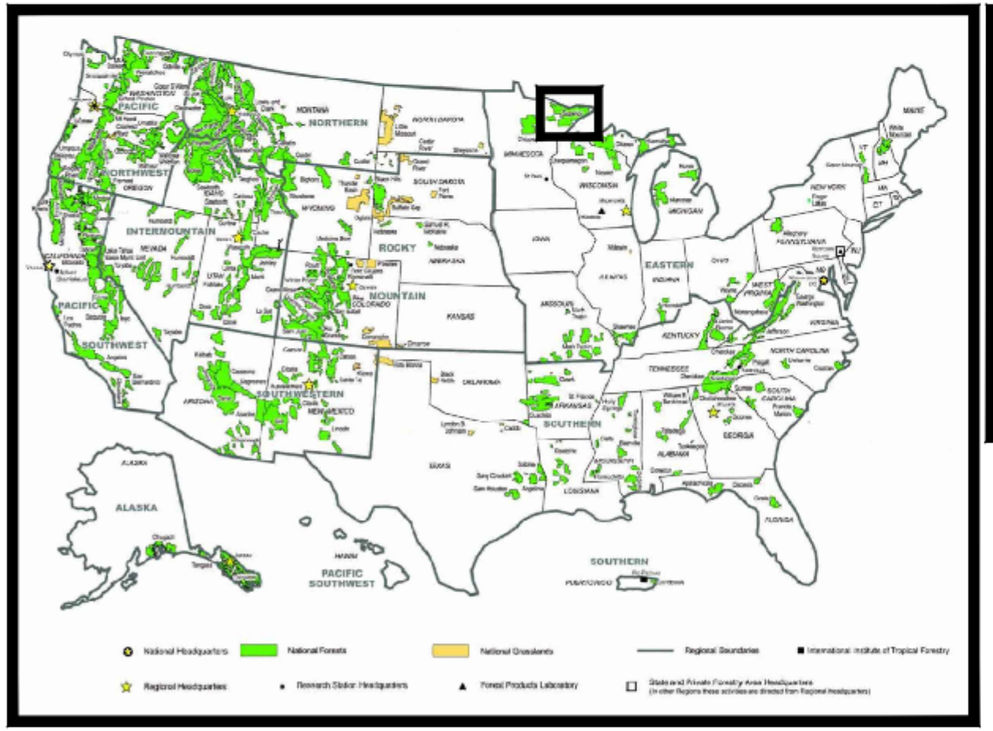
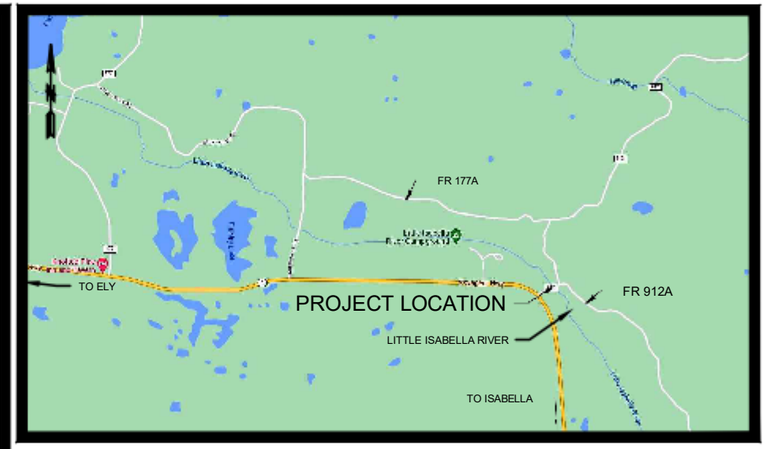
United States Department of Agriculture
Forest Service

EASTERN REGION
SUPERIOR NATIONAL FOREST - TOFTE RANGER DISTRICT
LAKE COUNTY
MINNESOTA

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT



PROJECT LOCATION



PROJECT SITE

PROJECT LOCATION: FROM THE STATE HWY 1 / FR 176 INTERSECTION IN ISABELLA, MINNESOTA, HEAD NORTHWEST ON STATE HWY 1 FOR 4.5 MILES, THEN TURN RIGHT AT FR 912. CONTINUE ON FR 912 FOR 0.1 MILES TO THE PROJECT LOCATION.

STRUCTURE NUMBER: 090907000036029 (LAT 47.646111, LONG -91.418333)

PROPOSED STRUCTURE DESCRIPTION:

TWIN CELL 12 FOOT SPAN BY 5 FOOT RISE PRECAST CONCRETE BOX CULVERT WITH A 24 FOOT BARREL LENGTH AND A 28.0 FOOT NBI STRUCTURE LENGTH.

INDEX OF SHEETS

SHEET	SHEET TITLE	DATE
G-01	TITLE SHEET	9/5/2023
C-02	QUANTITIES, DESIGN DATA, & GENERAL NOTES	9/5/2023
C-03	TEMPORARY TRAFFIC CONTROL PLAN	9/5/2023
C-04	DEWATERING PLAN	9/5/2023
C-05	TYPICAL SECTIONS	9/5/2023
C-06	PLAN OF SITE	9/5/2023
C-07	PROFILE OF SITE	9/5/2023
C-08	CULVERT PLAN	9/5/2023
C-09	CULVERT DETAILS	9/5/2023
C-10	CULVERT DETAILS	9/5/2023
C-11	SOIL BORINGS	9/5/2023
C-12 - C-13	CROSS SECTIONS	9/5/2023

U.P. ENGINEERS & ARCHITECTS, INC.
ENGINEERING ARCHITECTURE PLANNING SURVEYING ENVIRONMENTAL

STATE OF MICHIGAN
GUST B. JUNTTILA
ENGINEER
No. 6201063756
LICENSED PROFESSIONAL ENGINEER

2023.09.06
15:00:58-05'00'

RECOMMENDED BY:

Digitally signed by BRIANA PATTON
Date: 2025.03.10 16:40:31 -05'00'
FOREST ENGINEER — DATE

Digitally signed by ELLEN BOGARDUS-SZYMANIAK
Date: 2025.03.19 10:02:29 -05'00'
DISTRICT RANGER — DATE

Digitally signed by THOMAS HALL
Date: 2025.03.20 07:58:02 -05'00'
FOREST SUPERVISOR — DATE

JEFFREY DULKA
Digitally signed by JEFFREY DULKA
DN: CN=JEFFREY DULKA, OID.0.9.2342.19200300.100.1.1=U00102094845, O=U.S. Department of Agriculture, O=U.S. Government, C=US
Location: USFS Northeast Region
Reason: I am approving this document
Contact Info: Regional Bridge & Structures Program Manager
Date: 2025.03.24 11:24:32-05'00'
R9 BRIDGE PROGRAM MANAGER — DATE

APPROVED:

JON HODGSON
Digitally signed by JON HODGSON
Date: 2025.03.25 08:11:38 -05'00'
R9 DIRECTOR OF ENGINEERING — DATE

9/5/23 11:49 JALLEN Z:\028-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 21 BRIDGES\DWGS\TASK 113 - SUPERIORNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;

DESIGN DATA:

LOAD RATING (RATING FACTORS):

HL-93

INVENTORY RATING (STRENGTH 1, TOP SLAB, FLEXURE)..... 1.06

OPERATING RATING (STRENGTH 1, TOP SLAB, FLEXURE)..... 1.37

LEGAL (MN 6 AXLE)

OPERATING RATING (STRENGTH 1, BOTTOM SLAB)..... 1.57

HYDRAULIC DATA:

100 YEAR FREQUENCY

DRAINAGE AREA. ..... SQ MI

Q100..... 1090 CFS

VELOCITY THRU STRUCTURE..... 9.64 FPS

CULVERT OPEN AREA THRU STRUCTURE..... 120 SQ FT

FLOW AREA THRU STRUCTURE..... 120 SQ FT

HIGH WATER ELEVATION. ..... 1829.55 FT

SCOUR CRITICAL CODE..... 8

GENERAL NOTES:

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS OR IN THE SUPPLEMENTAL SPECIFICATIONS, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FHWA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14.

THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH:

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020
AASHTO GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS, 2ND EDITION, 2019
FSH 7709.56b TRANSPORTATION STRUCTURES HANDBOOK (USDA FOREST SERVICE)

THE EXISTING STRUCTURE SHALL BE CHECKED AT THE TIME OF STARTING CONSTRUCTION TO SEE THAT ITS RELATIONSHIP TO THE PROPOSED WORK IS AS SHOWN ON THESE PLANS AND ANY DIFFERENCES REQUIRING CHANGES IN THE NEW WORK SHALL BE REPORTED TO THE PROJECT ENGINEER.

THE WORK COVERED BY THESE PLANS INCLUDES REMOVAL OF THE EXISTING CULVERTS AND TIMBER MATS, INSTALLATION OF THE NEW CULVERT STRUCTURES AS SHOWN HEREIN AND PER THE MANUFACTURER'S DRAWINGS AND SPECIFICATIONS, CONSTRUCTION OF THE APPROACHES TO THE LIMITS SHOWN, AND SLOPE RESTORATION.

THE STATIONING AS SHOWN ON THESE PLANS FOR REFERENCE POINTS "A" AND "B" ARE BELIEVED TO BE CORRECT. IT SHALL, HOWEVER, BE CHECKED AT THE TIME OF STARTING CONSTRUCTION, AND IF THE STATIONING SHOWN ON THE PLANS IS INCORRECT, IT SHALL BE REPORTED TO THE ENGINEER.

THE CONTRACTOR SHALL COORDINATE ALL OF THEIR WORK AND ANY UTILITY COMPANIES RELOCATION WORK AT NO ADDITIONAL COST TO THE PROJECT.

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174, THE CONTRACTOR SHALL DIAL "811" A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "GOPHER STATE ONE CALL" ALERT SYSTEM.

WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXPECTED WATER LEVELS DURING CONSTRUCTION.

NO MATERIAL SHALL BE ALLOWED TO ERODE INTO THE WATER COURSE, NOR SHALL MATERIAL BE PLACED INTO THE WATER COURSE EXCEPT AS SHOWN ON THESE PLANS.

ALL EQUIPMENT SHALL BE CLEANED ACCORDING TO THE SPECIFICATIONS PRIOR TO USE ON THIS PROJECT. CONTRACTOR SHALL MAKE EQUIPMENT AVAILABLE FOR INSPECTION PRIOR TO MOBILIZATION ONTO FS LANDS.

THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE FOREST SERVICE CONTRACTING OFFICER REPRESENTATIVE IF HERITAGE RESOURCES OR HUMAN REMAINS ARE ENCOUNTERED.

NO WORK SHALL BE PERFORMED ON FEDERAL HOLIDAYS OR WEEKENDS WITHOUT PRIOR APPROVAL FROM THE FOREST SERVICE CONTRACTING OFFICER REPRESENTATIVE.

THE CONTRACTOR SHALL NOT PERFORM IN-STREAM WORK BETWEEN APRIL 1ST THROUGH JUNE 30TH. NO IN-STREAM WORK SHALL BE PERFORMED AFTER SEPTEMBER 15TH.

THE CONTRACTOR SHALL VERIFY WITH THE FOREST SERVICE CONTRACTING OFFICER REPRESENTATIVE THAT THE BAT SURVEY HAS BEEN COMPLETED PRIOR TO BEGINNING CONSTRUCTION.

CONSTRUCTION NOTES:

THE CONTRACTOR SHALL SUBMIT A RIPRAP GRADATION TEST RESULT ACCORDING TO ASTM D5519 PRIOR TO PLACING ROCK.

SPECIFICATIONS:

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE BOX CULVERT, WINGWALLS, AND HEADWALLS.

THE MAXIMUM FOUNDATION PRESSURE IS CALCULATED TO BE 588 PSF FOR SERVICE LIMIT STATE AND 917 PSF FOR STRENGTH LIMIT STATE, BASED ON GROSS WIDTH OF THE BOX.

ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60 (Fy=60,000 P.S.I.). ALL WELDED WIRE REINFORCEMENT (W.W.R.) SHALL BE IN ACCORDANCE WITH ASTM A1064 (Fy=70,000 P.S.I.). GALVANIZED INSERTS SHALL BE GALVANIZED PER ASTM B633-SC4. BOLTS, RODS, WASHERS, NUTS SHALL BE HOT DIP GALVANIZED OR ELECTRO GALVANIZED PER ASTM B633-SC1.

ANY SUBSURFACE CONDITIONS OR EXISTING FOUNDATIONS ENCOUNTERED THAT ARE NOT REPRESENTED ON THE PLANS OR IN THE SPECIFICATIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER FOR THE INSPECTION AND/OR AN ALTERNATE FOUNDATION/FOOTING DESIGN.

PRECAST CONCRETE BOX CULVERT DESIGN STRENGTH SHALL BE Fc=5,000 P.S.I. MINIMUM. PRECAST CONCRETE WINGWALL DESIGN STRENGTH SHALL BE F'c=4,000 P.S.I. MINIMUM. CONCRETE STRENGTH SHALL BE GREATER THAN 2,500 P.S.I. PRIOR TO REMOVAL FROM FORMS AND TRANSPORT.

PRECAST CONCRETE BOX CULVERT MANUFACTURING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CURRENT ASTM C1577, AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND FP-14 SECTION 552.

IT IS THE FABRICATOR'S RESPONSIBILITY TO MAKE SURE THAT THE REINFORCING STEEL ASSEMBLY (REINFORCEMENT CAGE PATTERN) SHALL NOT EXCEED 3 LAYERS OF WELDED WIRE REINFORCEMENT. MULTIPLE LAYERS SHALL NOT BE SEPARATED BY MORE THAN THE THICKNESS OF ONE LONGITUDINAL WIRE PLUS 1/4 INCH.

THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL NOT BE MORE THAN 2 INCHES FROM THE ENDS OF THE BOX SECTION.

CONSTRUCTION TRAFFIC OVER THE BOX CULVERT SECTION DURING CONSTRUCTION SHALL BE LIMITED TO A MAXIMUM SINGLE AXLE WHEEL LOAD OF 16,000 LBS OR TWO (TANDEM) WHEEL LOADS OF 13,000 LBS SPACED AT 4 FEET APART. THE MINIMUM EARTH COVER SHALL BE IN PLACE PRIOR TO THE DEPLOYMENT OF HEAVY EARTH MOVING EQUIPMENT LARGER THAN A D-4 DOZER WEIGHING IN EXCESS OF 12 TONS AND HAVING A TRACK PRESSURE OF 80 PSI OR GREATER CROSSING THE STRUCTURE. AT NO TIME SHALL EARTH MOVING EQUIPMENT EXCEEDING THE DESIGNED BOX CULVERT DESIGN LOADING OPERATE OVER THE BOX CULVERT STRUCTURE.

THE PRECAST BOX CULVERT SECTIONS SHALL BE MANUFACTURED USING THE WET CAST METHOD.

THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL BE NOT LESS THAN 1/2 INCH OR MORE THAN 2 INCHES FROM THE ENDS OF THE BOX SECTION.

FILL AND SEAL LIFTING HOLES IN SECTIONS AFTER PLACEMENT OF SECTIONS.

ALL EXPOSED CORNERS ON HEADWALLS AND WINGWALLS SHOWN SQUARE ON PLANS SHALL BE BEVELED WITH 1/2" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

ABBREVIATIONS (PLAN):

LPSM - LUMP SUM
LNFT - LINEAR FEET
CUYD - CUBIC YARD
SQYD - SQUARE YARD
EA - EACH
EX - EXISTING
PROP - PROPOSED
NTS - NOT TO SCALE
TYP - TYPICAL
CL - CENTER LINE
P.O.B. - POINT OF BEGINNING
P.O.E. - POINT OF ENDING
REF PT - REFERENCE POINT
OBS WSE - OBSERVED WATER SURFACE ELEVATION
Q100 WSE - 100 YEAR FLOOD WATER SURFACE ELEVATION
PL - PLATE
GALV - GALVANIZED
U.N.O. - UNLESS NOTED OTHERWISE

SUMMARY OF PROJECT QUANTITIES

ITEM NO.	DESCRIPTION	UNITS	QUANTITY
15101	MOBILIZATION	LPSM	1
15201	CONSTRUCTION SURVEY AND STAKING, METHOD 1, TOLERANCE CLASS C	LPSM	1
15702	SILT SOCK	LNFT	360
15712	TURBIDITY CURTAIN	LNFT	35
20101	CLEARING AND GRUBBING, DISPOSAL METHOD A	LPSM	1
20304	REMOVAL OF PIPE CULVERTS, DISPOSAL METHOD A	LNFT	96
20401	ROADWAY EXCAVATION, COMPACTION METHOD B	CUYD	85
20411	EMBANKMENT, PLACEMENT METHOD 1	CUYD	31
20801	STRUCTURE EXCAVATION	CUYD	460
20803	STRUCTURAL BACKFILL	CUYD	253
20805	DEWATERING	LPSM	1
25101	RIPRAP, CLASS V, MACHINE PLACED	CUYD	45
25116	GEOTEXTILE, TYPE III, CLASS I	SQYD	483
30111	AGGREGATE SURFACE COURSE, GRADING G, COMPACTION METHOD B	CUYD	127
60220	PRECAST CONCRETE BOX CULVERT, 12-FOOT SPAN BY 5-FOOT RISE	LNFT	48
60501	UNDERDRAIN SYSTEM, 6-INCH	LNFT	100
62403	PLACING CONSERVED TOPSOIL, 3-INCH	SQYD	400
62503	SEEDING, DRY METHOD	LPSM	1
62901	ROLLED EROSION CONTROL PRODUCT, TYPE 2.D WITH NATURAL NETTING	SQYD	400
63306	POST, WOOD, 4-INCH X 4-INCH	LNFT	40
63307	OBJECT MARKERS, TYPE 3	EACH	4
63501	TEMPORARY TRAFFIC CONTROL	LPSM	1
SPV	FOUNDATION GRAVEL PAD, 1" MINUS	CUYD	146

SUMMARY OF PROJECT QUANTITIES (BID ALTERNATE 1)

ITEM NO.	DESCRIPTION	UNITS	QUANTITY
64703	FLEXIBLE BAFFLE	EACH	6

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

QUANTITIES, DESIGN DATA, & GENERAL NOTES

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

DRAWN
J.ALLEN

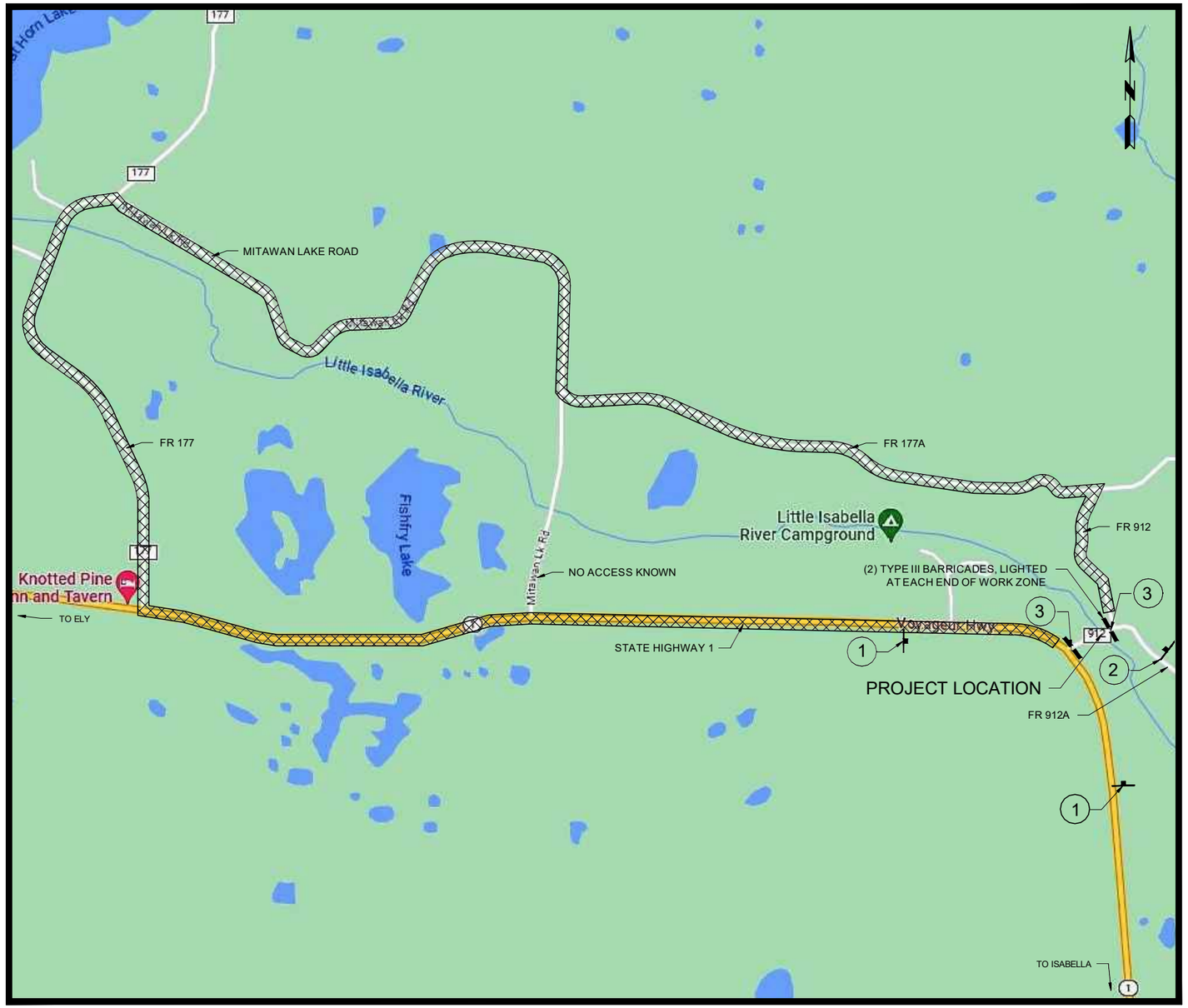
CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

