

REV.:
CRAWFORD COUNTY
STREAM CHANNEL STABILIZATION STRUCTURE
LHC28-13W
LETTING DATE
08/10/04

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 NO. _____.

DRAWING APPROVAL

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

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

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

Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

**FARM TO MARKET ROAD SYSTEM
CRAWFORD COUNTY**

PROJECT NO. LHC28-13W
STREAM CHANNEL STABILIZATION STRUCTURE
ON 330TH STREET OVER
HICKEY CREEK

IN COOPERATION WITH LOESS HILLS DEVELOPMENT AND
CONSERVATION AUTHORITY - HUNGRY CANYONS ALLIANCE

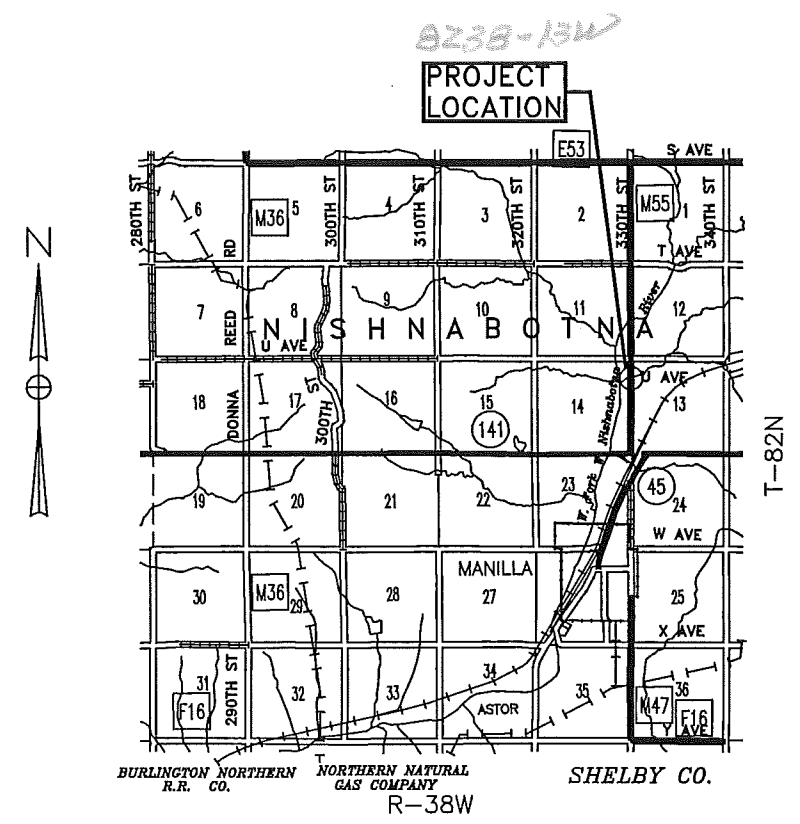
	TOTAL SHEETS
	10
PROJECT NUMBER	
LHC28-13W	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	

INDEX OF SHEETS	
NO.	DESCRIPTION
A1	TITLE SHEET
B1	ESTIMATED PROJECT QUANTITIES AND GENERAL INFORMATION
U1-2	DETAIL SHEETS
V1	WEIR SITUATION PLAN
Z1-5	CROSS SECTIONS - CHANNEL

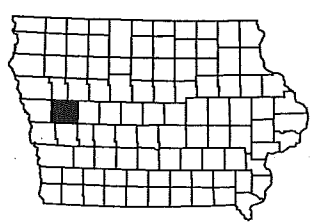
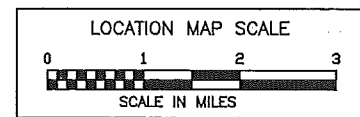
SCALES: As Noted

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				



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



04-30-02	101-4
DESIGN DATA RURAL	
2000 AADT	940 V.P.D.
2020 AADT	- V.P.D.
201X DHV	X V.P.H.
TRUCKS	X %
TOTAL	
DESIGN ESALS	

Approved

Mark Loggins
Lt. Dean Hanger
Robert Johnson
John P. Hawley

BOARD OF SUPERVISORS

Approved

[Signature] 6/29/04
CRAWFORD COUNTY ENGINEER DATE

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.

