

LETTING DATE
04/19/11

RCB CULVERT REPLACEMENT - TWIN BOX
BROS-C024(97)--5F-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

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 14, PERMIT NO. CEMVR-00-P-2010-1315. 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

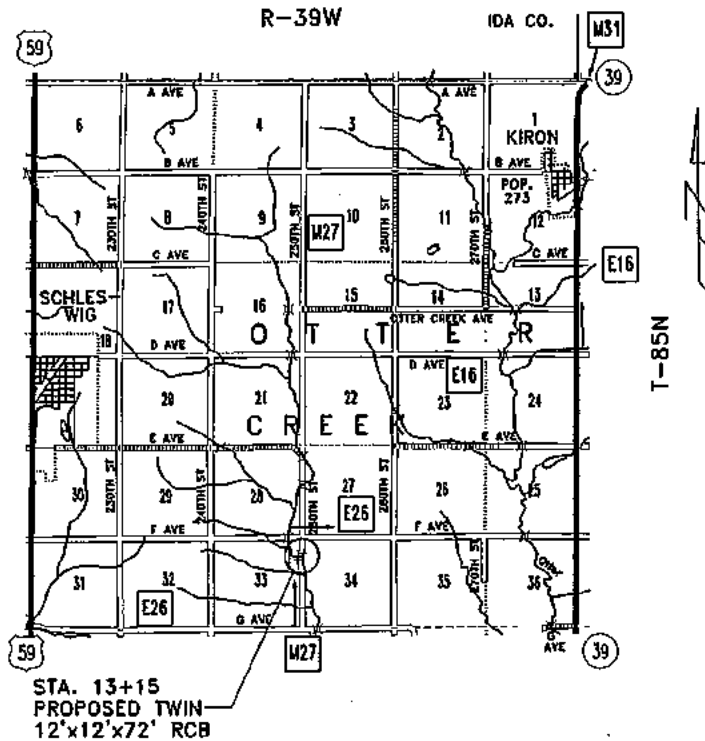
PLANS OF PROPOSED IMPROVEMENTS ON THE

**FARM-TO-MARKET SYSTEM
CRAWFORD COUNTY**

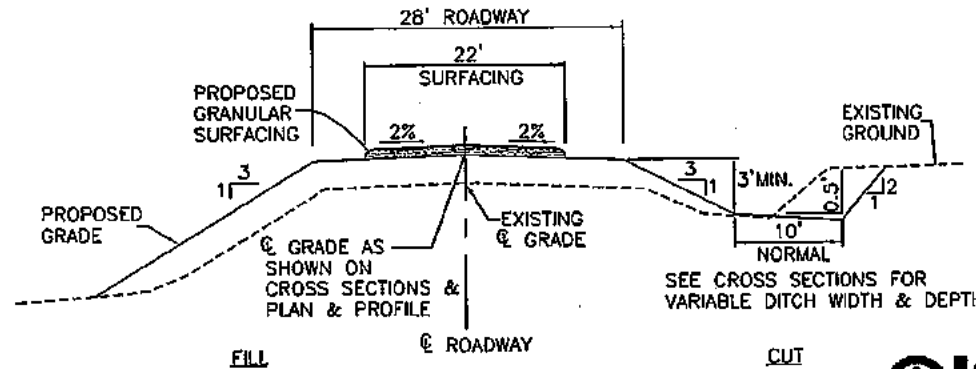
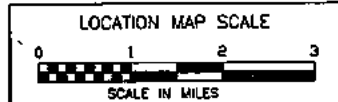
PROJECT NO. BROS-C024(97)--5F-24
RCB CULVERT REPLACEMENT - TWIN BOX
County Road M27 (250TH ST.) over
Big Creek

SCALES: AS NOTED

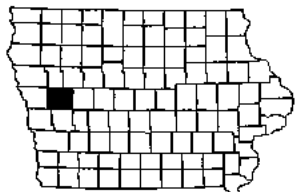
The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2009, plus General Supplemental Specifications; and applicable Supplemental Specifications, Developmental Specifications, and Special Provisions, shall apply to construction on this project.



LOCATION MAP



TYPICAL CROSS SECTION
NOT TO SCALE



31/NTF

DESIGN DATA RURAL		
2008 AADT	25	V.P.D.
2031 AADT	40	V.P.D.
20 DHV	X	V.P.H.
TRUCKS	X	%
TOTAL DESIGN ESALS	-	



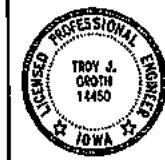
CALL BEFORE YOU DIG!
1-800-292-8989
www.iowaonecall.com

Approved
[Signatures]
BOARD OF SUPERVISORS

MILEAGE SUMMARY		
LOCATION	LIN. FT.	MILES
BOP STA. 12+00 TO EOP STA. 15+00	300.00	
NET LENGTH OF ROADWAY	300.00	0.057

Approved *[Signature]*
CRAWFORD COUNTY ENGINEER
DATE 11/11/11

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] 1/15/11
TROY J. GROTH, P.E. #14450
DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2011.
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS



TOTAL SHEETS	24
PROJECT NUMBER	BROS-C024(97)--5F-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
Q1	SOIL SHEET
U1-7	SPECIAL DETAILS
V1	SITUATION PLAN
V2	CHANNEL PLAN
V3	SUBDRAIN DETAILS
W1-4	CROSS SECTIONS - ROADWAY
Z1-4	CROSS SECTIONS - CHANNEL

STANDARD BRIDGE PLANS		
STANDARD	ISSUED	REVISED
TWRCB-G1-87	JULY, 1987	08-10
TWRCB 12-12-87	JULY, 1987	12-5-96
TWH D-1-87	JULY, 1987	03-08
TWH O-2-87	JULY, 1987	04-07
TWH O-3-87	JULY, 1987	1-1-98
TWH O-4-87	JULY, 1987	02-10
TWH 30-1-87	JULY, 1987	12-5-96
TWH 30-2-87	JULY, 1987	
TWH 30-3-87	JULY, 1987	04-07
TWH 30-4-87	JULY, 1987	
TWH 30-5-87	JULY, 1987	1-1-98

STANDARD ROAD PLANS
STANDARD ROAD PLANS ARE LISTED ON PLAN SHEET B1.

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

ESTIMATE REFERENCE INFORMATION

2102-0425070 SPECIAL BACKFILL

CRUSHED LIMESTONE OR CRUSHED CONCRETE SPECIAL BACKFILL MATERIAL SHALL MEET REQUIREMENTS OF SECTION 4132 OF THE STANDARD SPECIFICATIONS EXCEPT THAT IT SHALL MEET THE FOLLOWING GRADATION:

STD. SIEVE SIZE	PERCENT PASSING
1 1/2"	100
3/4"	50-100
#4	25-50
#40	10-20
#100	5-15
#200	0-10

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

INCLUDES 33 C.Y. CUT, 4423 C.Y. FILL +35% SHRINK. REFER TO TABULATION ON PLAN SHEET C1. TYPE "A" COMPACTION 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

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.

ITEM INCLUDES 4898 CY CUT AND PLACEMENT OF 4728 CY (3503 X 1.35) FILL ON THE CHANNEL BANKS. 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 V2. 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.

2104-2712020 EXCAVATION, CLASS 12, CHANNEL

ITEM INCLUDES REMOVAL OF BROKEN CONCRETE REVETMENT FROM THE EXISTING CHANNEL BANKS WITHIN THE PROJECT AREA AND THE PLACEMENT OF THIS MATERIAL WITHIN THE CHANNEL UPSTREAM OR DOWNSTREAM OF THE PROJECT AREA AS DIRECTED BY THE ENGINEER.

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.

2210-0475290 MACADAM STONE BASE

REFER TO DETAILS ON PLAN SHEET U1.

2312-8280051 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 AN 86' X 21' THREE 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, STEEL BEAMS, STEEL PIER CAPS AND STEEL ABUTMENT CAPS. 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 MACADAM STONE BASE AND 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.

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.

2502-8215136 SUBDRAIN, CORRUGATED METAL PIPE, 36 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 1454 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, ENDS AND SIDES OF THE MACADAM STONE BASE AND 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 445 S.Y. OF ENGINEERING FABRIC PLACED UNDER THE CLASS B REVETMENT. REFER TO DETAILS ON PLAN SHEETS U1, U2 AND U6. 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 SHEETS U1, U2 AND U6.

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 C1.

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	437	
2	2102-0425070	SPECIAL BACKFILL	TON	308	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	4423	
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	4898	
5	2104-2712020	EXCAVATION, CLASS 12, CHANNEL	CY	336	
6	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	128	
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	775	
8	2210-0475290	MACADAM STONE BASE	TON	462	
9	2312-8280051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	94	
10	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	
11	2402-2720000	EXCAVATION, CLASS 20	CY	3582	
12	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	411.4	
13	2404-7775000	REINFORCING STEEL	LB	55050	
14	2501-5775000	PILES, STEEL SHEET	SF	760	
15	2502-8215124	SUBDRAIN, CORRUGATED METAL PIPE, 24 IN. DIA.	LF	46	
16	2502-8215136	SUBDRAIN, CORRUGATED METAL PIPE, 36 IN. DIA.	LF	38	
17	2507-3250005	ENGINEERING FABRIC	SY	1899	
18	2507-6800021	REVTMENT, CLASS B	TON	444	
19	2518-6910000	SAFETY CLOSURE	EACH	2	
20	2528-6445110	TRAFFIC CONTROL	LS	1	
21	2533-4980005	MOBILIZATION	LS	1	
22	2599-9999005	INTAKE, SPECIAL, AS PER PLAN, 54 IN. DIA. CMP	EACH	1	
23	2601-2634100	MULCHING	ACRE	1.2	
24	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	1.2	
25	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT	SQ	6.9	
26	2602-0000020	SILT FENCE	LF	371	
27	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	61	

STANDARD ROAD PLANS

105-4
04-20-10

The following Standard Road Plans shall be considered applicable to construction work on this project.

NUMBER	DATE	TITLE
EC-101	04-20-10	WOOD EXCELSIOR MAT FOR DITCH PROTECTION
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

2599-9999005 INTAKE, SPECIAL, AS PER PLAN, 54 IN. DIA. CMP
ITEM INCLUDES FURNISHING AND INSTALLING THE VERTICAL INLET AS SHOWN; INCLUDING CONCRETE BASE WITH REINFORCING STEEL, EXCAVATION, BACKFILLING, TRASH RACK AND REMOVAL OF EXCESS MATERIAL FROM THE PROJECT. ALL METAL FITTINGS AND HARDWARE SHALL BE GALVANIZED AFTER FABRICATION.

REFER TO PLAN SHEETS U6 AND U7 FOR INTAKE AND TRASH RACK DETAILS.

INTAKE SHALL BE ANNULAR, RIVETED PIPE FABRICATED FROM 14 GAGE SHEET METAL WITH 3"x1" CORRUGATIONS.

THE ENGINEER WILL MEASURE, BY COUNT, EACH INTAKE INSTALLED. FOR EACH INTAKE COUNTED, THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE. THIS PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS, EQUIPMENT, TOOLS AND LABOR FOR ALL EXCAVATION AND CONSTRUCTING INTAKE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL INCLUDE FURNISHING SECTIONS OF PIPE FOR INLET AND OUTLET LINES THROUGH WALLS OF INTAKES.