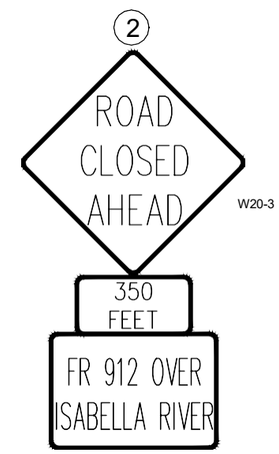
DWG SHEET NO.
C-02

SHEET 2 OF 13

9/6/23 10:42 JALLEN Z:\U28-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 21 BRIDGES\DWGS\TASK 113 - SUPERIORNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;



TRAFFIC CONTROL PLAN - ROAD CLOSURE / DETOUR



TRAFFIC CONTROL PLAN KEY

- DETOUR ROUTE
- SIGN
- TYPE III BARRICADE

ALL SIGNS, EXCEPT THOSE MOUNTED ON TYPE III BARRICADES SHALL BE MOUNTED ON DRIVEN POSTS AT A 7 FOOT BOTTOM HEIGHT.

DETOUR NOTES:

THE DETOUR ROUTE IS 4.7 MILES LONG AND TAKES APPROXIMATELY 9 MINUTES.

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

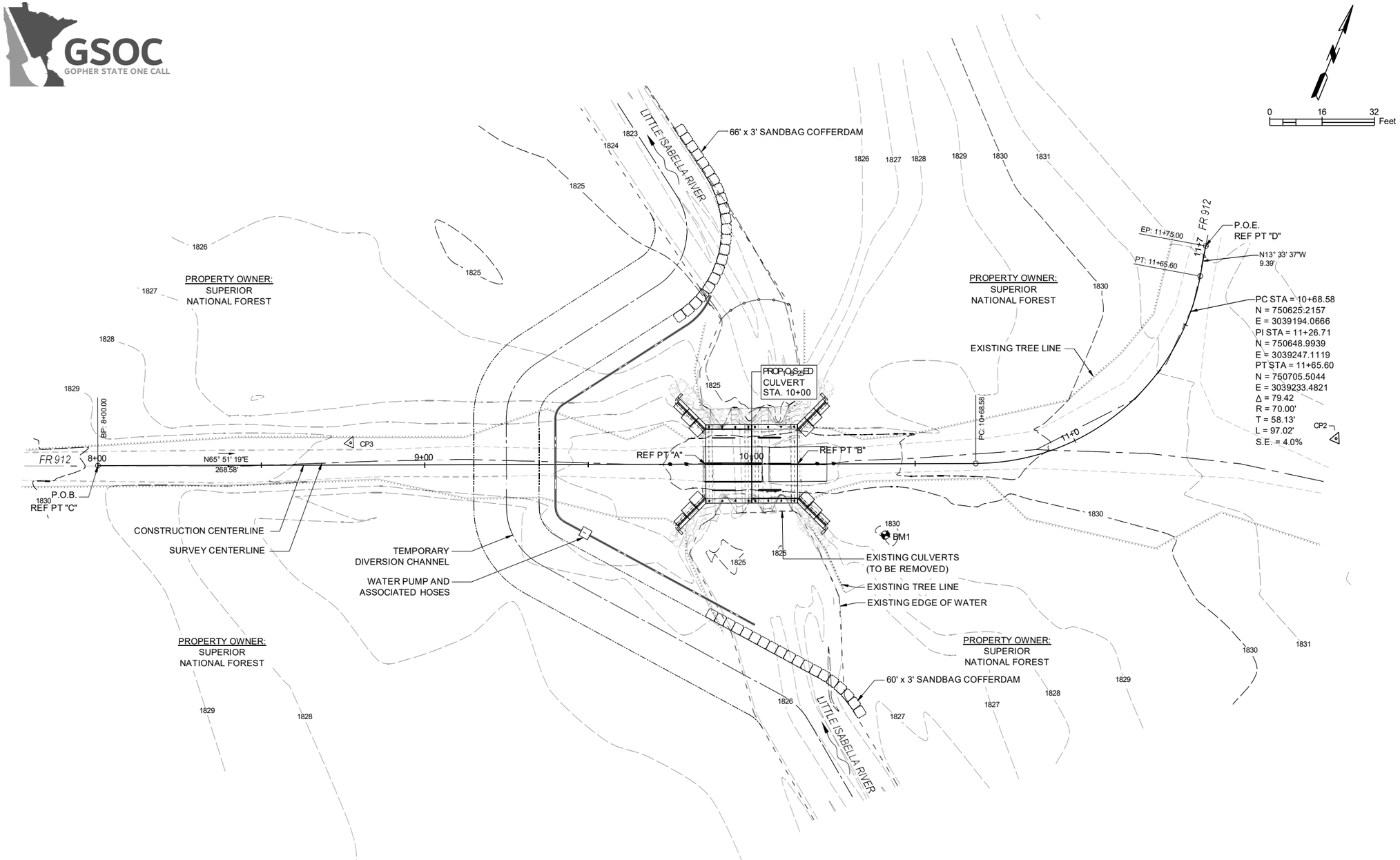
TOFTE RANGER DISTRICT

DRAWING TITLE

TEMPORARY TRAFFIC CONTROL PLAN

DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-03
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 3 OF 13
PROJECT NO. U28-02592	

9/5/23 11:49 JALLEN Z:\U28-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 21 BRIDGES\DWGS\TASK 113 - SUPERIORNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;



DEWATERING PLAN

DEWATERING NOTES:

DEWATERING PLAN SHOWN IS A SCHEMATIC; THE CONTRACTOR MUST SUBMIT A DEWATERING PLAN TO THE FOREST SERVICE CONTRACTING OFFICER REPRESENTATIVE 14 DAYS PRIOR TO CONSTRUCTION, ANY CLEARING, SEEDING, AND MULCHING IS INCIDENTAL TO "DEWATERING".

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

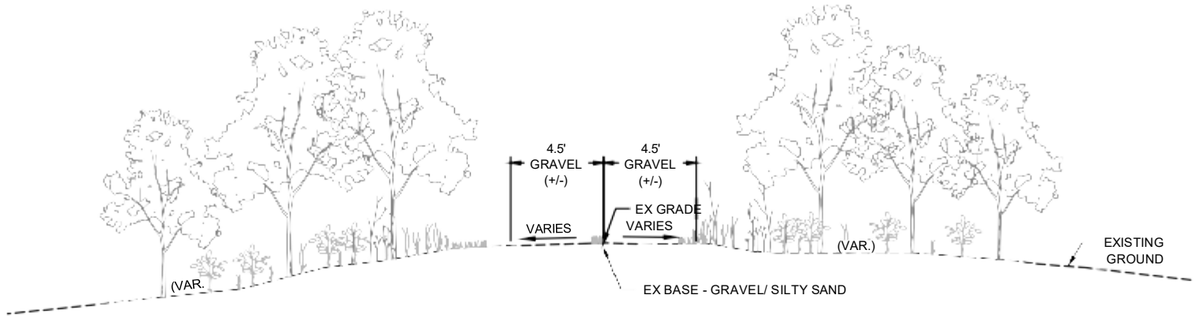
TOFTE RANGER DISTRICT

DRAWING TITLE

DEWATERING PLAN

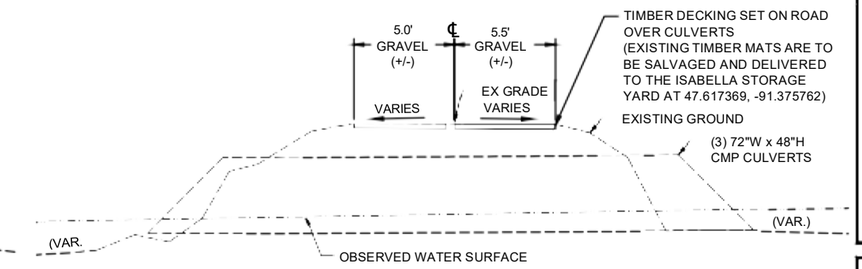
DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-04
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 4 OF 13
PROJECT NO. U28-02592	

9/5/23 11:49 JALLEN Z:\U28-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 21 BRIDGES\DWGS\TASK 113 - SUPERIOR\RNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;



