

PROJECT NO. DS-24(9)

CRAWFORD COUNTY

Letting Date June 12, 2001

#### TRAFFIC CONTROL PLAN

THROUGH TRAFFIC WILL BE MAINTAINED AT ALL TIMES 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 AND LAYOUTS SHALL BE AS PER PART VI OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) REVISION 3, DATED SEPTEMBER 3, 1993.

#### ARCHAEOLOGICAL

IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE ENGINEER MUST BE CONTACTED IMMEDIATELY SO THE PROPER AUTHORITIES CAN BE NOTIFIED ACCORDING TO THE EXISTING FEDERAL REGULATIONS AND STATE PROCEDURES. ADDITIONALLY, IT SHOULD BE NOTED THAT FINDINGS AND RECOMMENDATIONS FOR CLEARANCE FOR FURTHER TESTING CANNOT BE CONSIDERED FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE OFFICE OF THE STATE HISTORIC PRESERVATION OFFICER. PROJECT PLANNING 515-239-1225 LOCAL SYSTEMS 515-239-1528

#### PERMITS

THIS PROJECT IS COVERED BY THE FOLLOWING CORPS OF ENGINEERS (COE) AND IOWA DEPARTMENT OF NATURAL RESOURCES (IDNR) FLOOD PLAIN DEVELOPMENT PERMITS. COE PERMIT NO. NWP 13 AND NWP 14 IDNR PERMIT NO. FP 2000-301

## IOWA DEPARTMENT OF TRANSPORTATION

Project Development Division  
PLANS OF PROPOSED IMPROVEMENT ON THE

# SECONDARY ROAD SYSTEM CRAWFORD COUNTY STREAM CHANNEL STABILIZATION STRUCTURE PROJECT NO. DS-24(9)

IN COOPERATION WITH LOESS HILLS DEVELOPMENT AND  
CONSERVATION AUTHORITY - HUNGRY CANYONS ALLIANCE  
SITE HC 00-20

#### INDEX OF SHEETS

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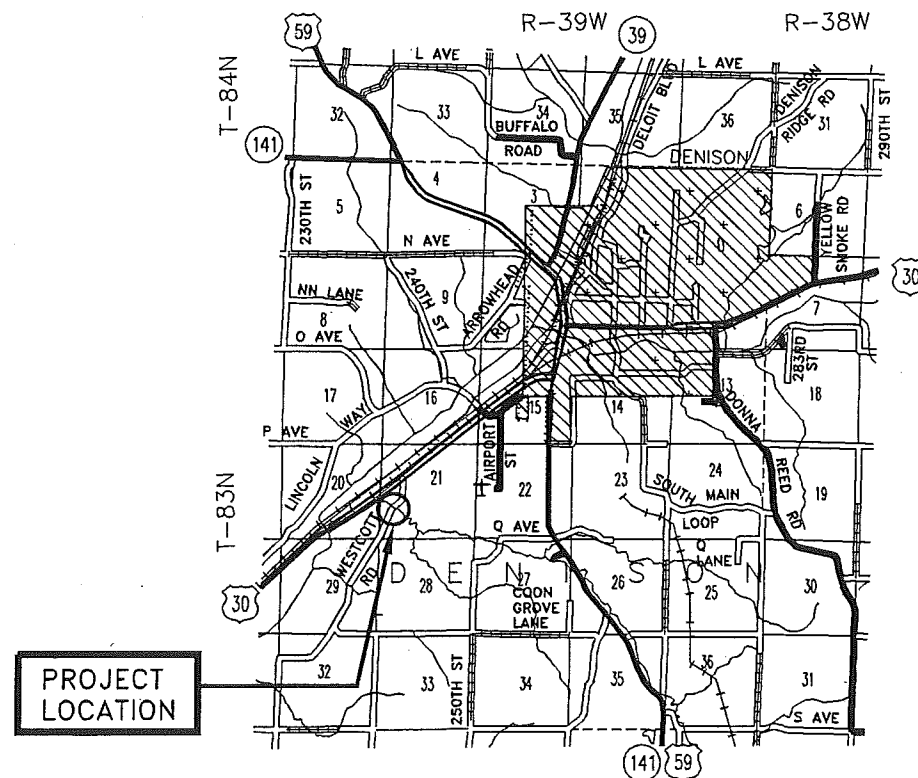
#### ROAD STANDARD PLANS

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

Identification	Date	Identification	Date	Identification	Date
RS-2	10-27-98	.	.	.	.
.	.	.	.	.	.

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, series of 1997, plus current Supplemental Specifications and Special Provisions shall apply to construction work on this project.

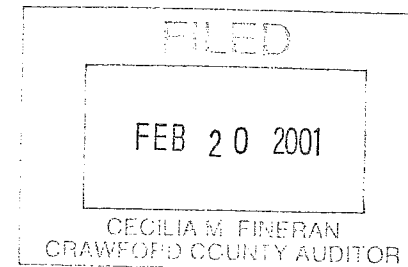
Scales: As Noted



LOCATION MAP



1996 AADT  
100 V.P.D.



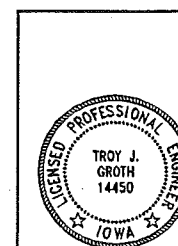
APPROVED

FEB 20 2001

CHAIRMAN  
BOARD OF SUPERVISORS

Approved  
*[Signature]* 2/20/01  
Crawford County Engineer Date

Approved  
*[Signature]*  
*[Signature]*  
*[Signature]*  
*[Signature]*  
*[Signature]*  
BOARD OF SUPERVISORS



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]* 12/14/00  
TROY J. GROTH, P.E. #14450 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2001.  
PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS

REV.

