DESIGN DATA				
EAST DIVIDE AVENUE				
TRAFFIC	AVERAGE DAILY			MAX HR
CURRENT 2011	PASS: 3860	TRUCKS: 80	TOTAL: 3940	384
FORECAST 2035	PASS: 8550	TRUCKS: 450	TOTAL: 9000	900
Clear Zone Distance: 14'		Design Speed: 35 mph		
Minimum Sight Dist. for Stopping: 205'		Bridges: N/A		
Minimum Sight Dist. for Safe Passing: N/A		Sight Dist. for No Passing Zone: N/A		
Pavement Design Life 30 (years)				

JOB # 6

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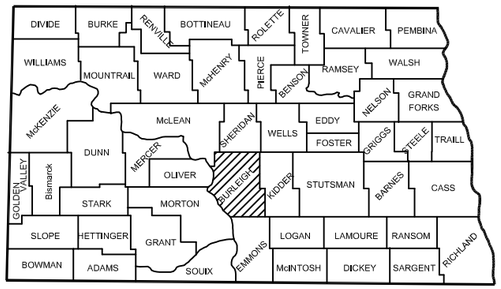
CITY OF BISMARCK
EAST DIVIDE AVENUE RECONSTRUCTION
SU-NHU-1-981(094)104
North 26th Street to East Bismarck Expressway
East Bismarck Expressway (RP 926.27 to RP 926.34)

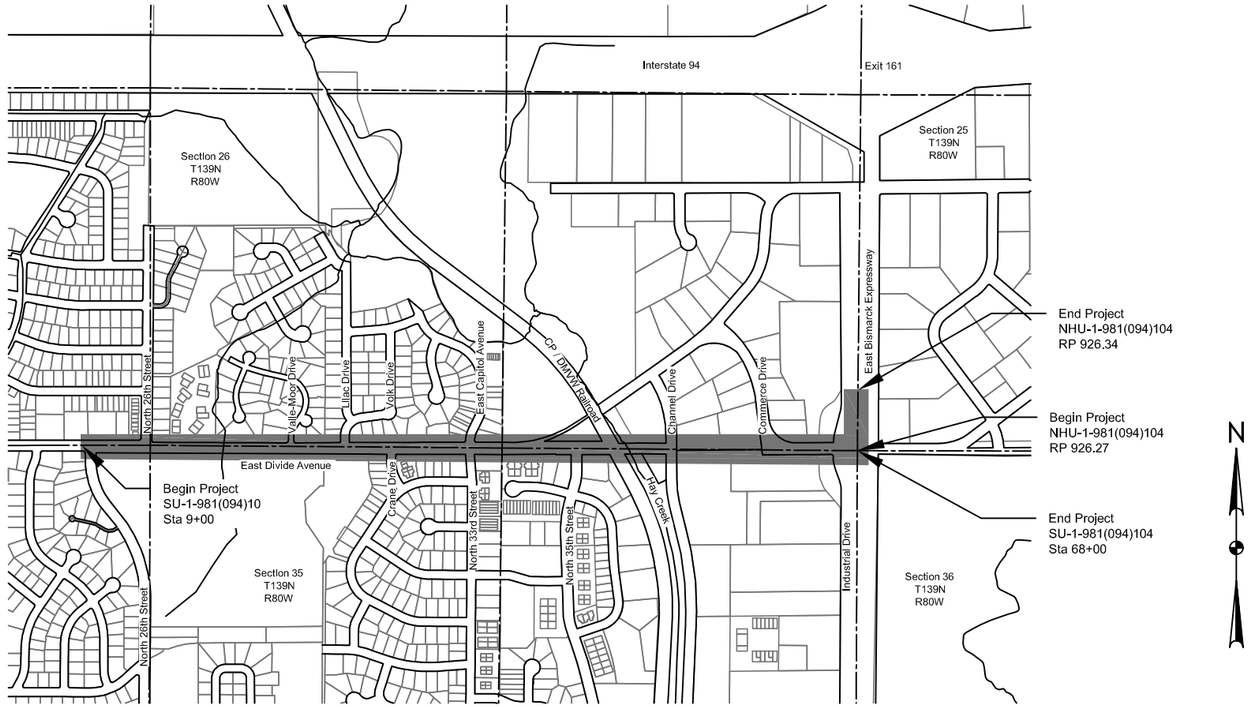
FHWA Limited Involvement
Burleigh County, North Dakota
Grading, Salvaged Base Course, PCC Pavement, Hot Bituminous Pavement, Curb & Gutter, Storm Sewer, Retaining Walls, Watermain, Reinforced Concrete Box, Lighting, Signal Revisions, Turn Lanes, Signing, Marking & Incidentals

Governing Specifications:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

DESCRIPTION	LENGTH OF PROJECT NET MILES	GROSS MILES
East Divide Avenue	1.117	1.117
East Bismarck Expressway	0.070	0.070



STATE OF NORTH DAKOTA



DESIGNERS

Gabe Schell, PE

Nick West, PE

Chris Horner, PE

Colin Moran, PE

Wade Frank, PE

APPROVAL OF CITY ENGINEER
I, MELVIN J. BULLINGER, P.E., CITY ENGINEER , FOR THE CITY OF BISMARCK, NORTH DAKOTA, HEREBY APPROVE THESE PLANS FOR EAST CENTURY AVENUE, PROJECT NUMBER SU-NHU-1-981(094)104 AS SHOWN ON THE ACCOMPANYING PLANS.

Melvin J. Bullinger \s\
MELVIN J. BULLINGER, P.E.
CITY ENGINEER BISMARCK,
NORTH DAKOTA

DATE: 8/08/2013

This document was originally issued and sealed by Melvin J. Bullinger Registration Number PE-2204 on 8/08/13 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, P.E.
PROJECT MANAGER

DATE: 8/08/2013

This document was originally issued and sealed by Troy Ripplinger Registration Number PE-5044 on 8/08/13 and the original document is stored at the City of Bismarck

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SP 1002(08)	Concrete Mix Design
SP 1003(08)	Permits and Environmental Considerations
SP 1010(08)	Temporary Erosion and Sediment Best Management Practices
SP 1058(08)	Conditions of Contract Award
SP 1101(08)	Split Sampling and Testing Requirements for Aggregate Base
SP 1275(08)	Weather Limitations for Hot Bituminous Mix

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LIST OF STANDARD DRAWINGS

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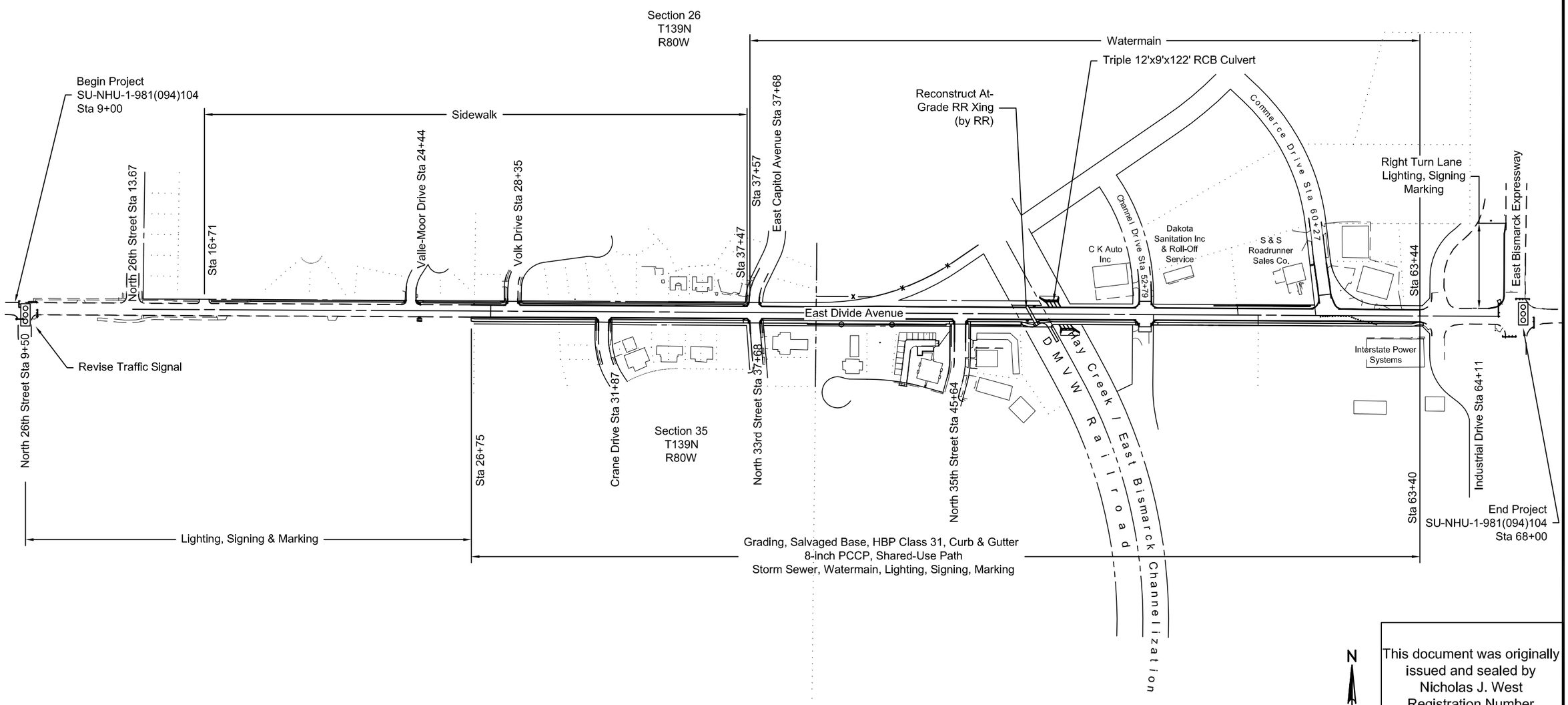

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Rev'd. 00/00/0000

EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Scope of Work

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
TSA	TJR	1411109	Aug 2013

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NOTES

GENERAL NOTES

100-P01 WEEKLY PLANNING/REPORTING MEETING:

A. Purpose of Weekly Meeting

1. 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.

1. 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.

2. The Contractor will be required to provide a written schedule of the next week's work and a tentative schedule of the following week.

3. Reporting/Planning meeting will include discussion of problems encountered during the current week; information of interest to local authorities, subcontractors, utilities, and next week's prospective schedule.

4. 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.

5. The Contractor shall organize the weekly meeting contacting interested agencies. These agencies include, but are not limited to, the following:

NDDOT-Bismarck District
City of Bismarck Engineering
City of Bismarck Public Works
Railroad
City Police
Burleigh County Sheriff
Fire Department
Ambulance service
Telephone Co
Power Co
Cable T.V.
Gas Co
Subcontractors
Bis-Man Transit
Chamber of Commerce

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:

1. Organize, schedule, and conduct the weekly planning and reporting meetings (plan note 100-P01 Weekly Planning/Reporting Meeting).

2. 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.

3. 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).

4. News media interviews.

5. The public relations coordinator's name, work address, and work telephone number shall be made available so that the coordinator may address public questions.

6. Work directly with property owners and businesses affected by construction activities. 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 21 days prior to the work taking place.

100-P04 FENCES & UNDERGROUND SPRINKLERS: The Engineer shall attend to the removal of existing fences and underground sprinkler systems. 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.

107-111 RAILROAD PROTECTIVE LIABILITY INSURANCE: This project crosses the Dakota, Missouri Valley & Western Railroad Company at RP 557.60. The type of work that will be performed within the railroad right of way is paving, earthwork, base work, watermain and storm sewer installation. Inquiries for protective liability insurance should be directed to:

Troy Fast
Manager
Dakota, Missouri Valley & Western Railroad, Inc.
3501 East Rosser Avenue
Bismarck, ND 58501
701-223-9282 Office
701-471-3435 Mobile
tfast@dmvwrr.com

Information on crossing number DOT 693 500K may be obtained from the Federal Railroad Administration website: http://safetydata.fra.dot.gov/Officeofsafety/

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107-P01 **RAILWAY PROTECTION DAKOTA MISSOURI VALLEY & WESTERN (DMVW) AND CANADIAN PACIFIC (CP) RAILROAD:** The Contractor shall notify the Engineer and DMVW Railroad at least 30 days before the date on which they propose to start work within the railroad's right of way. The Contractor shall also provide the Engineer and DMVW Railway 30 days written notice before flagging operations are needed. The Contractor shall be required to have DMVW Railroad supply flagmen whenever the construction operation is within 25 feet of the edge of the rail. The contact person for DMVW Railway is: Troy Fast.

The Contractor shall notify CP's Engineering contact person by telephone at least five working days prior to beginning any phase of work, and again promptly after such phase of work has been completed. CP's Engineering contact person is:

Dave LeClaire
Supervisor Public Works – US West
651-772-5908 Office
Dave_LeClaire@cpr.ca

The Contractor shall call CP ONE CALL at 1-888-625-8702 a minimum of five working days prior to commencing any excavation or boring activities within the railroad right-of-way.

If any tracks, facilities, or equipment owned, used, or maintained by CP or DMVW are damaged in connection with the work, CP shall repair such damage and the Contractor shall pay the full cost of such repair within 30 days after CP tenders a bill.

Payment for flagging required will be made by the Contractor to DMVW Railroad and shall be considered included in the price for "Mobilization". The cost for DMVW and CP railroad coordination shall be included in the price bid for "Mobilization".

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

201-P01 **CLEARING AND GRUBBING:** The Contractor is required to have a Commercial Arborist License from the City of Bismarck for tree pruning/trimming and for the removal of trees that are over 6-inches in diameter. The Contractor shall apply for a tree removal permit prior to removing existing trees located within the boulevard. See Section 40 in the plans for locations requiring a permit.

The Contractor shall coordinate with the Engineer and the City Forester prior to trimming any trees. The trees shall be trimmed to accommodate pedestrian movement for a sidewalk. See Section 40 for locations of trees to be trimmed. Tree trimming/pruning shall be included in the price bid for "Clearing and Grubbing".

202-P01 **SAW CONCRETE/SAW BITUMINOUS SURFACING:** Where the new pavement will abut existing pavement, a full-depth vertical saw cut shall be made along the entire length of the butt joint. The material to be removed shall then be removed without disturbing the material that is designated to remain. The new pavement shall be placed so as to match the existing pavement and so as to provide a satisfactory surface profile.

The areas to be sawed are shown on the removal layout sheets. Sawing shall be paid as "Saw Concrete" or "Saw Bituminous Surfacing (Full Depth)."

202-P02 **REMOVAL OF PIPE ALL TYPES AND SIZES:** This bid item is for the removal of the existing watermain from station 39+60 to 42+67, station 2+71 to 2+96 and from station 52+52 to 63+44 only. See Section 57 in the plans. Other pipe designated for removal in the plans or encountered during construction shall not be paid for separately as stated in Section 202.02.C.of the Standard Specifications.

Asbestos Cement Pipe (AC) is a category 2 hazardous material. Removal of AC pipe is non-regulated if hand tools are used to cut the pipe or the pipe is able to be pulled apart at the joints. Removal of AC pipe is regulated when power tools are used to separate pipe and all North Dakota Department of Health, Division of Air Quality, regulations and certifications need to be followed. Contact the Department of Health for further information on AC Pipe removal.

AC Pipe will be removed at the following locations:
Station 37+57 to 42+67
Station 2+71 to 2+96
Station 61+40 to 63+44

The following Pipe material type is unknown:
Station 101+64 to 102+02

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 AASHTO 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 in accordance with Section 203.03 B of the Standard Specifications (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 **COMPACTION AND DENSITY CONTROL:** Throughout the entire job, moisture and density controls shall be compacted to 90% of the maximum dry density as determined by AASHTO T-180.

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203-P03 **TOPSOIL - WETLAND**: The Contractor shall strip a minimum of 6 inches of topsoil from wetland areas. The Contractor shall construct a separate stockpile site for the wetland topsoil that is no greater than 3 feet high. The Contractor shall place and spread a minimum of 6 inches of wetland topsoil at the mitigation sites. If the wetland topsoil has been stockpiled for more than 30 days, the Contractor shall place, spread, and seed the wetland topsoil with the following seed mixture:

Grass			Full Seeding Rate PLS/Acre	% Species in Mix	PLS lbs./Ac
Common Name	Scientific Name	Variety			
Prairie Cord Grass	Spartina pectinata	Red River	7.0	15	1.1
American Slough Grass	Beckmannia syzigachne	Common	0.9	20	0.2
Canada Wild-rye	Elymus canadensis	Mandan	6.5	20	1.3
Fowl Blue Grass	Poa palustris	Common	1.0	20	0.2
Fox Sedge	Carex vulpinoidea	Common	1.0	15	0.2
American Manna Grass*	Glyceria grandis	Common	1.5	10	0.2
Fowl Manna Grass*	Glyceria striata	Common	1.0	10	0.1
Bluejoint Grass**	Calamagrostis canadensis	Common	1.0	10	0.1
			Total	120	3.1

o
American, fowl, or both may be used. If only one is used the seeding rate of other species does not need to be increased.
*** Seed may not be available and can be removed without increasing the seeding rate of other species*

The Contractor shall include all costs for removal, stockpiling, seeding, and placement of wetland topsoil in the price bid for "Topsoil - Wetland."

302-P01 **SALVAGED BASE COURSE:** Due to project sequencing, Aggregate Base Course Class 5 will be allowed to be used for Salvaged Base Course.

302-P02 **TRIMMING SALVAGED BASE COURSE:** Surface tolerance for the Salvaged Base Course shall comply with NDDOT Standard Specification 302.04 F.3 - Type C. Excess material removed from high points of the salvaged base course by the trimming operation shall be reincorporated into the salvaged base course. The cost for providing the required grade and cross section shall be included in the price bid for "Salvaged Base Course."

302-P03 **AGGREGATE SURFACE COURSE:** Aggregate Surface Course shall be used as temporary roadway surfacing during construction. The Aggregate Surface Course shall consist of Salvaged Base Course, Aggregate Base Course Class 5, or Recycled Asphalt Pavement (millings). The City of Bismarck has a stockpile of Recycled Asphalt (millings) that will be available for the Contractor (at no charge) to use on the project. The Contractor will be responsible for loading and hauling the millings. The millings are located at the City Landfill (2111 North 52nd Street).

302-P04 **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 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”.

408-P01 **CONTRACTOR MIX DESIGN:** The mix design shall be Contractor-developed per NDDOT Standard Specification.

408-P02 **HOT BITUMINOUS PAVEMENT CL 31:** The hot bituminous pavement shall be laid in lifts not to exceed 2 inches. Each lift of hot bituminous pavement shall cure overnight before installation of the next lift.

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

704-P01 **TRAFFIC CONTROL:** Should the Contractor elect to proceed on a schedule other than as proposed by the plans or decide to construct the project in segments, any cost associated with the modification of the proposed traffic control plan, lighting, or other traffic control features as his plan may require will become the responsibility of the Contractor. The 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 project shall be constructed under a road closure from Volk Drive to Channel Drive. A detour will be provided during this phase. The Contractor shall maintain access to Volk Drive from the west throughout construction. The Contractor shall also maintain access across Capitol Avenue/N 33rd Street throughout construction.

Commerce Drive shall be reconstructed under a road closure. A detour will be provided during this phase. Commerce Drive can be closed only if East Divide Avenue is open to traffic between Channel Drive and Volk Drive.

Work hours will be restricted on East Bismarck Expressway for construction of the right turn lane. Work activities will be restricted 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.

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704-P03 **MAINTAIN DRIVEWAY ACCESS:** The Contractor shall be responsible for providing access to all adjacent properties during construction. The Contractor shall coordinate with the adjacent properties for access to their facilities. Final details on location of access points and construction procedures shall be approved by the Engineer prior to the start of the work. Access across Channel Drive shall be maintained at all times since the adjacent businesses have operations on both the north and south sides of East Divide Avenue. The Contractor shall coordinate with these business to ensure reasonable access is provided during construction.

708-P01 **SEEDING-TYPE B-CL V:** The hydro mulch material shall be as specified in the NDDOT Standard Specification Section 708.02 B.3.a. The grass species shall be as follows:

Seeding-Type B-CL V Seed Mixture		
Variety and Species of Seed	Bulk rate Lb/Acre	Percent Pure Live Seed
LINCOLN Smooth Brome Grass (Rhizomatous Variety)	25	85
NORDAN Crested Wheat Grass	25	85
Total	50	

The seed shall be watered twice daily for three weeks minimum after placement in order to provide sufficient moisture for growth. All costs for hydro-mulch, seed, water, labor, equipment, and materials necessary to complete the work shall be included in the price bid for “Seeding-Type B-CL V”.

708-P02 **SODDING:** Sodding quantities have been provided to sod construction areas where the adjacent property has sod established. See Section 75 for locations. Sod placement shall be completed by the end of the construction season to allow adjacent property owners adequate time to reset their fences and sprinkler systems.

708-P03 **WEIGHTED FIBER ROLLS:** Weighted fiber roll shall be a photodegradable, extruded netting tube filled with wood curled excelsior and a weighted inner core. The roll diameter shall be six inches and the lengths shall be as required. The weight shall be a minimum of eight and one-third pounds per foot. An adequate number of weighted fiber rolls shall be placed around an inlet to provide complete protection. Approximately 3 to 6 inches shall be left between the weighted fiber rolls and the inlet. The ends shall overlap 12 inches. When silt is one-third the height of the roll, the Contractor shall remove and dispose of the silt and debris to allow the device to function properly. The cost of Maintenance as needed, labor, and materials shall be included in the price bid for “Weighted Fiber Rolls”.

708-P04 **INLET PROTECTION:** Inlet Protection shall consist of two bid items, “Inlet Protection-Fiber Roll 12IN” and “Inlet Protection-Special”. Once an inlet casting has been installed on the project, the “Inlet Protection-Fiber Roll 12IN” shall be removed and “Inlet Protection-Special” shall be installed.

708-P05 **REMOVAL FIBER ROLLS 12IN:** This bid item includes removal of “Fiber Rolls 12IN” and “Inlet Protection-Fiber Roll 12IN”. A plan quantity of 20LF was used per Inlet Type 2 and a quantity of 30LF was used per Inlet Type 2 Double.

708-P06 **RIPRAP-LOOSE ROCK:** The existing riprap around the existing culverts and inslopes at Hay Creek between the railroad tracks and approximate Station 51+00 shall be salvaged, stockpiled and replaced at the proposed box culvert as shown in Section 170 of the plans. Sediment is to be cleaned from the riprap prior to placement. Any excess riprap is to be disposed of by the Contractor at an off-site location. All costs associated with removal, salvaging, stockpiling, disposal, storage, cleaning, and replacement of Riprap shall be included in the bid price for “Riprap-Loose Rock”. Payment shall be made at final placement.

714-P01 **PIPE BACKFILL:** Aggregate Base Course Class 3, Class 5 or approved backfill shall be installed according to standard detail D-714-27 on all storm drain. All storm drain shall be considered not under the roadway. The labor, equipment and materials required shall be included in the price bid for the associated “Pipe Conduit (_)IN-Storm Drain”.

714-P02 **PIPE PVC 4IN DRAIN:** This pipe is for connecting the retaining wall corrugated perforated PE pipe to the storm drain system at the inlet or manhole shown in the plans. The PVC pipe and fittings shall be schedule 40 or approved equal by the Engineer. The joints shall be gasketed. The gasket shall be of the elastomeric type providing a watertight seal and shall conform to ASTM D3212. The connection to the PE pipe shall be made with a PVC adapter, flexible couplings are not acceptable. Any fittings, couplings or adapters necessary to complete this work shall be included in the lineal foot price for “Pipe PVC 4IN Drain”.

714-P03 **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-P04 **UNDERDRAIN CLEANOUT RISER:** The wye, bend, riser, cap, gate valve top section, concrete slab, labor, equipment and materials necessary to construct the cleanout risers shall be included in the price bid for “Underdrain Cleanout Riser”.

714-P05 **REINFORCED CONCRETE PIPE:** If RCP is selected; it shall be tongue and groove joint, sealed with butyl mastic.

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 the detail sheet. The castings shall be positioned to avoid falling within a wheel path. The manholes located outside of concrete shall have the standard casting (see Standard Drawing D-722-5). All castings that lie in the roadway shall be placed flush to within 1/8 inch below the pavement.

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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 V 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. See Schedule in Section 11 for approximate adjustments. 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. See Schedule in Section 11 for approximate adjustments. “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 **AIR RELIEF VALVE & MANHOLE:** The 16-inch watermain air relief valve shall be a combination air release valve and air/vacuum valve. The inlet x outlet size shall be 6" x 6.” The valve shall be supplied with bolted flanged inlet and plain outlet with protective hood. Flanges shall be in accordance with ANSI B16.1. The valve shall be installed in a vertical position. The valve shall be Valmatic model 106SS/38 Surge Suppression dual body Combination Air Valve or Engineer approved equal.

The combination air valve shall perform the functions of both an air release valve and a air/vacuum valve with surge suppression. The surge suppression shall consist of a Regulated-Exhaust Device. This device shall be mounted on the inlet of the Combination Air Valve, allow free air flow in and out of the valve, close upon rapid air exhaust, and control the exit velocity to reduce surges. The Regulated-Exhaust Device shall be Valmatic Anti-Slam Device model 1206 or Engineer approved equal.

The materials of construction shall follow the specifications for the above described Combination Air Valve and Anti-Slam Device.

The assembly for the combination air valve shall include a nylon-coated flanged 16” x 6" saddle, a six-inch (6") cam-centric plug valve, a six-inch (6") long flanged spool piece, the combination valve, and the regulated-exhaust device. The 6" saddle shall be ductile iron per ASTM A-536 covered by black nylon fused coating 10-12 mil thick. The band, bolts, and nuts for the saddle shall be stainless steel. The plug valve shall be the non- lubricated, resilient seat, eccentric type manufactured and tested in accordance with AWWA C504-80. The valve shall be equivalent to Valmatic or as determined by the Engineer. The spool piece shall be stainless steel.
The manhole housing the air relief valve shall use a precast reinforced concrete circular 60” manhole. Manhole risers and top sections shall conform to ASTM C478.

All barrel-to-barrel joints shall be a sealed Cretex CX-4 joint. Steps shall not be placed in the air release manhole. Openings for pipe shall have integral pipe boots.

724-P01 **WATERMAIN PIPE AND FITTINGS:** Watermain shall be Polyvinyl Chloride or Moleculary 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 PC 15.

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.

Restrained joints and thrust blocks shall be utilized as indicated on the appropriate plan sheets and all hydrants shall be mechanically restrained to tee. The cost of this work shall be included in the price bid for “(_)IN Watermain” or “Fittings-Ductile Iron”.

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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 Certainteed Certalok C900 RJ. 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 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-P02 **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.

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.

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 and steel fence posts and installation shall be included in the price bid for “Gate Valve & Box (_)IN”

724-P03 **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. All hydrants shall be furnished with an 8'-6" bury depth from the bottom of the inlet pipe to the top of the ground. All bolts and nuts connecting the barrel to the foot elbow shall be stainless steel. 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. All metal internal moving pars below ground shall 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. Extension rods shall be Class 304 or 316 stainless steel.

All 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 hydrants shall be mechanically restrained to tee. Hydrants removed shall become the property of the Contractor.

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724-P04 **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. 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 one hour. The Contractor shall furnish all tools, equipment, and material 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."

724-P05 **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.

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 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-P06 **WATERMAIN BEDDING:** 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".

724-P07 **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.

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	6	8

NOTES

724-P08 **CASING PIPE 42IN:** This item shall consist of supplying the casing pipe, and furnishing all labor, equipment, and materials necessary for proper installation as shown in the plans.

Casing pipe shall be Steel pipe with a minimum yield strength of 35,000 psi meeting the requirements of ASTM A53 or ASTM A139; Grade B with minimum wall thickness of 0.563 inches.

Casing pipe joints shall be welded to provide watertight fit. Contractor shall install water main in the appropriate casing pipe, using bolt-on steel pipeline casing spacers. A minimum of three (3) spacers shall be used per length of carrier (watermain) pipe. The watermain shall be mechanically restrained through the casing pipe.

Rubber casing end seals with stainless steel straps shall be installed at each end of all casing pipes. Pipeline casing spacers and end seals shall be installed per manufacturer's recommendations.

The Casing Pipe shall be jacked & bored from Station 47+70 to a minimum of Station 48+90. From Station 48+90 to 49+90 the Casing Pipe shall be open cut and backfilled with controlled density backfill.

Controlled density backfill shall be placed in the trench as shown on the Casing Pipe 42IN Installation detail. 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 75 psi to 125 psi at 28 days. The material shall be such that it lends itself to easy removal with a tractor backhoe. If the mix design shown is used, no further testing will be required. The mix design yields approximately one cubic yard of flowable mortar.

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

Controlled density backfill will not be measured separately but shall be included in the price bid for "Casing Pipe 42IN".

724-P09 **WATER SERVICE CONNECTION 1IN:** This item shall include the Tapping Sleeve with corporation stop, tapping of the main, and connection to existing 1" Copper Service Line with fittings. The tapping sleeve shall be stainless steel with a stainless steel flange and bolts and shall conform to the "Smith Blair" Type 663 or "Romac" Type SST or an approved equal. The corporation stop shall be Mueller No H-15000 or McDonald No. 4701 or Ford B22, without drain, having a Minneapolis Pattern, or an approved equal.

Tapping sleeves with valves shall be hydrostatically pressure tested on the main prior to requesting a tap. The test shall be 150 pounds per square inch for a duration of 30 minutes. 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.

The service connections shall require the watermain be shut down. The Contractor shall coordinate and give a minimum of 2 days written notice to all affected users. The Contractor shall make all reasonable efforts to minimize the downtime of service. The acceptable service downtime shall occur between 9 am and 4 pm. If additional downtime is needed, the Contractor shall restore all water service for the day by 4 pm, and resume downtime the following day at 9 am, or as approved by the Engineer. The Contractor may elect to provide temporary water service.

Temporary water service shall provide like water pressure and flow as existing conditions. It is anticipated that the service at station 61+57 shall require temporary water service.

The cost of locating existing services, exposing, verifying existing service pipe material and size, providing temporary water service and providing all labor, equipment and materials necessary to connect to the existing services shall be included in the price bid for "Water Service Connection (_)IN".

724-P10 **WATER SERVICE LINE 1IN COPPER:** Water service line shall be copper conforming to ASTM B88, Type K Soft. Lines shall be marked with marking tape.

724-P11 **GATE VALVE & BOX:** This item shall be for a 20IN Gate Valve and Box and shall meet the requirements of Plan Note 724-P02.

724-P12 **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.

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 D2127. 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 by 8-feet wide centered over the watermain. Material between pipe and insulation shall be pipe bedding material.

750-P01 **DRIVEWAY CONCRETE 8IN:** Construct driveways half at a time using Fast-Track Concrete to provide access to adjacent properties, unless otherwise directed by the Engineer. A Fast-Track Concrete mix design shall be submitted to the Engineer for approval. The mix design shall meet the following requirements:

- 20% Flyash Replacement (Min.)
- 564 lbs Cementitious (Max.)
- 5-7% Air Entrainment
- 0.40 w/c ratio
- Non-chloride Accelerator
- 24 hour compressive strength of 2500 psi (Min.)

All labor, equipment, and materials required to install the new concrete driveway shall be included in the price bid for "Driveway Concrete 8IN."

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750-P02 **DETECTABLE WARNING PANELS - NEW CONSTRUCTION:** Detectable warning panels for this project shall be cast iron with a Red Brick colored finish (FS 22144) or approved equal. Following is an approved supplier list for detectable warning panels used for newly constructed curb ramps, referred to as cast-in-place panels.

1. Cast Iron Coated by East Jordan Iron Works (800-874-4100) http://www.ejiw.com/
2. Cast Iron Coated by Neenah Foundry Company (800-252-5801) http://www.nfco.com/
3. Syracuse Castings (315-699-2601) http://www.syrcast.com/

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".

752-P01 **FENCE CHAIN LINK:** The fence height shall be 4-feet. The fence shall be hot-dipped galvanized and have a final black vinyl coating. The fence shall be placed immediately behind the retaining wall from stations 39+75 to 45+10. The fence shall not be placed or mounted to the top of the wall. The fence posts shall be set prior to pouring the sidewalk concrete. All posts shall be set in concrete. The alternate line post anchorage on standard drawing D-752-2 shall not be accepted. The Contractor shall use care when drilling the post foundations, to avoid puncturing the 4" HDPE drain pipe behind the retaining wall.

754-P01 **SIGN SUPPORTS:** A PVC sleeve or cored opening shall be provided for sign anchors that are placed within concrete surfaces.

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.

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)".

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 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)"

766-P01 **RESET MAILBOX:** The existing mailbox at station 61+60 is an 8 door CBU mailbox. The mailbox will be reset to Commerce Drive at station 102+59. Site preparation, concrete foundation, and pedestal installation shall be according to the Metal CBU Type I 1570 "F" Series Installation Manual. All cost associated with relocation of mailbox shall be included in the price bid for "Reset Mailbox".

770-P01 **CONCRETE LIGHT STANDARD 28FT-10IN:** Standards shall be pre-stressed spun concrete of natural polished finish the precast type as manufactured by Ameron MEO-8.5-C6 Brace - No. 112 sky gray natural polished finish to provide a minimum mounting height of 28 feet. Poles shall be complete with hand holds and metal covers secured in place with screws. Hand holes shall face opposite direction of the roadway. Concrete light standards shall be equipped with a grounding lead to bond the pole to the grounding system. See the embedded base detail provided in section 140 for additional requirements.

Sufficient excess conductor length shall be provided to permit withdrawal of the fuse holder through the hand hole a minimum of 6 inches outside of the hand hole for purposes of installation and inspection. The concrete to be used in the construction of the concrete housekeeping pads, base pads and foundations shall be a minimum of 3500 psi strength at 28 days with a minimum of six (6) bags of cement per cubic yard of concrete and shall conform in all respects to NDDOT Specifications.

770-P02 **LIGHT STANDARD 6FT MA 40FT MT HT BREAKAWAY:** The breakaway light standard shall be of the davit type and shall be steel, galvanized 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. Steel light standards shall be manufactured by Valmont Industries, Inc. DS90, of one- or two-piece construction. 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.

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 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 design of the Lighting standards shall meet the requirements of AASHTO publication, Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (6th Edition). A wind velocity of 90 mph with the necessary coefficient of height correction factor shall be used in the calculations. Each structure component shall be designed using the requirements of Table 11-1, "Fatigue Importance Factor, IF" Fatigue Category III shall be used for Lighting Standards. All the necessary calculations and drawings used in the design of these poles shall be furnished with the shop drawing submittal. Calculations and work drawings used in the design of Lighting Standards shall be signed, sealed, and dated by a Professional Engineer duly registered in the State of North Dakota.

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770-P03 **FEED POINT-TYPE IV PAD MOUNTED:** The feed point on the west side of the railroad tracks near Crane 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 be responsible for coordinating with Montana Dakota Utilities (MDU) for the new incoming electrical service. MDU shall be responsible for providing service connections and conductors from the transformer to the meter. The Contractor shall provide and install 3" conduit from the transformer to the metersocket. The Contractor shall install a conduit sweep into the bottom of the transformer base. The Contractor shall install a conduit sweep through the feed point foundation to the metersocket. Exposed conduit on the side of the feed point cabinet shall be rigid steel. Conduit shall be continuous from the meter socket to the transformer. The Contractor shall provide and install a 200 amp, lever by-pass meter socket and mount on the side of the feed point cabinet. The Contractor shall install conductors from the metersocket to the load center in conduit. Any cost imposed by MDU shall be coordinated by the Contractor and paid for by the City of Bismarck.

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 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.

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

Provide a contactor for each 120/240V (2-120V) 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, RCOC Model MR-UD No. 6342. Photo cell shall be Hubbell PBT-1 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.

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

770-P04 **FEED POINT-TYPE I PAD MOUNTED:** The feed point on the east side of the railroad tracks near Commerce 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 be responsible for coordinating with Capitol Electric Cooperative for the new incoming electrical service. Capitol Electric Cooperative shall be responsible for providing service connections from the transformer to the meter. The Contractor shall install a conduit sweep through the feed point conduit foundation to the metersocket. Exposed conduit on the side of the feed point cabinet shall be rigid steel. The Contractor shall provide and install a 200 amp meter socket with stud type connectors on the side of the feed point cabinet. The Contractor shall install conductors from the metersocket to the load center in conduit. Any cost imposed by Capitol Electric Cooperative shall be coordinated by the Contractor and paid for by the City of Bismarck.

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 details provided in section 140.

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 shall be made of minimum 1/8" aluminum, with a brushed aluminum finish, rated 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.

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

Provide a contactor for each 120/240V (2-120V) 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, RCOC Model MR-UD No. 6342. Photo cell shall be Hubbell PBT-1 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 loadcenter.

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

770-P05 **CONCRETE FOUNDATION-FEED POINT-TYPE B:** The concrete foundation shall be as sized as shown in the detail provided in section 140. Top of concrete foundations shall be 6" above the surrounding grade. Contractor shall provide two spare 3" Schedule 40 PVC conduits in each concrete feed point foundation. Notify the Engineer a minimum of 24 hours prior to pouring concrete base such that the form and cable entrance may be inspected. Duct seal all conduit stubs in concrete foundation. The concrete foundation shall have a 1-inch chamfer all around and down vertical sides to a minimum of 2 inches below grade.

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NOTES

770-P06 **HIGH PRESSURE SODIUM LUMINAIRES:** The luminaire shall be 400W as indicated in the plans. The 400W luminaires shall have type MSII optics as scheduled on the plans. Luminaires shall operate at 240 volts as shown on the plans. All luminaires, by type specified, shall be by one manufacturer similar and equal.

Heads shall have a die-cast aluminum housing. The housing shall have a drop down power door with no photocell receptacle and be designed for internal wiring and an internal 4 bolt 2-inch slip fitter adjustable plus or minus 5 degrees (±5°) from horizontal. An anodized aluminum reflector with a drop glass prismatic refractor shall provide a uniform distribution, IES Type II, medium, semi cutoff distribution unless otherwise noted in the plans or specifications. Photometric data shall be provided.

Ballasts shall be a constant wattage autotransformer or peak lead autotransformer with multiple voltage taps and suitable for cold weather starting at an ambient temperature of -20°F. Ballasts shall be pre-wired for the voltage shown on the plans. Data listing starting and normal operating currents shall be provided. Luminaire shall have an encapsulated starter.

Lamps shall supply the following:
400 watt – 45,000 Lumens, Mean

400 watt luminaires shall be as follows: American Electric Lighting, Model 325-40S-CAMT1-R2DG-ULNREC, General Electric, Model MDRA-40S-0-A-1-R-MS2-2U or approved equivalent.

770-P07 **LED LUMINAIRE-150 WATT:** The light emitting diode (LED) luminaires shall provide a minimum of 12,589 delivered lumens with no less than 60 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 135 Watts. Luminaires shall have an L_{70} (at 25°C) lumen maintenance greater than 100,000 hours and they shall have a color temperature no greater than 4300K 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 0.7 foot-candles (minimum) and an illuminance uniformity ratio of 4:1 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 28.5' 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: Philips Roadview, Model RVM-125W112LED4K-LE2-UNIV, American Electric Lighting, Model ATB2-60BLEDE70-MVOLT-R2-4000K-NL-NR, or approved equivalent.

770-P08 **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. Pull boxes shall be Quazite model PG, Oldcastle Precast, Inc. model Synertech Heavy-Duty, or approved equal.

770-P09 **PADLOCKS:** The Contractor shall obtain all padlocks from the City of Bismarck.

770-P10 **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-P11 **SPLICE CONNECTORS:** Splice connectors at pole hand hold shall be Penn-Union IPBNA2/0XS.

770-P12 **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 (3M Type EC-847).

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-P13 **RELOCATED LIGHT STANDARD:** 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 anchor bolts for the relocated light standard. Relocated light standard shall be reconnected up to the existing light circuit.

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

770-P14 **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 52nd Street). The luminaires shall be delivered to the City of Bismarck Public Works Department (601 South 26th 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 TRAFFIC SIGNAL SYSTEM:** The existing traffic signal system at the intersection of East Divide Avenue and N 26th Street shall be revised to include westbound protected-permissive left turn phase, a northbound right-turn overlap to occur during the westbound protected left turn phase, and an eastbound right-turn overlap to occur during the northbound thru phase when the southbound thru phase is not actuated.

The Contractor shall remove and salvage the existing three section heads as shown in the plans. The salvaged equipment from the signal shall be delivered to the City of Bismarck Public Works Department (601 South 26th 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.

Spare No. 12 AWG conductors were ran to the terminal block at the base of each signal head and quantities are provided for new No. 12 AWG conductors from the terminal block to the new signal heads. The Contractor shall modify the controller settings to create the new phasing plan. All materials, labor and equipment necessary to modify the signal system to create the new traffic signal phases shall be included in the price bid "REVISE TRAFFIC SIGNAL SYSTEM".

NOTES

970-P01 LANDSCAPING - APPLIES TO ALL TREES, SHRUBS, AND PERENNIALS

1. A plant establishment period shall extend for a period of one (1) year commencing on date of acceptance by Engineer/City Forester. Date of acceptance shall be date of initial planting.

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. 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.

7. 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.

8. All bracing and guying materials shall be removed and disposed of by the City of Bismarck.

9. 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.

10. 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.

11. 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.

12. 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

13. Plant care maintenance, warranty, weed fabric, stone mulch, wood mulch, and other items necessary for completion of the landscape plantings and planting beds shall be included in the price bid for the individual planting items.

14. Payment for Trees and Shrubs will be made at specific intervals. Fifty percent (50%) will be distributed after initial planting, twenty five percent (25%) on July 1, 2015 upon acceptance of proper plant care maintenance, and twenty five percent (25%) on September 1, 2015 upon acceptance of proper plant care maintenance and final acceptance. The Contractor must keep detailed records of their maintenance activities and must notify the Project Engineer 24 hours in advance of their maintenance activities in order to receive full payment for each period. All maintenance records must be submitted to the Project Engineer prior to the partial payment dates listed above to receive payment.

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ENVIRONMENTAL COMMITMENTS

ENVIRONMENTAL COMMITMENTS: The City of Bismarck, North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

COMMITMENT NO. 1: Unavoidable impacts to wetlands will be mitigated on-site, adjacent to the project, or at an approved location prior to or at the time of construction. Approximately 0.14 acres of wetlands will be permanently impacted of which 0.14 acres are jurisdictional. 0.14 acres of wetlands will be impacted temporarily (including 0.14 acres of jurisdictional).

ACTION TAKEN/REQUIRED: Of the 0.14 acres of permanently impacted wetlands, 0.14 acres require mitigation. The City of Bismarck will mitigate 0.14 acres on-site which include 0.14 acres of jurisdictional wetlands. Mitigation is required for all permanent natural wetland impacts and permanent artificial/jurisdictional impacts greater than 0.10 acre (excluding deep water). Deep water impacts (impacts greater than 6 feet) do not require mitigation. Temporary impacts will not be mitigated as original grades will be re-established.

Wetland Impacts Table

Wetland Number	Location	LONG/LAT (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Size (Acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts (Acres)		
								Temp.	Perm.	Mitigated
								—	—	—
1	Sec. 26, T139N, R80W	-100.737362 W 46.823545 N	PEM	Drainage Basin	0.70	Natural	X	0.09	0.08	0.08
2	Sec. 26, T139N, R80W	-100.737757 W 46.823548 N	PEM	Drainage Basin	0.22	Natural	X	0.05	0.03	0.03
3	Sec. 26, T139N, R80W	-100.738288 W 46.823706 N	PEM	Drainage Basin	0.15	Natural	X	—	0.03	0.03
4	Sec. 26, T139N, R80W	-100.737976W 46.82331 N	PEM	Drainage Basin	0.09	Natural	X	—	—	—
Hay Creek	Sec. 26, T139N, R80W	-100.737624 W 46.823553 N	R2	Open Water	525 feet	Natural	X	—	—	—
TOTALS					**0.86**			**0.14**	**0.14**	**0.14**

** A preliminary wetland Jurisdictional Determination was issued by the USACE on 9/20/2011; NWO-2009-00925-BIS*

COMMITMENT NO. 2: Approximately 50 trees in the right of way and easements will be impacted during construction and will be mitigated.

ACTION TAKEN/REQUIRED: The City of Bismarck will mitigate the tree impacts by planting trees along the boulevards and adjacent to the shared use path. 130 trees will be planted as a part of this project.

COMMITMENT NO. 3: There are landscaping beds located at the intersection of Commerce Drive and East Divide Avenue. These beds cannot be disturbed.

ACTION TAKEN/REQUIRED: The Contractor shall not use the area surrounding the landscaping beds for staging, parking, storage or other construction activities.

COMMITMENT NO. 4: Unavoidable impacts to wetlands will be mitigated on-site. Appropriate avoidance, minimization, and mitigation measures will be determined in cooperation with the USACE.

ACTION TAKEN/REQUIRED: The box culvert and associated riprap would be countersunk one foot below grade elevation to minimize impacts to Wetlands #1 & #2. No mitigation will be required for the footprint of the box culvert and riprap per agency agreement.

PERMITS REQUIRED:

A Section 404 permit (US Army Corps of Engineers) was obtained.

A Non-Building Situation Floodplain Permit was obtained by the City of Bismarck.

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ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-1-981(094)104	NHU-1-981(094)104	100% CITY FUNDS	TOTAL
103	0100	CONTRACT BOND	L SUM	1	-	-	1
107	0100	RAILWAY PROTECTION INSURANCE	L SUM	1	-	-	1
201	0330	CLEARING & GRUBBING	L SUM	1	-	-	1
202	0112	REMOVAL OF CONCRETE	SY	1,296	34	-	1,330
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	-	66	-	66
202	0119	SAW CONCRETE	LF	274	418	-	692
202	0121	REMOVE & SALVAGE BITUMINOUS SURFACING	TON	4,129	-	-	4,129
202	0129	REMOVAL OF CURB	LF	50	-	-	50
202	0130	REMOVAL OF CURB & GUTTER	LF	1,483	383	-	1,866
202	0153	SAW BITUMINOUS SURFACING-FULL DEPTH	LF	733	-	-	733
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	1,562	-	-	1,562
202	0230	REMOVAL OF INLETS	EA	-	1	-	1
202	0310	REMOVAL OF CHAIN LINK FENCE	LF	62	-	-	62
203	0101	COMMON EXCAVATION-TYPE A	CY	40,631	-	-	40,631
203	0109	TOPSOIL	CY	4,498	-	-	4,498
203	0110	ROCK EXCAVATION	CY	40	-	-	40
203	0119	TOPSOIL-IMPORTED	CY	500	-	-	500
203	0121	TOPSOIL-WETLAND	CY	185	-	-	185
216	0100	WATER	M GAL	512	5	-	517
302	0100	SALVAGED BASE COURSE	TON	20,911	251	-	21,162
302	0403	AGGREGATE SURFACE COURSE	TON	2,000	-	-	2,000
302	9002	SUBCUT GRAVEL	TON	400	-	400	800
401	0150	SS1H OR CSS1H OR MS1 EMULSIFIED ASPHALT	GAL	127	-	-	127
408	0188	HOT BITUMINOUS PAVEMENT CL 31	TON	768	-	-	768
408	0445	PG 58-28 ASPHALT CEMENT	TON	46	-	-	46
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	1,014	-	-	1,014
420	0130	COVER COAT MATERIAL CL 43	SY	2,535	-	-	2,535
550	0230	DOWELED EXPANSION JOINT ASSEMBLY	LF	180	-	-	180
550	0300	8IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	19,047	-	-	19,047
550	0310	10IN NON REINF CONCRETE PVMT CL AE-DOWELED	SY	-	279	-	279
602	0130	CLASS AAE-3 CONCRETE	CY	673	-	-	673
602	7000	SPECIAL SURFACE FINISH	SF	5,129	-	-	5,129
612	0115	REINFORCING STEEL-GRADE 60	LBS	94,608	-	-	94,608
624	0123	PEDESTRIAN RAILING	LF	370	-	-	370
702	0100	MOBILIZATION	L SUM	1	-	-	1
704	0100	FLAGGING	MHR	500	-	-	500
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1,881	-	-	1,881
704	1052	TYPE III BARRICADE	EA	29	-	-	29
704	1060	DELINEATOR DRUMS	EA	73	-	-	73
704	1067	TUBULAR MARKERS	EA	10	-	-	10
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	1	-	-	1
708	1325	SILT FENCE SUPPORTED	LF	540	-	-	540
708	1335	REMOVAL SILT FENCE SUPPORTED	LF	540	-	-	540
708	1400	WEIGHTED FIBER ROLLS	LF	108	-	-	108
708	1401	REMOVAL WEIGHTED FIBER ROLLS	LF	108	-	-	108
708	1430	FIBER ROLLS 12IN	LF	907	-	-	907
708	1431	REMOVAL FIBER ROLLS 12IN	LF	1,637	-	-	1,637
708	1531	INLET PROTECTION-FIBER ROLL 12IN	EA	31	-	-	31

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708	1540	INLET PROTECTION-SPECIAL	EA	42	-	-	42
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	42	-	-	42
708	2280	SEEDING-TYPE B-CL V	ACRE	3.93	-	-	3.93
708	4000	SODDING	SY	3,043	-	-	3,043
708	5652	ECB TYPE 3	SY	720	-	-	720
709	0701	GEOTEXTILE FABRIC-TYPE R1	SY	24,107	402	-	24,509
714	0916	PIPE CONC REINF 36IN CL IV-JACKED	LF	122	-	-	122
714	4097	PIPE CONDUIT 15IN-STORM DRAIN	LF	-	8	-	8
714	6581	PIPE POLYETHYLENE CORR PERF 6IN DRAIN	LF	5,312	-	-	5,312
714	6589	PIPE PVC 4IN DRAIN	LF	62	-	-	62
714	8522	CASING PIPE 42IN	LF	220	-	-	220
714	9705	UNDERDRAIN CLEANOUT RISER	EA	12	-	-	12
722	0100	MANHOLE 48IN	EA	4	-	-	4
722	0110	MANHOLE 60IN	EA	7	-	-	7
722	0120	MANHOLE 72IN	EA	4	-	-	4
722	0130	MANHOLE 84IN	EA	1	-	-	1
722	1100	MANHOLE RISER 48IN	LF	19.7	-	-	19.7
722	1110	MANHOLE RISER 60IN	LF	34.4	-	-	34.4
722	1120	MANHOLE RISER 72IN	LF	26.1	-	-	26.1
722	1130	MANHOLE RISER 84IN	LF	7.6	-	-	7.6
722	3410	MANHOLE REPAIR	EA	4	-	-	4
722	3510	INLET-TYPE 2	EA	21	-	-	21
722	3520	INLET-TYPE 2 DOUBLE	EA	11	1	-	12
722	3910	INLET SLOTTED DRAIN 15IN	LF	108	-	-	108
722	6200	ADJUST MANHOLE	EA	2	-	-	2
722	6240	ADJUST UTILITY APPURTENANCE	EA	11	-	-	11
722	6695	AIR RELIEF VALVE & MANHOLE	EA	-	-	1	1
724	0210	FITTINGS-DUCTILE IRON	LBS	-	-	7,879	7,879
724	0270	REMOVE GATE VALVE & BOX	EA	-	-	6	6
724	0310	GATE VALVE & BOX 8IN	EA	-	-	11	11
724	0314	GATE VALVE & BOX 12IN	EA	-	-	1	1
724	0317	GATE VALVE & BOX 16IN	EA	-	-	1	1
724	0350	GATE VALVE & BOX	EA	-	-	6	6
724	0412	8IN HYDRANT	EA	-	-	9	9
724	0427	ADJUST HYDRANT	EA	-	-	1	1
724	0430	REMOVE HYDRANT	EA	-	-	7	7
724	0610	WATER SERVICE LINE 1IN COPPER	LF	-	-	5	5
724	0820	WATERMAIN 8IN	LF	-	-	272	272
724	0854	WATERMAIN 20IN	LF	-	-	2,637	2,637
724	0855	12IN WATERMAIN	LF	-	-	280	280
724	0858	WATERMAIN 16IN	LF	-	-	276	276
724	0955	WATER SERVICE CONNECTION 1IN	EA	-	-	1	1
744	0100	POLYSTYRENE INSULATION BOARD	BD FT	4,480	-	-	4,480
748	0140	CURB & GUTTER-TYPE I	LF	7,900	377	-	8,277
748	0150	MOUNTABLE CURB & GUTTER-TYPE 1 SEC A	LF	68	-	-	68
748	0520	CURB-TYPE I	LF	17	-	-	17
748	1020	VALLEY GUTTER 36IN	SY	97	-	-	97
750	0100	SIDEWALK CONCRETE	SY	161	-	-	161
750	0111	DECORATIVE PAVED BOULEVARD	SY	615	-	-	615

Estimate of Quantities

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ESTIMATE OF QUANTITIES

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750	0115	SIDEWALK CONCRETE 4IN	SY	5,067	24	-	5,091
750	1020	DRIVEWAY CONCRETE 8IN	SY	786	-	-	786
750	2115	DETECTABLE WARNING PANELS	SF	300	20	-	320
752	0110	FENCE BARBED WIRE 3 STRAND-STEEL POST	LF	676	-	-	676
752	0600	FENCE CHAIN LINK	LF	535	-	-	535
752	0641	CHAIN LINK FENCE	L SUM	1	-	-	1
752	2100	GATE-VEHICLE	EA	1	-	-	1
752	2995	CORNER ASSEMBLY-WOOD POST	EA	3	-	-	3
754	0117	FLAT SHEET FOR SIGNS-TYPE 3A REFL SHEETING	SF	685	-	-	685
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	678	-	-	678
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	629	32	-	661
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	13,749	-	-	13,749
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE-GROOVED	LF	476	-	-	476
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	1,550	264	-	1,814
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED	LF	385	18	-	403
762	1500	OBLITERATION OF PVMT MK	SF	595	-	-	595
764	0131	W-BEAM GUARDRAIL	LF	275	-	-	275
766	100	MAILBOX-ALL TYPES	EA	1	-	-	1
766	0120	RESET MAILBOX	EA	1	-	-	1
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	EA	8	1	-	9
770	0060	CONCRETE FOUNDATION-FEED POINT-TYPE B	EA	2	-	-	2
770	0100	PULL BOX	EA	1	-	-	1
770	0210	CABLE TRENCH-TYPE I	LF	6,009	-	-	6,009
770	0330	2IN DIAMETER RIGID CONDUIT	LF	2,045	10	-	2,055
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	336	534	-	870
770	0505	UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	22,285	-	-	22,285
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	8,423	267	-	8,690
770	0730	FEED POINT-TYPE I-PAD MOUNTED	EA	1	-	-	1
770	0745	FEED POINT-TYPE IV-PAD MOUNTED	EA	1	-	-	1
770	1676	LT STD 6FT MA 40FT MT HT BREAKAWAY	EA	6	-	-	6
770	3807	CONCRETE LT STD 28FT-10IN	EA	21	-	-	21
770	4170	HP SODIUM VAPOR LUMINAIRE-400 WATT	EA	6	-	-	6
770	4220	LED LUMINAIRE - 150 WATT	EA	21	-	-	21
770	4540	RELOCATE LIGHT STANDARD	EA	2	1	-	3
770	4560	REMOVE LIGHT STANDARD	EA	9	-	-	9
770	4590	REMOVE FEED POINT	EA	1	-	-	1
772	2904	REVISE TRAFFIC SIGNAL SYSTEM	EA	1	-	-	1
930	9930	ANTI-GRAFFITI COATING	SF	5,129	-	-	5,129
970	2017	HOT WING MAPLE	EA	5	-	-	5
970	2055	SNOW BIRD HAWTHORN	EA	12	-	-	12
970	2187	HARVEST GOLD CRABAPPLE	EA	17	-	-	17
970	2194	RED SPLENDOR CRABAPPLE	EA	12	-	-	12
970	2200	SNOW DRIFT CRABAPPLE	EA	15	-	-	15
970	2300	PRAIRIE GEM PEAR	EA	13	-	-	13
970	2330	BUR OAK	EA	10	-	-	10
970	2392	IVORY SILK LILAC	EA	18	-	-	18
970	2449	ACCOLADE ELM	EA	12	-	-	12

Estimate of Quantities

PROJECT NO.	SECTION	SHEET
SU-NHU-1-981(094)104	8	4

ESTIMATE OF QUANTITIES

Alternative A

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-1-981(094)104	NHU-1-981(094)104	100% CITY FUNDS	TOTAL
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1	-	-	1
210	0201	FOUNDATION PREPARATION	EA	1	-	-	1
210	0210	FOUNDATION FILL	CY	2,150	-	-	2,150
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	425.4	-	-	425.4
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	75,368	-	-	75,368
708	1020	RIPRAP-LOOSE ROCK	CY	125	-	-	125
709	0600	GEOTEXTILE FABRIC-TYPE RR	SY	248	-	-	248
709	0701	GEOTEXTILE FABRIC-TYPE R1	SY	1,398	-	-	1,398

Alternative B

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-1-981(094)104	NHU-1-981(094)104	100% CITY FUNDS	TOTAL
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1	-	-	1
210	0201	FOUNDATION PREPARATION	EA	1	-	-	1
210	0210	FOUNDATION FILL	CY	2,200	-	-	2,200
606	1209	12FT X 9FT PRECAST RCB CULVERT	LF	366	-	-	366
606	5209	12FT X 9 FT PRECAST RCB END SECTION	EA	2	-	-	2
708	1020	RIPRAP-LOOSE ROCK	CY	140	-	-	140
709	0600	GEOTEXTILE FABRIC-TYPE RR	SY	275	-	-	275
709	0701	GEOTEXTILE FABRIC-TYPE R1	SY	1,419	-	-	1,419

Option 1: Reinforced Concrete Pipe

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-1-981(094)104	NHU-1-981(094)104	100% CITY FUNDS	TOTAL
714	4097	PIPE CONDUIT 15IN-STORM DRAIN	LF	752	-	-	752
714	4101	PIPE CONDUIT 18IN-STORM DRAIN	LF	950	-	-	950
714	4107	PIPE CONDUIT 24IN-STORM DRAIN	LF	1,474	-	-	1,474
714	4112	PIPE CONDUIT 30IN-STORM DRAIN	LF	156	-	-	156
714	4117	PIPE CONDUIT 36IN-STORM DRAIN	LF	298	-	-	298

Option 2: Flexible Pipe (See Section 51 for allowable materials)

SPEC	CODE	ITEM DESCRIPTION	UNIT	SU-1-981(094)104	NHU-1-981(094)104	100% CITY FUNDS	TOTAL
714	4097	PIPE CONDUIT 15IN-STORM DRAIN	LF	752	-	-	752
714	4101	PIPE CONDUIT 18IN-STORM DRAIN	LF	950	-	-	950
714	4107	PIPE CONDUIT 24IN-STORM DRAIN	LF	1,474	-	-	1,474
714	4112	PIPE CONDUIT 30IN-STORM DRAIN	LF	156	-	-	156
714	4117	PIPE CONDUIT 36IN-STORM DRAIN	LF	298	-	-	298

Estimate of Quantities

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	10	1

BASIS OF ESTIMATE

Item	Unit
Remove & Salvage Bituminous Surfacing @ 2.0 Ton/ CY	TON
Salvaged Base Course @ 1.875 Compacted Ton/ CY (Includes 25% For Shrinkage)	TON
SSIH or CSSIH or MS1 Emulsified Asphalt For 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
Hot Bituminous Pavement CL 31 @ 2 Ton/ CY	TON
Asphalt Cement PG 58-28 @ 6.0% of HBP	TON
MC 70 OR 250 LIQUID ASPHALT @ 0.25 GAL/SY	GAL
Blotter Material Class 44 @ 15 lbs/SY *	TON

* Blotter material shall be included in the price bid for CRS2P Emulsified Asphalt

CORE DATA

East Divide Avenue

Station	PVMT Depth	Aggr. Depth
29+34	4"	8"
34+20	5"	4"
39+46	5"	7.5"
43+77	3.5"	8"
49+87	5"	9"
54+95	-	-
56+56	-	-
60+93	4"	9"
Avg:	4.4"	
Std Dev:	0.61	

- Removal quantities were estimated as 5" on East Divide Avenue, 3" on Shared-Use Path

EARTHWORK SUMMARY

	COMMON EXC. (CY)	EMBANKMENT (CY)*	WASTE (CY)
East Divide Avenue (Subgrade)**	39,442	7,095	32,347
Mitigated Wetland	1,189	-	1,189
Total	40,631	7,095	33,536

*Quantity includes 25% for shrinkage
** Includes quantity for Commerce Drive and East Bismarck Expressway

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 6 inches. Removal, stockpiling and replacing of topsoil from excavation and embankment areas will be paid for as "Topsoil". A plan quantity of 4,498 CY of Topsoil has been calculated for the entire project.

