

13024

LETTING DATE  
02-16-10  
RCB CULVERT NEW - TWIN BOX  
BRS-C024(94)--60-24

### 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

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NO. 14, PERMIT NO. CEMVR-DD-P-2009-1335. A COPY OF THIS PERMIT IS AVAILABLE FROM THE CRAWFORD COUNTY ENGINEER'S OFFICE UPON REQUEST. 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 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. BRS-C024(94)--60-24 RCB CULVERT NEW - TWIN BOX County Road M40 (Boyer Blvd) over Unnamed Tributary to the Boyer River

SCALES: AS NOTED

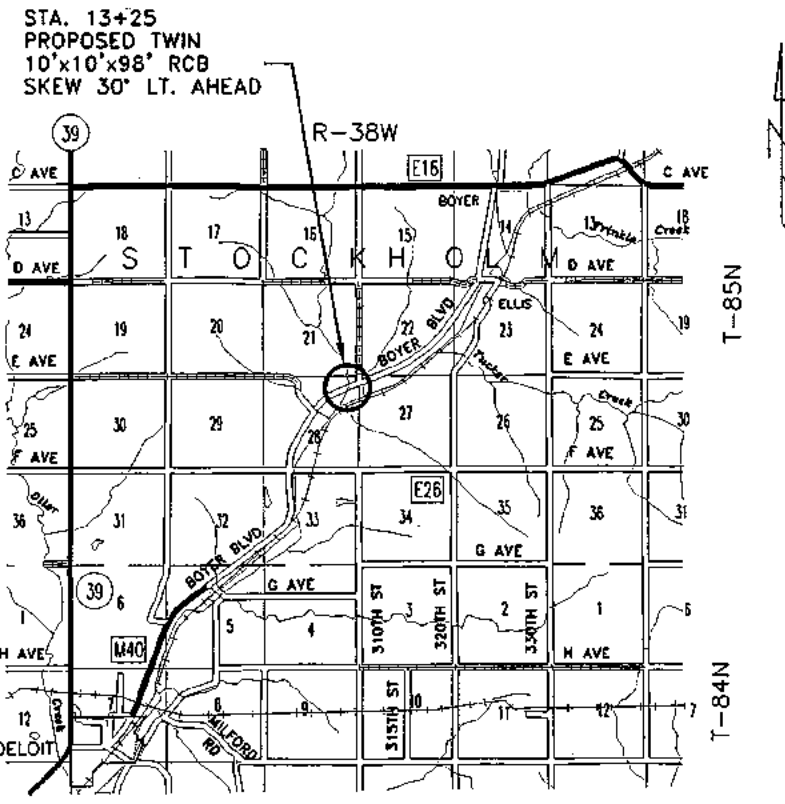
The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2009, plus General Supplemental Specifications; and applicable Supplemental Specifications, Developmental Specifications, and Special Provisions, shall apply to construction on this project.

TOTAL SHEETS	15
PROJECT NUMBER	BRS-C024(94)--60-24
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	

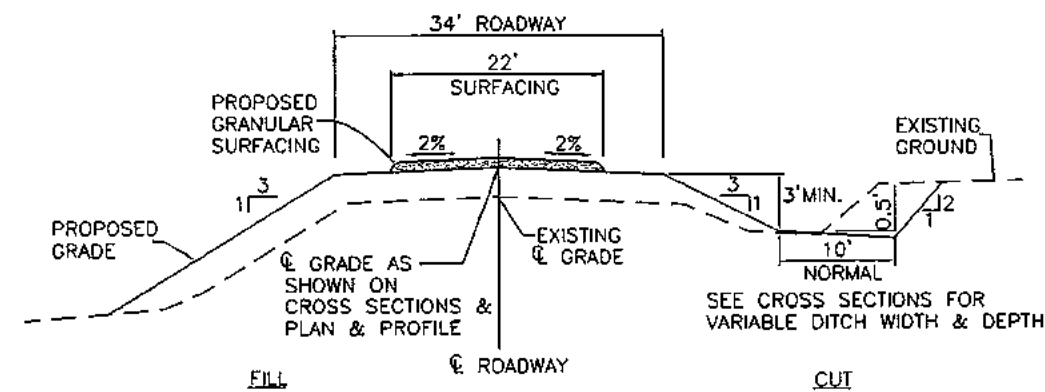
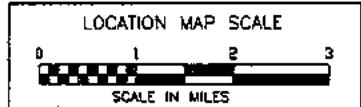
INDEX OF SHEETS	
NO.	DESCRIPTION
A1	TITLE SHEET
B1-2	ESTIMATE OF QUANTITIES AND GENERAL INFORMATION
C1-3	POLLUTION PREVENTION PLAN AND TABULATIONS, TYPICALS
Q1	SOIL SHEET
U1-4	SPECIAL DETAILS
VI	CULVERT SITUATION PLAN
W1	CROSS SECTIONS - ROADWAY
Z1-2	CROSS SECTIONS - CHANNEL

STANDARD BRIDGE PLANS		
STANDARD	ISSUED	REVISED
TWRCE-G1-87	JULY, 1987	01-09
TWRCE 10-10-87	JULY, 1987	12-5-96
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

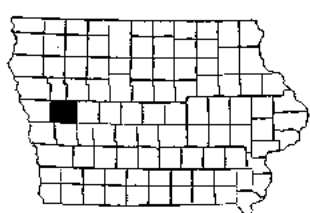
MILEAGE SUMMARY		
LOCATION	LIN. FT.	MILES
BOP STA. 11+00 TO EOP STA. 14+40	340.00	
NET LENGTH OF ROADWAY	340.00	0.064



LOCATION MAP



TYPICAL CROSS SECTION  
NOT TO SCALE



DESIGN DATA RURAL		
04-30-02	101-4	
2006 AADT	80	V.P.D.
2020 AADT	120	V.P.D.
20 DHV	X	V.P.H.
TRUCKS	X	%
TOTAL		
DESIGN ESALS		

Approved	<i>Mark Lambert</i>
	<i>John P. Lawler</i>
	<i>Steve Elson</i>
	<i>Robert Bohmann</i>
	<i>N. Upel</i>
BOARD OF SUPERVISORS	

Approved	<i>[Signature]</i>	11/12/09
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.

*John A. Munson III*  
JOHN A. MUNSON III, P.E. & L.S. #11118 DATE 11-9-09

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2010.  
PAGES OR SHEETS COVERED BY THIS SEAL:  
ALL SHEETS

**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**

**2101-0850001 CLEARING AND GRUBBING**  
INCLUDES CLEARING AND GRUBBING WITHIN THE LIMITS IDENTIFIED ON PLAN SHEET V1.

**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

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% (PERCENT) OF THE DENSITY AS DETERMINED BY ASTM D698 VALUES. A MINIMUM OF TWO IN-PLACE DENSITY TESTS SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY RETAINED BY THE CONTRACTOR. COST OF DENSITY TESTING SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO PRICE BID FOR THIS ITEM. REFER TO DETAILS ON PLAN SHEET U1.

**2102-2710070 EXCAVATION, CLASS 10, ROADWAY AND BORROW**  
INCLUDES 179 C.Y. CUT, 4,542 C.Y. FILL +35% SHRINK. 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 SHALL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES. REFER TO TABULATION ON PLAN SHEET C1.

**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 PLACEMENT OF 120 CY (89 X 1.35) OF 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 V1.

PAYMENT SHALL BE BASED ON PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.

**2107-3825025 GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN**  
REFER TO DETAILS ON PLAN SHEETS U1 AND V1. POROUS BACKFILL MATERIAL FOR THE FOUNDATION DRAINAGE SYSTEM SHALL MEET THE REQUIREMENTS OF SECTION 4131 OF THE STANDARD SPECIFICATIONS.

EXCAVATION REQUIRED TO INSTALL POROUS BACKFILL MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

**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.

**2312-8260051 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**  
INCLUDES EXISTING 42' X 22' SINGLE SPAN CONCRETE BEAM BRIDGE AT STA. 13+25.

**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.

REMOVAL OF ABANDONED TIMBER PILING IN ACCORDANCE WITH ARTICLE 2401.03, C, 1, OF THE STANDARD SPECIFICATIONS SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

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 SLAB.

**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 IN THE RCB CULVERT.

**ESTIMATED PROJECT QUANTITIES**

100-1A  
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	1.5	
2	2102-0425070	SPECIAL BACKFILL	TON	337	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	4542	
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1677	
5	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	146	
6	2107-3825025	GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN	CY	75	
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	495	
8	2210-0475290	MACADAM STONE BASE	TON	264	
9	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	107	
10	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	
11	2402-2720000	EXCAVATION, CLASS 20	CY	2770	
12	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	401.1	
13	2404-7775000	REINFORCING STEEL	LB	58502	
14	2501-5775000	PILES, STEEL SHEET	SF	357	
15	2502-8212306	SUBDRAIN, STANDARD, PERFORATED, 6 IN., AS PER PLAN	LF	162	
16	2502-8220197	SUBDRAIN OUTLET (RF-19F)	EACH	2	
17	2507-3250005	ENGINEERING FABRIC	SY	1140	
18	2507-6800021	REVTMENT, CLASS B	TON	63	
19	2518-6910000	SAFETY CLOSURE	EACH	4	
20	2528-8445110	TRAFFIC CONTROL	LS	1	
21	2533-4980005	MOBILIZATION	LS	1	
22	2601-2634100	MULCHING	ACRE	0.9	
23	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.9	
24	2602-0000020	SILT FENCE	LF	445	

**STANDARD ROAD PLANS**

105-4  
10-16-07

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

NUMBER	DATE	SHEETS	TITLE
RC-17	00-00-00	2	SILT FENCE
RF-19A	07-15-97	1	SUBDRAINS FOR FILL OR FOUNDATION DRAINAGE (STANDARD)
RF-19F	04-25-00	1	SUBDRAIN OUTLETS (STANDARD SUBDRAIN, PRESSURE RELEASE AND SPECIAL)
RL-1A	10-03-00	1	DETAILS OF EMBANKMENT AND REBUILDING EMBANKMENTS
TC-252	10-20-09	2	ROAD CLOSURE

**2501-5775000 PILES, STEEL SHEET**  
SHALL BE 5 GAGE STEEL SHEETING WITH A MINIMUM SECTION MODULUS OF 3.3 CU. IN. PER FT. REFER TO DETAILS ON PLAN SHEET U1.

