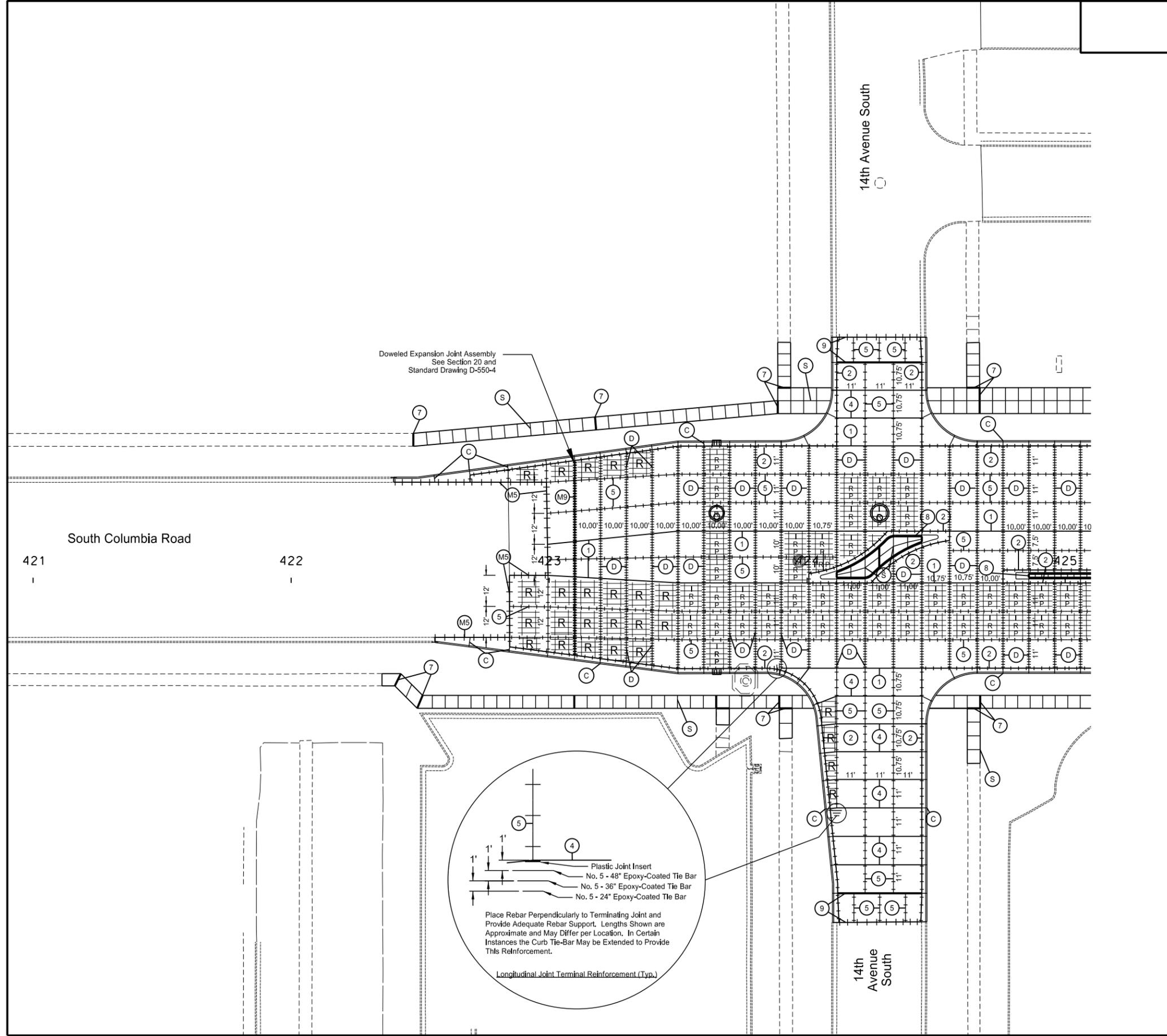


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Grading Plan Layout
 13th Avenue South
 Sta 14+07.62 to 16+85.50
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	8