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

AGGREGATE SURFACE COURSE
A quantity of 2000 TON of Aggregate Surface Course has been included for temporary surfacing. This quantity shall be used as directed by the engineer.

SALVAGED BASE COURSE
Remove & Salvage Bituminous Surfacing:

Removal of Pavement	4,129 TON
5% Less for Crushing and Handling	206 TON
Total Salvaged Material Available	3,923 TON

Salvaged Base Course Quantities:

Aggregate Needed for Salvaged Base Course	21,162 TON
Total Salvaged Material Available	3,923 TON
Additional Material Needed for Salvage Base Course	17,239 TON

REMOVAL AND SALVAGE OF BITUMINOUS SURFACING
Removal of bituminous surfacing is based on the Core Data.
15% was added to the pavement removal quantity for variable pavement thickness.

PARKING LOT & PRIVATE DRIVEWAY
HBP and Salvaged Base Course shall be constructed at depths equal to existing depths.
Quantities have been estimated with 6-inches of HBP and 12-inches of Salvaged Base Course.

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.

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Basis of Estimate

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	TJR	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	11	1

UTILITY ADJUSTMENT SCHEDULE					
SU-NHU-1-981(094)104					
East Divide Avenue					
Station	**Offset**	**Type**	**Existing Elev (ft)**	**Proposed Elev (ft)**	**Bid Item**
30+51.84	14.65' Lt	Gate Valve	1761.238	1762.30	Adjust Utility Appurenance
31+60.75	50.00' Rt	Hydrant	1761.540	1761.81	Adjust Hydrant
31+63.05	54.29' Rt	Gate Valve	1761.320	1761.83	Adjust Utility Appurenance
31+64.87	11.35' Lt	Gate Valve	1761.365	1761.26	Adjust Utility Appurenance
31+87.30	43.96' Rt	Sanitary MH	1761.315	1761.19	Adjust Manhole
33+60.18	38.01' Lt	Curb Stop Box	1758.685	1758.73	Adjust Utility Appurenance
34+28.00	44.73' Rt	Sanitary MH	1758.570	1758.58	Adjust Manhole
37+41.00	58.85' Lt	Curb Stop Box	1743.293	1742.60	Adjust Utility Appurenance
37+45.75	15.09' Lt	Gate Valve	1744.599	1744.73	Adjust Utility Appurenance
37+56.55	7.30' Lt	Gate Valve	1744.794	1744.63	Adjust Utility Appurenance
37+67.14	CI	Sanitary MH	1745.149	1744.49	Manhole Repair
37+72.70	45.00' Rt	Sanitary MH	1743.541	1743.94	Manhole Repair
59+62.64	131.12' Lt	Sanitary MH	1720.006	1720.42	Manhole Repair
61+08.10	1.00' Rt	Sanitary MH	1721.158	1720.07	Manhole Repair
61+67.00	40.00' Lt	Curb Stop Box	1721.978	1721.98	Adjust Utility Appurenance
62+56.34	30.30' Rt	Gate Valve	1722.381	1722.46	Adjust Utility Appurenance
102+02.70	37.30' Lt	Curb Stop Box	Field Verify, not Surveyed		Adjust Utility Appurenance
This Table is Meant to be a Guide: Contractor to Verify Appropriate Materials Prior to Ordering					

These tables are intended to be a reference.
Contractor to verify grades and actual field conditions.
The appropriate bid item will be selected based on field conditions.

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Utility Adjustment Schedule

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NJW	1411109	Aug 2013

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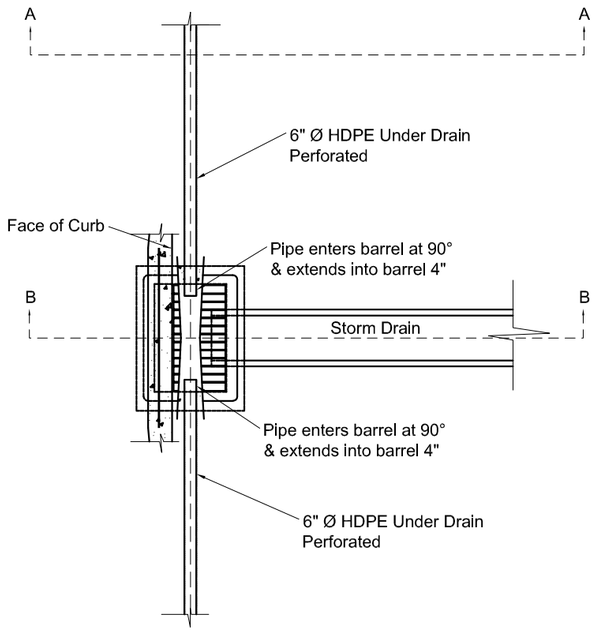
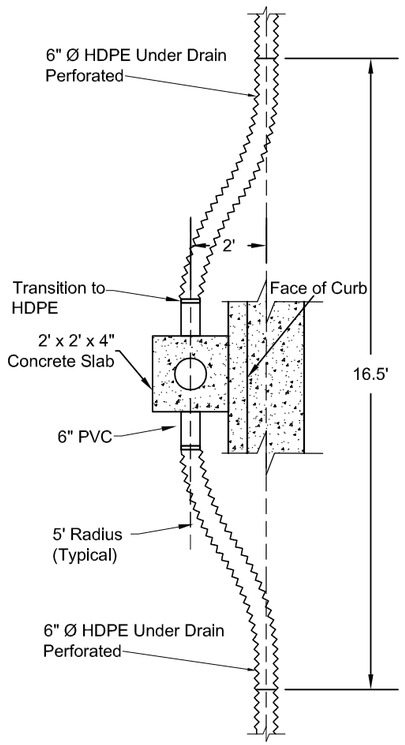
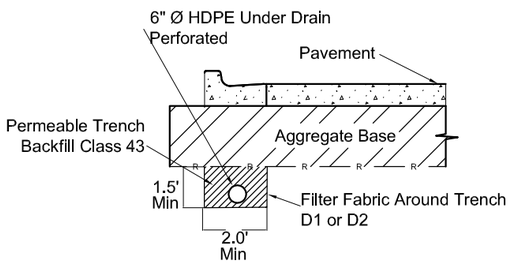
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	1



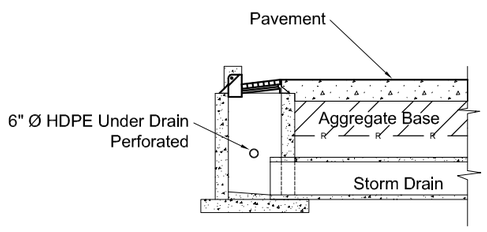
UNDER DRAIN CONNECTION TO INLETS
PLAN VIEW



UNDERDRAIN CLEANOUT TRANSITION
PLAN VIEW



UNDER DRAIN LAYOUT
PROFILE VIEW
SECTION A-A

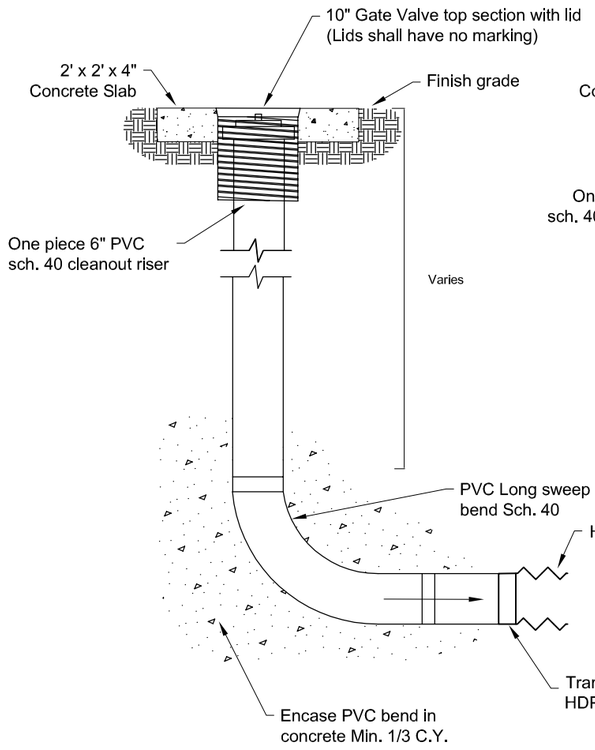


UNDER DRAIN CONNECTION TO INLETS
PROFILE VIEW
SECTION B-B

Core Drill Hole for Pipe &
Grout End Into Catch Basin

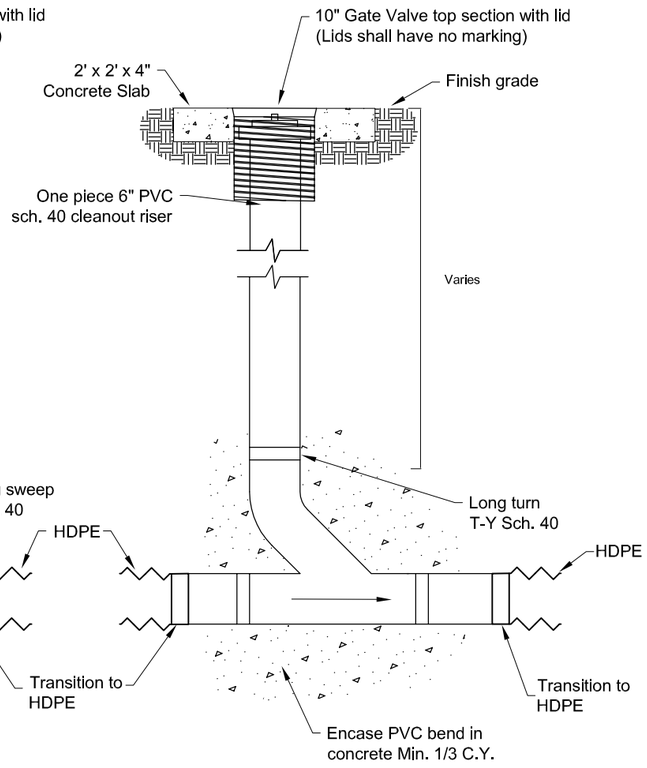
PIPE POLYETHYLENE CORR PERF 6IN DRAIN

NOTE:
6" hub with threaded PVC plug do
not glue



END OF LINE

NOTE:
Enclose long sweep bend or
combination wye in concrete as
shown.



IN-LINE

UNDERDRAIN CLEANOUT RISER

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East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Pipe Polyethylene Corr
Perf 6IN Drain &
Underdrain Cleanout Riser

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	2

STORM SEWER PIPE BEDDING SCHEDULE				
	RCP		Metal/PVC/HDPE	
Pipe Size (inch)	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 BEDDING QUANTITIES - WATERMAIN

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

20" Based on CL250 DI

24" Based on CL250 DI

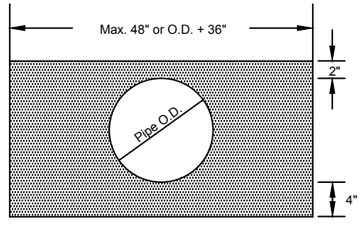
30" to 48" Based on CL150 DI

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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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Stor Sewer Pipe Pipe Bedding Schedule & Quantities – Water

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	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.

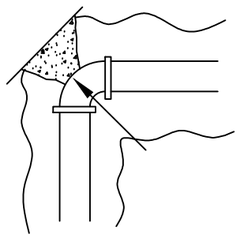
NOTE NO. 4 BLOCKING OF CROSS WITH 2 PLUGS IS AS SHOWN. WITH ONLY 1 PLUG PROCEED SAME AS TEE.

NOTE NO. 5 INSTALL CONCRETE ANCHOR AND TIE DOWNS AS SHOWN IF SIZE IS REDUCED 2 PIPE SIZES OR MORE.

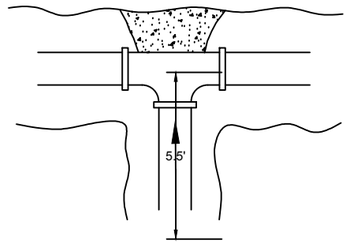
NOTE NO. 6 ALL VERTICAL BENDS TO BE BLOCKED AND TIED DOWN AS SHOWN.

NOTE NO. 7 ALL HYDRANTS TO BE BLOCKED AS SHOWN. KEEP CONCRETE AWAY FROM WEEP HOLES.

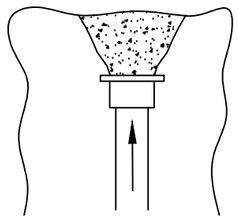
NOTE NO. 8 THE END AREA OF CONCRETE THRUST BLOCKS SHALL BE SUBMITTED WITH SOIL BEARING CHARACTERISTICS TO THE ENGINEER FOR APPROVAL.



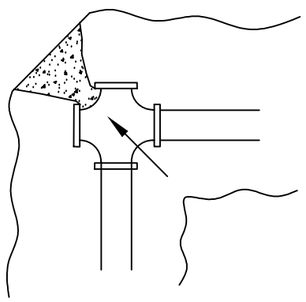
TYPICAL HORIZONTAL BEND
NOTE NO. 1



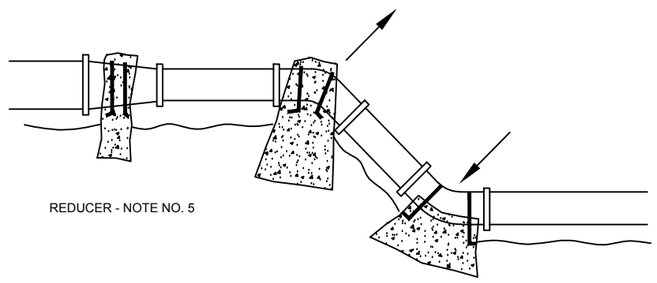
TEE AND WYE
NOTE NO. 2



DEAD END OR PLUG
NOTE NO. 3

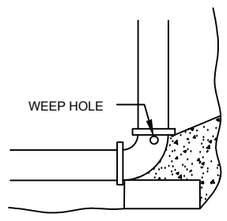


CROSS - NOTE NO. 4



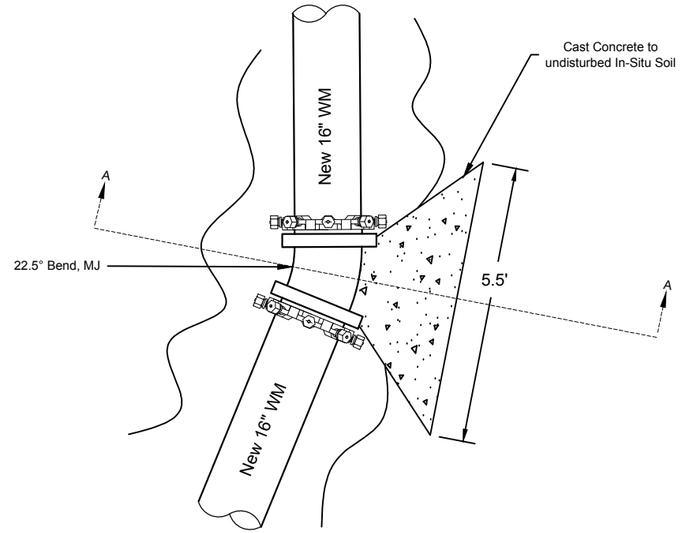
REDUCER - NOTE NO. 5

TYPICAL VERTICAL BENDS
NOTE NO. 6



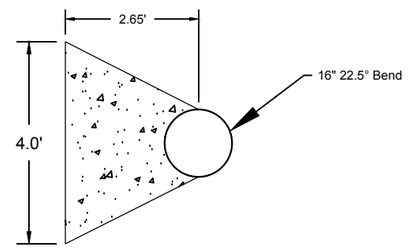
HYDRANT NOTE NO. 7

WATERMAIN CONCRETE THRUST BLOCKING



Plan View

Approx. 0.6 CY of concrete



Section A-A View

WATERMAIN CONCRETE THRUST BLOCKING
Thrust blocking for 16" 22.5° bend at Sta 2+93, 7' Rt

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East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Watermain Concrete Thrust Blocking

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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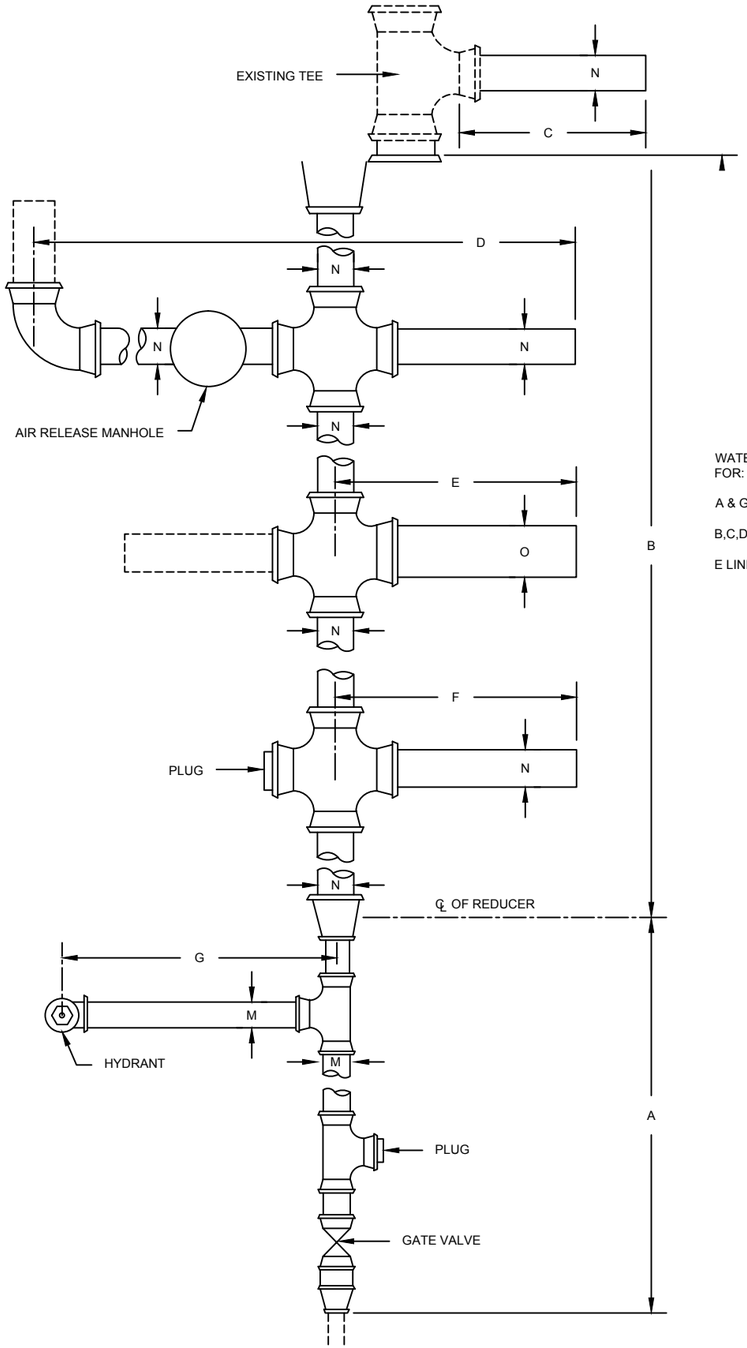
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	4



WATERMAIN PAYMENT DIAGRAM

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".

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. The weights of fitting sizes not listed in the AWWA tables were obtained from the Tyler/Union Utilities Catalog, dated 05/01/97.

BENDS (MJ-MJ)					SLEEVES		CAP	PLUG
SIZE	90°	45°	22-1/2°	11-1/4°	SHORT	LONG		
4"	27	23	18	16	17	20	10	10
6"	39	32	32	30	28	36	17	18
8"	57	46	46	42	38	46	25	26
10"	89	70	64	58	49	62	35	36
12"	108	86	84	74	56	76	44	46
14"	210	164	148	130	111	140	85	79
16"	264	202	178	158	130	172	93	100
18"	335	250	255	205	160	225	122	130
20"	519	372	376	374	212	269	149	158

MECHANICAL - JOINT TEES									
SIZE	X4	X6	X8	X10	X12	X14	X16	X18	X20
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"	-	335	390	417	460	475	530	560	605

REDUCERS (MJ - MJ)								
SIZE	X4	X6	X8	X10	X12	X14	X16	X18
6"	24	-	-	-	-	-	-	-
8"	32	36	-	-	-	-	-	-
10"	46	47	50	-	-	-	-	-
12"	58	60	60	64	-	-	-	-
14"	-	100	100	100	100	-	-	-
16"	-	124	124	124	124	140	-	-
18"	-	-	190	195	180	190	195	-
20"	-	-	-	225	214	208	225	233

CROSSES (MJ X MJ)									
SIZE	X4	X6	X8	X10	X12	X14	X16	X18	X20
6"	62	80	-	-	-	-	-	-	-
8"	84	108	120	-	-	-	-	-	-
10"	98	118	138	155	-	-	-	-	-
12"	123	140	162	187	212	-	-	-	-
14"	-	210	231	255	269	299	-	-	-
16"	-	250	264	286	310	-	410	-	-
18"	-	625	655	685	725	970	930	955	-
20"	-	-	790	820	860	905	1085	1155	1230

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

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Water Main Payment Diagram & Fitting Schedule

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RS	NW	1411109	Aug 2013

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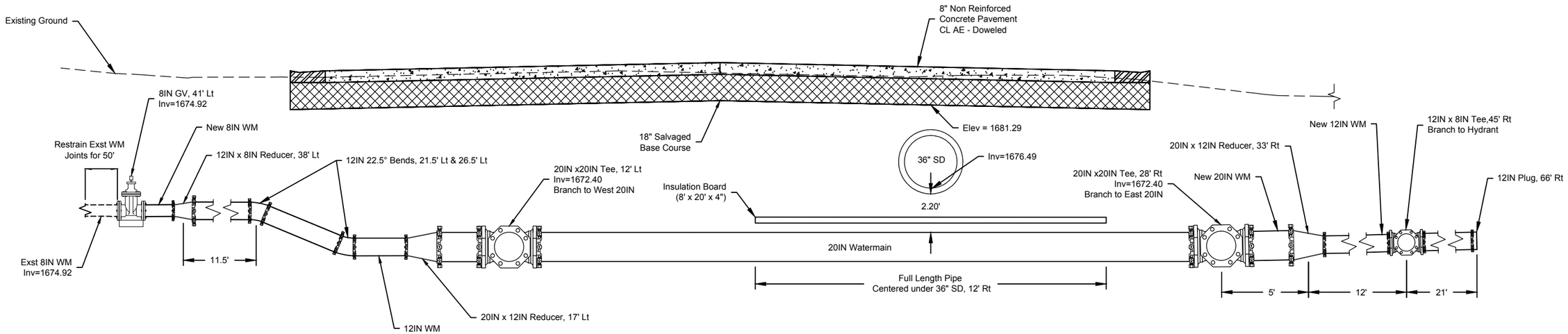
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	5



Note:

1. All joints to be restrained.
2. All backfill shall be mechanically compacted.
3. Insulation board shall be paid separately.
4. These details are for general planning purposes. Contractor to verify WM elevation prior to lowering.

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
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Watermain Lowering
Sta 52+52

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RRS	NJW	1411109	Aug 2013

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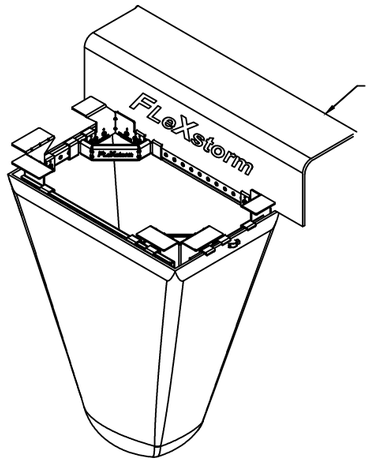
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	6



Magnetic Curb Opening Cover

Notes

This item shall consist of furnishing, installing, maintaining (cleaning), and removal of a drainage structure inlet filter assembly, consisting of a frame and filter bag to collect sediment in surface storm water runoff. The inlet filter assembly shall remain in place until further removal is directed by the Engineer and shall 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.

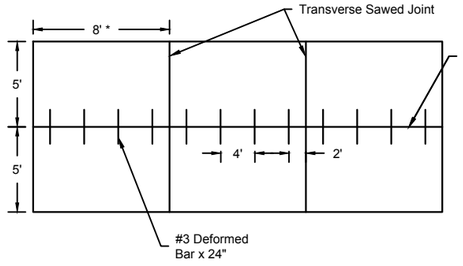
The drainage structure inlet filter shall be the FLEXSTORM Inlet Filter manufactured by Inlet & Pipe Protection, Inc., or an approved equal.

The inlet filter assembly frame shall be rigid steel and include an overflow feature designed to allow full flow of water into the structure if the filter bag is filled with sediment. The inlet filter assembly bag shall be constructed of a polypropylene fabric with a minimum flow rate of 145 gallons per minute per square foot, and designed for a minimum silt and debris capacity of 2 cubic feet.

If the surrounding surfaces are not stabilized by freeze up, with the approval of the City of Bismarck, the filters shall be removed for the winter. The filters then shall be reinstalled in the spring at a time in accordance with the City of Bismarck. 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 or installation, maintenance, replacement and removal shall be included in the price bid for "Inlet Protection-Special".

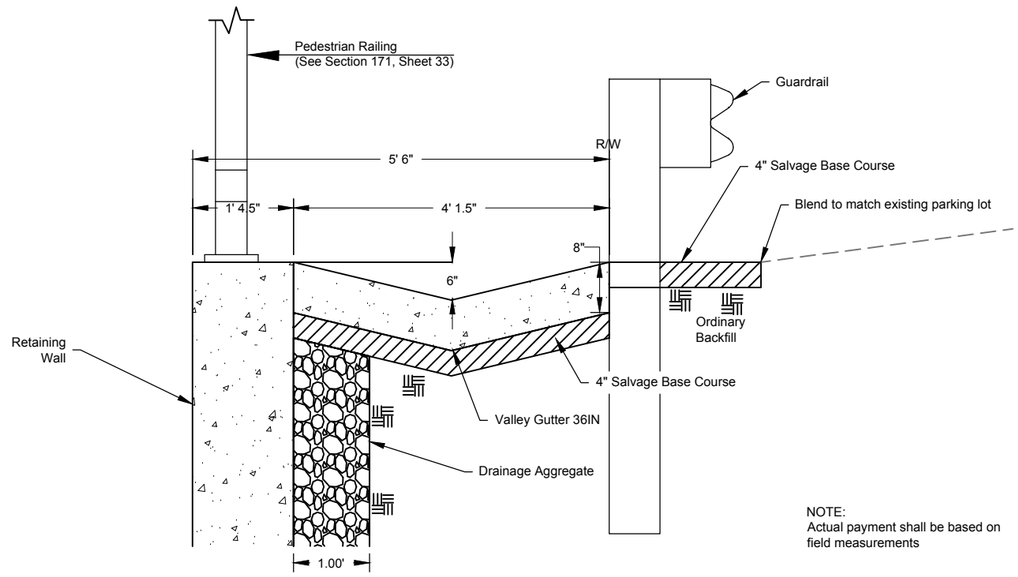
Inlet Protection-Special



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

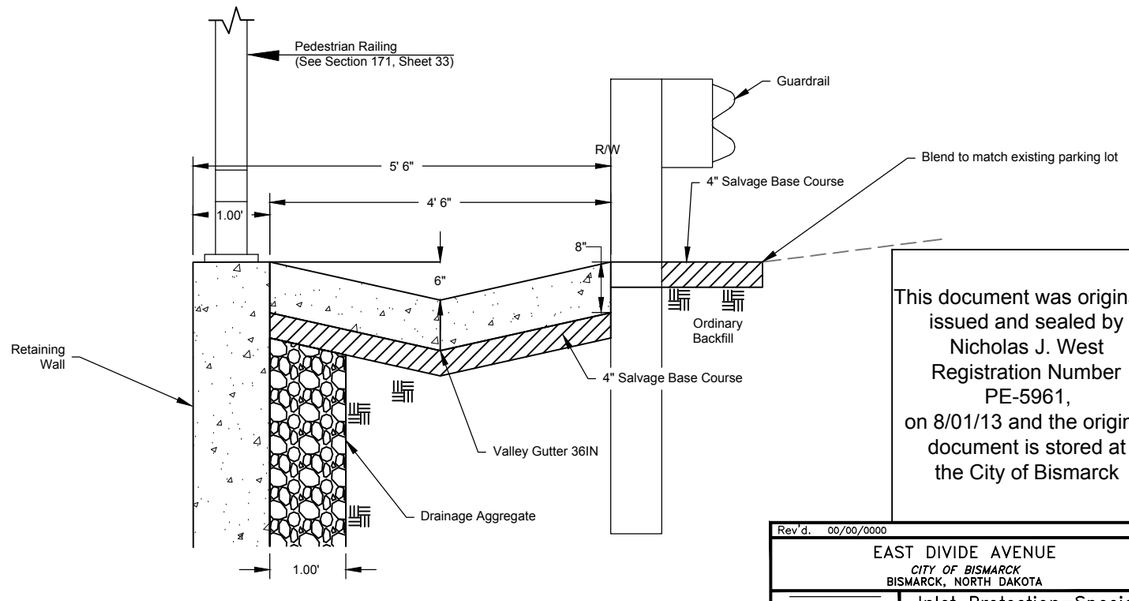
1. Deformed bars shall be held in place by a supporting device securely staked to the base material at the correct spacing, alignment, and elevation.
2. The Contractor shall determine transverse joint locations prior to placing concrete, to ensure deformed bars are properly located.

Shared-Use Path Jointing



NOTE:
Actual payment shall be based on field measurements

Sta. 56+30.00 to 57+74.17



Sta. 57+74.17 to 59+15.00

VALLEY GUTTER 36IN

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Inlet Protection-Special, Shared-Use Path Jointing & Valley Gutter Detail

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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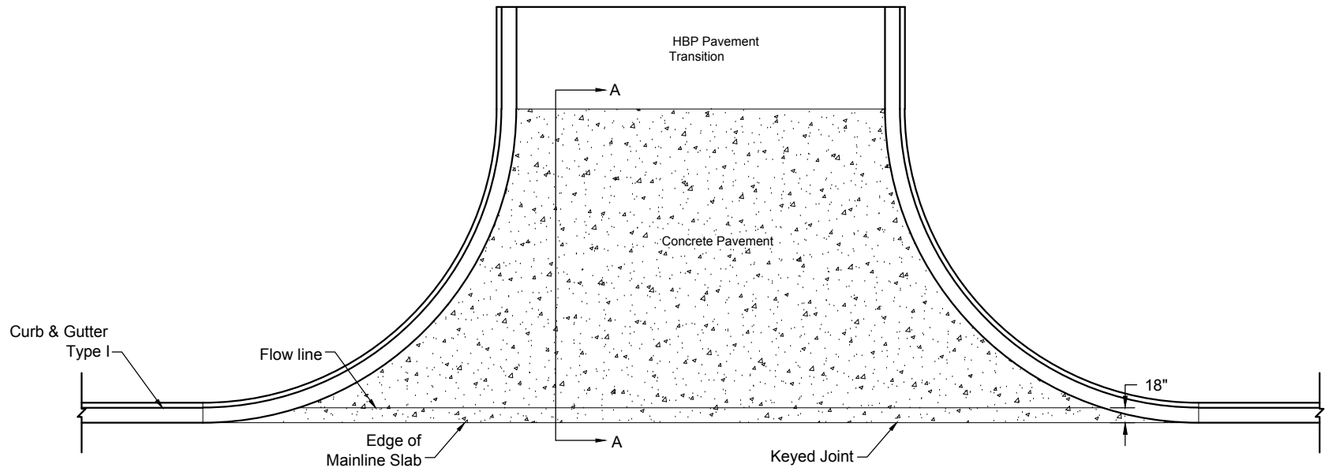
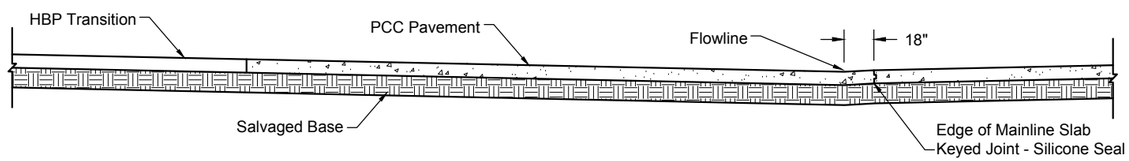
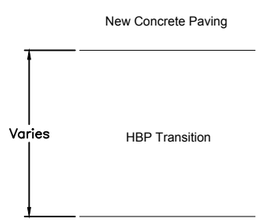
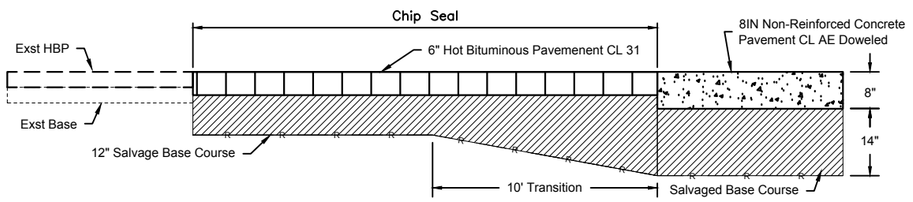
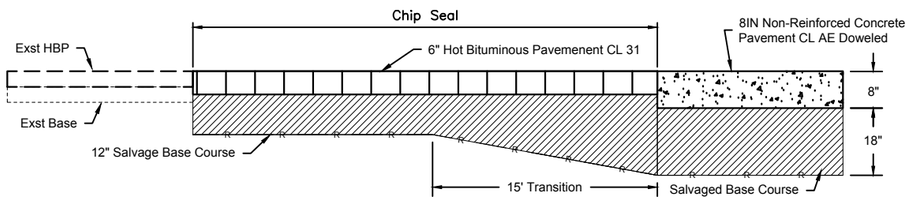








Section A-A



Section A-A

Sawing the existing asphalt surface will be paid for only once. If the vertical face becomes damaged before the transition is paved, it shall be the contractors cost to resaw the UNDER. Length of the patch shall be directed by the field engineer.

1. Volk Drive - Sta 28+35 38' LT to 48' LT
2. Crane Drive - Sta 31+87 40' RT to 74' RT
3. East Capitol Avenue - Sta 37+67 38' LT to 64' LT
4. North 33rd Street - Sta 37+71 40' RT to 82' RT
5. North 35rd Street- Sta 45+64 42' RT to 112' RT
6. Channel Drive - Sta 52+80 49' LT to 113' LT
7. Commerce Drive - Sta 59+73 75' LT to 200' LT

HBP 10' TRANSITION	HBP 15' TRANSITION
1. Volk Drive - 10 LF	1. Channel Drive - 64 LF
2. Crane Drive - 34 LF	2. Commerce Drive - 122 LF
3. East Capitol Avenue - 26 LF	
4 .North 33rd Street - 42 LF	
5. North 35rd Street - 70 LF	

PAY ITEMS

1. Hot Bituminous Pavement CL 31	TON
2. CRS2P Emulsified Asphalt	GAL
3. Cover Coat Material CL 43	SY
4. Salvaged Base Course	TON
5. Geotextile Fabric-Type R1	SY

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Side Street
Flow Line

Paving Transition

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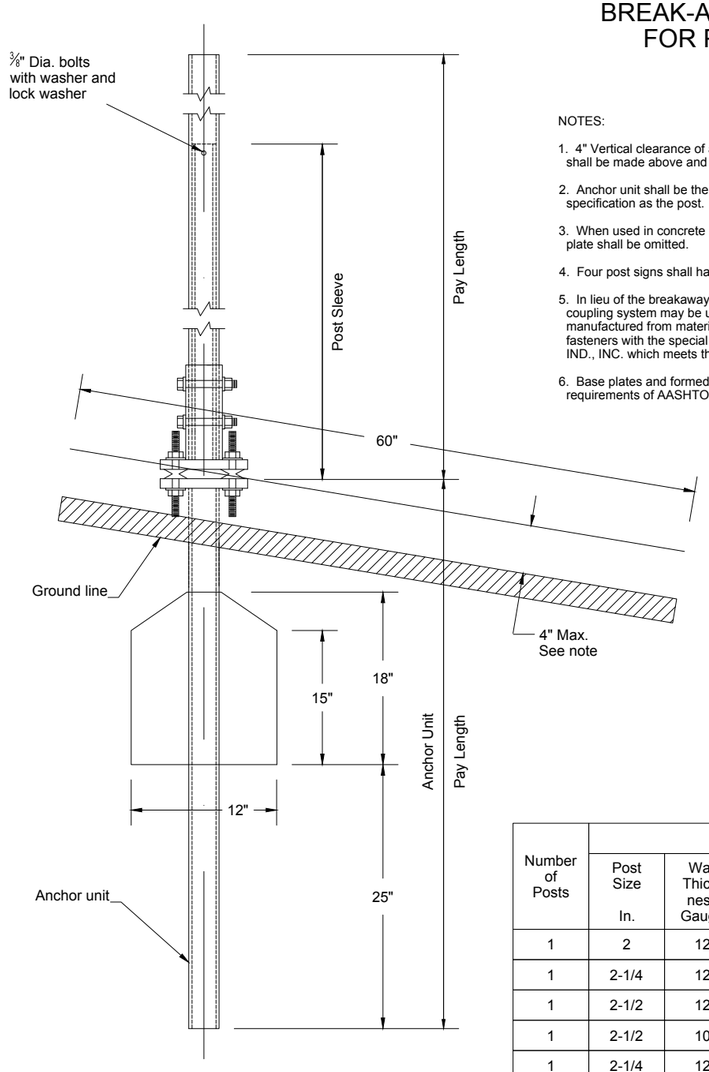
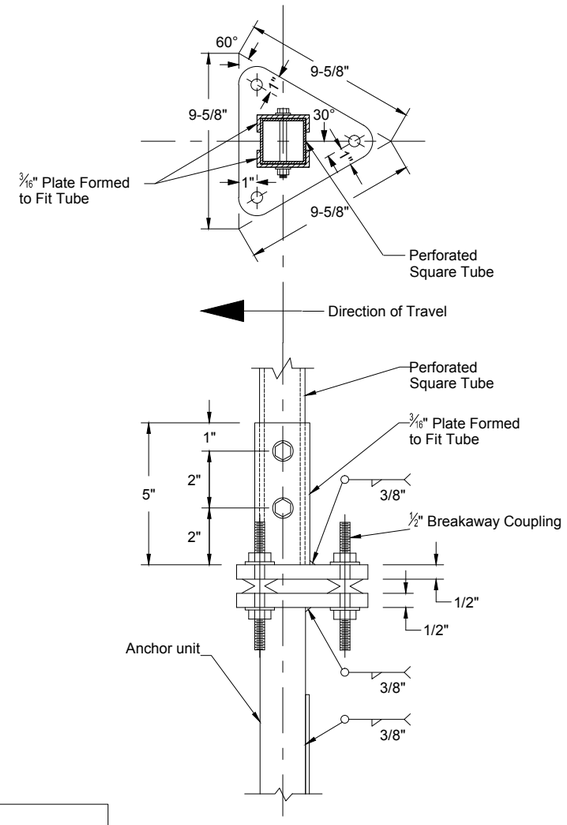
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	8

BREAK-AWAY COUPLER SYSTEM FOR PERFORATED TUBES



NOTES:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
2. Anchor unit shall be the same size as the post and shall have the same specification as the post.
3. When used in concrete sidewalk, anchor shall be the same except the anchor plate shall be omitted.
4. Four post signs shall have over 8' between the first and fourth post.
5. In lieu of the breakaway base system on standard D-754-24 the breakaway coupling system may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.
6. Base plates and formed plates shall be fabricated from steel meeting the requirements of AASHTO M-183 and M232.



BASE PLATE WITH BREAKAWAY COUPLER

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size In.
1	2	12			No	2-1/4
1	2-1/4	12			No	2-1/2
1	2-1/2	12			B	2-1/2
1	2-1/2	10			Yes	2-1/2
1	2-1/4	12	2	12	Yes	2-1/4 & 2 Sleeve
1	2-1/2	12	2-1/4	12	Yes	2-1/2 & 2-1/4 Sleeve
2	2	12			No	2-1/4
2	2-1/4	12			No	2-1/2
2	2-1/2	12			Yes	2-1/2
2	2-1/2	10			Yes	2-1/2
2	2-1/4	12	2	12	Yes	2-1/4 & 2 Sleeve
2	2-1/2	12	2-1/4	12	Yes	2-1/2 & 2-1/4 Sleeve
3 & 4	2-1/2	12			Yes	2-1/2
3 & 4	2-1/2	10			Yes	2-1/2
3 & 4	2-1/2	12	2-1/4	12	Yes	2-1/2 & 2-1/4 Sleeve
3 & 4	2-1/4	12	2	12	Yes	2-1/4 & 2 Sleeve
3 & 4	2-1/2	10	2-3/16	10	Yes	2-1/2 & 2-3/16 Sleeve

B - The 2½" 12 gauge posts do not need breakaway bases when placed in standard soils. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.4	Cross Sect. area In.2	Section Modules In.3
1-1/2 x 1-1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2-1/4 x 2-1/4	0.105	12	2.773	0.561	0.695	0.499
2-3/16 x 2-3/16	0.135	10	3.432	0.605	0.841	0.590
2-1/2 x 2-1/2	0.105	12	3.141	0.804	0.803	0.643
2-1/2 x 2-1/2	0.135	10	4.006	0.979	1.010	0.785

The 2⅜" size 10 gauge is shown as 2.19" size on the plans. The 2½" size 10 gauge is shown as 2.51" size on the plans.

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Break-Away Coupler System

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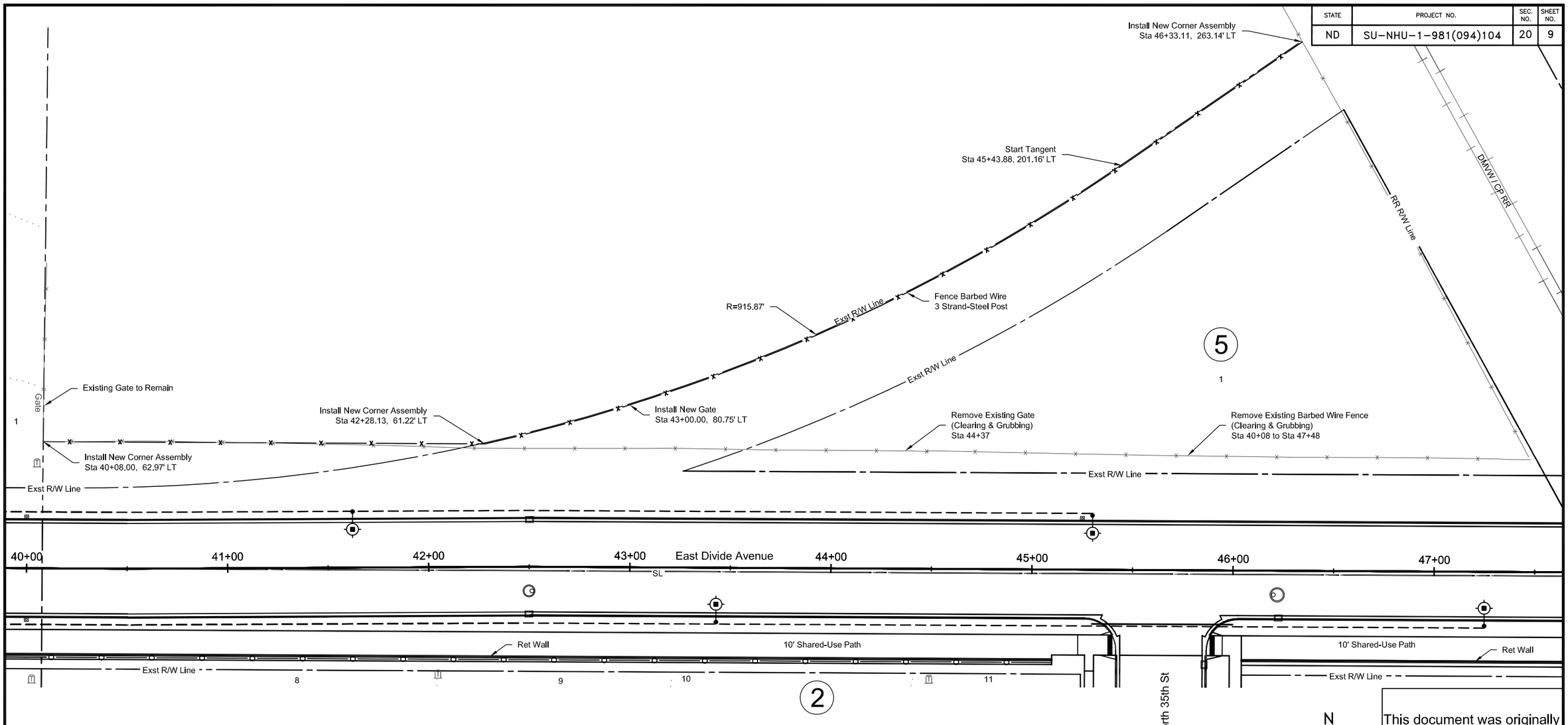
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	9



FENCE BARBED WIRE 3 STRAND-STEEL POST

Sta 40+08, 63' LT to Sta 46+33, 263' LT	676	LF

GATE-VEHICLE

Sta 43+00 LT	1	EA

CORNER ASSEMBLY-WOOD POST

Sta 40+08 LT	1	EA
Sta 42+28 LT	1	EA
Sta 46+33 LT	1	EA
Total	3	EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
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Barbed Wire Fence

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EH	TR	1411109	Aug 2013

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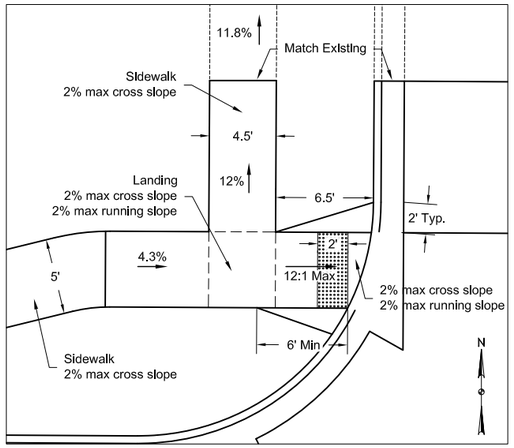
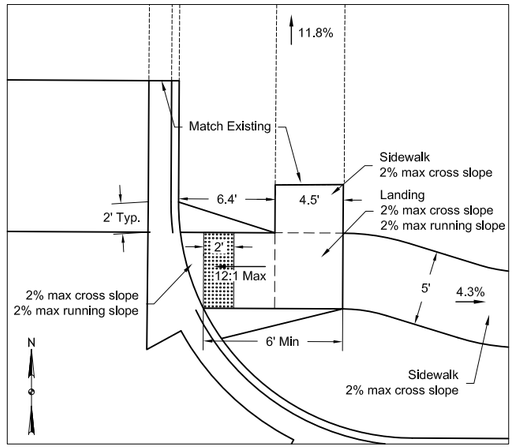
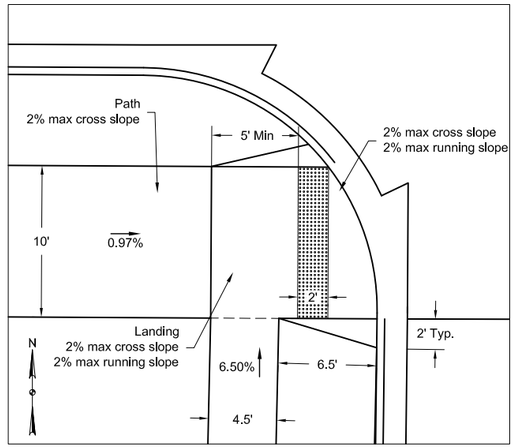


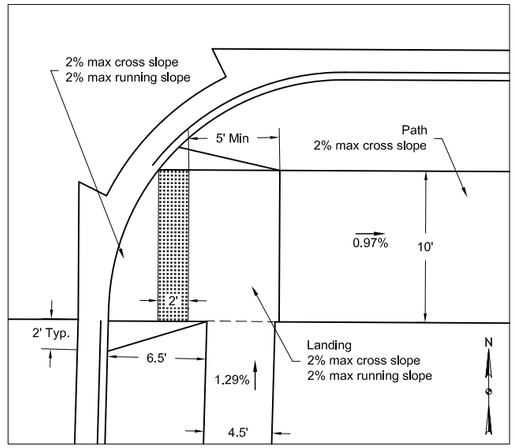
Volk Drive (NW Ramp Sta 28+12, Lt)



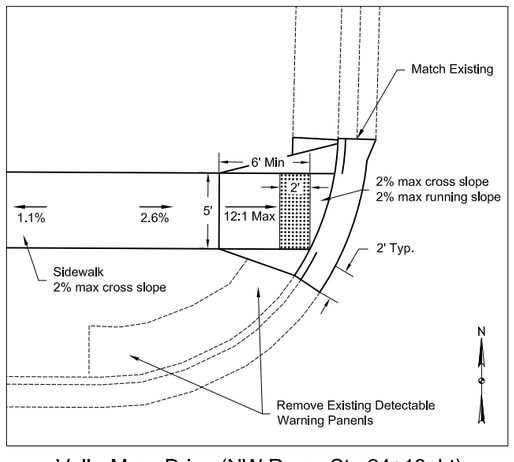
Volk Drive (NE Ramp Sta 28+58, Lt)



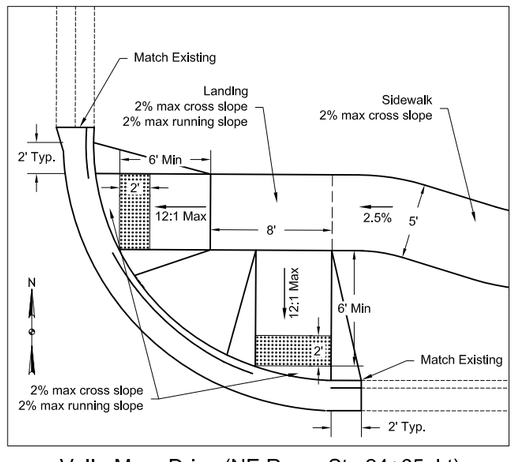
Crane Drive (SW Ramp Sta 31+62, Rt)



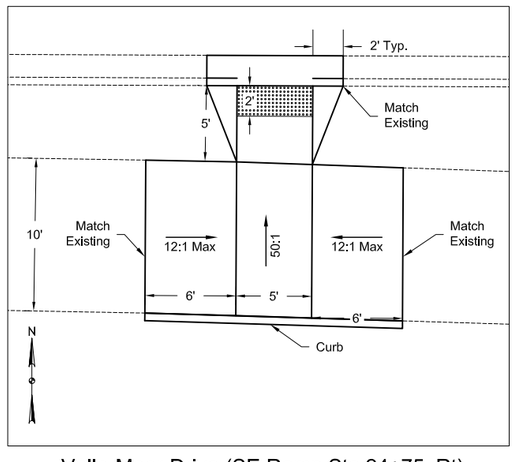
Crane Drive (SE Ramp Sta 32+12, Rt)



Valle-Moor Drive (NW Ramp Sta 24+19, Lt)



Valle-Moor Drive (NE Ramp Sta 24+65, Lt)



Valle-Moor Drive (SE Ramp Sta 24+75, 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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East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
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ADA Ramp Details

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EHH	NJW	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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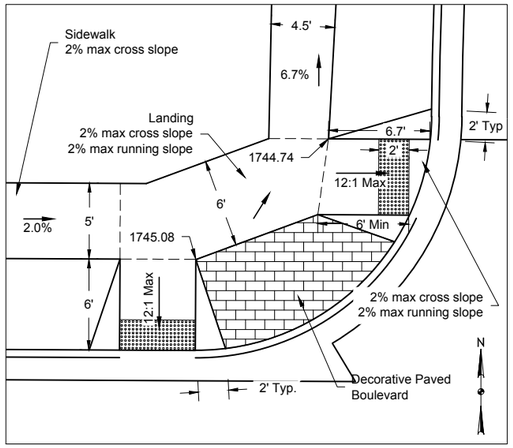
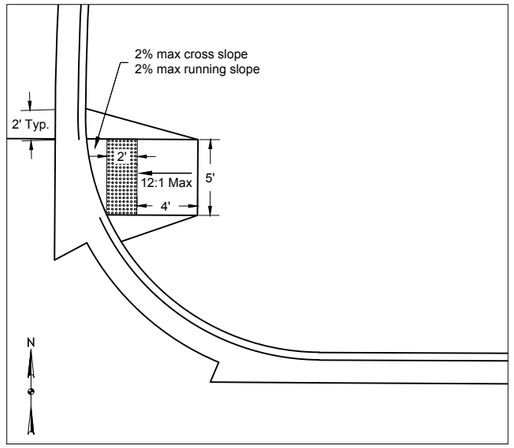
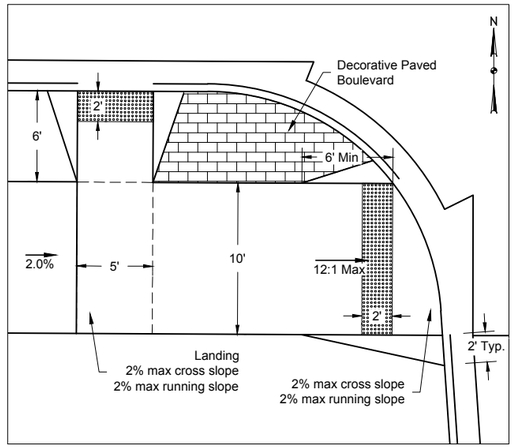


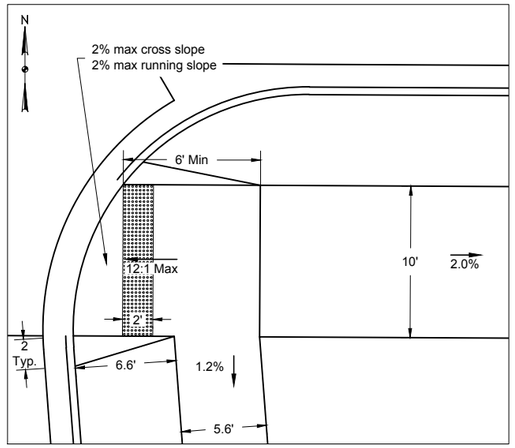
E Capitol Ave (NW Ramp Sta 37+45, Lt)



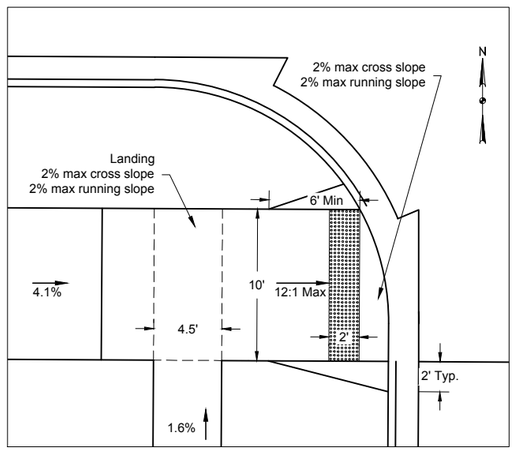
E Capitol (NE Ramp Sta 37+90, Lt)



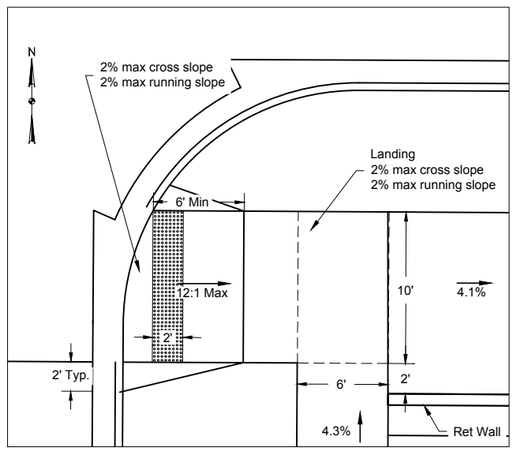
N 33rd Street (SW Ramp Sta 37+45, Rt)



N 33rd Street (SE Ramp Sta 37+95, Rt)



N 35th Street (SW Ramp Sta 45+40, Rt)



N 35th Street (SE Ramp Sta 45+90, 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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East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

ADA Ramp Details

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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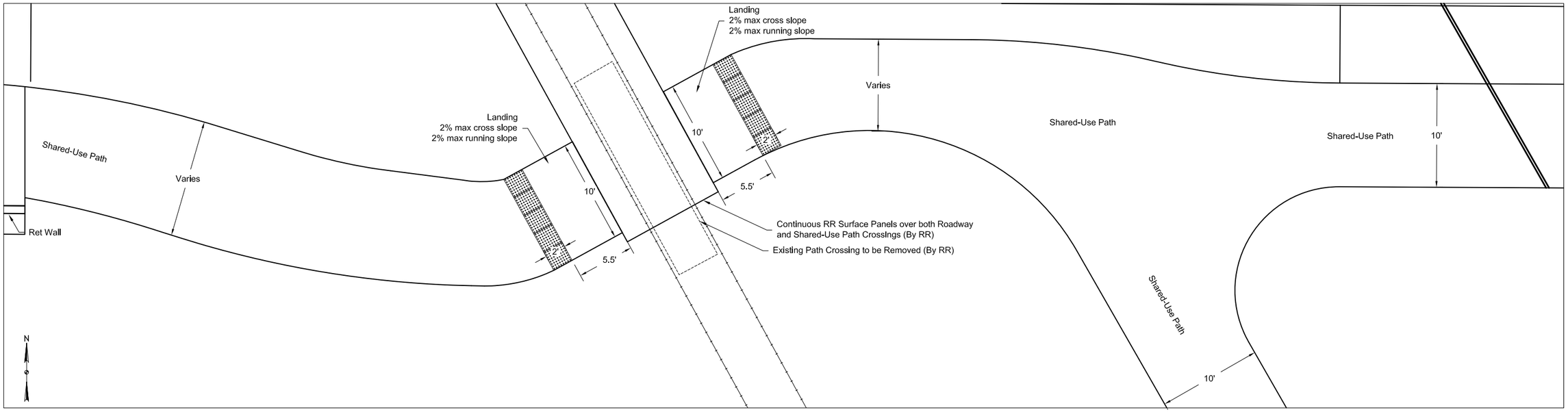
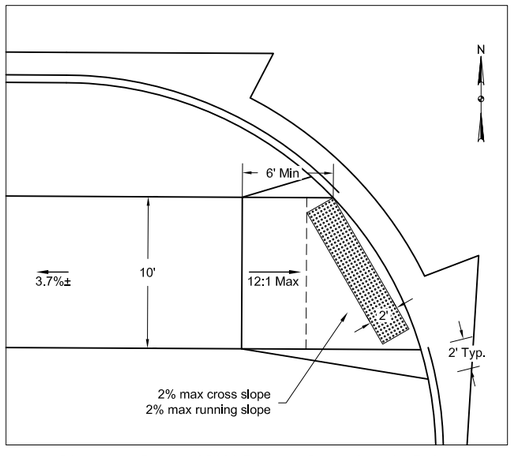
Aug 02, 2013 – 4:52pm – J:\trans\1411109\CADD\020GD_001_ADA.dwg

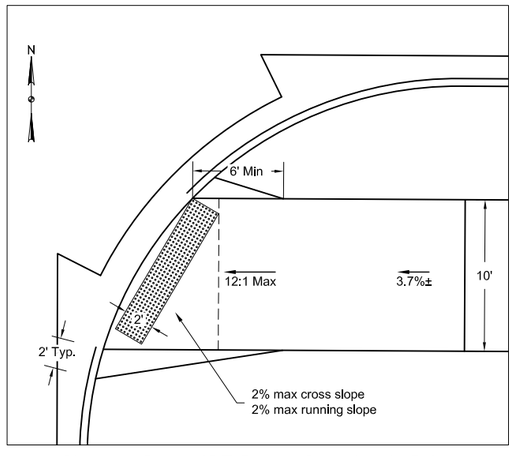
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	12



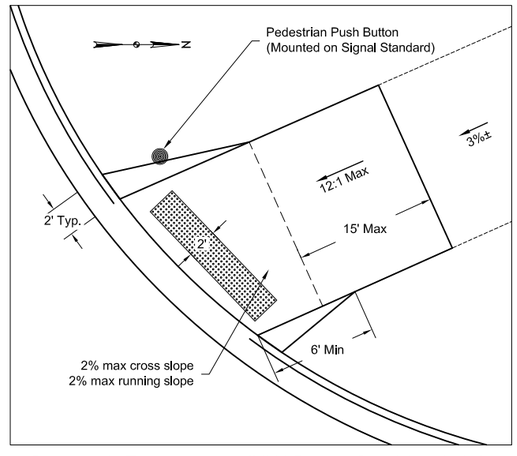
Rail Road Crossing (Sta 48+60, Rt)



Channel Drive (SW Ramp Sta 52+50, Rt)



Channel Drive (SE Ramp Sta 53+10, Rt)



Bismarck Expressway (NW Ramp Sta 66+52, 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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East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

ADA Ramp Details

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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Aug 07, 2013 – 1:50pm – J:\trans\1411109\CADD\020GD_001_ADA.dwg

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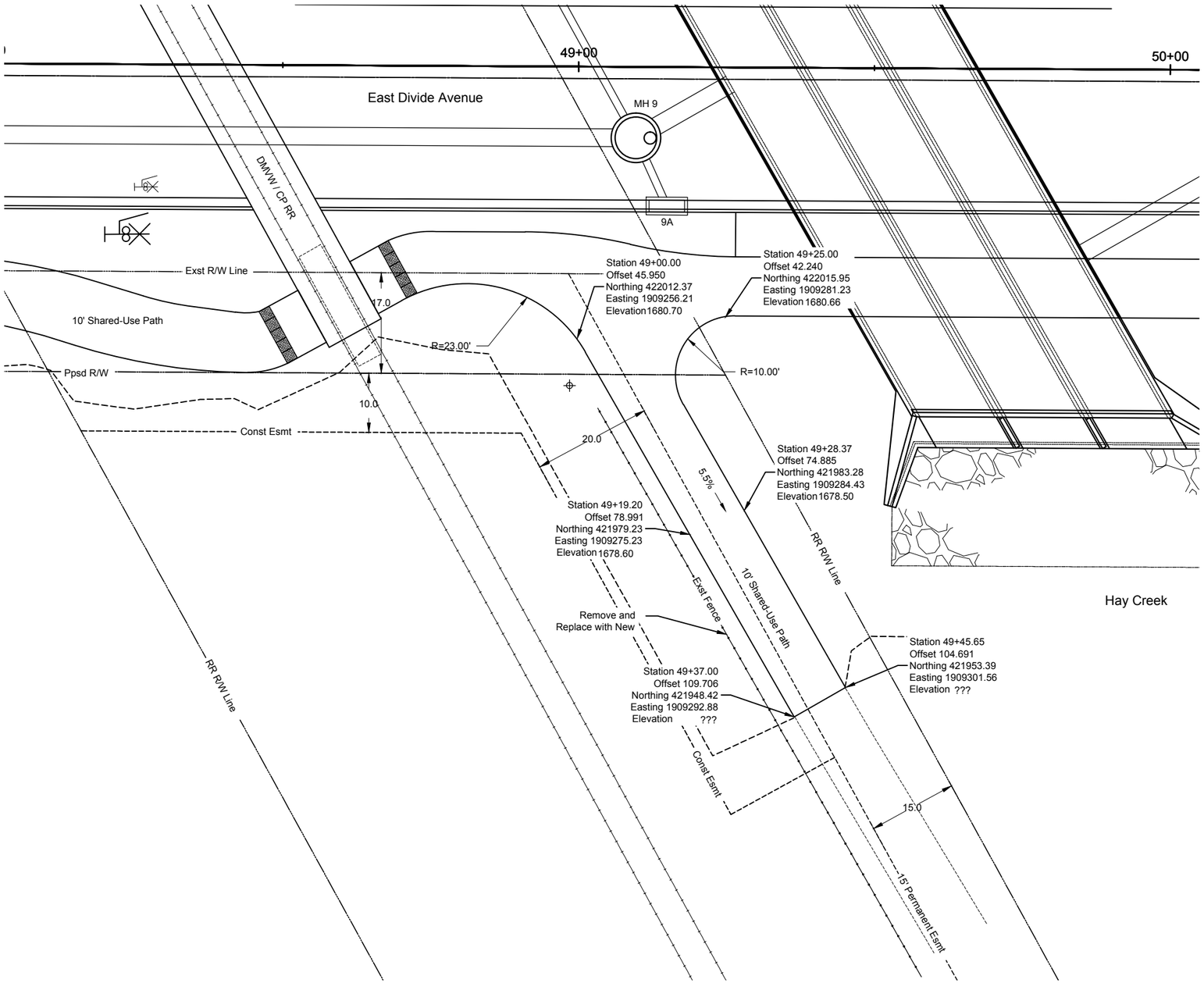

REMOVAL OF CHAIN LINK FENCE

EXISTING FENCE	62 LF

CHAIN LINK FENCE

Sta 49+03.51, 57.7' RT to 49+37.00, 109.7' RT	1 LSUM

Note:
Remove Existing Chain Link Fence along the Shared-Use Path and replace with a new 4' Galavanized Chain Link Fence.
New Fence shall match Existing Fence.

