US Army Corps of Engineers®

BOULANGER BEND CHANNEL MODIFICATIONS
MISSISSIPPI RIVER
UMR-MVP-POOL 2
HASTINGS, MN

JANUARY 2016

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

THE NAMES BELOW INDICATE THE OFFICIALS THAT ORIGINALLY SIGNED THIS SET OF DRAWINGS.THIS DRAWING HAS SINCE BEEN REVISED AND REPLOTTED. NEW SIGNATURES WERE NOT OBTAINED.

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:

MICHAEL J. BART
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APPROVAL RECOMMENDED BY:

THOMAS SULLY
CHIEF EC-D BRANCH

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CHIEF EC-G BRANCH

MICHAEL R. KNOFF
CHIEF EC-H BRANCH

XXX
PROJECT MANAGER

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

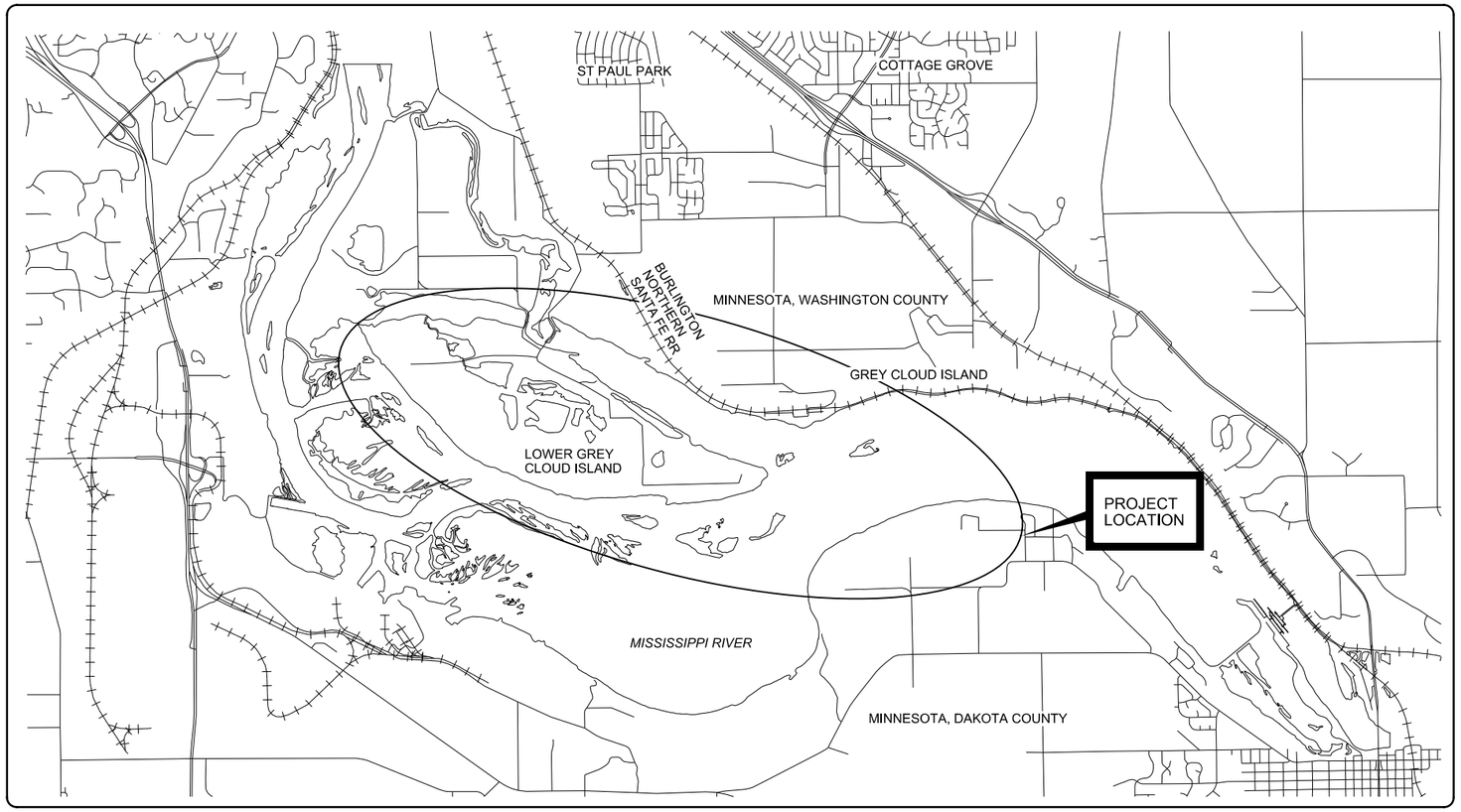
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

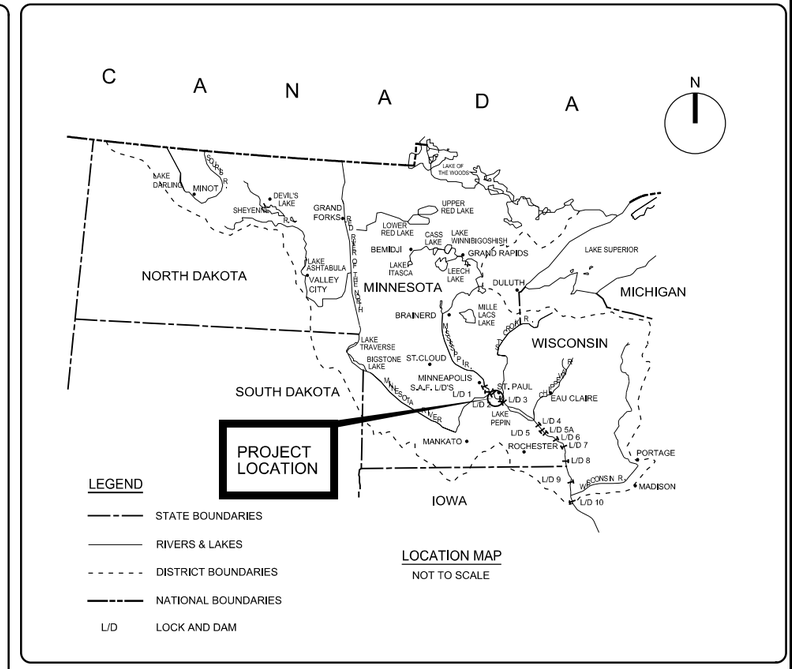
DESIGNED BY: EPP
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1:1
PLOT DATE: 1/22/2016
SIZE: ANSI D
FILE NAME: LP2SL_G-001---.DGN
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
COVER SHEET

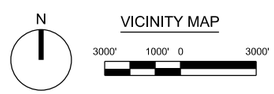
Sheet ID
G-001

Plate 8





LOCATION MAP
NOT TO SCALE



VICINITY MAP

CONTROL POINTS*

NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
CEPDNAV05	975868.01	2880337.89	699.31	COE PID ACJ229
CEPDNAV06	976057.28	2909809.61	691.25	COE PID ACJ230
8208 B	988521.32	2919730.11	985.23	NGS PID PP0667
8205 Y	972287.02	2919489.06	695.77	NGS PID PP3481

* ELEVATIONS REFER TO MSL 1912 DATUM. TO CONVERT FROM MSL 1912 TO NAVD 88, SUBTRACT 0.45 FEET (MSL 1912 -0.45 = NAVD88)

PRELIMINARY DRAWING - 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: THOMAS B SULLY
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1:1000
PLOT DATE: 10/20/2011
SIZE: ANSI D
FILE NAME: LP2SL_G-002---.dgn

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

VICINITY MAP AND LOCATION MAP
HORIZONTAL AND VERTICAL CONTROL

Sheet ID
G-002

CONSTRUCTION DRAWING INDEX

AS-BUILT DRAWING NO.	SHEET REF.	DESCRIPTION	PRODUCT I.D.
		BOULANGER BEND CHANNEL MODIFICATIONS	
		GENERAL SHEETS	
	G-001	COVER SHEET	LP2SL_G-001-–.dgn
	G-002	VICINITY AND LOCATION MAP	LP2SL_G-002-–.dgn
	G-003	DRAWING INDEX AND LEGEND	LP2SL_G-003-–.dgn
		GEOTECHNICAL DRAWINGS	
	B-101	GENERAL PLAN BORING LOCATIONS	LP2SL_B-101—.dgn
	B-201	BORING LOGS AND LEGEND, 15-58M THRU 15-63M	LP2SL_B-201—.dgn
	B-202	BORING LOGS, 15-64M THRU 15-72M	LP2SL_B-202—.dgn
		CIVIL DRAWINGS	
	C-101	GENERAL PLAN	LP2SL_C-101-–.dgn
	CS101	CHANNEL PLAN VIEW	LP2SL_CS101–-.dgn
	CS102	EAST ISLAND AND CHANNEL PLAN VIEW	LP2SL_CS102–-.dgn
	CS103	CHANNEL PLAN VIEW	LP2SL_CS103–-.dgn
	CS104	CHANNEL PLAN VIEW	LP2SL_CS104–-.dgn
	CS105	WEST ISLAND PLAN VIEW	LP2SL_CS105–-.dgn
	CS106	CHANNEL PLAN VIEW	LP2SL_CS106–-.dgn
	CS107	CHANNEL PLAN VIEW	LP2SL_CS107–-.dgn
	CS108	CHANNEL PLAN VIEW	LP2SL_CS108–-.dgn
	CS109	CHANNEL PLAN VIEW	LP2SL_CS109–-.dgn
	CS301	TYPICAL CROSS SECTIONS A, B, C AND D	LP2SL_CS301–-.dgn

REFERENCE DRAWING INDEX

DRAWING NO.		DESCRIPTION	PRODUCT I.D.
		DS ELEVATION DURATION CURVES, JANUARY - JUNE	
		DS ELEVATION DURATION CURVES, JULY - DECEMBER	
		US ELEVATION DURATION CURVES, JANUARY - JUNE	
		US ELEVATION DURATION CURVES, JULY - DECEMBER	

