

LETTING DATE
01-18-12

RCB CULVERT REPLACEMENT - TWIN BOX
BROS-C024(99)--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 1107.0B 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 14, PERMIT NO. CEMVR-OD-P-2011-888. A COPY OF THIS PERMIT IS AVAILABLE FROM THE IOWA DOT OFFICE OF CONTRACTS UPON REQUEST. THE U.S. ARMY CORPS OF ENGINEERS RESERVES THE RIGHT TO VISIT THE SITE WITHOUT PRIOR NOTICE.

THIS PROJECT IS COVERED BY THE IOWA DEPARTMENT OF NATURAL RESOURCES NPDES GENERAL PERMIT NO. 2. THE CONTRACTOR SHALL CARRY OUT THE TERMS AND CONDITIONS OF GENERAL PERMIT NO. 2 AND THE STORM WATER POLLUTION PREVENTION PLAN WHICH IS A PART OF THESE CONTRACT DOCUMENTS. REFER TO SECTION 2602 OF THE IOWA DOT STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION.

DRAWING APPROVAL

ALL SHOP DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY SUNDQUIST ENGINEERING, P.C.

ADDRESS: 120 SOUTH MAIN, P.O. BOX 220
DENISON, IOWA 51442-0220
TELEPHONE: (712)263-8118

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

**SECONDARY ROAD SYSTEM
CRAWFORD COUNTY**

PROJECT NO. BROS-C024(99)--8J-24
RCB CULVERT REPLACEMENT - TWIN BOX
County Road 350TH ST. over
Beaman Creek

SCALES: AS NOTED

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2009, plus General Supplemental Specifications; and applicable Supplemental Specifications, Developmental Specifications, and Special Provisions, shall apply to construction on this project.

TOTAL SHEETS
15

PROJECT NUMBER
BROS-C024(99)--8J-24

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

INDEX OF SHEETS

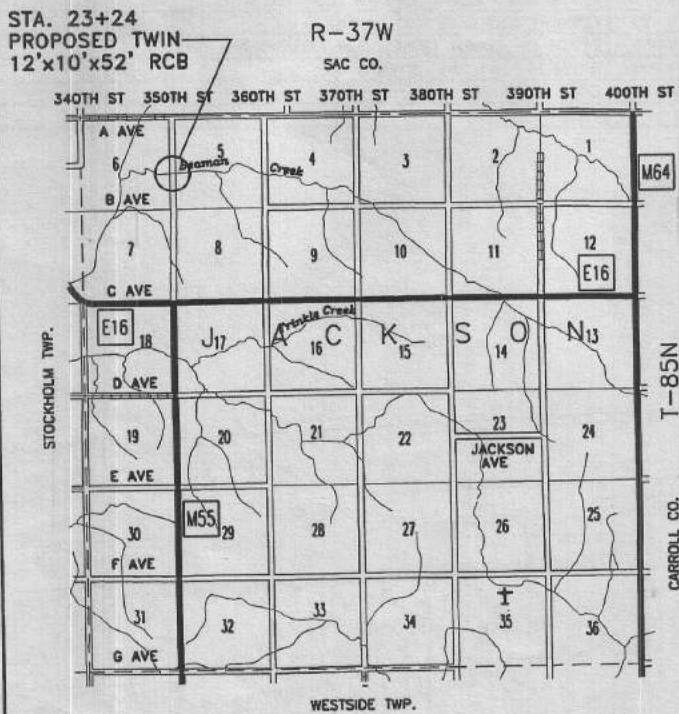
NO.	DESCRIPTION
A1	TITLE SHEET
B1-2	ESTIMATE OF QUANTITIES AND GENERAL INFORMATION
C1-2	POLLUTION PREVENTION PLAN AND TABULATIONS, TYPICALS
D1	PLAN AND PROFILE
Q1	SOILS SHEET
U1	SPECIAL DETAILS
V1	SITUATION PLAN
V2	SUBDRAIN DETAILS
W1-3	CROSS SECTIONS - ROADWAY
Z1-2	CROSS SECTIONS - CHANNEL

STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED
TWRCB-G1-87	JULY, 1987	08-10
TWRCB 12-10-87	JULY, 1987	12-5-96
TWH 0-1-87	JULY, 1987	03-06
TWH 0-2-87	JULY, 1987	04-07
TWH 0-3-87	JULY, 1987	1-1-98
TWH 0-4-87	JULY, 1987	02-10

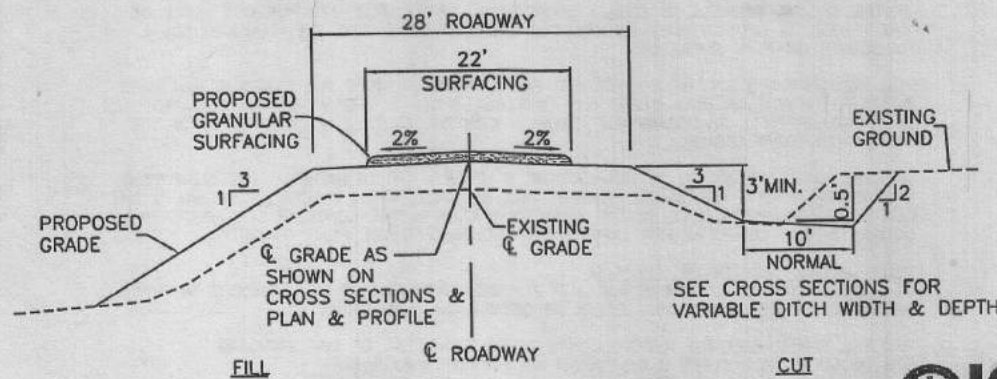
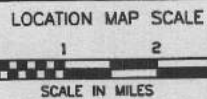
STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON PLAN SHEET B1.



LOCATION MAP

SUNDQUIST ENGINEERING, P.C.
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181
SUNDQUISTENGINEERING.COM



TYPICAL CROSS SECTION
NOT TO SCALE



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

29/LSS

DESIGN DATA RURAL		
2008 AADT	15	V.P.D.
2032 AADT	35	V.P.D.
20 DHV	X	V.P.H.
TRUCKS	X	%
TOTAL DESIGN ESALs	-	

Approved
Mark Sigurdson
Chris...
Steve...
John...
De...
BOARD OF SUPERVISORS

MILEAGE SUMMARY

LOCATION	LIN. FT.	MILES
BOP STA. 20+00 TO EOP STA. 26+50	650.00	
NET LENGTH OF ROADWAY	650.00	0.123

Approved *Paul...* 10/11/11
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 10/4/11
TROY J. GROTH, P.E. #14450 DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2011.
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS



ESTIMATE REFERENCE INFORMATION

2102-0425070 SPECIAL BACKFILL

CRUSHED LIMESTONE OR CRUSHED CONCRETE SPECIAL BACKFILL MATERIAL SHALL BE USED AND SHALL MEET REQUIREMENTS OF SECTION 4132 OF THE STANDARD SPECIFICATIONS EXCEPT THAT IT SHALL MEET IOWA DOT GRADATION NO. 14.

REMOVAL OF UNSUITABLE OR UNSTABLE SOIL AND PLACEMENT OF SPECIAL BACKFILL 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. A CONVERSION FACTOR OF 140 PCF WAS USED TO DETERMINE THE TOTAL WEIGHT OF SPECIAL BACKFILL MATERIAL REQUIRED.

MATERIAL SHALL BE PLACED IN LAYERS OF NOT MORE THAN EIGHT (8) INCHES IN THICKNESS, WITH EACH LAYER BEING COMPACTED TO A MINIMUM DENSITY OF 95% OF THE DENSITY AS DETERMINED BY ASTM D698 PROCEDURES. CONTRACTOR SHALL FURNISH LABORATORY TEST RESULTS FOR A MINIMUM OF TWO DENSITY TESTS FOR VERIFICATION. COST TO BE CONSIDERED INCIDENTAL TO SPECIAL BACKFILL ITEM. REFER TO DETAILS ON PLAN SHEET U1.

