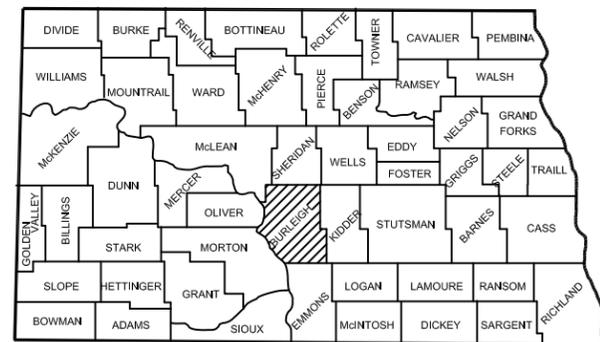


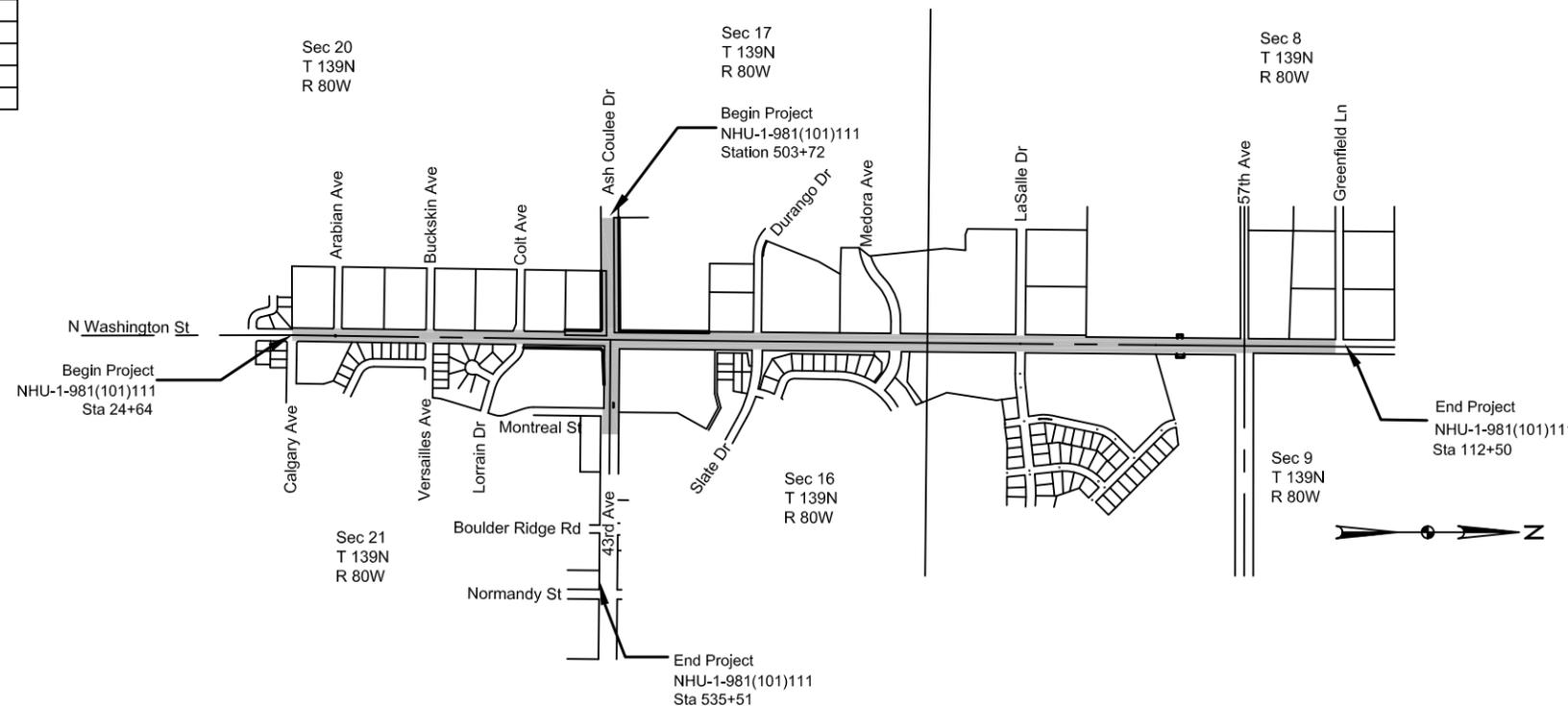
DESIGN DATA				
NORTH WASHINGTON STREET (CALGARY AVE TO 43RD AVE)				
TRAFFIC	AVERAGE DAILY			MAX HR
CURRENT 2012	PASS: 7960	TRUCKS: 160	TOTAL: 8120	812
FORECAST 2040	PASS: 26950	TRUCKS: 550	TOTAL: 27500	2750
Clear Zone Distance: 14'		Design Speed: 35 mph		
Minimum Sight Dist. for Stopping: 250'		Bridges: N/A		
Minimum Sight Dist. for Safe Passing: N/A		Sight Dist. for No Passing Zone: N/A		
Pavement Design Life 30 (years)				

DESIGN DATA				
NORTH WASHINGTON STREET (43RD AVE TO 57TH AVE)				
TRAFFIC	AVERAGE DAILY			MAX HR
CURRENT 2012	PASS: 3245	TRUCKS: 70	TOTAL: 3315	332
FORECAST 2040	PASS: 19800	TRUCKS: 400	TOTAL: 20200	2020
Clear Zone Distance: 14'		Design Speed: 40 mph		
Minimum Sight Dist. for Stopping: 305'		Bridges: HL-93		
Minimum Sight Dist. for Safe Passing: N/A		Sight Dist. for No Passing Zone: N/A		
Pavement Design Life 30 (years)				

DESIGN DATA				
ASH COULEE DR/43RD AVE				
TRAFFIC	AVERAGE DAILY			MAX HR
CURRENT 2012	PASS: 4120	TRUCKS: 85	TOTAL: 4205	420
FORECAST 2040	PASS: 14110	TRUCKS: 290	TOTAL: 14400	1440
Clear Zone Distance: 14'		Design Speed: 35 mph		
Minimum Sight Dist. for Stopping: 250'		Bridges: N/A		
Minimum Sight Dist. for Safe Passing: N/A		Sight Dist. for No Passing Zone: N/A		
Pavement Design Life 30 (years)				



STATE OF NORTH DAKOTA



# CITY OF BISMARCK

## NORTH WASHINGTON STREET

### NHU-1-981(101)111

### Calgary Ave to 57th Ave NW

JOB # 8

STATE	PROJECT NO.	PCN	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20196	1	1

Burleigh County, North Dakota  
 Grading, Aggregate Base Course, PCC Pavement, Hot Bituminous  
 Pavement, Curb & Gutter, Storm Sewer, Watermain, Reinforced Concrete Box  
 Extension, Lighting, Traffic Signals, Turn Lanes, Signing, Marking & 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.

DESCRIPTION	LENGTH OF PROJECT	
	NET MILES	GROSS MILES
North Washington Street	1.664	1.664
Ash Coulee/43rd Avenue	0.602	0.602
Total	2.266	2.266

DESIGNERS
Gabe Schell, PE
Brad Krogstad, PE
Chris Horner, PE
Dusty Kinnischtzke, PE
Josh Schroeder, PE



Basis of Survey  
 All coordinates are Burleigh County ground coordinates derived from the "North Dakota Coordinate System of 1983", NAD83 (CORS96), South Zone Combination factor (cf) = 0.9998515, international foot. All vertical control is NGVD29. All units are English.

APPROVAL OF CITY ENGINEER  
 I, MELVIN J. BULLINGER, P.E., CITY ENGINEER, FOR THE CITY OF BISMARCK, NORTH DAKOTA, HEREBY APPROVE THESE PLANS FOR NORTH WASHINGTON STREET, PROJECT NUMBER NHU-1-981(101)111 AS SHOWN ON THE ACCOMPANYING PLANS.

MELVIN J. BULLINGER /s/  
 MELVIN J. BULLINGER  
 CITY ENGINEER BISMARCK,  
 NORTH DAKOTA

DATE: 07/29/15

This document was originally issued and sealed by Melvin J. Bullinger Registration Number PE-2204, on 07/29/15 and the original document is stored at the City of Bismarck

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 NORTH DAKOTA.

TROY RIPPLINGER /s/  
 TROY RIPPLINGER  
 PROJECT MANAGER

DATE: 07/28/15

This document was originally issued and sealed by Troy Ripplinger Registration Number PE-5044, on 07/28/15 and the original document is stored at the City of Bismarck

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**LIST OF SPECIAL PROVISIONS (SP)**

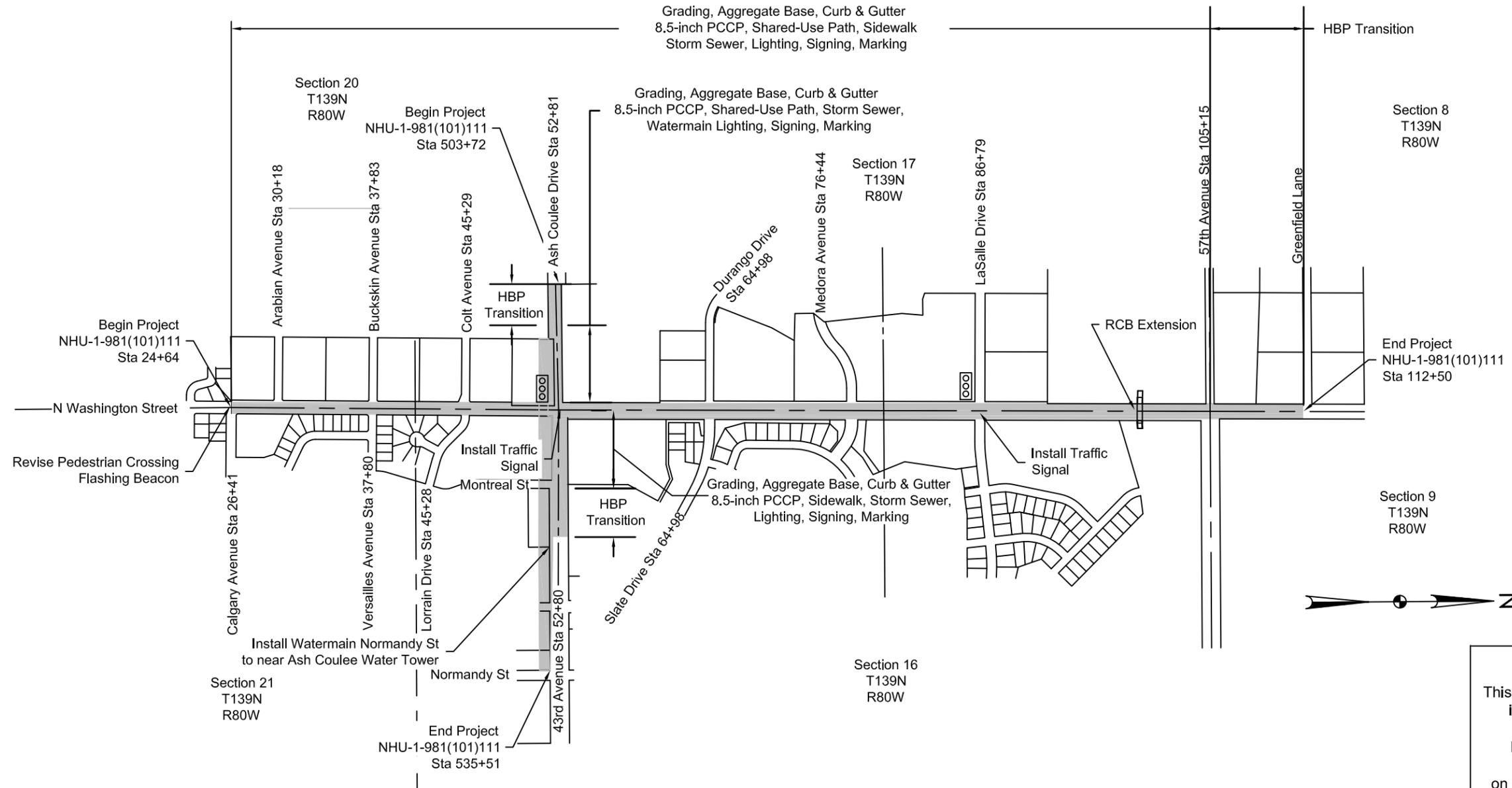
<b><u>SP #</u></b>	<b><u>Description</u></b>
SP 0003(14)	Temporary Erosion and Sediment Best Management Practices
SP 0004(14)	Federal Migratory Bird Treaty Act
SP 0011(14)	Interconnect Cable
SP 5005(14)	Permits and Environmental Considerations

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**LIST OF STANDARD DRAWINGS**

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D-255-2	Erosion and Siltation Control – Erosion Control Blanket Installation		
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		D-754-83	Object Markers - Culverts
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		D-770-3	Pull Box Details
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		D-772-2	Traffic Signal Standards
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		D-772-6	Span Wire Mounted Traffic Signals
		D-772-7	Flashing Beacon

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Rev'd.			
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Scope of Work	
DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014

**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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- 100-P01 WEEKLY PLANNING/REPORTING MEETING:
- A. Purpose of Weekly Meeting
- The Contractor shall organize the weekly meeting to coordinate the efforts between subcontractors, utilities, local authorities, and others.
- B. Contractor's Project Manager/Superintendent: Planning and Reporting.
- 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 within 24 hours of the meeting.
  - The Contractor will be required to provide a written schedule of the next week's work and a tentative schedule of the following week.
  - Reporting/Planning meeting will include discussion of problems encountered during the current week; information of interest to local authorities, subcontractors and utilities; and next week's prospective schedule.
  - The Contractor shall provide a suitable meeting room that has been approved by the Engineer. The cost of providing this meeting room shall be included in the price bid for other items.
  - The Contractor shall organize the weekly meeting contacting interested agencies. These agencies include, but are not limited to, the following:

City of Bismarck Engineering  
 City of Bismarck Public Works  
 FHWA  
 NDDOT-Bismarck District  
 City Police  
 Burleigh County Sheriff  
 Fire Department  
 Rural Fire Department  
 Ambulance service  
 Utilities  
 Subcontractors  
 Bis-Man Transit  
 Bismarck Public Schools

100-P02 PUBLIC RELATIONS COORDINATOR: The Contractor shall provide a public relations coordinator. The coordinator shall not be the project superintendent or construction foreman. The coordinator should be knowledgeable in construction operations, be able to develop effective media releases, possess written and verbal communication skills, and be able to organize productive meetings.

The public relations coordinator shall be responsible for the following:

- Organize, schedule, and conduct the weekly planning and reporting meetings (plan note 100-P01 Weekly Planning/Reporting Meeting).
- Notify the City of Bismarck, City Police, Burleigh County Sheriff, Highway Patrol, City and Rural Fire Department, emergency services, schools, and other pertinent City/County agencies of forthcoming construction activities in regard to street closures and traffic detour routes.

- Provide news releases and necessary drawings to the local media, including TV, radio, and newsprint prior to and during construction, to inform the public on construction activities, schedules, street closures, width or height restrictions to traffic, and traffic detour routes. News releases on construction activities shall be updated on a timely basis (minimum two-week update).
- News media interviews.
- The public relations coordinator's name, work address, and work telephone number shall be made available so that the coordinator may address public questions.
- Work directly with property owners and businesses affected by construction activities; including coordination with the adjacent properties for access to their properties. The coordinator must have sufficient knowledge and authority to resolve property owner and business concerns regarding scheduling, maintaining access, and construction operations.

100-P03 NOISE ORDINANCE: No construction activities shall occur between the hours of 11:00 p.m. to 7:00 a.m. unless the Contractor obtains written permission from the Engineer. The Contractor must request permission a minimum of 30 days prior to the work taking place.

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

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

100-P04 FENCES & UNDERGROUND SPRINKLERS: The Engineer shall attend to the removal of existing fences and underground sprinkler systems unless otherwise noted in the plans. The Contractor shall notify the Engineer, in writing, at least 30 days prior to the date the fences and sprinklers need to be removed. The Engineer shall then contact the landowners to have the fences and sprinklers removed. The Contractor shall be responsible for any fence or sprinklers damaged during grading operations. If underground sprinklers are encountered, the Contractor shall cap the line and salvage the sprinkler head to the landowner. This work shall be included in the cost of other items.

100-P05 EXISTING UTILITIES: The Contractor shall be advised that extensive utility coordination will be required on this project. The Contractor shall schedule, organize, provide a meeting room and conduct a utility coordination meeting a minimum of two (2) weeks prior to the pre-construction meeting.

The purpose of this meeting is to coordinate utility relocations required on the project which shall include discussion on project phasing, anticipated project schedule, timelines for relocation, etc. The Contractor shall be prepared to discuss these items and shall build into their schedule time for utility relocation as required by Section 105.03 and 108.03 of the Standard Specifications.

The invited attendees shall include at a minimum: The City of Bismarck Engineering & Public Works, NDDOT Bismarck District, Utility Companies and the Project Engineer.

107-P01 INSURANCE REQUIREMENTS: The Contractor shall include Brei Estates, LLLP (Temp Easement 6-3 Owner) as an additional insured for the commercial general liability and commercial automobile liability insurances.

200-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

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**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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201-P01 CLEARING AND GRUBBING: The Contractor is required to have a Commercial Arborist License from the City of Bismarck for tree pruning/trimming (if required) and for the removal of trees that are over 6-inches in diameter. Tree trimming/pruning and removal shall be included in the price bid for "Clearing and Grubbing".

Existing park benches (see Section 40) shall be removed and salvaged to the Bismarck Park District. Contact the Park District (701) 222-6455 for delivery location. Removing and salvaging the park benches shall be included in the price bid for "Clearing and Grubbing."

202-P01 SAW CONCRETE/SAW BITUMINOUS SURFACING: Pavement removal and saw cutting locations are shown on the removal layout sheets. Sawing will not be paid separately and all costs for saw cutting shall be included in the price bid for the respective removal item.

202-P02 REMOVAL OF PIPE ALL TYPES AND SIZES: Removal of pipes and end sections will not be paid for separately and will be included in the price bid for "Common Excavation-Type A"

202-P03 REMOVAL OF STRUCTURE: The Contractor shall be responsible for the removal of the existing building at Station 505+50 RT. The removal shall be in accordance with Section 202 of the Standard Specifications. The price bid shall include removing and disposing of the building and foundations; backfilling site; and disconnecting any utility service to the satisfaction of the utility company.

The contractor is required to obtain all required permits for the removal of the building. Permits include but are not limited to City of Bismarck Demolition Permit and ND Department of Health Asbestos Notification of Demolition and Renovation (SFN 17987). An Asbestos Survey Report has been performed for the structure and is available as supplemental information to the Contractor. The requirements of SP 0004(14) apply to the removal of structure.

The Contractor shall furnish copies of all forms submitted and approval letters received from the permitting agencies to the Engineer. All labor, equipment, and material necessary to complete the work shall be included in the price bid for "Removal of Structure".

203-P01 COMMON EXCAVATION-TYPE A: Excavation of the roadway subgrade shall be performed with a tracked excavator using a smooth cutting edge to minimize disturbance to underlying soils. Construction equipment will not be allowed to travel over the subgrade. Place reinforcement fabric Type R1 at the bottom of all subgrade excavations and backfill with salvaged base course. Place 9" of aggregate on the fabric prior to compacting, or as otherwise directed by the Engineer. Aggregate shall be spread with a tracked dozer. Do not scarify the bottom of the subgrade. Moisture and density controls for the salvaged base shall be compacted to 90% of the maximum dry density as determined by ND T-180. A transitional slope of approximately 20:1 must be constructed prior to entering and on exiting different paving sections to avoid differential heave.

All ditch grades, contours, and cross sections represent the finished grade (top of the topsoil). In areas where topsoil is to be placed, the grading shall be completed by cutting or filling earthwork to a point 6 inches below the final grade; with the topsoil bringing the grading template to finished grade elevations. This work shall be completed in the areas behind the curb and gutter, the inslopes, ditch bottoms, and backslopes. The earthwork shall be constructed to the lines and grades as shown on the plans.

Payment for the bid item "Common Excavation - Type A" shall be contract quantity. Any excess excavation must be disposed of by the Contractor off site. Copies of all agreements with property owners and governing agencies shall be furnished to the Engineer. All cost associated with disposal of the excess excavation shall be included in the price bid for "Common Excavation-Type A"

203-P02 EARTHWORK & CONSTRUCTION PHASING: The Contractor shall be advised that construction phasing will affect earthwork balance and haul distance. All costs associated with earthwork operations to permit construction phasing and constructing and removing the temporary roadway shall be included in the price bid for "Common Excavation-Type A."

203-P03 COMPACTION AND DENSITY CONTROL: Compaction control frequency for underground utility trenches are based on one (1) individual compaction test per 300 feet of trench per 30 inches of backfill and a minimum of one (1) test per service line, 2 feet below finish grades or where directed. The Contractor shall be responsible for the cost for the retesting of failing tests. The time, locations, depths, and frequency of compaction testing shall be at the discretion of the Engineer during construction.

251-P01 SEEDING CLASS III: The grass species shall be as follows:

Seeding Class III Seed Mixture	
Variety and Species of Seed	Pounds per Live Seed/Acre
LINCOLN Smooth Brome Grass (Rhizomatous Variety)	25
NORDAN Crested Wheat Grass	25
Total	50

302-P01 TRIMMING AGGREGATE BASE COURSE: Surface tolerance for the Aggregate Base Course shall comply with NDDOT Standard Specification 302.04 C.2 - Surface Tolerance Type C. Excess material removed from high points of the aggregate base course by the trimming operation shall be reincorporated into the aggregate base course.

302-P02 TRAFFIC SERVICE AGGREGATE: Traffic Service Aggregate shall be used as temporary roadway surfacing during construction. The Traffic Service Aggregate shall meet the requirements of Section 817 for Salvaged Base Course. Salvage Base Course containing concrete material will not be allowed for Traffic Service Aggregate.

302-P03 SUBCUT GRAVEL: Where the bottom of the trench uncovered at subgrade is unsuitable, and in the opinion of the Engineer cannot support the pipe, further depth and/or width shall be excavated and refilled to the pipe foundation grade with subcut gravel thoroughly compacted. The subcut gravel shall consist of granular material in accordance with the requirements of gradation shown in the following table:

Square Mesh Sieve Size	Percent By Weight Passing
2"	100%
No. 4	0-10%

Extra compensation shall not be allowed for extra excavation and gravel used for seepage and ground water control. This bid item is intended for storm drain, sanitary sewer and watermain only.

All costs for additional excavation, disposal of unsuitable material, labor, equipment and materials required to place subcut gravel shall be included in the price bid for "Subcut Gravel".

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**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: The hot mix asphalt supplied on the project shall be Superpave FAA 43.

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

704-P01 TRAFFIC CONTROL: Should the Contractor elect to proceed in a manner other than as proposed by the plans all costs associated with the modification of the proposed traffic control plan or other traffic control features as the revised plan may require will become the responsibility of the Contractor. The revised traffic control plans shall be approved by the Engineer.

704-P02 TRAFFIC CONTROL PHASING: See Section 100, "General Traffic Control Layout" for overview of construction phasing plan. The Contractor will be allowed to close North Washington Street between Calgary Avenue and 43<sup>rd</sup> Avenue and Ash Coulee Drive between the City of Bismarck water tower and North Washington Street from June 3, 2016 to August 22, 2016 when Bismarck Public Schools are recessed for the summer. The Contractor shall construct a temporary road between Calgary Avenue and Arabian Drive to facilitate two-way traffic during the road closure. The Contractor shall sign a detour as per the section 100 sheets. The Contractor shall maintain access across Colt Ave/Lorrain Dr or Buckskin Ave/Versailles Ave at all times.

- Phase 1 Work Areas: Maintain traffic on existing N Washington Street and Ash Coulee Dr/43<sup>rd</sup> Avenue. Pedestrian access on the existing trail does not need to be maintained. Construct temporary road along N Washington Street north of 43<sup>rd</sup> Avenue.
- Phase 2 Work Areas: Close Ash Coulee Dr and N Washington Street between Calgary Avenue and 43<sup>rd</sup> Avenue. Maintain traffic on N Washington Street temporary road north of 43<sup>rd</sup> Avenue. Construct NB lanes of N Washington Street and WB lanes of 43<sup>rd</sup> Avenue. Construct Ash Coulee Drive and SB lanes of N Washington Street between Calgary Avenue and 43<sup>rd</sup> Avenue.
- Phase 3 Work Areas: Maintain traffic on constructed N Washington Street NB lanes and 43<sup>rd</sup> Avenue/Ash Coulee Dr WB lanes. Construct N Washington Street SB lanes north of 43<sup>rd</sup> Avenue and 43<sup>rd</sup> Avenue/ EB lanes.
- The new watermain from near the Ash Coulee Drive water tower to Normandy Street shall be installed from the water tower to N Washington Street during Phase 2 while Ash Coulee Drive is closed and in any other phase from N Washington Street to Normandy Street as long as 43<sup>rd</sup> Avenue two-way traffic is maintained.
- The watermain lowering at the intersection of Boulder Ridge Road/43<sup>rd</sup> Avenue shall be complete prior to detouring traffic to Normandy Street. Traffic on 43<sup>rd</sup> Avenue shall be maintained by one way flagging operations and two way traffic will be required at the end of the work day. The one way flagging operation will not be permitted during peak traffic hours. The peak traffic hours are defined as 6:30 to 8:30 AM and 4:00 to 6:00 PM on weekdays. All lanes of traffic must be open, and traffic unrestricted during the peak traffic times. Sunday work will be allowed for this operation.
- Asphalt transitions on N Washington Street north of 57<sup>th</sup> Avenue and on 43<sup>rd</sup> Avenue east of Montreal Street can be constructed under traffic with flaggers. The Contractor shall maintain one-way flagger controlled during working hours and shall provide a two-way traffic surface at the end of the work day.

704-P03 PORTABLE CHANGEABLE MESSAGE SIGN: Portable Changeable Message Signs (PCMS) shall be in place prior to beginning of construction. PCMS will be used to display information throughout the project duration. One PCMS will be located between Aspen Avenue and Brandon Drive for NB traffic on N Washington Street and one PCMS will be located north of Greenfield Lane for SB traffic on N Washington Street. The Engineer will determine the message to be displayed. The PCMS shall conform to the requirements of the MUTCD, Part 6, and specifications. Upon completion of the project, the Contractor shall retain ownership of the PCMS.

704-P04 TEMPORARY DRAINAGE: The Contractor shall be responsible for providing drainage throughout construction. Temporary drainage culverts and storm sewer will need to be installed to accommodate drainage during the operation of the temporary roadway and until the storm sewer system is installed. The cost of providing temporary drainage shall be included in the bid price for other items.

704-P05 TRAFFIC CONTROL: The Contractor shall leave the work area free of all hazards during non-working hours. Hazards include any type of obstruction, drop-offs greater than 2-inches or steep embankment areas steeper than a 4:1 located within the clear zone. Any drop-offs greater than 2-inches shall be filled with a temporary 4:1 slope.

704-P06 TEMPORARY ROAD: This work shall consist of constructing, maintaining, installing/removing a temporary roadway required to maintain two-way traffic during construction. The temporary roadway shall meet the following criteria:

- 24 foot minimum width (width of aggregate surface)
- 10% maximum grade
- 100' minimum horizontal curve radius
- 4:1 max fill slope
- 25 mph design speed.

Refer to Section 100 of the plans for typical sections/details. Surfacing and traffic control for the temporary roadway will be paid at their respective bid items. All labor, equipment, and materials required to complete this work shall be included in the price bid for "Common Excavation-Type A."

704-P07 TYPE II BARRICADE: Type II barricades that are used for closing the sidewalk and shared used path shall be ADA Compliant.

708-P01 INLET PROTECTION: This item shall consist of furnishing, installing, maintaining (cleaning), and removal of a drainage inlet filter assembly to collect sediment in surface storm water runoff. The item shall also include the disposal of debris or silt that has accumulated in the bag. Periodic cleaning of the filter shall be included in the bid price.

The drainage inlet filter shall be Wimco, Lange IPD, Flexstorm, Dandy CurbSack, or an approved equal.

If the surrounding surfaces are not stabilized by freeze up, with the approval of the Engineer, the filters shall be removed for the winter. The filters then shall be reinstalled in the spring at a time approved by the Engineer. The cost to reinstall or replace the filters shall be included in the price bid. Each inlet location filter shall only be paid for once on the project no matter the number of filters required to provide adequate protection.

The filter shall remain in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris. All costs related to the material, installation, maintenance, replacement and removal shall be included in the price bid for "Inlet Protection-Special".

714-P01 PIPE BACKFILL: Backfill and bedding material shall be installed according to Standard Drawing D-714-27 for all storm drain. All storm drain shall be considered not under the roadway.

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**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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714-P02 PIPE POLYETHYLENE CORR PERF 6IN DRAIN: The underdrain shall be installed in accordance with the detail shown in Section 20 of the plans and Section 714.03 of the Standard Specifications. The pipe shall extend a minimum of two inches into the inlet or manhole and shall be grouted. All work required to install the Underdrain including excavation, trench backfill, fabric, connections, pipe, labor, materials and equipment shall be included in the price bid for "Pipe Polyethylene Corr Perf 6IN Drain".

714-P03 UNDERDRAIN CLEANOUT RISER: The wye, bend, riser, cap, casting, concrete slab, labor, equipment and materials necessary to construct the cleanout risers shall be included in the price bid for "Underdrain Cleanout Riser".

714-P04 REINFORCED CONCRETE PIPE: RCP shall be tongue and groove joint, sealed with butyl mastic. Pipe shall be tied only from the flared end section to the nearest structure. Wrapping the joints is not required.

714-P05 STORM DRAIN PIPE: All plugs shall be tied to the pipe. All plugs shall be included in the price bid for "Pipe Conc Reinf ( )IN CL ( )-Storm Drain".

722-P01 MANHOLE CASTINGS: All new or existing manholes that lie within the limits of the new concrete roadway, sidewalk or shared-use path shall have a floating manhole casting. The casting shall be installed as shown on Standard Drawing D-722-5A. The castings shall be positioned to avoid falling within a wheel path. All castings that lie in the roadway shall be placed flush to within 1/8 inch below the pavement. The new manholes, adjusted manholes, or repaired manholes located outside of concrete shall have the standard casting (see Standard Drawing D-722-5) and shall be outfitted with an infiltration and inflow (I&I) barrier adhered to the manhole cover with the adjusting rings and casting set around the I&I barrier.

722-P02 STORM DRAIN INLETS AND MANHOLES: All new inlets and manholes on this project have a minimum 4.0-foot riser. The bottom of the inlet or manhole shall be filled with concrete up to the elevation that will accommodate the lowest invert elevation. The concrete fill shall be placed and shaped to eliminate trapping of debris and/or sediment. All inlets and manholes on this project shall be backfilled with suitable backfill. All costs to accomplish this work will be included in the price bid for the respective inlet or manhole.

All barrel-to-barrel joints shall be sealed using a rubber gasketed joint.

Steps shall not be placed in manholes or inlets.

All "Inlet-Type 2" and "Inlet-Type 2 Double" shall have Neenah Foundry Company Type L grates and NDDOT Style Backs or East Jordan Iron Works with Type M4 Vane Grate and Type T5 Back or approved equal.

All inlet risers in the curb shall be constructed so top of riser is below subgrade elevation to allow clearance for paving machine.

722-P03 ADJUST MANHOLE: This bid item provides for the adjustment of various existing castings to the proper grade. A maximum of six rings will be allowed. "Adjust Manhole" shall be used when adjustments can be made by adding or removing adjusting rings. Bid items "Adjust Manhole" and "Manhole Repair" may interchange based on field findings. All labor, materials, and equipment necessary to complete the adjustment shall be included in the price bid for "Adjust Manhole".

722-P04 MANHOLE REPAIR: This bid item provides for the adjustment and modification to bring existing manholes to grade. "Manhole Repair" shall be used when adjustments require major reconstruction, beyond adding or removing adjusting rings. Bid items "Adjust Manhole" and "Manhole Repair" may interchange based on field findings. All labor, materials and equipment necessary to complete the modification to the existing manhole shall be included in the price bid for "Manhole Repair".

722-P05 ADJUST UTILITY APPURTENANCE: All existing gate valve boxes shall have debris plugs installed as specified in Plan Note 724-P05. All labor, equipment and materials required to install the plugs shall be included in the price bid for "Adjust Utility Appurtenance."

724-P01 UTILITY ADJUSTMENT: The Contractor shall notify the Bismarck Public Works Department (701)355-1700 and the City Engineering Department (701)355-1505 before each manhole, valve, or hydrant/watermain location is adjusted. Manholes, valves, watermains and hydrant relocations/adjustments will be inspected and approved by the Engineer.

724-P02 WATERMAIN GENERAL: The Contractor shall notify the Fire Department of any loss of service of a fire hydrant or ability to use a fire hydrant one day before the occurrence. The Contractor shall also notify when hydrant is back in service. Existing gate valves shall only be operated by City of Bismarck representatives. The Contractor will operate its newly installed valves until the project is accepted. Existing valves may not close tight enough to get a watertight closure. The Contractor may have to work without a total water shut off with no extra charge to the City of Bismarck. The Contractor shall coordinate any shut downs of existing lines with the City of Bismarck Water Department.

724-P03 SANITARY MANHOLE: Sanitary Manholes shall be paid by the each (EA) and shall include the riser height as indicated in the plans.

724-P04 SANITARY SEWER PIPE AND FITTINGS: The sanitary sewer pipe and fittings shall be PVC ASTM D3034 for type PSM, PVC sewer pipe and fittings and shall have an SDR of 35, all of which shall be stamped on the pipe. PVC sewer main line pipe and PVC sewer service pipe shall have the elastomeric gasket-type joint providing a watertight seal and shall conform to ASTM D3212. A solvent cement-type joint will not be allowed.

The Contractor will be required to furnish and install marking tape located 2 feet above the top of all sanitary sewer mains installed under the contract. The tape shall be of the non-detectable type and shall have a minimum width of 5 inches. The tape shall be green in color with the words "CAUTION SEWER LINE BELOW" imprinted on the tape in black capital letters. The marking tape shall be equal to that manufactured by Griffolyn Company, Inc. standard grade.

The Contractor will be required to flush all sanitary sewer pipe and manholes with clean water. After the pipes are flushed, the Contractor shall have the sewer main televised and recorded by a firm normally engaged in such type of work. The Contractor shall provide a high-quality DVD with a report for each section of sewer main televised. The recording shall be clearly marked as to the project number and recording number. The recording shall describe locations and conditions of the sewer and shall have a visual footage counter showing the distance of the camera from the manhole. After the Contractor has submitted the recordings and report, they will be viewed by the Engineer for acceptance.

All costs for labor, materials and equipment necessary for the installation including: pipe, fittings, plugs, bedding material, marking tape, flushing and televising shall be included in the price bid for "( )IN Sanitary Sewer Pipe".

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724-P05 WATERMAIN PIPE AND FITTINGS: Watermain shall be Polyvinyl Chloride or Molecularly Oriented PVC (PVCO) or Ductile Iron. Polyvinyl Chloride Pipe shall meet the requirements of AWWA C900 or C905 or C909 or the latest revision thereof and shall be furnished in Cast Iron Pipe equivalent outside diameters with elastomeric joints. The pressure class of PVC pipe shall be PC150 with a DR 18 for pipe smaller than 16 inches and PC235 with a DR of 18 for pipe 16 inches or larger and for 12 inches or smaller PVCO pipe the pressure class shall be PC150 (AWWA C900 DR18 equivalent).

Ductile Iron Pipe shall be manufactured in accordance with the requirements of AWWA/ANSI C151/A21.51. Push-on joints and mechanical joints shall be manufactured in accordance with AWWA/ANSI C111/A21.11. Pipe thickness shall be designated in accordance with AWWA/ANSI C150/A21.50. All pipe less than 16 inches shall use pressure class 350. All 16-inch to 20-inch pipe shall use pressure class 250 or higher. All 24- inch pipe shall be pressure class 200 or higher. All 30-inch pipe or larger shall be pressure class 150 or higher. All pipe shall be supplied with a cement mortar lining in accordance with AWWA/ANSI C104/A21.4. All pipe shall have a bituminous exterior coating in accordance with AWWA/ANSI C110/A21.10.

All pipe material suppliers shall be ISO 9001 or 9002 registered or provide the services of an independent inspection agency. Prior to the start of manufacturing, any manufacturer not meeting the ISO registration requirements shall submit to Owner or Owner's Engineer the name of an independent inspection agency for approval. The independent inspection agency shall be responsible for sample monitoring of chemical and mechanical tests, sample visual inspection of quality assurance tests performed on in-process pipe and fittings, and a sample visual and dimensional inspection report from the independent inspection agency of all witnessed tests shall be supplied to Owner or Owner's Engineer within ten (10) days of completion of pipe manufacturing.

Chemical samples shall be taken from each ladle of iron, and the manufacturers' chemical control limits shall be maintained for at least the following elements: carbon, sulfur, phosphorus, silicon, magnesium, chromium, manganese, tin, aluminum, cerium, copper, and lead. When chemical values fall outside the manufacturers' control limits, additional mechanical property tests shall be performed to assure minimum mechanical properties are met.

All hydrants and fittings, including tees, bends 22½ degrees and more, and reducers of two pipe sizes or more, shall be provided with suitable reaction blocking to prevent movement of fittings and hydrants when the pipe is under pressure. Concrete thrust blocking shall be cast between the fitting and against an undisturbed vertical trench wall, and shall allow pipe and fitting joints to be accessible for repair. The cost of this work shall be included in the price bid for "( )IN Watermain" or "Fittings-Ductile Iron".

Restrained joints shall be required as shown in the plans. All restrained jointing systems require approval of the Engineer, with the exception of preapproved systems. Preapproved restraining systems for Ductile Iron pipe include Griffin Pipe Product Co. Snap-Lok, US Pipe TR Flex, or American Cast Iron Pipe Co. Flex-Ring. Preapproved restraining systems for Polyvinyl Chloride pipe include Certa-Lok, Yellowmine, and EBAA Iron Inc. Fittings shall be Cast Iron or Ductile Iron. Cast Iron fittings shall be manufactured in accordance with AWWA/ANSI C110/A21.10 and shall be furnished with either Standardized Mechanical Joints or Push-On Joints in accordance with AWWA/ANSI C111/A21.11. Cast Iron Fittings for sizes up to and including 12 inches shall have a working pressure of 250 pounds per square inch and fittings larger than 12 inches shall have a working pressure of 150 pounds per square inch conforming with AWWA/ANSI C110/A21.10. Ductile Iron fittings shall be manufactured in accordance with AWWA/ANSI C153/A21.53 or AWWA/ANSI C110/A21.10. Ductile Iron fittings shall have a working pressure of 350 pounds per square inch conforming with AWWA/ANSI C153/A21.53 or AWWA/ANSI C110/A21.10. All Cast Iron and Ductile Iron fittings shall be cement mortar lined and contain an exterior bituminous seal conforming with AWWA/ANSI C104/A21.4. All fittings shall be mechanical restrained in addition to thrust blocking.

Connections to existing watermains shall be included in the price bid for "( )IN Watermain". All connections shall be wrapped with 8 mil Poly and any chips in epoxy shall be repaired prior to backfilling.

All ductile iron and cast iron pipe, valves, fittings, and hydrants shall be encased with 8-mil linear low-density (LLD) polyethylene film in accordance with ANSI/AWWA C105/A21.5. The cost of all encasements shall be included in the price bid for "( )IN Watermain, "Gate Valve & Box ( )IN", and "Fittings-Ductile Iron".

Bolts for mechanical joint fittings, valves, and hydrants shall alternate with one-half stainless steel and one-half low alloy steel. Low alloy steel bolts shall contain a maximum content of carbon at 0.2 percent, manganese at 1.25 percent, sulphur at 0.5 percent, minimum content of nickel at 0.25 percent, and a combined content of nickel, copper, and chromium at 1.25 percent. Stainless steel bolts shall be Grade 304.

All bolted fittings and service saddles shall be installed according to the manufacturer's recommendations. All bolts shall be tightened with a torque wrench according to the manufacturer's recommendations. The Contractor shall have a copy of the installation guide on site. All torque bolts shall be witnessed by the Engineer before the Contractor may backfill the area. The Contractor will be required to furnish and install marking tape located 2 feet above the top of all water mains installed under this contract. The tape shall be of the non-detectable type and shall have a minimum width of 5 inches. The tape shall be blue in color with the words "CAUTION WATER LINE BELOW" imprinted on the tape in black capital letters. The marking tape shall be equal to that manufactured by Griffolyn Company, Inc. Cost of marking tape and installation shall be included in the price bid for "( )IN Watermain".

724-P06 GATE VALVES: Gate Valves shall be of a quality equal to that manufactured by American Flow Control under the minimum requirements in design, material, and workmanship conforming to the latest AWWA Standard C515. The metals used shall be in accordance with AWWA and ASTM Standards. Unless otherwise designated, all gate valves shall have a non-rising stem, O-ring stem seals, 2-inch operating nuts, and open counterclockwise. All stem extensions shall be fastened to the operating nut with a set screw. The operating nut shall be drilled or otherwise indented to accept the set screw and provide a secure connection that will prevent an extension from coming loose during operation. The gate valve shall have a resilient synthetic rubber coating seat attached to the wedge, manufactured and designed in accordance with the latest AWWA Standard C515. Resilient-Seated Gate Valve body and bonnet shall be coated, inside and out, with a fusion bonded epoxy in accordance with AWWA C550. The waterway shall have a full unobstructed flow without recesses in the bottom. All bonnet bolts shall be stainless steel. Gate valves shall be provided with bevel gearing and shall be laid in the direction indicated on the plans. All gate valves shall be mechanically restrained.

Valve boxes shall be of a quality equal to that manufactured by Tyler Pipe Model 6860 or Star Pipe Products Cast Iron Heavy Duty Model "G" with bases and dimensions of each section to be as follows:

- No. 6 round base for 24-inch and smaller gate valves.
- No. 160 oval base for 30-inch or larger.
- Covers marked "Water."
- Top Section 25 1/2 inches long.
- Extension pieces as required.

Valve box debris plugs as manufactured by Infact Corporation or an approved equal shall be furnished and installed into new and reset valve boxes.

All valve boxes shall be capable of a minimum 6-inch top adjustment in either direction, up or down, to or from, the finished curb grades shown in the plans.

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Valve box debris plugs and valve box extension pieces required to make the abovementioned adjustment shall be considered incidental to the price bid for either "Butterfly Valve and Box and/or Gate Valve and Box."

The CONTRACTOR will be required to furnish and install a steel fence post by each valve box unless directed not to by the Engineer. Steel fence posts to be used for valve locations shall be a "Tee" or "U" post having a minimum length of 5½ feet. The post shall be located 2 feet from the valve box in a direction toward the street.

The cost of valve box extensions, debris plugs, and steel fence posts and installation shall be included in the price bid for "Gate Valve & Box ( )IN".

724-P07 LARGE WATERMAIN GATE VALVES: All 16" gate valves and larger shall be placed on their side and outfitted with a bevel gear operator. These gate valves shall be placed with a minimum 4 inch class 5 aggregate cushion at least 1' wider than the edge of the valve. All costs to supply and install the valves with aggregate cushion shall be included in the price bid for their respective bid items.

724-P08 HYDRANTS: Hydrants shall be manufactured in accordance with the requirements of AWWA C502. The hydrants shall be equipped with break-a-way type traffic flanges and two (2) 2½-inch hose connections with National Standard Threads and one (1) 4 1/2-inch pumper connection with National Standard Threads. All 6-inch and 8-inch hydrants shall be 5¼-inch Waterous Pacer Model WB-67-250 as manufactured by American Flow Control or 5¼-inch American Darling Model B-62-B as manufactured by American Flow Control or 5¼-inch American AVK Model 2700 as manufactured by the American AVK Company or an approved equal.

New and reset fire hydrants shall have a minimum of 24 inches between the 2½-inch hose connection and the nominal ground line groove and have a bury depth of 8½ feet unless otherwise called for in place. All metal internal moving parts below ground will be brass, Class 304 or 316 stainless steel, or have an epoxy coating as such to prevent corrosion for the life of the fire hydrant. All washers and barrel bolts below ground level shall be stainless steel. The hydrant lower rod shall be Class 304 or 316 stainless steel or have an epoxy coating as such to prevent corrosion for the life of the fire hydrant. The hydrants shall be surrounded by 1/2 cubic yards of subcut gravel so placed that it will readily take up all water from the drip valves. The hydrants shall be set on a concrete pad 6 inches thick and 18 inches square.

New and reset hydrants shall be furnished and installed with a 48-inch Red FH800 American Series Fire Hydrant Marker manufactured by Flexstake Inc. of Fort Myers Florida, or an approved equal. All hydrants shall have a minimum of 24 inches between the 2 ½ Inch Hose connection and the Nominal Ground Live Groove.

All non-terminal hydrants temporarily placed for future watermain extensions shall be mechanically restrained to tee. Hydrants removed shall become the property of the Contractor.

724-P09 MATERIAL & PRESSURE TESTING: Inspection and tests must be made by the manufacturer on all pipe and component parts before shipment. Such tests shall be made by a testing laboratory satisfactory to the Engineer, and such tests shall be made in accordance with the requirements of the American Society for Testing Materials. Documentary evidence that the materials have been passed such inspection and tests must be furnished to the Engineer before the delivery of the materials on the job. Any materials which do not prove satisfactory after being placed, must be removed from the premises and replaced with satisfactory material. The cost of foundry inspection shall be paid for by the Contractor. After the pipe has been laid, all new pipe or any valve section thereof shall be subject to hydrostatic pressure test under the supervision of the Engineer in accordance with AWWA C605. The test section shall be filled with water and the pressure shall be gradually increased. If defects are found, the Contractor shall immediately make the necessary repairs at its own expense. The final pressure test shall be 150 pounds per square inch and shall be held at least two hours. The Contractor shall furnish all tools, equipment, and material

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necessary to make the pressure test. The City of Bismarck will provide the water for filling the pipe. All costs for material and pressure testing shall be included in the price bid for "( )IN Watermain."

DISINFECTION AND BACTERIOLOGICAL TESTING: After the new mains, replacement mains, and valved extensions have been tested, they shall be flushed until all foreign material has been removed. Chlorination applications shall be made under supervision of the Engineer in accordance with AWWA C651. Water shall be fed into the new line with chlorine applied in amounts to maintain a chlorine residual of 50 milligrams per liter for 24 hours or chlorine residual of 200 milligrams per liter for three (3) hours. All valves and hydrants in the section treated shall be operated during this time in order to disinfect the appurtenance. Heavily chlorinated water should not remain in prolonged contact (maximum of 48 hours) with the watermain pipe. The chlorine shall be flushed from the main through hydrants and taps until all excess chlorine has been removed. The Contractor shall be responsible for repairing all grass, new or existing, damaged by the chlorination and flushing process. No chlorination water will be permitted in the watermain trench. The Contractor shall furnish all tools, equipment, materials, and chlorine to complete the chlorination process, incidental to other bid items. Prior to discharging chlorinated water into any drainage way, the Contractor shall obtain the permission of the Engineer. Taps are to be provided so at least one set of samples may be collected from every 1,200 feet of the new watermain, with one set from the end of the line and at least one set from each branch exceeding 50 feet in length.

After final flushing each 1,200-foot segment and branches greater than 50 L.F., and before the new watermain is connected to the distribution system, two consecutive sets of acceptable samples, per 1,200-foot main or 50-foot branch, taken at least 24 hours apart, shall be collected from the new main. The Contractor or testing laboratory, in the presence of the Engineer, shall perform the sampling. The Contractor shall record the locations the samples were taken. Sampling shall be performed with due care to prevent contamination using sterile bottles provided by the testing laboratory. It is not recommended that samples be collected from hoses or fire hydrants. The testing of the samples shall be performed by a State of North Dakota certified testing laboratory selected by the Contractor. All samples shall be tested for bacteriological quality and shall show the absence of coliform organisms. All super chlorinated water from the disinfection of a potable distribution system shall not reach waters of the state until the total residual chlorine level has become non-detectable. Any sample result less than 0.05 mg/l will be considered "non-detectable."

Written records of all test results shall be supplied to the Engineer and the Contractor by the testing laboratory as soon as possible. To expedite construction progress, it is necessary that the Contractor and Engineer be furnished with the results of all tests as soon as testing is completed.

If trench water has entered the new main during construction or, if in the opinion of the Engineer, excessive quantities of dirt or debris have entered the new main, bacteriological samples shall be taken at intervals of approximately 200 feet and shall be identified by location. Samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing has been completed.

The testing laboratory shall test for coliforms and e-coli using the "Colilert" or other Engineer approved equivalent test. The "Colilert" test is a pass/fail test that does not quantify the amount of bacteria. Any presence of coliforms or e-coli shall qualify as a failed test.

If the initial disinfection fails to produce satisfactory bacteriological results, the new main may be reflushed and shall be resampled. If check samples also fail to produce acceptable results, the main shall be rechlorinated by the continuous-feed or slug method of chlorination until satisfactory results are obtained.

Bacteriological samples shall be taken after repairs or short connection pieces are completed to provide a record for determining the procedure's effectiveness. If the direction of flow is unknown, the

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samples shall be taken on each side of the repair or connection. If positive bacteriological samples are recorded, then the situation shall be evaluated to determine corrective action, and daily sampling shall be continued until two (2) consecutive negative samples are recorded.

All costs for disinfection and bacteriological testing, including taps, shall be included in price bid for "( )IN Watermain".

724-P11 **BEDDING MATERIAL:** The bedding material shall consist of granular material in accordance with the requirements for gradation shown in the following table:

Square Mesh Sieve Size	Percent By Weight Passing
2"	100%
1"	90-100%
3/4"	80-100%
No. 4	30-90%
No. 30	10-60%
No. 100	0-15%

One gradation test shall be made for each source for each 500 tons of screened and/or blended material and for each 200 tons of non-screened or "bank run" material. The cost for pipe bedding (as shown in the Pipe Bedding Quantities Detail in Section 20) shall be included in the price bid for "( )IN Watermain" or "8IN Sanitary Sewer Pipe" .

724-P12 **RELOCATE WATERMAIN UTILITIES:** The cost of salvaging existing hydrants and gate valves and relocating to new locations shall be included in the price bid for "Relocate Gate Valve & Box" and "Hydrant-Relocate"

724-P13 **24IN WATERMAIN:** The cost of salvaging the existing 24" x 8" reducer at 535+50 RT and relocating it to 504+41 RT shall be included in the price bid for "24IN Watermain".

724-P14 **CONNECTION TO EXISTING MAIN:** This bid item is for the wet tap connection only, not including the median sprinkler system or other watermain connections. The connection occurs at the following locations:

- Sta 30+40: extend 8" watermain west to Arabian Ave from 16" watermain on N Washington St.
- Sta 58+97: extend 12" watermain east to adjacent property from 16" watermain on N Washington St.
- Sta 59+60: extend 12" watermain west to adjacent property from 16" watermain on N Washington St.
- Sta 95+28: extend 12" watermain west to adjacent property from 16" watermain on N Washington St.
- Sta 104+71: extend 12" watermain west to 57<sup>th</sup> Ave NW from 16" watermain on N Washington St.

These connections shall be made with a tapping sleeve and valve. The existing watermain shall remain in service during the connection. The gate valve will be paid separately under its respective bid item.

The tapping sleeve shall be stainless steel with a stainless steel flange and bolts and shall conform the "Smith Blair" Type 663 or "Romac" Type SST or an approved equal. See detail "Water Main Wet Tap" in section 20. Tapping saddles with valves shall be hydrostatically pressure tested on the main prior to requesting a tap. The test shall be 125 pounds per square inch for a duration of 30 minutes.

Tapping saddles shall be installed according to manufacturer's installation instructions. The tapping saddle bolts shall be torqued using a calibrated torque wrench with a handle at least 12

inches in length. The Contractor should be prepared to show certification of torque wrench calibration at the request of the Engineer.

The City of Bismarck Public Works Department will tap the watermain at a charge to the Contractor. The Contractor shall be responsible for all work connected with installation of the tapping sleeve and valve including the necessary space around the watermain required for the tapping machine and assisting the Public Works Department in positioning the tapping machine.

All costs for fees, labor, tapping sleeve, material and equipment shall be included in the price bid for "Connection to Existing Main".

