US Army Corps
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St Paul District

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

JULY 2011

US Army Corps
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ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

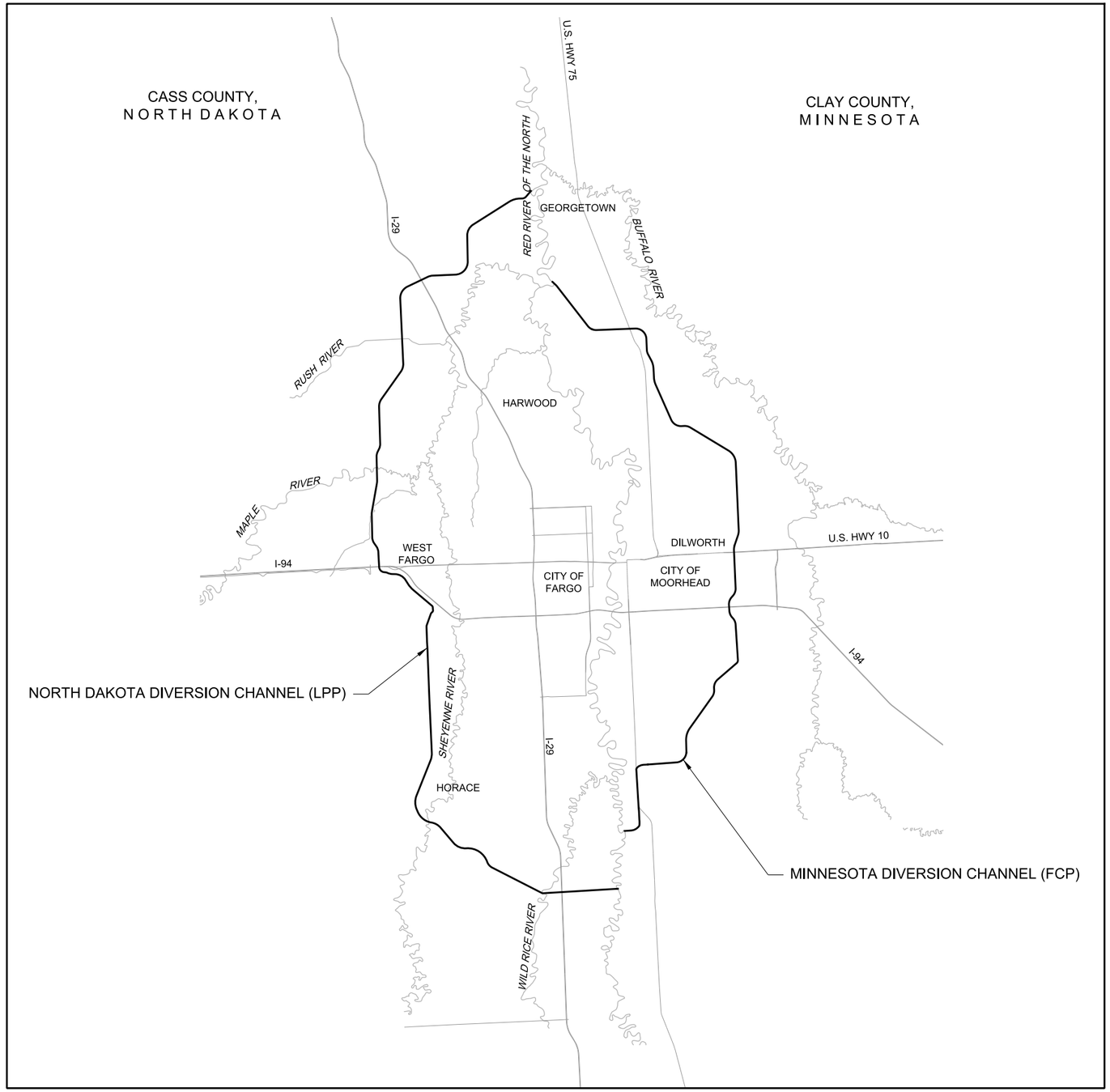
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE: None
PLOT DATE:
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_G-001---.dgn

FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
COVER SHEET

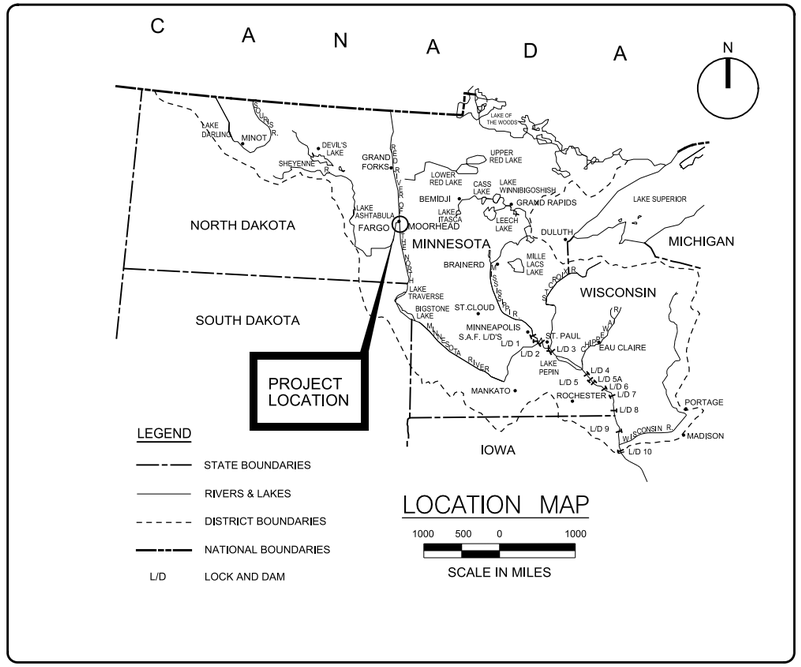
Sheet ID
G-001

auto_time

is: USACE-MVP-0000088174



VICINITY MAP



LOCATION MAP

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP | DATE: JULY 2011
DWN BY: EPP | CKD BY: JBM | SOLICITATION NO.:
SUBMITTED BY: MGM | CONTRACT NO.:
PLOT SCALE: None | PLOT DATE: | FILE NUMBER:
SIZE: | FILE NAME: FMM_G-002---.dgn

FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

VICINITY AND LOCATION MAPS

Sheet ID
G-002

is: USACE-MVP-0000088174

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	G-003	DRAWING INDEX, LEGEND AND GENERAL NOTES		FMM_G-003—.DGN
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		CIVIL SITE DRAWINGS		
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	CS202	MINNESOTA DIVERSION (FCP) PROFILE STA 480+00-STA 960+00		FMM_CS202—-.DGN
	CS203	MINNESOTA DIVERSION (FCP) PROFILE STA 960+00-STA 1310+00		FMM_CS203—-.DGN
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	CS305	MINNESOTA DIVERSION (FCP) TYPICAL SECTIONS I & J		FMM-CS305—.DGN
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	CS310	NORTH DAKOTA DIVERSION (LPP) TYPICAL SECTIONS S & T		FMM-CS310—.DGN
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	CS501	NORTH DAKOTA DIVERSION (LPP) DETAILS LOW FLOW CHANNEL		FMM_CS501—-.DGN

GENERAL CIVIL NOTES:

1. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
2. CADD UPDATE USACE ST. PAUL DISTRICT.
3. THE INFORMATION ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF EXISITNG UTILITIES MAY NOT BE ACCURATE OR ALL INCLUSIVE, THEY ARE INCLUDED IN THIS DOCUMENT FOR INFORMATION PURPOSES ONLY.
4. SEE ATTACHMENT 5, CONSULTANTS REPORT FOR ALL CALLOUTS OR REFERENCES TO STRUCTURAL DRAWINGS (S-XXX).

NOTES:

GENERAL CROSS-REFERENCING SYMBOLS

D5 — 1. X DETAIL/SECTION — SECTION/DETAIL TITLE ON SAME DRAWING (CENTERED UNDER SECTION/DETAIL)
SUPPLEMENTAL INFORMATION
SCALE: X

D5 / C-102 — 2. X DETAIL/SECTION — SECTION/DETAIL TITLE ON ANOTHER DRAWING (CENTERED UNDER SECTION/DETAIL)
SUPPLEMENTAL INFORMATION
SCALE:

TOP FRONT SIDE
ELEVATION SECTION
VIEW SUBTITLE (CENTERED UNDER EACH VIEW)

D5 — SECTION CUT W/ VIEW SHOWN ON SAME DRAWING

D5 / C-302 — SECTION CUT W/ VIEW SHOWN ON ANOTHER DRAWING

A — DETAIL SYMBOL W/ VIEW SHOWN ON SAME DRAWING

A / C-501 — DETAIL SYMBOL W/ VIEW SHOWN ON ANOTHER DRAWING

ABBREVIATIONS

* UNLESS OTHERWISE NOTED ON EACH SHEET

APPROX	APPROXIMATE	HT	HEIGHT
ALT W/	ALTERNATE WITH	IF	INSIDE FACE
ALUM	ALUMINUM	LG	LONG
BITUM	BITUMINOUS	L/W	LANDWARD
BOT	BOTTOM	MAX	MAXIMUM
C/L	CENTER LINE	MIN	MINIMUM
C&G	CURB & GUTTER	MIRR	MIRRORED
CLR	CLEAR	MISC	MISCELLANEOUS
CJ	CONSTRUCTION JOINT	NF	NEAR FACE
CMP	CORRUGATED METAL PIPE	NO	NUMBER
CONC	CONCRETE	OF	OUTSIDE FACE
		OC	ON CENTER
DIA	DIAMETER	R/W	RIVERWARD
DWG	DRAWING	SAN	SANITARY
EF	EACH FACE	SPEC	SPECIFICATIONS
EJ	EXPANSION JOINT	SST	STAINLESS STEEL
EL	ELEVATION	T&B	TOP AND BOTTOM
EW	EACH WAY	TYP	TYPICAL
EXIST	EXISTING	UNO	UNLESS NOTED OTHERWISE
FF	FAR FACE	UGND	UNDERGROUND
FES	FLARED END SECTION	W	WIDTH
GALV	GALVANIZED	WM	WATER MAIN

GENERAL LEGEND

- P.I. POINT
- FIRE HYDRANT
- MANHOLE
- CB — CATCHBASIN
- WATER VALVE
- REMOVED BUILDINGS
- S S — NEW SANITARY SEWER
- S D — NEW STORM SEWER
- S S_X — EXISTING SANITARY SEWER
- S D_X — EXISTING STORM SEWER
- W_X — WATERMAIN
- OP — EXISTING OVERHEAD P0WER
- X — X — EXISTING UNDER-GROUND DUCT
- G — EXISTING GAS
- 97-41M — BORING LOCATION AND NUMBER
- TEMPORARY EASEMENT
- FILL
- CUT
- SHEET ID X-000 — DWG OUTLINE AND NUMBER
- LEVEE

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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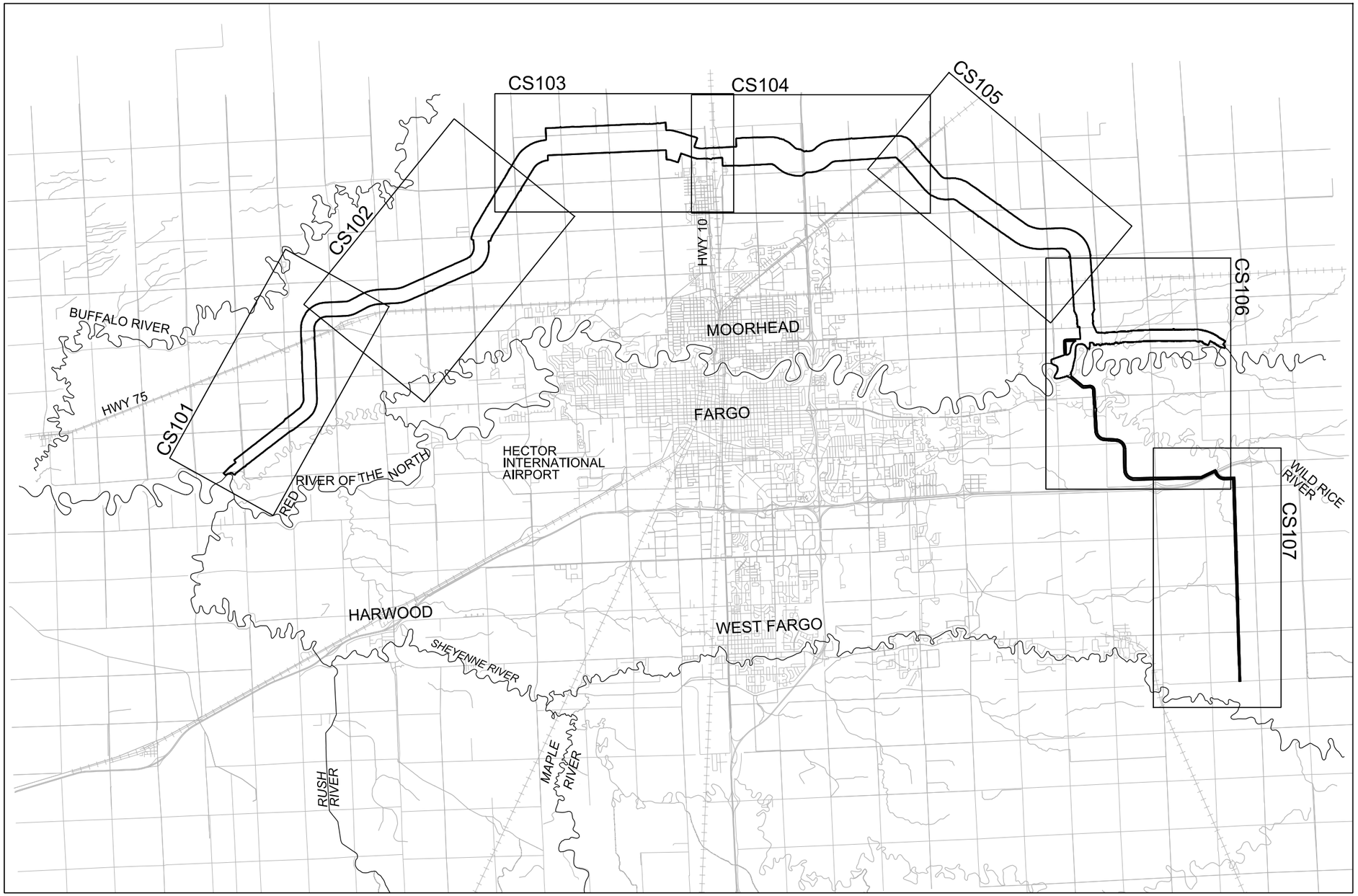
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE: None
PLOT DATE:
SIZE:
FILE NAME: FMM_G-003—.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

DRAWING INDEX
LEGEND & GENERAL NOTES

Sheet ID
G-003



GENERAL PLAN

MINNESOTA DIVERSION (FCP)

0 25000' 50000'

N

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: MLI
PLOT SCALE: N/A
PLOT DATE:
SIZE:
FILE NAME: FMM_CS100---.dgn
DATE: JULY 2011
SOLICITATION NO.:
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FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
GENERAL PLAN

Sheet ID
CS100

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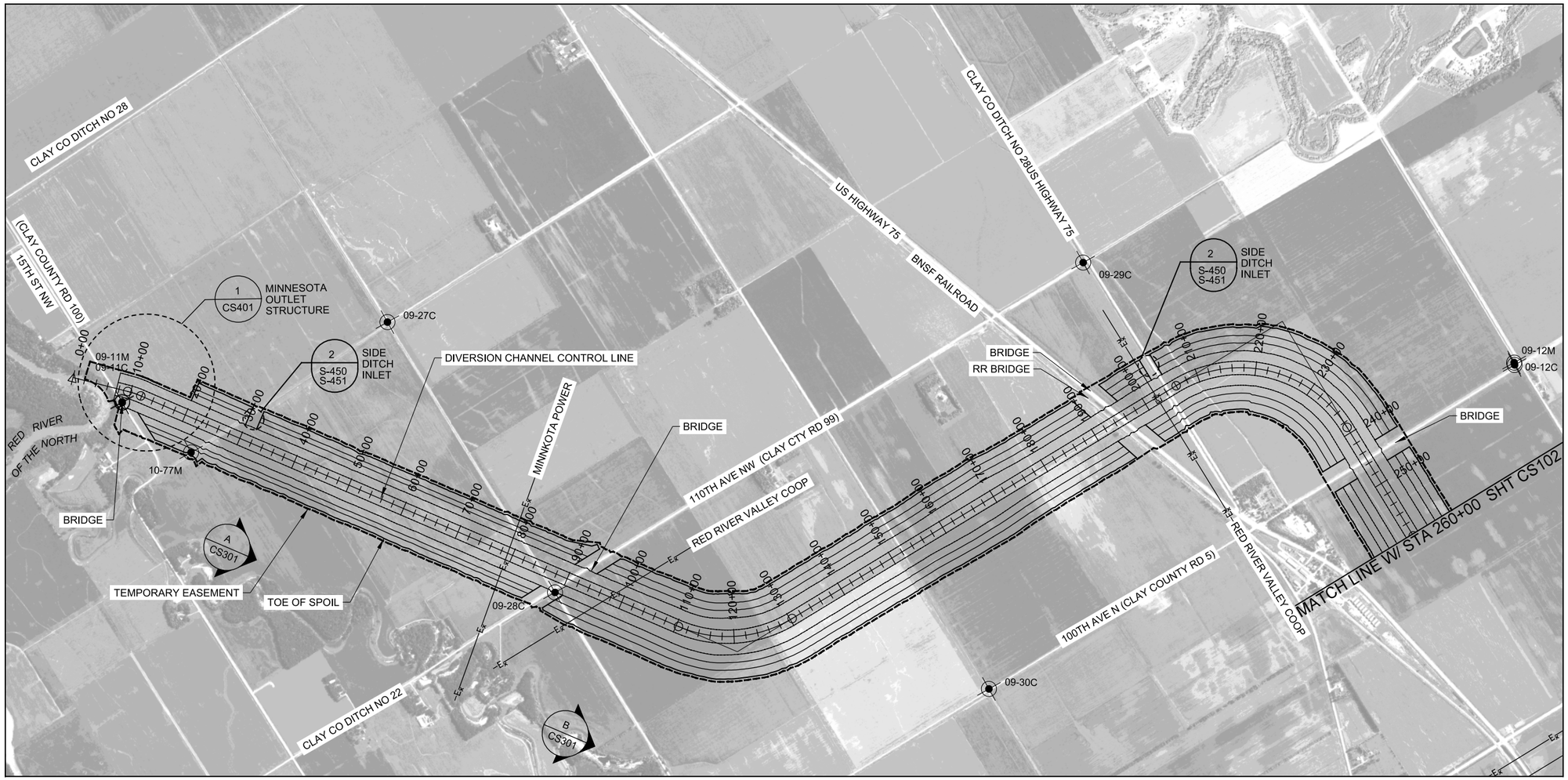

PLAN VIEW

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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DWN BY: MLUEPP
CKD BY: CGT
SUBMITTED BY: MJ
PLOT SCALE: As Noted
PLOT DATE:
SIZE:
FILE NAME: FMM_CS101---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
STA 0+00 - STA.280+00

Sheet ID
CS101

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PLAN VIEW

SCALE: 1" = 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
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COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers® ST. PAUL DISTRICT

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U.S. ARMY CORPS OF ENGINEERS ST. PAUL DISTRICT ST. PAUL, MINNESOTA

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DWN BY: MLIEPP | CKD BY: CGT | SOLICITATION NO.:
SUBMITTED BY: IMJ | CONTRACT NO.:
PLOT SCALE: | PLOT DATE: | FILE NUMBER:
SIZE: | FILE NAME: FMM_CS102---.dgn

FARGO MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
STA 260+00 - STA.500+00

Sheet ID
CS102

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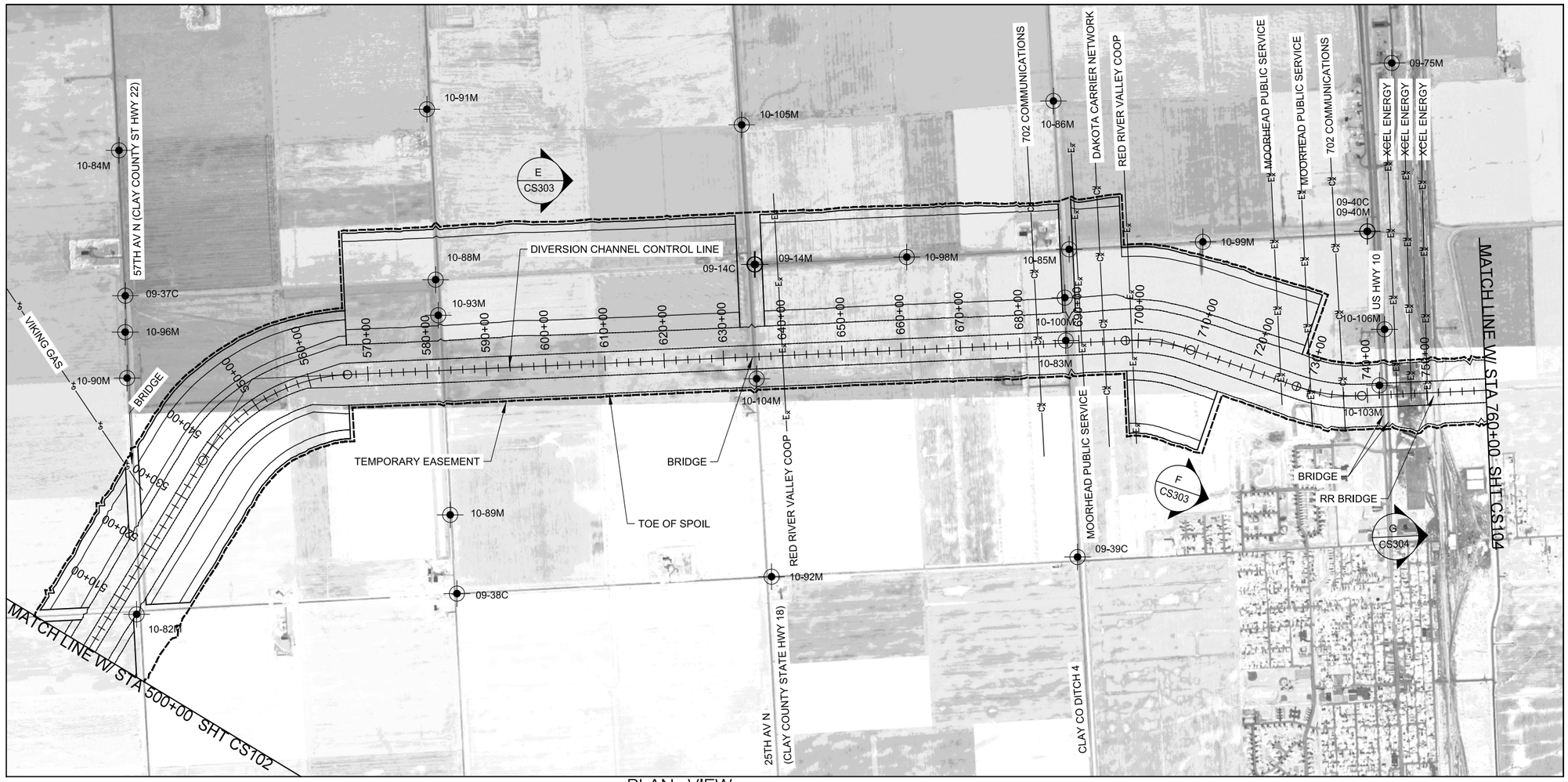

PLAN VIEW

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

N

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
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ST. PAUL DISTRICT

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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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DWN BY: MLHEPP
CKD BY: CGT
SUBMITTED BY: RLI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: As
PLOT DATE:
SIZE:
FILE NAME: AMM_CS103-...dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
MINNESOTA DIVERSION (FCP)
PLAN
STA 500+00 - STA.760+00

Sheet ID
CS103

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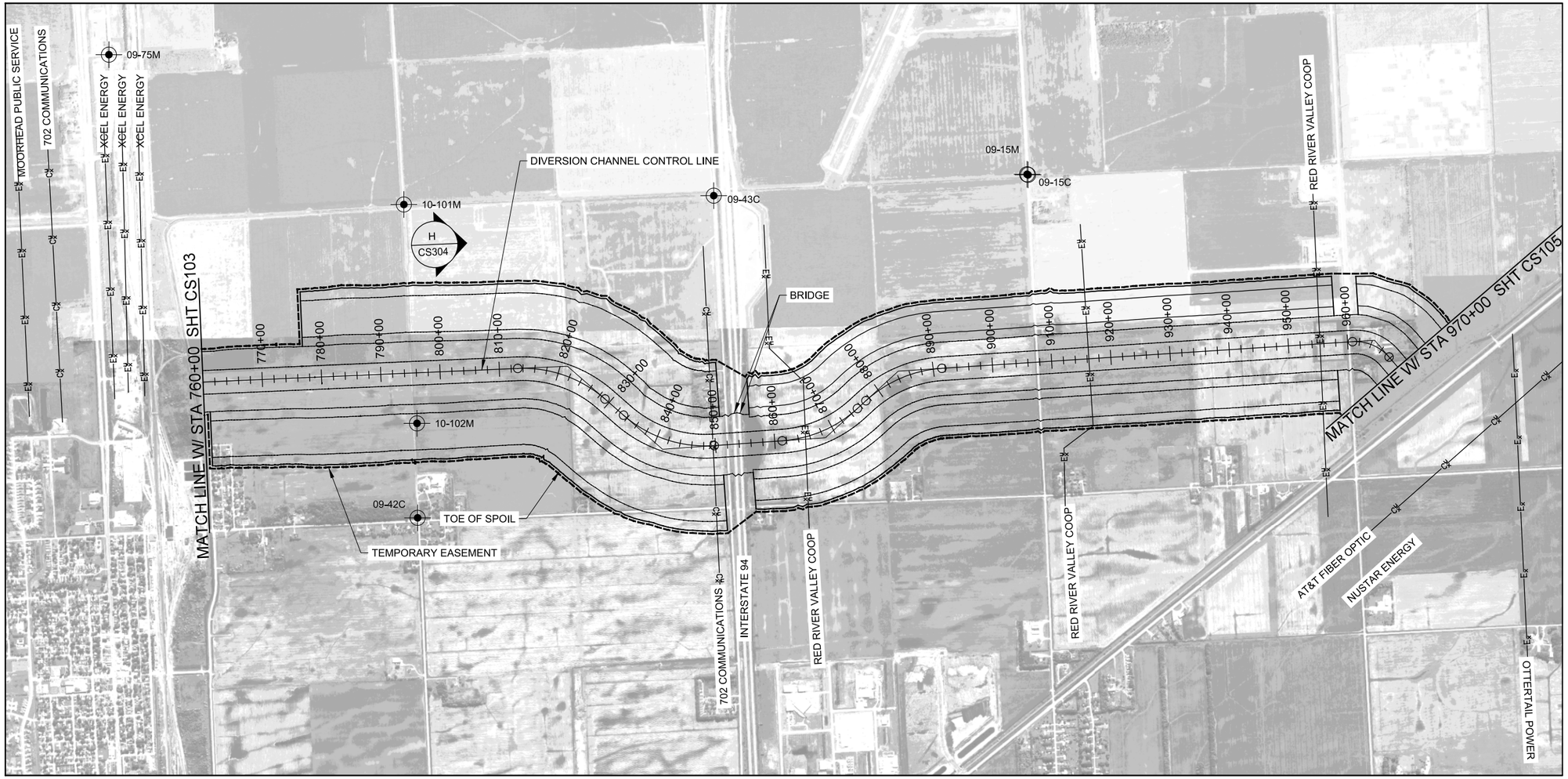

