LETTING DATE

UNION COUNTY

BRIDGES AND CULVERTS

F-FG-34-4(1)--24-88

LETTING DATE Mar. 2 - 1971

			SHEET NO. 1	TOTAL SHEETS 61

PROJECT NUMBER
F-FG-34-4(1)--24-88

R.O.W. PROJECT NUMBER
FN-34 -4(3)--21-88

STATE OF IOWA
STATE HIGHWAY COMMISSION

PLANS OF PROPOSED IMPROVEMENT
ON THE

PRIMARY ROAD SYSTEM

UNION COUNTY

BRIDGES AND CULVERTS

ON U.S. NO. 34 FROM CRESTON TO AFTON

SCALES: AS NOTED

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR CONSTRUCTION WORK, SERIES OF 1964 SHALL APPLY TO WORK ON THIS PROJECT

DESIGN STRESSES:

Design Stresses for the following materials are in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1969.
Concrete in accordance with Section 1.5.1 f'c=3500 psi
Reinforcing Steel in accordance with Section 1.5.1 d fs=20,000psi.

Prestressing Steel in accordance with Section 1.6.7 f's= 270,000 psi.
Prestress Concrete in accordance with Section 1.6.7 f'c=5000 psi.

Structural Steel in accordance with Section 1.7.1
ASTM A-36, fs=20,000 psi.

CONVENTIONAL SIGNS

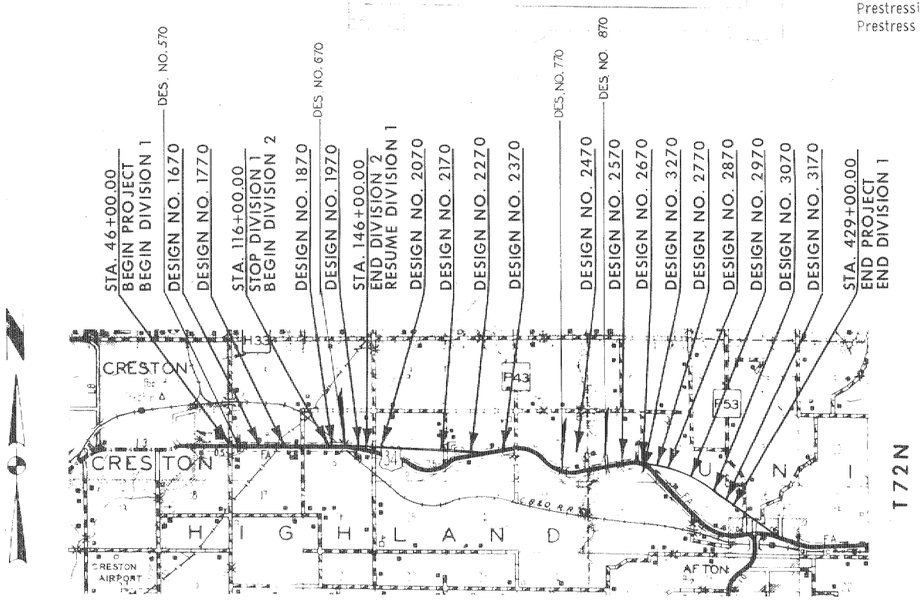
State Line
Co. Line
Twp. Line
Sec. Line
Corp. Line
Urban Bdry.
R.O.W. Lines
Survey Line
Profile Grade
Railroad
Field Tile
Underground Lines
Culverts
Utility Poles
Fences
Trees Or Brush
Stream
Dike
County Road No.
Primary Road No.
U. S. Road No.
Interstate Road No.



CONSTRUCTION PLANS SHOWING PROJECT "AS BUILT"
THREE COPIES PREPARED BY Harvey H. Olson
RES. CONST. ENGINEER
DATE 7-14-72

ONE COPY APPROVED AND FORWARDED TO AMES:
DATE 12/28/72
DIST. CONST. ENGINEER

COPIES SENT TO:
ROBERT I. BORTLE DISTRICT ENGINEER
RALPH D. CORNICK RES. MAINT. ENGINEER



LOCATION MAP

STATE CONTROL SECTION
NO. 88-0200

LOCATION MAP SCALE
0 1 2 3
miles

kirkham • michael & associates
architects & engineers

INDEX OF SHEETS 105.3

NO.	DESCRIPTION
1	TITLE SHEET
1A	REVISION SHEET
2,2A	ESTIMATE SHEETS
3	MISCELLANEOUS DETAIL SHEET
4	MISCELLANEOUS DETAIL SHEET (RA-13)
5	MISCELLANEOUS DETAIL SHEET (RA-16)
6	MISCELLANEOUS DETAIL SHEET (MF-1)
7	MISCELLANEOUS DETAIL SHEET (MF-2)
8	MISCELLANEOUS DETAIL SHEET (MF-3)
9	MISCELLANEOUS DETAIL SHEET (MF-4)
10	MISCELLANEOUS DETAIL SHEET (RF-13)
11	MISCELLANEOUS DETAIL SHEET (MF-14)
12	CULVERT DESIGN NO. 1670
13	CULVERT DESIGN NO. 1770
14	CULVERT DESIGN NO. 1870
15-16	CULVERT DESIGN NO. 1970
17-18	CULVERT DESIGN NO. 2070
19-20	CULVERT DESIGN NO. 2170
21-22	CULVERT DESIGN NO. 2270
23	CULVERT DESIGN NO. 2370
24	CULVERT DESIGN NO. 2470
25	CULVERT DESIGN NO. 2570
26	CULVERT DESIGN NO. 2670
27	CULVERT DESIGN NO. 2770
28	CULVERT DESIGN NO. 2870
29-30	CULVERT DESIGN NO. 2970
31	CULVERT DESIGN NO. 3070
32	CULVERT DESIGN NO. 3170
33	CULVERT DESIGN NO. 3270
34-36	TWIN CULVERT DES. NO. 570
37-39	TWIN CULVERT DES. NO. 870
40-53	BRIDGE DES. NO. 670
54-61	BRIDGE DES. NO. 770

MILEAGE SUMMARY 105.1

DIV.	LOCATION	LIN. FT.	MILES	STATE CONTROL SECTION NO.
	BRIDGE AT STA. 49+85.00	28.67	.005	
	BRIDGE AT STA. 282+62.00	171.19	.032	
	BRIDGE AT STA. 327+00.00	20.38	.004	
	BRIDGE AT STA. 125+63.94	286.24	.005	
	NET LENGTH BRIDGES	506.93	0.096	

DES. NO'S 570-870-770-870

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY SUPERVISION AND THAT ENGINEERING DECISIONS WITH REGARD TO THE DESIGN WERE MADE BY ME OR BY OTHER DULY REGISTERED PROFESSIONAL ENGINEERS UNDER THE LAWS OF THE STATE OF IOWA.

DATE _____ 19___ IOWA REG. NO. _____

Rec 35

IOWA STATE HIGHWAY COMMISSION STANDARDS
(Available at the I.S.H.C. Storeroom)

STANDARD	ISSUED	REVISED
C1P	1932	1967
CFP	1945	
C8P	1932	1944
C3P	1932	1944
C4P	1932	1944
C5P	1932	1944
C3J	1959	
C4J	1959	1964
C5J	1959	1964
C6J	1959	1964
C8J	1959	1964
C10J	1959	1964
CBH-00	1960	
CBH-30	1960	1961
CBH-45	1960	
C1P 2.5-65	1965	1967
F3J	1960	1964
F4J	1960	1964
F5J	1960	1964

101-4

DESIGN DATA
RURAL

1971 AADT	2700	V.P.D.
1991 AADT	3800	V.P.D.
1991 DHV	440	V.P.H.
DIRECTIONAL	53	%
TRUCKS	7	%
DESIGN V	70	M.P.H.
CLASS 2 ACCESS CONTROL		

REVISED:
SEE FOLLOWING SHEET 1A

APPROVED
DEPUTY CHIEF ENGINEER
IOWA HIGHWAY COMMISSION DATE

EXCEPT DES. NO'S 570-670-770-870

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY SUPERVISION AND THAT ENGINEERING DECISIONS WITH REGARD TO THE DESIGN WERE MADE BY ME OR BY OTHER DULY REGISTERED PROFESSIONAL ENGINEERS UNDER THE LAWS OF THE STATE OF IOWA.

Richard L. McManamon
DATE Oct. 12 1970 IOWA REG. NO. 6110

U.S. DEPT. TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ENGINEER DATE

RICHARD L. McMANAMON 6110 IOWA REGISTERED PROFESSIONAL ENGINEER

UNION COUNTY PROJECT NO. F-FG-34-4(1)--24-88 FILE NO. 22848 SHEET NO. 1 OF 61

fold

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS
		Let March 2, 1971
Mar. 23, '71	1A	Revision Sheet - added to Project.
	25	Design No. 2570 Reinforcing Steel quantity / ft. of Barrel corrected. Total quantities corrected.
	2	Design No. 2570 Reinforcing Steel quantity corrected. Total quantity corrected.
	1	"Revision Sheet" - (Sheet 1A) added to Index of Sheets.
July 1, '71		Let March 2, 1971
	28	Design No. 2870 Inlet F.L. raised. Structure relocated. Length and quantities corrected accordingly.
	2	Design No. 2870 relocated. Length and quantities changed. Totals corrected.

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS

CHANGE OR EXTRA WORK ORDER - CULVERTS

NO. 1 - BLANKET						
ITEM NO. 8001	ADDED	CLEARING AND GRUBBING - GRUBBING ONLY - 48" TO 60"	1 - @	$100.00		
NO. 2						
ITEM NO. 7001	INCREASED	ITEM NO. 2 STEEL REINF. - 413 LBS.	@	$.014	=	$ 5.782
NO. 3 - BLANKET						
ITEM NO. 7002	DECREASED	ITEM NO. 1 STRUCTURAL CONCRETE - 19.3 C.Y.	@	$ 68.00	=	$1,312.00
ITEM NO. 7003	DECREASED	ITEM NO. 2 STEEL REINF. - 1,908 LBS.	@	$ 0.14	=	$ 267.12
ITEM NO. 7004	INCREASED	ITEM NO. 3 EXCAVATION CLASS 20. 932 C.Y.	@	$ 4.00	=	$3,728.00