724-P15 **WATERMAIN MODIFICATIONS:** This bid item is for trench excavation and backfill required to install insulation over the existing 16" PVC watermain along N Washington Street from Sta 34+20 to 39+10 Rt. The price bid shall include all costs for labor, equipment, and materials required to locate the existing main, excavate, backfill, installation of new marking tape, and trench compaction. This work shall be included in the price bid for "Watermain Modifications." The insulation shall be paid for separately.

724-P16 **CONTROLLED DENSITY BACKFILL:** Controlled density backfill shall be installed to provide special structural support at the following storm-over-sanitary sewer crossings:

- STA 37+80, 18' LT
- STA 57+15, 115' LT
- STA 58+65, 115' LT

The properties of the backfill shall be a blend of cement, water, pozzolanic materials, and fillers. The materials shall be fluid on placement to flow around and fill voids around the pipe in the backfill area. The material shall be able to support normal loads after six hours and shall have a compressive strength in the range of 80 psi to 130 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 additional testing will be required. The mix design yields approximately one cubic yard of flowable mortar.

Mix Design

Sand	2600 lbs
Water	70 gals
Fly Ash (Class C)	300 lbs
Cement	100 lbs

The lower crossing pipe shall be excavated to the top of pipe for the width of the upper crossing pipe trench and the trench bottom shall be thoroughly compacted by mechanical means, with care taken not to damage or disturb the lower crossing pipe. The trench shall be filled with controlled density backfill for 5 feet in either direction for a length of ten feet along the upper crossing pipe. The trench shall be filled with controlled density backfill for 5-feet in either direction from the crossing up to 4" below the bottom of the upper pipe. The standard bedding material shall be placed over the controlled density backfill after the controlled density backfill has adequately cured. The cost of the controlled density backfill shall be included in the price bid for "Pipe Conc Reinf ( )IN CL ( )-Storm Drain".

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- 724-P17 MEDIAN SPRINKLER SYSTEM: The Contractor shall provide a controlled valve distribution irrigation system to provide supplemental water to the medians as shown on the plan sheets. There will be a total of seven locations in the plans. The irrigation system shall:
- Connect to the 16IN watermain with a tapping saddle with a minimum of 2-bolt stainless steel skirted or complete casket type.
  - Corporation Stop shall be Mueller No. H-15000, McDonald No. 4701, or Ford F600 or FB600 for copper water pipe or approved equal.
  - Curb Stop shall be the Mueller No. B-25154, Mueller No. H-15154, McDonald No. 6104 or Ford B22 having a Minneapolis Pattern or approved equal. Curb boxes shall be Mueller No. H-10304 or McDonald No. 5615 (2-inch diameter upper section) or approved equal. Curb boxes shall have a 75-inch rod installed with a stainless steel or brass pin to the curb stop. The length of the curb box extended shall be 8 feet. Curb stops shall be installed on a ½ square foot by 4-inch thick concrete brick or pad.
  - Pipe shall be 2-inch Copper, Polyethylene or PVC. Copper water pipe shall conform to ASTM B88, Type K. Polyethylene water service line of iron pipe size (IPS) shall be manufactured from ultra-high molecular weight polyethylene (average molecular weight of 1,750,000) of virgin materials and shall meet the requirements of Type III Class "C" Category 5-P34 polyethylene as defined in ASTM D1248. The pipe shall be designated UHMWPE 3408, with a design stress of 630 pounds per square inch (630 psi) and a working pressure of 150 pounds per square inch (150 psi) for water at 73.4°F. The pipe shall conform to ASTM D2239 with a standard dimension ratio (SDR) of seven (7). The pipe shall be permanently imprinted with the manufacturer's brand name, pipe size, identification of the National Sanitation Foundation (NSF) approval, ASTM specification, recommended working pressure, and production date code. Connection fittings shall be compression fittings (gasket type), stab fitting with O-ring seal (Mueller Insta-Tite or an approved equal), or an insert type. PVC shall be Schedule 40 suitable for potable water.
  - The Contractor shall purchase a 2-inch meter from the City of Bismarck and install a meter pit at the locations shown on the plans.
  - Provide a double backflow prevention device to keep water from flowing back into the service line.
  - Include sleeves (CL 200 PVC) under all concrete surfaces.
  - Provide a blow out tap and enclosure at point of connection.
  - Install 4" series pop-up sprinklers mounted flush with finish grade.
  - Provide 100% head-to-head irrigation coverage.
  - Install a ground controller per manufacturer's specifications for each median sprinkler system. Controller shall be placed as shown on the plans and shall be placed in a weatherproof enclosure capable of being padlocked. The City will provide a padlock.
  - Control box shall be mounted 5 feet above finished grade on nearby light pole.
  - Pulse Wire: #14 UF Direct Bury Multi-Strand Common Wire: #14 UF Direct Bury (White). Splice at controllers and valves only.
  - All electrical conductors and connections required between the light standard and sprinkler controller shall be included in the price bid for "Median Sprinkler System".

Shop drawings shall be provided to the engineer for approval prior to installation. Acceptable irrigation manufacturers are Hunter, Toro, RainBird or approved equal. Installation methods, procedures, and materials shall be in accordance with manufacturer's recommendations. Contractor shall test completed system under full line pressure and repair any leaks or malfunctioning components prior to acceptance. Contractor shall provide owners with 2 operating manuals for furnished equipment bound in standard 3 ring binders labeled to show Contractor's name and contact information. Contractor shall also provide the owner with a scaled drawing completed field "as built" of the system. All components are to be drawn and referenced to a fixed location on the site. All work necessary to complete the seven separate irrigation systems shall be included in the price bid for "Median Sprinkler System".

744-P01 POLYSTYRENE INSULATION BOARD: The Contractor shall furnish and install the insulation required to protect the water main as shown on the plans. The insulation shall have a thermal conductivity of not more than 0.28 BTU per hour per square foot per degree Fahrenheit per inch of thickness as tested in accordance with ASTM C177. The insulation shall not absorb moisture to an extent greater than 2.5 percent by volume as tested in accordance with ASTM D2842. The compression strength of the insulation shall be greater than 20 psi as tested in accordance with ASTM D-1621. The density of the insulation shall be between 0.9 and 1.3 pounds per cubic feet as tested in accordance with ASTM D-1622. The insulation shall be specifically designed for protection of underground utilities and shall be installed in accordance with the manufacturer's recommendations.

The insulation shall be a minimum of 4-inches thick and centered over the watermain. Material between pipe and insulation shall be pipe bedding material.

750-P02 DETECTABLE WARNING PANELS: Detectable warning panels for this project shall be cast iron.

750-P03 DECORATIVE PAVED BOULEVARD: The decorative paved boulevard shall be installed at the locations and to the dimensions shown in the plans. Finishing the concrete shall follow normal procedures except the surface shall not be troweled more than once. After the surface is troweled and floated, and while the concrete is still in the plastic state, platform stamping pads or rollers shall be used to obtain the brick pattern. The brick pattern shall be 6-inch by 12-inch, other brick dimensions shall be approved by the Engineer. A form release agent shall be used on the equipment used to stamp the concrete. The thickness of the decorative paved boulevard shall match the adjacent sidewalk thickness. Sawed joints shall match the adjacent sidewalk. All labor, equipment, and materials required to complete this work shall be included in the price bid for "Decorative Paved Boulevard".

754-120 PEDESTRIAN/SCHOOL CROSSING SIGNS: The pedestrian and school crossing signs shall have a fluorescent yellow green background with black letters and border.

754-P02 SIGN REMOVAL: The City of Bismarck Public Works Department will remove all existing signs and supports as identified by the Engineer in accord with the project phasing. The Contractor shall notify the Public Works Department 48 hours prior to needing the signs removed. The signs and supports shall become the property of the City of Bismarck.

754-P03 FLEXIBLE DELINEATORS-TYPE D: The flexible delineators-type D shall be Pexco FG 300 Model UR with heavy duty base, Safe-Hit Type 3 Channelizer or approved equal.

754-P04 RESET SIGN SUPPORT: This work shall consist of removing, salvaging and resetting the existing Bismarck Park and Recreation Trailhead Marker located in the northwest corner of the Ash Coulee Drive/N. Washington Street intersection. Please refer to the detail shown in Section 20. All labor, equipment, and materials required to complete this work shall be included in the price bid for "Reset Sign Support."

762-P01 TEMPORARY ROADWAY PAVEMENT MARKING: If the Contractor is unable to place permanent markings because of weather conditions in the late fall, temporary painted markings shall be used. Temporary painted markings shall be placed in such a manner that they will not be under plastic pavement markings, except when grooved markings are specified. When grooving is specified, the temporary markings may be placed in the same location, as the grooving will remove the painted markings when permanent markings are to be placed. Permanent pavement marking that may be subject to temporary painted marking will not be paid for separately but shall be included in the price bid for "Preformed Patterned Pvmt Mk ( ) IN Line-Grooved" or "Preformed Patterned Pvmt Mk-Message(Grooved)".

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762-P02 PREFORMED PATTERNED PAVEMENT MARKING-GROOVED: The Contractor shall provide preformed patterned pavement marking materials according to Section 762 of the Standard Specifications. The material shall be approved by the Engineer prior to ordering. The pavement markings shall be installed using primer and as recommended by the manufacturer. The Contractor has the option of using an approved extended season marking per manufacturer's recommendation. The extended season markings will be paid at the same price bid as "Preformed Patterned Pvmt Mk ( ) IN Line-Grooved" or "Preformed Patterned Pvmt Mk-Message (Grooved)"

shall provide and install a 200 amp meter socket, with stud type connectors, and mount on the side of the feed point cabinet. The Contractor shall provide and install a 2" conduit sweep in the concrete foundation for the service conductors to the metersocket from a point 24" below grade. All exposed conduit shall be rigid steel. Any cost imposed by the utility shall be coordinated by the Contractor and paid for by the City of Bismarck.

762-P03 PREFORMED THERMO PLASTIC PAVEMENT MARKING: All 6" and 24" pavement markings shall be a preformed thermoplastic film. The material shall be approved by the Engineer prior to ordering. The pavement markings shall be installed using primer and as recommended by the manufacturer. The Contractor shall grove the areas to receive 6" and 24" thermo plastic pavement markings. All costs to groove the pavement markings shall be included in the price bid for "Preformed Thermo Plastic Pvmt Mk \_In Line"

The feed point shall be oriented to face south. The Contractor shall provide a permanent label for the exterior feed point cabinet and for the contactors inside the cabinet as shown on the section 140 details.

The feed point cabinet shall be as sized as shown in the detail provided in section 140 and be manufactured by Povolny Specialties. Feed point cabinet shall be made of minimum 1/8" aluminum, with a brushed aluminum finish, rated for NEMA 3R and be ETL or UL listed in accordance with UL 50. The cabinet shall have a domed roof with a NEMA 3R drip shield and two doors. The doors shall have an aluminum continuous piano-style hinge, a neoprene gasket, and a stainless steel 3-point latch capable of being padlocked. The enclosure shall be equipped with back panel rails such that equipment may be mounted in the cabinet with no penetrations to exterior of the cabinet. The back panel shall be galvanized steel. Provide unistrut mounting brackets. All hardware shall be non-corrosive.

764-P01 ATTENUATING CRASH CUSHION TL-2: The attenuating crash cushion TL-2 units to be installed at the traffic signal standards at 43<sup>rd</sup> Avenue/N Washington Street at Sta 51+83-40.5' LT, 52+71-65.6' RT, 52+90-125.1' LT and 53+77-20.5' LT and at LaSalle Drive/Washington Street at Sta 86+17 37.5' LT and 87+41, 16.5' LT shall be Quadguard 2, manufactured by Energy Absorption, Inc. The width shall be no less than six inches greater than the width of the signal standard for each location. The centerline of the crash cushion shall be offset from the center of the signal pole so that the inside edge side panel of the crash cushion is a minimum five inches from the edge of traffic signal standard. The additional offset shall be to the side that the signal standard is protected from traffic. The devices shall be installed with steel post type backups and shall be installed on concrete slabs in accordance with the manufacturer's recommendations. The steel post type backup shall be anchored to the concrete slab. All costs to furnish and install the crash cushions complete with steel post backups and concrete slabs as shown in the plans, shall be included in the price bid for the item "ATTENUATING CRASH CUSHION TL-2." Shop drawings for attenuating crash cushion TL-2 installation shall be submitted to the engineer for review in accordance with Standard Specification 105.08 B.

Contractor shall provide all the necessary breakers as shown in the detail and panel schedule.

Provide a contactor for each 120x240V circuit. Lighting contactors shall be heavy-duty electromagnetic lighting control relay housed in weatherproof case, 2 pole, rated at 60 amp, 120v control coil, 240v rated load with load contactors normally open when coil is de-energized. Relay contactors shall be Trinetics, RCO Model MR-UD No. 6342. Photo cell shall be Hubbell PBT-1, Intermatic K4021C or approved equal and designed to recess into feedpoint cabinet. The photo cell shall be installed to face north. The Contractor shall provide a hand-off-auto test switch to override the photocell control. Utilizing laminate engraved nameplate(s), the switch options shall be marked as "Test" and "Auto" with two (2) 1/2-inch x 1 1/2-inch nameplate. Marker as a means of labeling will not be acceptable. Install a GFCI receptacle in a metal box inside the feed point cabinet with the branch circuit conductors in conduit to the load center.

770-P01 LIGHT STANDARD 6FT MA 40FT MT HT BREAKAWAY: The breakaway light standard shall be of the davit type and shall be steel, galvanized type. Where shown on the plans the light standard shall be of the twin mast arm type. The 40' breakaway light standards shall have transformer bases and vibration dampeners. Hand holes shall face opposite direction of the roadway. Duct seal all conduit stubs in concrete foundation. Double locknut washers shall be installed on all anchor bolts. Galvanizing shall be in accordance with ASTM A123. The shaft shall have only one longitudinal weld and shall have a minimum yield strength of 50,000 psi. The Davit type mast arm shall be constructed of same material and by same method as the shaft. Mast arm shall have a tenon adaptor for luminaire mounting. Grounding lug to be provided inside of the hand hold.

All materials, labor and equipment necessary to furnish and install the feed point shall be included in the price bid "FEED POINT-TYPE V PAD MOUNTED".

770-P03 MODIFY EXISTING FEED POINT: The existing feed point at the intersection of LaSalle Drive shall be modified to include the additional circuits as shown. The Contractor shall provide an additional light contactor for each proposed 120x240V circuit. Lighting contactors shall be heavy-duty electromagnetic lighting control relay housed in weatherproof case, 2 pole, rated at 60 amp, 120v control coil, 240v rated load with load contactors normally open when coil is de-energized. Relay contactors shall be Trinetics, RCO Model MR-UD No. 6342.

The Contractor shall connect the lighting contactors to the existing control circuitry and photo cell such that lights will turn on at dusk and turn off at dawn. The light circuits shall have the capability of turning on manually via the existing override switch.

Anchor bolt spacing to accommodate poles shall be verified in the field prior to construction. The Contractor shall notify the Engineer at least 24 hours prior to pouring concrete foundation such that the form with the anchor bolt placement, rebar, conduit stub-ins and ground rod can be inspected. The foundation shall be finished with a 4" thick, 30"x30" square top with 1" chamber around all sides The Contractor shall provide concrete tests in conformance with NDDOT Specifications, a minimum of one test per day or a minimum of one test per five (5) light standard foundations or as directed by the Engineer.

The Contractor shall provide new laminated engraved nameplate(s) to label the proposed contactors with two (2) 1/2-inch x 1 1/2-inch nameplate. Marker as a means of labeling will not be acceptable.

770-P02 FEED POINT-TYPE V PAD MOUNTED: The feed point at the intersection of 43<sup>rd</sup>/Ash Coulee Drive shall be installed at the location indicated in the plans. Incoming electrical service shall be underground. See standard drawing D-770-2 for details along with the feed point detail provided in section 140.

The Contractor shall provide all the necessary breakers as shown in the detail and panel schedule. New breakers shall be 50 Amp, 2-pole and be compatible with the existing loadcenter.

The Contractor shall be responsible for coordinating with Capital Electric Cooperative for the new incoming electrical service. The utility shall be responsible for providing service connections and conductors from the utility transformer to the metersocket located on the feed point cabinet. The utility shall be responsible for any boring or trenching required up to the meter. The Contractor

All materials, labor and equipment necessary to furnish and install the feed point shall be included in the price bid "MODIFY EXISTING FEED POINT".

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770-P04 CONCRETE FOUNDATION-FEED POINT-TYPE B: The concrete foundation shall be as sized as shown in the detail provided in section 140 and shall be poured in place. Top of concrete foundations shall be 6" above the surrounding grade. Duct seal all conduit stubs with wires in concrete foundation. Contractor shall provide two spare 3" Schedule 40 PVC conduits in each concrete feed point foundation. Spare conduits shall be capped with an oil-tight plug with wing nut and labeled as to which direction they face. Notify the Engineer a minimum of 24 hours prior to pouring concrete base such that the form and cable entrance may be inspected. The concrete foundation shall have a 1-inch chamfer all around and down vertical sides to a minimum of 2 inches below grade.

770-P05 LED LUMINAIRE-150 WATT: The light emitting diode (LED) luminaires shall provide a minimum of 24,191 delivered lumens with no less than 80 light emitting diodes and be capable of operating between 120 through 277 volts. Each luminaire shall have a maximum system wattage that does not exceed 284 Watts. Luminaires shall have an L<sub>70</sub> (at 25°C) lumen maintenance greater than 100,000 hours and they shall have a color temperature of 5000K CCT(ANSI Nominal). Each luminaire shall be provided with IEEE/ANSI C62.41 Category C surge protection, rated for an operating ambient temperature range of -40°C to +40°C, and be listed in the US. Exterior finish shall be gray.

All LED luminaires shall be matching in all characteristics. The Contractor shall furnish an electronic set of shop drawings to the Engineer for approval before orders are placed. The Contractor shall also submit an electronic ".ies" file of the exact luminaire to be used. The luminaire shall provide an average maintained illuminance of 1.2 foot-candles (minimum) and an illuminance uniformity ratio of 3:1 avg/min (maximum) for the locations shown on the plans with a lighting loss factor of 0.69. The luminaires shall be mounted to a light standard with a 40' mounting height and a 6' mast arm. The luminaire shall be reviewed for approval by the Engineer to ensure standard AASHTO lighting level values are met.

LED luminaires shall be as follows: American Electric Lighting, Model ATB2-80BLEDE10-MVOLT-R3-5000K-NL-NR.

770-P06 PULL BOXES: The pull boxes shall be polymer concrete type. The cover shall clearly be marked "Lighting" as required. See standard drawing D-770-3 for details. Duct seal all conduits entering and exiting pull boxes.

770-P07 PADLOCKS: The Contractor shall obtain all padlocks from the City of Bismarck.

770-P08 MARKER TAPE: Marker tape shall be installed 5" below finished grade in cable trenches above underground conductors. Marker tape shall be 6-inch wide red plastic tape marked "Caution – Buried Electric Cable."

770-P09 SPLICE CONNECTORS: Splice connectors at pole hand hold shall be Penn-Union IPBNA2/0XS, Polaris PIIT10 or approved equal.

770-P10 NAMEPLATES: The Contractor shall provide nameplates per detail provided in section 140 for all feed point cabinets to be installed. The nameplate shall consist of letters and/or numbers, printed on a thermosetting laminated plastic consisting of melamine or phenolic core and melamine surface.

The nameplates shall be mounted on the front of the feed point or control cabinet door with a combination of aluminum round head screws and an adhesive.

Name plates to have a black background with white letters and/or numbers unless noted otherwise. One (1) 1½-inch x 6-inch nameplate and one (1) 1½ inch x 3-inch nameplate shall be provided for each new feed point and two (2) ½-inch x 1½-inch nameplate for each test switch. The feed point number shall be as designated by the City of Bismarck.

770-P11 RELOCATE CONCRETE LIGHT STANDARD: Concrete light standards shall be removed from their present location and installed at a new location where specifically shown in the plans.

The wires to the luminaire shall be disconnected at the fuses and the light standard removed and installed in new location as specified in NDDOT specifications. Relocated light standards shall not need to be repainted. Contractor shall provide new concrete pads, connectors, and ground rods for the relocated light standard. Relocated light standard shall be reconnected up to the existing light circuit. The contractor shall provide new underground conductors as shown on the plans. The contractor shall reuse existing cable and provide underground rated splices and cable at Versailles Ave as required.

Remove and dispose of existing concrete pads and ground rods. Backfill and compact after removing existing light standard foundation. Restore the surface to match adjacent areas.

770-P12 REMOVE LIGHT STANDARD: Light standards, mast arms and luminaires designated in the plans for removal shall be removed and salvaged. The mast arms and standards shall be delivered to the City of Bismarck Landfill (2111 North 52<sup>nd</sup> Street). The luminaires shall be delivered to the City of Bismarck Public Works Department (601 South 26<sup>th</sup> Street). The contact for delivery is Paul Lies (701) 355-1700 or (701) 391-1698 and the Contractor shall provide a 48 hour notice prior to delivery.

772-P01 REVISE FLASHING BEACON SYSTEM: The Contractor shall remove and reset the existing mast arm mounted overhead pedestrian warning signs and signals located on the south approach of the intersection of Calgary Avenue and North Washington Street. The Contractor shall move the signal standards to new foundations at the locations noted in the plans and remove the existing foundations. All costs to remove and reset the existing standards on new foundations, reconfigure the system to an acceptable working order and remove the existing foundations shall be included in the price bid for "Revise Flashing Beacon System".

772-P02 REVISE TRAFFIC SIGNAL SYSTEM-SITE 1: There is an existing span wire traffic signal system located at the intersection of 43<sup>rd</sup> Avenue and North Washington Street. The Contractor shall maintain the traffic signal system or install a new span wire system until the permanent signal is operational. The Contractor may reuse the existing components at this intersection but all signal hardware, controllers, cabinets and other components shall be salvaged to the City of Bismarck Public Works at the completion of the project. The existing controller shall be reused as part of the permanent traffic signal system at this location. The Contractor shall switch over the existing components to the permanent signal system on non-school days. All costs to modify the existing span wire traffic signal to facilitate traffic throughout construction and remove the system shall be included in the price bid for "Revise Traffic Signal System-Site 1".

772-P03 REVISE TRAFFIC SIGNAL SYSTEM-SITE 2: There is an existing span wire traffic signal system located at the intersection of LaSalle Drive and North Washington Street. The Contractor shall maintain the traffic signal system or install a new span wire system until the permanent signal is operational. The Contractor may reuse the existing components but all signal hardware and other components shall be salvaged to the City of Bismarck Public Works at the completion of the project. The existing controller, cabinet and feedpoint shall be reused as part of the permanent traffic signal system at this location. The Contractor shall maintain a functional signal system when Liberty Elementary school is in session. The Contractor shall switch over the existing components to the permanent signal system on non-school days. All costs to modify the existing span wire traffic signal to facilitate traffic throughout construction and removal of the system shall be included in the price bid for "Revise Traffic Signal System-Site 2".

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772-P04 TRAFFIC SIGNALS SYSTEM: The price bid "Traffic Signal System – Site \_" shall include all labor and equipment necessary for each signal system to be fully operational as shown in the plans upon construction completion. This includes, but is not limited to, the installation of the following features where applicable; traffic signal standards and foundation, vehicular heads, video detection system, traffic signal controller and all ancillary controller hardware (conflict monitor, load switch, flasher, etc.), controller cabinet and foundation, feed point and all cable, conduit, junction boxes and appurtenances to install the traffic signal completely.

Traffic Signal System – Site 1 shall include utilizing the existing Econolite controller, Bus Interface Unit and power supply; Autoscope video detection equipment and monitor (including four Encore2 Cameras); Opticom EVP system (including 4 EVP units and phase selector); and conflict monitor reset into a new cabinet. Traffic Signal System – Site 1 shall include a new master controller for interconnection to Site 2. All other equipment for Traffic Signal System – Site 1 shall be new including conduits, conductors, load switches and other equipment as necessary for a fully functional signal system.

Traffic Signal System – Site 2 shall include utilizing the existing controller cabinet and components including the existing Econolite controller, Bus Interface Unit and power supply; Autoscope video detection equipment and monitor (including four Encore2 Cameras); Opticom EVP system (including 4 EVP units and phase selector); conflict monitor and load switches and solid state flasher. All other equipment for Traffic Signal System – Site 2 shall be new including conduits, conductors and other equipment as necessary for a fully functional signal system. 4 section left turn heads shall be installed and wired to the controller but a protected left turn phase will not be implemented at this time.

The Contractor shall furnish and deliver to the City of Bismarck Traffic Engineers office a laptop computer. The laptop computer shall meet the traffic signal controller and camera manufacturer supplier's specifications. The laptop computer shall have windows 7 64 bit professional operating system with minimum 16 GB RAM and I-7 processor. The cost of the laptop computer shall be included in the price bid for "Traffic Signal System – Site 1"

772-P05 TRAFFIC SIGNAL POLES: New traffic signal poles and pedestrian pushbutton poles shall be galvanized steel. Galvanizing shall be in accordance with AASHTO Specification M111 (ASTM A123). Steel pole material shall be in accordance with ASTM A36, A242, A570, A572, A607 or A595 Grade A or B. A595 material shall be limited to a 3/8 inch maximum thickness. Steel pole material with a thickness of 1/2 inch to 2 inches, shall satisfy Charpy V-Notch toughness test requirements of 15 ft. lb. at 40 degrees F. The Engineer shall be contacted for Charpy impact requirements for steel pole material thickness greater than 2 inches.

Signal poles shall have rotatable mast arms. Luminaire extension(s) shall have a 40 Ft. mounting height with 6 Ft. arm.

772-P06 TRAFFIC SIGNAL STANDARDS BASE: 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 \_".

772-P07 SIGNAL COMPONENT COLOR: The traffic signal system components shall be colored in accordance with the following:

- Signal housing - yellow
- Signal head mounting hardware – yellow
- Pedestrian pushbutton housing - yellow
- The color yellow shall be 13538 of Federal Standard No. 595.

772-P08 TRAFFIC SIGNAL ELECTRICAL SERVICE: The contractor shall be responsible for coordinating with the electric utility, Capital Electric, for the new incoming electrical service for the traffic signal at Ash Coulee Drive. The traffic signals shall be metered separately from the lighting.

The electrical service shall be 120/240V, 30 Amp, single phase. The utility shall be responsible for providing service conductors and connections from the utility transformer to the proposed metersocket on the controller cabinet exterior. The utility shall also be responsible for any boring or trenching required up to the meter.

The Contractor shall provide and install a 200 amp meter socket with stud-type connectors and mount on the side of the controller cabinet using a mounting frame constructed of unistrut or perforated tube. The frame shall be mounted in the controller cabinet concrete foundation and the foundation shall be increased in size accordingly. The Contractor shall provide and install a 2" conduit sweep in the concrete foundation for the service conductors to the metersocket from a point 24" below grade. All exposed conduit shall be rigid steel. Any cost imposed by Capital Electric shall be coordinated by the Contractor and paid for by the City of Bismarck.

The Contractor shall provide and install a 30 amp rated, fused disconnect (safety switch box) and install adjacent to the controller cabinet exterior on the mounting frame next to the metersocket. The disconnect shall be SUSE rated and act as the main service disconnect and be bonded according to the NEC. The disconnect shall be lockable in both positions, be NEMA 3R rated, shall be 2-pole, be double throw type, contain class H fuse spacings, and be fused at 30 amps. The disconnect shall be used as a generator transfer switch with a 30 amp twist lock receptacle. The contractor shall coordinate with the City of Bismarck to ensure the receptacle type matches their generators. In the past the receptacle has been field installed and has been Leviton 2615 flanged inlet, NEMA L5-30P, 120 Volt type, with a weather proof cover. The Contractor shall verify the exact fault current rating with the utility and the main disconnect shall have a minimum AIC rating as required by the NEC.

All materials, labor and equipment necessary to furnish and install the electrical service including the mounting frame, metersocket, and disconnect switch, shall be included in the price bid for "Traffic Signal System – Site \_."

772-P09 TRAFFIC SIGNAL CONTROLLER CABINET: The new concrete foundation shall be constructed as shown on standard detail D770-1 along with three spare 2" conduit sweeps. A GFCI receptacle shall be provided in the controller cabinet. The price bid for "Traffic Signal System – Site \_" and shall include all labor, materials and equipment required to relocate and/or revise the existing controller. This shall include but is not limited to the cabinet, concrete foundation, and controller cabinet components connected as required to make the existing controller equipment operational with the signal equipment. This also included any programming and data entry (i.e. signal timing plans) necessary to provide a fully functional traffic signal controller. The cabinet doors shall face south with the hinge on the west edge.

772-P10 CONTROLLER WORKING SLAB: Controller working slab shall be 6 feet wide and extend a minimum of 4 feet from the face of the controller foundation. The slab shall be 4 inches thick and reinforced with 6" x 6" x 10 GA welded wire fabric and shall be tied to the controller foundation with 18-inch long #3 rebar spaced 18 inches on center. The controller working slab shall have a slope of .25 inches per foot away from the controller cabinet foundation. The closest point of the top of the slab to finished grade shall be 2 inches above grade. Furnishing and installing the working slab is included in the price bid for "Traffic Signal System – Site 1".

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772-P11 SIGNAL EQUIPMENT:  
 A. All pedestal adapters/collars shall be steel.  
 B. All pedestrian heads shall be 16" with countdown displays.  
 C. All vehicle and pedestrian heads shall be polycarbonate and installed level on all sides. All fasteners shall be stainless steel and anti-seize lubricant used.  
 D. Two-point mounting system such as Astro Brackets, Sky Brackets or approved equal shall be used for all mast arm mounted signals.  
 E. All traffic signal backplates shall be louvered aluminum.  
 F. All indications on new signal heads shall be LED.  
 G. Furnishing and installing signal equipment is included in the price bid for "Traffic Signal System – Site \_".

772-P12 VIDEO DETECTION SYSTEM: The video detection system shall reuse the existing Autoscope ENCORE2 Video Detection Equipment. All cable connections, camera aiming and system set-up, including programming detection zones and verification of reliable operation shall be provided by the Contractor. The location of cameras in the plans are for reference only. Cable and camera installation shall be performed by the Contractor.

The video detection equipment shall be capable of transmitting continuous real time digital video images from any camera at 43<sup>rd</sup> Ave to the traffic engineer's office. Midcontinent Communications will provide a cable modem and cable from their existing pedestal to the new traffic signal controller cabinet at 43<sup>rd</sup> Avenue. The Contractor shall be responsible for coordination and providing technical support to Midcontinent Communications, and the City of Bismarck IT Department. The Contractor shall also be responsible for supplying Ethernet modem switches or any other equipment to relay the IP-based video images to the cable modem. The cable modem shall transmit the images to the traffic engineer's office.

The Contractor shall provide all labor and equipment necessary for the video detection system to be fully operational. All costs, labor, materials and equipment necessary for furnishing and installing this item and providing the video images, all technical support and equipment into the traffic engineer's office shall be included in the price bid for "Traffic Signal System – Site \_"

772-P13 TRAFFIC SIGNAL HEAD BACK PLATES: Traffic signal head back plates shall be furnished with a yellow Type XI retroreflective border. The yellow border shall be installed around the perimeter of the face of the backplate and shall be 1 inch wide. The backplates shall be installed with stainless steel fasteners including a washer. All fasteners shall be anti-seize lubricant applied to the threads. The cost for furnishing the border shall not be bid separately but shall be included in the price bid for "Traffic Signal System – Site \_".

772-P14 EMERGENCY VEHICLE PRE-EMPTION: The Contractor shall notify the fire chief (Joel Boespflug) (701-355-1400) when the proposed signalized intersection EVP systems are tested and operable. The existing EVP equipment shall be reset to the new signal mast arms. The confirmation light shall be at the same location on the mast arm as the EVP detectors. The City of Bismarck is responsible for setting the range of the system.

772-P15 CONDUIT: Conduit shall be installed at the location shown on the plans. HDPE conduit shall be used when boring. Bored conduit shall be included in the bid price for "Traffic Signal System – Site \_".

All conduits shall be sealed with duct seal at the controller cabinet and at the traffic signal standard foundations. The Contractor shall install two spare 2" conduit sweeps in the controller cabinet foundation and one spare 2" conduit sweep in each traffic signal standard base. Spare conduits shall be capped with an oil-tight plug with wing nut and labeled as to which direction they face.

772-P16 LABEL ALL FIELD CABLES: All labeling materials shall be approved by the City. Labels shall be readable without moving the cables. 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 detection cable	Approach Detection (i.e. NW, SW, etc.)	Within 6" of terminals
Control cable	Cable number & location (i.e. NW, SW, etc.)	Within 12" of conduit
Opticom cable	Pre-empt number/location (i.e. NW, SW, e tc.)	Within 6" of terminal

Not a separate pay item, cost to be included in the price bid for "Traffic Signal System – Site \_".

772-P17 CONTROLLER CABINET WIRING DIAGRAM: The following items shall be labeled on the cabinet wiring diagram, in addition to information required by NDDOT Standard Specification.

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

The Contractor shall use a heat-shrink labeling system. The cables shall not be stripped back from the connection more than 12 to 18 inches. This work is not a separate pay item and cost shall be included in the price bid for "Traffic Signal System – Site \_".

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772-P18 CONFLICT MONITOR TESTING: A complete controller conflict monitor test shall be performed by the Contractor prior to unveiling the traffic heads. The Contractor shall supply the conflict monitor maintenance record test form along with instructions that must be followed completely before the signals are put into operation. All materials, labor and equipment necessary to conduct the conflict monitor testing shall be included in the price bid "Traffic Signal System – Site \_".

772-P19 PADLOCKS: The City of Bismarck shall provide padlocks for the Traffic Signal System and Lighting System.

772-P20 WIRE SPLICING: No splicing is allowed in pull boxes. Splicing may only take place at the signal transformer base terminal strip, controller cabinet terminal blocks, and traffic signal head terminal blocks.

772-P21 TERMINAL STRIP PROTECTION: The Contractor shall mount the terminal strip on a 1/2" thick white plastic backing material and provide a terminal strip protection pipe within the signal transformer base. The protection pipe shall consist of a 3" to 3 1/2" PVC pipe with a minimum length of 12" and must cover the entire terminal strip. The PVC pipe shall have one end capped. The terminal strip shall be placed within the PVC pipe with the cap side up inside the transformer base. All materials, labor and equipment necessary to provide and install the terminal strip protection pipe shall be included in the price bid "Traffic Signal System – Site \_".

772-P22 PEDESTRIAN PUSHBUTTON POSTS: The pedestrian pushbutton posts shall be constructed with 2" rigid steel consisting of an above grade section of pipe with threaded bottom inserted into a 2" coupling set 1/8" above the surrounding concrete. The coupling shall be connected to a 2" rigid steel sweep. The design intent is to replace the upper portion if hit by a vehicle without impacting the 2" coupling or sweep embedded in the concrete and earth below. The Contractor shall submit shop drawings prior to ordering materials. All materials, labor and equipment necessary to provide and install the pushbutton posts shall be included in the price bid "Traffic Signal System – Site \_".

772-P23 PULL BOXES: The pull boxes shall be polymer concrete type. The cover shall clearly be marked as "Traffic Signal" as required. Pull boxes for Interconnect cable shall also be marked as "Traffic Signal". See standard drawing D770-3 for details. Duct seal all conduits entering and exiting pull boxes. No splicing is allowed in pull boxes. Pull box 5 on Ash Coulee and Pull Box 4 on LaSalle shall be sized larger to meet requirements of the NEC and at a minimum shall be 24"x36" with a 26" depth. The style shall be as shown on the standard drawings and include the stackable bottom extension with knockouts. 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 \_".

772-P24 ACCESSIBLE PEDESTRIAN SIGNALS (APS) PUSHBUTTON AND SIGN: All pedestrian pushbuttons shall meet the requirements of accessible pedestrian signal (APS) pushbuttons and include the features, installation procedures and be compliant with the following:

A. Features:

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

B. Installation Procedures

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

4. Pushbutton required to be located within reach range for wheelchair users (Proposed PROWAG, R406).

C. Code Compliance:

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

The Contractor shall supply an additional pushbutton unit at each site. The cost for the accessible pedestrian signals pushbutton and sign shall not be bid separately but shall be included in the item "Traffic Signal System – Site \_".

772-P23 FLASHING BEACON – POST MOUNTED: The price bid for "Flashing Beacon - Post Mounted" shall include all labor and equipment necessary for each flashing beacon to be fully operational as shown in the plans upon construction completion. Each assembly shall include a S1-5-24 sign and one LED flashing beacon with 5" louvered backplate mounted above the sign facing the direction of travel. The assembly shall be supported by (2) 2.5"x2.5" 10 gauge perforated tubes. The beacons shall flash alternately and be programmed to flash on days when school is in session during the hours of 7:30 AM to 9:00 AM and 2:30 PM to 4:00 PM. The flashing beacons shall be 120 volt powered from the LaSalle Dr intersection traffic signal controller cabinet in the same conduits as the lighting as shown on the plans. The price bid for each flashing beacon shall include flat sheet for signs, mounting hardware, LED beacons, controller wire and all ancillary hardware for a functional system.

970-P01 LANDSCAPING - APPLIES TO ALL TREES

1. A plant establishment period shall extend for a period of one (1) year commencing on date of acceptance by Engineer/City Forester.
2. The Contractor shall notify the City of Bismarck Forestry Department (701) 355-1733 for an inspection of all plant material prior to installation.
3. The Contractor shall properly care for all plants from the time of planting until the contract plant establishment period expires.
4. Proper care of plants shall consist of doing work such as supplemental watering, weeding, pruning, spraying, tightening of braces and guys, retying wrapping, remulching and other work as necessary to keep plants in a neat appearance and in a healthy growing condition.
5. Complete waterings shall be performed at 5 to 7 day intervals which may be lengthened when weather conditions and soil moisture permit. Additional waterings may be ordered by the Engineer at any time during the plant establishment period should conditions require such waterings. A 20 gallon slow release supplemental water bag shall be provided for each deciduous tree planted and is incidental to the cost of the unit bid price for each tree.
6. The contractor shall furnish and install shredded wood mulch at a 4" depth and 6' diameter at the base of all trees unless otherwise noted. See detail for placement of wood mulch. All materials and labor shall be included in the bid price for the individual tree items.

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7. Planting Soil Mixture for Trees
  - A. Topsoil and subsoil excavated in each proposed planting hole shall be removed and the excess material shall be disposed of by the Contractor.
  - B. All tree pits shall be backfilled with a mixture of 50% native soil and 50% potting mixture or approved equal.
  - C. Potting mixture shall consist of a mixture of peat moss, topsoil, and sand in a ratio of 1:1:1 by volume. The peat moss shall have the following characteristics:
    - a. Peat Moss shall consist of at least 75% of partially decomposed stems and leaves of sphagnum, hypnum, polytrichum, and other mosses in which the fibrous and cellular structure is still recognizable. It shall be nearly free of decomposed colloidal residue, wood, and other foreign matter, and shall be brown to black in color. Humus peat will not be acceptable.
    - b. Moisture content shall not exceed 60% by weight.
    - c. Ash content shall not exceed 20%, based on the oven dry weight of the material.
    - d. The pH value shall not be less than 3.2 nor greater than 7.0 at 25° C.
    - e. Water holding capacity shall not be less than 400% by weight, on an oven dry basis.
    - f. The Contractor shall furnish the Project Engineer with a certificate stating the type of peat moss, brand name, and the country or place of origin. If packed in bales, provide certificate from marking on bales.
    - g. The sand shall be from an approved source and 100% shall pass a 3/8" sieve.
    - h. The cost of providing the planting soil mixture shall be included in the price bid for the individual tree items.
    - i. All excess soil removed from the tree pit becomes the property of the contractor and disposal shall be considered included in the cost of plant material.
8. A sufficient amount of water shall be placed in each supplemental water bag at the time of each watering to keep plants in a moist condition, and to keep the plant in a healthy growing condition. All supplemental water bags shall be removed after the growing season.
9. All plants that die or show evidence of dying, in the opinion of the Engineer/City Forester, during the plant establishment period shall be replaced at the Contractor's expense at the earliest appropriate planting time after this condition becomes apparent.
10. All bracing and guying materials shall be removed and disposed of by the City of Bismarck.
11. Near the end of the applicable plant establishment period, an inspection of the planting will be made and only those plants found to be in a healthy growing condition will be accepted. Those plants not in a healthy growing condition will be replaced by the Contractor at the Contractor's expense.
12. Contractor shall provide, to a period through the plant establishment period, a replacement warranty on all plant materials found dead, or not in a healthy growing condition.
13. Weed fabric shall be included under all areas receiving rock mulching. Acceptable fabric shall be 5oz. woven, needle punched, polypropylene fabric designed for professional and commercial use. Plastic and other non-breathable material will not be accepted. Weed fabric shall be incidental to plant bid items.
14. Do not install plant material when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F. Do not install plant material when wind velocity exceeds 30 mph. Acceptable planting dates shall be as follows:
 

Spring: April 15 – June 15  
Fall: September 15 – October 15

970-P02

**LANDSCAPE APPURTENANCE – AREA 1**

1. Contractor shall provide and install new landscaping in the area from approximately Sta. 41+80 to Sta. 42+10 along the existing Century Baptist parking lot perimeter where the existing driveway has been removed due to grading operations. Landscaping to be installed shall have the appearance similar to the existing landscaping to the north. 3-#5 Gallon deciduous shrubs and 3-#1 Gallon perennials shall be installed centered in landscape area with matching spacing and location as existing planting scheme to the north.

Landscape edging shall be pure polyethylene with 3.5% - 4% carbon, black, MDPE with a melt factor under 2, 5" in height (1" bead and 4" wall) and .09" to .105" thick. Edging pieces shall span in 20' sections and connected with 1" poly connector. Bottom of edging bead shall be flush to existing grade. Install 9 1/2" steel stake through the wall at 45 degree angle every 4' of landscape edging.

Rock mulch shall be 3" rock mulch matching in existing color to adjacent north landscaping scheme and installed at 3" depth placed over 3 oz. non-woven landscape fabric.

No irrigation is intended for this area.

The cost of providing and installing plant material, landscape edging, rock mulch and landscape fabric shall be included in the Lump Sum Bid Price for Landscape Appurtenance.

2. Contractor shall inventory existing plant material, irrigation and rock mulch from approximate Sta. 42+10 to Sta. 44+80 along the existing Century Baptist parking lot perimeter where plant material has been removed due to grading operations. All plant material shall be replaced with same species at a minimum size of:
  - A. Deciduous Tree: 2" Caliper Min. and 10-12' Height Min.
  - B. Evergreen Tree: 6' Height
  - C. Deciduous Shrubs: #5 Gallon
  - D. Evergreen Shrubs: #5 Gallon
  - E. Perennials: #1 Gallon

Landscape edging shall be pure polyethylene with 3.5% - 4% carbon, black, MDPE with a melt factor under 2, 5" in height (1" bead and 4" wall) and .09" to .105" thick. Edging pieces shall span in 20' sections and connected with 1" poly connector. Bottom of edging bead shall be flush to existing grade. Install 9 1/2" steel stake through the wall at 45 degree angle every 4' of landscape edging.

Rock mulch removed shall be replaced with 3" depth of 1-1/2" crushed rock mulch matching in color over 3 oz. non-woven landscape fabric.

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All irrigation lines, heads and wiring disturbed during construction activity shall be reinstalled to match existing distribution and functionality. Any damage to the existing irrigation system parts shall be the responsibility of the contractor to replace, install and test to ensure proper working order.

The cost of providing and installing plant material, landscape edging, rock mulch, landscape fabric and irrigation adjustments shall be included in the Lump Sum Bid Price for Landscape Appurtenance

970-P03 LANDSCAPE APPURTENANCE – AREA 2

1. Contractor shall inventory existing plant material at Sta. 49+30 along the existing First Evangelical Free Church where plant material has been removed due to the installation of 5' sidewalk and grading operations. The individual tree shall be replaced with same species at a minimum size of:

F. Evergreen Tree: 6' Height

The location of replacement shall be at a minimum of 10' east from existing location.

The cost of providing and installing plant material shall be included in the Lump Sum Bid Price for Landscape Appurtenance.

970-P04 LANDSCAPE APPURTENANCE – AREA 3

1. Contractor shall provide and install new plant material from approximate Sta. 518+60 to Sta. 519+40 along the existing First Evangelical Free Church parking lot perimeter where an existing driveway has been removed. All plant material shall be installed with same species and spacing adjacent to the existing driveway with to a minimum size of:

A. Evergreen Tree: 6' Height

The cost of providing and installing plant material shall be included in the Lump Sum Bid Price for Landscape Appurtenance.

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## ENVIRONMENTAL COMMITMENTS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NHU-1-981(101)111	6	16

**ENVIRONMENTAL COMMITMENTS (EC):** The City of Bismarck, 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:** Unavoidable impacts to wetlands will be mitigated onsite, adjacent to the project, or at an approved mitigation site or bank.

**ACTION REQUIRED /TAKEN:** 0.08 acres of permanent impacts to jurisdictional waters will require mitigation. The City of Bismarck proposes to mitigate 0.08 acres onsite

Wetland Impact Table															
Wetland Number	Location	Cowardin Class.	Wetland Type	Wetland Size Ac.	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts (acres)		USFWS Easement Impacts		Wetland Mitigation				
							Temp. Ac.	Perm. Ac.	Temp.	Perm.	Mitigation Required			Location; Acreage; Wetland#; Ratio	Onsite Mitigation Acres
											EO 11990	USACE	USFWS		
1	Sec. 16, T139N, R80W	PEMC	Intermittent Drainage	0.32	Natural	Yes	0.08	0.08	0	0	Y	N	N	Onsite, 0.08, Wetland 1, 1:1	0.08
<b>Totals</b>				<b>0.32</b>			<b>0.08</b>	<b>0.08</b>	<b>0</b>	<b>0</b>					<b>0.08</b>

\* A wetland Jurisdictional Determination was issued by the USACE on 07/12/13; NWO-2013-1234-BIS.

\*\*All impacts to natural wetlands (natural/jurisdictional and natural/non-jurisdictional), regardless of size, as well as impacts greater than 0.10 acre to artificial/jurisdictional wetlands require mitigation.

