

LETTING DATE
01/20/2016

RCB CULVERT REPLACEMENT - TWIN BOX
BROS-C024(108)--5F-24

CRAWFORD COUNTY

CRAWFORD COUNTY

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. TEMPORARY TRAFFIC CONTROL DEVICES FOR THE DETOUR ROUTE WILL BE PROVIDED, INSTALLED, AND MAINTAINED BY THE COUNTY.

281-1
10-15-13

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide Permit No. 14, Permit No. CEMVR-OD-P-2015-880. A copy of this permit is available from the Iowa DOT website (<http://envpermits.iowadot.gov/CMERPortalENV/Home.aspx>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice

DRAWING APPROVAL

ALL SHOP DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY THE CRAWFORD COUNTY ENGINEER.

ADDRESS: 1202 BROADWAY, P.O. BOX 458
DENISON, IOWA 51442-0458
TELEPHONE: (712)263-2449
EMAIL: passman@crawfordcounty.org

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



Highway Division

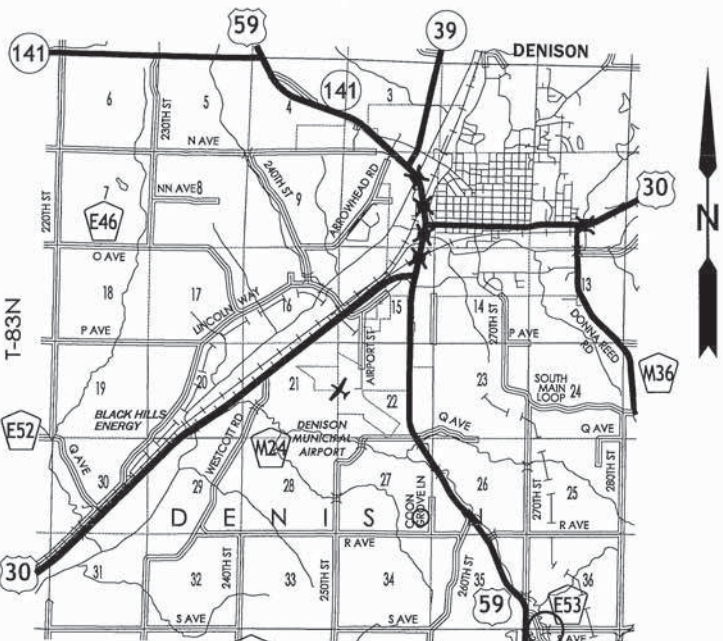
PLANS OF PROPOSED IMPROVEMENTS ON THE

**FARM-TO-MARKET SYSTEM
CRAWFORD COUNTY**

PROJECT NO. BROS-C024(108)--5F-24
RCB CULVERT REPLACEMENT - TWIN BOX
ON E53 (S AVENUE) 0.2 MILES EAST OF U.S. 59
OVER COON CREEK

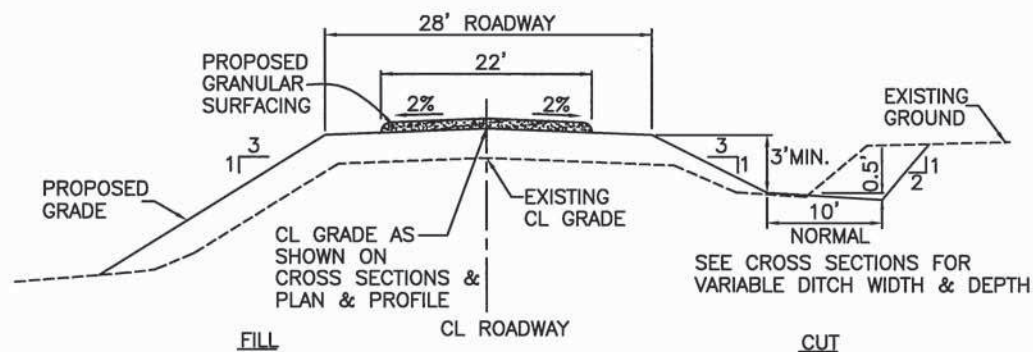
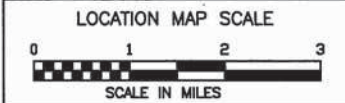
SCALES: AS NOTED

REFER TO THE PROPOSAL FORM FOR LIST OF APPLICABLE SPECIFICATIONS.



STA. 7+45
PROPOSED TWIN 10'x10'x82' RCB CULVERT
15' SKEW RT. AHEAD
B.O.P. STA. 6+25
E.O.P. STA. 8+25

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



TYPICAL CROSS SECTION
NOT TO SCALE

UTILITY CONTACTS

WESTERN IOWA POWER COOPERATIVE
James Freml
Phone: 712-263-2943
Email: wipco@pionet.net

QUAD COUNTY COMMUNICATIONS
Larry Nepl
Phone: 712-664-2221
Email: cornbelt@netins.net

DENISON MUNICIPAL UTILITIES
Roger Bukacek
Phone: 712-263-3046
Email: rbukacek@dmuonline.com

CTLQL-CENTURYLINK
Tom Sturmer
Phone: 303-664-8090
Email: Thomas.sturmer@centurylink.com

FRONTIER COMMUNICATIONS
Trent Flockhart
Phone: 515-573-1268
Email: trent.flockhart@ftr.com

TOTAL SHEETS	11
PROJECT NUMBER	BROS-C024(108)--5F-24
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
FHWA STRUCTURE NO.	126580

INDEX OF SHEETS

NO.	DESCRIPTION
A1	TITLE SHEET
C1	ESTIMATED PROJECT QUANTITIES
C1	STANDARD ROAD PLANS
C1-2	ESTIMATE REFERENCE INFORMATION
C3	TABULATIONS
G1	DETAILS OF REFERENCE INFORMATION
Q1	SOILS SHEET
U1	DETAIL SHEET
V1	SITUATION PLAN
W1	CROSS SECTIONS - ROADWAY
Z1-2	CROSS SECTIONS - CHANNEL

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON PLAN SHEET C1.

STANDARD CULVERT PLANS

STANDARD CULVERT PLANS ARE LISTED ON PLAN SHEET C1.

MILEAGE SUMMARY

LOCATION	LIN. FT.	MILES
BOP STA. 6+25 TO EOP STA. 8+25	200.00	
NET LENGTH OF ROADWAY	200.00	0.038

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A1	TROY J. GROTH	PRIMARY SIGNATURE BLOCK
Q1	JAMES A. BERTSCH	GEOTECHNICAL DESIGN

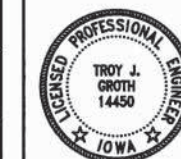
Approved

<i>[Signature]</i>	
<i>[Signature]</i>	
<i>[Signature]</i>	
<i>[Signature]</i>	
<i>[Signature]</i>	
BOARD OF SUPERVISORS	

Approved

[Signature] 10/13/15
CRAWFORD COUNTY ENGINEER DATE

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
[Signature] 10/15/15
TROY J. GROTH, P.E. #14450 DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2015.
PAGES OR SHEETS COVERED BY THIS SEAL:
A1, C1-3, G1, U1, V1, W1, Z1-2



04-30-02 101-4

DESIGN DATA RURAL

2012 AADT	80	V.P.D.
2036 AADT	100	V.P.D.
201X DHV	X	V.P.H.
TRUCKS	X	%
TOTAL		
DESIGN ESALS		

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QTY.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	0.7	
2	2102-0425071	SPECIAL BACKFILL	CY	136.8	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	2810.1	
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	236.5	
5	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	121.5	
6	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	368.6	
7	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	88.3	
8	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
9	2402-2720000	EXCAVATION, CLASS 20	CY	942	
10	2402-2725005	FOUNDATION TREATMENT MATERIAL	TON	223.800	
11	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	323.3	
12	2404-7775000	REINFORCING STEEL	LB	48400	
13	2507-3250005	ENGINEERING FABRIC	SY	938.7	
14	2507-6800021	REVTMENT, CLASS B	TON	45.0	
15	2507-6875002	REVTMENT, REMOVE AND REPLACE	CY	42.1	
16	2518-6910000	SAFETY CLOSURE	EACH	2	
17	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
18	2528-8445110	TRAFFIC CONTROL	LS	1.00	
19	2533-4980005	MOBILIZATION	LS	1.00	
20	2602-0000020	SILT FENCE	LF	815.0	
21	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	

STANDARD ROAD PLANS

105-4
10-18-11

The following Standard Road Plans apply to construction work on this project.

NUMBER	DATE	TITLE
EC-201	04-21-15	SILT FENCE
EW-101	10-20-15	EMBANKMENT AND REBUILDING EMBANKMENTS
TC-1	04-16-13	WORK NOT AFFECTING TRAFFIC (TWO-LANE OR MULTI-LANE)
TC-252	10-20-15	ROUTES CLOSED TO TRAFFIC

STANDARD CULVERT PLANS

STANDARD	ISSUED	REVISED
TWRCB G1-12	APRIL, 2012	10-12
TWRCB G2-12	APRIL, 2012	07-14
TWRCB 10-10-12	APRIL, 2012	
TWH 15-1-12	APRIL, 2012	
TWH 15-2-12	APRIL, 2012	
TWH 15-3-12	APRIL, 2012	
TWH 15-4-12	APRIL, 2012	
TWH 15-5-12	APRIL, 2012	05-13
TWH 15-7-12	APRIL, 2012	

INDEX OF TABULATIONS

111-25
10-18-11

Tabulation	Tabulation Title	Sheet No.
100-1A	ESTIMATED PROJECT QUANTITIES	C1
100-17	TABULATION OF SILT FENCES	C3
105-4	STANDARD ROAD PLANS	C1
108-13A	SAFETY CLOSURES	C3
111-25	INDEX OF TABULATIONS	C1
	TABULATION OF EARTHWORK QUANTITIES	C3
	PLACEMENT OF QUANTITIES	C3

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Description
1	2101-0850001 CLEARING AND GRUBBING INCLUDES AREA WITHIN THE LIMITS OF THE RIGHT-OF-WAY AND TEMPORARY EASEMENTS SHOWN ON PLAN SHEET V1.
2	2102-0425071 SPECIAL BACKFILL REFER TO DETAILS ON PLAN SHEET U1. AGGREGATE TYPE SHALL BE CRUSHED LIMESTONE OR CRUSHED PCC. NO GRAVEL OR RAP WILL BE ALLOWED.
3	2102-2710070 EXCAVATION, CLASS 10, ROADWAY AND BORROW INCLUDES 44.2 C.Y. CUT, 2810.1 C.Y. FILL +35% SHRINK, AND 2765.9 C.Y. BORROW. REFER TO TABULATION OF EARTHWORK QUANTITIES ON PLAN SHEET C3. TYPE A COMPACTION WILL BE REQUIRED. BORROW MAY BE OBTAINED FROM SUITABLE CLASS 20 AND CLASS 10 CHANNEL EXCAVATION. CONTRACTOR SHALL PROVIDE ADDITIONAL NECESSARY BORROW. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. EXISTING SLOPES THAT ARE TO RECEIVE EMBANKMENT, REGARDLESS OF THEIR HEIGHT, SHALL BE PREPARED IN ACCORDANCE WITH ARTICLE 2107.03, C, 2, OF THE STANDARD SPECIFICATIONS. A SUFFICIENT VOLUME OF SOIL HIGH IN ORGANIC CONTENT IS AVAILABLE WITHIN THE EXCAVATION LIMITS OF THE PROJECT. THIS MATERIAL SHALL BE DEPOSITED AS THE FINAL LAYER TO A MINIMUM FINISHED DEPTH OF 4 INCHES ON THE PROPOSED ROADWAY FORESLOPES AND OTHER DISTURBED AREAS TO FACILITATE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS BID ITEM. PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.
4	2104-2710020 EXCAVATION, CLASS 10, CHANNEL INCLUDES 236.5 C.Y. CUT, 132.9 C.Y. FILL + 35% SHRINK, AND 103.6 C.Y. WASTE. EXCESS MATERIAL AND UNSUITABLE MATERIAL NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED FROM THE SITE. 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. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED. QUANTITY INCLUDES EXCAVATION REQUIRED TO INSTALL REVTMENT. QUANTITY INCLUDES EXCAVATION REQUIRED TO TRANSITION PROPOSED CHANNEL SLOPES INTO EXISTING SLOPES WITHIN THE LIMITS SHOWN ON PLAN SHEET V1. PAYMENT FOR THIS ITEM WILL BE AT PLAN QUANTITY. CROSS SECTIONS WILL NOT BE TAKEN AFTER EXCAVATION FOR THE PURPOSE OF DETERMINING ACTUAL QUANTITIES.
6	2113-0001100 SUBGRADE STABILIZATION MATERIAL, POLYMER GRID REFER TO DETAILS ON PLAN SHEET U1.
7	2312-8260051 GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE MATERIAL SHALL BE SPREAD BY THE CONTRACTOR AND THE CONTRACT UNIT PRICE PER TON SHALL INCLUDE THE COST OF SPREADING GRANULAR SURFACING ON ROADWAY SURFACE. RATE OF APPLICATION SHALL BE 2330 TONS PER MILE.
8	2401-6745625 REMOVAL OF EXISTING BRIDGE ITEM INCLUDES REMOVAL AND DISPOSAL OF STEEL SHEET PILING AT STA. 7+78, 36' LT.
9	2402-2720000 EXCAVATION, CLASS 20 EXCAVATION TO THE LIMITS DETAILED ON PLAN SHEET U1 IS FOR PAY QUANTITIES ONLY. EXCESS MATERIAL AND UNSUITABLE SOILS 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 20 EXCAVATION. PRIOR TO CONSTRUCTION OF THE RCB CULVERT, BACKFILL OF THE CLASS 20 EXCAVATION WITH FOUNDATION TREATMENT MATERIAL AND SPECIAL BACKFILL SHALL BE COMPLETED THROUGHOUT THE ENTIRE CROSS SECTION TO AN ELEVATION AT OR ABOVE THE BOTTOM OF THE CULVERT FLOOR. ITEM SHALL INCLUDE ALL WORK IN CONJUNCTION WITH THE REMOVAL OF SURFACE WATER AND GROUND WATER AS NEEDED TO PERFORM THE REQUIRED CONSTRUCTION. THIS WORK 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. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE NATURE AND EXTENT OF DEWATERING REQUIRED TO COMPLETE THE PROPOSED WORK.
10	2402-2725005 FOUNDATION TREATMENT MATERIAL REFER TO DETAILS ON PLAN SHEET U1. USE AGGREGATE THAT MEETS THE REQUIREMENTS OF SECTION 4122 FOR MACADAM STONE BASE. REMOVAL OF UNSUITABLE OR UNSTABLE SOIL AND PLACEMENT OF FOUNDATION TREATMENT MATERIAL SHALL BE IN ACCORDANCE WITH ARTICLE 2402.03, C, 3, OF THE STANDARD SPECIFICATIONS. MATERIAL WILL BE MEASURED IN TONS TO THE NEAREST 0.1 TONS. PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER TON. NO ADJUSTMENT IN UNIT PRICE WILL BE ALLOWED FOR DEVIATION BETWEEN PLAN QUANTITY AND ACTUAL QUANTITY PLACED.
11	2403-0100020 STRUCTURAL CONCRETE (RCB CULVERT) REFER TO TABULATION ON PLAN SHEET C3 FOR CONCRETE PLACEMENT QUANTITIES. ITEM INCLUDES CERTIFIED PLANT INSPECTION IN ACCORDANCE WITH SECTION 2521 OF THE STANDARD SPECIFICATIONS.
12	2404-7775000 REINFORCING STEEL REFER TO TABULATION ON PLAN SHEET C3 FOR STEEL PLACEMENT QUANTITIES.

