



Highway Department

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SMB-HWY@casscountynd.gov

MEMORANDUM

TO: Cass County Commission

FROM: Jason Benson, County Engineer

DATE: July 7, 2023

SUBJECT: Agenda Item for July 17th, 2023 Cass County Commission. Amended Cass County and Metro Flood Diversion Authority Memorandum of Understanding.

Cass County previously signed the original Memorandum of Understanding with a different intent for the Frontage Road recently acquired from NDDOT now known as County Road 40. The original design of the portion of the Frontage Road west of the Channel was to be reduced to a gravel road up until 166th Avenue Southeast with a gate and the east side of the Channel along the Frontage Road would end with Termination-T cul-de-sac at the work limits. A request was made by the Cass County Highway Department to change the design to keep the largest amount of the original asphalt road in place with Termination Branches situated on either side. This request was accepted and will be reflected in the project work along the Channel. The amended Memorandum of Understanding shows the changes in the Exhibit E plan sheets.

Another change from the original Memorandum of Understanding was a design description change to a specific standard for the bridge barrier rail. This request from the Cass County Highway Department was made due to the standard is now being utilized on County bridges but was not at that the time the original was signed.

Both changes benefit Cass County. The first change along the Frontage Road saves Cass County on maintenance costs and the second change increases safety along the bridges.

SUGGESTED MOTION:

Move to approve the Amended Cass County and Metro Flood Diversion Authority Memorandum of Understanding.



CONTRACT APPROVAL

REQUIRED BY DEPARTMENT:

DEPARTMENT: Highway Department DATE OF REQUEST: 07-12-2023

COMPANY REQUESTING CONTRACT: Diversion Authority

BRIEF PROJECT DESCRIPTION: Amendment to MOU

 x NEW CONTRACT OR CONTRACT RENEWAL

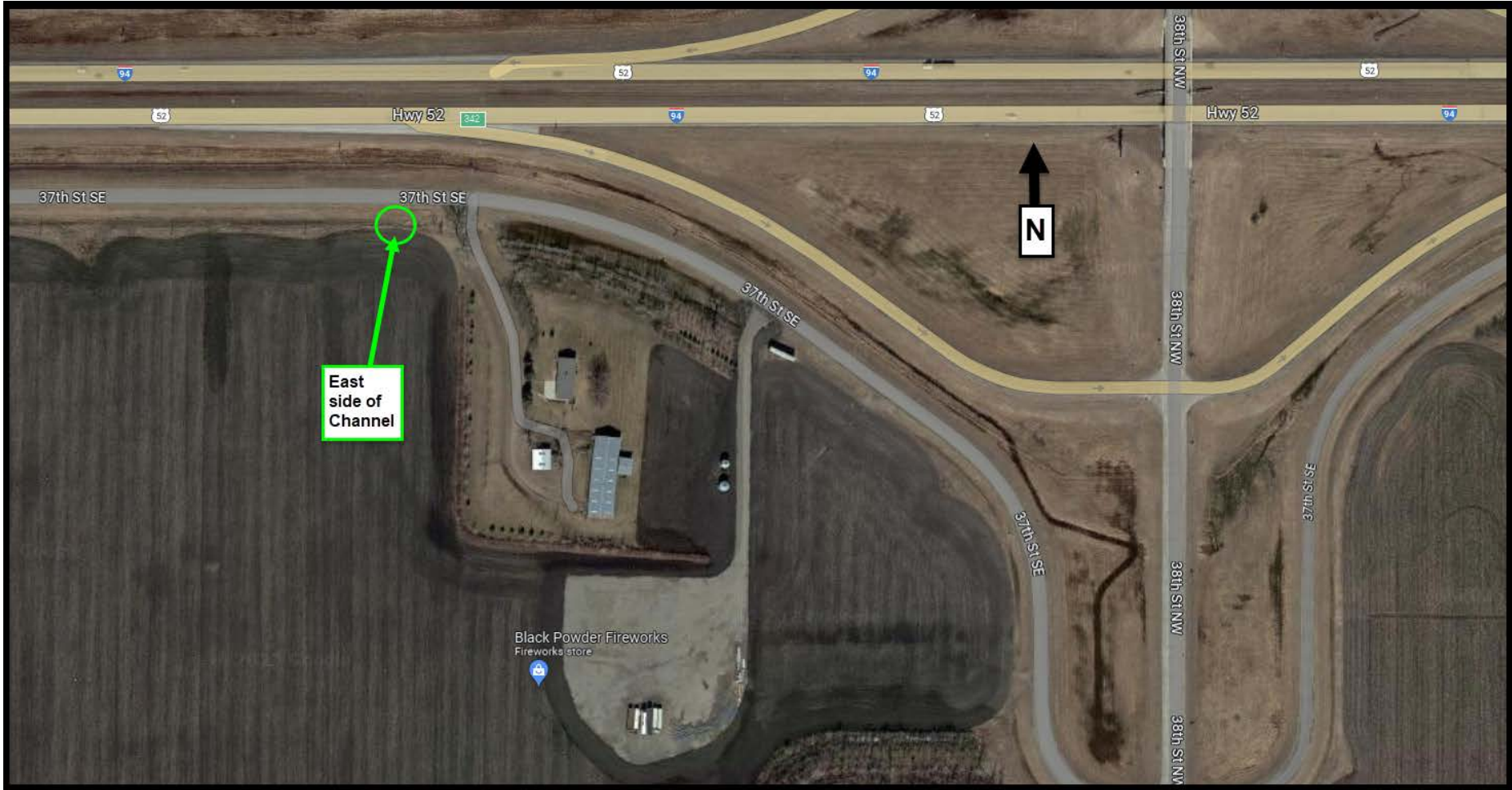
REQUIRED BY STATE'S ATTORNEY OFFICE:

STATE'S ATTORNEY SIGNATURE: _____

STATE'S ATTORNEY COMMENTS:







**FIRST AMENDMENT TO
MEMORANDUM OF UNDERSTANDING**

**BY AND BETWEEN
METRO FLOOD DIVERSION AUTHORITY
AND
CASS COUNTY, NORTH DAKOTA**

Dated as of _____, 2023

Relating to:

A First Amendment to the Memorandum of Understanding outlining roles and responsibilities for the design, construction, and relocation of road facilities in conjunction with the Storm Water Diversion Channel and Associated Infrastructure of the Fargo-Moorhead Metropolitan Area Flood Risk Management Project.

This instrument was drafted by:
Ohnstad Twichell, P.C.
P.O. Box 458
West Fargo, North Dakota 58078

FIRST AMENDMENT TO MEMORANDUM OF UNDERSTANDING

THIS FIRST AMENDMENT TO MEMORANDUM OF UNDERSTANDING (the “First Amendment”) is made and entered into this ____ day of _____, 2023 (the “Effective Date”), by and between METRO FLOOD DIVERSION AUTHORITY, a political subdivision of the State of North Dakota (the “Authority”), and CASS COUNTY, NORTH DAKOTA, a political subdivision and home rule county of the State of North Dakota (the “County”).

WHEREAS, construction of the locally preferred plan for the Fargo-Moorhead Metropolitan Area Flood Risk Management Project (the “Comprehensive Project”) at the Fargo, North Dakota, and Moorhead, Minnesota, metropolitan area was authorized by Section 7002(2) of the Water Resources Reform and Development Act of 2014, Public Law 113-121; and

WHEREAS, the Authority is the local sponsor responsible for delivering the Comprehensive Project; and

WHEREAS, on December 17, 2020, the Authority and the County entered into a Memorandum of Understanding (the “MOU”) outlining the roles and responsibilities of the Parties for the SWDCAI of the Comprehensive Project; and

WHEREAS, the Authority and the County now desire to enter into this First Amendment to modify some of the terms of such roles and responsibilities.

NOW, THEREFORE, in consideration of the mutual covenants and agreements made herein, the Authority and the County agree as follows:

1. Amendments. The Parties agree to amend the MOU as set forth in this paragraph. Text that is underlined indicates an addition to the MOU and text that has a ~~striketrough~~ indicates a deletion to the MOU.

A. Section 6.04 of the MOU is amended as follows:

Section 6.04. FRONTAGE ROAD. Between 166th Avenue Southeast and ~~the SWDCAI~~38th Street West, the Authority will ~~convert the Frontage Road to a minimum maintenance road by reclaiming/milling the existing asphalt and adding four (4) inches of gravel. The Authority will install a road closure gate on the east side of the 166th Avenue Southeast intersection per NDDOT Standard Drawing D900-3. On the east side of the SWDCAI, the Authority will dead end the Frontage Road and will construct a T-Type cul-de-sac for a single unit vehicle as shown in Figure 5-1G of the AASHTO A Policy on Geometric Design of Highways and Streets. The cul-de-sac will have a minimum of 7 inch HBP FAA 42 Superpave and 4 inch HBP FAA 42 Superpave shoulders. The Authority will provide end-of-road object markers and advance warnings signs per the FHWA Manual of Uniform Traffic Control Devices~~ construct improvements in accordance with BU-R22 – 37th St SE East of the Diversion Channel and BU-R23 – 37th St SE West of the Diversion Channel design documents, attached hereto as Exhibit E.

B. Exhibit D to the MOU is hereby modified as shown on the attached Exhibit D.

C. Exhibit E attached to this First Amendment is incorporated into the MOU as Exhibit E.

2. Governing Law. This First Amendment will be construed and enforced in accordance with North Dakota law.

3. Survival of Agreement. If any court of competent jurisdiction finds any provision or part of this First Amendment is invalid, illegal, or unenforceable, that portion will be deemed severed from this First Amendment, and all remaining terms and provisions of this First Amendment will remain binding and enforceable, and the Parties' obligations under this First Amendment will remain binding and enforceable.

4. Entire Agreement. This First Amendment, along with the MOU, and any other related documents, as well as any amendments to those agreements and documents, constitutes the entire agreement between the Parties regarding the matters described in this First Amendment.

5. Modifications. Any modifications or amendments to this First Amendment must be in writing and signed by all Parties of this First Amendment.

6. Binding Effect. The covenants, terms, conditions, provisions, and undertakings in this First Amendment, or in any amendment thereto, will be binding upon the Parties' permitted successors and assigns.

7. Representation. The Parties, having been represented by counsel or having waived the right to counsel, have carefully read the contents of this First Amendment and agree they have not been influenced by any representations or statements by any other parties.

8. Headings. Headings in this First Amendment are for convenience only and will not be used to interpret or construe its provisions.

9. Electronic Signatures. The Parties agree that an electronic signature to this First Amendment shall be valid as an original signature of the Party and shall bind the signatories of this MOU.

IN WITNESS WHEREOF, the Authority and the County caused this First Amendment to be executed.

(Remainder of page intentionally left blank.)

Signature Page for Metro Flood Diversion Authority

The Governing Body of the Metro Flood Diversion Authority approved this First Amendment on the ____ day of _____, 2023.

**METRO FLOOD DIVERSION
AUTHORITY**

By: _____
Dr. Timothy J. Mahoney, Chair

By: _____
Joel Paulsen, Executive Director

ATTEST:

Dawn Lindblom, Secretary

Signature Page for Cass County, North Dakota

The Governing Body of Cass County, North Dakota, approved this First Amendment on the ____ day of _____, 2023.

CASS COUNTY, NORTH DAKOTA

By: _____
Chad M. Peterson, Chairman of the
Board of County Commissioners

ATTEST:

Brandy Madrigga, County Finance Director

EXHIBIT D

BRIDGE DESIGN CRITERIA

1. Design and construct Bridges in accordance with the following:

- A. AASHTO *LRFD Bridge Design Specifications*
- B. NDDOT *Design Manual Chapters IV and V*
- C. NDDOT *Standard Specifications for Road and Bridge Construction*

For cases where AASHTO specifications conflict with NDDOT standards and policies, the NDDOT standards and policies take precedence.

