

LETTING DATE 01/21/15  
 TWIN BOX  
 BROS-C024(103)--5F-24  
 RCB CULVERT REPLACEMENT -  
 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 NATIONWIDE PERMIT NO. 14, PERMIT NO. CEMVR-OD-P-2014-352. A COPY OF THIS PERMIT IS AVAILABLE FROM THE IOWA DOT WEBSITE (HTTP://ENVPERMITS.IOWADOT.GOV/CMPORTALENV/HOME.ASPX). 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@crawfordcounty.org  
 THESE SHOP DRAWINGS SHALL NOT BE SENT TO IOWA D.O.T. OFFICE OF BRIDGE DESIGN.

## Iowa Department of Transportation Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

# FARM-TO-MARKET SYSTEM CRAWFORD COUNTY

PROJECT NO. BROS-C024(103)--5F-24  
 RCB CULVERT REPLACEMENT - TWIN BOX  
 ON E35 (L AVENUE) 0.5 MILES EAST OF M55  
 OVER MILLER CREEK

SCALES: AS NOTED

REFER TO THE PROPOSAL FORM FOR LIST OF APPLICABLE SPECIFICATIONS.

### UTILITY CONTACTS

WINDSTREAM COMMUNICATIONS  
 JOEL SCHROEDER  
 PHONE: 800-289-1901  
 EMAIL: locote.desk@windstream.com

CENTURYLINK LOCAL NETWORK  
 TOM STURMER  
 PHONE: 303-864-8090  
 EMAIL: Thomasl.sturmer@centurylink.com

WESTERN IOWA POWER COOPERATIVE  
 JAMES FREML  
 PHONE: 712-263-2943  
 EMAIL: wipco@pionet.net

### INDEX OF SHEETS

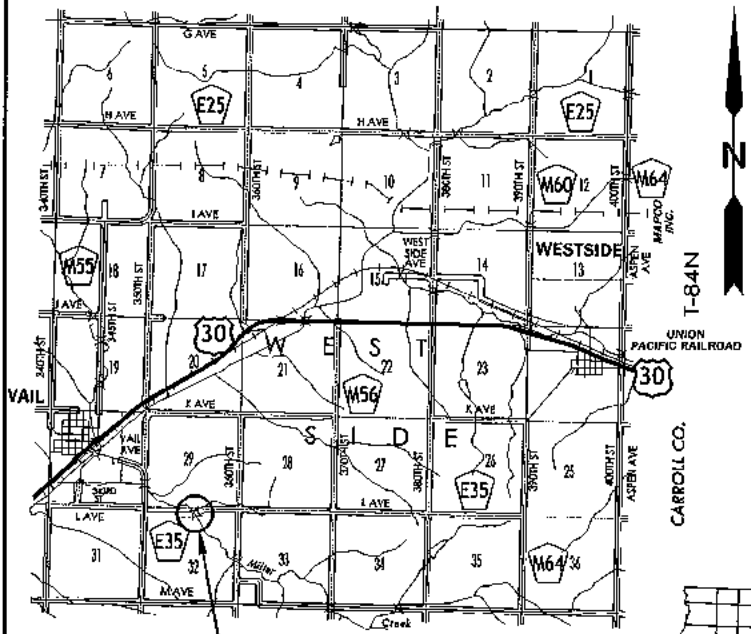
NO.	DESCRIPTION
A1	TITLE SHEET
C1	ESTIMATED PROJECT QUANTITIES
C1	STANDARD ROAD PLANS
C1-2	ESTIMATE REFERENCE INFORMATION
C3	TABULATIONS
Q1	SOILS SHEET
U1	DETAIL SHEET
V1	SITUATION PLAN
W1-2	CROSS SECTIONS - ROADWAY
Z1-2	CROSS SECTIONS - CHANNEL

### STANDARD ROAD PLANS

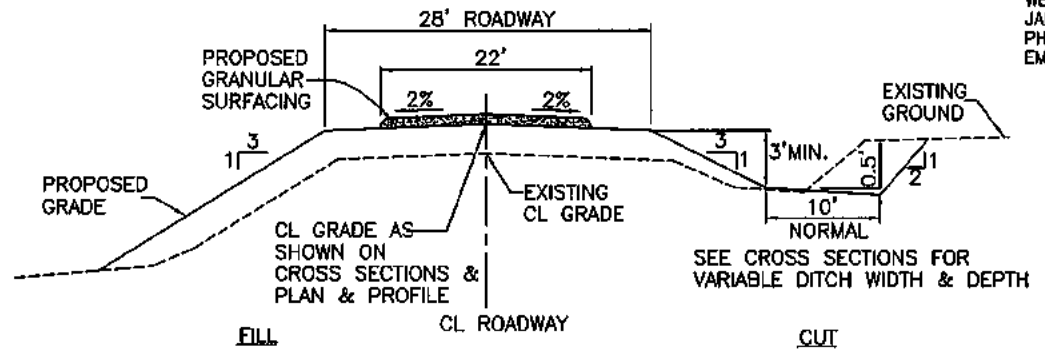
STANDARD ROAD PLANS ARE LISTED ON PLAN SHEET C1.

### STANDARD BRIDGE PLANS

STANDARD BRIDGE PLANS ARE LISTED ON PLAN SHEET C1.



STA. 5+40  
 PROPOSED TWIN 12'x10'x72' RCB CULVERT  
 15' SKEW RT. AHEAD  
 B.O.P. STA. 4+37  
 E.O.P. STA. 6+43



TYPICAL CROSS SECTION  
NOT TO SCALE

DESIGN DATA RURAL		
2012 AADT	70	V.P.D.
2035 AADT	80	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	JAMES A. BERTSCH	GEOTECHNICAL DESIGN
CULVERT STANDARDS	NORMAN L. McDONALD	STRUCTURAL DESIGN

Approved

*John Buller*  
*James A. Bertsch*  
*Norman L. McDonald*

BOARD OF SUPERVISORS

MILEAGE SUMMARY		
LOCATION	LIN. FT.	MILES
BOP STA. 4+37 TO EOP STA. 6+43	206.00	
NET LENGTH OF ROADWAY	206.00	0.039

Approved

*James A. Bertsch* 10/14/14  
 CRAWFORD COUNTY ENGINEER DATE

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.