**2502-8212306 SUBDRAIN, STANDARD, PERFORATED, 6 IN., AS PER PLAN**  
REFER TO DETAILS ON PLAN SHEETS U1 AND V1. PORTIONS OF SUBDRAIN NOT EMBEDDED IN POROUS BACKFILL SHALL BE NON-PERFORATED.

**2502-8220197 SUBDRAIN OUTLET (RF-19F)**  
REFER TO DETAILS ON PLAN SHEETS U1 AND V1. SHALL BE SPECIAL OUTLET TYPE C. MATERIAL SHALL BE CORRUGATED METAL PIPE.

**2507-3250005 ENGINEERING FABRIC**  
ITEM INCLUDES 783 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 83 S.Y. OF ENGINEERING FABRIC PLACED UNDER THE CLASS B REVETMENT. SEE PLAN SHEET U1 FOR INSTALLATION DETAILS. MATERIAL SHALL CONFORM TO IOWA DOT MATERIALS IM 496.01 APPENDIX C, EMBANKMENT EROSION CONTROL (ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS).

ITEM INCLUDES 274 S.Y. OF ENGINEERING FABRIC PLACED AROUND FOUNDATION DRAIN (POROUS BACKFILL). MATERIAL SHALL CONFORM TO IOWA DOT MATERIALS IM 496.01 APPENDIX A, EMBANKMENT EROSION CONTROL (ARTICLE 4196.01, B OF THE STANDARD SPECIFICATIONS). REFER TO DETAILS ON PLAN SHEET U1.

MATERIAL SHALL BE JOINED BY OVER LAPPING 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**  
THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS. REFER TO DETAILS ON PLAN SHEETS U1 AND V1.

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 WILL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

**2518-6910000 SAFETY CLOSURE**  
REFER TO TABULATION ON PLAN SHEET C1.

**2602-0000020 SILT FENCE**  
REFER TO DETAILS ON PLAN SHEETS C2 AND C3. QUANTITY INCLUDES 40 LF OF SILT FENCE FOR DITCH CHECKS.

**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.

EQUIPMENT FOR HANDLING AND CONVEYING MATERIALS DURING CONSTRUCTION SHALL BE OPERATED TO PREVENT DUMPING OR SPILLING THE MATERIAL INTO WATERBODIES, STREAMS OR WETLANDS EXCEPT AS APPROVED HEREIN AND IN THE 404 PERMIT.

CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED DURING LOW TO NORMAL FLOWS. LOW TO NORMAL FLOWS SHALL BE DETERMINED IN CONSULTATION WITH THE PROJECT ENGINEER AND ARE DEFINED AS FLOWS AT OR BELOW THE ORDINARY HIGH WATER MARK. THE ORDINARY HIGH WATER MARK IS THAT LINE ON THE SHORE OF A STREAM OR WATERBODY ESTABLISHED BY THE FLUCTUATIONS OF WATER AND BEST INDICATED BY THE LINE IMPRESSED ON THE BANK CONTAINING VEGETATION ABOVE AND BARE SOIL BELOW.

THE PRIME CONTRACTOR SHALL EMPLOY CONTROLS TO REDUCE THE EROSION OF LAND ADJACENT TO SURFACE WATERS AND WETLANDS, INCLUDING ESTABLISHMENT AND MAINTENANCE OF EROSION CONTROL DURING AND AFTER CONSTRUCTION AND REVEGETATION OF ALL DISTURBED AREAS UPON PROJECT COMPLETION. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL EROSION CONTROL MEASURES.

CARE SHALL BE TAKEN TO PREVENT ANY PETROLEUM PRODUCTS, CHEMICALS, OR OTHER DELETERIOUS MATERIALS FROM ENTERING WATERBODIES, STREAMS OR WETLANDS.

ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF AT AN UPLAND, NON-WETLAND LOCATION, IN SUCH A MANNER THAT IT CANNOT ENTER A WATERWAY OR WETLAND.

CONSTRUCTION EQUIPMENT, ACTIVITIES, AND MATERIALS SHALL BE KEPT OUT OF STREAMS AND WETLANDS TO THE MAXIMUM EXTENT POSSIBLE.

CLEARING AND GRUBBING OF VEGETATION, INCLUDING TREES LOCATED IN OR IMMEDIATELY ADJACENT TO WETLANDS AND STREAMS, SHALL BE LIMITED TO THAT WHICH IS ABSOLUTELY NECESSARY FOR CONSTRUCTION OF THE PROJECT. ALL VEGETATIVE MATERIAL REMOVED FROM THE RIGHT OF WAY SHALL BE DISPOSED OF AT AN UPLAND, NON-WETLAND LOCATION.

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.

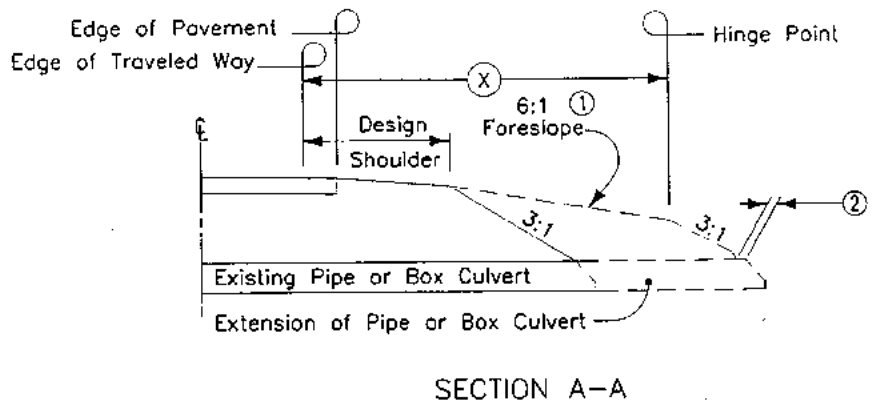
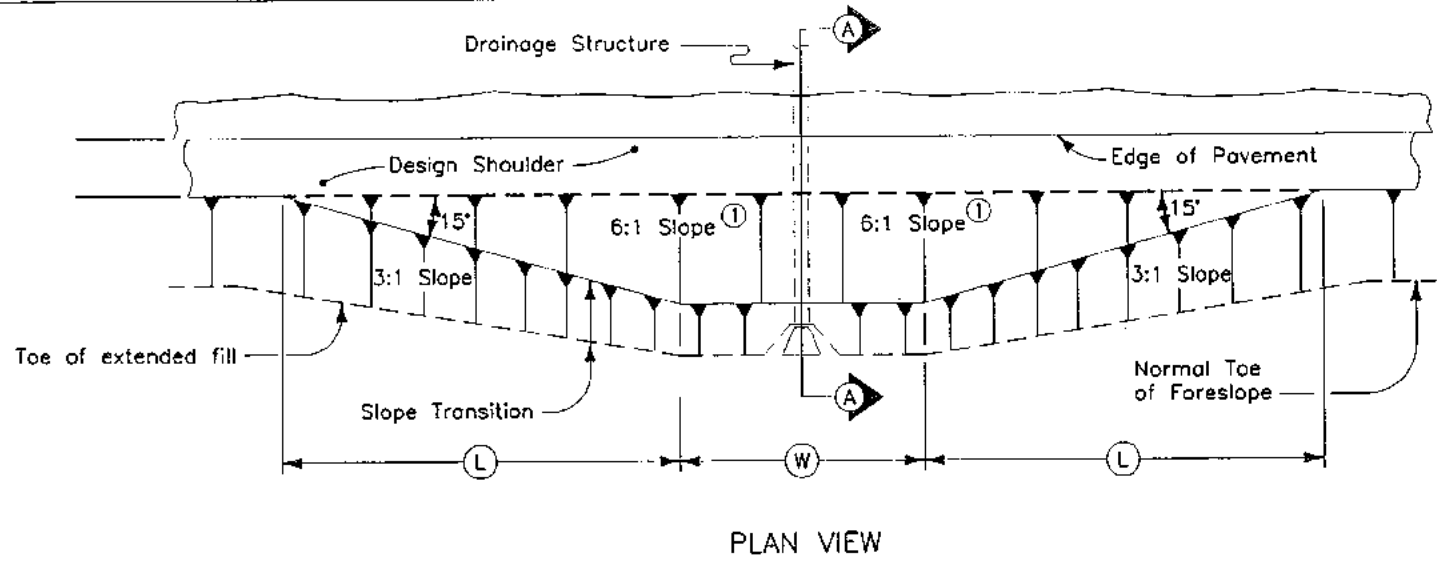
10-27-98 213-4  
THE CONTRACTOR SHALL APPLY NECESSARY MOISTURE TO THE CONSTRUCTION AREA AND HAUL ROADS TO PREVENT THE SPREAD OF DUST. REFER TO ARTICLE 1107.07 OF THE CURRENT STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

01-19-88 251-1  
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.

## ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION



- 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+97.6	R	59.9	14.9	10
13+46.7	L	66.3	14.9	10

DETAILS OF  
BARNROOF FORESLOPE  
AT DRAINAGE STRUCTURE

PLACEMENT OF QUANTITIES					
TWIN 10'x10'x98' RCB CULVERT					
LOCATION	CONCRETE C.Y.				STEEL LBS.
	SLAB	FLOOR	WALLS	TOTAL	
BASIN		31.8	12.0	43.8	6804
CHUTE**		30.4	23.8	54.2	8689
BARREL*	63.9	82.4	87.1	233.4	34737
HEADWALL	2.7	47.0	20.0	69.7	8472
TOTAL	66.6	191.6	142.9	401.1	58502

TABULATION OF EARTHWORK QUANTITIES							
STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
11+00							
12+00	47		176		47	176	
12+95	83		1446	139	83	1585	
13+47.54	35		1554	147	35	1701	
14+00	14		978		14	978	
14+40	0		102		0	102	
TOTAL					179	4542	

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

\*INCLUDES 5r1 x 3'-6" DOWEL BARS @ 1'0" SPACING REQUIRED IN SLAB AT ALL CULVERT BARREL JOINTS. THESE BARS EXTEND THRU ALL JOINTS BETWEEN SECTIONS EXCEPT AT HEADWALL. 5r1 BARS REQUIRED PER JOINT = 22  
TOTAL WEIGHT PER JOINT = 80 LBS.