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
13	2507-3250005	<p><u>ENGINEERING FABRIC</u> ITEM INCLUDES 813.0 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, TOP, ENDS AND SIDES OF THE FOUNDATION TREATMENT MATERIAL. REFER TO DETAILS ON PLAN SHEET U1. ENGINEERING FABRIC FOR THIS PURPOSE SHALL BE MIRAFI 500X, GEOTEX 200ST, CONTECH C200, OR APPROVED EQUAL.</p> <p>ITEM INCLUDES 125.7 S.Y. OF ENGINEERING FABRIC PLACED ON THE BOTTOM, ENDS AND SIDES OF CLASS B REVETMENT. REFER TO DETAILS ON PLAN SHEET U1. ENGINEERING FABRIC FOR THIS PURPOSE SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.</p> <p>MATERIAL SHALL BE JOINED BY OVERLAPPING A MINIMUM OF 18 INCHES. THE QUANTITY OF ENGINEERING FABRIC FOR WHICH PAYMENT WILL BE MADE, WHEN PLACED AS DETAILED IN THE CONTRACT DOCUMENTS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS IN SQUARE YARDS. MATERIAL FOR LAPS IS NOT INCLUDED IN THE PLAN QUANTITY.</p>
14	2507-6800021	<p><u>REVETMENT, CLASS B</u> THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING REVETMENT STONE, COMPLETE IN PLACE AS SHOWN ON THE DRAWINGS. REFER TO DETAILS ON PLAN SHEET U1.</p> <p>DEWATERING REQUIRED TO INSTALL REVETMENT SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.</p> <p>THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF ALL REMNANTS OF REVETMENT STOCKPILES FROM FARM FIELDS UTILIZED BY CONTRACTOR IN THE PROJECT AREA. THIS WORK SHALL BE INCLUDED IN AND CONSIDERED INCIDENTAL TO THE PRICE BID FOR THIS ITEM.</p>
15	2507-6875002	<p><u>REVETMENT, REMOVE AND REPLACE</u> ITEM INCLUDES REMOVING EXISTING CHANNEL BANK REVETMENT TO THE EXTENT NECESSARY TO COMPLETE INSTALLATION OF THE PROPOSED IMPROVEMENTS AND IN ACCORDANCE WITH DETAILS SHOWN IN THE PLANS. REVETMENT SHALL BE STOCKPILED AND REPLACED AT THE CULVERT APRONS. REMOVAL AND DISPOSAL OF EXISTING ENGINEERING FABRIC, IF PRESENT, SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.</p> <p>THE QUANTITY OF REVETMENT, REMOVE AND REPLACE FOR WHICH PAYMENT WILL BE MADE, WHEN PLACED AS SHOWN IN THE CONTRACT DOCUMENTS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS IN CUBIC YARDS.</p> <p>FOR REVETMENT, REMOVE AND REPLACE THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE PER CUBIC YARD. THIS PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR AND FOR PERFORMANCE OF ALL WORK NECESSARY FOR REMOVING AND STOCKPILING THE EXISTING REVETMENT AND REPLACEMENT OF THE REVETMENT.</p>
16	2518-6910000	<p><u>SAFETY CLOSURE</u> REFER TO TAB. 108-13A.</p>
20	2602-0000020	<p><u>SILT FENCE</u> REFER TO TAB. 100-17.</p>

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 CONTRACTOR'S EXPENSE WITHOUT COST TO THE CONTRACTING AUTHORITY. ANY TILE LINES BROKEN OR DISTURBED BY CUT LINES WILL BE REPLACED AS DIRECTED BY THE ENGINEER IN CHARGE OF CONSTRUCTION AND AT THE CONTRACTING AUTHORITY'S EXPENSE.

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.

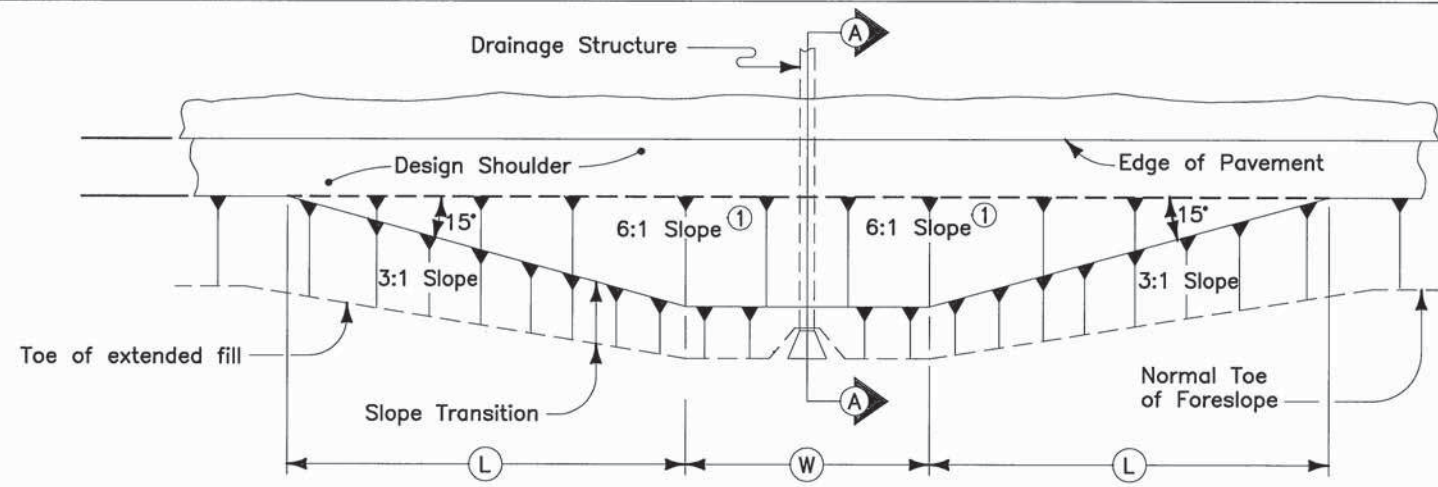
SEEDING WILL BE ACCOMPLISHED BY THE COUNTY.

04-15-14 213-3
ALL STOCKPILE AREAS, HAUL ROADS, AND AREAS USED FOR EQUIPMENT ON THIS PROJECT REQUIRE SUBSOIL TILLAGE TO AN AVERAGE DEPTH OF 16 TO 20 INCHES PRIOR TO PLACEMENT OF TOPSOIL AND/OR STABILIZING CROP SEEDING. COMPLETE THIS TILLAGE AT 3 FOOT MAXIMUM CENTERS AND AT RIGHT ANGLES TO THE FINISHED SLOPE.

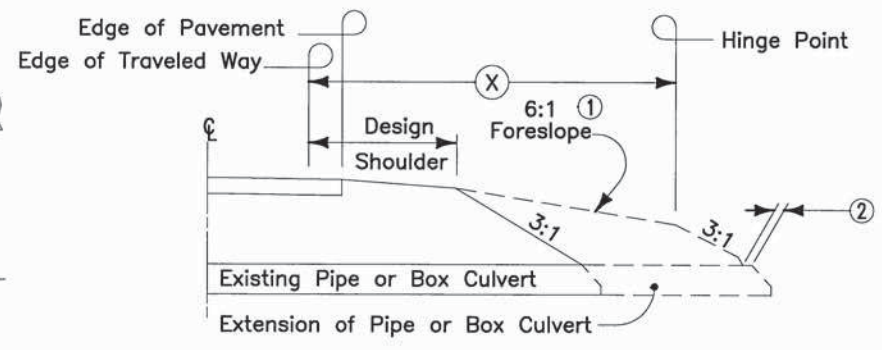
USE TILLAGE EQUIPMENT EQUIPPED WITH AN ARROWHEAD TYPE SHOE THAT WILL PROVIDE LATERAL DISPLACEMENT AND LIMIT THE MOVEMENT OF THE SUBSOIL TO THE SURFACE. OBTAIN THE ENGINEER'S APPROVAL FOR THE EQUIPMENT. THIS WORK IS INCIDENTAL TO OTHER WORK ON THE PROJECT.

FOLLOWING THE SUBSOIL TILLAGE, THE AREA IS TO REMAIN IN A "LOOSENEED" CONDITION. ADDITIONAL COMPACTION OR THE OPERATION OF HEAVY EQUIPMENT, OTHER THAN REQUIRED FOR TOPSOIL PLACEMENT AND SHAPING, WILL NOT BE ALLOWED ON AREAS WHICH HAVE BEEN RECEIVED SUBSOIL TILLAGE.

10-21-14 232-10
DISPOSE OF ALL WOOD MATERIAL GENERATED AS A RESULT OF CLEARING AND/OR GRUBBING ACCORDING TO THE IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP'S EMERALD ASH BORER (EAB) QUARANTINE ORDER. FOR MORE INFORMATION REFER TO http://www.iowatreepests.com/eab_regulations.html.



PLAN VIEW



SECTION A-A

Notes:

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, the foreslope shall be flattened as indicated so as to cover the structure. Minimum earth cover is 6".

- ① 6:1 Maximum - Slope may be flatter.
- ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
- Ⓜ = Pipe or R.C.B. width plus 20 feet each side.
- ⓧ = Clear Zone.

STRUCTURE LOCATION		Ⓜ	Ⓛ	ⓧ
STATION	SIDE	FEET	FEET	FEET
7+45	L & R	92.5	11.2	6

DETAILS OF
BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE

STA.	CUT	ADD. CUT	FILL +35%	ADD. FILL	TOTAL CUT	TOTAL FILL+35%	BALANCE
6+25							
6+50	4.7		19.8		4.7	19.8	
7+00	22.1		383.9		22.1	383.9	
7+14	7.2		192.9		7.2	192.9	
7+50	9.2		1594.5		9.2	1594.5	
7+61	0.1		431.5		0.1	431.5	
8+00	0.7		142.0		0.7	142.0	
8+25	0.2		45.5		0.2	45.5	
TOTAL					44.2	2810.1	

Location			Length LF	Remarks
Begin Station	End Station	Side		
6+25	8+25	L	323.0	
6+25	8+25	R	329.0	
TOTAL			652.0	TABULATED QUANTITY
TOTAL +25%			815.0	BID QUANTITY

LOCATION	CONCRETE C.Y.				STEEL LBS.
	SLAB	FLOOR	WALLS	TOTAL	
INLET HEADWALL, 15' SKEW	2.5	*40.8	17.9	61.2	7916
INLET BARREL SECTION, 22'-0	15.1	19.3	19.5	53.9	8695
BARREL SECTION, 38'-0	26.1	33.4	33.7	93.1	15018
OUTLET BARREL SECTION, 22'-0	15.1	19.3	19.5	53.9	8695
OUTLET HEADWALL, 15' SKEW	2.5	*40.8	17.9	61.2	7916
5r1 DOWEL BARS (2 SETS REQ'D @ 80 LBS.)					160
TOTAL	61.3	153.6	108.5	323.3	48400

*INCLUDES 0.1 CY FOR APRON AND FLOOR THICKNESS TRANSITION.

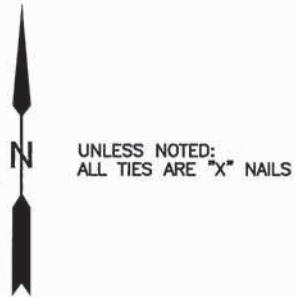
NOTE: FOR GENERAL INFORMATION, NOTES, SPECIFICATIONS & DESIGN STRESSES REFER TO IOWA D.O.T. HIGHWAY DIVISION STANDARD TWRCB-G1-12.

FOR DETAILS AND NOTES NOT SHOWN REFER TO STANDARD CULVERT PLANS LISTED ON PLAN SHEET C1.

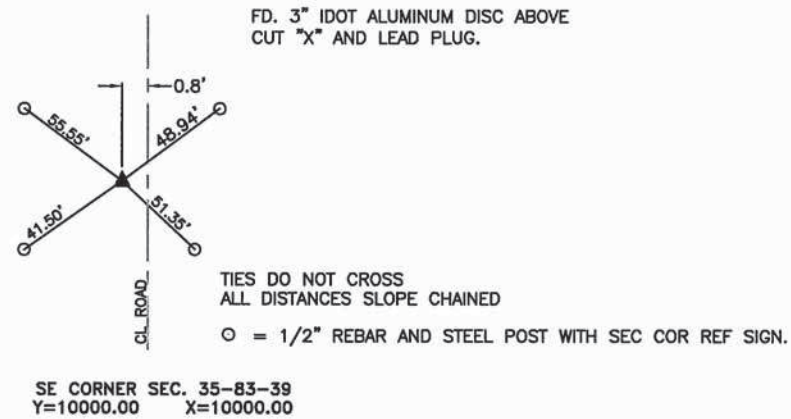
STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
5+75	-	1	WEST END
8+75	-	1	EAST END
TOTAL		2	

GENERAL INFORMATION
THIS SURVEY IS IN ENGLISH UNITS.

BENCH MARKS	ELEVATION
BM#1 STA. 5+68.02, 34.55' RT. RR SPIKE IN PP	430.31
BM#2 STA. 6+56.00, 31.59' RT. RING SHANK SPIKE IN PP	428.79



UNLESS NOTED:
ALL TIES ARE "X" NAILS



FD. 5/8" DIA. REBAR (0.4' DEEP) OVER
BROKEN OFF C.M.

3' SOUTH TO PHYSICAL CENTERLINE OF ROAD.
34.24' NW TO "X" NAILS TOP OF FENCE POST.
36.38' NE TO "X" NAILS TOP OF FENCE POST.
32.86' SE TO "X" NAILS TOP OF FENCE POST.

S1/4 CORNER SEC. 36-83-39
Y=10000.00 X=12608.89

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent		Begin Spiral		Begin Curve		Simple Curve PI or Master PI of SCS		End Curve		End Spiral	
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
S AVE.		6+00.00	10000.00	11004.69									
S AVE.		9+00.00	10000.00	11304.69									

DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)

REV.:

LOG OF EXPLORATORY BORING

Sheet 1 of 1

Job Number: G4451S Boring No.: B-1
 Project: S Avenue Bridge Replacement Boring Location: Crawford County, IA
 Date Started: 7/17/15 Drill Type: Hollow Stem
 Date Completed: 7/17/15 Ground Elev.: 434.8

Depth in Feet	Graphic Log	Sample Type	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity Ohm-M	SOIL DESCRIPTION
														<input type="checkbox"/> Shelby Tube <input type="checkbox"/> Modified California <input type="checkbox"/> Standard Split Spoon <input type="checkbox"/> Grab Sample <input type="checkbox"/> Water Level ATD <input type="checkbox"/> Water Level After 7 Days
0-2														2-Foot Gravel Layer
2-5				5-6-9 N= 15	19									FILL, Lean Clay, Dark Brown, Moist (Dark Gray Brown)
5-10				2-5-5 N= 10	24									
10-15				2-3-5 N= 8	28									LEAN CLAY, Dark Gray Brown, Very Moist, Stiff, Alluvium
15-20				3-4-5 N= 9	35									CLAYEY SAND, Brownish Gray, Moist, Alluvium LEAN CLAY, Dark Gray, Very Moist, Stiff, Alluvium
20-25				2-2-2 N= 4	25									SANDY LEAN CLAY, Medium Gray, Very Moist, Medium, Alluvium
25-30				16-28-26 N= 54										GRAVELLY SAND, Grayish Yellow Brown, Wet, Very Dense to Medium Dense, Alluvium
30-35				8-12-15 N= 27										
35-40				5-9-9 N= 18	17									LEAN CLAY WITH SAND, Dark Gray, Very Moist, Very Stiff to Hard, Glacial Till (Gray and Yellow Brown)
40-45				10-11-16 N= 27	21									END OF BORING AT 45 FEET FREE WATER WAS ENCOUNTERED AT 30 FEET AT TIME OF DRILLING

LOG OF EXPLORATORY BORING

Sheet 1 of 1

Job Number: G4451S Boring No.: B-2
 Project: S Avenue Bridge Replacement Boring Location: Crawford County, IA
 Date Started: 7/17/15 Drill Type: Hollow Stem
 Date Completed: 7/17/15 Ground Elev.: 434.3

Depth in Feet	Graphic Log	Sample Type	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity Ohm-M	SOIL DESCRIPTION
														<input type="checkbox"/> Shelby Tube <input type="checkbox"/> Modified California <input type="checkbox"/> Standard Split Spoon <input type="checkbox"/> Grab Sample <input type="checkbox"/> Water Level ATD <input type="checkbox"/> Water Level After 7 Days
0-2														2-Foot Gravel Layer
2-5				12-10-11 N= 21	5									FILL, Lean Clay, Dark Brown, Dry to Very Moist
5-10				1-1-1 N= 2	25									
10-15				1-2-2 N= 4	26									LEAN CLAY, Dark Brown, Very Moist, Medium, Slopewash
15-20				1-2-3 N= 5	26									
20-25				2-7-8 N= 15										LEAN CLAY WITH SAND, Dark Gray, Very Moist to Wet, Medium, Alluvium
25-30				1-3-3 N= 6	26									(Sand Lenses)
30-35				4-8-9 N= 17										CLAYEY SAND, Gray and Yellow Brown, Wet, Medium Dense, Alluvium (With Gravel)
35-40				4-11-15 N= 26	19									LEAN CLAY WITH SAND, Gray and Yellow Brown, Very Moist, Hard, Glacial Till
40-45				6-12-16 N= 28	25									(Dark Gray)
45				8-12-14 N= 26	17									END OF BORING AT 45 FEET FREE WATER WAS ENCOUNTERED AT 25 FEET AT TIME OF DRILLING

SOUNDING DATA

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

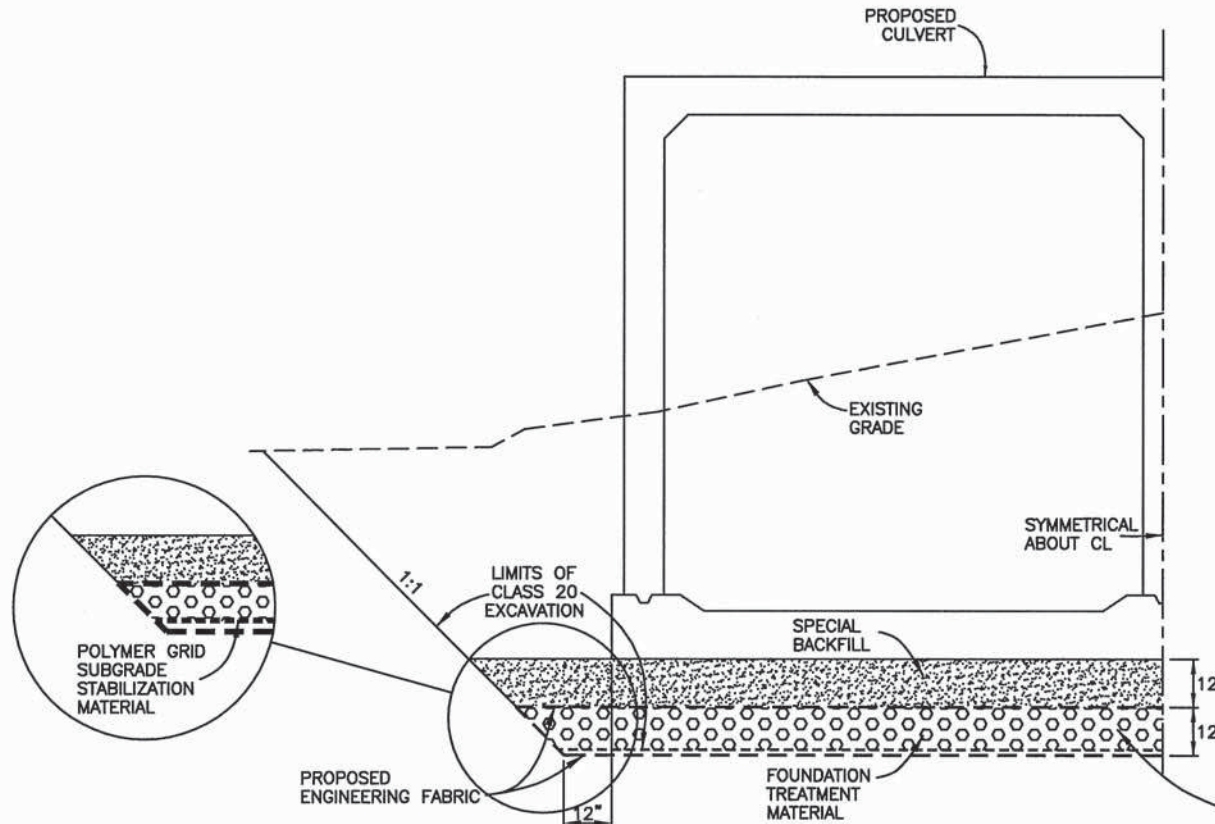
SOUNDINGS WERE TAKEN ON JULY 17, 2015.

SEE SHEET V1 FOR BORING LOCATIONS.

GEOTECHNICAL INFORMATION PROVIDED HERewith IS THE SOLE RESPONSIBILITY OF CERTIFIED TESTING SERVICES, INC., WHOSE GEOTECHNICAL REPORT DATED JULY 21, 2015, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING.

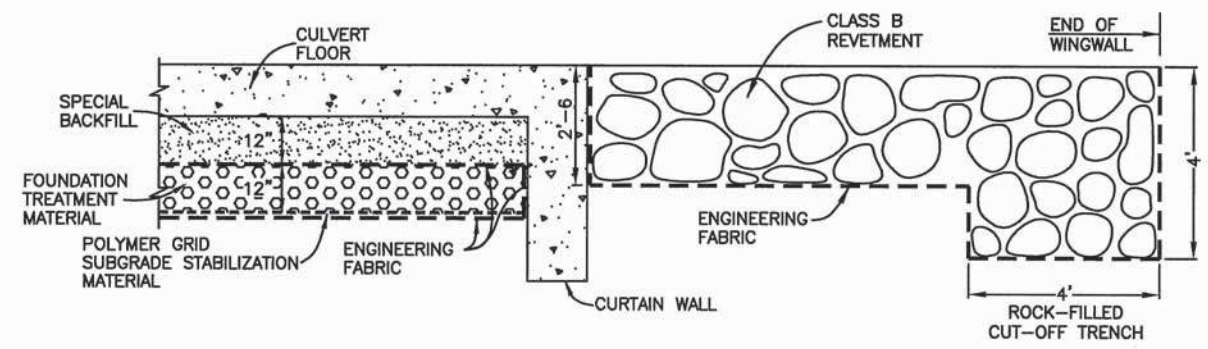


I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
 James A. Bertsch 9-25-2015
 JAMES A. BERTSCH, P.E. #12121 DATE
 MY LICENSE RENEWAL DATE IS DECEMBER 31, 2016.
 PAGES OR SHEETS COVERED BY THIS SEAL:
 Q1

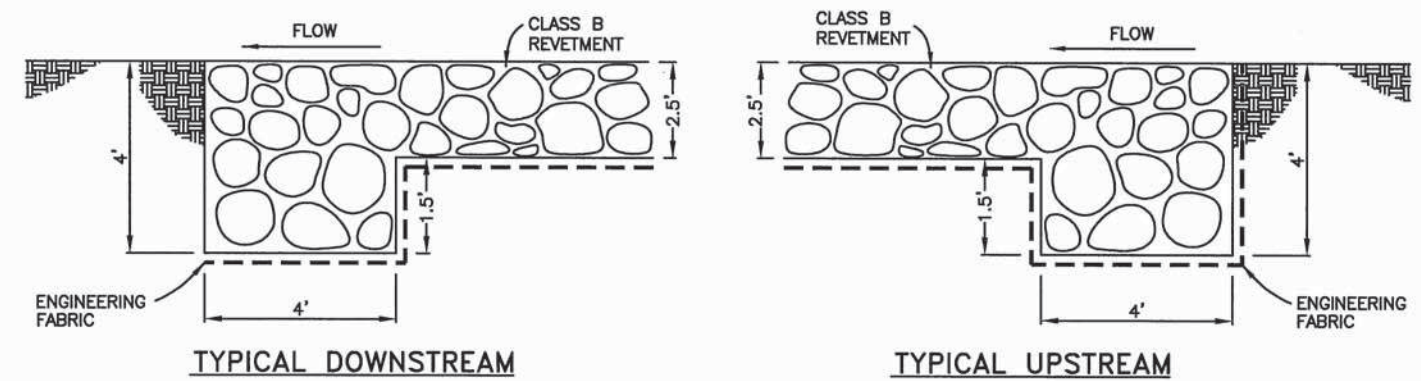


CLASS 20 EXCAVATION & FOUNDATION TYPICAL SECTION
NOT TO SCALE

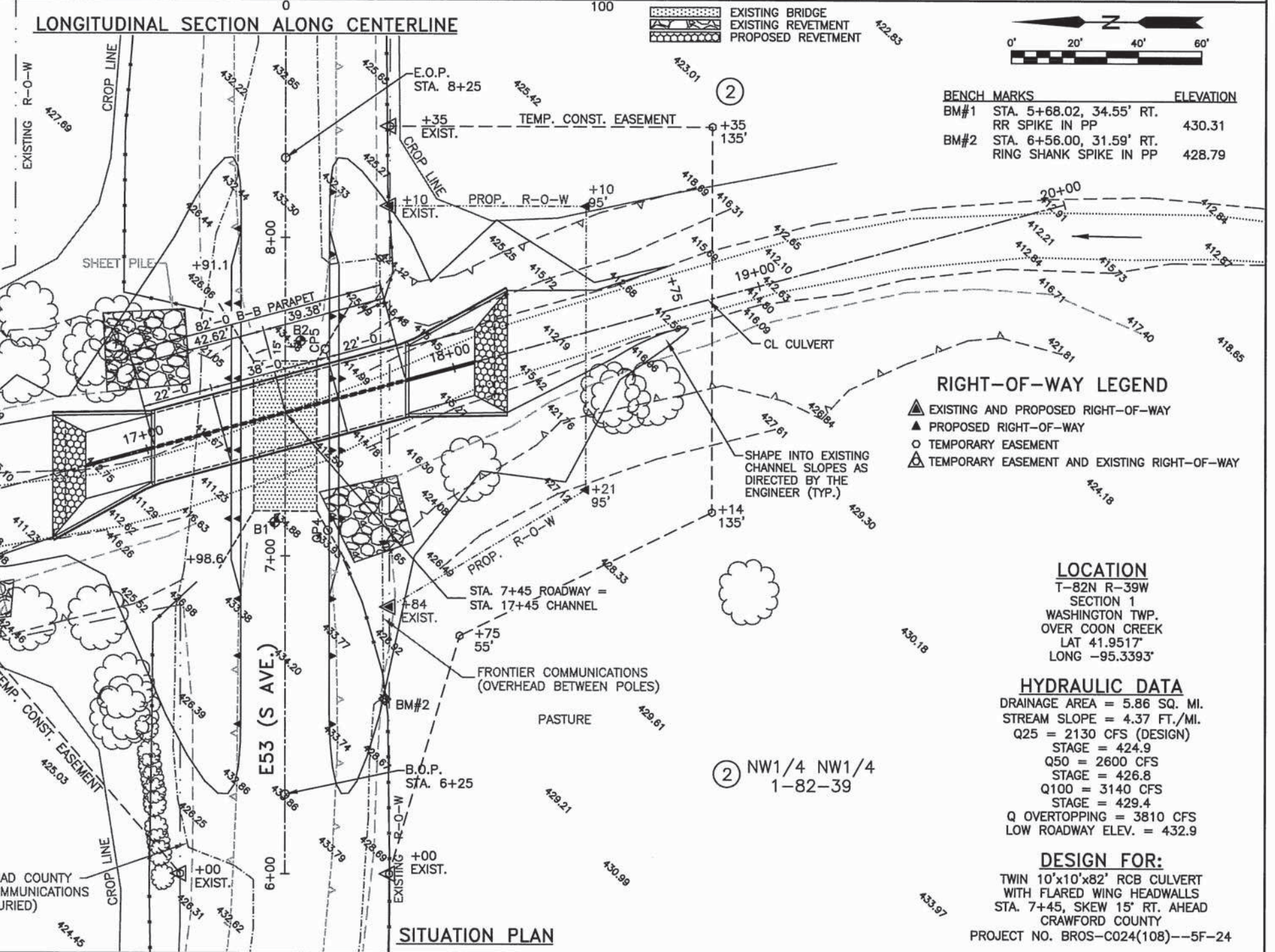
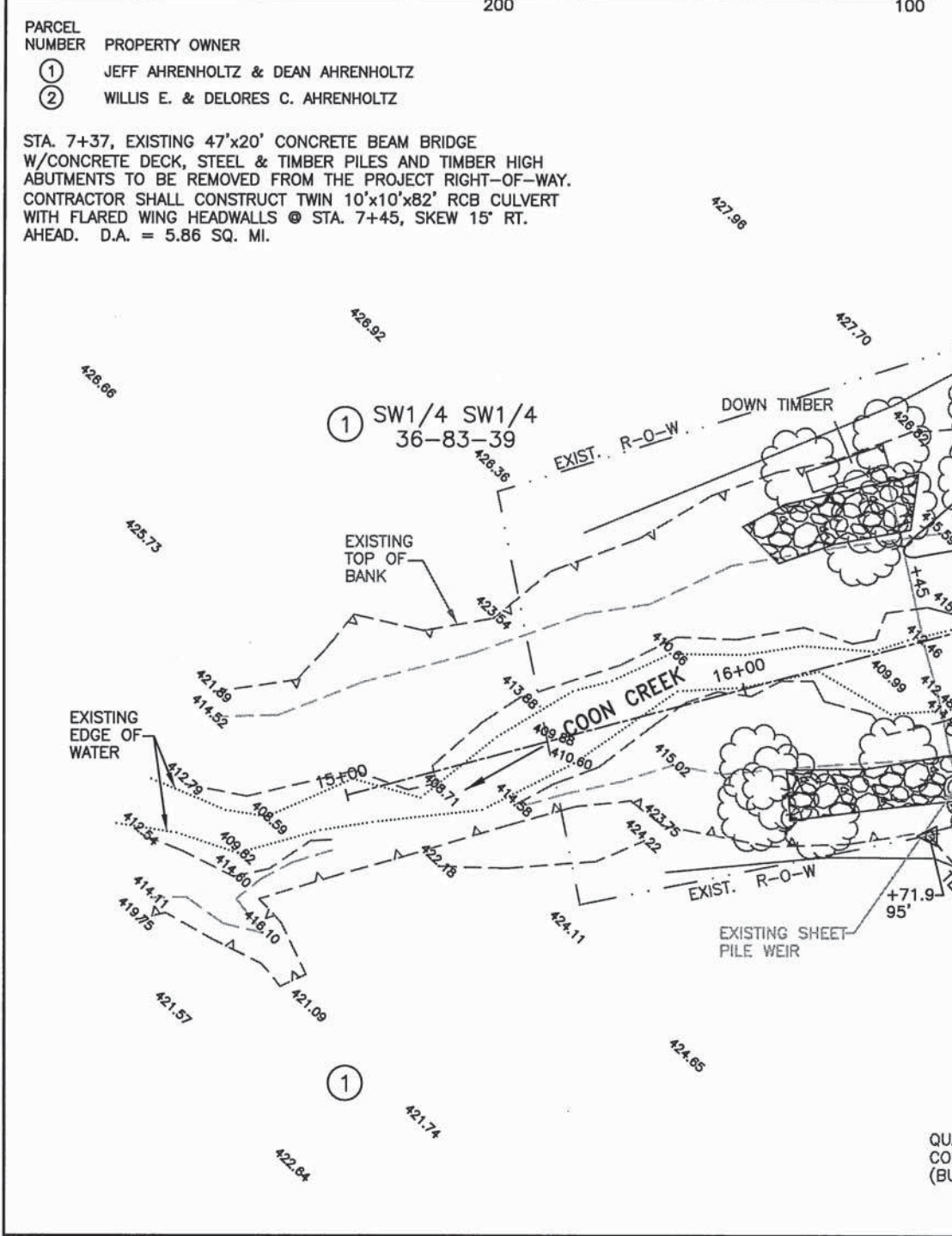
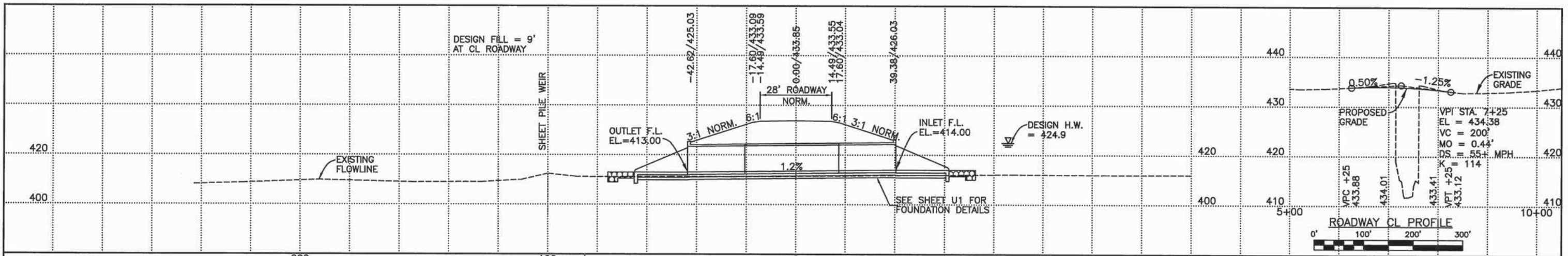
MINIMUM DEPTH OF FOUNDATION TREATMENT MATERIAL SHALL BE 12 INCHES. ACTUAL DEPTH REQUIRED WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.



SECTION AT HEADWALL CURTAIN WALL
NOT TO SCALE



ROCK-FILLED CUTOFF TRENCH DETAILS
NOT TO SCALE



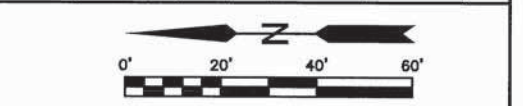
PARCEL NUMBER PROPERTY OWNER

1	JEFF AHRENHOLTZ & DEAN AHRENHOLTZ
2	WILLIS E. & DELORES C. AHRENHOLTZ

STA. 7+37, EXISTING 47'x20' CONCRETE BEAM BRIDGE W/CONCRETE DECK, STEEL & TIMBER PILES AND TIMBER HIGH ABUTMENTS TO BE REMOVED FROM THE PROJECT RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT TWIN 10'x10'x82' RCB CULVERT WITH FLARED WING HEADWALLS @ STA. 7+45, SKEW 15' RT. AHEAD. D.A. = 5.86 SQ. MI.