*Troy J. Groth* 10/10/2014  
 TROY J. GROTH, P.E. #14450 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2015.  
 PAGES OR SHEETS COVERED BY THIS SEAL:  
 A1, C1-3, U1, V1, W1-2, Z1-2

ESTIMATED PROJECT QUANTITIES

100-1A  
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QTY.
1	2101-0850002	CLEARING AND GRUBBING	UNIT	112	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	3851.6	
3	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	556.5	
4	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	106.7	
5	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	389.7	
6	2115-0100000	MODIFIED SUBBASE	CY	132.9	
7	2210-0475290	MACADAM STONE BASE	TON	235.5	
8	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	90.9	
9	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
10	2402-2720000	EXCAVATION, CLASS 20	CY	810	
11	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	336.3	
12	2404-7775000	REINFORCING STEEL	LB	50890	
13	2507-3250005	ENGINEERING FABRIC	SY	993.1	
14	2507-6800021	REVTMENT, CLASS B	TON	120.9	
15	2518-6910000	SAFETY CLOSURE	EACH	2	
16	2528-8445110	TRAFFIC CONTROL	LS	1.00	
17	2533-4980005	MOBILIZATION	LS	1.00	
18	2601-2634100	MULCHING	ACRE	0.5	
19	2601-2636015	NATIVE GRASS SEEDING	ACRE	0.2	
20	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.3	
21	2602-000030	SILT FENCE FOR DITCH CHECKS	LF	90.0	

STANDARD ROAD PLANS

105-4  
10-18-11

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

NUMBER	DATE	TITLE
EC-201	04-20-10	SILT FENCE
EW-101	04-19-11	EMBANKMENT AND REBUILDING EMBANKMENTS
TC-252	04-17-12	ROUTES CLOSED TO TRAFFIC

STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED
TWRCB G1-12	APRIL, 2012	10-12
TWRCB G2-12	APRIL, 2012	07-14
TWRCB 12-10-12	APRIL, 2012	
TWH 15-1-12	APRIL, 2012	
TWH 15-2-12	APRIL, 2012	
TWH 15-3-12	APRIL, 2012	
TWH 15-4-12	APRIL, 2012	
TWH 15-5-12	APRIL, 2012	05-13
TWH 15-6-12	APRIL, 2012	

INDEX OF TABULATIONS

111-25  
10-18-11

Tabulation	Tabulation Title	Sheet No.
100-1A	ESTIMATED PROJECT QUANTITIES	C1
100-18	TABULATION OF SILT FENCES FOR DITCH CHECKS	C3
105-4	STANDARD ROAD PLANS	C1
108-13A	SAFETY CLOSURES	C3
110-17	CLEARING AND GRUBBING	C3
111-25	INDEX OF TABULATIONS	C1
	TABULATION OF EARTHWORK QUANTITIES	C3
	PLACEMENT OF QUANTITIES	C3

ESTIMATE REFERENCE INFORMATION

100-4A  
10-29-02

2101-0850001 CLEARING AND GRUBBING  
INCLUDES CLEARING AND GRUBBING WITHIN THE LIMITS OF THE RIGHT-OF-WAY AND TEMPORARY EASEMENTS SHOWN ON PLAN SHEET V1.

2102-2710070 EXCAVATION, CLASS 10, ROADWAY AND BORROW  
INCLUDES 268.7 C.Y. CUT, 3851.6 C.Y. FILL +35% SHRINK, AND 3582.9 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. THE 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.

PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.

2104-2710020 EXCAVATION, CLASS 10, CHANNEL  
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 45.1 C.Y. OF EXISTING BROKEN CONCRETE REVTMENT SHOWN ON PLAN SHEET V1. THIS MATERIAL MAY BE DISPOSED WITHIN THE PROJECT LIMITS AS DIRECTED BY THE ENGINEER.

ITEM INCLUDES 556.5 C.Y. OF CUT, PLACEMENT OF 117.1 C.Y. (86.7 X 1.35) OF FILL ON THE CHANNEL BANKS, AND 439.4 C.Y. WASTE. QUANTITY INCLUDES EXCAVATION REQUIRED TO INSTALL REVTMENT. QUANTITY INCLUDES EXCAVATION REQUIRED TO TRANSITION PROPOSED CHANNEL SLOPES INTO EXISTING SLOPES WITHIN THE LIMITS SHOWN ON PLAN SHEET V1.

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.

PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.

2113-0001100 SUBGRADE STABILIZATION MATERIAL, POLYMER GRID  
REFER TO DETAILS ON PLAN SHEET U1.

2115-0100000 MODIFIED SUBBASE  
REFER TO DETAILS ON PLAN SHEET U1. CRUSHED LIMESTONE OR CRUSHED CONCRETE MODIFIED SUBBASE MATERIAL SHALL BE USED. NO GRAVEL OR RAP WILL BE ALLOWED. PROVISIONS OF ARTICLE 2115.03, B, 1, 2, AND 3 OF THE STANDARD SPECIFICATIONS SHALL NOT APPLY. QUANTITY INCLUDES MODIFIED SUBBASE MATERIAL NECESSARY TO CONSTRUCT THE CULVERT FOUNDATION ABOVE THE MACADAM STONE BASE AS DETAILED ON PLAN SHEET U1.

REMOVAL OF UNSUITABLE OR UNSTABLE SOIL AND PLACEMENT OF MODIFIED SUBBASE MATERIAL SHALL BE IN ACCORDANCE WITH ARTICLE 2402.03, C, 3, OF THE STANDARD SPECIFICATIONS. NO ADJUSTMENT IN UNIT PRICE WILL BE ALLOWED FOR DEVIATION BETWEEN PLAN QUANTITY AND ACTUAL QUANTITY PLACED. THE ENGINEER WILL COMPUTE THE QUANTITY IN CUBIC YARDS FROM MEASUREMENTS OF THE MATERIAL FURNISHED AND ACCEPTABLY PLACED WITHIN THE SPECIFIED LIMITS. PAYMENT FOR MODIFIED SUBBASE WILL BE THE CONTRACT PRICE PER CUBIC YARD. PAYMENT IS FULL COMPENSATION FOR FURNISHING ALL MATERIALS, WATER, AND FOR ALL WORK NECESSARY TO COMPLETE THE MODIFIED SUBBASE IN COMPLIANCE WITH CONTRACT DOCUMENTS.

2210-0475290 MACADAM STONE BASE  
REFER TO DETAILS ON PLAN SHEET U1.

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.

2401-6745625 REMOVAL OF EXISTING BRIDGE  
THE EXISTING BRIDGE IS A 53' X 20.3' SINGLE SPAN STEEL BEAM BRIDGE WITH TIMBER HIGH ABUTMENTS AND CONCRETE DECK.