PROJECT GOALS & OBJECTIVES:

1. IMPROVE CHANNEL NAVIGATION.

GENERAL PROJECT NOTES:

1. MUCH OF THE PROJECT SITE IS WITHIN THE RIVER AND IS HIGHLY SUSCEPTIBLE TO FLOODING AND RIVER STAGE FLUCTUATIONS THAT MAY IMPACT CONTRACTOR WORK PROGRESS. SEE HYDROGRAPHS (REFERENCE DRAWINGS).
2. TOPOGRAPHICAL CONTOURS AND SITE ELEVATIONS DEPICTED ON THESE DRAWINGS WERE DEVELOPED FROM AERIAL PHOTOGRAPHY AND SURVEY DATA. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL ELEVATIONS.
3. THE LAYOUT OF THE PROJECT FEATURES AS SHOWN SHALL BE FIELD STAKED BY THE CONTRACTOR AND APPROVED BY THE CONTRACTING OFFICER PRIOR TO CONSTRUCTION.
4. THE GOVERNMENT RESERVES THE RIGHT TO MAKE MINOR ADJUSTMENTS TO ANY OF THE PROJECT FEATURES.
5. STAGING AREA IS AVAILABLE FOR CONTRACTOR USE JUST SOUTH OF LOCK & DAM 2, SITE AS INDICATED ON THE GENERAL PLAN INSET.
6. TIE DIAGRAMS AND DETAILS DESCRIPTIONS OF HORIZONTAL AND VERTICAL CONTROL POINTS ARE AVAILABLE FROM THE ST. PAUL DISTRICT OFFICE (651) 290-5596.
7. ORIGINAL SOUNDING DATA FROM 2015 SOUNDINGS.
8. 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.
9. CHANNEL DREDGING AND TRAINING STRUCTURES MAY BE LOCATED WITHIN A STUMP FIELD. DUE CONSIDERATION SHALL BE GIVEN TOTHE DIFFICULTIES OF NAVIGATING AND DREDGING IN SUCH CONDITIONS. STUMPS ENCOUNTERED DURING DREDGING OPERATIONS SHALL BE REMOVED FROM WITHIN THE LIMITS OF CONSTRUCTION AND PLACED WITHIN THE LIMITS OF AN APPROVED DREDGE DISPOSAL AREA.

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
CONC	CONCRETE	OF	OUTSIDE FACE
		OC	ON CENTER
DIA	DIAMETER	R/W	RIVERWARD
DWG	DRAWING	SAN	SANITARY
AEW	APRON END WALL	SPEC	SPECIFICATIONS
EJ	EXPANSION JOINT	SST	STAINLESS STEEL
EL	ELEVATION	T&B	TOP AND BOTTOM
RCCP	REINFORCED CONCRETE PIPE	TYP	TYPICAL
EXIST	EXISTING	UGND	UNDERGROUND
RW	ROCK WEIR	W	WIDTH
DS	DOWN STREAM	WM	WATER MAIN
US	UPSTREAM		

GENERAL LEGEND

P.I. POINT
97-41M — BORING LOCATION AND NUMBER
RIPRAP LIMIT
SHEETPILE
AREA OF ADDITIONAL EXCAVATION
PROJECT BOUNDARY
— SURVEY CONTROL POINT
FILL
LAYOUT CONTROL POINT
CUT
SHEET ID X-000 — DWG OUTLINE AND NUMBER
— — C/E — — FEE TITLE

ELEVATION DATUM (VERTICAL CONTROL):
Vertical Datum
GEOIDGeoid Epoch Projection

COORDINATE SYSTEM (HORIZONTAL CONTROL):
Horizontal Datum
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF); Correction Scale

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 | DATE: | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:
DWN BY: EPP | CKD BY: GCW | SUBMITTED BY: THOMAS B SULLY | PLOT SCALE: 1:1 VARIANT | PLOT DATE: N/A | SIZE: ANSI D | FILE NAME: LP2SL_G-003-–.dgn

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
DRAWING INDEX
GENERAL NOTES AND LEGEND

Sheet ID
G-003

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

auto_time

Plate 10

GENERAL PLAN

BORING LOCATIONS

0 500' 1000'

N

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL): COORDINATE SYSTEM (HORIZONTAL CONTROL):

GEOID COMBINED FACTOR (CF):

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: AAM | DATE:
DWN BY: AAM | CKD BY: GCW | SOLICITATION NO.:
SUBMITTED BY: THOMAS SULLY | CONTRACT NO.:
PLOT SCALE: 1" = 500' | PLOT DATE: 01/20/2017 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: LP2SL_B-101---.dgn

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

SOIL BORING LOCATIONS

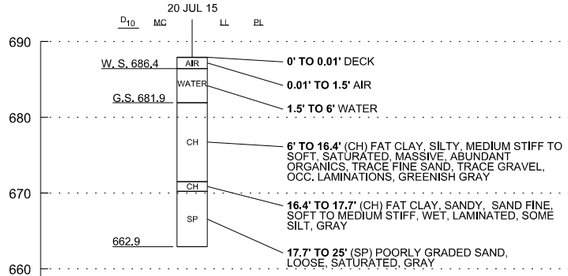
Sheet ID
B-101

auto_time

Plate 11

15-58M

20 JUL 15



NOTES:
1. WATER SURFACE PRORATED FROM POOL 2 ELEVATION
2. HOLE STABILIZED WITH 4-INCH PIPE CASINGTO EL. 672.9 BENTONITE DRILLING FLUID USED BELOW CASING
3. ENVIRONMENTAL SAMPLE TAKEN EL 679.9 TO 681.9
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

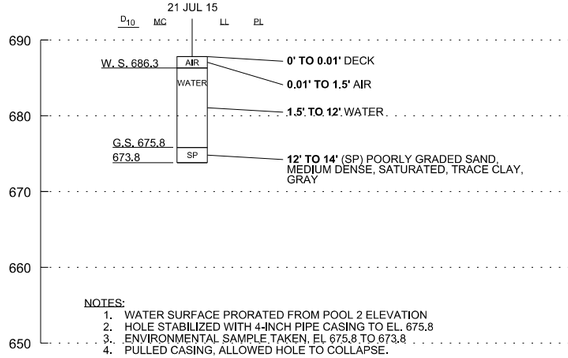
15-59M

21 JUL 15

NOTES:
1. WATER SURFACE PRORATED FROM POOL 2 ELEVATION
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 673.8 BENTONITE DRILLING FLUID USED BELOW CASING
3. ENVIRONMENTAL SAMPLE TAKEN, EL 678.0 TO 680.5
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-60M

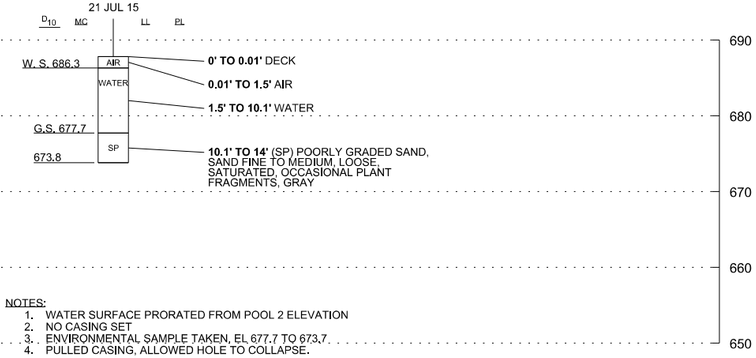
21 JUL 15



NOTES:
1. WATER SURFACE PRORATED FROM POOL 2 ELEVATION
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.8
3. ENVIRONMENTAL SAMPLE TAKEN, EL 675.8 TO 673.8
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-61M

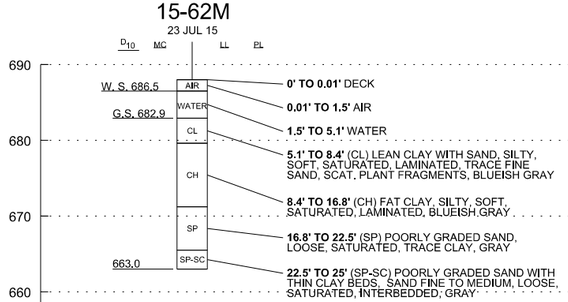
21 JUL 15



NOTES:
1. WATER SURFACE PRORATED FROM POOL 2 ELEVATION
2. NO CASING SET
3. ENVIRONMENTAL SAMPLE TAKEN, EL 677.7 TO 673.7
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-62M

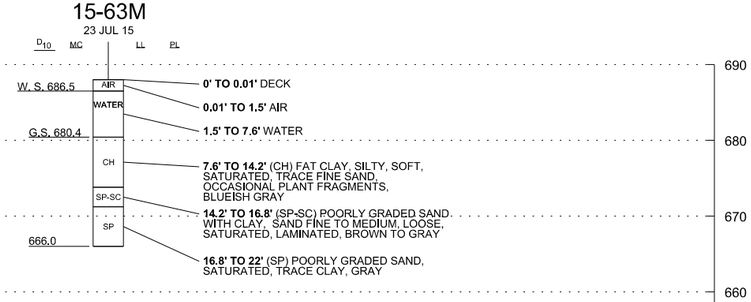
23 JUL 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 680.0 BENTONITE DRILLING FLUID USED BELOW CASING
3. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-63M

23 JUL 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 676.5, BENTONITE FLUID USED BELOW CASING
3. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