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

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2005.
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS



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	1524	
2	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	2126	
3	.	PILES, FURNISH & INSTALL STEEL, HP 10x42	LF	78	
4	2501-5775000	PILES, STEEL SHEET	SF	1440	
5	2502-8215124	SUBDRAIN, CORRUGATED METAL PIPE, 24 IN. DIA.	LF	122	
6	2507-3250005	ENGINEERING FABRIC	SY	1260	
7	2507-4011100	CONCRETE GROUT FOR REVETMENT OR GABION	CY	35	
8	2507-6850053	REVETMENT, SPECIAL	TON	1090	
9	2528-8445110	TRAFFIC CONTROL	LS	1	
10	2533-4980005	MOBILIZATION	LS	1	
11	2599-9999010	REMOVAL OF WATER	LS	1	

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.

QUANTITY INCLUDES PLACEMENT OF EMBANKMENT OVER PROPOSED 24" SUBDRAIN IN ACCORDANCE WITH DETAILS ON DRAWING SHEET V1.

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. SUBDRAIN, CORRUGATED METAL PIPE, 24 IN. DIA.
ALL CORRUGATED METAL PIPE LARGER THAN 12 INCHES IN DIAMETER SHALL BE ANNULAR, RIVETED PIPE. "SPIRAL" PIPE WILL NOT BE ALLOWED FOR PIPE DIAMETERS LARGER THAN 12 INCHES. ALL BANDS SHALL BE 24-INCH BANDS.

CONNECTION WITH 24-INCH BAND TO EXISTING FIELD ENTRANCE CULVERT AT STA. 11+44, 167' RT. SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

6. 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.

7. 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.

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

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

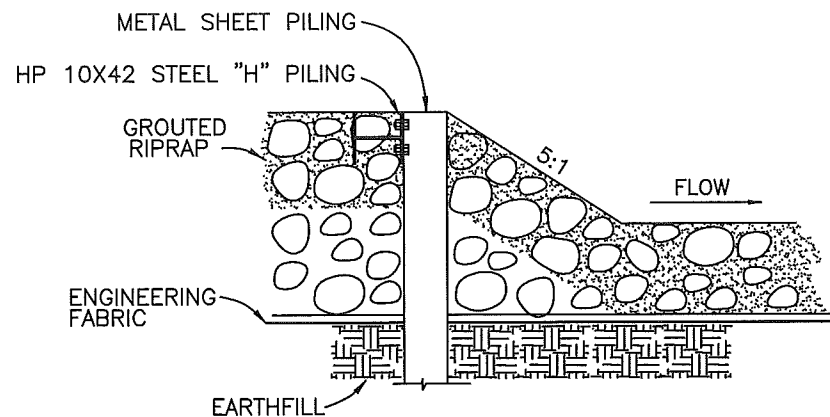
THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF ALL REMNANTS OF RIPRAP STOCKPILES FROM FARM FIELDS UTILIZED BY CONTRACTOR IN THE PROJECT AREA. THIS WORK WILL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.

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.