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

Summary Impact Table			
Total Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.08	Temporary JD	0.08
Natural/Non-JD	0	Non-JD Temporary	0
Artificial/JD	0	Permanent JD > 0.10	0
Artificial /Non-JD	0	Permanent OW	0
<b>Total</b>	<b>0.08</b>	<b>Temporary OW</b>	<b>0</b>

Compensation Requirements by Agency and Water Type		
Water Type	USACE Mitigation	EO 11990 Mitigation
Natural/JD Wetland	> 0.1 acre	All
Natural/Non-JD Wetland	No mitigation required	All
Artificial/JD Wetland	> 0.1 acre	No mitigation required
Artificial/Non-JD Wetland	No mitigation required	No mitigation required
Deep Water (> than 6.6 feet)	No mitigation required	No mitigation required
Other Water	> 300 linear feet	No mitigation required
<b>Preamble</b>	No mitigation required	No mitigation required

**ESTIMATE OF QUANTITIES**

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-1-981(101)111	PARTIALLY PARTICPATING (49% Federal/51% City)	100% CITY FUNDS	TOTAL
103	0100	CONTRACT BOND	L SUM	1	-	-	1
103	0200	ESCROW OF BID DOCUMENTATION	L SUM	1	-	-	1
201	0330	CLEARING & GRUBBING	L SUM	1	-	-	1
202	0104	REMOVAL OF STRUCTURE	EA	1	-	-	1
202	0112	REMOVAL OF CONCRETE	SY	454	-	-	454
202	0127	REMOVE & SALVAGE CULVERT-ALL TYPES & SIZES	LF	44	-	-	44
202	0130	REMOVAL OF CURB & GUTTER	LF	637	-	-	637
202	0135	REMOVAL OF BITUMINOUS SURFACING	TON	19,724	-	-	19,724
202	0210	REMOVAL OF MANHOLES	EA	1	-	-	1
202	0235	REMOVAL OF CATCH BASIN	EA	1	-	-	1
203	0101	COMMON EXCAVATION-TYPE A	CY	111,845	-	-	111,845
203	0109	TOPSOIL	CY	12,301	-	-	12,301
203	0119	TOPSOIL-IMPORTED	CY	500	-	-	500
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1	-	-	1
210	0127	CHANNEL EXCAVATION	L SUM	1	-	-	1
210	0210	FOUNDATION FILL	CY	138	-	-	138
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1	-	-	1
216	0100	WATER	M GAL	2,802	-	-	2,802
251	0300	SEEDING CLASS III	ACRE	16.31	-	-	16.31
251	1000	WETLAND SEED	ACRE	0.16	-	-	0.16
251	2000	TEMPORARY COVER CROP	ACRE	4.21	-	-	4.21
252	0100	SOD	SY	9,185	-	-	9,185
253	0101	STRAW MULCH	ACRE	4.21	-	-	4.21
253	0201	HYDRAULIC MULCH	ACRE	11.91	-	-	11.91
255	0103	ECB TYPE 3	SY	21,688	-	-	21,688
256	0200	RIPRAP GRADE II	CY	37	-	-	37
261	0112	FIBER ROLLS 12IN	LF	6,279	-	-	6,279
261	0113	REMOVE FIBER ROLLS 12IN	LF	5,529	-	-	5,529
302	0050	TRAFFIC SERVICE AGGREGATE	TON	8,000	-	-	8,000
302	0120	AGGREGATE BASE COURSE CL 5	TON	73,676	-	-	73,676
302	9002	SUBCUT GRAVEL	TON	500	-	500	1,000
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	4,835	-	-	4,835
420	0130	COVER COAT MATERIAL CL 43	SY	12,085	-	-	12,085
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	3,814	-	-	3,814
430	5828	PG 58-28 ASPHALT CEMENT	TON	229	-	-	229
550	0302	8.5IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	67,500	-	-	67,500
606	0705	7FT X 5FT PRECAST RCB CULVERT	LF	86.8	-	-	86.8
702	0100	MOBILIZATION	L SUM	1	-	-	1
704	0100	FLAGGING	MHR	5,000	-	-	5,000
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3,722	-	-	3,722

Estimate of Quantities

**ESTIMATE OF QUANTITIES**

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-1-981(101)111	PARTIALLY PARTICPATING (49% Federal/51% City)	100% CITY FUNDS	TOTAL
704	1051	TYPE II BARRICADE	EA	16	-	-	16
704	1052	TYPE III BARRICADE	EA	78	-	-	78
704	1060	DELINEATOR DRUMS	EA	296	-	-	296
704	1067	TUBULAR MARKERS	EA	170	-	-	170
704	1080	STACKABLE VERTICAL PANELS	EA	267	-	-	267
704	4011	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2	-	-	2
708	1531	INLET PROTECTION-FIBER ROLL 12IN	EA	12	-	-	12
708	1533	REMOVAL INLET PROTECTION-FIBER ROLL 12IN	EA	12	-	-	12
708	1540	INLET PROTECTION-SPECIAL	EA	95	-	-	95
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	95	-	-	95
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	91,849	-	-	91,849
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	74	-	-	74
714	0210	PIPE CONC REINF 15IN CL III-STORM DRAIN	LF	1,639	739	-	2,378
714	0315	PIPE CONC REINF 18IN CL III-STORM DRAIN	LF	2,137	265	-	2,402
714	0620	PIPE CONC REINF 24IN CL III-STORM DRAIN	LF	2,197	413	-	2,610
714	0825	PIPE CONC REINF 30IN CL III-STORM DRAIN	LF	866	378	-	1,244
714	0910	PIPE CONC REINF 36IN CL III-STORM DRAIN	LF	659	53	-	712
714	1010	PIPE CONC REINF 42IN CL III-STORM DRAIN	LF	-	420	-	420
714	1110	PIPE CONC REINF 48IN CL III-STORM DRAIN	LF	-	374	-	374
714	1212	PIPE CONC REINF 54IN CL III-STORM DRAIN	LF	-	58	-	58
714	3005	END SECT-CONC REINF 15IN	EA	-	2	-	2
714	3010	END SECT-CONC REINF 18IN	EA	3	1	-	4
714	3020	END SECT-CONC REINF 24IN	EA	4	1	-	5
714	3035	END SECT-CONC REINF 36IN	EA	2	-	-	2
714	6581	PIPE POLYETHYLENE CORR PERF 6IN DRAIN	LF	2,817	-	-	2,817
714	9640	RELAY PIPE-ALL TYPES & SIZES	LF	116	-	-	116
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	2	-	-	2
714	9705	UNDERDRAIN CLEANOUT RISER	EA	22	-	-	22
722	0100	MANHOLE 48IN	EA	19	-	-	19
722	0106	MANHOLE 54IN	LF	4	-	-	4
722	0110	MANHOLE 60IN	EA	6	-	-	6
722	0120	MANHOLE 72IN	EA	5	-	-	5
722	0130	MANHOLE 84IN	EA	3	-	-	3
722	0140	MANHOLE 96IN	EA	1	-	-	1
722	0300	MANHOLE SANITARY	EA	-	-	4	4
722	1100	MANHOLE RISER 48IN	LF	99.1	-	-	99.1
722	1106	MANHOLE RISER 54IN	LF	17.2	-	-	17.2
722	1110	MANHOLE RISER 60IN	LF	42.0	-	-	42.0
722	1120	MANHOLE RISER 72IN	LF	30.4	-	-	30.4
722	1130	MANHOLE RISER 84IN	LF	22.1	-	-	22.1
722	1140	MANHOLE RISER 96IN	LF	7.5	-	-	7.5

Estimate of Quantities

**ESTIMATE OF QUANTITIES**

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722	3410	MANHOLE REPAIR	EA	3	-	-	3
722	3510	INLET-TYPE 2	EA	24	-	-	24
722	3520	INLET-TYPE 2 DOUBLE	EA	37	-	-	37
722	3701	INLET SPECIAL-TYPE 2 48IN	EA	1	-	-	1
722	3730	INLET SPECIAL CATCH BASIN 9IN BEEHIVE 48IN	EA	2	-	-	2
722	3761	INLET SPECIAL-TYPE 2 60IN	EA	4	-	-	4
722	3790	INLET SPECIAL CATCH BASIN 9IN BEEHIVE 60IN	EA	1	-	-	1
722	4020	INLET CATCH BASIN 9IN BEEHIVE	EA	2	-	-	2
722	6200	ADJUST MANHOLE	EA	12	-	-	12
722	6240	ADJUST UTILITY APPURTENANCE	EA	32	-	-	32
724	0210	FITTINGS-DUCTILE IRON	LBS	865	-	675	1,540
724	0310	GATE VALVE & BOX 8IN	EA	-	-	1	1
724	0314	GATE VALVE & BOX 12IN	EA	-	-	4	4
724	0317	GATE VALVE & BOX 16IN	EA	2	-	-	2
724	0324	GATE VALVE & BOX 24IN	EA	-	-	1	1
724	0375	RELOCATE GATE VALVE & BOX	EA	2	-	-	2
724	0412	8IN HYDRANT	EA	1	-	4	5
724	0420	HYDRANT-RELOCATE	EA	4	-	1	5
724	0427	ADJUST HYDRANT	EA	2	-	-	2
724	0430	REMOVE HYDRANT	EA	1	-	-	1
724	0820	WATERMAIN 8IN	LF	29	-	130	159
724	0855	12IN WATERMAIN	LF	-	-	239	239
724	0858	WATERMAIN 16IN	LF	966	-	132	1,098
724	0870	24IN WATERMAIN	LF	-	-	3,109	3,109
724	0891	WATERMAIN MODIFICATIONS	L SUM	1	-	-	1
724	0944	CONNECTION TO EXISTING MAIN	EA	-	-	5	5
724	1020	MEDIAN SPRINKLER SYSTEM	L SUM	1	-	-	1
724	1117	12IN SANITARY SEWER PIPE	LF	-	-	619	619
724	1118	15IN SANITARY SEWER PIPE	LF	-	-	109	109
744	0100	POLYSTYRENE INSULATION BOARD	BD FT	10,928	-	1,536	12,464
748	0140	CURB & GUTTER-TYPE I	LF	34,197	-	-	34,197
750	0111	DECORATIVE PAVED BOULEVARD	SY	175	-	-	175
750	0115	SIDEWALK CONCRETE 4IN	SY	13,558	-	-	13,558
750	0140	SIDEWALK CONCRETE 6IN	SY	577	-	-	577
750	0200	CONCRETE MEDIAN PAVING	SY	3,833	-	-	3,833
750	0210	CONCRETE MEDIAN NOSE PAVING	SY	451	-	-	451
750	1020	DRIVEWAY CONCRETE 8IN	SY	209	-	-	209
750	2115	DETECTABLE WARNING PANELS	SF	1,230	-	-	1,230
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	832	-	-	832
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	624	-	-	624

Estimate of Quantities

**ESTIMATE OF QUANTITIES**

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-1-981(101)111	PARTIALLY PARTICPATING (49% Federal/51% City)	100% CITY FUNDS	TOTAL
754	0193	FLEXIBLE DELINEATORS-TYPE D	EA	105	-	-	105
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	1,659	-	-	1,659
754	0592	RESET SIGN PANEL	EA	2	-	-	2
754	0593	RESET SIGN SUPPORT	EA	1	-	-	1
754	0805	OBJECT MARKERS - CULVERTS	EA	15	-	-	15
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	1,280	-	-	1,280
762	0420	SHORT TERM 4IN LINE-TYPE R	LF	770	-	-	770
762	0424	SHORT TERM 8IN LINE-TYPE R	LF	150	-	-	150
762	1108	PVMT MK PAINTED 8IN LINE	LF	150	-	-	150
762	1255	PREFORMED THERMO PLASTIC PVMT MK 6IN LINE	LF	1,999	-	-	1,999
762	1270	PREFORMED THERMO PLASTIC PVMT MK 24IN LINE	LF	718	-	-	718
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	18,951	-	-	18,951
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	8,948	-	-	8,948
764	9010	ATTENUATING CRASH CUSHION TL-2	EA	6	-	-	6
766	0120	RESET MAILBOX	EA	3	-	-	3
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	EA	57	-	-	57
770	0060	CONCRETE FOUNDATION-FEED POINT-TYPE B	EA	2	-	-	2
770	0100	PULL BOX	EA	13	-	-	13
770	0210	CABLE TRENCH-TYPE I	LF	151	-	-	151
770	0330	2IN DIAMETER RIGID CONDUIT	LF	13,024	-	-	13,024
770	0503	UNDERGROUND CONDUCTOR NO2-TYPE RHW	LF	26,492	-	-	26,492
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	11,936	-	-	11,936
770	0507	UNDERGROUND CONDUCTOR NO10-TYPE RHW	LF	1,252	-	-	1,252
770	0604	UNDERGROUND CONDUCTOR NO4-TYPE THW	LF	10,179	-	-	10,179
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	3,832	-	-	3,832
770	0750	FEED POINT-TYPE V-PAD MOUNTED	EA	1	-	-	1
770	1676	LT STD 6FT MA 40FT MT HT BREAKAWAY	EA	19	-	-	19
770	2876	LT STD TWIN 6FT MA 40FT MT HT BREAKAWAY	EA	38	-	-	38
770	4220	LED LUMINAIRE - 150 WATT	EA	103	-	-	103
770	4540	RELOCATE LIGHT STANDARD	EA	2	-	-	2
770	4560	REMOVE LIGHT STANDARD	EA	8	-	-	8
770	9270	MODIFY EXISTING FEED POINT	EA	1	-	-	1
772	2110	FLASHING BEACON-POST MOUNTED	EA	4	-	-	4
772	2906	REVISE TRAFFIC SIGNAL SYSTEM-SITE 1	EA	1	-	-	1
772	2907	REVISE TRAFFIC SIGNAL SYSTEM-SITE 2	EA	1	-	-	1
772	2935	REVISE FLASHING BEACON SYSTEM	EA	1	-	-	1
772	9200	IT SYSTEM	EA	1	-	-	1
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1	EA	1	-	-	1
772	9812	TRAFFIC SIGNAL SYSTEM - SITE 2	EA	1	-	-	1
970	0001	LANDSCAPING APPURTENANCES	L SUM	1	-	-	1
970	2330	BUR OAK	EA	22	-	-	22
970	2456	PRAIRIE EXPEDITION AMERICAN ELM	EA	16	-	-	16
970	2465	VANGUARD ELM	EA	16	-	-	16

Estimate of Quantities

BASIS OF ESTIMATE	
Item	Unit
Removal of Bituminous Surfacing @ 2.0 Ton/ CY	TON
Aggregate Base Course CL 5 @ 1.875 Compacted Ton/ CY (Includes 25% For Shrinkage)	TON
Tack Coat @ 0.05 Gal/SY *	GAL
CRS2P Emulsified Asphalt For Seal Coat @ 0.40 Gal/SY	GAL
Cover Coat Material CL 43 @ 25 lbs/SY	SY
Superpave FAA 43 @ 2 Ton/ CY	TON
Asphalt Cement PG 58-28 @ 6.0% of HBP	TON
Blotter Material Class 44 @ 15 lbs/SY **	TON

\* Tack coat shall be included in the price bid for Superpave FAA 43  
 \*\* Blotter material shall be included in the price bid for CRS2P Emulsified Asphalt

EARTHWORK SUMMARY			
	COMMON EXC. (CY)	EMBANKMENT (CY)*	WASTE (CY)
Total	111,845	55,654	56,191

\*Quantity includes 25% for shrinkage

#### WATER

50 M Gal for Dust Palliative  
 20 Gal/Ton for Salvaged Base  
 10 Gal/CY for Embankment

#### TOPSOIL

Topsoil shall be removed from the entire construction area at an assumed depth of 4 inches. Removal, stockpiling and replacing of topsoil from excavation and embankment areas will be paid for as "Topsoil". A plan quantity of 12,301 CY of Topsoil has been calculated for the entire project.

Topsoil shall be respread at a depth of 6 inches minimum.

#### TRAFFIC SURFACE AGGREGATE

A quantity of 8000 TON of Traffic Surface Aggregate has been included for temporary surfacing. This quantity shall be used as directed by the engineer.

#### REMOVAL OF BITUMINOUS SURFACING

Removal of bituminous surfacing is based on the Core Data and assumed to be 7". Removal of shared use path is based on 3" thickness.

#### PARKING LOT & PRIVATE DRIVEWAY

HBP and Aggregate Base Course CL 5 shall be constructed at depths equal to existing depths. Quantities have been estimated with 6 inches of HBP and 12 inches of Aggregate Base Course CL 5.

#### SEEDING

Disturbed area within the construction limits, excluding hard surfaced areas and areas identified for sodding.

#### TOPSOIL-IMPORTED

A quantity of 500 CY of imported topsoil has been included to be used as directed by the engineer.

Core Data			
Station	Boring	Bituminous Thickness (inches)	Aggregate Base Thickness (inches)
28+30	ST-1	6.0	3.0
33+84	ST-2	6.0	3.0
41+52	ST-3	6.0	4.0
49+92	ST-4	5.5	6.0
52+82	ST-5	7.0	3.0
52+71	ST-6	6.0	2.0
60+45	ST-7	5.0	4.5
64+17	ST-8	7.0	4.0
69+72	ST-9	8.0	4.0
75+14	ST-10	7.0	7.5
81+29	ST-11	6.0	4.5
85+96	ST-12	6.0	4.0
91+55	ST-13	6.0	4.0
98+66	ST-14	8.0	4.0
102+60	ST-15	8.0	4.0
107+89	ST-16	5.5	4.5

Avg: 6.63"  
 Std Dev: 0.95

Object Markers - Culverts		
Station	LT	RT
33+89	1	
34+19	1	
41+43	1	
45+56	1	
57+57	1	
58+73	1	
58+92		1
66+95	1	
82+92		1
100+24		1
101+02		1
105+61	1	
105+76		1
108+40	1	
521+59		1
	9	6
Total		15

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Rev'd.	Scale: 1:40 Hor, 1:10 Ver		
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
Basis of Estimate			
	DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129
			DATE 07/2015
J:\trans\1412129\CADD\010BE_001_BASIS.dwg			
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	1

PIPE BEDDING QUANTITIES - WATERMAIN AND SANITARY

6" to 18" Based on C900, C905 PVC, C909 PVCO, or SDR35 PVC

20" Based on CL250 DI

24" Based on CL250 DI

30" to 48" Based on CL150 DI

STORM SEWER PIPE BEDDING SCHEDULE				
Pipe Size (inch)	RCP		Metal/PVC/HDPE	
	Under Roadway (CY per Lin. Ft)	Not Under Roadway (CY per Lin. Ft)	Under Roadway (CY per Lin. Ft)	Not Under Roadway (CY per Lin. Ft)
12	0.61	0.28	0.71	0.40
15	0.68	0.33	0.78	0.46
18	0.75	0.39	0.85	0.51
21	0.83	0.44	0.92	0.57
24	0.90	0.50	0.99	0.62
27	0.98	0.56	1.07	0.68
30	1.06	0.62	1.14	0.74
33	1.14	0.68	1.22	0.80
36	1.22	0.74	1.29	0.86
42	1.38	0.88	1.45	0.99
48	1.56	1.01	1.61	1.11
54	1.73	1.15	1.77	1.25
60	1.92	1.30	1.94	1.38
66	2.10	1.45	2.11	1.52
72	2.44	1.61	2.29	1.67

NOTE:

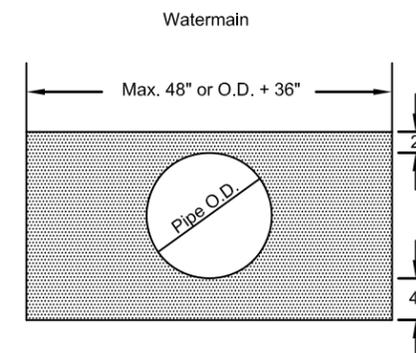
1. The pipe backfill shall be compacted in layers not to exceed 6 inches using a hand-held vibratory plate compactor or a hand-held mechanical tamper to the top of the pipe and within a distance of 2 feet on either side of the pipe.

2. The storm sewer pipe bedding shall be included in the lineal foot bid price of the associated pipe. Quantities were calculated based on the compacted (in-place) volume.

3. This schedule is a quantification of Standard Detail D-714-27 and is for information purposes only.

PIPE SIZE	TRENCH WIDTH	C.Y. / FT.	TONS / FT.
4"	48"	0.1287	0.2188
6"	48"	0.1496	0.2543
8"	48"	0.1693	0.2878
10"	48"	0.1862	0.3165
12"	49"	0.2068	0.3516
16"	54"	0.2638	0.4485
18"	56"	0.2905	0.4939
20"	58"	0.3175	0.5398
24"	62"	0.3726	0.6334
30"	68"	0.4578	0.7783
36"	74"	0.5468	0.9296
42"	81"	0.6521	1.1086
48"	87"	0.7497	1.2745

5 Tons / Manhole  
 2.5 Tons / Hydrant  
 0.1 Tons / LF of Service Line (2" & Under)



PIPE BEDDING QUANTITIES - WATER

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Rev'd.	Scale:		
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Storm Sewer Pipe Pipe Bedding Schedule & Quantities - Water	
DRWN. BY JE	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
J:\trans\1412129\CADD\020GD_001_DETAILS.dwg			
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### DUCTILE-IRON & COMPACT FITTINGS

Weight in Pounds per ANSI/AWWA C1531/A21.53-94

The following table contains the weights of compact ductile iron fittings as listed in the AWWA C153 specification.

\* - Fitting weights per AWWA - C110.

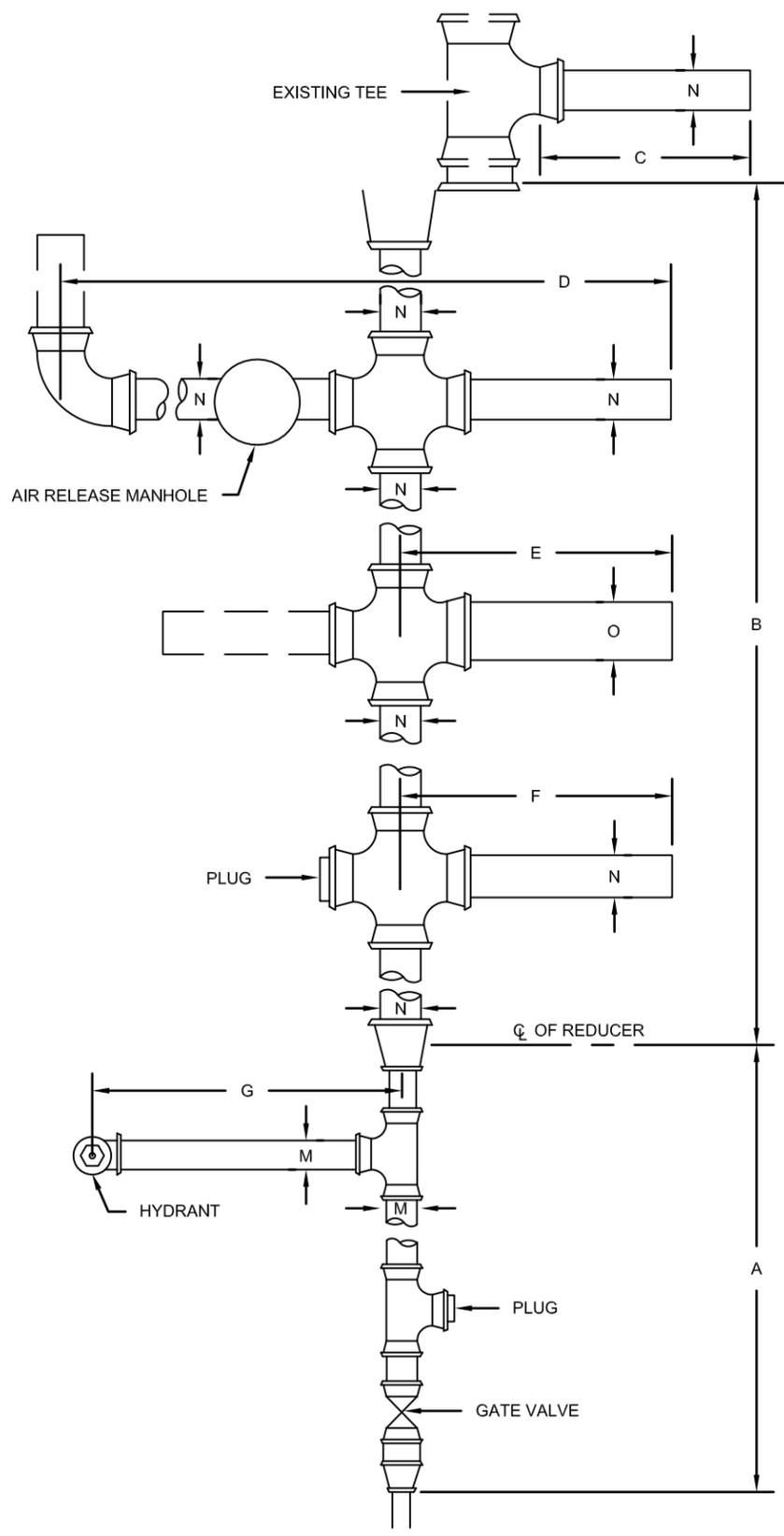
SIZE	BENDS (MJ-MJ)				SLEEVES		CAP	PLUG
	90°	45°	22-1/2°	11-1/4°	SHORT	LONG		
4"	25	22	18	16	15	20	9	10
6"	39	32	31	30	23	29	15	16
8"	57	46	46	42	38	31	45	22
10"	89	70	64	58	45	61	32	36
12"	108	86	80	67	56	76	42	46
14"	210	160	136	93	94	128	66	75
16"	264	202	172	148	118	159	92	95
18"	335	250	255	205	145	200	114	121
20"	400	305	310	245	173	236	125	135
24"	565	405	412	415	226	306	166	175

SIZE	MECHANICAL - JOINT TEES									
	X4	X6	X8	X10	X12	X14	X16	X18	X20	X24
4"	32	-	-	-	-	-	-	-	-	-
6"	46	56	-	-	-	-	-	-	-	-
8"	60	72	86	-	-	-	-	-	-	-
10"	78	90	105	120	-	-	-	-	-	-
12"	94	110	125	140	160	-	-	-	-	-
14"	172	182	206	228	234	280	-	-	-	-
16"	-	228	248	264	280	316	322	-	-	-
18"	-	275	295	315	335	380	405	435	-	-
20"	-	315	345	370	395	440	465	505	535	-
24"	-	415	445	470	500	550	580	625	660	720

SIZE	REDUCERS (MJ - MJ)								
	X4	X6	X8	X10	X12	X14	X16	X18	X20
6"	24	-	-	-	-	-	-	-	-
8"	32	36	-	-	-	-	-	-	-
10"	46	47	50	-	-	-	-	-	-
12"	58	58	57	61	-	-	-	-	-
14"	-	100	100	100	100	-	-	-	-
16"	-	124	124	124	112	140	-	-	-
18"	-	-	190	195	180	190	195	-	-
20"	-	-	-	220	205	200	200	225	-
24"	-	-	-	-	305	306	320	305	300

SIZE	CROSSES (MJ X MJ)									
	X4	X6	X8	X10	X12	X14	X16	X18	X20	X24
6"	57	75	-	-	-	-	-	-	-	-
8"	68	74	105	-	-	-	-	-	-	-
10"	112	119	124	145	-	-	-	-	-	-
12"	119	126	149	179	213	-	-	-	-	-
14"	-	200	228	255	269	299	-	-	-	-
16"	-	240	260	317	306	620*	410	-	-	-
18"	-	505*	535*	560*	348	720*	765*	795*	-	-
20"	-	635*	379	685*	413	745*	915*	945*	1,015*	-
24"	-	875*	481	930*	529	975*	576	1,365*	1,430*	1,570*

**Fittings**  
Fittings shall be measured on a pound basis of compact ductile iron fittings as published in AWWA C153 excluding the weight of glands, gaskets, bolts or other accessories



WATERMAIN SHALL BE MEASURED AND PAYMENT WILL BE MADE FOR:  
 A & G LINEAR FEET OF PIPE OF DIAMETER "M".  
 B, C, D & F LINEAR FEET OF PIPE OF DIAMETER "N".  
 E LINEAR FEET OF PIPE OF DIAMETER "O".

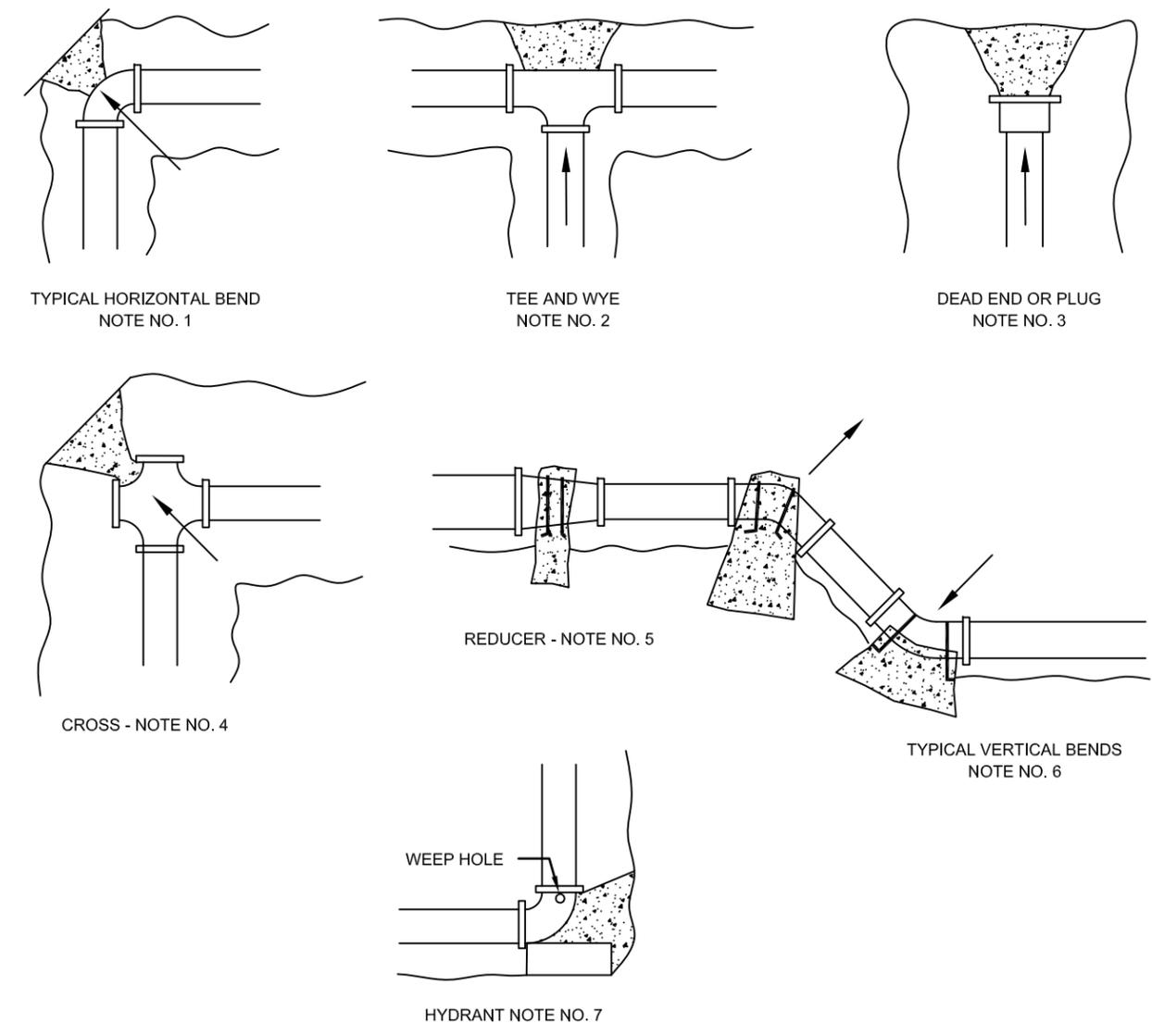
**WATERMAIN PAYMENT DIAGRAM**

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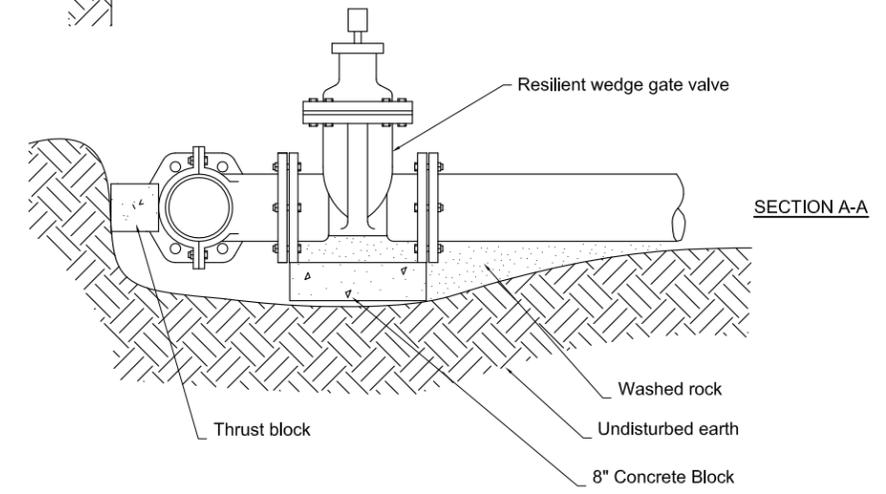
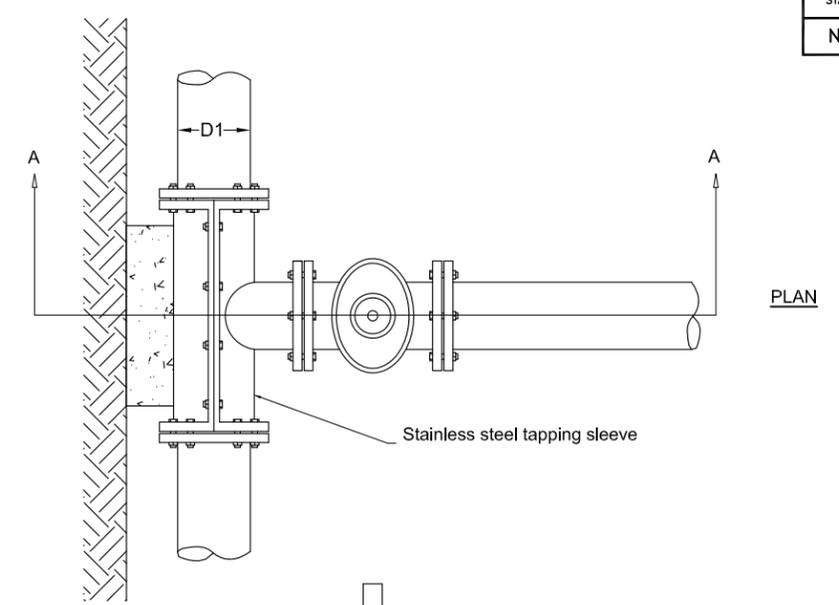
Rev'd.		Scale:	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Water Main Payment Diagram & Fitting Schedule	
DRWN. BY JE	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
<small>J:\trans\1412129\CADD\020GD_001_DETAILS.dwg © Kadmas, Lee &amp; Jackson 2014</small>			

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	3

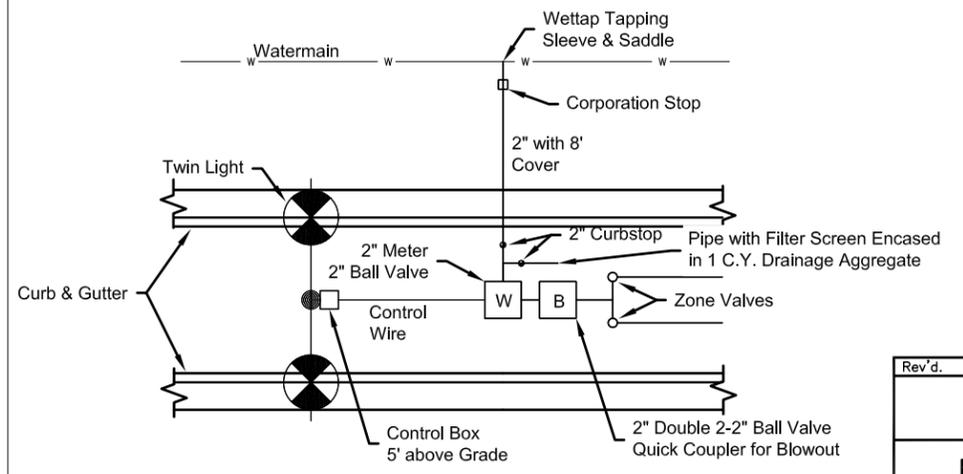
- NOTE NO. 1 BLOCKING OF TYPICAL HORIZONTAL BEND WILL INCLUDE ALL BENDS 11 1/4° (1/32) TO 90° (1/4)
- NOTE NO. 2 BLOCK TEE AS SHOWN. IN THE EVENT THAT ONE SIDE OF THE MAIN IS PLUGGED, 2 THRUST BLOCKS WILL BE REQUIRED.
- NOTE NO. 3 BLOCKING OF PLUG IS TO INCLUDE PLYBOARD BETWEEN THE PLUG AND CONCRETE.
- NOTE NO. 4 BLOCKING OF CROSS WITH 2 PLUGS IS AS SHOWN. WITH ONLY 1 PLUG PROCEED SAME AS TEE.
- NOTE NO. 5 INSTALL CONCRETE ANCHOR AND TIE DOWNS AS SHOWN IF SIZE IS REDUCED 2 PIPE SIZES OR MORE.
- NOTE NO. 6 INSTALL CONCRETE ANCHOR AND TIE DOWNS AS SHOWN IF SIZE IS REDUCED 2 PIPE SIZES OR MORE.
- NOTE NO. 7 ALL VERTICAL BENDS TO BE BLOCKED AND TIED DOWN AS SHOWN.
- NOTE NO. 8 ALL HYDRANTS TO BE BLOCKED AS SHOWN. KEEP CONCRETE AWAY FROM WEEP HOLES.
- THE END AREA OF CONCRETE THRUST BLOCKS SHALL BE SUBMITTED WITH SOIL BEARING CHARACTERISTICS TO THE ENGINEER FOR APPROVAL.



**WATERMAIN CONCRETE THRUST BLOCKING**



**WATERMAIN WET TAP**

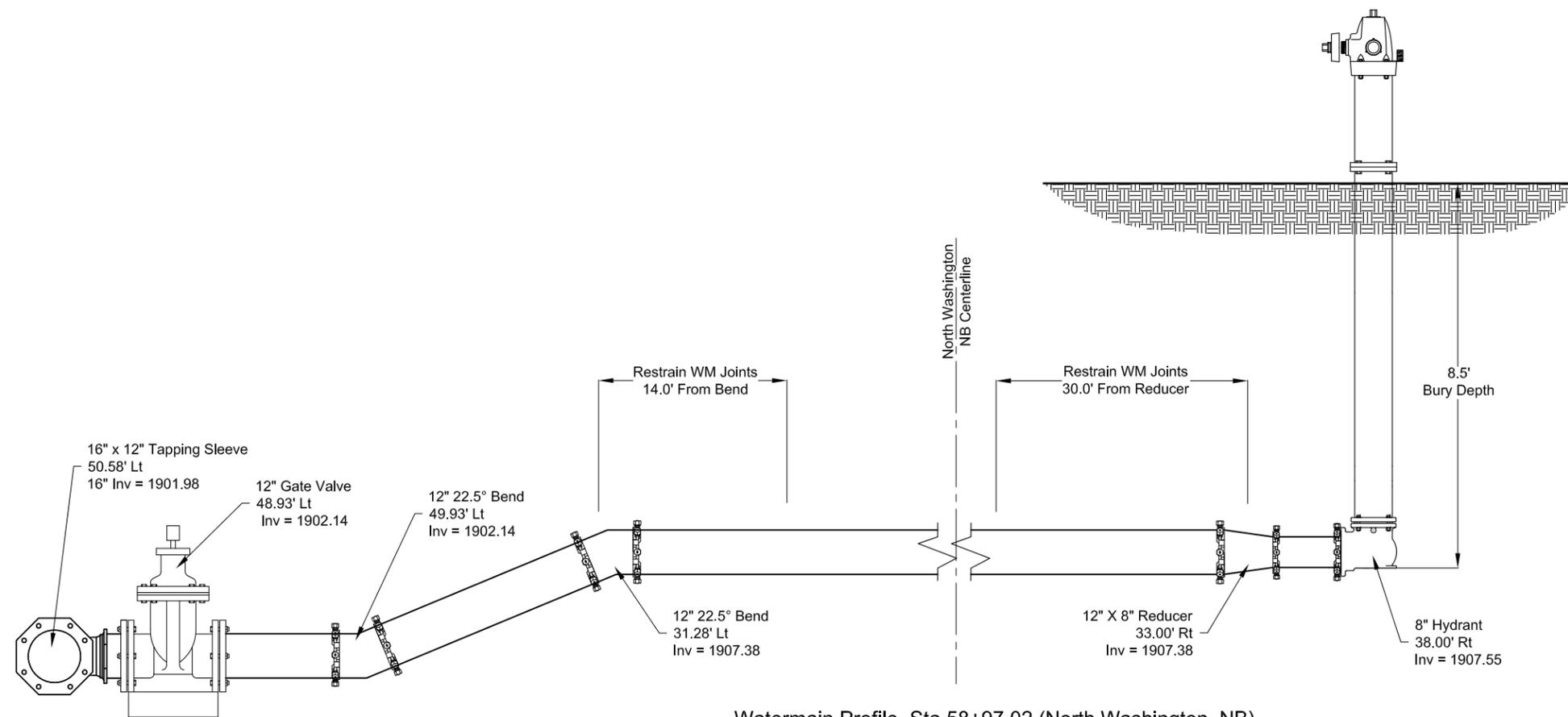


**TYPICAL MEDIAN IRRIGATION SYSTEM**

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Rev'd.		Scale:	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>Watermain Concrete Thrust Blocking and Wet Tap Typical Median Irrigation System</b>			
DRWN. BY JE	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
J:\trans\1412129\CADD\020GD_001_DETAILS.dwg			
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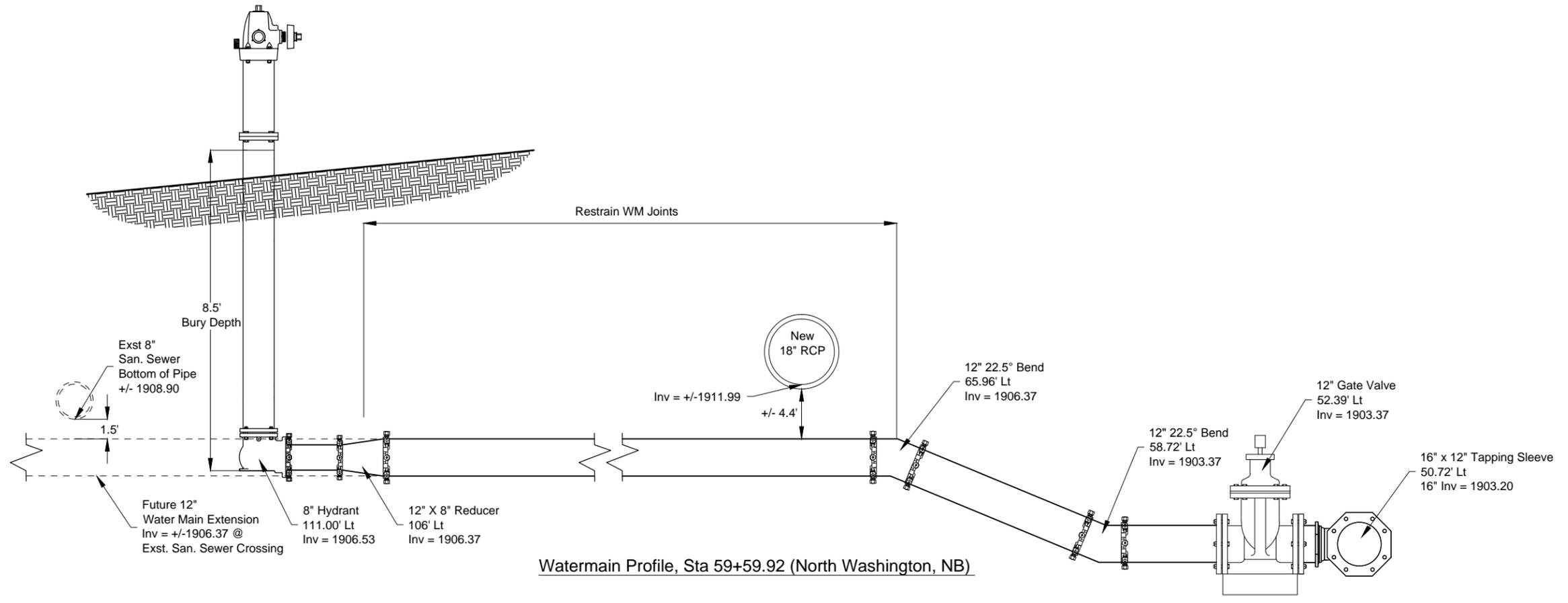
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	4



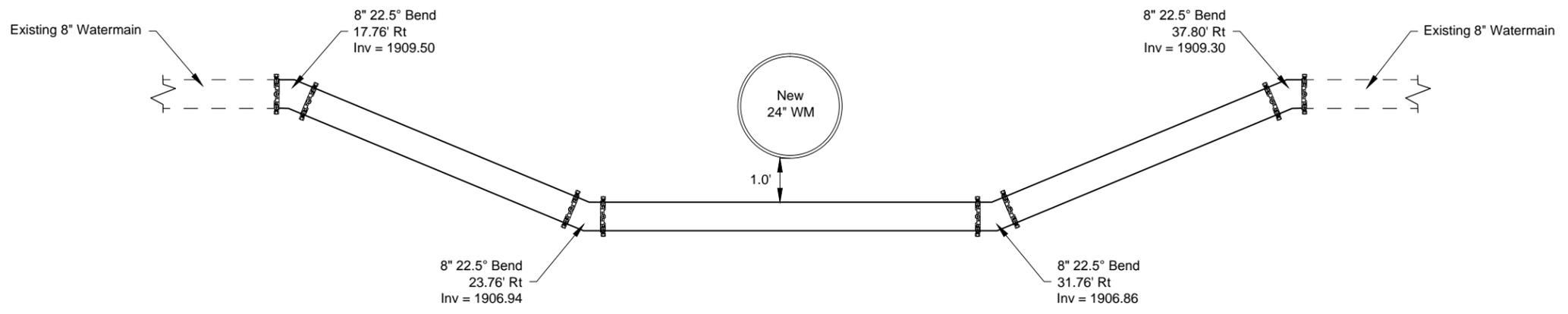
Watermain Profile, Sta 58+97.02 (North Washington, NB)

Rev'd.	Scale:		
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>Watermain Sections</b> Sta 37+60 Sta 58+97	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JKS	GJS	1412129	07/2015
<small>J:\trans\1412129\CADD\020GD_004_WM_SECTIONS.dwg</small>			
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	5



Watermain Profile, Sta 59+59.92 (North Washington, NB)

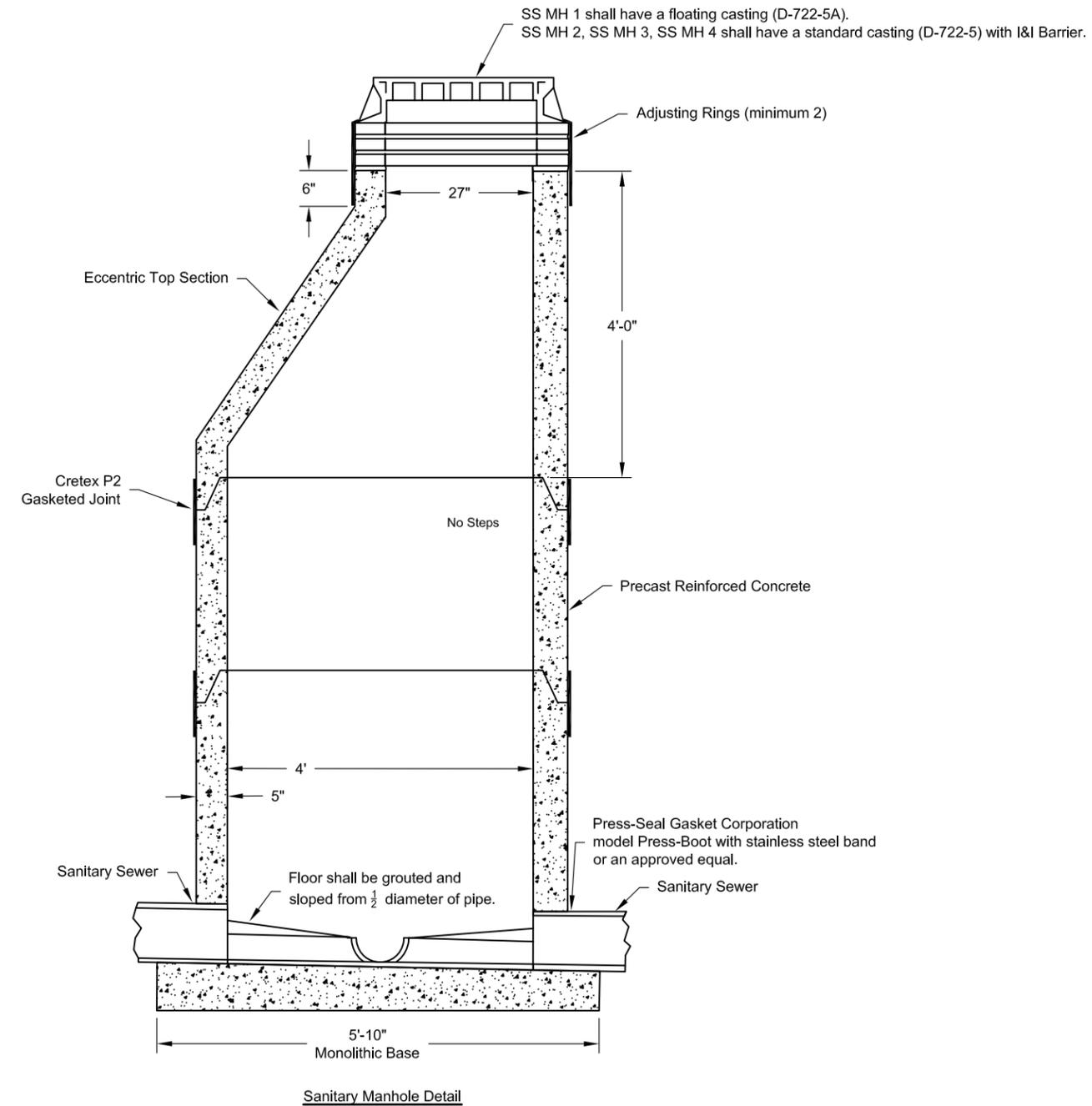


Existing 8" Watermain Offset, Sta 530+25.56 (43rd Avenue)

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Rev'd.		Scale:	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Watermain Sections Sta 59+60 (North Wash.) Sta 530+26 (43rd Ave)	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JKS	GJS	1412129	07/2015
<small>J:\trans\1412129\CADD\020GD_018_WM_SECTIONS.dwg          © Kadmas, Lee &amp; Jackson 2015</small>			

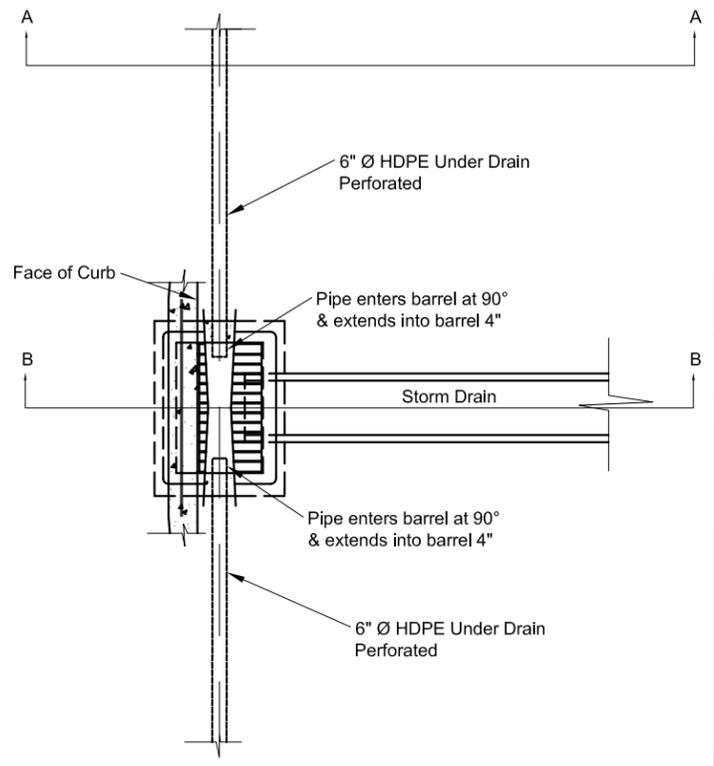
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	6



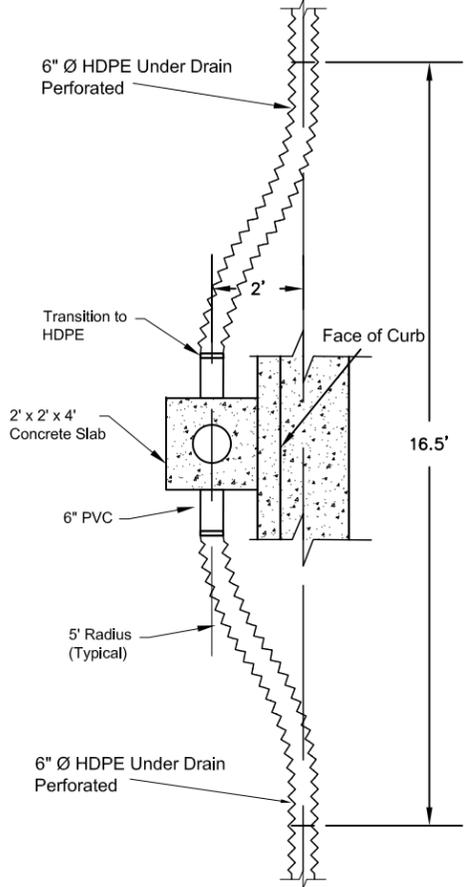
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Rev'd.		Scale:	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Sanitary Manhole Detail	
		DRWN. BY JE	CHK'D BY GJS
\\bsmk-files01\jtrans\1412129\CADD\020GD_001_DETAILS.dwg			
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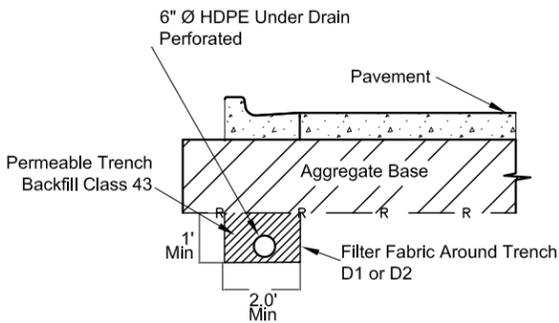
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	7



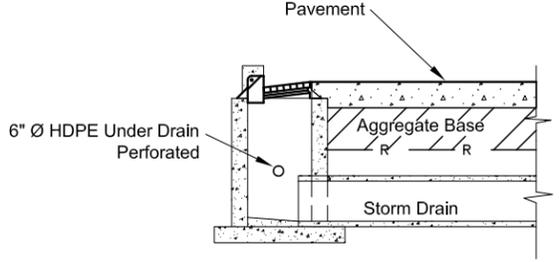
UNDER DRAIN CONNECTION TO INLETS  
PLAN VIEW



UNDERDRAIN CLEANOUT TRANSITION  
PLAN VIEW



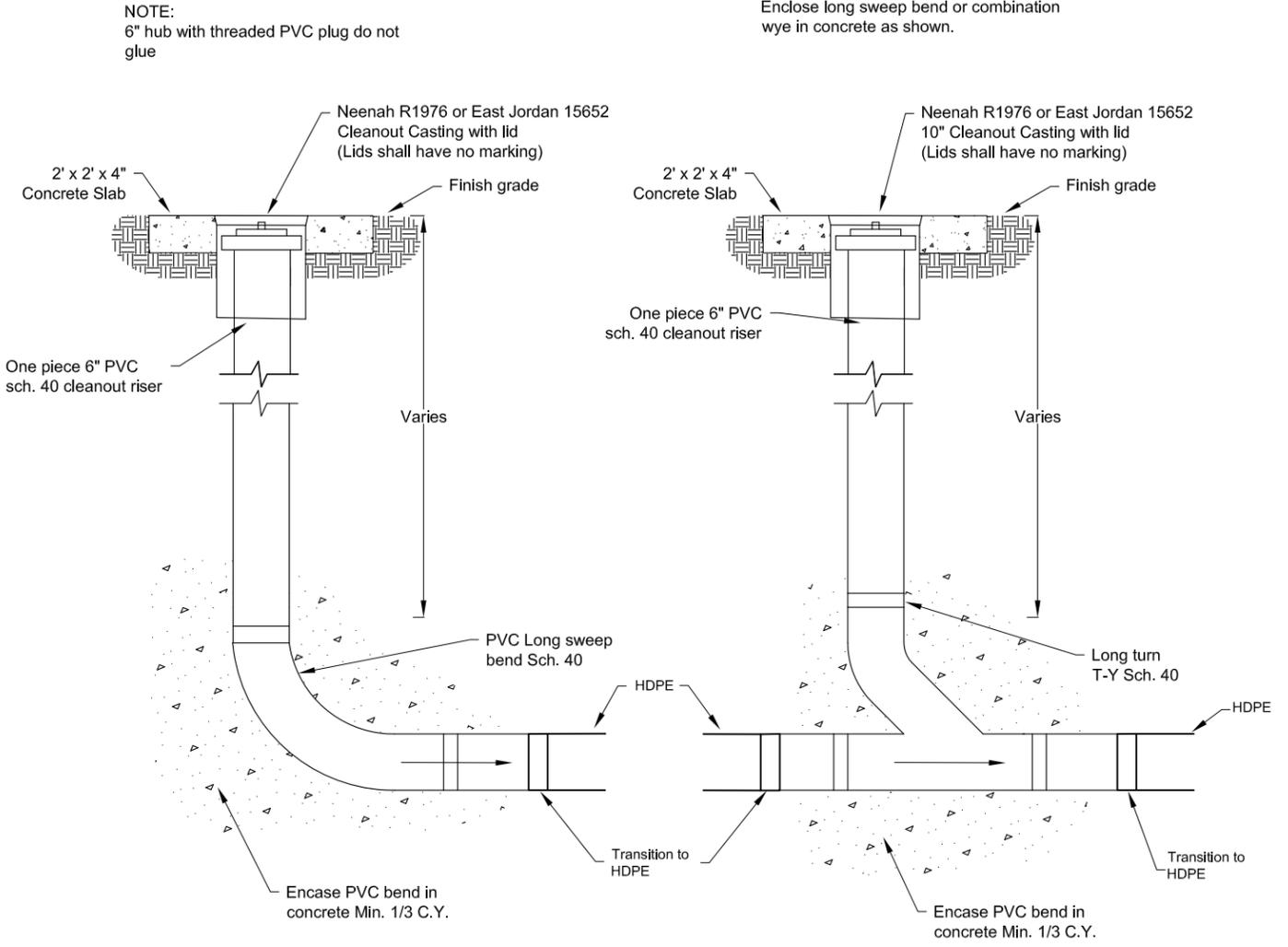
UNDER DRAIN LAYOUT  
PROFILE VIEW  
SECTION A-A



UNDER DRAIN CONNECTION TO INLETS  
PROFILE VIEW  
SECTION B-B

Core Drill Hole for Pipe & Grout  
End Into Catch Basin

PIPE POLYETHYLENE CORR PERF 6IN DRAIN



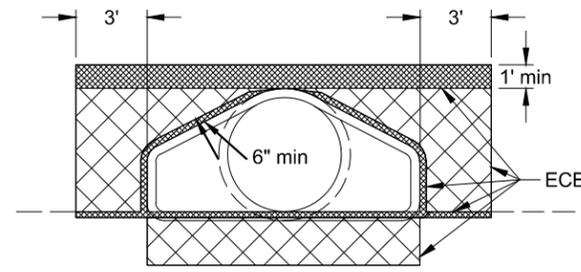
END OF LINE

IN-LINE

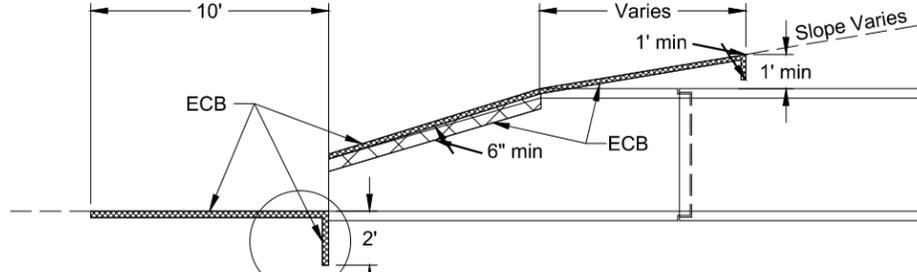
UNDERDRAIN CLEANOUT RISER

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Rev'd.		Scale:	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>KLJ</b> Pipe Polyethylene Corr Perf 6IN Drain & Underdrain Cleanout Riser			
DRWN. BY JE	CHK'D BY GJS	PROJECT NO. 1412129	DATE 07/2015
J:\trans\1412129\CADD\020GD_001_DETAILS.dwg			
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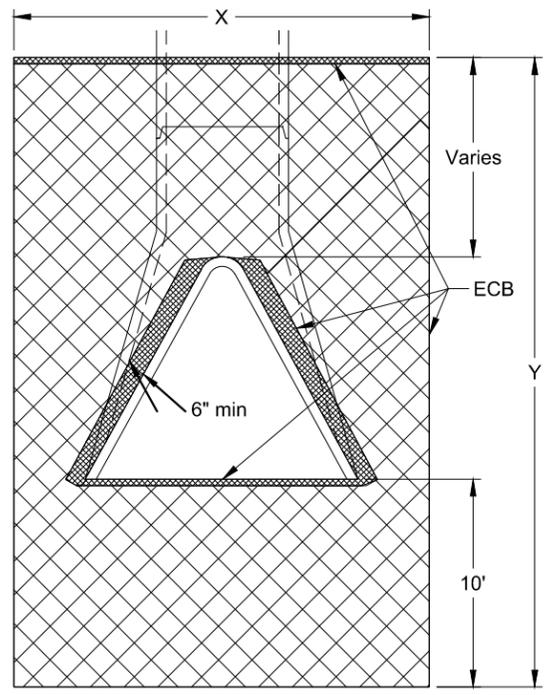


FRONT VIEW

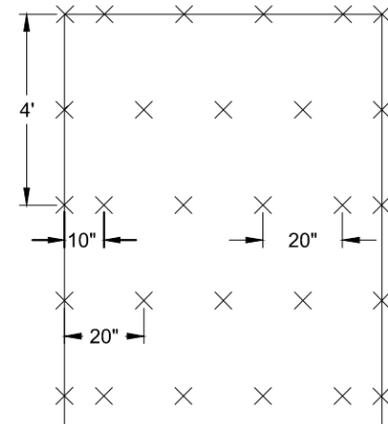


SIDE VIEW

See Details A & B



TOP VIEW



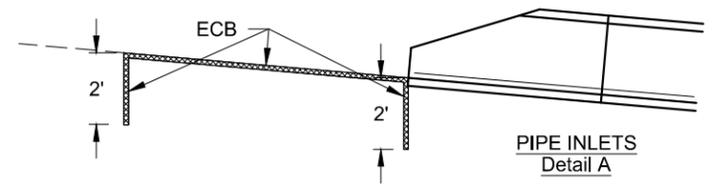
STAPLE PATTERN: 3.8 staples per square yard using 8-inch 11 gauge wire "u" staples

Erosion Control Blanket (ECB)		
Location of Surface Area to be Protected Station	Pipe Diam (Inch)	Total Quantity Type 3 (SY)
33+89 LT	15	20
34+19 LT	15	20
41+43 LT	18	22
45+61 LT	15	20
58+15 LT	24	24
58+44 LT	24	24
59+58 RT	24	24
66+95 LT	18	22
82+94 RT	24	24
100+34 RT	36	30
101+18 RT	30	27
105+58 LT	15	20
105+81 RT	18	22
107+20 LT	24	24
521+64 RT	15	20
Total (SYs)		343

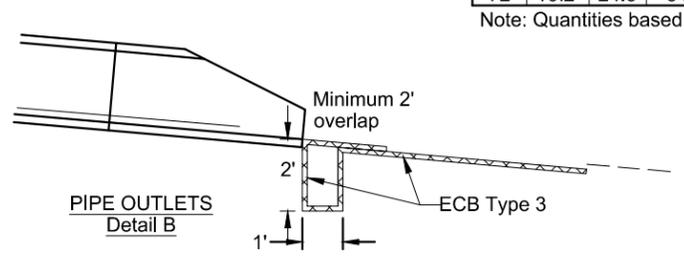
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	23.0	307.5	35
66	15.6	24.0	325.6	37
72	16.2	24.5	340.6	38

Note: Quantities based on 8:1 slope.

