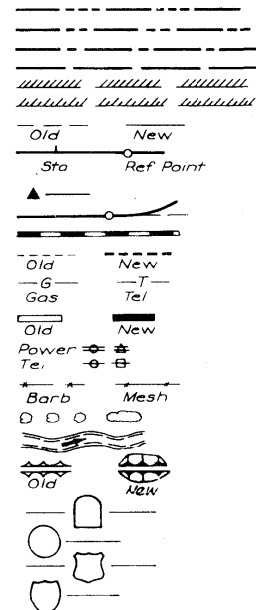


- State Line
- Co. Line
- Twp. Line
- Sec. Line
- Corp. Line
- Urban Bdry.
- R.O.W. Lines
- Survey Line
- Sec. Corner
- Profile Grade
- Railroad
- Field Tile
- Underground Lines
- Culverts
- Utility Poles
- Fences
- Trees Or Brush
- Stream
- Dike
- County Road No.
- Primary Road No.
- U. S. Road No.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

CONVENTIONAL SIGNS



STATE OF IOWA

STATE HIGHWAY COMMISSION

PLANS OF PROPOSED IMPROVEMENT

ON THE

PRIMARY ROAD SYSTEM

MUSCATINE COUNTY

BRIDGES ~~AND CULVERTS~~

JCT. U.S. NO. 61 NORTH TO SOUTH JCT. U.S. NO. 6

SCALES: AS NOTED

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS

FOR CONSTRUCTION WORK, SERIES OF 1972 SHALL

APPLY TO WORK ON THIS PROJECT

(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)

DESIGN STRESSES:

Design stresses for the following materials are in accordance

with AASHTO'S Standard Specifications for Highway Bridges,

Series of 1969, plus 1970 Interim Specifications.

Reinforcing steel in accordance with Section 1.5.1 D

"Reinforcement", $f_s=20,000$ psi.

Concrete in accordance with Section 1.5.1, $f'_c= 3,500$ psi.

Prestressed Concrete in accordance with Section 1.6.7, $f'_c= 5,000$ psi.

Prestressing Steel in accordance with Section 1.6.7, $f'_s= 270,000$ psi.

CONTRACTOR ART NELSON & IA. CULVERT BUILDERS

COMPLETED 1972

NO MILEAGE SUMMARY

CONSTRUCTION PLANS

SHOWING PROJECT AS BUILT

Plan Preparation Supervised by: *[Signature]* Date *1/26/77*

Reviewed & Forwarded to Ames By: *[Signature]* Date *3/7/77*

No. of Copies (Full 1/50% 2) to be made & returned to:

Robert Petcival District Engineer

After Microfilming Return Original to District No. 5

DESIGN DATA

RURAL

1971 AADT 2300 V.P.D.

1991 AADT 3200 V.P.D.

1991 DHV 2372 V.P.H.

Directional 54 %

Trucks 17 %

Design V 70 M.P.H.

Class 3 Access Control

REVISED:

SEE FOLLOWING SHEET 1A

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

[Signature] *11-25-71*

IOWA REGISTRATION NUMBER DATE

APPROVED

DEPUTY CHIEF ENGINEER

IOWA HIGHWAY COMMISSION DATE

U.S. DEPT. TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

INDEX OF SHEETS

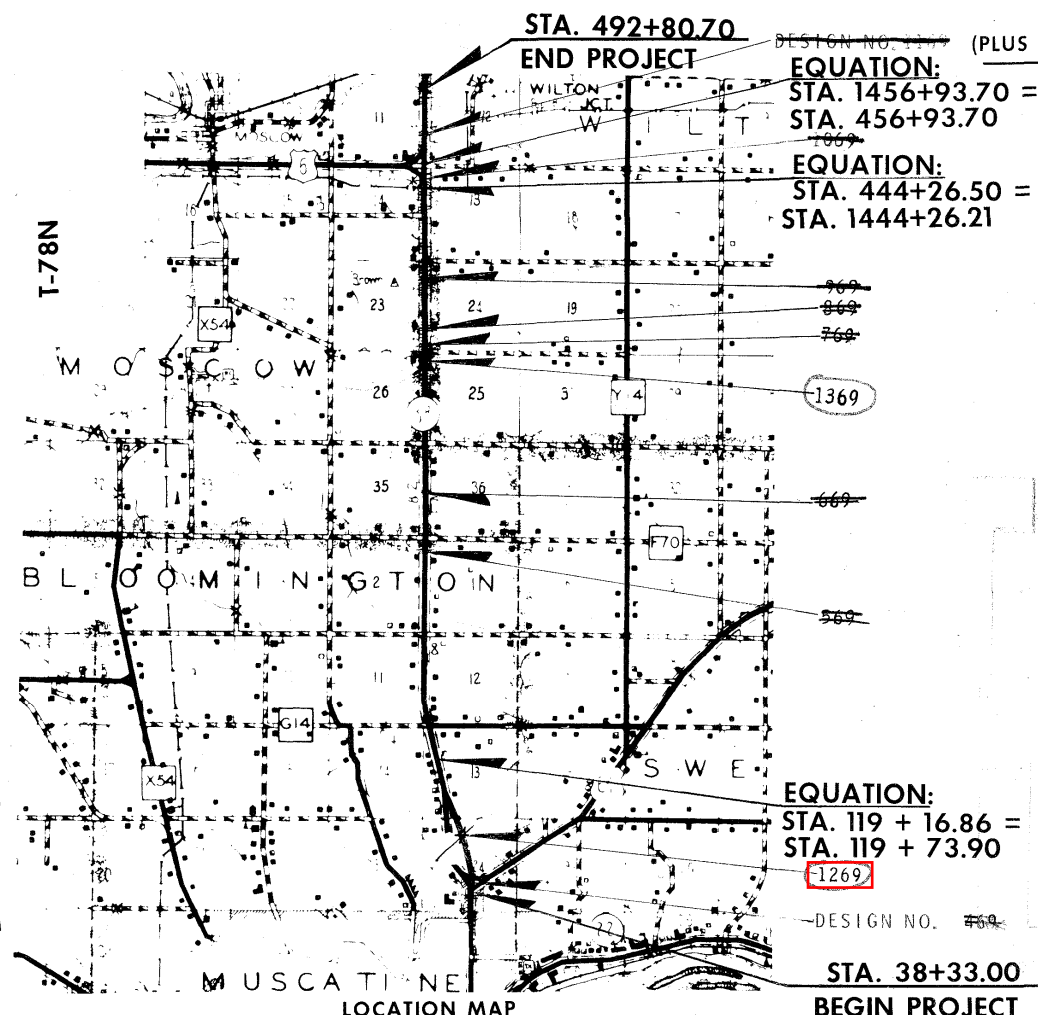
105.3

NO.	DESCRIPTION
1	TITLE SHEET
1A	REVISION SHEET
2	ESTIMATE SHEET (BRIDGES)
3	ESTIMATE SHEET (CULVERTS)
4	MISCELLANEOUS DETAIL SHEET
5	MISCELLANEOUS DETAIL SHEET (RF-1)
6	MISCELLANEOUS DETAIL SHEET (RF-2)
7	MISCELLANEOUS DETAIL SHEET (RF-3)
8	MISCELLANEOUS DETAIL SHEET (RF-4)
9	CULVERT DESIGN NO. 469
10-12	CULVERT DESIGN NO. 569
13	CULVERT DESIGN NO. 669
14	CULVERT DESIGN NO. 769
15	CULVERT DESIGN NO. 869
16	CULVERT DESIGN NO. 969-1069
17	CULVERT DESIGN NO. 1169
18-27	BRIDGE DESIGN NO. 1269
28-38	BRIDGE DESIGN NO. 1369
18A	PILING LOG'S DES. NO. 1269
29A	PILING LOG'S DES. NO. 1369

IOWA STATE HIGHWAY COMMISSION STANDARDS REQUIRED

(Available at the I.S.H.C. Storeroom)

STANDARD	ISSUED	REVISED
C1P	1932	6-1944
C4P	1932	6-1944
CFP	1945	
F4J	1964	6-19-64
JDI-65	1965	8-25-1967
CHP-2.5-65	1965	8-25-1967
CBH-000	1960	



fold -

old

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.

11-03-71 DATE William C. Eyer WILLIAM C. EYER REG. NO. 2926

IN LETTING OF JAN. 4, 1972	DESIGN NO. 1269 IOWA NO. 38 OVER MAD CREEK STA. 64+30.00			
	MUSCATINE COUNTY SECTION 24 T - 77N R - 2W BLOOMINGTON TWP.			
	DESIGN NO. 30° SKEW			
	180'-6 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE			
	ESTIMATE OF QUANTITIES			
	ITEM NO.	ITEM	UNIT	TOTAL
	1	Structural Concrete	Cu. Yds.	410.0
	2	Reinforcing Steel	Lbs.	82 255
	3	Preten. Prestrs. B50	No.	7
	4	Concrete Beams B63	No.	14

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 92.2 cu. yds. of Class "C" concrete and 317.8 cu. yds. of Class "D" concrete.	

ITEM NO.	ITEM	UNIT	TOTAL
8001	12BP53, CUTOFF & UNUSED	C.F.	382.3
8002	PILING, SPICE	ONLY	1
8003	10BP42, CUTOFF & UNUSED	C.F.	200.7
8004	RETARDING AGENT, PAYMENT FOR	C.Y.	266.3

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.

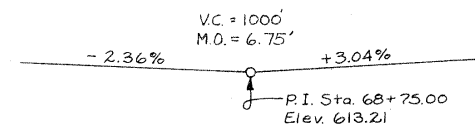
11-03-71 DATE William C. Eyer WILLIAM C. EYER REG. NO. 2926

IN LETTING OF JAN. 4, 1972	DESIGN NO. 1369 IOWA #33 STA. 340+31.90			
	MUSCATINE COUNTY OVER MOSQUITO CREEK (Q SURVEY 1A, #33)			
	SECTIONS 25 - 26 T - 78N R - 2W WILTON-MOSCOW TWP.			
	DESIGN FOR 20° SKEW			
	151'-4x44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE			
	ESTIMATE OF QUANTITIES			
	ITEM NO.	ITEM	UNIT	TOTAL
	1	Structural Concrete	Cu. Yds.	359.9
	2	Reinforcing Steel	Lbs.	71 892
	3	Pretensioned Prestressed Concrete Beams C80	No.	7

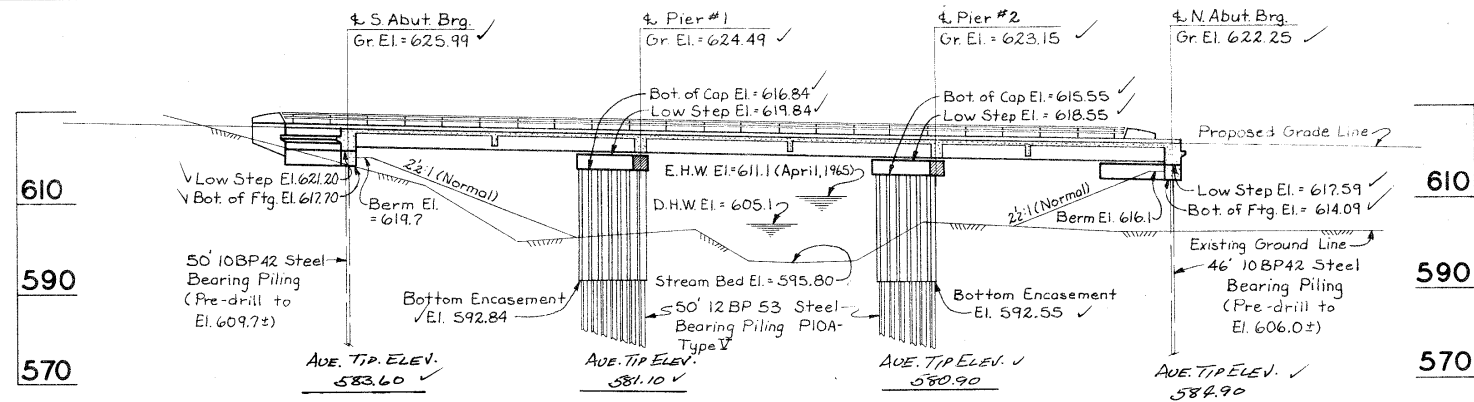
ESTIMATE REFERENCE INFORMATION		100.4
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.		
ITEM NO.	DESCRIPTION	
1.	Includes 73.0 cu. yds. Class "C" concrete and 286.9 cu. yds. of Class "D" concrete.	

ITEM NO.	ITEM	UNIT	TOTAL
8005	HEATING & PROTECTION	C.Y.	229.1

ESTIMATE SHEET (BRIDGES)



GRADE ON IOWA 38



LONGITUDINAL SECTION ALONG ROADWAY

BENCH MARK:

N² TEM Sta 70+83 Set R.R. Spk in Power Pole
44' LT Elev. 619.10
B.M. NO. 3C STA. 63+27 LT 22' CUT "D" S.W. WINGWALL ELEV. 626.87

TOTAL ESTIMATED QUANTITIES

Item N ^o	Item	Unit	Superstr & Int. Abuts	2 Piers	Total
1	Structural Concrete	C.Y.	367.0	43.0	410.0
2	Reinforcing Steel	Lbs.	75,558	6697	82,255
3	Pretensioned Concrete Beams	N ^o	7		7
4	Aluminum Handrail or Steel Handrail	Lin. Ft.	369.6		369.6
5	12BP53 Steel Bearing Piling	Lin. Ft.		1250	1250
6	10BP42 Steel Bearing Piling	Lin. Ft.		588	588
7	Class 20 Excavation	Cy Yds	110		110
8	Granular Backfill	Cy Yds	130		130
9	4" Tile Subdrain	Lin. Ft.			208
8001	12BP53 CUTOFF & UNUSED	L.F.			332.3
8002	PILING, SPICE	ONLY			1
8003	10BP42 CUTOFF & UNUSED	L.F.			200.7

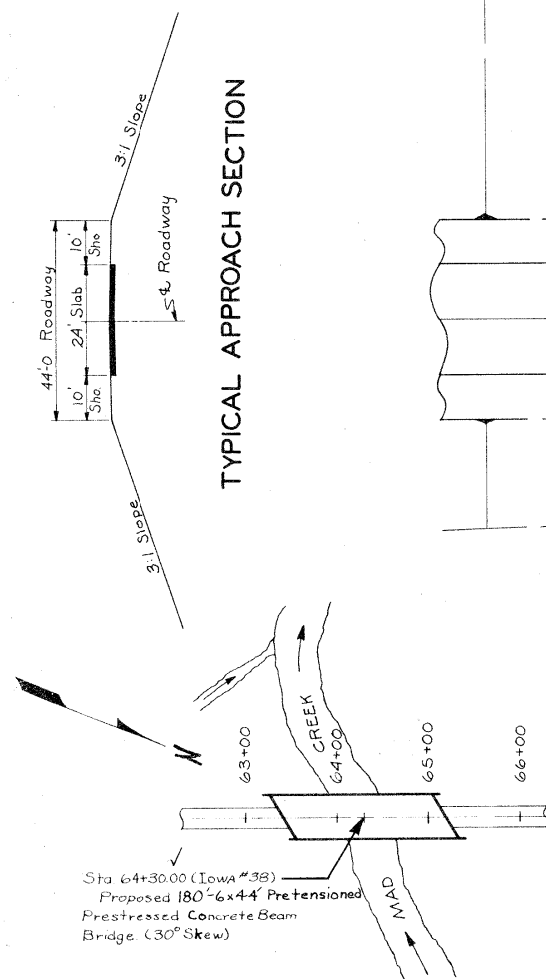
Item N^o Estimate Reference Information:
1 Includes 92.2 Cu Yds. of Class "C" concrete and 317.8 Cu Yds. of Class "D" concrete.

ITEM NO	ITEM	UNIT	TOTAL
8004	RETARDING AGENTS PAYMENT FOR	C.Y.	266.3

LOCATION:

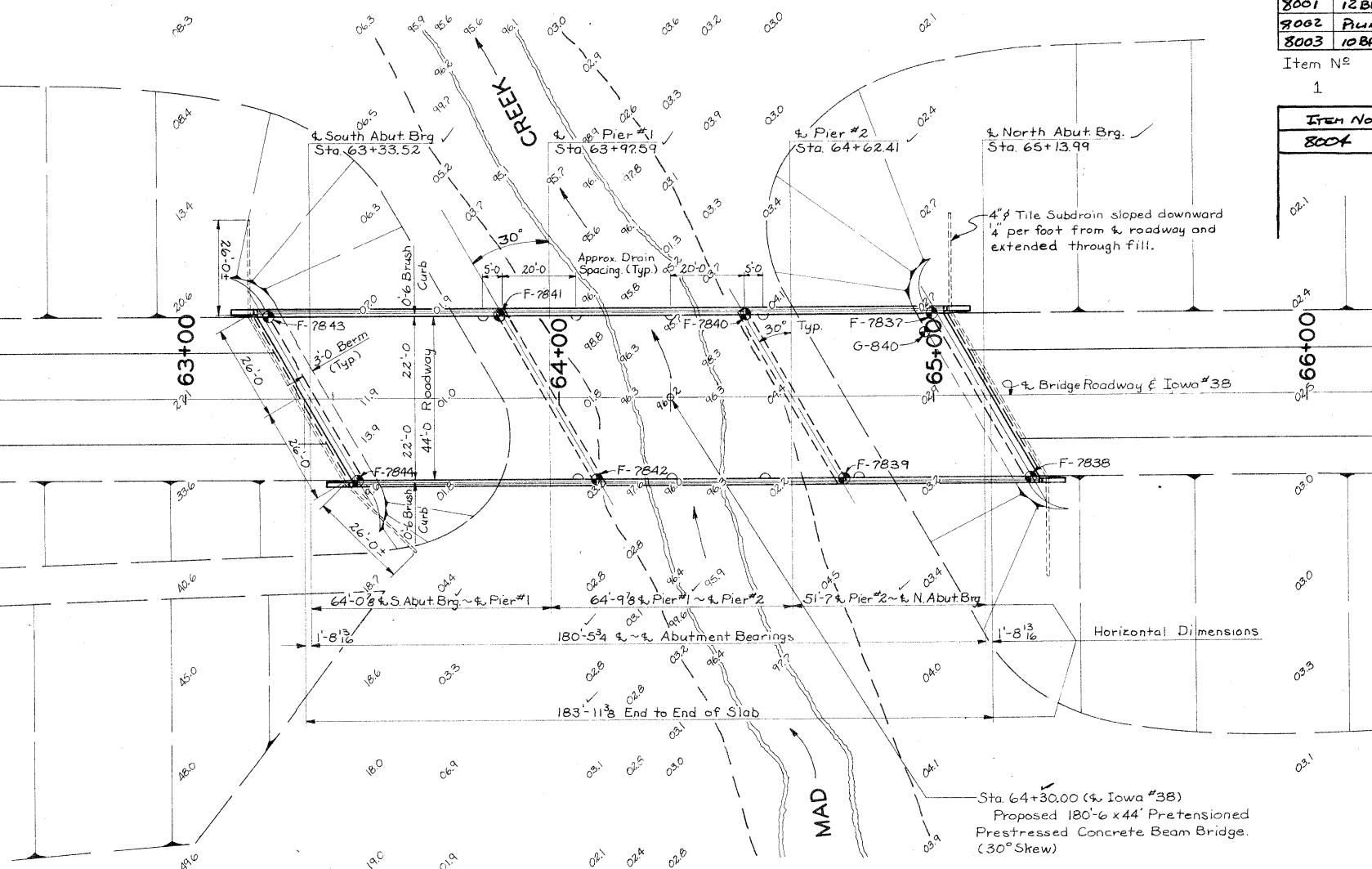
Iowa #38 over Mad Creek
Section 24
Bloomington Twp.
T-77N R-2W
Muscatine County

TYPICAL APPROACH SECTION



GENERAL PLAN

D.A. = 5735 Ac. H-R
Design Q = 3000 cfs



SITUATION PLAN

Traffic Count 3200 VPD (1991)

Design for 30° Skew RA 180'-6 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

64'-1 & 51'-7 End Spans 64'-10 Center Span

SITUATION PLAN

Station: 64+30.00 (Survey Ia. #38) January 1971

MUSCATINE COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 1 Of 10 File No.: 23091 Design No.: 1269

TAKEN FROM ORIGINAL LOG OF PILING REPORT
IOWA STATE HIGHWAY COMMISSION
LOG OF PILING DRIVENKind of Piling STEEL H 12BP53
Un-treated, Treated, (Give Species) Steel, (Give Type),
Concrete (Precast or Prestressed)Type of Hammer GRAVITY
Single or Double Acting Steam, Gravity, DieselI. H. Comm. No. of Hammer 721
Gross Weight of Hammer 7200 Effective Wt. 7250
Hammer Energy _____ Ft. Tons
Driving Cap No. 620 lbs
Weight of Pile 2650 lbs
Formula Used SEE BELOW
Plan Length 50'
Required Bearing PRACTICAL REFUSAL
Was Bearing Determined Immediately Upon Completion of Driving? YESProj. No. FD-38-1(3)-21-70 County MUSCATINEContractor ARTHUR W. NELSONDesign No. 1269 Sta. of C. L. 64+30.0
Foundation Number PIER #1
Length, Width and Type of Structure 180'6" x 44'
PRESTRESSED PRESTRESSED CONC. BEAM
Remarks: (Include instructions from District or Central Office.)
* CAP NUMBER 107 COULDN'T BE
FOUND IN ANY S.H.G. RECORDS, CAP WAS
WEIGHED BY CONTRACTOR, WEIGHT WAS
FOUND TO BE 620 LBS.

$$P = \frac{3004}{510.35} \times \frac{10}{1071} \rightarrow P = \frac{3(3.625)(5)}{510.35} \times \frac{3.625}{5.26}$$

$$P = \frac{65.25}{510.35} \times .689 \rightarrow P = \frac{44.96}{510.35} \text{ VERTICAL}$$

$$P = \frac{44.96}{510.35} \times .9882 = \frac{44.43}{510.35} \text{ BATTER (1:12)}$$

Pile No.	Date Driven	Length in Leads Nearest Foot	Length Cut Off Nearest Tenth Foot	Ave. Penetration Last Blows (inches)	Drop in Feet	Bearing in Tons	
1	3-23	50	12.5	32.5	.08	6' 10.33	R. BATTER (1:12)
2	3-20		13.0	32.0	.07	10.66	
3	3-21		12.7	32.3	.05	11.8	
4	3-21		12.9	32.1	.05	11.8	
5	3-20		13.1	31.9	.05	10.66	
6	3-21		13.3	31.7	.08	10.66	
7	3-21		13.0	31.0	.05	11.8	
8	3-20		13.8	31.2	.08	10.66	
9	3-21		13.0	31.0	.08	10.66	
10	3-21		13.0	31.1	.08	10.66	
11	3-21		12.5	31.5	.05	11.8	
12	3-20		12.6	31.4	.06	10.66	
13	3-23	45	11.6	38.4	.08	6' 10.33	R. BATTER (1:12)
14	TOTALS	650.0	165.9	484.1			
15							
16							
17							
18							
19							
20							

TAKEN FROM ORIGINAL LOG OF PILING REPORT
IOWA STATE HIGHWAY COMMISSION
LOG OF PILING DRIVENKind of Piling STEEL H 12BP53
Un-treated, Treated, (Give Species) Steel, (Give Type),
Concrete (Precast or Prestressed)Type of Hammer GRAVITY
Single or Double Acting Steam, Gravity, DieselI. H. Comm. No. of Hammer 721
Gross Weight of Hammer 7200 Effective Wt. 7250
Hammer Energy _____ Ft. Tons
Driving Cap No. 822 lbs No. 493
Weight of Pile 2650 lbs
Formula Used SEE BELOW
Plan Length 50'
Required Bearing REFUSAL DESIGNS BEARING 46 TONS
Was Bearing Determined Immediately Upon Completion of Driving? YESProj. No. FD-38-1(3)-21-70 County MUSCATINEContractor ARTHUR W. NELSONDesign No. 1269 Sta. of C. L. 64+30.0
Foundation Number PIER #2
Length, Width and Type of Structure 120'6" x 44'
PRESTRESSED PRESTRESSED CONC. BEAM BRIDGE
Remarks: (Include instructions from District or Central Office.)
* PILING IS OK'D BY AHS WITH A BEARING
OF 32.4 TONS / SEE 2 ADDED 8.7 FT. TO PILING
2.5 TO BRING UP TO CUTOFF GRADE.

$$P = \frac{3004}{510.35} \times \frac{10}{1071} \rightarrow P = \frac{3(3.625)(5)}{510.35} \times \frac{3.625}{5.26}$$

$$P = \frac{65.25}{510.35} \times .676 \rightarrow P = \frac{44.11}{510.35} \text{ VERTICAL}$$

$$P = \frac{44.11}{510.35} \times .9882 = \frac{43.59}{510.35} \text{ BATTER (1:12)}$$

Pile No.	Date Driven	Length in Leads Nearest Foot	Length Cut Off Nearest Tenth Foot	Ave. Penetration Last Blows (inches)	Drop in Feet	Bearing in Tons	
1	2-23-72	50.0	16.0	34.0	.06	6' 11.8	R.
2	2-25-72		15.2	34.8	.03	11.8	R.
3	2-28-72		15.9	34.1	.03	11.8	R.
4	2-28-72	50.0	15.7	34.3	.08	11.8	R.
5	2-28-72	50.0	15.8	34.2	.06	5.0	34.5
6	2-28-72	50.0	15.8	34.2	.04	11.8	R.
7	2-28-72		15.1	34.9	.08	10.66	R.
8	2-28-72		15.7	34.3	.03	11.8	R.
9	2-28-72		16.0	34.0	.08	13.6	R.
10	2-28-72		15.3	34.7	.09	11.8	R.
11	2-28-72		15.7	34.3	.04	11.8	R.
12	2-28-72	50.0	15.2	34.8	.08	6' 11.8	R.
13	TOTALS	604.7	171.1	433.6			
14							
15							
16							
17							
18							
19							
20							

TAKEN FROM ORIGINAL LOG OF PILING REPORT
IOWA STATE HIGHWAY COMMISSION
LOG OF PILING DRIVENKind of Piling 10BP42 STEEL H
Un-treated, Treated, (Give Species) Steel, (Give Type),
Concrete (Precast or Prestressed)Type of Hammer GRAVITY
Single or Double Acting Steam, Gravity, DieselI. H. Comm. No. of Hammer 721
Gross Weight of Hammer 7200 Effective Wt. 7250
Hammer Energy _____ Ft. Tons
Driving Cap No. 620 lbs
Weight of Pile 1932 lbs
Formula Used SEE BELOW
Plan Length 46'
Required Bearing PRACTICAL REFUSAL / 55 TONS
Was Bearing Determined Immediately Upon Completion of Driving? YESProj. No. FD-38-1(3)-21-70 County MUSCATINEContractor ARTHUR W. NELSONDesign No. 1269 Sta. of C. L. 64+30.00
Foundation Number NORTH ABUTMENT #2
Length, Width and Type of Structure 180'6" x 44'
PRESTRESSED PRESTRESSED CONC. BEAM BRIDGE
Remarks: (Include instructions from District or Central Office.)
ABOUT PILING CUTOFF'S SIMILAR TO ALL OTHER
FOUNDATIONS IN THIS STRUCTURE.

$$P = \frac{3004}{510.35} \times \frac{10}{1071} \rightarrow P = \frac{3(3.625)(5)}{510.35} \times \frac{3.625}{5.26}$$

$$P = \frac{54.38}{510.35} \times .740 \rightarrow P = \frac{40.24}{510.35} \text{ VERTICAL}$$

Pile No.	Date Driven	Length in Leads Nearest Foot	Length Cut Off Nearest Tenth Foot	Ave. Penetration Last Blows (inches)	Drop in Feet	Bearing in Tons	
1	5-30	46'	14.3	31.2	.20	5'	73.2
2	5-30		14.9	31.1	.175		76.6
3	5-30		15.1	30.9	.115		77.0
4	5-30		15.2	31.1	.10		89.3
5	5-30		15.8	31.2	.225		69.5
6	5-30		15.6	31.2	.15		80.5
7	5-30	46'	14.1	31.9	.10	5'	89.3
8	TOTALS	322.0	103.2	288.4			
9							
10							
11							
12							
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17							
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TAKEN FROM ORIGINAL LOG OF PILING REPORT
IOWA STATE HIGHWAY COMMISSION
LOG OF PILING DRIVENKind of Piling 10BP42 STEEL H
Un-treated, Treated, (Give Species) Steel, (Give Type),
Concrete (Precast or Prestressed)Type of Hammer GRAVITY
Single or Double Acting Steam, Gravity, DieselI. H. Comm. No. of Hammer 721
Gross Weight of Hammer 7200 Effective Wt. 7250
Hammer Energy _____ Ft. Tons
Driving Cap No. 620 lbs
Weight of Pile 2100 lbs
Formula Used SEE BELOW
Plan Length 50'
Required Bearing PRACTICAL REFUSAL - 55 TONS
Was Bearing Determined Immediately Upon Completion of Driving? YESProj. No. FD-38-1(3)-21-70 County MUSCATINEContractor ARTHUR W. NELSONDesign No. 1269 Sta. of C. L. 64+30.00
Foundation Number ABUTMENT #1 SOUTH
Length, Width and Type of Structure 180'6" x 44'
PRESTRESSED PRESTRESSED CONC. BEAM BRIDGE
Remarks: (Include instructions from District or Central Office.)
ABOUT PILING CUTOFF'S SIMILAR TO PIER'S
1 & 2 PILING CUTOFF'S.

$$P = \frac{3004}{510.35} \times \frac{10}{1071} \rightarrow P = \frac{3(3.625)(5)}{510.35} \times \frac{3.625}{5.26}$$

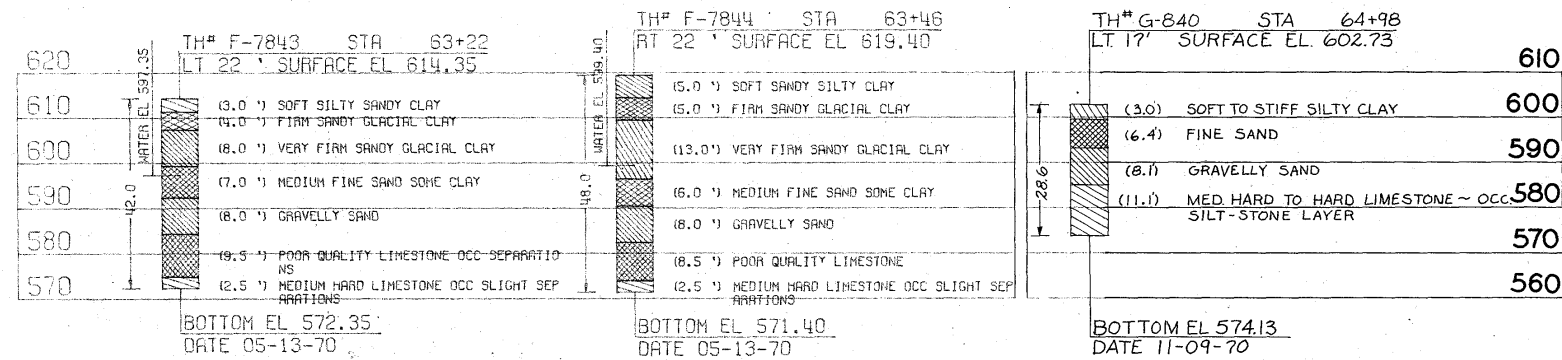
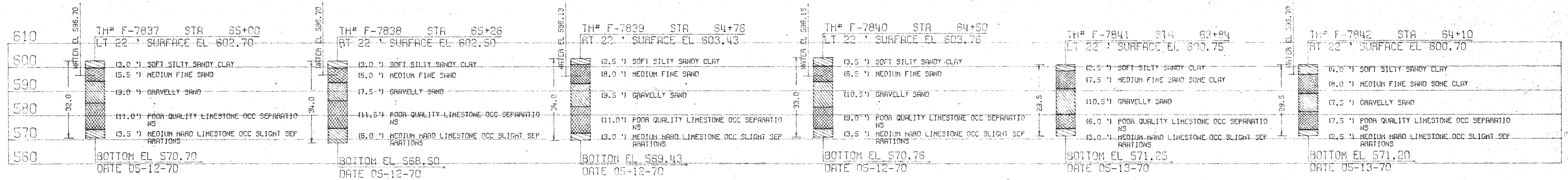
$$P = \frac{54.38}{510.35} \times .727 \rightarrow P = \frac{39.53}{510.35} \text{ VERTICAL}$$

Pile No.	Date Driven	Length in Leads Nearest Foot	Length Cut Off Nearest Tenth Foot	Ave. Penetration Last Blows (inches)	Drop in Feet	Bearing in Tons	
1	5-19	50	13.7	36.3	.20	5'	71.9
2	5-19		13.7	36.3	.285		67.3
3	5-19		13.9	36.1	.20		71.9
4	5-18		14.0	36.0	.185		73.6
5	5-18		13.5	35.5	.20		71.9
6	5-18		13.8	36.2	.215		63.2
7	5-18	50	13.9	36.1	.20	5'	71.9
8	TOTALS	350.0	97.5	352.5			
9							
10							
11							
12							
13							
14							
15							
16							
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20							

* On Pile Trestle Bridges give length in ground and also total length in structure.
** 5 Blows for gravity hammers, 10 blows for steam or diesel hammers.

Inspector

Resident Const. Engineer



SOUNDING DATA

GENERAL NOTES:

This bridge is designed for H620-44 loading, plus 20 lbs. per square foot of roadway for future wearing surface.
The approach fills as shown are not a part of this contract, but are to be in place before abutment piles are driven. The Bridge Contractor is to level off and shape the berms to the elevations and dimensions shown. Dressing of the slopes outside the bridge area not disturbed by the bridge contractor shall be paid for as extra work.
The Bridge Contractor is to install tile subdrain behind each abutment as detailed. The price bid for "4" Tile Subdrain" is to include the excavation necessary for installation.
The bottom of the abutment footing at the piles shall be formed to exclude concrete from the pre-drilled holes.

DESIGN STRESSES:

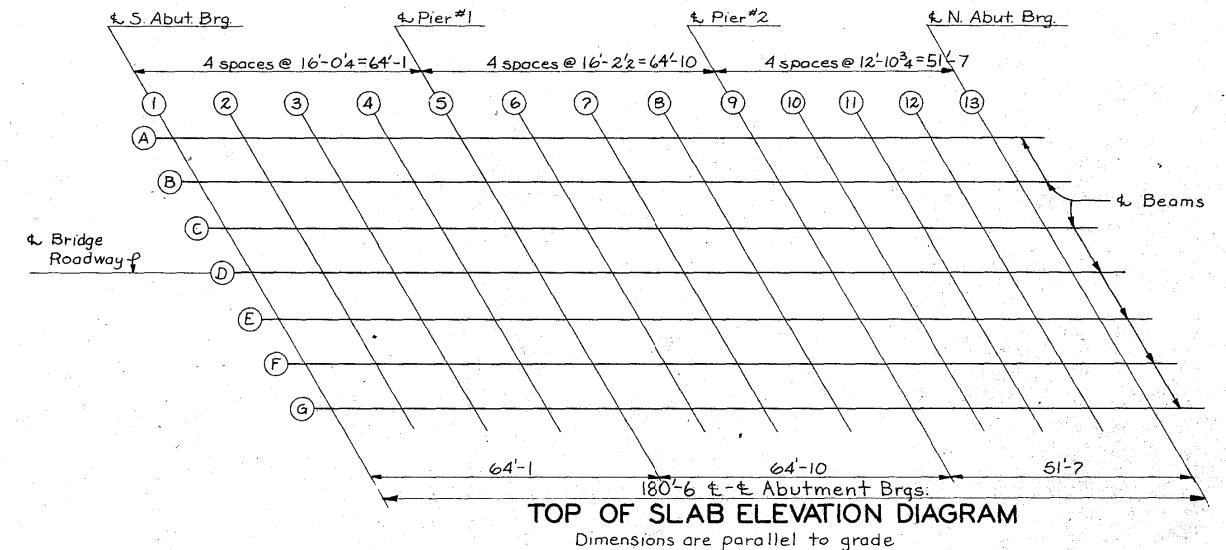
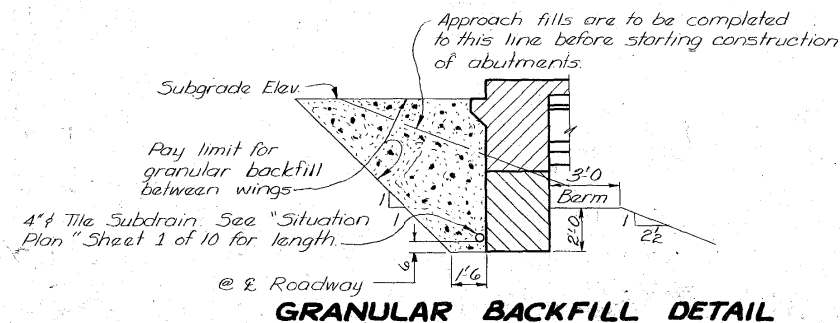
Design stresses for the following materials are in accordance with AASHTO Standard Specifications for Highway Bridges, Series of 1969.
Concrete in accordance with Section 1.5.1. $f'_c = 3,500$ psi.
Reinforcing Steel in accordance with Section 1.5.1 $f_s = 20,000$ psi.
Prestressing Steel in accordance with Section 1.6.7. $f_s = 270,000$ psi.
Prestress Concrete in accordance with Section 1.6.7 $f'_c = 5,000$ psi.

SPECIFICATIONS:

Design: AASHTO, Series of 1969
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1972, plus current Special Provisions and Supplemental Specifications.

ABUTMENT PILING NOTE:

The 10BP42 steel bearing piles shall be driven to practical refusal and seated in limestone. Seating shall be done with a diesel hammer of at least 26,000 ft.lbs. of rated energy operating at full capacity, or a gravity hammer having an effective weight of at least 6,000 lbs. and driving energy of not less than 38,000 ft.lbs. nor more than 40,000 ft.lbs. Design bearing is 55 tons per pile.
Abutment piles shall be driven thru holes (minimum 18") drilled to El. 609.7± at the S. Abutment and El. 606.0± at the N. Abutment. Voids around piles shall not be filled. Cost of drilling holes shall be included in bid price for driving piles.



(Built As Per Plan)

	1	2	3	4	5	6	7	8	9	10	11	12	13
A	625.98	625.61	625.23	624.85	624.47	624.11	623.76	623.42	623.10	622.85	622.61	622.38	622.16
B	625.99	625.62	625.24	624.86	624.49	624.13	623.78	623.44	623.12	622.88	622.64	622.42	622.20
C	626.01	625.63	625.25	624.87	624.50	624.14	623.80	623.47	623.15	622.91	622.68	622.45	622.24
D	625.99	625.61	625.23	624.86	624.49	624.14	623.79	623.47	623.15	622.91	622.68	622.46	622.25
E	625.82	625.44	625.06	624.69	624.32	623.97	623.63	623.31	623.00	622.76	622.54	622.32	622.11
F	625.62	625.24	624.86	624.49	624.13	623.78	623.45	623.13	622.82	622.59	622.36	622.15	621.94
G	625.42	625.04	624.67	624.30	623.94	623.60	623.27	622.95	622.65	622.42	622.19	621.98	621.78

Built as per plan.

Design for 30° Skew RA
180' 6 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

64'-1 & 51'-7 End Spans 64'-10 Center Span

SOUNDING DATA

Station: 64+30.00 (Survey Ia # 38) January 1971

MUSCATINE COUNTY

IOWA STATE HIGHWAY COMMISSION

DESIGN NO. 1269
FILE NO. 23091
DES. SH. NO. 2 OF 10

MUSCATINE COUNTY

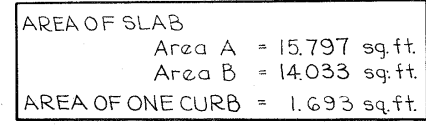
PROJECT NUMBER
FN-38-1(3)-21-70

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		19	38

Detailed by: D. Nolte

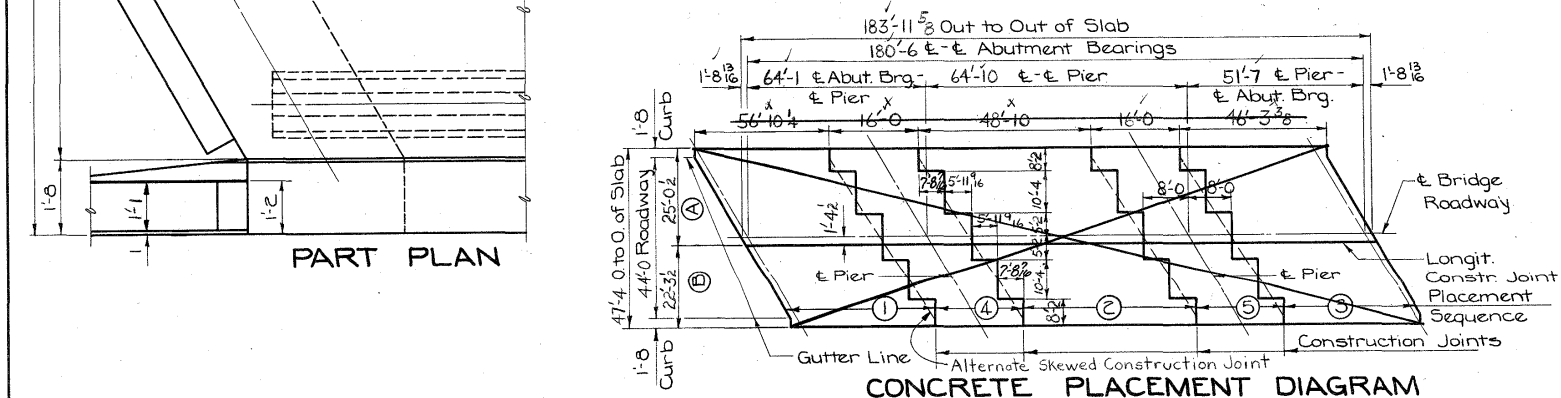
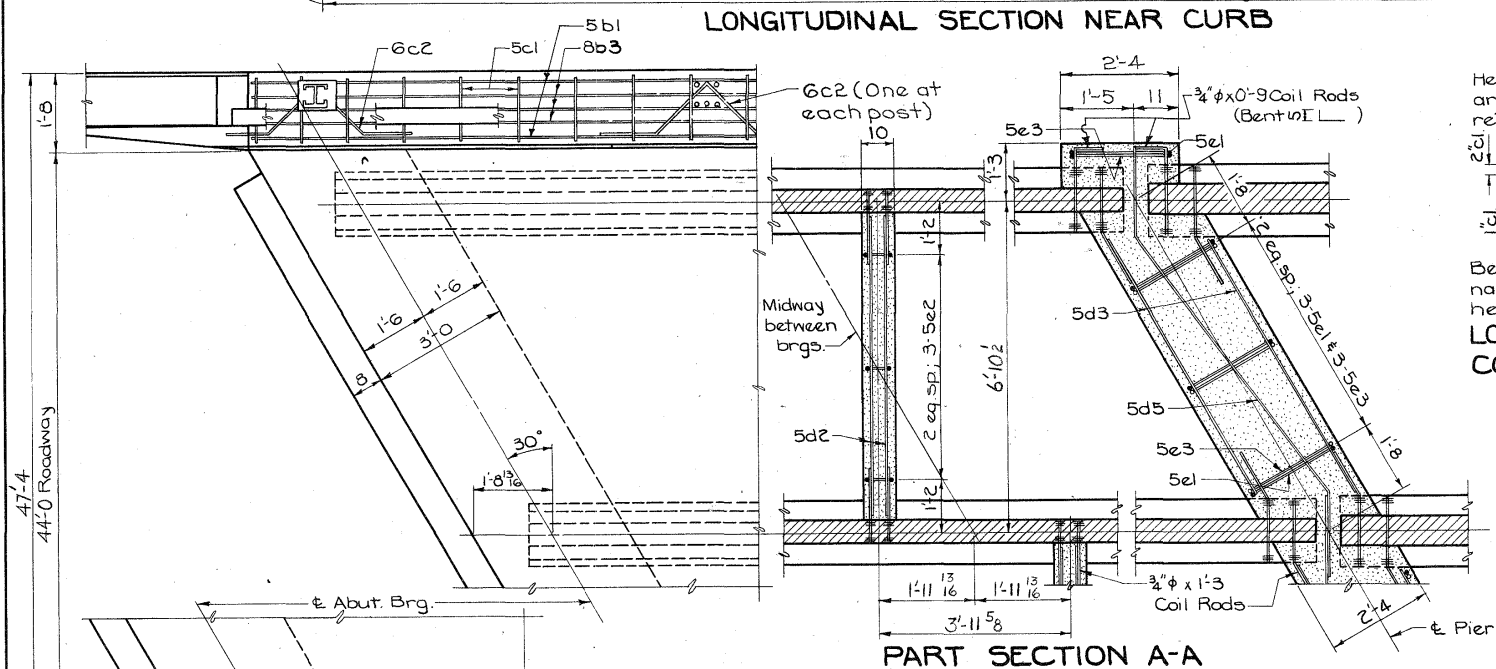
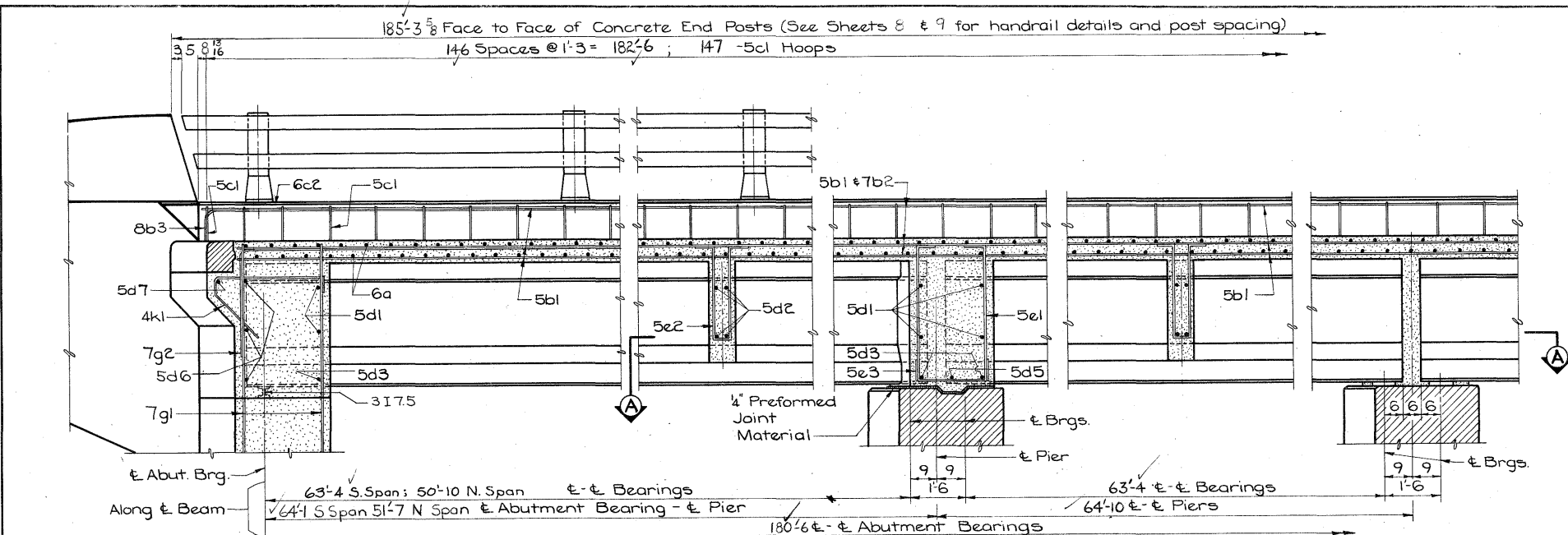
Traced by: D. Nolte
Checked by: J. Harkin

Bench Mark N+TBM Sta. 70+83 Set 88 30k in power pole 99' LT. --- Elev. 619.10



This sheet to be used with PC66 Prestress Beams and wood piles. Use a minimum detailing haunch of 2".

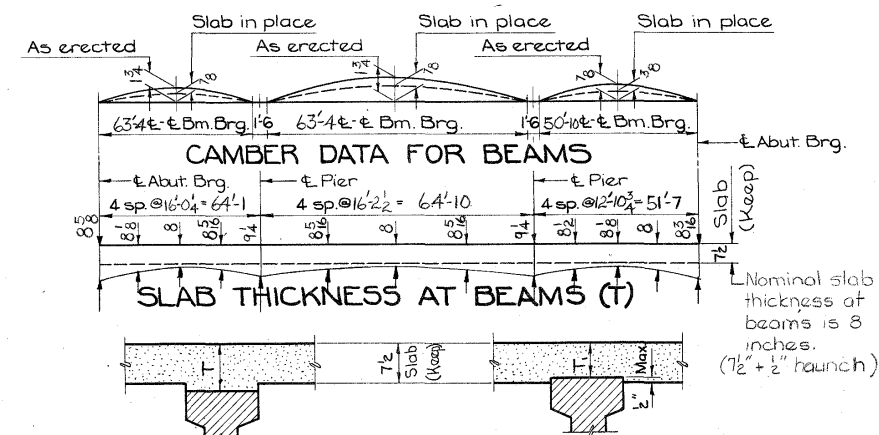
This sheet to be used with PC66 Prestress Beams and wood piles. Use a minimum detailing haunch of 2".



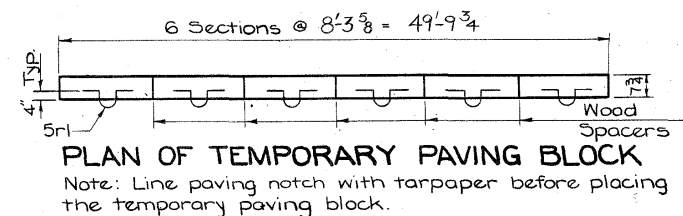
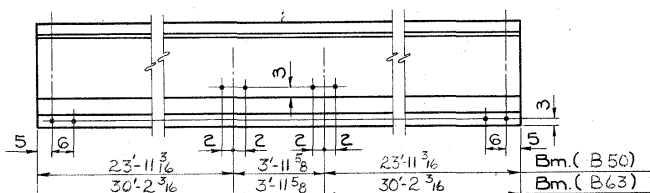
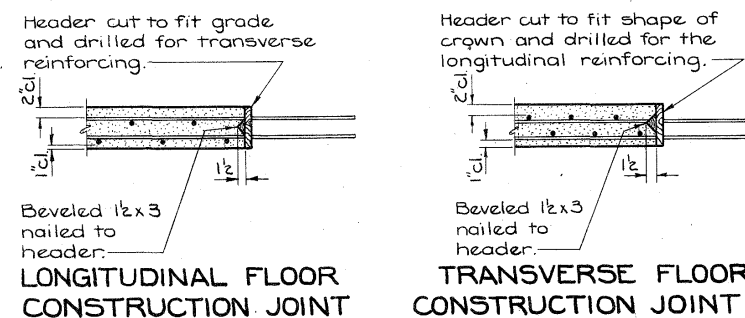
Note: Roadway slab shall be placed in sections and in sequence indicated by encircled numbers on placement diagram and preferably at intervals not exceeding 24 hours. Curbs may be placed continuously. Alternate procedures for placing concrete may be submitted for approval, together with a statement of the proposed method, and evidence that the Contractor possesses the necessary equipment and facilities to accomplish the required result.

NOTE: DECK CONCRETE PLACED USING LONGITUDINAL CONSTRUCTION JOINT 1'-1/2" WEST OF & ROADWAY. PLACED IN TWO END TO END POURS. (EAST HALF FIRST.)

By G. Huffman



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 undercambered, increase slab thickness (T) at beam to compensate. If beam is overcambered, the slab thickness (T) at beam may be decreased to a maximum of 2" embedment at the beam (T). If more than 2" embedment is required, or if the haunch exceeds 2", the grade line is to be revised.



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

Item	A	B	Class "C"	Class "D"
Section 1 Slab & Diaph.	46.8 ✓	41.7 ✓		88.5 ✓
Section 2 Slab & Diaph.	30.3 ✓	26.9 ✓		57.2 ✓
Section 3 Slab & Diaph.	39.6 ✓	35.2 ✓		74.8 ✓
Section 4 Slab & Diaph.	16.9 ✓	14.7 ✓		31.6 ✓
Section 5 Slab & Diaph.	16.8 ✓	14.8 ✓		31.6 ✓
Curbs 2 @ 11.5				23.0 ✓
*Paving Blocks 2 @ 1.2			2.4 ✓	
Abutment Wings 4 @ 2.3				8.9 ✓
Abutment Footings 2 @ 23.4			46.8 ✓	
End Posts 4 @ 5.4				2.2 ✓
Total (Cu. Yds.)			49.2 ✓	317.8 ✓

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

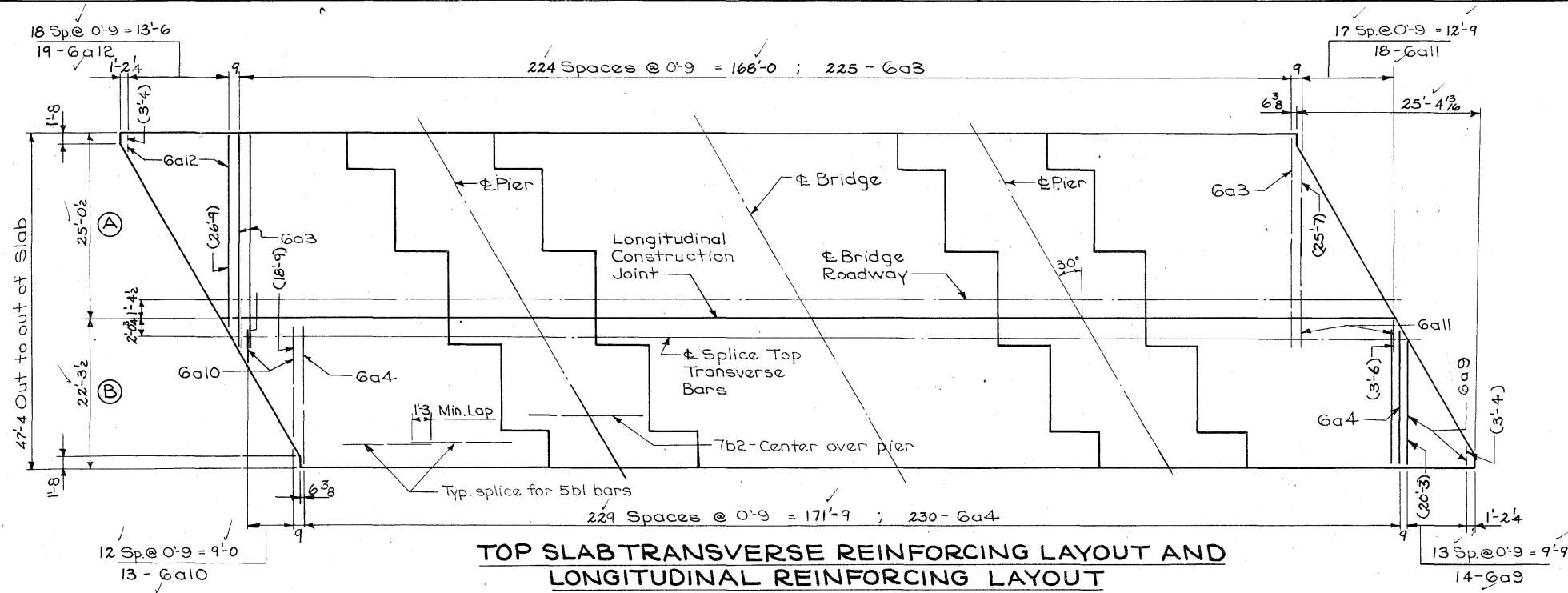
Item	Unit	Quantity
Structural Concrete Class "C"	Cu. Yds.	49.2 ✓
Structural Concrete Class "D"	Cu. Yds.	317.8 ✓
Prestressed Prestressed Concrete Beams	Nº	7 ✓
	Nº	14 ✓
Reinforcing Steel	Lb.	75,558 ✓
Class 20 Excavation	Cu. Yds.	110 ✓
Granular Backfill	Cu. Yds.	130 ✓
10 EP42 Steel	L.F.	672 471.3
Bearing Piling	L.F.	672 471.3

* May be Class "C" or Class "D" Concrete.

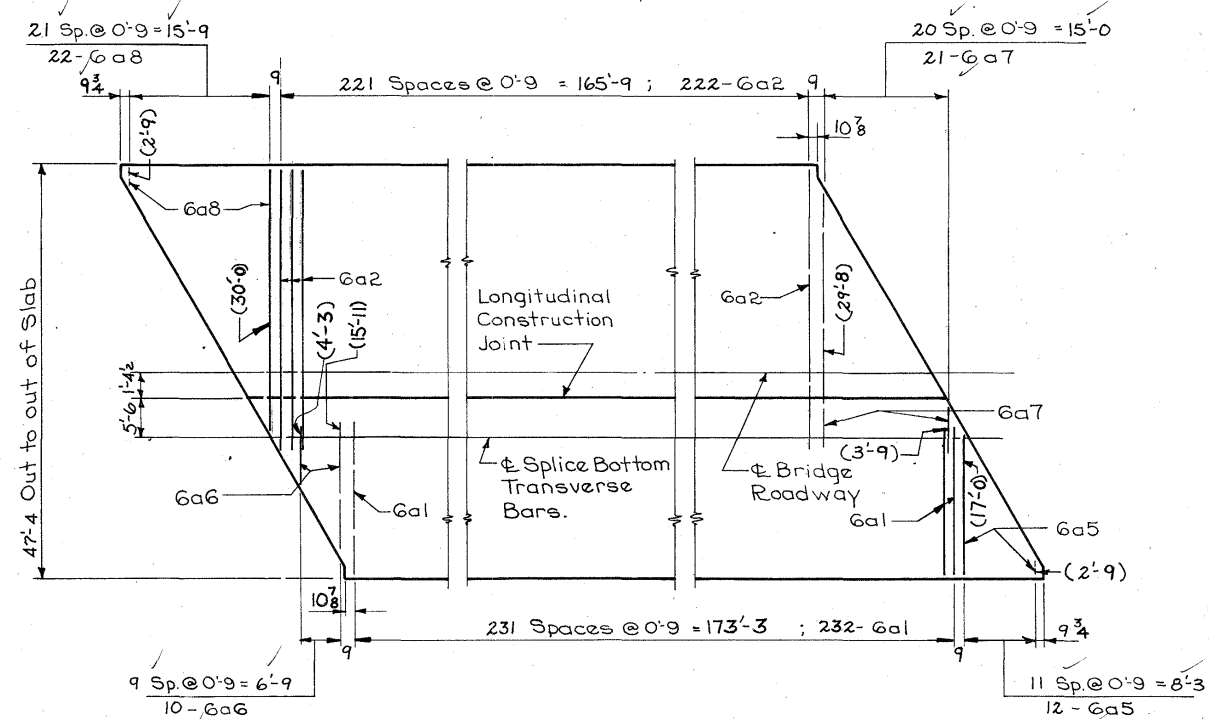
Designed For 30° Skew R.A.
180'-6" x 44' PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGE
64'-10" End Spans 64'-10" Center Span
SUPERSTRUCTURE DETAILS
Station: 64+30.00 (Survey Ia. #38) January 1971
MUSCATINE COUNTY

IOWA STATE HIGHWAY COMMISSION
Design Sheet No 5 of 10 File No 23091 Design No 1269

This sheet to be used with PC66 Prestress Beams and wood piles.



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 1" of wearing surface.

All exposed corners 90° or sharper are to be filleted with a 3/4" 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 prestressed beams.

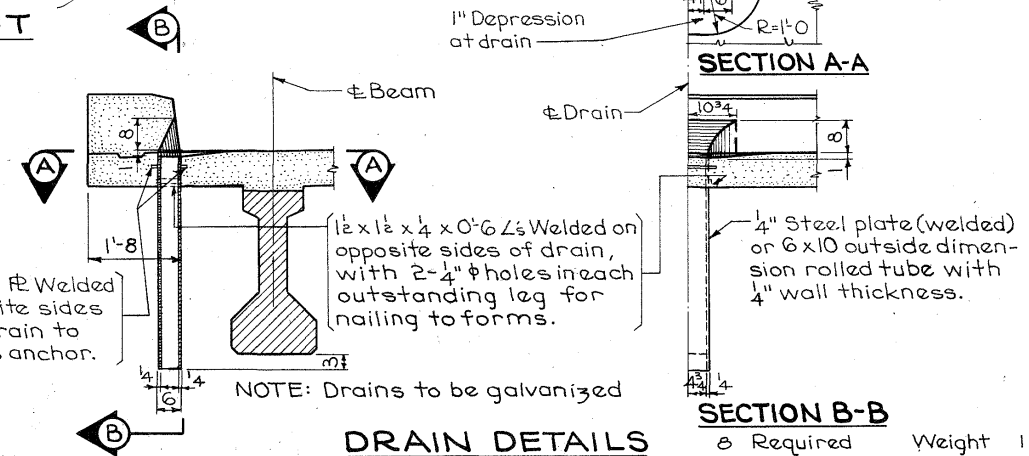
The pier and abutment diaphragm concrete is to be placed monolithically with the floor slab.

Clear distance from face of concrete to near reinforcing bar shall be 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 the wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.

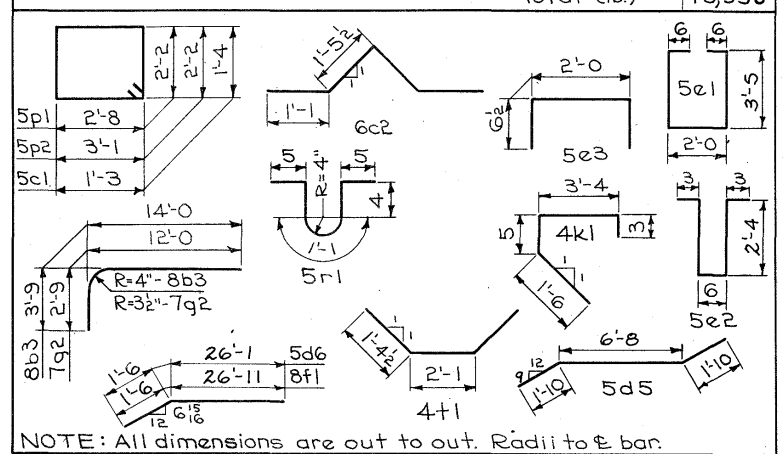
See "Situation Plan" on Sheet 1 for drain locations.

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



REINF. STEEL - ONE SUPER. & TWO INTEGRAL ABUTS.

Bar	Location	Shape	Nº	Length	Weight
6a1	Slab Transverse, Bottom		232	17'-5	6069
6a2	Slab Transverse, Bottom		222	31'-2	10392
6a3	Slab Transverse, Top		225	27'-8	9350
6a4	Slab Transverse, Top		230	20'-10	7197
6a5	Slab Transverse, Bottom, End		12	Varies	178
6a6	Slab Transverse, Bottom, End		10	Varies	151
6a7	Slab Transverse, Bottom, End		21	Varies	527
6a8	Slab Transverse, Bottom, End		22	Varies	541
6a9	Slab Transverse, Top, End		14	Varies	248
6a10	Slab Transverse, Top, End		13	Varies	214
6a11	Slab Transverse, Top, End		18	Varies	393
6a12	Slab Transverse, Top, End		19	Varies	429
5b1	Slab & Curb Longit.		582	31'-8	19222
7b2	Slab & Curb Longit. - Over Piers		80	25'-0	4088
8b3	Abut. Diaphragm To Curb, Vertical		12	17'-7	563
5c1	Curb Hoops		294	5'-11	1814
6c2	Curb Transverse At Each Post		46	5'-0	345
5d1	Abut. & Pier Diaphragm Longit.		72	6'-9	507
5d2	Intermediate Diaph. Longit.		72	5'-10	438
5d3	Abut. & Pier Diaphragm Longit.		36	5'-9	216
5d4	Abut. Diaphragm, Ends		12	1'-8	21
5d5	Pier Diaphragm, Longit.		12	10'-4	129
5d6	Abut. Diaphragm, Longit.		12	27'-7	345
5e1	Pier Diaphragm, Hoops		40	9'-6	396
5e2	Intermediate Diaph. Hoops		54	5'-4	300
5e3	Pier Diaphragm, Ties		48	2'-11	146
8f1	Abutment Footing, Longit.		36	28'-5	2731
7g1	Abutment, Vertical - B.F. & E.F.		184	6'-0	2257
7g2	Abutment Diaph. Vertical B.F.		92	14'-7	2742
5h1	Abutment Wing & End Post, Horiz.		64	6'-8	445
5h2	Abutment To Wing Dowels		56	4'-4	253
5h3	End Post, Horizontal		16	Varies	104
4k1	Paving Notch, Transverse		88	5'-4	314
5p1	Abutment Hoops		144	10'-5	1564
5p2	Abutment Hoops At Ends		8	11'-3	94
5r1	Paving Block Lifting Loops		12	2'-5	30
5s1	Wing Vertical		56	Varies	321
5s2	End Post - Wing, Vertical		56	3'-7	209
4+1	Abut. Diaph., Horiz., At Each Beam		14	4'-9	44
	Pile Spiral #2 Bar		14	38'-6	90
	Spiral Spacer, #E.O.69		28	1'-10	35
5d7	Paving Notch, Longit.		4	25'-5	106
Total (lb.)				75,558	



Design for 30° Skew RA
180'-6 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
64'-1 & 51'-7 End Spans 64'-10 Center Span
SUPERSTRUCTURE DETAILS
Station: 64+30.00 (Survey Ia #38) January 1971
MUSCATINE COUNTY

Revised (9-12-67)

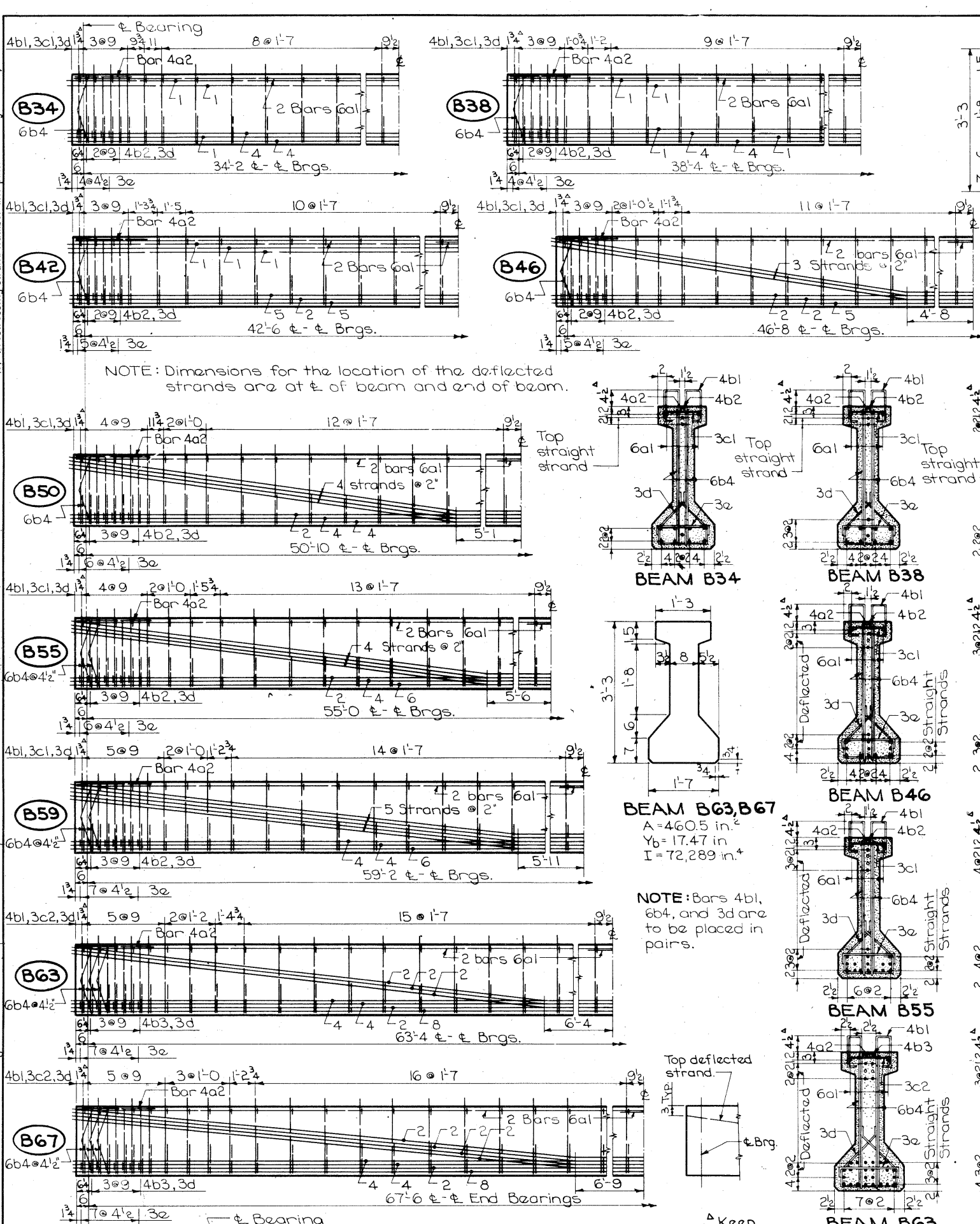
Revised (7-8-66) Lower figures of D.L. deflection due to creep and shrinkage in Beam Data table changed.
Revised (1-25-67) Bars 3c added & No. of 3d Bars increased, deflection note re-written.
Revised 5-2-67: Note concerning roughening of beams at diaphragms added.
Revised 6-1-67: Initial Prestress for B3 changed.
Revised 9-4-68: Projection of Bar 4b1 above top flange changed from 4" to 4 1/2". Also Future W.S. Loading changed.
Revised 3-6-69: Beam designation numbers changed.
Revised 1-14-70: Design Stresses & Specifications updated.

Revised (9-12-67)

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

(8) Camber for B1, B2 & B3 changed in Beam Data table.

(9) Camber for B1, B2 & B3 changed in Beam Data table.



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	2 34'-11"	2 39'-1"	4 22'-7"	4 24'-8"	4 26'-9"	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 2'-6"	2 2'-6"	2 2'-6"	2 2'-6"	2 2'-6"
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"	8 6'-2"	8 6'-2"
4b3	1	1	1	1	1	1	1	1	1
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"	48 1'-1"	52 1'-1"
3c2	1	1	1	1	1	1	1	1	1
*3d	68 2'-8"	72 2'-8"	76 2'-8"	84 2'-8"	96 2'-8"	100 2'-8"	108 2'-8"	112 2'-8"	120 2'-8"
3e	10 1'-5"	10 1'-5"	12 1'-5"	12 1'-5"	14 1'-5"	14 1'-5"	16 1'-5"	16 1'-5"	16 1'-5"

*Where deflecting strands interfere with placement, some in-place banding 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	12	2	2	2	2	2	2	2	2
Straight Strands	11	12	15	9	10	12	14	18	18
Deflected Strands	1	1	1	3	4	4	5	6	8
Hold Down Stress Kips				11.2	13.8	12.7	13.7	16.6	19.3
Camber @	1.3	1.8	1.3	2.5	2.6	3.7	4.6	6.5	6.0
D.L. Deflection @ in. (7'-35pcg)	.08	.02	.14	.04	.19	.05	.26	.07	.37
D.L. Deflection @ in. (8'-05pcg)	.09	.02	.16	.04	.21	.05	.28	.07	.41
D.L. Deflection @ in. (9'-65pcg)	.10	.03	.18	.05	.24	.06	.33	.08	.48
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	6.33	6.74

- 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.

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 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 or the Iowa State Highway Commission, current series, plus current special provisions and supplemental specifications.

Design for 30° skew R.A.

180'-6" X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

64'-1" ϕ 51'-7" End Spans
64'-10" Center Spans
BEAM DETAILS PC 66 B

Station: 64+30.00 (Survey Ia. #38) January 1971

MUSCATINE COUNTY

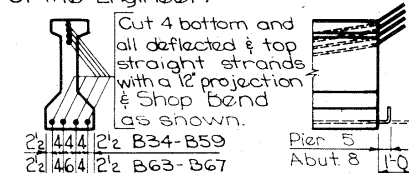
IOWA STATE HIGHWAY COMMISSION

STANDARD SHEET 4101

Des. Sh. No. 7 of 10 File No. 23091 Des. No. 1269

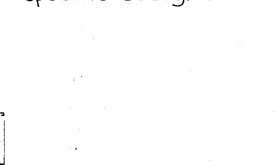
LIFTING LOOP DETAILS

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



COIL TIE DETAILS

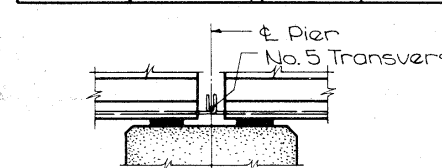
Number and location of coil ties to be as detailed on specific designs.



BEAM END DETAIL AT PIER AND ABUT.

MAXIMUM SPACING OF BEAMS FOR SPANS SHOWN

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



DETAILS AT PIER BEFORE PLACING PIER DIAPHRAGM

CHECKED BY: J. Harkin

Revised 12-26-68: Added explanation for material for clamp bar bolt.

Rev. 10-1-67: Red lead shop coat paint note added.

Rev. 1-6-67: Material specifications for aluminum and stainless steel changed.

Rev. 10-12-66: Note concerning 2" drain holes added.

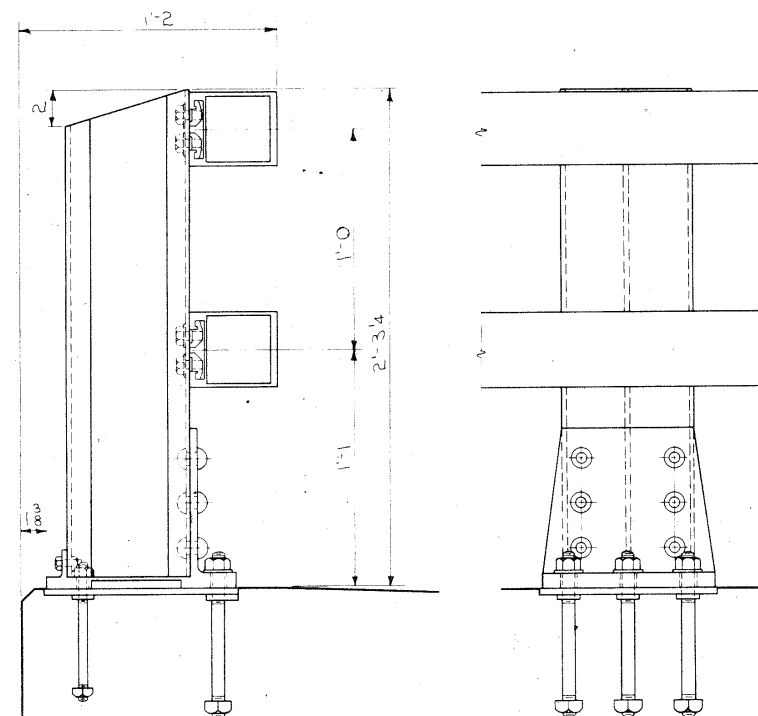
Rev. 9-13-66: Gauge of holes in Post Base Plate changed.

Revised 8-19-66: Post base plate and Anchor Bolt Assembly Plate details changed.

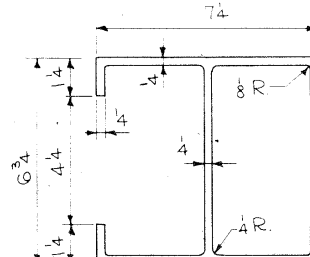
Revised 7-25-66: Caulking at posts eliminated.

Revised 3-14-66: Minor changes made.

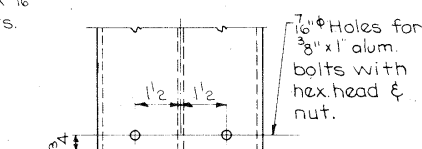
Revised 11-13-70: Exposed anchor bolt nuts & washers changed from aluminum to stainless steel.



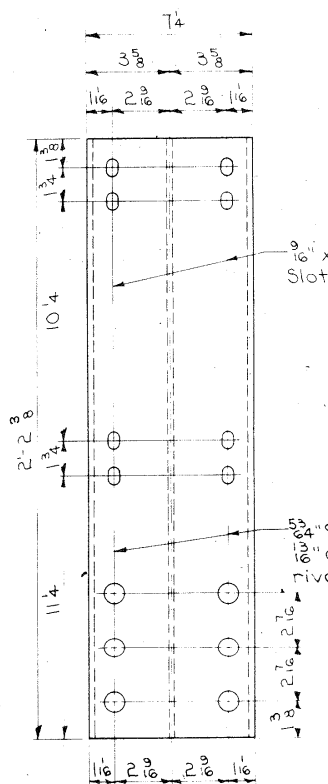
RAIL POST ASSEMBLY



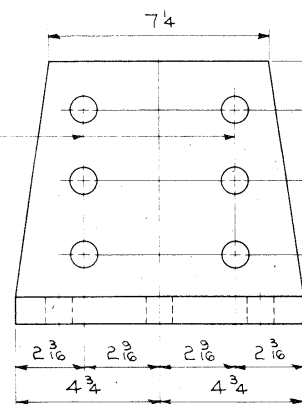
POST SECTION



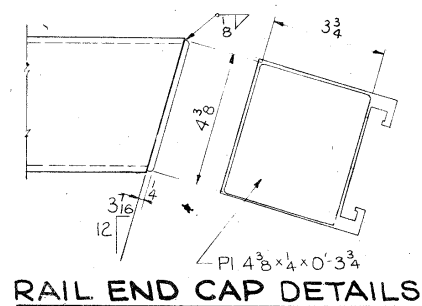
REAR VIEW OF POST



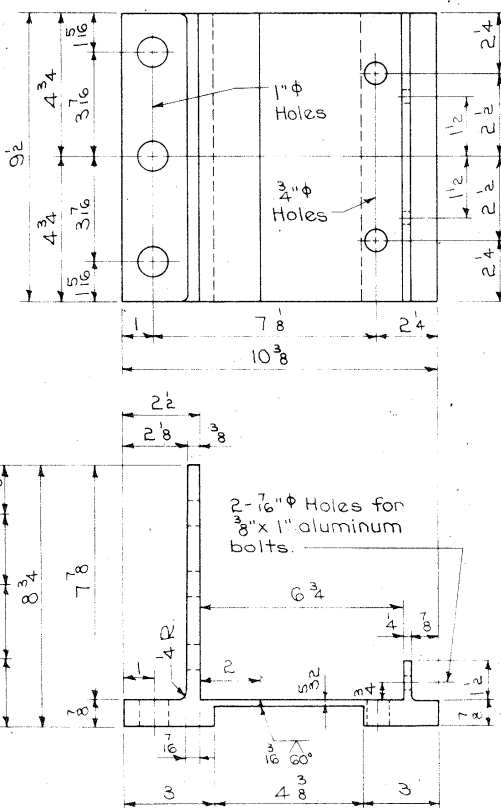
POST



POST BASE PLATE DETAILS



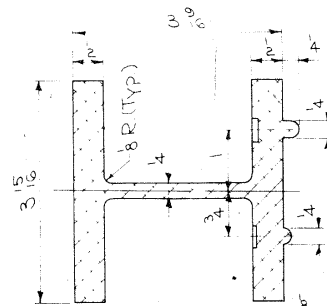
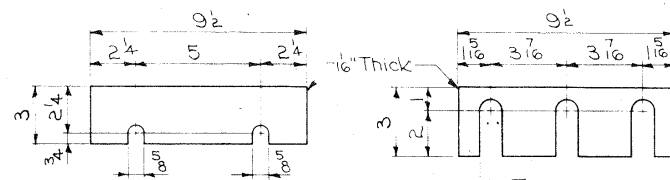
RAIL END CAP DETAILS



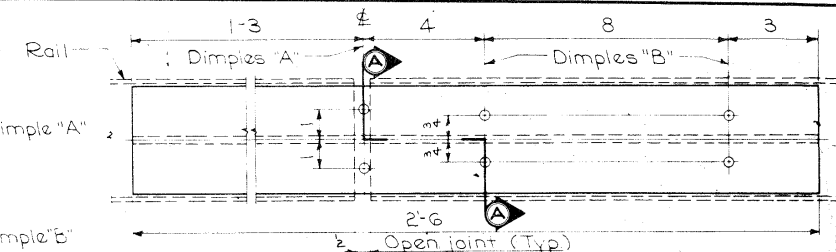
RAIL SECTION

SHIM "A" DETAIL

SHIM "B" DETAIL



SECTION A-A



RAIL SPLICE DETAIL

ALUMINUM HANDRAIL NOTES:

The aluminum handrail is to be bid on a linear foot basis measured from end to end of rail. The price bid for "Aluminum Handrail" shall be full compensation for furnishing all material including the anchor bolts and all of the 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 rails, post, post base plate, rail splice bar and clamp bar shall be ASTM B-221 Alloy 6061-T6. Material for aluminum nuts shall be ASTM B-211 Alloy 6061-T6 or 6262-T9. Material for the aluminum bolts shall be ASTM B-211 Alloy 2024-T4.

Material for aluminum washers and shims shall be ASTM B-209; Alloy 6061-T6 for washers and Alloy 1100-O for shims.

Material for anchor studs shall be ASTM A276 Stainless steel with a minimum ultimate strength of 100,000 psi, a minimum elongation in two inches of 12% and a minimum reduction of area of 40%. Stud thread shall conform to A.S.A. B-11 for UNC threads series, class 2A fit. Threads may be rolled or cut. Diameter of stud shall be not less than pitch diameter of threads.

Material for steel nuts shall be ASTM A-307 Grade A, and shall conform to A.S.A. B-18.2. Threads shall comply with A.S.A. B-11 for UNC threads series, class 2B fit.

The anchor bolt assembly plate shall be a flat and true aluminum alloy permanent mold casting complying with ASTM B-108 Alloy 5670 A or B. Condition F is acceptable. Suitable alternates will be considered for approval.

The entire surfaces of anchor bolt assembly plate and the shims are to be given one shop coat of zinc chromate shop coat paint or red lead shop coat paint.

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

Material for clamp bar bolt shall be stainless steel A.S.T.M. A-193, Grade B8 (Carbide solution treated) or ASTM A-276 Type 430 (Annealed - hot or cold finished).

The material for the stainless steel nuts and washers shall be non-magnetic stainless steel. The stainless steel nuts shall be hexagonal, finished and shall comply with A.S.A. B-18.2. Threads shall comply with A.S.A. B-11 for UNC threads series, class 2B fit.

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

Material for aluminum rivets shall be A.S.T.M. B-316 or B-221 Alloy 6061-T6. Rivets shall be button head, cone point and cold driven.

A 2" drain hole is to be provided, 3 inches in from the end, at the bottom side of the end sections of all rails.

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

DESIGN SPECIFICATIONS:

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

ALUMINUM HANDRAIL QUANTITIES	
Aluminum Handrail	369.6 Lin Ft
(PLACED AS PER PLAN)	
Design for 30° Skew R.A.	
180'-6 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE	
64'-1 1/2' End Spans	64'-10' Center Span
ALUMINUM HANDRAIL DETAILS	
Station: 64+30.00 (E Survey Ia. #38) January, 1971	
MUSCATINE COUNTY	
IOWA STATE HIGHWAY COMMISSION	Design Sheet No 8 Of 10 File No 23091 Design No 1269
STANDARD SHEET 1012 A	MUSCATINE COUNTY
PROJECT NUMBER	FN-38-1(3)-21-70
STATE	IOWA
FED. ROAD DIST. NO.	5
FISCAL YEAR	25
SHEET NO.	25
TOTAL SHEETS	38

DESIGNED BY: C.A. PANAKUL
DETAILED BY: C.A. PANAKUL

TRACED BY: A. SIMPSON
CHECKED BY: C. COLE

ALUMINUM HANDRAIL DETAILS

STANDARD SHEET 1012 A

MUSCATINE COUNTY

PROJECT NUMBER
FN-38-1(3)-21-70

STATE
IOWA

FED. ROAD DIST. NO.
5

FISCAL YEAR
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CONCRETE FOUNDATION PILE

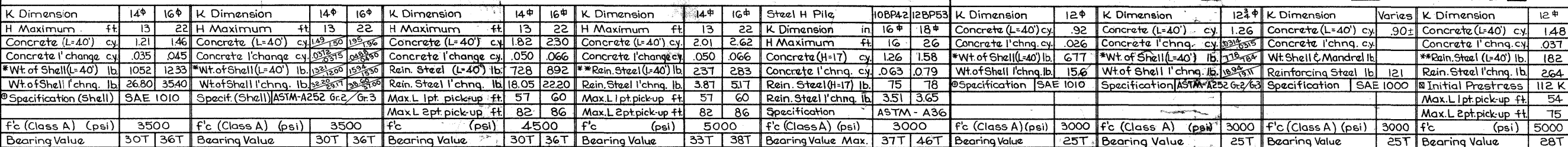
CONCRETE ENCASED
STEEL H PILE

PRECAST-PRESTRESSED

TAPERED &
FLUTED

STEP-TAPERED MANDREL DRIVEN

TABLE 1. Field Results



*Includes weight of Type A tip. **Includes prestressing strands.
 †Cold worked to raise yield point to 45,000.

Except as noted elsewhere, material, construction, driving and extensions or build ups when necessary shall be in accordance with current Standard Specifications of the Iowa State Highway Commission and current Special Provisions applicable.

Heads of precast piles to be finished smooth and normal to axis of pile.

Shell thicknesses shown are minimum requirements. The method of driving steel shell piles shall be adapted to the type and thickness of shell specified. Any shells which have been improperly driven, broken or are otherwise defective shall be removed and replaced by the Bridge Contractor.

Driving points for cast in place piles shall, unless otherwise noted, be Type A.

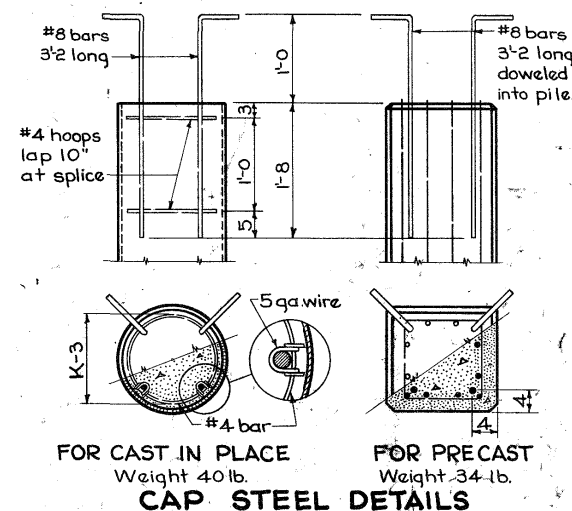
Driving points for prestressed piles, if called for, shall be as detailed.

Cap steel will, in general, not be required, but if called for shall be as detailed on this sheet. It should be used for trestle pile if embedment is less than 1'-6". Cap steel shall be required with Type V piling.

Cost of all driving points and cap steel is to be included in the price bid per lineal foot for piling.

Except as otherwise noted all exposed corners 90° or sharper shall be filleted ³/₄" "Bearing value" and "H" as given in tables are recommended design values for ordinary conditions, but may be modified for special conditions on any given job.

Bearing value required shall in all cases be as specified on the plans.



Artificial curing.

6" 16" 14" 12" 8" 7" 50lb 33lb 20lb 7lb

TYPE-A

TYPE-B

NOTE: Unless noted on plans Type A is to be used.

FOR CAST IN PLACE

FOR PRESTRESSED

STEEL DRIVING POINTS

ASTM - A36

8" - 10lb.
12" - 15lb.
14" - 18lb.
16" - 20lb.

10BP 42 - 16" pile
8BP 36 - 14" pile
6WF 25 - 12" pile

2'-0"

1'-0"

If build up is necessary, break down precast pile to expose 24 diameters of reinforcing bars and extend with same size and number of bars. Place spiral reinforcing at 3" pitch if pile is to be driven or at 9" pitch if pile is not to be driven. Spiral is to have 6 close turns at top. If practicable extensions shall be made after pile has been driven to the required bearing. In case of prestressed pile, strands also are to be exposed and bonded into new concrete.

NOTE: Piles should be bid designating the size, type and length if a particular type is required; e.g.: 14" P10A Piling Type IV, 40' " would mean a 14" # prestressed concrete pile 40' long.

Unless conditions at the site make it inadvisable, choice of type within the specified size should be left optional with the Bidder, except Type V which will be used only when specified. It should be kept in mind that for a given size and bearing value, length may vary with the type (square or round).

Type I, II, VI, VII and VIII piling will be bid per lineal foot of pile furnished and lineal foot of pile driven. Type V piling will be bid per lineal foot of pile furnished, lineal foot of pile driven and lineal foot of encasement. All other piles will be bid per lineal foot of pile in place. Price bid for encasement shall be full payment for necessary excavation and for furnishing and placing all material.

STANDARD DESIGN
CONCRETE AND STEEL PILES
CAST IN PLACE, PRECAST AND ENCASED
FOR USE IN
PILE BENTS AND FOUNDATIONS
IOWA STATE HIGHWAY COMMISSION

JUNE 1959

Design Sheet No. 10 of 10 File No.: 23091 Des. No. 1269 PIO A

MUSCATINE COUNTY

FN-38-1(3)--21-70

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		22	38

Checked by: J. Harkin