LEGEND

- EXISTING BRIDGE
- EXISTING REVETMENT
- PROPOSED REVETMENT



BENCH MARKS

BM#	STA.	ELEVATION
BM#1	STA. 5+68.02, 34.55' RT. RR SPIKE IN PP	430.31
BM#2	STA. 6+56.00, 31.59' RT. RING SHANK SPIKE IN PP	428.79

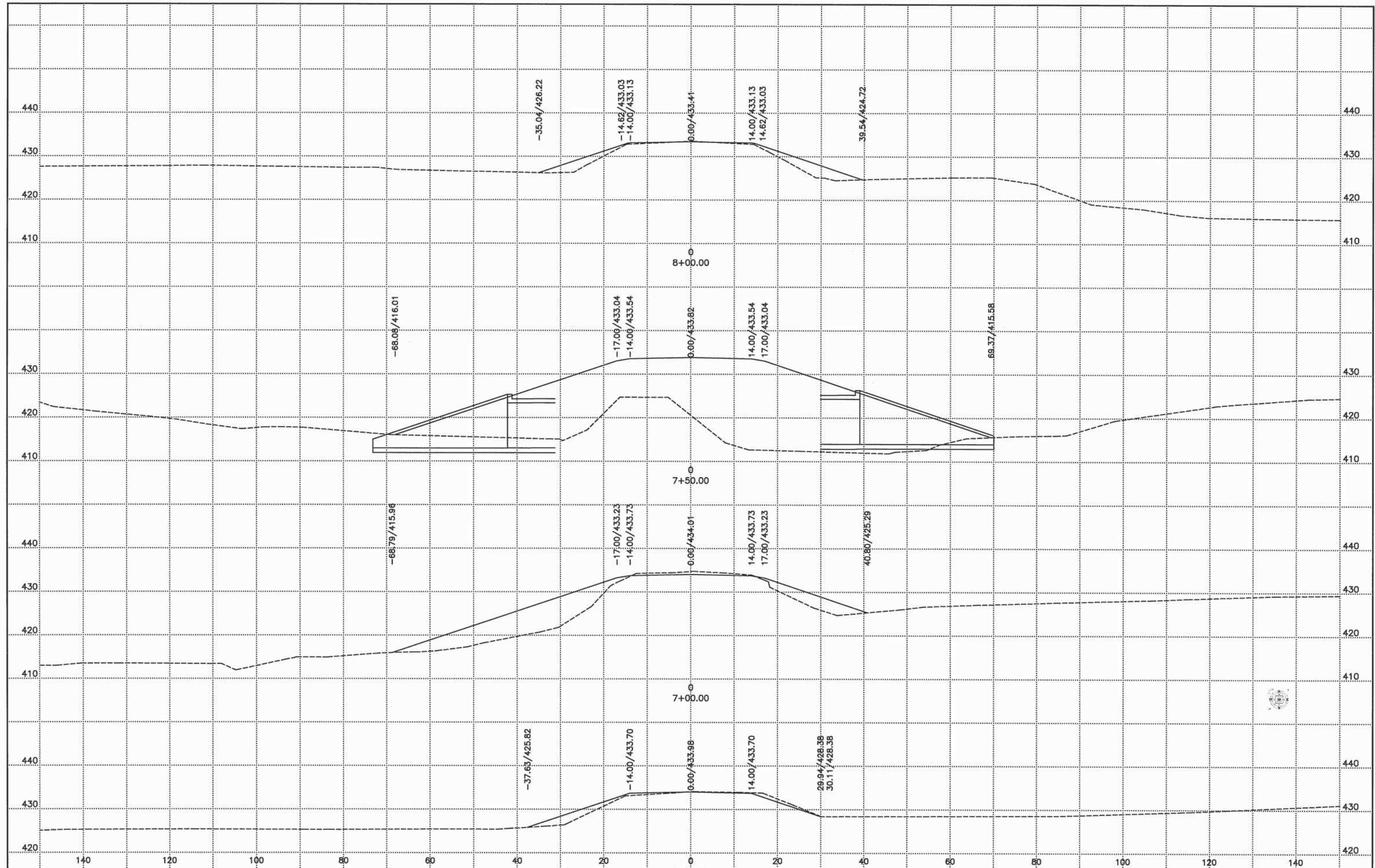
RIGHT-OF-WAY LEGEND

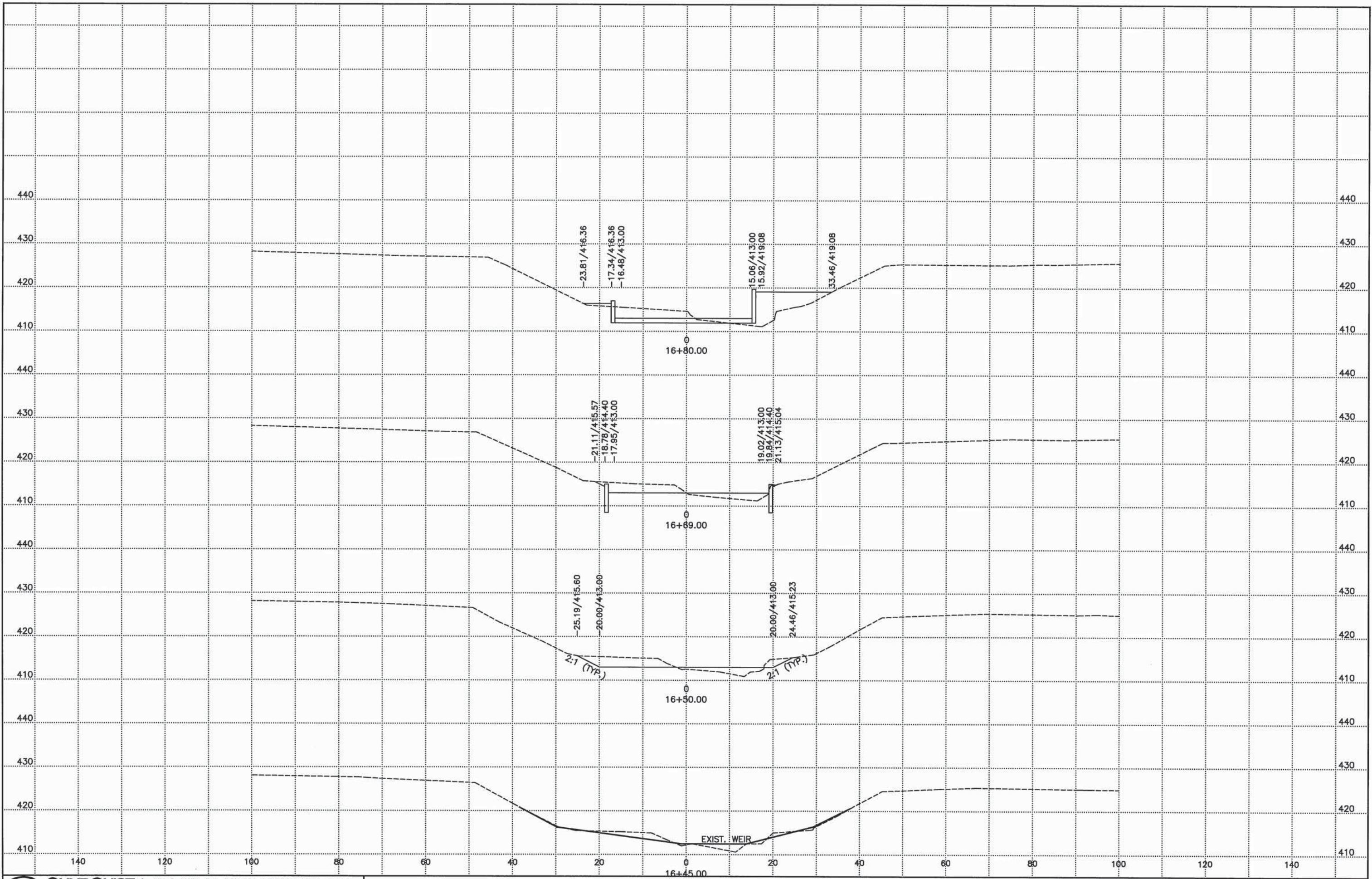
- EXISTING AND PROPOSED RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- TEMPORARY EASEMENT
- TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY

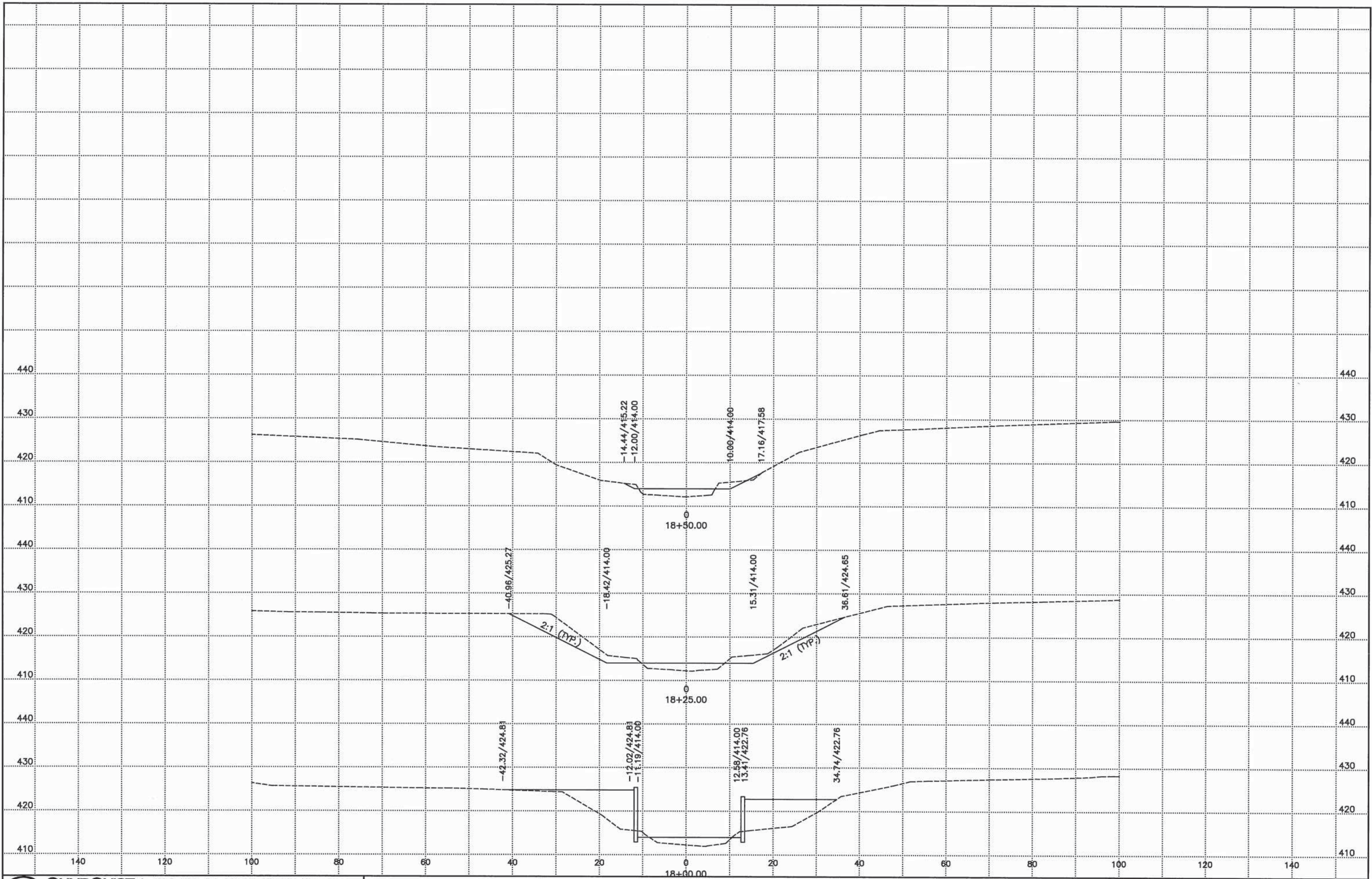
LOCATION
 T-82N R-39W
 SECTION 1
 WASHINGTON TWP.
 OVER COON CREEK
 LAT 41.9517'
 LONG -95.3393'

HYDRAULIC DATA
 DRAINAGE AREA = 5.86 SQ. MI.
 STREAM SLOPE = 4.37 FT./MI.
 Q25 = 2130 CFS (DESIGN)
 STAGE = 424.9
 Q50 = 2600 CFS
 STAGE = 426.8
 Q100 = 3140 CFS
 STAGE = 429.4
 Q OVERTOPPING = 3810 CFS
 LOW ROADWAY ELEV. = 432.9

DESIGN FOR:
 TWIN 10'x10'x82' RCB CULVERT WITH FLARED WING HEADWALLS
 STA. 7+45, SKEW 15' RT. AHEAD
 CRAWFORD COUNTY
 PROJECT NO. BROS-C024(108)--5F-24







REV:

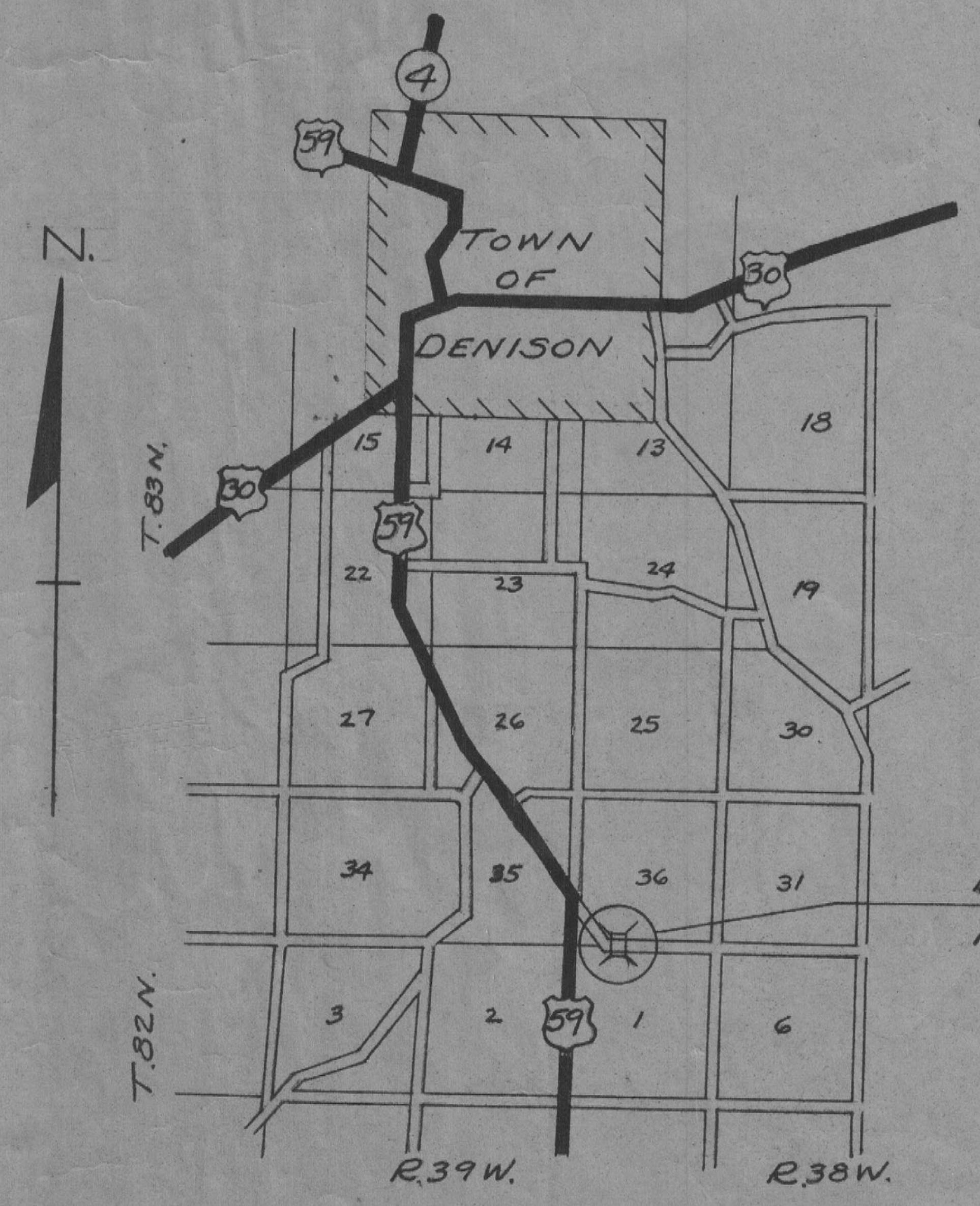
STATE OF IOWA
 STATE HIGHWAY COMMISSION
 DESIGN FOR
 46'-8" x 20' PRE-STRESSED CONCRETE BEAM BRIDGE
 SECONDARY ROAD SYSTEM PROJ. S-2791 (1)
 CRAWFORD COUNTY
 DECEMBER 1957.

MILEAGE SUMMARY: = 48'-8" = 0.00921 MILES.

SPECIFICATIONS:
 Design: A.A.S.H.O. Series of 1953.
 Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1956, plus current Special Provisions, except as noted.

IN LETTING OF DECEMBER 16, 1958

DESIGN-358 WASHINGTON TWP. CRAWFORD COUNTY			
SEC. - 1, STA. 11+50.0 OVER LOCAL CREEK			
46'-8" x 20' PRESTRESSED CONCRETE BEAM BRIDGE.			
DESCRIPTION	ABUTMENTS	SUPERSTRUCT.	TOTAL
CONCRETE CLASS - "A"	12.54 C.Y.	2628 C.Y.	3882 C.Y.
REIN. STEEL	1318 LBS.	5381 LBS.	6699 LBS.
STRUCT. STEEL	4638 "	944 "	5582 "
PRE-STRESSED CONG. BEAMS.		5 @ 46'-8" (A)	5 @ 46'-8" (A)
HANDRAIL		113'-4" L.F.	113'-4" L.F.
WOOD RAIL POSTS 8" x 6'		4	4
TREATED WOOD TREESTLE PILING	12-35' = 420 L.F.		900 L.F.
	16-30' = 480 L.F.		
TREATED LUMBER.	6544 F.B.M.		6544 F.B.M.
GALVANIZED HARDWARE	176 LBS.		176 LBS.
EXCAVATION CLASS #20	177 C.Y.		177 C.Y.
" CLASS #10			
" CLASS #21	10 C.Y.		10 C.Y.
REMOVAL OF OLD STRUCTURE			LUMP SUM.



DESIGN No. 358
 PROJECT No. S-2791 (1)

NOTE: Bridge Sign Assemblies will be furnished & placed by Crawford County to conform with S & T instruction No. 11, revised March-1, 1956.

APPROVED.