2. Bridge requirements:

- A. Provide a minimum one (1) foot clearance between the 1.0 percent ACE (100-year) Red River Peak Design Flow water surface elevation and the bottom of the lowest girder flange or appurtenance within each bridge span.
- B. Permissible bridge types are as follows:
 - a. Pre-stressed concrete I girder
 - b. Steel plate girders
 - c. Wide flange rolled girders
 - d. Cast-in-place and precast concrete box culverts
- C. Bridges utilizing fracture critical members are not allowed.
- D. Design and construct Bridges with concrete decking.
- E. Design bridges on “straight” or tangent sections. Horizontal curves or curve transitions are not permitted in the geometric design.
- ~~F. Design and construct bridges with a steel H pile foundation in which the piles are driving to the required bearing capacity.~~
- ~~G. Design and construct bridges with 1” expansion joints at each bridge end in accordance with NDDOT CADD Standard Drawing D550-04 Transverse Expansion Joint Detail.~~
- H. Obtain an individual bridge number for each structure from NDDOT; include this bridge number on design and plan sheets.

- I. Design and construct concrete bridge barrier rail with a ~~Kansas Corral Rail~~ an open style concrete railing that is rated TL-3 or better under MASH 2016 in compliance with the Technical Requirements.

EXHIBIT E

BU-R22 AND BU-R23 DESIGN REPORTS

DESIGN DATA				<h3 style="margin: 0;">THE FARGO MOORHEAD METROPOLITAN FLOOD RISK MANAGEMENT PROJECT DIVERSION CHANNEL ASSOCIATED INFRASTRUCTURE WORK PACKAGE</h3> <p style="margin: 0;">BU-R22 DESIGN REPORT - CONSTRUCTION DOCUMENTS SUBMITTAL</p> <p style="margin: 0;">Cass County 37th St. SE East of Diversion Channel 37th St SE (East of Channel)</p>	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.						
Traffic	Average Daily	Less Than 100 VPD			ND	----	1	1						
Current	Pass:	Trucks:	Total: N/A		<p>GOVERNING SPECIFICATIONS</p> <p>The Work for this Buildable Unit will be performed in accordance with the NDDOT Construction Specifications as provided in Exhibit C of the Executed Memorandum of Understanding By and Between the Metro Flood Diversion Authority and the North Dakota Department of Transportation.</p> <p>These Construction Specifications are Referenced in the Plans and are Provided on Annex as RRVA Document Number NDOT-MD-SPE-00001 and Authority Document Number RRVA_LLC-RPT-00209.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">DESCRIPTION</th> <th style="width: 20%;">NET MILES</th> <th style="width: 20%;">GROSS MILES</th> </tr> </thead> <tbody> <tr> <td>37th St SE (East of Channel)</td> <td>---</td> <td>---</td> </tr> </tbody> </table>				DESCRIPTION	NET MILES	GROSS MILES	37th St SE (East of Channel)	---	---
DESCRIPTION	NET MILES	GROSS MILES												
37th St SE (East of Channel)	---	---												
Forecast	Pass:	Trucks:	Total: N/A											
Clear Zone Distance: 18 FT	Design Speed: 55 MPH													
Minimum Sight Dist. for Stopping: 495 FT	Bridges:													
Sight Dist. for No Passing Zone: N/A														
Pavement Design Life														

KEY PLAN
SCALE: N.T.S.

STATE COUNTY MAP

No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023		DESIGNER	COREY RAYFORD	06/12/2023
						CHECKER	PHIL ROBERTS	06/12/2023
						APPROVER	STEVE SEYMOUR	06/12/2023

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

TITLE SHEET

R22-C-000101

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	2	1

TABLE OF CONTENTS

PLAN SECTIONS

Section	Sheet	Description
1	1	Cover Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1	Notes
20	1-3	General Details
40	1	Removals
50	1	Inlet Summary
51	1	Allowable Pipe List
60	1	Plan View
76	1	Temporary Erosion Control
82	1	Alignment Tables
110	1-3	Signing
200	1	Cross-sections

STANDARD DRAWING LIST

Standard No	Description
D101-01	NDDOT Abbreviations
D101-02	NDDOT Abbreviations
D101-03	NDDOT Abbreviations
D101-04	NDDOT Abbreviations
D101-20	Line Styles
D101-21	Line Styles
D101-30	Symbols
D101-31	Symbols
D101-32	Symbols
D101-33	Symbols
D260-01	Erosion and Siltation Control - Silt Fence
D261-01	Erosion Control - Fiber Roll Placement Details
D714-27M	Pipe Installation Detail for Multiple Longitudinal Mainline Pipe or Pipe Not Under the Roadway
D754-23	Perforated Tube Assembly Details
D754-24	Mounting Details Perforated Tube
D754-24A	Breakaway Coupler System for Perforated Tubes
D754-25	Mounting Details Perforated Tube
D754-29	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-31	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-32	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-46	Punching, Stringer and Support Location Details for Regulatory, Warning and Guide Bike Route Signs
D754-47	Sign Punching, Stringer and Support Location Details for Variable Length Signs
D714-05	Corrugated Steel Pipe Arch Culverts and End Sections

These Standard Drawings are provided on Aconex as
 RRVA Document Number: NDOT-MD-DWG-00001
 Authority Document Number: RRVA_LLC-DGN-00027

NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION								FARGO-MOORHEAD AREA DCAI WORK PACKAGE
				DESIGNER COREY RAYFORD 06/12/2023 CHECKER PHIL ROBERTS 06/12/2023 APPROVER STEVE SEYMOUR 06/12/2023	PE-R22 - 37th St SE (East of Diversion Channel) BU-R22 - 37th St SE (East of Diversion Channel)			
				TABLE OF CONTENTS				
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023				

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	6	1

NOTES

- 102-P01 SOIL INFORMATION AND BORING LOGS:** Bore locations are referenced on the Section 4 Scope of Work plan sheets. Additional soil information including bore logs can be found in the project Geotechnical Design Report.
- 202-P01 REMOVE AGGREGATE MATERIALS:** This item shall include the salvaging or removal of aggregate material at locations shown in Section 40 of the plans. Upon salvaging or removal the material becomes property of the contractor. If salvaging, material must meet requirements of Section 816 of the NDDOT Standard Specification as executed in the Memorandum of Understanding for the Metro Flood Diversion Authority Project.
- 203-360 COMPACTION AND DENSITY CONTROL:** Compaction and density controls shall be in accordance with Section 203.4 E.2.b of the specification, "ND T-99" for clay embankment material and "ND T-180" for granular embankment material. Manipulate embankment material with diskling equipment.
- 203-P01 ROADWAY OBLITERATION:** Limits of the roadway obliteration are as detailed in Section 40 of the plans. The work associated with this item shall include removal of base aggregate and topsoil within the existing roadbed and roadside ditches, and regrading of the roadway and ditches to match existing grades adjacent to the area while maintaining drainage. Existing ditching will remain where continuity of the drainage is needed. Remove a minimum of 50 feet length of the roadbed beyond the proposed roadway limits to a depth of 2 feet below the existing road grade.
- 203-P02 ROADWAY EMBANKMENT:** The road embankment for the dead-end terminations will consist of clay fill sourced from the Sherrack formation as excavated from the Diversion Channel excavation work.
- 203-P03 ROADWAY SUBGRADE PREPARATION AND PROOF ROLLING:** All subgrade areas to receive fill materials shall be inspected and approved by the Contractor. Fill materials shall not be placed on unstable or soft surfaces. In addition, the subgrade surface shall be free of ponding water, not frozen, or covered with snow or ice. Subgrades for roadways embankments and levees shall be proof rolled as noted below.

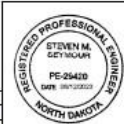
The proof rolling shall be performed on the exposed subgrade, free of surface water which would promote degradation of the subgrade. The test shall be a single pass for every 10' of roadway width including shoulders, for the full length of the roadway embankment alignment. Acceptable equipment type are dump truck, articulated truck, scraper loaded with 4 cubic yards of soil or a minimum of 15 tons of material, pneumatic tired roller (for cohesive soil subgrades) or a steel-wheeled roller (for cohesionless soil subgrades), or other equipment as accepted by the geotechnical engineering representative.

The proof rolling equipment shall operate systematically to ensure that the equipment has passed over all areas, and at speeds between 2.5 and 5.0 miles per hour. The subgrades shall be considered acceptable if 2 inches or less of deflection (i.e., that includes both recoverable and non-recoverable deformation) for new construction and 1/2 inch deflection for re-constructed or stabilized subgrade, as well as no pumping and cracking, is observed during the proof rolling activities. All proof rolling activities will be performed in the presence of a geotechnical engineering representative.

Unstable ground conditions shall be addressed as directed by the geotechnical engineering representative and accepted by the Engineer of Record.
- 203-P04 CONTROL OF SURFACE WATER:** The Contractor shall be responsible for managing the control of surface water onto and off the work areas such that it does not interfere with performing the Work as required by the Design and Construction requirements. The Contractor shall put in place water management procedures to intercept all points or areas of surface water and overland flow that may run-onto the project/work areas. Off-site surface water run-on shall be diverted through or around the project work areas in a way that does not introduce construction related pollution, sedimentation, or erosion.

- 253-P01 MULCHING:** All excavation and embankment areas shall be stabilized with mulch after the completion of the earth moving operations.
- 430-P01 HMA:** The 7" hot bituminous pavement to be placed on the field approach shall be paver laid in 3 lifts. The first lift shall be 2.5" thick, the second lift shall be 2.5" thick, and the third lift shall be 2" thick.
- 704-P01 MAINTAINING ACCESS:** The contractor shall be responsible for providing continuous access to all residential dwellings and business establishments along and adjacent to this project. The contractor will be responsible for coordinating and communicating with adjacent landowners and residents regarding access control at the site.
- 950-P01 UTILITY COORDINATION:** Coordinate all utility relocation, lowering, and adjustments to finished grade with utility owner including adjustments to all handholes, pedestals, and appurtenances. Maintain minimum 4' cover depth with cover depth for water mains to be 7.5' minimum. Roadway crossings to be installed in conduit meeting the utility owner requirements.

NOT FOR CONSTRUCTION



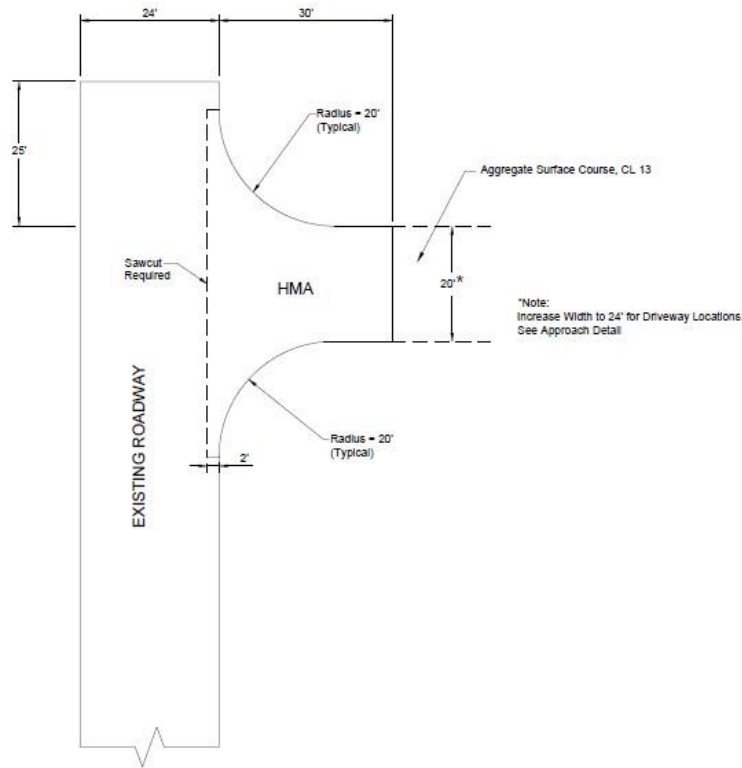
PE-E22: 37th St SE (East of Diversion Channel)
BU-R22: 37th St SE (East of Diversion Channel)

NOTES

00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023				
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	---	20	1

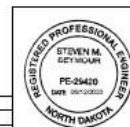
Note:
 Paved Section of Field approach to be 7" HMA on 5" of Crushed Concrete on top of Geosynthetic Material Reinforcement R1.



