

JULY 22 . 1958

STATE OF IOWA
 STATE HIGHWAY COMMISSION
 DESIGN FOR
 55'x20' PRE-STRESSED CONCRETE BEAM BRIDGE
 SECONDARY ROAD SYSTEM PROJ. DS-2672 (2)
 CRAWFORD COUNTY
 JANUARY 1958.

MILEAGE SUMMARY: = 57'-0" = 0.01079 MILES.

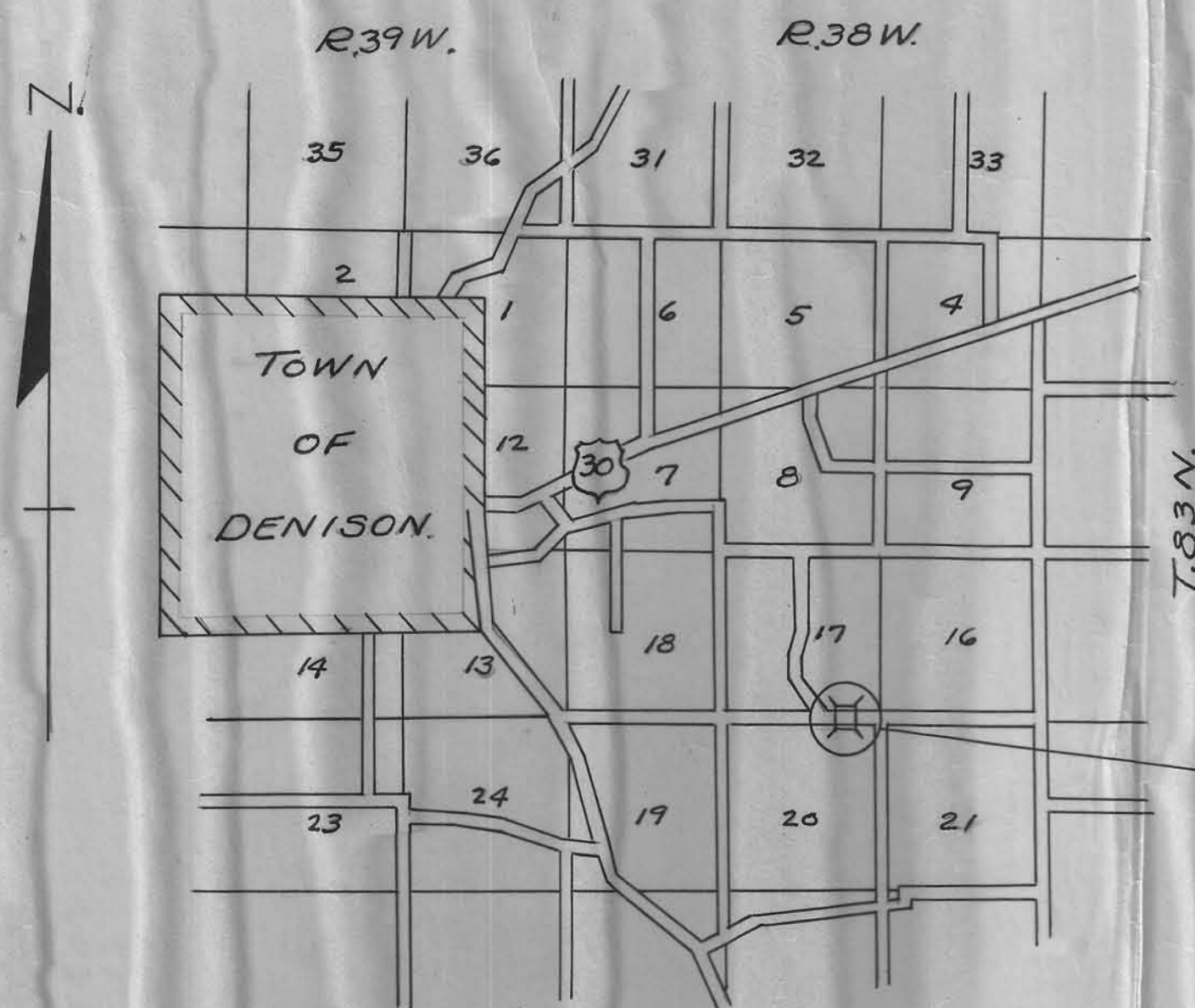
SPECIFICATIONS:
 Design: A.A.S.H.O. Series of 1953.
 Construction: Standard Specifications of
 the Iowa State Highway Commission, Series
 of 1956, plus current Special Provisions
 except as noted.

In Letting of July 22, 1958

DESIGN-2258 EAST BOYER TWP. CRAWFORD COUNTY. SEC-17-20 STA. 165+325 OVER WILLOW CREEK 55'x20' PRESTRESSED CONCRETE BEAM BRIDGE					
DESCRIPTION	ABUTMENTS.		SUPERSTRUCT.		TOTAL
CONCRETE CLASS-"A"	12.60	C.Y.	* 31.40	C.Y.	44.00 C.Y.
REIN. STEEL	1316	LBS.	6459	LBS.	7775 LBS.
STRUCT. STEEL	4498	"	1078	"	5576 "
PRE-STRESSED BEAMS			5-55'-0" (a)		5-55'-0" (a)
HANDRAIL			130'-0" L.F.		130'-0" L.F.
WOOD RAIL POSTS 8"x6'			4		4
TREATED WOOD PILING	20@30=600, 4@25=100	4@20=80 L.F.			780 L.F.
TREATED LUMBER	6256	F.B.M.			6256 F.B.M.
GALVANIZED HARDWARE	170	LBS.	32		202 LBS.
EXCAVATION CLASS#20	193	C.Y.			193 C.Y.
" CLASS# 10		C.Y.			C.Y.
" CLASS# 21	10	C.Y.			10 C.Y.
REMOVAL OF OLD STRUCTURE					LUMP SUM.

* Includes 248 Cu. yds for Slab thickening. (Assumed for estimating purposes only.)

NOTE: Bridge Sign Assemblies will be furnished & placed by Crawford County to conform with S. & T. Instruction No. 11, revised March-1, 1957.



LOCATION MAP
SCALE 1" = 1 MILE.

DESIGN No. # 2258
 PROJECT No. DS-2672 (2)

APPROVED

[Redacted Signature]

APPROVED

CHIEF ENGINEER DATE
 IOWA HIGHWAY COMMISSION.

DEPARTMENT OF COMMERCE
 BUREAU OF PUBLIC ROADS.

RECOMMENDED FOR APPROVAL

DISTRICT ENGINEER DATE

APPROVED

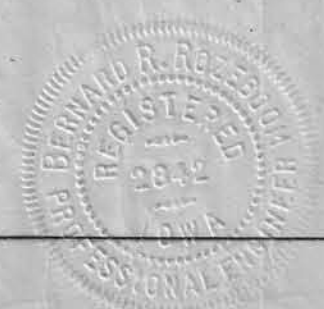
DIVISION ENGINEER DATE

BOARD OF SUPERVISORS DATE

4717 July 12/58

Sheet # 1 of 5.