\*\* INCLUDES PARAPET

TABULATION OF SAFETY CLOSURES			
Refer to Section 2516 of the S't'd. Specifications			
STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
10+00	1	-	SOUTH END
12+50	-	1	SOUTH END
14+00	-	1	NORTH END
16+00	1	-	NORTH END

TABULATIONS, TYPICALS

POLLUTION PREVENTION PLAN

110-12A  
02-23-93

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 FARM-TO-MARKET BOX CULVERT ON COUNTY ROAD M40 (BOYER BLVD.) OVER AN UNNAMED TRIBUTARY TO THE BOYER RIVER.

THIS PPP COVERS APPROXIMATELY 1.5 ACRES WITH AN ESTIMATED 1.5 ACRES BEING DISTURBED. THE PORTION OF THE PPP COVERED BY THIS CONTRACT HAS 1.5 ACRES DISTURBED.

THE PPP IS LOCATED IN AN AREA OF ONE SOIL ASSOCIATION (MARSHALL). THE ESTIMATED AVERAGE NRCS RUNOFF CURVE NUMBER FOR THIS PPP AFTER COMPLETION WILL BE 63.

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 VARIOUS UNNAMED DITCHES, TRIBUTARIES AND WATERWAYS WHICH FLOW INTO BOYER RIVER.

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

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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 TO 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

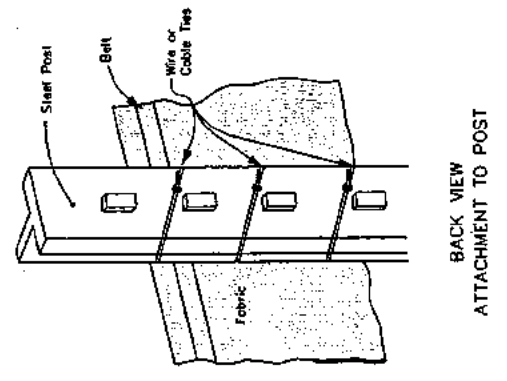
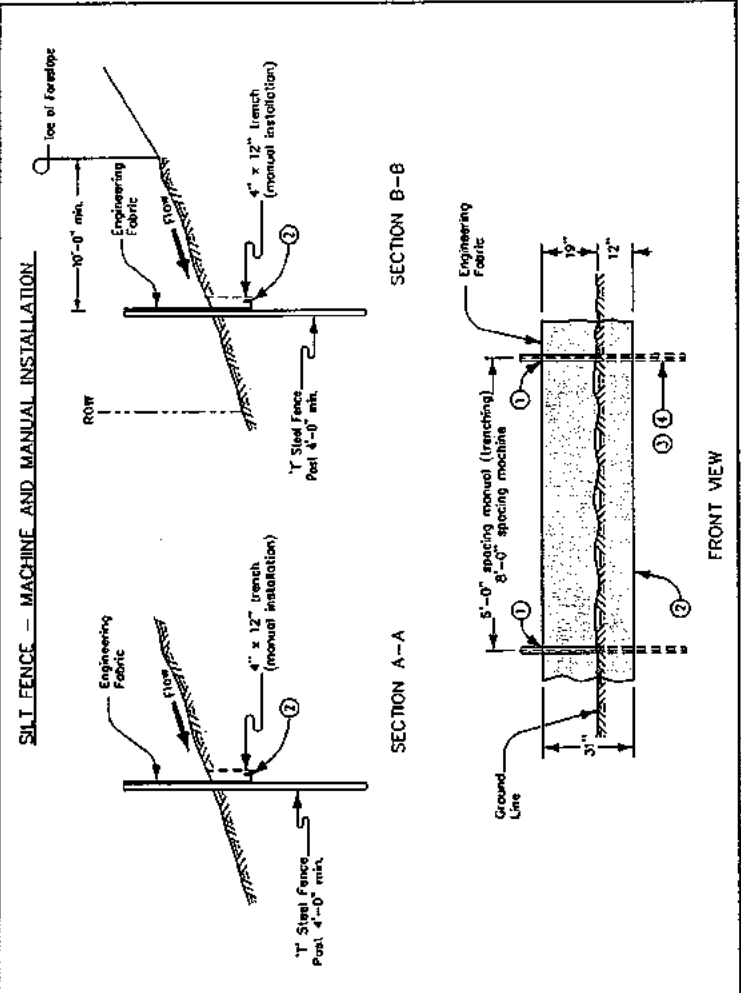
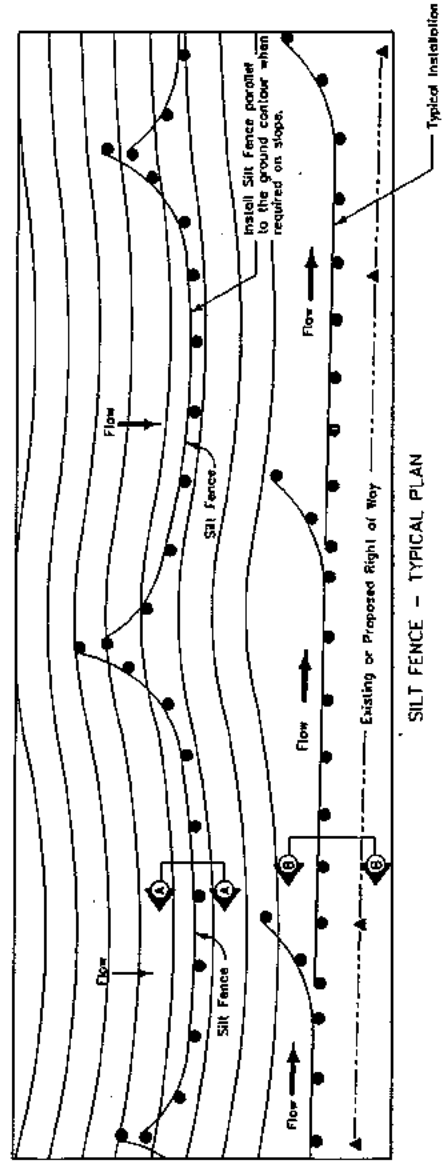
THIS INCLUDES SUBSURFACE DRAINS (I.E. LONGITUDINAL AND STANDARD SUBDRAINS), SLOPE DRAINS AND BRIDGE END DRAINS. THE VELOCITY OF THE DISCHARGE FROM THESE FEATURES MAY BE CONTROLLED BY THE USE OF PATIO BLOCKS, CLASS A STONE OR EROSION STONE.

TABULATION OF EROSION CONTROL FEATURES

100-19  
MODIFIED

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.)	SILT FENCE (Lin. Ft.)	
12+00	R				257	
12+95	L				148	
12+00	R	1		20		
12+95	L	1		20		
TOTAL				40	405	

TABULATIONS, TYPICALS



All Silt Fence shall be installed using a Silt Fence machine. Manual (trench) installation may be used if physical conditions prohibit machine installation.

For machine installation, all compaction shall be accomplished by driving over each side of silt fence at least two times with device exerting 60 p.s.i. or greater.

For manual installation, all compaction shall be accomplished with a mechanical or pneumatic tamper.

Silt fence may be placed continuously up to a maximum length of 200 feet. For every segment of silt fence that is placed, the last 20 feet of the segment shall be flared up the slope to contain runoff as shown.

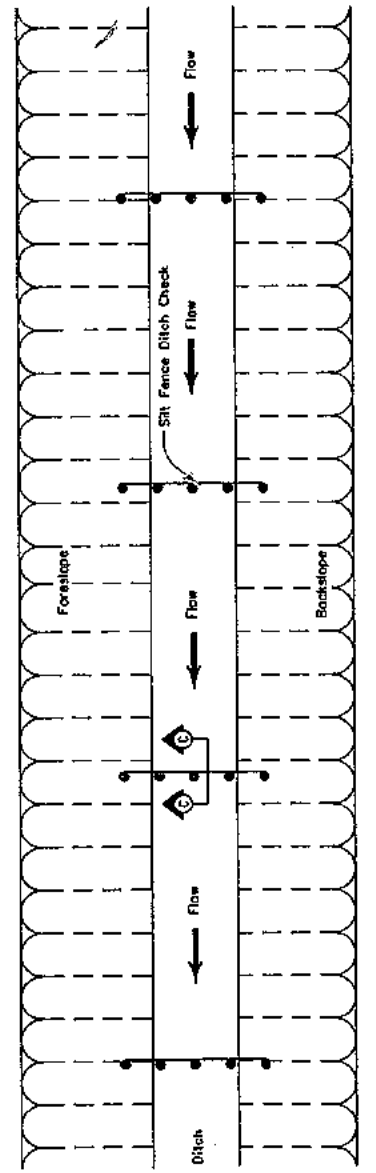
- Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See back view attachment to post.
- Engineering fabric to be folded along bottom of trench for manual installation only.
- For machine installation, posts shall be embedded 29 inches below the ground line. First and last posts of a segment shall be embedded 27 inches below the ground line.
- For manual installation, posts shall be embedded 16 inches below the trench bottom. First and last posts of a segment shall be embedded 27 inches below the trench bottom.



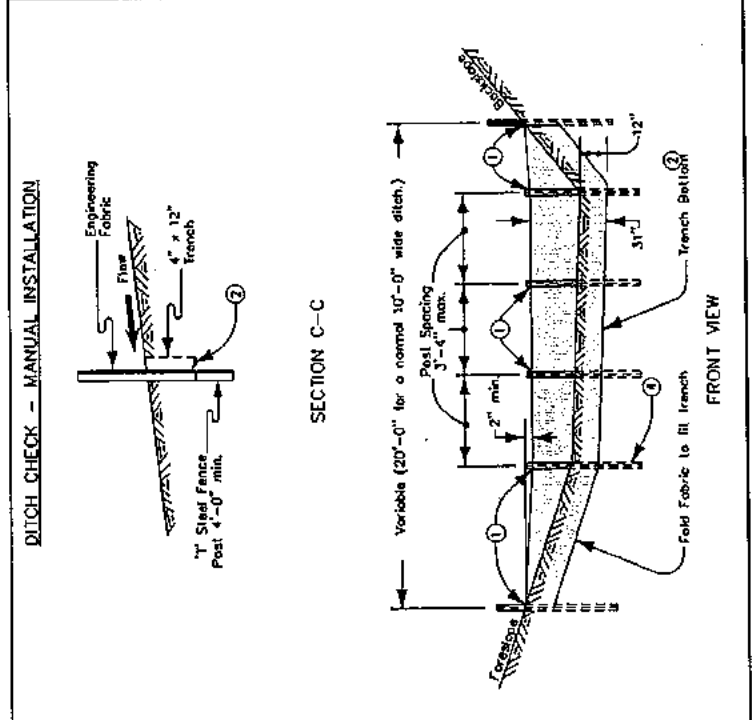
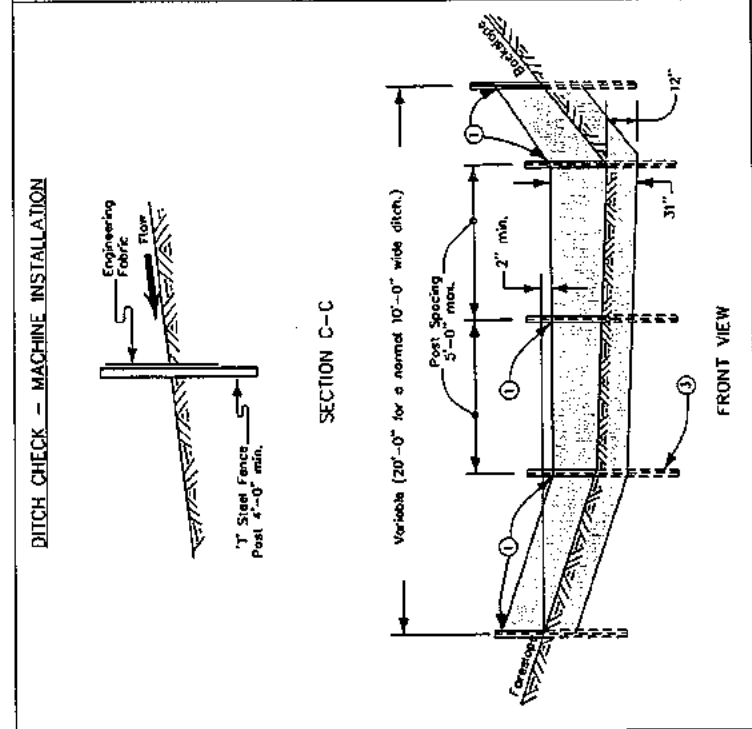
Possible Contract Items:  
Silt Fence  
Silt Fence for Ditch Checks

Possible Tabulations:  
100-17  
100-18  
100-19

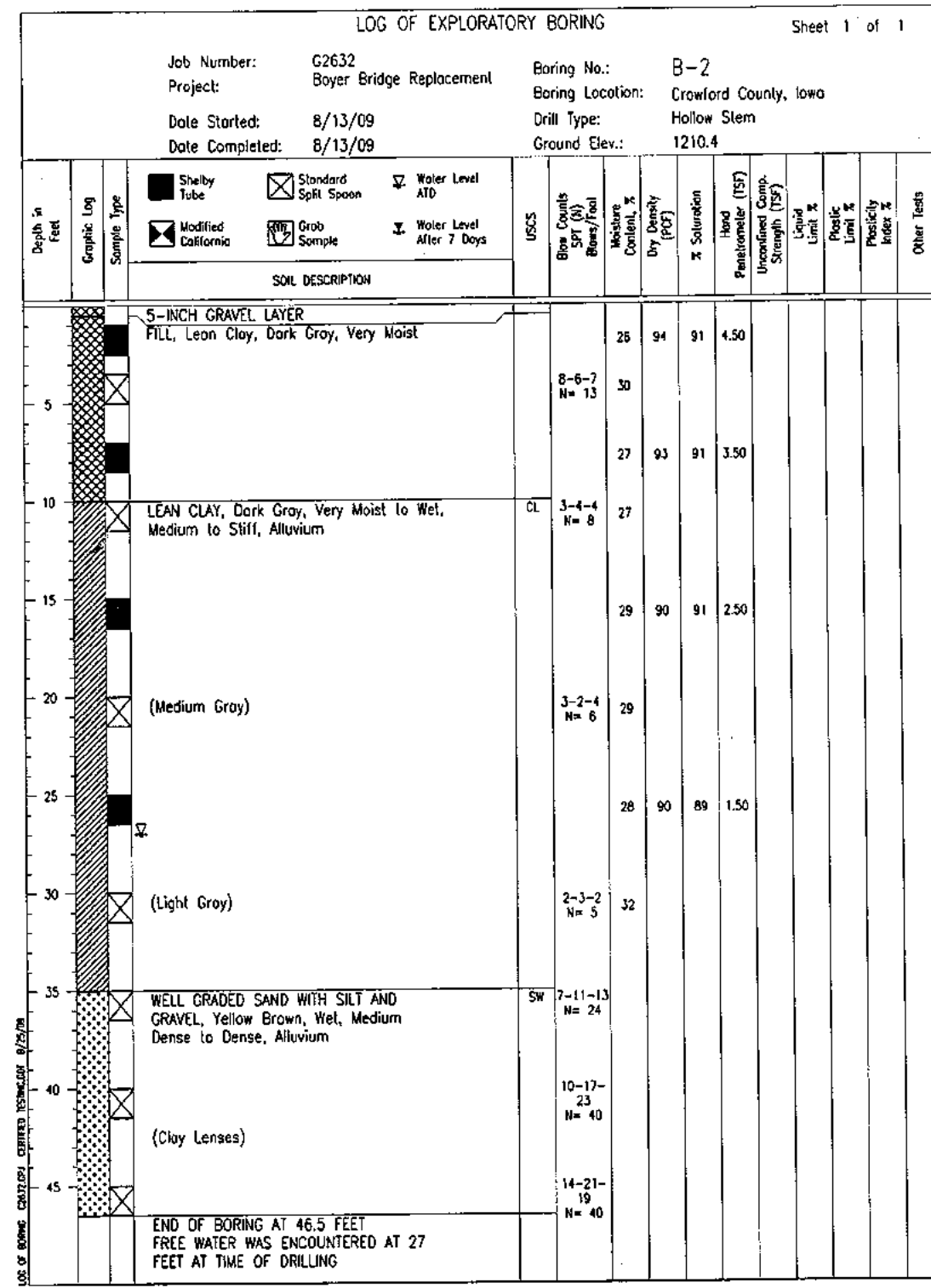
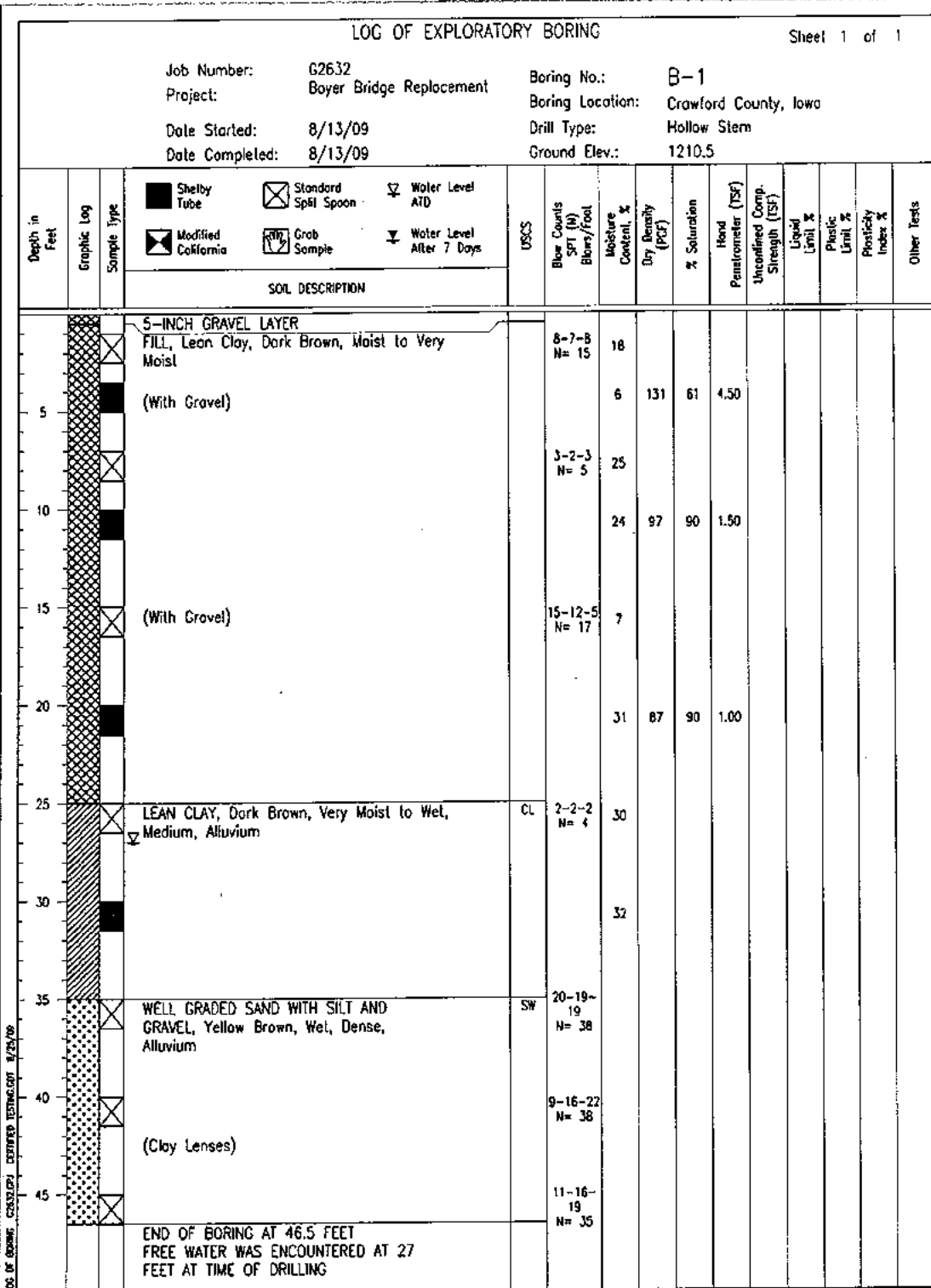
INTERIM	3	100-00-00
STANDARDROADPLAN	RC-17	SHEET 2 of 2
EXHIBIT: Attached with Item 3 to 4 of meeting. Change order table 3 and 4. Add general note.		
APPROVED BY: [Signature] DATE: 11/09/09		
SILT FENCE		



- Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See back view attachment to post.
- Engineering fabric to be folded along bottom of trench for manual installation only.
- For machine installation, posts shall be embedded 29 inches below the ground line. First and last posts of a segment shall be embedded 27 inches below the ground line.
- For manual installation, posts shall be embedded 16 inches below the trench bottom. First and last posts of a segment shall be embedded 27 inches below the trench bottom.



INTERIM	3	100-00-00
STANDARDROADPLAN	RC-17	SHEET 2 of 2
EXHIBIT: Attached with Item 3 to 4 of meeting. Change order table 3 and 4. Add general note.		
APPROVED BY: [Signature] DATE: 11/09/09		
SILT FENCE		



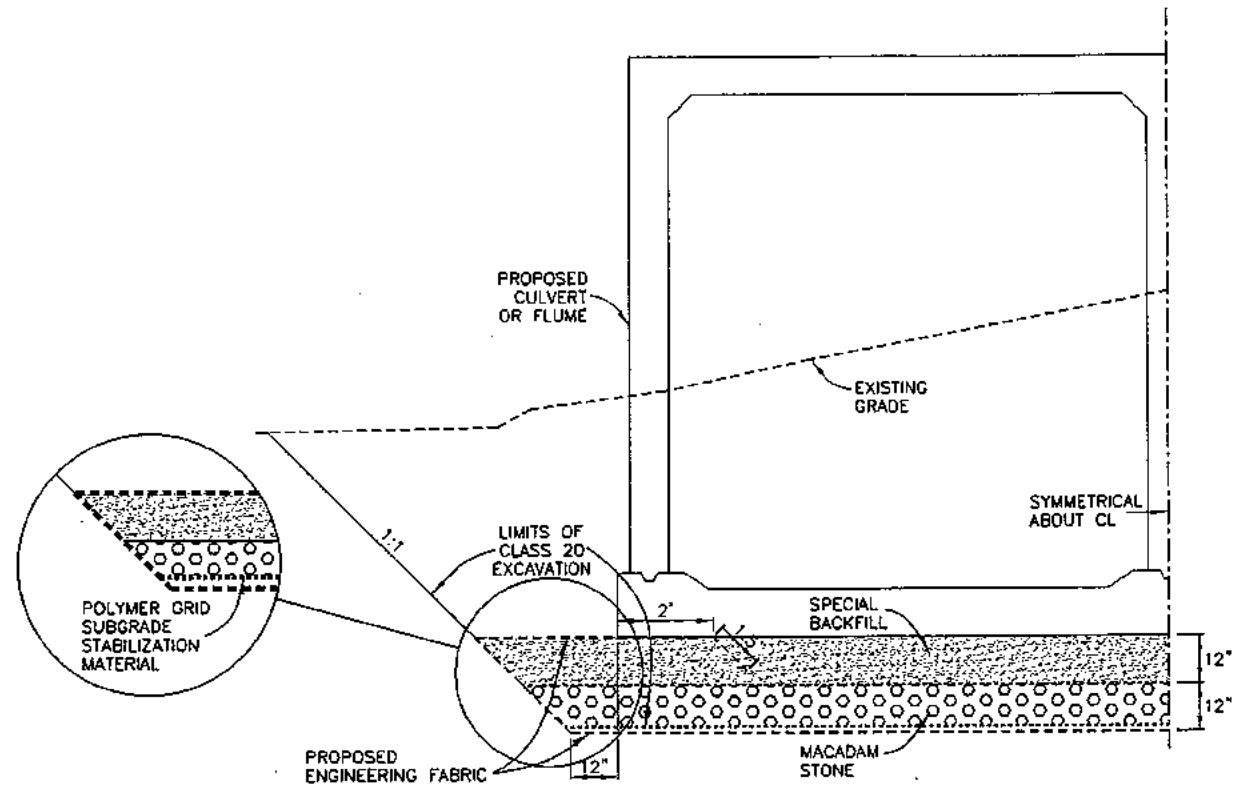
GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED AUGUST 25, 2009, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

**SOUNDING DATA**

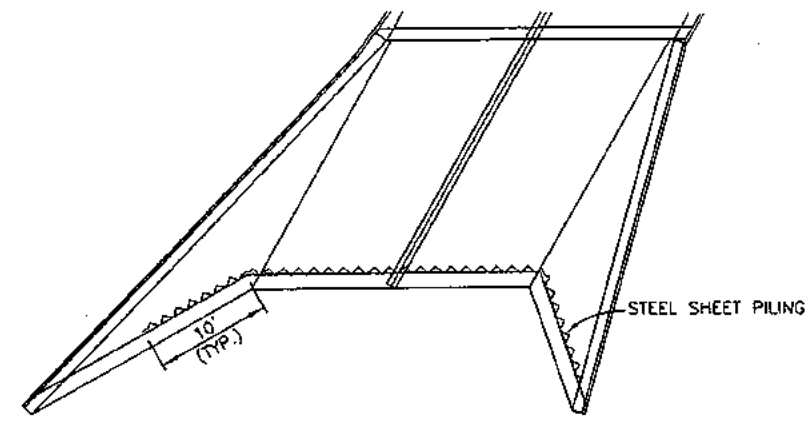
NOTE: THESE SOUNDINGS WERE MADE FOR DESIGN PURPOSES AND ARE NOT GUARANTEED FOR CONSTRUCTION.

SOUNDINGS WERE TAKEN ON AUGUST 13, 2009.

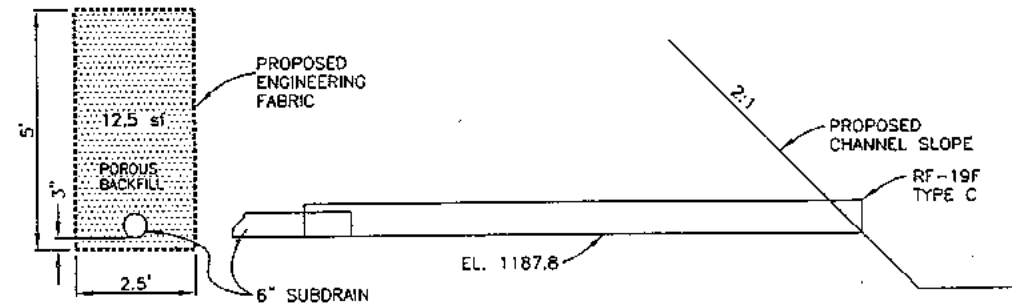
SEE SHEET V1 FOR BORING LOCATIONS.



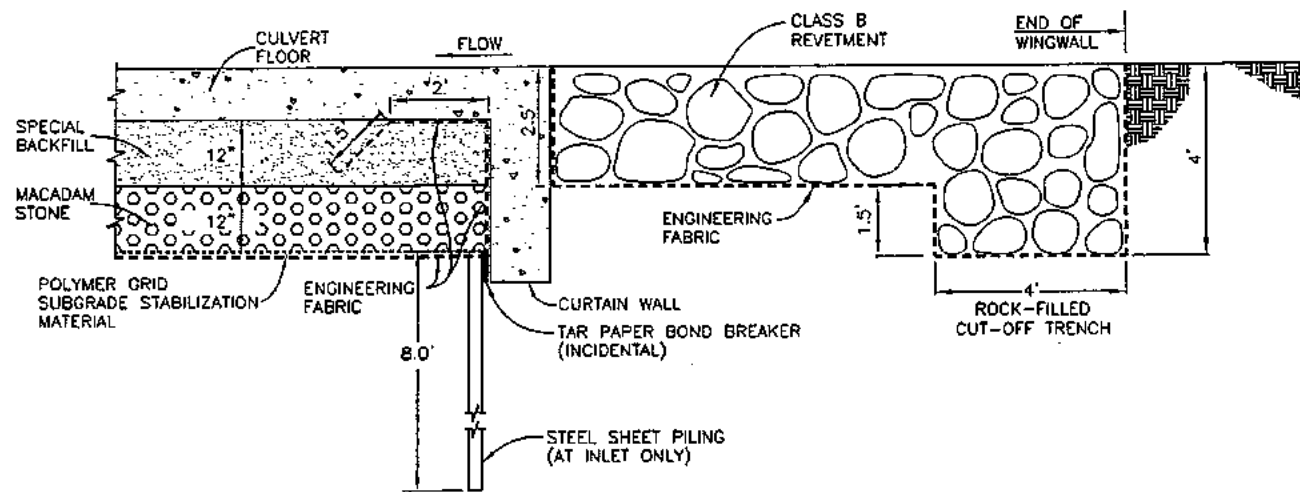
**CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION**  
NOT TO SCALE



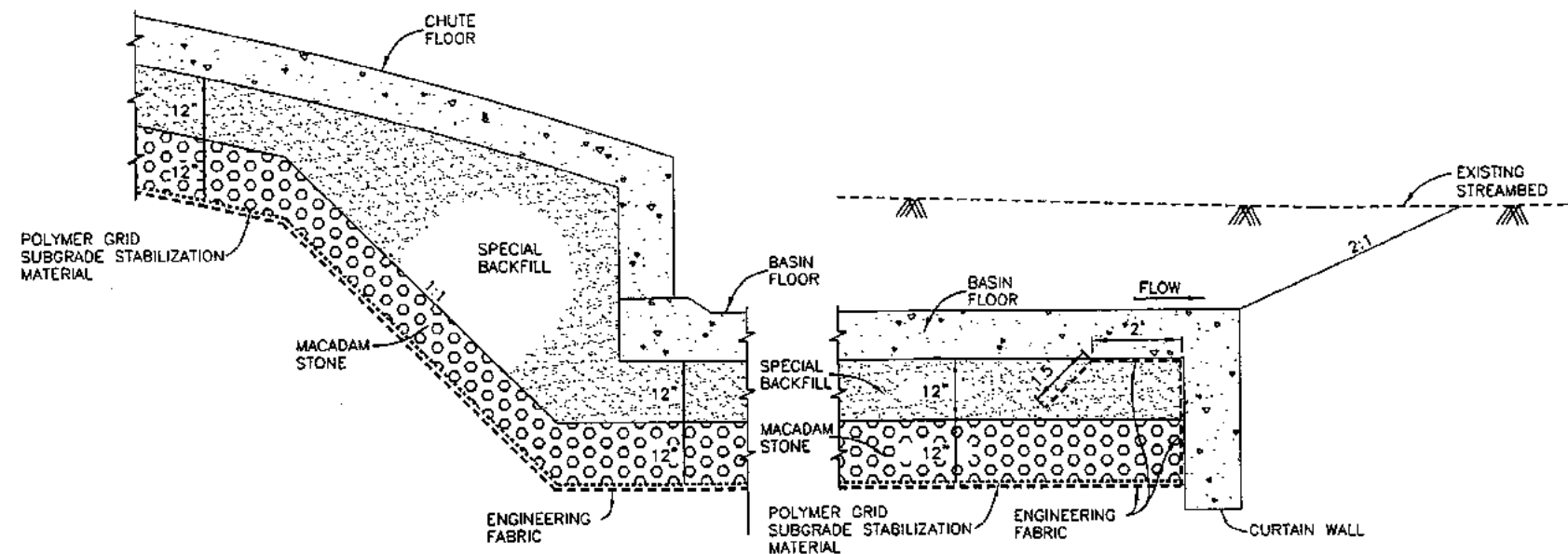
**STEEL SHEET PILE AT CURTAIN WALL**  
NOT TO SCALE



**FOUNDATION DRAIN**  
NOT TO SCALE



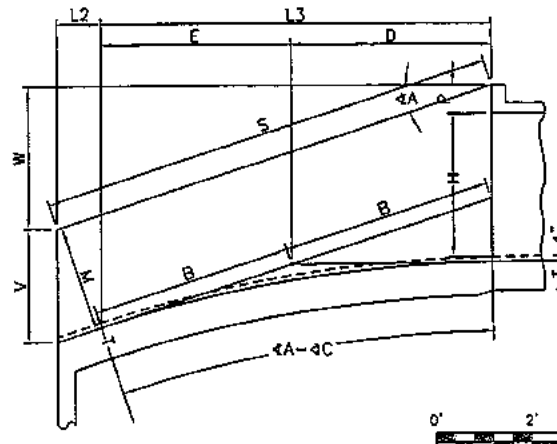
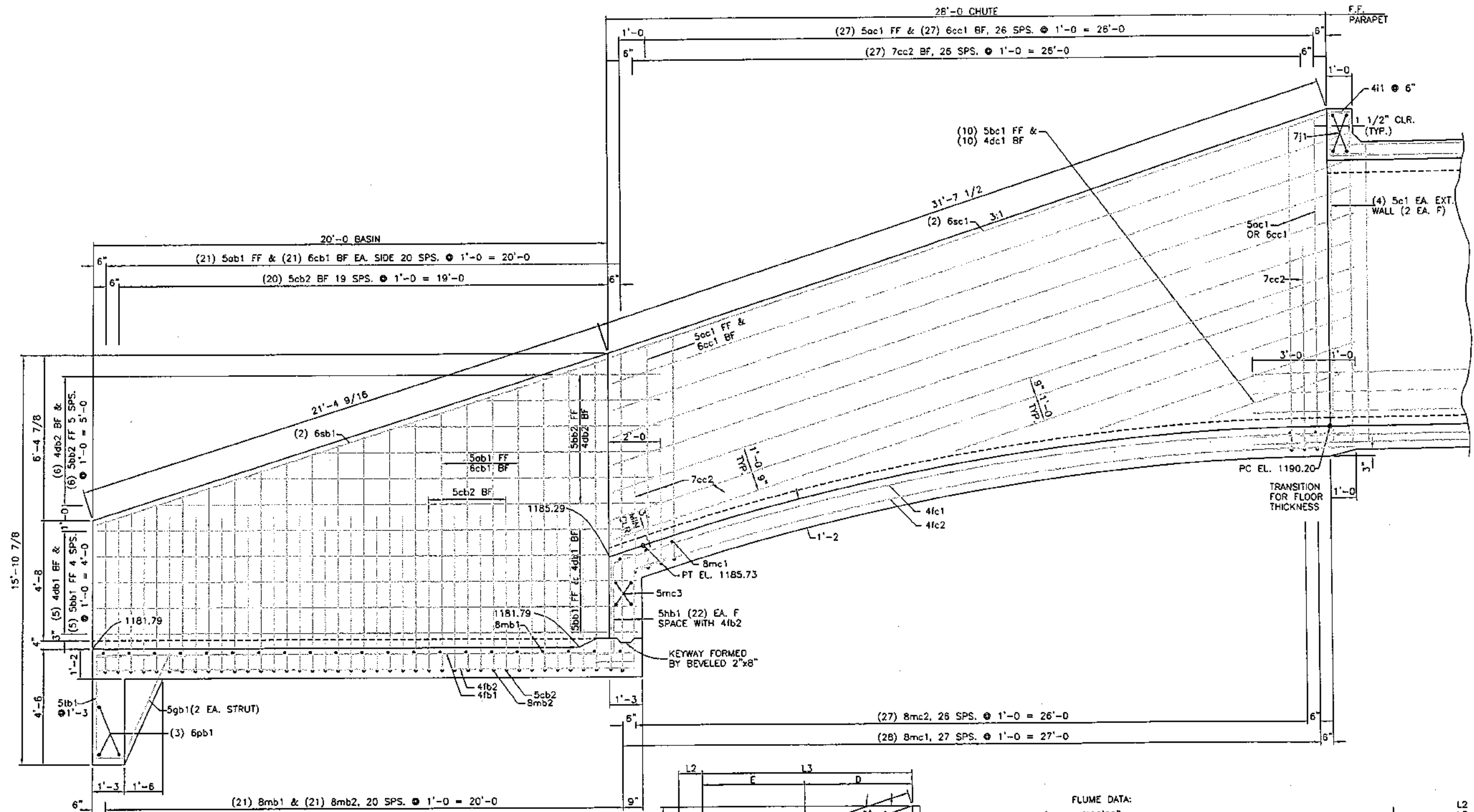
**SECTION AT INLET HEADWALL CURTAIN WALL**  
NOT TO SCALE



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

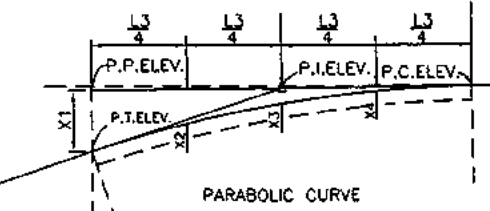
**SPECIAL DETAILS**





FLUME DATA:

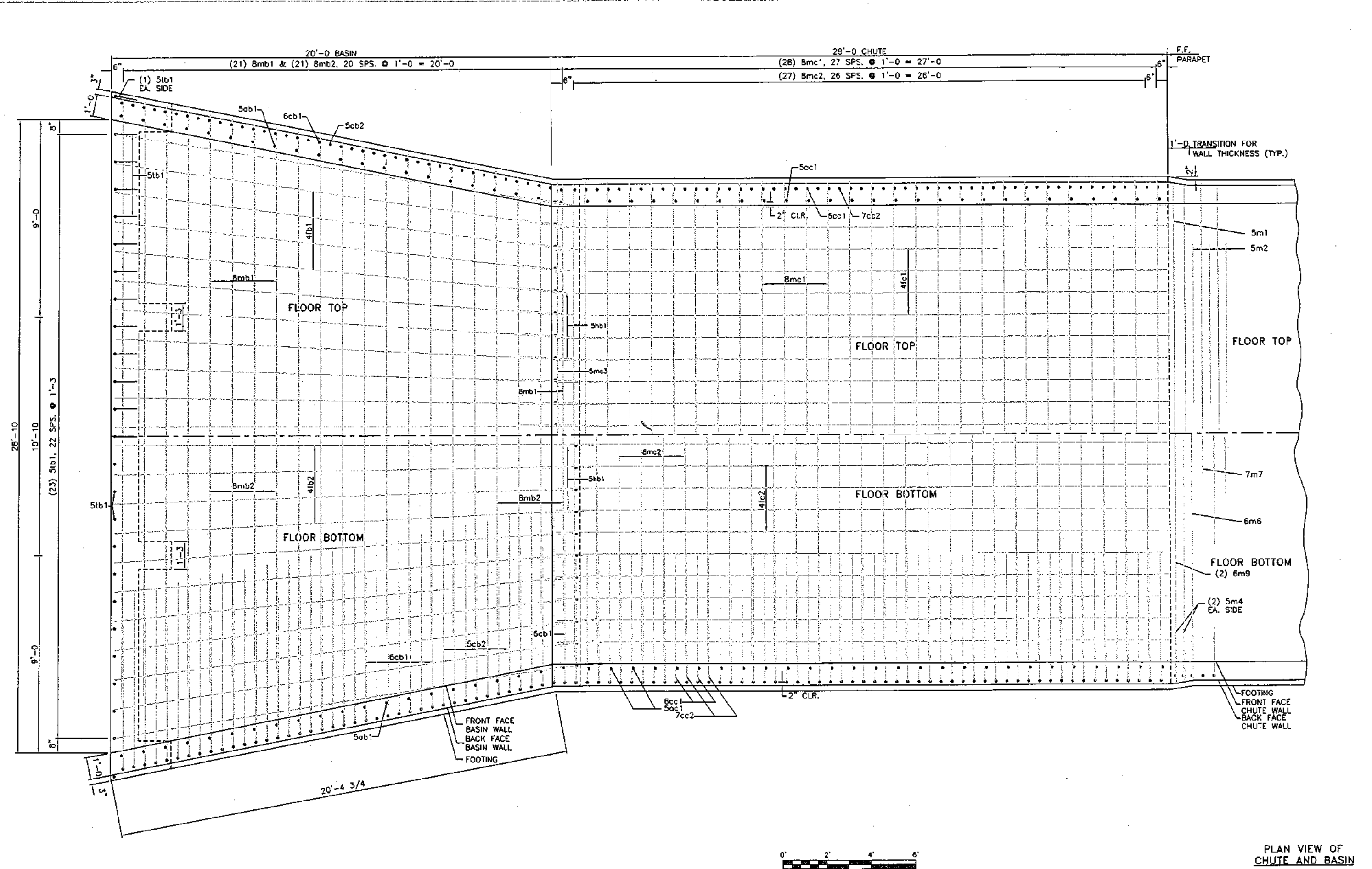
A	= 18°25'06"
C	= 00°34'23"
B	= 13'-8 3/8
S	= 29'-6 1/8
V	= 7'-10 7/8
W	= 9'-4
M	= 7'-6
T	= 1'-1
H	= 10'-0
P	= 2'-0



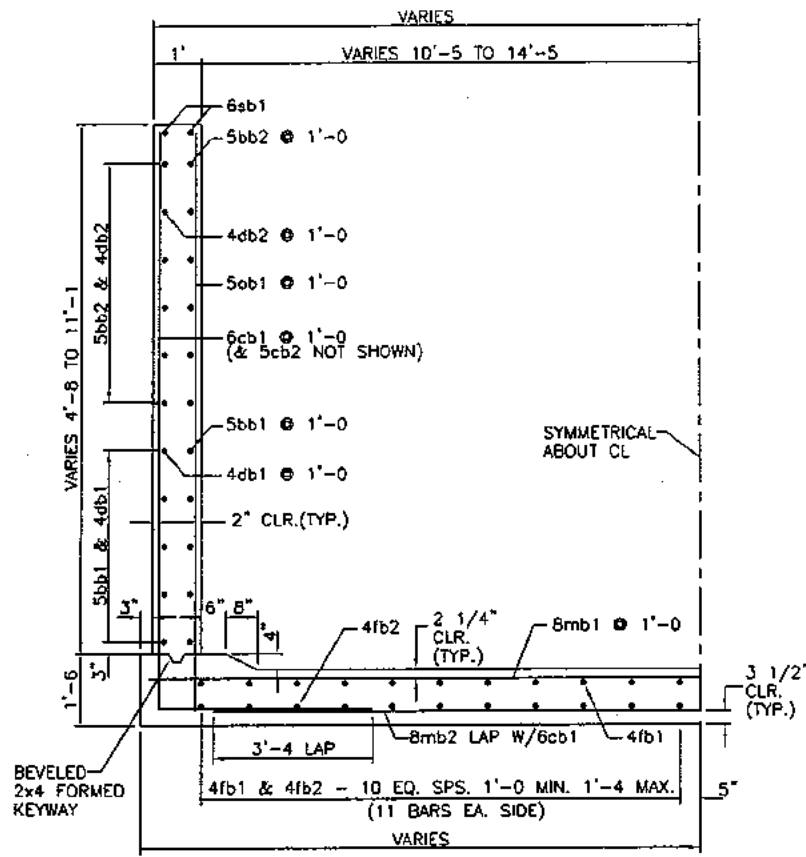
CURVE DATA:

L2	= 1'-3 3/4
L3	= 25'-8 1/4
D	= 13'-8 1/4
E	= 13'-0
P.C. ELEV.	= 1190.20
P.I. ELEV.	= 1190.06
P.P. ELEV.	= 1189.93
P.T. ELEV.	= 1185.73
X1	= 4'-2 3/8
X2	= 2'-4
X3	= 1'-0 3/8
X4	= 0'-3
L3/4	= 6'-8

LONGITUDINAL SECTION  
CHUTE AND BASIN



PLAN VIEW OF CHUTE AND BASIN



SECTION THROUGH BASIN

REINFORCING BAR LIST - BASIN					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5ob1	WALLS - VERT. - FF	I	42	LISTED	398
5bb1	WALLS - LONGIT. - FF	—	10	21'-4	223
5bb2	WALLS - LONGIT. - FF	—	12	LISTED	151
6cb1	WALLS - VERT. - BF	L	42	LISTED	983
5cb2	WALLS - VERT. - BF	L	40	14'-0	585
4db1	WALLS - LONGIT. - BF	—	10	21'-4	143
4db2	WALLS - LONGIT. - BF	—	12	LISTED	97
6sb1	WALL - TOP SLOPE	∕	4	23'-4	141
4fb1	FLOOR LONGIT. - TOP	—	22	LISTED	315
4fb2	FLOOR LONGIT. - BOTT.	—	22	LISTED	315
8mb1	FLOOR TRANSV. - TOP	—	21	LISTED	1506
8mb2	FLOOR TRANSV. - BOTT.	—	21	LISTED	1122
6pb1	CURTAIN - TRANS.	—	3	LISTED	139
5gb1	CURTAIN BRACKET - VERT.	∕	8	6'-6	55
5tb1	CURTAIN - VERT.	∕	25	4'-11	129
5hb1	BASIN BACKWALL - VERT.	∕	44	6'-7	302
TOTAL ( LBS. )					6604

CONCRETE PLACEMENT QUANTITIES				
LOCATION	FOOTING	WALLS	BASIN CURTAIN	TOTAL
BASIN	31.8	12.0	-	43.8
CHUTE**	30.4	21.3	2.5	54.2
TOTAL (CU. YDS.)	62.2	33.3	2.5	98.0

\*\* INCLUDES PARAPET

LISTED BARS

BAR 5ob1  
42 BARS VAR. - 2 EA. LGTH.  
5'-10,  
6'-2, 6'-6, 6'-10,  
7'-2, 7'-6, 7'-9,  
8'-1, 8'-5, 8'-9,  
9'-0, 9'-5, 9'-8,  
10'-0, 10'-4, 10'-8,  
11'-0, 11'-4, 11'-8, 11'-11,  
12'-4

BAR 5bb2 & 4db2  
12 BARS VAR. - 2 EA. LGTH.  
4'-1, 7'-3, 10'-6, 13'-8, 16'-10, 20'-0

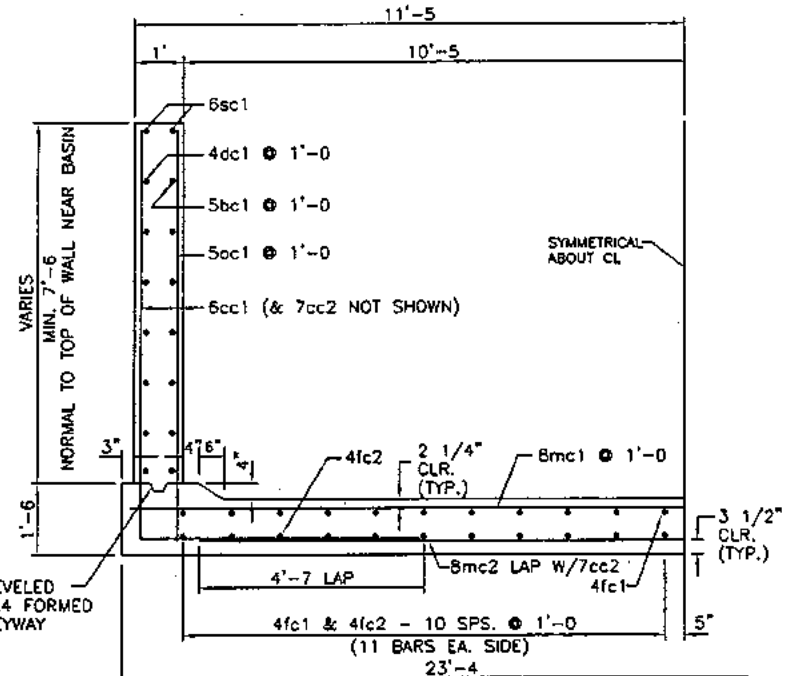
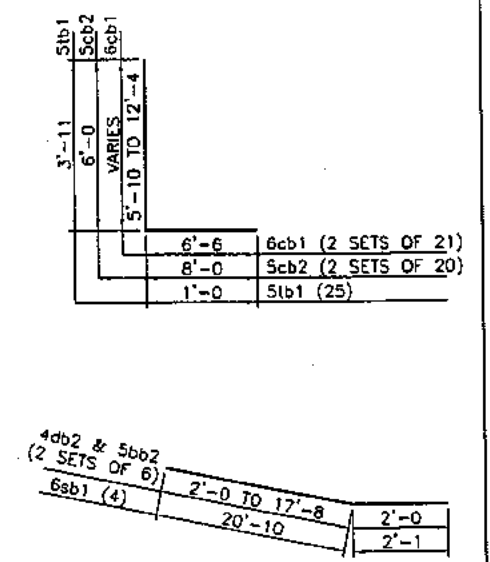
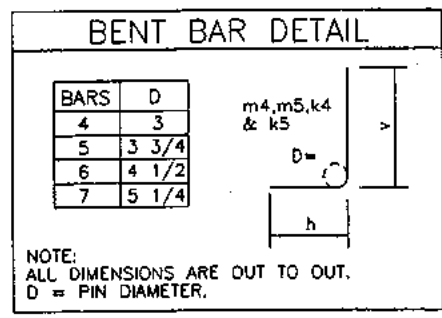
BAR 6cb1  
42 BARS VAR. - 2 EA. LGTH.  
12'-4, 12'-8,  
13'-0, 13'-4, 13'-8,  
14'-0, 14'-3, 14'-7, 14'-11,  
15'-3, 15'-6, 15'-11,  
16'-2, 16'-6, 16'-10,  
17'-2, 17'-6, 17'-10,  
18'-2, 18'-5, 18'-10

BAR 4fb1 & 4fb2  
22 BARS  
4 AT 21'-2  
4 AT 21'-1  
6 AT 21'-0  
8 AT 20'-11

BAR 8mb1  
21 BARS VAR. - 1 EA. LGTH.  
23'-0, 23'-3, 23'-8, 24'-0, 24'-5,  
24'-10, 25'-3, 25'-8, 26'-0, 26'-5,  
26'-10, 27'-3, 27'-8, 28'-0, 28'-5,  
28'-10, 29'-3, 29'-8, 30'-0, 30'-5,  
30'-10,

BAR 8mb2  
21 BARS VAR. - 1 EA. LGTH.  
16'-0, 16'-5, 16'-10, 17'-2, 17'-7, 18'-0,  
18'-5, 18'-10, 19'-2, 19'-7, 20'-0, 20'-5,  
20'-10, 21'-2, 21'-7, 22'-0, 22'-5,  
22'-10, 23'-2, 23'-7, 24'-0

BAR 6pb1  
2 AT 30'-11  
1 AT 30'-7



SECTION THROUGH CHUTE

REINFORCING BAR LIST - CHUTE					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5c1	WALLS BOTH FV	I	8	12'-10	108
5ac1	WALLS FFV	I	54	LISTED	568
6cc1	WALLS BFV	L	54	LISTED	1285
7cc2	WALLS BFV	L	54	LISTED	1208
5bc1	WALLS FFH	∕	20	LISTED	513
4dc1	WALLS BFH	∕	20	LISTED	329
6sc1	WALLS BOTH F ALONG SLOPE	∕	4	31'-8	191
4fc1	FLOOR LONGIT. TOP	—	22	29'-5	433
4fc2	FLOOR LONGIT. BOTT.	—	22	29'-5	433
8mc1	FLOOR TRANSV. TOP	—	28	22'-8	1695
8mc2	FLOOR TRANSV. BOTT.	—	27	20'-2	1455
5mc3	BASIN BACKWALL TRANSV.	—	4	29'-5	123
4h1	PARAPET, VERTICAL	∕	41	6'-1	167
7h1	PARAPET, HORIZONTAL	—	4	22'-2	181
TOTAL ( LBS. )					8689

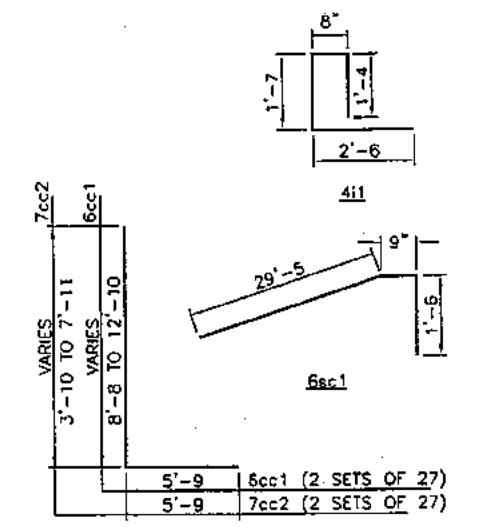
LISTED BARS

BAR 5oc1  
54 BARS  
8 AT 8'-8, 4 EA. AT 8'-9, 9'-2  
2 EA. LGTH.  
8'-10, 8'-11, 9'-0, 9'-2, 9'-5, 9'-7,  
9'-9, 9'-11, 10'-1, 10'-3, 10'-6, 10'-8,  
10'-11, 11'-2, 11'-5, 11'-8, 12'-0, 12'-3,  
12'-7, 12'-10

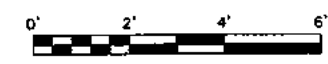
BAR 6cc1  
54 BARS  
8 AT 14'-5, 4 EA. AT 14'-6, 14'-11  
2 EA. LGTH.  
14'-7, 14'-8, 14'-9, 15'-2, 15'-4, 15'-6,  
15'-8, 15'-10, 16'-0, 16'-3, 16'-5, 16'-8,  
16'-11, 17'-2, 17'-5, 17'-9, 18'-0, 18'-4,  
18'-7

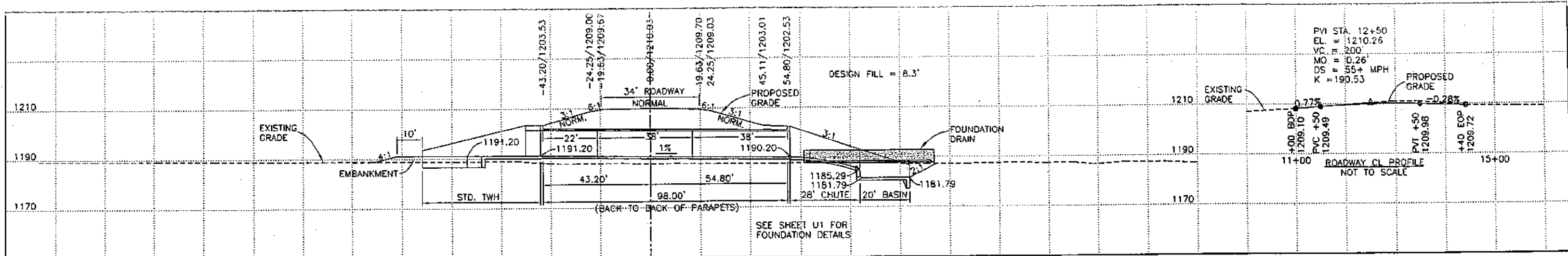
BAR 7cc2  
54 BARS  
8 AT 9'-7, 4 AT 9'-8  
2 EA. LGTH.  
9'-9, 9'-10, 9'-11, 10'-0, 10'-2, 10'-3,  
10'-5, 10'-7, 10'-9, 10'-11, 11'-1, 11'-4,  
11'-6, 11'-9, 12'-0, 12'-3, 12'-6, 12'-9,  
13'-0, 13'-4, 13'-8

BAR 5bc1 & 4dc1  
20 BARS  
14 AT 30'-5  
2 EA. LGTH.  
16'-5, 10'-6, 6'-0



BENT BAR DETAILS  
NO SCALE



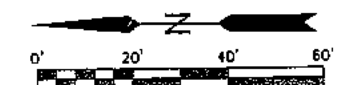


**LONGITUDINAL SECTION ALONG CENTERLINE**

PARCEL NUMBER PROPERTY OWNER

① BRADLEY WALDEMAR

② CRAWFORD COUNTY

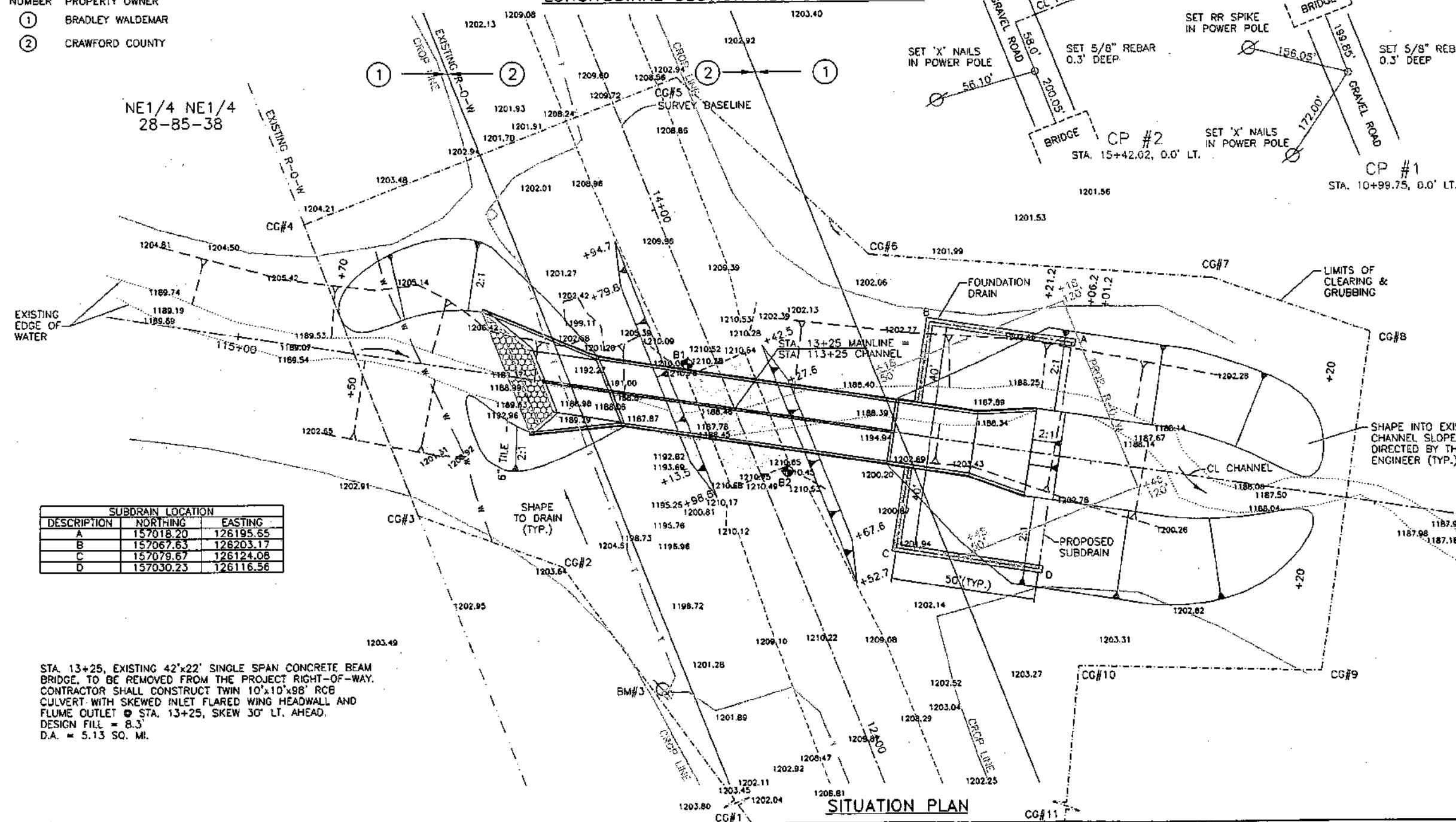


BM#3  
RR SPIKE IN POWER POLE, STA. 12+44.36  
58.76' LT., EL. = 1205.73



HORIZONTAL CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
CP #1	157053.35	125963.22	
CP #2	157214.33	126375.15	
BM#3	157160.71	126076.52	1205.73

LIMITS OF CLEARING AND GRUBBING			
DESCRIPTION	NORTHING	EASTING	ELEVATION
CG#1	157076.48	125954.45	
CG#2	157195.62	126118.30	
CG#3	157245.55	126136.35	
CG#4	157285.35	126238.19	
CG#5	157154.87	126288.85	
CG#6	157088.53	126226.74	
CG#7	156968.89	126218.02	
CG#8	156913.95	126198.70	
CG#9	156931.97	126080.35	
CG#10	157016.52	126082.58	
CG#11	157027.04	125973.77	



SUBDRAIN LOCATION		
DESCRIPTION	NORTHING	EASTING
A	157018.20	126195.65
B	157067.63	126203.17
C	157079.67	126124.08
D	157030.23	126116.56

STA. 13+25, EXISTING 42'x22' SINGLE SPAN CONCRETE BEAM BRIDGE, TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT TWIN 10'x10'x98' RCB CULVERT WITH SKEWED INLET FLARED WING HEADWALL AND FLUME OUTLET @ STA. 13+25, SKEW 30' LT. AHEAD. DESIGN FILL = 8.3'. D.A. = 5.13 SQ. MI.

**LOCATION**  
T-85N R-38W  
SECTION 28  
STOCKHOLM TWP.  
OVER TRIBUTARY TO BOYER RIVER

**HYDRAULIC DATA**  
DRAINAGE AREA = 5.13 SQ. MI.  
DESIGN DISCHARGE = 2020 CFS (Q100)  
DESIGN HIGH WATER = 1202.0  
REACH SLOPE (LOCAL) = 0.0032 FT./FT.  
CULVERT WATERWAY AREA = 200 SQ. FT.  
Q50 = 1680 CFS STAGE = 1200.8  
DESIGN VELOCITY (D.S. CHANNEL) = 10.1 FT./SEC.

**DESIGN FOR:**  
TWIN 10'x10'x98' RCB CULVERT  
WITH SKEWED INLET FLARED WING HEADWALL  
AND FLUME OUTLET  
STA. 13+25, SKEW 30' LT. AHEAD  
CRAWFORD COUNTY  
PROJECT NO. BRS-C024(94)--60-24