Dead-end Termination Branch

NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023



FARGO-MOORHEAD AREA
 DIVERSION
 DCAI WORK PACKAGE

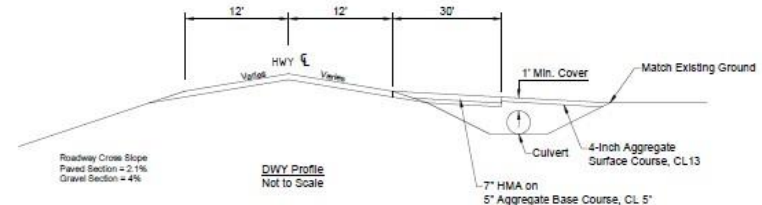
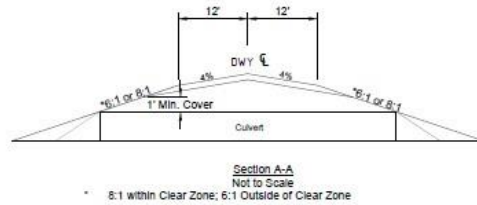
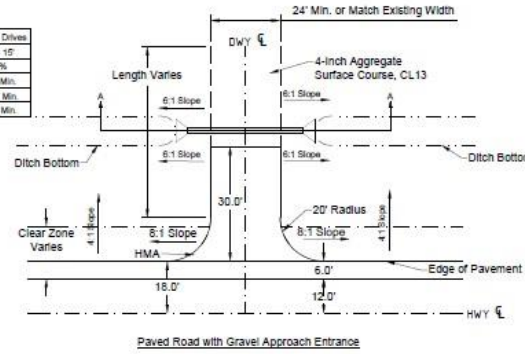
PE-E22 - 37th St SE East of Diversion Channel
 BU-R22 - 37th St SE East of Diversion Channel

GENERAL LAYOUT DETAIL
 PROPOSED

DESIGNER	COREY RAYFORD	06/12/2023	
CHECKER	PHIL ROBERTS	06/12/2023	
APPROVER	STEVE SEYMOUR	06/12/2023	
REG. PROF.	ROLE	NAME	DATE

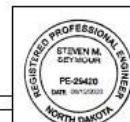
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	20	2

	Field Drives	Private Drives
Radius	R = 15'	R = 15'
Maximum Grade	10%	7%
Vertical Curve Length	10' Min.	10' Min.
Culvert Pipe Dia.	24" Min.	24" Min.
Culvert Pipe Length	40' Min.	40' Min.



*Geosynthetic Material Reinforcement R1 Under Paved Area.

NOT FOR CONSTRUCTION



HATCH COWI
Westwood



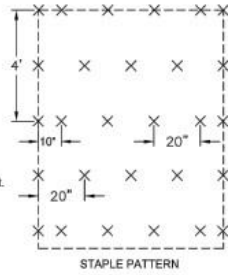
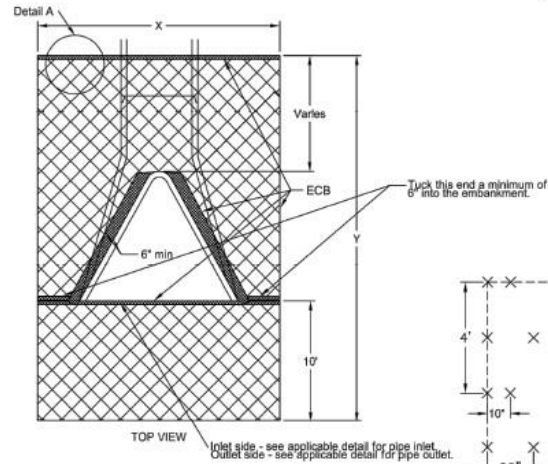
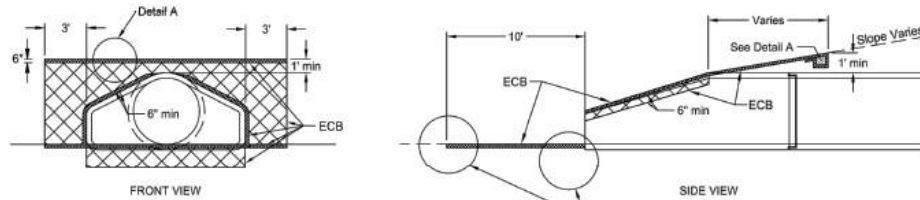
FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

APPROACH DETAIL

No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023		DESIGNER	COREY RAYFORD	06/12/2023
						CHECKER	PHIL ROBERTS	06/12/2023
						APPROVER	STEVE SEYMOUR	06/12/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	20	3



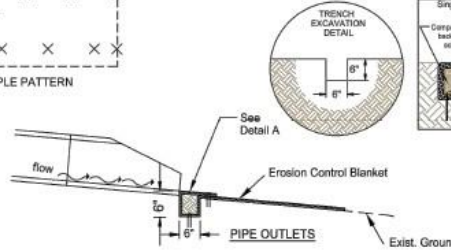
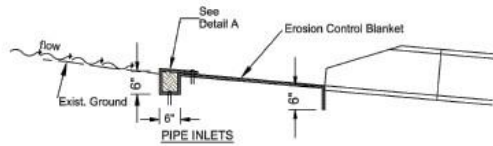
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	8.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	19.6	193.1	22
27	11.0	20.0	204.3	23
30	11.6	20.5	218.3	25
36	12.7	21.2	242.1	27
42	13.3	21.2	251.8	28
48	13.8	22.0	265.6	30
54	14.5	21.5	273.7	31
60	15.0	21.0	278.3	31
66	15.6	22.0	295.7	33
72	16.2	22.5	309.2	35

Note: Quantities based on 6:1 slope.

DIA	X	Y	Surface area to be protected	ECB	DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY	In	Ft	Ft	SF	SY
24	10.5	19.6	193.1	22	24	10.5	17.6	172.1	20
27	11.0	20.0	204.3	23	27	11.0	18.0	192.3	21
30	11.6	20.5	218.3	25	30	11.6	18.5	195.1	22
36	12.7	21.2	242.1	27	36	12.7	19.2	216.7	24
42	13.3	21.2	251.8	28	42	13.3	19.2	225.2	25
48	13.8	22.0	265.6	30	48	13.8	20.0	238.0	27
54	14.5	21.5	273.7	31	54	14.5	19.5	244.7	28
60	15.0	21.0	278.3	31	60	15.0	19.0	248.3	28
66	15.6	22.0	295.7	33	66	15.6	20.0	264.5	30
72	16.2	22.5	309.2	35	72	16.2	20.5	276.8	31

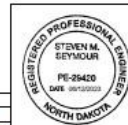
Note: Quantities based on 4:1 slope.

NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.



NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023



HATCH COWI
Woodswood

RED RIVER VALLEY ALLIANCE

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
REG. PROF.	ROLE	NAME
		DATE

FARGO-MOORHEAD AREA DIVERSION DCAI WORK PACKAGE

PE-E22 - 37th St SE (East of Diversion Channel)
BU-E22 - 37th St SE (East of Diversion Channel)

CULVERT END PROTECTION

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	50	1

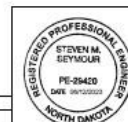
CULVERT END SECTION DATA
 Inlet No.: 100A
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE (East)
 Station: 103+86.92 53.10 R
 CSP - 24 Inch (E): 899.53

CULVERT END SECTION DATA
 Inlet No.: 100B
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE (East)
 Station: 104+38.00 53.65 R
 CSP - 24 Inch (W): 899.48

CULVERT END SECTION DATA
 Inlet No.: 101A
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE (East)
 Station: 103+87.10 46.10 R
 CSP - 24 Inch (E): 899.53

CULVERT END SECTION DATA
 Inlet No.: 101B
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE (East)
 Station: 104+38.04 46.65 R
 CSP - 24 Inch (W): 899.48

NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
 BU-R22 - 37th St SE East of Diversion Channel

INLET SUMMARY

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	51	1

ALLOWABLE PIPE LIST																
Begin Station	Begin Offset	End Station	End Offset	Location	Design Flow Q ₁₀ (cfs)	Pipe Installation			Allowable Material	Required Diameter Inch	Steel Pipe Coating Type	Steel Pipe Corrugations or Spiral Rib Inch	Steel Pipe Mn. Thickness Inch	End Section		Applicable Backfill Detail
						Inch	Item	LF						Begin EA	End EA	
103+86.92	53.10' R	104+38.00	53.65' R	37th St SE (East of Channel)	11.6	24	Pipe Corr. Steel 0.064 In 24 In	50	Corrugated Steel Pipe (barrel length - 50 LF)	24	Z, A	2	0.064	1 - FES	1 - FES	See Standard Drawing D-714-27M
103+87.10	46.10' R	104+38.04	46.65' R	37th St SE (East of Channel)	See Above	24	Pipe Corr. Steel 0.064 In 24 In	50	Corrugated Steel Pipe (barrel length - 50 LF)	24	Z, A	2	0.064	1 - FES	1 - FES	See Standard Drawing D-714-27M

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

Corrugations: 2 = 2-2/3" x 1/2"
3 = 3" x 1"
5 = 5" x 1"

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

End Sections: R & R = Remove & Relay
FES = Flared End Section
TES = Traversable End Section

Note: Alternative Water Conveyance Being Considered to Convey Equivalent Flows. Engineer Approval Required

NOT FOR CONSTRUCTION

					 		 FARGO-MOORHEAD AREA DCAI WORK PACKAGE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023	CHECKER	PHIL ROBERTS	06/12/2023
No.	DESCRIPTION	BY	APVR	DATE	APPROVER	STEVE SEYMOUR	06/12/2023
					REG. PROF.	NAME	DATE

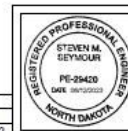
PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