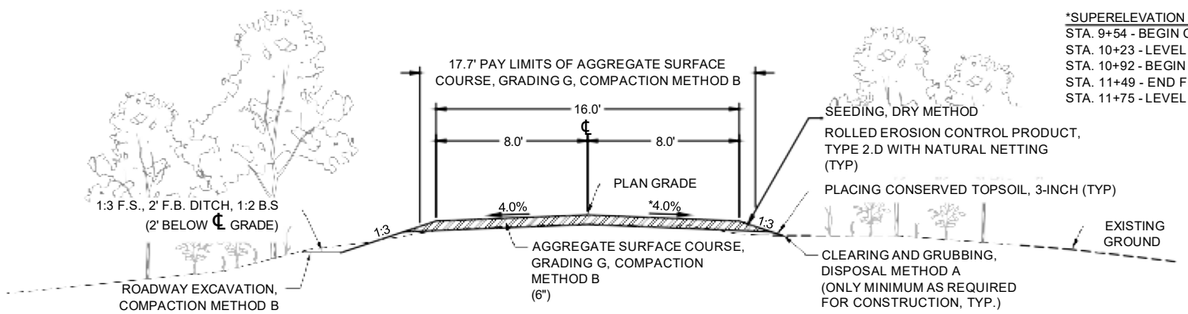
EXISTING TYPICAL SECTION (STA 8+00.00 - STA. 11+75.00)

SCALE: NTS



EXISTING CULVERT SECTION

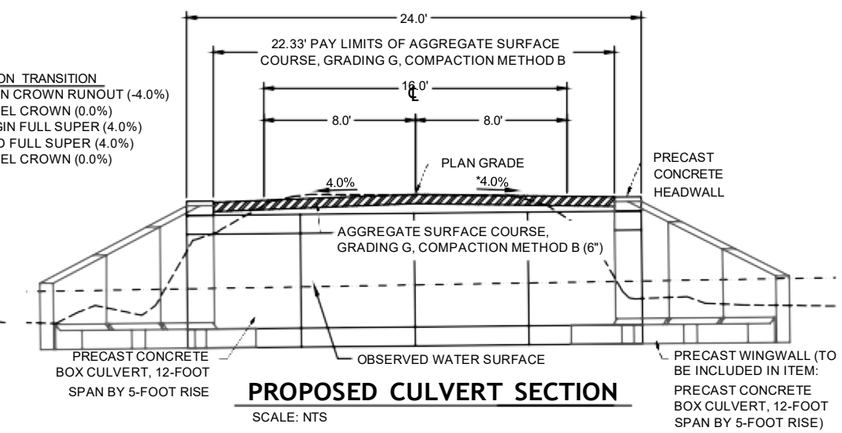
SCALE: NTS



PROPOSED TYPICAL SECTION (STA 8+00.00 - STA 11+75.00)

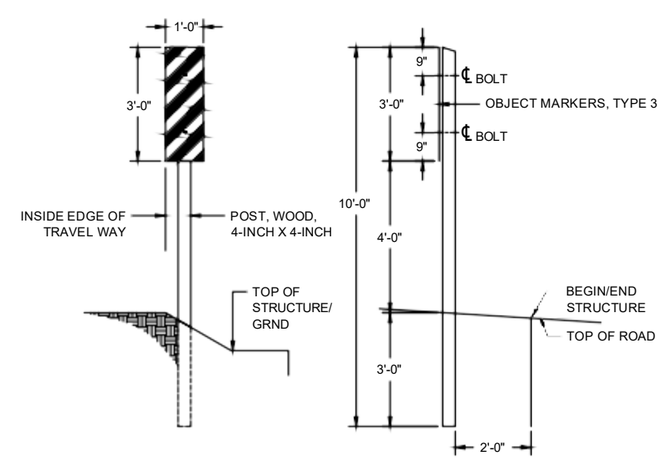
SCALE: NTS

*SUPERELEVATION TRANSITION
STA. 9+54 - BEGIN CROWN RUNOUT (-4.0%)
STA. 10+23 - LEVEL CROWN (0.0%)
STA. 10+92 - BEGIN FULL SUPER (4.0%)
STA. 11+49 - END FULL SUPER (4.0%)
STA. 11+75 - LEVEL CROWN (0.0%)



PROPOSED CULVERT SECTION

SCALE: NTS



OBJECT MARKER

SCALE: NTS

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

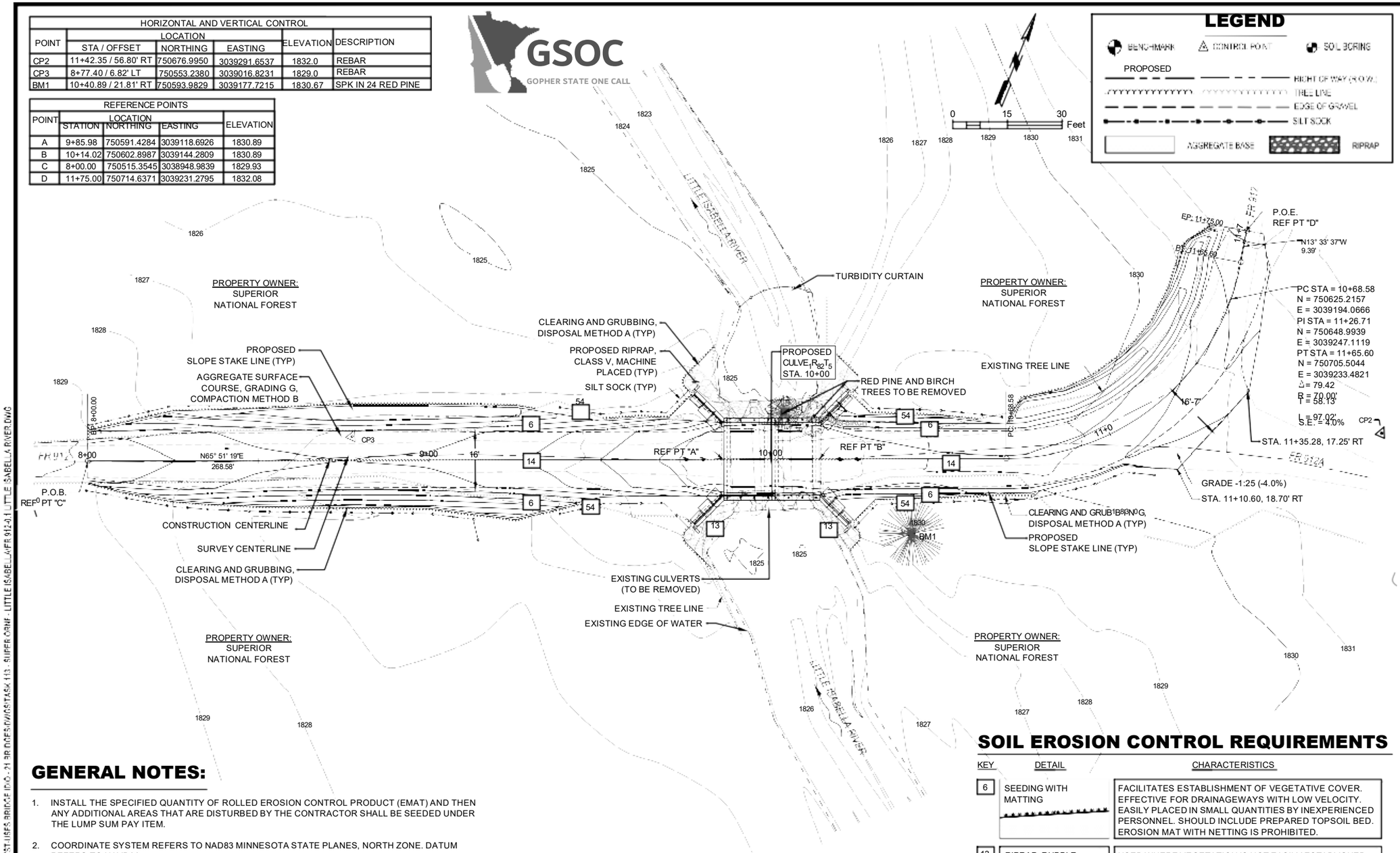
DRAWING TITLE

TYPICAL SECTIONS

DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-05
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 5 OF 13
PROJECT NO. U28-02592	

HORIZONTAL AND VERTICAL CONTROL					
POINT	LOCATION			ELEVATION	DESCRIPTION
	STA / OFFSET	NORTHING	EASTING		
CP2	11+42.35 / 56.80' RT	750676.9950	3039291.6537	1832.0	REBAR
CP3	8+77.40 / 6.82' LT	750553.2380	3039016.8231	1829.0	REBAR
BM1	10+40.89 / 21.81' RT	750593.9829	3039177.7215	1830.67	SPK IN 24 RED PINE

REFERENCE POINTS				
POINT	LOCATION			ELEVATION
	STATION	NORTHING	EASTING	
A	9+85.98	750591.4284	3039118.6926	1830.89
B	10+14.02	750602.8987	3039144.2809	1830.89
C	8+00.00	750515.3545	3038948.9839	1829.93
D	11+75.00	750714.6371	3039231.2795	1832.08



GENERAL PLAN OF SITE

GENERAL NOTES:

1. INSTALL THE SPECIFIED QUANTITY OF ROLLED EROSION CONTROL PRODUCT (EMAT) AND THEN ANY ADDITIONAL AREAS THAT ARE DISTURBED BY THE CONTRACTOR SHALL BE SEEDED UNDER THE LUMP SUM PAY ITEM.
2. COORDINATE SYSTEM REFERS TO NAD83 MINNESOTA STATE PLANES, NORTH ZONE. DATUM REFERS TO NAVD88.
3. REFERENCE POINTS "A" AND "B" REFER TO FINISH GRADE AT CENTERLINE AT THE OUTSIDE FACES OF THE TWIN-CELL CULVERTS.
4. PROVIDE SMOOTH TRANSITION FROM EXISTING TO PROPOSED TRAIL AT REFERENCE POINTS "C" AND "D". FADE OR EXTEND PROFILE SLIGHTLY AS REQUIRED.
5. SURVEY WAS COMPLETED BY UPEA FOR THIS PROJECT ON 12-2-2022.
6. ALL TREE REMOVAL TO BE INCIDENTAL TO CLEARING AND GRUBBING, DISPOSAL METHOD A.
7. THE EXISTING TIMBER MATS ABOVE THE CULVERTS SHALL BE SALVAGED AND DELIVERED TO THE ISABELLA STORAGE YARD AT 47.617369, -91.375762. THIS WORK SHALL BE INCIDENTAL TO "REMOVAL OF PIPE CULVERTS, DISPOSAL METHOD A".

SOIL EROSION CONTROL REQUIREMENTS

KEY	DETAIL	CHARACTERISTICS
6	SEEDING WITH MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER. EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY. EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL. SHOULD INCLUDE PREPARED TOPSOIL BED. EROSION MAT WITH NETTING IS PROHIBITED.
13	RIPRAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED. EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS. PERMITS RUNOFF TO INFILTRATE SOIL. DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS.
14	AGGREGATE COVER	STABILIZES SOIL SURFACE THUS MINIMIZING EROSION. PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER. MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS.
54	SILT SOCK	FILTERS AND DETAINS RUNOFF.