2102-2710070 EXCAVATION, CLASS 10, ROADWAY AND BORROW

TYPE "A" COMPACTION WILL BE REQUIRED. REFER TO TABULATION ON PLAN SHEET C1. BASED ON THE CUT AND FILL BALANCE, IT IS ANTICIPATED THAT 3,269 C.Y. OF BORROW WILL BE REQUIRED. BORROW MAY BE OBTAINED FROM SUITABLE CLASS 10 CHANNEL AND CLASS 20 EXCAVATION. THE CONTRACTOR SHALL PROVIDE ADDITIONAL NECESSARY BORROW. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED.

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

INCLUDES 762 C.Y. CUT, 23 C.Y. FILL, AND 739 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 THE CLASS B 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.

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 1650 TONS PER MILE.

2401-6745625 REMOVAL OF EXISTING BRIDGE

THE EXISTING BRIDGE IS A 50' X 16' TWO SPAN STEEL BEAM BRIDGE WITH TIMBER TRESTLE PILE, TIMBER HIGH ABUTMENTS AND TIMBER DECK.

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.

2402-2720000 EXCAVATION, CLASS 20

EXCAVATION TO THE LIMITS SHOWN ON PLAN SHEET U1 IS FOR PAY QUANTITIES ONLY. EXCESS MATERIAL AND UNSUITABLE MATERIAL 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 SPECIAL BACKFILL SHALL BE COMPLETED THROUGHOUT THE ENTIRE CROSS SECTION TO AN ELEVATION AT OR ABOVE THE BOTTOM OF THE CULVERT FLOOR.

2403-0100020 STRUCTURAL CONCRETE (RCB CULVERT)

REFER TO TABULATION ON PLAN SHEET C1 FOR CONCRETE PLACEMENT QUANTITIES. ITEM INCLUDES CERTIFIED PLANT INSPECTION IN ACCORDANCE WITH SECTION 2521 OF THE STANDARD SPECIFICATIONS.

2404-7775000 REINFORCING STEEL

REFER TO TABULATION ON PLAN SHEET C1 FOR STEEL PLACEMENT QUANTITIES.

FURNISHING AND PLACING TWO 3 INCH DIAMETER X 5 FT STEEL POSTS TO SUPPORT EACH CMP SUBDRAIN SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. POSTS SHALL BE PAINTED GREEN. EMBED POSTS A MINIMUM OF 1 FT INTO THE TOP OF THE RCB CULVERT WINGWALL. DRILL A 1/2 INCH DIAMETER DRAIN HOLE AT THE BASE OF EACH EMBEDDED POST.

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.

2502-8215124 SUBDRAIN, CORRUGATED METAL PIPE, 24 IN. DIA.

ALL METAL PIPE SHALL BE RIVETED PIPE WITH ANNULAR CORRUGATIONS. ALL BANDS SHALL HAVE ANNULAR CORRUGATIONS AND SHALL BE THE SAME THICKNESS AS THE PIPE. BANDWIDTHS SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 441 EXCEPT THAT NO BAND SHALL BE LESS THAN 24 INCHES IN WIDTH. SPIRAL PIPE WILL NOT BE ALLOWED. ALL CORRUGATED METAL PIPES 36 INCHES IN DIAMETER OR LARGER SHALL BE FURNISHED WITH 3 IN. X 1 IN. CORRUGATIONS. DIAPHRAGMS ARE NOT A BID ITEM. REFER TO TABULATION ON PLAN SHEET C2.

2507-3250005 ENGINEERING FABRIC

ITEM INCLUDES 505 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, ENDS AND SIDES OF THE SPECIAL BACKFILL MATERIAL. ENGINEERING FABRIC FOR THIS PURPOSE SHALL BE MIRAFI 500X, SI GEOSOLUTIONS GEOTEX 200 ST, CONTECH C-200, OR APPROVED EQUAL. REFER TO DETAILS ON PLAN SHEET U1.

ITEM INCLUDES 135 S.Y. OF ENGINEERING FABRIC PLACED UNDER THE CLASS B REVETMENT. REFER TO DETAILS ON PLAN SHEET U1. MATERIAL SHALL CONFORM TO IOWA DOT MATERIALS IM 496.01 APPENDIX A, EMBANKMENT EROSION CONTROL (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 SHOWN 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

ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS. REFER TO DETAILS ON PLAN SHEET U1.

MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 4130 OF THE STANDARD SPECIFICATIONS FOR CLASS B REVETMENT ON PRIMARY PROJECTS.

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 RIPRAP 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 C2.

2602-0000020 SILT FENCE

REFER TO TABULATION ON PLAN SHEET C2. THIS ITEM INCLUDES 25% MORE SILT FENCE THAN THE TABULATED QUANTITY FOR FIELD ADJUSTMENTS AND REPLACEMENTS.

2602-0000030 SILT FENCE FOR DITCH CHECKS

QUANTITY INCLUDES SILT FENCE AT CULVERT INLETS AS DETAILED ON PLAN SHEET C2. MAXIMUM SPACING OF STEEL POSTS SHALL BE 5 FEET. REFER TO TABULATION ON PLAN SHEET C2. THIS ITEM INCLUDES 50% MORE SILT FENCE FOR DITCH CHECKS THAN THE TABULATED QUANTITY FOR FIELD ADJUSTMENTS AND REPLACEMENTS.

ESTIMATED PROJECT QUANTITIES

100-1A
08-01-08

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101-0850002	CLEARING AND GRUBBING	UNIT	280	
2	2102-0425070	SPECIAL BACKFILL	TON	222	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	4755	
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	762	
5	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	77	
6	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	204	
7	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	
8	2402-2720000	EXCAVATION, CLASS 20	CY	1291	
9	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	259.3	
10	2404-7775000	REINFORCING STEEL	LB	36428	
11	2417-1040024	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 24 IN. DIA.	LF	76	
12	2501-5775000	PILES, STEEL SHEET	SF	736	
13	2502-8215124	SUBDRAIN, CORRUGATED METAL PIPE, 24 IN. DIA.	LF	74	
14	2507-3250005	ENGINEERING FABRIC	SY	640	
15	2507-6800021	REVTMENT, CLASS B	TON	118	
16	2518-6910000	SAFETY CLOSURE	EACH	2	
17	2528-8445110	TRAFFIC CONTROL	LS	1	
18	2533-4980005	MOBILIZATION	LS	1	
19	2601-2634100	MULCHING	ACRE	1.1	
20	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	1.1	
21	2602-0000020	SILT FENCE	LF	450	
22	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	486	

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
RF-7	10-16-07	CORRUGATED METAL TYPE "A" DIAPHRAGM
RF-30A	10-19-10	CULVERT (BEDDING AND BACKFILL)
RF-32	10-19-10	DEPTH OF COVER TABLES FOR CORRUGATED PIPE
RL-4	09-21-99	DITCH BLOCKS AND DIKES
TC-252	10-20-09	ROAD CLOSURE

ESTIMATED PROJECT QUANTITIES
AND GENERAL INFORMATION

GENERAL NOTES

UTILITY CONTACTS

293

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.

ALL BORROW AREAS, STOCKPILE AREAS, HAUL ROADS AND AREAS FOR MANEUVERING EQUIPMENT ON THIS PROJECT WILL REQUIRE SUBSOIL TILLAGE TO AN AVERAGE DEPTH OF 18 TO 24 INCHES. SUCH TILLAGE SHALL BE ACCOMPLISHED ON MAXIMUM OF THREE FOOT CENTERS. SUCH AREAS SHALL BE DESIGNATED BY THE ENGINEER.

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. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING AN INDEPENDENT CHECK OF ALL CONSTRUCTION STAKES PLACED FOR THE PROJECT. THIS INDEPENDENT CHECK SHALL BE SUFFICIENT TO UNDERSTAND THE PLACEMENT AND INTENT OF THE STAKES.

THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN ACCESS TO INDIVIDUAL PROPERTIES DURING CONSTRUCTION. RELOCATED ACCESS SHALL BE COMPLETED TO INDIVIDUAL PROPERTIES PRIOR TO REMOVAL OF EXISTING ACCESS. IF THE PERMANENT ACCESS CANNOT BE COMPLETED PRIOR TO REMOVAL OF THE EXISTING ACCESS, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN AN ALTERNATE ACCESS. TEMPORARY GRANULAR SURFACING WILL BE PAID FOR AS A CONTRACT ITEM OR BY EXTRA WORK.

