IOWADOT

Structure Inventory and Appraisal

Bridge ID: MILFORD-003616
FHWA No.: 3616

Official	SR: 51.3	SD/FO: Not Deficient or Obsolete
Unofficial	SR: 41.5	SD/FO: Functionally Obsolete

IDENTIFICATION

7 Facility Carried:	CO RD
5B Rte. Signing Prefix:	4
5C Level of Service:	1 - MAINLINE
5D Inventory Route:	00000
City:	DELOIT
3 County:	024 - Crawford
9 Location:	084381801
5E Directional Suffix:	0 - NOT APPLICABLE
6 Feature Intersected:	BOYER RIVER
2 District:	0
Garage:	000
98 Border Bridge Code:	
% Responsibility:	0
99 Border Bridge No.:	

STRUCTURE TYPE AND MATERIALS

43A Main Span	4 - Steel Continuous
43B Main Span Design:	02 - Stringer/Multi-beam or Girder
45 No. Spans Main Unit:	3
44A Appr. Span	000 - NA
44B Appr. Span Design:	000 - NA
46 No. of Appr. Spans:	Near 0 Far 0
107 Deck Type:	1 - Concrete Cast-in-Place
108A Wearing Surface:	1 - Monolithic Concrete (concurrently placed with structural deck)
108B Membrane:	0 - None
108C Deck Protection:	0 - None

GEOMETRIC DATA

48 Length Max Span:	58 ft.
49 Structure Length:	152 ft.
34 Skew:	0°
Deck Area:	3648.0 sq. ft.
50B Curb/Sdwk Width R:	0 ft.
50A Curb/Sdwk Width L:	0 ft.
51 Width Curb to Curb:	22.0 ft.
52 Width Out to Out:	24.0 ft.
32 Appr. Roadway width: (w/ Shoulders)	30 ft.
33 Median:	0 - No median
35 Structure Flared:	00 - No flare
10 Vertical Clearance:	99'99"
47 Horiz. Clearance:	22'00"
53 Min. Vert. Clearance Over:	99'99"
54B Min. Vert. Underclearance:	00'00"
55 Min. Lat. Underclearance R:	00'00"
56 Min. Lat. Underclearance L:	00'00"

NAVIGATION DATA

38 Navigation Control:
0 - No navigation control on waterway (bridge permit not required)

111 Pier Protection:	
39 Vertical Clearance:	00'00"
40 Horiz. Clearance:	000'00"

16 Latitude: 42.09449467 17 Longitude: -95.31175356

FRA No. (if RR Bridge):
Mile Post:

INSPECTION

90 Inspection Date:	**04/01/2016**	Inspection Type:	N/A
Next Routine Insp Date:	04/01/2018	91 Frequency:	24
		Next Insp Type:	In-Depth
Inspection Agency:	5 - Consultant	Inspection Group:	Crawford County
93A FC Inspection Date:			
92A FC Frequency:	0	Next FC Insp.:	NA
93B UW Inspection Date:			
92B UW Frequency:	0	Next UW Insp.:	NA
93C SI Date:			
92C SI Frequency:	0	Next Spec. Insp.:	NA
Other Non-NBI Date:			
Other Non-NBI Freq.:		Next Other Insp.:	NA

CONDITION

58 Deck:	5 - Fair Condition (minor section loss)
59 Super:	6 - Satisfactory Condition (minor deterioration)
60 Sub:	5 - Fair Condition (minor section loss)
61 Channel/Channel Prot.:	6 - Bank slump, widespread minor damage
62 Culvert:	N - Not Applicable

APPRAISAL

67 Str. Evaluation:	4 - Meets minimum tolerable limits
68 Deck Geometry:	4 - Meets minimum tolerable limits
69 Underclear Vert & Horiz:	N - Not applicable
71 Waterway Adequacy:	6 - Occasional Overtopping of Approaches
72 Approach Alignment:	3 - Intolerable - high priority of corrective action
36A Bridge Rail:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED.
36B Transition:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
36C Approach Rail:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
36D Approach Rail Ends:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
113 Scour Critical:	8 - Stable - Excellent Condition

LOAD RATING AND POSTING

31 Design Load:	2 - H 15
63 Rating Method:	1 - Load Factor (LF) reported in english tons using HS-20 loading.
64 Operating Rating:	27.4 Tons
65 Rating Method:	1 - Load Factor (LF) reported in english tons using HS-20 loading.
66 Inventory Rating:	16.4 Tons
70 Posting:	3 - 10.0-19.9% below legal loads
41 Posting Status:	P - Posted for Load

AGE AND SERVICE

27 Year Built:	1949	Design No.:	0
106 Year Reconstructed:	0		
42A Type of Service on:	1 - Highway		
42B Type of Service Under:	5 - Waterway		
28A Lanes on:	2	28B Lanes under:	0
29 ADT:	260	30 Year of ADT:	2008
109 Truck ADT:	0 %	Speed Limit:	25
19 Detour Length:	12 mi.		

CLASSIFICATION

112 NBIS Length:	Y
26 Functional Class:	08 - Rural - Minor Collector
100 STRAHNET:	0 - Not a defense highway
101 Parallel Structure:	N - No parallel structure
102 Direction of Traffic:	2 - 2-way traffic
22 Owner:	02 - County Highway Agency
21 Custodian:	02 - County Highway Agency
37 Historical Significance:	5 - Not eligible
75A Type of Work Proposed:	
75B Work Done by:	

Structure Inventory and Appraisal

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FHWA No.: 3616

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93C SI Date:			
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Other Non-NBI Date:			
Other Non-NBI Freq.:		Next Other Insp.:	NA

CONDITION

58 Deck:	4 - Poor Condition (advanced deterioration)
59 Super:	6 - Satisfactory Condition (minor deterioration)
60 Sub:	5 - Fair Condition (minor section loss)
61 Channel/Channel Prot.:	6 - Bank slump. widespread minor damage
62 Culvert:	N - Not Applicable

APPRAISAL

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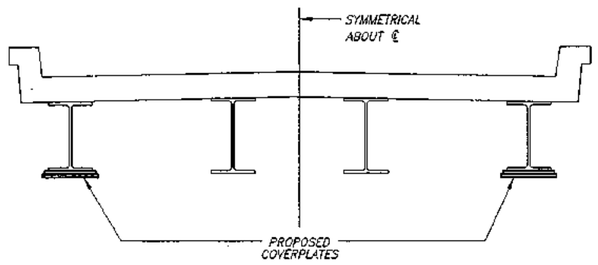
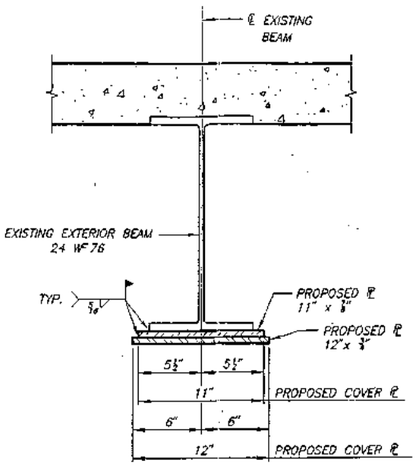
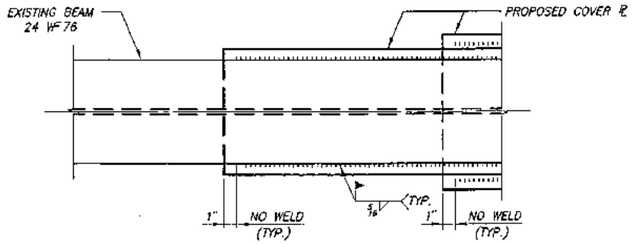


TYPICAL CROSS SECTION
NEAR MID SPANS



EXTERIOR BEAMS



TYPICAL WELD

GENERAL NOTES

THE INTENT OF THIS SHEET IS TO STRENGTHEN CRAWFORD COUNTY BRIDGE 'MILFORD 9' (FHWA NO. 003616), A THREE SPAN CONTINUOUS STEEL I-BEAM BRIDGE. THE BRIDGE IS LOCATED IN THE CITY OF DELOIT OVER THE BOYER RIVER. STRENGTHENING OF THE BRIDGE SHALL CONSIST OF ADDING COVER PLATES TO THE BOTTOM FLANGE OF THE EXTERIOR BEAM FOR EACH SPAN. (TWELVE (12) PLATES REQUIRED).

THIS DESIGN IS SITE-SPECIFIC FOR THE BRIDGE DESIGNATED BY THE COUNTY AS CRAWFORD COUTNY BRIDGE 'MILFORD 9' (FHWA NO. 003616.) AS SHOWN IN THE TITLE BLOCK OF THIS DRAWING, AND IS NOT TO BE CONSIDERED USEABLE AT ANY OTHER SITE.