GENERAL BORING LEGEND

84-1M	YEAR OF BORING-BORING NUMBER, BORING TYPE (EG: M=MACHINE, A=AUGER, TP=TEST PIT, P=PIEZOMETER).
1 MAY 1984	DATE OF BORING
W.S. 1026.7	WATER SURFACE ELEVATION ON DAY OF BORING
G.S. 1020.2	GROUND SURFACE ELEVATION AT BORING
GW	WELL GRADED GRAVELS, GRAVEL - SAND MIXTURE, LITTLE OR NO FINES
GP	POORLY GRADED GRAVELS, LITTLE OR NO FINES
GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SM	SILTY SANDS, SAND - SILT MIXTURES
SC	CLAYEY SANDS, SAND - CLAY MIXTURES
ML	INORGANIC SILTS, LIQUID LIMIT LESS THAN 50
MH	INORGANIC SILTS, LIQUID LIMIT GREATER THAN 50
CL	INORGANIC CLAYS, LOW TO MEDIUM PLASTICITY, LIQUID LIMIT LESS THAN 50
CH	INORGANIC CLAYS, HIGH PLASTICITY, LIQUID LIMIT GREATER THAN 50
OL	ORGANIC SILTS OR CLAYS, LOW PLASTICITY, LIQUID LIMIT LESS THAN 50
OH	ORGANIC SILTS OR CLAYS, MEDIUM TO HIGH PLASTICITY, LIQUID LIMIT GREATER THAN 50 PEAT
PT	
SP-SM	BORDERLINE MATERIAL
SP&SM	STRATIFIED MATERIAL
1	LOCATION AND SAMPLE NUMBER FOR UNDISTURBED SAMPLE
	NO RECOVERY
W.L. 726.7	WATER LEVEL ON DATE OF BORING
700.1	ELEVATION AT BOTTOM OF BORING
(238.56)	ELEVATION IN METERS

GENERAL BORING NOTES

1. GENERAL: THE UNIFIED SOIL CLASSIFICATION SYSTEM IS USED TO IDENTIFY BASIC SOIL TYPE. THE LEGEND REPRESENTS ONLY THE BASIC SOILS. TO COMPLETE THE CLASSIFICATION, PERTINENT INFORMATION IS ADDED TO THE RIGHT OF THE BORING STAFF. NOTES PERTAINING TO A SPECIFIC BORING ARE SHOWN BELOW THE BORING STAFF.
2. MOISTURE CONTENT: THE NATURAL MOISTURE CONTENT IN PERCENT OF DRY WEIGHT (MC) IS SHOWN TO THE LEFT OF THE BORING STAFF.
3. BLOW COUNT (SPT): BLOW COUNTS ARE SHOWN TO THE LEFT OF THE BORING STAFF AND, EXCEPT AS NOTED, ARE THE NUMBER OF BLOWS NECESSARY TO DRIVE THE SAMPLER USED A DISTANCE OF 12-INCHES. STANDARD BLOW COUNTS ARE FOR A STANDARD PENETRATION TEST (SPT) USING A 1... X 2-INCH SAMPLER, 3#8 X 2-INCH SAMPLER, 140 LB. HAMMER, AND A 30-INCH DROP. FOR NON-STANDARD BLOW COUNTS SAMPLER SIZE, HAMMER WEIGHT, AND HEIGHT OF DROP ARE AS SHOWN.
4. ATTERBERG LIMITS: LIQUID LIMIT (LL) AND PLASTIC LIMIT (PL) ARE SHOWN TO THE RIGHT OF THE BORING STAFF.
5. D_{10} SIZE: THE GRAIN SIZE IN MILLIMETERS OF WHICH 10% OF THE SAMPLE IS FINER IS SHOWN TO THE LEFT OF THE BORING STAFF.
6. RQD: ROCK QUALITY DESIGNATION (RQD) IS SHOWN TO THE LEFT OF THE PERCENT RECOVERY COLUMN. RQD IS THE PERCENT RECOVERY CONSISTING OF UNBROKEN PIECES LONGER THAN 4-INCHES.
7. % RECOVERY: PERCENT CORE RECOVERY IS SHOWN TO THE LEFT OF THE BORING STAFF. PERCENT RECOVERY IS LENGTH OF CORE RECOVERED/LENGTH OF CORE CUT X 100. UNLESS SPECIFIED OTHERWISE, ALL CORE IS 4-INCH DIAMETER.
8. ELEVATIONS REFERENCED TO N.G.V.D. 1929 ADJ. UNLESS SPECIFIED OTHERWISE.
9. THE BORINGS SHOW SUMMARIES OF INFORMATION RECORDED ON THE ORIGINAL FIELD LOGS. THESE LOGS ARE AVAILABLE FOR INSPECTION AT THE ST. PAUL DISTRICT OFFICE. ARRANGEMENTS TO INSPECT LOGS CAN BE MADE BY CALLING (651) 290-5599.

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88 GEOID

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)

COMBINED FACTOR (CF): 0.9999046797

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 | DATE: | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:
DWN BY: EPP | CKD BY: GCW | SUBMITTED BY: THOMAS B SULLY | PLOT SCALE: 1" = 10' | PLOT DATE: 10/29/2017 | SIZE: ANSI D | FILE NAME: LPDSL B-200---.dgn

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

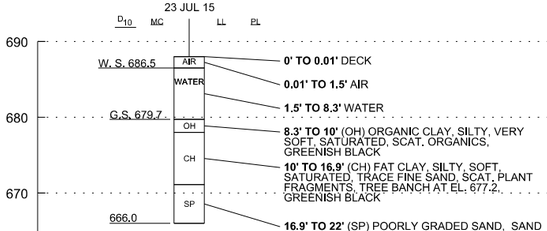
BORINGS LOGS
NOTES AND LEGEND
15-58M TO 15-63M

Sheet ID
B-200

Plate 12

15-64M

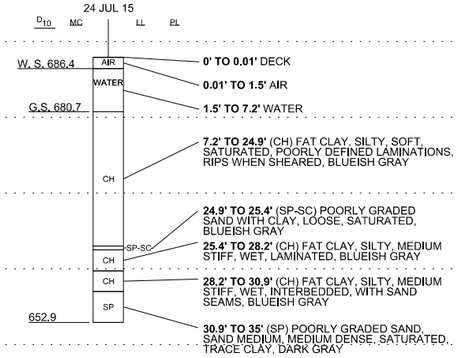
23 JUL 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 676.6, BENTONITE FLUID USED BELOW CASING
3. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-65M

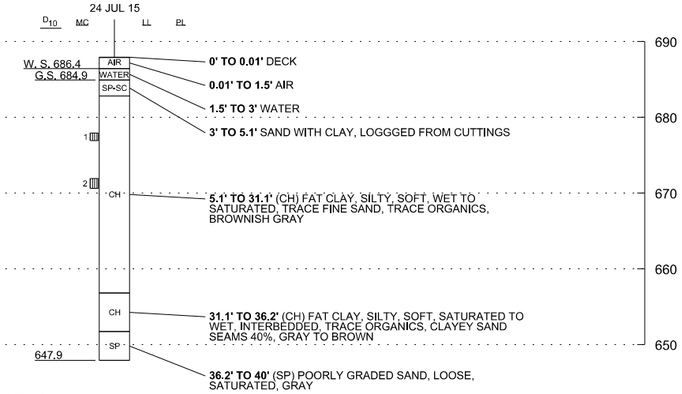
24 JUL 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 671.4, BENTONITE FLUID USED BELOW CASING
3. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-66M

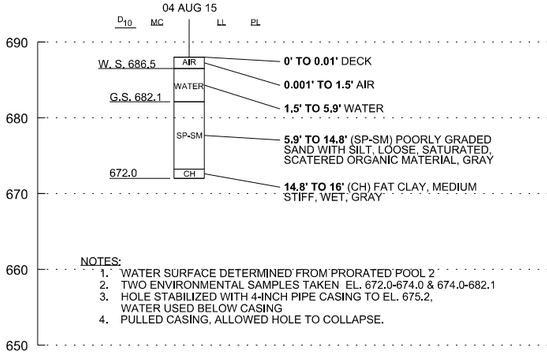
24 JUL 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 678.4, BENTONITE FLUID USED BELOW CASING
3. 3-INCH UNDISTURBED SAMPLES ODTAINED IN OFFSET BORING.
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-67M

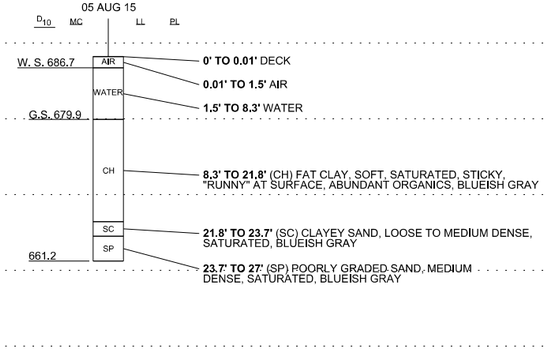
04 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. TWO ENVIRONMENTAL SAMPLES TAKEN EL. 672.0-674.0 & 674.0-682.1
3. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.2, WATER USED BELOW CASING
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-68M

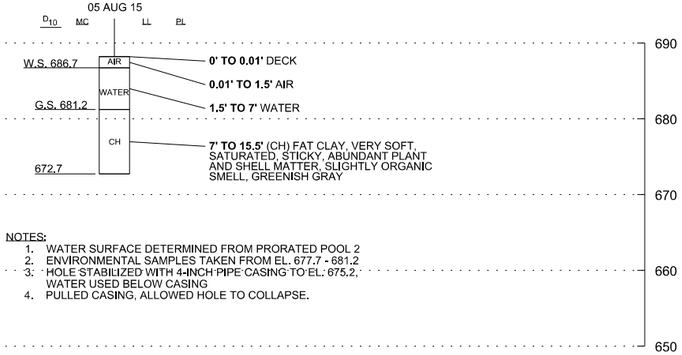
05 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. ENVIRONMENTAL SAMPLE TAKEN FROM EL. 677.2 - 679.9
3. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.2, BENTONITE FLUID USED BELOW CASING
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-69M