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 MACADAM STONE BASE AND MODIFIED SUBBASE 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 IN ACCORDANCE WITH THE SPECIFICATIONS. IT 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.

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.

## ESTIMATE REFERENCE INFORMATION

100-4A  
10-29-02

2404-777500 REINFORCING STEEL  
REFER TO TABULATION ON PLAN SHEET C3 FOR STEEL PLACEMENT QUANTITIES.

2507-3250005 ENGINEERING FABRIC  
ITEM INCLUDES 850.6 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, TOP, ENDS AND SIDES OF THE MACADAM STONE BASE. 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 142.5 S.Y. OF ENGINEERING FABRIC PLACED UNDER THE 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.

2507-6800021 REVETMENT, 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.

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.

2518-6910000 SAFETY CLOSURE  
REFER TO TABULATION ON PLAN SHEET C3.

2601-2638015 NATIVE GRASS SEEDING  
SEED ALL AREAS OF DISTURBED CHANNEL SLOPES THAT DO NOT RECEIVE REVETMENT.

2601-2636043 SEEDING AND FERTILIZING (RURAL)  
SEED AND FERTILIZE ALL DISTURBED AREAS OUTSIDE OF THE CHANNEL WHICH DO NOT RECEIVE GRANULAR SURFACING.

2602-0000030 SILT FENCE FOR DITCH CHECKS  
REFER TO TABULATION ON PLAN SHEET C3. BID ITEM INCLUDES 50% ADDITIONAL QUANTITY FOR FIELD ADJUSTMENTS 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.

CONSTRUCTION STAKING SHALL BE PROVIDED BY THE OWNER IN ACCORDANCE WITH ARTICLE 1105.06 OF THE STANDARD SPECIFICATIONS.

SOUNDING AND TEST BORING DATA SHOWN ON PLANS WERE ACCUMULATED FOR DESIGNING AND ESTIMATING PURPOSES. THEIR APPEARANCE ON THE PLAN DOES NOT CONSTITUTE A GUARANTEE THAT CONDITIONS OTHER THAN THOSE INDICATED WILL NOT BE ENCOUNTERED.

04-15-14 213-3  
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.

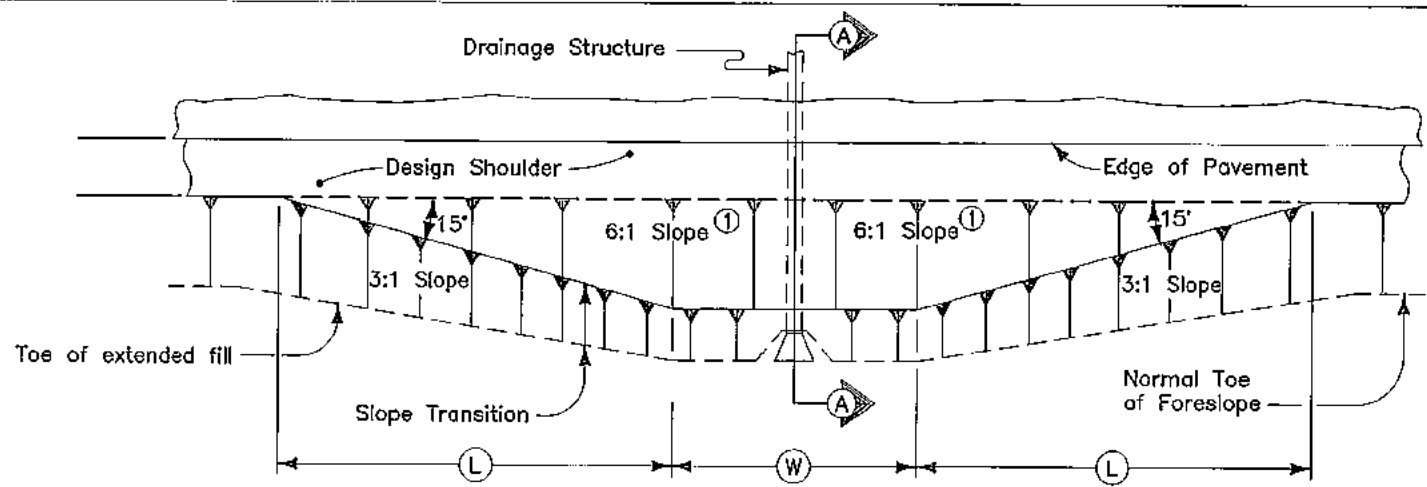
USE TILLAGE EQUIPMENT EQUIPPED WITH AN ARROWHEAD TYPE SHOE THAT WILL PROVIDE LATERAL DISPLACEMENT AND LIMIT THE MOVEMENT OF THE SUBSOIL TO THE SURFACE. OBTAIN THE ENGINEER'S APPROVAL FOR THE EQUIPMENT. THIS WORK IS INCIDENTAL TO OTHER WORK ON THE PROJECT.

FOLLOWING THE SUBSOIL TILLAGE, THE AREA IS TO REMAIN IN A "LOOSENEED" 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.

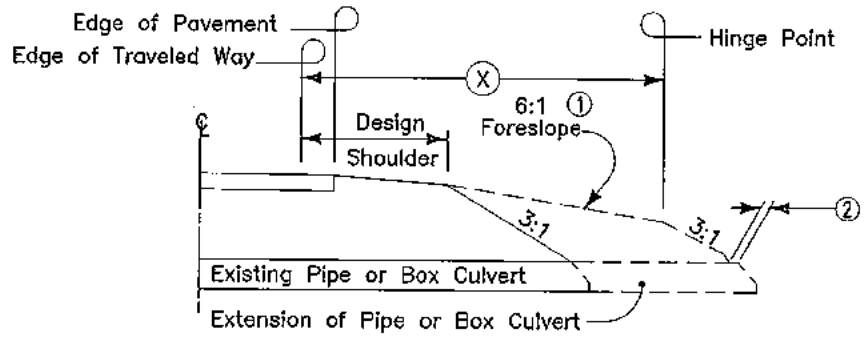
MODIFIED 232-9  
CUT DOWN ALL TREES INCLUDED IN CLEARING AND GRUBBING AFTER SEPTEMBER 30 AND BEFORE APRIL 1. THESE TREES MAY BE INHABITED BY STATE AND FEDERAL LISTED THREATENED/ENDANGERED BAT SPECIES. REMOVING A TREE BETWEEN APRIL 1 AND SEPTEMBER 30 BEING USED BY A LISTED BAT CONSTITUTES A "TAKING" OF A PROTECTED SPECIES, WHICH IS PUNISHABLE BY LAW.

