PROJ. NO. BROS-24(44)--8J-24
BRIDGE REPLACEMENT

CRAWFORD COUNTY

Letting Date 10-27-98

TRAFFIC CONTROL PLAN

THE EXISTING STRUCTURE IS TO REMAIN IN PLACE AND OPEN TO LOCAL TRAFFIC UNTIL THE NEW BRIDGE IS COMPLETED AND APPROVED BY THE ENGINEER. THE ROAD MAY BE CLOSED TO COMPLETE THE APPROACH GRADING.

THIS ROAD WILL BE CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08 OF THE CURRENT STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES AND LAYOUTS SHALL BE AS PER PART VI OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) REVISION 3, DATED SEPTEMBER 3, 1993.

THE GUARDRAIL INSTALLATION MUST BE COMPLETED BEFORE THE ROAD IS OPENED TO THROUGH TRAFFIC.

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 14
IDNR PERMIT NO. FP-98-161

DRAWING APPROVAL

ALL SHOP DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY SUNDQUIST ENGINEERING, P.C.

ADDRESS:120 SOUTH MAIN
DENISON, IOWA 51442
TELEPHONE: (712)263-8118

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

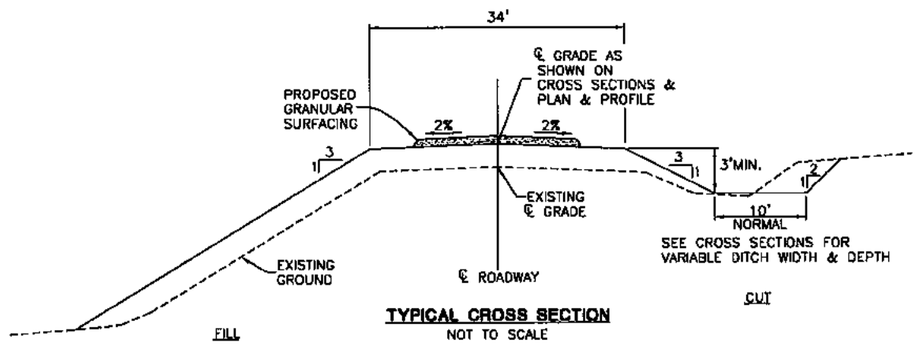
IOWA
DEPARTMENT OF TRANSPORTATION

Project Development Division
PLANS OF PROPOSED IMPROVEMENT ON THE

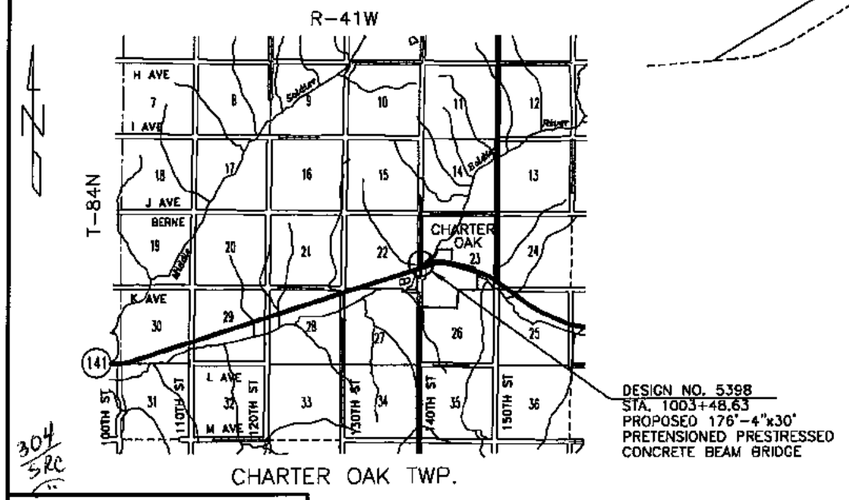
SECONDARY ROAD SYSTEM
CRAWFORD COUNTY
PROJECT NO. BROS-24(44)--8J-24
BRIDGE REPLACEMENT

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



TYPICAL CROSS SECTION
NOT TO SCALE



DESIGN NO. 5398
STA. 1003+48.63
PROPOSED 176'-4"x30'
PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGE

304
5RC

LOCATION MAP

1996 AADT 130 V.P.D.

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

Proj. No. BROS-24(44)--8J-24

INDEX OF SHEETS

MILEAGE SUMMARY

LOCATION	LIN.FT.	MILES
B.O.P. STA. 1000+12 TO E.O.P. STA. 1011+67	1155.00	0.2188
DEDUCT BRIDGE AT STA. 1003+46.51	176.33	0.0334
NET LENGTH OF ROADWAY	978.67	0.1854

ROAD STANDARD PLANS

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

Identification	Date	Identification	Date	Identification	Date
RE-2A	10-31-95	RE-68	12-03-96	RF-32	03-28-95
RE-2B	10-22-93	RE-69	12-03-96	RL-7	12-03-96
RE-12A	12-03-96	RE-70(1)	04-28-98	RL-14	03-26-96
RE-12B	12-03-96	RE-70(2)	12-03-96	RS-2	10-27-98
RE-47	10-28-97	RE-70(3)	12-03-96	RS-3	12-03-96
RE-48A	12-08-95	RF-5	03-28-95	RS-26A	10-28-97
RE-65A	07-15-97	RF-30A	03-28-95		

BRIDGE STANDARDS

(May be obtained at Bridge Design Services)

Standard	Date Issued	Latest Revision	Standard	Date Issued	Latest Revision
H30-0-94	JANUARY, 1994	.	H30-17-94	JANUARY, 1994	.
H30-1-94	JANUARY, 1994	.	H30-20-94	JANUARY, 1994	.
H30-3-94	JANUARY, 1994	8-4-97	H30-22-94	JANUARY, 1994	.
H30-4-94	JANUARY, 1994	.	H30-23-94	JANUARY, 1994	.
H30-16-94	JANUARY, 1994	.	P10A	8-08-88	8-1-96

Iowa Department of Transportation
Project Development Division
Accepted for Letting 8/5/98
Secondary Roads Engineer Date

APPROVED BY
7/29/98
MAYOR, CITY OF CHARTER OAK, IOWA DATE

Approved
H. Dale Wight 7-28-98
H. DALE WIGHT, P.E. #5798 Date
Crawford County Engineer

Approved
H. Dean Hargens
Milford J. Goode
Robert D. Ehrmann
John D. Lawler
Mark Siegbahn
BOARD OF SUPERVISORS

LICENSED PROFESSIONAL ENGINEER PAUL J. ASSMAN #11982 IOWA

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.

7/28/98
PAUL J. ASSMAN, P.E. #11982 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 1998.

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

501541

GENERAL NOTES

THE EXISTING STRUCTURE IS TO REMAIN IN PLACE AND OPEN TO LOCAL TRAFFIC UNTIL THE NEW BRIDGE IS COMPLETED AND APPROVED BY THE ENGINEER.

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.

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

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 AT THE COUNTY'S EXPENSE.

THE BRIDGE CONTRACTOR SHALL EXCAVATE THE STREAM CHANNEL TO THE LINES AND GRADES SHOWN HEREIN ALL SUCH WORK SHALL BE PAID FOR AS "EXCAVATION, CLASS 10, CHANNEL".

CERTIFIED PCC PLANT INSPECTION AND FIELD LABORATORY SHALL BE PROVIDED BY CRAWFORD COUNTY.

CONSTRUCTION STAKING SHALL BE PROVIDED BY CRAWFORD COUNTY.

THE CONTRACTOR IS ENCOURAGED TO CONDUCT CONSTRUCTION ACTIVITIES DURING A PERIOD OF LOW FLOW. ANY TEMPORARY CROSSINGS SHALL INCLUDE ENOUGH CULVERTS TO ACCOMMODATE LOW FLOWS AND MUST BE REMOVED AFTER COMPLETION OF WORK ON THIS PROJECT. THE CONTRACTOR IS REQUIRED TO REMOVE ALL FILL MATERIAL USED AS A TEMPORARY CROSSING TO AN UPLAND, NON-WETLAND SITE, TO SEED ALL DISTURBED AREAS WITH NATIVE GRASSES AND TO IMPLEMENT APPROPRIATE MEASURES TO INSURE SEDIMENTS ARE NOT INTRODUCED INTO WATERS OF THE UNITED STATES DURING CONSTRUCTION OF THIS PROJECT. THE COST OF INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY CROSSINGS, INCLUDING CULVERTS, SHALL BE INCIDENTAL TO THE PROJECT.

THE COUNTY, THE CONTRACTOR AND ANY SUBCONTRACTORS ARE HEREIN ADVISED THAT THE PAINT SYSTEM APPLIED TO THE EXISTING STRUCTURAL STEEL CONTAINS HAZARDOUS MATERIALS IN THE AMOUNTS OF 36,050 PPM LEAD AND 27,090 PPM CHROMIUM, AS DETERMINED BY A PAINT SCRATCH TEST AND LABORATORY ANALYSIS. APPROPRIATE PROTECTIVE MEASURES SHOULD BE TAKEN WHEN HANDLING THIS MATERIAL TO SAFEGUARD HEALTH AND ENVIRONMENT. THESE AND ALL JOBSITE SAFETY AND HEALTH MEASURES ARE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR WHO SHALL INDEMNIFY THE COUNTY AND ITS CONSULTING ENGINEER FOR THE DURATION OF THE CONSTRUCTION CONTRACT.

THE BRIDGE SITE IS ON A ROADWAY RELOCATION. APPROACH ROADWAY CONSTRUCTION WILL BE DONE SIMULTANEOUSLY WITH THE BRIDGE CONSTRUCTION. THE CONTRACTORS INVOLVED WILL BE EXPECTED TO COORDINATE THE WORK FOR THE EXPEDIENT COMPLETION OF THE PROJECT.

THE APPROACH FILLS SHALL BE BUILT TO THE CONSTRUCTION LIMITS SHOWN AND SHALL BE IN PLACE BEFORE ABUTMENT AND PIER PILES ARE DRIVEN. THE CONTRACTOR SHALL LEVEL AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN.

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.

203-4
THE CONTRACTOR IS ENCOURAGED TO TAKE FULL ADVANTAGE OF SPECIFICATION 1105.15 - VALUE ENGINEERING INCENTIVE PROPOSAL. A PAMPHLET AND CONCEPTUAL PROPOSAL FORM WILL BE AVAILABLE AT THE PRECONSTRUCTION CONFERENCE.

212-1
SOUNDING AND TEST BORING DATA SHOWN ON PLANS WERE ACCUMULATED FOR DESIGNING AND ESTIMATING PURPOSES. THEIR APPEARANCE ON THE PLAN DOES NOT CONSTITUTE A GUARANTEE THAT CONDITIONS OTHER THAN THOSE INDICATED WILL NOT BE ENCOUNTERED.

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.

THE CONTRACTOR SHALL NOTIFY ONE-CALL (1-800-292-8989) FOR UTILITY LOCATES PRIOR TO COMMENCING WORK.

ESTIMATE REFERENCE INFORMATION

2101-0850002 CLEARING AND GRUBBING
INCLUDES REMOVAL AND DISPOSAL OF TREES, DOWN TIMBER, LOGS, DRIFTS, DEBRIS AND OTHER OBSTRUCTIONS (EXCLUDING OPEN DUMP REFUSE) LYING WITHIN THE CONSTRUCTION LIMITS.

2102-2710070 EXCAVATION, CLASS 10 ROADWAY AND BORROW
TYPE "A" COMPACTION WILL BE REQUIRED. BORROW FROM SUITABLE CLASS 10 CHANNEL AND CLASS 20 EXCAVATION. ADDITIONAL NECESSARY BORROW SHALL BE PROVIDED BY THE CONTRACTOR AND MATERIAL SHALL BE AS APPROVED BY THE ENGINEER. 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 AS DIRECTED BY THE ENGINEER. SUCH WORK SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM. PAYMENT FOR THIS ITEM SHALL BE AT PLAN QUANTITY.

