

JANUARY 7 1958

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR

R C BOX CULVERT
PRIMARY ROAD SYSTEM PROJECT NO. FN-13
WEBSTER COUNTY
DECEMBER 1957

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA	FN-13 FG-13(2)		1	3

ESTIMATE OF QUANTITIES

In Letting of	Design No.	LOCATION			DESCRIPTION		CONCRETE cu yds.	REFINE STEEL lbs.	EXCAVATION class 20 cu yds.
		Sect.	Township	Sta.	Size & Type				
Jan 7th 1958	557	10	City of Ft Dodge	227+06.00	7' x 7' x 30.5' R.C. Box with inspection walls each end.		524.7	96,262	2,040

The Iowa Highway Commission standard specification for construction work, series of 1956 shall apply on this project.

BEG. OF PROJ. FN-13
STA. 2000 + 09.03

EQUA. STA. 1998 + 25.00 =
STA. 201 + 84.03

DESIGN NO.
557

STOP PROJ. FN-13
BEG. PROJ. FG-13 (7)
STA. 228 + 96.75

END PROJ. FG-13 (7)
RESUME PROJ. FN-13
STA. 235 + 50.50

END OF PROJ. FN 13
STA. 237 + 26.65

DESIGN: 1457
SECTION: 19

STA. 213+16 TO
STA. 224+25
TWR WAHKONSA

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546' x 58' SECTION AND
546' x 58' SECTION WITH 18'-3" TRANSITION SECTION

ESTIMATE OF QUANTITIES

Concrete	5485.6	Cu.Yd.
Reinforcing Steel	679,862	lbs.
Structural Steel	299,353	lbs.
Furnished BP 10-42" Steel Piling 33@35' 20@55'	2794	Lin. Ft.
Placing BP 10-42" Steel Piling 33@35' 20@55'	2794	Lin. Ft.
Excavation Cl 21	1738	Cu.Yd.
" " Cl 22	278	Cu.Yd.
" " Cl 24	470	Cu.Yd.
" " Cl 20	768	Cu.Yd.
Lighting System	Lump Sum	

MILEAGE SUMMARY
BRIDGE AT STA. 213+16 TO STA. 224+25 = 1109.39' = 0.21 MI.

THIS BRIDGE WILL REQUIRE BRIDGE SIGN
ASSEMBLIES, FURNISHED AND PLACED BY
OTHERS, AS SPECIFIED IN S&T INSTRUCTIONS
NO. 11, REVISED MARCH 1, 1956.

APPROVED

CHIEF ENGINEER
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DISTRICT ENGINEER

LAYOUT

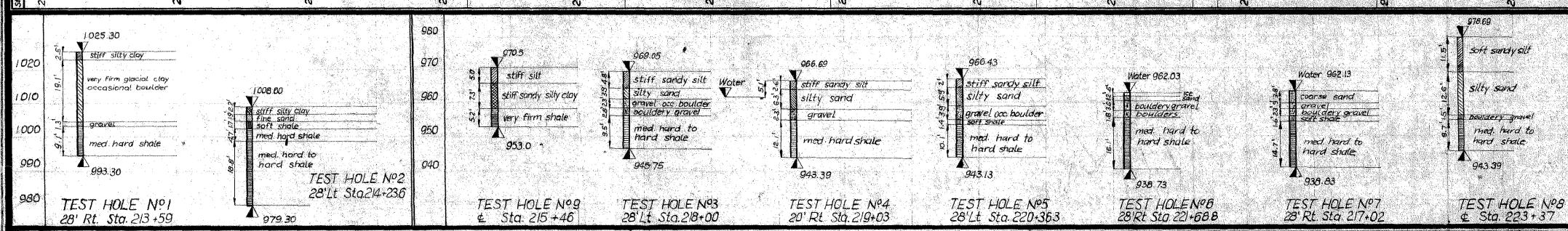
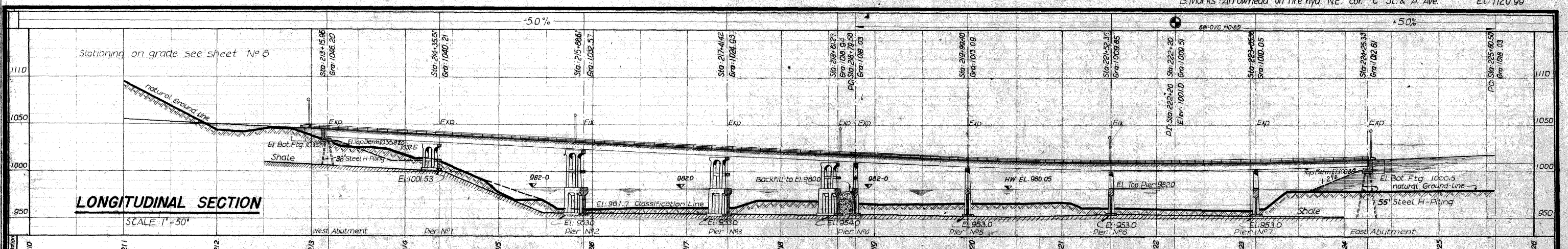
Part of City of Fort Dodge, Iowa

Revised 10-21-58: Design No. 1457: Reinforcing Steel Quantities changed.
1-28-58: Revision Design No. 1457: Excavation & Reinforcing Quantities Changed.
1-28-58: Revision Design No. 557: Reinforcing Schedule changed. Position of several reinforcing bars changed. per Revision Note.

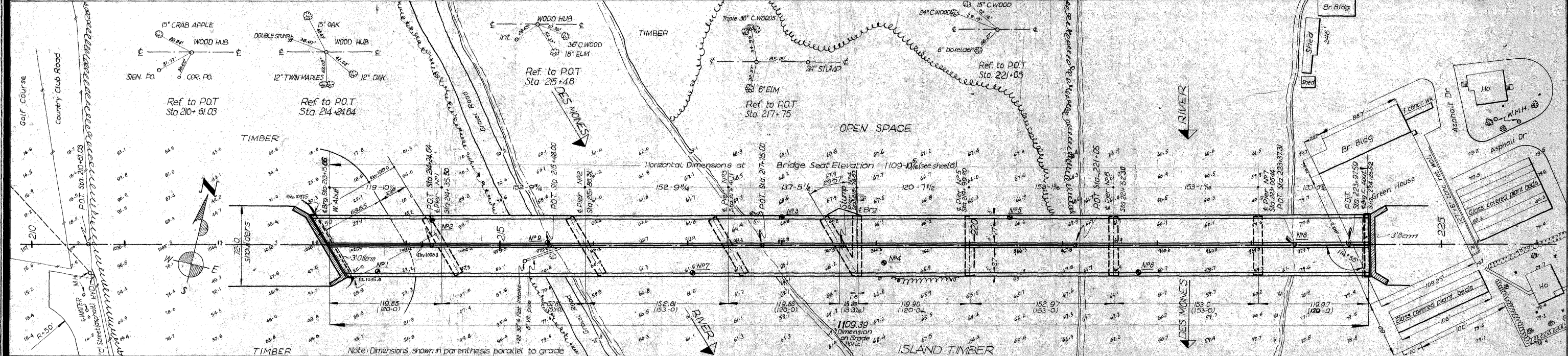
Lechner Engr. Co. Jan 7th 1957
WEBSTER CO. PROJ. NO. FN-13
File No. 19143
18762

9475.25007

B.Marks: Sta. 220+80 40' spike in root 24' cottonwood
B.Marks: Arrowhead on fire hyd. NE. cor. 'C' St. & 'A' Ave.
El. 967.01
El. 1120.90



ESTIMATED QUANTITIES				
ITEM	SUPERSTR.	ABUTMENT	PIER	Total:
Concrete	1943.4	223	3319.4	5485.8 cy
Reinforcing Steel	478.292	14.116	189.816	679.927 lb
Structural Steel	2,998.353			2,998.353 lb
Furnishing BP 10-42" Steel Piling		33@38' 26@55'		2794 LF
Placing BP 10-42" Steel Piling		33@38' 28@55'		2794 LF
Excavation	0121		1738	1738 cy
	0122		567	567 cy
	0124		470	470 cy
	0120		646	646 cy
Lighting System		12.2		12.2
				Lump Sum



General Notes:
This bridge is designed for H-20 loading with an allowance of 19" sq. ft. roadway for future wearing surface. Approach fills are not a part of this contract but are to be in place 90 days before abutment piles are driven. Bridge Contractor to level off and shape berms to elevations shown.

SPECIFICATIONS:
Design - A.A.S.H.O. Series of 1953 with modification shown on sheet 11.
Construction - Std. Spec. Ia State Highway Comm. Series of 1956 plus current Special Provisions.

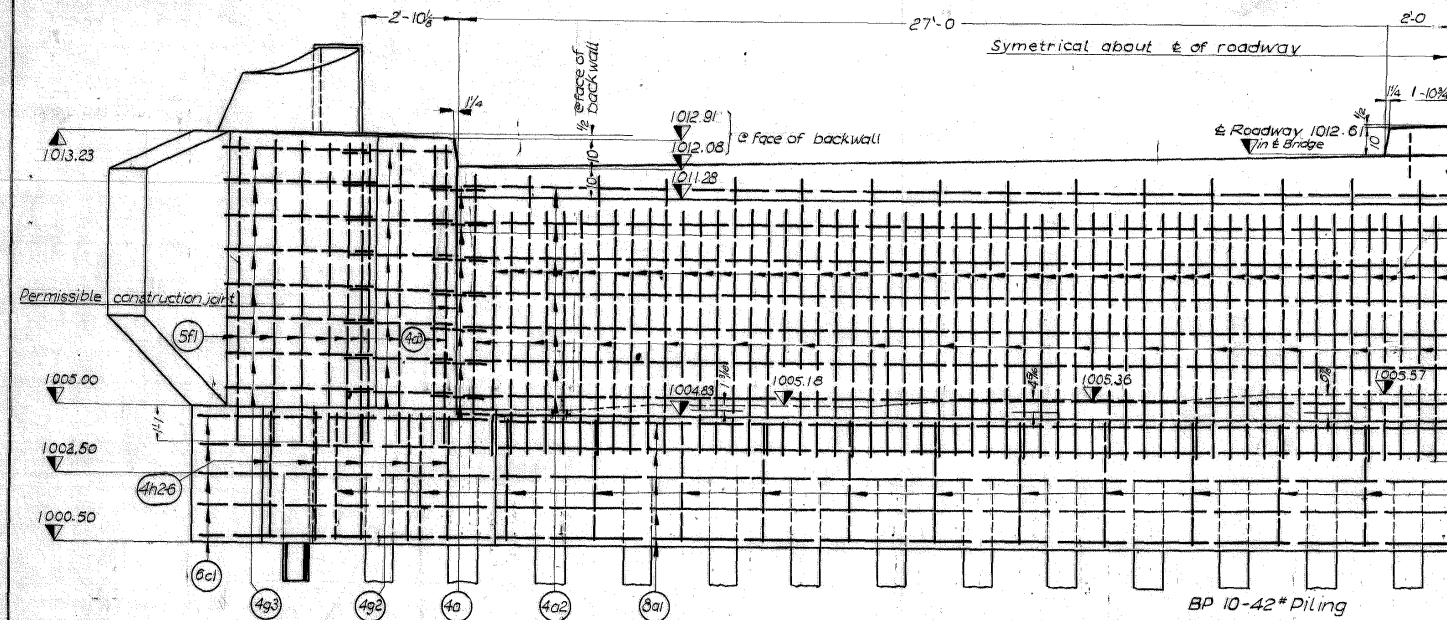
SITUATION PLAN
SCALE 1"=50'

LOCATION:
Section 19
Township WAHKONSA
Webster Co.
over DES MOINES Riv.

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x58' SECTION AND
546'x58' SECTION WITH 18'-3" TRANSITION SECTION
CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL OVER
DES MOINES RIVER
SITUATION PLAN
STATION 213+16 TO STATION 224+25 PROJECT FN-13
WEBSTER COUNTY
DECEMBER 1957-**Lechmer** ENGINEERING CO.-SHEET 1 OF 15
Design No. 1457 Webster Co. File No. 18762

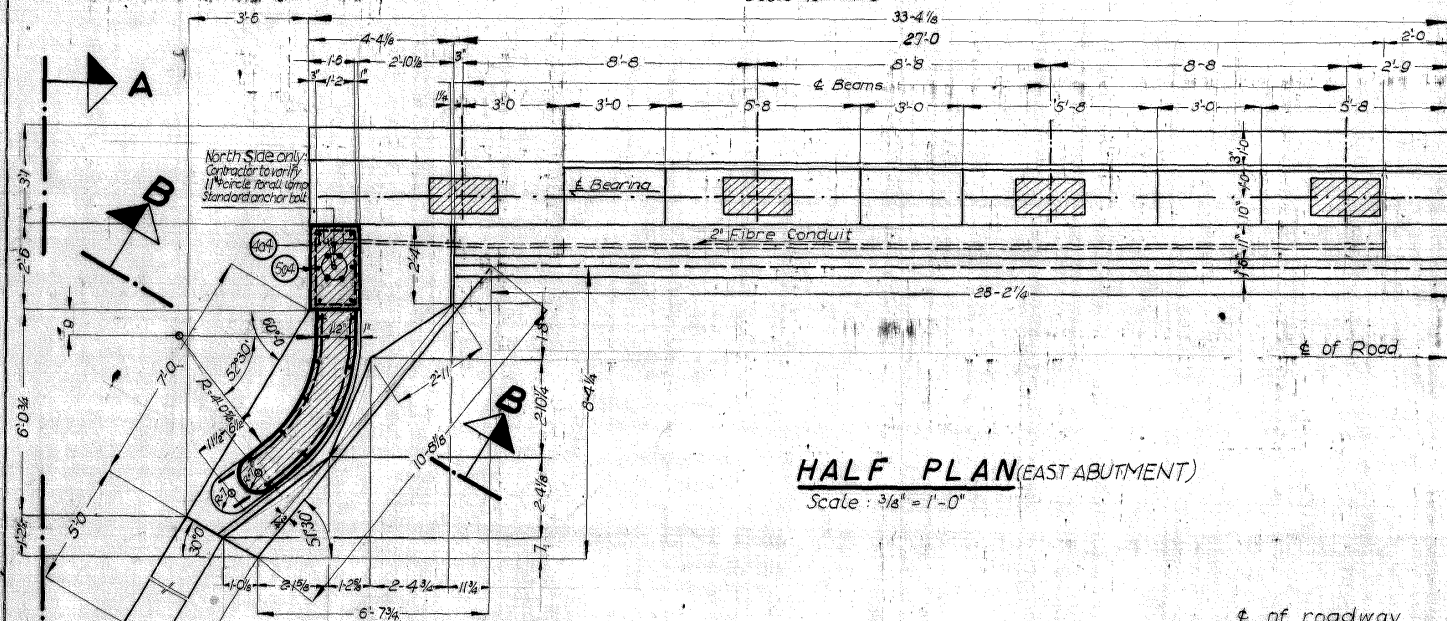
Revised 10-21-58 Reinforcing Steel Quantities changed (see Sheet No. 14)
Revised 1-28-58 Excavation & Reinforcing Quantities changed (see Sheet No. 5)

Webster IA 7424



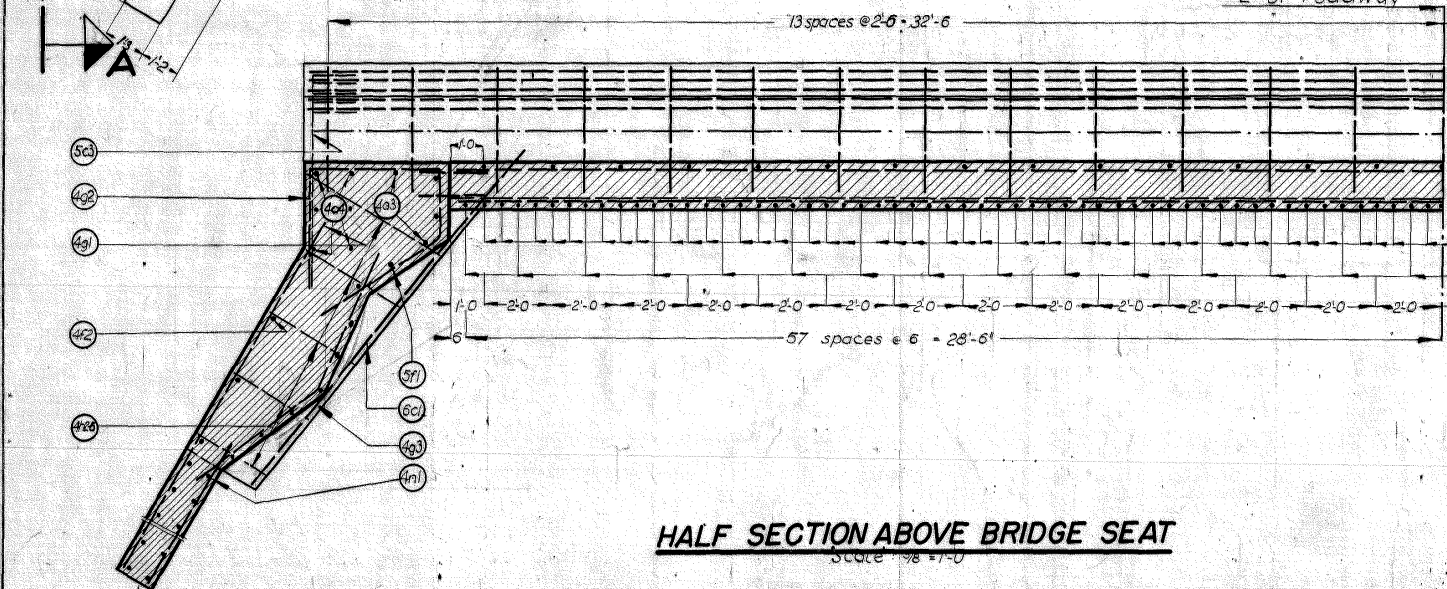
HALF REAR ELEVATION

Scale: 3/8" = 1'-0"



HALF PLAN (EAST ABUTMENT)

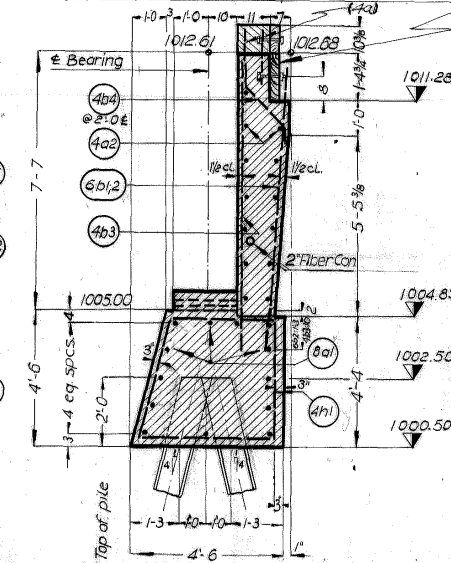
Scale: 3/8" = 1'-0"



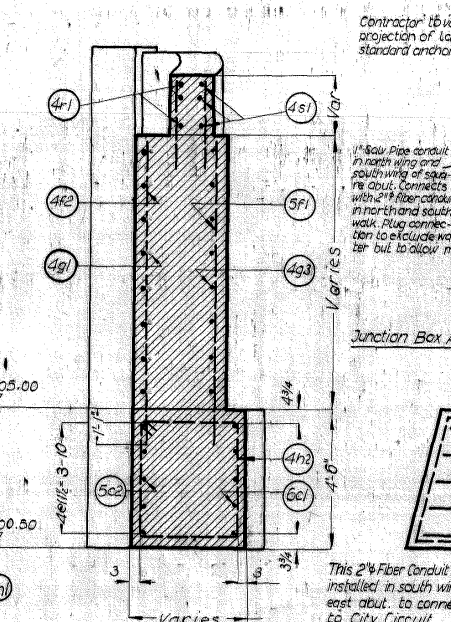
HALF SECTION ABOVE BRIDGE SEAT

Scale: 3/8" = 1'-0"

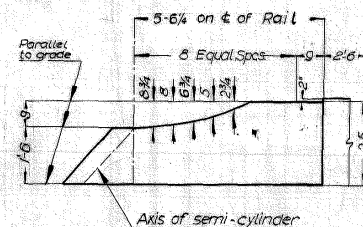
Temporary paving block made from 3" plank. Cut to fit crown and fasten to backwall with 25# x 9" bolts @ 2'-0" o.c. Remove plank and cut bolts flush when paving is placed. Include cost in price bid for concrete.



E SECTION



SECTION B-B



VIEW A-A

ABUTMENT NOTES:

All exposed corners of 90° or sharper except vertical corners of wing posts are to be filleted with a 3/4" dressed and beveled strip.
Minimum distance from face of concrete to 5/8" of outside reinforcing bar is to be 2" unless otherwise shown or noted.
All piling is to be driven to full penetration if possible but in no case to less than 30 tons bearing capacity.

SPECIFICATIONS:

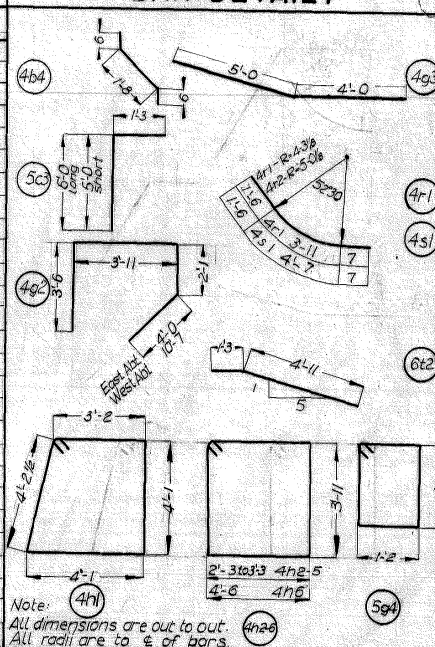
Design: A.A.S.H.O. Series of 1953.
Construction: Iowa State Highway Commission Series of 1956 plus current Special Provisions

BENCH MARK: Sta 220+80 40" spike in root 24" cottonwood ----- ELEV 967.01

BILL OF REINFORCEMENT

BAR	LOCATION	SHAPE	Nº	LENGTH	WEIGHT
3a1	Bridge Seat Longitudinal	—	26	34'-0"	2360
4a2	Backwall Longitudinal F.F. & B.F.	—	26	29'-3"	508
6b1	Backwall Vertical B.F.	—	85	7'-3"	926
6b2	Backwall Vertical B.F.	—	30	8'-6"	363
4b3	Backwall Vertical F.F.	—	29	8'-1"	157
4b4	Backwall Tie	—	29	2'-8"	517
6c1	Wing Footing Longitudinal B.F.	—	10	12'-6"	188
5c2	Wing Footing Longitudinal F.F.	—	10	8'-0"	83
5c3	Wing Footing Bridge Seat F.F.	—	10	variable	70
4g1	Wing Wall Longitudinal F.F.	—	16	8'-0"	86
4g2	Wing Wall Longitudinal F.F. & B.F.	—	16	13'-6"	144
4g3	Wing Wall Longitudinal B.F.	—	16	9'-0"	96
4a3	Wing Wall Vertical B.F.	—	8	9'-0"	75
4a4	Wing Wall Vertical F.F.	—	8	11'-5"	61
4f2	Wing Wall Vertical F.F.	—	8	9'-0"	75
5f1	Wing Wall Vertical B.F.	—	16	9'-0"	150
5g4	Lamp Post Hoops	—	10	7'-6"	78
4h1	Bridge Seat Hoops	—	27	16'-4"	295
4h2-6	Wing Footing Hoops	—	10	variable	82
4n1	Butterfly Vertical	—	28	variable	121
4p1	Wing Post Vertical	—	20	2'-9"	37
4r1	Wing Post Horizontal F.F.	—	6	6'-0"	24
4s1	Wing Post Horizontal B.F.	—	6	6'-6"	27
4t1	Butterfly Horizontal	—	24	6'-0"	96
6t2	Butterfly Slope	—	4	6'-2"	37
4q	Dowels Backwall Long & Median	—	32	2'-0"	43
Total:					6719

BAR DETAIL:



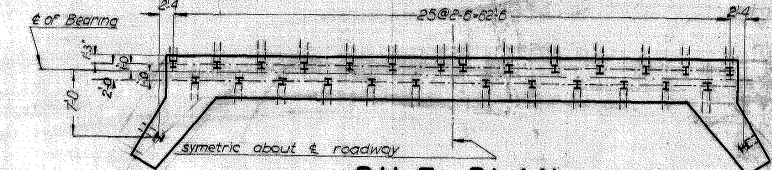
CONCRETE PLACEMENT QUAT.

ITEM	W. ABUT	E. ABUT	TOTAL
Footing & Backwall	71.7	56.0	127.7
Wing & Postseat	26.5	20.6	47.1
Wingpost & Rail	24.3	20.5	44.8
	1.7	1.7	3.4
Total	124.2	98.8	223.0

ESTIMATED QUANTITIES-2ABUTS.

ITEM	W. ABUT	E. ABUT	TOTAL
Concrete	124.2	98.8	223.0 cy
Reinforcing Steel	7397	6719	14116 lb
Furn. Piles BP10-42"	33 @ 38'	28 @ 55'	2794 LF
Place Piles BP10-42"	33 @ 38'	28 @ 55'	2794 LF
Excavation C120	66 cy	56 cy	122 cy

* Abutment of skewed bridge



PILE PLAN

Piles are shown at bottom of footing.
28-BP 10 Piles required for east abutment.

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x 58' SECTION AND
546'x 58' SECTION WITH 18'-3" TRANSITION SECTION
CONCRETE FLOOR AND SUBSTRUCTURE—STEEL RAIL OVER
DES MOINES RIVER

SUBSTRUCTURE DETAILS

STATION 213 16 TO STATION 224 25 PROJECT FN-13
WEBSTER COUNTY

DECEMBER 1957 **Lechner** ENGINEERING CO. SHEET 2 OF 15

Design No. 1457 Webster Co. File No. 18762

WEST ABUT.

PIER 1

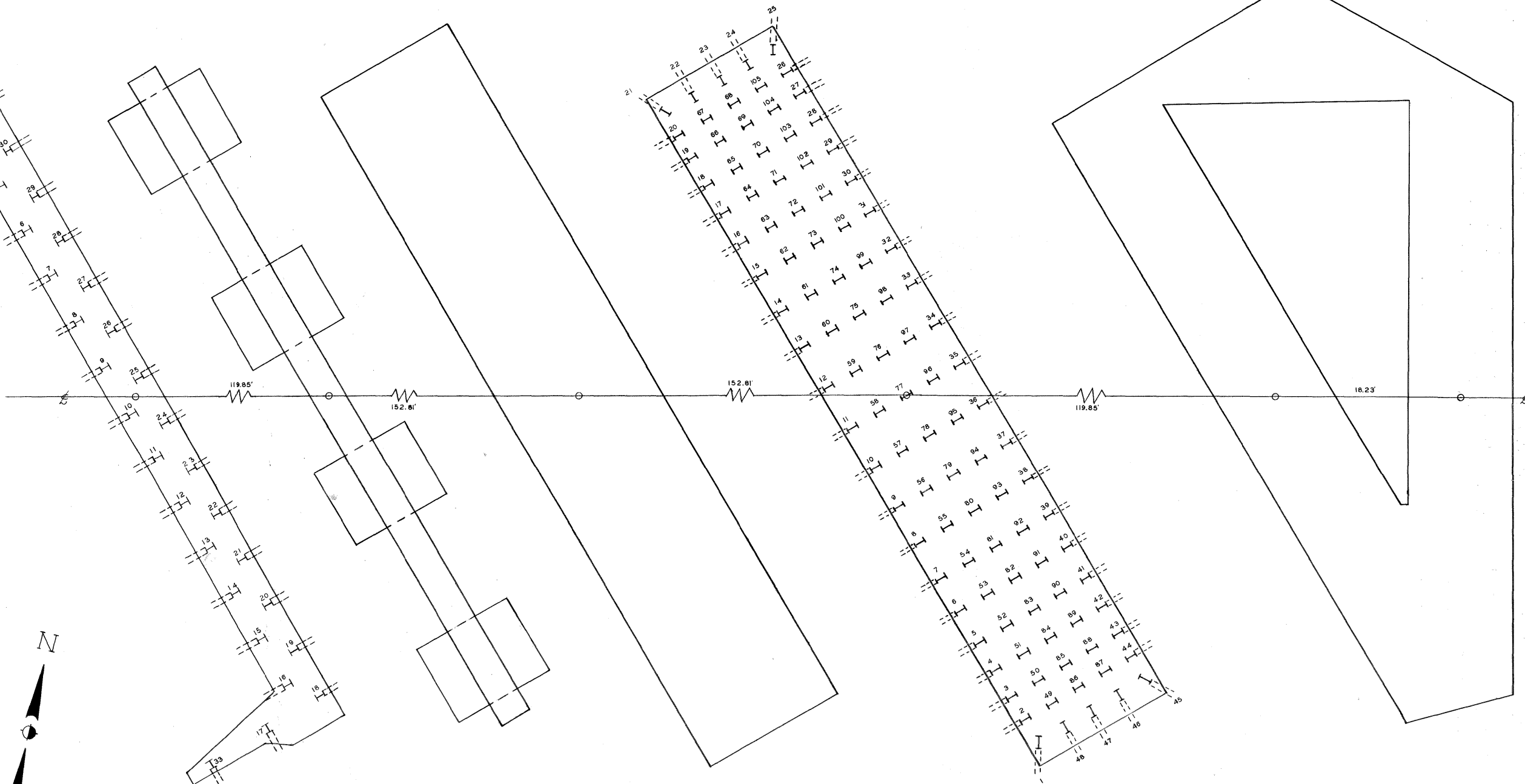
PIER 2

PIER 3

PILE NO.	LENGTH IN STRUCTURE BEARING IN TONS	WEST ABUT.
1	37	30.7
2	32	Ref.
3	37.2	30.2
4	35.4	Ref.
5	37.3	30.2
6	35.7	30.2
7	36.7	32.2
8	37.1	30.2
9	36.7	31.7
10	37.3	31.7
11	37.2	30.7
12	36.6	29.7
13	36.9	31.2
14	36.5	31.7
15	36.4	30.2
16	36.7	31.7
17	37.3	29.7
18	36.6	30.7
19	37.1	29.7
20	36.5	32.2
21	37	30.2
22	36.4	30.2
23	37	30.7
24	36.4	31.7
25	37	31.2
26	34.3	30.2
27	31	Ref.
28	32.8	Ref.
29	33	Ref.
30	36.7	30.7
31	36.5	30.2
32	36.6	35.1
33	37.3	30.7

PILE NO.	LENGTH IN STRUCTURE BEARING IN TONS	WEST ABUT.
16	18.1	Ref.
17	17.0	Ref.
18	16.8	Ref.
19	17.1	36.7
20	16.9	Ref.
21	17	Ref.
22	19.0	Ref.
23	15.5	36.7
24	17.5	Ref.
25	17.2	Ref.
26	16.8	36.7
27	17.9	Ref.
28	18.1	Ref.
29	17.3	Ref.
30	17.8	Ref.
31	16.9	Ref.
32	17.2	Ref.
33	17.1	Ref.
34	17.4	Ref.
35	17.6	Ref.
36	17.0	Ref.
37	17.4	Ref.
38	17.7	Ref.
39	17.9	Ref.
40	18.2	Ref.
41	17.8	Ref.
42	18.2	Ref.
43	18.0	Ref.
44	17.9	Ref.
45	17.0	Ref.
46	18.4	Ref.
47	17.0	Ref.
48	18.2	Ref.
49	16.5	36.8
50	17.0	Ref.
51	18.0	Ref.
52	17.4	Ref.
53	17.2	Ref.
54	17.1	Ref.
55	17.3	Ref.
56	17.5	Ref.
57	17.7	Ref.
58	17.6	Ref.
59	15.6	31.6
60	15.8	Ref.
61	14.5	Ref.
62	15.2	Ref.
63	15.8	Ref.
64	15.9	Ref.

PILE NO.	LENGTH IN STRUCTURE BEARING IN TONS	WEST ABUT.
65	15.7	Ref.
66	15.8	Ref.
67	16.9	Ref.
68	16.2	Ref.
69	15.7	Ref.
70	15.6	Ref.
71	16.1	Ref.
72	16.9	Ref.
73	15.9	Ref.
74	16.1	Ref.
75	15.6	Ref.
76	16.8	Ref.
77	16.6	Ref.
78	17.3	Ref.
79	17.4	Ref.
80	17.8	Ref.
81	18.9	Ref.
82	18.6	Ref.
83	18.9	Ref.
84	18.4	Ref.
85	18.7	Ref.
86	17.9	Ref.
87	17.0	Ref.
88	17.1	Ref.
89	16.9	Ref.
90	18.1	Ref.
91	17.9	Ref.
92	17.6	Ref.
93	17.9	Ref.
94	17.8	Ref.
95	18.3	Ref.
96	17.3	Ref.
97	16.9	Ref.
98	16.8	Ref.
99	17.6	Ref.
100	17.7	Ref.
101	17.6	Ref.
102	17.1	Ref.
103	17.5	Ref.
104	15.0	33.4
105	15.8	Ref.



Temporary paving block made from 3" plank.
Cut to fit crown and fasten to backwall with
28-1/8" x 6" bolts @ 2'-6" o.c. Remove plank and
cut bolts flush when paving is placed. Include
cost in price bid for concrete.

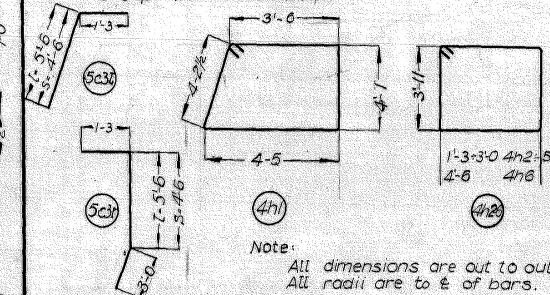
Bench Mark: Sta. 220+80 - 40d spike in root 24" Cottonwood El. 967.01

BILL of REINFORCEMENT-SKEWED ABUT.

BAR	LOCATION	SHAPE	Nº	LENGTH	WEIGHT
8a1	Bridge Seat Longitudinal		26	37'-9"	2621
4a2	Backwall Longitudinal F&B.F.		32	33'-8"	720
6b1	Backwall Vertical B.F.		99	var	1220
6b2	Backwall Vertical B.F.		35	var	506
4b3	Backwall Vertical F.F.		34	var	215
4b4	Backwall Tie		34	2'-8"	61
8c1	Wing Footing Longitudinal B.F.		13	15'-6"	207
5c2	Wing Footing Longitudinal F.F.		10	9'-0"	94
5c3	Wing Footing-Bridge Seat F.F.		5 each	var	86
4g1	Wing Wall Longitudinal F.F.		19	8'-9"	111
4g2	Wing Wall Longitudinal F&B.F.		19	20'-0"	254
4a3	Wing Wall Vertical B.F.		3	19'-3"	66
4a4	Wing Wall Vertical F.F.		12	var	71
4f2	Wing Wall Vertical F.F.		3	10'-7"	63
5f1	Wing Wall Vertical B.F.		8	15'-0"	170
5g4	Lamp Post Hoops		10	7'-6"	78
4h1	Bridge Seat Hoops		30	18'-0"	341
4h2-6	Wing Footing Hoops		10	var	94
4n1	Butterfly Vertical		28	var	135
4l1	Wing Post Vertical		20	2'-9"	37
4r1	Wing Post Horizontal F.F.		6	6'-0"	24
4s1	Wing Post Horizontal B.F.		6	6'-8"	27
4t1	Butterfly Horizontal		8	15'-4"	110
6t2	Butterfly Slope		2	11'-6"	35
4a	Dowels Backwall Longitud. and Median		38	2'-0"	51
Total:					7397

BAR DETAILS:

Bar details are to be found on sheet No. 2 except bars listed below.



ABUTMENT NOTES:

All exposed corners of 90° or sharper except vertical corners of wing posts are to be filleted with a 3/4" dressed and beveled strip.
Minimum distance from face of concrete to center of outside reinforcing bar is to be 2" unless otherwise shown or noted. All piling is to be driven to full penetration if possible but in no case to less than 30 tons bearing capacity.

SPECIFICATIONS:

Design: A.A.S.H.O. Series of 1953.
Construction: Iowa State Highway Commission - Series of 1956, plus current Special Provisions

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x58' SECTION AND
546'x58' SECTION WITH 18'-3" TRANSITION SECTION
 CONCRETE FLOOR AND SUBSTRUCTURE—STEEL RAIL OVER
 DES MOINES RIVER
SUBSTRUCTURE DETAILS
 STATION 213+16 TO STATION 224+25 PROJECT FN-13
WEBSTER COUNTY

DECEMBER 1957 *Lechner* ENGINEERING CO. SHEET 3 OF 15

Design No: 1457 Webster Co. File No: 18762

SECTION C-C

SCALE 1/4" = 1'-0"

REAR ELEVATION

SCALE 1/4" = 1'-0"

ABUTMENT LAYOUT

SCALE 1/8" = 1'-0"

SECTION ABOVE BRIDGE SEAT

PILE PLAN

Piles are shown at bottom of footing
33 BP 10 Piles required for west abutment

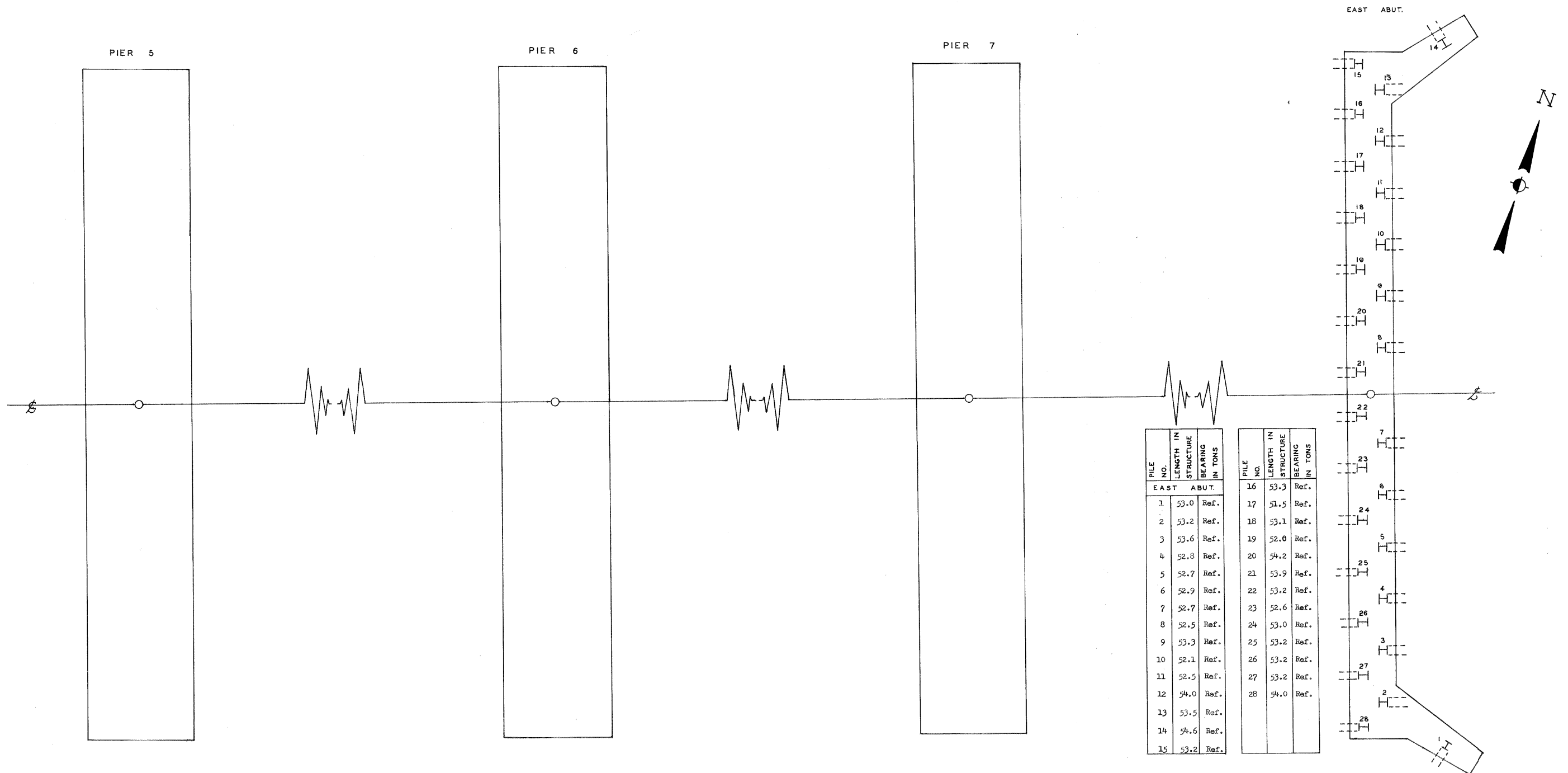
VIEW A-A

Scale 1/4" = 1'-0"

VIEW D-D

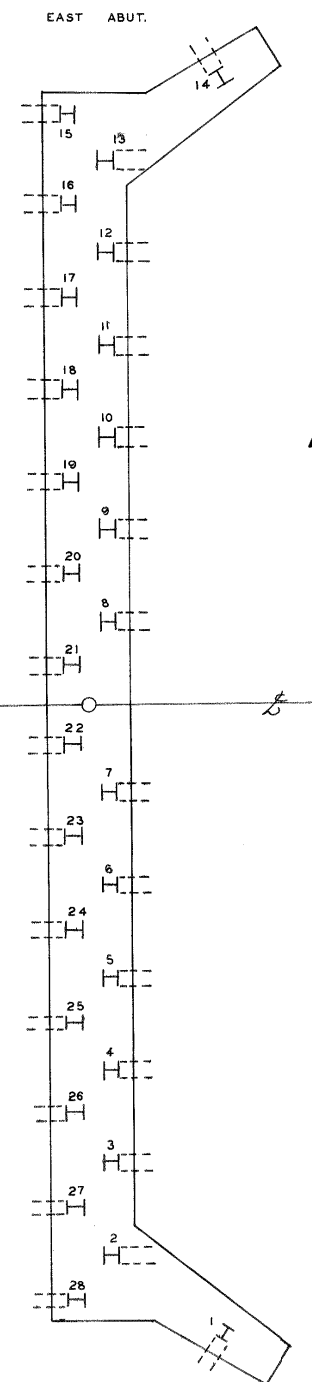
SECTION B-B

Scale 1/4" = 1'-0"



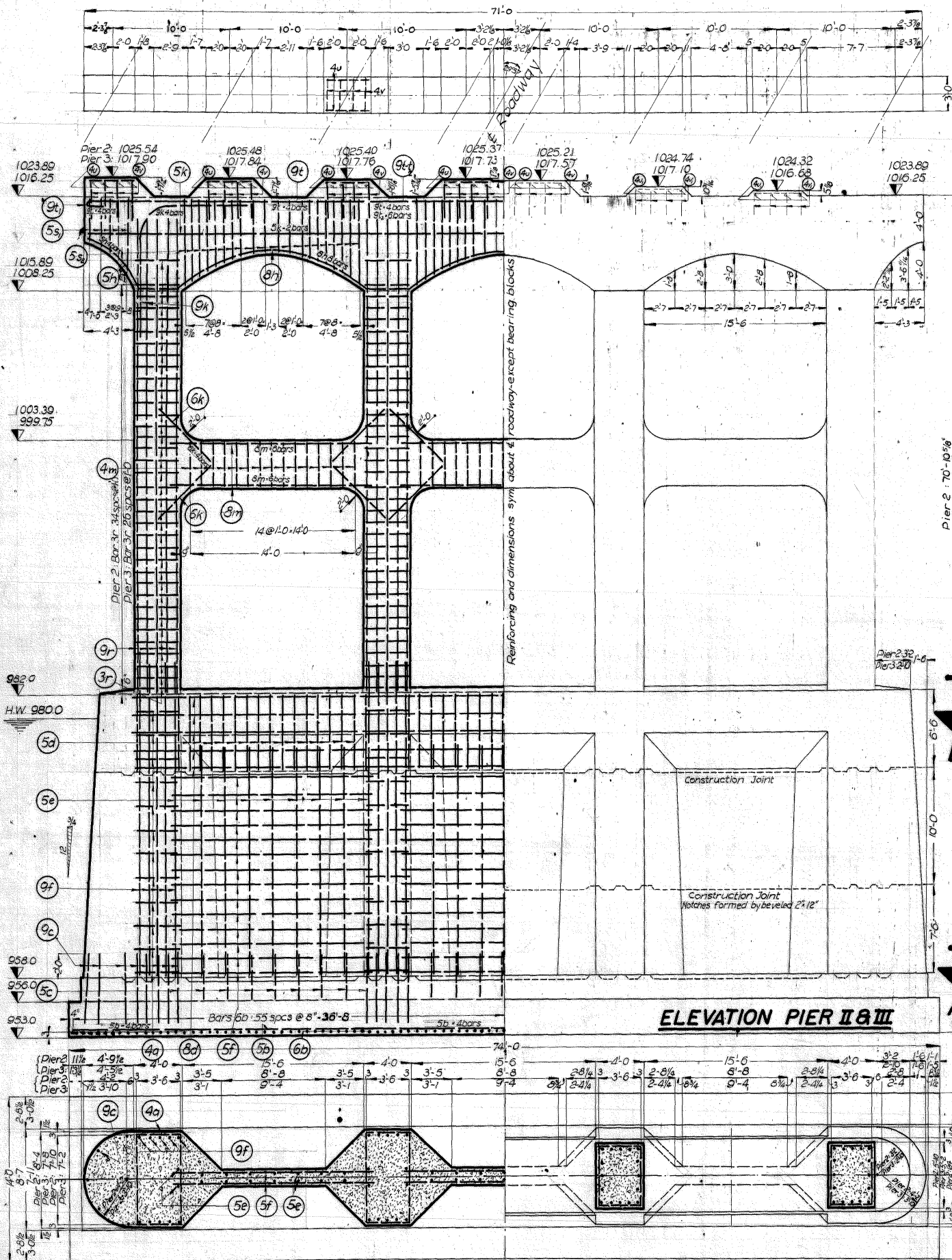
PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
EAST	ABUT.	
1	53.0	Ref.
2	53.2	Ref.
3	53.6	Ref.
4	52.8	Ref.
5	52.7	Ref.
6	52.9	Ref.
7	52.7	Ref.
8	52.5	Ref.
9	53.3	Ref.
10	52.1	Ref.
11	52.5	Ref.
12	54.0	Ref.
13	53.5	Ref.
14	54.6	Ref.
15	53.2	Ref.

PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
16	53.3	Ref.
17	51.5	Ref.
18	53.1	Ref.
19	52.0	Ref.
20	54.2	Ref.
21	53.9	Ref.
22	53.2	Ref.
23	52.6	Ref.
24	53.0	Ref.
25	53.2	Ref.
26	53.2	Ref.
27	53.2	Ref.
28	54.0	Ref.



Bench Mark: Sta. 220+80 40d Spike in root 24" Cottonwood Elev. 967.01

PLAN of PIER
TOP VIEW



SECTION through
PIER II&III.

BILL OF REINFORCEMENT - PIER No I - II - III											
BAR		LOCATION	SHAPE	No°	PIER 2		PIER 3		PIER I		
PIER 3	PIER I				LENGTH	WEIGHT	LENGTH	WEIGHT	No°	LENGTH	WEIGHT
5b	--	Footing-Longitud.		8	38-0	316	38-0	316	--	--	
6b	--	-- -- Transver.		111	13-8	2279	13-8	2279	--	--	
--	8b ₁	-- -- Bottom		--	--	--	--	--	48	9-8 1239	
--	8b ₂	-- -- Top		--	--	--	--	--	60	7-9 1242	
5c	--	-- -- Dowels		54	2-6	141	2-6	141	--	--	
9c	--	-- -- Dowels		50	7-6	1275	7-6	1275	--	--	
4d	--	Pier-Column Hoops		48	variable	703	variable	660	--	--	
5d	--	Pier-Beam Vert Hoops		51	19-4	1028	18-8	993	--	--	
5e	--	Pier-Beam Longitud.		26	33-0	2291	33-0	2291	--	--	
8d	--	Diaphragm Vertical		54	20-0	1126	20-0	1126	--	--	
5f	--	Diaphragm Horiz.		84	17-0	1489	17-0	1489	--	--	
9f	--	Pier Column Vert.		40	27-0	3672	27-0	3672	--	--	
3r	3r	Frame Column Hoop		114	varies	862	varies	842	38	variable 4-86	
9r	8r	-- -- -- Vert.		64	41-2	8959	33-7	7307	64	261-10 4586	
5k	5k	-- -- Beam-Long.		4	36-3	151	36-3	151	4	36-3 151	
6k	6k	-- -- Fillets		49	6-0	433	6-0	433	48	6-0 433	
9k	9k	-- -- Column Corn.		8	15-8	426	15-8	426	8	15-8 426	
4m	4m	-- -- Strut Hoop		45	10-7	318	10-7	318	45	9-7 258	
8m	8m	-- -- Strut Longit.		36	18-10	1810	18-10	1810	30	18-10 1508	
5h	5h	-- -- Cant. Bottom		8	7-7	63	7-7	63	8	7-7 63	
8h	8h	-- -- Beam Bottom		24	20-5	1309	20-5	1309	24	20-5 1309	
5s ₁	5s ₁	-- -- Cant. Stir.		40	varies	347	varies	347	40	varies 347	
5s ₂	5s ₂	-- -- Beam Stir.		240	varies	3306	varies	3306	240	varies 3306	
9t	9t	-- -- -- Top		8	37-0	1006	37-0	1006	8	37-0 1006	
9t ₁	9t ₁	-- -- --		6	13-3	360	13-3	360	6	13-3 360	
9t ₂	9t ₂	-- -- --		12	11-6	469	11-6	469	12	11-6 469	
4u	4u	Bearing Steps		10	6-6	43	6-6	43	10	6-6 43	
4v	4v	-- -- --		20	7-4	98	7-4	98	20	7-4 98	
4u ₁	4u ₁	-- -- --		4	5-2	14	5-2	14	4	5-2 14	
4v ₁	4v ₁	-- -- --		8	6-0	32	6-0	32	8	6-0 32	
9r ₁	--	Frame Col. Dowels		24	4-0	326	4-0	326	--	--	
Total:					34,654		32,704		17,371		

FOOTING PLAN
PIER I



CONCRETE PLAC. QUAN.

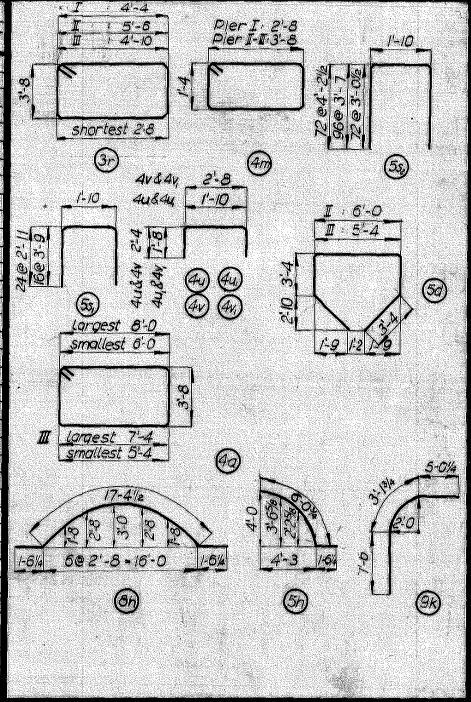
ITEM	PIER 1
Footing	29.6
Frame Column & Struts	53.5
-- Beam	56
Total:	139.1 cy

CONCRETE PLAC. QUAN.

ITEM	PIER 2	PIER 3	TOTAL
Footings	151.0	157.0	318
Pier Bottom	88.5	80.0	168.5
-1- 170p	104.3	93.8	198.1
-1- Cap	98.5	87.9	186.4
Frame Cold Sls	103.2	78.1	181.3
-1- Beam	56.0	56.0	112.0

SECTION through PIER I

BAR DETAILS:



ESTIMATED QUANTITIES - 3 PIERS

[illegible]

① No of bars for Pier 2 & 3 the same except for Column Hoops 3r. General notes see sheet No 5.

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x 58' SECTION AND
546'x 58' SECTION WITH 18'-3" TRANSITION SECTION
CONCRETE FLOOR AND SUBSTRUCTURE—STEEL RAIL OVER
DES MOINES RIVER

SUBSTRUCTURE DETAILS

STATION 213+16 TO STATION 224+25 PROJECT FN-13 (1)

WEBSTER COUNTY

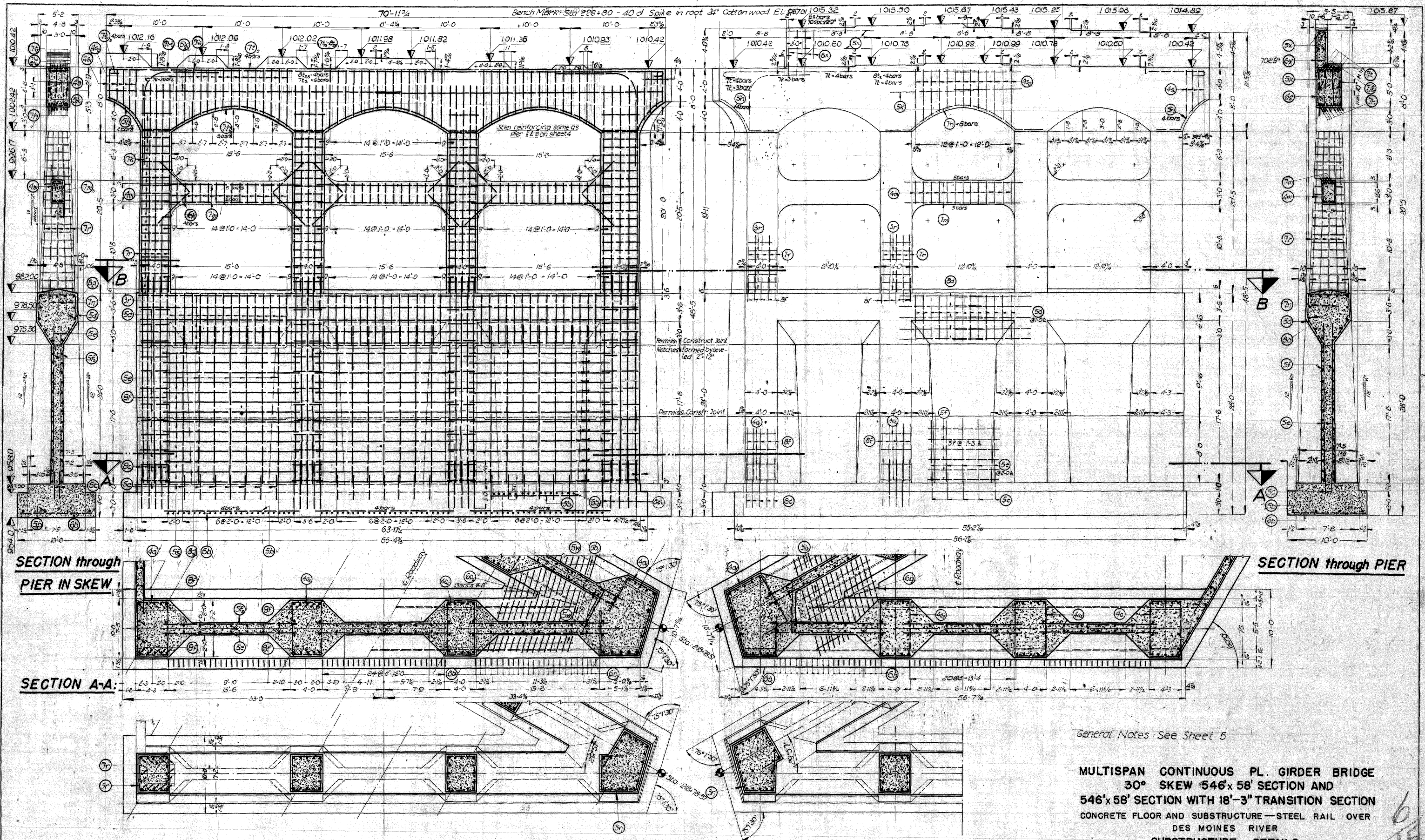
DECEMBER 1957 *Lechner* ENGINEERING CO. SHEET 4 OF 15

Design No: *1457* Webster Co. File No: *18762*

Pier NOTES:

All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.
Permissible construction joints filleted with ¾" dressed & beveled strip.
Anchor bolts on fixed Pier are to be pre-set.
Min. distance from face of concrete to outside reinforcing bar to be 2" unless otherwise shown.
All reinforcing to be securely wired in position before concrete is placed.
Footings to be carried a minimum of 6" into firm shale.

Note: Bars 5e & 6e
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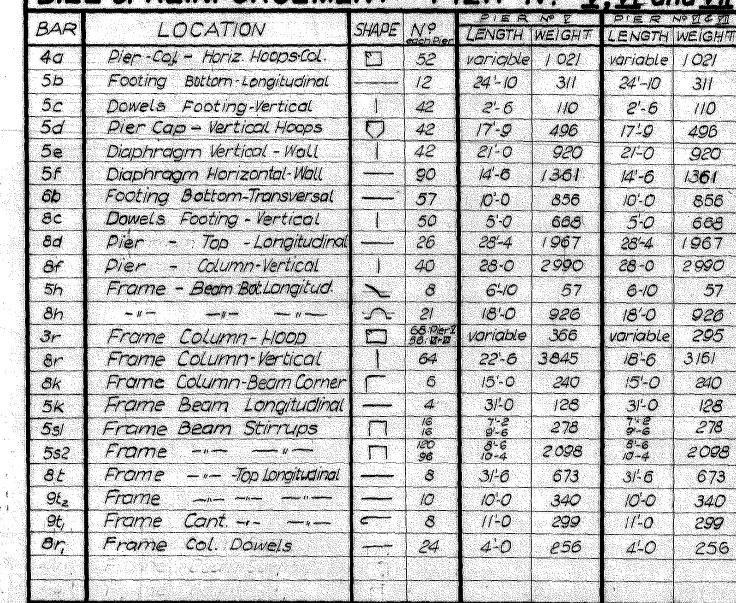
TRIANGLE PIER: PART FOOTING PLAN

General Notes: See Sheet 5

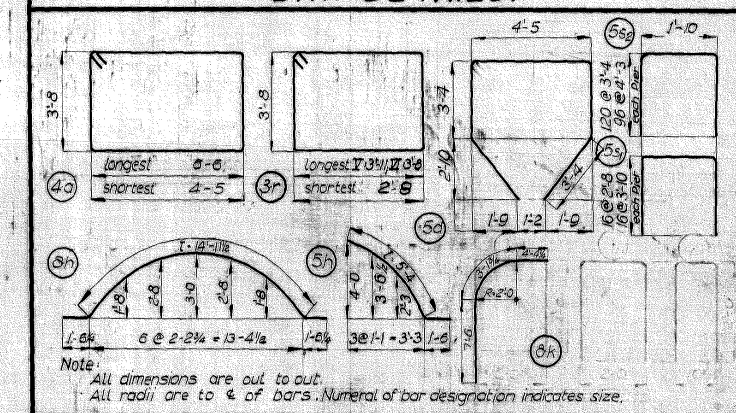
MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x58' SECTION AND
546'x58' SECTION WITH 18'-3" TRANSITION SECTION
CONCRETE FLOOR AND SUBSTRUCTURE—STEEL RAIL OVER
DES MOINES RIVER
SUBSTRUCTURE DETAILS
STATION 213+16 TO STATION 224+25 PROJECT FN-13
WEBSTER COUNTY

DECEMBER 1957 *Lechner* ENGINEERING CO. SHEET 6 OF 15

Design No: 1457 Webster Co. File No: 18762



BAR DETAILS:



General Notes see sheet №5

CONCRETE PLACEMENT QUANT				
ITEM :	PIER V	PIER VI	PIER VII	TOTAL
Footings	91.11	91.11	91.11	273.33
Pier Shaft - Bottom	74.9	74.9	74.9	224.7
Pier Shaft - Top	75.8	75.8	75.8	227.4
Pier Cap	65.5	65.5	65.5	196.5
Frame Column	32.7	24.9	25.3	82.9
Frame Beam	48.1	46.1	46.1	139.3

ESTIMATED QUANTITIES - 3 Pier				
ITEM	PER Y	PER Y	PER Y	TOTAL
Concrete	356.11	378.31	378.71	1143.13
Reinforcing	202.06	19.45	19.45	59.10
Excavation @ 1.00	134			134.00
" " @ 21	235		202	675.00
" " @ 22	50	95	13	108.00

MULTISPAN CONTINUOUS PL. GIRDER BRIDGE
30° SKEW 546'x 58' SECTION AND
546'x 58' SECTION WITH 18'-3" TRANSITION SECTION
CONCRETE FLOOR AND SUBSTRUCTURE — STEEL RAIL OVER
DES MOINES RIVER

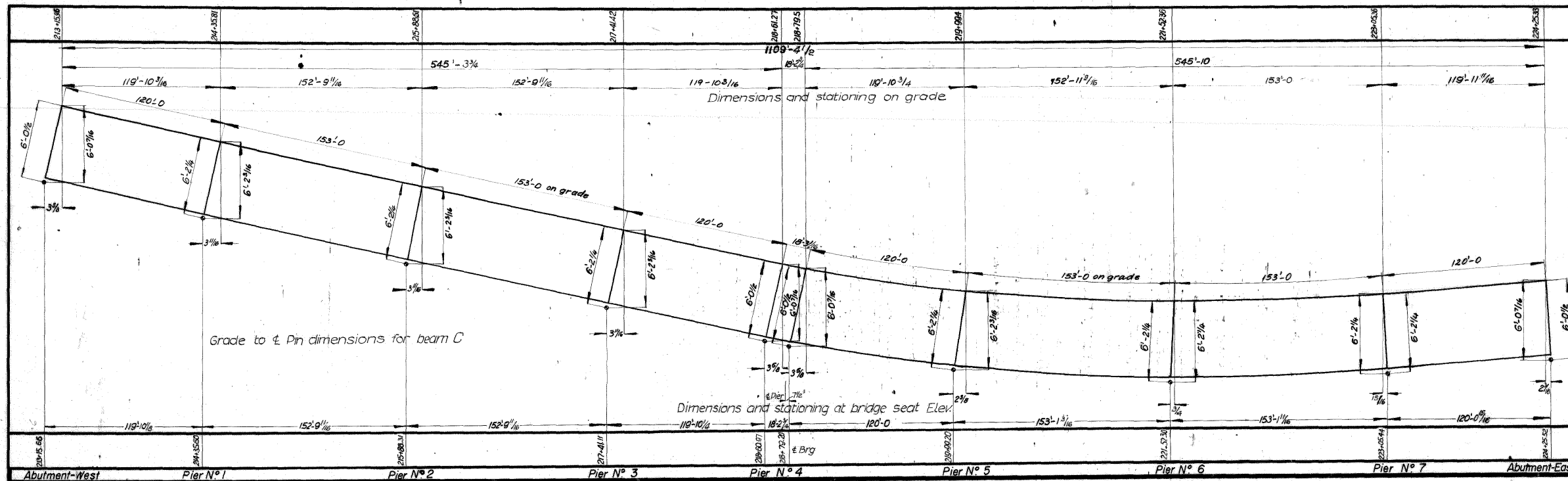
SUBSTRUCTURE DETAILS

STATION 213+16 TO STATION 224+25 PROJECT FN-13

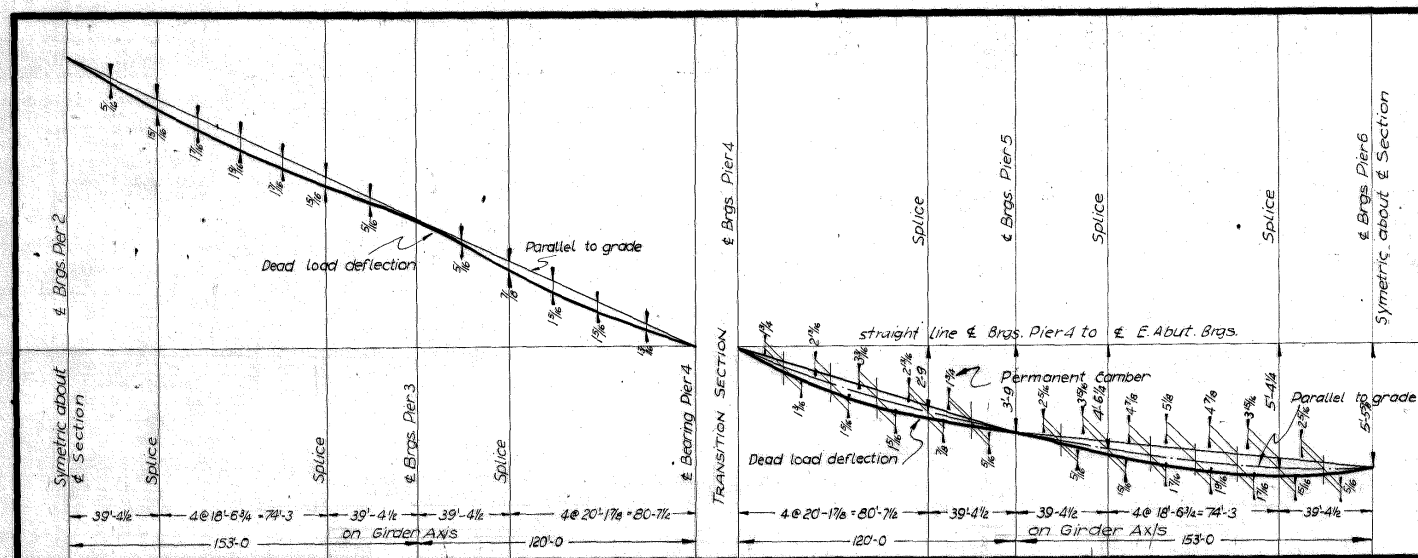
WEBSTER COUNTY

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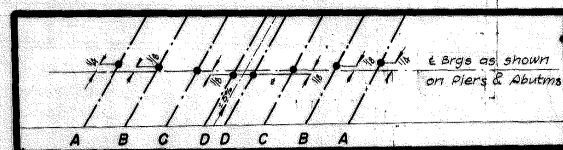


GIRDER COORDINATE DIAGRAM

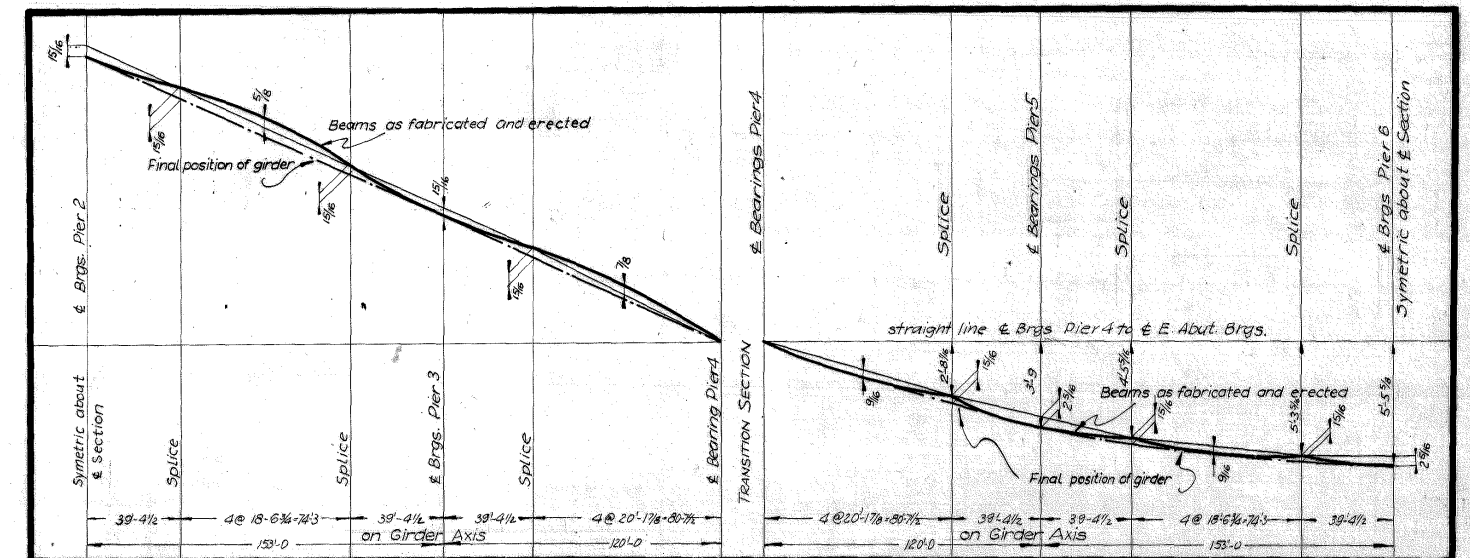


PERMANENT CAMBER & DEAD LOAD DEFLECTION DIAGRAM

NOTE: Approximately 30% of Dead load deflection anticipated due to weight of steel only. No slab thickening estimated.



NOTE: $\pm$ Bearing located through bearing-plates for beams C. Points will vary from straight line slightly as indicated, with less variation for decreased grade slope. DIMENSIONS SHOWN for Abutment-West & Pier 1-4.



CAMBER DIAGRAM

NOTE: Splice points are to be supported by falsework or other approved means as directed by the engineer.

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HALF INTERMEDIATE SECTION

HALF SECTION NEAR ABUTMENT & PIER 4

NOTE: Bottom of slab between haunches is a plane surface

REINFORCING STEEL: Slab transverse bottom : 6a 6x28-8@7 1/2 ctrs. } staggered
 Slab transverse top : 6b 6x28-8@7 1/2 ctrs. }
 Slab longitudinal top and bottom : 6c 6x varies as shown
 Curb and median strip longitudinal : 4c2-3 4x varies as shown (4c2 in median)
 Curb transverse hoops : 5c1 5x4-2@1'-3" ctrs-except as shown
 Curb transverse : 5c2 5x4-5'4" between each pair of posts
 Post anchors : 6c4 6x7-6" one at each post
 Median strip anchors : 4c4 4x4-11@1'-3" ctrs.

Note: Top reinforcing is parallel to and 1 1/2" clear but not less than 1" clear below top of slab. Bottom reinforcing is parallel to and 2 1/2" clear above bottom of slab. Top and bottom reinforcing is to be supported by individual bar chairs (3-0 spacing)

SUPERSTRUCTURE NOTES: This bridge is designed for H-20-44 loading, plus 19 lbs. per sq. ft. of roadway for future wearing surface with the following modifications:
 Except for the floor slab, this bridge is designed so that an increase in the H-20 live load and impact of 100% will not increase the total unit stress to more than 150% of the specification stresses.

The floor slab as shown includes 1/2" of wearing surface.
 Field connections may be riveted or bolted except as noted or shown.
 Splice connections and Abutment and Pier-diaphragm connections, if bolted, require "HIGH TENSILE STRENGTH BOLTS". The estimated weight for this connection is based on "HIGH TENSILE STRENGTH BOLTS".
 All open holes are to be 15/16" unless otherwise noted.
 All rivets and bolts are to be 7/8" unless otherwise noted.
 Bottom flanges are to be perpendicular to webs at reaction points.

Beam splices are to be subpunched and reamed. Before reaming all beams are to be assembled to proper as shown on sheet "BEAMS AS FABRICATED AND ERECTED" for inspection. After inspection all holes are to be reamed and all parts match-marked. Masonry plates are to be set in paint and canvas. Bearing surfaces of unfinished masonry plates are to be flat and true. Shop coat is to be omitted on tops of top flanges of beam and on other surfaces in contact with concrete.
 Parts inaccessible after erection are to be given three coats of paint in the shop. Forms for slab and curbs are to be supported by the beams.

SPECIFICATIONS: Design - A.A.S.H.O. 1953 (with modifications as noted)
 Construction - IOWA STATE HIGHWAY COMMISSION
 Series of 1956 plus current special provisions.