N

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Shared Use Path Detail

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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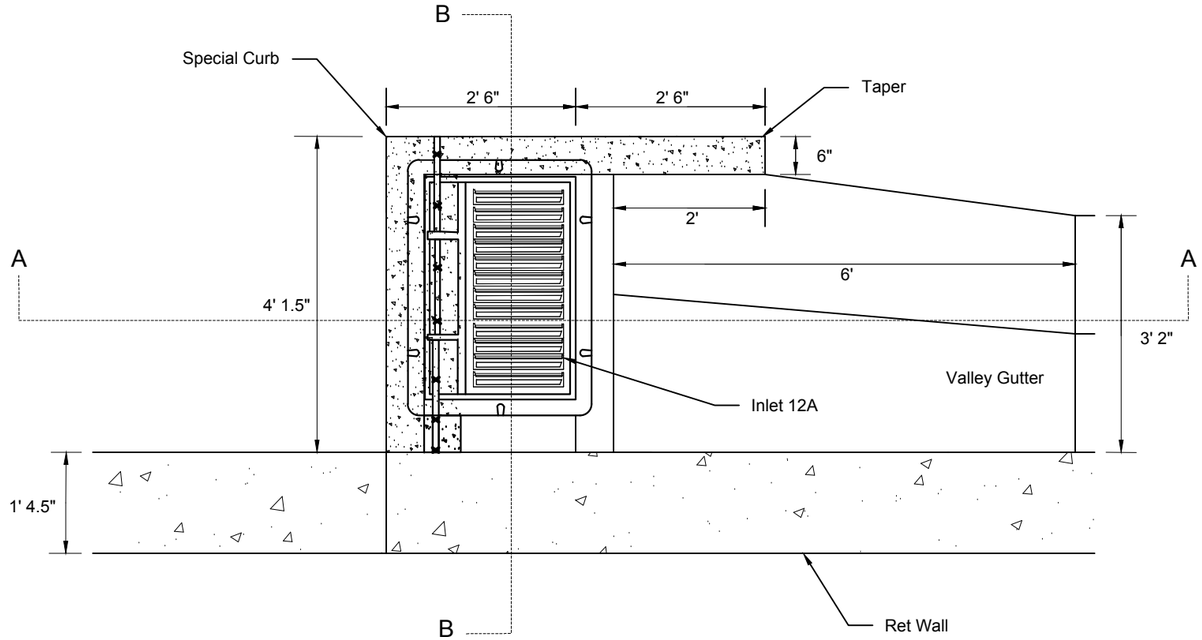
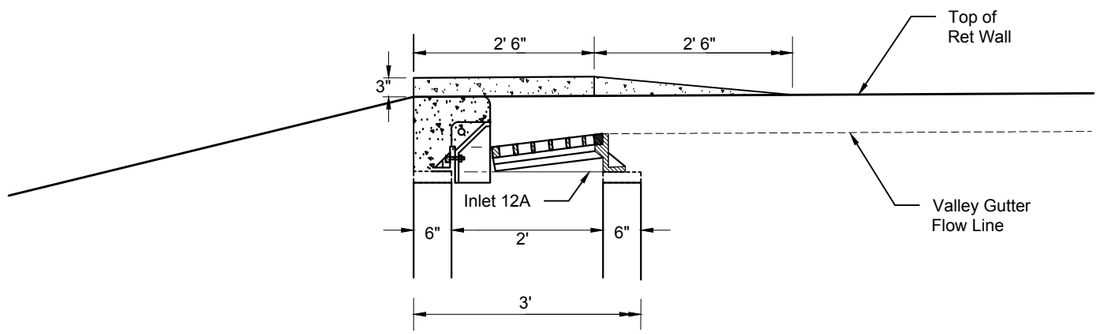
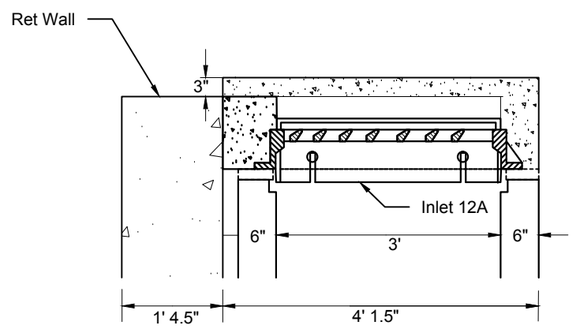
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	14



Plan View



Section A-A View



Section B-B View

Note:
Special Curb shall be constructed to force excess water to be directed southerly over the retaining wall. The special curb shall be poured integral with Valley Gutter and included in the SY bid price.

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CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

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Inlet 12A Detail

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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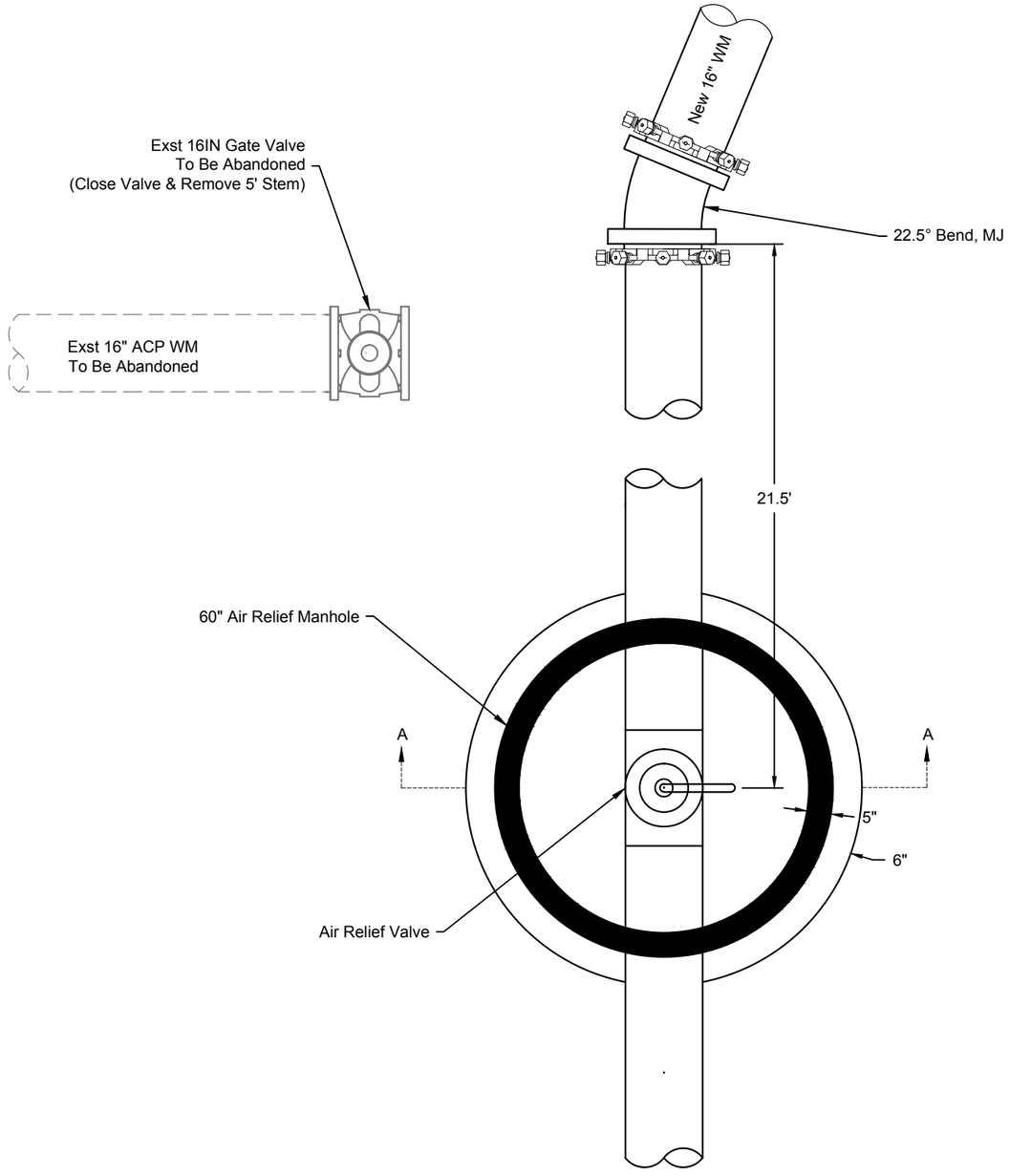
Aug 05, 2013 – 8:45am – J:\trans\1411109\CADD\020GD_001_DETAILS.dwg

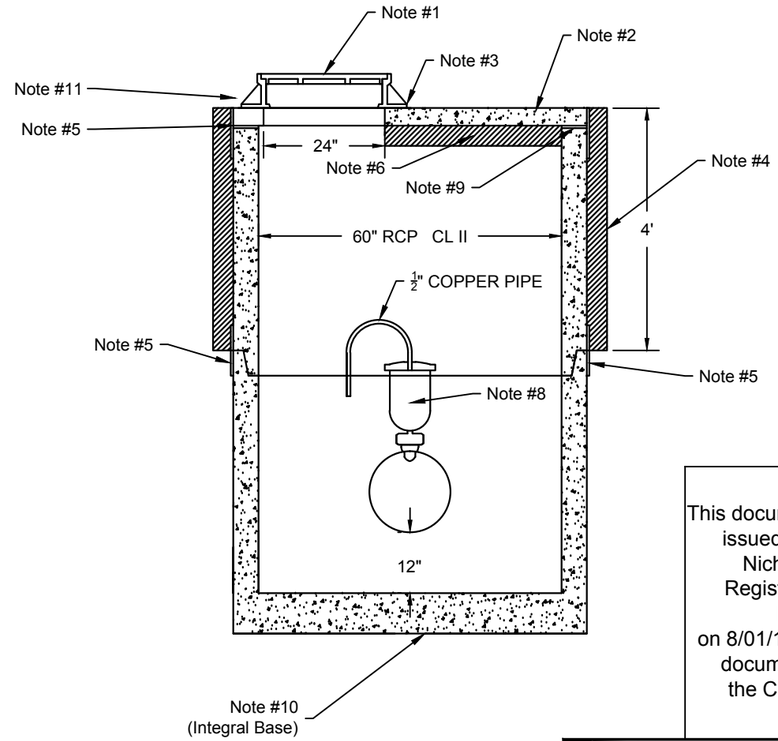
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	20	15

Note- Items outside of Manhole shall be paid for Seperately. Items inside of Manhole shall be included in the the price bid for "Air Relief Valve & Manhole"



Plan View

Note 1. Manhole casting and cover as defined in notes with insulated lid.
Note 2. Cretex 60" Type II Cover
Note 3. No Adjusting Rings
Note 4. 4" Styrofoam Insulation shall be installed around the outside of the top 4 feet of the Manhole and held in place by bands or glue until backfilled.
Note 5. Cretex CX-4 Joint or Exterior Seal by Press-Seal Gasket Corp. EZ Wrap and EZ Stik NO. 4 Primer, Cretex Specialty Products "Mac Wrap", or an approved equal.
Note 6. Install 4" Styrofoam insulation glued to the bottom of the Precast Cover.
Note 7. Manhole shall be supplied with Integral Pipe Boots.
Note 8. Aire Relief Valve as specified.
Note 9. Seal with Kentseal or an approved equal.
Note 10. Reinforced Precast Integral Manhole Base.
Note 11. Steps shall not be placed in Air Relief Manholes.



Section A-A

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East Divide Avenue
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Air Release Manhole

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NW	1411109	Aug 2013

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Aug 05, 2013 – 8:45am – J:\trans\1411109\CADD\020GD_001_DETAILS.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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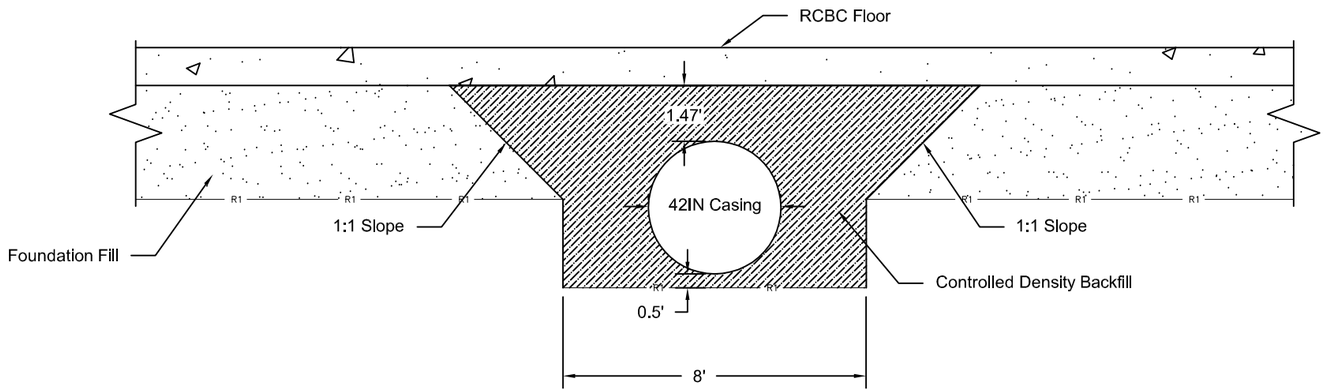

Approx. 156 Cu. Yd. Controlled Density Backfill
(Included in Price Bid for Casing Pipe 42IN)

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CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
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Casing Pipe 42IN
Installation Detail

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NJW	1411109	Aug 2013

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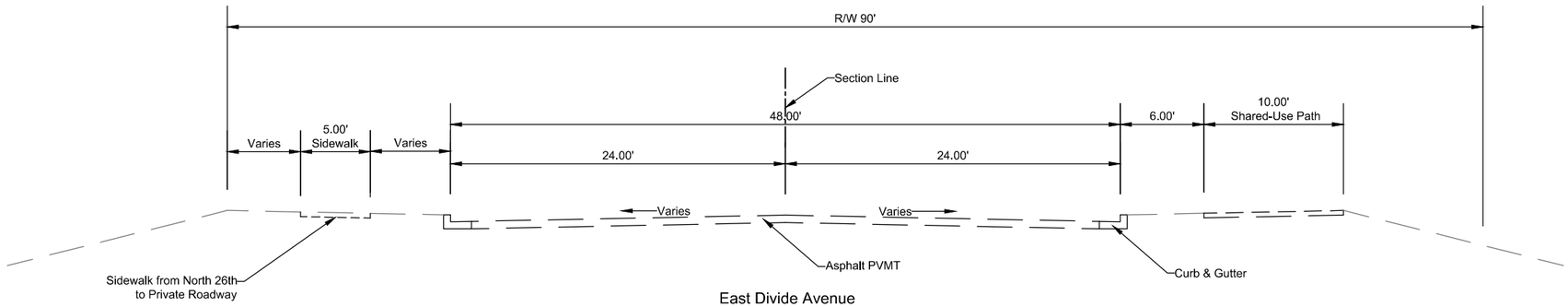
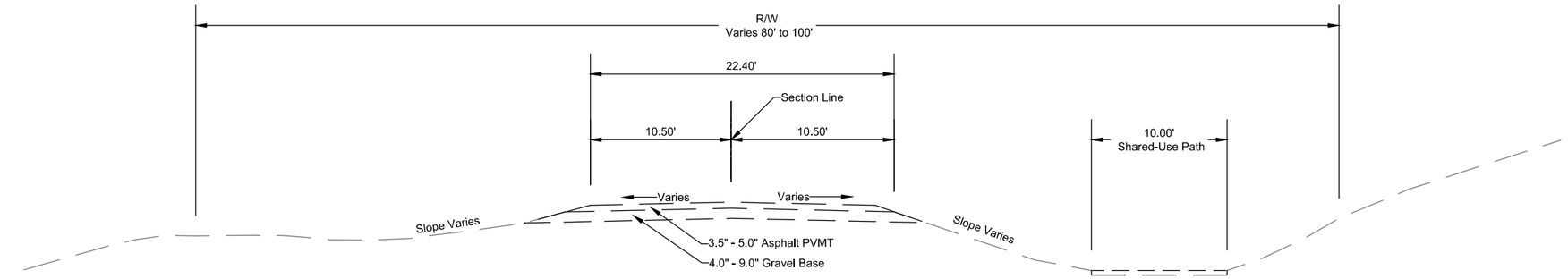
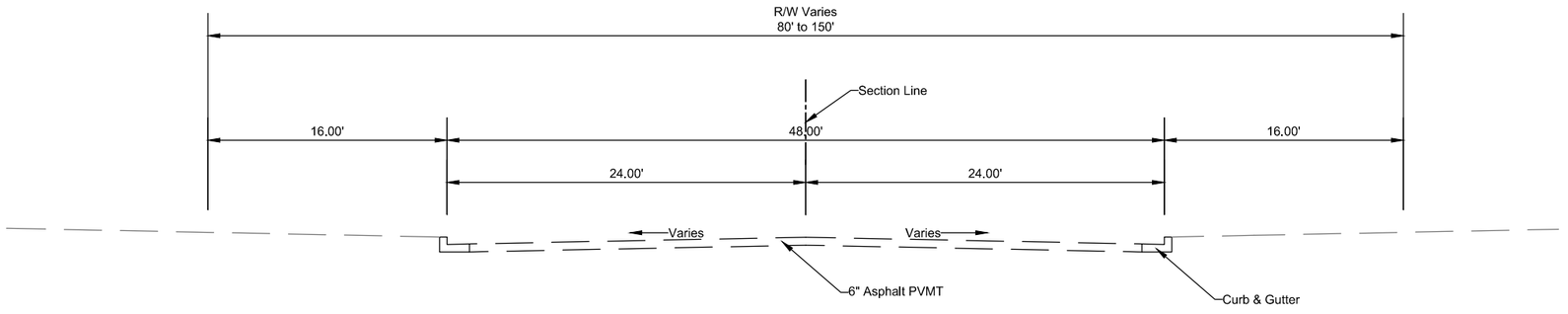
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	30	1



East Divide Avenue
(North 26th Street to Volk Drive)



East Divide Avenue
(Volk Drive to Channel Drive)



Commerce Drive
(to Industrial Drive)

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Existing
Typical Sections

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
TSA	TJR	1411109	Aug 2013

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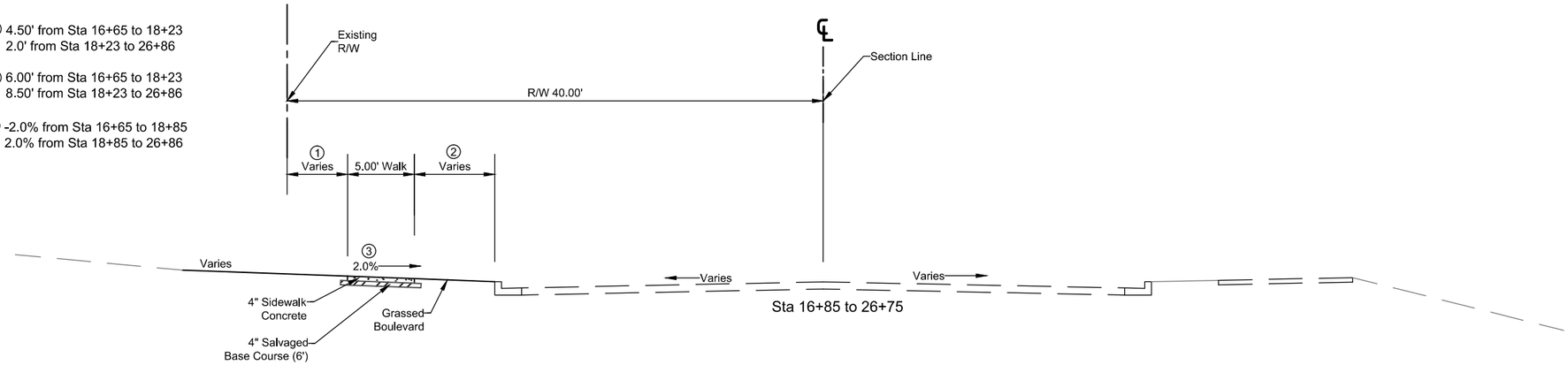
Aug 08, 2013 – 11:45am – J:\trans\1411109\CADD\030TP_001_TYP.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	30	2

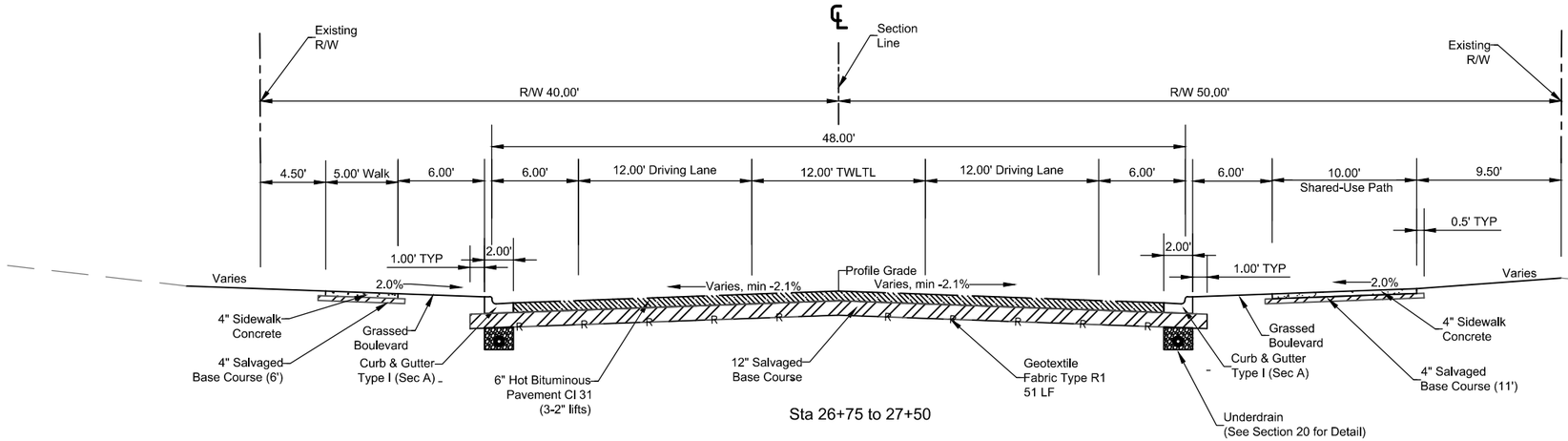
① 4.50' from Sta 16+65 to 18+23
2.0' from Sta 18+23 to 26+86

② 6.00' from Sta 16+65 to 18+23
8.50' from Sta 18+23 to 26+86

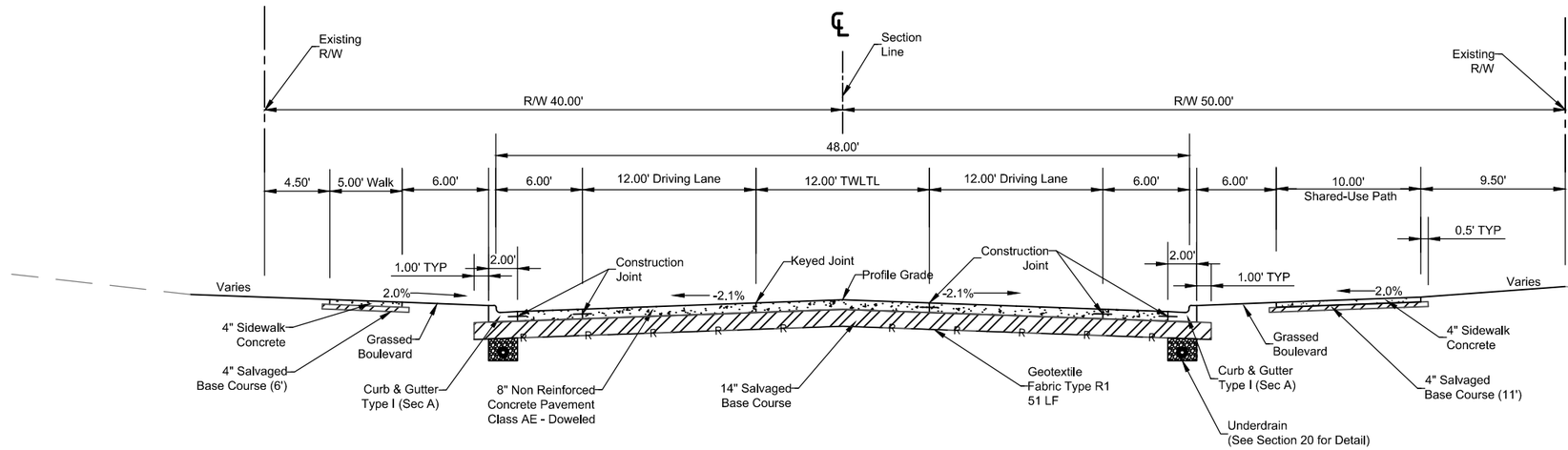
③ -2.0% from Sta 16+65 to 18+85
2.0% from Sta 18+85 to 26+86



Sta 16+85 to 26+75



Sta 26+75 to 27+50



Sta 27+50 to 37+50

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Proposed
Typical Sections

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	TJR	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	30	3

① Alignment distance from Section line
- 0' from Sta 37+50 to 40+50
- Varies from Sta 40+50 to 42+50
- 2' from Sta 42+50 to 48+30

② ROW distance from Section line
- 40' from Sta 37+50 to 43+26
- 50' from Sta 43+26 to 48+30

③ Retaining Wall and 12' Shared-Use Path
(See Section 171 for Detail)
- Sta 39+75 to 45+10
- Sta 46+04 to 48+00

④ Fence and additional concrete behind Retaining Wall
(See Section 171 for Detail)
- Sta 39+75 to 45+10

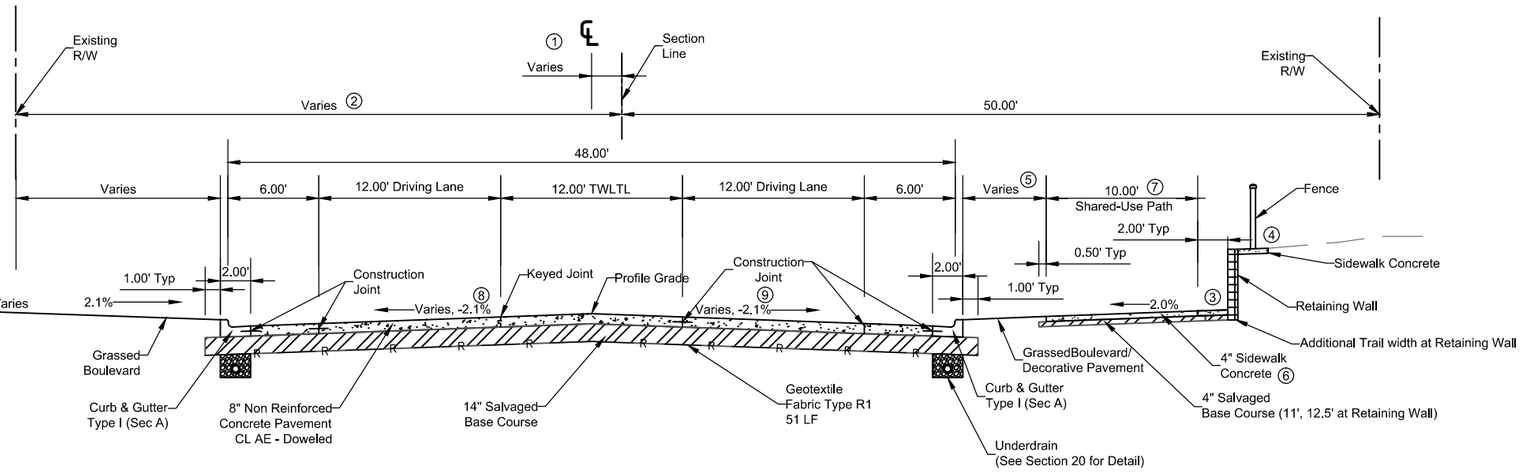
⑤ Boulevard Width
- 6' from Sta 37+50 to 40+50
- Varies from 40+50 to 42+50
- 8' from 42+50 to 48+00
- Varies from 48+00 to 48+30

⑥ Sidewalk Concrete
(See Section 171 for Detail)
- Bid Item: CLASS AAE- 3 CONCRETE
-Sta 46+04 to 48+00

⑦ 10' Shared-Use Path
- Sta 48+25 to 48+75 has -2.00% slope

⑧ - Slope is 2.1% from Sta 37+50 to 47+53
- Slope varies from Sta 47+53 to 48+30

⑨ - Slope is 2.1% from Sta 37+50 to 47+73
- Slope varies from Sta 47+73 to 48+30



Sta 37+50 to 48+30

① Alignment distance from Section line
- 2' from Sta 48+30 to 60+50
- Varies from Sta 60+50 to 62+00
- 0' from Sta 62+00 to 63+41

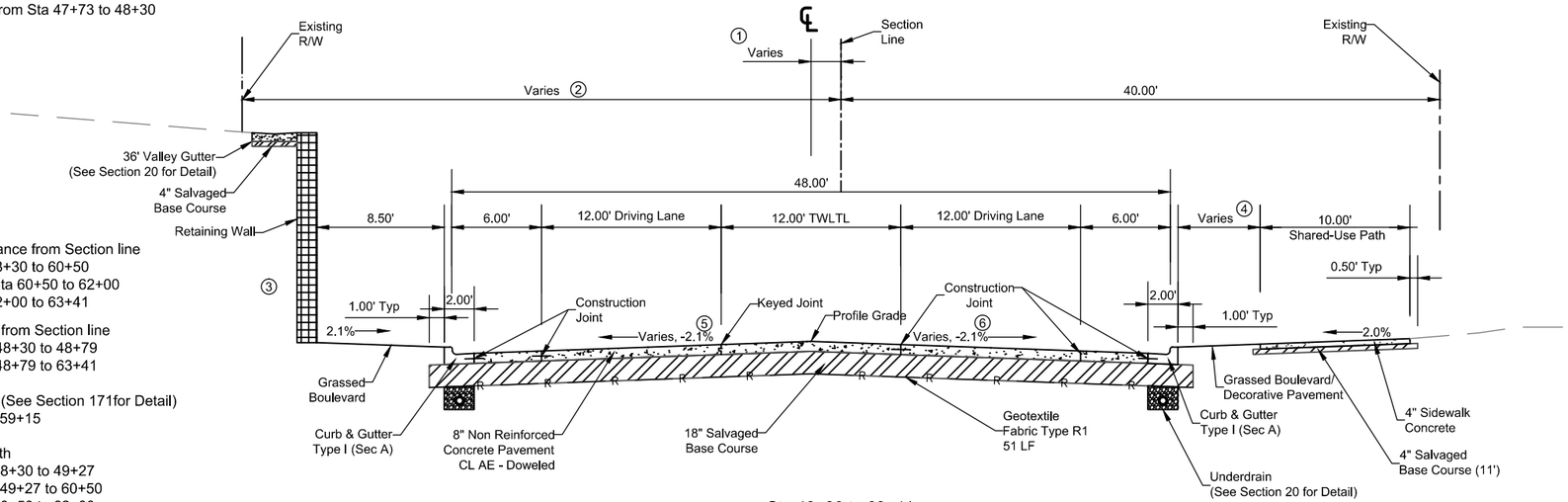
② ROW distance from Section line
- 50' from Sta 48+30 to 48+79
- 40' from Sta 48+79 to 63+41

③ Retaining Wall (See Section 171for Detail)
- Sta 55+45 to 59+15

④ Boulevard Width
- Varies from 48+30 to 49+27
- 7.5' from Sta 49+27 to 60+50
- Varies from 60+50 to 62+00
- 5.5' from 62+00 to 63+10

⑤ - Slope varies from Sta 48+30 to 48+90
- Slope is 2.1% from 48+90 to 63+41

⑥ - Slope varies from Sta 48+30 to 49+40
- Slope is 2.1% from 40+40 to 63+41



Sta 48+30 to 63+41

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Proposed
Typical Sections

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
TSA	TJR	1411109	Aug 2013

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Aug 08, 2013 – 11:45am – J:\trans\1411109\CADD\030TP_001_TYP.dwg

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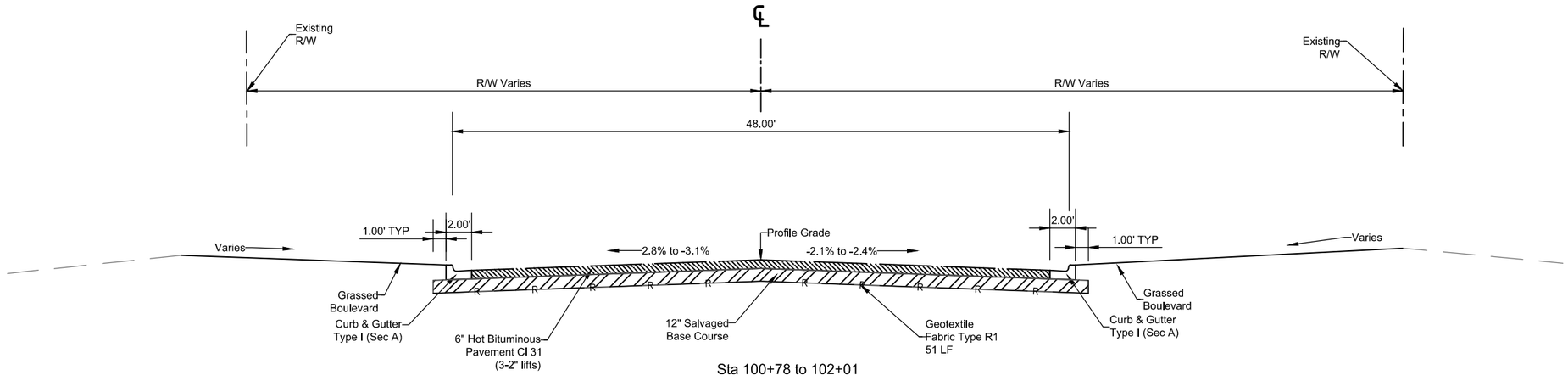

Sta 100+78 to 102+01

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BISMARCK, NORTH DAKOTA

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Commerce Drive
Proposed
Typical Sections

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NJW	1411109	Aug 2013

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Aug 08, 2013 – 11:45am – J:\trans\1411109\CADD\030TP_001_TYP.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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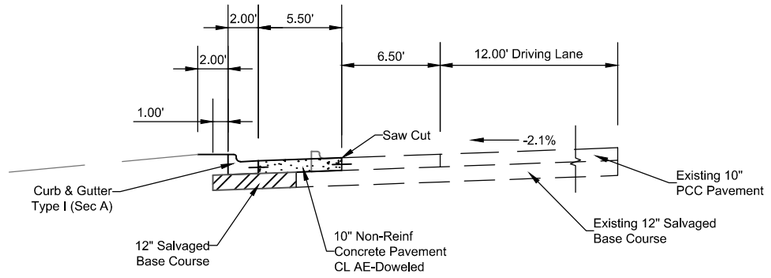

Sta 1387+10 to 1390+45

East Bismarck Expressway

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EAST DIVIDE AVENUE

CITY OF BISMARCK

BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson

Engineers Surveyors Planners

East Bismarck Expressway
Proposed
Typical Sections

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	TJR	1411109	Aug 2013

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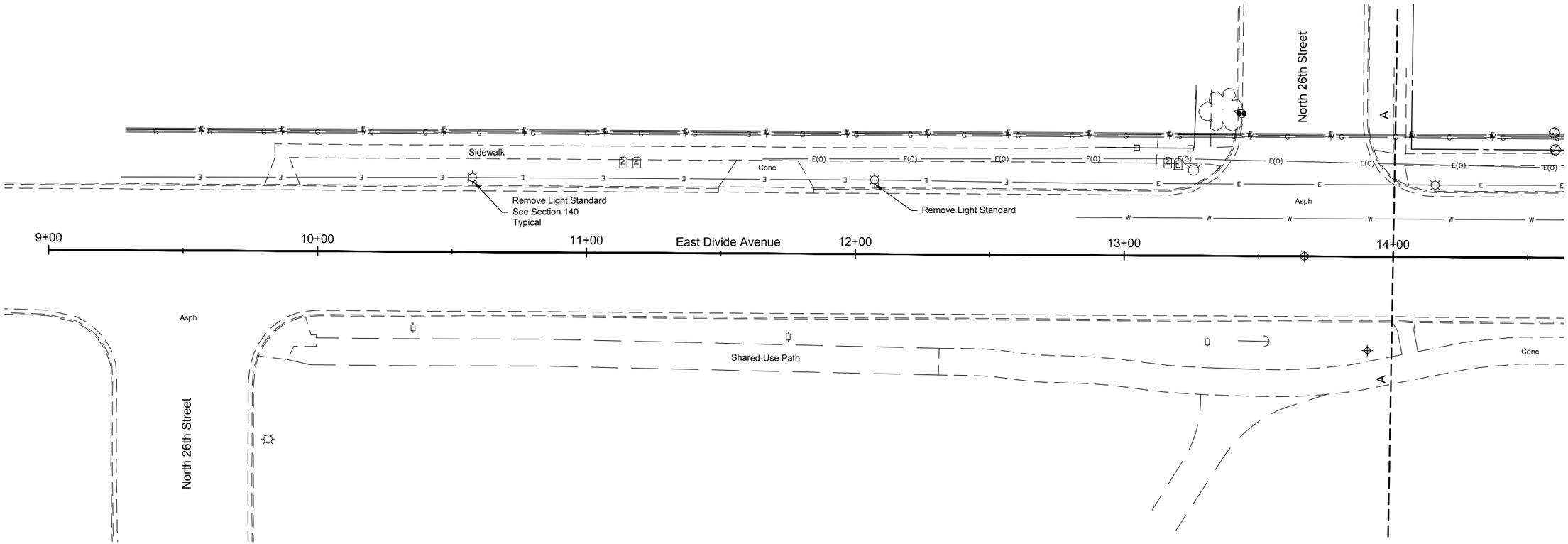
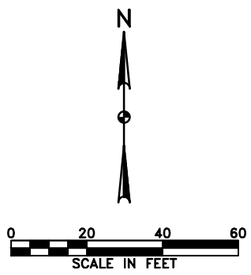
Aug 08, 2013 – 11:45am – J:\trans\1411109\CADD\030TP_001_TYP.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	1





REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 9+00 to 14+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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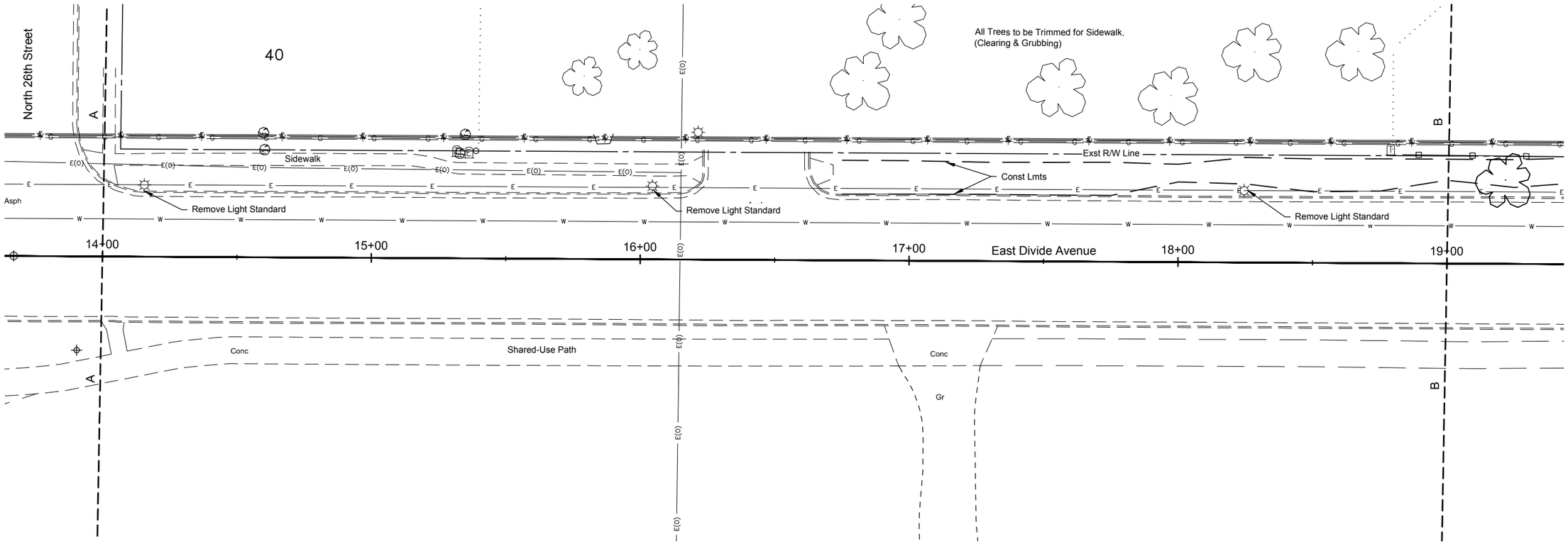
Aug 08, 2013 – 11:49am – J:\trans\1411109\CADD\040RM_001_RDL.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	2



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REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 14+00 to 19+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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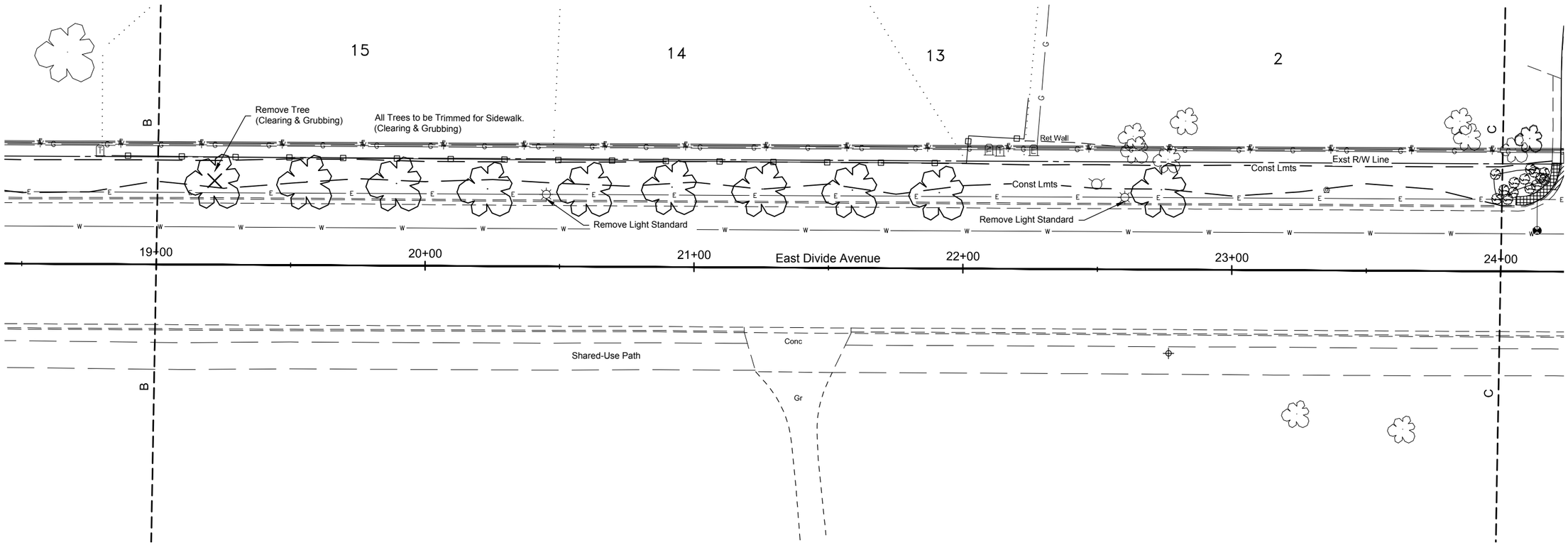
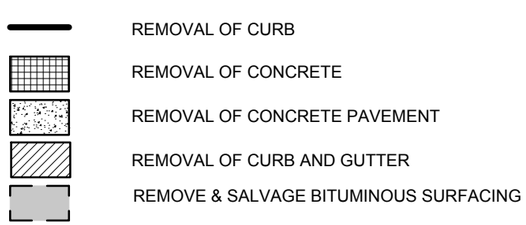
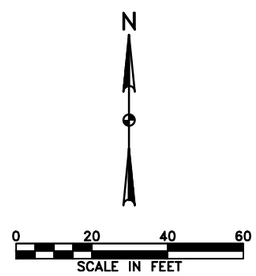
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	3







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 19+00 to 24+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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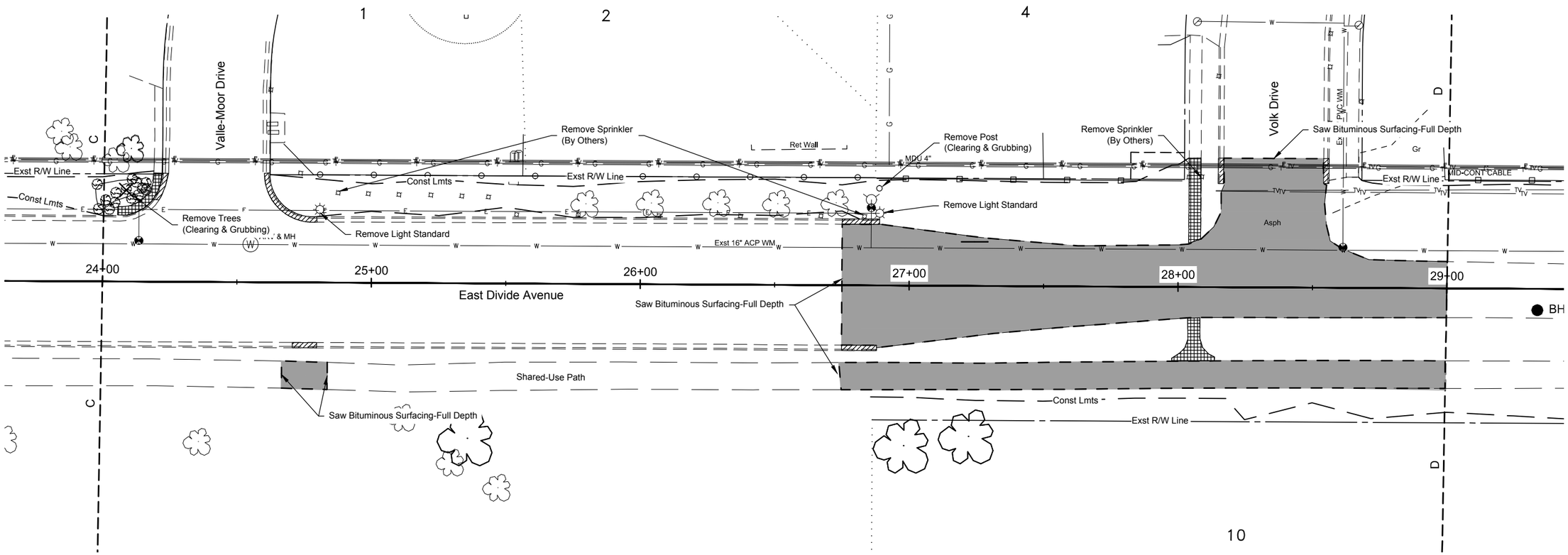
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	4



REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 26+75 to 29+00 (Mainline)	296	TON
Sta 24+66 to 24+84 (Trail)	3	TON
Sta 26+74 to 29+00 (Trail)	42	TON
Total	341	TON

REMOVAL OF CONCRETE

Sta 24+05 to 24+22 LT (Trail)	7	SY
Sta 28+04 to 28+08 LT (Sidewalk)	15	SY
Sta 27+98 to 28+14 RT (Sidewalk)	13	SY
Total	35	SY

SAW CONCRETE

Sta 24+19, 40' LT to 24+24, 40' LT	5	LF
Sta 24+19, 31' LT to 24+21, 30' LT	2	LF
Sta 26+75, 22' RT to 26+75, 24' RT	2	LF
Sta 26+75, 22' LT to 26+75, 24' LT	2	LF
Sta 24+60, 41' LT to 24+62, 41' LT	2	LF
Sta 24+80, 22' LT to 24+80, 24' LT	2	LF
Sta 24+71, 22' RT to 24+71, 24' RT	2	LF
Sta 24+80, 22' RT to 24+80, 24' RT	2	LF
Sta 28+04, 48' LT to 28+08, 48' LT	4	LF
Sta 28+15, 48' LT to 28+17, 48' LT	2	LF
Sta 28+54, 48' LT to 28+56, 48' LT	2	LF
Total	27	LF

REMOVAL OF CURB & GUTTER

Sta 24+21, 30' LT to 24+24, 40' LT	11	LF
Sta 24+60, 41' LT to 24+80, 22' LT	31	LF
Sta 24+71, 22' RT to 24+80, 22' RT	9	LF
Sta 26+75, 23' RT to 26+89, 23' RT	14	LF
Sta 26+75, 23' LT to 26+89, 23' LT	14	LF
Sta 28+17, 38' LT to 28+17, 48' LT	10	LF
Sta 28+54, 38' LT to 28+54, 48' LT	10	LF
Total	99	LF

SAW BITUMINOUS SURFACING-FULL DEPTH

Sta 24+66, 39' RT to 24+66, 29' RT	10	LF
Sta 24+84, 39' RT to 24+84, 29' RT	10	LF
Sta 26+75, 39' RT to 26+75, 29' RT	10	LF
Sta 26+75, 23' RT to 26+75, 23' LT	46	LF
Sta 28+17, 48' LT to 28+54, 48' LT	37	LF
Total	113	LF

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 24+00 to 29+00

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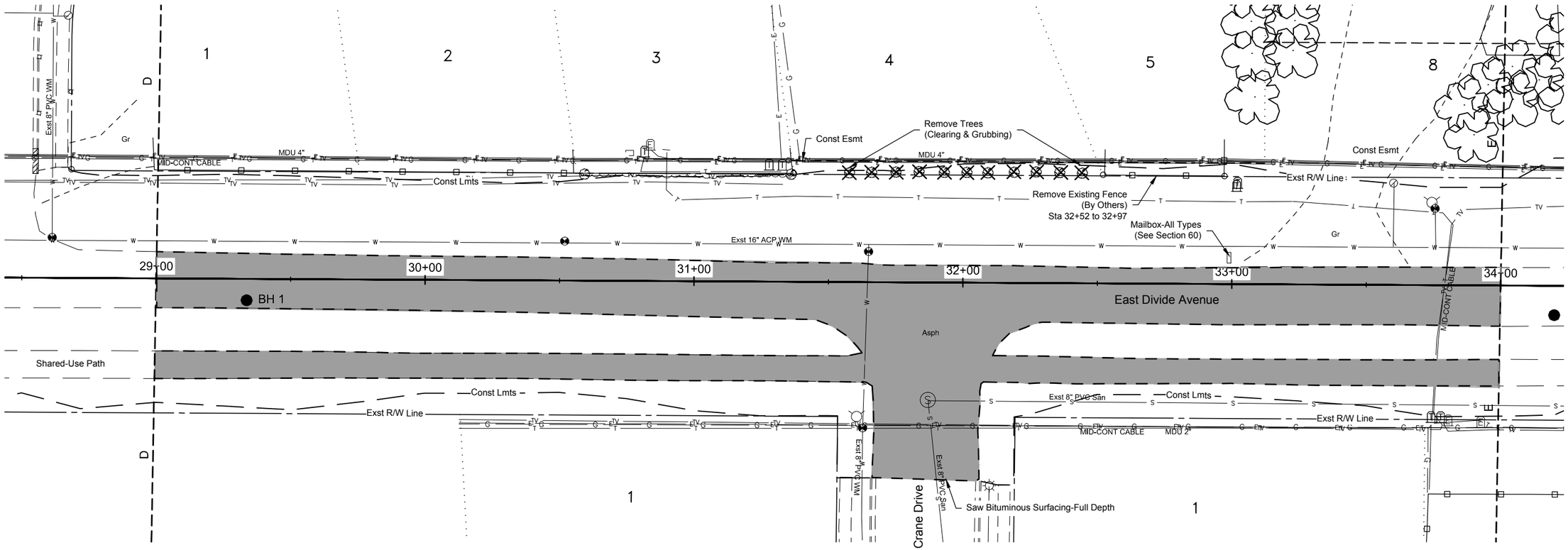

REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 29+00 to 34+00 (Mainline)	403	TON
Sta 29+00 to 31+66 (Trail)	47	TON
Sta 32+07 to 34+00 (Trail)	34	TON
Total	484	TON

SAW BITUMINOUS SURFACING-FULL DEPTH

Sta 31+66, 73' RT to 32+07, 73' RT	41	LF

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REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Removals

Sta 29+00 to 34+00

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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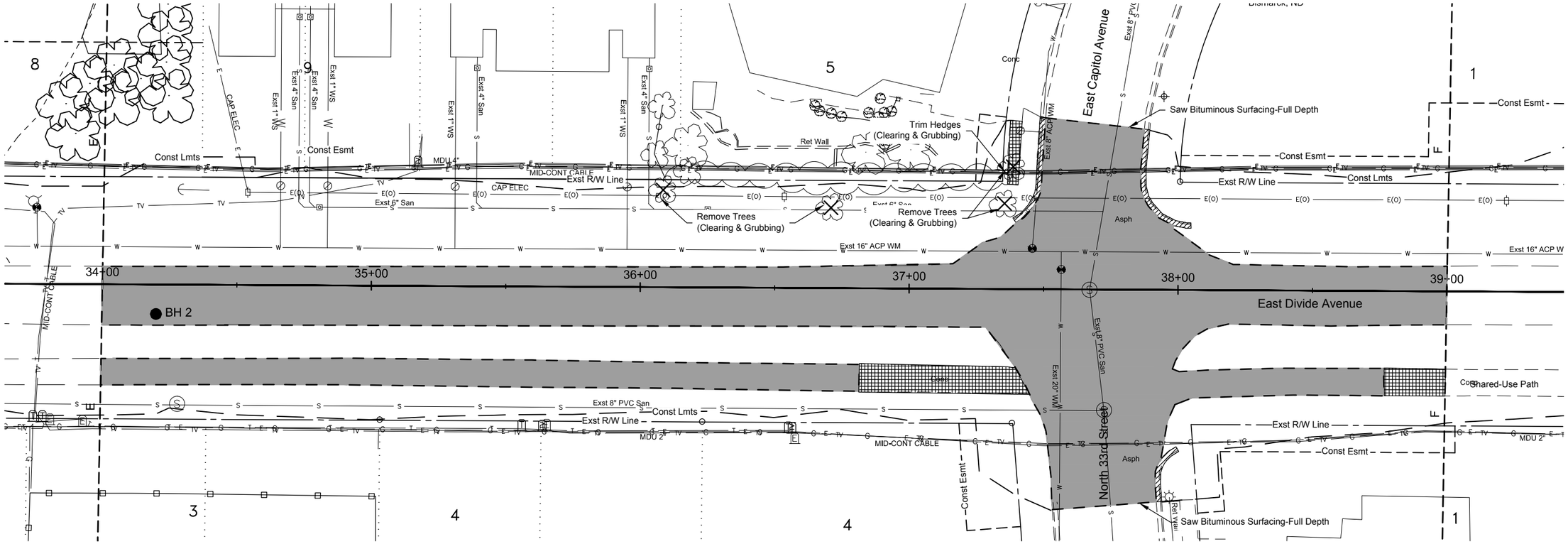

