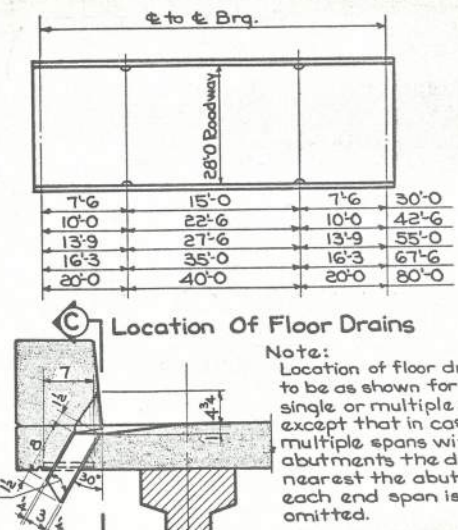
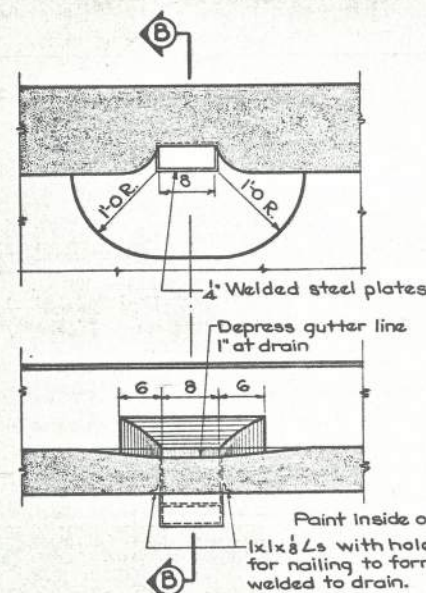
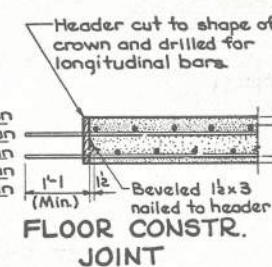
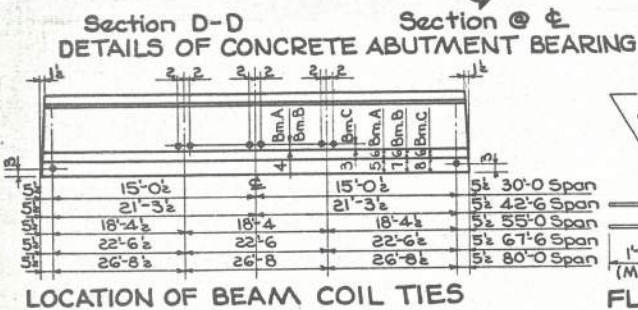
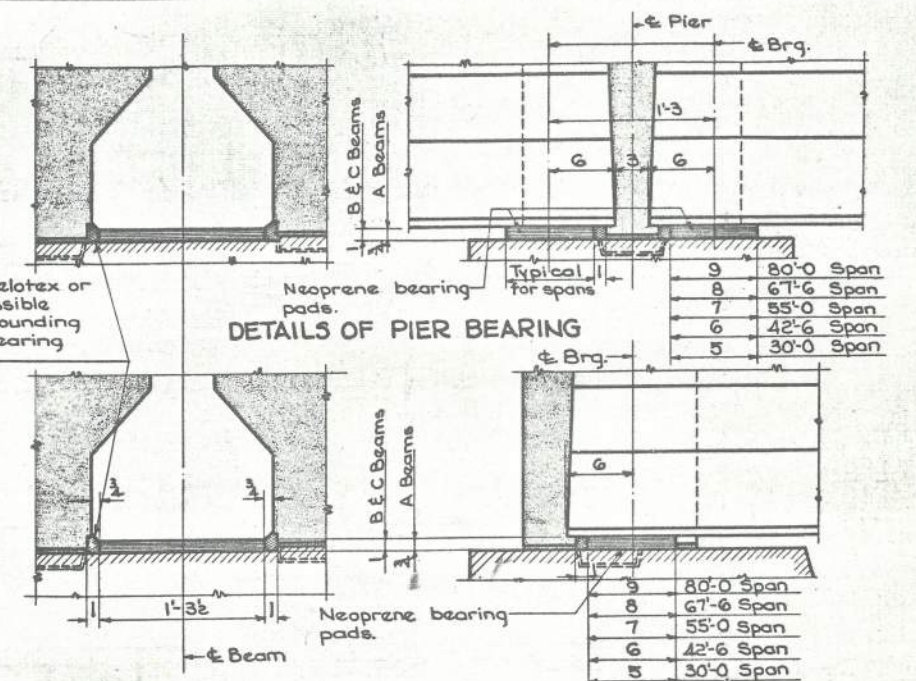
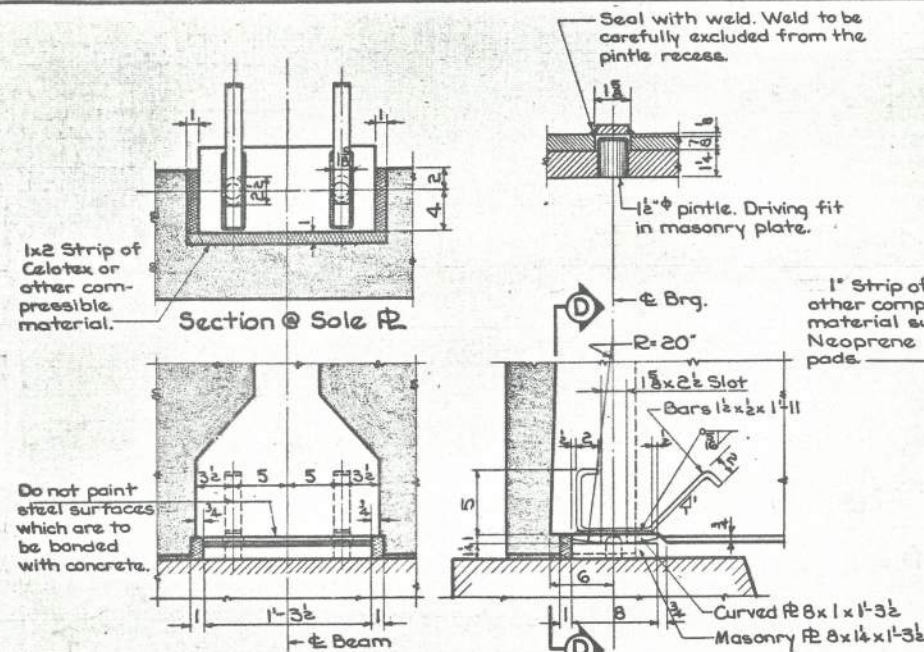
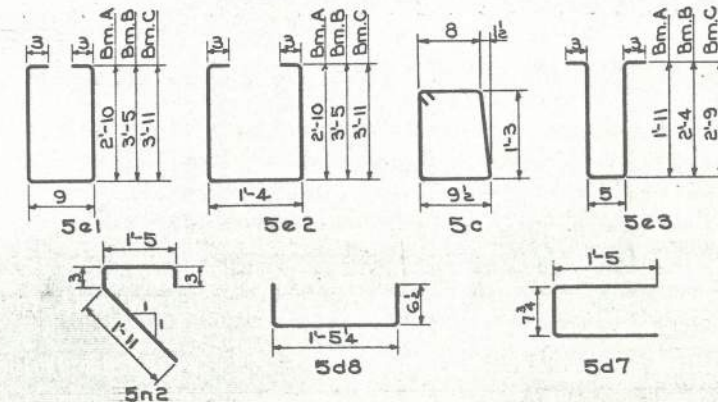




Single Span Rail Post Spacing	
Abut. Brg.	"N"
30'-0	5 @ 5'-3 ⁵ / ₈
42'-6	6 @ 6'-6
55'-0	8 @ 6'-5 ¹ / ₂
67'-6	10 @ 6'-4 ³ / ₄
80'-0	12 @ 6'-4 ¹ / ₂

Abutment Brg. "L"	Multiple Span Combinations			Beam Series	"X" (ft)	Bar b3 Size	Rail Post Spacing "N"	Grade To Bridge Seat "U"		Slab Thickening		Abutment Reaction, Kips		Pier Reaction, Kips	
	L1	L2	L3					Steel @ Bearing R2	Neoprene @ Bearing Pad	"a"	"p"	DL	LL	DL	LL
92'-6"	30'-7 1/2"	31'-3"	30'-7 1/2"	A	4	4	14 @ 6'-4 1/2"	3'-3 1/2"	3'-2 1/2"	0	0	92.2	72.6	177.6	95.5
105'-0"	30'-7 1/2"	43'-9"	30'-7 1/2"	A	5	5	16 @ 6'-4 1/2"	3'-3 1/2"	3'-2 1/2"	0	0	92.2	72.6	207.9	105.7
130'-0"	43'-1 1/2"	43'-9"	43'-1 1/2"	A	6	5	20 @ 6'-3 1/2"	3'-3 1/2"	3'-2 1/2"	0	0	122.6	79.1	239.7	113.1
142'-6"	43'-1 1/2"	56'-3"	43'-1 1/2"	A	7	6	22 @ 6'-3 1/2"	3'-3 1/2"	3'-2 1/2"	0	0	122.6	79.1	274.3	123.2
167'-6"	55'-7 1/2"	56'-3"	55'-7 1/2"	A	8	6	26 @ 6'-3 1/2"	3'-3 1/2"	3'-2 1/2"	0	0	154.5	87.2	307.1	130.7
180'-0"	55'-7 1/2"	68'-9"	55'-7 1/2"	B	9	7	28 @ 6'-3 1/2"	3'-10 1/2"	3'-10 1/2"	0	0	168.3	87.2	367.9	140.5
205'-0"	68'-1 1/2"	68'-9"	68'-1 1/2"	B	9	7	32 @ 6'-3 1/2"	3'-10 1/2"	3'-10 1/2"	0	0	202.2	95.3	401.0	148.3
217'-6"	68'-1 1/2"	81'-3"	68'-1 1/2"	C	10	7	34 @ 6'-3 1/2"	4'-4 1/2"	4'-4 1/2"	0	0	213.7	95.3	457.9	158.7
242'-6"	80'-7 1/2"	81'-3"	80'-7 1/2"	C	10	7	38 @ 6'-3 1/2"	4'-4 1/2"	4'-4 1/2"	0	0	247.7	103.2	492.6	165.8



Revised 12-13-68: Curved plate thickness & bar length changed.
 Revised 6-28-68: Galvanized drain note added.
 Revised 9-11-67: Rail details deleted, minor corrections and additions made.
 Revised 7-25-60: Slab thickening dimensions and quantities changed.