2601-2640350 SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT
REFER TO STANDARD ROAD PLAN EC-101 AND PLAN SHEET Z4 FOR DETAILS.

2602-0000020 SILT FENCE
REFER TO TABULATION ON PLAN SHEET C2.

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.

ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION

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.

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.

01-20-B4 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-D8 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.

01-19-B8 251-1
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.

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 54,000 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 2,200 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.

UTILITY CONTACTS

WESTERN IOWA POWER COOPERATIVE
ATTN: JIM FREML
803 HWY. 39 N.
P.O. BOX 428
DENISON, IA 51442
712-263-2943

WINDSTREAM COMMUNICATIONS
ATTN: RICH HIGGINS
2010 MAIN STREET
EMMETSBURG, IA 50535
712-852-2443

ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION

POLLUTION PREVENTION PLAN

110-12A

ALL CONTRACTORS/SUBCONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN A MANNER THAT MINIMIZES EROSION AND PREVENTS SEDIMENTS FROM LEAVING THE HIGHWAY RIGHT-OF-WAY. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AND IMPLEMENTATION OF THE POLLUTION PREVENTION PLAN (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.

1. SITE DESCRIPTION

THIS POLLUTION PREVENTION PLAN (PPP) IS FOR THE CONSTRUCTION OF A CRAWFORD COUNTY SECONDARY ROAD TWIN REINFORCED CONCRETE BOX CULVERT ON M27 (250TH STREET) OVER BIG CREEK.

THIS PPP COVERS APPROXIMATELY 1.7 ACRES WITH AN ESTIMATED 1.7 ACRES BEING DISTURBED. THE PORTION OF THE PPP COVERED BY THIS CONTRACT HAS 1.7 ACRES DISTURBED.

THE PPP IS LOCATED IN AN AREA OF ONE SOIL ASSOCIATION (MONONA-MARSHALL) THE ESTIMATED AVERAGE NRCS RUNOFF CURVE NUMBER FOR THIS PPP AFTER COMPLETION WILL BE 61.

REFER TO THE PROJECT PLANS FOR LOCATIONS OF TYPICAL SLOPES, DITCH GRADES, AND MAJOR STRUCTURAL AND NON-STRUCTURAL CONTROLS. A COPY OF THIS PLAN WILL BE ON FILE AT THE PROJECT ENGINEER'S OFFICE. RUNOFF FROM THIS WORK WILL FLOW INTO BIG CREEK.

POTENTIAL SOURCES OF POLLUTION:

SITE SOURCES OF POLLUTION GENERATED AS A RESULT OF THIS WORK RELATE TO SILTS AND SEDIMENT WHICH MAY BE TRANSPORTED AS A RESULT OF A STORM EVENT. HOWEVER, THIS PPP PROVIDES CONVEYANCE FOR OTHER (NON-PROJECT RELATED) OPERATIONS. THESE OTHER OPERATIONS HAVE STORM WATER RUNOFF, THE REGULATION OF WHICH IS BEYOND THE CONTROL OF THIS PPP. POTENTIALLY THIS RUNOFF CAN CONTAIN VARIOUS POLLUTANTS RELATED TO SITE-SPECIFIC LAND USES. EXAMPLES ARE:

RURAL AGRICULTURAL ACTIVITIES:

RUNOFF FROM AGRICULTURAL LAND USE CAN POTENTIALLY CONTAIN CHEMICALS INCLUDING HERBICIDES, PESTICIDES, FUNGICIDES AND FERTILIZERS.

COMMERCIAL AND INDUSTRIAL ACTIVITIES:

RUNOFF FROM COMMERCIAL AND INDUSTRIAL LAND USE MAY CONTAIN CONSTITUENTS ASSOCIATED WITH THE SPECIFIC OPERATION. SUCH OPERATIONS ARE SUBJECT TO POTENTIAL LEAKS AND SPILLS WHICH COULD BE COMMINGLED WITH RUN-OFF FROM THE FACILITY. POLLUTANTS ASSOCIATED WITH COMMERCIAL AND INDUSTRIAL ACTIVITIES ARE NOT READILY AVAILABLE SINCE THEY ARE TYPICALLY PROPRIETARY.

2. CONTROLS

AT LOCATIONS WHERE RUNOFF CAN MOVE OFFSITE, SILT FENCE SHALL BE PLACED ALONG THE PERIMETER OF THE AREAS TO BE DISTURBED PRIOR TO BEGINNING GRADING, EXCAVATION OR CLEARING AND GRUBBING OPERATIONS. VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION SHALL BE PRESERVED. AS AREAS REACH THEIR FINAL GRADE, ADDITIONAL SILT FENCES, SILT BASINS, INTERCEPTING DITCHES, SOD FLUMES, LETDOWNS, BRIDGE END DRAINS, AND EARTH DIKES SHALL BE INSTALLED AS SPECIFIED IN THE PLANS AND/OR AS REQUIRED BY THE PROJECT ENGINEER. THIS WILL INCLUDE USING SILT FENCE AS DITCH CHECKS AND TO PROTECT INTAKES. 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.

THIS WORK SHALL BE DONE IN ACCORDANCE WITH SECTION 2602 OF THE STANDARD SPECIFICATIONS. IF THE WORK INVOLVED IS NOT APPLICABLE TO ANY CONTRACT ITEMS, THE WORK SHALL BE PAID FOR ACCORDING TO ARTICLE 1109.03 PARAGRAPH B.

POLLUTION PREVENTION PLAN

110-12A

AS THE WORK PROGRESSES, ADDITIONAL EROSION CONTROL ITEMS MAY BE REQUIRED AS DETERMINED BY THE ENGINEER AFTER FIELD INVESTIGATION. THESE MAY BE ITEMS SUCH AS LETDOWN STRUCTURES, SOIL STABILIZATION MATS, AND OTHER APPROPRIATE MEASURES SHALL BE INSTALLED BY CONTRACTOR, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL COMPLETE THE CONSTRUCTION WITH THE ESTABLISHMENT OF PERMANENT PERENNIAL VEGETATION OF ALL DISTURBED AREAS.

3. OTHER CONTROLS

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.

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.

4. MAINTENANCE

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

5. INSPECTIONS

INSPECTIONS SHALL BE MADE JOINTLY BY THE CONTRACTOR AND THE CONTRACTING AUTHORITY EVERY SEVEN CALENDAR DAYS AND AFTER EACH RAIN EVENT THAT IS ONE HALF INCH OR GREATER. THE CONTRACTOR SHALL IMMEDIATELY BEGIN CORRECTIVE ACTION OF ALL DEFICIENCIES FOUND. THE FINDINGS OF THIS INSPECTION SHALL BE RECORDED IN THE PROJECT DIARY. THIS PPP MAY BE REVISED BASED ON THE FINDINGS OF THE INSPECTION. THE CONTRACTOR SHALL IMPLEMENT ALL REVISIONS. ALL CORRECTIVE ACTIONS SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS OF THE INSPECTION.

6. NON-STORM DISCHARGES

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

TABULATION OF EARTHWORK QUANTITIES

STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
12+00							
12+23.1	0		27		0	27	
12+32.21	0		22		0	22	
12+57.51	2		74		2	74	
12+82.84	2		98		2	98	
13+00	1		240		1	240	
13+15	0		292	582	0	874	
13+31.41	0		687		0	687	
13+48	0		1026	107	0	1133	
13+70	0		856		0	856	
14+00	6		354		6	354	
15+00	22		58		22	58	
TOTAL					33	4423	

PLACEMENT OF QUANTITIES

TWIN 12'x12'x72' RCB CULVERT

LOCATION	CONCRETE C.Y.			TOTAL	STEEL LBS.
	SLAB	FLOOR	WALLS		
INLET HEADWALL, 0' SKEW	2.7	57.3	28.1	88.1	9947
INLET BARREL SECTION, 19'-0	14.0	18.9	24.5	57.4	8636
BENT BARREL SECTION, 38'-0	28.0	37.8	49.1	114.9	17952
OUTLET BARREL SECTION, 15'-0	11.1	14.9	19.4	45.4	6818
OUTLET HEADWALL, 30' SKEW	3.2	69.2	33.2	105.6	11507
5#1 DOWEL BARS (2 SETS REQ'D @ 95 LBS.)					190
TOTAL	59.0	198.1	154.3	411.4	55050

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.

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the St'd. Specifications

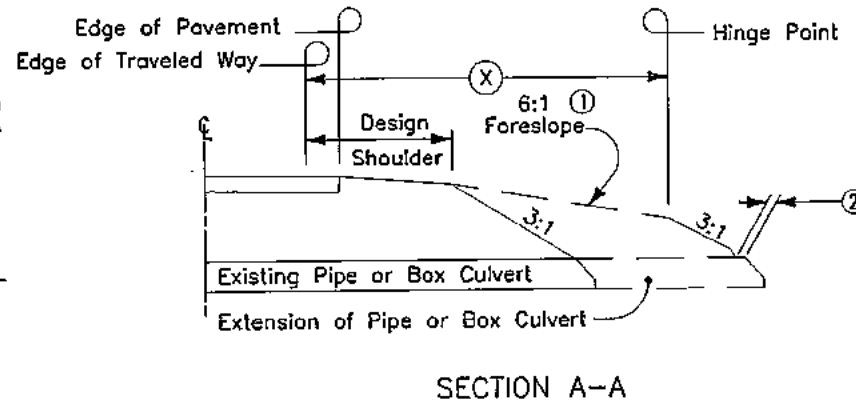
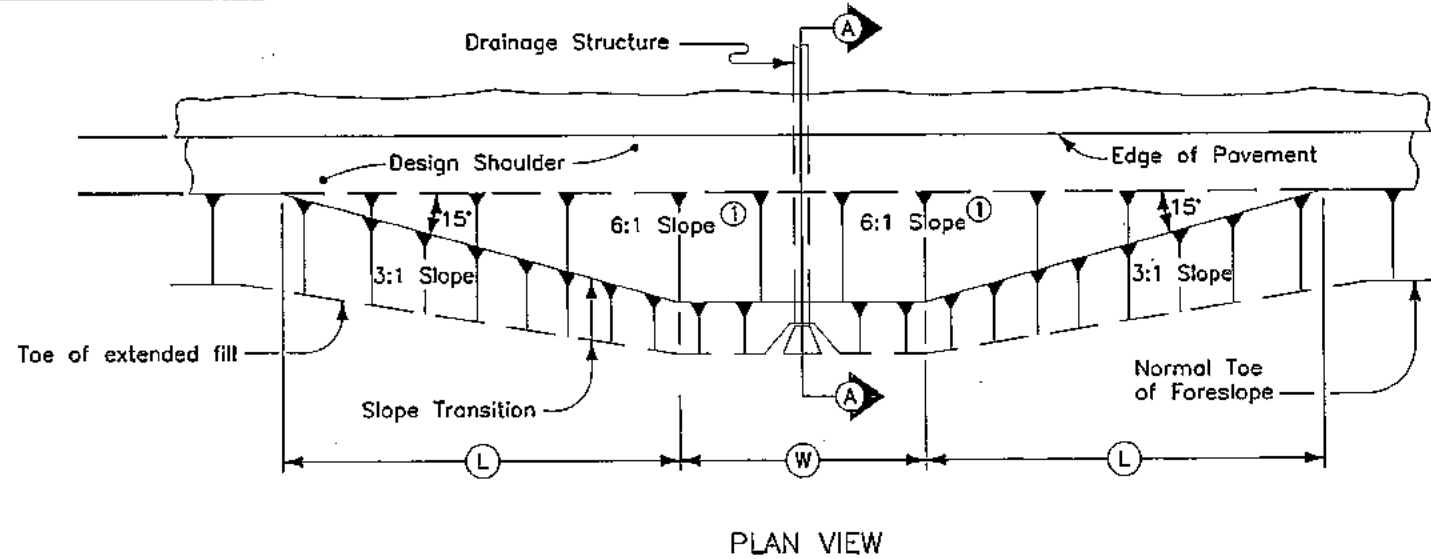
STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
10+50	-	1	SOUTH END
16+50	-	1	NORTH END