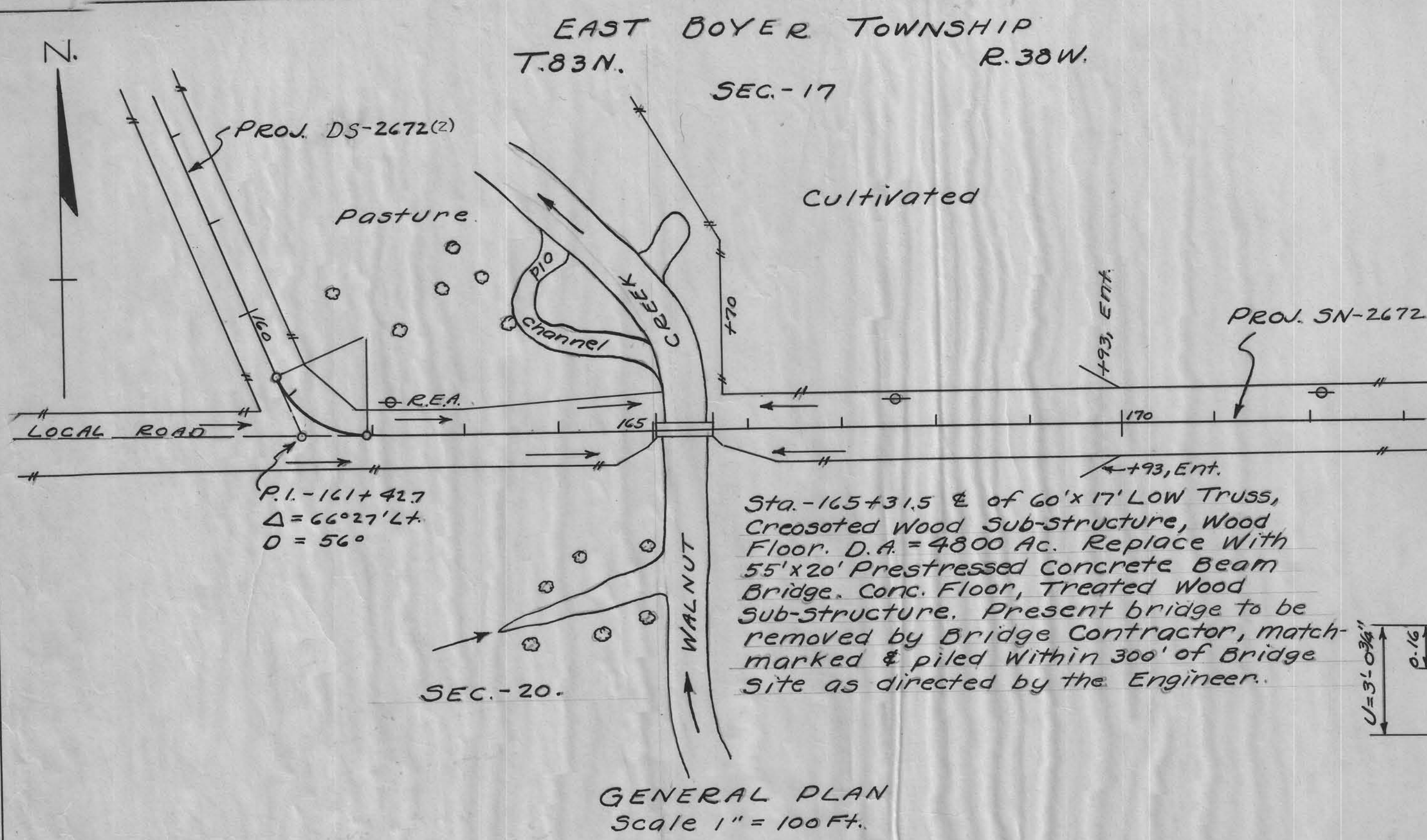
off the home
6-27-58



File 19743

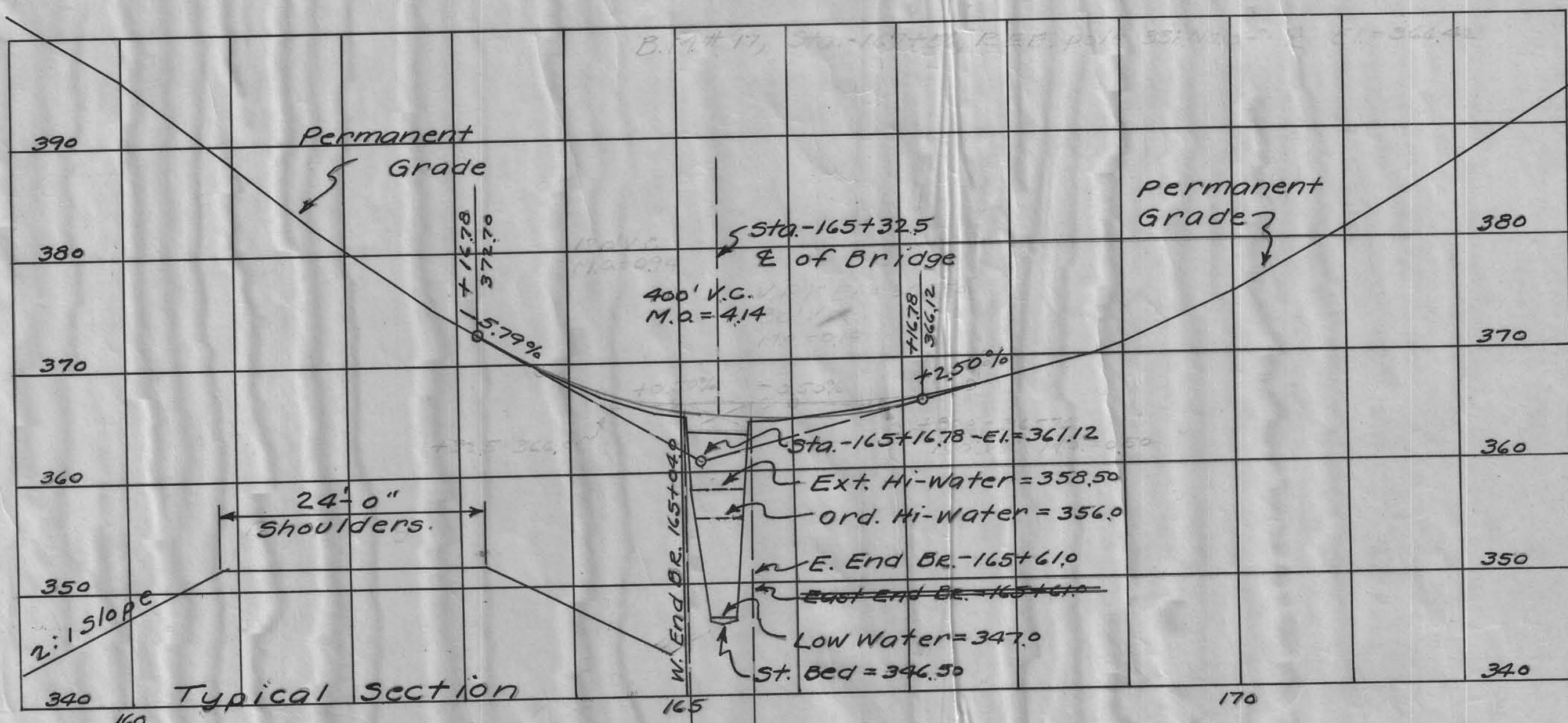
CRAWFORD COUNTY. Design No. 2258 PROJ. # DS-2672 (2)

Tab

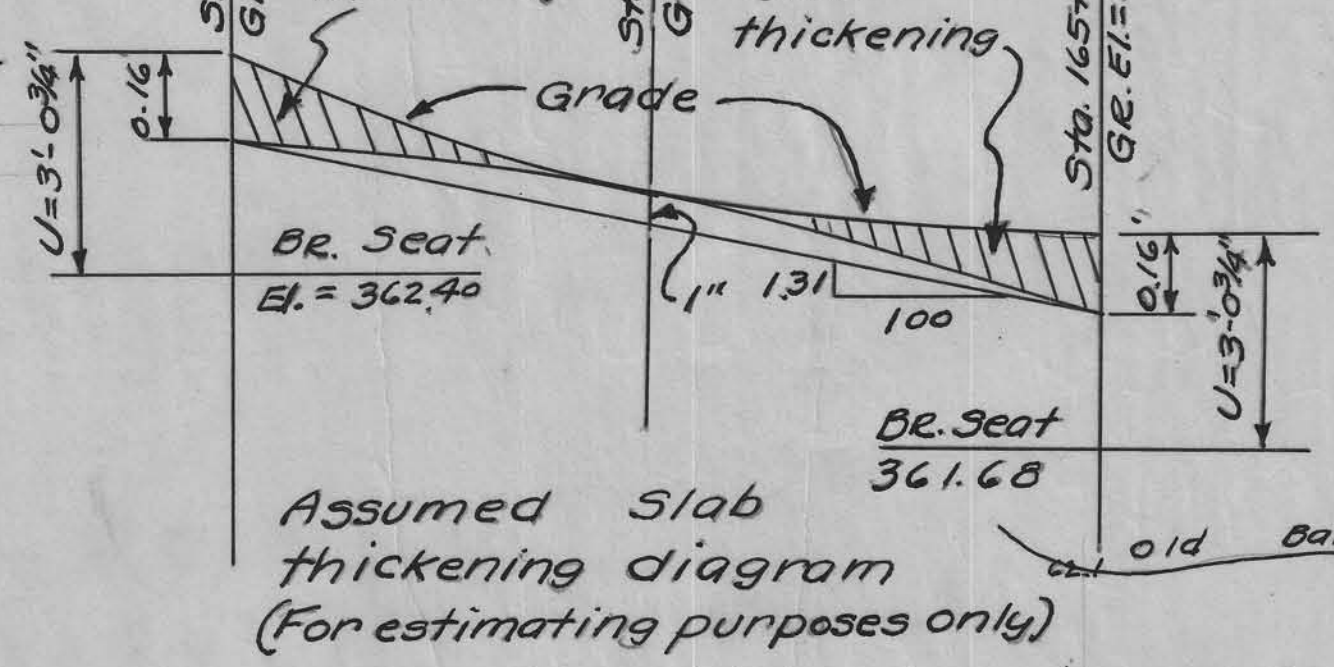
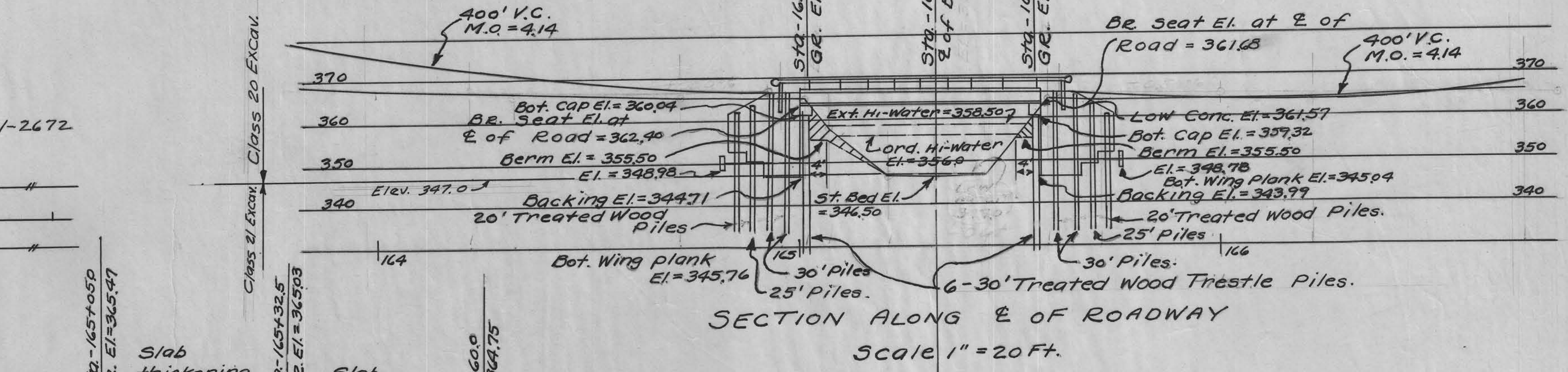


Sta. -165+31.5 E of 60'x17' Low Truss, Creosoted Wood Sub-structure, Wood Floor. D.A. = 4800 Ac. Replace With 55'x20' Prestressed Concrete Beam Bridge. Conc. Floor, Treated Wood Sub-structure. Present bridge to be removed by Bridge Contractor, match-marked & piled within 300' of Bridge Site as directed by the Engineer.