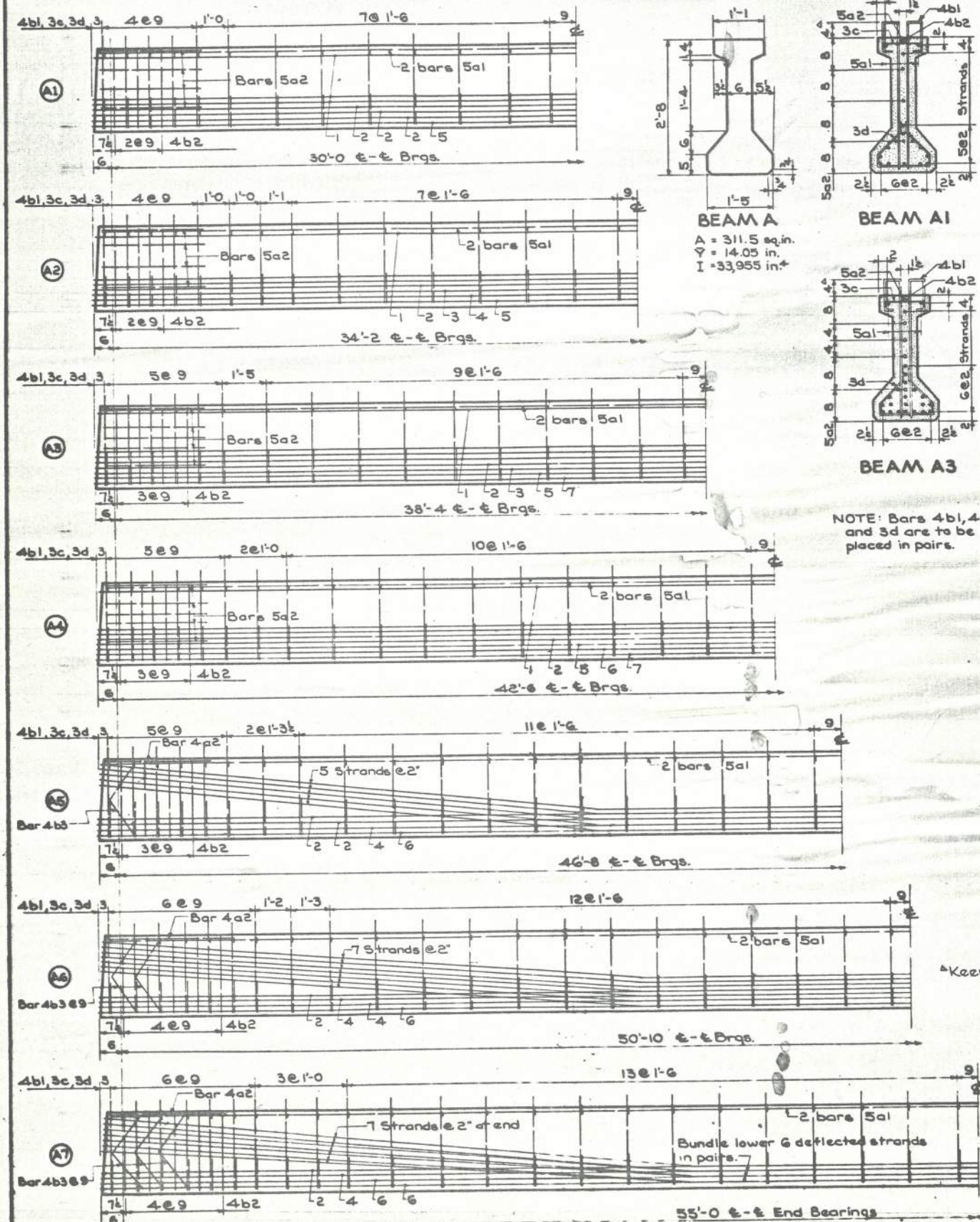
- ① If suggested grade line is used for multiple spans increase "U" distance at piers by "p" and abutments by "a" and concrete quantities in table of Total Estimated Quantities by the amount shown above. "U" distance for single spans same as above.
- ② Including 1/2" paint and canvas.
- ③ No slab thickening necessary for single span bridges.
- ④ Total reaction of five beams. Live Load shown does not include impact.
- ⑤ Including 1/2" deformation of bearing pad due to Dead Load.

Design For
**PRE-TENSIONED
 PRESTRESSED CONCRETE BRIDGES**
 28'-0" ROADWAY H20 LOADING
 SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6", 80'-0"
SUPERSTRUCTURE DETAILS
 Iowa State Highway Commission

Approved by: *L. M. Chauson*
 Chief Engineer

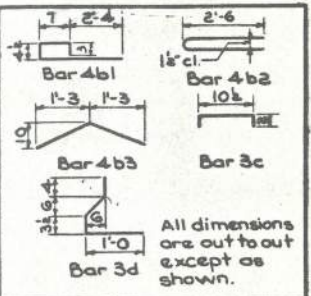
July, 1960

H14-2



REINFORCING BAR LIST

Beam	A1	A2	A3	A4	A5	A6	A7
Span	30'-0	34'-2	38'-4	42'-6	46'-8	50'-10	55'-0
Bar Shape	N# Length	N# Length	N# Length	N# Length	N# Length	N# Length	N# Length
5a1	2 30'-7	2 34'-9	2 38'-11	4 22'-6	4 24'-7	4 26'-8	4 28'-9
4a2	—	—	—	—	2 3'-0	2 3'-9	2 3'-9
5a2	8 5'-0	8 5'-3	10 5'-6	10 5'-6	—	—	—
4b1	52 3'-11	60 3'-11	64 3'-11	72 3'-11	76 3'-11	84 3'-11	92 3'-11
4b2	6 5'-0	6 5'-0	8 5'-0	8 5'-0	8 5'-0	10 5'-0	10 5'-0
4b3	—	—	—	—	—	8 3'-1	12 3'-1
3c	26 1'-2	30 1'-2	32 1'-2	36 1'-2	38 1'-2	42 1'-2	46 1'-2
3d	52 2'-2	60 2'-2	64 2'-2	72 2'-2	76 2'-2	84 2'-2	92 2'-2



BEAM DATA

Beam	A1	A2	A3	A4	A5	A6	A7
Span	30'-0	34'-2	38'-4	42'-6	46'-8	50'-10	55'-0
① Initial Prestress Kips	196	238	294	336	359	435	473
Size Strands	3	3	3	3	3	3	3
Straight Strands	14	17	21	24	14	16	18
Deflected Strands	—	—	—	—	5	7	7
Hold Down Stress Kips	—	—	—	—	10.40	10.81	12.00
Camber in.	.11	.26	.42	.58	.85	1.04	1.21
DL Deflection in. (5'-0 Spcg.)	.06	.10	.16	.26	.38	.53	.71
DL Deflection in. (6'-6 Spcg.)	.08	.13	.21	.34	.50	.70	.94
Reinforcing Steel lb.	318	358	403	446	425	475	524
Concrete cu.	248	282	315	348	382	415	449

① Increase 5% if artificial curing is to be used. ② Due to weight of slab.

NOTES:

Unless otherwise specified an allowance of .0005 L is to be made on all beams for shrinkage and elastic shortening.

All deflected strands are to be held down at the third points of the beam except that the hold down point may be moved toward the center of the beam a distance not to exceed .05 span at the producer's option.

Tops of beams are to be struck off level and artificially roughened in accordance with I.S.H.C. Materials Department recommendations.

Hold down devices and procedure for tensioning and detensioning must be approved by the Engineer.

Bearing details will be as detailed on Sheet H14-2.

Unless otherwise noted, the cost of bearing details, including masonry plates and/or neoprene pads, coil ties, coil rods and lifting loops are to be included in the price bid for prestressed concrete beams.

Strand ends which will be encased in concrete in the finished structure are to be cut with a 1" projection with the exception of four strands at the pier end of beam which are to be cut with a 9" projection and bent as detailed. Strand ends which will be exposed in the finished structure are to be cut flush and painted with two coats of red lead at the plant.

DESIGN STRESSES: Design Stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1957 and TI(58):

Reinforcing steel in accordance with Section 1.4.12, "Reinforcement" for Intermediate, Hard or Rail Steel Grade.

