

LETTING DATE
01-18-17

RCB CULVERT NEW - TWIN BOX
BROS-C024(114)--8J-24

CRAWFORD COUNTY

TRAFFIC CONTROL PLAN

THIS ROAD WILL BE CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08 OF THE CURRENT STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING, AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130."

PERMITS

CONSTRUCT THIS PROJECT ACCORDING TO THE REQUIREMENTS OF U.S. ARMY CORPS OF ENGINEERS REGIONAL PERMIT 7, PERMIT NO. CEMVR-OD-P-2016-932. A COPY OF THIS PERMIT IS AVAILABLE FROM THE IOWA DOT WEBSITE (<http://www.enrpermits.iowadot.gov/>), THE U.S. ARMY CORPS OF ENGINEERS RESERVES THE RIGHT TO VISIT THE SITE WITHOUT PRIOR NOTICE.

DRAWING APPROVAL

ALL SHOP DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY THE CRAWFORD COUNTY ENGINEER.

ADDRESS: 1202 BROADWAY, P.O. BOX 458
DENISON, IOWA 51442-0458
TELEPHONE: (712)263-2449
EMAIL: passman@crowfordcounty.org

THESE SHOP DRAWINGS SHALL NOT BE SENT TO IOWA D.O.T. OFFICE OF BRIDGE DESIGN.



Highway Division

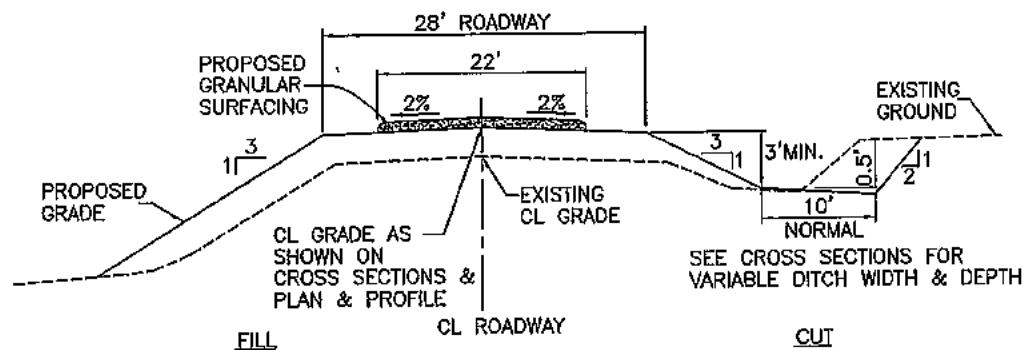
PLANS OF PROPOSED IMPROVEMENTS ON THE

**SECONDARY ROAD SYSTEM
CRAWFORD COUNTY**

PROJECT NO. BROS-C024(114)--8J-24
RCB CULVERT REPLACEMENT - TWIN BOX
F AVENUE: FROM 240TH ST. TO 250TH ST.

SCALES: AS NOTED

REFER TO THE PROPOSAL FORM FOR LIST OF APPLICABLE SPECIFICATIONS.



TYPICAL CROSS SECTION
NOT TO SCALE

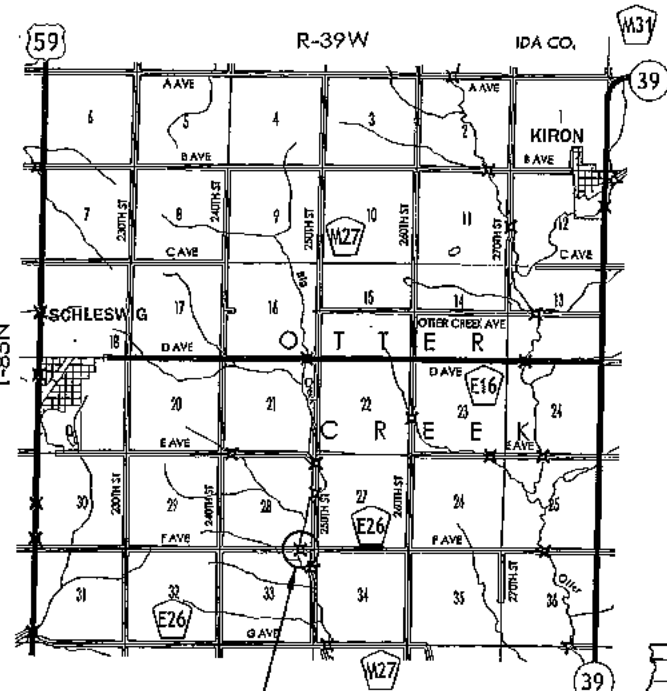
UTILITY CONTACTS

WINDSTREAM COMMUNICATIONS
Joel Schroeder
Phone: 800-289-1901
Email: locote.desk@windstream.com

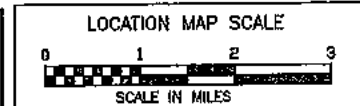
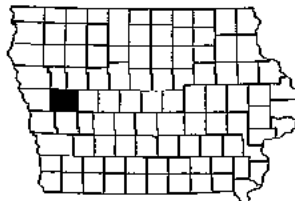
WESTERN IOWA POWER COOPERATIVE
Jason Lee
Phone: 712-263-2943
Email: jason.lee@wipco.com

WEST CENTRAL IOWA RURAL WATER
Jean Hargens
Phone: 712-655-2534
Email: wcirwa@plonet.net

NORTHWEST IOWA POWER COOPERATIVE
Steve Haringa
Phone: 712-539-1612



STA. 5+20
PROPOSED TWIN 12'x12'x64' RCB CULVERT
7' SKEW LT. AHEAD
B.O.P. STA. 4+50
E.O.P. STA. 6+00



GUNDQUIST ENGINEERING, P.C.
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181
www.gundquistengineering.com



CALL BEFORE YOU DIG!
1-800-292-8989
www.iowadonecall.com

04-30-02 101-4

DESIGN DATA RURAL

2012 AADT	25	V.P.D.
2036 AADT	35	V.P.D.
201X DHV	X	V.P.H.
TRUCKS	X	%
TOTAL DESIGN ESALs		

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A1	TROY J. GROTH	PRIMARY SIGNATURE BLOCK
Q1	MATTHEW R. DAILEY	GEOTECHNICAL DESIGN

Approved

[Signatures]
BOARD OF SUPERVISORS

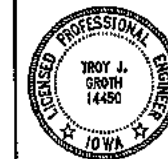
MILEAGE SUMMARY

LOCATION	LIN. FT.	MILES
BOP STA. 4+50 TO EOP STA. 6+00	150.00	
NET LENGTH OF ROADWAY	150.00	0.028

Approved

[Signature]
CRAWFORD COUNTY ENGINEER
DATE: 10/11/16

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
[Signature]
TROY J. GROTH, P.E. #14450
DATE: 10/6/2016
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2017.
PAGES OR SHEETS COVERED BY THIS SEAL:



TOTAL SHEETS	10
PROJECT NUMBER	BROS-C024(114)--8J-24
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
FHWA STRUCTURE NO.	130450

INDEX OF SHEETS

NO.	DESCRIPTION
A1	TITLE SHEET
C1	ESTIMATED PROJECT QUANTITIES
C1	STANDARD ROAD PLANS
C1-2	ESTIMATED REFERENCE INFORMATION
C3	TABULATIONS
G1	DETAILS OF REFERENCE INFORMATION
Q1	SOILS SHEET
U1	DETAIL SHEET
V1	SITUATION PLAN
W1	CROSS SECTIONS - ROADWAY
Z1	CROSS SECTIONS - CHANNEL

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON PLAN SHEET C1.