2104-2710020 EXCAVATION, CLASS 10, CHANNEL
EXCESS MATERIAL AND UNSUITABLE MATERIAL SHALL BE HAULED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 CHANNEL EXCAVATION. PAYMENT FOR THIS ITEM SHALL BE AT PLAN QUANTITY. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED.

INCLUDES PLACEMENT OF 8,316 CY (1.35 x 6,160) OF FILL IN THE CHANNEL AS SHOWN ON THE CHANNEL CROSS SECTIONS.

2312-8260201 GRANULAR SURFACING ON ROAD, CLASS C GRAVEL
GRANULAR SURFACE SHALL MEET THE REQUIREMENTS OF CLASS "C" GRAVEL IN ACCORDANCE WITH ARTICLE 4120, AND SHALL INCLUDE THE COST OF SPREADING GRANULAR SURFACING ON ROADWAY SURFACE. RATE OF APPLICATION SHALL BE 1650 TONS PER MILE.

ITEM INCLUDES 50 TON TO BE USED FOR RESTORATION OF THE PARKING AREA AT THE SW CORNER OF THE PROJECT.

2401-6745625 REMOVAL OF EXISTING BRIDGE
THE EXISTING BRIDGE IS A 75'x18'-0" RIVETED STEEL PONY TRUSS BRIDGE WITH TWO STEEL I-BEAM APPROACH SPANS, HIGH TIMBER ABUTMENTS AND TIMBER TRESTLE PIERS. THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL OF THE EXISTING STRUCTURE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. ANY MATERIAL NOT DESIGNATED AS SALVAGEABLE FOR THE COUNTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY HIM. ANY MATERIAL CONSIDERED REUSABLE BY THE COUNTY SHALL BE REMOVED BY THE CONTRACTOR AND RETAINED BY THE COUNTY. MATERIALS TO BE SALVAGED BY THE COUNTY SHALL BE STACKED NEATLY WITHIN THE RIGHT-OF-WAY BY THE CONTRACTOR. THE EXISTING STRUCTURE SHALL BE REMOVED TO AN ELEVATION AT LEAST 1' BELOW FINISHED GROUNDLINE AND TO THE EXTENT THAT IT WILL NOT INTERFERE WITH THE NEW CONSTRUCTION. THE EXISTING STRUCTURE IS TO REMAIN IN PLACE AND OPEN TO LOCAL TRAFFIC UNTIL THE NEW BRIDGE IS COMPLETED AND APPROVED BY THE ENGINEER.

2401-6750001 REMOVALS, AS PER PLAN
LUMP SUM BID FOR "REMOVALS AS PER PLAN" SHALL INCLUDE REMOVAL FROM THE SITE AND DISPOSAL OF EXISTING CONCRETE RUBBLE, OPEN DUMP REFUSE, JUNK CARS AND OTHER DEBRIS LOCATED WITHIN THE CONSTRUCTION LIMITS.

2403-0100000 STRUCTURAL CONCRETE (MISCELLANEOUS)
ITEM INCLUDES 7.6 CUBIC YARDS OF CONCRETE FOR CONCRETE CURTAIN WALLS ON GABION FLUMES.

2403-0100010 STRUCTURAL CONCRETE (BRIDGE)
SECTION 2317 (DECK SMOOTHNESS) SHALL APPLY. ALL STRUCTURAL CONCRETE IS TO BE CLASS "C". CLASS "D" WILL NOT BE ALLOWED.

2407-0580255 BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LXB55
2407-0580263 BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LXB63
REFER TO STANDARD BRIDGE PLANS H30-18-94 AND H30-17-94.

2414-6424120 RAIL, CONCRETE OPEN
REFER TO STANDARD BRIDGE PLAN H30-22-94.

2417-0225018 APRONS, METAL 18 IN. DIA.
ITEMS SHALL INCLUDE FURNISHING AND INSTALLING THE OPTIONAL TOE PLATE.

2417-1040018 CULVERT, CORRUGATED METAL ENTRANCE PIPE, 18 IN. DIA.
ALL CORRUGATED METAL PIPE ON THIS PROJECT SHALL BE RIVETED PIPE. NO "SPIRAL" PIPE WILL BE ALLOWED. ALL BANDS SHALL BE 24" BANDS.

2501-5425042 PILING, DRIVE STEEL BEARING, HP 10x42
2501-5425053 PILING, DRIVE STEEL BEARING, HP 12x53
2501-5550042 PILING, FURNISH STEEL BEARING, HP 10x42
2501-5550053 PILING, FURNISH STEEL BEARING, HP 12x53
THE REQUIRED DESIGN BEARING FOR THE HP 10X42 ABUTMENT PILES IS 33 TON. THE REQUIRED DESIGN BEARING FOR THE HP 12x53 PIER PILES IS 32 TON. WAVE EQUATION ANALYSIS WILL BE USED AT THE TIME OF PILE DRIVING TO DETERMINE PILE BEARING. THE CONTRACTOR SHALL SUBMIT ADEQUATE HAMMER INFORMATION SO THAT PROPER ANALYSIS CAN BE PERFORMED.

THE 11 PILE BENT AS DETAILED ON STANDARD BRIDGE PLAN H30-23-94 SHALL BE USED FOR THE PIERS ON THIS BRIDGE. ENCASEMENT DETAILS SHALL BE AS DETAILED ON THE P10A STANDARD FOR TYPE 3 PILING.

2507-3250005 FABRIC, ENGINEERING
FABRIC SHALL CONFORM WITH IOWA DOT MATERIALS I.M. 496.01 APPENDIX A, EMBANKMENT EROSION CONTROL (SPECIFICATION 4196.01C)

2507-6800060 REVETMENT, CLASS E, RIPRAP
THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS.

EXCAVATION AND DEWATERING REQUIRED TO INSTALL REVETMENT, CLASS E RIPRAP SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

ITEM DOES NOT INCLUDE REVETMENT STONE FOR GABIONS.

ESTIMATED PROJECT QUANTITIES

ITEM NUMBER	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
	2101-0850002	CLEARING AND GRUBBING	UNIT	386	
	2102-2710070	EXCAVATION, CLASS 10 ROADWAY AND BORROW	CY	8,184	
	2104-2710020	EXCAVATION, CLASS 10 CHANNEL	CY	14,785	
	2312-8260201	GRANULAR SURFACING ON ROAD, CLASS C GRAVEL	TON	356	
	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	
	2401-6750001	REMOVALS AS PER PLAN	LS	1	
	2402-2720000	EXCAVATION, CLASS 20	CY	101	
	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	7.6	
	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	243	
	2404-7775000	REINFORCING STEEL	LB	4,712	
	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	59,239	
	2407-0580255	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LXB55	EACH	10	
	2407-0580263	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LXB63	EACH	5	
	2408-7800000	STEEL, STRUCTURAL	LB	3,210	
	2414-6424120	RAIL, CONCRETE OPEN	LF	386.7	
	2417-0225018	APRONS, METAL, 18 IN. DIA.	EACH	1	
	2417-1040018	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 18 IN. DIA.	LF	116	
	2501-5425042	PILING, DRIVE STEEL BEARING, HP 10X42	LF	840	
	2501-5425053	PILING, DRIVE STEEL BEARING, HP 12X53	LF	1,430	
	2501-5475053	CONCRETE ENCASEMENT OF STEEL BEARING PILING, HP 12X53	LF	594	
	2501-5550042	PILING, FURNISH STEEL BEARING, HP 10X42	LF	840	
	2501-5550053	PILING, FURNISH STEEL BEARING, HP 12X53	LF	1,430	
	2501-6335010	PREBORED HOLES	LF	168	
	2505-4020170	GUARDRAIL, END ANCHORAGE, BEAM, RE-70	EACH	4	
	2505-4020250	GUARDRAIL, FORMED STEEL BEAM	LF	150	
	2505-4020251	GUARDRAIL, FORMED STEEL THRIE BEAM	LF	125	
	2505-4020400	GUARDRAIL, POSTS, BEAM	EACH	44	
	2505-4021690	GUARDRAIL, END ANCHORAGE, BEAM, RE-69	EACH	4	
	2505-5110200	OBJECT MARKER, TYPE 2	EACH	8	
	2505-5110300	OBJECT MARKER, TYPE 3	EACH	4	
	2507-3250005	FABRIC ENGINEERING	SY	2,901	
	2507-6800060	REVETMENT, CLASS E, RIPRAP	TON	2,945	
	2518-6910000	SAFETY CLOSURE	EACH	4	
	2528-8445110	TRAFFIC CONTROL	LS	1	
	2528-8445112	FLAGGERS	DAY	10	
	2533-4980005	MOBILIZATION	LS	1	
	2546-1000100	GABIONS OR MATTRESSES	CY	147	
	2599-9999003	CONCRETE GROUT FOR RIPRAP	CY	69	
	2601-2634100	MULCHING	ACRE	4	
	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	4	

2546-1000100 GABIONS OR MATTRESSES
ITEM INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, FURNISHING, ASSEMBLING, AND PLACING THE BASKETS, AND FURNISHING AND PLACING THE REVETMENT STONE IN THE BASKETS.

EXCAVATION, SHAPING OF SLOPES AND DEWATERING REQUIRED TO INSTALL GABIONS SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

2599-9999003 CONCRETE GROUT FOR RIPRAP
INCLUDES FURNISHING AND PLACING CONCRETE GROUT AS SHOWN ON THE DRAWINGS. DEWATERING REQUIRED TO INSTALL THE GROUT SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

THE GROUTING MIXTURE SHALL BE AS FOLLOWS:
CEMENT: TYPE IA, TYPE I OR TYPE II WITH AN AIR ENTRAINING ADMIXTURE, 10 SACKS OR 940 LBS/C.Y.

FINE CONCRETE AGGRAGATE: 2,100 LBS/C.Y. (SURFACE DRY WEIGHT).

WATER: 45 GAL/C.Y., OR ENOUGH TO PROVIDE A THICK CREAMY CONSISTENCY.

AIR CONTENT: 6 TO 10 PERCENT.

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

FLY ASH CONFORMING TO ASTM C618 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.

THE GROUT SHALL BE CONSOLIDATED INTO THE VIODS WITH THE USE OF A CONCRETE VIBRATOR. GROUTING OPERATION SHALL NOT BE PERFORMED EXCEPT IN THE PRESENCE OF THE ENGINEER.

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

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

SEE CONSTRUCTION SPECIFICATIONS FOR MATERIAL AND INSTALLATION DETAILS ON SHEET C1.