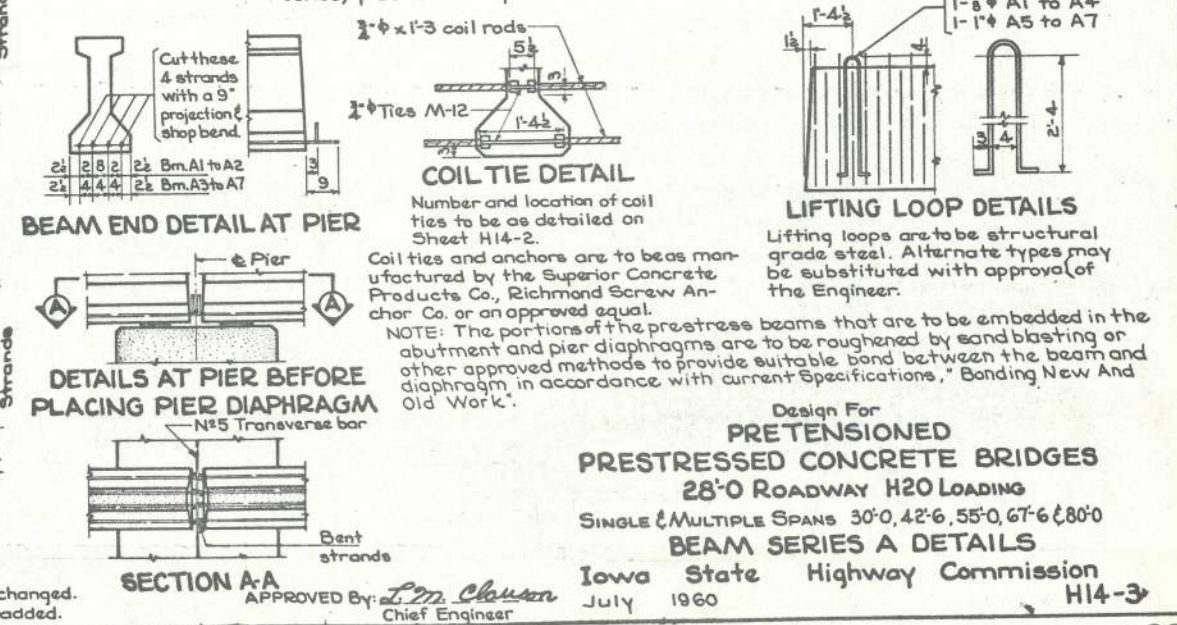
Concrete in accordance with TI(58) 1.13.7. $f'_c = 5000$ psi.

Prestressing steel in accordance with TI(58) 1.13.7. $f'_s = 250,000$ psi.

SPECIFICATIONS:

DESIGN: A.A.S.H.O. TI(58).

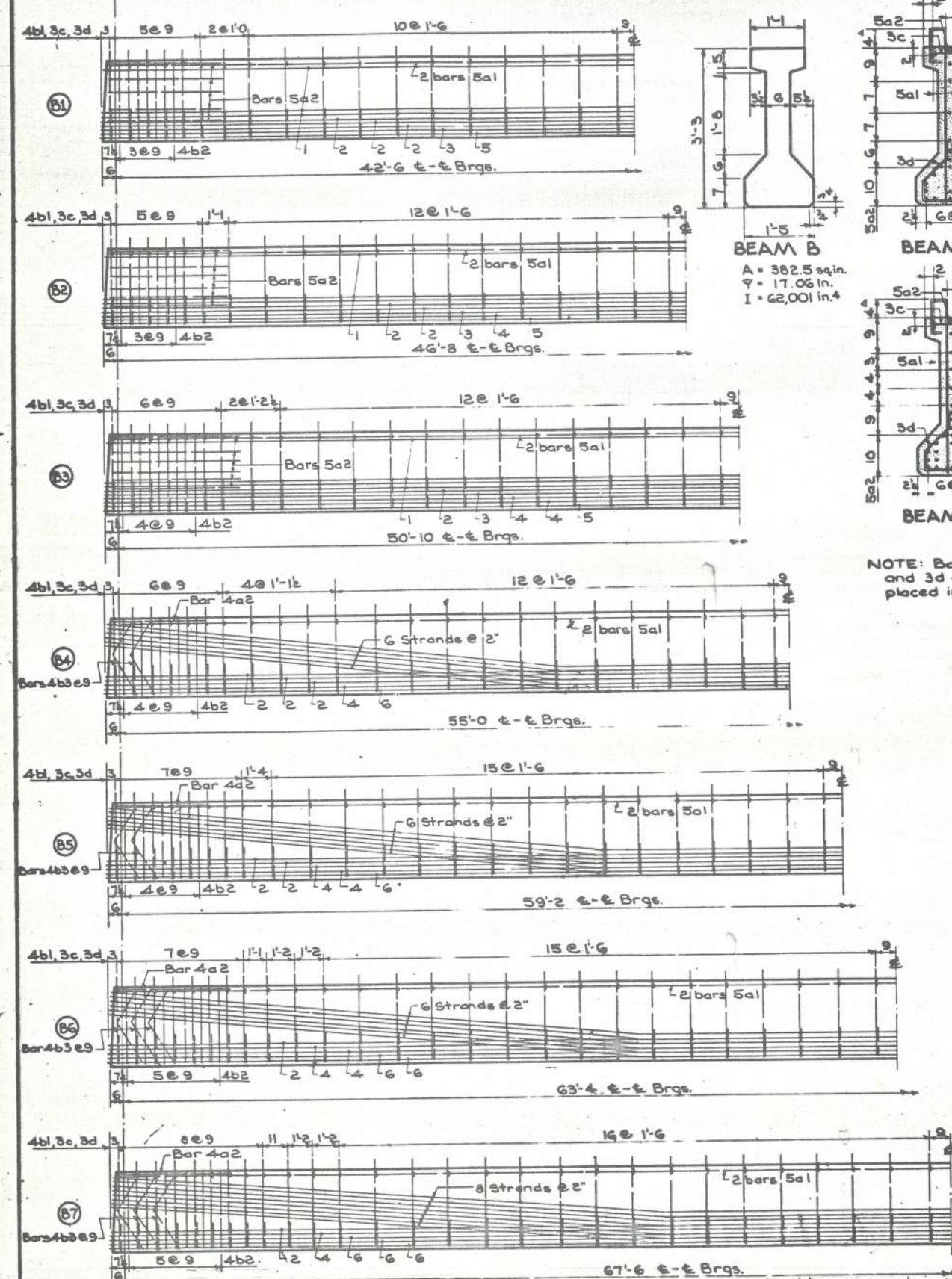
CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, current series, plus current Special Provisions.



Revised 9-11-67: 4b1 Bar length changed, embedment and roughening notes added.
 Revised (12-8-60): Minor mistakes corrected. Number of strands shown in beam section for A2 corrected.

Revised (11-16-60): Notes concerning the projection of strands at end of beams changed.
 Details showing the embedment of prestressing strands in pier diaphragms added.

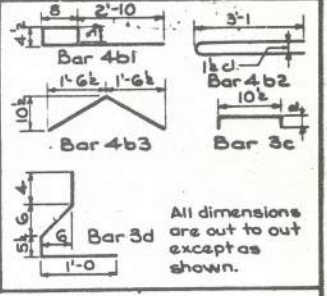
XXX



BEAM B
 $A = 382.5 \text{ sq. in.}$
 $\bar{y} = 17.06 \text{ in.}$
 $I = 62,001 \text{ in.}^4$

NOTE: Bars 4b1, 4b3 and 3d are to be placed in pairs.

REINFORCING BAR LIST																
Beam	B1		B2		B3		B4		B5		B6		B7			
Span	42'-6"		46'-8"		50'-10"		55'-0"		59'-2"		63'-4"		67'-6"			
Bar	Shape	N ^o	Length	N ^o	Length	N ^o	Length	N ^o	Length	N ^o	Length	N ^o	Length	N ^o	Length	
5a1	—	4	22'-6"	4	24'-7"	4	26'-8"	4	28'-9"	4	30'-10"	4	32'-11"	4	35'-0"	
4a2	—	—	—	—	—	—	2	3'-9"	2	3'-9"	2	4'-6"	2	4'-6"	—	
5a2	—	10	5'-0"	12	5'-3"	12	5'-6"	—	—	—	—	—	—	—	—	
4b1	□	72	4'-7"	76	4'-7"	84	4'-7"	92	4'-7"	96	4'-7"	104	4'-7"	112	4'-7"	
4b2	—	8	6'-2"	8	6'-2"	10	6'-2"	10	6'-2"	10	6'-2"	12	6'-2"	12	6'-2"	
4b3	—	—	—	—	—	—	8	3'-5"	8	3'-5"	8	3'-5"	12	3'-5"	12	3'-5"
3c	┌	36	1'-2"	38	1'-2"	42	1'-2"	46	1'-2"	48	1'-2"	52	1'-2"	56	1'-2"	
3d	└	72	2'-4"	76	2'-4"	84	2'-4"	92	2'-4"	96	2'-4"	104	2'-4"	112	2'-4"	



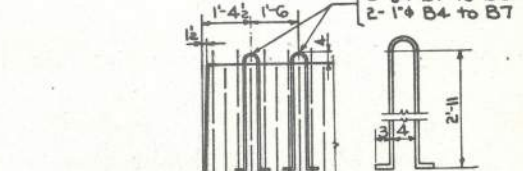
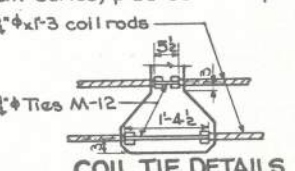
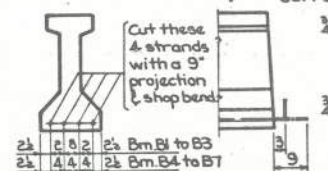
NOTE: The portions of the prestress beams that are to be embedded in the abutment and pier diaphragms are to be roughened by sand blasting or other approved methods to provide suitable bond between the beam and diaphragm in accordance with current Specifications, "Bonding New And Old Work".

BEAM DATA									
Beam	B1	B2	B3	B4	B5	B6	B7		
Span	42'-6"	46'-8"	50'-10"	55'-0"	59'-2"	63'-4"	67'-6"		
① Initial Prestress	Kips	321	359	416	454	529	605		
Strand Size		7/16	7/16	7/16	7/16	7/16	7/16		
Straight Strands		17	19	22	16	18	22		
Deflected Strands		—	—	—	6	6	6		
Hold Down Stress	Kips	—	—	—	15.2	12.3	11.5		
Camber	in.	.34	.46	.57	.79	.95	1.16		
② D.L. Deflection in (5'-0" Spcs.)		.15	.23	.32	.44	.52	.75		
② D.L. Deflection in (6'-6" Spcs.)		.20	.29	.41	.55	.73	.95		
Reinforcing Steel	lb.	481	521	576	572	598	658		
Concrete	cy.	4.28	4.69	5.10	5.51	5.92	6.33		

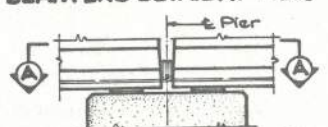
① Increase 5% if artificial curing is to be used. ② Due to weight of slab.

