LETTING DATE 08/10/04

STREAM CHANNEL STABILIZATION STRUCTURE LHC28-14N

CRAWFORD COUNTY

REV.:

TRAFFIC CONTROL PLAN

THIS ROAD WILL BE OPEN TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08 OF THE CURRENT STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING, AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 130."

PERMITS

THIS PROJECT IS COVERED BY U.S. ARMY CORPS OF ENGINEERS' NATIONWIDE PERMIT NOS. 3 AND 13.

THIS PROJECT IS COVERED BY IOWA DNR FLOOD PLAIN DEVELOPMENT PERMIT NO. FP 2004-115.

DRAWING APPROVAL

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

ADDRESS: 120 SOUTH MAIN, P.O. BOX 220
DENISON, IOWA 51442-0220
TELEPHONE: (712)263-8118

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

Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

SECONDARY ROAD SYSTEM
CRAWFORD COUNTY

PROJECT NO. LHC28-14N
STREAM CHANNEL STABILIZATION STRUCTURE
ON U AVENUE OVER
WEST FORK WEST NISHNABOTNA RIVER
IN COOPERATION WITH LOESS HILLS DEVELOPMENT AND CONSERVATION AUTHORITY - HUNGRY CANYONS ALLIANCE

TOTAL SHEETS
8
PROJECT NUMBER
LHC28-14N
R.O.W. PROJECT NUMBER
PROJECT IDENTIFICATION NUMBER

INDEX OF SHEETS

SCALES: As Noted

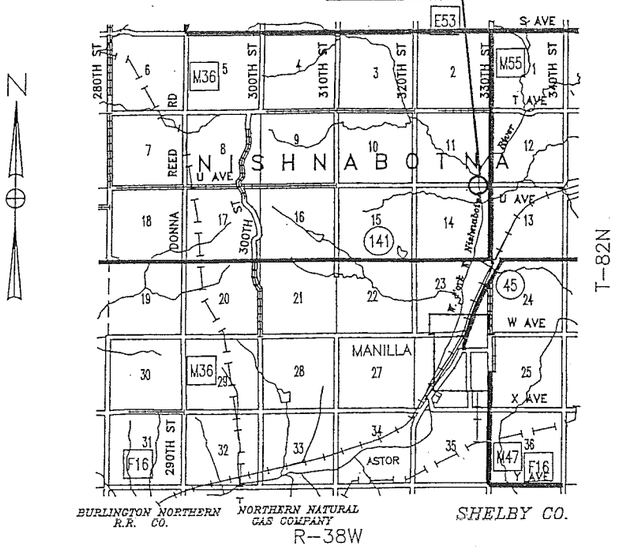
The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, plus the applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions, shall apply to construction work on this project.

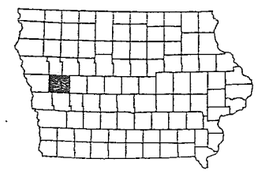
ROAD STANDARD PLANS

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

IDENTIFICATION	DATE	IDENTIFICATION	DATE	IDENTIFICATION	DATE
RS-12	04-30-96				

PROJECT LOCATION





LOCATION MAP SCALE
0 1 2 3
SCALE IN MILES

04-30-02	101-4
DESIGN DATA RURAL	
2000 AADT	15 V.P.D.
2020 AADT	- V.P.D.
201X DHV	X V.P.H.
TRUCKS	X %
TOTAL DESIGN ESALs	

Approved

BOARD OF SUPERVISORS

Approved

6/29/04
CRAWFORD COUNTY ENGINEER DATE

LICENSED PROFESSIONAL ENGINEER TROY J. GROTH 14450 IOWA

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

TROY J. GROTH, P.E. #14450 6/29/04 DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2005.

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS
HIGHWAYS • MUNICIPAL • MAPPING • SURVEYING
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442-0220
PHONE: (712)263-8118 FAX: (712)263-2181

DESIGN TEAM: TJG/SAS/LMD	ENGLISH	SE PROJECT NO. : 05803	DATE : 12/03	FHWA# 126461	CRAWFORD COUNTY	PROJECT NUMBER LHC28-14N	SHEET NUMBER A1

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	976	
2	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1278	
3	.	PILES, FURNISH & INSTALL STEEL, HP 10x42	LF	130	
4	2501-5775000	PILES, STEEL SHEET	SF	2440	
5	2507-3250005	ENGINEERING FABRIC	SY	1100	
6	2507-4011100	CONCRETE GROUT FOR REVETMENT OR GABION	CY	107	
7	2507-6850053	REVETMENT, SPECIAL	TON	1356	
8	2528-8445110	TRAFFIC CONTROL	LS	1	
9	2533-4980005	MOBILIZATION	LS	1	
10	2599-9999010	REMOVAL OF WATER	LS	1	
ALTERNATE BID ITEMS					
3	2409-4575000	TREATED LUMBER	MFBM	0.52	
4	.	PILES, PVC SHEET	SF	2440	

GENERAL NOTES

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL NECESSARY ARRANGEMENTS WITH ADJACENT PROPERTY OCCUPANTS FOR RESTRAINING LIVESTOCK FROM ENTERING THE RIGHT-OF-WAY.

CONTRACTOR IS TO USE DUE CAUTION IN WORKING OVER AND AROUND ALL TILE LINES. BREAKS IN THE TILE LINE DUE TO THE CONTRACTOR'S CARELESSNESS ARE TO BE REPLACED AT HIS EXPENSE WITHOUT COST TO THE COUNTY. ANY TILE LINES BROKEN OR DISTURBED BY CUT LINES WILL BE REPLACED AS DIRECTED BY THE ENGINEER IN CHARGE OF CONSTRUCTION AND AT THE COUNTY'S EXPENSE.