USDA

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

PLAN OF SITE

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

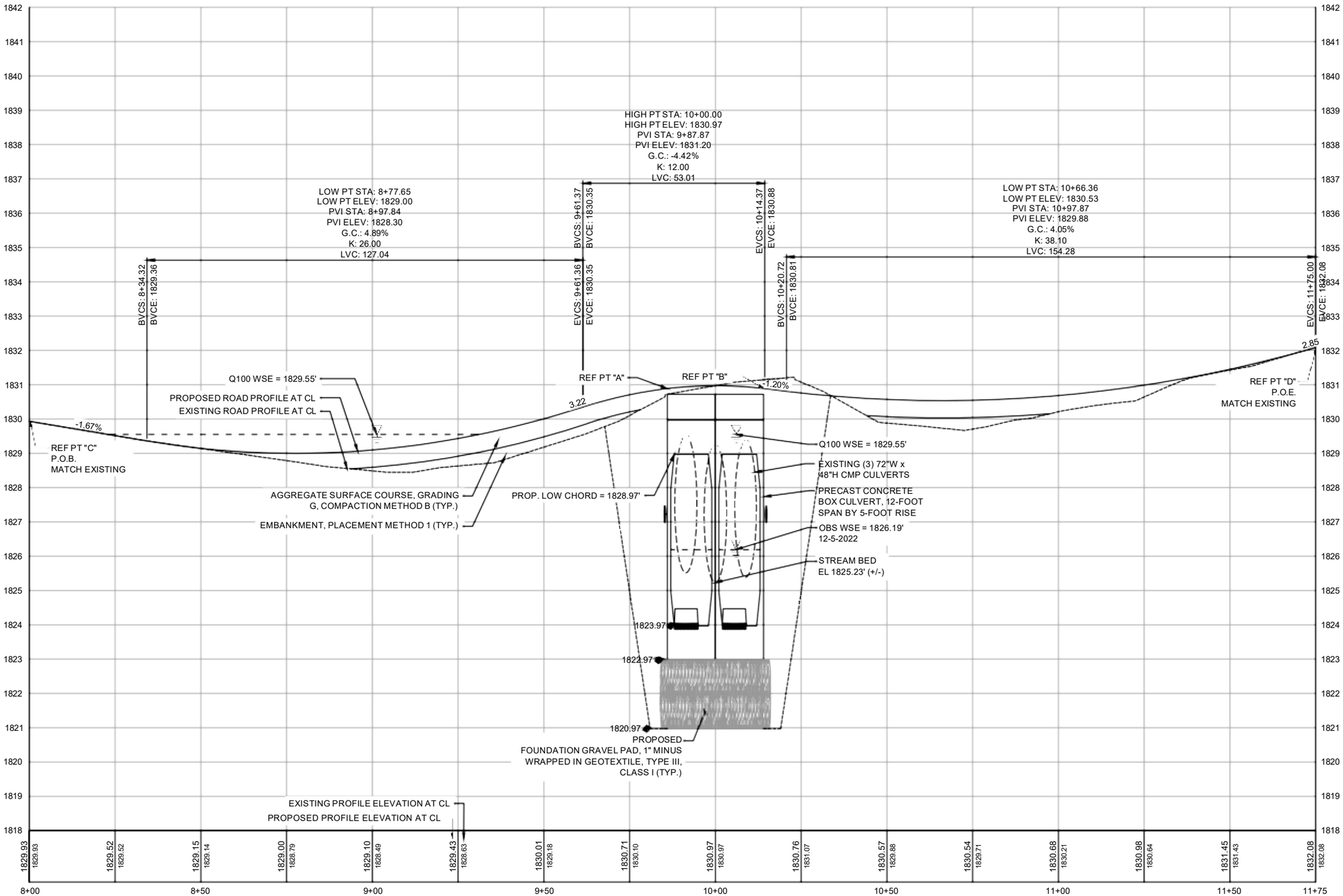
DRAWN
J.ALLEN

CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

DWG SHEET NO.
C-06

SHEET 6 OF 13



EXISTING CULVERTS (TO BE REMOVED):
THREE 72"W x 48"H x 32'L CORRUGATED METAL PIPE ARCH CULVERTS.

PROPOSED STRUCTURE, CL STA 10+00:
TWIN CELL 12 FOOT SPAN BY 5 FOOT RISE PRECAST CONCRETE BOX CULVERT WITH A 24 FOOT BARREL LENGTH AND A 28.0 FOOT NBI STRUCTURE LENGTH.

GENERAL PROFILE

0 15 30 Feet (HORIZONTAL)

0 1.5 3 Feet (VERTICAL)

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

PROFILE OF SITE

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

DRAWN
J.ALLEN

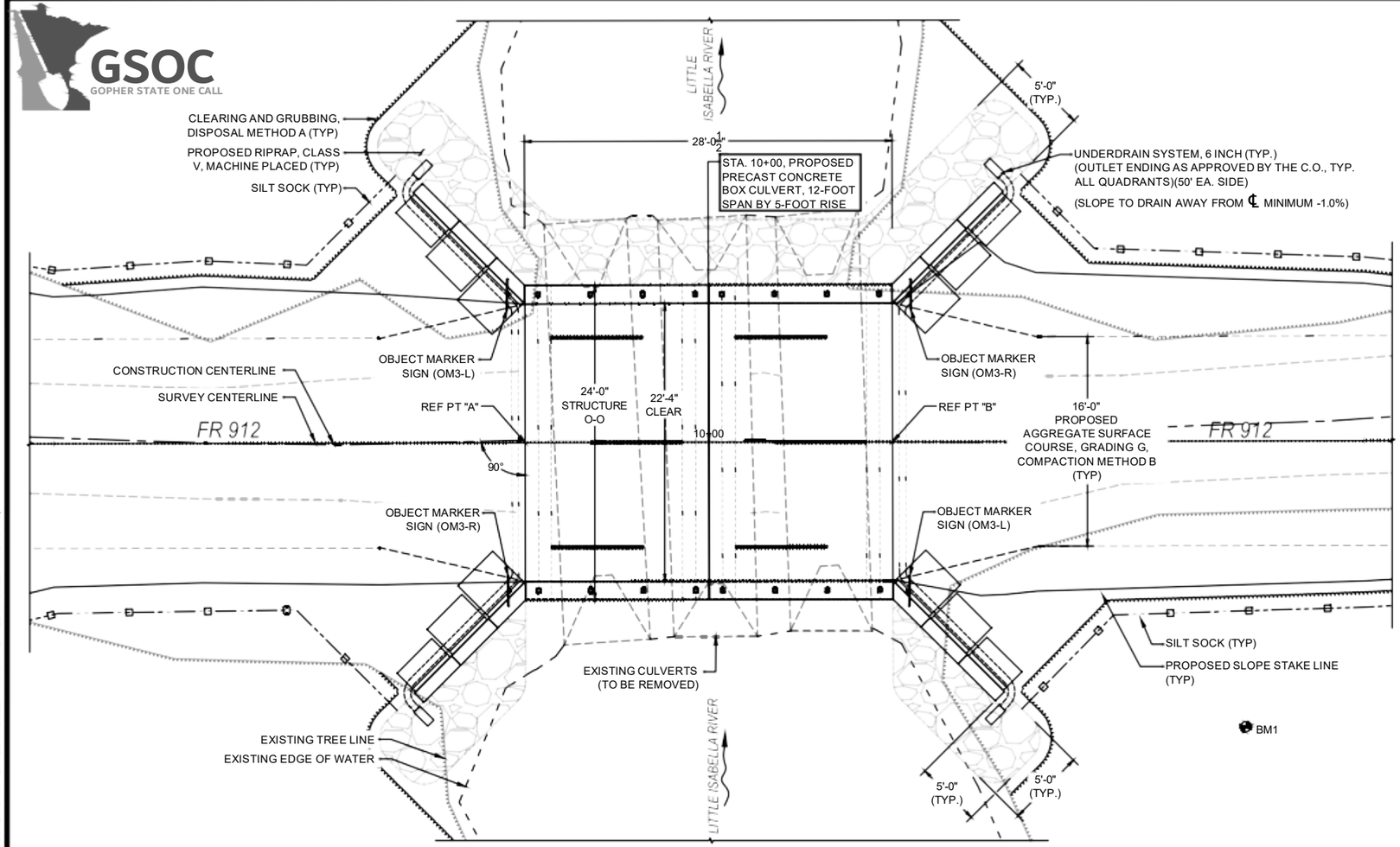
CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