CHANGE OR EXTRA WORK ORDER - BRIDGES

NO. 1 - BLANKET						
ITEM NO. 8001	ADDED	CONCRETE, RETARDING AGENT - 339.6 CU.YDS.	@	$ 1.50	=	$ 509.40
NO. 2						
ITEM NO. 7001	INCREASED	ITEM NO. 24 EXCAVATION CLASS 20. - 137 C.Y.	@	$ 8.00	=	$1,096.00
NO. 1 - BLANKET						
ITEM NO. 7001	DECREASED	ITEM NO. 36 PILING, CREOSOTED - 1550 L.F.	@	$ 3.00	=	$4,650.00
ITEM NO. 8001	ADDED	PILING, CREOSOTED, FURN. & DRIVE - 2170 L.F.	@	$ 3.31	=	$7,182.70
ITEM NO. 8002	ADDED	PILING, CREOSOTED, COST OF HANDLING - 1550 L.F.	@	$ 0.745	=	$1,154.75
NO. 2						
ITEM NO. 7002	INCREASED	ITEM NO. 35 SUBDRAIN TILE 4 IN. DIA. - 53 L.F.	@	$ 2.00	=	$ 106.00
NO. 3 - BLANKET						
ITEM NO. 7003	DECREASED	ITEM NO. 36 PILING, CREOSOTED - 350 L.F.	@	$ 3.00	=	$1,050.00
ITEM NO. 8003	UNUSED	PILING, CREOSOTED, (7 @ 50 L.F.) - 350 L.F.	@	$ 1.50	=	$ 525.00
ITEM NO. 8004	ADDED	PILING, CREOSOTED, FURN. & DRIVE - 420 L.F.	@	$ 3.54	=	$1,486.80
NO. 4 - BLANKET						
ITEM NO. 8005	ADDED	CONCRETE, RETARDING AGENT - 165.0 C.Y.	@	$ 1.50	=	$ 247.50

PROJECT PERSONNEL

CULVERTS
Design Numbers 870 and 570
INSPECTOR LES BARTON

Design Numbers 1670 Through 3270
INSPECTOR BOB OGLESBEE

BRIDGES
Design Numbers 570 and 870
INSPECTOR CHARLIE CRITZ

REVISION SHEET

fold

UNION COUNTY FILE NO. 22848

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
F-FG-34-4(1)--24-88	IOWA	5		1-A	61

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

DATE 12-9-70 DALE E. DERBY REG. NO. 3049

IN LETTING OF Mar. 2 - 1971

DESIGN NO. 570 ROAD U. S. #34 STATION 48+85
UNION COUNTY MIDDLE PLATTE RIVER
SECTION 8 T - 72N R - 30W HIGHLAND TOWNSHIP

DESIGN FOR 30° SKEW
TWIN 12.0'x10.0'x97.0' REINFORCED CONCRETE BOX CULVERT

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete Cl. "C"	Cu. Yds.	404.6
2	Reinforcing Steel	Lbs.	66 270
3	Excavation Class 20	Cu. Yds.	1 099
4	Removal as Per Plan	L. S.	Lump Sum

THESE BRIDGES WILL REQUIRE BRIDGE SIGN ASSEMBLIES, FURNISHED AND PLACED BY OTHERS, AS SPECIFIED IN SECTION 2 C-5 OF THE I. S. H. C. MANUAL ON "UNIFORM TRAFFIC CONTROL DEVICES", DATED JANUARY - 1963.

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

DATE 12-9-70 DALE E. DERBY REG. NO. 3049

IN LETTING OF Mar. 2 - 1971

DESIGN NO. 870 STATION 327+00
UNION COUNTY
SECTION 7 T - 72N R - 29W UNION TOWNSHIP

DESIGN FOR
TWIN 10.0'x10.0'x84.0' REINFORCED CONCRETE BOX CULVERT

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Concrete - Structural Class "C"	Cu. Yds.	312.0
2	Reinforcing Steel	Lbs.	42 182
3	Excavation Class 20	Cu. Yds.	833

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

DATE Dec. 7, 1970 WM. A. LUNDQUIST REG. NO. 4449

IN LETTING OF Mar. 2 - 1971

DESIGN NO. 670 U. S. #34 OVER C. B. & Q. RAILROAD STA. 125+63.94
UNION COUNTY RAILROAD CROSSING #5
SECTION 9 T - 72N R - 30W HIGHLAND TOWNSHIP

DESIGN FOR 45° SKEW
282'-0 x 44'-0 CONTINUOUS WELDED GIRDER BRIDGE

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete	Cu. Yds.	748.1
2	Reinforcing Steel	Lbs.	186 162
3	Structural Steel	Lbs.	357 580
4	Aluminum Handrail or Steel Handrail	L. F.	612.65
5	Creosoted Piling	L. F.	3 400
6	Class 20 Excavation	Cu. Yds.	561
7	4"ø Tile Subdrain	L. F.	252
8	Granular Backfill -	Cu. Yds.	242
9	Removal of Existing Structure	L. S.	LumpSum
10	Creosoted Test Pile	L. S.	LumpSum

ESTIMATE REFERENCE INFORMATION 100-4

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	Includes 375.2 cu. yds. of Structural Concrete Class "D" in Superstructure and 372.9 cu. yds. of Class "C" in Substructure.

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

DATE 12-8-70 JAMES R. SASSAMAN REG. NO. 2663

IN LETTING OF Mar. 2 - 1971

DESIGN NO. 770 ON U. S. #34 STATION 282+62.00
UNION COUNTY OVER 12 MILE CREEK
SECTION 12 T - 72N R - 30W HIGHLAND TOWNSHIP

DESIGN FOR 20° SKEW
168'-0x44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

ESTIMATE OF QUANTITIES

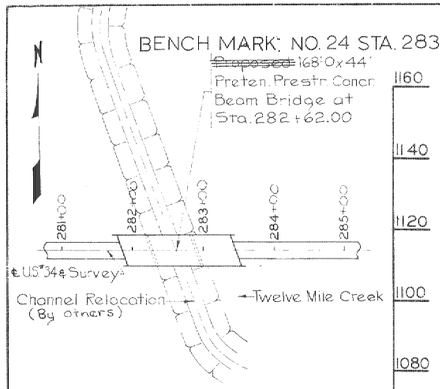
ITEM NO.	ITEM		UNIT	TOTAL
1	Structural Concrete		Cu. Yds.	468.1
2	Reinforcing Steel		Lbs.	91 214
3	Prestressed Concrete Beams	Pretensioned B42	No.	7
		Prestressed B55	No.	7
		B67	No.	7
4	Granular Backfill		Cu. Yds.	120
5	4"ø Tile Subdrain		L. F.	192
6	Creosoted Piling		L. F.	3 250
7	Class 20 Excavation		Cu. Yds.	321
8	Class 21 Excavation		Cu. Yds.	223
9	Aluminum Handrail or Steel Handrail		L. F.	344.1

ESTIMATE REFERENCE INFORMATION 100-4

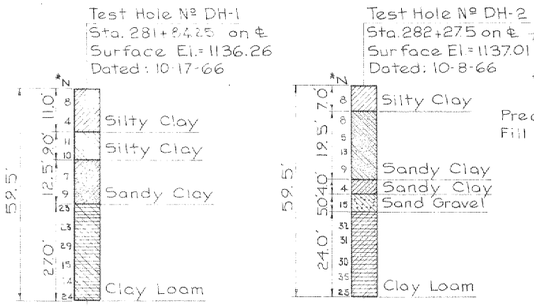
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	The piers, abutment footings, and temporary pavement block concrete, 170.2 cu. yds. are to be Class "C" Concrete. The remainder, 297.9 cu.yds. is to be Class "D" Concrete.

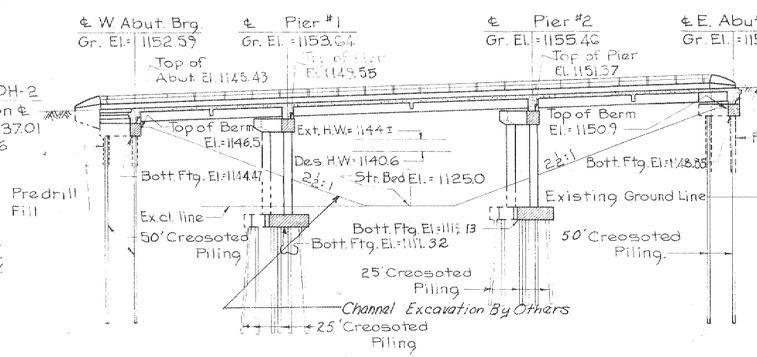
BENCH MARK: NO. 24 STA. 283+50 I.H.C.B.M. ON TOP SW. WING POST BRIDGE ELEV. 1,155.66.



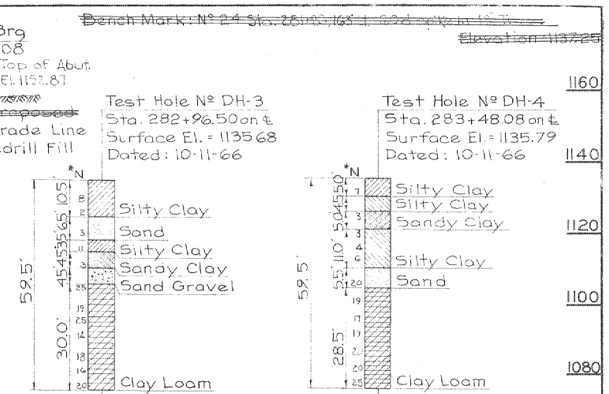
GENERAL PLAN
SCALE: 1" = 100'



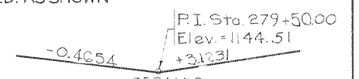
* Blow count - blows per foot.



LONGITUDINAL SECTION ALONG ℄ ROADWAY
SCALE: 1" = 20'



SOUNDING DATA
SCALE: 1" = 20'
DATED: AS SHOWN



PROPOSED GRADE

GENERAL NOTES:

This bridge is designed for HS20-44 loading, plus 20 lbs. per sq. ft. of roadway for future wearing surface.

The approach fills are not a part of this contract but ~~are to be~~ were in place at least 45 days before any work on the abutments is started. The Bridge Contractor ~~is to~~ shall level off and shape the berms to the elevations and dimensions shown. Dressing of slopes outside bridge area not disturbed by the Bridge Contractor ~~shall be~~ paid for as extra work.

Abutment piles are ~~to be~~ driven in oversize holes drilled to Elev. 1136.3(±) at the West Abutment and to Elevation 1135.8(±) at the East Abutment. The minimum diameter of the drilled holes is ~~to be~~ 4" greater than the diameter 3 feet from the butt end of the pile. Voids around the piles are ~~to be~~ filled with dry sand except for the 8' below the bottom of the footing which is ~~to be~~ left void. No separate payment ~~will be~~ made for drilling holes or filling voids since it is considered incidental to driving piles.

The Bridge Contractor ~~is to~~ install tile subdrain behind each abutment as noted or shown on sheets 1 & 5 of 8. The price bid for "4" ϕ Tile Subdrain" ~~is to~~ included all the labor and the excavation necessary for installation.

The portions of the prestressed beams that are ~~to be~~ embedded in the abutment and pier diaphragms are ~~to be~~ roughened by sand blasting or other approved means to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the Standard Specifications.

The pier excavation quantities assume the grading and channel change ~~will be~~ completed prior to the start of pier construction.

DESIGN STRESSES:

Design Stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1969:

Concrete in accordance with Section 1.5.1 f'c = 3500 p.s.i.
Reinforcing Steel in accordance with Section 1.5.1 D
fs = 20,000 p.s.i.
See Sheet 6 of 8 for the design stresses for Pretensioned Prestressed Concrete Beams.