ALL BORROW AREAS, STOCKPILE AREAS, HAUL ROADS AND AREAS FOR MANEUVERING EQUIPMENT ON THIS PROJECT WILL REQUIRE SUBSOIL TILLAGE TO AN AVERAGE DEPTH OF 18 TO 24 INCHES. SUCH TILLAGE SHALL BE ACCOMPLISHED ON MAXIMUM OF THREE FOOT CENTERS. SUCH AREAS SHALL BE DESIGNATED BY THE COUNTY ENGINEER.

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK.

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

CONSTRUCTION STAKING SHALL BE PROVIDED BY THE OWNER IN ACCORDANCE WITH ARTICLE 1105.06 OF THE CURRENT STANDARD SPECIFICATIONS.

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 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.

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. THESE AREAS SHALL NOT IMPACT WETLANDS OR "WATERS OF THE U.S." NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE RIGHT-OF-WAY, UNLESS SPECIFICALLY STATED IN THE PLANS OR APPROVED BY THE ENGINEER.

251-1
THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN ACCESS TO INDIVIDUAL PROPERTIES DURING CONSTRUCTION.

RELOCATED ACCESS SHALL BE COMPLETED TO INDIVIDUAL PROPERTIES PRIOR TO REMOVAL OF EXISTING ACCESS.

IF THE PERMANENT ACCESS CANNOT BE COMPLETED PRIOR TO REMOVAL OF THE EXISTING ACCESS, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN AN ALTERNATE ACCESS. TEMPORARY GRANULAR SURFACING WILL BE PAID FOR AS A CONTRACT ITEM OR BY EXTRA WORK.

ESTIMATE REFERENCE INFORMATION

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

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

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

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 FOR THIS ITEM SHALL BE BASED ON PLAN QUANTITY.

2. EXCAVATION, CLASS 10, CHANNEL
SUITABLE CLASS 10 CHANNEL EXCAVATION MAY BE USED FOR EMBANKMENT-IN-PLACE. EXCESS MATERIALS AND UNSUITABLE MATERIAL SHALL BE HAULED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 CHANNEL EXCAVATION.

QUANTITY INCLUDES REMOVAL OF EXISTING BROKEN CONCRETE TO THE RIPRAP SUBGRADE. THIS MATERIAL SHALL BE INCORPORATED IN THE EMBANKMENT FILL BELOW THE PROPOSED RIPRAP. EXCESS EXCAVATED BROKEN CONCRETE SHALL BE PLACED IN THE CHANNEL AS DIRECTED BY THE ENGINEER.

ANY CLEARING AND GRUBBING NECESSARY TO COMPLETE THE WORK UNDER THIS CONTRACT SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM.

PAYMENT FOR THIS ITEM SHALL BE BASED ON PLAN QUANTITY.

3. PILES, FURNISH AND INSTALL, STEEL HP 10X42
INCLUDES FURNISHING AND INSTALLING THE HP 10X42 WALER AS DETAILED ON DRAWING SHEET U2. BOLTS, NUTS AND WASHERS REQUIRED TO INSTALL WALER SHALL MEET THE REQUIREMENTS OF ARTICLE 4153.07 AND SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM.

4. PILES, STEEL SHEET
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING THE SHEET PILES AS SHOWN ON THE DRAWINGS. THIS ITEM SHALL INCLUDE FIELD CUTTING THE SHEET PILES TO THE SPECIFIED 2:1 GRADE AS SHOWN ON THE DRAWINGS.

THE SHEET PILES AND APPURTENANT METAL WORK SHALL MEET THE REQUIREMENTS OF ASTM A328, A572 OR A690. THE SHEET PILES SHALL BE INSTALLED STARTING FROM THE CENTERLINE OF THE WEIR SECTION AND PROGRESSING AWAY FROM THE CENTERLINE.

SHEET PILES SHALL MEET THE FOLLOWING REQUIREMENTS:

(a) MINIMUM SECTION MODULUS OF 19.25 CU. IN. PER FOOT OF LENGTH.
(b) MINIMUM WALL THICKNESS OF 3/8 INCH.

5. ENGINEERING FABRIC
SEE DRAWING SHEET U1 - DETAILS OF PLACEMENT OF ENGINEERING FABRIC FOR INSTALLATION DETAILS. MATERIAL TO CONFORM TO IOWA DOT MATERIALS IM 496.01 APPENDIX A, EMBANKMENT EROSION CONTROL (SPECIFICATION 4196.01C).

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

6. CONCRETE GROUT FOR REVETMENT OR GABION
GROUTING OPERATION SHALL NOT BE PERFORMED EXCEPT IN THE PRESENCE OF THE ENGINEER.

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

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

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

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

MATERIAL SHALL MEET THE REQUIREMENTS OF STANDARD SPECIFICATIONS SECTION 4130 FOR CLASS B REVETMENT ON PRIMARY PROJECTS. PRIOR TO MATERIAL DELIVERY, CONTRACTOR SHALL PROVIDE CERTIFICATION THAT MATERIAL MEETS SAID SPECIFICATIONS.

CONTRACTOR SHALL BE REQUIRED TO STOCKPILE SELECTED LARGE STONES. SELECTED STONES SHALL BE PLACED IN THE LONGITUDINAL CENTER 1/3 OF THE CHANNEL BOTTOM AS DIRECTED BY THE ENGINEER. SUCH PLACEMENT SHALL OCCUR AFTER INSTALLATION OF SPECIAL REVETMENT AND PRIOR TO GROUTING OPERATION. THIS WORK SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

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

MATERIAL FOR SPECIAL REVETMENT SHALL BE MEASURED IN TONS TO THE NEAREST 0.1 TONS. ONLY MATERIAL PLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS WILL BE MEASURED.