SUNDQUIST ENGINEERING, P.C.  
CONSULTING ENGINEERS

HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING  
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442  
PHONE: (712)263-8118 FAX: (712)263-2181

SE PROJECT NO. 04100

DATE: 07/00

DRAWN BY: LMD

REVIEWED BY: SAS

APPROVED BY: TJG

CLIENT: CRAWFORD COUNTY

DESCRIPTION: TITLE SHEET

SHEET A1

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.

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 HIS EXPENSE WITHOUT COST TO THE COUNTY. ANY TILE LINES BROKEN OR DISTURBED BY CUT LINES WILL BE REPLACED AS DIRECTED BY THE ENGINEER IN CHARGE OF CONSTRUCTION AND AT THE COUNTY'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 COUNTY 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.

ANY INCONVENIENCE OR DELAY INCURRED BY THE CONTRACTOR DUE TO ARCHAEOLOGICAL WORK SHALL BE CONSIDERED INCIDENTAL TO "CLASS 10 EXCAVATION, ROADWAY AND BORROW".

213-1  
IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL, OPEN DUMP REFUSE OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. 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 OR APPROVED BY THE ENGINEER.

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.

ESTIMATE REFERENCE INFORMATION

DATA LISTED BELOW ARE FOR INFORMATIONAL PURPOSES ONLY AND SHALL NOT CONSTITUTE A BASIS FOR ANY EXTRA WORK ORDERS.

2. EMBANKMENT-IN-PLACE  
PLAN QUANTITY FOR EMBANKMENT-IN-PLACE INCLUDES FILL + 35% SHRINK.

TYPE "A" COMPACTION WILL BE REQUIRED. BORROW FROM SUITABLE CLASS 10 CHANNEL EXCAVATION ALLOWED. ADDITIONAL NECESSARY BORROW SHALL BE PROVIDED BY THE CONTRACTOR. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. ALL AREAS TO RECEIVE NEW EMBANKMENT SHALL BE THOROUGHLY CLEAN OF ALL VEGETATION AND OTHER DEBRIS. EXISTING SURFACES SHALL BE PLOWED, STEPPED OR BENCHED PRIOR TO PLACEMENT OF NEW EMBANKMENT FILLS. SUCH WORK SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM. PAYMENT FOR THIS ITEM SHALL BE BASED ON PLAN QUANTITY.

FILL MATERIALS SHALL CONTAIN NO SOD, BRUSH, ROOTS OR OTHER PERISHABLE MATERIALS. FILL SHALL NOT BE PLACED UPON A FROZEN SURFACE, NOR SHALL SNOW, ICE OR FROZEN MATERIAL BE INCORPORATED IN THE FILL.

3. EXCAVATION, CLASS 10, CHANNEL  
SUITABLE CLASS 10 CHANNEL EXCAVATION MAY BE USED FOR EMBANKMENT-IN-PLACE. EXCESS MATERIALS 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 10 CHANNEL EXCAVATION.

SHAPING OF THE EXISTING CHANNEL BOTTOMS AND SIDESLOPES AS DIRECTED BY THE ENGINEER TO TRANSITION INTO THE PROPOSED IMPROVEMENTS SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 CHANNEL EXCAVATION.

PAYMENT FOR THIS ITEM SHALL BE BASED ON PLAN QUANTITY.

6. ENGINEERING FABRIC  
SEE DRAWING SHEET C2 - DETAILS OF PLACEMENT OF ENGINEERING FABRIC FOR INSTALLATION DETAILS. MATERIAL TO CONFORM TO IOWA DOT MATERIALS IM 496.01 APPENDIX A, EMBANKMENT EROSION CONTROL (SPECIFICATION 4196.01C).

MATERIAL SHALL BE JOINED BY OVERLAPPING A MINIMUM OF 18 INCHES.

7. CONCRETE GROUT FOR REVETMENT OR GABION  
REFER TO SUPPLEMENTAL SPECIFICATIONS FOR CONCRETE GROUT FOR REVETMENT OR GABIONS.

THE GROUT SHALL BE CONSOLIDATED INTO THE VOIDS WITH THE USE OF A CONCRETE VIBRATOR.

GROUTING OPERATION SHALL NOT BE PERFORMED EXCEPT IN THE PRESENCE OF THE ENGINEER.

THE AVERAGE RATE OF GROUT APPLICATION SHALL BE 5.4 CUBIC FEET OF GROUT PER SQUARE YARD OF SURFACE AREA.

METHOD OF MEASUREMENT: THE ENGINEER WILL COMPUTE TO THE NEAREST 0.1 CUBIC YARD THE VOLUME OF CONCRETE GROUT FOR REVETMENT OR GABION FURNISHED AND ACCEPTABLY PLACED WITHIN THE SPECIFIED LIMITS, FROM THE NOMINAL VOLUME OF EACH BATCH AND A COUNT OF BATCHES. GROUT UNUSED OR WASTED, INCLUDING ANY PARTIAL BATCH REMAINING AT THE COMPLETION OF THE OPERATION, WILL BE ESTIMATED AND DEDUCTED BY THE ENGINEER. METHOD OF MEASUREMENT IN SUPPLEMENTAL SPECIFICATIONS FOR CONCRETE GROUT FOR REVETMENT OR GABIONS SHALL NOT APPLY.