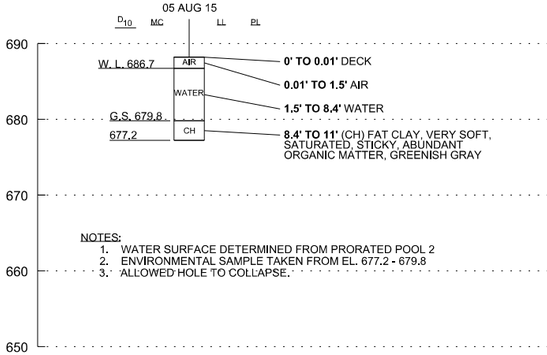
05 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. ENVIRONMENTAL SAMPLES TAKEN FROM EL. 677.7 - 681.2
3. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.2, WATER USED BELOW CASING
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-70M

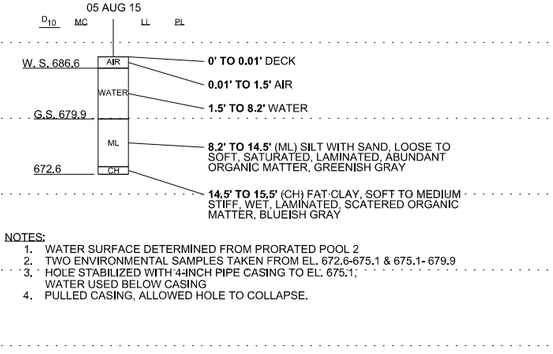
05 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. ENVIRONMENTAL SAMPLE TAKEN FROM EL. 677.2 - 679.8
3. ALLOWED HOLE TO COLLAPSE.

15-71M

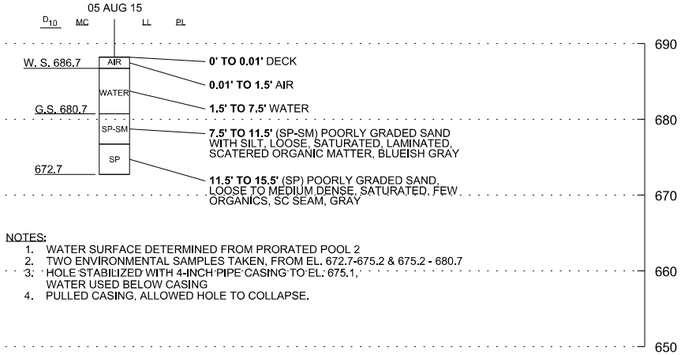
05 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. TWO ENVIRONMENTAL SAMPLES TAKEN FROM EL. 672.6-675.1 & 675.1- 679.9
3. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.1, WATER USED BELOW CASING
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

15-72M

05 AUG 15



NOTES:
1. WATER SURFACE DETERMINED FROM PRORATED POOL 2
2. TWO ENVIRONMENTAL SAMPLES TAKEN, FROM EL. 672.7-675.2 & 675.2 - 680.7
3. HOLE STABILIZED WITH 4-INCH PIPE CASING TO EL. 675.1, WATER USED BELOW CASING
4. PULLED CASING, ALLOWED HOLE TO COLLAPSE.

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88 GEOID

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)

COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

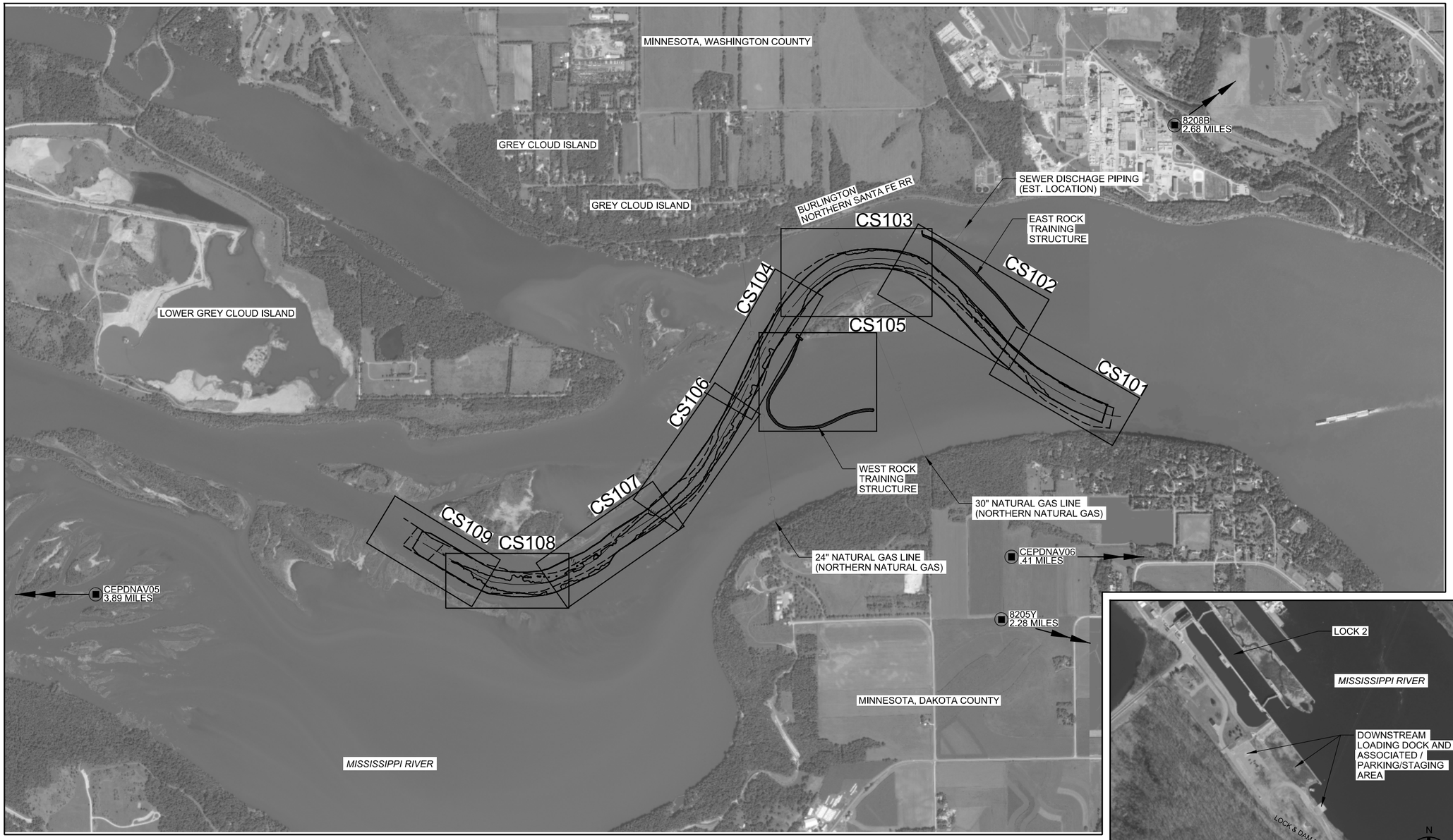
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

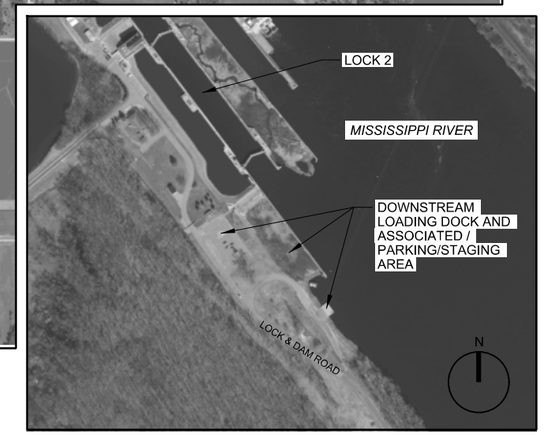
DESIGNED BY: EPP | DATE: | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:
DWN BY: EPP | CKD BY: GCW | SUBMITTED BY: THOMAS B SULLY | PLOT SCALE: 1" = 10' | PLOT DATE: 10/ 2/2015 | SIZE: ANSI D | FILE NAME: LP25SL_B-201---.dgn

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
BORINGS LOGS
15-64M, 15-65M, 15-66M, 15-67M, 15-68M, 15-69M, 15-70M, 15-71M, AND 15-72M,

Sheet ID
B-201

Plate 13





GENERAL PLAN

0 1000' 2000'

N

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
Vertical Datum
GEOIDGeoid Epoch

COORDINATE SYSTEM (HORIZONTAL CONTROL):
Horizontal Datum
Projection
COMBINED FACTOR (CF): Correction Scale

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

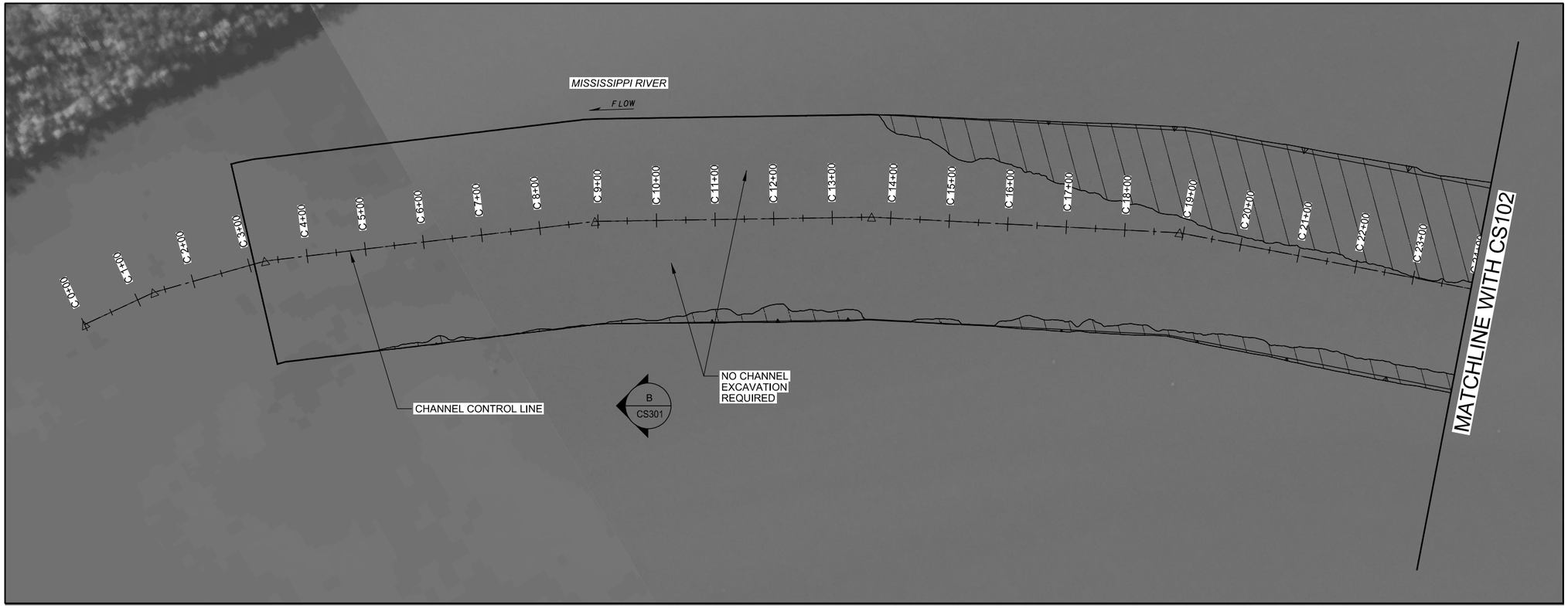
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 2000'
PLOT DATE: 7/20/2011
SIZE: ANSI D
FILE NAME: LPZSL_C-101--.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
GENERAL PLAN
PROPOSED ISLAND LOCATIONS

Sheet ID
C-101

Plate 14



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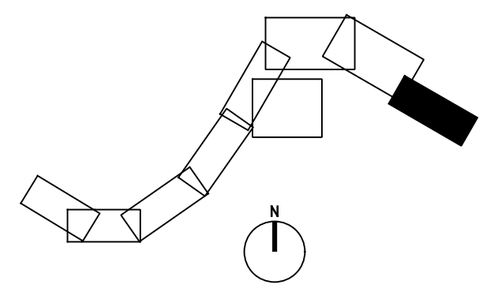
PLAN VIEW

0 100' 200'



ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

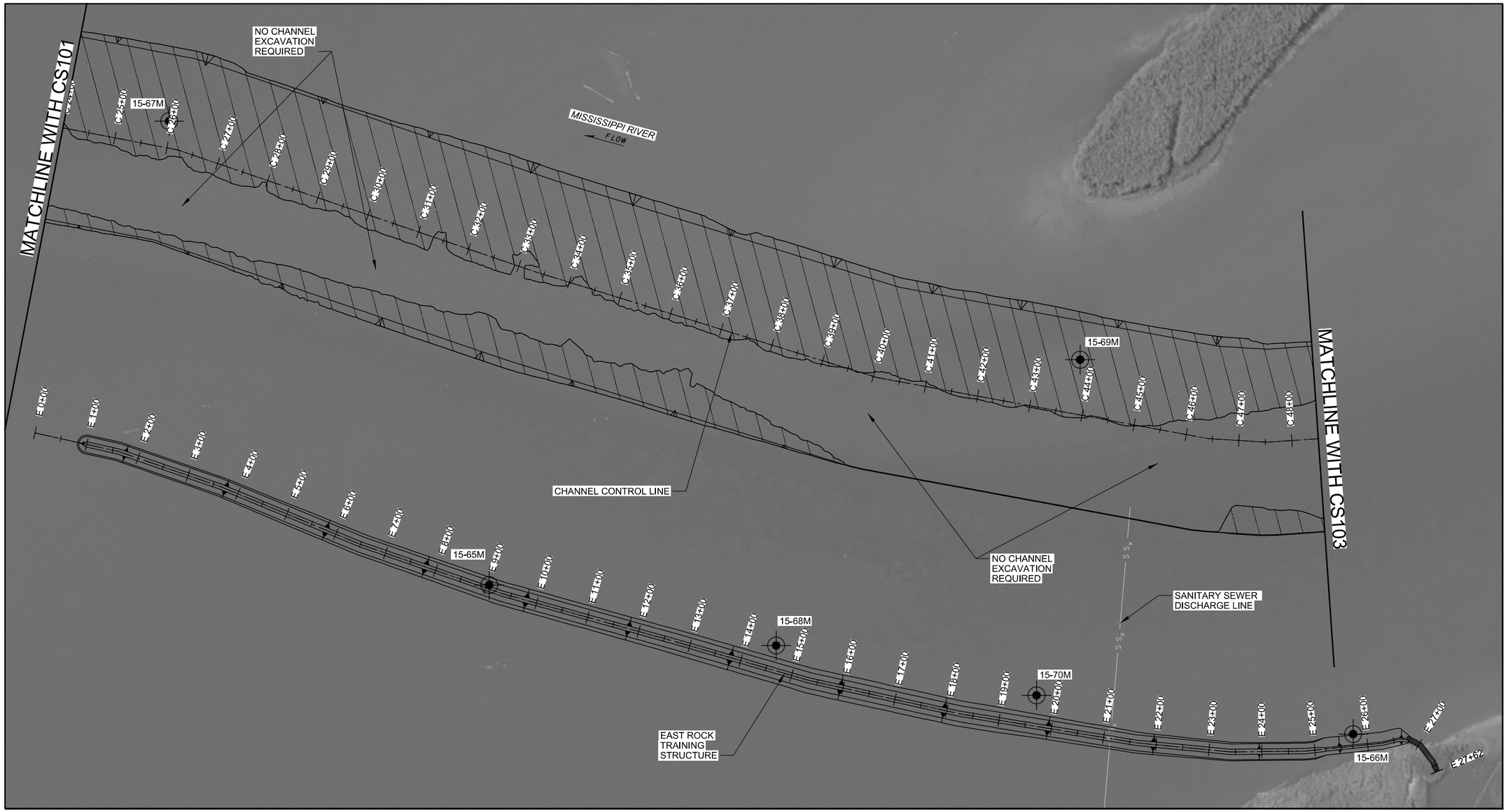
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 11/20/2017
SIZE: ANSI D
FILE NAME: LPSL_CS101--.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

CHANNEL PLAN VIEW

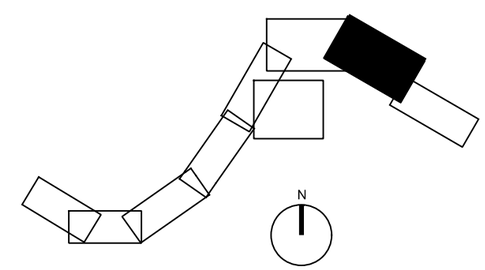
Sheet ID
CS101



PLAN VIEW

0 100' 200'

N



ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

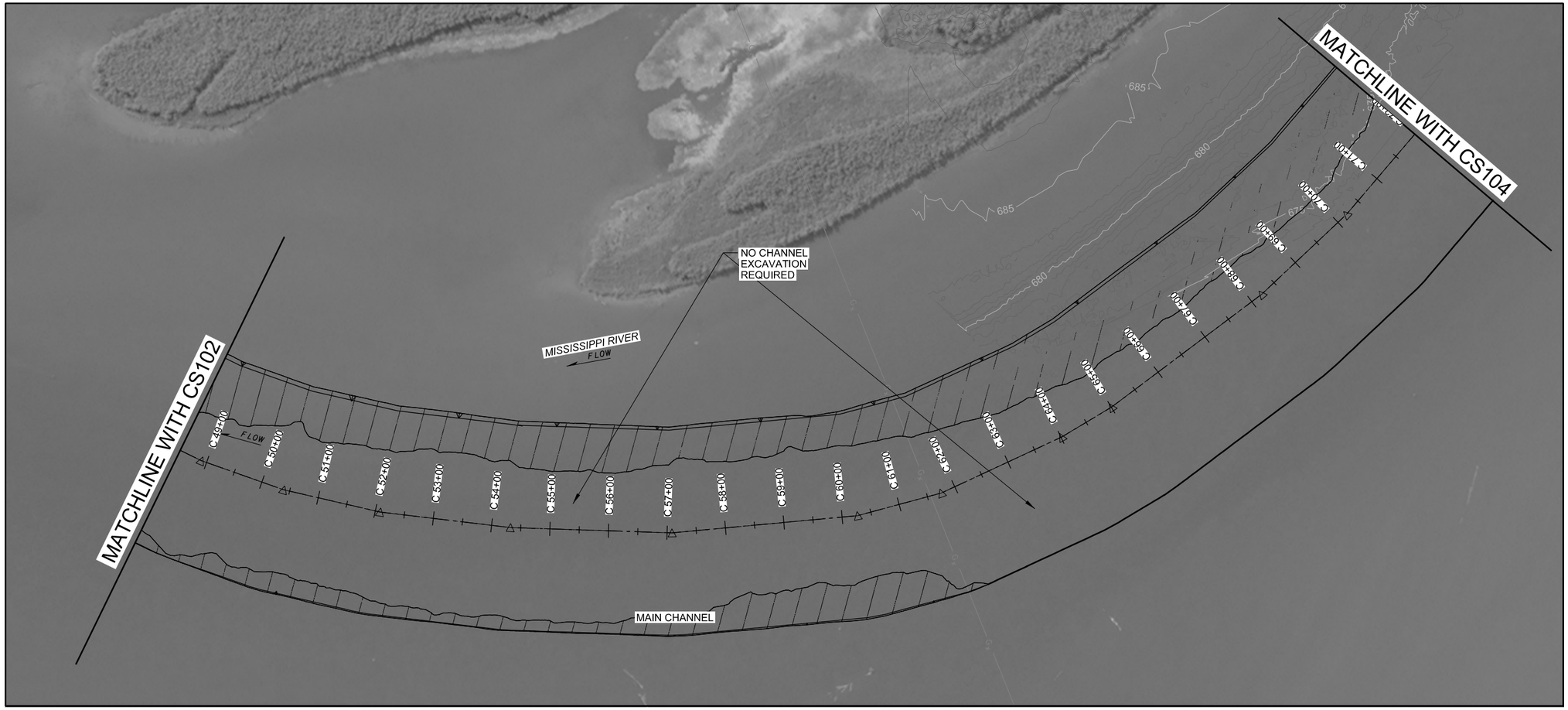
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1:1
PLOT DATE: 2/20/2017
SIZE: ANSI D
FILE NAME: LPPSL_CS102---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