FOR THE QUANTITY OF REVETMENT FURNISHED AND PLACED, THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE PER TON.

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

ALTERNATE BID ITEMS

3. TREATED LUMBER
INCLUDES FURNISHING AND INSTALLING THE TREATED TIMBER WALERS AS DETAILED ON DRAWING SHEET U2. BOLTS, NUTS AND WASHERS REQUIRED TO INSTALL THE WALERS SHALL MEET THE REQUIREMENTS OF ARTICLE 4153.07 AND SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM.

TIMBER MATERIAL SHALL BE CCA TREATED IN ACCORDANCE WITH SECTION 4161 FOR LUMBER AND TIMBER FOR STRUCTURES. WALERS REQUIRED ON EACH SIDE OF SHEET PILE. WALERS SHALL BE FASTENED AT FOUR FOOT INCREMENTS AND ON EACH SIDE OF ALL WALER SPLICES.

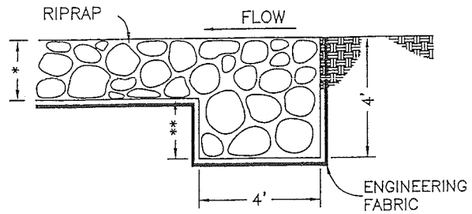
4. PILES, PVC SHEET
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING THE SHEET PILES AS SHOWN ON THE DRAWINGS. THIS ITEM SHALL INCLUDE FIELD CUTTING THE SHEET PILES TO THE SPECIFIED 2:1 GRADE AS SHOWN ON THE DRAWINGS.

THE SHEET PLIES SHALL BE INSTALLED STARTING FROM THE CENTERLINE OF THE WEIR SECTION AND PROGRESSING AWAY FROM THE CENTERLINE. METHOD OF INSTALLATION SHALL BE IN CONFORMANCE WITH THE SHEET PILE MANUFACTURER'S RECOMMENDATIONS WHICH MAY REQUIRE DRIVING PILES WITH A DROP HAMMER.

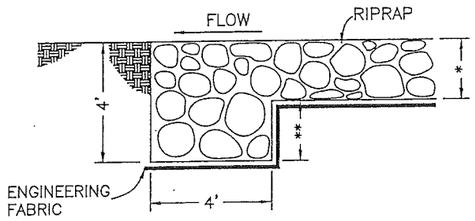
SHEET PILES SHALL BE OF THE INTERLOCKING TYPE MADE OF 100% UV STABILIZED VINYL GRAY OR BROWN IN COLOR. SHEET PILES SHALL BE SHOREGUARD 550 OR APPROVED EQUAL AND SHALL MEET THE FOLLOWING REQUIREMENTS:

(A) MINIMUM SECTION MODULUS OF 22.5 CU. IN. PER FOOT LENGTH
(B) MINIMUM WALL THICKNESS OF 0.400 INCH.

ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION



TYPICAL UPSTREAM



TYPICAL DOWNSTREAM

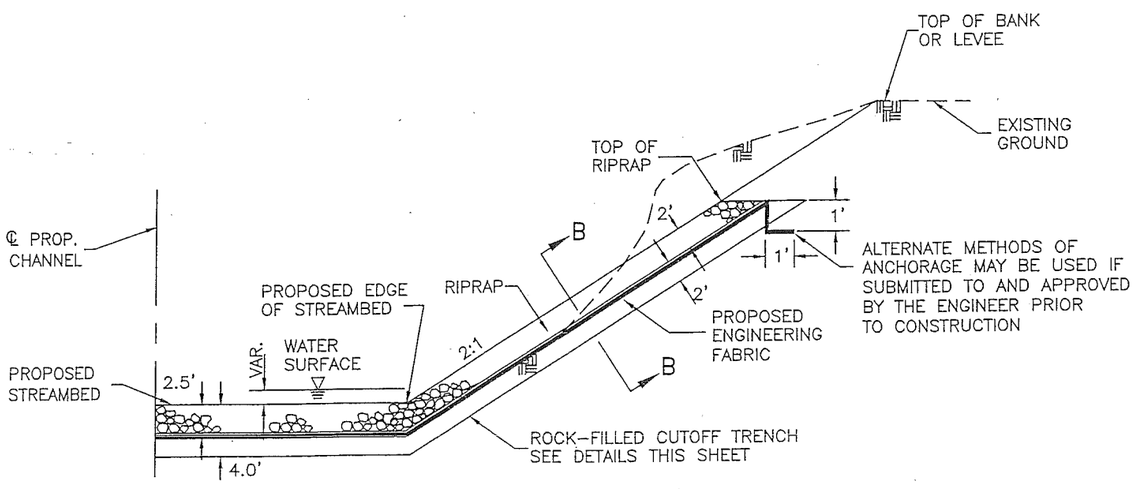
* 2.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES

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

SECTION B-B

ROCK-FILLED CUTOFF TRENCH DETAILS

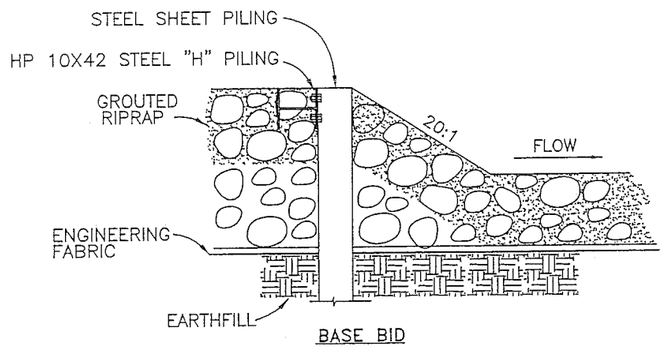
CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES
NO SCALE