NOTE: The ECB shall be tucked a minimum of 1' into the embankment above the flared end section, a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section, and 2' into the ground at the end of the flared end section.



PIPE INLETS Detail A

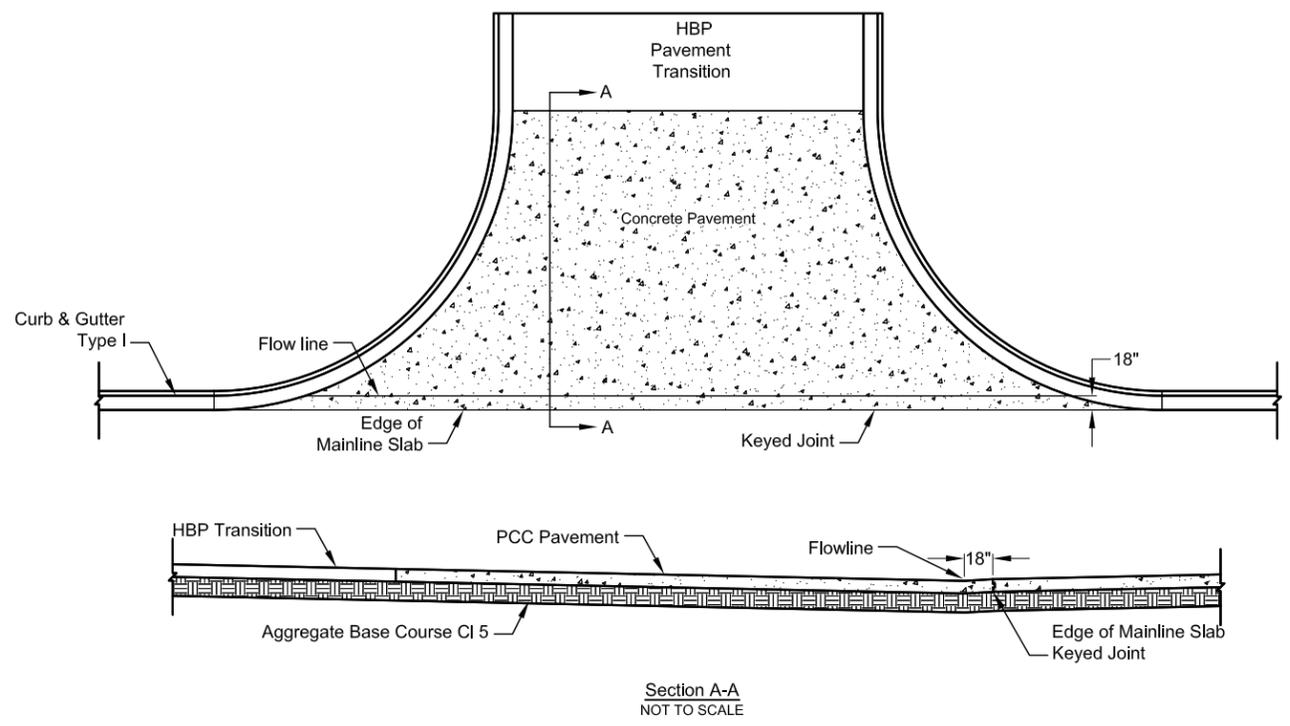


PIPE OUTLETS Detail B

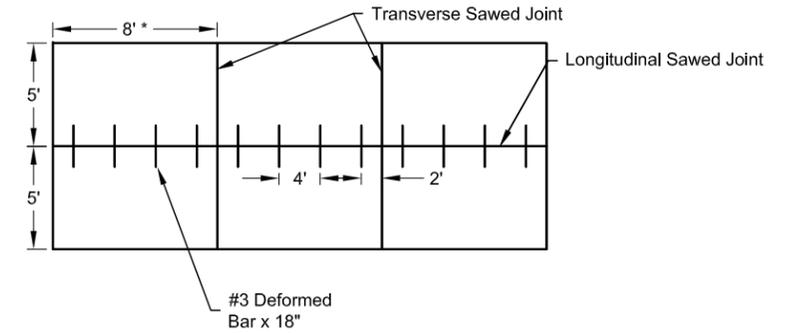
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Rev'd.		Scale:	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Erosion Control Culvert End Flared Sections	
DRWN. BY JE	CHK'D BY GJS	PROJECT NO. 1412129	DATE 07/2015
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ND	NHU-1-981(101)111	20	9



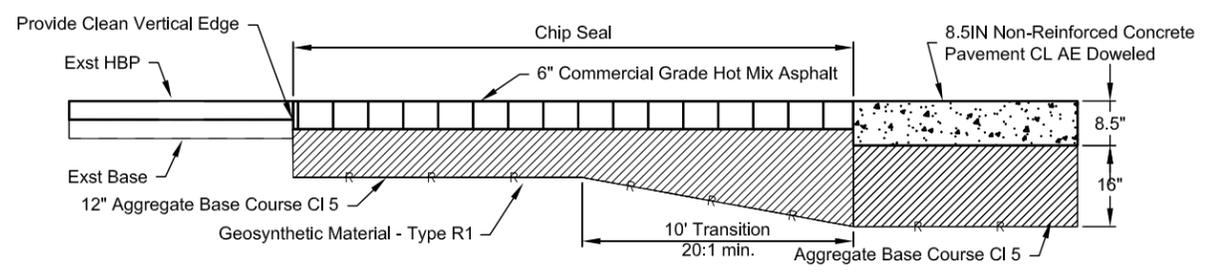
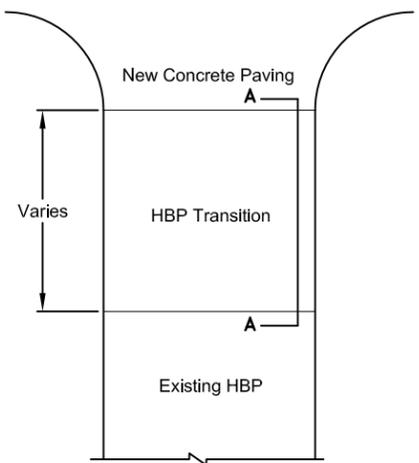
**SIDE STREET INTERSECTION FLOW LINE**



\* Shall match street pavement spacing when adjacent to curb & gutter, maximum 8'.

1. Deformed bars shall be held in place by a supporting device securely staked to the base material at the correct spacing, alignment, and elevation.
2. The Contractor shall determine transverse joint locations prior to placing concrete, to ensure deformed bars are properly located.

**SHARED-USE PATH JOINTING**



**PAVING TRANSITION DETAIL**

Length of the patch shall be directed by the field engineer.

**LOCATIONS**

1. Calgary Drive - Sta 26+40 33' RT to 54' RT
2. Arabian Avenue - Sta 30+18 78' LT to 169' LT
3. Versailles Avenue - Sta 37+80 27' RT to 90' RT
4. Buckskin Avenue - Sta 37+83 78' LT to 174' LT
5. Lorrain Drive - Sta 45+28 32' RT to 50' RT
6. Colt Avenue - Sta 45+29 78' LT to 164' LT
7. Durango Avenue - Sta 64+98 86' LT to 207' LT
8. Slate Drive - Sta 64+98 32' RT to 150' RT
9. Medora Avenue - Sta 76+44 92' LT to 102' LT
10. Medora Avenue - Sta 76+44 38' RT to 48' RT
11. LaSalle Drive - Sta 86+79 98' LT to 152' LT
12. LaSalle Drive - Sta 86+79 45' RT to 98' RT
13. 57th Avenue - Sta 105+19 95' LT to 112 LT
14. 57th Avenue - Sta 105+20 43' RT to 53' RT

**HBP TRANSITION**

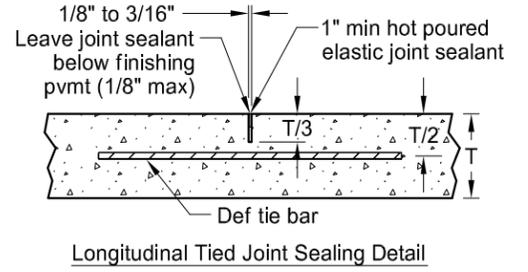
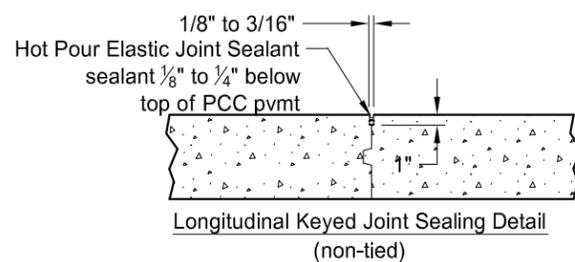
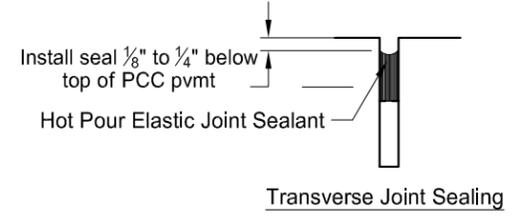
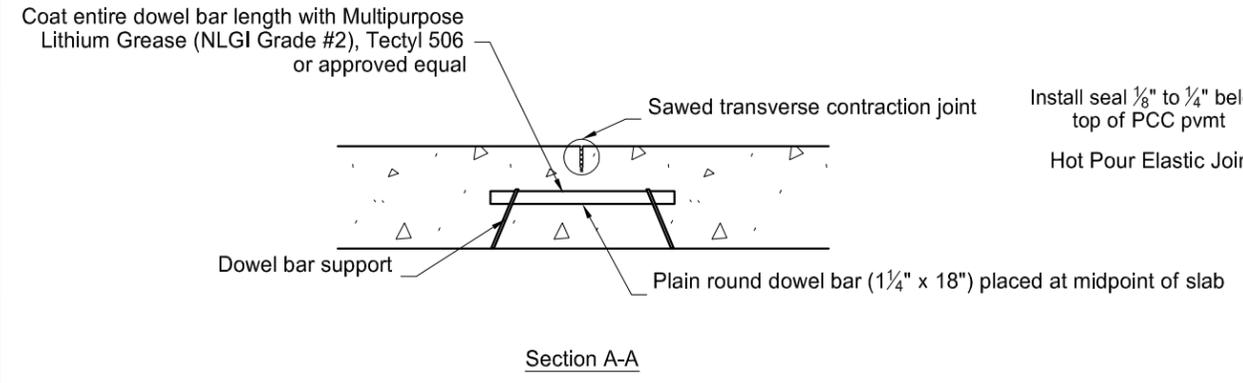
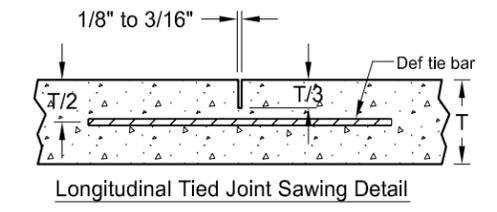
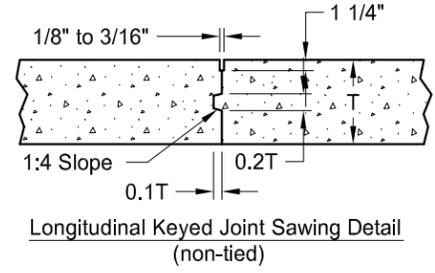
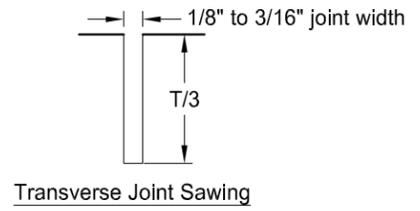
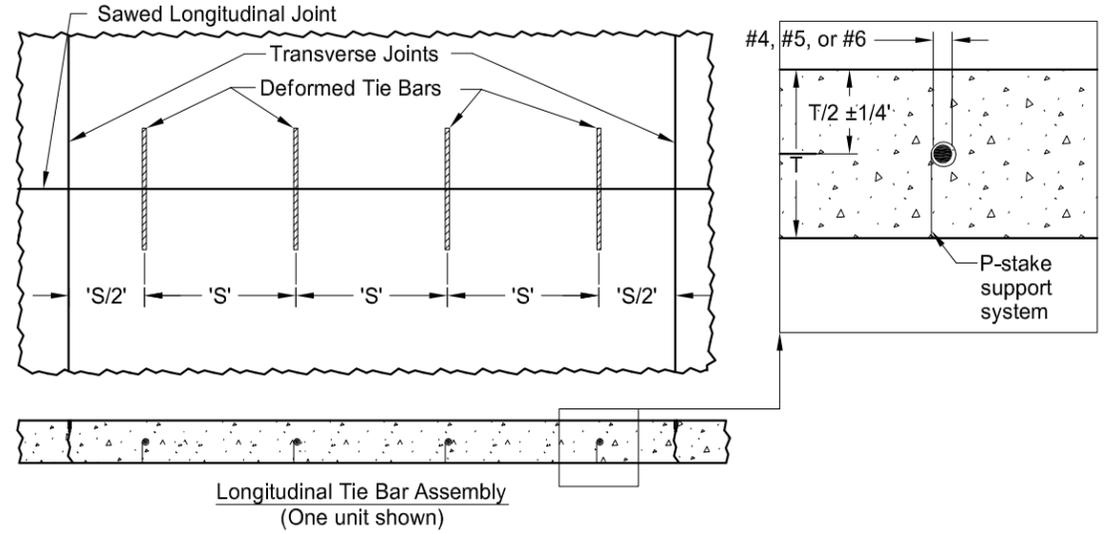
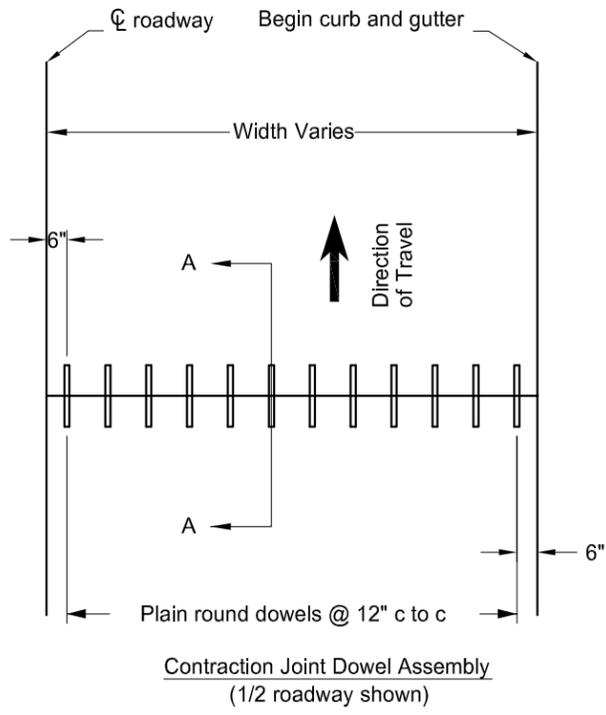
- |                              |                              |
|------------------------------|------------------------------|
| 1. Calgary Drive - 21 LF     | 8. Slate Drive - 118 LF      |
| 2. Arabian Avenue - 91 LF    | 9. Medora Avenue LT - 10 LF  |
| 3. Versailles Avenue - 63 LF | 10. Medora Avenue RT - 10 LF |
| 4. Buckskin Avenue - 97 LF   | 11. LaSalle Drive LT - 54 LF |
| 5. Lorrain Drive - 18 LF     | 12. LaSalle Drive RT - 53 LF |
| 6. Colt Avenue - 86 LF       | 13. 57th Avenue LT - 17 LF   |
| 7. Durango Drive - 121 LF    | 14. 57th Avenue RT - 10 LF   |

**PAY ITEMS**

- |                                     |     |
|-------------------------------------|-----|
| 1. Commercial Grade Hot Mix Asphalt | TON |
| 2. CRS2P Emulsified Asphalt         | GAL |
| 3. Cover Coat Material CL 43        | SY  |
| 4. Aggregate Base Course CI 5       | TON |
| 5. Geosynthetic Material - Type R1  | SY  |

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Rev'd.		Scale:	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>Side Street Flow Line, Shared-Use Path Jointing &amp; Paving Transition</b>			
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JE	GJS	1412129	07/2015
<small>J:\trans\1412129\CADD\020GD_001_DETAILS.dwg</small>			
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Pavement Depth (8.5")	Max Spacing "S"	Size and Length
Mainline		
Grade 40 Steel	28"	#4 Bar X 24"
Grade 40 Steel	44"	#5 Bar X 30"
Grade 40 Steel	45"	#6 Bar X 36"
Grade 60 Steel	24"	#3 Bar X 30"
Grade 60 Steel	42"	#4 Bar X 36"
Grade 60 Steel	45"	#5 Bar X 42"
Grade 60 Steel	45"	#6 Bar X 48"

"S" is maximum spacing. Contractor shall adjust spacing to actual panel width.

- Notes:  
 1. T = Pavement Thickness  
 2. S = Tiebar spacing

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 BISMARCK, NORTH DAKOTA

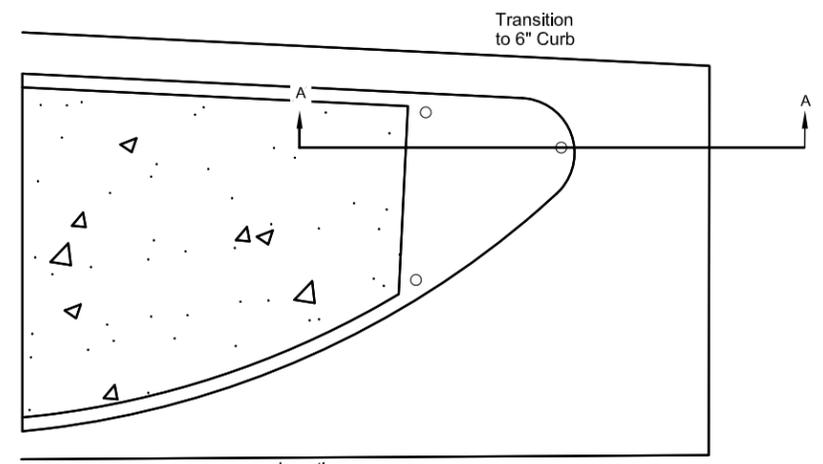
**KLJ**

Concrete Joint Detail

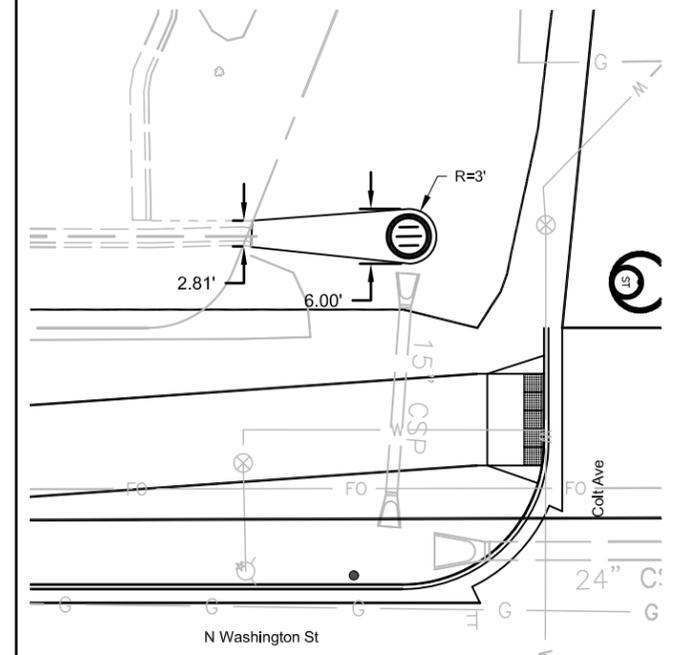
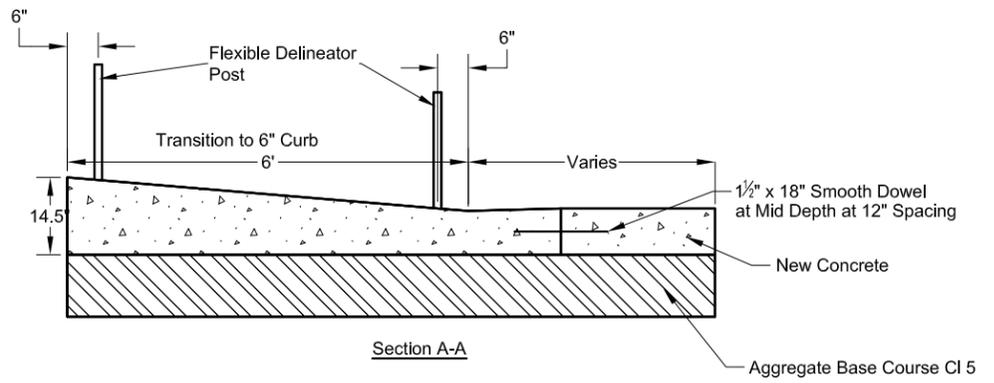
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
PTG	GJS	1412129	07/2015

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ND	NHU-1-981(101)111	20	11

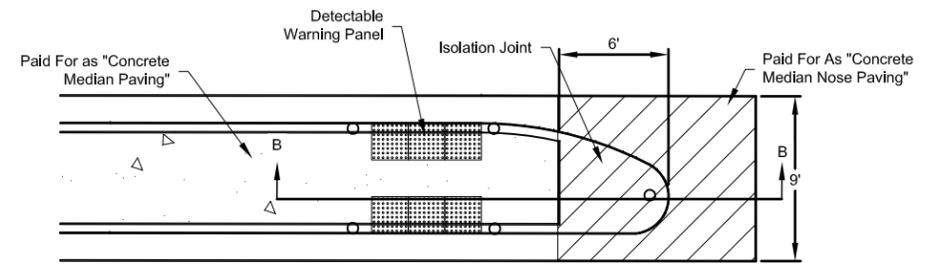


- Locations  
 Sta 46+72 Sta 52+09  
 Sta 53+46 Sta 64+71  
 Sta 65+24 Sta 76+04  
 Sta 76+86 Sta 86+43  
 Sta 87+15 Sta 94+73  
 Sta 95+30 Sta 104+73  
 Sta 507+43 Sta 514+41  
 Sta 515+74 Sta 520+59

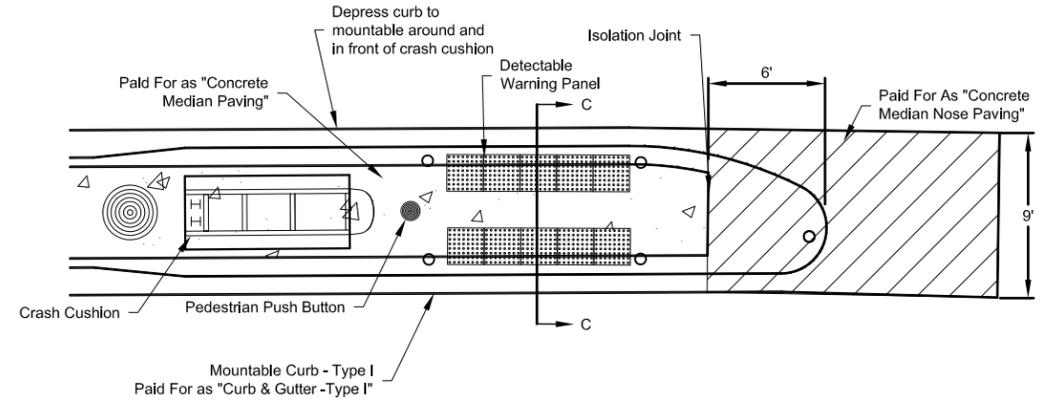


**CENTURY BAPTIST CHURCH SPLASHWAY**

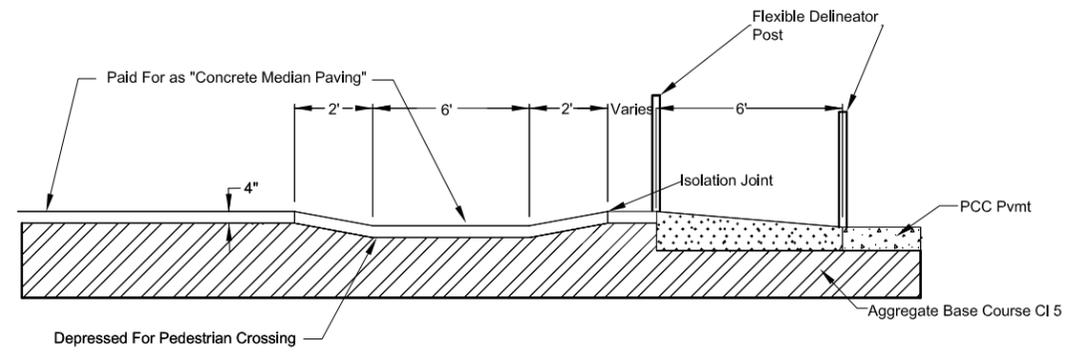
SIDEWALK CONCRETE 4IN  
 STA 44+93 10 SY



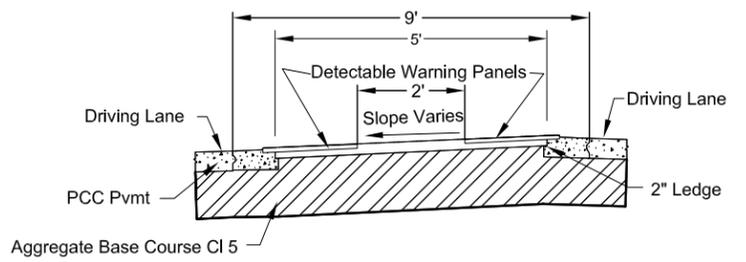
**MEDIAN NOSE W/ PEDESTRIAN CROSSING**



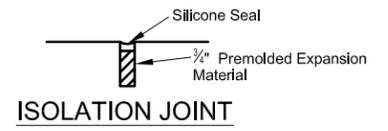
**MEDIAN NOSE W/ PEDESTRIAN CROSSING & CRASH CUSHION**



SECTION B-B  
 W/ PEDESTRIAN CROSSING



SECTION C-C



ISOLATION JOINT

- NOTES:  
 1. The cost of all labor, equipment, and materials for the construction of the median nose shall be paid for as "CONCRETE MEDIAN NOSE PAVING".

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<b>KLJ</b>			
Median Nose Detail			
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	12

LIGHT & SIGNAL STANDARD FOUNDATION SELECTION TABLE		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
<u>Light Standard</u>		
40' Mounting Height - 6' Arm	6'	5'
40' Mounting Height - Twin 6' Arms	6'	5'
<u>Overhead Flashing Beacon</u>	11'	11'
<u>Type VI Signal Standard</u>	8'	7'
<u>Combination 40' Mounting Height</u>		
0' - 12' Signal Mast Arm	12'	12'
31' - 35' Signal Mast Arm	13'	13'
36' - 40' Signal Mast Arm	16'	15'

**NOTES FOR LIGHT & SIGNAL STANDARD FOUNDATIONS:**

1. For Light & Signal Standards, the foundation diameter shall be the largest of the following scenarios:

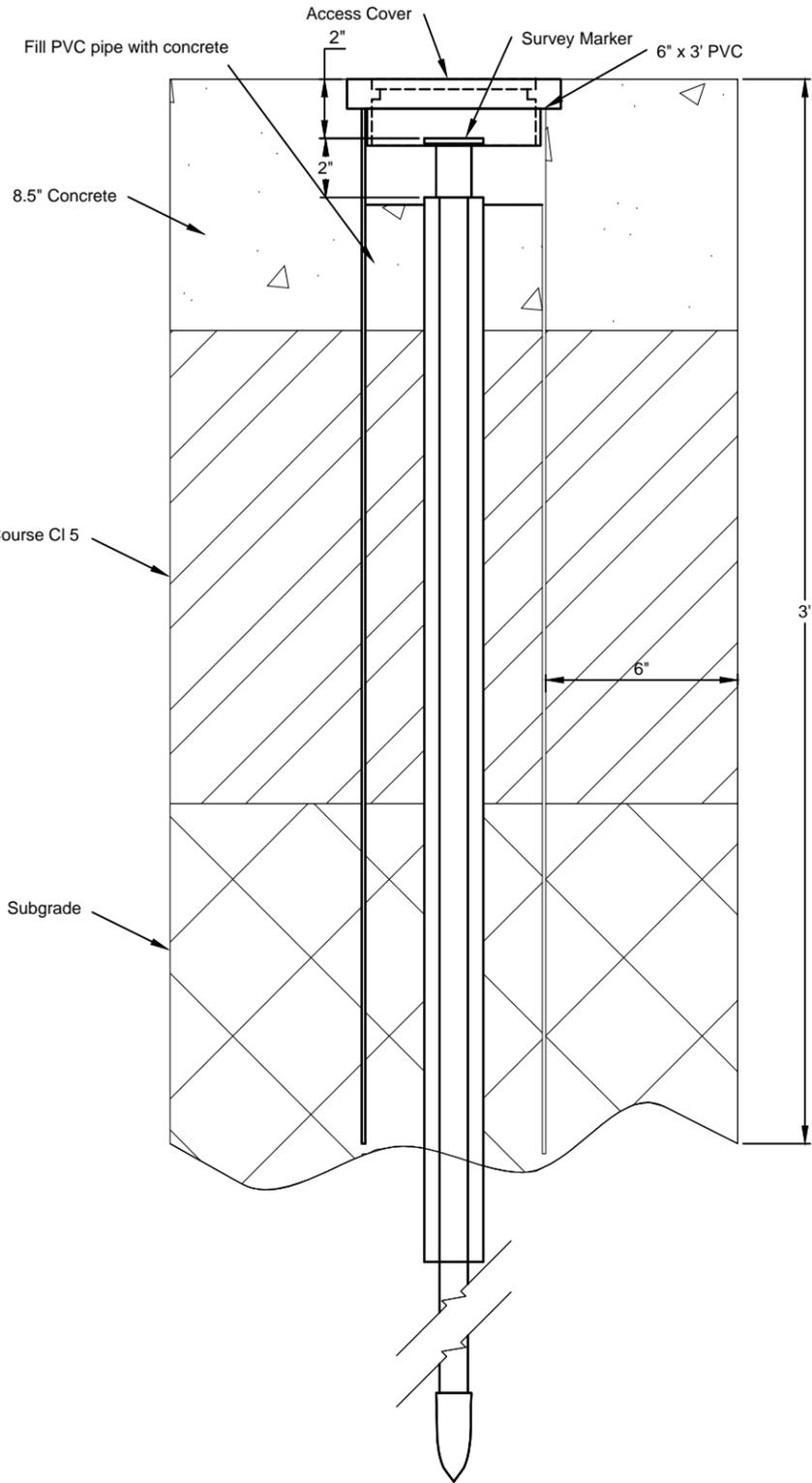
- Anchor bolt circle diameter plus 12"
- Light base plus 6"
- 24"

It is the contractor's responsibility to determine the foundation diameter and include the corresponding costs for the actual diameter in the unit price bid for "CONCRETE FOUNDATION-HIGHWAY LIGHTING" and "CONCRETE FOUNDATION-TRAFFIC SIGNALS".

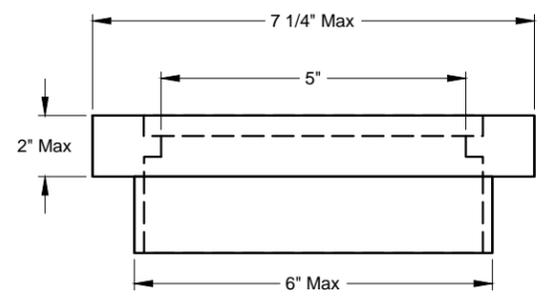
2. Concrete used in the work shall be Class AAE-3 Portland Cement Concrete mixed and proportioned as specified in Section 802.
3. All reinforcing steel shall be Grade 60.
4. The contractor may use temporary casing to maintain the opening prior to placement of concrete. The casing shall be removed prior to curing of the concrete. If casing is used, it shall be of sufficient strength to withstand handling and installation procedures. The contractor shall submit a casing material proposal to the engineer for review two weeks prior to ordering casing material. All costs associated with the temporary casing shall be included in the unit price bid for "CONCRETE FOUNDATION-HIGHWAY LIGHTING" and "CONCRETE FOUNDATION-TRAFFIC SIGNALS". Permanent casing of the foundation shall not be used.
5. All costs associated with the construction of the foundation shall be included in the unit price bid for "CONCRETE FOUNDATION-HIGHWAY LIGHTING" and "CONCRETE FOUNDATION-TRAFFIC SIGNALS". This includes but not limited to excavation, concrete, reinforcing steel, anchor bolts, anchor bolt cage, conduit, ground rod and temporary casing.
6. See Standard Drawing D-770-1 for additional foundation information.
7. Light standards shall have a minimum of 4 anchor bolts. Signal standards shall have a minimum of 6 anchor bolts.

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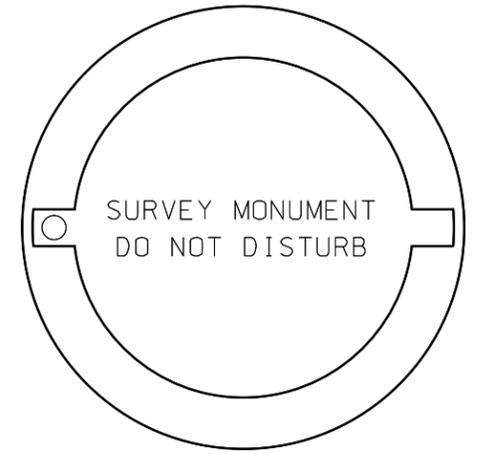
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NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Concrete Foundations Traffic Signal & Highway Lighting	
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**SURVEY MARKER SECTION**



**ACCESS COVER DETAIL**



Existing Survey Markers at these location will be disturbed by construction:

SW SEC COR SEC 16	432,694.0210	1,895,305.3930
W 1/4 COR SEC 16	435,321.5690	1,895,330.2380
NW SEC COR SEC 16	437,949.2420	1,895,355.0490

The contractor and the engineer will cooperate to construct replacement markers as follows:

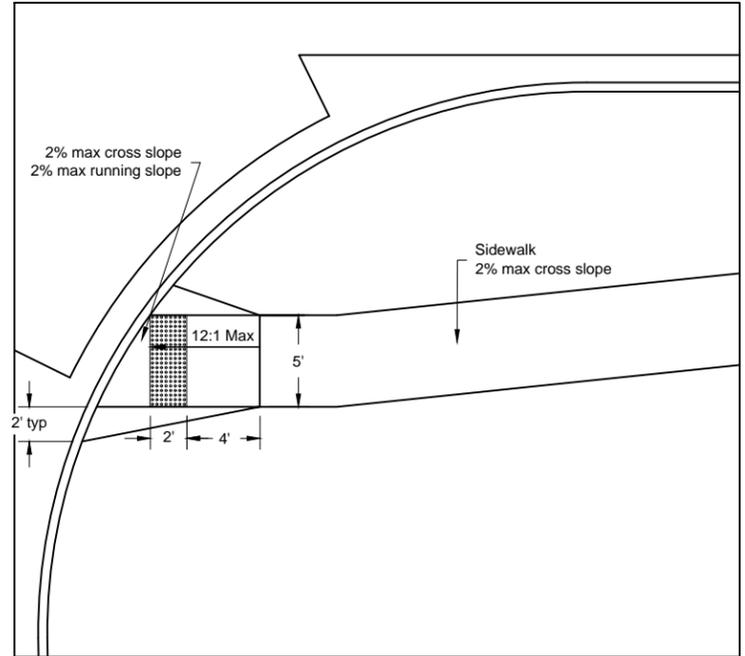
1. The contractor shall construct a survey marker receptacle as shown on this sheet. The marker shall be 6" Ø schedule 40 PVC filled with a Berntsen BMAC-6 or SURV-KAP AC-RT. Access Cover or approved equal bonded to the PVC. Concrete shall be placed inside the pipe to within 4" of access cover.
2. The engineer shall locate the placement for the markers and provide a 1/2" x 18" Ferro-Magnetic Monument fitted with a cap bearing the surveyors registration number. The engineer will be responsible for filing new corner recordation forms.
3. The top of the access cover shall be installed 1/4" to 1/2" below the finished pavement. The contractor shall recess the monument cap 2" below the access cover.

Costs for all labor, equipment, and materials shall be included in the price bid for "(\_)IN Non-Reinf Concrete PVMT CL AE-Doweled".

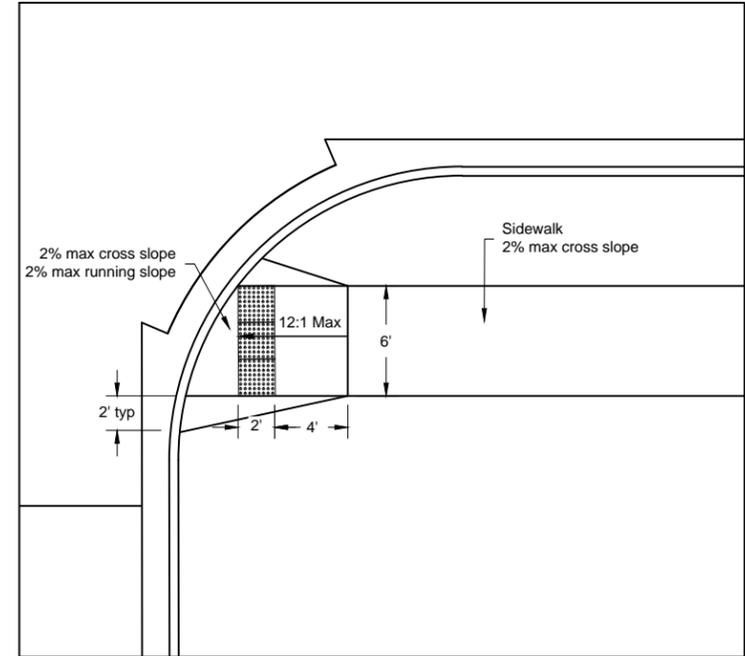
The Contractor shall use special care to avoid disturbing existing property corners or survey markers. If a corner needs to be disturbed by construction the contractor shall notify the engineer who will then work with the contractor using offsets to replace the corner pin. Failure of the contractor to cooperate with the engineer will result in the contractor having to hire a registered Land Surveyor, at his own expense, to replace lost corners.

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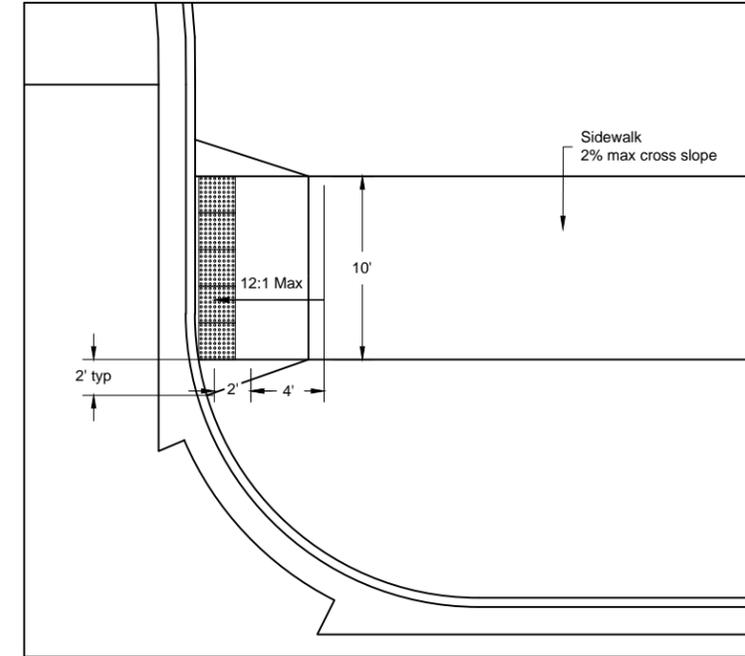
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>Survey Marker Detail and Notes</b>	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JE	GJS	1412129	07/2015
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**5' Ramp Typical**  
 Calgary Ave (SE Ramp Sta 26+10, RT)  
 Calgary Ave (NE Ramp Sta 26+72, RT)  
 Versailles Ave (SE Ramp Sta 37+55, RT)  
 Versailles Ave (NE Ramp Sta 38+05, RT)  
 Lorrain Dr (SE Ramp Sta 45+03, RT)  
 Montreal St (SE Ramp Sta 521+26, RT)



**6' Ramp Typical**  
 Calgary Ave (SW Ramp Sta 25+79, LT)  
 Calgary Ave (SE Ramp Sta 25+82, RT)  
 Lorrain Ave (NE Ramp Sta 45+53, RT)  
 Medora Ave (SW Ramp Sta 75+88, LT)  
 Medora Ave (NW Ramp Sta 76+99, LT)  
 Montreal St (SW Ramp Sta 520+80, RT)



**10' Ramp Typical**  
 Arabian Ave (SW Ramp 29+97, LT)  
 Arabian Ave (NW Ramp 30+40, LT)  
 Buckskin Ave (SW Ramp 37+61, LT)  
 Buckskin Ave (NW Ramp 38+05, LT)  
 Colt Ave (SW Ramp 45+07, LT)  
 Colt Ave (NW Ramp 45+51, LT)  
 Medora Ave (SW Ramp 76+17, LT)  
 Medora Ave (NW Ramp 76+70, LT)  
 Cornice Dr (SW Ramp 94+83, LT)  
 Cornice Dr (NW Ramp 95+30, LT)  
 57th Ave (NW Ramp 105+61, LT)  
 Ash Coulee Dr (NW Ramp 504+63, LT)  
 Ash Coulee Dr (NE Ramp 505+19, LT)

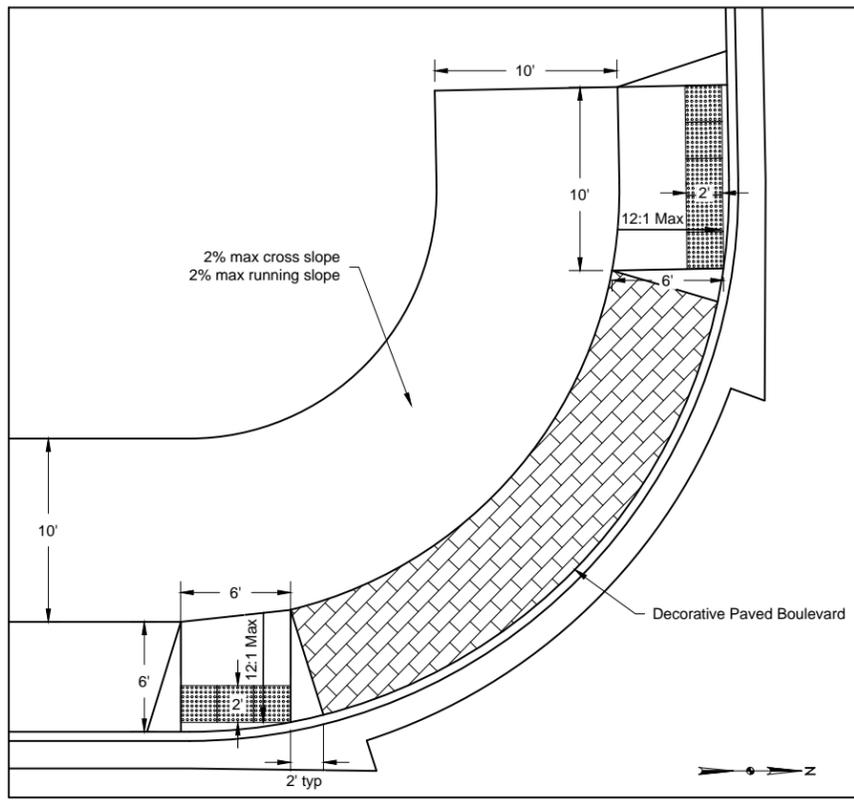
**Notes:**

1. The Engineer shall approve all form grades prior to placing 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 meet dimensions given.