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

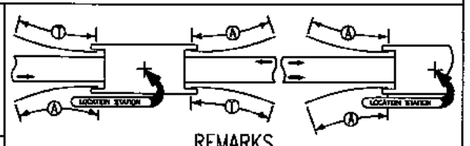
PROJECT NO.: 0677	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA	
DESCRIPTION: ESTIMATE OF QUANTITIES & GENERAL INFO.			SHEET
PROJECT NO. BROS-24(44)--8J-24			B1
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 501540			

① Includes 2 - 12.5' Thrie Beam Sections and 1 - 6.25' "W" to Thrie Beam Transition Section

② Not a bid item

TABULATION OF STEEL BEAM GUARDRAIL FOR STANDARD ROAD PLANS RE-63, RE-65A AND RE-65B

LOCATION NO.	LOCATION STATION	STANDARD ROAD PLAN	CASE	FORMED STEEL BEAM GUARDRAIL (A) "W" Beam Lin. Ft.	(A) STS ① Thrie Beam 31.25' Lin. Ft.	(H) Thrie Beam Lin. Ft.	(T) STS ① Thrie Beam 31.25' Lin. Ft.	(T) "W" Beam Lin. Ft.	TOTAL "W" BEAM Lin. Ft.	TOTAL THRIE BEAM Lin. Ft.	BEAM GUARDRAIL POSTS With 8"x 8" Spacer Blocks 10"x10"x6' No.	8"x8"x6' No.	CRT 6"x8"x6' No. (4)	Terminal ② 5 1/2"x7 1/2"x3'-6 1/2" No. (2)	ANCHOR SYSTEM Type	No.	REMARKS
	1003+46.51	RE-65A	S	37.5				37.5	75.0		-	2	8	4	RE-70	2	
					31.25	-	31.25			62.5	6	6	-	-	RE-69	2	
	1003+46.51	RE-65A	S	37.5				37.5	75.0		-	2	8	4	RE-70	2	
					31.25	-	31.25			62.5	6	6	-	-	RE-69	2	



TABULATION OF DELINEATORS AND OBJECT MARKERS

Refer to Standard Plan RE-48A-B *and RE-29C ** Not a Bid Item

108-17
04-28-92

LOCATION Station	Type*	DELINEATOR Single White D-1W Number	OBJECT MARKER Type 2 OM2-3W Number	Type 3 OM-3L Number	Type 3 OM-3R Number	Offset Brackets ** Number	REMARKS
1003+46.51	1	-	4	1	1	-	SOUTH END
1003+46.51	1	-	4	1	1	-	NORTH END

TABULATION OF GRADING FOR GUARDRAIL INSTALLATIONS

* Refer to Standard Road Plan RL-12, RL-14, or Typicals 4303 and 4306

LOCATION POINT No.	Station	TYPE	*DIMENSIONS (A)/(T) Lin. Ft.	(Y) Lin. Ft.	(Z) Lin. Ft.	CLASS 10 EXCAV. Cu.Yds.	EMBANK. IN PLACE Cu.Yds.	PIPE Size Inches	Type	Length Lin. Ft.	REMARKS
	1001+95.92	2	56.25	9	74	-	**	-	-	-	LT. SIDE
	1001+95.92	3	56.25	9	74	-	**	-	-	-	RT. SIDE
	1004+97.09	2	56.25	9	54	-	**	-	-	-	LT. SIDE
	1004+97.09	2	56.25	9	54	-	**	-	-	-	RT. SIDE

** QUANTITY INCLUDED IN EXCAVATION, CLASS 10, ROADWAY AND BORROW.

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the St'd. Specifications

STATION	CLOSURE TYPE Road Qty.	Hazard Qty.	REMARKS
1000+50	1	-	SO. END
1002+00	-	1	SO. END
1013+00	1	-	NO. END
1005+00	-	1	NO. END

CONSTRUCTION SPECIFICATIONS
CONCRETE GROUT

1. SCOPE

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

2. MATERIALS

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

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.

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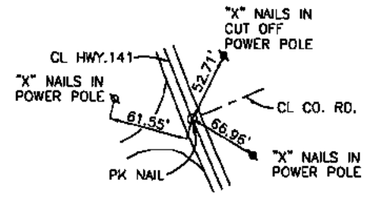
PHONE: (712)263-8118 FAX: (712)263-2181

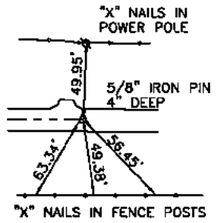
PROJECT NO.: 0877	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA	
DESCRIPTION: TABULATIONS & CONSTRUCTION SPECIFICATIONS			SHEET
PROJECT NO. BROS-24(44)--8J-24			C1
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 5015(40			

CHARTER OAK TWP.
T-84N R-41W
SEC. 22

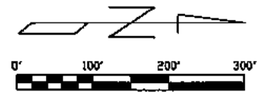
PARCEL NUMBER	PROPERTY OWNER
1	ROYCE MAACK
2	KRAGEL FARM CORP.
3	LARRY PETERSEN
4	RICHARD BUTLER



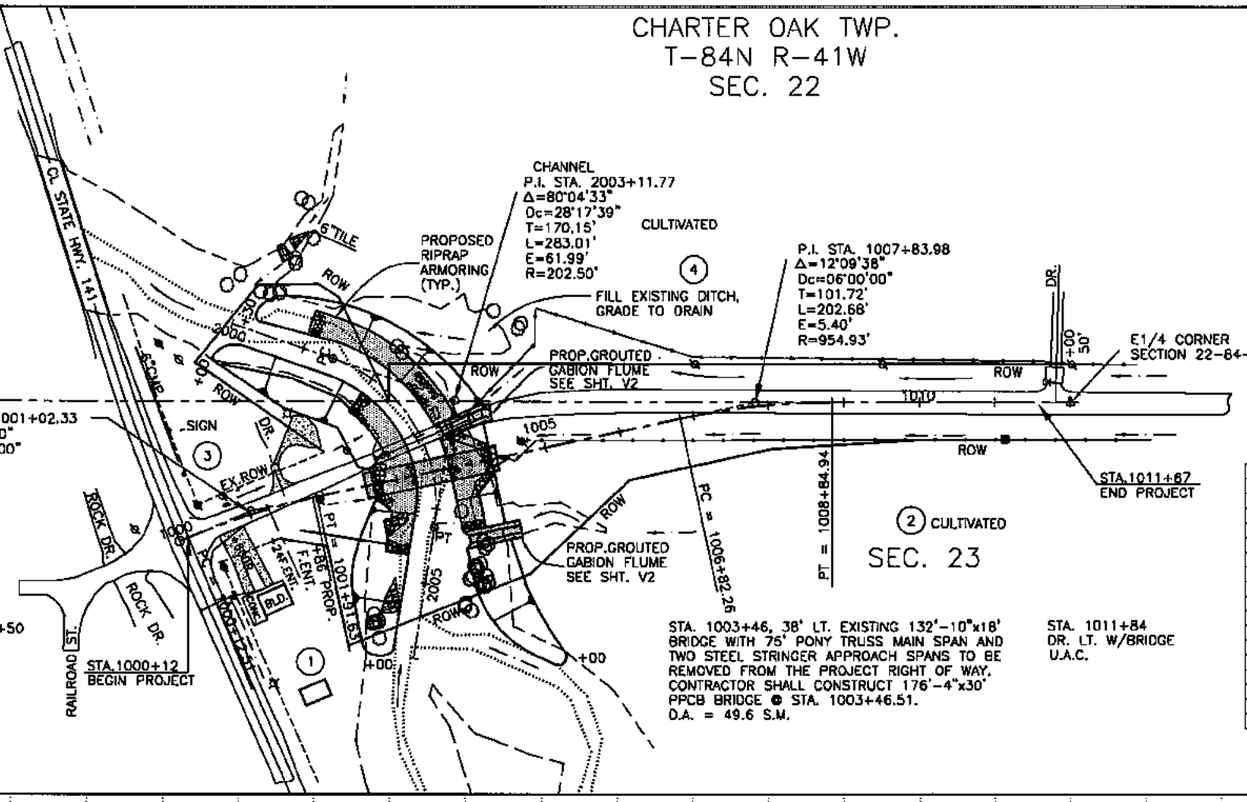
P.O.T. STA. 1000+00



E1/4 CORNER SECTION 22-84-41



HORIZONTAL CENTERLINE CONTROL (CHANNEL)		
STATION	NORTHING	EASTING
2000+00 POT	9634.5839	9896.9996
2001+41.62 PC	9768.5041	9942.7003
2003+11.77 PI	9929.5474	9997.6077
2004+24.63 PT	9903.3164	10165.7042
2006+00 POT	9876.1768	10338.9632



RIGHT OF WAY LOCATION	
STATION	DISTANCE
1001+28.28	41.39' RT.
1001+91.63	66.72' RT.
1001+91.63	201.64' RT.
1004+45.43	158.83' RT.
1006+00	65' RT.
1008+00	58' RT.
1010+00	49.77' RT.
1012+00	50' RT.
1002+13.71	55.49' LT.
1000+91.97	213.97' LT.
1001+77.52	289.62' LT.
1002+52.44	272.97' LT.
1002+75.12	250.38' LT.
1003+11.26	102.95' LT.
1003+21.85	151.81' LT.
1012+00	50' LT.

HORIZONTAL CENTERLINE CONTROL (ROADWAY)			
STATION	NORTHING	EASTING	ELEVATION
1000+00 POT	9565.6759	10183.5302	1002.36
1000+12.51 PC	9577.1859	10178.6677	–
1001+02.33 PI	9659.9253	10143.7037	–
1001+91.63 PT	9747.7333	10124.7620	–
1006+82.26 PC	10227.3572	10021.4280	–
1007+83.98 PI	10326.7959	10000.0000	–
1008+84.94 PT	10428.5172	10000.0000	–
1012+00.55 POT	10744.1300	10000.0000	1000.90

B.M. #1 – R.R. SPK. IN POWER POLE @ STA. 1000+70.8, 41.6' LT. EL. = 1000.00

B.M. #2 – R.R. SPK. IN POWER POLE @ STA. 1012+04.8, 49.7' LT. EL. = 1002.72

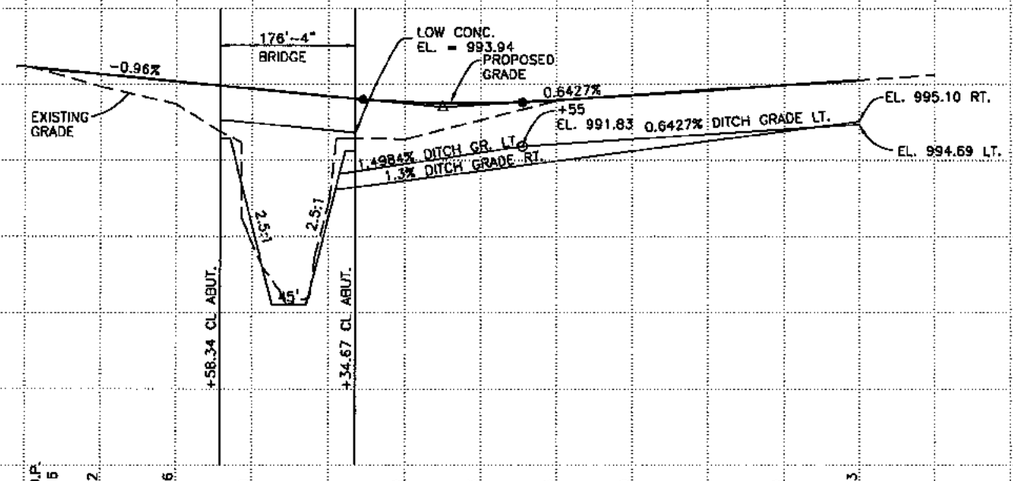
CUT	0	53	120		740	1097	850	531	334	249	234	130	
FILL	154	464	409		1552	1664	952	430	166	131	72	16	