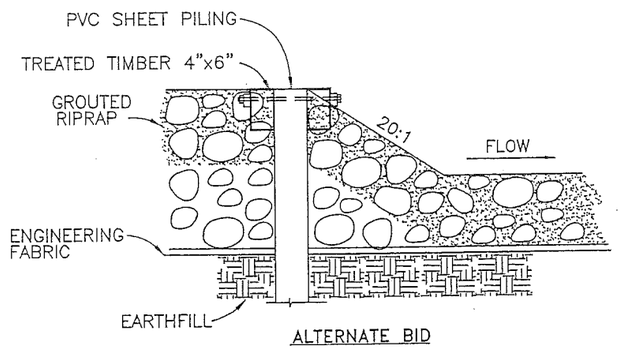
TYPICAL FULL-CHANNEL BANK STABILIZATION SECTION

NO SCALE

FOR TOP OF RIPRAP ELEVATIONS SEE CROSS SECTIONS



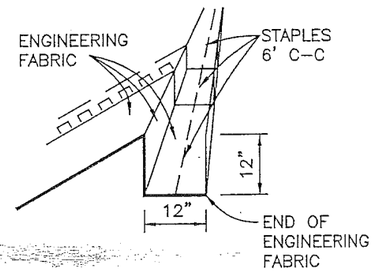
BASE BID



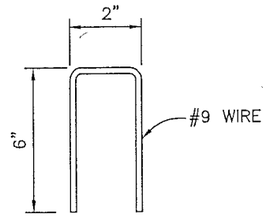
ALTERNATE BID

GROUTED RIPRAP DETAIL

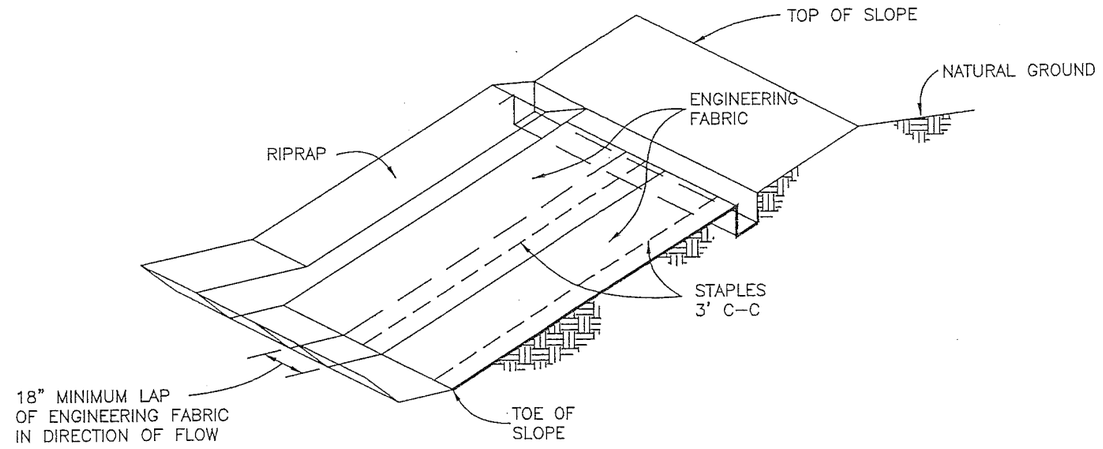
NO SCALE



DETAIL OF TRENCH



STAPLE

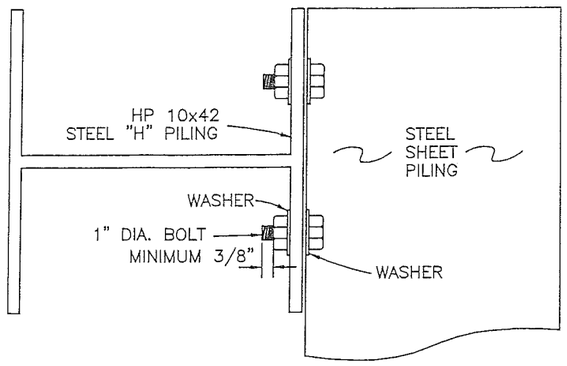


EXCAVATE 12"x12" TRENCH ALONG TOP OF RIPRAP. PLACE END OF ENGINEERING FABRIC STRIPS INTO TRENCH WITH STAPLES AS SHOWN. BACKFILL WITH THE EXCAVATED MATERIAL AND COMPACT. THE ENGINEER MAY PERMIT THE USE OF THE WHEELS OF PNEUMATIC-TIRED EQUIPMENT FOR CONSOLIDATING THE TRENCH BACKFILL MATERIAL.