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.iowatreepests.com/eab\\_regulations.html](http://www.iowatreepests.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 897 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 19,800 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.



PLAN VIEW



SECTION A-A

- Notes:
- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, the foreslope shall be flattened as indicated so as to cover the structure. Minimum earth cover is 6".
  - ① 6:1 Maximum - Slope may be flatter.
  - ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
  - Ⓜ = Pipe or R.C.B. width plus 20 feet each side.
  - ⓧ = Clear Zone.

STRUCTURE LOCATION	STATION	SIDE	Ⓜ FEET	Ⓛ FEET	ⓧ FEET
	5+40	L & R	67.5	11.2	6

DETAILS OF  
BARNROOF FORESLOPE  
AT DRAINAGE STRUCTURE

TABULATION OF EARTHWORK QUANTITIES

STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
4+37							
4+50	3.3		32.1		3.3	32.1	
4+66	6.8		75.2		6.8	75.2	
4+84	5.1		100.6		5.1	100.6	
5+00	4.1		230.8		4.1	230.8	
5+13	3.8		287.8		3.8	287.8	
5+40	78.1		1189.8	290.7	78.1	1480.5	
5+66	75.2		1145.7		75.2	1145.7	
6+00	43.5		430.5		43.5	430.5	
6+43	48.8		68.4		48.8	68.4	
TOTAL					268.7	3851.6	

TABULATION OF SILT FENCES  
FOR DITCH CHECKS

Refer to EC-201

Location Station	Side	Length LF	Remarks
4+66	R	20	
4+83	R	20	
5+00	R	20	
TOTAL		60	TABULATED QUANTITY
TOTAL +50%		90	BID QUANTITY

PLACEMENT OF QUANTITIES

TWIN 12'x10'x72" RCB CULVERT

LOCATION	CONCRETE C.Y.				STEEL LBS.
	SLAB	FLOOR	WALLS	TOTAL	
INLET HEADWALL, 15' SKEW	2.8	47.2	17.9	67.9	8555
INLET BARREL SECTION, 17'-0"	14.9	17.3	15.1	47.3	7931
BARREL SECTION, 38'-0"	33.4	38.8	33.7	105.9	17728
OUTLET BARREL SECTION, 17'-0"	14.9	17.3	15.1	47.3	7931
OUTLET HEADWALL, 15' SKEW	2.8	47.2	17.9	67.9	8555
5r1 DOWEL BARS (2 SETS REQ'D @ 95 LBS.)					190
TOTAL	68.8	167.8	99.7	336.3	50890

NOTE: FOR GENERAL INFORMATION, NOTES, SPECIFICATIONS & DESIGN STRESSES REFER TO IOWA D.O.T. HIGHWAY DIVISION STANDARD TWRCB-G1-12.

FOR DETAILS AND NOTES NOT SHOWN REFER TO STANDARD BRIDGE PLANS LISTED ON PLAN SHEET C1.

SAFETY CLOSURES

Refer to Section 2518 of the Standard Specifications

STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
4+00	-	1	WEST END
7+00	-	1	EAST END
TOTAL		2	

CLEARING AND GRUBBING

Location Station to Station or Milepost to Milepost or Description	Direction of Travel	Work and Material Type	Trees, Stumps, and Logs and Down Timber Material Diameters						All other Materials		Remarks		
			3"-6"	>6"-9"	>9"-12"	>12"-15"	>15"-18"	>18"-24"	>24"-30"	Length		Width	
									FT	FT			
4+37 - 6+43	EAST	CLEARING AND GRUBBING	6		3	1	3	1					
		DISPOSAL OF DOWN TIMBER			1			1					
		BRUSH REMOVAL							25	25			

**LOG OF EXPLORATORY BORING** Sheet 1 of 1

Job Number: G3699      Boring No.: B-1  
 Project: Miller Creek Bridge Replacement      Boring Location: Crawford County, IA  
 Date Started: 3/14/14      Drill Type: HOLLOW STEM  
 Date Completed: 3/14/14      Ground Elev.: 1190.7

Depth in Feet	Graphic Log	Sample Type	USCS		Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (pcf)	% Saturation	Hand Penetration (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity (ohm-cm)
			Shelby Tube	Standard Split Spoon										
0-12	12-Inch Gravel Layer, 30-Inch Frost Layer													
12-15	FILL, Lean Clay with Sand, Dark Brown and Medium Brown, Moist to Very Moist (Cinders)				19-18-15 N= 33	13								
15-23					23	93	80	4.50						
23-4					4-3-4 N= 7	13								
4-10	(Dark Brown and Olive Gray)				2-5-4 N= 9	27								
10-15	LEAN CLAY, Gray and Yellow Brown, Very Moist, Stiff, Oxidized, Alluvium		CL		2-5-5 N= 10	26								
15-20					6-11-14 N= 25									
20-25	POORLY GRADED SAND WITH CLAY LENSES, Gray and Yellow Brown, Very Moist to Wet, Alluvium		SP		3-5-5 N= 10									
25-30	SILTY SAND, Gray and Yellow Brown, Wet, Medium Dense, Alluvium		SM		4-8-8 N= 16	15								
30-35	LEAN CLAY WITH SAND, Gray and Grayish Yellow Brown, Very Moist, Very Stiff, Glacial Till		CL		3-8-11 N= 19	14								
35-40					5-8-9 N= 17	16								
40	END OF BORING AT 40 FEET FREE WATER WAS ENCOUNTERED AT 21 FEET AT TIME OF DRILLING													

**LOG OF EXPLORATORY BORING** Sheet 1 of 1

Job Number: G3699      Boring No.: B-2  
 Project: Miller Creek Bridge Replacement      Boring Location: Crawford County, IA  
 Date Started: 3/14/14      Drill Type: HOLLOW STEM  
 Date Completed: 3/14/14      Ground Elev.: 1190.6