 BOARD OF SUPERVISORS. DATE

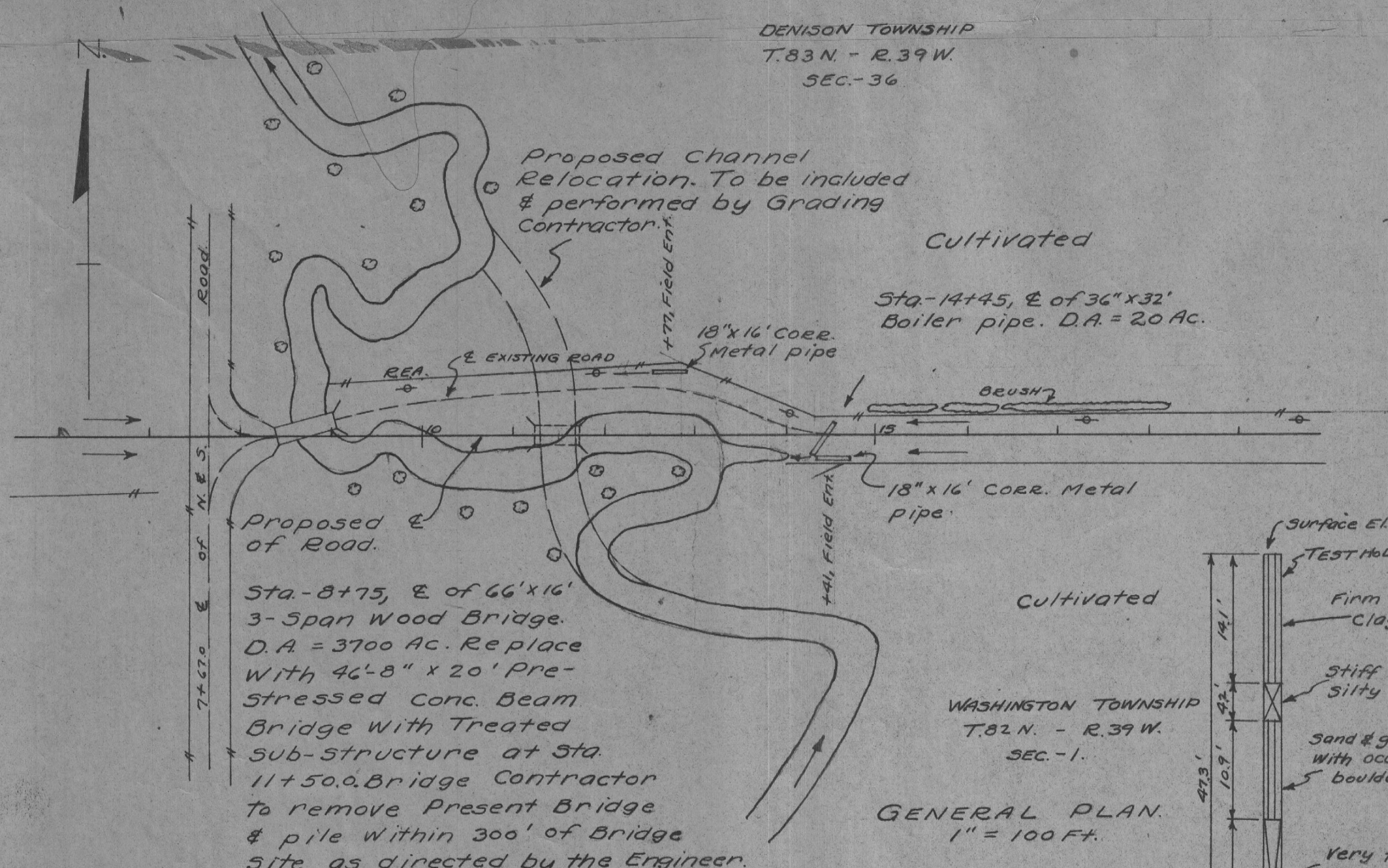
APPROVED.

 CHIEF ENGINEER. DATE
 IOWA HIGHWAY COMMISSION.
 DEPARTMENT OF COMMERCE
 BUREAU OF PUBLIC ROADS.
 RECOMMENDED FOR APPROVAL

 DISTRICT ENGINEER. DATE
 APPROVED

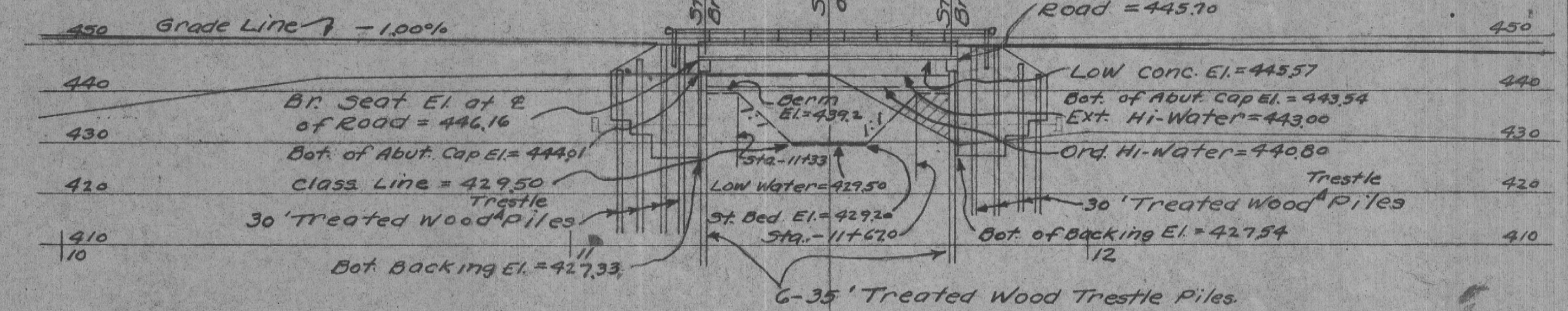
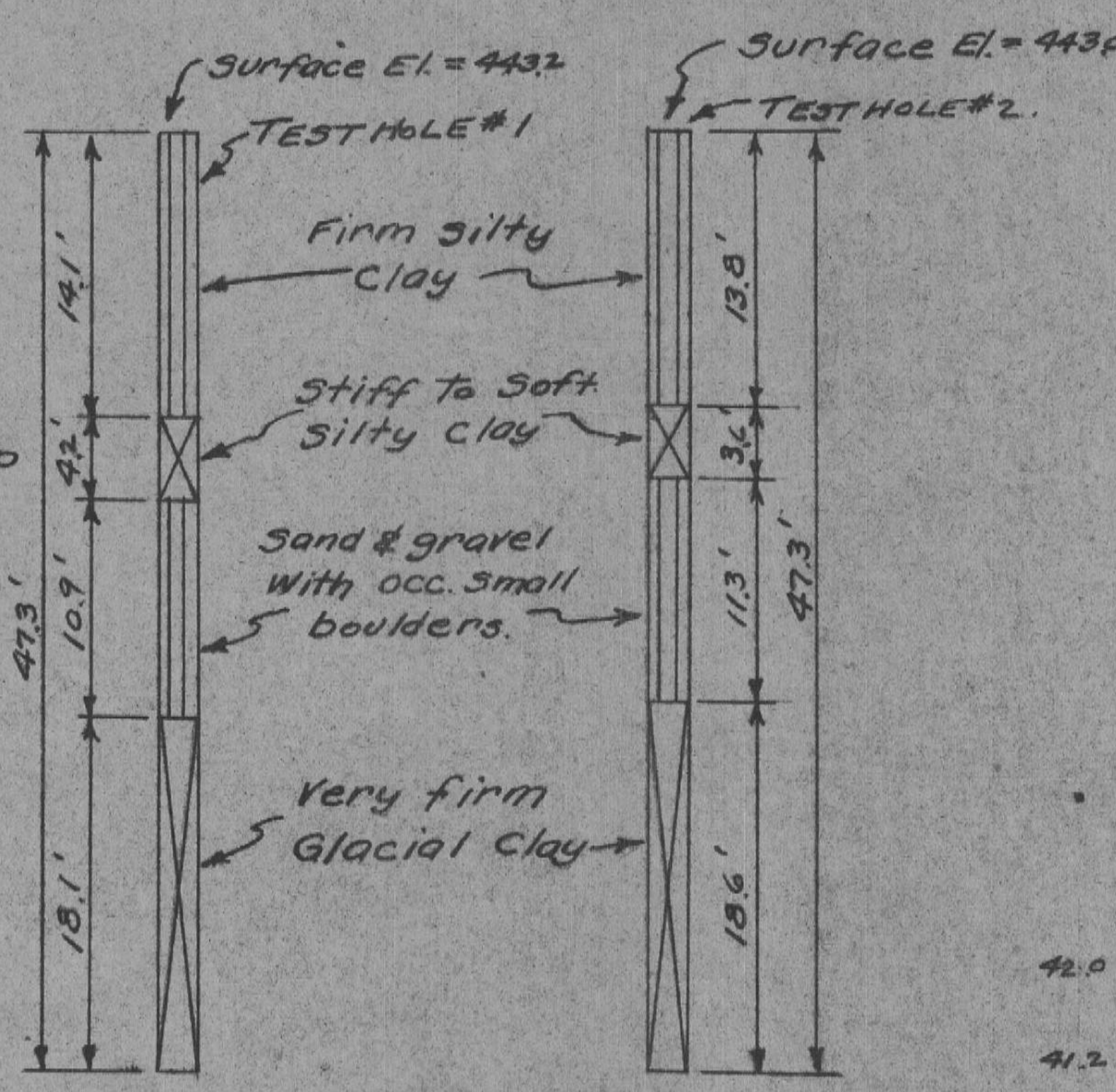
 DIVISION ENGINEER. DATE

DENISON TOWNSHIP
T.83 N. - R.39 W.
SEC.-36

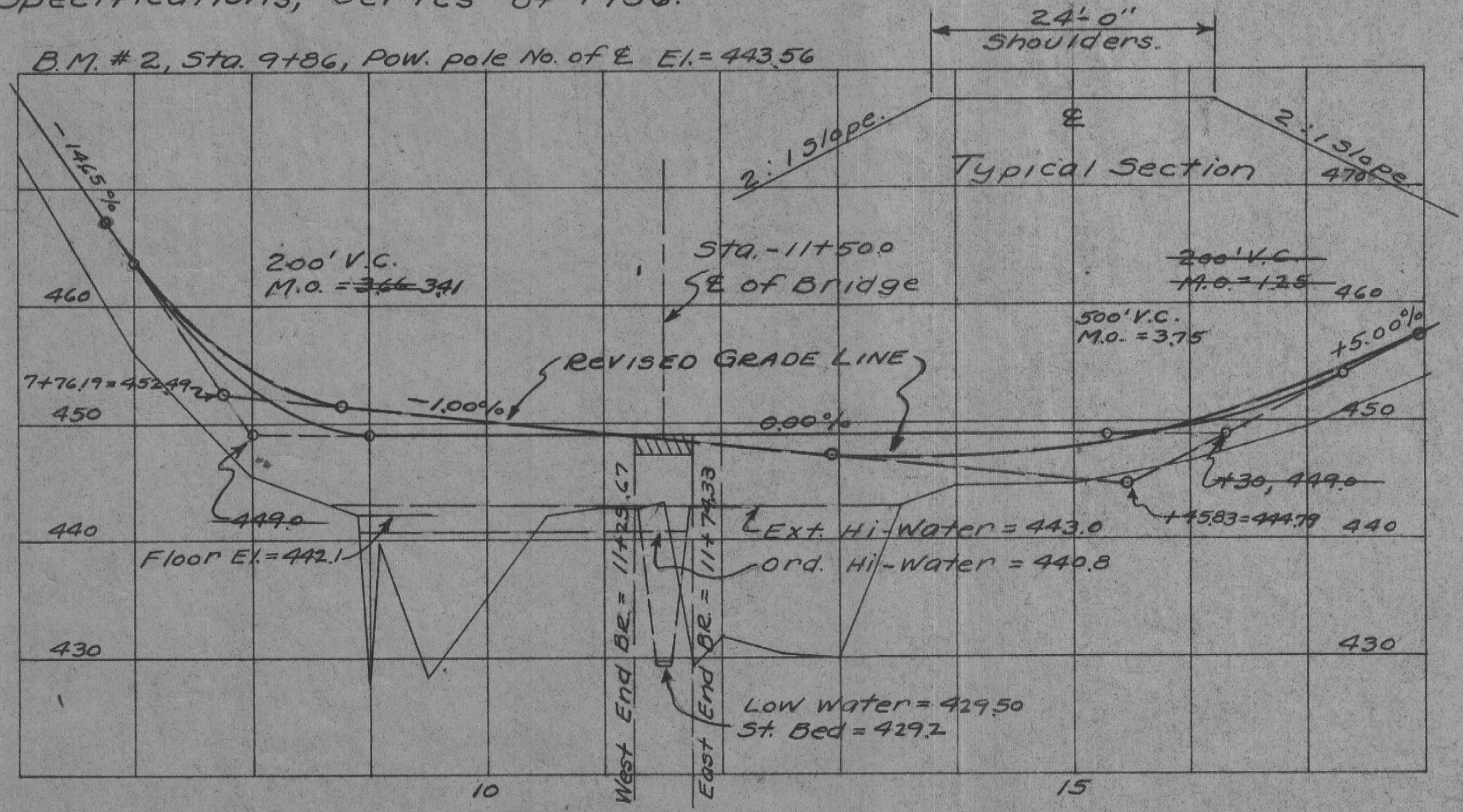
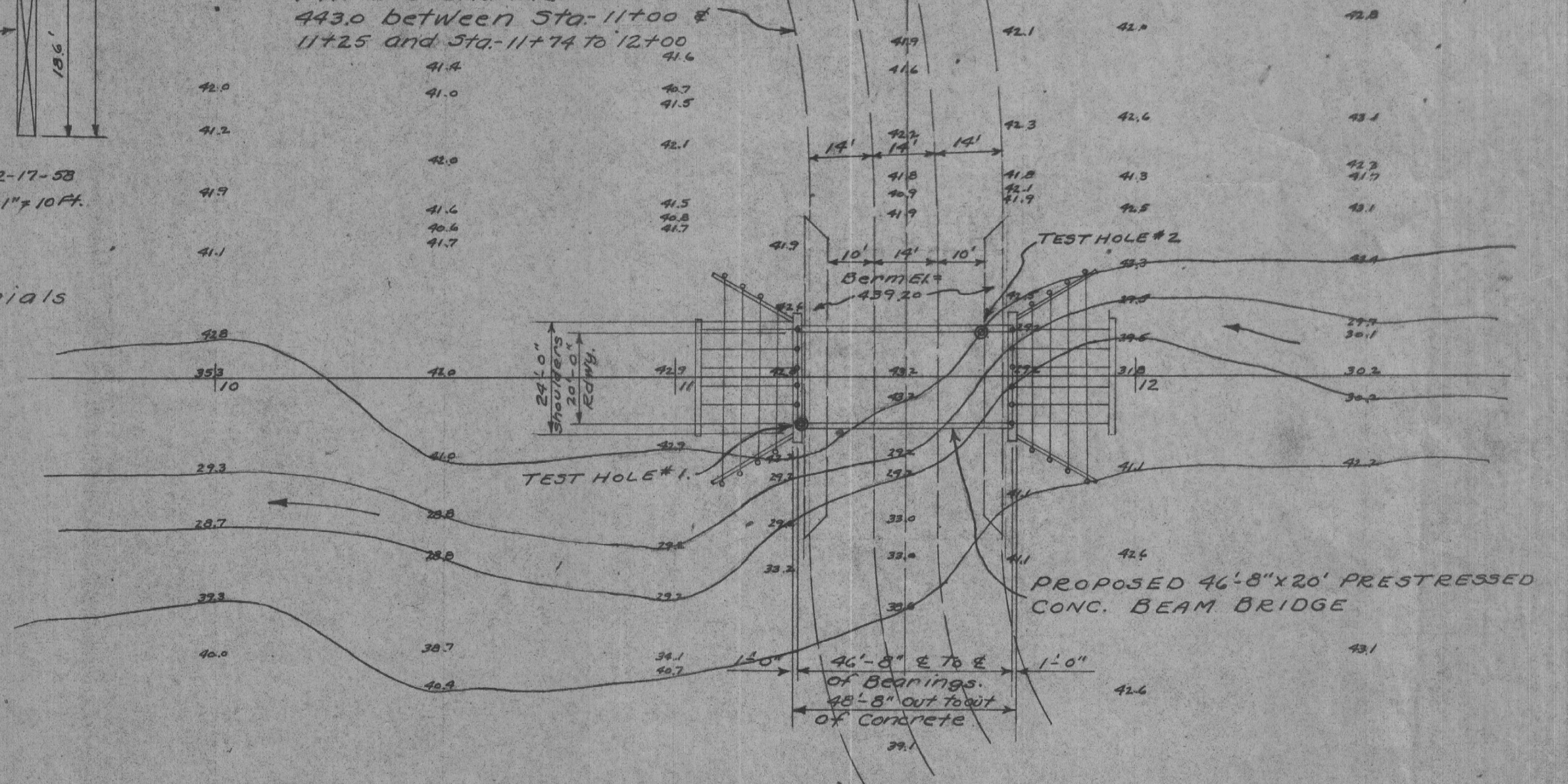


GENERAL NOTES:

All Lumber is to be creosoted. Backing & Wing plank in 10" x 12" widths may be substituted for 8" plank shown but payment will be made on basis of quantities shown. All piling are to be creosoted & are to comply with the specifications for treated timber trestle piles. All hardware is to be galvanized. C.I. Ogee or malleable Washers are to be used under all heads & nuts bearing on wood. All bolts to have square heads & nuts. For details of Super-structure refer to Iowa Highway Commission Standard P C-5 and PC-5(a) and for details of Abutments refer to Standard H10-2. With further details on Sheet #3 of these plans. All materials & construction to conform with the Iowa Highway Commission Standard Specifications, Series of 1956.