PLAN VIEW

N

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

NOTES:

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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
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SUBMITTED BY: MLI
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SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: N/A
PLOT DATE:
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FILE NAME: FMM_CS104---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
STA 760+00 - STA.970+00

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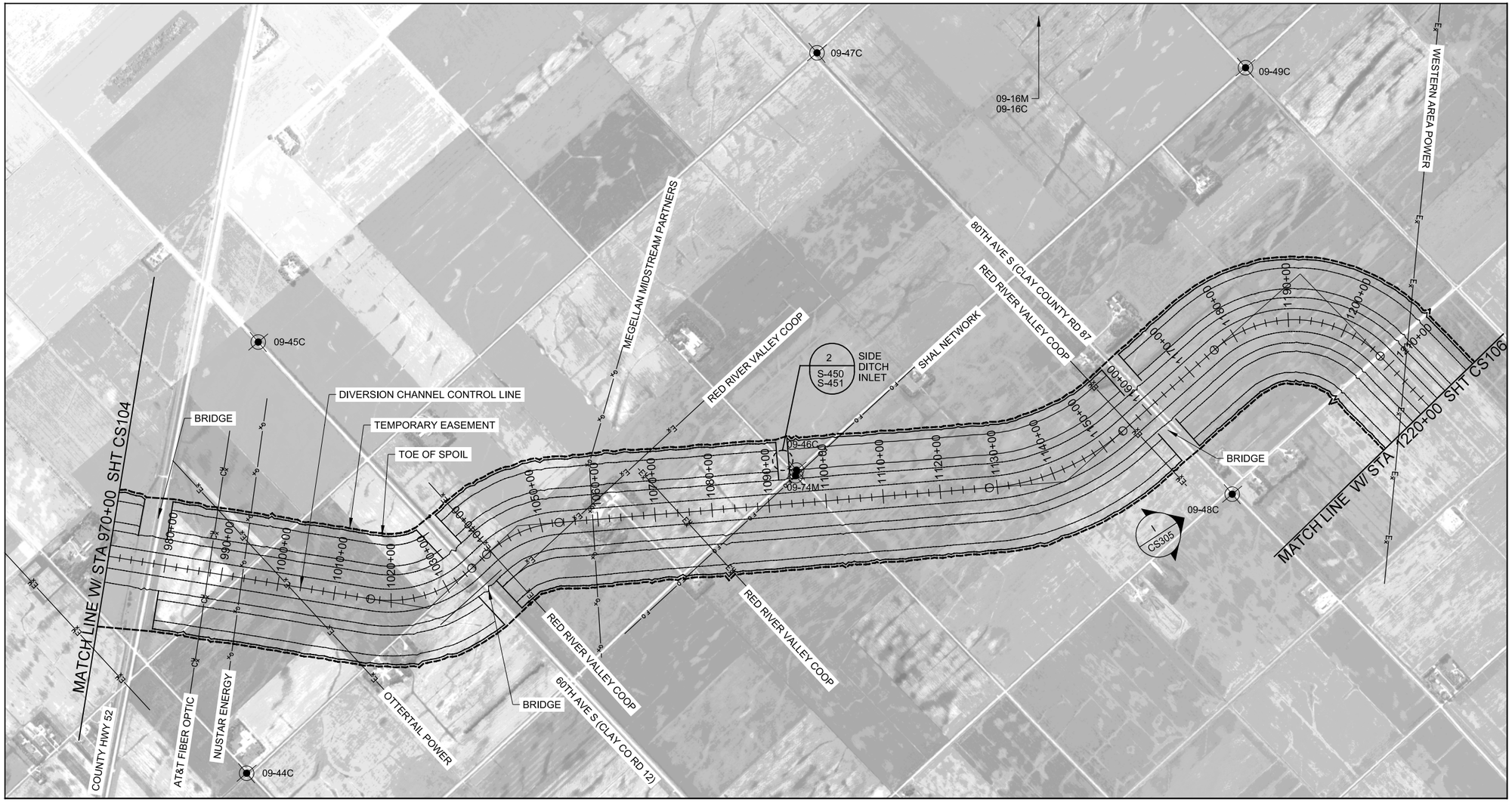

PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
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COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
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CKD BY: CGT
SUBMITTED BY: IMLI
PLOT SCALE:
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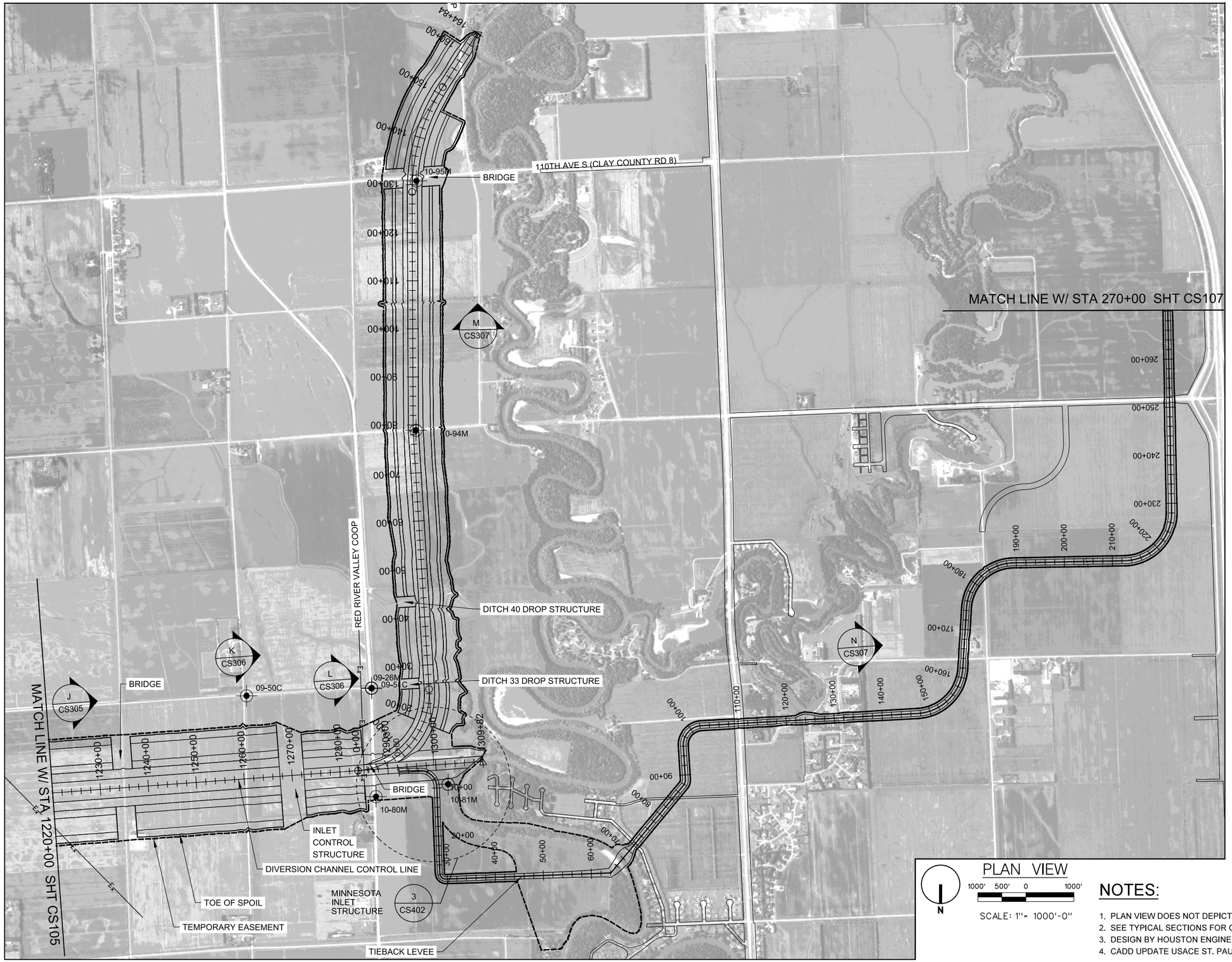
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS105---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
STA 970+00 - STA. 1220+00

Sheet ID
CS105

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

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NOTES:

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ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIPHEI
DWN BY: MUEHRI
CKD BY: CGT
SUBMITTED BY: ALL
PLOT SCALE:
PLOT DATE:
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS106---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
& TIEBACK LEVEE

Sheet ID
CS106

is: USACE-MVP-0000088174

PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

N

1 DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
2. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

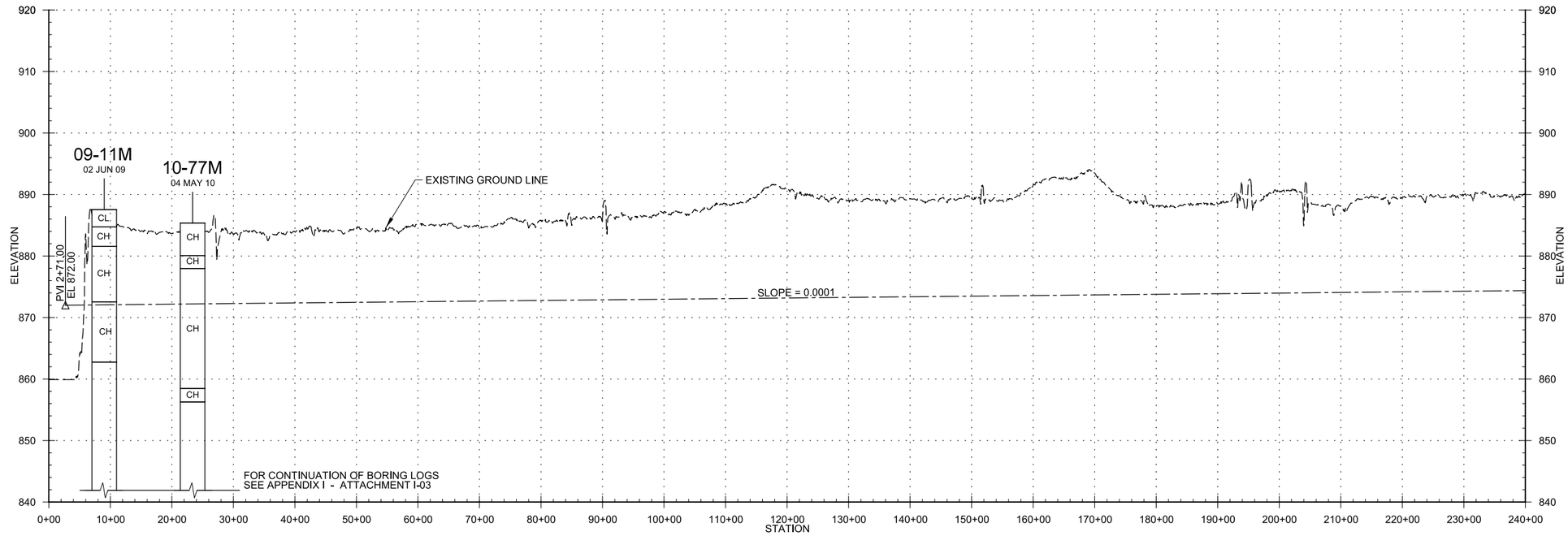
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: MLI
PLOT SCALE:
PLOT DATE:
SIZE:
FILE NAME: FMM_CS107---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PLAN
TIEBACK LEVEE STA 270+00 - STA.566+28

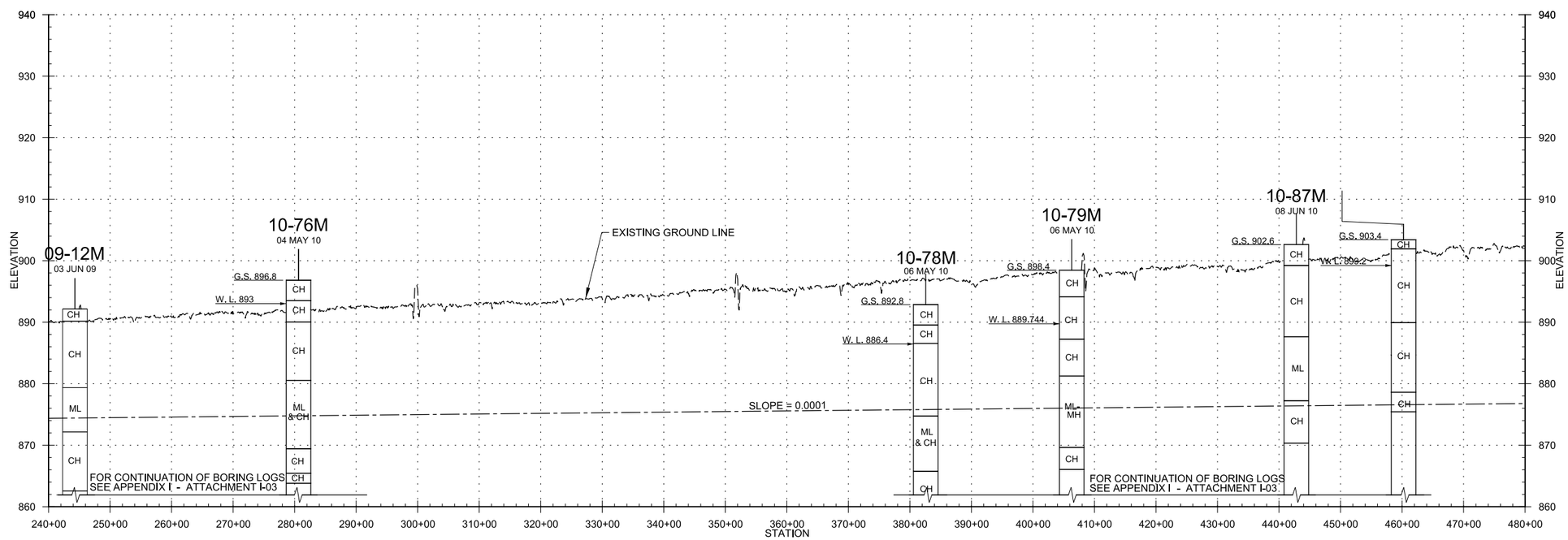
Sheet ID
CS107

is: USACE-MVP-0000088174



PROFILE

MINNESOTA DIVERSION (FCP)



PROFILE

MINNESOTA DIVERSION (FCP)

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT
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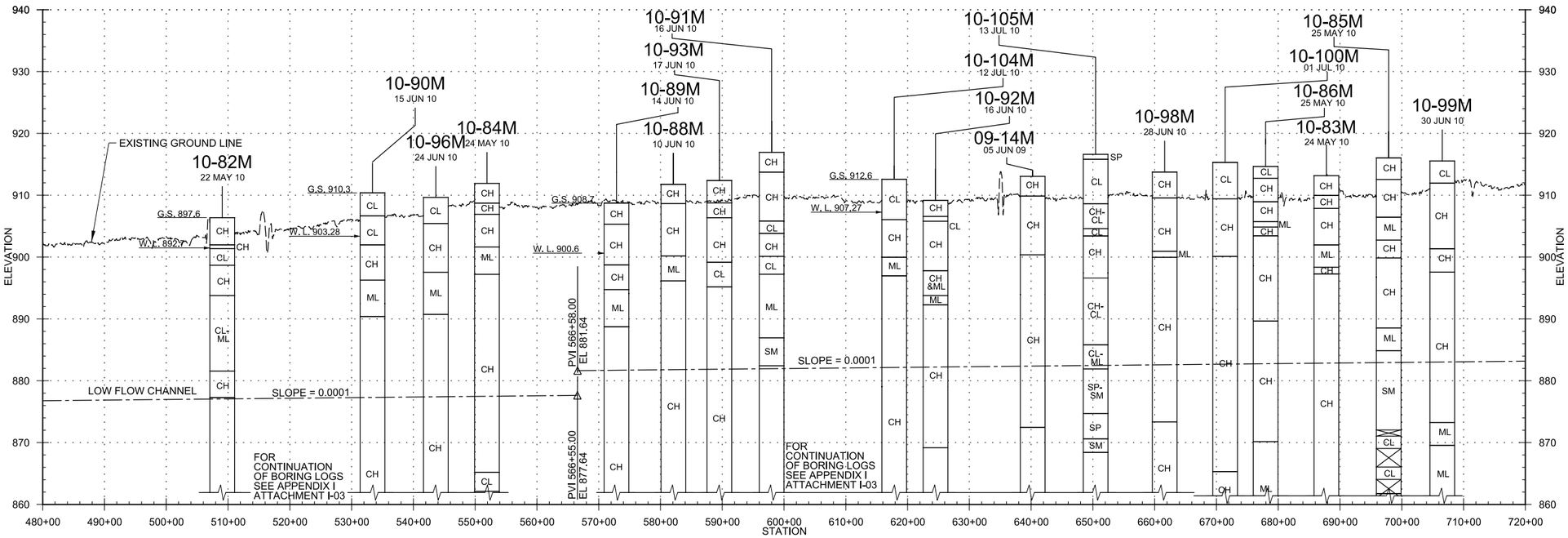
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE: No Scale
PLOT DATE: No Date
SIZE:
FILE NAME: FMM_CS201---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PROFILE
STA.0+00 - STA. 480+00

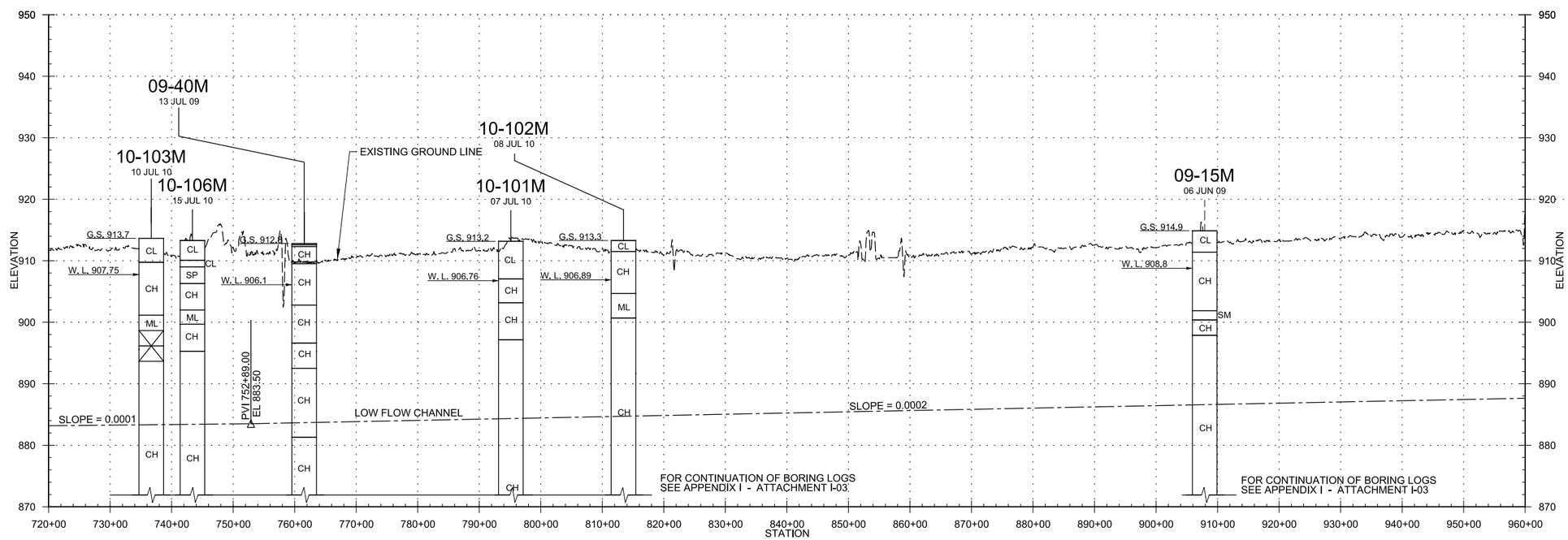
Sheet ID
CS201

is: USACE-MVP-0000088174



PROFILE

MINNESOTA DIVERSION (FCP)



PROFILE

MINNESOTA DIVERSION (FCP)

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT
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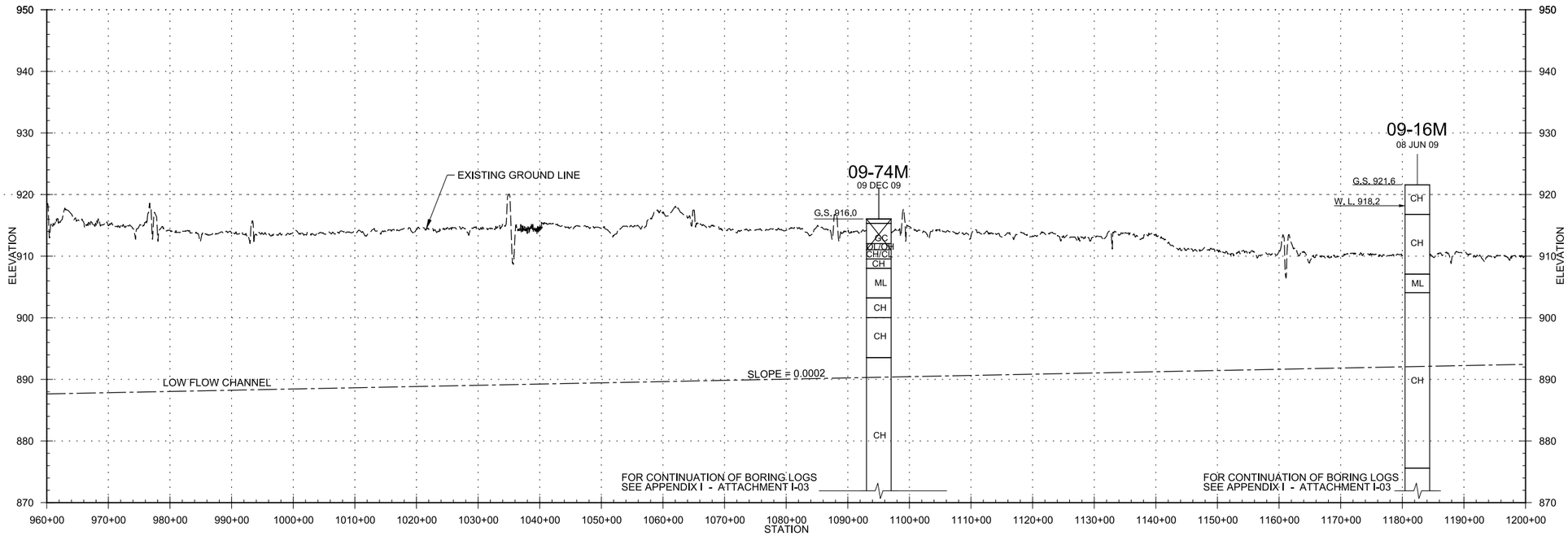
DESIGNED BY: EPP/KAH
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE: None
PLOT DATE:
SIZE:
FILE NAME: FMM_CS202---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

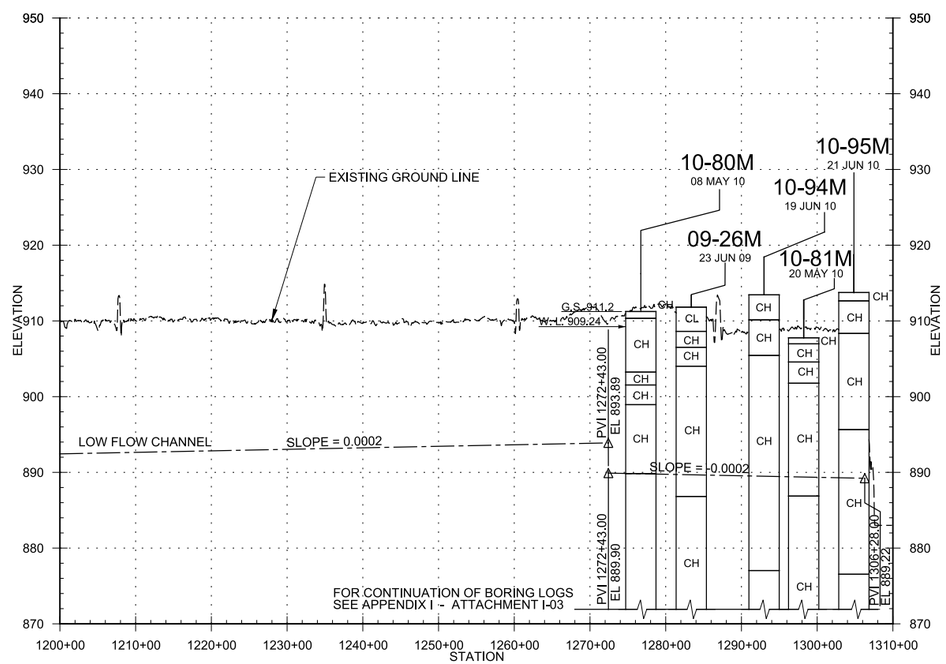
MINNESOTA DIVERSION (FCP)
PROFILE
STA.480+00 - STA. 960+00

Sheet ID
CS202



PROFILE

MINNESOTA DIVERSION (FCP)



PROFILE

MINNESOTA DIVERSION (FCP)

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

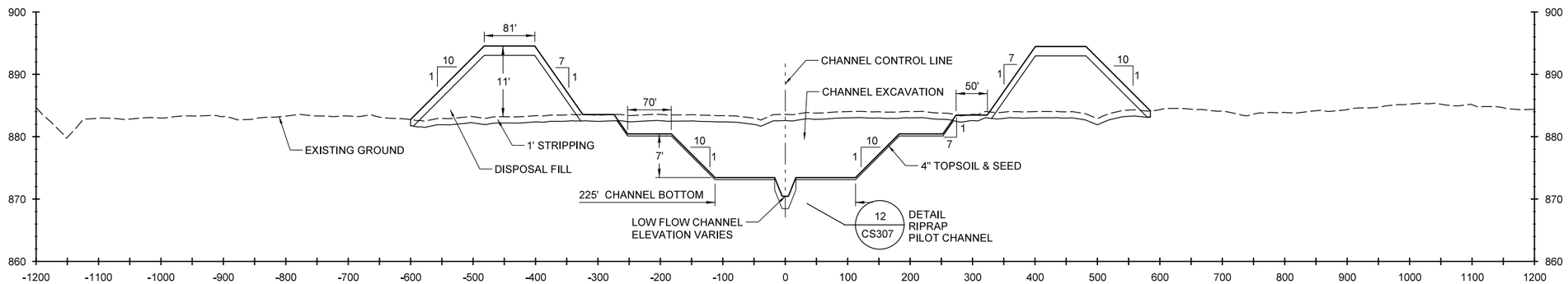
DESIGNED BY: EPP/KAH
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE: 1=1
PLOT DATE: No
SIZE:
FILE NAME: FMML_CS203---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
PROFILE
STA.960+00 - STA. 1310+00

