JAN 13, 59

CONVENTIONAL SIGNS

CITY LIMITS
STATE OR COUNTY LINES
SECTION LINES
FENCE LINES
RIGHT OF WAY LINES
GUARD RAIL
TRAVELED WAY
BASE OR SURVEY LINE
RAILROADS
PRESENT TILE DRAINS
PROPOSED TILE DRAINS
CULVERTS
TELEPHONE, TELEGRAPH OR TRANSMISSION LINES
PRIMARY ROAD NUMBERS — 15
U. S. ROAD NUMBERS — 65

STATE OF IOWA

STATE HIGHWAY COMMISSION

DESIGNS FOR BRIDGES AND CULVERT

ON THE

INTERSTATE ROAD SYSTEM

I.-IG PROJECT NO. 80-4(2)142

FROM A POINT IN SE1/4NE1/4SEC. 18-79-23, EAST BY NORTHEAST TO A POINT JUST WEST OF WEST LINE OF SW1/4 SEC. 12-79-23

POLK COUNTY

SCALES PLAN 1 INCH = 100 FT.
PROFILE HOR. 1 INCH = 100 FT. VERT. 1 INCH = 10 FT.

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR CONSTRUCTION WORK, SERIES OF 1956, SHALL APPLY TO WORK ON THIS PROJECT

CONSTRUCTION PLANS SHOWING PROJECT AS BUILT
PREPARED BY [illegible] RESIDENT ENGINEER
DATE 4-12-61 NO. OF COPIES PREPARED 2

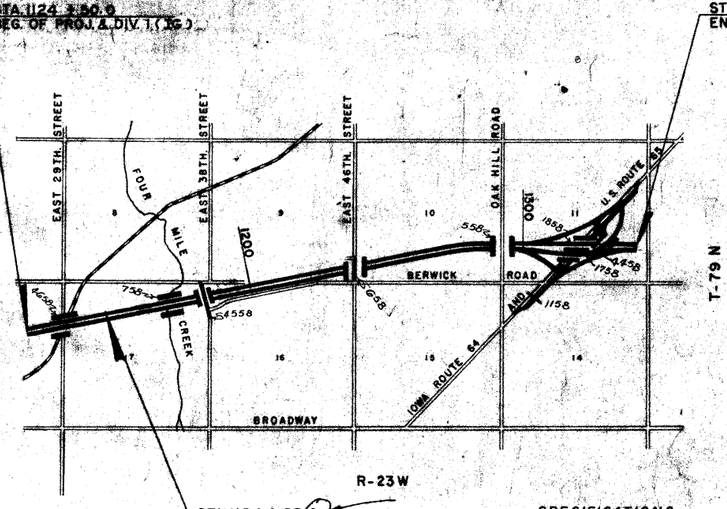
Construction Plans Showing Project as Built
Prepared by [illegible] Resident Engr.
Date 4-5-63 No. of copies prepared 2
This copy approved and forwarded to Ames
Date
Other copy delivered to Division Maintenance Engineer
Date FEB 1 1963
Signed Steiner Silence Dist. Engineer

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS.
5	IOWA	I-IG-01-4(2)		1	187

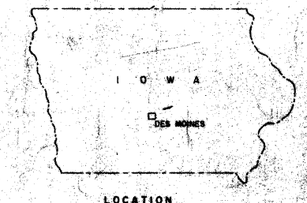
I-IG-80-4(2)142

STA. 1124+30.9
BEG. OF PROJ. & DIV. 1 (IG)

STA. 1341+54.30
END OF PROJ. & DIV. 2 (I)



STA. 1134+30.6
END DIV. 1 (IG) & BEG. DIV. 2 (I)



LOCATION

SPECIFICATIONS:
ALL MATERIAL AND CONSTRUCTION TO BE IN ACCORDANCE WITH IOWA STATE HIGHWAY COMM. STANDARD SPECIFICATIONS SERIES 1956, PLUS CURRENT SPECIAL PROVISIONS.

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

RECOMMENDED:
[illegible] 9/3/58
PRINCIPAL DATE
BROWN ENGINEERS
CONSULTING ENGINEERS, N.Y., N.Y.

APPROVED:
CHIEF ENGINEER DATE
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED:
DIVISION ENGINEER DATE

offls. dand 12/22/58

G+I JAN 13/59

SHEET 1 OF 2 SHEETS

IN LETTING OF JAN. 13 TH 1959

SECTION: 10 EAST LINE — STA. 1293+01.21 ℄ INTERSTATE
DESIGN: 558 — TWP. DELAWARE

223'-9 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE 0º-54'-30" SKEW

ESTIMATE OF QUANTITIES

CONCRETE	337.3	CU. YD.
REINFORCING STEEL	53,100	LBS.
STRUCTURAL STEEL	14,028	LBS.
PRESTR. CONC. BEAMS 42'-6"	12	BMS.
PRESTR. CONC. BEAMS 67'-6"	12	BMS.
TREATED WOOD PILES 20@40' & 54@35'	2690	LIN. FT.
EXCAVATION CLASS 20	242	CU. YD.
* FORMED STL. BEAM RAIL	75	LIN. FT.
CREOSOTED 8" ø X 6'-0" POSTS	10	EACH

* BID PRICE TO INCLUDE COST OF ALL SPECIAL BOLTS. 10 END POST BOLTS AND 8 CURVED END TERMINALS.

IN LETTING OF JAN. 13 TH 1959

SECTION: 9-10 — STA. 1239+54.26 ℄ INTERSTATE
DESIGN: 658 — TWP. DELAWARE

223'-9 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE 11º-12'-55" SK.

ESTIMATE OF QUANTITIES

CONCRETE	344.4	CU. YD.
REINFORCING STEEL	53,976	LBS.
STRUCTURAL STEEL	14,028	LBS.
PRESTRESSED CONC. BMS. 42'-6"	12	BMS.
PRESTRESSED CONC. BMS. 67'-6"	12	BMS.
TREATED WOOD PILES 20@40' & 54@35'	2690	LIN. FT.
EXCAVATION CLASS 20	244.0	CU. YD.
TREATED POSTS 8" ø X 6'-0"	10	EACH
* FORMED STEEL BEAM WG. RAILS	75	LIN. FT.

* BID PRICE TO INCLUDE COST OF ALL SPECIAL BOLTS. 10 END POST BOLTS AND 8 CURVED END TERMINALS.

IN LETTING OF JAN. 13 TH 1959

SECTION: 17 — STA. 1174+05 ℄ INTERSTATE
DESIGN: 758 — TWP. DELAWARE

TWIN 188'-4 x 42' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE 16º 54' SKEW

ESTIMATE OF QUANTITIES

CONCRETE	1047.0	~~1038.2~~	CU. YD.
REINFORCING STEEL		140,066	LBS.
STRUCTURAL STEEL		23,704	LBS.
PRESTRESSED CONC. BEAMS 67'-6"		22	BMS.
PRESTRESSED CONC. BEAMS 59'-2"		44	BMS
EXCAVATION CLASS 20		393.6	CU. YD.
EXCAVATION CLASS 21		770	CU. YD
FURNISHED 10 BP 42 PILES		3244	LIN. FT.
DRIVING 10 BP 42 PILES		3244	LIN. FT.

IN LETTING OF JAN. 13 TH 1959

SECTION: 11 — STA. 32+83.5 (℄ IA. RTE. 64 & U.S. 65)
DESIGN: 1158 — TWP. CLAY

7'x 7' R.C. BOX CULVERT EXT.

ESTIMATE OF QUANTITIES

CONCRETE	110.2	CU. YD.
REINFORCING STEEL	12,215	LBS.
CLASS 20 EXCAVATION	157.0	CU. YD.
REMOVE PORTIONS PRES. CULV AS PER PLAN	LUMP	SUM

MILEAGE SUMMARY:

DESIGN 558 BR. AT STA. 1293+01.21 ℄ INTERSTATE = 226'7" = .043 MI.
DESIGN 658 BR. AT STA. 1239+54.26 ℄ INTERSTATE = 226'7¾" = .043 MI.
DESIGN 758 BR. AT STA. 1174+05.00 ℄ INTERSTATE = 191'-3½" = .036 MI.
DESIGN 1758 BR. AT STA. 1314+59.34 = 251'-5¼" = .048 MI.
DESIGN 1858 BR. AT STA. 1316+62.55 = 276'-10⅞" = .052 MI.
DESIGN 4458 BR. AT STA. 1326+96.11 ℄ INTERSTATE = 213'-2¼" = .040 MI.
DESIGN 4558 BR. AT STA. 1181+53.00 ℄ INTERSTATE = 226'-8¼" .043 MI.
DESIGN 4658 BR. AT STA. 1131+87.84 ℄ INTERSTATE = 318'-3¾" = .061 MI.

TOTAL MILEAGE = 366 MI

IN LETTING OF JAN 13 TH 1959

SECTION: 11 — STA. 1314+59.34
DESIGN: 1758 — TWP. CLAY

246'-6 x 42' CONTINUOUS I-BEAM BRIDGE 35º 50' 04" SKEW

ESTIMATE OF QUANTITIES

CONCRETE	676.3	CU. YD.
REINFORCING STEEL	137,545	LBS.
* STRUCTURAL STEEL	285,084	LBS.
TREATED WOOD PILES 130 @ 30'	3900	LIN. FT.
EXCAVATION CLASS 20	561	CU. YD.
LIGHTING CONDUIT 2" ø	280	LIN. FT.

* INCLUDES "LIGHTING DETAILS" QUANTITIES

IN LETTING OF JAN. 13 TH 1959

SECTION: 11 — STA. 1316+62.55
DESIGN: 1858 — TWP. CLAY

271'-6 x 30' CONTINUOUS I-BEAM BRIDGE 42º 13' 30" SKEW

ESTIMATE OF QUANTITIES

* CONCRETE	550.8	CU. YD.
* REINFORCING STEEL	106,540	LBS.
* STRUCTURAL STEEL 239316	~~232,270~~	LBS.
TREATED WOOD PILES 100@30'	3,000	LIN. FT.
EXCAVATION CLASS 20	488	CU. YD.
LIGHTING CONDUIT 2" ø	295	LIN. FT.