Depth in Feet	Graphic Log	Sample Type	USCS		Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (pcf)	% Saturation	Hand Penetration (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity (ohm-cm)
			Shelby Tube	Standard Split Spoon										
0-11	12-Inch Gravel Layer, 30-Inch Frost Layer													
11-21	FILL, Lean Clay with Sand, Dark Brown, Moist				11-10-21 N= 39	22								
21-19					8-7-9 N= 16	19								
19-22					22	99	84	1.00						
22-10	LEAN CLAY, Dark Gray, Very Moist to Wet, Medium to Stiff, Alluvium (Organics)		CL		1-3-3 N= 6	32								
10-15	(With Sand)				24	87	91	1.00						
15-20					2-5-4 N= 9	30								
20-25	(Olive Gray)				2-5-10 N= 15									
25-30	SILTY SAND, Gray and Yellow Brown, Wet, Medium Dense to Dense, Alluvium		SM		10-14-17 N= 31									
30-35					26-10-12 N= 22	16								
35-40	LEAN CLAY WITH SAND, Gray and Grayish Yellow Brown, Very Moist, Very Stiff, Glacial Till		CL		5-9-11 N= 20	15								
40	END OF BORING AT 40 FEET FREE WATER WAS ENCOUNTERED AT 21 FEET AT TIME OF DRILLING													

GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED MARCH 20, 2014, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

### SOUNDING DATA

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

SOUNDINGS WERE TAKEN ON MARCH 14, 2014.

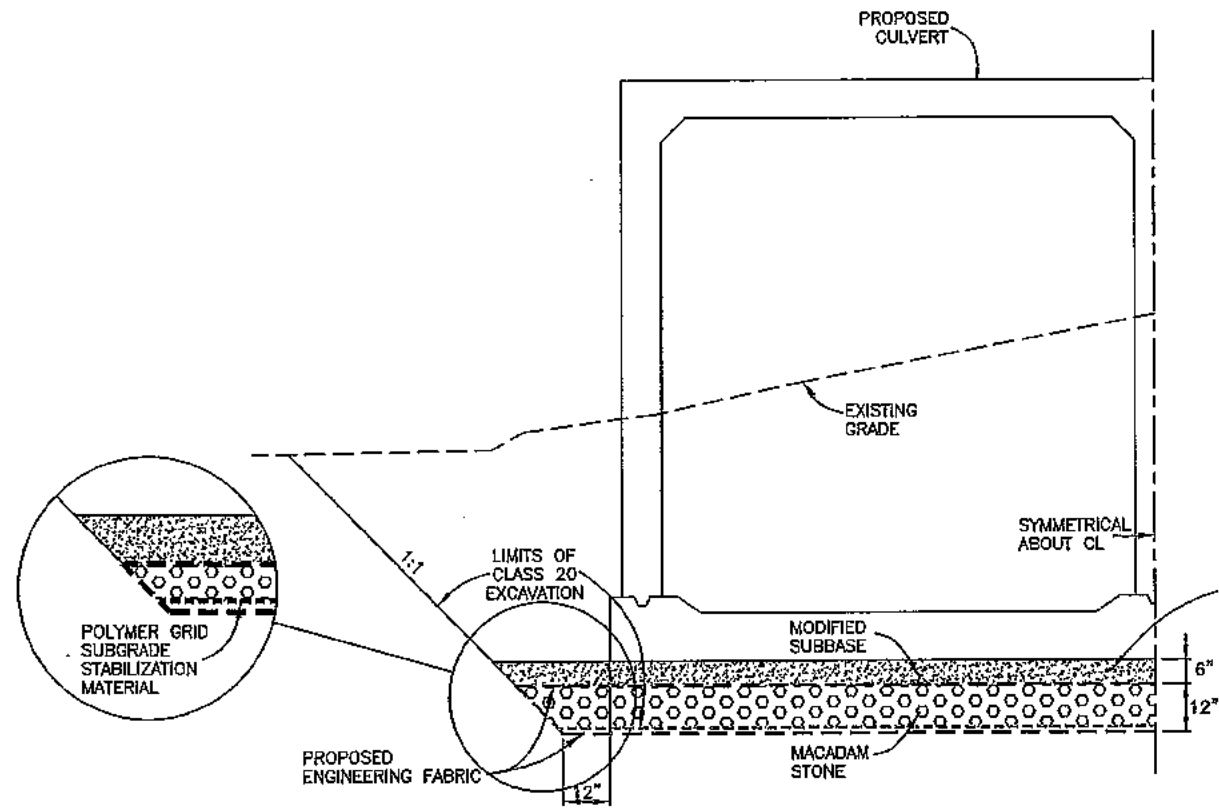
SEE SHEET V1 FOR BORING LOCATIONS.

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.

*James A. Bertsch*

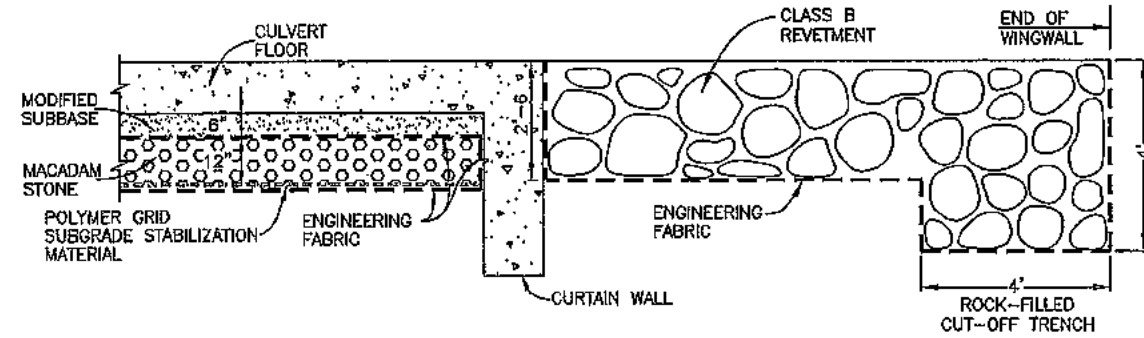
JAMES A. BERTSCH, P.E. #12121      DATE 9-18-2014

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2014.  
 PAGES OR SHEETS COVERED BY THIS SEAL: 01