01-20-84 212-1
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.

04-15-08 213-1
IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT AREAS (INCLUDING HAUL ROADS) SELECTED FOR WASTE OR DISPOSAL NOT IMPACT 1) CULTURALLY SENSITIVE SITES OR GRAVES OR 2) WETLANDS OR "WATERS OF THE U.S.", INCLUDING STREAMS OR STREAM BANKS BELOW THE "ORDINARY HIGH WATER MARK", WITHOUT AN APPROVED U.S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT.


NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE RIGHT-OF-WAY, UNLESS SPECIFICALLY STATED IN THE PLANS.

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 63,000 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 18 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.

CORN BELT COMMUNICATIONS
ATTN: BILL CATES
108 MAIN STREET
WALL LAKE, IA 51466
712-664-2221

ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION

REV.:

 120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
F712 263 8118 F712 263 2181 SUNDQUISTENGINEERING.COM

SE PROJECT NO. 03910 DATE: 08/11 DRAWN BY: TKK REVIEWED BY: SAS APPROVED BY: T.JG

CRAWFORD COUNTY

PROJECT NO. BROS-C024(99)-8J-24

SHEET B2

POLLUTION PREVENTION PLAN

110-12A
04-19-11

THIS BASE POLLUTION PREVENTION PLAN (PPP) INCLUDES INFORMATION ON ROLES AND RESPONSIBILITIES, PROJECT SITE DESCRIPTION, CONTROLS, MAINTENANCE PROCEDURES, INSPECTION REQUIREMENTS, NON-STORM WATER CONTROLS, POTENTIAL SOURCES OF OFF RIGHT-OF-WAY POLLUTION, AND DEFINITIONS. THIS PLAN REFERENCES OTHER DOCUMENTS RATHER THAN REPEATING THE INFORMATION CONTAINED IN THE DOCUMENTS. A COPY OF THIS BASE POLLUTION PREVENTION PLAN, AMENDED AS NEEDED PER PLAN REVISIONS OR BY CONTRACT MODIFICATION, WILL BE READILY AVAILABLE FOR REVIEW.

ALL CONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN A MANNER THAT CONTROLS POLLUTANTS, MINIMIZES EROSION, AND PREVENTS SEDIMENTS FROM ENTERING WATERS OF THE STATE AND LEAVING THE HIGHWAY RIGHT-OF-WAY. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AND IMPLEMENTATION OF THE PPP FOR THEIR ENTIRE CONTRACT. THIS RESPONSIBILITY SHALL BE FURTHER SHARED WITH SUBCONTRACTORS WHOSE WORK IS A SOURCE OF POTENTIAL POLLUTION AS DEFINED IN THIS PPP.

I. ROLES AND RESPONSIBILITIES

- A. DESIGNER:
 1. PREPARES BASE PPP INCLUDED IN THE PROJECT PLAN.
 2. PREPARES NOTICE OF INTENT (NOI) SUBMITTED TO IOWA DNR.
 3. SIGNATURE AUTHORITY ON THE BASE PPP AND NOI.
- B. CONTRACTOR/SUBCONTRACTOR:
 1. AFFECTED CONTRACTORS/SUBCONTRACTORS ARE CO-PERMITTEES WITH CRAWFORD COUNTY AND WILL SIGN A CERTIFICATION STATEMENT ADHERING TO THE REQUIREMENTS OF THE NPDES PERMIT AND THIS PPP. ALL CO-PERMITTEES ARE LEGALLY REQUIRED UNDER THE CLEAN WATER ACT AND THE IOWA ADMINISTRATIVE CODE TO ENSURE COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS PPP.
 2. SUBMIT A DETAILED SCHEDULE ACCORDING TO ARTICLE 2602 OF THE SPECIFICATIONS AND ANY ADDITIONAL PLAN NOTES.
 3. INSTALL AND MAINTAIN APPROPRIATE CONTROLS.
 4. SUPERVISE AND IMPLEMENT GOOD HOUSEKEEPING PRACTICES.
 5. CONDUCT JOINT REQUIRED INSPECTIONS OF THE SITE WITH INSPECTION STAFF.
 6. SIGNATURE AUTHORITY ON CO-PERMITTEE CERTIFICATION STATEMENTS AND STORM WATER INSPECTION REPORTS.
- C. RCE/INSPECTOR:
 1. UPDATE PPP WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION OR MAINTENANCE, WHICH HAS A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS FROM THE PROJECT.
 2. MAINTAIN AN UP-TO-DATE LIST THAT IDENTIFIES CONTRACTORS AND SUBCONTRACTORS AS CO-PERMITTEES.
 3. MAKE THESE PLANS AVAILABLE TO THE DNR UPON THEIR REQUEST.
 4. CONDUCT JOINT REQUIRED INSPECTIONS OF THE SITE WITH THE CONTRACTOR/SUBCONTRACTOR.
 5. COMPLETE AN INSPECTION REPORT AFTER EACH INSPECTION.
 6. SIGNATURE AUTHORITY ON STORM WATER INSPECTION REPORTS AND NOTICE OF DISCONTINUATION (NOD).

II. PROJECT SITE DESCRIPTION

- A. THIS POLLUTION PREVENTION PLAN (PPP) IS FOR THE CONSTRUCTION OF A CRAWFORD COUNTY RCB CULVERT ON 350TH STREET OVER BEAMAN CREEK.
- B. THIS PPP COVERS APPROXIMATELY 2 ACRES WITH AN ESTIMATED 2 ACRES BEING DISTURBED. THE PORTION OF THE PPP COVERED BY THIS CONTRACT HAS 2 ACRES DISTURBED.
- C. THE PPP IS LOCATED IN AN AREA OF TWO SOIL ASSOCIATIONS (MARSHALL AND KENNEBECK-NODAWAY-COLO). THE ESTIMATED AVERAGE SCS RUNOFF CURVE NUMBER FOR THIS PPP AFTER COMPLETION WILL BE 64.
- D. STORM WATER SITE MAP - MULTIPLE SOURCES OF INFORMATION COMPRISE THE BASE STORM WATER SITE MAP INCLUDING:
 1. DRAINAGE PATTERNS - PLAN AND PROFILE SHEETS AND SITUATION PLANS.
 2. PROPOSED SLOPES - CROSS SECTIONS.
 3. AREAS OF SOIL DISTURBANCE - CONSTRUCTION LIMITS SHOWN ON PLAN AND PROFILE SHEETS.
 4. LOCATION OF STRUCTURAL CONTROLS - TABULATIONS ON C SHEETS.
 5. LOCATIONS OF NON-STRUCTURAL CONTROLS - TABULATIONS ON C SHEETS.
 6. LOCATIONS OF STABILIZATION PRACTICES - GENERALLY WITHIN CONSTRUCTION LIMITS SHOWN ON PLAN AND PROFILE SHEETS.
 7. SURFACE WATERS (INCLUDING WETLANDS) - PLAN AND PROFILE SHEETS.
 8. LOCATIONS WHERE STORM WATER IS DISCHARGED - PLAN AND PROFILE SHEETS.
- E. THE BASE SITE MAP IS AMENDED BY CONTRACT MODIFICATIONS AND PROGRESS PAYMENTS OF COMPLETED EROSION CONTROL WORK.
- F. RUNOFF FROM THIS WORK WILL FLOW INTO BEAMAN CREEK. BEAMAN CREEK IS A TRIBUTARY TO THE BOYER RIVER.