ALLOWABLE PIPE LIST

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	82	1

37th St SE
Tangent Data
 Start Point - N: 461,165.1400 E: 2,849,159.6882 Sta: 97+90.03
 Course - N87° 27' 43.31"E Dist: 649.9743
 End Point - N: 461,193.9218 E: 2,849,609.0249 Sta: 104+00.00
Tangent Data
 Start Point - N: 461,193.9218 E: 2,849,609.0249 Sta: 104+00.00
 Course - N86° 37' 21.75"E Dist: 90.0000'
 End Point - N: 461,196.0850 E: 2,849,898.9989 Sta: 104+90.00
Tangent Data
 Start Point - N: 461,196.0850 E: 2,849,898.9989 Sta: 104+90.00
 Course - S89° 52' 23.34"E Dist: 39.3344'
 End Point - N: 461,195.9979 E: 2,849,938.3332 Sta: 105+29.33
Curve Data
 P.I. Station - N: 461,195.7890 E: 2,850,032.7045 Sta: 106+23.71
 Delta - 10° 03' 55.18"
 Degree - 5° 20' 47.68"
 Tangent - 94.3715'
 Length - 188.2573'
 Radius - 1,071.6345'
 External - 4.1473'
 Long Chord - 188.0154'
 Mid. Ord. - 4.1313'
 P.C. Station - N: 461,195.9979 E: 2,849,938.3332 Sta: 105+29.33
 P.T. Station - N: 461,179.0899 E: 2,850,125.5868 Sta: 107+17.59
 C.C. - N: 460,124.3661 E: 2,849,935.9607
 Back - S89° 52' 23.34"E
 Ahead - S79° 48' 28.16"E
 Chord Bear - S84° 50' 25.75"E
Tangent Data
 Start Point - N: 461,179.0899 E: 2,850,125.5868 Sta: 107+17.59
 Course - S79° 48' 28.16"E Dist: 23.4121'
 End Point - N: 461,174.9472 E: 2,850,148.6295 Sta: 107+41.00

NOT FOR CONSTRUCTION



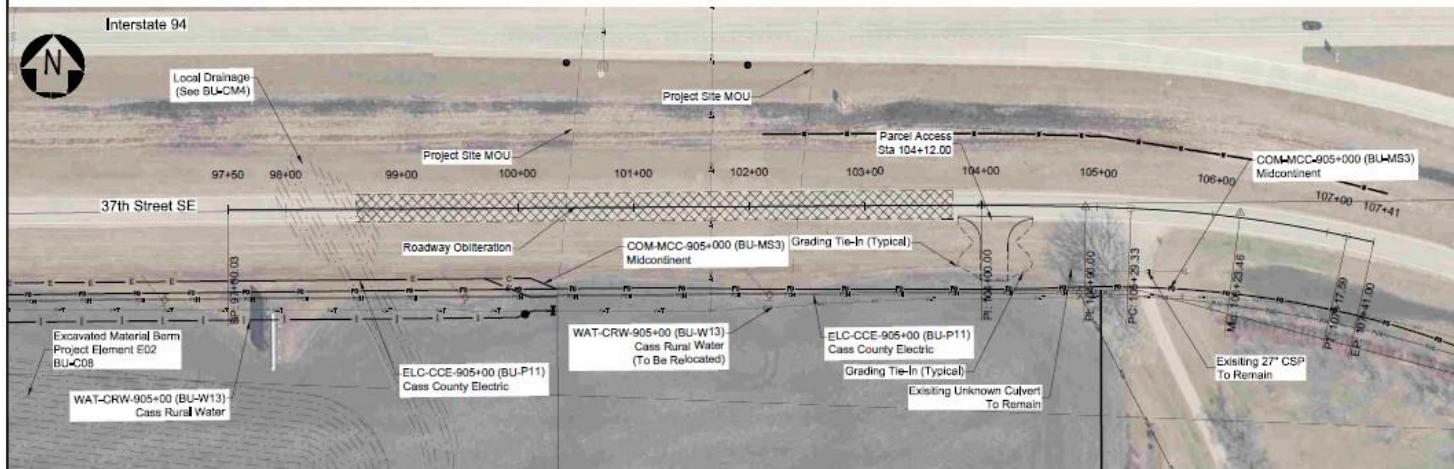
FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
 BU-R22 - 37th St SE East of Diversion Channel

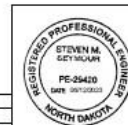
ALIGNMENT TABLES

No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023		DESIGNER	COREY RAYFORD	06/12/2023
						CHECKER	PHIL ROBERTS	06/12/2023
						APPROVER	STEVE SEYMOUR	06/12/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	---	40	1



NOT FOR CONSTRUCTION



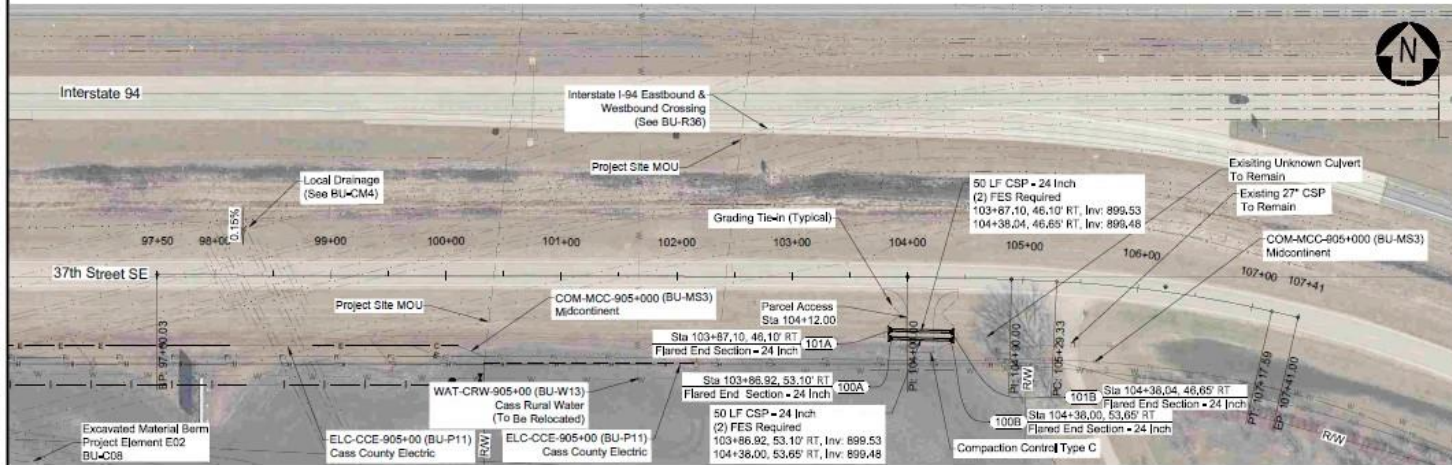
FARGO-MOORHEAD AREA
DIVISION DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

REMOVALS
STA 98+50 TO STA 104+90
37TH ST SE (EAST OF DIVERSION CHANNEL)

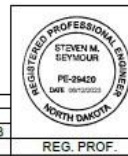
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023		DESIGNER	COREY RAYFORD	06/12/2023
						CHECKER	PHIL ROBERTS	06/12/2023
						APPROVER	STEVE SEYMOUR	06/12/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	60	1



NOT FOR CONSTRUCTION

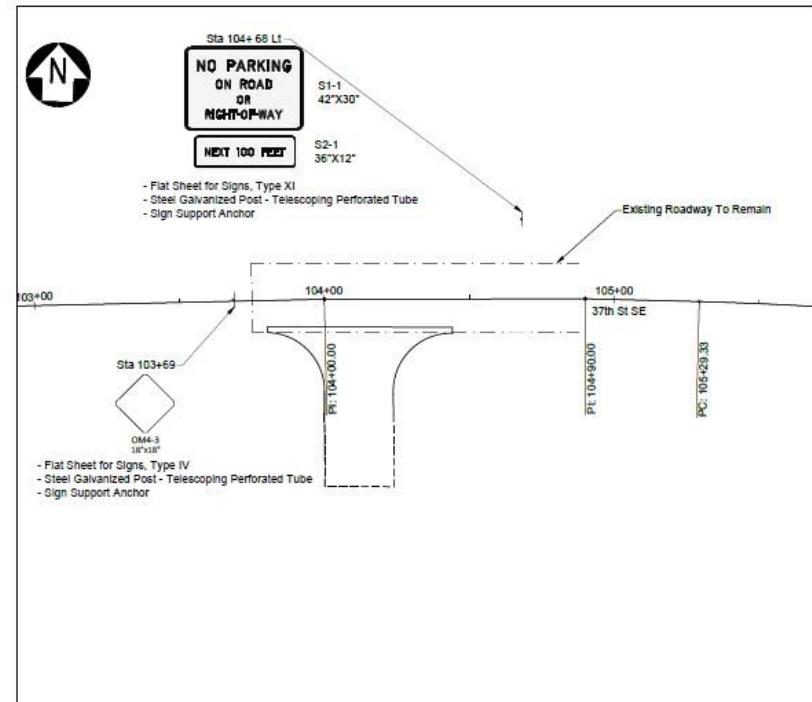
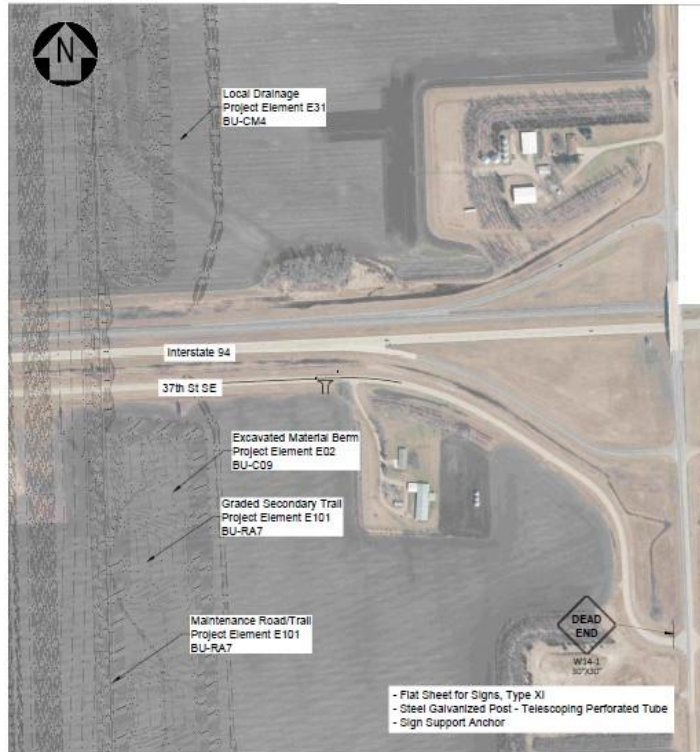
No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023



HATCH COWI		
Westwood		
DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
REG. PROF.	ROLE	NAME
		DATE

	FARGO-MOORHEAD AREA DCAI WORK PACKAGE
PE-E22 - 37th St SE East of Diversion Channel BU-R22 - 37th St SE East of Diversion Channel	
PLAN VIEW 37TH ST SE EAST OF DIVERSION CHANNEL STA 103+75 TO STA 104+90	

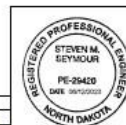
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	110	1



- Notes:
1. Minimum Vertical Clearance: Provide at Least 6' Measured From the Bottom of the Sign to the Edge of the Driving Lane or Auxiliary Lane at the Side of the Road in Rural Districts. Provide at Least 7' Clearance to the Bottom of the Sign Where Parking or Pedestrian Movements Occur.
 2. Maximum Vertical Clearance is 6' Greater Than the Minimum Vertical Clearance.
 3. Posts: Use Telespar Posts, Breakaway Systems, and Anchor Systems per Cass County Standards.
 4. Cass County Ordinance Signing for No Motorized Vehicles, No Littering, and Pedestrian Access Only Included and Installed as Part of the Security and Access Buildable Unit (See BU-RH6).

NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023



HATCH COWI
Westwood



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

SIGNING

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	---	110	2

SIGN DETAIL
1:20



SIGN NUMBER	S1-1
WIDTH x HIGHT.	3'-6" x 2'-6"
BORDER WIDTH	0-7/8"
CORNER RADIUS	2-1/4"
MOUNTING	Ground
SIGN AREA	8.8 Sq.Ft.
BACKGROUND	TYPE: Reflective
	COLOR: White
LEGEND/BORDER	TYPE: Reflective
	COLOR: Black

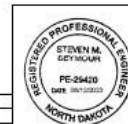
SYMBOL	X	Y	WD	HT

Dimensions are in inches eighths 42" Word lengths and spaces between words are shown

LETTER POSITIONS (X)												LENGTH	SERIES/SIZE	
	N	O		P	A	R	K	I	N	G				D 2000
47/8"	6 1/2"		4	2 13/4"							47/8"		32 1/4"	
	O	N		R	O	A	D						19 3/8"	D 2000
11 3/8"	5 1/4"		3 1/4"	10 7/8"							11 3/8"		4 3/8"	D 2000
	O	R											26 5/8"	D 2000
18 3/4"	4 3/8"		18 3/4"										7 3/4"	D 2000
	R	I	G	H	T	-	O	F	-	W	A	Y		
7 3/4"	26 5/8"											7 3/4"	26 5/8"	



NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

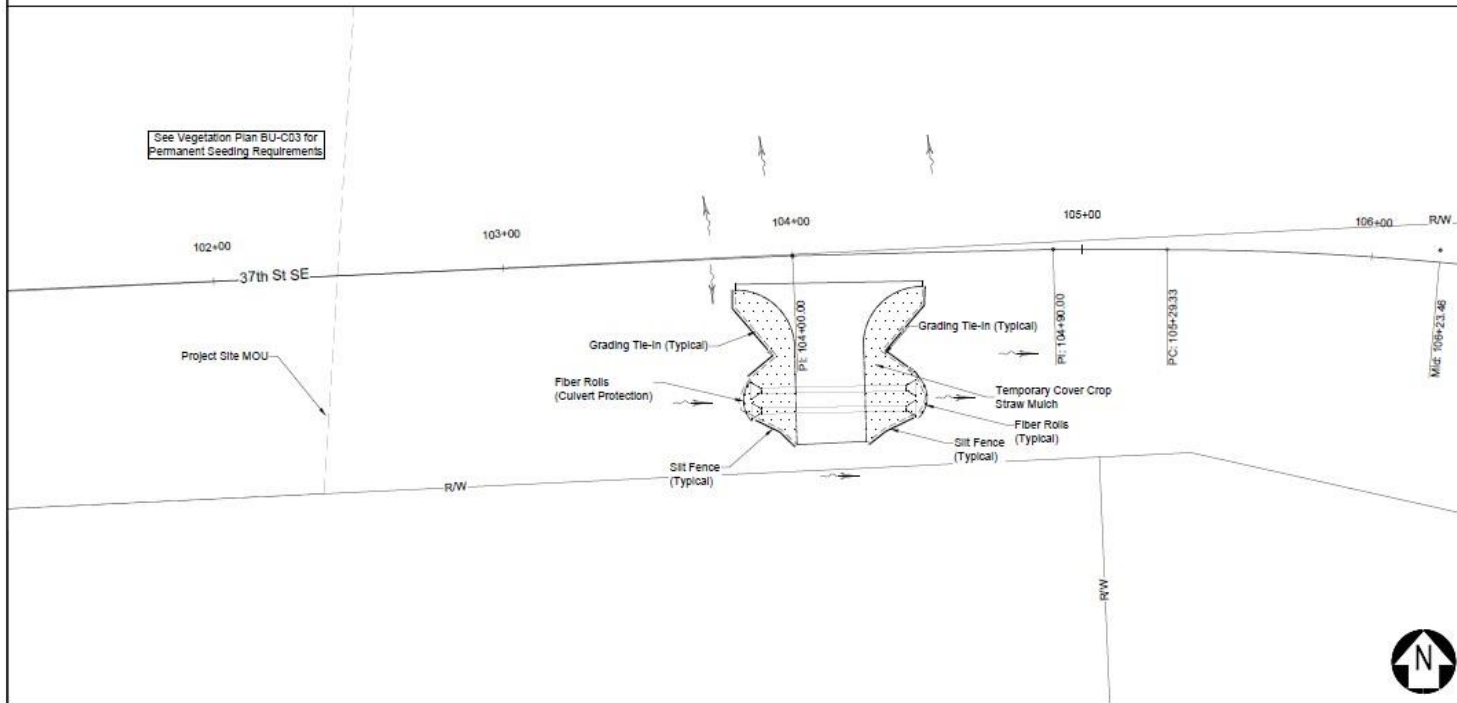
PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

SIGN DETAIL

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
REG. PROF.	ROLE	NAME
DATE	DATE	DATE

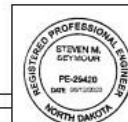
No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	76	1



Notes:
 1. Silt Fence To Be Placed a Maximum of 5' Clear From the Grading Tie-in.

NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

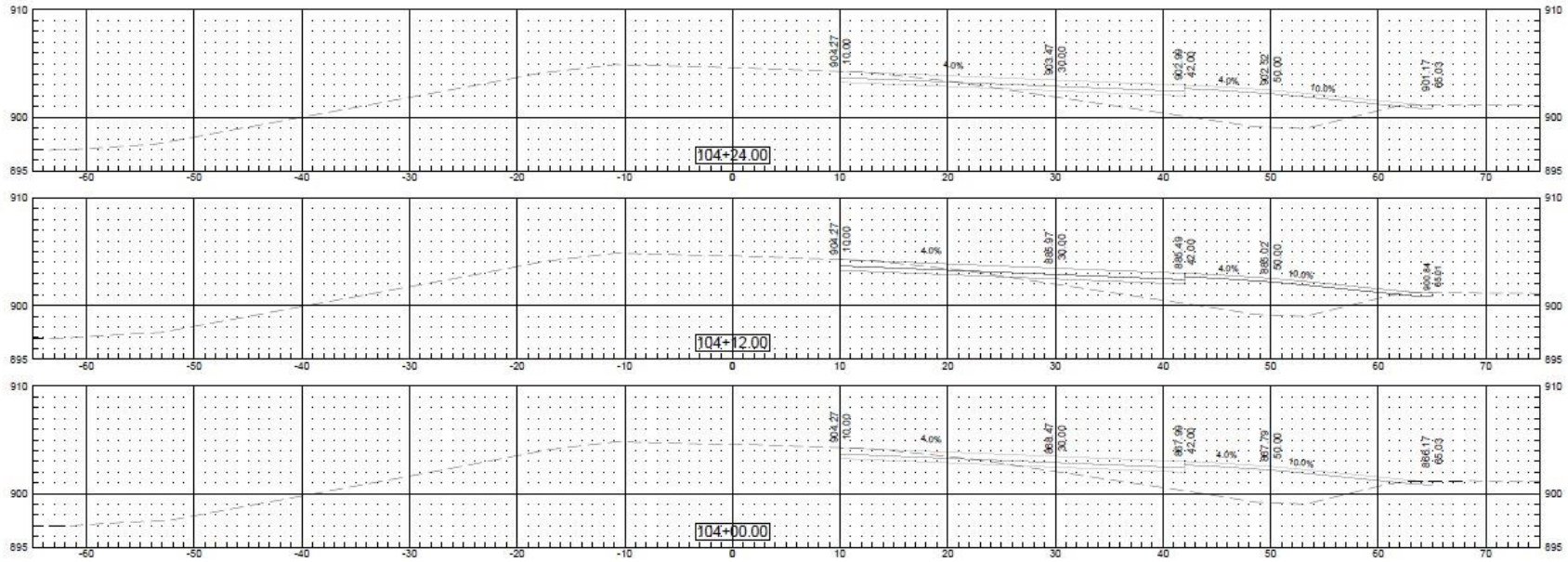
PE-E22 - 37th St SE East of Diversion Channel
 BU-R22 - 37th St SE East of Diversion Channel

TEMPORARY EROSION CONTROL
 37TH ST SE (EAST OF DIVERSION CHANNEL)
 STA 103+75 TO STA 104+90

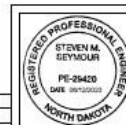
No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	200	1



NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

CROSS SECTIONS
37TH ST SE (EAST OF DIVERSION CHANNEL)

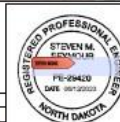
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023	

DESIGNER	COREY RAYFORD	06/12/2023
CHECKER	PHIL ROBERTS	06/12/2023
APPROVER	STEVE SEYMOUR	06/12/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	4	1



NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E22 - 37th St SE East of Diversion Channel
BU-R22 - 37th St SE East of Diversion Channel

SCOPE OF WORK

No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/12/2023		DESIGNER	COREY RAYFORD	06/12/2023
						CHECKER	PHIL ROBERTS	06/12/2023
						APPROVER	STEVE SEYMOUR	06/12/2023

DESIGN DATA			
Traffic	Average Daily Less Than 100 VPD		
Current	Pass:	Trucks:	Total: N/A
Forecast	Pass:	Trucks:	Total: N/A
Clear Zone Distance: 18 FT	Design Speed: 55 MPH		
Minimum Sight Dist. for Stopping: 495 FT	Bridges:		
Sight Dist. for No Passing Zone: N/A			
Pavement Design Life			

THE FARGO MOORHEAD METROPOLITAN FLOOD RISK MANAGEMENT PROJECT DIVERSION CHANNEL ASSOCIATED INFRASTRUCTURE WORK PACKAGE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	1	1

GOVERNING SPECIFICATIONS

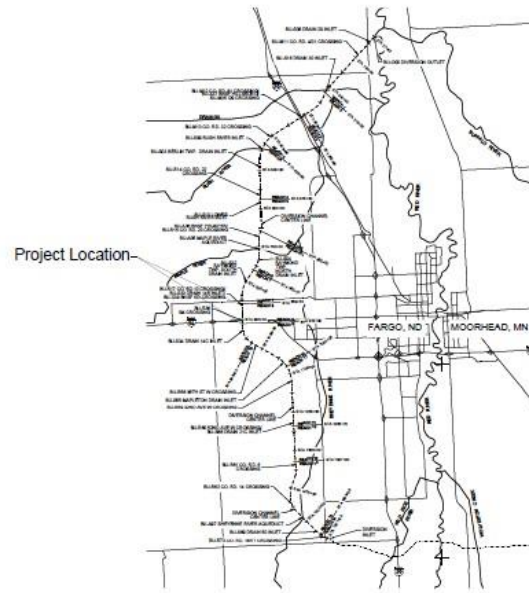
The Work for this Buildable Unit will be performed in accordance with the NDDOT Construction Specifications as provided in Exhibit C of the Executed Memorandum of Understanding By and Between the Metro Flood Diversion Authority and the North Dakota Department of Transportation.

These Construction Specifications are Referenced in the Plans and are Provided on Aconex as RRVA Document Number NDOT-MD-SPE-00001 and Authority Document Number RRVA_LLC-RPT-00209.

BU-R23 DESIGN REPORT - CONSTRUCTION DOCUMENTS SUBMITTAL

Cass County
37th St. SE West of Diversion Channel
37th St SE (West of Channel)

DESCRIPTION	NET MILES	GROSS MILES
37th St SE (West of Channel)	--	--



KEY PLAN

SCALE: N.T.S.