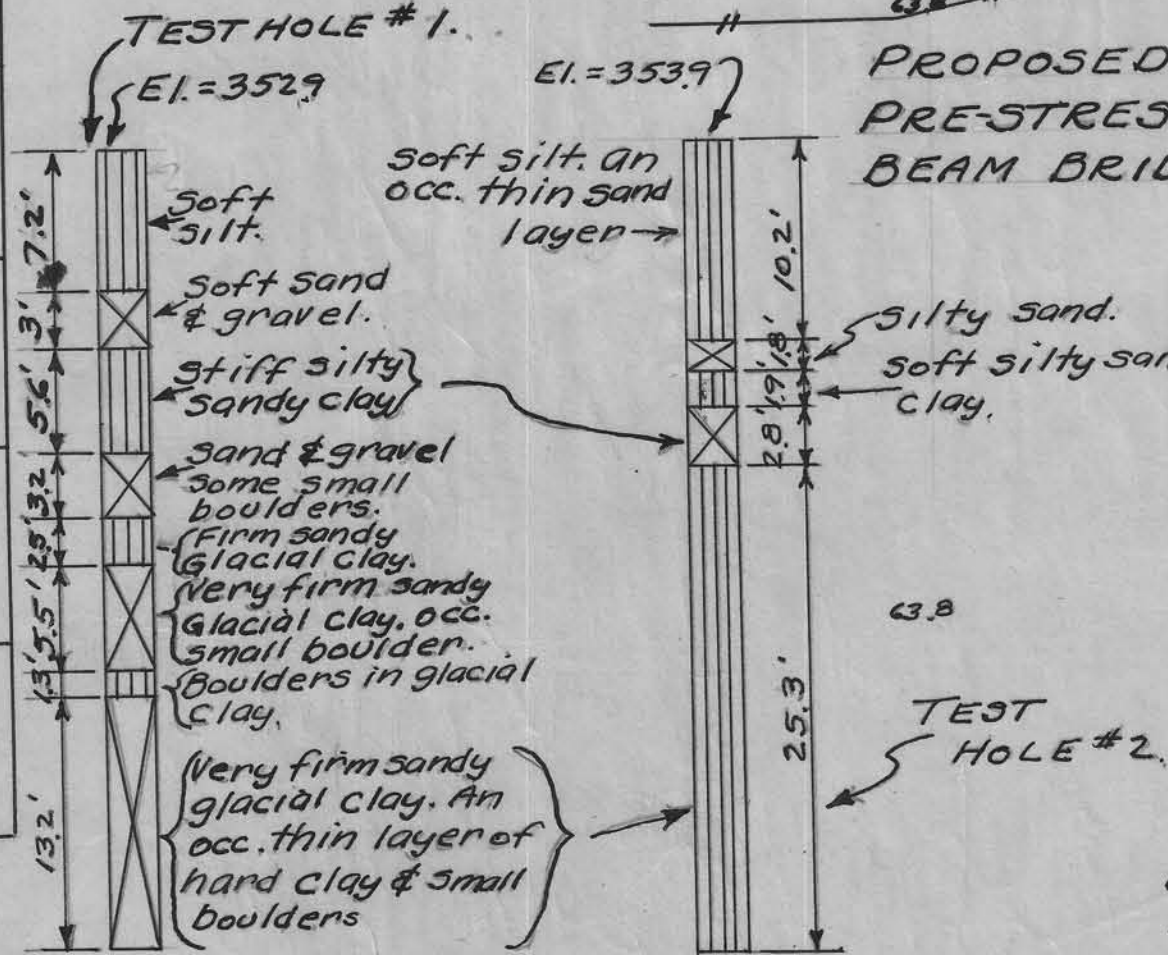
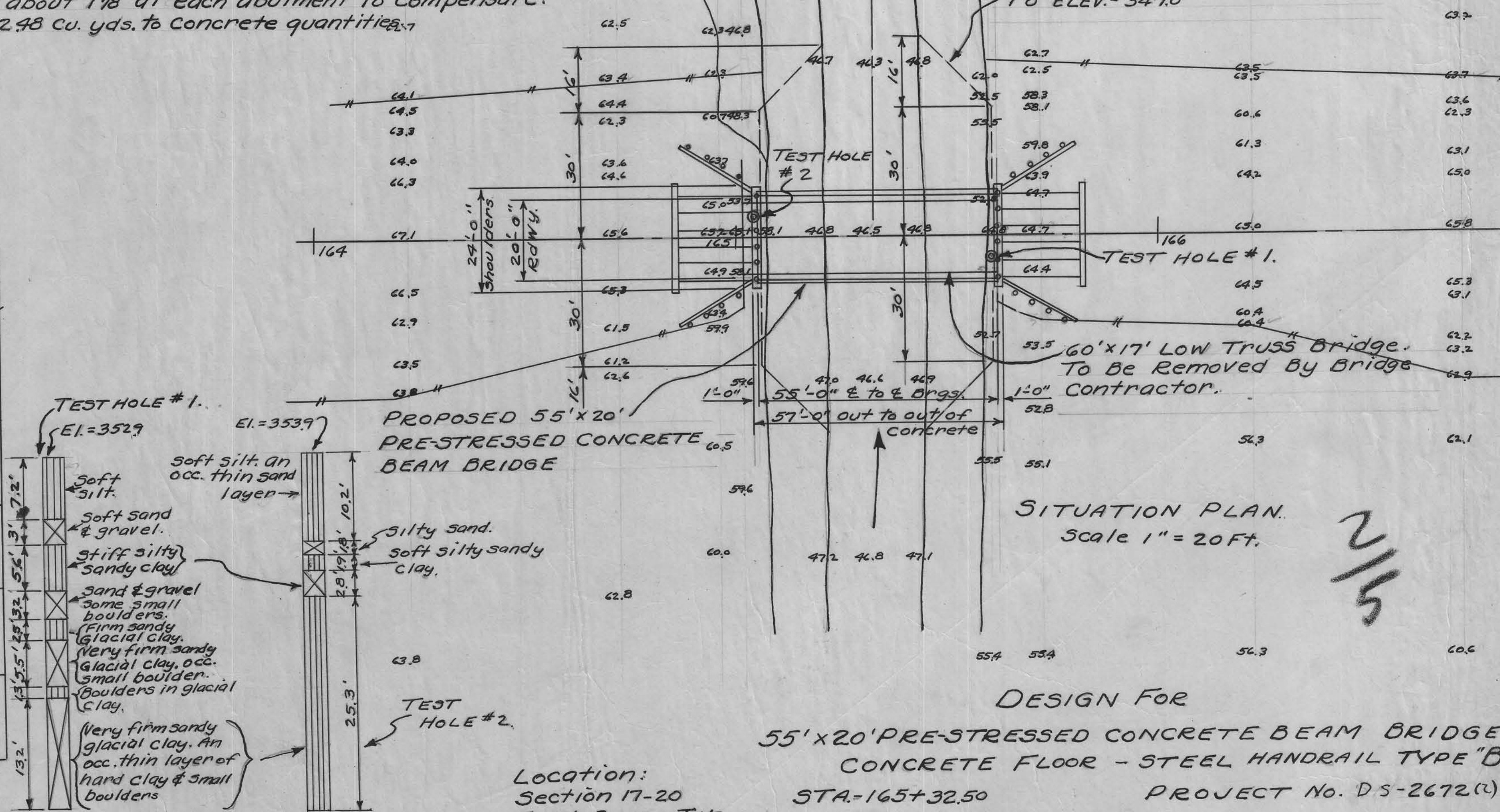
GENERAL NOTES:
 All Lumber is to be creosoted. Backing & Wing plank in 10" & 12" widths may be substituted for 8" plank shown but payment will be made on basis of quantities shown. All piling are to be creosoted & are to comply with the specifications for Treated Timber Trestle piles. All hardware is 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 H11-1 and for details of Abutments refer to Standard H11-4 with further details on sheet #5. of these plans. All materials & construction to conform with the Iowa Highway Commission Standard Specifications, Series of 1956.



ROAD PROFILE
 HOR. 1" = 100 Ft.
 SCALE VERT. 1" = 10 Ft.



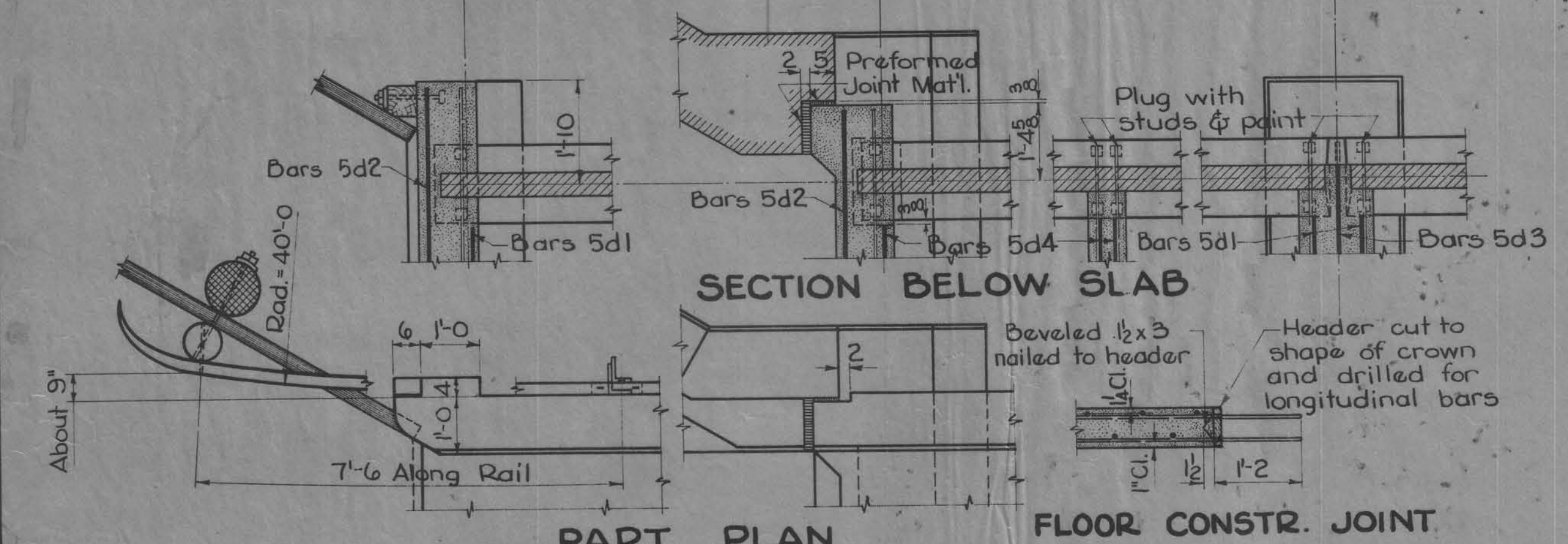
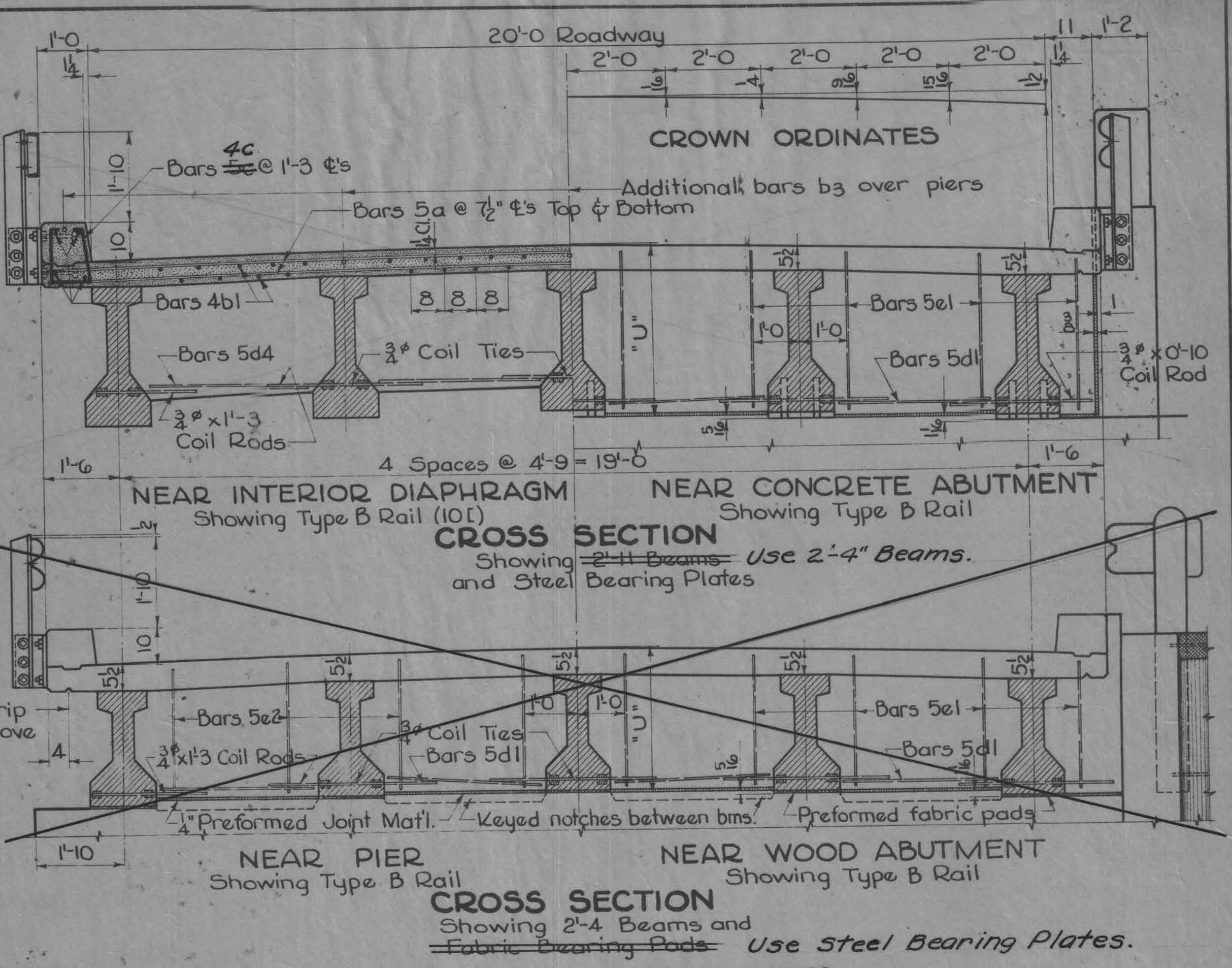
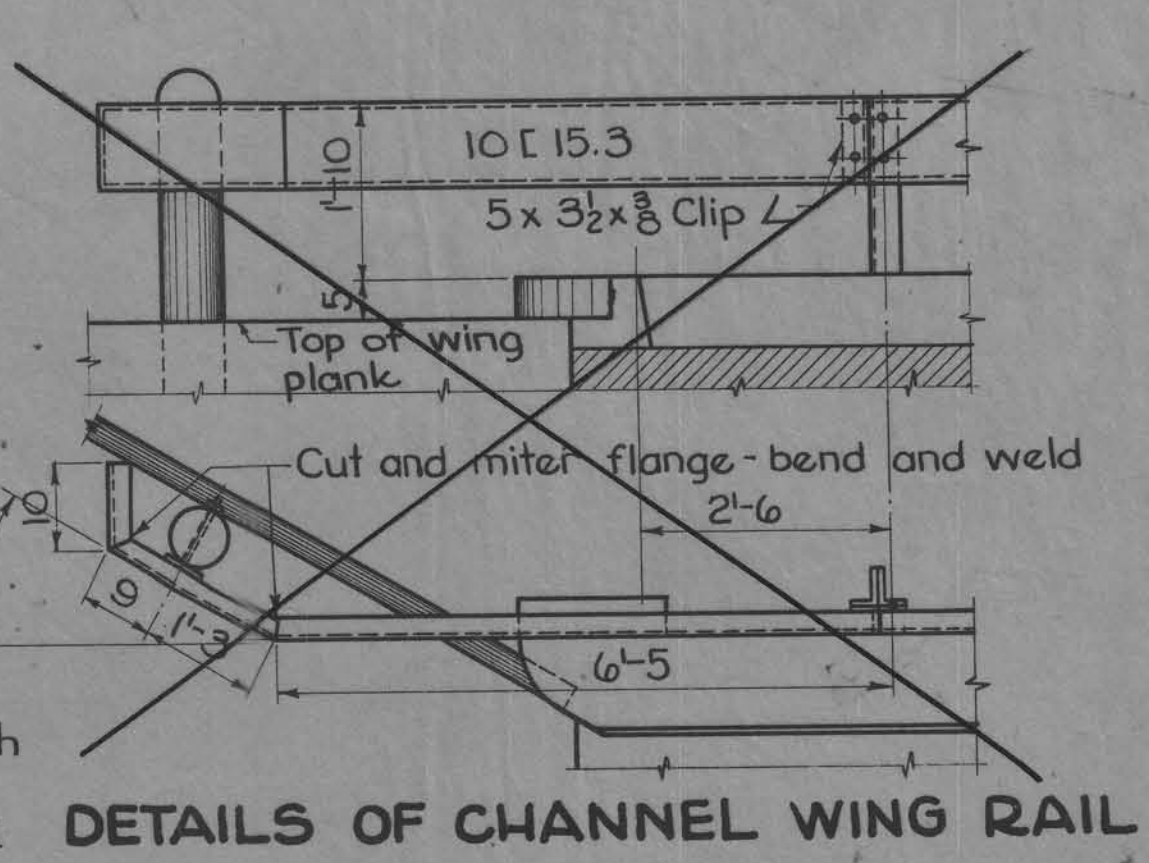
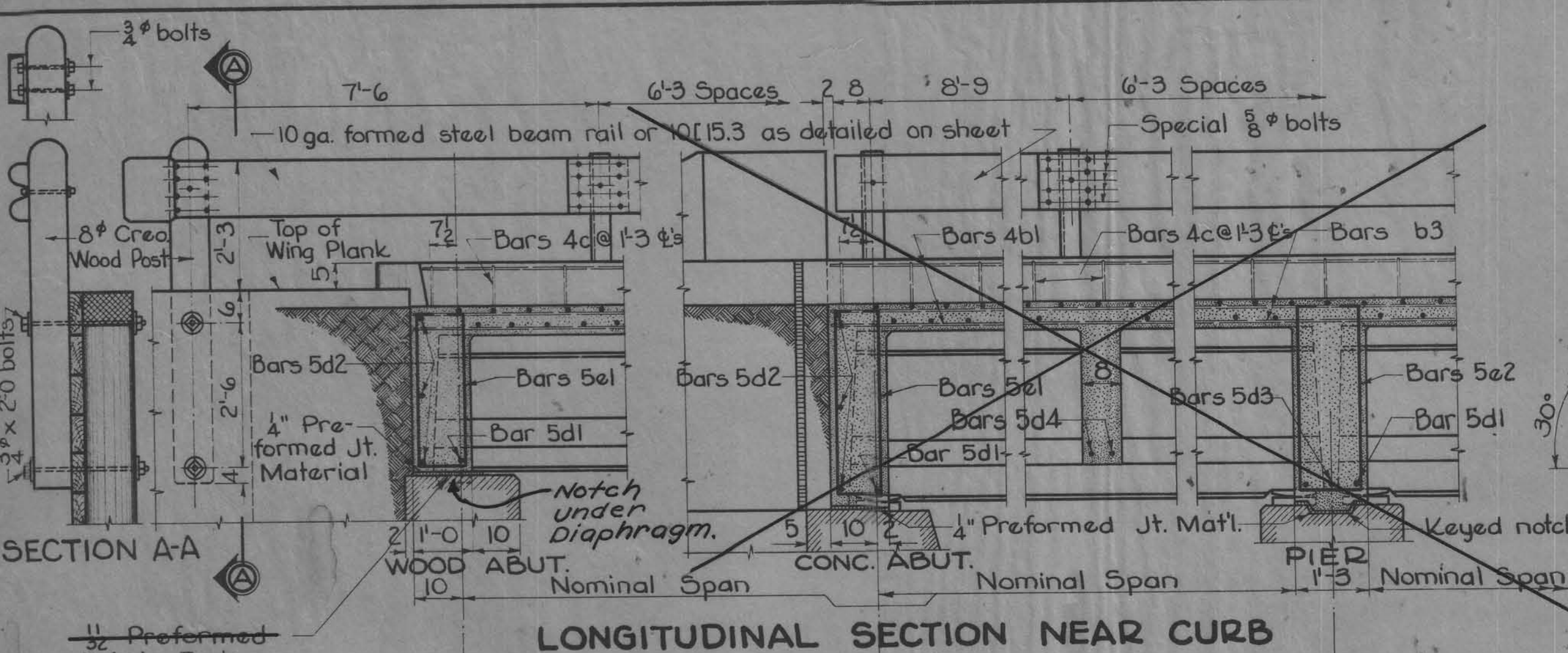
Note: Grade to bridge seat has been increased because of beam camber and sag curve. Thicken Slab about 1 7/8" at each abutment to compensate. Add 2.98 Cu. yds. to Concrete quantities.