Key	Qty	Description
①	329 LF	Type 1 Joint
②	832 LF	Curb & Gutter Joint
④	417 LF	Type 4 Joint
⑤	1386 LF	Type 3 or Type 5 Joint
Ⓜ5	168 LF	Modified Type 5 Joint
⑦	76 LF	Type 7 Joint
⑧	116 LF	Type 8 Joint
⑨	66 LF	Type 9 Joint
Ⓜ9	75 LF	Modified Type 9 Joint (Doweled Expansion Joint Assembly)
Ⓒ	158 LF	Curb Contraction Joint
Ⓓ	1473 LF	Contraction Joint Dowel Assembly
Ⓔ	633 LF	Sidewalk/Bikeway/Median Sawcut
R		Reinforced Panels
I R P		Individually Reinforced Panels
12'		Panel Dimension



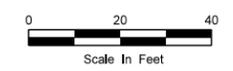
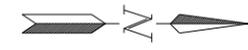
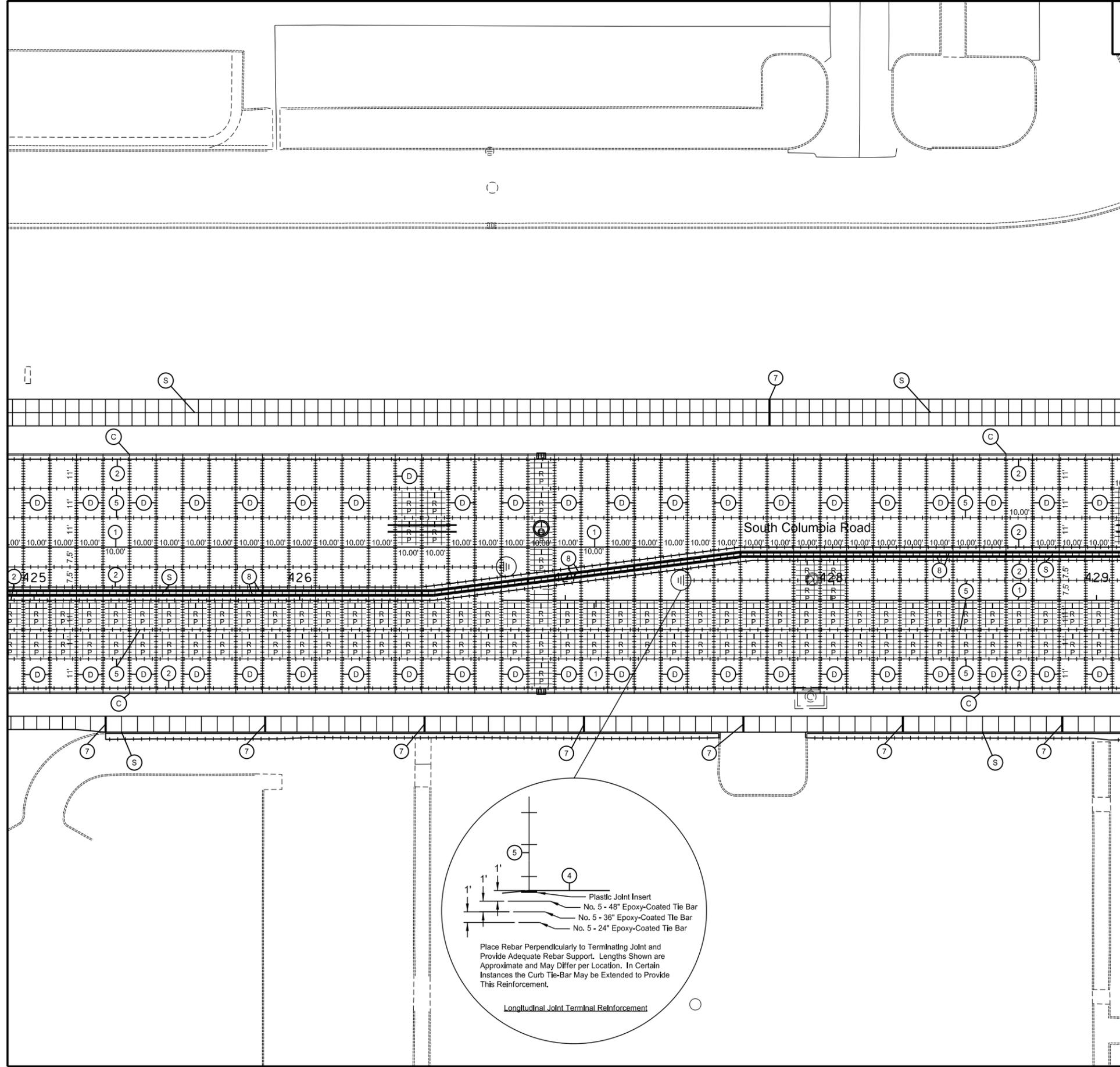
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Joint Layout
Sta 421+00 to 425+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	9