TABULATIONS, TYPICALS

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

* Not a bid item

Drainage Area	Location	Type	Size	Kind of Pipe	Length New Const.	Bedding Class	Design Cover (H)	Camber* (RF-30B)	Apron No.	Apron Guards* (RF-26)	Elbow*	Diaphragm* (RF-7)	Tee Section* (RF-21)	"D" Section* (RF-13)	Reducer*	Adaptors* RF-2	Connected Pipe Joint* (RF-14)	4" Perforated Subdrain*	Flow Line Elevations				Dimensions Lin. Ft.				Skew Ahead Degrees		Dike				Class 20	Flowable Mortar	Floodable Backfill* (A)	Porous Backfill* (B)	Flooded Backfill (A+B)	Remarks
																			Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Rt.	Lt.						
53	13+45	SEE V3	36	CMP	38	C	4.9												491.5	490.5	495.5		14.6	29.0			R	13+31.4	499.0	-								SUBDRAIN W/VERT. RISER
1	13+78	SEE V3	24	CMP	46	C	2.6						1						494.5	495.0			18.9	27.1			L	13+50	499.5	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".

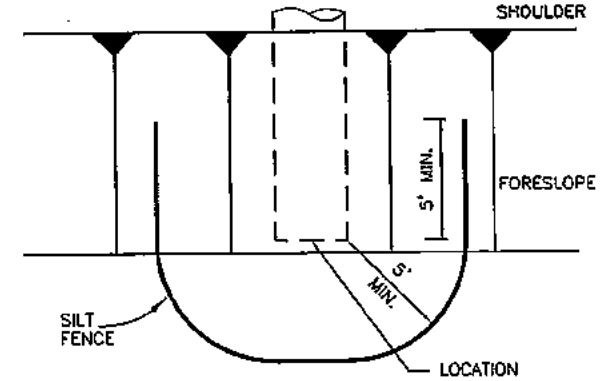
① 6:1 Maximum - Slope may be flatter.
 ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
 (W) = Pipe or R.C.B. width plus 20 feet each side.
 (X) = Clear Zone.

STRUCTURE LOCATION		(W)	(L)	(X)
STATION	SIDE	FEET	FEET	FEET
12+97.25	R	112.5	31.3 - 33.6	12
13+15	L	65.7	60.6 - 52.2	17

DETAILS OF BARNROOF FORESLOPE AT DRAINAGE STRUCTURE

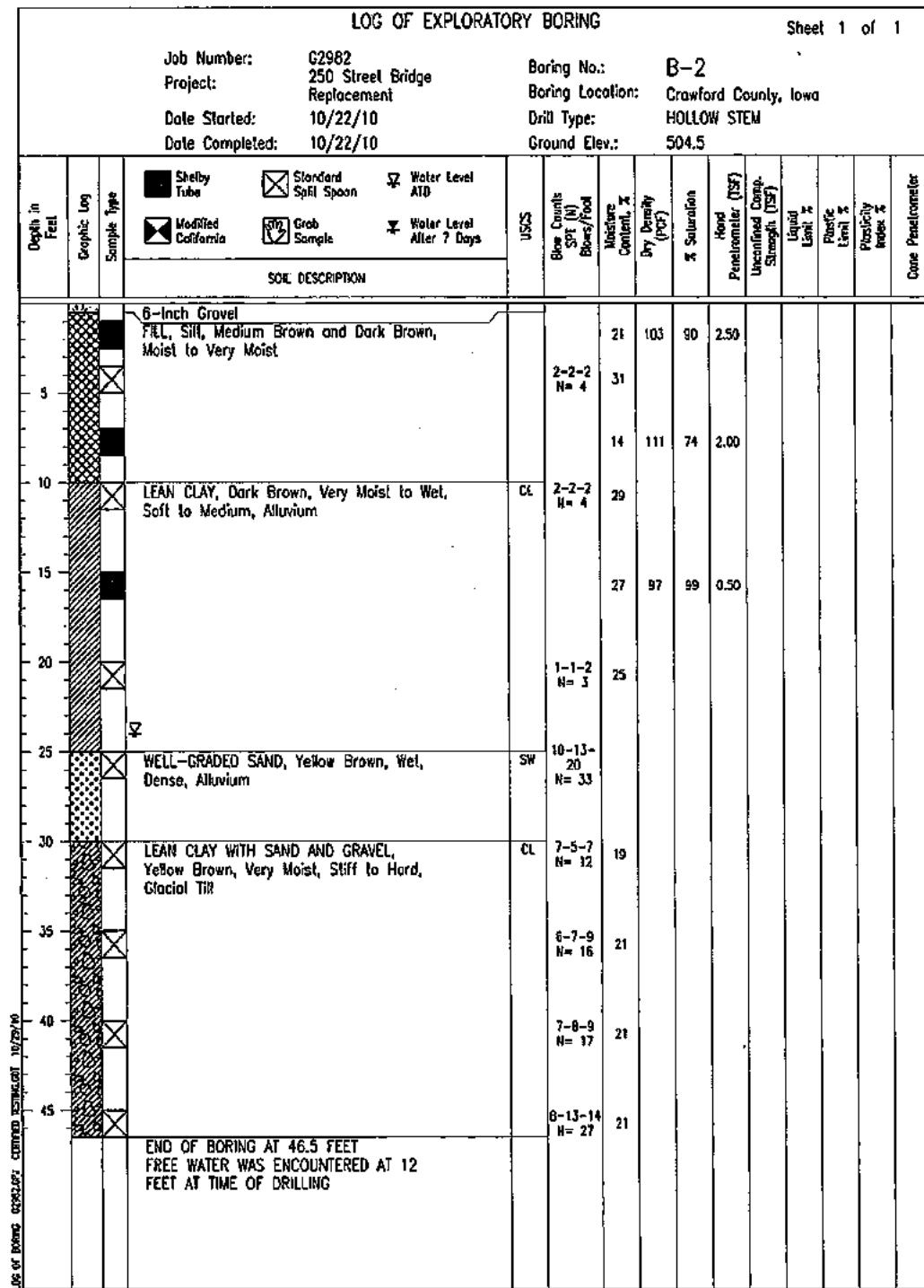
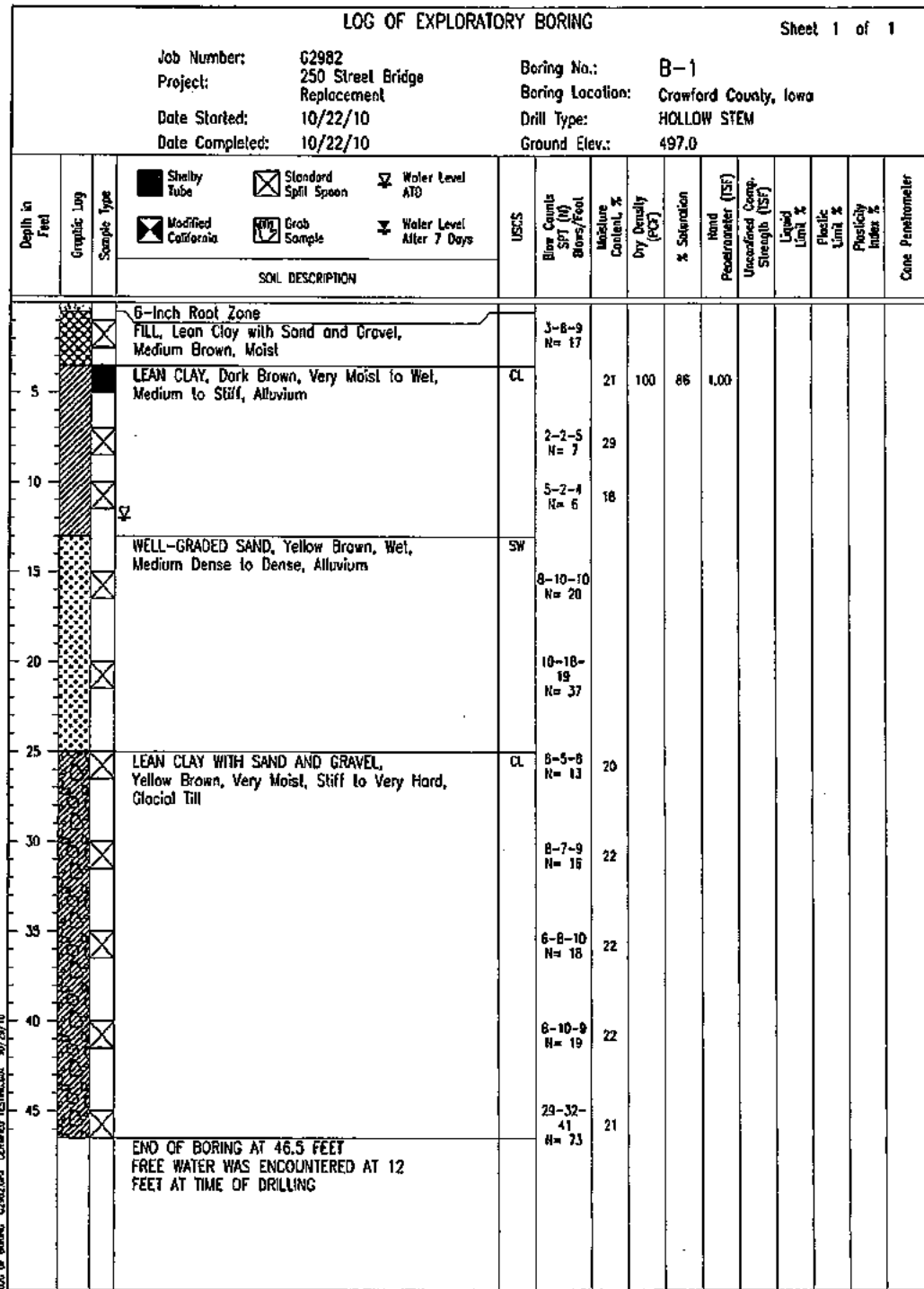
TABULATION OF EROSION CONTROL FEATURES