* INCLUDES "LIGHTING DETAILS" QUANTITIES

IN LETTING OF JAN. 13 TH 1959

DESIGN: 4458 — STA. 31327+72.96 ℄ RAMP "C"
SECTION: 11 — 1326+96.11 ℄ INTERSTATE
TWP. CLAY

205'-10 x 28' SIMPLE SPAN I-BEAM BRIDGE 47º 10' 31" SKEW

ESTIMATE OF QUANTITIES

* CONCRETE	531.7	CU. YD.
* REINFORCING STEEL	83,470	LBS.
* STRUCTURAL STEEL	255,122	LBS.
TREATED WOOD PILES 83@30' & 30@35'	3,540	LIN. FT.
EXCAVATION CLASS 20	575	CU. YD.
LIGHTING CONDUIT 2" ø	242	LIN. FT.

* INCLUDES "LIGHTING DETAIL" QUANTITIES

IN LETTING OF JAN. 13 TH 1959

DESIGN: 4558 — STA. 1181+53.00 ℄ INTERSTATE
SECTION: 17 — TWP. DELAWARE

223'-9 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE 15º 00' 00" SKEW

ESTIMATE OF QUANTITIES

CONCRETE	342.1	CU. YD.
REINFORCING STEEL	54,795	LBS.
STRUCTURAL STEEL	14,968	LBS.
PRESTRESSED CONC. BEAM 42'-6"	12	BEAMS
PRESTRESSED CONC. BEAM 67'-6"	12	BEAMS
TREATED WOOD PILES 20@30' 54@25'	1,950	LIN. FT.
EXCAVATION CLASS 20	222	CU. YD.
* FORMED STEEL BEAM RAIL	75	LIN. FT.
CREOSOTED 8" ø X 6'-0" POSTS	10	EACH

* BID PRICE TO INCLUDE COST OF ALL SPECIAL BOLTS AND 8 CURVED END TERMINALS.

IN LETTING OF JAN 13 TH 1959

DESIGN: 4658 — STA. 1131+87.84 ℄ INTERSTATE
SECTION: 17 & 18 — TWP. DELAWARE

315'-5 x 42' & 280'-0 x 42' PRETENSIONED PRESTRESSED CONC. BM. BRIDGE 11º 04' SK.

ESTIMATE OF QUANTITIES

CONCRETE	1685.0	~~1586.0~~	CU. YD.
REINFORCING STEEL		331,107	LBS.
STRUCTURAL STEEL		320	LBS.
TREATED WOOD PILES 76@30'		2280	LIN. FT.
10 BP 42 STEEL PILES FURNISH	60@35' 120@30'	5100	LIN. FT.
10 BP 42 STEEL PILES DRIVE	60@25' 120@30'	5100	LIN. FT.
ALUMINUM HANDRAIL		1159	LIN. FT.
PRESTRESSED CONC. BEAMS 42'-6"		22	BMS.
PRESTRESSED CONC. BEAMS 46'-8"		22	BMS.
PRESTRESSED CONC. BEAMS 50'-10"		11	BMS.
PRESTRESSED CONC. BEAMS 55'-0"		22	BMS.
PRESTRESSED CONC. BEAMS 59'-2"		22	BMS.
PRESTRESSED CONC. BEAMS 63'-4"		22	BMS.
EXCAVATION CLASS 20		1,096	CU. YD.

No bridge mark for this design available at this time -12-17-59-

Small Prints of Design No. 6158 - 5'x3' R.C.B. Culvert sht - Sta 46+84 - Hwy 64 & 65 - to be attached to this page

Corrected quantities taken from office file book # 130.

Concrete = 10.4 cu. yds.
steel = 855 lbs
Class 20 Excav. = 7 - cu. yds
Removal = Lump Sum

$1,032.80

Revised 7-15-59: Des. 4658 - Superstructure Concrete Estimate changed to include Diaphragms.
Revised 5-7-59: Des. 1858 Structural Steel estimate corrected.
Revised 4-2-59: Des. 758 Concrete Quantity changed.
Revised 1-2-59: Sheet 8 Des. 4458 Polk "Turned Bolts" note deleted.
Revised 12-22-58 Bridge mileage design 1858 and 4658 and total mileage corrected.

APPROVED

CHIEF ENGINEER DATE
IOWA HIGHWAY COMMISSION

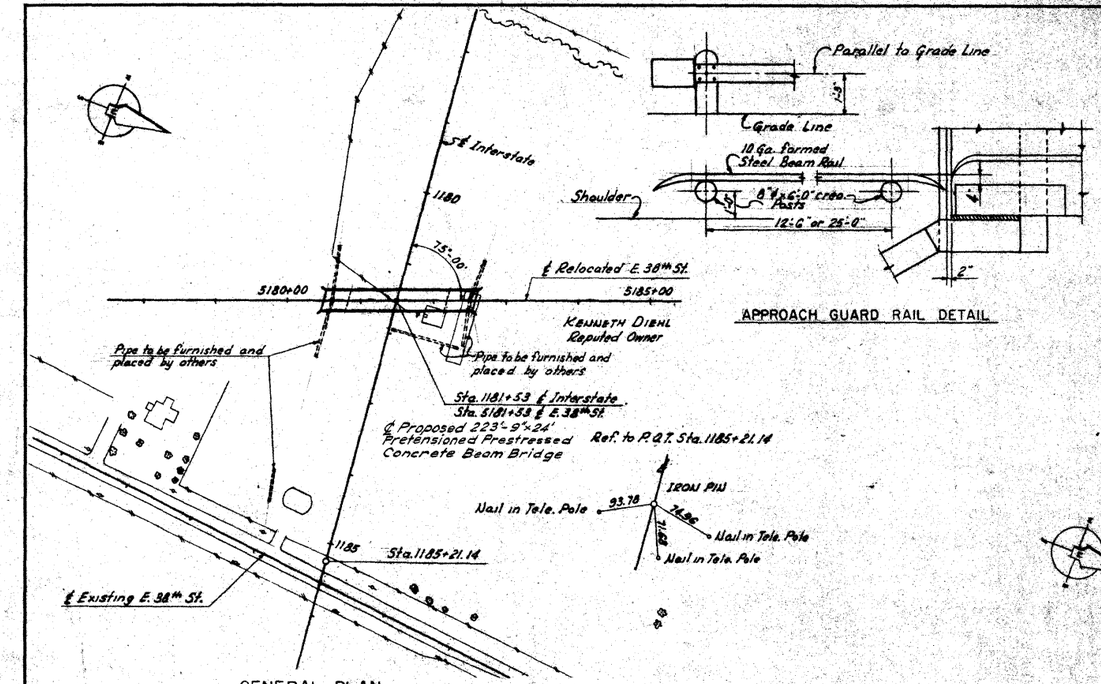
DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER DATE