Key	Qty	Description
①	460 LF	Type 1 Joint
②	1936 LF	Curb & Gutter Joint
④	0 LF	Type 4 Joint
⑤	1930 LF	Type 3 or Type 5 Joint
Ⓜ5	0 LF	Modified Type 5 Joint
⑦	46 LF	Type 7 Joint
⑧	814 LF	Type 8 Joint
⑨	0 LF	Type 9 Joint
Ⓒ	306 LF	Curb Contraction Joint
Ⓓ	3233 LF	Contraction Joint Dowel Assembly
Ⓔ	1803 LF	Sidewalk/Bikeway/Median Sawcut
		Reinforced Panels
		Individually Reinforced Panels
		Panel Dimension



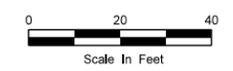
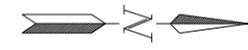
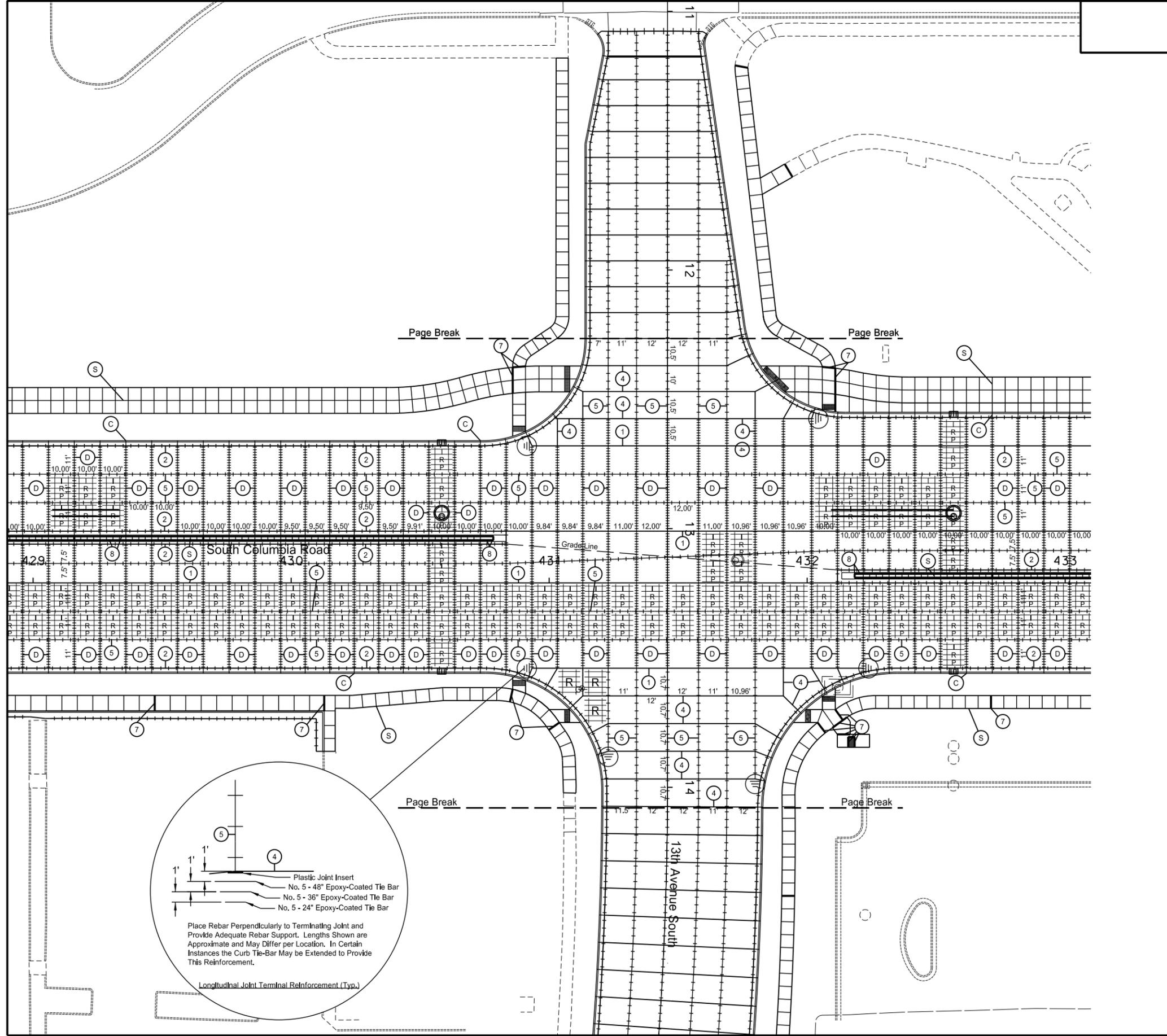
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Joint Layout
Sta 425+00 to 429+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	10

Key	Qty	Description
①	870 LF	Type 1 Joint
②	1454 LF	Curb & Gutter Joint
④	729 LF	Type 4 Joint
⑤	2446 LF	Type 3 or Type 5 Joint
Ⓜ5	0 LF	Modified Type 5 Joint
⑦	101 LF	Type 7 Joint
⑧	529 LF	Type 8 Joint
⑨	0 LF	Type 9 Joint
Ⓒ	259 LF	Curb Contraction Joint
Ⓓ	3411 LF	Contraction Joint Dowel Assembly
Ⓔ	1637 LF	Sidewalk/Bikeway/Median Sawcut
		Reinforced Panels
		Individually Reinforced Panels
12'		Panel Dimension



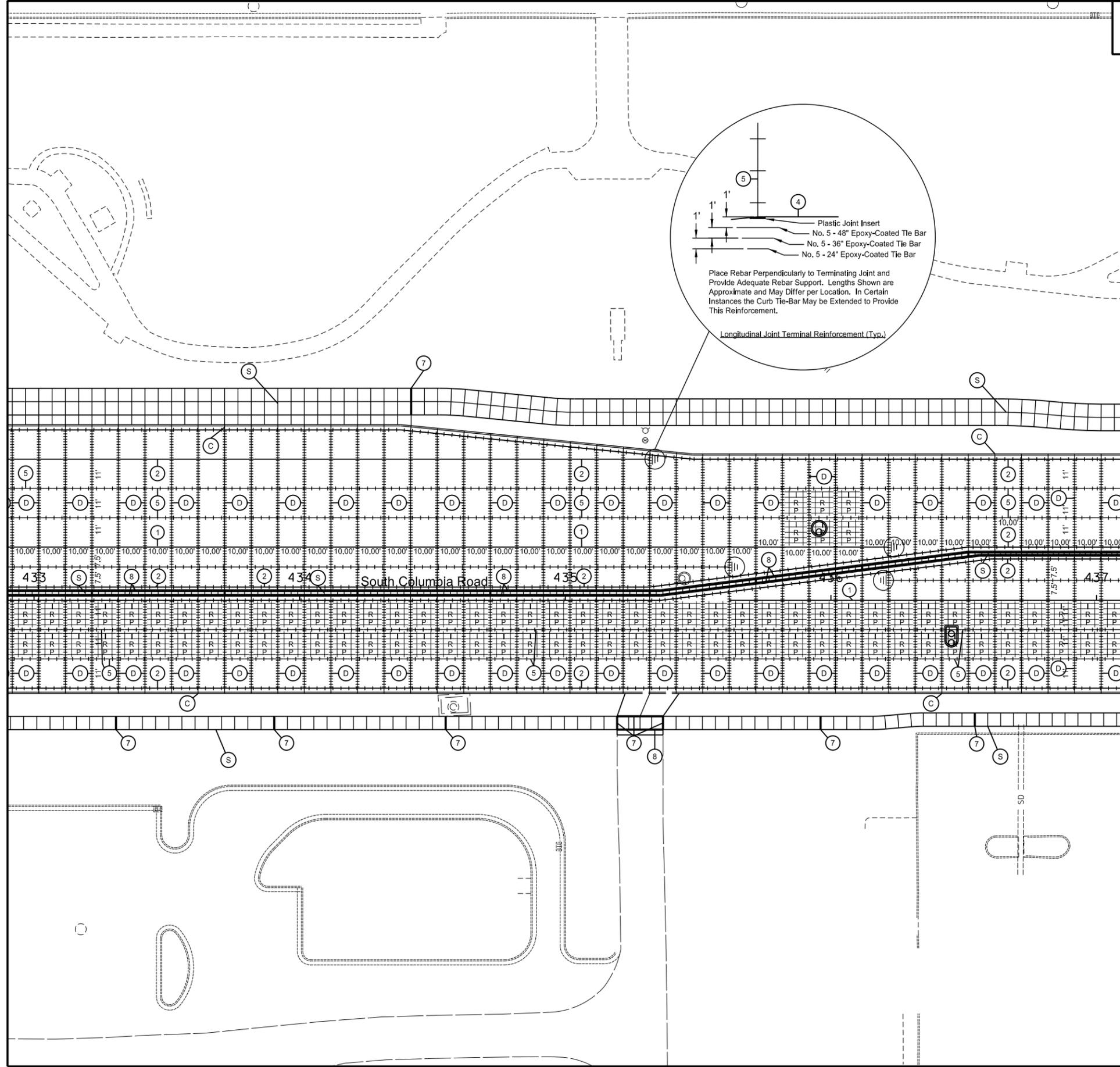
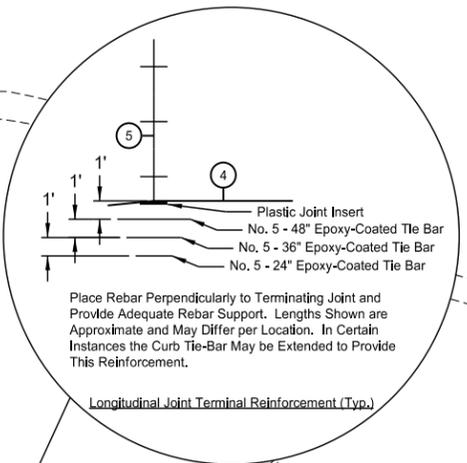
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Joint Layout
 Sta 429+00 to 433+00
 O/s 94.5 Lt to 87.0 Rt