STANDARD BRIDGE PLANS

STANDARD BRIDGE PLANS ARE LISTED ON PLAN SHEET C1.

DESIGN TEAM: TJC/SAS/TKK

ENGLISH

SE PROJECT NO. : 05015

FHWA NO. 130450

CRAWFORD COUNTY

PROJECT NUMBER - BROS-C024(114)--8J-24

SHEET NUMBER A1

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QTY.
1	2102-0425071	SPECIAL BACKFILL	CY	72.1	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	2151.2	
3	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	2024.2	
4	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	113.8	
5	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	401.0	
6	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	66.2	
7	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
8	2402-2720000	EXCAVATION, CLASS 20	CY	1334	
9	2402-2725005	FOUNDATION TREATMENT MATERIAL	TON	242.034	
10	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	380.7	
11	2404-7775000	REINFORCING STEEL	LB	55078	
12	2501-5775000	PILES, STEEL SHEET	SF	720	
13	2507-3250005	ENGINEERING FABRIC	SY	1031.8	
14	2507-6800021	REVTMENT, CLASS B	TON	143.1	
15	2518-6910000	SAFETY CLOSURE	EACH	2	
16	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
17	2528-8445110	TRAFFIC CONTROL	LS	1.00	
18	2533-4980005	MOBILIZATION	LS	1.00	
19	2602-0000020	SILT FENCE	LF	458.9	
20	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	

STANDARD ROAD PLANS

105-4
10-18-11

The following Standard Road Plans apply to construction work on this project.

NUMBER	DATE	TITLE
EQ-201	10-18-16	SILT FENCE
EW-101	10-20-15	EMBANKMENT AND REBUILDING EMBANKMENTS
TC-1	04-16-13	WORK NOT AFFECTING TRAFFIC (TWO-LANE OR MULTI-LANE)
TC-252	04-19-16	ROUTES CLOSED TO TRAFFIC

INDEX OF TABULATIONS

111-25
10-18-11

Tabulation	Tabulation Title	Sheet No.
100-1A	ESTIMATED PROJECT QUANTITIES	C1
100-4A	ESTIMATE REFERENCE INFORMATION	C1-2
100-17	TABULATION OF SILT FENCES	C3
105-4	STANDARD ROAD PLANS	C1
108-13A	SAFETY CLOSURES	C3
111-25	INDEX OF TABULATIONS	C1
	TABULATION OF EARTHWORK QUANTITIES	C3
	PLACEMENT OF QUANTITIES	C3

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
1	2102-0425071	SPECIAL BACKFILL REFER TO DETAILS ON PLAN SHEET U1. AGGREGATE TYPE SHALL BE CRUSHED LIMESTONE OR CRUSHED P.C.C. NO GRAVEL OR RAP WILL BE ALLOWED.
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW INCLUDES 50.8 C.Y. CUT, 2151.2 C.Y. FILL +35% SHRINK, AND 2100.4 C.Y. BORROW. REFER TO TABULATION OF EARTHWORK QUANTITIES ON PLAN SHEET C3. TYPE A COMPACTION WILL BE REQUIRED. BORROW MAY BE OBTAINED FROM SUITABLE CLASS 20 AND CLASS 10 CHANNEL EXCAVATION. CONTRACTOR SHALL PROVIDE ADDITIONAL NECESSARY BORROW. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. EXISTING SLOPES THAT ARE TO RECEIVE EMBANKMENT, REGARDLESS OF THEIR HEIGHT, SHALL BE PREPARED IN ACCORDANCE WITH ARTICLE 2107.03, C, 2, OF THE STANDARD SPECIFICATIONS. A SUFFICIENT VOLUME OF SOIL HIGH IN ORGANIC CONTENT IS AVAILABLE WITHIN THE EXCAVATION LIMITS OF THE PROJECT. THIS MATERIAL SHALL BE DEPOSITED AS THE FINAL LAYER TO A MINIMUM FINISHED DEPTH OF 4 INCHES ON THE PROPOSED ROADWAY FORESLOPES AND OTHER DISTURBED AREAS TO FACILITATE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS BID ITEM. ANY CLEARING AND GRUBBING NECESSARY TO COMPLETE THE WORK ON THIS PROJECT SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM. PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
3	2104-2710020	EXCAVATION, CLASS 10, CHANNEL INCLUDES 2024.2 C.Y. CUT, 8.3 C.Y. FILL + 35% SHRINK, AND 2015.9 C.Y. WASTE. EXCESS MATERIAL AND UNSUITABLE MATERIAL NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED FROM THE SITE. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 CHANNEL EXCAVATION. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. QUANTITY INCLUDES EXCAVATION REQUIRED TO INSTALL REVETMENT. QUANTITY INCLUDES EXCAVATION REQUIRED TO TRANSITION PROPOSED CHANNEL SLOPES INTO EXISTING SLOPES WITHIN THE LIMITS SHOWN ON PLAN SHEET V1. PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.
5	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID REFER TO DETAILS ON PLAN SHEET U1.
6	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE MATERIAL SHALL BE SPREAD BY THE CONTRACTOR AND THE CONTRACT UNIT PRICE PER TON SHALL INCLUDE THE COST OF SPREADING GRANULAR SURFACING ON ROADWAY SURFACE. RATE OF APPLICATION SHALL BE 2330 TONS PER MILE.
7	2401-6745625	REMOVAL OF EXISTING BRIDGE CONTRACTOR SHALL COORDINATE WITH COUNTY FOR REMOVAL OF TIMBER DECKING PLANK AND STEEL BEAMS. THESE MATERIALS SHALL BE REMOVED BY COUNTY FORCES AND REMAIN THE PROPERTY OF THE COUNTY. THE REMAINDER OF THE STRUCTURE SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
8	2402-2720000	EXCAVATION, CLASS 20 EXCAVATION TO THE LIMITS DETAILED ON PLAN SHEET U1 IS FOR PAY QUANTITIES ONLY. EXCESS MATERIAL AND UNSUITABLE SOILS SHALL BE HAULED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 20 EXCAVATION. PRIOR TO CONSTRUCTION OF THE RCB CULVERT, BACKFILL OF THE CLASS 20 EXCAVATION WITH FOUNDATION TREATMENT MATERIAL AND SPECIAL BACKFILL SHALL BE COMPLETED THROUGHOUT THE ENTIRE CROSS SECTION TO AN ELEVATION AT OR ABOVE THE BOTTOM OF THE CULVERT FLOOR. ITEM SHALL INCLUDE ALL WORK IN CONJUNCTION WITH THE REMOVAL OF SURFACE WATER AND GROUND WATER AS NEEDED TO PERFORM THE REQUIRED CONSTRUCTION. THIS WORK SHALL INCLUDE (1) BUILDING AND MAINTAINING ALL NECESSARY TEMPORARY IMPOUNDING WORKS, CHANNELS AND DIVERSIONS, (2) FURNISHING, INSTALLING AND OPERATING ALL NECESSARY PUMPS, PIPING AND OTHER FACILITIES AND EQUIPMENT, AND (3) REMOVING ALL SUCH TEMPORARY WORKS AND EQUIPMENT AFTER THEY HAVE SERVED THEIR PURPOSES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE NATURE AND EXTENT OF DEWATERING REQUIRED TO COMPLETE THE PROPOSED WORK.
9	2402-2725005	FOUNDATION TREATMENT MATERIAL REFER TO DETAILS ON PLAN SHEET U1. USE AGGREGATE THAT MEETS THE REQUIREMENTS OF SECTION 4122 FOR MACADAM STONE BASE. REMOVAL OF UNSUITABLE OR UNSTABLE SOIL AND PLACEMENT OF FOUNDATION TREATMENT MATERIAL SHALL BE IN ACCORDANCE WITH ARTICLE 2402.03, C, 3, OF THE STANDARD SPECIFICATIONS. MATERIAL ORDERED PLACED BY THE ENGINEER WILL BE MEASURED IN TONS TO THE NEAREST 0.1 TONS. PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER TON. NO ADJUSTMENT IN UNIT PRICE WILL BE ALLOWED FOR DEVIATION BETWEEN PLAN QUANTITY AND ACTUAL QUANTITY PLACED.
10	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) REFER TO TABULATION ON PLAN SHEET C3 FOR CONCRETE PLACEMENT QUANTITIES. ITEM INCLUDES CERTIFIED PLANT INSPECTION IN ACCORDANCE WITH SECTION 2521 OF THE STANDARD SPECIFICATIONS.
11	2404-7775000	REINFORCING STEEL REFER TO TABULATION ON PLAN SHEET C3 FOR STEEL PLACEMENT QUANTITIES.
12	2501-5775000	PILES, STEEL SHEET SHALL BE 5 GAGE STEEL SHEETING WITH A MINIMUM SECTION MODULUS OF 3.3 CUBIC INCHES PER FOOT. REFER TO DETAILS ON PLAN SHEET U1.
13	2507-3250005	ENGINEERING FABRIC ITEM INCLUDES 872.8 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, TOP, ENDS AND SIDES OF THE FOUNDATION TREATMENT MATERIAL. REFER TO DETAILS ON PLAN SHEET U1. ENGINEERING FABRIC FOR THIS PURPOSE SHALL BE MIRAFI 500X, GEOTEX 200ST, CONTECH C200, OR APPROVED EQUAL. ITEM INCLUDES 159.0 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, ENDS AND SIDES OF CLASS B REVETMENT. REFER TO DETAILS ON PLAN SHEET U1. ENGINEERING FABRIC FOR THIS PURPOSE SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. MATERIAL SHALL BE JOINED BY OVERLAPPING A MINIMUM OF 18 INCHES. THE QUANTITY OF ENGINEERING FABRIC FOR WHICH PAYMENT WILL BE MADE, WHEN PLACED AS DETAILED IN THE CONTRACT DOCUMENTS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS IN SQUARE YARDS. MATERIAL FOR LAPS IS NOT INCLUDED IN THE PLAN QUANTITY.
14	2507-6800021	REVTMENT, CLASS B THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS. REFER TO DETAILS ON PLAN SHEET U1.