LOCATION LOCATION STATION OR STATION TO STATION (Exact location to be determined by the Engineer)	SIDE L or R	TYPE OF WORK FOR DITCH CHECK				REMARKS
		NO.	SPACING (Ft.)	SILT FENCE (Lin. Ft.)	WOOD EXCELSIOR MAT (Squares)	
12+10	L				193	
12+00	R				178	
13+46	R	1		33		CULVERT INLET
13+78	L	1		28		CULVERT INLET
114+20	R				6.9	
TOTAL				61	371	6.9



DETAILS OF SILT FENCE AT CULVERT INLETS
NO SCALE

TABULATIONS, TYPICALS



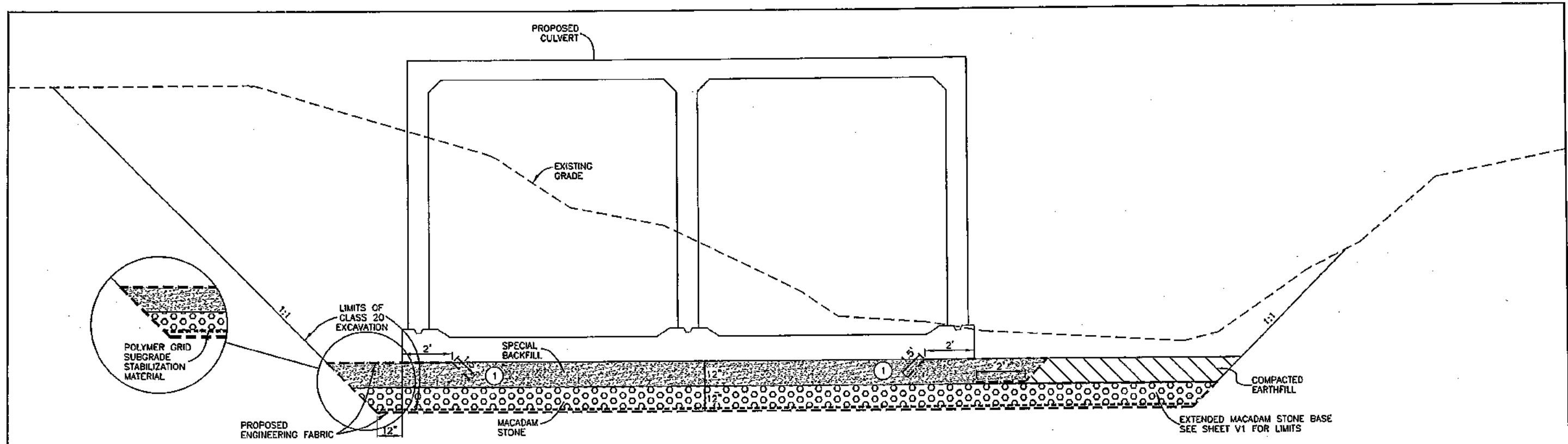
GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED OCTOBER 28, 2010, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

SOUNDING DATA

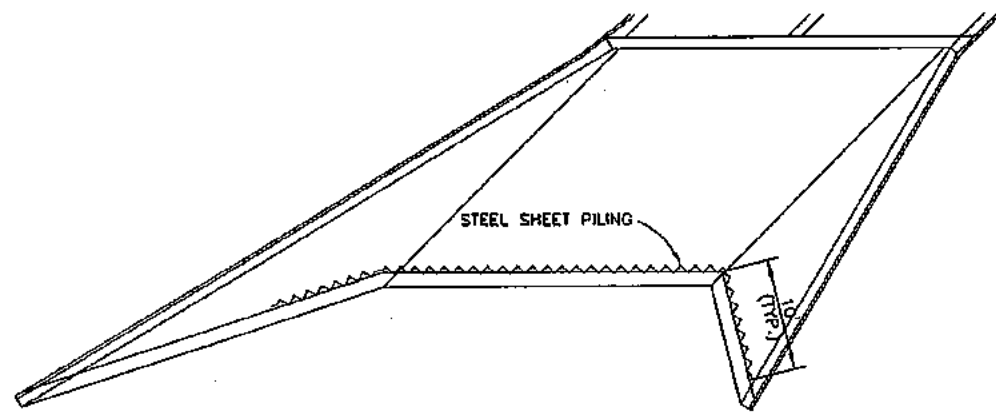
NOTE: THESE SOUNDINGS WERE MADE FOR DESIGN PURPOSES AND ARE NOT GUARANTEED FOR CONSTRUCTION.

SOUNDINGS WERE TAKEN ON OCTOBER 22, 2010.

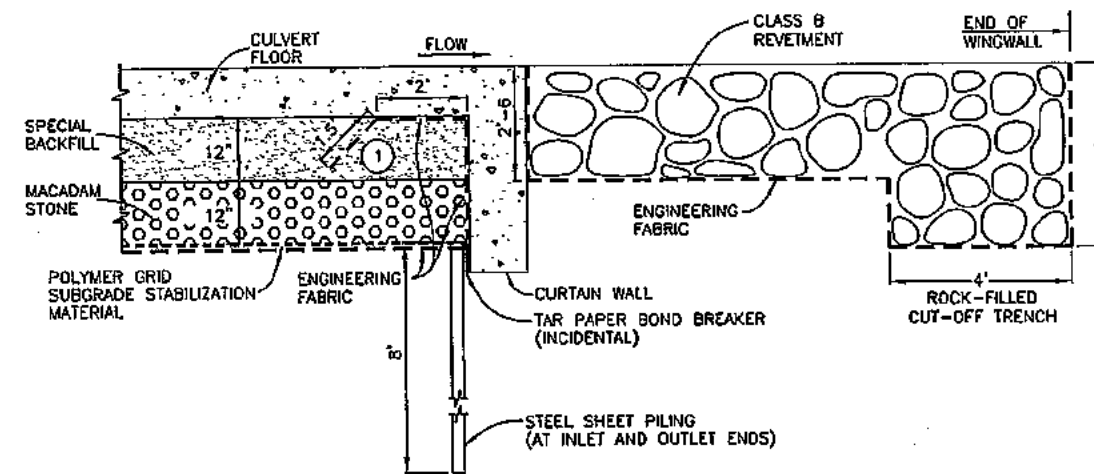
SEE SHEET V1 FOR BORING LOCATIONS.



CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION
NOT TO SCALE

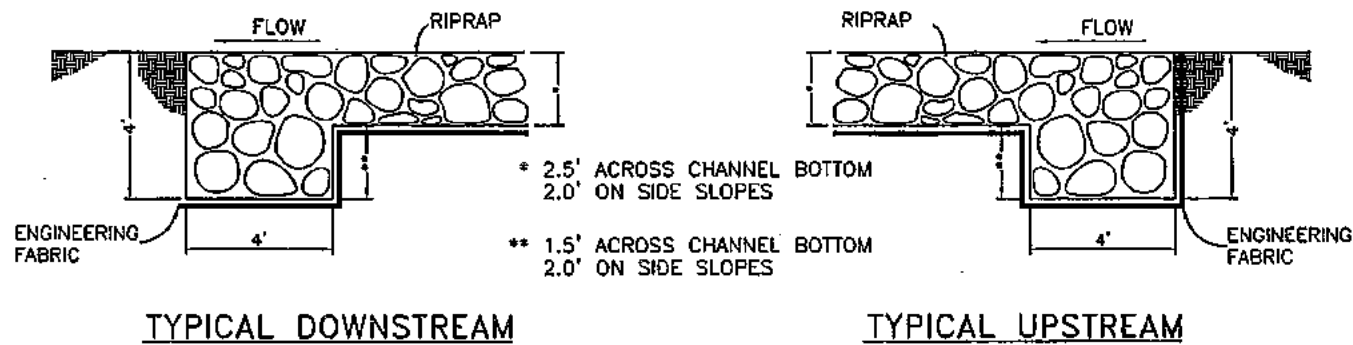


STEEL SHEET PILE AT CURTAIN WALL
NOT TO SCALE



SECTION AT HEADWALL CURTAIN WALL
NOT TO SCALE

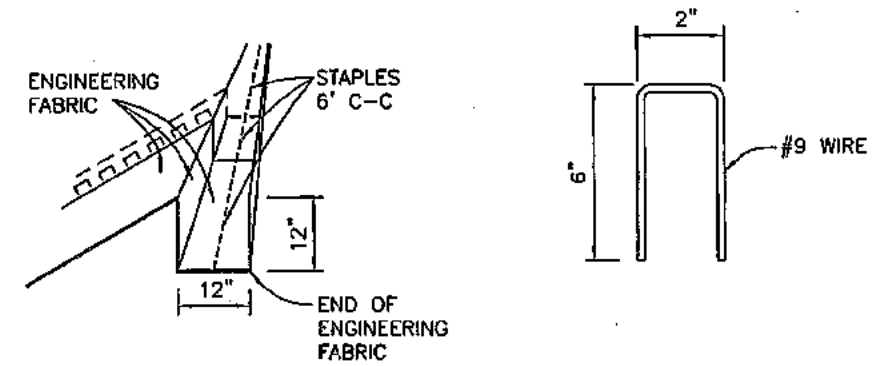
① ALTERNATE METHODS OF ANCHORAGE OF ENGINEERING FABRIC MAY BE USED IF SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.