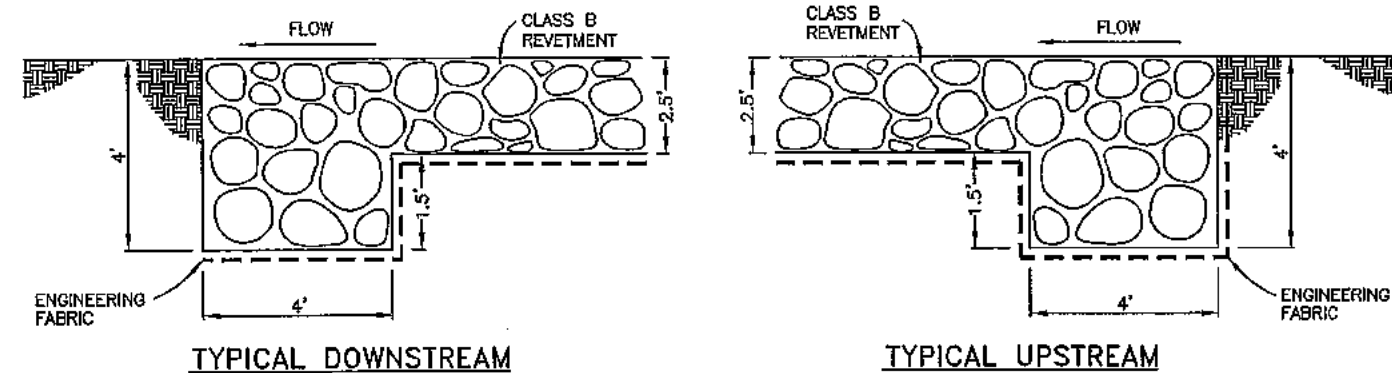


**CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION**  
NOT TO SCALE

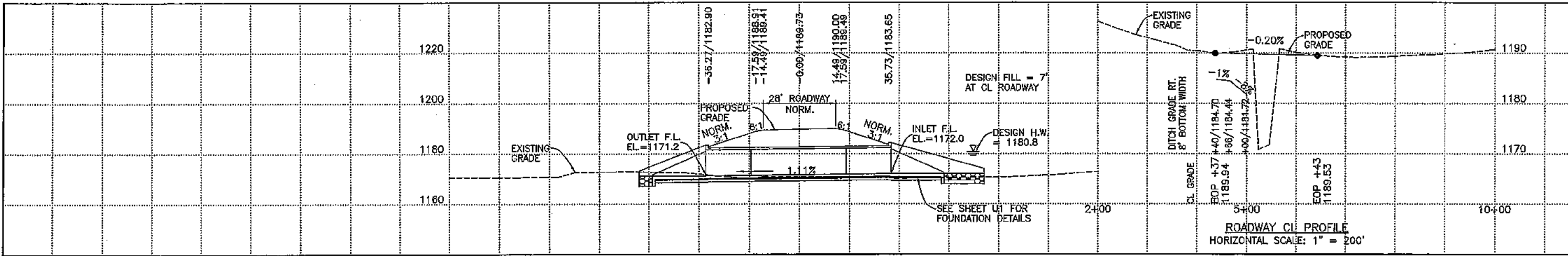
MODIFIED SUBBASE IS ESTIMATED TO BE 6" DEEP. ACTUAL DEPTH REQUIRED WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.



**SECTION AT HEADWALL CURTAIN WALL**  
NOT TO SCALE



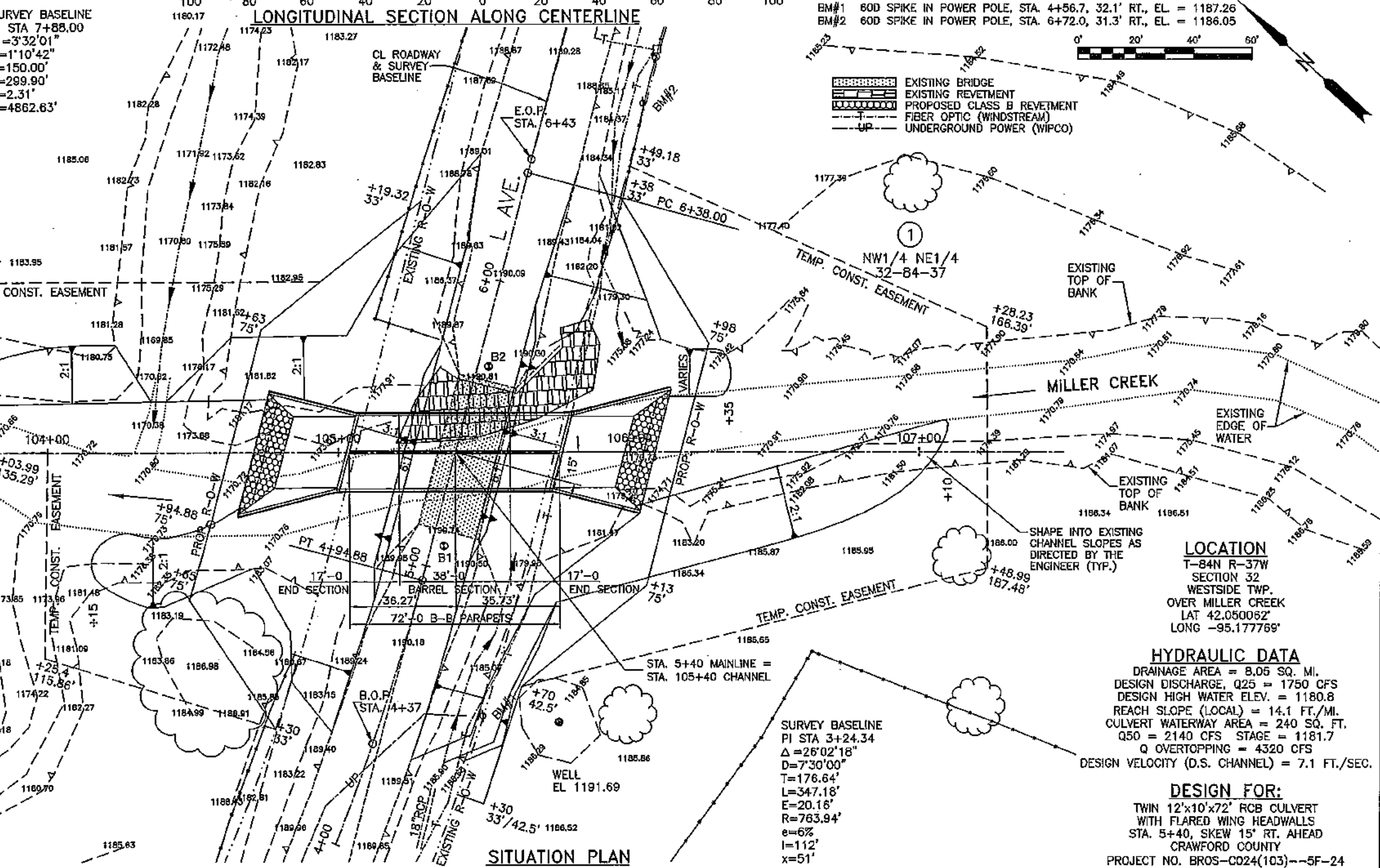
**ROCK-FILLED CUTOFF TRENCH DETAILS**  
NOT TO SCALE

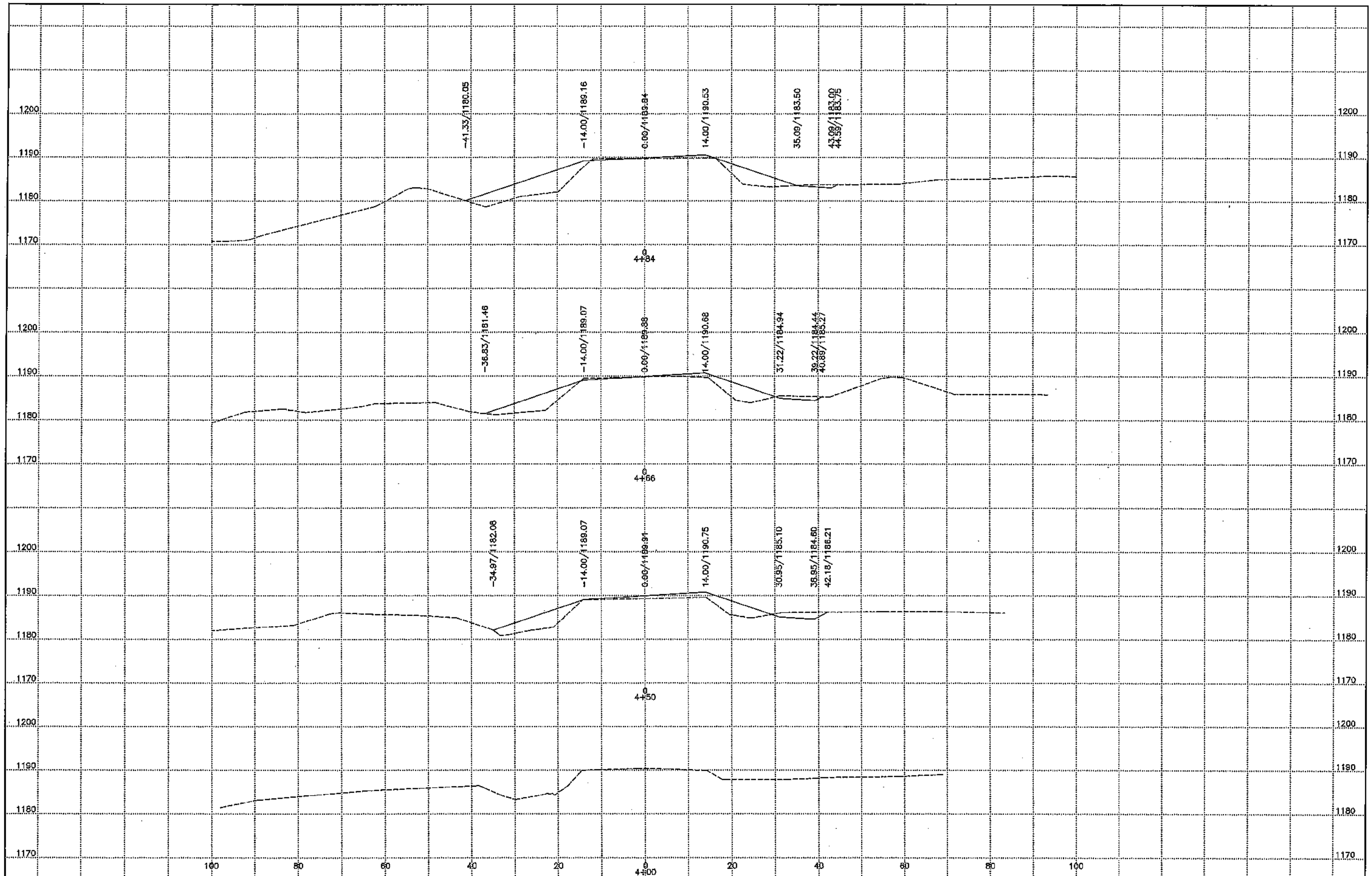


PARCEL NUMBER ① PROPERTY OWNER JOHN J. WALSH

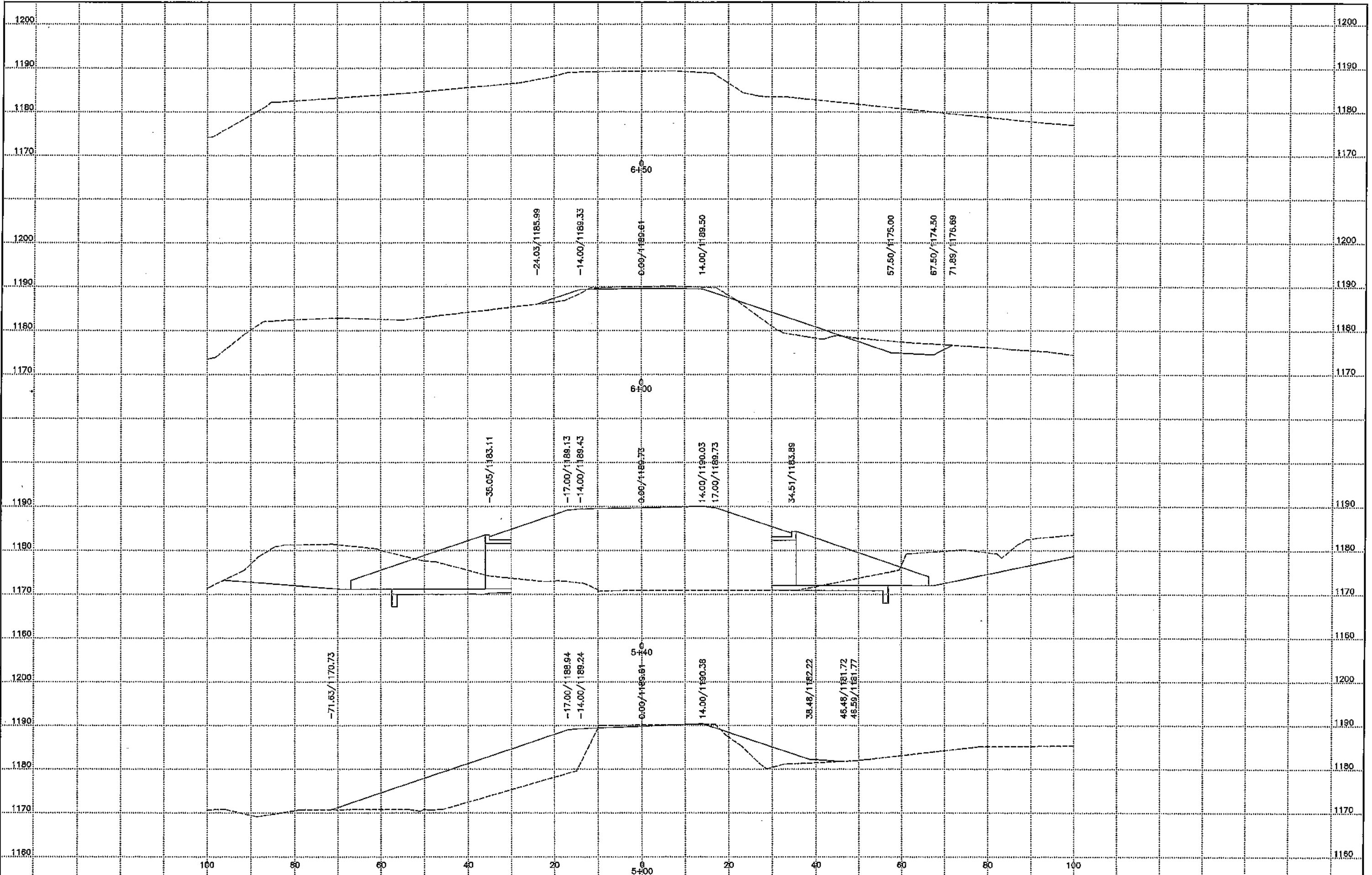
SURVEY BASELINE  
PI STA 7+88.00  
Δ=3°32'01"  
D=1°10'42"  
T=150.00'  
L=289.90'  
E=2.31'  
R=4862.63'

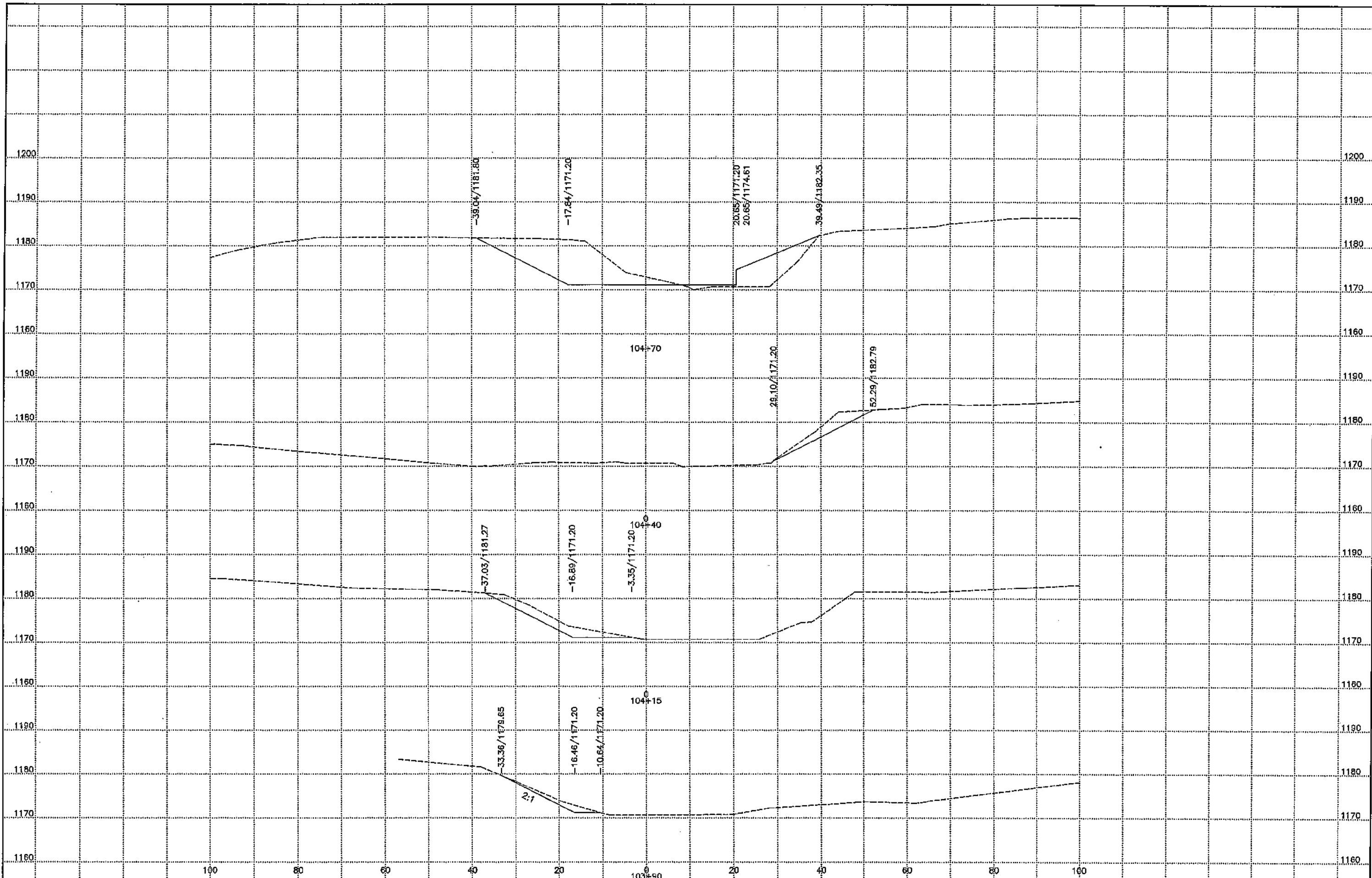
HORIZONTAL CONTROL				
DESCRIPTION	NORTHING	EASTING	ELEVATION	LOCATION
CP #1	9886.8582	12708.1821		3+81.25, 0.05' RT.
CP #2	9885.5381	13058.3714		7+70.24, 0.09' RT.
BM#1	9885.3652	12781.5438	1187.26	4+56.7, 32.1' RT.
BM#2	9784.2199	12984.4093	1186.05	6+72.0, 31.3' RT.











REV