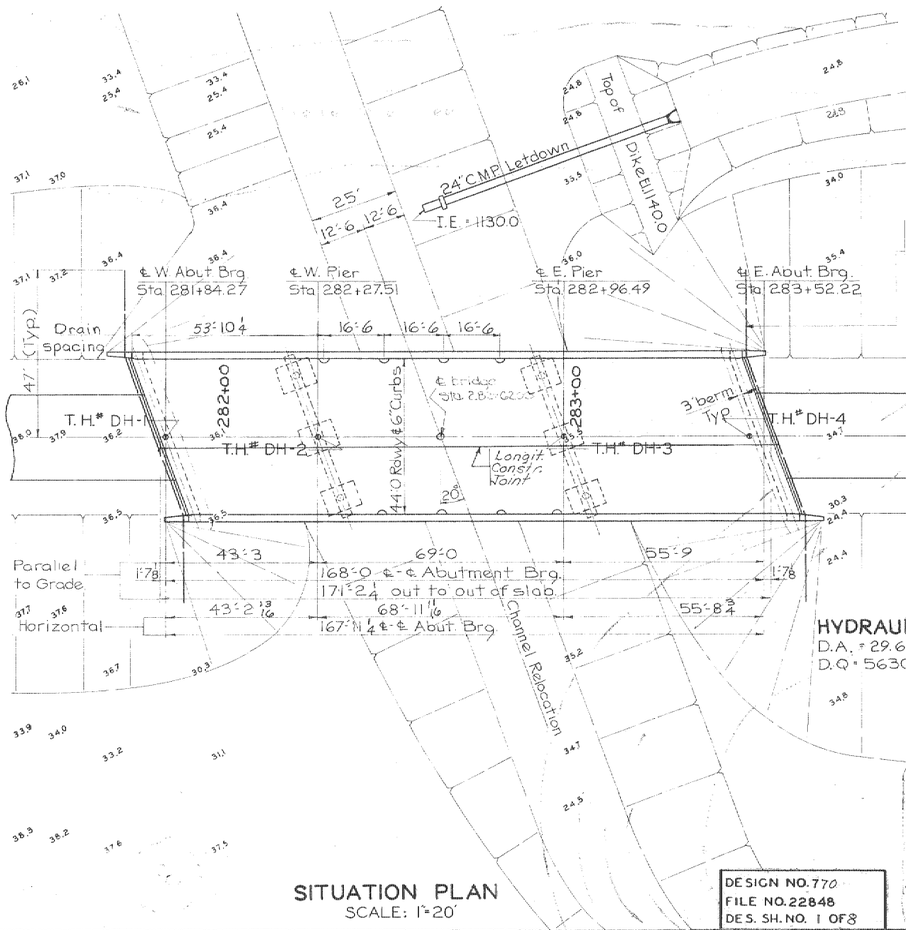
SPECIFICATIONS:

FINAL

TOTAL ~~ESTIMATED~~ QUANTITIES

ITEM		UNITS	2-PIERS	SUPER. & INTEG. ABUT.	TOTAL
Structural Concrete *		C.Y.	126.3	341.8	468.1
Reinforcing Steel		Lb.	20,746	70,468	91,214
Pretensioned Prestressed Concrete Beams	B42	Nº		7	7
	B55	Nº		7	7
	BG1	Nº		7	7
Granular Backfill		C.Y.		120	120
4" ϕ Tile Subdrain		L.F.			~~192~~ 145
Creosoted Piling		L.F.	~~66~~ @ 25' 25 ~~32~~ @ 50'	1,348.8	~~3250~~
Class 20 Excavation		C.Y.	221	100	321
Class 21 Excavation		C.Y.	223		223
Aluminum Handrail ~~Steel Handrail~~		L.F.			344.1

* The piers, abutment footings, and temporary pavement block concrete, 170.2 cu.yds. are ~~to be~~ Class "C" concrete. The remainder, 297.9 cu.yds. is ~~to be~~ Class "D" Concrete.



SITUATION PLAN
SCALE: 1" = 20'

TYPICAL APPROACH SECTION

TRAFFIC COUNT 3100 V.P.D. (1988)

HYDRAULIC DATA:
D.A. = 29.6 sq. miles
D.Q. = 5630 cfs.

LOCATION
Union County
Highland Twp
Section 12
T-72 N R-30W
On U.S. # 34
Over Twelve Mile Creek

Design For 20° Skew

168'-0 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43'-3 & 55'-9 End Spans — 69'-0 Interior Span

GENERAL & SITUATION PLANS

Station: 282+62.00 — April, 1970

UNION COUNTY

IOWA STATE HIGHWAY COMMISSION

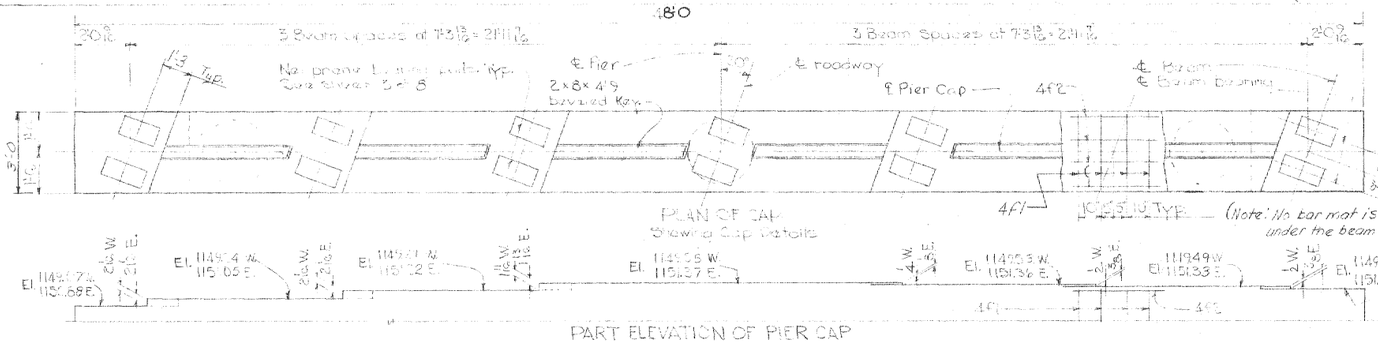
DESIGN NO. 770
FILE NO. 22848
DES. SH. NO. 1 OF 8

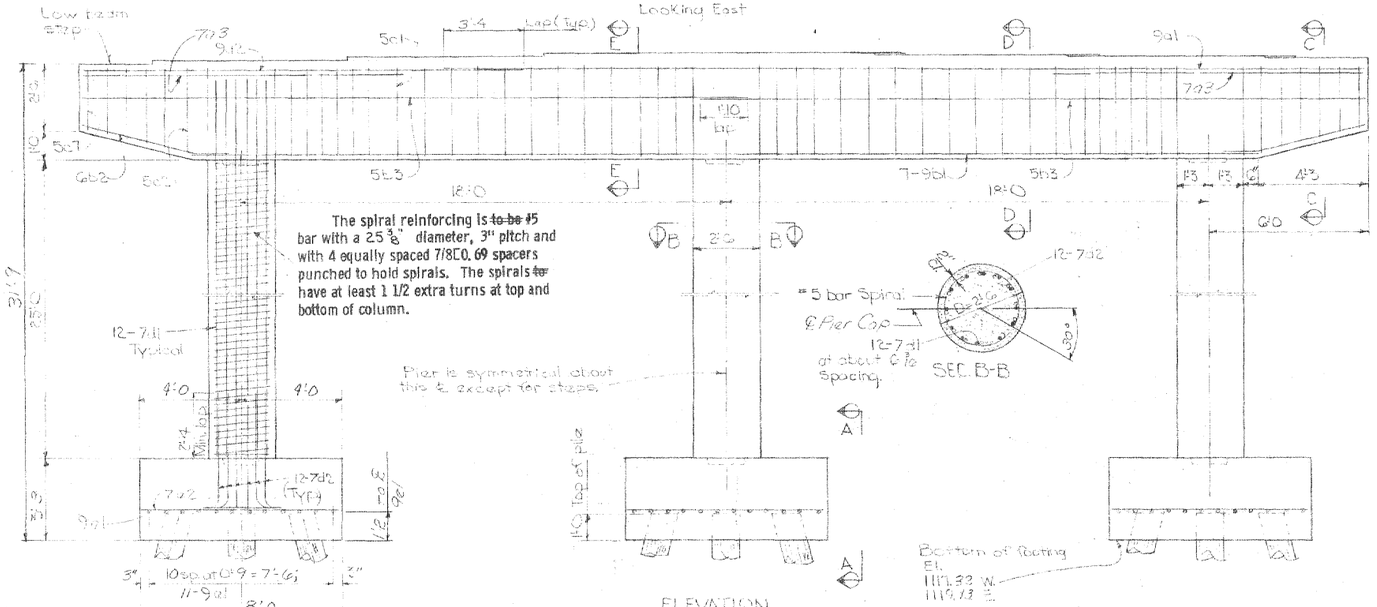
DESIGNED BY: J. Clausen TRACED BY: JK CHECKED BY: M. L. Lemmer

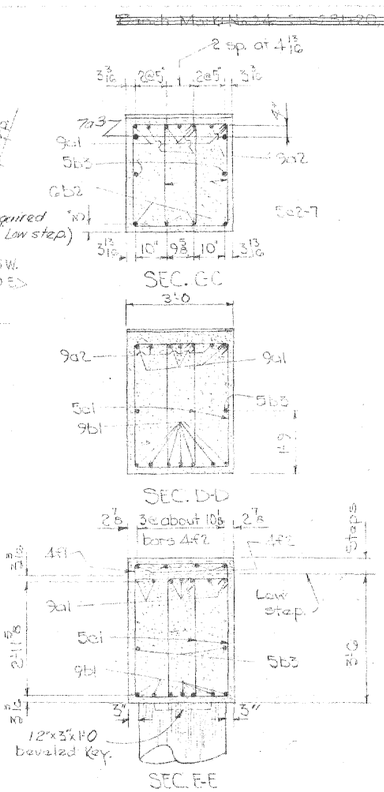
Section Leader: J. Sassaman

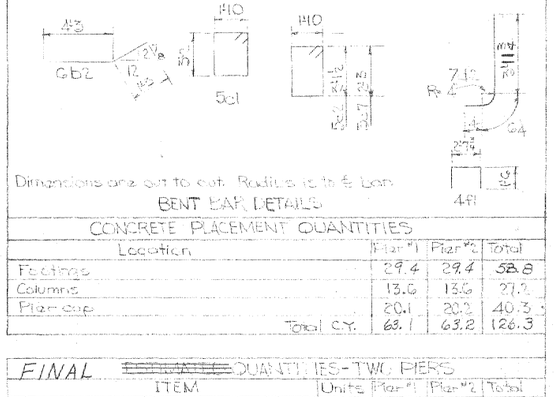
UNION COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
F-FG-34-4(1)--24-88	IOWA	5		54	61









Dimensions are out to out. Radius is to ℄ bars.