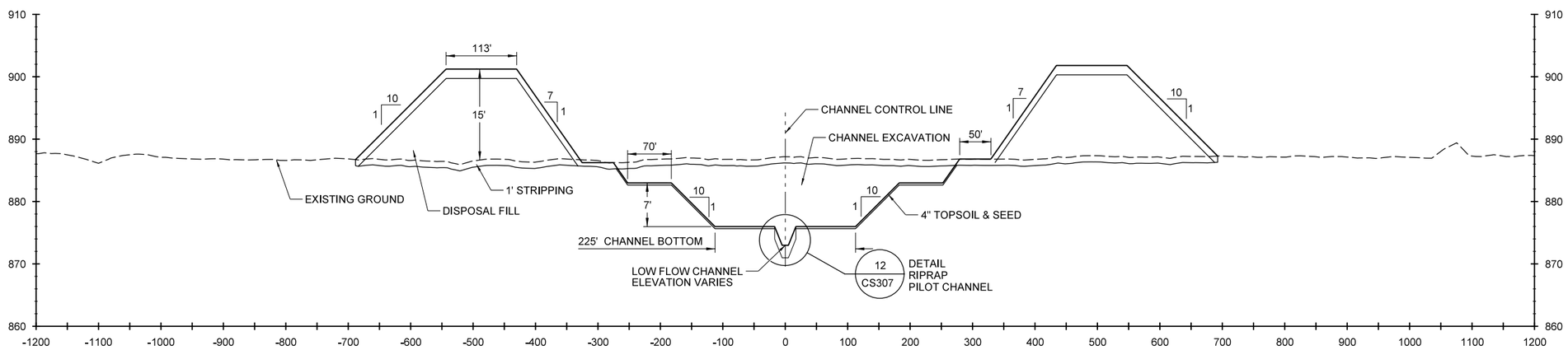
Sheet ID
CS203

is: USACE-MVP-0000088174



A / CS101 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 2+71 TO STA. 70+00



B / CS102 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 70+00 TO STA. 220+00

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1 (ANSI D)
PLOT DATE:
SIZE:
FILE NAME: FMM_CS301---.dgn

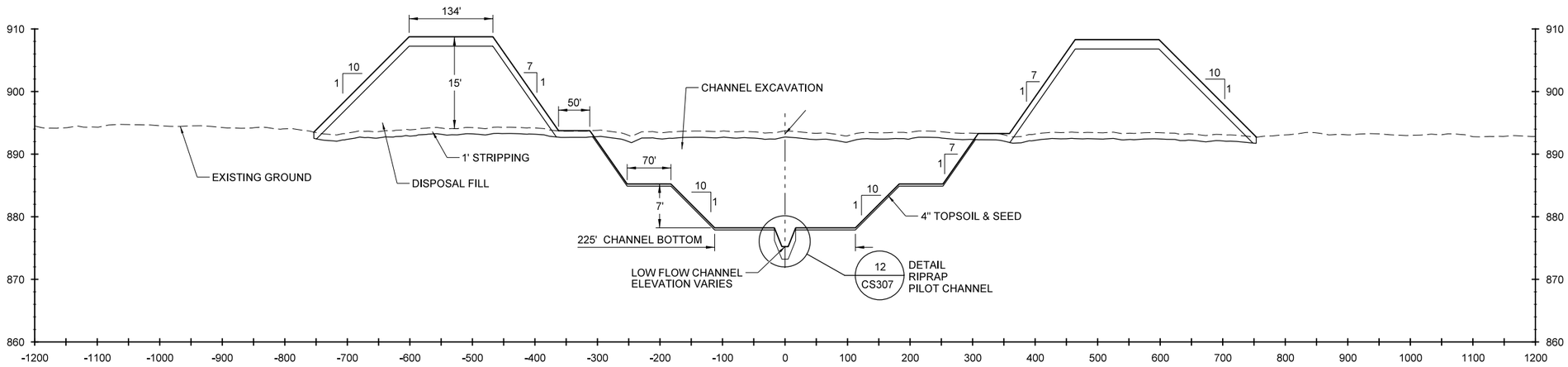
HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
A & B

Sheet ID
CS301

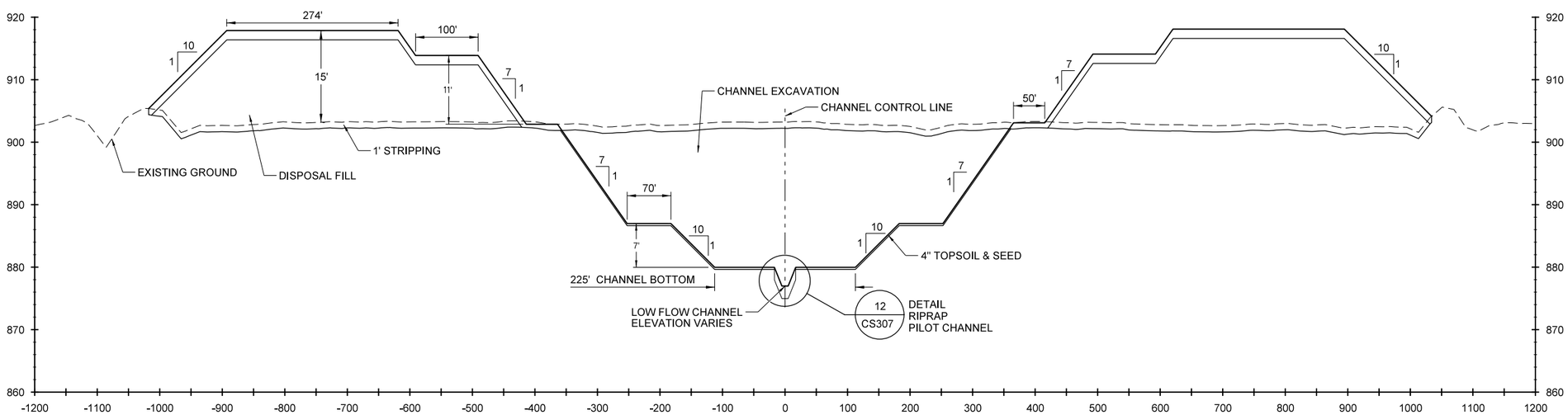
is: USACE-MVP-0000088174



C
CS102

TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 220+00 TO STA. 440+00



D
CS102

TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 440+00 TO STA. 566+55

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1
PLOT DATE:
SIZE:
FILE NAME: FM_CS302---dgn

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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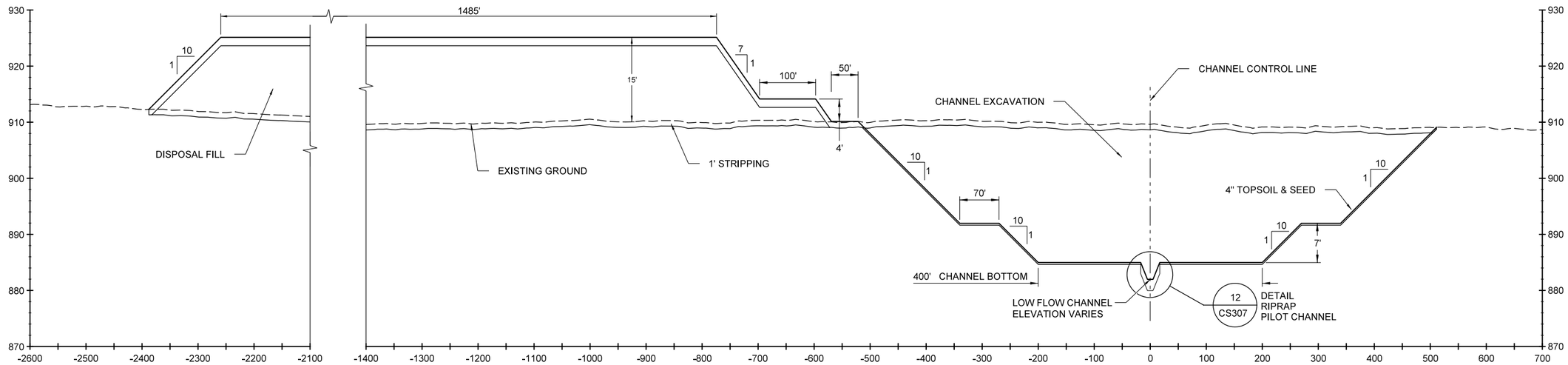
FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

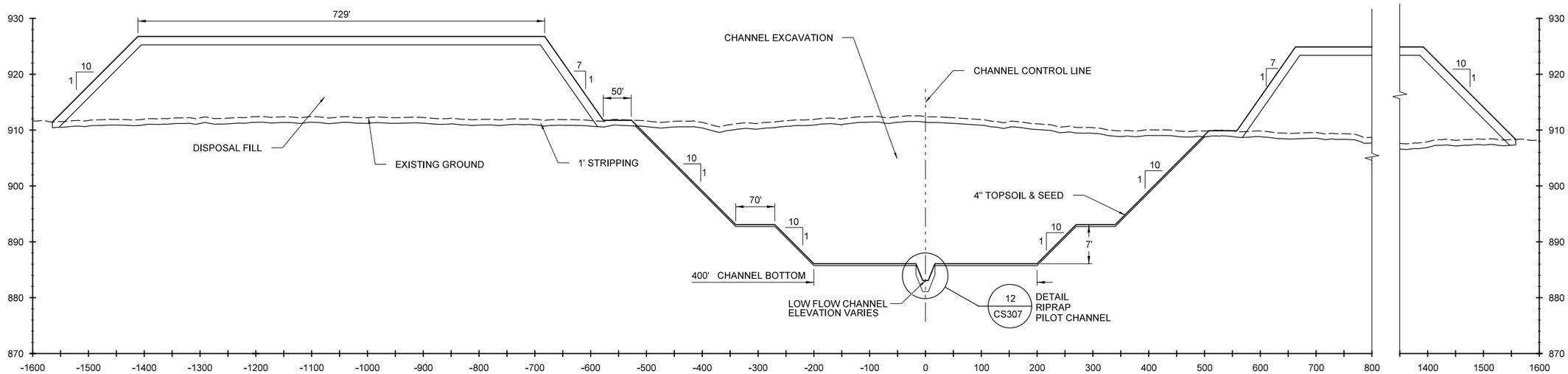
MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
C & D

Sheet ID
CS302



E / CS103 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 566+55 TO STA. 665+00



F / CS103 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 665+00 TO STA. 727+32

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
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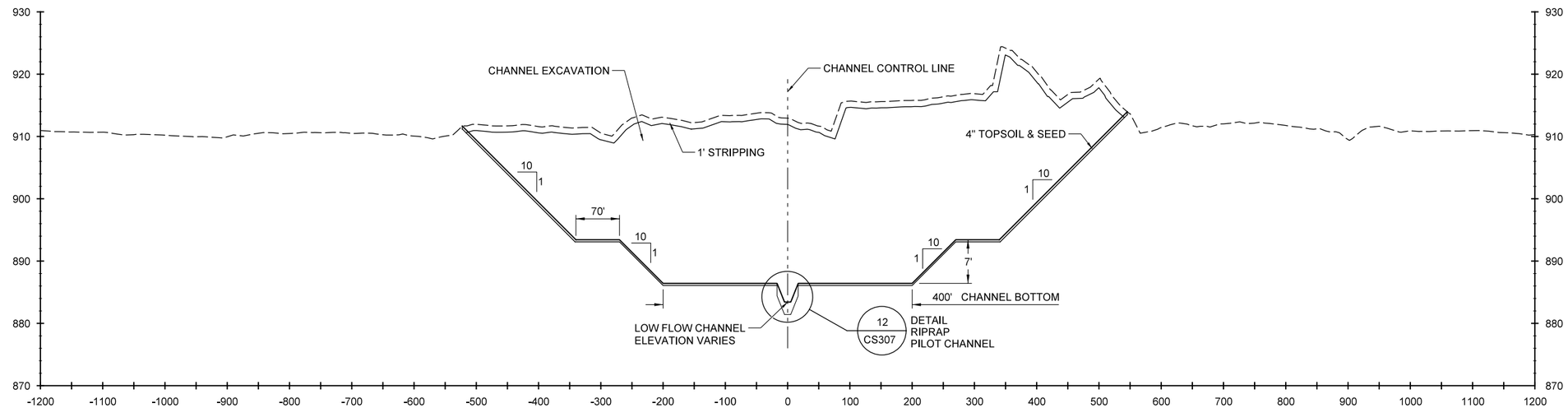
1401 21ST AVE. N.
FARGO, ND 58102

DESIGNED BY: MEI/HEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1:1 / 1:2
PLOT DATE: N/A
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS303---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
E & F

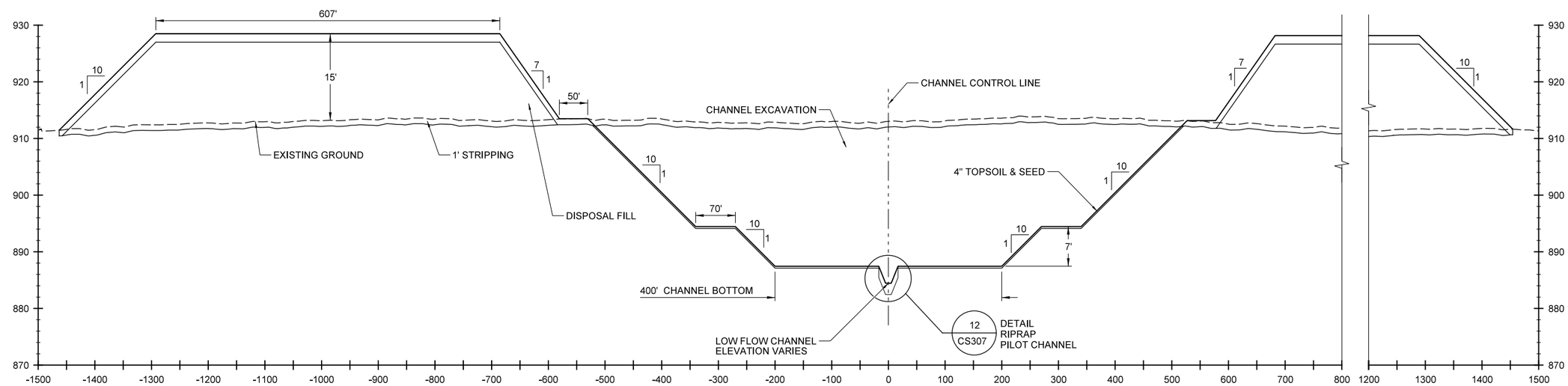
Sheet ID
CS303



G / CS103

TYPICAL SECTION - MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 727+32 TO STA. 752+89



H / CS104

TYPICAL SECTION - MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 752+89 TO STA. 856+02

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1:1000
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS304---.dgn

HOUSTON ENGINEERING, INC.
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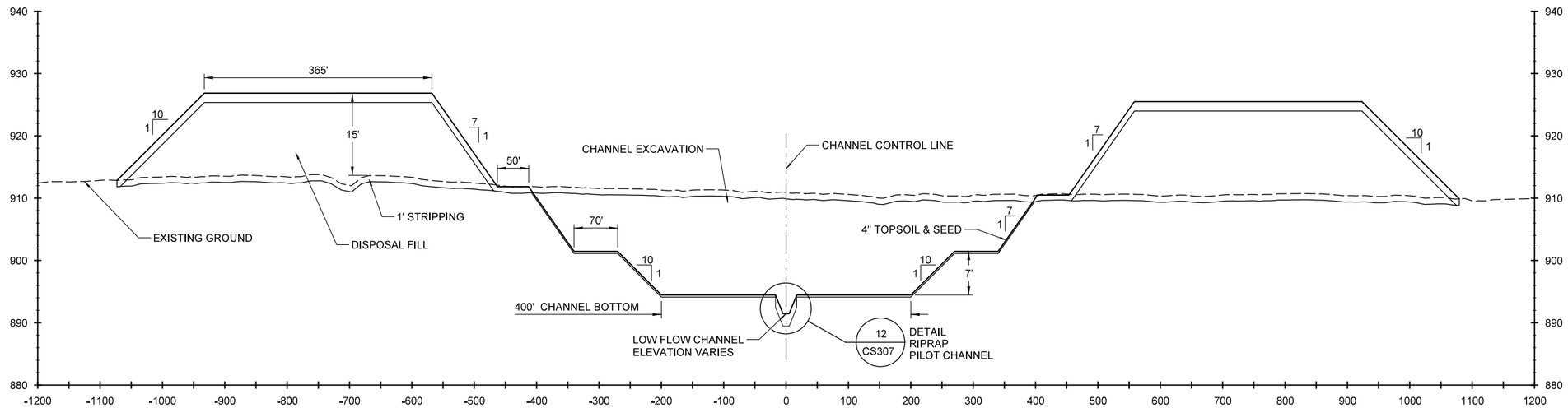
FARGO, ND 58102

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

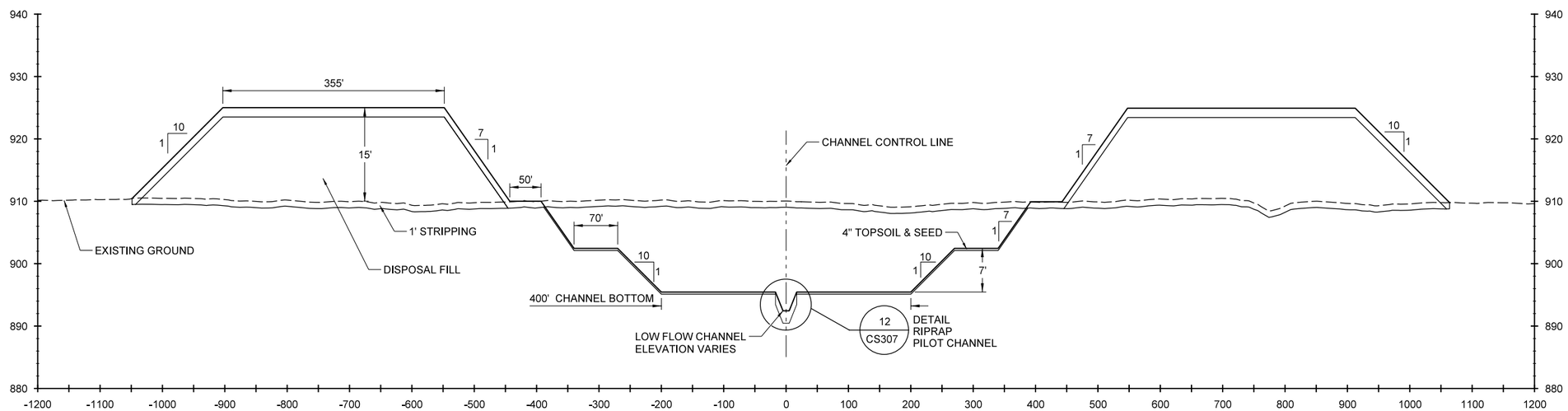
MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
G & H

Sheet ID
CS304



I / CS105 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 856+02 TO STA. 1190+00



J / CS106 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 1190+00 TO STA. 1226+00

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
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ST. PAUL, MINNESOTA

HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

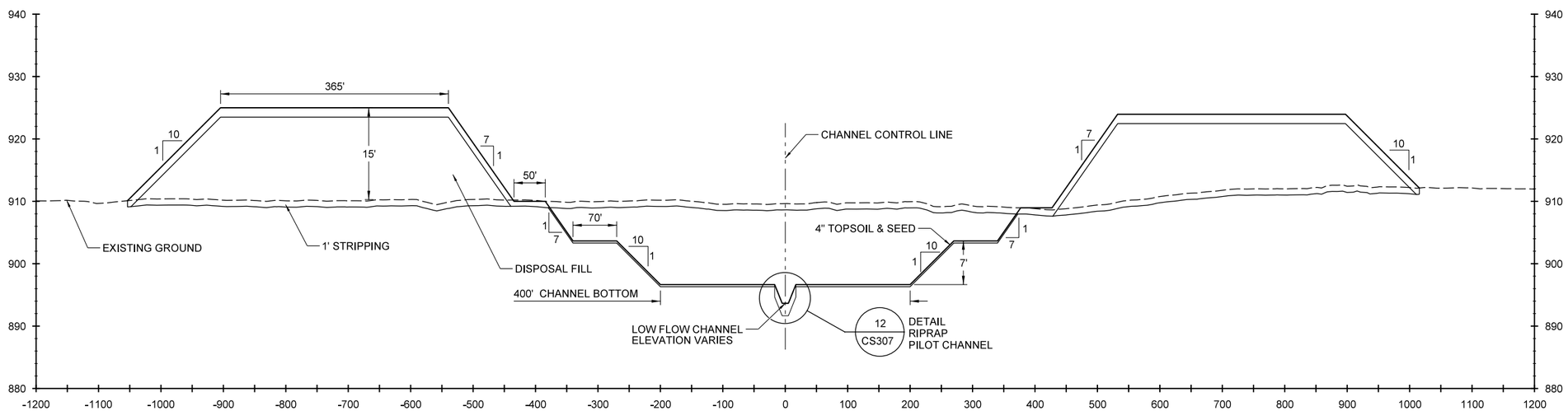
DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1" = 10.00'
PLOT DATE: N/A
SIZE:
FILE NAME: FMM_CS305---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
I & J

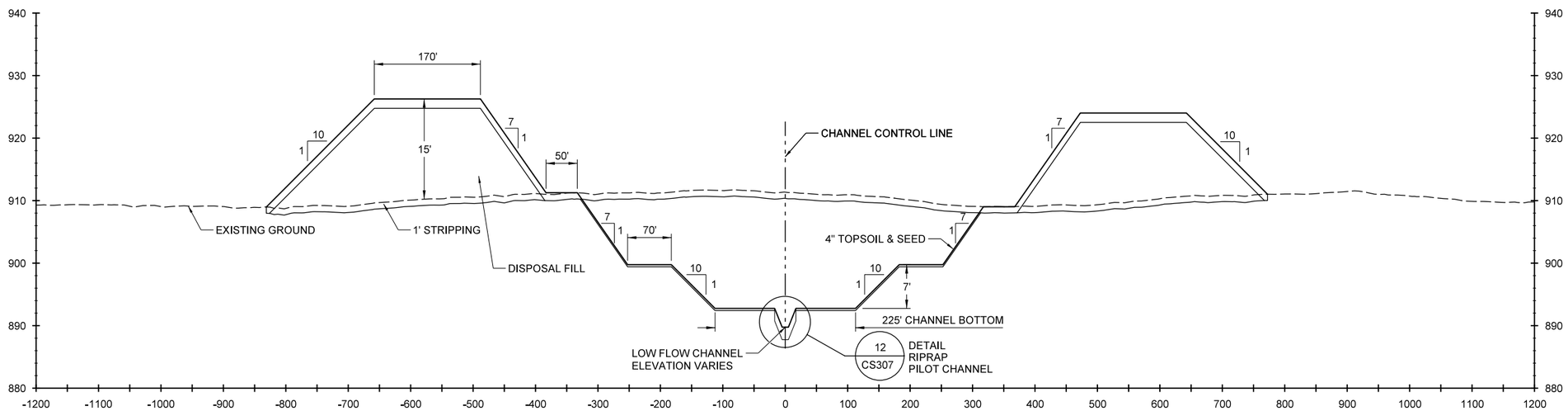
Sheet ID
CS305

is: USACE-MVP-0000088174



K / CS106 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 1226+00 TO STA. 1267+43



L / CS106 TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

CHANNEL AND SPOIL PILES
STA. 1277+43 TO STA. 1309+78

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETRMINED

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1401 21ST AVE. N.
FARGO, ND 58102

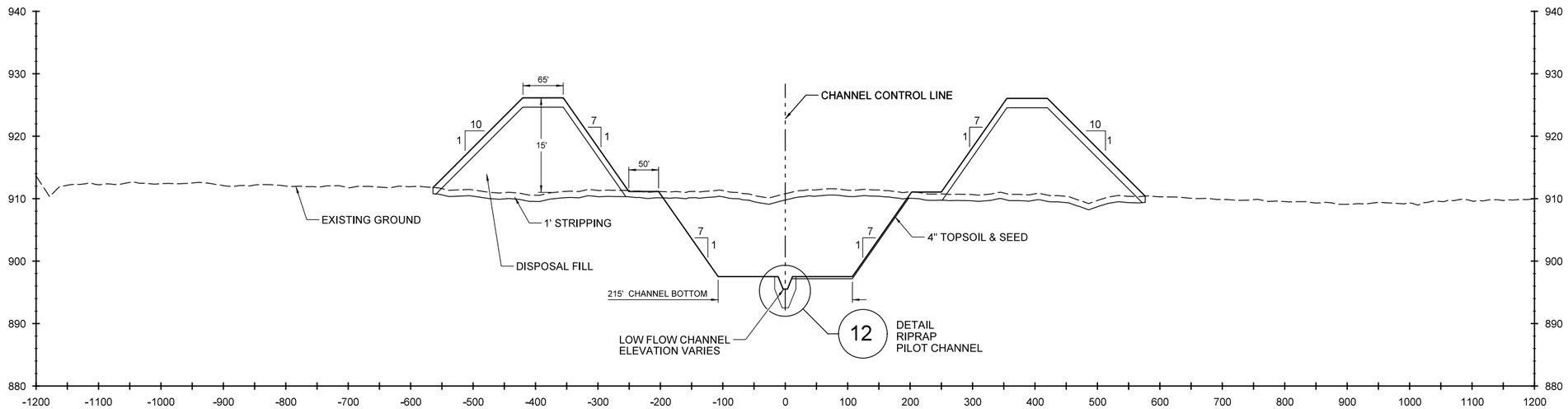
DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1:1000
PLOT DATE:
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS306---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS
K & L