THE CONTRACTOR IS ADVISED THAT TOXIC LEVELS OF LEAD, CHROMIUM AND OTHER CONSTITUENTS MAY EXIST ON THE EXISTING BEAMS AND COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS.

ALL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT ANSI/AWS STRUCTURAL WELDING CODE, AS MODIFIED BY THE AASHTO STEEL WELDING SPECIFICATIONS AND ARTICLE 2408.13. WELDING SHALL BE PERFORMED BY AN AWS PREQUALIFIED WELDER, CERTIFIED IN THE POSITIONS AND CONDITIONS REQUIRED, AND IN CONFORMANCE WITH WEATHER CONDITIONS AT THE TIME THE WORK IS PERFORMED. UNLESS NOTED OTHERWISE, THE DESIGN JOINT DETAILS ARE FOR MANUAL SHIELDED METAL ARCWELDING. LOW HYDROGEN RODS OF AT LEAST FY= 60,000 PSI SHOULD BE USED.

ALL NEW STEEL SHALL BE ASTM A-709 FY=36,000 PSI.

CONTRACTOR IS TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND BEGINNING WORK. IF FIELD DIMENSIONS DIFFER FROM DIMENSIONS SHOWN, THE ENGINEER SHALL BE NOTIFIED.

THIS BRIDGE STRENGTHENING WILL PROVIDE A LEGAL RATING FOR TYPE 4, 3S3A, 3-3, 3S3B AND 4S3 TRUCKS, AT OPERATING STRESSES.

BRIDGE IS TO BE CLOSED TO ALL TRAFFIC DURING FIELD CONSTRUCTION IN ACCORDANCE WITH CURRENT IDOT REQUIRMENTS.

SCOPE OF WORK FOR THIS PROJECT INCLUDES ALL LABOR, EQUIPMENT, MATERIALS AND SUPERVISION NECESSARY TO REPAIR AND STENGTHEN THIS BRIDGE IN ACCORDANCE WITH THIS PLAN AND THE STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, SERIES OF 2001, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

EXISTING BRIDGE IS IOWA DEPARTMENT OF TRANSPORTATION STANDARD V7, 1939

ALL NEW STRUCTURAL STEEL SHALL BE PAINTED AS PER THE REQUIREMENTS OF SECTION 2408.30 OF THE STANDARD SPECIFICATIONS. THE TOP COAT SHALL BE USED AND ITS COLOR SHALL MATCH AS CLOSELY AS POSSIBLE THE COLOR OF THE EXISTING PAINT.

ALL EXISTING STRUCTURAL STEEL AFFECTED BY THIS WORK AND NEW COVER PLATES SHALL BE PRIMED AND FIELD PAINTED IN ACCORDANCE WITH IDOT SPECIFICATIONS.

ALL CONSTRUCTION LOADS AND EQUIPMENT EXCEPT ANY NECESSARY CLAMPS MUST NOT BE SUPPORTED BY THE BRIDGE DURING FIELD WELDING OPERATIONS.

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

DATE: 6-16-06

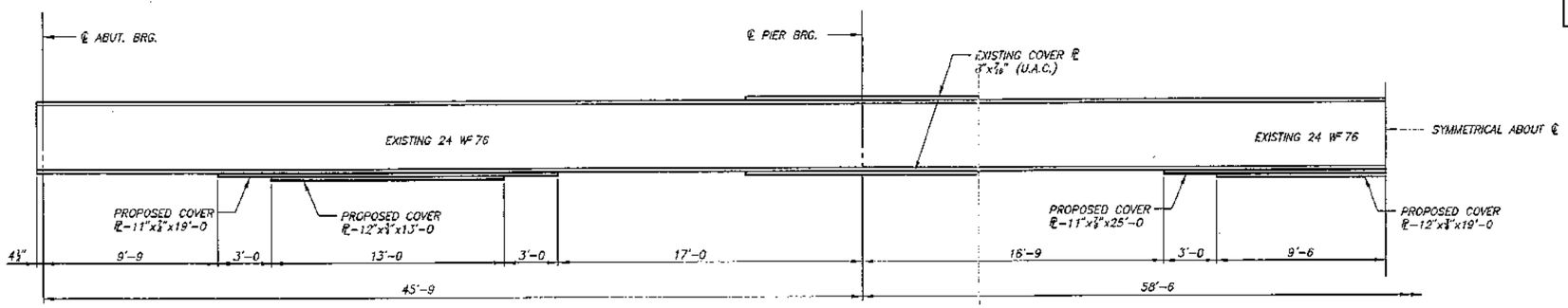
LOWELL G. MILLER. P.E.

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2006.

PAGES OR SHEETS COVERED BY THIS SEAL:

Sheet 1 of 1

BILL OF MATERIALS		
	END SPAN	CENTER SPAN
EXTERIOR BEAMS	℄ 11"x⅞"x19'-0	℄ 11"x⅞"x25'-0
	4 REQUIRED	2 REQUIRED
	℄ 12"x¾x13'-0	℄ 12"x¾x19'-0
	4 REQUIRED	2 REQUIRED



END SPANS

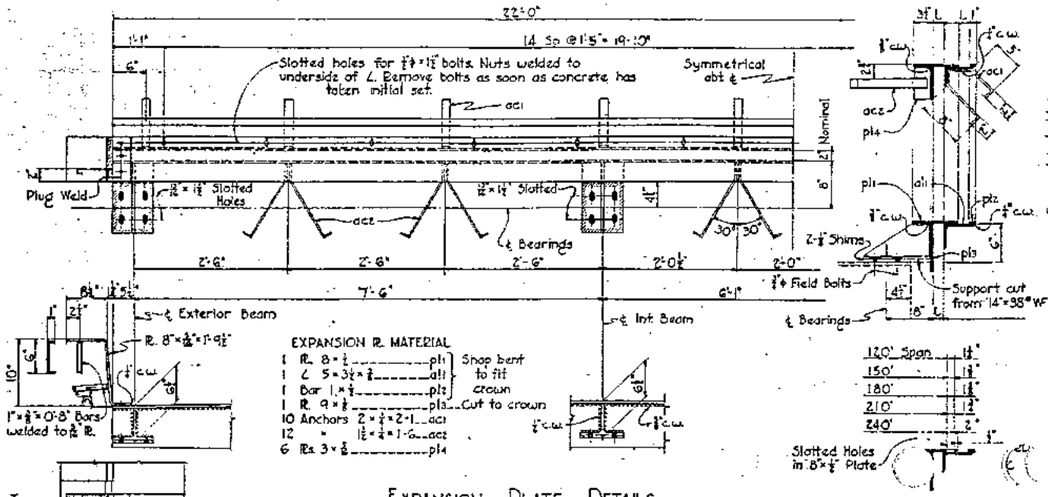
CENTER SPAN

EXTERIOR BEAM

FHWA NO. 003616 CITY OF DELOIT

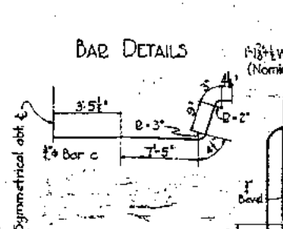
BRIDGE STRENGTHENING DETAILS

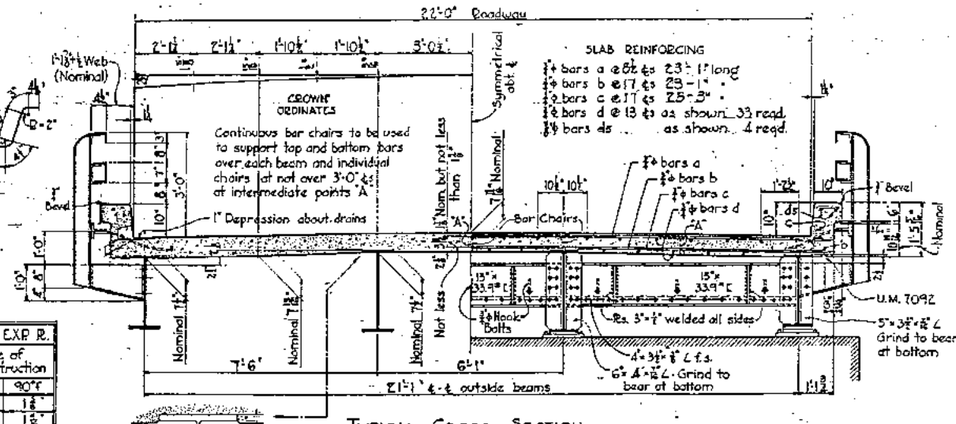
CRAWFORD COUNTY IOWA



EXPANSION PLATE DETAILS

BAR DETAILS





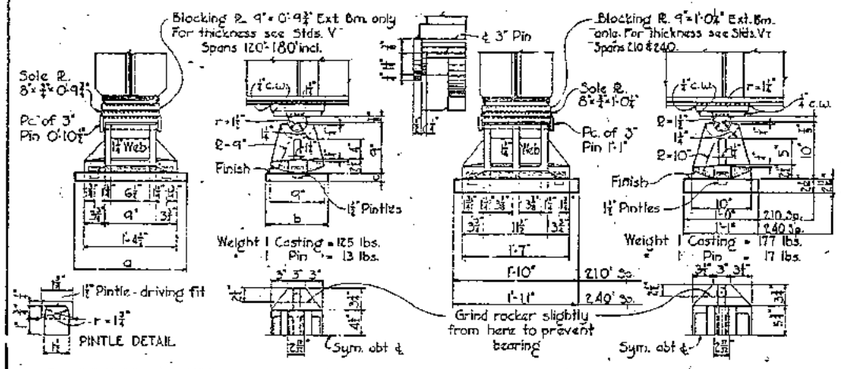
TYPICAL CROSS SECTION
Scale ½" = 1'-0"

TABLE No. 2

DIM. "L" for SETTING EXP R.			
SPAN	Temp. at time of back wall construction		
	10°F	50°F	90°F
120'-0"	2½"	2"	1½"
150'-0"	2⅝"	2"	1⅜"
180'-0"	2¾"	2"	1¼"
210'-0"	2⅞"	2"	1⅛"
240'-0"	3"	2"	1"

TABLE No. 1

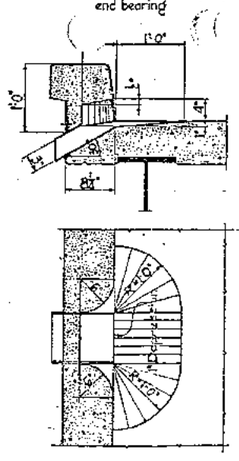
DIM. + for SETTING ROCKERS					
10°F		50°F		90°F	
Pier No. 1	Pier No. 2	Pier No. 1	Pier No. 2	Pier No. 1	Pier No. 2
1"	½"	0	0	½"	1"



C. I. ROCKER & STEEL MASONRY R.
120'-150'-180' SPANS

C. I. ROCKER & STEEL MASONRY R.
210' & 240' SPANS

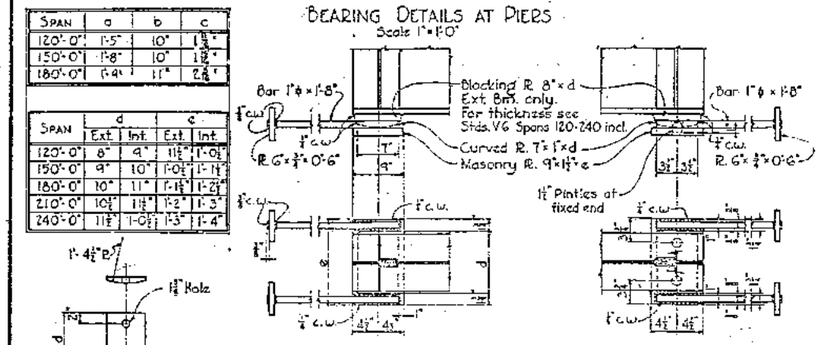
Note: Pier No. 1 adjacent to fixed end bearing.
Pier No. 2 adjacent to expansion end bearing

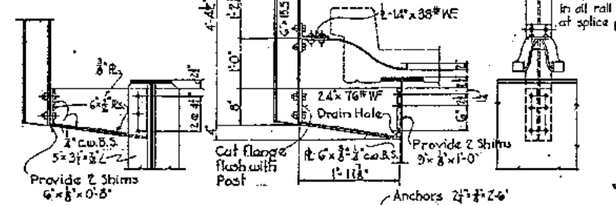


DRAIN DETAILS
Scale 1"=1'-0"

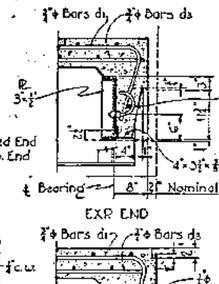
SPAN	a	b	c
120'-0"	1'-5"	10"	1⅜"
150'-0"	1'-8"	10"	1⅝"
180'-0"	1'-11"	11"	2⅛"

SPAN	d		e	
	Ext.	Int.	Ext.	Int.
120'-0"	8"	9"	11½"	1'-0½"
150'-0"	9"	10"	1'-0½"	1'-1½"
180'-0"	10"	11"	1'-1½"	1'-2½"
210'-0"	10½"	1'-0"	1'-2½"	1'-3½"
240'-0"	11½"	1'-0½"	1'-3½"	1'-4½"



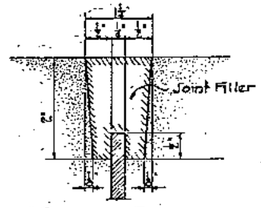


RAIL POST CONNECTION AT PIERS AND ABUTS.



RAIL POST DETAILS
Scale ½" = 1'-0"

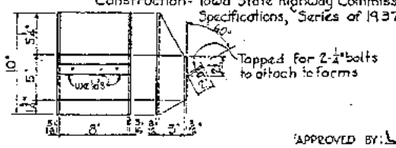
SECTION THRU END DIAPHRAGM
Scale ½" = 1'-0"



SEALED JOINT FIXED END

GENERAL NOTES

This series is designed for H-15 loading plus 19 lbs. per sq. ft. of roadway for future wearing surface. Slab as shown includes ½" of wearing surface.
Field connections may be riveted or bolted, except as noted or indicated.
All rivets and bolts to be ¾"ϕ unless otherwise noted.
Bottom flange of beams to be perpendicular to web at reaction points.
Beam splices to be sub punched and reamed. Before reaming all beams shall be assembled to proper camber for inspection after which holes may be reamed and all parts match marked.
All masonry plates to be set in red lead and canvas. Bearing surfaces of unfinished masonry plates to be flat and true.
Adjustment in rocker and expansion plate settings may be computed by interpolation within range of temperature shown in tables.
Forms for floor and curb to be supported by beams.
Specifications:
Design - A.A.S.H.O. (1935) with modifications. 9'-0" Lanes.
Construction - Iowa State Highway Commission Standard Specifications, Series of 1937.



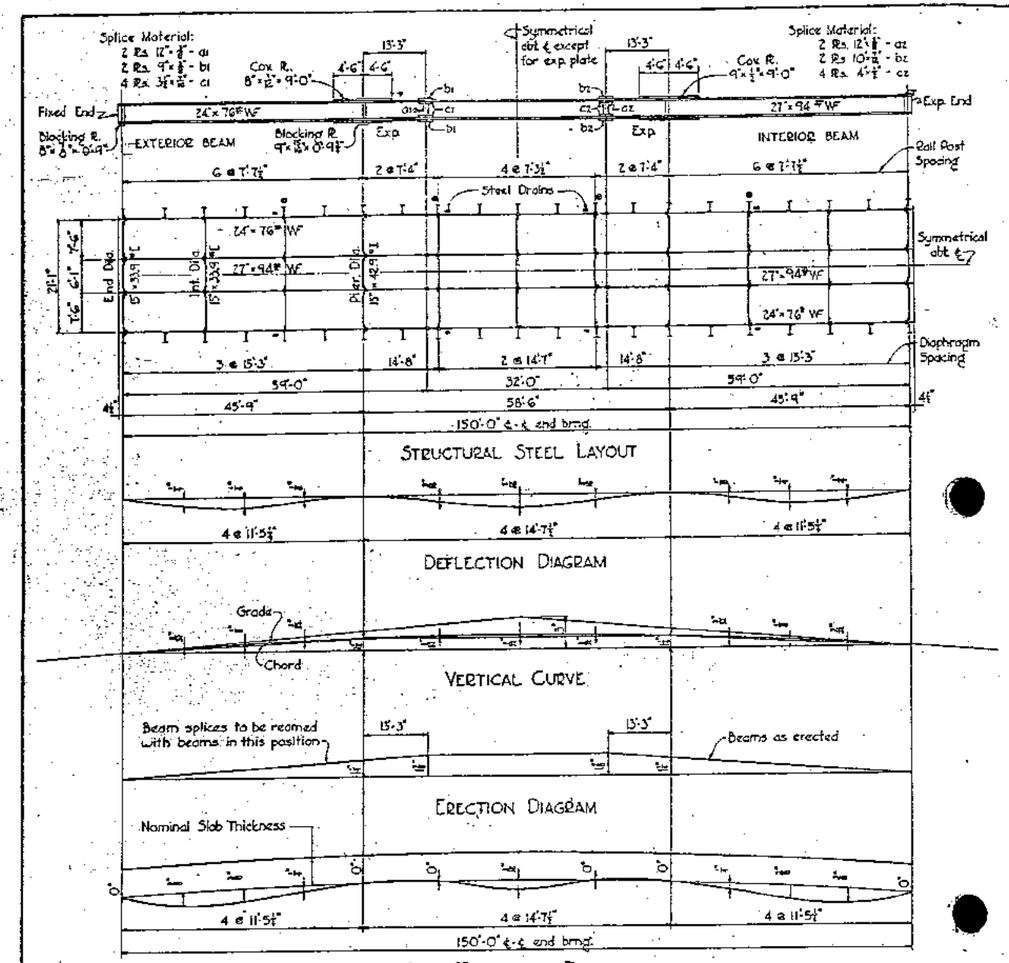
WELDED STEEL DRAINS
Wt. 12 lbs. ea.