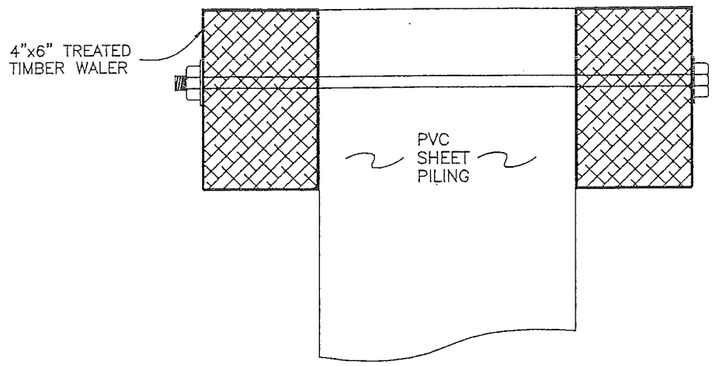
DETAILS OF PLACEMENT OF ENGINEERING FABRIC

NO SCALE

SPECIAL DETAILS

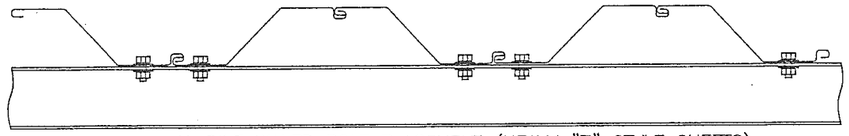


BASE BID

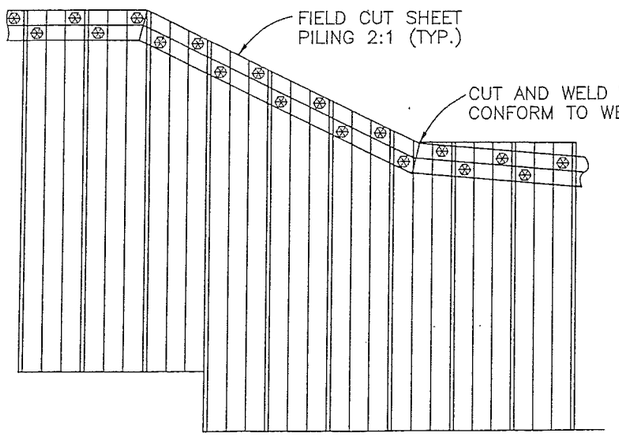


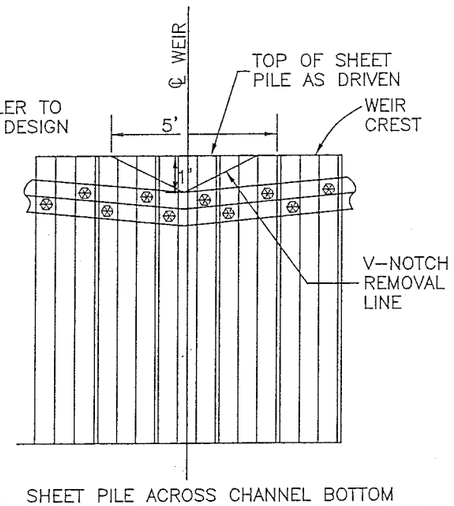
ALTERNATE BID

BOLT DETAIL



H–PILE WALER BOLT PLACEMENT (HEAVY "Z" STYLE SHEETS)





NOTES:

1. ALL BOLTS SHALL BE 1" DIA. W/2 WASHERS. BOLTS SHALL EXTEND AT MINIMUM 3/8" BEYOND NUT.
2. ALL HOLES SHALL BE FIELD CUT 1/16" DIA. LARGER THAN THE BOLTS.
3. ALL HARDWARE SHALL BE GALVANIZED.
4. SHEET PILE ACROSS CHANNEL BOTTOM SHALL BE DRIVEN TO DESIGN WEIR CREST ELEVATION. FOLLOWING INSTALLATION OF WALER, V–NOTCH AS DETAILED SHALL BE FIELD CUT FROM SHEET PILE.

DETAILS OF WALER

NO SCALE

CONSTRUCTION SPECIFICATIONS

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 ENGINEER, 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 ENGINEER, 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.

SPECIAL DETAILS

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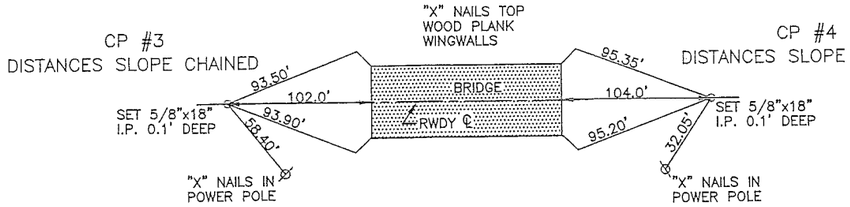
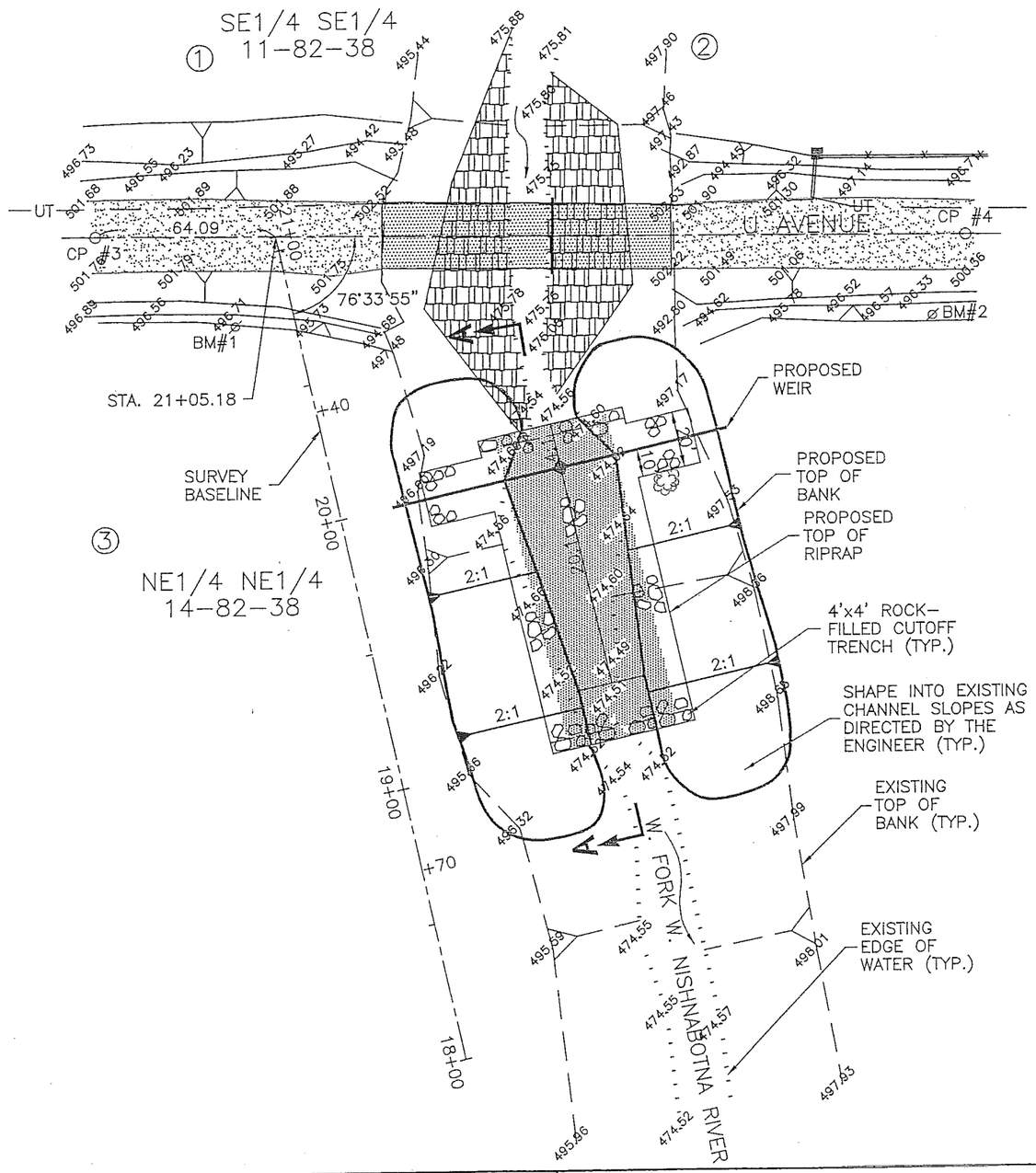
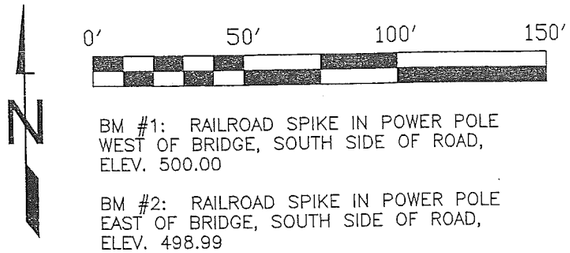
120 S. MAIN, P.O. BOX 220, DENISON, IOWA 51442
PHONE: (712)263-8118 FAX: (712)263-2181