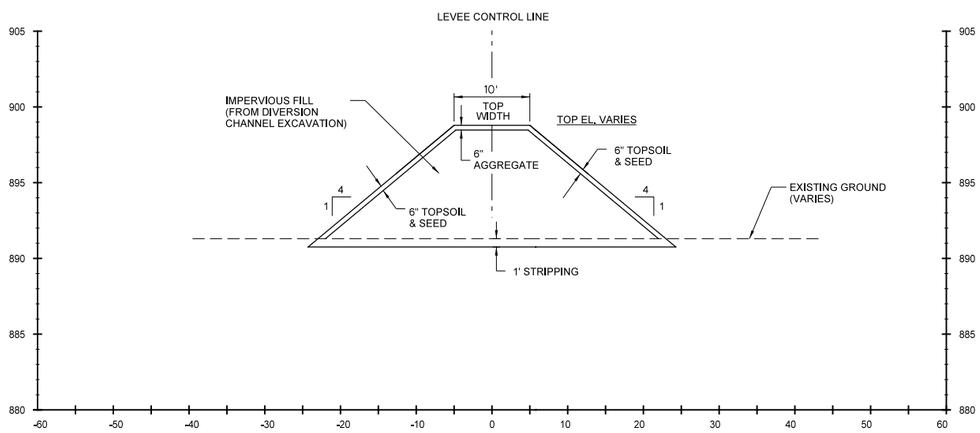
Sheet ID
CS306

is: USACE-MVP-0000088174



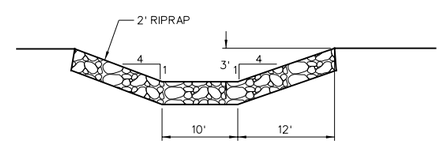
M / CS106 — TYPICAL SECTION – MINNESOTA DIVERSION (FCP) EXTENSION CHANNEL

CHANNEL AND SPOIL PILES
STA. 0+00 TO STA. 162+00



N / CS106 — TYPICAL SECTION – MINNESOTA DIVERSION (FCP)

TIEBACK LEVEE



12 / CS301, CS302, CS303, CS304, CS305, CS306 — DETAIL

RIPRAP PILOT CHANNEL

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

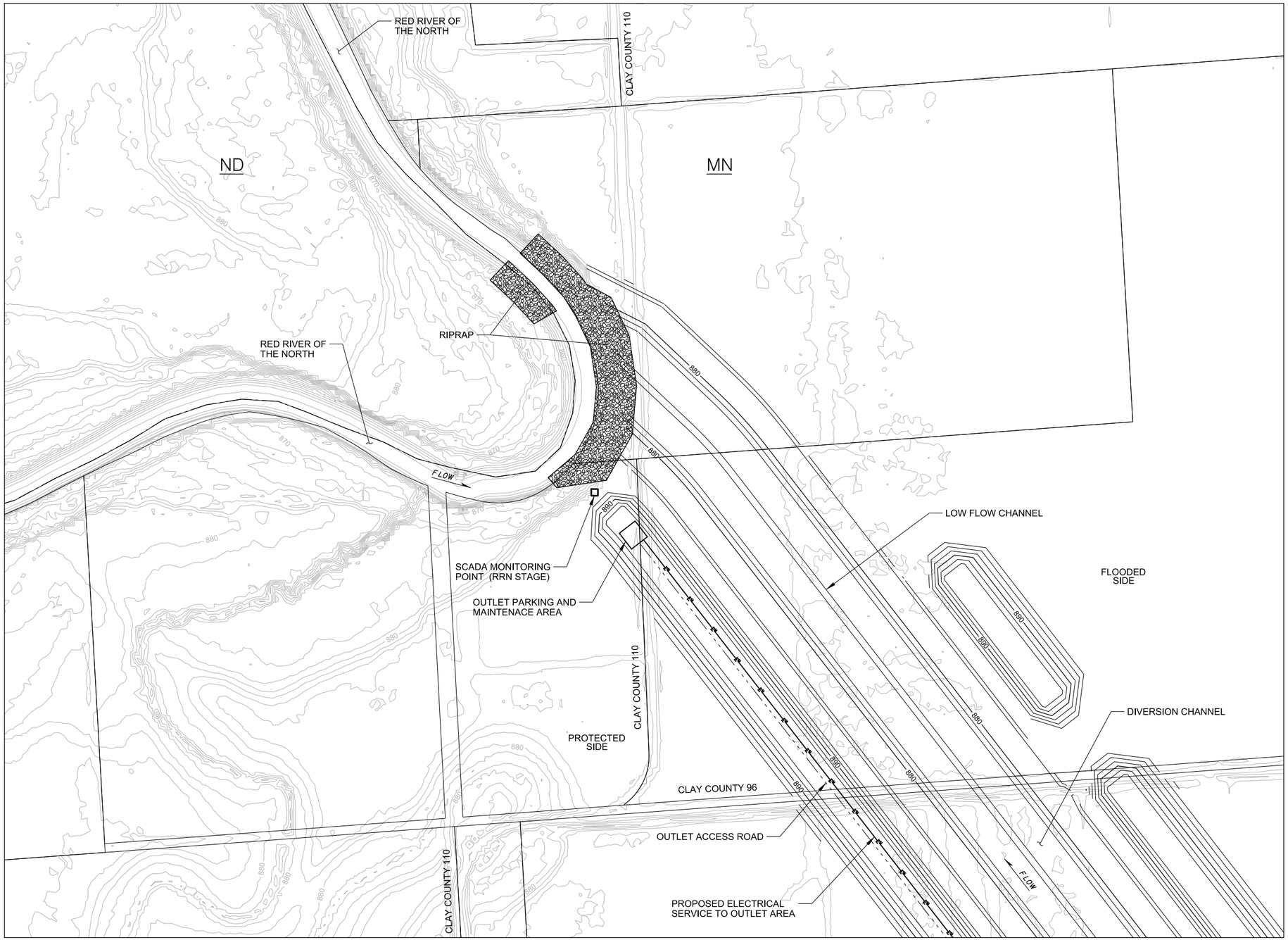
HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1" = 10000'
PLOT DATE: N/A
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS307---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
TYPICAL SECTIONS M & N
AND DETAIL 12

Sheet ID
CS307



N

1 / CS101 DETAIL
MINNESOTA OUTLET STRUCTURE

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MW/HPKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1"= 400'
PLOT DATE:
SIZE:
FILE NAME: FM_CS401---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

MINNESOTA DIVERSION (FCP)
DETAIL
OUTLET STRUCTURE

Sheet ID
CS401

is: USACE-MVP-0000088174

FEMA DEEDED PROPERTIES
FEMA DEEDED PROPERTIES
RIPRAP (TYP.)
76TH AVE S.
CLAY COUNTY 67
HIGHWAY 75
RRN CLOSURE STRUCTURE SEE DRAWING S-402
FISH PASSAGE UP TO 50YEAR EVENT SEE DRAWING S-404
SCADA MONITORING POINT (RRN STAGE AND HEAD ACROSS CLOSURE STRUCTURE)
MAINTENANCE BUILDING AND PARKING
PROTECTED SIDE
FEMA DEEDED PROPERTIES
FOREST RIVER ROAD
PROTECTED SIDE
APPROXIMATE LIMITS OF TEMPORARY FLOOD PROTECTION FOR CONSTRUCTION
ACCESS ROAD FOR RRN ICE/DEBRIS CONTROL AND DIVERSION INLET WEIR
FLOODWALL TO AVOID FEMA DEEDED PROPERTY
PROPOSED ELECTRICAL SERVICE TO CLOSURE STRUCTURE
WEIR MAINTENANCE PARKING AREA
SCADA MONITORING POINT (HEAD ACROSS WEIR)
PROPOSED ELECTRICAL SERVICE TO WEIR AREA
ACCESS ROAD FOR RRN CLOSURE
SCADA MONITORING POINT (HEAD ACROSS ICE/DEBRIS CONTROL MEASURE)
DIVERSION INLET WEIR SEE DRAWING S-405
RAMP OVER TIE BACK LEVEE
TIE BACK LEVEES EXTENDS TO WEST
TIE BACK LEVEE
RED RIVER OF THE NORTH
UNPROTECTED SIDE
ICE/DEBRIS CONTROL MEASURE
FEMA DEEDED PROPERTIES
BRIDGE OVER DIVERSION
DIVERSION CHANNEL
HIGHWAY 75
28TH ST S
FEMA DEEDED PROPERTIES
HIGHWAY 81
FLOW
EXTENSION CHANNEL

N

3 / CS107 DETAIL
MINNESOTA INLET STRUCTURE

400' 200' 0 400'
SCALE: 1"= 400'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

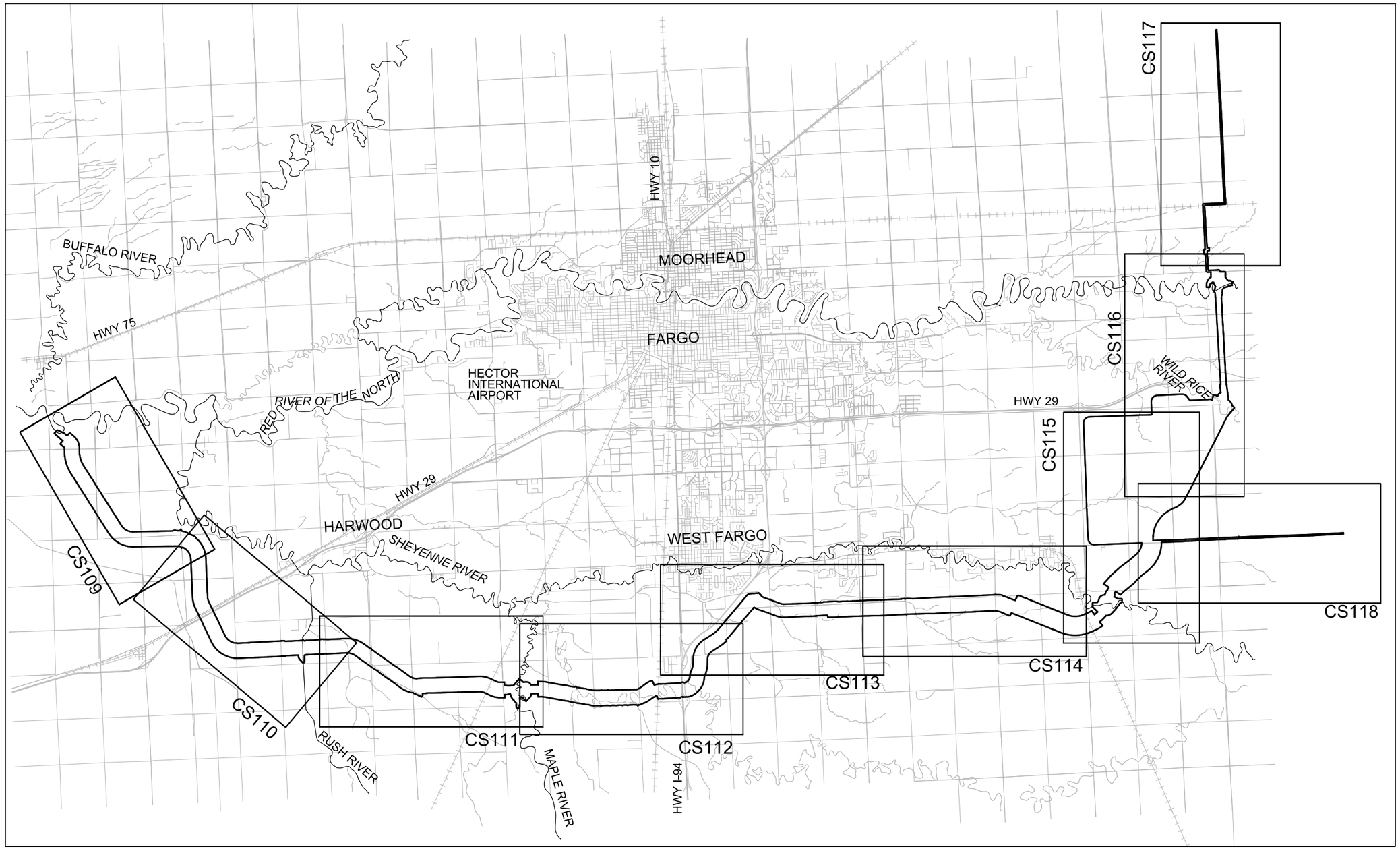
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MWV/PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1" = 400'
PLOT DATE:
SIZE:
FILE NAME: FM\L_CS402---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
MINNESOTA DIVERSION (FCP)
DETAIL
INTLET STRUCTURE

Sheet ID
CS402

is: USACE-MVP-0000088174



GENERAL PLAN
NORTH DAKOTA DIVERSION (LPP)
0 25000' 50000'

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

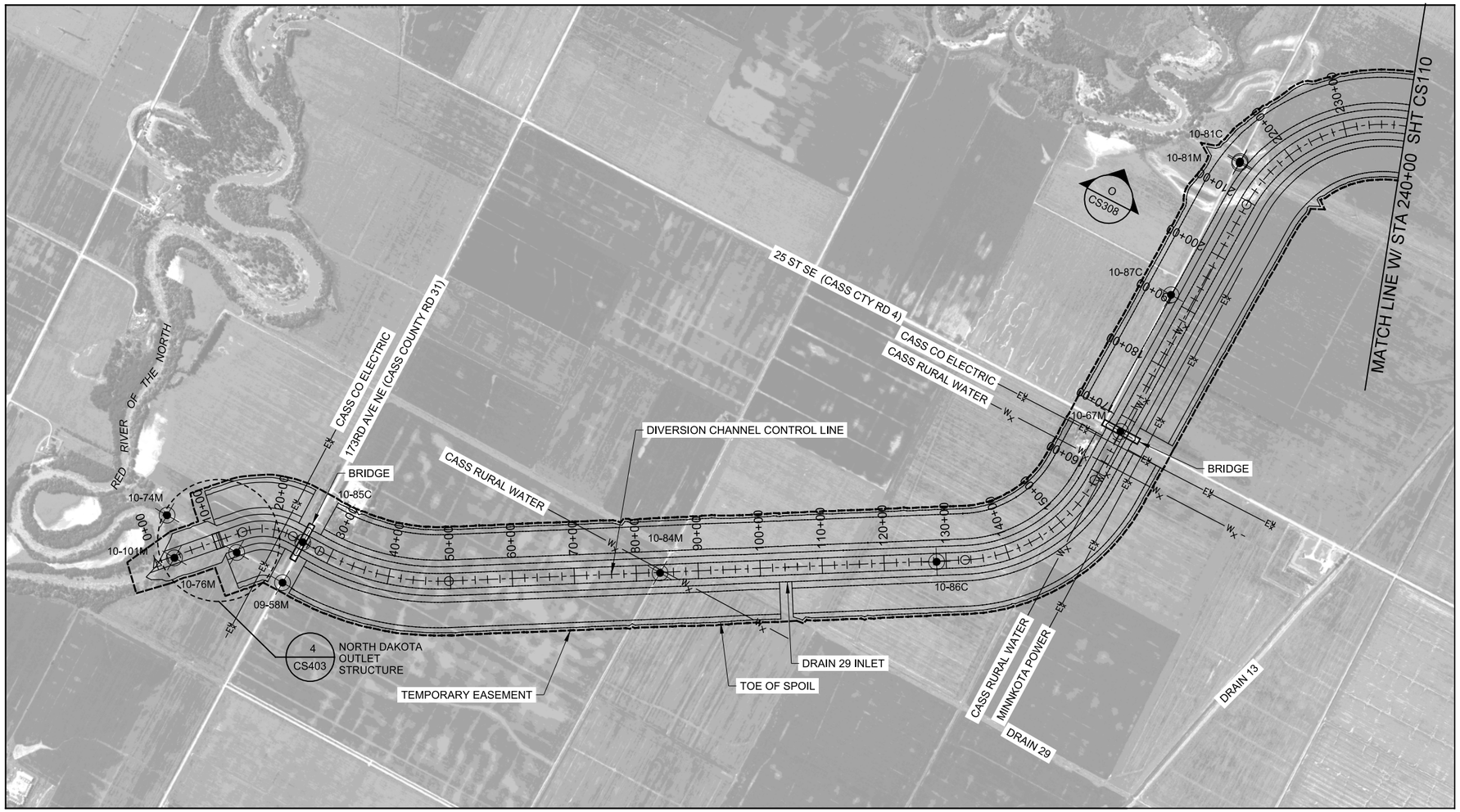
DESIGNED BY: MEIHEI
DATE: JULY 2011
DWN BY: MLUEPP
CKD BY: CGT
SOLICITATION NO.:
SUBMITTED BY: MLI
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS108--dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
GENERAL PLAN

Sheet ID
CS108

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

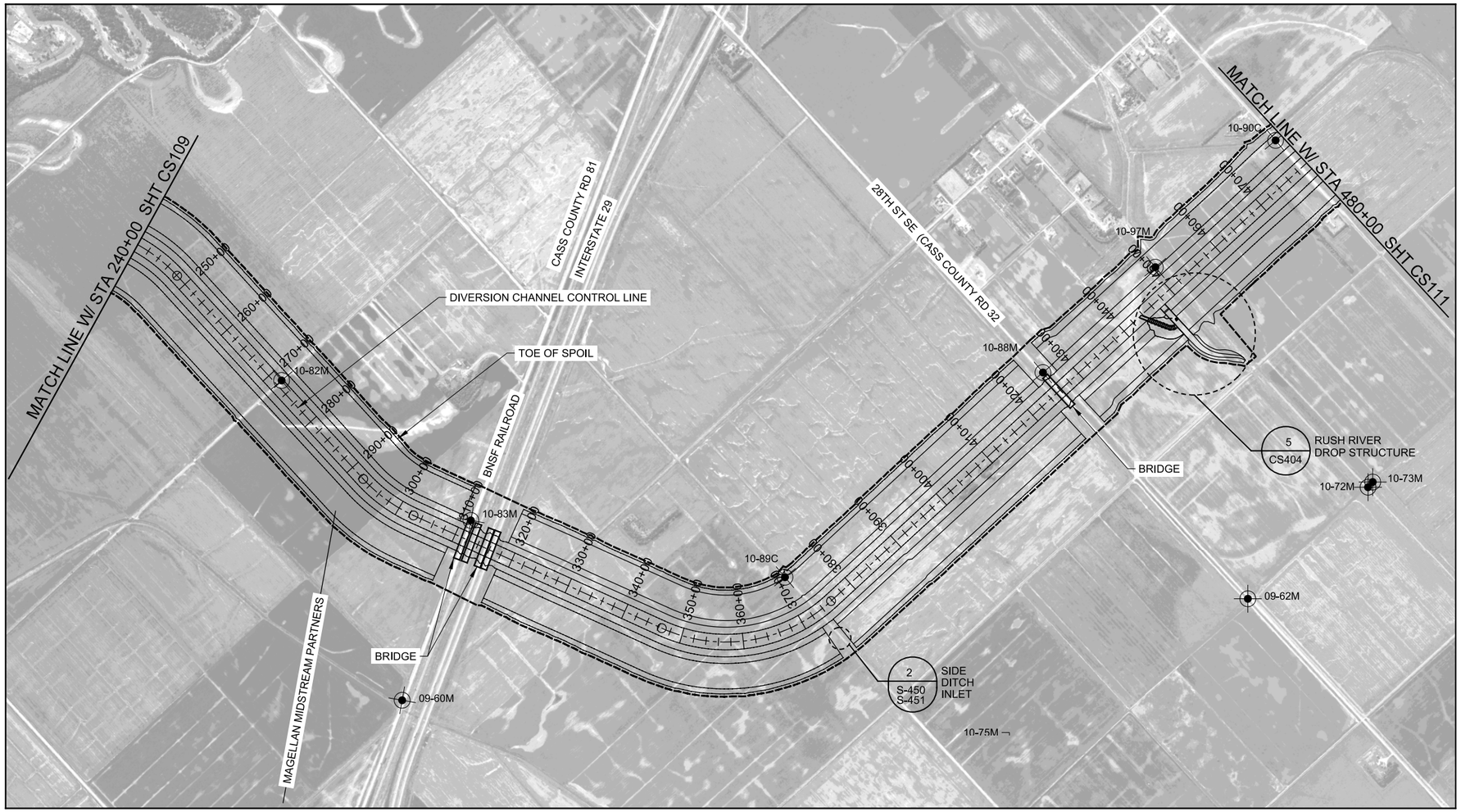
DESIGNED BY: MEI/HEI
DWN BY: MLI/EPP
CKD BY: CGT
SUBMITTED BY: MLI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: As shown
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS109---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 0+00 - STA. 240+00

Sheet ID
CS109

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

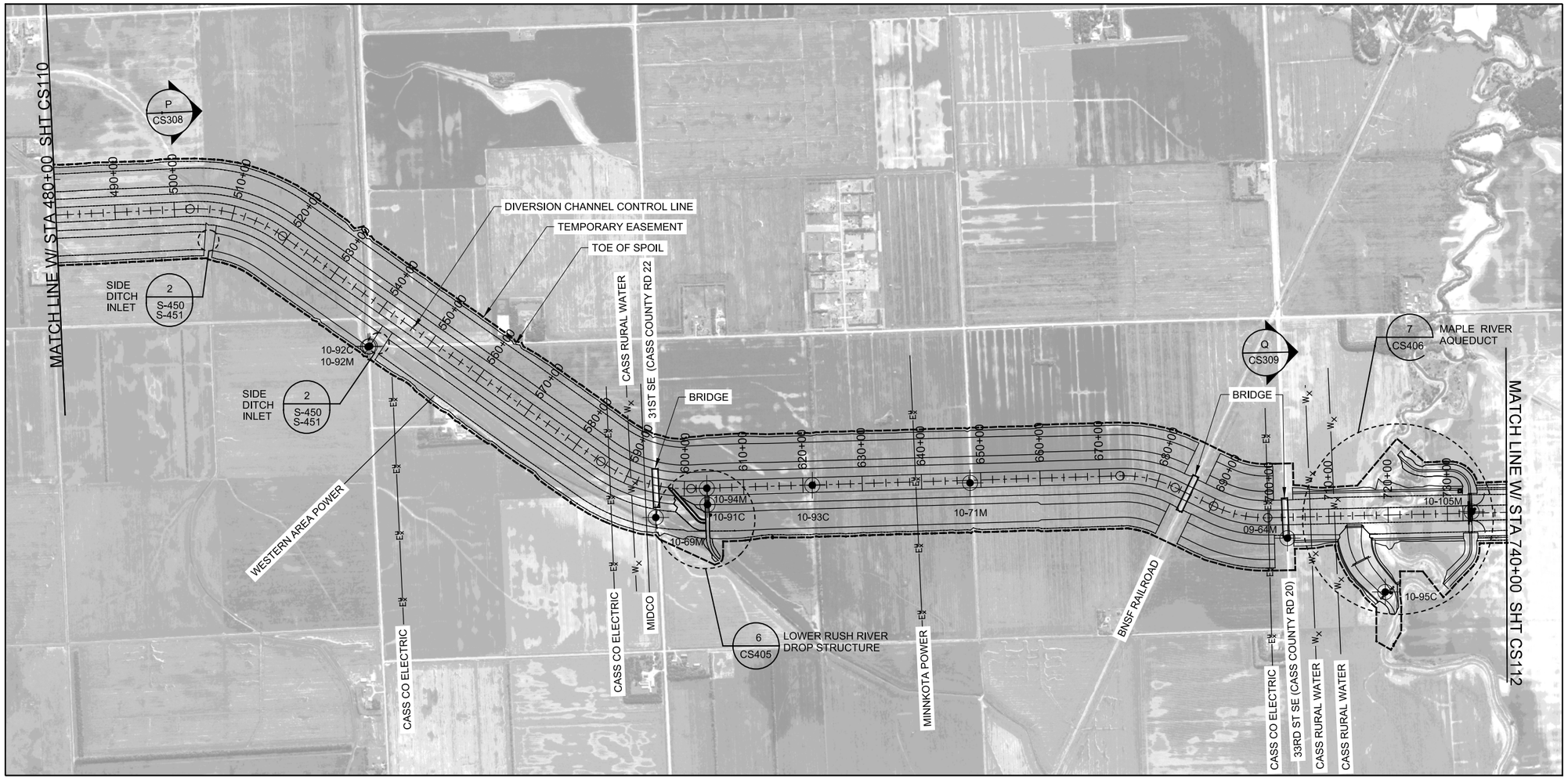
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: ALI
PLOT SCALE: As Noted
PLOT DATE:
SIZE:
FILE NAME: FMML_CS110---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 240+00 - STA. 480+00

Sheet ID
CS110

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

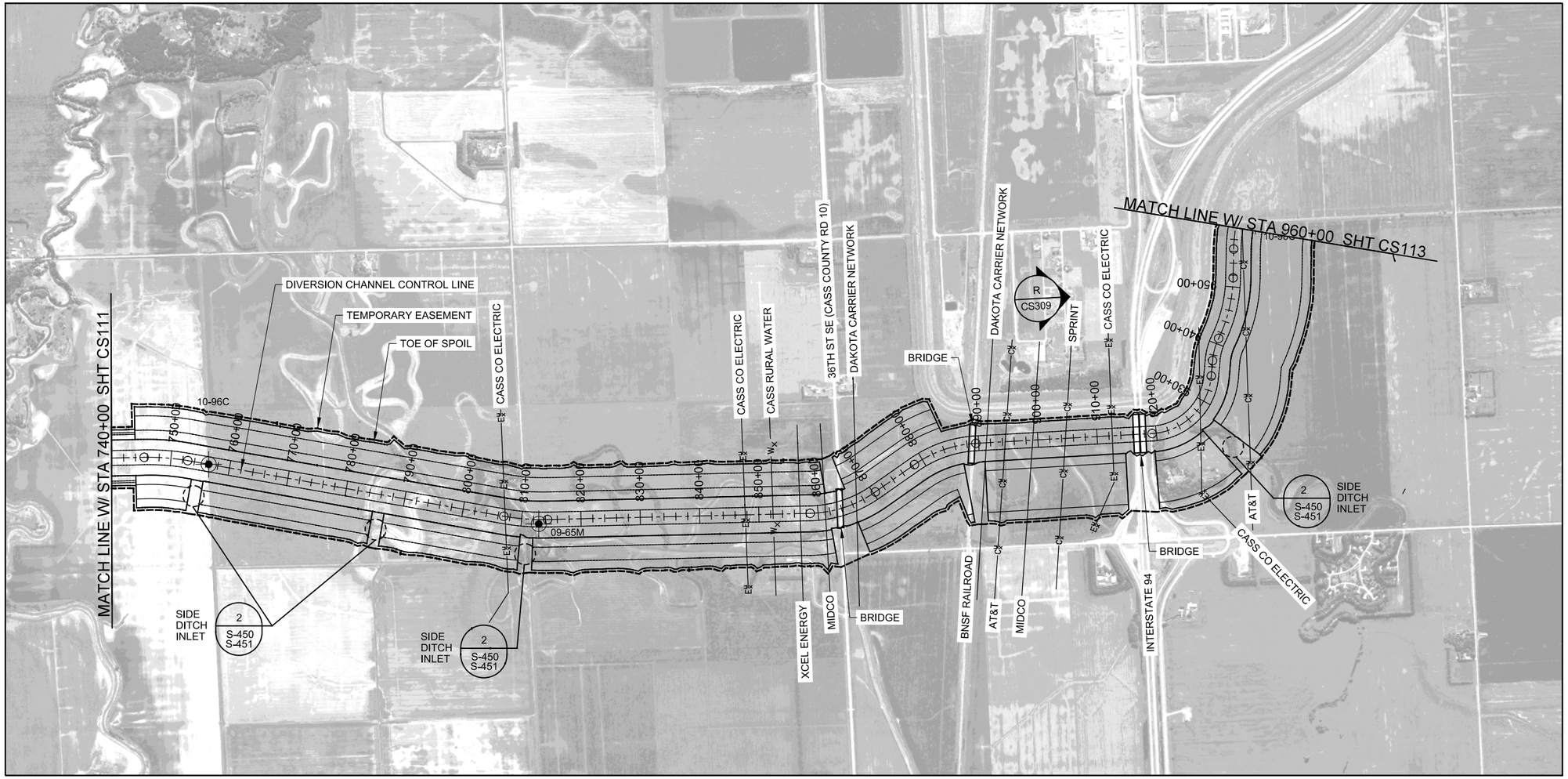
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
DWN BY: MLUEPP
CKD BY: CGT
SUBMITTED BY: MLI
PLOT SCALE:
PLOT DATE:
SIZE:
FILE NAME: FM_CS111---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 480+00 - STA. 740+00