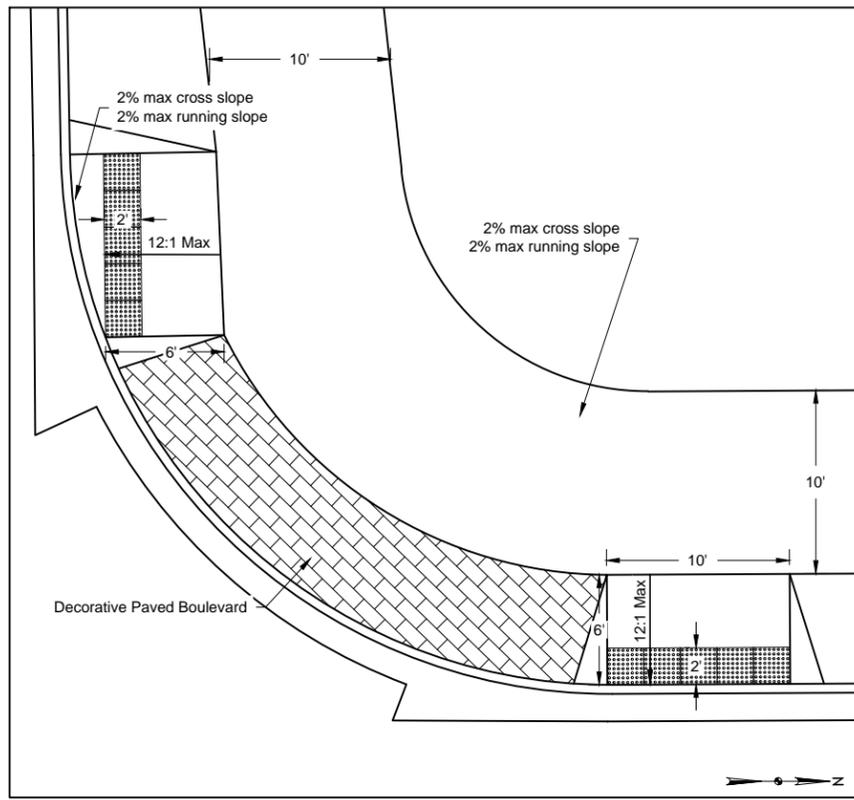
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>ADA Ramp Details</b> Typical Ramps	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015
<small>C:\Users\gabeschell\appdata\local\temp\AcPublish_8508\020GD_014_ADA.dwg</small>			
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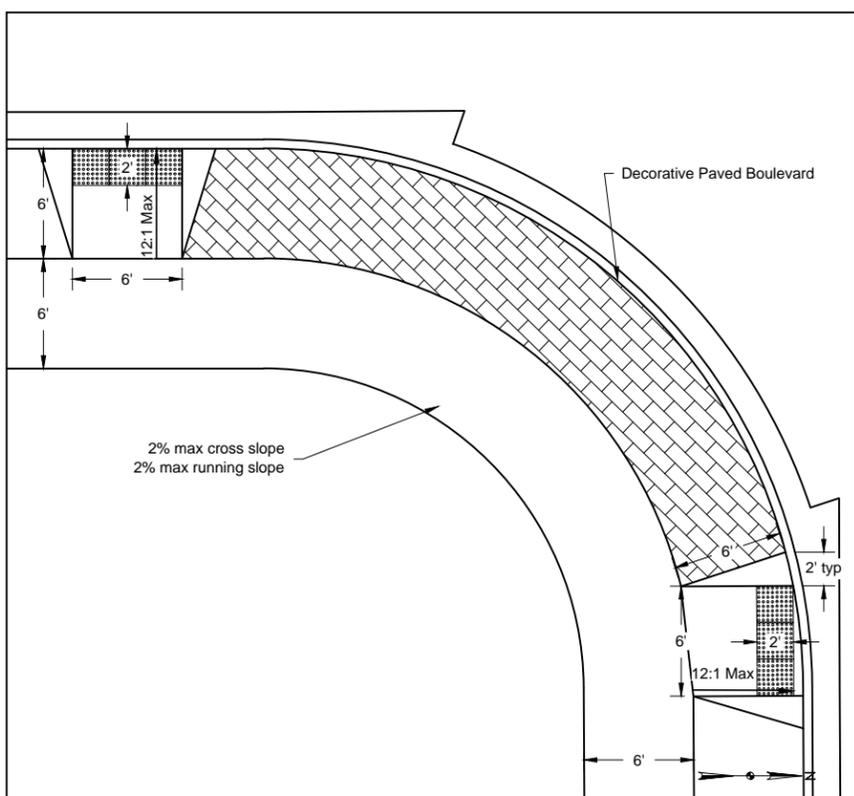
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	15



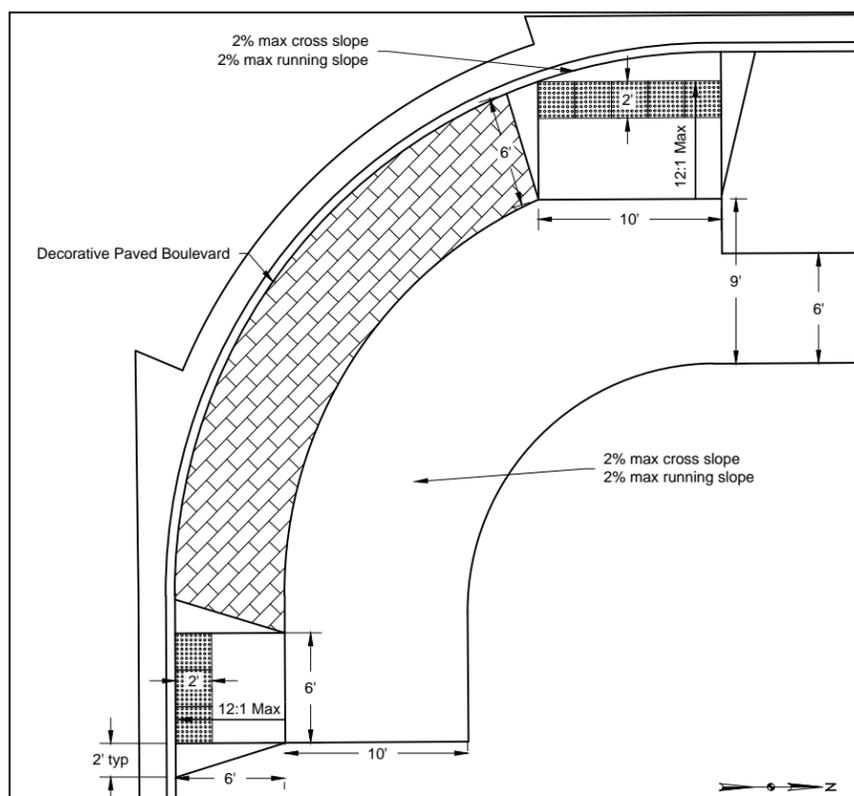
Ash Coulee Dr (SW Ramp Sta 52+12, LT)



Ash Coulee Dr (NW Ramp Sta 53+42, LT)



43rd Ave. (SE Ramp Sta 52+16, RT)



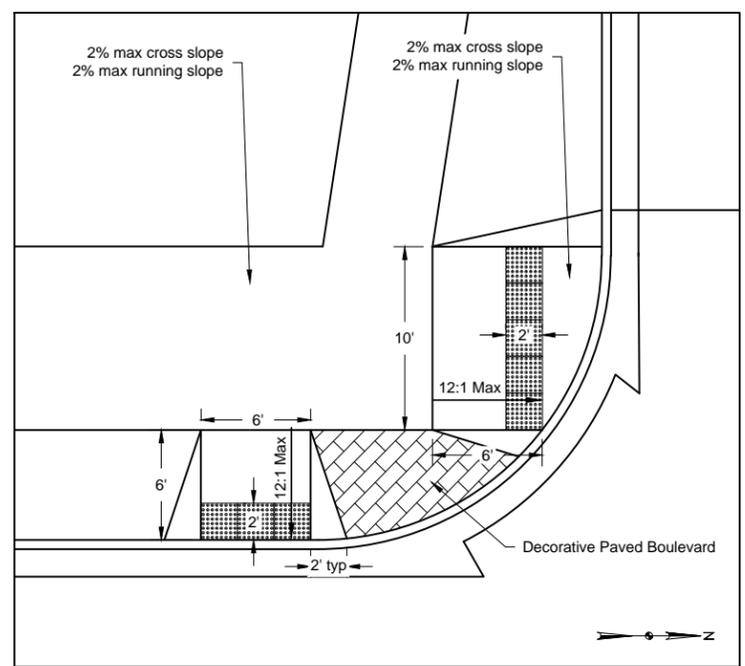
43rd Ave (NE Ramp Sta 53+46, RT)

Notes:

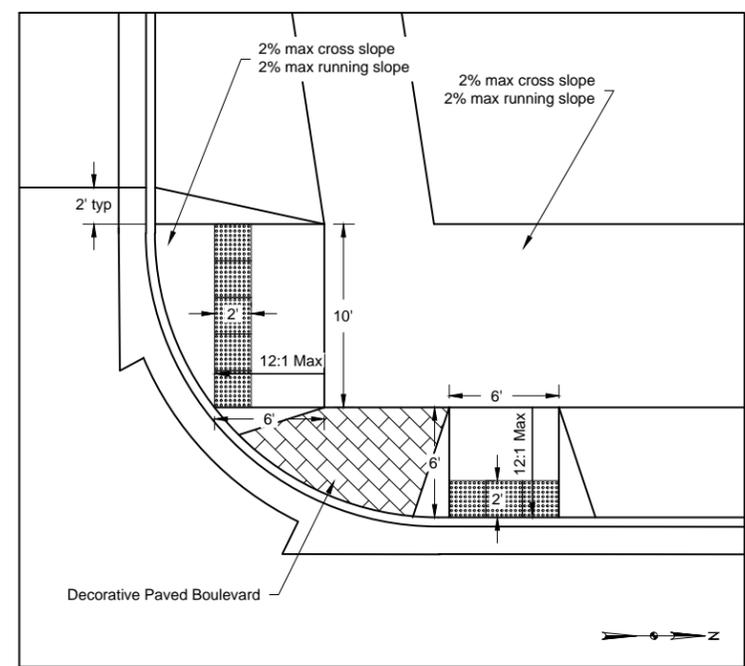
1. The Engineer shall approve all form grades prior to placing concrete.
2. Any ramp found to be in noncompliance shall be removed and replaced by the contractor at their own expense.
3. Dimensions shown may vary from actual. Contractor shall field adjust if maximum slopes cannot meet dimensions given.

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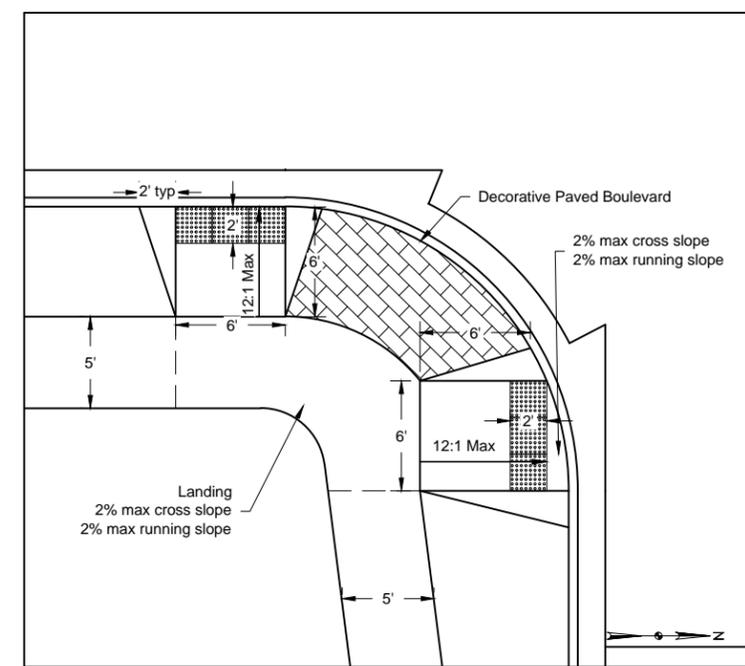
Rev'd.		Scale: 1:10 Hor, 1:10 Ver	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>KLJ</b> ADA Ramp Details Ash Coulee Dr and 43rd Ave Ramps			
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015
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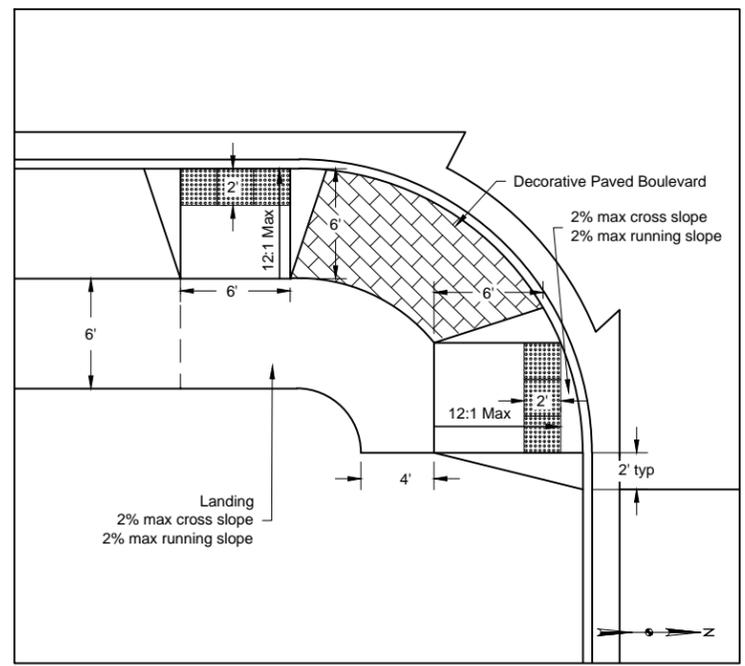
Durango Dr (SW Ramp Sta 64+65, LT)



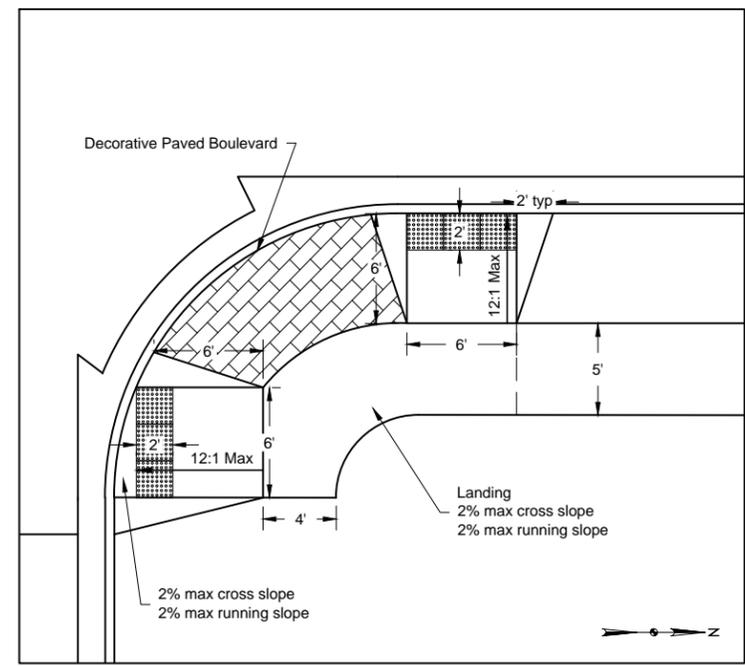
Durango Dr (NW Ramp Sta 65+30, LT)



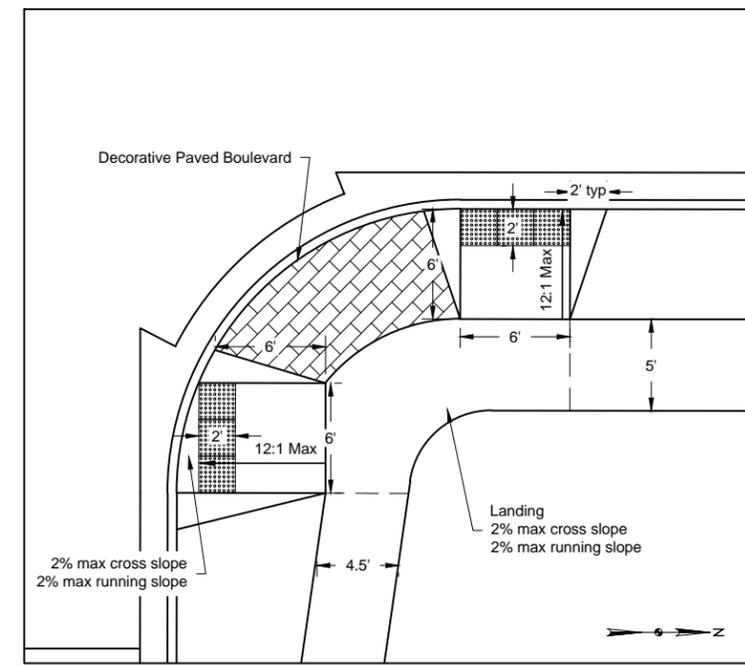
Medora Ave (SE Ramp Sta 75+96, RT)



Slate Dr (SE Ramp Sta 64+67, RT)



Slate Dr (NE Ramp Sta 65+28, RT)



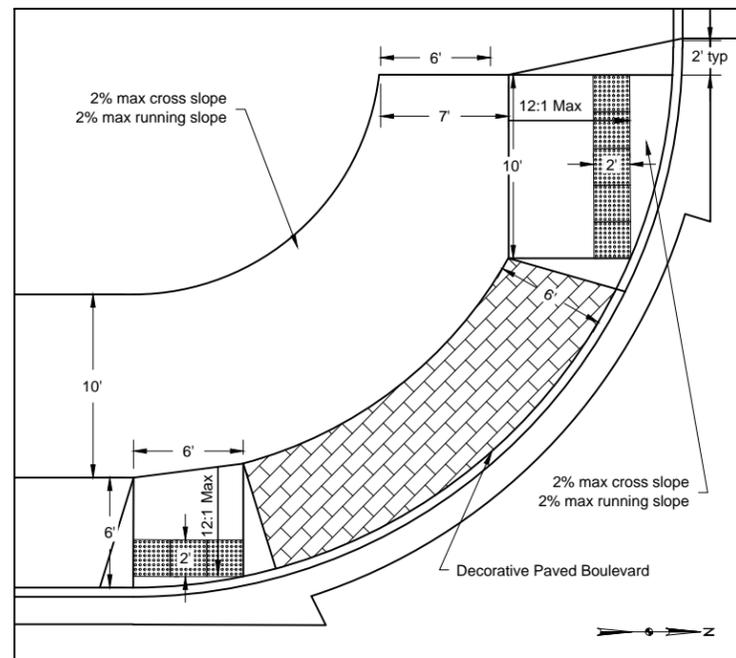
Medora Ave (NE Ramp Sta 76+91, RT)

Notes:

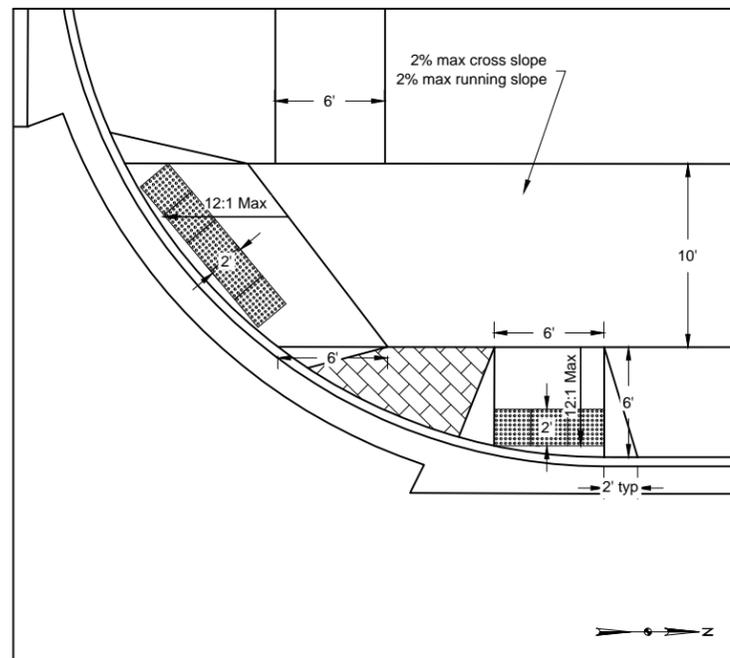
1. The Engineer shall approve all form grades prior to placing concrete.
2. Any ramp found to be in noncompliance shall be removed and replaced by the contractor at their own expense.
3. Dimensions shown may vary from actual. Contractor shall field adjust if maximum slopes cannot meet dimensions given.

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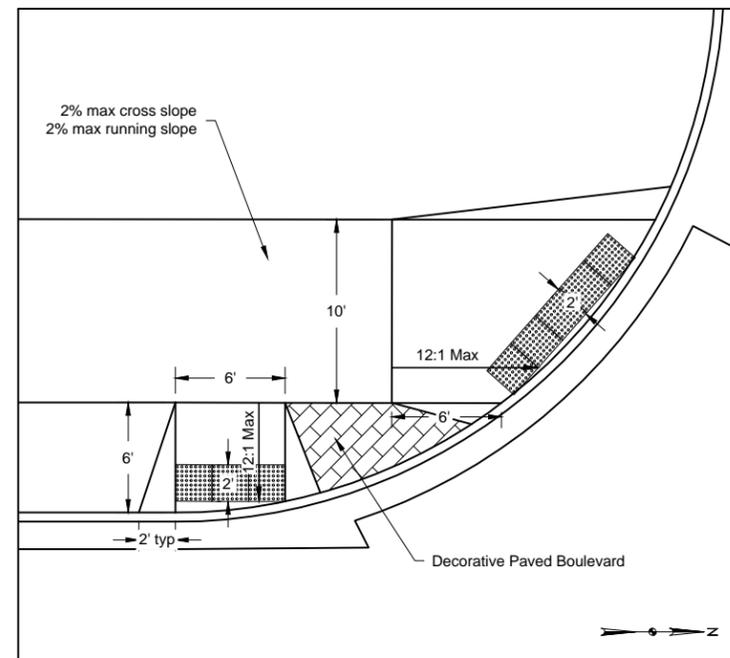
Rev'd.				Scale: 1:10 Hor, 1:10 Ver			
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA							
 ADA Ramp Details Durango Dr, Slate Dr Medora Ave Ramps							
DRWN. BY	CHK'D BY	PROJECT NO.	DATE	DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015	ANG	GJS	1412129	07/2015
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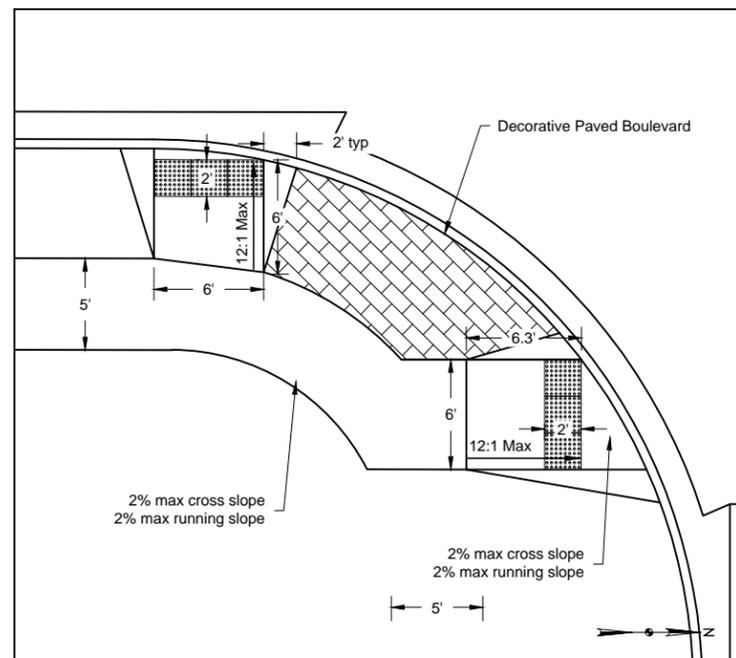
W LaSalle Dr (SW Ramp Sta 86+42, LT)



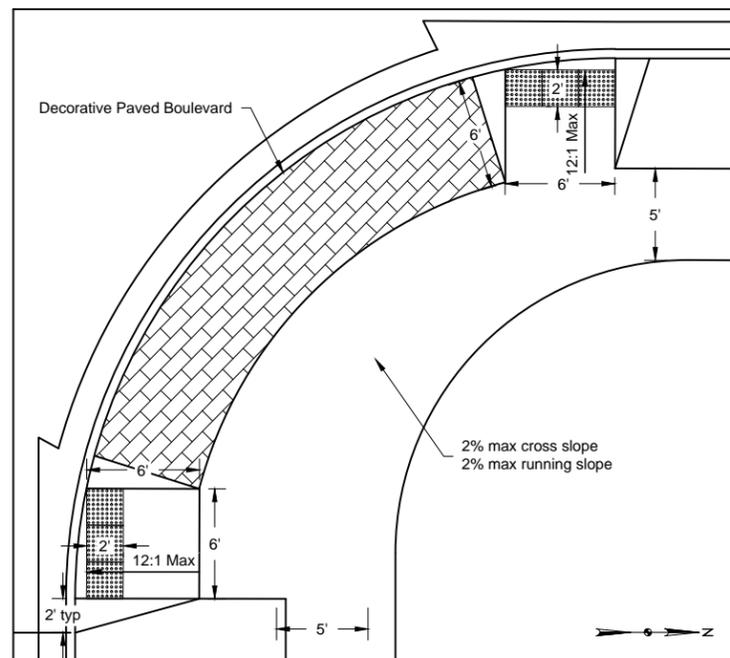
W LaSalle Dr (NW Ramp Sta 87+21, LT)



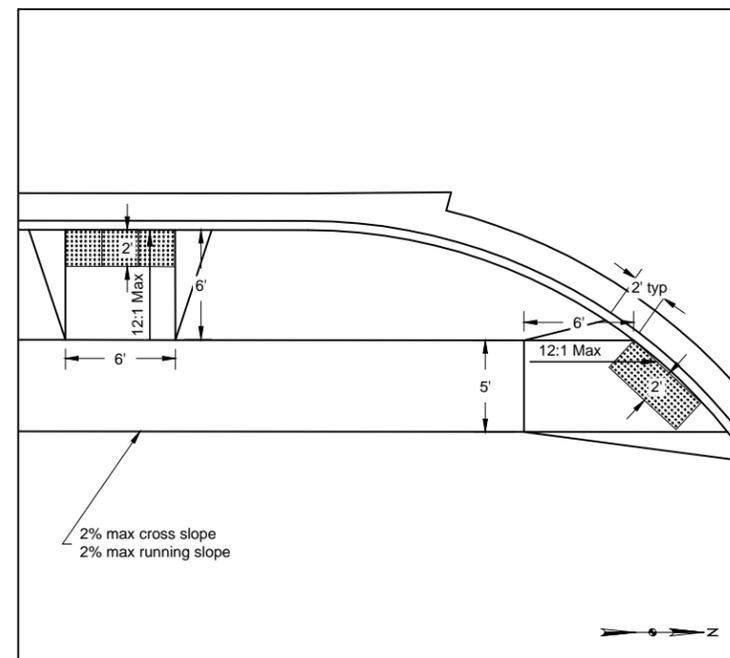
57th Ave (SW Ramp Sta 104+67, LT)  
Street Entrance (SW Ramp Sta 59+11, LT)  
Street Entrance (NW Ramp Sta 59+64, LT)



W LaSalle Dr (SE Ramp Sta 86+40, RT)



W LaSalle Dr (NE Ramp Sta 87+13, RT)



57th Ave (SE Ramp Sta 104+70, RT)

Notes:

1. The Engineer shall approve all form grades prior to placing 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 meet dimensions given.

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**NORTH WASHINGTON STREET**  
CITY OF BISMARCK  
BISMARCK, NORTH DAKOTA

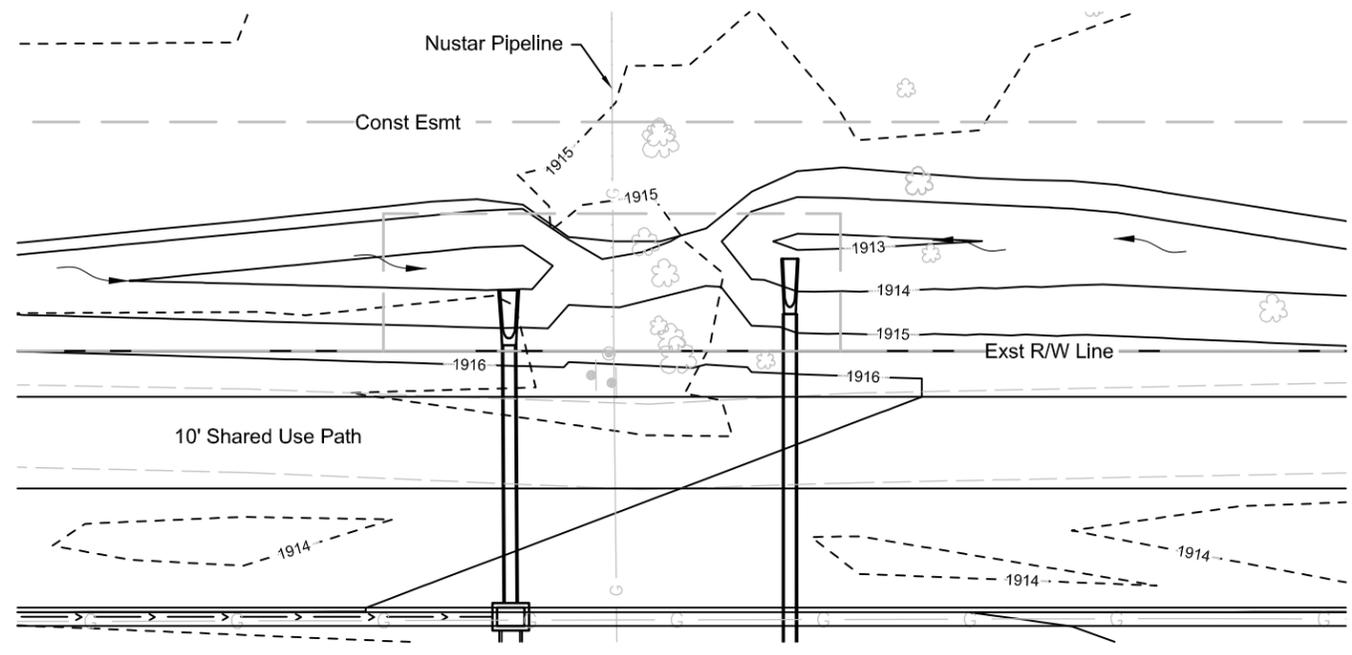
**KLJ**

ADA Ramp Details  
LaSalle Dr and  
57th Ave Ramps

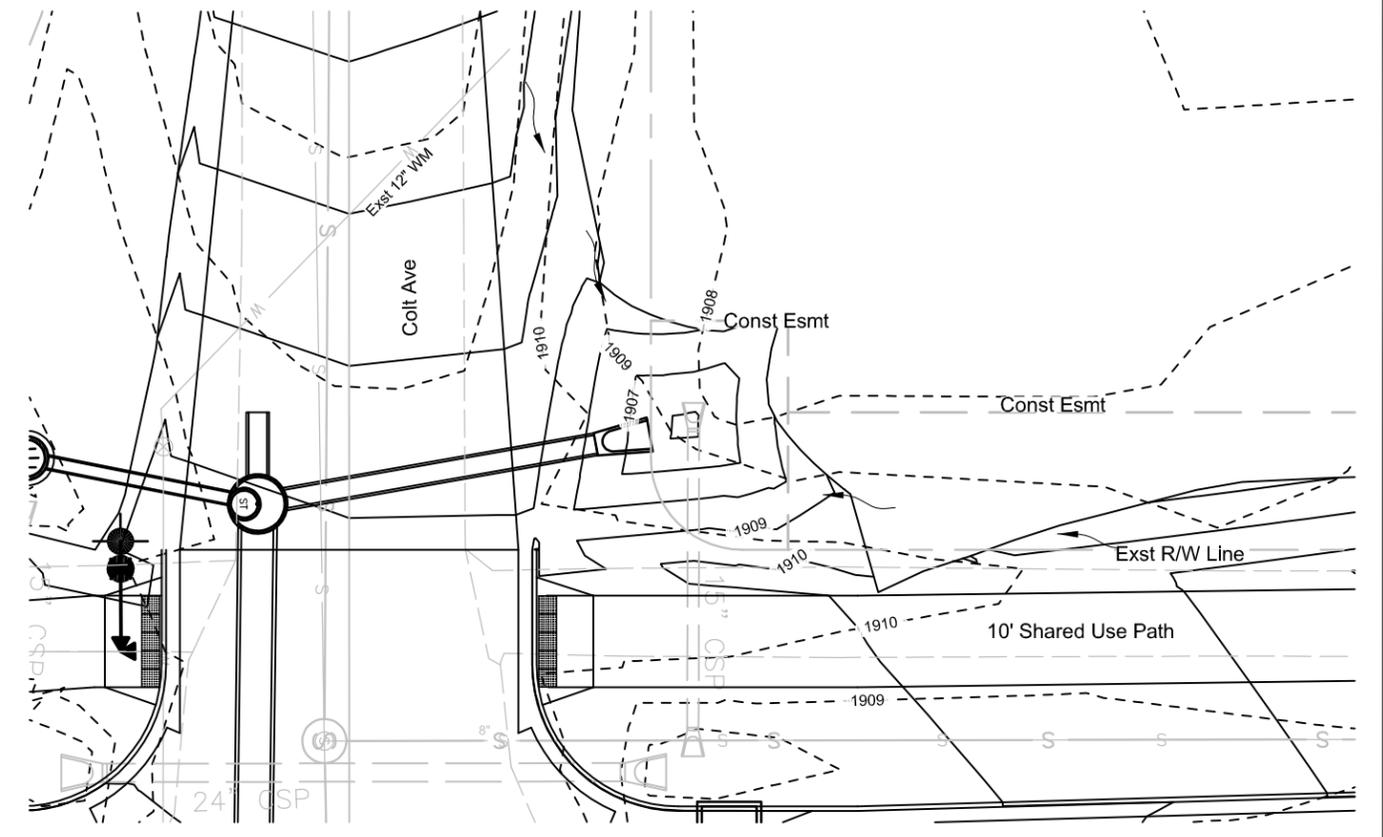
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015

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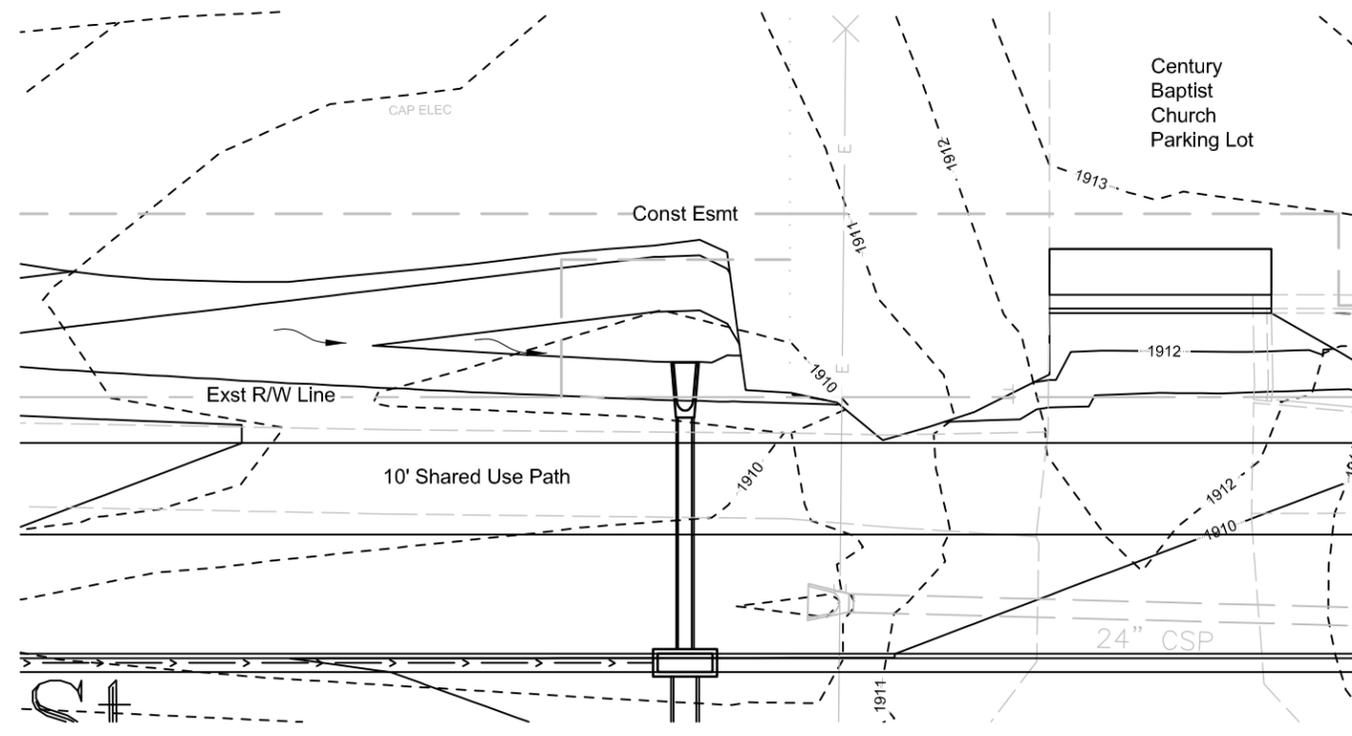
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	18



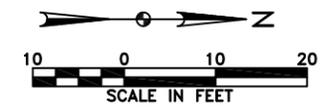
Sta 34+00 LT Grading Detail



Sta 45+00 LT Grading Detail



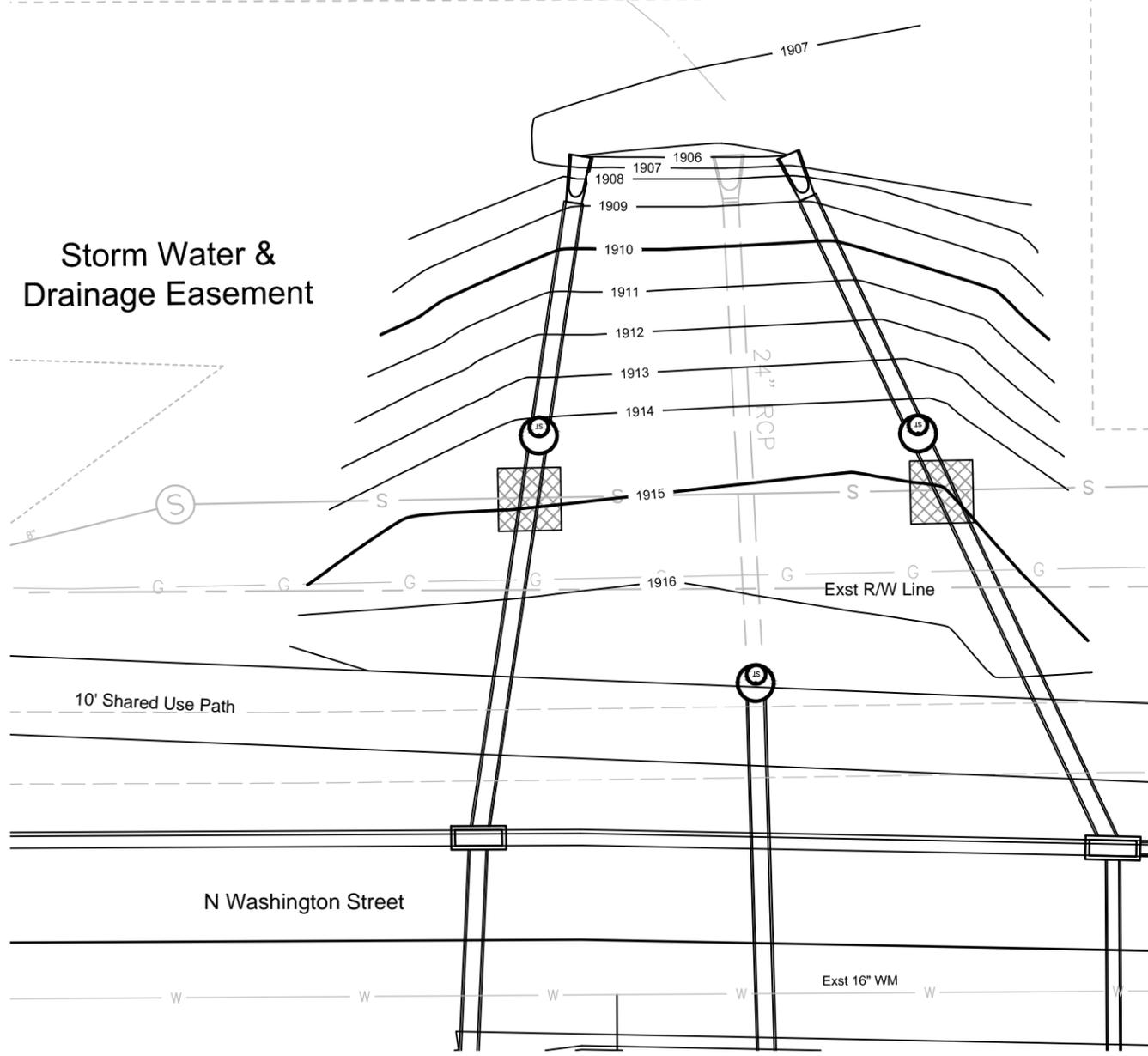
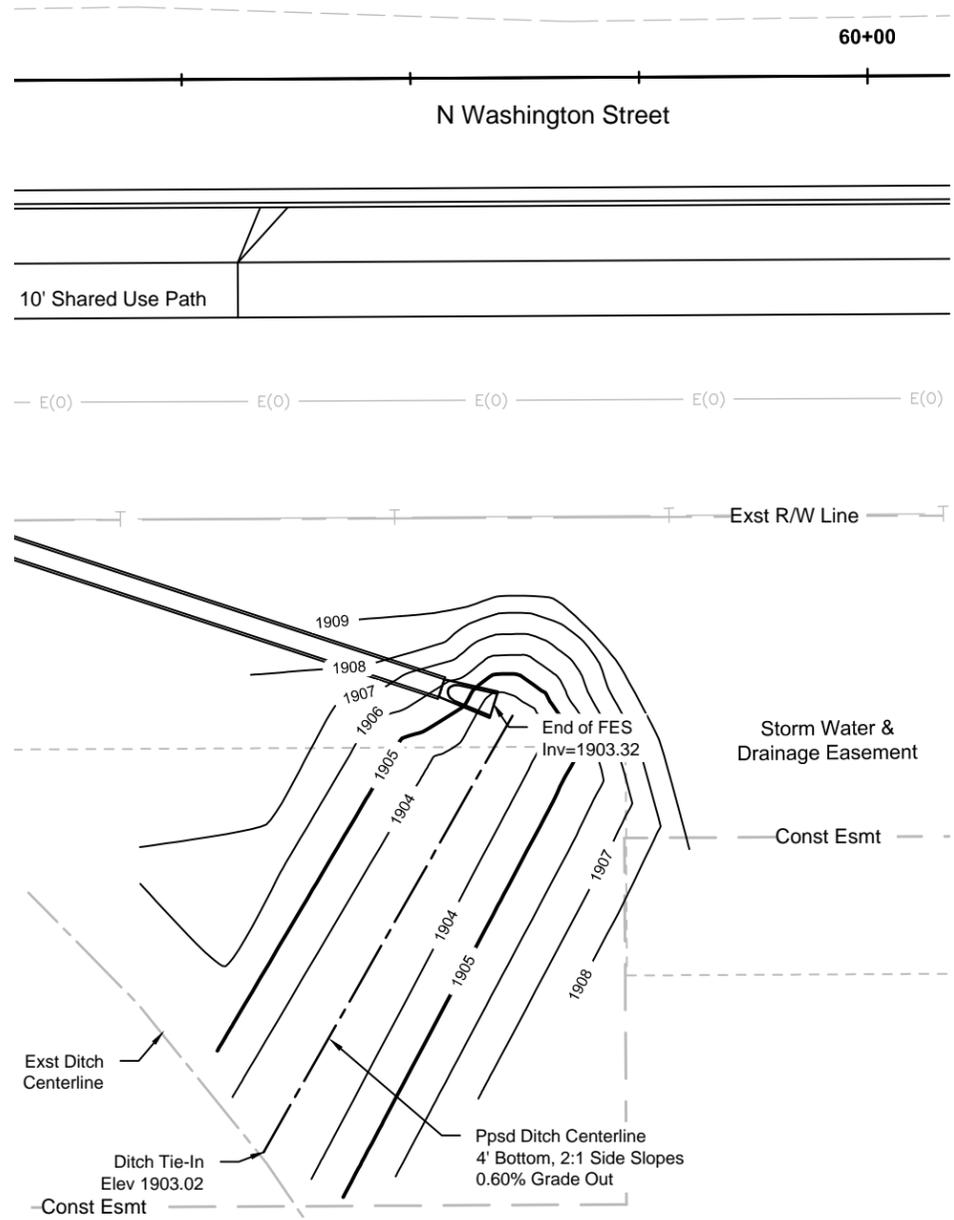
Sta 42+00 LT Grading Detail



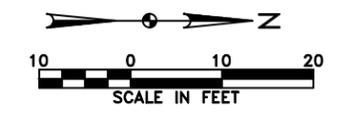
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NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		N Washington St Sta 34+00, 42+00, and 45+00 Grading Plan	
DRWN BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2014
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	19

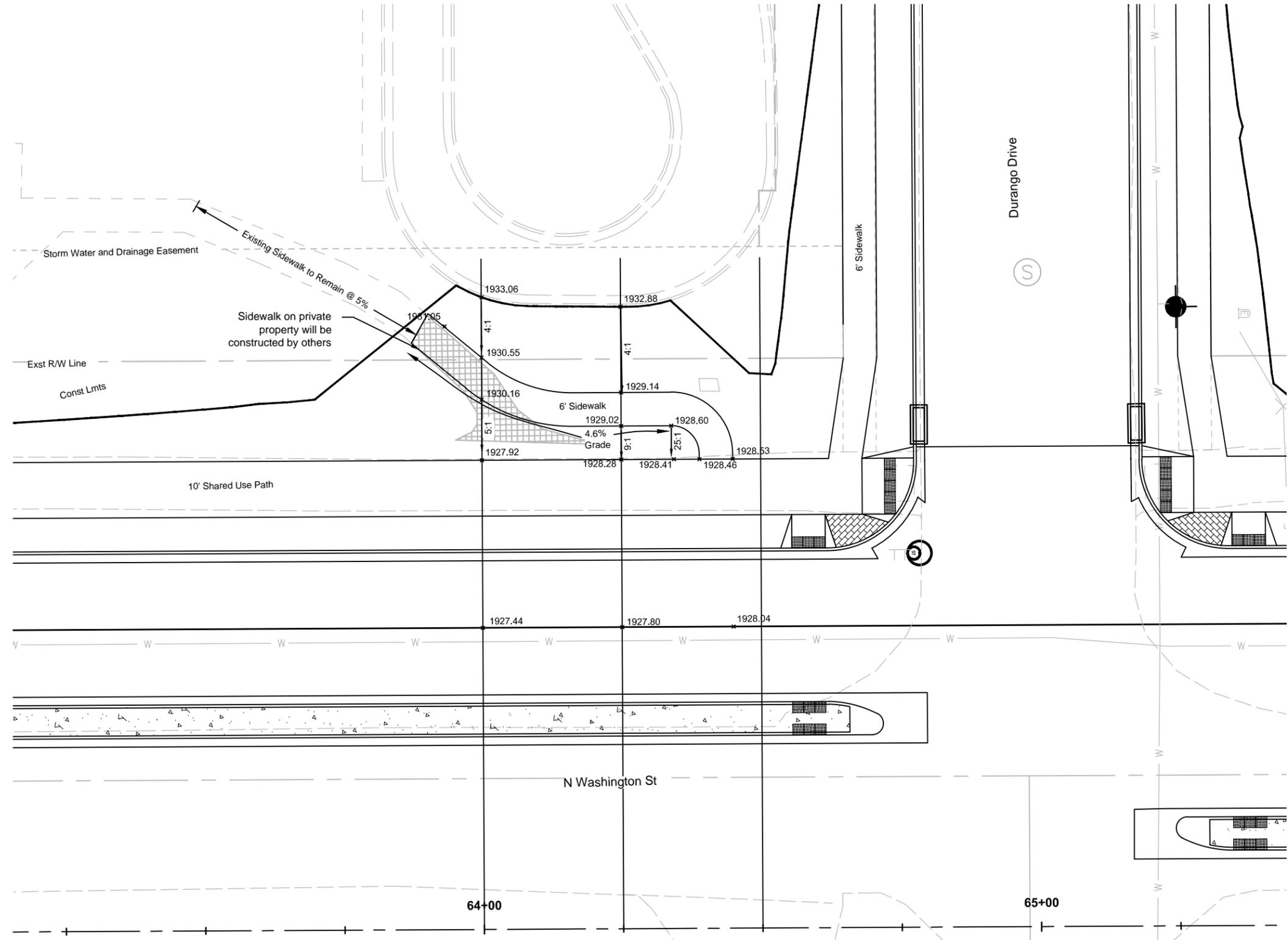


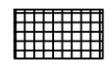
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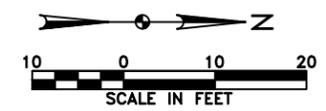
Rev'd.				Scale:			
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA							
N Washington St Sta 34+00, 42+00, and 45+00 Grading Plan							
DRWN. BY	CHK'D BY	PROJECT NO.	DATE	DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015	ANG	GJS	1412129	07/2015

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	20



 Concrete Removal

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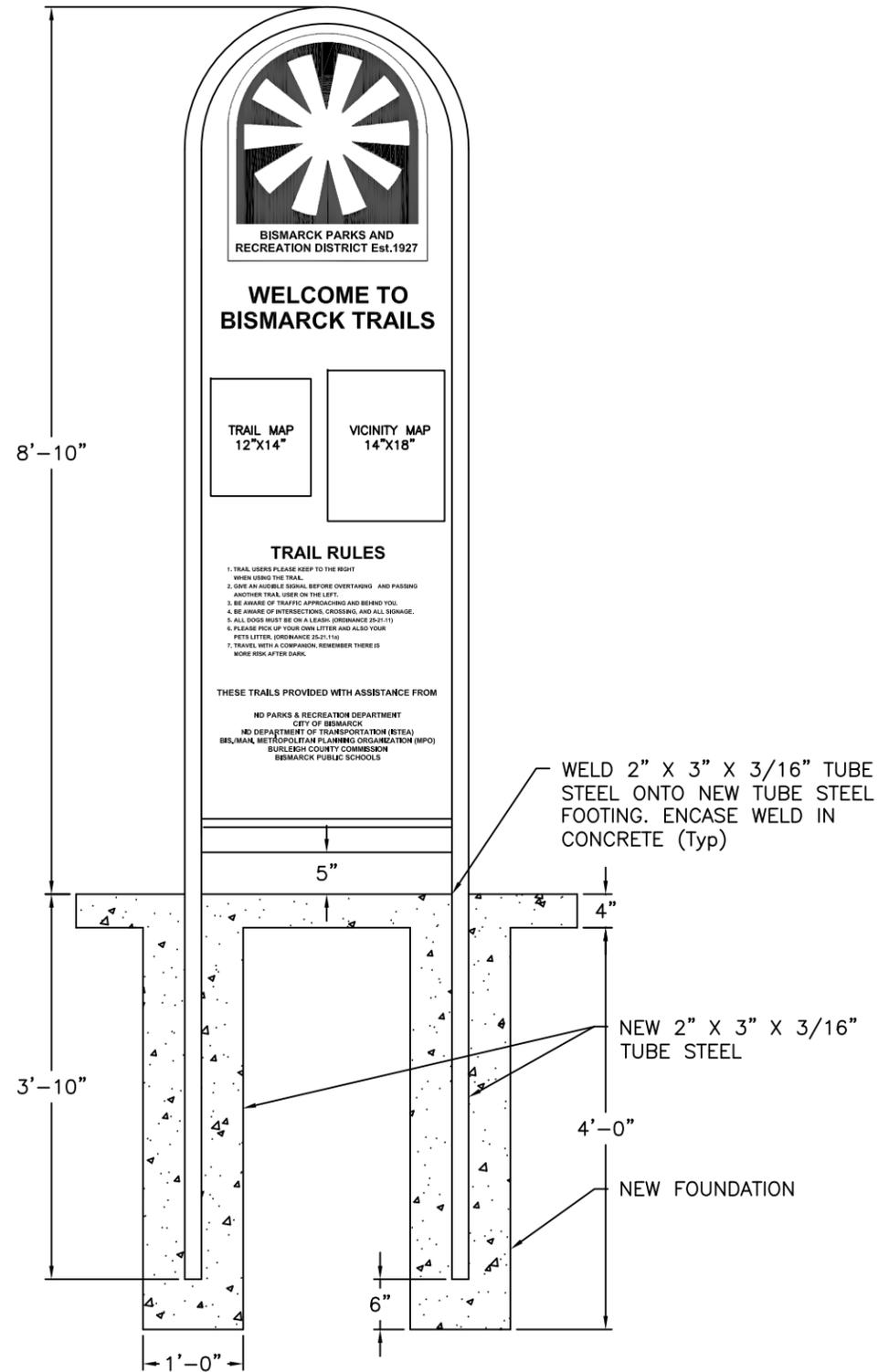
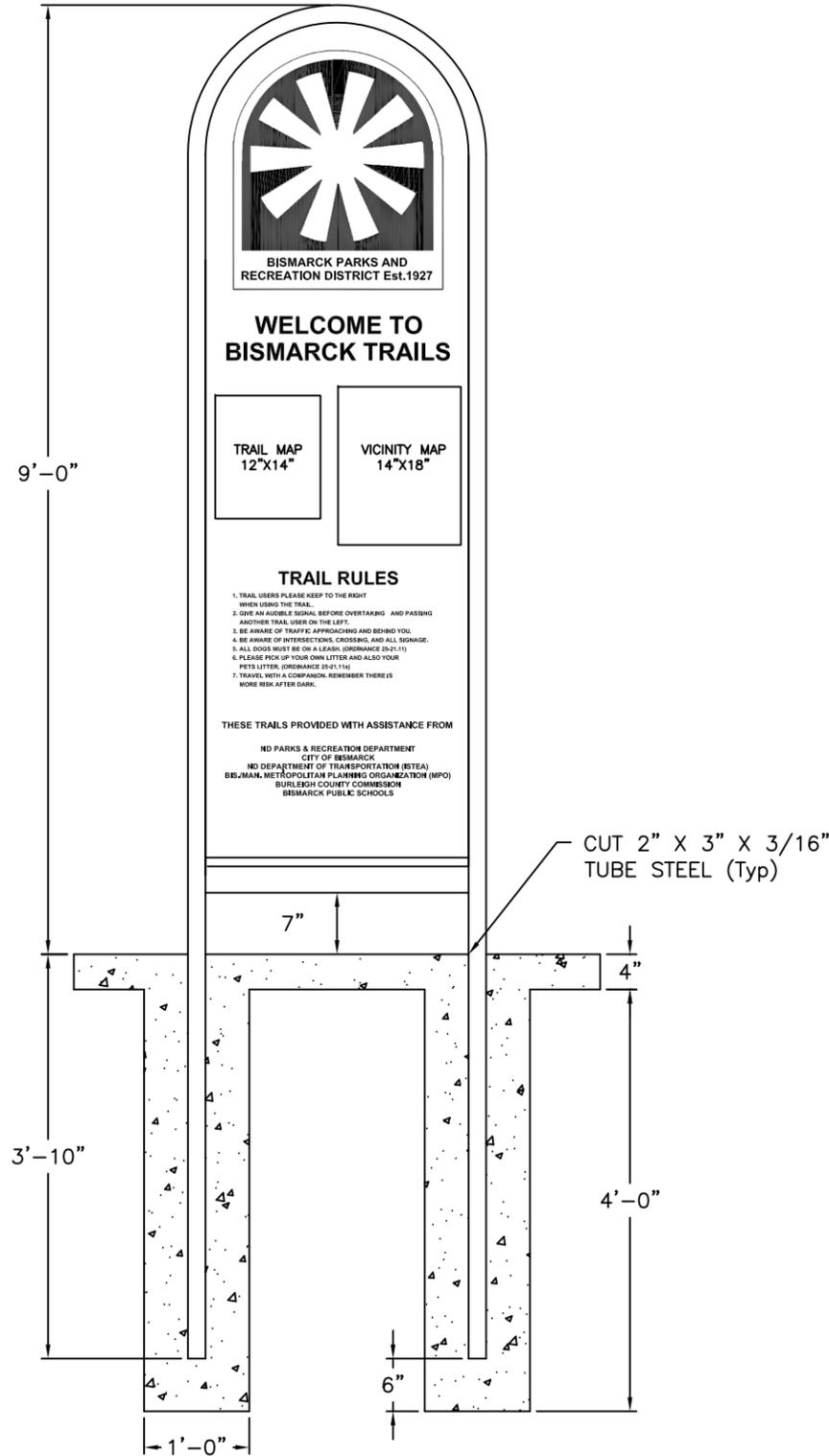


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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>Horizon Market</b> Pedestrian Access Detail	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
ANG	GJS	1412129	07/2015
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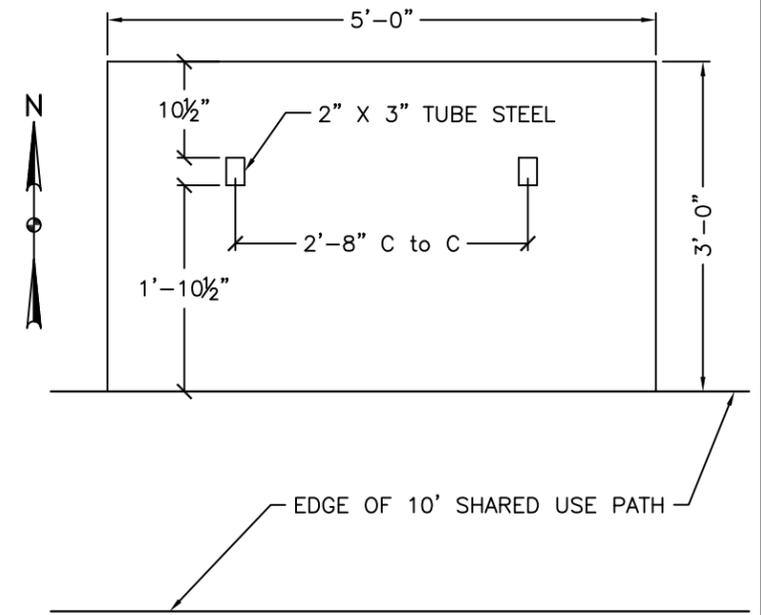
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	20	21

**EXISTING SIGN FRAME**  
Sta 53+27 95' LT

**PROPOSED SIGN FRAME**  
Sta 53+48 120' LT



RESET SIGN SUPPORT  
Sta 53+48 120' LT 1 EA



**NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR THE LOCATION OF ALL UNDERGROUND UTILITIES.
2. 4000 PSI CONCRETE WILL BE USED FOR SIGN FOOTINGS.
3. 3' X 5' CONCRETE PAD SHALL BE PLACED PARALLEL TO ASH COULEE DR SHARED USE PATH.