REV.:

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
		DEWATERING REQUIRED TO INSTALL REVETMENT SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.
		THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF ALL REMNANTS OF REVETMENT STOCKPILES FROM FARM FIELDS UTILIZED BY CONTRACTOR IN THE PROJECT AREA. THIS WORK SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.
15	2518-6910000	<u>SAFETY CLOSURE</u> REFER TO TAB. 108-13A.
19	2602-0000020	<u>SILT FENCE</u> REFER TO TAB. 100-17. THE TABULATION INCLUDES ESTIMATED LOCATIONS FOR PLACEMENT OF SILT FENCE TO ADDRESS POSSIBLE EROSION DURING CONSTRUCTION. VERIFY THE SPECIFIC LOCATIONS WITH THE ENGINEER PRIOR TO BEGINNING PLACEMENT. BID ITEM INCLUDES 25% ADDITIONAL QUANTITY FOR FIELD ADJUSTMENT AND REPLACEMENTS.

GENERAL NOTES

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL NECESSARY ARRANGEMENTS WITH ADJACENT PROPERTY OCCUPANTS FOR RESTRAINING LIVESTOCK FROM ENTERING THE RIGHT-OF-WAY DURING CONSTRUCTION.

CONTRACTOR IS TO USE DUE CAUTION IN WORKING OVER AND AROUND ALL TILE LINES. BREAKS IN THE TILE LINE DUE TO THE CONTRACTOR'S CARELESSNESS ARE TO BE REPLACED AT CONTRACTOR'S EXPENSE WITHOUT COST TO THE CONTRACTING AUTHORITY. ANY TILE LINES BROKEN OR DISTURBED BY CUT LINES WILL BE REPLACED AS DIRECTED BY THE ENGINEER IN CHARGE OF CONSTRUCTION AND AT THE CONTRACTING AUTHORITY'S EXPENSE.

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK.

CONTRACTOR SHALL NOTIFY ONE-CALL (1-800-292-8989) FOR UTILITY LOCATES PRIOR TO COMMENCING WORK.

NORTHWEST IOWA POWER COOPERATIVE HAS EXPRESSED A WILLINGNESS TO TEMPORARILY RELOCATE AN OVERHEAD ELECTRIC TRANSMISSION LINE. UTILITY CONTACT INFORMATION IS SHOWN ON PLAN SHEET A1.

SEEDING WILL BE ACCOMPLISHED BY THE COUNTY.

ALL STOCKPILE AREAS, HAUL ROADS, AND AREAS USED FOR EQUIPMENT ON THIS PROJECT REQUIRE SUBSOIL TILLAGE TO AN AVERAGE DEPTH OF 16 TO 20 INCHES PRIOR TO PLACEMENT OF TOPSOIL AND/OR STABILIZING CROP SEEDING. COMPLETE THIS TILLAGE AT 3 FOOT MAXIMUM CENTERS AND AT RIGHT ANGLES TO THE FINISHED SLOPE.

USE TILLAGE EQUIPMENT EQUIPPED WITH AN ARROWHEAD TYPE SHOE THAT WILL PROVIDE LATERAL DISPLACEMENT AND LIMIT THE MOVEMENT OF THE SUBSOIL TO THE SURFACE. OBTAIN THE ENGINEER'S APPROVAL FOR THE EQUIPMENT. THIS WORK IS INCIDENTAL TO OTHER WORK ON THE PROJECT.

FOLLOWING THE SUBSOIL TILLAGE, THE AREA IS TO REMAIN IN A "LOOSENE" CONDITION. ADDITIONAL COMPACTION OR THE OPERATION OF HEAVY EQUIPMENT, OTHER THAN REQUIRED FOR TOPSOIL PLACEMENT AND SHAPING, WILL NOT BE ALLOWED ON AREAS WHICH HAVE BEEN RECEIVED SUBSOIL TILLAGE.

10-21-14 232-10
DISPOSE OF ALL WOOD MATERIAL GENERATED AS A RESULT OF CLEARING AND/OR GRUBBING ACCORDING TO THE IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP'S EMERALD ASH BORER (EAB) QUARANTINE ORDER. FOR MORE INFORMATION REFER TO http://www.iowatrepepests.com/eab_regulations.html.