Sheet ID
CS111

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

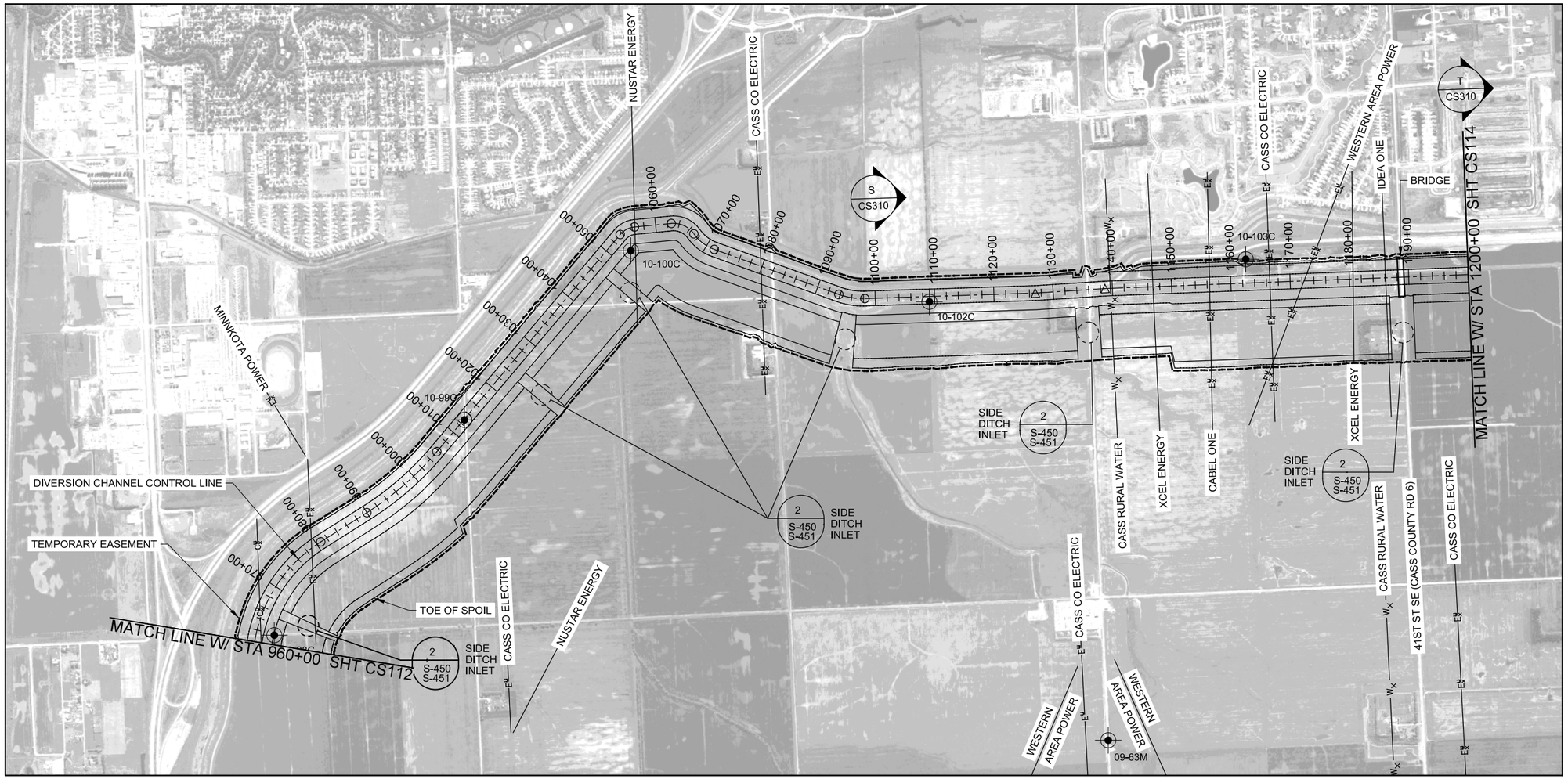
DESIGNED BY: MEI/HEI
DWN BY: MLI/EPP
CKD BY: CGT
SUBMITTED BY: MLI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: None
PLOT DATE:
SIZE:
FILE NAME: FMM_CS112---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 740+00 - STA. 960+00

Sheet ID
CS112

is: USACE-MVP-0000088174



PLAN VIEW

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

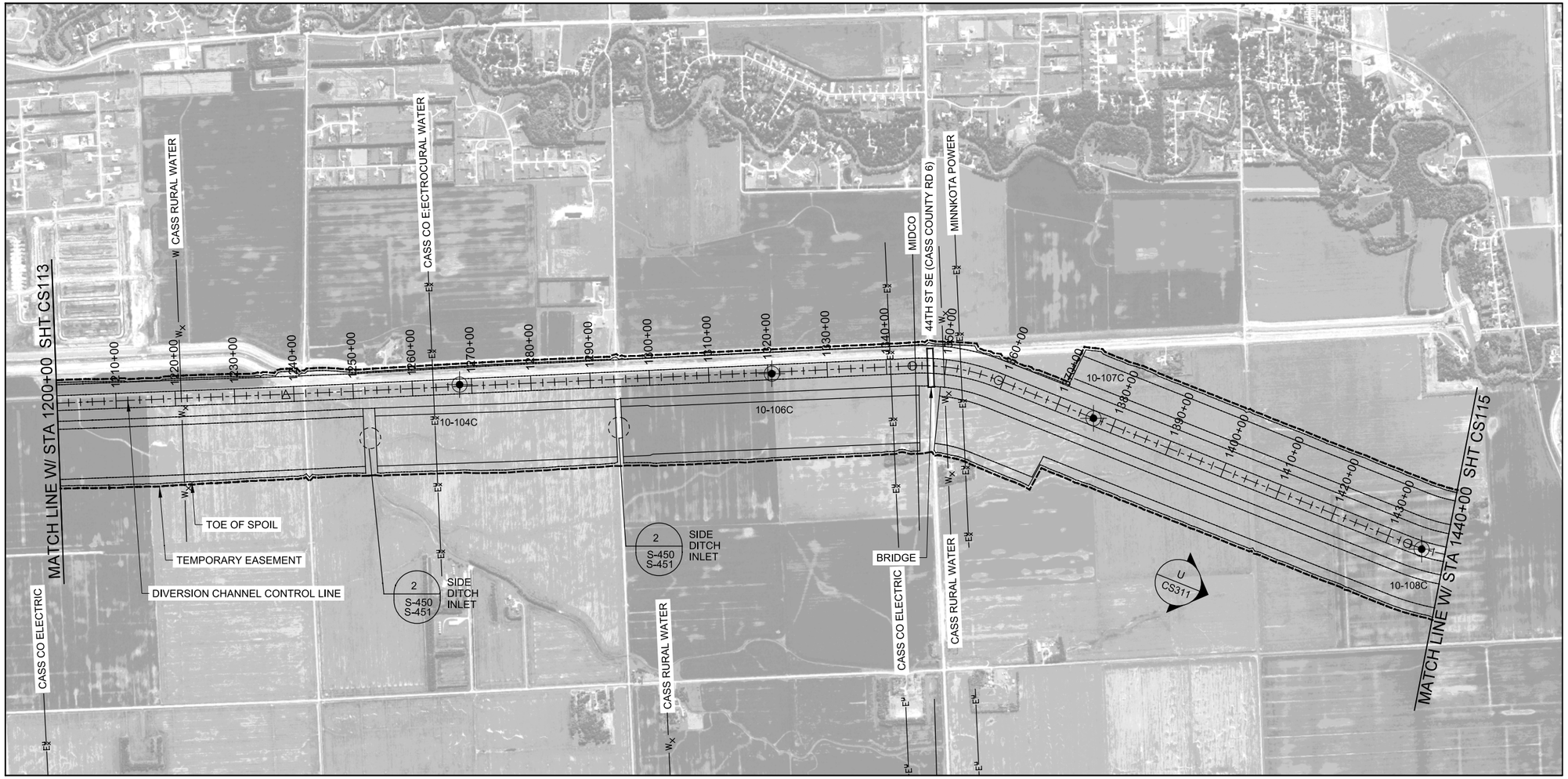
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: ALI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE:
PLOT DATE:
SIZE:
FILE NAME: FM4_CS113---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 960+00 - STA. 1200+00

Sheet ID
CS113

is: USACE-MVP-0000088174



PLAN VIEW

N

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
4. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

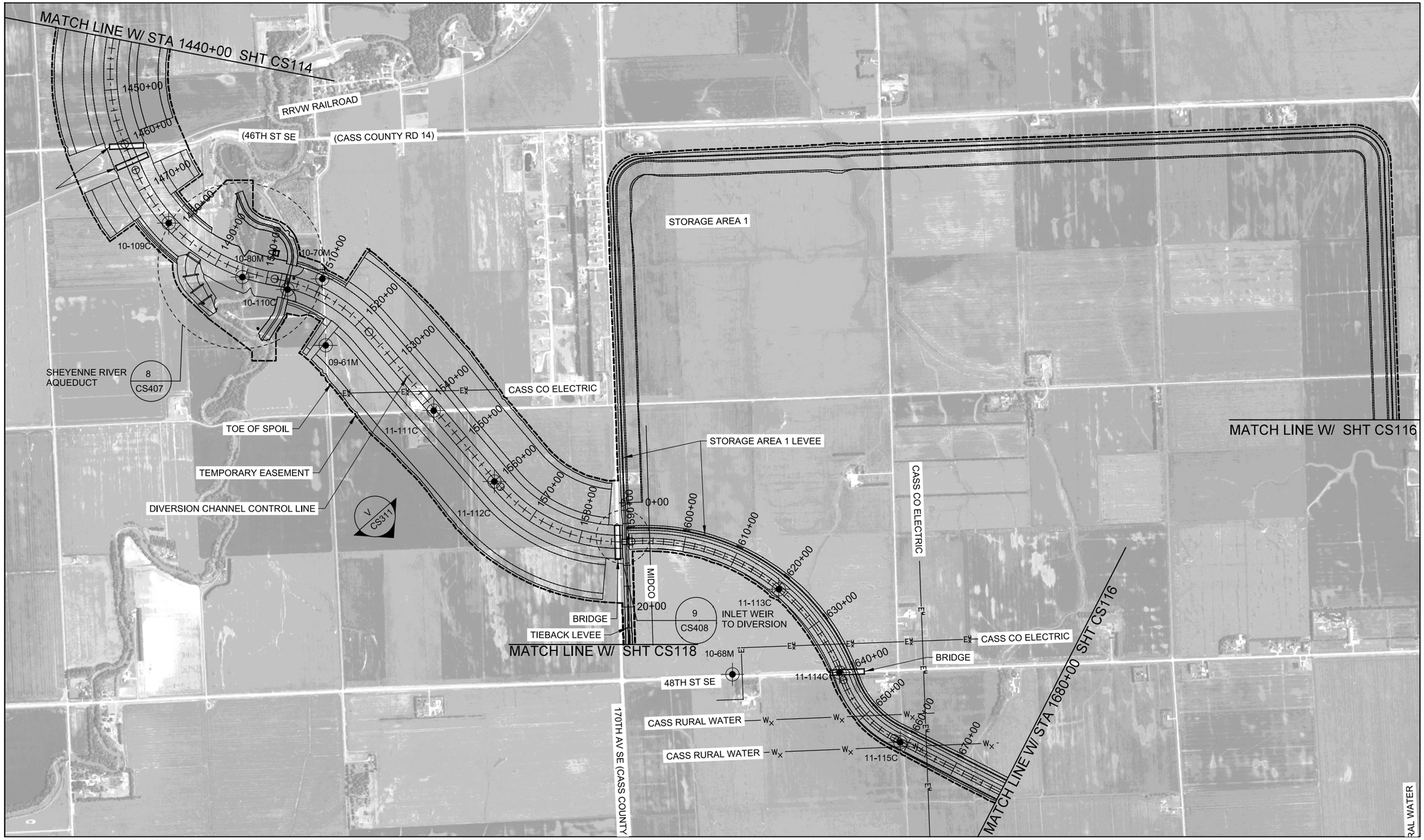
DESIGNED BY: MEIHEI
DATE: JULY 2011
DWN BY: MLIEPP
CKD BY: CGT
SOLICITATION NO.:
SUBMITTED BY: MLI
CONTRACT NO.:
PLOT SCALE: As Noted
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS114---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 1200+00 - STA. 1440+00

Sheet ID
CS114

is: USACE-MVP-0000088174



PLAN VIEW

N

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. SEE SHEET CS409 FOR STORAGE AREA 1 DETAIL.
4. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
5. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

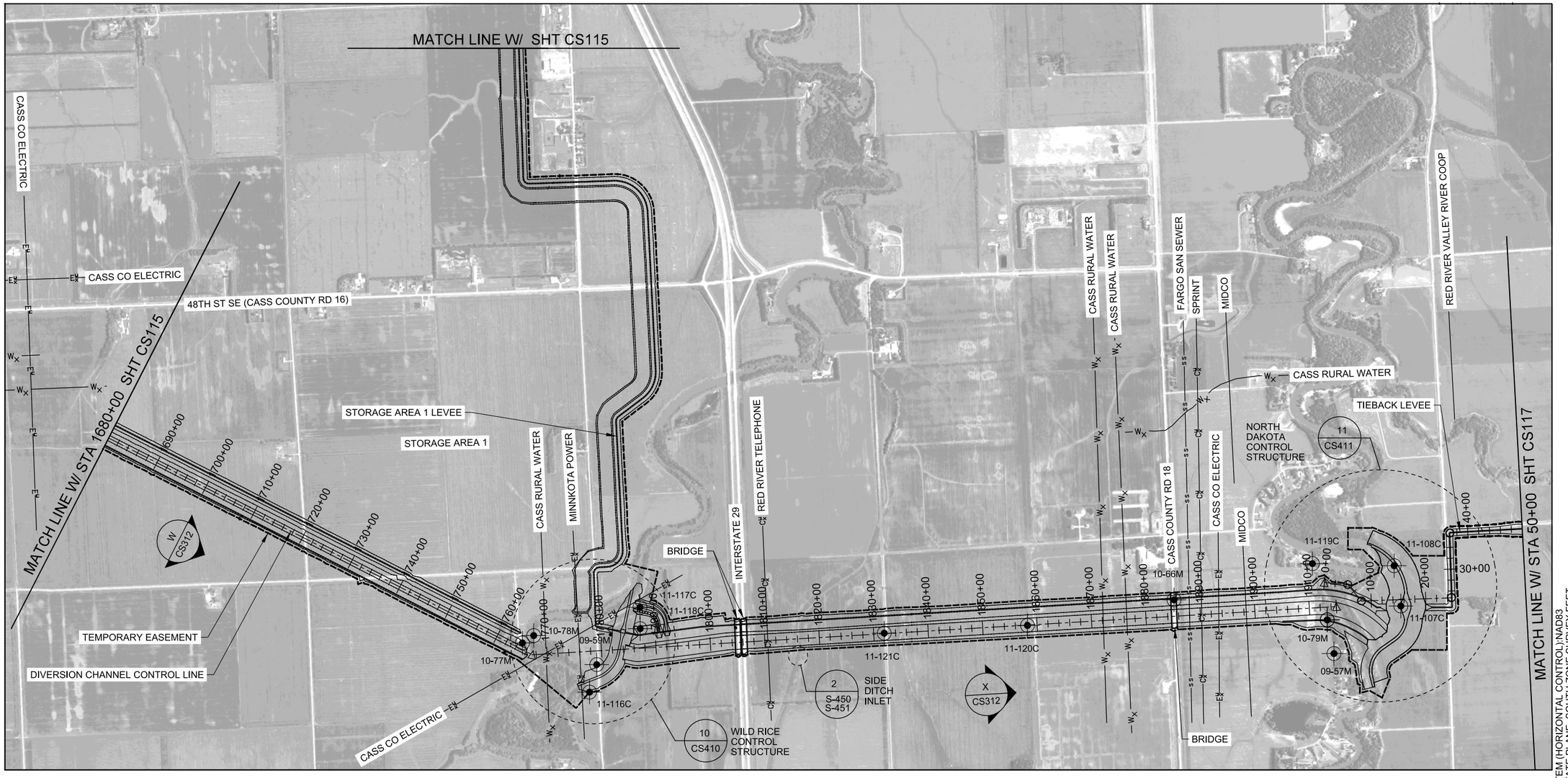
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: IALI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS115---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 1440+00 - STA. 1680+00

Sheet ID
CS115

is: USACE-MVP-0000088174



PLAN VIEW

SCALE: 1"= 1000'-0"

NOTES:

1. PLAN VIEW DOES NOT DEPICT BENCHING.
2. SEE TYPICAL SECTIONS FOR GEOMETRY OF CHANNEL.
3. SEE SHEET CS409 FOR STORAGE AREA 1 DETAIL.
4. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
5. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

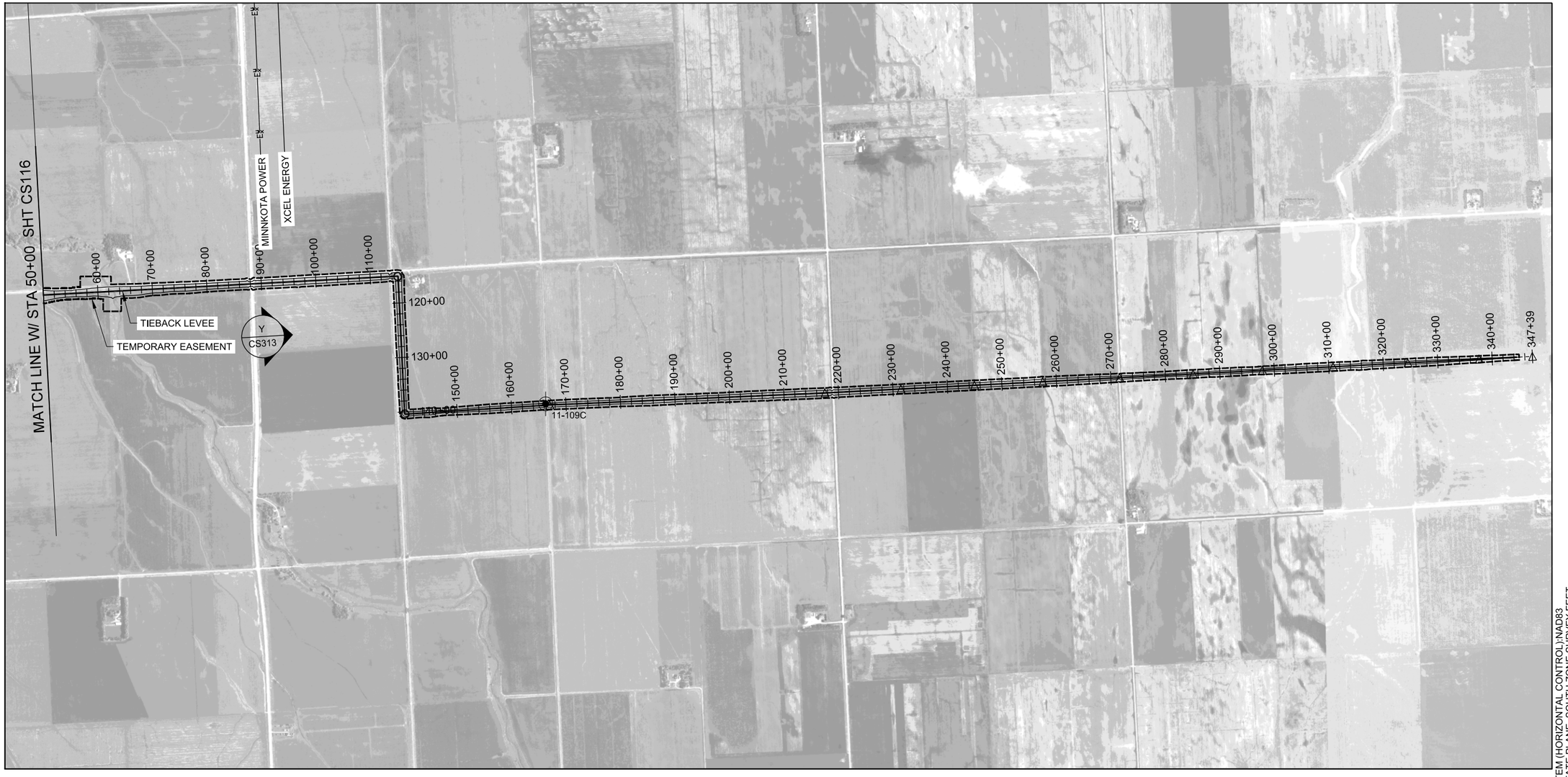
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: MLI
SIZE:
FILE NAME: FMM_CS116---.dgn
PLOT SCALE:
PLOT DATE:
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
STA 1680+00 - STA. 1920+00

Sheet ID
CS116

is: USACE-MVP-0000088174



PLAN VIEW

N

1000' 500' 0 1000'

SCALE: 1"= 1000'-0"

NOTES:

1. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
2. CADD UPDATE USACE ST. PAUL DISTRICT.

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MEIHEI
DWN BY: MLUEPP
CKD BY: CGT
SUBMITTED BY: IALI
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS117---dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
EAST OPTION TIEBACK LEVEE

Sheet ID
CS117

is: USACE-MVP-0000088174

PLAN VIEW

N

1000' 500' 0 1000'

SCALE: 1" = 1000'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

NOTES:

1. DESIGN BY HOUSTON ENGINEERING AND BARR ENGINEERING.
2. CADD UPDATE USACE ST. PAUL DISTRICT.

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

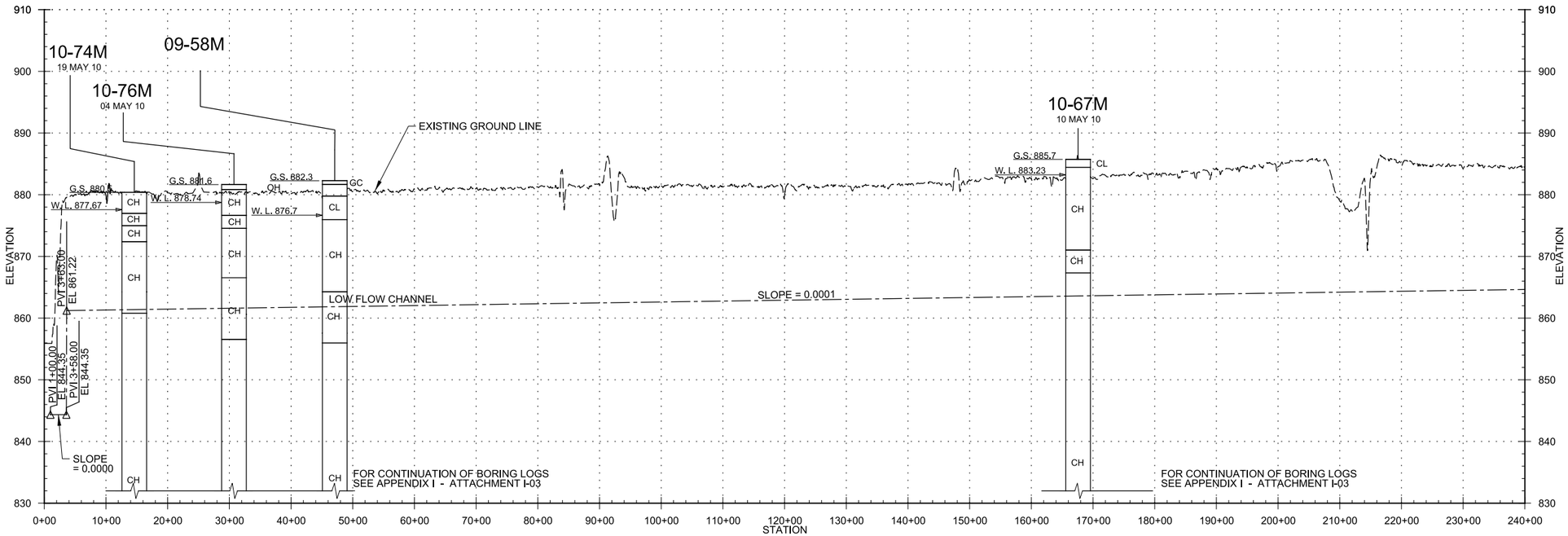
DESIGNED BY: MEIHEI
DWN BY: MLIEPP
CKD BY: CGT
SUBMITTED BY: MLI
PLOT SCALE: 1:50
PLOT DATE:
SIZE:
FILE NAME: FMM_CS118---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PLAN
CASS COUNTY ROAD 17 TIEBACK LEVEE

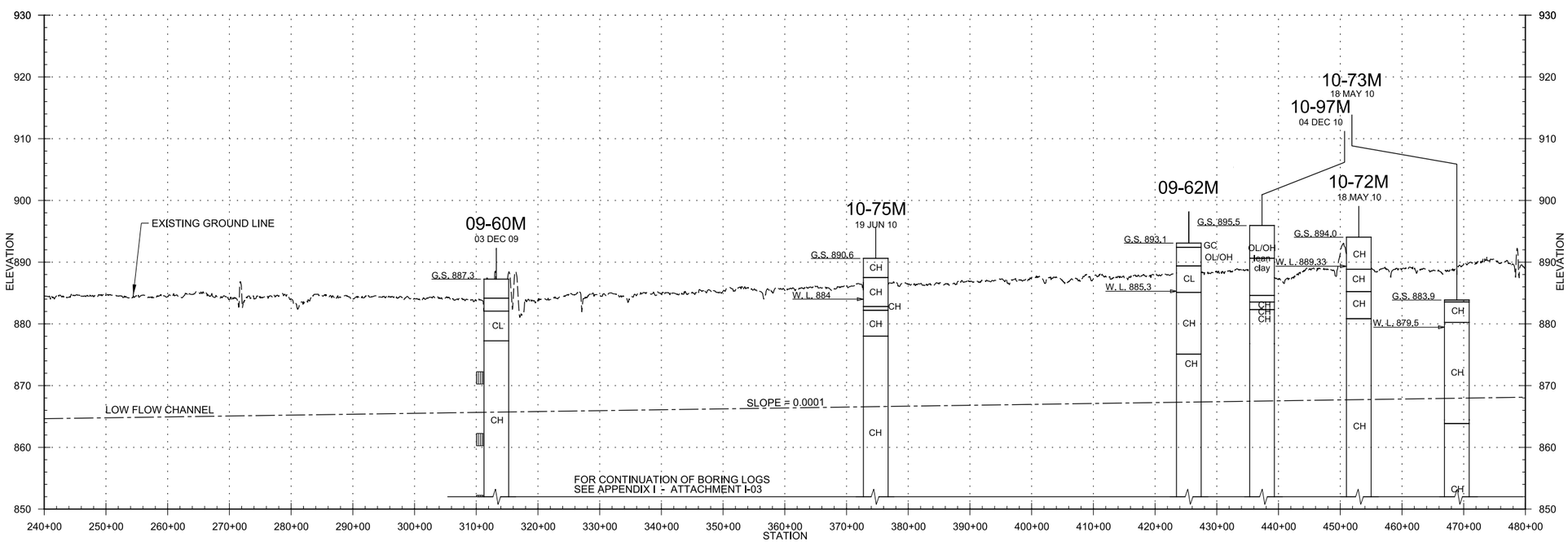
Sheet ID
CS118

is: USACE-MVP-0000088174



PROFILE

NORTH DAKOTA DIVERSION (LPP)