SOUNDING DATA.
 Scale VERT. 1" = 10 Ft.

Location:
 Section 17-20
 East Boyer Twp.
 T.83N. R.38W.

DESIGN FOR
 55'x20' PRE-STRESSED CONCRETE BEAM BRIDGE
 CONCRETE FLOOR - STEEL HANDRAIL TYPE "B"
 STA.-165+32.50 PROJECT No. DS-2672(2)
 CRAWFORD COUNTY, IOWA.



MULTIPLE SPAN COMBINATIONS

Span	Abutment	Pier	Span	Abutment	Pier	Span	Abutment	Pier
30'-7 1/2"	31'-3"	30'-7 1/2"	30'-7 1/2"	31'-3"	30'-7 1/2"	30'-7 1/2"	31'-3"	30'-7 1/2"
43'-1 1/2"	43'-9"	43'-1 1/2"	43'-1 1/2"	43'-9"	43'-1 1/2"	43'-1 1/2"	43'-9"	43'-1 1/2"
55'-7 1/2" (a)	56'-3" (a)	55'-7 1/2" (a)	55'-7 1/2" (b)	56'-3" (b)	55'-7 1/2" (b)	55'-7 1/2" (a)	56'-3" (a)	55'-7 1/2" (a)
68'-1 1/2"	68'-9"	68'-1 1/2"	68'-1 1/2"	68'-9"	68'-1 1/2"	68'-1 1/2"	68'-9"	68'-1 1/2"

REINFORCING BAR LIST

Bar	Location	Shape	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight	N°	Length	Weight										
5a	Slab Transverse T. & B.	—	95	21-8	2147	135	21-8	3051	175	21-8	3955	215	21-8	4859	287	21-8	6500	327	21-8	7345	407	21-8	9198	447	21-8	10,102	527	21-8	11,910	567	21-8	12,514	647	21-8	14,622	
4b1	Slab & Curb Longitudinal	—	44	31-4	919	88	22-6	1322	88	28-9	1687	88	35-0	2053	88	28-6	1676	88	27-6	1619	88	39-0	2294	88	38-0	2236	176	25-4	2982	176	24-10	2920	176	31-0	3644	
4b2	Slab & Curb Longitudinal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4b3	Slab & Curb Long. Over Piers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4c	Curb Dowels	□	52	3-2	110	72	3-2	153	92	3-2	196	112	3-2	235	152	3-2	323	172	3-2	365	212	3-2	450	232	3-2	452	272	3-2	577	292	3-2	619	332	3-2	704	
5d1	Diaphragms (short)	—	8	3-2	26	8	3-2	26	8	3-2	26	8	3-2	26	24	3-2	79	24	3-2	79	24	3-2	79	24	3-2	79	24	3-2	79	24	3-2	79	24	3-2	79	
5d2	Diaphragms Abut. Wood	—	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	6	22-4	140	
5d3	Diaphragms Piers	—	—	—	—	—	—	—	—	—	—	—	—	—	2	21-2	44	2	21-2	44	2	21-2	44	2	21-2	44	2	21-2	44	2	21-2	44	2	21-2	44	
5d4	Interior Diaphragms	—	8	3-6	29	8	3-6	29	8	3-6	29	8	3-6	29	24	3-6	87	24	3-6	87	24	3-6	87	24	3-6	87	24	3-6	87	24	3-6	87	24	3-6	87	
5e1	Abutment Diaph. Hoops	□	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	20	5-11	124	
5e2	Pier Diaphragm Hoops	□	—	—	—	—	—	—	—	—	—	—	—	—	16	6-3	104	16	6-3	104	16	6-3	104	16	6-3	104	16	6-3	104	16	6-3	104	16	6-3	104	
				3495			4845			6459			7466			10357			11624			14316			16211			19007			21381			23998		

ESTIMATED QUANTITIES

Bid Item	Unit	Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type		Abutment Type	
		Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete	Wood	Concrete
Concrete	cu.yd.	18.1	18.0	23.5	23.5	28.9	28.9	34.3	34.3	50.4	50.3	55.8	55.8	66.6	66.6	72.1	72.1	82.9	82.9	90.9	90.9	101.9	101.9	101.9	101.9	101.9	101.9
Reinforcing Steel	lbs.	3495	3495	4845	4845	6459	6454	7466	7461	10337	10332	11598	11593	14285	14280	16156	16151	18940	18935	21275	21270	23892	23887	23892	23887	23892	23887
Structural Steel	lbs.	637	637	858	858	1078	1078	1299	1299	1910	1826	2131	2047	2573	2489	2793	2709	3235	3151	3456	3372	3898	3814	3898	3814	3898	3814
Hardware	lbs.	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
Rail & End Posts	LF.	80	60	105	85	130	110	155	135	205	185	230	210	280	260	305	285	355	335	380	360	430	410	430	410	430	410
Creosoted Wood Posts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Prestressed Conc. Bms.	ea.	5 @ 30'-0"	5 @ 42'-6"	5 @ 55'-0"	5 @ 67'-6"	15 @ 30'-0"	10 @ 30'-0"	5 @ 42'-6"	15 @ 42'-6"	10 @ 42'-6"	5 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	10 @ 55'-0"	15 @ 55'-0"	