DR.RT. 35 CY

F.ENT.LT 20 CY
F.ENT.RT. 15 CY

VPI STA. 1005+50
EL. = 997.00
V.C. = 210'
M.O. = 0.41'
D.S. = 55+ MPH
K = 133.7

TOTAL CUT = 4338 CY
TOTAL FILL+35% = 8164 CY
BORROW = 3846 CY



+12 B.O.P.												
1002.15	1001.32	1000.36	999.40	998.44	997.59	997.43	997.96	998.60	999.24	999.89	1000.53	

1000+00 1005+00 1010+00

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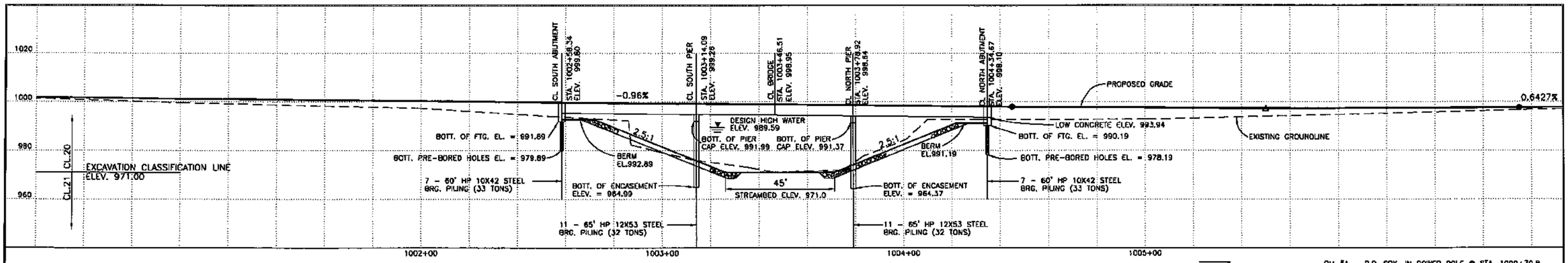
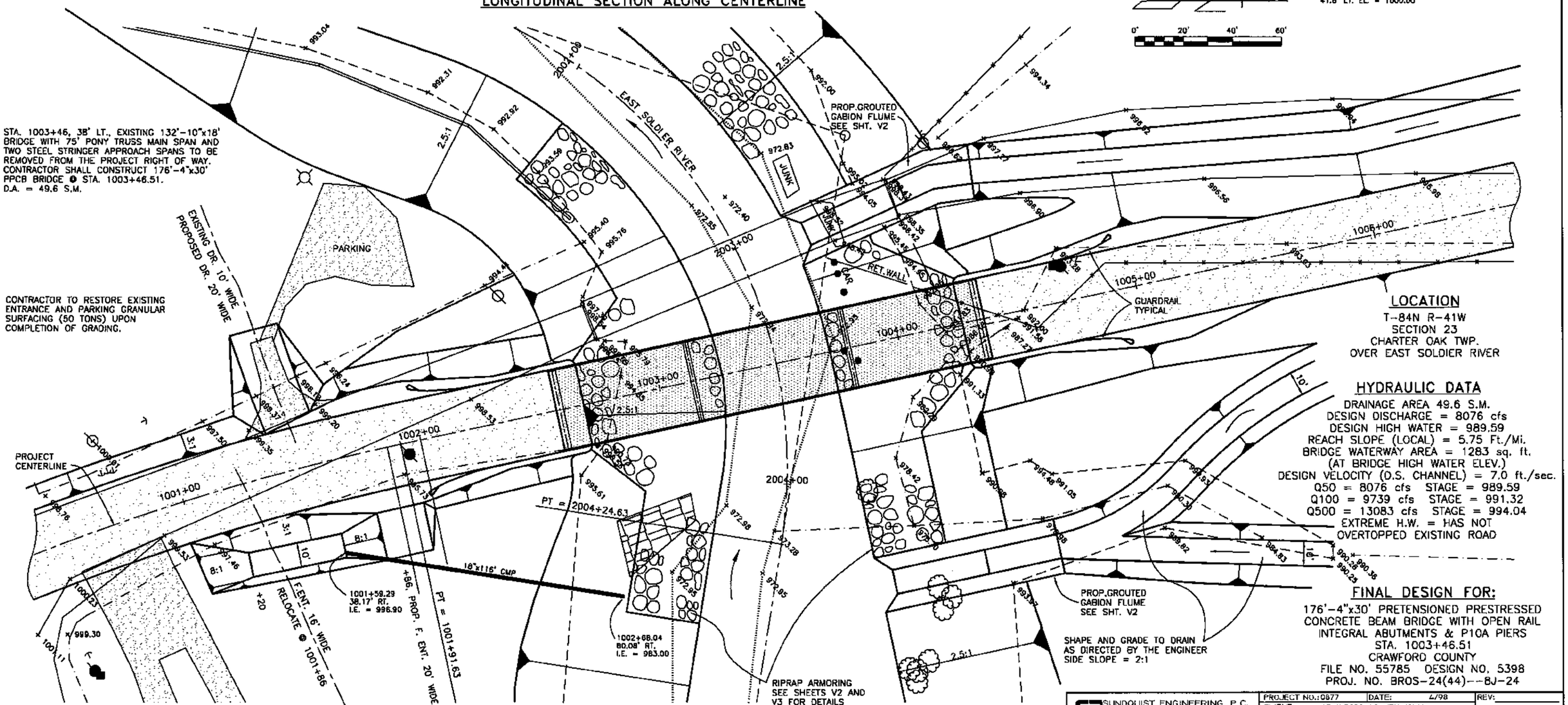
PROJECT NO.: 0877	DATE: 3/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: PLAN & PROFILE		SHEET	
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO. 5398 FILE NO. 55785			D1

LONGITUDINAL SECTION ALONG CENTERLINE





SITUATION PLAN

BM #1 - R.R. SPK. IN POWER POLE @ STA. 1000+70.8, 41.6' LT. EL. = 1000.00

LOCATION

T-84N R-41W
SECTION 23
CHARTER OAK TWP.
OVER EAST SOLDIER RIVER

HYDRAULIC DATA

DRAINAGE AREA 49.6 S.M.
DESIGN DISCHARGE = 8076 cfs
DESIGN HIGH WATER = 989.59
REACH SLOPE (LOCAL) = 5.75 Ft./Mi.
BRIDGE WATERWAY AREA = 1283 sq. ft.
(AT BRIDGE HIGH WATER ELEV.)
DESIGN VELOCITY (D.S. CHANNEL) = 7.0 ft./sec.
Q50 = 8076 cfs STAGE = 989.59
Q100 = 9739 cfs STAGE = 991.32
Q500 = 13083 cfs STAGE = 994.04
EXTREME H.W. = HAS NOT OVERTOPPED EXISTING ROAD

FINAL DESIGN FOR:

176'-4"x30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE WITH OPEN RAIL
INTEGRAL ABUTMENTS & P10A PIERS
STA. 1003+46.51
CRAWFORD COUNTY
FILE NO. 55785 DESIGN NO. 5398
PROJ. NO. BROS-24(44)--8J-24

SUNDQUIST ENGINEERING, P.C.
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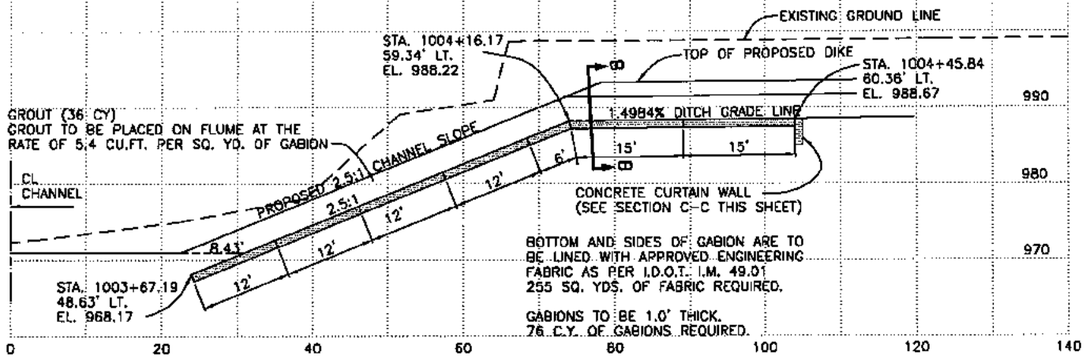
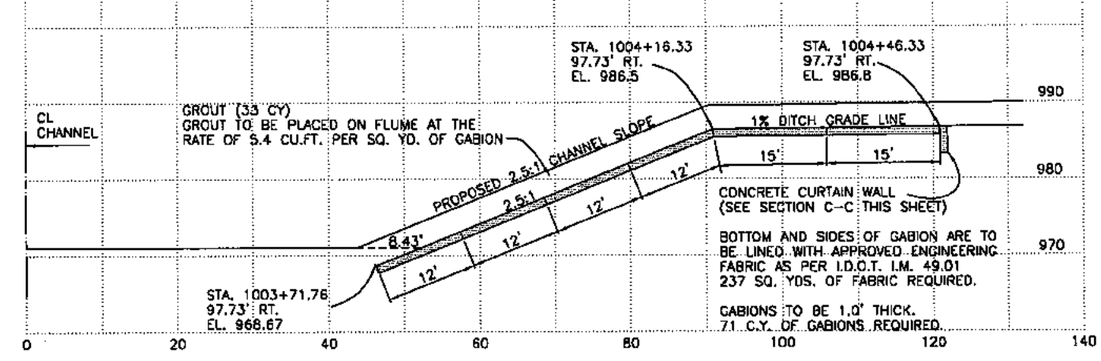
PROJECT NO.: 0877	DATE: 4/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: P.J.A	
DESCRIPTION: BRIDGE SITUATION PLAN			SHEET V1
PROJECT NO. BROS-24(44)--8J-24			
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 501540			