III. CONTROLS

- A. THE CONTRACTOR'S WORK PLAN AND SEQUENCE OF OPERATIONS SPECIFIED IN ARTICLE 2602.03 FOR ACCOMPLISHMENT OF STORM WATER CONTROLS SHOULD CLEARLY DESCRIBE THE INTENDED SEQUENCE OF MAJOR ACTIVITIES AND FOR EACH ACTIVITY DEFINE THE CONTROL MEASURE AND THE TIMING DURING THE CONSTRUCTION PROCESS THAT THE MEASURE WILL BE IMPLEMENTED.
- B. PRESERVE VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION.
- C. SECTION 2601 AND 2602 OF THE STANDARD SPECIFICATIONS DEFINE REQUIREMENTS TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES. ACTUAL QUANTITIES USED MAY VARY FROM THE BASE PPP AND AMENDMENT OF THE PLAN WILL BE DOCUMENTED VIA FIELDBOOK ENTRIES OR BY CONTRACT MODIFICATION. ADDITIONAL EROSION AND SEDIMENT CONTROL ITEMS MAY BE REQUIRED AS DETERMINED BY THE INSPECTOR AND/OR CONTRACTOR DURING STORM WATER MONITORING INSPECTIONS. IF THE WORK INVOLVED IS NOT APPLICABLE TO ANY CONTRACT ITEMS, THE WORK WILL BE PAID FOR ACCORDING TO ARTICLE 1109.03 PARAGRAPH B.
 1. EROSION AND SEDIMENT CONTROLS
 - a. STABILIZATION PRACTICES
 - 1) SITE PLANS WILL ENSURE THAT EXISTING VEGETATION IS PRESERVED WHERE ATTAINABLE AND DISTURBED PORTIONS OF THE SITE WILL BE STABILIZED.
 - 2) STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED.

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- 3) TEMPORARY STABILIZING SEEDING SHALL BE COMPLETED AS THE DISTURBED AREAS ARE CONSTRUCTED. IF CONSTRUCTION ACTIVITY IS NOT PLANNED TO OCCUR IN A DISTURBED AREA FOR AT LEAST 21 DAYS, THE AREA SHALL BE STABILIZED BY TEMPORARY SEEDING OR MULCHING WITHIN 14 DAYS. OTHER STABILIZING METHODS SHALL BE USED OUTSIDE THE SEEDING TIME PERIOD.
- 4) STABILIZATION MEASURES TO BE USED FOR THIS PROJECT ARE LOCATED IN THE ESTIMATED PROJECT QUANTITIES (100-1A) AND ESTIMATE REFERENCE INFORMATION LOCATED ON THE B SHEETS OF THE PLAN. ADDITIONAL ITEMS MAY BE FOUND IN THE INSPECTOR'S DAILY REPORTS (IDR) OR CONTRACT MODIFICATIONS.
- b. STRUCTURAL PRACTICES
 - 1) STRUCTURAL PRACTICES WILL BE IMPLEMENTED TO DIVERT FLOWS FROM EXPOSED SOILS AND DETAIN OR OTHERWISE LIMIT RUNOFF AND THE DISCHARGE OF POLLUTANTS FROM EXPOSED AREAS OF THE SITE.
 - 2) STRUCTURAL ITEMS TO BE USED FOR THIS PROJECT ARE LOCATED IN THE ESTIMATED PROJECT QUANTITIES (100-1A) AND ESTIMATE REFERENCE INFORMATION LOCATED ON THE B SHEETS OF THE PLAN, AS WELL AS ALL OTHER ITEM SPECIFIC TABULATIONS. TYPICAL DRAWINGS DETAILING CONSTRUCTION OF THE DEVICES TO BE USED ON THIS PROJECT CAN BE FOUND ON THE C SHEETS OF THE PLAN OR ARE REFERENCED IN THE STANDARD ROAD PLANS TABULATION.
- c. STORM WATER MANAGEMENT
 - 1) MEASURES SHALL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT WILL OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED. THE INSTALLATION OF THESE DEVICES MAY BE SUBJECT TO SECTION 404 OF THE CLEAN WATER ACT.
- 2. OTHER CONTROLS
 - a. CONTRACTOR DISPOSAL OF UNUSED CONSTRUCTION MATERIALS AND CONSTRUCTION MATERIAL WASTES SHALL COMPLY WITH APPLICABLE STATE AND LOCAL WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEM REGULATIONS. IN THE EVENT OF A CONFLICT WITH OTHER GOVERNMENTAL LAWS, RULES AND REGULATIONS, THE MORE RESTRICTIVE LAWS, RULES OR REGULATIONS SHALL APPLY.
 - 1) VEHICLE ENTRANCES AND EXITS - CONSTRUCT AND MAINTAIN ENTRANCES AND EXITS TO PREVENT TRACKING OF SEDIMENTS ONTO ROADWAYS.
 - 2) MATERIAL DELIVERY, STORAGE AND USE - IMPLEMENT PRACTICES TO PREVENT DISCHARGE OF CONSTRUCTION MATERIALS DURING DELIVERY, STORAGE, AND USE.
 - 3) STOCKPILE MANAGEMENT - INSTALL CONTROLS TO REDUCE OR ELIMINATE POLLUTION OF STORM WATER FROM STOCKPILES OF SOIL AND PAVING.
 - 4) WASTE DISPOSAL - DO NOT DISCHARGE ANY MATERIALS, INCLUDING BUILDING MATERIALS, INTO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT.
 - 5) SPILL PREVENTION AND CONTROL - IMPLEMENT PROCEDURES TO CONTAIN AND CLEAN-UP SPILLS AND PREVENT MATERIAL DISCHARGES TO THE STORM DRAIN SYSTEM AND WATERS OF THE STATE.
 - 6) CONCRETE RESIDUALS AND WASHOUT WASTES - DESIGNATE TEMPORARY CONCRETE WASHOUT FACILITIES FOR RINSING OUT CONCRETE TRUCKS. PROVIDE DIRECTIONS TO TRUCK DRIVERS WHERE DESIGNATED WASHOUT FACILITIES ARE LOCATED.
 - 7) VEHICLE AND EQUIPMENT CLEANING - EMPLOY WASHING PRACTICES THAT PREVENT CONTAMINATION OF SURFACE AND GROUND WATER FROM WASH WATER.
 - 8) VEHICLE AND EQUIPMENT FUELING AND MAINTENANCE - PERFORM ON-SITE FUELING AND MAINTENANCE IN ACCORDANCE WITH ALL ENVIRONMENT LAWS SUCH AS PROPER STORAGE OF ON-SITE FUELS AND PROPER DISPOSAL OF USED ENGINE OIL OR OTHER FLUIDS ON SITE.
 - 9) LITTER MANAGEMENT - ENSURE EMPLOYEES PROPERLY DISPOSE OF LITTER.
 - b. APPROVED STATE OR LOCAL PLANS

DURING THE COURSE OF THIS CONSTRUCTION, IT IS POSSIBLE THAT SITUATIONS WILL ARISE WHERE UNKNOWN MATERIALS WILL BE ENCOUNTERED. WHEN SUCH SITUATIONS ARE ENCOUNTERED, THEY WILL BE HANDLED ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS IN EFFECT AT THE TIME.

IV. MAINTENANCE PROCEDURES

THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES IN PROPER WORKING ORDER, INCLUDING CLEANING, REPAIRING, OR REPLACING THEM THROUGHOUT THE CONTRACT PERIOD. THIS SHALL BEGIN WHEN THE FEATURES HAVE LOST 50% OF THEIR CAPACITY.

V. INSPECTION REQUIREMENTS

- A. INSPECTIONS SHALL BE MADE JOINTLY BY THE CONTRACTOR AND THE CONTRACTING AUTHORITY AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND AFTER EACH RAIN EVENT THAT IS 1/2" OR GREATER. STORM WATER MONITORING INSPECTIONS WILL INCLUDE:
 1. DATE OF THE INSPECTION.
 2. SUMMARY OF THE SCOPE OF THE INSPECTION.
 3. NAME AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION.
 4. RAINFALL AMOUNT.
 5. REVIEW EROSION AND SEDIMENT CONTROL MEASURES WITHIN DISTURBED AREAS FOR THE EFFECTIVENESS IN PREVENTING IMPACTS TO RECEIVING WATERS.
 6. MAJOR OBSERVATIONS RELATED TO THE IMPLEMENTATION OF THE PPP.
 7. IDENTIFY CORRECTIVE ACTIONS REQUIRED TO MAINTAIN OR MODIFY EROSION AND SEDIMENT CONTROL MEASURES.
 8. VERIFY THAT LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE CONTROL OFFSITE SEDIMENT TRACKING.
- B. INCLUDE STORM WATER MONITORING INSPECTION REPORTS IN THE AMENDED PPP. INCORPORATE ANY ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES DETERMINED AS A RESULT OF THE INSPECTION. IMMEDIATELY BEGIN CORRECTIVE ACTIONS ON ALL DEFICIENCIES FOUND AND COMPLETE ALL ACTIONS WITHIN 3 CALENDAR DAYS OF THE INSPECTION.