REMOVE & SALVAGE BITUMINOUS SURFACING		
Sta 34+00 to 39+00 (Mainline)	532	TON
Sta 34+00 to 36+82 (Trail)	51	TON
Sta 37+99 to 39+00 (Trail)	15	TON
Total	598	TON

REMOVAL OF CONCRETE		
Sta 36+82 to 37+45 RT	68	SY
Sta 37+37 to 37+42 LT	11	SY
Sta 38+77 to 39+00 LT	26	SY
Total	105	SY

SAW CONCRETE		
Sta 37+37, 63' LT to 37+42, 63' LT	5	LF
Sta 37+48, 64' LT to 37+50, 64' LT	2	LF
Sta 37+87, 60' LT to 37+89, 60' LT	2	LF
Sta 37+92, 79' RT to 37+94, 79' RT	2	LF
Total	11	LF

REMOVAL OF CURB & GUTTER		
Sta 37+39, 25' LT to 37+50, 64' LT	43	LF
Sta 37+87, 60' LT to 38+05, 23' LT	48	LF
Sta 37+92, 79' RT to 38+00, 60' RT	26	LF
Total	117	LF

SAW BITUMINOUS SURFACING-FULL DEPTH		
Sta 37+53 , 82' RT to 37+92, 80' RT	40	LF
Sta 37+51, 64' LT to 37+87, 60' LT	37	LF
Total	77	LF

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals
Sta 34+00 to 39+00

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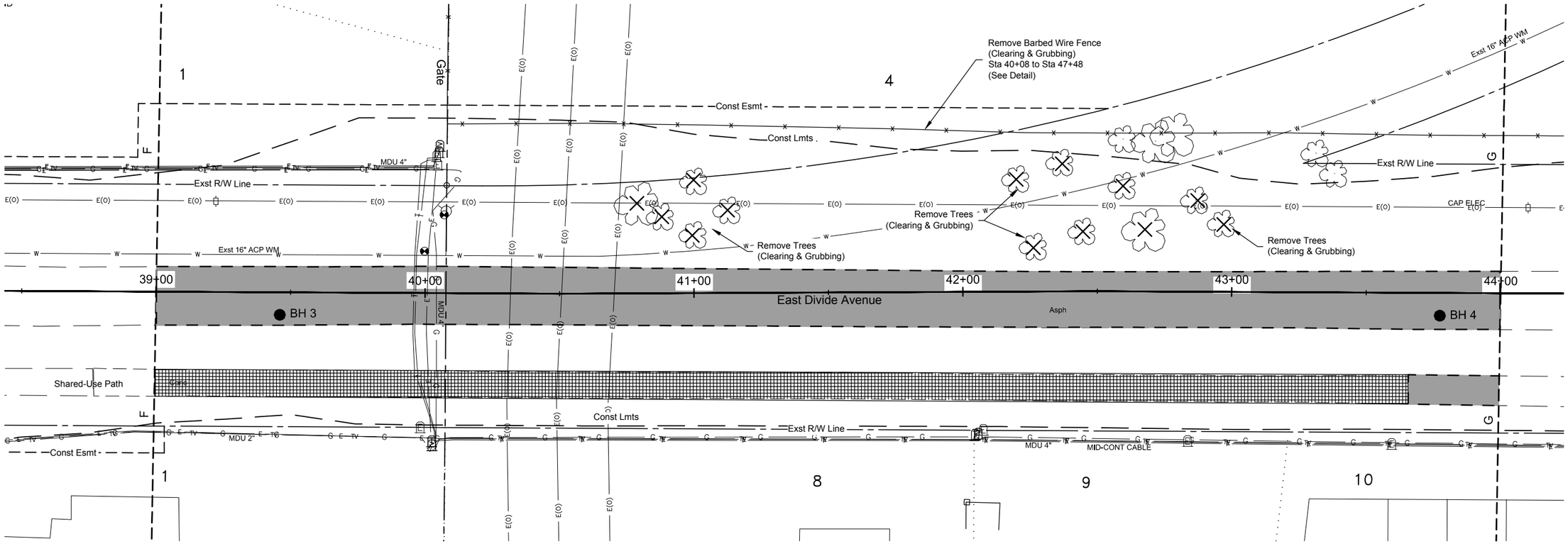
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	7



REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 39+00 to 44+00 (Mainline)	328	TON
Sta 43+65 to 44+00 (Trail)	7	TON
Total	335	TON

REMOVAL OF CONCRETE

Sta 39+00 to 43+65 RT (Trail)	511	SY

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SCALE IN FEET

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Removals

Sta 39+00 to 44+00

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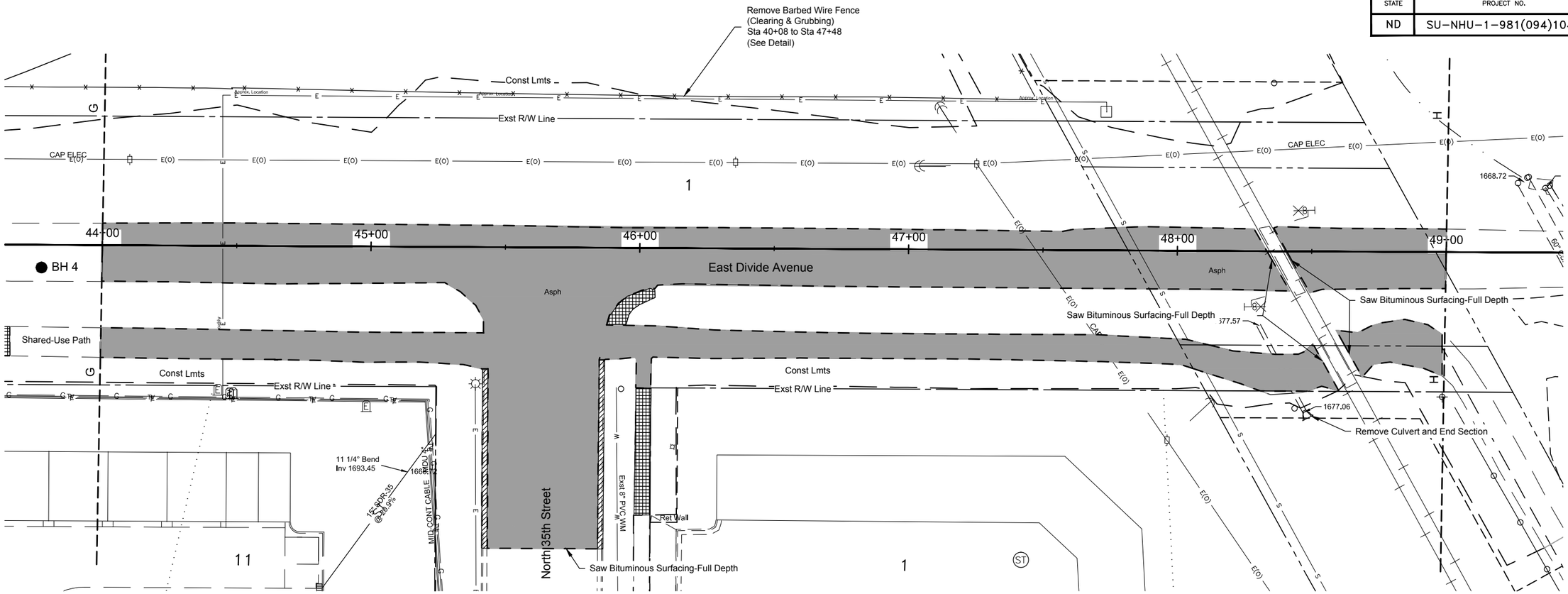
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	8



REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 44+00 to 48+42 (Mainline)	426	TON
Sta 48+36 to 49+00 (Mainline)	40	TON
Sta 44+00 to 45+44 (Trail)	30	TON
Sta 45+85 to 48+60 (Trail)	53	TON
Sta 48+59 to 49+00 (Trail)	11	TON
Total	560	TON

REMOVAL OF CONCRETE

Sta 45+88 to 46+06 RT	11	SY
Sta 46+01, 52' RT to 46+01, 100' RT	30	SY
Total	41	SY

SAW CONCRETE

Sta 45+42, 112' RT to 45+44, 112' RT	2	LF
Sta 45+85, 112' RT to 45+87, 112' RT	2	LF
Sta 45+98, 100' RT to 46+04, 100' RT	6	LF
Total	10	LF

REMOVAL OF CURB & GUTTER

Sta 45+44, 112' RT to 45+44, 45' RT	67	LF
Sta 45+85, 112' RT to 45+85, 42' RT	70	LF
Total	137	LF

SAW BITUMINOUS SURFACING-FULL DEPTH

Sta 45+44, 112' RT to 45+85, 112' RT	41	LF
Sta 48+29, 8' LT to 48+42, 15' RT	27	LF
Sta 48+51, 34' RT to 48+60, 52' RT	28	LF
Sta 48+36, 9' LT to 48+49, 15' RT	20	LF
Sta 48+59, 29' RT to 48+69, 47' RT	20	LF
Total	136	LF

REMOVAL OF CULVERT AND END SECTION (Not a Pay Item)

Sta 48+30 to 48+50 RT (18" CSP)	36	LF

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 44+00 to 49+00

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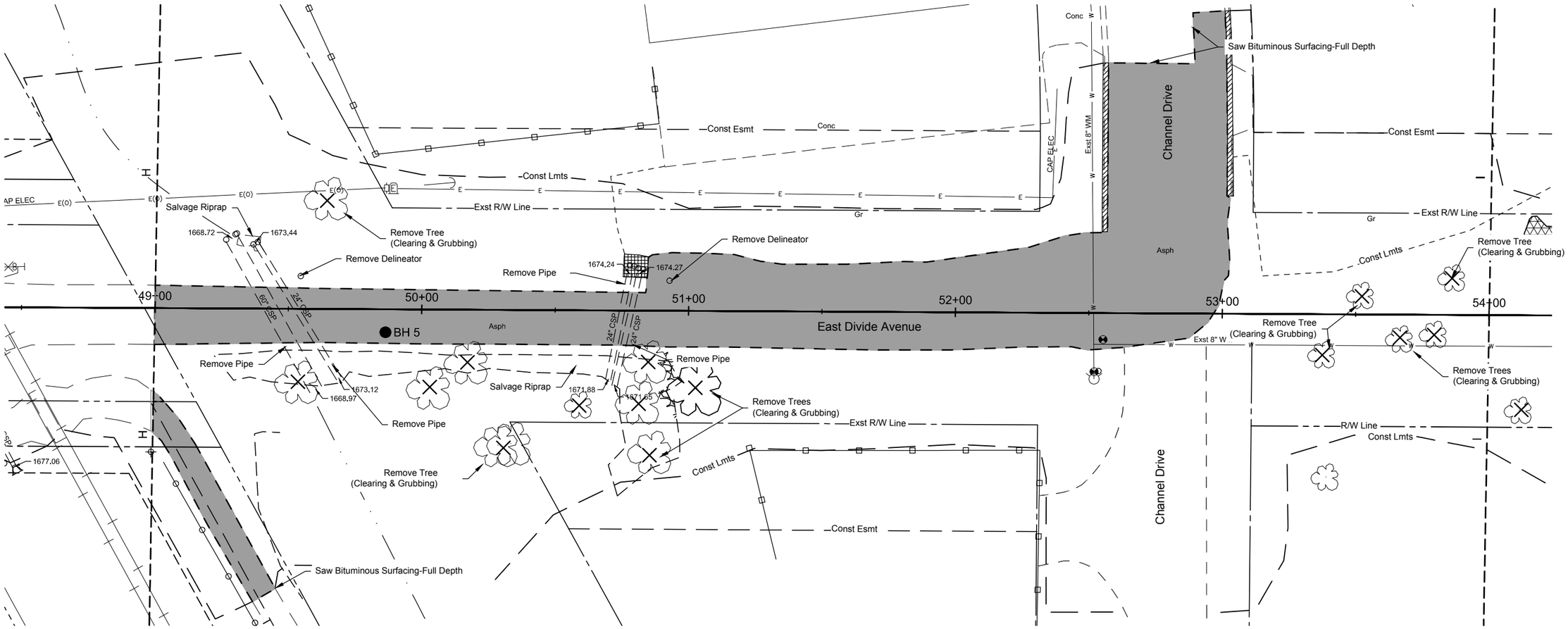
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	9



REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 49+00 to 53+02 (Mainline)	451	TON
Sta 49+00 to 49+37 (Trail)	16	TON
Total	467	TON

REMOVAL OF CONCRETE

Sta 50+75 to 50+84, LT	8	SY

SAW CONCRETE

Sta 52+55, 94' LT to 52+57, 94' LT	2	LF
Sta 53+02, 114' LT to 53+04, 114' LT	2	LF
Total	4	LF

REMOVAL OF CURB & GUTTER

Sta 52+57, 32' LT to 52+57, 94' LT	63	LF
Sta 53+02, 44' LT to 53+02, 114' LT	70	LF
Total	133	LF

SAW BITUMINOUS SURFACING-FULL DEPTH

Sta 52+57, 94' LT to 52+89, 94' LT	33	LF
Sta 49+37, 110' LT to 49+46, 105' LT	10	LF
Sta 52+89, 94' LT to 52+89, 113' LT	19	LF
Sta 52+89, 113' LT to 53+00, 114' LT	12	LF
Total	74	LF

REMOVAL OF CULVERT AND END SECTION (Not a Pay Item)

Sta 49+26 25' LT to 49+63 32' RT (60" CSP)	65	LF
Sta 49+37 25' LT to 49+70 27' RT (24" CSP)	60	LF
Sta 50+69 26' RT to 50+79 14' LT (24" CSP)	40	LF
Sta 50+72 29' RT to 50+83 14' LT (24" CSP)	43	LF
Total	208	LF

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals
Sta 49+00 to 54+00

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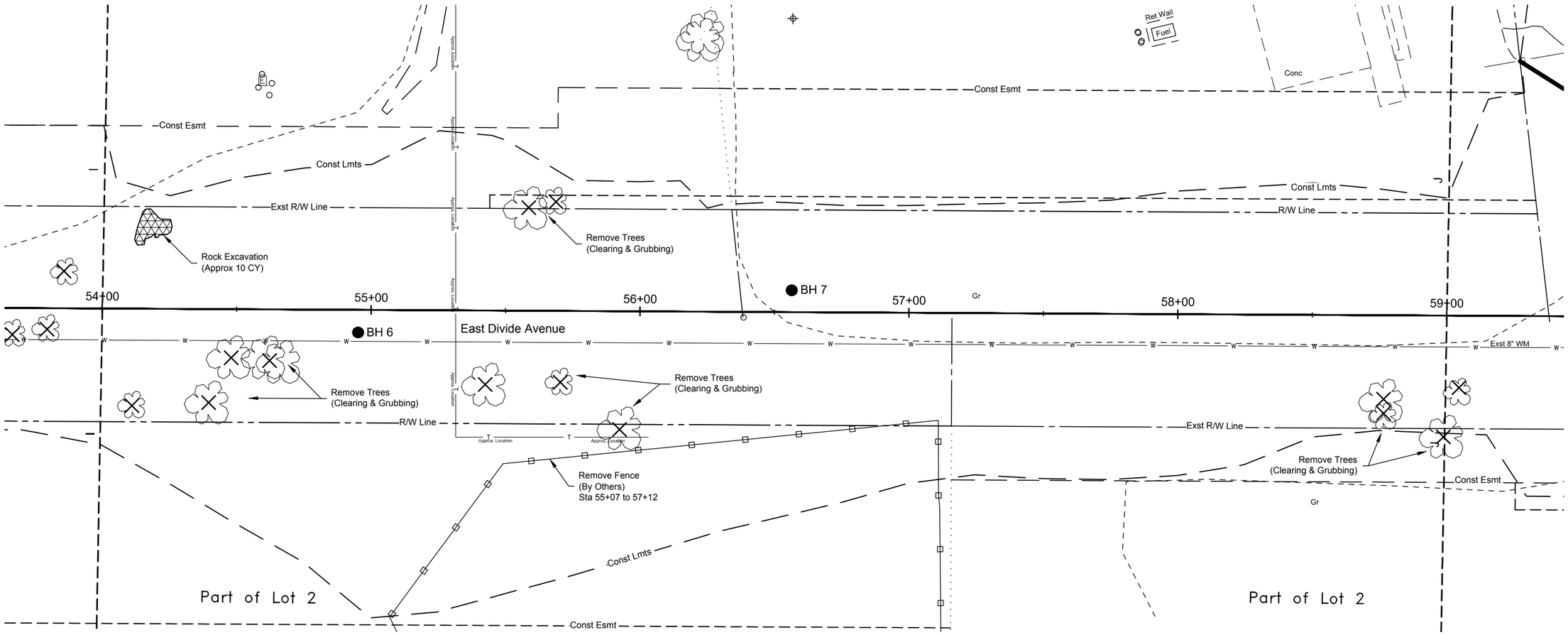
ND	SU-NHU-1-981(094)104	40	10



ROCK EXCAVATION

Sta 54+18, 30' LT	10	CY

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

ROCK EXCAVATION

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Removals

Sta 54+00 to 59+00

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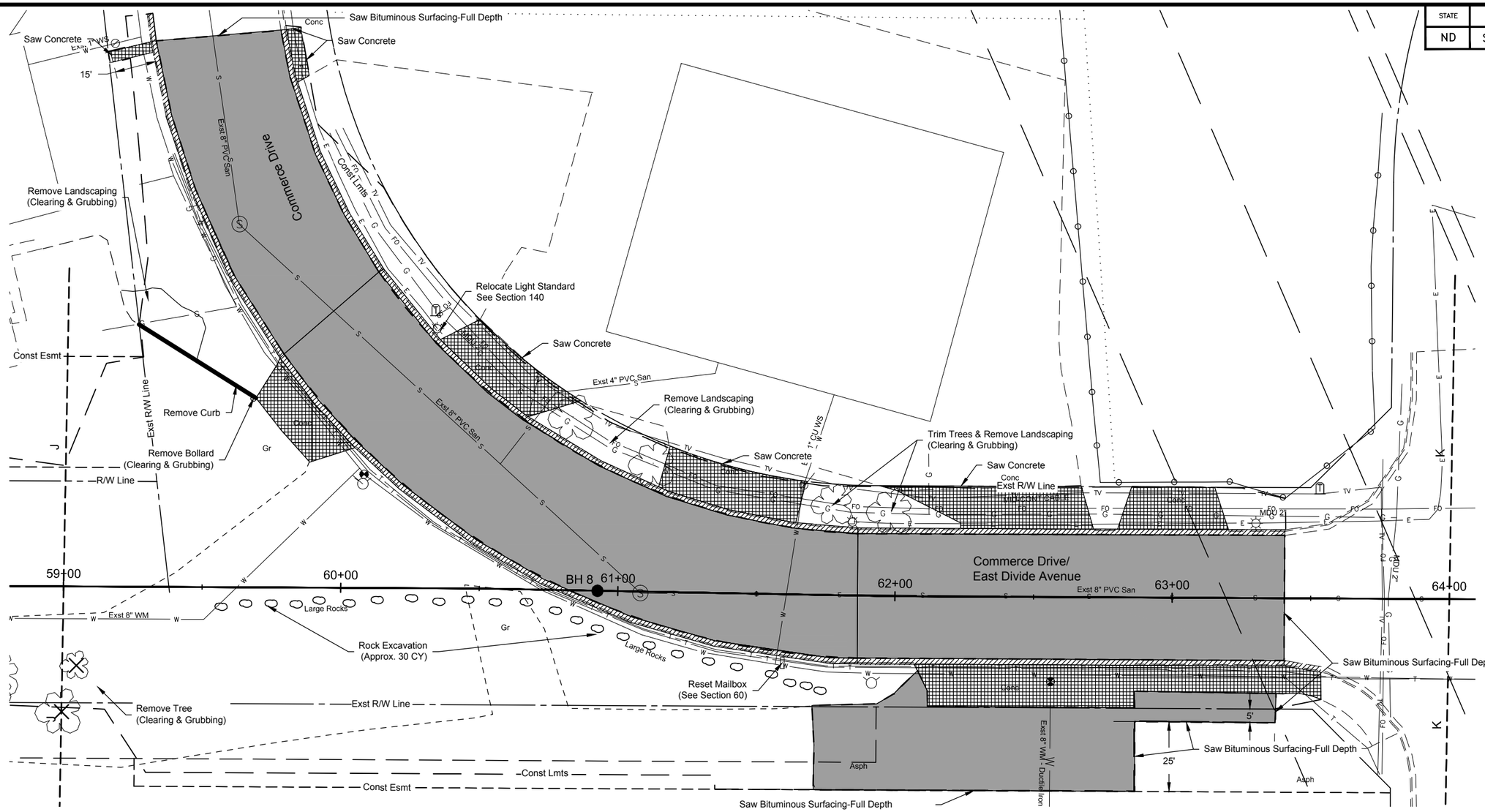
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	11



REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

REMOVE & SALVAGE BITUMINOUS SURFACING

Sta 59+32 to 63+40	676	TON
Sta 61+71 RT to 63+38 RT	129	TON
Total	805	TON

REMOVAL OF CONCRETE

Sta 59+16 to 59+31, LT	7	SY
Sta 59+70 to 60+05, LT	62	SY
Sta 60+50 to 60+86, LT	76	SY
Sta 61+17 to 61+68, LT	86	SY
Sta 61+94 to 62+67, LT	95	SY
Sta 62+07 to 63+54, RT	201	SY
Sta 62+85 to 63+15, LT	59	SY
Sta 59+79 to 59+88, LT	10	SY
Total	696	SY

SAW CONCRETE

Sta 59+16, 193' LT to 59+16, 189' LT	4	LF
Sta 59+30, 197' LT to 59+32, 197' LT	2	LF
Sta 59+77, 201' LT to 59+79, 201' LT	2	LF
Sta 63+40, 23' LT to 63+40, 25' LT	2	LF
Sta 63+40, 22' RT to 63+40, 35' RT	13	LF
Sta 60+50, 97' LT to 60+86, 68' LT	50	LF
Sta 61+17, 53' LT to 61+68, 41' LT	54	LF
Sta 61+94, 40' LT to 62+67, 40' LT	72	LF
Sta 59+85, 202' LT to 59+88, 185' LT	23	LF
Total	222	LF

REMOVAL OF CURB

Sta 59+27 to 59+70, LT	50	LF

REMOVAL OF CURB & GUTTER

Sta 59+30, 207' LT to 63+54, 22' RT	544	LF
Sta 59+77, 201' LT to 63+40, 23' LT	453	LF
Total	997	LF

SAW BITUMINOUS SURFACING-FULL DEPTH

Sta 59+32, 197' LT to 59+77, 201' LT	45	LF
Sta 61+71, 70' RT to 62+87, 70' RT	116	LF
Sta 62+87, 45' RT to 62+87, 70' RT	25	LF
Sta 62+87, 45' RT to 63+38, 45' RT	51	LF
Sta 63+38, 35' RT to 63+38, 45' RT	10	LF
Sta 63+40, 23' LT to 63+40, 22' RT	45	LF
Total	292	LF

ROCK EXCAVATION

Sta 59+50 TO 61+75, RT	30	CY

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals
Sta 59+00 to 64+00

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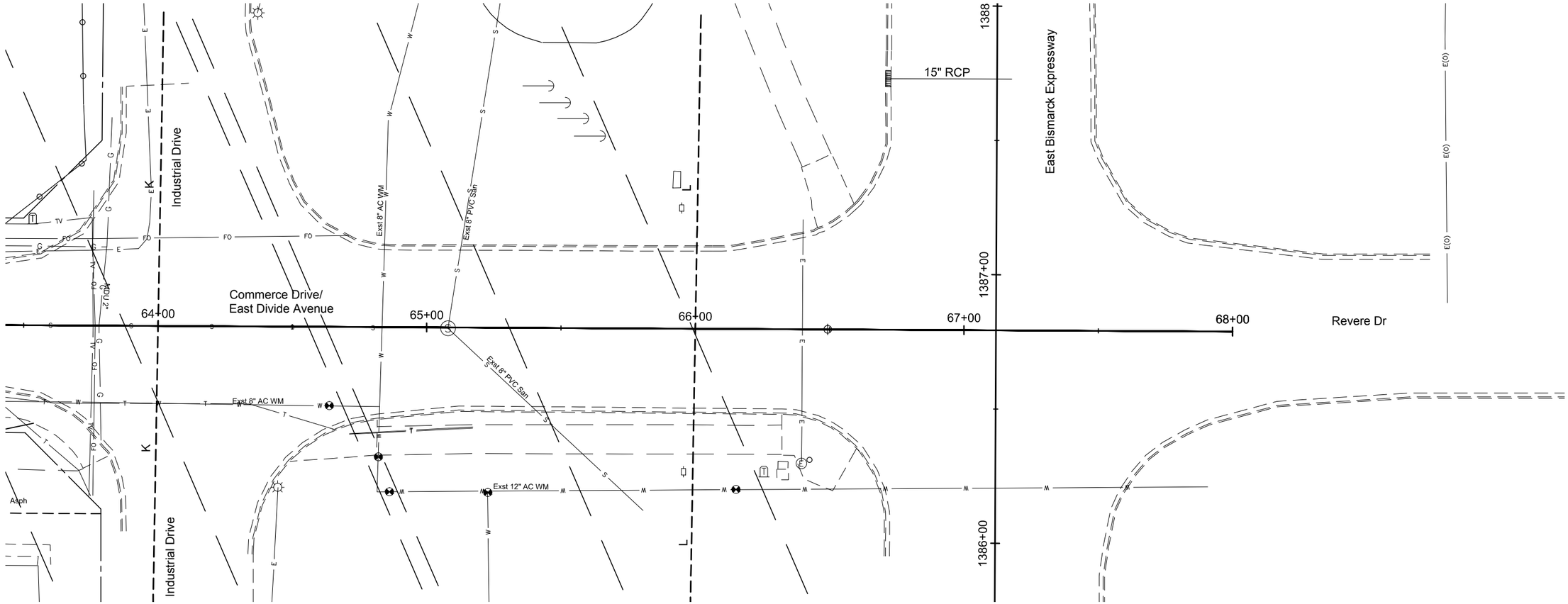

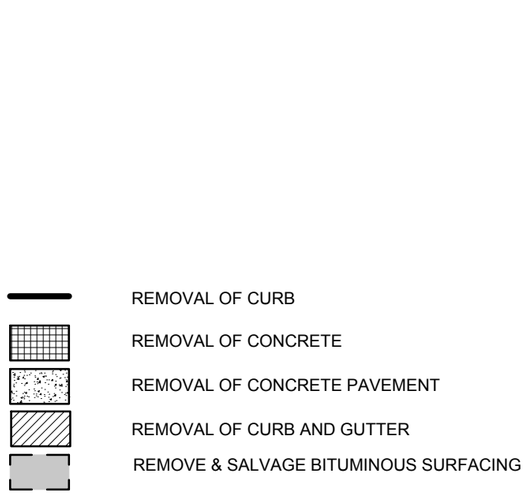

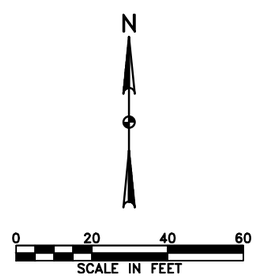

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Removals

Sta 64+00 to 66+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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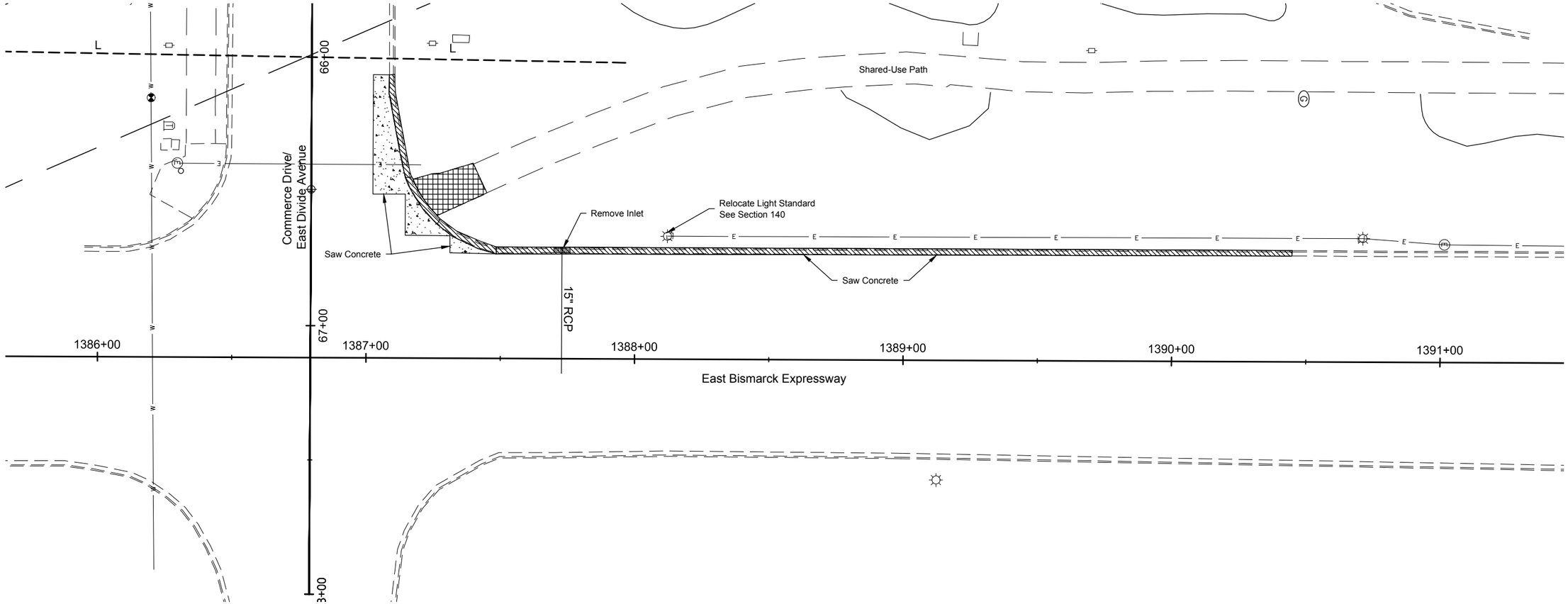
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	40	13



REMOVAL OF CONCRETE PAVEMENT

Sta 1387+02 to 1387+48	66	SY

REMOVAL OF CONCRETE

Sta 1387+17 LT to 1387+45 LT (Trail)	34	SY

SAW CONCRETE

Sta 1387+08, 106' LT to 1387+10, 106' LT	2	LF
Sta 1387+02, 105' LT to 1387+48, 39' LT	118	LF
Sta 1387+48, 39' LT to 1390+45, 39' LT	296	LF
Sta 1390+45, 40' LT to 1390+45, 42' LT	2	LF
Total	418	LF

REMOVAL OF CURB & GUTTER

Sta 1387+08, 106' LT to 1390+45, 40' LT	383	LF

REMOVAL OF INLETS

Sta 1387+73 LT	1	EA

REMOVAL OF CURB

REMOVAL OF CONCRETE

REMOVAL OF CONCRETE PAVEMENT

REMOVAL OF CURB AND GUTTER

REMOVE & SALVAGE BITUMINOUS SURFACING

N

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SCALE IN FEET

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Rev'd. 00/00/0000 Scale: 1:40

EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Bismarck Expressway
Removals
Sta 1386+00 to 1391+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-NHU-1-981(094)104	050	1

MH No. 1 - 48 In. (Floating Casting)
Sta. 30+00.00 - 12' Rt. (East Divide Ave)
Top Elev. 1762.98
Base Elev. 1757.10
Invert Elev. 1757.60
Riser 4.00 Ft.

15 In. Conduit	S	1757.85
18 In. Conduit	E	1757.60

Inlet No. 1A
Type Inlet - Type 2
Grate Style V
Sta. 30+00.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1762.59
Base Elev. 1757.76
Invert Elev. 1757.95
H' Dist. 4.50 Ft.

MH No. 2 - 60 In. (Floating Casting)
Sta. 32+50 - 12' Rt. (East Divide Ave)
Top Elev. 1760.40
Base Elev. 1753.46
Invert Elev. 1753.71
Riser 4.89 Ft.

15 In. Conduit	N	1755.05
18 In. Conduit	S	1753.81
18 In. Conduit	W	1755.78
24 In. Conduit	E	1753.71

Inlet No. 2A
Type Inlet - Type 2
Grate Style V
Sta. 31+67.17 - 48.5' Rt. (East Divide Ave)
Grate Elev. 1761.15
Base Elev. 1756.32
Invert Elev. 1756.51
H' Dist. 4.50 Ft.

Inlet No. 2B
Type Inlet - Type 2
Grate Style V
Sta. 32+06.76 - 48.5' Rt. (East Divide Ave)
Inv W - 1756.13' Rt. (15-Inch)
Grate Elev. 1760.86
Base Elev. 1755.84
Invert Elev. 1756.03
H' Dist. 4.69 Ft.

Inlet No. 2C
Type Inlet - Type 2
Grate Style V
Sta. 32+50.00 - 23.5' Rt. (East Divide Ave)
Inv SW - 1754.16' Rt. (15-Inch)
Grate Elev. 1760.03
Base Elev. 1753.70
Invert Elev. 1753.91
H' Dist. 6.00 Ft.

Inlet No. 2D
Type Inlet - Type 2
Grate Style V
Sta. 32+50.00 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1760.03
Base Elev. 1755.20
Invert Elev. 1755.39
H' Dist. 4.50 Ft.

MH No. 3 - 60 In. (Floating Casting)
Sta. 37+20.00 - 12' Rt. (East Divide Ave)
Top Elev. 1745.30
Base Elev. 1738.96
Invert Elev. 1739.21
Riser 4.29 Ft.

24 In. Conduit	W	1739.71
24 In. Conduit	E	1739.21
15 In. Conduit	N	1739.96
15 In. Conduit	S	1740.20

Inlet No. 3A
Type Inlet - Type 2
Grate Style V
Sta. 37+20.00 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1744.94
Base Elev. 1740.11
Invert Elev. 1740.30
H' Dist. 4.50 Ft.

Inlet No. 3B
Type Inlet - Type 2
Grate Style V
Sta. 37+20.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1744.94
Base Elev. 1740.11
Invert Elev. 1740.30
H' Dist. 4.50 Ft.

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Inlet and Manhole Summary

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-NHU-1-981(094)104	050	2

MH No. 4 - 60 In. (Floating Casting)
Sta. 37+92.66 - 12' Rt. (East Divide Ave)
Top Elev. 1743.34
Base Elev. 1734.97
Invert Elev. 1735.22
Riser 6.32 Ft.

24 In. Conduit	E	1735.22
24 In. Conduit	W	1737.22
18 In. Conduit	S	1737.22

Inlet No. 4A
Type Inlet - Type 2 - Double
Grate Style V
Sta. 37+92.95 - 73.59' Rt. (East Divide Ave)
Inv W - 1738.35' Rt. (15-Inch)
Grate Elev. 1742.44
Base Elev. 1737.89
Invert Elev. 1738.10
H' Dist. 4.22 Ft.

Inlet No. 4B
Type Inlet - Type 2
Grate Style V
Sta. 37+54.35 - 76.35' Rt. (East Divide Ave)
Grate Elev. 1743.39
Base Elev. 1738.56
Invert Elev. 1738.75
H' Dist. 4.50 Ft.

Inlet No. 4C
Type Inlet - Type 2 - Double
Grate Style V
Sta. 37+92.00 - 62.5' Rt. (East Divide Ave)
Inv S - 1738' Rt. (18-Inch)
Grate Elev. 1742.44
Base Elev. 1737.59
Invert Elev. 1737.80
H' Dist. 4.52 Ft.

MH No. 5 - 60 In. (Floating Casting)
Sta. 42+49.99 - 12' Rt. (East Divide Ave)
Top Elev. 1708.73
Base Elev. 1700.22
Invert Elev. 1700.47
Riser 6.46 Ft.

24 In. Conduit	E	1700.47
24 In. Conduit	W	1700.57
15 In. Conduit	N	1703.48
15 In. Conduit	S	1703.72

Inlet No. 5A
Type Inlet - Type 2
Grate Style V
Sta. 42+50.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1708.46
Base Elev. 1703.63
Invert Elev. 1703.82
H' Dist. 4.50 Ft.

Inlet No. 5B
Type Inlet - Type 2
Grate Style V
Sta. 42+50.00 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1708.46
Base Elev. 1703.63
Invert Elev. 1703.82
H' Dist. 4.50 Ft.

MH No. 6 - 72 In. (Floating Casting)
Sta. 46+22.01 - 12' Rt. (East Divide Ave)
Top Elev. 1686.09
Base Elev. 1676.51
Invert Elev. 1676.80
Riser 7.53 Ft.

18 In. Conduit	S	1679.49
30 In. Conduit	E	1676.80
24 In. Conduit	W	1677.30

Inlet No. 6A
Type Inlet - Type 2
Grate Style V
Sta. 46+22.63 - 23.5' Rt. (East Divide Ave)
Inv SW - 1679.69' Rt. (15-Inch)
Grate Elev. 1685.71
Base Elev. 1679.38
Invert Elev. 1679.59
H' Dist. 6.00 Ft.

Inlet and Manhole Summary

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-NHU-1-981(094)104	050	3

Inlet No. 6B
Type Inlet - Type 2
Grate Style V
Sta. 45+85.86 - 47' Rt. (East Divide Ave)
Inv SW - 1683.74' Rt. (15-Inch)
Grate Elev. 1688.28
Base Elev. 1683.45
Invert Elev. 1683.64
H' Dist. 4.50 Ft.

Inlet No. 6C
Type Inlet - Type 2
Grate Style V
Sta. 45+42.87 - 69.44' Rt. (East Divide Ave)
Inv SW - 1685.15' Rt. (15-Inch)
Inv NW - 1687.79' Rt. (4-Inch)
Grate Elev. 1689.79
Base Elev. 1684.71
Invert Elev. 1684.90
H' Dist. 4.75 Ft.

MH No. 7 - 48 In.
Sta. 45+13.49 - 84.56' Rt. (East Divide Ave)
Top Elev. 1696.55
Base Elev. 1687.31
Invert Elev. 1687.50
Riser 7.74 Ft.

15 In. Conduit	NE	1687.50

MH No. 8 - 72 In. (Floating Casting)
Sta. 47+83.05 - 12' Rt. (East Divide Ave)
Top Elev. 1680.68
Base Elev. 1671.75
Invert Elev. 1672.08
Riser 6.88 Ft.

15 In. Conduit	N	1673.61
18 In. Conduit	S	1674.54
36 In. Conduit	E	1672.08
30 In. Conduit	W	1672.93

Inlet No. 8A
Type Inlet - Type 2 - Double
Grate Style V
Sta. 47+86.42 - 23.5' Rt. (East Divide Ave)
Inv E - 1675.24' Rt. (15-Inch)
Grate Elev. 1680.12
Base Elev. 1674.78
Invert Elev. 1674.99
H' Dist. 5.01 Ft.

Inlet No. 8B
Type Inlet - Type 2 - Double
Grate Style V
Sta. 47+77.99 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1680.16
Base Elev. 1674.35
Invert Elev. 1674.54
H' Dist. 5.48 Ft.

Inlet No. 8C
Type Inlet - Type 2 - Double
Grate Style V
Sta. 47+97.99 - 23.5' Rt. (East Divide Ave)
Inv S - 1675.68' Rt. (4-Inch)
Grate Elev. 1679.88
Base Elev. 1675.15
Invert Elev. 1675.34
H' Dist. 4.40 Ft.

MH No. 9 - 84 In. (Floating Casting)
Sta. 49+09.74 - 12' Rt. (East Divide Ave)
Top Elev. 1680.04
Base Elev. 1670.43
Invert Elev. 1670.76
Riser 7.56 Ft.

15 In. Conduit	N	1673.06
15 In. Conduit	S	1673.06
36 In. Conduit	E	1670.76
36 In. Conduit	W	1670.86

Inlet No. 9A
Type Inlet - Type 2 - Double
Grate Style V
Sta. 49+15.01 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1679.57
Base Elev. 1673.37
Invert Elev. 1673.56
H' Dist. 5.87 Ft.

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Inlet and Manhole Summary

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-NHU-1-981(094)104	050	4

Inlet No. 9B
Type Inlet - Type 2 - Double
Grate Style V
Sta. 48+89.97 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1679.63
Base Elev. 1674.80
Invert Elev. 1674.99
H' Dist. 4.50 Ft.

Inlet No. 9C
Type Inlet - Type 2 - Double
Grate Style V
Sta. 49+26 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1679.57
Base Elev. 1675.00
Invert Elev. 1675.19
H' Dist. 4.24 Ft.

MH No. 10 - 48 In. (Floating Casting)
Sta. 58+90.00 - 12' Lt. (East Divide Ave)
Top Elev. 1717.53
Base Elev. 1711.65
Invert Elev. 1711.93
Riser 4.00 Ft.

18 In. Conduit	W	1711.93
15 In. Conduit	NE	1712.83
15 In. Conduit	S	1712.18

Inlet No. 10A
Type Inlet - Type 2
Grate Style V
Sta. 58+90.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1717.16
Base Elev. 1712.33
Invert Elev. 1712.52
H' Dist. 4.50 Ft.

Inlet No. 10B
Type Inlet - Type 2
Grate Style V
Sta. 59+13.61 - 23.5' Lt. (East Divide Ave)
Inv N - 1714.72' Rt. (15-Inch)
Grate Elev. 1717.71
Base Elev. 1712.88
Invert Elev. 1713.07
H' Dist. 4.50 Ft.

Inlet No. 10C
Type Inlet - Type 2
Grate Style V
Sta. 59+17.50 - 35.5' Lt. (East Divide Ave)
Grate Elev. 1717.92
Base Elev. 1713.59
Invert Elev. 1715.92
H' Dist. 4.00 Ft.

MH No. 11 - 60 In. (Floating Casting)
Sta. 55+37.00 - 12' Lt. (East Divide Ave)
Top Elev. 1700.03
Base Elev. 1693.98
Invert Elev. 1694.51
Riser 4.00 Ft.

18 In. Conduit	E	1694.61
15 In. Conduit	N	1694.76
15 In. Conduit	S	1694.76
18 In. Conduit	W	1694.51

Inlet No. 11A
Type Inlet - Type 2
Grate Style V
Sta. 55+37.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1699.74
Base Elev. 1694.91
Invert Elev. 1695.10
H' Dist. 4.50 Ft.

Inlet No. 11B
Type Inlet - Type 2
Grate Style V
Sta. 55+37.00 - 23.5' Lt. (East Divide Ave)
Inv N - 1695.2' Rt. (15-Inch)
Grate Elev. 1699.74
Base Elev. 1694.91
Invert Elev. 1695.10
H' Dist. 4.50 Ft.

MH No. 12 - 48 In.
Sta. 55+37.00 - 35.5' Lt. (East Divide Ave)
Inv E - 1698.8' Rt. (4-Inch HDPE)
Top Elev. 1700.52
Base Elev. 1695.02
Invert Elev. 1695.78
Riser 4.00 Ft.

15 In. Conduit	S	1695.78
15 In. Conduit	E	1695.88

Inlet No. 12A
Type Inlet - Type 2
Grate Style V
Sta. 56+31.00 - 36' Lt. (East Divide Ave)
Grate Elev. 1721.17
Base Elev. 1716.34
Invert Elev. 1716.53
H' Dist. 4.50 Ft.

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Inlet and Manhole Summary

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SU-NHU-1-981(094)104	050	5

MH No. 13 - 60 In. (Floating Casting)
Sta. 53+30.00 - 12' Lt. (East Divide Ave)
Top Elev. 1686.67
Base Elev. 1680.62
Invert Elev. 1681.17
Riser 4.00 Ft.

18 In. Conduit	E	1681.27
18 In. Conduit	W	1681.17
15 In. Conduit	N	1681.42
15 In. Conduit	S	1681.42

Inlet No. 13A
Type Inlet - Type 2
Grate Style V
Sta. 53+30.00 - 23.5' Rt. (East Divide Ave)
Grate Elev. 1686.40
Base Elev. 1681.57
Invert Elev. 1681.76
H' Dist. 4.50 Ft.

Inlet No. 13B
Type Inlet - Type 2
Grate Style V
Sta. 53+30.00 - 23.5' Lt. (East Divide Ave)
Grate Elev. 1686.40
Base Elev. 1681.57
Invert Elev. 1681.76
H' Dist. 4.50 Ft.

MH No. 14 - 72 In. (Floating Casting)
Sta. 52+67.52 - 12' Lt. (East Divide Ave)
Top Elev. 1683.94
Base Elev. 1676.35
Invert Elev. 1676.68
Riser 5.54 Ft.

18 In. Conduit	E	1677.84
36 In. Conduit	W	1676.68
24 In. Conduit	N	1676.78

MH No. 15 - 60 In.
Sta. 52+67.52 - 52.05' Lt. (East Divide Ave)
Top Elev. 1683.13
Base Elev. 1677.05
Invert Elev. 1677.30
Riser 4.41 Ft.

24 In. Conduit	S	1677.30
15 In. Conduit	W	1678.81
24 In. Conduit	NE	1677.40

Inlet No. 15A
Type Inlet - Type 2 - Double
Grate Style V
Sta. 53+02.14 - 97.06' Lt. (East Divide Ave)
Inv N - 1678.97' Rt. (15-Inch)
Grate Elev. 1683.07
Base Elev. 1678.62
Invert Elev. 1678.87
H' Dist. 4.12 Ft.

Inlet No. 15B
Type Inlet - Type 2 - Double
Grate Style V
Sta. 53+01.74 - 108.02' Lt. (East Divide Ave)
Grate Elev. 1683.07
Base Elev. 1678.88
Invert Elev. 1679.07
H' Dist. 3.86 Ft.

Inlet No. 15C
Type Inlet - Type 2 - Double
Grate Style V
Sta. 52+55.94 - 52.42' Lt. (East Divide Ave)
Grate Elev. 1682.68
Base Elev. 1678.35
Invert Elev. 1678.91
H' Dist. 4.00 Ft.

MH No. 16 - 72 In. (Floating Casting)
Sta. 50+60 - 12' Lt. (East Divide Ave)
Top Elev. 1681.33
Base Elev. 1673.16
Invert Elev. 1673.49
Riser 6.12 Ft.

36 In. Conduit	W	1673.49
36 In. Conduit	E	1673.69

Inlet No. 17A - 48 In.
Type Inlet - Type 2 - Double
Grate Style V
Sta. 1387+72.83 - 46.25' Lt. (Bismarck Expressway)
Grate Elev. 1732.38
Base Elev. 1729.76
Invert Elev. 1729.95
H' Dist. 2.29 Ft.

Inlet and Manhole Summary

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Storm Drain Pay Size	Allowable Material	Minimum Thickness	Applicable Backfill Detail
				LF	In		In	
1A		MH 1		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 1		MH 2		248	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
2A		2B		38	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
2B		2C		50	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
2C		MH 2		10	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
2D		MH 2		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 2		MH 3		466	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
3A		MH 3		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
3B		MH 3		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 3		MH 4		86	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
4B		4A		38	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
4A		4C		6	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
4C		MH 4		50	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 4		MH 5		438	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
5A		MH 5		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
5B		MH 5		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	

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Rev'd. 00/00/0000

EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Allowable Pipe List

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

J:\trans\1411109\CADD\051AP_001_Pipelist.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	51	2

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Storm Drain Pay Size	Allowable Material	Minimum Thickness	Applicable Backfill Detail
				LF	In		In	
MH 5		MH 6		368	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 7		6C		32	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
6C		6B		48	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
6B		6A		42	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
6A		MH 6		10	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 6		MH 8		156	30	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
8C		8A		8	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
8A		MH 8		8	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
8B		MH 8		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 8		MH 9		122	36	Reinforced Concrete Pipe - Class IV		N/A
9A		MH 9		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
9C		9B		6	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
9B		MH 9		38	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 9	12' Rt.	STA 49+25.60	2.80' Rt	16	36	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 16	12' Lt.	STA 49+85.30	18.50' Rt.	36	36	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 14		MH 16		246	36	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 14		MH 15		60	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	

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Rev'd. 00/00/0000

EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Allowable Pipe List

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	51	3

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Storm Drain Pay Size	Allowable Material	Minimum Thickness	Applicable Backfill Detail
				LF	In		In	
15C		MH 15		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
15B		15A		6	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
15A		MH 15		56	24	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 13		MH 14		64	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
13A		MH 13		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
13B		MH 13		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 11		MH 13		204	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
11A		MH 11		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
11B		MH 11		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 12		11B		10	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
12A		MH 12		92	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
MH 10		MH 11		350	18	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
10A		MH 10		34	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
10C		10B		12	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
10B		MH 10		24	15	Reinforced Concrete Pipe - Class III		D-714-27
						Polymeric Coated Steel (over zinc or aluminum coated steel)(Spiral-Rib)	0.064	
17A		STA 1387+72.8	38.5' Lt.	8	15	Reinforced Concrete Pipe - Class III		D-714-27

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Allowable Pipe List

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

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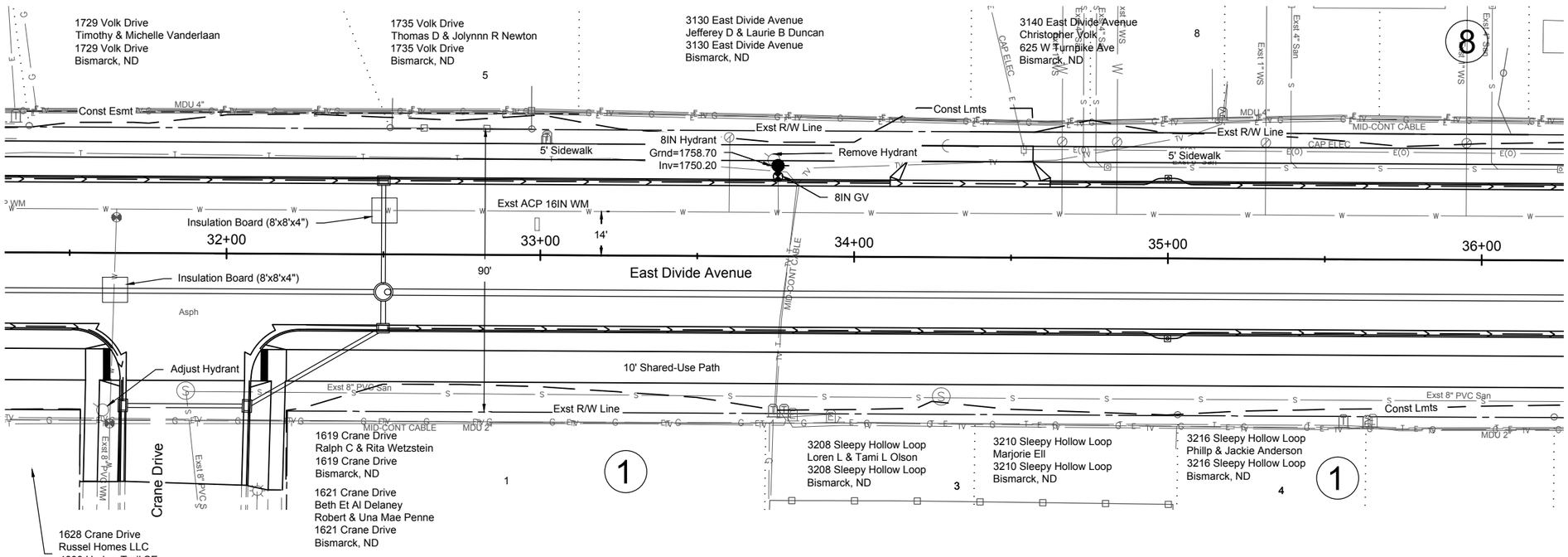
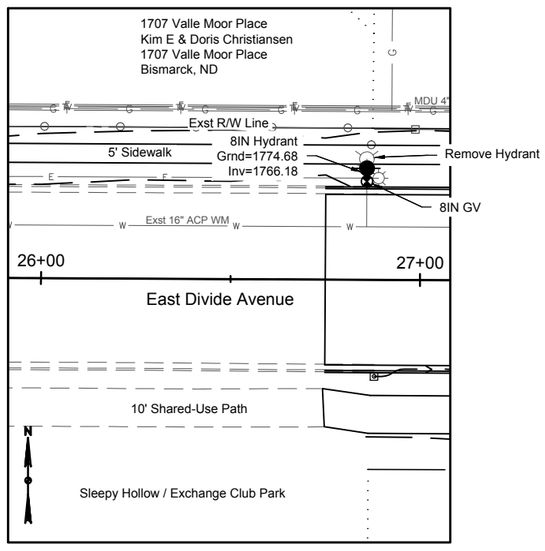
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	1





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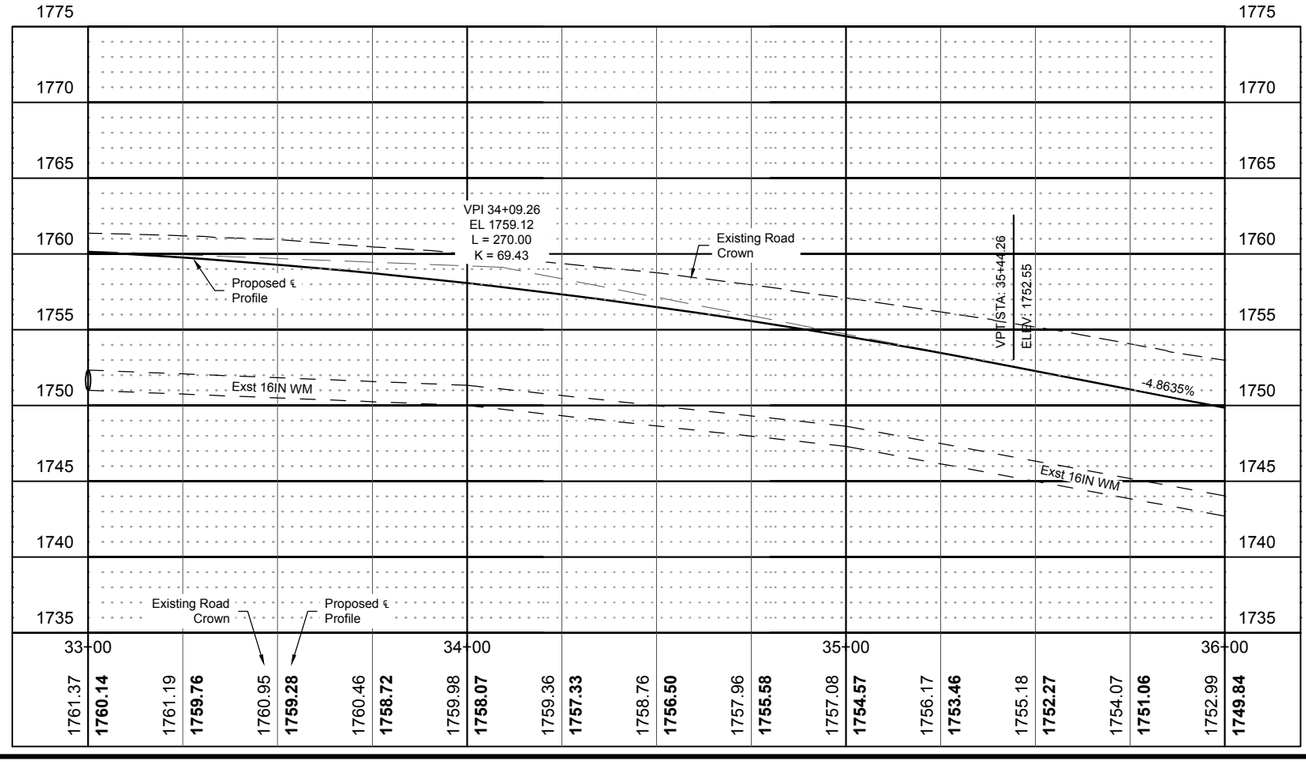

REMOVE GATE VALVE & BOX		
Sta 26+85, 29' Lt	1	EA
Sta 33+75, 28' Lt	1	EA

GATE VALVE & BOX 8IN		
Sta 26+86, 25.5' Lt	1	EA
Sta 33+76, 25.5' Lt	1	EA

8IN HYDRANT		
Sta 26+86, 29' Lt	1	EA
Sta 33+76, 29' Lt	1	EA

ADJUST HYDRANT		
Sta 31+60, 50' Rt	1	EA

REMOVE HYDRANT		
Sta 26+86, 32' Lt	1	EA
Sta 33+75, 32' Lt	1	EA

POLYSTYRENE INSULATION BOARD		
Sta 31+65, 12' Rt (8'x8'x4")	256	BD FT
Sta 32+50, 14' Lt (8'x8'x4")	256	BD FT
Total	512	BD FT