PROFILE

NORTH DAKOTA DIVERSION (LPP)

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

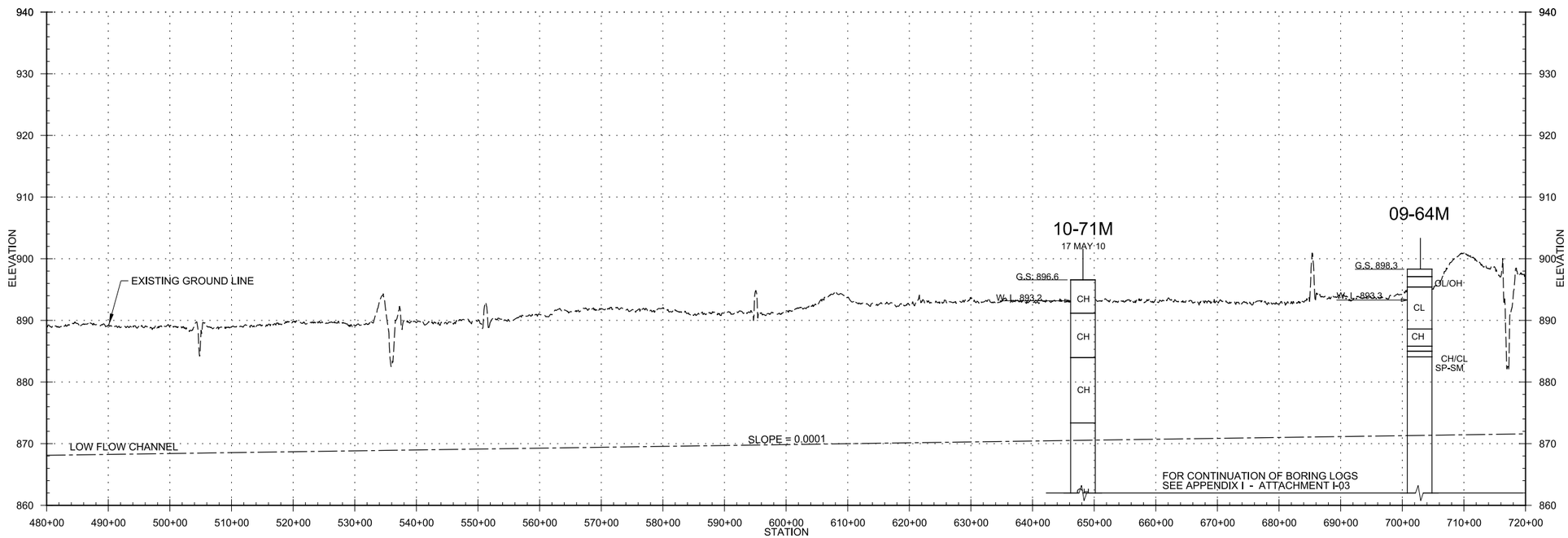
DESIGNED BY: EPP/KAH
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FM_CS204---dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PROFILE
STA. 0+00+00 - STA. 480+00

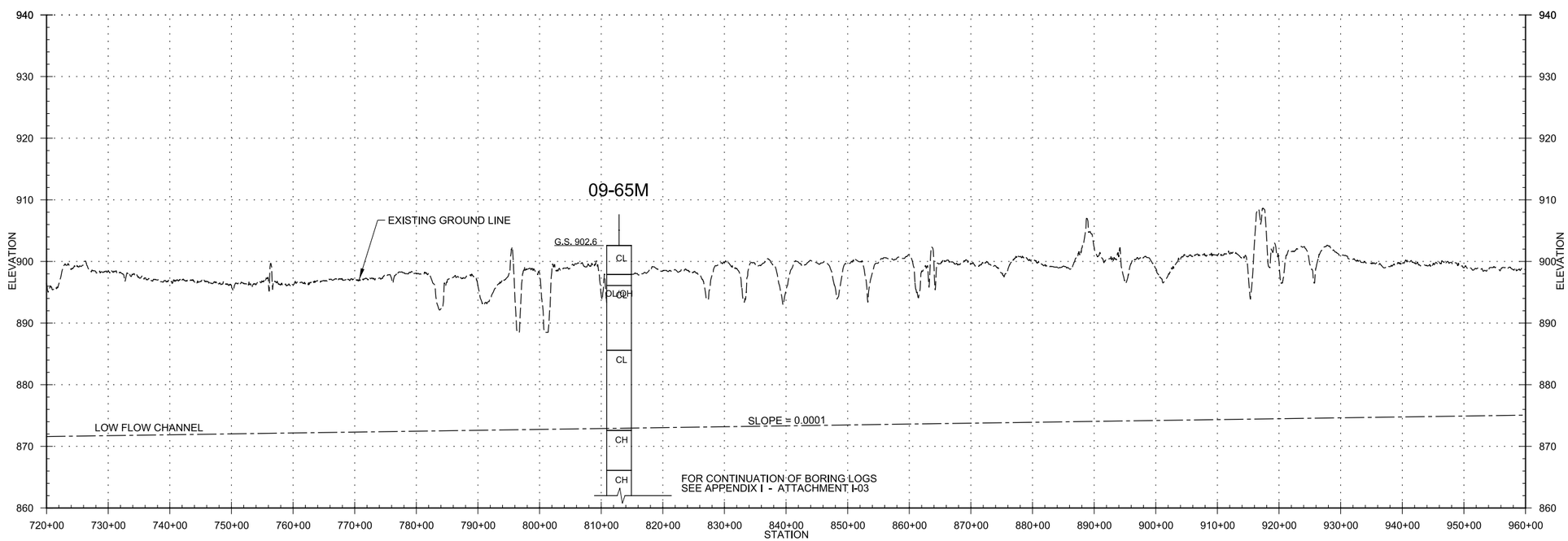
Sheet ID
CS204

is: USACE-MVP-0000088174



PROFILE

NORTH DAKOTA DIVERSION (LPP)



PROFILE

NORTH DAKOTA DIVERSION (LPP)

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

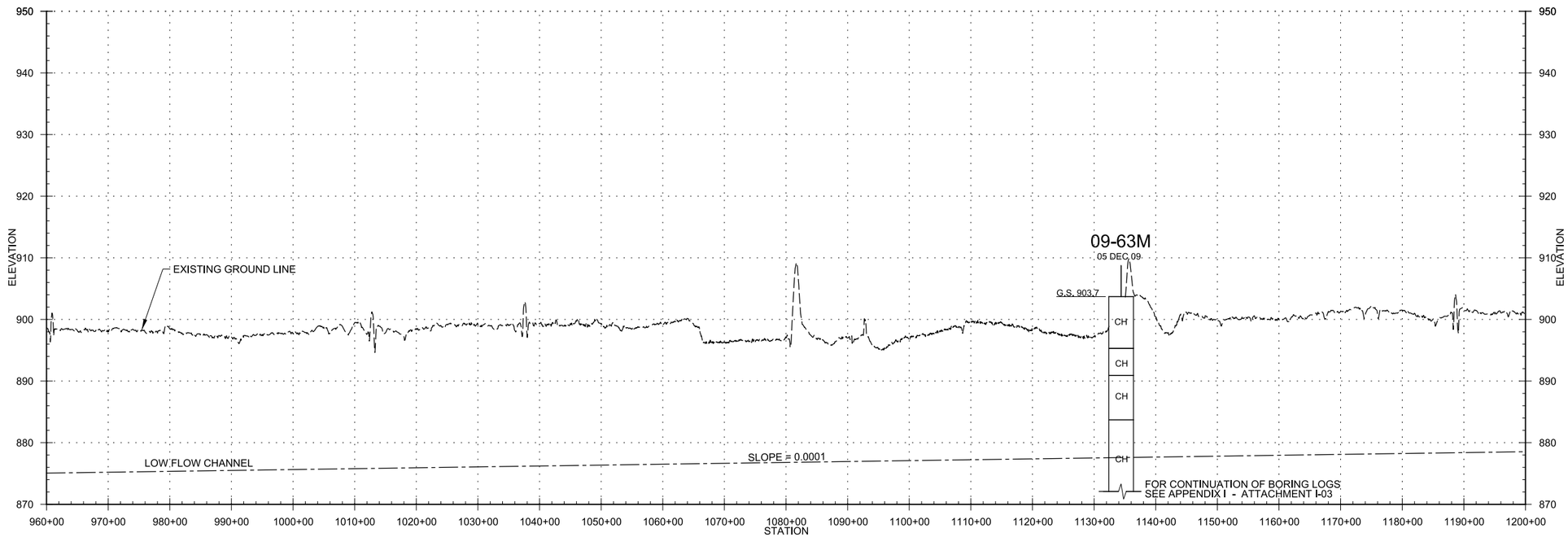
DESIGNED BY: EPP/KAH
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FM_CS205---dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PROFILE
STA. 480+00+00 - STA.960+00

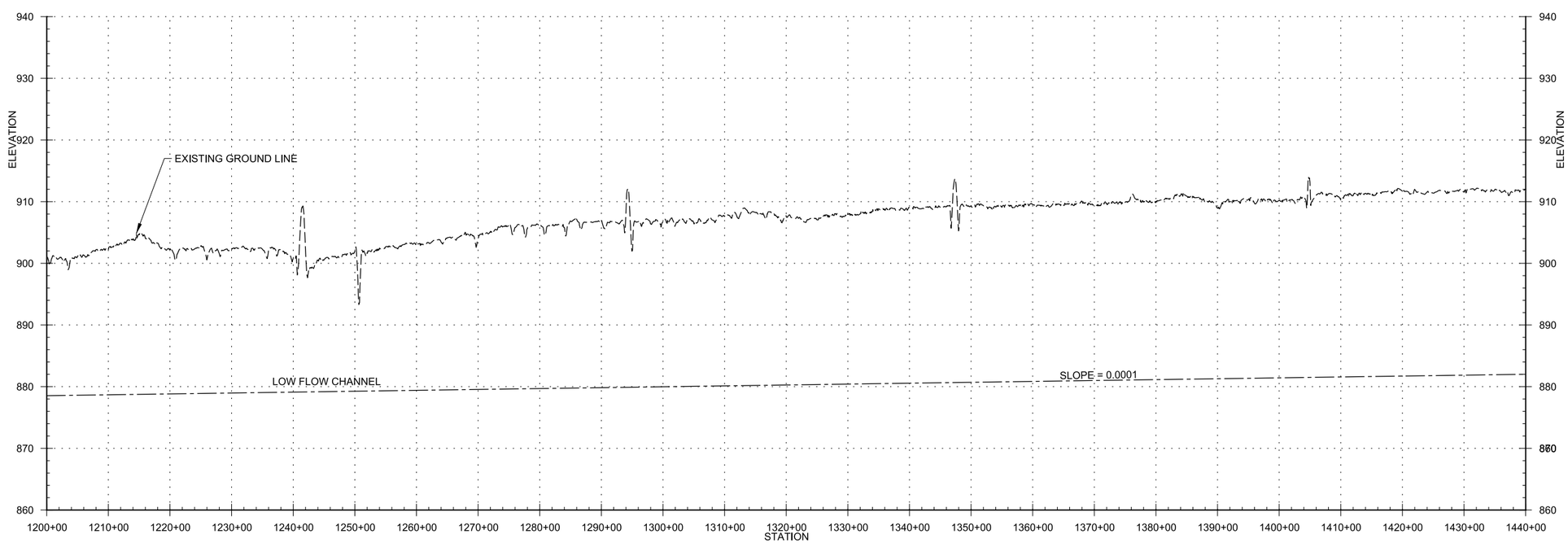
Sheet ID
CS205

is: USACE-MVP-0000088174



PROFILE

NORTH DAKOTA DIVERSION (LPP)



PROFILE

NORTH DAKOTA DIVERSION (LPP)

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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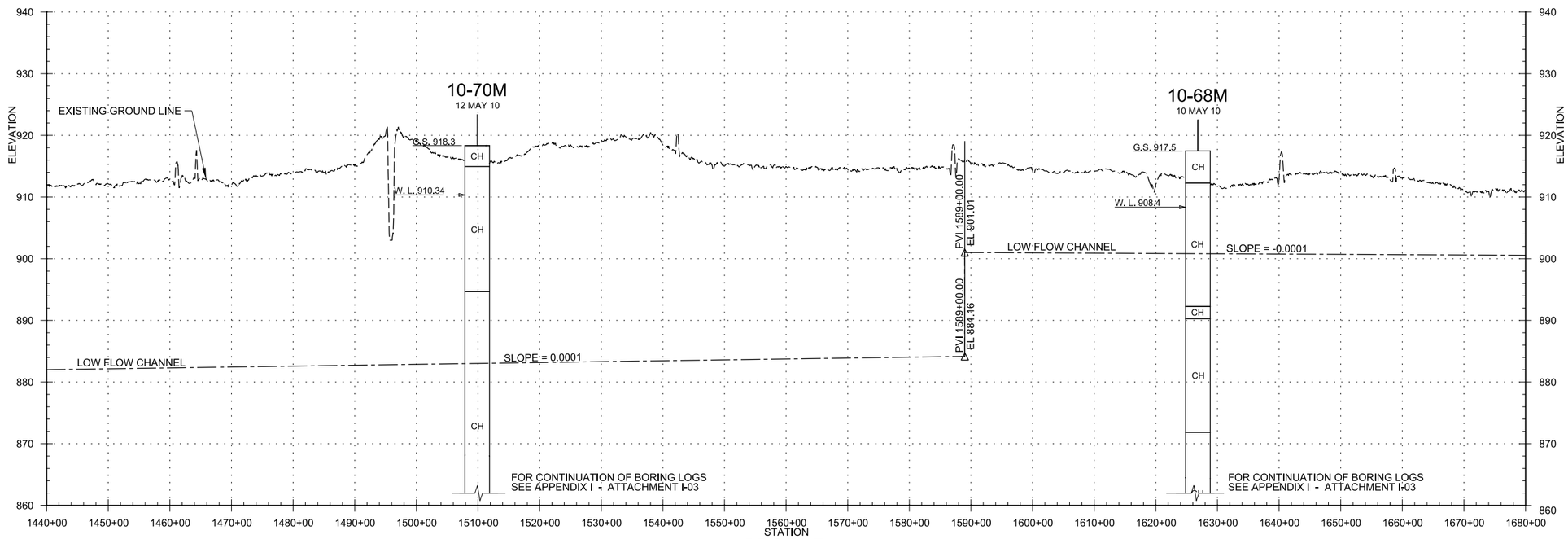
DWN BY: EPP
CKD BY: JBM
SUBMITTED BY: MGM
PLOT SCALE:
PLOT DATE:
SIZE:
FILE NAME: FM_CS206---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PROFILE
STA.960+00+00 - STA.1400+00

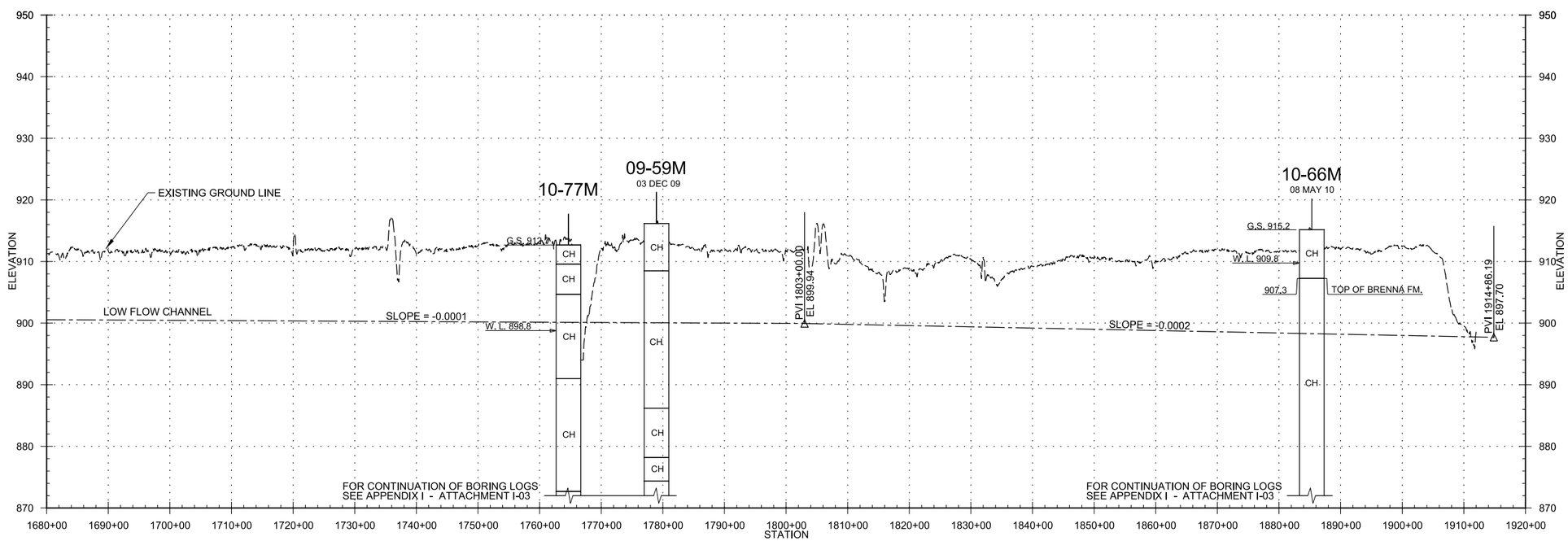
Sheet ID
CS206

is: USACE-MVP-0000088174



PROFILE

NORTH DAKOTA DIVERSION (LPP)



PROFILE

NORTH DAKOTA DIVERSION (LPP)

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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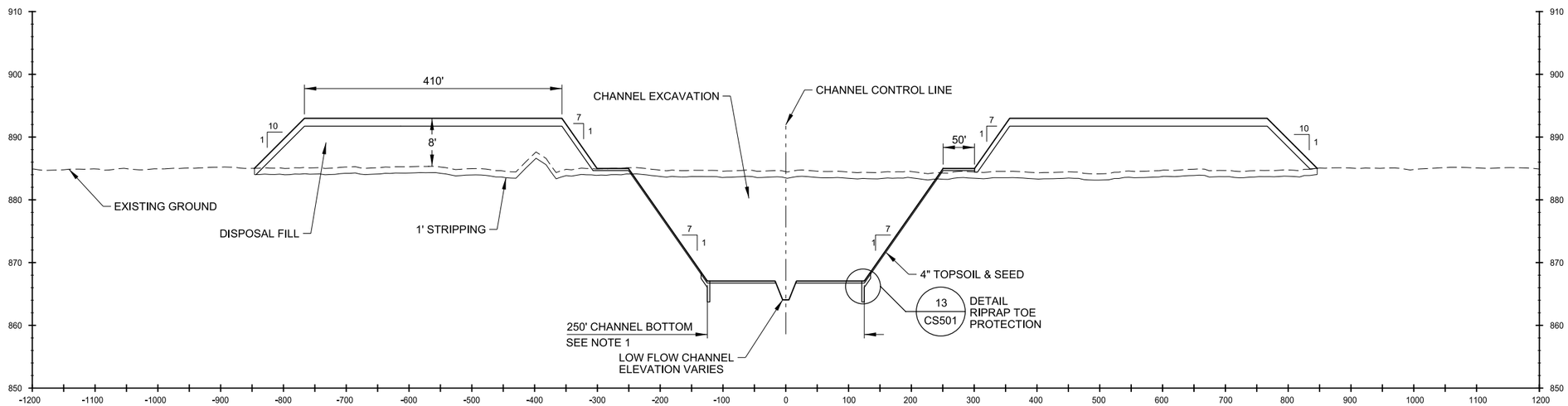
DATE: JULY 2011
DWN BY: EPP
CKD BY: JBM
SOLICITATION NO.:
SUBMITTED BY: MGM
CONTRACT NO.:
PLOT SCALE:
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FM_CS207.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
PROFILE
STA.1400+00+00 - STA.1920+00

Sheet ID
CS207

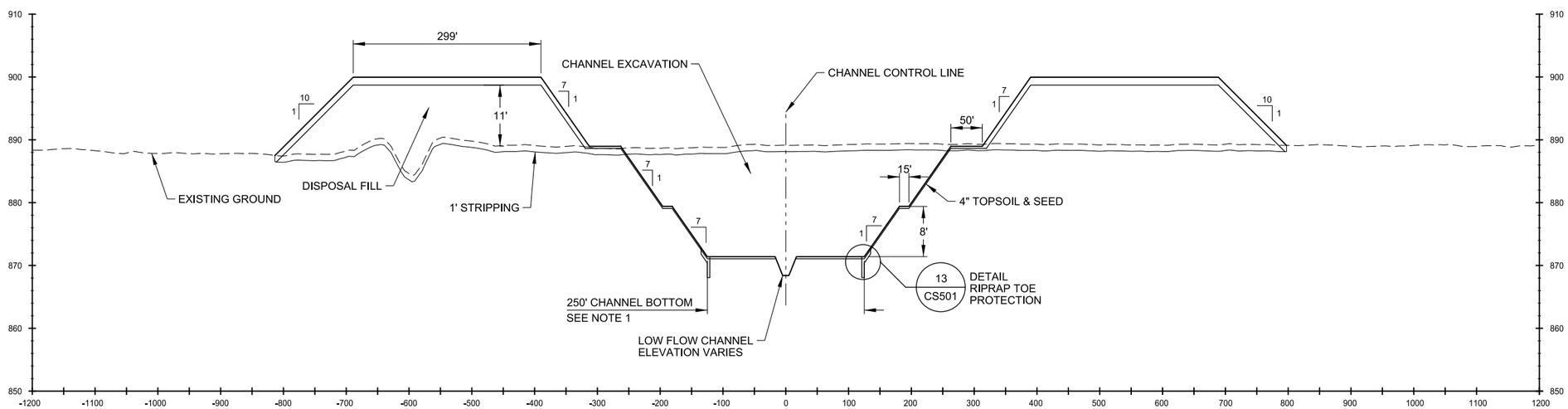
is: USACE-MVP-0000088174



O
CS109

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 0+00 TO STA. 390+00



P
CS111

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 390+00 TO STA. 660+00

NOTES:

1. TO PREVENT EROSION OF LOW FLOW INVERT PLACE RIPRAP GRADE CONTROL EVERY 5000'. SEE SHEET I.D. CS501 FOR DETAILS.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

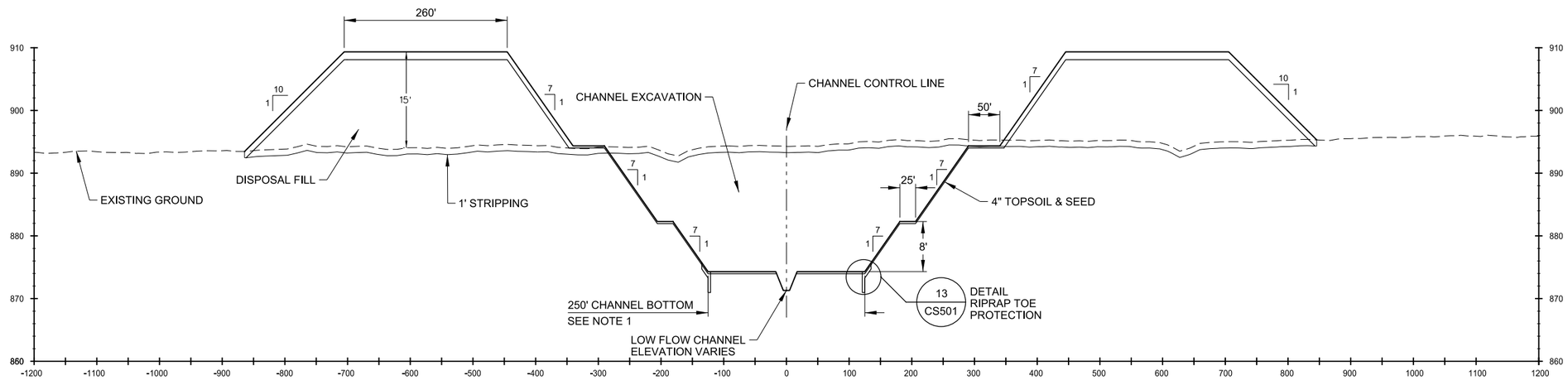
DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1:1
PLOT DATE: N/a
SIZE:
FILE NAME: FMM_CS308---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
O & P

Sheet ID
CS308

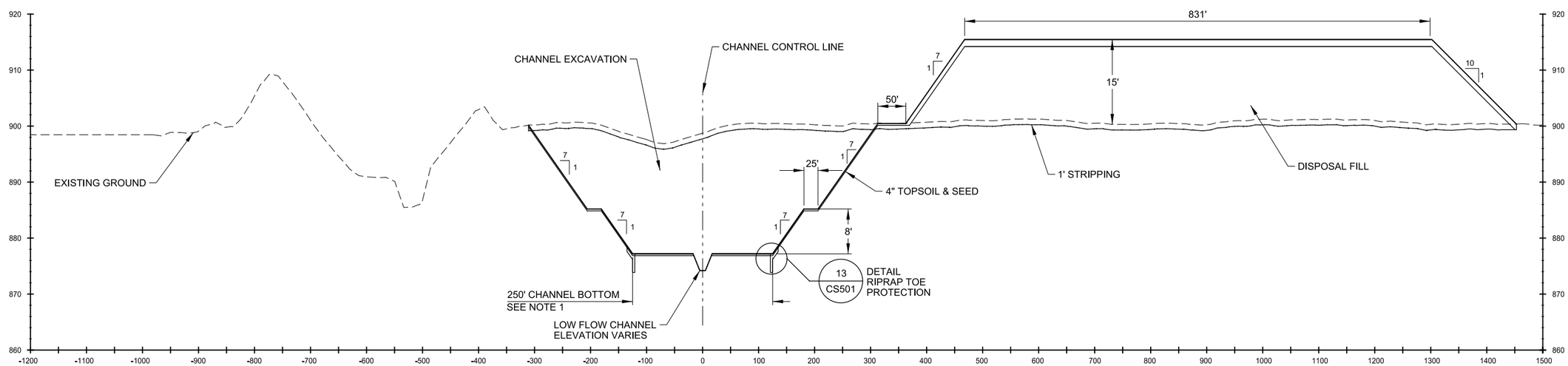
auto_time



Q
CS111

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 660+00 TO STA. 885+00



R
CS112

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 885+00 TO STA.1000+00

NOTES:

1. TO PREVENT EROSION OF LOW FLOW INVERT PLACE RIPRAP GRADE CONTROL EVERY 5000'. SEE SHEET I.D. CS501 FOR DETAILS.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT

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DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1" = 10000'
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FMM_CS309---.dgn

U.S. ARMY CORPS OF ENGINEERS
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ST. PAUL, MINNESOTA

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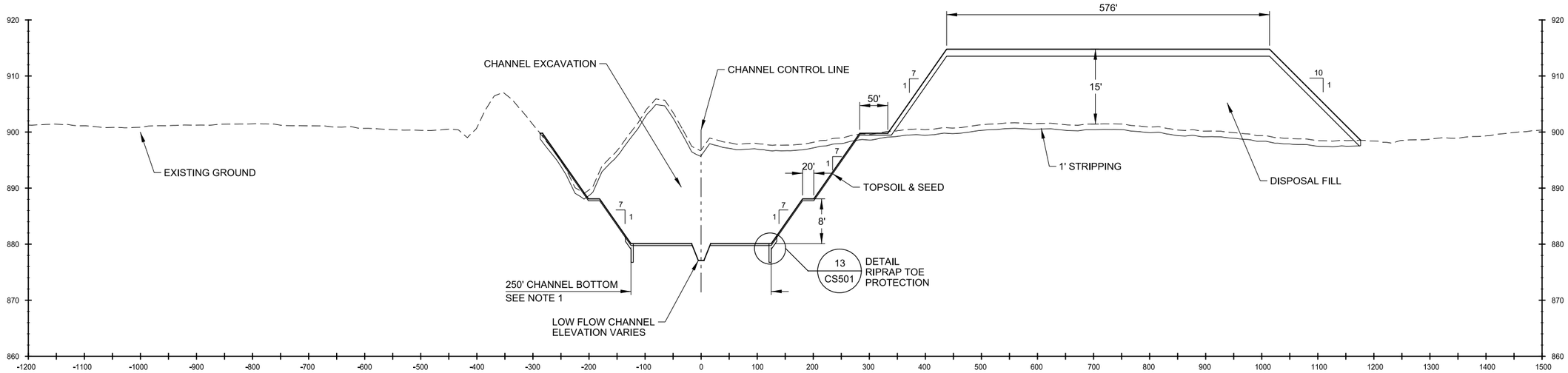
FARGO, ND 58102

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
Q & R

Sheet ID
CS309

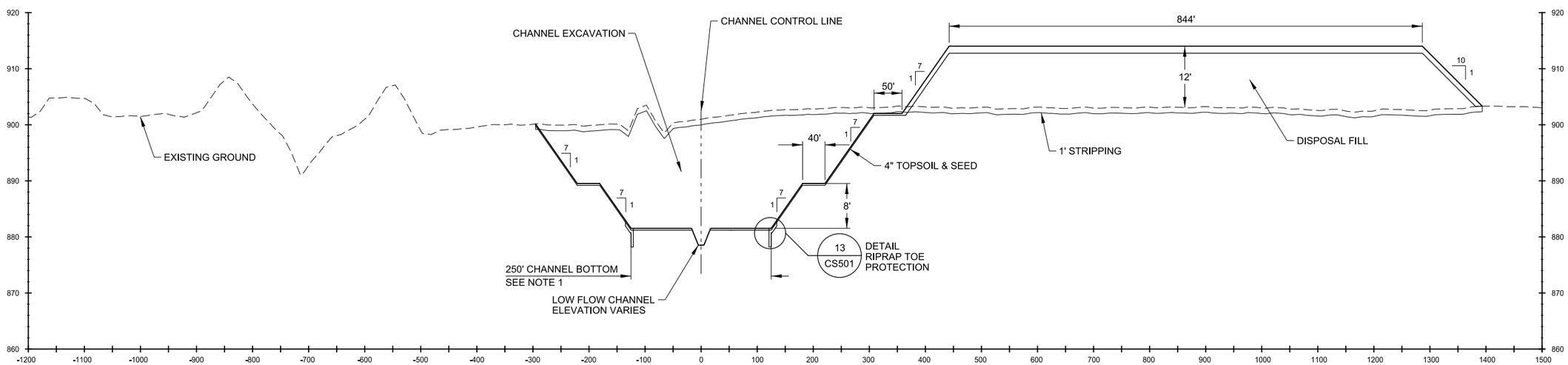
auto_time



S
CS113

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1000+00 TO STA. 1150+00



T
CS113

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1150+00 TO STA. 1300+00

NOTES:

1. TO PREVENT EROSION OF LOW FLOW INVERT PLACE RIPRAP GRADE CONTROL EVERY 5000'. SEE SHEET I.D. CS501 FOR DETAILS.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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MARK	DESCRIPTION	DATE	APPR.

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CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1000
PLOT DATE:
SIZE:
FILE NAME: FMM_CS310---.dgn

U.S. ARMY CORPS OF ENGINEERS
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FARGO, ND 58102

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
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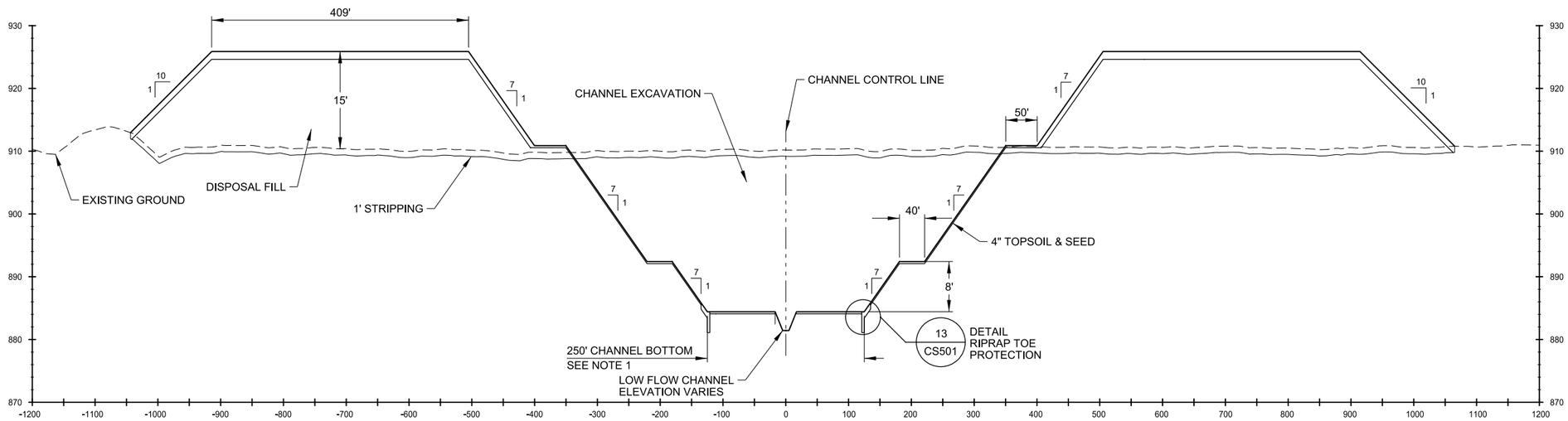
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
S & T

Sheet ID
CS310

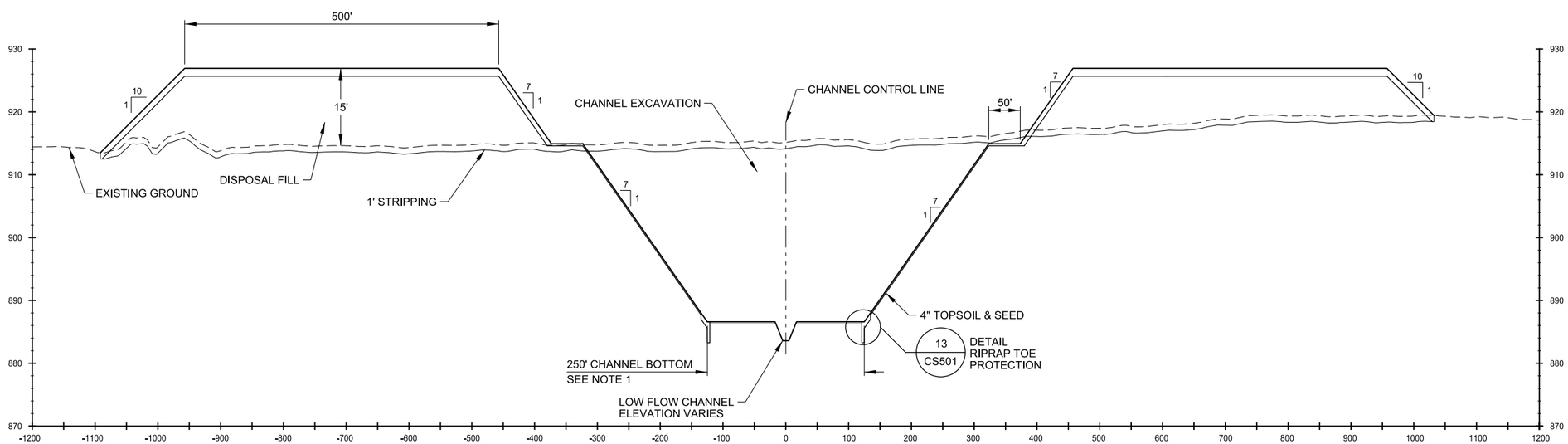
auto_time



U
CS114

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1300+00 TO STA. 1490+00



V
CS115

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1514+00 TO STA. 1585+00

NOTES:

1. TO PREVENT EROSION OF LOW FLOW INVERT PLACE RIPRAP GRADE CONTROL EVERY 5000'. SEE SHEET I.D. CS501 FOR DETAILS.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

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ST. PAUL DISTRICT
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HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1:1000
PLOT DATE: N/A
SIZE:
FILE NAME: FMM_CS311---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

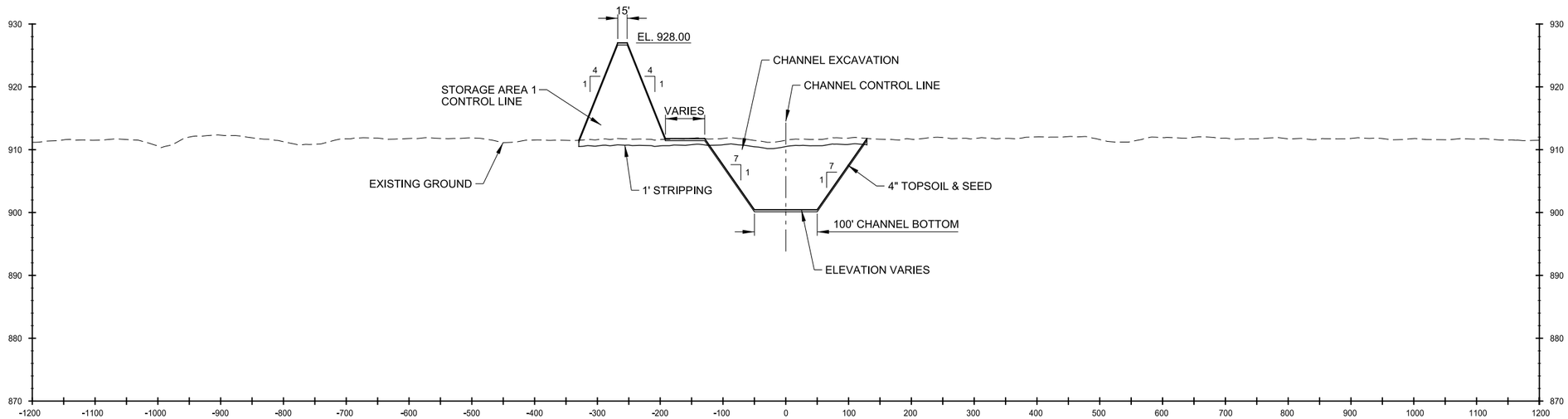
FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
U & V

Sheet ID
CS311

auto_time

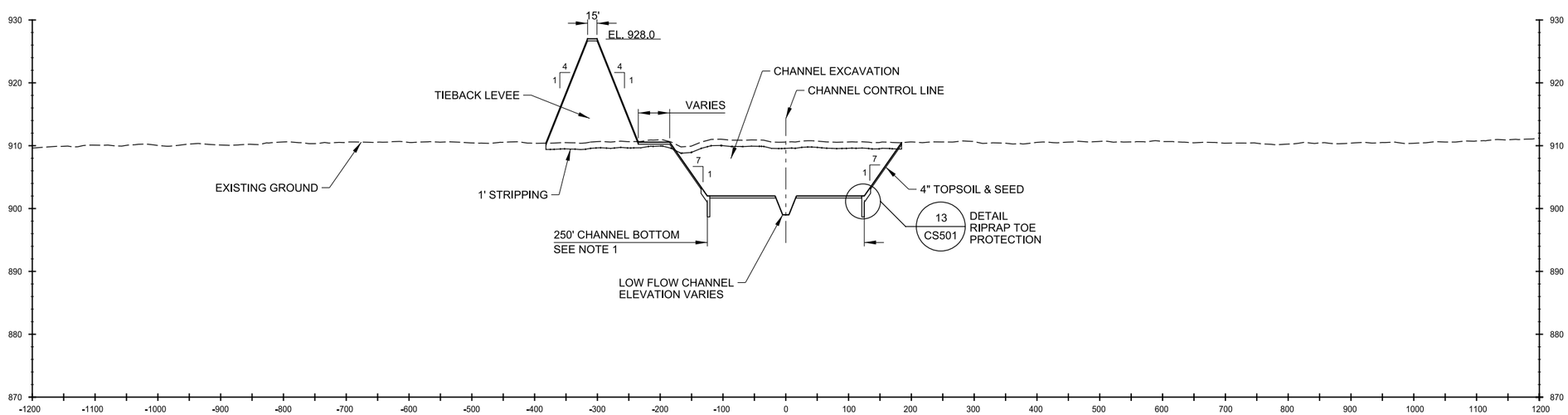
is: USACE-MVP-0000088174



W / CS116

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1595+00 TO STA. 1766+50



X / CS116

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CHANNEL AND SPOIL PILES
STA. 1803+00 TO STA. 1905+00

NOTES:

1. TO PREVENT EROSION OF LOW FLOW INVERT PLACE RIPRAP GRADE CONTROL EVERY 5000'. SEE SHEET I.D. CS501 FOR DETAILS.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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FARGO, ND 58102

DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1" = 1000'
PLOT DATE: N/a
SIZE:
FILE NAME: FMM_CS312---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
W & X

Sheet ID
CS312

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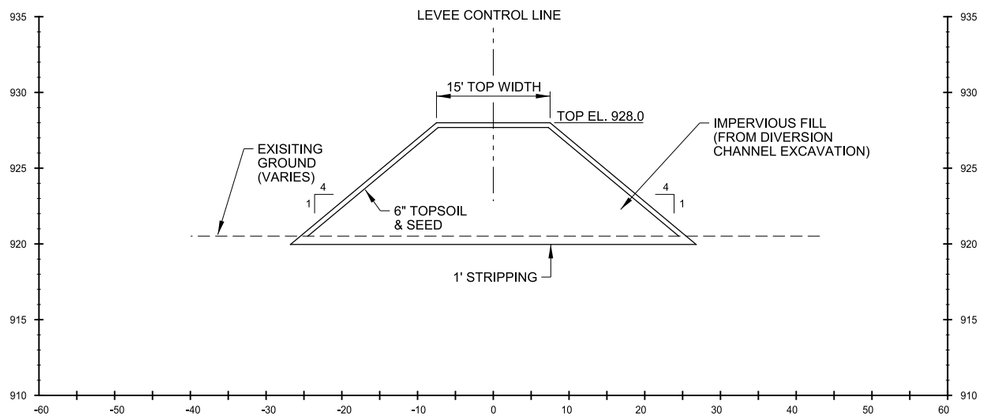
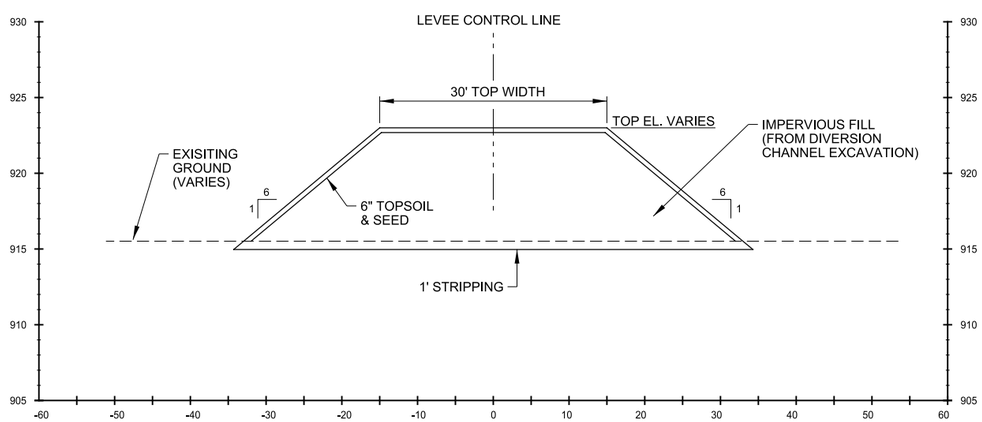
is: USACE-MVP-0000088174



Y
CS117

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

EAST OPTION 2B TIEBACK LEVEE



Z
CS118

TYPICAL SECTION - NORTH DAKOTA DIVERSION (LPP)

CASS 17 TIEBACK LEVEE

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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MARK	DESCRIPTION	DATE	APPR.

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HOUSTON ENGINEERING, INC.
1401 21ST AVE. N.
FARGO, ND 58102

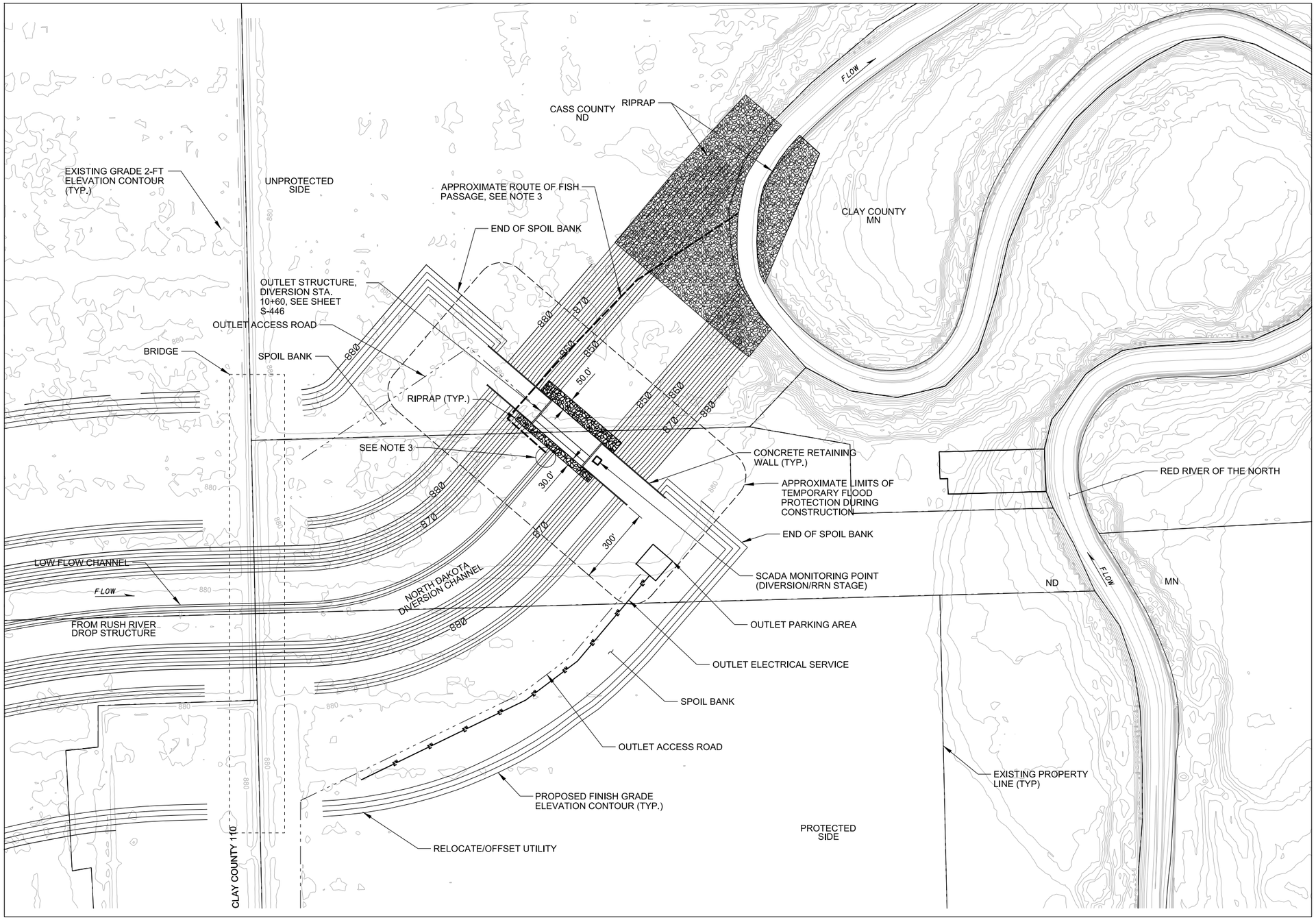
DESIGNED BY: MEIHEI
DWN BY: MLI
CKD BY: CGT
SUBMITTED BY: MATTEW L. ISLEY
PLOT SCALE: 1:1 / 1:500
PLOT DATE: N/a
SIZE:
FILE NAME: FMM_CS313---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
TYPICAL SECTIONS
TIEBACK LEVEES, Y & Z

Sheet ID
CS313

auto_time



N

4
CS109

DETAIL

NORTH DAKOTA (LPP) OUTLET STRUCTURE

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
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ST. PAUL, MINNESOTA

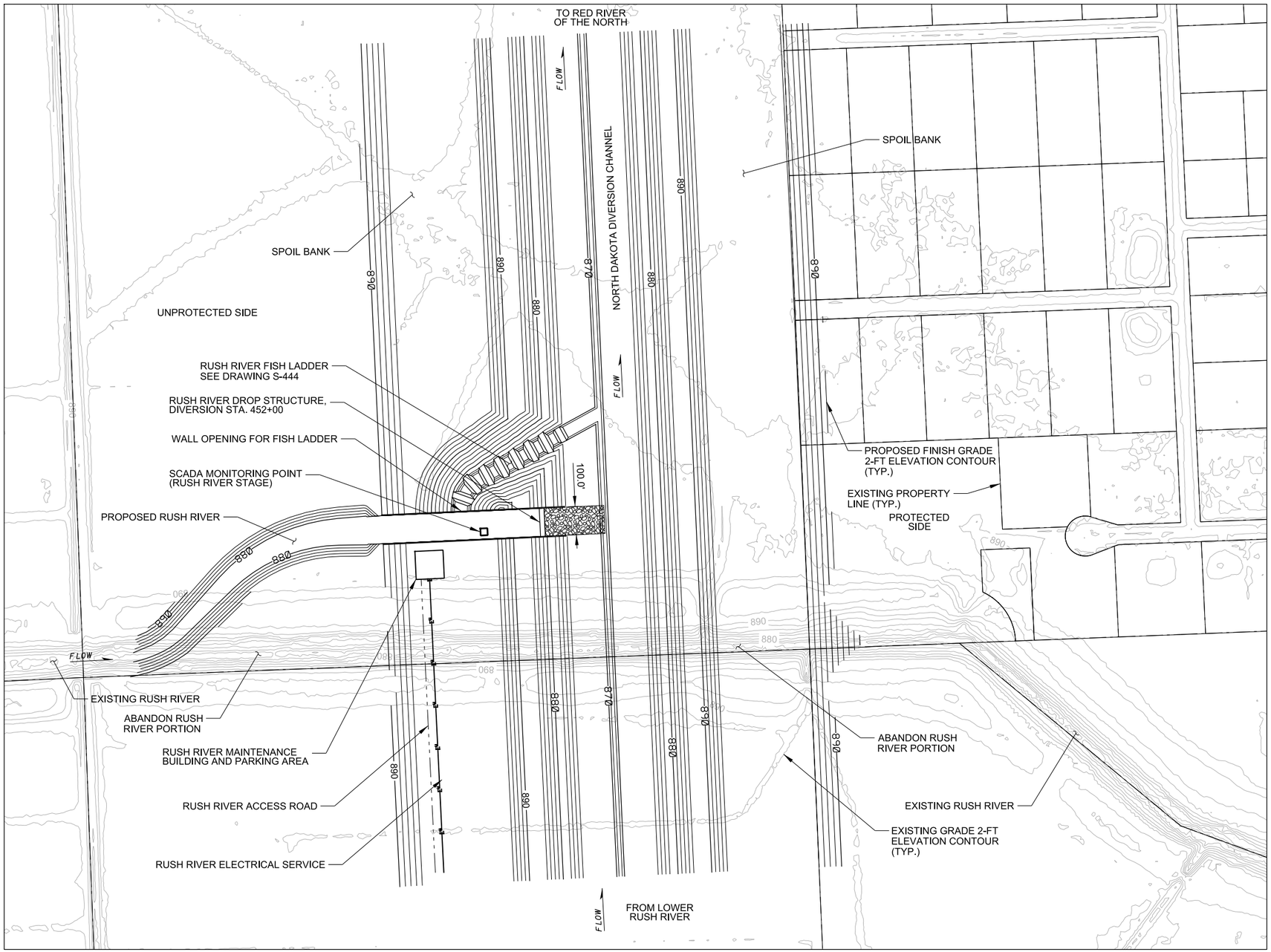
DESIGNED BY: MRM/MWH/PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1" = 400'
PLOT DATE: N/A
SIZE:
FILE NAME: FMM_CS403---dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
OUTLET STRUCTURE

Sheet ID
CS403

is: USACE-MVP-0000088174



N

5
CS110

DETAIL

RUSH RIVER DROP STRUCTURE

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MWY/PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1:1 = 400'
PLOT DATE:
SIZE:
FILE NAME: FM4_CS404---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
RUSH RIVER DROP STRUCTURE