WELD 2" X 3" X 3/16" TUBE STEEL FOOTING. ENCASE WELD IN CONCRETE (Typ)

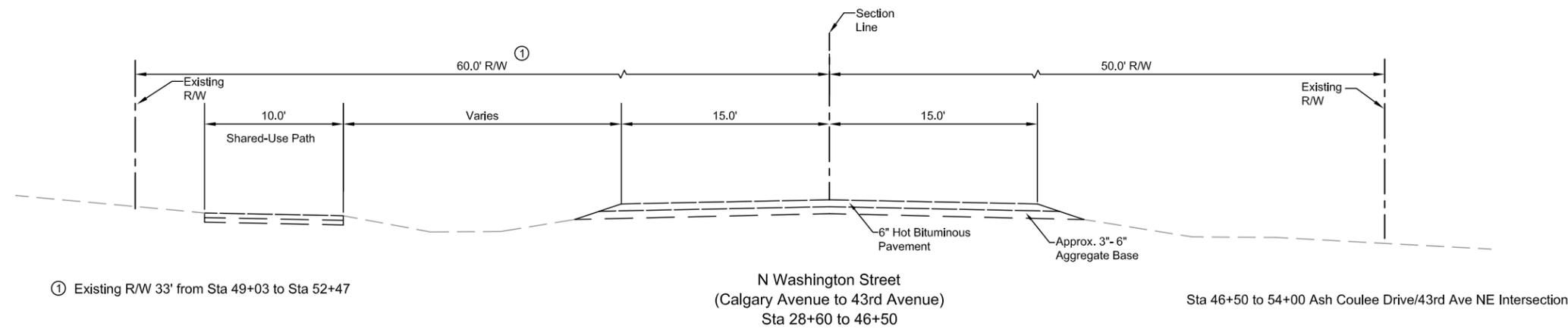
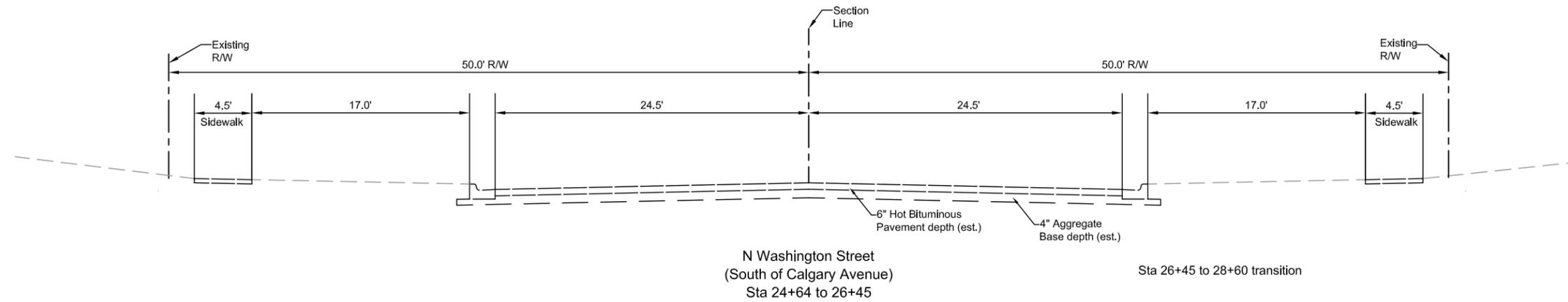
NEW 2" X 3" X 3/16" TUBE STEEL

NEW FOUNDATION

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NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Trailhead Marker	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JE	GJS	1412129	07/2015
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	1

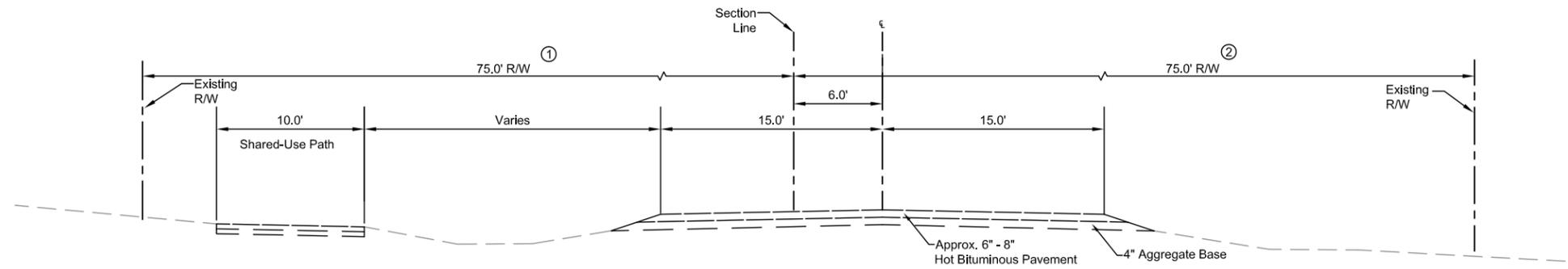


① Existing R/W 33' from Sta 49+03 to Sta 52+47

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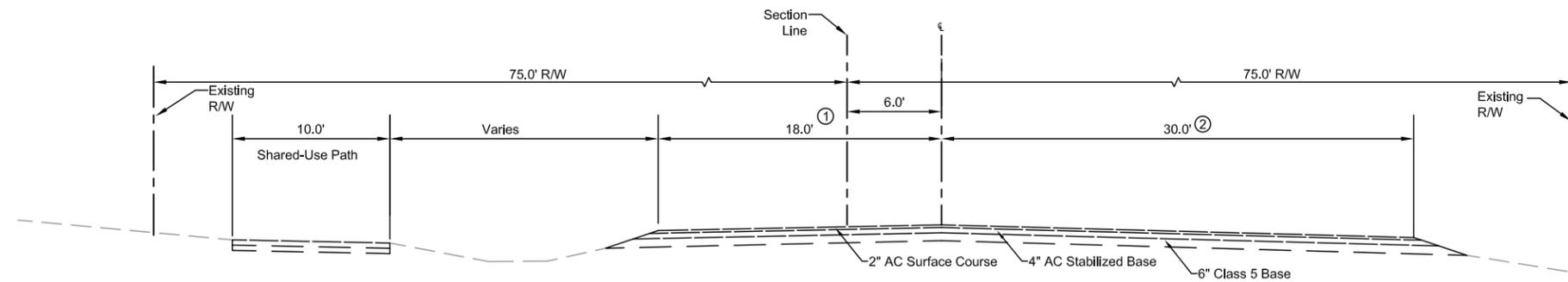
Rev'd.		Scale: 1:10 Hor, 1:10 Ver	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St</b> Existing Typical Section	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
KAW	GJS	1412129	01/2014
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	2



- ① Existing R/W 60' from Sta 92+23 to Sta 112+50
- ② Existing R/W 60' from Sta 98+02 to Sta 112+50

N Washington Street  
 (43rd Avenue to LaSalle Avenue  
 LaSalle Avenue to Greenfield Lane)  
 Sta 54+00 to 82+99  
 Sta 90+17 to 112+50



- ① Transitions from 15' at Sta 82+99 to 18' at Sta 85+31  
 Transitions from 18' at Sta 89+04 to 15' at Sta 90+17
- ② Transitions from 15' at Sta 82+99 to 30' at Sta 85+31  
 Transitions from 30' at Sta 89+04 to 15' at Sta 90+17

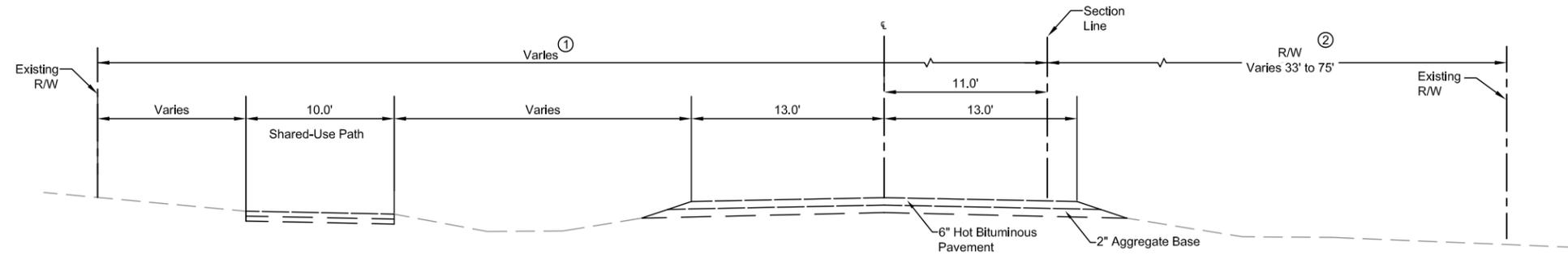
N Washington Street  
 (LaSalle Avenue)  
 Sta 82+99 to 86+25  
 Sta 87+29 to 90+17

Sta 86+25 to 87+29 LaSalle Avenue Intersection

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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St</b> Existing Typical Section	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
KAW	GJS	1412129	01/2014
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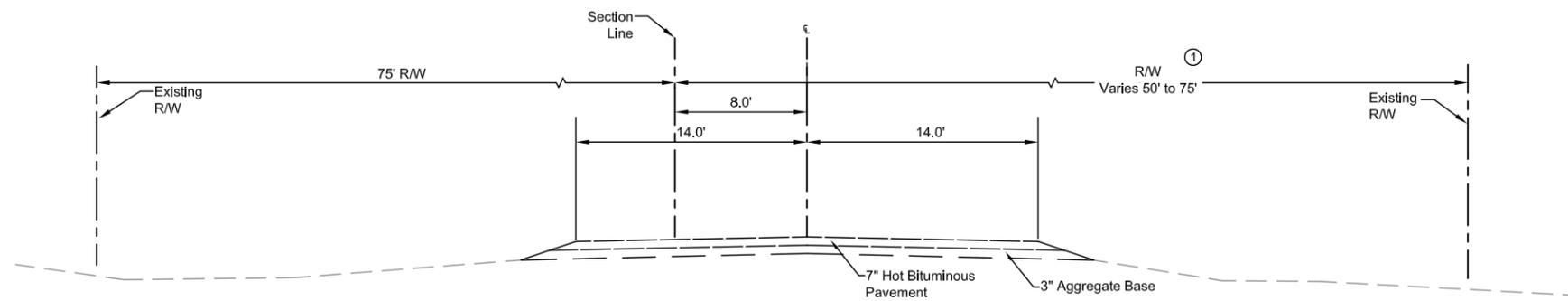
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	3



- ① Existing R/W 70' from Sta 503+72 to Sta 504+98
- ② Existing R/W 75' from Sta 504+98 to Sta 509+30
- Existing R/W 33' from Sta 509+30 to Sta 514+45

Ash Coulee Drive  
Sta 503+72 to 514+45

Sta 514+45 to 515+62 N Washington St Intersection



- ① Existing R/W 50' from Sta 515+62 to Sta 520+67
- Existing R/W 75' from Sta 521+33 to Sta 525+60

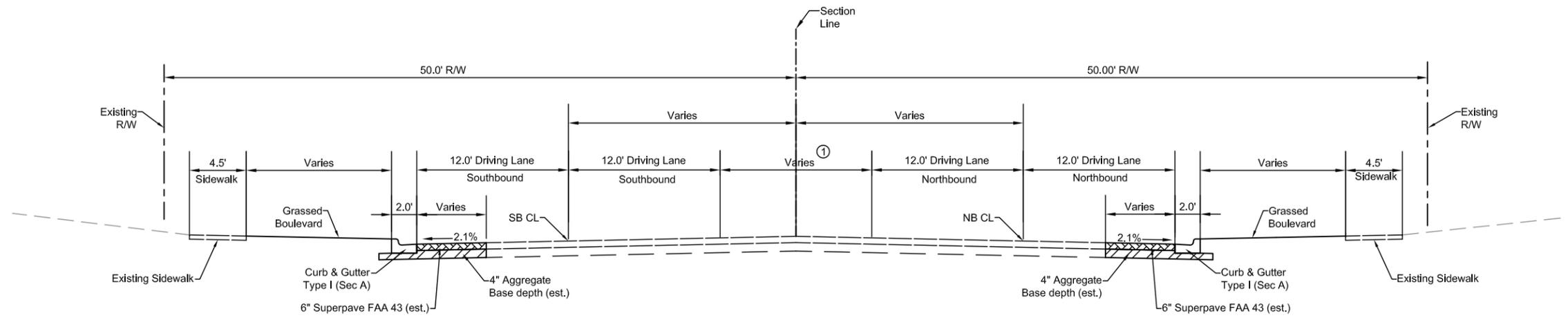
43rd Avenue  
Sta 515+62 to 525+60

Sta 520+67 to 521+33 Montreal St Intersection

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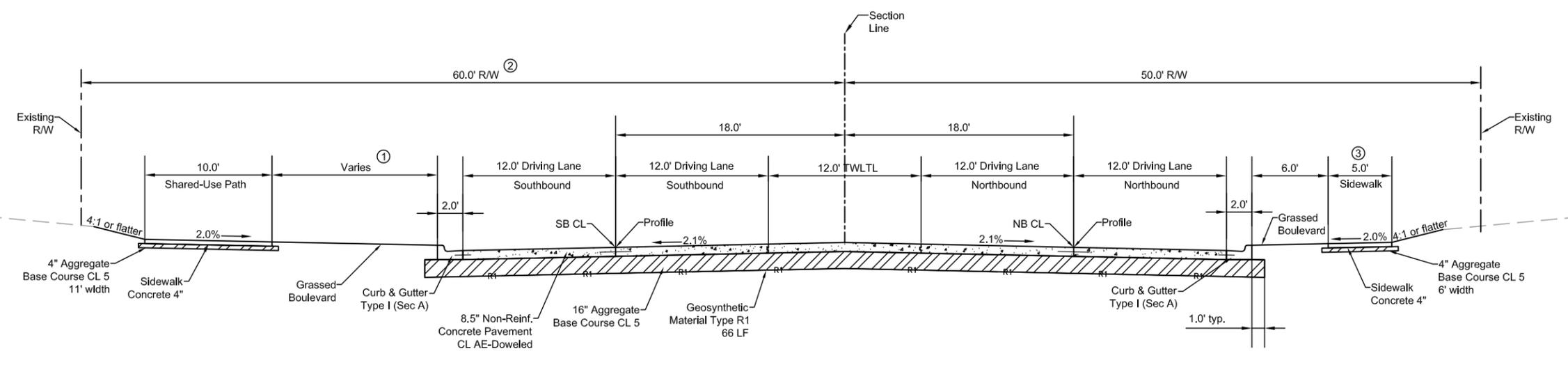
Rev'd.		Scale: 1:10 Hor, 1:10 Ver	
NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Ash Coulee Dr/43rd Ave Existing Typical Section	
		DRWN. BY KAW	CHK'D BY GJS
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	4



① Median transitions from 0' @ Sta 24+64 to 12' @ Sta 25+78

Sta 24+64 to 25+78

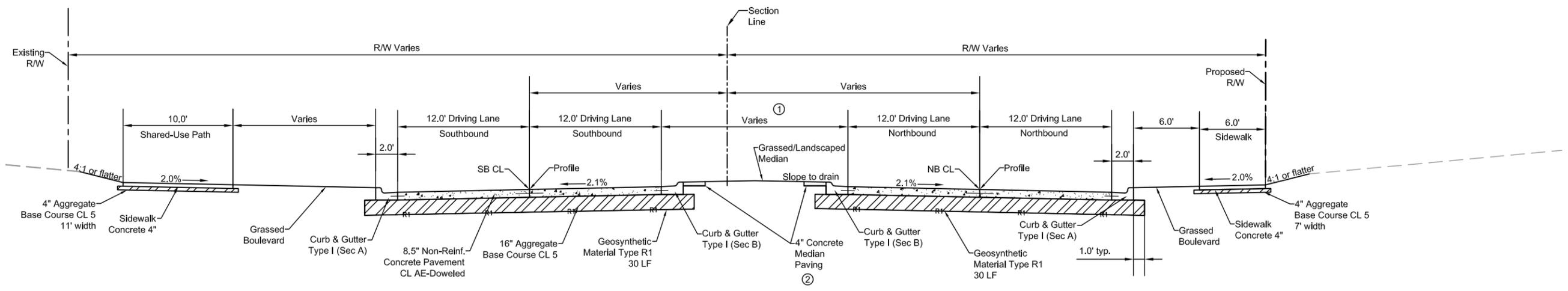


- ① Grassed boulevard transitions from 6' @ Sta 28+00 to 13' @ Sta 29+00  
Grassed boulevard transitions from 13' @ Sta 42+25 to 6' @ Sta 43+25  
Grassed boulevard transitions from 6' @ Sta 44+00 to 13' @ Sta 45+00
- ② R/W 50' from Sta 24+64 to Sta 26+40
- ③ 6' Sidewalk from Sta 45+51 to Sta 45+83

Sta 25+78 to 45+83

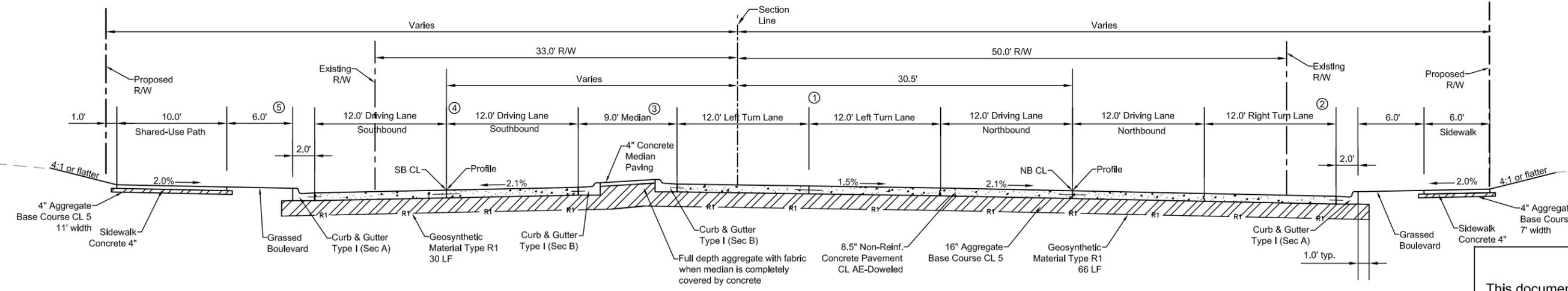
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St</b> Proposed Typical Section	
DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
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- ① SB left-turn lane transitions from Sta 45+83 to Sta 46+70  
Raised median begins @ Sta 46+70
- ② Concrete median paving from Sta 45+83 to Sta 47+09

Sta 45+83 to 47+67



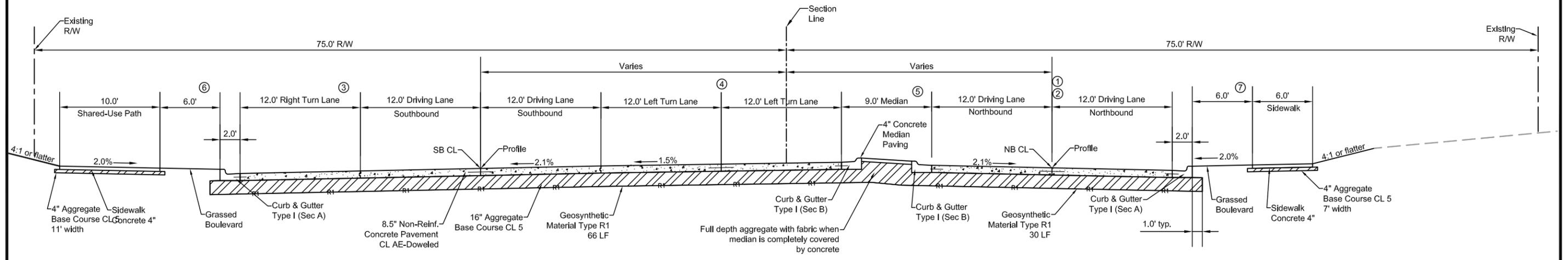
- ① NB double left-turn lane transitions from 0' @ Sta 47+69 to 24' @ Sta 49+35
- ② NB right-turn lane transitions from 0' @ Sta 48+39 to 12' @ Sta 49+35
- ③ Median transitions from Sta 49+35 to Sta 51+07
- ④ SB driving lanes transition from 12' @ Sta 50+27 to 16' @ Sta 51+07  
SB driving lanes are 16' from Sta 51+07 to Sta 52+10
- ⑤ Grassed boulevard transitions from Sta 49+35 to Sta 50+27

Sta 47+67 to 52+10

Sta 52+10 to 53+46 Ash Coulee Drive/43rd Ave NE Intersection

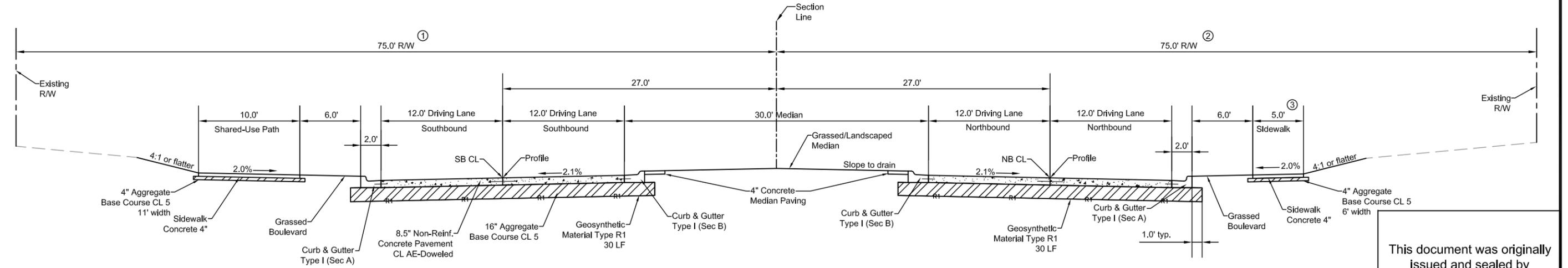
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St</b> Proposed Typical Section	
DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
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- ① NB driving lanes are 16' from Sta 53+67 to Sta 53+89
- ② NB driving lanes transition from 16' @ Sta 53+89 to 12' @ Sta 55+49
- ③ SB right-turn lane transitions from 12' @ Sta 56+26 to 0' @ Sta 57+19
- ④ SB double left-turn lane transitions from 24' @ Sta 56+24 to 0' @ Sta 58+15
- ⑤ Median transitions from Sta 53+89 to Sta 59+55
- ⑥ Grassed boulevard transitions from Sta 56+26 to Sta 59+55
- ⑦ Grassed boulevard transitions from Sta 53+67 to Sta 56+89

Sta 53+46 to 59+55



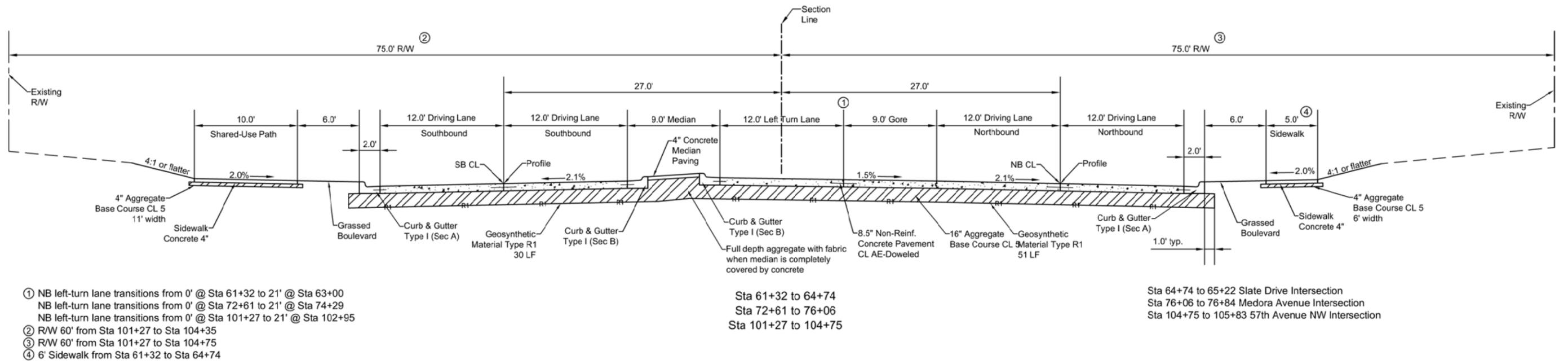
- ① R/W 60' from Sta 95+28 to Sta 101+27
- ② R/W 60' from Sta 98+02 to Sta 101+27
- ③ 6' sidewalk from Sta 54+55 to Sta 64+69

Sta 59+55 to 61+32  
 Sta 68+65 to 72+61  
 Sta 80+26 to 82+53  
 Sta 90+55 to 92+12  
 Sta 95+28 to 101+27

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NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		N Washington St Proposed Typical Section	
DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
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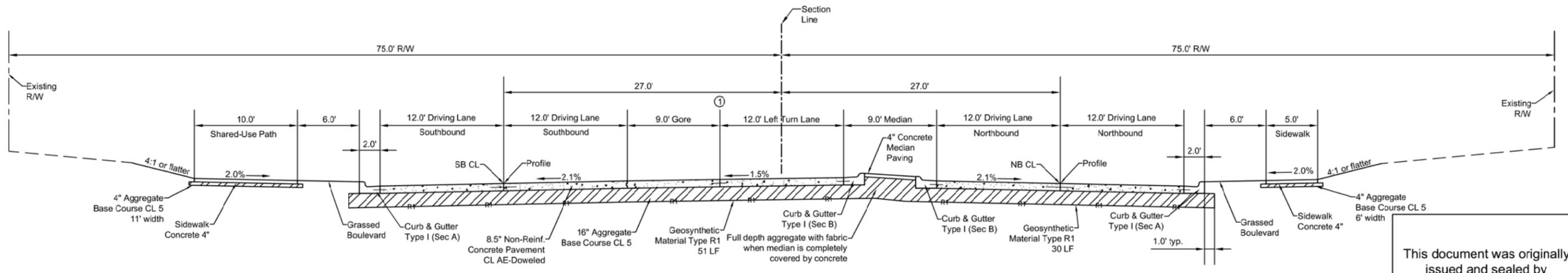
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	7



- ① NB left-turn lane transitions from 0' @ Sta 61+32 to 21' @ Sta 63+00  
NB left-turn lane transitions from 0' @ Sta 72+61 to 21' @ Sta 74+29  
NB left-turn lane transitions from 0' @ Sta 101+27 to 21' @ Sta 102+95
- ② R/W 60' from Sta 101+27 to Sta 104+35
- ③ R/W 60' from Sta 101+27 to Sta 104+75
- ④ 6' Sidewalk from Sta 61+32 to Sta 64+74

Sta 61+32 to 64+74  
Sta 72+61 to 76+06  
Sta 101+27 to 104+75

Sta 64+74 to 65+22 Slate Drive Intersection  
Sta 76+06 to 76+84 Medora Avenue Intersection  
Sta 104+75 to 105+83 57th Avenue NW Intersection



- ① SB left-turn lane and gore area transitions from 21' @ Sta 66+97 to 0' @ Sta 68+65  
SB left-turn lane and gore area transitions from 21' @ Sta 78+58 to 0' @ Sta 80+26

Sta 65+22 to 68+65  
Sta 76+84 to 80+26

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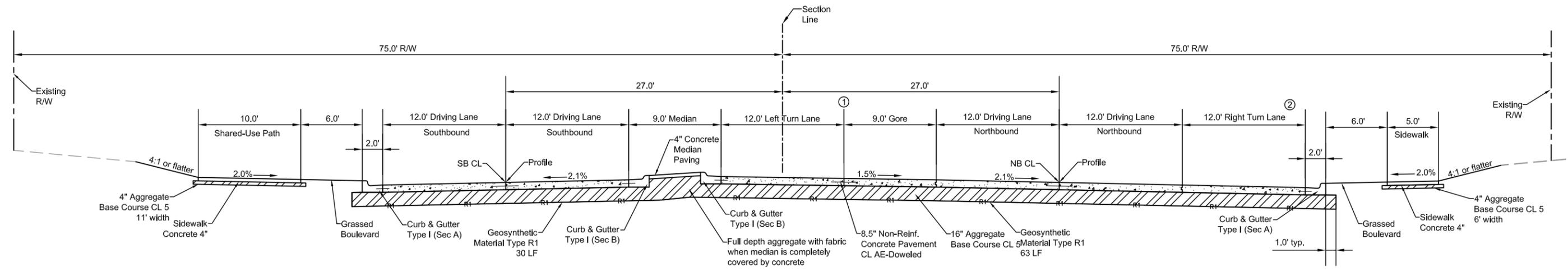
**NORTH WASHINGTON STREET**  
CITY OF BISMARCK  
BISMARCK, NORTH DAKOTA

**N Washington St Proposed Typical Section**

DRAWN BY KAW	CHECKED BY GJS	PROJECT NO. 1412129	DATE 01/2014
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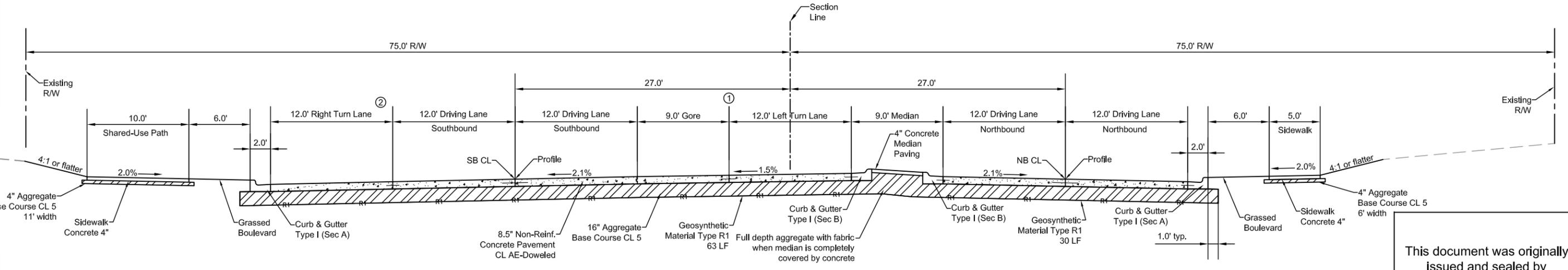
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	30	8



- ① NB left-turn lane transitions from 0' @ Sta 82+53 to 21' @ Sta 84+21
- ② NB right-turn lane transitions from 0' @ Sta 83+25 to 12' @ Sta 84+21

Sta 82+53 to 86+45

Sta 86+45 to 87+13 Lasalle Drive Intersection



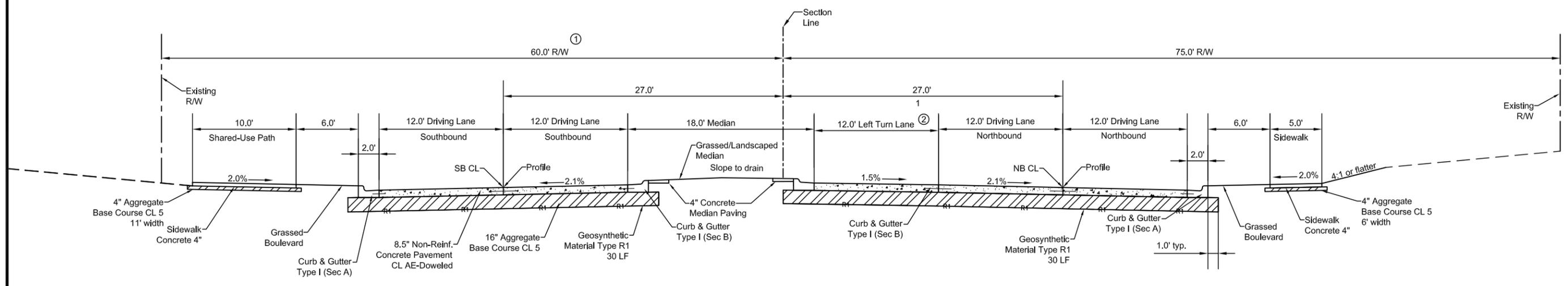
- ① SB left-turn lane and gore area transitions from 21' @ Sta 88+87 to 0' @ Sta 90+55
- ② SB right-turn lane transitions from 12' @ Sta 88+87 to 0' @ Sta 89+83

Sta 87+13 to 90+55

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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St Proposed Typical Section</b>	
DRWN. BY KAW	CHK'D BY GJS	PROJECT NO. 1412129	DATE 01/2014
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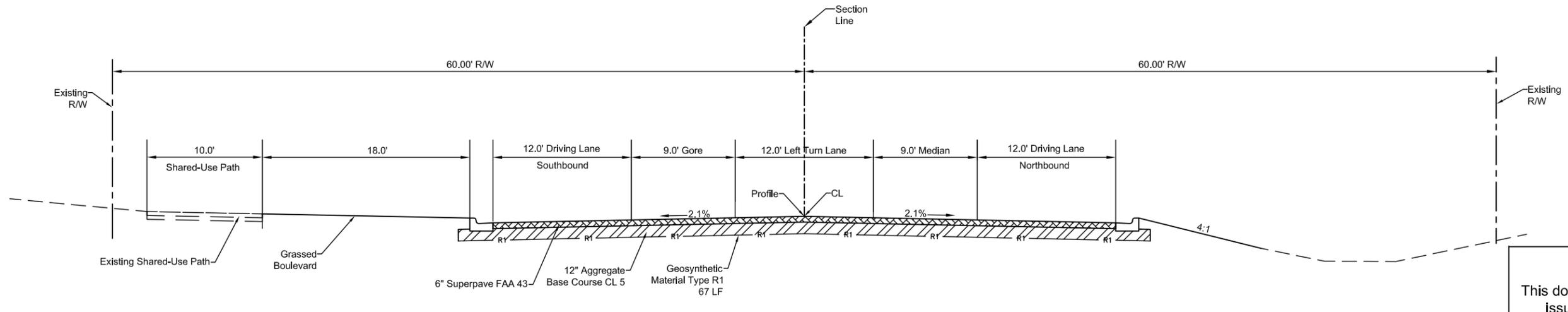
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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- ① R/W 75' from Sta 92+12 to Sta 92+23
- ② NB left turn lane transitions from 0' @ Sta 92+12 to 12' @ 93+08

Sta 92+12 to 94+78

Sta 94+78 to 95+28 Street Return

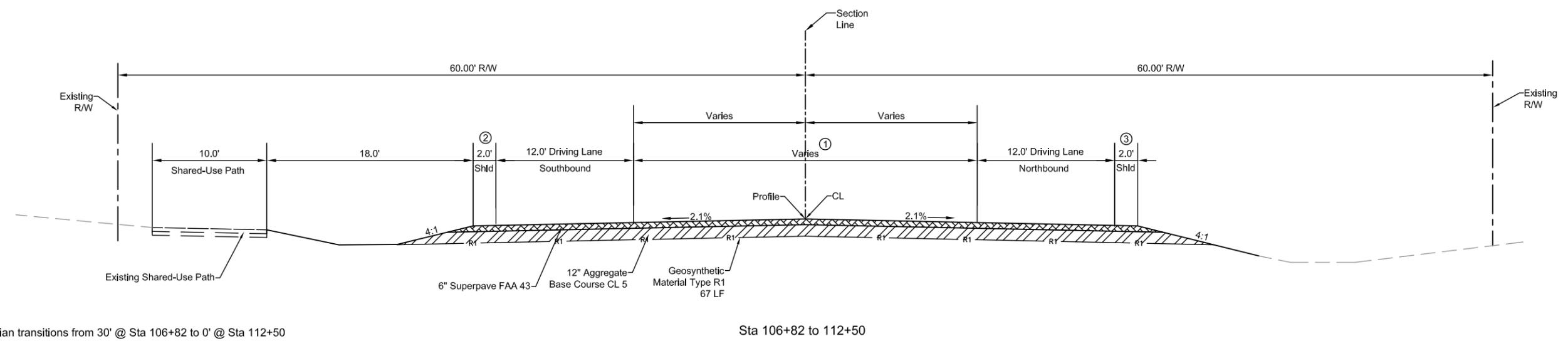


Sta 105+83 to 106+82

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		<b>N Washington St</b> Proposed Typical Section	
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ND	NHU-1-981(101)111	30	10



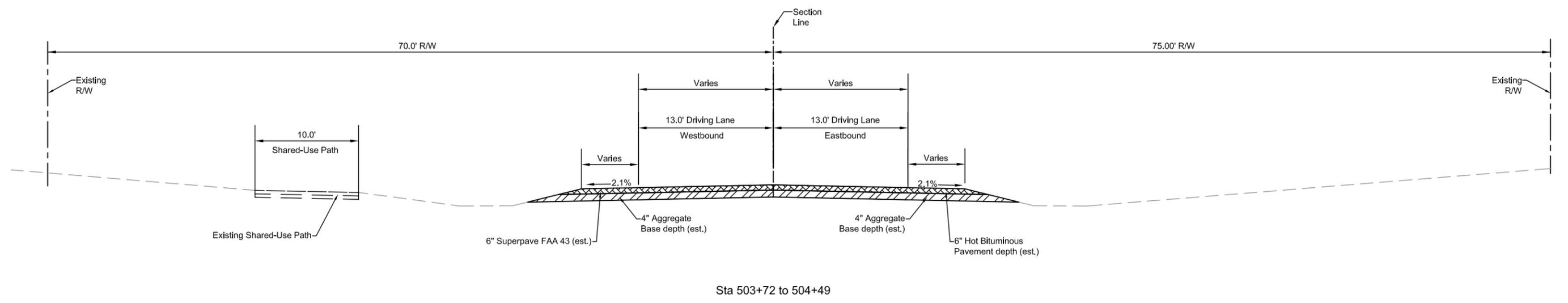
- ① Median transitions from 30' @ Sta 106+82 to 0' @ Sta 112+50
- ② Curb and gutter section from Sta 106+82 to Sta 108+50
- ③ Curb and gutter section from Sta 106+82 to Sta 108+50

Sta 106+82 to 112+50

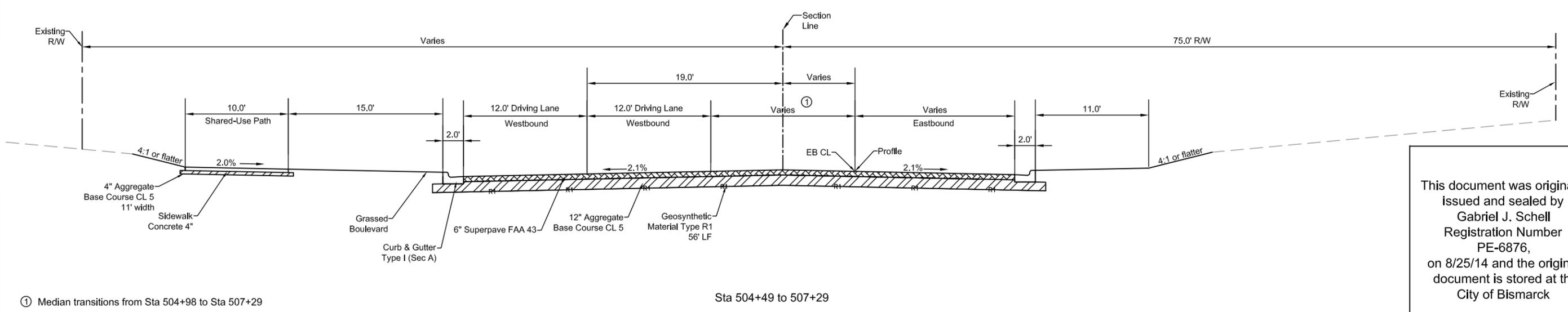
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		<b>N Washington St</b> Proposed Typical Section	
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KAW	GJS	1412129	01/2014
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Sta 503+72 to 504+49

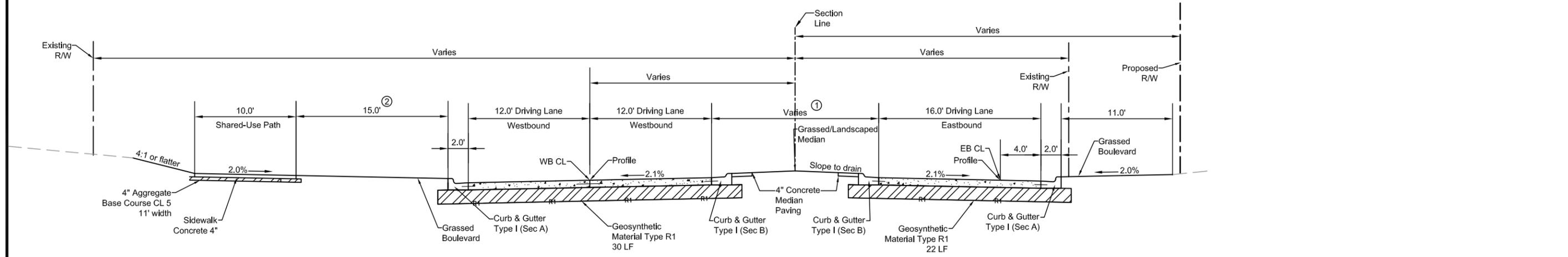


Sta 504+49 to 507+29

① Median transitions from Sta 504+98 to Sta 507+29

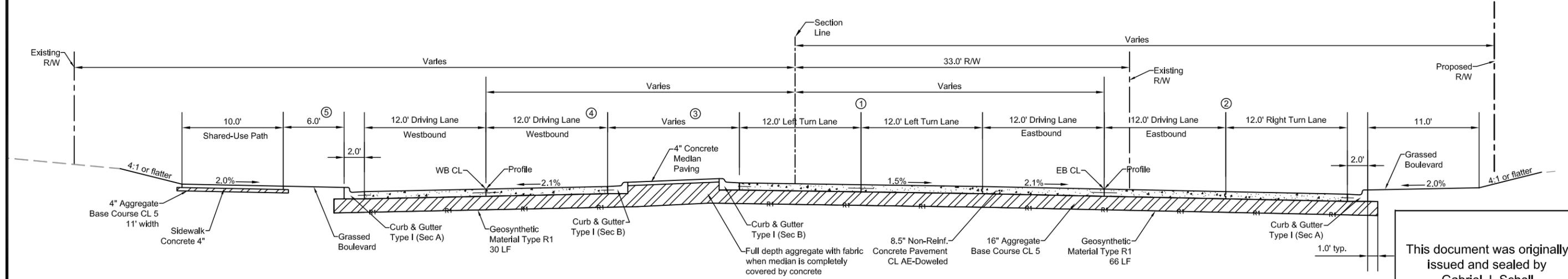
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>43rd Ave/Ash Coulee Dr</b> Proposed Typical Section	
		<small>DRWN. BY</small> KAW	<small>CHK'D BY</small> GJS
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- ① Median transitions from Sta 507+29 to Sta 509+87  
Concrete paved median from Sta 507+34 to Sta 507+88
- ② Grassed boulevard transitions from 15' @ Sta 508+53 to 11' @ Sta 509+87

Sta 507+29 to 509+87



- ① EB double left-turn lane transitions from 0' @ Sta 510+19 to 24' @ Sta 512+59
- ② EB thru lane and right-turn lane transitions from 0' @ Sta 509+87 to 24' @ Sta 511+60
- ③ Median transitions from Sta 507+29 to Sta 513+94
- ④ WB driving lanes transition from 12' @ Sta 512+54 to 16' @ Sta 513+94  
WB driving lanes are 16' from Sta 513+94 to 514+16
- ⑤ Grassed boulevard transitions from 11' @ Sta 509+87 to 6' @ Sta 511+71

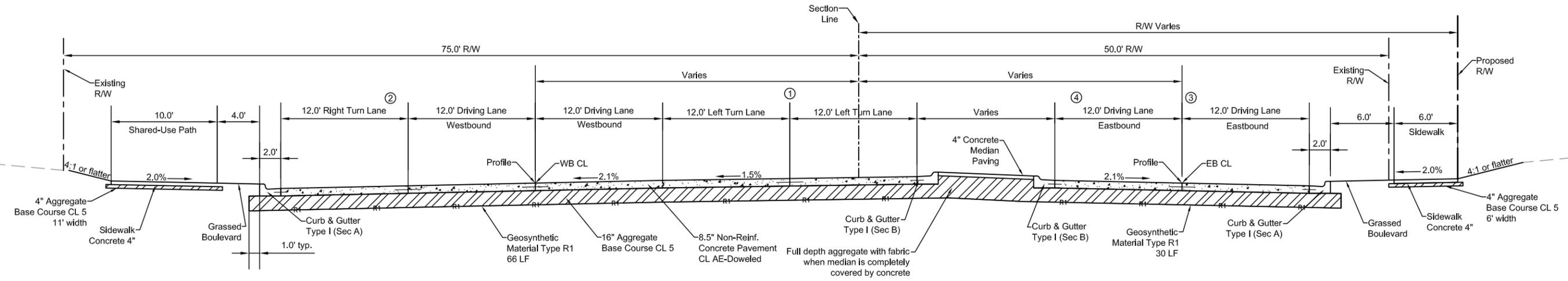
Sta 509+87 to 514+38

Sta 514+38 to 515+69 N Washington Street Intersection

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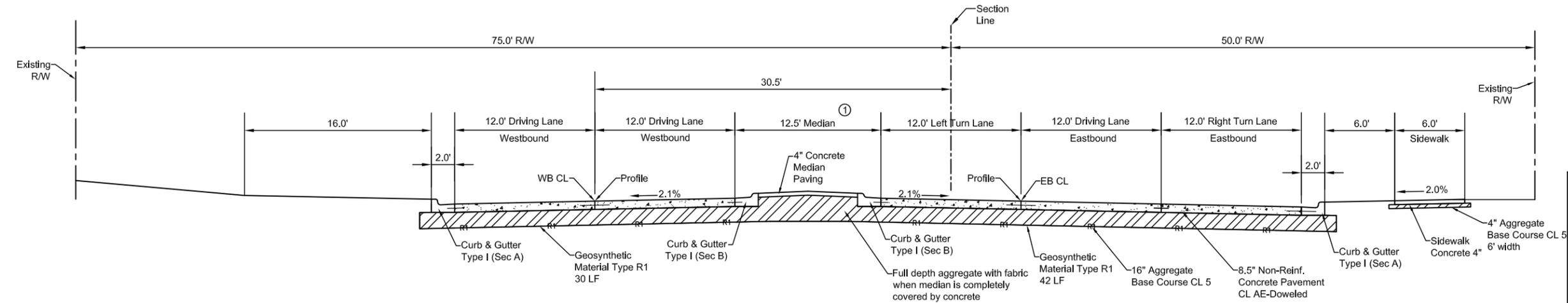
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		43rd Ave/Ash Coulee Dr Proposed Typical Section	
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- ① WB double left-turn lane transitions from 24' @ Sta 517+94 to 0' @ Sta 519+85
- ② WB right-turn lane transitions from 12' @ Sta 517+47 to 0' @ Sta 518+92
- ③ EB driving lanes are 16' wide from Sta 515+81 to 516+13  
EB driving lanes transition from 16' @ Sta 516+13 to 12' @ Sta 516+95
- ④ EB left-turn lane at Montreal Street transitions from 0' @ Sta 517+93 to 12' @ Sta 519+50