09-27-94 271-9
A SCRAPE SAMPLE WAS TAKEN FROM ONE AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF THE LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 46.5 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 129 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE CONTRACTING AUTHORITY'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

PRECAST CONCRETE BOX OPTION

THE CULVERT CONTRACTOR MAY SUBSTITUTE PRECAST CONCRETE BOX SECTIONS AND PRECAST CONCRETE HEADWALLS IN PLACE OF THE CONCRETE CAST IN PLACE BARRELS AND HEADWALLS SHOWN ON THE PLANS.

IF A CONTRACTOR CHOOSES TO SUBSTITUTE PRECAST SECTIONS THE FOLLOWING SHALL APPLY:

- THE CONTRACTOR SHALL FURNISH AND INSTALL PRECAST CONCRETE BOX CULVERTS OF THE SIZE AND LENGTH AS SHOWN IN THE PLANS FOR CAST IN PLACE CONCRETE BOX CULVERTS IN ACCORDANCE WITH SECTION 2415 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL FURNISH AND INSTALL EYE BOLT TIES ON EACH SIDE OF EACH JOINT. EYE BOLT TIES SHALL BE INSTALLED WITH NUTS ON INSIDE OF BARREL. THE MAIN SECTION JOINTS WILL HAVE ONE TIE ON EACH SIDE OF THE BARREL EXCEPT THE LAST THREE BARREL TO BARREL JOINTS AT EACH END SHALL HAVE TWO TIES PER SIDE WITH THE BOTTOM ROW OF TIES LOCATED 1'-8" ABOVE TOP OF BARREL FLOOR.
- THE CONTRACTOR SHALL FURNISH AND INSTALL AN APPROVED BITUMINOUS SEAL MATERIAL FOR EACH JOINT AS PER MATERIALS I.M. 491.09. MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER AND SHALL EXTEND VERTICALLY 6 INCHES ABOVE THE BOTTOM FILLET.
- THE CONTRACTOR SHALL FURNISH AND INSTALL A 24" WIDE STRIP OF ENGINEERING FABRIC COMPLETELY AROUND THE TOP AND SIDES OF EACH JOINT WITH A MINIMUM OVERLAP OF 18 INCHES. THE FABRIC SHALL BE CENTERED WITH 1 FOOT ON EACH SIDE OF THE JOINT. THE FABRIC SHALL BE ATTACHED TO THE WALLS AND TOP OF EACH SECTION TO PREVENT THE FABRIC FROM SLIPPING OFF THE JOINT DURING BACKFILLING OPERATIONS. ATTACHMENT METHODS SHALL BE APPROVED BY THE ENGINEER. THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL FURNISH AND INSTALL LIFTING HOLE PLUGS FOR EACH SECTION. LIFTING HOLES SHALL BE PLUGGED WITH A PRECAST CONCRETE PLUG, SEALED AND COVERED WITH MASTIC OR MORTAR.
- THE CURTAIN WALL SHALL EXTEND THE SAME DISTANCE BELOW THE CULVERT INVERT AS THE CURTAIN WALL FOR THE CAST IN PLACE BOX SHOWN ON THE PLANS.
- SHEET PILE SHALL BE DRIVEN BEHIND CURTAIN WALL TO DEPTH SHOWN IN DETAIL ON PLAN SHEET U1.
- GAP BETWEEN ADJACENT BARRELS SHALL BE A NOMINAL 12 INCHES. GAP SHALL BE CENTERED ON CENTERLINE OF CULVERT. REFER TO DETAIL ON PLAN SHEET U1.
- SUBBASE CONFIGURATION SHALL BE THE SAME AS THE DETAILS ON PLAN SHEET U1 FOR THE CAST IN PLACE BOX. NO ADJUSTMENTS TO PLAN QUANTITIES WILL BE MADE DUE TO WIDER FOUNDATION NECESSITATED BY PRECAST OPTION.
- A 4 FOOT WIDE STRIP OF ENGINEERING FABRIC SHALL BE PLACED ON TOP OF THE SPECIAL BACKFILL FOUNDATION MATERIAL. THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. ENGINEERING FABRIC SHALL BE PLACED THE FULL LENGTH OF THE PRECAST CULVERT, INCLUDING END SECTIONS. THE ENGINEERING FABRIC SHALL BE CENTERED OVER THE CENTERLINE OF CULVERT BEFORE THE PRECAST CULVERTS ARE PLACED.
- A 4" DIAMETER SUBDRAIN SHALL TERMINATE AND BE CAPPED AT THE UPSTREAM END 12 INCHES SHORT OF THE END OF THE APRON OF THE END OF SECTION. THE SUBDRAIN SHALL OUTLET DOWNSTREAM AT THE END OF THE APRON OF THE END SECTION. THE SUBDRAIN SHALL BE SURROUNDED BY POROUS BACKFILL IN ACCORDANCE WITH SECTION 4131 OF THE STANDARD SPECIFICATIONS. NO COMPACTION OF THE POROUS BACKFILL IS REQUIRED.
- POROUS BACKFILL SHALL BE PLACED BETWEEN THE PRECAST BARREL WALLS UP TO 8 INCHES FROM THE TOP OF THE BARREL SLABS. POROUS BACKFILL SHALL ALSO BE PLACED BETWEEN THE END SECTIONS UP TO 8 INCHES FROM THE TOP OF THE WALLS AND 16 INCHES SHORT OF THE END OF THE APRON OF THE END SECTION. THE POROUS BACKFILL SHALL BE IN ACCORDANCE WITH SECTION 4131 OF THE STANDARD SPECIFICATIONS.
- A CONCRETE CAP SHALL BE PLACED ON TOP OF THE POROUS BACKFILL BETWEEN THE PRECAST CULVERTS FOR A DEPTH OF 8 INCHES FROM THE TOP OF THE BARREL SLABS, THE TOP OF THE END SECTION WALLS, AND TO A 16 INCH DEPTH AT THE ENDS OF THE APRON OF THE END SECTIONS. THE CONCRETE SHALL BE CLASS C CONCRETE IN ACCORDANCE WITH SECTION 2403 OF THE STANDARD SPECIFICATIONS.
- LENGTH OF TYPE 1 PARAPETS SHALL BE INCREASED SO THE ADJOINING ENDS WILL ABUT AGAINST EACH OTHER AT THE CENTERLINE OF CULVERT FOR SIDE-BY-SIDE PRECAST CULVERT STRUCTURES.
- LENGTH OF TYPE 3 LINTEL BEAMS AND PARAPETS SHALL BE INCREASED SO THE ADJOINING ENDS WILL ABUT AGAINST EACH OTHER AT THE CENTERLINE OF CULVERT FOR SIDE-BY-SIDE PRECAST CULVERT STRUCTURES.
- LENGTH OF CURTAIN WALLS SHALL BE SHORTENED SO THE ADJOINING ENDS WILL ABUT AGAINST EACH OTHER AT THE CENTERLINE OF CULVERT FOR SIDE-BY-SIDE PRECAST CULVERT STRUCTURES.