CHANNEL PLAN VIEW

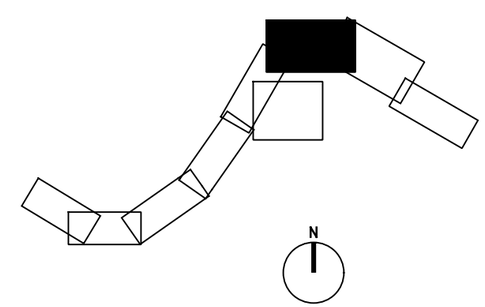
Sheet ID
CS102



PLAN VIEW

0 100' 200'

N



ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

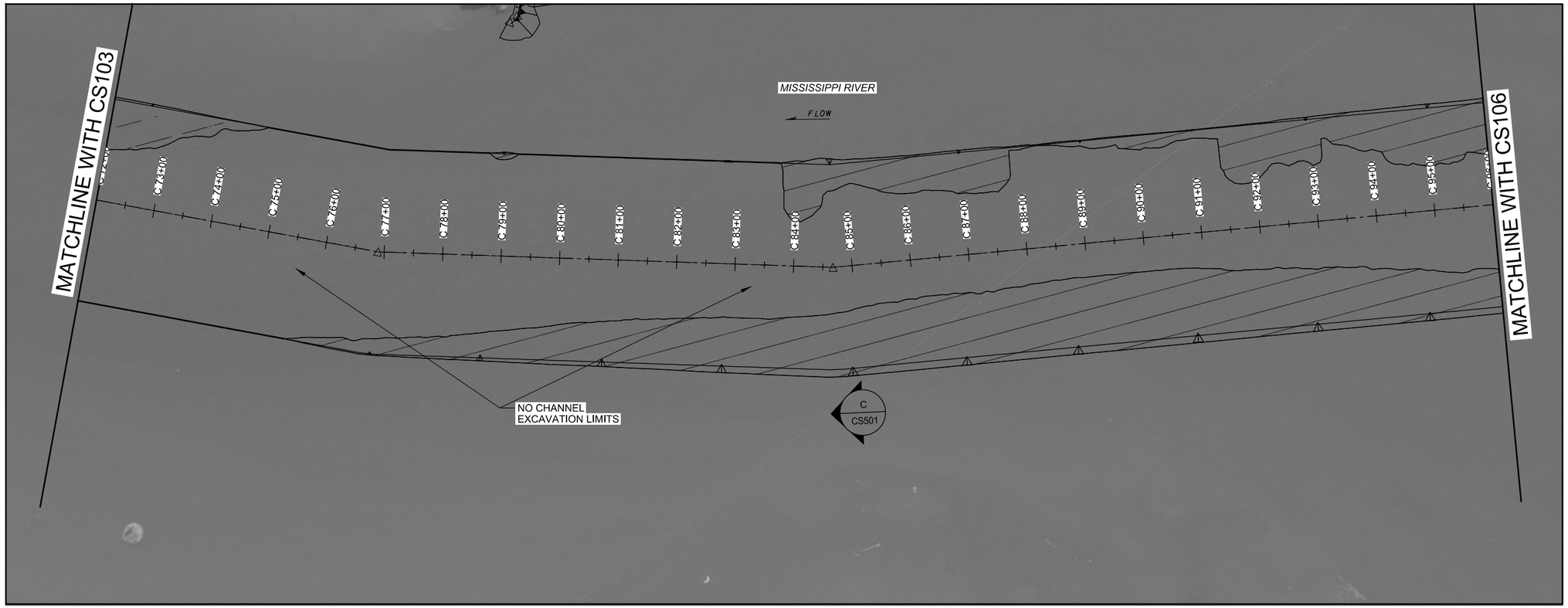
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 11/22/2021
SIZE: ANSI D
FILE NAME: LPSL_CS103---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

CHANNEL PLAN VIEW

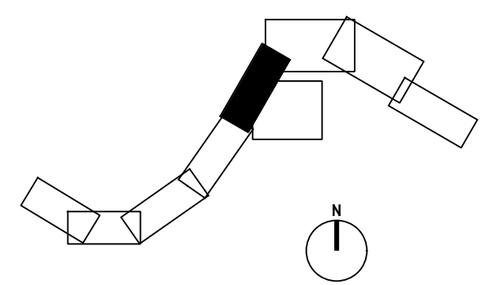
Sheet ID
CS103



PLAN VIEW

0 100' 200'

N



PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

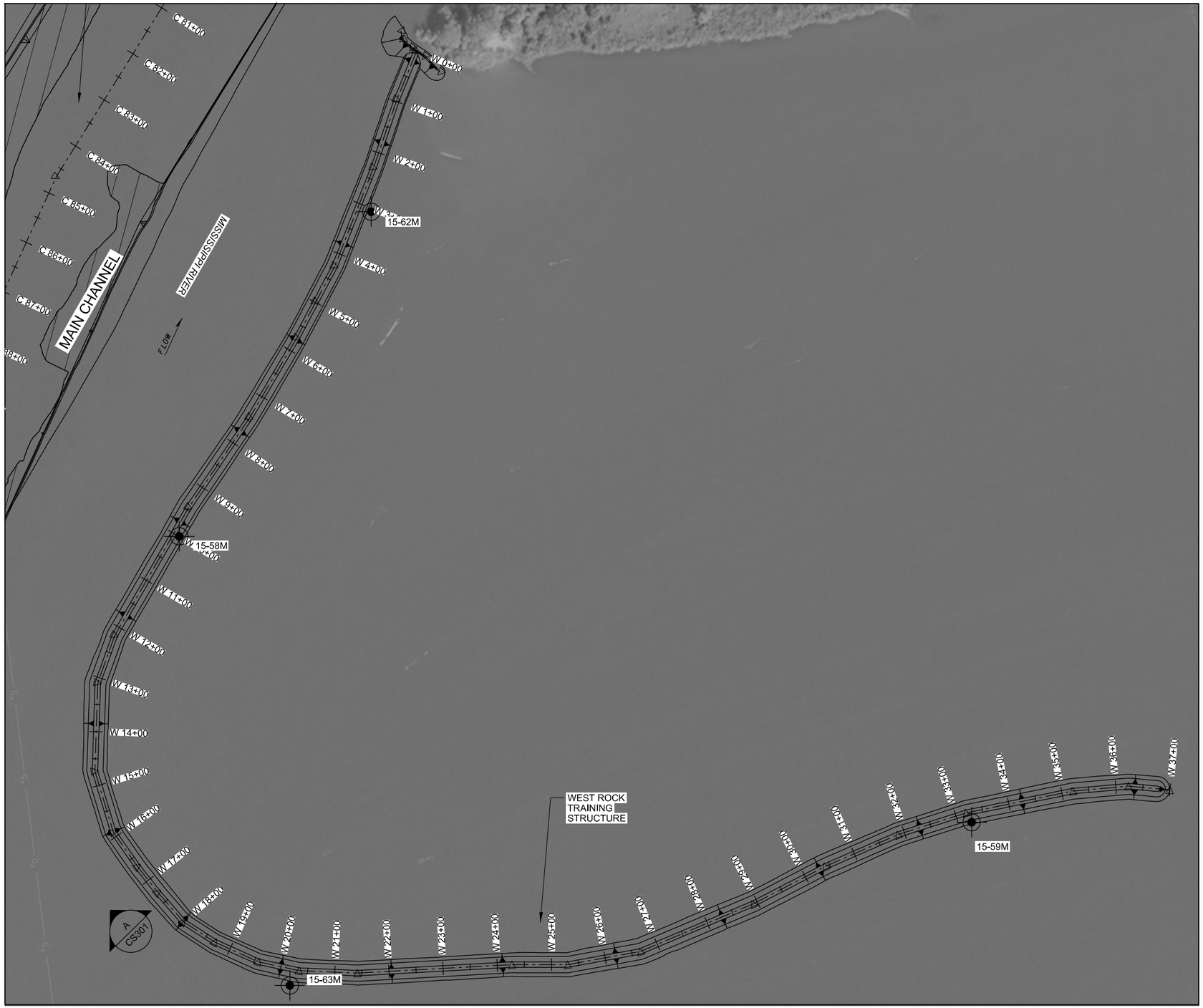
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 1/20/2017
SITE: ANSI D
FILE NAME: LP2SL_CS104---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
CHANNEL PLAN VIEW

Sheet ID
CS104

Plate 18



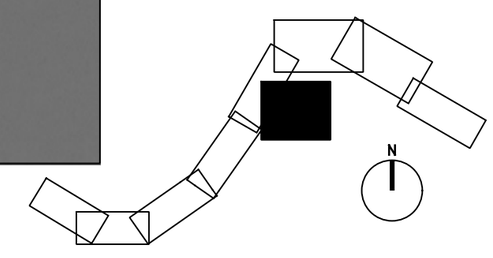
PLAN VIEW

0 100' 200'

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

NOTES:

1. SEE SHEET C-301 FOR ISLAND DIMENSIONS.
2. CLEARING AND GRUBBING WILL BE REQUIRED AT CONNECTION OF WEST ISLAND TO THE EXISTING ISLAND. CONTRACTOR SHALL LIMIT CLEARING AND GRUBBING TO THE MINIMUM REQUIRED TO CONSTRUCT PROPOSED FEATURES. VEGETATION REMOVAL LIMITS SHALL BE STAKED AND APPROVED BY THE CONTRACTOR OFFICER'S REPRESENTATIVE PRIOR TO WORK. VARY FILL SLOPES AT ISLAND CONNECTION TO PROVIDE A NATURAL CONNECTION TO EXISTING ISLAND AND TO LIMIT VEGETATION REMOVAL.



ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

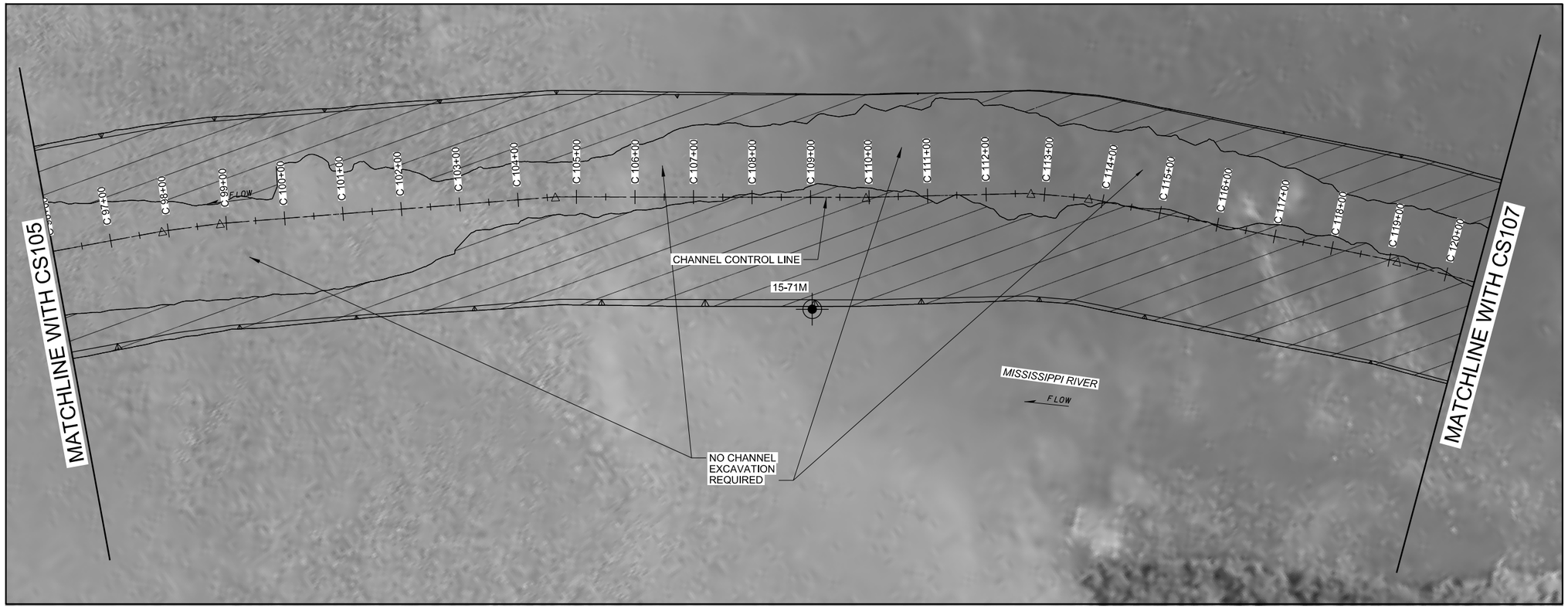
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 200'
PLOT DATE: 11/12/2021
SIZE: ANSI D
FILE NAME: LPSL_CS105--.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

WEST ISLAND PLAN VIEW

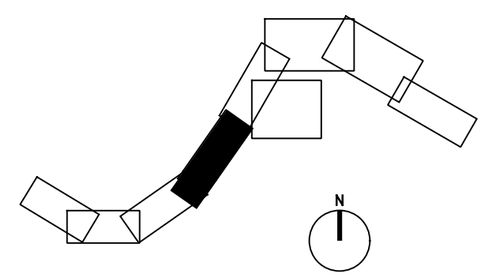
Sheet ID
CS105



PLAN VIEW

0 100' 200'

N



PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

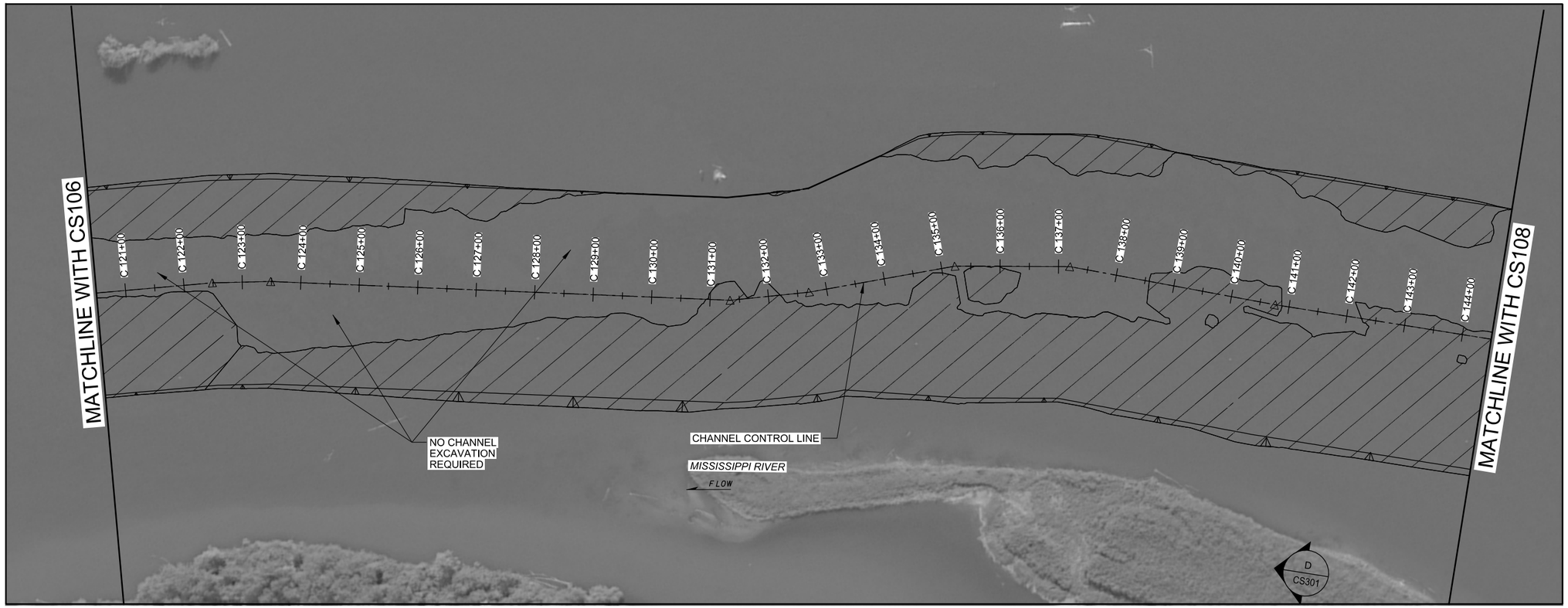
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 7/ 7/2017
SITE: ANSI D
FILE NAME: LP25L_CS106---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
CHANNEL PLAN VIEW

Sheet ID
CS106

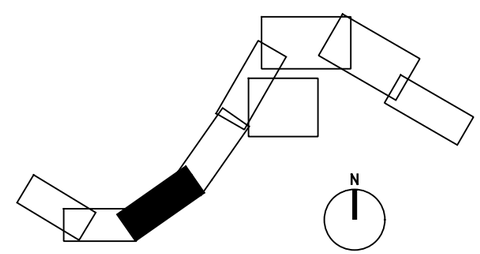
Plate 20



PLAN VIEW

0 100' 200'