STATE COUNTY MAP

NOT FOR CONSTRUCTION

							PE-E23 - 37th St SE West of Diversion Channel BU-R23 - 37th St SE West of Diversion Channel	
No.	DESCRIPTION	BY	DATE	REG. PROF.	ROLE	NAME	DATE	
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	06/09/2023		DESIGNER	COREY RAYFORD	06/09/2023	
		SMS			CHECKER	PHIL ROBERTS	06/09/2023	
		APVR			APPROVER	STEVE SEYMOUR	06/09/2023	

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	2	1

TABLE OF CONTENTS

PLAN SECTIONS

Section	Sheet	Description
1	1	Cover Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1	Notes
20	1-3	General Details
40	1	Removals
50	1	Inlet Summary
51	1	Allowable Pipe List
60	1	Plan View
76	1	Temporary Erosion Control
82	1	Alignment Tables
110	1-3	Signing
200	1	Cross-sections

STANDARD DRAWING LIST

Standard No	Description
D101-01	NDDOT Abbreviations
D101-02	NDDOT Abbreviations
D101-03	NDDOT Abbreviations
D101-04	NDDOT Abbreviations
D101-20	Line Styles
D101-21	Line Styles
D101-30	Symbols
D101-31	Symbols
D101-32	Symbols
D101-33	Symbols
D203-08	Standard Rural Approaches
D260-01	Erosion and Siltation Control - Silt Fence
D261-01	Erosion Control - Fiber Roll Placement Details
D714-27M	Pipe Installation Detail for Multiple Longitudinal Mainline Pipe or Pipe Not Under the Roadway
D754-23	Perforated Tube Assembly Details
D754-24	Mounting Details Perforated Tube
D754-24A	Breakaway Coupler System for Perforated Tubes
D754-25	Mounting Details Perforated Tube
D754-29	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-31	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-32	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D754-46	Punching, Stringer and Support Location Details for Regulatory, Warning and Guide Bike Route Signs
D754-47	Sign Punching, Stringer and Support Location Details for Variable Length Signs

These Standard Drawings are provided on Aconex as
 RRVA Document Number: NDOT-MD-DWG-00001
 Authority Document Number: RRVA_LLC-DGN-00027

NOT FOR CONSTRUCTION

								 FARGO-MOORHEAD AREA DCAI WORK PACKAGE	
				<small>DESIGNER</small> COREY RAYFORD 06/09/2023 <small>CHECKER</small> PHIL ROBERTS 06/09/2023 <small>APPROVER</small> STEVE SEYMOUR 06/09/2023		<small>DESIGNER</small> COREY RAYFORD 06/09/2023 <small>CHECKER</small> PHIL ROBERTS 06/09/2023 <small>APPROVER</small> STEVE SEYMOUR 06/09/2023		PE-R23 - 37th St SE (West of Diversion Channel) BU-R23 - 37th St SE (West of Diversion Channel)	
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE	
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023					

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	6	1

NOTES

102-P01 SOIL INFORMATION AND BORING LOGS: Bore locations are referenced on the Section 4 Scope of Work plan sheets. Additional soil information including bore logs can be found in the project Geotechnical Design Report.

202-P01 REMOVE AGGREGATE MATERIALS: This item shall include the salvaging or removal of aggregate material at locations shown in Section 40 of the plans. Upon salvaging or removal the material becomes property of the contractor. If salvaging, material must meet requirements of Section 816 of the NDDOT Standard Specification as executed in the Memorandum of Understanding for the Metro Flood Diversion Authority Project.

203-360 COMPACTION AND DENSITY CONTROL: Compaction and density controls shall be in accordance with Section 203.4 E.2.b of the specification, "ND T-99" for clay embankment material and "ND T-180" for granular embankment material. Manipulate embankment material with diskling equipment.

203-P01 ROADWAY OBLITERATION: Limits of the roadway obliteration are as detailed in Section 40 of the plans. The work associated with this item shall include removal of base aggregate and topsoil within the existing roadbed and roadside ditches, and regrading of the roadway and ditches to match existing grades adjacent to the area while maintaining drainage. Existing ditching will remain where continuity of the drainage is needed. Remove a minimum of 50 feet length of the roadbed beyond the proposed roadway limits to a depth of 2 feet below the existing road grade.

203-P02 ROADWAY EMBANKMENT: The road embankment for the dead-end terminations will consist of clay fill sourced from the Sherrick formation as excavated from the Diversion Channel excavation work.

203-P03 ROADWAY SUBGRADE PREPARATION AND PROOF ROLLING: All subgrade areas to receive fill materials shall be inspected and approved by the Contractor. Fill materials shall not be placed on unstable or soft surfaces; in addition, the subgrade surface shall be free of ponding water, not frozen, or covered with snow or ice. Subgrades for roadways embankments and levees shall be proof rolled as noted below.

The proof rolling shall be performed on the exposed subgrade, free of surface water which would promote degradation of the subgrade. The test shall be a single pass for every 10' of roadway width including shoulders, for the full length of the roadway embankment alignment. Acceptable equipment type are dump truck, articulated truck, scraper loaded with 4 cubic yards of soil or a minimum of 15 tons of material, pneumatic tired roller (for cohesive soil subgrades) or a steel-wheeled roller (for cohesionless soil subgrades), or other equipment as accepted by the geotechnical engineering representative.

The proof rolling equipment shall operate systematically to ensure that the equipment has passed over all areas, and at speeds between 2.5 and 5.0 miles per hour. The subgrades shall be considered acceptable if 2 inches or less of deflection (i.e., that includes both recoverable and non-recoverable deformation) for new construction and 1/2 inch deflection for re-constructed or stabilized subgrade, as well as no pumping and cracking, is observed during the proof rolling activities. All proof rolling activities will be performed in the presence of a geotechnical engineering representative.

Unstable ground conditions shall be addressed as directed by the geotechnical engineering representative and accepted by the Engineer of Record.

203-P04 CONTROL OF SURFACE WATER: The Contractor shall be responsible for managing the control of surface water onto and off the work areas such that it does not interfere with performing the Work as required by the Design and Construction requirements. The Contractor shall put in place water management procedures to intercept all points or areas of surface water and overland flow that may run-onto the project/work areas. Off-site surface water run-on shall be diverted through or around the project work areas in a way that does not introduce construction related pollution, sedimentation, or erosion.

253-P01 MULCHING: All excavation and embankment areas shall be stabilized with mulch after the completion of the earth moving operations.

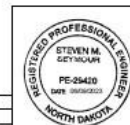
430-P01 HMA: The 7" hot bituminous pavement to be placed on the field approach shall be paver laid in 3 lifts. The first lift shall be 2.5" thick, the second lift shall be 2.5" thick, and the third lift shall be 2" thick.

704-P01 MAINTAINING ACCESS: The contractor shall be responsible for providing continuous access to all residential dwellings and business establishments along and adjacent to this project. The contractor will be responsible for coordinating and communicating with adjacent landowners and residents regarding access control at the site.

950-P01 UTILITY COORDINATION: Coordinate all utility relocation, lowering, and adjustments to finished grade with utility owner including adjustments to all handholes, pedestals, and appurtenances. Maintain minimum 4' cover depth with cover depth for water mains to be 7.5' minimum. Roadway crossings to be installed in conduit meeting the utility owner requirements.

NOT FOR CONSTRUCTION

00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023
No.	DESCRIPTION	BY	APVR	DATE

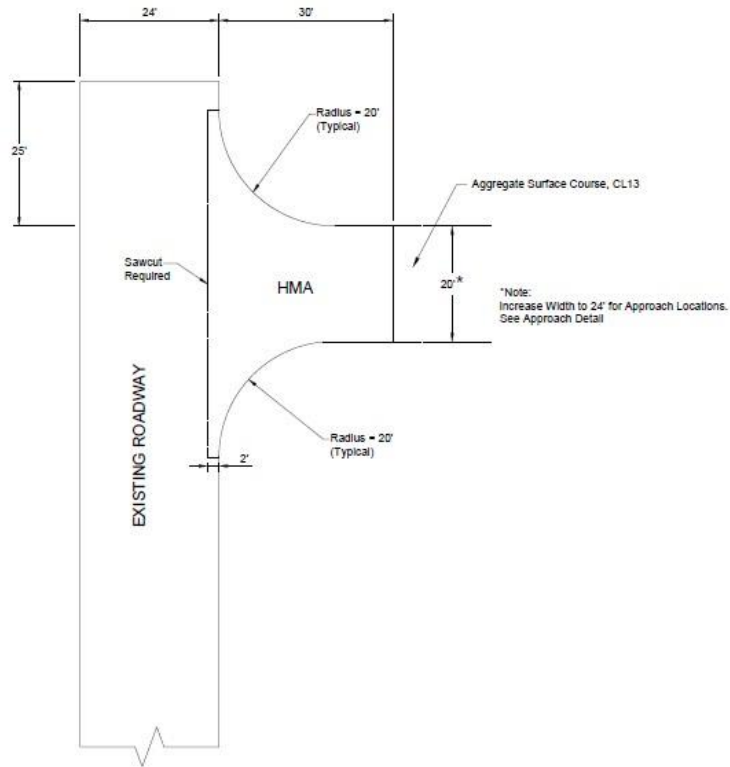


PE-E23 - 37th St SE (West of Diversion Channel)
BU-R23 - 37th St SE (West of Diversion Channel)

NOTES

DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE

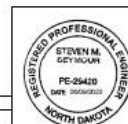
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	20	1



Note:
 Paved Section of Field Approach to be 7"
 HMA on 5" of Crushed Concrete on top of
 Geosynthetic Material Reinforcement R1.

Dead-end Termination Branch

NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
 BU-R23 - 37th St SE West of Diversion Channel

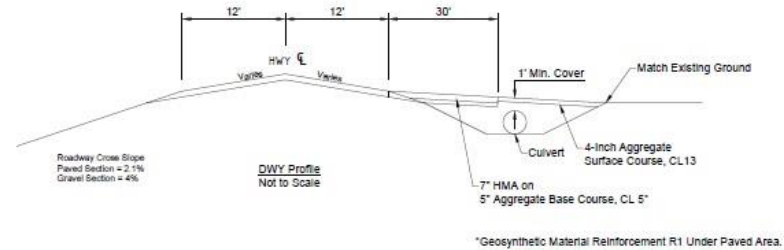
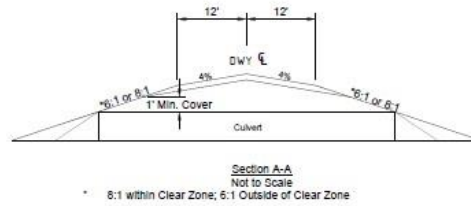
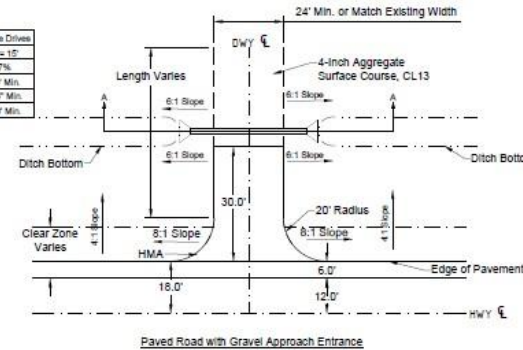
GENERAL LAYOUT DETAIL
 PROPOSED

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023

REG. PROF.	ROLE	NAME	DATE
STEVEN M. GERTMAN	DESIGNER	COREY RAYFORD	06/09/2023
	CHECKER	PHIL ROBERTS	06/09/2023
	APPROVER	STEVE SEYMOUR	06/09/2023

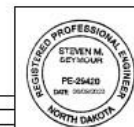
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	20	2

Design Criteria for Rural Approach		
	Field Drives	Private Drives
Radius	R = 15'	R = 15'
Maximum Grade	10%	7%
Vertical Curve Length	10' Min.	10' Min.
Culvert Pipe Dia.	24" Min.	24" Min.
Culvert Pipe Length	40' Min.	40' Min.