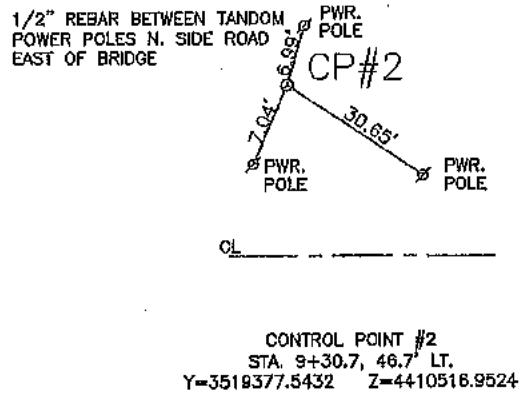
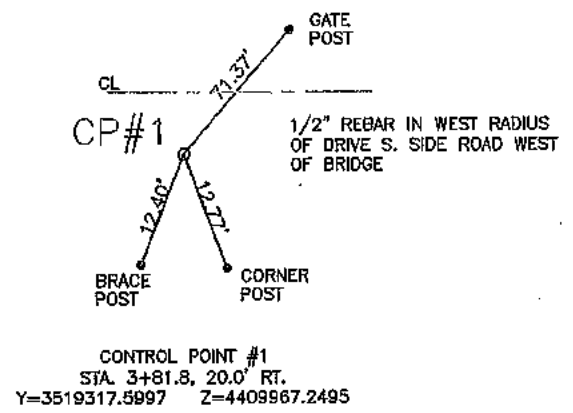
BEFORE BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED PRECAST BOX SECTIONS AND HEADWALL TO THE CRAWFORD COUNTY ENGINEER FOR APPROVAL. THE DETAILS SHALL INCLUDE THE FOLLOWING:

- A SITUATION PLAN DRAWING SHOWING THE BACK OF PARAPET DIMENSION FOR THE LINE OF THE CULVERT SECTIONS.
- A DETAIL OF THE PRECAST CULVERT AND HEADWALL SECTIONS SHOWING A CROSS SECTION VIEW OF THE SECTION, STEEL LOCATIONS, DIMENSIONS, ETC.
- A DETAIL OF THE INLET AND OUTLET HEADWALL SHOWING DIMENSIONS AND SLOPES.
- A DETAIL OF THE PARAPET SHOWING A CROSS SECTION WITH DIMENSIONS AND A DETAIL OF HOW IT IS ATTACHED TO THE HEADWALL.
- A DETAIL OF THE CURTAIN WALL SHOWING A CROSS SECTION WITH DIMENSIONS AND A DETAIL OF HOW IT IS ATTACHED TO THE HEADWALL.

THE ABOVE DETAILS SHALL BE CERTIFIED BY AN ENGINEER LICENSED IN THE STATE OF IOWA. THE CONTRACTOR SHALL ALLOW SEVEN DAYS FOR THE COUNTY ENGINEER'S REVIEW. FOR CONSTRUCTION OF THE PRECAST ALTERNATE THE CONTRACTOR WILL BE PAID THE PRICES BID FOR THE PLAN QUANTITIES OF "STRUCTURAL CONCRETE (R.C.B. CULVERT)" AND "REINFORCING STEEL".

REV.:

GENERAL INFORMATION
THIS SURVEY IS IN ENGLISH UNITS.



BENCH MARKS	ELEVATION
CP#1 STA. 3+81.8, 20.0' RT., 1/2" REBAR IN WEST RADIUS OF DR.	1329.81
CP#2 STA. 9+30.7, 476.7' LT., 1/2" REBAR BETWEEN TANDEM POWER POLES	1332.18

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent		Begin Spiral		Begin Curve		Simple Curve PI or Master PI of SCS		End Curve		End Spiral	
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
F AVE.		0+00.00	3519342.4024	4409585.7355									
F AVE.		10+00.00	3519329.9424	4410585.6578									

DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)

LOG OF EXPLORATORY BORING										Sheet 1 of 1				
Job Number: G4802S		Boring No.: B-1		Project: F Avenue Bridge Replacement		Boring Location: Crawford County, IA		Date Started: 7/15/16		Drill Type: Hollow Stem				
Date Completed: 7/15/16		Ground Elev.: 1328.1												
Depth in Feet	Graphic Log	Sample Type	USCS			Blow Counts (SPT) (N)	Moisture Content, %	Dry Density (pcf)	% Saturation	Hard Penetrometer (TSF)	Unclassified Comp. Strength (TSF)	Liquid Limit %	Plasticity Index %	Cone Penetrometer (Blows per 1-3/4')
			Soil Description	USCS	Blow Counts (SPT) (N)									
0-12						2-3-3 N=6	14							
12-14						14	113	79	4.50					
14-18						1-3-3 N=6	18							
18-16						16	113	91	2.50					
16-20						1-2-3 N=5	28							
20-25						1-2-3 N=5	30							
25-30						2-2-3 N=5								
30-35						5-7-8 N=15								
35-40						12-10-13 N=23								
40-45						12-8-6 N=14	20							
45-45						5-8-10 N=18	21							

LOG OF EXPLORATORY BORING										Sheet 1 of 1				
Job Number: G4802S		Boring No.: B-2		Project: F Avenue Bridge Replacement		Boring Location: Crawford County, IA		Date Started: 7/15/16		Drill Type: Hollow Stem				
Date Completed: 7/15/16		Ground Elev.: 1327.7												
Depth in Feet	Graphic Log	Sample Type	USCS			Blow Counts (SPT) (N)	Moisture Content, %	Dry Density (pcf)	% Saturation	Hard Penetrometer (TSF)	Unclassified Comp. Strength (TSF)	Liquid Limit %	Plasticity Index %	Cone Penetrometer (Blows per 1-3/4')
			Soil Description	USCS	Blow Counts (SPT) (N)									
0-18						5-3-4 N=7	15							
18-21						1-3-3 N=6	21							
21-18						18	108	85	2.00					
18-22						1-2-2 N=4	22							
22-25						1-3-3 N=6	22							
25-20						1-3-3 N=8	25							
20-25						2-8-8 N=14								
25-30						29-37-27 N=64								
30-35						47-50-100 N=160								
35-40						9-8-9 N=17	19							
40-45						4-5-9 N=17	21							


SOUNDING DATA

NOTE: THESE SOUNDINGS WERE MADE FOR DESIGN PURPOSES AND ARE NOT GUARANTEED FOR CONSTRUCTION.

SOUNDINGS WERE TAKEN ON JULY 15, 2016.

SEE SHEET V1 FOR BORING LOCATIONS.

GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED JULY 21, 2016, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.