VI. NON-STORM WATER DISCHARGES

THIS INCLUDES SUBSURFACE DRAINS (I.E. LONGITUDINAL AND STANDARD SUBDRAINS) AND SLOPE DRAINS. THE VELOCITY OF THE DISCHARGE FROM THESE FEATURES MAY BE CONTROLLED BY THE USE OF PATIO BLOCKS, CLASS A STONE, EROSION STONE OR OTHER APPROPRIATE MATERIALS.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

SILTS, SEDIMENT, AND OTHER FORMS OF POLLUTION MAY BE TRANSPORTED ONTO HIGHWAY RIGHT-OF-WAY (ROW) AS A RESULT OF A STORM EVENT. POTENTIAL SOURCES OF POLLUTION LOCATED OUTSIDE HIGHWAY ROW ARE BEYOND THE CONTROL OF THIS PPP. POLLUTION WITHIN HIGHWAY ROW WILL BE CONVEYED AND CONTROLLED PER THIS PPP.

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VIII. DEFINITIONS

- A. BASE PPP - INITIAL POLLUTION PREVENTION PLAN.
- B. AMENDED PPP - MAY INCLUDE PLAN REVISIONS OR CONTRACT MODIFICATIONS FOR NEW ITEMS AND FIELDBOOK ENTRIES MADE BY THE INSPECTOR.
- C. IDR + INSPECTOR'S DAILY REPORT - THIS CONTAINS THE INSPECTOR'S DAILY DIARY AND ITEM POSTINGS.
- D. CONTROLS - METHODS, PRACTICES, OR MEASURES TO MINIMIZE OR PREVENT EROSION, CONTROL SEDIMENTATION, CONTROL STORM WATER, OR MINIMIZE CONTAMINANTS FROM OTHER TYPES OF WASTE OR MATERIALS.
- E. SIGNATURE AUTHORITY - REPRESENTATIVE FROM DESIGNER, CONTRACTOR/SUBCONTRACTOR, OR RCE/INSPECTOR AUTHORIZED TO SIGN VARIOUS STORM WATER DOCUMENTS.

TABULATION OF EARTHWORK QUANTITIES

STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
20+00					29	73	
20+50	29		73		108	169	
21+00	108		169		295	467	
22+00	295		467		184	864	
22+80	184		799	65	28	332	
23+00	28		332		230	1318	
24+00	230		1258	60	359	987	
25+00	359		577	410	227	449	
26+00	227		449		26	96	
26+50	26		96				
TOTAL					1486	4755	

PLACEMENT OF QUANTITIES

TWIN 12'x10'x52' RCB CULVERT

LOCATION	CONCRETE C.Y.				STEEL LBS.
	SLAB	FLOOR	WALLS	TOTAL	
INLET HEADWALL, 0' SKEW	2.6	45.2	16.9	64.7	7940
INLET BARREL SECTION, 10'-0	7.2	8.9	8.9	25.0	3915
BENT BARREL SECTION, 32'-0	22.9	28.6	28.4	79.9	12528
OUTLET BARREL SECTION, 10'-0	7.2	8.9	8.9	25.0	3915
INLET HEADWALL, 0' SKEW	2.6	45.2	16.9	64.7	7940
5r1 DOWEL BARS (2 SETS REQ'D @ 95 LBS.)					190
TOTAL	42.5	136.8	80.0	259.3	36428

NOTE: FOR GENERAL INFORMATION, NOTES, SPECIFICATIONS & DESIGN STRESSES REFER TO IOWA D.O.T. HIGHWAY DIVISION STANDARD TWRCB-G1-87.

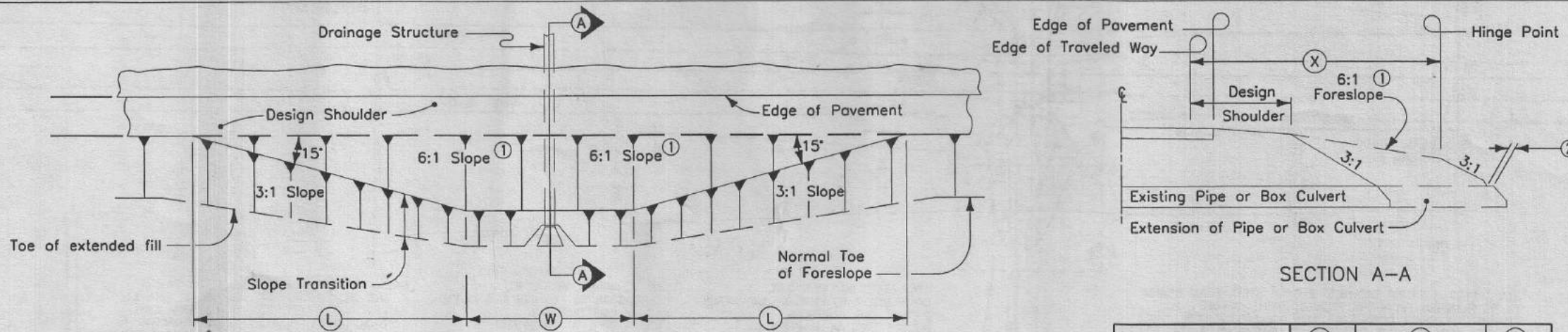
FOR DETAILS AND NOTES NOT SHOWN REFER TO STANDARD BRIDGE PLANS LISTED ON PLAN SHEET A1.

TABULATIONS, TYPICALS

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

* Not a bid item

Drainage Area Acre	Location	Type	Size Inch	Kind of Pipe	Length New Const. Lin. Ft.	Bedding Class	Design Cover (H) Ft.	Camber* (RF-30B) Ft.	Apron No.	Apron Guards* (RF-26)		Elbow* No.	Diaphragm* (RF-7) No.	Tee Section* (RF-21) No.	"D" Section* (RF-13) No.	Reducer* No.	Adaptors* RF-2 Type	Connected Pipe Joint* (RF-14) Type	4" Perforated Subdrain* Ft.	Flow Line Elevations				Dimensions Lin. Ft.				Skew Ahead Degrees				Dike				Remarks		
										Inlet	Outlet									Total		Extensions		Lt. Rt.		Lt. Rt.		Lt. Rt.		Location Station	Top Elevation	Type	Class 20	Flowable Mortar	Floodable Backfill (A)		Porous Backfill (B)	Flooded Backfill (A+B)
										No.	No.									Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.									
	22+78.85	SEE V2	24	CMP	26	C	2.2						1							1133.07	1132.50			11.2	14.8			L	22+90.82	1137.0	F							SUBDRAIN
	23+63.50	SEE V2	24	CMP	22	C	1.2						1							1133.50	1133.95			12.8	9.2			L	23+54.23	1137.0	F							SUBDRAIN
	23+67.83	SEE V2	24	CMP	26	C	2.0						1							1134.36	1133.50			11.2	14.8			R	23+56.69	1138.0	F							SUBDRAIN



- 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.
 - (W) = Pipe or R.C.B. width plus 20 feet each side.
 - (X) = Clear Zone.

STRUCTURE LOCATION		(W)	(L)	(X)
STATION	SIDE	FEET	FEET	FEET
23+24	R	67	26.1	10
23+24	L	67	26.1	10

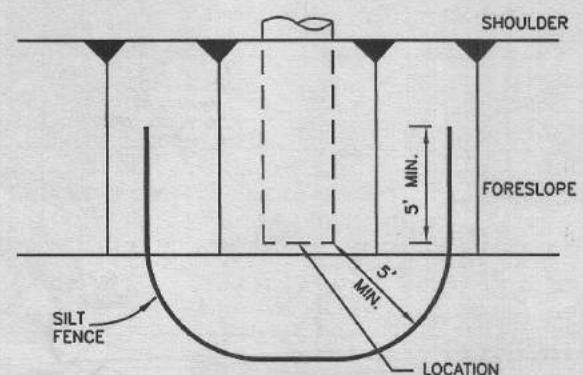
**DETAILS OF
BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE**

**TABULATION OF
SAFETY CLOSURES**

108-13A
10-28-97

Refer to Section 2518 of the St'd. Specifications

STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
18+50	-	1	SOUTH END
28+00	-	1	NORTH END



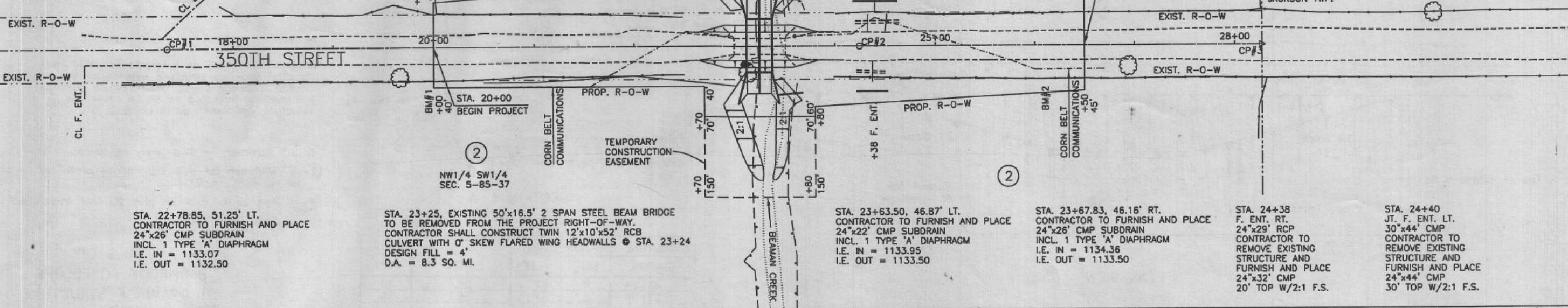
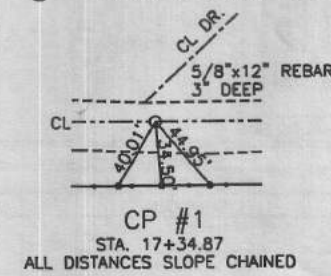
DETAILS OF SILT FENCE AT CULVERT INLETS
NO SCALE

TABULATION OF EROSION CONTROL FEATURES

LOCATION		TYPE OF WORK					REMARKS
LOCATION STATION OR STATION TO STATION (Exact location to be determined by the Engineer)	SIDE L or R	FOR DITCH CHECK			SILT FENCE	WOOD EXCELSIOR MAT (Squares)	
		NO.	SPACING (Ft.)	(Lin. Ft.)			
20+00	23+11	R			360		
20+50	21+00	L	3	25	60		
21+30	22+50	L	5	30	100		
22+79		L			28		CULVERT INLET
23+64		L			28		CULVERT INLET
23+68		R			28		CULVERT INLET
25+00	26+00	L	2	100	40		
25+00	26+00	R	2	100	40		
SUB TOTAL					324	360	
FIELD ADJUST					+50%	+25%	
TOTAL					486	450	

TABULATIONS, TYPICALS

PARCEL NUMBER	PROPERTY OWNER
①	BEVERLY EINSPAHR TRUST
②	BEVERLY EINSPAHR TRUST



BM #1 - 60D SPIKE IN FENCE POST
 STA. 19+97.79, 32.3' RT., EL. = 1147.71
 BM #2 - 60D SPIKE IN POWER POLE
 STA. 26+10.14, 31.5' RT., EL. = 1142.79

STA. 22+78.85, 51.25' LT.
 CONTRACTOR TO FURNISH AND PLACE
 24"x26" CMP SUBDRAIN
 INCL. 1 TYPE 'A' DIAPHRAGM
 I.E. IN = 1133.07
 I.E. OUT = 1132.50

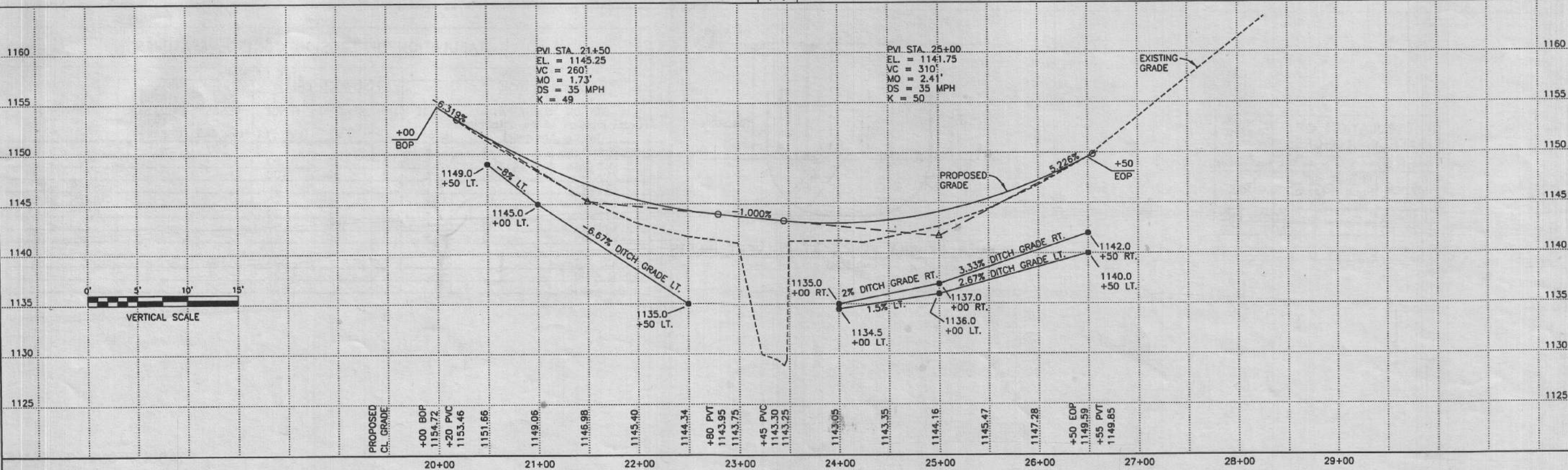
STA. 23+25, EXISTING 50'x16.5' 2 SPAN STEEL BEAM BRIDGE
 TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY.
 CONTRACTOR SHALL CONSTRUCT TWIN 12'x10'x52" RCB
 CULVERT WITH 0' SKEW FLARED WING HEADWALLS @ STA. 23+24
 DESIGN FILL = 4'
 D.A. = 8.3 SQ. MI.

STA. 23+63.50, 46.87' LT.
 CONTRACTOR TO FURNISH AND PLACE
 24"x22" CMP SUBDRAIN
 INCL. 1 TYPE 'A' DIAPHRAGM
 I.E. IN = 1133.95
 I.E. OUT = 1133.50

STA. 23+67.83, 46.16' RT.
 CONTRACTOR TO FURNISH AND PLACE
 24"x26" CMP SUBDRAIN
 INCL. 1 TYPE 'A' DIAPHRAGM
 I.E. IN = 1134.36
 I.E. OUT = 1133.50

STA. 24+38
 F. ENT. RT.
 24"x29" RCP
 CONTRACTOR TO
 REMOVE EXISTING
 STRUCTURE AND
 FURNISH AND PLACE
 24"x32" CMP
 20' TOP W/2:1 F.S.

STA. 24+40
 JT. F. ENT. LT.
 30"x44" CMP
 CONTRACTOR TO
 REMOVE EXISTING
 STRUCTURE AND
 FURNISH AND PLACE
 24"x44" CMP
 30' TOP W/2:1 F.S.



LOG OF EXPLORATORY BORING

Sheet 1 of 1

Job Number: G3190 Boring No.: B-1
 Project: BROS-C024(99)-8J-24 Boring Location: Crawford County, Iowa
 Date Started: 7/15/11 Drill Type: HOLLOW STEM
 Date Completed: 7/15/11 Ground Elev.: 1141.3

Depth in Feet	Graphic Log	Sample Type	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (pcf)	Saturation %	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Cone Penetrometer Blows per 1-3/4"
0-5	8-INCH GRAVEL LAYER			3-3-3 N=6	22								
5-10	FILL, Lean Clay with Sand and Gravel, Dark Brown and Yellow Brown, Moist			22	103	93	2.50						
10-15	SANDY LEAN CLAY, Dark Gray, Very Moist, Medium, Alluvium		CL	3-3-3 N=6	28								
15-20	LEAN CLAY, Gray Brown, Very Moist to Wet, Soft to Medium, Alluvium		CL	29	91	94	1.00						
20-25	(Dark Gray)			1-2-2 N=4	33								
25-30	(Gray)			2-1-2 N=3	30								
30-35	POORLY-GRADED SAND WITH GRAVEL, Yellow Brown, Wet, Loose, Alluvium		SP	2-3-5 N=8									
35-40	LEAN CLAY WITH SAND, Dark Gray, Very Moist, Very Stiff, Glacial Till		CL	7-8-9 N=17	17								
40-41.5	END OF BORING AT 41.5 FEET FREE WATER WAS ENCOUNTERED AT 12 FEET AT TIME OF DRILLING			7-10-13 N=23	19								

LOG OF EXPLORATORY BORING

Sheet 1 of 1

Job Number: G3190 Boring No.: B-2
 Project: BROS-C024(99)-8J-24 Boring Location: Crawford County, Iowa
 Date Started: 7/15/11 Drill Type: HOLLOW STEM
 Date Completed: 7/15/11 Ground Elev.: 1141.2

Depth in Feet	Graphic Log	Sample Type	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (pcf)	Saturation %	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Cone Penetrometer Blows per 1-3/4"
0-5	18-INCH GRAVEL LAYER												
5-10	FILL, Lean Clay, Medium Brown, Moist			13	118	86	4.00						
10-15	LEAN CLAY WITH SAND, Dark Gray, Moist, Soft, Alluvium		CL	3-2-1 N=3	21								
15-20	LEAN CLAY, Dark Gray, Very Moist to Wet, Soft, Alluvium		CL	29	91	94	0.50						
20-25	(Sandy)			1-1-1 N=2	23								
25-30	(Gray)			1-2-1 N=3	31								
30-35	SANDY LEAN CLAY, Gray, Wet, Medium to Stiff, Alluvium (Rocks)		CL	1-1-4 N=5	24								
35-40	(Rocks)			1-2-1 N=3	23								
40-45	LEAN CLAY WITH SAND AND GRAVEL, Grayish Yellow Brown, Very Moist, Stiff to Very Stiff, Glacial Till		CL	3-4-4 N=8	21								
45-50	(Yellow Gray)			3-5-9 N=14	23								
50-55	END OF BORING AT 41.5 FEET FREE WATER WAS ENCOUNTERED AT 12 FEET AT TIME OF DRILLING			8-11-13 N=24	22								

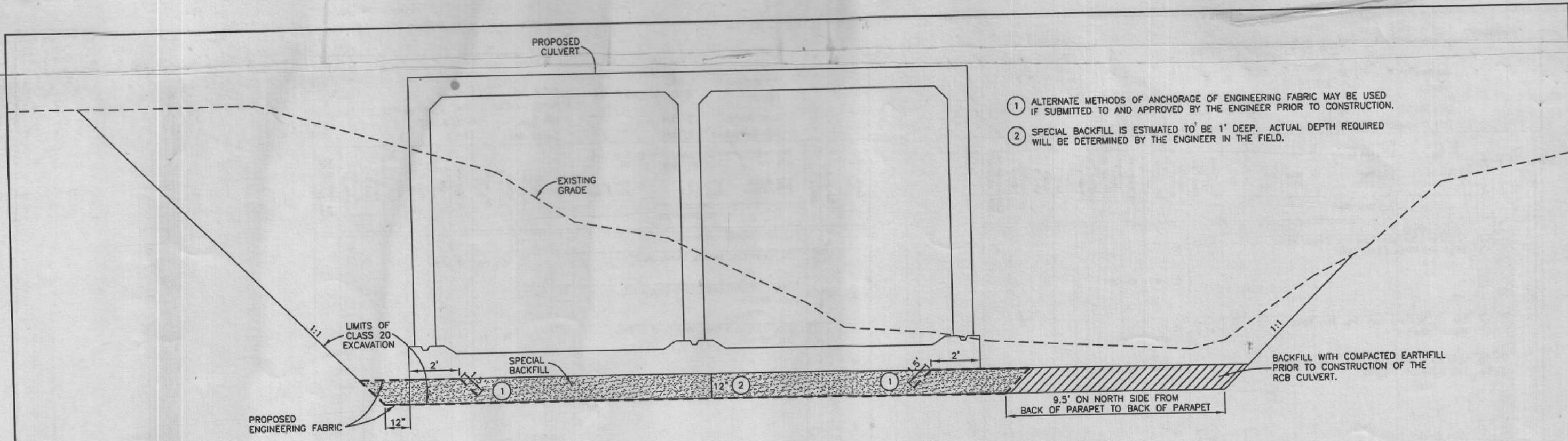
SOUNDING DATA

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

SOUNDINGS WERE TAKEN ON JULY 15, 2011.

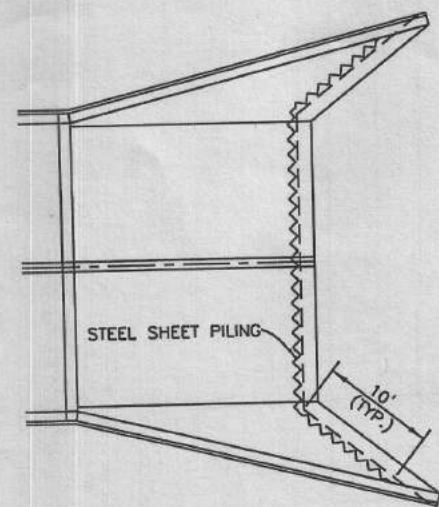
SEE SHEET V1 FOR BORING LOCATIONS.

GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED JULY 25, 2011, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

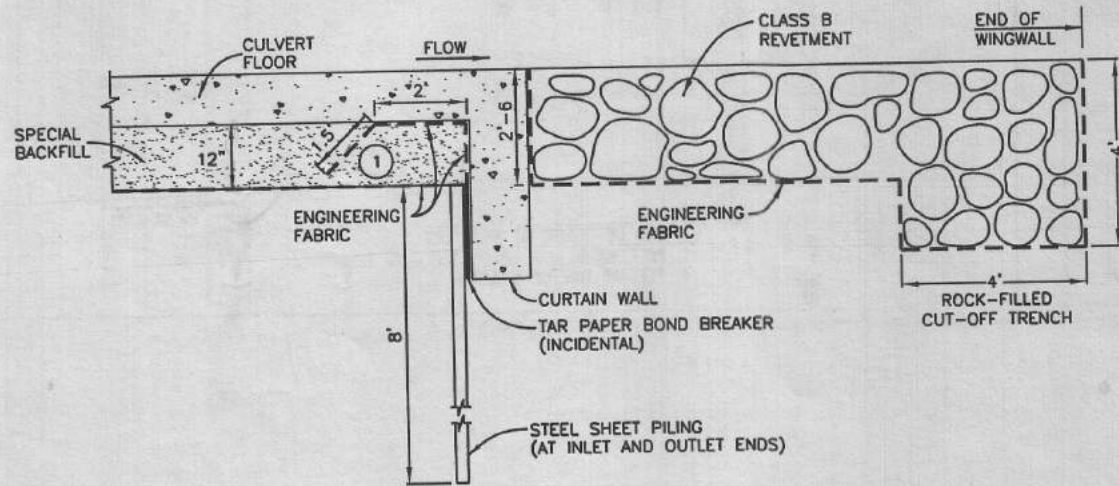


- ① ALTERNATE METHODS OF ANCHORAGE OF ENGINEERING FABRIC MAY BE USED IF SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- ② SPECIAL BACKFILL IS ESTIMATED TO BE 1' DEEP. ACTUAL DEPTH REQUIRED WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

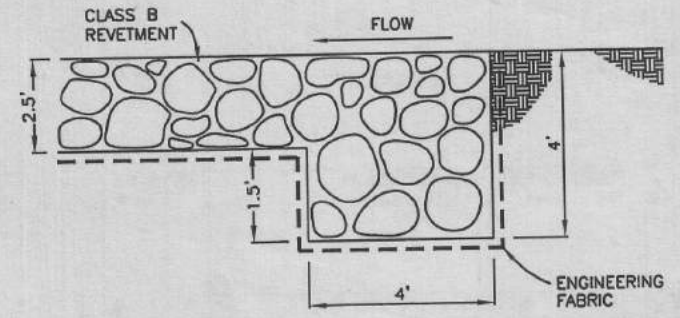
CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION
NOT TO SCALE



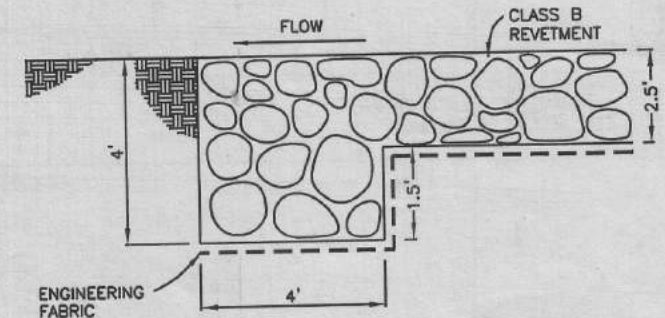
STEEL SHEET PILE AT CURTAIN WALL
NOT TO SCALE



SECTION AT HEADWALL CURTAIN WALL
NOT TO SCALE

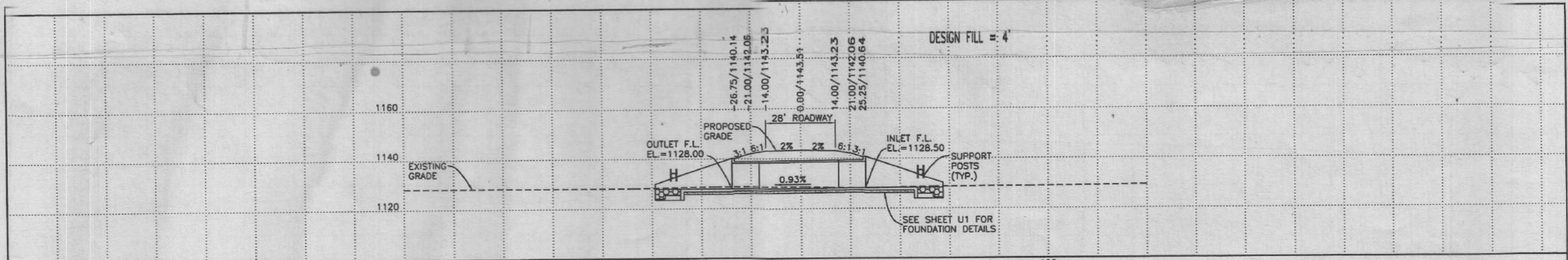


TYPICAL UPSTREAM



TYPICAL DOWNSTREAM

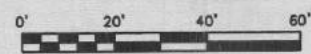
ROCK-FILLED CUTOFF TRENCH DETAILS
NOT TO SCALE



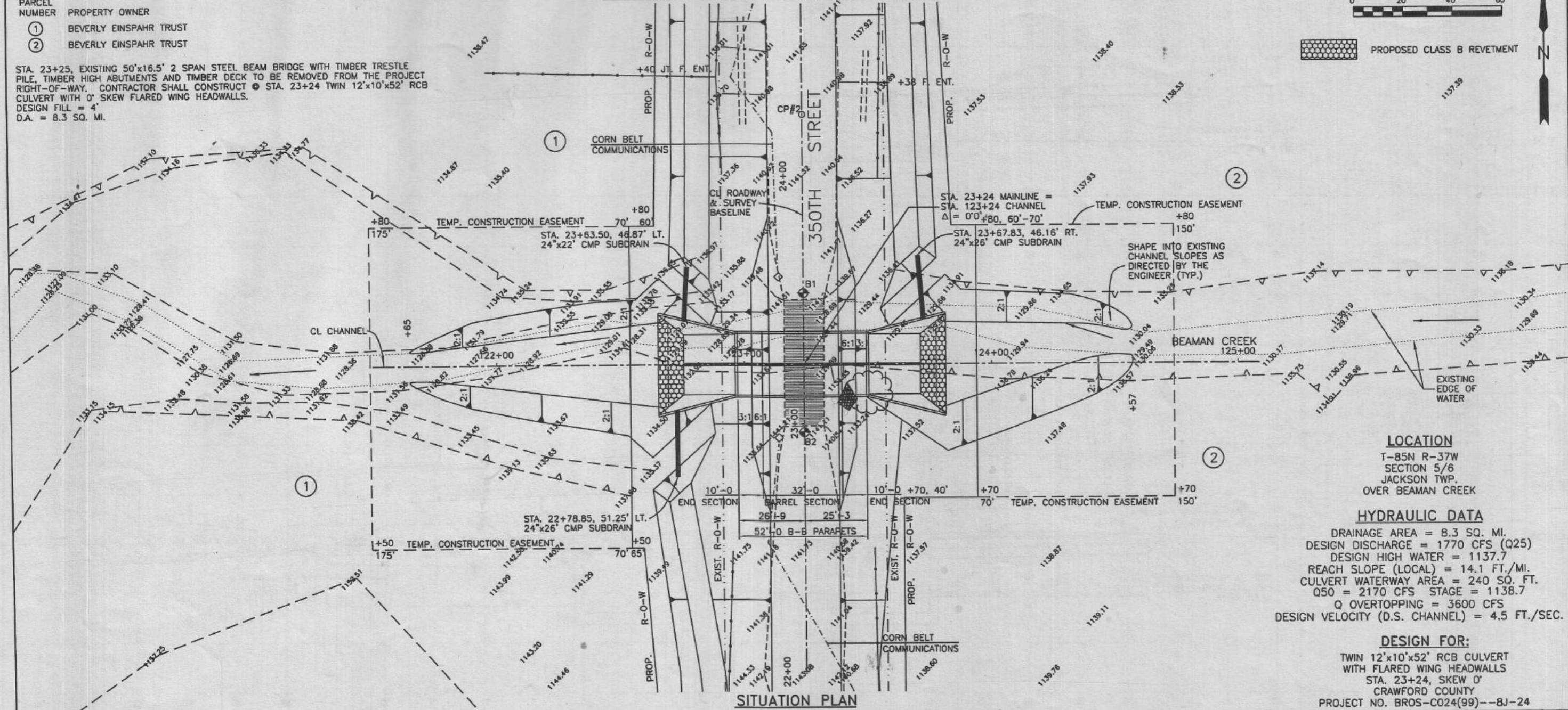
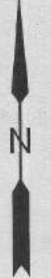
LONGITUDINAL SECTION ALONG CENTERLINE

PARCEL NUMBER	PROPERTY OWNER
①	BEVERLY EINSPAHR TRUST
②	BEVERLY EINSPAHR TRUST

STA. 23+25, EXISTING 50'x16.5' 2 SPAN STEEL BEAM BRIDGE WITH TIMBER TRESTLE PILE, TIMBER HIGH ABUTMENTS AND TIMBER DECK TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT @ STA. 23+24 TWIN 12'x10'x52' RCB CULVERT WITH 0' SKEW FLARED WING HEADWALLS.
 DESIGN FILL = 4'
 D.A. = 8.3 SQ. MI.



PROPOSED CLASS B REVETMENT



LOCATION
 T-85N R-37W
 SECTION 5/6
 JACKSON TWP.
 OVER BEAMAN CREEK

HYDRAULIC DATA
 DRAINAGE AREA = 8.3 SQ. MI.
 DESIGN DISCHARGE = 1770 CFS (Q25)
 DESIGN HIGH WATER = 1137.7
 REACH SLOPE (LOCAL) = 14.1 FT./MI.
 CULVERT WATERWAY AREA = 240 SQ. FT.
 Q50 = 2170 CFS STAGE = 1138.7
 Q OVERTOPPING = 3600 CFS
 DESIGN VELOCITY (D.S. CHANNEL) = 4.5 FT./SEC.

DESIGN FOR:
 TWIN 12'x10'x52' RCB CULVERT
 WITH FLARED WING HEADWALLS
 STA. 23+24, SKEW 0'
 CRAWFORD COUNTY
 PROJECT NO. BROS-C024(99)--8J-24