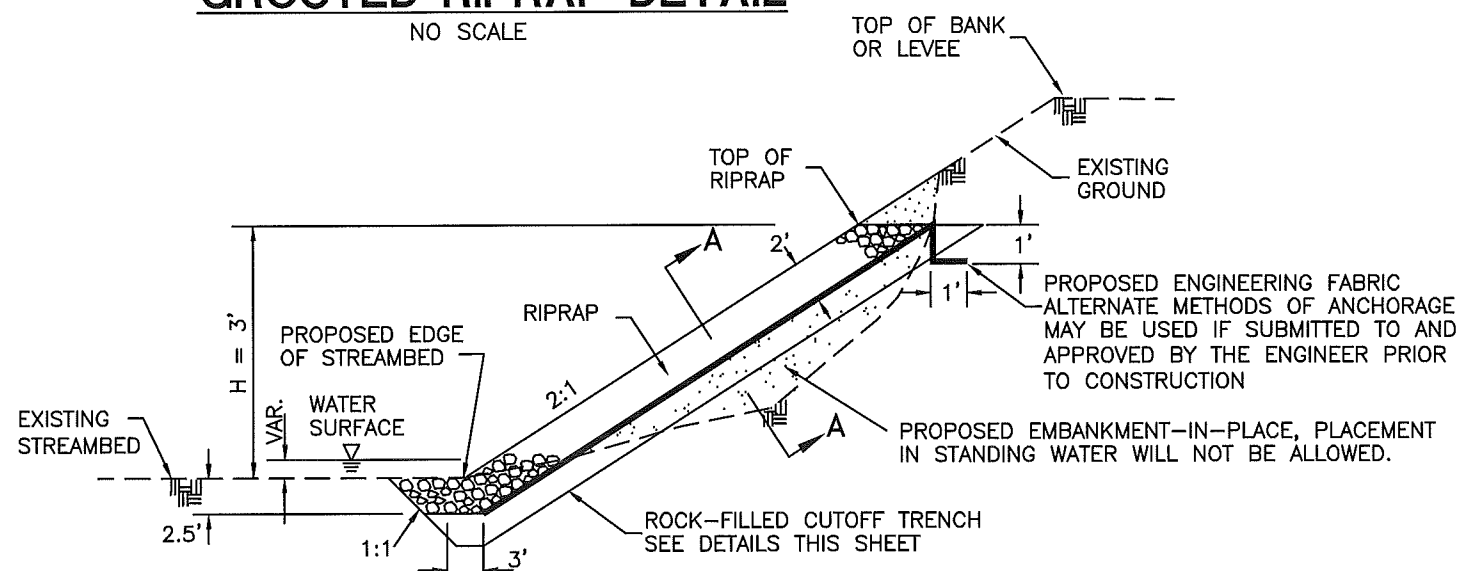
11. REMOVAL OF WATER
THIS ITEM CONSISTS OF DIVERTING SURFACE WATER AND DEWATERING THE SITE AS NEEDED FOR CONSTRUCTION. POLLUTION CONTROL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THIS ITEM. DEWATERING OF SITE SHALL INCLUDE REMOVAL OF WATER FROM THE PROPOSED STILLING BASIN TO FACILITATE PLACEMENT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