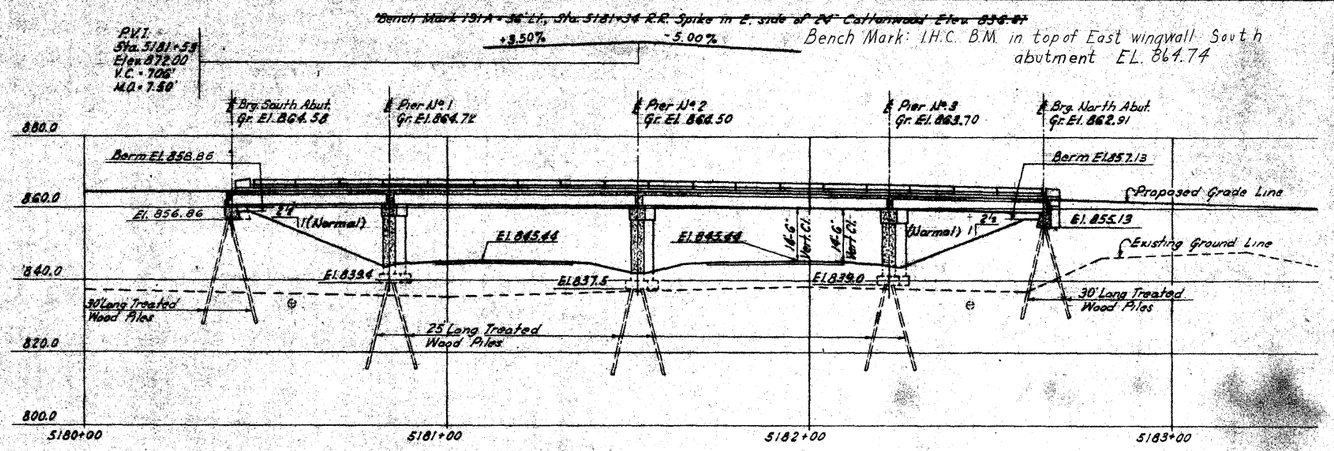
SHEET 1 OF 2

POLK COUNTY PROJECT NO. I-IG-01-4(2) FILE NO. 18856

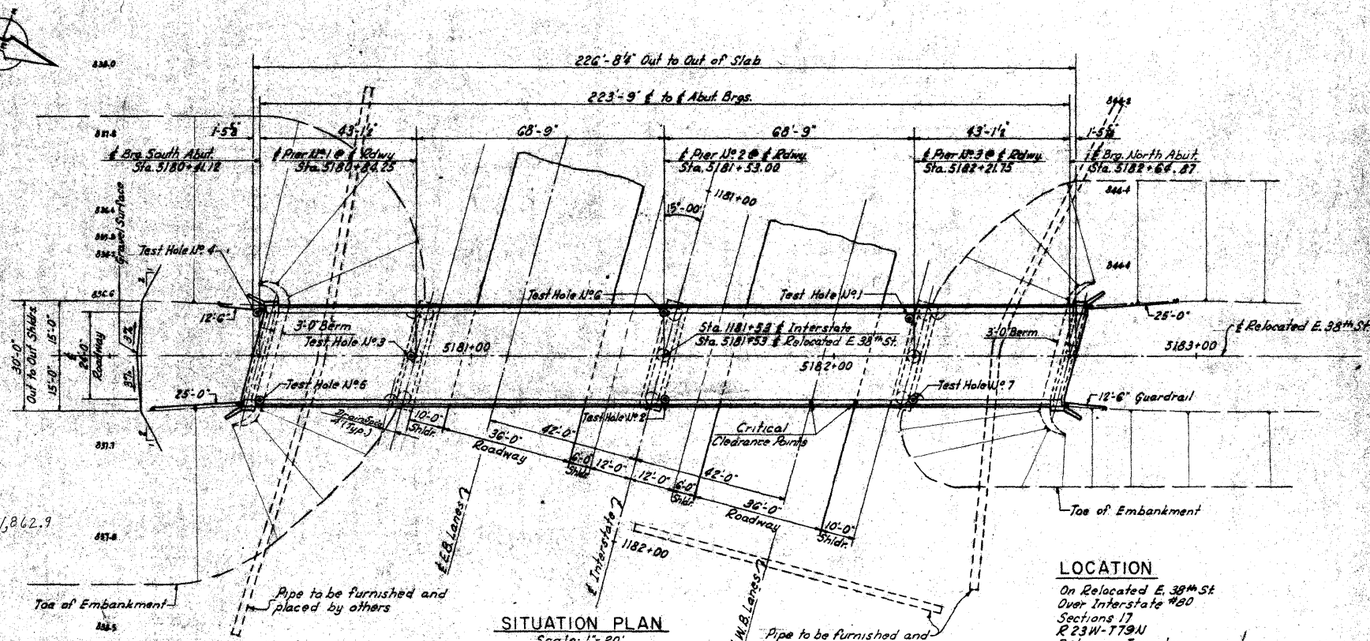


GENERAL PLAN
Scale: 1"=100'

APPROACH GUARD RAIL DETAIL



LONGITUDINAL SECTION ALONG ℄ OF ROADWAY
Scale: 1"=20'



SITUATION PLAN
Scale: 1"=20'

GENERAL NOTES:

This Bridge is designed for H15-44 loading with an allowance of 19 pounds per square foot of roadway for future wearing surface.

The approach fills are not a part of this estimate but are to be in place before abutment piles are driven. The Bridge Contractor is to level off and shape the berms to the elevation shown. Excavation for Piers assumed from finished ground line.

Abutment concrete is not to be placed until one month before anticipated delivery date of superstructure elements to job site.

SPECIFICATIONS:

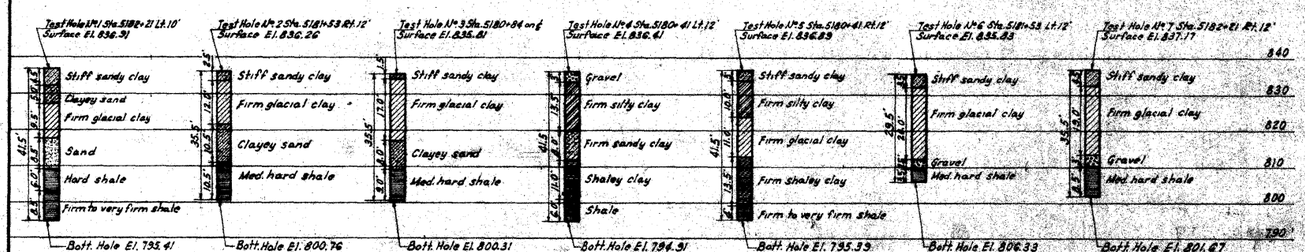
Design: A.A.S.H.O. Series of 1953, and U.S. Bureau of Public Roads Design Criteria for Prestressed Concrete Bridges, 1955.
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1956, plus Current Special Provisions.

TOTAL ESTIMATED QUANTITIES

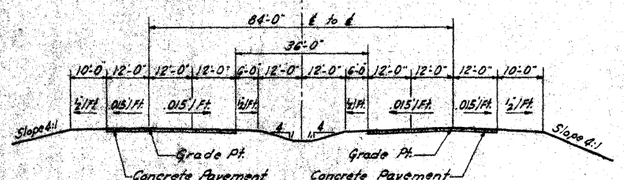
Item	Unit	2 Abuts	3 Piers	Superstr.	Total	
Concrete	Cu.Yds.	41.0	150.5	150.6	342.1	✓
Reinforcing Steel	Lbs.	4088	16,720	33,987	54,795	✓
Structural Steel	Lbs.	——	——	14,968	14,968	✓
Prestressed Conc. Beams 42'-6"	Bms.	——	——	12	12	✓
Prestressed Conc. Beams 67'-6"	Bms.	——	——	12	12	✓
Treated Wood Piles	Lin.Ft.	20@30'	54@25'	——	1,950	
Excavation, Class 20	Cu.Yds.	36	186	——	222	✓
*Formed Steel Beam Rail	Lin. Ft.				75	✓
Creosoted 8"ϕ x 6'-0" Posts	Ea.				10	✓

1,862.9

*Bid price to include cost of all special bolts. 10 end post bolts and 8 curved end terminals.



SOUNDING DATA
Scale: 1"=20'
Date July 6, 1958



TYPICAL SECTION OF INTERSTATE
Scale: 1"=20'

LOCATION

On Relocated E. 38th St. Over Interstate #80
Sections 17
R23W-T79N
Delaware Township
Polk County

DESIGN FOR 15°00-00" SKEW

223'-9" x 24' PRE-TENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

2-43'-1½" END SPANS 2-68'-9" INTERMEDIATE SPANS
CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL
RELOCATED E. 38TH STREET OVER INTERSTATE

GENERAL & SITUATION PLAN

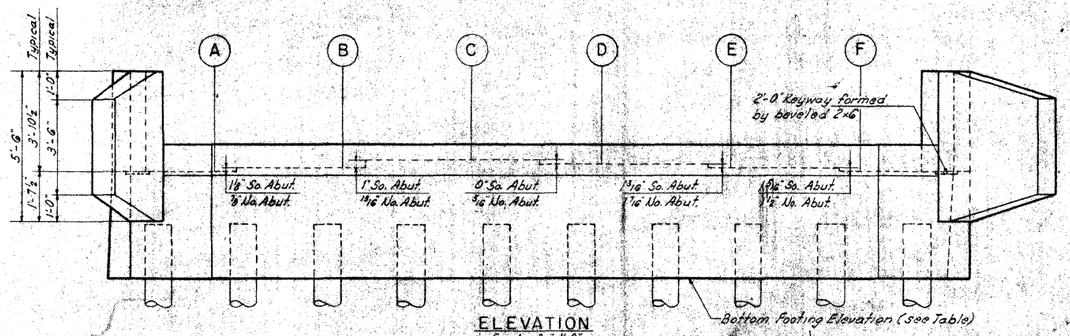
STATION 1181+53.00 ℄ INTERSTATE PROJ. NO I-IG-01--4(2) I-IG-80-4(21)42
POLK COUNTY
DESIGNED BY BROWN ENGINEERS, NEW YORK, N.Y. FOR IOWA STATE HIGHWAY COMMISSION
AUGUST 1958 SHEET 1 OF 5

In Charge Of: L.G.
Made By: F.P.K.
Traced By: F.P.K.
Checked By: G.P.

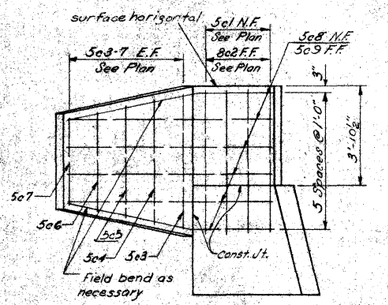
DESIGN NO. 4558 POLK CO. FILE NO. 18856

~~Bench Mark 191-A - 36'-11, Sta. 5181+34 12" R.R. Spike in E. side of 24" Cottonwood Elev. 838.81~~

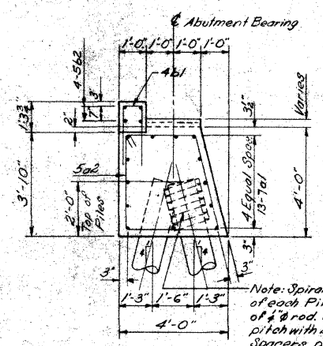
Bench Mark: I.H.C. B.M. in top of East wingwall South abutment EL. 864.74



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

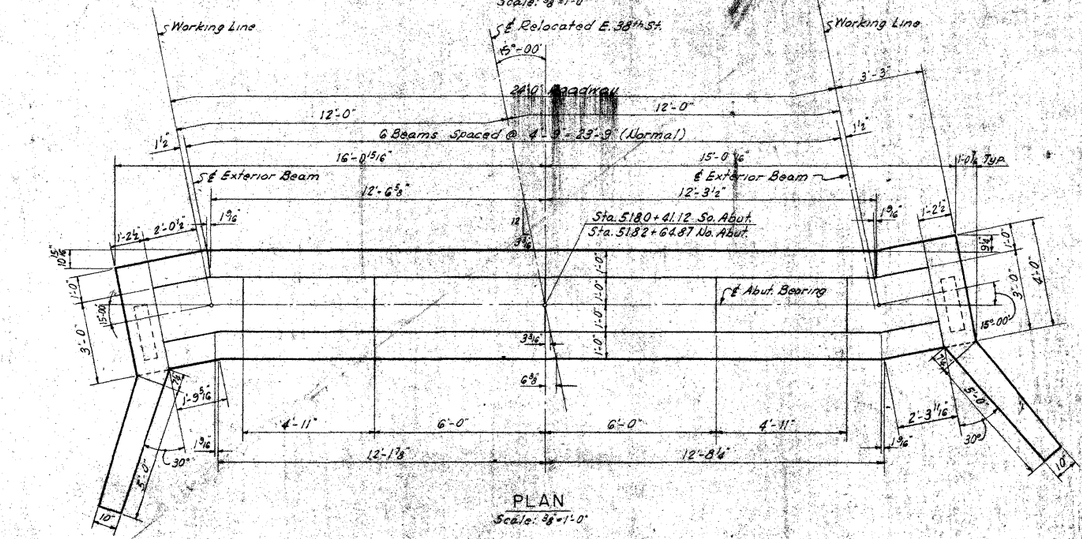


WINGWALL DETAIL
Scale: 3/8"=1'-0"