BENT BAR DETAILS

REINFORCING BAR LIST - 1 PIER

Bar	Location	Shape	No.	Length	Weight
9a1	Cap, longitudinal, Top	—	7	34'6	821
9a2	" " "	—	7	16'6	393
7a3	" " " Top	—	4	12'0	98
9b1	Cap, longitudinal, bottom	—	7	39'4	936
5b2	Cap, longitudinal, bottom, at ends	—	8	5'6	66
5b2	Cap, longitudinal, at sides	—	4	24'9	103
5a1	Cap, hoops	□	84	12'3	1073
5a2-7	" "	□	24	Variable	243
7d1	Column	—	32	28'2	2079
7d2	Footing, at wall	⌐	36	4'10	366
9a1	Footing, at top of piles	—	33	10'2	1141
7d3	" " " "	—	39	7'8	611
#5	Column Spiral	|||||	2	67'0.4	2116
	Tef. 0.34 Spacers	—	12	2'4.0	201
4a1	Beneath Beam bearings	□	24	5'6	88
4a2	" " "	—	24	3'0	48
	Total Lb.				10,373

CONCRETE PLACEMENT QUANTITIES

Location	Pier #1	Pier #2	Total
Footings	29.4	29.4	58.8
Columns	13.6	13.6	27.2
Pier cap	20.1	20.2	40.3
Total C.Y.	63.1	63.2	126.3

FINAL ~~ESTIMATED~~ QUANTITIES - TWO PIERS

ITEM	Units	Pier #1	Pier #2	Total
Structural Concrete - class 'C'	C.Y.	63.1	63.2	126.3
Reinforcing steel	Lb.	10,373	10,373	20,746
Creosoted Piling	L.F.	~~265~~ 275	~~265~~ 275	~~530~~ 550
Class 20 Excavation	C.Y.	113	108	221
Class 21 Excavation	C.Y.	126	97	223

PIER NOTES:

All exposed corners of 90° or sharper are ~~to be~~ filleted with a 3/4" dressed and beveled strip.

The minimum clear distance from face of concrete to near reinforcing bar is ~~to be~~ 2 inches unless otherwise noted or shown.

The spiral reinforcing ~~may be~~ spliced by lapping 1 1/2 turns. The length of the spiral shown does not include the lapped length of the splices. The cost of the laps is ~~to be~~ included in the price bid for other reinforcing.

The pier piles are ~~to be~~ driven to full penetration, if practicable, but in no case to a bearing value less than 20 tons nor more than 40 tons per pile.

Number 5 spirals ~~shall be~~ of a material permitted for #4 spirals.

Design For 20° Skew

168'-0 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43-3'@55'-9 End Spans 69'-0 Interior Span

PIER DETAILS

Station: 282+62.00 April, 1970

UNION COUNTY

IOWA STATE HIGHWAY COMMISSION

DESIGN NO. 770
FILE NO. 22848
DES. SH. NO. 2 OF 8

UNION COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	F-FG-34-4(1)--24-88	IOWA	5		55	64

DESIGNED BY: E.N. TRACED BY: CHECKED BY: M.L. Lemmer

This sheet to be used with PC66 Prestress Beams and wood piles. Use a minimum detailing haunch of 1".
Revised 5-26-69: Minor details changed.

Holes for 7/8" bolts are ═══ formed 1 7/16" (nominal dia). Std. steel pipe sleeves ═══ with ears ═══ galvanized after cutting to proper length. The pipe sleeves ═══ securely fixed in exact location as shown before concrete ▒▒ poured. The cost of pipe sleeves is ═══ included in the price bid for concrete. The 1" bolts and ═══ furnished and placed by others.

45° Face to face of handrails

44'-0 Roadway

22'-0

20'-8 Tangent on 1.5% slope

3'-0 Parabolic Crown

3'-0 Parabolic Crown

20'-8 Tangent on 1.5% slope

Top transverse reinforcing steel is ═══ parallel to and 2" clear below top of slab. Bottom longitudinal reinforcing steel is ═══ parallel to and 1" clear and 2 1/2" from ends of beams. Top and bottom reinforcing steel is ═══ supported by individual bar chairs spaced at not more than 3'-0 centers longitudinally and transversely.

Typical 8@1'-2 spaces @ 0'-5½ = 5'-6 — 5b1 Top & Bottom

Construction Joint

This line of curb is ═══ 8⅝" above the design ℄ Grade.

Beveled 1 × 4 Keyway

This line of curb is ═══ 8⅝" above the design ℄ Grade.

Permissible Const. Joint

Straight line between beams

¾" × 1'-3 Coil Rods

Fill with mortar

¾" Drip groove

Indicates thickness of slab at face of haunch. For slab thickness over beams see "Slab Thickness Details" on sheet 4 of 8.

℄ Roadway

HALF SECTION NEAR MID SPAN

Area of One Curb = 1.693 sq. ft.
Area of Slab Area A = 15.797 sq. ft.
Area B = 14.033 sq. ft.

These lines to be parallel to grade

4 Spaces @ 1'-1" = 4'-4

Field bend

3'-5

Center Line

Construction Joint

Field bend

3'-0 L Beam Guard Rail. Posts are ═══ furnished & placed by others

Keyway formed by beveled 2 × 8

PART END VIEW A-A

Temporary paving block

Detail A

Free Line

Face of pavement

Edge to ℄ Radius

Approx ½" × ¾" indentation cutter to cutter

Face of paving notch

DETAIL A

NOTE: After piles are cut off the upper 3' except as shown is ═══ wrapped with a double thickness of rug reinforcing held in place by tacking with galvanized roofing nails and wrapped with 14 guage galvanized wire at 4" pitch. Care ═══ taken not to damage coating when placing concrete. Padding is ═══ hair and jute rug carpeting reinforced both sides and weighing not less than 58 oz. per square yard.

Spirals at top of each pile 7 turns of No 2 bar. Diameter 3' out to out with 6" & 8" spacing furnished to help spiral.

Felt padding

PART SECTION B-B

℄ Abut

Typical Spacing 21 @ 10½ = 18'-4½

Inside Spacing 7 spa @ 3'-1½ = 21'-10½

5pl Hdgs

℄ Rdwy

℄ Piles

46'-9⅞

44'-0

ABUTMENT PILE PLAN

℄ Beams

ABUTMENT STEP DIAGRAM

Looking East (Both Abutments)

ABUTMENT STEPS	W. Abut.	E. Abut.
A	1 15/16	2 1/2
B	1 1/16	2 13/16
C	1 1/16	1 13/16
D	4	0
E	3/8	3/8
F	℄	℄

ABUTMENT STEP ELEV.	Point	W. Abut.	E. Abut.
	A	1147.97	1152.35
	B	1148.13	1152.53
	C	1148.29	1152.71
	D	1148.43	1152.87
	E	1148.41	1152.87
	F	1148.36	1152.84
	G	1148.31	1152.81

HALF SECTION NEAR ABUTMENT

Keyway formed by beveled 2×8

Bottom of Footing Elev. [W. Abut. = 1144.47; E. Abut. = 1148.85]

Slab Area B — Slab Area A

6 Beam spaces @ 6'-10⅜ = 41'-3

47'-4

PART SECTION C-C

Based on ⅛" compression of Neoprene bearing pads.

Typical 8@1'-2 spaces @ 0'-5½ = 5'-6 — 8@1'-8

Grade to Pier Top at ℄ Pier

4'-1⅛

¾" × 1'-3 Coil Rods

HALF SECTION NEAR PIER

End Spans 1'-3½

Center Span 1'-5½

¼" Thick strips of compressible material around bearing pads, face of steps and ends of keyways. Compressible material ═══ conforms to A.A.S.H.O. Specifications, M-153 (Type III).

¼ Pref. Joint material

℄ Pier

1'-3 — 1'-3

℄ Beam

PART PLAN

Neoprene bearing pads (8" × 1'-1" × 1'-3½" End Spans, (8" × 1'-1" × 1'-5½" Center Span

1" Min. Typ.

Keyway formed by beveled 2×8

℄ Pier

SECTION D-D

PIER TOP DETAILS

NOTE: Place 7g2 bars parallel to longit. steel. Shift 7g1 bars in F.F as necessary to miss beams.

Spacing for 7g, 7g2 & 4h1
6@ 7a1 Back Face
4@ 7g1 Front Face
6@ 7g2 Back Face
4h1 Back Face

Design For 20° Skew

168'-0 × 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43'-3½ End Spans 69'-0 Interior Span

SUPERSTRUCTURE DETAILS

Station 282+62.00 — April, 1970

UNION COUNTY

Iowa State Highway Commission

Dist. 5 Sh. No. 3 of 8 — File No. 22848 — Des. No. 770

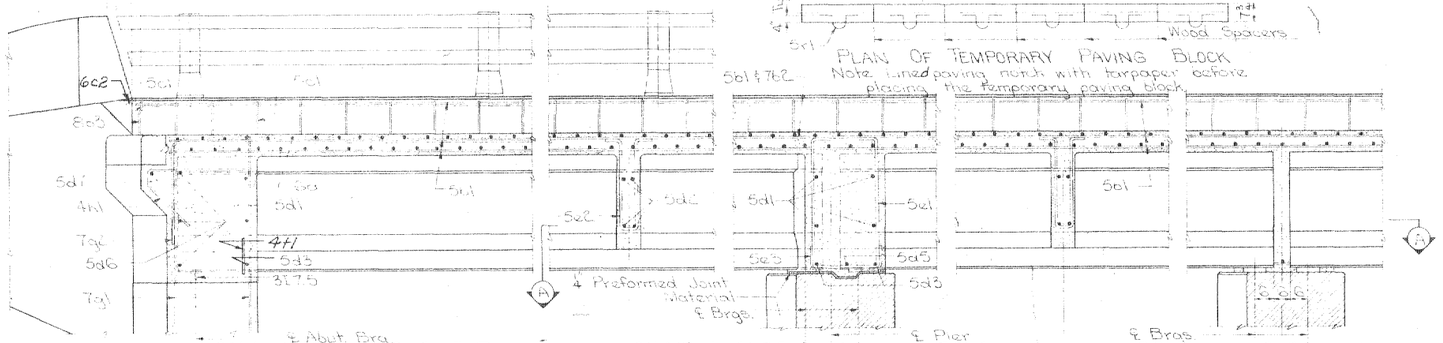
DESIGNED BY L. L. Clausen — DETAILED BY — TRACED BY L. Lipsey — CHECKED BY M. J. Flemmer — Q. — As Cross Section at Roadway — R.F.

UNION COUNTY — PROJECT NUMBER F-FG-34-4(1)--24-88

STATE TRUST	FED ROAD DIST NO.	F. SCAL YEAR	SHEET NO.	TOTAL SHEETS
	5		56	61

172'-6¼ Face to Face of Concrete End Posts (See sheet 7 of 8 for handrail details and post spacing)
136 Spaces @ 1'-3" = 170'-0 ; 137 - 8x8 Posts

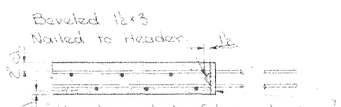
6 Sections @ 7'-7½" = 45'-7" — BENCH MARK: NO. 24 STA. 283+50 I.H.C.B.M. ON TOP SW. WING POST BRIDGE ELEV. 1,155.66.