MATTHEW R. DAILEY
19700

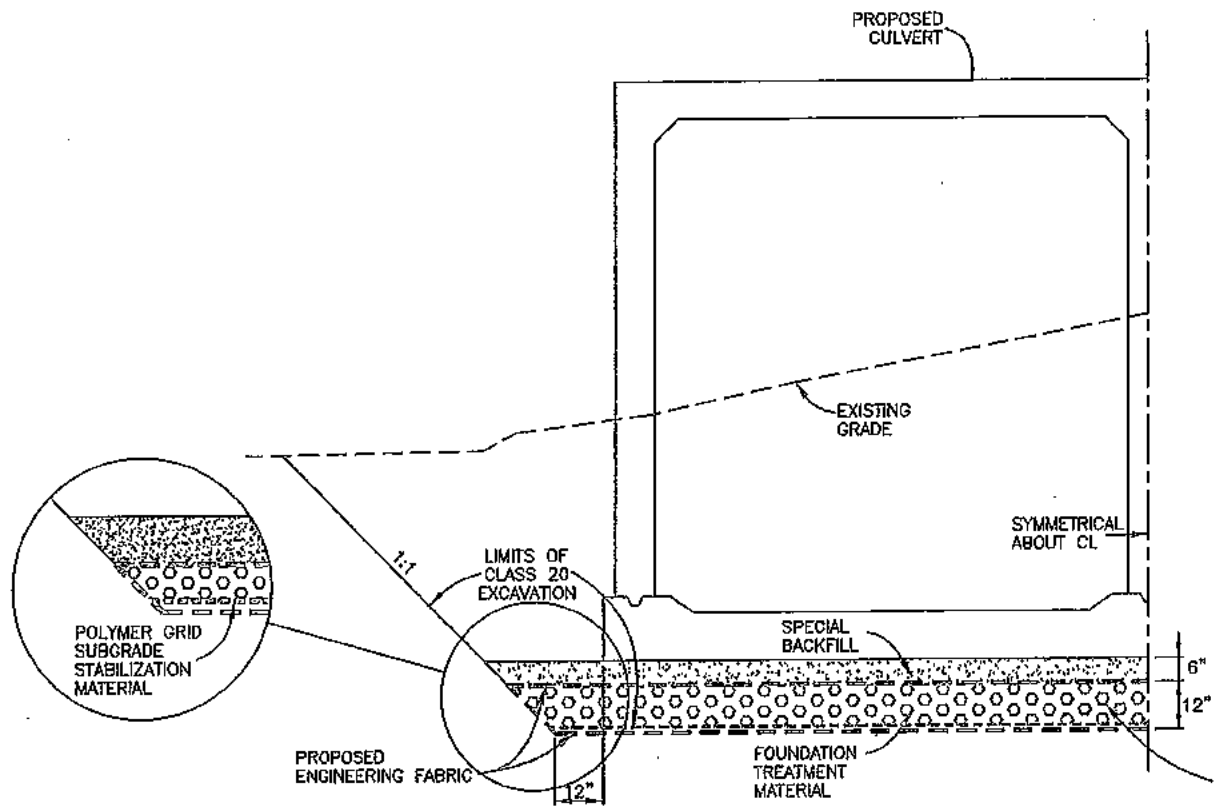
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Matthew R. Dailey 9-21-2016
DATE

MATTHEW R. DAILEY, P.E. #19700

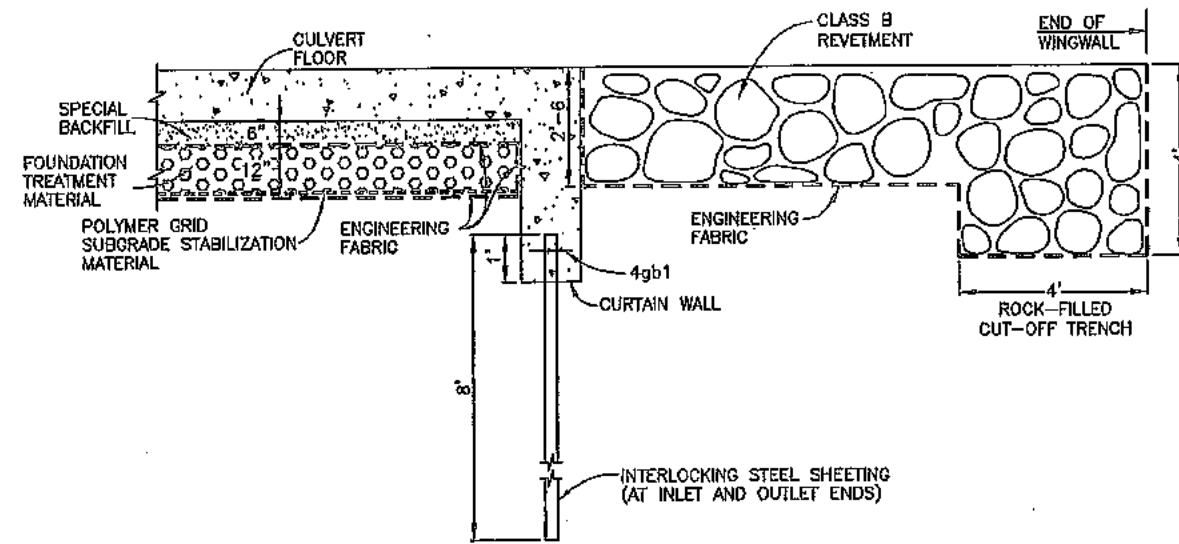
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2017.

PAGES OR SHEETS COVERED BY THIS SEAL:
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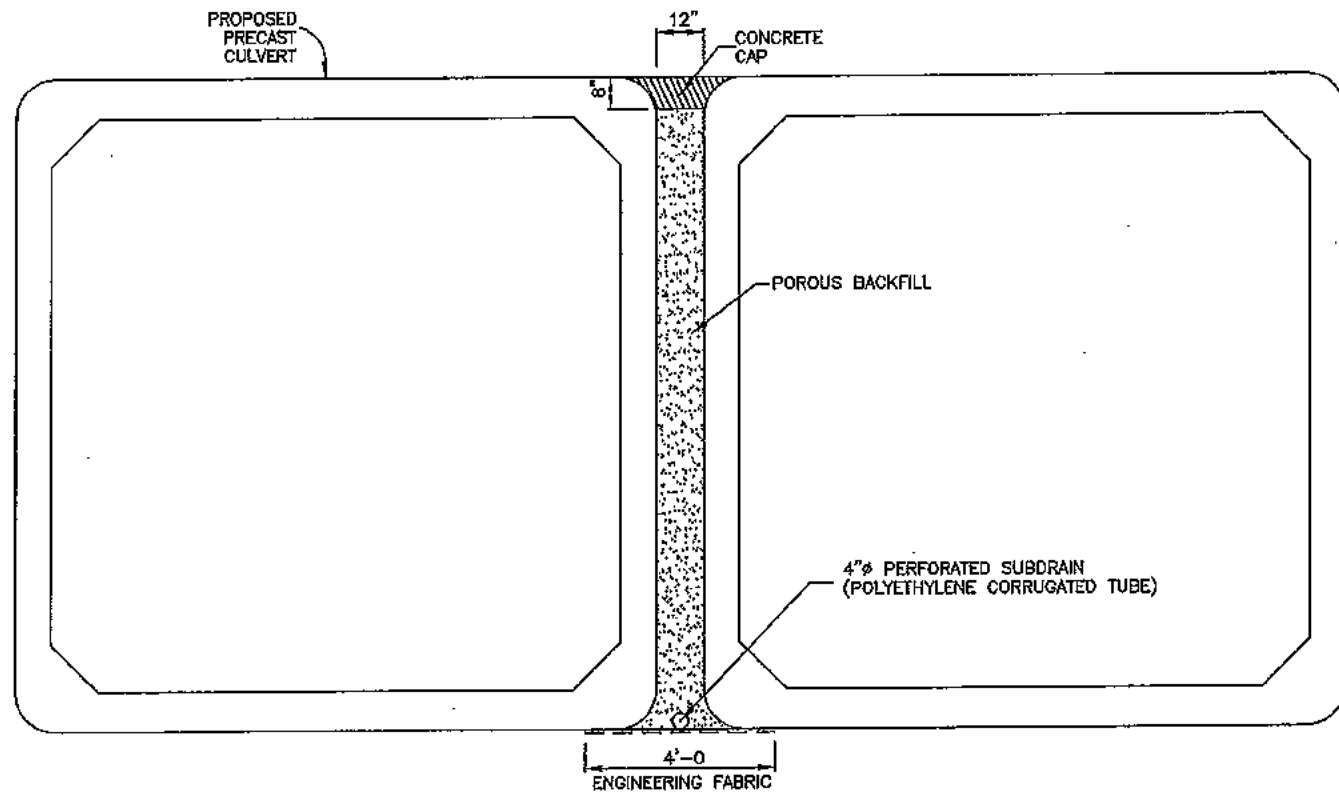
CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION
NOT TO SCALE