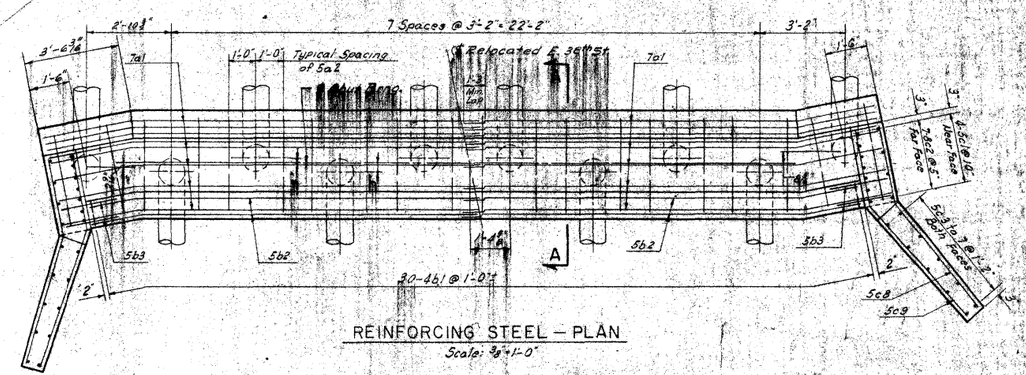


Note: Spiral at the top of each Pile - 7 Turns of ½" rod, 21" dia. 3" pitch with 2-⅜" T.O.G.9 Spacers punched to hold spiral.

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



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

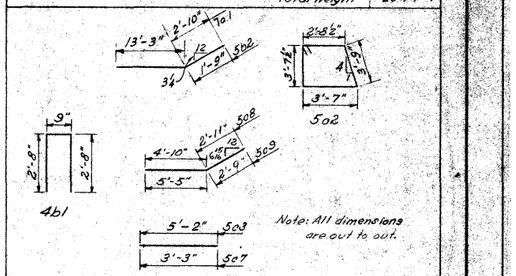


REINFORCING STEEL — PLAN
Scale: 3/8"=1'-0"

Note: 10-30' Treated wood piles required for each abutment.
Batter piles 1:4 in direction indicated.
All locations shown are at top of piles.

ABUTMENT ELEVATIONS							
	A	B	C	D	E	F	Bott. Ftg.
North Abut.	859.27	859.34	859.41	859.38	859.26	859.13	855.13
South Abut.	860.90	860.99	861.07	861.07	860.97	860.86	856.86

BILL OF REINFORCING STEEL — ONE ABUT.					
Mark	Location	No.	Shape	Length	Weight
7a1	Footing, Longitudinal	26		18'-1"	470
5a2	Footing, Hoops	20		14'-6"	302
4b1	Backwall, Vertical	30		6'-1"	122
5b2	Backwall, Longitudinal	8		15'-0"	125
5b3	Backwall, Dowel	8		2'-9"	23
5c1	Wingwall, Vertical	8		5'-3"	48
8c2	Wingwall, Vertical	14		5'-3"	196
5c8-7	Wingwall, Vertical	4 each of 5		Varies	88
5c8	Wingwall, Horizontal	12		7'-9"	97
5c9	Wingwall, Horizontal	12		8'-2"	102
	Pile Spirals 4" ℄	10	coil	38'-6"	65
	Spiral Spacers ⅜ T.O.G.9	20	C	1'-10"	25
				Total Weight	2044 #



Note: All dimensions are out to out.

BAR DETAILS

CONCRETE PLACEMENT — ONE ABUT.	
Footing	15.9 C.Y.
Backwall	1.4 C.Y.
Wingwalls	3.2 C.Y.
Total	20.5 C.Y.

ESTIMATED QUANTITIES — TWO ABUTS.		
Concrete	41.0 C.Y.	
Reinforcing Steel	4088 Lbs.	
Treated Wood Piles	~~600~~ L.F.	588 L.F.
Class 20 Excavation	36.6 C.Y.	

ABUTMENT NOTES

All piles are to be treated wooden piles.
Piling is to be driven to full penetration if practicable but to at least 20 ton bearing value.
All exposed corners of 30° or sharper are to be filleted with a 3" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Clear distance from face of concrete to nearest reinforcing bar is to be 2" unless noted or shown otherwise.
Concrete is to have 28 day crushing strength of 3500 p.s.i.

SPECIFICATIONS:

Design: AASHO, Series of 1953
Construction: Iowa State Highway Commission. Standard Specifications; Series of 1956, plus current Special Provisions.

DESIGN FOR 15°00'00" SKEW

223'-9" x 24' PRE-TENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

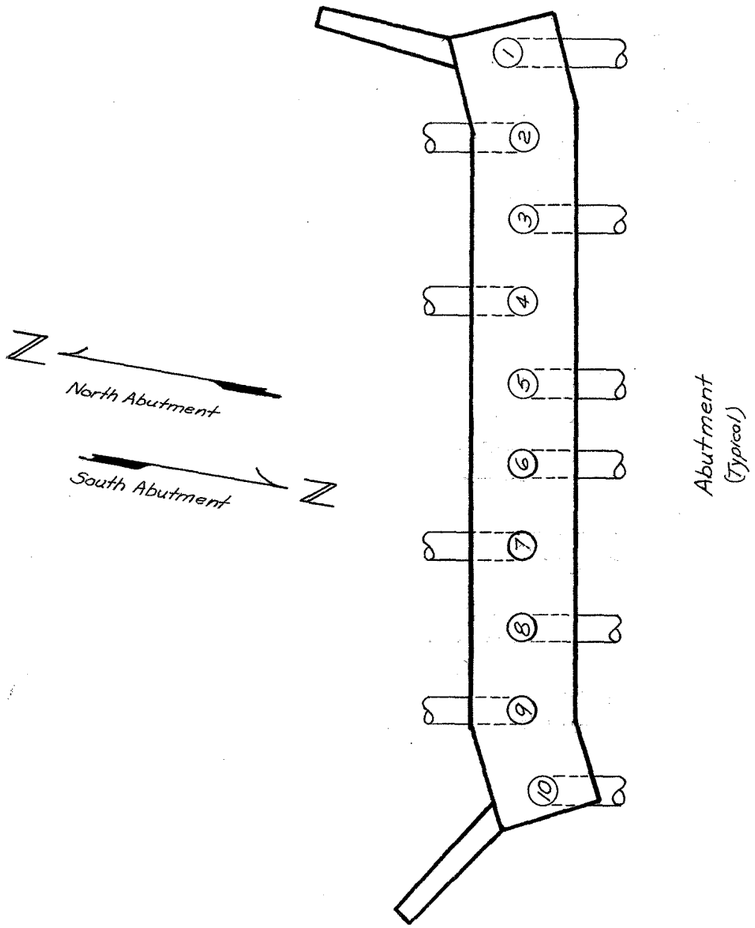
2-43'-1½" END SPANS 2-68'-9" INTERMEDIATE SPANS
CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL
RELOCATED E. 38TH STREET OVER INTERSTATE

ABUTMENTS

STATION 1181+53.00 ℄ INTERSTATE PROJ. NO. I-IG-01-4(2) I-IG-80-4(2)142
POLK COUNTY
DESIGNED BY BROWN ENGINEERS, NEW YORK, N.Y. FOR
IOWA STATE HIGHWAY COMMISSION
AUGUST 1958 SHEET 2 OF 5

In Charge Of: L.G.
Made By: F.P.K.
Traced By: F.P.K.
Checked By: G.R.

DESIGN NO. 4558 POLK CO. FILE NO. 18856



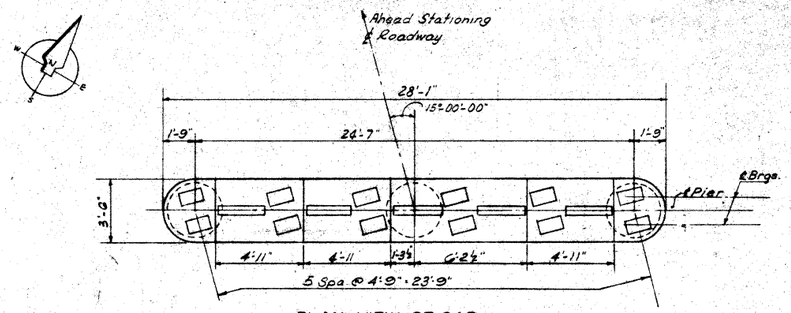
	No	Date	Length in Leads	Length of Cutoff	Length in Structure	Batter	Drop	Av. Pen. in last 5 blows	Bearing
South Abutment	1	7-8-59	30	1.0	29.0	1:4	10'	0.60	35.1
	2	7-7-59		1.1	28.9			0.48	40.2
	3	7-8-59		1.0	29.0			0.60	35.1
	4	7-7-59		0.8	29.2			0.70	31.7
	5	7-8-59		0.9	29.1			1.40	19.1
	6	7-8-59		0.5	29.5			0.80	29.0
	7	7-7-59		0.9	29.1			0.70	31.7
	8	7-7-59		0.6	29.4			0.65	33.4
	9	7-7-59		0.7	29.3			0.75	30.3
	10	7-7-59	↓	0.6	29.4	↓	↓	0.85	27.8
North Abutment	1	7-16-59	30'	0.7	29.3	1:4	10'	0.30	50.1
	2	7-16-59		0.4	29.6			0.35	46.5
	3	7-16-59		0.4	29.6			0.50	38.3
	4	7-17-59		0.4	29.6			0.25	54.3
	5	7-16-59		0.5	29.5			0.55	36.2
	6	7-16-59		0.5	29.5			0.35	46.5
	7	7-17-59		0.0	30.0			0.40	43.4
	8	7-16-59		0.2	29.8			0.55	36.2
	9	7-17-59		0.2	29.8			0.55	36.2
	10	7-16-59	↓	0.2	29.8	↓	↓	0.40	43.4

DATA

Type of piling: Treated Southern Yellow Pine
Type of hammer: Gravity I.H.C. #742
Weight of hammer:
Gross 3830 lb
Eff. 3750 lb
Weight of cap 1110 lb
Weight of pile 1124 lb
Full penetration or 20 ton minimum bearing

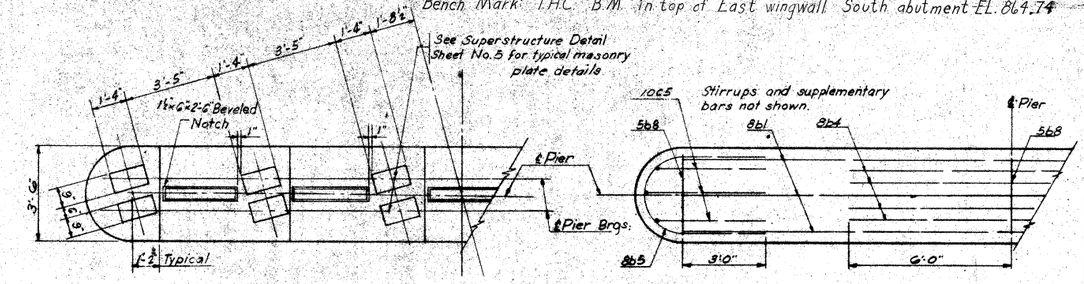
Pile bearing formula: $P = \frac{3WH}{S+0.35} \times \frac{WK}{W+M}$

P = pile bearing, in tons
H = height of hammer drop, in feet
W = weight of hammer, in tons
M = weight of cap plus pile, in tons
S = average penetration in inches
K = batter factor (0.946 for 1:4)



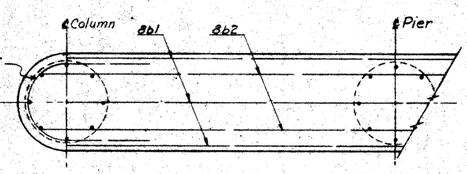
PLAN VIEW OF CAP
Scale: ¼"=1'-0"

~~Bench Mark (Pk. Nail in 36" Ø Elm, Sta. 518+34 R.R. Spike in E. side of 24" Cottonwood Ø 838.61~~
Bench Mark: I.H.C. B.M. in top of East wingwall South abutment EL. 864.74



PART PLAN
Scale: ⅜"=1'-0"

TOP

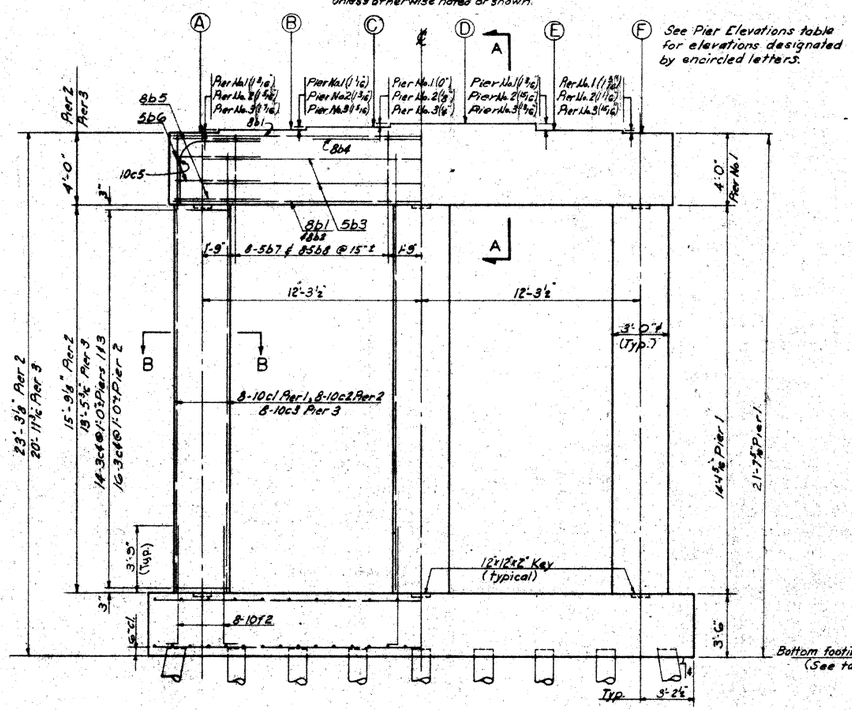


BOTTOM

HALF PLAN — CAP REINFORCING
Scale: ⅜"=1'-0"

Construction symmetrical about ℄ Pier unless otherwise noted or shown.

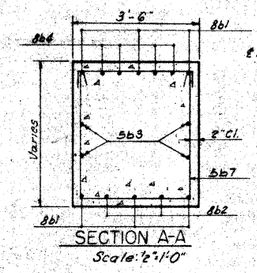
See Pier Elevations table for elevations designated by encircled letters.



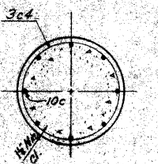
(Looking Ahead)
PIER ELEVATION
Scale: ¼"=1'-0"



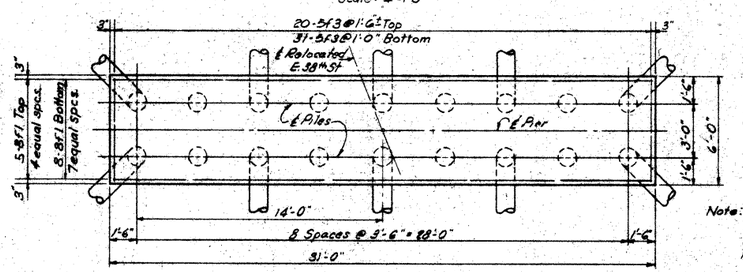
END ELEVATION
Scale: ¼"=1'-0"



SECTION A-A
Scale: ½"=1'-0"



SECTION B-B
Scale: ½"=1'-0"



FOOTING PLAN
Scale: ¼"=1'-0"

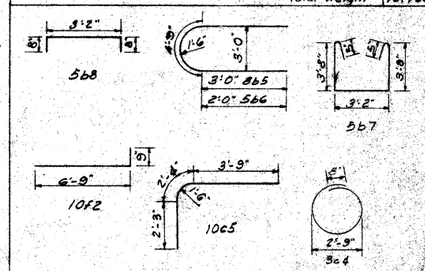
Note: 18-25' treated timber Piles required for each footing. Batter piles 1:4 in direction indicated.

PIER ELEVATIONS

LOCATION	A	B	C	D	E	F	Bott. Flg.
℄ Brg. Pier No.1	861.02	861.12	861.21	861.21	861.11	861.01	839.40
℄ Brg. Pier No.2	860.76	860.87	860.97	860.98	860.80	860.81	837.50
℄ Brg. Pier No.3	859.93	860.05	860.16	860.18	860.11	860.03	839.00

BILL OF REINF STEEL — THREE PIERS

Mark	Location	Shape	No.	Length	Weight
8b1	Pier Cap, Longitudinal	——	18	24'-7"	1181
8b2	Pier Cap, Longitudinal	——	6	26'-10"	430
5b3	Pier Cap, Longitudinal	——	12	24'-7"	307
8b4	Pier Cap, Longitudinal	——	12	12'-0"	384
8b5	Pier Cap, Hoops	⊂⊃	12	10'-9"	344
5b6	Pier Cap, Hoops	⊂⊃	12	8'-9"	110
5b7	Pier Cap, Stirrup	⊓	48	11'-4"	567
5b8	Pier Cap, Stirrup tie	⊓	57	4'-6"	268
10c1	Column, Longitudinal	——	24	17'-10"	1842
10c2	Column, Longitudinal	——	24	19'-6"	2014
10c3	Column, Longitudinal	——	24	17'-2"	1773
3c4	Column, Hoops	○	132	9'-3"	459
10c5	Column, Corners	⌐	18	8'-4"	646
8f1	Footing, Longitudinal	——	99	30'-6"	3176
10f2	Footing dowel	⌐	72	7'-6"	2324
5f3	Footing	——	156	5'-6"	895
				Total weight	16,720



Note: All bar dimensions are out to out of bars.
All radii are to ℄ of bars.

BAR DETAILS

ESTIMATED QUANTITIES — THREE PIERS

Item	Pier 1	Pier 2	Pier 3	Total
Concrete in footing	24.1 c.y.	24.1 c.y.	24.1 c.y.	——
Concrete above footing	25.8 c.y.	27.1 c.y.	25.3 c.y.	——
Total Concrete	49.9 c.y.	51.2 c.y.	49.4 c.y.	150.5 c.y.
Reinforcing Steel	5,537	5,715	5,468	16,720 lbs.
Treated timber piles	450 L.F.	450 L.F.	450 L.F.	~~1,350 L.F.~~ 1274
Class 20 Excavation	62 c.y.	62 c.y.	62 c.y.	186 c.y.

PIER NOTES:

All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.
Pier piles are to be driven to full penetration if practicable but in no case to less than 20 tons bearing capacity.
Minimum distance from face of concrete to nearest reinforcing bar is to be 2" unless otherwise shown or noted.
All pier piles are to be treated timber.

SPECIFICATIONS

Design: AASHO, Series of 1953
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1953, plus current special provisions.

DESIGN FOR 15°00'-00" SKEW

223'-9½" x 24' PRE-TENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

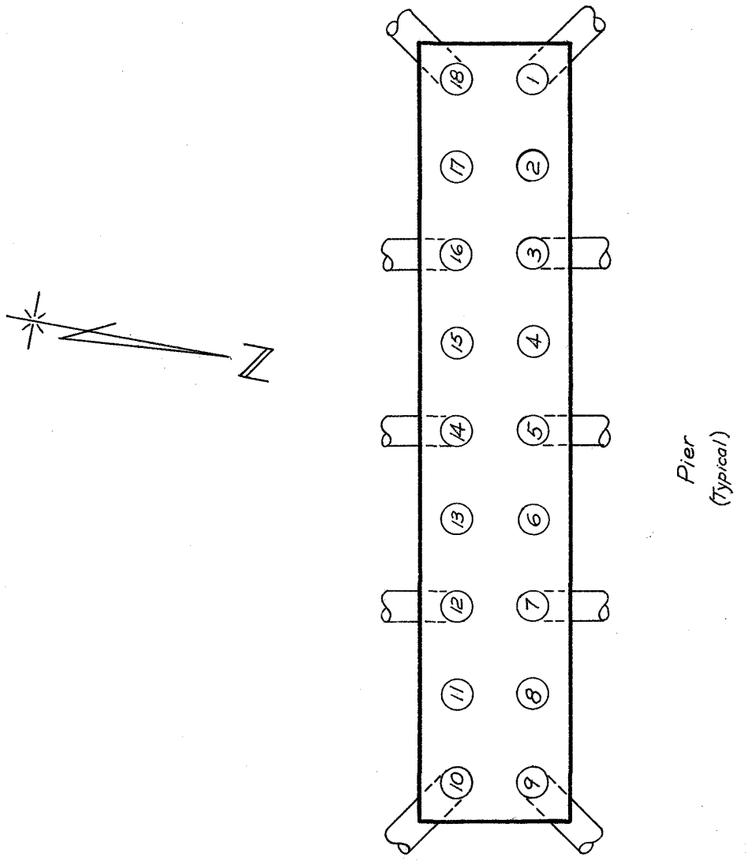
2-43'-1½" END SPANS 2-68'-9" INTERMEDIATE SPANS
CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL
RELOCATED E. 38TH STREET OVER INTERSTATE

PIERS

STATION 1181+53.00 ℄ INTERSTATE PROJ. NO. I-IG-01-4(2) I-IG-80-4(2)142
POLK COUNTY
DESIGNED BY BROWN ENGINEERS, NEW YORK, N.Y. FOR IOWA STATE HIGHWAY COMMISSION
AUGUST 1958 SHEET 3 OF 5

In Charge of: L.G.
Made by: F.P.K.
Traced by: E.P.E.
Checked by: G.R.

DESIGN NO. 4558 POLK CO. FILE NO. 18856



No	Date	Length in Leads	Length of Cutoff	Length in Structure	Batter	Drop	Av. Pen in last 5 blows	Bearing
Pier No 1								
1	6-9-59	25'	1.4	23.6	1:4	10'	0.85	28.0
2	6-8-59		1.4	23.6	Vert.		0.70	33.8
3	6-9-59		1.6	23.4	1:4		0.70	32.0
4	6-8-59		1.1	23.9	Vert		0.80	30.8
5	6-9-59		1.6	23.4	1:4		0.55	37.3
6	6-8-59		1.3	23.7	Vert		1.25	22.2
7	6-9-59		1.4	23.6	1:4		1.20	21.6
8	6-8-59		1.4	23.6	Vert		0.70	33.8
9	6-9-59		1.3	23.7	1:4		0.60	35.4
10	6-9-59		1.6	23.4	1:4		0.90	26.9
11	6-8-59		1.5	23.5	Vert		0.90	28.4
12	6-8-59		1.5	23.5	1:4		1.00	24.9
13	6-8-59		1.4	23.6	Vert		0.90	28.4
14	6-8-59		2.0	23.0	1:4		0.80	29.2
15	6-8-59		1.6	23.4	Vert		0.70	33.8
16	6-9-59		1.3	23.7	1:4		0.90	26.9
17	6-8-59		1.3	23.7	Vert		0.90	28.4
18	6-9-59	↓	1.5	23.5	1:4	↓	0.95	25.8
Pier No 2								
1	6-9-59	25'	1.3	23.7	1:4	10'	0.75	30.5
2	6-9-59		0.8	24.2	Vert.		0.90	28.4
3	6-10-59		1.2	23.8	1:4		0.85	28.0
4	6-9-59		0.9	24.1	Vert.		0.95	27.3
5	6-10-59		1.0	24.0	1:4		1.05	24.0
6	6-9-59		1.1	23.9	Vert		1.00	26.3
7	6-9-59		1.6	23.4	1:4		0.90	26.1
8	6-9-59		0.8	24.2	Vert.		1.10	24.5
9	6-9-59		1.0	24.0	1:4		1.00	24.9
10	6-10-59		1.2	23.8	1:4		0.85	28.0
11	6-9-59		0.8	24.2	Vert.		1.20	22.9
12	6-9-59		0.9	24.1	1:4		0.90	24.9
13	6-9-59		1.2	23.8	Vert		0.70	33.8
14	6-9-59		0.8	24.2	1:4		0.95	25.8
15	6-9-59		0.9	24.1	Vert.		0.95	27.3
16	6-10-59		0.6	24.4	1:4		0.80	29.2
17	6-9-59		1.2	23.8	Vert		0.75	32.3
18	6-10-59	↓	6.1	18.9	1:4	↓	0.40	44.8
Pier No 3								
1	6-11-59	25'	0.4	24.6	1:4	10'	1.30	20.3
2	6-10-59		0.5	24.5	Vert.		1.10	24.5
3	6-11-59		0.9	24.1	1:4		1.10	23.2
4	6-10-59		1.2	23.8	Vert		1.00	26.3
5	6-11-59		1.0	24.0	1:4		1.20	21.7
6	6-10-59		0.9	24.1	Vert		1.25	22.2
7	6-11-59		1.0	24.0	1:4		1.15	22.4
8	6-10-59		0.9	24.1	Vert		1.10	24.5
9	6-11-59		1.2	23.8	1:4		1.20	21.7
10	6-10-59		1.0	24.0	1:4		1.20	21.7
11	6-10-59		0.9	24.1	Vert		0.80	30.9
12	6-10-59		0.9	24.1	1:4		1.10	23.2
13	6-10-59		1.0	24.0	Vert		1.10	24.5
14	6-10-59		0.7	24.3	1:4		1.10	23.2
15	6-10-59		0.7	24.3	Vert		1.15	23.7
16	6-10-59		0.8	24.2	1:4		1.20	21.7
17	6-10-59		0.9	24.1	Vert		1.20	22.9
18	6-11-59	↓	11.0	14.0	1:4	↓	2.00	17.2

DATA

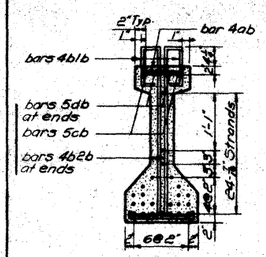
Type of piling : Treated Southern Pine
Type of hammer : Gravity I.H.C. # 742
Weight of hammer :

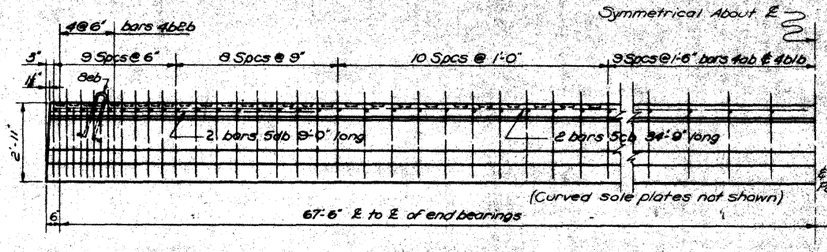
Gross	3830	lb
Eff.	3750	lb

Weight of cap 1110 lb
Weight of pile 1124 lb
Full penetration or 20 ton minimum bearing

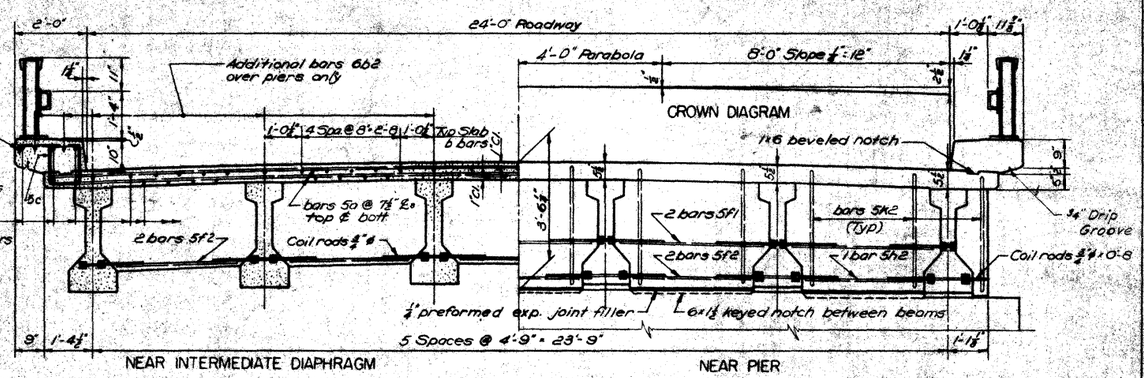
Pile bearing formula : $P = \frac{3WH}{S+0.35} \times \frac{WK}{W+M}$

P = pile bearing, in tons
H = height of hammer drop, in feet
S = average penetration, in inches
W = weight of hammer, in tons
M = weight of cap plus pile, in tons
K = batter factor (0.946 for 1:4)

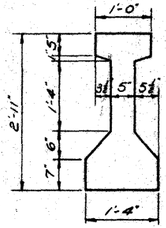


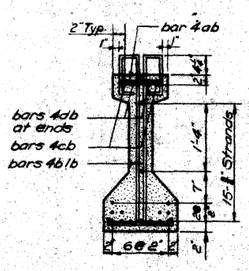


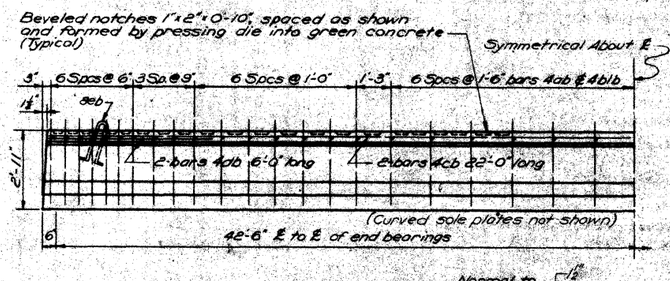
Note: For Curb details see Sht 6



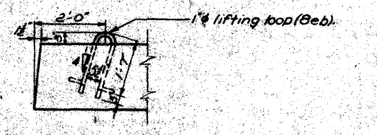
ROADWAY SECTIONS
Scale: ½"=1'-0"





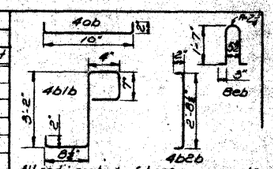


DETAILS OF BEAMS



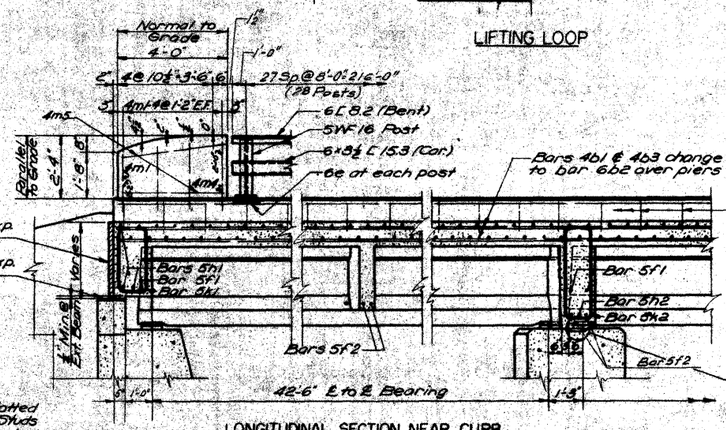
LIFTING LOOP

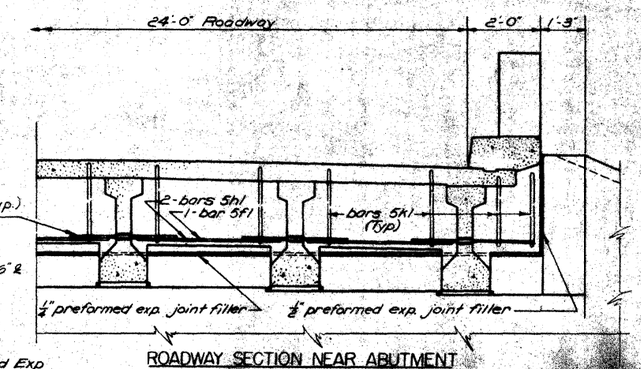
BILL OF REINFORCING STEEL (ONE BEAM)								
Bar	Shape	42'-6"			67'-6"			
		No	Length	Weight	No	Length	Weight
4ab	⌐	45	1'-2"	35	73	1'-2"	57
4b1b	P	90	4'-11"	295	146	4'-11"	479
4b2b	⌋	—	——	——	20	3'-0"	40
cb	—	¾	22'-0"	59	¾	36'-9"	145
db	—	¼	6'-0"	16	¾	9'-0"	38
6eb	⊂	2	3'-11"	21	2	3'-11"	21
Total Wt			426			780	



All radii are to ℄ of bars.
All dimensions are out to out.

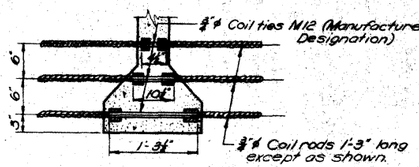
BEAM DATA								
Span	Depth	Strands	Concr't C.Y.	Reinf. Steel lb.	Struct. Steel lb.	Init. Pre. stress	Camber	
							At erect.	Stabilized
42'-6"	2'-11"	15-⅜"ø	3.60	426	190	210k	¾"	½"
67'-6"	2'-11"	24-⅜"ø	5.70	780	217	453k	1⅜"	15/16"





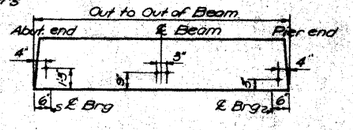
ROADWAY SECTION NEAR ABUTMENT

Coil rods shown below shall be similar to and equal to those manufactured by the Superior Concrete Accessories Co., Inc. of Chicago and the Richmond Screw Anchor Co., of St. Joseph, Mo.



COIL TIE DETAILS
Not to scale

Coil ties are to be held in place in forms by slotted coil setting studs projecting through forms. Studs are to be left in place until beams are erected when they are to be replaced with coil rods. Cost of coil ties and rods is to be included in price bid for beams.

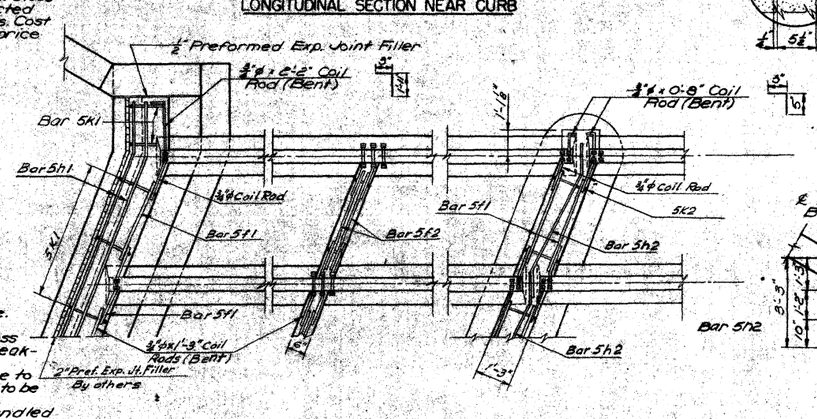


Note: Intermediate diaphragms are located at ℄s of beams.

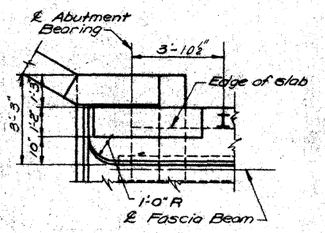
Concrete in beams shall have a 28 day crushing strength of 5000 p.s.i. and a minimum of 4500 p.s.i. when stress is released. It shall contain no Class 'V' aggregate. The maximum size of coarse aggregate shall be 1".

Prestressing tendons shall be 7 wire strands of high strength uncoated wire, stress relieved after stranding with a modulus of elasticity of about 25,000,000, ultimate breaking strength of 27,000 lbs. for ⅜" strands and 20,000 lbs. for ½" strands, yield strength (0.2% offset) of 85% of the ultimate and minimum elongation in 10' of 4%. Strands are to be initially stressed to 70% of the ultimate = 18,900 for ⅜" and 14,000 for ½". Stress is to be determined by the measured elongation and checked by gauges on calibrated jacks.

After release of strands beams are to be supported at all times near ends and handled by means of lifting loops cast in the concrete near the ends of the beams.



SECTION BELOW SLAB
Scale: ½"=1'-0"



PLAN AT ABUT
Scale: ⅜"=1'-0"

SUPERSTRUCTURE NOTES

The beams detailed on this sheet are designed for H-15-44 loading.

The concrete in slab is to have a 28 day crushing strength of 3500 p.s.i. and is to contain no Class 'V' aggregate. It is to be placed as dry as practicable to reduce shrinkage to a minimum and special precautions are to be taken to secure complete bond between beams and slab.

All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.

All reinforcing is to be securely wired in place and adequately supported on metal bar chairs before placing concrete.

Masonry plates are to be flat and true and are to be set in specification red lead and canvas. Beams are to be set vertically.

Cost of all preformed expansion joint filler is to be included in price bid for concrete.

Forms for slab are to be supported by the prestressed beams.

SPECIFICATIONS

Design: AASHO, Series of 1953 and U.S. Bureau of Public Roads Design Criteria for Prestressed Concrete Bridges, 1955.

Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1956, plus current Special Provisions.

DESIGN FOR 15°-00'-00" SKEW

223'-9"x24' PRE-TENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

2-43'-1½" END SPANS 2-68'-9" INTERMEDIATE SPANS

CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL

RELOCATED E. 38TH STREET OVER INTERSTATE

SUPERSTRUCTURE DETAILS - I

STATION 1181+53.00 ℄ INTERSTATE PROJ. NO. I-IG-01-4(2) I-IG-80-4(2)142

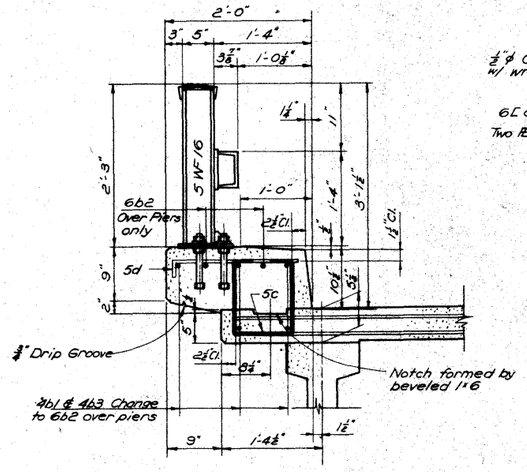
POLK COUNTY

DESIGNED BY BROWN ENGINEERS, NEW YORK, N.Y. FOR IOWA STATE HIGHWAY COMMISSION

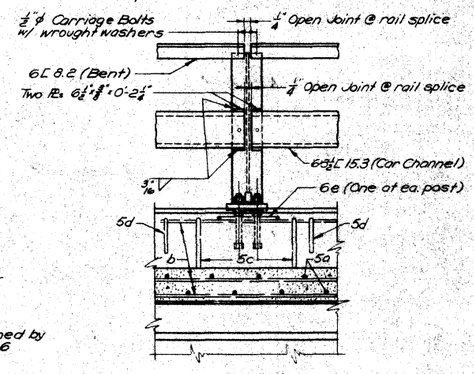
AUGUST 1958 SHEET 4 OF 5

In Charge of L.G.
Made By A.K.
Traced By A.K.
Checked By G.E.

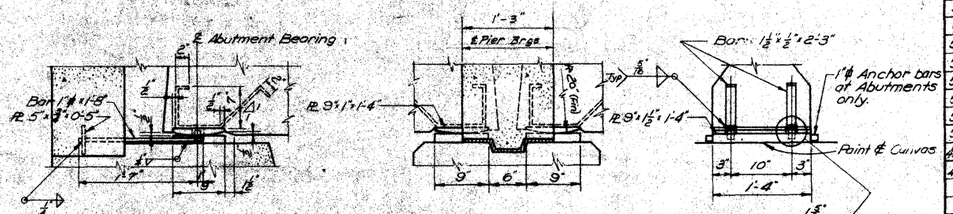
DESIGN NO. 4558 POLK CO. FILE NO. 18856



Note: Top & Bottom rails to be spliced at different posts.