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 26+00 to 36+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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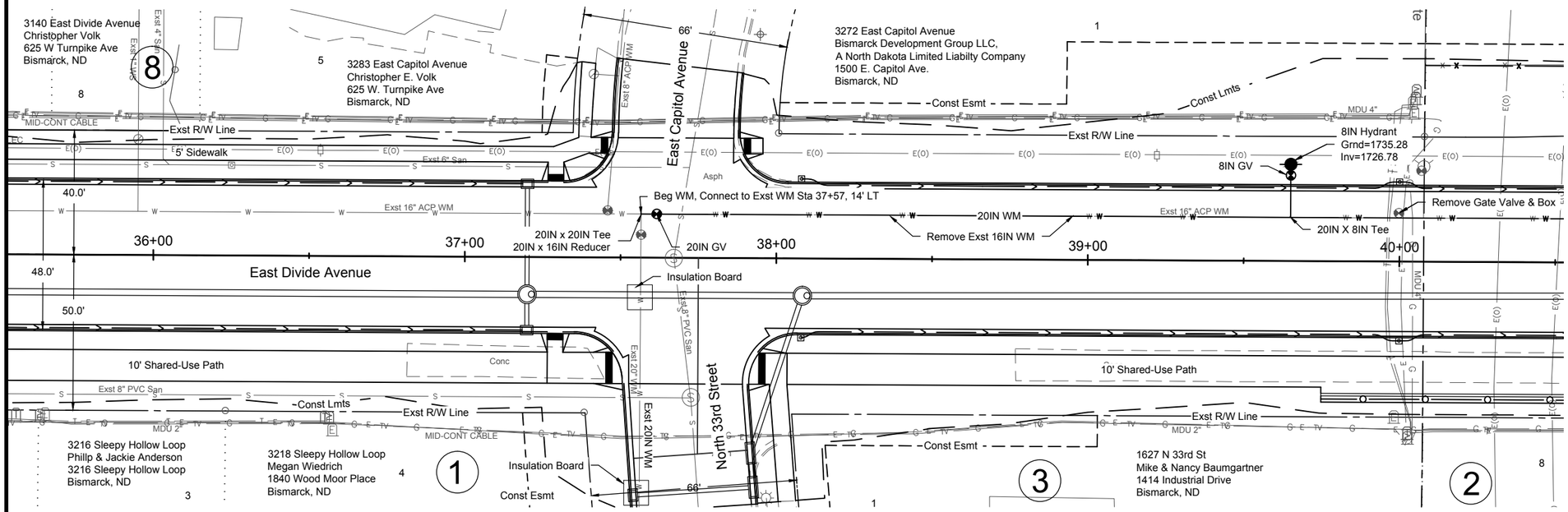
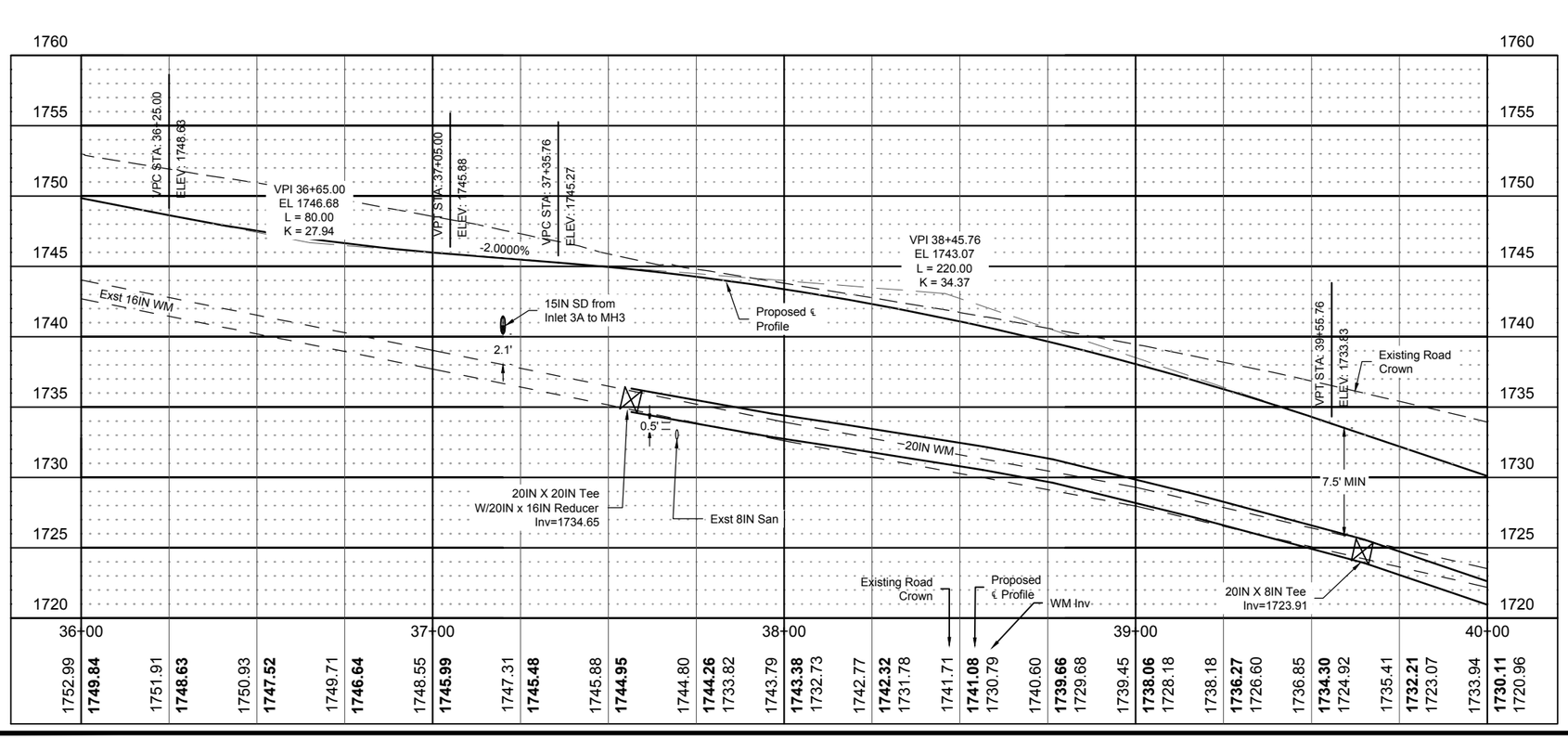
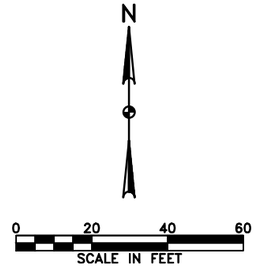
Aug 05, 2013 – 2:48pm – J:\trans\1411109\CADD\057WM_001_PP.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	2







REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 37+57 to 40+00 14' Lt (Exst WM)	243	LF

FITTINGS-DUCTILE IRON

Sta 37+54, 14' Lt (20IN X 16IN Reducer)	225	LBS
Sta 37+57, 14' Lt (20IN X 20IN Tee)	605	LBS
Sta 39+65, 14' Lt (20IN X 8IN Tee)	390	LBS
Total	1220	LBS

REMOVE GATE VALVE & BOX

Sta 40+00, 14' Lt	1	EA

GATE VALVE & BOX 8IN

Sta 39+65, 27.5' Lt	1	EA

GATE VALVE & BOX

Sta 37+62, 14' Lt	1	EA

8IN HYDRANT

Sta 39+65, 31' Lt	1	EA

WATERMAIN 8IN

Tee to Hydrant	18	LF

WATERMAIN 20IN

Sta 37+57 to 40+00	243	LF

POLYSTYRENE INSULATION BOARD

Sta 37+57, 13' Rt (8'x8'x4")	256	BD FT
Sta 37+55, 76' Rt (8'x8'x4")	256	BD FT
Total	512	BD FT

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 36+00 to 40+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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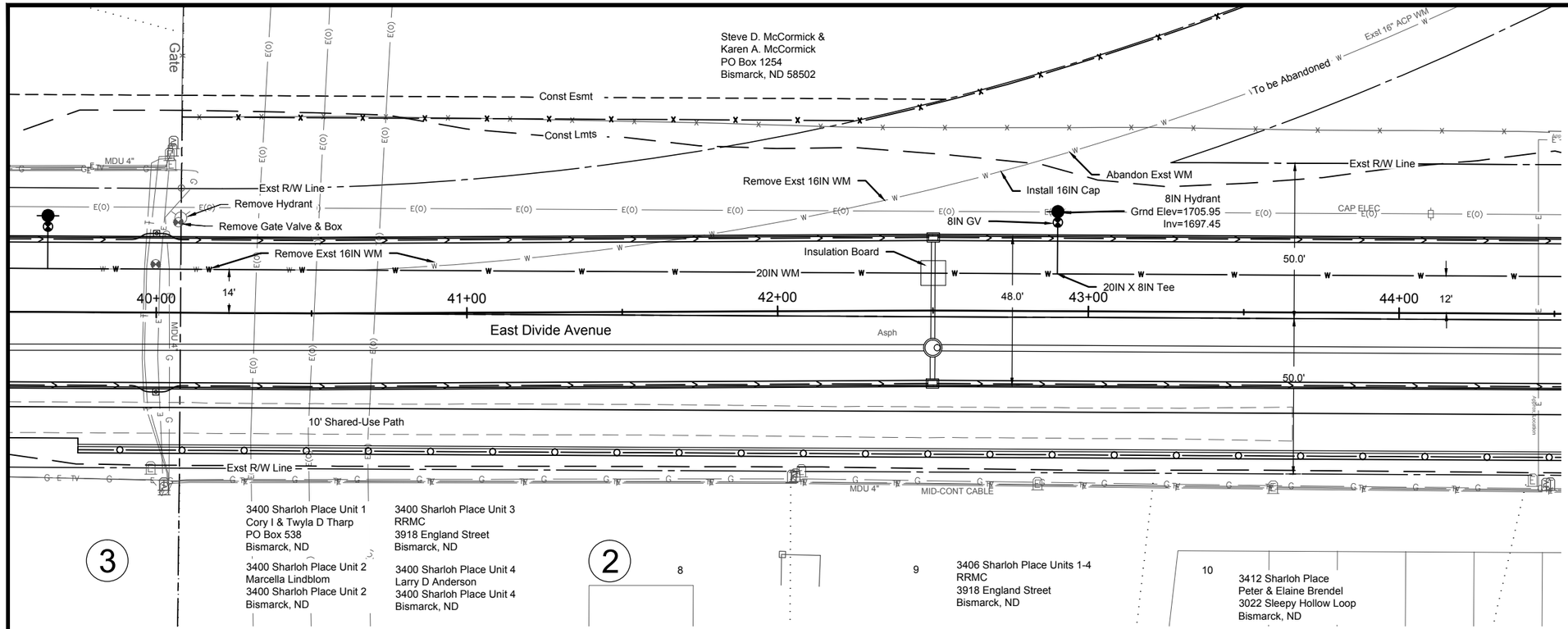
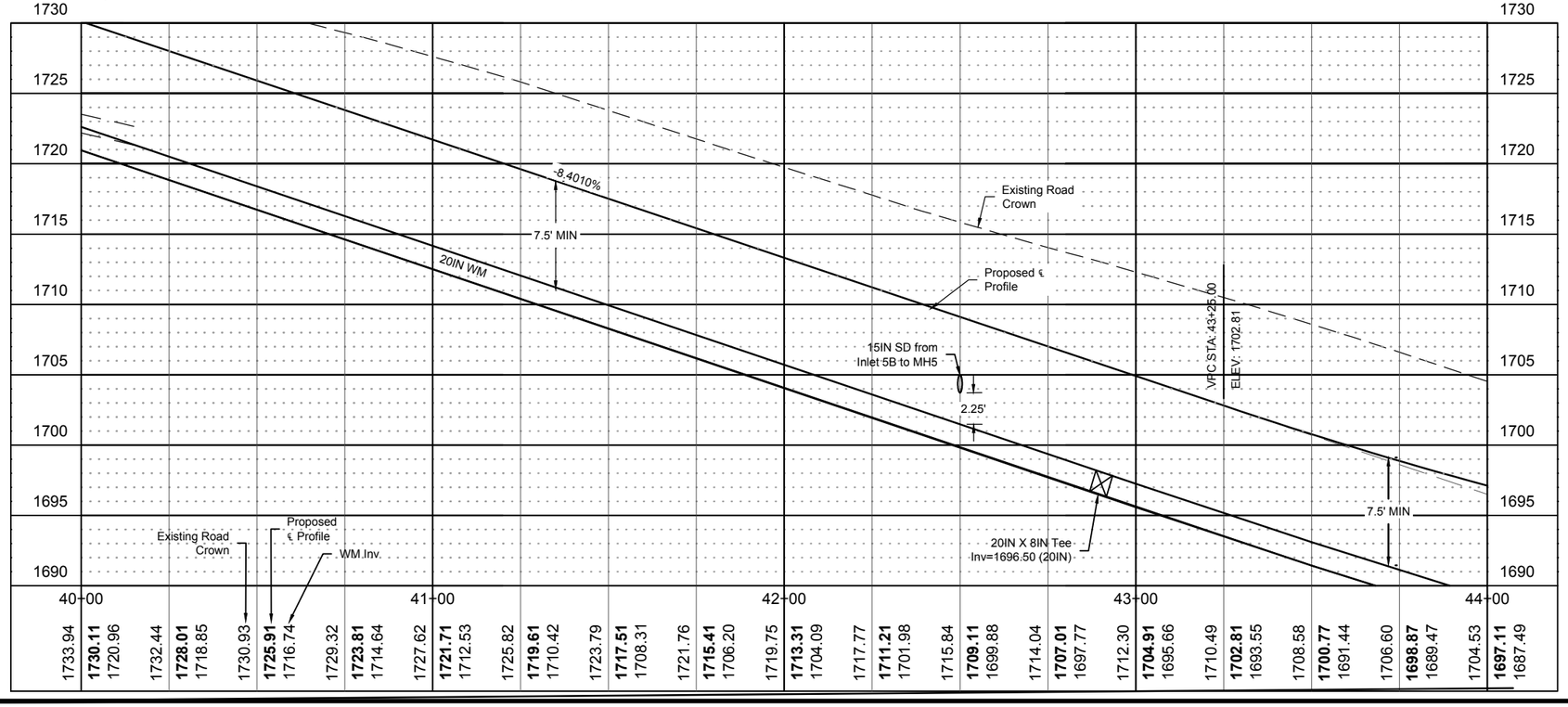
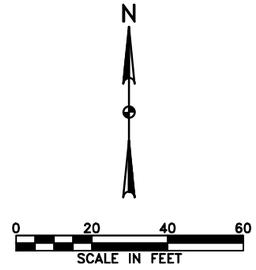
Aug 05, 2013 – 2:49pm – J:\trans\1411109\CADD\057WM_001_PP.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	3







REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 40+00 to 42+67, 45' Lt (Exst WM)	270	LF

FITTINGS-DUCTILE IRON

Sta 42+67, 45' Lt (16IN Cap)	93	LBS
Sta 42+90, 12' Lt (20IN X 8IN Tee)	390	LBS
	483	LBS

REMOVE GATE VALVE & BOX

Sta 40+07, 29' Lt	1	EA

GATE VALVE & BOX 8IN

Sta 42+90, 28.5' Lt	1	EA

8IN HYDRANT

Sta 42+90, 32' Lt	1	EA

REMOVE HYDRANT

Sta 40+08, 30.5' Lt	1	EA

8IN WATERMAIN

Tee to Hydrant	20	LF

WATERMAIN 20IN

Sta 40+00 to 44+00	400	LF

POLYSTYRENE INSULATION BOARD

Sta 42+50, 12' Lt (8'x8'x4")	256	BD FT

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 40+00 to 44+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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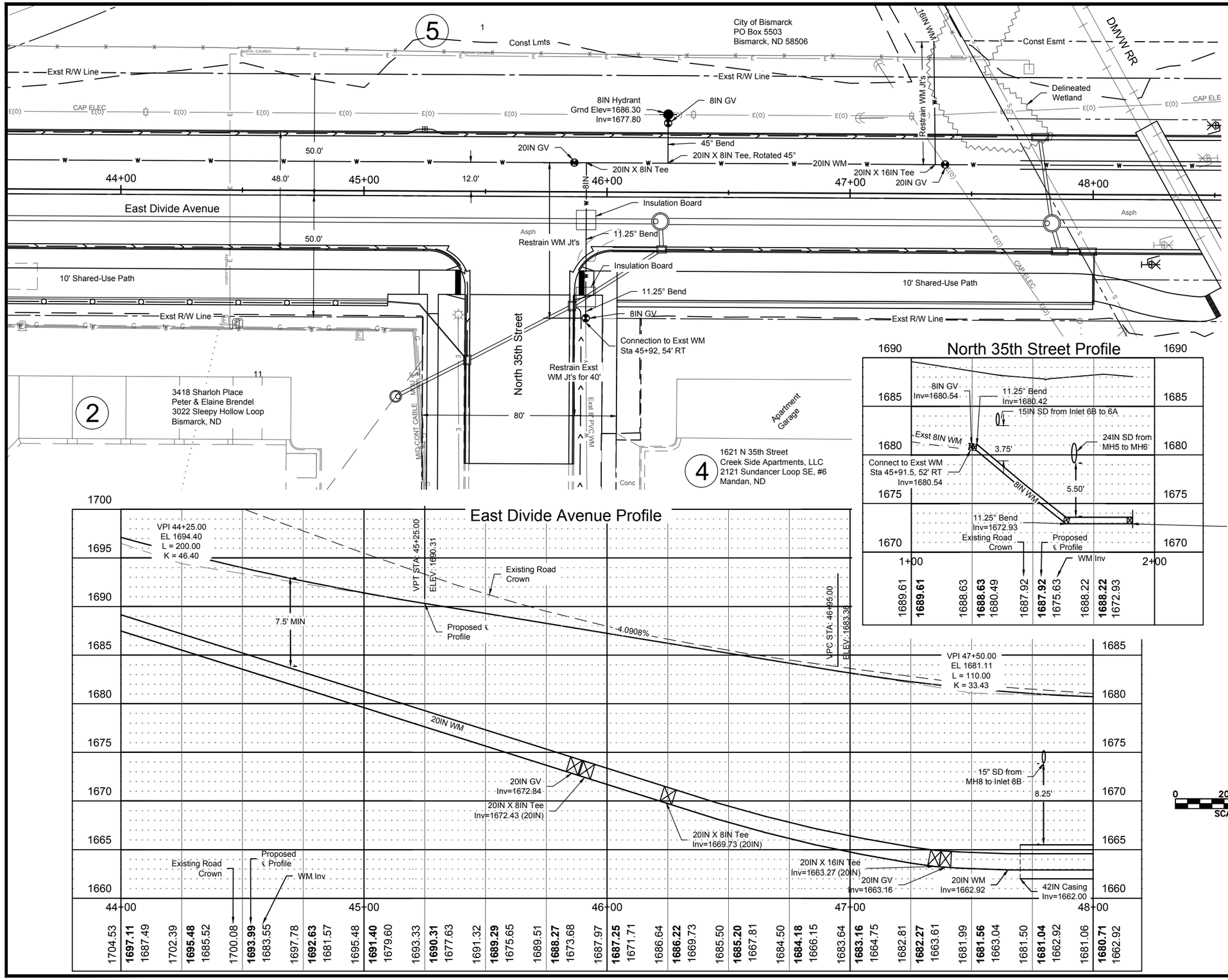
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	4



FITTINGS-DUCTILE IRON

Sta 45+91.5, 12' Lt (20IN X 8IN Tee)	390	LBS
Sta 45+91.5, 16.5' Rt (8IN 11.25° Bend)	42	LBS
Sta 45+91.5, 52' Rt (8IN 11.25° Bend)	42	LBS
Sta 46+25, 12' Lt (20IN X 8IN Tee)	390	LBS
Sta 46+25, 16' Lt (8IN 45° Bend)	46	LBS
Sta 47+35, 12' Lt (20IN X 16IN Tee)	530	LBS
Total	1440	LBS

GATE VALVE & BOX 8IN

Sta 45+91.5, 52' Rt	1	EA
Sta 46+25, 28.5' Lt	1	EA

GATE VALVE & BOX

Sta 45+87, 12' Lt	1	EA
Sta 47+39, 12' Lt	1	EA

8IN HYDRANT

Sta 46+25, 32' Lt	1	EA

WATERMAIN 8IN

Tee to Hydrant	20	LF
Tee to Existing 8IN WM	64	LF
Total	84	LF

WATERMAIN 20IN

Sta 44+00 to 48+00	400	LF

POLYSTYRENE INSULATION BOARD

Sta 45+92, 12' Rt (8'x8'x4")	256	BD FT
Sta 45+92, 44' Rt (8'x8'x4")	256	BD FT
Total	512	BD FT

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 44+00 to 48+00

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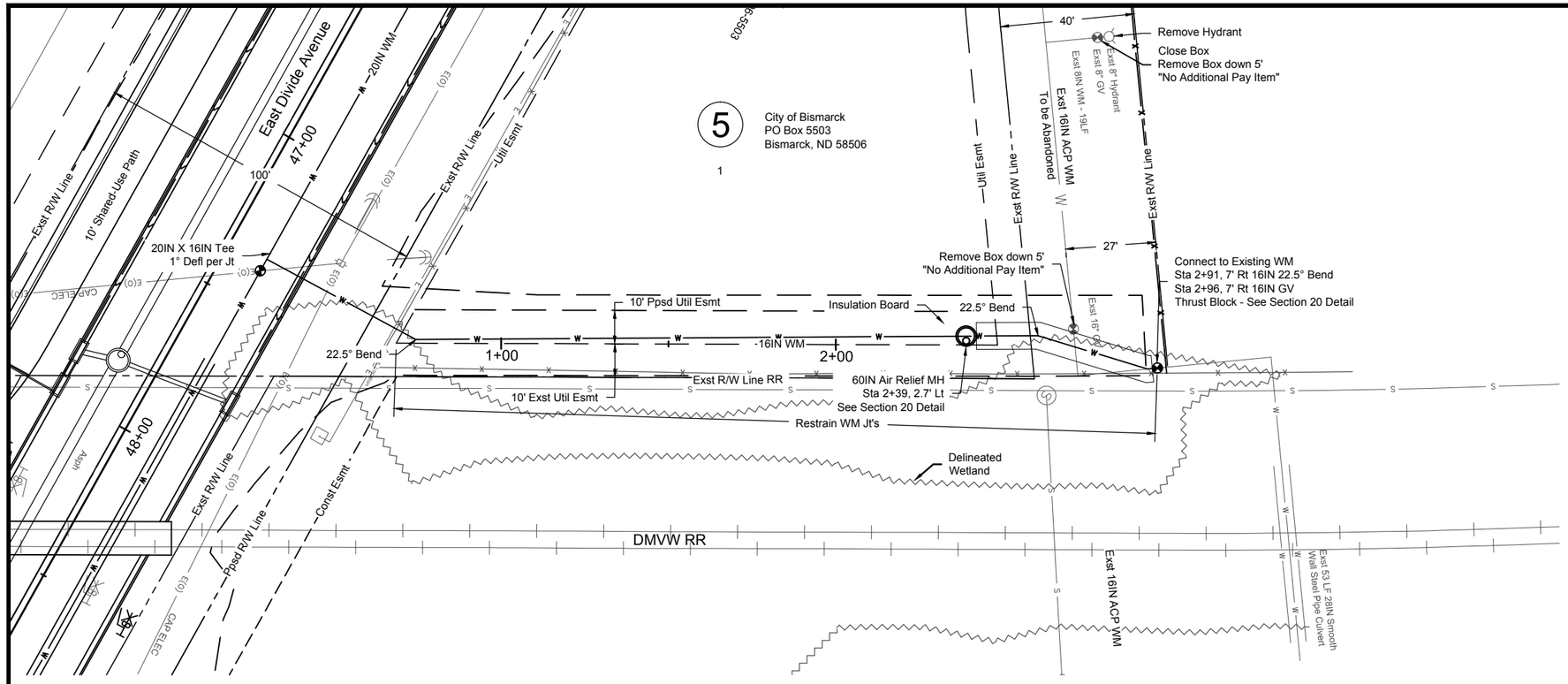
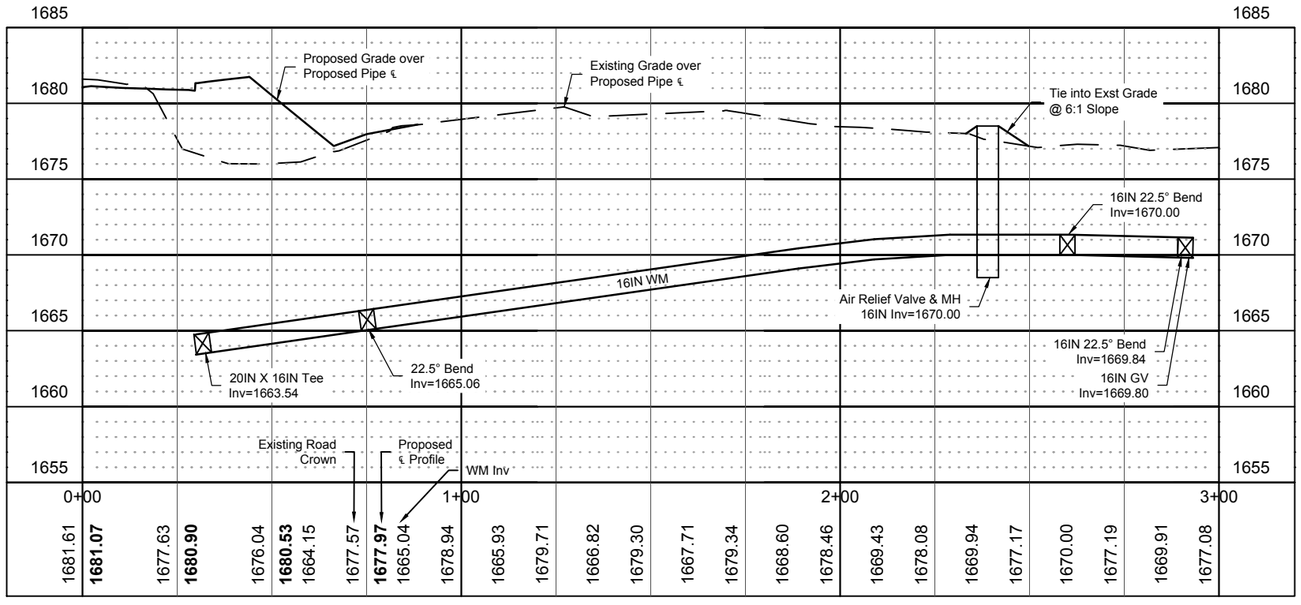
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	5





REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 2+71 to Sta 2+96	40	LF

AIR RELIEF VALVE & MANHOLE

Sta 2+39, 2.7' Lt	1	EA

FITTINGS-DUCTILE IRON

Sta 0+75.2, 4' Lt (16IN 22.5° Bend)	178	LBS
Sta 2+60.5, 3' Lt (16IN 22.5° Bend)	178	LBS
Sta 2+93, 7' Rt (16IN 22.5° Bend)	178	LBS
Total	534	LBS

GATE VALVE & BOX 16IN

Sta 2+96, 7' Rt	1	EA

REMOVE HYDRANT

Sta 2+81, 92' Lt	1	EA

WATERMAIN 16IN

Sta 0+31, 26.6' Lt to 2+96.5, 7' Rt	276	LF

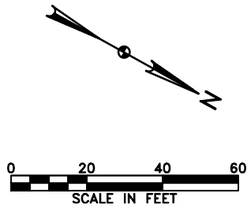
POLYSTYRENE INSULATION BOARD

Sta 2+42 to 2+95 (56'x8'x4")	1792	BD FT

Note:
Watermain pipe will need to be deflected up to 5° from Sta 0+575 to Sta 2+96 to tie into the existing watermain

Air Relief Manhole
Rim=1678.50
16IN Inv=1670.00
Structure Inv=1669.00

*16IN Inv to be 0.2' higher than actual tie-in Inv. at Sta 2+96 (Field Verify)



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 0+00 to 3+00

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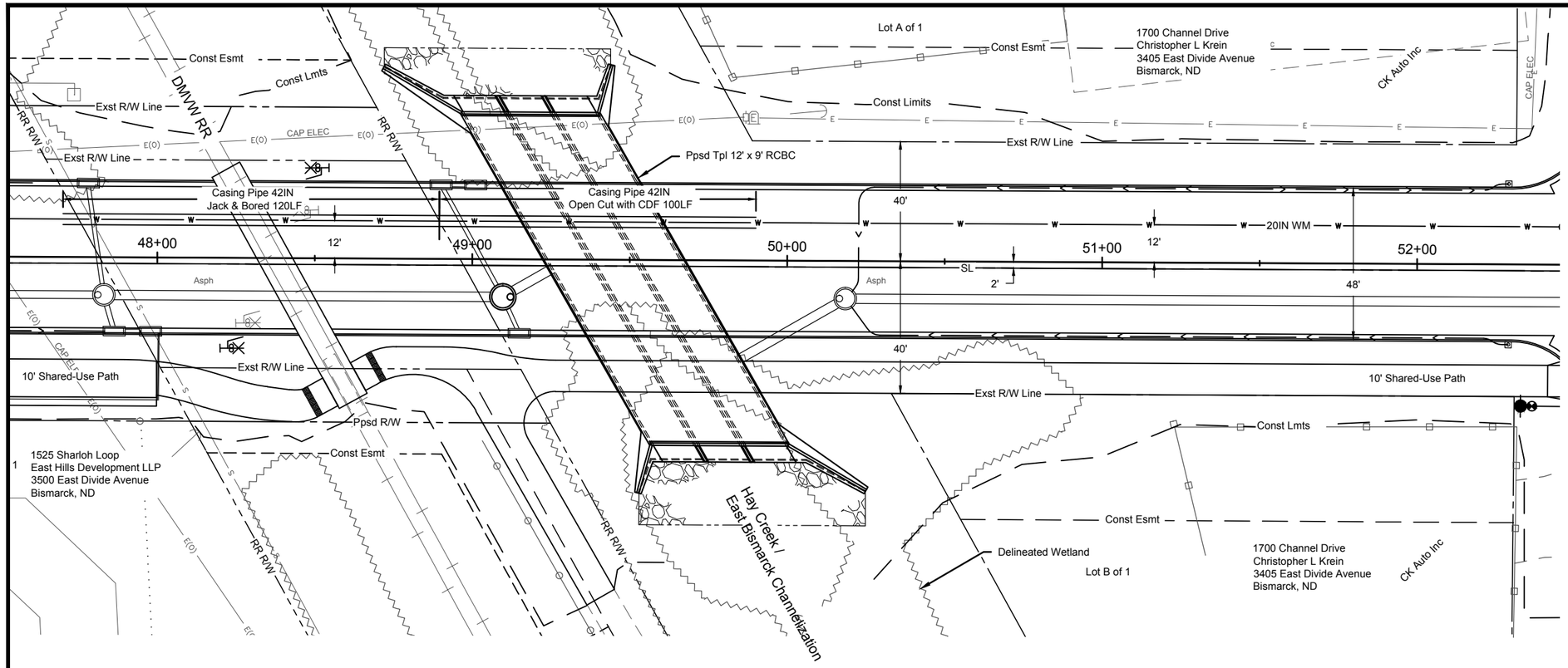
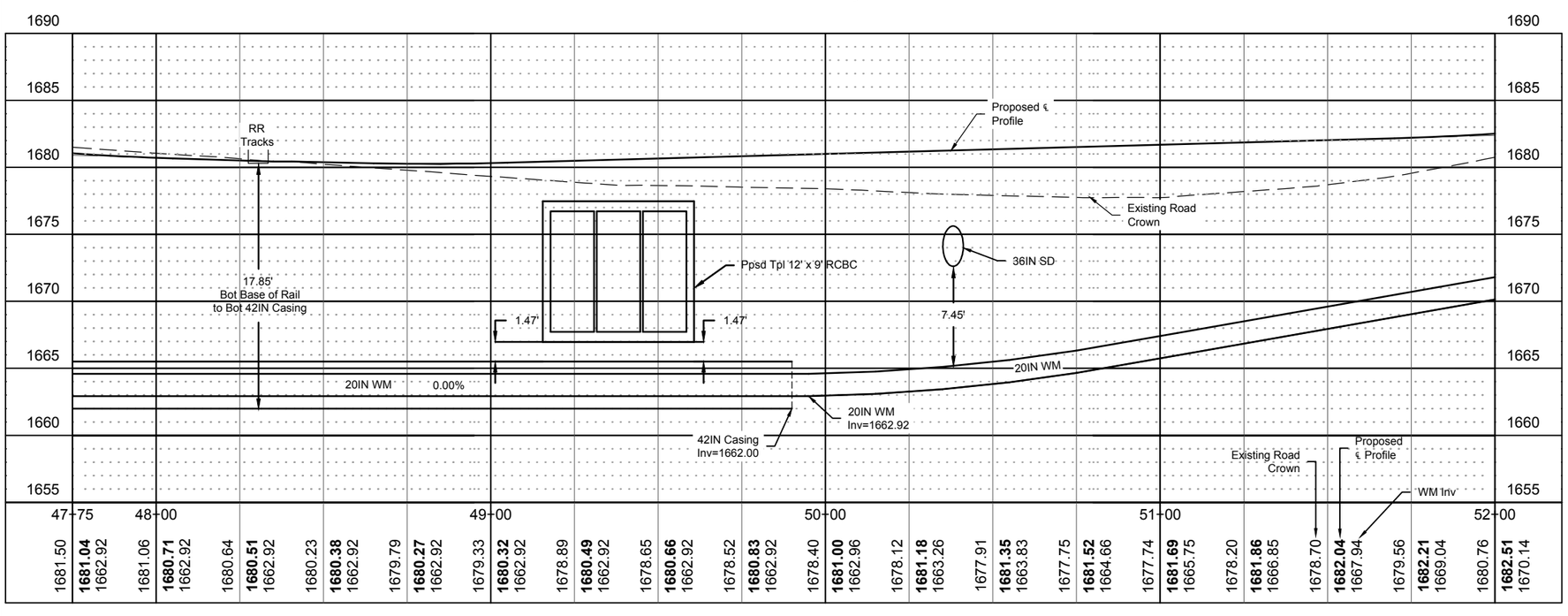
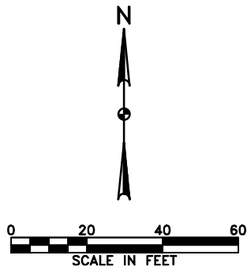
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	6

WATERMAIN 20IN
Sta 48+00 to 52+00 — 400 LF

CASING PIPE 42IN
Sta 47+70 to 49+90, 12' Lt — 220 LF







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 48+00 to 52+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NJW	1411109	Aug 2013

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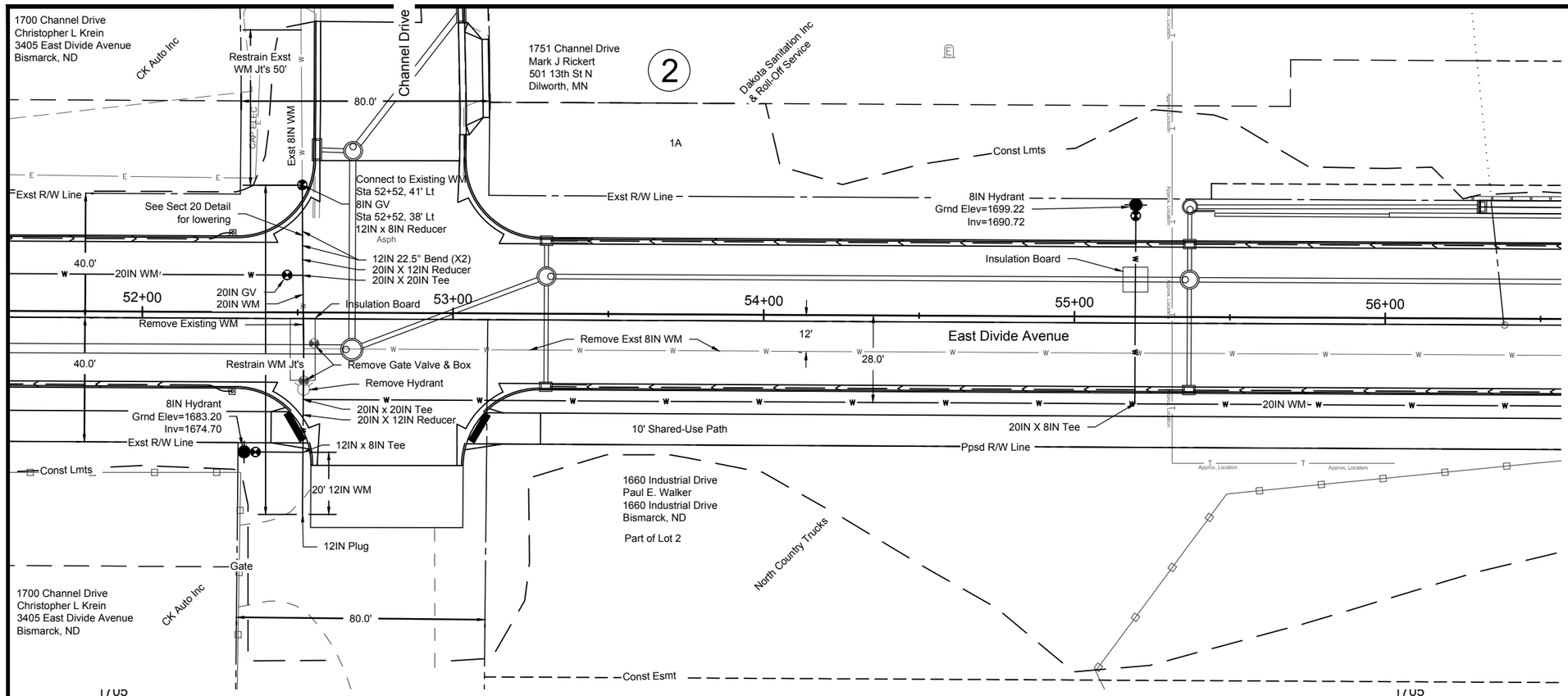
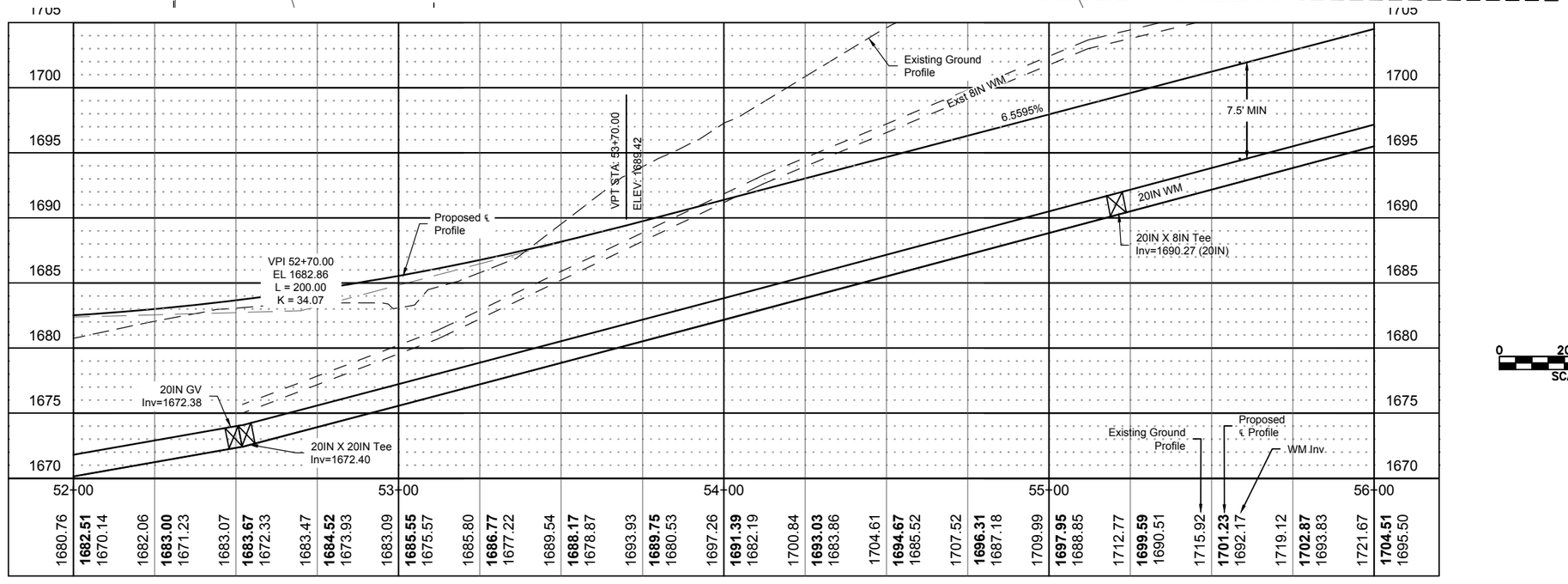
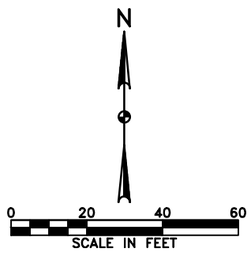
Aug 05, 2013 – 2:50pm – J:\trans\1411109\CADD\057WM_001_PP.dwg







STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	7

REMOVAL OF PIPE ALL TYPES AND SIZES		
Sta 52+52 to 56+00 12' Rt (Exst WM)	348	LF
Sta 52+52, 38' Lt to Hydrant (Exst WM)	66	LF
Total	414	LF

FITTINGS-DUCTILE IRON		
Sta 52+52, Lt (12IN 22.5° Bend) (X2)	168	LBS
Sta 52+52, 38' Lt (12IN x 8IN Reducer)	60	LBS
Sta 52+52, 17' Lt (20IN x 12IN Reducer)	214	LBS
Sta 52+52, 12' Lt (20IN X 20IN Tee)	605	LBS
Sta 52+52, 28' Rt (20IN X 20IN Tee)	605	LBS
Sta 52+52, 33' Rt (20IN x 12IN Reducer)	214	LBS
Sta 52+52, 45' Rt (12IN X 8IN Tee)	125	LBS
Sta 52+52, 66' Rt (12IN Plug)	47	LBS
Sta 55+20, 28' Rt (20IN X 8IN Tee)	390	LBS
Total	2428	LBS

REMOVE GATE VALVE & BOX		
Sta 52+52, 22' Rt	1	EA
Sta 52+56, 10' Rt	1	EA

GATE VALVE & BOX 8IN		
Sta 52+36.5, 45' Rt	1	EA
Sta 52+52, 41' Lt	1	EA
Sta 55+20, 32.5' Lt	1	EA

GATE VALVE & BOX		
Sta 52+47, 12' Lt	1	EA

8IN HYDRANT		
Sta 52+33, 45' Rt	1	EA
Sta 55+20, 36' Lt	1	EA

REMOVE HYDRANT		
Sta 52+52, 25' Rt	1	EA

WATERMAIN 8IN		
Sta 52+52, 38' Lt to 41' Lt	4	LF
Tee to Hydrant, Sta 52+52	20	LF
Tee to Hydrant, Sta 55+20	64	LF
Total	88	LF

WATERMAIN 20IN		
Sta 52+00 to 56+00	400	LF
Sta 52+52, 17' Lt to 33' Rt	50	LF
Total	450	LF

12IN WATERMAIN		
Sta 52+52,17' Lt to 38' Lt	22	LF
Sta 52+52, 33' Rt to 65'	32	LF
Total	54	LF

POLYSTYRENE INSULATION BOARD		
Sta 52+52, 12' Lt (20'x8'x4")	640	BD FT
Sta 55+20, 12' Lt (8'x8'x4")	256	BD FT
	896	BD FT

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 52+00 to 56+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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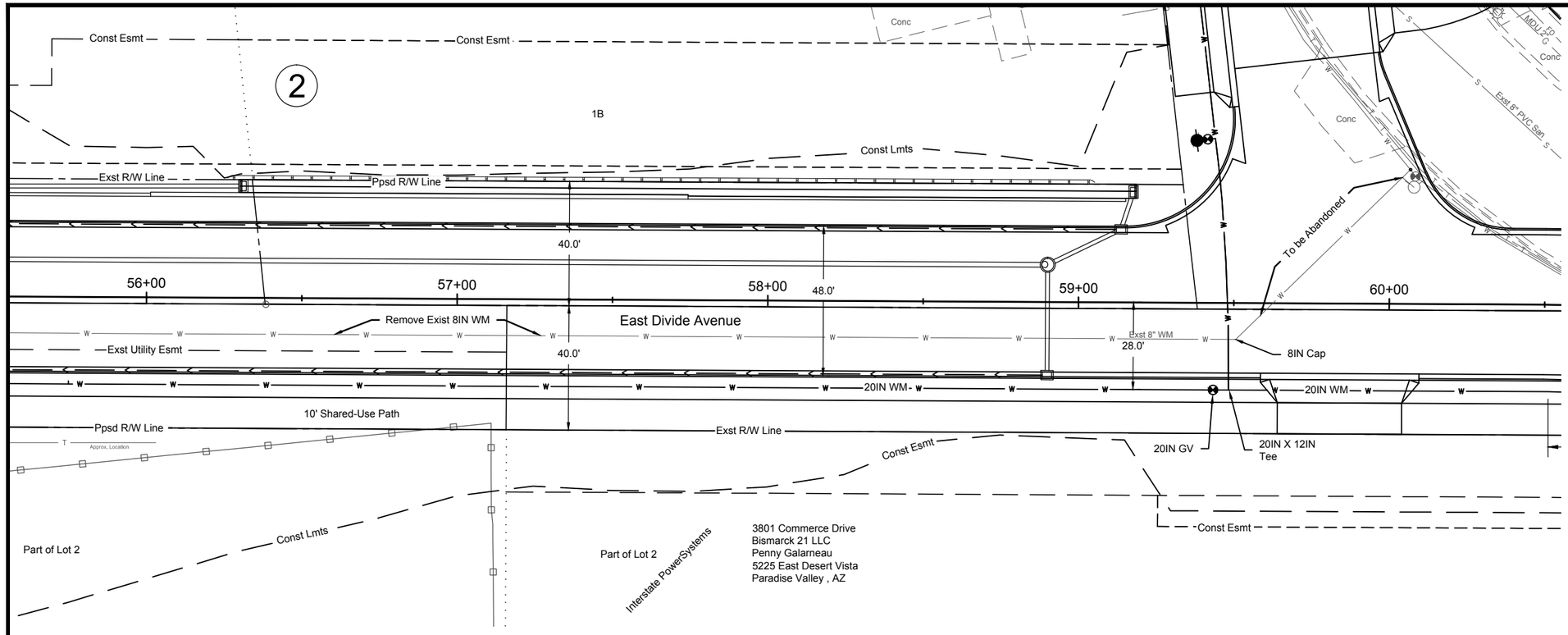
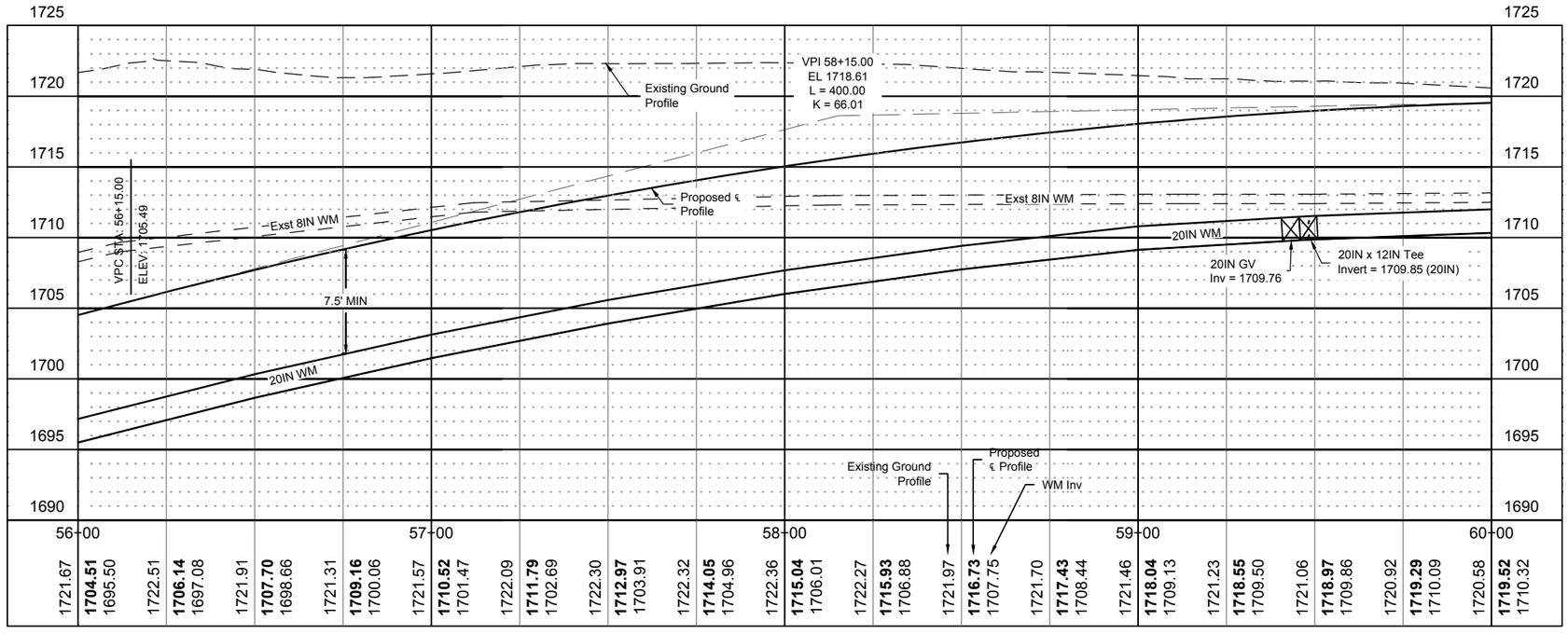




STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	8

REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 56+00, 12' Rt to 59+51, 12' Rt (Exst WM)	351	LF

FITTINGS-DUCTILE IRON

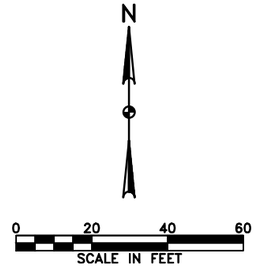
Sta 59+48, 28' Rt (20IN x 12IN Tee)	460	LBS
Sta 59+51, 12' Rt (8IN Cap)	25	LBS
Total	485	LSB

GATE VALVE & BOX

Sta 59+43, 28' Rt	1	EA

20IN WATERMAIN

Sta 56+00 to 60+00	400	LF



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue Watermain Layouts Sta 56+00 to 60+00

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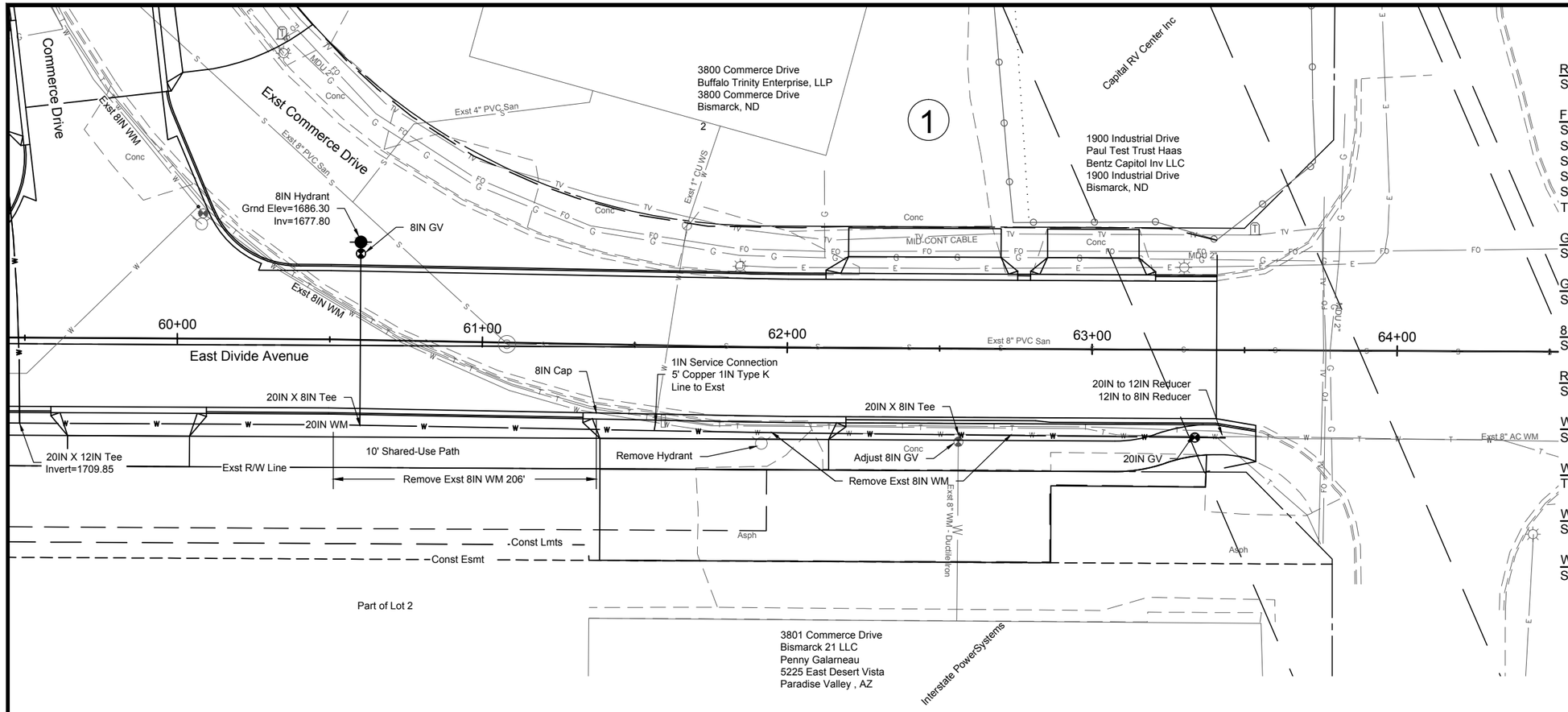
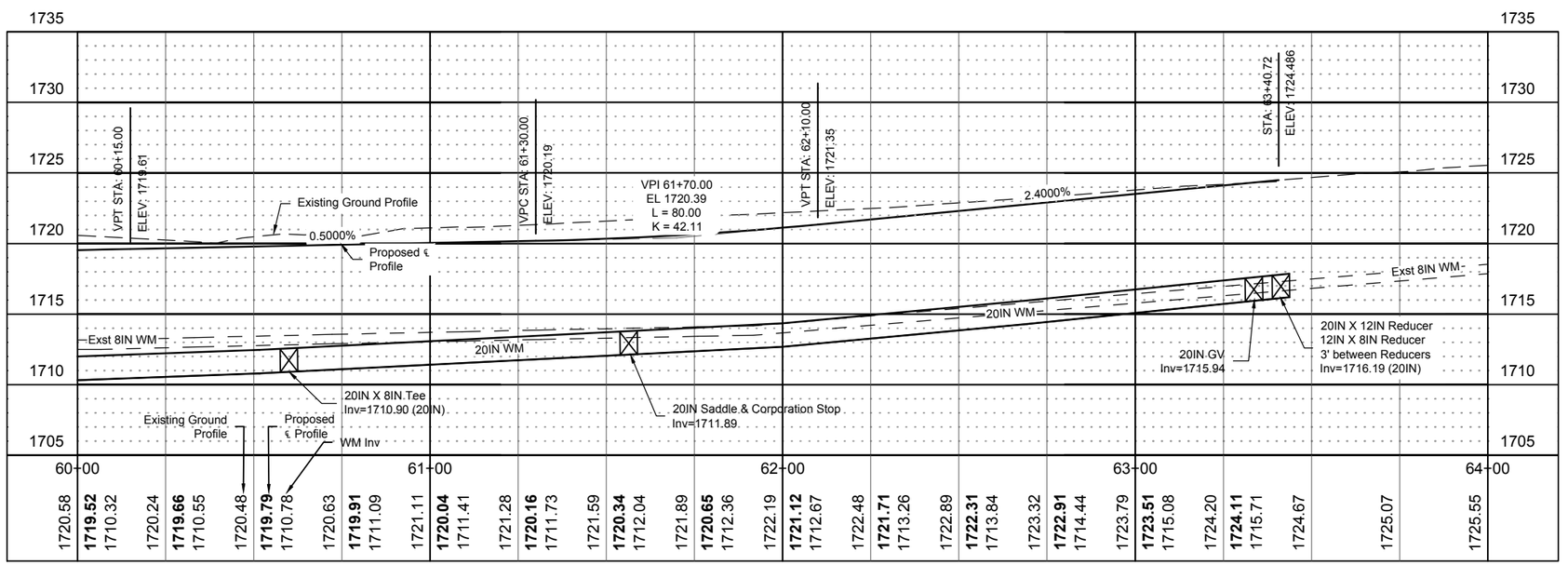
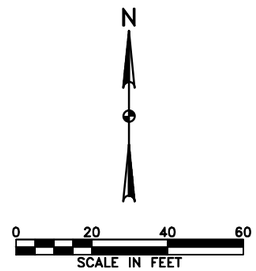
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	57	9







REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 61+40, 22' Rt to 63+44, 28.5' Rt	206	LF

FITTINGS-DUCTILE IRON

Sta 60+60, 28' Rt (20IN X 8IN Tee)	390	LBS
Sta 61+40, 22' Rt (8IN Cap)	25	LBS
Sta 62+56, 28' Rt (20IN X 8IN Tee)	390	LBS
Sta 63+41, 28.5' Rt (20IN X 12IN Reducer)	214	LBS
Sta 63+44, 28.5' Rt (12IN X 8IN Reducer)	60	LBS
Total	1079	LBS

GATE VALVE & BOX 8IN

Sta 60+60, 28' Lt	1	EA

GATE VALVE & BOX

Sta 63+34, 28.5' Rt	1	EA

8IN HYDRANT

Sta 60+60, 32' Lt	1	EA

REMOVE HYDRANT

Sta 61+92, 31.5' Rt	1	EA

WATER SERVICE LINE 1IN COPPER

Sta 61+57, 27' Rt	5	LF

WATERMAIN 8IN

Tee to Hydrant	60	LF

WATERMAIN 20IN

Sta 60+00,28.0' Rt to 63+44, 28.5' Rt	344	LF

WATER SERVICE CONNECTION 1IN

Sta 61+57, 27' Rt	1	EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Watermain Layouts
Sta 60+00 to 64+00

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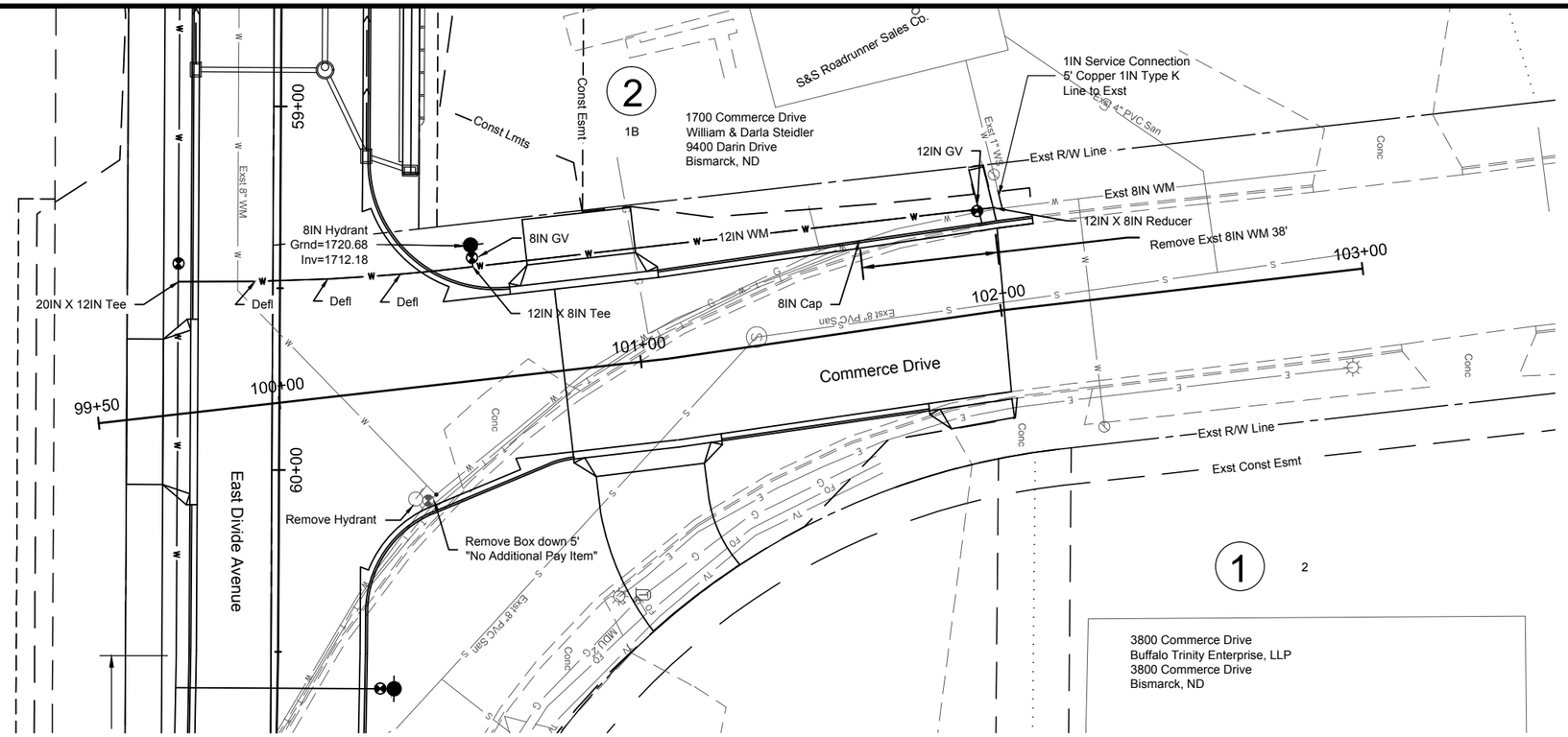
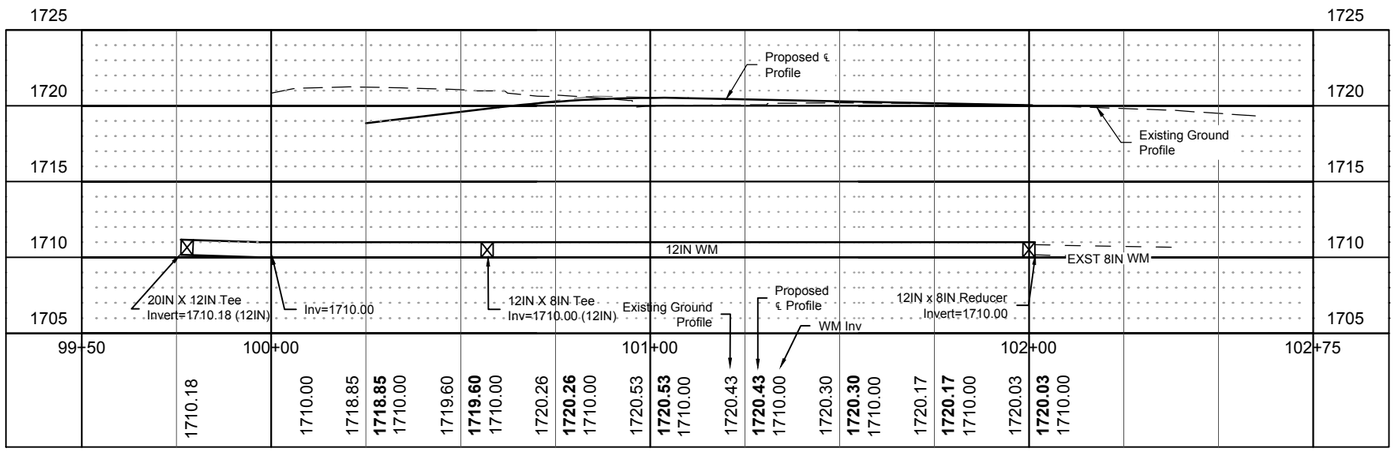
ND	SU-NHU-1-981(094)104	57	10