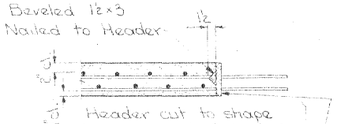
LONGITUDINAL SECTION NEAR CURB

PLAN OF TEMPORARY PAVING BLOCK

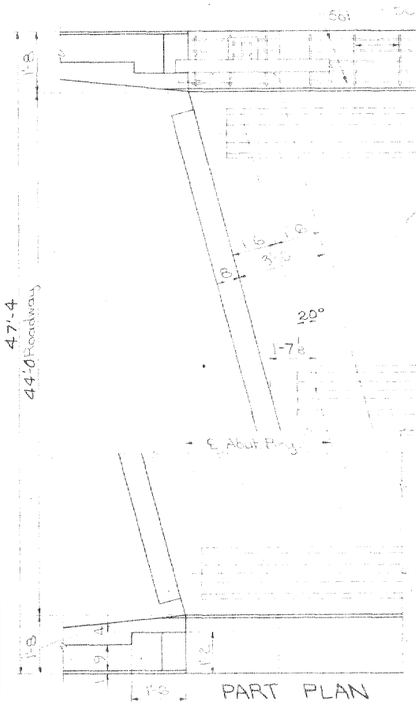
Note: Lined paving notch with tarpaper before placing the temporary paving block

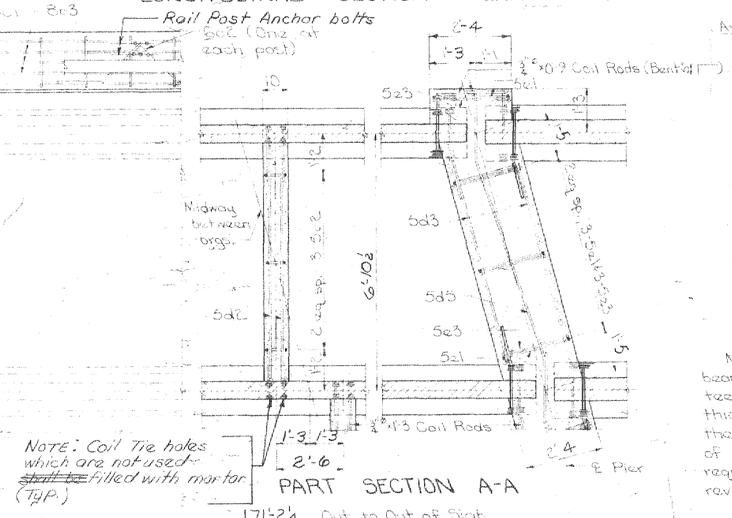


LONGITUDINAL FLOOR CONSTRUCTION JOINT

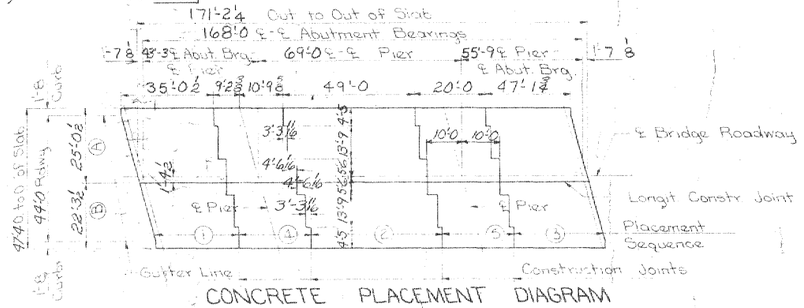


TRANSVERSE FLOOR CONSTRUCTION JOINT



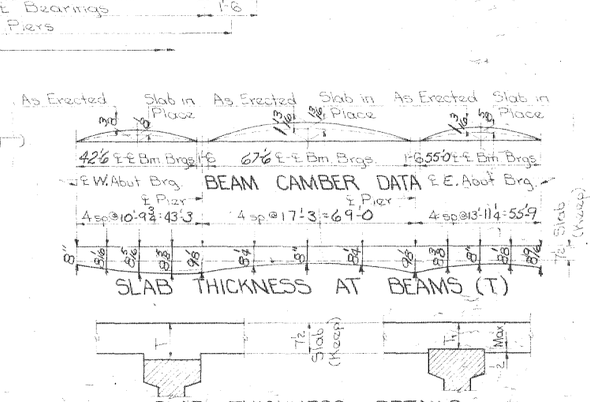


PART SECTION A-A



CONCRETE PLACEMENT DIAGRAM

Note: Roadway slab ~~shall be~~ placed in sections and sequence indicated and preferably at intervals not exceeding 24 hours. Alternate procedures for placing slab concrete ~~shall be~~ submitted for approval, together with a statement of the proposed method and evidence that the Contractor possessed the necessary equipment and facilities to accomplish the required results. Curbs ~~shall be~~ placed continuously ~~Side (A) of slab to be placed prior to Side (B).~~
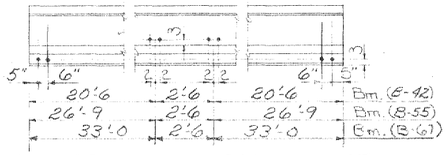


BEAM CAMBER DATA

SLAB THICKNESS AT BEAMS (T)

SLAB THICKNESS DETAILS

Note: The slab thickness (T) at beams is based on the anticipated beam camber remaining after placing the slab, but is not guaranteed for construction. If beam is under cambered, increase slab thickness (T) at beams to compensate. If beam is over cambered, the slab thickness (T) at beam ~~shall be~~ decreased to a maximum of ½" embedment at the beam (T). If more than ½" embedment is required, or if the haunch exceeds 2", the grade line ~~shall be~~ revised.



LOCATION OF BEAM COIL TIES

N

CONC. PLACEMENT QUANT.- 1 SUPER. & 2 ABUTS.

Item	A	B	Class "C"	Class "D"
Section 1 Slab & Diaph.	33.1	29.5		62.6
Section 2 Slab & Diaph.	30.9	27.4		58.3
Section 3 Slab & Diaph.	40.3	35.9		76.2
Section 4 Slab & Diaph.	18.5	16.7		35.2
Section 5 Slab & Diaph.	18.5	16.1		35.2
Curbs 2 @ 10.7				21.4
Paving Blocks 2 @ 1.1			2.2	
Abutment Wings 4 @ 1.85				7.4
Abutment Footings W. Abut: 20.5 ; E. Abut: 21.2			41.7	
End Posts 4 @ .4				1.6
Total (Cu. Yd.)			43.9	297.9

~~ESTIMATED~~ QUANT.- 1 BRIDGE (SUPER & ABUTS.)

Item		Unit	Quantity
Structural Concrete Class "C"		Cu. Yd.	43.9
Structural Concrete Class "D"		Cu. Yd.	297.9
Pretensioned Prestressed	1842	No.	7
I Concrete Beams	1655	No.	7
	1667	No.	7
Reinforcing Steel		Lbs.	70,468
Class 20 Excavation		Cu. Yd.	100
Granular Backfill		Cu. Yd.	120
Concrete Piling 25 ~~30~~ @ 50'		L.F.	~~1600~~ 1248

~~Alloy Bar Class "A"~~ Class "D" Concrete

Design For 20° Skew

168'-0 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43'-3 & 55'-9 End Spans — 69'-0 Interior Span

SUPERSTRUCTURE DETAILS

Station 282+62.00 — April, 1970

UNION COUNTY

Iowa State Highway Commission

Dist. Sh. No. 4 of 8 File No. 22948 Dist. No. 770

This sheet to be used with PCA's Prestress, Beams and wood piles. Use a minimum of 2 detailing launch of 2.
Revised 5-26-69 Minor details changed.

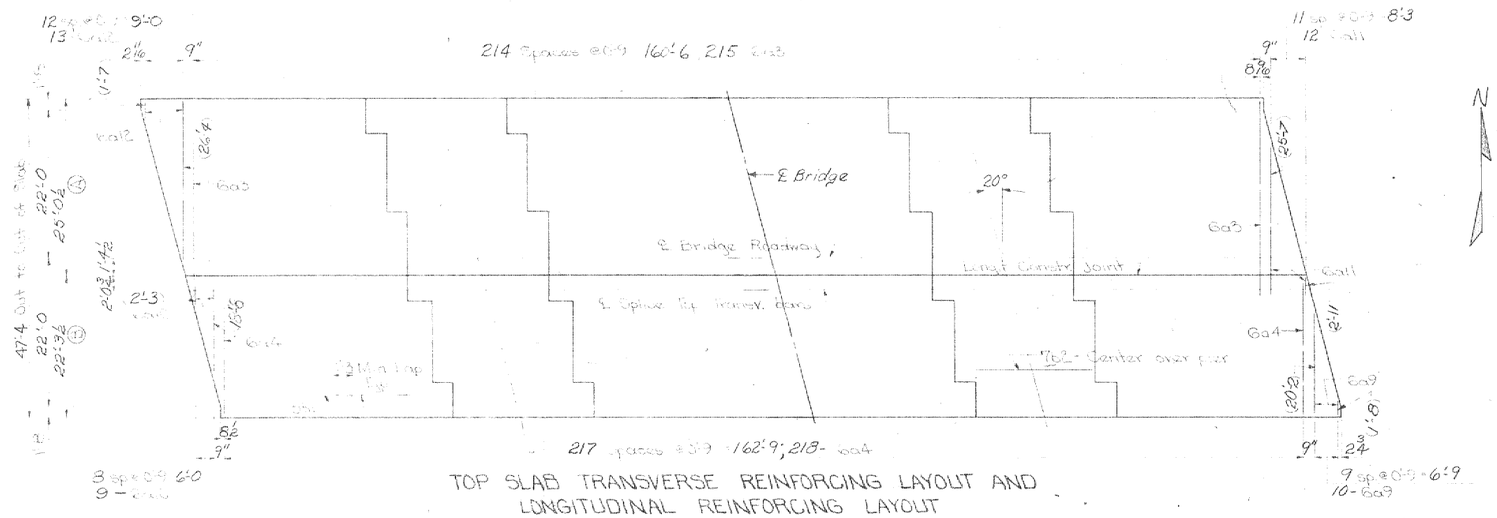
DESIGNED BY [illegible] TRACED BY [illegible]
DETAILED BY [illegible] CHECKED BY M. L. Hammer

P.C. Longitudinal Section - 44' Roadway R.F.

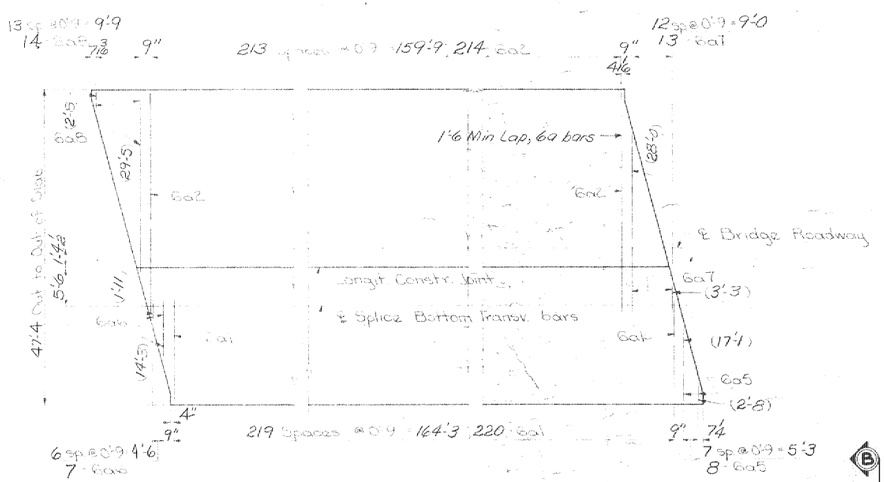
UNION COUNTY

PROJECT NUMBER F-FG-34-4(1)--24-88

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		57	61



TOP SLAB TRANSVERSE REINFORCING LAYOUT AND LONGITUDINAL REINFORCING LAYOUT



BOTTOM SLAB TRANSVERSE REINFORCING LAYOUT

SUPERSTRUCTURE AND ABUTMENT NOTES:

This bridge is designed for HS20-44 loading plus an allowance of 20 lb. per square foot of roadway for future wearing surface.