ESTIMATED PROJECT QUANTITIES
AND GENERAL INFORMATION



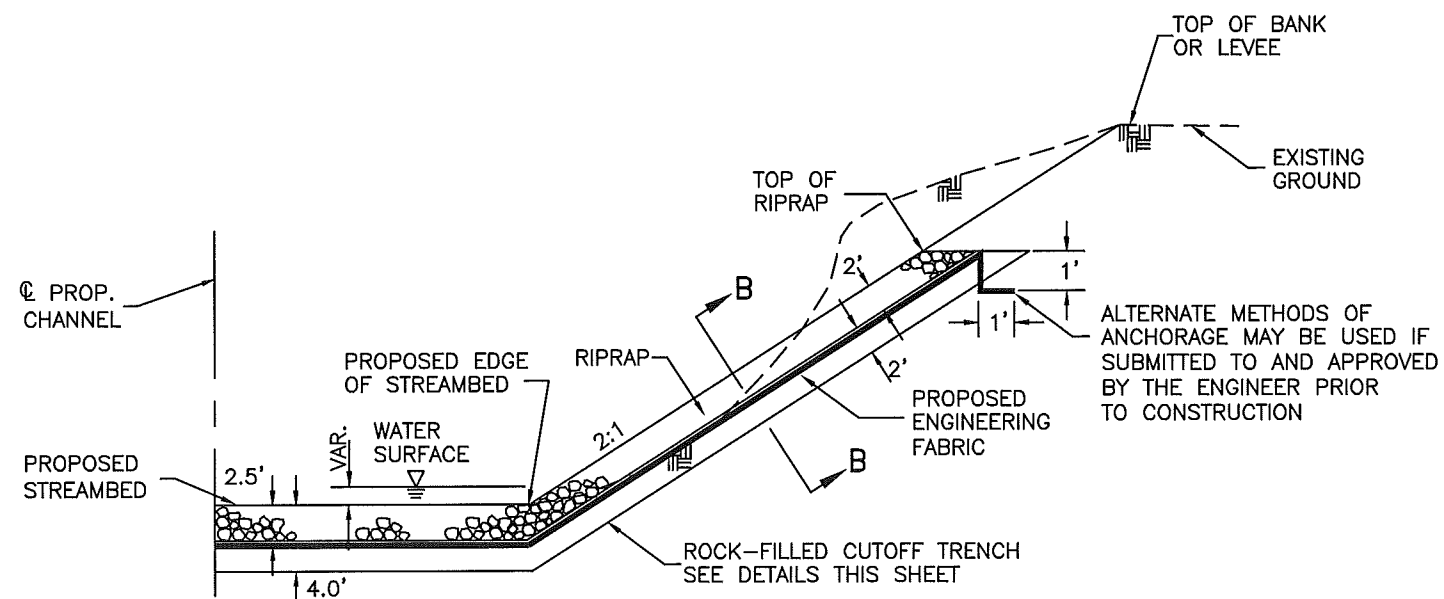
GROUTED RIPRAP DETAIL

NO SCALE



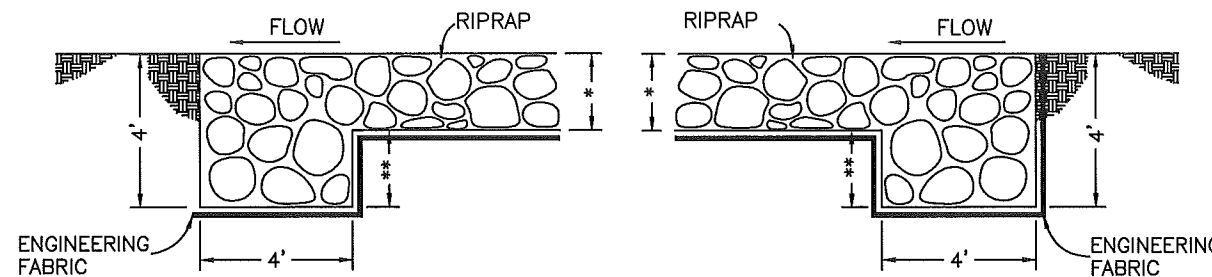
TYPICAL HALF-CHANNEL BANK STABILIZATION SECTION

NO SCALE



TYPICAL FULL-CHANNEL BANK STABILIZATION SECTION

NO SCALE
FOR TOP OF RIPRAP ELEVATIONS SEE CROSS SECTIONS



TYPICAL DOWNSTREAM

TYPICAL UPSTREAM

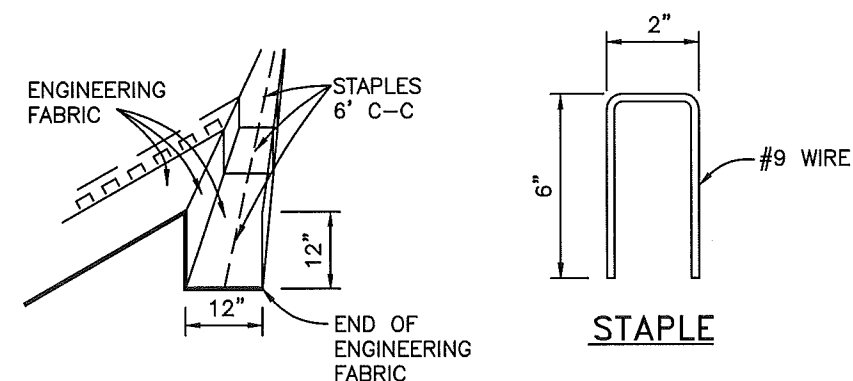
* 2.5' ACROSS CHANNEL BOTTOM
2.0' ON SIDE SLOPES