PARCEL NUMBER	PROPERTY OWNER
①	ELLSWORTH I. & GRACE SCHECHINGER
②	MICHAEL R. MUNDT
③	JAMES A. & NORMA GROSS







BM #1: RAILROAD SPIKE IN POWER POLE WEST OF BRIDGE, SOUTH SIDE OF ROAD, ELEV. 500.00

BM #2: RAILROAD SPIKE IN POWER POLE EAST OF BRIDGE, SOUTH SIDE OF ROAD, ELEV. 498.99

HORIZONTAL CONTROL		
DESCRIPTION	NORTHING	EASTING
S1/4 COR. 11	73395.0640	134112.0445
SE COR. 11	73373.8309	136748.9464
CP #3	73381.5786	135770.9914
CP #4	73379.0578	136081.5075
P.O.T. 18+00	73083.6666	135903.5712
P.O.T. 21+05.18	73381.0583	135835.0792

LOCATION
CRAWFORD COUNTY
T-82N R-38W
SECTION 14
NISHNABOTNA TWP.
OVER W. FORK W. NISHNABOTNA RIVER

HYDROLOGY AND HYDRAULICS
DRAINAGE AREA = 47.4 SM
CHANNEL SLOPE = 5.95 FT/MILE

STORM	RUNOFF CFS	VELOCITY FT/SEC	STAGE ELEV.*
Q2	1460	4.6	484.2
Q5	3070	4.9	488.5
Q10	4380	5.2	491.1
Q25	6140	5.5	494.0
Q50	7500	5.7	495.9
Q100	8900	6.0	497.4