The floor slab as shown includes ½" of wearing surface.

All exposed corners 90° or sharper ~~are~~ were filleted with a ¾" dressed and beveled strip.

Cost of bearing material is ~~to be~~ included in price bid for prestressed concrete beams.

Cost of preformed joint and compressible materials is ~~to be~~ included in price bid for concrete.

All beams are ~~to be~~ set vertical.

Forms for the slab and curb are ~~to be~~ supported by the pre-stressed beams.

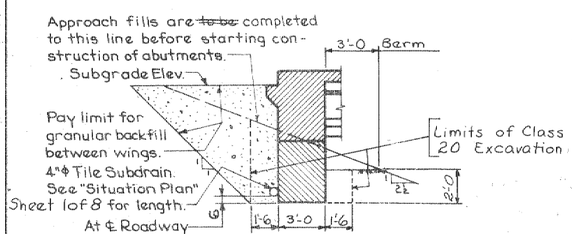
The pier and abutment diaphragm concrete is ~~to be~~ placed monolithically with the floor slab.

Clear distance from face of concrete to near reinforcing bar is ~~not less~~ 2 inches unless otherwise noted or shown. All reinforcing bars are ~~to be~~ securely wired in place and adequately supported on bar chairs before concrete ~~is~~ placed.

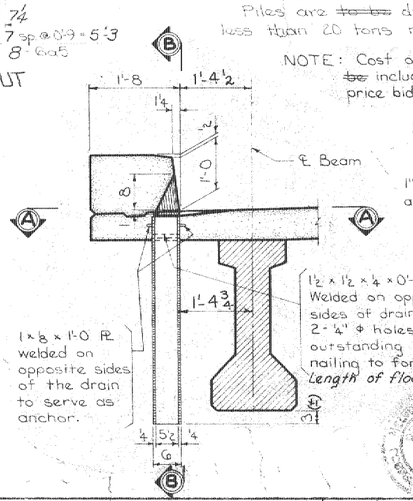
All backfill behind the abutment between wings is ~~to be~~ granular backfill. The remainder of the abutment excavation is ~~to be~~ backfilled with soil.

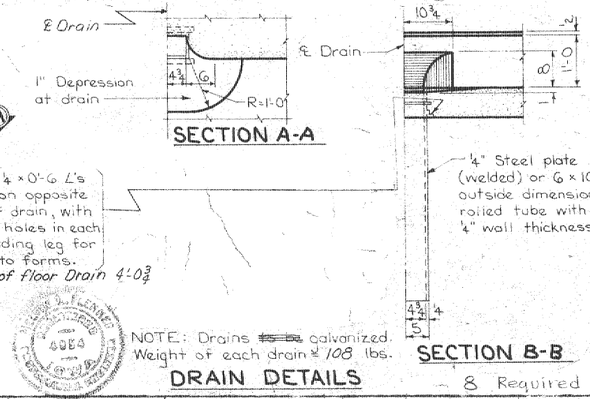
Piles are ~~to be~~ driven to full penetration if practicable, but to not less than 20 tons nor more than 40 tons bearing value per pile.

NOTE: Cost of drains ~~to be~~ included in the price bid for concrete.



BACKFILL DETAIL





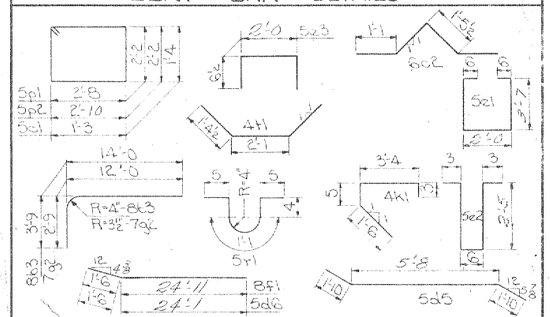
NOTE: Drains ~~to be~~ galvanized. Weight of each drain ≅ 108 lbs.

8 Required

DRAIN DETAILS

REINF. STEEL - ONE SUPER. & TWO INTEGRAL ABUTS.					
Bar	Location	Type	No	Length	Weight
6a1	Slab Transverse, Bottom		220	17'-5	4755
6a2	Slab Transverse, Bottom		214	31'-2	10019
6a3	Slab Transverse, Top		215	27'-5	8935
6a4	Slab Transverse, Top		218	20'-10	6821
6a5	Slab Transverse, Bottom, End		8	Varies	119
6a6	Slab Transverse, Bottom, End		7	Varies	85
6a7	Slab Transverse, Bottom, End		13	Varies	305
6a8	Slab Transverse, Bottom, End		14	Varies	337
6a9	Slab Transverse, Top, End		10	Varies	164
6a10	Slab Transverse, Top, End		9	Varies	141
6a11	Slab Transverse, Top, End		12	Varies	257
6a12	Slab Transverse, Top, End		13	Varies	275
7b1	Slab & Curb Longit.		455	35'-2	17759
7b2	Slab & Curb Longit. - Over Piers		80	19'-8	3216
8b3	Abut. Diaphragm to Curb, Vertical		12	11'-7	563
5a1	Curb Hoops	□	274	5'-11	1691
6a2	Curb Transverse at each Post	⌒	42	5'-0	315
5d1	Abut & Pier Diaphragm Longit		72	6'-5	482
5d2	Intermediate Diaph. Longit.		12	6'-0	451
5d3	Abut & Pier Diaphragm Longit.		36	5'-5	203
5d4	Abut Diaphragm, Ends		12	1'-5	21
5d5	Pier Diaphragm, Longit.		12	9'-4	117
5d6	Abut Diaphragm, Longit.		12	25'-7	320
5e1	Pier Diaphragm, Hoops	□	40	9'-10	410
5e2	Intermediate Diaph. Hoops	U	54	5'-6	310
5e3	Pier Diaphragm, Ties	⊓	48	2'-11	146
8f1	Abut Footing, Longit.		36	26'-5	2539
7g1	Abutment, Vertical - BF & FF		184	6'-4	2382
7g2	Abutment Diaph. Vertical B.F.		92	14'-1	2742
5h1	Abut. Wing & End Post, Horiz.	—	72	6'-8	501
5h2	Abutment to Wing Dowels		56	4'-4	253
4h3	End Post Horizontal		8	4'-0	21
4k1	Paving Notch, Transverse	⊃	88	5'-4	313
5p1	Abutment Hoops	□	120	10'-2	1304
5p2	Abutment Hoops at Ends	□	16	10'-2	17
5r1	Paving Notch Lifting Hoops	U	2	2'-6	30
5s1	Wing Vertical		96	Varies	300
5s2	End Post - Wing, Vertical		40	3'-9	156
5s3	End Post - Wing, Vertical		24	3'-0	75
4t1	Abut. Diaph. Horiz. at Each Beam	⌣	14	4'-9	44
5d7	Paving Notch Longitudinal		4	23'-5	94
	Pile Spiral # 2 Bar	∿∿∿	32	38'-6	206
	Spiral Spacer, 8 E 069		64	1'-10	81
				Total (Lbs)	70,468

BENT BAR DETAILS



Note All dimensions are out to out. Radii are to ℄ bar.

Design For 20° Skew

168'-0 x 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43'-3 ℄ 55'-9 End Spans, 69'-0 Interior Span

SUPERSTRUCTURE DETAILS

Station 282+62.00

April, 1970

UNION COUNTY

Iowa State Highway Commission

Des. Sh. No. 5 of 8 File No. 22848 Des. No. 770

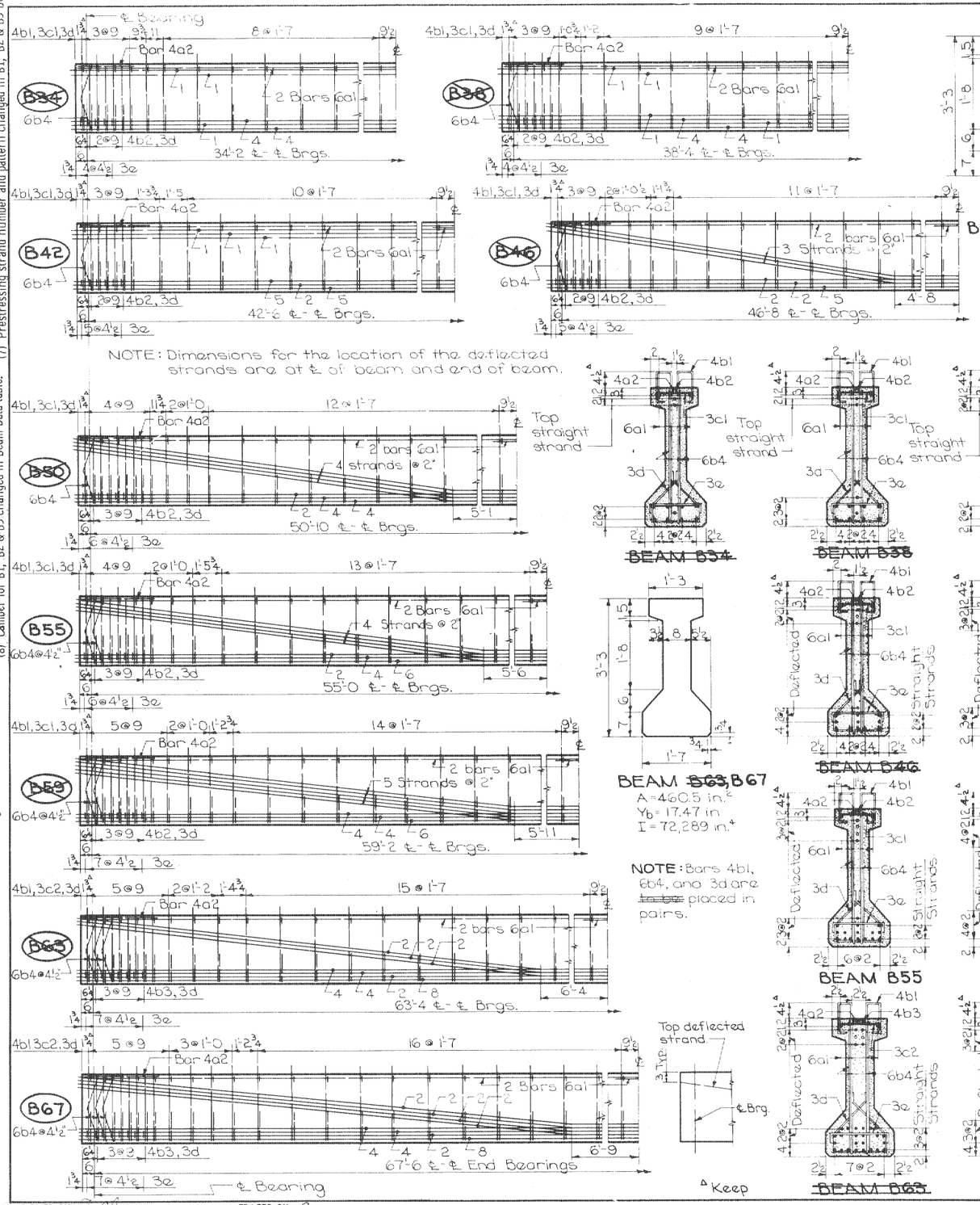
This sheet to be used with PCPC Prestress Beams and wood piles.
Revised: 5-26-69: Minor details changed.