GENERAL NOTES:

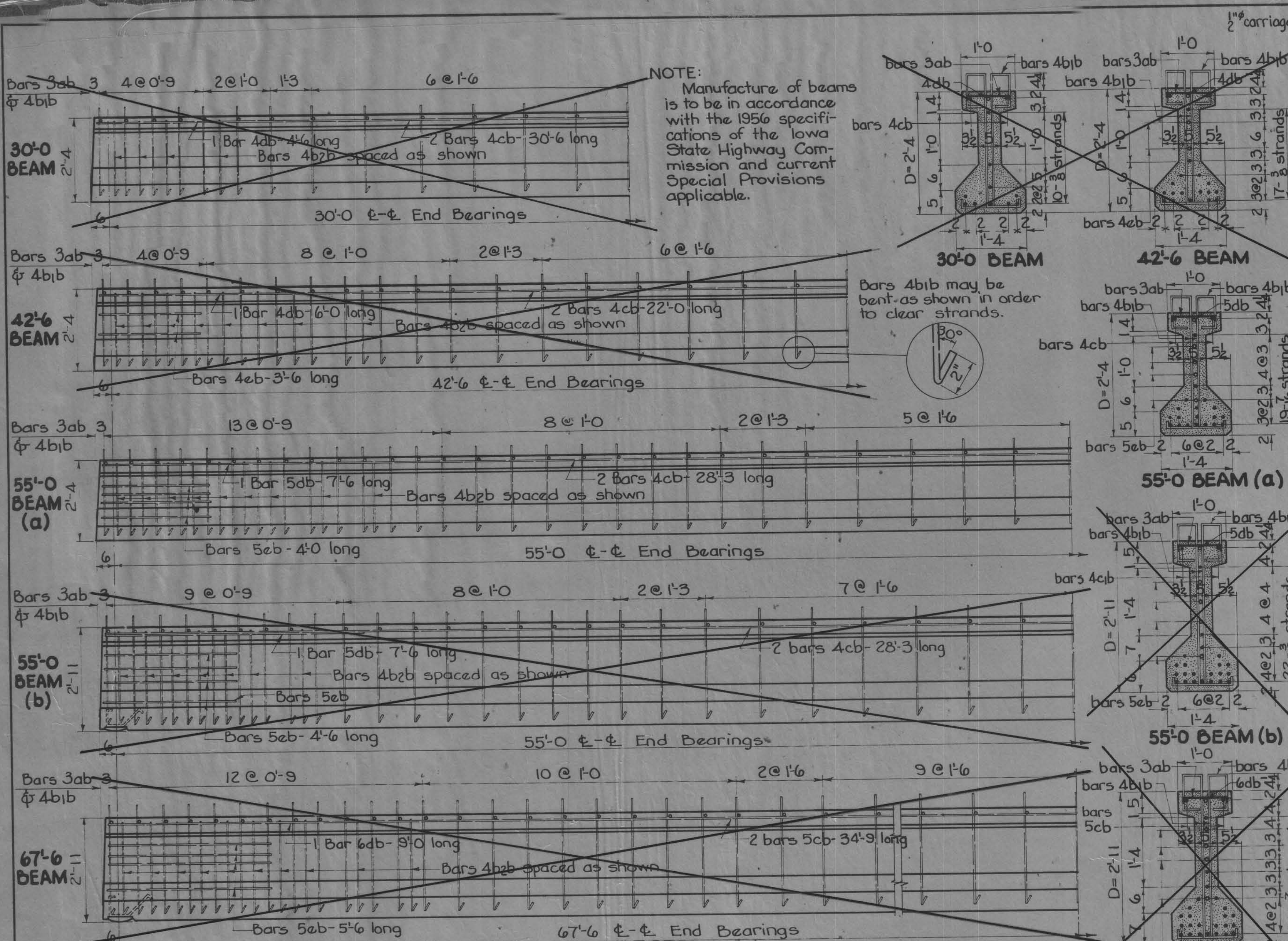
These bridges are designed for H15-44 Loading. They may be used with either timber or concrete abutments and with either timber or concrete pile bents or open pedestal or other flexible type piers. Concrete in slab is to have a 28-day crushing strength of 3500 p.s.i. and contain no Class V aggregate. It is to be placed as dry as practicable to reduce shrinkage to a minimum and special precaution is to be taken to secure complete bond between slab and beam. All exposed corners of 90° or sharper are to be filleted 3/4".

All reinforcing is to be securely wired in place and adequately supported on metal supports. In general preformed fabric bearing pads (TP4149.07) are to be used under beams of 30'-0", 42'-6" and 55'-0" (a) spans, and steel bearing plates are to be used under beams of 67'-6" spans and of any other span used in multiple with the 67'-6" span, or under beams of any span where the grade exceeds 1%.

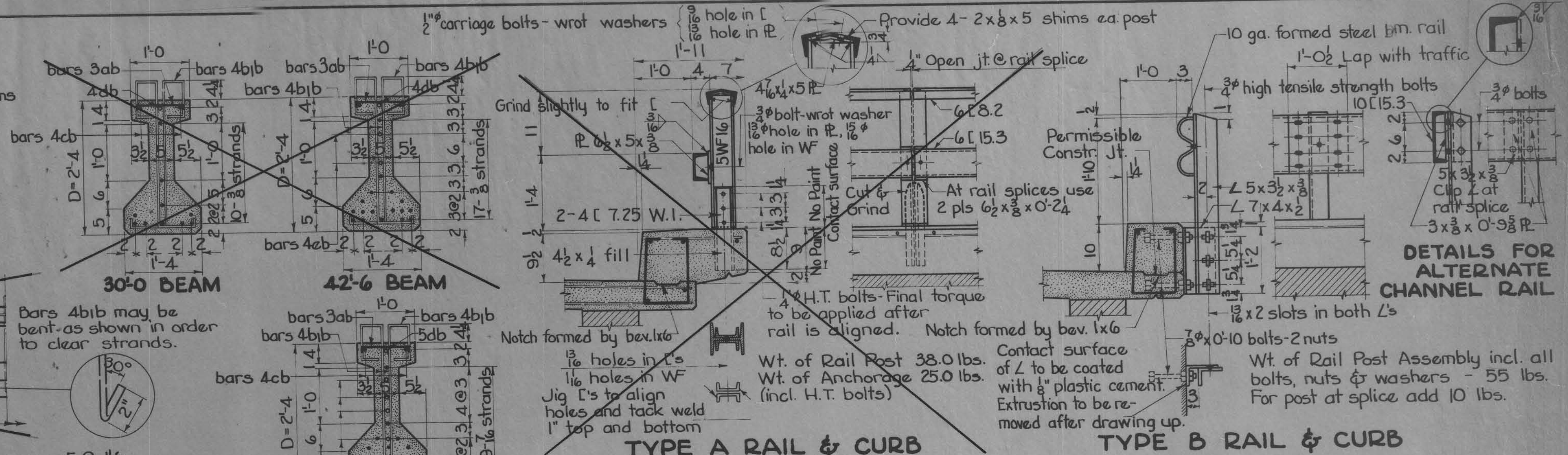
Rail may be either 10 ga formed steel beam or 10#15.3 as detailed and at the contractor's option unless specified in the proposal. The price bid per L.F. for rail regardless of type includes cost of all horizontal rail, bolts connecting rail to posts and end terminals or projections. Rail posts are included in Structural Steel quantities. For details of beams and other miscellaneous details see Sheet H11-3. Rail and rail post assemblies are to be painted white.

SPECIFICATIONS:

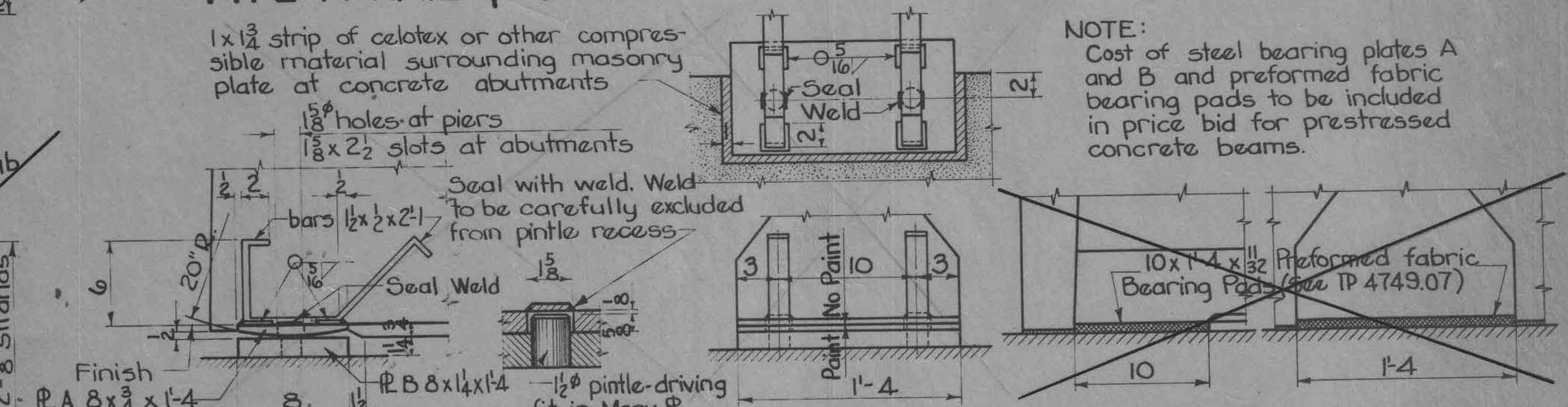
Design: A.A.S.H.O., Series of 1953, and U.S.B.P.R. Design Criteria for Prestressed Concrete Bridges, 1955. Construction: Iowa State Highway Commission, Series of 1956, and current Special Provisions applicable. This standard supercedes Iowa State Highway Commission Std. H10 and Sheet PC-5.



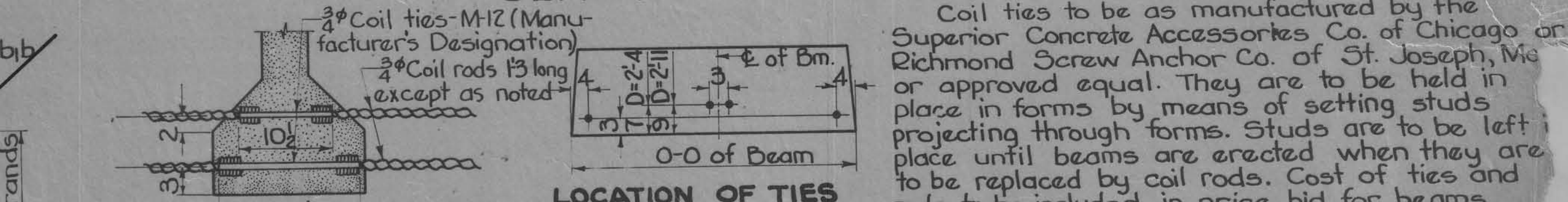
NOTE: Manufacture of beams is to be in accordance with the 1956 specifications of the Iowa State Highway Commission and current Special Provisions applicable.