APPROVED BY: R. A. White
CHIEF ENGINEER

STANDARD DESIGN
CONTINUOUS I-B SPANS
MISCELLANEOUS DETAILS
H-15 LOADING - CONCRETE FLOOR - STEEL RAILS
IOWA STATE HIGHWAY COMMISSION
JUNE 1939

V7
MISCEL
H-15

Revised 11-15-46 Curb, bracket, rail and drain details changed



Note:
Slab thickening based on vertical curve shown above. When different vertical curve is used change slab thickening ordinates and erection diagram accordingly.

Note:
Roadway slab to be placed in sections and order indicated by numbers in circles. Intervals between placing slab sections shall preferably not exceed 24 hours.

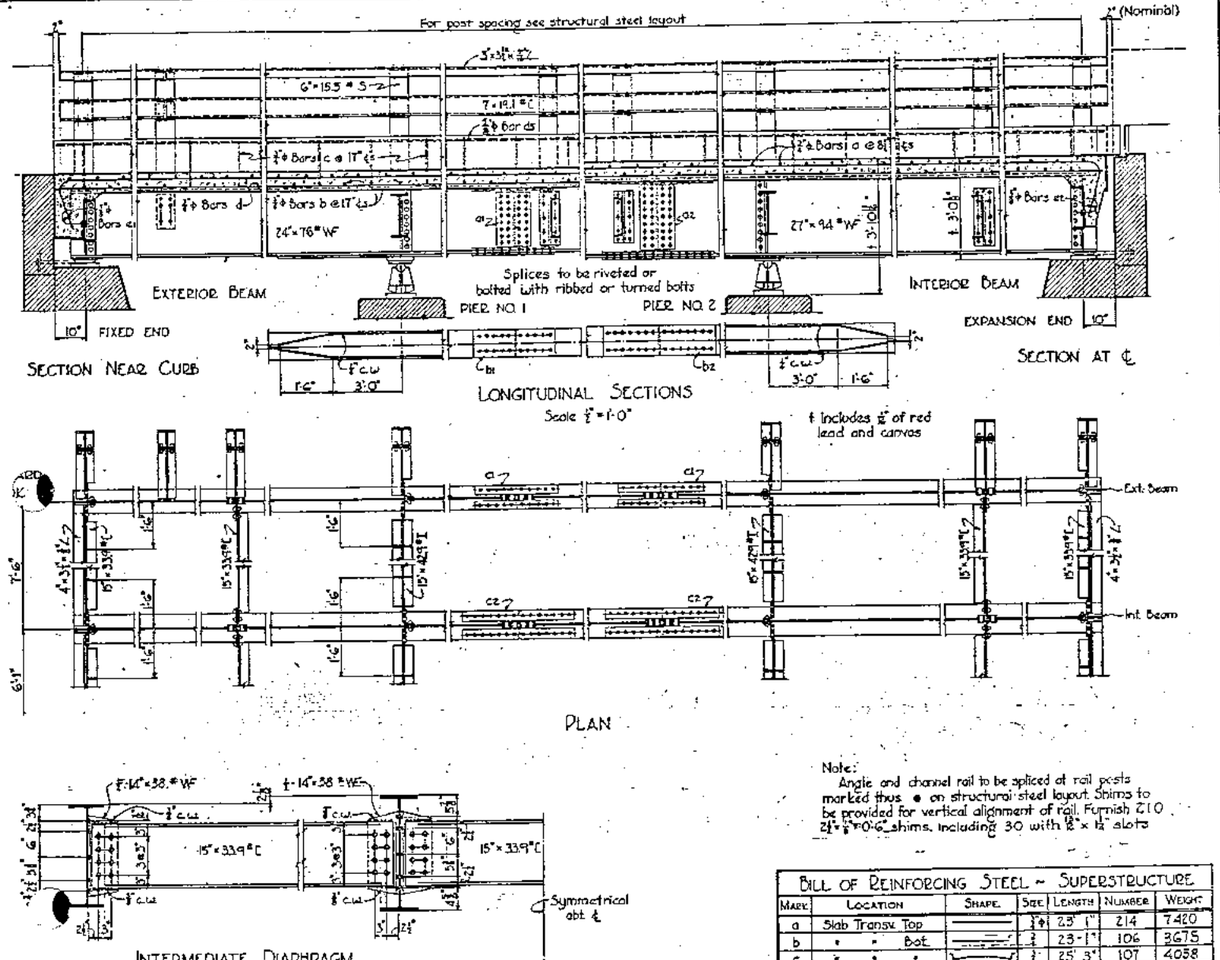
MOMENTS AND REACTIONS

IN FT. KIPS AND KIPS

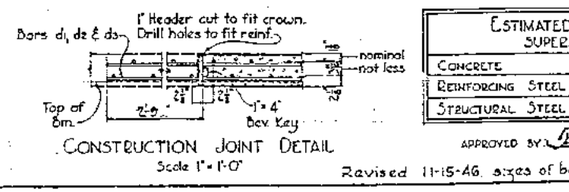
* Truck Loading

	Pos. Moment End Span		Neg. Moment at Piers		Pos. Moment Center Sp.		Pier Reactions		Abut. Reactions	
	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam
Dead Load	96.0	122.1	226.0	287.5	90.9	115.7	43.5	55.4	12.0	15.3
Live Load	* 100.0	* 183.0	92.6	142.2	104.5	* 189.0	20.7	31.7	12.5	* 20.2
Impact	30.0	54.9	27.8	42.7	31.4	56.7	6.2	9.5	3.7	6.1
Total	◇ 226.0	360.0	346.4	472.4	◇ 226.8	361.4	70.4	96.6	28.2	41.6

Overload:
◇ 237.0 Kips
◈ 238.0 Kips



For miscellaneous details and general notes see Sheet No. V7-Miscel-H15



ESTIMATED QUANTITIES
SUPERSTRUCTURE

Concrete	96.2 cu. yds.
Reinforcing Steel	23967 lbs.
Structural Steel	86390 lbs.

APPROVED BY: R. R. Whitson
CHIEF ENGINEER

Revised 11-15-46. sizes of beams, rails and estimates changed

Note:
Angle and channel rail to be spliced at rail posts marked thus • on structural steel layout. Shims to be provided for vertical alignment of rail. Furnish 210 2½"×⅜"×0'-6" shims, including 30 with ⅞"×1¼" slots

BILL OF REINFORCING STEEL ~ SUPERSTRUCTURE

Mark	Location	Shape	Size	Length	Number	Weight
a	Slab Transv. Top		¾	23' 1"	214	7420
b	" " Bot.		¾	23'-1"	106	3675
c	" " "		¾	25' 3"	107	4058
d1	Slab Long. Top ①③		¾	36' 8"	34	1872
d2	Slab Long. Top ② Bot ④		¾	36' 0"	33	1784
d3	" " Bot. ①⑤		¾	35' 2"	32	1690
d4	" " Top ④⑤ Bot ③		¾	27' 9"	66	2751
e1	End Diaphragm		¾	7' 3"	4	30
e2	" "		¾	5'-10"	2	12
d5	Curb Long. Top		½	#varies	20	675
	TOTAL WT.					23967 #

* Same lengths as d2 - d3 - d4 respectively.