SECTION B-B

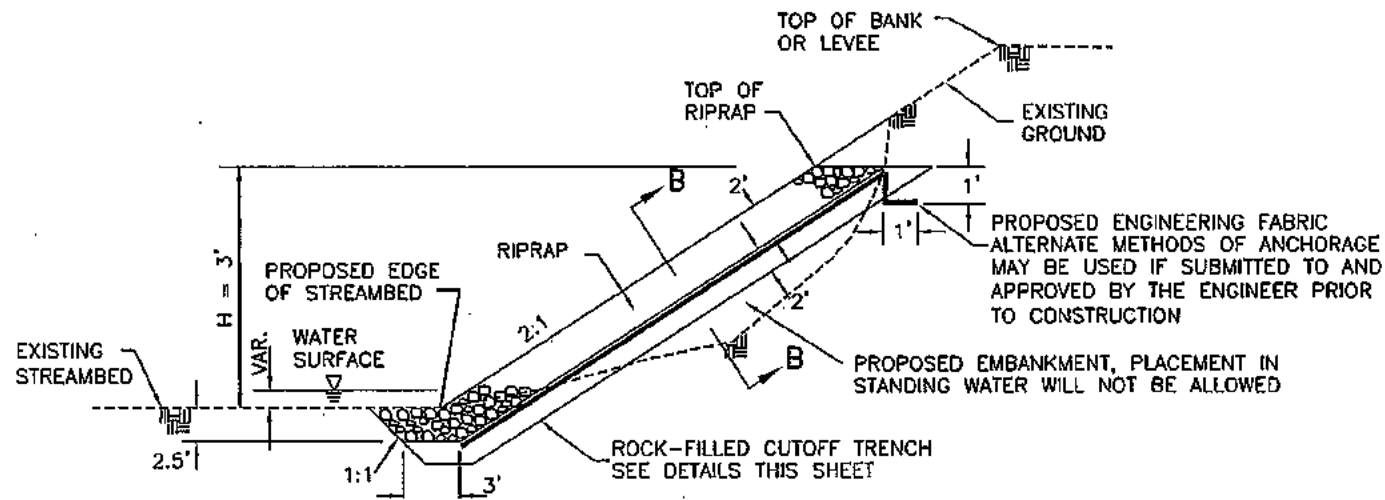
ROCK-FILLED CUTOFF TRENCH DETAILS

CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES
NO SCALE

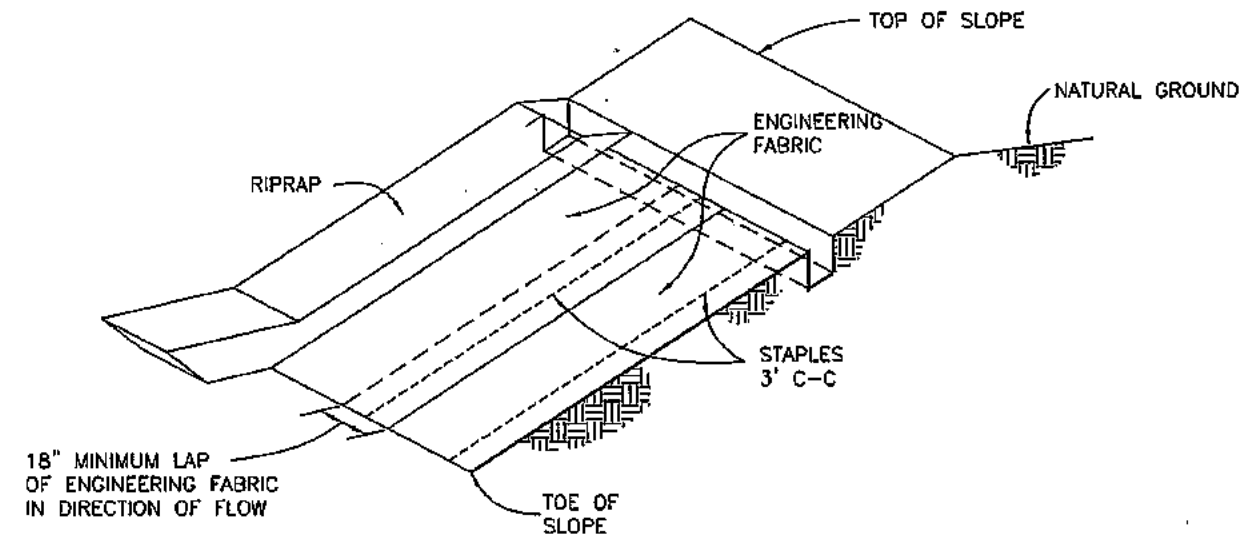


DETAIL OF TRENCH

STAPLE



TYPICAL HALF-CHANNEL BANK STABILIZATION SECTION
NO SCALE

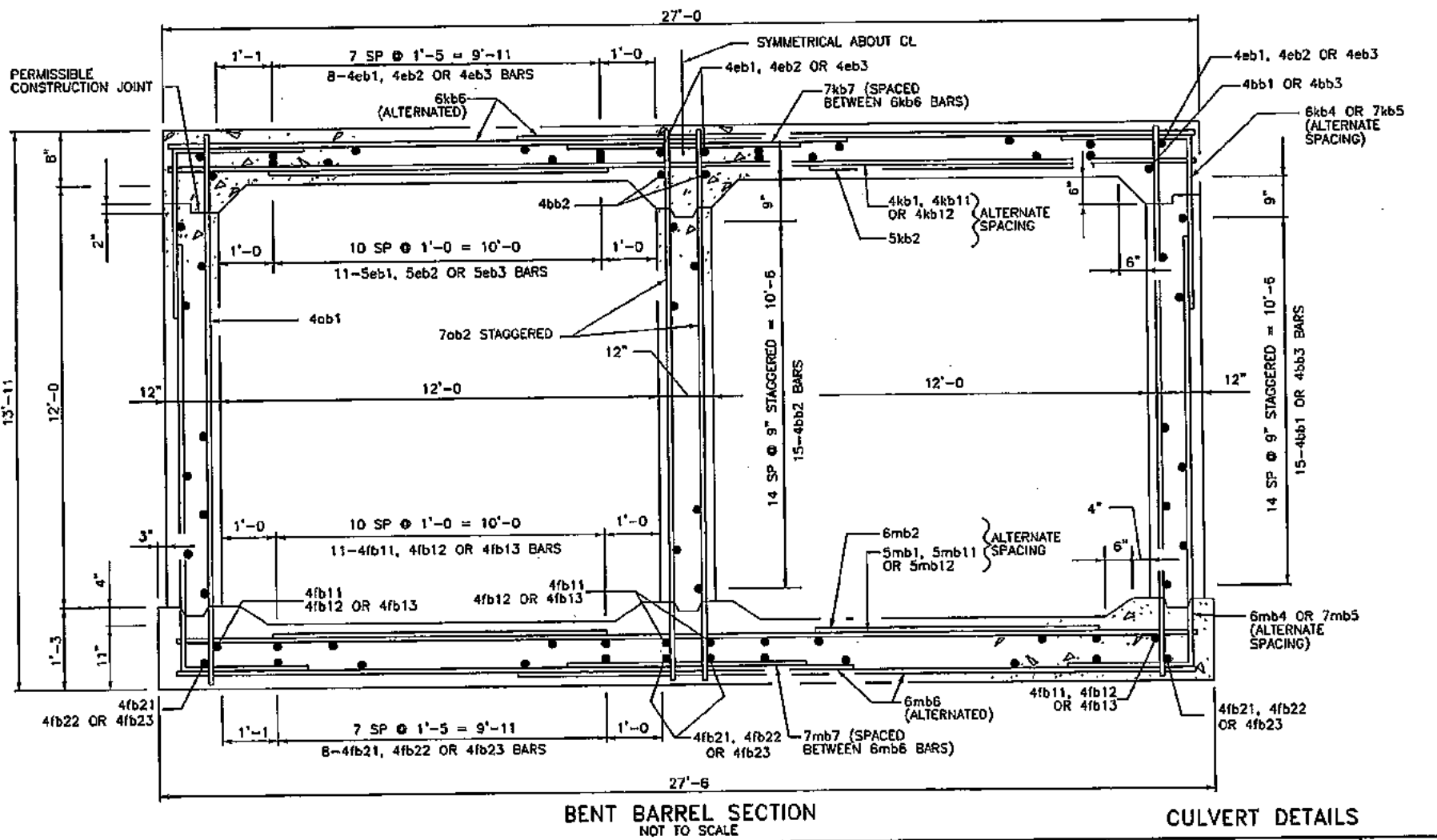
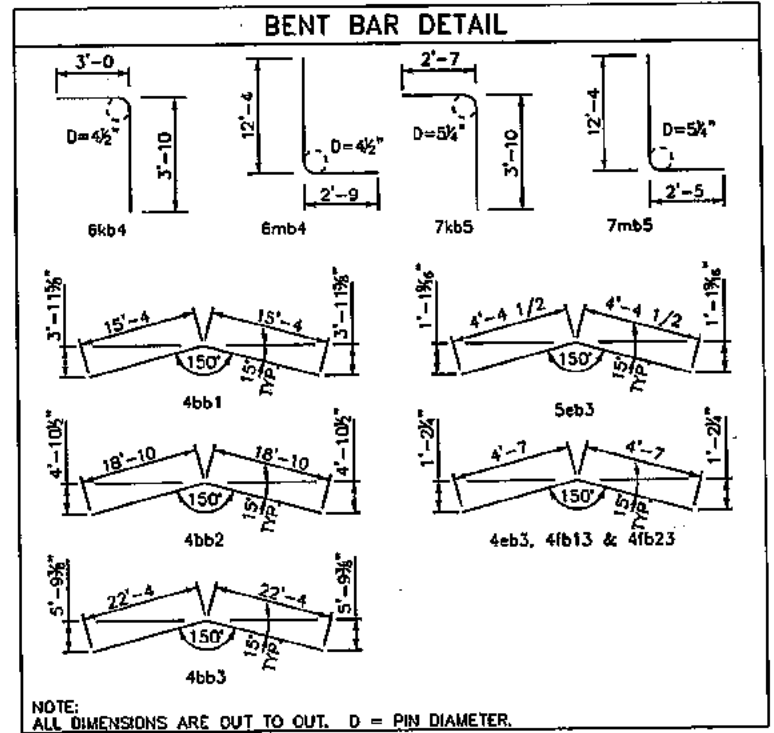