MINIMUM DEPTH OF FOUNDATION TREATMENT MATERIAL SHALL BE 12 INCHES. ACTUAL DEPTH REQUIRED WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

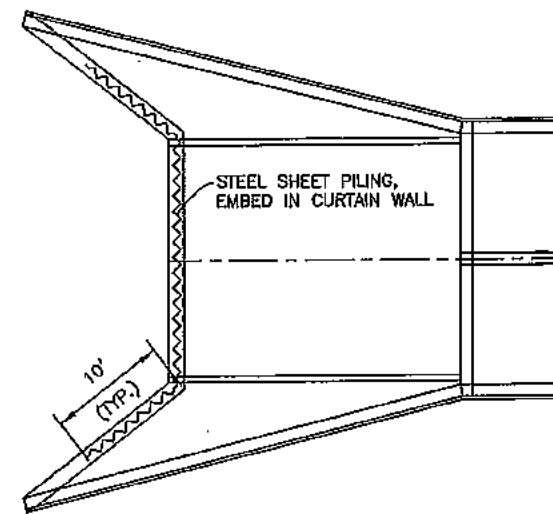


SECTION AT HEADWALL CURTAIN WALL
NOT TO SCALE

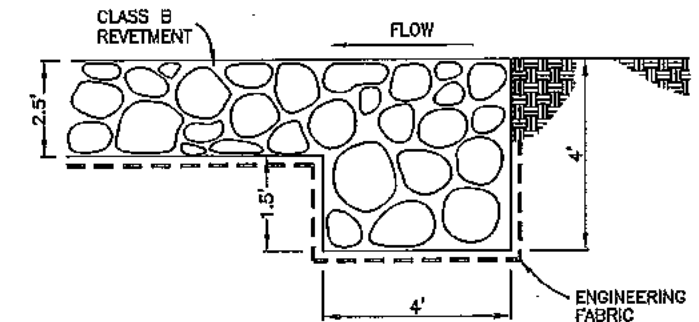
NOTE:
A HOLE LOCATED 3 INCHES DOWN FROM THE TOP AND ON THE VERTICAL CENTERLINE OF THE STEEL SHEETING IS TO BE PUNCHED OR FIELD CUT IN EACH PIECE OF SHEETING AND IS TO BE LARGE ENOUGH TO ACCOMMODATE A 4gb1 BAR. LENGTH OF 4gb1 BARS SHALL BE 11 INCHES. THIS WORK TO BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR PILES, STEEL SHEET.