STANDARD DESIGN

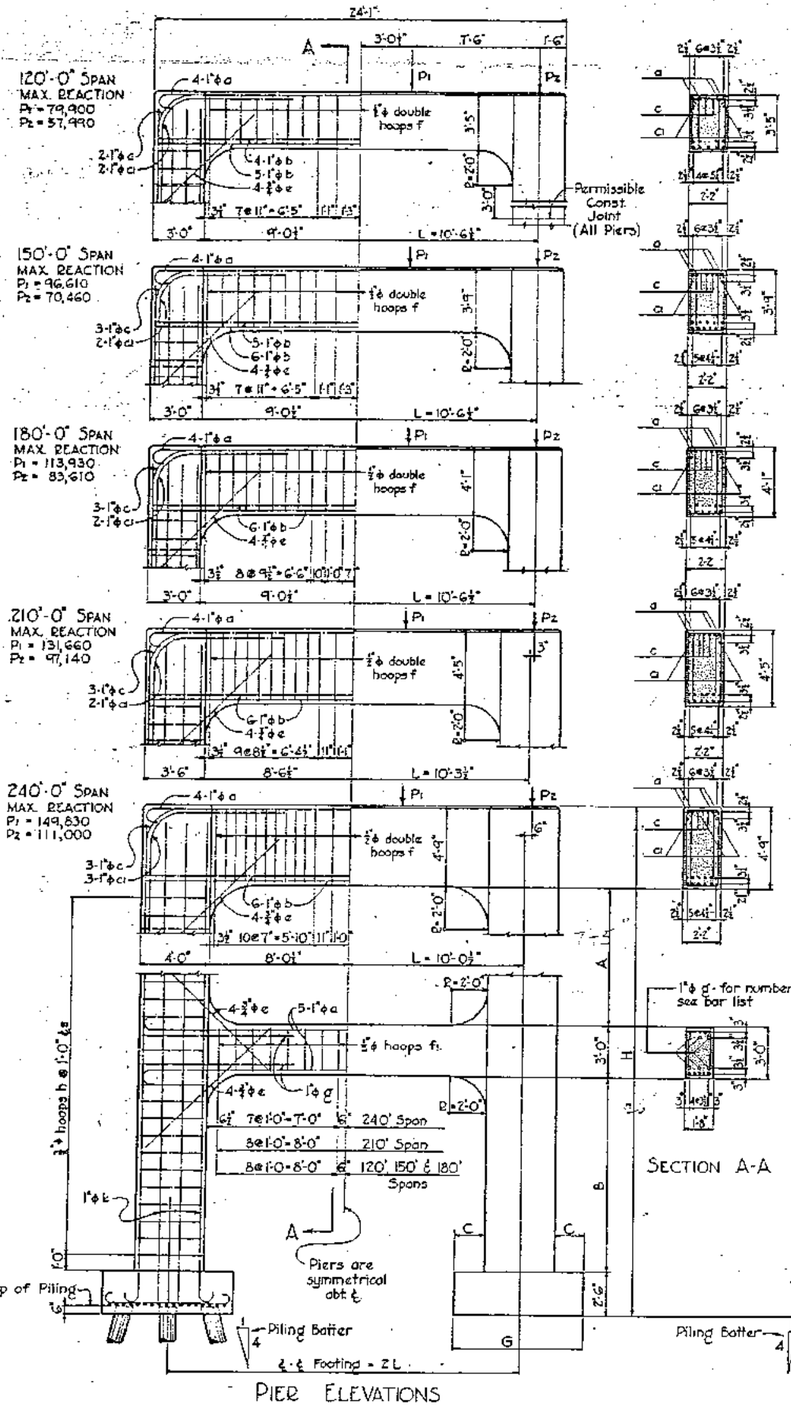
150' × 22' CONTINUOUS I-B. SPANS

H-15 LOADING - CONCRETE FLOOR - STEEL RAILS

IOWA STATE HIGHWAY COMMISSION

OCTOBER 1939

V7
150 × 22
H-15



Revised 11-15-46, sizes of bars m & mi and reinforcing steel estimate changed

	H	PIER DATA A	B	C	D	E	F	G	REINFORCING STEEL DATA: 1"ϕ g: 9'-0" lg., Number	1"ϕ k: 24 bars, Length	¾"ϕ h: Var. Lgth., Number	BARS COMMON TO ALL HEIGHTS: Mark	Location	Shape	Size	Length	Number	ESTIMATED QUANTITIES: Concrete	Reinf. Steel	Piling	H
120'-0" SPAN	26'	7'-8"	9'-5"	1'-11"	4'-6"	1'-6"	7'-6"	6'-10"	0"	25'-9"	40	a	Beam & Strut		1"ϕ	25'-6"	14	36.2 cu.y.	4629#	16	26'
	27	8'-2	9'-11	"	4'-7	1'-5½	"	"	"	26'-9	42	b	Beam Bot.		1 ϕ	22'-9	9	37.2	4704	"	27
	28	8'-8	10'-5	"	4'-8	1'-5	"	"	"	27'-9	44	c	Corners		1 ϕ	15'-4	4	38.2	4778	"	28
	29	9'-2	10'-11	"	4'-9	1'-4½	"	"	"	28'-9	46	ci	"		1 ϕ	14'-0	4	38.3	4854	"	29
	30	9'-8	11'-5	"	4'-10	1'-4	"	"	"	29'-9	48	e	Fillets		¾ ϕ	8'-6	24	40.3	4930	"	30
	31	10'-2	11'-11	"	4'-11	1'-3½	"	"	"	30'-9	50	f	Beam Hoops		½ ϕ	9'-10	38	41.4	5004	"	31
	32	10'-8	12'-5	"	5'-0	1'-3	"	"	"	31'-9	52	fi	Strut Hoops		½ ϕ	8'-6	18	42.5	5079	"	32
	33	11'-2	12'-11	"	5'-1	1'-2½	"	"	"	32'-9	54							43.6	5154	"	33
150'-0" SPAN	26'	7'-5"	9'-4"	1'-11"	4'-6"	1'-6"	7'-6"	6'-10"	0	25'-9"	40	a	Beam & Strut		1"ϕ	25'-6"	14	36.7 cu.y.	4861#	16	26'
	27	7'-11	9'-10	"	4'-7	1'-5½	"	"	"	26'-9	42	b	Beam Bot.		1 ϕ	22'-9	11	37.7	4936	"	27
	28	8'-5	10'-4	2'-3	4'-8	1'-5	7'-6	7'-6	"	27'-9	44	c	Corners		1 ϕ	15'-8	6	39.6	5050	18	28
	29	8'-11	10'-10	"	4'-9	1'-4½	"	"	"	28'-9	46	ci	"		1 ϕ	14'-4	4	40.6	5126	"	29
	30	9'-5	11'-4	"	4'-10	1'-4	"	"	"	29'-9	48	e	Fillets		¾ ϕ	8'-6	24	41.7	5201	"	30
	31	9'-11	11'-10	"	4'-11	1'-3½	"	"	"	30'-9	50	f	Beam Hoops		½ ϕ	10'-7	38	42.8	5276	"	31
	32	10'-5	12'-4	"	5'-0	1'-3	"	"	"	31'-9	52	fi	Strut Hoops		½ ϕ	8'-6	18	43.9	5351	"	32
	33	10'-11	12'-10	"	5'-1	1'-2½	"	"	"	32'-9	54							45.0	5427	"	33
180'-0" SPAN	26'	7'-2"	9'-3"	2'-3"	4'-6"	1'-6"	7'-6"	7'-6"	8	25'-9"	40	a	Beam & Strut		1"ϕ	25'-6"	14	38.1 cu.y.	5224#	18	26'
	27	7'-8	9'-9	"	4'-7	1'-5½	"	"	"	26'-9	42	b	Beam Bot.		1 ϕ	22'-9	12	39.1	5299	"	27
	28	8'-2	10'-3	"	4'-8	1'-5	"	"	"	27'-9	44	c	Corners		1 ϕ	16'-0	6	40.1	5374	"	28
	29	8'-8	10'-9	1'-11	4'-9	2'-7½	10'-0	6'-10	"	28'-9	46	ci	"		1 ϕ	14'-8	4	43.3	5644	20	29
	30	9'-2	11'-3	"	4'-10	2'-7	"	"	"	29'-9	48	e	Fillets		¾ ϕ	8'-6	24	44.4	5719	"	30
	31	9'-8	11'-9	"	4'-11	2'-6½	"	"	"	30'-9	50	f	Beam Hoops		½ ϕ	11'-3	44	45.5	5794	"	31
	32	10'-2	12'-3	"	5'-0	2'-6	"	"	"	31'-9	52	fi	Strut Hoops		½ ϕ	8'-6	18	46.6	5870	"	32
	33	10'-8	12'-9	"	5'-1	2'-5½	"	"	"	32'-9	54							47.7	5945	"	33
210'-0" SPAN	26'	7'-0"	9'-1"	1'-6"	4'-6"	2'-9"	10'-0"	6'-10"	8	25'-9"	38	a	Beam & Strut		1"ϕ	25'-6"	14	43.2 cu.y.	5470#	20	26'
	27	7'-5	9'-8	"	4'-7	2'-8½	"	"	"	26'-9	40	b	Beam Bot.		1 ϕ	22'-9	12	44.4	5545	"	27
	28	7'-11	10'-2	"	4'-8	2'-8	"	"	"	27'-9	42	c	Corners		1 ϕ	16'-4	6	45.6	5621	"	28
	29	8'-5	10'-8	"	4'-9	2'-7½	"	"	"	28'-9	44	ci	"		1 ϕ	15'-0	4	46.8	5696	22	29
	30	8'-11	11'-2	"	4'-10	2'-7	"	"	"	29'-9	46	e	Fillets		¾ ϕ	8'-6	24	48.0	5772	"	30
	31	9'-5	11'-8	"	4'-11	2'-6½	"	"	"	30'-9	48	f	Beam Hoops		½ ϕ	11'-11	46	49.3	5847	"	31
	32	9'-11	12'-2	"	5'-0	2'-6	"	"	"	31'-9	50	fi	Strut Hoops		½ ϕ	8'-6	17	50.6	5924	"	32
	33	10'-5	12'-8	"	5'-1	2'-5½	"	"	"	32'-9	52							51.9	6001	"	33
240'-0" SPAN	26'	7'-0"	8'-9"	1'-5"	4'-6"	2'-9"	10'-0"	6'-10"	8	25'-9"	38	a	Beam & Strut		1"ϕ	25'-6"	14	46.2 cu.y.	5620#	22	26'
	27	7'-2	9'-3	1'-9	4'-7	2'-8½	10'-0	7'-6	"	26'-9	40	b	Beam Bot.		1 ϕ	22'-9	12	48.8	5767	24	27
	28	7'-8	10'-1	"	4'-8	2'-8	"	"	"	27'-9	42	c	Corners		1 ϕ	16'-8	6	50.2	5844	"	28
	29	8'-2	10'-7	"	4'-9	2'-7½	"	"	"	28'-9	44	ci	"		1 ϕ	15'-4	6	51.6	5920	"	29
	30	8'-8	11'-1	"	4'-10	2'-7	"	"	12	29'-9	46	e	Fillets		¾ ϕ	8'-6	24	53.0	6033	"	30
	31	9'-2	11'-7	"	4'-11	2'-6½	"	"	"	30'-9	48	f	Beam Hoops		½ ϕ	12'-7	50	54.4	6169	"	31
	32	9'-8	12'-1	"	5'-0	2'-6	"	"	"	31'-9	50	fi	Strut Hoops		½ ϕ	8'-6	16	55.8	6250	"	32
	33	10'-2	12'-7	"	5'-1	2'-5½	"	"	"	32'-9	52							57.3	6323	"	33