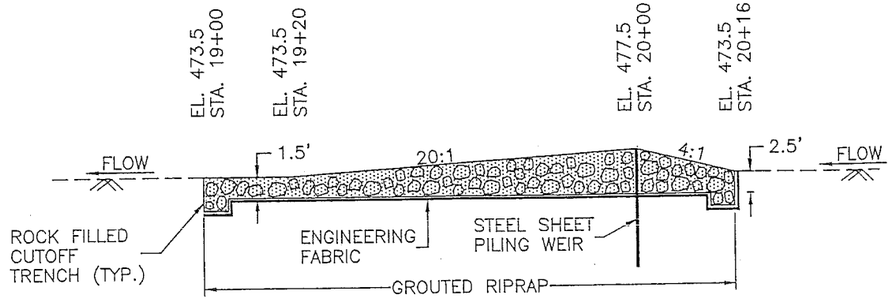
* AT WEIR SECTION STA. 20+00

EXISTING BROKEN CONCRETE

LOOSE RIPRAP

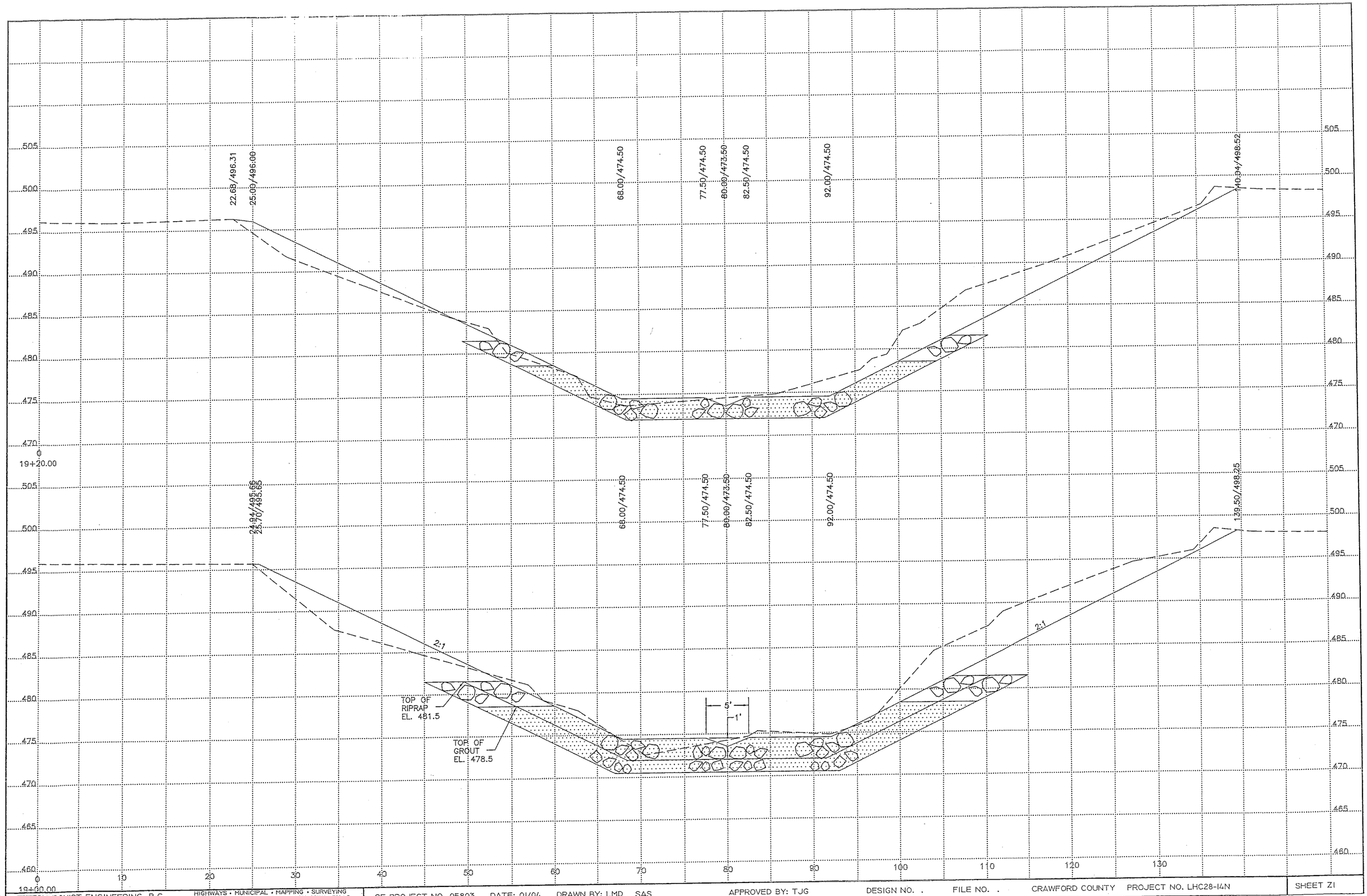
GROUTED RIPRAP

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



SECTION A-A
NOT TO SCALE

WEIR SITUATION PLAN



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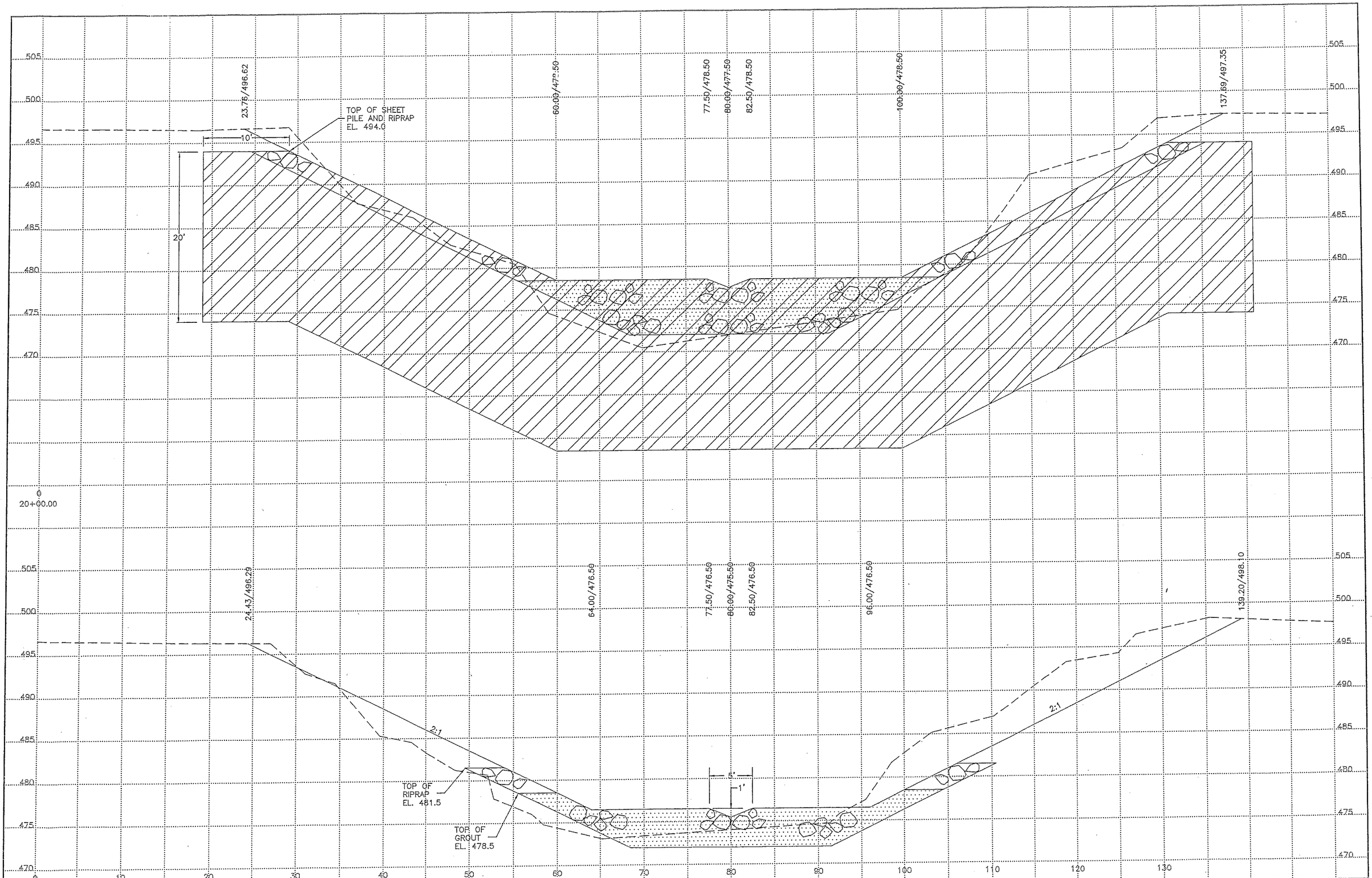
SHEET 21