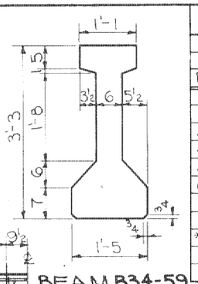
DESIGNED BY: L. Clausen | TRACED BY: [illegible] | CHECKED BY: M. L. Hammer | PC Slab Layout | 44' Roadway | (F.F.) | UNION COUNTY | PROJECT NUMBER: F-FG-34-4 (1)--24-88

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		58	61

Revised (9-12-67)
(1) End of bm changed from sloped to square.
(2) Projection of Bar 4b1 above top flange changed from 4 1/2" to 4".
(3) Stirrup spacings near bm end changed.
(4) Bend detail of projected bottom strands at bm end changed.
(5) Length of bar 5a1 & 4b1 changed.
(6) Detail showing location of top deflected strands at bm end added
(7) Prestressing strand number and pattern changed in B1, B2 & B3 Beams

Revised (7-8-66) Lower figures of D.L. deflection due to creep and shrinkage in Beam Data table changed.
Revised (1-25-67) Bars 3a added & No. of 3d Bars increased, deflection note, re-written.
Revised 5-2-67: Note concerning roughening of beams at diaphragms added.
Revised 6-1-67: Initial Prestress for B3 changed.
Revised 9-4-68: Projection of Bar 4b1 above top flange changed from 4" to 4½". Also Future W.S. Loading changed.
Revised 3-6-69: Beam designation numbers changed.
(8) Camber for B1, B2 & B3 changed in Beam Data table.

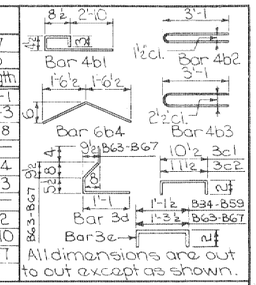




NOTE: Bars 4b1, 6b4, and 3d are ~~to be~~ placed in pairs.

REINFORCING BAR LIST

Beam	B34		B38		B42		B46		B50		B55		B59		B63		B67	
Span	34'-2		38'-4		42'-6		46'-8		50'-10		55'-0		59'-2		63'-4		67'-6	
Bar	Shape	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length
6a1		4	34'-11	4	39'-1	4	22'-7	4	24'-8	4	26'-6	4	28'-10	4	30'-11	4	33'-0	4	35'-1
4a2		2	2'-6	2	2'-6	2	2'-6	2	2'-6	2	3'-3	2	3'-3	2	3'-3	2	3'-3	2	3'-3
4b1		56	4'-8	60	4'-8	64	4'-8	72	4'-8	80	4'-8	84	4'-8	92	4'-8	96	4'-8	104	4'-8
4b2		6	6'-2	6	6'-2	6	6'-2	6	6'-2	8	6'-2	8	6'-2	8	6'-2	—	—	—	—
4b3		—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	6'-4	8	6'-4
6b4		4	3'-3	4	3'-3	4	3'-3	4	3'-3	4	3'-3	8	3'-3	8	3'-3	12	3'-3	12	3'-3
3c1		28	1'-1	30	1'-1	32	1'-1	36	1'-1	40	1'-1	42	1'-1	46	1'-1	—	—	—	—
3c2		—	—	—	—	—	—	—	—	—	—	—	—	—	—	48	1'-2	52	1'-2
*3d		68	2'-8	72	2'-8	76	2'-8	84	2'-8	96	2'-8	100	2'-8	108	2'-8	112	2'-10	120	2'-10
3e		10	1'-5	10	1'-5	12	1'-5	12	1'-5	14	1'-5	14	1'-5	16	1'-5	16	1'-7	16	1'-7

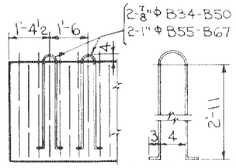


*Where deflecting strands interfere with placement, some in-place bending ~~may be~~ necessary.

BEAM DATA

Beam	B34	B38	B42	B46	B50	B55	B59	B63	B67
Span	34'-2	38'-4	42'-6	46'-8	50'-10	55'-0	59'-2	63'-4	67'-6
Initial Prestress Kips	318	347	434	347	405	462	548	694	752
Size Strands	½	½	½	½	½	½	½	½	½
Straight Strands	11	12	15	9	10	12	14	18	18
Deflected Strands	—	—	—	3	4	4	5	6	8
Hold Down Stress Kips	—	—	—	11.2	13.8	12.7	13.7	16.6	19.3
Camber ②	.13	.18	.25	.26 .37	.46 .60	.65 .84	.83 1.18	1.04 1.48	1.25 1.75	1.30 1.80
① D.L. Deflection ③ in (6'-10½ Spcg.)	.08	.12	.14	.18 .05	.25 .07	.26 .37	.37 .04	.48 .12	.66 .17	.70 .19	.71 .21
② D.L. Deflection ③ in (8'-0 Spcg.)	.09	.13	.16	.21 .06	.29 .08	.30 .43	.43 .10	.56 .14	.77 .19	.82 .20	.83 .21	.84 .24
③ D.L. Deflection ③ in (9'-0 Spcg.)	.10	.15	.18	.24 .06	.33 .09	.34 .49	.49 .11	.64 .16	.88 .22	.94 .23	.95 .24	.96 .27
Reinforcing Steel Lbs.	411	441	478	526	585	635	684	744	792
Concrete C.Y.	3.47	3.87	4.28	4.69	5.10	5.51	5.92	7.62	8.11

① Due to weight of slab and diaphragms.
② Upper figure is the beam camber at release. Lower figure is the beam camber just before slab is placed.
③ Upper figure is the elastic deflection of beam due to weight of slab. Lower figure is the deflection due to the combined effect of creep due to weight of slab and shrinkage of slab. Total deflection of beam is upper figure + 75% of lower figure for end spans and upper figure + 50% of lower figure for interior spans.

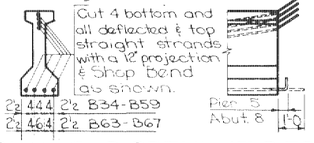


LIFTING LOOP DETAILS

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

COILTIE DETAILS

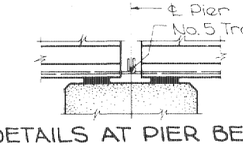
Number and location of coil ties ~~to be~~ as detailed on specific designs.



BEAM END DETAIL AT PIER AND ABUT.

MAXIMUM SPACING OF BEAMS FOR SPANS SHOWN

Loading	Future W.S.	Maximum Spacing
H20-S16 (Primary)	20#/□'	7'-3
~~H20 (Primary)~~	~~20#/□'~~	~~8'-0~~
~~H15 (Secondary)~~		~~9'-6~~



DETAILS AT PIER BEFORE PLACING PIER DIAPHRAGM

NOTES

Unless otherwise noted lengths of all beams ~~shall be~~ increased .0005 L to compensate for creep shrinkage and elastic shortening.

All deflected strands are ~~to be~~ held down at .4 points except that the hold down point ~~may be~~ moved toward the end of the beam a distance not to exceed .05 span at the producer's option.

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

Bearing details ~~will be~~ as detailed on the Bridge design sheets.

All strands are ~~to be~~ 1/2" ϕ 270 kip grade.

Beams for continuous bridges ~~shall be~~ at least 4 weeks old before the slab is placed except as otherwise approved by the Engineer.

The portions of the prestress beams that are ~~to be~~ embedded in the abutment and pier diaphragms ~~shall be~~ roughened by sandblasting or other approved methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

DESIGN STRESSES

Design stresses for the following materials are ~~to be~~ in accordance with A. A. S. H. O. Standard Specifications for Highway Bridges, Series of 1969.

Reinforcing steel in accordance with section 1.5.1 D f_s = 20,000 psi.

Concrete in accordance with 1. 6. 7, f'c = 5000 psi.
Prestressing steel in accordance with 1. 6. 7 f's = 270,000 psi.

SPECIFICATIONS

DESIGN: A. A. S. H. O. Series 1969.
CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, current series, plus current special provisions and supplemental specifications.

DESIGN FOR 20° SKEW

168'-0 x 44' CONCRETE PRETENSIONED BEAM PRESTRESSED BRIDGE

43'-3 & 55'-9 END SPANS — 69'-0 INTERIOR SPAN

BEAM DETAILS

STATION: 282+62.0

April, 1970

UNION COUNTY

IOWA DES. SH. NO. 6 OF 8 — STATE — HIGHWAY FILE NO. 2848 — COMMISSION DES. NO. 170

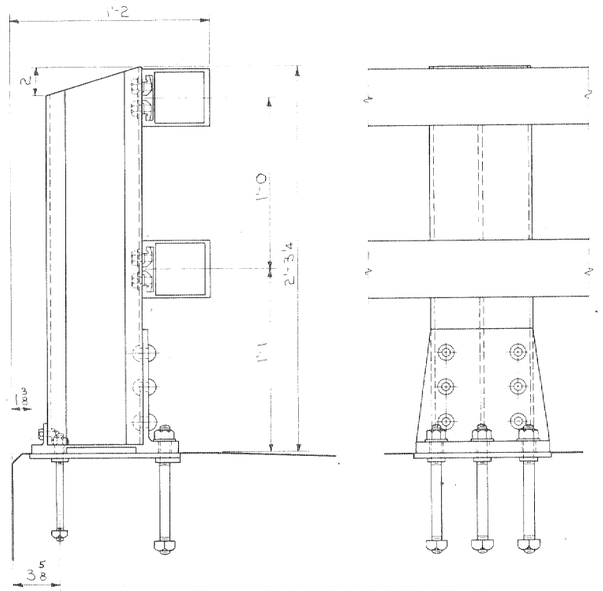
DESIGNED BY: L. Clausen
DETAILED BY:
TRACED BY: R. Rupay
CHECKED BY: M. L. Skinner

4101

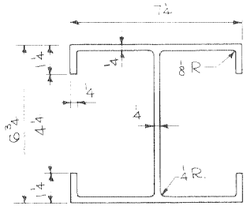
UNION COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
F-FG-34-4(1)--24-88	IOWA	3		39	61

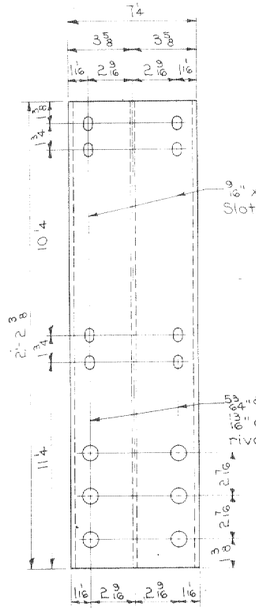
Revised 12-26-68: Added explanation for material for clamp bar bolt.
Revised 6-7-67: Red lead shop coat paint note added.
Revised 5-2-67: Material specifications for aluminum and stainless steel changed.
Revised 10-12-66: Note concerning 1"ϕ drain holes added.
Revised 9-13-66: Gage of holes in Post Base Plate Changed.
Revised 8-19-66: Post Base Plate and Anchor Bolt Assembly Plate details changed.
Revised 7-25-66: Caulking at posts eliminated.
Revised 3-14-66: Minor changes made.