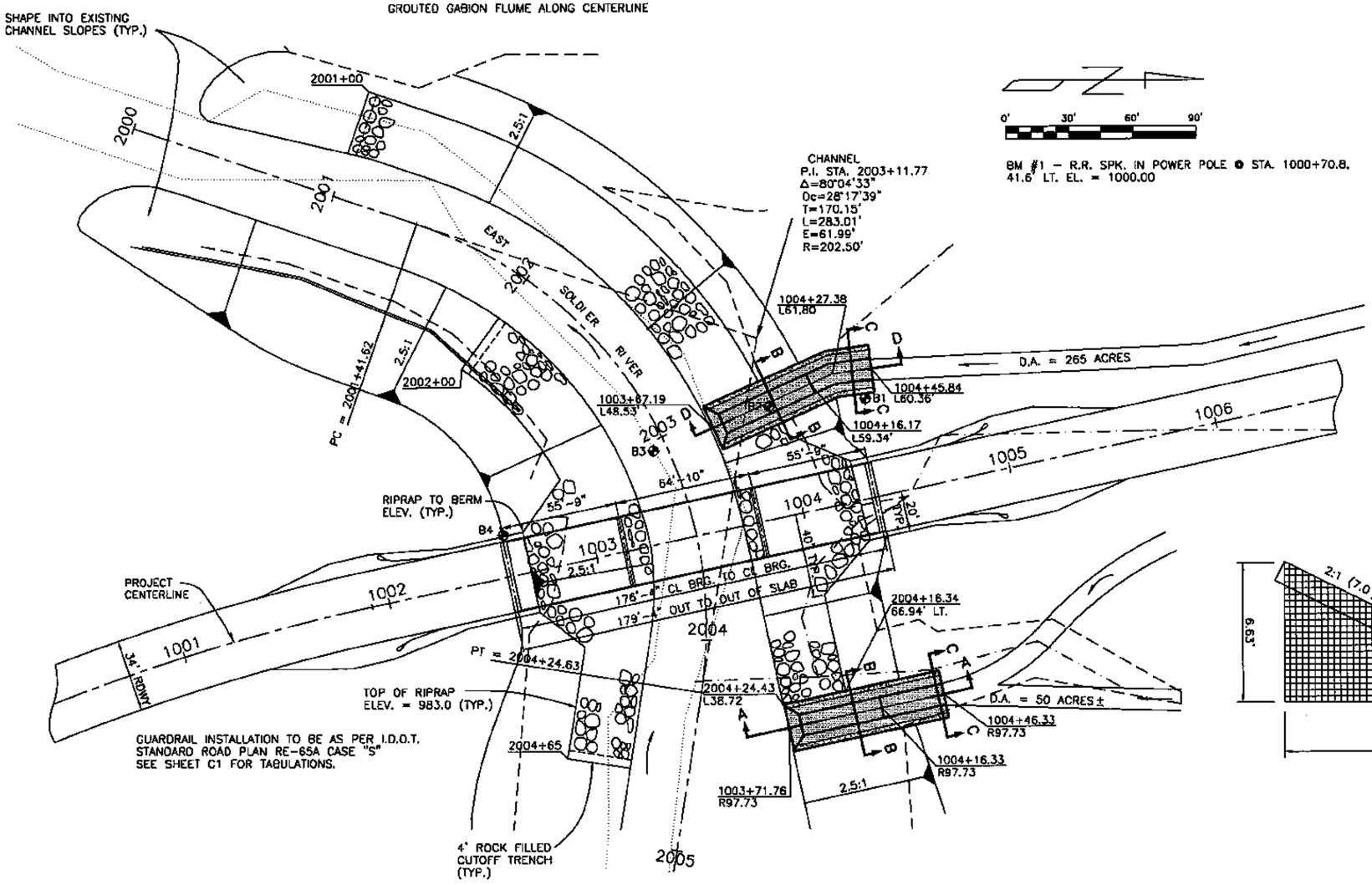
SECTION D-D

GROUTED GABION FLUME ALONG CENTERLINE

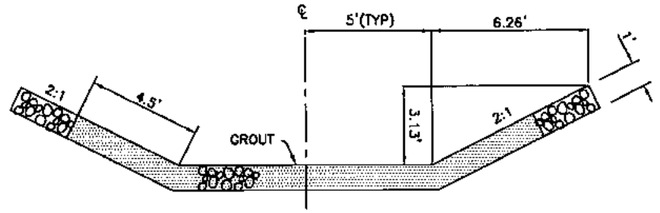


SECTION A-A

GROUTED GABION FLUME ALONG CENTERLINE

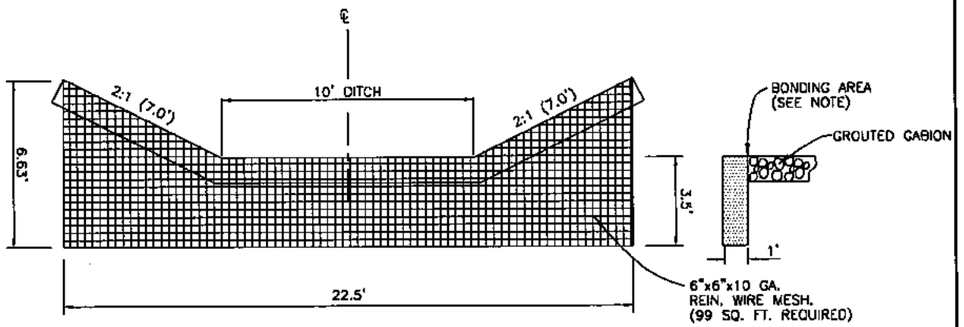


SITUATION PLAN



SECTION B-B

SECTION PERPENDICULAR TO CENTERLINE OF GROUTED GABION FLUME



SECTION C-C

SECTION PERPENDICULAR TO CENTERLINE OF GROUTED GABION FLUME

NOTE: CONCRETE IS TO BE VIBRATED IN SUCH A MANNER TO FORM A BOND WITH THE GABION. THE REINFORCING WIRE MESH IS TO BE INCLUDED IN THE PRICE BID FOR THE CONCRETE.
WIRE MESH REQUIRED = 99 SQ. FT.
CONCRETE REQUIRED = 3.80 C.Y.

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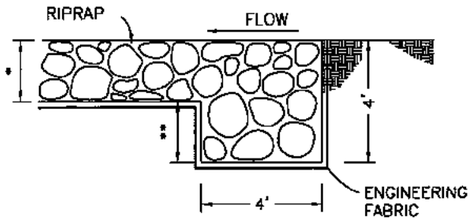
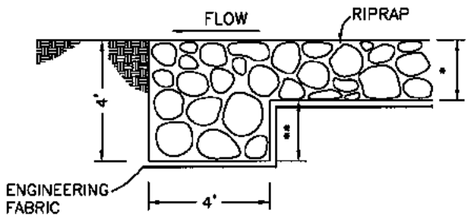
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 6/98	REV:
CLIENT: CRAWFORD COUNTY, IOWA		
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA
DESCRIPTION: CHANNEL ARMORING DETAILS		SHEET V2
PROJECT NO. BROS-24(44)--8J-24		
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 501540		



TYPICAL UPSTREAM



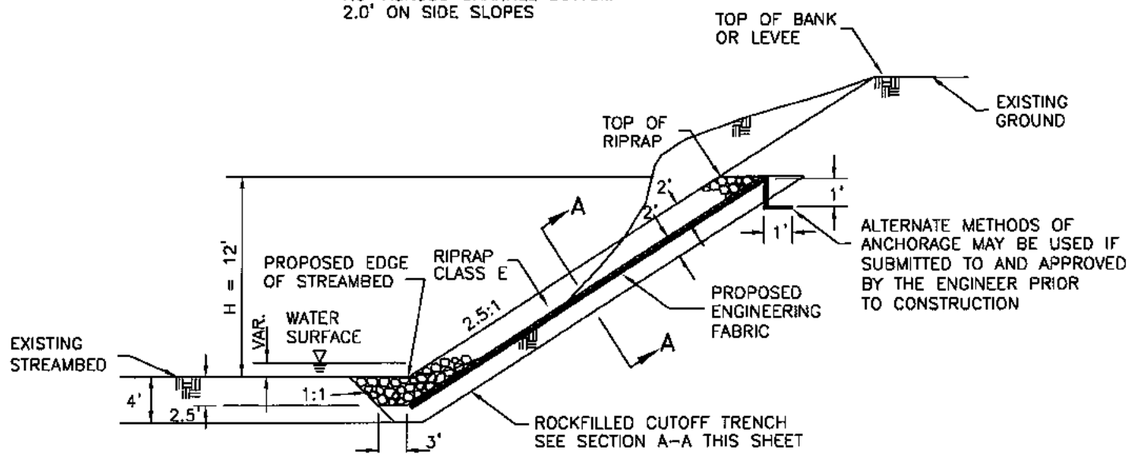
TYPICAL DOWNSTREAM

SECTION A-A

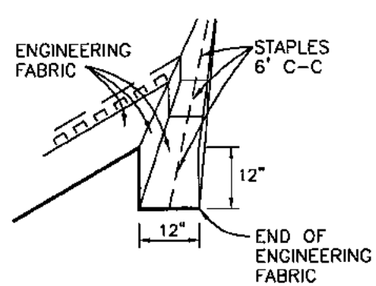
ROCK FILLED CUTOFF TRENCH DETAILS

CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES.

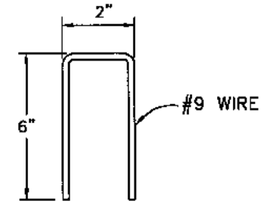
* 2.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES
** 1.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES



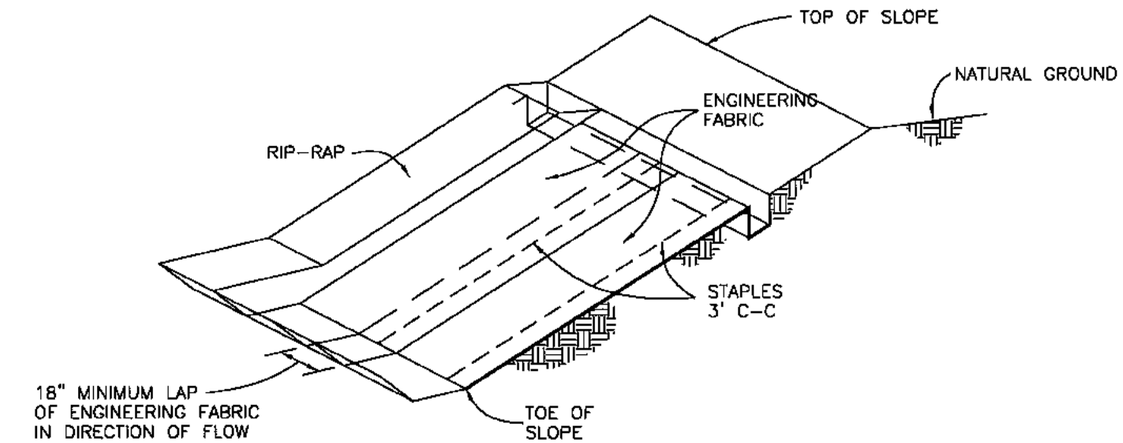
TYPICAL BANK STABILIZATION SECTION



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

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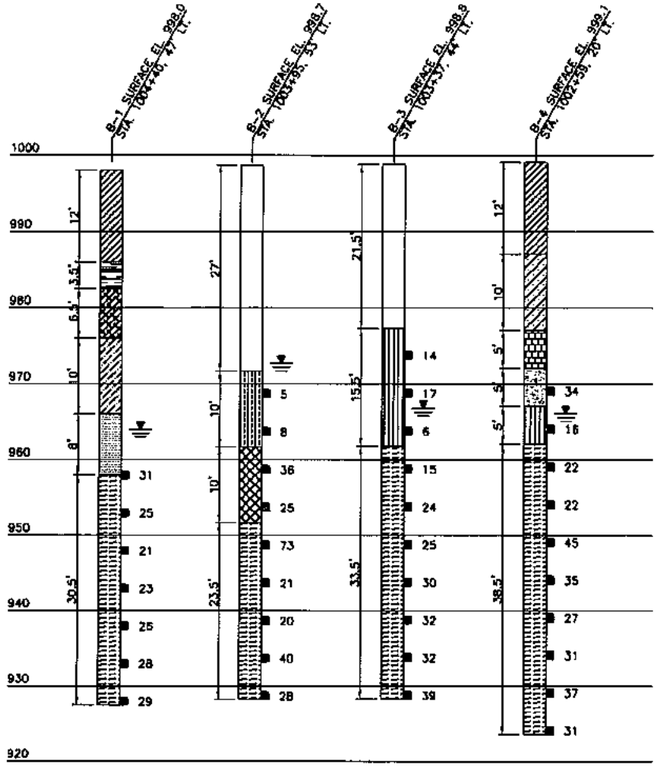
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2161

PROJECT NO.: 0877	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA	
DESCRIPTION: CHANNEL ARMORING DETAILS			SHEET
PROJECT NO. BROS-24(44)--8J-24			V3
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 601540			



FILL, STIFF TO FIRM, SILTY CLAY, BROWN

STIFF TO FIRM, SILTY CLAY, DARK GRAY BROWN, ALLUVIUM

STIFF TO FIRM, SILTY CLAY, LIGHT GRAY BROWN, ALLUVIUM

STIFF TO FIRM, SILTY CLAY, GRAY, ALLUVIUM

CLAYEY SAND, GRAY, ALLUVIUM

VERY FIRM, SANDY, GLACIAL CLAY, LIGHT GRAY TO LIGHT YELLOW BROWN

SILTY SAND, ALLUVIUM

FIRM SILTY CLAY, LIGHT GRAY, ALLUVIUM

SOFT SILTY CLAY, LIGHT GRAY BROWN, ALLUVIUM

SOFT SILTY CLAY, DARK GRAY, ALLUVIUM

POORLY GRADED SAND, COARSE SAND, MEDIUM TO DENSE, ALLUVIUM

CLAYEY SAND, YELLOW BROWN, ALLUVIUM

GROUND WATER ⊽ DRILLING

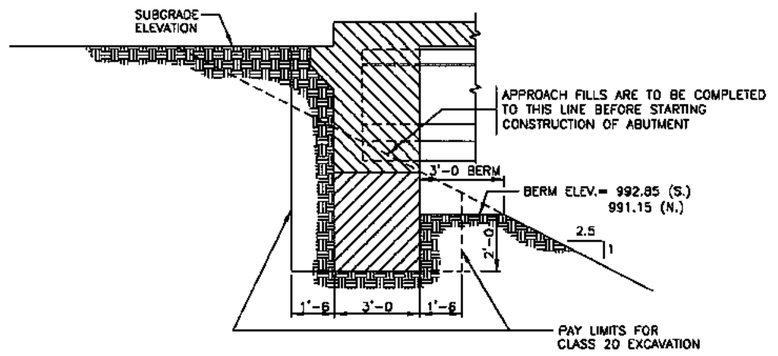
■ 31 BLOW COUNT

SOUNDING DATA

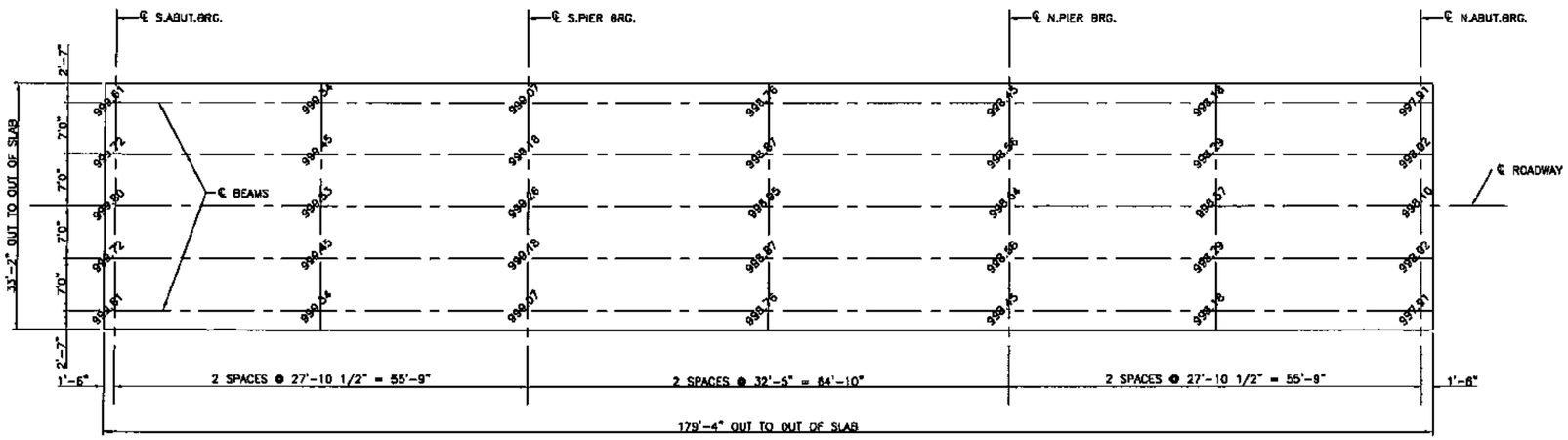
NOTE: THESE SOUNDINGS WERE MADE FOR DESIGN PURPOSES AND ARE NOT GUARANTEED FOR CONSTRUCTION.

SOUNDINGS WERE TAKEN ON JUNE 4, 5 AND 11, 1998

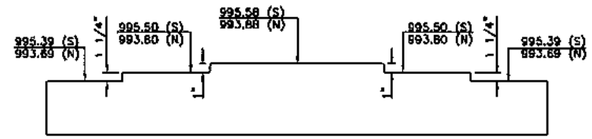
SEE SHEET V2 FOR BORING LOCATIONS



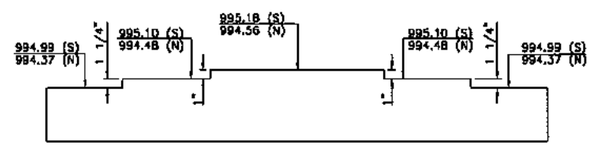
CLASS 20 EXCAVATION DETAIL



TOP OF SLAB ELEVATIONS



ABUTMENT STEP DIAGRAM



PIER STEP DIAGRAM

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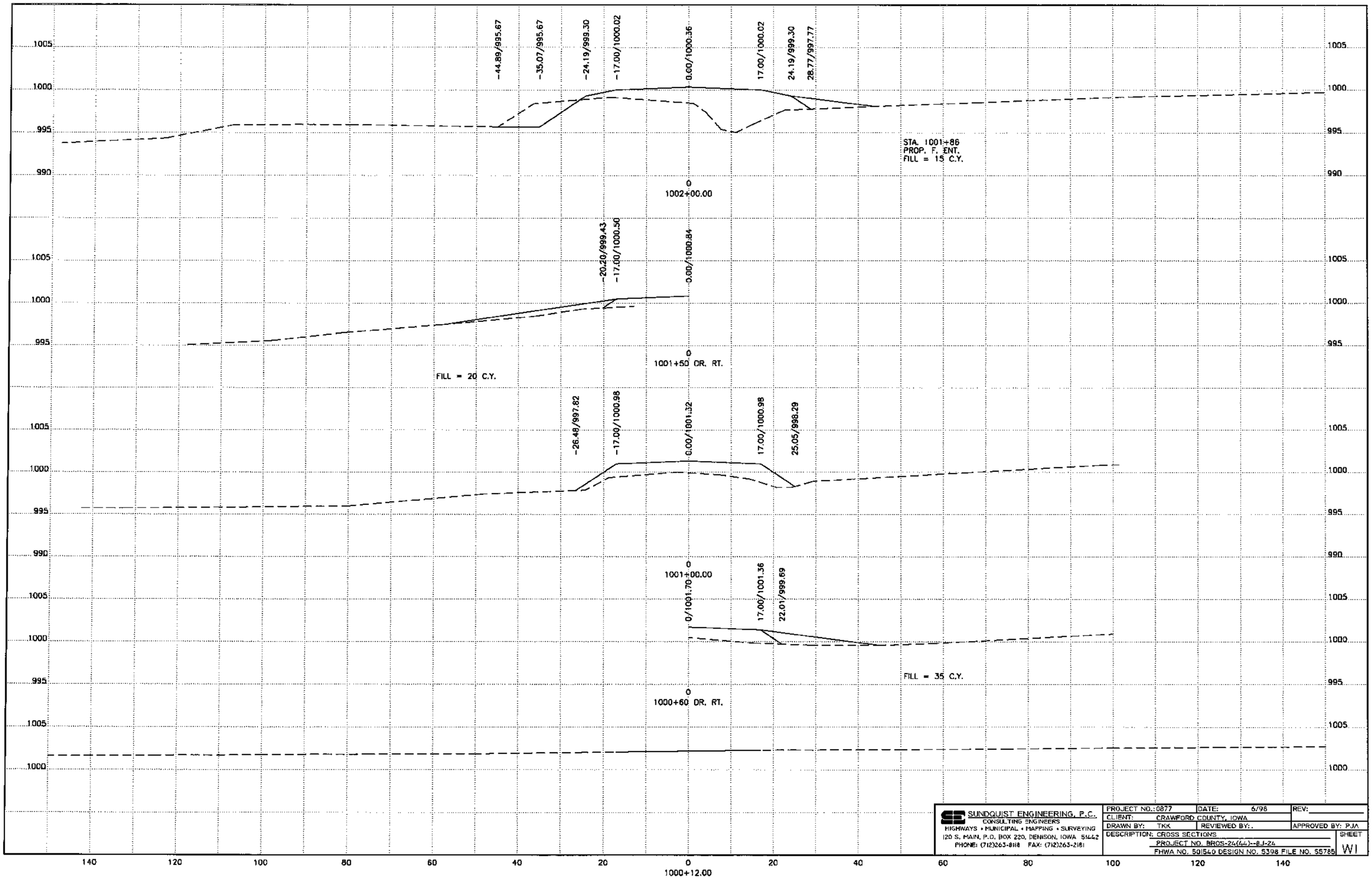
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA	
DESCRIPTION: SOILS SHEET & BIDGE ELEVATIONS			SHEET V4
PROJECT NO. BROS-24(44)--8J-24			
DESIGN NO. 5398 FILE NO. 55785 FHWA NO. 501540			



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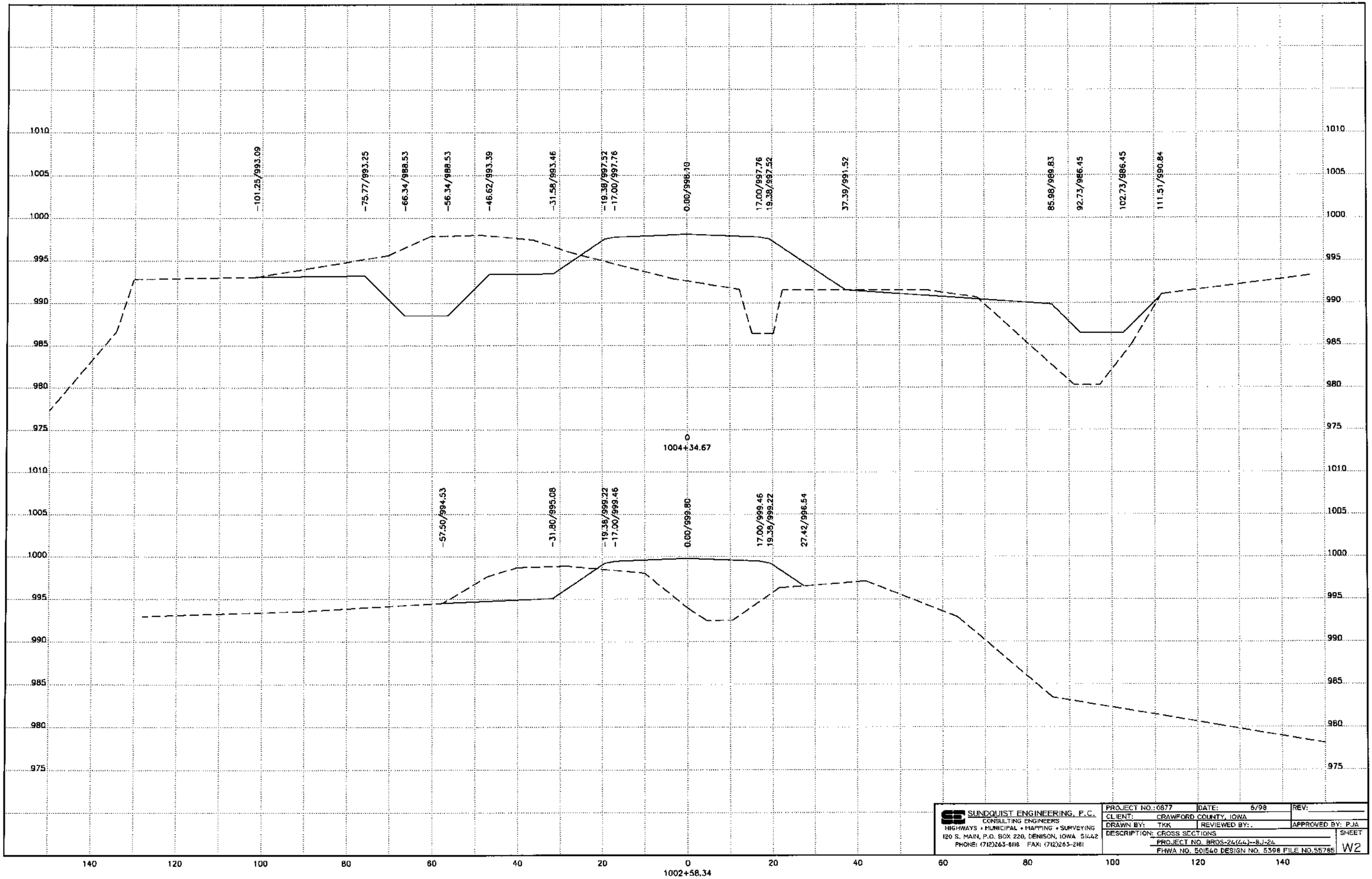
PROJECT NO.: 0877	DATE: 6/98	REV:
CLIENT: CRAWFORD COUNTY, IOWA		
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA
DESCRIPTION: CROSS SECTIONS		SHEET W1
PROJECT NO. BROS-24(44)--8J-24		
FHWA NO. 501540 DESIGN NO. 5398 FILE NO. 55785		