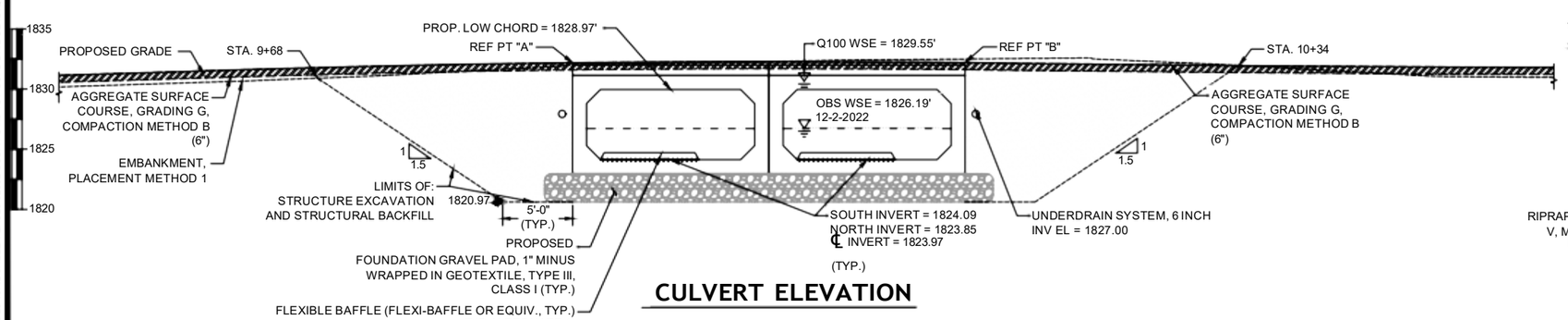
DWG SHEET NO.
C-07

SHEET 7 OF 13

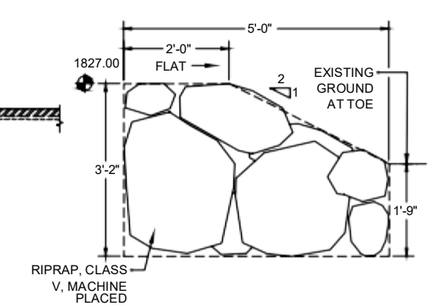
GSOC
GOPHER STATE ONE CALL



CULVERT PLAN



CULVERT ELEVATION



RIPRAP DETAIL

SCALE: NTS

0 5 10 Feet

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

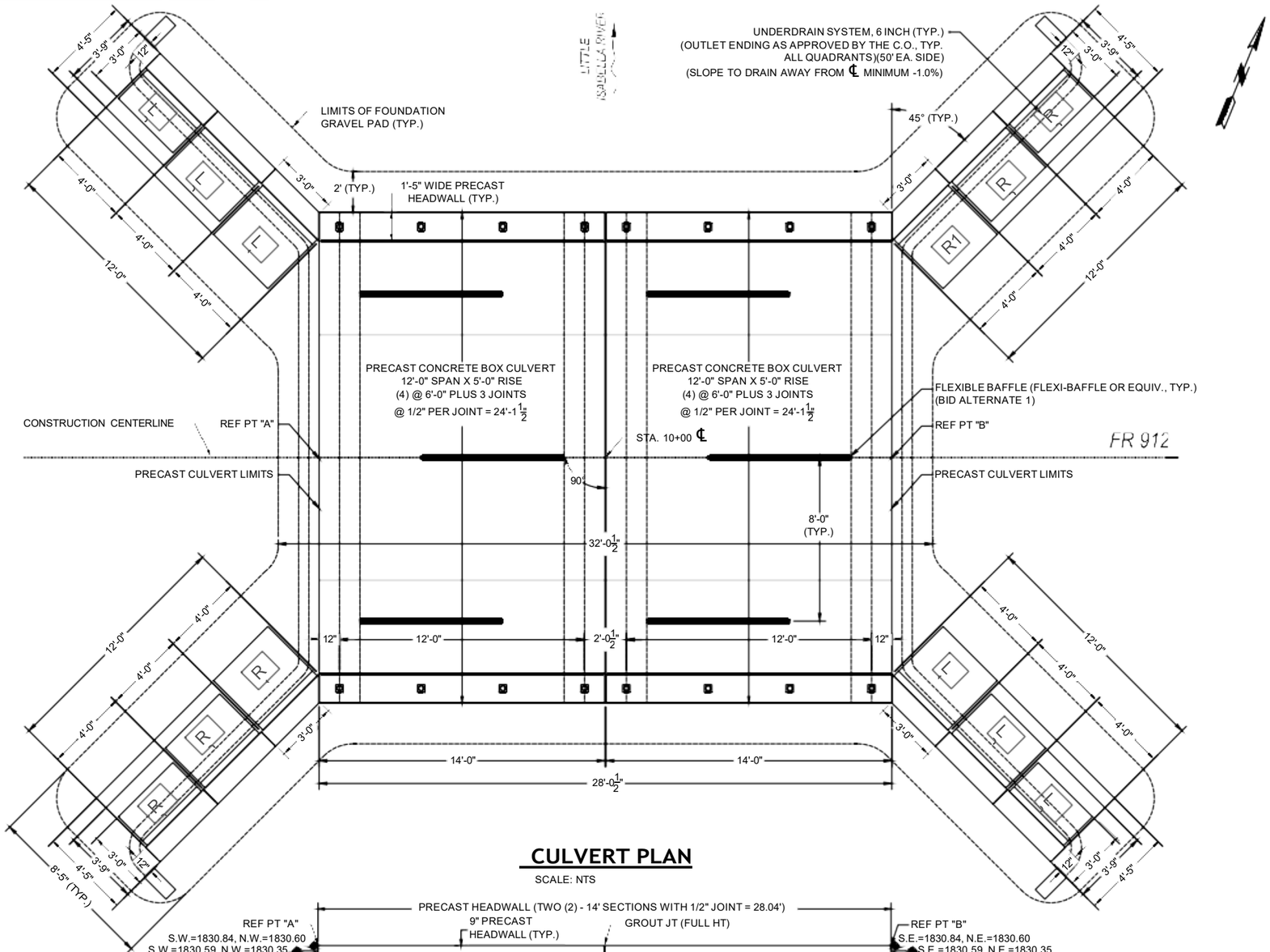
TOFTE RANGER DISTRICT

DRAWING TITLE

CULVERT PLAN

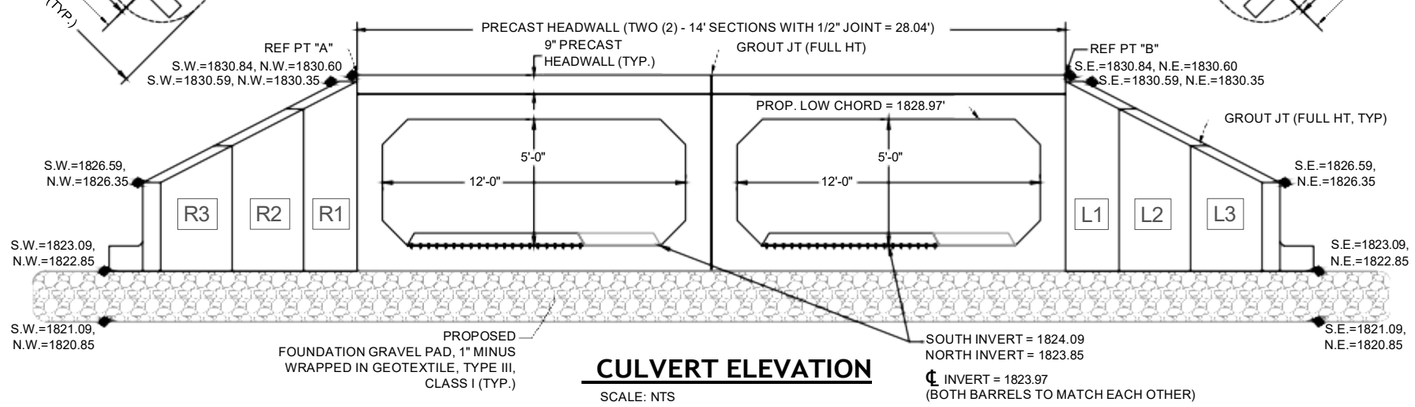
DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-08
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 8 OF 13
PROJECT NO. U28-02592	

9/6/23 10:42 JALLEN Z:\U28-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 2\ BRIDGES\DWGS\TASK 113 - SUPERIOR\RNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;



CULVERT PLAN

SCALE: NTS



CULVERT ELEVATION

SCALE: NTS

NOTE:
PRECAST WINGWALLS, HEADWALLS, HARDWARE, JOINT WRAP, MEMBRANES, AND GROUT TO BE INCLUDED WITH PRECAST CONCRETE BOX CULVERT, 12-FOOT SPAN BY 5-FOOT RISE.

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

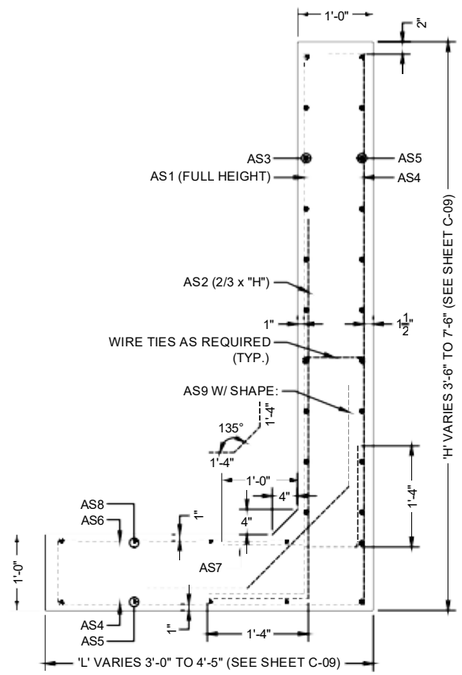
TOFTE RANGER DISTRICT

DRAWING TITLE

CULVERT DETAILS

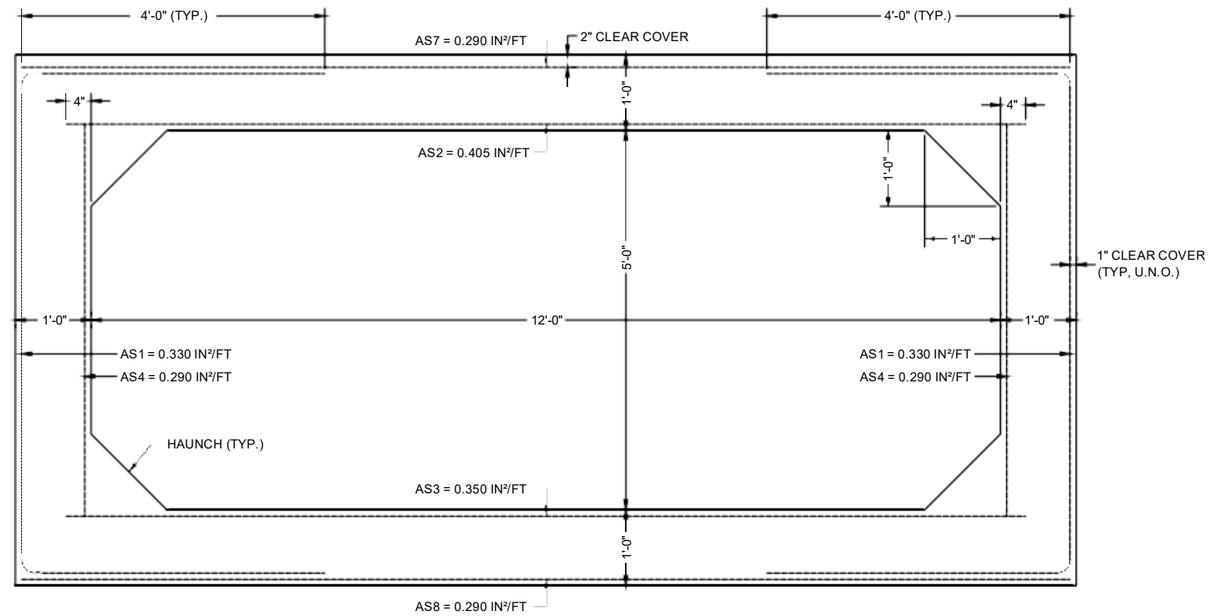
DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-09
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 9 OF 13
PROJECT NO. U28-02592	