ESTIMATED PROJECT QUANTITIES

100-1A  
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101-0850002	CLEARING AND GRUBBING	UNIT	243	
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	1167	
3	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1718	
4	2501-5425036	PILES, DRIVE STEEL BEARING, HP 8 x 36	LF	800	
5	2501-5550036	PILES, FURNISH STEEL BEARING, HP 8 x 36	LF	800	
6	2507-3250005	ENGINEERING FABRIC	SY	949	
7	2507-4011100	CONCRETE GROUT FOR REVETMENT OR GABION	CY	90	
8	2507-6850053	REVETMENT, SPECIAL	TON	1263	
9	2528-8445110	TRAFFIC CONTROL	LS	1	
10	2533-4980005	MOBILIZATION	LS	1	
11	2599-9999005	HOG PANELS, GALVANIZED, 192 IN. x 34 IN.	EACH	36	
12	2599-9999009	1/2 IN. CABLE	LF	557	
13	2599-9999010	REMOVAL OF WATER	LS	1	
14	2601-2634100	MULCHING	ACRE	0.5	
15	2601-2636041	SEEDING AND FERTILIZING	ACRE	0.5	

8. REVETMENT, SPECIAL  
SPECIAL REVETMENT SHALL MEET THE REQUIREMENTS OF STANDARD SPECIFICATIONS SECTION 2507.03, CLASS B REVETMENT.

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

MATERIAL FOR SPECIAL REVETMENT SHALL BE MEASURED IN TONS TO THE NEAREST 0.1 TONS.

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.

9. TRAFFIC CONTROL  
INCLUDES BARRICADES AND WARNING SIGNS NECESSARY TO PROTECT THE CONTRACTOR'S WORK AND EQUIPMENT AND THE SAFETY OF THE TRAVELING PUBLIC. ALL SIGNS, BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", 1988.

11. HOG PANELS, GALVANIZED, 192 IN. x 34 IN.  
GALVANIZED HOG PANELS SHALL BE FABRICATED OF 1/4 IN. RODS. AVERAGE SPACING OF LONGITUDINAL RODS SHALL BE 3 IN. AND VERTICAL RODS 8 IN. THE COST OF FURNISHING AND INSTALLING CABLE CLAMPS AT HOG PANEL LAPS AND THE COST OF FURNISHING AND INSTALLING 9 GAGE GALVANIZED WIRE FOR TYING THE PANELS TO THE PILES SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE PER EACH PANEL INSTALLED IN ACCORDANCE WITH THE PLANS.

12. 1/2 IN. CABLE  
THE CABLE IS TO BE BID ON A LINEAR FOOT BASIS. METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE PER LINEAR FOOT OF MATERIAL INSTALLED IN ACCORDANCE WITH THE PLANS EXCLUSIVE OF SPLICES. CABLE SHALL BE GALVANIZED, STRANDED CABLE.

THE COST OF FURNISHING AND INSTALLING ALL NECESSARY CABLE CLAMPS, INCLUDING AT SPLICES AND ENDS, SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

13. REMOVAL OF WATER  
THIS ITEM CONSISTS OF DIVERTING SURFACE WATER AND DEWATERING THE SITE AS NEEDED FOR CONSTRUCTION. POLLUTION CONTROL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM. DEWATERING OF SITE SHALL INCLUDE REMOVAL OF WATER FROM THE PROPOSED STILLING BASIN TO FACILITATE PLACEMENT OF ENGINEERING FABRIC, RIPRAP AND GROUT. PLACEMENT OF GROUT IN STANDING WATER SHALL NOT BE ALLOWED.

14. MULCHING  
15. SEEDING AND FERTILIZING  
INCLUDES RESTORING ALL DISTURBED AREAS IN ACCORDANCE WITH SECTION 2601 OF THE REFERENCE SPECIFICATIONS EXCEPT THAT THE FOLLOWING SPECIFIED SPECIES AND RATE OF SEED SHALL BE SOWN PER ACRE:

SWITCHGRASS (CAVE-IN-ROCK)	3 POUNDS (PLS)
SMOOTH BROMEGRASS (SOUTHERN TYPE)	15 POUNDS
TALL FESCUE (ENDOPHYTE FREE)	12 POUNDS
RED CLOVER (MEDIUM)	5 POUNDS
BIRDSFOOT TREFOIL (EMPIRE)	5 POUNDS
PERENNIAL RYEGRASS	10 POUNDS

AT THE OPTION OF THE ENGINEER, 1½ BUSHELS PER ACRE OF OATS MAY BE SEEDED AS A NURSE CORP. THIS DECISION WILL BE BASED ON THE STEEPNESS OF THE SLOPES AND THE NEED FOR IMMEDIATE COVER. SECTION 1109.16 PARAGRAPH C OF THE REFERENCE SPECIFICATIONS DOES NOT APPLY.

REV:

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

SE PROJECT NO. 04100

DATE: 07/00

DRAWN BY: LMD

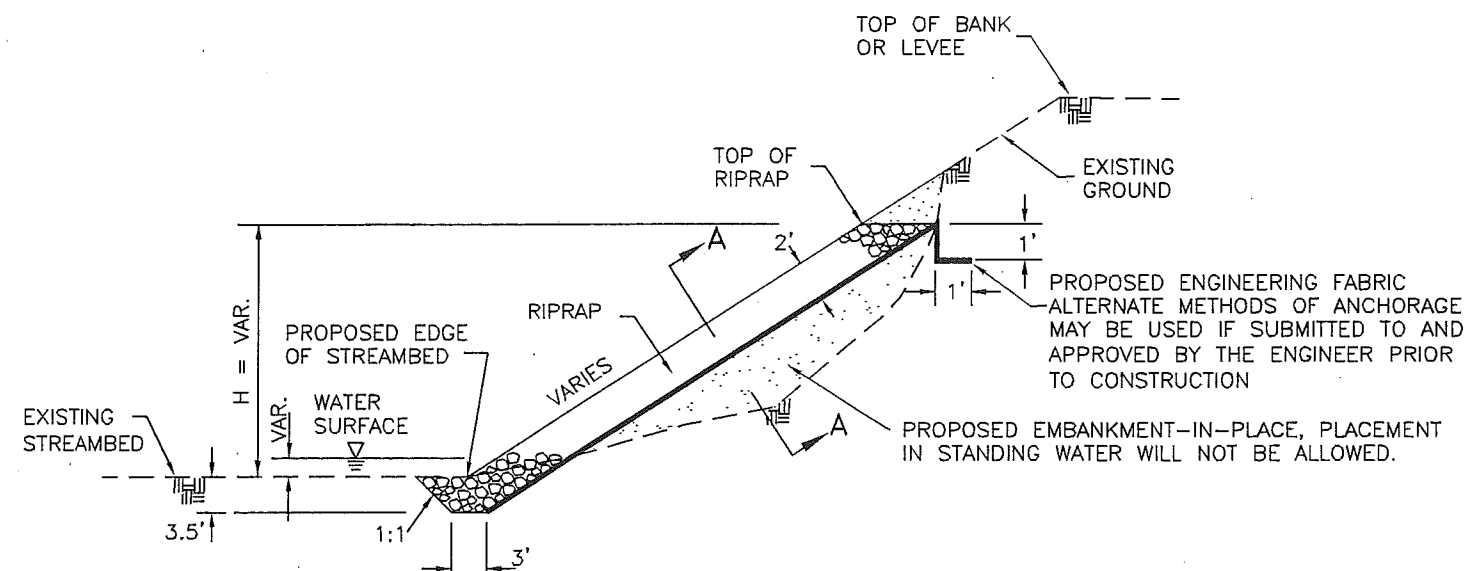
REVIEWED BY: SAS

APPROVED BY: T.JG

CLIENT: CRAWFORD COUNTY

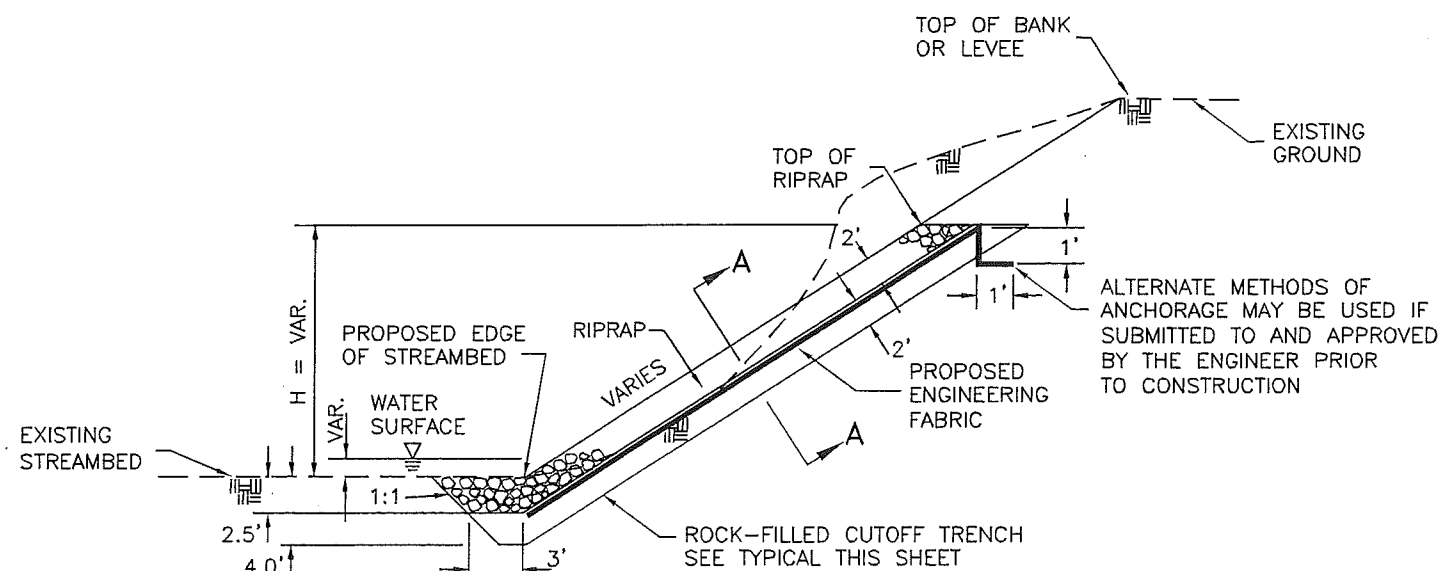
DESCRIPTION: GENERAL NOTES, ESTIMATED PROJECT QUANTITIES  
AND ESTIMATE REFERENCE INFORMATION