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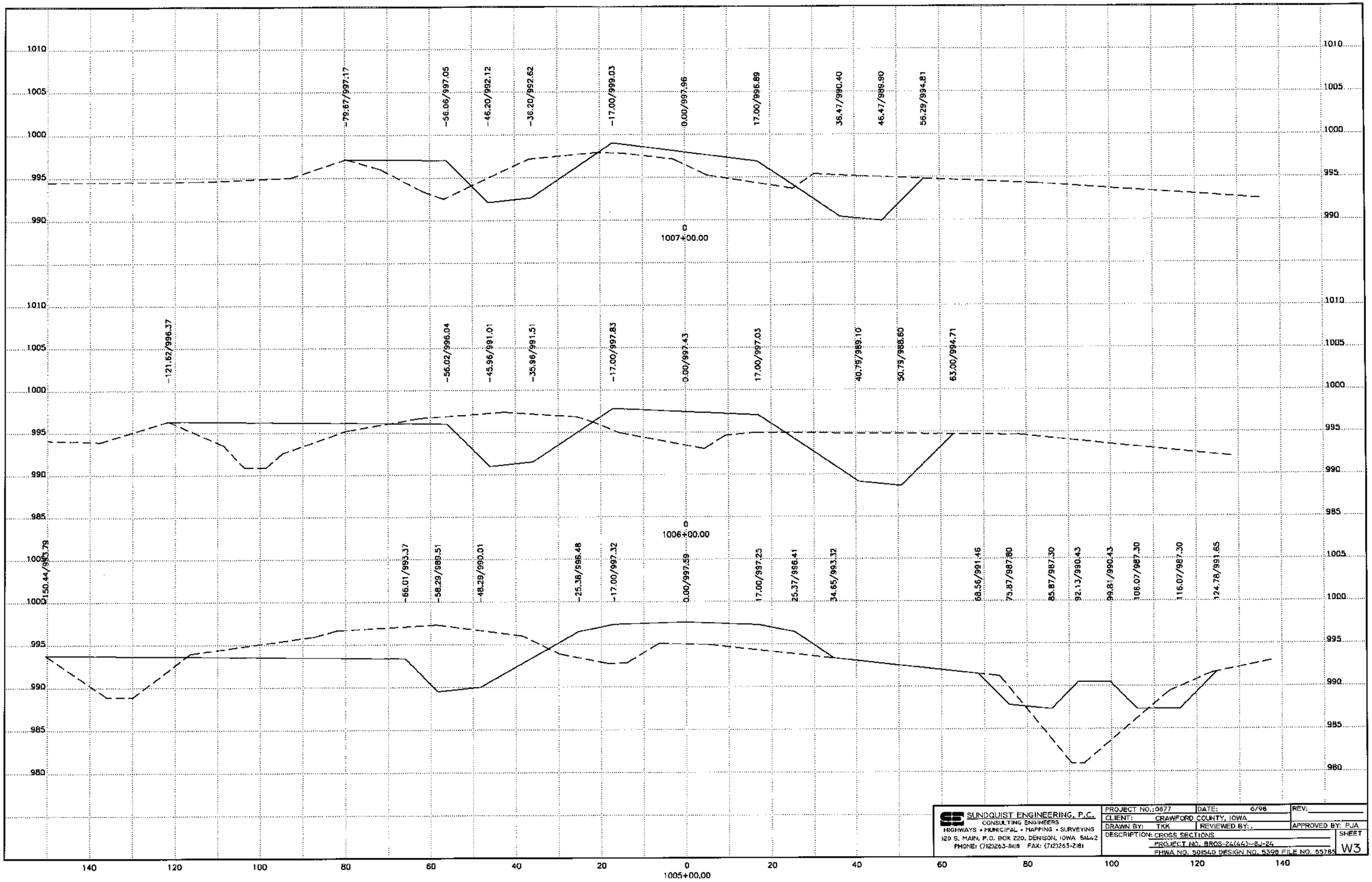
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2161

PROJECT NO.: 0677	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS		SHEET	
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO. 5398 FILE NO.55785		W2	



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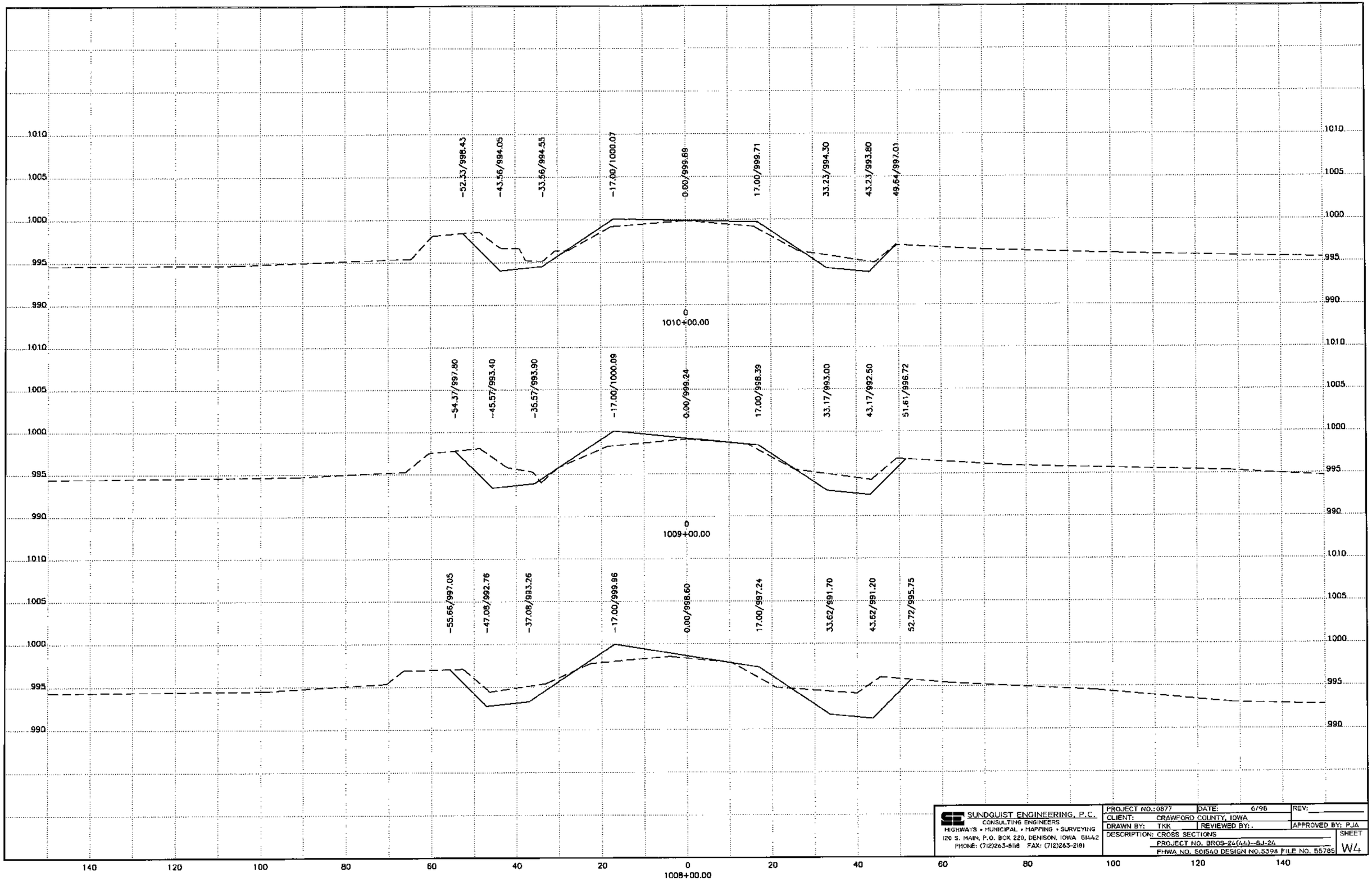
PHONE: (712)263-5119 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS		SHEET	
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO. 5398 FILE NO. 55785		W3	



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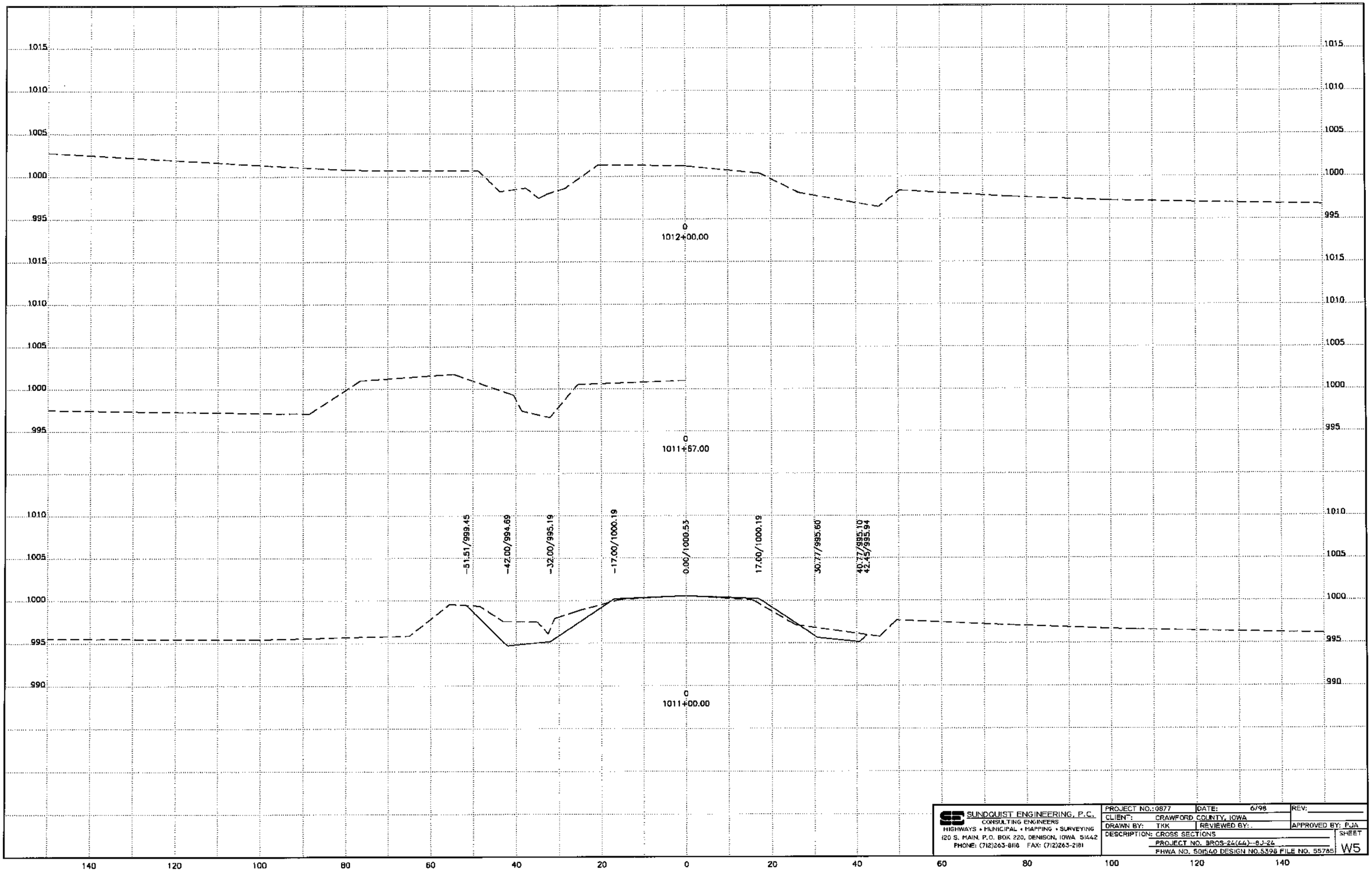
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 6/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS		SHEET	
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO.5398 FILE NO. 55785		W4	