Part of Lot 2





REMOVAL OF PIPE ALL TYPES AND SIZES

Sta 101+64 to 102+02, 24.5' Lt to 28.3' Lt	38	LF

FITTINGS-DUCTILE IRON

Sta 100+57, 31.2' Lt (12IN x 8IN Tee)	125	LBS
Sta 102+02, 28.3' Lt (12IN x 8IN Reducer)	60	LBS
Sta 101+64, 24.5' Lt (8IN Cap)	25	LBS
	210	LBS

GATE VALVE & BOX 8IN

Sta 100+57, 33.7' Lt	1	EA

GATE VALVE & BOX 12IN

Sta 101+97, 28.3' Lt	1	EA

8IN HYDRANT

Sta 100+57, 37.2' Lt	1	EA

REMOVE HYDRANT

Sta 100+34, 30.5' Rt	1	EA

WATERMAIN 8IN

Tee to Hydrant	6	LF

12IN WATERMAIN

Sta 99+76 to 102+02	226	LF

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Commerce Drive
Watermain Layouts
Sta 99+50 to 103+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RRS	NJW	1411109	Apr. 2013

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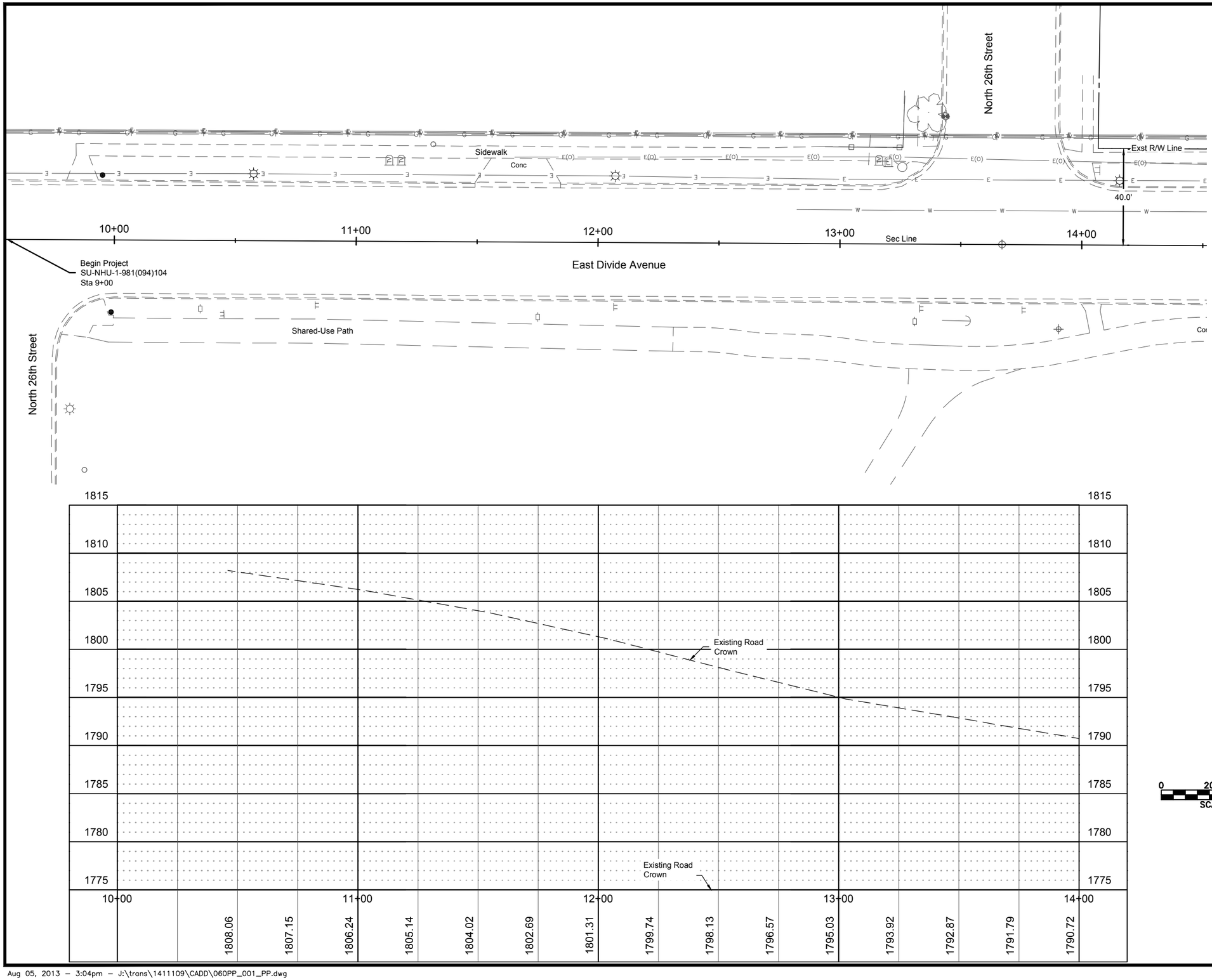
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	1



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 10+00 to 14+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
NJW	TJR	1411109	Aug 2013

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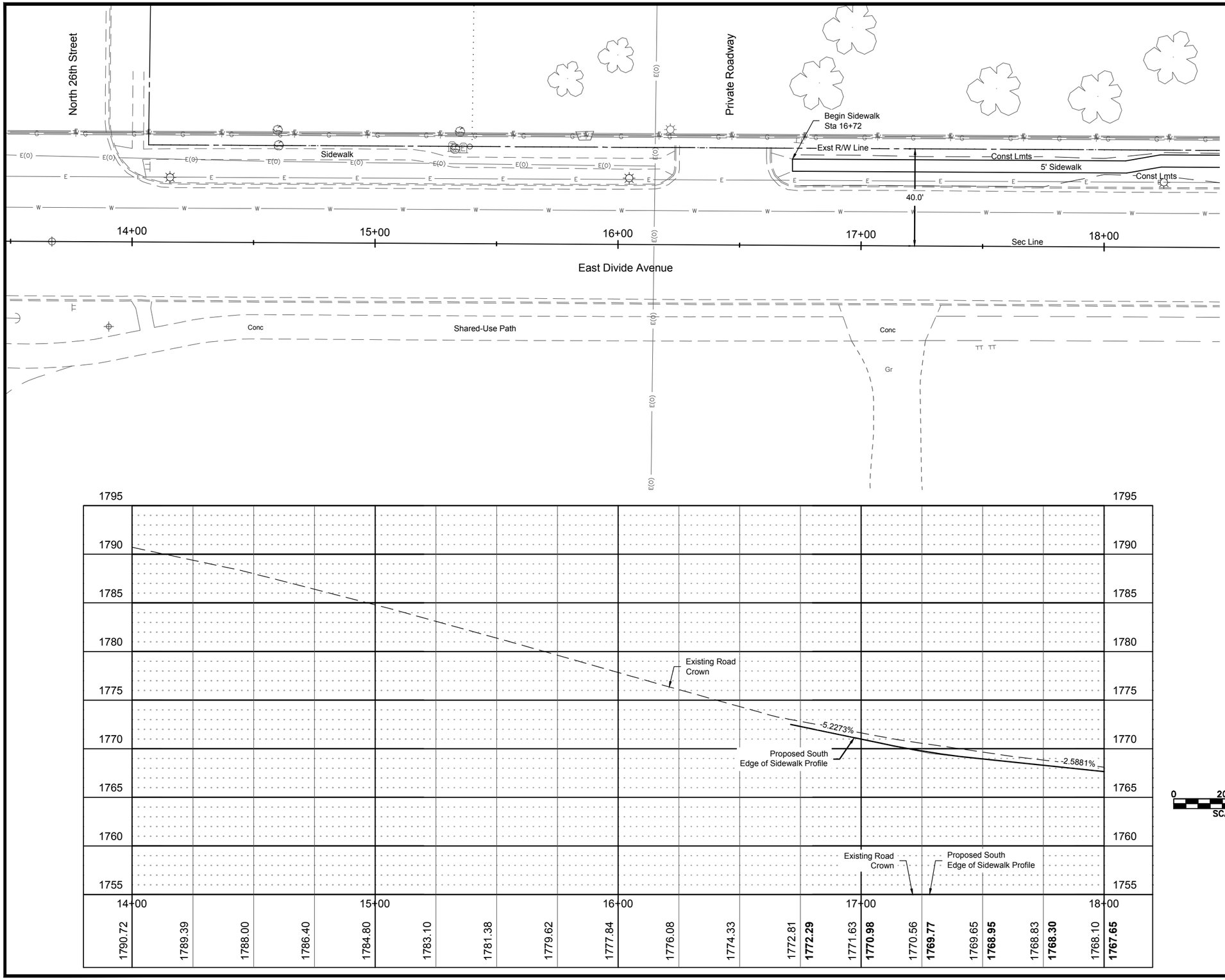
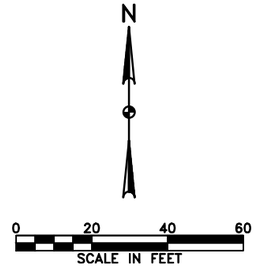
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	2





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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 14+00 to 18+00

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NJW	TJR	1411109	Aug 2013

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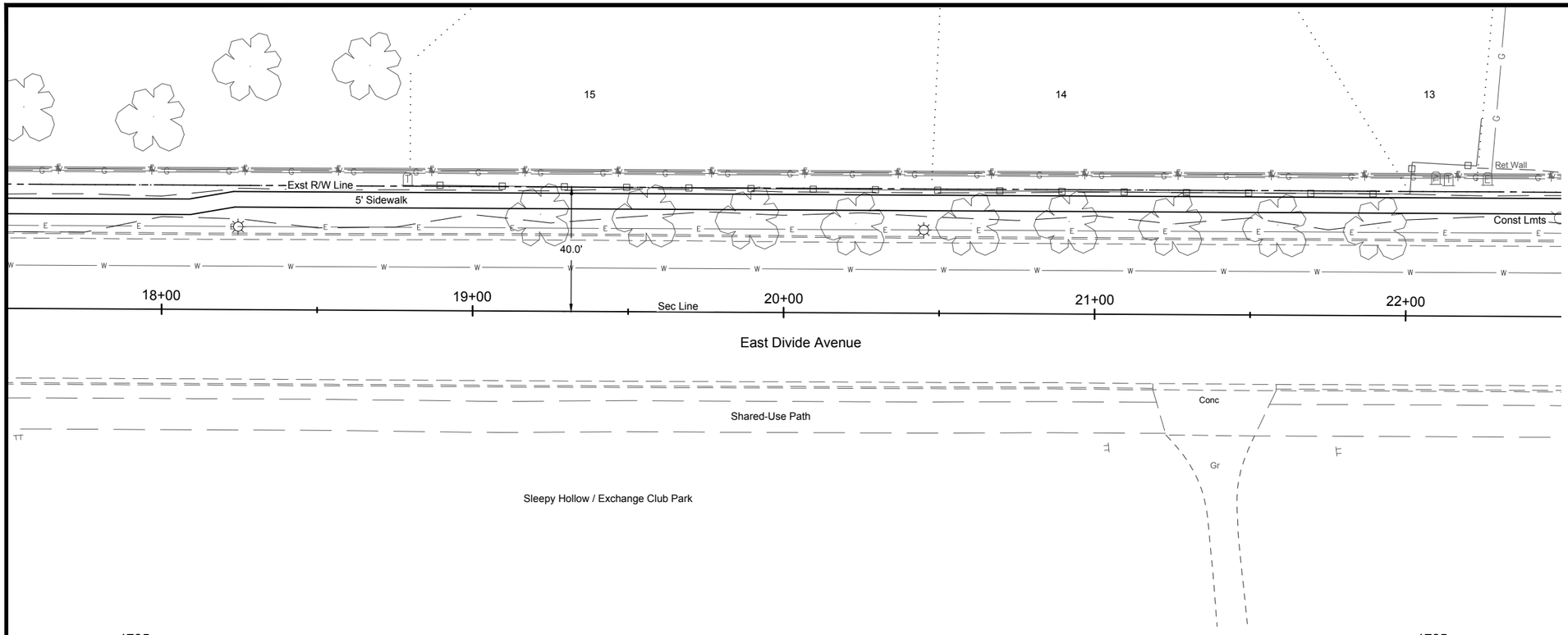
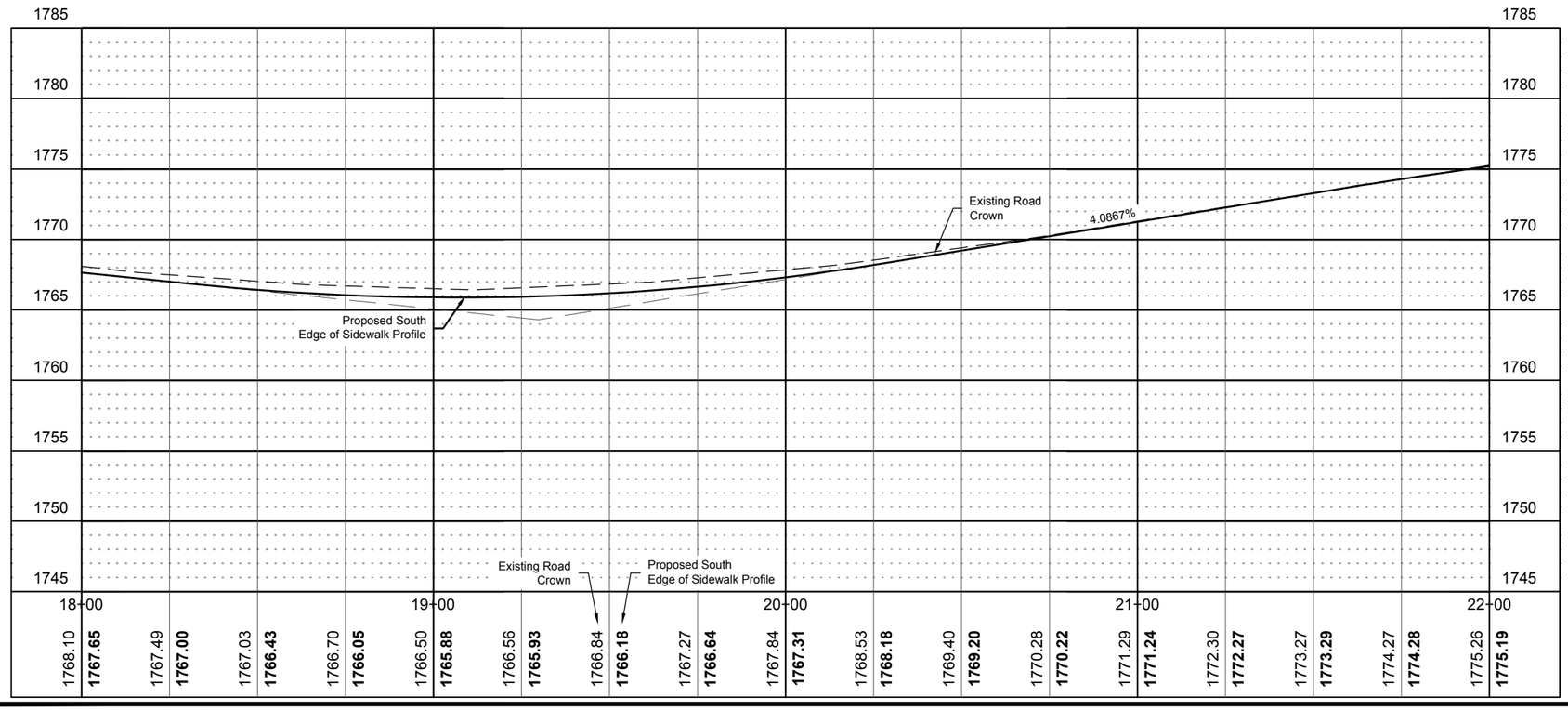
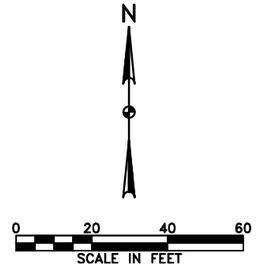
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	3







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 18+00 to 22+00

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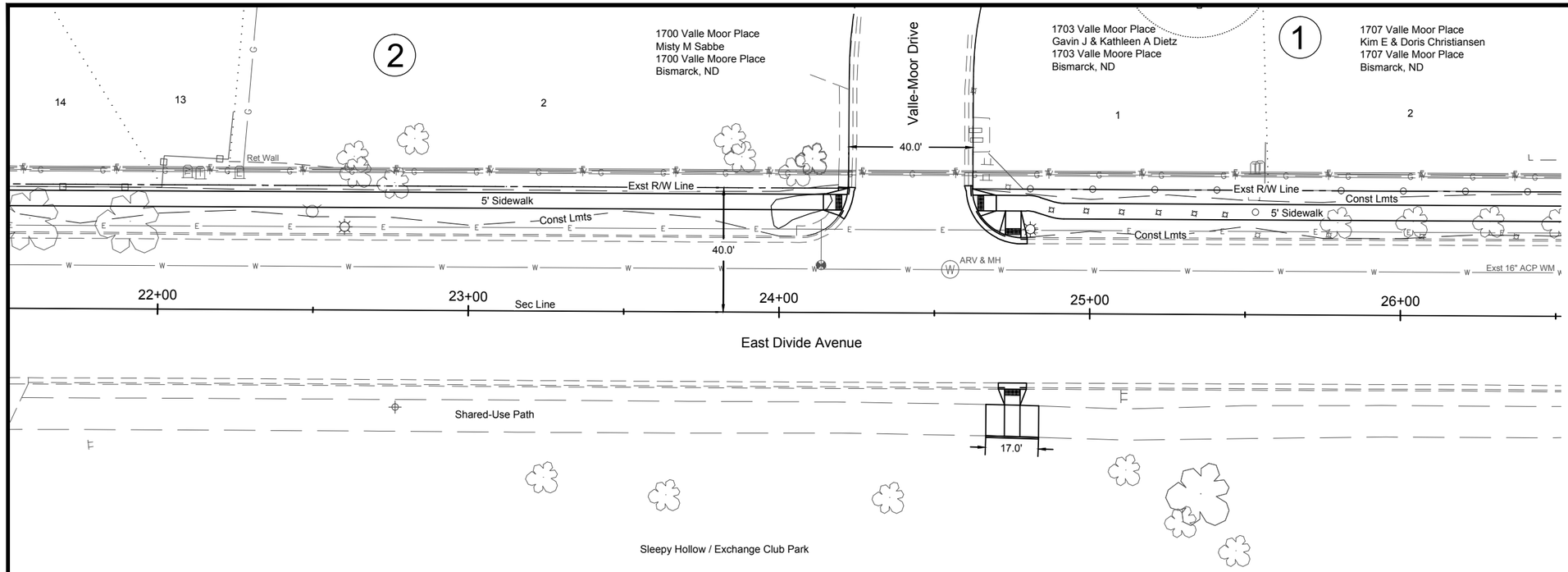
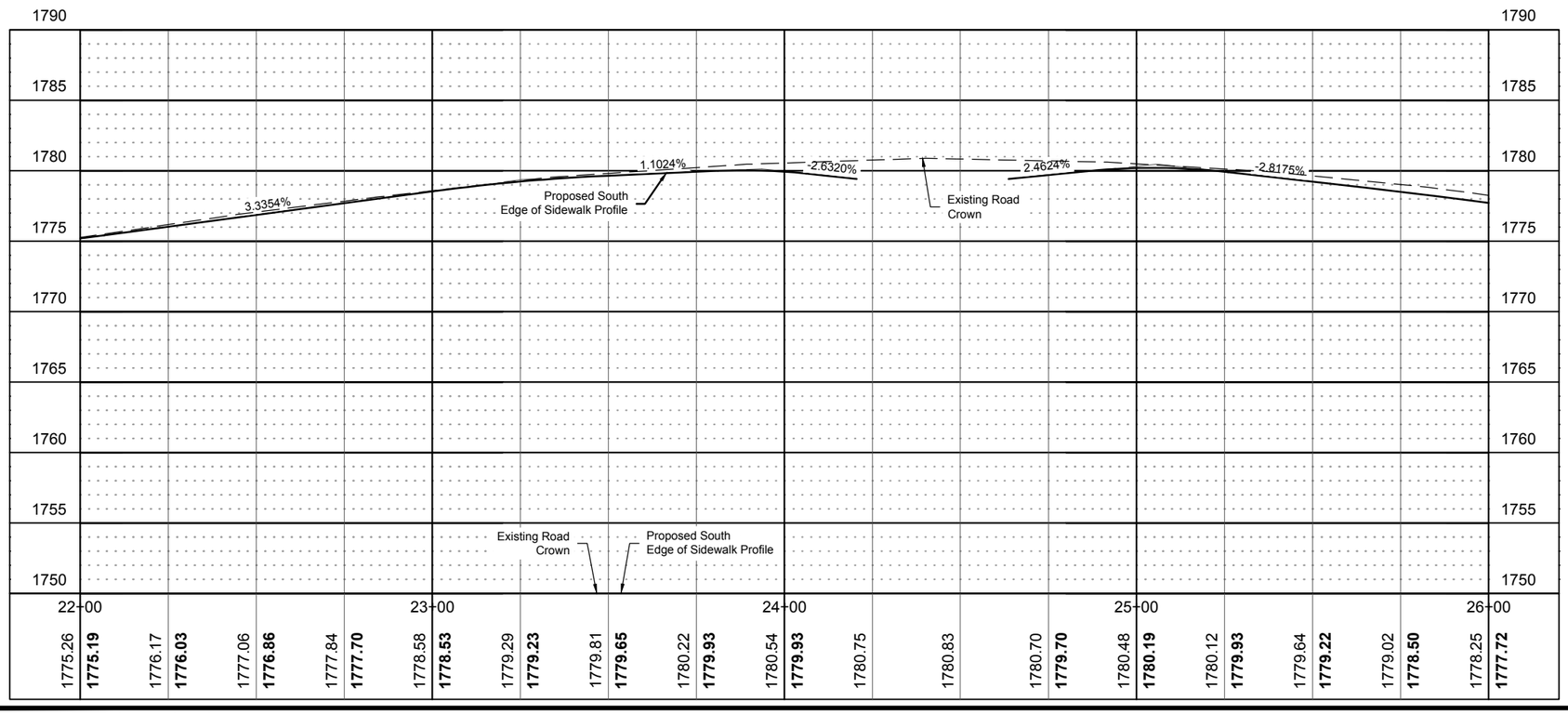
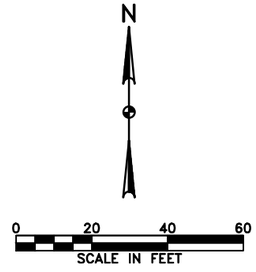
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	4







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 22+00 to 26+00

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	5

PIPE POLYETHYLENE CORR PERF 6IN DRAIN

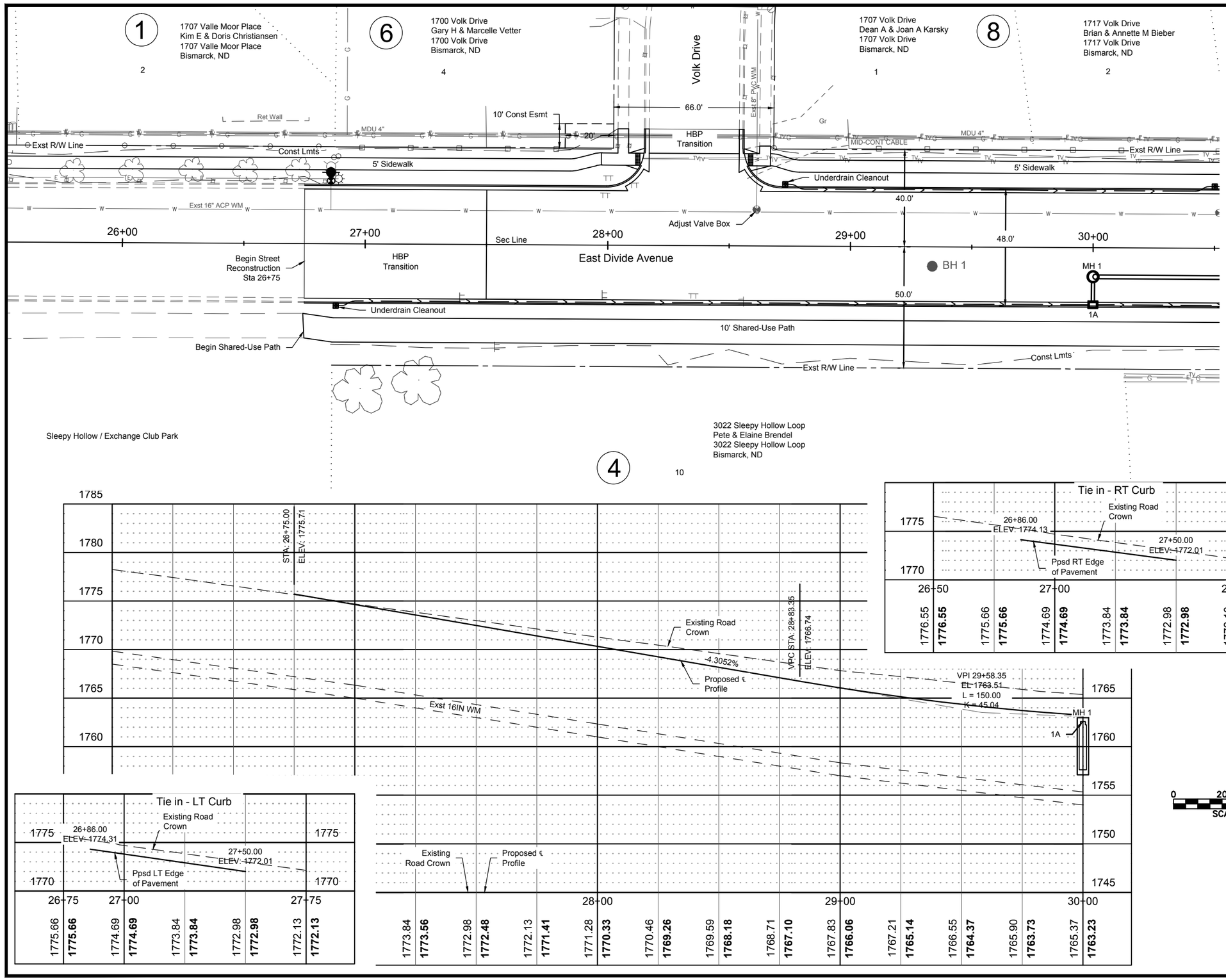
Sta 26+88, 25.5' RT to Inlet 1A	312 LF
Sta 28+73, 25.5' LT to Sta 29+75, 25.5' LT	102 LF
Total	414 LF

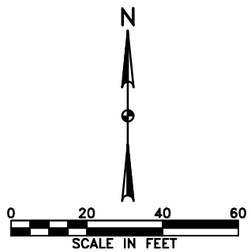
UNDERDRAIN CLEANOUT RISER

Sta 26+88, 25.5' RT	1 EA
Sta 28+73, 25.5' LT	1 EA

ADJUST UTILITY APPURTENANCE

Sta 28+61, 15' Lt (GATE VALVE BOX)	1 EA





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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 26+00 to 30+00

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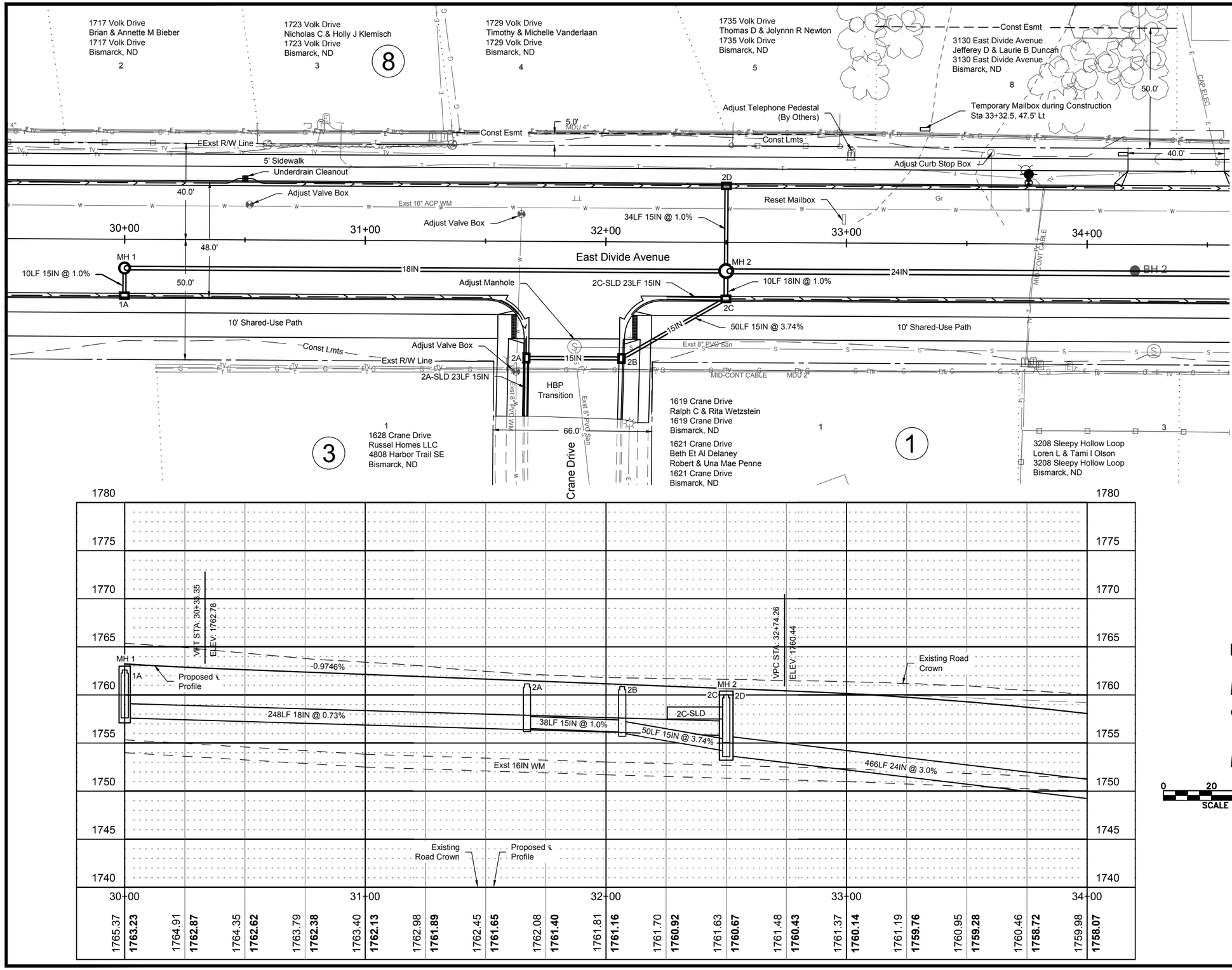

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	6

PIPE CONDUIT 15IN-STORM DRAIN

Inlet 1A to MH 1	10 LF
Inlet 2A to Inlet 2B	38 LF
Inlet 2B to Inlet 2C	50 LF
Inlet 2D to MH 2	34 LF
Total	132 LF

PIPE CONDUIT 18IN-STORM DRAIN

MH 1 to MH 2	248 LF
Inlet 2C to MH 2	10 LF
Total	258 LF

PIPE CONDUIT 24IN-STORM DRAIN

MH 2 to Sta 34+00,12' RT	148 LF

PIPE POLYETHYLENE CORR PERF 6IN DRAIN

Inlet 1A to Inlet 2A	184 LF
Sta 29+75, 25.5' LT to Inlet 2D	274 LF
Inlet 2D to Sta 34+00, 23.5' LT	150 LF
Inlet 2C to Sta 34+00, 23.5' RT	150 LF
Total	758 LF

UNDERDRAIN CLEANOUT RISER

Sta 30+50, 25.5' Lt	1 EA

MANHOLE 48IN

MH 1	1 EA

MANHOLE 60IN

MH 2	1 EA

MANHOLE RISER 48IN

MH 1	4.0 LF

MANHOLE RISER 60IN

MH 2	4.9 LF

INLET-TYPE 2

1A	1 EA
2A	1 EA
2B	1 EA
2C	1 EA
2D	1 EA

INLET SLOTTED DRAIN 15IN

2A	23 LF
2C	23 LF
Total	46 LF

ADJUST MANHOLE

Sta 31+87, 44' Rt	1 EA

ADJUST UTILITY APPURTENANCE

Sta 30+52, 15' Lt (GATE VALVE BOX)	1 EA
Sta 31+65, 11' Rt (GATE VALVE BOX)	1 EA
Sta 31+63, 54' Rt (GATE VALVE BOX)	1 EA
Sta 33+60, 38' Lt (CURB STOP BOX)	1 EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 30+00 to 34+00

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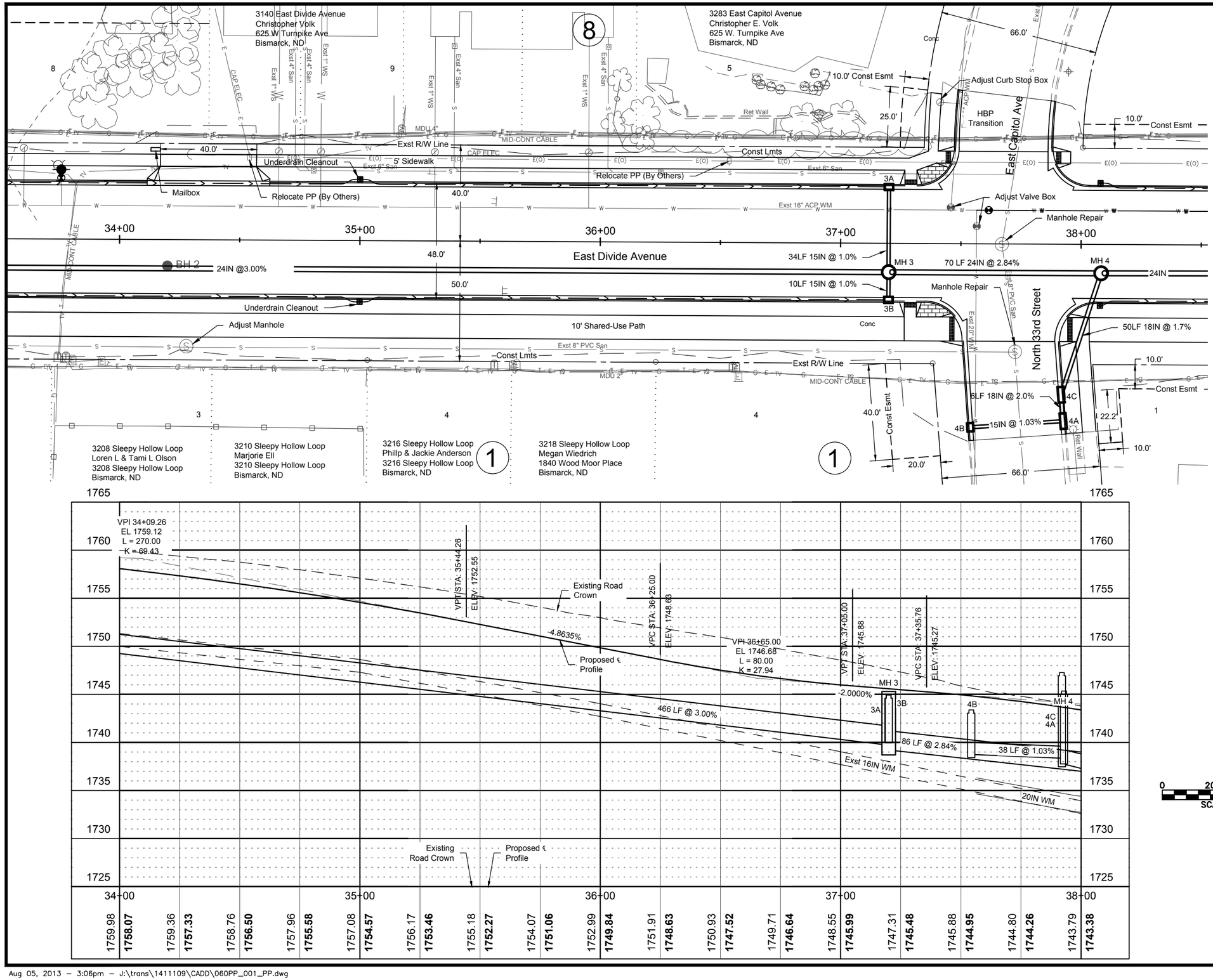

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	7

PIPE CONDUIT 15IN-STORM DRAIN

Inlet 3A to MH 3	34 LF
Inlet 3B to MH 3	10 LF
Inlet 4B to Inlet 4A	38 LF
Total	82 LF

PIPE CONDUIT 18IN-STORM DRAIN

Inlet 4A to Inlet 4C	6 LF
Inlet 4C to MH 4	50 LF
Total	56 LF

PIPE CONDUIT 24IN-STORM DRAIN

Sta 34+00, 12' RT to MH 3	318 LF
MH 3 to MH 4	86 LF
Total	404 LF

PIPE POLYEHTYLENE CORR PERF 6IN DRAIN

Sta 34+00, 23.5' LT to Inlet 3A	320 LF
Sta 34+00, 23.5' RT to Inlet 3B	320 LF
Total	640 LF

UNDERDRAIN CLEANOUT RISER

Sta 35+00, 25.5' Lt	1 EA
Sta 35+00, 25.5' Rt	1 EA

MANHOLE 60IN

MH 3	1 EA
MH 4	1 EA

MANHOLE RISER 60IN

MH 3	4.3 LF
MH 4	6.3 LF

MANHOLE REPAIR

Sta 37+67, 0'	1 EA
Sta 37+73, 45' Rt	1 EA

INLET-TYPE 2

3A	1 EA
3B	1 EA
4B	1 EA

INLET-TYPE 2 DOUBLE

4A	1 EA
4C	1 EA

ADJUST MANHOLE

Sta 34+28, 44' Rt	1 EA

ADJUST UTILITY APPURTENANCE

Sta 37+46, 15' Lt (GATE VALVE BOX)	1 EA
Sta 37+57, 7' Lt (GATE VALVE BOX)	1 EA
Sta 37+41, 59' Lt (CURB STOP BOX)	1 EA

MAILBOX-ALL TYPES

Sta 34+15, 37.5' Lt	1 EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 34+00 to 38+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	8

PIPE CONDUIT 24IN-STORM DRAIN

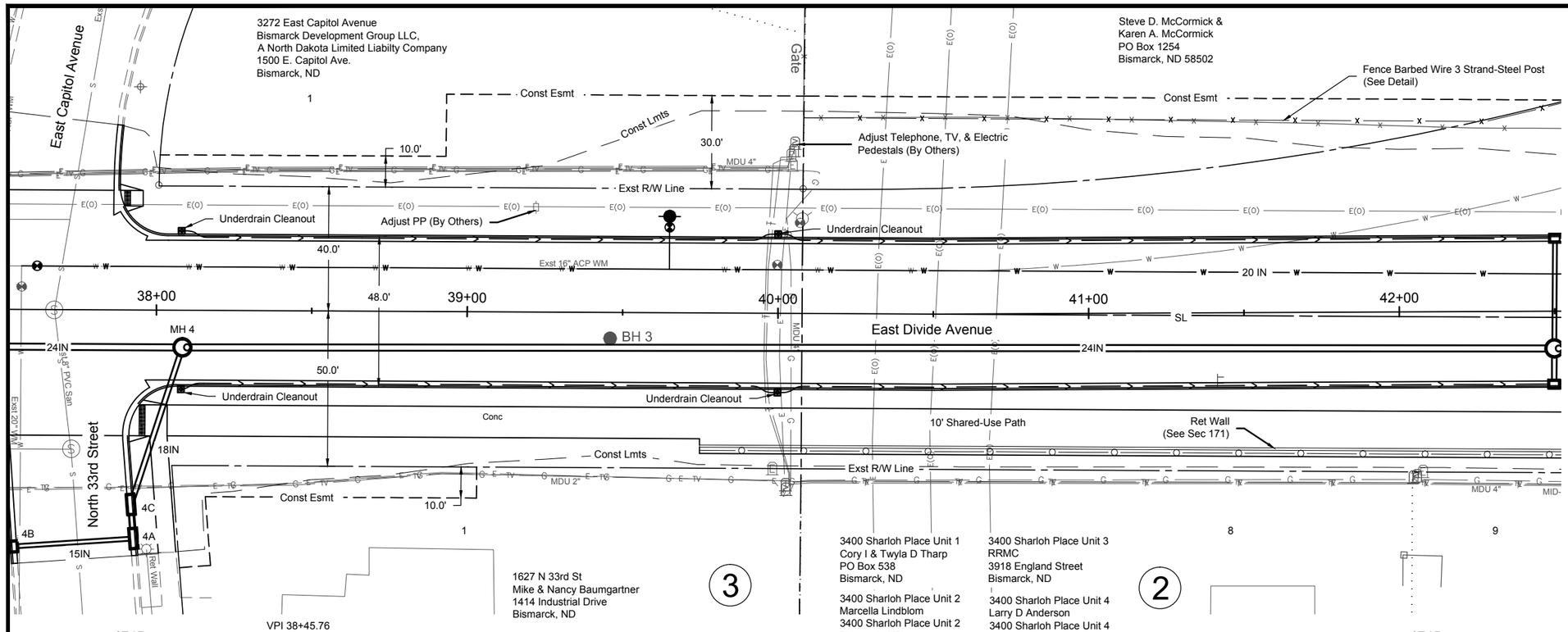
MH 4 to Sta 42+00, 12' RT	390 LF

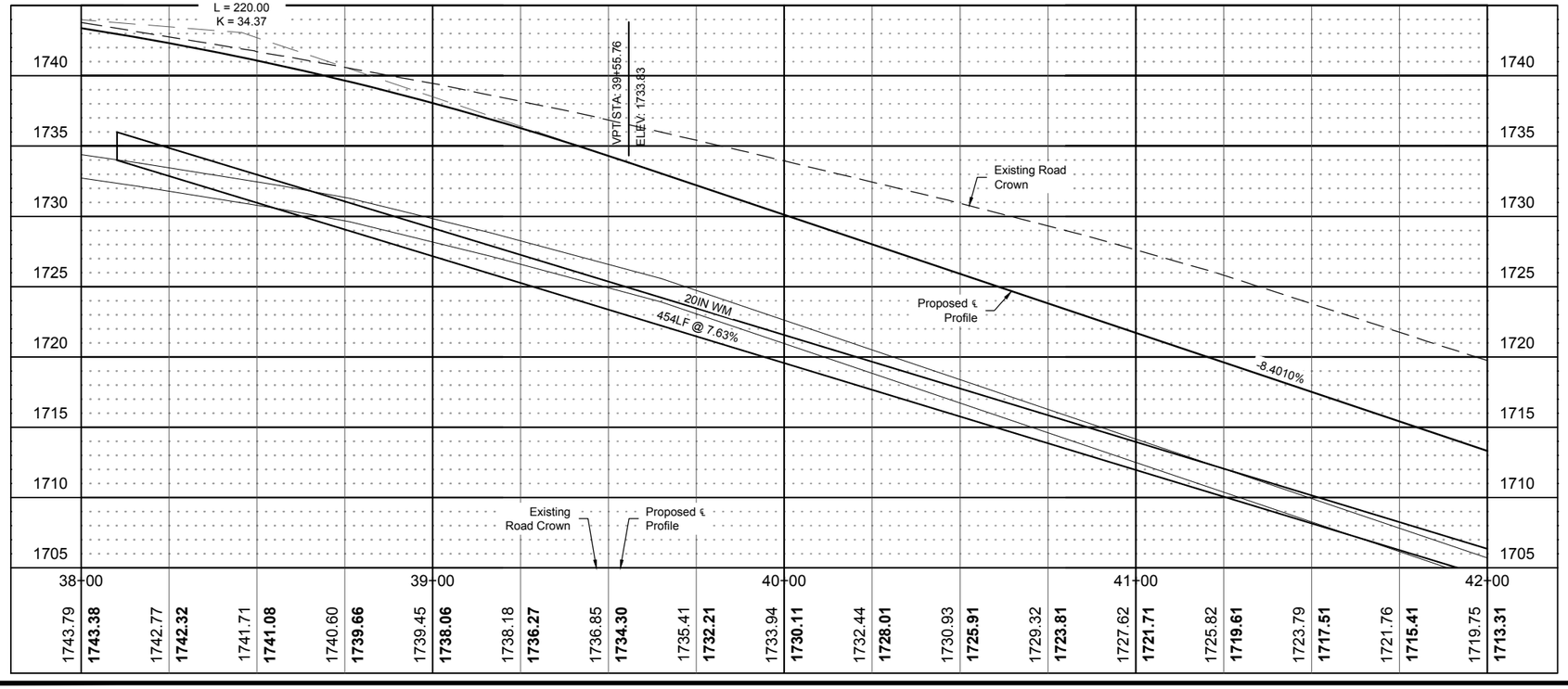
PIPE POLYEHTYLENE CORR PERF 6IN DRAIN

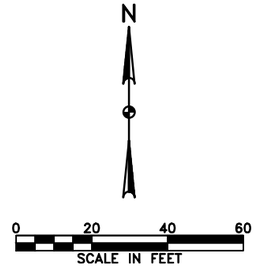
Sta 38+08, 25.5' RT to Sta 40+00, 25.5' RT	192 LF
Sta 38+08, 25.5' LT to Sta 40+00, 25.5' LT	192 LF
Sta 40+00, 25.5' RT to Inlet 5A	250 LF
Sta 40+00, 25.5' LT to Inlet 5B	250 LF
Total	884 LF

UNDERDRAIN CLEANOUT RISER

Sta 38+08, 25.5' LT	1 EA
Sta 38+08, 25.5' RT	1 EA
Sta 40+00, 25.5' LT	1 EA
Sta 40+00, 25.5' RT	1 EA







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile

Sta 38+00 to 42+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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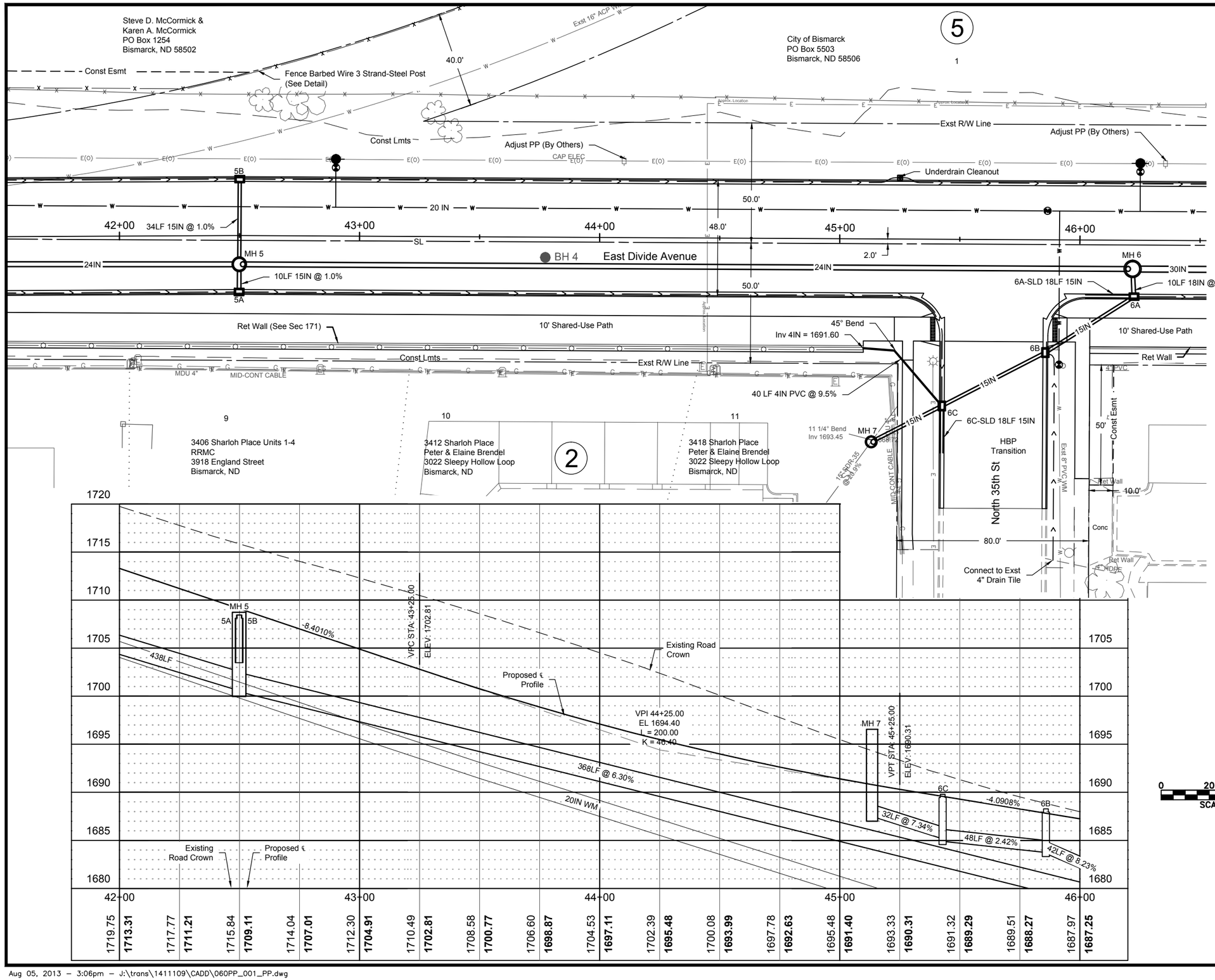
Aug 05, 2013 – 3:06pm – J:\trans\1411109\CADD\060PP_001_PP.dwg



STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	9

PIPE CONDUIT 15IN-STORM DRAIN

Inlet 5A to MH 5	10LF
Inlet 5B to MH 5	34 LF
MH 7 to Inlet 6C	32 LF
Inlet 6C to Inlet 6B	48 LF
Inlet 6B to Inlet 6A	42 LF
Total	166 LF

PIPE CONDUIT 18IN-STORM DRAIN

Inlet 6A to MH 6	10 LF

PIPE CONDUIT 24IN-STORM DRAIN

Sta 42+00, 12' RT to MH 5	48 LF
MH 5 to MH 6	368 LF
Total	416 LF

PIPE POLYETHYLENE CORR PERF 6IN DRAIN

Inlet 5A to Inlet 6C	330 LF
Inlet 5B to Sta 45+25, 25.5' LT	274 LF
Sta 45+25, 25.5' LT to Sta 46+00, 23.5' LT	76 LF
Sta 45+89.5, 133.5' RT to Inlet 6B	86 LF
Total	766 LF

PIPE PVC 4IN DRAIN

Retaining wall to 6C	40 LF

UNDERDRAIN CLEANOUT RISER

Sta 45+25, 25.5' LT	1 EA

MANHOLE 48IN

MH 7	1 EA

MANHOLE 60IN

MH 5	1 EA

MANHOLE 72IN

MH 6	1 EA

MANHOLE RISER 48IN

MH 7	7.7 LF

MANHOLE RISER 60IN

MH 5	6.5 LF

MANHOLE RISER 72IN

MH 6	7.5 LF

INLET-TYPE 2

5A	1 EA
5B	1 EA
6A	1 EA
6B	1 EA
6C	1 EA

INLET SLOTTED DRAIN 15IN

6A	18 LF
6C	18 LF
Total	36 LF

N

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 42+00 to 46+00

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ND	SU-NHU-1-981(094)104	60	10

City of Bismarck
PO Box 5503
Bismarck, ND 58506

RR R/W

DMVW / CP RR

Delineated Wetland

Const Esmt

Const Lmts

Exst R/W Line

Ppsd R/W

Adjust PP (By Others)

Adjust PP & Pedestal (By Others)

Reset RR Signal (By RR)

CAP ELEC

Ppsd Tpl 12' x 9' RCBC

Casing Pipe 42IN

East Divide Avenue

46+00 47+00 48+00 49+00 50+00

MH 6 MH 8 MH 9 MH 16

BH 5

24IN 30IN 36IN 20IN 16IN 15IN

6A-SLD 18LF 15IN

10LF 18IN @ 1.0%

10LF 18IN @ 4.50%

10LF 15IN @ 5.0%

6LF 15IN @ 1.67%

34LF 15IN @ 2.75%

38LF 15IN @ 5.08%

Jack or Bore Under Railroad
CL IV CONC REINF

42LF 15IN @ 8.23%

Ret Wall
(See Sec 171)

10' Shared-Use Path

22LF 4IN @ 9.76%

Inv 4IN = 1679.42

48LF 15IN @ 2.42%

4" PVC

Install RR Crossing
Continuous RR Surface Panels over both Roadway and Shared-Use Path Crossings (By RR)

1525 Sharloh Loop
East Hills Development LLP
3500 East Divide Avenue
Bismarck, ND

North 35th Street

East 8" PVC WM

Apartment Garage

Conc

4 1621 N 35th Street
Creek Side Apartments, LLC
2121 Sundancer Loop SE, #6
Mandan, ND

East Bismarck Channelization / Hay Creek

15' Permanent Esmt

Lot A of 1

Sta 47+73.00 1680.60
Sta 47+98.00 680.05 -2.2000%
-0.4130%
Sta 48+30.00 1680.53
-0.2727%
-0.7833%
Sta 48+19.00 1680.53
Ppsd RT Edge of Pavement
Sta 49+15.00 1679.72 -1.4800%
Sta 49+40.00 1680.11
Existing Road Crown

47+50	48+00	49+00	49+50
1681.99	1681.50 **1680.56** 1681.06 **1680.06** 1680.64 **1680.16** 1680.23 **1680.22** 1679.79 **1680.05** 1679.33 **1679.86** 1678.89 **1679.89**		

Existing Road Crown
Sta 48+44.00 1680.24
Sta 48+55.00 1680.21
Sta 48+90.00 1679.80
-2.7800% 0.5000% 0.0000% -1.2167%
Sta 47+53.00 1681.02
Ppsd LT Edge of Pavement

47+50	48+00	49+00
1681.99	1681.50 **1680.41** 1681.06 **1680.44** 1680.64 **1680.53** 1680.23 **1680.29** 1679.79 **1679.98** 1679.33	

VPI 48+85.00
EL 1680.21
L = 40.00
K = 33.63

VPC STA: 46+95.00
ELEV: 1683.36
VPC STA 46+95.00
ELEV: 1683.36
VPI 47+50.00
EL 1681.11
L = 110.00
K = 33.43
VPT STA: 48+05.00
ELEV: 1680.67
STA: 48+35.00
ELEV: 1680.43
VPC STA: 48+65.00
ELEV: 1680.31
LP STA: 48+81.82
ELEV: 1680.268
VPT STA: 49+05.00
ELEV: 1680.35

MH 6 MH 8 MH 9
6A 8A 8B 8C 9A 9B 9C
-4.0908% -0.8000% 0.0000% -0.5000% 0.6894%
Existing Road Crown
Proposed ℄ Profile
6A-SLD
42LF @ 8.23%
368LF @ 6.30%
156LF @ 2.48%
8LF
Top of Existing Track Elev= 1680.30
Jack or Bore Under Railroad
122LF @ 1.0%
16LF @ 1.25%
20IN WM
Ppsd Tpl 12' x 9' RCBC

46+00	47+00	48+00	49+00	50+00
1687.97 **1687.25** 1686.64 **1686.22** 1685.50 **1685.20** 1684.50 **1684.18** 1683.64 **1683.16** 1682.81 **1682.27** 1681.99 **1681.56** 1681.50 **1681.04** 1681.06 **1680.71** 1680.64 **1680.51** 1680.23 **1680.38** 1679.79 **1680.27** 1679.33 **1680.32** 1678.89 **1680.49** 1678.65 **1680.66** 1678.52 **1680.83** 1678.40 **1681.00**				

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PIPE CONC REINF 36IN CL IV-JACKED

MH 8 to MH 9	122 LF

PIPE CONDUIT 15IN-STORM DRAIN

Inlet 8C to Inlet 8A	8 LF
Inlet 8B to MH 8	34 LF
Inlet 9A to MH 9	10 LF
Inlet 9C to Inlet 9A	6 LF
Inlet 9B to MH 9	38 LF
Total	96 LF

PIPE CONDUIT 18IN-STORM DRAIN

Inlet 8A to MH 8	8 LF

PIPE CONDUIT 30IN-STORM DRAIN

MH 6 to MH 8	156 LF

PIPE CONDUIT 36IN-STORM DRAIN

MH 9 to Sta 49+20	16 LF

PIPE POLYETHYLENE CORR PERF 6IN DRAIN

Inlet 6A to Inlet 8A	162 LF
Sta 46+00, 23.5' LT to Inlet 8B	176 LF
Total	338 LF

PIPE PVC 4IN DRAIN

Retaining wall to 8C	22 LF

MANHOLE 72IN

MH 8	1 EA

MANHOLE 84IN

MH 9	1 EA

MANHOLE RISER 72IN

MH 8	6.9 LF

MANHOLE RISER 84IN

MH 9	7.6 LF

INLET-TYPE 2 DOUBLE

8A	1 EA
8B	1 EA
8C	1 EA
9A	1 EA
9B	1 EA
9C	1 EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 46+00 to 50+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
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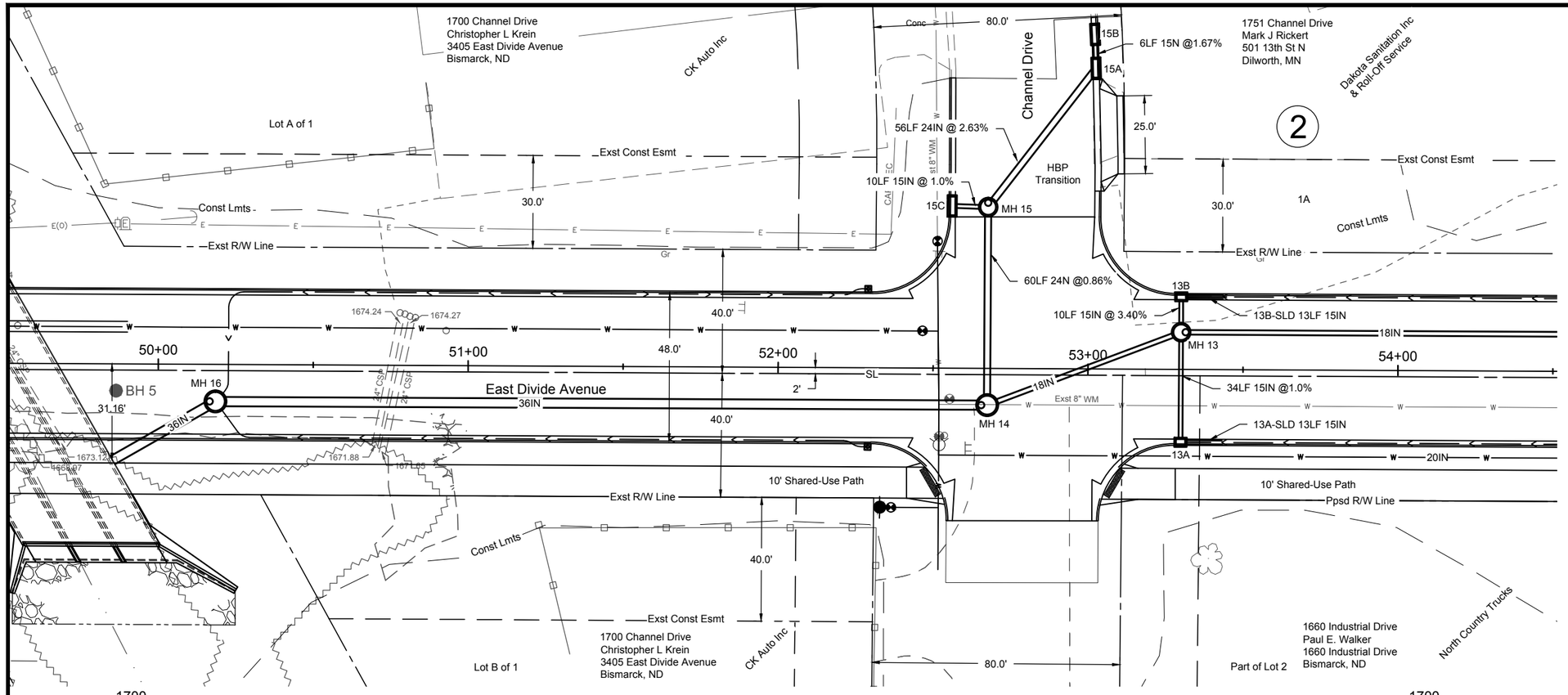

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	11

PIPE CONDUIT 15IN-STORM DRAIN	
Inlet 15B to Inlet 15A	6 LF
Inlet 15C to MH 15	10 LF
Inlet 13A to MH 13	34 LF
Inlet 13B to MH 13	10 LF
Total	60 LF

PIPE CONDUIT 18IN-STORM DRAIN	
MH 14 to MH 13	64 LF
MH 13 to Sta 54+00,12' LT	68 LF
Total	132 LF

PIPE CONDUIT 24IN-STORM DRAIN	
Inlet 15A to MH 15	56 LF
MH 15 to MH 14	60 LF
Total	116 LF

PIPE CONDUIT 36IN-STORM DRAIN	
MH 14 to MH 16	246 LF
MH 16 to Sta 49+85, 31.2' RT	36 LF
Total	282 LF

PIPE POLYETHYLENE CORR PERF 6IN DRAIN	
MH 16 to Sta 52+29, 25.5' LT	174 LF
MH 16 to Sta 52+29, 25.5' RT	198 LF
Inlet 13A to Sta 54+00, 23.5' RT	70 LF
Inlet 13B to Sta 54+00, 23.5' LT	70 LF
Total	512 LF

UNDERDRAIN CLEANOUT RISER	
Sta 52+29, 25.5' LT	1 EA
Sta 42+29, 25.5' RT	1 EA

MANHOLE 60IN	
MH 13	1 EA
MH 15	1 EA

MANHOLE 72IN	
MH 14	1 EA
MH 16	1 EA

MANHOLE RISER 60IN	
MH 13	4.0 LF
MH 15	4.4 LF

MANHOLE RISER 72IN	
MH 14	5.5 LF
MH 16	6.2 LF

INLET-TYPE 2	
13A	1 EA
13B	1 EA

INLET-TYPE 2 DOUBLE	
15A	1 EA
15B	1 EA
15C	1 EA

INLET SLOTTED DRAIN 15IN	
13A	13 LF
13B	13 LF
Total	26 LF

N

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 50+00 to 54+00

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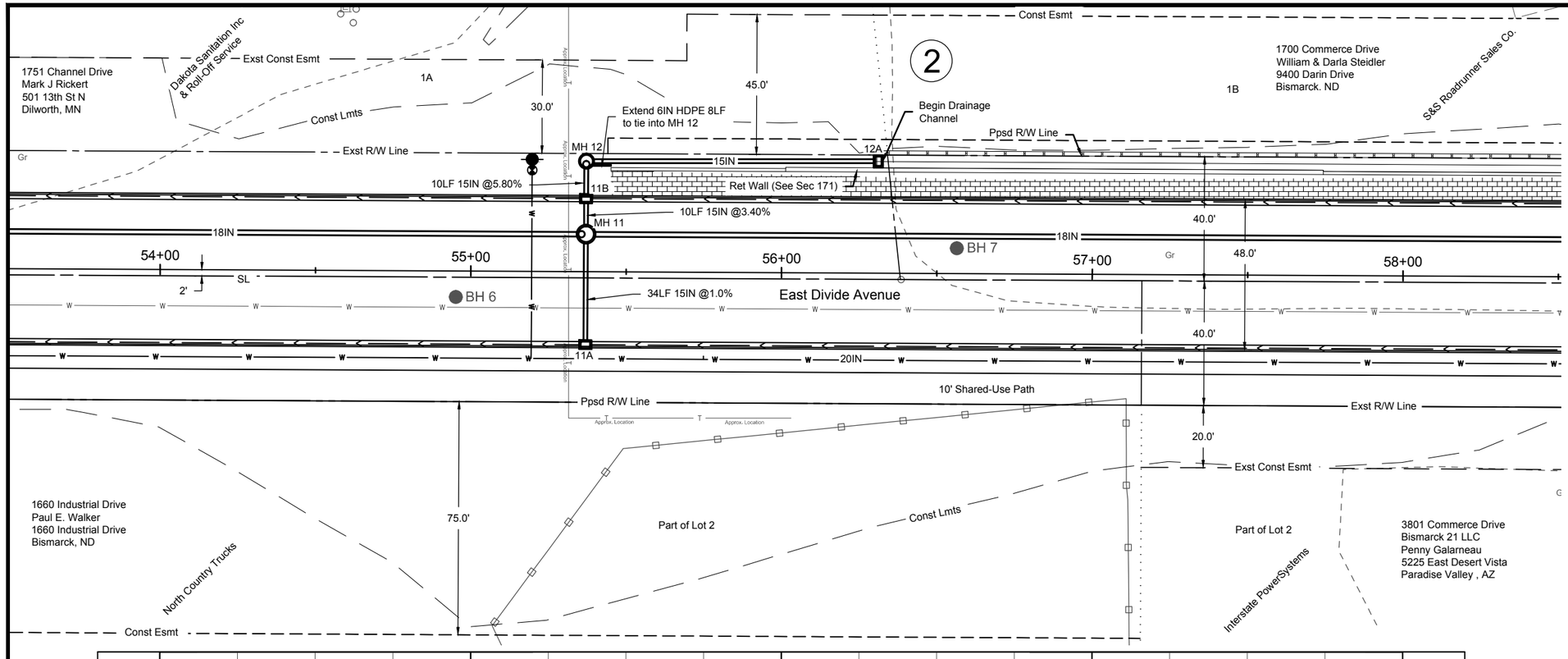

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	12

PIPE CONDUIT 15IN-STORM DRAIN

Inlet 12A to MH 12	92 LF
MH 12 to Inlet 11B	10 LF
Inlet 11B to MH 11	10 LF
Inlet 11A to MH 11	34 LF
Total	146 LF

PIPE CONDUIT 18IN-STORM DRAIN

Sta 54+00, 12' LT to MH 11	136 LF
MH 11 to Sta 58+00, 12' LT	262 LF
Total	398 LF

PIPE POLYETHYLENE CORR PERF 6IN DRAIN

Sta 54+00, 23.5' RT to Inlet 11A	136 LF
Sta 54+00, 23.5' LT to Inlet 11B	136 LF
Inlet 11A to Sta 58+00, 23.5' RT	262 LF
Inlet 11B to Sta 58+00, 23.5' LT	262 LF
Total	796 LF

MANHOLE 48IN

MH 12	1 EA

MANHOLE 60IN

MH 11	1 EA

MANHOLE RISER 48IN

MH 12	4.0 LF

MANHOLE RISER 60IN

MH 11	4.0 LF

INLET-TYPE 2

11A	1 EA
11B	1 EA
12A	1 EA

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 54+00 to 58+00

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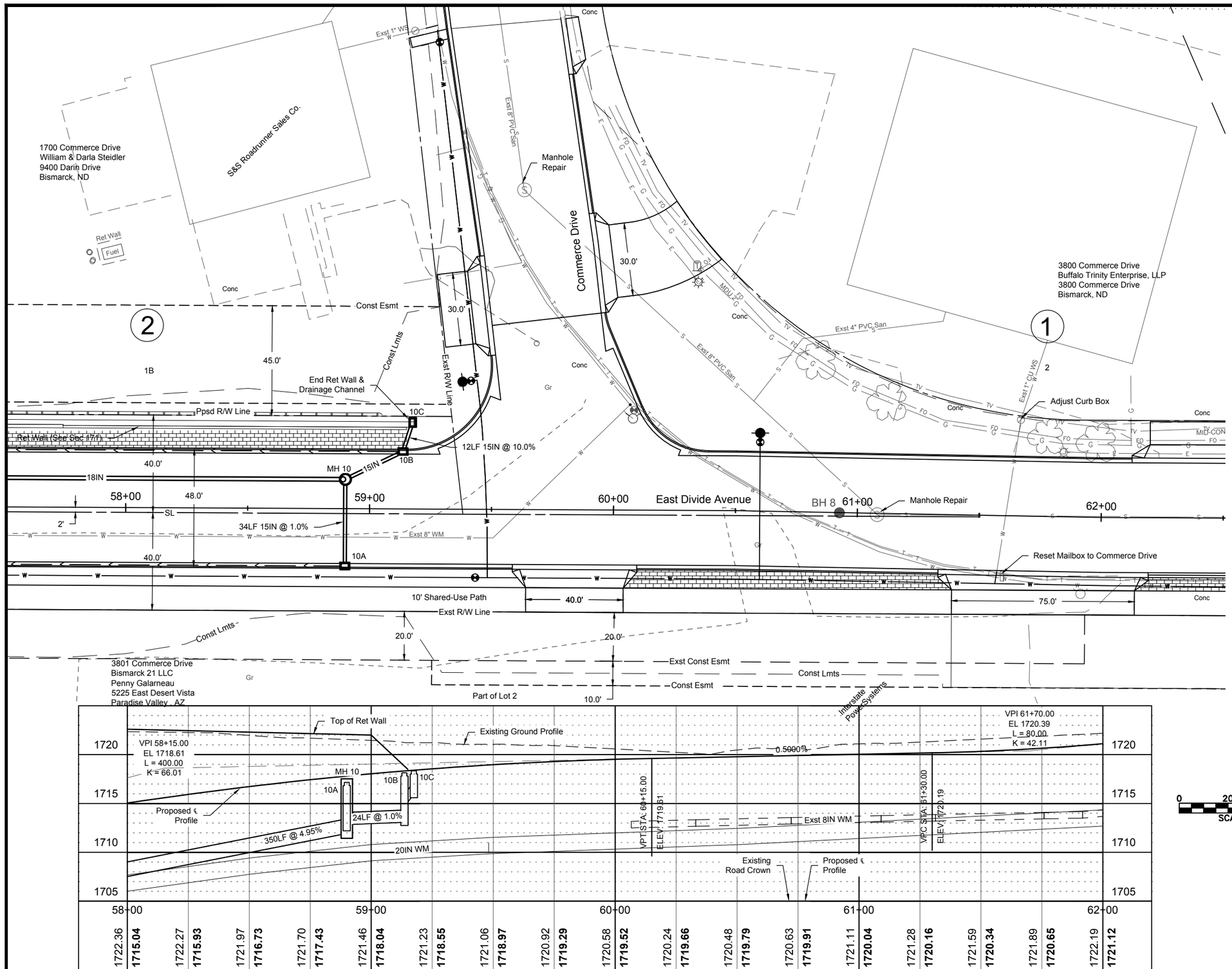
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	13

PIPE CONDUIT 15IN-STORM DRAIN	
Inlet 10A to MH 10	34 LF
Inlet 10C to Inlet 10B	12 LF
Inlet 10B to MH 10	24 LF
Total	70 LF
PIPE CONDUIT 18IN-STORM DRAIN	
Sta 58+00, 12' LT to MH 10	88 LF
PIPE POLYETHYLENE CORR PERF 6IN DRAIN	
Sta 58+00, 23.5' RT to Inlet 10A	90 LF
Sta 58+00, 23.5' LT to Inlet 10B	114 LF
Total	204 LF
MANHOLE 48IN	
MH 10	1 EA
MANHOLE RISER 48IN	
MH 10	4.0 LF
MANHOLE REPAIR	
Sta 59+63, 131' Lt	1 EA
Sta 61+08, 1' Rt	1 EA
INLET-TYPE 2	
10A	1 EA
10B	1 EA
10C	1 EA
ADJUST UTILITY APPURTENANCE	
Sta 61+67, 40' Lt (CURB STOP BOX)	1 EA



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 58+00 to 62+00

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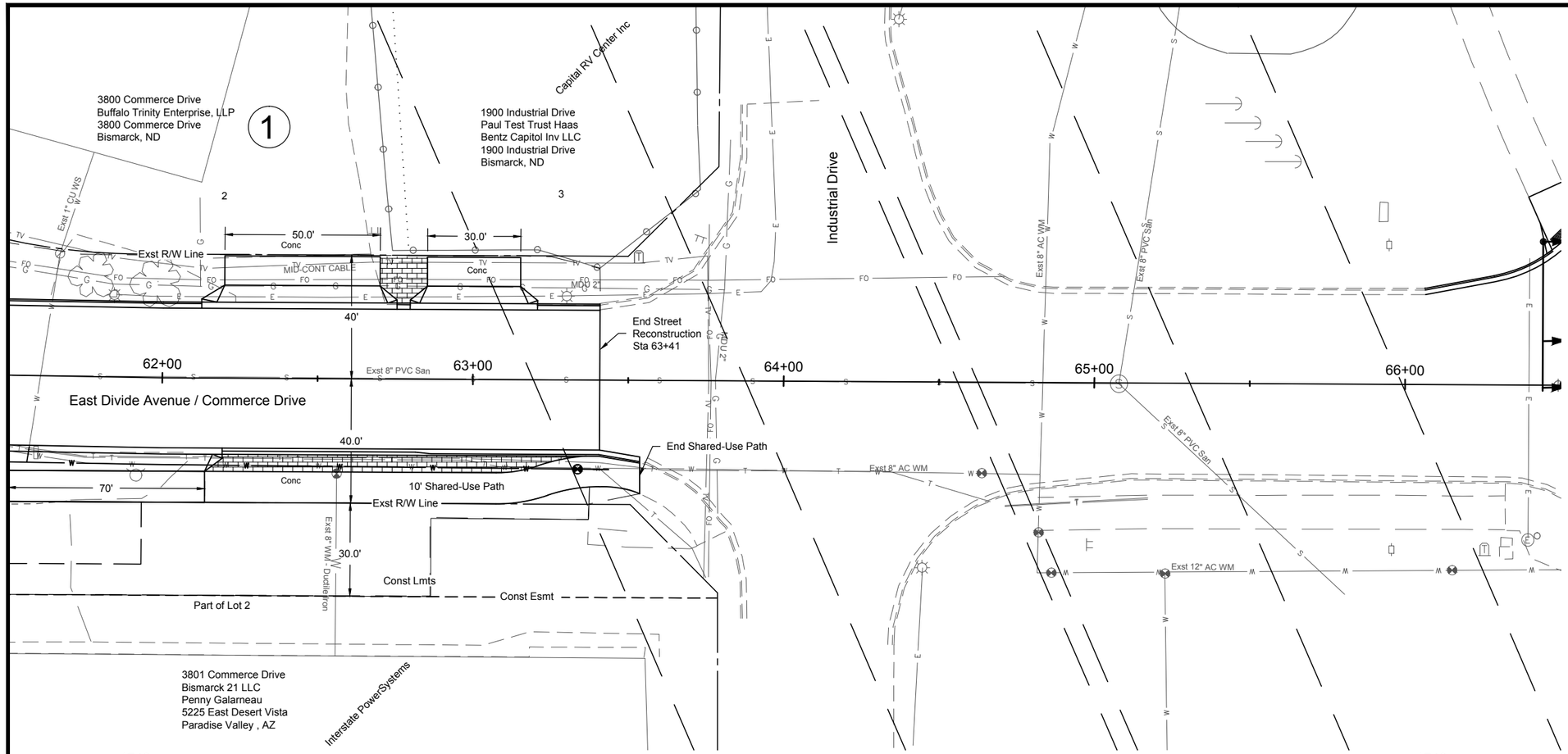
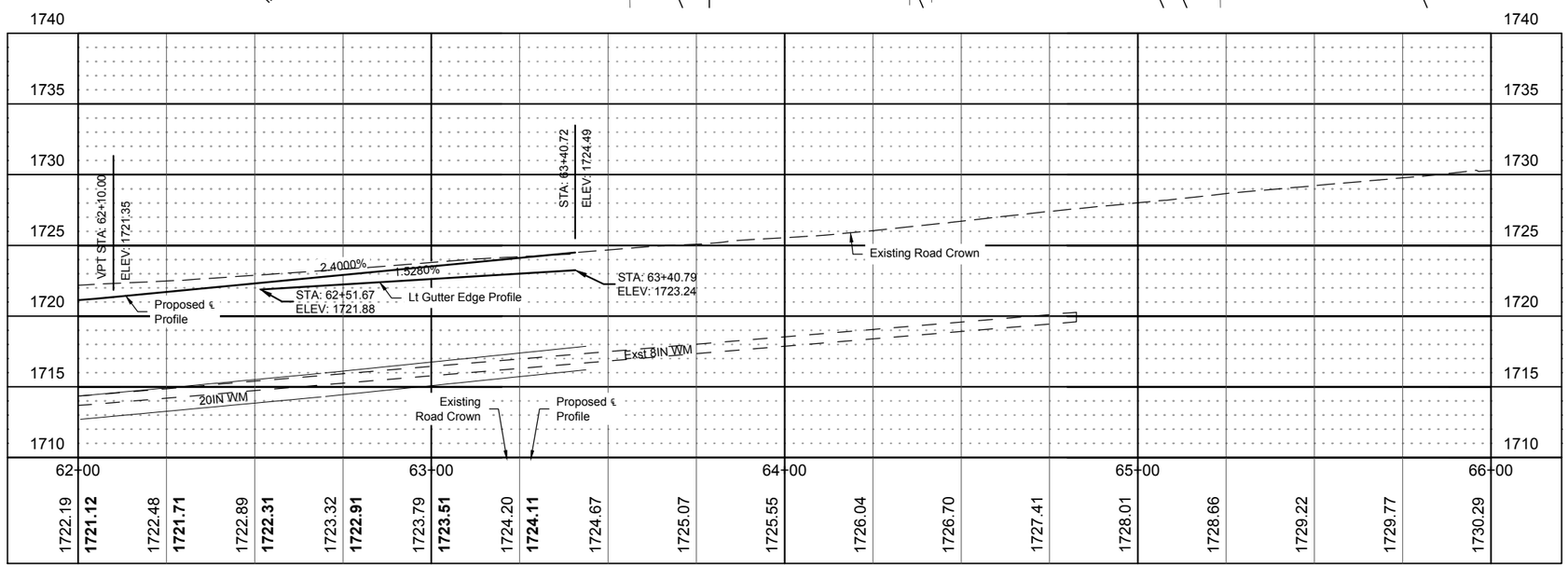
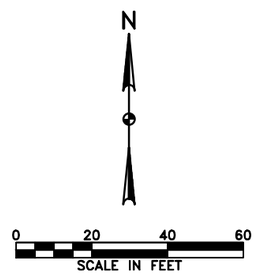
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	14

ADJUST UTILITY APPURTENANCE
Sta 62+56, 31' Rt (GATE VALVE BOX) 1 EA







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Plan & Profile
Sta 62+00 to 66+00

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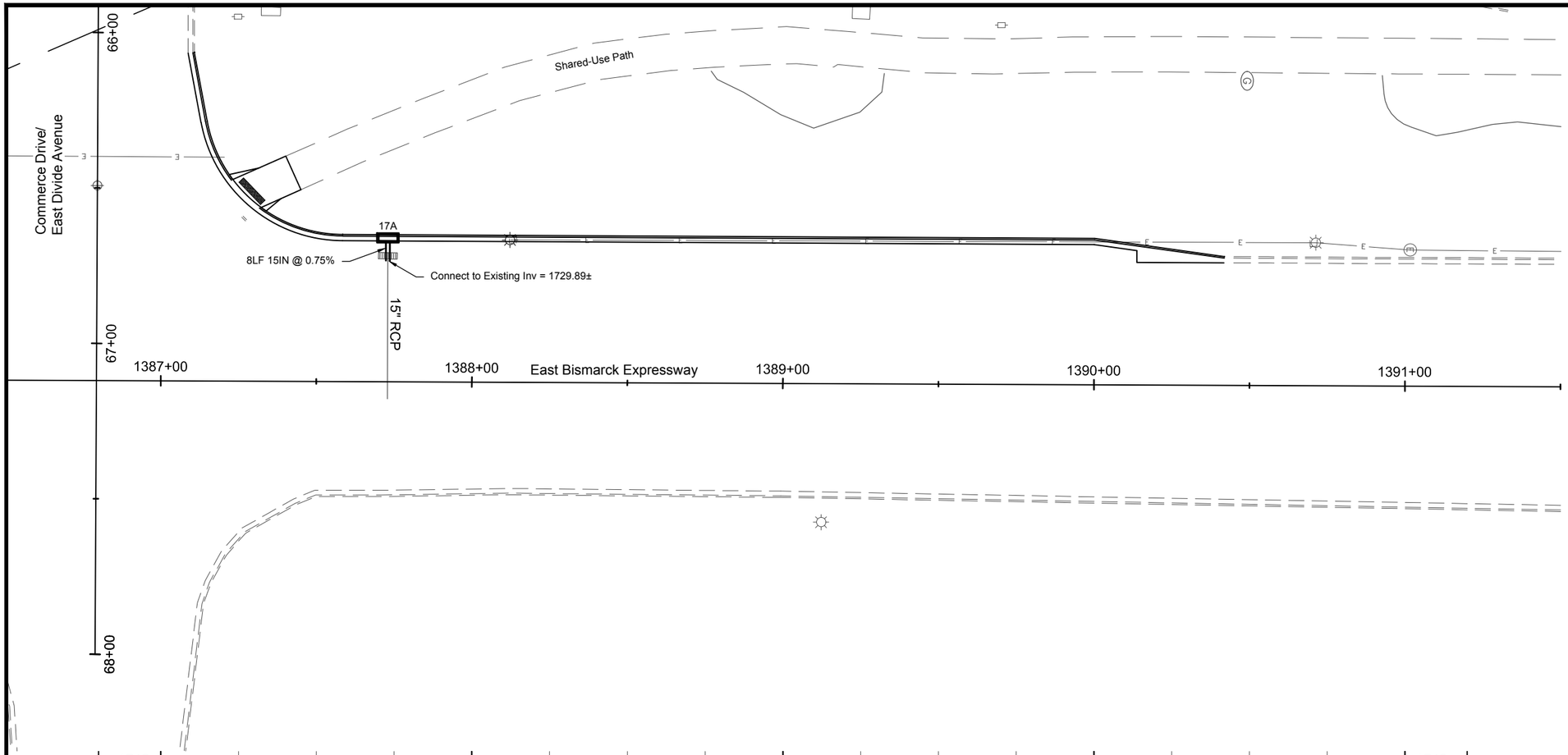
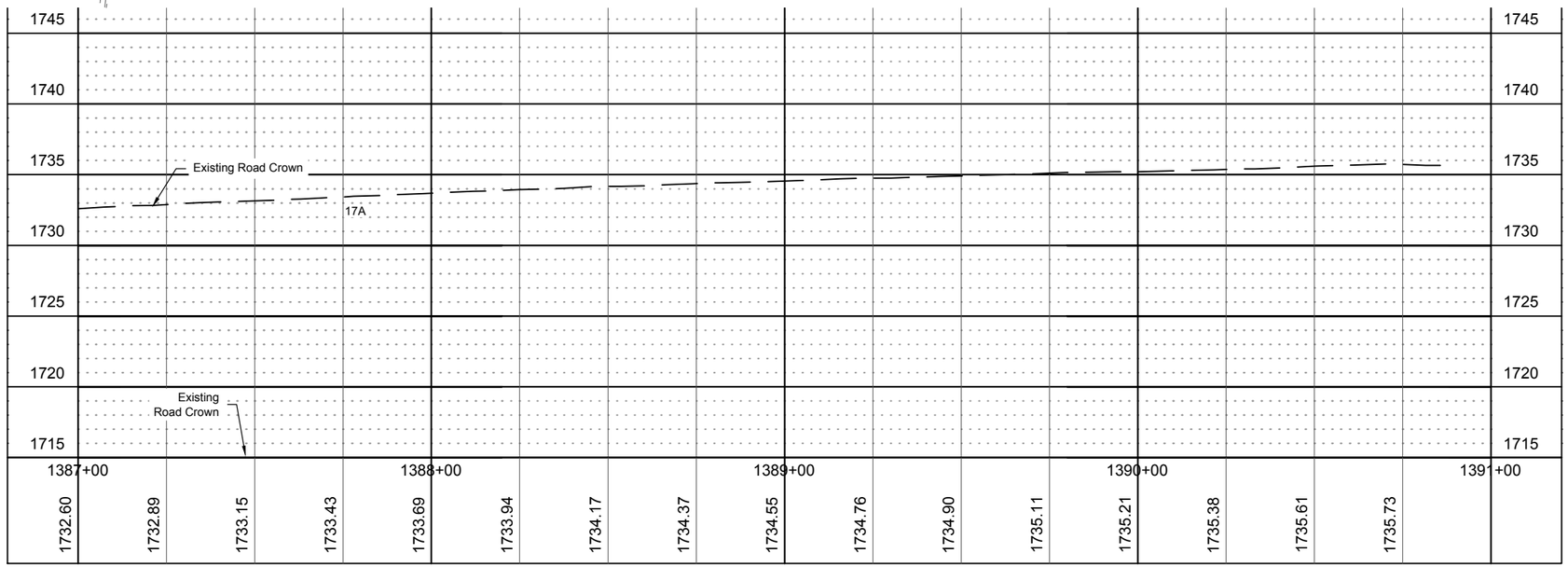
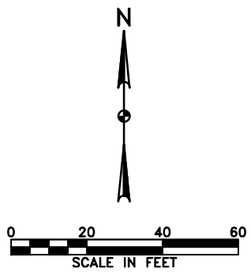
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	15

PIPE CONDUIT 15IN-STORM DRAIN
Inlet 17A to Exst 8 LF

INLET-TYPE 2 DOUBLE
17A 1 EA







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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Bismarck Expressway
Plan & Profile
Sta 1387+00 to 1391+00

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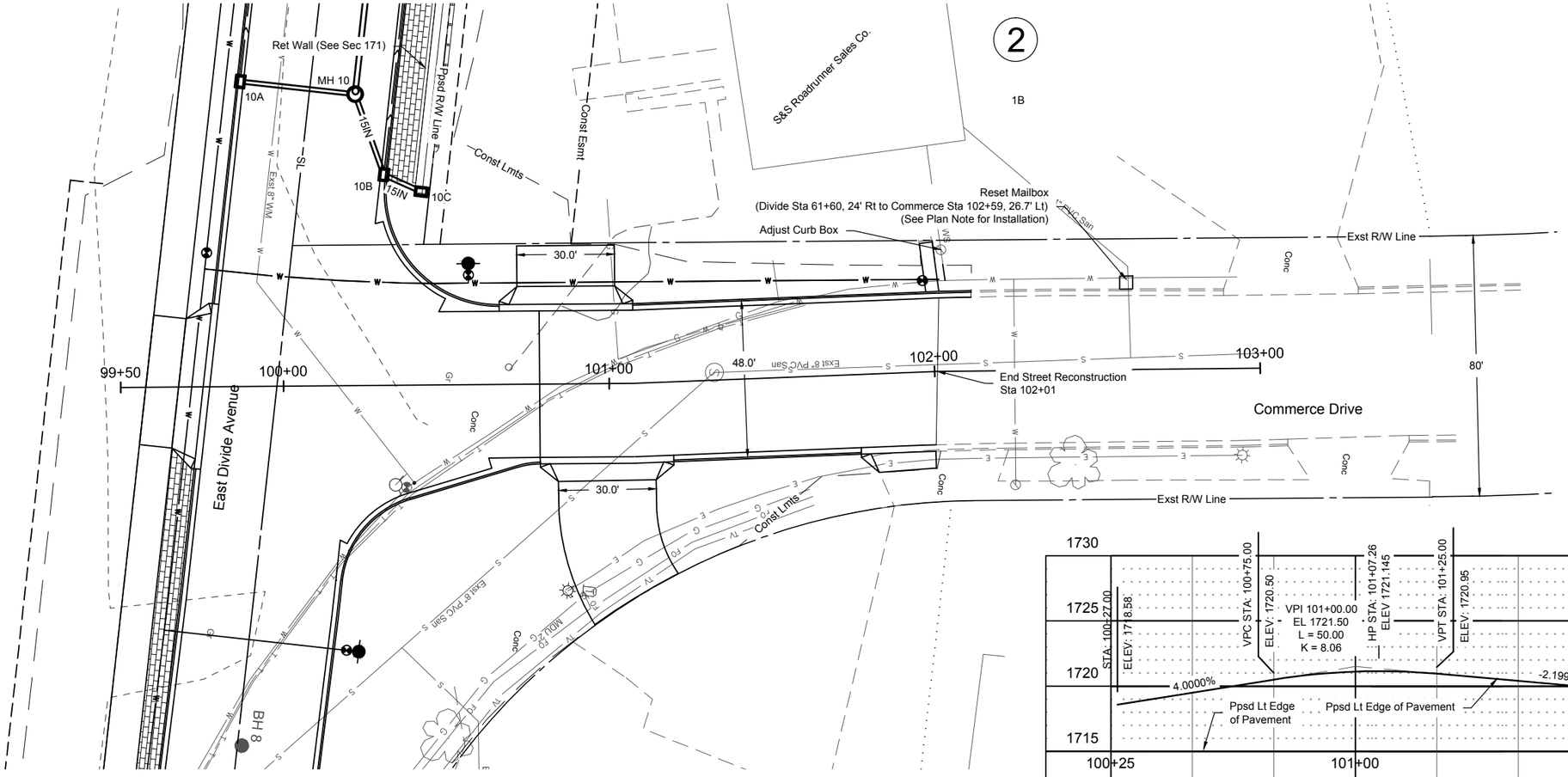
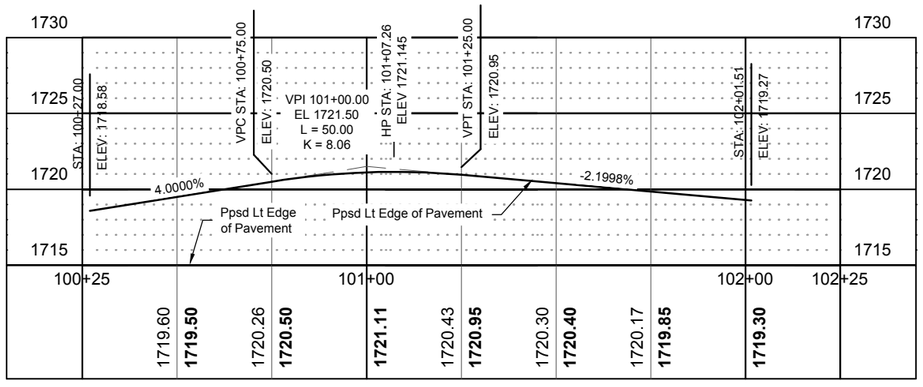
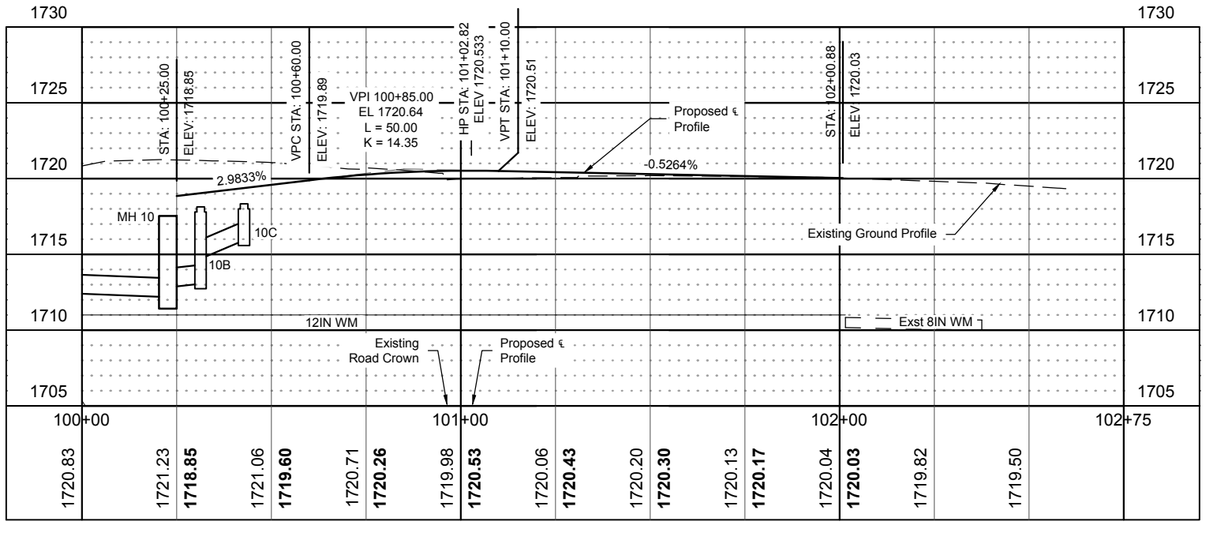
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	60	16

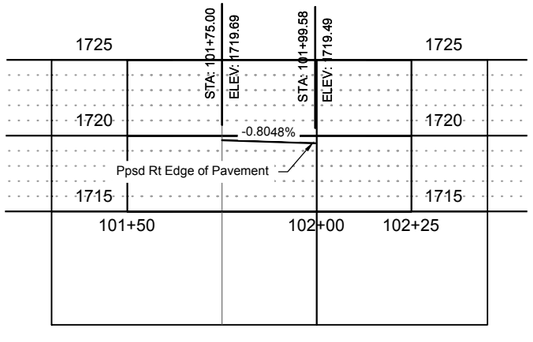
ADJUST UTILITY APPURTENANCE
Sta 102+02.7, 37.3' Lt (CURB STOP BOX) 1 EA

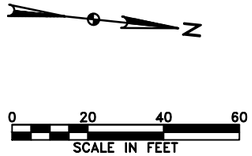
RESET MAILBOX
Sta 102+59, 26.7' Lt 1 EA











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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Commerce Drive
Plan & Profile
Sta 100+00 to 101+77

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	70	1

C K Auto Inc

Delineated Wetland

DMVW / CP RR

Delineated Wetland

Const Esmt

15.0'

Exst R/W Line

Exst R/W Line

Exst R/W Line

East Divide Avenue

Conc

Conc

CAP ELEC

Exst 8" WM

47+00

48+00

49+00

50+00

51+00

52+00

Asph

Asph

BH 5

10' Shared-Use Path

10' Shared-Use Path

Exst R/W Line

Ppsd Permanent Esmt Line

Exst R/W Line

Const Esmt

20.0'

10' Shared-Use Path

Blend into Existing Channel

Apartment Garage

Delineated Wetland

Hay Creek / East Bismarck Channelization

1680

1675

1670

1685

1690

1695

1677.06

1672.06

1672.19

1671.93

1673.34

1674.24

1674.27

1670.12

1671.88

36" CSP

18" CSP

24" CSP

60" CSP

4" PVC

CAP ELEC

E(O)

S

W

Gr

0 20 40 60

SCALE IN FEET

N

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Rev'd. 00/00/0000

Scale: 1:40 Hor, 1:10 Ver

EAST DIVIDE AVENUE

CITY OF BISMARCK

BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson

Engineers Surveyors Planners

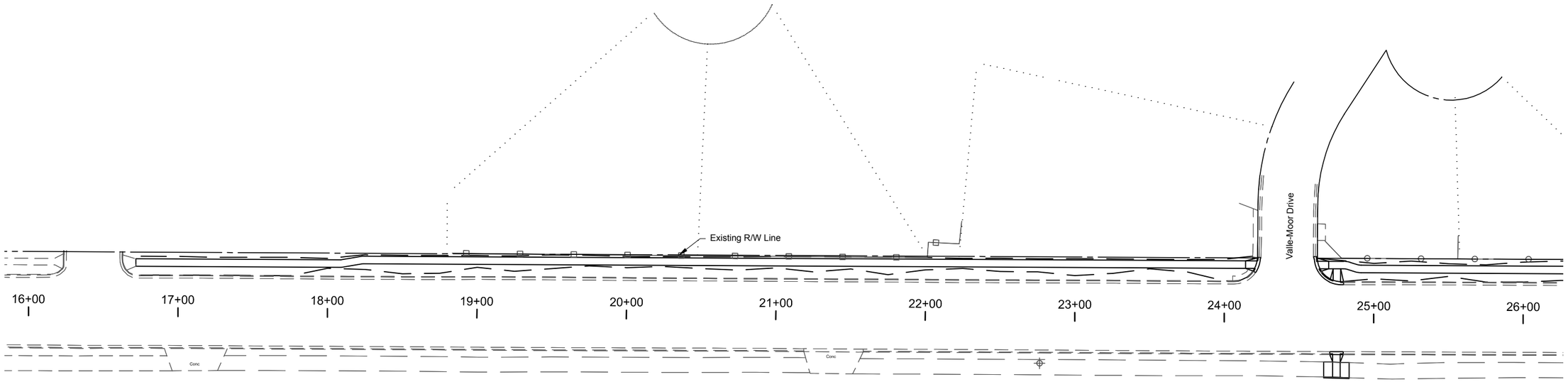
CONTOUR LAYOUT at RCBC

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
RS	NW	1411109	Aug 2013

J:\trans\1411109\CADD\070CT_001_CNTRL.dwg

Aug 02, 2013 – 4:34pm – J:\trans\1411109\CADD\070CT_001_CNTRL.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	1

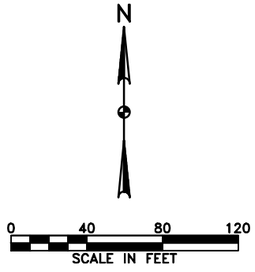


NO QUANTITIES ON THIS SHEET

INLET PROTECTION-SPECIAL

FIBER ROLLS 12IN

WEIGHTED FIBER ROLLS



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Temporary
Erosion Control
Sta 16+00 to 26+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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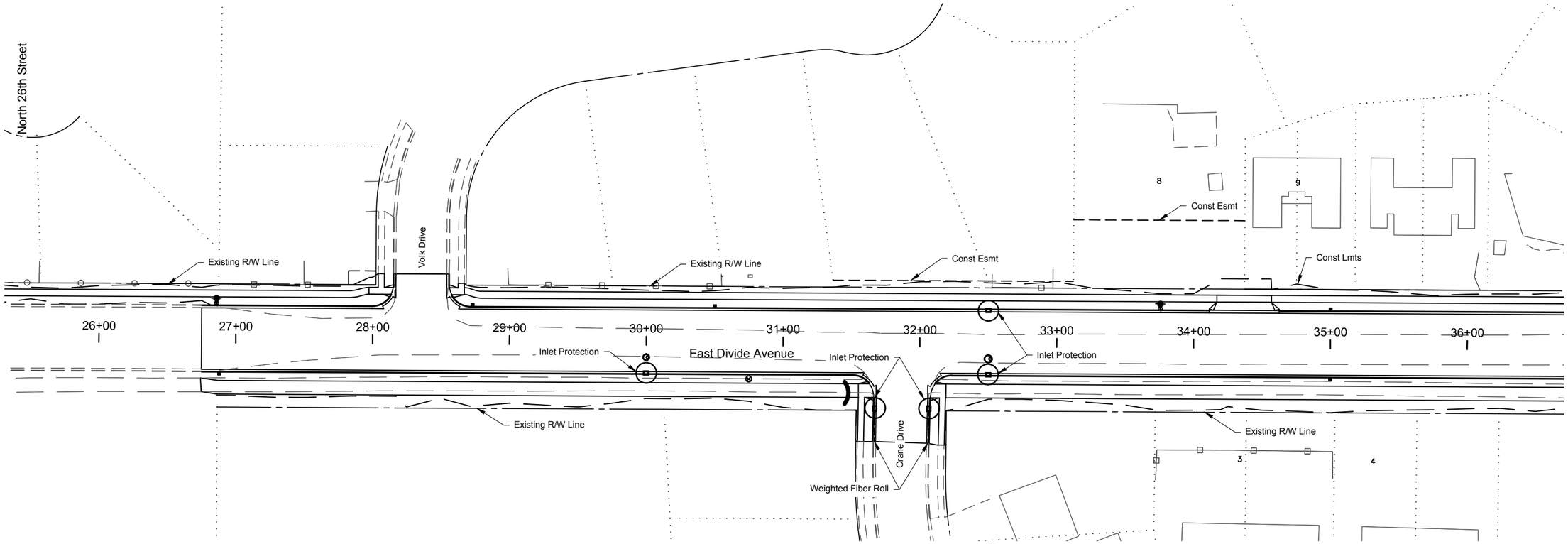
Aug 05, 2013 – 3:20pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	2



WEIGHTED FIBER ROLLS	46	LF
REMOVAL WEIGHTED FIBER ROLLS	46	LF
FIBER ROLLS 12IN	30	LF
REMOVAL FIBER ROLLS 12IN	130	LF
INLET PROTECTION-FIBER ROLL 12IN	5	EA
INLET PROTECTION-SPECIAL	5	EA
REMOVE INLET PROTECTION-SPECIAL	5	EA

INLET PROTECTION

FIBER ROLLS 12IN

WEIGHTED FIBER ROLLS

N

0 40 80 120

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Temporary
Erosion Control
Sta 26+00 to 36+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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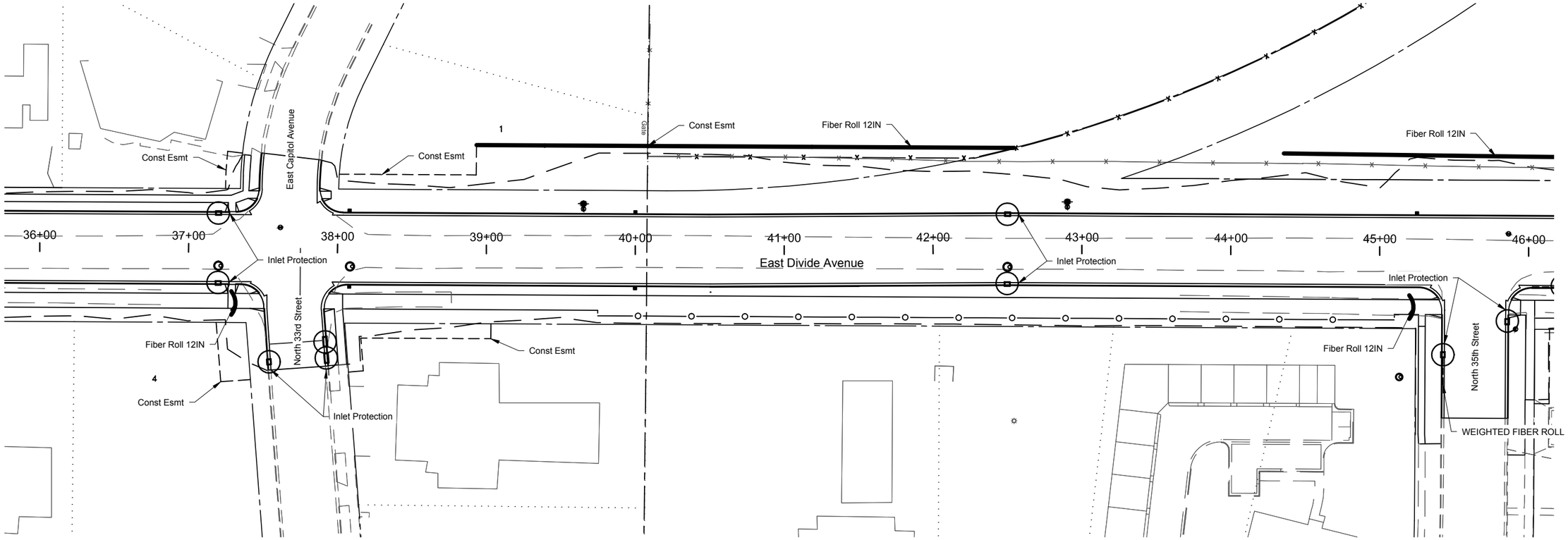
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	3



WEIGHTED FIBER ROLLS	18	LF
REMOVAL WEIGHTED FIBER ROLLS	18	LF
FIBER ROLLS 12IN	552	LF
REMOVAL FIBER ROLLS 12IN	752	LF
INLET PROTECTION-FIBER ROLL 12IN	9	EA
INLET PROTECTION-SPECIAL	11	EA
REMOVE INLET PROTECTION-SPECIAL	11	EA

INLET PROTECTION

FIBER ROLLS 12IN

WEIGHTED FIBER ROLLS

N

0 40 80 120

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Temporary
Erosion Control
Sta 36+00 to 46+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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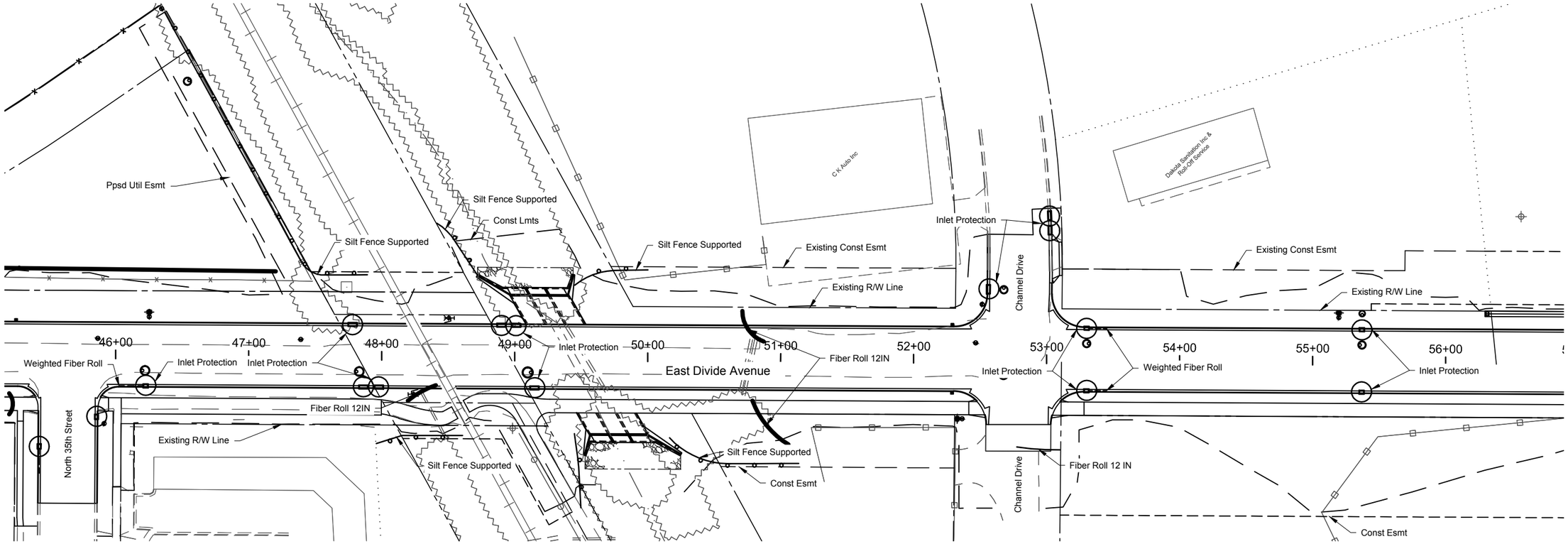
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	4



SILT FENCE SUPPORTED	540	LF
REMOVAL SILT FENCE SUPPORTED	540	LF
WEIGHTED FIBER ROLLS	44	LF
REMOVAL WEIGHTED FIBER ROLLS	44	LF
FIBER ROLLS 12IN	325	LF
REMOVAL FIBER ROLLS 12IN	695	LF
INLET PROTECTION-FIBER ROLL 12IN	14	EA
INLET PROTECTION-SPECIAL	23	EA
REMOVE INLET PROTECTION-SPECIAL	23	EA

INLET PROTECTION

FIBER ROLLS 12IN

WEIGHTED FIBER ROLLS

SILT FENCE

N

0 40 80 120

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Temporary
Erosion Control
Sta 46+00 to 56+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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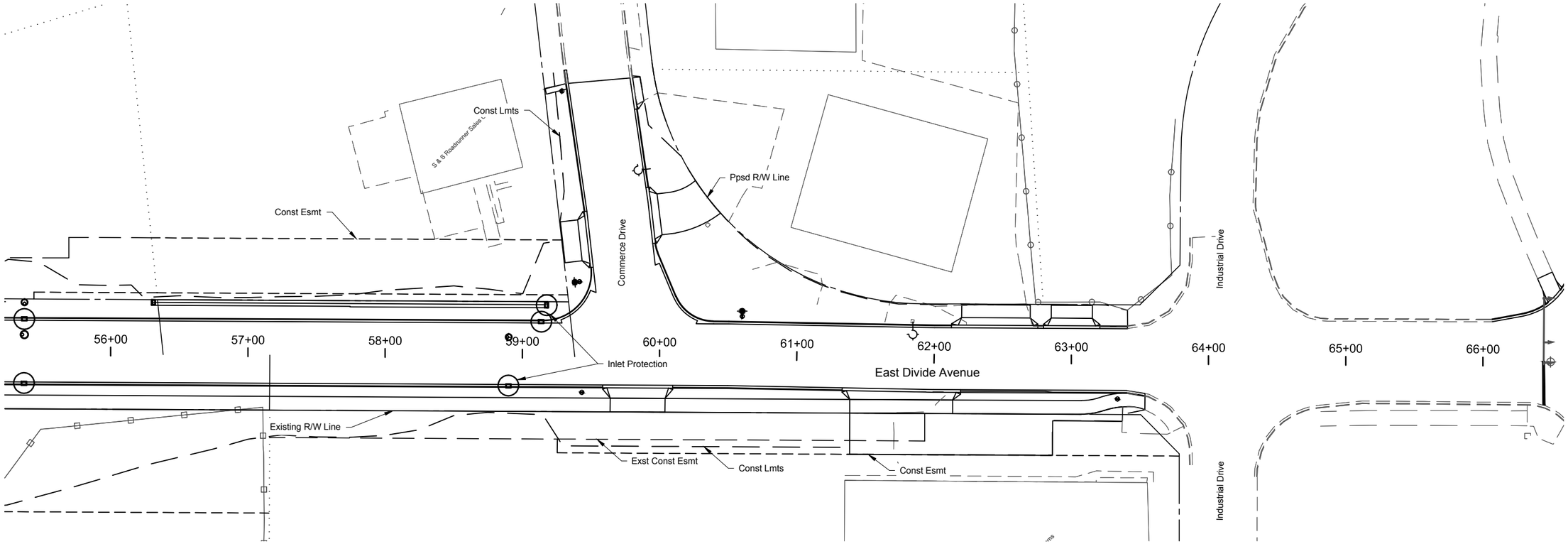
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	5



REMOVAL FIBER ROLLS 12IN	60	LF
INLET PROTECTION-FIBER ROLL 12IN	3	EA
INLET PROTECTION-SPECIAL	3	EA
REMOVE INLET PROTECTION-SPECIAL	3	EA

INLET PROTECTION

FIBER ROLLS 12IN

WEIGHTED FIBER ROLLS

N

0 40 80 120

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Temporary
Erosion Control
Sta 56+00 to 66+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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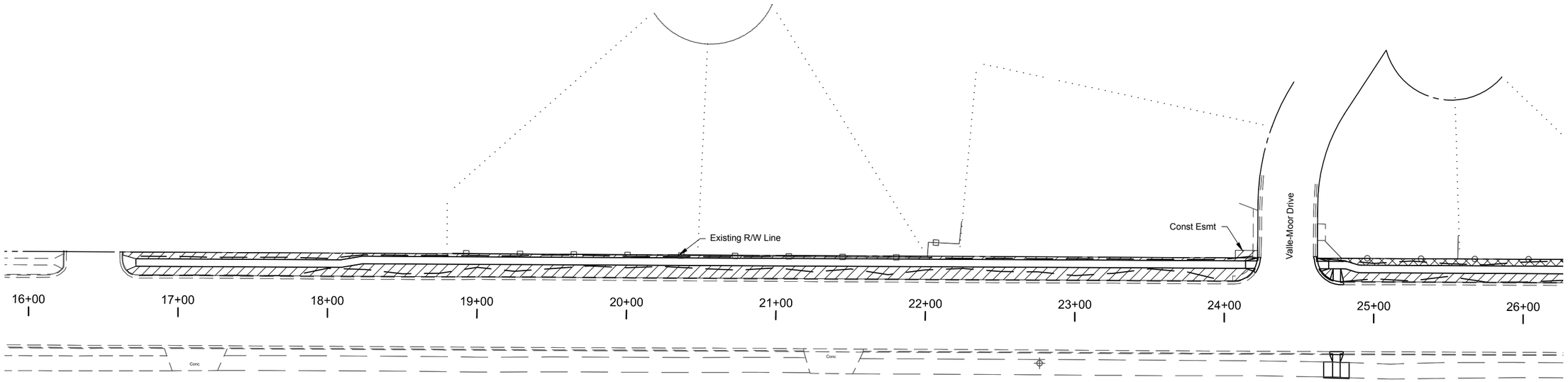
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	6



SEEDING-TYPE B-CL V	0.20	ACRE
SODDING	81	SY

SEEDING-TYPE B-CL V & ECB TYPE 3

SEEDING-TYPE B-CL V (HYDRO-MULCH)

SODDING

N

0 40 80 120

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Permanent
Erosion Control
Sta 16+00 to 26+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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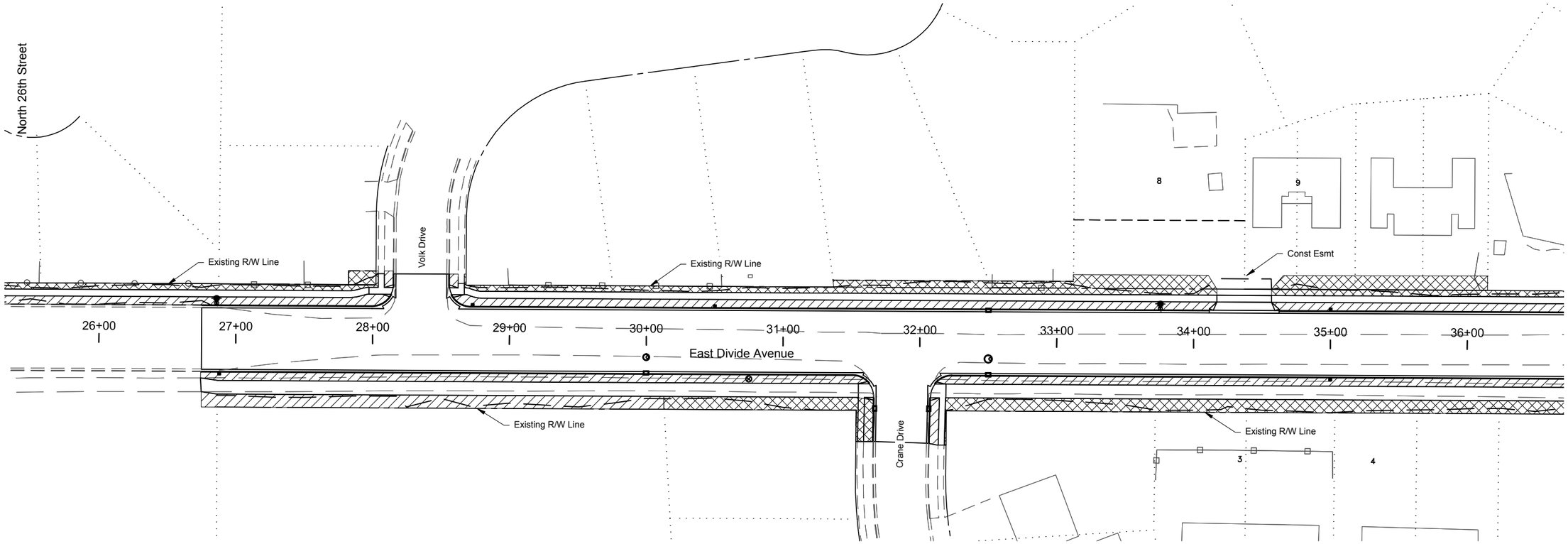
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	7



SEEDING-TYPE B-CL V	0.33	ACRE
SODDING	1433	SY

SEEDING-TYPE B-CL V & ECB TYPE 3

SEEDING-TYPE B-CL V (HYDRO-MULCH)

SODDING

N

0 40 80 120
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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Permanent
Erosion Control
Sta 26+00 to 36+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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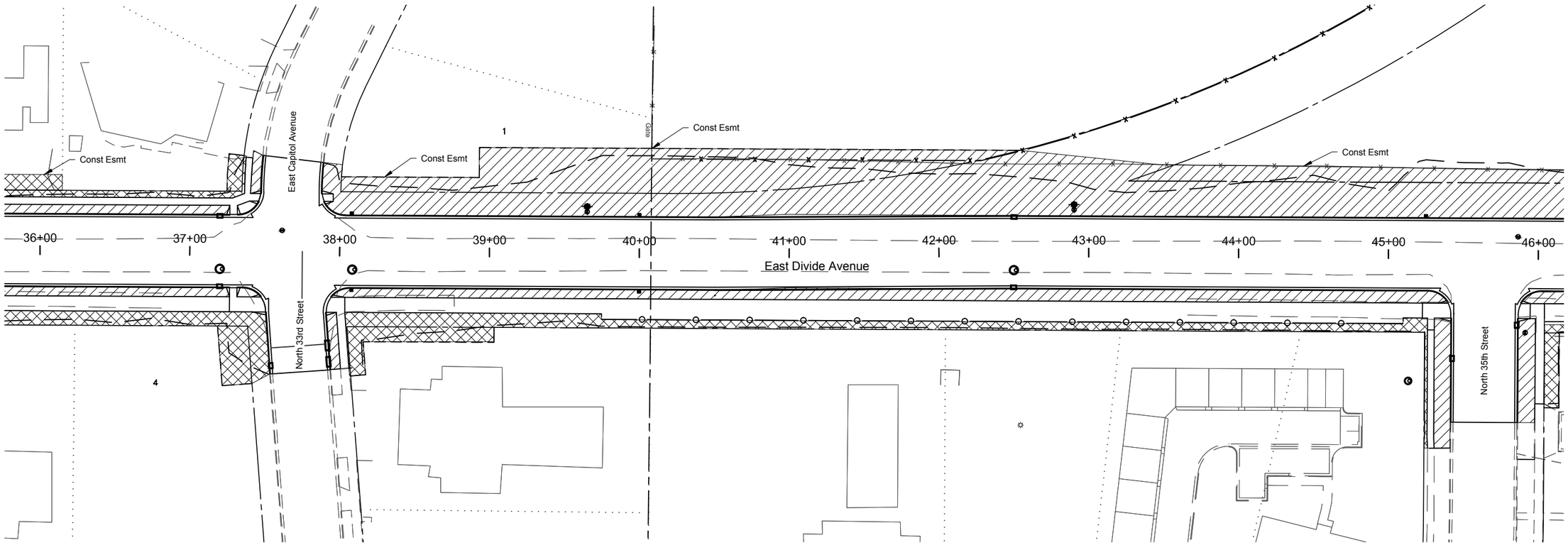
Aug 05, 2013 – 3:21pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	8



SEEDING-TYPE B-CL V	0.92	ACRE
SODDING	1091	SY

SEEDING-TYPE B-CL V & ECB TYPE 3

SEEDING-TYPE B-CL V (HYDRO-MULCH)

SODDING

N

0 40 80 120
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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Permanent
Erosion Control
Sta 36+00 to 46+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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Aug 05, 2013 – 3:22pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
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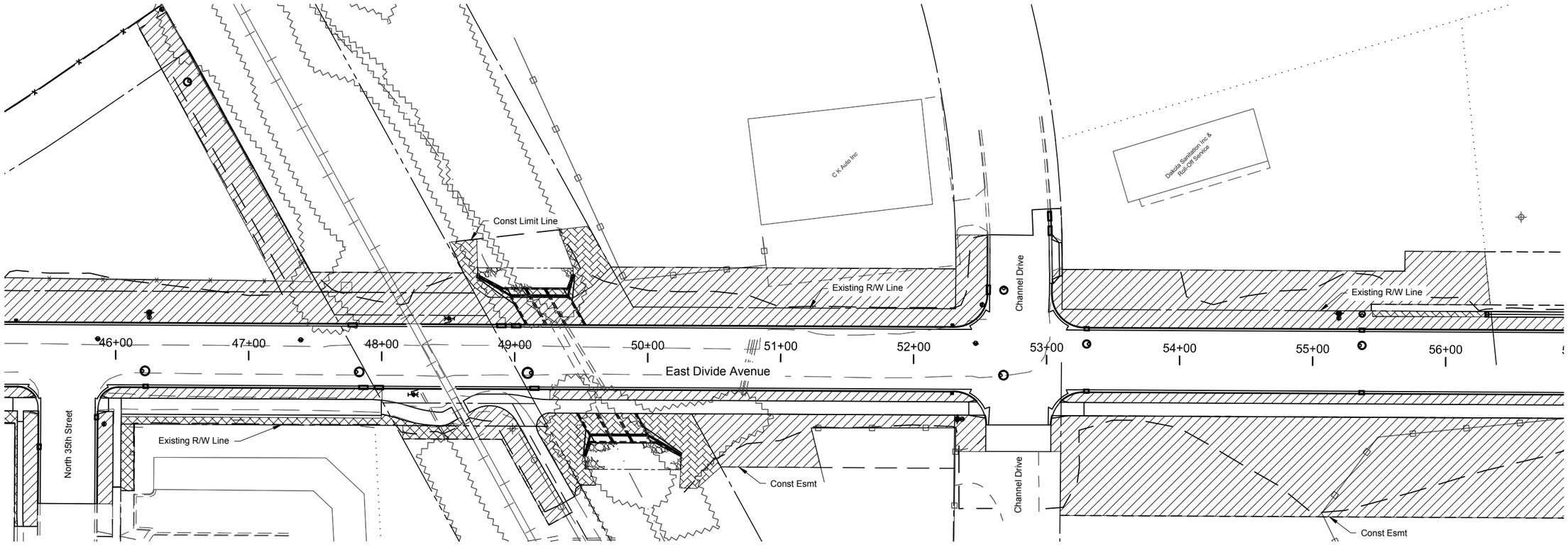

SEEDING-TYPE B-CL V	1.80	ACRE
SODDING	251	SY
ECB TYPE 3	682	SY

SEEDING-TYPE B-CL V & ECB TYPE 3

SEEDING-TYPE B-CL V (HYDRO-MULCH)

SODDING

N

0 40 80 120
SCALE IN FEET

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Permanent
Erosion Control
Sta 46+00 to 56+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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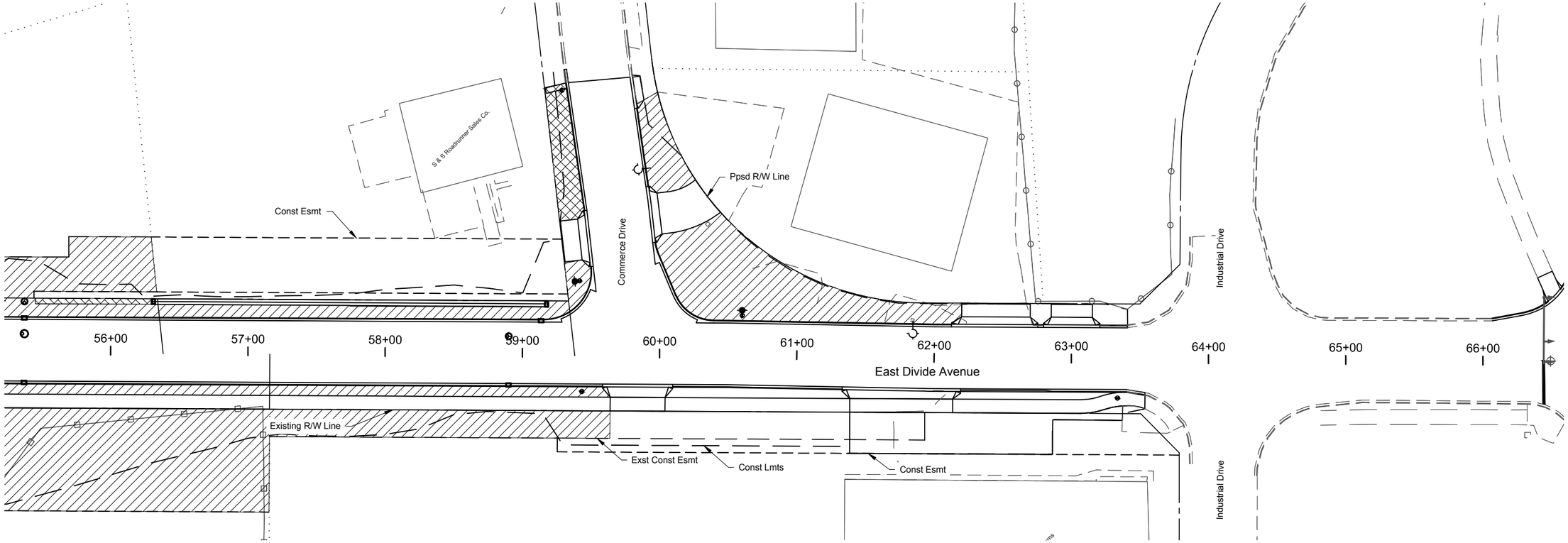
Aug 05, 2013 – 3:22pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	10



SEEDING-TYPE B-CL V	0.68	ACRE
SODDING	187	SY
ECB TYPE 3	38	SY

SEEDING-TYPE B-CL V & ECB TYPE 3

SEEDING-TYPE B-CL V (HYDRO-MULCH)

SODDING

N

0 40 80 120
SCALE IN FEET

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Permanent
Erosion Control
Sta 56+00 to 66+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	75	11

Sec 26
T-139-N
R-80-W

Proposed Grading

City of Bismarck R/W

80.00'

Excavate Wetland to elevation 1673'

Mitigated Wetland
0.14 acres

Wetland 2
Temporary Impact =0.05 acres
Permanent Impact =0.03 acres

Wetland 1
Temporary Impact =0.09 acres
Permanent Impact =0.08 acres

Wetland 3
Permanent Impact =0.03 acres

Hay Creek

DMWW/CP Railroad

Approx. Cofferdam Location

Riprap Limits

Const Limits

C-K Auto Inc

Channel Drive

East Divide Avenue

North 35th Street

Wetland 4

Sec 35
T-139-N
R-80-W

RR R/W

℄ Hay Creek

45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00

N

TOPSOIL-WETLAND
Mitigated Wetland 185 CY

COMMON EXCAVATION-TYPE A
Mitigated Wetland 1,189 CY

Section A-A

Varies

Varies

Channel Bottom

Existing Ground

Proposed Ground

Mitigated Wetland

Riprap

Temporary Impact

Permanent Impact

0 40 80 120
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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Wetland Impacts
and Mitigation
Sta 44+00 to 54+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
MMM	GJS	1411109	Aug 2013

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Aug 07, 2013 – 5:37pm – J:\trans\1411109\CADD\075WL_001.dwg

STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	81	1

SURVEY CONTROL COORDINATE & CURVE DATA

HORIZONTAL ALIGNMENT				HORIZONTAL ALIGNMENT				US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS			
EAST DIVIDE AVENUE MAINLINE ALIGNMENT				COMMERCE DRIVE ALIGNMENT				**DESC.**	**NORTHING**	**EASTING**	**ELEVATION**	**PNT**	**NORTHING**	**EASTING**	**ELEVATION**
PNT	**PI Station**	**Northing**	**Easting**	**PNT**	**PI Station**	**Northing**	**Easting**								
BOP	9+00.00	422,077.2681	1,905,256.5074	BOP	95+00.00	422,002.9706	1,910,343.5578					CP FH 1047	422,552.9131	1,909,450.7850	1,686.51
PI 1	40+50.00	422,060.7692	1,908,406.4644	PI 1	101+07.41	422,159.3831	1,910,325.8306					CP FH1511	422,301.5458	1,912,025.2080	1719.67
PI 2	42+50.00	422,061.7217	1,908,606.4621	PI 2	102+00.88	422,251.8770	1,910,312.4034					CP FH2710	421,929.6076	1,908,951.9570	1694.86
PI 3	60+50.00	422,052.2937	1,910,406.4372	EOP	103+00.00	422,350.2449	1,910,301.0657					CP FH2232	423,423.2964	1,907,109.0280	1693.78
PI 4	62+00.00	422,049.5081	1,910,556.4114									CP FH0987	422,048.9313	1,904,701.0230	1802.40
EOP	68+00.00	422,046.3655	1,911,156.4033									CP FH462	420,376.8140	1,903,754.7900	1781.92
												CP FH1043	422,099.7668	1,907,042.4660	1776.83
												CP FH2389	422,015.4403	1,907,516.9570	1763.46
												CP FH1044	422,095.0461	1,907,730.9040	1761.49
												CP 10 FH 1067	422,031.7467	1,909,608.3750	1686.21
												CP 11 REBAR	422,004.4037	1,909,254.9230	1677.85
HORIZONTAL ALIGNMENT				HORIZONTAL ALIGNMENT				SECTION CORNERS				CP FH	422,091.5036	1,908,364.3590	1736.63
EXPRESSWAY MAINLINE ALIGNMENT				WATERMAIN NORTH ALIGNMENT				**DESC.**	**SEC-T-R**	**NORTHING**	**EASTING**	CP NAIL	422,133.9459	1,908,151.3030	1742.63
BOP	1371+46.86	420,514.4100	1,911,061.6400	BOP	0+00.00	422,056.9910'	1,909,127.7864'	SW SECCOR	SEC 26 T139N R80W	422,074.8221	1,905,723.5010	CP NAIL	422,163.4653	1,910,013.2740	1723.19
EOP	1413+07.94	424,675.4500	1,911,079.8300	EOP	3+00.00	422,319.8511'	1,908,983.2107'	SE SECCOR	SEC 26 T139N R80W	422,047.1550	1,911,005.6670	CP AC11	422,039.7819	1,905,746.9010	1790.90

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All Horizontal coordinates on this sheet are Burleigh County ground coordinates. They are derived form the "North Dakota Coordinate System of 1983" NAVD83(HARN). South Zone Combination factor (cf) = 0.9998515. All Vertical control is NAVD29. All units are English

Rev'd. 00/00/0000

East Divide Avenue
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

Survey Alignment & Control Data

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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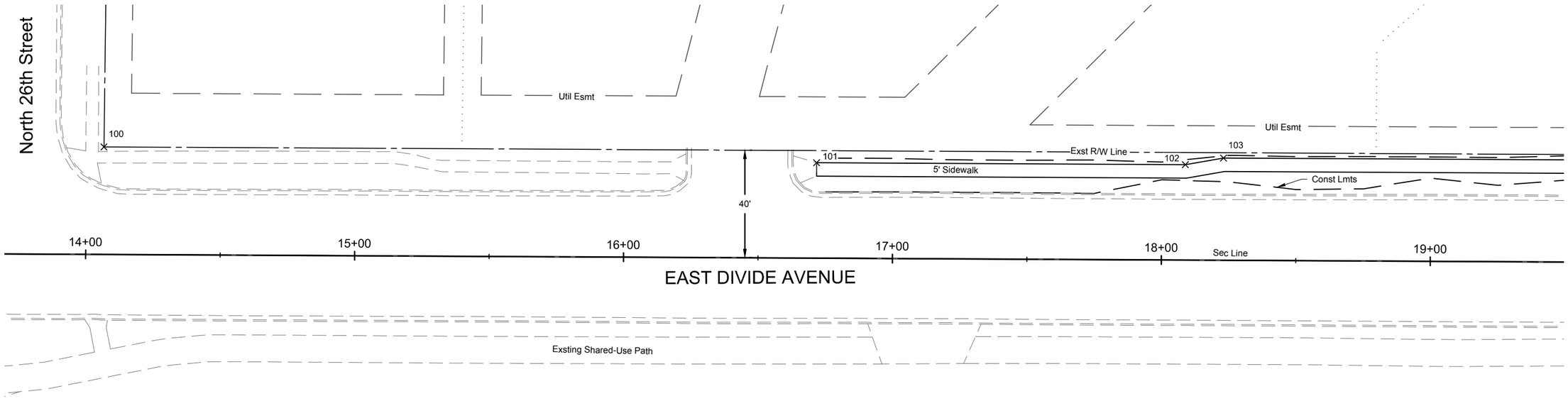
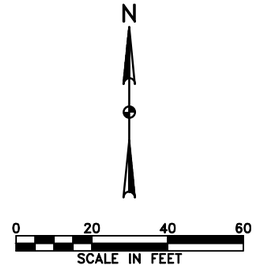
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	1



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
100	422114.614	1905763.296	14+06.59	-40.00
101	422108.726	1906028.295	16+71.61	-35.50
102	422108.008	1906165.437	18+08.76	-35.50
103	422110.434	1906179.628	18+22.93	-38.00



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout

Sta 14+00 to 19+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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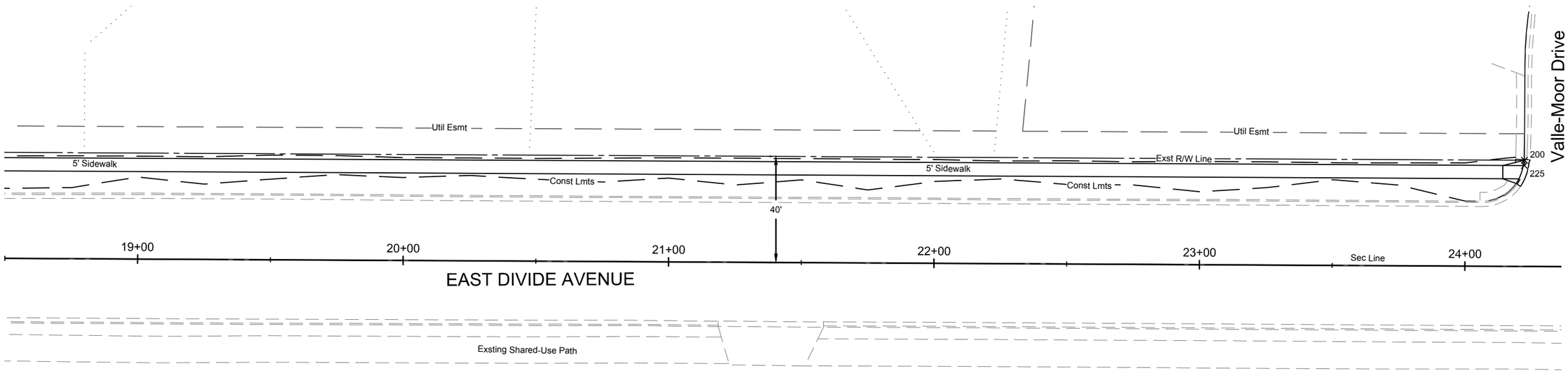
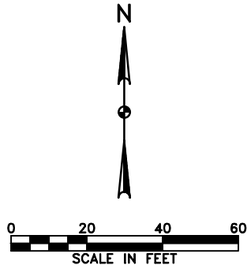
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	2





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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout

Sta 19+00 to 24+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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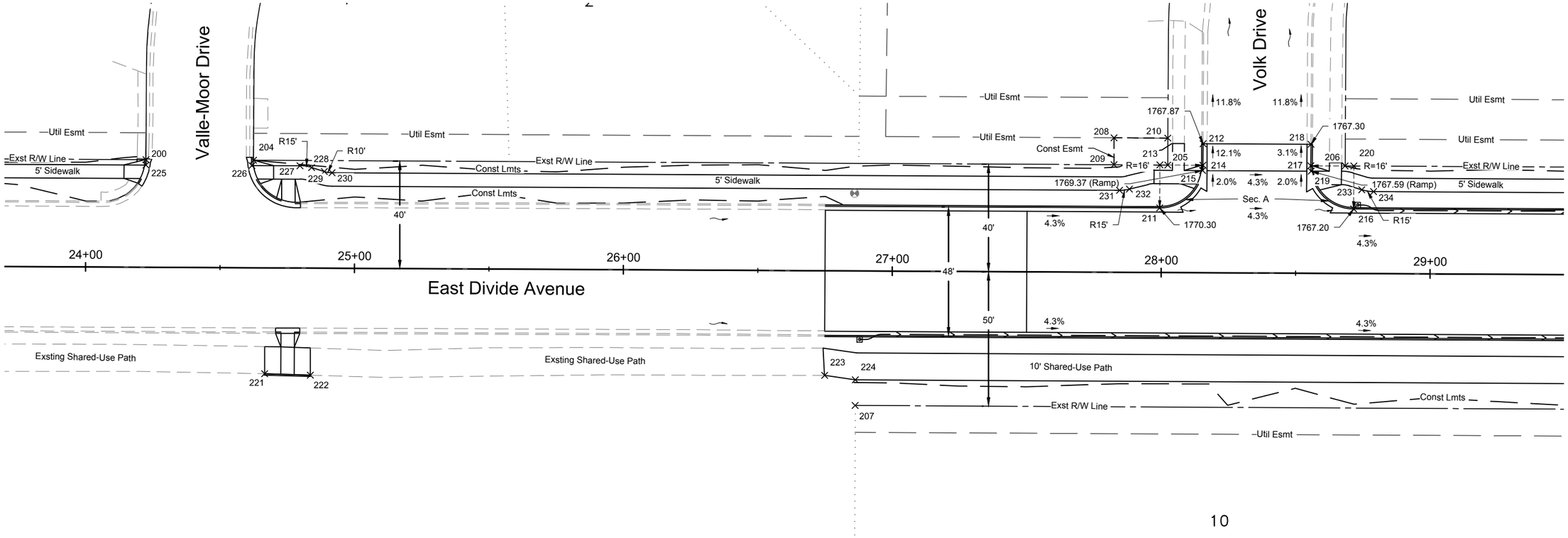
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	3



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
200	422109.295	1906778.912	24+22.22	-40.00
204	422109.085	1906818.911	24+62.22	-40.00
205	422107.304	1907158.907	28+02.22	-40.00
206	422106.921	1907224.869	28+68.18	-39.96
207	422017.912	1907042.657	26+86.44	50.00
208	422117.409	1907138.959	27+82.22	-50.00
209	422107.409	1907138.907	27+82.22	-40.00
210	422117.304	1907158.959	28+02.22	-50.00
211	422091.32	1907155.939	27+99.33	-24.00
212	422115.235	1907172.064	28+15.33	-48.00
213	422107.319	1907156.023	27+99.33	-40.00
214	422107.236	1907172.022	28+15.33	-40.00
215	422105.293	1907171.894	28+15.21	-38.06

Point	Northing	Easting	Station	Offset
216	422090.942	1907228.077	28+71.47	-24.00
217	422107.025	1907212.161	28+55.47	-40.00
218	422115.025	1907212.203	28+55.47	-48.00
219	422104.997	1907212.28	28+55.60	-37.97
220	422106.941	1907228.161	28+71.47	-40.00
221	422029.698	1906823.038	24+66.76	39.36
222	422029.183	1906840.036	24+83.76	39.79
223	422029.112	1907031.357	26+75.08	38.86
224	422027.411	1907042.76	26+86.49	40.50
225	422107.295	1906778.907	24+22.22	-38.00
226	422107.088	1906818.324	24+61.64	-38.00
227	422106.994	1906836.207	24+79.52	-38.00
228	422106.328	1906840.55	24+83.87	-37.35
229	422104.876	1906845.257	24+88.58	-35.92
230	422104.432	1906848.152	24+91.48	-35.50
231	422097.898	1907141.021	27+84.38	-30.50
232	422098.327	1907144.662	27+88.02	-30.94
233	422098.07	1907231.095	28+74.45	-31.14
234	422097.403	1907235.439	28+78.80	-30.50

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SCALE IN FEET

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 24+00 to 29+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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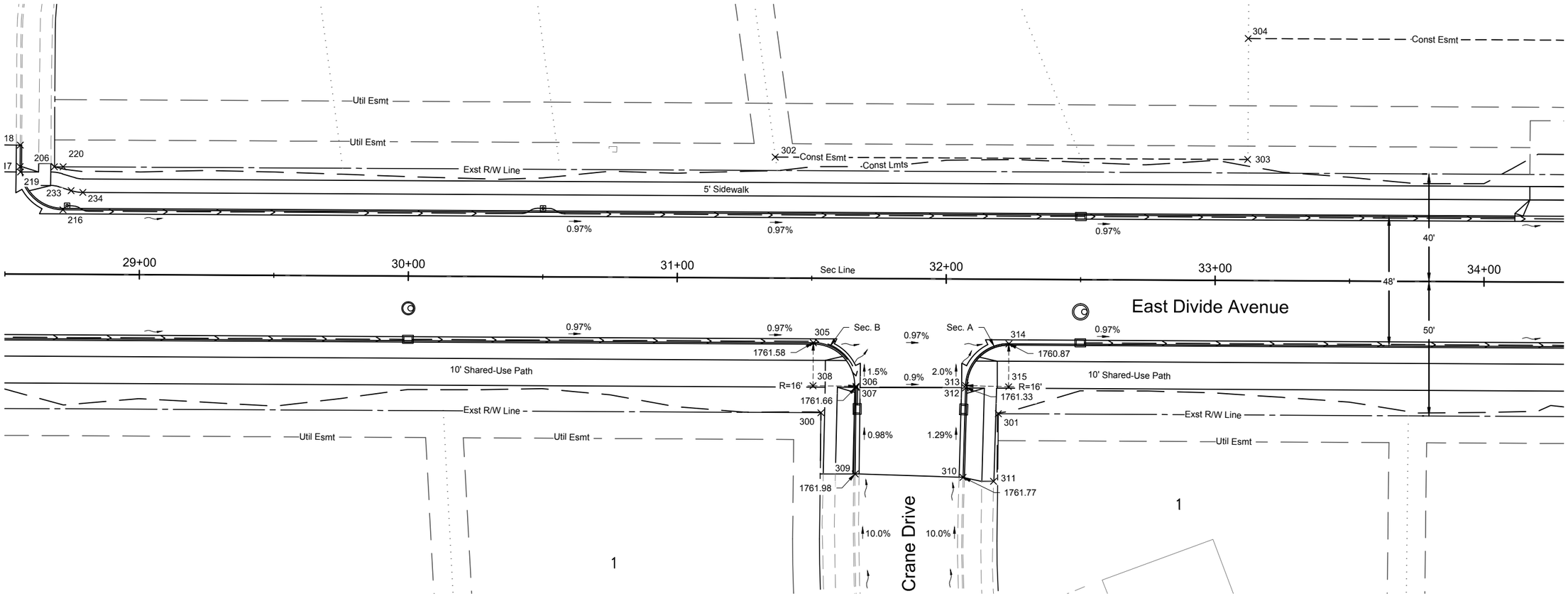
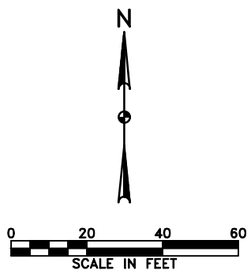
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	4



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
300	422015.461	1907509.897	31+53.68	50.00
301	422015.115	1907575.897	32+19.68	50.00
302	422110.556	1907492.878	31+36.17	-45.00
303	422109.656	1907668.579	33+11.87	-45.00
304	422154.635	1907668.814	33+11.87	-90.00
305	422041.48	1907507.078	31+50.73	24.00
306	422025.292	1907522.993	31+66.73	40.10
307	422024.896	1907522.988	31+66.72	40.50
308	422025.48	1907506.994	31+50.73	40.00
309	421992.718	1907522.63	31+66.53	72.68
310	421991.438	1907562.782	32+06.69	73.75
311	421989.968	1907574.071	32+17.99	75.16
312	422024.694	1907563.703	32+07.44	40.49
313	422025.542	1907563.726	32+07.46	39.64
314	422041.099	1907579.804	32+23.45	24.00
315	422025.099	1907579.72	32+23.45	40.00



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 29+00 to 34+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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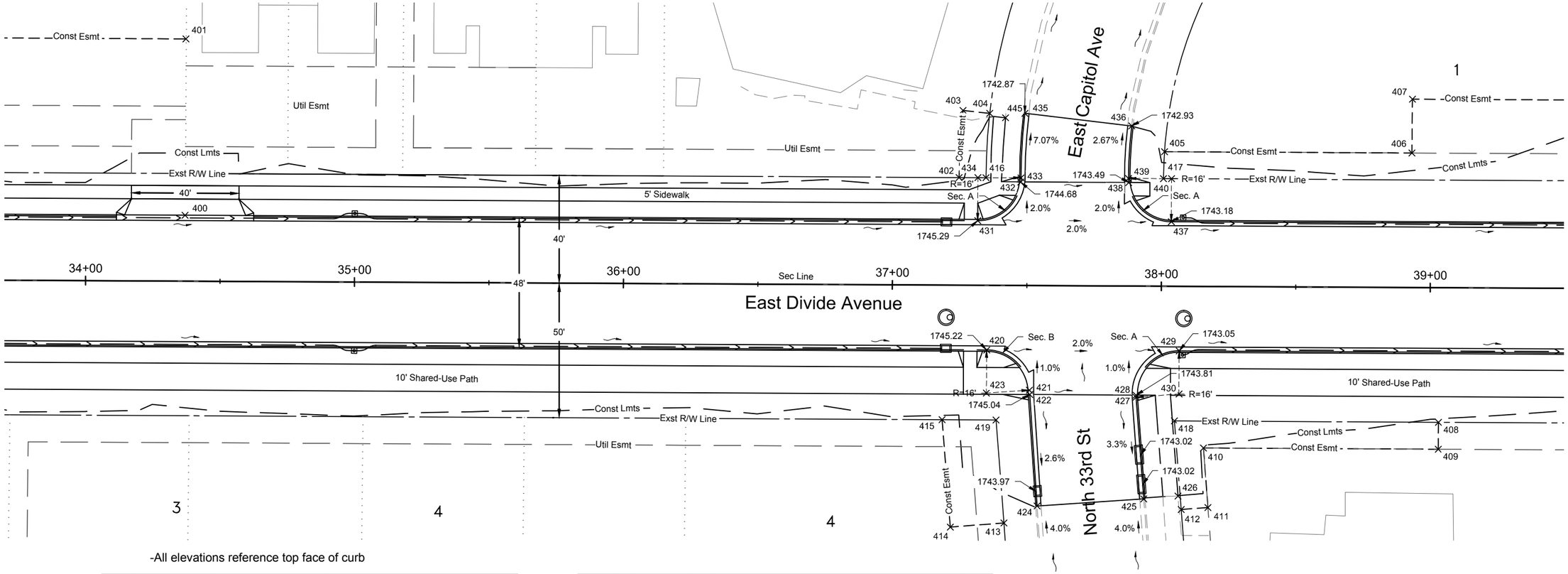
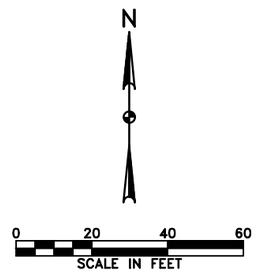
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	5



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
400	422088.48	1907793.469	34+36.87	-24.50
401	422153.98	1907793.812	34+36.87	-90.00
402	422102.473	1908081.291	37+24.61	-40.00
403	422127.419	1908082.744	37+25.94	-64.95
404	422126.31	1908092.682	37+35.88	-63.90
405	422112.073	1908157.655	38+00.93	-50.00
406	422111.591	1908249.654	38+92.93	-50.00
407	422131.591	1908249.862	38+93.03	-70.00
408	422011.535	1908259.515	39+03.31	50.00
409	422001.535	1908259.462	39+03.31	60.00
410	422001.992	1908172.151	38+16.00	60.00
411	421979.875	1908173.827	38+17.79	82.11
412	421979.119	1908163.856	38+07.82	82.92
413	421974.126	1908097.954	37+41.95	88.26
414	421972.616	1908078.011	37+22.01	89.87
415	422012.501	1908074.989	37+18.78	50.00
416	422102.421	1908091.291	37+34.61	-40.00
417	422102.075	1908157.29	38+00.61	-40.00
418	422012.049	1908161.375	38+05.17	50.00
419	422012.396	1908095.054	37+38.85	50.00
420	422038.418	1908091.538	37+35.19	24.00
421	422023.483	1908107.418	37+51.15	38.85
422	422021.87	1908107.526	37+51.27	40.46

Point	Northing	Easting	Station	Offset
423	422022.419	1908091.454	37+35.19	40.00
424	421980.444	1908110.289	37+54.25	81.88
425	421983.061	1908149.946	37+93.89	79.05
426	421984.152	1908162.679	38+06.62	77.89
427	422020.841	1908147.098	37+90.85	41.29
428	422021.611	1908147.059	37+90.80	40.52
429	422038.043	1908163.137	38+06.79	24.00
430	422022.044	1908163.053	38+06.79	40.00
431	422086.436	1908088.208	37+31.61	-24.00
432	422100.802	1908104.208	37+47.54	-38.45
433	422102.353	1908104.291	37+47.61	-40.00
434	422102.436	1908088.291	37+31.61	-40.00
435	422126.344	1908105.772	37+48.97	-64.00
436	422121.633	1908145.493	37+88.71	-59.50
437	422086.059	1908160.207	38+03.61	-24.00
438	422100.594	1908144.358	37+87.69	-38.45
439	422102.143	1908144.291	37+87.61	-40.00
440	422102.059	1908160.29	38+03.61	-40.00
445	422124.686	1908098.542	37+41.75	-62.30



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 34+00 to 39+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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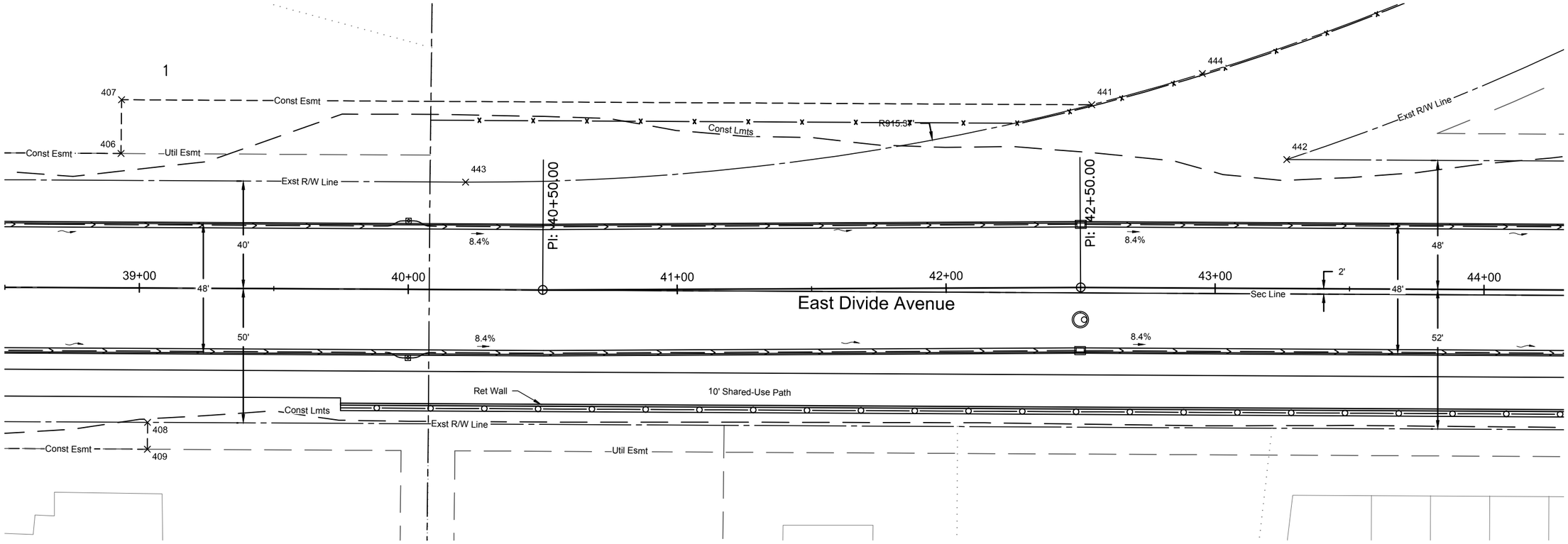
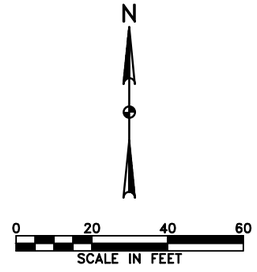
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	6



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
441	422129.701	1908610.629	42+53.84	-68.00
442	422109.319	1908683.11	43+26.43	-48.00
443	422100.92	1908377.749	40+21.07	-40.00
444	422141.29	1908651.733	42+94.88	-79.81



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout

Sta 39+00 to 44+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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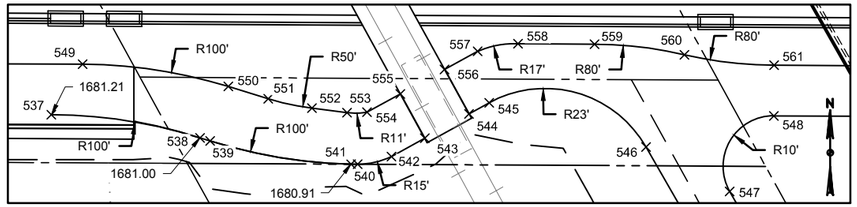
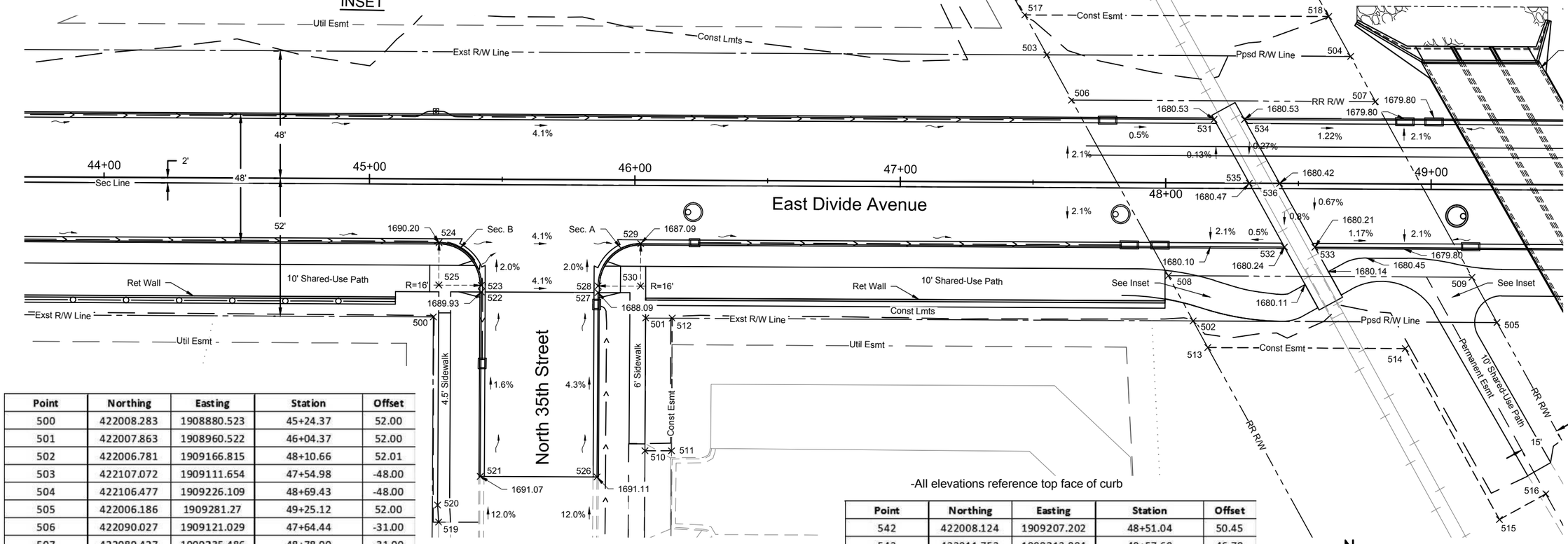
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	7



INSET

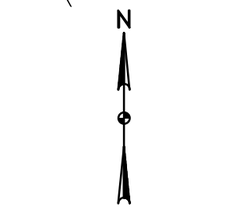


-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
500	422008.283	1908880.523	45+24.37	52.00
501	422007.863	1908960.522	46+04.37	52.00
502	422006.781	1909166.815	48+10.66	52.01
503	422107.072	1909111.654	47+54.98	-48.00
504	422106.477	1909226.109	48+69.43	-48.00
505	422006.186	1909281.27	49+25.12	52.00
506	422090.027	1909121.029	47+64.44	-31.00
507	422089.427	1909235.486	48+78.90	-31.00
508	422023.835	1909157.435	48+01.19	35.00
509	422023.236	1909271.892	49+15.65	35.00
510	421957.864	1908960.26	46+04.37	102.00
511	421957.811	1908970.26	46+14.37	102.00
512	422007.811	1908970.522	46+14.37	52.00
513	421996.757	1909172.329	48+16.23	62.00
514	421996.367	1909246.726	48+90.63	62.00
515	421931.918	1909282.173	49+26.41	126.26
516	421941.557	1909299.698	49+43.89	116.53
517	422122.12	1909103.378	47+46.62	-63.00
518	422121.52	1909217.835	48+61.08	-63.00
519	421930.965	1908882.514	45+26.76	129.31
520	421937.404	1908882.151	45+26.37	122.87
521	421948.198	1908898.208	45+42.37	111.99
522	422017.691	1908898.573	45+42.37	42.50
523	422020.191	1908898.586	45+42.37	40.00
524	422036.275	1908882.67	45+26.37	24.00
525	422020.275	1908882.586	45+26.37	40.00

Point	Northing	Easting	Station	Offset
526	421947.967	1908942.208	45+86.37	111.99
527	422017.461	1908942.572	45+86.37	42.50
528	422019.961	1908942.585	45+86.37	40.00
529	422035.877	1908958.669	46+02.37	24.00
530	422019.877	1908958.585	46+02.37	40.00
531	422082.746	1909174.699	48+18.15	-24.00
532	422034.606	1909201.216	48+44.92	24.00
533	422034.546	1909212.665	48+56.37	24.00
534	422082.686	1909186.149	48+29.60	-24.00
535	422058.676	1909187.957	48+31.53	0.00
536	422058.616	1909199.407	48+42.98	0.00
537	422016.427	1909139.901	47+83.70	42.50
538	422011.837	1909169.331	48+13.15	46.94
539	422011.206	1909171.341	48+15.17	47.56
540	422006.635	1909199.249	48+43.10	51.98
541	422006.609	1909200.516	48+44.36	52.00

Point	Northing	Easting	Station	Offset
542	422008.124	1909207.202	48+51.04	50.45
543	422011.753	1909213.804	48+57.60	46.79
544	422016.569	1909222.568	48+66.33	41.93
545	422018.761	1909226.555	48+70.34	39.71
546	422010.034	1909257.592	49+01.42	48.28
547	422001.209	1909274.17	49+18.05	57.02
548	422016.178	1909282.9	49+26.70	42.00
549	422026.395	1909146.097	47+89.84	32.50
550	422021.983	1909174.954	48+18.72	36.76
551	422019.561	1909182.832	48+26.61	39.14
552	422017.722	1909191.47	48+35.26	40.94
553	422016.818	1909198.444	48+42.24	41.80
554	422016.888	1909202.386	48+46.18	41.71
555	422020.512	1909208.979	48+52.72	38.05
556	422025.328	1909217.743	48+61.46	33.19
557	422028.925	1909224.287	48+68.02	29.56
558	422030.443	1909232.289	48+76.01	28.00
559	422030.364	1909247.421	48+91.14	28.00
560	422028.271	1909265.187	49+08.92	30.00
561	422026.178	1909282.952	49+26.70	32.00



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 44+00 to 49+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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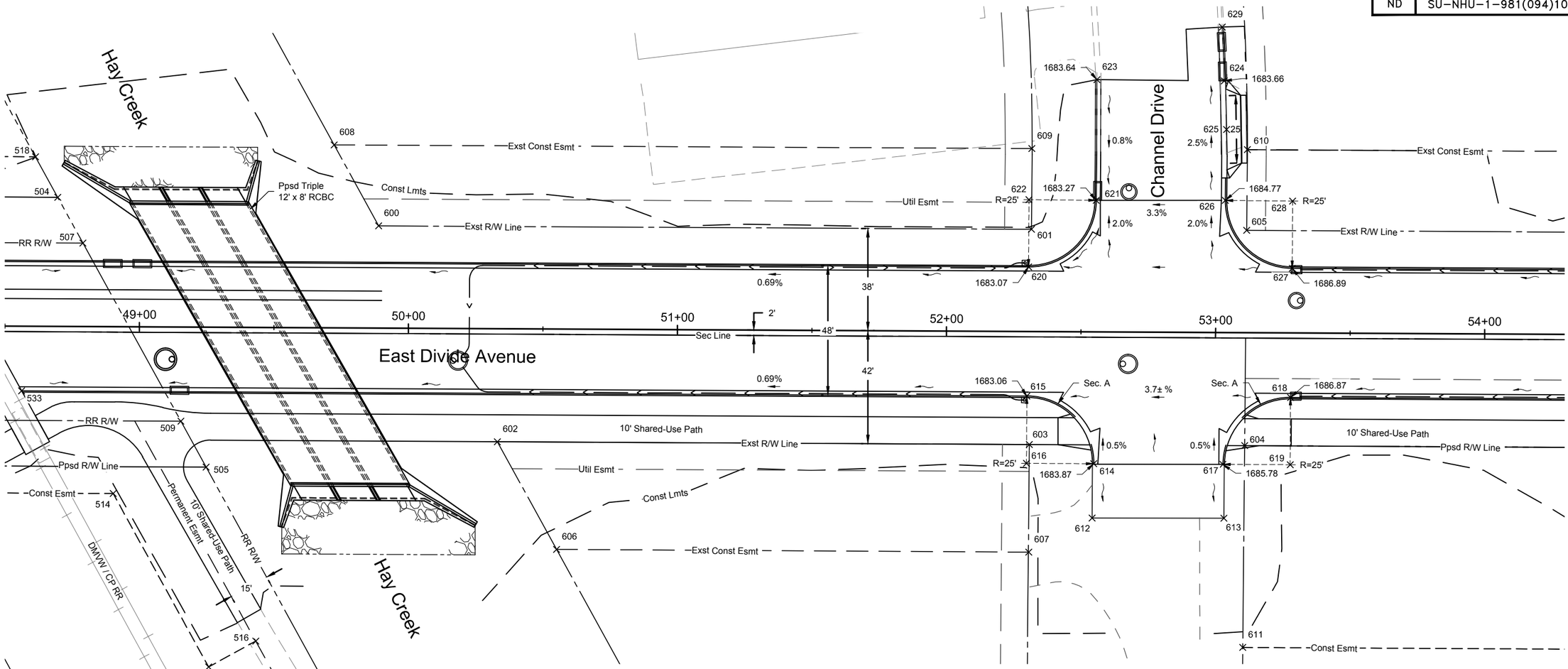
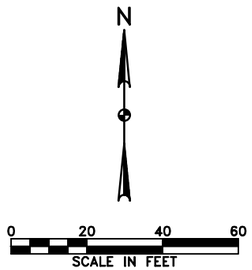
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	8



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
600	422095.852	1909345.392	49+88.77	-38.00
601	422094.581	1909587.998	52+31.38	-38.00
602	422015.62	1909389.52	50+33.32	42.00
603	422014.584	1909587.253	52+31.05	42.00
604	422014.165	1909667.253	53+11.06	42.00
605	422094.162	1909667.998	53+11.38	-38.00
606	421975.62	1909411.52	50+55.53	81.88
607	421974.584	1909587.044	52+31.05	82.00
608	422125.939	1909328.843	49+72.07	-68.00
609	422124.581	1909588.155	52+31.38	-68.00
610	422124.161	1909668.273	53+11.50	-68.00
611	421939.167	1909666.554	53+10.75	117.00
612	421987.261	1909610.573	52+54.52	69.20
613	421987.205	1909659.575	53+03.52	69.00
614	422007.458	1909611.179	52+55.02	49.00

Point	Northing	Easting	Station	Offset
615	422032.589	1909586.31	52+30.02	24.00
616	422007.589	1909586.179	52+30.02	49.00
617	422007.207	1909659.18	53+03.02	49.00
618	422032.076	1909684.331	53+28.04	24.00
619	422007.076	1909684.179	53+28.02	49.00
620	422080.586	1909586.97	52+30.43	-24.00
621	422105.353	1909612.1	52+55.43	-48.90
622	422105.586	1909587.101	52+30.43	-49.00
623	422150.205	1909612.336	52+55.43	-93.75
624	422149.731	1909659.649	53+02.74	-93.53
625	422131.669	1909660.543	53+03.70	-75.47
626	422105.305	1909660.101	53+03.43	-49.10
627	422080.073	1909684.969	53+28.43	-24.00
628	422105.073	1909685.1	53+28.43	-49.00
629	422169.744	1909658.946	53+01.90	-113.53



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 49+00 to 54+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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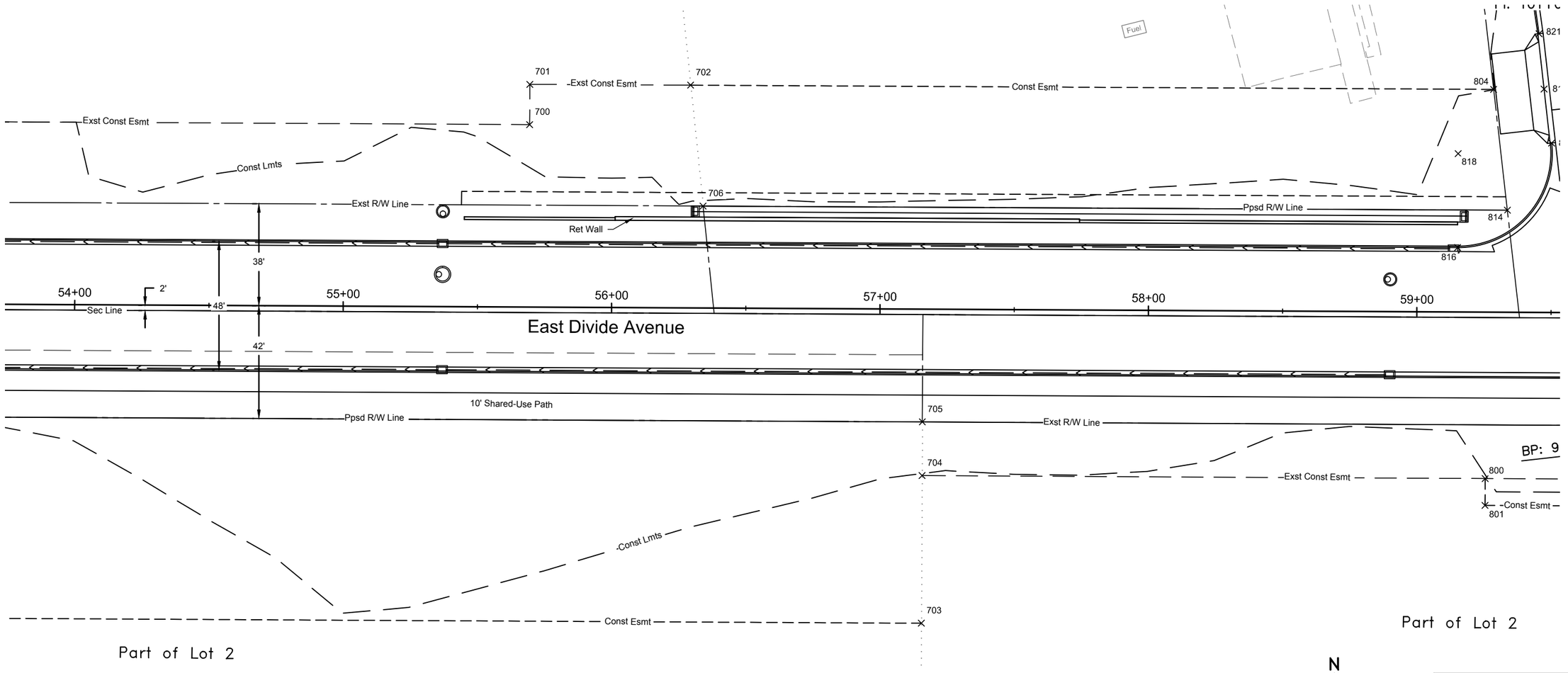
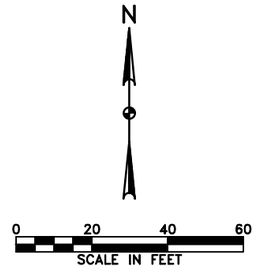
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	9



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
700	422122.811	1909925.93	55+69.16	-68.00
701	422137.811	1909926.008	55+69.16	-83.00
702	422137.498	1909985.882	56+29.03	-83.00
703	421937.045	1910071.814	57+16.02	117.00
704	421992.044	1910072.103	57+16.02	62.00
705	422012.044	1910072.207	57+16.02	42.00
706	422092.473	1909990.533	56+33.92	-38.00



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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout

Sta 54+00 to 59+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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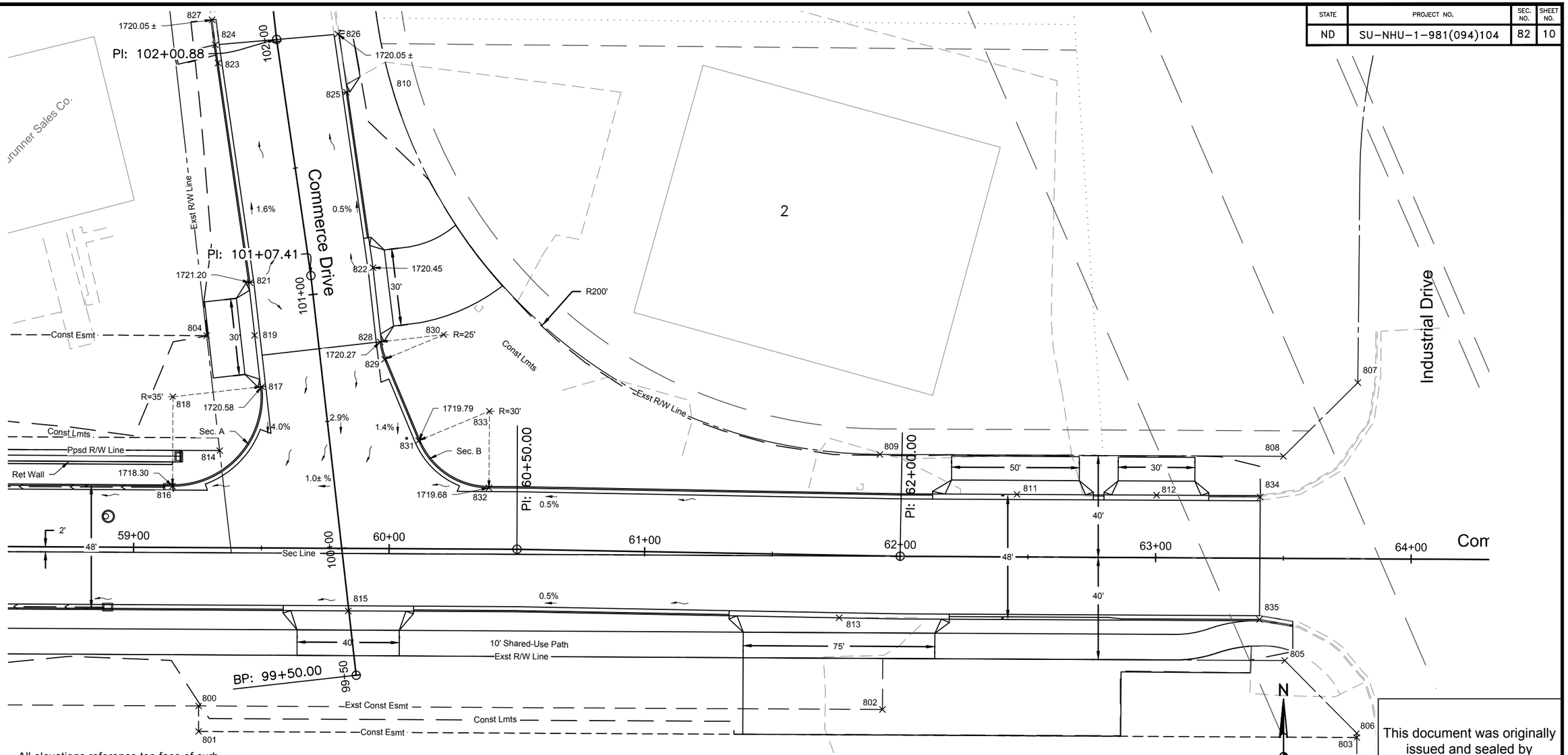
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	10



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
800	421990.945	1910281.897	59+25.81	62.00
801	421980.945	1910281.845	59+25.81	72.00
802	421989.543	1910549.536	61+93.50	60.00
803	421978.571	1910735.142	63+79.16	70.00
804	422135.931	1910285.029	59+28.18	-83.00
805	422008.719	1910706.953	63+50.81	40.00
806	421980.283	1910735.142	63+79.15	68.29
807	422117.562	1910735.582	63+78.87	-68.99
808	422088.673	1910706.405	63+49.84	-39.95
809	422089.417	1910548.507	61+91.36	-39.76
810	422266.996	1910350.71	59+93.18	-214.41
811	422073.769	1910602.162	62+45.68	-24.50
812	422073.483	1910656.733	63+00.25	-24.50

Point	Northing	Easting	Station	Offset
813	422025.445	1910532.566	61+76.61	24.50
814	422090.903	1910290.132	59+33.52	-38.00
815	422028.139	1910340.468	59+84.19	24.50
816	422077	1910271.64	59+15.11	-24.00
817	422115.941	1910306.6	59+49.86	-63.12
818	422112	1910271.823	59+15.11	-59.00
819	422136.0639	1910303.817	59+46.95	-83.23
821	422156.679	1910301.972	59+45.00	-103.83
822	422162.5503	1910350.128	59+93.11	-109.96
823	422242.6883	1910289.486	59+32.05	-189.78
824	422249.8044	1910288.418	59+30.95	-196.89
825	422231.2625	1910339.654	59+82.28	-178.61
826	422254.0008	1910336.361	59+78.89	-201.35

Point	Northing	Easting	Station	Offset
827	422259.6039	1910287.16	59+29.64	-206.68
828	422133.5021	1910352.918	59+96.05	-80.93
829	422126.6847	1910354.685	59+97.89	-74.12
830	422136.304	1910377.76	60+20.91	-83.86
831	422094.808	1910367.973	60+11.34	-42.31
832	422076.351	1910395.506	60+38.97	-24.00
833	422106.351	1910395.664	60+38.97	-54.00
834	422072.77	1910697.346	63+40.87	-24.00
835	422024.771	1910697.095	63+40.87	24.00

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 59+00 to 64+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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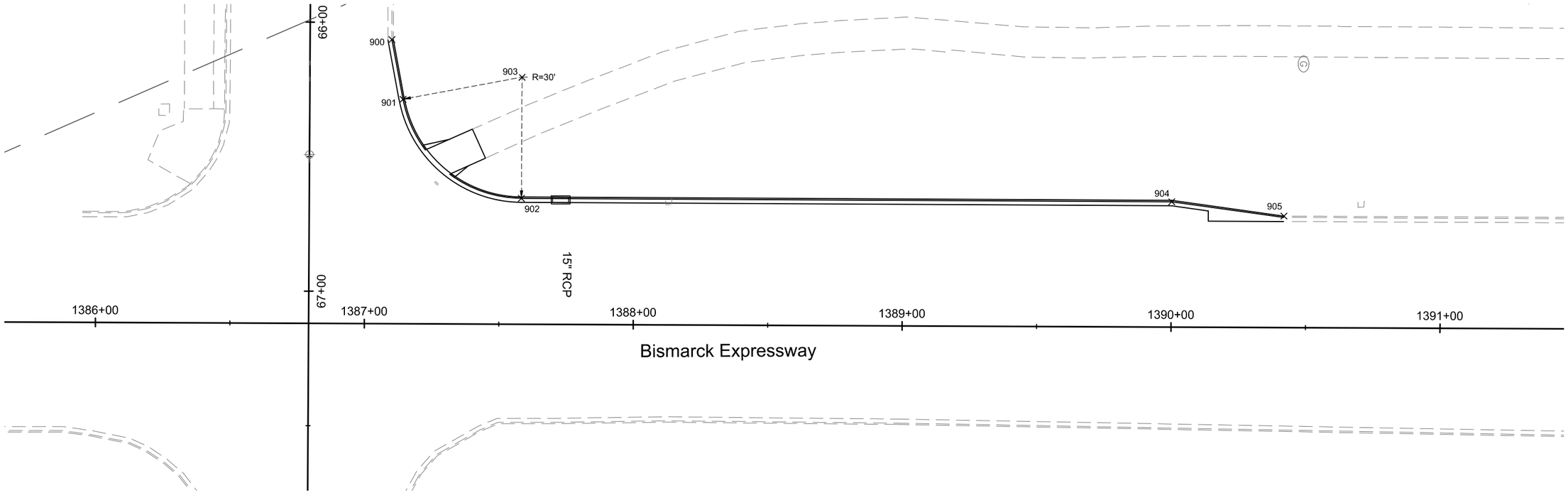
STATE	PROJECT NO.	SEC. NO.	SHEET NO.
ND	SU-NHU-1-981(094)104	82	11



-All elevations reference top face of curb

Point	Northing	Easting	Station	Offset
900	422077.826	1910962.891	66+06.38	-30.45
901	422081.934	1910985.096	66+28.57	-34.67
902	422125.947	1911021.909	66+65.15	-78.88
903	422126.183	1910976.909	66+20.15	-78.88
904	422367.762	1911023.175	66+65.15	-320.69
905	422409.501	1911028.487	66+70.18	-362.46

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SCALE IN FEET

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EAST DIVIDE AVENUE
CITY OF BISMARCK
BISMARCK, NORTH DAKOTA

Kadrmas Lee & Jackson
Engineers Surveyors Planners

East Divide Avenue
Survey Data Layout
Sta 1386+00 to 1391+00

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
EHH	NJW	1411109	Aug 2013

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