Sole plates are to be set in forms when beams are cast and formed out as shown. Top of sole plate is to be beveled to compensate for grade of beam. Sole plates must be spaced to compensate for shrinkage & elastic shortening to maintain ℄ to ℄ bearing dimensions.

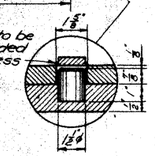


1" ø Pintles. Driving fit in all masonry Pls. Bevel upper end ¼". 1⅛"×2½" slots in abut. Sole Pls & 1⅛" ø holes in Pier Sole Pls.

AT ABUT AT PIER

Weld metal is to be carefully excluded from pintle recess

Msry Pls to be flat & true



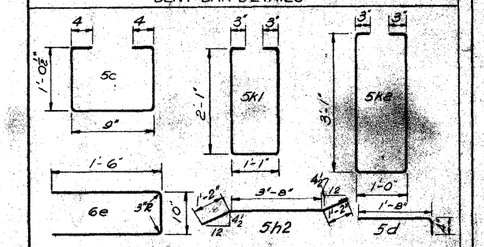
BEARING PLATE DETAILS

Cost of Bearing Pls is to be included in price bid for beams.

BILL OF REINFORCING STEEL — SUPERSTRUCTURE

Bar	Location	Shape	No.	Length	Weight
5a	Slab transverse, top & bot	—	721	26'-3"	18,740
4b1	Slab & Curb, longitudinal	—	110	38'-8	2841
6b2	Slab & Curb, longit. over pier	—	195	13'-9"	4027
4b3	Slab & Curb, longitudinal	—	220	29'-0"	4262
5c	Curb Dowels	⌐	304	3'-6"	1,110
5d	Curb transverse	⌐	224	2'-0"	467
6e	Rail Post tie	⌐	56	3'-10"	322
5f1	Abutment & Pier Diaphragm (Short)	—	40	4'-0"	167
5f2	Pier & Interm. Diaphragm (Short)	—	70	3'-3"	237
5h1	Abutment Diaphragm (Long)	—	6	27'-6"	172
5h2	Pier Diaphragm (Long)	—	15	6'-0"	94
5k1	Abutment Diaphragm Hoops	⌐	28	5'-9"	168
5k2	Pier Diaphragm Hoops	⌐	36	7'-8"	288
4m4	Wing Post - Vertical	—	8 Sets of 4	2'-2 Min. 2'-10 Max.	53
4m5	Wing Post - Horizontal	—	16	3'-8"	39
				Total	33,987

BENT BAR DETAILS



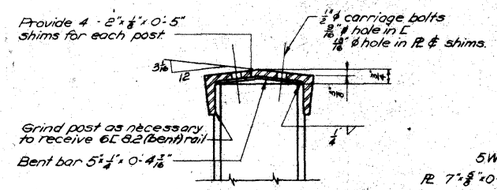
Note: All bar dimensions are out to out.

ESTIMATED QUANTITIES — SUPERSTRUCTURE

Item	Unit	Quantity
Concrete	C.Y.	150.6 V
Reinforcing Steel	lbs	33,987 V
Structural Steel	lbs	14,968 V
Prestressed Concrete Beam 42'-6"	Beam	12 V
Prestressed Concrete Beam 67'-6"	Beam	12 V

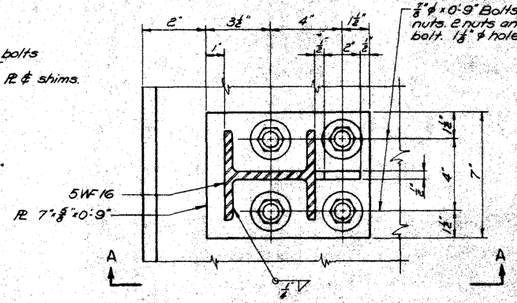
RAIL AND CURB DETAILS

Scale: 1" = 1'-0"



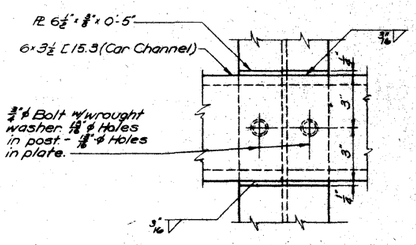
TOP RAIL CONNECTION DETAIL

Scale: 3" = 1'-0"



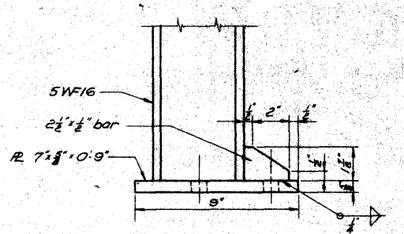
RAIL POST CONNECTION DETAIL

Scale: 3" = 1'-0"



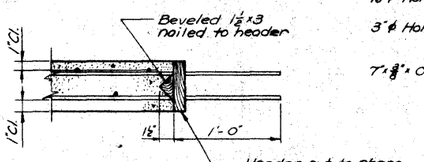
BOTTOM RAIL CONNECTION DETAIL AT INTERMEDIATE POST

Scale: 3" = 1'-0"



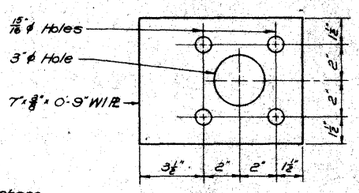
VIEW A A

Scale: 3" = 1'-0"



FLOOR CONST JT

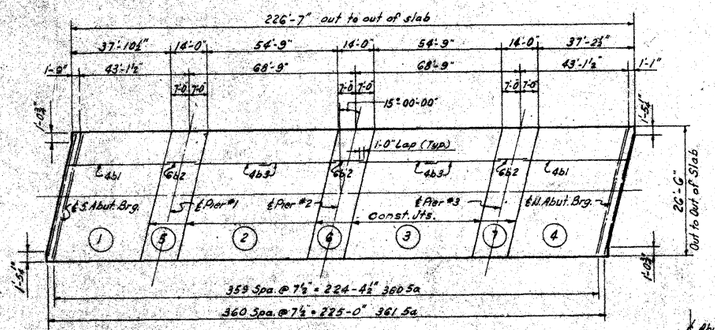
Scale: 1" = 1'-0"



BASE PLATE DETAIL

Scale: 3" = 1'-0"

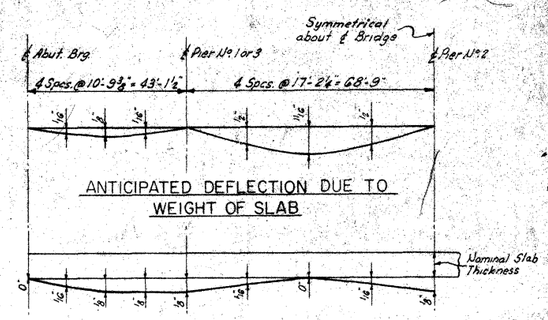
CONC. PLACEMENT QUANTITIES	
Section	Quantity
①	20.2 C.Y.
②	25.7 C.Y.
③	25.7 C.Y.
④	20.2 C.Y.
⑤	9.8 C.Y.
⑥	9.8 C.Y.
⑦	9.8 C.Y.
4-Parapet Posts	1.3 c.y.
Two Curbs	28.1 c.y.
Total	150.6 V



Slab is to be placed in sections and in the order indicated by encircled figures. Curb may be placed continuously.

CONCRETE PLACEMENT DIAGRAM & LAYOUT OF LONGITUDINAL STEEL

Not to Scale

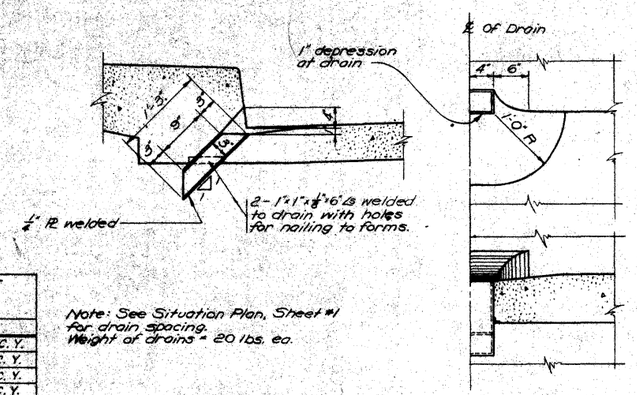


ANTICIPATED DEFLECTION DUE TO WEIGHT OF SLAB

SLAB THICKENING DIAGRAM

(For Estimating Purposes only)

Note: The floor slab is to be thickened or thinned to compensate for dead load deflection due to weight of floor slab and for the difference between permanent camber and actual camber of beams as erected. Maximum thinning not to exceed ½". Screeds are to be adjusted accordingly before placing slab.



Note: See Situation Plan, Sheet #1 for drain spacing. Weight of drains = 20 lbs. ea.

DRAIN DETAILS

Scale: 1" = 1'-0"

In Charge of L.G.
Made By F.P.K.
Traced By F.P.K.
Checked By G.R.

DESIGN FOR 15°00'00" SKEW

223'-9½" x 24' PRE-TENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

2-43'-1½" END SPANS 2-68'-9" INTERMEDIATE SPANS

CONCRETE FLOOR AND SUBSTRUCTURE - STEEL RAIL

RELOCATED E. 38TH STREET OVER INTERSTATE

SUPERSTRUCTURE DETAILS — 2

STATION 1181+53.00 ℄ INTERSTATE PROJ. NO. I-IG-01-4(2) I-IG-80-4(2)142

POLK COUNTY

DESIGNED BY BROWN ENGINEERS, NEW YORK, N.Y. FOR IOWA STATE HIGHWAY COMMISSION

AUGUST 1958 SHEET 5 OF 5

DESIGN NO. 4558 POLK CO. FILE NO. 18856