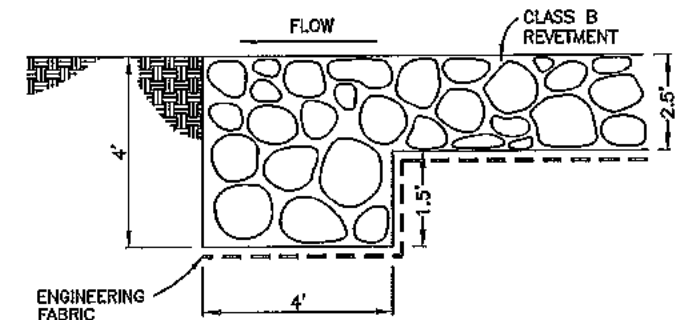
PRECAST CULVERT DETAIL
NOT TO SCALE



STEEL SHEET PILE AT CURTAIN WALL
NOT TO SCALE

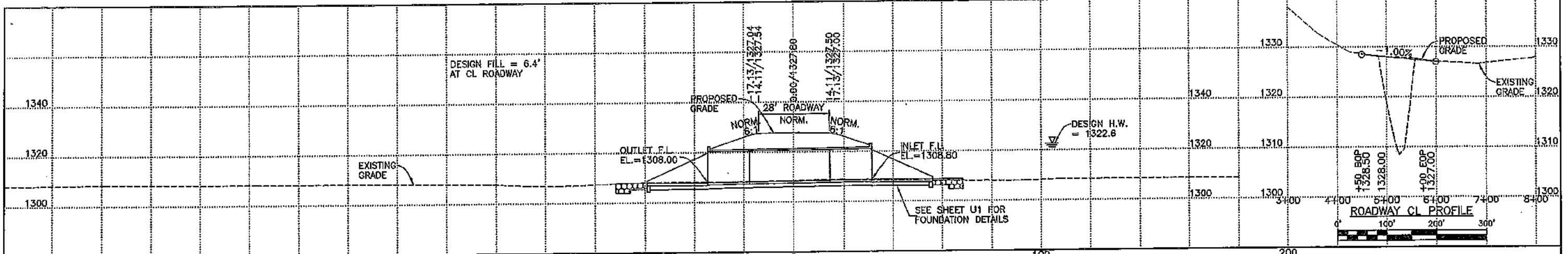


TYPICAL UPSTREAM



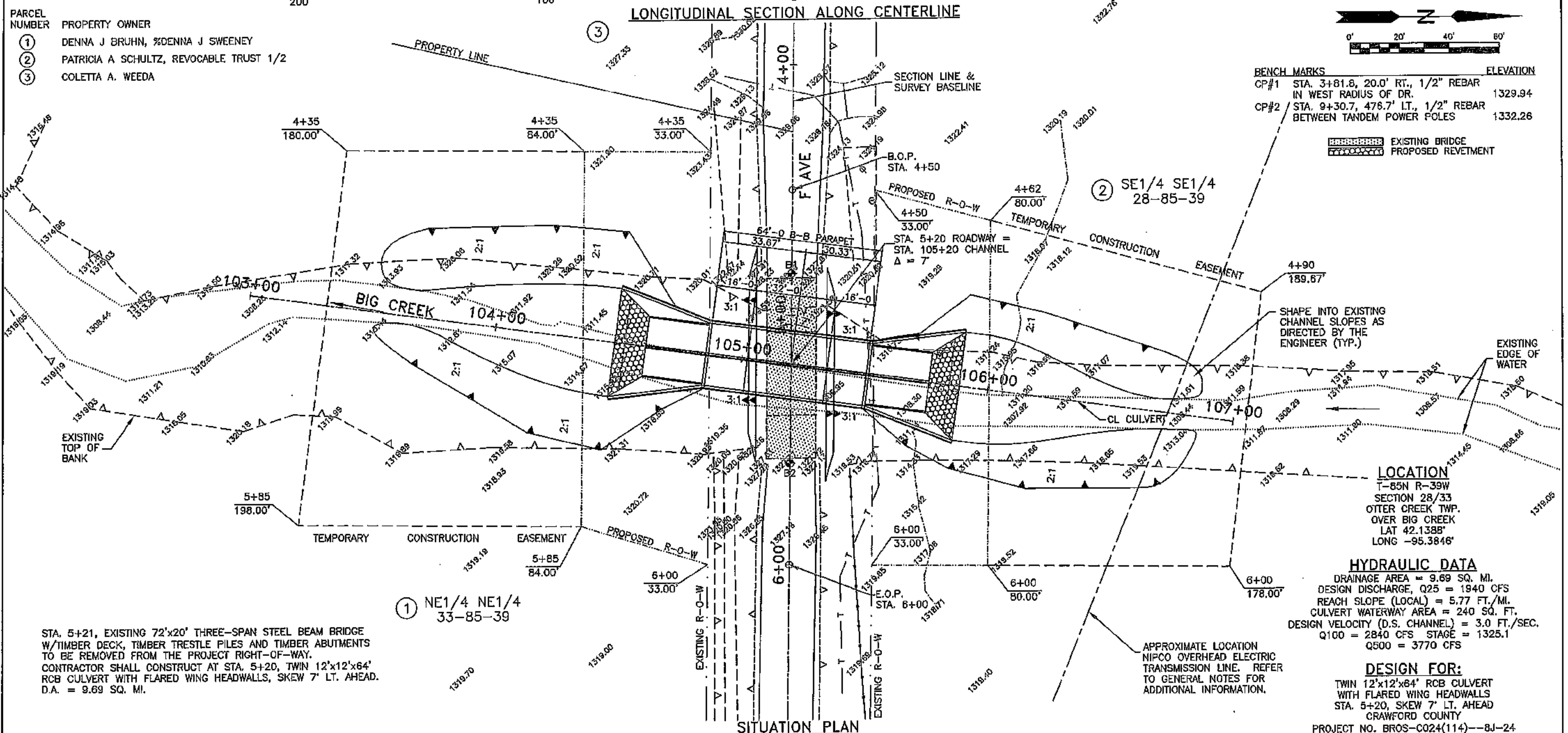
TYPICAL DOWNSTREAM

ROCK-FILLED CUTOFF TRENCH DETAILS
NOT TO SCALE



PARCEL NUMBER PROPERTY OWNER

①	DENNA J BRUHN, %DENNA J SWEENEY
②	PATRICIA A SCHULTZ, REVOCABLE TRUST 1/2
③	COLETTA A. WEEDA



BENCH MARKS

CP#1	ELEVATION
STA. 3+81.8, 20.0' RT., 1/2" REBAR IN WEST RADIUS OF DR.	1329.94
CP#2 STA. 9+30.7, 476.7' LT., 1/2" REBAR BETWEEN TANDEM POWER POLES	1332.26

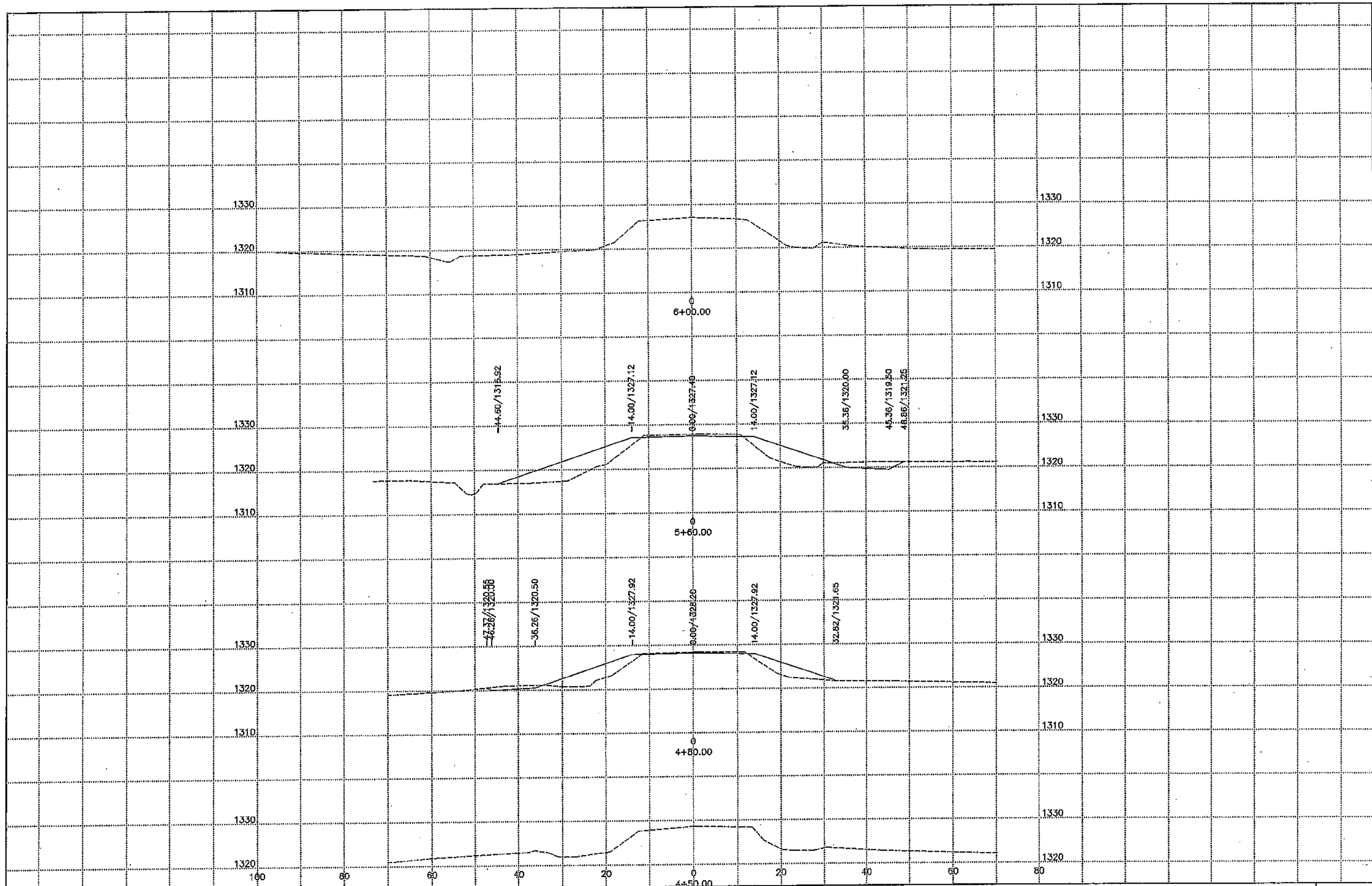
EXISTING BRIDGE
PROPOSED REVETMENT

STA. 5+21, EXISTING 72'x20' THREE-SPAN STEEL BEAM BRIDGE W/TIMBER DECK, TIMBER TRESTLE PILES AND TIMBER ABUTMENTS TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT AT STA. 5+20, TWIN 12'x12'x64' RCBC CULVERT WITH FLARED WING HEADWALLS, SKEW 7' LT. AHEAD. D.A. = 9.69 SQ. MI.

LOCATION
T-85N R-39W
SECTION 28/33
OTTER CREEK TWP.
OVER BIG CREEK
LAT 42.1388°
LONG -95.3846°

HYDRAULIC DATA
DRAINAGE AREA = 9.69 SQ. MI.
DESIGN DISCHARGE, Q25 = 1940 CFS
REACH SLOPE (LOCAL) = 5.77 FT./MI.
CULVERT WATERWAY AREA = 240 SQ. FT.
DESIGN VELOCITY (D.S. CHANNEL) = 3.0 FT./SEC.
Q100 = 2840 CFS STAGE = 1325.1
Q500 = 3770 CFS

DESIGN FOR:
TWIN 12'x12'x64' RCBC CULVERT WITH FLARED WING HEADWALLS STA. 5+20, SKEW 7' LT. AHEAD CRAWFORD COUNTY
PROJECT NO. BROS-C024(114)-8J-24



REV:

