

LETTING DATE

8/23/2011

CRAWFORD COUNTY
PROJECT NO. LWC40-11N

PROJECT TRAFFIC CONTROL PLAN

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 FOR STREETS AND HIGHWAYS" AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (ICA), CHAPTER 130.

TRAFFIC CONTROL TO BE FURNISHED BY CRAWFORD COUNTY.

IOWA DEPARTMENT OF TRANSPORTATION Project Development Division Plans of Proposed Improvement on the SECONDARY ROAD SYSTEM CRAWFORD COUNTY

0.21 MI. EAST OF THE NW COR. SEC. 11 HANOVER TWP.

PROJECT NO. LWC40-11N LOW WATER CROSSING / STREAM BED STABILIZATION IN COOPERATION WITH LOESS HILLS DEVELOPEMENT AND CONSERVATION AUTHORITY - HUNGRY CANYONS ALLIANCE

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2009, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT

Scales As Noted

PROJECT NO. LWC40-11N
FHWA STRUCTURE NO. 129370

ROAD STANDARD PLANS

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

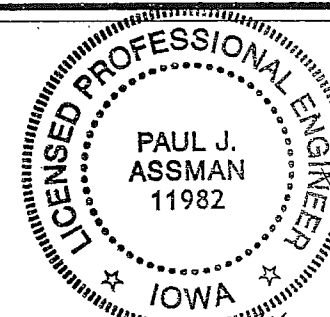
Identification	Date	Identification	Date
EC-201	04/20/11	TC-252	10/20/09

MILEAGE SUMMARY

Div.	Location	Lin. Ft.	Miles
	STA. 9+00 TO STA. 15+00	600.00	0.114
	TOTAL	600.00	0.114

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE PAGE, LOCATION MAP, MILEAGE SUMMARY, TRAFFIC NOTES, ROAD STANDARD PLANS
2	QUANTITY SHEET INCLUDING ESTIMATE OF QUANTITIES, ITEM NOTES, GENERAL NOTES
3	SPECIAL DETAILS GRADE CONTROL
4	SPECIAL DETAILS AND TYPICAL CROSS SECTION
5	SITUATION PLAN GRADING
6	SITUATION PLAN GRADE CONTROL
7	DETAIL SHEET LOW WATER CROSSING AND GRADE CONTROL
8	CHANNEL CROSS SECTIONS
9-11	GRADING CROSS SECTIONS



Pages or sheets covered by this plan: ALL

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.

Paul J. Assman 8/2/2011
Paul J. Assman Date

MY LICENSE RENEWAL DATE IS 12/31/12.

C. J. Blum

Steve Vlesner

Mark J. J. J.

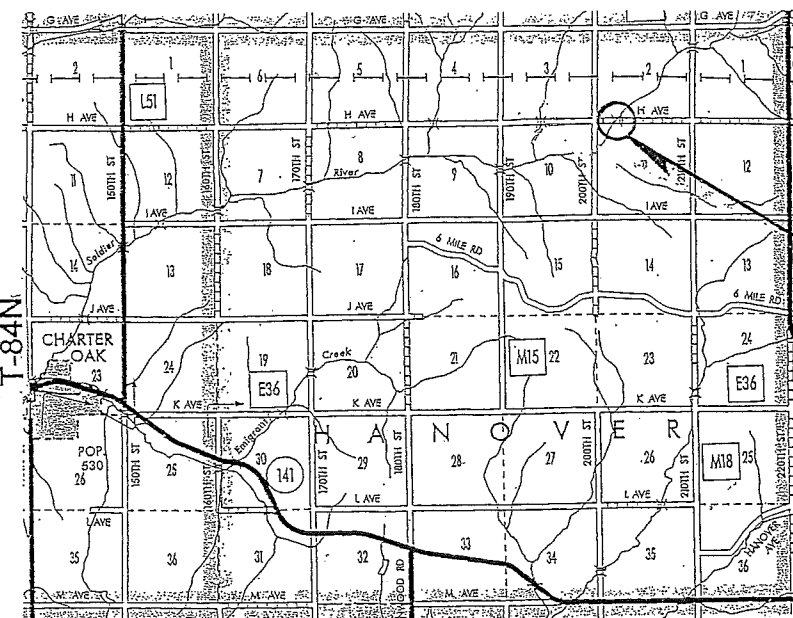
Eugene J. J.

Don Bullen

APPROVED

BOARD OF SUPERVISORS

R-40W



LWC40-11N
LOW WATER CROSSING /
STREAM BED STABILIZATION

LOCATION MAP



0' 2 MILES 4 MILES
SCALE 1" = 2 MILES

2004 ADT = 5 VPD

CRAWFORD COUNTY ENGINEER'S OFFICE
P.O. 458, DENISON, IOWA 51442
PHONE: (712) 263-2449 FAX: (712) 263-3423

DRAWN BY: MFB
REVIEWED BY: PJA
APPROVED BY: PJA

LOW WATER CROSSING / STREAM BED STABILIZATION

PROJECT NO. LWC40-11N SHEET NO. 1 of 11

ESTIMATE REFERENCE INFORMATION

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

1. CLEARING AND GRUBBING

THIS ITEM SHALL CONSIST OF CLEARING AND GRUBBING WITHIN THE LIMITS OF CONSTRUCTION SHOWN ON PLAN SHEET 6.

2. SPECIAL BACKFILL

CRUSHED LIMESTONE OR CRUSHED CONCRETE SPECIAL BACKFILL MATERIAL SHALL BE FURNISHED AND MEET THE REQUIREMENTS OF SECTION 4132 OF THE STANDARD SPECIFICATIONS EXCEPT THAT IT SHALL MEET THE FOLLOWING REQUIREMENTS:

STD. SIEVE SIZE	PERCENT PASSING
1 1/2"	100
3/4"	50-100
#4	10-20
#100	5-15
#200	0-10

MATERIAL SHALL BE PLACED IN LAYERS OF NOT MORE THAN 8 INCHES IN THICKNESS.

3. EXCAVATION CLASS 10, ROADWAY AND BORROW

INCLUDES 3108 C.Y. CUT, 1026 C.Y. FILL + 35% SHRINK. TYPE "A" COMPACTION WILL BE REQUIRED. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.

EXCESS MATERIALS AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF ON SITE OR NEAR SITE BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE COST OF HAULING AND DISPOSING OF THIS MATERIAL SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR CLASS 10 ROADWAY AND BORROW.

4. EXCAVATION CLASS 10 CHANNEL

CUBIC YARDS BASED ON CUT QUANTITIES

ANY "EMBANKMENT IN PLACE" TO BE CONSIDERED INCIDENTAL TO CLASS 10 CHANNEL.

EXCESS MATERIALS AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF ON SITE OR NEAR SITE BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER. 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 BASED ON PLAN QUANTITY.

5. CULVERT, CORR. METAL ROADWAY PIPE, 24 IN. DIA.

ALL METAL PIPE SHALL BE RIVETED PIPE WITH ANNULAR CORRUGATIONS. ALL BANDS SHALL HAVE ANNULAR CORRUGATIONS AND SHALL BE THE SAME THICKNESS AS THE PIPE. BANDWIDTHS SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 441 EXCEPT THAT NO BAND SHALL BE LESS THAN 24 INCHES IN WIDTH. SPECIAL PIPE WILL NOT BE ALLOWED.

6. ENGINEERING FABRIC

SEE PLAN SHEET 3 - 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

CONCRETE GROUT FOR REVETMENT OR GABION SHALL MEET THE REQUIREMENTS OF ARTICLE 2507.02.

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.

THE GROUTED SURFACE ON THE TRAVELED PORTION OF THE ROADWAY SHALL BE RAKED AND/OR TROWELED AS DIRECTED BY THE ENGINEER TO PROVIDE A UNIFORM AND REASONABLY SMOOTH SURFACE WITH NO PROTRUDING REVETMENT.

8. REVETMENT SPECIAL

SPECIAL REVETMENT SHALL MEET THE REQUIREMENTS OF ARTICLE 2507.03, CLASS B REVETMENT.

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

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.

REFER TO PLAN SHEET 4 FOR ADDITIONAL REQUIREMENTS OF THIS ITEM.

ESTIMATE OF QUANTITIES

LWC40-11N

REF. NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2101-0850002	CLEARING AND GRUBBING	UNIT	43.8
2	2102-0425070	SPECIAL BACKFILL	TON	193
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY & BORROW	CY	3108
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	2706
5	2417-1060024	CULVERT, CORR. METAL ROADWAY PIPE, 24 IN. DIA.	LF	184
6	2507-3250005	ENGINEERING FABRIC	SY	1116
7	2507-4011100	CONCRETE GROUT FOR REVETMENT OR GABION	CY	178.7
8	2507-6850053	REVETMENT, SPECIAL	TON	1257.9
9	2533-4980005	MOBILIZATION	LS	1
10	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 DURING CONSTRUCTION.

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 WILL BE PROVIDED BY THE OWNER IN ACCORDANCE WITH ARTICLE 1105.06.

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, NONWETLAND 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.

SEEDING WILL BE COMPLETED BY OTHERS.

BRIDGE REMOVAL WILL BE COMPLETED BY OTHERS.

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.

ESTIMATE OF QUANTITIES AND NOTES

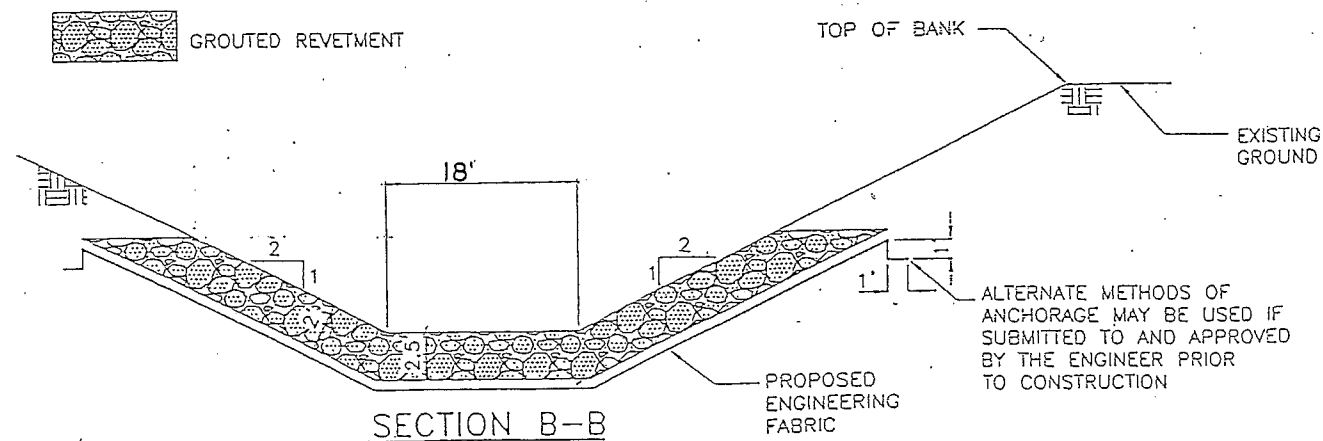
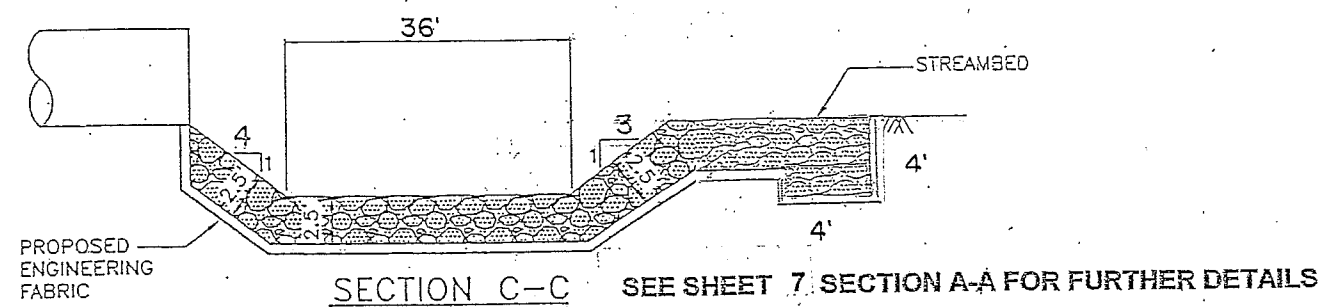
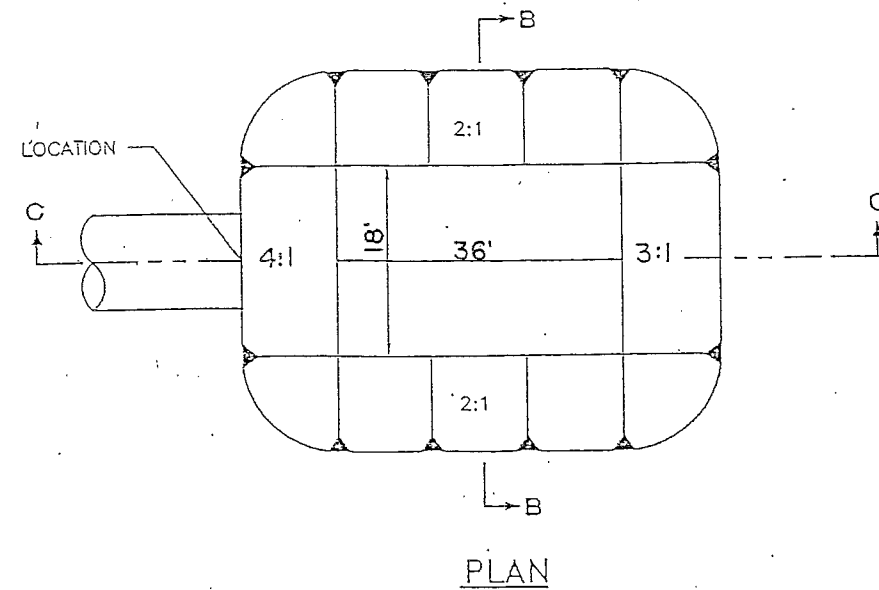
CRAWFORD COUNTY ENGINEER'S OFFICE
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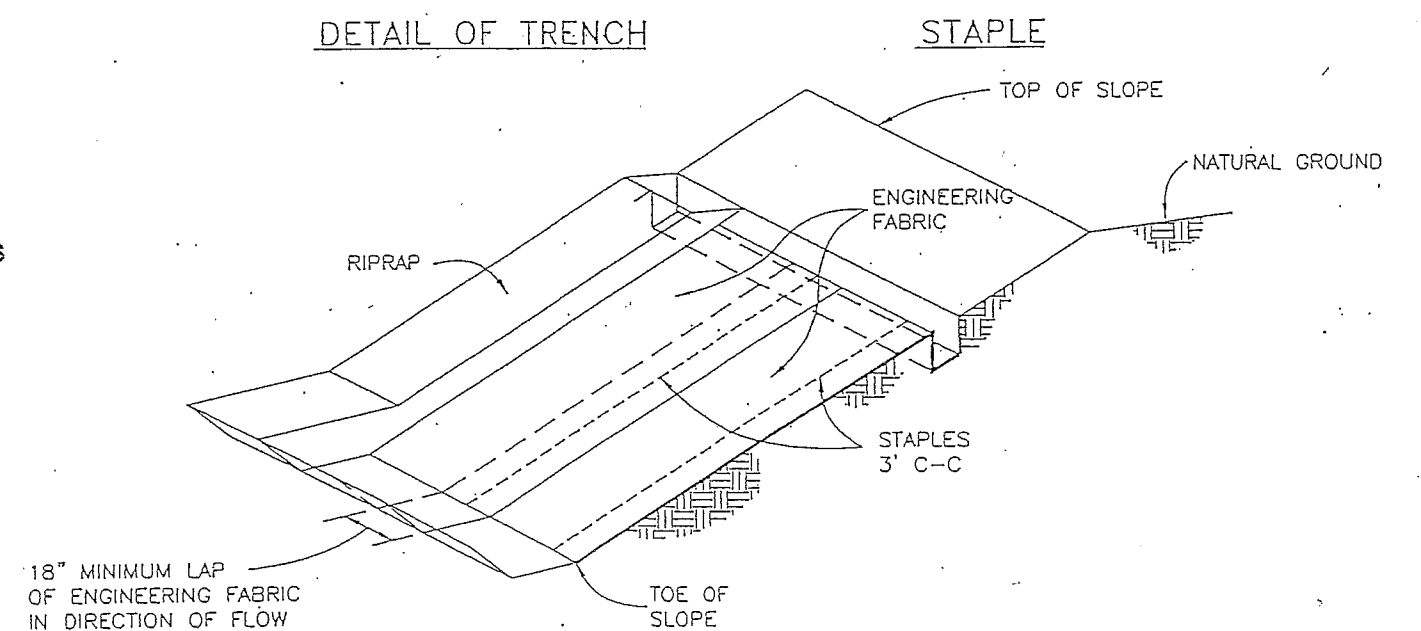
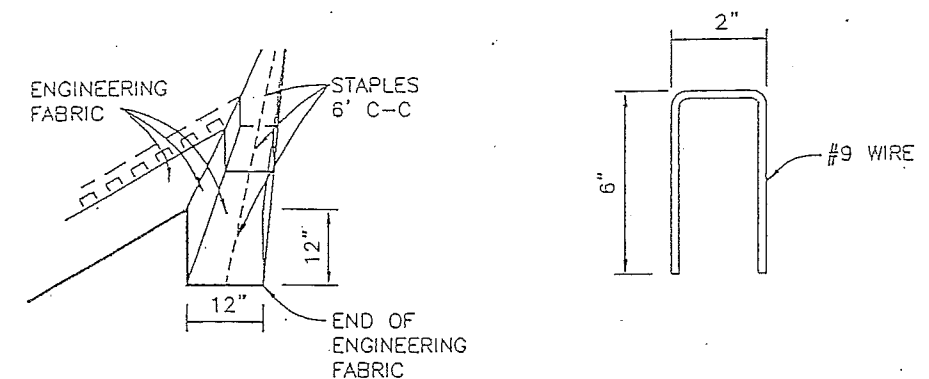
LOWER WATER CROSSING

PROJECT NO. LWC40-11N

SHEET NO. 2 of 11



DETAILS OF PREFORMED SCOUR HOLE
NO SCALE



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 GRADE CONTROL

REMOVAL OF WATER

TYPICAL GRADING CROSS SECTION

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.

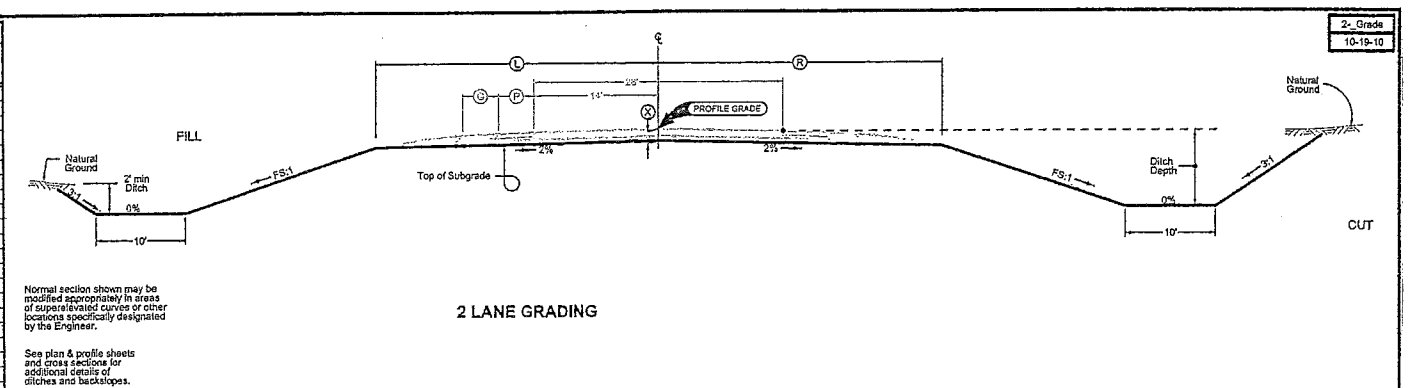
5. REMOVAL OF TEMPORARY WORKS

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 WORK.

[illegible]

SPECIAL DETAILS AND TYPICAL CROSS SECTION

Existing 104'x18' Bridge
Bridge No. 129370
over Soldier River

R. HUEBNER
R. SCHULTZ
R. SCHULTZ
R. UNZICKER

JAMES SAILER

MARLAN HARM
R. WESSEL & C. BRUAN
TRUSTEE

Iron Pin

wood pos.
500.0
VC=100'
MO=1.11'

wood pos.

Iron Pin

DENCO-B LTD

500.0
VC=100'
MO=0.93'

NOT TO SCALE

4-24"x46" CMPS
14 gage, Annular
corr's 40° skewed
ends.

Hydraulics: (DA=10.4 sq. mi.)

Region II

$Q_c = a A^b$

$Q_c = 2.0$

$a = 6.78$

$b = 0.90$

$Q_c = (6.78)(8.23) = 56 cfs$

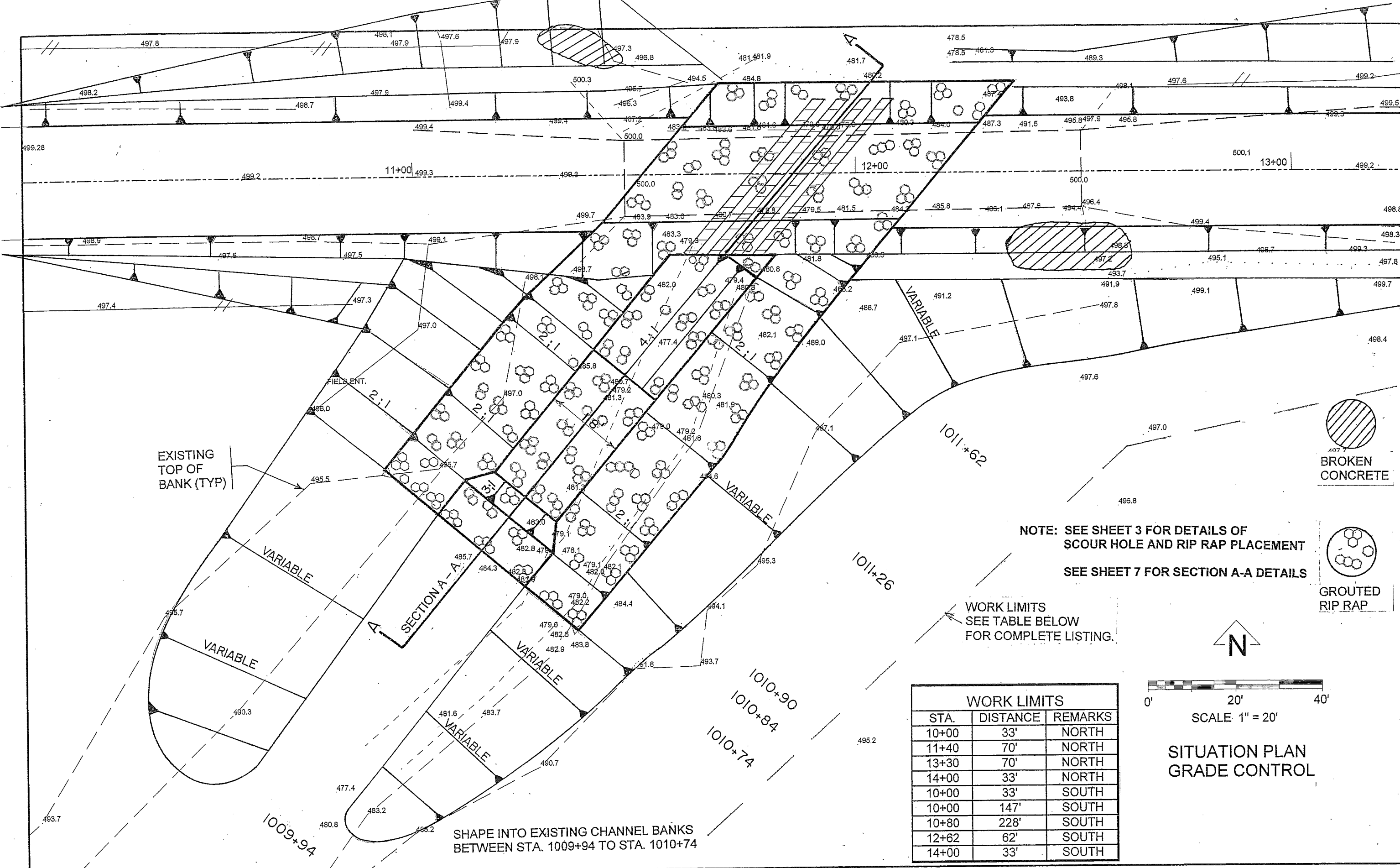
$56 cfs = 14 cfs$

$24" cnp \frac{H_w}{D} = 1.1, H_w = 2.2'$

Location:

Between Sec's 2 & 11
Hanover township
Crawford County
Project No. LWC40-11N

SITUATION PLAN GRADING



EXISTING
TOP OF
BANK (TYP)

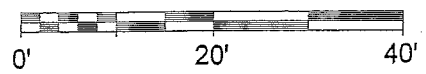
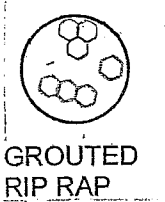
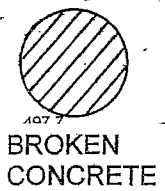
FIELD ENT.

SECTION A-A

SHAPE INTO EXISTING CHANNEL BANKS
BETWEEN STA. 1009+94 TO STA. 1010+74

NOTE: SEE SHEET 3 FOR DETAILS OF
SCOUR HOLE AND RIP RAP PLACEMENT
SEE SHEET 7 FOR SECTION A-A DETAILS

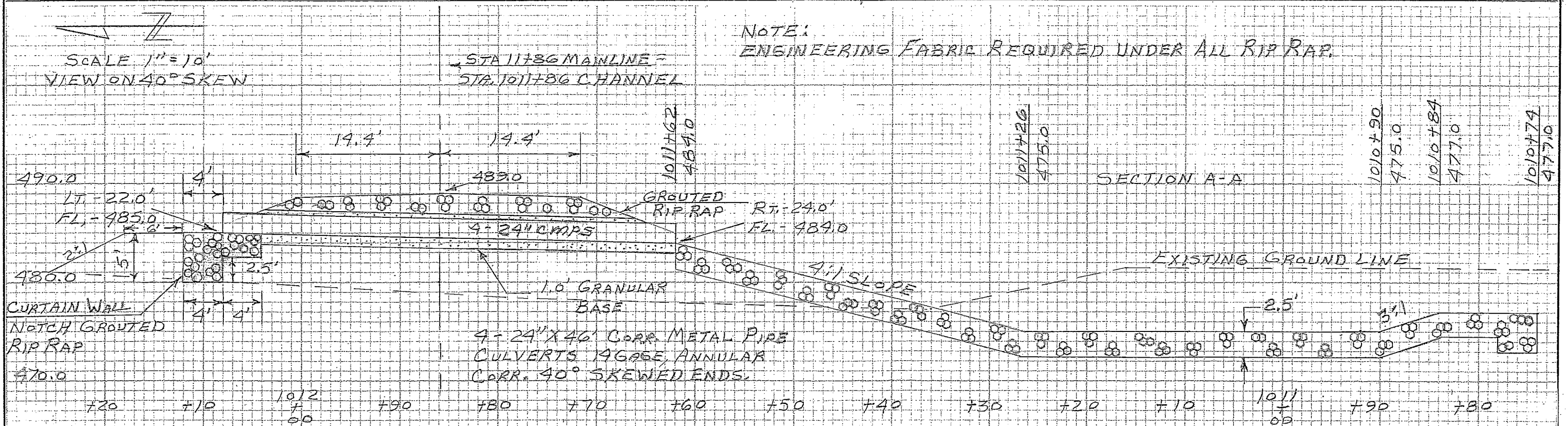
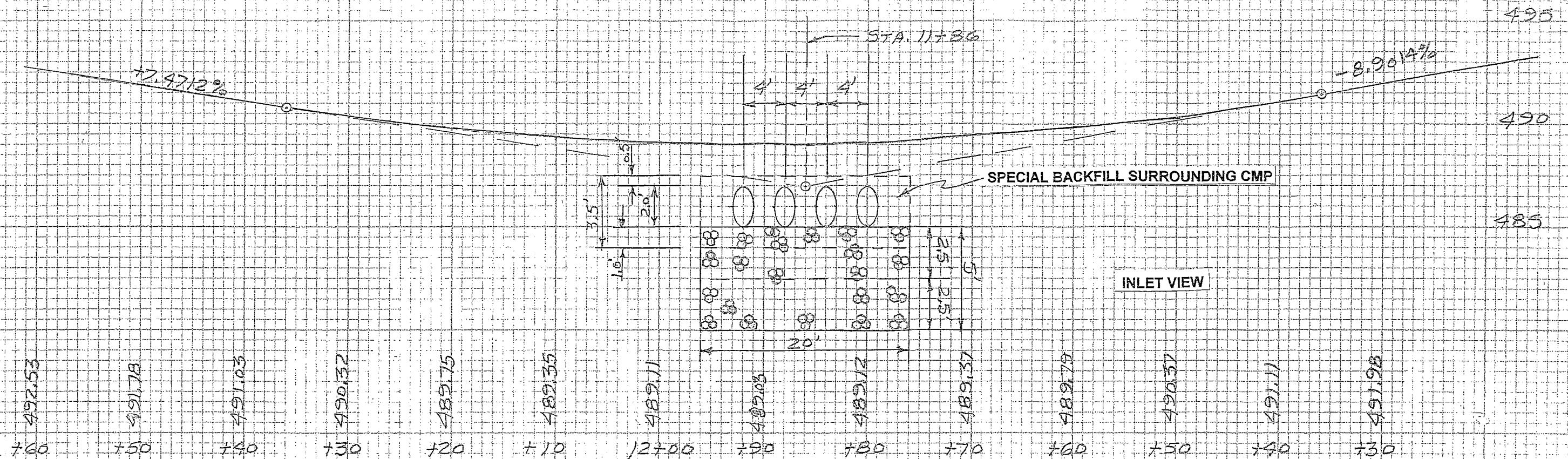
WORK LIMITS
SEE TABLE BELOW
FOR COMPLETE LISTING.



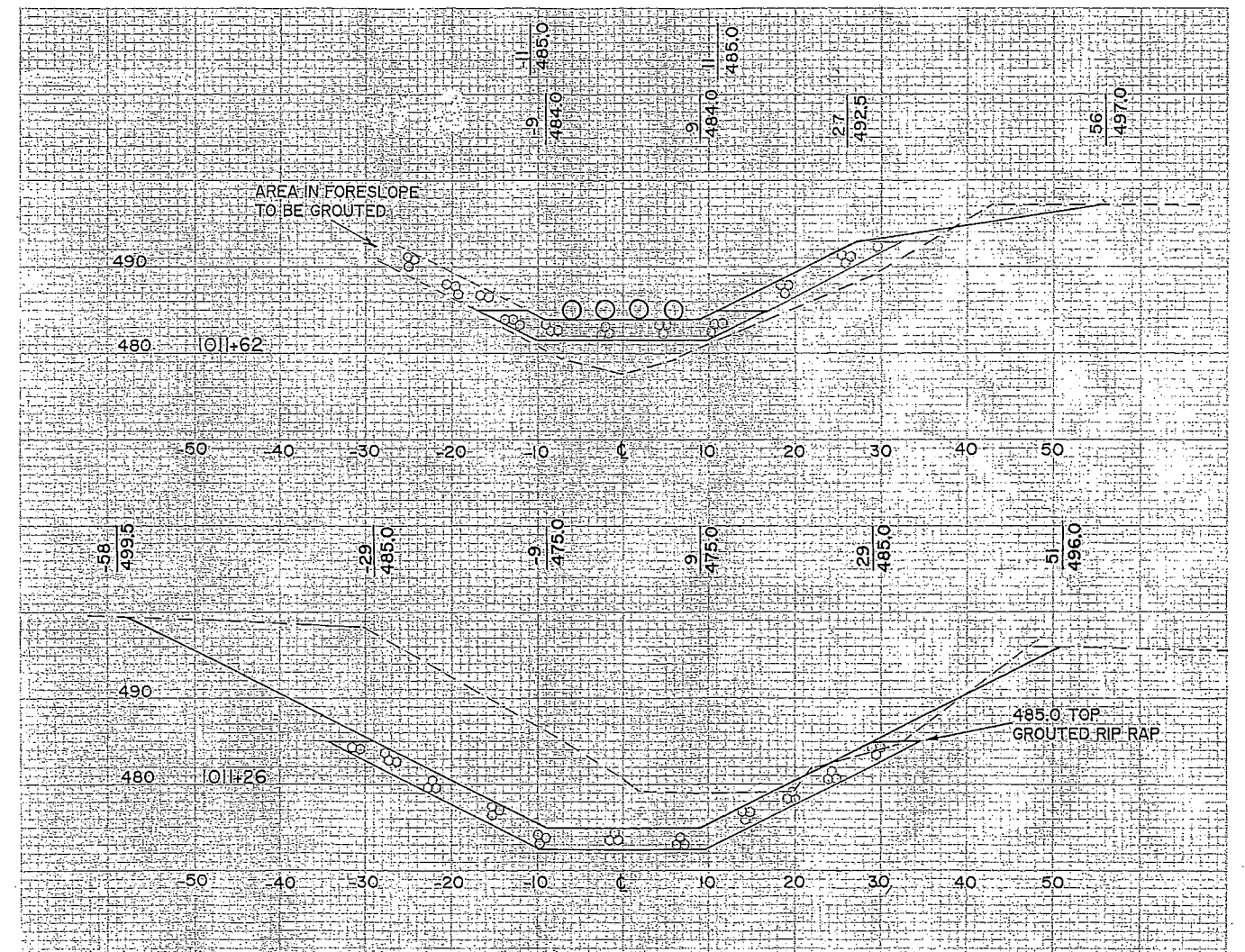
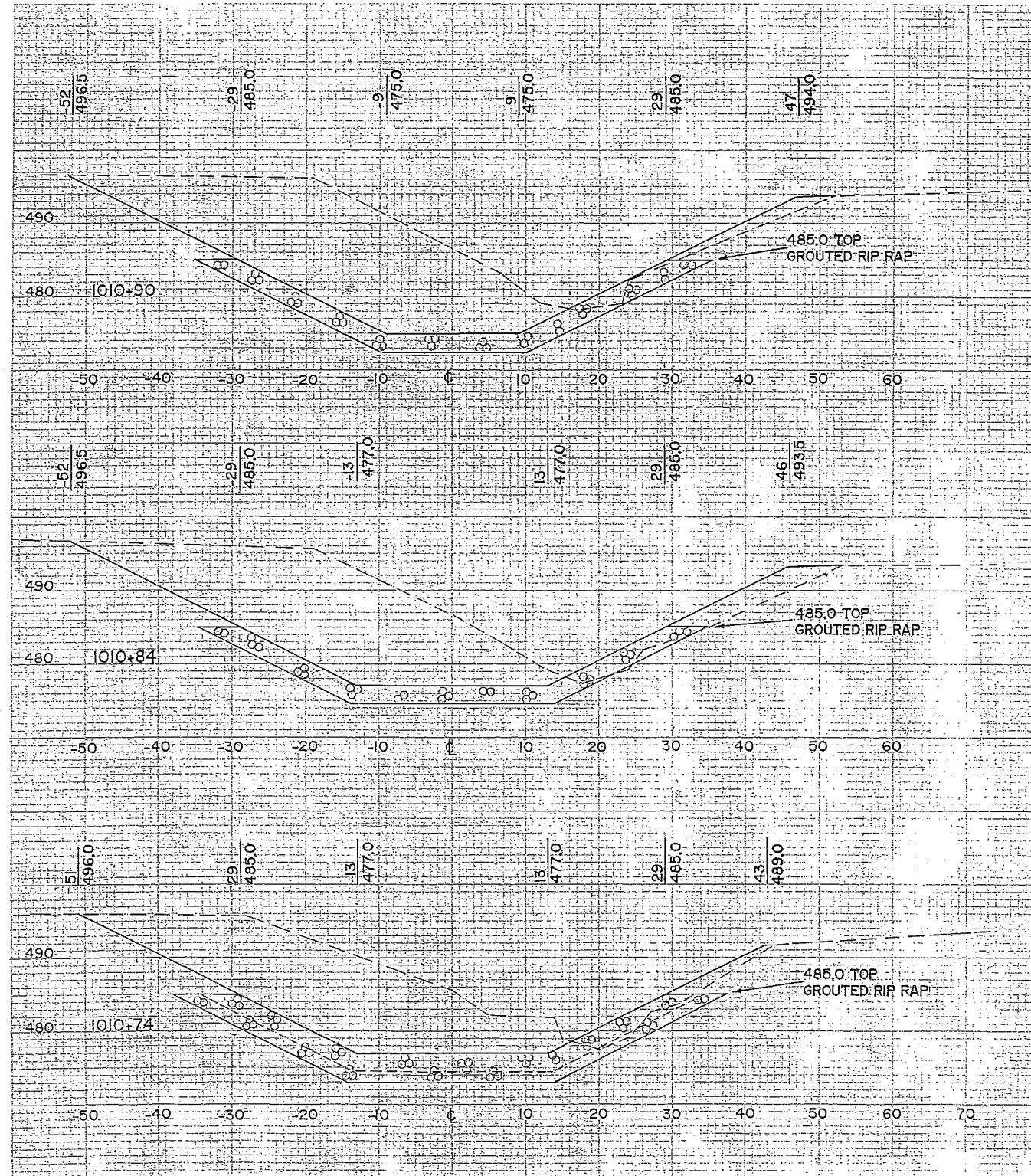
SCALE 1" = 20'

SITUATION PLAN
GRADE CONTROL

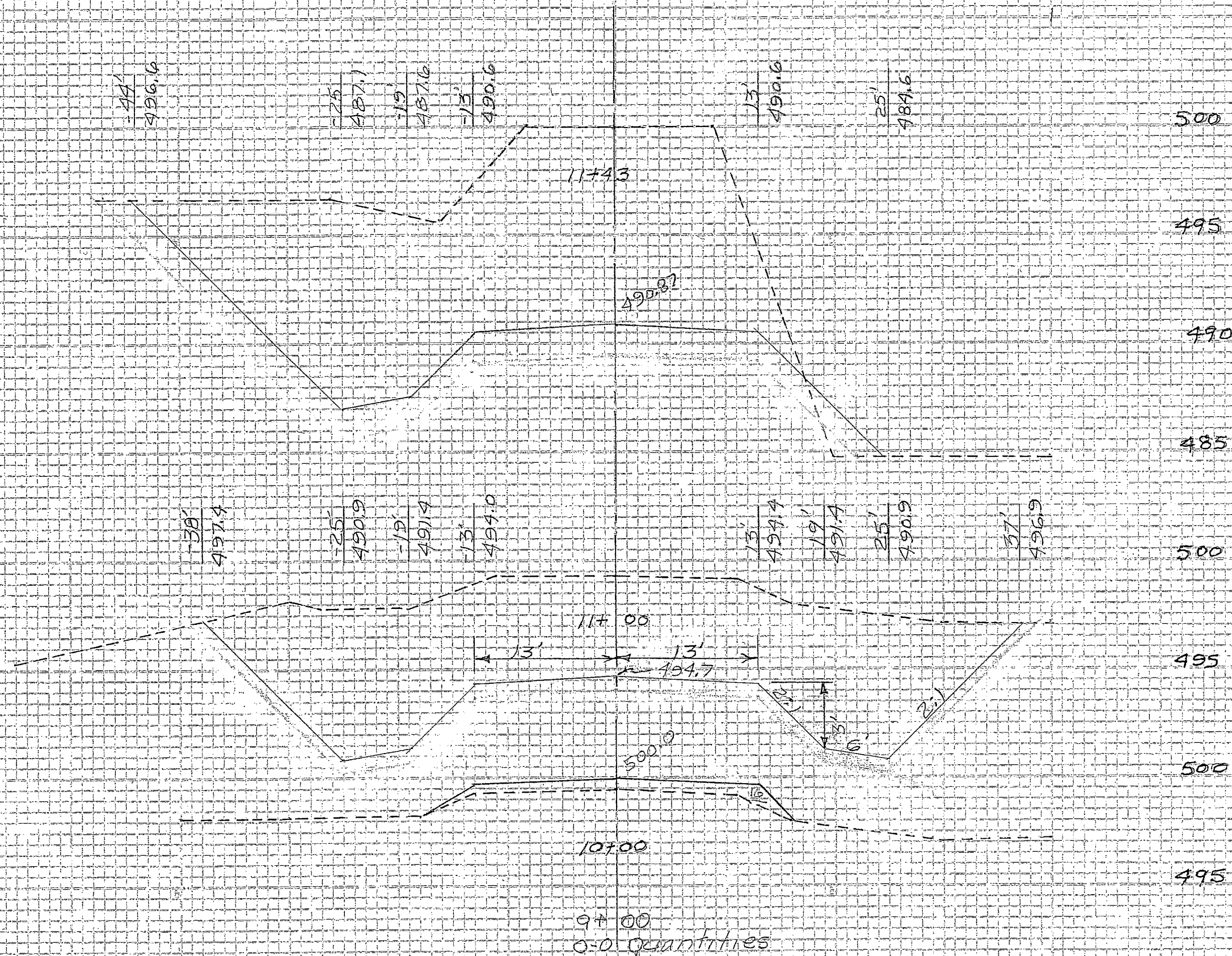
WORK LIMITS		
STA.	DISTANCE	REMARKS
10+00	33'	NORTH
11+40	70'	NORTH
13+30	70'	NORTH
14+00	33'	NORTH
10+00	33'	SOUTH
10+00	147'	SOUTH
10+80	228'	SOUTH
12+62	62'	SOUTH
14+00	33'	SOUTH



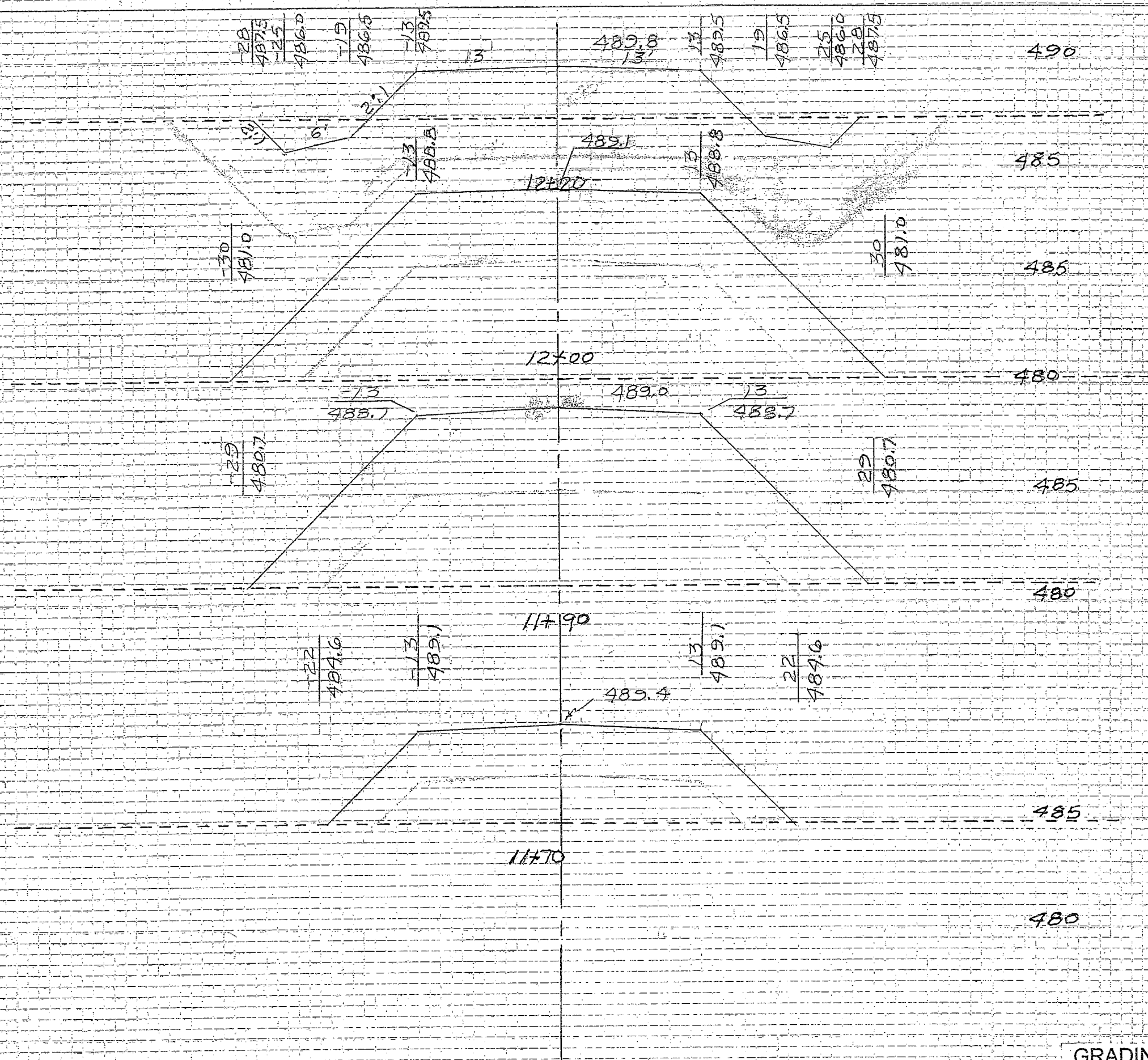
DETAIL SHEET LOW WATER CROSSING AND GRADE CONTROL



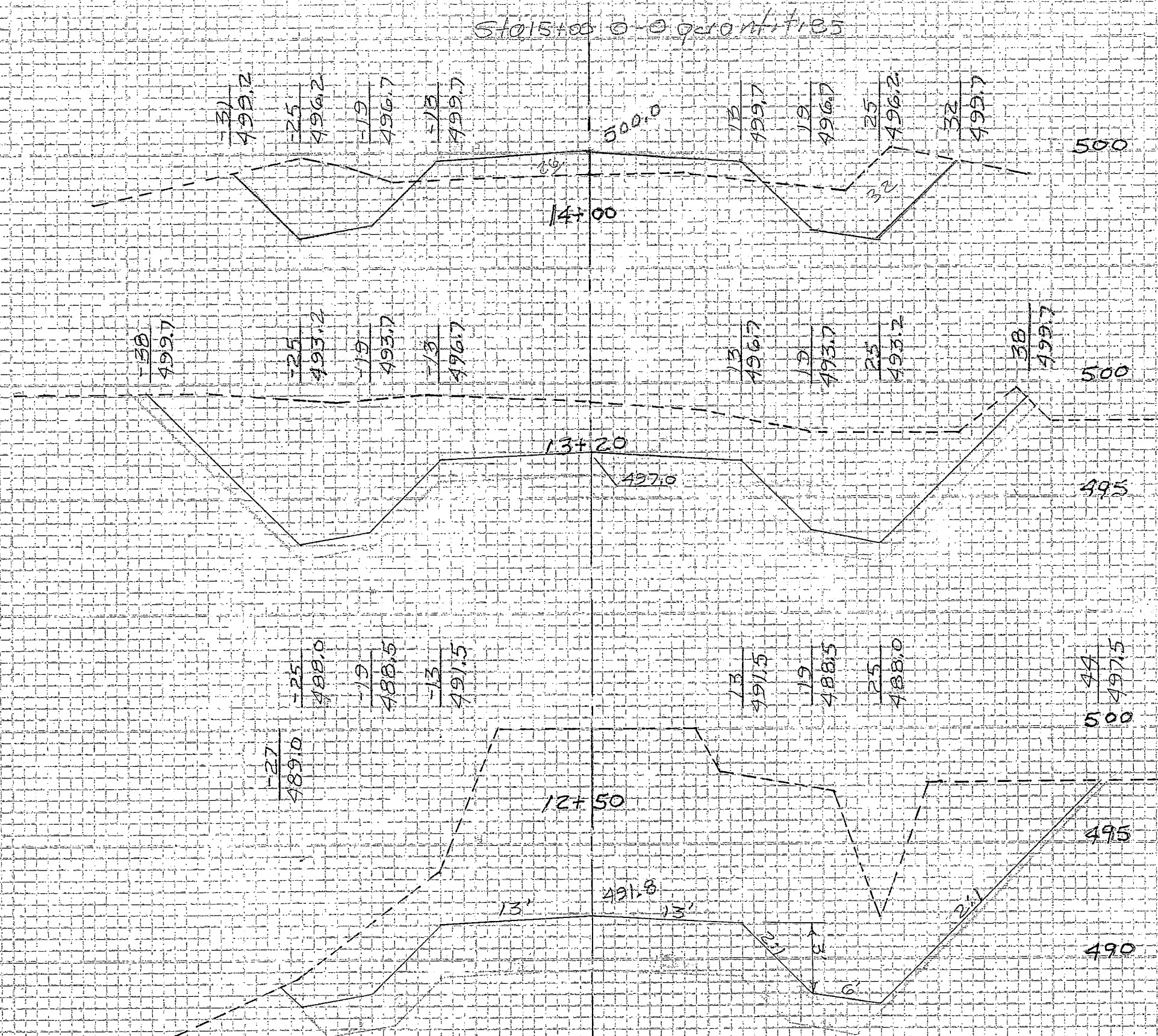
CHANNEL CROSS SECTIONS



GRADING CROSS SECTIONS



GRADING CROSS SECTIONS



GRADING CROSS SECTIONS