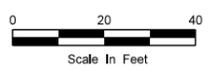
Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	11

Key	Qty	Description
①	692 LF	Type 1 Joint
②	1602 LF	Curb & Gutter Joint
④	0 LF	Type 4 Joint
⑤	1940 LF	Type 3 or Type 5 Joint
Ⓜ5	0 LF	Modified Type 5 Joint
⑦	62 LF	Type 7 Joint
⑧	831 LF	Type 8 Joint
⑨	0 LF	Type 9 Joint
Ⓒ	306 LF	Curb Contraction Joint
Ⓓ	3452 LF	Contraction Joint Dowel Assembly
Ⓔ	1926 LF	Sidewalk/Bikeway/Median Sawcut
Ⓡ		Reinforced Panels
Ⓢ		Individually Reinforced Panels
12'		Panel Dimension



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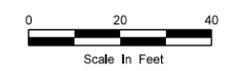
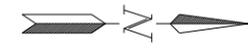
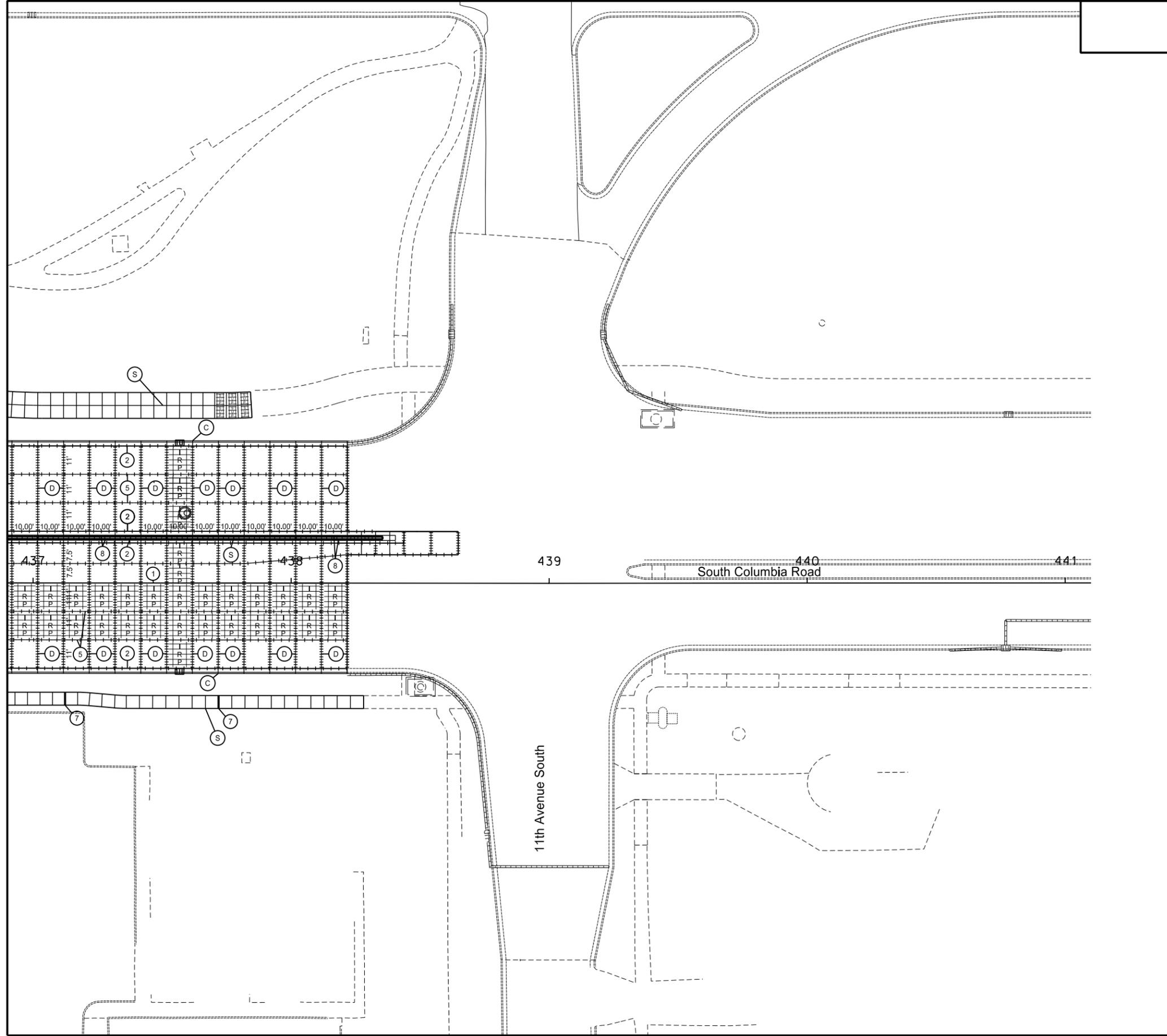


Joint Layout
Sta 433+00 to 437+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	12

Key	Qty	Description
①	154 LF	Type 1 Joint
②	509 LF	Curb & Gutter Joint
④	0 LF	Type 4 Joint
⑤	663 LF	Type 3 or Type 5 Joint
Ⓜ5	0 LF	Modified Type 5 Joint
⑦	10 LF	Type 7 Joint
⑧	275 LF	Type 8 Joint
⑨	0 LF	Type 9 Joint
Ⓒ	101 LF	Curb Contraction Joint
Ⓓ	1091 LF	Contraction Joint Dowel Assembly
Ⓔ	459 LF	Sidewalk/Bikeway/Median Sawcut
		Reinforced Panels
		Individually Reinforced Panels
12'		Panel Dimension
		Shared Use Path Reinforced Panels