REV:

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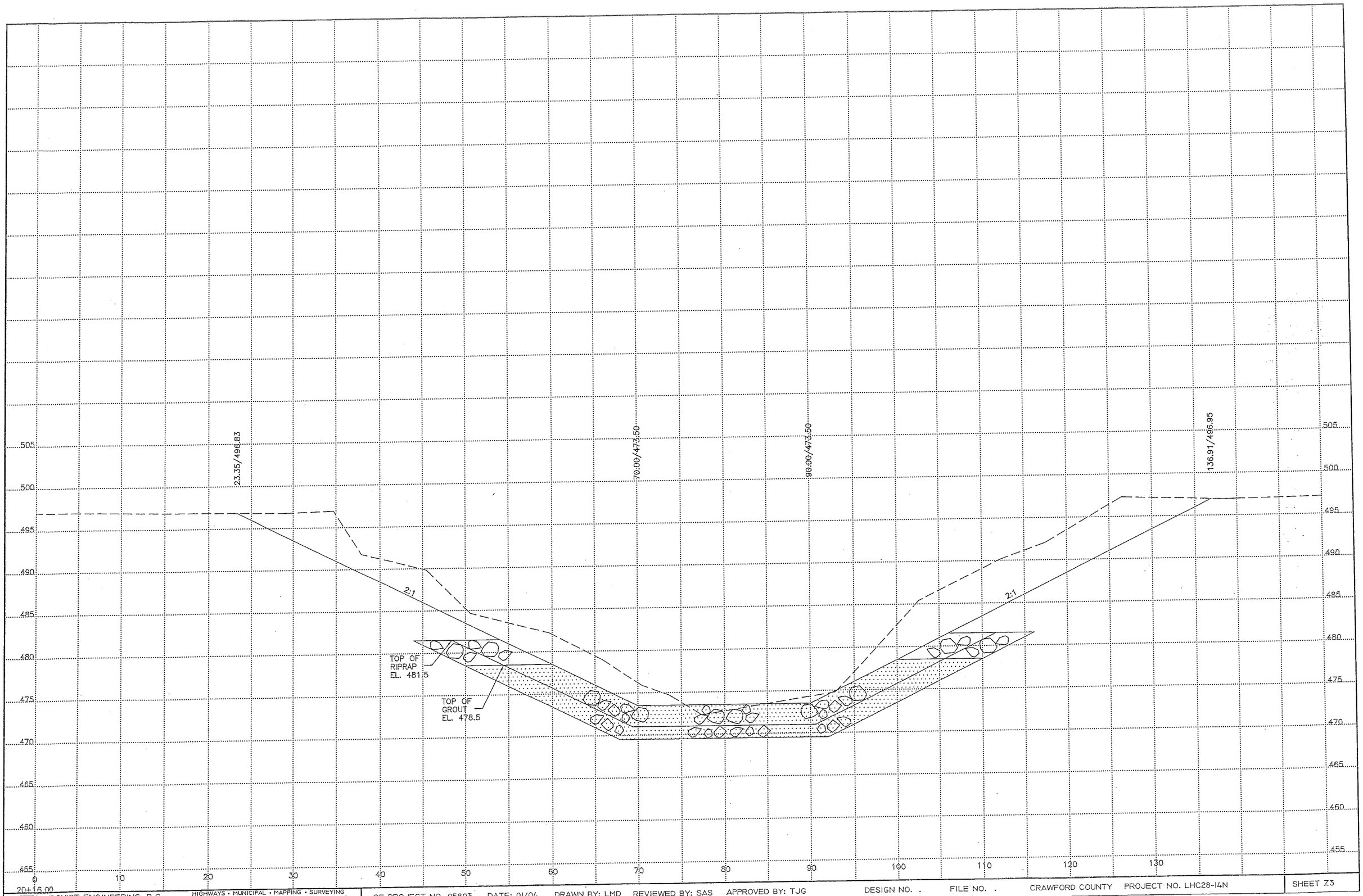
SHEET Z2



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SHEET Z3