DETAILS FOR ALTERNATE CHANNEL RAIL



STEEL BEARING PLATES FOR 55'-0(b) & 67'-6 SPANS



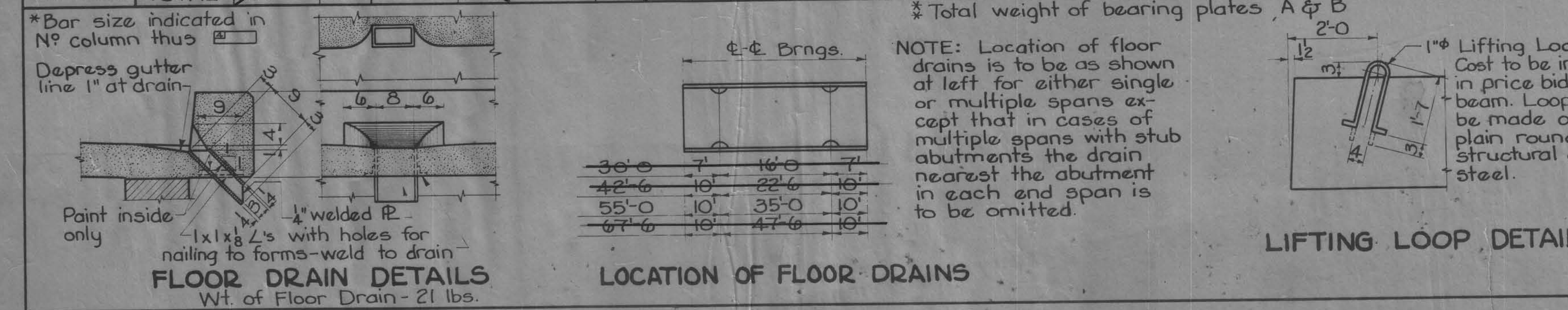
COIL TIE DETAILS



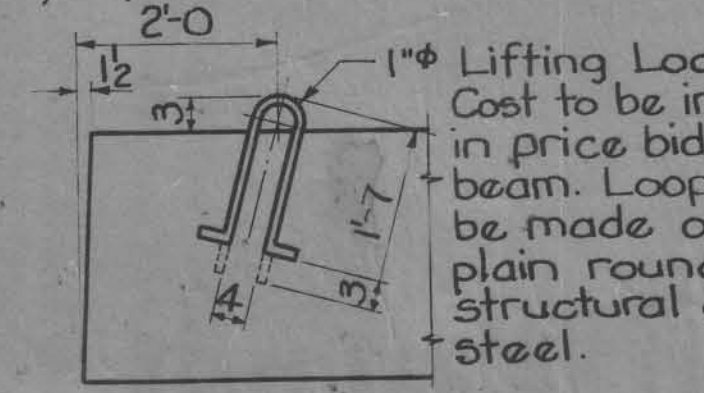
DETAILS OF PRESTRESSED CONCRETE BEAMS

NOTES: Unless otherwise specified allowance is to be made for shortening equal to .0005L for shrinkage and elastic change. Unless otherwise noted strands are to be left projecting 1" beyond end of beam. Top of beams are to be roughened by scoring transversely with a sharp tool at 3" centers. Bars 4b1b and 4b2b are to be placed in pairs spaced as shown. Beam 55'-0 (b) is for use in multiple with 67'-6 spans.

BILL OF REINFORCING STEEL - ONE BEAM												BEAM DATA												
Bar	Shape	30'-0		42'-6		55'-0(a)		55'-0(b)		67'-6		Span	Bm Depth	Strands Nbr.	Initial Pre-str. Size	Concr. cu yd.	Reinf. Steel lbs.	Struct. Steel lbs.	Bearing Pads sq. ft.	Camber & Beam				
		Nº	Length	Nº	Length	Nº	Length	Nº	Length	Nº	Length									As Erected	Deflect With caused slab in place			
3ab	1-2	12	39	17	57	1-2	25	53	1-2	23	65	1-2	29	30'-0	2-4	10	147	2-06	241	2-22	10	10		
4b1b	1-2	15	78	14	4-4	330	106	5-0	354	130	5-0	434	42'-6	2-4	17	250	2-00	371	2-22	10	10	10		
4b2b	1-2	26	32	2-5	52	36	2-5	58	28	3-0	50	40	3-0	80	55'-0(a)	2-4	19	377	3-73	537	1-58	1-58	1-58	
*cb	4-2	30-6	41	4-2	22-0	59	4-4	28-3	75	4-4	28-3	75	5-4	34-9	145	55'-0(b)	2-4	22	323	4-66	562	1-58	1-58	1-58
*db	4-2	4-6	6	4-2	6-0	8	5-2	7-6	16	5-2	7-6	16	6-2	3-0	27	67'-6	2-4	24	476	5-70	761	1-58	1-58	1-58
*eb	4-2	3-6	9	5-8	4-0	33	5-8	4-6	38	5-8	5-6	46	6-2	4-6	46	67'-6	2-4	24	476	5-70	761	1-58	1-58	1-58
Bar 4b2b	TOTAL WT.	241	371	537	562	761																		



LIFTING LOOP DETAIL



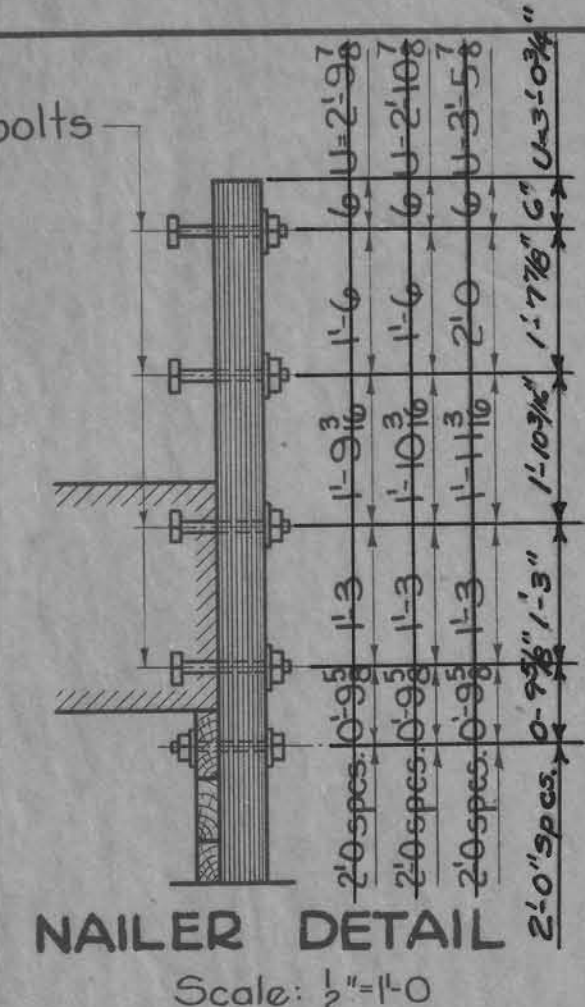
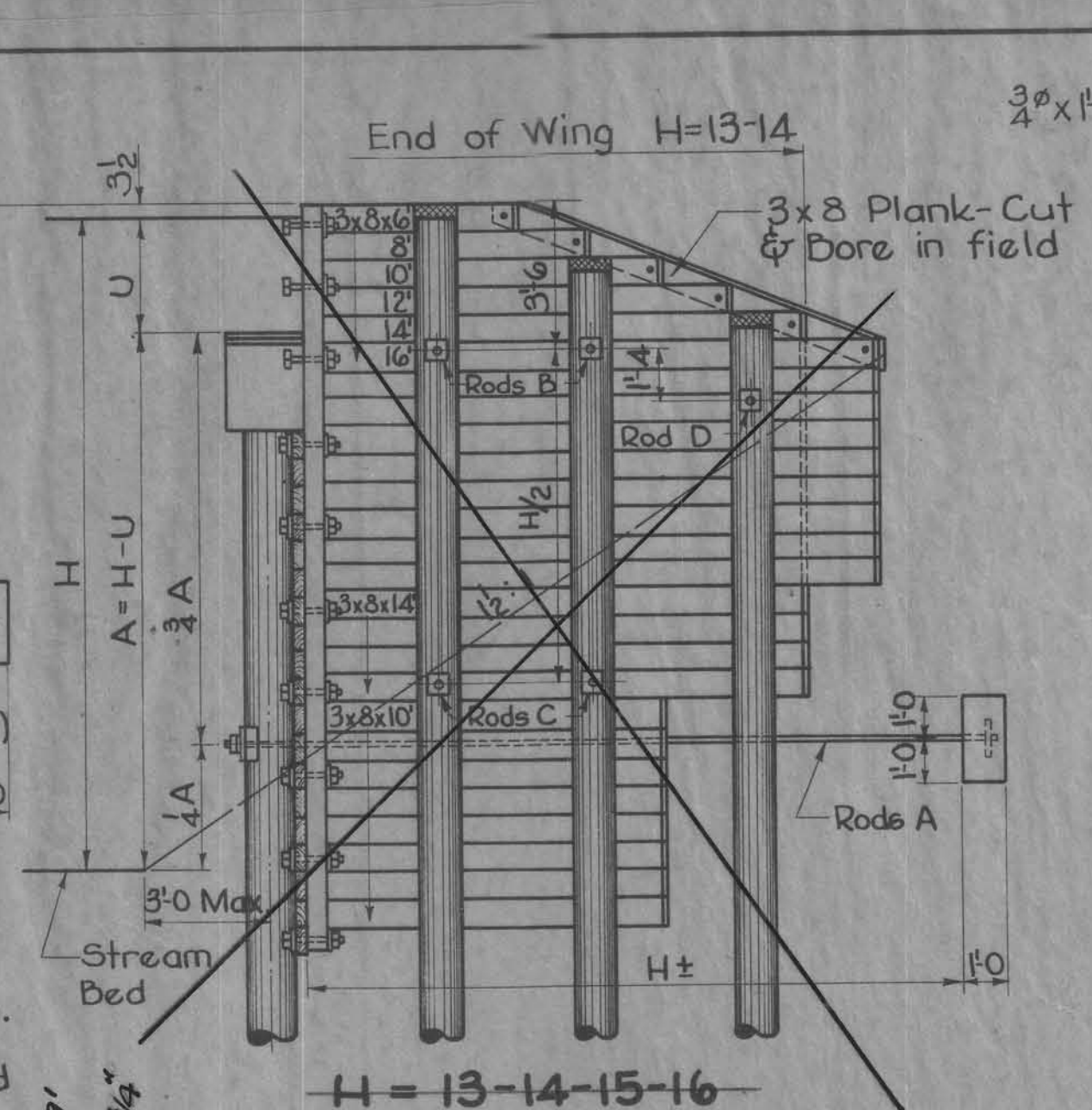
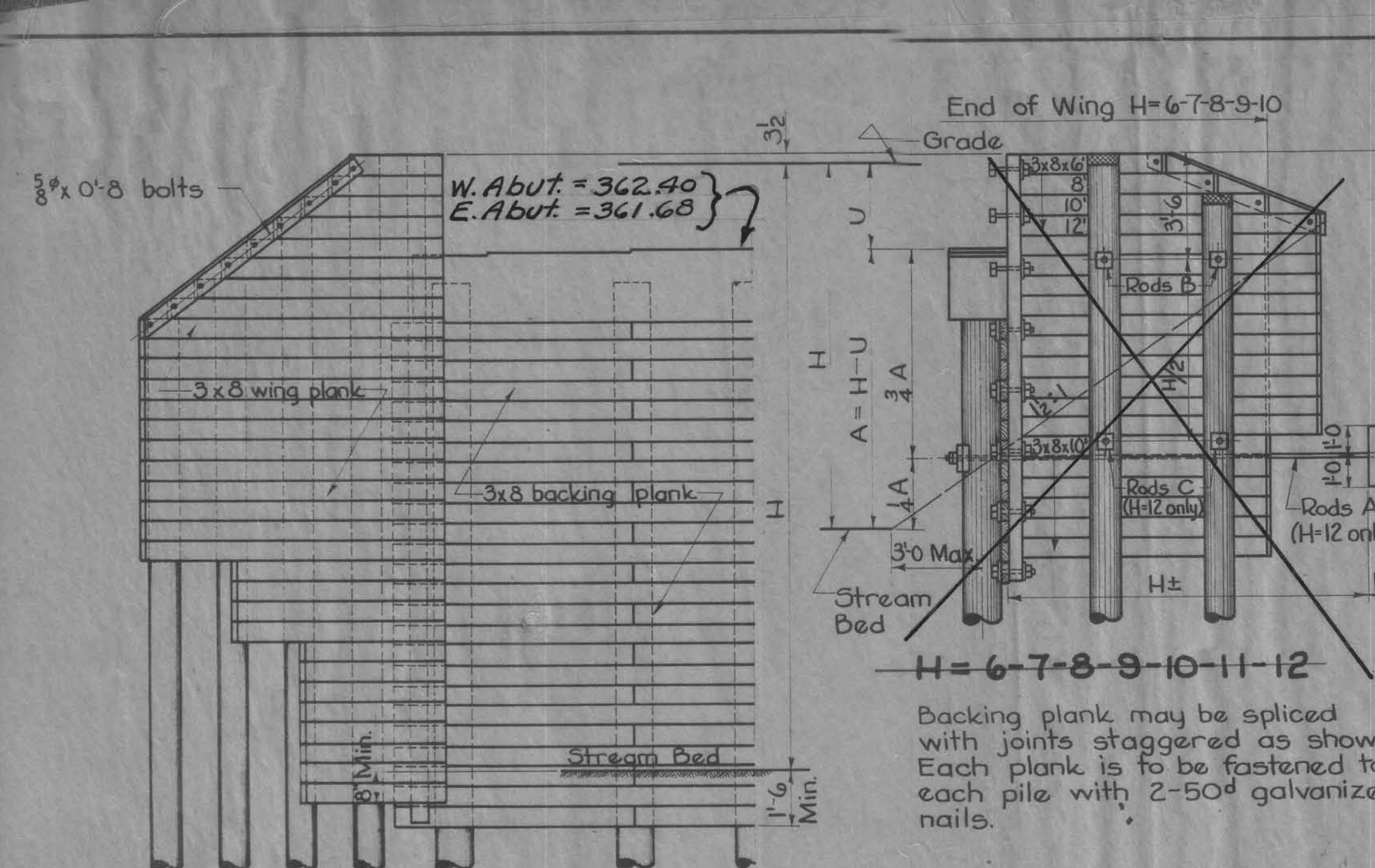
BRIDGE CAMBER NOTE:
 (In general with multiple spans)
 1. Camber bridge .0000545L² ft at ϕ and fit appro grades to this curve (.00218L% for symm. grade
 2. It should be assumed that no additional deflect will occur when curb is placed, and curb height should be varied slightly if necessary to give a smooth curb line over bridge.