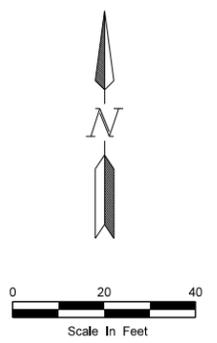
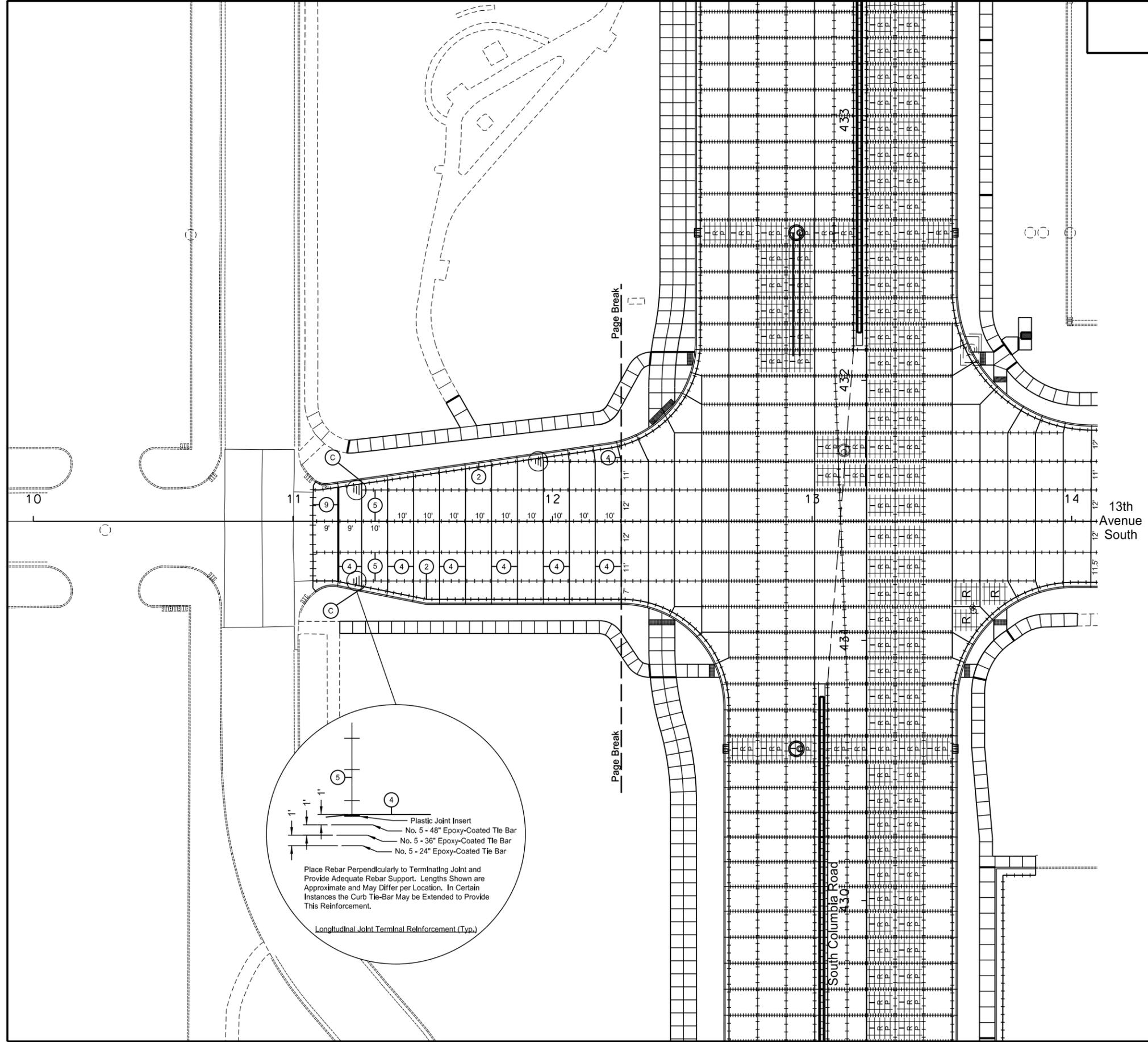
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Joint Layout
Sta 437+00 to 441+00

Reconstruction of South Columbia Road
14th Avenue South to 11th Avenue South
Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	13