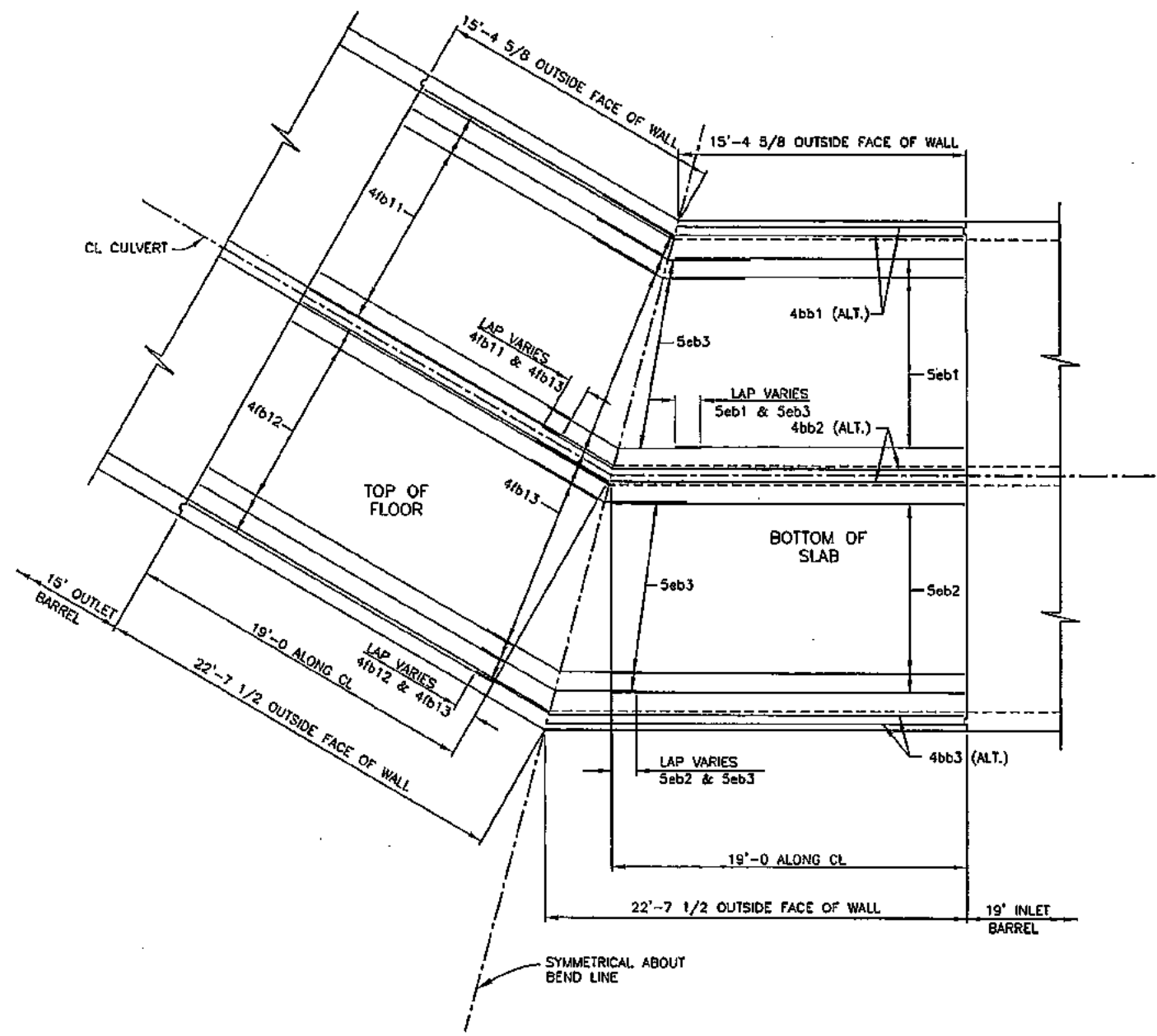
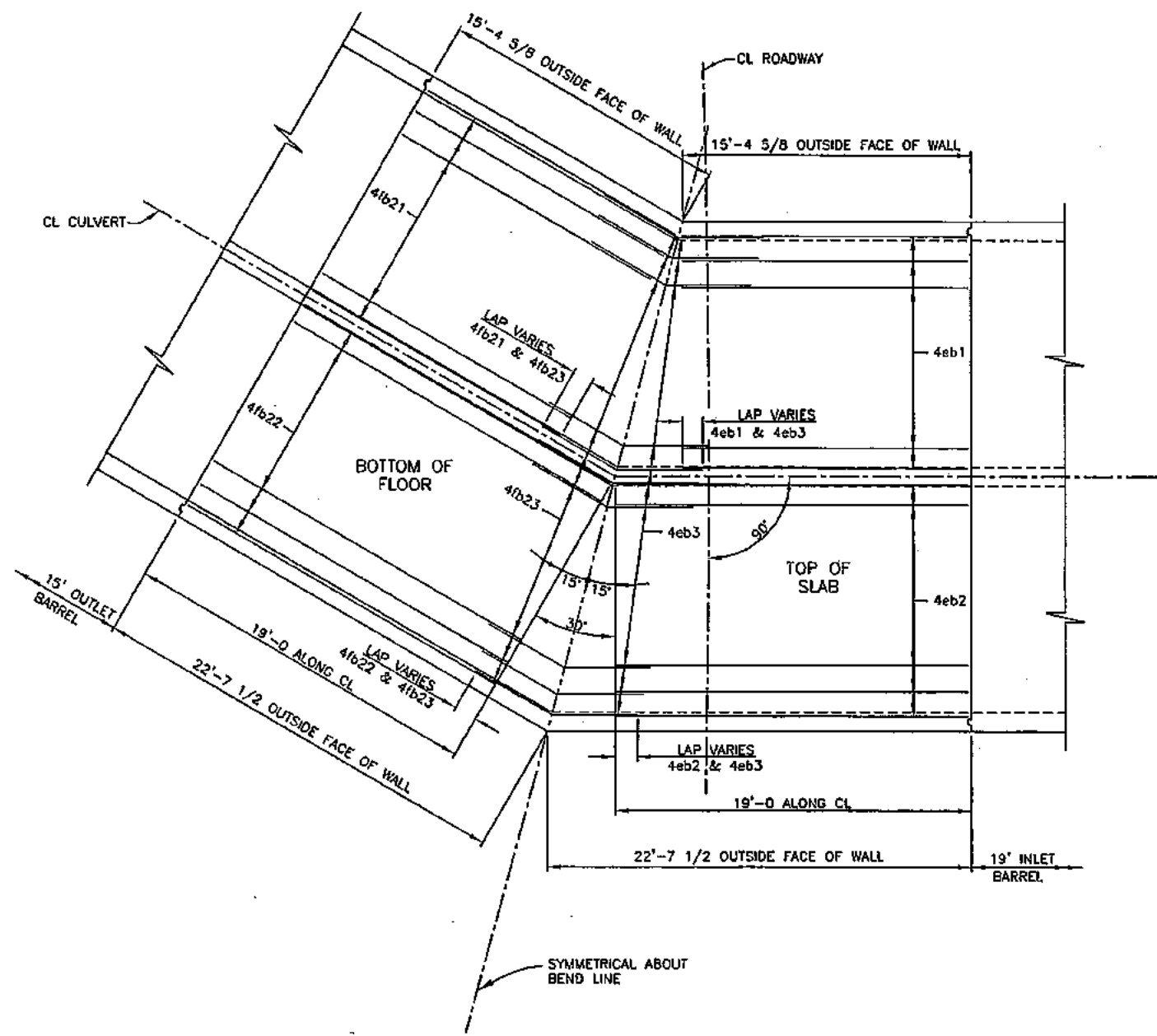
DETAILS OF PLACEMENT OF ENGINEERING FABRIC
NO SCALE

EXCAVATE 12"x12" TRENCH ALONG TOP OF RIPRAP. PLACE END OF ENGINEERING FABRIC STRIPS INTO TRENCH WITH STAPLES AS SHOWN. BACKFILL WITH THE EXCAVATED MATERIAL AND COMPACT. THE ENGINEER MAY PERMIT THE USE OF THE WHEELS OF PNEUMATIC-TIRED EQUIPMENT FOR CONSOLIDATING THE TRENCH BACKFILL MATERIAL.

REINFORCING BAR LIST - BENT BARREL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4ob1	EXTERIOR WALLS, FRONT FACE, VERT.	—	152	13'-6"	1371
7ob2	INTERIOR WALLS, BOTH FACES, VERT.	—	51	13'-6"	1408
4bb1	EXT. WALL, S. BOTH FACES, HORIZ.	∧	16	30'-8"	328
4bb2	INT. WALL, BOTH FACES, HORIZ.	∧	17	37'-8"	428
4bb3	EXT. WALL, L. BOTH FACES, HORIZ.	∧	16	44'-8"	478
5eb1	SLAB, BOTTOM, LONGITUDINAL, S	—	22	15'-5"	354
5eb2	SLAB, BOTTOM, LONGITUDINAL, L	—	22	18'-10"	433
5eb3	SLAB, BOTTOM, LONGITUDINAL, B	∧	22	8'-9"	201
4eb1	SLAB, TOP, LONGITUDINAL, S	—	20	15'-5"	206
4eb2	SLAB, TOP, LONGITUDINAL, L	—	20	18'-10"	252
4eb3	SLAB, TOP, LONGITUDINAL, B	∧	20	9'-2"	123
4fb11	FLOOR, TOP, LONGITUDINAL, S	—	26	15'-5"	268
4fb12	FLOOR, TOP, LONGITUDINAL, L	—	26	18'-10"	328
4fb13	FLOOR, TOP, LONGITUDINAL, B	∧	26	8'-2"	160
4fb21	FLOOR, BOTTOM, LONGITUDINAL, S	—	20	15'-5"	206
4fb22	FLOOR, BOTTOM, LONGITUDINAL, L	—	20	18'-10"	252
4fb23	FLOOR, BOTTOM, LONGITUDINAL, B	∧	20	9'-2"	123
4kb1	SLAB, BOTTOM, TRANSVERSE	—	44	26'-8"	784
5kb2	SLAB, BOTTOM, TRANSVERSE	—	92	7'-11"	760
6kb4	SLAB, TOP, CORNER	L	54	6'-10"	554
7kb5	SLAB, TOP, CORNER	L	48	6'-5"	630
6kb6	SLAB, TOP, TRANSVERSE	—	37	17'-7"	977
7kb7	SLAB, TOP, TRANSVERSE	—	36	5'-10"	430
6kb9	SLAB, TOP, TRANSVERSE	—	4	26'-8"	161
4kb11	SLAB, BOTTOM, TRANSVERSE	—	7	23'-2"	109
4kb12	SLAB, BOTTOM, TRANSVERSE	—	8	19'-6"	105
5mb1	FLOOR, TOP, TRANSVERSE	—	34	27'-2"	964
6mb2	FLOOR, TOP, TRANSVERSE	—	76	8'-0"	914
5mb4	FLOOR, BOTTOM, CORNER	L	54	15'-1"	1224
7mb5	FLOOR, BOTTOM, CORNER	L	48	14'-9"	1448
6mb6	FLOOR, BOTTOM, TRANSVERSE	—	37	17'-10"	991
7mb7	FLOOR, BOTTOM, TRANSVERSE	—	36	5'-8"	417
5mb9	FLOOR, BOTTOM, TRANSVERSE	—	4	27'-2"	164
5mb11	FLOOR, TOP, TRANSVERSE	—	9	22'-8"	213
5mb12	FLOOR, TOP, TRANSVERSE	—	10	18'-0"	188
TOTAL (LBS.)					17952