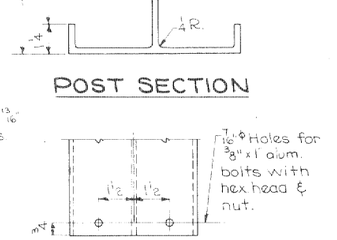
RAIL POST ASSEMBLY



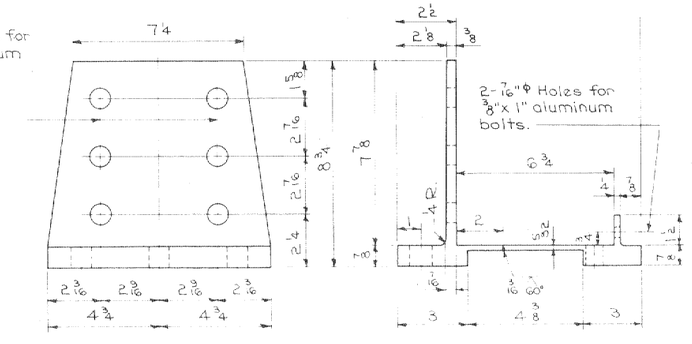
POST SECTION

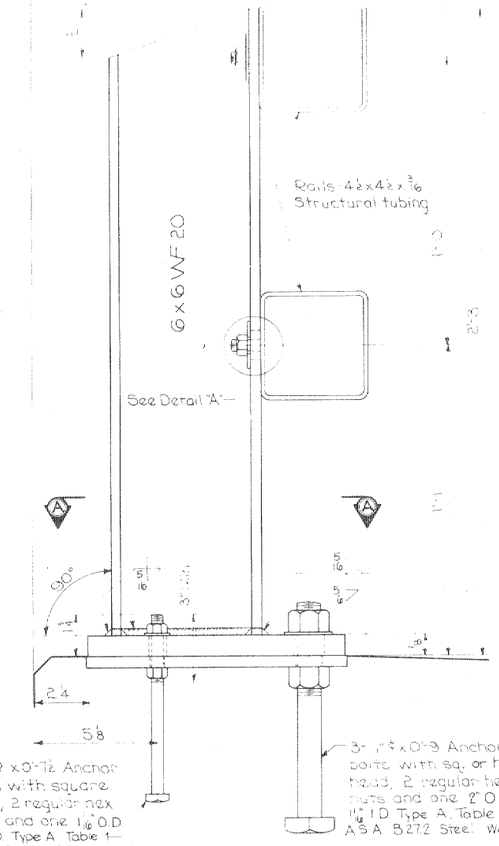


POST

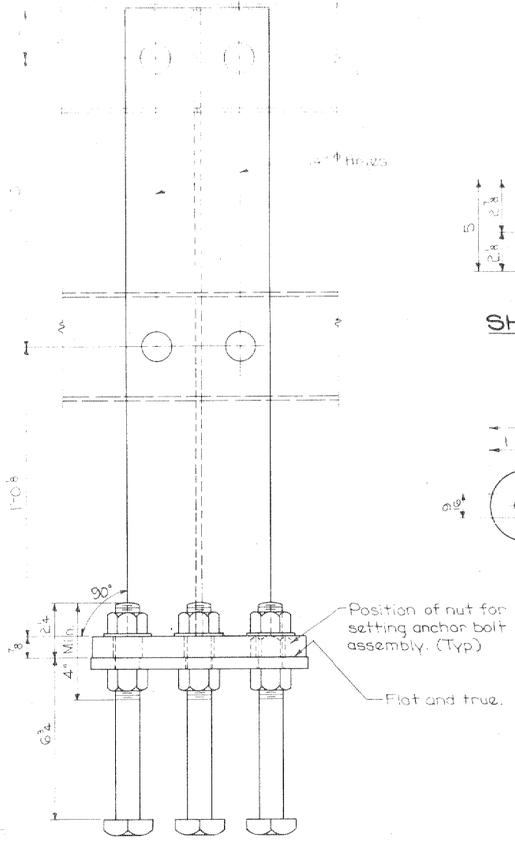


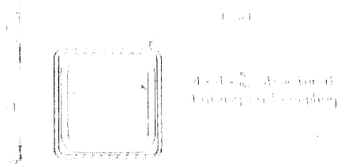
REAR VIEW OF POST


7¼
2⅛
2⅞
⅜
1⅝
2⅞
2⅞
2⅞
2⅞

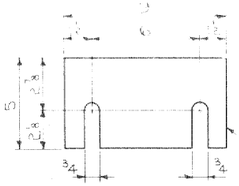


RAIL POST

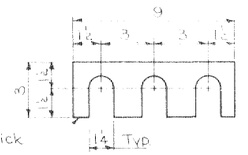




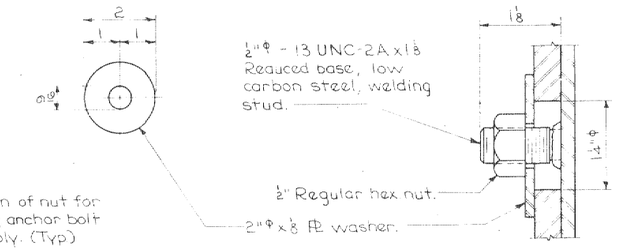
SECTION B-B



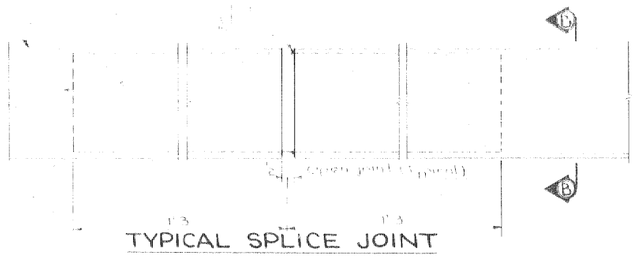
SHIM "A" DETAIL



SHIM "B" DETAIL



DETAIL "A"



TYPICAL SPLICE JOINT

STEEL HANDRAIL NOTES:

The steel handrail is to be bid on a lineal foot basis measured from end to end of rail. The price bid for "Steel Handrail" shall be full compensation for furnishing all material including the anchor bolts and all equipment and labor required to erect the rail in accordance with these plans and Specifications.

Each rail section must be attached to as many posts as possible, but to at least three posts before being spliced.

Material for rail tubing, post, base plate and anchor cage shall be A.S.T.M. A-36 and are to be galvanized after fabrication to A.S.T.M. A-123.

Material for anchor bolts and nuts, and rail to post attachment nuts shall be A.S.T.M. A-307 - Gr. T, Grade A.

Anchor bolts and nuts, rail to post attachment nuts, end caps, washers and shims are to be galvanized to A.S.T.M. A-153.

Ends of tube sections to be sawed or milled. Cut ends to be true, smooth and free from burrs or ragged edges.

Welding shall be in accordance with Section 2408.15 of the Standard Specifications.

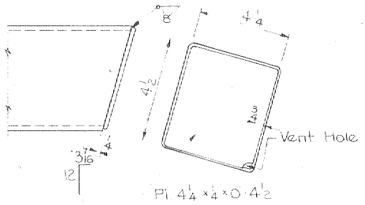
Handling, storage and installation of steel handrail shall be in accordance with Section 2414.06 of the Standard Specifications, except that no caulking will be required.

One shim "A" and one shim "B" is to be furnished for each post, to be used as required.

A surface is considered to be "Flat and True" when the deviation from a straight edge placed on this surface in any position, is less than 1/16".

No painting will be required.

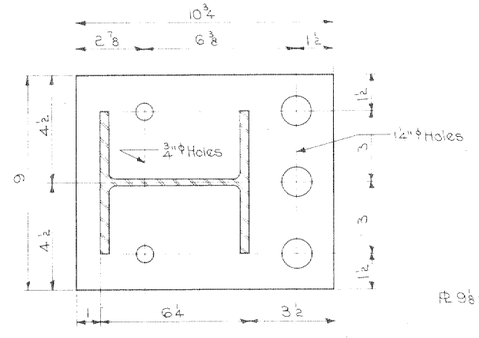
Rail studs shall be provided with adequate protection during shipment.



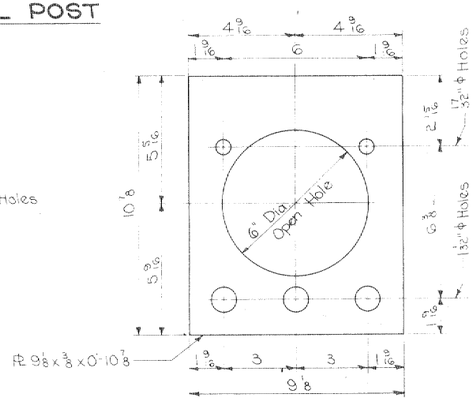
RAIL END CAP DETAILS

DESIGN SPECIFICATIONS:

Designed in accordance with 1964 interim A.A.S.H.O. Specifications.



SECTION A-A



ANCHOR CAGE DETAILS

172'-6¼" Face to face of concrete End Posts

3" 1'-10⅛" 20 Rail Post Spaces @ 8'-5" = 168'-4"; 21 Posts 1'-10⅞" 3"

End Cap (See detail above). ℄ Splices 1" to 3"

NOTE:
Maximum rail post spacing = 8'-6".

TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

STEEL HANDRAIL QUANTITIES	
Steel Handrail	344.1 Lin. Ft.

DESIGN FOR 20° SKEW

168'-0 x 44' CONCRETE PRETENSIONED BEAM PRESTRESSED BRIDGE

43'-3 & 55'-9 END SPANS 69'-0 INTERIOR SPAN

STEEL HANDRAIL DETAILS

STATION: 282+62.0

April, 1970

UNION COUNTY

IOWA DES. SH. NO. 8 OF 8 STATE HIGHWAY FILE NO. 2204B COMMISSION DES. NO. 770

Revised 7-25-66: Caulking at posts eliminated.

DESIGNED BY: [illegible] TRACED BY: Ruppert

DETAILED BY: [illegible] CHECKED BY: W. J. Kammer

1013A

UNION COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. No.	FISCAL YEAR	SHEET No.	Total SHEETS
F-FG-34-4(1)--24-88	IOWA	5		61	61