09/05/2023 12:42:41 PM, P:\U28-02592 USDA FS R9 *ST USES BRIDGE\DWG\STA5X 113 - SUPERIOR\FR 912-0.1 LITTLE ISABELLA RIVER.DWG



PRECASTWINGWALL SECTION

SCALE: NTS



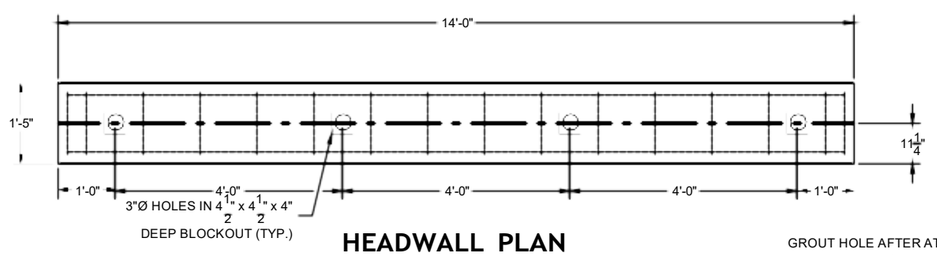
CULVERT SECTION

SCALE: NTS

WINGWALLS

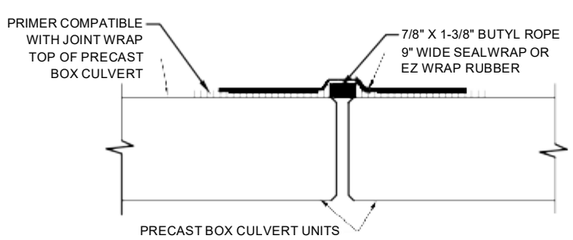
WINGWALL SECTION	EARTH LOCK DIMENSIONS		AREA OF STEEL PER FOOT OF WALL LENGTH (IN²/FT)								
	H (')	J (')	AS1	AS2	AS3	AS4	AS5	AS6	AS7	AS8	AS9
R1 & L1	7.50	4.20	0.18	0.10	0.03	0.08	0.03	0.20	0.20	0.08	0.20
R2 & L2	6.50	3.75	0.03	0.10	0.03	0.08	0.03	0.18	0.18	0.08	0.20
R3 & L3	4.00	3.00	0.03	0.08	0.03	0.08	0.03	0.08	0.08	0.08	0.20

NOTE:
CULVERT AND WINGWALL REINFORCEMENT SHALL BE W.W.R. GRADE 70.



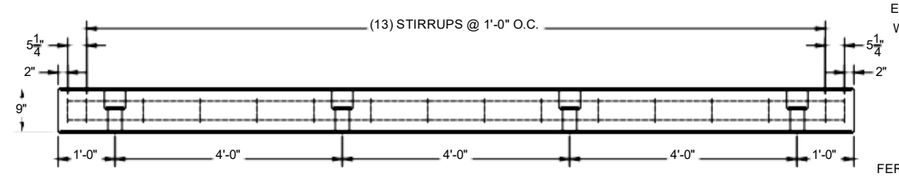
HEADWALL PLAN

SCALE: NTS



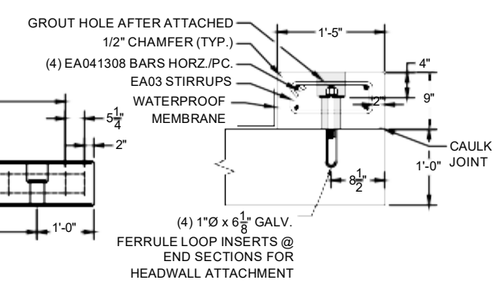
JOINT DETAIL

SCALE: NTS



HEADWALL ELEVATION

SCALE: NTS



HEADWALL SECTION

SCALE: NTS

USDA

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

CULVERT DETAILS

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

DRAWN
J.ALLEN

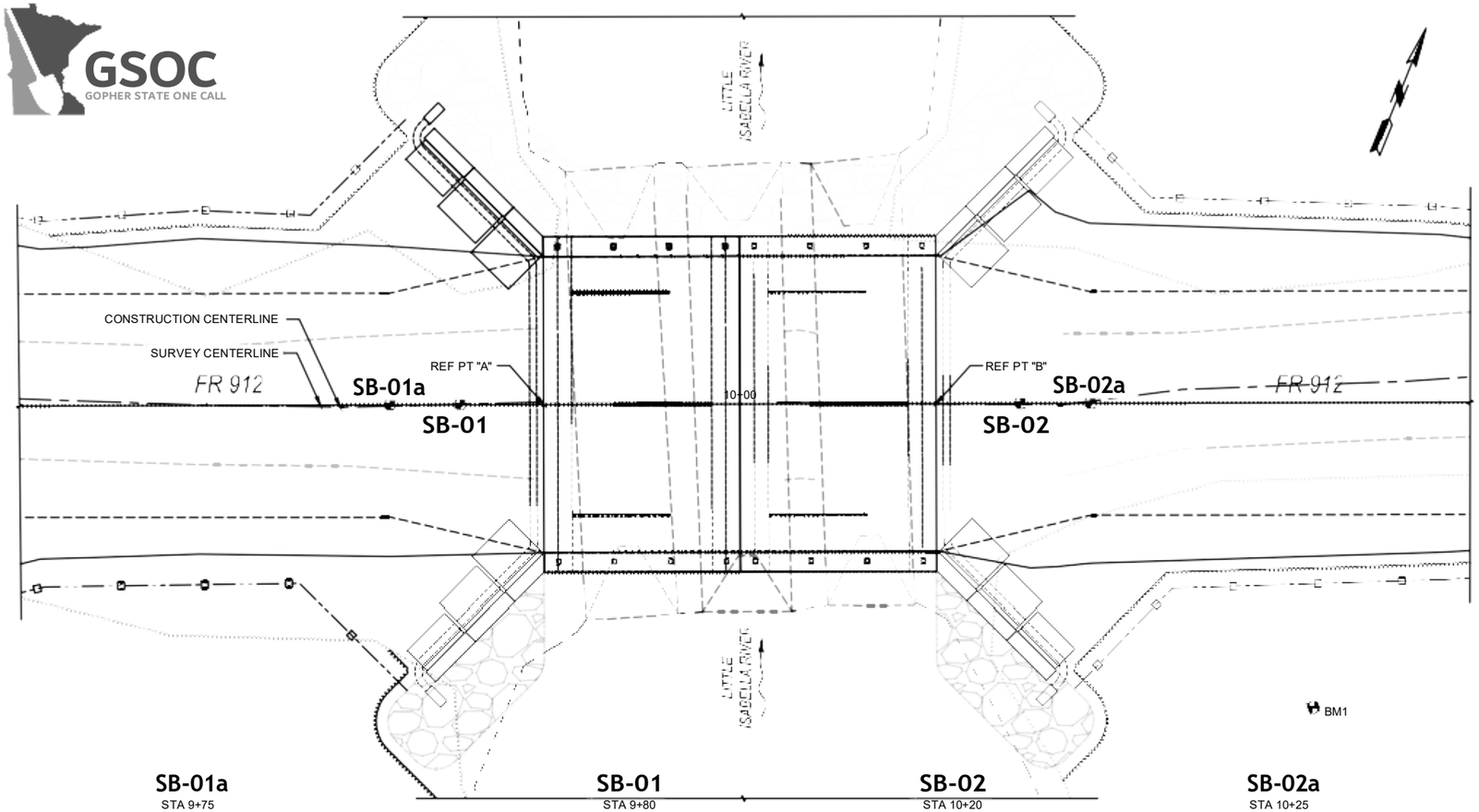
CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

DWG SHEET NO.
C-10

SHEET 10 OF 13

9/5/2023 11:48:41 PM, 7.1/25-2023 USDA FS R9 ***STUDES BRIDGE DWG - 21 BR DGFS/DWGS/TASK 113 - SUPER CRNF - LITTLE ISABELLA/FR 912-0.1 LITTLE ISABELLA RIVER.DWG



SOIL BORINGS BY:

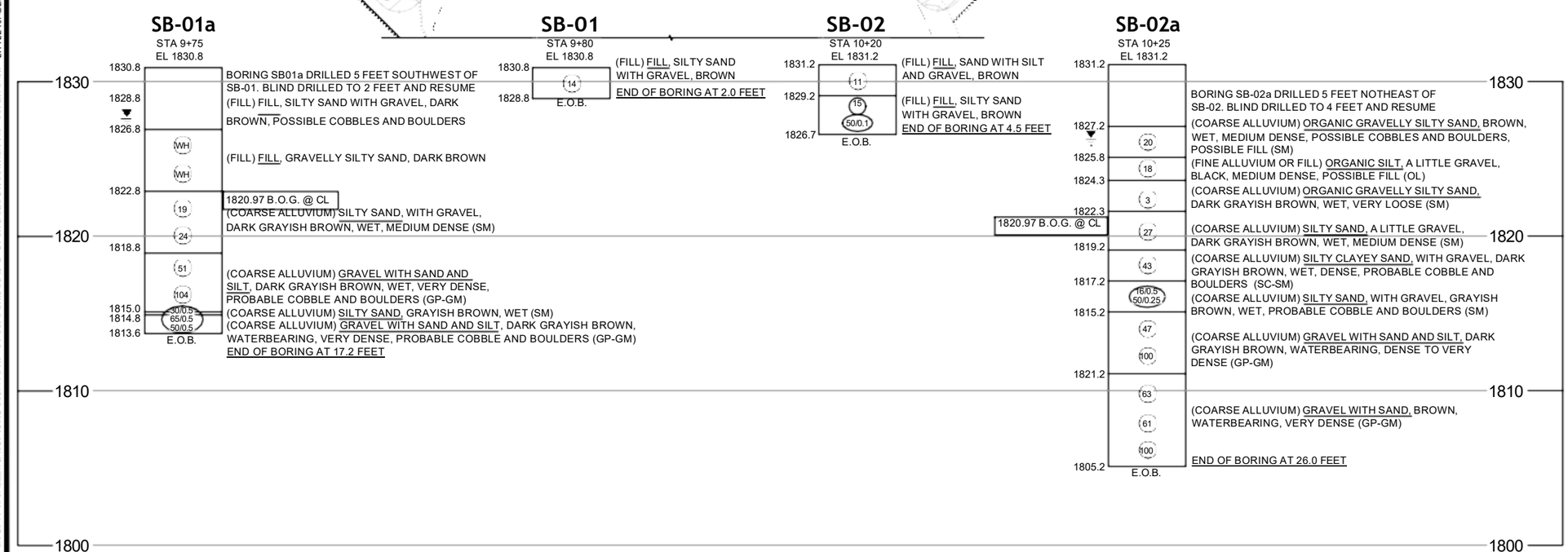
AMERICAN ENGINEERING TESTING, INC.
4431 W. MICHIGAN STREET #4
DULUTH, MINNESOTA
BORING DATES: MAY 24, 2021

NOTES:

NUMBER IN CIRCLES DENOTE THE 'N' VALUE IN BLOWS PER FOOT BY USING A 2" O.D. SPLIT SPOON SAMPLER AND A 140 POUND HAMMER FALLING 30". WATER LEVELS MAY BE INFLUENCED BY RESIDUAL BORING WATER. BLOW COUNTS AT 6".

THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUB-SURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.

B.O.G. - BOTTOM OF FOUNDATION GRAVEL PAD



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

SOIL BORINGS

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

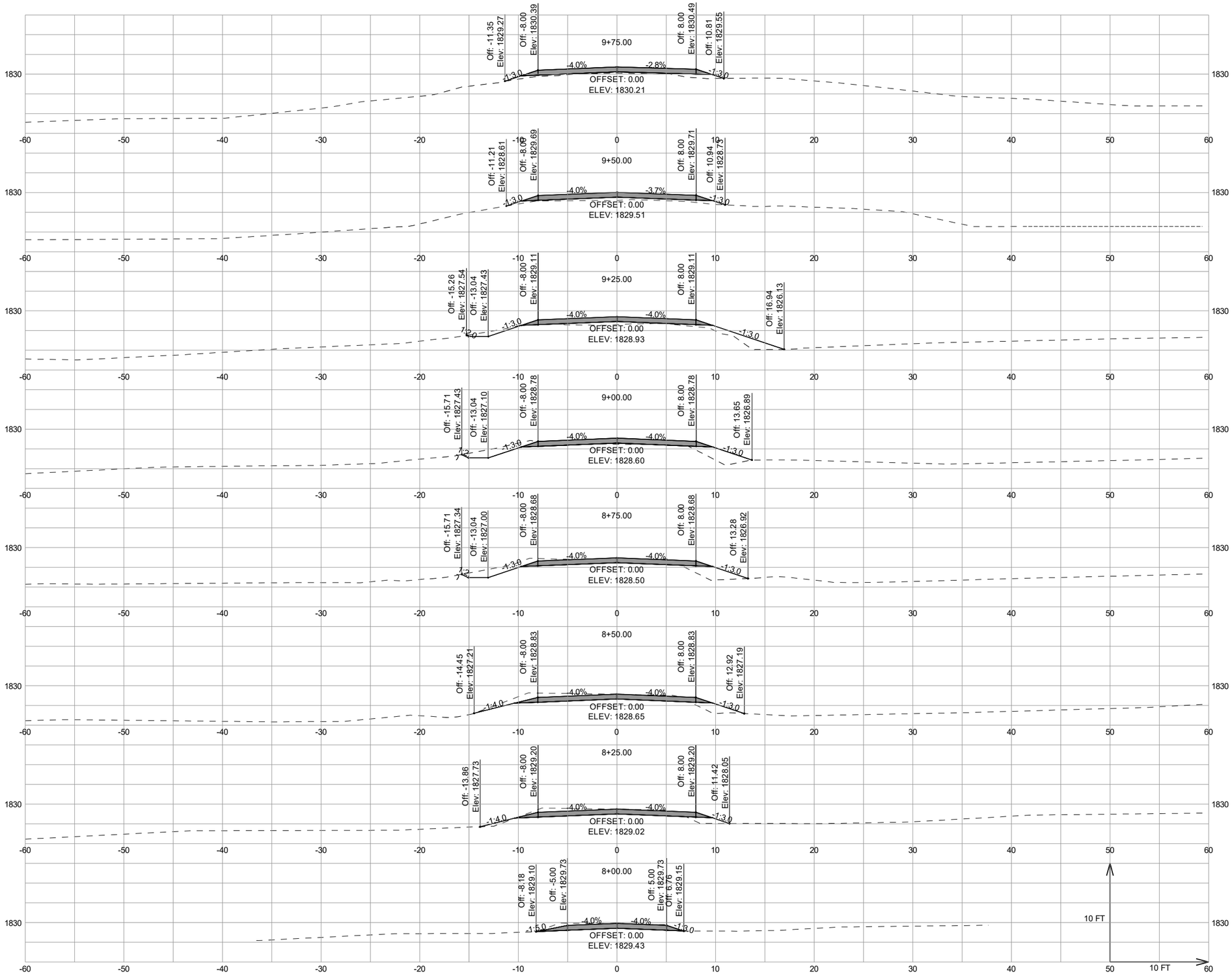
DRAWN
J.ALLEN

CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

DWG SHEET NO.
C-11

SHEET 11 OF 13



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

CROSS SECTIONS

DATE
9/5/2023

ARCHIVE NO.

DESIGNER
C.SMITH

DRAWN
J.ALLEN

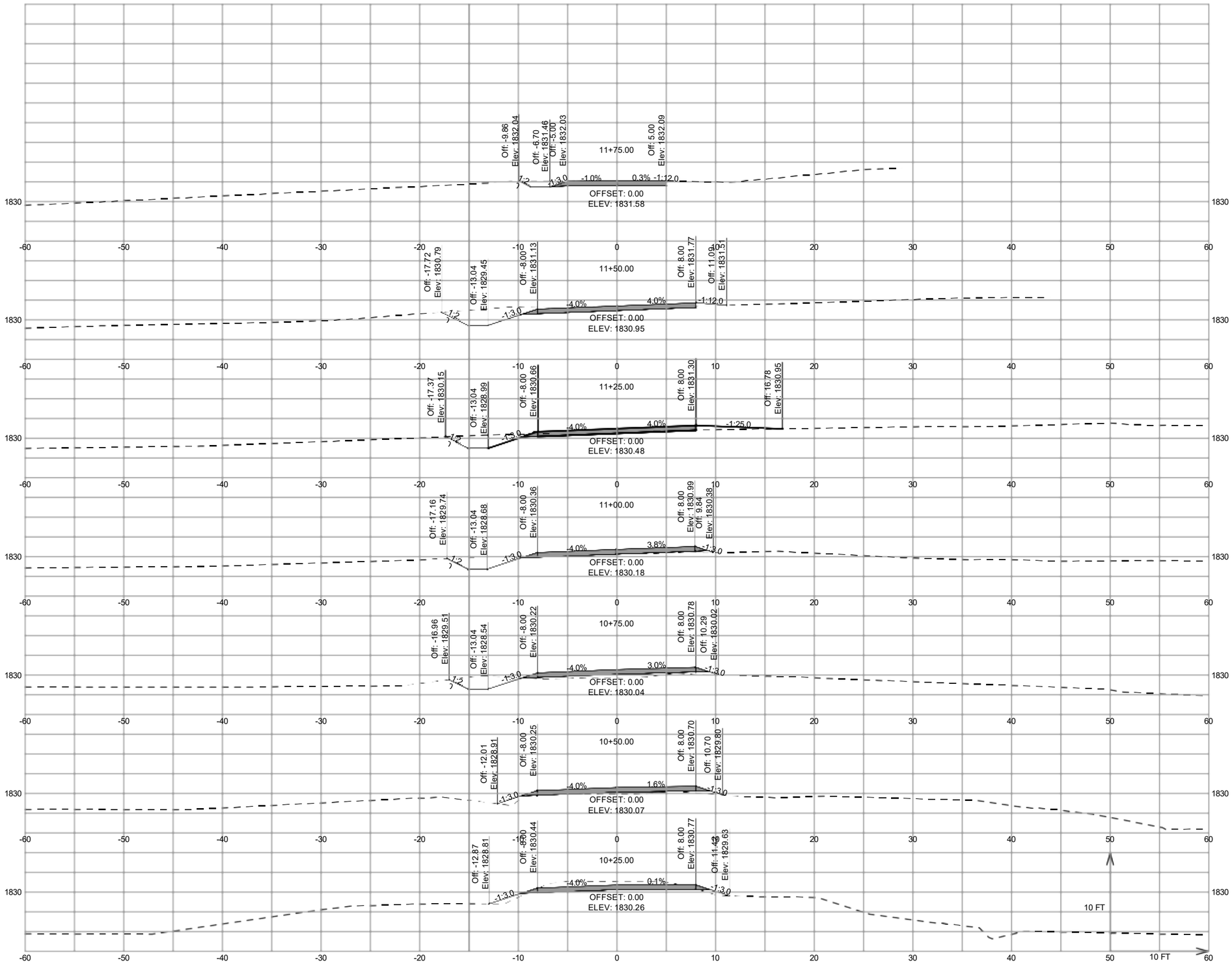
CHECKED
G.JUNTTILA

PROJECT NO.
U28-02592

DWG SHEET NO.
C-12

SHEET 12 OF 13

9/5/23 11:49 JALLEN Z:\U28-02592 USDA FS R9 TST-USFS BRIDGE IDIQ - 21 BRIDGES\DWGS\TASK 113 - SUPERIORNF - LITTLE ISABELLA\FR 912-0.1 LITTLE ISABELLA RIVER.DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

FR 912-0.101 OVER LITTLE ISABELLA RIVER CULVERT REPLACEMENT

SUPERIOR NATIONAL FOREST

TOFTE RANGER DISTRICT

DRAWING TITLE

CROSS SECTIONS

DATE 9/5/2023	
ARCHIVE NO.	
DESIGNER C.SMITH	DWG SHEET NO. C-13
DRAWN J.ALLEN	
CHECKED G.JUNTTILA	SHEET 13 OF 13
PROJECT NO. U28-02592	