SHEET B1



### CHANNEL FILL

NO SCALE

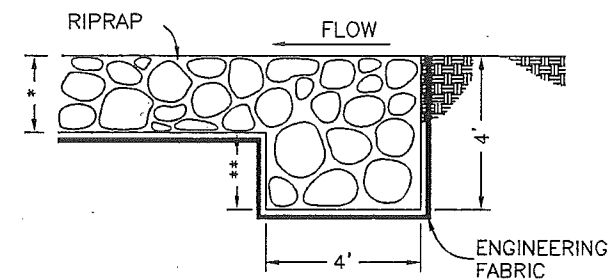


### CHANNEL CUT

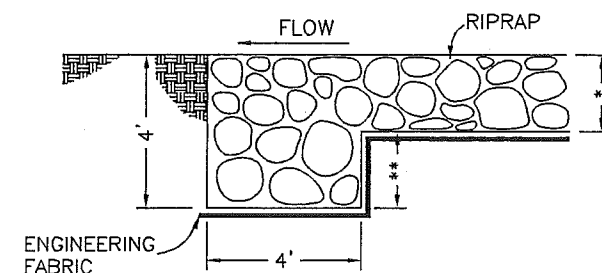
NO SCALE

## TYPICAL HALF-CHANNEL BANK STABILIZATION SECTION

FOR H DIMENSION AND CHANNEL SLOPE SEE CROSS SECTIONS



### TYPICAL UPSTREAM



### TYPICAL DOWNSTREAM

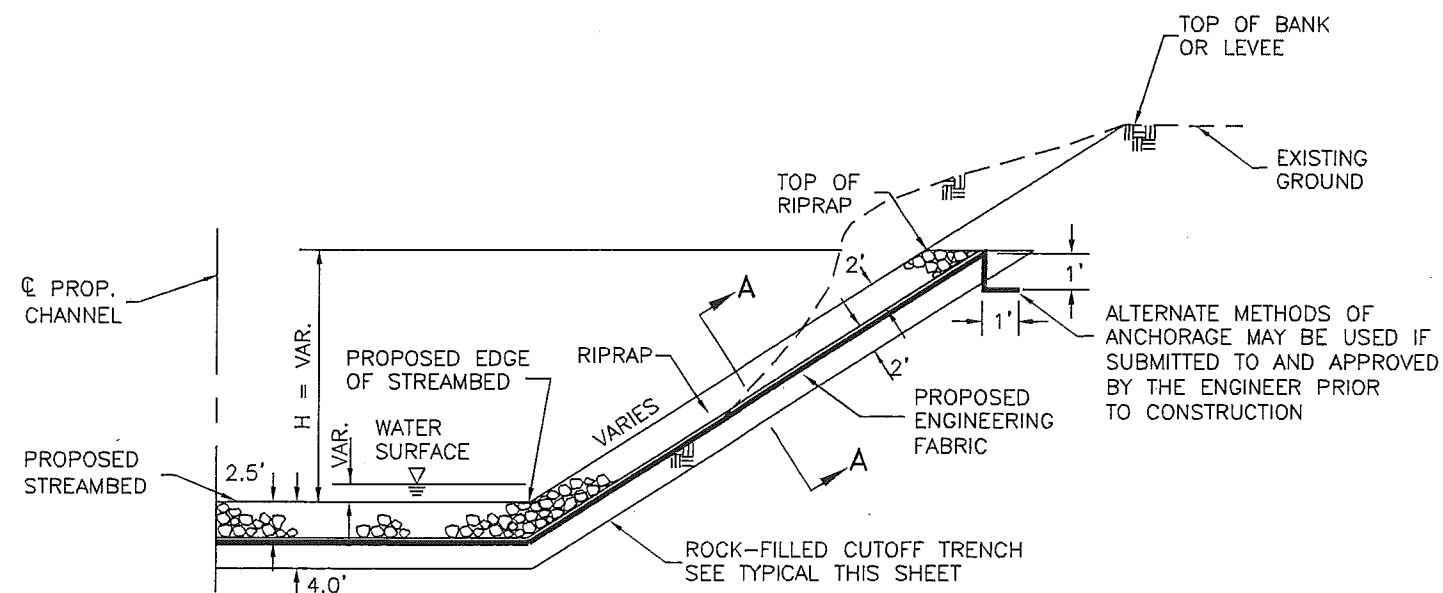
\* 2.5' ACROSS CHANNEL BOTTOM  
2.0' ON SIDE SLOPES

\*\* 1.5' ACROSS CHANNEL BOTTOM  
2.0' ON SIDE SLOPES

### SECTION A-A

## ROCK-FILLED CUTOFF TRENCH DETAILS

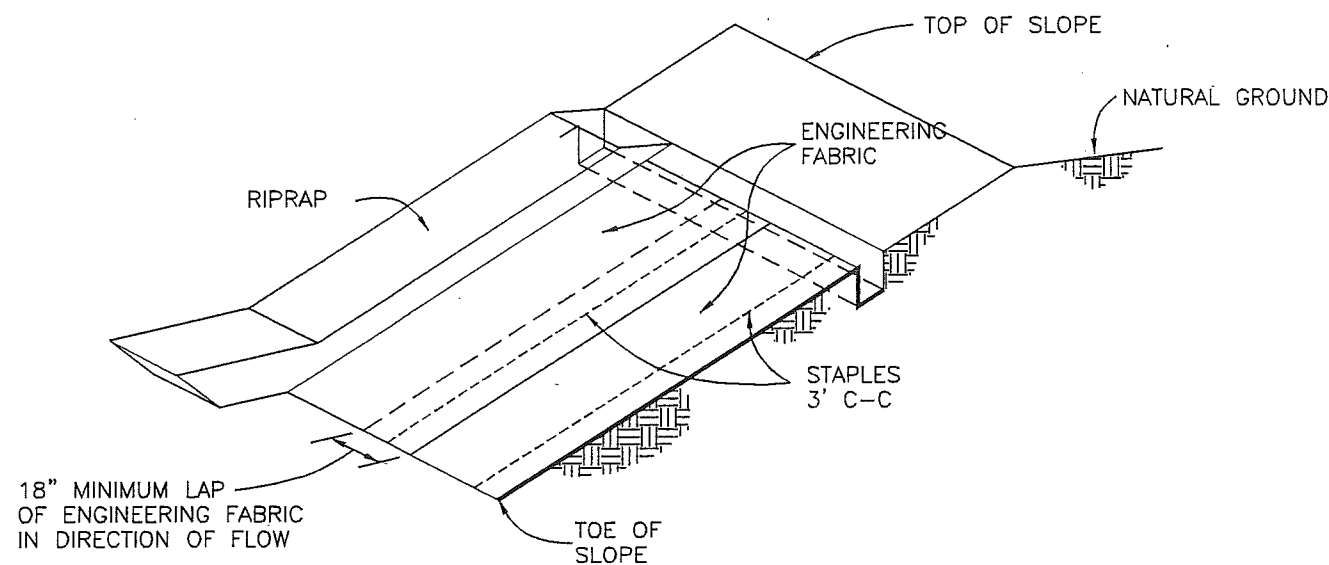
CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES  
NO SCALE



## TYPICAL FULL-CHANNEL BANK STABILIZATION SECTION

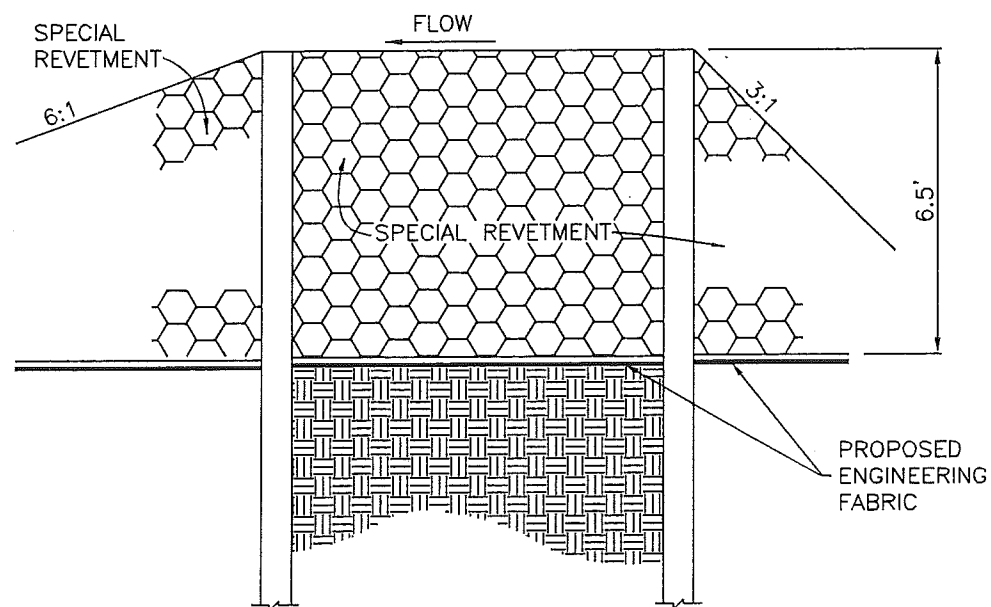
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FOR H DIMENSION AND CHANNEL SLOPE SEE CROSS SECTIONS



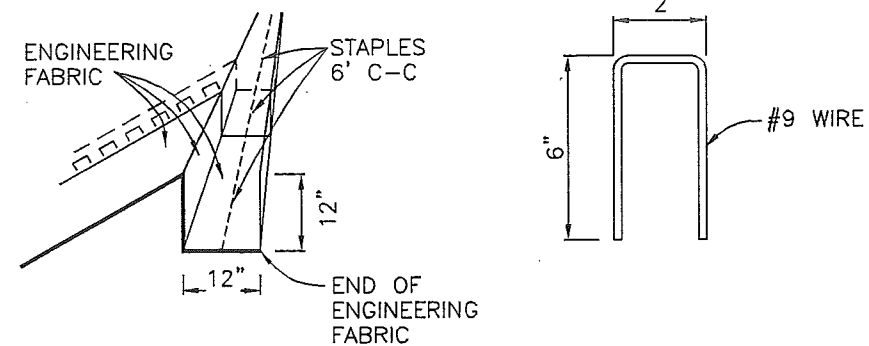
EXCAVATE 12"x12" TRENCH ALONG TOP OF RIPRAP. PLACE END OF ENGINEERING FABRIC STRIPS INTO TRENCH WITH STAPLES AS SHOWN. BACKFILL WITH THE EXCAVATED MATERIAL AND COMPACT. THE ENGINEER MAY PERMIT THE USE OF THE WHEELS OF PNEUMATIC-TIRED EQUIPMENT FOR CONSOLIDATING THE TRENCH BACKFILL MATERIAL.

## DETAILS OF PLACEMENT OF ENGINEERING FABRIC



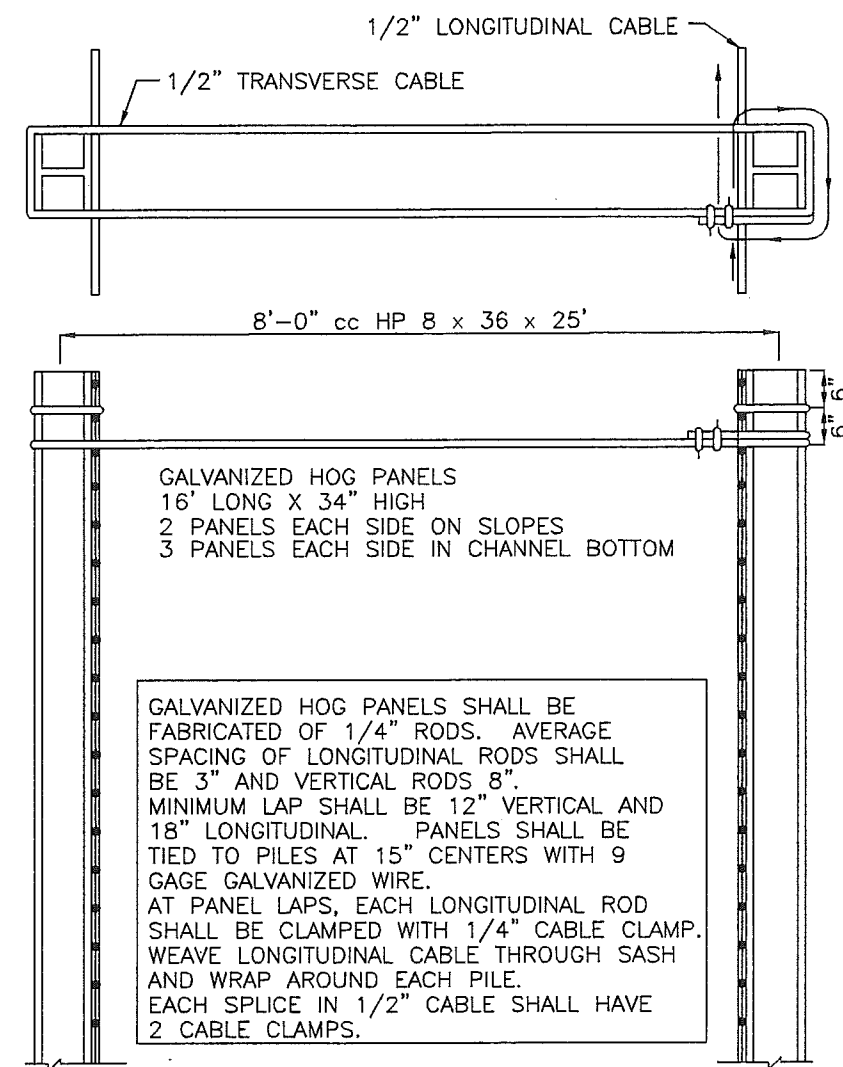
## SECTION ON C THROUGH ROCK CRIB

NO SCALE



DETAIL OF TRENCH

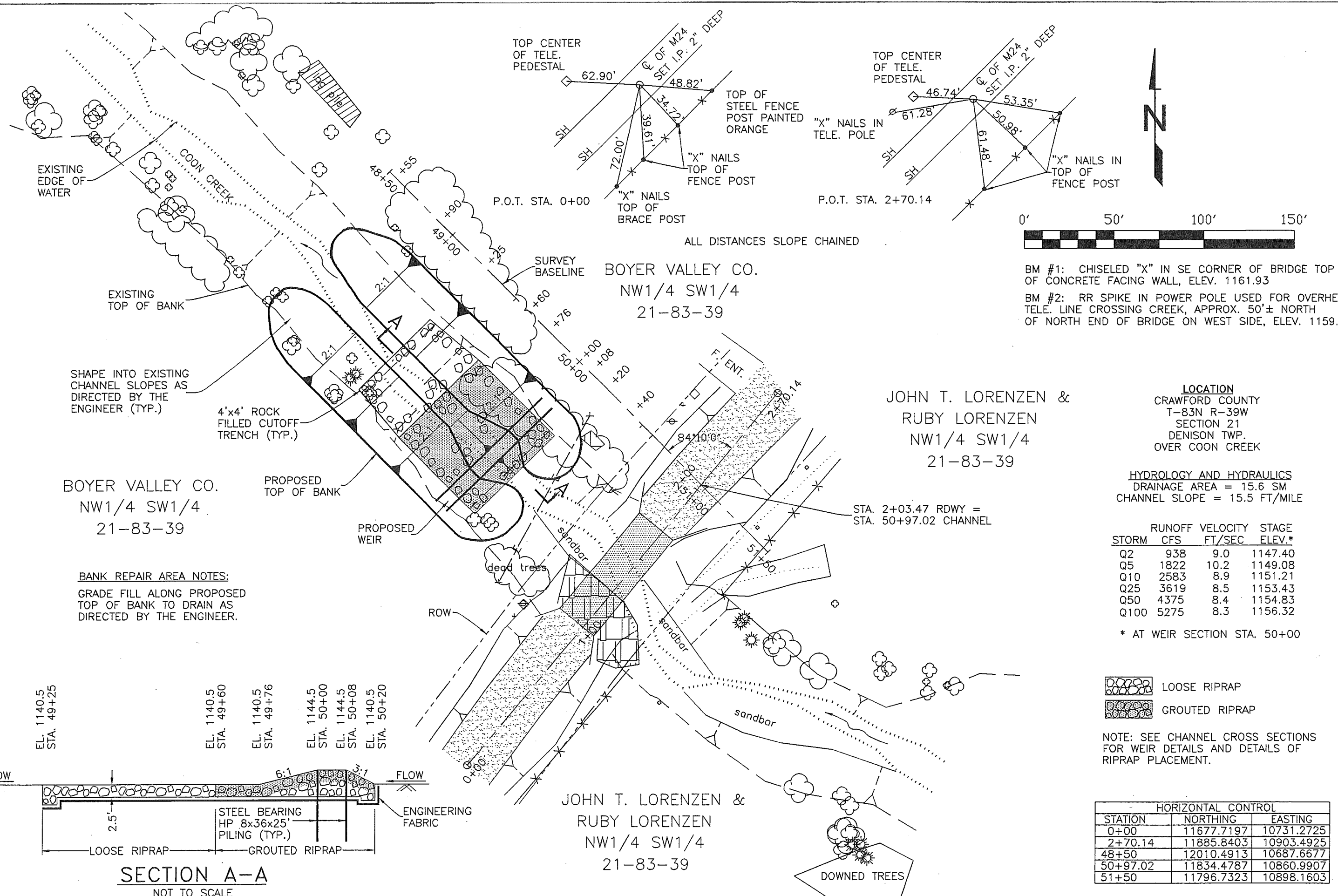
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## DETAILS ON PANEL & CABLE PLACEMENT

NO SCALE

FOR LOCATION OF PLACEMENT SEE SHEET D1  
FOR H-PILE LONGITUDINAL SPACING REFER TO CROSS SECTION SHEET Z3



BM #1: CHISELED "X" IN SE CORNER OF BRIDGE TOP OF CONCRETE FACING WALL, ELEV. 1161.93  
 BM #2: RR SPIKE IN POWER POLE USED FOR OVERHEAD TELE. LINE CROSSING CREEK, APPROX. 50'± NORTH OF NORTH END OF BRIDGE ON WEST SIDE, ELEV. 1159.42

**LOCATION**  
 CRAWFORD COUNTY  
 T-83N R-39W  
 SECTION 21  
 DENISON TWP.  
 OVER COON CREEK

**HYDROLOGY AND HYDRAULICS**  
 DRAINAGE AREA = 15.6 SM  
 CHANNEL SLOPE = 15.5 FT/MILE

STORM	CFS	VELOCITY FT/SEC	STAGE ELEV.*
Q2	938	9.0	1147.40
Q5	1822	10.2	1149.08
Q10	2583	8.9	1151.21
Q25	3619	8.5	1153.43
Q50	4375	8.4	1154.83
Q100	5275	8.3	1156.32

\* AT WEIR SECTION STA. 50+00

- LOOSE RIPRAP
- GROUTED RIPRAP

NOTE: SEE CHANNEL CROSS SECTIONS FOR WEIR DETAILS AND DETAILS OF RIPRAP PLACEMENT.

HORIZONTAL CONTROL		
STATION	NORTHING	EASTING
0+00	11677.7197	10731.2725
2+70.14	11885.8403	10903.4925
48+50	12010.4913	10687.6677
50+97.02	11834.4787	10860.9907
51+50	11796.7323	10898.1603

BOYER VALLEY CO.  
 NW1/4 SW1/4  
 21-83-39

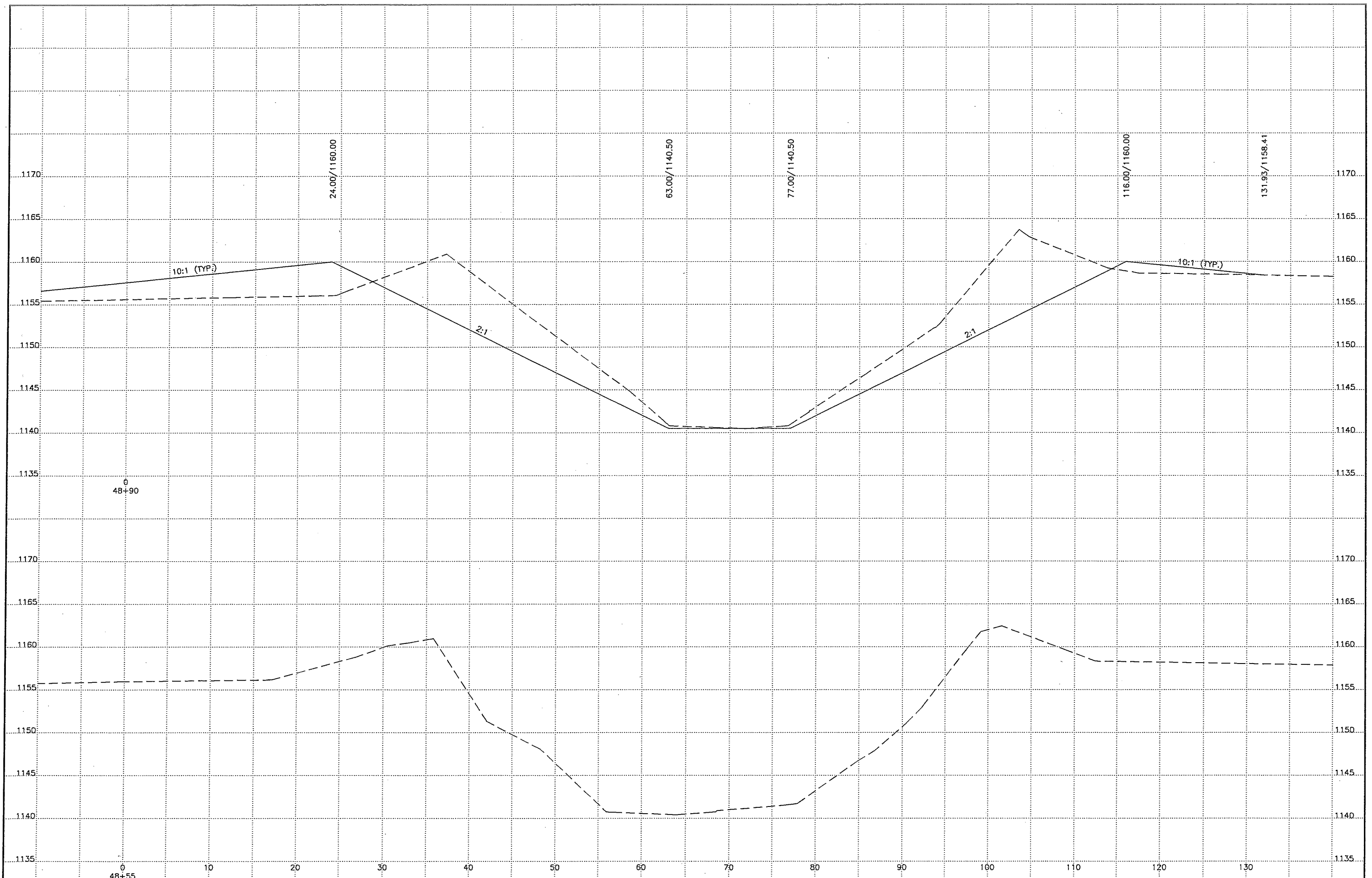
**BANK REPAIR AREA NOTES:**  
 GRADE FILL ALONG PROPOSED TOP OF BANK TO DRAIN AS DIRECTED BY THE ENGINEER.

BOYER VALLEY CO.  
 NW1/4 SW1/4  
 21-83-39

JOHN T. LORENZEN &  
 RUBY LORENZEN  
 NW1/4 SW1/4  
 21-83-39

JOHN T. LORENZEN &  
 RUBY LORENZEN  
 NW1/4 SW1/4  
 21-83-39

**SECTION A-A**  
 NOT TO SCALE



REV:

**SE** SUNDQUIST ENGINEERING, P.C.  
CONSULTING ENGINEERS

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DESCRIPTION: CHANNEL CROSS SECTIONS

SHEET Z1