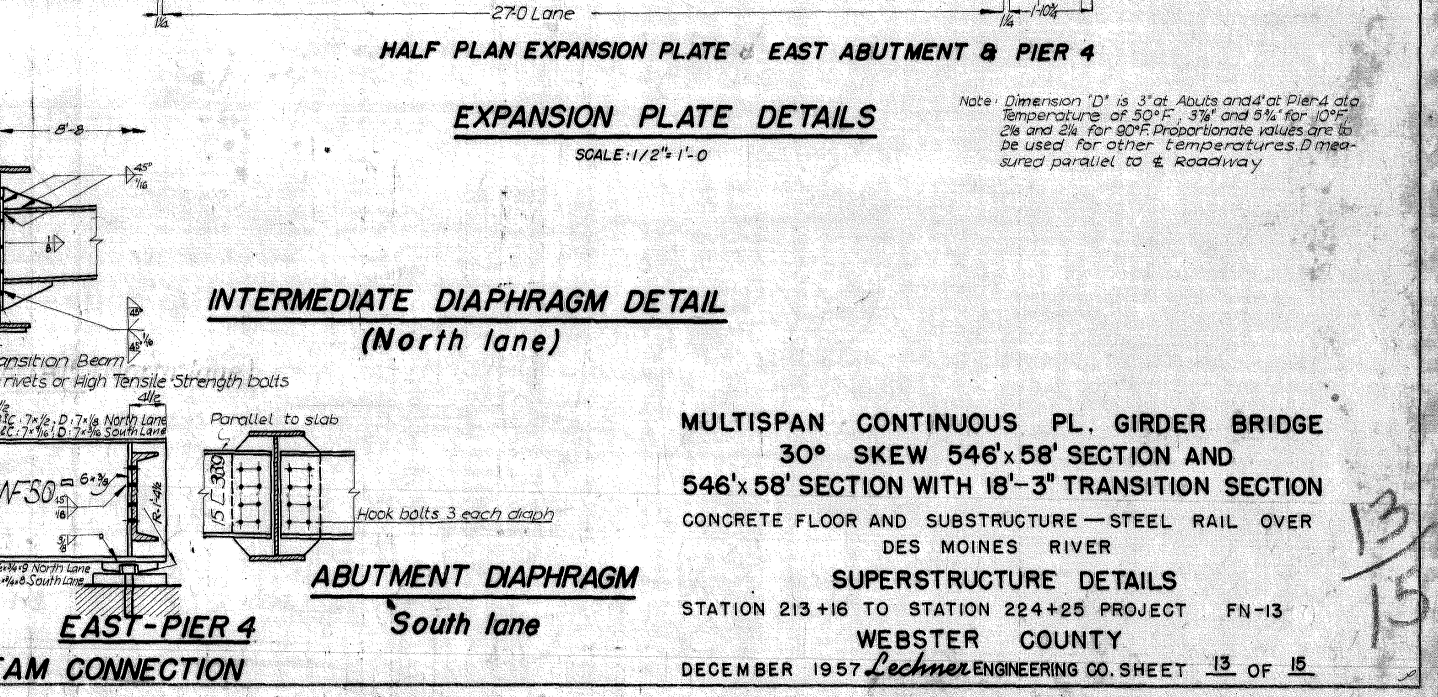
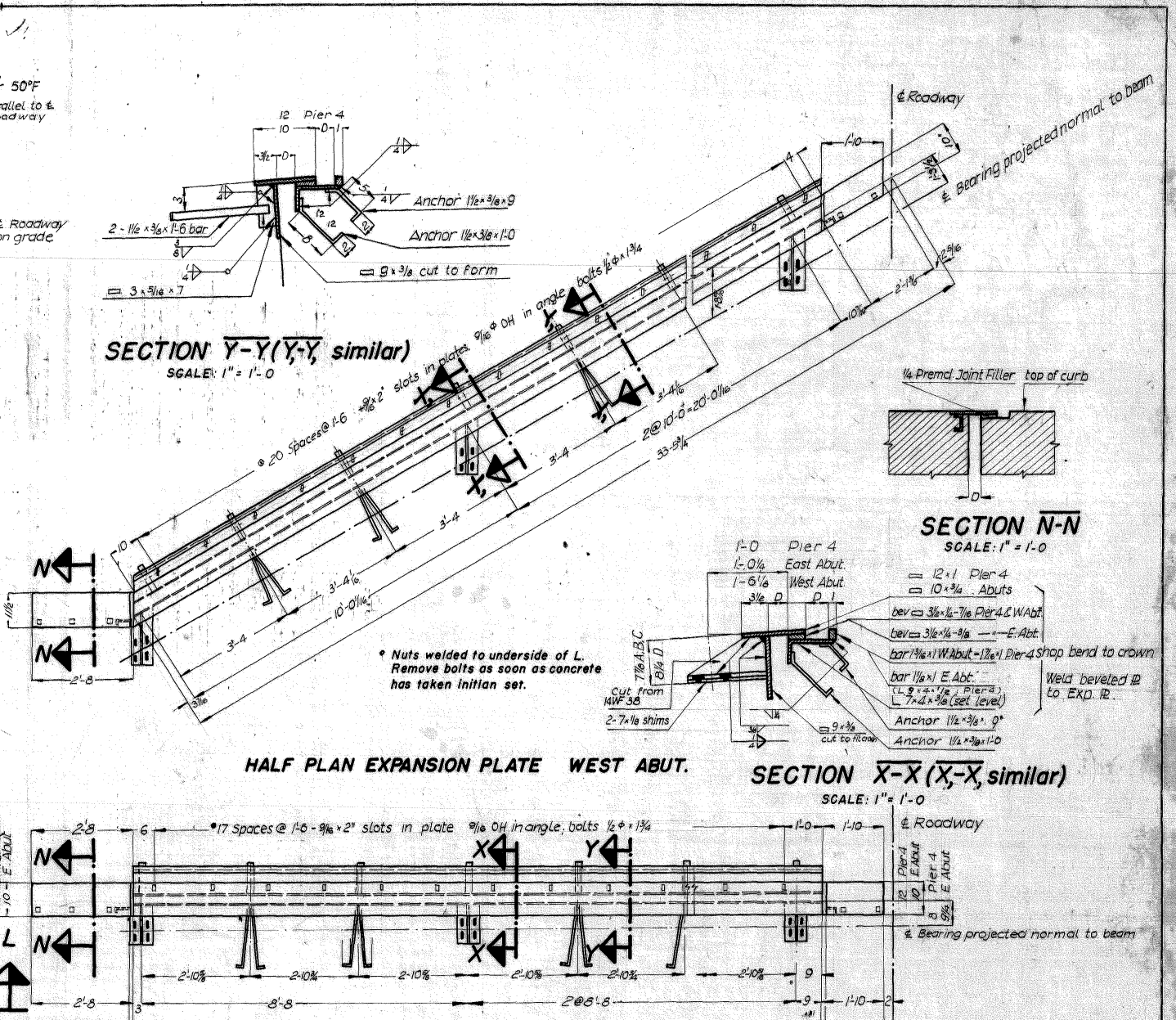
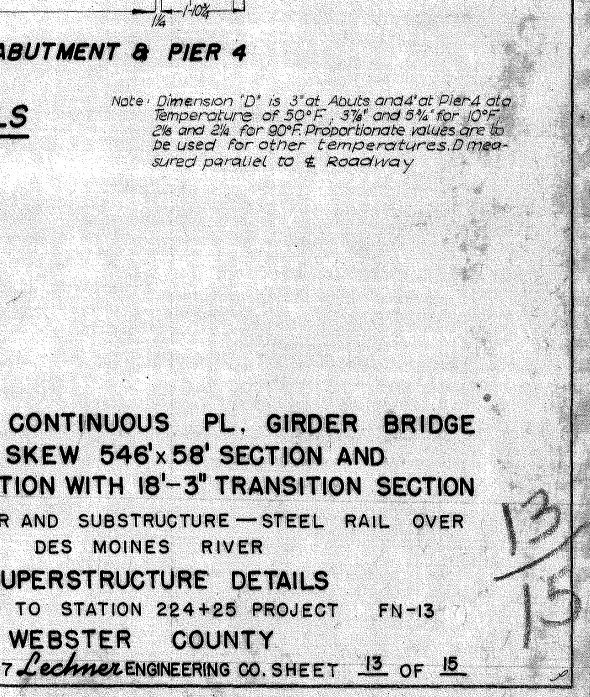
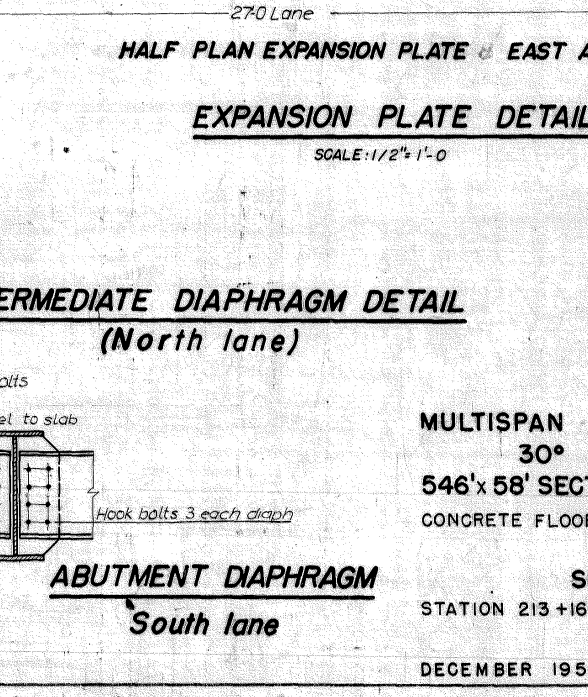
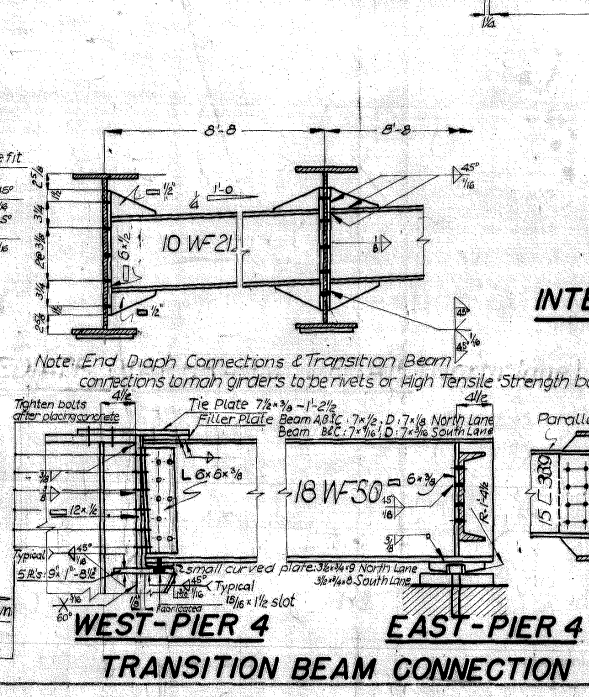
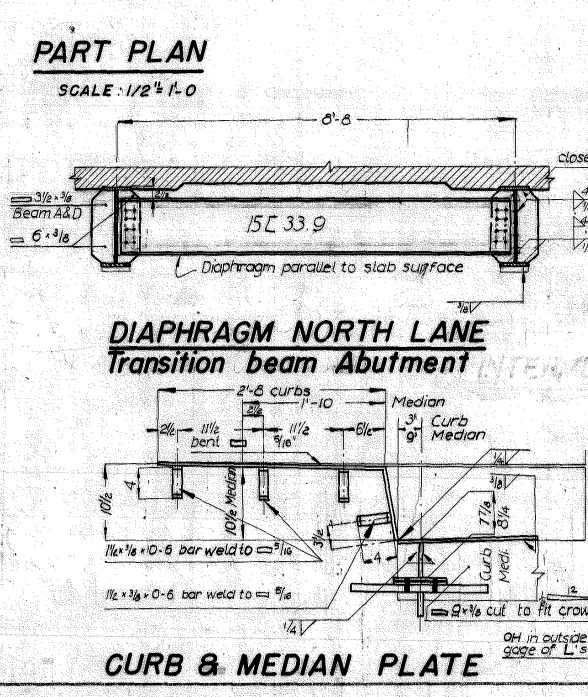
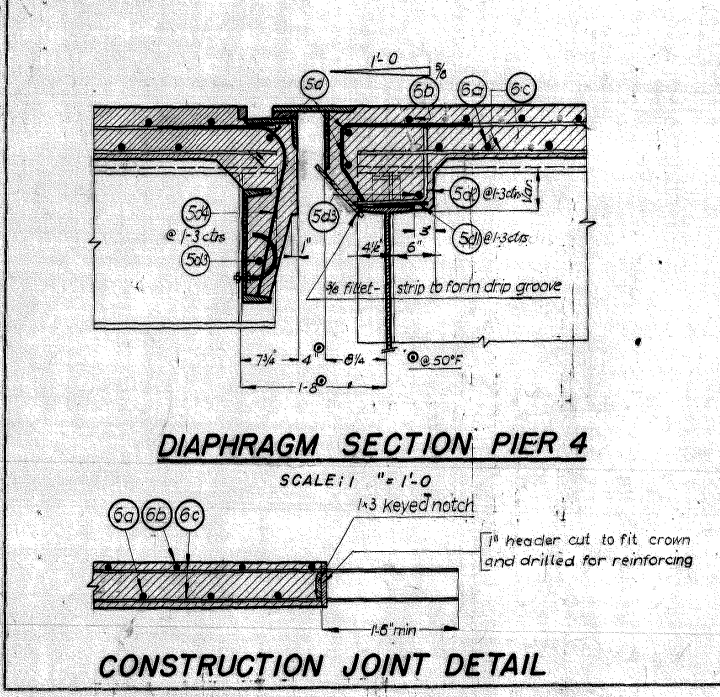
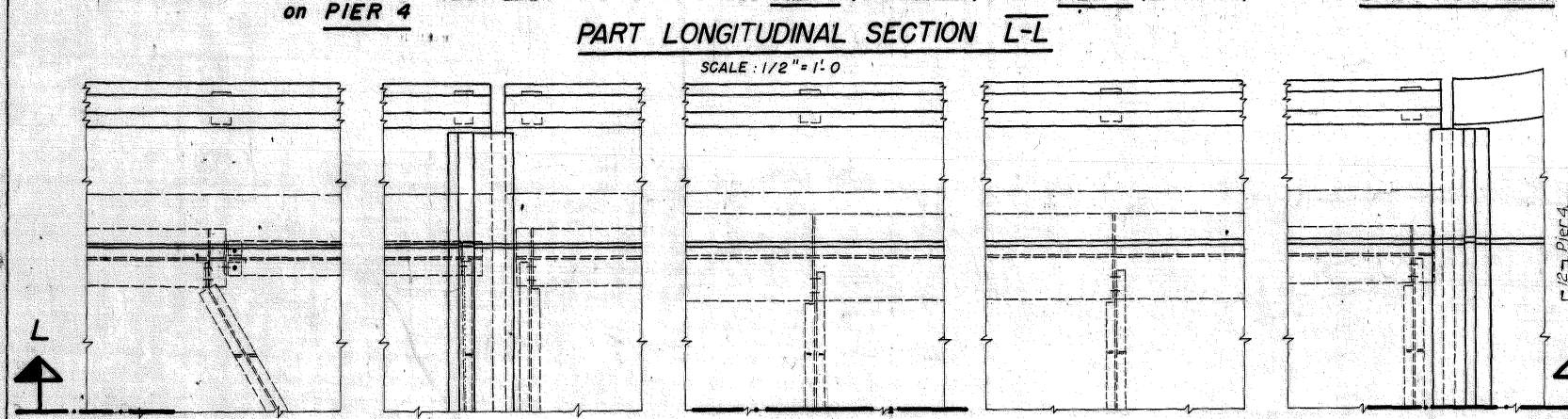
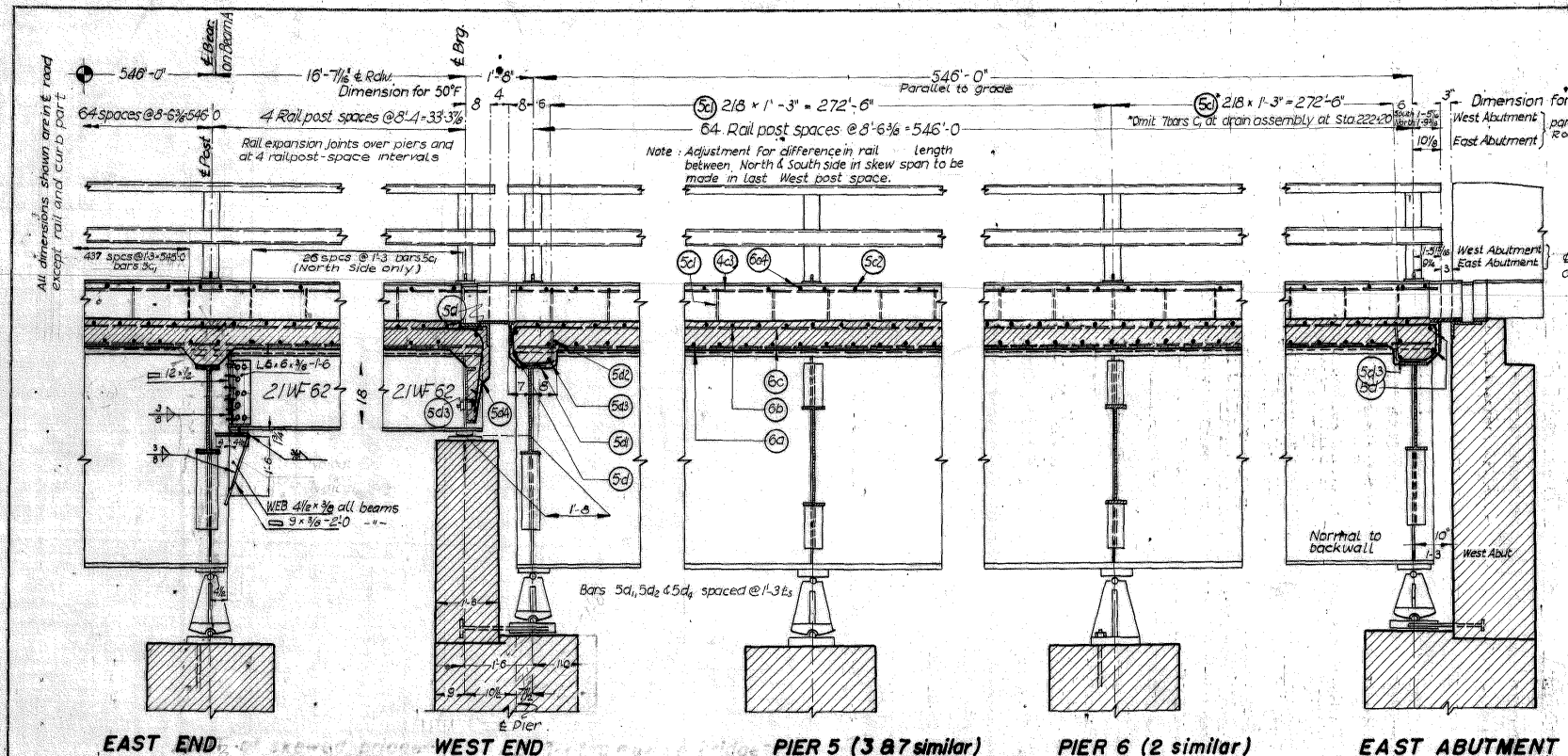
Revised 8-27-53 Weld symbol and note for stiffeners at Intermediate Diaphragms added.