This Standard supercedes Iowa State Highway Commission Standard H10 and Sheet PC-5.

Design for
**PRE-TENSIONED
 PRESTRESSED CONCRETE BRIDGES**
 20'-0 & 24'-0 ROADWAY H-15 LOADING
 SIMPLE & MULTIPLE SPANS 30'-0, 42'-6, 55'-0, 67'-6
MISCELLANEOUS DETAILS

Iowa State Highway Commission
 February 1958 SHEET #4 OF 5. H11-3

Approved by: _____ Chief Engineer



CURVED R. WASHERS

Rod	Washer
3/8" - 7/8"	5 x 2 x 0'-5
1"	5 x 2 x 0'-5
1 1/8"	6 x 2 x 0'-6
1 1/4"	6 x 2 x 0'-6
1 1/2"	7 x 2 x 0'-7
1 3/4"	8 x 1 x 0'-8
1 7/8"	9 x 1 1/2 x 0'-9

All plate washers curved to 6" radius.

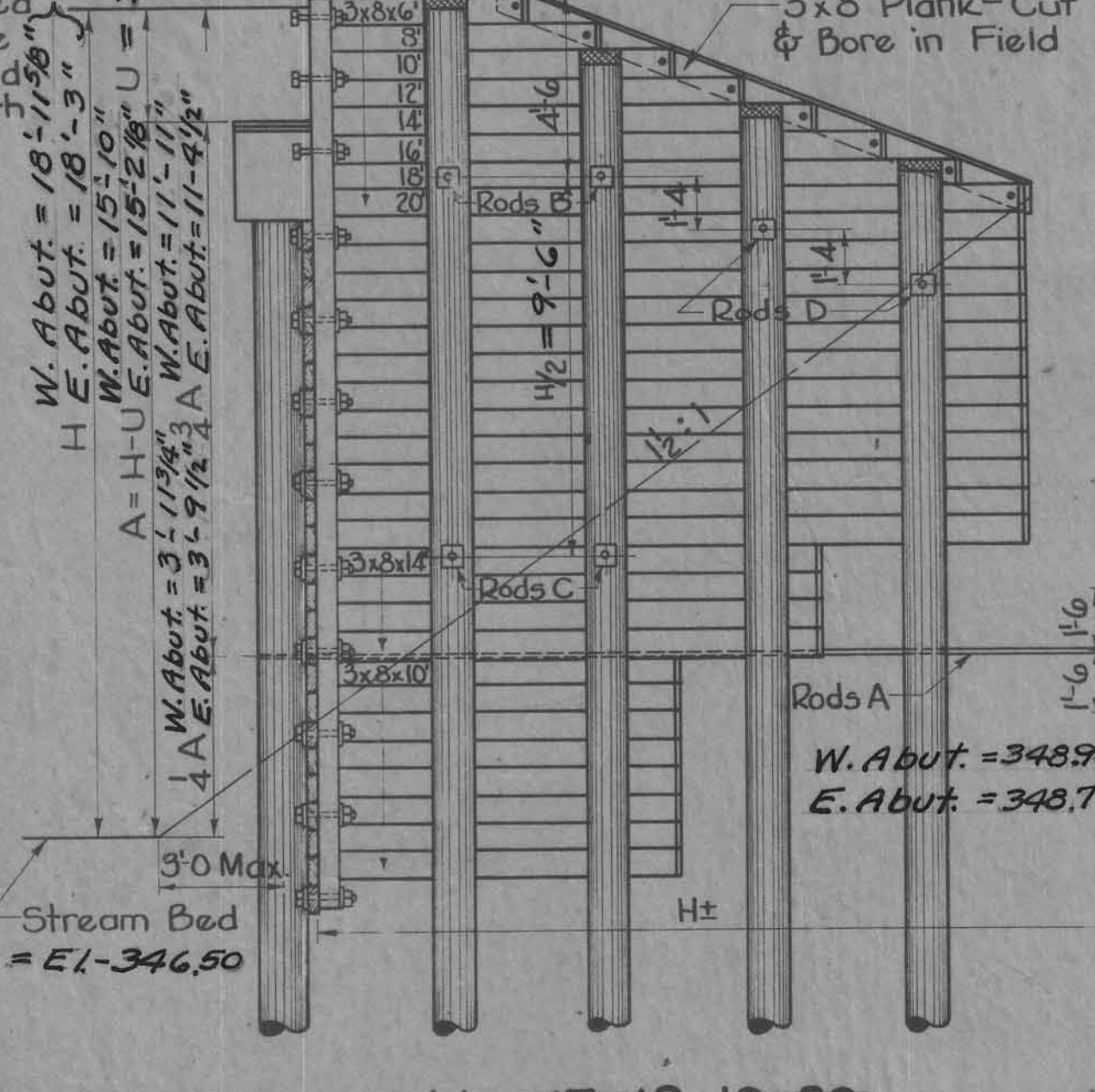
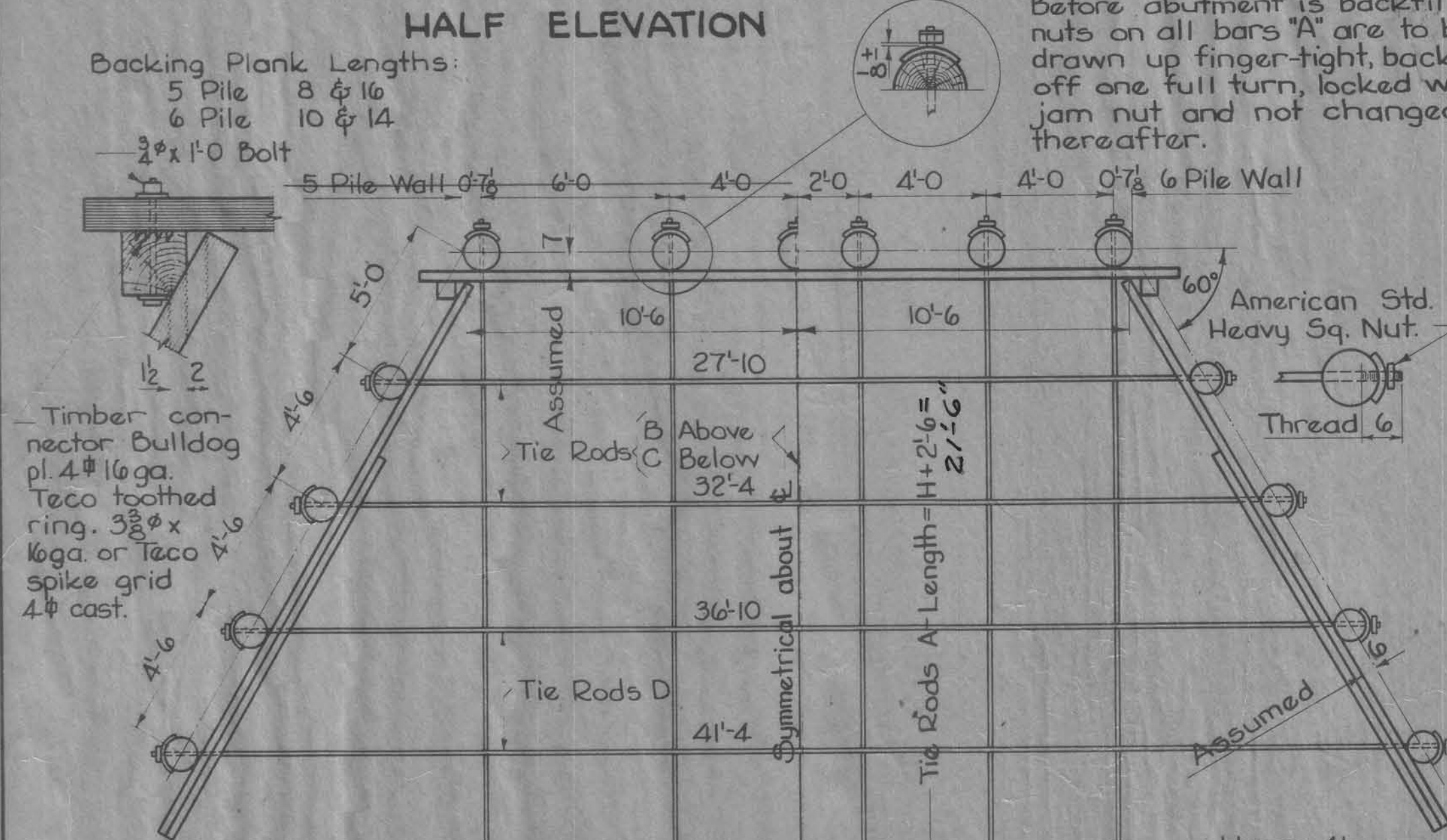
BILL OF MATERIAL FOR ONE ABUTMENT