Grading Contractor to excavate New Channel & Fill old Channel to Elev. 443.0 between Sta-11+00 & 11+25 and Sta-11+74 to 12+00.

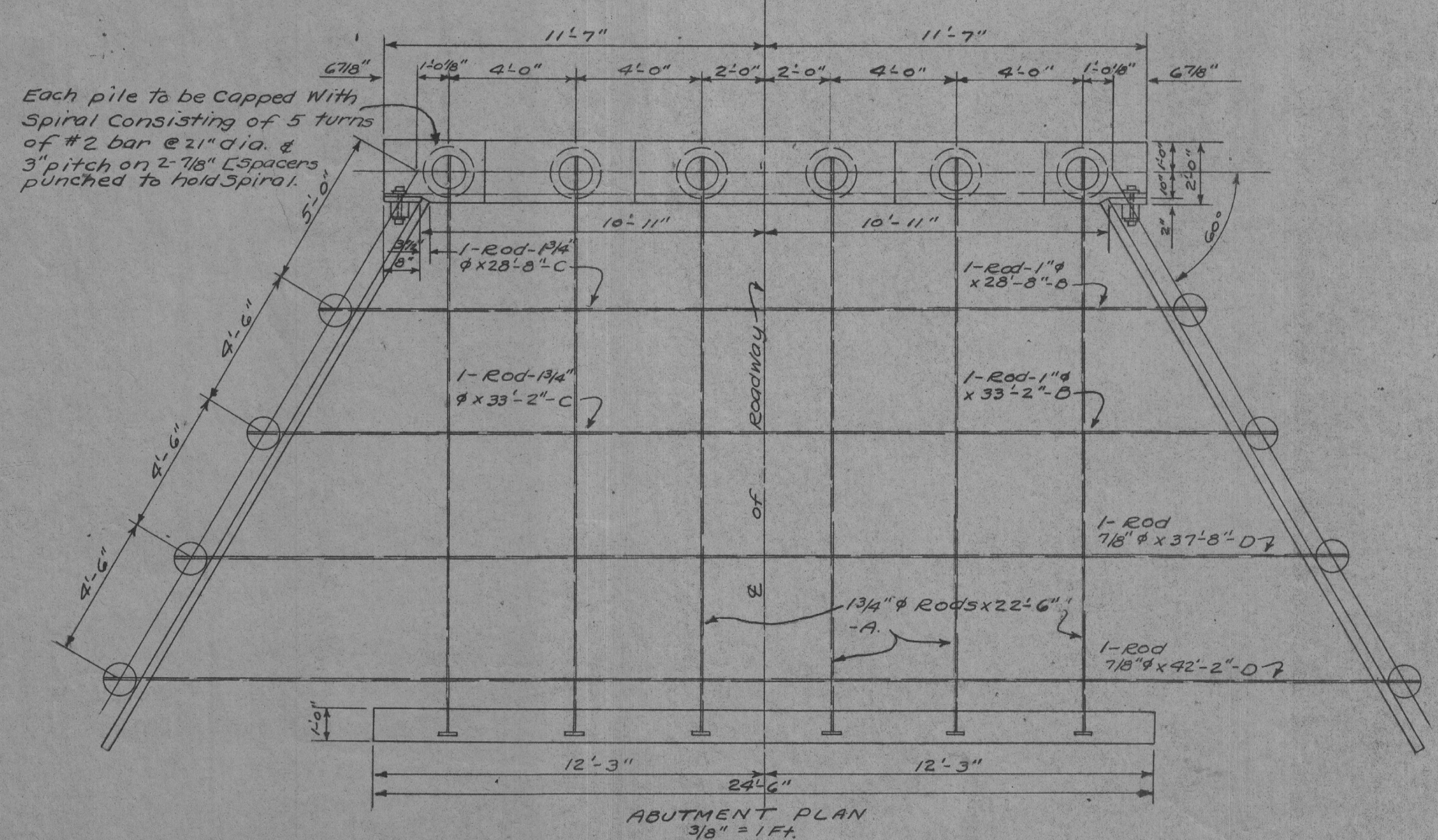
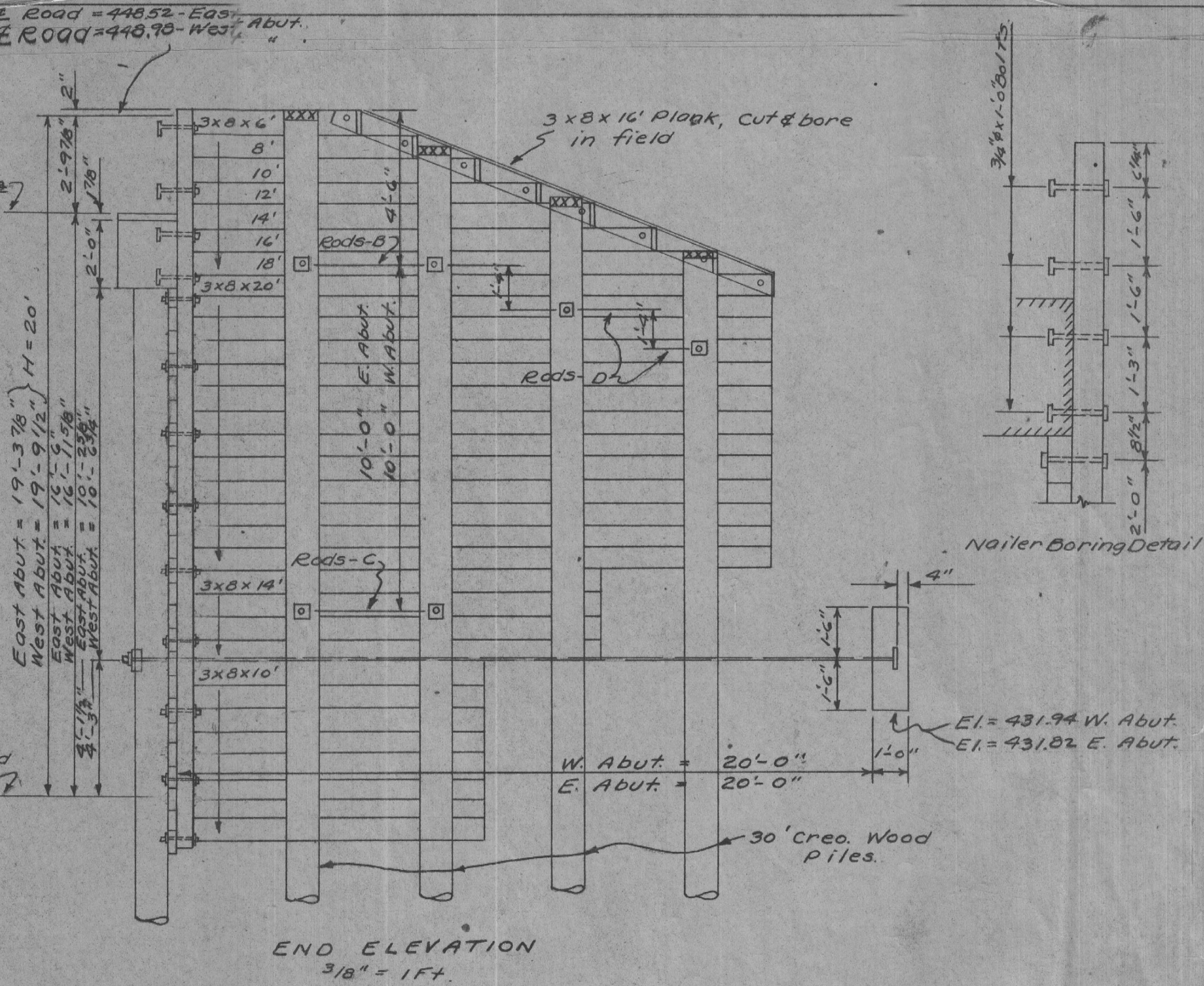
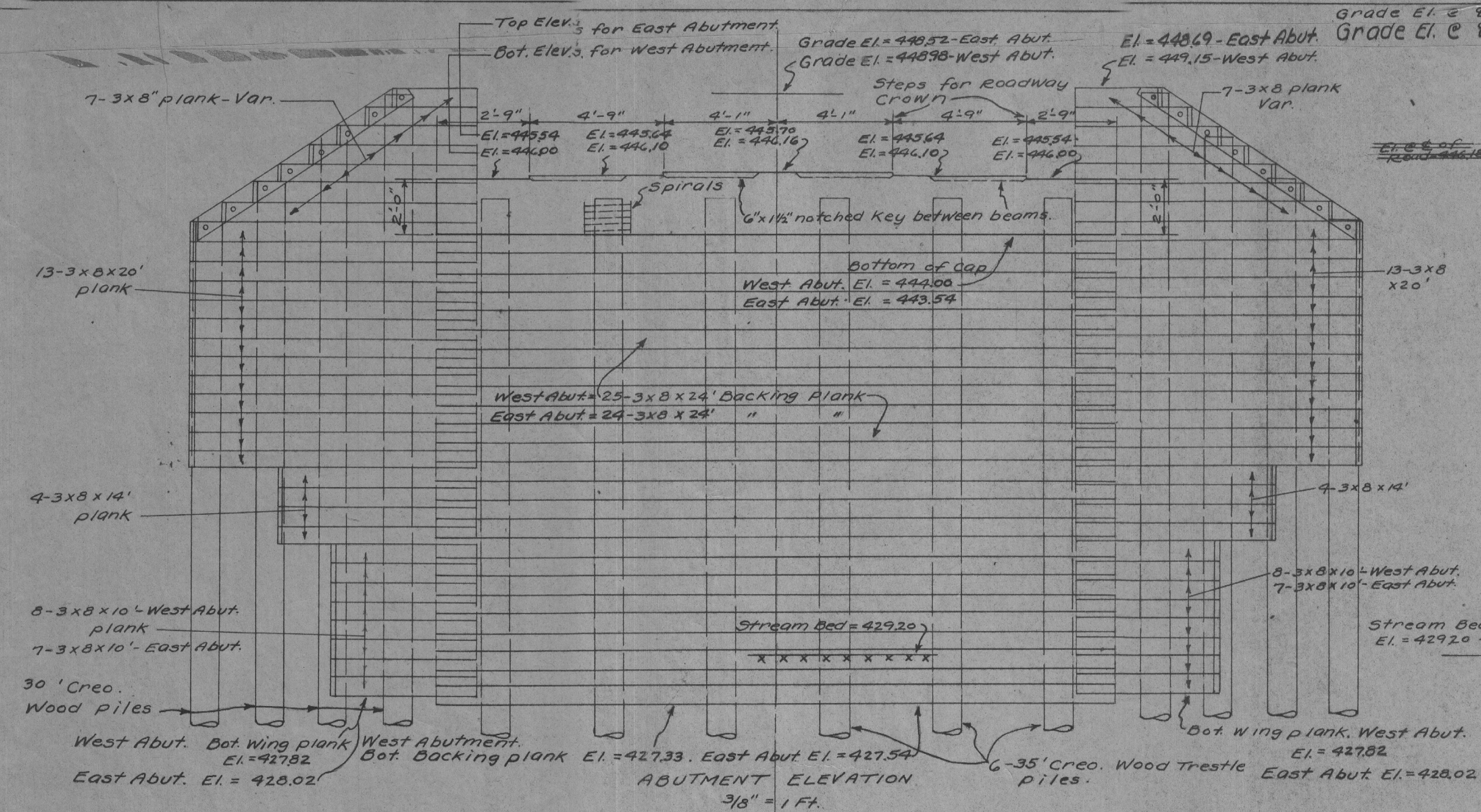


DESIGN FOR
46'-8" x 20' PRE-STRESSED CONCRETE BEAM BRIDGE
CONCRETE FLOOR - STEEL HANDRAIL TYPE "C"

Location
No. Line Sec.-1.
Washington Twp.
T.82 N. R.39 W.

STA-11+50.0 PROJECT NO. S-2791(I)
CRAWFORD COUNTY, IOWA.