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No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023



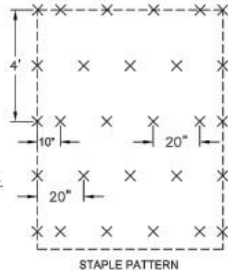
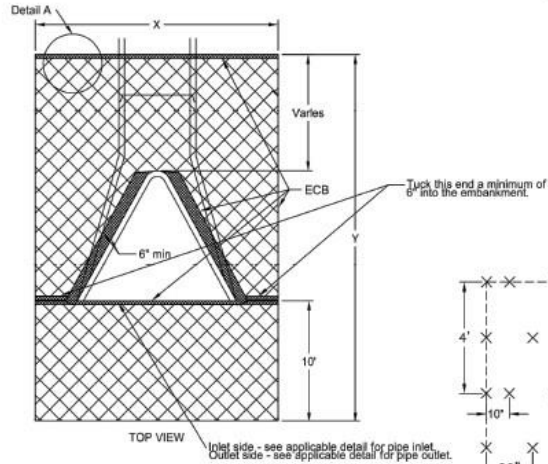
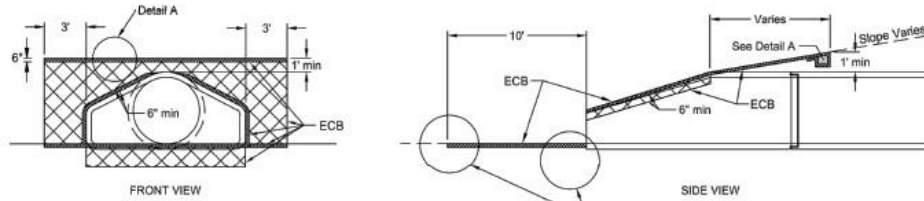
FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

APPROACH DETAIL

DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	---	20	3



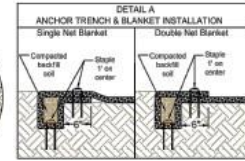
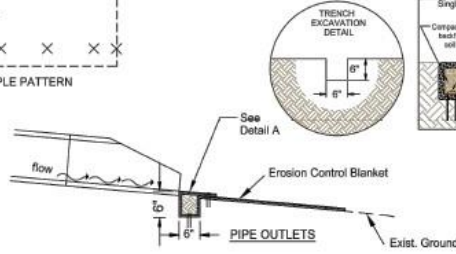
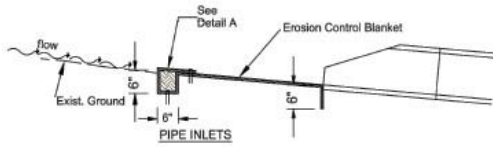
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	19.6	193.1	22
27	11.0	20.0	204.3	23
30	11.6	20.5	218.3	25
36	12.7	21.2	242.1	27
42	13.3	21.2	251.8	28
48	13.8	22.0	265.6	30
54	14.5	21.5	273.7	31
60	15.0	21.0	278.3	31
66	15.6	22.0	295.7	33
72	16.2	22.5	309.2	35

Note: Quantities based on 6:1 slope.

DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
24	10.5	19.6	193.1	22
27	11.0	20.0	204.3	23
30	11.6	20.5	218.3	25
36	12.7	21.2	242.1	27
42	13.3	21.2	251.8	28
48	13.8	22.0	265.6	30
54	14.5	21.5	273.7	31
60	15.0	21.0	278.3	31
66	15.6	22.0	295.7	33
72	16.2	22.5	309.2	35

Note: Quantities based on 4:1 slope.

NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.



NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023

			DESIGNER	COREY RAYFORD	06/09/2023
			CHECKER	PHIL ROBERTS	06/09/2023
			APPROVER	STEVE SEYMOUR	06/09/2023
			REG. PROF.	ROLE	NAME

	DESIGNER	COREY RAYFORD	06/09/2023
	CHECKER	PHIL ROBERTS	06/09/2023
	APPROVER	STEVE SEYMOUR	06/09/2023
	CULVERT END PROTECTION		

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	50	1

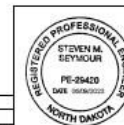
CULVERT END SECTION DATA
 Inlet No.: 100A
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE West - Proposed
 Station: 310+61.76 40.53 R
 CSP - 24 Inch (E): 899.91

CULVERT END SECTION DATA
 Inlet No.: 100B
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE West - Proposed
 Station: 311+13.99 43.35 R
 CSP - 24 Inch (W): 899.96

CULVERT END SECTION DATA
 Inlet No.: 101A
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE West - Proposed
 Station: 310+61.06 46.40 R
 CSP - 24 Inch (E): 899.91

CULVERT END SECTION DATA
 Inlet No.: 101B
 Inlet Type: Flared End Section - 24 Inch
 Alignment: 37th St SE West - Proposed
 Station: 311+13.77 50.65 R
 CSP - 24 Inch (W): 899.96

NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
 BU-R23 - 37th St SE West of Diversion Channel

INLET SUMMARY

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023

REG. PROF.	ROLE	NAME	DATE
STEVEN M. SEYMOUR	DESIGNER	COREY RAYFORD	06/09/2023
	CHECKER	PHIL ROBERTS	06/09/2023
	APPROVER	STEVE SEYMOUR	06/09/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	51	1

ALLOWABLE PIPE LIST																
Begin Station	Begin Offset	End Station	End Offset	Location	Design Flow Q ₁₀ (cfs)	Pipe Installation			Allowable Material	Required Diameter Inch	Steel Pipe Coating Type	Steel Pipe Corrugations or Spiral Rib Inch	Steel Pipe Min. Thickness Inch	End Section		Applicable Backfill Detail Plan/Standard
						Inch	Item	LF						Begin EA	End EA	
310+61.76	40.93' R	311+13.99	43.35' R	37th St SE (West of Channel)	2.3	24	Pipe Corr. Steel 0.064 In 24 In	50	Corrugated Steel Pipe (barrel length - 50 LF)	24	Z, A	2	0.064	1 - FES	1 - FES	See Standard Drawing D-714-27M
310+61.08	48.40' R	311+13.77	50.85' R	37th St SE (West of Channel)	See Above	24	Pipe Corr. Steel 0.064 In 24 In	50	Corrugated Steel Pipe (barrel length - 50 LF)	24	Z, A	2	0.064	1 - FES	1 - FES	See Standard Drawing D-714-27M

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

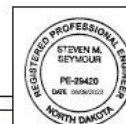
Corrugations: 2 = 2-2/3" x 1/2"
3 = 3" x 1"
5 = 5" x 1"

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

End Sections: R & R = Remove & Relay
FES = Flared End Section
TES = Traversable End Section

Note: Alternative Water Conveyance Being Considered to Convey Equivalent Flows. Engineer Approval Required

NOT FOR CONSTRUCTION



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

ALLOWABLE PIPE LIST

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023

DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
REG. PROF.	ROLE	NAME
		DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	82	1

37th St SE West of Channel

Tangent Data

Start Point - N: 460,908.3839 E: 2,846,082.7888 Sta: 300+56.00
 Course - N87° 27' 53.72"E Dist: 438.5096
 End Point - N: 460,927.7796 E: 2,846,520.8694 Sta: 304+94.51

Curve Data

P.I. Station - N: 460,933.1640 E: 2,846,642.4828 Sta: 306+16.24
 Delta - 17° 18' 15.13"
 Degree - 7° 09' 43.15"
 Tangent - 121.7326'
 Length - 241.6118'
 Radius - 799.9984'
 External - 9.2036'
 Long Chord - 240.6946'
 Mid. Ord. - 9.1040'
 P.C. Station - N: 460,927.7796 E: 2,846,520.8694 Sta: 304+94.51
 P.T. Station - N: 460,974.4779 E: 2,846,756.9904 Sta: 307+36.12
 C.C. - N: 461,726.9951 E: 2,846,485.4847

Back - N87° 27' 53.72"E
 Ahead - N70° 09' 38.59"E
 Chord Bear - N78° 48' 46.16"E

Tangent Data

Start Point - N: 460,974.4779 E: 2,846,756.9904 Sta: 307+36.12
 Course - N70° 09' 38.59"E Dist: 154.2467
 End Point - N: 461,026.8267 E: 2,846,902.0823 Sta: 308+90.37

Curve Data

P.I. Station - N: 461,062.6678 E: 2,847,001.4213 Sta: 309+95.97
 Delta - 17° 09' 31.38"
 Degree - 8° 11' 06.46"
 Tangent - 105.6069'
 Length - 209.6329'
 Radius - 699.9986'
 External - 7.9215'
 Long Chord - 208.8504'
 Mid. Ord. - 7.8329'
 P.C. Station - N: 461,026.8267 E: 2,846,902.0823 Sta: 308+90.37
 P.T. Station - N: 461,067.6068 E: 2,847,106.9126 Sta: 311+00.00
 C.C. - N: 460,366.3741 E: 2,847,139.6499

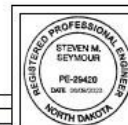
Back - N70° 09' 38.59"E
 Ahead - N87° 19' 09.98"E
 Chord Bear - N78° 44' 24.28"E

Tangent Data

Start Point - N: 461,067.6068 E: 2,847,106.9126 Sta: 311+00.00
 Course - N87° 19' 09.98"E Dist: 2,783.8277
 End Point - N: 461,197.7997 E: 2,849,887.6942 Sta: 338+83.83

NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023



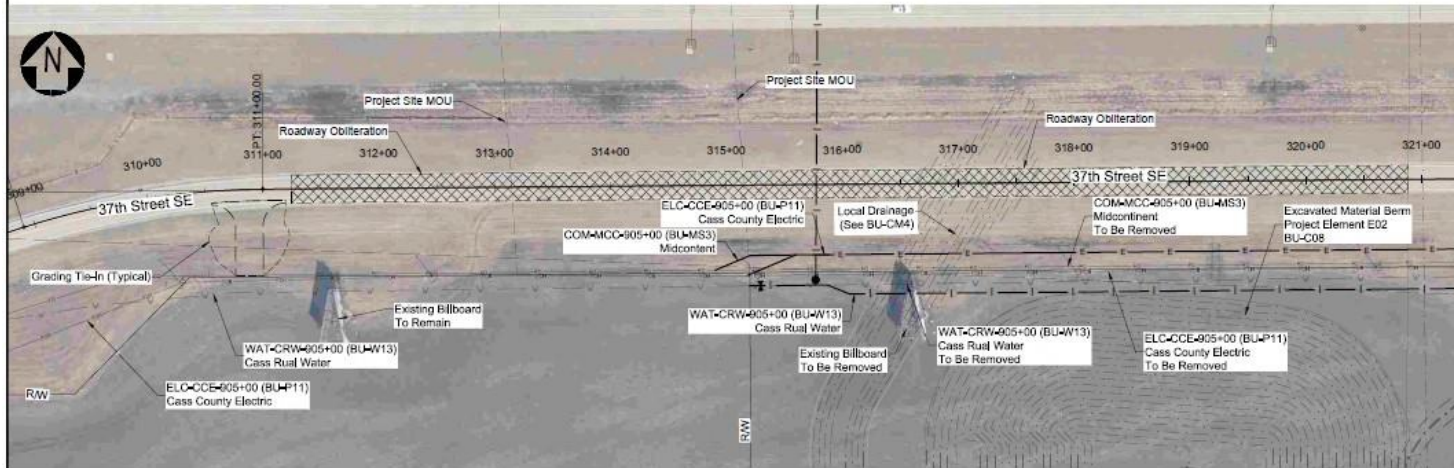
FARGO-MOORHEAD AREA
 DCAI WORK PACKAGE

PE-R23 - 37th St SE West of Diversion Channel
 BU-R23 - 37th St SE West of Diversion Channel