Sheet ID
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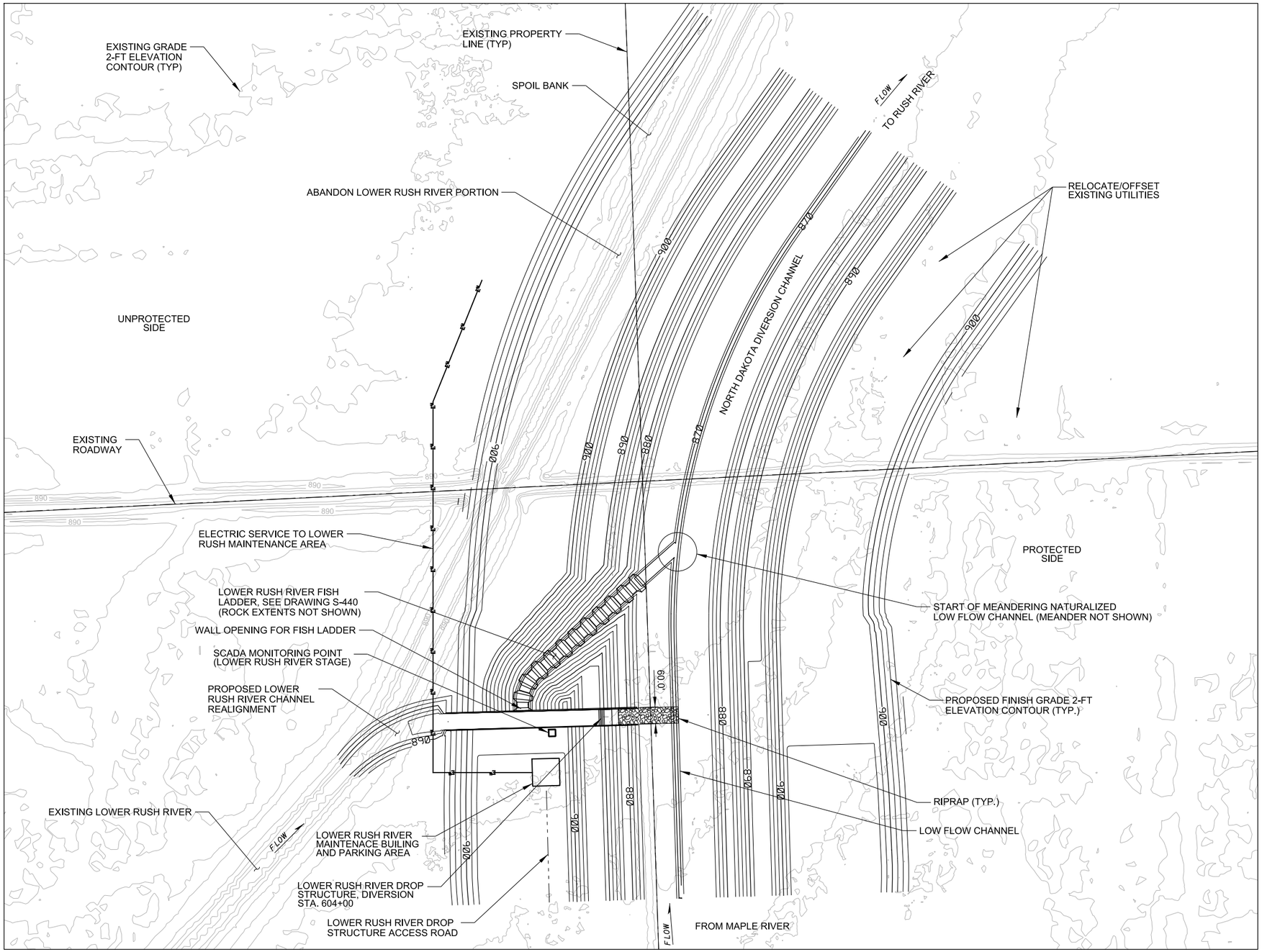
is: USACE-MVP-0000088174



N

6 / CS111 DETAIL

LOWER RUSH RIVER DROP STRUCTURE

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

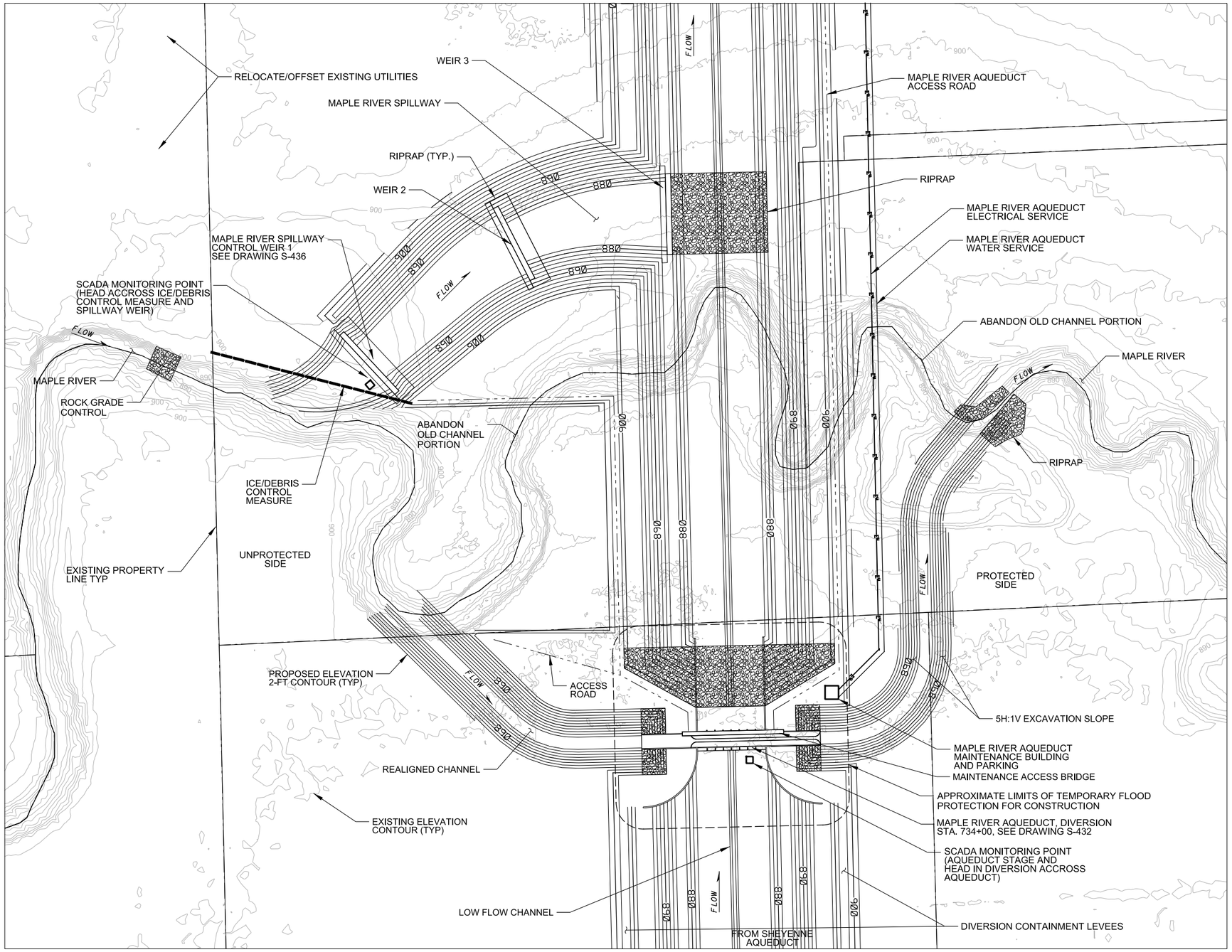
DESIGNED BY: MRM/MWY/PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1"= 400'
PLOT DATE:
SIZE:
FILE NAME: FM4_CS405--.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
LOWER RUSH RIVER DROP STRUCTURE

Sheet ID
CS405

is: USACE-MVP-0000088174



7 / CS111 DETAIL
MAPLE RIVER AQUEDUCT

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MAV/PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1"=400'
PLOT DATE: N/A
SIZE:
FILE NAME: FMM_CS406---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
NORTH DAKOTA DIVERSION (LPP)
DETAIL
MAPLE RIVER AQUEDUCT

Sheet ID
CS406

is: USACE-MVP-0000088174

N

8 / CS115 DETAIL

SHEYENNE RIVER AQUEDUCT

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MW/1PKN
DWN BY: MJJ
CKD BY: BKL
SUBMITTED BY:
PLOT SCALE: 1"=400'
PLOT DATE: N/A
SIZE:
FILE NAME: FMM_CS407---.dgn
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
SHEYENNE RIVER AQUEDUCT

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EXISTING CASS COUNTY ROAD 17

PROTECTED SIDE

SPOIL BANK

MAINTENANCE BUILDING ACCESS ROAD

STORAGE AREA 1 WEST EMBANKMENT, TOP EL. 927.0

STORAGE AREA 1

MAINTENANCE BUILDING AND PARKING

INLET STRUCTURE ACCESS ROAD

UNPROTECTED SIDE

ENERGY DISSIPATION APRON

SCADA MONITORING POINT (HEAD OVER DIVERSION INLET)

STORAGE AREA 1 SOUTH EMBANKMENT/SPOIL BANK, TOP EL. 924.0

TO SHEYENNE RIVER

FLOW

RIPRAP (TYP.)

ICE/DEBRIS CONTROL MEASURE

NORTH DAKOTA DIVERSION CHANNEL

LOW FLOW CHANNEL

30.0'

50.0'

CONCRETE RETAINING WALL (TYP.)

FROM WILD RICE RIVER

7H:1V

SCADA MONITORING POINT HEAD ACROSS ICE/DEBRIS CONTROL MEASURE.

INLET STRUCTURE TO DIVERSION STA. 1589+00, SEE SHEET S-422

CONNECTION CHANNEL TO INLET STRUCTURE TO DIVERSION (HIGH FLOWS)

ROADWAY BRIDGE OVER DIVERSION CHANNEL

INLET STRUCTURE ACCESS ROAD

EXISTING GRADE ELEVATION CONTOUR (TYP)

SPOIL BANK

UNPROTECTED SIDE

UNPROTECTED SIDE

CASS COUNTY 17 ROAD BRIDGE, PROPOSED EL. 924.0

N

9
CS115

DETAIL

DIVERSION INLET WEIR

100' 50' 0 100'

SCALE: 1"= 100'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
DIVERSION INLET WEIR

Sheet ID
CS408

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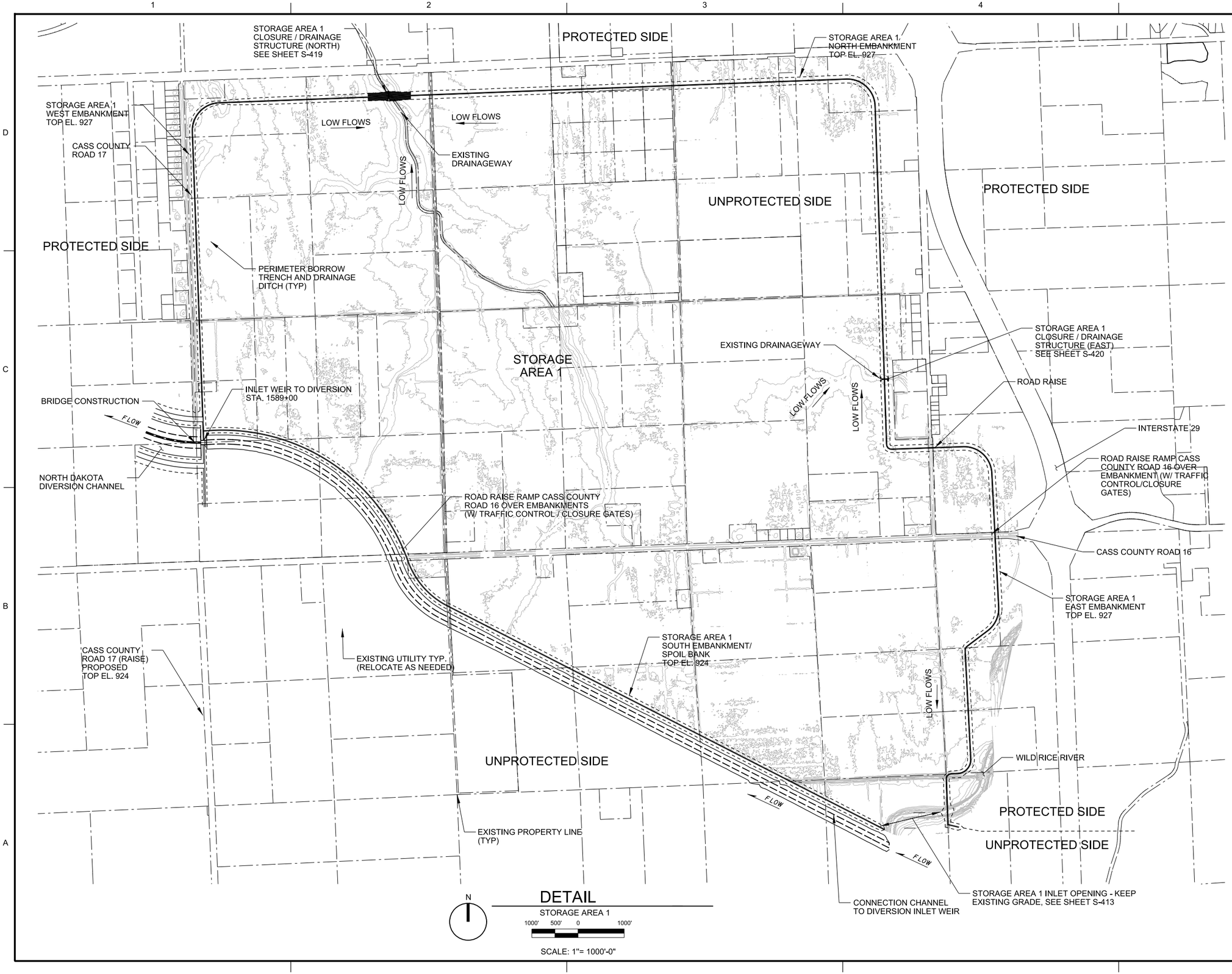

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT

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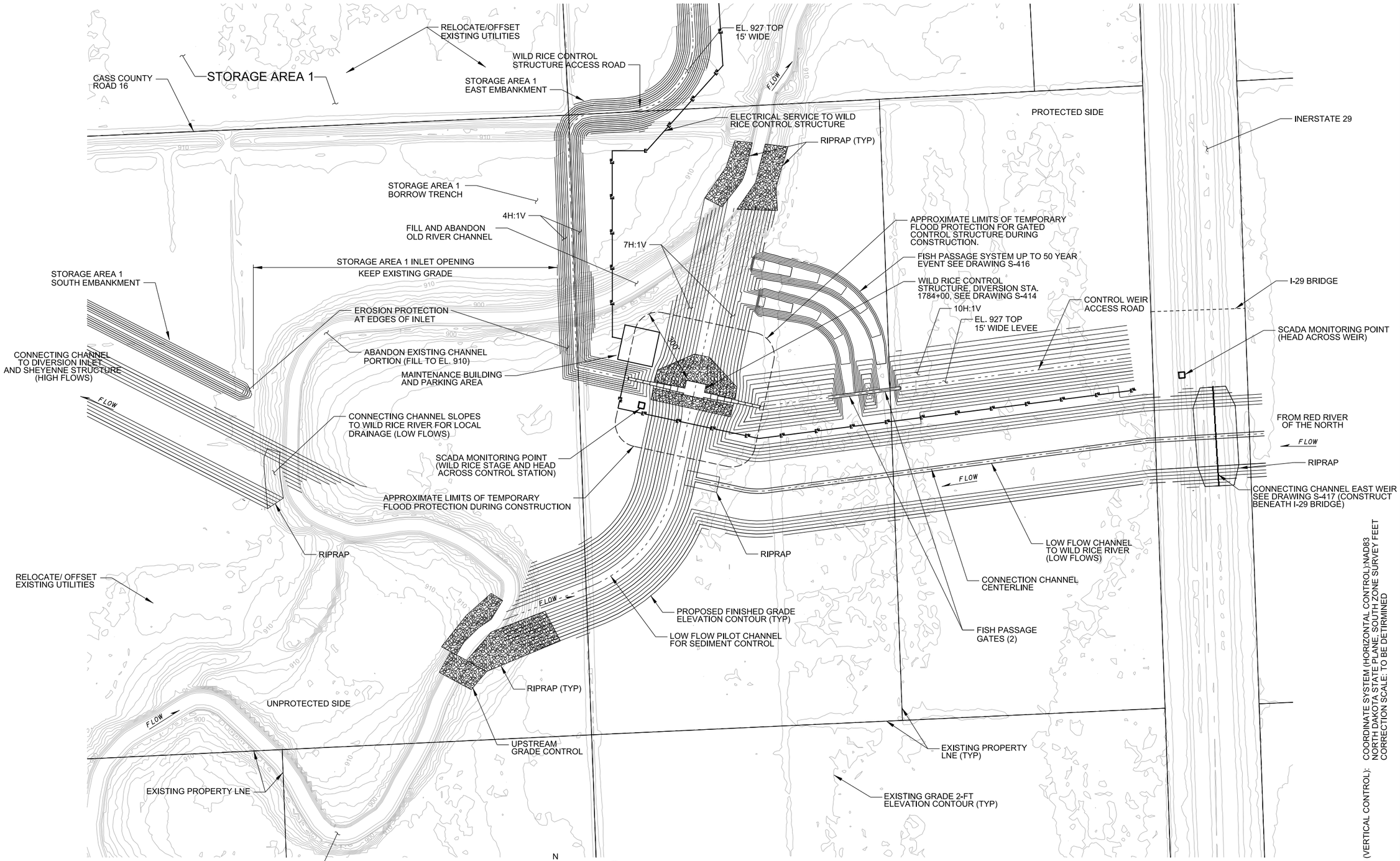
FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
NORTH DAKOTA DIVERSION (LPP)
DETAIL
STORAGE AREA 1

Sheet ID
CS409

is: USACE-MVP-0000088174



ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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ST. PAUL DISTRICT

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MWY/PKN
DATE: JULY 2011
DWN BY: MJJ
CKD BY: BKL
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.:
PLOT SCALE: 1" = 400'
PLOT DATE:
FILE NUMBER:
SIZE:
FILE NAME: FM-L_CS410---dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
NORTH DAKOTA DIVERSION (LPP)
DETAIL
WILD RICE CONTROL STRUCTURE

Sheet ID
CS410

is: USACE-MVP-0000088174

PROTECTED SIDE

PFIFFER DRIVE

49TH ST SE

FLOW

RED RIVER OF THE NORTH

FEMA DEEDED PROPERTY (1)

RIPRAP TYP.

REROUTE EXISTING ROADWAY UP ONTO THE TIEBACK LEVEE

PROPOSED FINISH GRADE 2-FT ELEVATION CONTOUR (TYP)

EXISTING PROPERTY LINE (TYP.)

7H:1V EXCAVATION

7H:1V EXCAVATION

CLAY COUNTY 59

PROPOSED ELECTRICAL SERVICE FOR CLOSURE STRUCTURE

PROPOSED ACCESS ROAD FOR CLOSURE STRUCTURE ND SIDE

FILL AND ABANDON OLD RIVER CHANNEL

FISH PASSAGE SYSTEM UP TO 50 YEAR EVENT SEE DRAWING S-410

4H:1V W/ 15' TOP

MAINTENANCE BUILDING AND PARKING

RAMP ROAD UP OVER THE BACK LEVEE (NOT SHOWN)

927 TOP

PROPOSED ACCESS ROAD FOR CLOSURE STRUCTURE MN SIDE

CONNECTIVITY CHANNEL TO WILD RICE RIVER CONTROL STRUCTURE

FISH PASSAGE SYSTEM GATES (2)

SCADA MONITORING POINT (RRN STAGE AND HEAD ACROSS CLOSURE STRUCTURE)

RIPRAP TYP.

ABANDON EXISTING CHANNEL PORTION

APPROXIMATE LIMITS OF TEMPORARY FLOOD PROTECTION DURING CONSTRUCTION

LOW FLOW CHANNEL TO RED RIVER OF THE NORTH (LOW FLOWS)

7H:1V EXCAVATION

RRN CLOSURE STRUCTURE SEE DRAWING S-408

OFFSET/RELOCATE EXISTING UTILITIES

RIPRAP (TYP)

REALIGNED CHANNEL

KLITZKE DR

EXISTING GRADE ELEVATION CONTOUR (TYP)

DROP STRUCTURE(1) SEE DRAWING S-449

CASS COUNTY, ND

CLAY COUNTY MN

EXISTING PROPERTY LINE

UNPROTECTED SIDE

RED RIVER OF THE NORTH

N

11 / CS116 DETAIL

NORTH DAKOTA CONTROL STRUCTURE

200' 100' 0 200'

SCALE: 1"= 200'-0"

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETRMINED

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ST. PAUL DISTRICT
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PLOT SCALE: 1" = 400'
PLOT DATE:
DATE: JULY 2011
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE: B
FILE NAME: FMM_CS411---.dgn

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

NORTH DAKOTA DIVERSION (LPP)
DETAIL
CONTROL STRUCTURE

Sheet ID
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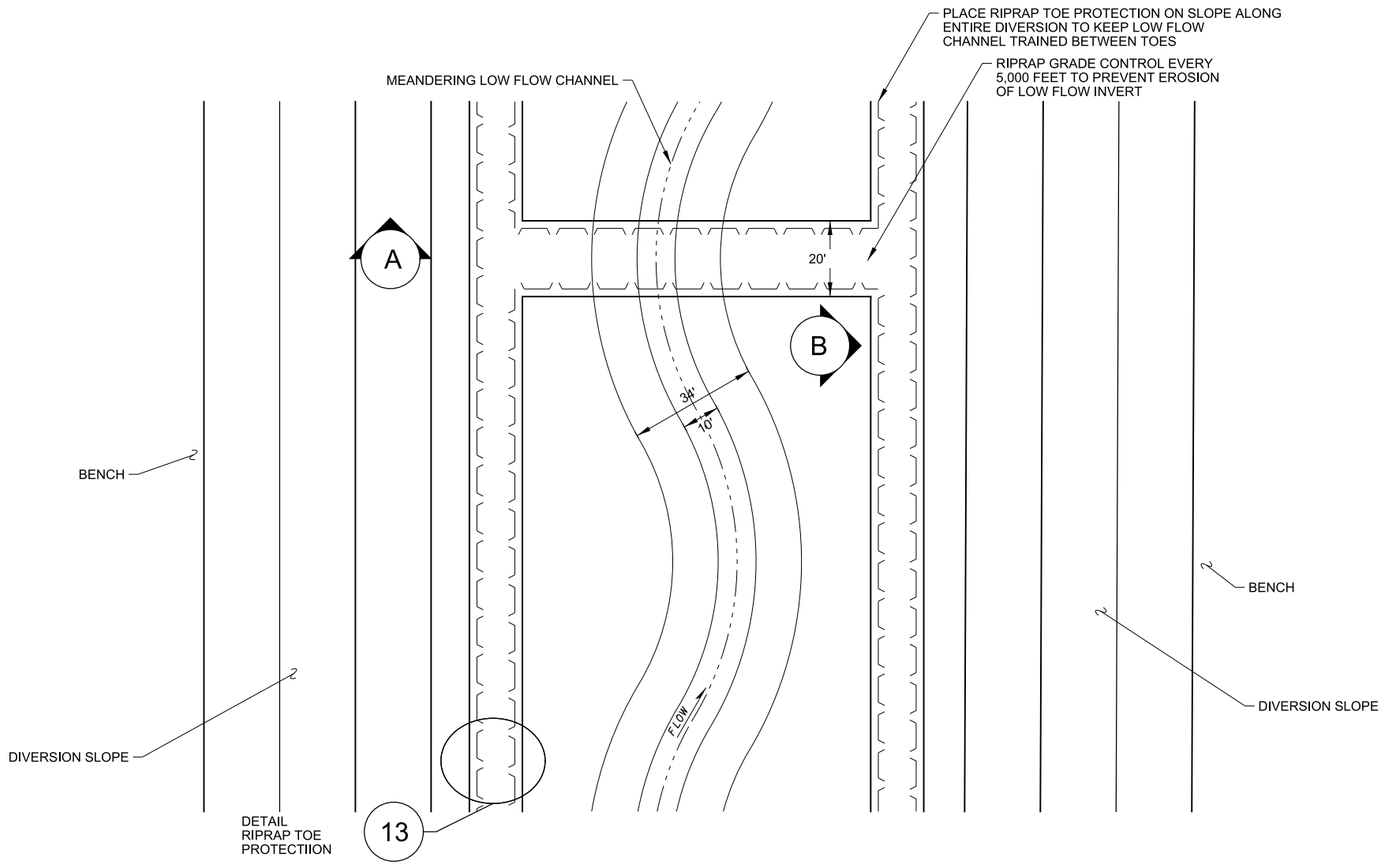

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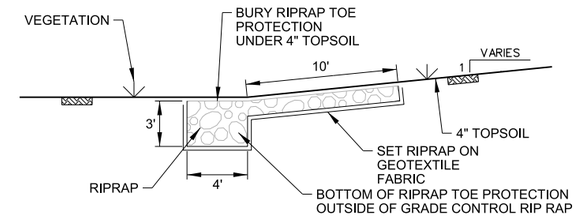
DETAIL - PLAN

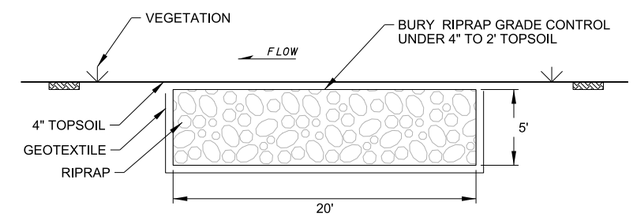
LOW FLOW CHANNEL
SCALE: 0 10' 20' 40'



13 — CS308 CS309 CS310 CS311 CS312

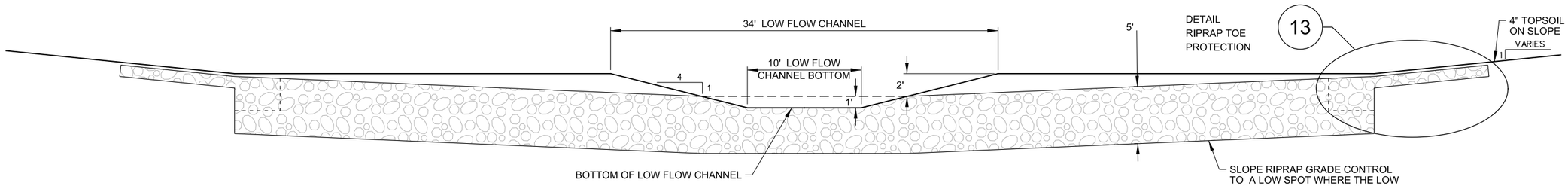
DETAIL

RIPRAP TOE PROTECTION
SCALE: N.T.S.



B — SECTION

RIPRAP GRADE CONTROL
SCALE: N.T.S.



A — SECTION

GRADE CONTROL
SCALE: N.T.S.

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: MRM/MWY/TEM
DWN BY: MJJ
CKD BY: BRL
SUBMITTED BY:
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FILE NAME: FMM_CS501---.dgn
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FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
NORTH DAKOTA DIVERSION (LPP)
DETAILS
LOW FLOW CHANNEL

Sheet ID
CS501

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