FOOTING REINFORCING

m	10'-0" × 7'-6" Ftg.		¾"ϕ	10'-9	34
mi	" " "		½"ϕ	8'-0	46
m	10'-0" × 6'-10" "		¾"ϕ	10'-9	30
mi	" " "		½"ϕ	7'-3	46
m	7'-6" × 7'-6" "		¾"ϕ	8'-0	68
m	7'-6" × 6'-10" "		¾"ϕ	8'-0	30
mi	" " "		½"ϕ	7'-3	34

General Notes:

These piers are designed for use with the Standard V7 Beam Series but may be used with other beam types of like roadway and reactions.

The bottom of pier footings shall be located a minimum of 6'-0" below stream bed except where solid rock is encountered.

This type of pier should not be used in streams where ice conditions are severe.

Exposed corners 90° or sharper are to be filleted with a ¾" dressed bevelled strip.

Minimum edge distance of reinforcing steel to be 2" unless otherwise shown.

Specifications:

Design- A.A.S.H.O. (1935) with modifications. 10'-0" lanes.

Construction- Iowa State Highway Commission Standard Specifications, Series of 1937.

DESIGN FOR

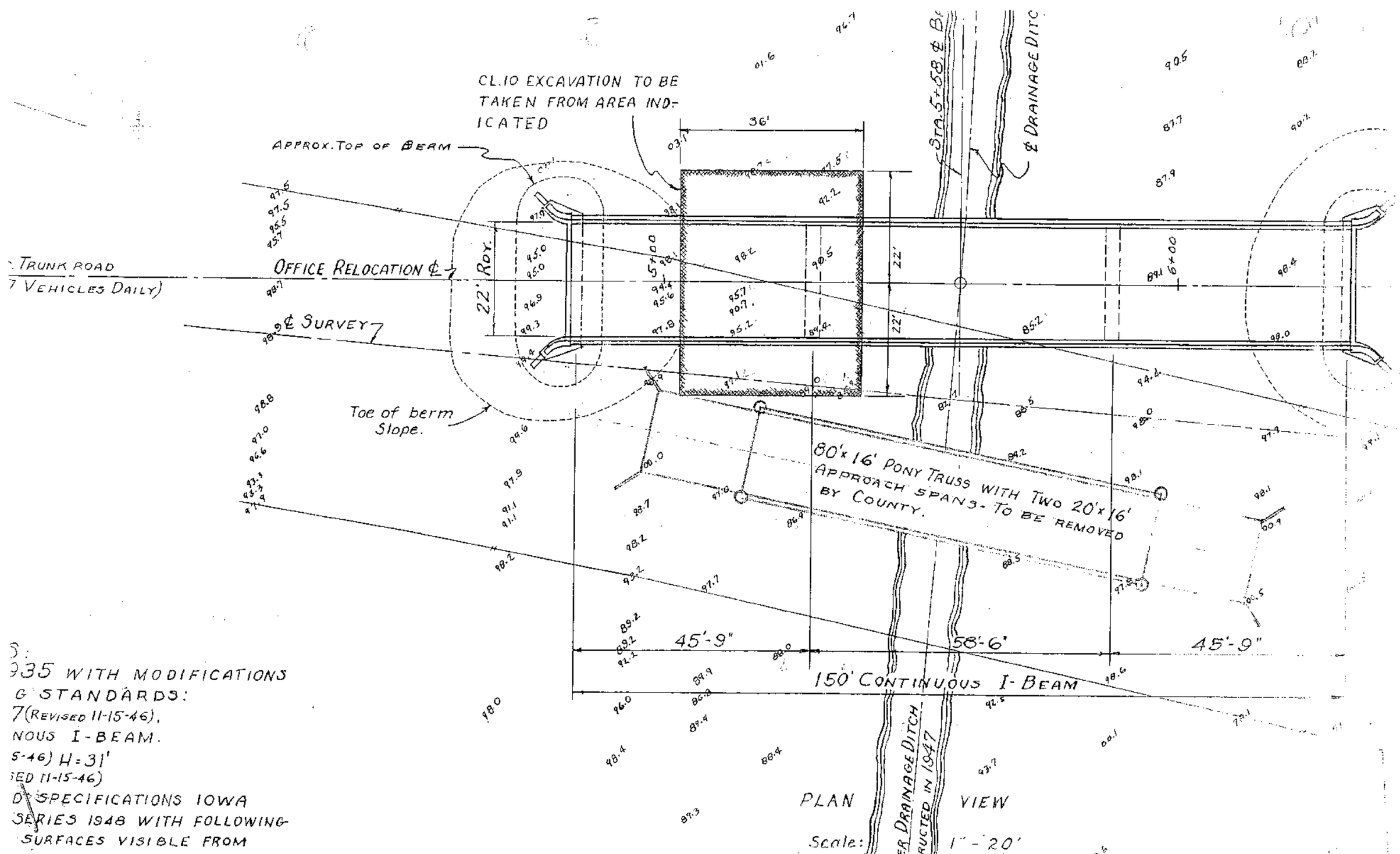
STANDARD CONCRETE PIERS FOR V-7 BEAM SPANS 22 ROADWAY

IOWA STATE HIGHWAY COMMISSION

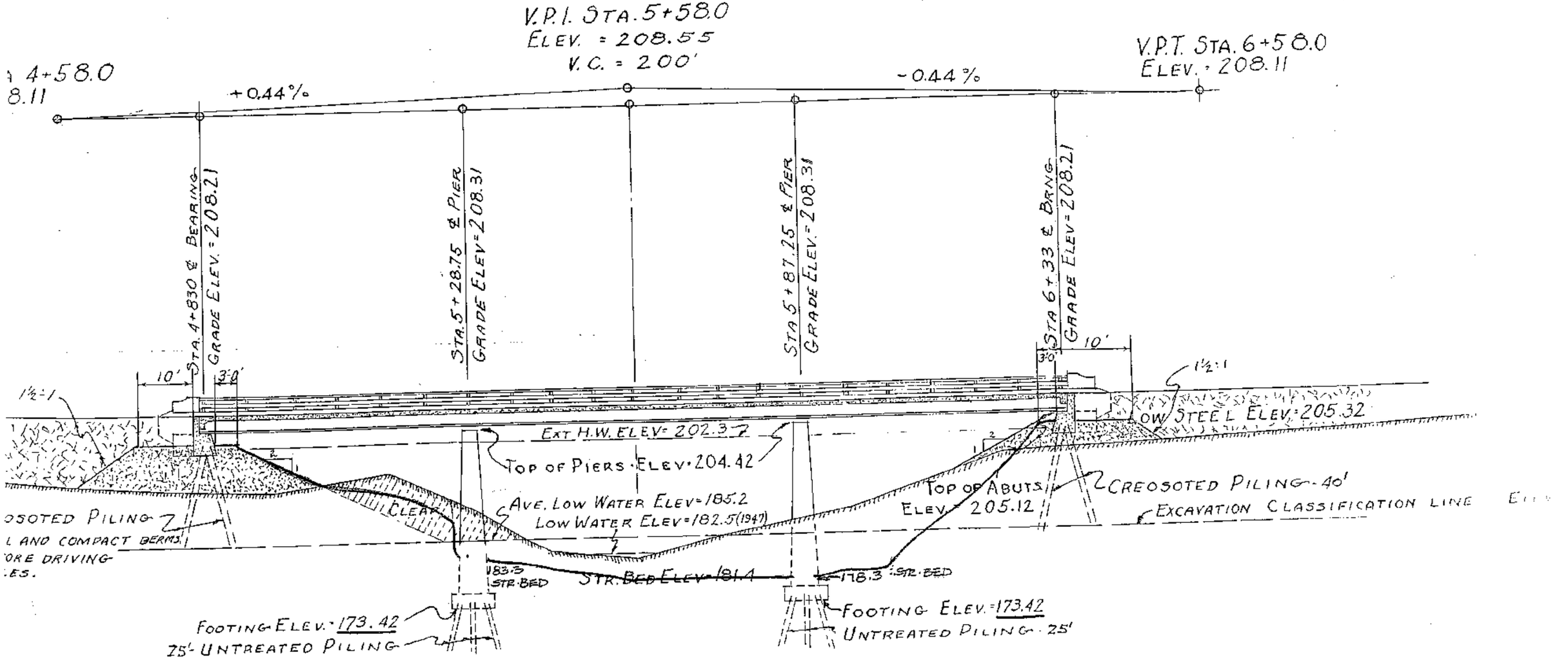
AUGUST 1940

APPROVED BY: R. R. White
CHIEF ENGINEER

P8

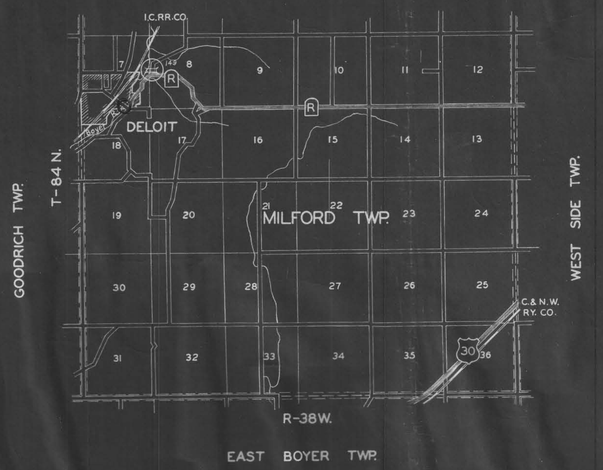


935 WITH MODIFICATIONS
G STANDARDS:
7 (REVISED 11-15-46),
NOUS I-BEAM.
5-46) H=31'
ED 11-15-46)
D SPECIFICATIONS IOWA
SERIES 1948 WITH FOLLOWING
SURFACES VISIBLE FROM
O SECOND FIELD COATS SHALL


V.P.I. STA. 5+58.0
ELEV. = 208.55
V.C. = 200'
V.P.T. STA. 6+58.0
ELEV. = 208.11
4+58.0
8.11
+0.44%
-0.44%
STA. 4+830 ℄ BEARING
GRADE ELEV. = 208.21