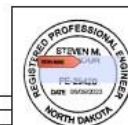
ALIGNMENT TABLES

DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	40	1



NOT FOR CONSTRUCTION



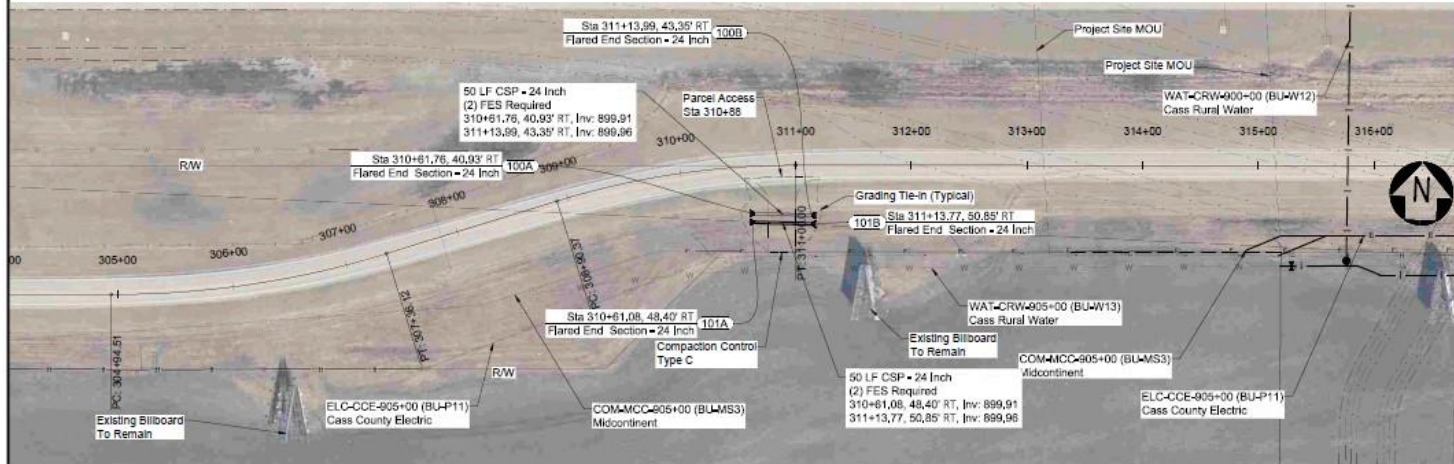
**FARGO-MOORHEAD AREA
DCAI WORK PACKAGE**

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

REMOVALS
STA 310+76 TO STA 311+25
37TH ST SE (WEST OF DIVERSION CHANNEL)

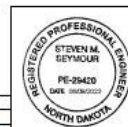
No.	DESCRIPTION	BY	APVR	DATE	REG. PROF.	ROLE	NAME	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023		DESIGNER	COREY RAYFORD	06/09/2023
						CHECKER	PHIL ROBERTS	06/09/2023
						APPROVER	STEVE SEYMOUR	06/09/2023

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	60	1



NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023



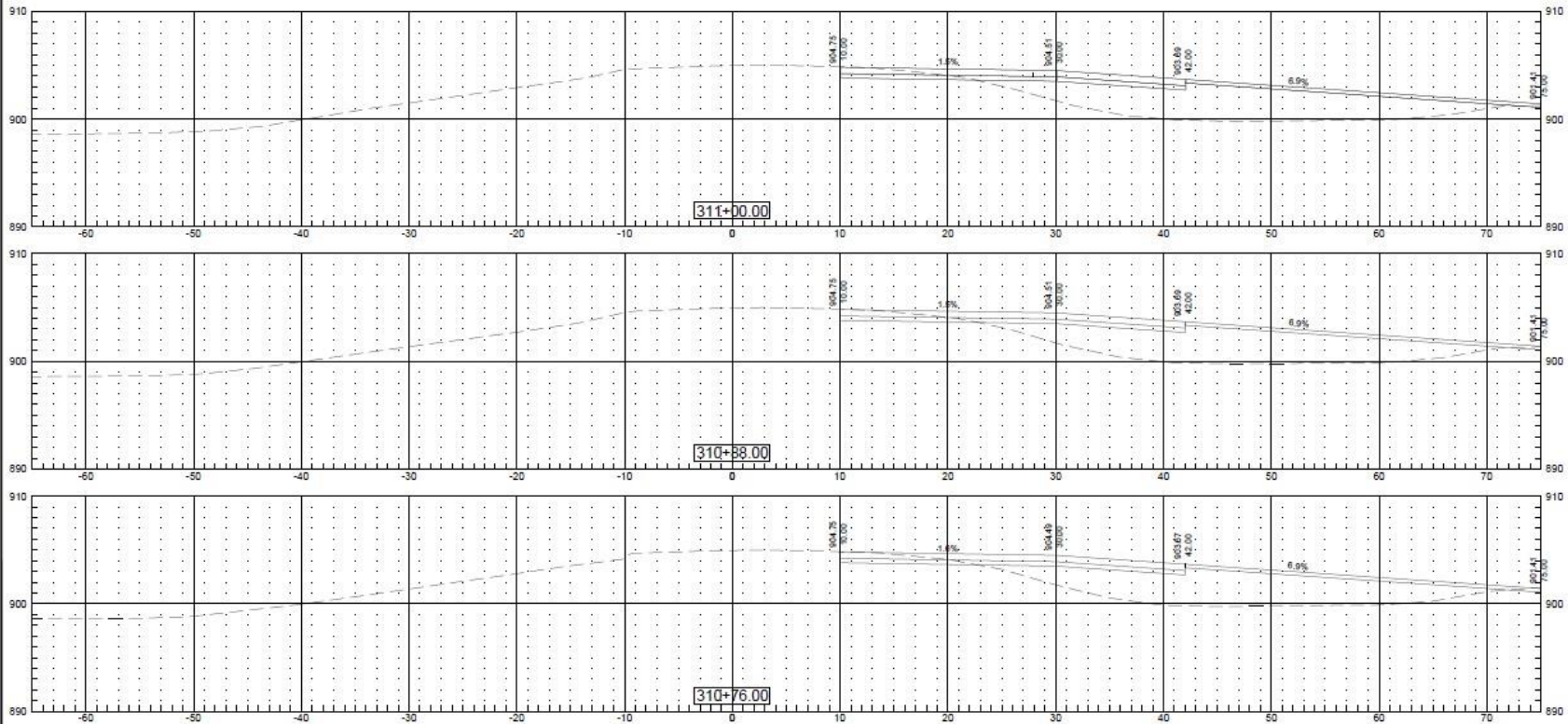
FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

PLAN VIEW
37TH ST SE WEST OF DIVERSION CHANNEL
STA 310+76 TO STA 311+25

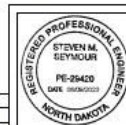
DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	200	1



NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023



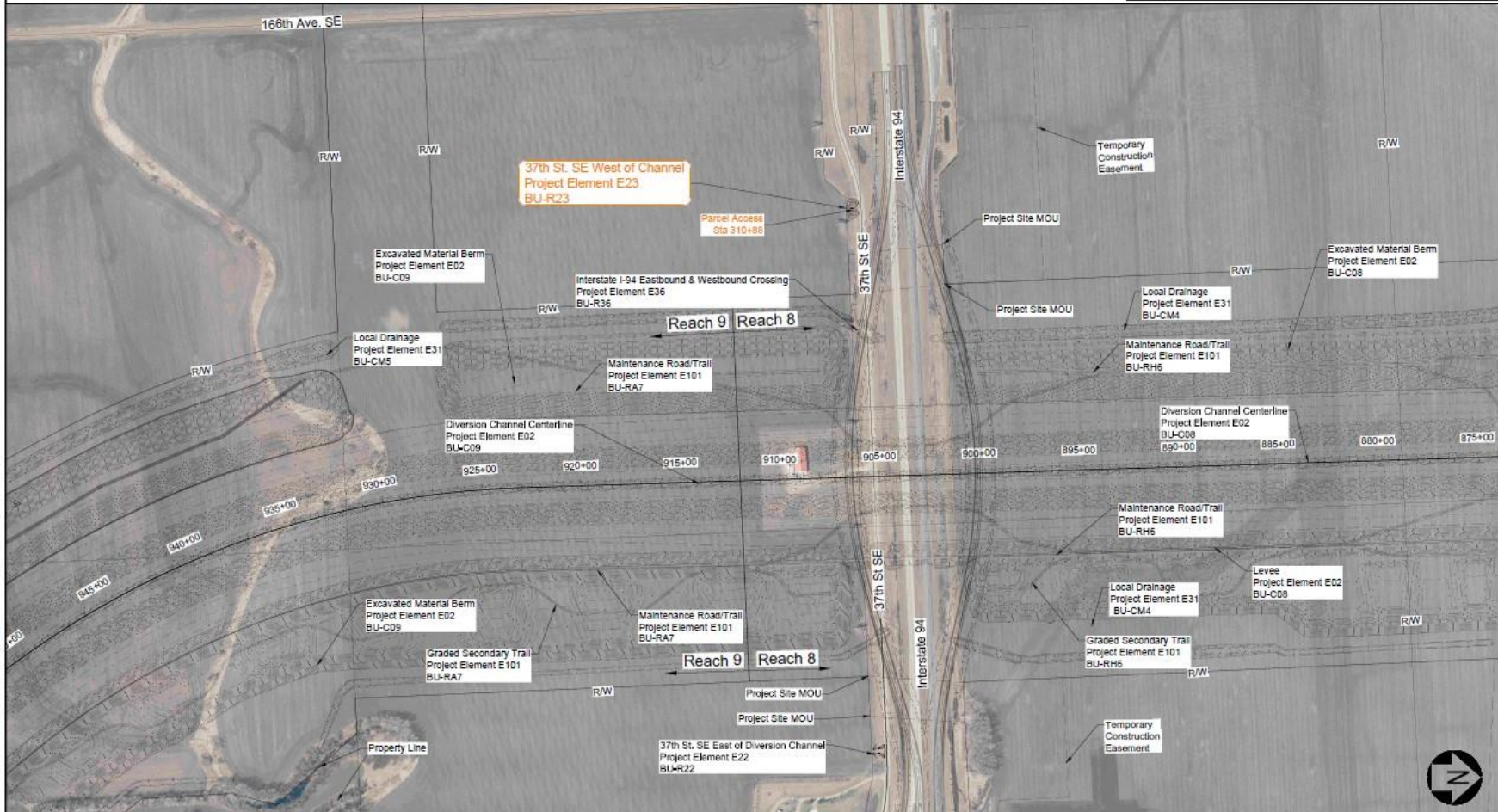
FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

CROSS SECTIONS
37TH ST SE (WEST OF DIVERSION CHANNEL)

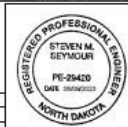
DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	----	4	1



NOT FOR CONSTRUCTION

No.	DESCRIPTION	CRK BY	SMS APVR	DATE
00	CONSTRUCTION DOCUMENTS SUBMITTAL	CRK	SMS	06/09/2023



FARGO-MOORHEAD AREA
DCAI WORK PACKAGE

PE-E23 - 37th St SE West of Diversion Channel
BU-R23 - 37th St SE West of Diversion Channel

SCOPE OF WORK

DESIGNER	COREY RAYFORD	06/09/2023
CHECKER	PHIL ROBERTS	06/09/2023
APPROVER	STEVE SEYMOUR	06/09/2023
ROLE	NAME	DATE