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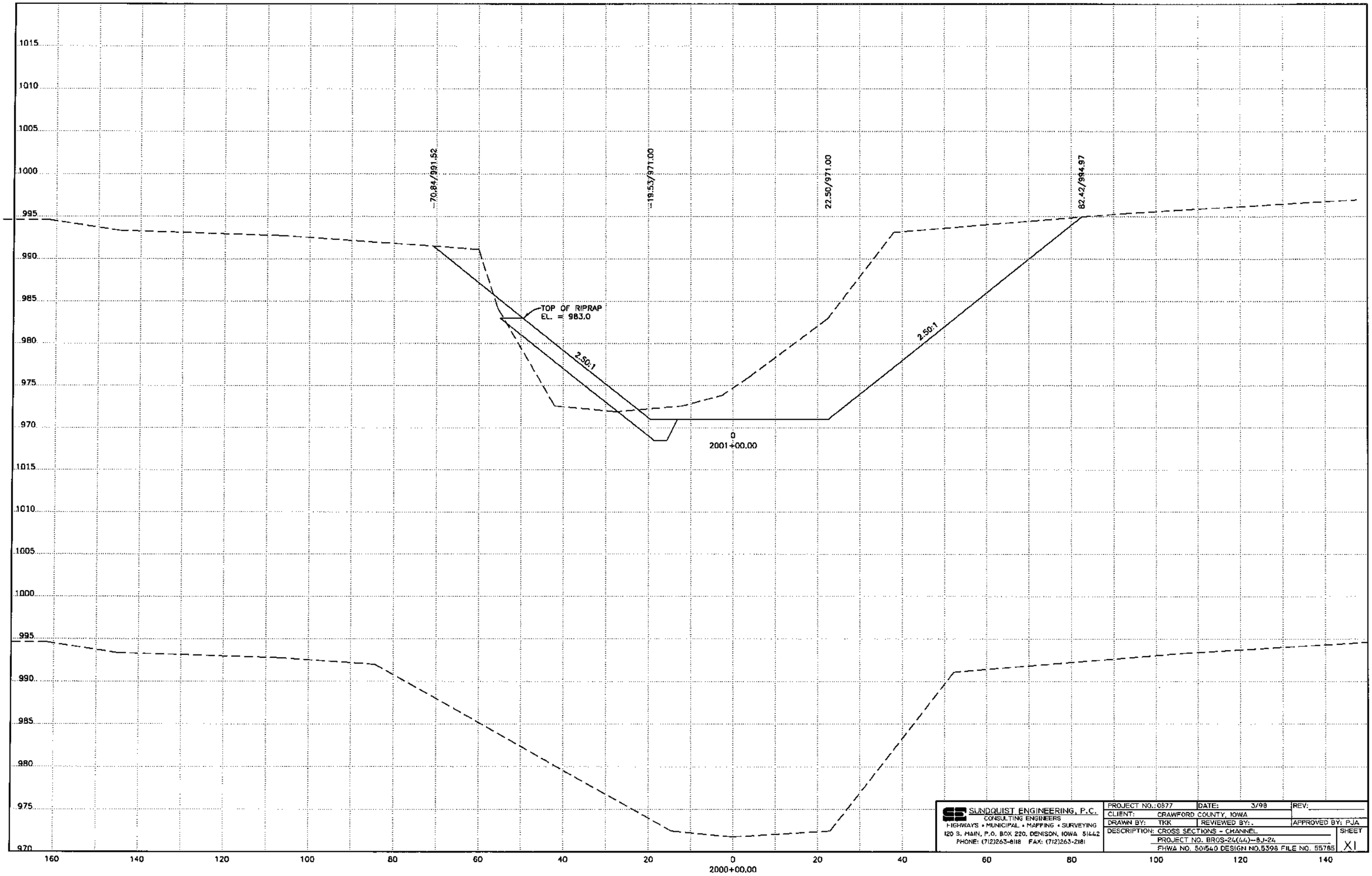
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 6/98	REV:
CLIENT: CRAWFORD COUNTY, IOWA		
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA
DESCRIPTION: CROSS SECTIONS		SHEET W5
PROJECT NO. BROS-24(44)--8J-24		
FHWA NO. 501540 DESIGN NO.5398 FILE NO. 55785		



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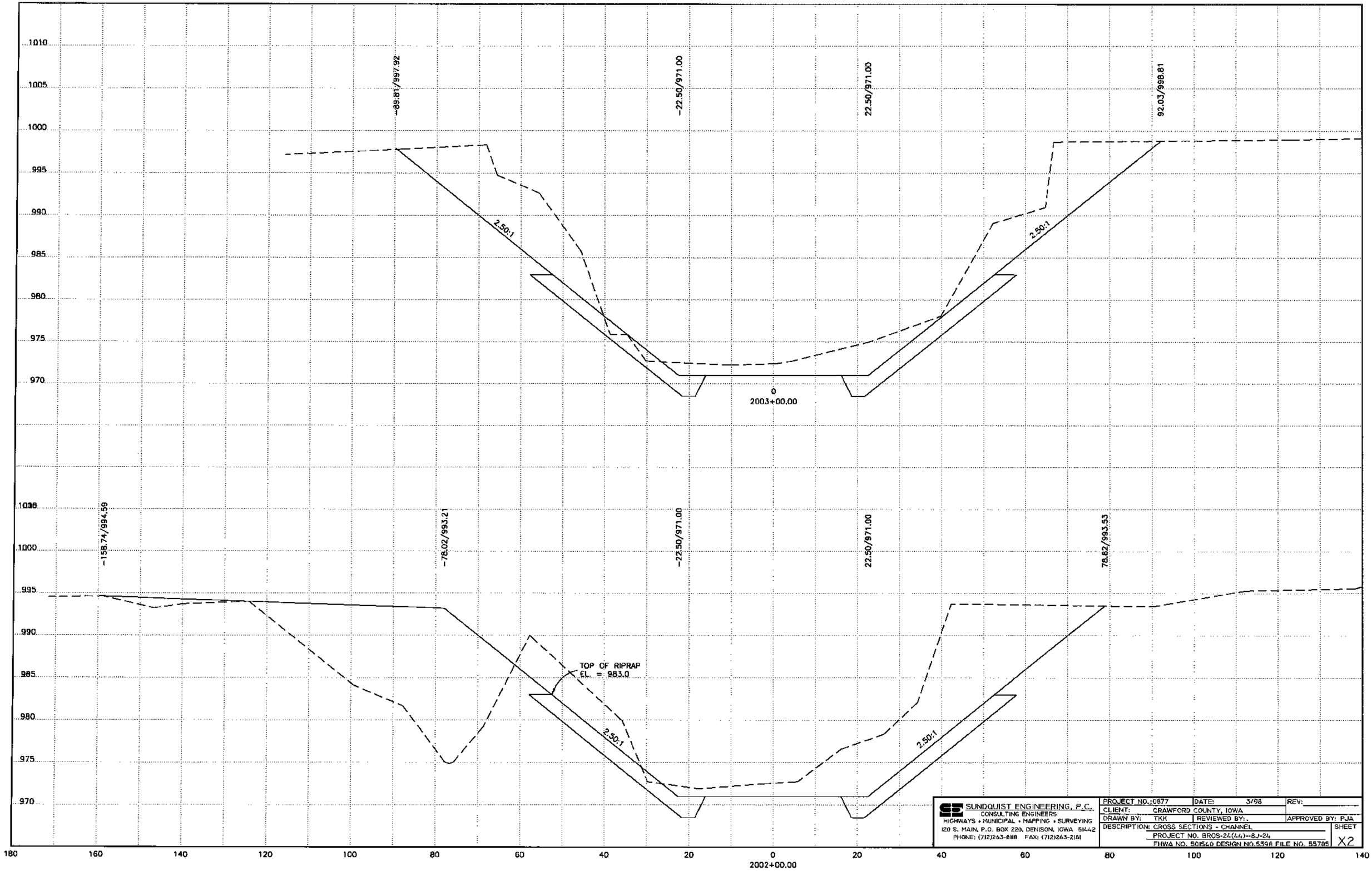
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 3/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY:	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - CHANNEL		SHEET	
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO.5398 FILE NO. 55785			XI



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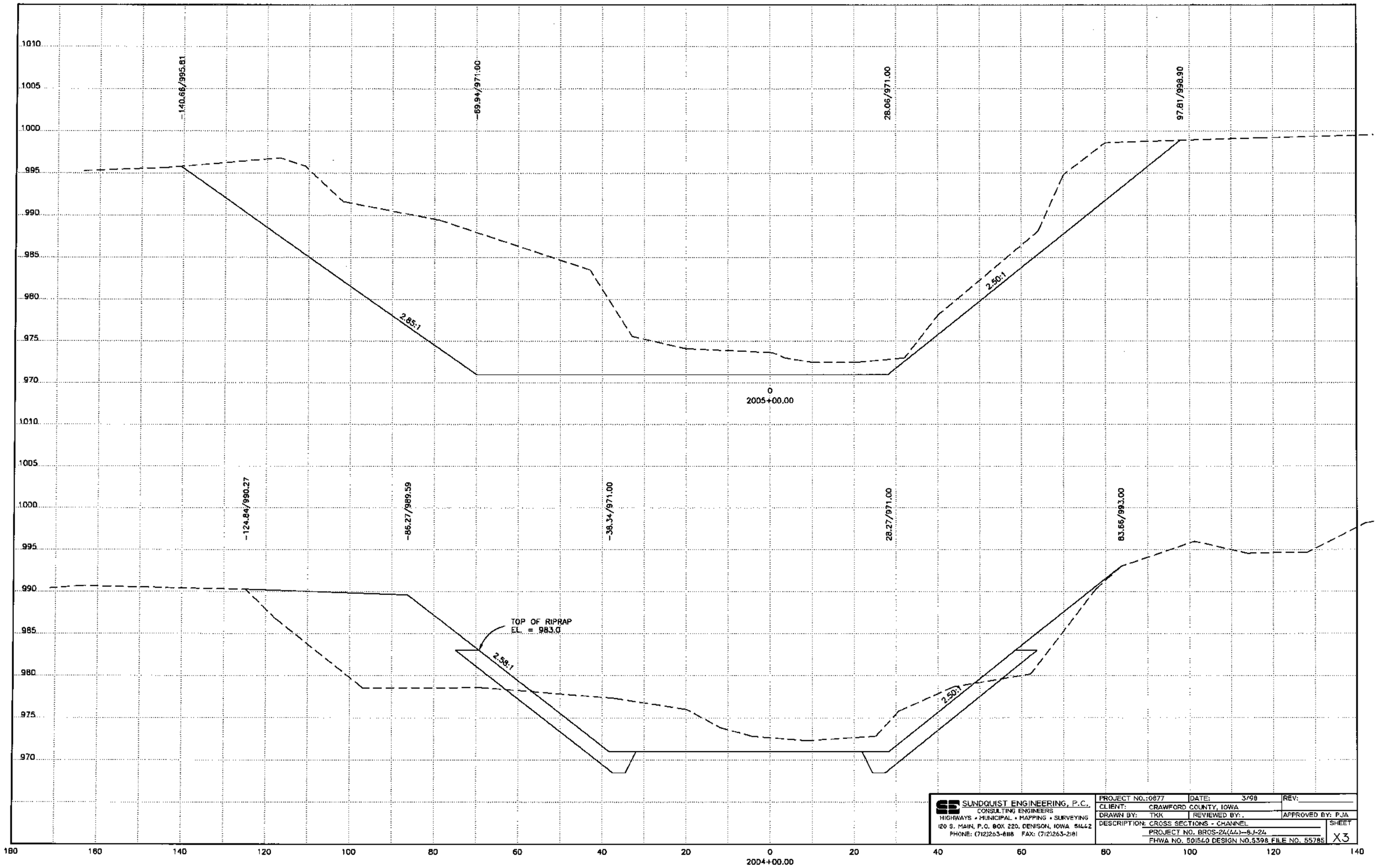
PHONE: (712)263-8118 FAX: (712)263-2181

PROJECT NO.: 0877	DATE: 3/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - CHANNEL		SHEET	
PROJECT NO. BROS-24(44)--8J-24		X2	
FHWA NO. 501540 DESIGN NO.5396 FILE NO. 55785			



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120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-6118 FAX: (712)263-2181

PROJECT NO.:0877	DATE: 3/98	REV:	
CLIENT: CRAWFORD COUNTY, IOWA			
DRAWN BY: TKK	REVIEWED BY: .	APPROVED BY: PJA	
DESCRIPTION: CROSS SECTIONS - CHANNEL			SHEET X3
PROJECT NO. BROS-24(44)--8J-24			
FHWA NO. 501540 DESIGN NO.5398 FILE NO. 55785			