STA. 5+28.75 ℄ PIER
GRADE ELEV. = 208.31
STA. 5+87.25 ℄ PIER
GRADE ELEV. = 208.31
STA. 6+33 ℄ BRNG
GRADE ELEV. = 208.21
10'
3'-0"
1½:1
EXT. H.W. ELEV. 202.37
TOP OF PIERS ELEV. 204.42
AVE. LOW WATER ELEV. 185.2
LOW WATER ELEV. 182.5 (1947)
STR. BED ELEV. 181.4
183.3 STR. BED
178.3 STR. BED
TOP OF ABUTS. ELEV. 205.12
OW STEEL ELEV. 205.32
CREOSOTED PILING - 40'
EXCAVATION CLASSIFICATION LINE
OSOTED PILING
L AND COMPACT BERMS.
ORE DRIVING
ES.
FOOTING ELEV. 173.42
25'- UNTREATED PILING
FOOTING ELEV. 173.42
UNTREATED PILING - 25'
5+00
6+00
PROFILE ON ℄
AREA BELOW HW = 1840°'

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	S-1408			

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
150'X 22' CONTINUOUS I BEAM BRIDGE
SECONDARY ROAD SYSTEM PROJECT S/M1408
CRAWFORD COUNTY
JUNE 1949



DESIGN 149 MILFORD TWP. CRAWFORD CO.
SECTION 7 STATION 5+58 OVER BOYER DR. DITCH

150' × 22' CONT. I-BEAM

PART	TOTAL
Concrete	226.7 Cu. Yds.
Reinforcing Steel	37459 Lbs.
Structural Steel	86390 Lbs.
Untreated Piling 36 @ 25'	900 Lin. Ft.
Creosoted Piling 16 @ 40'	640 Lin. Ft.
Excavation Class 10	325 Cu. Yds.
Excavation Class 20	54 Cu. Yds.
Excavation Class 21	196 Cu. Yds.
Excavation Class 24	880 Cu. Yds.

Mileage Summary: = 153'-2" = .0290 mile.

Specifications:
Design: A.A.S.H.O. 1935
Construction: Standard Specifications
Iowa State Highway Commission, Series 1948

APPROVED
A W Stegeman
BOARD OF SUPERVISORS

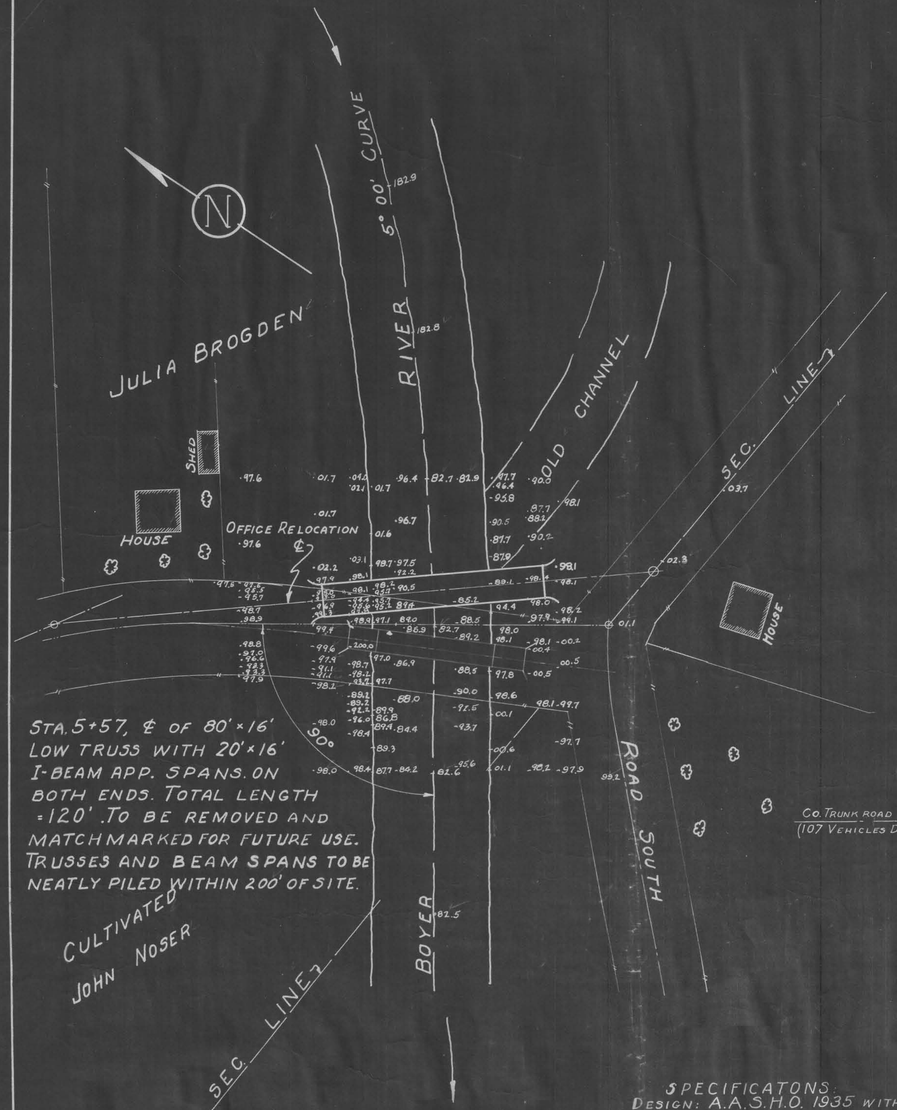
APPROVED
M E Jones 7-28-49
CHIEF ENGINEER
IOWA HIGHWAY COMMISSION

RECOMMENDED FOR APPROVAL
Chris M Ware
DISTRICT ENGINEER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

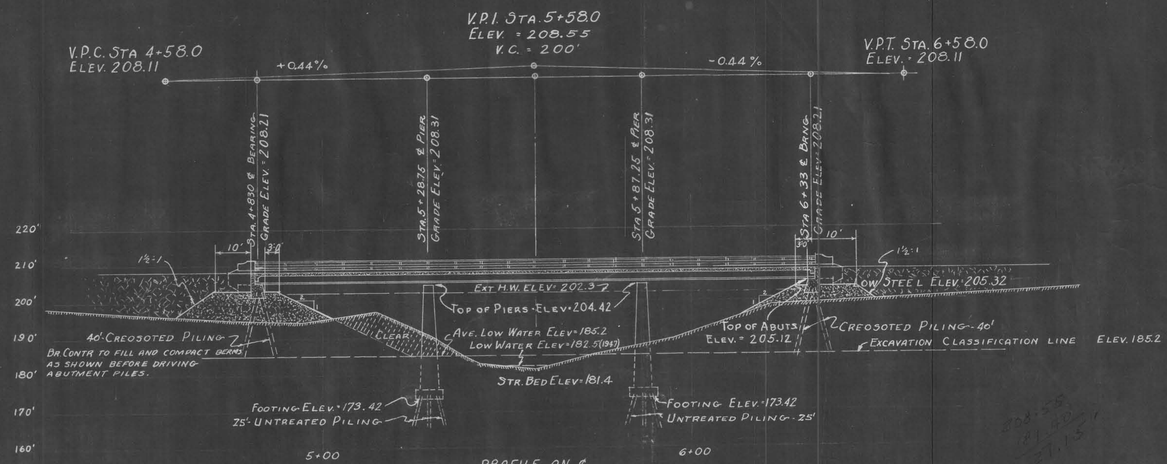
APPROVED
Wm. F. Dreessen Chr
BOARD OF SUPERVISORS

APPROVED
DIVISION ENGINEER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

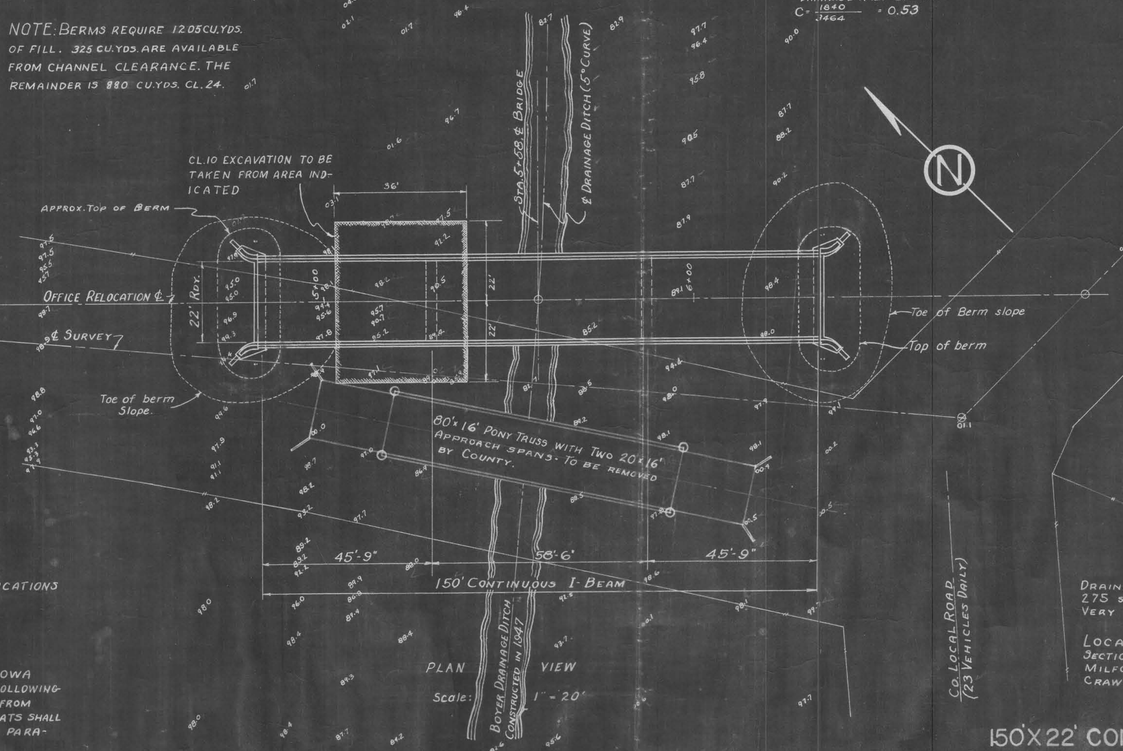
Crawford Co. Design No. 149. Project No. S/M 1408. File No. 1277

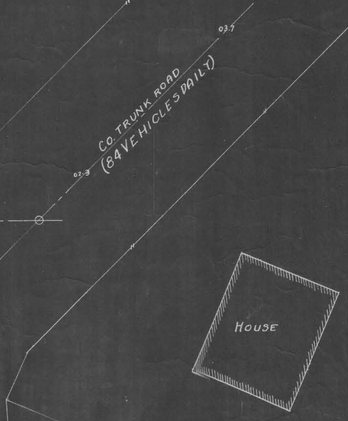


STA. 5+57, ℄ OF 80'×16' LOW TRUSS WITH 20'×16' I-BEAM APP. SPANS ON BOTH ENDS. TOTAL LENGTH =120'. TO BE REMOVED AND MATCHMARKED FOR FUTURE USE. TRUSSES AND BEAM SPANS TO BE NEATLY PILED WITHIN 200' OF SITE.



NOTE: BERMS REQUIRE 12.05 CU. YDS. OF FILL. 325 CU. YDS. ARE AVAILABLE FROM CHANNEL CLEARANCE. THE REMAINDER IS 880 CU. YDS. CL. 24.





DRAINAGE AREA:
2.75 SQ. MI.
VERY HILLY

LOCATION:
SECTION 7
MILFORD TWP.
CRAWFORD COUNTY

SPECIFICATIONS

DESIGN: A.A.S.H.O. 1935 WITH MODIFICATIONS USING THE FOLLOWING STANDARDS:

SUPERSTRUCTURE: V-7 (REVISED 11-15-46), 150'×22' CONTINUOUS I-BEAM.

PIERS: P-8 (REVISED 11-15-46) H=31'

ABUTMENTS: K-7 (REVISED 11-15-46)

CONSTRUCTION: STANDARD SPECIFICATIONS IOWA HIGHWAY COMMISSION SERIES 1948 WITH FOLLOWING MODIFICATIONS: "ON RAIL SURFACES VISIBLE FROM ROADWAY, THE FIRST AND SECOND FIELD COATS SHALL CONSIST OF WHITE PAINT CONFORMING TO PARAGRAPH 4135.04A".

ESTIMATED QUANTITIES

	CONCRETE	REINF. STEEL	STRUCT. STEEL	PILING		EXCAVATION			
				UNTREATED	CREOSOTED	CLASS 20	CLASS 21	CLASS 24	CL. 10 CHANNEL CLEARING
SUPERSTRUCTURE	96.2 C.Y.	23967 lbs.	86390 Lbs.						
PIERS	85.6 C.Y.	10,582 LBS.		36 @ 25'		23.5	196		
ABUTMENTS	*44.9 C.Y.	2340 lbs.			16 @ 40'	30.5			
TOTALS	226.7 C.Y.	37459 Lbs.	86390 Lbs.	900 Lin. Ft.	640 Lin. Ft.	54.0	196	880	325

* INCLUDES 1.9 C.Y. CLASS "C" CONCRETE

150'X22' CONTINOUS, I-BEAM BRIDGE

CONCRETE FLOOR & STEEL RAIL

STA. 5+58 PROJECT NO. SM408

CRAWFORD COUNTY

IOWA STATE HIGHWAY [illegible]

APRIL, 1949

JO[illegible]

DESIGN # 149 CRAWFORD COUNTY FILE # 142