

LETTING DATE  
02/16/10

RCB CULVERT NEW - TWIN BOX  
FM-C024(95)--55-24

CRAWFORD COUNTY

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 13D."

**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-0D-P-2009-1275. 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.

**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. FM-C024(95)--55-24  
RCB CULVERT REPLACEMENT - TWIN BOX  
County Road E26 (G Avenue) over  
Unnamed Tributary to the East Soldier River

SCALES: AS NOTED

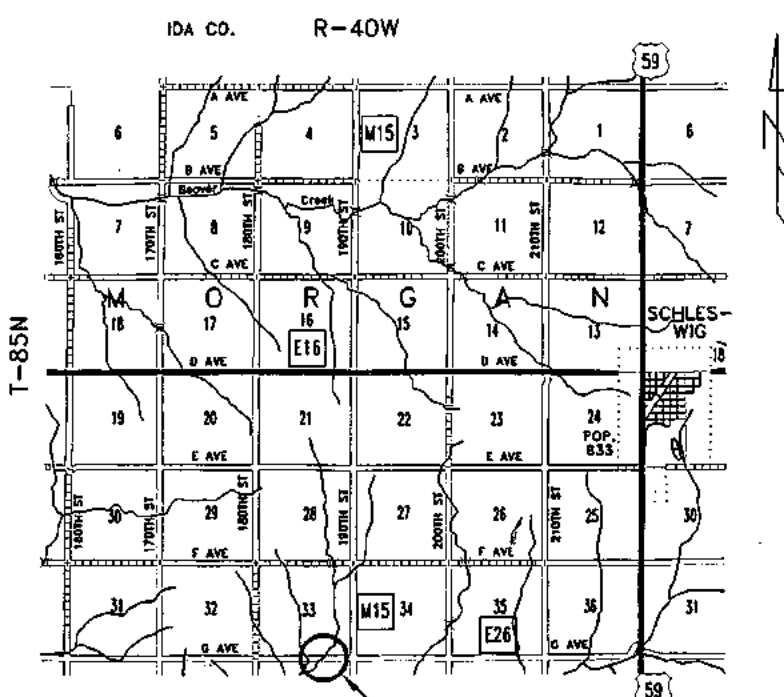
The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2009, plus General Supplemental Specifications; and applicable Supplemental Specifications, Developmental Specifications, and Special Provisions, shall apply to construction on this project.

TOTAL SHEETS	14
PROJECT NUMBER	FM-C024(95)--55-24
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	

NO.	DESCRIPTION
A1	TITLE SHEET
B1-2	ESTIMATE OF QUANTITIES AND GENERAL INFORMATION
C1-3	TABULATIONS, TYPICALS
H1	RIGHT-OF-WAY
Q1	SOIL SHEET
U1	SPECIAL DETAILS
V1	CULVERT SITUATION PLAN
V2	CULVERT DETAILS
W1-2	CROSS SECTIONS - ROADWAY
Z1	CROSS SECTIONS - CHANNEL

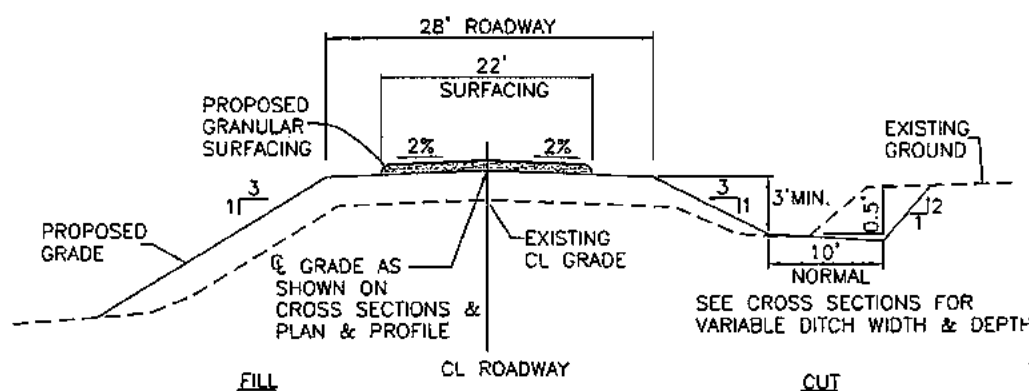
STANDARD	ISSUED	REVISED
TWRCB-GI-87	JULY, 1987	01-09
TWRCB 10-10-87	JULY, 1987	12-5-96
TWH 45-1-87	JULY, 1987	12-5-96
TWH 45-2-87	JULY, 1987	
TWH 45-3-87	JULY, 1987	
TWH 45-4-87	JULY, 1987	04-07
TWH 45-5-87	JULY, 1987	
TWH 45-6-87	JULY, 1987	1-1-98

LOCATION	LIN. FT.	MILES
BOP STA. 20+00 TO EOP STA. 23+50	350.00	
NET LENGTH OF ROADWAY	350.00	0.066

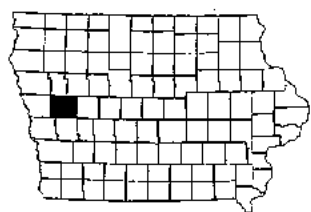


LOCATION MAP

STA. 22+00  
PROPOSED TWIN 10'x10'x85' RCB  
SKEW 45° LT. AHEAD



TYPICAL CROSS SECTION  
NOT TO SCALE



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

04-30-02	101-4
<b>DESIGN DATA RURAL</b>	
2008 AADT	60 V.P.D.
2029 AADT	80 V.P.D.
20 DHV	X V.P.H.
TRUCKS	X %
TOTAL	
DESIGN ESALS	

Approved

*[Signature]*

*[Signature]*

*[Signature]*

*[Signature]*

*[Signature]*

BOARD OF SUPERVISORS

Approved

*[Signature]* 11/17/09

CRAWFORD COUNTY ENGINEER DATE

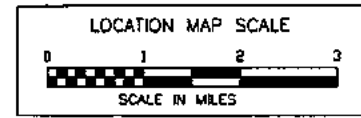
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

*[Signature]* 11/19/09

TROY J. GROTH, P.E. #14450 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2009.  
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 H1.

**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 B31 C.Y. CUT, B30 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 C2.

**2104-2710020 EXCAVATION, CLASS 10, CHANNEL**  
EXCESS MATERIAL AND UNSUITABLE MATERIAL NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED FROM THE SITE. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 CHANNEL EXCAVATION. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED.

QUANTITY INCLUDES 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.

**2113-0001100 SURGRADE 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.

**2401-6745650 REMOVAL OF EXISTING STRUCTURES**  
INCLUDES EXISTING 174 IN. DIA. X 112 FT. SPP CULVERT WITH REINFORCED CONCRETE SLOPE COLLARS AND WINGWALLS AT STA. 22+00.

**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 SLAB.

**2403-0100020 STRUCTURAL CONCRETE (RCB CULVERT)**  
REFER TO TABULATION ON PLAN SHEET C2 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 C2 FOR STEEL PLACEMENT QUANTITIES IN THE RCB CULVERT.

**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.

**2417-1040042 CULVERT, CORRUGATED METAL ENTRANCE PIPE, 42 IN. DIA.**

**2417-1060036 CULVERT, CORRUGATED METAL ROADWAY 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. DIAPHRAGMS ARE NOT A BID ITEM. REFER TO TABULATION ON PLAN SHEET C1.

**2507-3250005 ENGINEERING FABRIC**

ITEM INCLUDES 875 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 180 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 A, EMBANKMENT EROSION CONTROL (ARTICLE 4196.01, B. 3, OF THE STANDARD SPECIFICATIONS).

**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 C2.

**2602-0000030 SILT FENCE FOR DITCH CHECKS**

QUANTITY INCLUDES SILT FENCE AT CULVERT INLETS AS DETAILED ON PLAN SHEET C1. MAXIMUM SPACING OF STEEL POSTS SHALL BE 5 FEET. REFER TO TABULATION ON PLAN SHEET C1.

## 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	0.5	
2	2102-0425070	SPECIAL BACKFILL	TON	312	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	831	
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	2640	
5	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	126	
6	2113-0001100	SURGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	445	
7	2210-0475290	MACADAM STONE BASE	TON	270	
8	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	110	
9	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	
10	2402-2720000	EXCAVATION, CLASS 20	CY	4144	
11	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	245	
12	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	375.1	
13	2404-7775000	REINFORCING STEEL	LB	48832	
14	2417-1040042	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 42 IN. DIA.	LF	52	
15	2417-1060036	CULVERT, CORRUGATED METAL ROADWAY PIPE, 36 IN. DIA.	LF	82	
16	2501-5775000	PILES, STEEL SHEET	SF	796	
17	2507-3250005	ENGINEERING FABRIC	SY	1058	
18	2507-6800021	REVTMENT, CLASS B	TON	168	
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	0.7	
23	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.7	
24	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	60	

## 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-7	10-16-07	1	CORRUGATED METAL TYPE "A" DIAPHRAGM
RF-30A	10-20-09	1	CULVERT (BEDDING AND BACKFILL)
RF-32	10-20-09	2	DEPTH OF COVER TABLES FOR CORRUGATED PIPE
RL-1A	10-03-00	1	DETAILS OF EMBANKMENT AND REBUILDING EMBANKMENTS
RL-4	09-21-99	1	DITCH BLOCKS AND DIKES
TC-252	10-20-09	2	ROAD CLOSURE

## 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 EROSIVENESS 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.

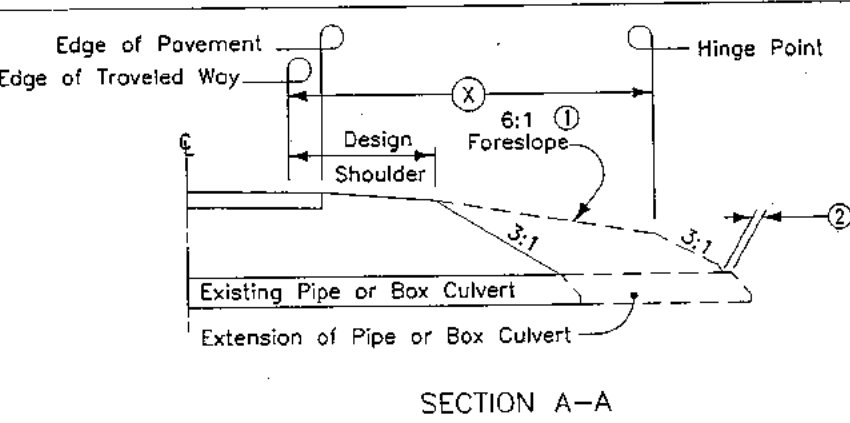
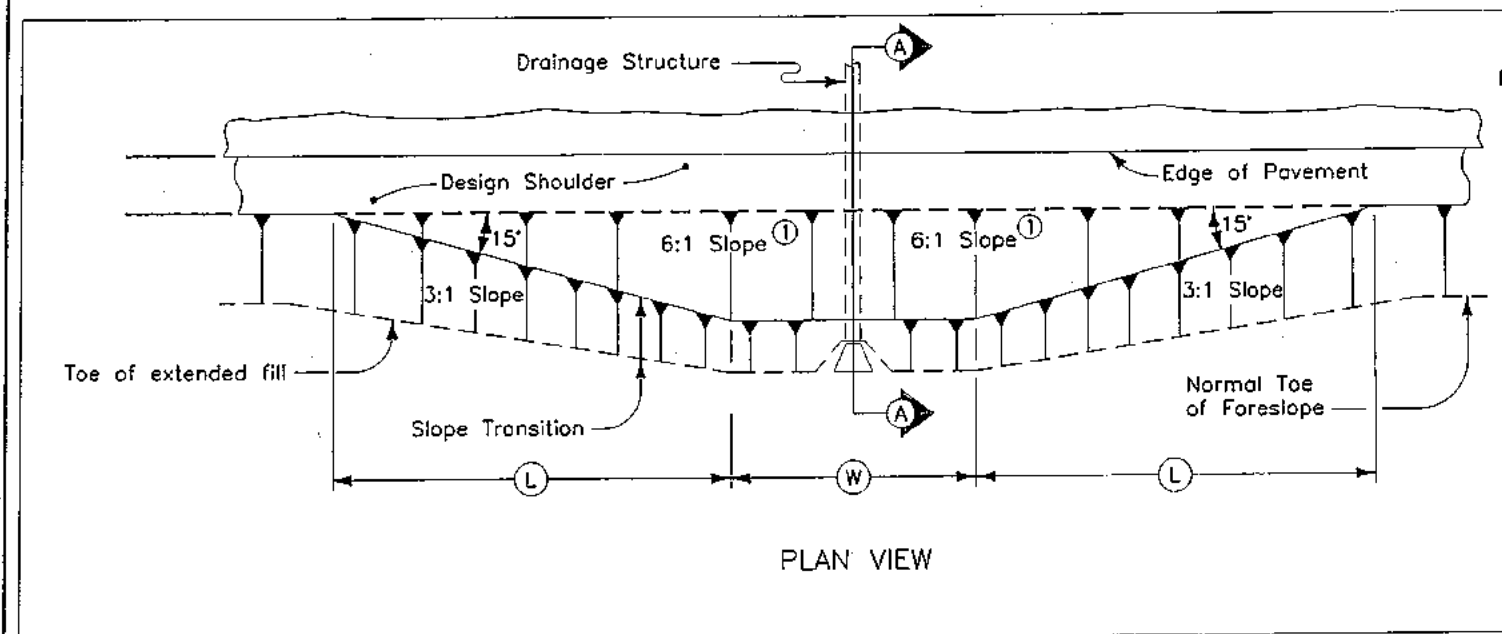
## ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

104-3  
MODIFIED

\* Not a bid item

Drainage Area	Location	Type	Size	Kind of Pipe	Length New Const. (Lin. Ft.)	Bedding Class	Design Cover (H) (Ft.)	Camber* (RF-30B) (Ft.)	Apron No.	Apron Guards* (RF-26) (No.)	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					
																			Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Location Station	Top Elevation	Type		Class 20 (Cu. Yds.)	Flowable Mortar (Cu. Yds.)	Floodable Backfill (A) (Cu. Yds.)	Porous Backfill (B) (Cu. Yds.)	Flooded Backfill (A+B) (Cu. Yds.)
15	21+20.2	1101	36	CMP	82	C	4.7												491.0	490.0																			



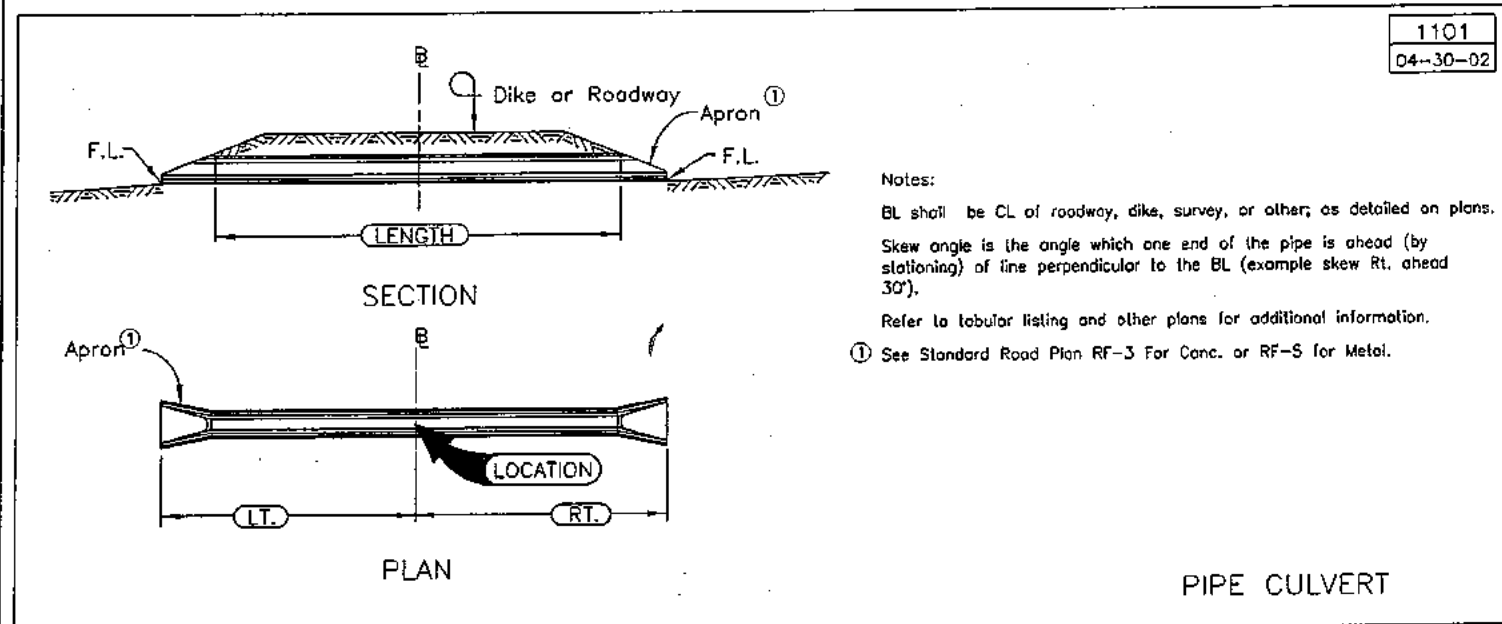
4311  
04-30-02

Notes:  
At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, the foreslope shall be flattened as indicated so as to cover the structure. Minimum earth cover is 6".

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

STRUCTURE LOCATION		Ⓜ	Ⓛ	ⓧ
STATION	SIDE	FEET	FEET	FEET
21+10	L	43.0	26.1	10
21+68	R	93.3	26.1	10
22+29	L	72.2	26.1	10

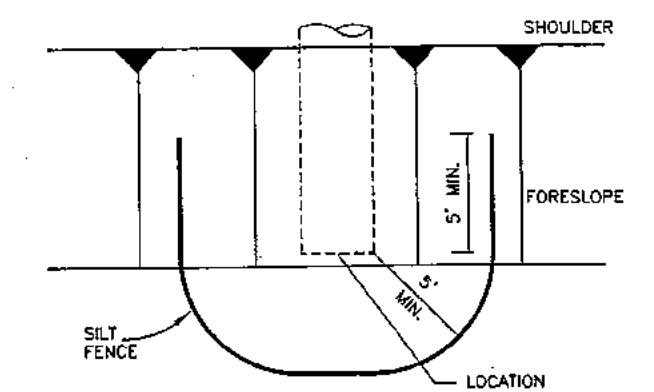
DETAILS OF BARNROOF FORESLOPE AT DRAINAGE STRUCTURE



100-19  
MODIFIED

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				REMARKS
		NO.	SPACING (Ft.)	SILT FENCE (Lin. Ft.)	WOOD EXCELSIOR MAT (Squares)	
21+10	L	1		30		CULVERT INLET
22+27	R	1		30		CULVERT INLET
TOTAL				60		



TABULATIONS, TYPICALS

TABULATION OF EARTHWORK QUANTITIES

STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
20+00							
20+50	53		31		53	31	
21+00	105		43		105	43	
21+50	69		132		69	132	
22+00	48		138		48	138	
22+50	148		24	445	148	469	
23+00	262		11		262	11	
23+50	146		6		146	6	
TOTAL					831	830	

PLACEMENT OF QUANTITIES

LOCATION	CONCRETE C.Y.				STEEL LBS.
	SLAB	FLOOR	WALLS	TOTAL	
HEADWALL	3.3	62.3	25.2	90.8	10711
BARREL*	52.4	65.5	75.6	193.5	27410
HEADWALL	3.3	62.3	25.2	90.8	10711
TOTAL	59.0	190.1	126.0	375.1	48832

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.

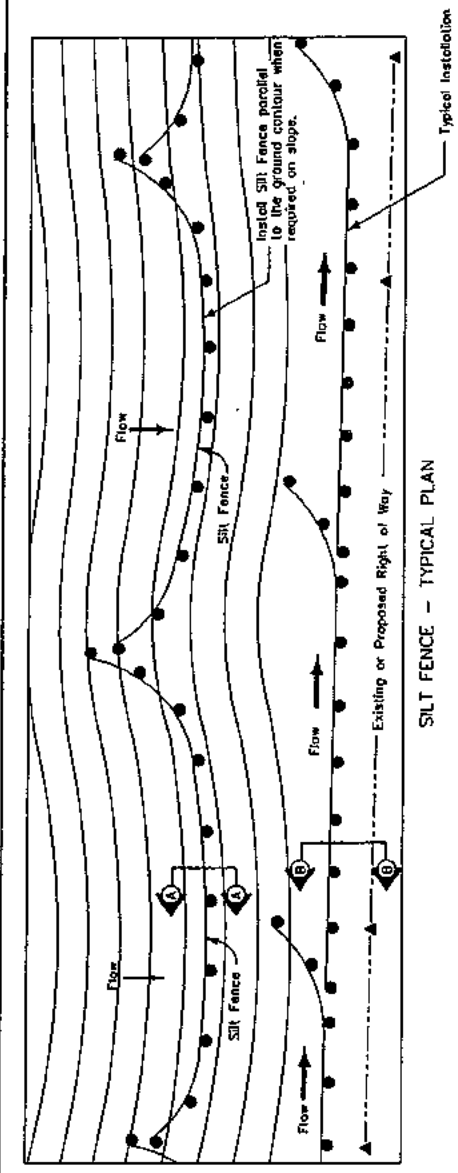
TABULATION OF SAFETY CLOSURES

10B-13A  
10-28-97

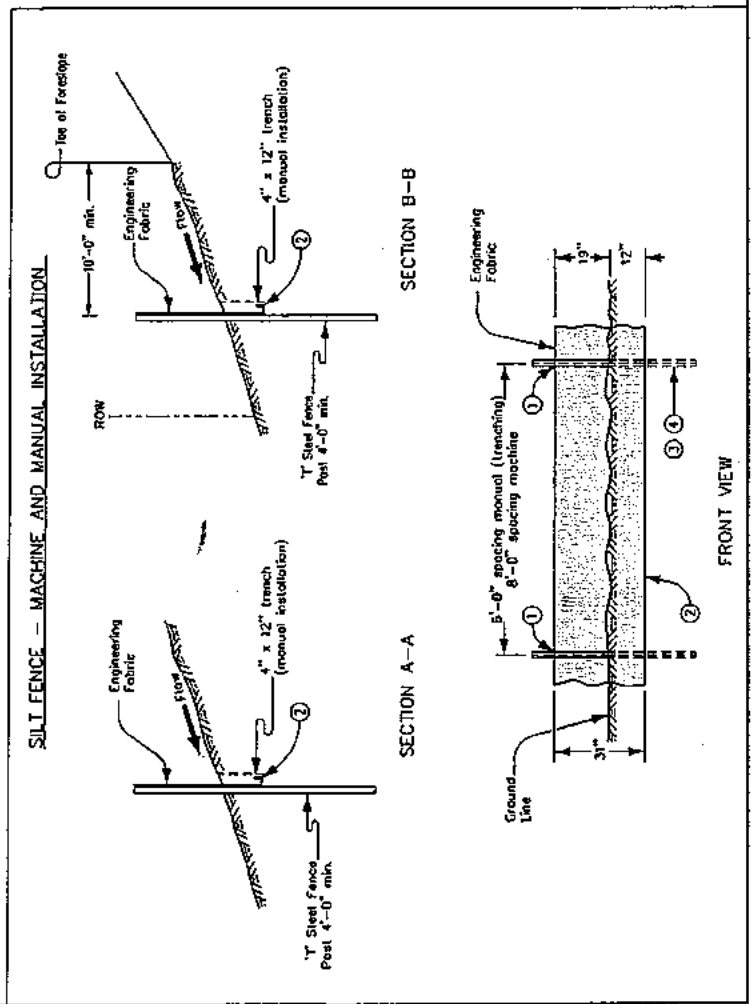
Refer to Section 2518 of the St'd. Specifications

STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
17+50	1	-	WEST END
19+00	-	1	WEST END
24+50	-	1	EAST END
26+00	1	-	EAST END

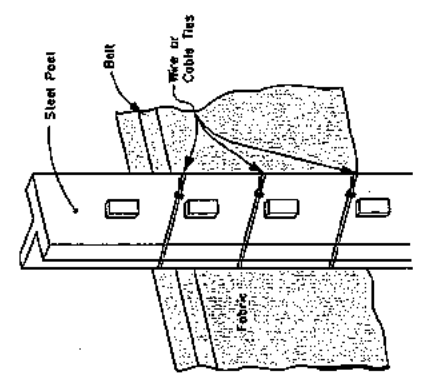
TABULATIONS, TYPICALS



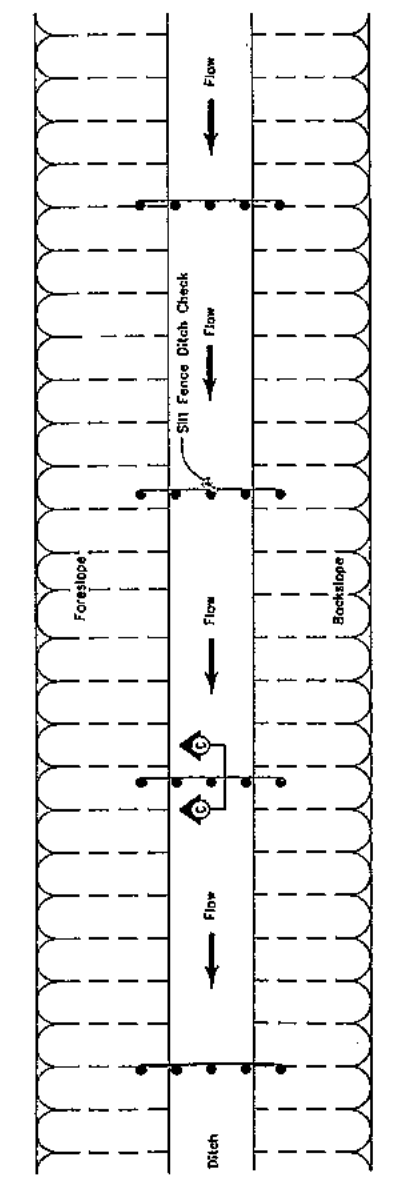
SILT FENCE - TYPICAL PLAN



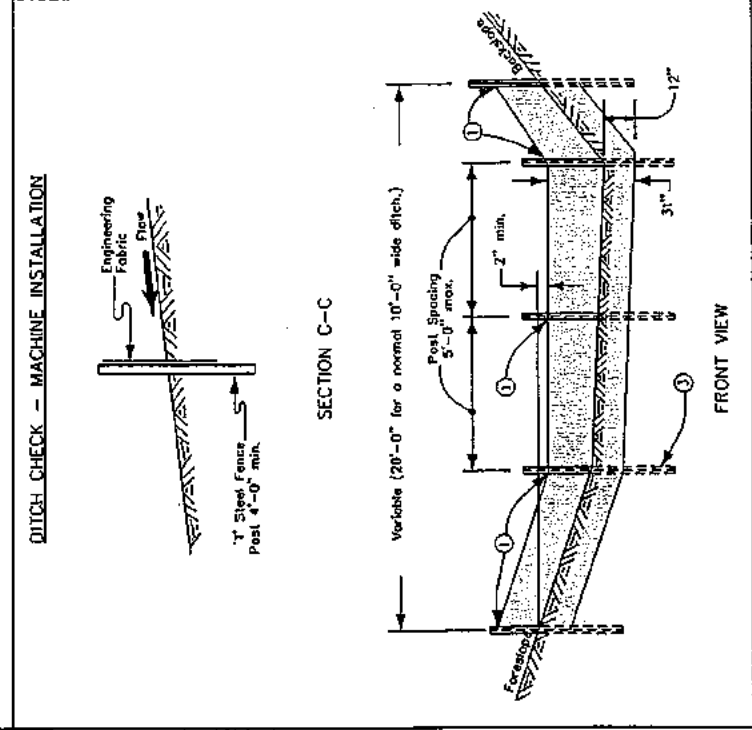
SILT FENCE - MACHINE AND MANUAL INSTALLATION



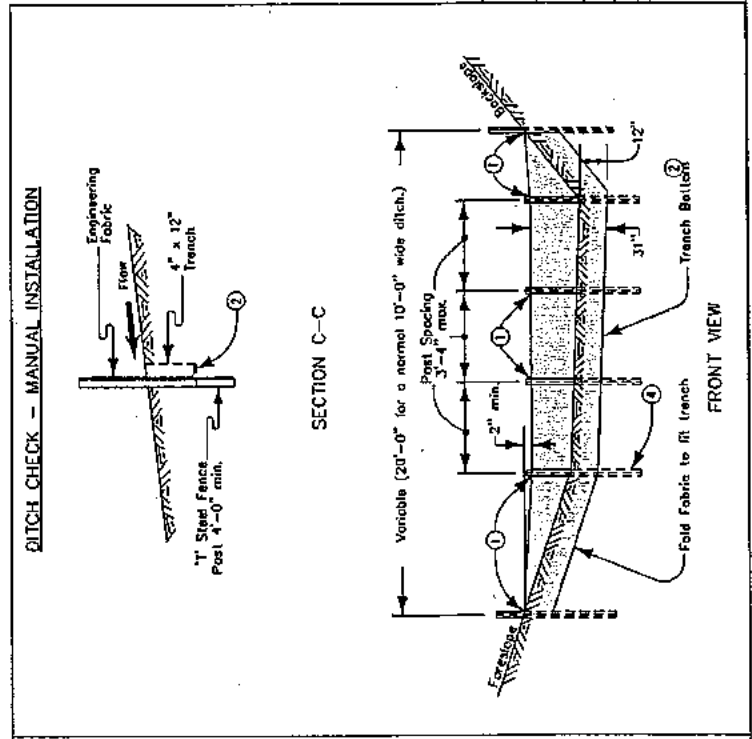
BACK VIEW ATTACHMENT TO POST



DITCH CHECK - TYPICAL PLAN



DITCH CHECK - MACHINE INSTALLATION



DITCH CHECK - MANUAL INSTALLATION

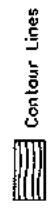
All Silt Fence shall be installed using a Silt Fence machine. Manual (trench) installation may be used if physical conditions prohibit machine installation.

For machine installation, ad compensation shall be accomplished by driving over each side of silt fence at least two times with device exerting 80 p.s.i. or greater.

For manual installation, all compensation 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 (80 lb.) or wire. See back view attachment to post.
- Engineering fabric to be flared along bottom of trench for manual installation only.
- For machine installation, posts shall be embedded 28 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.



Contour Lines

Possible Contract Items:  
Silt Fence  
Silt Fence for Ditch Checks

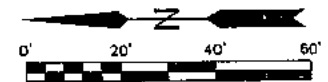
Possible Tabulations:  
100-17  
100-18  
100-19

INTERIM	3	10-00-00
STANDARD ROAD PLAN	RC-17	SHEET 1 of 2
REVISION: Add post height from 5' to 4' and spacing. Change color from 3 and 4.		
APPROVED BY DESIGN ENGINEER: [Signature]		
SILT FENCE		

- Secure top of engineering fabric to steel posts using cable ties (80 lb.) or wire. See back view attachment to post.
- Engineering fabric to be flared along bottom of trench for manual installation only.
- For machine installation, posts shall be embedded 28 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.

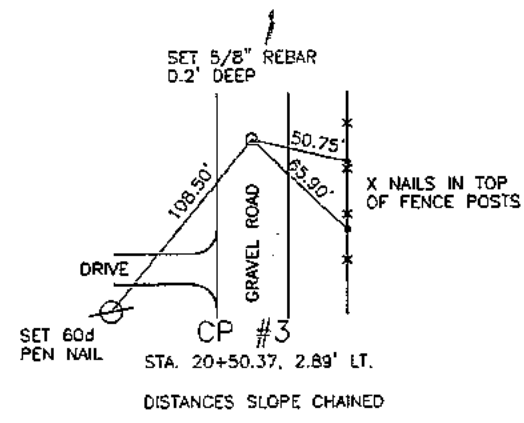
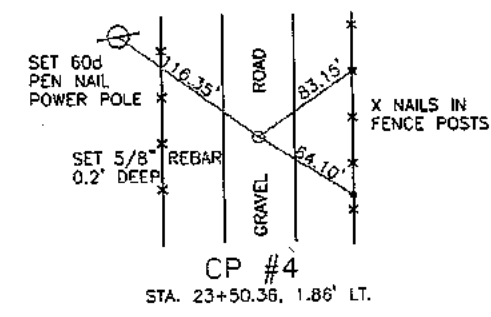
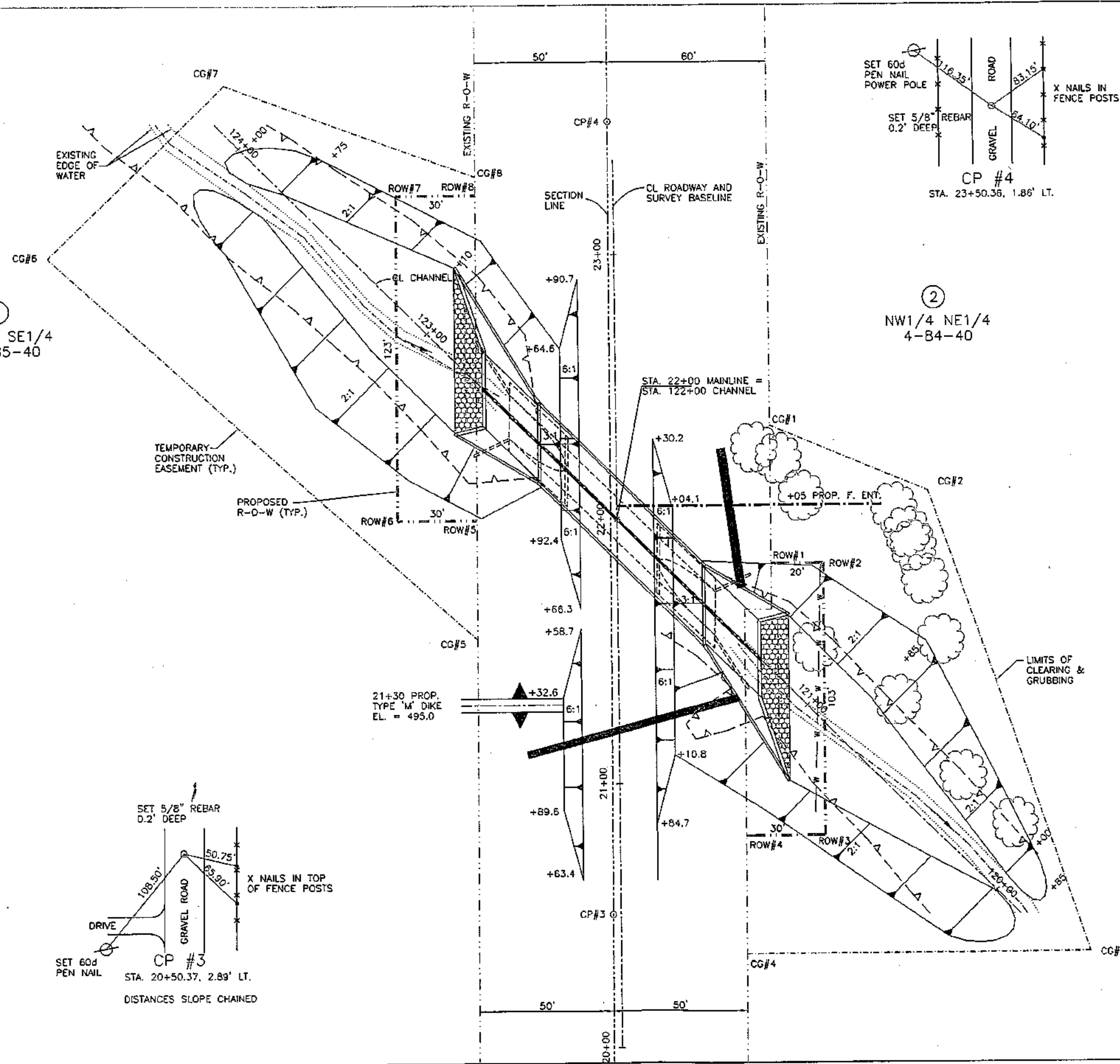
INTERIM	3	10-00-00
STANDARD ROAD PLAN	RC-17	SHEET 2 of 2
REVISION: Add post height from 5' to 4' and spacing. Change color from 3 and 4.		
APPROVED BY DESIGN ENGINEER: [Signature]		
SILT FENCE		

PARCEL NUMBER	PROPERTY OWNER
①	LOUIE HARGENS, JR.
②	JOEL SAILER



①  
SW1/4 SE1/4  
33-85-40

②  
NW1/4 NE1/4  
4-84-40

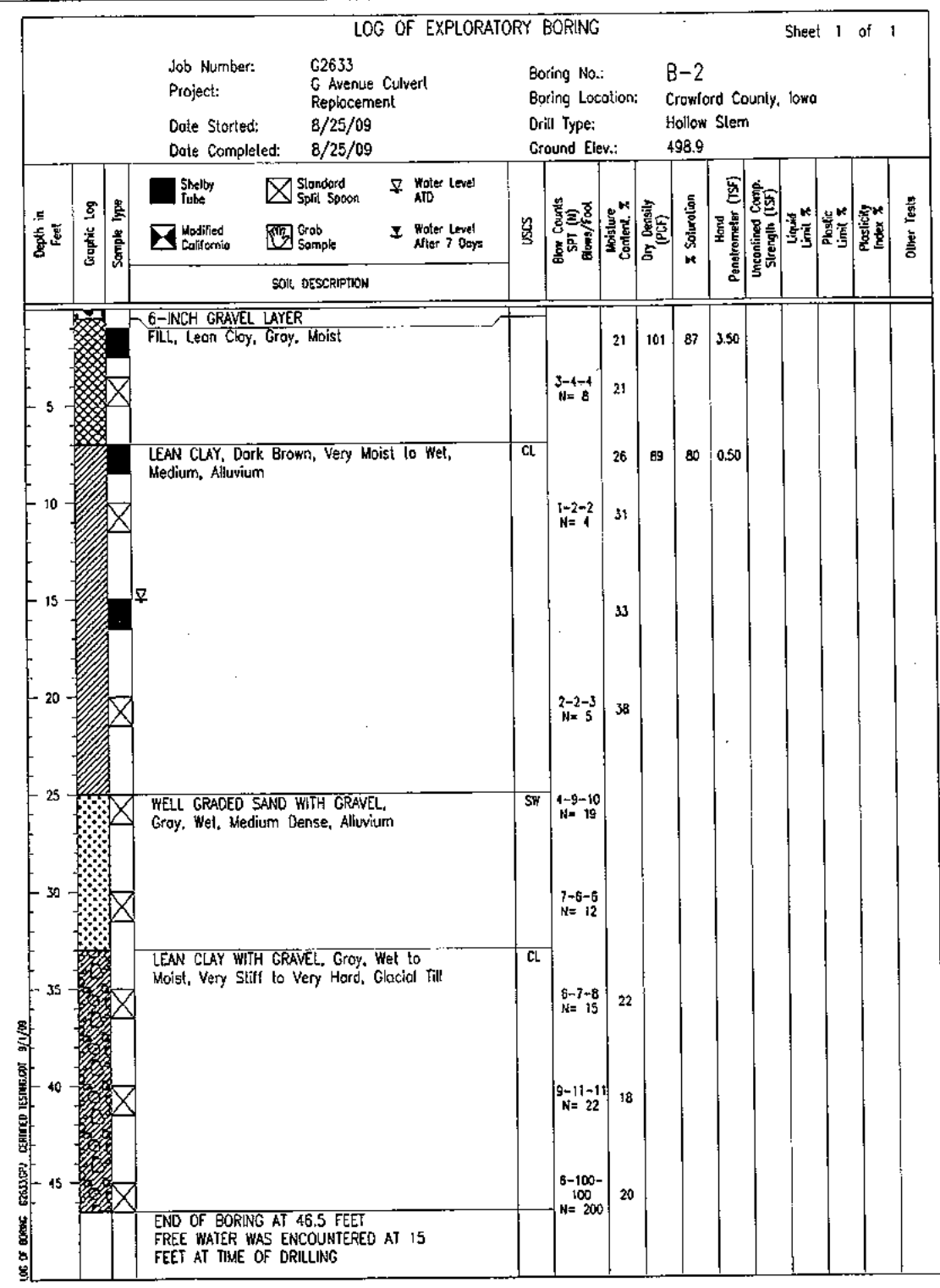
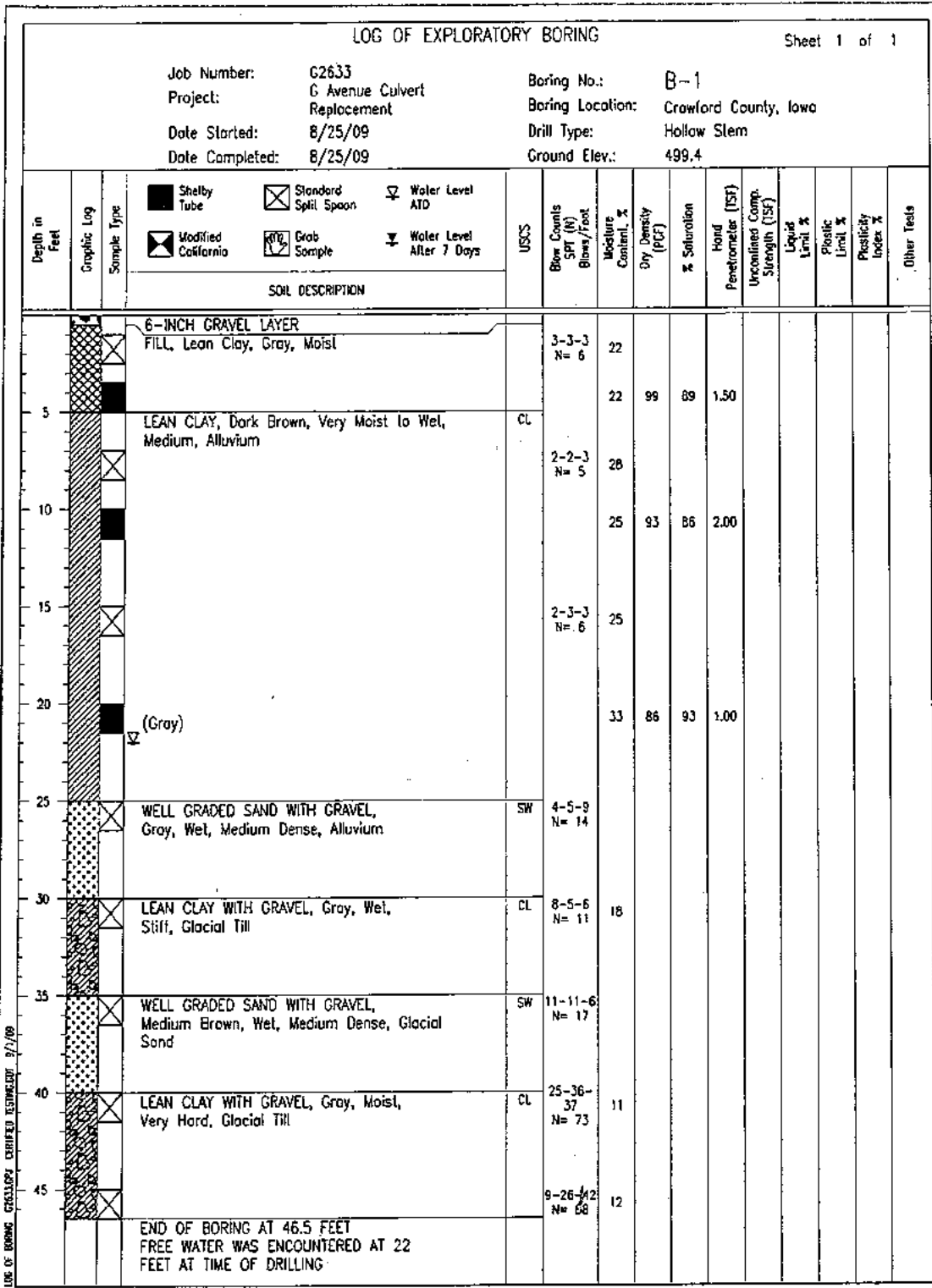


HORIZONTAL CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
CP #3	10000.00	10855.00	
CP #4	10000.00	11155.00	
BM A	10050.11	10758.76	500.00
BM B	10049.11	11260.13	501.16

LIMITS OF CLEARING AND GRUBBING AND TEMPORARY CONSTRUCTION EASEMENT		
DESCRIPTION	NORTHING	EASTING
CG#1	9940.0000	11039.8434
CG#2	9880.0000	11015.0508
CG#3	9820.0011	10840.2570
CG#4	9950.0000	10839.8078
CG#5	10050.0000	10959.4527
CG#6	10212.0000	11103.9037
CG#7	10145.0000	11169.1356
CG#8	10050.0000	11134.4638

PROPOSED RIGHT-OF-WAY		
DESCRIPTION	NORTHING	EASTING
ROW#1	9940.0000	10987.8431
ROW#2	9920.0005	10987.9122
ROW#3	9920.0005	10884.9116
ROW#4	9950.0000	10884.8079
ROW#5	10050.0000	11004.4630
ROW#6	10080.0000	11004.3593
ROW#7	10080.0000	11127.3600
ROW#8	10050.0000	11127.4637

RIGHT-OF-WAY



GEOTECHNICAL INFORMATION PROVIDED HEREWITH IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED AUGUST 31, 2009, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

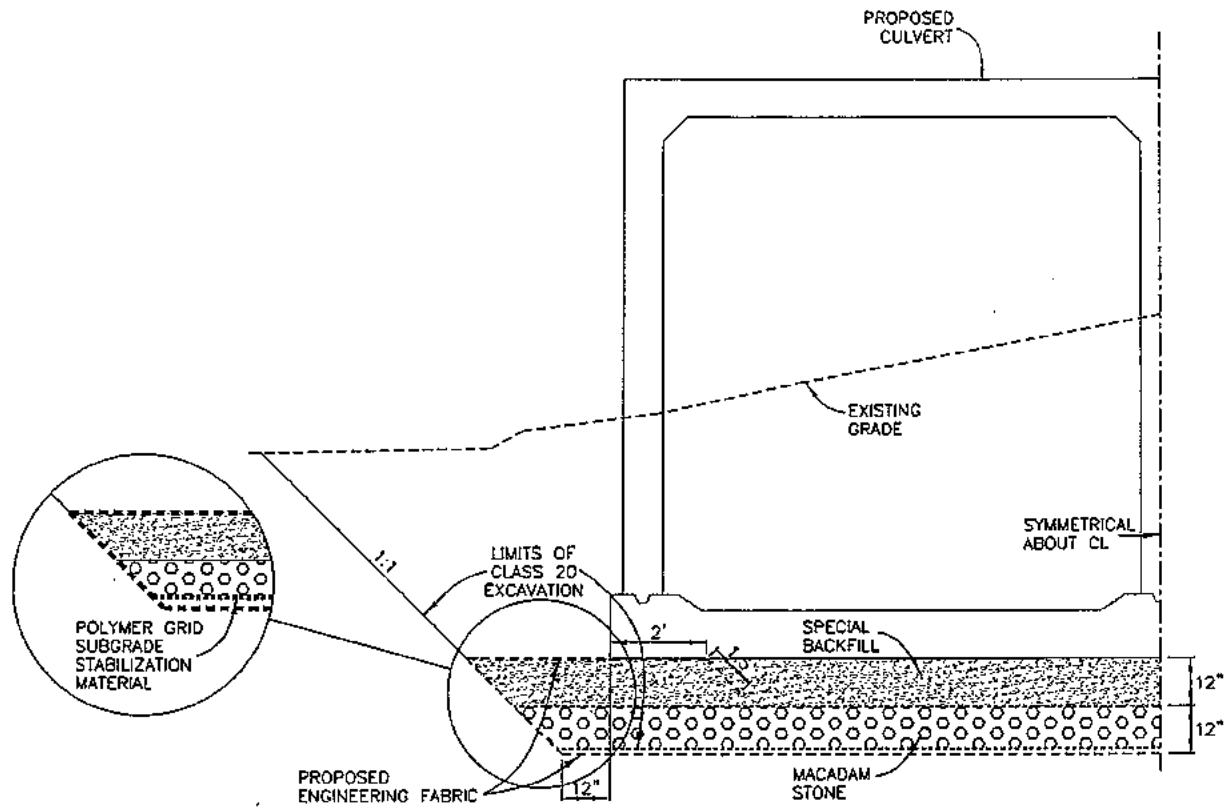
**SOUNDING DATA**

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

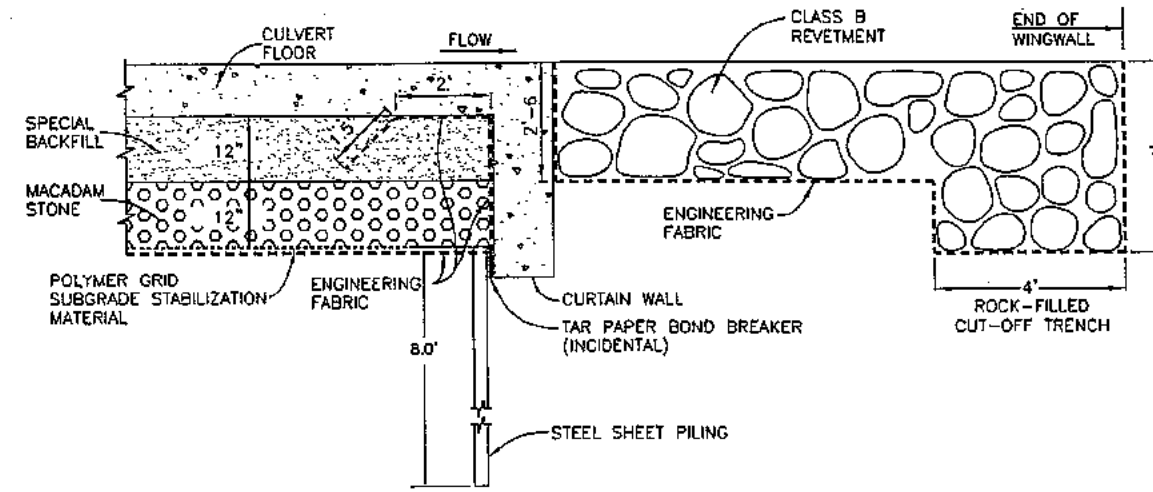
SOUNDINGS WERE TAKEN ON AUGUST 25, 2009.

SEE SHEET V1 FOR BORING LOCATIONS.

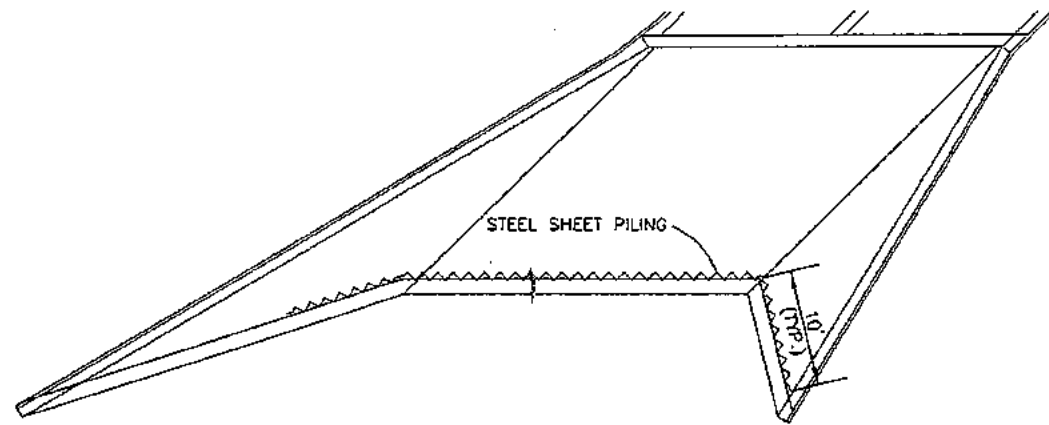




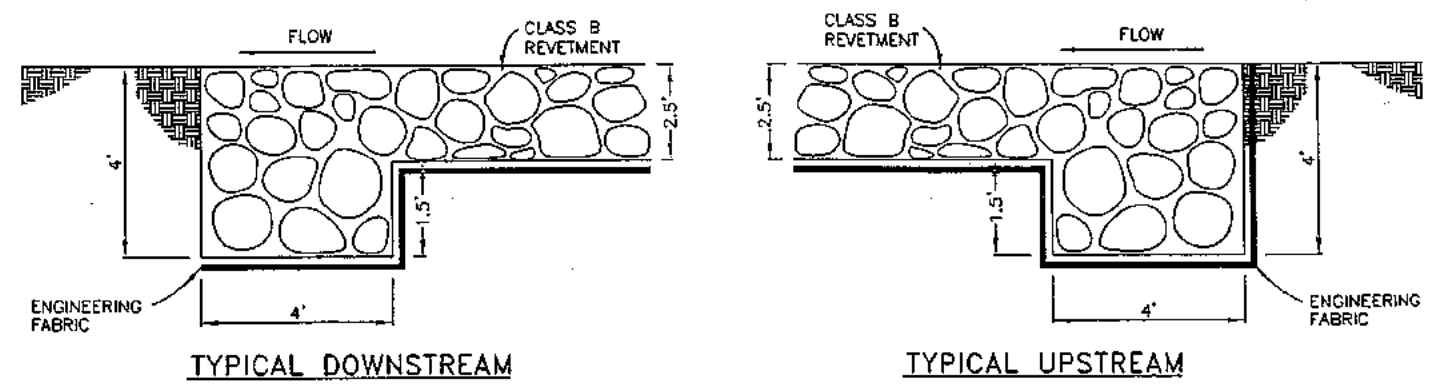
**CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION**  
NOT TO SCALE



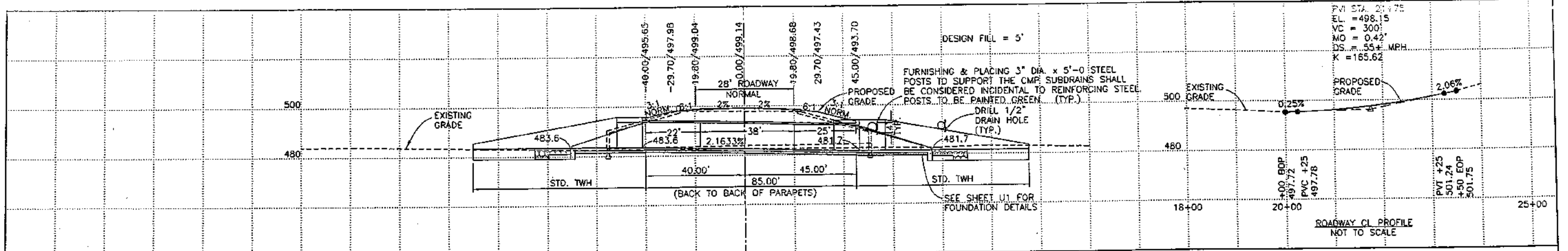
**SECTION AT HEADWALL CURTAIN WALL**  
NOT TO SCALE



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



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



LONGITUDINAL SECTION ALONG CENTERLINE

PARCEL NUMBER PROPERTY OWNER

① LOUIE HARGENS, JR.

② JOEL SAILER

SHAPE INTO EXISTING CHANNEL SLOPES AS DIRECTED BY THE ENGINEER (TYP.)

① SW1/4 SE1/4 33-85-40

② NW1/4 NE1/4 4-84-40

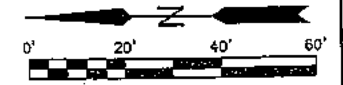
STA. 22+52 F. ENT. RT. 42"x86" CMP CONTRACTOR TO REMOVE EXISTING STRUCTURE AND FURNISH AND PLACE AT STA. 22+05, 42"x52" CMP 24" TOP W/2:1 F.S. D.A. = 29 AC. I.E. IN = 493.0 I.E. OUT = 489.5

STA. 21+23.5, 48"x56" CMP CONTRACTOR TO REMOVE EXISTING STRUCTURE AND FURNISH AND PLACE AT STA. 21+20.2, 36"x82" CMP INCL. 1 - TYPE A DIAPHRAGM SKEW 15' RT. AHEAD D.A. = 15 AC. I.E. IN = 491.0 I.E. OUT = 490.0

STA. 22+00, EXISTING 174"x112" SPP W/CONCRETE HEADWALLS, TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT TWIN 10'x10'x85" RCB CULVERT WITH SKEWED FLARED WING HEADWALLS, SKEW 45' LT. AHEAD. DESIGN FILL = 5' D.A. = 2.77 SQ. MI.

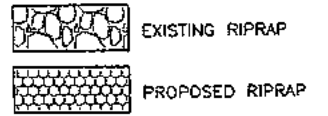
21+30 PROP. TYPE 'M' DIKE EL. = 495.0

SITUATION PLAN



BM A NAIL IN POWER POLE, STA. 19+54.30, 53.34' LT., EL. = 500.00

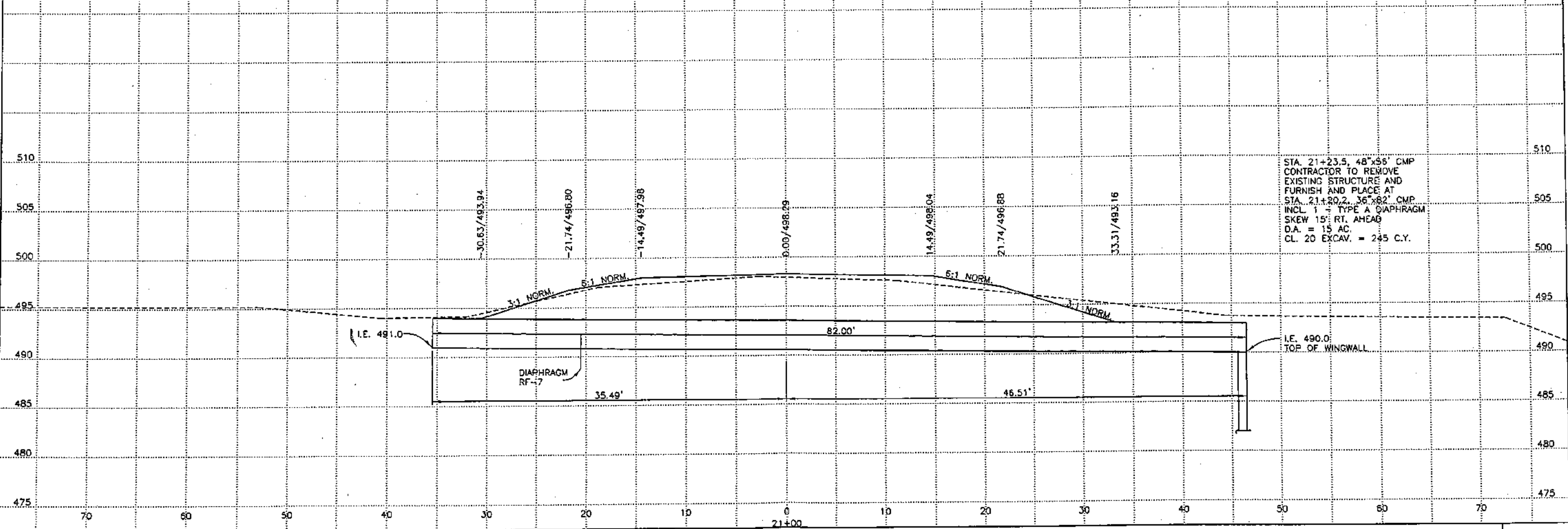
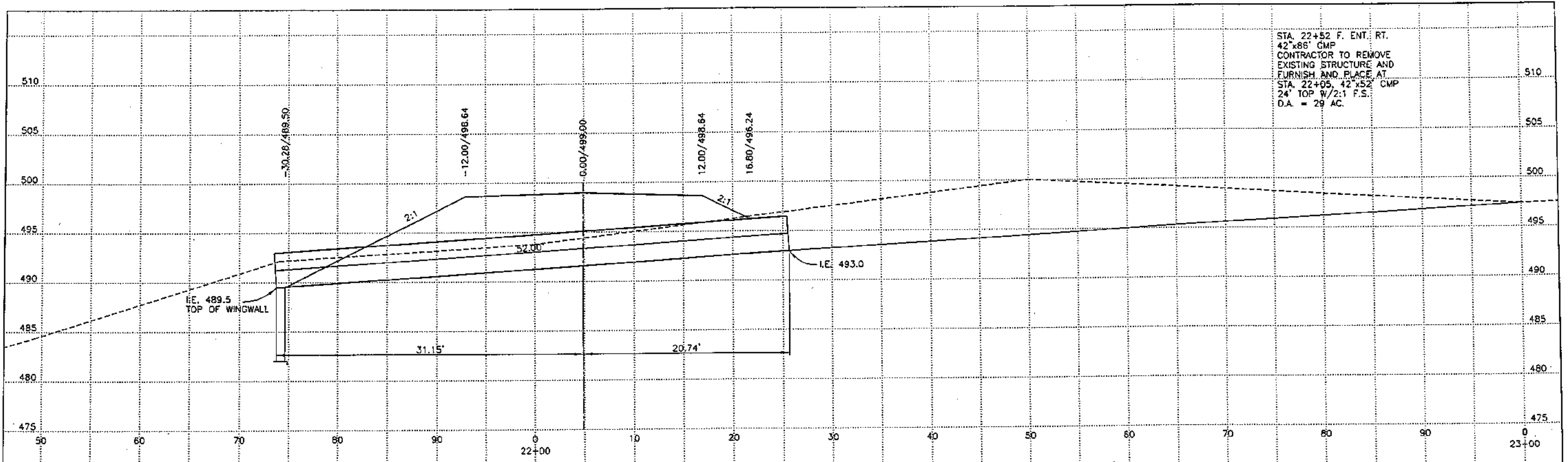
BM B NAIL IN POWER POLE, STA. 24+55.66, 50.60' LT., EL. = 501.16

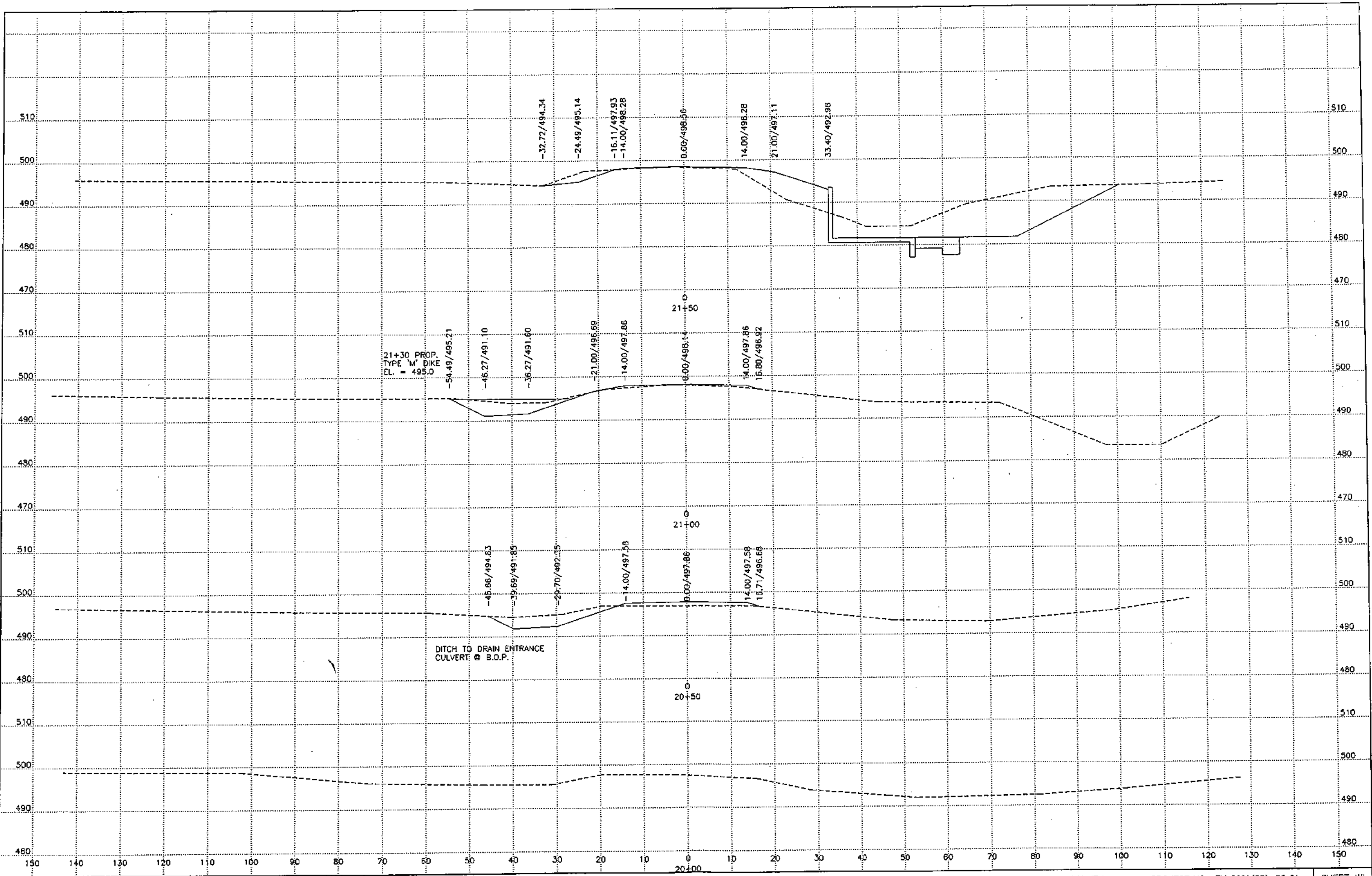


LOCATION  
T-84N R-40W  
SECTION 4  
HANOVER TWP.  
OVER TRIBUTARY TO THE  
EAST SOLDIER RIVER

HYDRAULIC DATA  
DRAINAGE AREA = 2.77 SQ. MI.  
DESIGN DISCHARGE = 1420 CFS (Q25)  
DESIGN HIGH WATER = 494.2  
REACH SLOPE (LOCAL) = 26.6 FT./MI.  
CULVERT WATERWAY AREA = 200 SQ. FT.  
Q50 = 1750 CFS STAGE = 495.7  
Q100 = 2110 CFS STAGE = 497.5  
DESIGN VELOCITY (D.S. CHANNEL) = 7.8 FT./SEC.

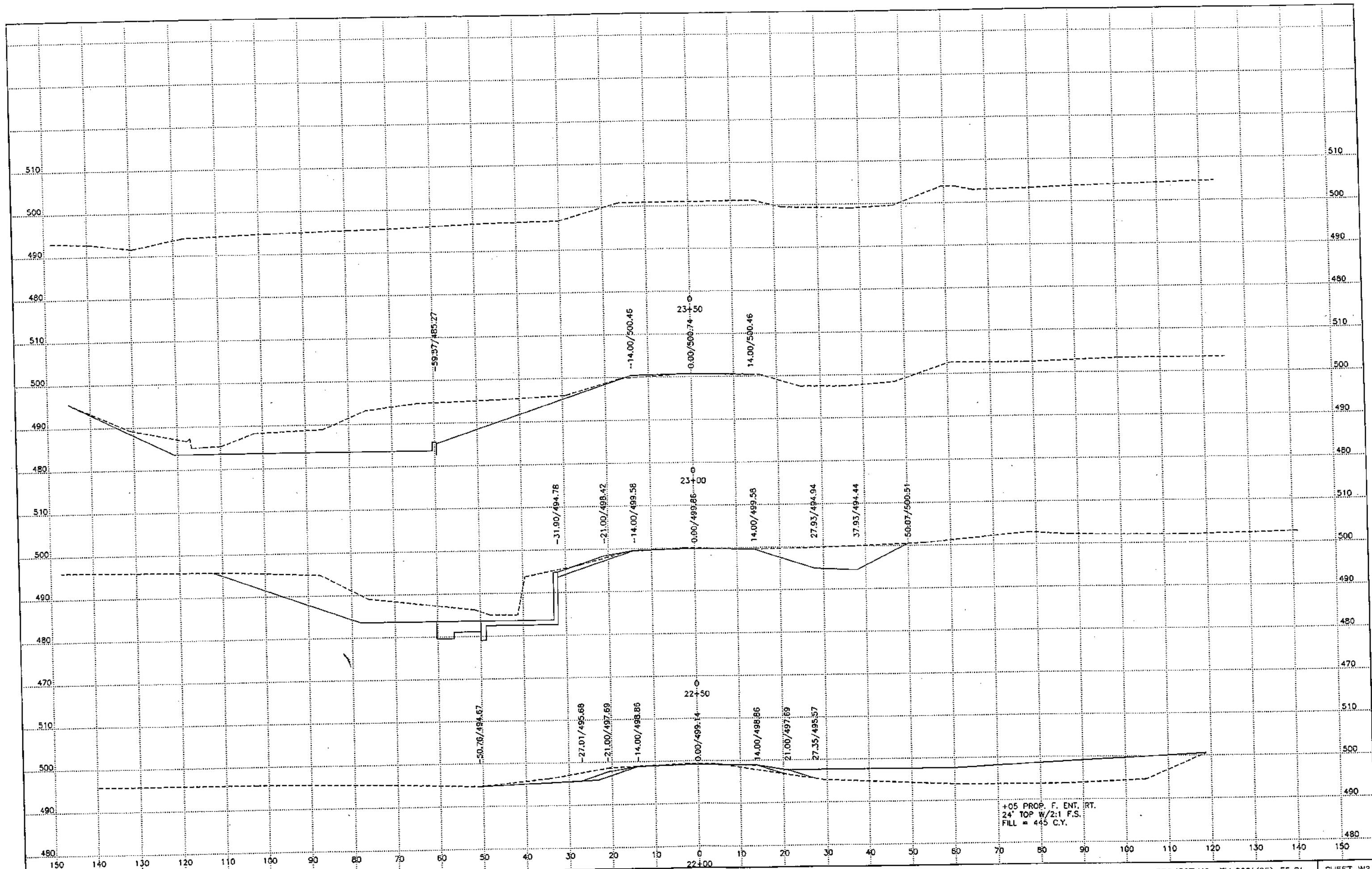
DESIGN FOR:  
TWIN 10'x10'x85" RCB CULVERT  
WITH SKEWED FLARED WING HEADWALLS  
STA. 22+00, SKEW 45' LT. AHEAD  
CRAWFORD COUNTY  
PROJECT NO. FM-C024(95)--55-24





21+30 PROP.  
TYPE "M" DIKE  
CL. = 495.0

DITCH TO DRAIN ENTRANCE  
CULVERT @ B.O.P.



+05 PROP. F. ENT. RT.  
 24' TOP W/2:1 F.S.  
 FILL = 445 C.Y.