WING TYPE	2 PILE WING					3 PILE WING					4 PILE WING				
Grade to Stream Bed - Ft. 19'	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No. of Bearing Piles	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
Minimum Butt Diameter	11	11	12	12	13	14	11	11	12	12	13	13	14	14	14
Backing U=3'-5 1/2" 3x8x24"	3	4	6	7	9	10	12	13	15	16	18	19	21	22	24
Plank U=2'-9 3/4" 2x10 3x8x24"	4	5	7	8	10	11	13	14	16	17	19	20	22	23	25
Wing Plank 3x8x6' @ 8' each	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Wing Plank 3x8x10' each	18	20	24	26	30	10	14	8	12	14	18	8	12	14	18
Wing Plank 3x8x12' each						22	22	2	2	2	2	2	2	2	2
Wing Plank 3x8x14' each								28	28	10	10	10	10	10	10
Wing Plank 3x8x16' each										18	18	2	2	2	2
Wing Plank 3x8x18' each												2	2	2	2
Wing Plank 3x8x20' each													26	26	26
Wing Slope 2 plank 3x8x	5	5	5	5	5	7	7	9	9	11	11	16	16	16	16
Nailers 6x6 (R&L) x	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22
Rod A 1 ea. Brg. Pile										1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Rod B 2 ea. Abutment	3/4"	7/8"	7/8"	1"	1"	1"				1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"
Rod C 2 ea. Abutment										1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"
Rod D 1-3 Pile Wing; 2-4 Pile Wing										3/4"	3/4"	3/4"	3/4"	3/4"	3/4"

ESTIMATED QUANTITIES

Item	U=2'-9 3/4" @ 2'-10"	670	764	952	1040	1228	1412	1600	1840	2028	2196	2384	2852	3040	3128	3316
Creosoted Lumber FBM U=3'-5 1/2"	628	716	904	992	1180	1364	1552	1792	1980	2148	2336	2804	2992	3080	3268	
Structural Steel (lbs.) *	107	140	140	182	182	182	677	926	1000	1226	1257	1679	1715	2249	2298	
Concrete (cu. yd.)	3.6	3.6	3.6	3.6	3.6	3.6	5.4	5.4	5.4	5.4	5.4	6.3	6.3	6.3	6.3	
Reinforcing Steel (lbs.)	357	357	357	357	357	357	570	570	570	570	570	658	658	658	658	
Galvanized Hardware (lbs.)	36	36	41	41	47	50	54	57	63	67	73	79	85	85	90	

*Includes all tie rods with nuts and plate washers.
**Includes nuts, bolts, washers and timber connectors - square heads and nuts and malleable washers assumed for estimating purposes.



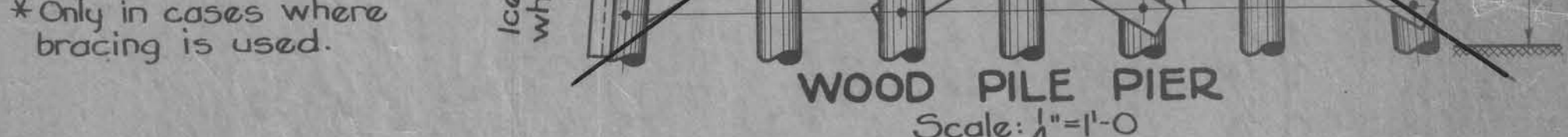
"U" DIMENSION

Span	w/fabric pads	w/steel brg. fl's
30'-0"	2'-0"	2'-10 1/2"
42'-6"	2'-9 3/4"	2'-10 1/2"
55'-0(a)	2'-9 3/4"	2'-10 1/2"
55'-0(b)	3'-5"	3'-5"
67'-6"	3'-5"	3'-5"

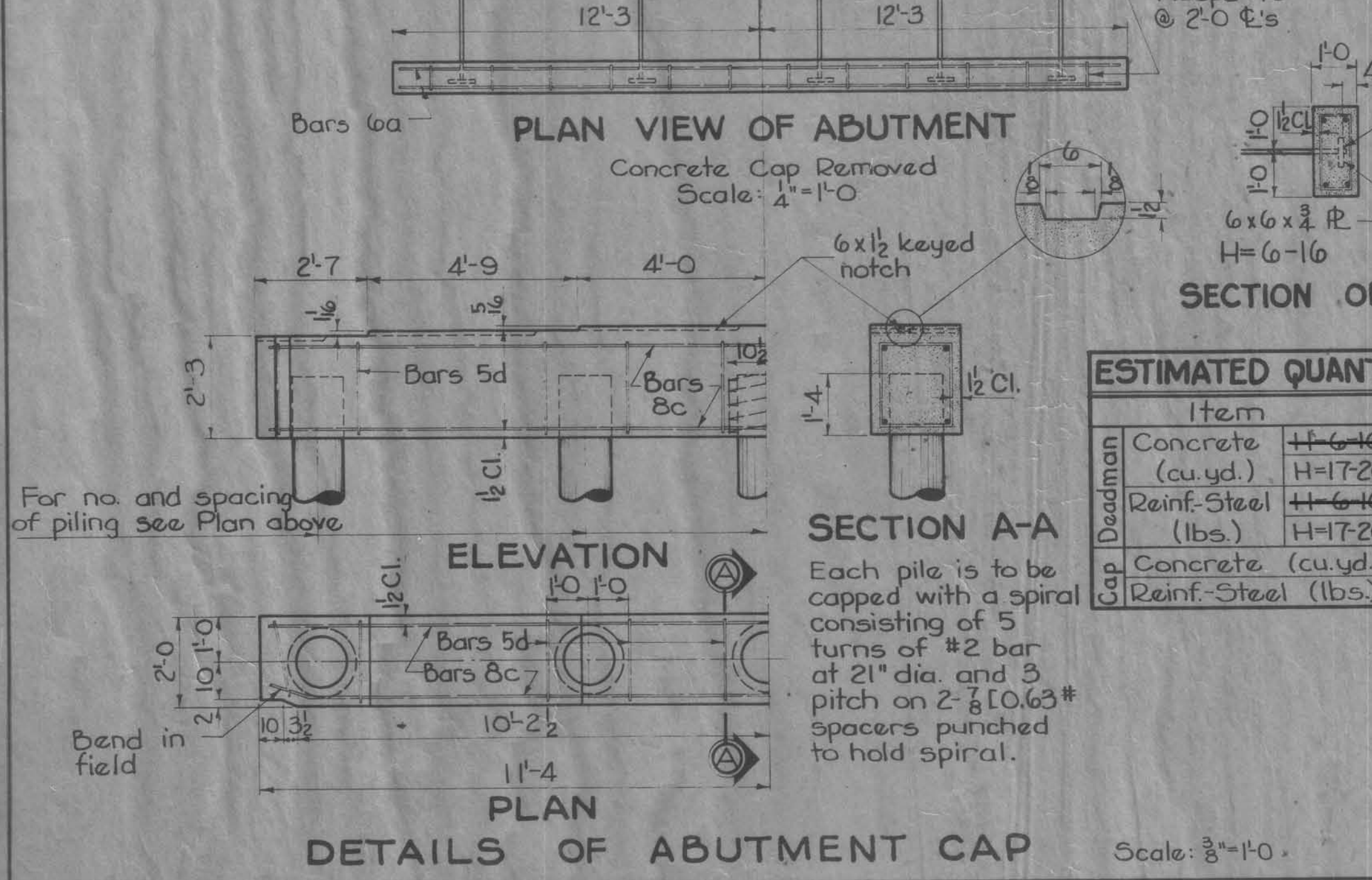
* To be used when beams are set on grade of 1% or more.

ESTD. QUANTITIES-1 PIER

Item	Spans	20' Edwy
Creosoted Piles	30'-0"	6
	42'-6"	7
	55'-0(a)	8
3'-0 3/4" Concrete (cu. yd.)	30'-0"	3.58
	42'-6"	3.53
	55'-0(a)	3.48
Reinf. Steel (lbs.)	30'-0"	380
	42'-6"	404
	55'-0(a)	427
* Hardware (lbs.)	30'-0"	70
	42'-6"	75
	55'-0(a)	79



NOTE:
Each bracing plank is to be fastened to each pile with a timber connector, 3/4 bolt and 2-7" galvanized spikes. Diagonal bracing is to be omitted where "D" is less than 7". Use horizontal strut at upstream end of bent when "D" is 10" or more. Ice Nose is to be used only when specifically called for on plans. Details of caps not shown are the same as for abutment caps. All diagonal bracing is to be 3 x 10's.



ESTIMATED QUANTITIES-1 ABUT.

Item	5 Pile	6 Pile
Concrete (cu. yd.)	1.82	2.73
Reinf. Steel (lbs.)	190	190
Concrete (cu. yd.)	3.64	3.58
Reinf. Steel (lbs.)	357	380

REINFORCING BAR LIST-ONE ABUT.

Bar	Location	Shape	N°	Length	Weight
Bar 4a	H=6-16	4	6	24'-2	145 211
Bar 4b	H=6-16	12	5-8	7-8	45 61
Bar 4c	H=17-20	4	22'-5	239	
Bar 4d	H=17-20	10	12*	8'-4	87 104
Bar 4e	H=17-20	5	6*	3'	37

* For 6 Pile Wall

PILE BEARING REQUIRED-TONS

Span	ABUTMENTS		PIERS		
	5 Pile	6 Pile	6 Pile	7 Pile	8 Pile
30'-0	15	13	17		
42'-6	17	15	18		
55'-0 (a)	18	15			18
55'-0 (b)	18	16	*	*	*
67'-6	18	18	*	*	*

* Use concrete piers as detailed on Standard Sheet H11-6.

GENERAL NOTES:
These abutments and piers are designed for use with Standard H-11 Prestressed Concrete Bridges. They are designed under the 1953 Specifications of the A.A.S.H.O. for H-15 Loading. They are to be constructed in accordance with the 1952 Specifications of the Iowa State Highway Commission and any current Special Provisions applicable. All lumber is to be creosoted. Backing and wing plank in 10" and 12" widths may be substituted for 8" plank shown, but payment will be made on the basis of quantities shown. All piling are to be creosoted and are to comply with the specifications for Treated Timber Trestle Piles. Where butt diameter given indicates oversize, the same oversize is to continue uniformly to tip of pile. All hardware is to be galvanized. C.I. Ogee or malleable washers are to be used under all heads and nuts bearing on wood. All bolts are to have square heads and nuts. Tie rods are to be given shop and first field coat of paint. These abutments are not to be back-filled until the floor slab has attained full strength.

STANDARD DESIGN
CREOSOTED TIMBER ABUTMENTS & PIERS
FOR USE WITH
H-11 PRESTRESSED CONCRETE BRIDGES
20'-0 ROADWAY
H-15 LOADING

Iowa State Highway Commission

Approved by: _____ Chief Engineer February 1958

File 19743 CRAWFORD COUNTY. DESIGN #2258. PROJ. # 2672(2)

SHEET # 5 OF 5 H11-4