Sheet # 2 of 5

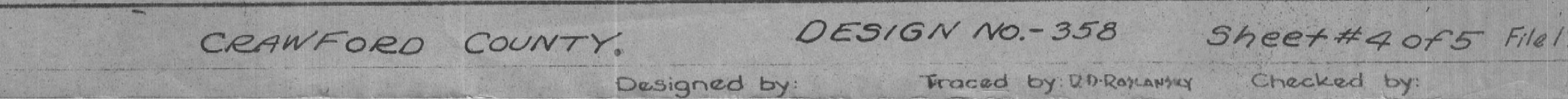
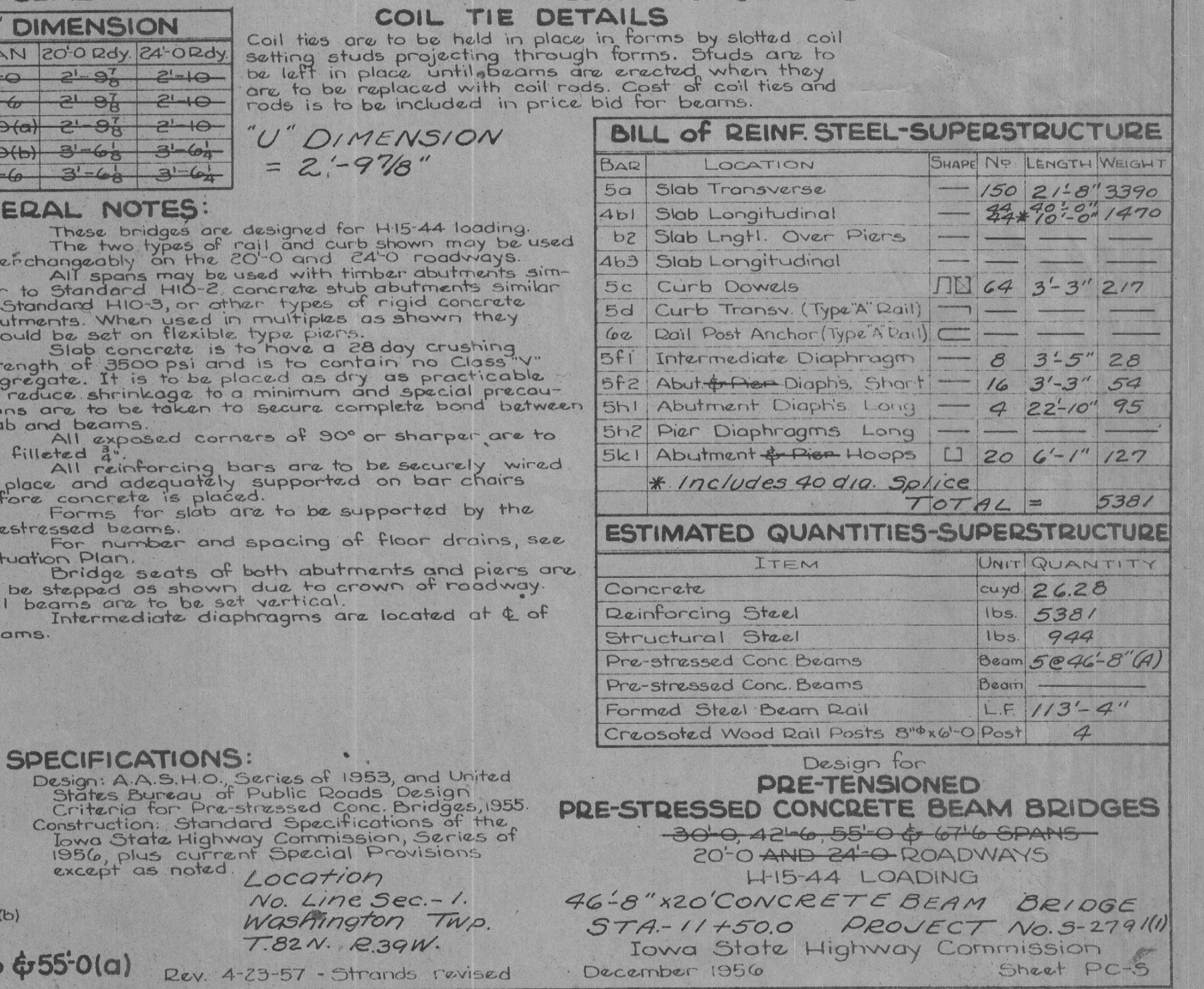
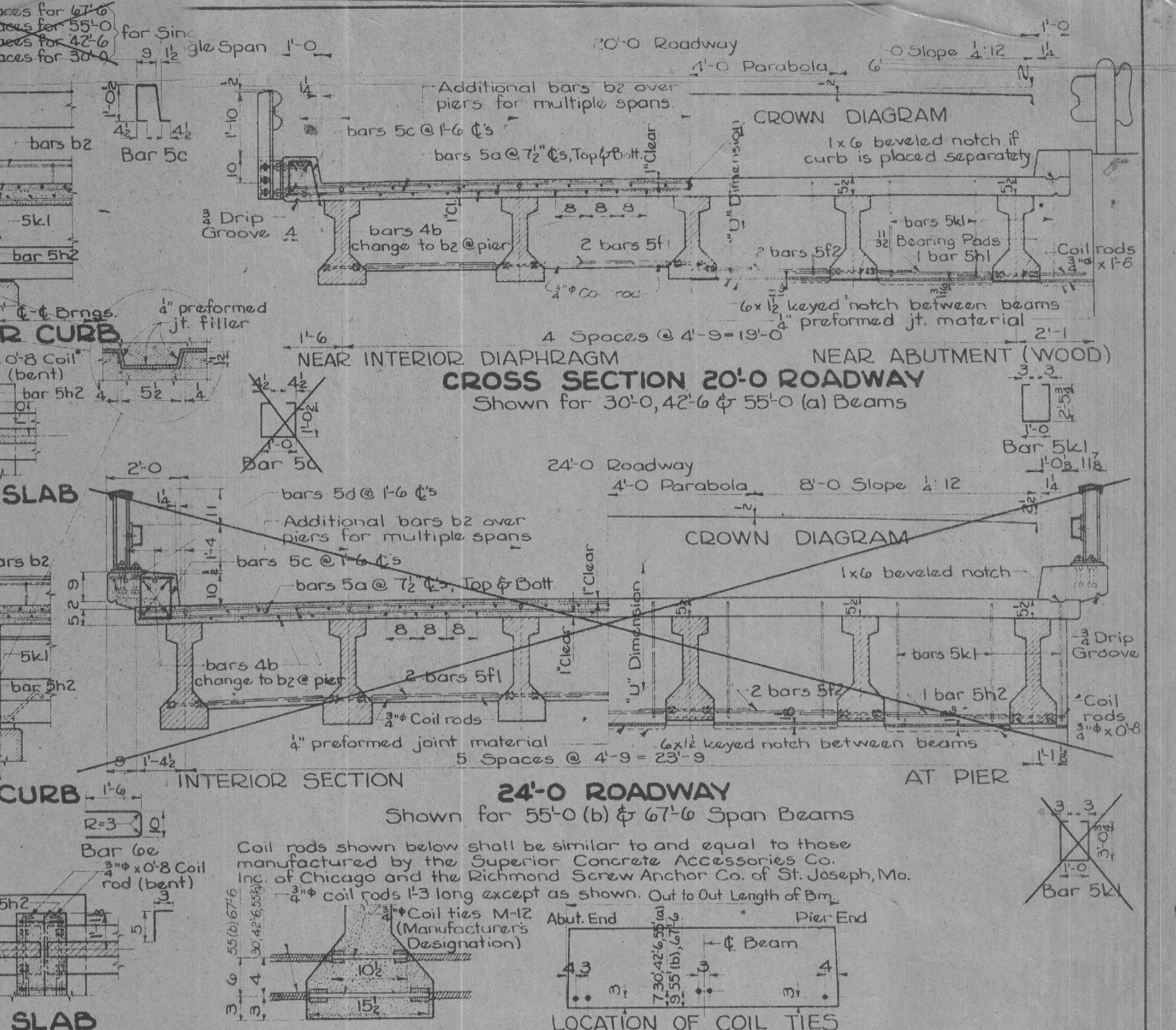
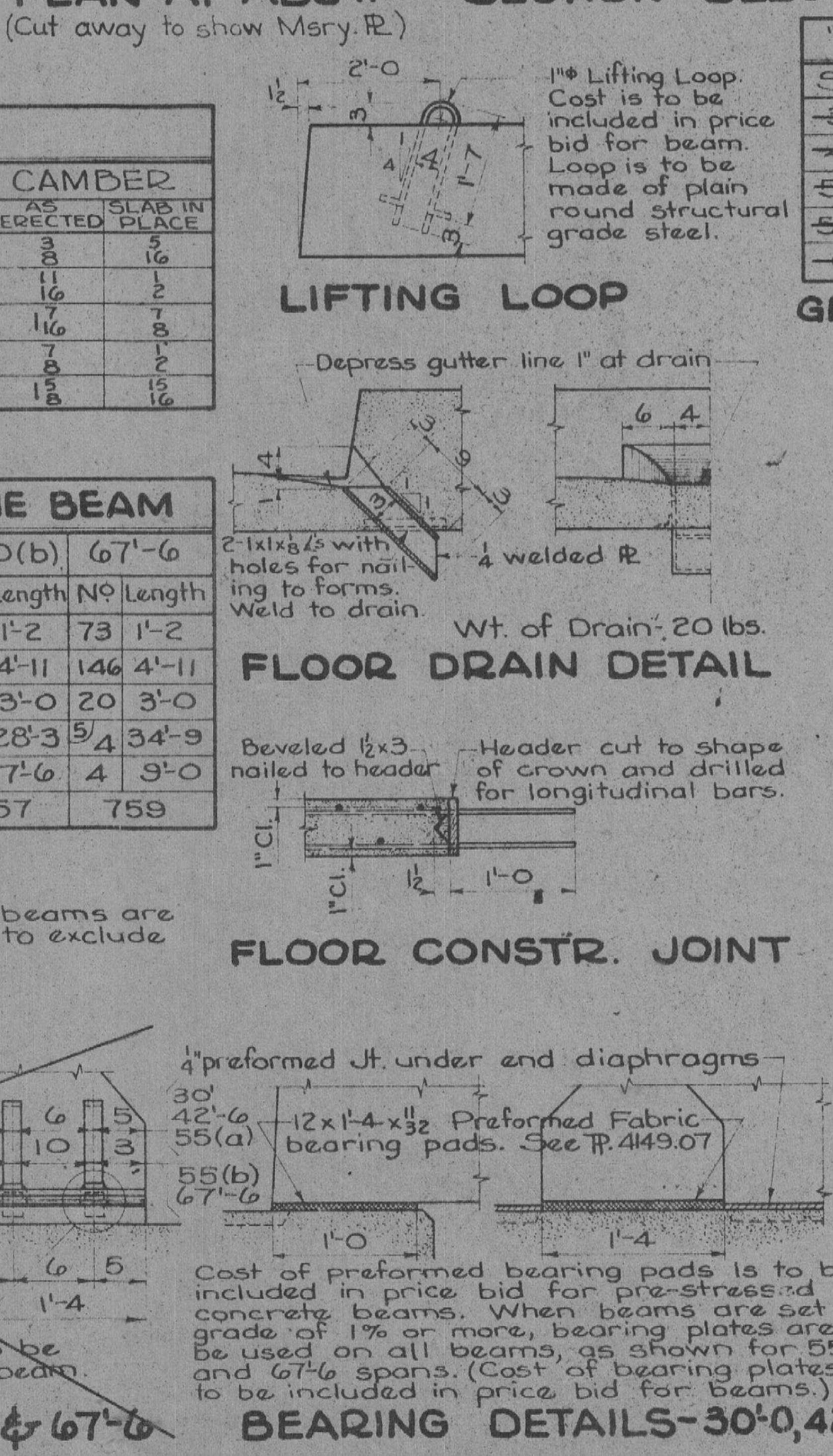
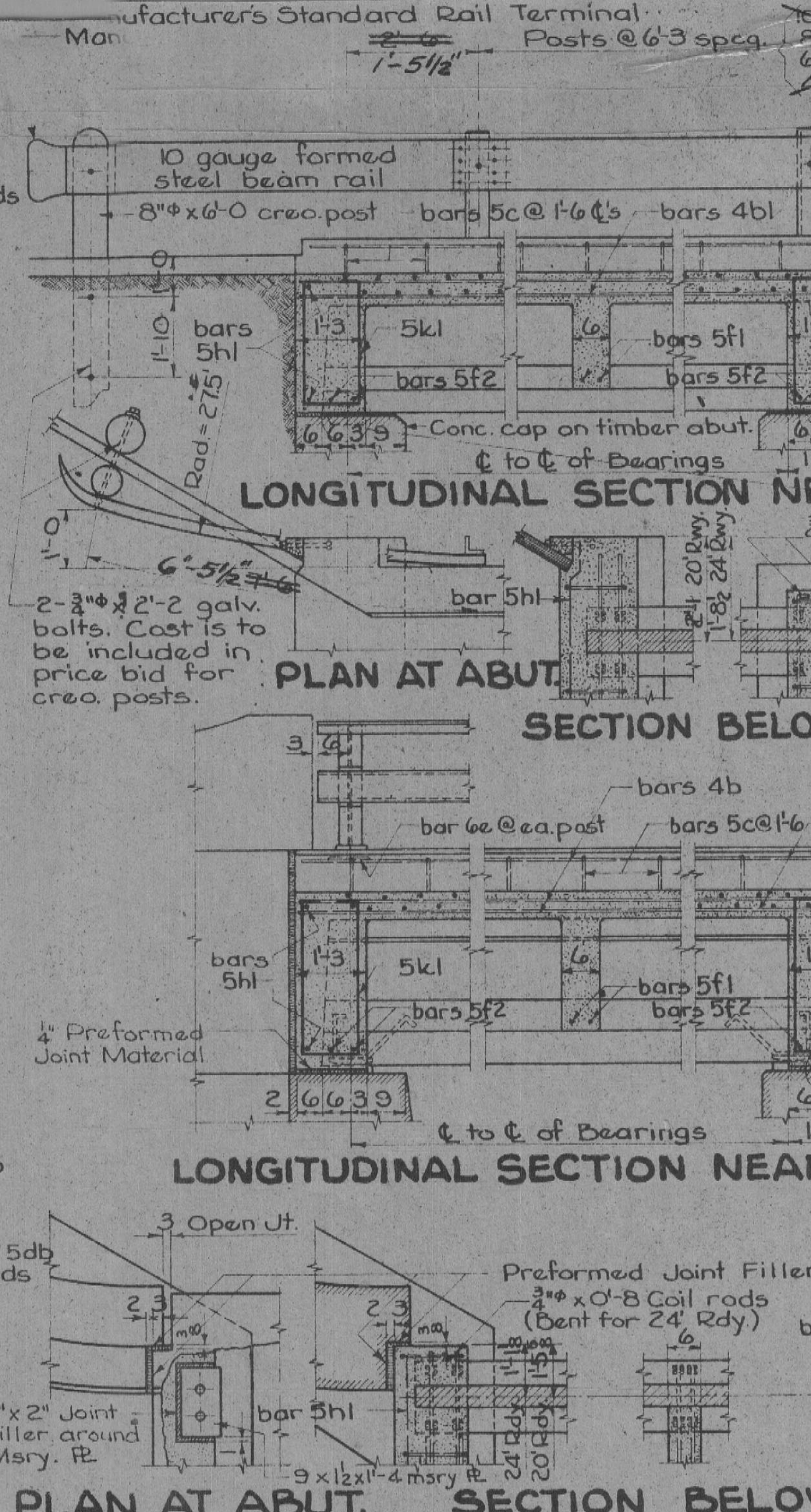
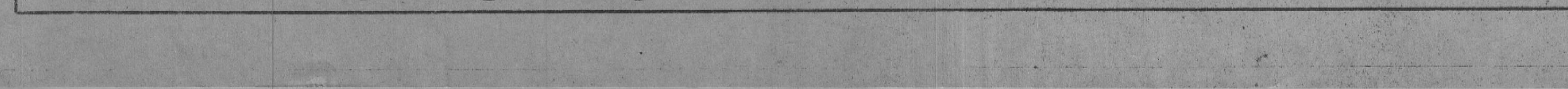
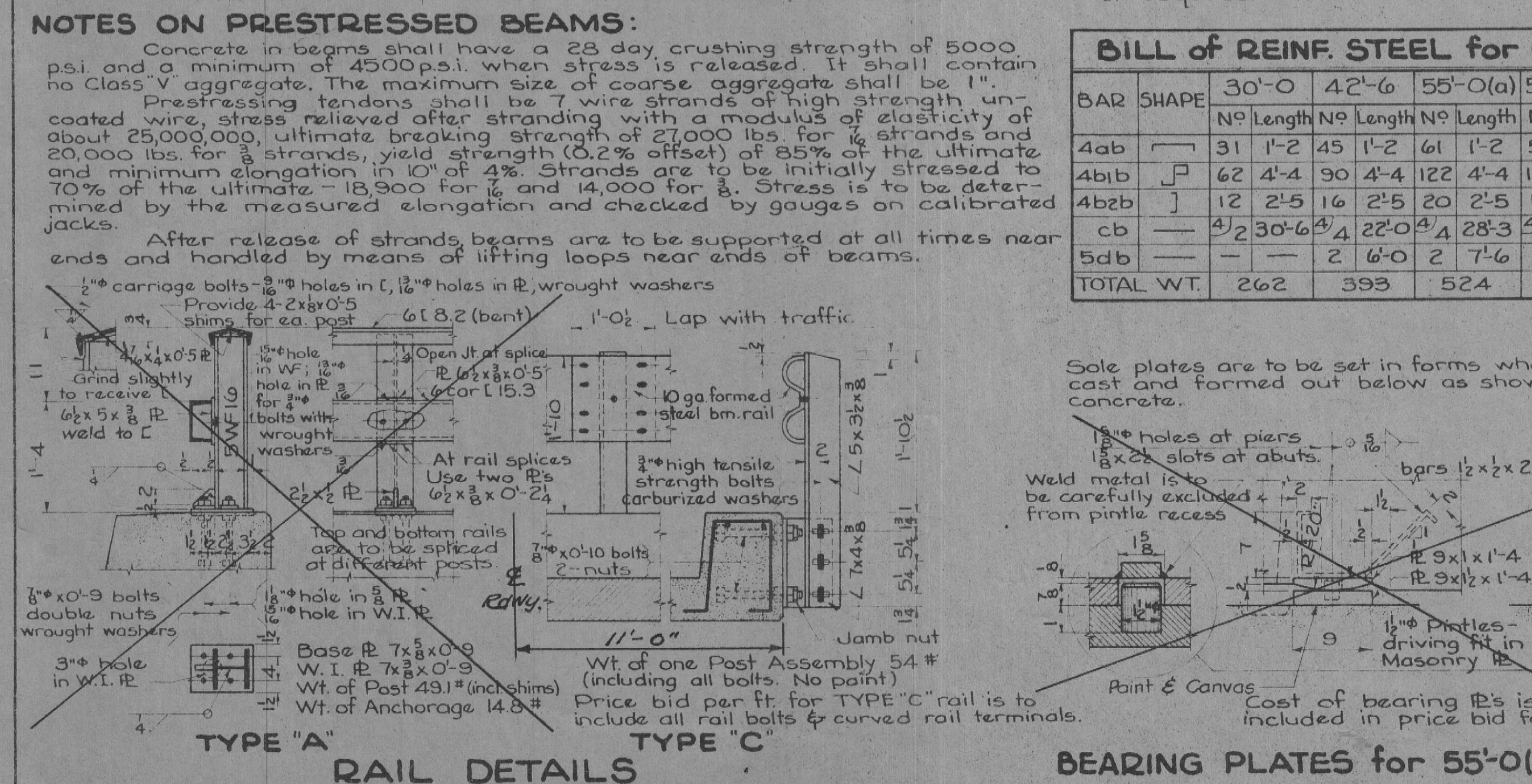
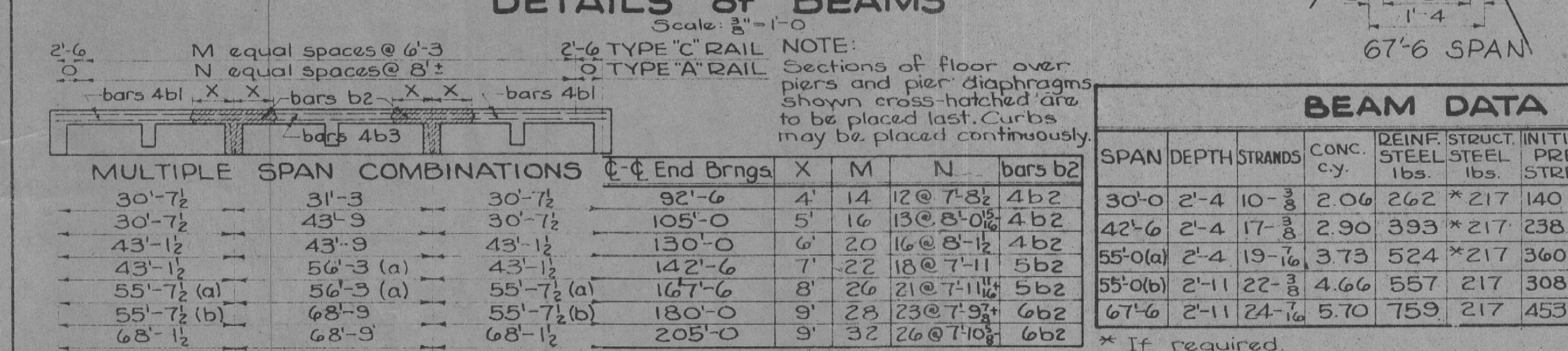
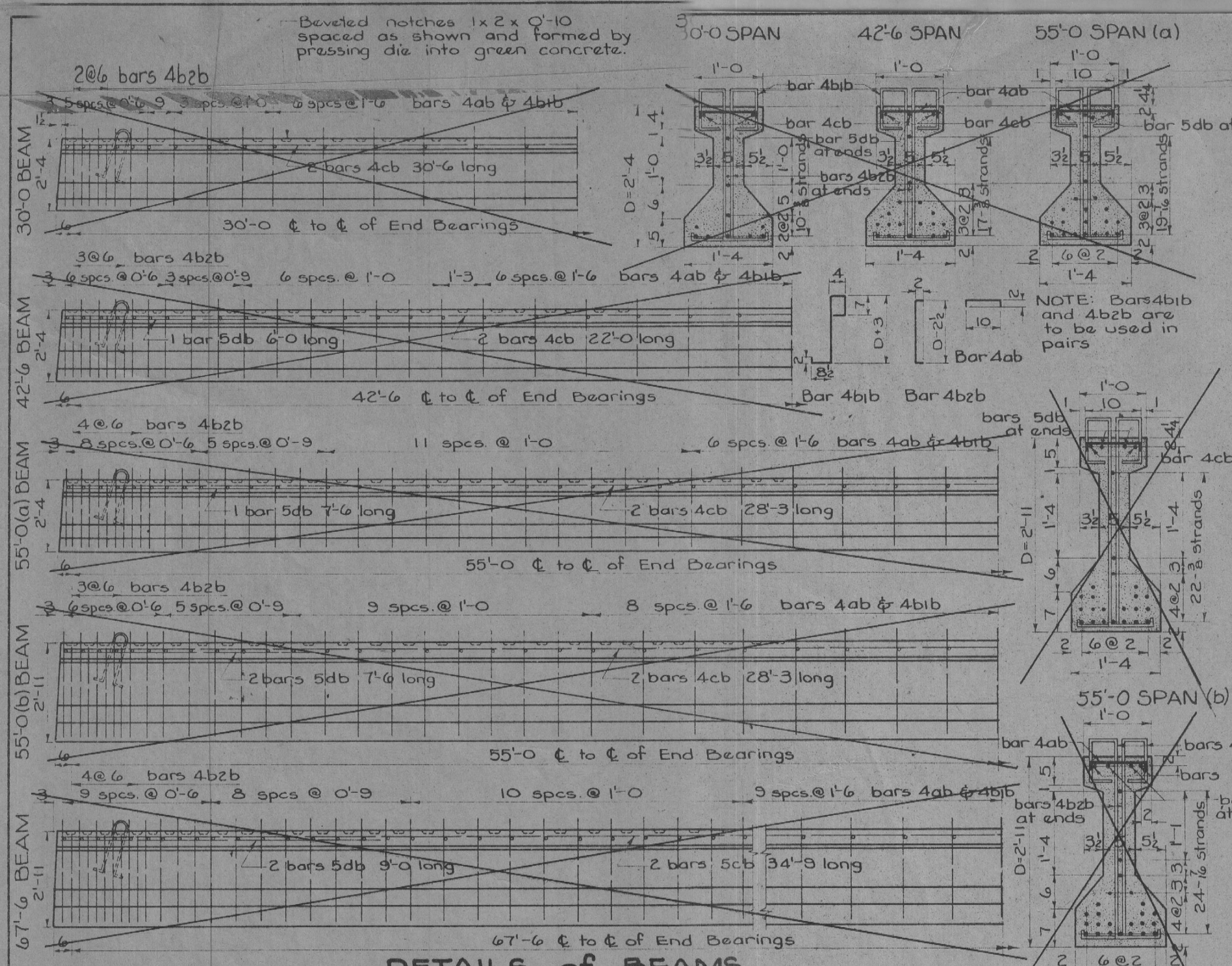


QUANTITIES - ONE ABUTMENT

Mark	Description	Shape	Size	Length	No.	Quant.
	Wing Piles			30'-0"	8	240 LF
	Org. Piles			35'-0"	6	210 "
	Total Piling				=	450 LF
	Backing Plank	3x8	24'-0"		33	1176 FBM
	Wing plank	3x8	6'-0"		2	24 FBM
	"	"	8'-0"		2	32 "
	"	"	10'-0"		18	340 "
	"	"	12'-0"		2	48 "
	"	"	14'-0"		10	280 "
	"	"	16'-0"		2	64 "
	"	"	18'-0"		2	72 "
	"	"	20'-0"		26	1040 "
	" Slope	"	16'-0"		2	64 "
	Nailers	6x6	22'-0"		2	132 "
	Total Creosoted Lumber = 3272 FBM					
	Struct. Steel					2319 Lbs.
	Concrete - Deadman					2.73 C.Y.
	" - Abutment cap.					3.54 "
	Total Concrete = 6.27 C.Y.					
	Rein. Steel - Deadman					278 Lbs.
	" - Abutment cap.					381 "
	Total Rein. Steel = 659 Lbs.					
	Galvanized Hardware					88 "

GENERAL NOTE:
For construction details not shown hereon refer to Iowa Highway Commission Standard H10-2.

DESIGN FOR
46'-8" x 20' PRE-STRESSED CONCRETE BEAM BRIDGE
CONCRETE FLOOR - STEEL HANDRAIL TYPE "C"
Location No. Line Sec. - 1. STA. - 11+50.0 PROJECT No. S-2791 (1)
Washington TWP. CRAWFORD COUNTY, IOWA
T.82.N. R.39.W.
Sheet # 3 of 5
CRAWFORD COUNTY. DESIGN No. - 358 PROJ. No. - S2791(1) File 19607



SPAN	DEPTH	STRANDS	CONC. C.Y.	DEINF. STEEL lbs.	STRUCT. STEEL lbs.	INITIAL PRE-STRESS	CAMBER AS SLAB IN PLACE
30'-0	2'-4	10-3/8	2.06	262	*217	140 k	1/16"
42'-6	2'-4	17-3/8	2.90	393	*217	238 k	1/16"
55'-0(a)	2'-4	19-1/8	3.73	524	*217	360 k	1/16"
55'-0(b)	2'-11	22-3/8	4.66	557	217	308 k	7/16"
67'-6	2'-11	24-1/8	5.70	759	217	453 k	1 1/16"

BAR SHAPE	30'-0	42'-6	55'-0(a)	55'-0(b)	67'-6
4ab	31	45	61	57	73
4bib	62	90	122	114	146
4b2b	12	16	20	16	20
cb	4	4	4	4	4
5db	-	2	2	4	4
TOTAL WT.	262	393	524	557	759

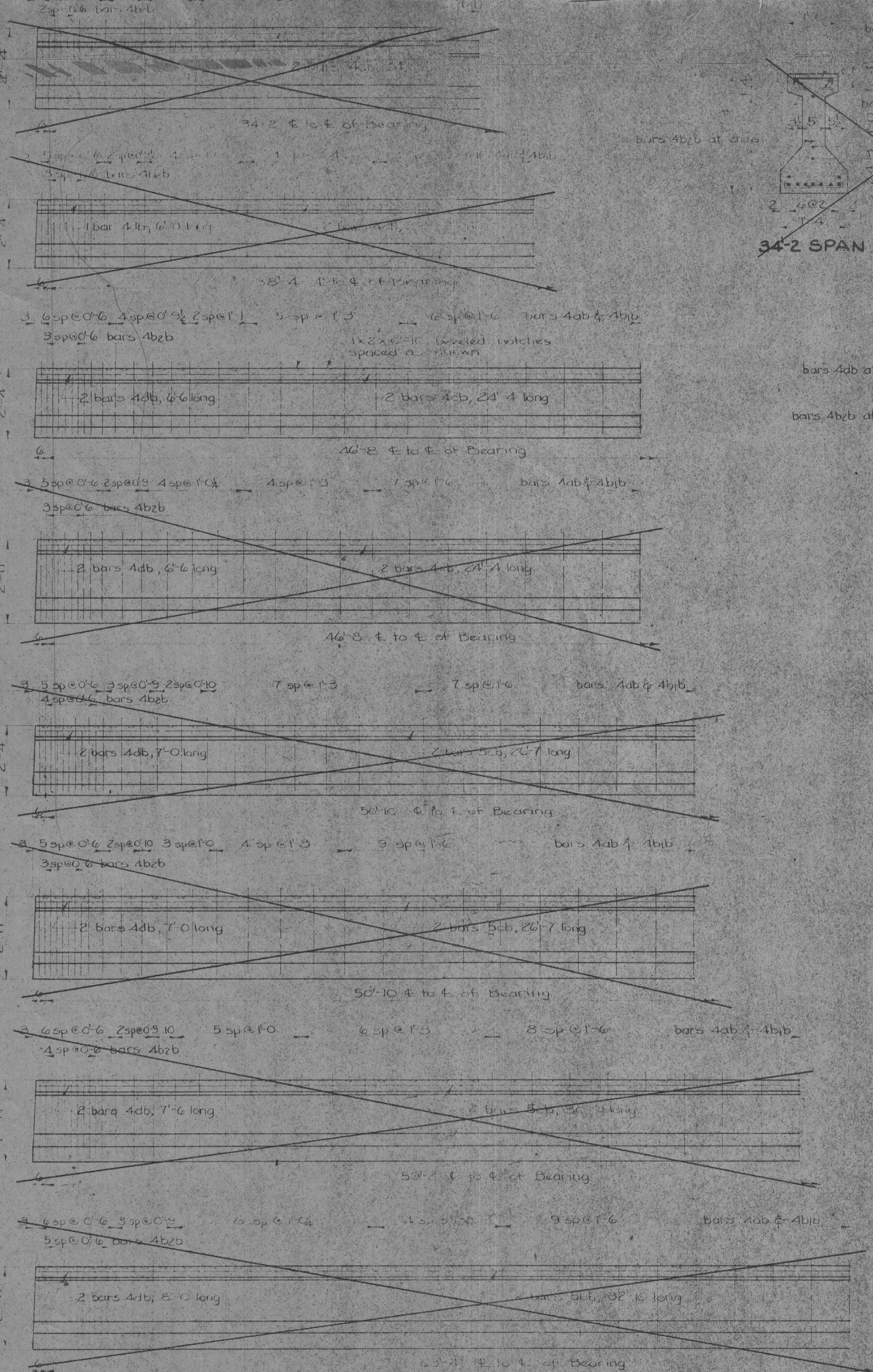
SPAN	20'-0 Rdy	24'-0 Rdy
30'-0	2'-9 3/8	2'-10
42'-6	2'-9 7/8	2'-10
55'-0(a)	2'-9 7/8	2'-10
55'-0(b)	3'-6 1/2	3'-6 1/2
67'-6	3'-6 1/2	3'-6 1/2

BAR	LOCATION	SHAPE	NO	LENGTH	WEIGHT
5a	Slab Transverse	---	150	2'-8"	3390
4b1	Slab Longitudinal	---	34	40'-0"	1470
b2	Slab Longt. Over Piers	---	---	---	---
4b3	Slab Longitudinal	---	---	---	---
5c	Curb Dowels	---	64	3'-3"	217
5d	Curb Transv. (Type A Rail)	---	---	---	---
6e	Rail Post Anchor (Type A Rail)	---	---	---	---
5f1	Intermediate Diaphragm	---	8	3'-5"	28
5f2	Abutment Pier Diaphragm Short	---	16	3'-3"	54
5h1	Abutment Diaphragm Long	---	4	22'-10"	95
5h2	Pier Diaphragms Long	---	---	---	---
5k1	Abutment Pier Hoops	---	20	6'-1"	127
* Includes 40 dia. Splice				TOTAL =	5381

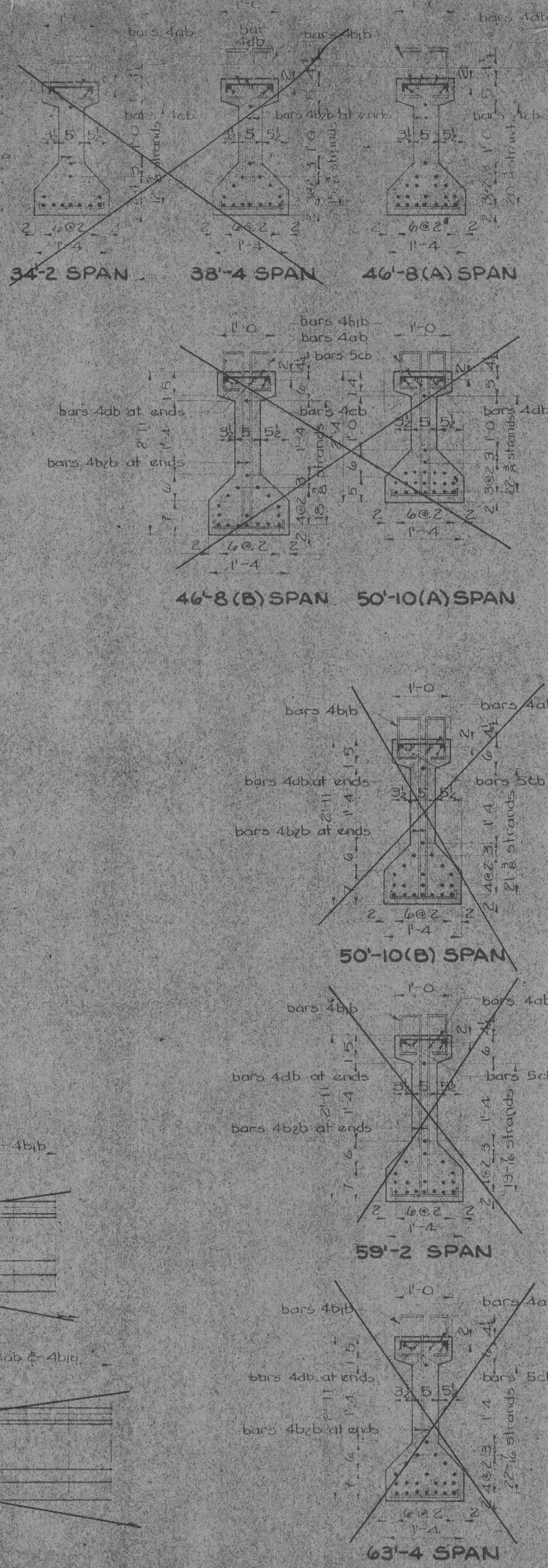
ITEM	UNIT	QUANTITY
Concrete	cuyd	2628
Reinforcing Steel	lbs.	5381
Structural Steel	lbs.	944
Pre-stressed Conc. Beams	Beam	5 @ 46'-8" (A)
Pre-stressed Conc. Beams	Beam	---
Formed Steel Beam Rail	L.F.	113'-4"
Cresosated Wood Rail Posts	Post	4

DESIGN FOR PRE-TENSIONED PRE-STRESSED CONCRETE BEAM BRIDGES
 30'-0, 42'-6, 55'-0 & 67'-6 SPANS
 20'-0 AND 24'-0 ROADWAYS
 H15-44 LOADING
46'-8" x 20' CONCRETE BEAM BRIDGE
 STA. 11+50.0 PROJECT No. 5-279(11)
 Iowa State Highway Commission
 Sheet PC-5

34'-2 SPAN
38'-4 SPAN
46'-8 (A) SPAN
46'-8 (B) SPAN
50'-10 (A) SPAN
50'-10 (B) SPAN
59'-2 SPAN
63'-4 SPAN



DETAILS OF BEAMS



BEAM DATA								
SPAN	DEPTH	STRANDS	INITIAL PRE STRESS	CONC. (cu yd)	REINF. STEEL (lbs)	SLAB WEIGHT (lbs)	BEAM CAMBER As Erected Slab in Place	
34'-2	2'-4	12	168 k	2.54	354	217	1/16	1/4
38'-4	2'-4	15	210 k	2.62	340	217	1/16	1/4
46'-8 A	2'-4	20	280 k	3.17	414	217	1/16	1/4
46'-8 B	2'-11	18	252 k	3.94	442	217	1/16	1/4
50'-10 A	2'-4	22	308 k	3.15	480	217	1/16	1/4
50'-10 B	2'-11	21	294 k	4.30	504	217	1/16	1/4
59'-2	2'-11	19	360 k	4.95	604	217	1/16	1/4
63'-4	2'-11	22	416 k	5.28	651	217	1/16	1/4

BILL OF REINFORCING STEEL FOR ONE BEAM										
BAR SHAPE	34'-2	38'-4	46'-8 A	46'-8 B	50'-10 A	50'-10 B	59'-2	63'-4		
	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length	Nº Length
4db	35 1'-1	39 1'-1	47 1'-1	45 1'-1	49 1'-1	47 1'-1	57 1'-1	61 1'-1		
4bb	70 4'-4	78 4'-4	94 4'-4	90 4'-11	98 4'-4	94 4'-11	114 4'-11	122 4'-11		
4bzb	12 2'-5	16 2'-5	16 2'-5	16 3'-0	20 2'-5	16 3'-0	20 3'-0	24 3'-0		
5cb	2 34'-8	2 38'-10	4 42'-4	4 42'-4	4 52'-7	4 52'-7	4 53'-9	4 53'-10		
4db		2 6'-0	4 6'-6	4 6'-6	4 7'-0	4 7'-0	4 7'-6	4 8'-0		
TOTAL WT. (lbs)	294	340	414	442	480	504	604	651		

NOTE
This sheet is supplementary to Iowa State Highway Commission design sheet PCS and covers additional spans not covered on that sheet.
For details, notes and specifications not shown refer to sheets PCS.

DESIGN FOR
46'-8" x 20' PRE-STRESSED CONCRETE BEAM BRIDGE
CONCRETE FLOOR - STEEL HANDRAIL TYPE "C"
Location: No. Line Sec.-1, Washington Twp., Crawford County, Iowa.
STA-11+50.0 PROJECT No. S-2791 (I)
CRAWFORD COUNTY, IOWA.
Sheet #5 of 5 PCS(a)
CRAWFORD COUNTY, DESIGN No. - 358 PROJ. No. - S-2791(I) File 19607
Designed by: Tragedy by I. D. ... Checked by: