CRAWFORD COUNTY PROJECT NO. EWP-24(96-2)
JULY 1996 FLOOD REPAIR

Letting Date MAY 13, 1997

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.

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.

THESE PROJECTS ARE COVERED BY THE CORPS OF ENGINEERS NATIONWIDE PERMIT NUMBERS 13 & 26 AND IOWA DEPARTMENT OF NATURAL RESOURCES FLOOD PLAIN DEVELOPMENT PERMITS:

SITE	PERMIT NO.
6311-36	

IOWA DEPARTMENT OF TRANSPORTATION

Project Development Division

PLANS OF PROPOSED IMPROVEMENT ON THE

SECONDARY ROAD SYSTEM CRAWFORD COUNTY

EWP-24(96-2)

JULY 1996 FLOOD REPAIR PROJECTS

USDA Natural Resources Conservation Service and Crawford County, Iowa

NRCS Emergency Watershed Protection Program

Site Number 6311-36

Proj. No. EWP-24(96-2)

INDEX OF SHEETS

NO.	DESCRIPTION
A.01	TITLE SHEET
B.01	CONSTRUCTION SPECIFICATIONS
B.02-.03	TYPICAL SECTIONS
C.01	ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION
D.01-.04	PLAN VIEW - SITE 6311-36
W.01-.08	CROSS SECTIONS - SITE 6311-36

The Standard Specifications, Series of 1992 of the Iowa Department of Transportation Shall Apply to Construction Work on this Project

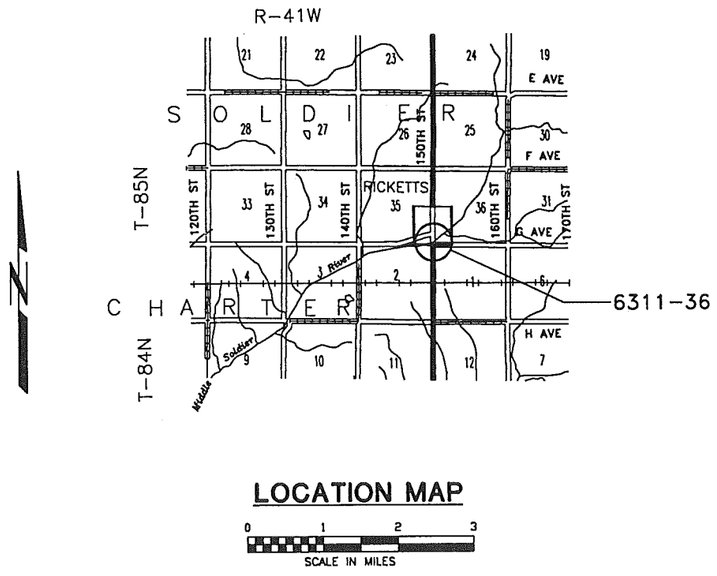
Plus Current Special Provisions and Supplemental Specifications

Scales: As Noted

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	6-15-93	RS-3	2-23-93	.	.
.	.	.	.	.	.



LOCATION MAP

0 1 2 3
SCALE IN MILES

Approved

Robert D. Lohrmann
Willard L. Nordhus
J. Dean Hargens
John P. Fawcett
Mark Siegbart

BOARD OF SUPERVISORS

Approved

H. Dale Wright 4-14-97

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.

LICENSED PROFESSIONAL ENGINEER — PAUL J. ASSMAN 11982 — IOWA

Paul J. Assman 4/17/97

PAUL J. ASSMAN, P.E. #11982 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 1998.

PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS

Iowa Department of Transportation

Accepted for Letting

SECONDARY ROADS ENGINEER Date

CONSTRUCTION SPECIFICATIONS

CONCRETE GROUT

1. SCOPE

THE WORK SHALL CONSIST OF FURNISHING, TRANSPORTING, AND PLACING CONCRETE GROUT IN THE CONSTRUCTION OF GROUTED ROCK RIPRAP SECTIONS SHOWN ON THE DRAWINGS.

2. MATERIALS

PORTLAND CEMENT SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 85, TYPE 1.

POZZOLAN. UNLESS OTHERWISE SPECIFIED IN SECTION 10 OF THIS SPECIFICATION, POZZOLANS CONFORMING TO SPECIFICATION ASTM C-618 CLASS F IN AMOUNTS NOT TO EXCEED 20 PERCENT, BASED ON ABSOLUTE VOLUME, MAY BE SUBSTITUTED FOR AN EQUIVALENT AMOUNT OF PORTLAND CEMENT IN THE GROUT MIXTURE.

AGGREGATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION C-33.

WATER SHALL BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OILS, ACID, ALKALI, ORGANIC MATTER OR OTHER DELETERIOUS SUBSTANCES.

AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 154.

CURING COMPOUND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 148.

OTHER ADMIXTURES, WHEN REQUIRED, SHALL BE AS SPECIFIED IN THE CONSTRUCTION DETAILS.

3. DESIGN OF THE GROUT MIX

THE MIX PROPORTIONS FOR THE GROUT MIX SHALL BE AS SPECIFIED IN THE CONSTRUCTION DETAILS. DURING THE COURSE OF THE WORK THE ENGINEER WILL REQUIRE ADJUSTMENT OF THE MIX PROPORTIONS WHENEVER NECESSARY. AFTER THE MIX HAS BEEN DESIGNATED, IT SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.

4. HANDLING AND MEASUREMENT OF MATERIAL

MATERIALS SHALL BE STOCKPILED AND BATCHED BY METHODS THAT WILL PREVENT SEGREGATION OR CONTAMINATION OF AGGREGATES AND INSURE ACCURATE PROPORTIONING OF THE INGREDIENTS OF THE MIX.

EXCEPT AS OTHERWISE PROVIDED IN SECTION 8, CEMENT AND AGGREGATES SHALL BE MEASURED AS FOLLOWS:

CEMENT SHALL BE MEASURED BY WEIGHT OR IN BAGS OF 94 POUNDS EACH. WHEN CEMENT IS MEASURED IN BAGS, NO FRACTION OF A BAG SHALL BE USED UNLESS WEIGHED.

AGGREGATES SHALL BE MEASURED BY WEIGHT. MIX PROPORTIONS SHALL BE BASED ON SATURATED, SURFACE-DRY WEIGHTS. THE BATCH WEIGHT OF EACH AGGREGATE SHALL BE THE REQUIRED SATURATED, SURFACE-DRY WEIGHT PLUS THE WEIGHT OF SURFACE MOISTURE IT CONTAINS.

WATER SHALL BE MEASURED BY VOLUME OR BY WEIGHT, TO AN ACCURACY WITHIN ONE PERCENT OF THE TOTAL QUANTITY OF WATER REQUIRED FOR THE BATCH.

ADMIXTURES SHALL BE MEASURED WITHIN A LIMIT OF ACCURACY OF ±3 PERCENT.

5. MIXERS AND MIXING

THE MIXER, WHEN LOADED TO CAPACITY, SHALL BE CAPABLE OF COMBINING THE INGREDIENTS OF THE GROUT MIX INTO A THOROUGHLY MIXED AND UNIFORM MASS AND OF DISCHARGING IT WITH A SATISFACTORY DEGREE OF UNIFORMITY.

MIXER SHALL BE OPERATED WITHIN THE LIMITS OF THE MANUFACTURER'S GUARANTEED CAPACITY AND SPEED OF ROTATION.

THE TIME OF MIXING AFTER ALL CEMENT AND AGGREGATES ARE IN THE MIXER DRUM SHALL BE NOT LESS THAN ONE MINUTE FOR MIXERS HAVING A CAPACITY OF ONE CUBIC YARD OR LESS. FOR MIXERS OF LARGER CAPACITIES, THE MINIMUM TIME SHALL BE INCREASED FIFTEEN SECONDS FOR EACH CUBIC YARD OR FRACTION THEREOF OF ADDITIONAL CAPACITY. THE BATCH SHALL BE SO CHARGED INTO THE MIXER THAT SOME WATER WILL ENTER IN ADVANCE OF CEMENT AND AGGREGATE, AND ALL MIXING WATER SHALL BE INTRODUCED INTO THE DRUM BEFORE ONE-FOURTH OF THE MIXING TIME HAS ELAPSED.

WHEN READY-MIXED GROUT MIX IS FURNISHED, THE CONTRACTOR SHALL FURNISH TO THE ENGINEER A DELIVERY TICKET SHOWING THE TIME OF LOADING AND THE QUANTITIES OF MATERIALS USED FOR EACH LOAD OF GROUT MIX.

NO MIXING WATER IN EXCESS OF THE AMOUNT CALLED FOR BY THE JOB MIX SHALL BE ADDED TO THE GROUT MIX DURING MIXING OR HAULING OR AFTER ARRIVAL AT THE DELIVERY POINT.

6. CONVEYING AND PLACING

THE GROUT MIX SHALL BE DELIVERED TO THE SITE AND PLACED WITHIN 1-1/2 HOURS AFTER THE INTRODUCTION OF THE CEMENT TO THE AGGREGATES. IN HOT WEATHER OR UNDER CONDITIONS CONTRIBUTING TO QUICK STIFFENING OF THE CONCRETE, THE TIME BETWEEN THE INTRODUCTION OF THE CEMENT TO THE AGGREGATES AND DISCHARGE SHALL NOT EXCEED 45 MINUTES. THE ENGINEER MAY ALLOW A LONGER TIME, PROVIDED THE SETTING TIME OF THE CONCRETE IS INCREASED A CORRESPONDING AMOUNT BY THE ADDITION OF AN APPROVED SET-RETARDING MIXTURE. IN ANY CASE, CONCRETE SHALL BE CONVEYED FROM THE MIXER TO THE FINAL PLACEMENT AS RAPIDLY AS PRACTICABLE BY METHODS THAT WILL PREVENT SEGREGATION OF THE AGGREGATES OR LOSS OF MORTAR.

GROUT MIX SHALL NOT BE DROPPED MORE THAN 5 FEET VERTICALLY UNLESS SUITABLE EQUIPMENT IS USED TO PREVENT SEGREGATION.

THE GROUT MIX SHALL NOT BE PLACED UNTIL THE ROCK RIPRAP HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER.

ROCK TO BE GROUTED SHALL BE KEPT WET FOR AT LEAST 2 HOURS IMMEDIATELY PRIOR TO GROUTING.

THE ROCK RIPRAP SHALL BE FLUSHED WITH WATER TO REMOVE THE FINES FROM THE ROCK PRIOR TO PLACING THE GROUT. THE ROCK SHALL BE KEPT MOIST JUST AHEAD OF THE ACTUAL PLACING, BUT THE GROUT SHALL NOT BE PLACED IN STANDING OR FLOWING WATER. GROUT PLACED ON INVERTS OR OTHER NEARLY LEVEL AREAS MAY BE PLACED IN ONE COURSE. ON SLOPES, THE GROUT SHALL BE PLACED IN TWO (2) COURSES IN SUCCESSIVE LATERAL STRIPS APPROXIMATELY TEN (10) FEET IN WIDTH STARTING AT THE TOE OF THE SLOPE AND PROGRESSING TO THE TOP. THE GROUT SHALL BE DELIVERED TO THE PLACE OF FINAL DEPOSIT BY APPROVED MEANS AND DISCHARGED DIRECTLY ON THE SURFACE OF THE ROCK, USING A SPLASH PLATE OF METAL OR WOOD TO PREVENT DISPLACEMENT OF THE ROCK DIRECTLY UNDER THE DISCHARGE. THE FLOW OF GROUT SHALL BE DIRECTED WITH BROOMS, SPADES OR BAFFLES TO PREVENT IT FROM FLOWING EXCESSIVELY ALONG THE SAME PATH AND TO ASSURE THAT ALL INTERMITTENT SPACES ARE FILLED. SUFFICIENT BARRING SHALL BE DONE TO LOOSEN TIGHT POCKETS OF ROCK AND OTHERWISE AID THE PENETRATION OF GROUT SO THAT ALL VOIDS SHALL BE FILLED AND THE GROUT FULLY PENETRATES THE ROCK BLANKET. ALL BROOMING ON SLOPES SHALL BE UPHILL AND AFTER THE GROUT HAS STIFFENED, THE ENTIRE SURFACE SHALL BE REBROOMED TO ELIMINATE RUNS AND TO FILL VOIDS CAUSED BY SLOUGHING.

AFTER COMPLETION OF ANY STRIP OR PANEL, NO WORKMAN OR OTHER LOAD SHALL BE PERMITTED ON THE GROUTED SURFACE FOR A PERIOD OF TWENTY FOUR (24) HOURS. THE GROUTED SURFACE SHALL BE PROTECTED FROM INJURIOUS ACTION BY THE SUN, RAIN, FLOWING WATER AND MECHANICAL INJURY.

7. CURING AND PROTECTION

THE SURFACE OF TREATMENT MATERIALS SHALL BE PREVENTED FROM DRYING FOR A CURING PERIOD OF AT LEAST 7 DAYS AFTER IT IS PLACED. EXPOSED SURFACES SHALL BE KEPT CONTINUOUSLY MOIST FOR THE ENTIRE PERIOD, OR UNTIL CURING COMPOUND IS APPLIED AS SPECIFIED BELOW. MOISTURE SHALL BE MAINTAINED BY SPRINKLING, FLOODING OR FOG SPRAYING OR BY COVERING WITH CONTINUOUSLY MOISTENED CANVAS, CLOTH MATS, STRAW, SAND OR OTHER APPROVED MATERIAL. WATER OR COVERING SHALL BE APPLIED IN SUCH A WAY THAT THE CONCRETE SURFACE IS NOT ERODED OR OTHERWISE DAMAGED.

THE GROUTED ROCK MAY BE COATED WITH AN APPROVED CURING COMPOUND IN LIEU OF CONTINUED APPLICATION OF MOISTURE. THE COMPOUND SHALL BE SPRAYED ON THE MOIST CONCRETE SURFACES AS SOON AS FREE WATER HAS DISAPPEARED, BUT SHALL NOT BE APPLIED TO ANY SURFACE UNTIL FINISHING OF THAT SURFACE IS COMPLETED. THE COMPOUND SHALL BE APPLIED AT A UNIFORM RATE OF NOT LESS THAN ONE GALLON PER 150 SQUARE FEET OF SURFACE AND SHALL FORM A CONTINUOUS ADHERENT MEMBRANE OVER THE ENTIRE SURFACE. CURING COMPOUND SHALL NOT BE APPLIED TO SURFACES REQUIRING BOND TO SUBSEQUENTLY PLACED CONCRETE. IF THE MEMBRANE IS DAMAGED DURING THE CURING PERIOD, THE DAMAGED AREA SHALL BE RESPRAYED AT THE RATE OF APPLICATION SPECIFIED ABOVE.

GROUT MIX SHALL NOT BE PLACED WHEN THE DAILY MINIMUM TEMPERATURE IS LESS THAN 40° F UNLESS FACILITIES ARE PROVIDED TO INSURE THAT THE TEMPERATURE OF THE MATERIALS IS MAINTAINED AT NOT LESS THAN 50° F NOR MORE THAN 90° F DURING PLACEMENT AND THE CURING PERIOD. GROUT MIX SHALL NOT BE PLACED ON FROZEN SURFACES. WHEN FREEZING CONDITIONS PREVAIL, ROCK TO BE GROUTED MUST BE COVERED AND HEATED TO A RANGE OF 50° F TO 90° F FOR AT LEAST 24 HOURS PRIOR TO PLACING TREATMENT MATERIALS.

8. INSPECTING AND TESTING FRESH GROUT

THE ENGINEER WILL INSPECT AND TEST GROUT DURING THE COURSE OF THE WORK. SAMPLING OF FRESH GROUT WILL BE DONE BY THE METHODS PRESCRIBED IN ASTM DESIGNATION C 172. THE VOLUME OF EACH BATCH WILL BE DETERMINED BY THE METHODS PRESCRIBED IN ASTM DESIGNATION C 138.

THE ENGINEER SHALL HAVE FREE ENTRY TO ALL PARTS OF THE CONTRACTOR'S PLANT AND EQUIPMENT WHICH CONCERN MIXING AND PLACING THE GROUT WHILE WORK ON THE CONTRACT IS BEING PERFORMED. PROPER FACILITIES SHALL BE PROVIDED FOR THE ENGINEER TO INSPECT MATERIALS AND PROCESSES USED IN MIXING AND PLACING THE GROUT AS WELL AS FOR SECURING SAMPLES OF THE GROUT MIX. ALL TESTS AND INSPECTIONS SHALL BE SO CONDUCTED AS NOT TO INTERFERE UNNECESSARILY WITH THE MIXING AND PLACING OF THE GROUT.

WHEN READY-MIXED GROUT IS FURNISHED, THE CONTRACTOR SHALL FURNISH TO THE ENGINEER A STATEMENT-OF-DELIVERY TICKET FOR EACH BATCH DELIVERED TO THE JOB SITE. THE TICKET SHALL SHOW THE TOTAL WEIGHTS IN POUNDS OF CEMENT, WATER, AND FINE AND COARSE AGGREGATES, AMOUNT OF AIR-ENTRAINING AGENT, TIME OF LOADING, AND THE REVOLUTION COUNTER READING AT THE TIME OF BATCHING.

9. MEASUREMENT AND PAYMENT

FOR ITEMS OF WORK FOR WHICH SPECIFIC UNIT PRICES ARE ESTABLISHED IN THE CONTRACT, THE QUANTITY OF CONCRETE GROUT PLACED WITHIN THE SPECIFIED LIMITS WILL BE COMPUTED TO THE NEAREST 0.1 CUBIC YARD BY VOLUME. THE VOLUME OF GROUT WILL BE DETERMINED FROM THE SUMMATION OF ALL STATEMENT-OF-DELIVERY TICKETS FOR CONCRETE GROUT DELIVERED TO THE SITE AND ACCEPTABLY PLACED IN THE WORK.

PAYMENT FOR THE CONCRETE GROUT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH ITEM. SUCH PAYMENT WILL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, MATERIALS, EQUIPMENT, AND ALL OTHER ITEMS NECESSARY AND INCIDENTAL TO THE COMPLETION OF THE WORK.

COMPENSATION FOR ANY ITEM OF WORK DESCRIBED IN THE CONTRACT BUT NOT LISTED IN THE BID SCHEDULE WILL BE INCLUDED IN THE PAYMENT FOR THE ITEM OF WORK TO WHICH IT IS MADE SUBSIDIARY. SUCH ITEMS AND THE ITEMS TO WHICH THEY ARE MADE SUBSIDIARY ARE IDENTIFIED IN SECTION 10 OF THIS SPECIFICATION.

10. ITEMS OF WORK AND CONSTRUCTION DETAILS

ITEMS OF WORK TO BE PERFORMED IN CONFORMANCE WITH THIS SPECIFICATION AND THE CONSTRUCTION DETAILS THEREFOR ARE:

(1) THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING CONCRETE GROUT AS SHOWN ON THE DRAWINGS.

(2) THE GROUTING MIXTURE SHALL BE AS FOLLOWS:

- (A) CEMENT: TYPE IA, TYPE I OR TYPE II WITH AN AIR ENTRAINING ADMIXTURE, 10 SACKS OR 940 LBS/C.Y.
- (B) FINE CONCRETE AGGREGATE: 2,100 LBS/C.Y. (SURFACE DRY WEIGHT)
- (C) WATER: 45 GAL./C.Y., OR ENOUGH TO PROVIDE A THICK CREAMY CONSISTENCY.
- (D) AIR CONTENT: 6 TO 10 PERCENT.

OTHER SIMILAR GROUT MIXES THAT INCORPORATE SMALL COARSE AGGREGATE MAY BE USED IF APPROVED IN ADVANCE BY THE ENGINEER.

(3) FLY ASH CONFORMING TO ASTM C 618 CLASS F OR CLASS C, IN AMOUNTS NOT TO EXCEED 20 PERCENT BASED ON ABSOLUTE VOLUME, MAY BE SUBSTITUTED FOR AN EQUIVALENT AMOUNT OF PORTLAND CEMENT IN THE GROUT MIXTURE.

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

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

(6) A SMOOTH SURFACE IS NOT TO BE CREATED BY THE GROUTING OPERATIONS.

(7) THE AVERAGE RATE OF GROUT APPLICATION SHALL BE 5.4 CUBIC FEET OF GROUT PER SQUARE YARD OF LOOSE ROCK RIPRAP.

REMOVAL OF WATER

1. SCOPE

THE WORK SHALL CONSIST OF REMOVAL OF SURFACE WATER AND GROUND WATER AS NEEDED TO PERFORM THE REQUIRED CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS. IT SHALL INCLUDE (1) BUILDING AND MAINTAINING ALL NECESSARY TEMPORARY IMPOUNDING WORKS, CHANNELS, AND DIVERSIONS, (2) FURNISHING, INSTALLING AND OPERATING ALL NECESSARY PUMPS, PIPING AND OTHER FACILITIES AND EQUIPMENT, AND (3) REMOVING ALL SUCH TEMPORARY WORKS AND EQUIPMENT AFTER THEY HAVE SERVED THEIR PURPOSES.

2. DIVERTING SURFACE WATER

THE CONTRACTOR SHALL BUILD, MAINTAIN AND OPERATE ALL COFFERDAMS, CHANNELS, FLUMES, SUMPS, AND OTHER TEMPORARY DIVERSION AND PROTECTIVE WORKS NEEDED TO DIVERT STREAMFLOW AND OTHER SURFACE WATER THROUGH OR AROUND THE CONSTRUCTION SITE AND AWAY FROM THE CONSTRUCTION WORK WHILE CONSTRUCTION IS IN PROGRESS. UNLESS OTHERWISE SPECIFIED, A DIVERSION MUST DISCHARGE INTO THE SAME NATURAL DRAINAGEWAY IN WHICH ITS HEADWORKS ARE LOCATED.

UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL FURNISH TO THE CONTRACTING OFFICER, IN WRITING, HIS PLAN FOR DIVERTING SURFACE WATER BEFORE BEGINNING THE CONSTRUCTION WORK FOR WHICH THE DIVERSION IS REQUIRED. ACCEPTANCE OF THIS PLAN WILL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLETING THE WORK AS SPECIFIED.

3. DEWATERING THE CONSTRUCTION SITE

FOUNDATIONS, CUTOFF TRENCHES AND OTHER PARTS OF THE CONSTRUCTION SITE SHALL BE DEWATERED AND KEPT FREE OF STANDING WATER OR EXCESSIVELY MUDDY CONDITIONS AS NEEDED FOR PROPER EXECUTION OF THE CONSTRUCTION WORK. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE AND MAINTAIN ALL DRAINS, SUMPS, PUMPS, CASING, WELLPOINTS, AND OTHER EQUIPMENT NEEDED TO PERFORM THE DEWATERING AS SPECIFIED. DEWATERING METHODS THAT CAUSE A LOSS OF FINES FROM FOUNDATION AREAS WILL NOT BE PERMITTED.

UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL FURNISH TO THE CONTRACTING OFFICER, IN WRITING, HIS PLAN FOR DEWATERING BEFORE BEGINNING THE CONSTRUCTION WORK FOR WHICH THE DEWATERING IS REQUIRED. ACCEPTANCE OF THIS PLAN WILL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLETING THE WORK AS SPECIFIED.

4. EROSION AND POLLUTION CONTROL

REMOVAL OF WATER FROM THE CONSTRUCTION SITE SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT EROSION AND THE TRANSMISSION OF SEDIMENT AND OTHER POLLUTANTS ARE MINIMIZED.

5. REMOVAL OF TEMPORARY WORKS

AFTER THE TEMPORARY WORKS HAVE SERVED THEIR PURPOSES, THE CONTRACTOR SHALL REMOVE THEM OR LEVEL AND GRADE THEM TO THE EXTENT REQUIRED TO PRESENT A SIGHTLY APPEARANCE AND TO PREVENT ANY OBSTRUCTION OF THE FLOW OF WATER OR ANY OTHER INTERFERENCE WITH THE OPERATION OF OR ACCESS TO THE PERMANENT WORKS.

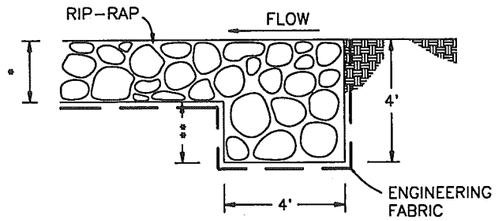
EXCEPT AS OTHERWISE SPECIFIED, PIPES AND CASINGS SHALL BE REMOVED FROM TEMPORARY WELLS AND THE WELLS SHALL BE FILLED TO GROUND LEVEL WITH GRAVEL OR OTHER MATERIAL APPROVED BY THE CONTRACTING OFFICER.

6. MEASUREMENT AND PAYMENT

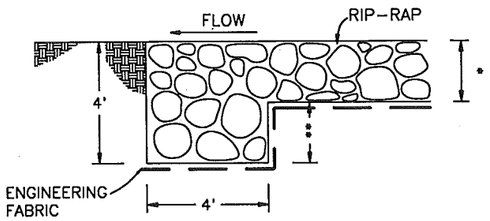
PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT LUMP SUM PRICE AND WILL CONSTITUTE FULL COMPENSATION FOR COMPLETION OF THE WORK.

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

PROJECT NO.:	0836	DATE:	2/97	REV:	
CLIENT:	CRAWFORD COUNTY, IOWA				
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY:	PJA
DESCRIPTION:	CONSTRUCTION SPECIFICATIONS PROJECT NO. EWP-24(96-2) .			SHEET	B.01



TYPICAL UPSTREAM



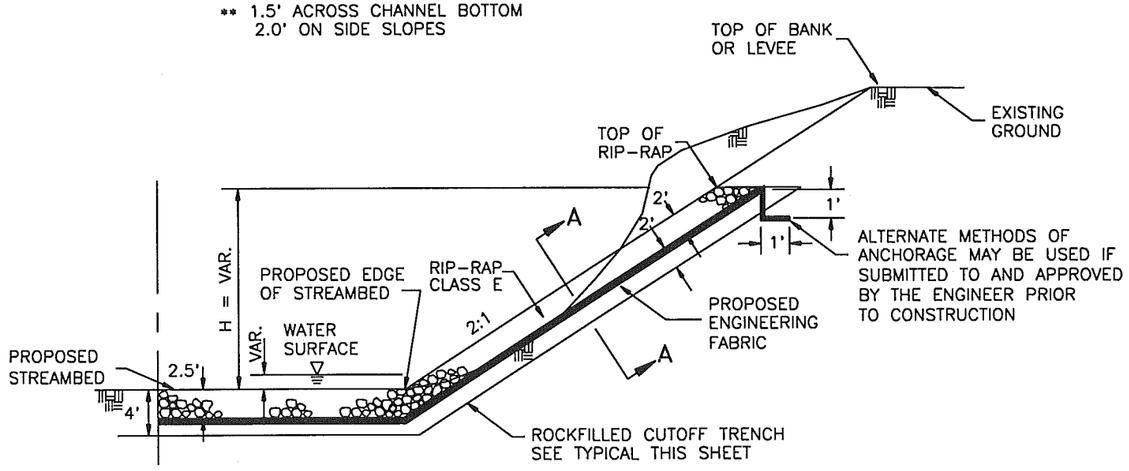
TYPICAL DOWNSTREAM

SECTION A-A

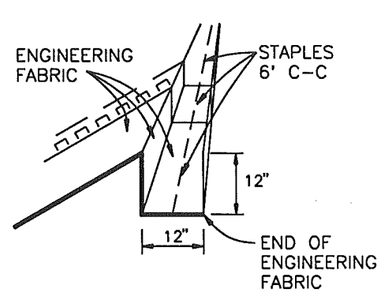
ROCK FILLED CUTOFF TRENCH DETAILS

CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES.

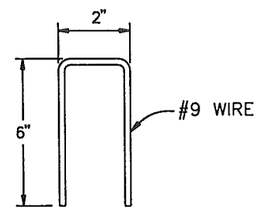
* 2.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES
** 1.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES



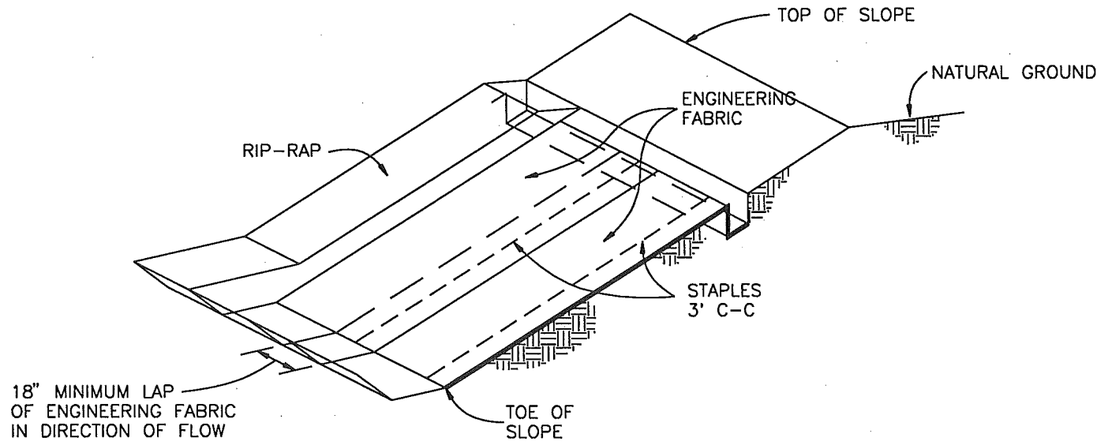
TYPICAL STILLING BASIN SECTION



DETAIL OF TRENCH



STAPLE

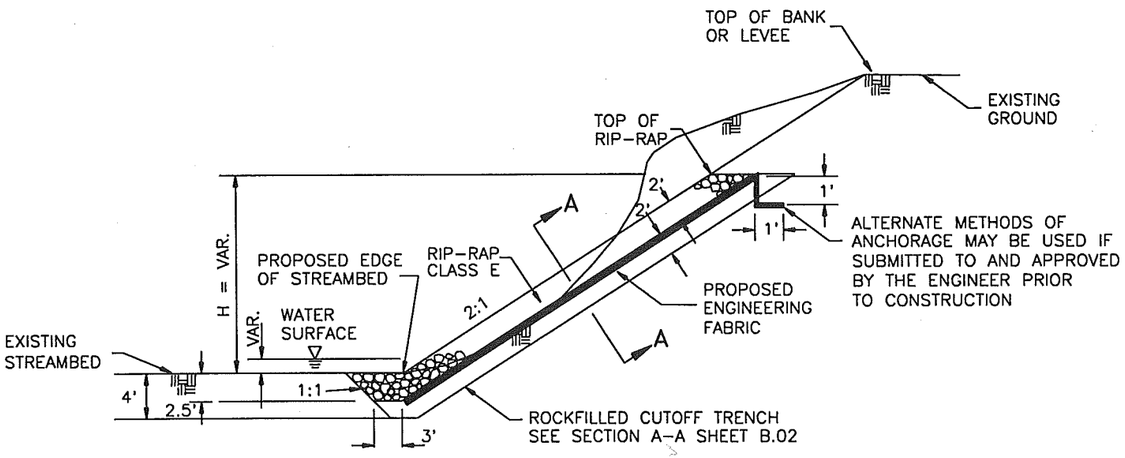


EXCAVATE 12"x12" TRENCH ALONG TOP OF RIPRAP. PLACE END OF ENGINEERING FABRIC STRIPS INTO TRENCH WITH STAPLES AS SHOWN. BACKFILL WITH THE EXCAVATED MATERIAL AND COMPACT. THE ENGINEER MAY PERMIT THE USE OF THE WHEELS OF PNEUMATIC-TIRED EQUIPMENT FOR CONSOLIDATING THE TRENCH BACKFILL MATERIAL.

DETAILS OF PLACEMENT OF ENGINEERING FABRIC

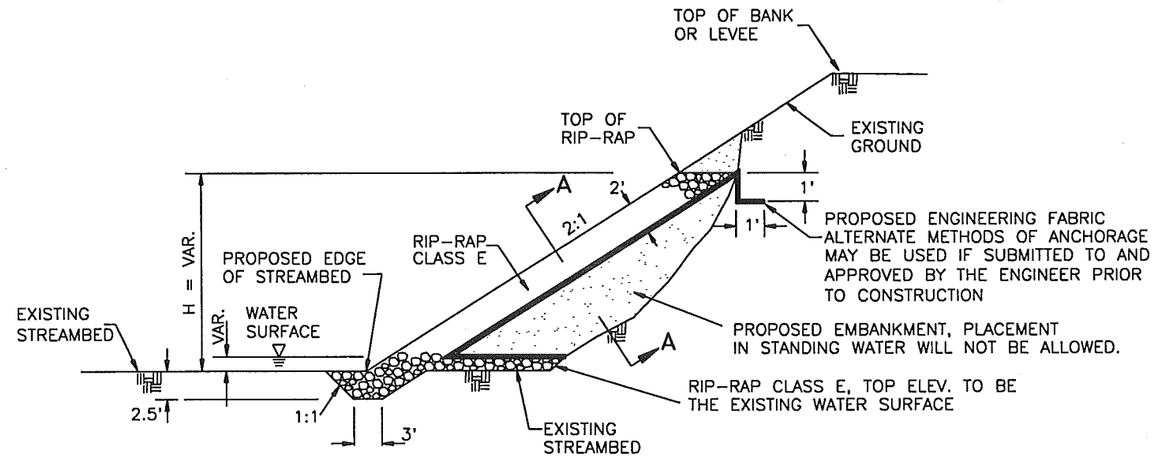
SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.:	0836	DATE:	2/97	REV:	
CLIENT:	CRAWFORD COUNTY, IOWA				
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY:	PJA
DESCRIPTION:	TYPICAL SECTIONS PROJECT NO. EWP-24(96-2) .			SHEET	B.02



CHANNEL CUT

NO SCALE



CHANNEL FILL

NO SCALE

TYPICAL BANK STABILIZATION SECTION

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

PROJECT NO.:	0836	DATE:	2/97	REV:	
CLIENT:	CRAWFORD COUNTY, IOWA				
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY:	PJA
DESCRIPTION:	TYPICAL SECTIONS PROJECT NO. EWP-24(96-2)			SHEET	B.03

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM	UNIT	6311-36	AS BUILT QUAN.
1	EMBANKMENT-IN-PLACE	CY	5039	
2	EXCAVATION, CLASS 10 CHANNEL	CY	1914	
3	REMOVALS, AS PER PLAN	LS	LS	
4	FABRIC, ENGINEERING	SY	2205	
5	REVETMENT, CLASS E, RIPRAP	TON	1958	
6	TRAFFIC CONTROL	LS	LS	
7	MOBILIZATION	LS	LS	
8	GROUT	CY	134	
9	REMOVAL OF WATER	LS	LS	
10	CORRUGATED METAL PIPE, 48 IN. DIA.	LF	24	

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.

ROAD 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.

202-1
THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT ARCHAEOLOGICAL REMAINS MAY BE UNCOVERED ON THIS PROJECT. REFER TO SECTION 2102.10 OF THE STANDARD SPECIFICATIONS. THE ENGINEER SHALL NOTIFY BOTH THE OFFICE OF THE STATE ARCHAEOLOGIST IN IOWA CITY AND THE OFFICE OF PROJECT PLANNING, IOWA DOT A MINIMUM OF ONE WEEK PRIOR TO THE EXPECTED DATE OF THE START OF CONSTRUCTION ACTIVITIES.

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. 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.

261-1
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.

ESTIMATE REFERENCE INFORMATION

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

1. INCLUDES THE FOLLOWING QUANTITIES FOR SITE 3 ONLY AS ESTIMATED FROM THE CROSS SECTIONS:

   SITE 6311-36 = 5039 C.Y. (3733 x 1.35)

   INCLUDES APPROXIMATELY 3125 CY OF CONTRACTOR PROVIDED BORROW TO BE USED AS FILL TO CONSTRUCT THE SLOPES OF THE STREAM BANKS AS SHOWN ON THE CROSS SECTIONS. SUITABLE CHANNEL EXCAVATION MAY BE USED FOR EMBANKMENT MATERIAL AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SELECTED BORROW MATERIAL SHALL BE APPROVED BY THE ENGINEER. OVERHAUL IS INCIDENTAL TO THE PRICE BID FOR EMBANKMENT-IN-PLACE.

   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.

   PAYMENT SHALL BE BASED ON PLAN QUANTITY.

2. QUANTITY INCLUDES STRIPPING OF EXISTING VEGETATIVE COVER TO A DEPTH OF 6". THE STRIPPINGS AND ANY REMAINING CLASS 10 CHANNEL EXCAVATION NOT INCORPORATED IN THE EMBANKMENT FILL SHALL BE DISPOSED OF.

   PAYMENT SHALL BE BASED ON PLAN QUANTITY.

3. INCLUDES REMOVAL OF EXISTING RIPRAP, BROKEN CONCRETE AND BARRIER RAILS FROM PROPOSED BANK REPAIR AREAS AND DISPOSAL ON SITE AS DIRECTED BY THE ENGINEER.

   INCLUDES REMOVAL AND DISPOSAL OF TREES, DOWN TIMBER, LOGS, DRIFTS, DEBRIS AND OTHER OBSTRUCTIONS LYING WITHIN THE CONSTRUCTION LIMITS.

4. SEE DRAWING SHEET B.02 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).

5. THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS.

   INCLUDES FURNISHING AND PLACING CLASS E REVETMENT STONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MAXIMUM STONE SIZE SHALL BE 400 POUNDS AND A MINIMUM OF 50% OF THE MATERIAL SHALL BE GREATER THAN 150 POUNDS.

   REVETMENT STONE SHALL BE SCREENED PRIOR TO HAULING BY RUNNING THE STONE THROUGH A GRIZZLY OR PLATE SCREEN WITH A MINIMUM OPENING SIZE OF 8 INCHES. THIS OPERATION SHALL BE DONE AT THE QUARRY. THE PORTION OF THE STONE THAT IS REMOVED BY SCREENING WILL NOT BE ACCEPTABLE FOR USE AS REVETMENT STONE.

   THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF ALL REMNANTS OF RIPRAP FROM FARM FIELDS SURROUNDING THE PROJECT AREA. THIS WORK WILL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

8. SEE CONSTRUCTION SPECIFICATIONS ON SHEET B.01 FOR MATERIAL AND INSTALLATION DETAILS.

9. THIS ITEM CONSIST 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 6311-36 SHALL INCLUDE REMOVAL OF WATER FROM THE EXISTING STILLING BASIN TO FACILITATE PLACEMENT OF FILL MATERIAL. PLACEMENT OF FILL IN STANDING WATER SHALL NOT BE ALLOWED.

10. SHALL BE 16 GAUGE RIVETED PIPE WITH ANNULAR CORRUGATEDS. ALL BANDS SHALL BE 24" WIDE. NO. SPIRAL PIPE WILL BE ALLOWED.

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

PROJECT NO.: 0836	DATE: 2/97		REV:	
CLIENT: CRAWFORD COUNTY, IOWA				
DRAWN BY: TKK	REVIEWED BY: .		APPROVED BY: PJA	
DESCRIPTION: ESTIMATED PROJECT QUANTITIES & GENERAL INFORMATION PROJECT NO. EWP-24(96-2)				SHEET C.01

ESTIMATED QUANTITIES – SITE 6311–36

ITEM	UNIT	*DIV. I	*DIV. II	*DIV. III	TOTAL
EMBANKMENT–IN–PLACE	CY	263	3530	1246	5039
EXCAVATION, CLASS 10, CHANNEL	CY	20	1264	630	1914
REMOVALS, AS PER PLAN	LS	–	LS	LS	LS
FABRIC, ENGINEERING	SY	281	954	970	2205
REVETMENT, CLASS E, RIPRAP	TON	274	892	792	1958
TRAFFIC CONTROL	LS	LS	–	–	LS
MOBILIZATION	LS	LS	LS	LS	LS
GROUT	CY	35	11	88	134
REMOVAL OF WATER	LS	LS	LS	LS	LS
CORRUGATED METAL PIPE, 48 IN. DIA.	LF	24	–	–	24

*DIVISION I INCLUDES ALL WORK WITHIN THE R.O.W.
*DIVISION II INCLUDES ALL WORK OUTSIDE OF THE R.O.W. UPSTREAM ONLY
*DIVISION III INCLUDES ALL WORK OUTSIDE OF THE R.O.W. DOWNSTREAM ONLY

DIVISION III | DIVISION I | DIVISION II

LOCATION
CRAWFORD COUNTY
T–85N R–41W
SECTIONS 35 & 36
SOLDIER TWP.
OVER MIDDLE SOLDIER RIVER
DRAINAGE AREA = 6.9 S.M.

EWP PORTION OF PROJECT

Δ=52°55'56"
Dc=21°56'30"
R=261.13'
T=130.00'
A=241.24'
E=30.57'
PT = 16+95.50

SCALE 1"=50'

PROPOSED TOP OF BANK

CONTRACTOR SHALL EXTEND EXISTING 48" CMP 24 LF TO OUTLET ON GROUTED RIPRAP ARMORING
I.E. OUTLET = 80.80

PC = 14+54.26

PROPOSED TOP OF BANK

SEE SHEET D.02 FOR DETAILS OF WEIR NO. 1

PT = 13+41.65

PLACE AND GROUT RIPRAP ADJACENT TO TIMBER BACKING PLANK

SEE SHEET D.03 FOR DETAILS OF WEIR NO. 2

EXISTING TOP OF BANK

SEE SHEET D.04 FOR DETAILS

EXISTING TOP OF BANK

Δ=15°18'57"
Dc=09°03'48"
R=632.17'
T=85.00'
A=168.99'
E=5.69'

ROW | ℄ COUNTY ROAD L51 | ROW

HYDROLOGY AND HYDRAULICS
DRAINAGE AREA = 6.9 SM

STORM	RUNOFF CFS	VELOCITY FT/SEC	STAGE* ELEV.
Q2	589	4.56	81.6
Q5	1163	5.59	83.3
Q10	1649	6.15	84.4
Q25	2330	6.75	85.7
Q50	2839	7.12	86.6
Q100	3424	7.51	87.5

*AS MEASURED FROM ELEV. 78.0

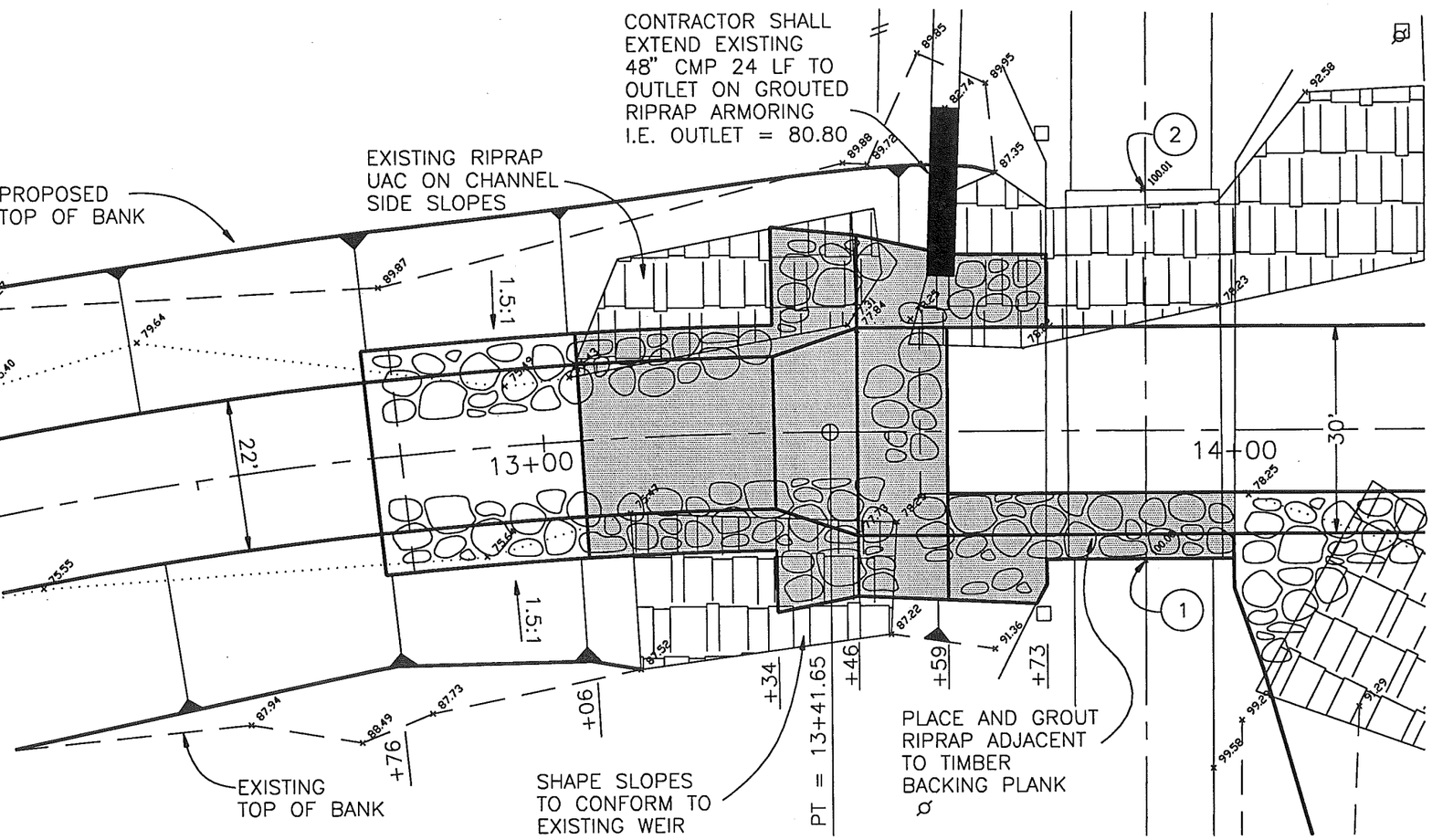
BM#1 – 60D SPIKE IN SOUTH END OF BRIDGE DECK EL. 100.00

POINT NO.	LOCATION	ELEV.
1	13+87.10, 18.76' RT.	100.00
2	13+87.07, 34.55' LT.	100.01

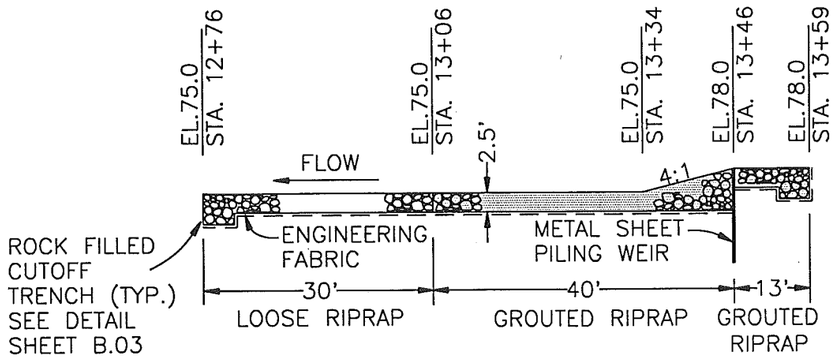
PLAN VIEW – SITE 6311–36

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

PROJECT NO.: 0836	DATE: 2/97	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: PLAN VIEW – SITE 6311-36		SHEET	
RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER		D.01	
PROJECT NO. EWP-24(96-2)			



SCALE 1"=20'



SECTION A–A

WEIR NO. 1

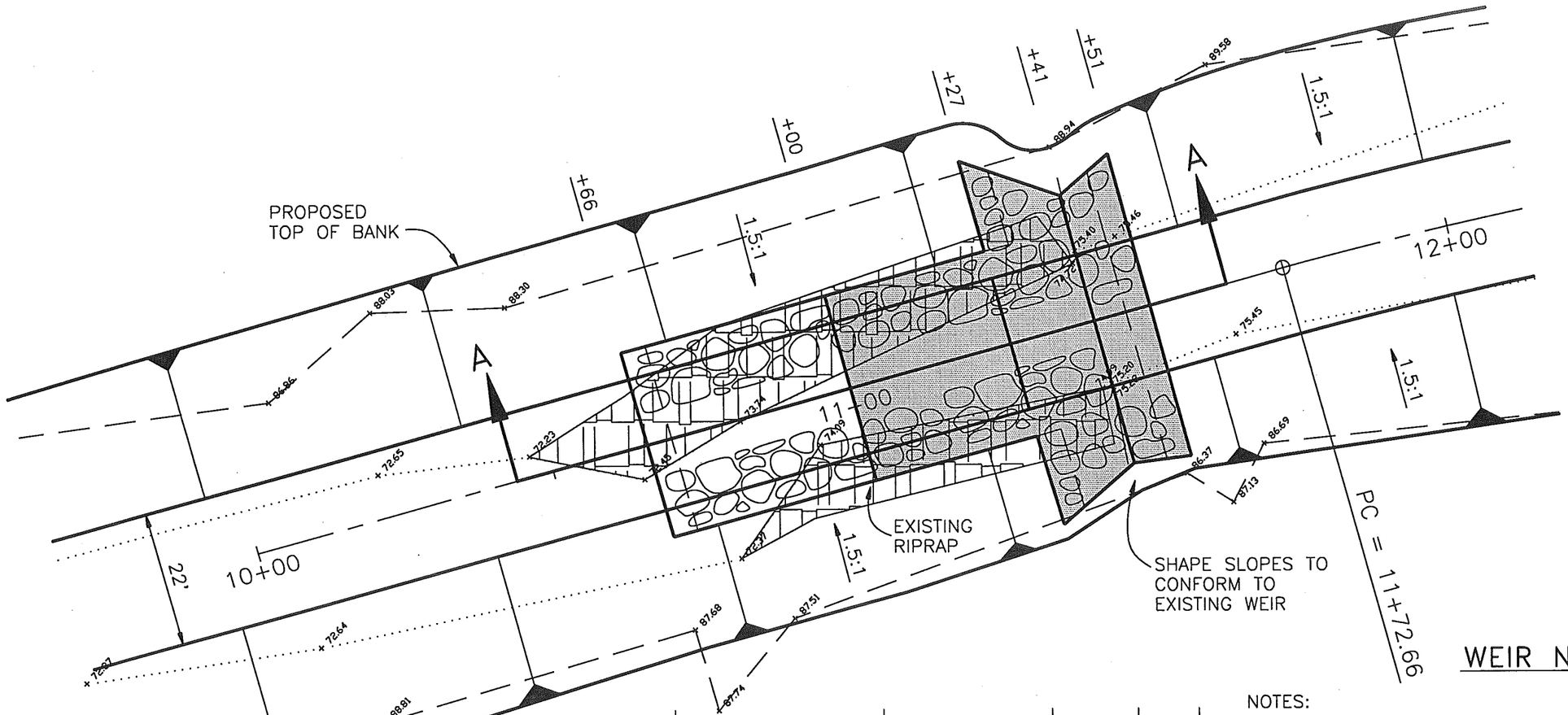
NOTES:

CONTRACTOR SHALL REMOVE EXISTING RIPRAP, ENGINEERING FABRIC AND BARRIER RAILS FROM CHANNEL BOTTOM ONLY. NEW RIPRAP AND ENGINEERING FABRIC SHALL BE PLACED IN THE CHANNEL BOTTOM AND ON THE SIDESLOPES TO THE EXTENT NECESSARY TO TRANSITION INTO EXISTING RIPRAP.

EXISTING RIPRAP ON CHANNEL SIDESLOPES SHALL BE LEFT IN PLACE, HOWEVER, MINOR RESHAPING AND ADDITION OF RIPRAP MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

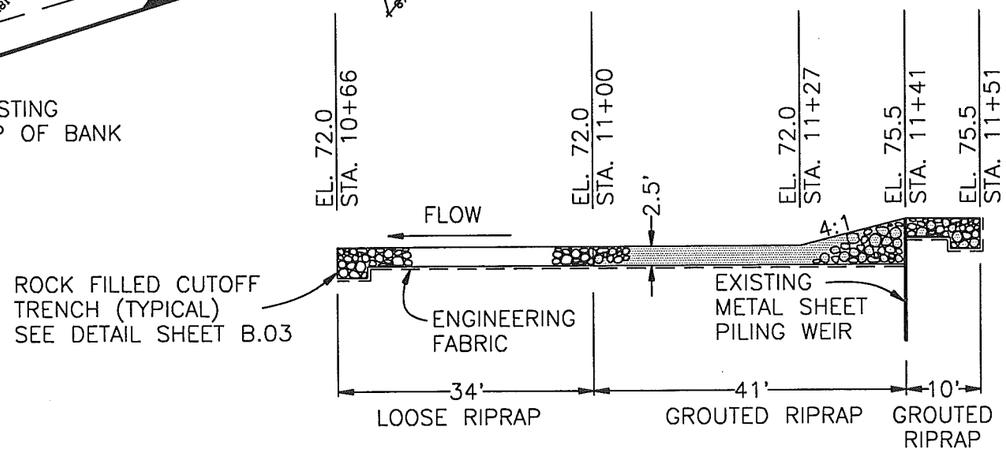
SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.:	0836	DATE:	2/97	REV:	
CLIENT:	CRAWFORD COUNTY, IOWA				
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY:	PJA
DESCRIPTION:	PLAN VIEW - SITE 6311-36 RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER PROJECT NO. EWP-24(96-2)			SHEET	D.02



SCALE 1"=20'

WEIR NO. 2



SECTION A–A

NOTES:

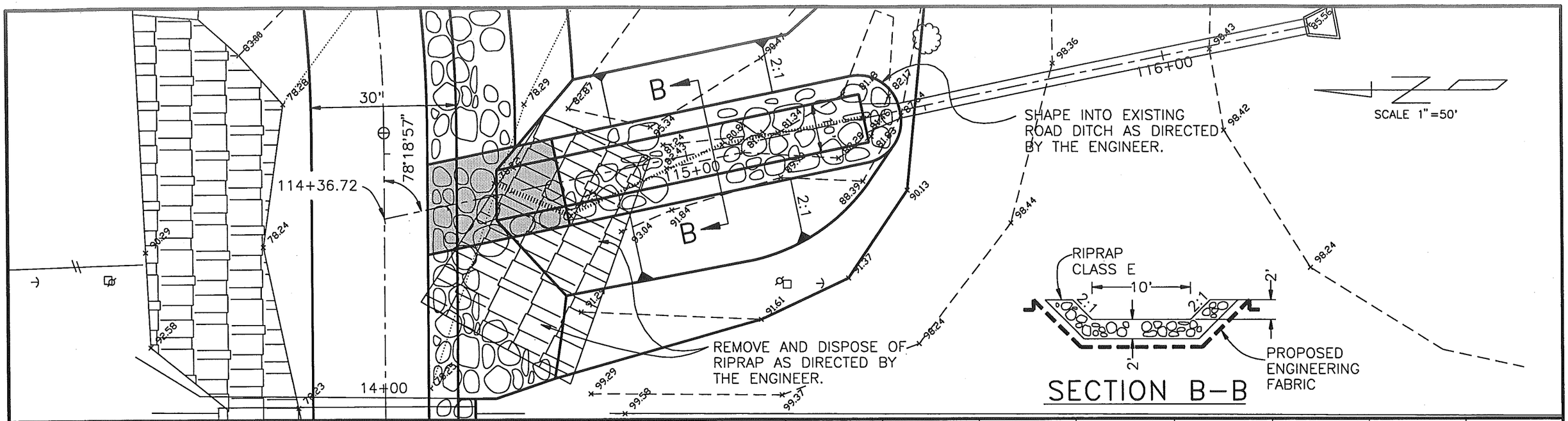
CONTRACTOR SHALL REMOVE EXISTING RIPRAP, ENGINEERING FABRIC AND BARRIER RAILS FROM WITHIN THE REPAIR AREA. EXISTING RIPRAP SHALL BE SALVAGED FOR REUSE AT THE SITE. BARRIER RAILS SHALL BE SALVAGED TO THE COUNTY SHOP. ENGINEERING FABRIC SHALL BE DISPOSED OF.

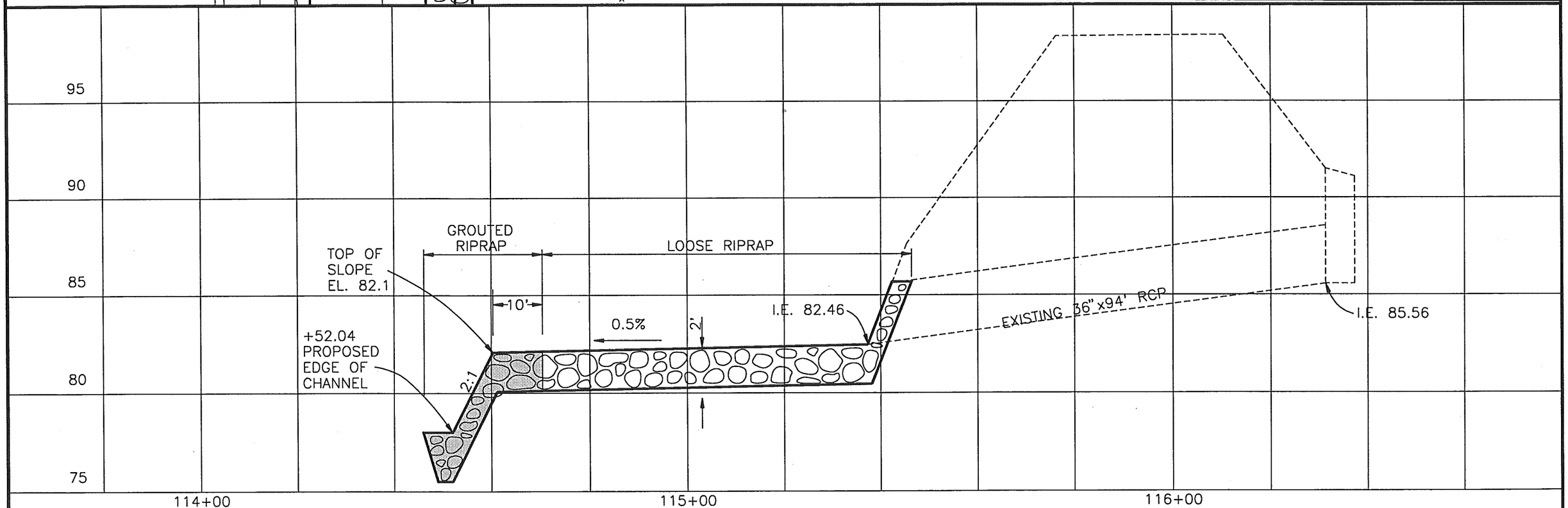
CONTRACTOR SHALL SHAPE SLOPES, AS SHOWN OR AS DIRECTED. ENGINEERING FABRIC AND RIPRAP SHALL BE PLACED ON THE FINISHED SLOPES AS SHOWN. SALVAGED RIPRAP SHALL BE PLACED IN THE NON–GROUTED PORTION OF THE PROPOSED ARMORING. IT IS ESTIMATED THAT SUFFICIENT SALVAGED RIPRAP WILL BE AVAILABLE AT THIS WEIR TO COMPLETE THE NON–GROUTED ARMORING. FIELD ADJUSTMENTS TO THE EXTENT OF THE NON–GROUTED ARMORING MAY BE REQUIRED AS DIRECTED BY THE ENGINEER TO CONFORM WITH AVAILABLE SALVAGED MATERIAL.

SALVAGED RIPRAP SHALL NOT BE ALLOWED IN THAT PORTION OF THE REPAIR AREA REQUIRING GROUT.

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

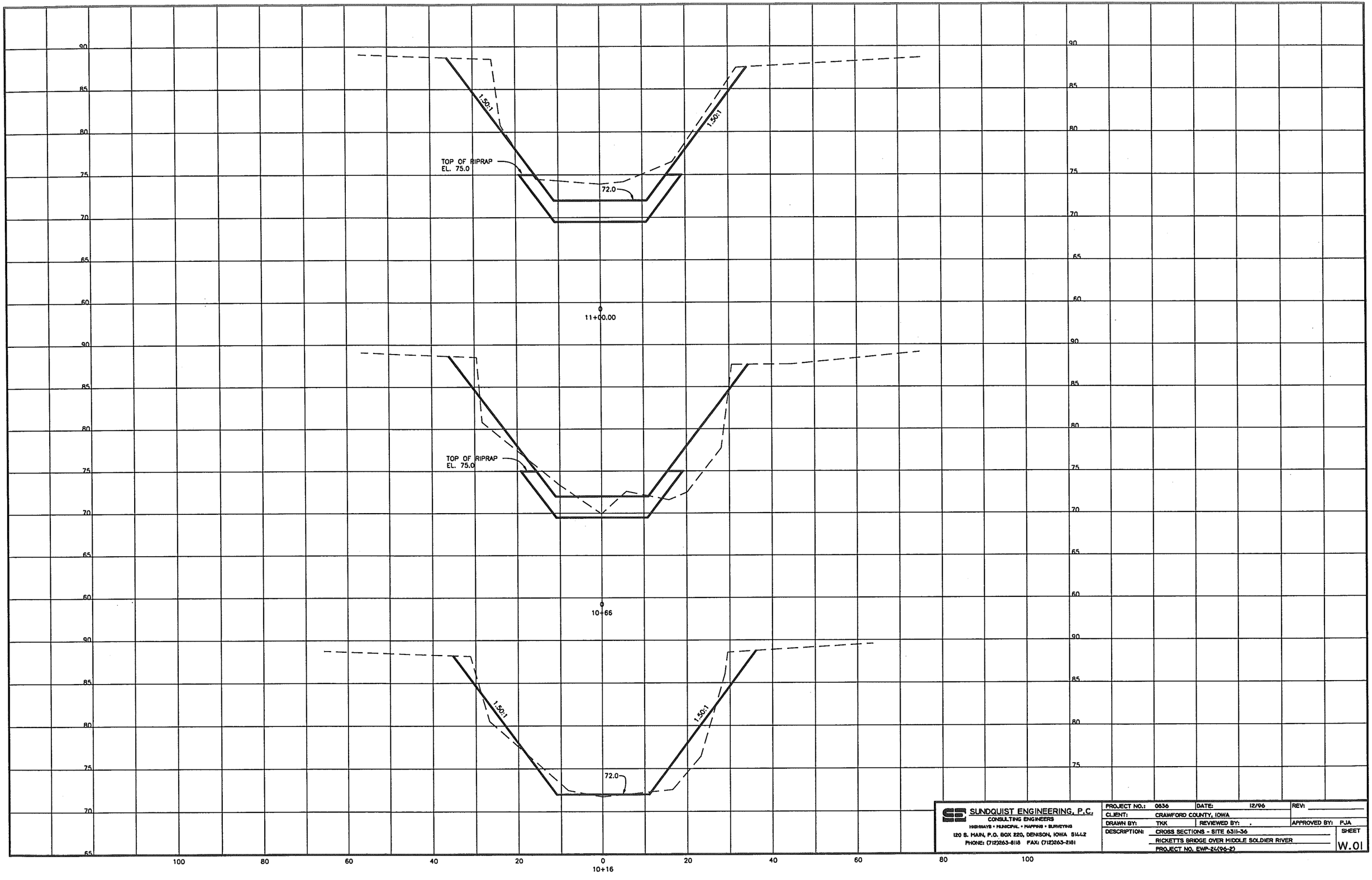
PROJECT NO.:	0836	DATE:	2/97	REV:	
CLIENT:	CRAWFORD COUNTY, IOWA				
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY:	PJA
DESCRIPTION:	PLAN VIEW - SITE 6311-36 RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER PROJECT NO. EWP-24(96-2)			SHEET	D.03



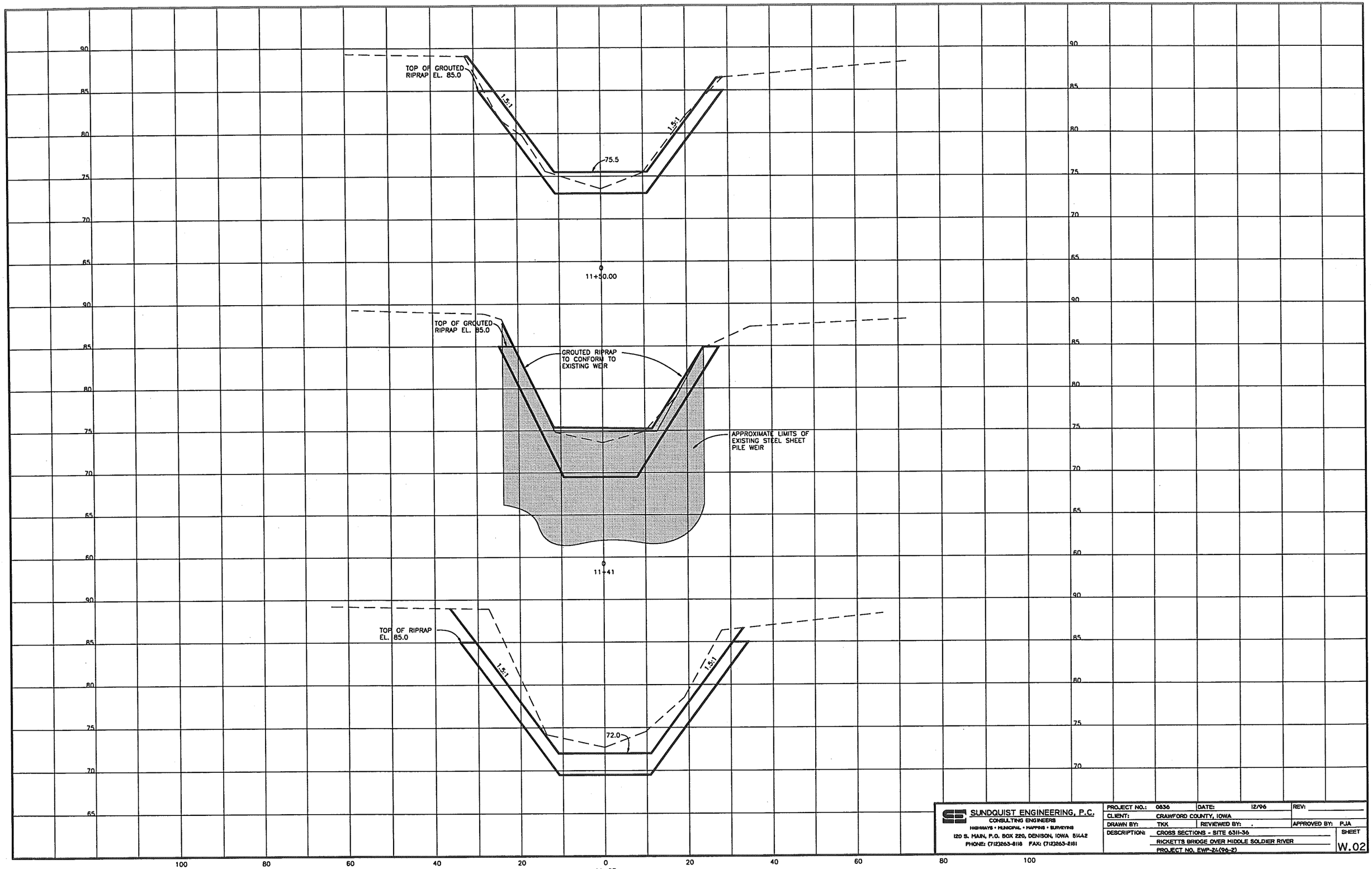


SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0836	DATE: 2/97	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: SIDE DITCH PROFILE - SITE 6311-36 RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER PROJECT NO. EWP-24(96-2)			SHEET D.04

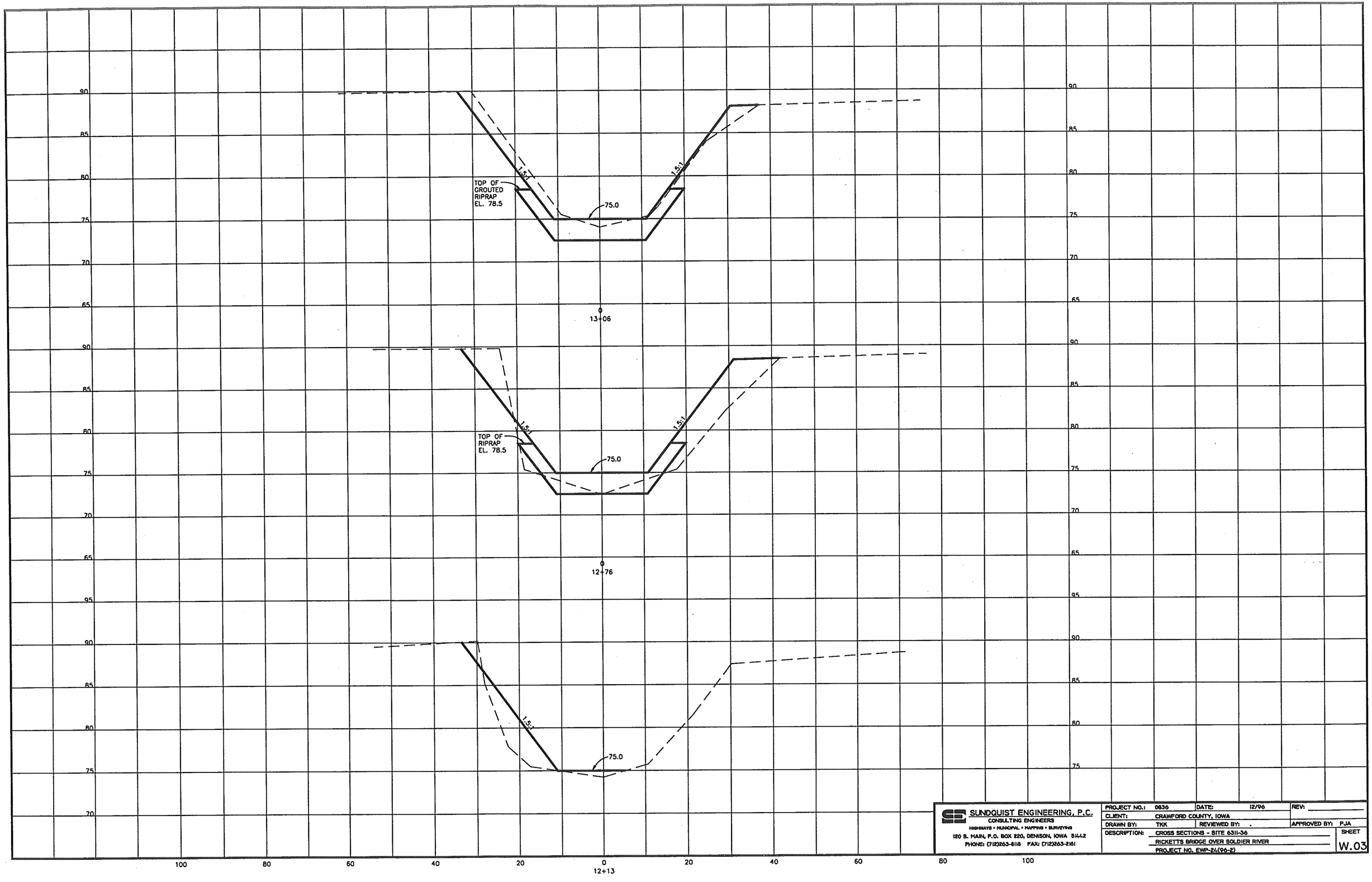


SUNDQUIST ENGINEERING, P.C. CONSULTING ENGINEERS HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING 120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442 PHONE: (712)263-8118 FAX: (712)263-2181	PROJECT NO.: 0836	DATE: 12/96	REV:
	CLIENT: CRAWFORD COUNTY, IOWA		
	DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA
	DESCRIPTION: CROSS SECTIONS - SITE 6311-36		SHEET
	RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER		W.01
	PROJECT NO. BWP-24(96-2)		

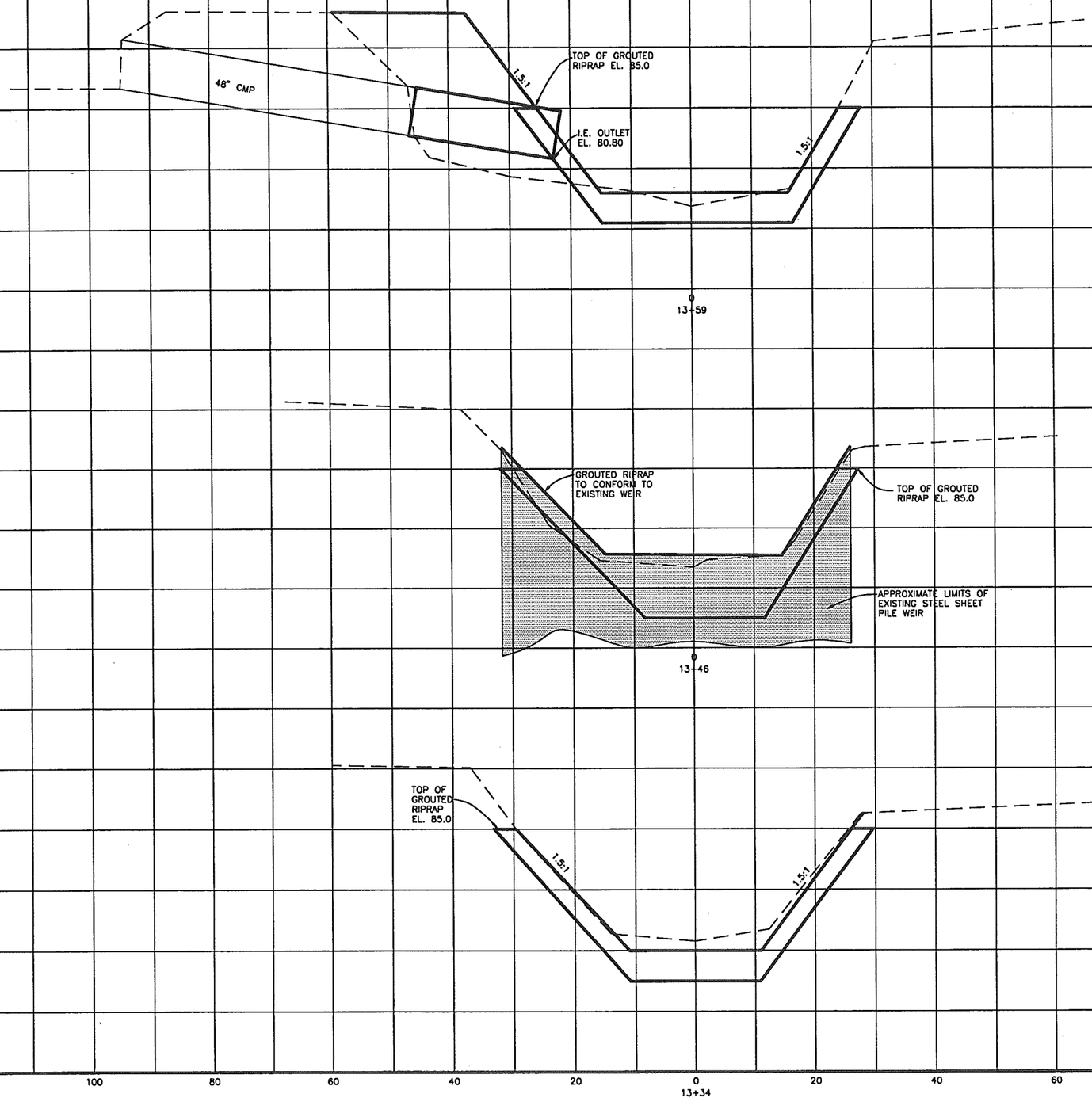


SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • PLATTING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.:	0836	DATE:	12/96	REV:
CLIENT:	CRAWFORD COUNTY, IOWA			
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY: PJA
DESCRIPTION:	CROSS SECTIONS - SITE 6311-36			SHEET W.02
	RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER			
	PROJECT NO. BWP-24(96-2)			

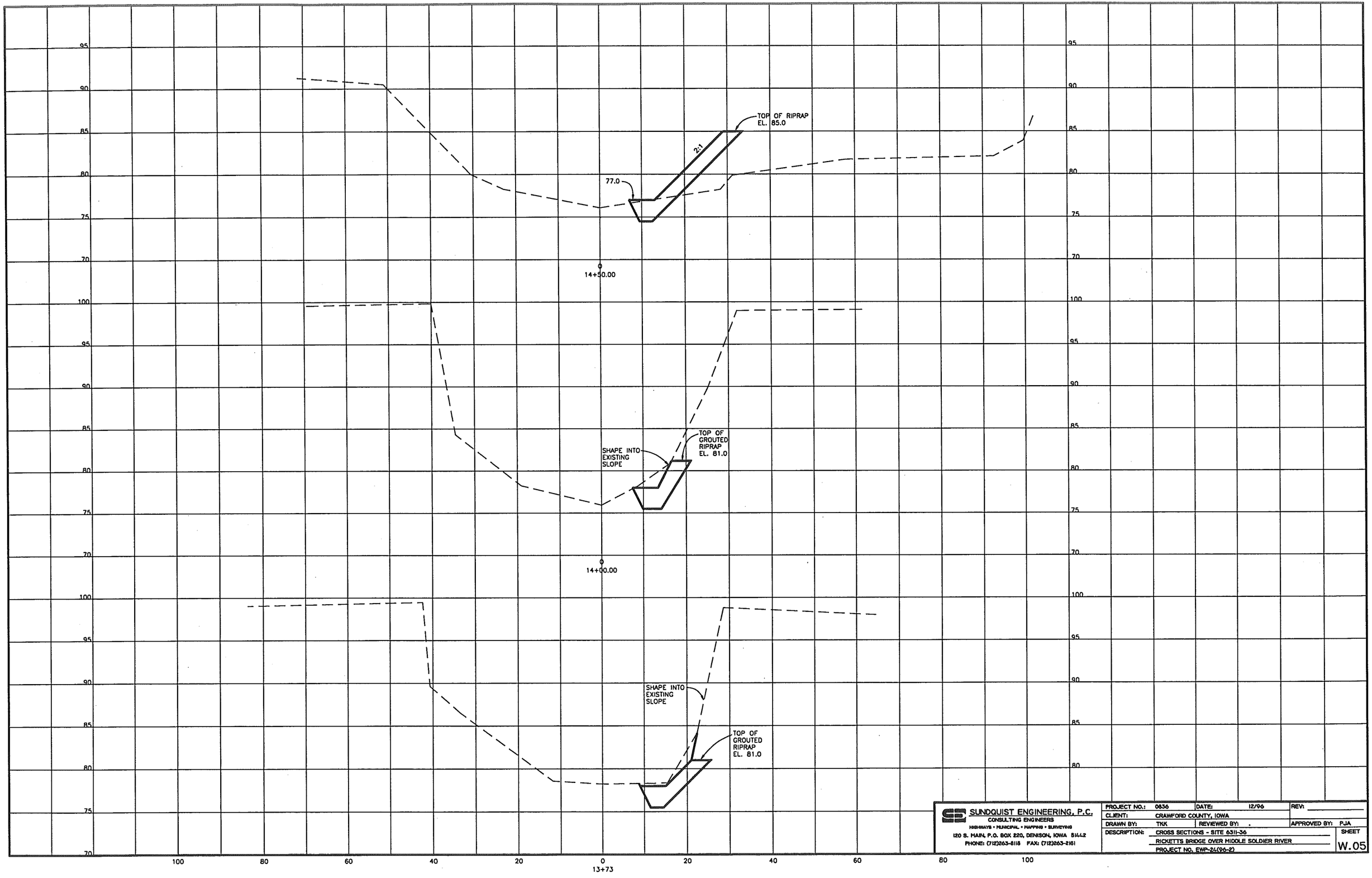


SUNDQUIST ENGINEERING, P.C. CONSULTING ENGINEERS HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING 120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442 PHONE: (712)263-8118 FAX: (712)263-2181	PROJECT NO.: 0836	DATE: 12/96	REV:
	CLIENT: CRAWFORD COUNTY, IOWA		
	DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA
	DESCRIPTION: CROSS SECTIONS - SITE 6311-36 RICKETTS BRIDGE OVER SOLDIER RIVER PROJECT NO. EWP-24(96-2)		SHEET W.03



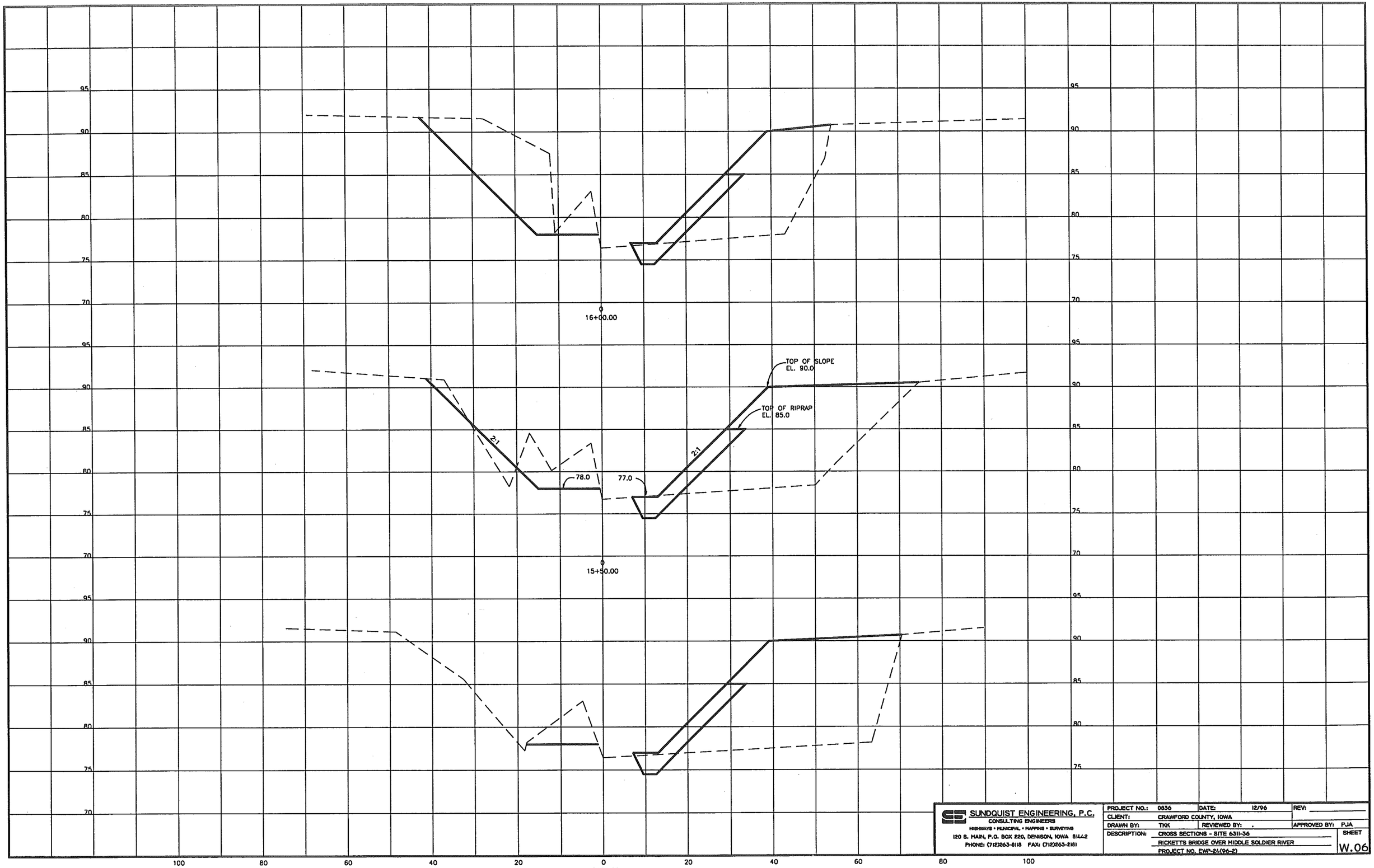
SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • PLATTING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.:	0836	DATE:	12/96	REV:
CLIENT:	CRAWFORD COUNTY, IOWA			
DRAWN BY:	TKK	REVIEWED BY:	.	APPROVED BY: PJA
DESCRIPTION:	CROSS SECTIONS - SITE 6311-36			SHEET
	RICKETTS BRIDGE OVER SOLDIER RIVER			W.04
	PROJECT NO. EWP-24(96-2)			



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)263-2161

PROJECT NO.: 0836	DATE: 12/96	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - SITE 6311-36			SHEET
RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER			W.05
PROJECT NO. EWP-24(96-2)			



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)263-2161

PROJECT NO.: 9836	DATE: 12/96	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TNK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - SITE 6311-36			SHEET
RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER			W.06
PROJECT NO. EWP-24(96-2)			

105
100
95
90
85
80
75
70

105
100
95
90
85
80
75
70

℄
17+00.00

TOP OF RIPRAP
EL. 85.0

2:1

78.0

77.0

100 80 60 40 20 0 20 40 60 80 100

16+50.00

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

PROJECT NO.: 0636	DATE: 12/96	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - SITE 6311-36			SHEET
RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER			W.07
PROJECT NO. EWP-24(96-2)			



SUNDQUIST ENGINEERING, P.C.	PROJECT NO.: 0836	DATE: 12/96	REV:
CONSULTING ENGINEERS	CLIENT: CRAWFORD COUNTY, IOWA		
HIGHWAYS • MUNICIPAL • PLANNING • SURVEYING	DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442	DESCRIPTION: CROSS SECTIONS - SITE 6311-36		SHEET
PHONE: (712)263-5118 FAX: (712)263-2181	RICKETTS BRIDGE OVER MIDDLE SOLDIER RIVER		W.08
	PROJECT NO. BWP-24(96-2)		

PROJECT NO. DS-24(1)

IOWA
DEPARTMENT OF TRANSPORTATION
Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

FARM TO MARKET SYSTEM

CRAWFORD COUNTY

STREAM STABILIZATION STRUCTURES

THE STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, SERIES OF 1992, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS, SHALL APPLY TO WORK ON THIS PROJECT.

STANDARD ROAD PLANS

THE FOLLOWING STANDARD ROAD PLANS SHALL BE CONSIDERED APPLICABLE TO CONSTRUCTION WORK ON THIS PROJECT.

IDENT.	DATE	IDENT.	DATE	IDENT.	DATE
RL-1	4-23-82				

INDEX OF SHEETS

1. TITLE SHEET
2. SITUATION PLAN
3. WEIR #1 DETAILS
4. WEIR #2 DETAILS
5. TEMPORARY BARRIER RAIL DETAILS

TOTAL ESTIMATED QUANTITIES

NO.	ITEM	UNIT	WEIR#1	WEIR#2	TOTAL
1	PILING, STEEL SHEET, FURNISH AND DRIVE	S.F.	1,240	1,073	2,313
2	STRUCTURAL STEEL	LBS.	2,581	2,472	5,053
3	MOBILIZATION	L.S.	–	–	LUMP SUM
4	EXCAVATION, CLASS 10, CHANNEL	C.Y.	300	175	475
5	REVETMENT, SPECIAL RIPRAP	TONS	394	253	647
6	FABRIC, ENGINEERING	S.Y.	367	287	654
7	TEMPORARY BARRIER RAIL, FURNISH ONLY	L.F.	40	40	80
8	TEMPORARY BARRIER RAIL, PLACE ONLY	L.F.	40	40	80

ITEM NO. ESTIMATE REFERENCE INFORMATION

1. SHEET PILE MAY BE NEW OR USED MATERIAL. SEE WEIR NOTES FOR ADDITIONAL INFORMATION.
2. INCLUDES WEIGHT OF HP10X42 WALE AND ALL WELDS.
4. SEE SITUATION PLAN FOR LIMITS.
5. SEE RIP-RAP NOTES.
6. SEE SITUATION PLAN AND WEIR DETAILS FOR LIMITS. TO CONFORM TO I.D.O.T. MATERIALS I.M. 496.01 APPENDIX A.
7. SEE NOTES, SHEET 5. MAY BE NEW OR USED.
8. INCLUDES COST FOR EXCAVATION, TIE BARS AND ALL LABOR FOR PLACEMENT OF THE RAIL SECTIONS AS SHOWN SHEETS 2, 3 AND 4.

THIS PROJECT (COE # 264010) IS COVERED BY THE CORPS OF ENGINEERS NATIONWIDE 404 PERMIT #26.

DRAWING APPROVAL

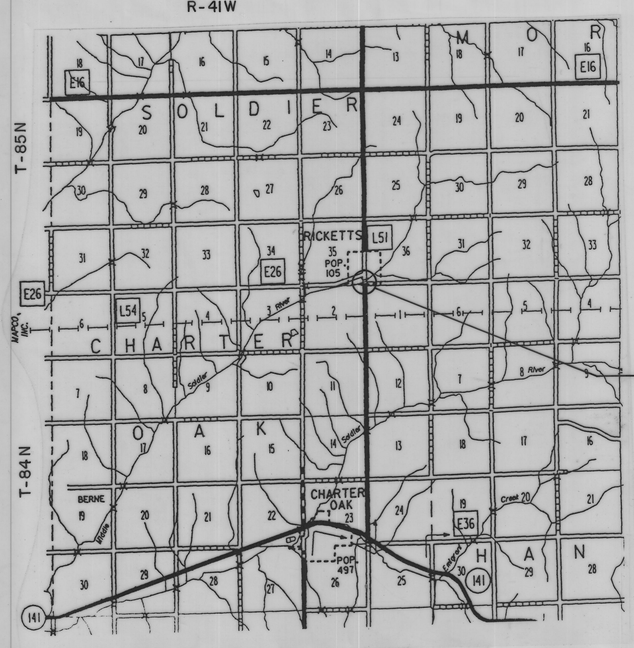
ALL SHOP DRAWINGS AND FALSEWORK DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY CALHOUN-BURNS AND ASSOCIATES, INC.

ADDRESS : 1801 FULLER ROAD, P.O. BOX 65859
WEST DES MOINES, IOWA 50265
TELEPHONE : (515) 224-4344

THESE SHOP DRAWINGS SHALL NOT BE SENT TO IOWA D.O.T. OFFICE OF BRIDGE DESIGN.

IA. DEPT. OF NATURAL RESOURCES PEMIT NO. FP93-3; DATED: 1-8-93

R-41W



PROJECT LOCATION
SCALE 3" = 1 MILE

DESIGN NO.
PROJECT NO. DS-24(1)
STREAM STABILIZATION
STRUCTURES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

APPROVED BY: DATE

Lee C. White — 2-1-94
Acting STATE CONSERVATION ENGINEER

Richard C. Schandel — 2/17/94
HEAD ENGINEERING STAFF, MNTC
LINCOLN, NEBRASKA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED

H. Dale Wright 1-28-94
CRAWFORD COUNTY ENGINEER DATE

Virgil E. Carlson
John P. Lawler
LeRoy A. Hansohn
Eileen Heiden
1-28-94
BOARD OF SUPERVISORS DATE

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED UNDER MY SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
SIGNATURE: Steven B Reneker
NAME: STEVEN B. RENEKER, P.E.
DATE: 10.18.93 REG. NO. 11455
MY REGISTRATION EXPIRES DECEMBER 31, 1994

DEPARTMENT OF TRANSPORTATION IOWA — Highway Division

AUTHORIZED FOR LETTING

DEPUTY CHIEF ENGINEER DATE

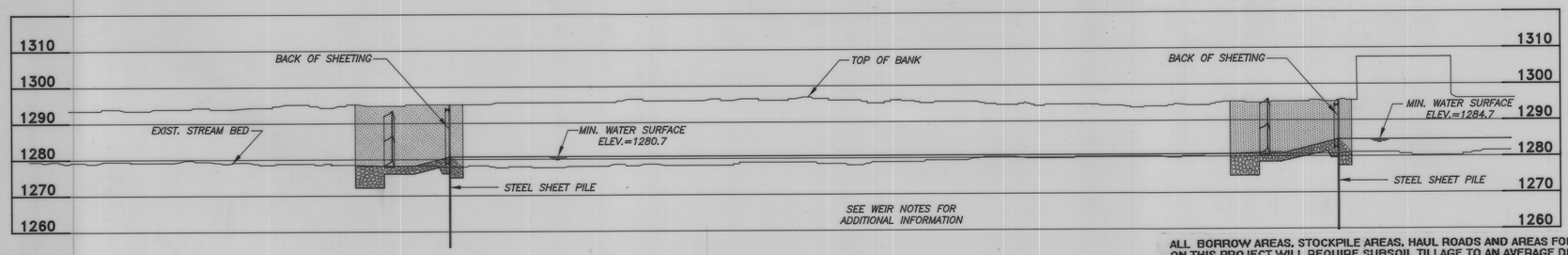
IOWA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

ACCEPTED FOR LETTING

DISTRICT LOCAL SYSTEMS ENGR. DATE

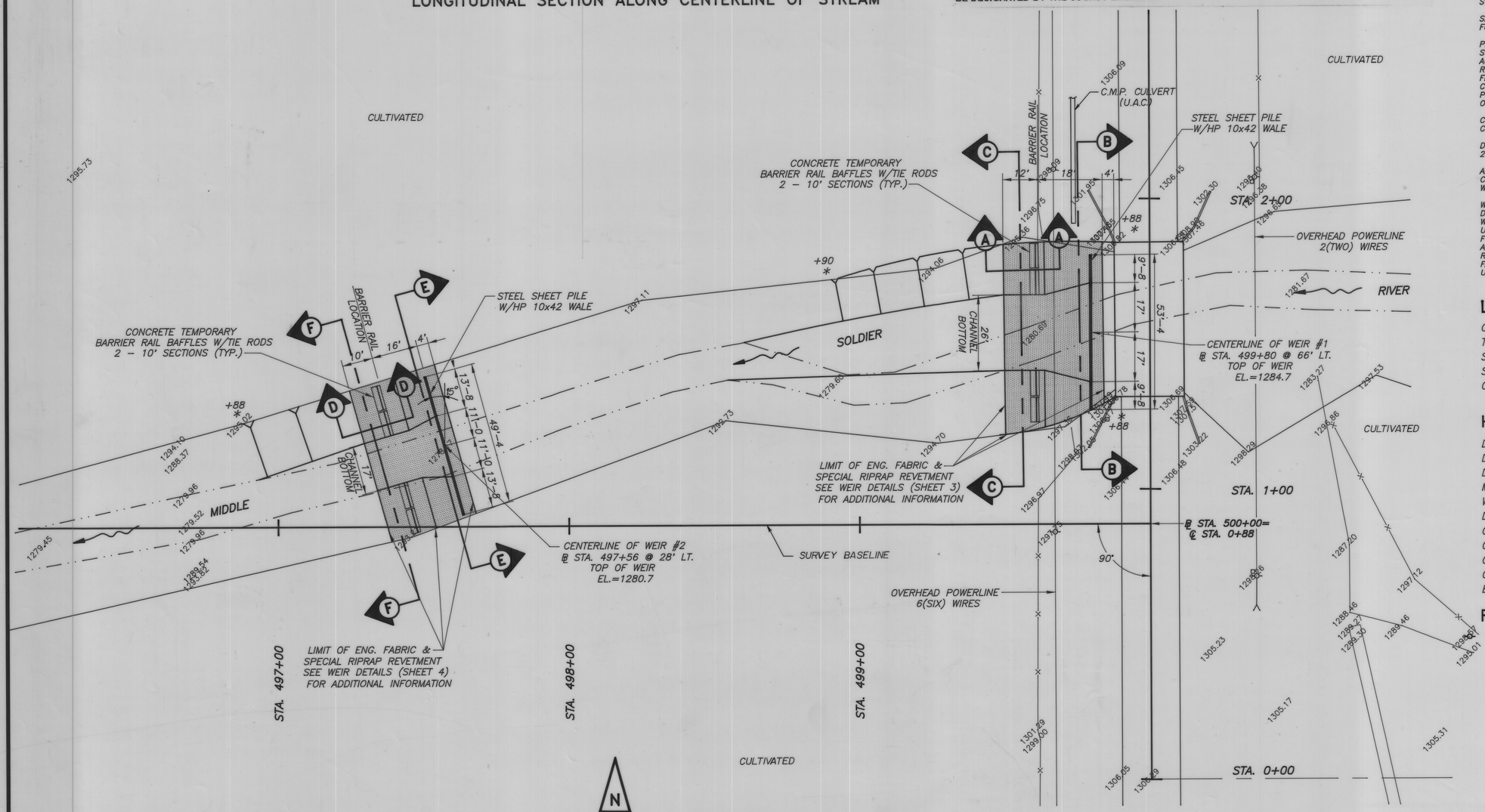
SHEET 1 OF 5

STREAM STABILIZATION STRUCTURES
PROJECT NO. DS-24(1)
CRAWFORD COUNTY
LETTING DATE :



LONGITUDINAL SECTION ALONG CENTERLINE OF STREAM

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.



SITUATION PLAN

SCALE 1" = 20'

* LIMITS OF CLASS 10, CHANNEL EXCAVATION

BENCH MARK NO.1 :NAIL IN ℄ SAWCUT, STA. 0+00, ELEV.=1306.29
NO.2 :NAIL IN ℄ SAWCUT, STA. 3+60, ELEV.=1304.58

SPECIFICATIONS

DESIGN: AASHTO, SERIES OF 1989, PLUS INTERIM SPECIFICATIONS.
CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, SERIES OF 1992, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1989, PLUS INTERIM NOT EXCEEDING SPECIFICATIONS.

STRUCTURAL STEEL ASSUMING SALVAGED MATERIAL WITH STRESSES NOT EXCEEDING 0.55 FY.

STEEL SHEET PILE ASSUMING SALVAGED MATERIAL WITH STRESSES NOT EXCEEDING 0.65 FY.

GENERAL NOTES

QUANTITY SHOWN FOR STRUCTURAL STEEL IS FOR FURNISHING AND PLACING STEEL I–BEAM WALER AND ALL WELDING.

THE CONTRACTOR SHALL CLEAR THE CHANNEL AS SHOWN ON THE WEIR DETAIL SHEET AND "SITUATION PLAN". EXCESS MATERIAL SHALL BE DISPOSED AT A SITE FURNISHED BY THE CONTRACTOR.

IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE OFFICE OF PLANNING AND/OR THE OFFICE OF LOCAL SYSTEMS (IOWA DOT) 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 OR FURTHER TESTING CANNOT BE CONSIDERED FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE STATE HISTORICAL PRESERVATION OFFICER PHONE: OFFICE OF PROJECT PLANNING – (515)239–1225; OFFICE OF LOCAL SYSTEMS – (515)239–1528.

THE CONTRACTOR IS TO CONTACT ALL UTILITY COMPANIES WHO HAVE LINES, CONDUITS OR OTHER FACILITIES WITHIN THE WORK AREA, BEFORE STARTING CONSTRUCTION.

SEEDING, FERTILIZING, AND MULCHING OF ALL DISTURBED AREAS SHALL BE DONE FOLLOWING THE COMPLETION OF WORK ON THIS PROJECT AS PER ARTICLE 2601.04 FOR RURAL AREAS.

THE PREPARATION OF THE SEEDBED, FURNISHING AND APPLICATION OF SEED AND FERTILIZER TO ALL DISTURBED AREAS ON THIS PROJECT SHALL BE CONSIDERED INCIDENTAL TO WORK ON THIS PROJECT, AND NO EXTRA COMPENSATION WILL BE ALLOWED.

THE CONTRACTOR IS TO VISIT THE SITE TO ENSURE THAT HE IS FAMILIAR WITH THE EXISTING SITE CONDITIONS. UTILITIES ARE INDICATED ON THE DRAWINGS TO PROVIDE GENERAL LOCATION INFORMATION ONLY. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. SHOULD ANY UNDERGROUND UTILITIES BE FOUND DIFFERENT THAN SHOWN ON DRAWINGS, THEY SHALL BE PROTECTED IN PLACE AND THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

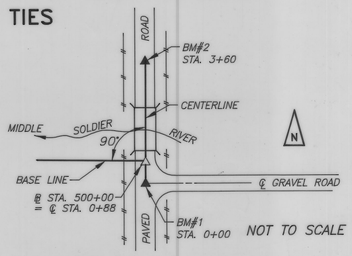
LOCATION

CRAWFORD COUNTY
T–85N, R–41W
SECTION 35
SOLDIER TOWNSHIP
ON MIDDLE SOLDIER RIVER

HYDRAULIC DATA

DRAINAGE AREA = 6.9 SQ. MI.
DESIGN DISCHARGE = 3600 C.F.S.
DESIGN HIGH WATER EL. = 1293.5
MANNINGS SLOPE = 0.0033 FT./FT.
WATERWAY AREA = 377 SQ. FT.
DESIGN VELOCITY = 9.6 F.P.S.
Q25 = 2770 C.F.S. STAGE EL. = 1291.9
Q50 = 3600 C.F.S. STAGE EL. = 1293.5(DESIGN)
Q100 = 4450 C.F.S. STAGE EL. = 1295.1
Q500 = 5850 C.F.S. STAGE EL. = 1296.9
EXT. H.W. EL. = UNKNOWN

REFERENCE TIES

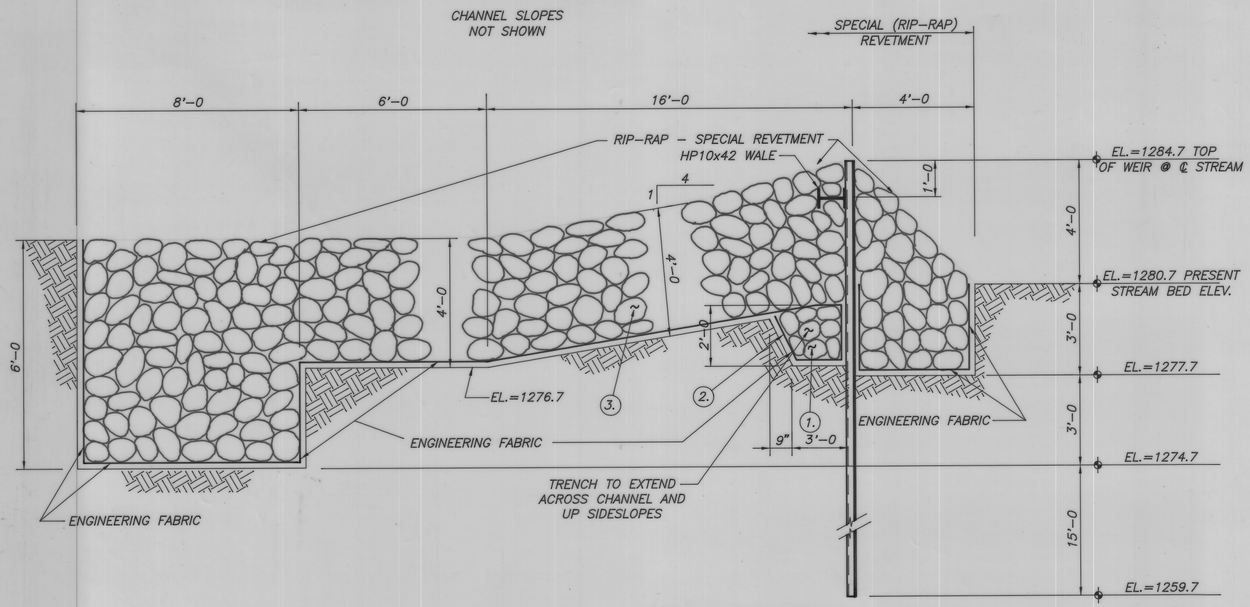


STREAM STABILIZATION STRUCTURES

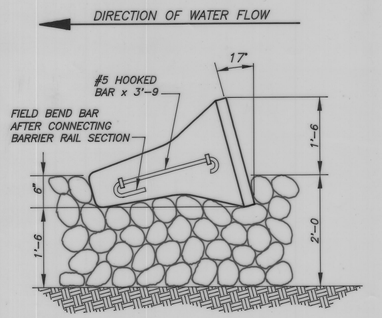
SITUATION PLAN

CRAWFORD COUNTY IOWA

SHEET 2 OF 5



LONGITUDINAL SECTION ALONG CENTERLINE OF STREAM



SECTION A-A

CONCRETE BARRIER RAIL BAFFLES

BENCH MARK NO.1 :NAIL IN ℄ SAWCUT, STA. 0+00, ELEV.=1306.29
NO.2 :NAIL IN ℄ SAWCUT, STA. 3+60, ELEV.=1304.58

WEIR NOTES

ENGINEERING FABRIC INSTALLATION SEQUENCE DOWNSTREAM FROM WEIR SHALL BE AS FOLLOWS:

1. EXCAVATE TRENCH BELOW HP10X42 WALE.
2. PLACE ENGINEERING FABRIC, BEGINNING AT DOWNSTREAM END OF TRENCH, ROLLING FABRIC UP THE FACE OF THE SHEET PILE WALL. ROLL A SUFFICIENT AMOUNT OF FABRIC FREE TO FACILITATE RIP-RAP PLACEMENT WITHIN TRENCH. PLACE RIP-RAP IN THE TRENCH TO LEVELS SHOWN AND COVER WITH FABRIC. ENGINEERING FABRIC SHALL CONFORM TO I.D.O.T. MATERIALS I.M. 496.01.
3. PLACE REMAINDER OF FABRIC AND COVER WITH RIP-RAP.

ENGINEERING FABRIC SHALL BE LAPPED 3'-0" MINIMUM IN DIRECTION SHOWN.

STEEL SHEET PILE SECTION SHOWN IS A MINIMUM SIZE AND MAY BE SALVAGED MATERIAL; OTHER SHEET PILE SIZES MAY BE SUBSTITUTED WITH COUNTY ENGINEER'S APPROVAL. ALL SALVAGED MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO INCORPORATION INTO THE PROJECT. THE WEIR SHEET PILE WALL SHALL CARRY A MOMENT OF 200,000 IN.-LBS./FT. AT A STRESS NOT EXCEEDING .65 FY. MINIMUM SHEET PILE THICKNESS IS 3/8 INCH, MINIMUM SECTION MODULUS WILL BE 8.0 CUBIC INCHES PER FOOT OF WALL USING FY = 38,500 PSI (REGULAR CARBON GRADE STEEL). THE HP10X42 WALE IS A MINIMUM SIZE, ASSUMING SALVAGED MATERIAL, FY = 33,000 PSI. SHEET PILE SHALL BE DRIVEN TO FULL PENETRATION WHERE PRACTICABLE.

ALL EXCAVATION FOR RIP-RAP WEIR INSTALLATION SHALL BE PAID FOR AS CLASS 10, CHANNEL, EXCAVATION.

THE STEEL SHEET PILE WEIR AND RIP-RAP STILLING BASIN ARE DESIGNED AND CONSTRUCTED AS A RESEARCH PROJECT IN CONNECTION WITH EFFORTS TO DEVELOP ECONOMICAL STREAM STABILIZATION FACILITY WHICH PROVIDES A DEGREE OF PROTECTION AND EXTENSION OF EXPECTED LIFE OF BRIDGE STRUCTURES LOCATED IN CLOSE PROXIMITY OF THE FACILITY.

DESIGN TECHNIQUES AND PRINCIPLES USED TO DESIGN THIS PROJECT ARE THOSE GENERALLY ACCEPTED IN THE ENGINEERING PROFESSION, OR REPRESENT THE GENERALLY ACCEPTED EFFORTS OF A COMPETENT ENGINEER. THESE TECHNIQUES AND PRINCIPLES, AND THEIR ASSOCIATED DESIGN CODES, INCLUDE ACCEPTABLE AMOUNTS OF MOVEMENT, DEFLECTION, SETTLEMENT, DEVIATION, CRACKING, BENDING, AND DETERIORATION OVER TIME, AS THE INTENDED LEVEL OF PERFORMANCE OF THE FACILITY.

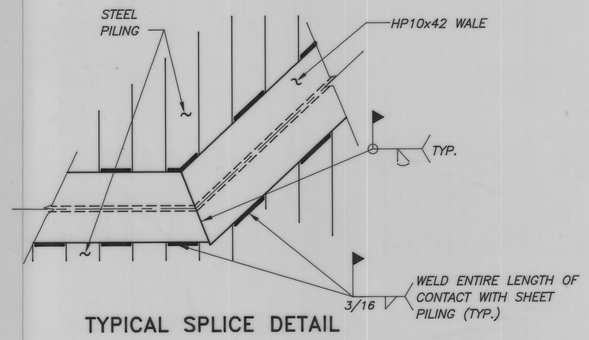
RIPRAP NOTES

SPECIAL (RIP-RAP) REVETMENT AROUND WEIR AS SHOWN ON THE PLANS SHALL COMPLY WITH SECTION 2507 OF STANDARD SPECIFICATIONS, 1992 AND THE FOLLOWING:

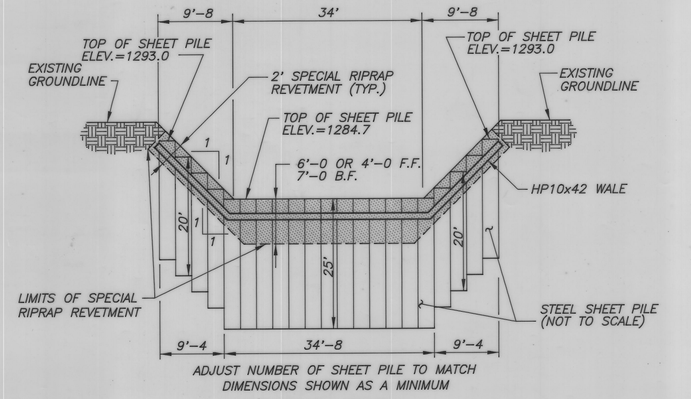
STONE WT., POUNDS	MINIMUM % LARGER THAN
1500	0
700	20
400	50
70	80

NO MORE THAN 5% PASSING THE 1/2" SIEVE.

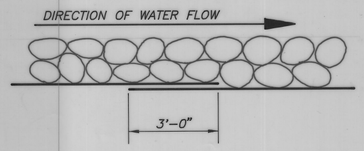
SPECIAL (RIP-RAP) REVETMENT SHALL COMPLY WITH DURABILITY AND FREEZE AND THAW REQUIREMENTS AS PER SECTION 4130.01 FOR CLASS "E" REVETMENT, METHOD A, WITH UP TO 25% VARIANCE.



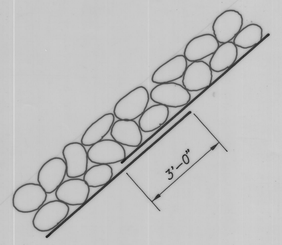
TYPICAL SPLICE DETAIL



SECTION B-B

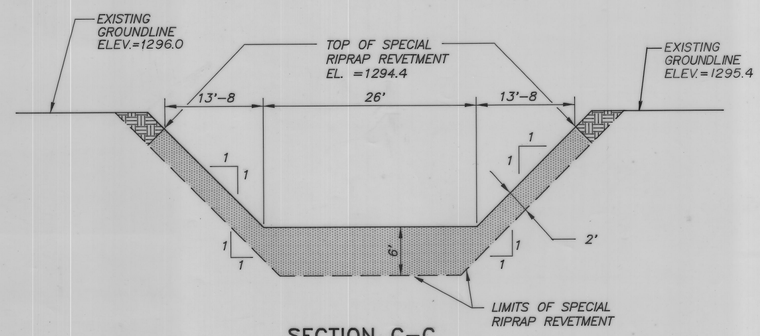


BOTTOM CHANNEL TRANSVERSE LAP



SIDE SLOPE LONGITUDINAL LAP

TYPICAL ENGINEERING FABRIC LAP DETAILS



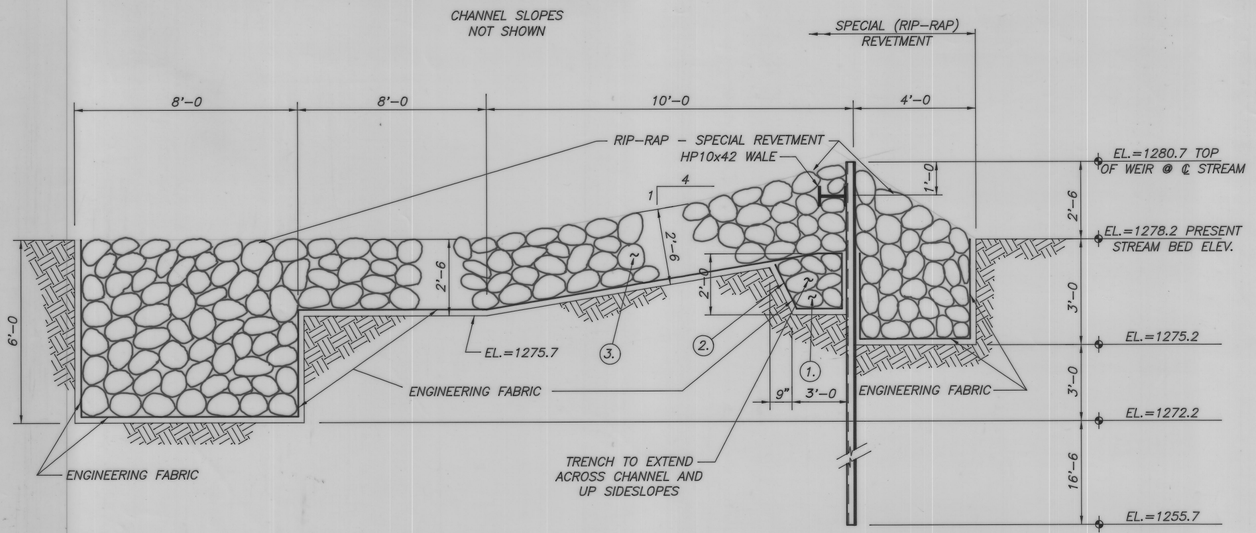
SECTION C-C

STREAM STABILIZATION STRUCTURE

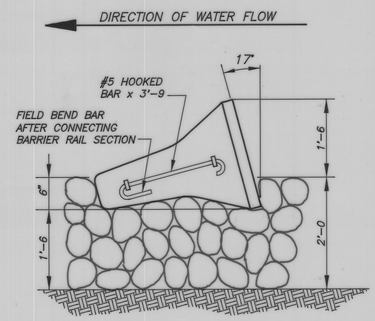
WEIR #1 DETAILS

CRAWFORD COUNTY IOWA

SHEET 3 OF 5



LONGITUDINAL SECTION ALONG CENTERLINE OF STREAM



SECTION D-D

CONCRETE BARRIER RAIL BAFFLES

BENCH MARK NO.1 :NAIL IN ℄ SAWCUT, STA. 0+00, ELEV.=1306.29
NO.2 :NAIL IN ℄ SAWCUT, STA. 3+60, ELEV.=1304.58

WEIR NOTES

ENGINEERING FABRIC INSTALLATION SEQUENCE DOWNSTREAM FROM WEIR SHALL BE AS FOLLOWS:

1. EXCAVATE TRENCH BELOW HP10X42 WALE.
2. PLACE ENGINEERING FABRIC, BEGINNING AT DOWNSTREAM END OF TRENCH, ROLLING FABRIC UP THE FACE OF THE SHEET PILE WALL. ROLL A SUFFICIENT AMOUNT OF FABRIC FREE TO FACILITATE RIP-RAP PLACEMENT WITHIN TRENCH. PLACE RIP-RAP IN THE TRENCH TO LEVELS SHOWN AND COVER WITH FABRIC. ENGINEERING FABRIC SHALL CONFORM TO I.D.O.T. MATERIALS I.M. 496.01.
3. PLACE REMAINDER OF FABRIC AND COVER WITH RIP-RAP.

ENGINEERING FABRIC SHALL BE LAPPED 3'-0" MINIMUM IN DIRECTION SHOWN.

STEEL SHEET PILE SECTION SHOWN IS A MINIMUM SIZE AND MAY BE SALVAGED MATERIAL; OTHER SHEET PILE SIZES MAY BE SUBSTITUTED WITH COUNTY ENGINEER'S APPROVAL. ALL SALVAGED MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO INCORPORATION INTO THE PROJECT. THE WEIR SHEET PILE WALL SHALL CARRY A MOMENT OF 200,000 IN.-LBS./FT. AT A STRESS NOT EXCEEDING .65 FY. MINIMUM SHEET PILE THICKNESS IS 3/8 INCH, MINIMUM SECTION MODULUS WILL BE 8.0 CUBIC INCHES PER FOOT OF WALL USING FY = 38,500 PSI (REGULAR CARBON GRADE STEEL). THE HP10X42 WALE IS A MINIMUM SIZE, ASSUMING SALVAGED MATERIAL, FY = 33,000 PSI. SHEET PILE SHALL BE DRIVEN TO FULL PENETRATION WHERE PRACTICABLE.

ALL EXCAVATION FOR RIP-RAP WEIR INSTALLATION SHALL BE PAID FOR AS CLASS 10, CHANNEL, EXCAVATION.

THE STEEL SHEET PILE WEIR AND RIP-RAP STILLING BASIN ARE DESIGNED AND CONSTRUCTED AS A RESEARCH PROJECT IN CONNECTION WITH EFFORTS TO DEVELOP ECONOMICAL STREAM STABILIZATION FACILITY WHICH PROVIDES A DEGREE OF PROTECTION AND EXTENSION OF EXPECTED LIFE OF BRIDGE STRUCTURES LOCATED IN CLOSE PROXIMITY OF THE FACILITY.

DESIGN TECHNIQUES AND PRINCIPLES USED TO DESIGN THIS PROJECT ARE THOSE GENERALLY ACCEPTED IN THE ENGINEERING PROFESSION, OR REPRESENT THE GENERALLY ACCEPTED EFFORTS OF A COMPETENT ENGINEER. THESE TECHNIQUES AND PRINCIPLES, AND THEIR ASSOCIATED DESIGN CODES, INCLUDE ACCEPTABLE AMOUNTS OF MOVEMENT, DEFLECTION, SETTLEMENT, DEVIATION, CRACKING, BENDING, AND DETERIORATION OVER TIME, AS THE INTENDED LEVEL OF PERFORMANCE OF THE FACILITY.

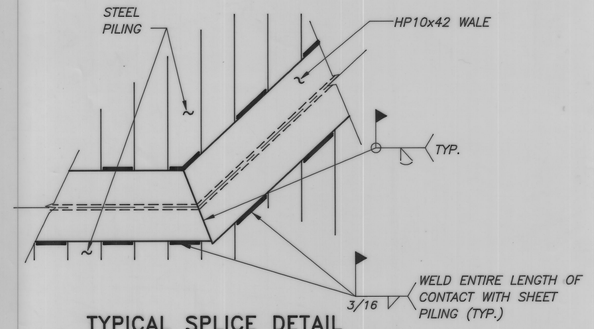
RIPRAP NOTES

SPECIAL (RIP-RAP) REVETMENT AROUND WEIR AS SHOWN ON THE PLANS SHALL COMPLY WITH SECTION 2507 OF STANDARD SPECIFICATIONS, 1992 AND THE FOLLOWING:

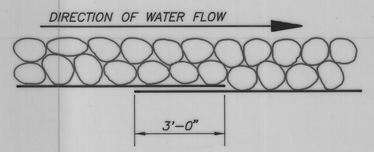
STONE WT., POUNDS	MINIMUM % LARGER THAN
1500	0
700	20
400	50
70	80

NO MORE THAN 5% PASSING THE 1/2" SIEVE.

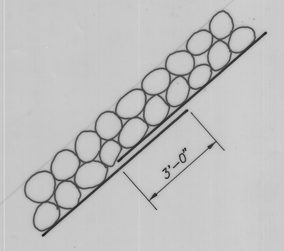
SPECIAL (RIP-RAP) REVETMENT SHALL COMPLY WITH DURABILITY AND FREEZE AND THAW REQUIREMENTS AS PER SECTION 4130.01 FOR CLASS "E" REVETMENT, METHOD A, WITH UP TO 25% VARIANCE.



TYPICAL SPLICE DETAIL

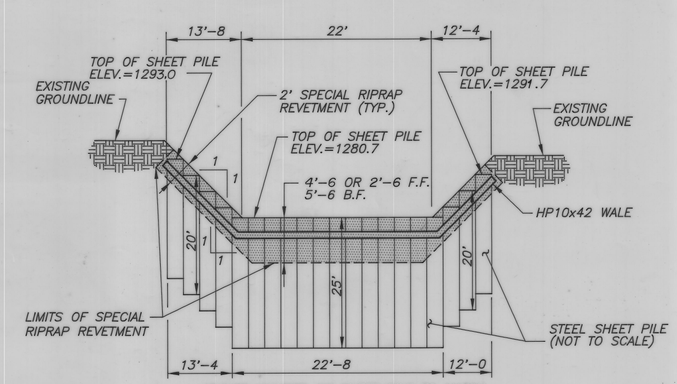


BOTTOM CHANNEL TRANSVERSE LAP



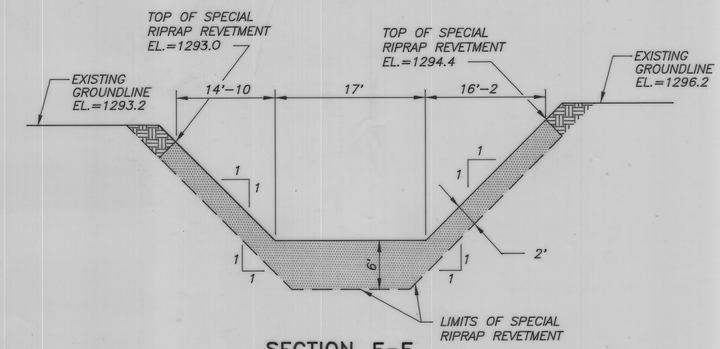
SIDE SLOPE LONGITUDINAL LAP

TYPICAL ENGINEERING FABRIC LAP DETAILS



ADJUST NUMBER OF SHEET PILE TO MATCH DIMENSIONS SHOWN AS A MINIMUM

SECTION E-E



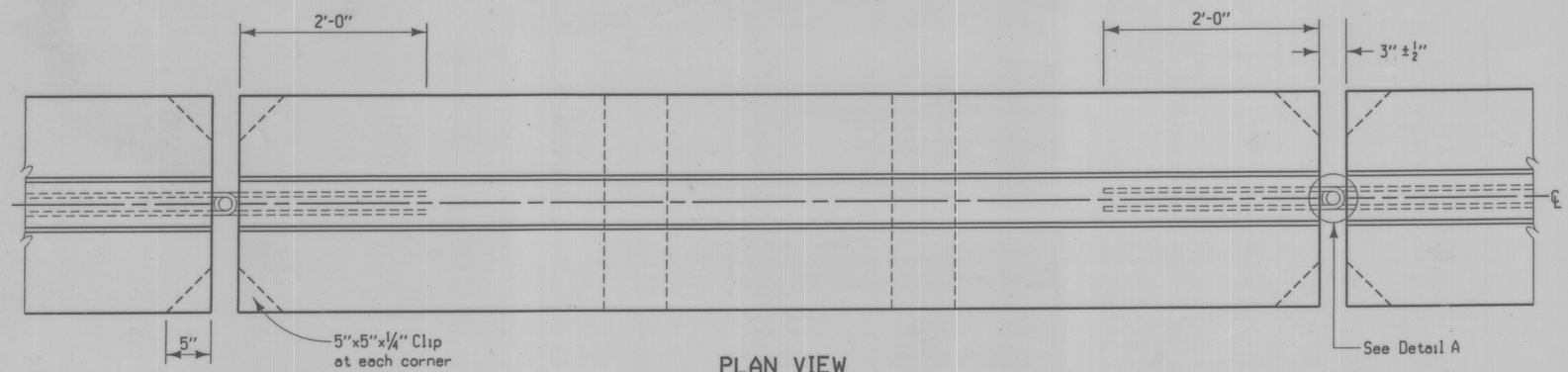
SECTION F-F

STREAM STABILIZATION STRUCTURE

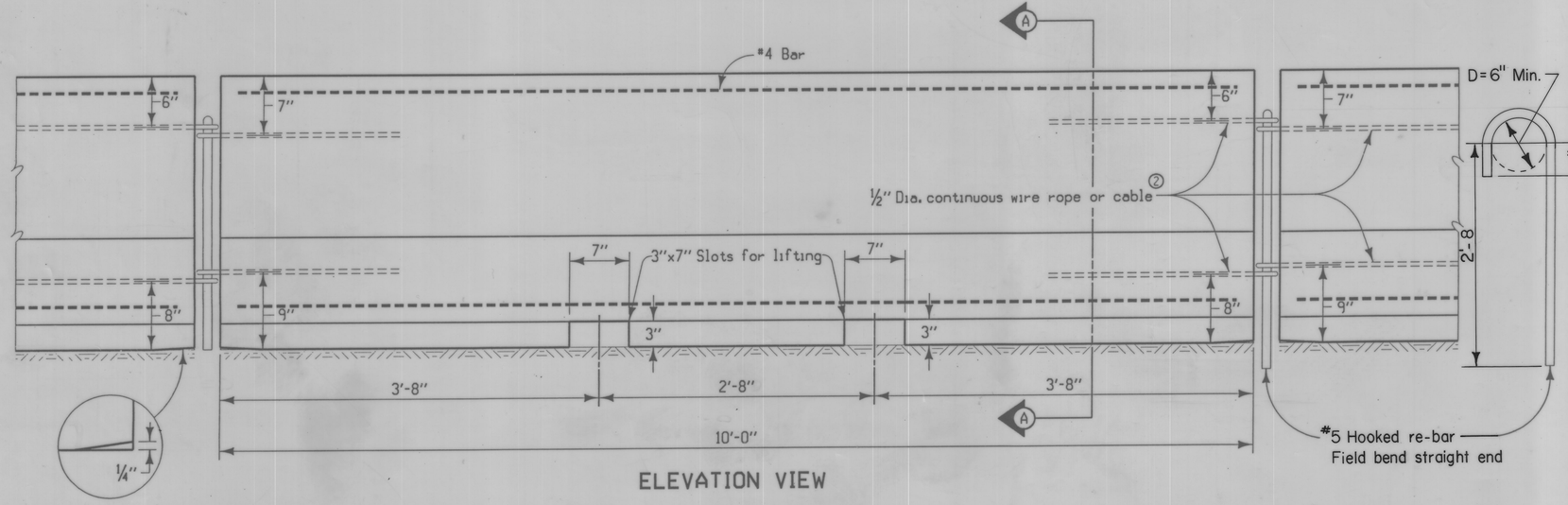
WEIR #2 DETAILS

CRAWFORD COUNTY **IOWA**

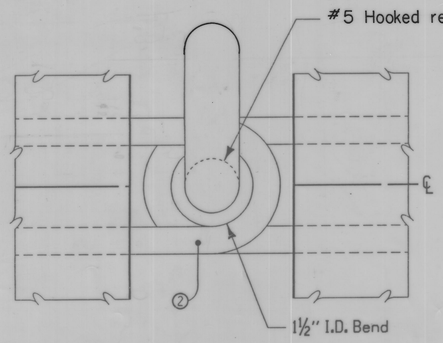
SHEET 4 OF 5



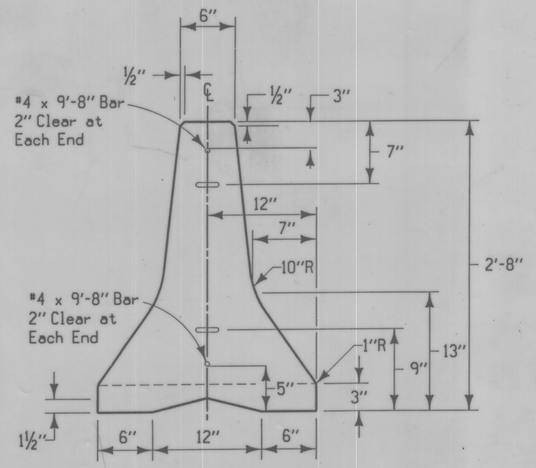
PLAN VIEW



ELEVATION VIEW



DETAIL A



SECTION A-A

GENERAL NOTES:

The details hereon are for the fabrication and installation of temporary concrete barrier rail. The barrier shall be Class "D" structural concrete and finished in conformance with current specifications.

Details shown are typical. Alternate design details may be submitted to the engineer for approval.

*** The contractor shall provide for an approved monitoring schedule with a person on call and available 24 hours a day, each day of the week, to realign barrier rail which has been struck. Initiation of service shall be within one hour of notification of need.**

*** Markers shall be furnished and installed by the contractor. Markers shall be placed on the barrier as recommended by the manufacturer, and as shown in the Marker Placement Detail or as directed by the engineer. The markers shall be installed at 10 ft. spacing and face oncoming traffic. Refer to Details of Barrier Placement. The contractor shall maintain the markers and promptly repair or replace any damaged or missing units. All costs for furnishing, installing and maintaining markers shall be included in the price bid for the temporary barrier rail.**

*** Unless stated otherwise in the plans, the barrier rail sections shall remain the property of the contractor and at the completion of the work shall be removed from the site by him.**

*** When Temporary Barrier Rail is installed within 2 feet of a drop-off, tie downs as described and shown on Detail Sheet 540-10 shall be required.**

The price bid for "Temporary Barrier Rails Furnish Only" in linear feet shall be full compensation for furnishing temporary barrier rail as detailed and measured on this sheet.

Δ The price bid for "Temporary Barrier Rails, Place Only" in linear feet of Barrier Rail shall be full compensation for placing temporary barrier rail as detailed on this sheet and elsewhere in the plan.

Contractor may add extra reinforcing bars to increase the service life of the rail sections.

(1) Color same as adjacent edgeline.

(2) Wire rope or cable to be 1/2" diameter, with a minimum breaking strength of 20,000 pounds.

* NOTES INDICATED SHALL NOT APPLY TO THIS PROJECT, BARRIER RAIL SECTIONS SHALL BE INCORPORATED INTO THE PROJECT AND SHALL BECOME THE PROPERTY OF CRAWFORD COUNTY. TEMPORARY BARRIER RAILS MAY BE NEW OR USED BUT UNDAMAGED SECTIONS.

Δ PRICE BID FOR "TEMPORARY BARRIER RAILS, PLACE ONLY" SHALL BE FULL COMPENSATION FOR EXCAVATION, TIE BARS AND ALL LABOR FOR PLACEMENT OF THE RAIL SECTIONS SHOWN ON SHEET 2, 3 AND 4.

TEMPORARY BARRIER RAIL DETAILS

CRAWFORD COUNTY IOWA

SHEET 5 OF 5

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224-4344

JOB NO. 7591

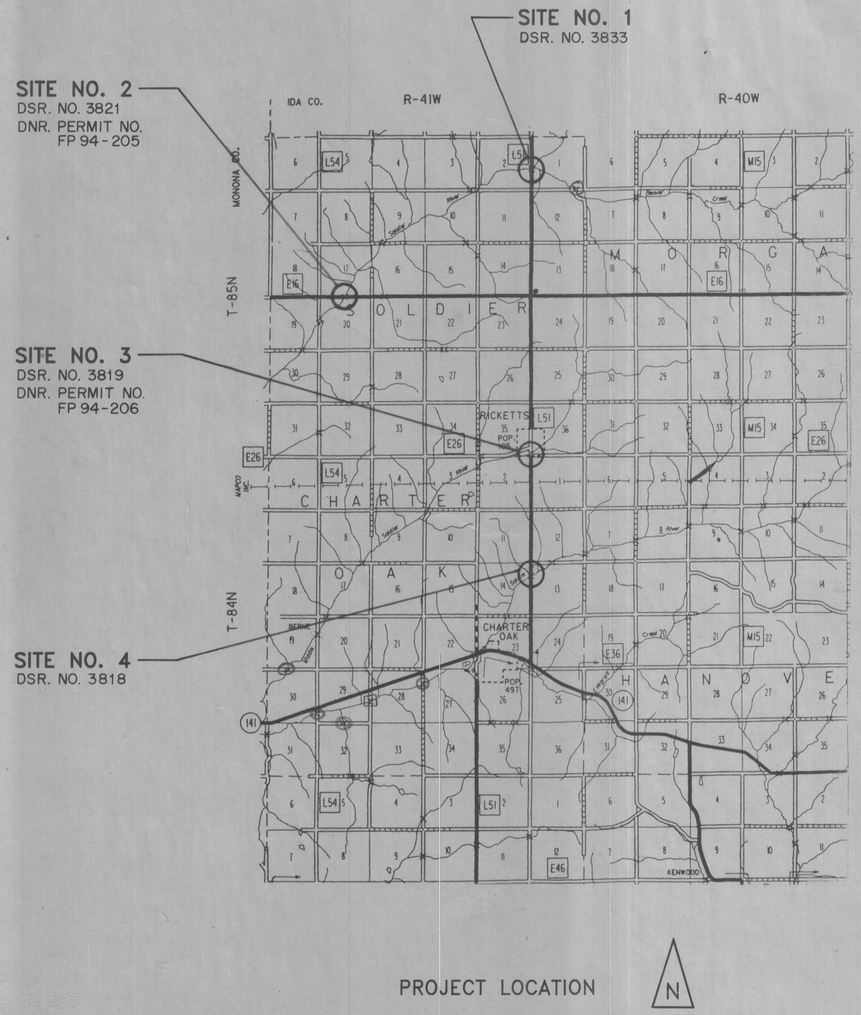
DESIGNED BY : RJV
DRAWN BY : RAL
CHECKED BY : SBB

DESIGN NO.

CRAWFORD COUNTY

PROJECT NO.

FILE NO. 54847



PROJECT LOCATION

N

IOWA
DEPARTMENT OF TRANSPORTATION
Project Development Division

THE STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, SERIES OF 1992, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS, SHALL APPLY TO WORK ON THIS PROJECT.

BANK REPAIR AND RIP RAP IN THE NORTHWEST AREA OF CRAWFORD COUNTY, IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED UNDER MY SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
SIGNATURE: Steven B. Reneker
NAME: STEVEN B. RENEKER
DATE: 6-6-94 REG. NO. 11455
MY REGISTRATION EXPIRES DECEMBER 31, 1994

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

IOWA DEPARTMENT OF TRANSPORTATION
ACCEPTED FOR LETTING
SECONDARY ROADS ENGINEER DATE

APPROVED
H. Dale Wright 5-24-94
CRAWFORD CO. ENGINEER DATE

Lyle A. Anderson
John P. Lawler
LeRoy A. Hansohn
Eileen Heiden
5-24-94
BOARD OF SUPERVISORS DATE

INDEX OF SHEETS

1. SITE LOCATIONS
2. QUANTITY SUMMARY AND GENERAL NOTES
3. SITE NO. 1 SITUATION PLAN
4. SITE NO. 2 SITUATION PLAN
5. SITE NO. 3 SITUATION PLAN
6. SITE NO. 4 SITUATION PLAN

BANK REPAIR AND RIP RAP
PROJECT NO. ER-24(31)--58-24
CRAWFORD COUNTY
LETTING DATE : DECEMBER 13, 1994

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224-4344

JOB NO. 94098 DESIGNED BY : SBR DRAWN BY : TCK CHECKED BY : BDS DESIGN NO. CRAWFORD COUNTY PROJECT NO. ER-24(31)--58-24 FILE NO.

TOTAL ESTIMATED QUANTITIES

NO.	ITEM	UNIT	SITE 1	SITE 2	SITE 3	SITE 4	TOTAL
1	EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	155	120	105	160	540
2	EXCAVATION, CLASS 10, ROADWAY & BORROW	CU.YDS.	880	555	918	514	2,867
3	REVETMENT, CLASS "E", RIP-RAP	TONS	607	752	390	784	2,533
4	FABRIC, ENGINEERING	SQ.YDS.	815	953	491	907	3,166
5	REMOVALS, AS PER PLAN, SITE 1	L.S.	LUMP SUM	–	–	–	LUMP SUM
6	REMOVALS, AS PER PLAN, SITE 2	L.S.	–	LUMP SUM	–	–	LUMP SUM
7	REMOVALS, AS PER PLAN, SITE 3	L.S.	–	–	LUMP SUM	–	LUMP SUM
8	REMOVALS, AS PER PLAN, SITE 4	L.S.	–	–	–	LUMP SUM	LUMP SUM
9	TRAFFIC CONTROL, SITE 1	L.S.	LUMP SUM	–	–	–	LUMP SUM
10	TRAFFIC CONTROL, SITE 2		–	LUMP SUM	–	–	LUMP SUM
11	TRAFFIC CONTROL, SITE 3		–	–	LUMP SUM	–	LUMP SUM
12	TRAFFIC CONTROL, SITE 4		–	–	–	LUMP SUM	LUMP SUM
							LUMP SUM

STANDARD ROAD PLANS

THE FOLLOWING STANDARD ROAD PLANS SHALL BE CONSIDERED APPLICABLE TO CONSTRUCTION WORK ON THIS PROJECT.

IDENT.	DATE	IDENT.	DATE	IDENT.	DATE
RL-1	4-23-82				
RS-12	6-7-94				
RS-13	6-7-94				

ITEM NO. ESTIMATE REFERENCE INFORMATION

1 INCLUDES CUT MATERIAL REQUIRED TO COMPLETE BANK SHAPING.

2 INCLUDES FILL MATERIAL REQUIRED TO COMPLETE BANK SHAPING. INCLUDES 35% TO COMPENSATE FOR SHRINKAGE.

3 REFER TO BANK SECTION(S) ON SHEETS 3 - 6 FOR TYPICAL DETAILS ON RIP-RAP PLACEMENT.

4 FABRIC SHALL MEET THE REQUIREMENT OF SECTION 4190.01C OF THE STANDARD SPECIFICATIONS.

5 - 8 INCLUDES COSTS TO REMOVE AND DISPOSE OF DEBRIS AND RUBBLE AT ALL SITES.

9 - 12 INCLUDES TRAFFIC CONTROL NECESSARY FOR ALL SITES.

SPECIFICATIONS

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, SERIES OF 1992, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

GENERAL NOTES

THE SITUATION PLAN IS PROVIDED FOR GENERAL SITE INFORMATION AND QUANTITY ESTIMATING PURPOSES. QUANTITIES SHOWN ARE APPROXIMATE ONLY. PAYMENT WILL BE BASED ON FIELD MEASUREMENTS MADE AT THE TIME OF CONSTRUCTION. SECTIONS SHOWN ON THE SITUATION PLANS ARE INTENDED TO BE TYPICAL FOR A TYPE OF REPAIR AND MAY NOT EXACTLY MATCH EXISTING SITE CONDITIONS.

IN AREAS DEFINED AS "BANK REPAIR AREAS", THE BANKS ARE TO BE SHAPED TO APPROXIMATELY A 2:1 SLOPE. THE SLOPE IS TO BE COVERED WITH ENGINEERING FABRIC AND A UNIFORM 18" THICKNESS OF CLASS "E" REVETMENT, UNLESS SPECIFIED OTHERWISE.

SUITABLE CLASS 10 CHANNEL EXCAVATION MAY BE USED TO SHAPE THE BANKS. THE ENGINEER WILL DETERMINE SUITABLE MATERIAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING HIS OWN BORROW FOR ALL FILL MATERIAL NOT AVAILABLE AT THE SITE. THE CONTRACTOR IS TO FAMILIARIZE HIMSELF WITH THE PROVISIONS OF IOWA LAW AS IT APPLIES TO THE REMOVAL AND REPLACEMENT OF TOPSOIL ON BORROW AREAS.

THE CONTRACTOR SHALL SHAPE, FERTILIZE AND SEED THE CONTRACTOR'S WORK AND MATERIAL STORAGE AREA IN ORDER TO RETURN IT TO ITS PRESENT CONDITION. THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

THE CONTRACTOR WILL BE RESPONSIBLE TO REMOVE ALL REMNANTS OF RIPRAP FROM FARM FIELDS SURROUNDING THE BANK REPAIR SITES. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS CLEAN-UP ACTIVITY.

ALL UNSALVAGEABLE MATERIAL AND RUBBLE GENERATED DURING THIS PROJECT SHALL BE DISPOSED OF OFF THE HIGHWAY RIGHT-OF-WAY ON A WASTE AREA PROVIDED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER OR BURNED IN ACCORDANCE WITH CURRENT REGULATIONS. THE WASTED MATERIAL MUST NOT CREATE AN UNSIGHTLY CONDITION WHEN VIEWED FROM PUBLIC HIGHWAYS. THE COST OF WASTING OR BURNING UNSALVAGEABLE MATERIAL AND RUBBLE IS TO BE INCLUDED IN THE BID ITEM "REMOVALS, AS PER PLAN". NO PAYMENT WILL BE MADE FOR OVERHAUL.

UTILITY COMPANIES WHOSE FACILITIES ARE KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

THE CONTRACTOR SHALL VISIT THE CONSTRUCTION SITE TO ENSURE THAT HE IS FAMILIAR WITH THE EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. SHOULD ANY UNDERGROUND UTILITIES BE FOUND, THEY SHALL BE PROTECTED IN PLACE AND THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO OTHER WORK ON THE PROJECT.

IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THIS PROJECT. THE OFFICE OF PROJECT PLANNING (IDOT) 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 OR FURTHER TESTING CANNOT BE CONSIDERED FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE STATE HISTORICAL PRESERVATION OFFICER. PHONE: OFFICE OF PROJECT PLANNING 515-239-1215.

QUANTITY SUMMARY AND NOTES

CRAWFORD COUNTY, IOWA

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224-4344

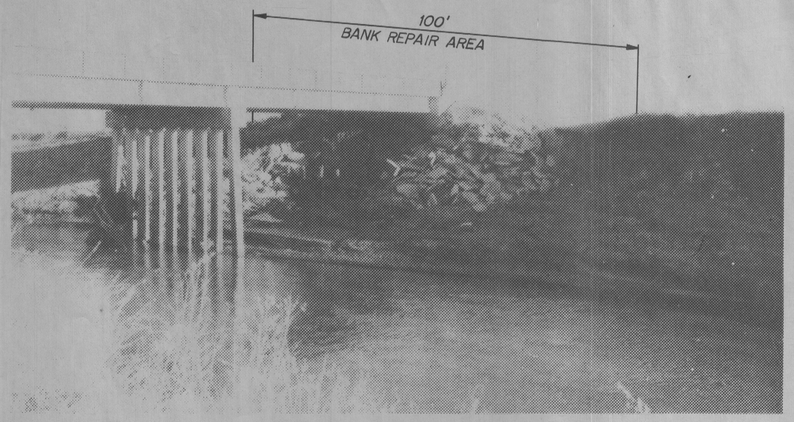
JOB. NO. 94098

DESIGNED BY : SAR
DRAWN BY : YCK
CHECKED BY : EDS

DESIGN NO.

CRAWFORD COUNTY

FILE NO.



VIEW A–A

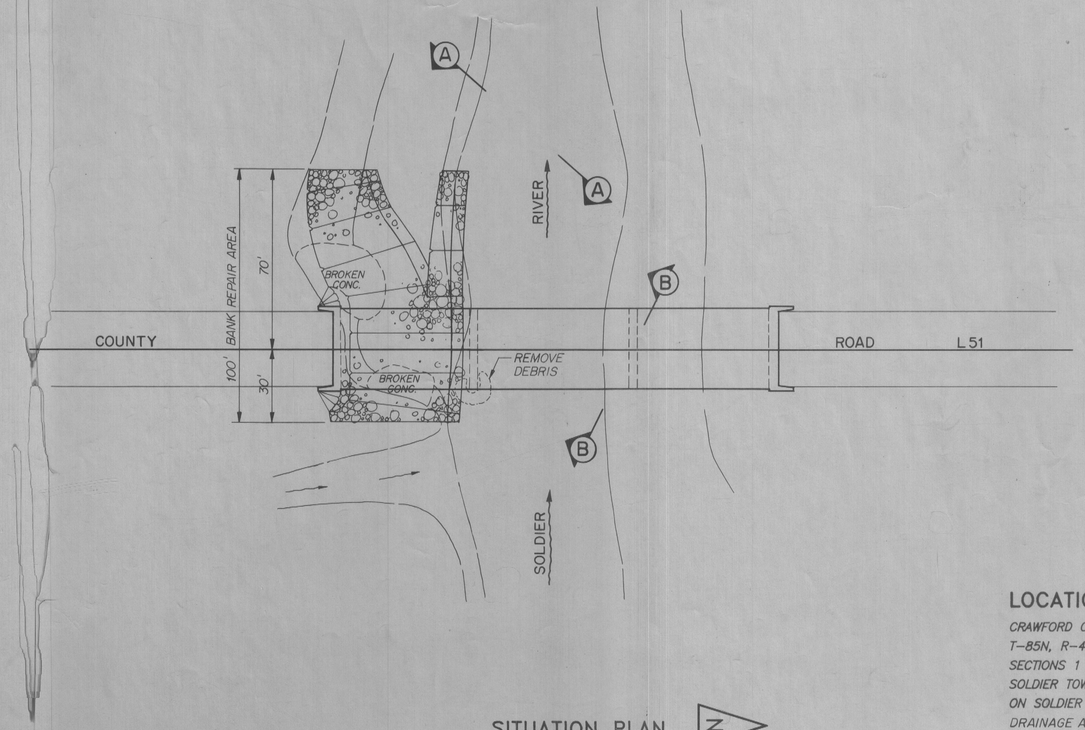


VIEW B–B

SITE 1 NOTES

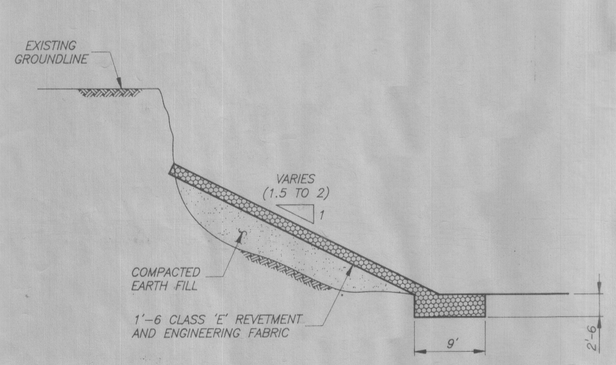
REMOVE AND DISPOSE OF DRIFT AND DEBRIS AT BRIDGE PIERS AND ALONG SOUTH ABUTMENT BERM AS PART OF "REMOVALS, AS PER PLAN".

REMOVAL AND DISPOSAL OF EXISTING PILES OF BROKEN CONCRETE SHALL BE HANDLED AS DESCRIBED IN ARTICLE 2102.03 OF THE STANDARD SPECIFICATIONS AS PART OF "CLASS 10 ROADWAY AND BORROW" EXCAVATION.

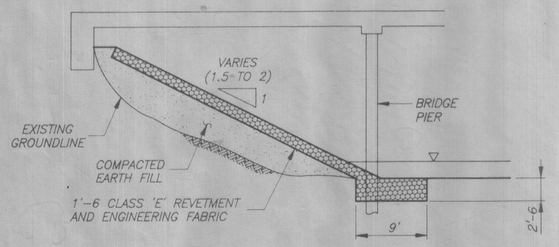


SITUATION PLAN

SCALE : N.T.S.



DOWNSTREAM BANK SECTION



BANK SECTION UNDER BRIDGE

LOCATION

CRAWFORD COUNTY
T–85N, R–41W
SECTIONS 1 & 2
SOLDIER TOWNSHIP
ON SOLDIER RIVER
DRAINAGE AREA = 91 SQ. MI.

ESTIMATED QUANTITIES – SITE 1

ITEM	UNIT	QUANTITY
EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	155
EXCAVATION, CLASS 10, ROADWAY & BORROW	CU.YDS.	880
REVETMENT, CLASS "E", RIP–RAP	TONS	607
FABRIC, ENGINEERING	SQ.YDS.	815
REMOVALS, AS PER PLAN	L.S.	LUMP SUM
TRAFFIC CONTROL	L.S.	LUMP SUM

BANK REPAIR AND RIP–RAP

BRIDGE OVER SOLDIER RIVER

SITUATION PLAN – SITE 1

CRAWFORD COUNTY, IOWA

SHEET 3 OF 6

CALHOUN–BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224–4344

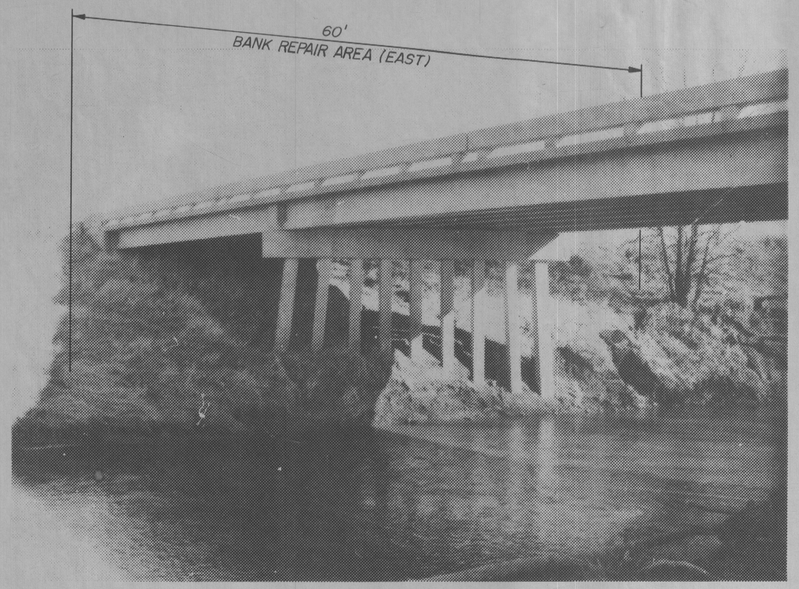
JOB NO. 94098

DESIGNED BY : SBE
DRAWN BY : TGK
CHECKED BY : EDS

DESIGN NO.

CRAWFORD COUNTY

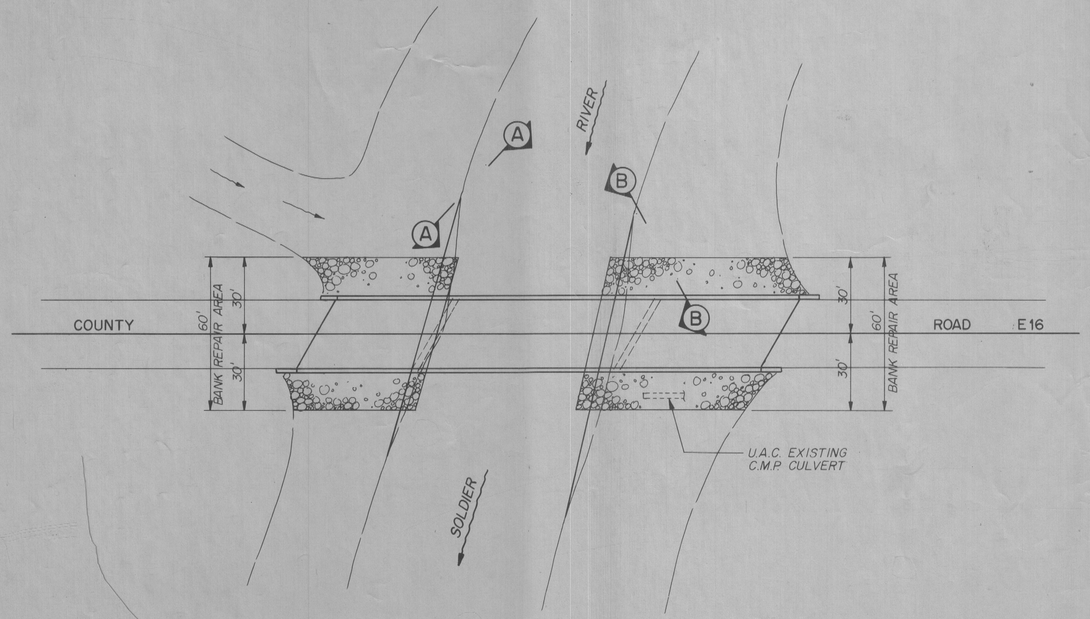
FILE NO.



VIEW A–A



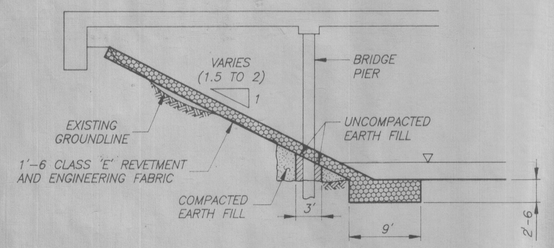
VIEW B–B



SITUATION PLAN

SCALE : N.T.S.

N



BANK SECTION UNDER BRIDGE

SITE 2 NOTES

FILL MATERIAL PLACED AROUND EXISTING PIER PILES IS TO REMAIN UNCOMPACTED FOR A MINIMUM 3' DIAMETER AROUND THE CENTER OF THE PILE.

REMOVE AND DISPOSE OF DRIFT AND DEBRIS AT EXISTING PIERS AS PART OF "REMOVALS AS PER PLAN".

BANK SHAPING SHALL INCLUDE STRIPPING OF VEGETATION WITHIN THE BANK REPAIR AREA.

ESTIMATED QUANTITIES – SITE 2

ITEM	UNIT	QUANTITY
EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	120
EXCAVATION, CLASS 10, ROADWAY & BORROW	CU.YDS.	555
REVETMENT, CLASS "E", RIP–RAP	TONS	752
FABRIC, ENGINEERING	SQ.YDS.	953
REMOVALS, AS PER PLAN	L.S.	LUMP SUM
TRAFFIC CONTROL	L.S.	LUMP SUM

LOCATION

CRAWFORD COUNTY
T–85N, R–41W
SECTIONS 17 & 20
SOLDIER TOWNSHIP
ON SOLDIER RIVER
DRAINAGE AREA = 112 SQ.MI.

BANK REPAIR AND RIP–RAP
BRIDGE OVER SOLDIER RIVER

SITUATION PLAN – SITE 2

CRAWFORD COUNTY, IOWA

CALHOUN–BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224–4344

JOB NO. 94098

DESIGNED BY : SAP
DRAWN BY : YCK
CHECKED BY : BAS

DESIGN NO.

CRAWFORD COUNTY

FILE NO.



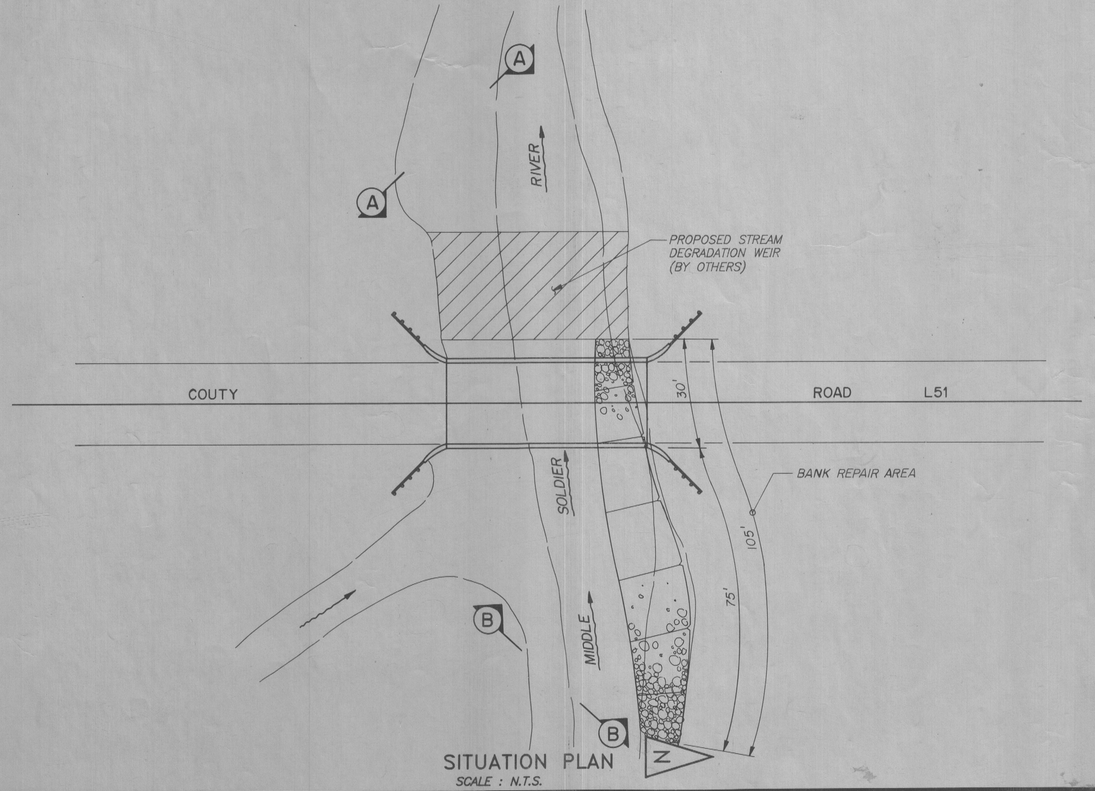
VIEW A–A



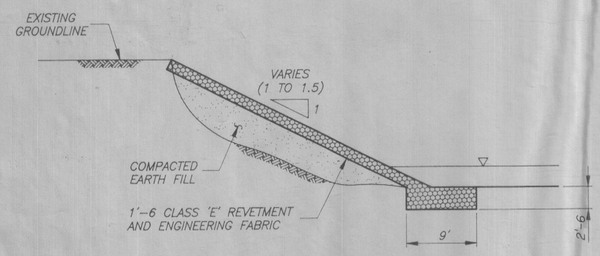
VIEW B–B

SITE 3 NOTES

BANK REPAIR WORK AT THIS SITE IS TO BE COORDINATED WITH THE CONSTRUCTION OF A STREAM DEGRADATION WEIR IMMEDIATELY DOWNSTREAM OF THE EXISTING BRIDGE.



SITUATION PLAN
SCALE : N.T.S.



UPSTREAM BANK SECTION

ESTIMATED QUANTITIES – SITE 3		
ITEM	UNIT	QUANTITY
EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	105
EXCAVATION, CLASS 10, ROADWAY & BORROW	CU.YDS.	918
REVETMENT, CLASS "E", RIP–RAP	TONS	390
FABRIC, ENGINEERING	SQ.YDS.	491
REMOVALS, AS PER PLAN	L.S.	LUMP SUM
TRAFFIC CONTROL	L.S.	LUMP SUM

LOCATION

CRAWFORD COUNTY
T–85N, R–41W
SECTION 35
SOLDIER TOWNSHIP
ON MIDDLE SOLDIER RIVER
DRAINAGE AREA = 6.7 SQ. MI.

BANK REPAIR AND RIP–RAP

BRIDGE OVER M. SOLDIER RIVER
AT RICKETTS

SITUATION PLAN – SITE 3

CRAWFORD COUNTY, IOWA

SHEET 5 OF 6

CALHOUN–BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224–4344

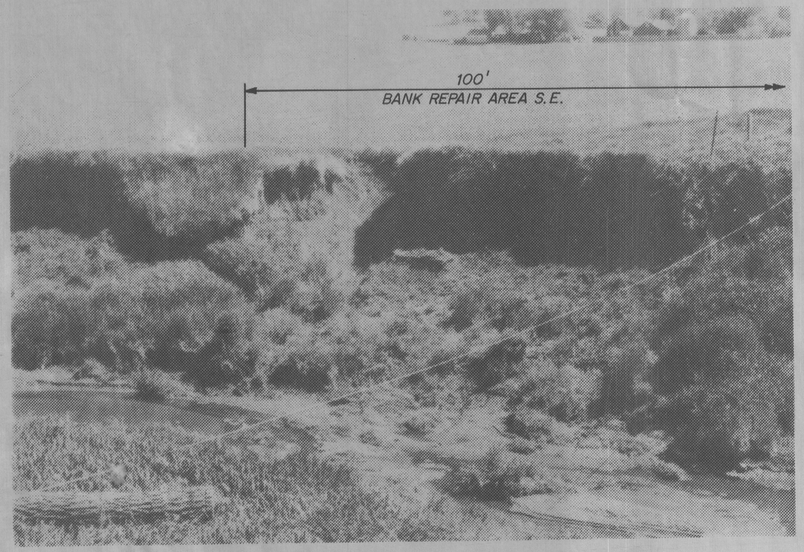
JOB NO. 94098

DESIGNED BY : SBP
DRAWN BY : YCK
CHECKED BY : EDS

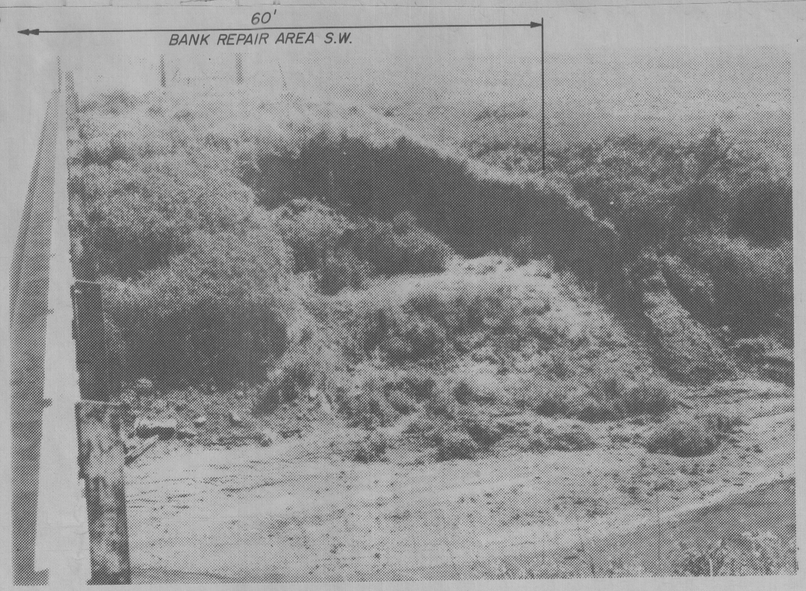
DESIGN NO.

CRAWFORD COUNTY

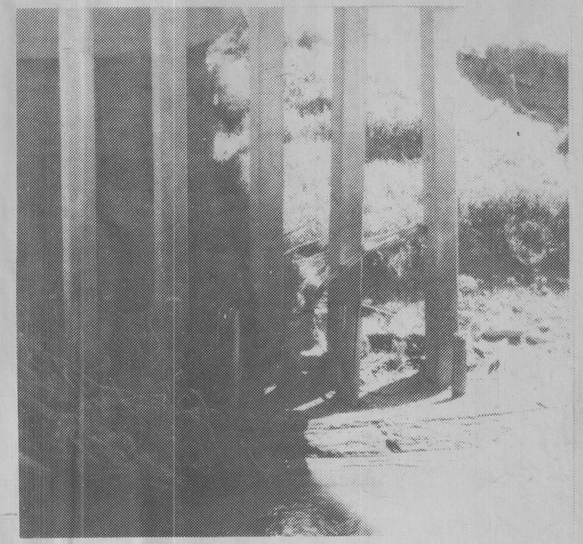
FILE NO.



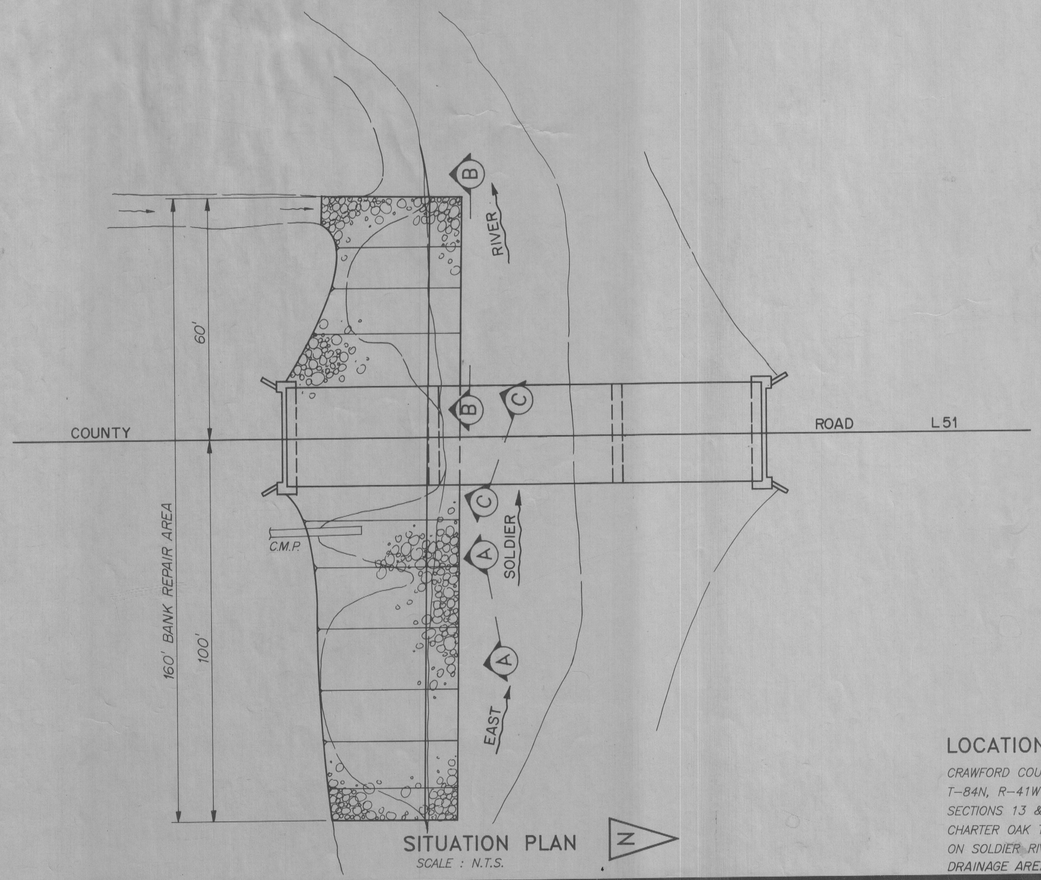
VIEW A–A



VIEW B–B



VIEW C–C

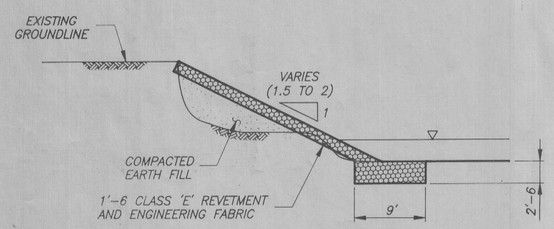


SITUATION PLAN

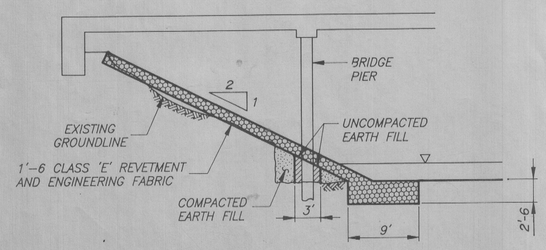
SCALE : N.T.S.

LOCATION

CRAWFORD COUNTY
T–84N, R–41W
SECTIONS 13 & 14
CHARTER OAK TOWNSHIP
ON SOLDIER RIVER
DRAINAGE AREA = 35 SQ. MI.



BANK SECTION



BANK SECTION UNDER BRIDGE

SITE 4 NOTES

REMOVAL AND DISPOSAL OF EXISTING PILES OF BROKEN CONCRETE SHALL BE HANDLED AS DESCRIBED IN ARTICLE 2102.03 OF THE STANDARD SPECIFICATIONS AS PART OF "CLASS 10 ROADWAY AND BORROW" EXCAVATION.

FILL MATERIAL PLACED AROUND EXISTING PIER PILES IS TO REMAIN UNCOMPACTED FOR A MINIMUM 3' DIAMETER AROUND THE CENTER OF THE PILE.

ESTIMATED QUANTITIES – SITE 4

ITEM	UNIT	QUANTITY
EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	160
EXCAVATION, CLASS 10, ROADWAY & BORROW	CU.YDS.	514
REVETMENT, CLASS "E", RIP–RAP	TONS	784
FABRIC, ENGINEERING	SQ.YDS.	907
REMOVALS, AS PER PLAN	L.S.	LUMP SUM
TRAFFIC CONTROL	L.S.	LUMP SUM

BANK REPAIR AND RIP–RAP

BRIDGE OVER SOLDIER RIVER

SITUATION PLAN – SITE 4

CRAWFORD COUNTY, IOWA

SHEET 6 OF 6

CALHOUN–BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50265 (515)224–4344

JOB NO. 94098

DESIGNED BY : EDS
DRAWN BY : YCK
CHECKED BY : SBP

DESIGN NO.

CRAWFORD COUNTY

FILE NO.