N



PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

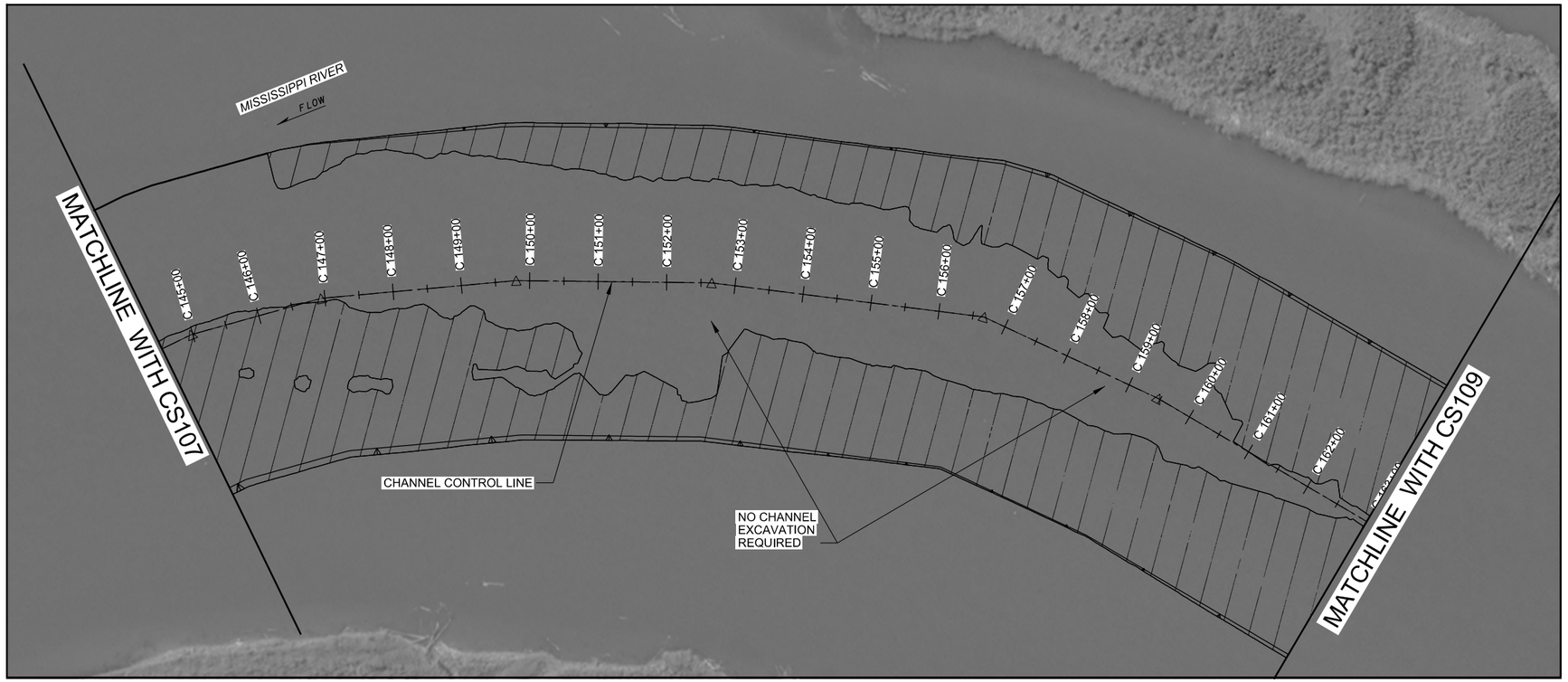
MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

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

DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 7/ 7/2021
SITE: ANS1D
FILE NAME: LP2SL_CS107---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
CHANNEL PLAN VIEW

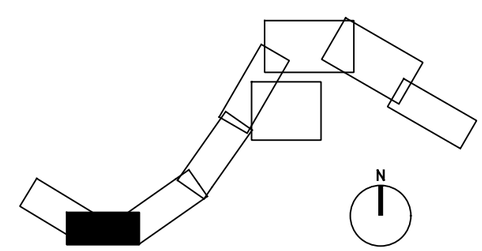
Sheet ID
CS107



PLAN VIEW

0 100' 200'

N



PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

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: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 1/7/2011
SIZE: ANSI D
FILE NAME: LP2SL_CS108---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN

CHANNEL PLAN VIEW

Sheet ID
CS108

PLAN VIEW

0 100' 200'

N

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL):
NAVD 88
GEOID12B

COORDINATE SYSTEM (HORIZONTAL CONTROL):
NAD 83 (2007)
MN SPCS, SOUTH ZONE-U.S. SURVEY FT.
COMBINED FACTOR (CF): 0.9999046797

US Army Corps of Engineers®

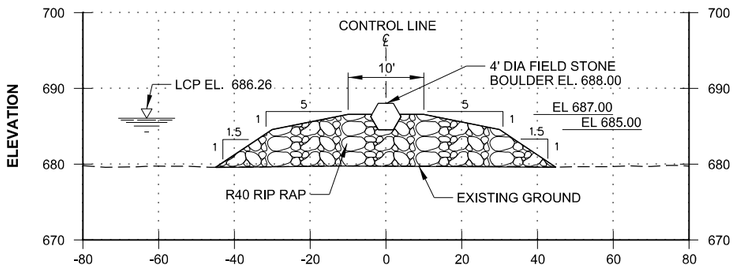
MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

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

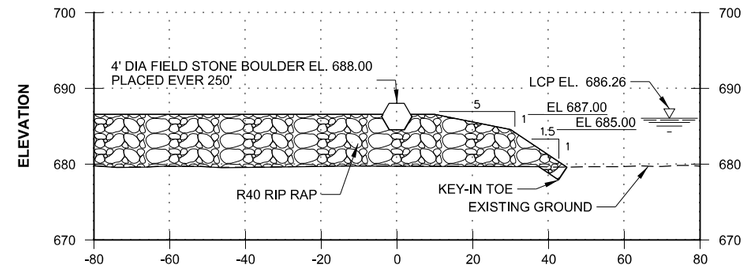
DESIGNED BY: AAM
DWN BY: AAM
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 100'
PLOT DATE: 1/10/2017
SIZE: ANSI D
FILE NAME: LP2SL_CS109---.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
CHANNEL PLAN VIEW

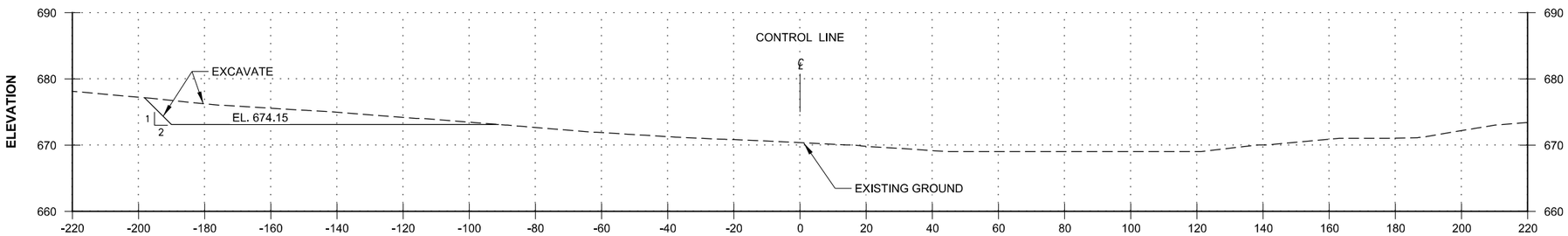
Sheet ID
CS109



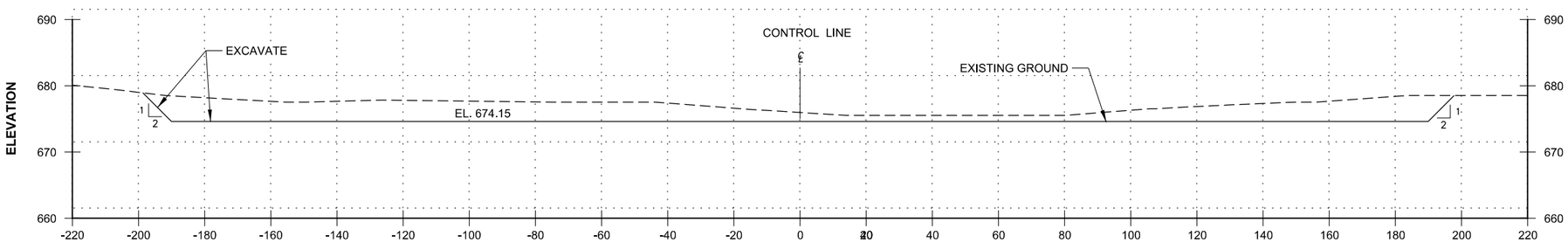
A
CS105
TYPICAL SECTION
ROCK TRAINING STRUCTURE



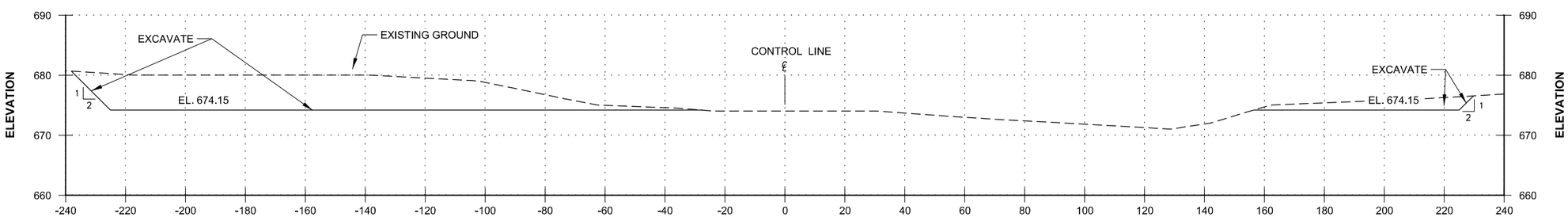
A1
CS105
LONGITUDINAL SECTION - END CAP
ROCK TRAINING STRUCTURE



B
CS101
TYPICAL SECTION
CHANNEL EXCAVATION



C
CS104
TYPICAL SECTION
CHANNEL EXCAVATION



D
CS107
TYPICAL SECTION
CHANNEL EXCAVATION

PRELIMINARY DRAWING - NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL): NAVD 88
GEOID

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD 83 (2007)
COMBINED FACTOR (CF): 0.9999046797

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
DWN BY: EPP
CKD BY: GCW
SUBMITTED BY: THOMAS B SULLY
PLOT SCALE: 1" = 5'
PLOT DATE: 11/17/2021
SIZE: ANSI D
FILE NAME: LPSIL_CS301--.dgn
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

LOWER POOL 2 - SPRING LAKE
MISSISSIPPI RIVER
MISSISSIPPI RIVER - POOL 2
HASTINGS, MN
TYPICAL SECTIONS AND DIMENSIONS
EAST AND WEST ISLANDS

Sheet ID
CS301

Plate 24