Sta 515+69 to 519+50



- ① Median transitions from Sta 519+50 to Sta 519+84

Sta 519+50 to 520+56

Sta 520+56 to 521+49 Montreal Street Intersection

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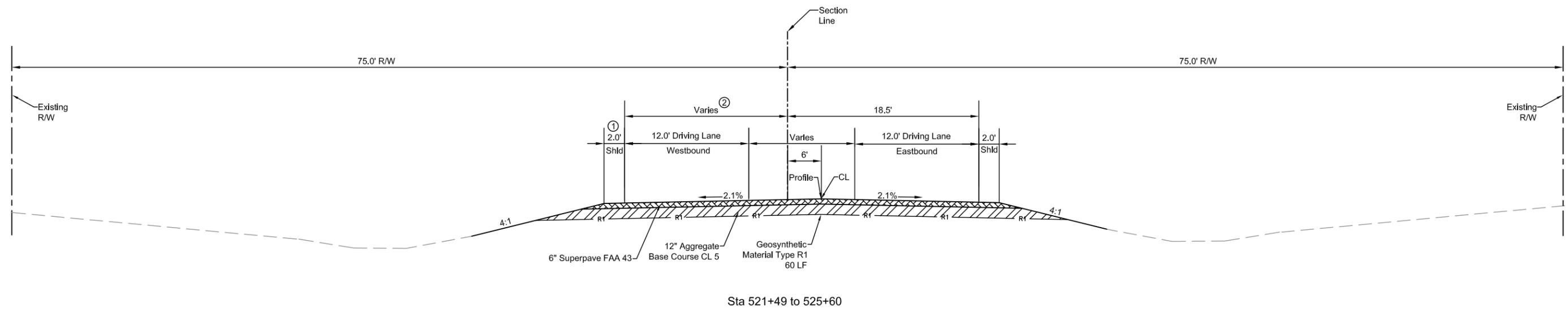
**NORTH WASHINGTON STREET**  
CITY OF BISMARCK  
BISMARCK, NORTH DAKOTA

**KLJ** 43rd Ave/Ash Coulee Dr  
Proposed  
Typical Section

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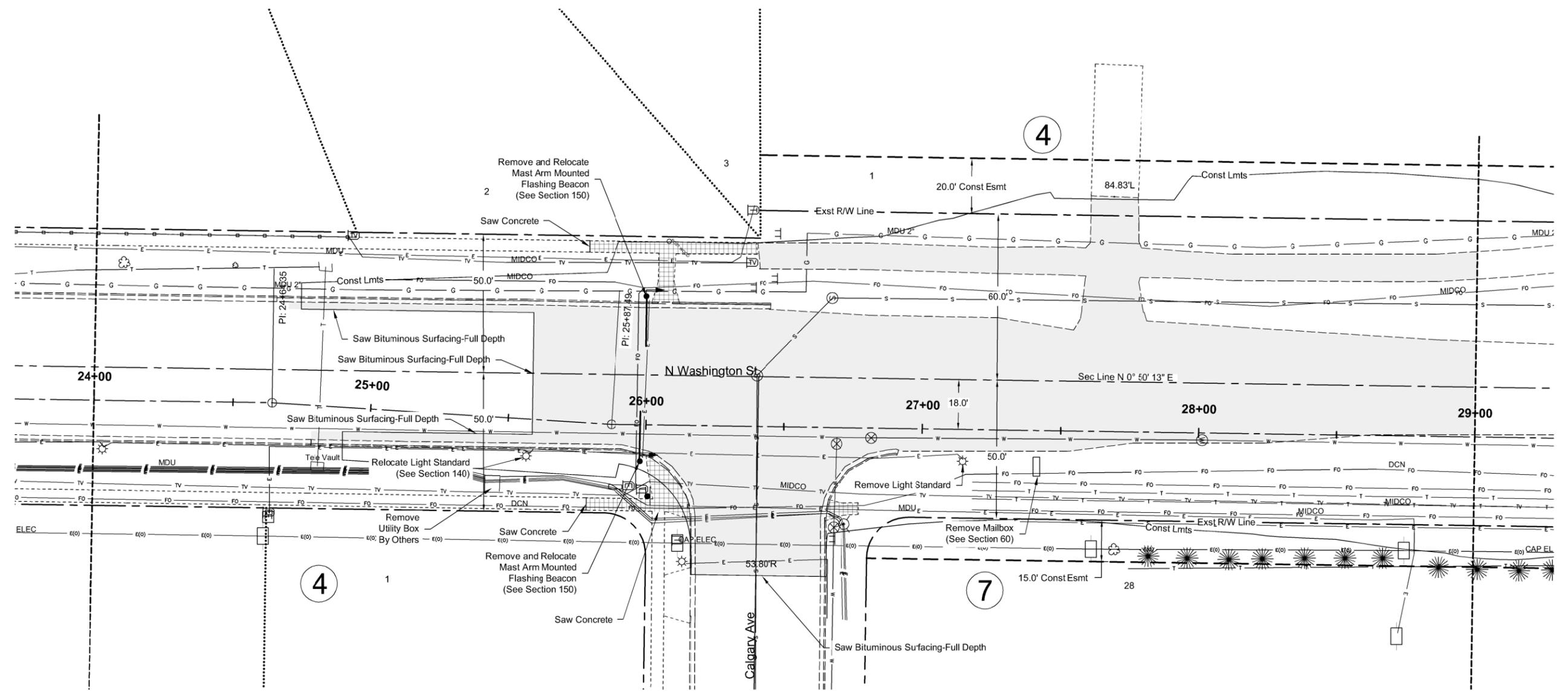


- ① WB shoulder transitions from 14' @ Sta 520+56 to 2' @ Sta 522+08
- ② WB offset from section line transitions from 30.5' @ Sta 520+56 to 5.5' @ Sta 525+60

Sta 521+49 to 525+60

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	43rd Ave/Ash Coulee Dr Proposed Typical Section		
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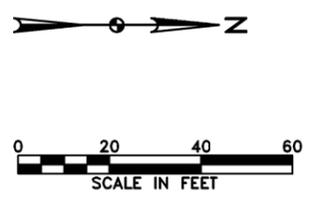
REMOVAL OF CONCRETE		
Sta 25+76, LT to 26+40, LT (Sidewalk)	41	SY
Sta 25+80, RT to 26+16, RT (Sidewalk)	34	SY
Sta 26+65, RT to 26+77, RT (Sidewalk)	6	SY
<b>Total</b>	<b>81</b>	<b>SY</b>

REMOVAL OF BITUMINOUS SURFACING		
Sta 24+65 to 29+00 (Mainline)	819	TON
Sta 27+62, LT to 27+77, LT (Private Drive)	14	TON
Sta 26+40, LT to 29+00, LT (Trail)	47	TON
<b>Total</b>	<b>880</b>	<b>TON</b>

REMOVAL OF CURB & GUTTER		
Sta 24+65, LT to 26+45, LT	179	LF
Sta 24+79, RT to 26+17, RT	169	LF
Sta 26+45, RT to 26+91, RT	60	LF
<b>Total</b>	<b>408</b>	<b>LF</b>

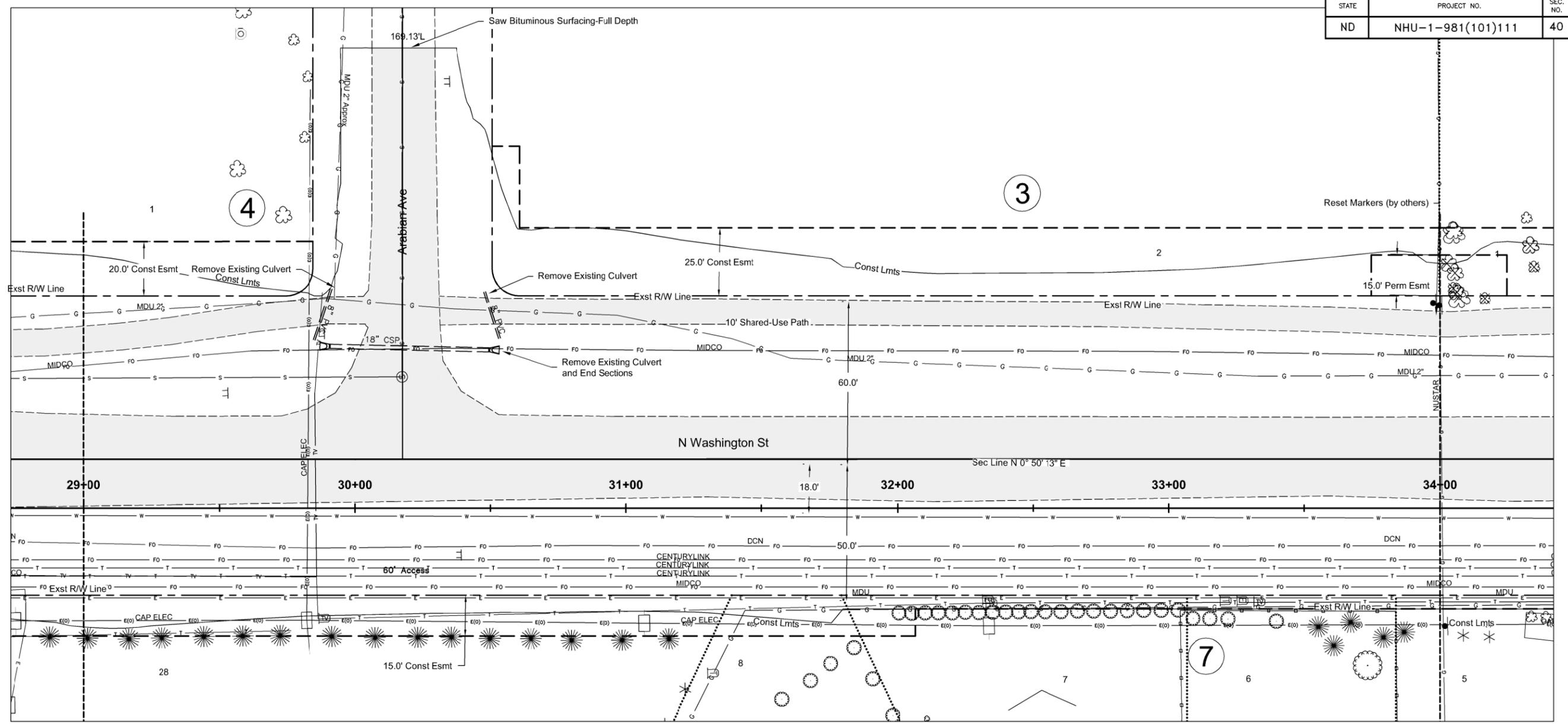
REMOVE LIGHT STANDARD		
Sta 27+05, RT	1	EA

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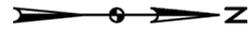
	REMOVAL OF CONCRETE
	REMOVAL OF CONCRETE PAVEMENT
	REMOVAL OF CURB AND GUTTER
	REMOVAL OF BITUMINOUS SURFACING

Rev'd		Scale: 1:40 Hor	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>N Washington St</b> <b>Removals</b> Sta 24+72.68-29+00			
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REMOVAL OF BITUMINOUS SURFACING	
Sta 29+00 to 34+00 (Mainline)	831 TON
Sta 29+00, LT to 30+05, LT (Trail)	19 TON
Sta 30+31, LT to 34+00, LT (Trail)	63 TON
<b>Total</b>	<b>913 TON</b>

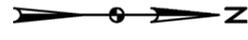
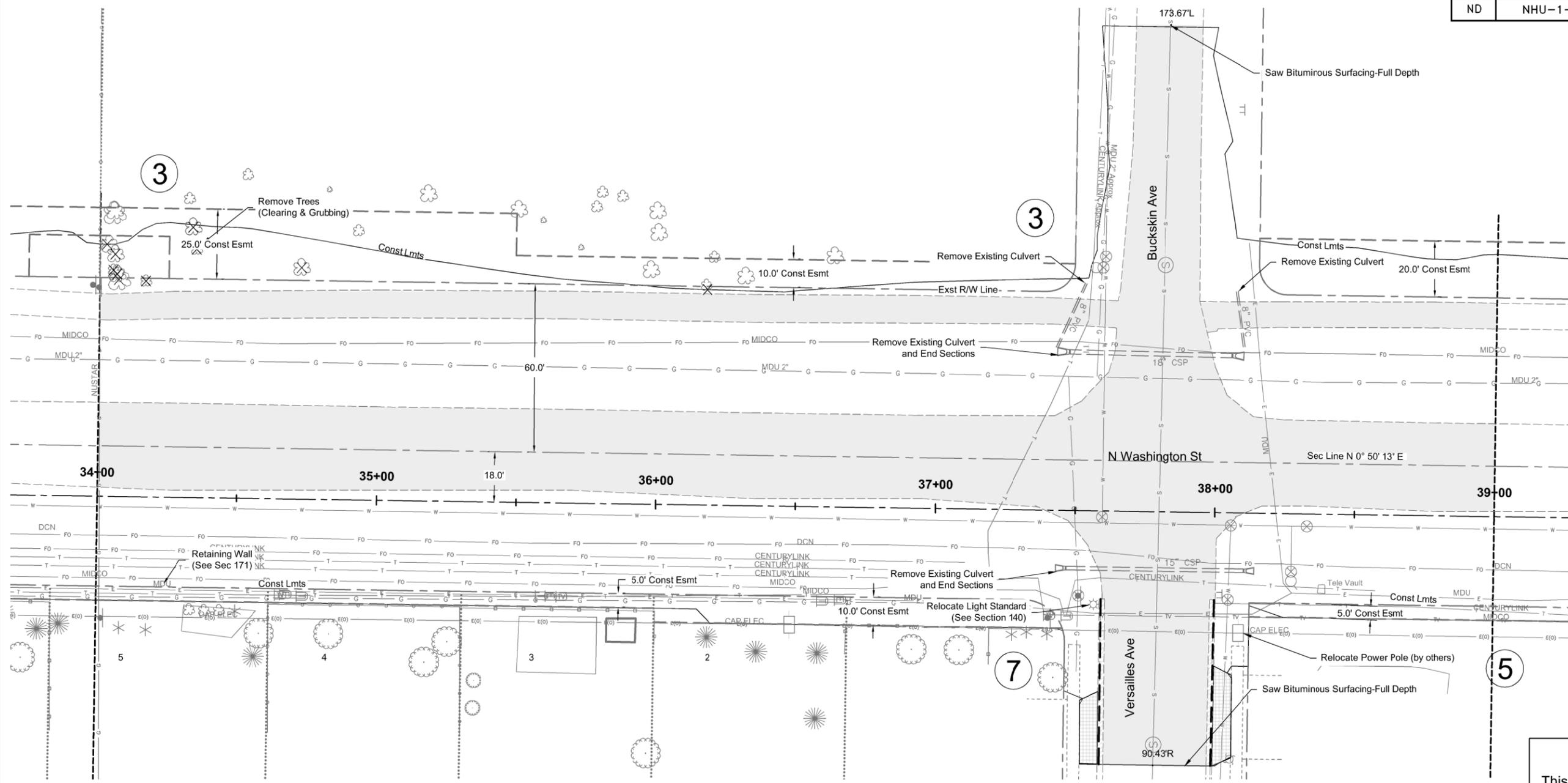
REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)	
Sta 29+87, LT to 30+53, LT (18" CSP)	66 LF
Sta 29+85, LT to 29+91, LT (8" PVC)	20 LF
Sta 30+53, LT to 30+46, LT (8" PVC)	18 LF
<b>Total</b>	<b>104 LF</b>



- REMOVAL OF CONCRETE
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- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>N Washington St Removals</b>	
<b>Sta 29+00-34+00</b>			
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- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

REMOVAL OF CONCRETE	
Sta 37+50 to 38+00, RT (Driveway)	18 SY
Sta 38+00 to 38+10, RT (Driveway)	24 SY
<b>Total</b>	<b>42 SY</b>

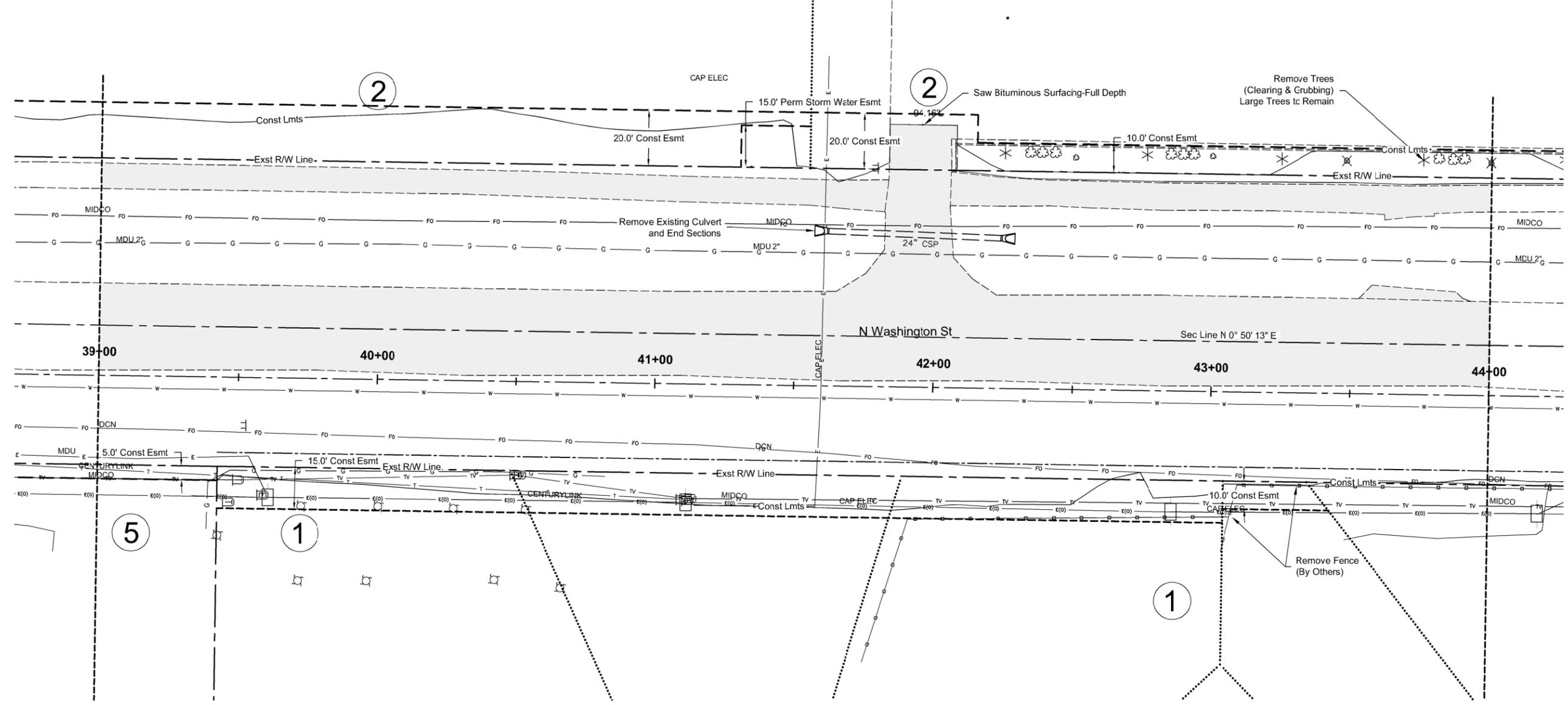
REMOVAL OF CURB & GUTTER	
Sta 37+60, RT to 37+61, RT	59 LF
Sta 37+99, RT to 38+00, RT	59 LF
<b>Total</b>	<b>118 LF</b>

REMOVAL OF BITUMINOUS SURFACING	
Sta 34+00 to 39+00 (Mainline)	1006 TON
Sta 34+00, LT to 37+64, LT (Trail)	66 TON
Sta 37+97, LT to 39+00, LT (Trail)	18 TON
<b>Total</b>	<b>1090 TON</b>

REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)	
Sta 37+42, LT to 37+53, LT (8" PVC)	25 LF
Sta 37+43, LT to 38+10, LT (18" CSP)	65 LF
Sta 37+44, RT to 38+13, RT (15" CSP)	70 LF
Sta 38+09, LT to 38+06, LT (8" PVC)	20 LF
<b>Total</b>	<b>180 LF</b>

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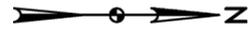
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>N Washington St</b> <b>Removals</b> <b>Sta 34+00-39+00</b>			
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**REMOVAL OF CURB & GUTTER**  
 Sta 42+07, 77' LT to 42+07, 89' LT      12    LF

**REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)**  
 Sta 41+56, LT to 42+29, LT (24" CSP)      72    LF

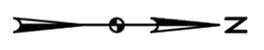
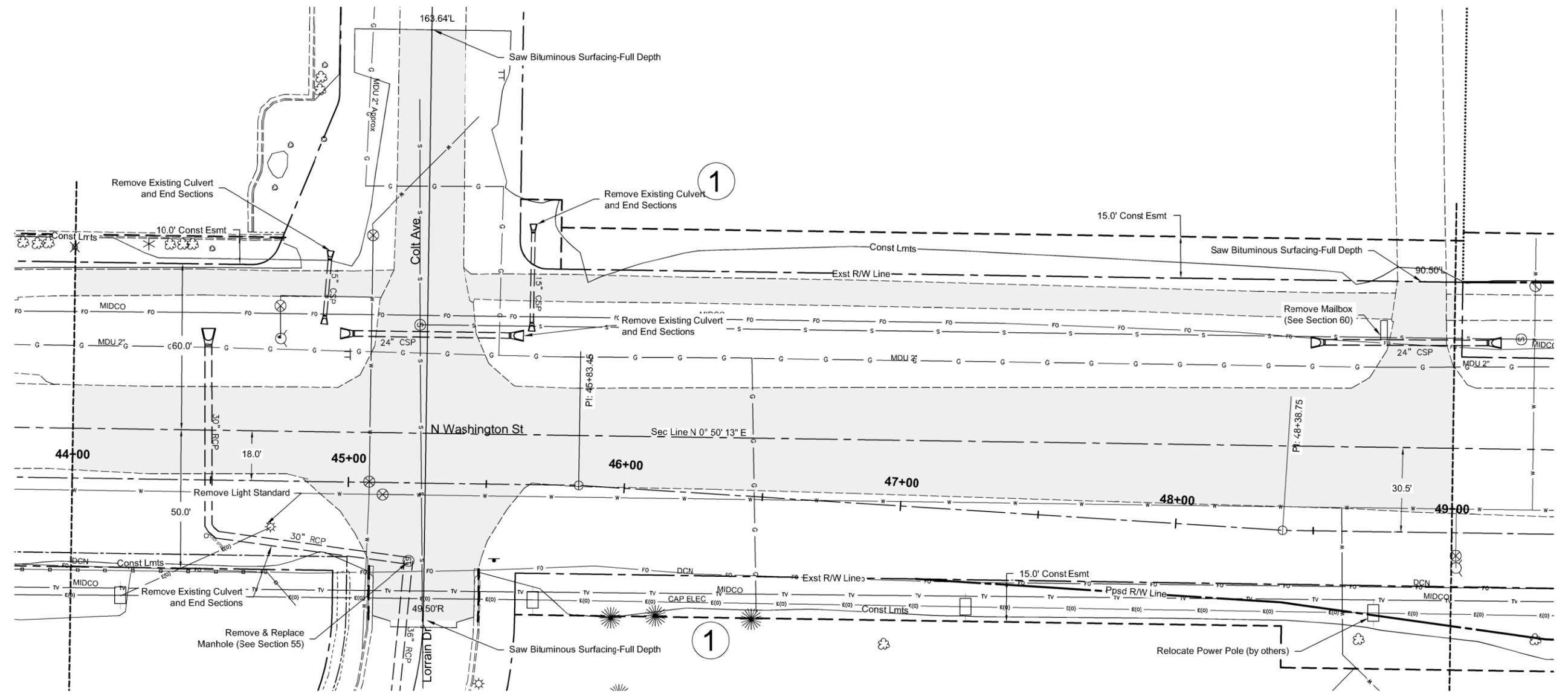
**REMOVAL OF BITUMINOUS SURFACING**  
 Sta 39+00 to 44+00 (Mainline)      749    TON  
 Sta 39+00, LT to 41+82, LT (Trail)      48    TON  
 Sta 42+05, LT to 44+00, LT (Trail)      36    TON  
 Total      833    TON



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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<b>N Washington St</b> <b>Removals</b> <b>Sta 39+00-44+00</b>			
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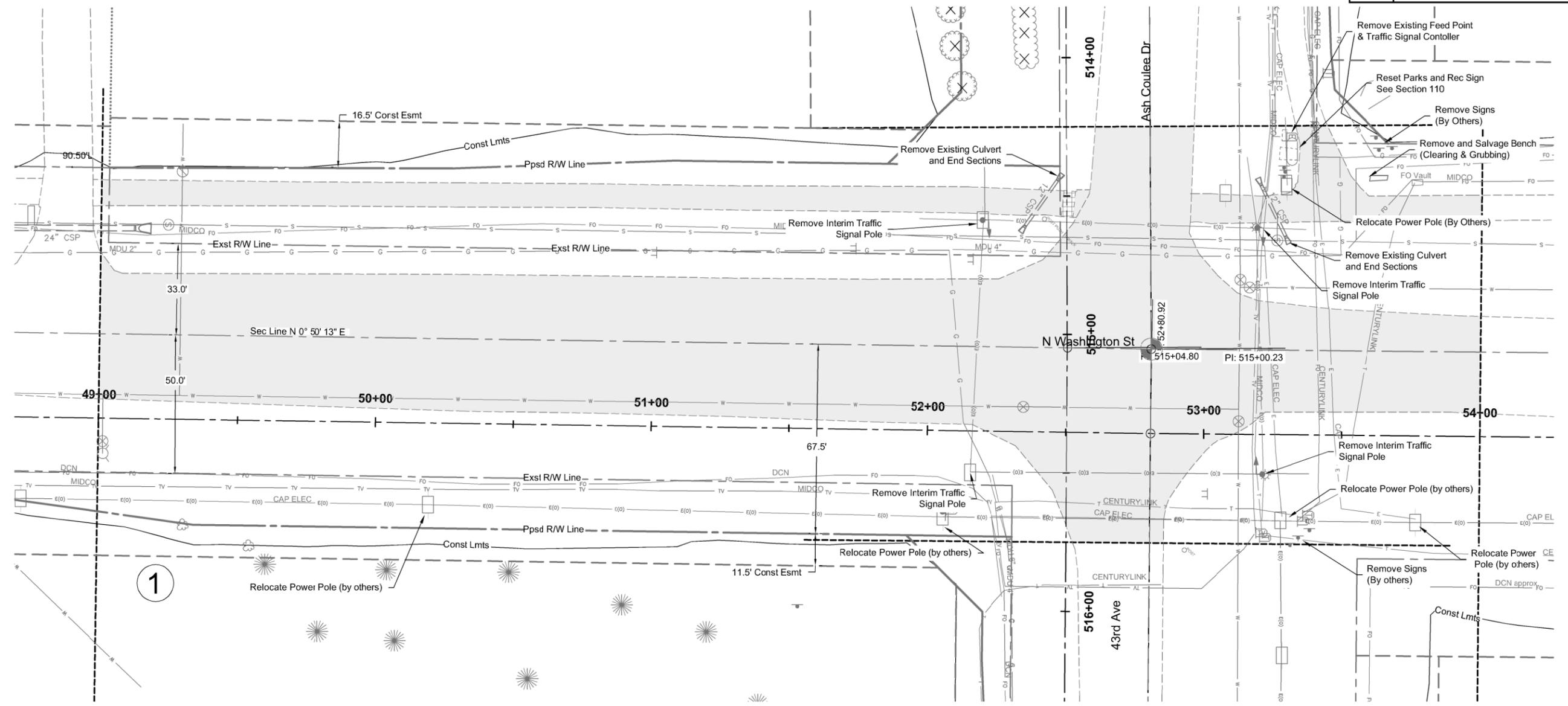
- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

<b>REMOVAL OF CURB &amp; GUTTER</b>	
Sta 45+07, RT to 45+08, RT	19 LF
Sta 45+47, RT to 45+48, RT	18 LF
<b>Total</b>	<b>37 LF</b>
<b>REMOVAL OF BITUMINOUS SURFACING</b>	
Sta 44+00 to 49+00 (Mainline)	1113 TON
Sta 44+00, LT to 45+10, LT (Trail)	20 TON
Sta 45+44, LT to 48+77, LT (Trail)	57 TON
Sta 48+97, LT to 49+00, LT (Trail)	1 TON
<b>Total</b>	<b>1191 TON</b>
<b>REMOVAL OF MANHOLES</b>	
Sta 45+22 RT	1 EA

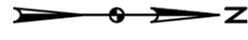
<b>REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)</b>	
Sta 44+48, LT to 45+20, RT (30" RCP)	144 LF
Sta 44+90, LT to 44+92, LT (15" CSP)	26 LF
Sta 44+96, LT to 45+62, LT (24" CSP)	66 LF
Sta 45+65, LT to 45+66, LT (15" CSP)	38 LF
Sta 48+48, LT to 49+17, LT (24" CSP)	68 LF
<b>Total</b>	<b>342 LF</b>
<b>REMOVE LIGHT STANDARD</b>	
Sta 44+70, RT	1 EA

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N Washington St Removals			
Sta 44+00-49+00			
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1



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

<b>REMOVAL OF CONCRETE</b>		
Sta 52+47, LT to 52+51, LT (Sidewalk)	5	SY
<b>REMOVAL OF BITUMINOUS SURFACING</b>		
Sta 49+00 to 54+00 (Mainline)	1236	TON
Sta 49+00, LT to 52+47, LT (Trail)	57	TON
Sta 52+51, LT to 52+53, LT (Trail)	1	TON
Sta 52+94, LT to 54+00, LT (Trail)	27	TON
<b>Total</b>	<b>1321</b>	<b>TON</b>

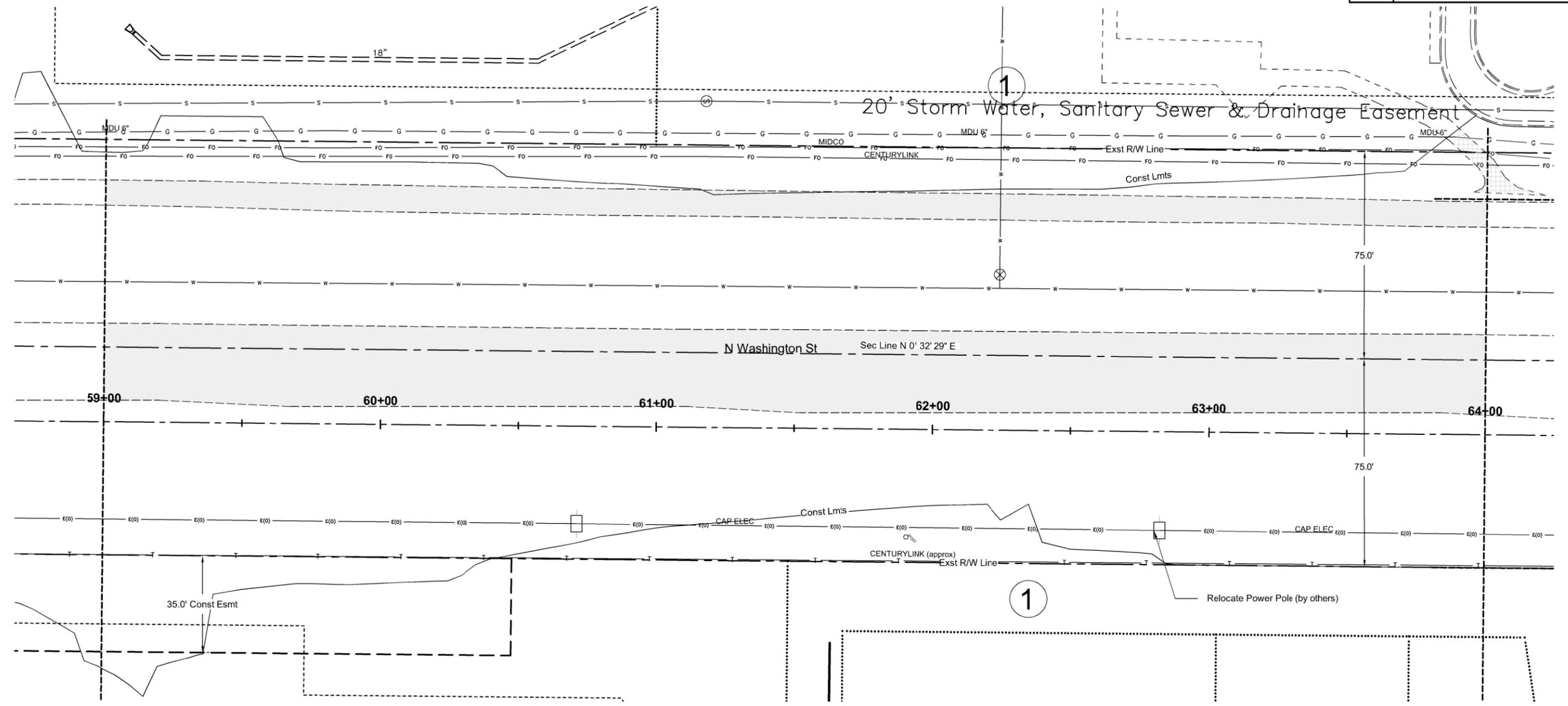
<b>REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)</b>		
Sta 52+33, LT to 52+47, LT (12" CSP)	25	LF
Sta 53+30, LT to 53+19, LT (12" CSP)	25	LF
<b>Total</b>	<b>50</b>	<b>LF</b>

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		<b>N Washington St</b> Removals NB CL Sta 49+00-54+00 EB CL Sta 514+25-515+75	
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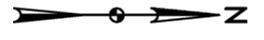


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**REMOVAL OF BITUMINOUS SURFACING**

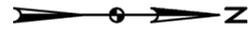
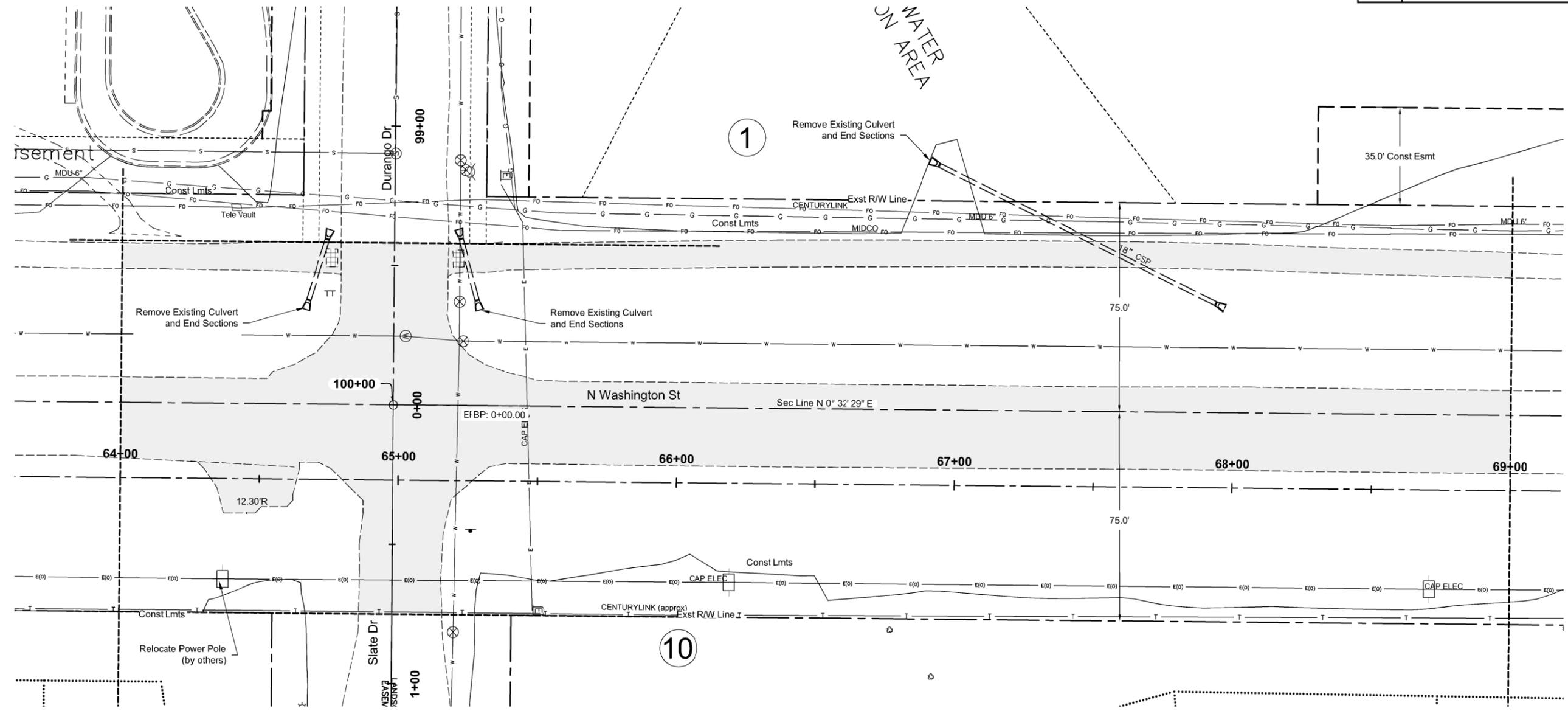
Sta 59+00 to 64+00 (Mainline)	622 TON
Sta 59+00, LT to 64+00, LT (Trail)	88 TON
<b>Total</b>	<b>710 TON</b>



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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<b>N Washington St</b> <b>Removals</b> <b>Sta 59+00-64+00</b>			
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REMOVAL OF CONCRETE		
Sta 64+73, LT to 64+77, LT (Trail)	3	SY
Sta 65+19, LT to 65+23, LT (Trail)	3	SY
<b>Total</b>	<b>6</b>	<b>SY</b>

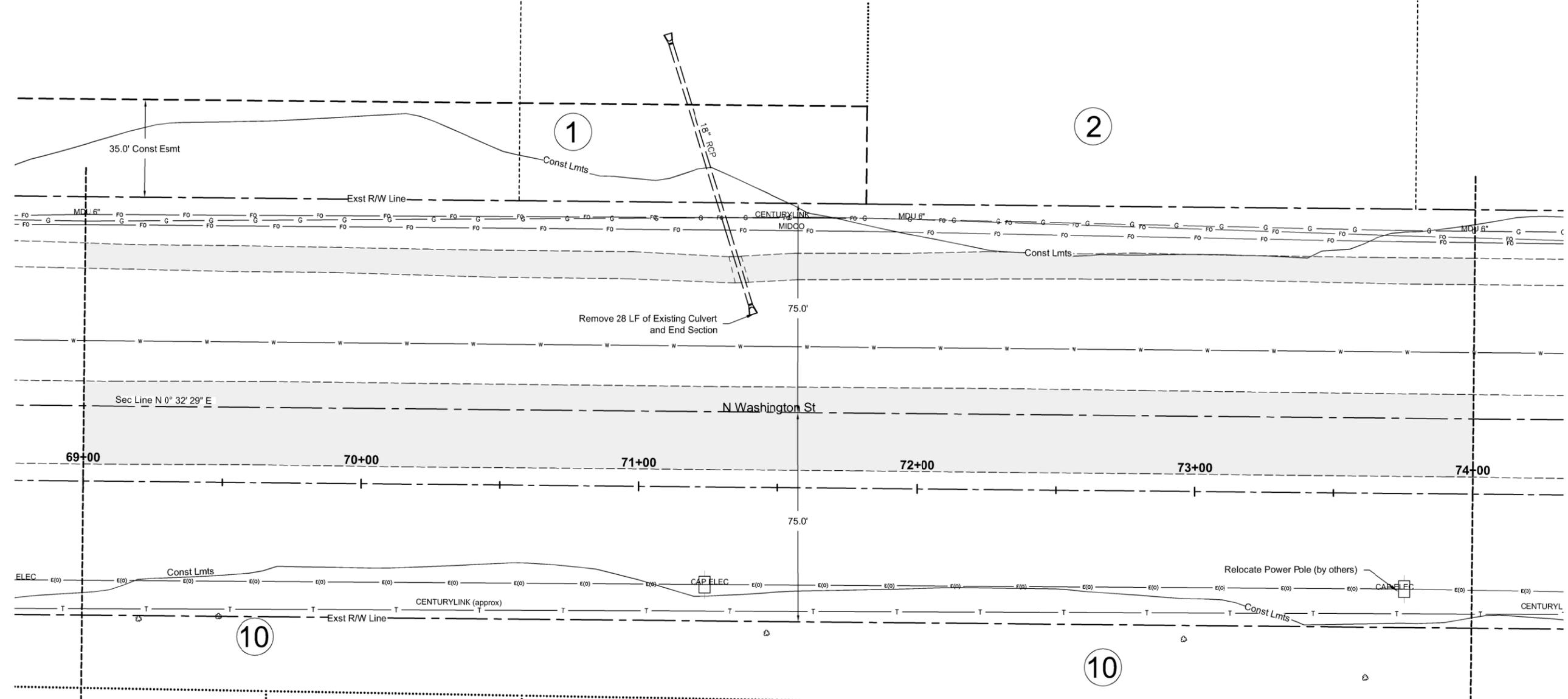
REMOVAL OF BITUMINOUS SURFACING		
Sta 64+00 to 69+00 (Mainline)	845	TON
Sta 64+00, LT to 64+78, LT (Trail)	14	TON
Sta 65+17, LT to 69+00, LT (Trail)	67	TON
<b>Total</b>	<b>926</b>	<b>TON</b>

REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)		
Sta 64+66, LT to 64+75, LT (18" CSP)	30	LF
Sta 65+28, LT to 65+21, LT (18" CSP)	30	LF
Sta 66+90, LT to 67+97, LT (18" CSP)	118	LF
<b>Total</b>	<b>178</b>	<b>LF</b>

- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

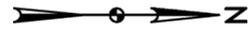
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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>N Washington St</b> <b>Removals</b> <b>Sta 64+00-69+00</b>			
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REMOVAL OF BITUMINOUS SURFACING	
Sta 69+00 to 74+00 (Mainline)	645 TON
Sta 69+00, LT to 74+00, LT (Trail)	87 TON
<b>Total</b>	<b>732 TON</b>

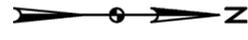
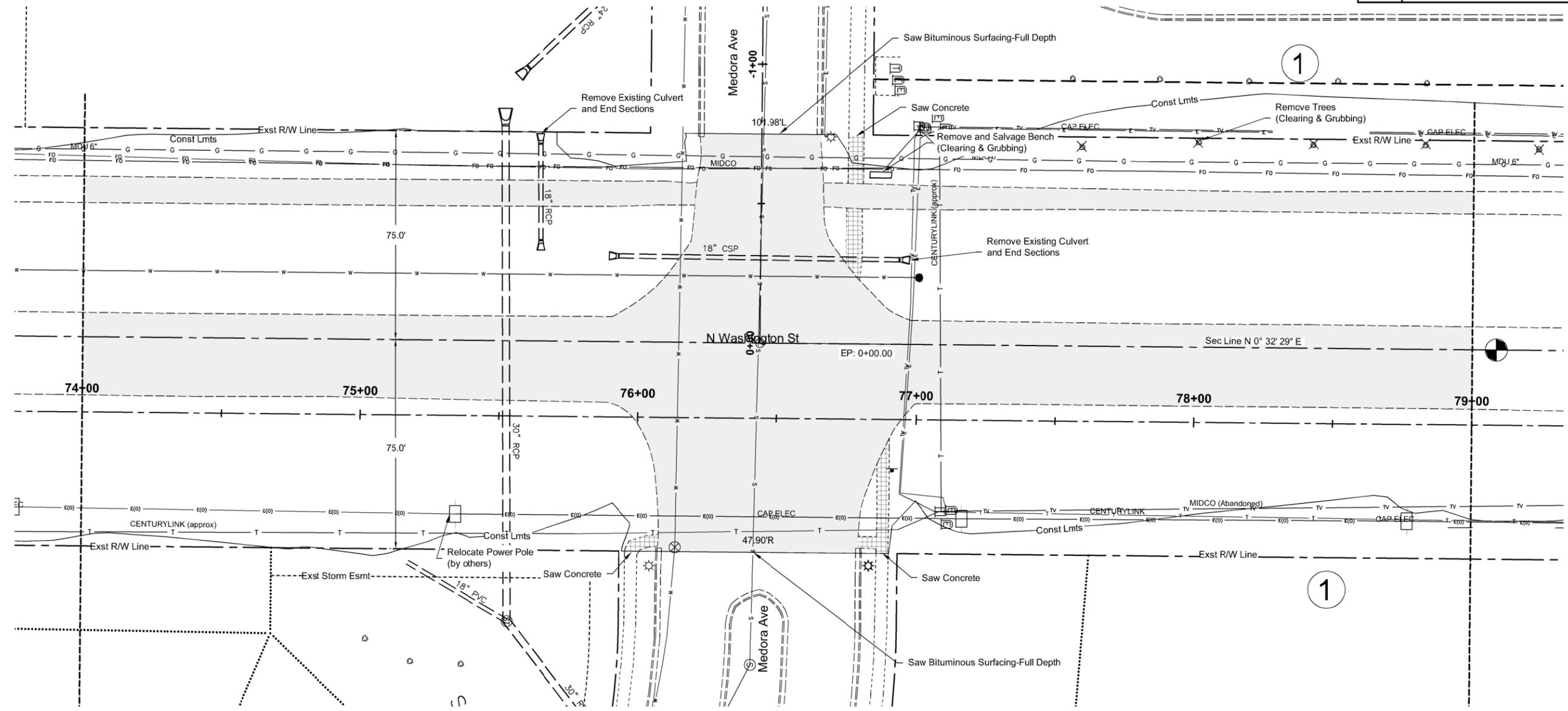
REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)	
Sta 71+40, LT to 71+73, LT (18\"/>	



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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<b>N Washington St</b> <b>Removals</b> <b>Sta 69+00-74+00</b>			
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- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

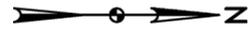
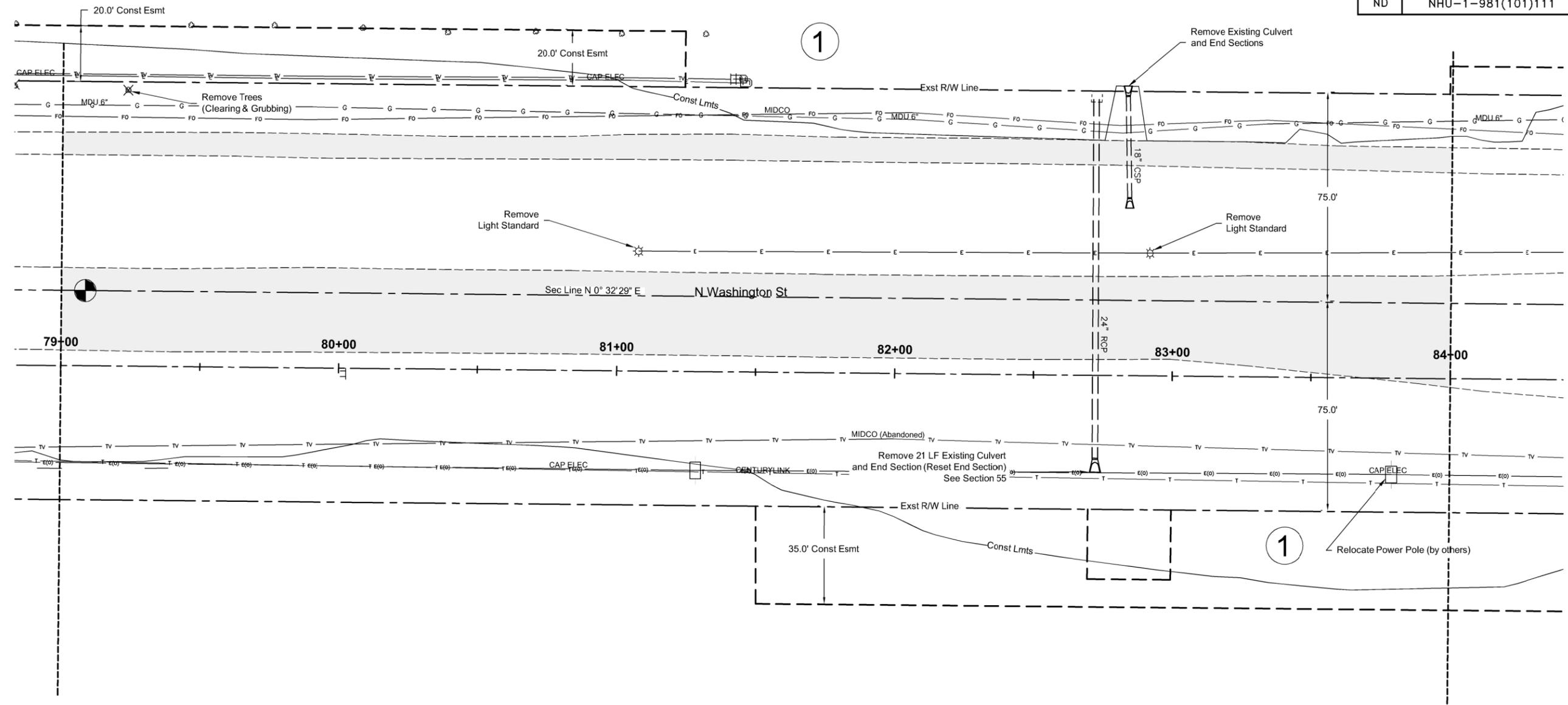
REMOVAL OF CONCRETE	
Sta 75+95, RT to 76+08, RT (Sidewalk)	5 SY
Sta 76+74, LT to 76+75, LT (Sidewalk)	15 SY
Sta 76+75, LT to 76+75, LT (Sidewalk)	10 SY
Sta 76+86, RT to 76+91, RT (Sidewalk)	20 SY
<b>Total</b>	<b>50 SY</b>

REMOVAL OF BITUMINOUS SURFACING	
Sta 74+00 to 79+00 (Mainline)	996 TON
Sta 74+00, LT to 76+20, LT (Trail)	38 TON
Sta 76+78, LT to 79+00, LT (Trail)	34 TON
<b>Total</b>	<b>1068 TON</b>

REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)	
Sta 75+64, LT (18" RCP)	42 LF
Sta 75+89, LT to 76+97, LT (18" CSP)	108 LF
<b>Total</b>	<b>150 LF</b>

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<b>N Washington St</b> <b>Removals</b> <b>Sta 74+00-79+00</b>			
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- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

**REMOVAL OF BITUMINOUS SURFACING**

Sta 79+00 to 84+00 (Mainline)	666 TON
Sta 79+00, LT to 84+00 LT, (Trail)	81 TON
<b>Total</b>	<b>747 TON</b>

**REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)**

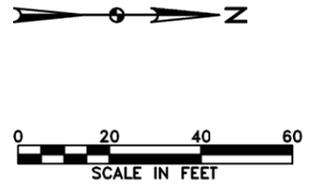
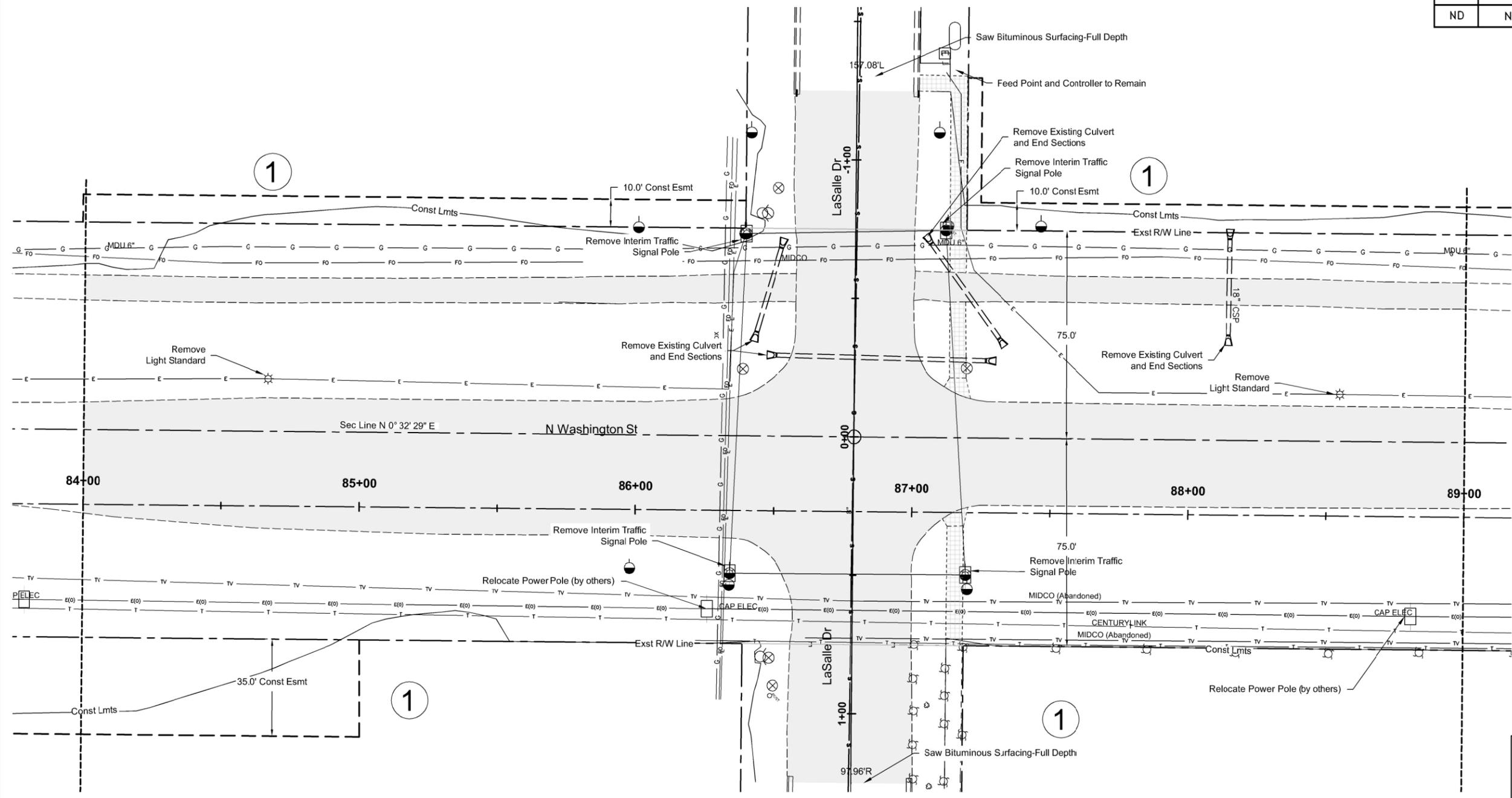
Sta 82+72, RT (24" RCP)	21 LF
Sta 82+84, LT (18" CSP)	44 LF
<b>Total</b>	<b>65 LF</b>

**REMOVE LIGHT STANDARD**

Sta 81+07, LT	1 EA
Sta 82+92, LT	1 EA
<b>Total</b>	<b>2 EA</b>

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NORTH WASHINGTON STREET CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
N Washington St Removals			
Sta 79+00-84+00			
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**REMOVAL OF CONCRETE**

Sta -0+59, LT to -1+22, LT (Sidewalk)	56	SY
Sta -0+14, LT to -0+50, LT (Sidewalk)	22	SY
Sta 0+27, LT to 1+98, LT (Sidewalk)	32	SY
<b>Total</b>	<b>110</b>	<b>SY</b>

**REMOVAL OF BITUMINOUS SURFACING**

Sta 84+00 to 89+00 (Mainline)	1341	TON
Sta 84+00, LT to 86+59, LT (Trail)	44	TON
Sta 86+99, LT to 89+00, LT (Trail)	36	TON
<b>Total</b>	<b>1421</b>	<b>TON</b>

**REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)**

Sta 86+46, LT to 86+54, LT (18" CSP)	46	LF
Sta 86+48, LT to 87+37, LT (18" CSP)	90	LF
Sta 87+03, LT to 87+40, LT (18" CSP)	54	LF
Sta 88+14, LT (18" CSP)	42	LF
<b>Total</b>	<b>232</b>	<b>LF</b>

**REMOVE LIGHT STANDARD**

Sta 84+66, LT	1	EA
Sta 88+54, LT	1	EA
<b>Total</b>	<b>2</b>	<b>EA</b>

- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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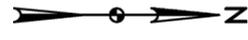
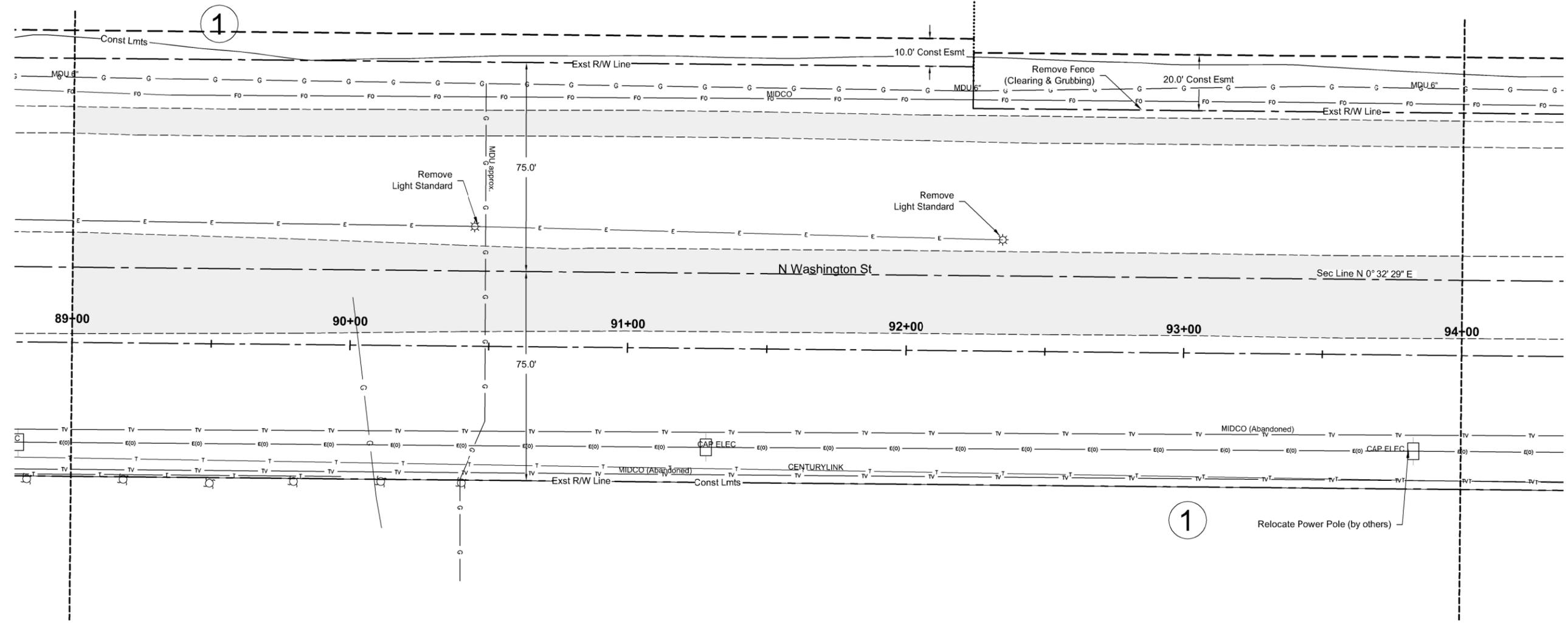
**NORTH WASHINGTON STREET**  
CITY OF BISMARCK  
BISMARCK, NORTH DAKOTA

**N Washington St Removals**

**Sta 84+00-89+00**

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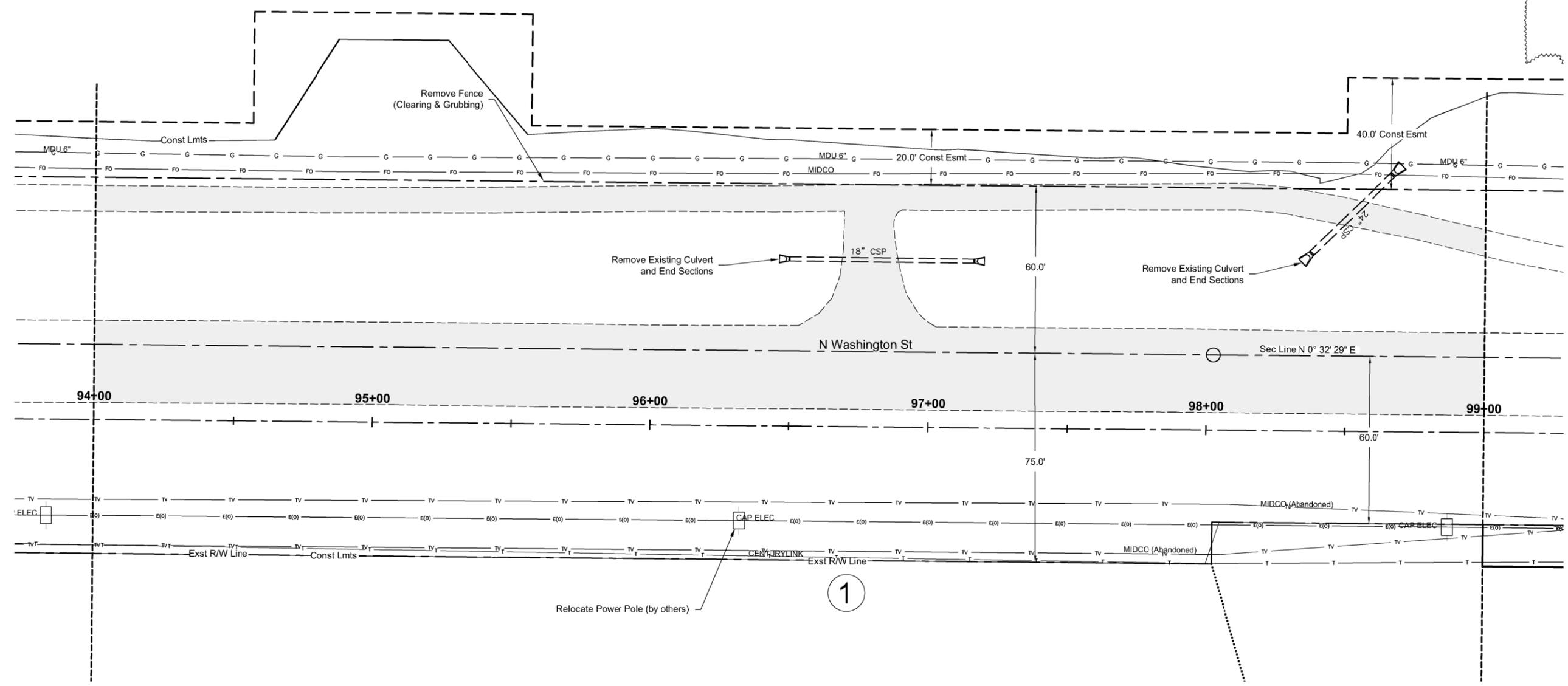
- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

REMOVAL OF BITUMINOUS SURFACING	
Sta 89+00 to 94+00 (Mainline)	668 TON
Sta 89+00, LT to 94+00, LT (Trail)	87 TON
<b>Total</b>	<b>755 TON</b>

REMOVE LIGHT STANDARD	
Sta 90+45, LT	1 EA
Sta 92+34, LT	1 EA
<b>Total</b>	<b>2 EA</b>

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		<b>N Washington St</b> <b>Removals</b> <b>Sta 89+00-94+00</b>	
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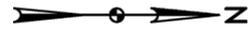
**REMOVAL OF BITUMINOUS SURFACING**

Sta 94+00 to 99+00 (Mainline)	687 TON
Sta 94+00, LT to 99+00, LT (Trail)	87 TON
<b>Total</b>	<b>774 TON</b>

**REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)**

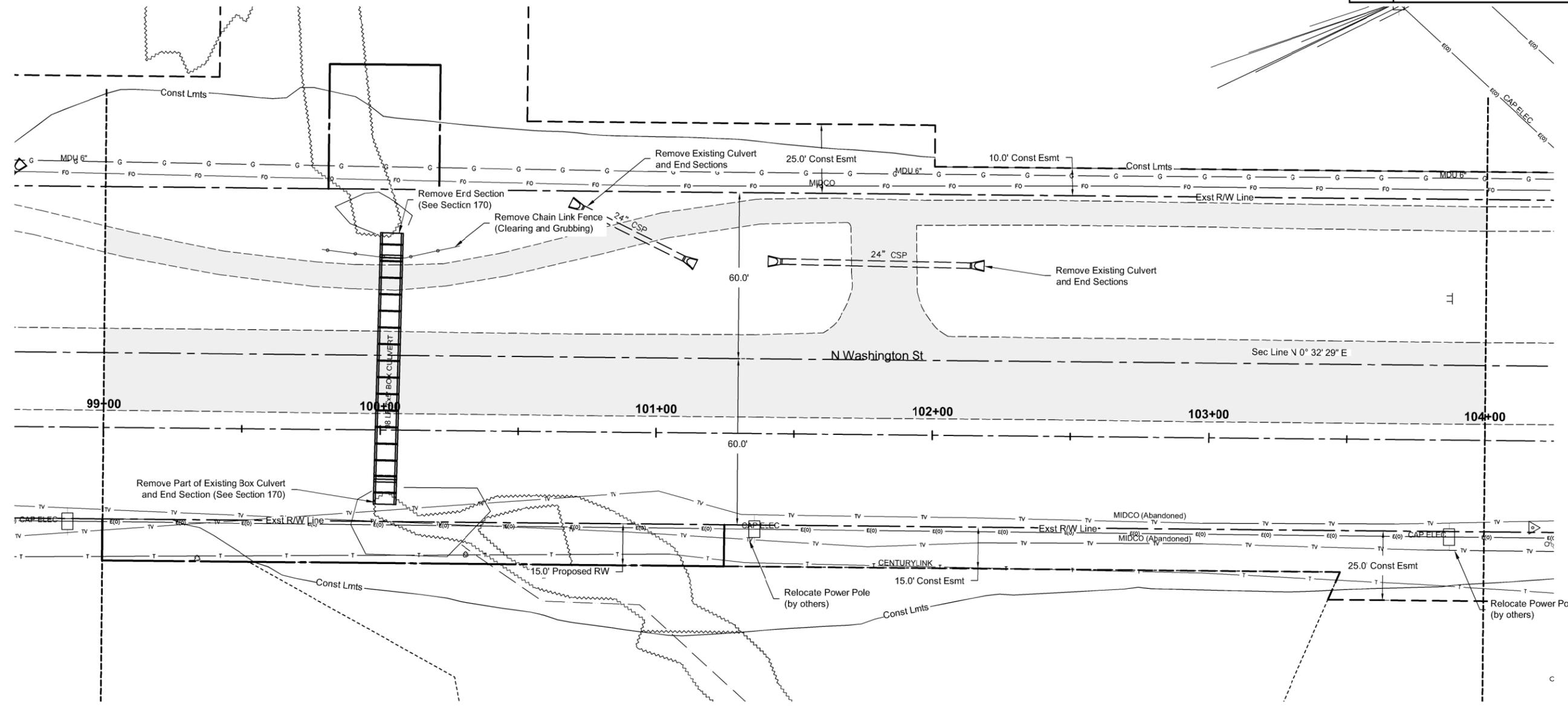
Sta 96+46, LT to 97+20, LT (18" CSP)	74 LF
Sta 98+34, LT to 98+70, LT (24" CSP)	50 LF
<b>Total</b>	<b>124 LF</b>

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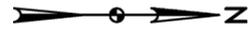
- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
<b>N Washington St</b> <b>Removals</b> <b>Sta 94+00-99+00</b>			
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REMOVAL OF BITUMINOUS SURFACING	
Sta 99+00 to 104+00	687 TON
Sta 99+00, LT to 104+00, LT	83 TON
<b>Total</b>	<b>770 TON</b>

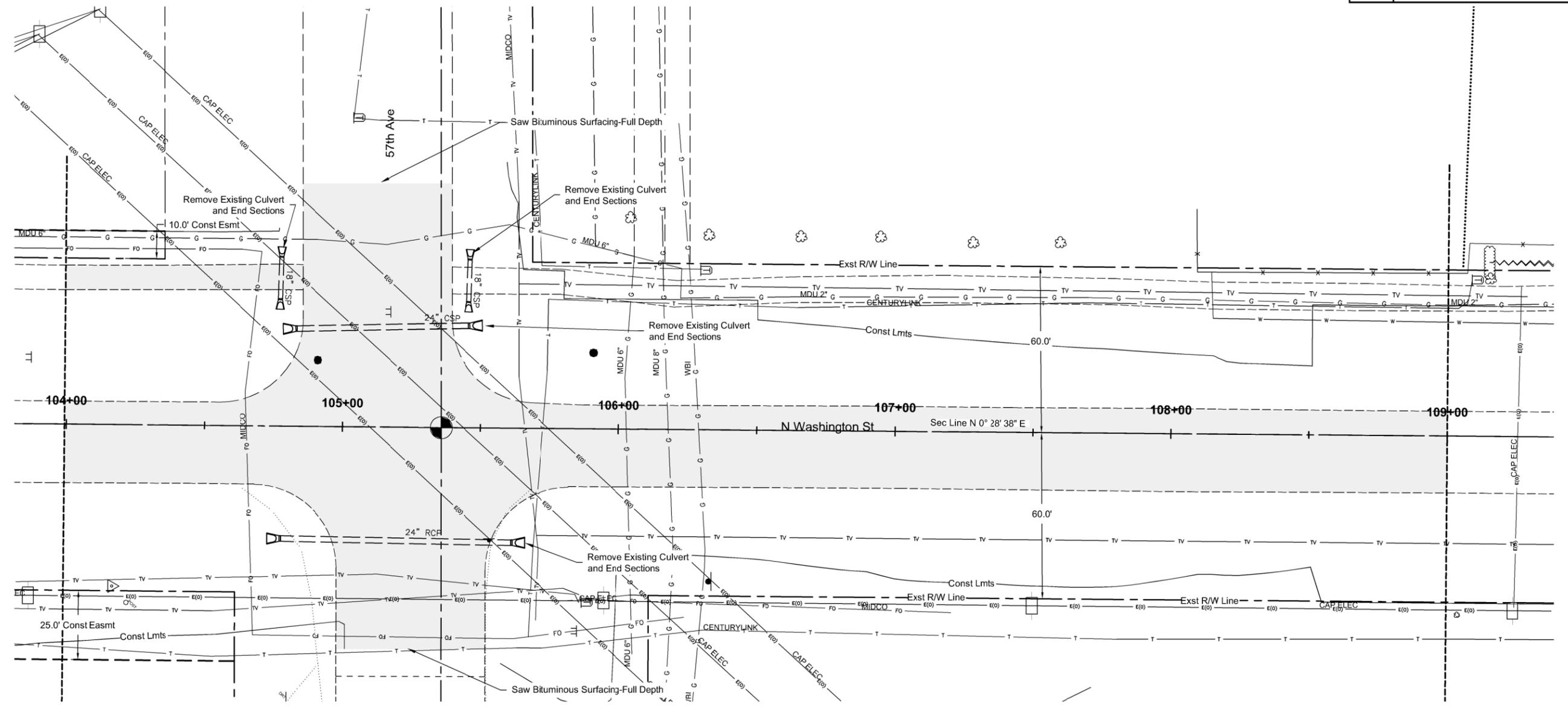
REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)	
Sta 100+68, LT to 101+14, LT (24" CSP)	50 LF
Sta 101+40, LT to 102+18, LT (24" CSP)	78 LF
<b>Total</b>	<b>128 LF</b>



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<b>N Washington St</b> <b>Removals</b> <b>Sta 99+00-104+00</b>			
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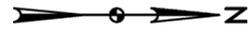


**REMOVAL OF BITUMINOUS SURFACING**

Sta 104+00 to 109+00 (Mainline)	999 TON
Sta 104+00, LT to 104+85, LT (Trail)	14 TON
<b>Total</b>	<b>1013 TON</b>

**REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)**

Sta 104+73, RT to 105+66, RT (24" RCP)	93 LF
Sta 105+01, LT to 105+14, LT (18" CSP)	37 LF
Sta 105+01, LT to 105+73, LT (24" CSP)	72 LF
Sta 105+75, LT to 105+63, LT (15" CSP)	26 LF
<b>Total</b>	<b>228 LF</b>

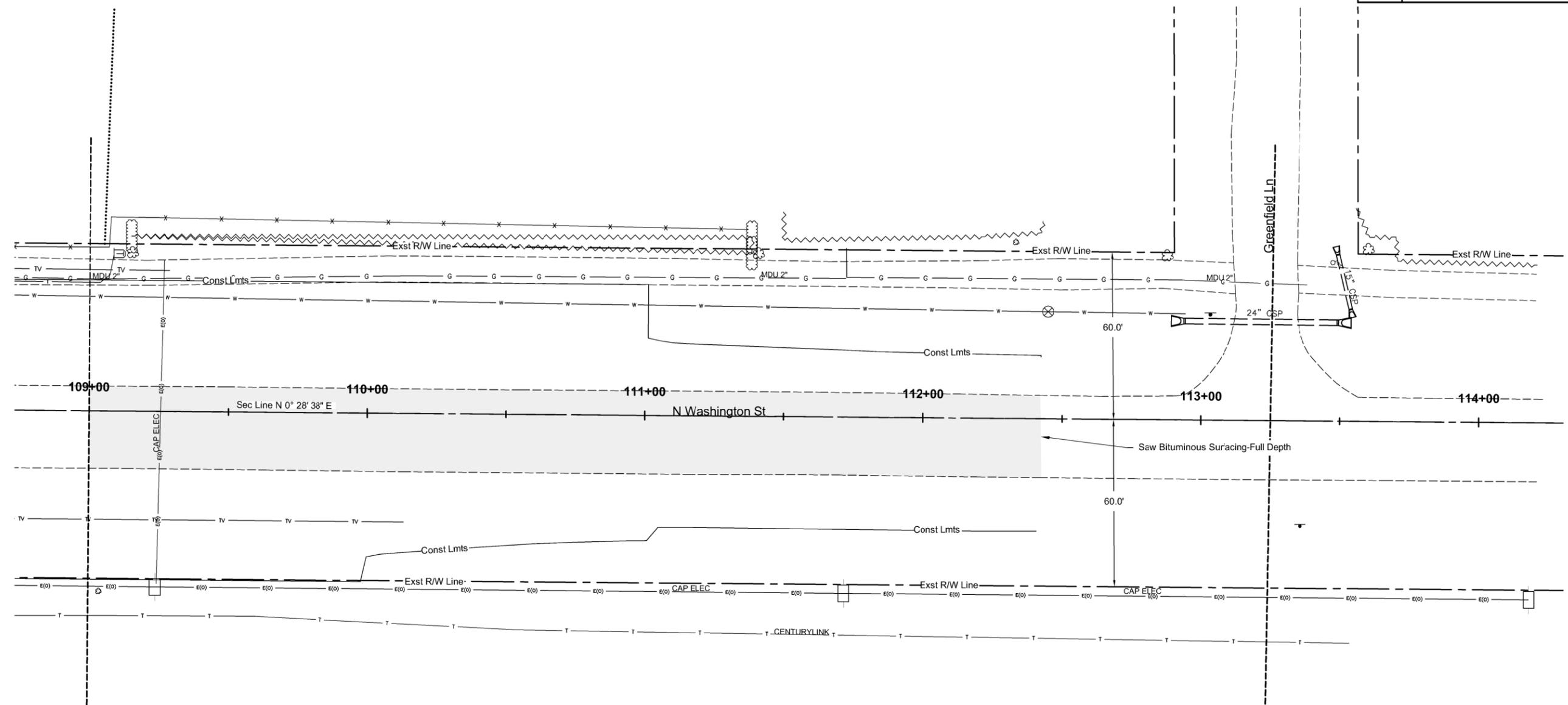


- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

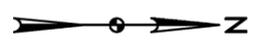
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<b>N Washington St</b> Removals NB Centerline Sta 104+00 to Main Centerline Sta 109+00			
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	40	18



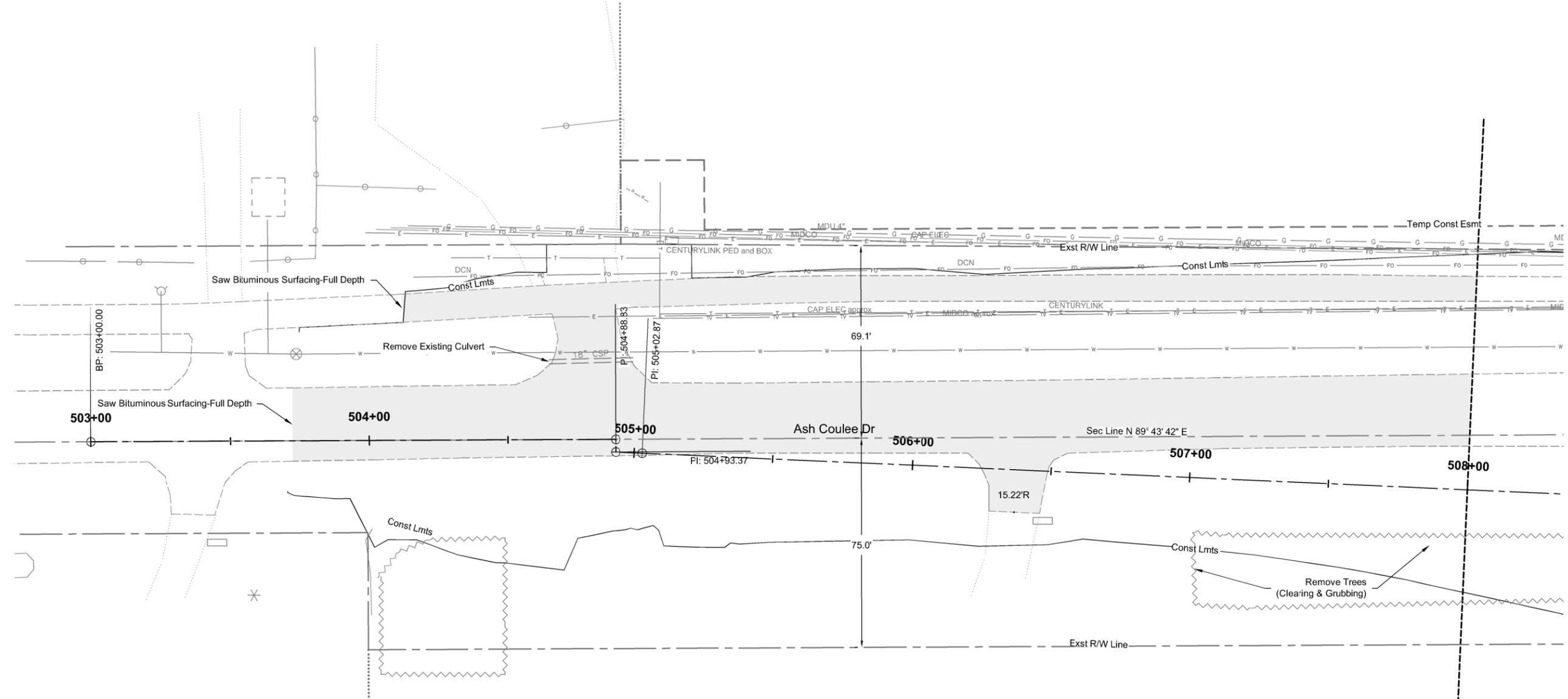
**REMOVAL OF BITUMINOUS SURFACING**  
 Sta 109+00 to 112+42.28 (Mainline) 439 TON



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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		<b>N Washington St</b> Removals Main Centerline Sta 109+00-112+42.28	
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REMOVAL OF BITUMINOUS SURFACING	
Sta 503+72.42 to 508+00 (Mainline)	525 TON
Sta 504+12, LT to 508+00 LT (Trail)	69 TON
<b>Total</b>	<b>594 TON</b>

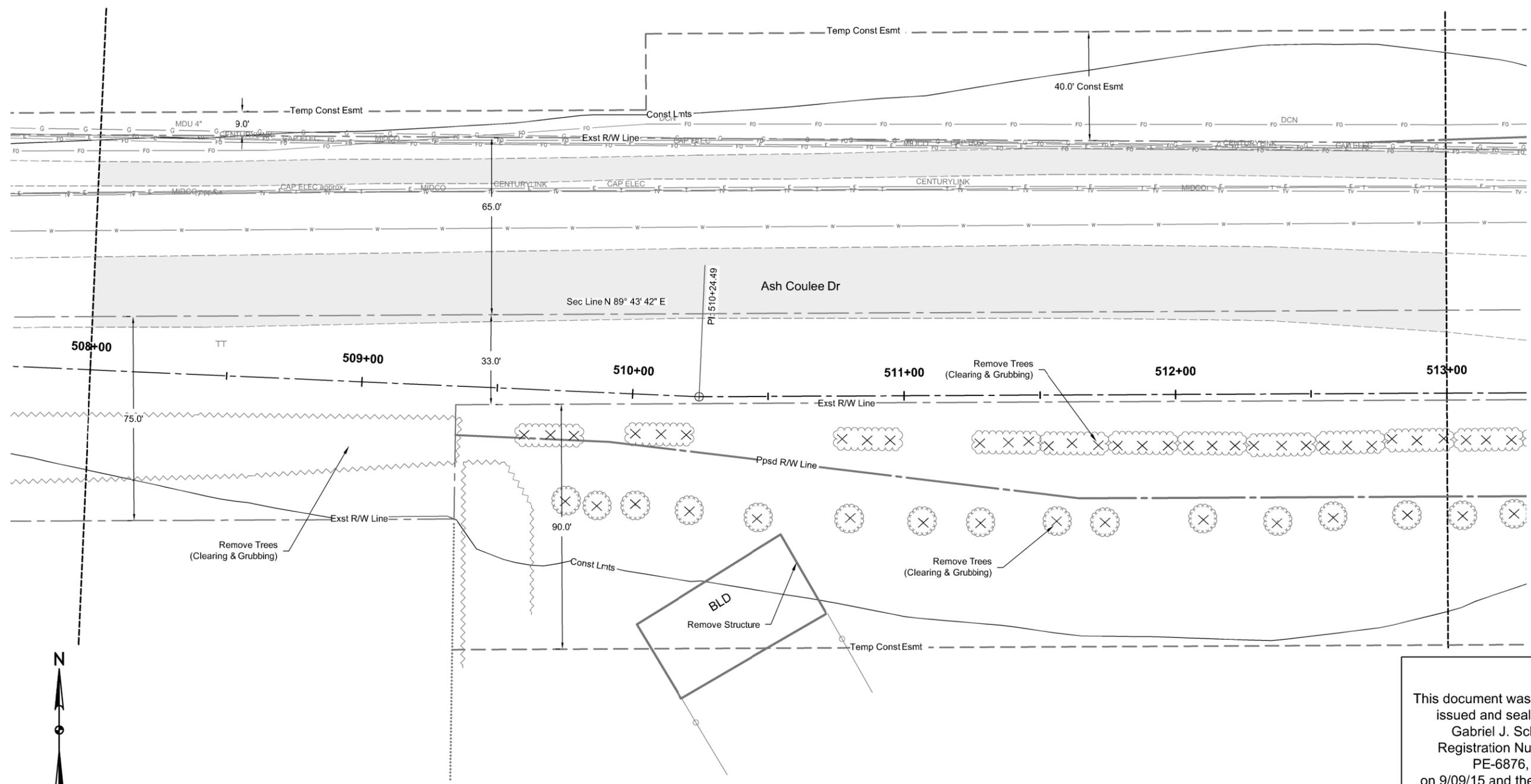
REMOVAL OF PIPE ALL TYPES AND SIZES (Not a Pay Item)  
 Sta 504+65, LT to 504+98, LT (18" CSP) 30 LF

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- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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		Ash Coulee Dr/43rd Ave Removals EB Centerline Sta 503+72.42-508+00	
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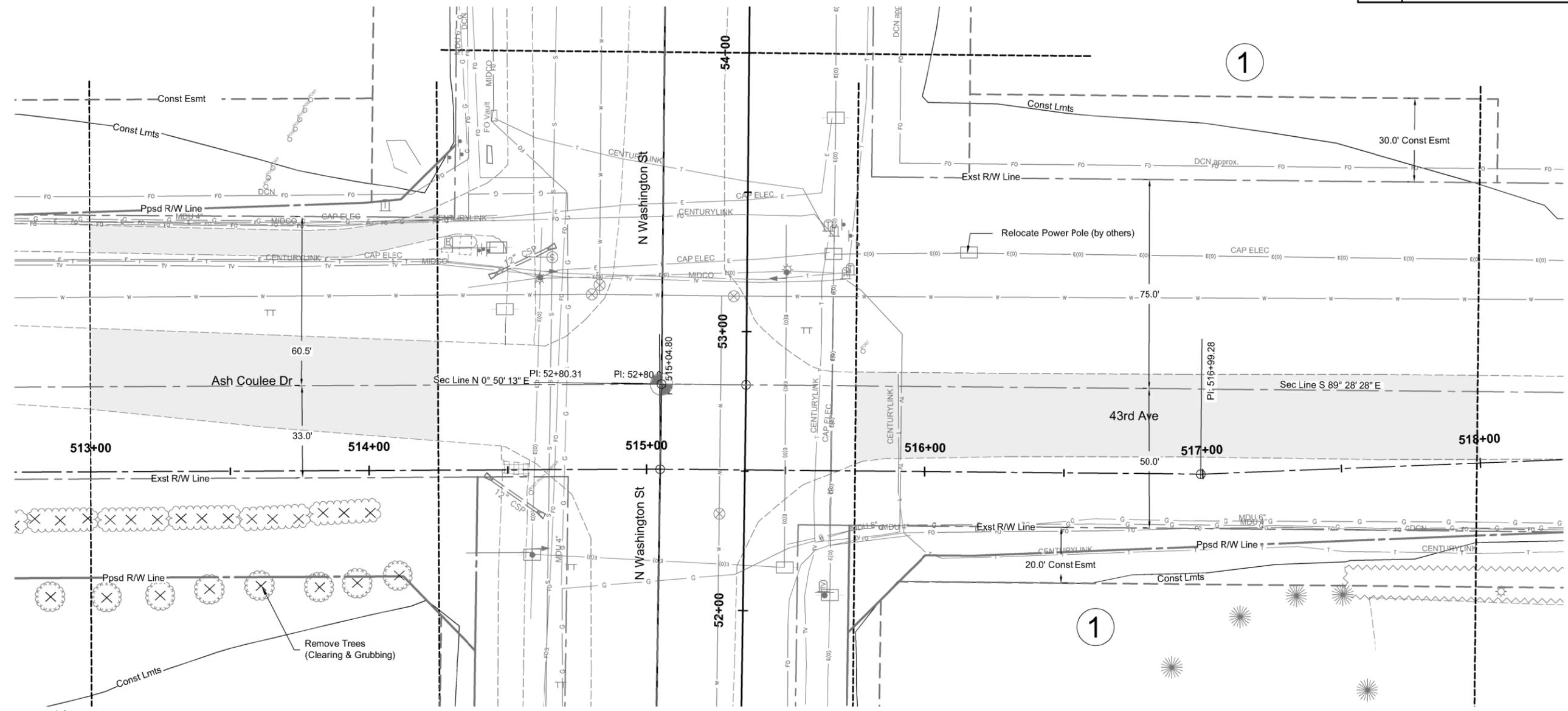


- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

REMOVAL OF STRUCTURE	
Sta 510+50 RT	1 EA
REMOVAL OF BITUMINOUS SURFACING	
Sta 508+00 to 513+00 (Mainline)	570 TON
Sta 508+00, LT to 513+00, LT (Trail)	85 TON
<b>Total</b>	<b>655 TON</b>

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<b>Ash Coulee Dr/43rd Ave</b> <b>Removals</b> <b>EB Centerline</b> <b>Sta 508+00-513+00</b>			
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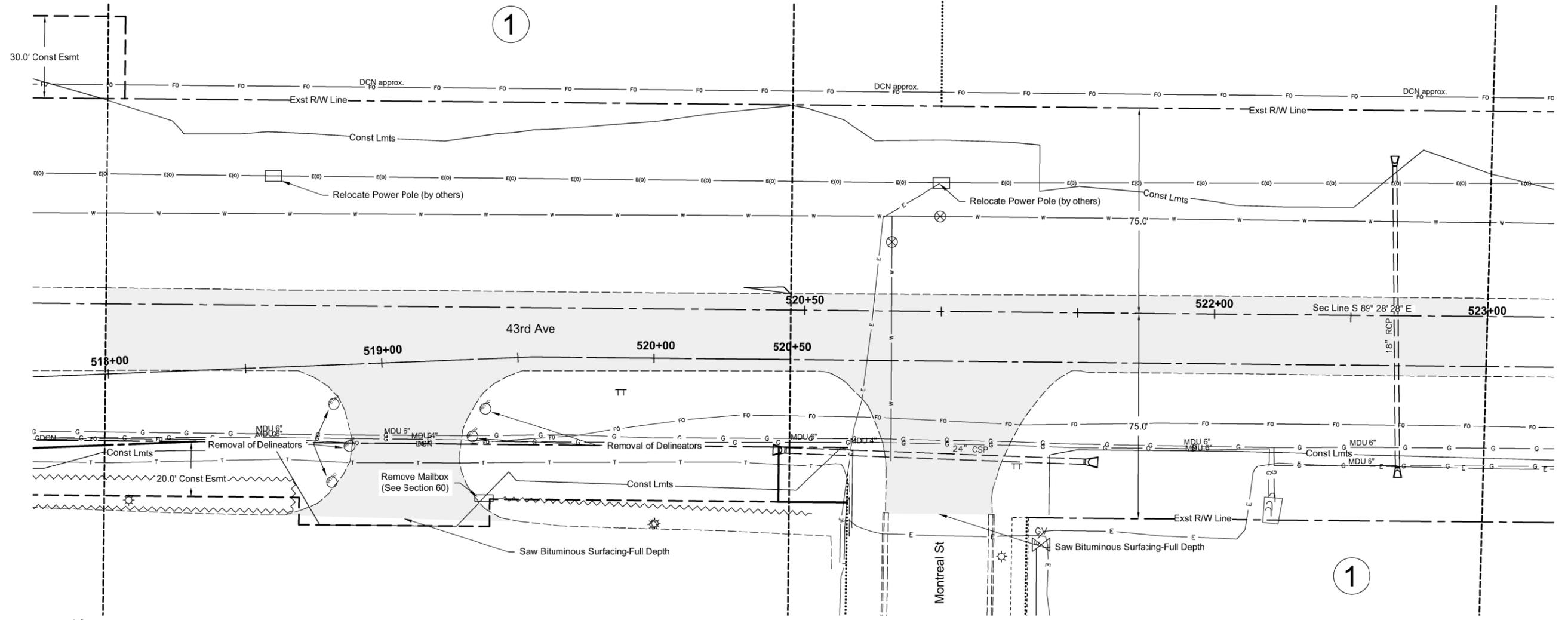
**REMOVAL OF BITUMINOUS SURFACING**

Sta 513+00 to 514+25 (Mainline)	177 TON
Sta 515+75 to 518+00 (Mainline)	292 TON
Sta 513+00, LT to 514+25, LT (Trail)	23 TON
<b>Total</b>	<b>492 TON</b>

- REMOVAL OF CONCRETE
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- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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		Ash Coulee Dr/43rd Ave Removals EB CL Sta 513+00-514+25 EB CL Sta 515+75-518+00	
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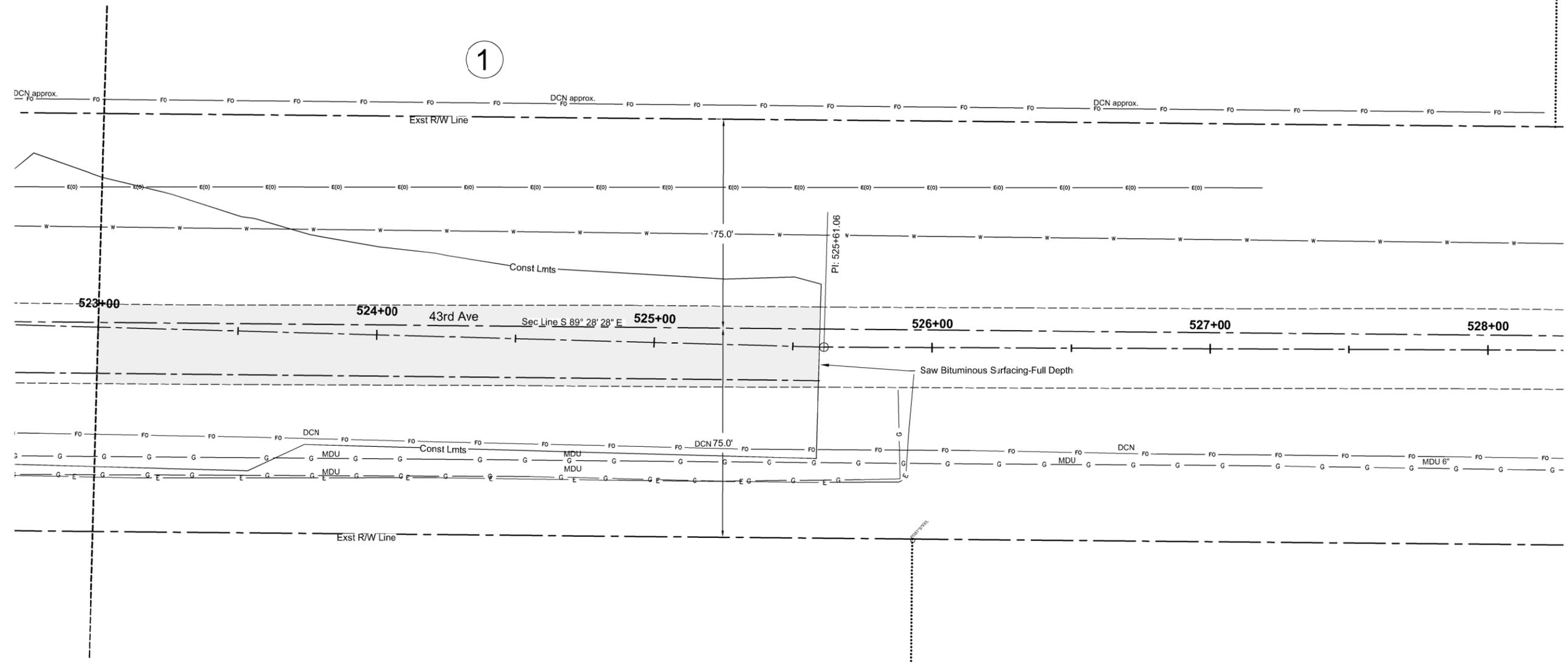
**REMOVAL OF BITUMINOUS SURFACING**  
 Sta 518+00 to 523+00 (Mainline) 862 TON

**REMOVAL OF DELINEATORS (Not a Pay Item)**  
 Sta 518+82, RT to 519+37, RT 5 EA

-  REMOVAL OF CONCRETE
-  REMOVAL OF CONCRETE PAVEMENT
-  REMOVAL OF CURB AND GUTTER
-  REMOVAL OF BITUMINOUS SURFACING

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		Ash Coulee Dr/43rd Ave Removals EB CL 518+00-520+50 43rd CL Sta 520+50-523+00	
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**REMOVAL OF BITUMINOUS SURFACING**  
 Sta 523+00 to 525+60.25 (Mainline) 323 TON

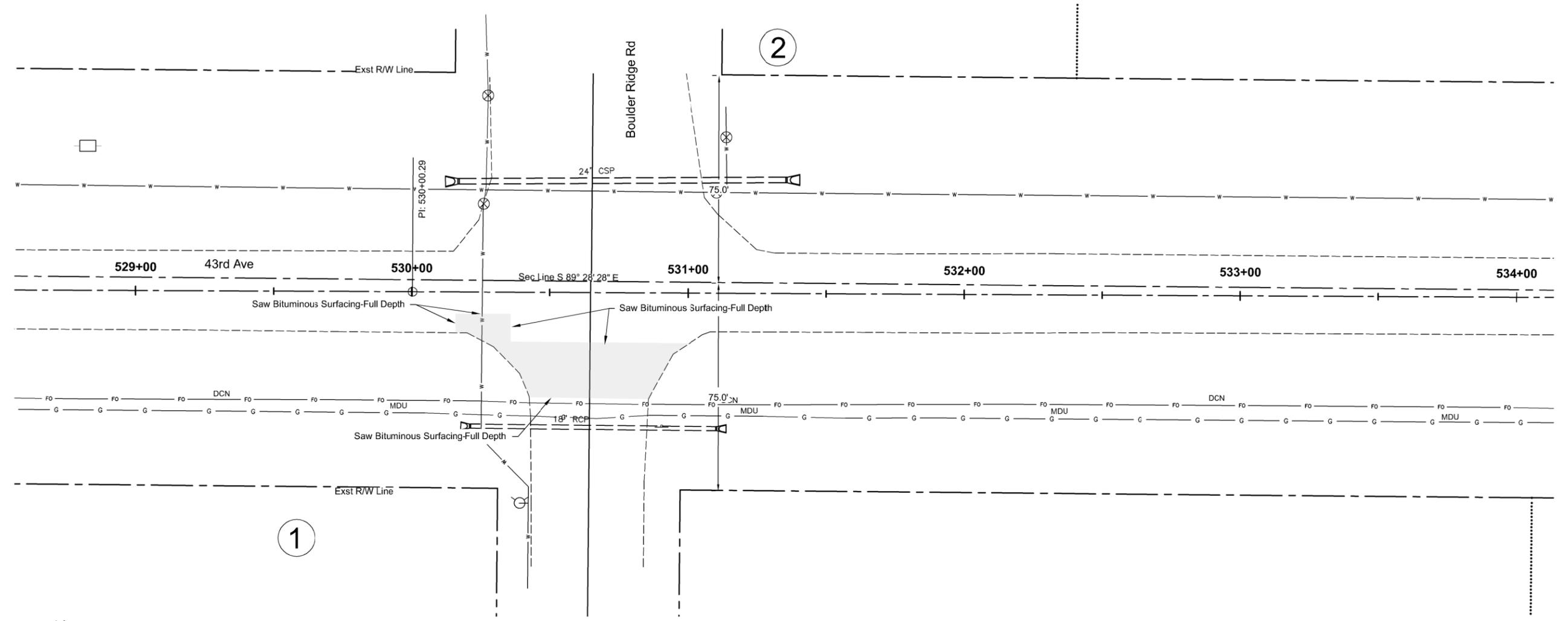


-  REMOVAL OF CONCRETE
-  REMOVAL OF CONCRETE PAVEMENT
-  REMOVAL OF CURB AND GUTTER
-  REMOVAL OF BITUMINOUS SURFACING

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				Ash Coulee Dr/43rd Ave Removals 43rd Centerline Sta 523+00-525+60			
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	NHU-1-981(101)111	40	24



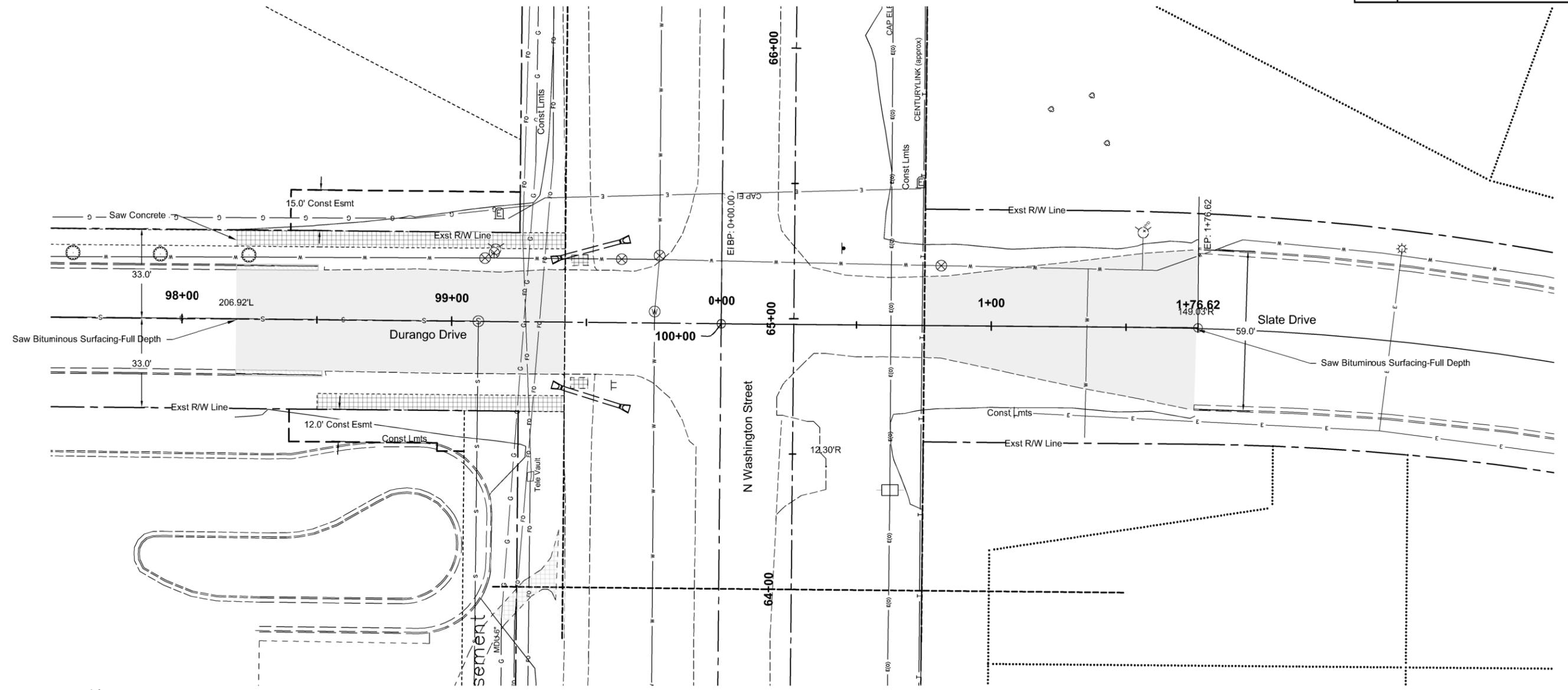
**REMOVAL OF BITUMINOUS SURFACING**  
 Sta 530+26 to 531+00 (Mainline) 56 TON



- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

This document was originally issued and sealed by Gabriel J. Schell, Registration Number PE-6876, on 8/25/14 and the original document is stored at the City of Bismarck.

Rev'd		Scale: 1:40 Hor	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		Ash Coulee Dr/43rd Ave Removals 43rd Centerline 529+00 to 534+00	
		DRWN. BY JKK	CHK'D BY GJS
<small>J:\trans\1412129\CADD\040RM_001_RDL.dwg © Kadmas, Lee &amp; Jackson 2014</small>			



REMOVAL OF CONCRETE			
Sta 98+20, LT to 99+42, LT (Sidewalk)	79	SY	
Sta 98+50, RT to 99+42, RT (Sidewalk)	59	SY	
Sta 99+17, RT to 99+40, RT (Sidewalk)	22	SY	
<b>Total</b>	<b>160</b>	<b>SY</b>	

REMOVAL OF CURB & GUTTER			
Sta 98+20, 18' LT to 98+50, 18' LT	30	LF	
Sta 98+20, 19' RT to 98+52, 19' RT	32	LF	
<b>Total</b>	<b>62</b>	<b>LF</b>	

REMOVAL OF BITUMINOUS SURFACING			
Sta 98+20 to 99+42 (Side Street)	200	TON	
Sta 0+75 to 1+76 (Side Street)	194	TON	
<b>Total</b>	<b>394</b>	<b>TON</b>	

- REMOVAL OF CONCRETE
- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF CURB AND GUTTER
- REMOVAL OF BITUMINOUS SURFACING

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Rev'd		Scale: 1:40 Hor	
<b>NORTH WASHINGTON STREET</b> CITY OF BISMARCK BISMARCK, NORTH DAKOTA			
		<b>Durango DR / Slate DR</b> Removals Durango Sta 98+20-99+41 Slate Sta 0+56-1+75	
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
JJK	GJS	1412129	04/2014