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 DES MOINES RIVER

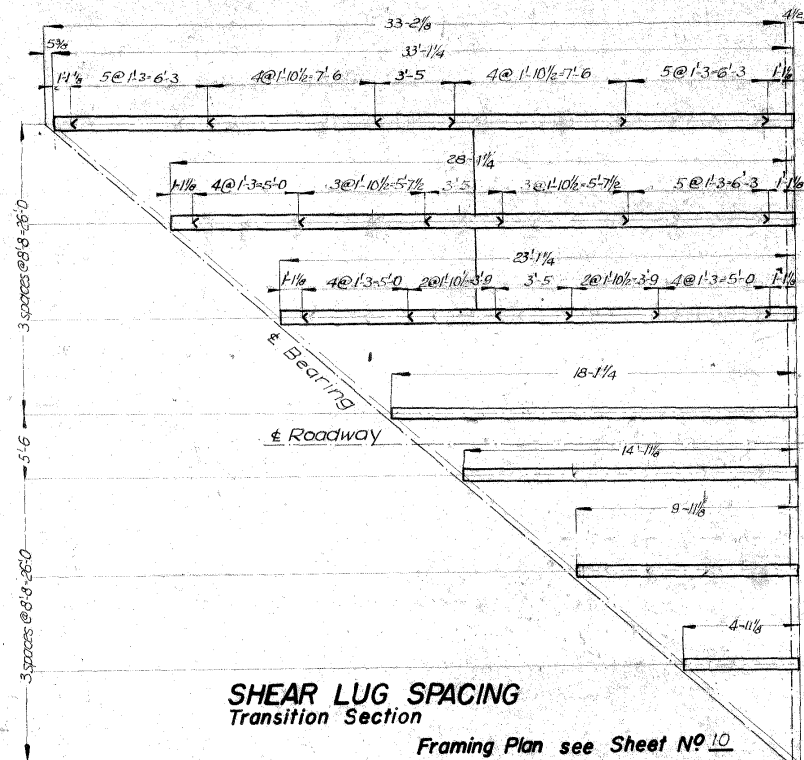
SUPERSTRUCTURE DETAILS
 STATION 213+16 TO STATION 224+25 PROJECT FN-13
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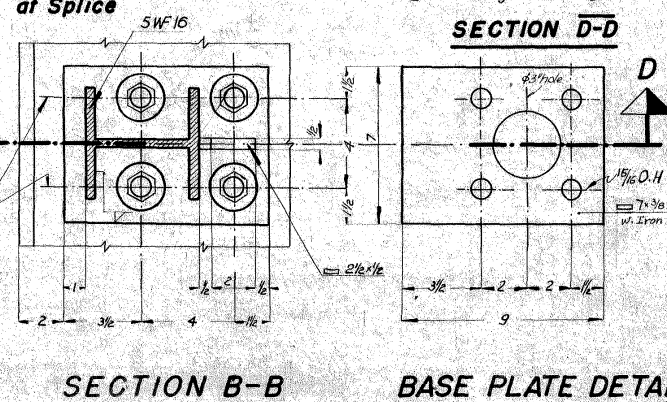
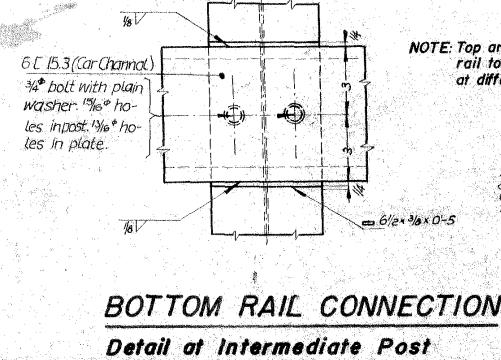
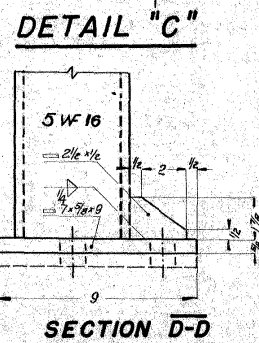
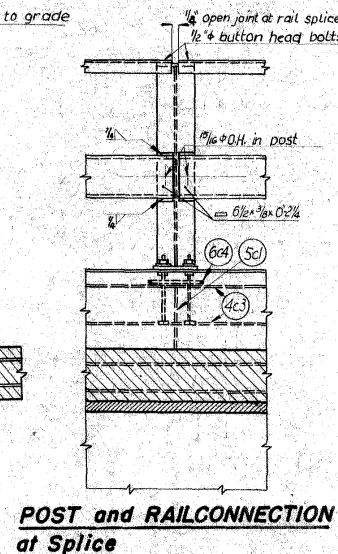
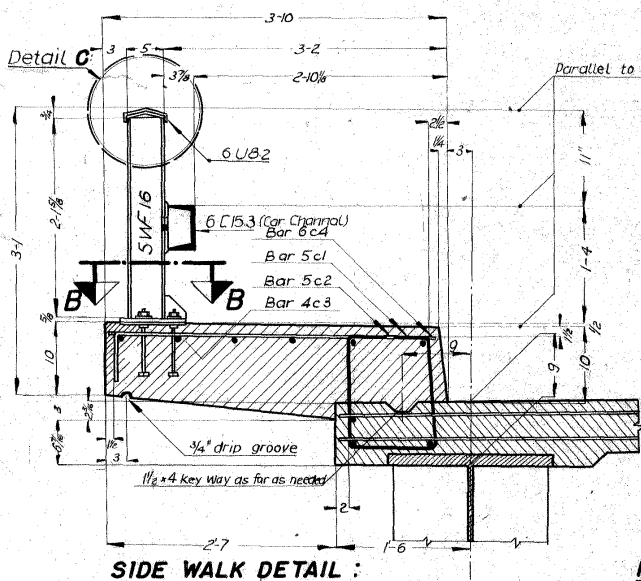
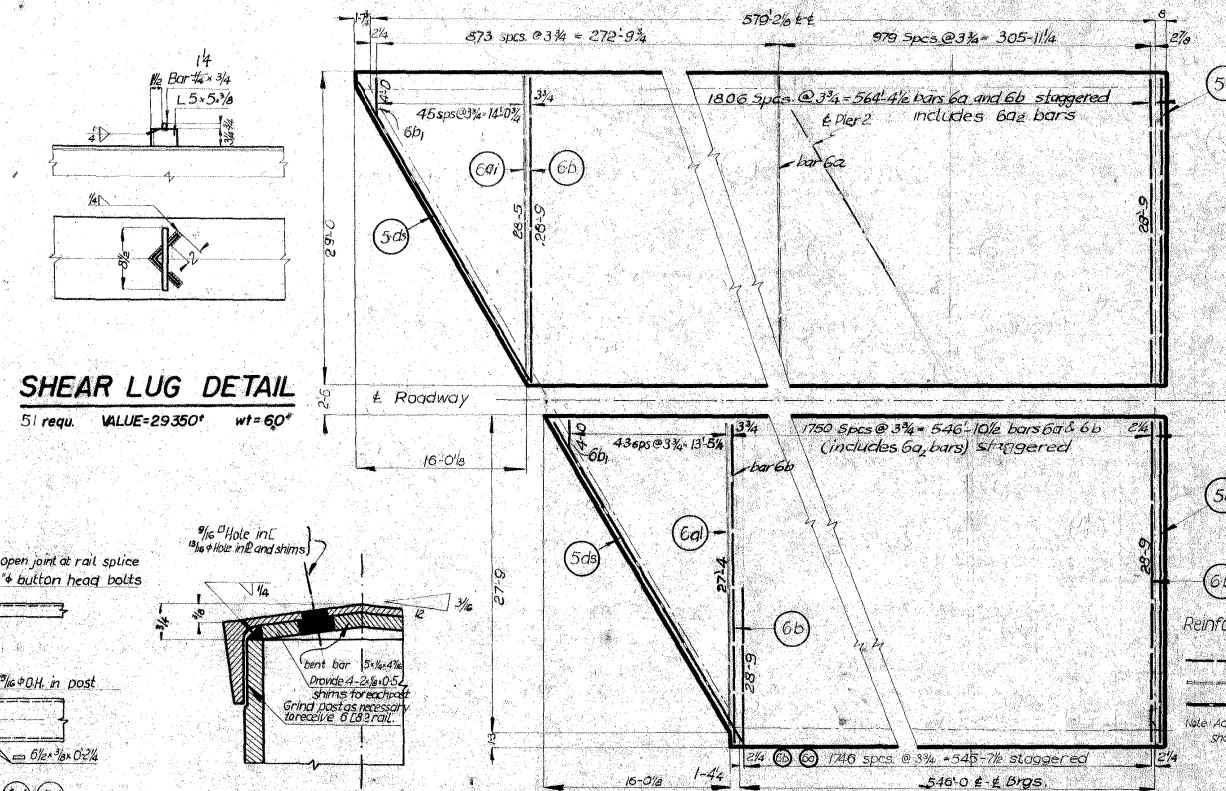
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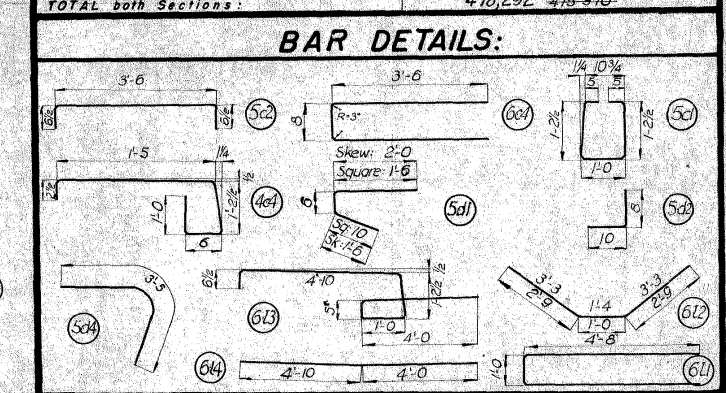
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LOADS	MAXIMUM MOMENTS (KIPS)																MAXIMUM REACTIONS (KIPS)											
	Neg. Moment Piers 1&3				Neg. Moment Pier 2				Pos. Moment End Span				Pos. Moment Interm. Span				Abutment				Pier 1&3				Pier 2			
BEAM	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Dead Load 1	-1780	-2297	-2297	-1649	-1834	-2366	-2366	-1802	807	+1042	+1042	793	+700	+900	+900	688	36.8	47.4	47.4	37.7	129.0	166.0	166.0	127.0	131.7	170.0	170.0	129.5
Dead Load 2	-1439	-19	-420	-490	-1483	-20	-430	-510	+775	+11	+230	+270	+768	+10	+220	+260	36.6	0.6	10.3	12.1	114.8	1.5	33.0	39.0	117.0	1.6	33.7	39.8
Uniform Live L.	655	1235	1235	722	712	1341	1341	785	+457	+866	+866	504	+520	+977	+977	572	17.0	31.9	31.9	18.7	48.0	90.3	90.3	53.0	50.4	94.8	94.8	55.5
Concentr. Live L.	210	397	397	233	212	400	400	235	+221	+417	+417	245	+228	+419	+419	246	12.4	22.6	22.6	13.8	12.4	22.6	22.6	13.8	12.0	22.6	22.6	13.4
Impact	-160	-294	-294	-183	-167	-315	-315	-185	+139	+262	+262	153	+135	+253	+253	149	6.0	11.3	11.3	6.6	9.6	21.6	21.6	12.7	13.1	21.2	21.2	12.4
Walk	-517	-39	-39	-562	-	-41	-	-361	26	26	26	26	411	30	30	30	13.4	1.0	1.0	1.0	38.0	2.8	2.8	2.8	39.8	2.9	2.9	2.9
Total:	+4761	+4242	+4661	+3277	+4970	+4442	+4893	+3517	+12760	+12598	+12843	+11965	+12756	+12559	+12799	+11915	122.2	113.6	124.3	84.9	351.8	302.0	336.3	2455	364.0	310.2	345.8	250.6



BILL of REINFORCING - SUPERSTRUCTURE									
BAR	LOCATION	SHAPE	Nº	LENGTH	WEIGHT	Nº	LENGTH	WEIGHT	
6a46b	Slab Transversal - Bot & Top		3543	28.9	152.996	3468	28.9	149.757	
6a46b	Skew Ends		30	var	2.151				
6a46b	at Drains		25	27.4	1.027	26	27.4	1.067	
6a46b	Skewed Corn		8	4.0	151.48				
6c	Longitudinal - all Sections		10386	39.7	57429	936	39.7	55.645	
6c	Skew		75	var	5.348				
6c	Skew		75	var	3.113				
6c	Square		156	4.4	5.406				
4c	Side Walk - Longitudinal - North		96	37.3	2.389				
4c	South		84	40.0	2.344				
4c	North					54	40.0	2.344	
4c	South					84	40.0	2.344	
5c	Curb Hoops		905	4.2	3.936	860	4.2	3.741	
5c	Walk Transversal - North/South		528	4.7	2.522	504	4.7	2.409	
6c	at Railpost		134	7.8	1.544	130	7.8	1.495	
4c	Median - Longitudinal - Skew		90	38.7	2.319				
4c	Median - Square					84	40.0	2.344	
4c	Transversal Anchors		902	4.4	2.609	874	4.4	2.528	
4c	Walk - Bottom at Drain in Low Point					10	2.0	1.4	
5c	Longitud.					10	9.9	9.9	
5d	End Diaphragm - Longitud.		2	25.6	60	4	25.6	120	
5d	Vertical		36	4.0	150	72	4.0	213	
5d	Longitud.		36	1.6	56	72	1.6	112	
5d	Vertical		36	3.5	128	12	3.5	105	
5ds	Skew - Longit.		4	32.8	136				
5ds			6	9.9	61				
5c4	Walk - Top at Drain in Low Point					3	4.0	3.3	
61	Lamp Post Reinforcing		4	10.4	62	3	10.4	51	
612			16	varies	172	12	varies	129	
613			16	11.6	272	12	11.6	267	
614			12	8.0	155	9	8.0	119	
TOTAL					243,310			234,982	
TOTAL both Sections:					478,292			478,970	



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