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

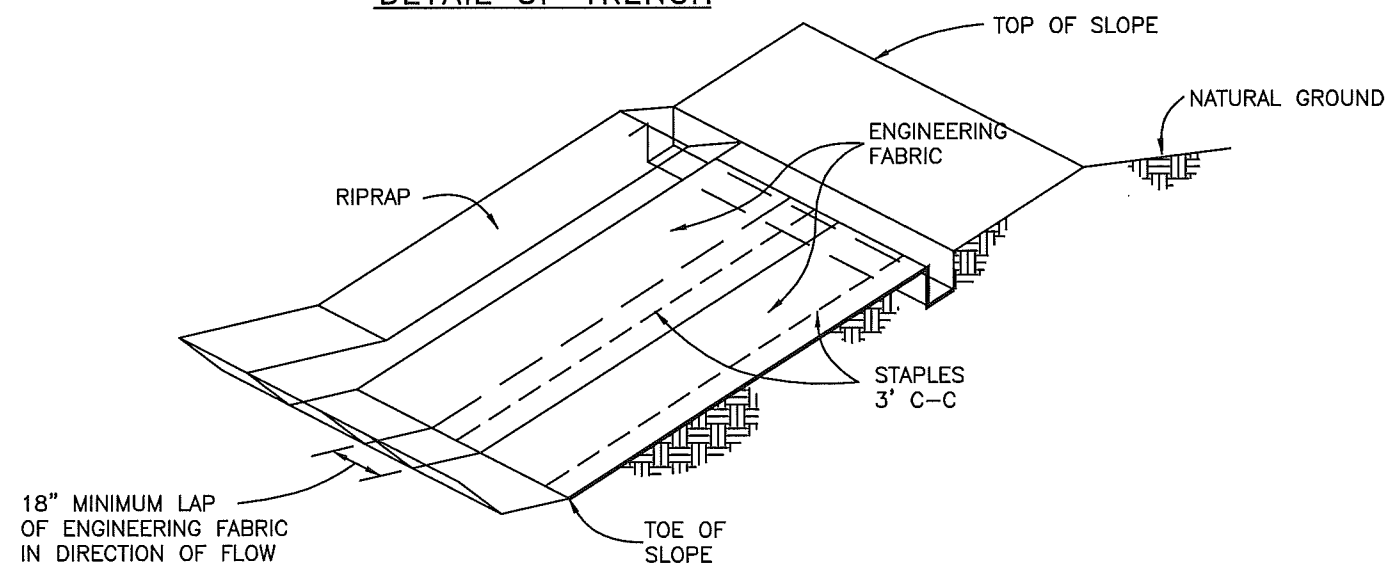
SECTION B-B

ROCK-FILLED CUTOFF TRENCH DETAILS

CONTINUOUS ACROSS BOTTOM WIDTH AND SIDE SLOPES
NO SCALE



DETAIL OF TRENCH



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

REV.:

SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS

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

SE PROJECT NO.: 05703 DATE: 12/03 DRAWN BY: LMD REVIEWED BY: SAS APPROVED BY: TJG

DESIGN NO. . FILE NO. . CRAWFAORD COUNTY PROJECT NO. LHC28-13W

SHEET UI

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

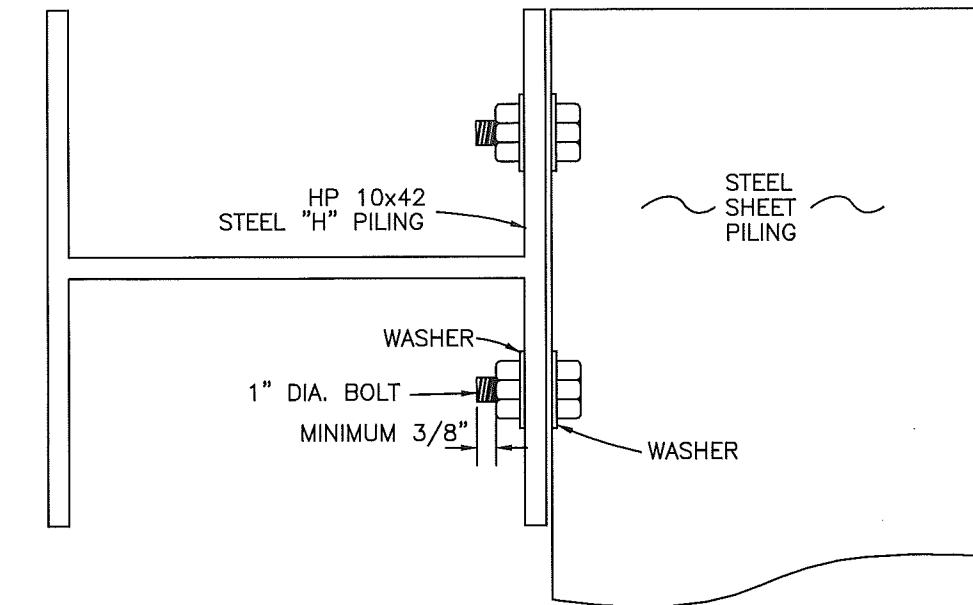
AFTER THE TEMPORARY WORKS HAVE SERVED THEIR PURPOSES, THE CONTRACTOR SHALL REMOVE THEM OR LEVEL AND GRADE THEM TO THE EXTENT REQUIRED TO PRESENT A SIGHTLY APPEARANCE AND TO PREVENT ANY OBSTRUCTION OF THE FLOW OF WATER OR ANY OTHER INTERFERENCE WITH THE OPERATION OF OR ACCESS TO THE PERMANENT WORKS.

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.

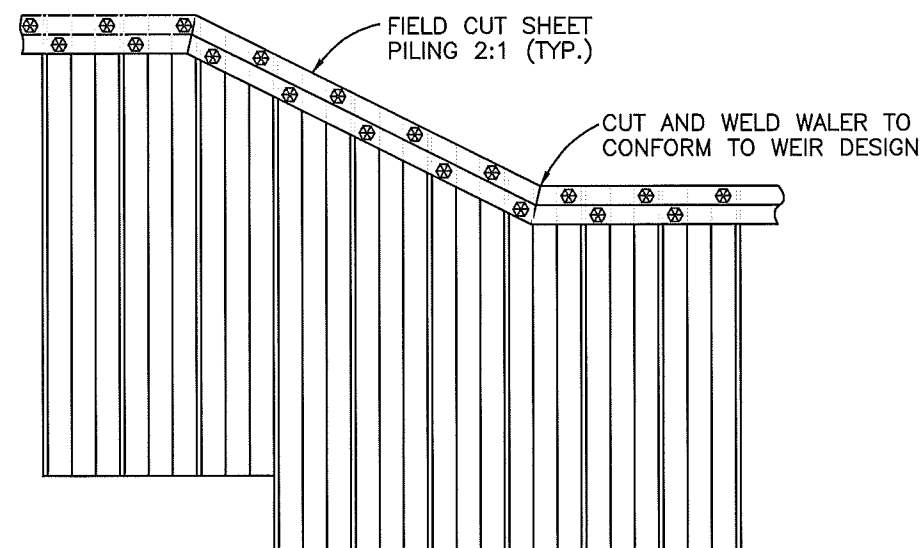
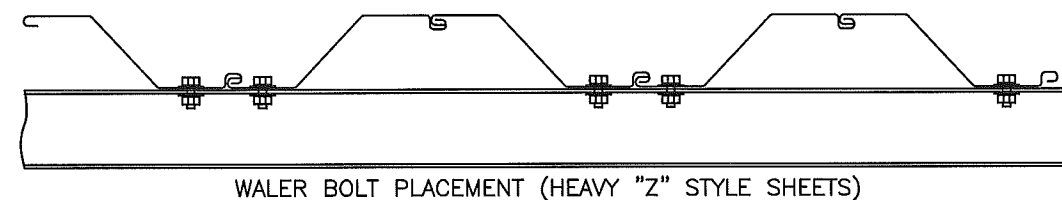
6. MEASUREMENT AND PAYMENT

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



BOLT DETAIL



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.

DETAILS OF WALER

NO SCALE

REV.:

SE SUNDQUIST ENGINEERING, P.C.
CONSULTING ENGINEERS

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

SE PROJECT NO.: 05703 DATE: 06/04 DRAWN BY: LMD REVIEWED BY: SAS APPROVED BY: TJG

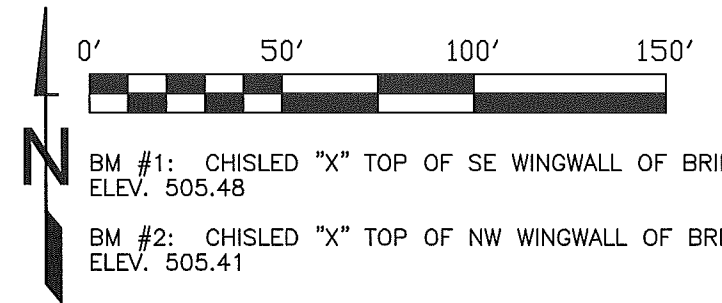
DESIGN NO. .

FILE NO. .

CRAWFORD COUNTY PROJECT NO. LHC28-13W

SHEET U2

PARCEL NUMBER	PROPERTY OWNER
①	JAMES A. & NORMA GROSS
②	SHIREE MAHNKE JENSEN



①
NE1/4 NE1/4
14-82-38

②
NW1/4 NW1/4
13-82-38

HORIZONTAL CONTROL		
STATION	NORTHING	EASTING
NE COR.14	73373.8309	136748.9464
E1/4 COR.14	70738.4310	136737.6979
CP#1	72183.1204	136737.7036
CP#2	72489.3055	136745.1780
8+00	72369.0125	136455.7228
10+24.03	72398.0008	136677.8651
12+50	72397.0453	136903.8374

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

HYDROLOGY AND HYDRAULICS
DRAINAGE AREA = 5.7 SM
CHANNEL SLOPE = 26.72 FT/MILE

STORM	CFS	FT/SEC	STAGE ELEV.*
Q2	466	7.1	485.1
Q5	1090	8.9	487.1
Q10	1637	9.8	488.3
Q25	2415	10.8	489.7
Q50	3030	11.5	490.7
Q100	3709	12.1	491.6

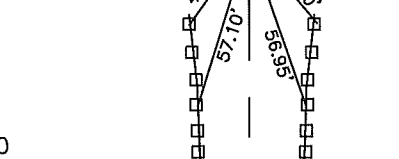
* AT WEIR SECTION STA. 10+00

	EXISTING BROKEN CONCRETE
	LOOSE RIPRAP
	GROUTED RIPRAP

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

CONTROL PT. NO. 2
DISTANCES SLOPE CHAINED

"X" NAILS TOP
GUARD RAIL POSTS

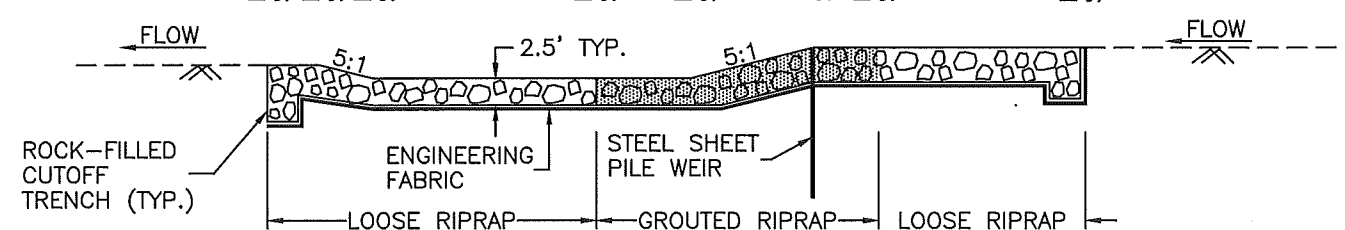


CONTROL PT. NO. 1
DISTANCES SLOPE CHAINED

"X" NAILS TOP
GUARD RAIL POSTS



EL. 476.0 STA. 9+00	EL. 474.0 STA. 9+50	EL. 474.0 STA. 9+65	EL. 481.0 STA. 10+00	EL. 481.0 STA. 10+20	EL. 481.0 STA. 12+00
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SECTION A-A
NOT TO SCALE

SECTION B-B
NOT TO SCALE