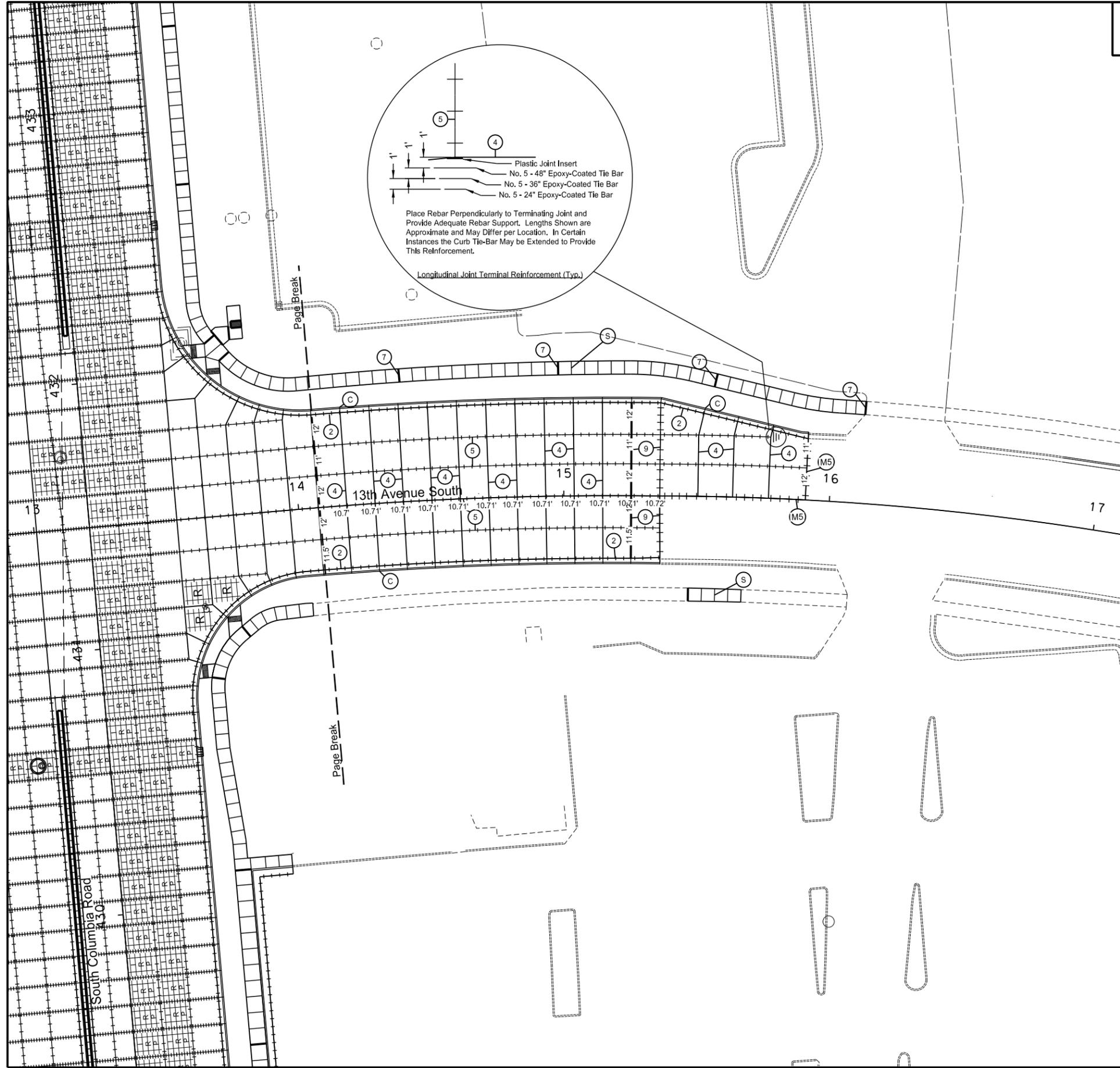
Key	Qty	Description
①	0 LF	Type 1 Joint
②	239 LF	Curb & Gutter Joint
④	500 LF	Type 4 Joint
⑤	499 LF	Type 3 or Type 5 Joint
Ⓜ5	0 LF	Modified Type 5 Joint
⑦	11 LF	Type 7 Joint
⑧	0 LF	Type 8 Joint
⑨	36 LF	Type 9 Joint
Ⓒ	46 LF	Curb Contraction Joint
Ⓓ	0 LF	Contraction Joint Dowel Assembly
Ⓔ	230 LF	Sidewalk/Bikeway/Median Sawcut
Ⓡ		Reinforced Panels
Ⓢ		Individually Reinforced Panels
12'		Panel Dimension



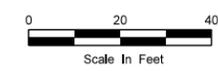
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Joint Layout
 13th Avenue South
 Sta 11+00 to 12+26.48
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NHU-6-986(105)109	90	14



Key	Qty	Description
①	0 LF	Type 1 Joint
②	315 LF	Curb & Gutter Joint
④	671 LF	Type 4 Joint
⑤	637 LF	Type 3 or Type 5 Joint
Ⓜ5	78 LF	Modified Type 5 Joint
⑦	25 LF	Type 7 Joint
⑧	0 LF	Type 8 Joint
⑨	59 LF	Type 9 Joint
Ⓒ	55 LF	Curb Contraction Joint
Ⓓ	0 LF	Contraction Joint Dowel Assembly
Ⓢ	209 LF	Sidewalk/Bikeway Sawcut
Ⓡ		Reinforced Panels
Ⓟ		Individually Reinforced Panels
12'		Panel Dimension



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Joint Layout
 13th Avenue South
 Sta 14+07.62 to 16+85.50
 Reconstruction of South Columbia Road
 14th Avenue South to 11th Avenue South
 Grand Forks, North Dakota