NOTES:

Unless otherwise specified an allowance of .0005 L is to be made on all beams for shrinkage and elastic shortening.
 All deflected strands are to be held down at the third points of the beam except that the hold down point may be moved toward the center of the beam a distance not to exceed .05 span at the producers option.
 Tops of beams are to be struck off level and artificially roughened in accordance with I.S.H.C. Materials Department recommendations.
 Hold down devices and procedure for tensioning and detensioning must be approved by the Engineer.
 Bearing details will be as detailed on Sheet H14-2.
 Unless otherwise noted, the cost of bearing details including masonry plates and/or neoprene pads, coil ties, coil rods and lifting loops are to be included in the price bid for prestressed concrete beams.
 Strand ends which will be encased in concrete in the finished structure are to be cut with a 1" projection with the exception of four strands at the pier end of beam which are to be cut with a 9" projection and bent as detailed. Strand ends which will be exposed in the finished structure are to be cut flush and painted with two coats of red lead at the plant.
DESIGN STRESSES: Design stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1957 and T1(58):
 Reinforcing steel in accordance with Section 1.4.12 "Reinforcement for Intermediate, Hard or Roll Steel Grade."
 Concrete in accordance with T1(58) 1.13.1. $f'_c = 5000 \text{ psi}$.
 Prestressing steel in accordance with T1(58) 1.13.7. $f'_s = 250,000 \text{ psi}$.
SPECIFICATIONS:
 DESIGN: A.A.S.H.O. T1(58).
 CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, current series, plus current Special Provisions.



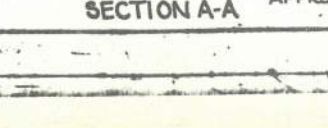
BEAM END DETAIL AT PIER



DETAILS AT PIER BEFORE PLACING PIER DIAPHRAGM



SECTION A-A



COIL TIE DETAILS

Number and location of coil ties to be as detailed on Sheet H14-2.
 Coil ties and anchors are to be as manufactured by the Superior Concrete Products Co., Richmond Screw Anchor Co. or an approved equal.

LIFTING LOOP DETAILS

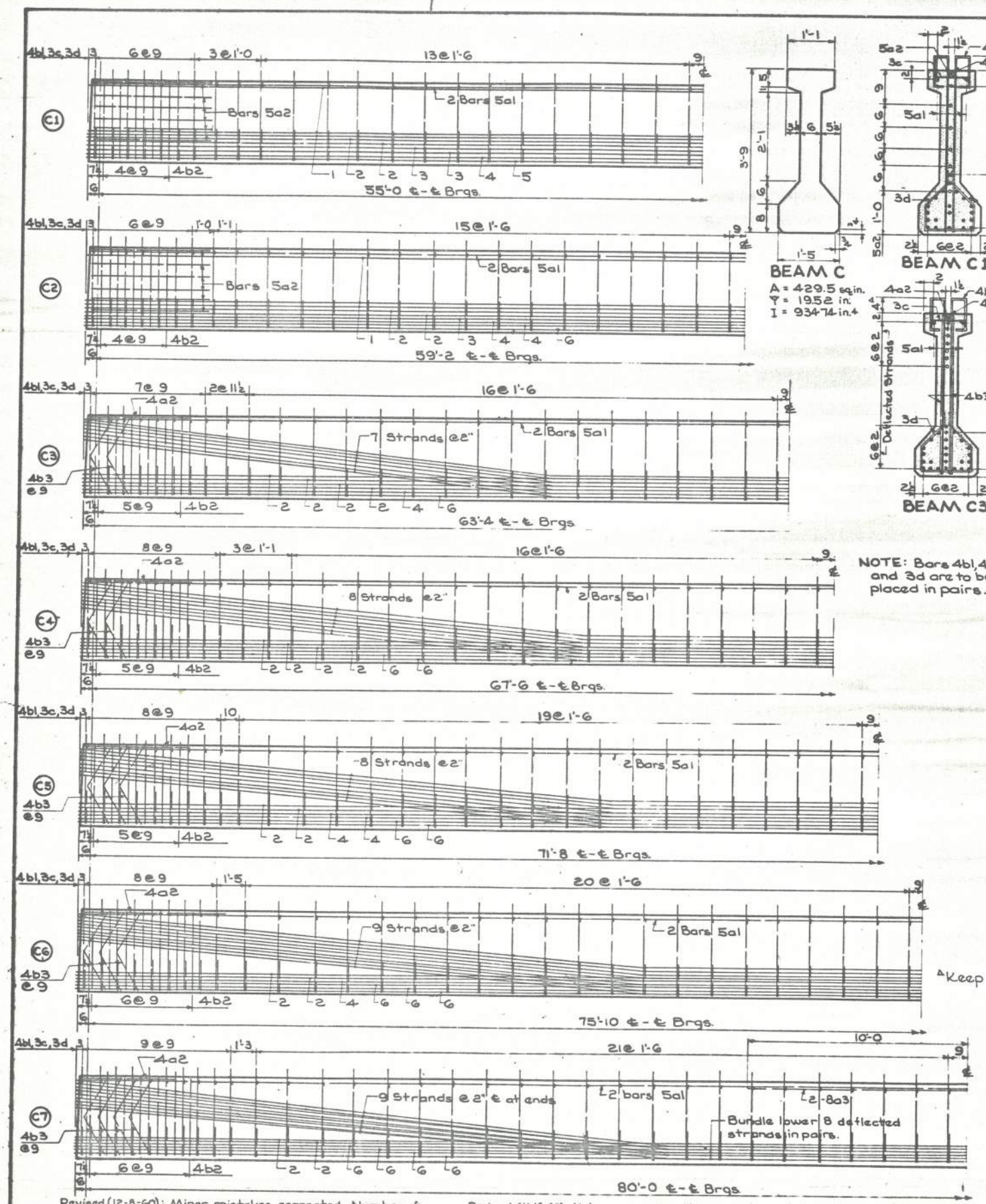
Lifting loops are to be structural grade steel. Alternate types may be substituted with approval of the Engineer.

Design For
PRESTRESSED CONCRETE BRIDGES
 28'-0" ROADWAY H20 LOADING
 SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6" & 80'-0"
BEAM SERIES B DETAILS
 Iowa State Highway Commission
 H14-4
 July 1960

Revised (12-8-60): Minor mistakes corrected.

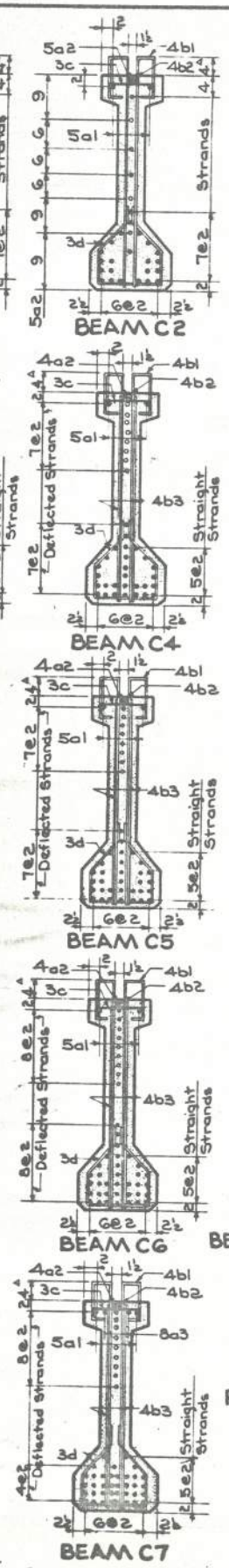
Revised 9-11-67: 4b1 Bar length changed, embedment & roughening notes added.
 Revised (11-16-60): Notes concerning the projection of strands at end of beams changed. Details showing the embedment of prestressing strands in pier diaphragms added.

APPROVED BY: *M. Chasman*
 Chief Engineer

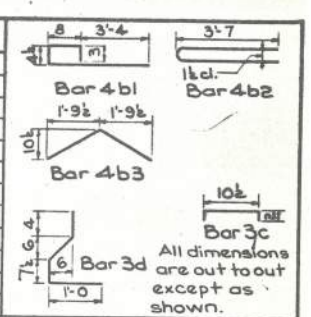


BEAM C
 A = 429.5 sq. in.
 Y = 19.52 in.
 I = 93474 in.⁴

NOTE: Bars 4b1, 4b3 and 3d are to be placed in pairs.



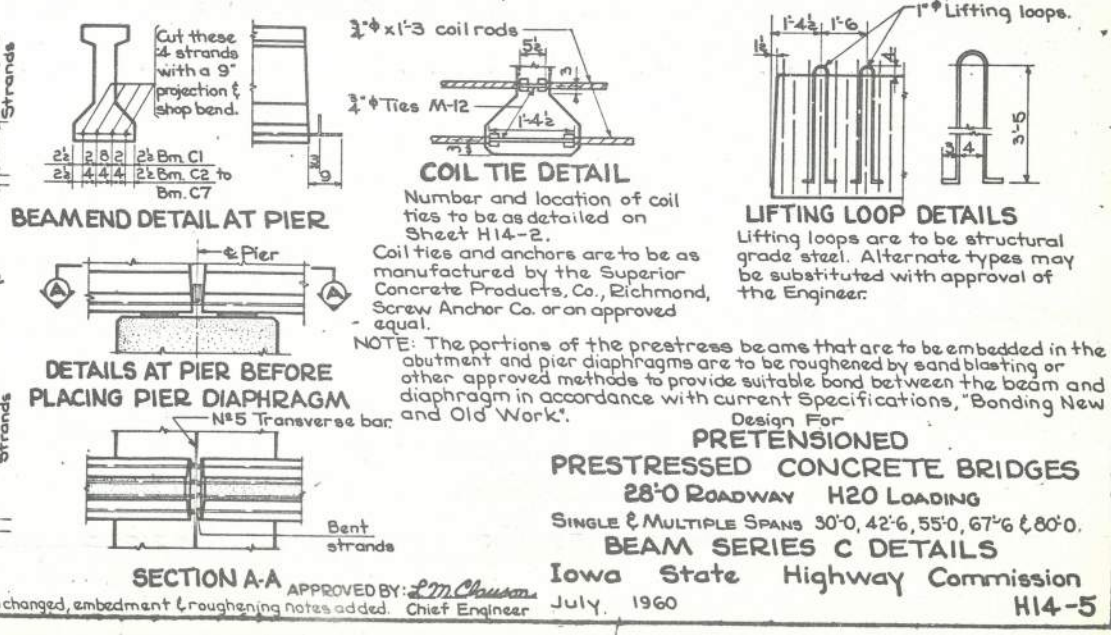
REINFORCING BAR LIST													
Beam	C1	C2	C3	C4	C5	C6	C7						
Span	55'-0"	59'-2"	63'-4"	67'-6"	71'-8"	75'-10"	80'-0"						
Bar Shape	N#	N#	N#	N#	N#	N#	N#						
5a1	4	28'-9"	4	30'-10"	4	32'-11"	4	35'-0"	4	37'-1"	4	39'-2"	4
4a2	—	—	—	2	4'-6"	2	4'-6"	2	4'-6"	2	5'-3"	2	5'-3"
5a2	12	5'-6"	12	6'-0"	—	—	—	—	—	—	—	—	—
8a3	—	—	—	—	—	—	—	—	—	—	2	20'-0"	—
4b1	92	5'-1"	96	5'-1"	104	5'-1"	112	5'-1"	116	5'-1"	120	5'-1"	128
4b2	10	7'-2"	10	7'-2"	12	7'-2"	12	7'-2"	12	7'-2"	14	7'-2"	14
4b3	—	—	—	8	4'-1"	8	4'-1"	8	4'-1"	12	4'-1"	16	4'-1"
3c	46	1'-2"	48	1'-2"	52	1'-2"	56	1'-2"	58	1'-2"	60	1'-2"	64
3d	92	2'-6"	96	2'-6"	104	2'-6"	112	2'-6"	116	2'-6"	120	2'-6"	128



BEAM DATA							
Beam	C1	C2	C3	C4	C5	C6	C7
Span	55'-0"	59'-2"	63'-4"	67'-6"	71'-8"	75'-10"	80'-0"
Initial Prestress	Kips	416	454	473	529	605	699
Size Strands		7/16	7/16	7/16	7/16	7/16	7/16
Straight Strands		22	24	18	20	24	28
Deflected Strands		—	—	7	8	8	9
Hold Down Stress	Kips	—	—	15.9	15.6	14.7	16.2
Camber	in.	.52	.69	.95	1.00	1.33	2.05
DL Deflection in (5'-0" Spc.)		.30	.38	.50	.67	.79	1.03
DL Deflection in (6'-6" Spc.)		.38	.49	.65	.85	1.02	1.26
Reinforcing Steel	lb.	661	694	702	748	785	987
Concrete	c.y.	6.19	6.65	7.11	7.57	8.04	8.96

① Increase 5% if artificial curing is to be used. ② Due to weight of slab.

NOTES:
 Unless otherwise specified an allowance of .0005 L is to be made on all beams for shrinkage and elastic shortening.
 All deflected strands are to be held down at third points of the beam except that the hold down point may be moved toward the center of the beam a distance not to exceed .05 span at the producer's option.
 Tops of beams are to be struck off level and artificially roughened in accordance with I.S.H.C. Materials Department recommendations.
 Hold down devices and procedures for tensioning and detensioning must be approved by the Engineer.
 Bearing details will be as detailed on Sheet H14-2.
 Unless otherwise noted, the cost of bearing details, including masonry plates and/or neoprene pads, coil ties, coil rods and lifting loops are to be included in the price bid for prestressed concrete beams.
 Strand ends which will be encased in concrete in the finished structure are to be cut with a 1" projection with the exception of four strands at pier end of beam which are to be cut with a 9" projection and bent as detailed. Strand ends which will be exposed in the finished structure are to be cut flush and painted with two coats of red lead at the plant.
DESIGN STRESSES: Design Stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1957 and T1(58): Reinforcing steel in accordance with Section 1.4.12, "Reinforcement" for Intermediate, Hard or Rail Steel Grade. Concrete in accordance with T1(58) 1.13.7, f'c = 5000 psi. Prestressing steel in accordance with T1(58) 1.13.7, f's = 250,000 psi.
SPECIFICATIONS:
 DESIGN: A.A.S.H.O. T1(58).
 CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, current series, plus current Special Provisions.

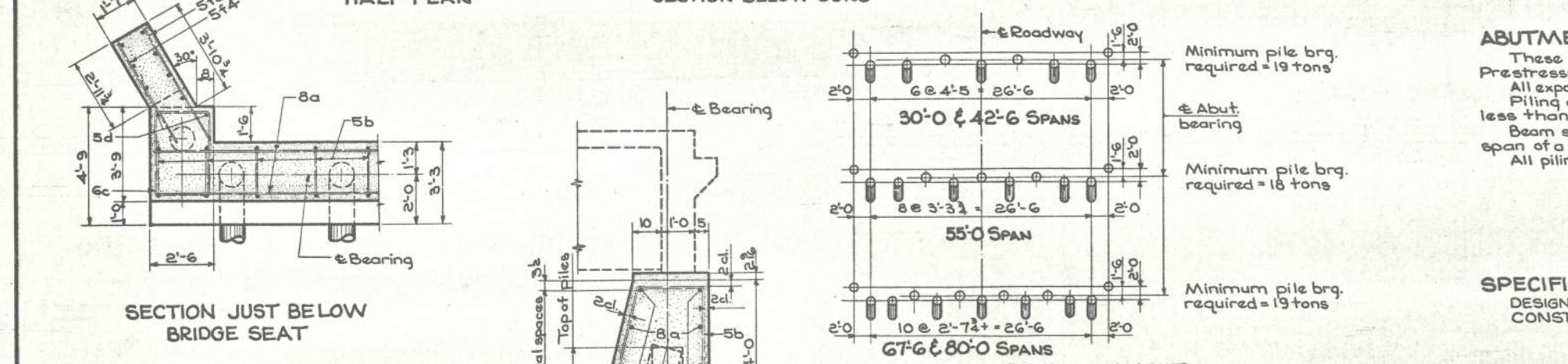
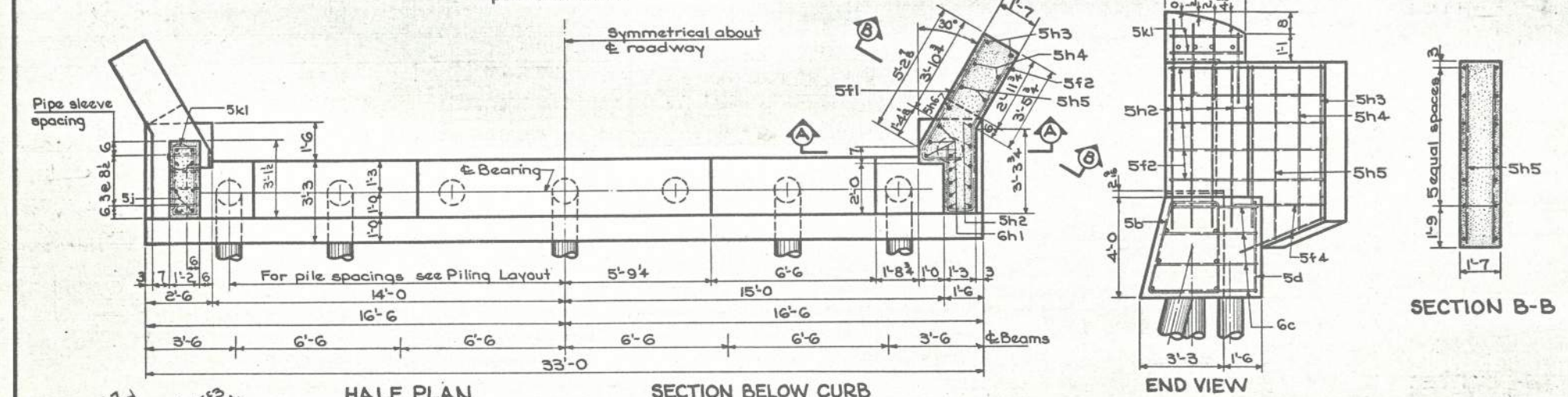
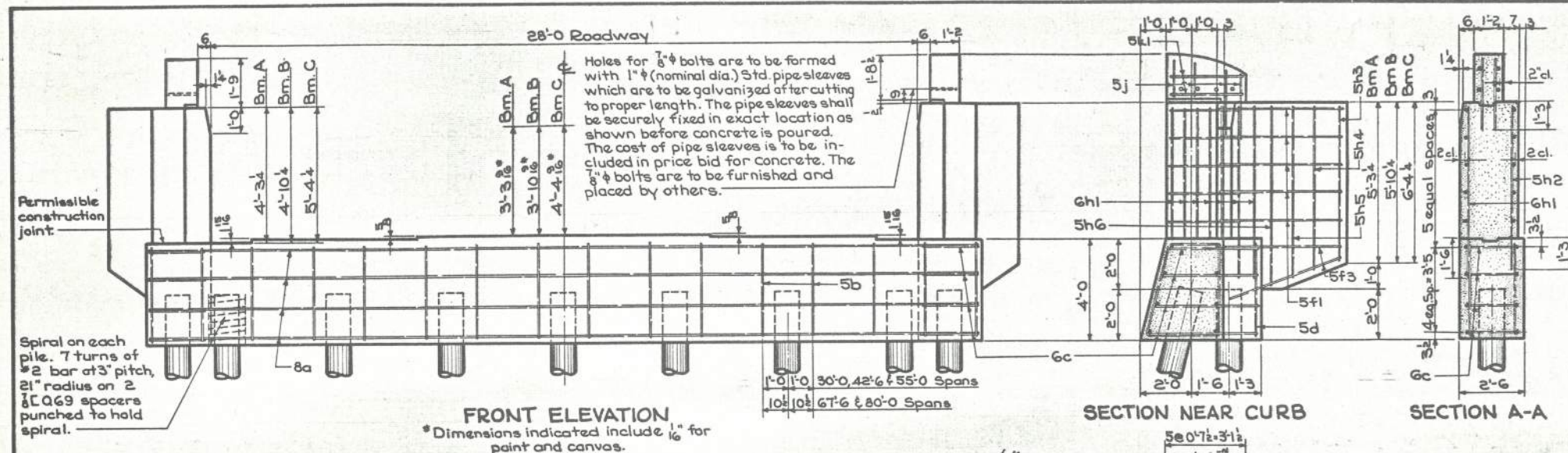