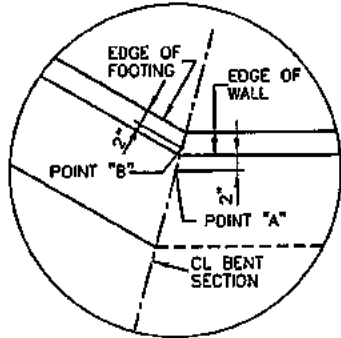




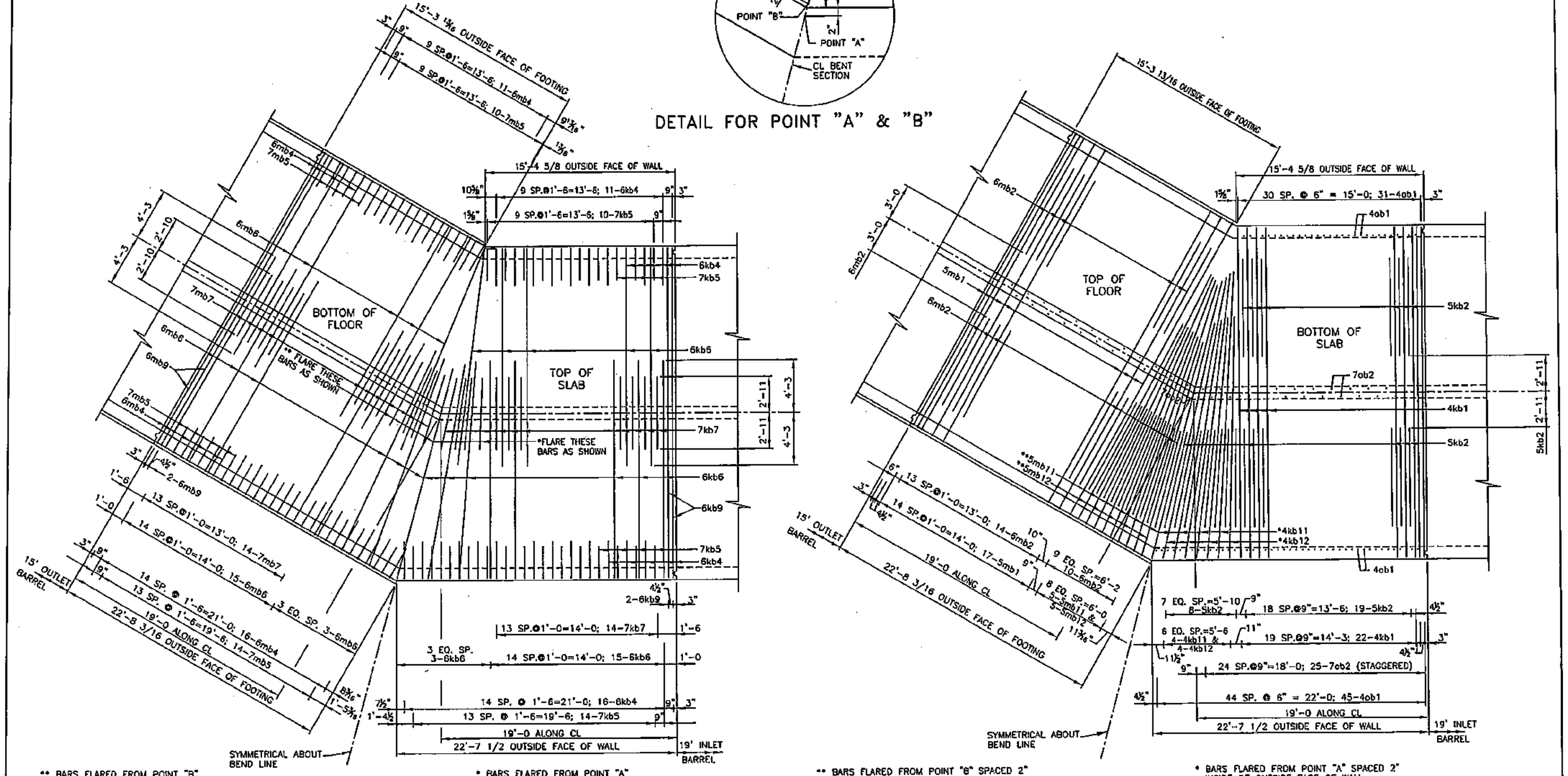
BENT SECTION - LONGITUDINAL BAR LAYOUT



CULVERT DETAILS



DETAIL FOR POINT "A" & "B"



** BARS FLARED FROM POINT "B" SPACED 2" INSIDE OF OUTSIDE FACE OF FOOTING.

* BARS FLARED FROM POINT "A" SPACED 2" INSIDE OF OUTSIDE FACE OF WALL.

** BARS FLARED FROM POINT "B" SPACED 2" INSIDE OF OUTSIDE FACE OF FOOTING.

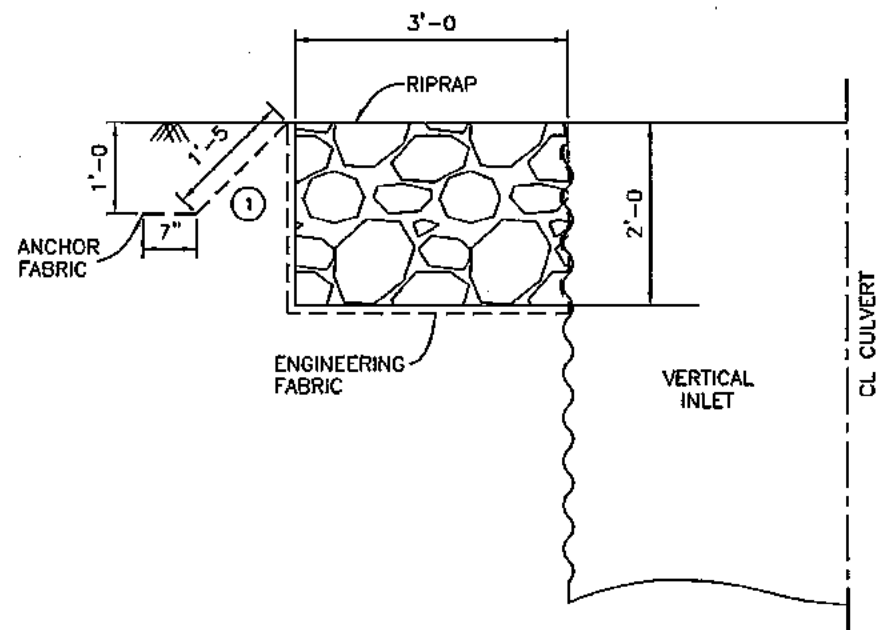
* BARS FLARED FROM POINT "A" SPACED 2" INSIDE OF OUTSIDE FACE OF WALL.

NOTE:
ADJUST FLARED BARS AS REQUIRED TO MAINTAIN 3" CLEARANCE CNTR-CNTR BARS.

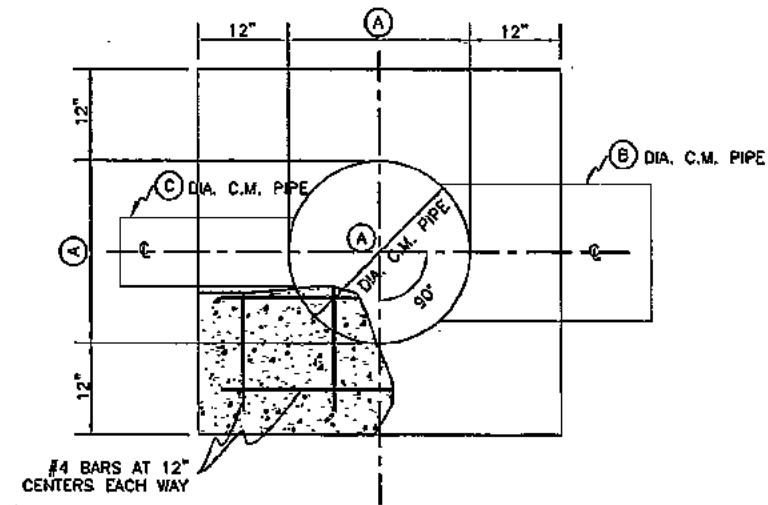
BENT SECTION - TRANSVERSE BAR LAYOUT



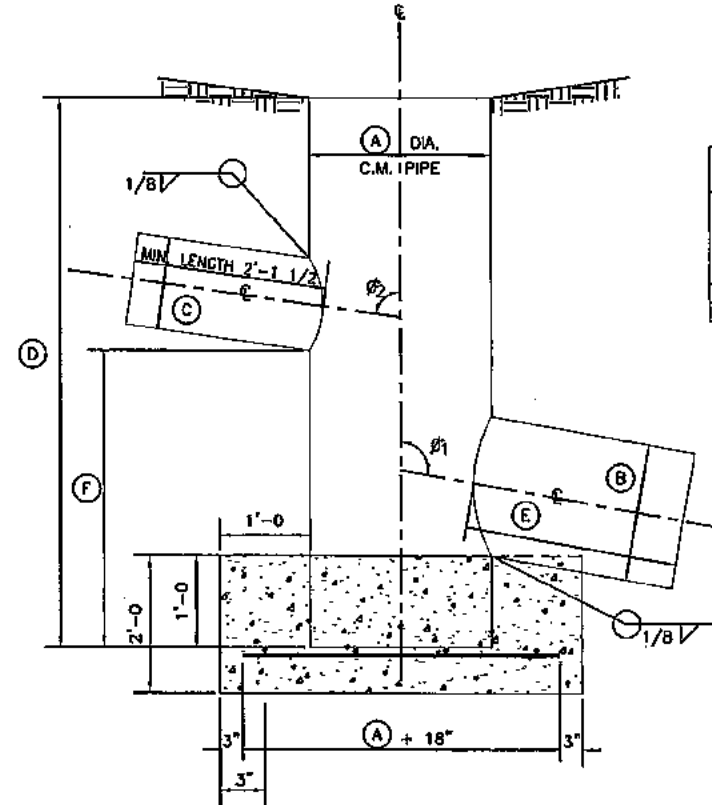
CULVERT DETAILS



DETAILS OF PLACEMENT OF RIPRAP AND ENGINEERING FABRIC
NO SCALE



TYPICAL PLAN VIEW



TYPICAL SECTION ON CENTERLINE

VERTICAL INLET TO BE SHOP FABRICATED. MATERIALS AND METHODS USED IN THE FABRICATION SHALL CONFORM TO CURRENT IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CORRUGATED METAL PIPE CULVERTS. ALL METAL PARTS AND HARDWARE SHALL BE GALVANIZED AS PER CURRENT IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. ANY DAMAGE TO PROTECTIVE COATING RESULTING FROM INSTALLATION OF CULVERT SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER.

TABLE -- DIMENSIONS AND MATERIAL

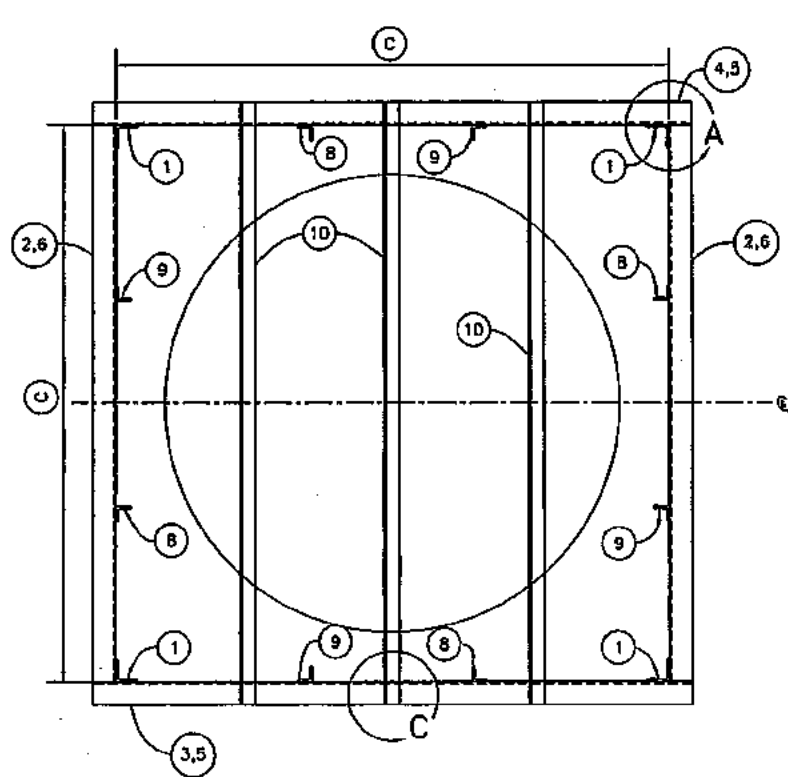
STATION	13+46
(A)	54"
(B)	36"
(C)	-
(D)	6'-0"
(E)	4'-0"
(F)	-
END CAPS REQUIRED 0	
SHEET THICKNESS FOR (A) DIA. 0.079"	
SHEET THICKNESS FOR (B) DIA. 0.079"	
SHEET THICKNESS FOR (C) DIA. -	
β DEGREES - ANGLE β ₁ 91°23'04"	
β ₂ -	
β ₃ -	
β ₄ -	

VERTICAL INLET BASE QUANTITIES

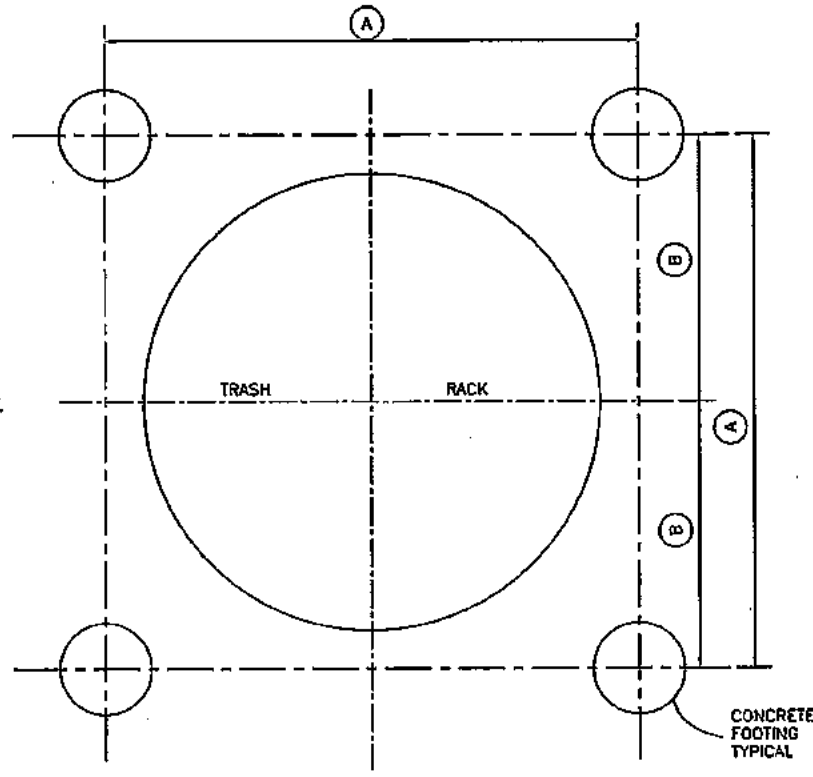
DIMENSION (A)	CONCRETE CU. YDS.	STEEL REINFORCEMENT #4 BAR		
		LENGTH EACH BAR	NUMBER OF BARS	TOTAL WEIGHT POUNDS
54"	3.1	6'-0"	14	56.1

① ALTERNATE METHODS OF ANCHORAGE OF ENGINEERING FABRIC MAY BE USED IF SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

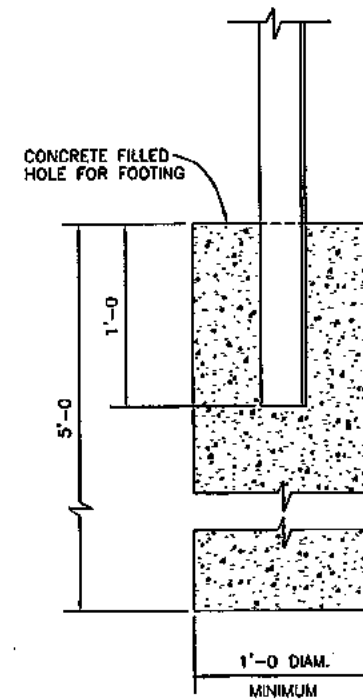
DETAILS OF CORRUGATED METAL PIPE VERTICAL INLET



PLAN



CONCRETE FOOTING LAYOUT



CONCRETE FOOTING DETAIL

A VOID SHALL BE FORMED IN THE CONCRETE FOOTINGS TO RECEIVE THE MARK 1 POSTS. THE VOID SHALL BE ONE FOOT DEEP. THE CROSS SECTION OF THE VOID MAY BE TRIANGULAR, RECTANGULAR OR CIRCULAR WITH 1/4" CLEARANCE BETWEEN THE CONCRETE AND THE MARK 1 POST

AFTER THE POSTS ARE INSTALLED, THE REMAINING VOIDS SHALL BE FILLED WITH ASPHALT.

TRASH RACK BILL OF MATERIALS			
MARK	QUANTITY	ITEM	LENGTHS 54" DIAM.
1	4	L ^S 3"x3"x5/16"	4'-11"
2	2	"	6'-1"
3	1	"	6'-7"
4	1	"	6'-7"
5	2	L ^S 2"x2"x3/16"	6'-5"
6	2	"	6'-1"
7	0	"	-
8	4	"	3'-11"
9	4	"	3'-11"
10	3	"	6'-7"
45		1/2" ϕ MACHINE BOLTS W/LOCK WASHERS & HEX NUTS	
	0.6 CY	CONCRETE	

CONSTRUCTION NOTES:

STRUCTURE IS SYMMETRICAL ABOUT CL.

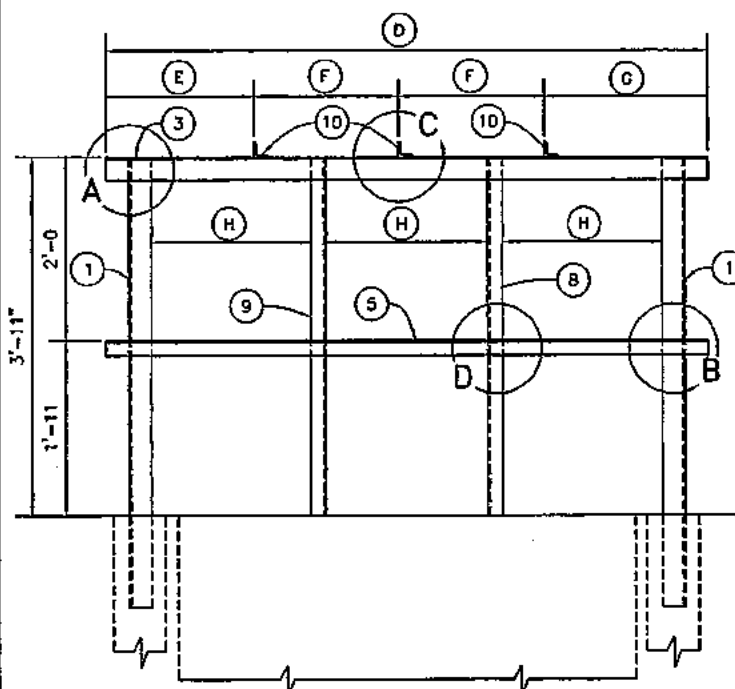
TRASH RACK TO BE FABRICATED OF STEEL ANGLES BOLTED TOGETHER WITH 1/2" ϕ MACHINE BOLTS.

ALL CUTS SHALL BE SAW CUTS.

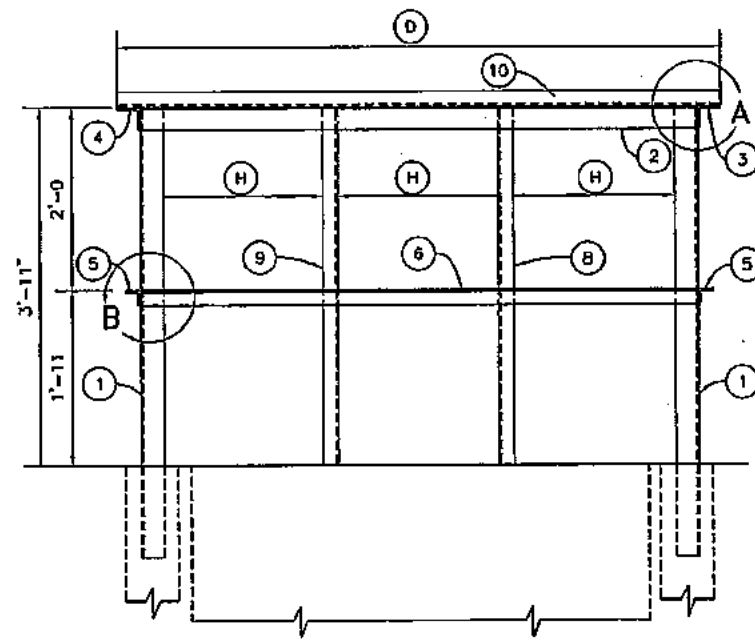
ALL HOLES FOR BOLTS SHALL BE 1/16" ϕ LARGER THAN BOLT DIAM.

ALL ANGLES AND BOLTS SHALL BE GALVANIZED.

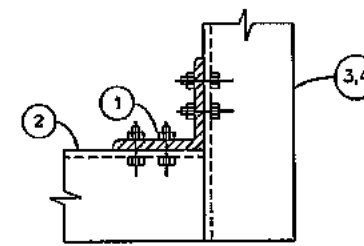
TRASH RACK DIMENSIONS	
MARK	54" DIAM.
A	5'-10"
B	2'-11"
C	6'-1"
D	6'-7"
E	1'-7 1/2"
F	1'-7"
G	1'-9 1/2"
H	1'-9"



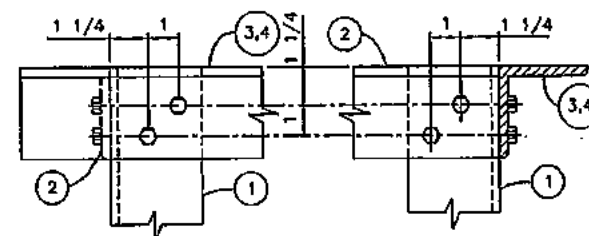
RIGHT SIDE ELEVATION



FRONT ELEVATION

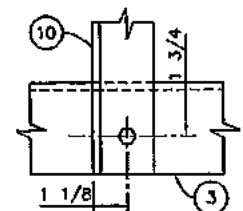


PLAN

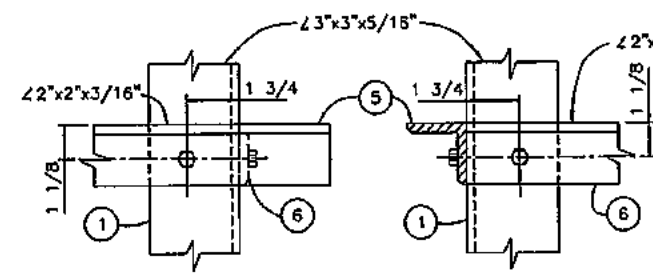


SIDE ELEV. VIEW "A"

FRONT ELEV.

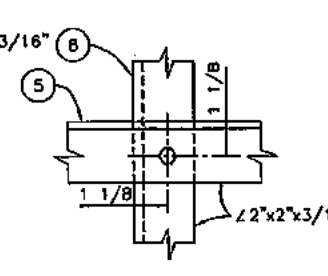


PLAN

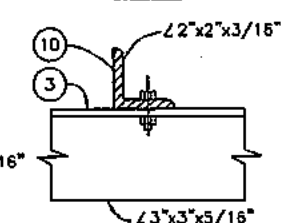


SIDE ELEV. VIEW "B"

FRONT ELEV.



SIDE ELEV. VIEW "D"



SIDE ELEV. VIEW "C"

