

In Letting of January 8, 1963

~~in Letting of Jan. 8, 1963~~

Letter of Jan 8 1963

\* Includes one Type "D" Connection.

**DETAIL PLANS  
REDUCED IN SIZE  
(DO NOT SCALE)**

Letting of January 8, 1964	DESIGN No. 5781	STA 209+00
	SECTION 34	GRANT TWP.
	TRIPLE 10'x12'x18'-0 REINFORCED CONCRETE	
	BOX CULVERT 15° SKEW	
	TOTAL QUANTITIES	
	Concrete	955.0 c.y.
	Reinforcing Steel	124005 #27433 lbs.
	Class 20 Excavation	2300 c.y.
	Foundation Treatment Matl.	260.85 Ton

19-Sheets



Design Stresses for the following materials are in accordance with AASHTO Standard Specifications for Highway Bridges, Series of 1961.  
Reinforcing Steel in accordance with Article 1.4.12 "Reinforcement" for Intermediate, Hard, or Rail Steel Grade.  
Concrete in accordance with Article 1.4.11  $f'_c = 3500$  psi.

Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1960, plus current Supplemental Specifications and Special Provisions.

*This bridge will require Bridge Sign Assemblies furnished and placed by others as specified in Traffic and Highway Planning Instruction No. 11, Revised October 1, 1961.*

CONSTRUCTION PLANS SHOW'G PROJECT AS BUILT  
THREE COPIES PREPARED

PREPARED BY J. H. G. G. G. G.  
RESIDENT CONSTRUCTION ENGINEER  
DATE January 20, 1964  
ONE COPY APPROVED AND FORWARDED TO AMES

DATE \_\_\_\_\_  
ONE COPY DELIVERED TO RESIDENT  
MAINTENANCE ENGINEER \_\_\_\_\_

DATE \_\_\_\_\_  
SIGNED \_\_\_\_\_

DISTRICT ENGINEER

MILEAGE SUMMARY

Sta. 209 +00	35.200'	• .007 mi.
Sta. 213 +4.3	114.5'	• .021 mi.
Sta. 276 +00	27.202'	• .005 mi.
		<u>.033 mi.</u>

APPROVED  
*R.M. Tutton* NOV 16 1964  
 DEPUTY CHIEF ENGINEER DATE  
 IOWA HIGHWAY COMMISSION

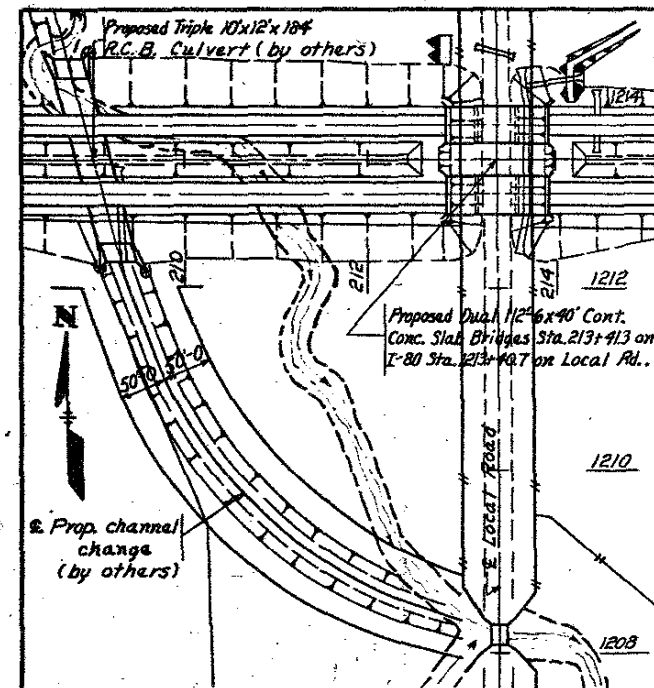
DEPARTMENT OF COMMERCE BUREAU OF PUBLIC ROADS	
APPROVED	
DIVISION ENGINEER	DATE

Revised: 7-1-63: Reinforcing Steel Quantities on Design #5761 & #5961 corrected (Sheets 1, 2 & 3 both designs)

POWESHIEK COUNTY PROJECT No. 1-80-529188 FILE No. 21379

8

Bench Mark: #117 Sta. 212+83 Lt. 63' I.H.C. Plug in N.W. Wing Wall of N. Bridge Elev. 496.75 of 18  
 Bench Mark: #116 Sta. 213+49 - 321' Rt. Cut (L.I.) on E. H.R.I. Bridge Elev. 499.23



**GENERAL NOTES:**

These bridges are designed for H20-S16-44 loading and alternate loading designated in B.P.R.'s P.P.M. 20-4, section 4c, plus an allowance of 19 lbs. per sq. ft. of roadway for future wearing surface.

Bridge Contractor is to shape bents as shown on the "Situation Plan."

Preformed joint material is to be included in price bid for concrete.

The approach fills as shown are not a part of this estimate but are to be placed and compacted before abutment piles are driven. Abutment piles are to be driven in oversized holes drilled through the fill to Elevation 477.0 West Abutments; Elev. 484.0 East Abutments.

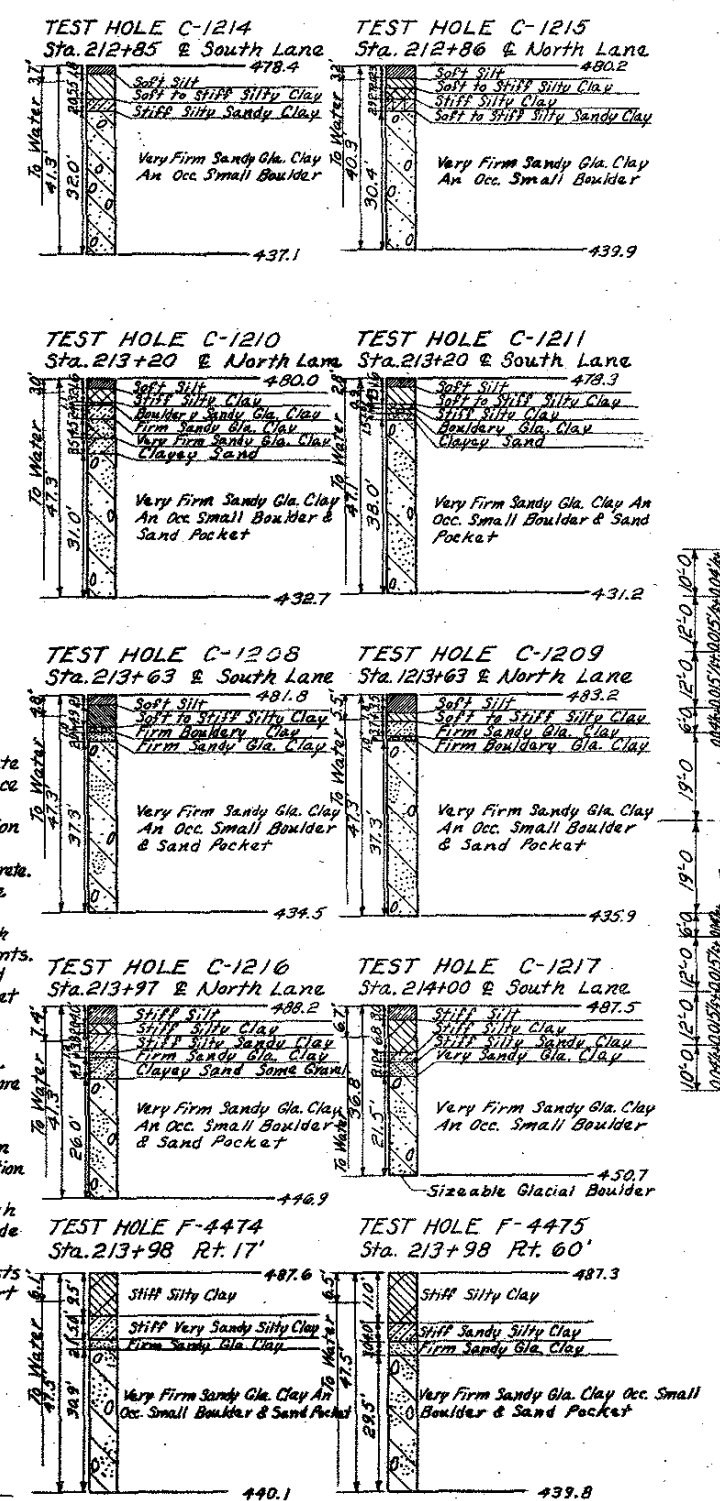
The minimum diameter of the drilled to be 4 inches greater than the diameter of the pile 3 feet butt. Voids around piles are to be filled with dry separate payment will be made for drilling holes or as since it is considered incidental to driving piles.

Concrete is not to be placed until one month before anticipated date of construction of superstructure.

Excavation quantities are based on the assumption that local road grading will be completed before bridge construction is begun.

The Bridge Contractor is to install the tile drain behind each abutment as detailed. The price for "4" Tile Drain" is to include excavation necessary for installation.

The formed steel beam guardrail and creosoted wood posts are to be furnished and placed by others and are not a part of this estimate.



**TOTAL ESTIMATED QUANTITIES**  
 Scale: 1"=20'-0"  
 Test Holes C-1208 - 1217 Dated November 1, 1961  
 Test Holes F-4474 & 4475 Dated December 19, 1961

Item	4 Abuts.	4 Piers	2 Super.	Total
Concrete	110.0	145.0	586.4	842.0 c.y.
Reinforcing Steel	9816	30,500	129,844	170,160 lbs.
Creosoted Piling	13 @ 40'	56 @ 30'		6645 L.F.
	13 @ 45'	56 @ 35'		
	26 @ 50'			
Class 20 Excavation	269	388		657 c.y.
4" Tile Drain				228 L.F.
Granular Backfill	173			173 Tons
Aluminum Handrail (2" end posts)				416.0 L.F.
Steel Handrail (2" end posts)				416.0 L.F.

**SPECIFICATIONS:**

Design: A.A.S.H.O., Series of 1961

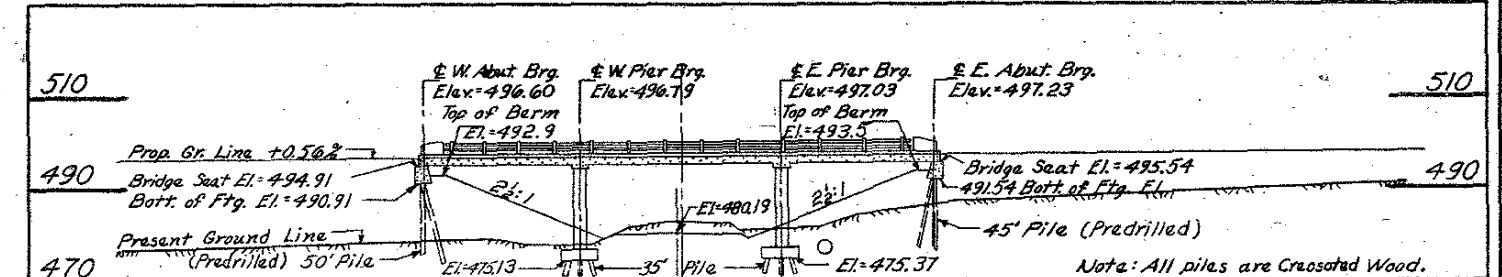
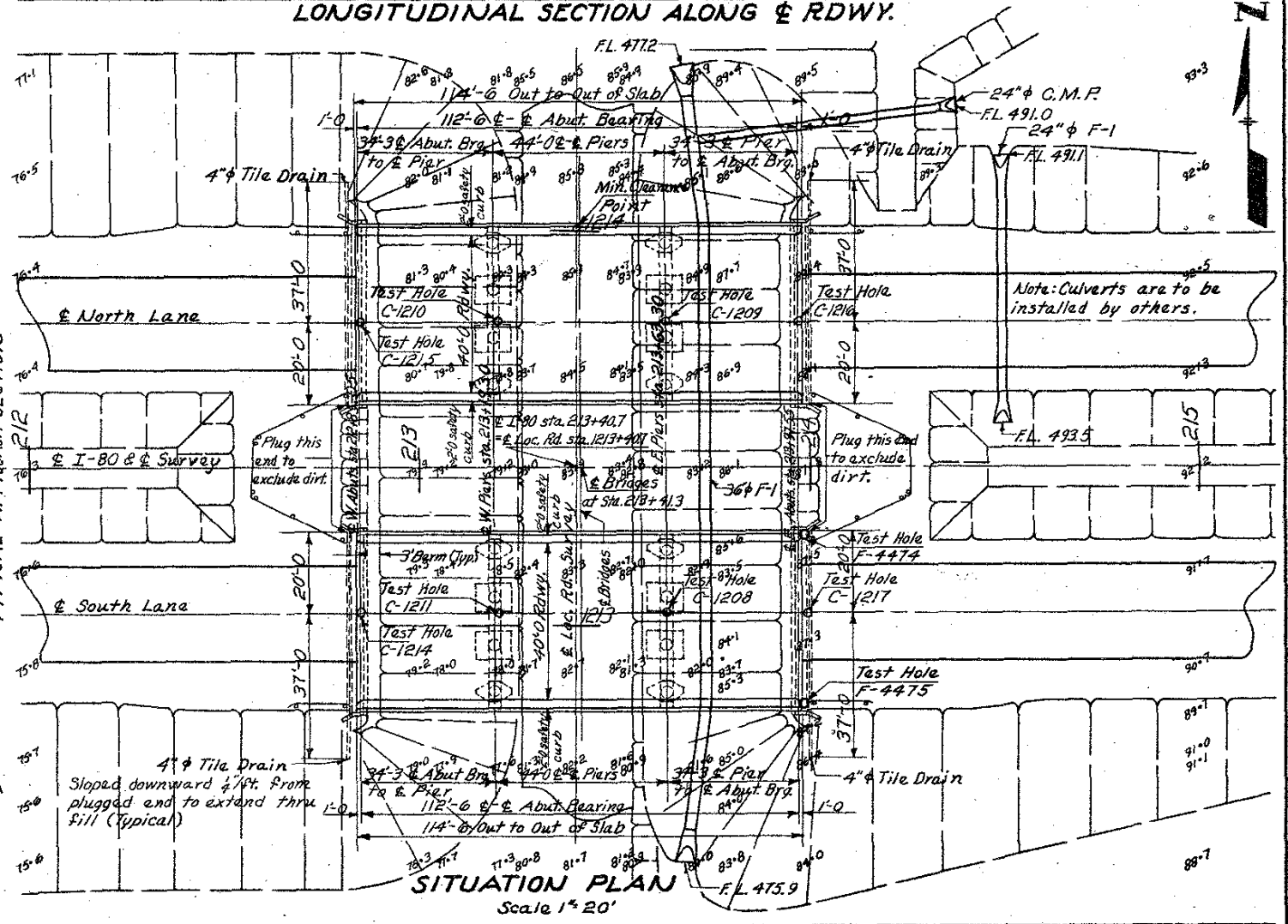
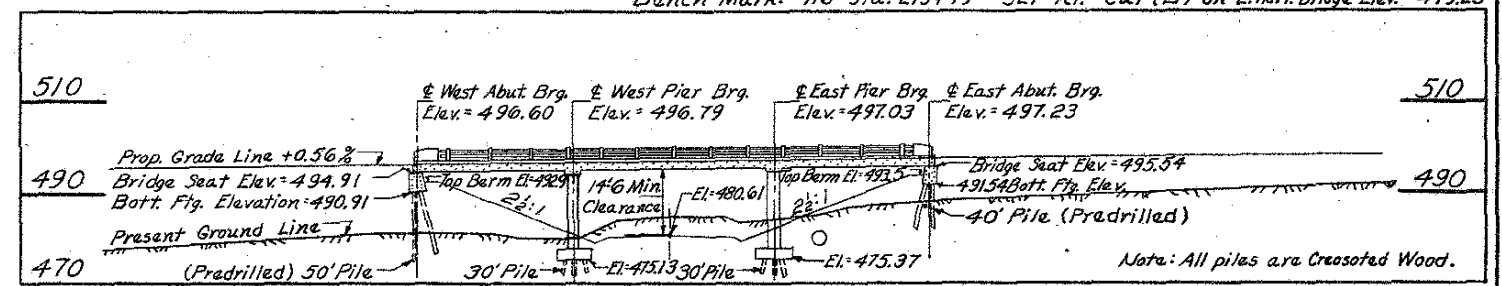
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1960 plus current special provisions and Supplemental Specifications.

**DESIGN STRESSES:**

Design stresses for the following material are in accordance with Specifications for Highway Bridges, Series of 1961, in accordance with Section 1.4.12.

Concrete: 4000 psi, Intermediate, Hard, or Rail Steel Grade.

Steel: 36,000 psi.



**LOCATION**  
 F80N R-16-W  
 Sections 34 & 35  
 Grant Twp.  
 Poweshiek County  
 Over Local Road

**DUAL 112'-6x40' CONTINUOUS CONCRETE SLAB BRIDGES**

Design for 34'-3" End Spans  
 Concrete Substructure  
 44'-0" Center Span

**GENERAL & SITUATION PLAN**

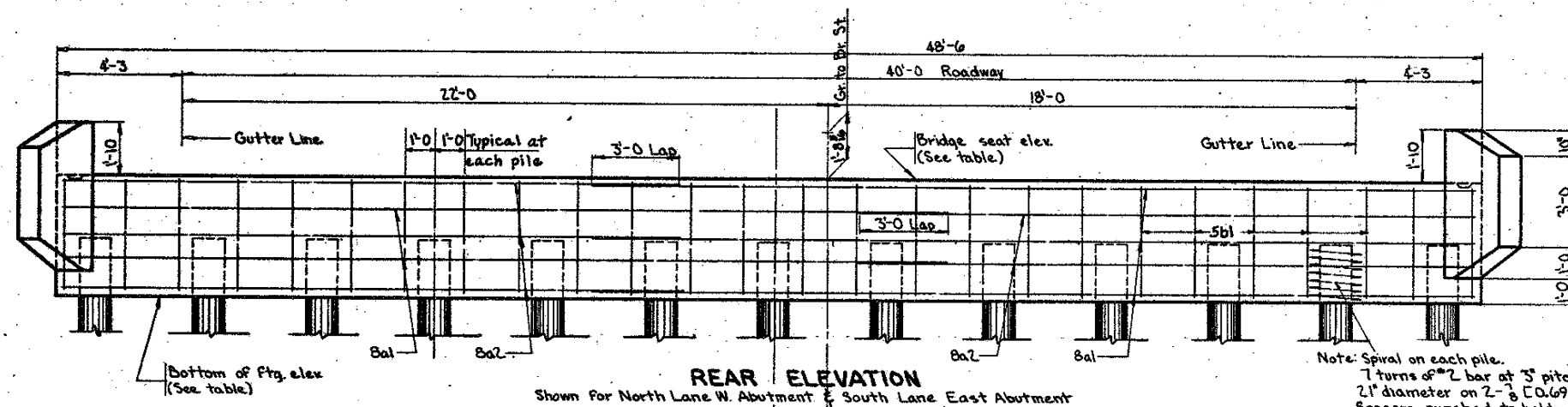
Station 213+41.3 on Interstate #80  
 Station 213+40.7 on Local Road

**POWESHIEK COUNTY**

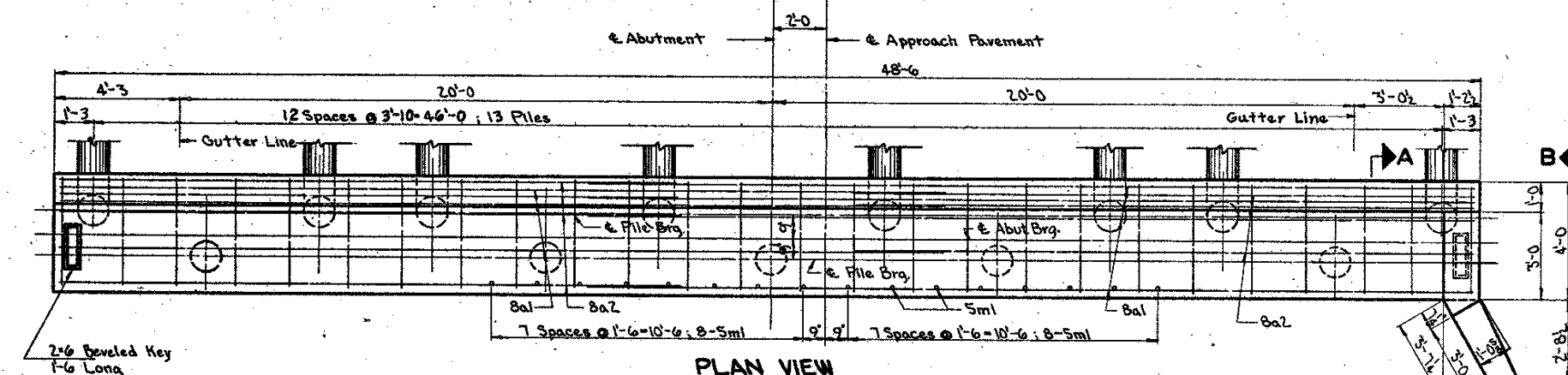
Iowa State Highway Commission  
 March, 1962  
 Design No. 5861  
 Poweshiek County  
 File No. 21379

Traced by: B.B.B. Checked by: LEP

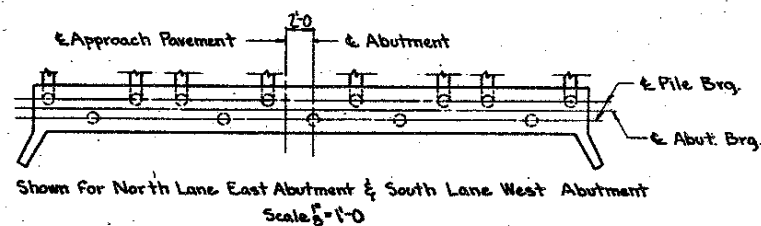
BENCH MARK: No. 116 Sta. 213+49, Rt. 521, Cut # On E. Handrail of Bridge; Elev. = 479.25  
 No. 117 Sta. 212+83 Lt. 13' I.H.C. Plug in N.W. Wing wall of N. Bridge  
 Elev. = 496.75



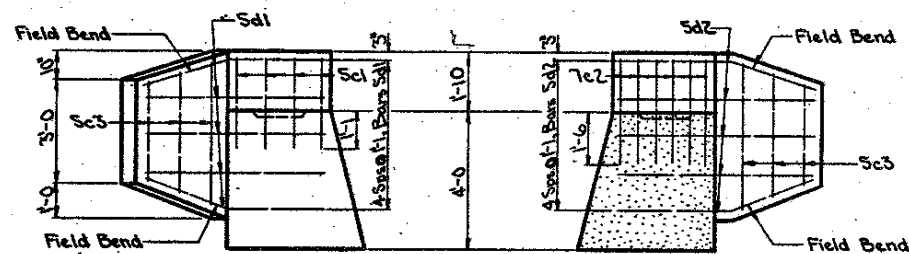
REAR ELEVATION  
 Shown For North Lane W. Abutment & South Lane East Abutment



PLAN VIEW  
 Scale 3/8" = 1'-0"

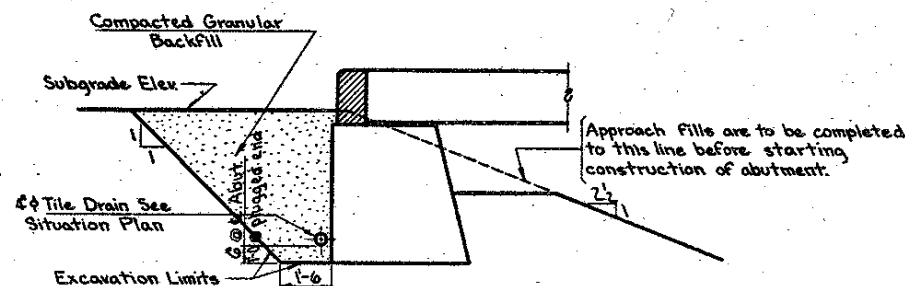


Shown For North Lane East Abutment & South Lane West Abutment  
 Scale 3/8" = 1'-0"



VIEW B-B

VIEW A-A



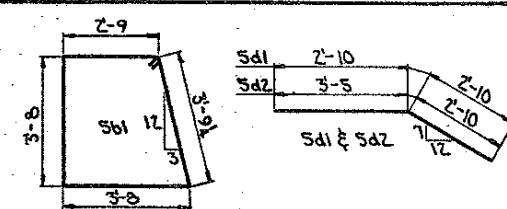
BACKFILL DETAILS AT ABUTMENT

Excavation outside limits shown above is to be backfilled with granular backfill material at the contractor's expense.

	ABUTMENT ELEV			
	NORTH LANE		SOUTH LANE	
Bridge Seat	495.54	494.91	495.54	494.91
Bott. of Ftg.	491.54	490.91	491.54	490.91

Bar	Location	Shape	Height
Ba1	Footing, Longitudinal	—	7
Ba2	"	—	3
Sbl	"	—	5
Sc1	Wings, Vertical F.F.	—	3
Sc2	"	—	18
Sc3	"	—	44
Sd1	"	—	59
Sd2	"	—	65
Sml	Dowels for Paving	—	33
Pile Spirals #2 Bar	—	—	84
Spiral Spacers #6 O.D. 69	—	—	33
Structural Grade			2454

BENT BAR DETAILS



Note: All dimensions are out to out.

CONC-PLACEMENT QUANT.-ONE ABUT	
Footing	24.4
Wings	1.4
Paving Block	1.7
Total	27.5 Cu. Yd.

ESTIMATED QUANTITIES - FOUR ABUTS	
Items	Quantity
Concrete	110.0 Cu. Yd.
Reinforcing Steel	9816 lbs.
Creosoted Piling - #4 @ 13 @ 45, 26 @ 30	2405 Lin. Ft.
Class 20 Excavation	269 Cu. Yd.
Granular Backfill Material	173 Tons

#### ABUTMENT NOTES:

Bridge Contractor is to backfill abutments between wings to subgrade elevation with granular backfill material complying with Sec. 4133 of the Specifications.  
 All exposed corners of 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.  
 Reinforcing steel is to be securely wired in place before concrete is poured.  
 Clear distance from face of concrete to near reinforcing bar is to be 1 1/2" unless otherwise noted or shown.  
 Piling is to be driven to full penetration, if practicable, but to not less than 20 tons nor more than 40 tons bearing capacity.

#### SPECIFICATIONS:

Design: A.A.S.H.O. Series of 1961.  
 Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1960, plus current special provisions and Supplemental Specifications.

#### DUAL 11'-6" x 40' CONTINUOUS CONCRETE SLAB BRIDGES

34'-3" End Spans Concrete Substructure 44'-0" Center Span

#### ABUTMENT DETAILS

Station: 213+41.3 on Interstate #80 1213+40.7 on Local Road Project No. I-80-5(2)188

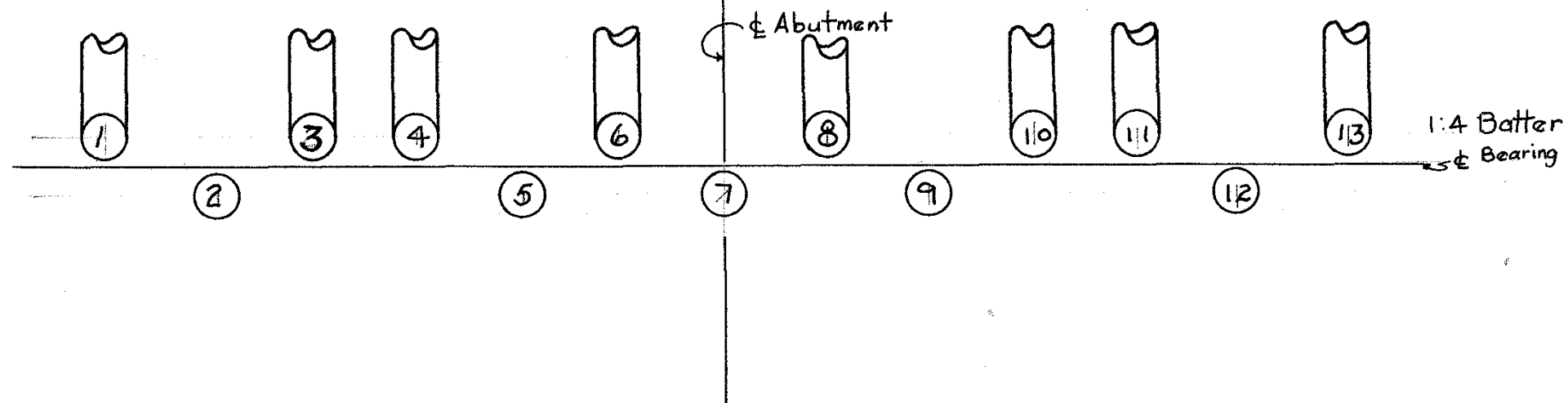
#### POWESHIEK COUNTY

Iowa March, 1962 State Highway Commission Sheet 2 of 5

Design No. 5861 Poweshiek County File No. 21579

Designed by: C.W.O. Traced by: K.L. Checked by: J.L.





### WEST ABUTMENT E.B.

Pile No	Date Driven	Length in Leads	Cut-off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	8-22-63	50	2.4	47.6	—	10	Refusal
2	8-22-63	50	1.3	48.7	0.525	10	35.6
3	8-22-63	50	1.4	48.6	0.300	10	45.4
4	8-22-63	50	6.3	43.7	—	10	Refusal
5	8-22-63	50	1.1	48.9	0.400	10	41.6
6	8-22-63	50	1.0	49.0	0.900	10	23.6
7	8-22-63	50	0.8	49.2	1.260	10	19.5
8	8-22-63	50	1.2	48.8	0.425	10	38.0
9	8-23-63	50	1.3	48.7	0.800	10	27.1
10	8-23-63	50	1.3	48.7	0.400	10	39.3
11	8-23-63	50	1.4	48.6	0.800	10	25.6
12	8-23-63	50	1.3	48.7	0.475	10	37.8
13	8-23-63	50	1.3	48.7	0.350	10	42.1

### EAST ABUTMENT E.B.

Pile No	Date Driven	Length in Leads	Cut-off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	8-13-63	45	6.2	38.8	0.400	10	40.2
2	8-13-63	45	6.6	38.4	0.425	10	41.2
3	8-13-63	45	2.7	42.3	0.350	10	43.2
4	8-13-63	45	0.8	44.2	0.625	10	31.0
5	8-13-63	45	8.7	36.3	0.250	10	53.1
6	8-13-63	45	0.6	44.4	0.600	10	31.8
7	8-13-63	45	14.4	30.6	—	10	Refusal
8	8-13-63	45	0.8	44.2	0.400	10	40.2
9	8-13-63	45	9.7	35.3	0.450	10	39.9
10	8-13-63	45	3.2	41.8	0.250	10	50.4
11	8-13-63	45	12.2	32.8	0.350	10	43.2
12	8-13-63	45	5.0	40.0	0.350	10	45.6
13	8-13-63	45	9.2	35.8	0.200	10	54.9

### WEST ABUTMENT W.B.

Pile No	Date Driven	Length in Leads	Cut-off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	8-23-63	50	6.5	43.5	—	10	Refusal
2	8-23-63	50	1.2	48.8	0.650	10	31.2
3	8-23-63	50	1.2	48.8	0.700	10	28.1
4	8-23-63	50	0.8	49.2	0.660	10	29.5
5	8-26-63	50	6.0	44.0	—	10	Refusal
6	8-26-63	50	4.5	45.5	—	10	Refusal
7	8-26-63	50	1.0	49.0	0.450	10	38.9
8	8-26-63	50	1.0	49.0	0.500	10	34.7
9	8-26-63	50	1.2	48.8	0.450	10	38.9
10	8-26-63	50	2.0	48.0	—	10	Refusal
11	8-26-63	50	0.5	49.5	1.200	10	19.0
12	8-26-63	50	0.6	49.4	0.675	10	30.4
13	8-26-63	50	2.4	47.6	0.400	10	39.3

### EAST ABUTMENT W.B.

Pile No	Date Driven	Length in Leads	Cut-off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	8-15-63	40	0.7	39.3	0.760	10	29.2
2	8-15-63	40	0.0	40.0	2.400	10	12.4
3	8-15-63	40	1.3	38.7	0.550	10	35.8
4	8-15-63	40	3.6	36.4	0.425	10	41.6
5	8-16-63	40	1.3	38.7	0.600	10	35.8
6	8-16-63	40	1.3	38.7	0.450	10	40.2
7	8-16-63	40	1.9	38.1	0.450	10	42.6
8	8-15-63	40	4.2	35.8	0.700	10	36.6
9	8-15-63	40	1.5	38.5	0.500	10	40.0
10	8-15-63	40	1.1	38.9	0.575	10	34.8
11	8-15-63	40	1.0	39.0	0.475	10	39.1
12	8-15-63	40	1.0	39.0	0.425	10	44.0
13	8-15-63	40	1.2	38.8	0.425	10	41.6

TYPE of PILING— Treated Southern Pine

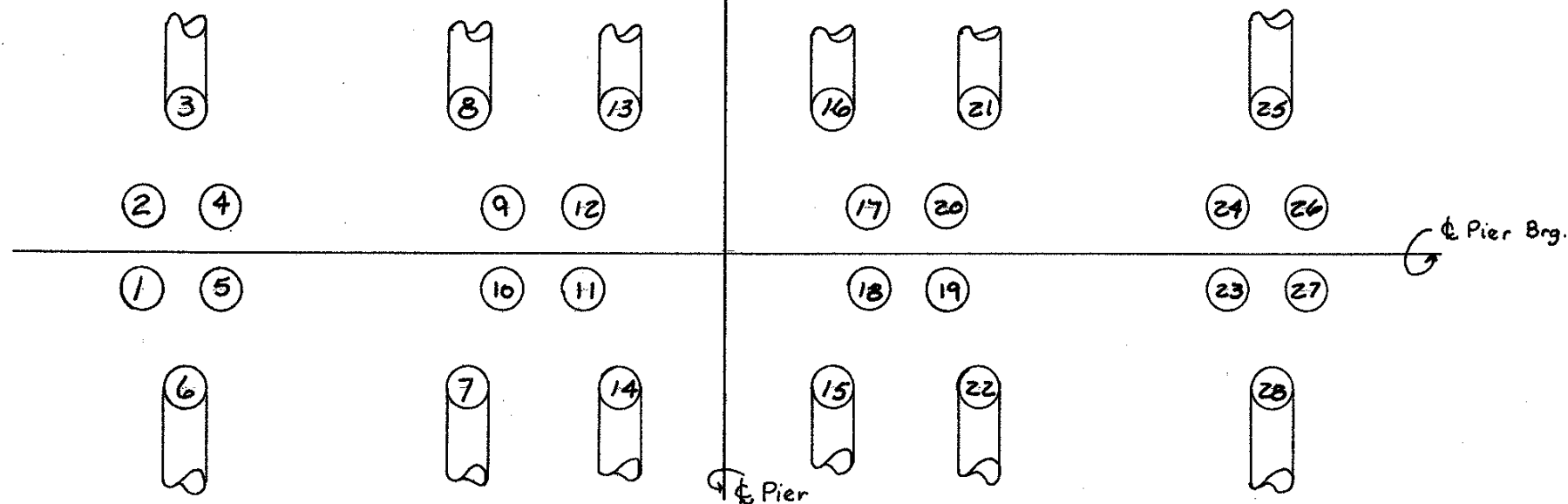
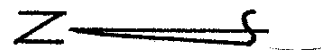
WEIGHT of PILING— 50' = 1890/lbs. 45' = 1750/lbs. 40' = 1370/lbs.

I.H.C. No of HAMMER— 746 EFFECTIVE WEIGHT— 3600/lbs.

I.H.C. No of DRIVING CAP— 758 WEIGHT— 747/lbs.

FORMULA USED—  $P = \frac{3WH}{5+0.35} \times \frac{W}{W+M}$





### WEST PIER E.B.

Pile No.	Date Driven	Length in Leads	Cut off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	8-19-63	35	1.0	34.0	0.500	10	40.5
2	8-20-63	35	1.2	33.8	0.500	10	40.5
3	8-20-63	35	1.1	33.9	0.450	10	40.7
4	8-20-63	35	1.4	33.6	0.500	10	40.5
5	8-19-63	35	1.0	34.0	0.700	10	32.8
6	8-20-63	35	1.0	34.0	0.700	10	31.0
7	8-20-63	35	1.3	33.7	0.475	10	39.4
8	8-20-63	35	1.2	33.8	0.400	10	43.4
9	8-20-63	35	0.9	34.1	0.600	10	36.2
10	8-20-63	35	1.1	33.9	0.700	10	32.8
11	8-20-63	35	0.9	34.1	0.450	10	43.0
12	8-20-63	35	1.1	33.9	0.525	10	39.4
13	8-20-63	35	1.1	33.9	0.550	10	36.2
14	8-20-63	35	1.4	33.6	0.715	10	28.9
15	8-12-63	35	6.7	28.3	0.600	10	34.3
16	8-12-63	35	0.4	34.6	1.375	10	18.9
17	8-10-63	35	4.6	30.4	0.550	10	38.2
18	8-10-63	35	3.6	31.4	0.525	10	39.4
19	8-10-63	35	4.8	30.2	0.400	10	45.9
20	8-10-63	35	6.0	29.0	0.450	10	43.0
21	8-12-63	35	9.4	25.6	0.450	10	40.7
22	8-12-63	35	1.0	34.0	0.500	10	38.3
23	8-9-63	35	1.5	33.5	0.600	10	36.2
24	8-9-63	35	1.5	33.5	0.600	10	36.2
25	8-10-63	35	8.5	26.5	0.425	10	42.0
26	8-9-63	35	10.2	24.8	0.350	10	49.2
27	8-9-63	35	10.0	25.0	0.400	10	45.9
28	8-10-63	35	11.3	23.7	—	10	Refusal

### WEST PIER W.B.

Pile No.	Date Driven	Length in Leads	Cut off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	9-19-63	30	4.3	25.7	0.400	10	47.0
2	9-20-63	30	16.5	13.5	—	10	Refusal
3	9-20-63	30	11.1	18.9	—	10	Refusal
4	9-20-63	30	8.0	22.0	0.400	10	47.0
5	9-19-63	30	2.0	28.0	—	10	Refusal
6	9-20-63	30	8.3	21.7	0.400	10	44.4
7	9-19-63	30	1.5	28.5	—	10	Refusal
8	9-20-63	30	1.5	28.5	0.400	10	44.4
9	9-19-63	30	3.5	26.5	—	10	Refusal
10	9-19-63	30	1.3	28.7	0.450	10	44.0
11	9-19-63	30	1.5	28.5	0.500	10	41.4
12	9-19-63	30	1.4	28.6	0.950	10	27.1
13	9-19-63	30	4.9	25.1	0.500	10	39.2
14	9-19-63	30	3.0	27.0	0.500	10	39.2
15	9-17-63	30	3.8	26.2	0.400	10	44.4
16	9-17-63	30	3.6	26.4	0.400	10	44.4
17	9-17-63	30	1.0	29.0	0.400	10	47.0
18	9-17-63	30	1.0	29.0	0.500	10	41.4
19	9-17-63	30	1.0	29.0	0.400	10	47.0
20	9-17-63	30	1.0	29.0	0.400	10	47.0
21	9-17-63	30	4.1	25.9	0.400	10	44.4
22	9-17-63	30	4.5	25.5	0.400	10	44.4
23	9-17-63	30	1.0	29.0	0.550	10	39.2
24	9-17-63	30	0.9	29.1	0.500	10	41.4
25	9-18-63	30	1.4	28.6	0.500	10	39.2
26	9-17-63	30	5.8	24.2	0.450	10	44.0
27	9-17-63	30	1.0	29.0	0.450	10	44.0
28	9-17-63	30	1.2	28.8	0.400	10	44.4

### EAST PIER W.B.

Pile No.	Date Driven	Length in Leads	Cut off	Length in Structure	Ave. Penetration	Drop in Feet	Bearing
1	9-25-63	30	4.0	26.0	—	10	Refusal
2	9-26-63	30	1.1	28.9	0.400	10	47.0
3	9-26-63	30	2.7	27.3	0.400	10	44.4
4	9-26-63	30	2.5	27.5	0.450	10	44.0
5	9-26-63	30	1.3	28.7	0.400	10	47.0
6	9-26-63	30	3.8	26.2	—	10	Refusal
7	9-26-63	30	1.5	28.5	0.400	10	44.4
8	9-26-63	30	1.5	28.5	0.500	10	39.2
9	9-26-63	30	11.0	19.0	—	10	Refusal
10	9-26-63	30	1.3	28.7	0.500	10	41.4
11	9-26-63	30	1.5	28.5	0.400	10	47.0
12	9-26-63	30	1.5	28.5	0.400	10	47.0
13	9-26-63	30	2.0	28.0	0.400	10	44.4
14	9-26-63	30	6.8	23.2	—	10	Refusal
15	9-24-63	30	3.0	27.0	—	10	Refusal
16	9-24-63	30	1.4	28.6	0.400	10	44.4
17	9-24-63	30	7.5	22.5	0.400	10	47.0
18	9-24-63	30	3.5	26.5	—	10	Refusal
19	9-24-63	30	1.1	28.9	0.400	10	47.0
20	9-24-63	30	1.3	28.7	0.500	10	41.4
21	9-24-63	30	1.5	28.5	0.500	10	39.2
22	9-24-63	30	1.4	28.6	0.450	10	41.6
23	9-23-63	30	1.0	29.0	0.550	10	39.2
24	9-23-63	30	1.0	29.0	0.400	10	47.0
25	9-23-63	30	1.5	28.5	—	10	Refusal
26	9-23-63	30	1.1	28.9	0.500	10	41.4
27	9-23-63	30	5.3	24.7	—	10	Refusal
28	9-23-63	30	3.3	26.7	0.400	10	44.4

### EAST PIER E.B.

Pile No.	Date Driven	Length in Leads	Length in Structure	Ave. Penetration	Cut off	Drop in Feet	Bearing
1	8-17-63	35	30.7	0.450	4.3	10	43.0
2	8-17-63	35	33.5	0.400	1.5	10	45.9
3	8-19-63	35	27.0	—	8.0	10	Refusal
4	8-16-63	35	33.5	0.850	1.5	10	28.6
5	8-16-63	35	30.0	0.400	5.0	10	45.9
6	8-19-63	35	33.6	0.375	1.4	10	44.9
7	8-19-63	35	33.7	0.700	1.3	10	31.0
8	8-19-63	35	30.4	0.200	4.6	10	59.3
9	8-17-63	35	34.0	0.500	1.0	10	40.5
10	8-17-63	35	34.0	0.600	1.0	10	40.5
11	8-17-63	35	33.9	0.600	1.1	10	36.2
12	8-17-63	35	34.0	0.400	1.0	10	45.9
13	8-19-63	35	14.8	—	20.2	10	Refusal
14	8-19-63	35	33.5	0.350	1.5	10	46.5
15	8-9-63	35	26.0	0.400	9.0	10	43.4
16	8-9-63	35	29.2	0.500	5.8	10	38.2
17	8-8-63	35	24.3	0.500	10.7	10	40.5
18	8-8-63	35	25.0	0.550	10.0	10	38.2
19	8-8-63	35	23.0	0.475	12.0	10	41.7
20	8-8-63	35	25.0	0.250	10.0	10	54.3
21	8-9-63	35	33.6	1.400	1.4	10	18.6
22	8-9-63	35	29.2	0.250	5.8	10	54.3
23	8-8-63	35	18.2	0.350	16.8	10	49.2
24	8-8-63	35	24.3	—	10.7	10	Refusal
25	8-8-63	35	21.2	0.500	13.8	10	38.3
26	8-8-63	35	21.5	0.500	13.5	10	40.5
27	8-8-63	35	18.5	0.550	16.5	10	38.2
28	8-9-63	35	20.8	0.475	14.2	10	39.5

TYPE of PILING- Treated Southern Pine

WEIGHT of PILING- 30' = 1170 lbs. 35' = 1336 lbs.

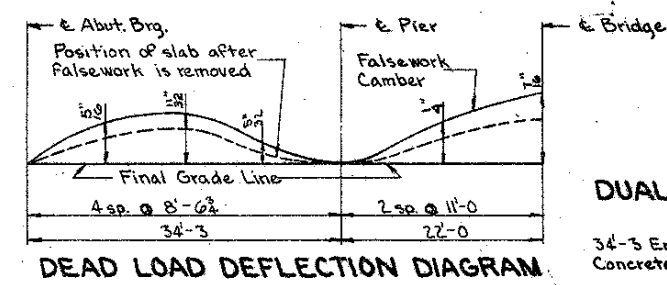
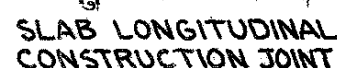
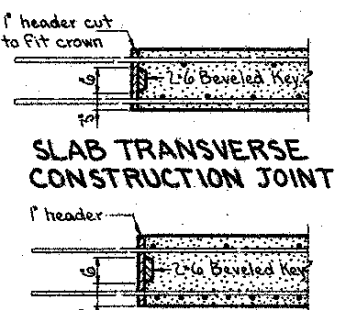
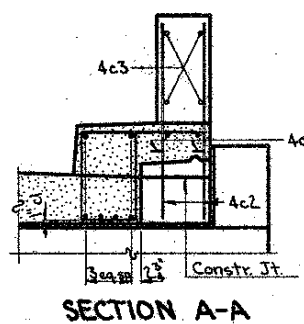
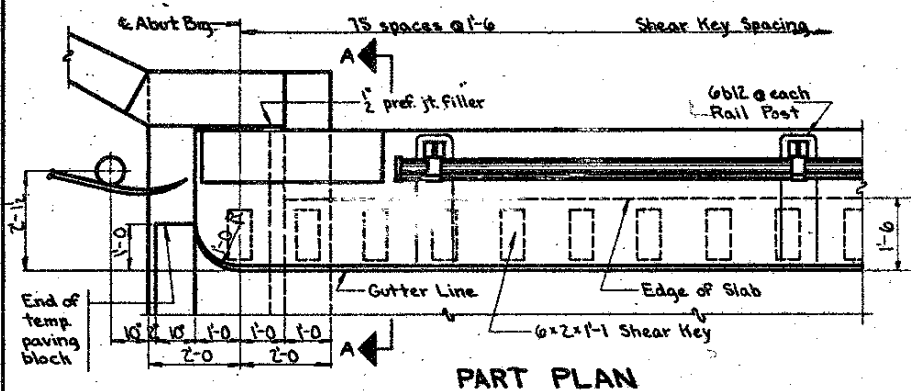
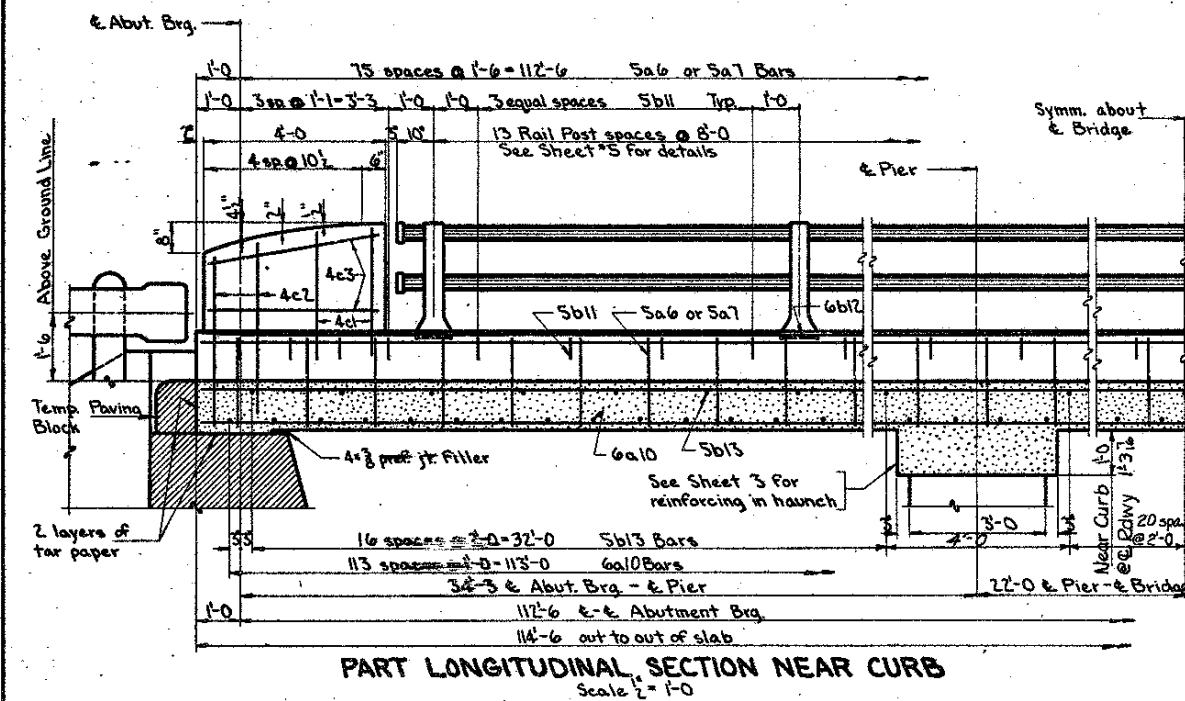
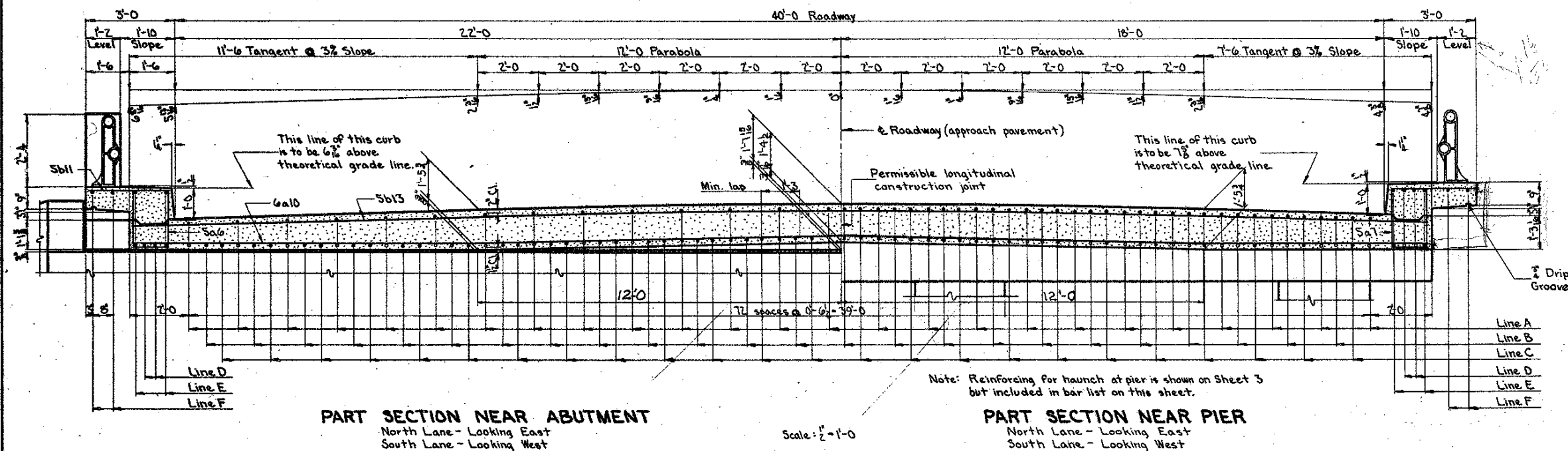
I.H.C. N° of HAMMER- 746

EFFECTIVE WEIGHT- 3600 lbs.

I.H.C. N° of CAP- 758

WEIGHT- 747 lbs.

FORMULA USED-  $P = \frac{3WH}{5+0.35} \times \frac{W}{W+M}$



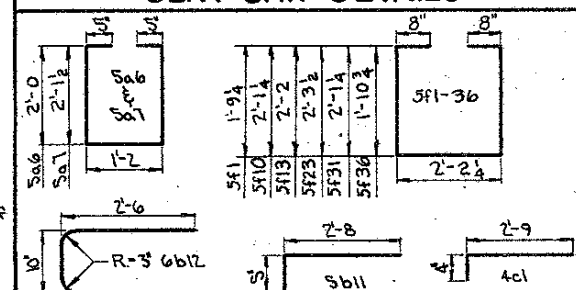
This diagram shows the camber required for the anticipated dead load deflection and includes plastic flow. These figures do not include any allowance for settlement of forms.

# REINFORCING BAR LIST-ONE SUPERST.

Bar	Location	Shape	No.	Length	Weight
10a1	Bottom Slab & Curb, Longitudinal	—	84	37'-6"	14,271
10a2	" " " " " " " "	—	48	27'-2"	3,611
10a3	" " " " " " " "	—	24	29'-0"	2,995
10a4	" " " " " " " "	—	50	20'-6"	4,411
10a5	" " " " " " " "	—	25	21'-6"	2,313
5a6	Curb, Hoops	□	76	5'-8"	449
5a7	Curb, Hoops	□	76	5'-11"	469
10a8	Bottom Curb, Longitudinal	—	8	23'-6"	809
10a9	" " " " " " " "	—	4	26'-0"	448
6a10	Bottom Slab, Transverse	—	228	22'-0"	15,341
11b1	Top Slab, Longitudinal	—	48	13'-9"	3,501
10b2	" " " " " " " "	—	48	19'-3"	3,916
10b3	" " " " " " " "	—	50	26'-0"	5,594
6b4	" " " " " " " "	—	50	25'-0"	1,878
6b5	" " " " " " " "	—	25	21'-2"	795
11b6	Top Curb, Longitudinal	—	8	13'-3"	563
11b7	" " " " " " " "	—	8	27'-8"	1,176
5b8	" " " " " " " "	—	8	23'-9"	198
5b9	" " " " " " " "	—	11	18'-8"	78
5b10	" " " " " " " "	—	12	59'-4"	492
5b11	Curb, Transverse	—	120	3'-0"	375
6b12	Rail Post Anchor	—	28	5'-6"	231
5b13	Top Slab, Transverse	—	110	22'-0"	2,524
4c1	End Post, Vertical, F.F. & B.F.	—	16	3'-0"	32
4c2	" " " " " " " "	—	16	3'-8"	39
4c3	" " " " " " " "	—	16	3'-9"	40
9d1	Bottom Pier Haunch, Longit.	—	16	17'-0"	925
8d2	" " " " " " " "	—	8	12'-0"	256
10e1	Top " " " " " " " "	—	8	10'-0"	344
9e2	" " " " " " " "	—	16	23'-0"	1,251
9e3	" " " " " " " "	—	8	8'-11"	220
5f1-36	Pier Hauch, Hoops	□	144	Varies	1,112

Total (lbs.) 64,922

## BENT BAR DETAILS



All dimensions are out to out. Radii to &amp; bar.

## CONCRETE PLACEMENT QUANTITIES

Section 1	106.0 cy.
Section 2	106.0 cy.
Section 3	56.9 cy.
Curbs	22.8 cy.
End Posts	1.5 cy.
Total	293.2 cy.

## ESTIMATED QUANTITIES-TWO SUPERST.

Concrete	586.4 cy.
Reinforcing Steel	129,844 lbs.

## DUAL 11'-6" x 40' CONTINUOUS CONCRETE SLAB BRIDGES

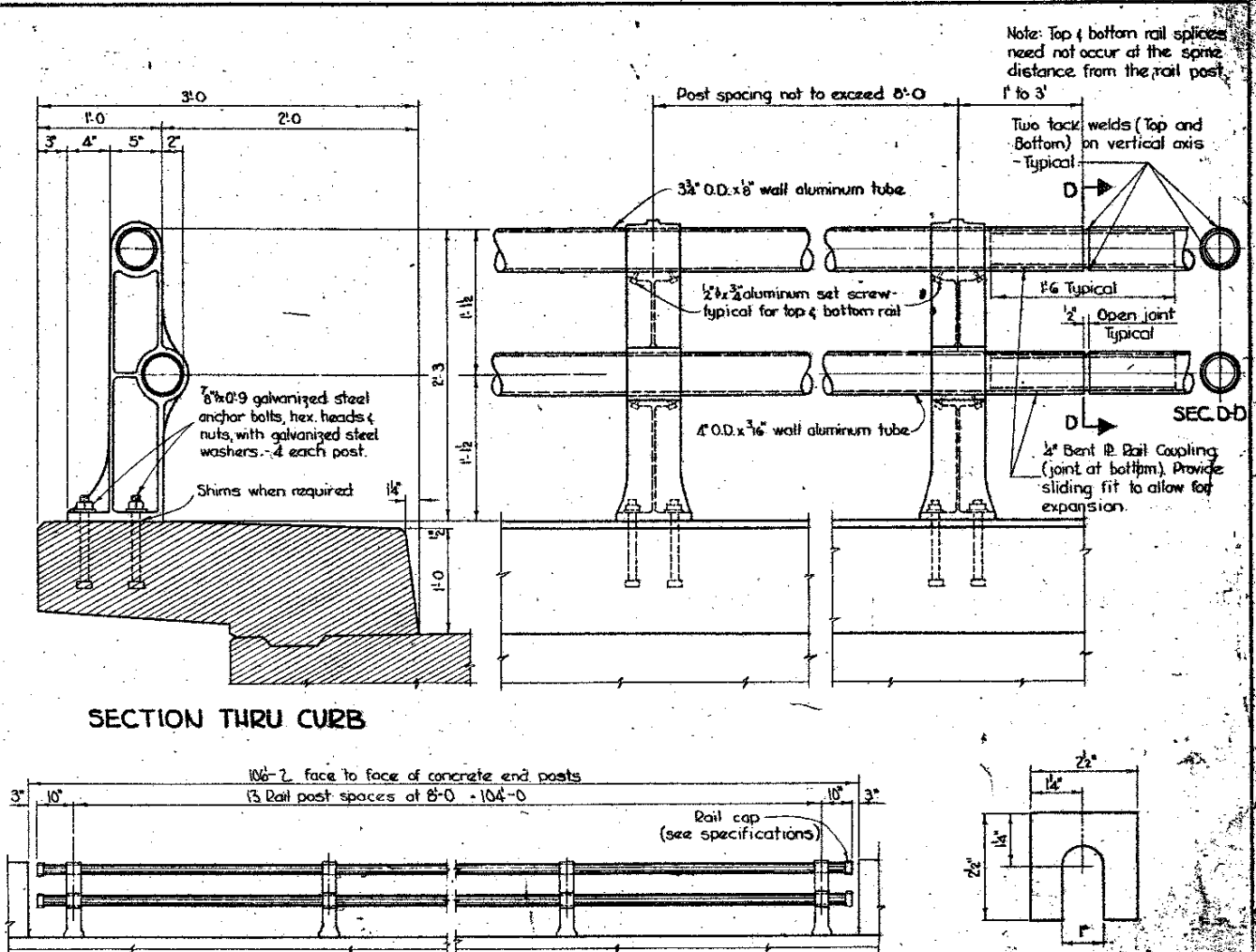
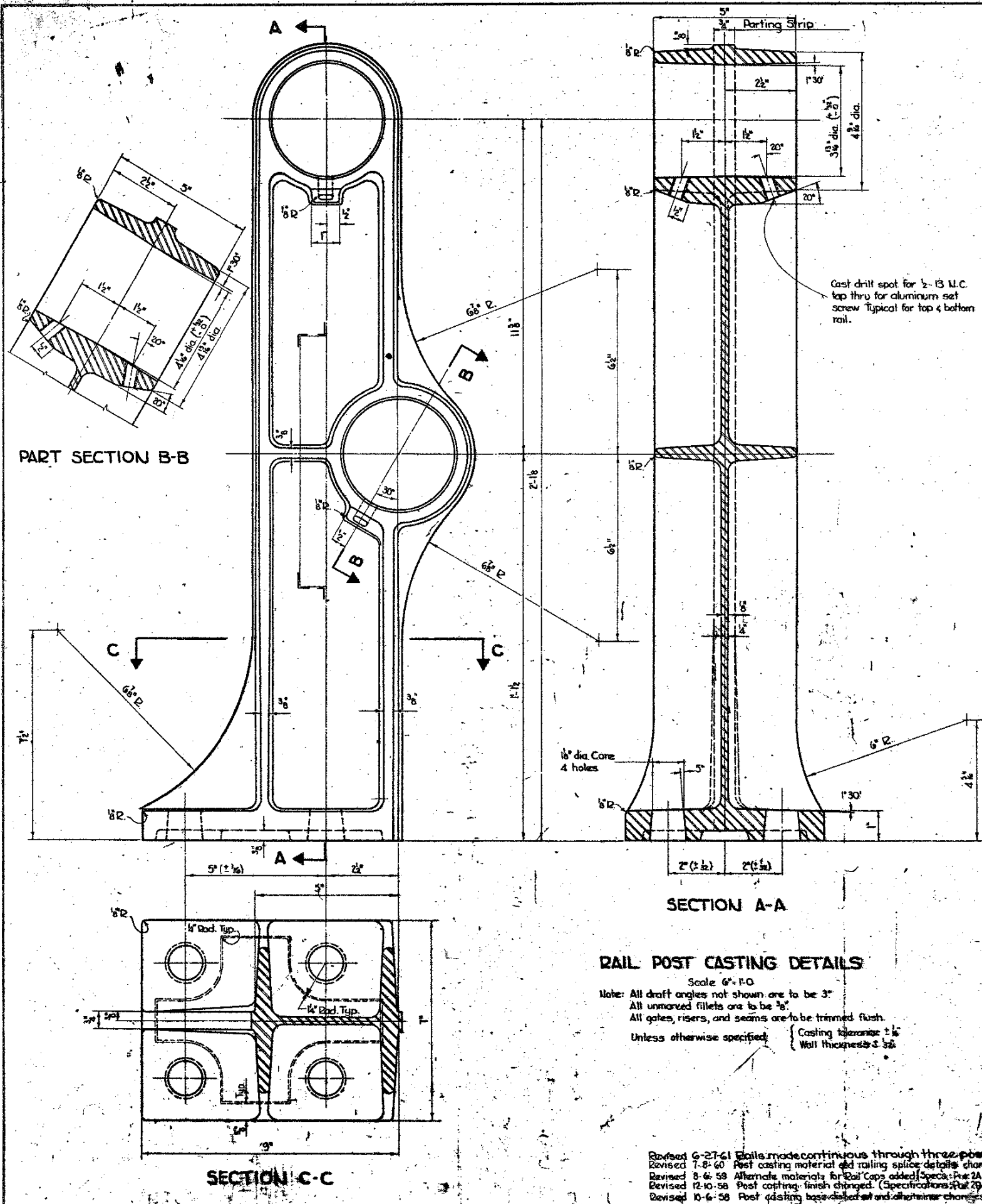
Design for  
34'-3" End Spans  
Concrete Substructure  
Station: 213+41.3 on Interstate #80  
1213+40.7 on Local Road  
Iowa  
March, 1962  
Design No. 5861  
Designed by: J. L. Powell

44'-0" Center Span  
SUPERSTRUCTURE DETAILS  
Project No. I-80-5(29)188  
POWESHIEK COUNTY  
State Highway  
Commission Sheet 4 of 5  
File No. 21379

Traced by: J. L. Powell  
Checked by: LEP

See Sheet 3 for "SUPERSTRUCTURE NOTES"





**SPECIFICATIONS:**

- 1. DESCRIPTION OF BID ITEM**
- A. Aluminum handrail is to be bid on a linear foot basis measured from center to center of end posts. The price bid for "Aluminum Handrail" shall consist of furnishing, fabricating, erecting, and cleaning all metal handrail and shall include the furnishing and installation of anchor bolts and all other incidental items in accordance with these plans and specifications.
- 2. COMPONENT PARTS AND MATERIALS**
- A. Aluminum Bridge Rail Tubing
1. Aluminum tubing shall comply with the A.S.T.M. Specification B235 - alloy 6061-T6 (commercial designation 6061-T6). The rail tubing is to be fabricated from random length tubing and joined as indicated. Each rail section must pass thru at least three posts before being spliced.
  2. The aluminum rail tubing shall be closed at the ends next to the concrete end posts, as detailed, by means of cast caps or plugs or by means of welded end plates. The cast caps or plugs shall comply with the material specifications as outlined for post castings or with A.S.T.M. Spec. B216 alloy 356 condition F.
- B. Aluminum Rail Post Castings
1. Aluminum post castings shall comply with:  
(a) The A.S.T.M. Specification B108 - alloy 356-T6 condition T6 for aluminum alloy permanent mold castings (commercial designation - A356-T6).
  2. The post castings shall have smooth and even surfaces, free from shrinkage cracks, oxide inclusions, and other defects.
  3. The post castings shall follow the outlines and dimensions as detailed. Minor changes, such as draft angles and radii for fillets and corners, shall be permitted. Draft on front and back face of post may be omitted providing minimum wall thicknesses as detailed are maintained. Shop drawings for post castings must be submitted and approved by the Engineer before castings are made.
  4. The 3" parting strip is to be finished with a 120 grit finish or an approved equal. All other surfaces are to have a uniformly polished or burnished finish.
  5. Before setting posts, the entire base of the post casting shall be coated with an aluminum impregnated caulking compound 1/2" thick. The caulking compound shall comply with Federal Specification TT-C-598 for knife grade to which shall be added aluminum paste complying with Paragraph 4181.02 in proportion to one pound of aluminum to 5 pound of caulking compound.
- C. Aluminum Set Screws for Posts
1. Aluminum set screws shall comply with the A.S.T.M. Specification B211 - alloy 6061-T6 (commercial designation 6061-T6 with 1/2" 205 alumite finish). The finished set screws shall be supplied in the T-4 temper and shall be given an anodic coating of at least 0.0002" in thickness and chromate sealed. The set screws shall have a hexagon socket head and oval point.
- D. Aluminum Shims
1. Aluminum shims shall comply with the A.S.T.M. Specification B209 - alloy 990A condition O (commercial designation - 990-O).
- \* Current tentative A.S.T.M. Standard Specifications.

**3. CONSTRUCTION**

- A. The specifications for construction shall be the Standard Specifications of the Iowa State Highway Commission, Series of 1960, plus current Special Provisions with the added provisions and Supplemental Specifications.
1. The anchor bolts for the aluminum posts shall be set at the time and elevations shown on the plans. They shall be firmly held in place by suitable templates that will assure their correct position during the placement of concrete. Aluminum shims, as detailed, shall be used if necessary to insure the correct elevation of the rails.
  2. The cast aluminum posts and the aluminum tube rails shall be carefully handled during their unloading, handling, and erection. Members that are marred, disfigured or damaged to the extent that they impair their usefulness or appearance shall be rejected and replaced at the contractor's expense.
  3. The aluminum handrail shall be stored above ground upon suitable platforms and kept free from dirt, grease and contact with dissimilar metals. The stored aluminum handrail shall be protected from moisture as far as practical.
  4. After anchor bolts have been tightened, the excess caulking compound shall be removed and all openings around the base of the post pointed full and flush with caulking compound.
  5. After erection, rails and posts and the concrete around the post bases shall be thoroughly cleaned of all dirt, grease, caulking compound and other foreign material by an approved means as directed by the Engineer.
  6. Set screws are to be tightened to prevent rails from rattling, but they are not to be tightened so as to prevent movement due to rail expansion.

**ALUMINUM HANDRAIL QUANTITIES**

Aluminum Handrail (4" End Posts)*	416.0	lin. ft.
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\*Two Bridges

Design for  
**DUAL 112'-6" x 46" CONTINUOUS CONCRETE SLAB BRIDGES**

34'-3" End Spans  
Concrete Substructure  
**ALUMINUM HANDRAIL DETAILS**  
Station 213+41.3 on Interstate #80  
1213+40.1 on Local Road  
**POWESHIEK COUNTY**  
Iowa State Highway Commission  
March 1962 Rail Standard Sheet 1000 Sheet 5 of 5  
Design No. 586a Poweshiek County File No. 213-12