Revised (12-8-60): Minor mistakes corrected. Number of strands shown in beam section for C2 corrected.

Revised (11-16-60): Notes concerning the projection of strands at end of beams changed. Details showing the embedment of prestressing strands in pier diaphragms added.

Revised 9-11-67: 4b1 bar length changed, embedment & roughening notes added.

APPROVED BY: *L.M. Chausse*
 Chief Engineer
 July, 1960
PRETENSIONED PRESTRESSED CONCRETE BRIDGES
28'-0" ROADWAY H20 LOADING
SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6" & 80'-0".
BEAM SERIES C DETAILS
Iowa State Highway Commission
H14-5



CONCRETE PLACEMENT QUANTITIES - ONE ABUTMENT

Item	Beam A 30'-0" & 42'-6"		Beam B 55'-0"		Beam C 67'-6" & 80'-0"
	30'-0"	42'-6"	55'-0"	67'-6"	80'-0"
Pile Cap	14.4 cy.	14.3 cy.	14.3 cy.	14.2 cy.	14.2 cy.
Wing Post Bases	4.3 cy.	4.3 cy.	4.8 cy.	4.8 cy.	5.2 cy.
Wing Post **	0.4 cy.	0.4 cy.	0.4 cy.	0.4 cy.	0.4 cy.

**Wing post concrete (Q4) shall be Class D. All other concrete, Class C.

Revised 9-11-67: End post details and quantities changed.

SECTION NEAR E

PILING LAYOUT

⊔ Indicates the piling to be battered 1:4 in the direction shown. Piling positions shown are at bottom of footing.

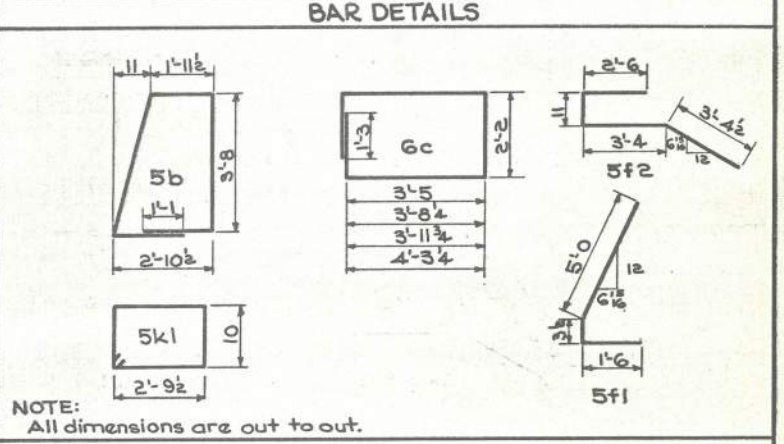
ESTIMATED QUANTITIES - ONE ABUTMENT

Item	Unit	Beam Series And Span			
		Beam A 30'-0" & 42'-6"		Beam B 55'-0"	Beam C 67'-6" & 80'-0"
Structural Concrete **	c.y.	19.1	19.0	19.5	19.4
Reinforcing Steel	lb.	1730	1803	1832	1905
Treated Bearing Piles	ea.	9	11	11	13

Revised 9-11-67: End post details and quantities changed.

Approved by: _____

REINFORCING BAR LIST FOR ONE ABUTMENT										
Bar	Location	Shape	Nº	Length	Weight-lb.					
					Beam Series And Span					
					Beam A		Beam B		Beam C	
					30'-0 42'-6	55'-0	55'-0	67'-6	67'-6 80'-0	
8a	Pile Cap Longitudinal	—	8	32'-9		700	700	700	700	700
5b	Pile Cap Hoops	▢	Shown	13'-1	16	218	20	273	20	273
6c	Pile Cap End Horiz. Hoops	▢	8	Shown		155	155	155	155	155
5d	Pile Cap End Vertical	—	4	3'-9		16	16	16	16	16
5f1	Wing Post Base Horiz. B.F.	→	10	6'-9		70	70	70	70	70
5f2	Wing Post Base Horiz. E.F.	→	10	10'-0		104	104	104	104	104
5f3	Wing Post Base Horiz. B.F.	—	4	5'-0		21	21	21	21	21
5f4	Wing Post Base Horiz. E.F.	—	4	4'-6		19	19	19	19	19
6h1	Wing Post Base Vert.	—	16	Shown	5'-8	136	5'-8	136	6'-3	150
5h2	Wing Post Base Vert.	—	10	Shown	5'-3	57	5'-3	57	6'-0	63
5h3	Wing Post Base Vert.	—	4	Shown	5'-0	21	5'-0	21	5'-7	23
5h4	Wing Post Base Vert.	—	4	Shown	5'-4	22	5'-4	22	5'-11	25
5h5	Wing Post Base Vert.	—	4	Shown	5'-8	24	5'-8	24	6'-3	26
5h6	Wing Post Base Vert.	—	2	Shown	5'-11	12	5'-11	12	6'-6	14
5i	Wing Post Vert.	—	12	4'-2 1/8 - 1-6		40	40	40	40	40
5k1	Wing Post Horiz.	▢	4	8'-0		34	34	34	34	34
2w	Pile Spiral	②	Shown	38'-6	9	58	11	71	13	84
x	#4 Q69 Spiral Spacer	—	Shown	1'-0	18	23	22	28	26	33
Total (lb.)						1730	1803	1832	1905	1929



Quantities indicated at corners are either number or length of bars.

ABUTMENT NOTES:

These abutments are for use with Standard H-14 Prestressed Concrete Bridges.

All exposed corners of 90° or sharper are to be filleted 3/4".

Piling are to be driven to full penetration if practicable, but to not less than bearing values indicated.

Beam spans shown on this sheet refer to either single span or the end span of a multiple span bridge.

All piling is to be treated.

SPECIFICATIONS:

DESIGN: A.A.S.H.O. Series 1957.

CONSTRUCTION: Current Standard Specifications of the Iowa State Highway Commission and current Special Provisions.

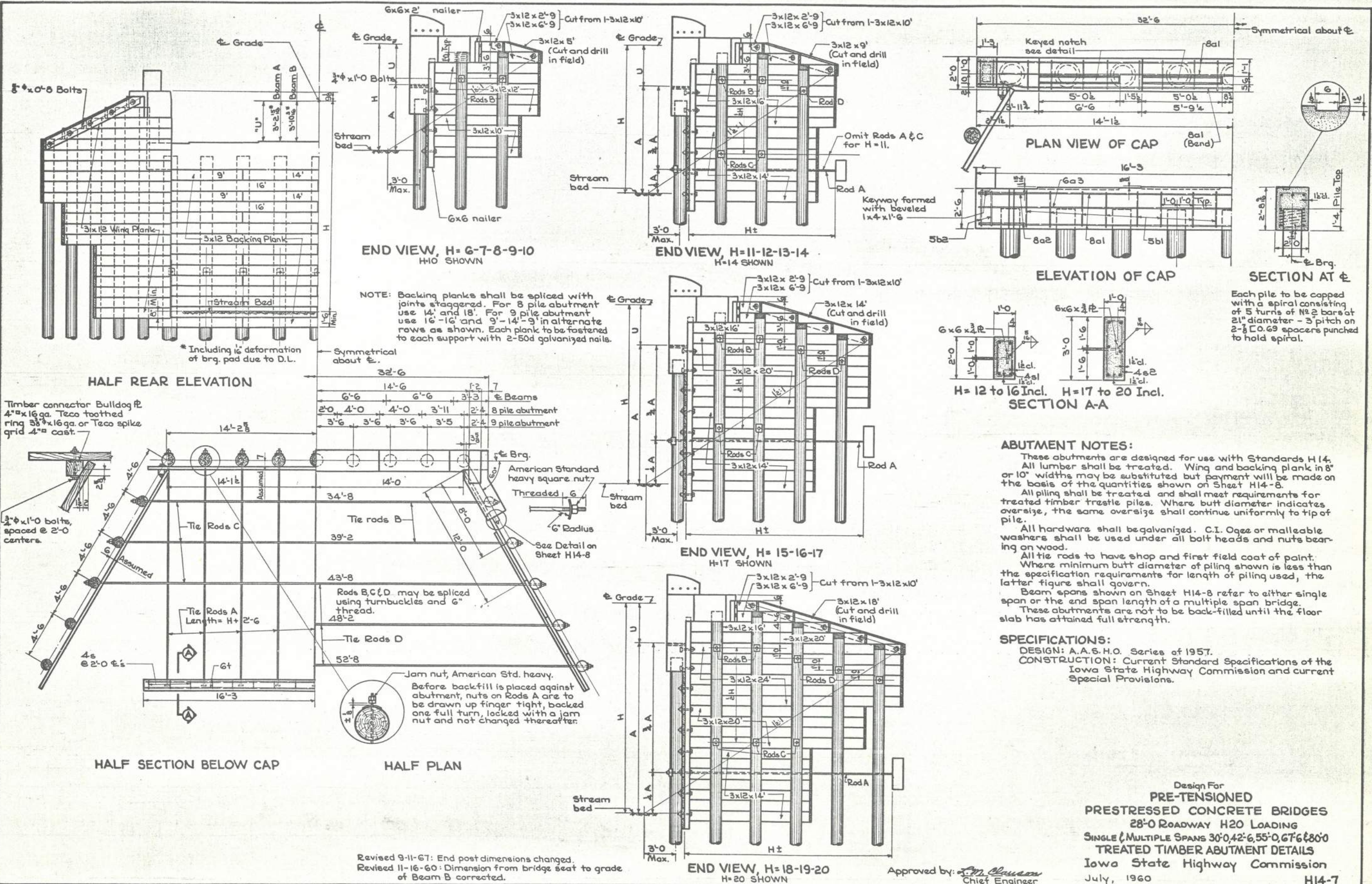
Design For
**PRE-TENSIONED
PRESTRESSED CONCRETE BRIDGES**
28'-0" ROADWAY H20 LOADING
SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6", 80'-0"
CONCRETE STUB ABUTMENTS
Iowa State Highway Commission

Revised 6-28-68: Guard rail anchor bolt size and location changed.

Approved By: *W. M. Clauson*
Chief Engineer

July, 1960

H14-6



Beam Series			A 30'-0, 42'-6 & 55'-0						B 55'-0 & 67'-6					
Span Lengths														
Number of Bearing Piles			8			9			9					
Reinforcing Steel :														
Bar	Location	Shape	Nº	Length	Weight	Nº	Length	Weight	Nº	Length	Weight	Nº	Length	Weight
8a1	Abutment Cap Longit	—	5	32'-3	431	5	32'-3	431	5	32'-3	431	5	32'-3	431
8a2	Abutment Cap End Tie	⌋	4	7'-0	75	4	7'-0	75	4	7'-0	75	4	7'-0	75
8a3	Abutment Cap Longit.	—	2	32'-3	97	2	32'-3	97	2	32'-3	97	2	32'-3	97
5b1	Abutment Cap Hoops	⌈	14	8'-9	128	16	8'-9	146	16	8'-9	146	16	8'-9	146
5b2	Abut. Cap Hoops Ends	⌈	4	8'-5	35	4	8'-5	35	4	8'-5	35	4	8'-5	35
4c	Abut.Wing Supports-Hoops	⌈	8	5'-9	31	8	5'-9	31	8	5'-9	31	8	5'-9	31
8d1	Abut.Wing Supports-Vert.	—	10	6'-6	174	10	6'-6	174	10	7'-1	189	10	7'-1	189
6d2	Abut.Wing Supports-Vert.	—	6	6'-6	59	6	6'-6	59	6	7'-1	64	6	7'-1	64
5f1	Wing Post Base-Horiz.	⌋	6	6'-4	40	6	6'-4	40	6	6'-4	40	6	6'-4	40
5f2	Wing Post Base-Horiz.	⌋	6	9'-4	58	6	9'-4	58	6	9'-4	58	6	9'-4	58
5h1	Wing Post Base-Hoops	⌈	8	8'-8	72	8	8'-8	72	8	8'-8	72	8	8'-8	72
5h2	Wing Post Base-Hoops	⌈	2	9'-0	19	2	9'-0	19	2	9'-0	19	2	9'-0	19
5j	Wing Post-Vert.	—	¹² 4 ^{2'-8} 1'-6	40	¹² 4 ^{2'-8} 1'-6	40	¹² 4 ^{2'-8} 1'-6	40	¹² 4 ^{2'-8} 1'-6	40	¹² 4 ^{2'-8} 1'-6	40	¹² 4 ^{2'-8} 1'-6	40
5k1	Wing Post- Horiz.	⌋	4	8'-0	34	4	8'-0	34	4	8'-0	34	4	8'-0	34
2w	Pile Spiral	⌀	10	27'-6	46	11	27'-6	51	11	27'-6	51	11	27'-6	51
	↳ C.O.G Spiral Spacer	—	20	1'-2	16	22	1'-2	18	22	1'-2	18	22	1'-2	18
Total (lbs.)			1355			1380			1400					

are to be
(nominal
sleeves
galvanized
proper length.
shall be
exact loca-
fore concrete
et of pipe
included in
concrete.
e to be fur-
ed by others.

6x6 nailer

Beam A

Beam B

4-2#

4-3#

2" cl.

5h2

5h1

8d1

4c

6d2

2"

Technical drawing of a structural connection between a column and a beam. The column is on the left, and the beam is on the right. The connection is a moment-resisting joint. Dimensions are given in feet and inches. Key dimensions include: column width 14'-0" to centerline, column height 3'-11", beam width 1'-11 1/2", and various spacing dimensions for reinforcement bars (5j, 5kl). Labels include "Pipe sleeve spacing" and "5kl".

Technical drawing of a roof structure showing a cross-section and elevation. The cross-section (top) shows a parabolic curve with dimensions 8' and 2'1". The elevation (bottom) shows a wall with horizontal siding, a window, and a door. Dimensions include 6'6" x 2'1" nailer, 5f2, 6d2, 5k1, 5j, 8d1, 1'0", 6", 2'3", and 1'0". Section lines A-A and B-B are indicated.

SECTION A-A

5 spaces @ $0-7\frac{1}{2} = 3-1\frac{1}{2}$

[illegible]

SECTION B-B		
MINIMUM PILE BEARINGS		
Depth	Number of Brq. Piles	Min. Bearing (Tons)
0	8	13
6	8	15
0	8	17
0	9	11
6	9	13
0	9	15
0	9	16
6	9	18

Revised 9-11-67: End post details and quantities changed.
Revised: (11-16-60) Dimension from bridge seat to top of curb of Beam B corrected. Deadman concrete and reinforcing quantities for H=16' corrected.

MINIMUM PILE BEARINGS			
Beam Series	Span Length	Number of Brq. Piles	Min. Bearing (Tons)
A	30'-0	8	13
	42'-6	8	15
	55'-0	8	17
	30'-0	9	11
	42'-6	9	13
	55'-0	9	15
B	55'-0	9	16
	67'-6	9	18

Design For
PRE-TENSIONED
PRESTRESSED CONCRETE BRIDGES
28'-0" Roadway H20 Loading
SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6" & 80'-0"
TREATED TIMBER ABUTMENT DETAILS
Iowa State Highway Commission
July, 1960 H14 -

July, 1960

Designed by:  Traced by: (t15) Checked by: y/h2

H = Grade to Stream Bed (ft)				12, 13, 14, 15 & 16			17, 18, 19 & 20		
Reinforcing Steel:				No	Length	Weight	No	Length	Weight
6t	Longitudinal	—		4	32'-2	193	6	32'-2	290
4#1	Hoops	□		17	5'-7	63	—	—	—
4#2	Hoops	□		—	—	—	17	7'-7	86
Total (lbs.)						256			376

BAR DETAILS

The diagram illustrates various reinforcement bar details with dimensions in feet and inches:

- 5b1 & 5b2:** A straight bar with a total length of 1'-7" (1'-3" + 1'-4"). The width is 1'-1" and the height is 2'-3". The bottom width is 1'-9" and the bottom height is 5b1.
- 4c:** A straight bar with a total length of 1'-7" (1'-3" + 1'-4"). The width is 1'-0" and the height is 1'-0". The bottom width is 2'-10" and the bottom height is 8a2.
- 5f1:** A bent bar with a total length of 4'-4". The width is 1'-6" and the height is 5'-12". The bottom width is 1'-6" and the bottom height is 5f1.
- 5f2:** A bent bar with a total length of 3'-2". The width is 2'-8" and the height is 2'-8". The bottom width is 2'-8" and the bottom height is 5f2.
- 5h1 & 5h2:** A bent bar with a total length of 2'-3". The width is 1'-8" and the height is 1'-0". The bottom width is 1'-0" and the bottom height is 5h1.
- 5k1:** A straight bar with a total length of 2'-9". The width is 1'-0" and the height is 2'-9". The bottom width is 1'-0" and the bottom height is 5k1.
- 4s1 & 4s2:** A bent bar with a total length of 4'-6". The width is 1'-0" and the height is 1'-9". The bottom width is 1'-0" and the bottom height is 4s1 & 4s2.
- 8a1 (Bend two only):** A bent bar with a total length of 2'-0" (1'-0" + 1'-0"). The width is 2'-0" and the height is 2'-0". The bottom width is 2'-0" and the bottom height is 8a1.

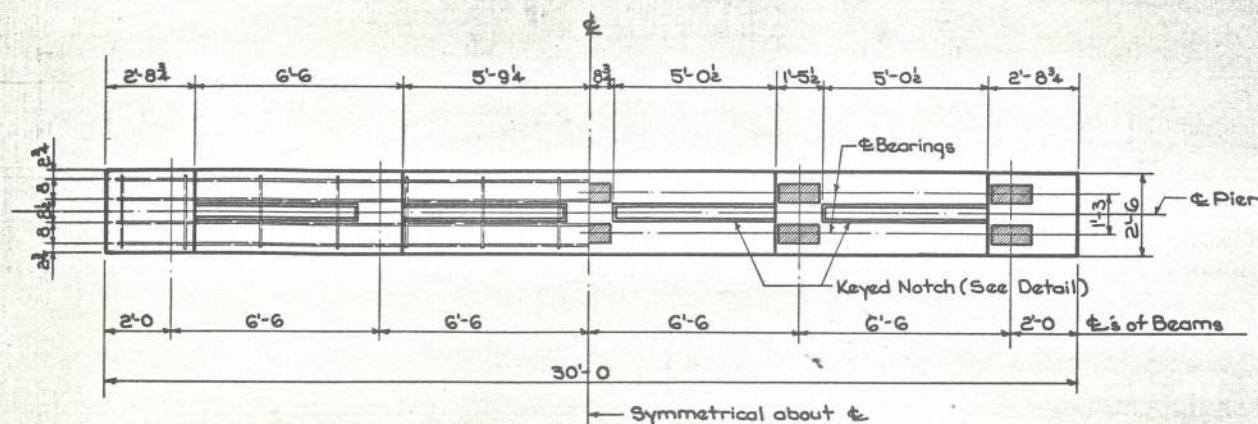
NOTE: All dimensions are out to out. All radii to ϕ of bar.

H = Grade to Stream Bed (ft.)	6	7	8	9	10	11	12
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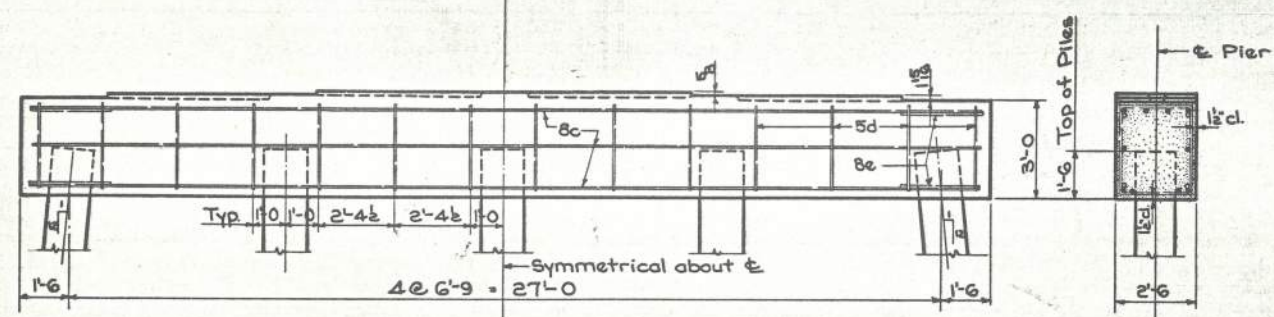
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④ Structural steel item includes tie rods with nuts, plate washers and anchor plates.

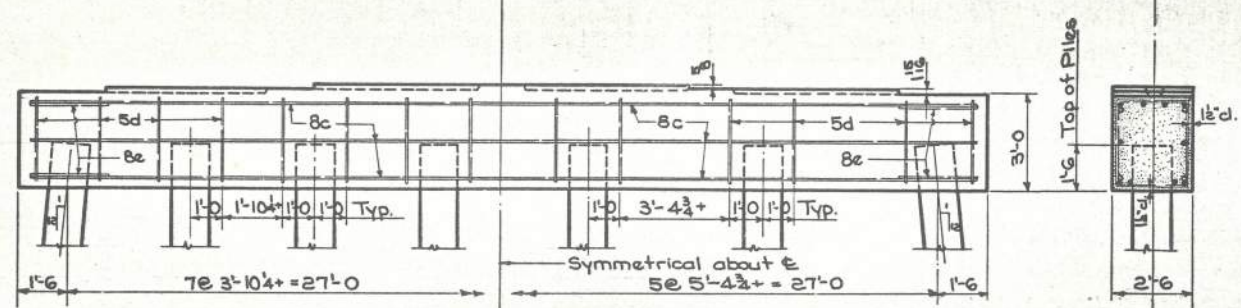
© Structural Concrete Class C except 0.4 c.y. Class D for end post.



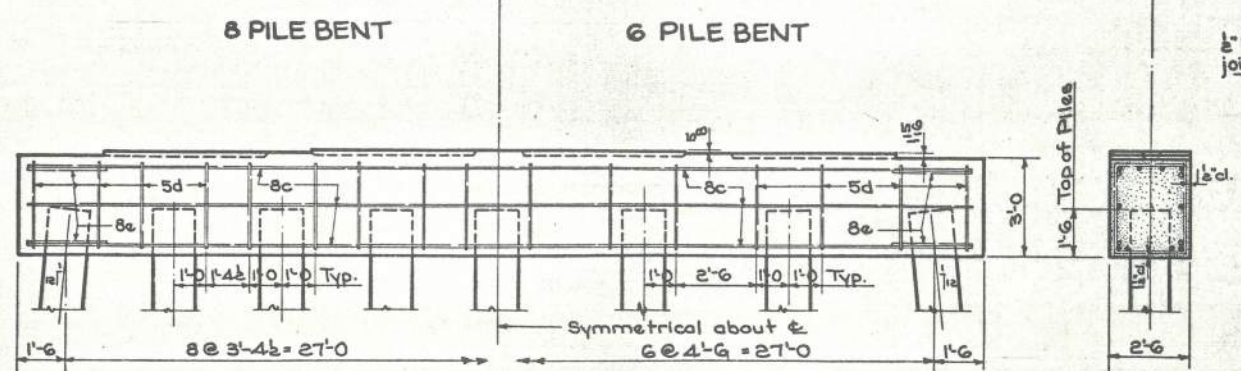
TYPICAL PLAN



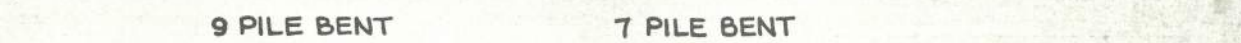
5 PILE BENT



6 PILE BENT



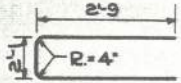
8 PILE BENT



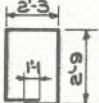
7 PILE BENT

Revised 9-11-67: Concrete bid item designation changed and pile data corrected.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES FOR ONE PILE BENT																
		5 Pile Bent			6 Pile Bent			7 Pile Bent			8 Pile Bent			9 Pile Bent		
Bar	Shape	Nº	Length	Weight	Nº	Length	Weight	Nº	Length	Weight	Nº	Length	Weight	Nº	Length	Weight
8c		10	29'-8"	792	10	29'-8"	792	10	29'-8"	792	10	29'-8"	792	10	29'-8"	792
5d		14	10'-9"	157	12	10'-9"	135	14	10'-9"	157	16	10'-9"	179	18	10'-9"	202
8e		4	7'-2"	77	4	7'-2"	77	4	7'-2"	77	4	7'-2"	77	4	7'-2"	77
Reinforcing Steel		1026 lb.			1004 lb.			1026 lb.			1048 lb.			1071 lb.		
Structural Concrete Class C	14" Pile				8.3 cy.			8.2 cy.			8.2 cy.			8.1 cy.		
	16" Pile	8.3 cy.			8.2 cy.			8.1 cy.			8.0 cy.			7.9 cy.		

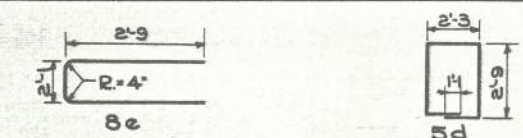


8e



5d

Note : All bar dimensions are out to out.
All radii to E of bar.



Note: All bar dimensions are out to out. All radii to center of bar.

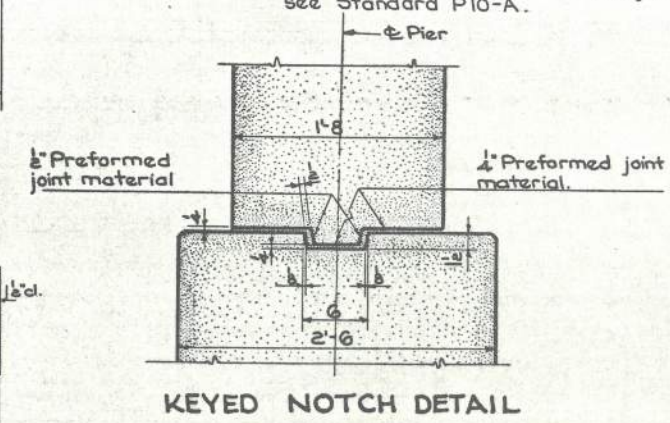
Span L' ①	Bottom Cap to Stream Bed ②	Number of Concrete Trestle Piles	Minimum K (in.) ③	Minimum Pile Bearing (Tons)
92'-6"	6' to 13'	6	14	29
105'-0"	14' to 22'	5	16	35
130'-0"	6' to 13'	7	14	28
	14' to 22'	6	16	33
142'-6"	6' to 13'	8	14	30
167'-6"	14' to 22'	7	16	34
180'-0"	6' to 13'	9	14	30
	14' to 22'	8	16	34
205'-0"	6' to 22'	9	16	38
217'-6"				
242'-6"				

PIER BENT NOTES:

These pier bents are designed for use with Standard H14 pretensioned prestressed concrete bridges in locations where ice and drift conditions are not severe. For details of concrete trestle piles see Standard P10A. Piles are to be driven to full penetration, if practicable, but not to less than the bearing values shown. All exposed corners 90° or sharper are to be filleted 3".

SPECIFICATIONS:

DESIGN: A.A.S.H.O. Series of 1957.
CONSTRUCTION: Current Standard Specifications of the Iowa State Highway Commission and current Special Provisions.



KEYED NOTCH DETAIL

Design For
PRE-TENSIONED
PRESTRESSED CONCRETE BRIDGES
28'-0" ROADWAY H20 LOADING
SINGLE & MULTIPLE SPANS 30'-0", 42'-6", 55'-0", 67'-6" & 80'-0"
PILE BENT DETAILS
Iowa State Highway Commission

Approved by: *L.M. Clauson*
Chief Engineer

July, 1960

H14-9

