US Army Corps of Engineers®

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B

RED RIVER OF THE NORTH RIVER BASIN

FARGO - MOORHEAD FLOOD RISK MANAGEMENT

CASS COUNTY, ND

Solicitation: W912ES-XX-X-XXXX

Contract: W912ES-XX-X-XXXX

AUGUST 1, 2013

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

THIS PROJECT WAS DESIGNED BY THE ST. PAUL DISTRICT CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152. SIGNATURES INDICATE OFFICIAL RECOMMENDATION OF ALL DRAWINGS IN THIS SET.

APPROVED BY:

CHIEF ENGR & CONST DIVISION

APPROVAL RECOMMENDED BY:

CHIEF EC-D BRANCH

CHIEF EC-H BRANCH

PROJECT MANAGER

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

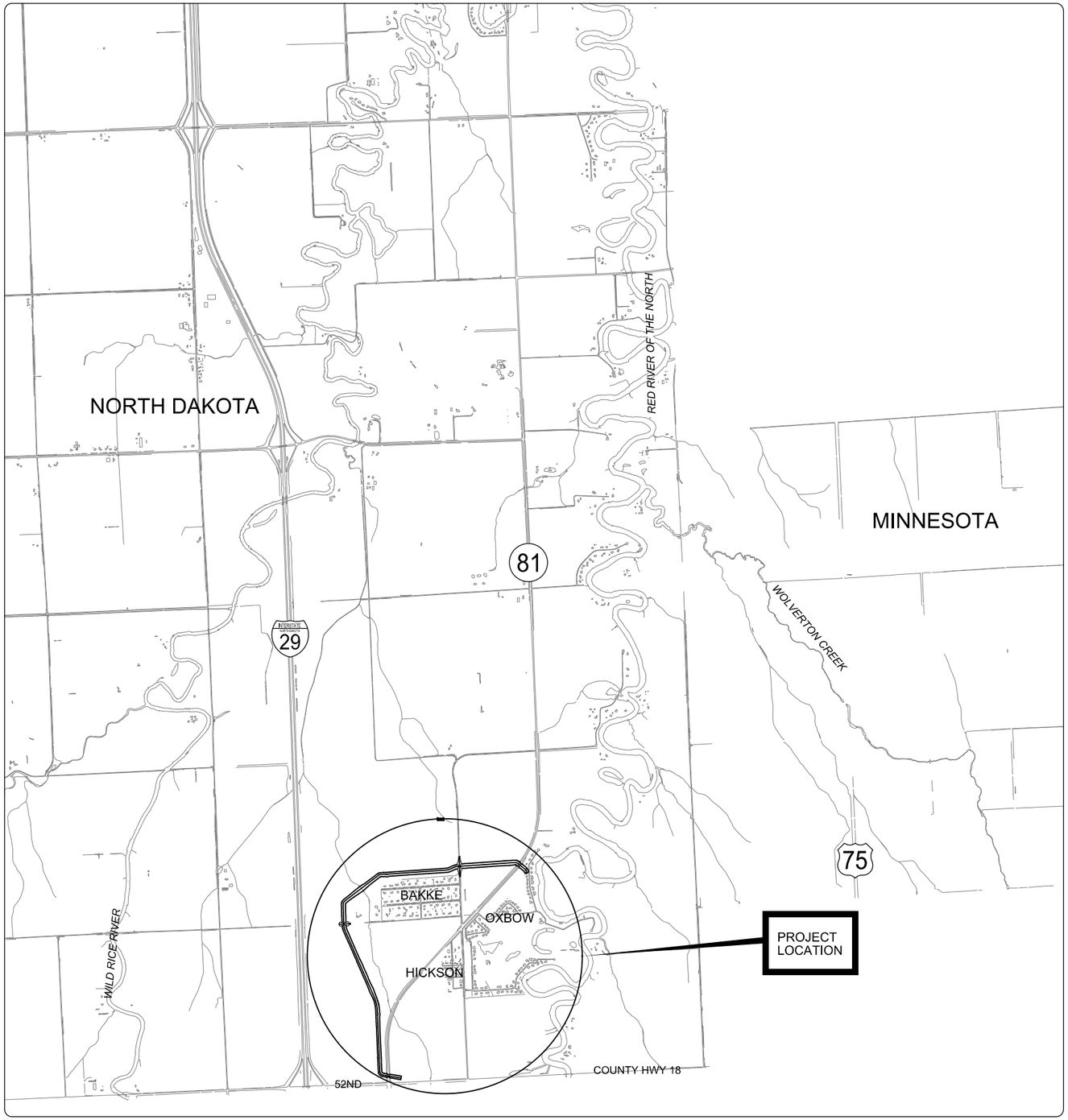
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:1 PDF
PLOT DATE: 11/20/14
SIZE:
FILE NAME: FM43B_G-001---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

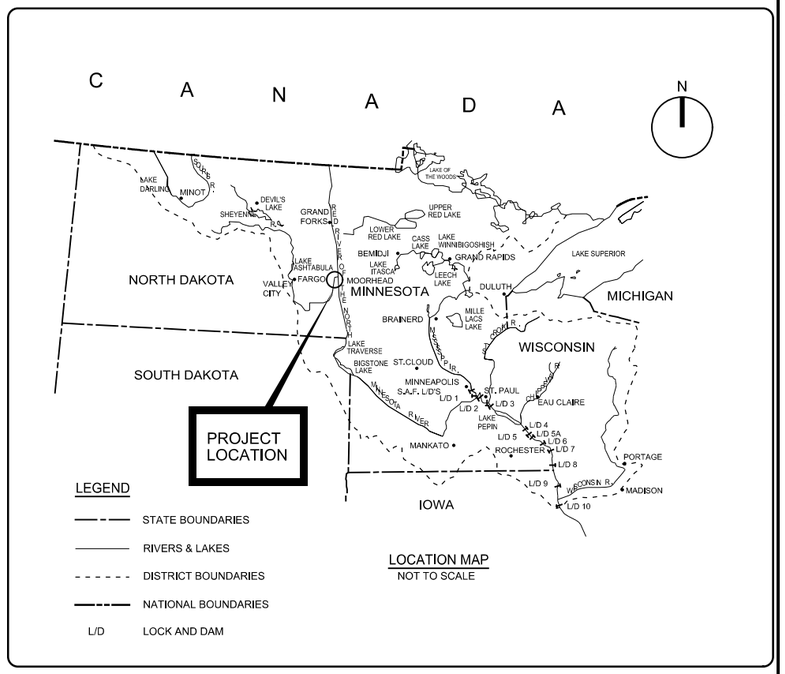
COVER SHEET

Sheet ID
G-001



VICINITY MAP
NOT TO SCALE

N



LOCATION MAP
NOT TO SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

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DTR-ATR

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

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1" = 500'
PLOT DATE: NOV 2014
SIZE:
FILE NAME: FMM-03_G-002---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

VICINITY AND LEGEND

Sheet ID
G-002

CONSTRUCTION DRAWING INDEX

AS-BUILT DRAWING NO.	SHEET REF.	DESCRIPTION	PRODUCT I.D.
	G-001	COVER SHEET	FMM43B_G-001—.dgn
	G-002	VICINITY AND LOCATION MAP	FMM43B_G-002—.dgn
	G-003	DRAWING INDEX AND LEGEND	FMM43B_G-003IND.dgn
	B-101	GENERAL PLAN BORING LOCATIONS	FMM43B_B-101—-.dgn
	B-201	BORING LOGS AND LEGEND – NOT INCLUDED	
	B-202	BORING LOGS -- NOT INCLUDED	
	C-101	GENERAL PLAN	FMM43B_C-101—.dgn
	CS101	PLAN VIEW STA B 0+00 - STA B 10+00	FMM43B_CS101—-.dgn
	CS102	PLAN VIEW STA B 10+00 - STA B 20+00	FMM43B_CS102—-.dgn
	CS103	PLAN VIEW STA B 20+00 - STA B 30+00	FMM43B_CS103—-.dgn
	CS104	PLAN VIEW STA B 30+00 - STA B 40+00	FMM43B_CS104—-.dgn
	CS105	PLAN VIEW STA B 40+00 - STA B 50+00	FMM43B_CS105—-.dgn
	CS106	PLAN VIEW STA B 50+00 - STA B 60+00	FMM43B_CS106—-.dgn
	CS107	PLAN VIEW STA B 60+00 - STA B 70+00	FMM43B_CS107—-.dgn
	CS108	PLAN VIEW STA B 70+00 - STA B 80+00	FMM43B_CS108—-.dgn
	CS109	PLAN VIEW STA B 80+00 - STA B 90+00	FMM43B_CS109—-.dgn
	CS110	PLAN VIEW STA B 90+00 - STA B 100+00	FMM43B_CS110—-.dgn
	CS111	PLAN VIEW STA B 100+00 - STA B 110+00	FMM43B_CS111—-.dgn
	CS112	PLAN VIEW STA B 110+00 - STA B 120+00	FMM43B_CS112—-.dgn
	CS113	PLAN VIEW STA B 120+00 - STA B 128+00	FMM43B_CS113—-.dgn
	CS201	PROFILE OUTSIDE DRAINAGE DITCH STA OD 70+00 - STA OD 100+00	FMM43B_CS201—-.dgn
	CS202	PROFILE OUTSIDE DRAINAGE DITCH STA OD 100+00 - STA OD 130+00	FMM43B_CS202—-.dgn
	CS203	PROFILE OUTSIDE DRAINAGE DITCH STA OD 130+00 - STA OD 160+00	FMM43B_CS203—-.dgn
	CS204	PROFILE OUTSIDE DRAINAGE DITCH STA OD 160+00 - STA OD 190+00	FMM43B_CS204—-.dgn
	CS205	PROFILE OUTSIDE DRAINAGE DITCH AND INSIDE DRAINAGE DITCH	FMM43B_CS205—-.dgn
	CS206	PROFILE INSIDE DRAINAGE DITCH STA ID 90+00 - STA IS 120+00	FMM43B_CS206—-.dgn
	CS207	PROFILE INSIDE DRAINAGE DITCH STA ID 120+00 - STA IS 150+00	FMM43B_CS207—-.dgn
	CS208	PROFILE INSIDE DRAINAGE DITCH STA ID 150+00 - STA IS 169+00	FMM43B_CS208—-.dgn
	CS301	TYPICAL CROSS SECTIONS A B AND C	FMM43B_CS301—-.dgn
	CS302	TYPICAL CROSS SECTIONS D E AND F	FMM43B_CS302—-.dgn
	CS303	TYPICAL CROSS SECTIONS – NOT INCLUDED	FMM43B_CS303—-.dgn
	CS304	TYPICAL CROSS SECTIONS – NOT INCLUDED	FMM43B_CS304—-.dgn
	CS401	DETAIL PLANS LEVEE TURNOUTS	FMM43B_CS401—-.dgn
	CS501	DETAILS	FMM43B_CS501—-.dgn
	CS601	HORIZONTAL CONTROL TABLES	FMM43B_CS601—-.dgn
	CP101	PLAN AND PROFILE FIELD ACCESS 1 AT 51ST STREET	FMM43B_CP101—-.dgn
	CP102	PLAN AND PROFILE FIELD ACCESS 2 AT MAIN STREET	FMM43B_CP102—-.dgn

GENERAL NOTES:

1. TIE DIAGRAMS AND DETAILS DESCRIPTIONS OF HORIZONTAL AND VERTICAL CONTROL POINTS ARE AVAILABLE FROM THE ST. PAUL DISTRICT OFFICE (651) 290-5596.
2. ORIGINAL DATA COMPILED NAD 83 US SURVEY FEET.
3. ELEVATION REFER TO NAVD88 (GEOID09).
4. ORIGINAL DATA FROM LIDAR.
5. ORIGINAL DATA FROM HYDROGRAPHIC SURVEYS.
6. THE INFORMATION ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UTILITIES MAY NOT BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THE DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE TO THESE UTILITIES.
7. COORDINATES BASED ON NORTH DAKOTA STATE PLANE GRID SYSTEM, SOUTH ZONE.

GENERAL CROSS-REFERENCING SYMBOLS

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

D5 / C-102 — 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
CSPA	CORRUGATED STEEL PIPE ARCH	OF	OUTSIDE FACE
CONC	CONCRETE	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
- E_x — EXISTING OVERHEAD P0WER
- X — EXISTING UNDER-GROUND DUCT
- G_x — EXISTING GAS
- 97-41M — BORING LOCATION AND NUMBER
- SURVEY CONTROL POINT
- WORK LIMITS
- FILL
- CUT
- SHEET ID X-000 — DWG OUTLINE AND NUMBER
- LEVEE
- BOROW SITE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1:1000
PLOT DATE: 1/7/2014
SIZE:
FILE NAME: FMM43B_G-003IND.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

DRAWING INDEX AND LEGEND

Sheet ID
G-003

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

GENERAL PLAN

BORING LOCATIONS

0 500' 1000'

N

CONTROL POINT INFORMATION				
NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
L 506	394566.441	2897030.508	912.9	NGS PID RP1149
M 506	387402.834	2894483.934	917.94	NGS PID RP1150
N 506	383672.425	2892147.745	916.46	NGS PID RP1151

NOTES:

1. THE ARE NO BORING LOG LOCATION PLAN VIEWS.
   BORING LOGS ARE INCLUDED ON THE CS100's SERIES PLAN VIEWS.

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

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

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1" = 250'
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FM4439_B-101---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

GENERAL PLAN
BORING LOCATIONS

Sheet ID
B-101

CONTROL POINT INFORMATION				
NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
L 506	394566.441	2897030.508	912.9	NGS PID RP1149
M 506	387402.834	2894483.934	917.94	NGS PID RP1150
N 506	383672.425	2892147.745	916.46	NGS PID RP1151

GENERAL PLAN

PHASE WP-43B

0 500' 1000'

N

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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DTR-ATR

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

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:2500'
PLOT DATE:
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DATE:
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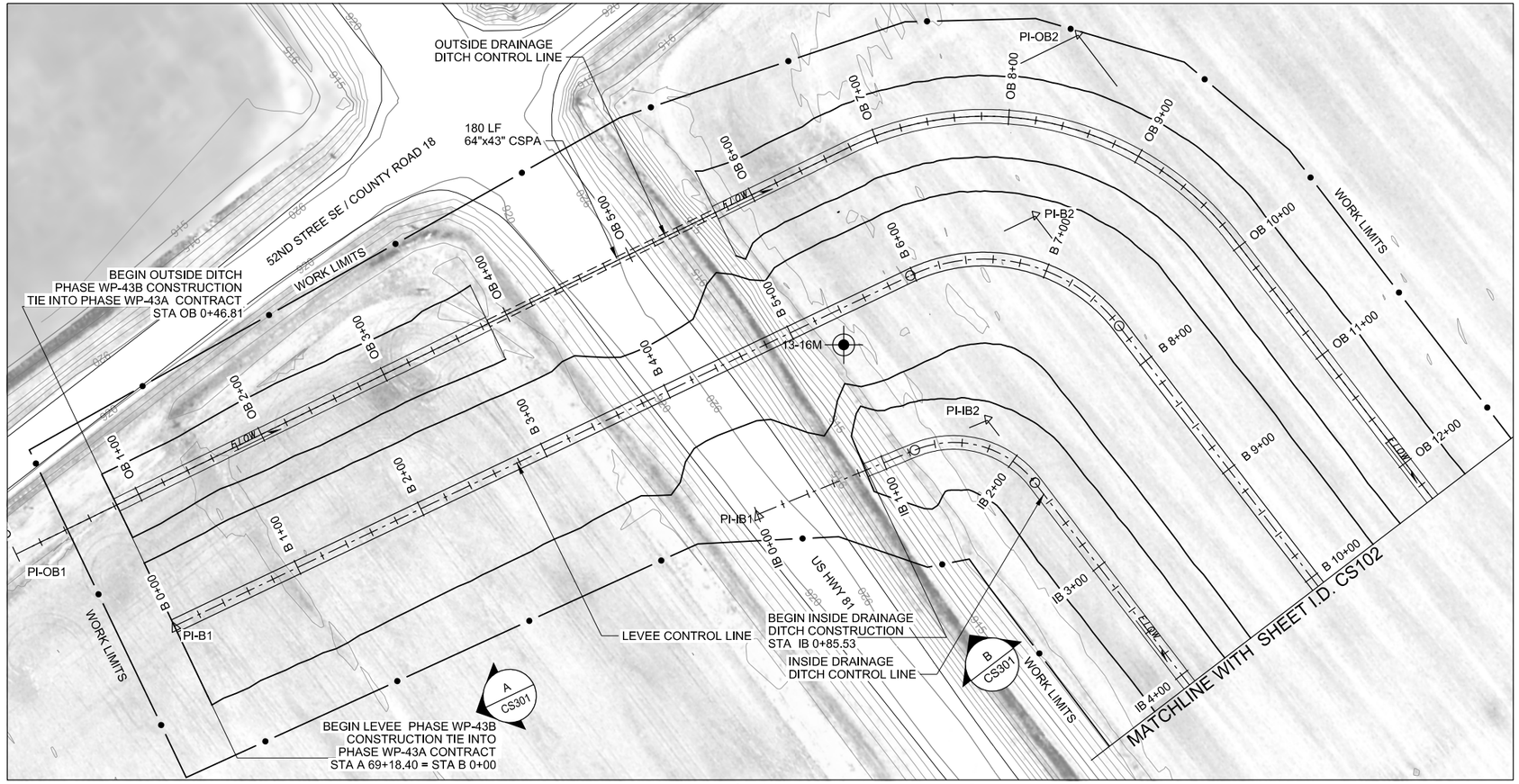
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

GENERAL PLAN

Sheet ID
C-101

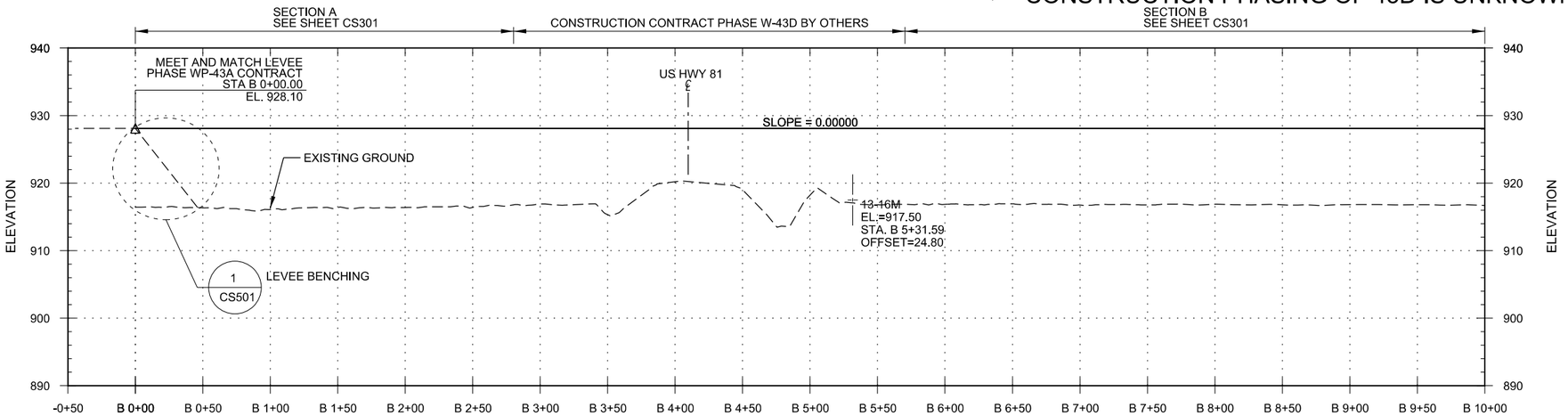


PLAN

LEVEE

0 25' 50' 100'

FOR ATR REVIEWERS:
AT THE TIME OF ATR SUBMITTAL THE DESIGN AND CONSTRUCTION PHASING OF 43D IS UNKNOWN

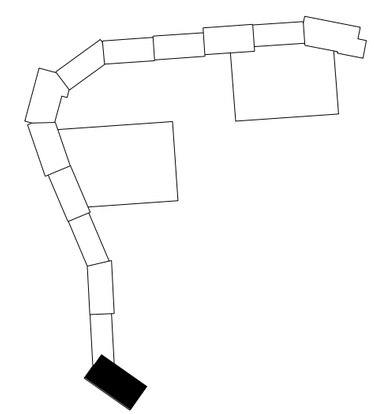


PROFILE

LEVEE

HORIZONTAL SCALE 0 25' 50' 100'

VERTICAL SCALE 0 10' 20'



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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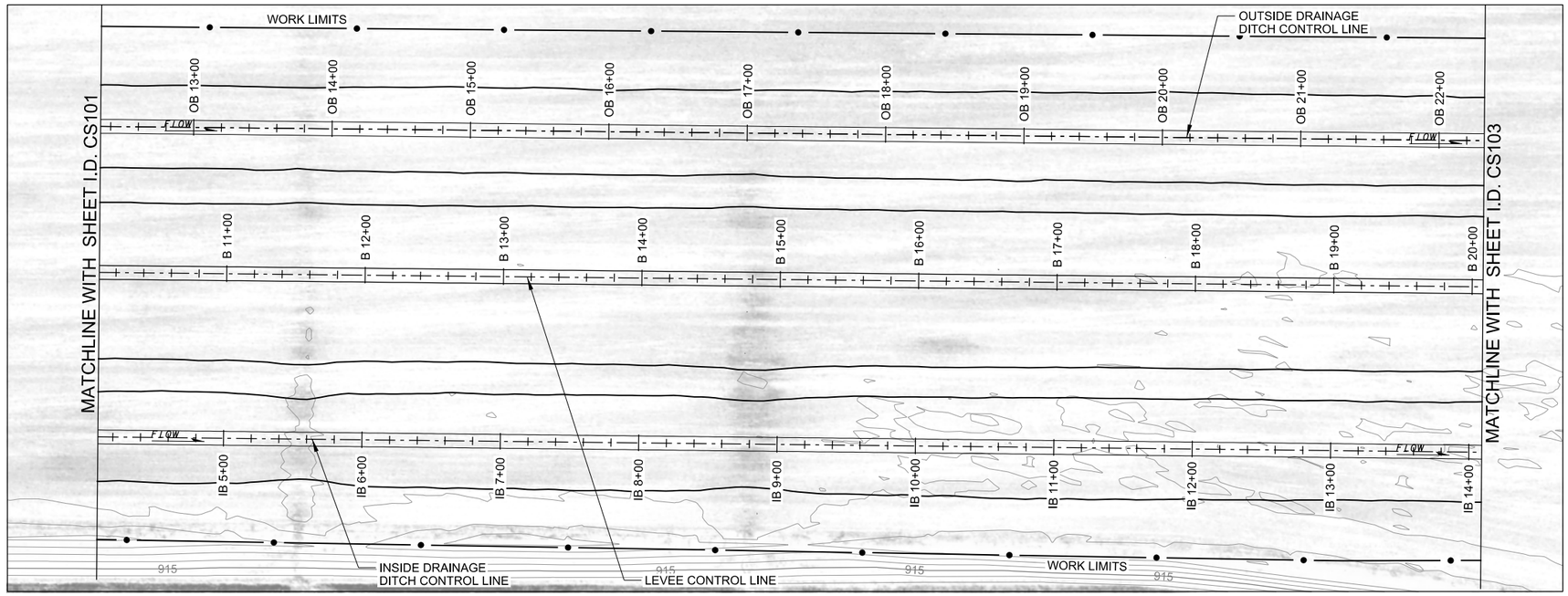
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA A. MOSE
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT DATE: 10/20/2014
PLOT SCALE: 1" = 50'
SIZE:
FILE NAME: FMM43B_CS101---dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 0+00 - STA B 10+00

Sheet ID
CS101



PLAN

LEVEE

0 25' 50' 100'

N

NOTES:

1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

X
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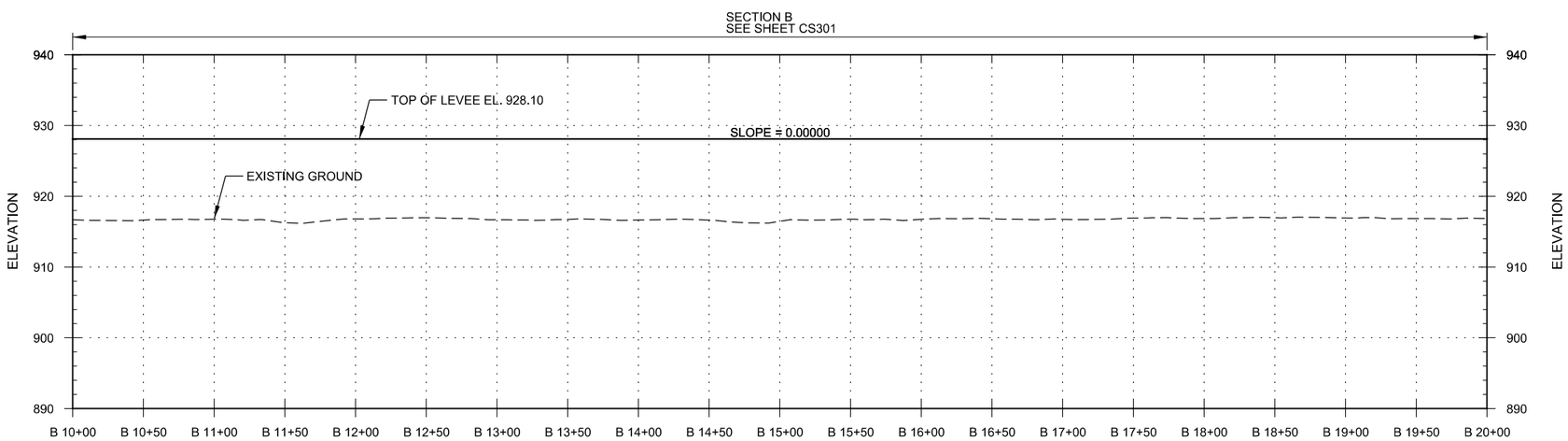


PROFILE

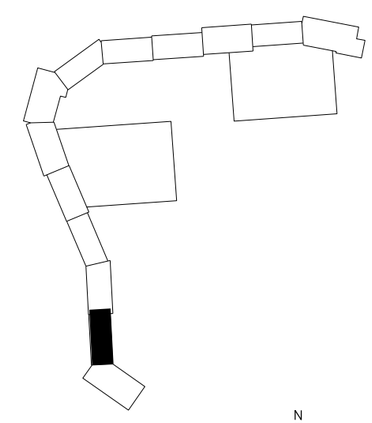
LEVEE

0 25' 50' 100'

HORIZONTAL SCALE

0 10' 20'

VERTICAL SCALE



KEY PLAN

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ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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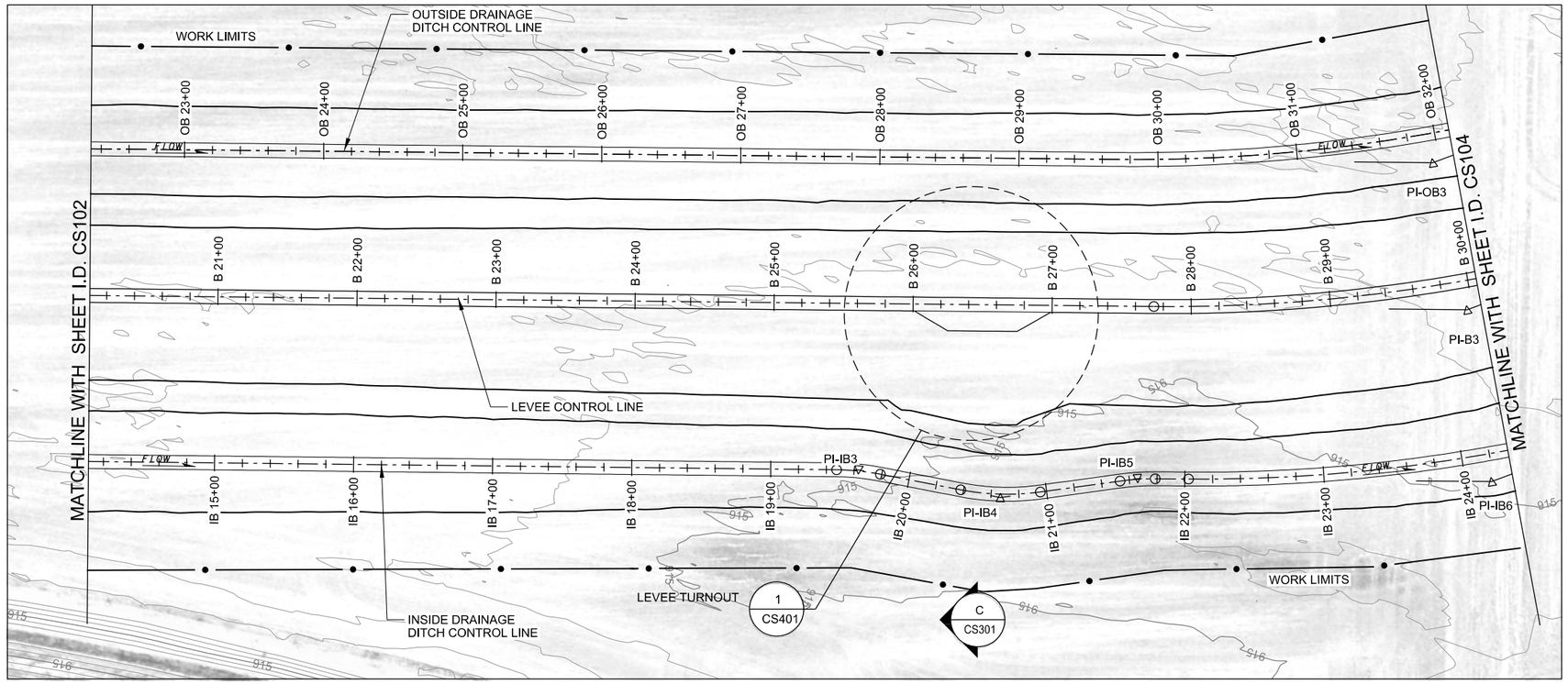
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1" = 50'
PLOT DATE: 1/12/2014
SIZE:
FILE NAME: FMM43B_CS102---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 10+00 - STA B 20+00

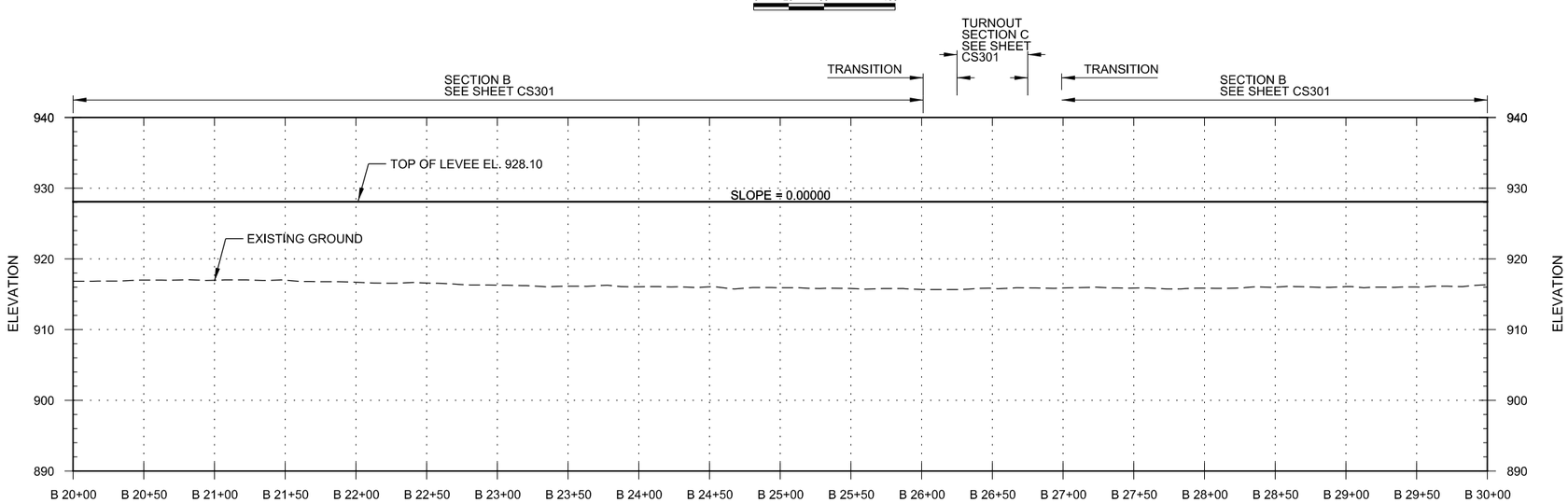
Sheet ID
CS102



PLAN

LEVEE

0 25' 50' 100'



PROFILE

LEVEE

0 25' 50' 100'

HORIZONTAL SCALE

0 10' 20'

VERTICAL SCALE

NOTES:

1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
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SHEET ID

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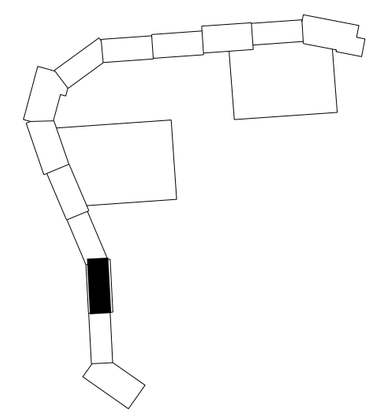

KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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DTR-ATR

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:20
PLOT DATE: 11/20/14
SIZE: F
FILE NAME: FMM439_CS103---.dgn

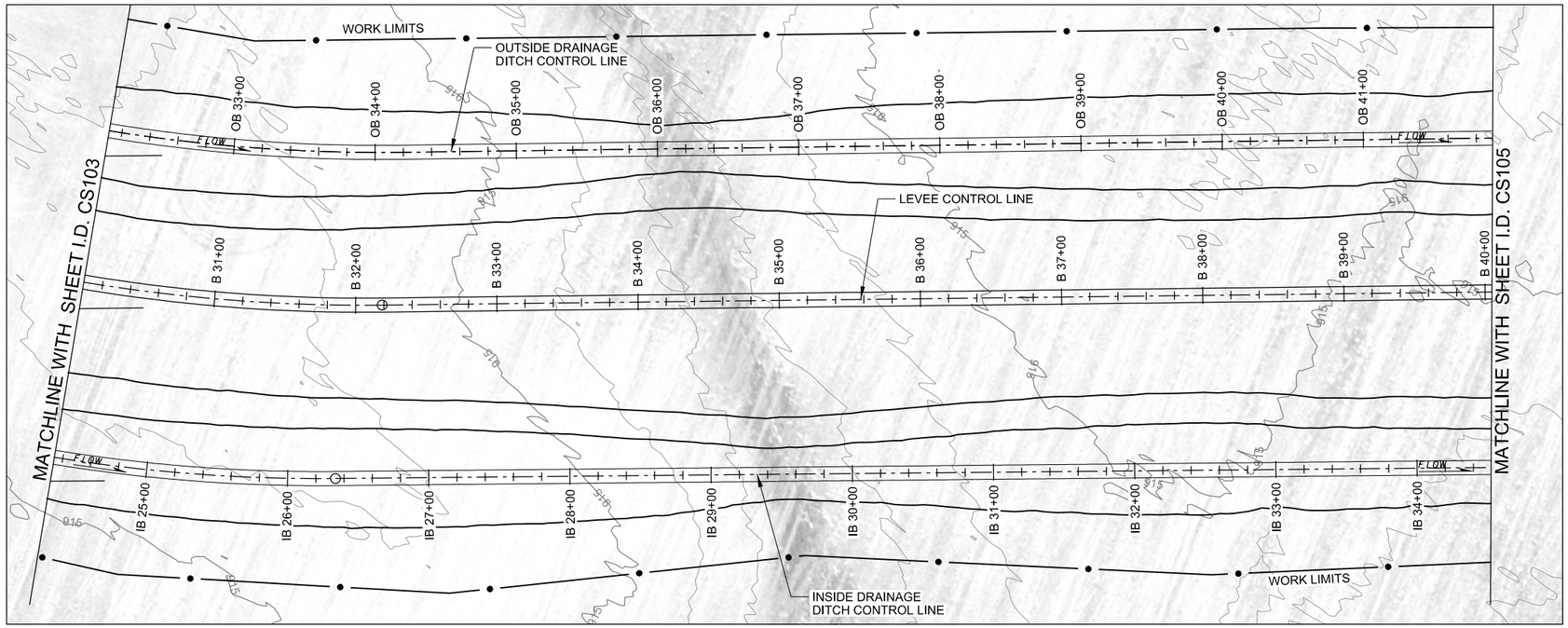
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 20+00 - STA B 30+00

Sheet ID
CS103



PLAN

LEVEE

0 25' 50' 100'

NOTES:

1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
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SHEET ID

X
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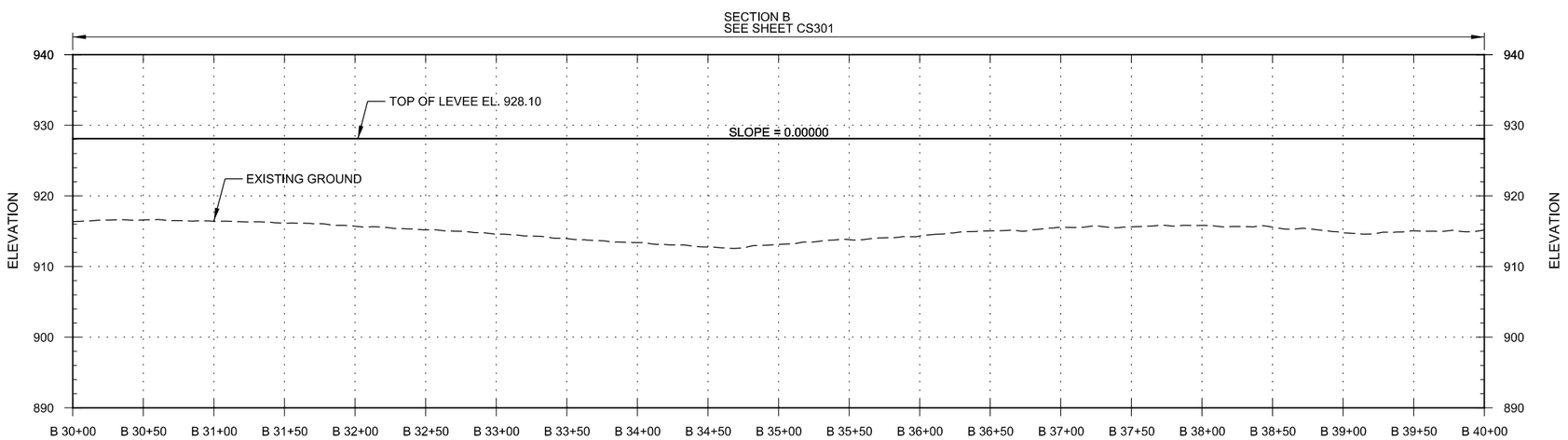
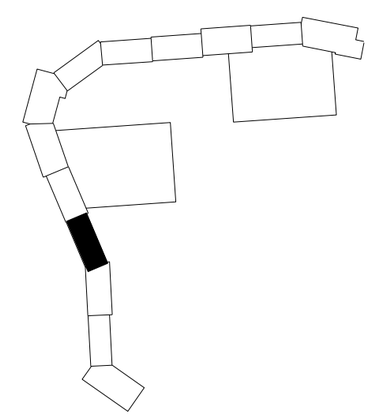


PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE
0 10' 20'
VERTICAL SCALE



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

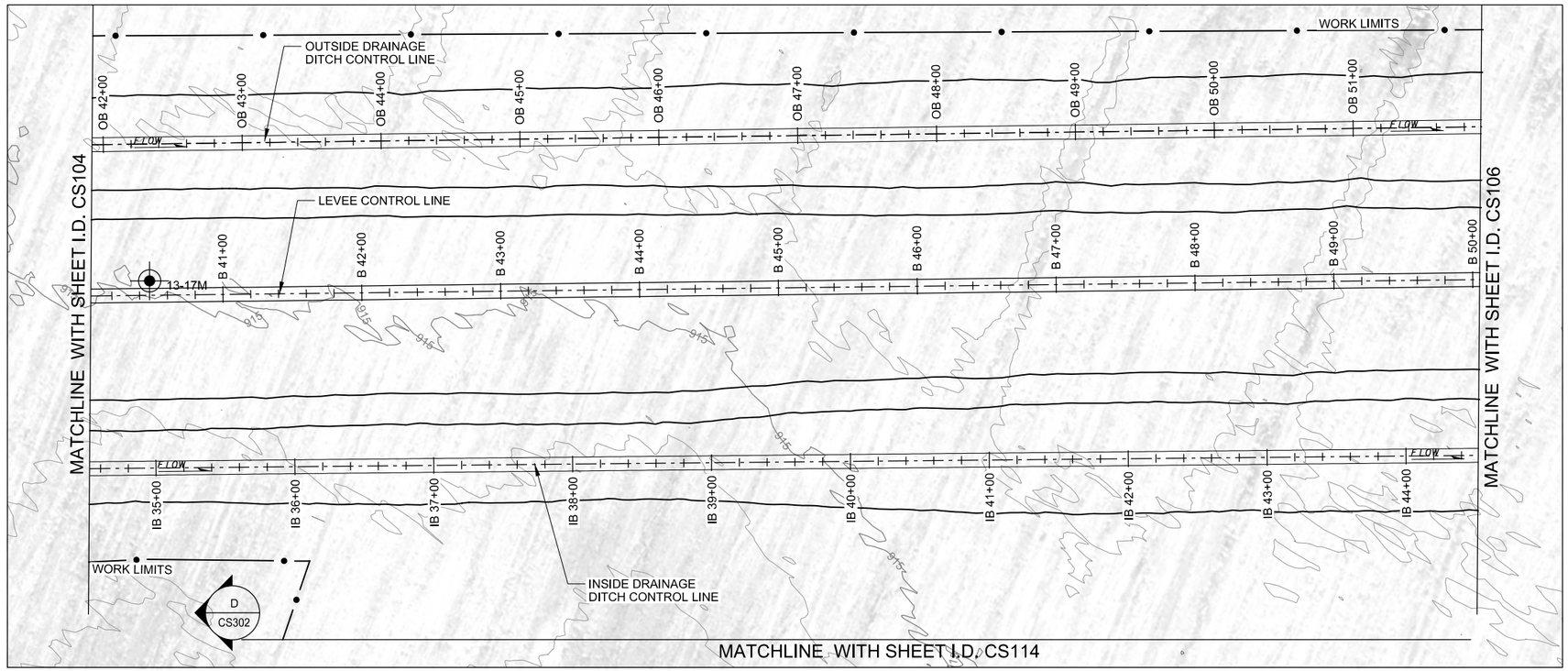
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 1/20/2014
SIZE:
FILE NAME: FMM43B_CS104---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-23B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 30+00 - STA B 40+00

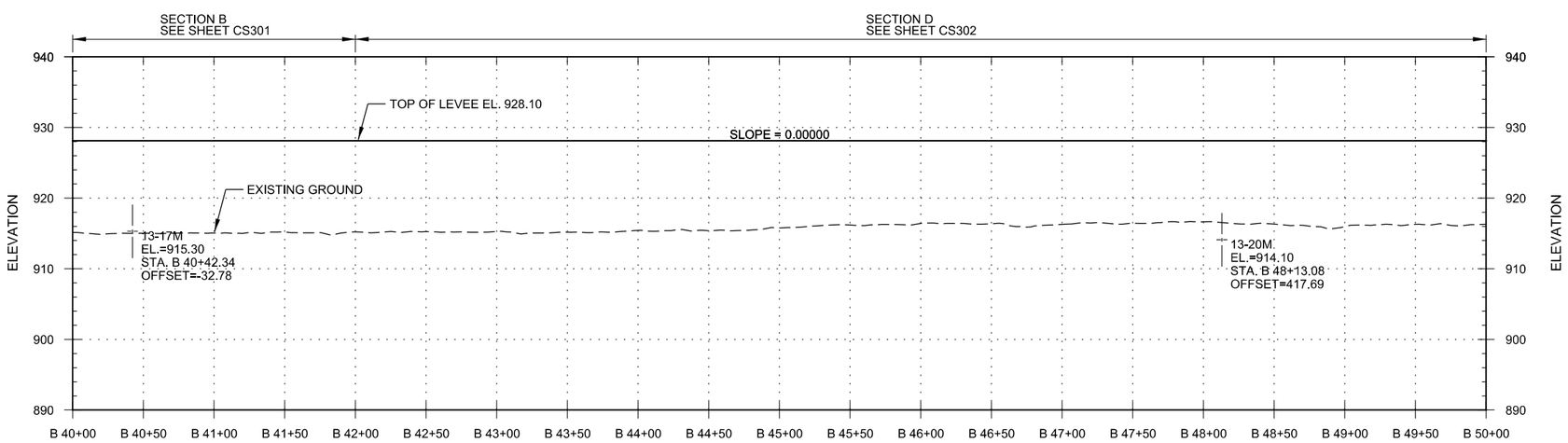
Sheet ID
CS104



PLAN

LEVEE

0 25' 50' 100'



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

NOTES:

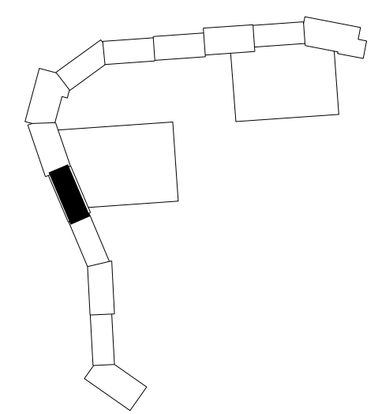
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

X
X



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:100
PLOT DATE: 1/10/2014
SIZE: F-36"
FILE NAME: FMM-03_CS105---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

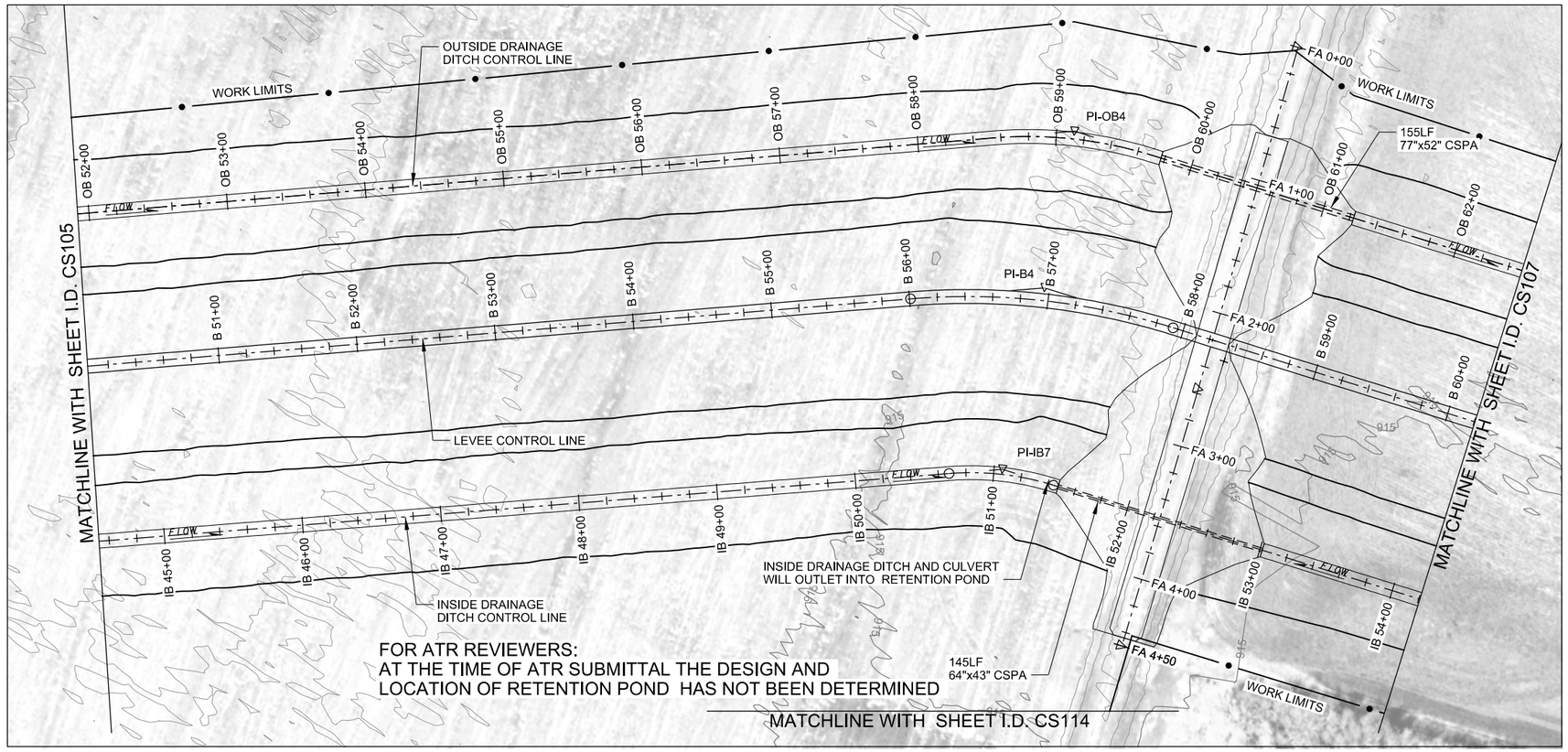
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 40+00 - STA B 50+00

Sheet ID
CS105

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION



FOR ATR REVIEWERS:
AT THE TIME OF ATR SUBMITTAL THE DESIGN AND LOCATION OF RETENTION POND HAS NOT BEEN DETERMINED

PLAN

LEVEE

0 25' 50' 100'

NOTES:

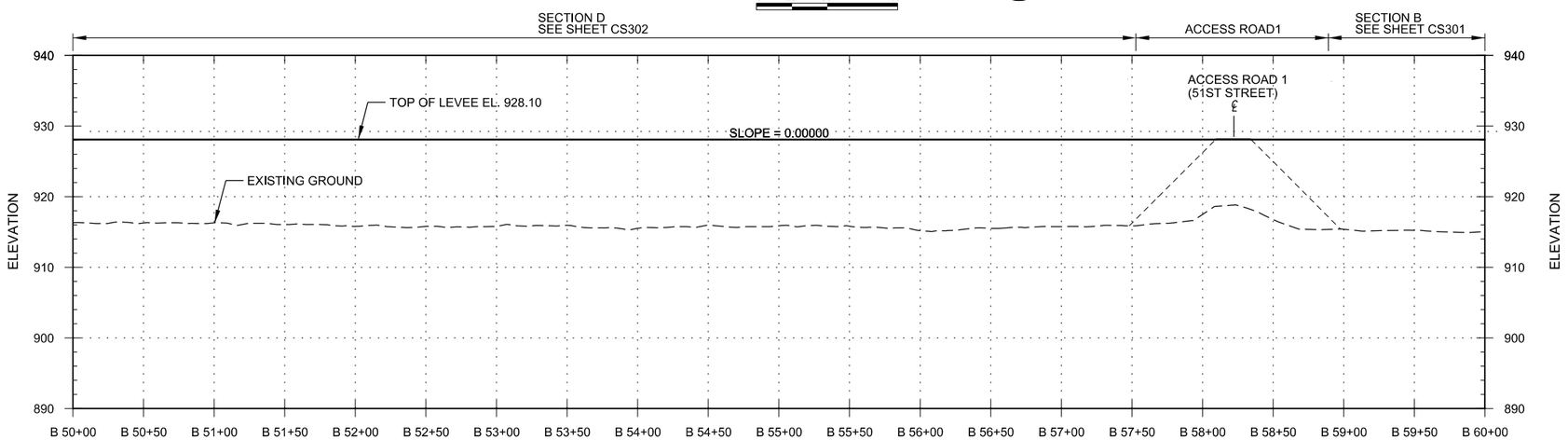
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

ACCESS ROAD 1

SHEET ID

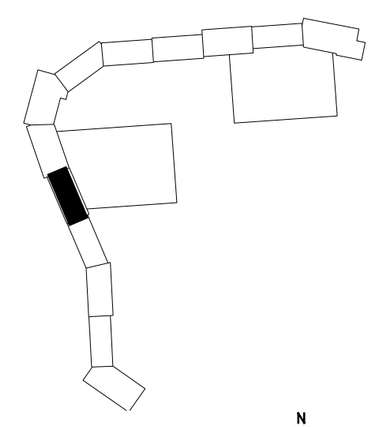
CP101



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE
0 10' 20'
VERTICAL SCALE



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

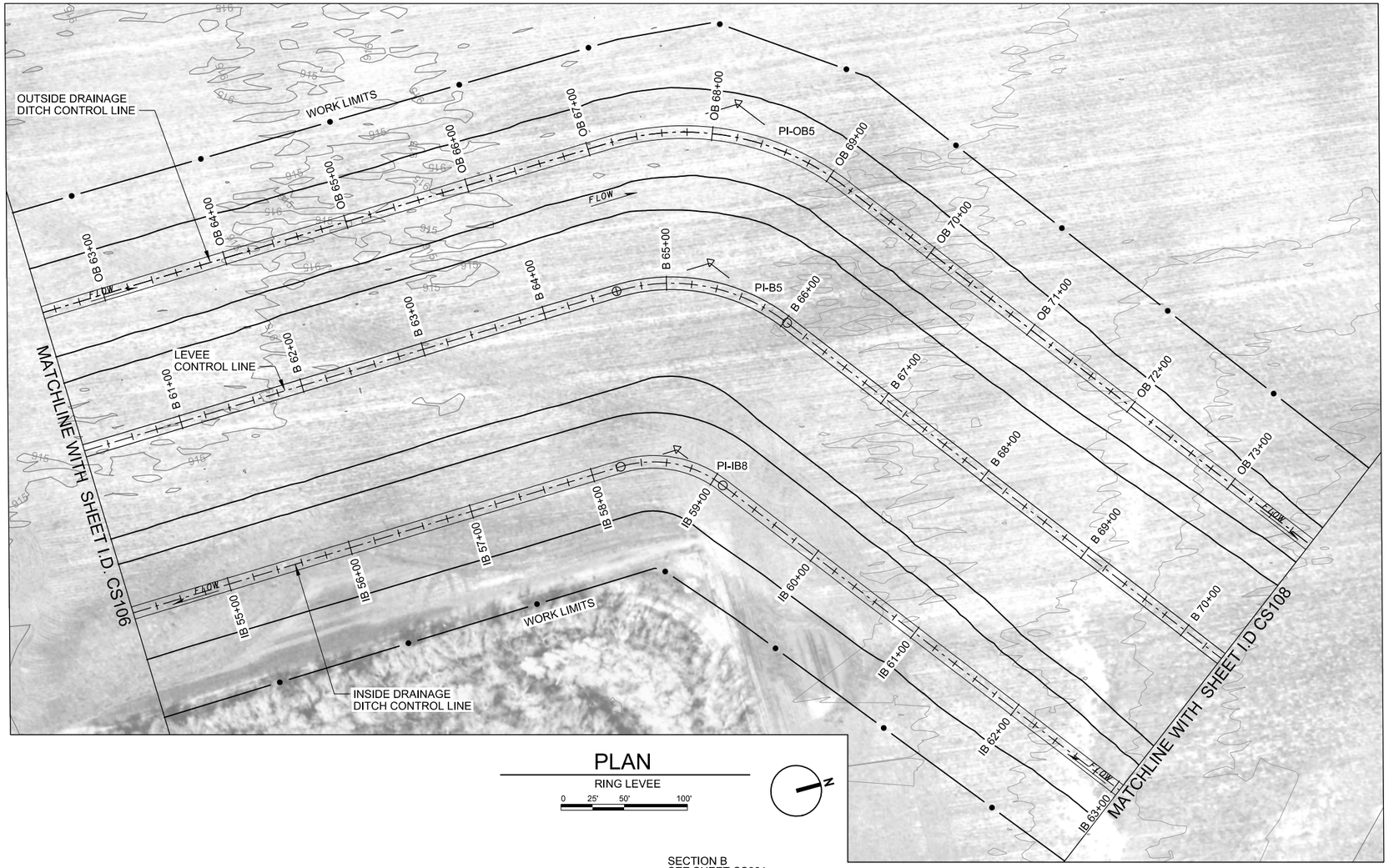
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:50
PLOT DATE: 1/20/2014
SIZE:
FILE NAME: FMM-03B_CS106---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 50+00 - STA B 60+00

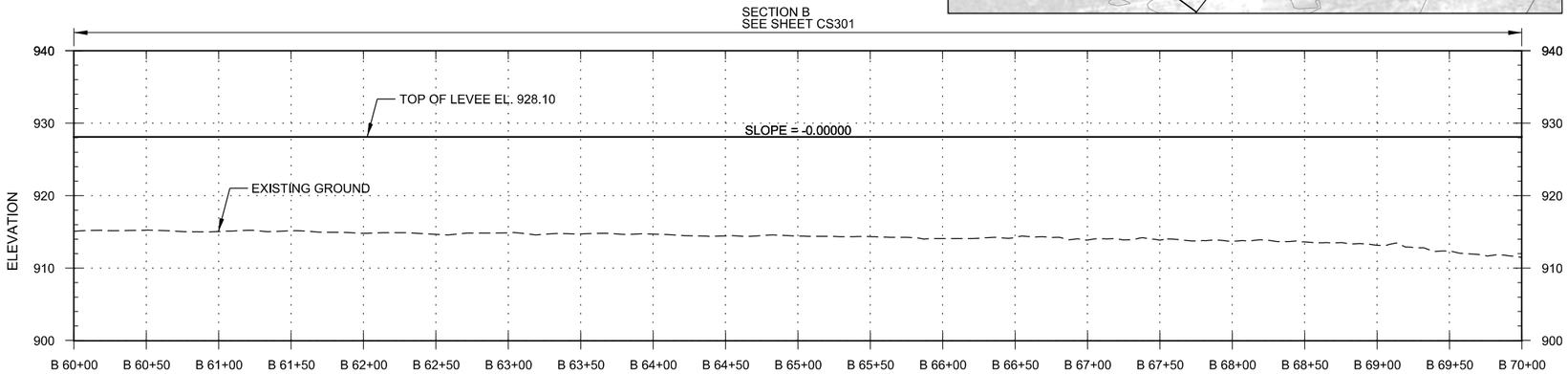
Sheet ID
CS106



PLAN

RING LEVEE

0 25' 50' 100'



PROFILE

RING LEVEE

0 25' 50' 100'

HORIZONTAL SCALE

0 10' 20'

VERTICAL SCALE

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

NOTES:

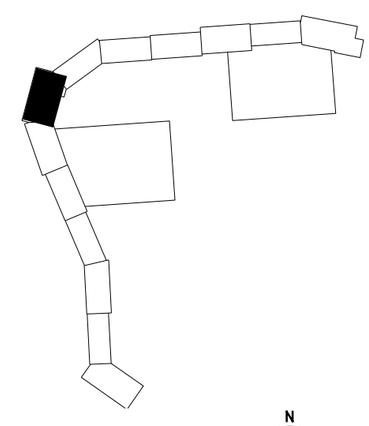
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

X
X



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

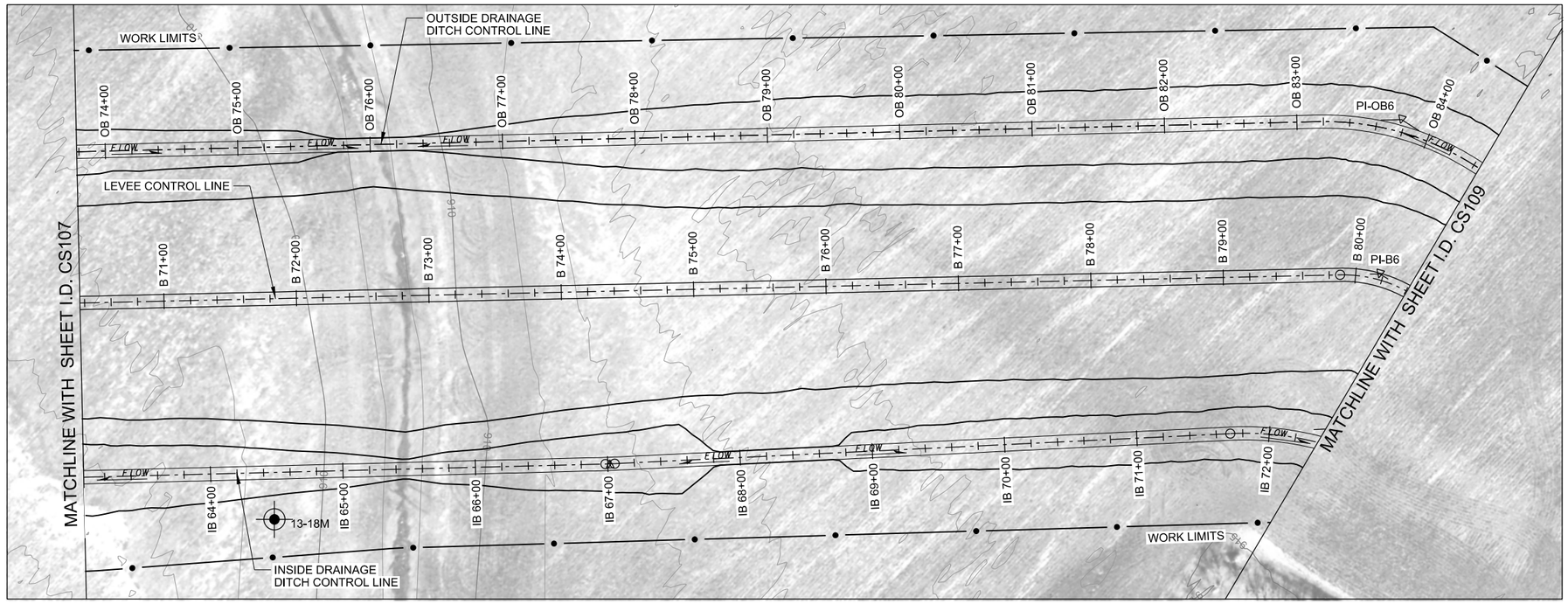
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT DATE: 11/20/24
PLOT SCALE: 1" = 50'
SIZE:
FILE NAME: FMM-43B_CS107---sign
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 60+00 - STA B 70+00

Sheet ID
CS107



PLAN

LEVEE

0 25' 50' 100'

NOTES:

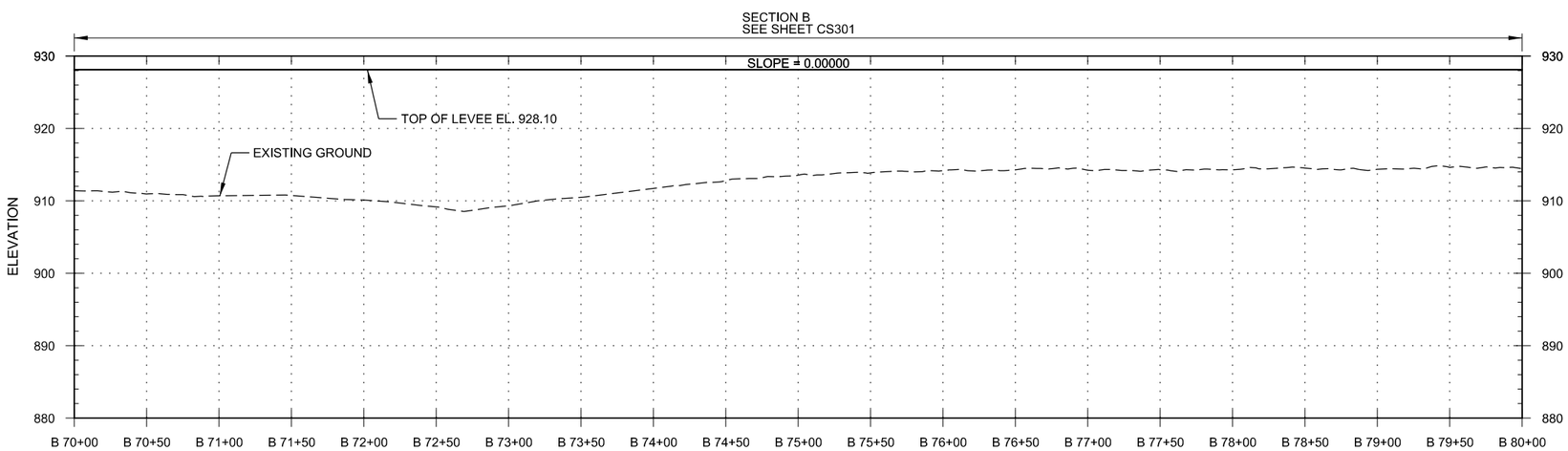
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

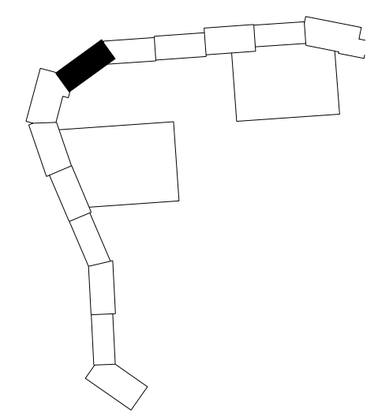
X
X



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE
0 10' 20'
VERTICAL SCALE



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

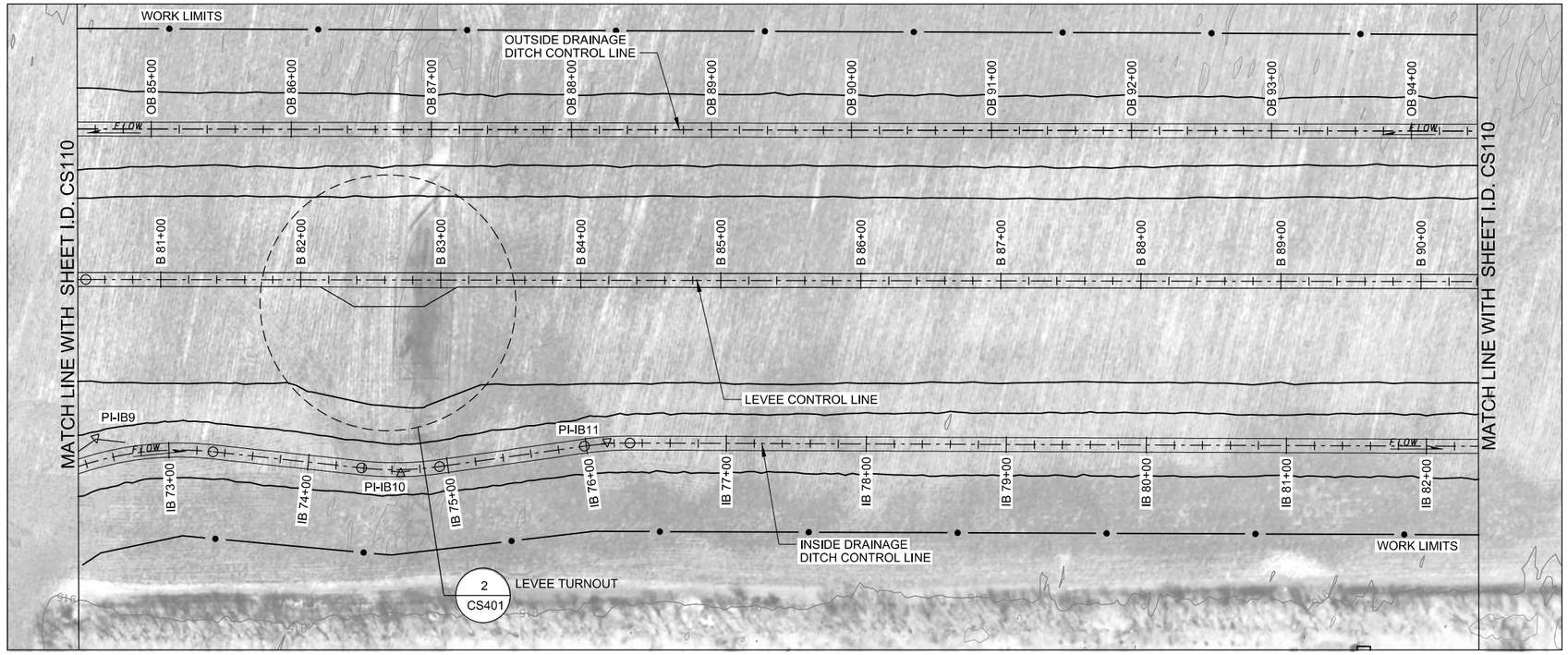
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1" = 50'
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FMM-09_CS108---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-438
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 70+00 - STA B 80+00

Sheet ID
CS108

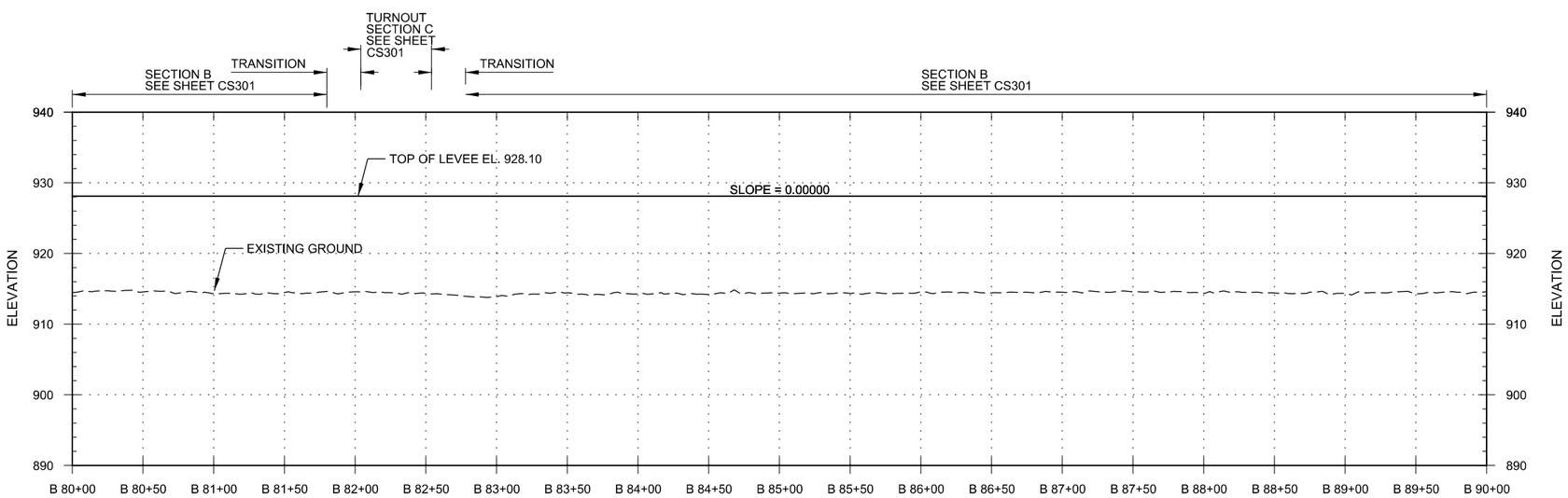


PLAN

LEVEE

0 25' 50' 100'

N



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

NOTES:

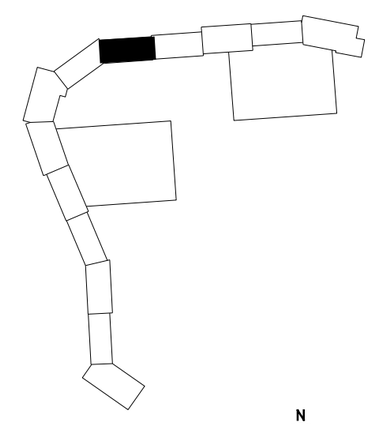
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

X
X



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

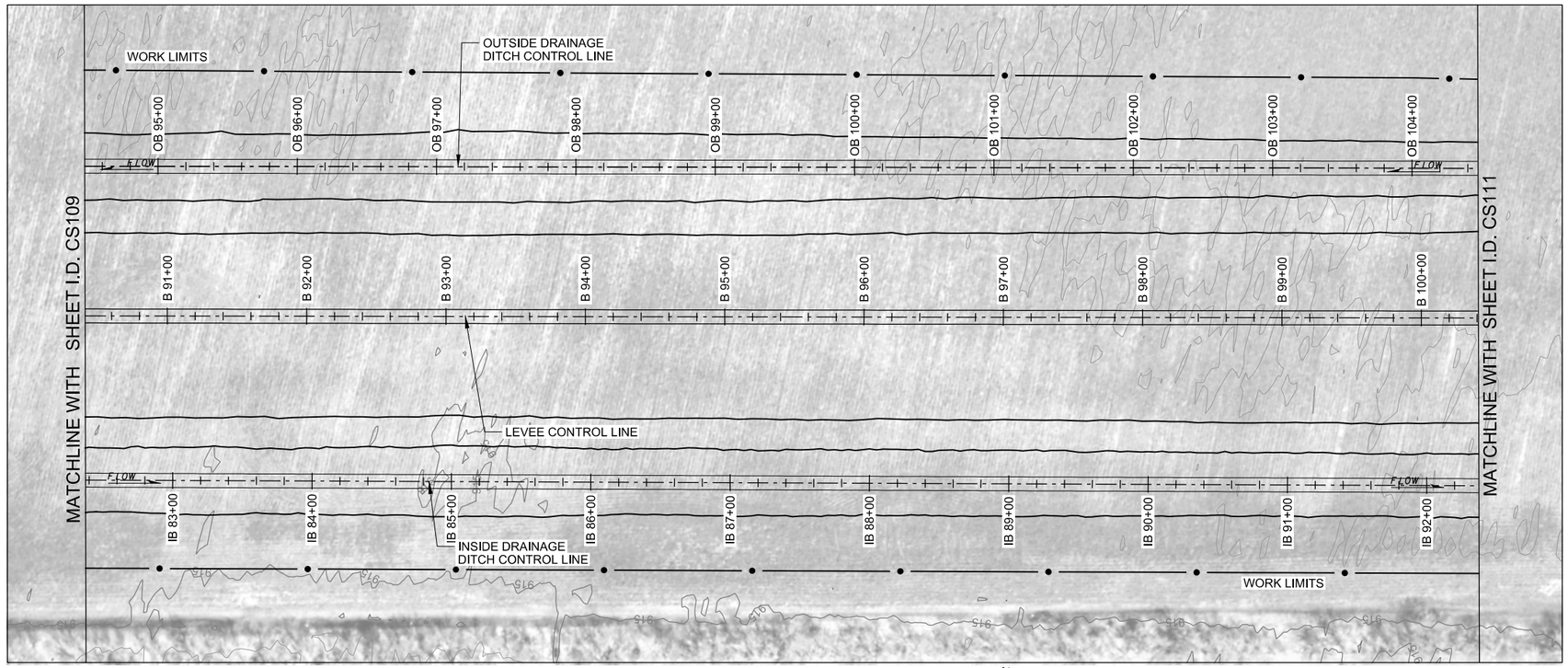
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA K. MOSE
PLOT SCALE: 1:50'
PLOT DATE: 10/20/14
SIZE:
FILE NAME: FMM43B_CS109---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 80+00 - STA B 90+00

Sheet ID
CS109



PLAN

LEVEE

0 25' 50' 100'

N

NOTES:

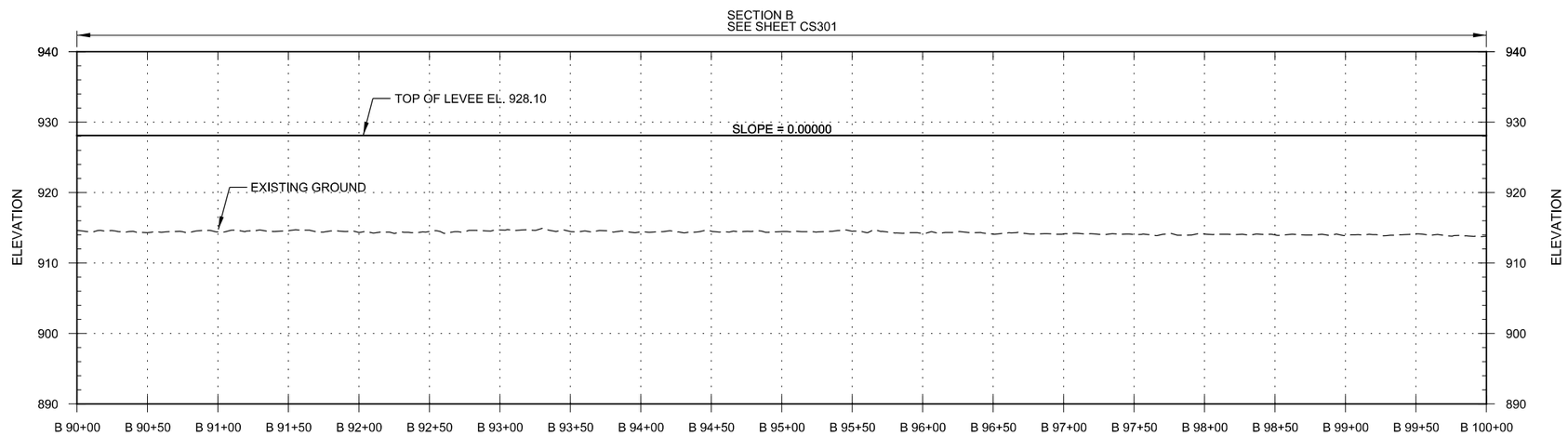
1. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2. X
   X

REFERENCES:

X
X

SHEET ID

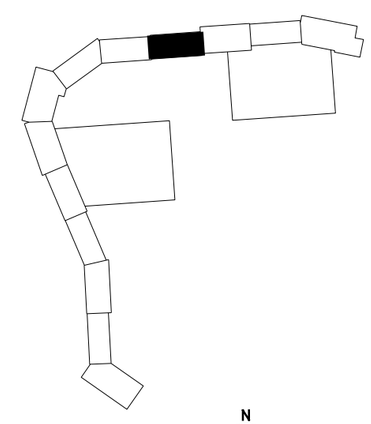
X
X



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE
0 10' 20'
VERTICAL SCALE



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

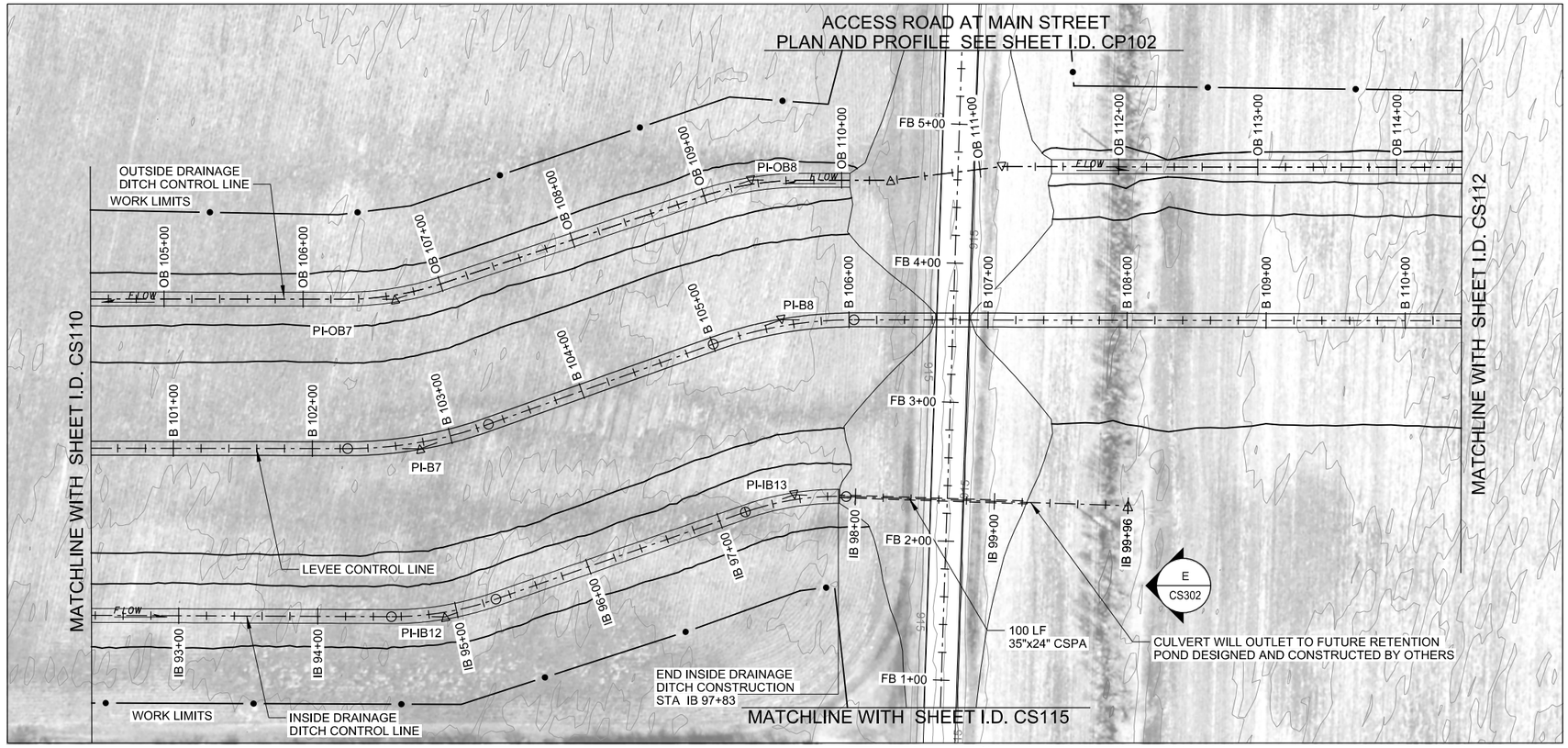
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA.M.MOSE
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1 = 50'
PLOT DATE: 10/7/2014
SIZE:
FILE NAME: FM0439_CS110--dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 90+00 - STA B 100+00

Sheet ID
CS110



PLAN

LEVEE

0 25' 50' 100'

NOTES:

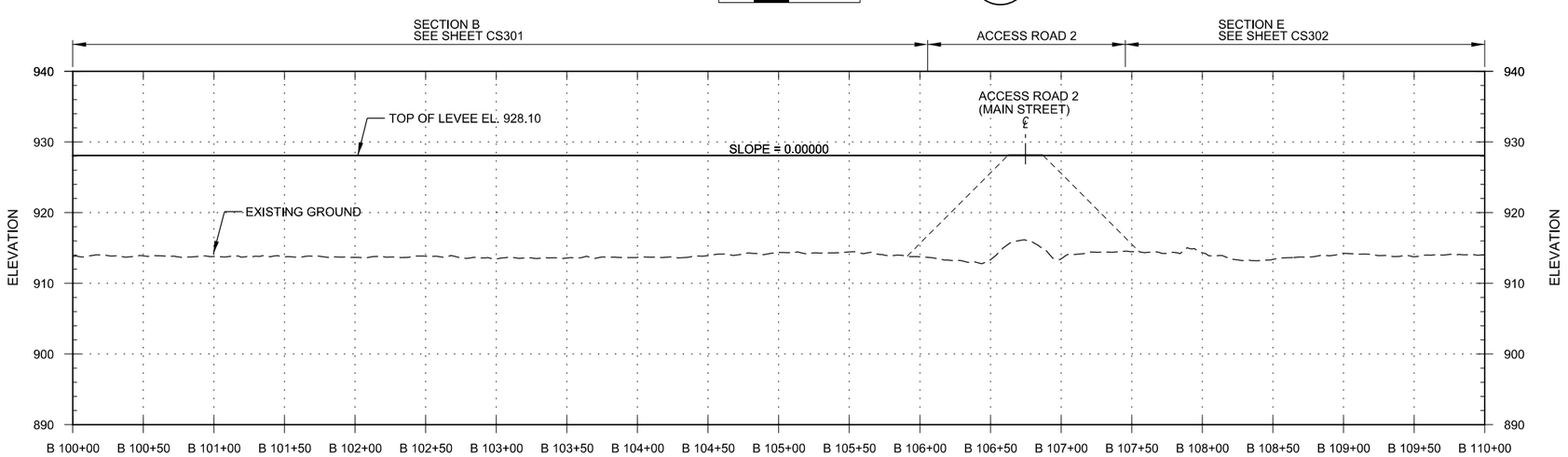
1. SEE SHEET C-XXX FOR WORK LIMIT POINTS NOT SHOWN ON PLAN VIEW.
2. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.

REFERENCES:

ACCESS ROAD 2

SHEET ID

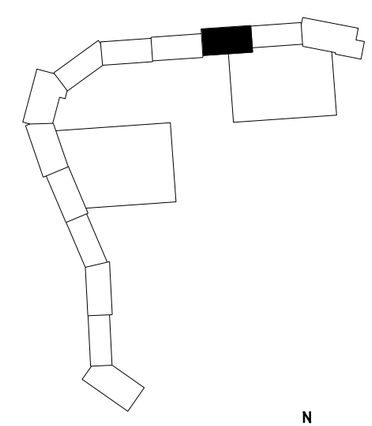
CP102



PROFILE

LEVEE

0 25' 50' 100'
HORIZONTAL SCALE
0 10' 20'
VERTICAL SCALE



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

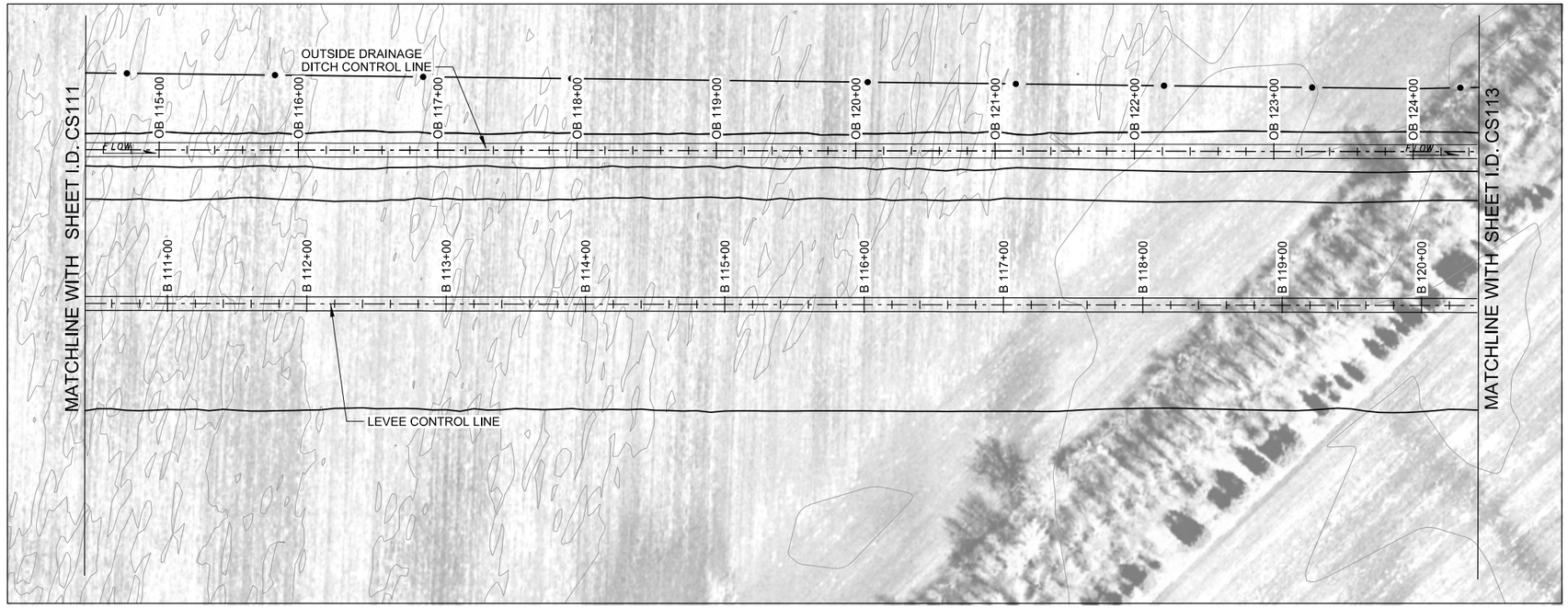
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT DATE: 10/20/14
PLOT SCALE: 1" = 50'
SIZE:
FILE NAME: FMM49_CS111---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 100+00 - STA B 110+00

Sheet ID
CS111



PLAN

LEVEE

0 25' 50' 100'

N

NOTES:

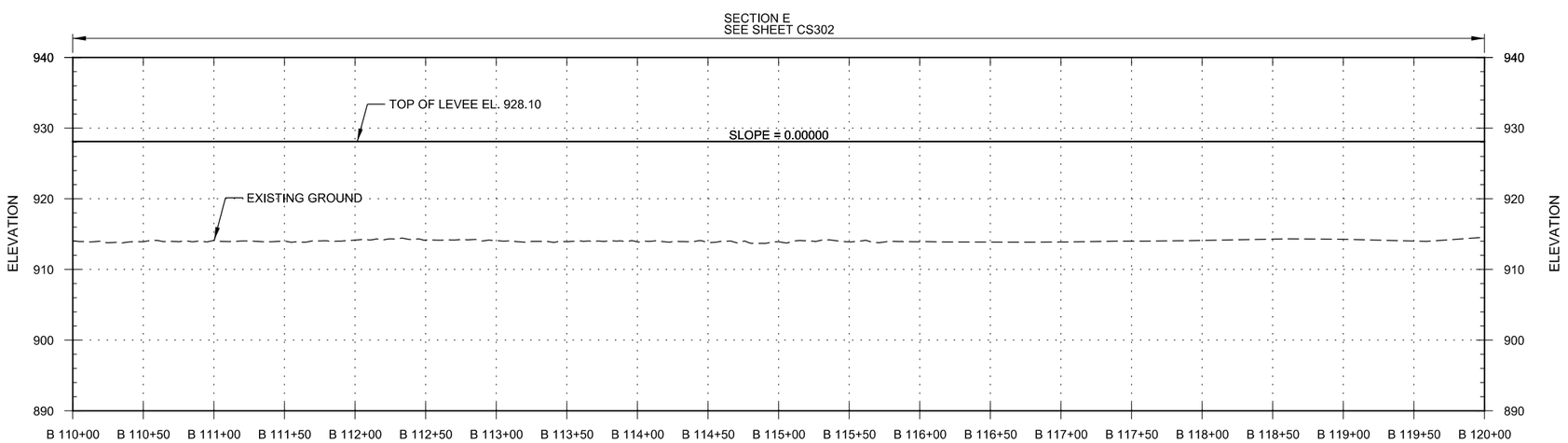
1. SEE SHEET C-XXX FOR WORK LIMIT POINTS NOT SHOWN ON PLAN VIEW.
2. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.

REFERENCES:

X
X

SHEET ID

X
X



PROFILE

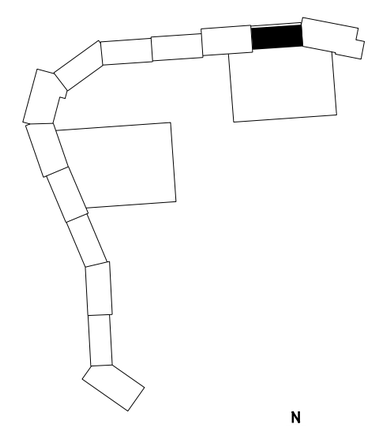
LEVEE

0 25' 50' 100'

HORIZONTAL SCALE

0 10' 20'

VERTICAL SCALE



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

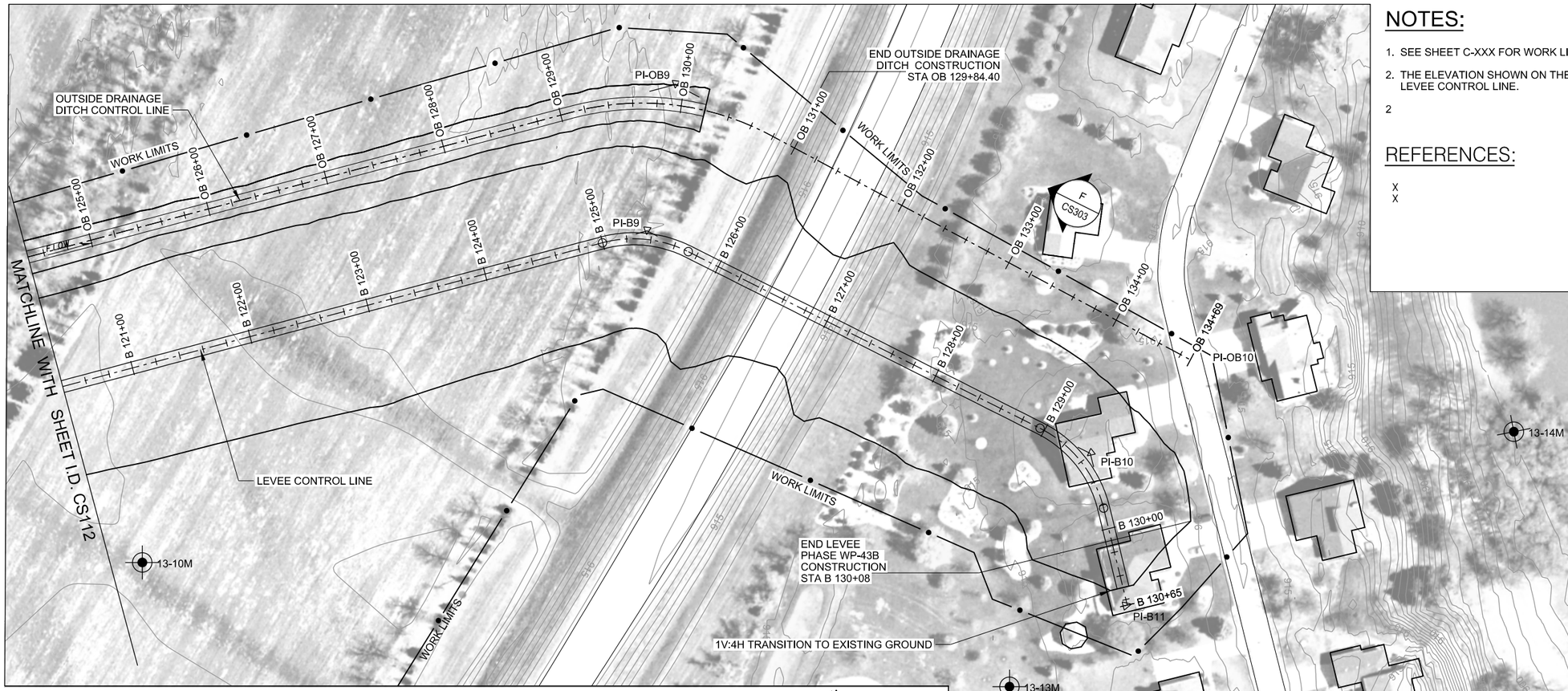
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 1/20/2014
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FM449_CS112---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-23B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 110+00 - STA B 120+00

Sheet ID
CS112



PLAN

LEVEE

0 25' 50' 100'

NOTES:

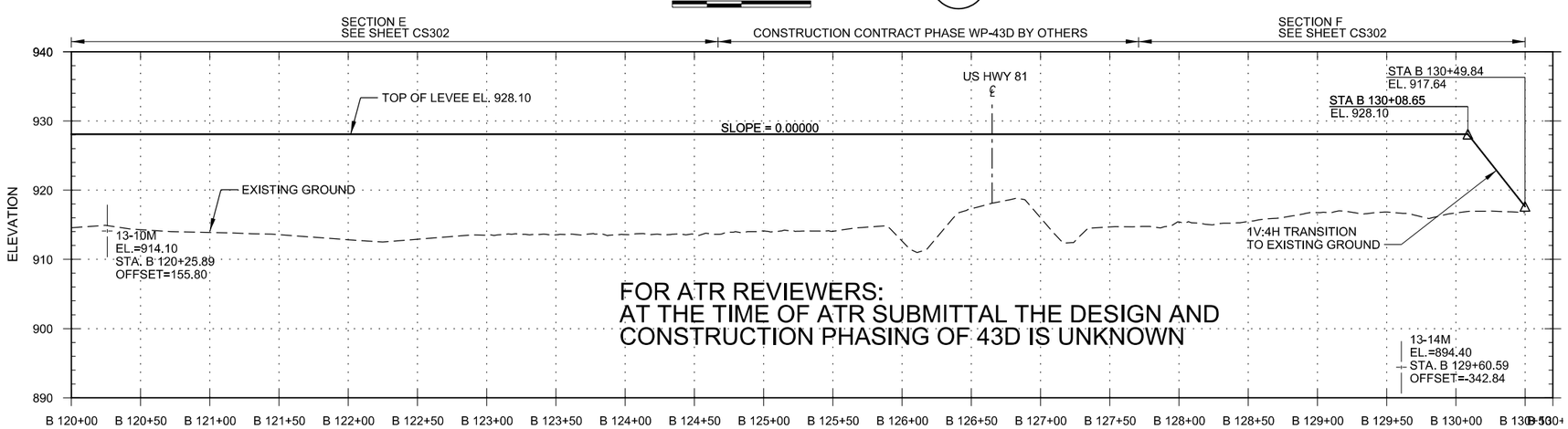
1. SEE SHEET C-XXX FOR WORK LIMIT POINTS NOT SHOWN ON PLAN VIEW.
2. THE ELEVATION SHOWN ON THE PROFILE IS AT THE LEVEE CONTROL LINE.
2

REFERENCES:

X
X

SHEET ID

X
X



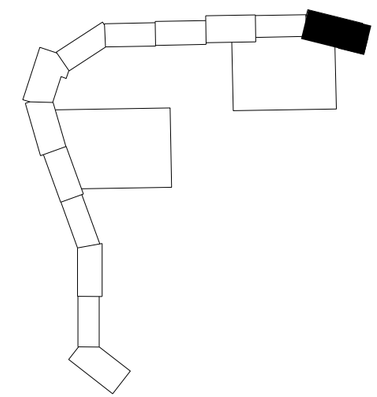
FOR ATR REVIEWERS:
AT THE TIME OF ATR SUBMITTAL THE DESIGN AND CONSTRUCTION PHASING OF 43D IS UNKNOWN

PROFILE

LEVEE

HORIZONTAL SCALE 0 25' 50' 100'

VERTICAL SCALE 0 10' 20'



KEY PLAN

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

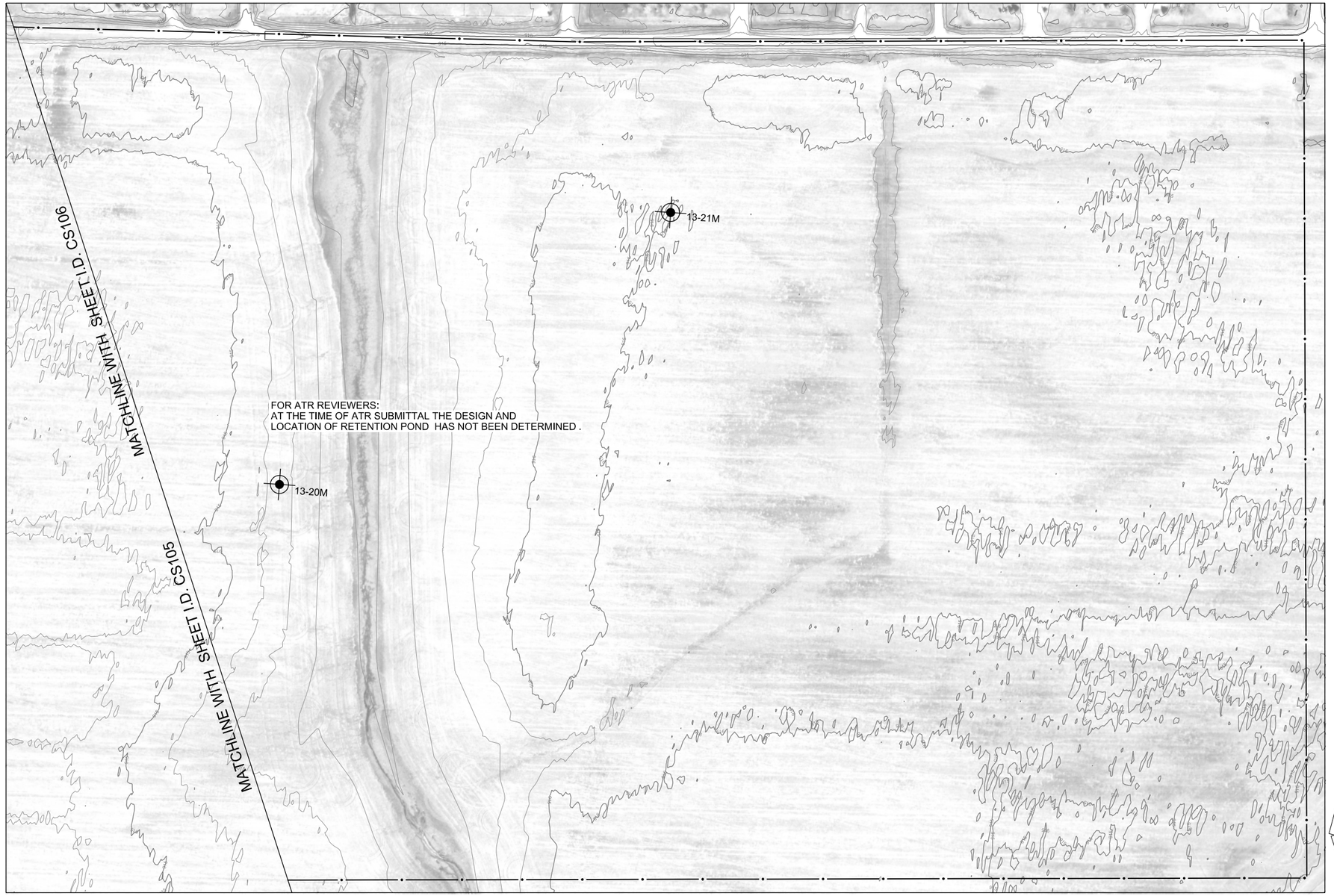
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:1 WORK
PLOT DATE: 7/30/2010
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM43B_CS113---.dgn

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
STA B 120+00 - STA B 128+00

Sheet ID
CS113



PLAN

WEST BORROW AREA

0 100' 200'

N

NOTES:

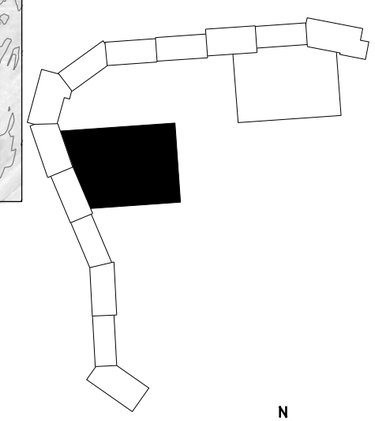
1. x.
2. X

REFERENCES:

ACCESS ROAD 2

SHEET ID

CP102



KEY PLAN

N

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:250'
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FMM43B_CS114---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN VIEW
WEST BORROW AREA

Sheet ID
CS114

PLAN

NORTH BORROW AREA

0 100' 200'

N

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

NOTES:

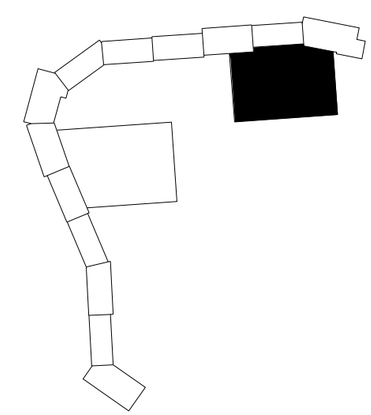
1. x.
2. X

REFERENCES:

ACCESS ROAD 2

SHEET ID

CP102



KEY PLAN

N

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

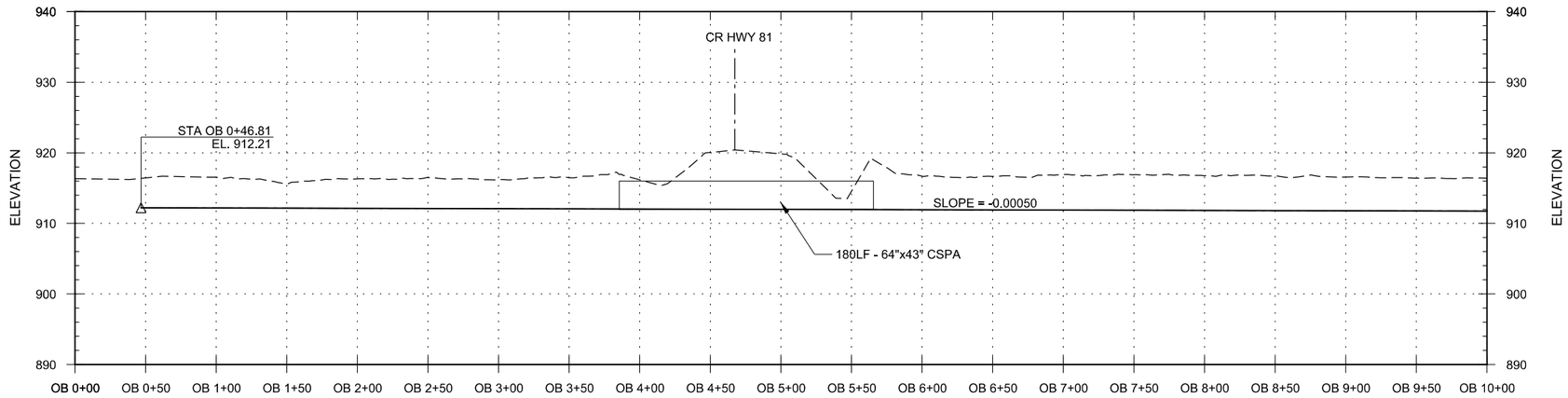
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1" = 50'
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FMM39_CS115---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

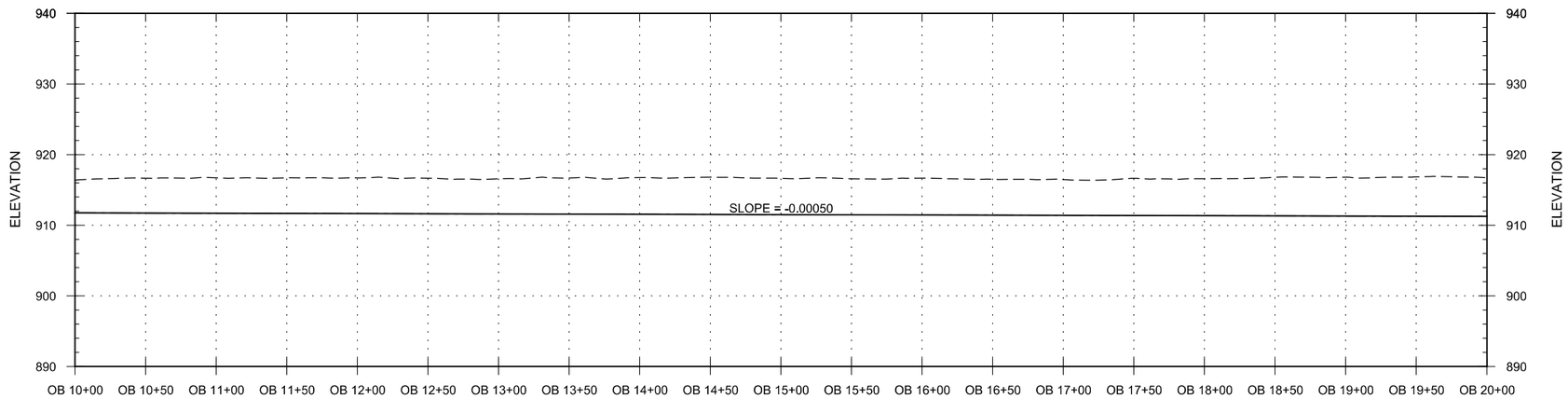
PLAN VIEW
NORTH BORROW AREA

Sheet ID
CS115



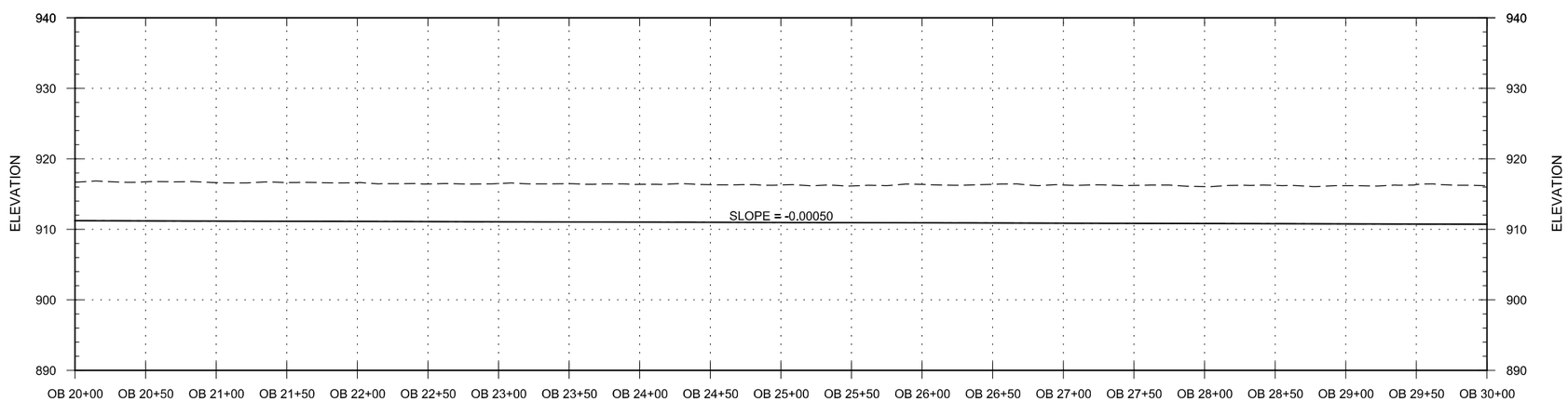
PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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DTR-ATR

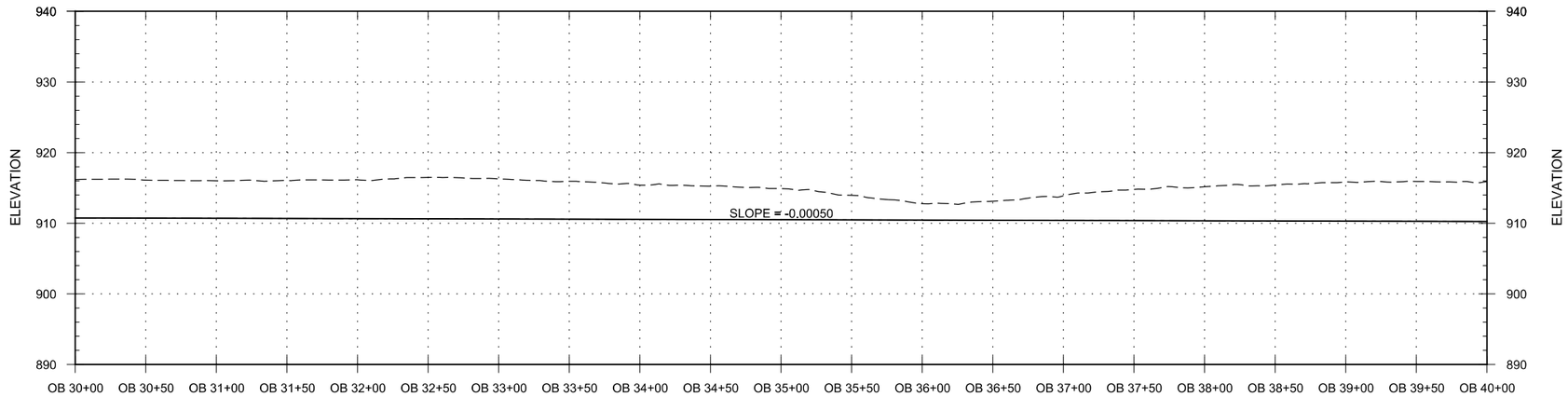
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1" = 50'
PLOT DATE: 11/20/2014
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM43B_CS201---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

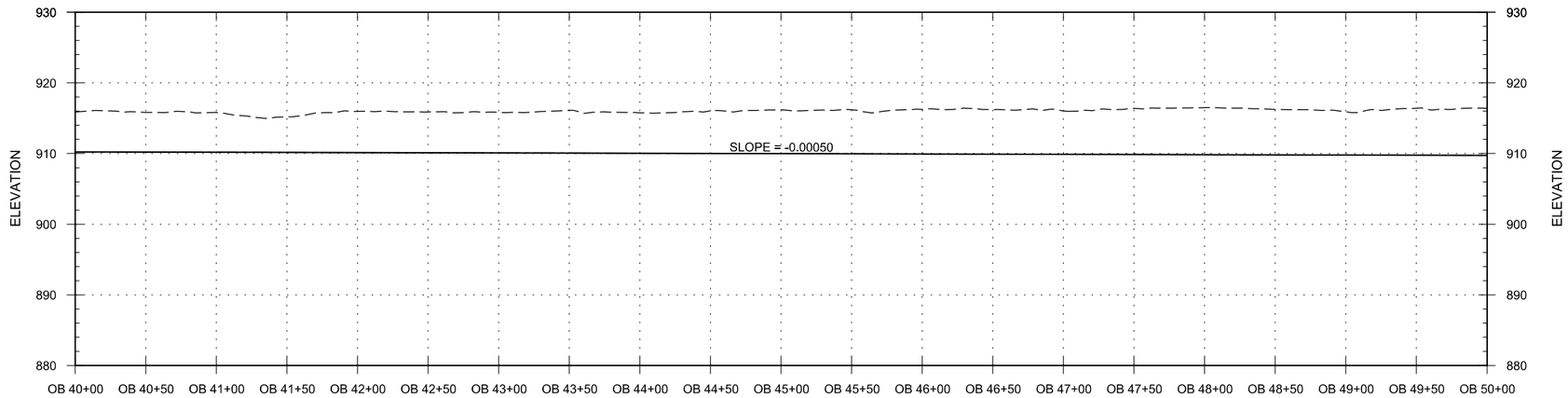
PROFILE
OUTSIDE DRAINAGE DITCH
STA OD 70+00 - STA OD 100+00

Sheet ID
CS201



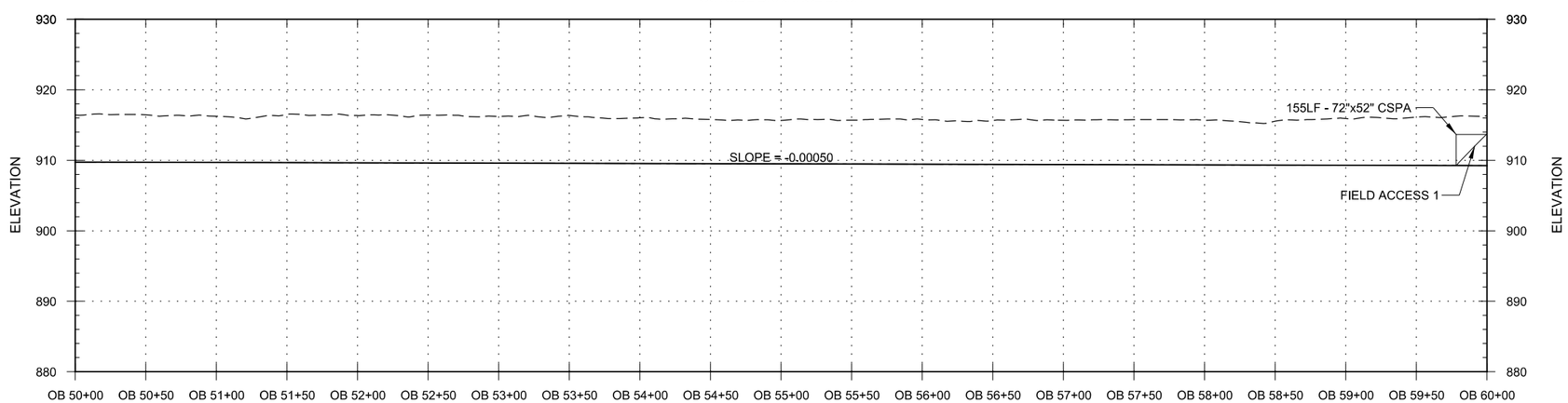
PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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DTR-ATR

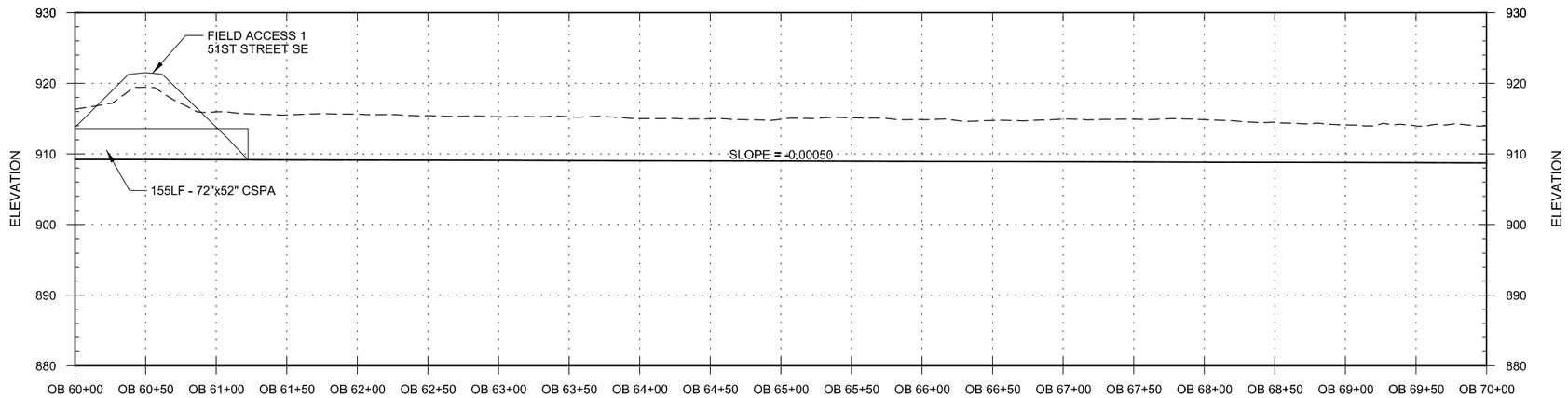
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1" = 50'
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FMM-09_CS202---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-438
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

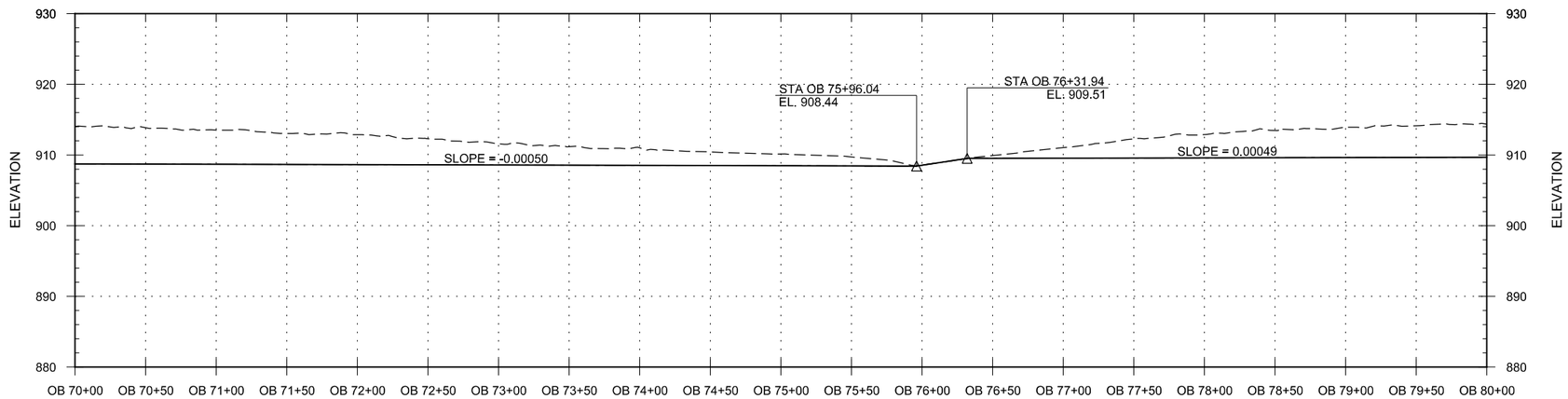
PROFILE
OUTSIDE DRAINAGE DITCH
STA OD 100+00 - STA OD 130+00

Sheet ID
CS202



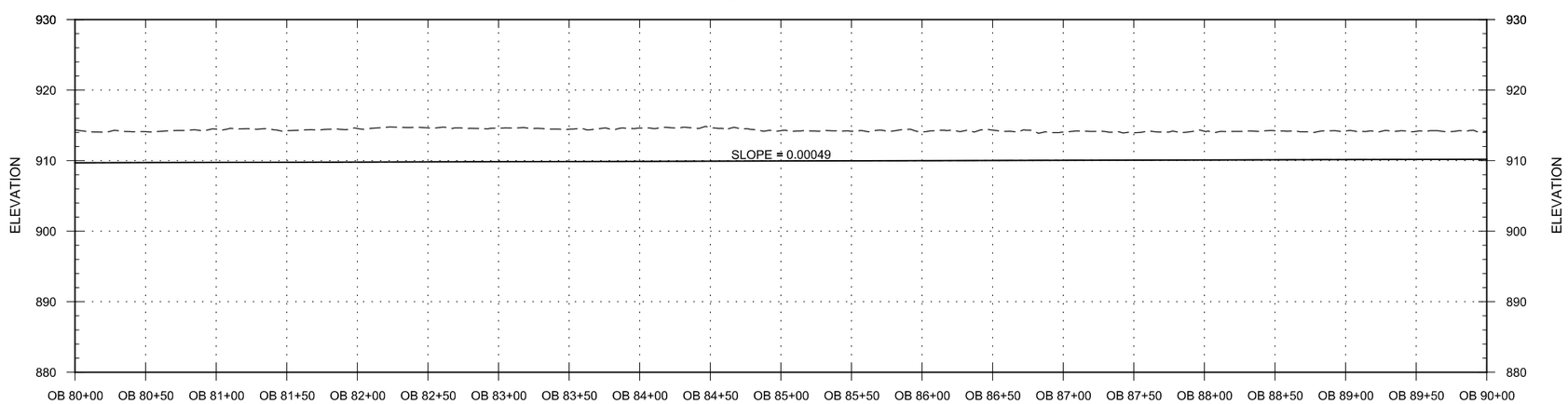
PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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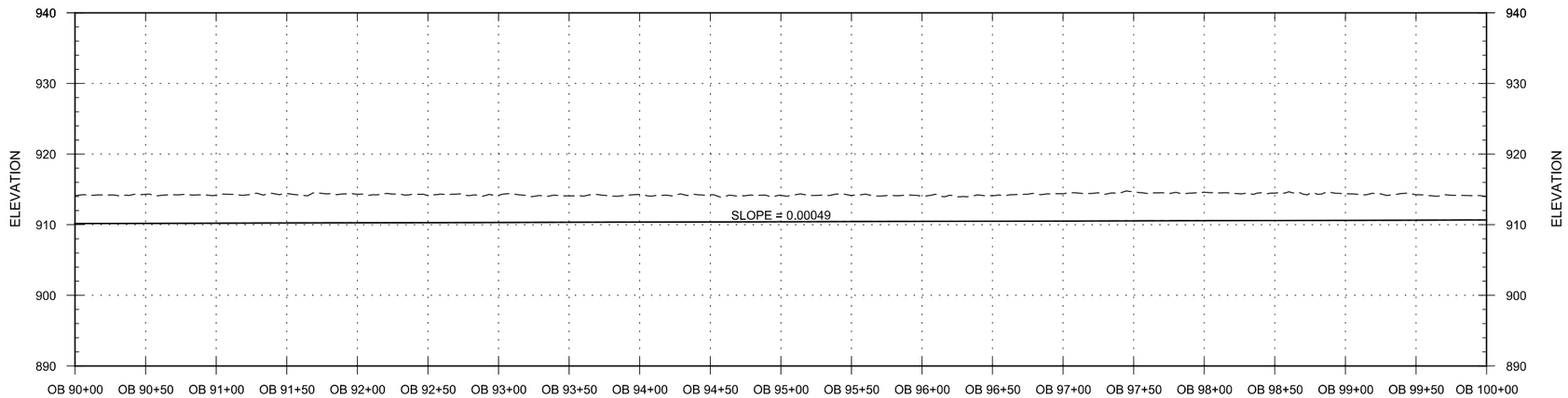
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 11/20/2014
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM43B_CS203---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

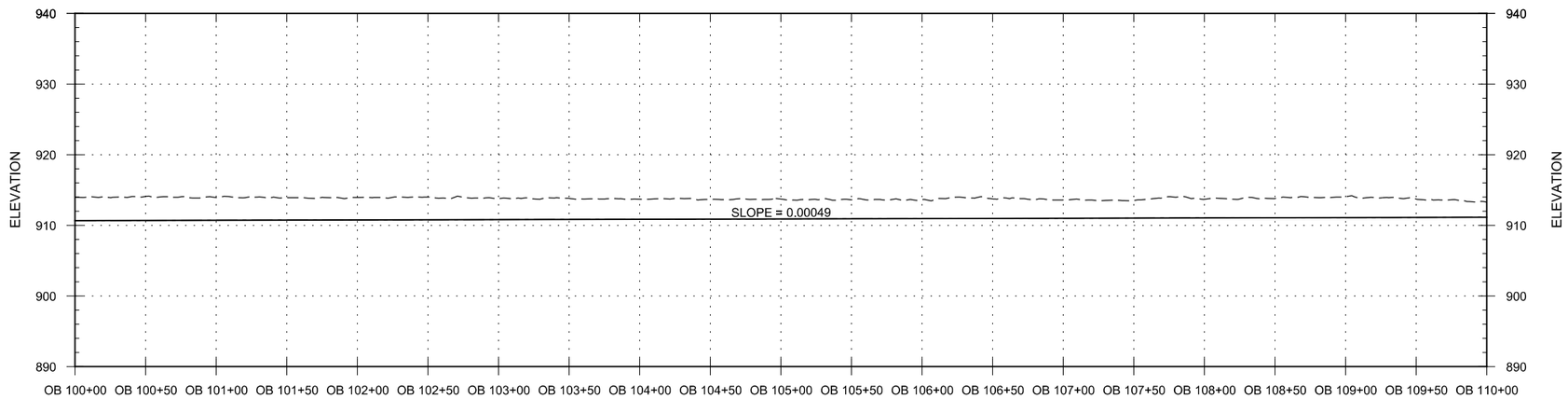
PROFILE
OUTSIDE DRAINAGE DITCH
STA OD 130+00 - STA OD 160+00

Sheet ID
CS203



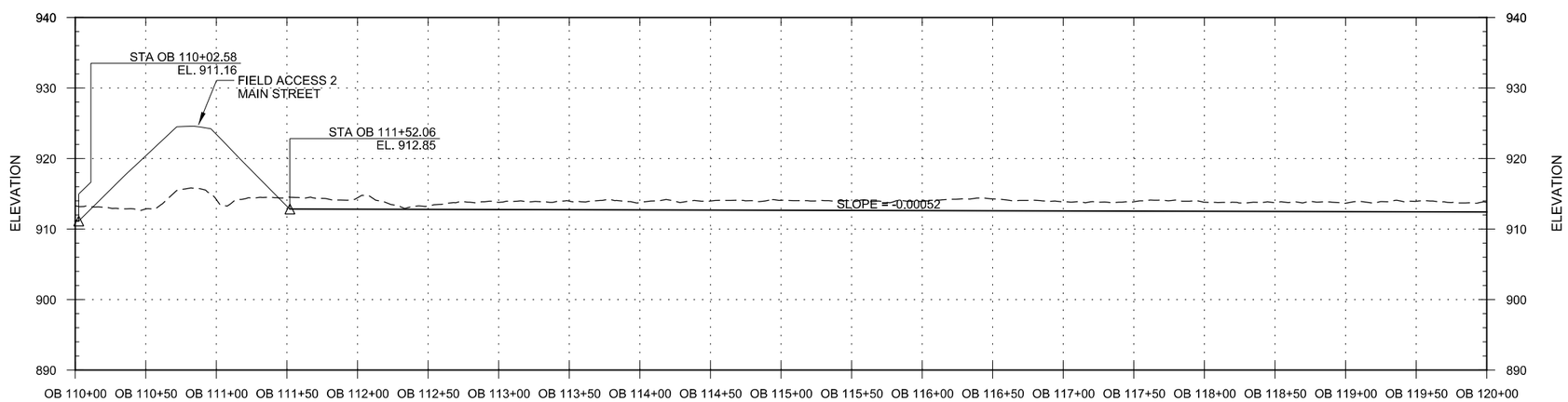
PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH



PROFILE

OUTSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

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DTR-ATR

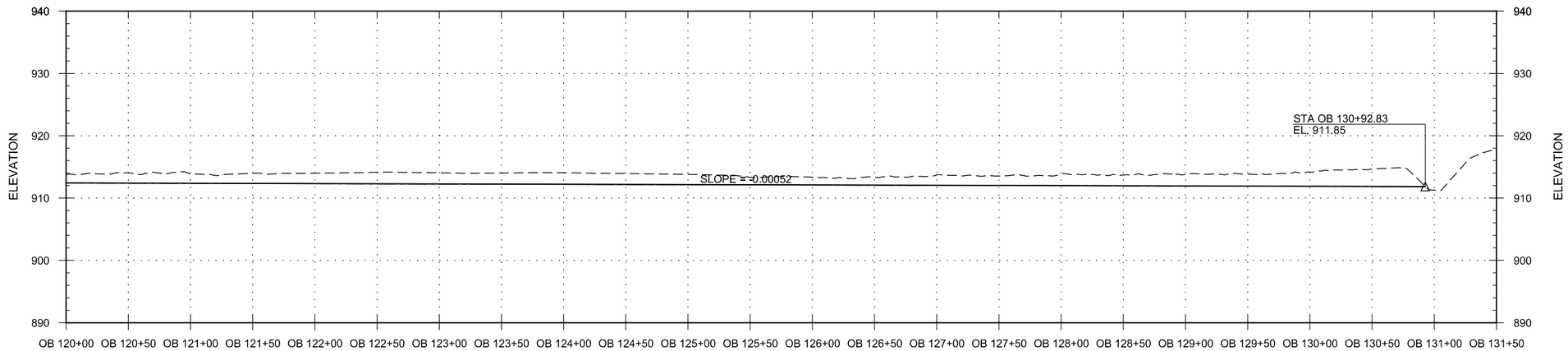
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:100 FOR 24 X 36
PLOT DATE:
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FM-439_CS204---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

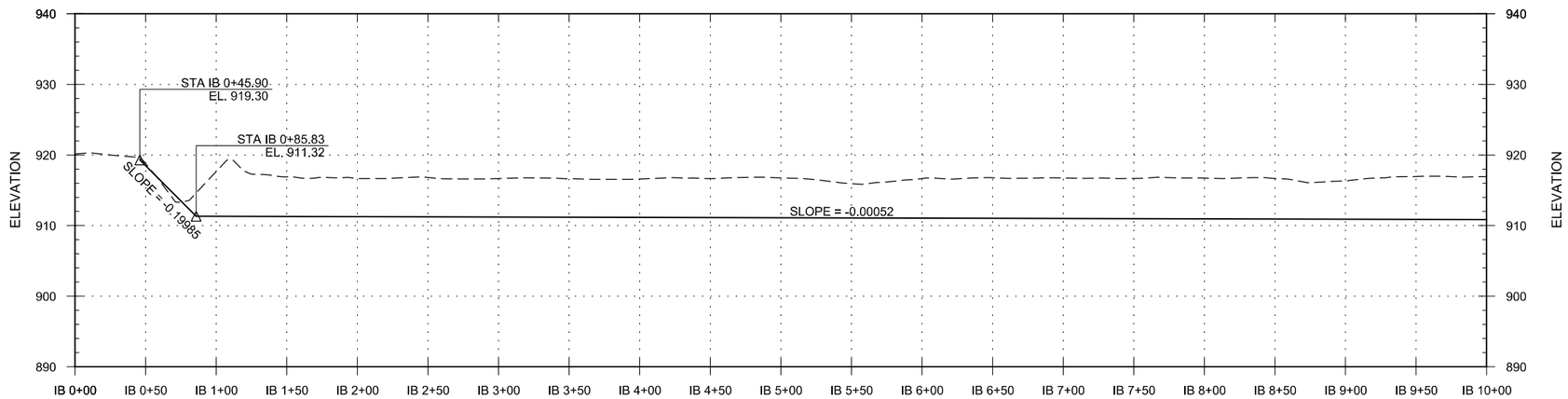
PROFILE
OUTSIDE DRAINAGE DITCH
STA OD 160+00 - STA OD 190+00

Sheet ID
CS204



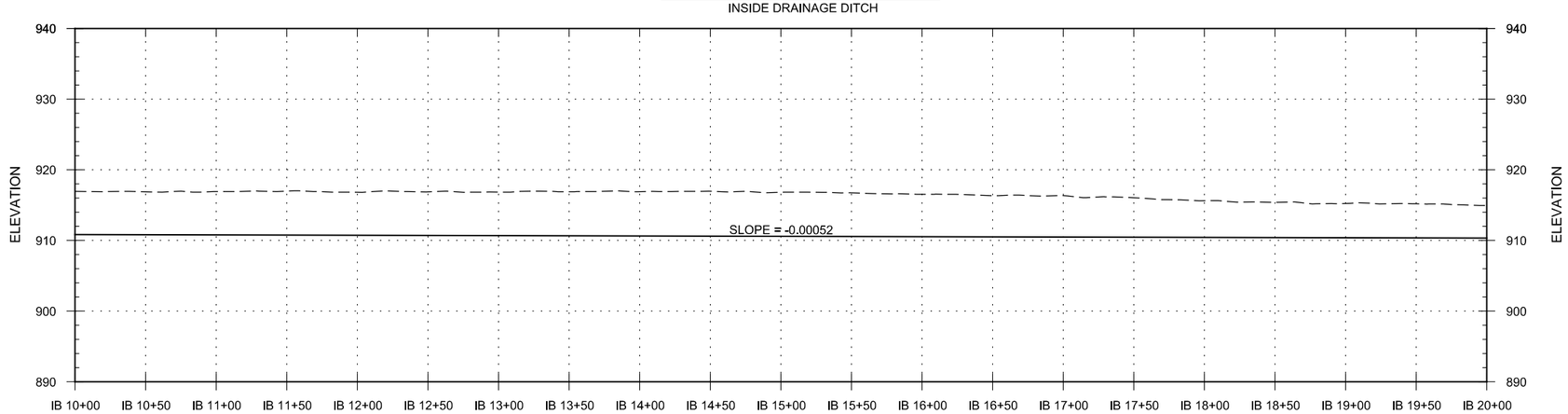
PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

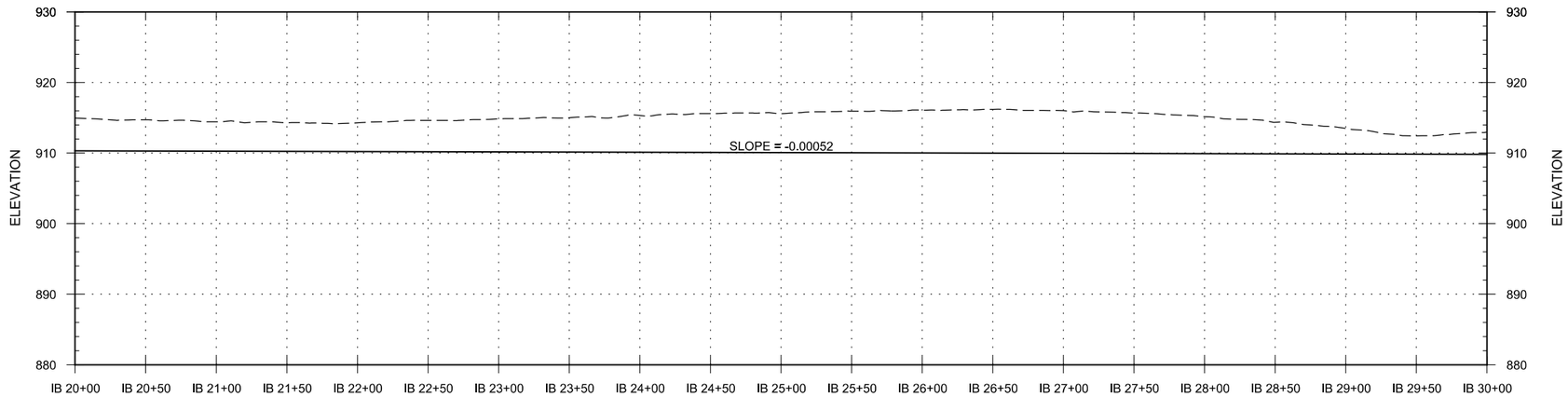
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:100 SCALE
PLOT DATE: 1/10/2014
SIZE: 1" x 36"
FILE NAME: FMM43B_CS205---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

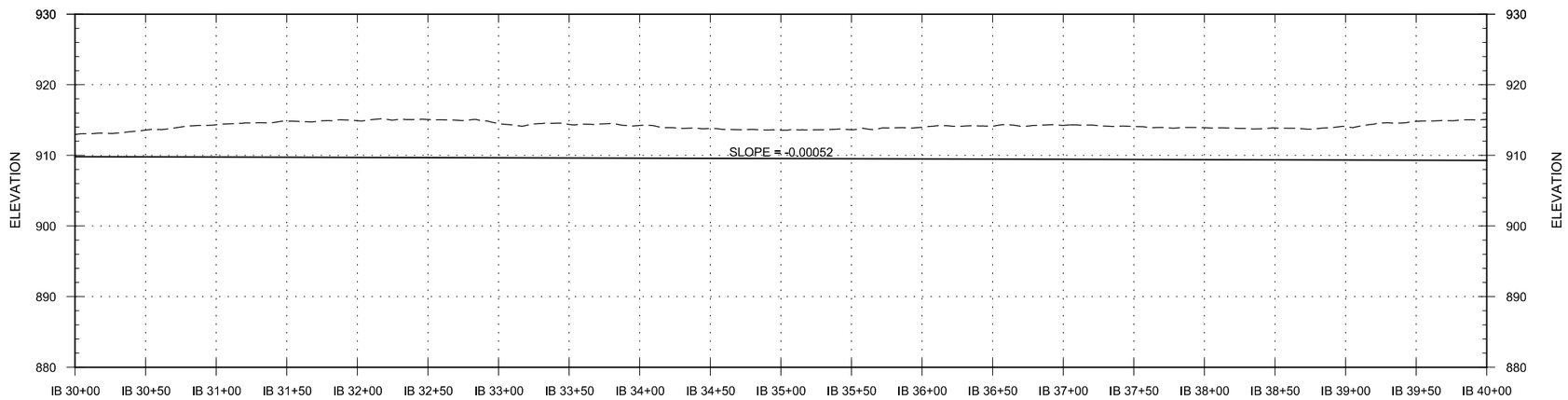
PROFILE
OUTSIDE DRAINAGE DITCH
AND INSIDE DRAINAGE DITCH

Sheet ID
CS205



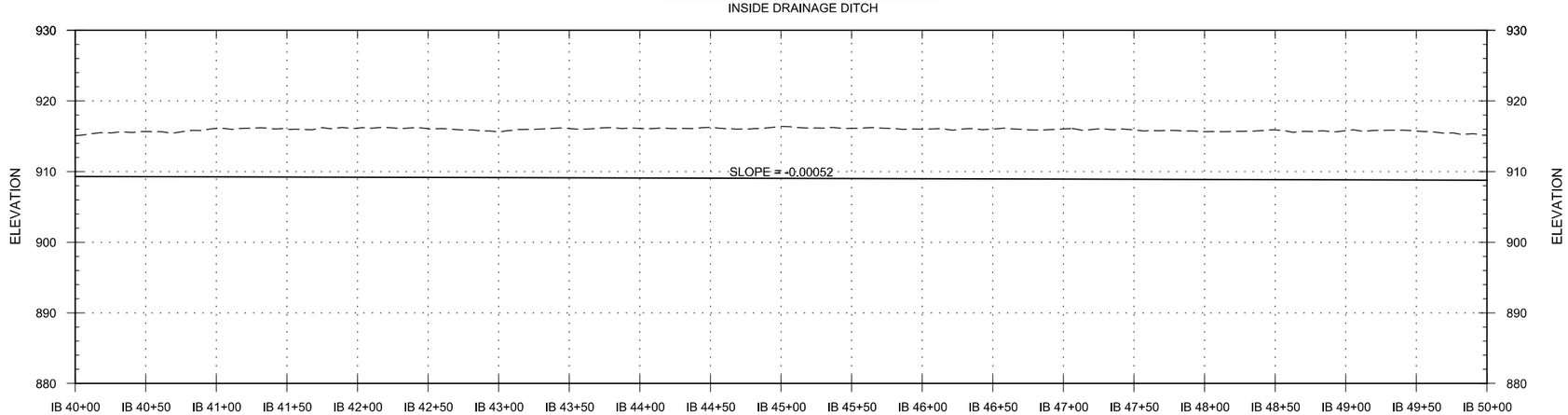
PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

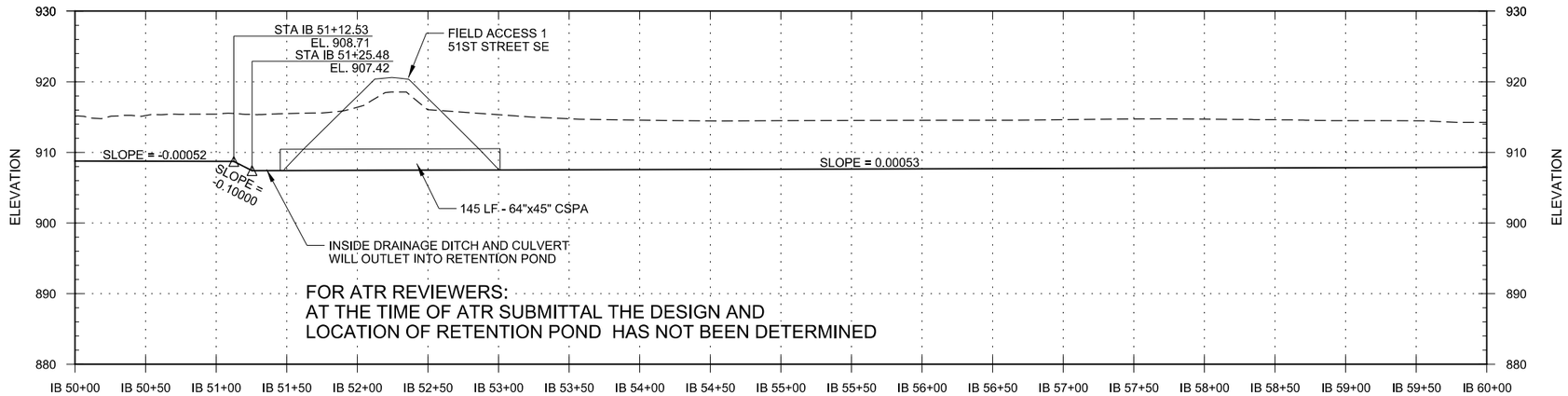
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 11/20/2014
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FMM43B_CS206---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

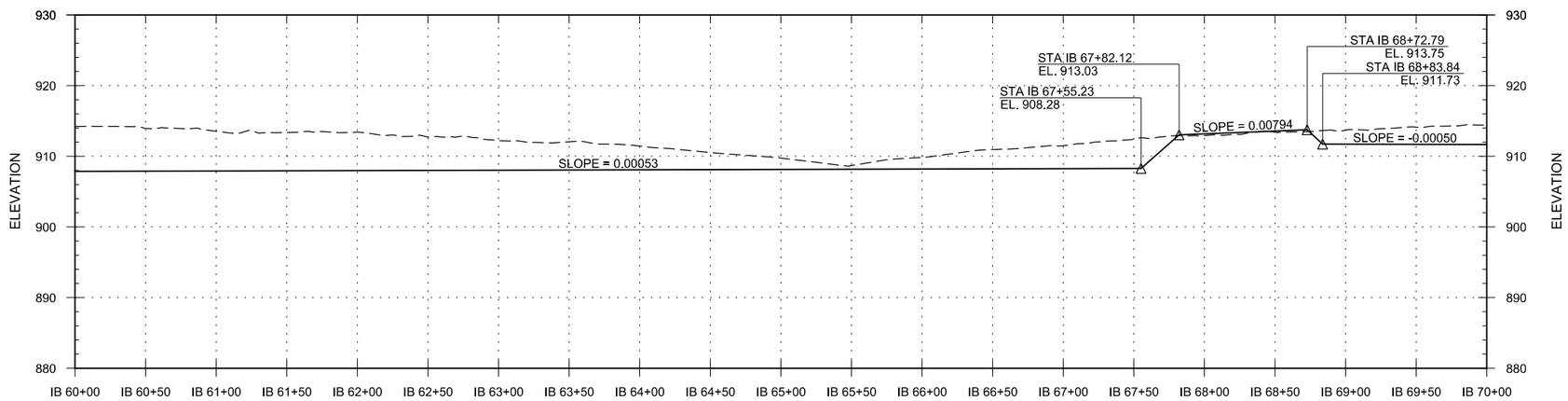
PROFILE
INSIDE DRAINAGE DITCH
STA ID 90+00 - STA IS 120+00

Sheet ID
CS206



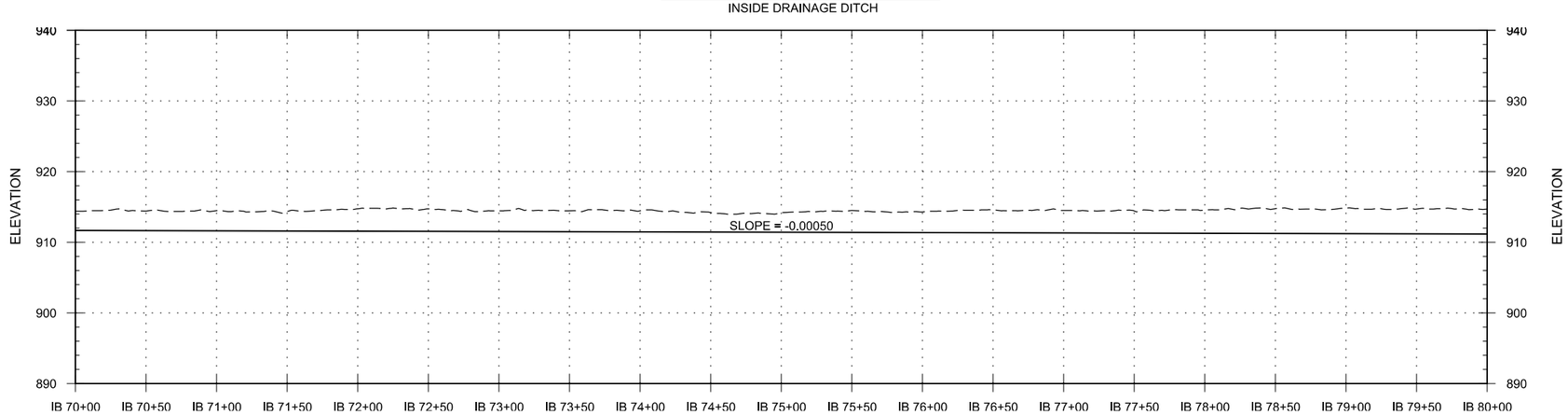
PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

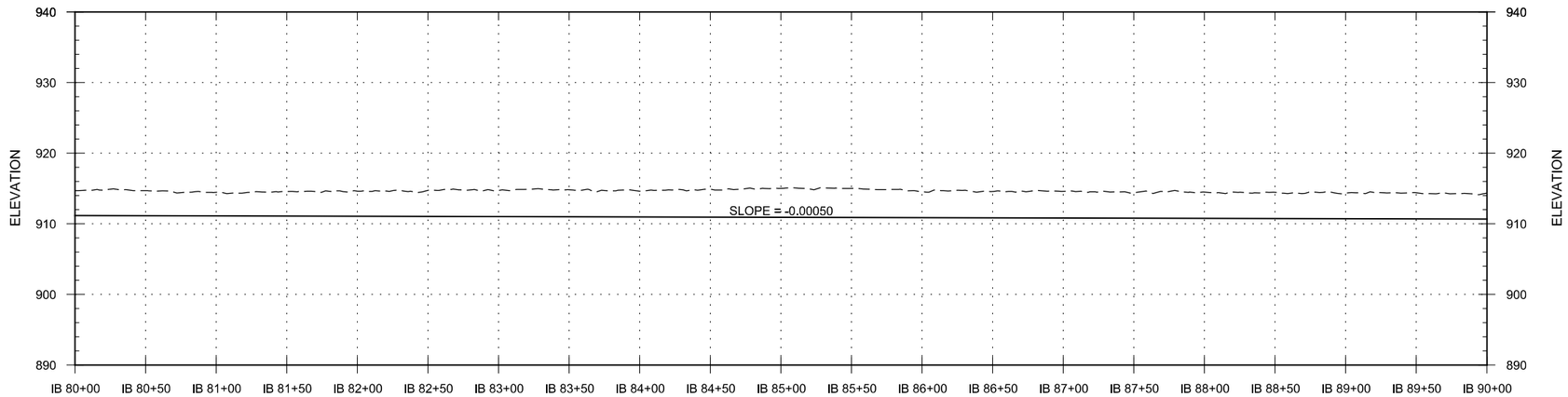
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 7/20/2021
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FM4439_CS207---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-23B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

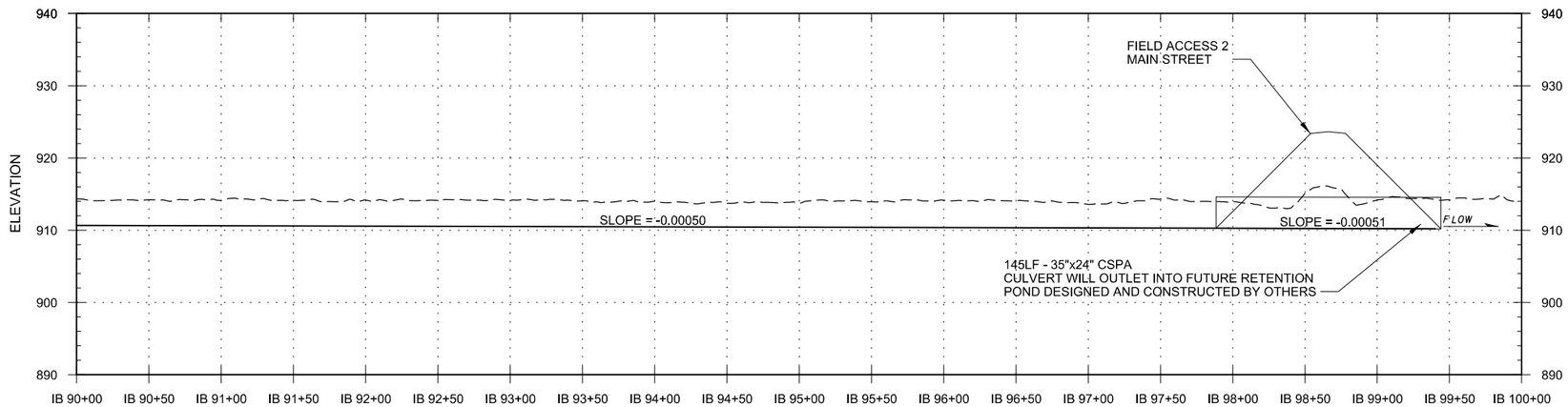
PROFILE
INSIDE DRAINAGE DITCH
STA ID 120+00 - STA IS 150+00

Sheet ID
CS207



PROFILE

INSIDE DRAINAGE DITCH



PROFILE

INSIDE DRAINAGE DITCH

0 25' 50' 100'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

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MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

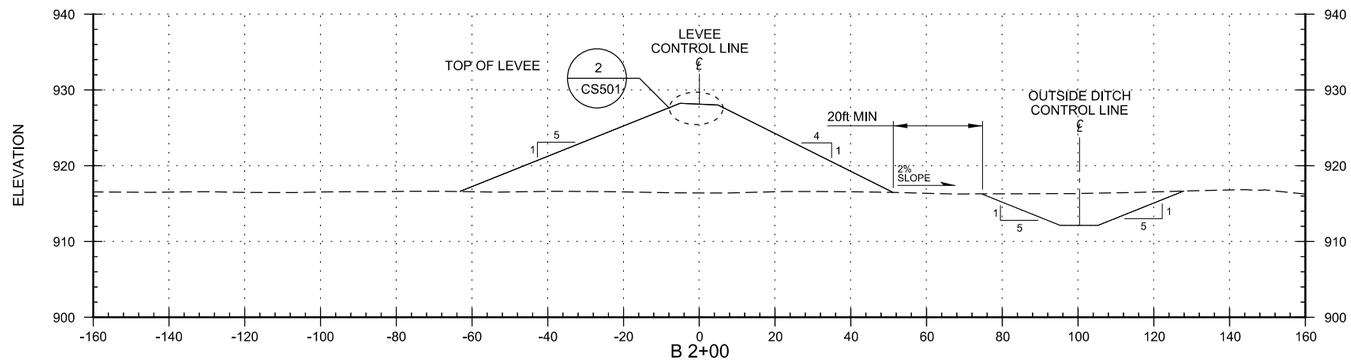
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA N. MOSE
PLOT SCALE: 1:100
PLOT DATE: 1/7/2014
SIZE: 11"x17"
FILE NAME: FMM-03B_CS208---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PROFILE
INSIDE DRAINAGE DITCH
STA ID 150+00 - STA IS 169+00

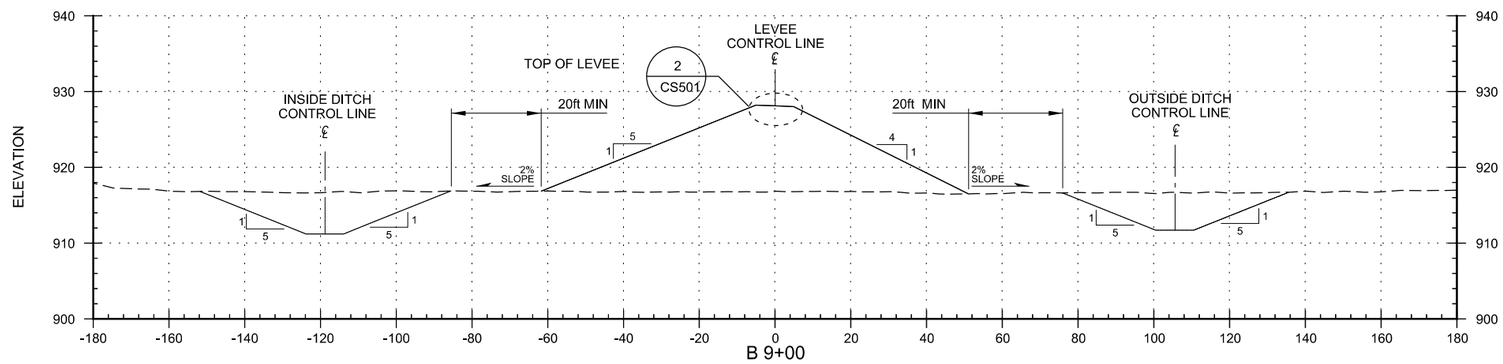
Sheet ID
CS208



A
CS101

TYPICAL SECTION

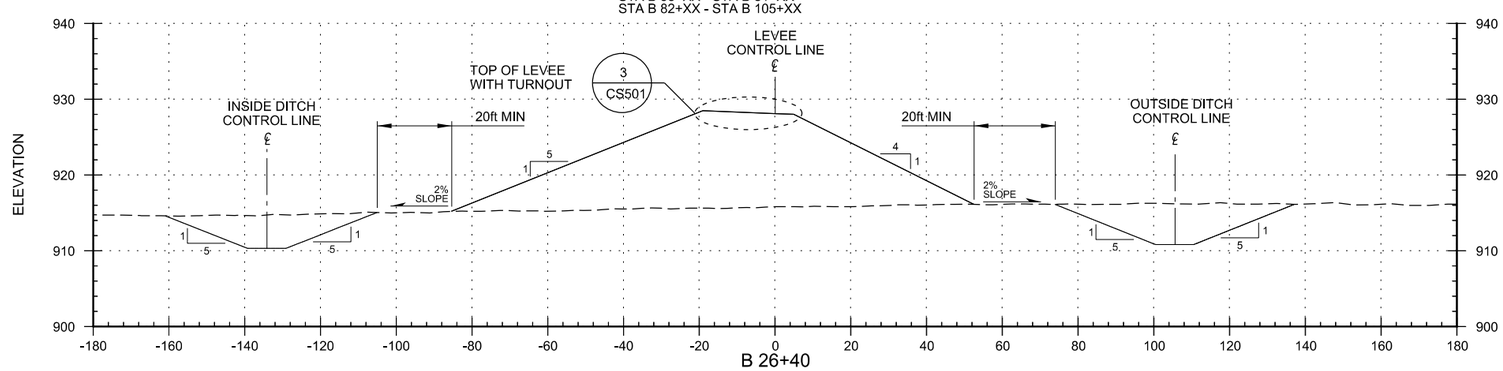
STA B 0+00 - STA B 3+00



B
CS101

TYPICAL SECTION

STA B 5+50 - STA B 26+00
STA B 27+00 - STA B 57+XX
STA B 58+XX - STA B 81+XX
STA B 82+XX - STA B 105+XX



C
CS103

TYPICAL SECTION

AT LEVEE TURNOUT
STA B 26+40
STA B 82+XX

0 10' 20' 40'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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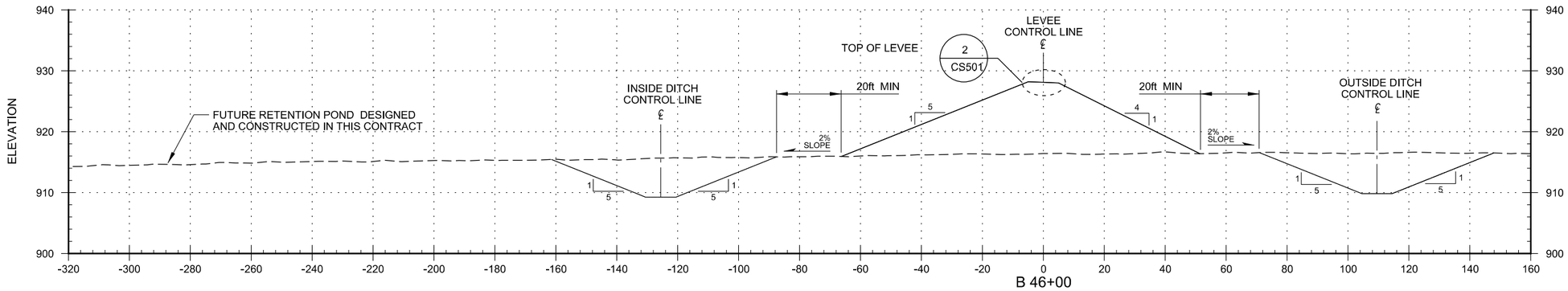
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:1 FOR 24x36
PLOT DATE:
SIZE:
FILE NAME: FMM43B_CS301---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

TYPICAL CROSS SECTIONS
A B AND C

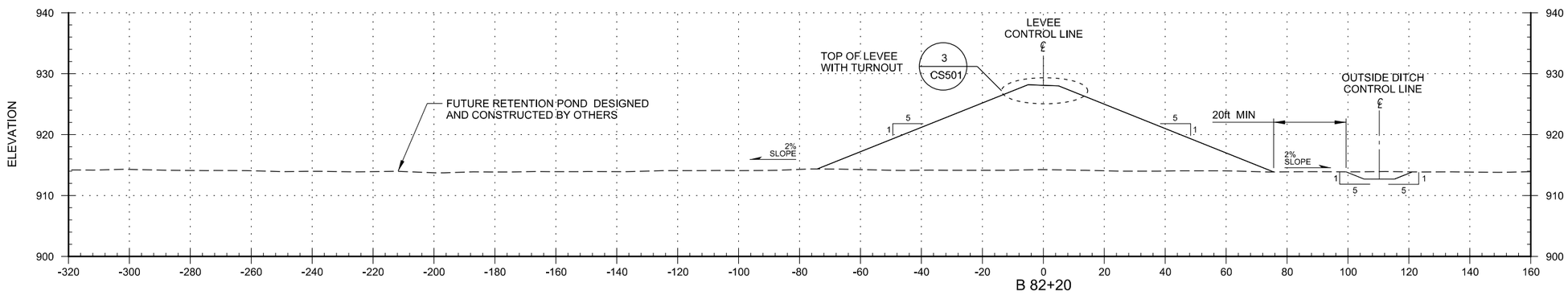
Sheet ID
CS301



D
CS105

TYPICAL SECTION

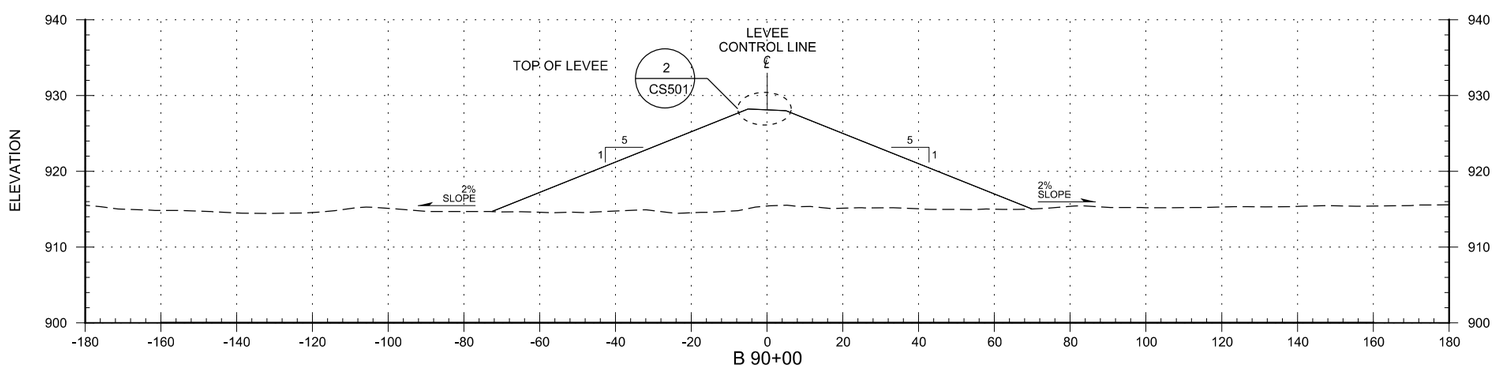
STA B 42+XX - STA B 57+00



E
CS109

TYPICAL SECTION

STA B 107+00 - STA B 125+XX



F
CS1XX

TYPICAL SECTION

STA B 127+25 - STA B 130+XX

0 10' 20' 40'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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DESIGNED BY: EPP
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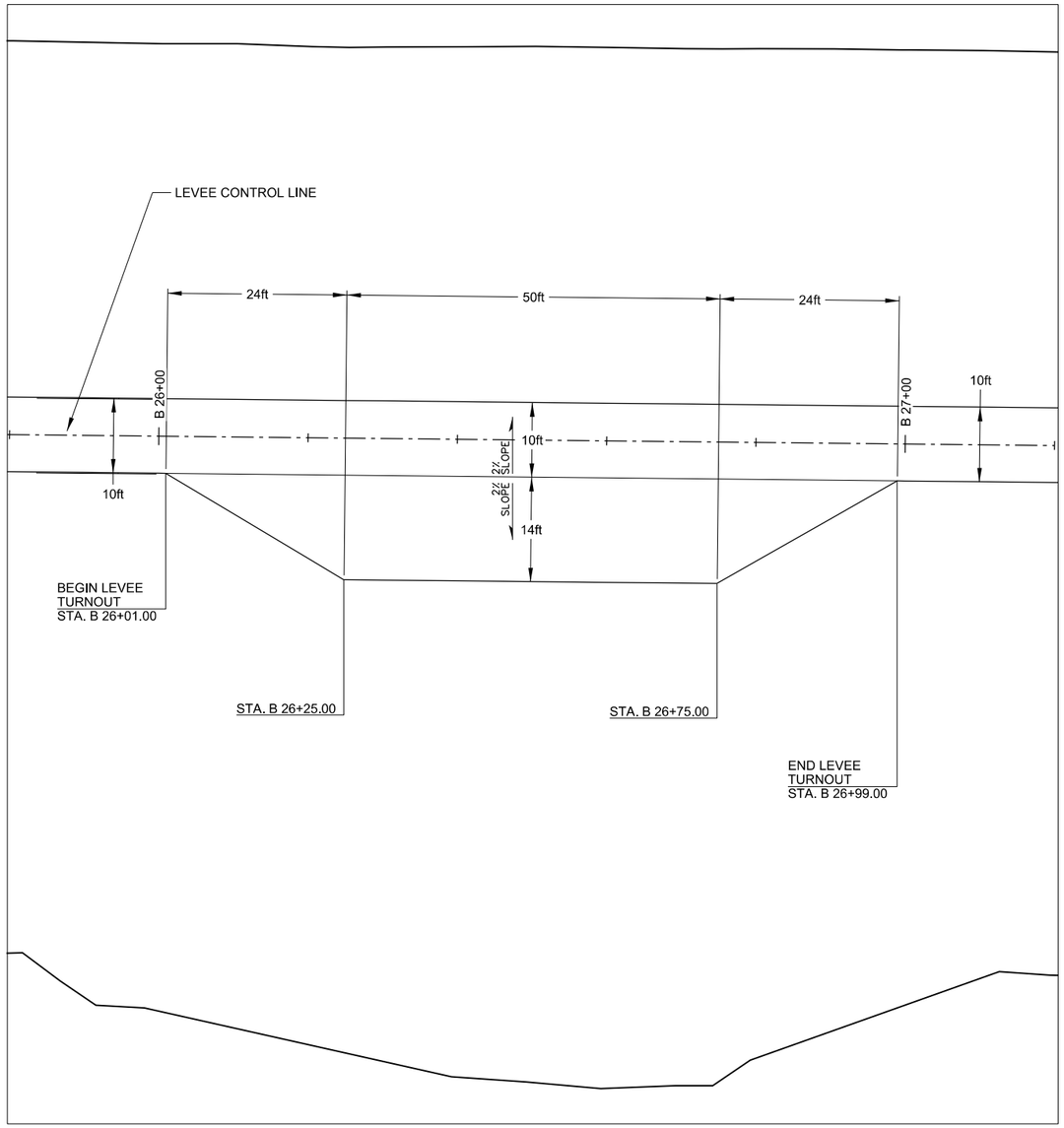
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:50
PLOT DATE: 10/20/2014
SIZE:
FILE NAME: FMM-MB_CS302---dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

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

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

TYPICAL CROSS SECTIONS
D E AND F

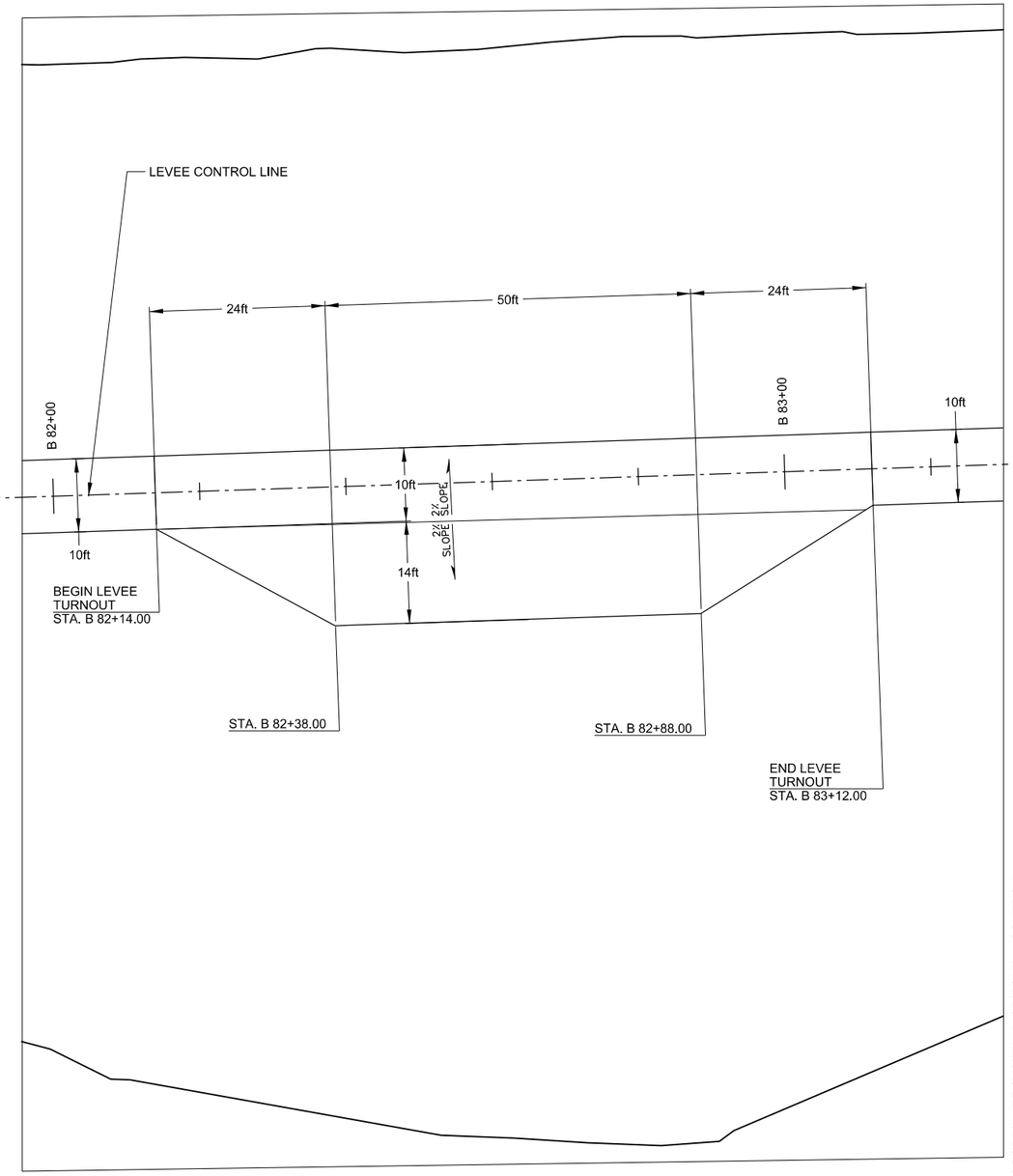
Sheet ID
CS302



1 CS103 DETAIL PLAN
LEVEE TURNOUT 1

0 5' 10' 20'

N



2 CS109 DETAIL PLAN
LEVEE TURNOUT 2

0 5' 10' 20'

N

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

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ST. PAUL, MINNESOTA

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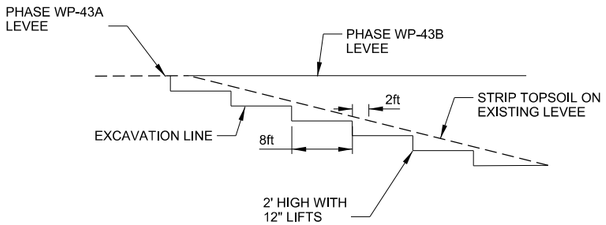
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1"=50'
PLOT DATE: 11/20/24
SIZE:
FILE NAME: FMM43B_CS401---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

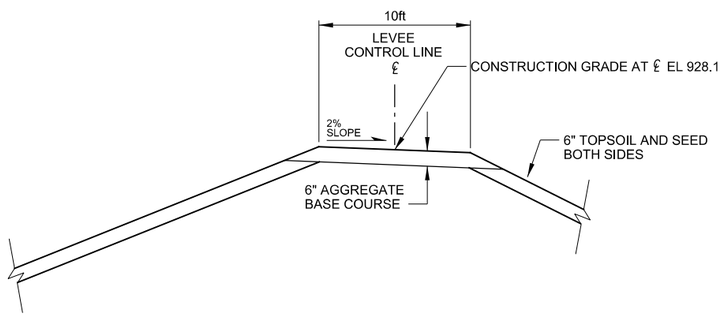
OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-23B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

DETAIL PLANS - LEVEE TURNOUTS

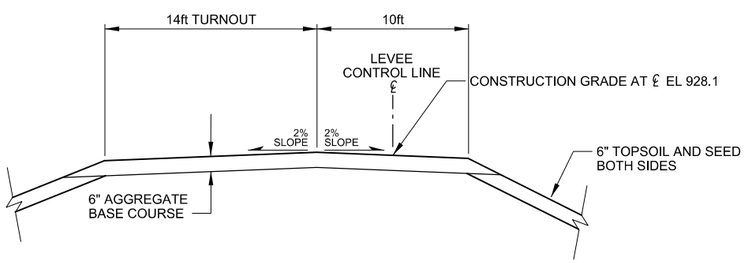
Sheet ID
CS401



1 / CS101 **DETAIL**
LEVEE BENCHING
NOT TO SCALE



2 / CS301 CS302 **DETAIL**
TOP OF LEVEE
NOT TO SCALE



3 / CS301 CS302 **DETAIL**
TOP OF LEVEE WITH TURNOUT
NOT TO SCALE

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:1 FS2
PLOT DATE: 11/20/2014
SIZE:
FILE NAME: FM43B_CS501---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND
DETAILS

Sheet ID
CS501

RING LEVEE - CONTROL LINE DATA

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
PI-B1			383781.879	2892462.879		B 0+00.00					
	N 80°27'31" W	688.65 '									
PI-B2			383896.028	2891783.760	B 5+87.55		B 7+57.57	77°55'53.17"	125.00 '	170.02 '	101.10 '
	N 2°31'38" W	2335.13 '									
PI-B3			386228.886	2891680.794	B 28+13.38		B 31+66.11	20°12'35.12"	-1000.00 '	352.73 '	178.21 '
	N 22°44'13" W	2738.87 '									
PI-B4			388754.912	2890622.216	B 56+33.96		B 58+17.47	21°01'45.95"	500.00 '	183.52 '	92.80 '
	N 1°42'27" W	810.32 '									
PI-B5			389564.874	2890598.070	B 64+83.54		B 65+78.58	54°27'31.54"	100.00 '	95.05 '	51.46 '
	N 52°45'04" E	1447.23 '									
PI-B6			390440.849	2891750.085	B 79+44.52		B 80+02.51	33°13'17.16"	100.00 '	57.98 '	29.83 '
	N 85°58'21" E	2251.45 '									
PI-B7			390598.976	2893995.977	B 101+72.25		B 102+74.99	19°37'16.70"	-300.00 '	102.74 '	51.88 '
	N 66°21'05" E	278.4 '									
PI-B8			390710.650	2894250.998	B 104+49.61		B 105+52.39	19°37'44.42"	300.00 '	102.78 '	51.90 '
	N 85°58'49" E	1994.8 '									
PI-B9			390850.484	2896240.892	B 124+57.41		B 125+29.84	41°30'04.80"	100.00 '	72.43 '	37.89 '
	S 52°31'06" E	409.21 '									
PI-B10			390601.475	2896565.622	B 128+54.76		B 129+41.66	49°47'26.91"	100.00 '	86.90 '	46.41 '
	S 2°43'39" E	128.3 '									
PI-B11			390473.320	2896571.728		B 130+23.55					

OUTSIDE DRAINAGE DITCH - CONTROL LINE DATA

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
PI-OB1			383682.255	2892493.502		OB 0+00.00					
	N 80°39'30" W	809.71 '									
PI-OB2			383813.69	2891694.53	OB 6+31.89		OB 9+30.99	77°53'45.75"	220.00 '	299.10 '	177.82 '
	N 2°45'44" W	2397.97 '									
PI-OB1			386208.87	2891578.97	OB 30+26.17		OB 32+73.49	20°14'36.55"	-700.00 '	247.32 '	124.96 '
	N 23°00'20" W	2706.65 '									
PI-OB2			388700.25	2890521.15	OB 57+95.18		OB 59+13.84	20°55'03.78"	325.00 '	118.65 '	59.99 '
	N 2°05'17" W	916.73 '									
PI-OB3			389616.37	2890487.75	OB 66+61.80		OB 68+62.52	54°45'46.38"	210.00 '	200.72 '	108.77 '
	N 52°40'30" E	1530.62 '									
PI-OB4			390544.44	2891704.91	OB 82+21.33		OB 83+43.81	33°25'03.69"	210.00 '	122.48 '	63.04 '
	N 86°05'33" E	2255.95 '									
PI-OB5			390698.17	2893955.62	OB 105+01.42		OB 105+71.46	17°50'09.04"	-225.00 '	70.04 '	35.31 '
	N 68°15'24" E	298.15 '									
PI-OB6			390808.62	2894232.56	OB 107+99.06		OB 108+68.99	17°48'27.75"	225.00 '	69.93 '	35.25 '
	N 86°03'52" E	2060.64 '									
PI-OB7			390950.05	2896288.34	OB 128+06.39		OB 129+74.15	42°43'11.45"	225.00 '	167.76 '	88.00 '
	S 51°12'56" E	471.46 '									
PI-OB8			390654.73	2896655.85	OB 132+57.65		OB 134+45.79	47°54'30.38"	225.00 '	188.14 '	99.96 '
	S 3°18'26" E	725.6 '									
PI-OB9			389930.34	2896697.71	OB 139+73.21		OB 141+68.87	12°27'23.60"	-900.00 '	195.67 '	98.22 '

INSIDE DRAINAGE DITCH - CONTROL LINE DATA

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
PI-IB1			383950.48	2892063.088		IB 0+00.00					
	N 80°27'31" W	176.46 '									
PI-IB2			383979.73	2891889.07	IB 1+15.63		IB 2+17.85	78°05'29.93"	75.00 '	102.22 '	60.83 '
	N 2°22'01" W	1818.51 '									
PI-IB3			385796.69	2891813.97	IB 19+59.67		IB 19+91.29	10°21'04.36"	175.00 '	31.62 '	15.85 '
	N 7°59'04" E	103.81 '									
PI-IB4			385899.493	2891828.389	IB 20+50.23		IB 21+07.74	18°49'46.36"	-175.00 '	57.51 '	29.02 '
	N 10°50'43" W	99.6 '									
PI-IB5			385997.31	2891809.65	IB 21+65.59		IB 21+91.00	8°19'07.65"	175.00 '	25.41 '	12.73 '
	N 2°31'35" W	247.96 '									
PI-IB6			386245.03	2891798.72	IB 22+17.91		IB 26+30.28	20°06'28.53"	-1175.00 '	412.37 '	208.33 '
	N 22°38'04" W	2733.1 '									
PI-IB7	N 1°42'55" W	733.37 '	388767.63	2890746.89	IB 50+85.83		IB 52+22.74	20°55'09.02"	375.00 '	136.92 '	69.23 '
PI-IB8			389500.67	2890724.94	IB 58+40.77		IB 59+26.00	54°15'22.56"	90.00 '	85.23 '	46.11 '
	N 52°32'28" E	808.41 '									
PI-IB9			389992.34	2891366.65	IB 66+84.81		IB 66+91.79	1°20'02.81"	-300.00 '	6.99 '	3.49 '
	N 51°12'25" E	552.95 '									
PI-IB10			390338.77	2891797.63	IB 71+57.21		IB 73+18.08	40°57'54.87"	225.00 '	160.87 '	84.05 '
	S 87°49'40" E	218.89 '									
PI-IB11			390330.473	2892016.364	IB 74+24.85		IB 74+80.71	14°13'26.03"	-225.00 '	55.86 '	28.07 '
	N 77°56'54" E	148.89 '									
PI-IB12			390361.56	2892161.97	IB 75+85.32		IB 76+17.67	8°14'18.34"	225.00 '	32.35 '	16.20 '
	N 86°11'12" E	1866.05 '									
PI-IB13			390485.66	2894023.89	IB 94+28.18		IB 95+06.07	19°50'03.08"	-225.00 '	77.89 '	39.34 '
	N 66°21'09" E	278.43 '									
PI-IB14			390597.34	2894278.94	IB 97+06.54		IB 97+83.03	19°28'40.65"	225.00 '	76.49 '	38.62 '
	N 85°49'50" E	1910.29 '									
PI-IB15			390736.23	2896184.17	IB 115+74.06		IB 117+28.92	39°26'05.74"	225.00 '	154.86 '	80.64 '

FIELD ACCESS 1 AT 51ST STREET - CONTROL LINE DATA

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
PI-FA1			388823.269	2890416.138		FA 0+00.00					
	N 87°17'26" E	206.48 '									
PI-FA2			388833.030	2890622.388		FA 2+06.48					
	N 87°35'01" E	253.52 '									
PI-FA3			388843.718	2890875.680		FA 4+60.00					

FIELD ACCESS AT MAIN STREET - CONTROL LINE DATA

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
PI-FB1			390364.581	2894397.494		FB 0+00.00					
	N 2°07'40" W	700.00 '									
PI-FB2			391064.099	2894371.505		FB 7+00.00					

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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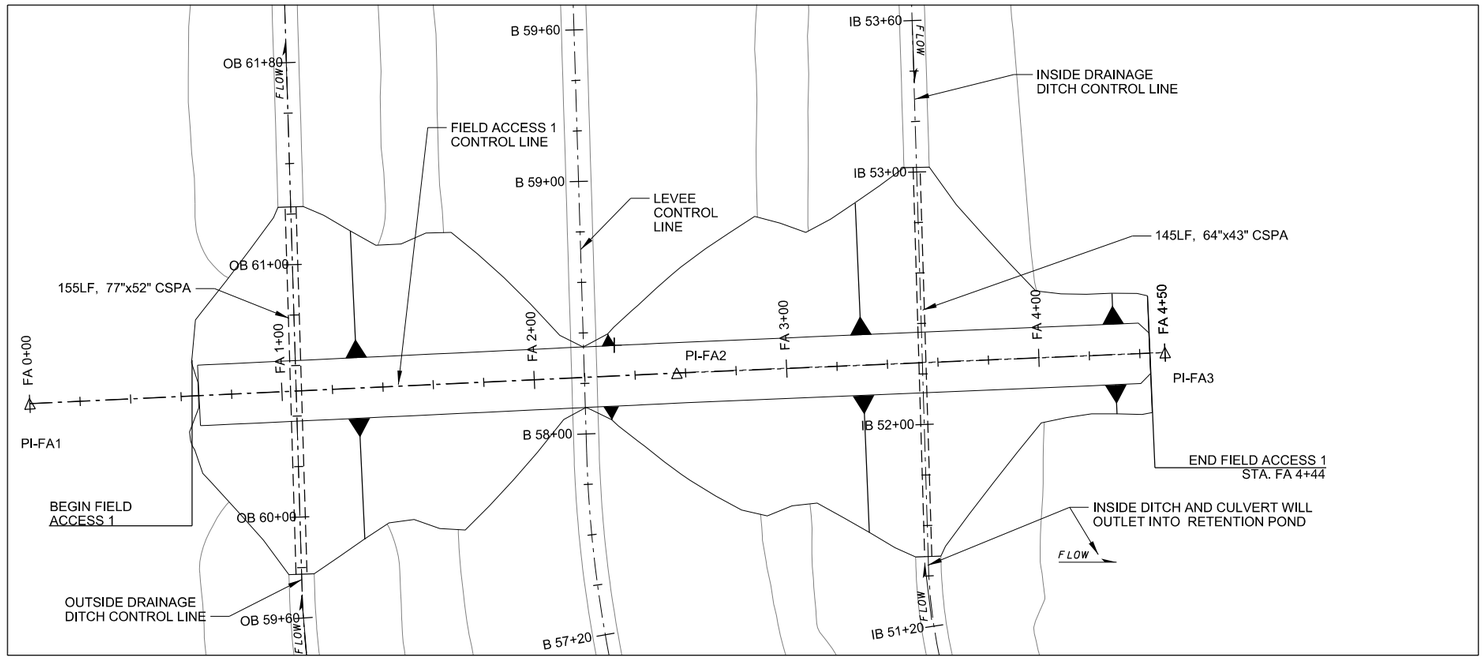
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MOSE
PLOT SCALE: 1:1
PLOT DATE: 7/7/2021
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: PMM439_CS601---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

HORIZONTAL CONTROL TABLES

Sheet ID
CS601



NOTES:

1. THE ORIENTATION OF THIS VIEW HAS BEEN ROTATED 90 DEGREES FROM THE ORIGINAL PLAN VIEW ON SHEET CS106.
2. X
   X

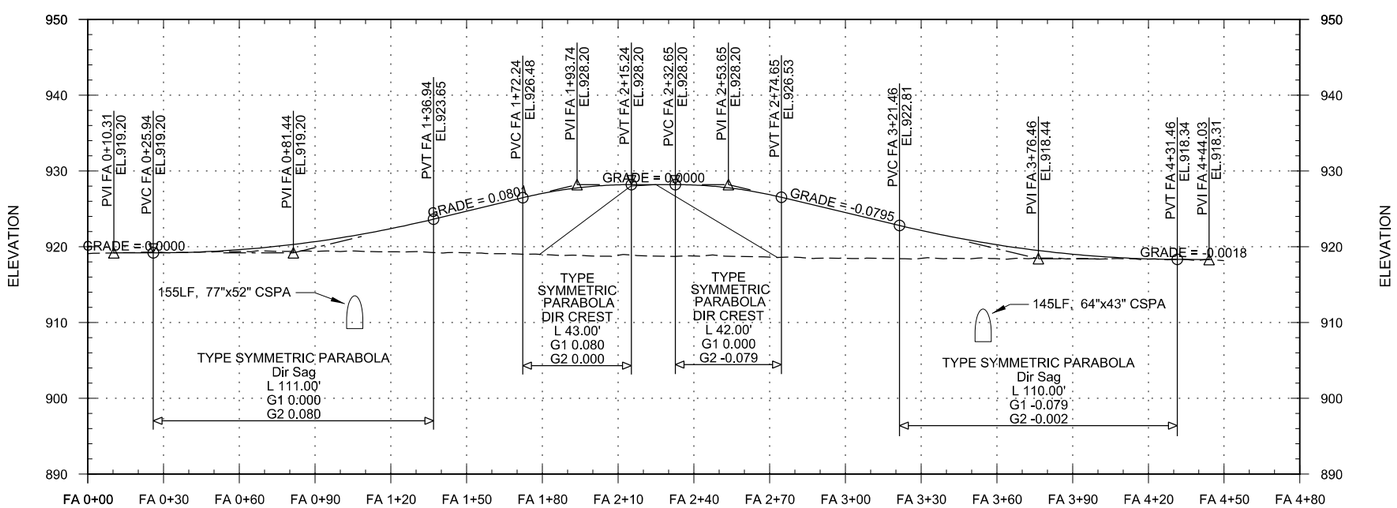
PLAN

FIELD ACCESS 1 AT 51ST STREET

0 30' 60'

N

FOR ATR REVIEWERS:
AT THE TIME OF ATR SUBMITTAL THE DESIGN AND
LOCATION OF RETENTION POND HAS NOT BEEN DETERMINED



PROFILE

FIELD ACCESS 1 AT 51ST STREET

0 30' 60'
HORIZONAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

PRELIMINARY DRAWINGS - NOT FOR CONSTRUCTION

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MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DTR-ATR

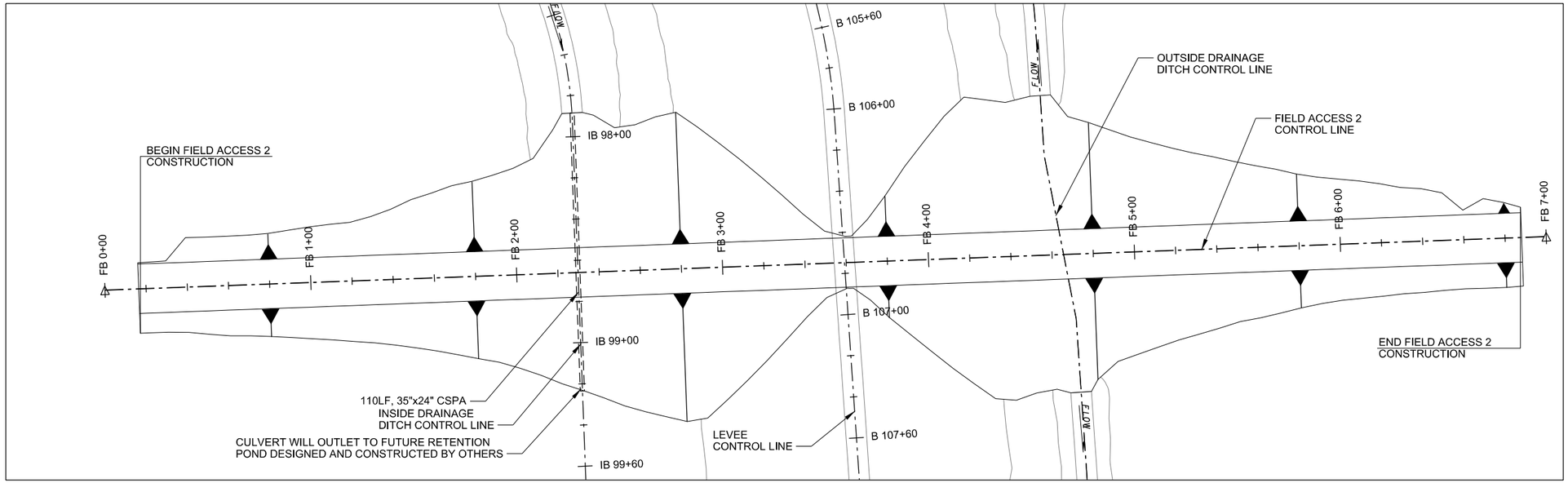
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:100
PLOT DATE: 11/20/2014
SIZE: 30"x42"
FILE NAME: FM4439_CP101---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND

PLAN AND PROFILE
FIELD ACCESS 1 AT 51ST STREET

Sheet ID
CP101



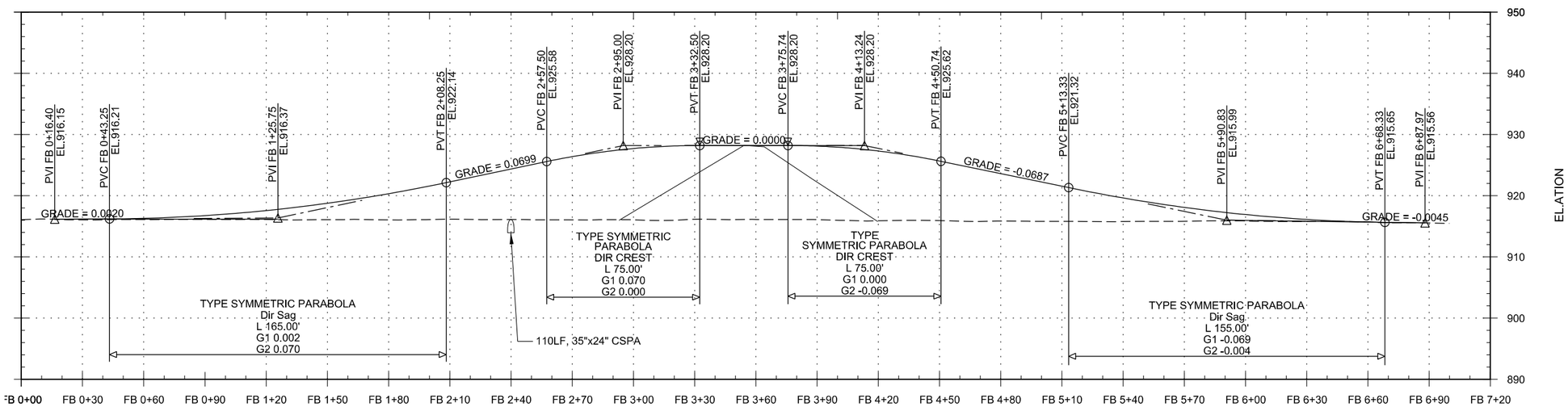
PLAN

FIELD ACCESS 2 AT MAIN STREET

0 30' 60'

NOTES:

1. THE ORIENTATION OF THIS VIEW HAS BEEN ROTATED 90 DEGREES FROM THE ORIGINAL PLAN VIEW ON SHEET CS111.



PROFILE

FIELD ACCESS 2 AT MAIN STREET

0 30' 60'
HORIZONAL SCALE

0 10' 20'
VERTICAL SCALE

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID: 09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.999900290

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DTR-ATR

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

DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: MARSHA M. MUSE
PLOT SCALE: 1:50
PLOT DATE: 7/29/2014
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE:
FILE NAME: FM4439_CP102---.dgn

OXBOW, HICKSON, BAKKE RING LEVEE PHASE WP-43B
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, ND
PLAN AND PROFILE
FIELD ACCESS 2 AT MAIN STREET

Sheet ID
CP102