

BREMER Co - F-88(9) - 2 Bridges Widening & Culvert Extensions Let August - 17, 1965

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
BRIDGES AND CULVERTS
PRIMARY ROAD SYSTEM
PROJECT NO. F-88 (9)
ON IOWA NO. 3
BREMER COUNTY
JUNE 1965

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

DESIGN NO. 265	STATION 454+05.3 ON IOWA NO. 3
OVER WAPSIPINICON RIVER OVERFLOW	
SECTIONS 5&8 T-9IN R-12W FRANKLIN TWP.	
DESIGN FOR WIDENING 3.33'-4"x24' SIMPLE SPAN I-BEAM BRIDGE TO 3.33'-4"x30' SIMPLE SPAN I-BEAM BRIDGE	
ESTIMATE OF QUANTITIES	
ITEM	TOTAL
* Concrete (Structural)	70.4 ✓ C.Y.
Reinforcing Steel	11,907 ✓ LBS.
Structural Steel	3,322 3346 LBS.
16" Pres. Conc. Piling, PDA Type II 4@30'	120 ✓ L.F.
Creosoted Piling - 4@30'	115.4 L.F.
Excavation Class 20	40.7 C.Y.
Removal of Old Concrete	Lump Sum ✓
P.C. Concrete Pavement Widening	8.55 S.Y.
Hauling, Fabricating & Erecting Steel	Lump Sum ✓
Cleaning & Painting Structural Steel	Lump Sum ✓
Flood Lighting	Lump Sum ✓
Aluminum Handrail	187.6 L.F.
Steel Handrail	167.5 L.F.

* 48.6 C.Y. of Structural Concrete Class "D" for Superstructure, and 21.8 C.Y. of Class "C" for Substructure.

CONSTRUCTION PLANS SHOWING PROJECT AS BUILT
One Copy Prepared By Sherald Lund Date 2/1/67
Res. Const. Engineer
One Copy Prepared and Forwarded to Ames
District Construction Engineer Date _____
Two Copies Made and Returned to:
District Engineer
Res. Maint. Engineer

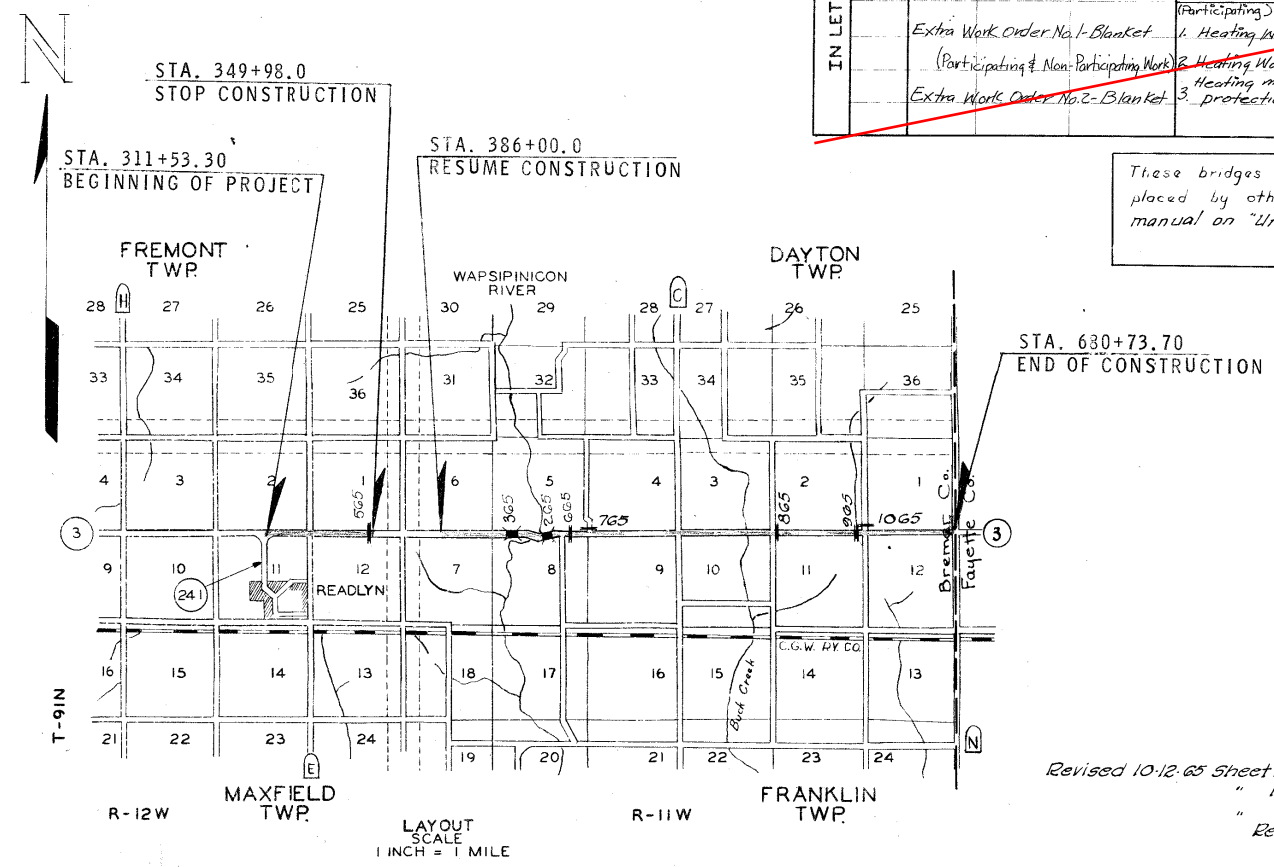
STANDARDS	ISSUED	REVISED
P10A	1959	
C1P	1956	
C2P	1932	1944
C3P	1932	1944
C5P	1932	1944
C1P	1932	

DESIGN NO. 365 ON IOWA NO. 3	STATION 410+53.60
SECTIONS 6&7 T-9IN R-11W	FRANKLIN TWP.
DESIGN FOR WIDENING UNDER TRAFFIC 40' x 24' I-BEAM BRIDGE TO 40' x 44' I-BEAM BRIDGE	
ESTIMATE OF QUANTITIES	
ITEM	TOTAL
* Concrete (Structural)	65.4 ✓ C.Y.
Reinforcing Steel	7,987 ✓ LBS.
Prestressed Prestressed Concrete Beams 45'-0" by 2'-9"	4 ✓ No.
Untreated Piling 16 @ 30'	442.7 L.F.
Structural Steel	1,390 ✓ LBS.
Formed Beam Steel Guardrail (10 gal) (#-# End Post)	125 ✓ L.F.
Excavation Class 20	92.0 C.Y.
Excavation Class 21	28.8 C.Y.
Excavation Class 24	20 ✓ C.Y.
Removal of Old Concrete	Lump Sum ✓
Cleaning and Painting Structural Steel	Lump Sum ✓
Flood Lighting	Lump Sum ✓
P.C. Concrete Pavement Widening	8.5 S.Y.
Extra Work Order No. 1-Blanket (Heating Materials & Protection of Structural Concrete)	35.6 C.Y.

* 29.8 C.Y. of Class "D" Structural Concrete for Superstructure, and 35.6 C.Y. of Class "C" for Substructure.

DESIGN	LOCATION			DESCRIPTION	ESTIMATE OF QUANTITIES							REMOVALS	
	SECTION	TOWNSHIP	STATION		SIZE AND TYPE	Struc. Conc. CL. C. Y.	REINF STEEL LBS.	EXCAVATION CL. 20	C.Y.	GRANULAR BACKFILL C.Y.	CONC. APRONS		
565	1&12	Maxfield	347+02	2'x2' Reinforced Concrete Box Culvert Extension	5.2	313	3					As Per Plan	
665	5&8	Franklin	458+52	3'x3' Reinforced Concrete Box Culvert Extension	9.8	583	7		20			As Per Plan	
765	4	Franklin	470+10-5011	5'x3' Reinforced Concrete Box Culvert Extension	19.9	1206	44						
865	2&11	Franklin	575+14	30" Concrete Roadway Pipe Culvert Extension	1.3	84	21			(1) 32 31	2	As Per Plan	
965	2&11	Franklin	625+86	12'x5' Reinforced Concrete Box Culvert Extension	51.3	1262	45					As Per Plan	
1065	1&2	Franklin	627+13-14	5'x3' Reinforced Concrete Box Culvert Ext. - 30° Skew	28.2	2745	20					As Per Plan	
Extra Work Order No. 1-Blanket (Participating) Extra Work Order No. 2-Blanket												(Non-Participating) Extra Work Order No. 1-Blanket	
1. Heating Water					13.3 C.Y.								Provide payment for un-incorporated
(Participating & Non-Participating Work) 2. Heating Water & Aggregates					4.7 C.Y.								reinforcing steel comp Sum # 7.17
3. Heating materials & protection of concrete					18.2 C.Y.								(Delivered but not-incorporated)
Totals					114.6	12,607	140		16.9	32 31	2		

These bridges will require Bridge Sign Assemblies furnished and placed by others as specified in section 20-5 of the I.S.H.C. manual on "Uniform Traffic Control Devices", Dated January 1963.



DESIGN STRESSES:
Design stresses for the following materials are in accordance with AASHTO Standard Specifications for Highway Bridges, Series of 1957 & TI (58).
Structural Steel in accordance with Section 1.4.2
"Structural Carbon Steel".
Reinforcing Steel in accordance with Section 1.4.12
"Reinforcement" for Intermediate Hard or Rail Steel Grade.
Cast in place Concrete in accordance with Section 1.4.11
f'c = 3,500 psi.
Prestressed Steel in accordance with TI(58) Section 1.13.7
f's = 250,000 psi.
Prestressed Concrete in accordance with TI(58) Section 1.13.7
f'c = 5,000 psi.

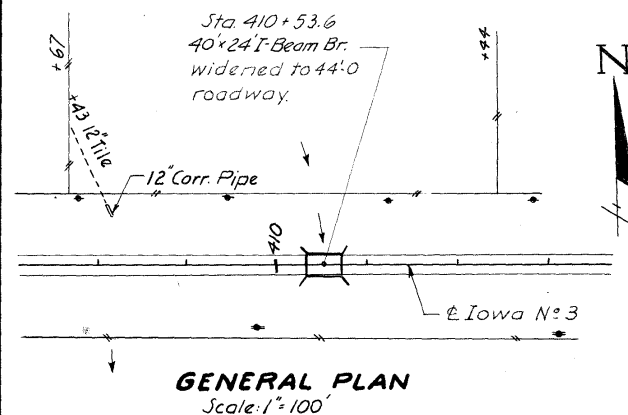
SPECIFICATIONS:
DESIGN: AASHTO, Series of 1957 & TI (58).
CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, Series of 1964, plus current Supplemental Spec's. and Special Provisions and Supplemental Spec's. for Bridge Remodeling
Project dated Nov. 3, 1964

Revised 10-12-65 Sheet 16 of 18, Des. No. 865 Existing Conc. Rdwy. Pipe Ext. to be used. Dimensions & quantities to be corrected accordingly.
" 17 of 18 " " 965 Reinforcing Steel quantity corrected.
" 1 of 18 Quantities corrected accordingly.
Revised 9-24-65 Sheet 1 of 18, Des. No. 965 Concrete quantity corrected. Total quantity corrected.
" 16 of 18, Des. No. 565 and 1065. Junction Detail dimensions corrected.
" 17 of 18, Des. No. 965 Concrete quantity corrected.

Mileage Summary:
Bridge @ Sta. 410+53.60 - 42.0' = 0.008 mi.
Bridge @ Sta. 454+05.3 - 102.583' = 0.019 mi.
Total 0.027 mi.

APPROVED
R.M. Tilton
DEPUTY CHIEF ENGINEER
IOWA HIGHWAY COMMISSION
DATE

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED
DIVISION ENGINEER
DATE



GENERAL NOTES:

This design shows details for widening the existing 40'x24' I-Beam Bridge, Design No. 929 Bremer County, to a 40'x44' I-Beam Bridge.

All work is to be accomplished under traffic, at least one 12' traffic lane is to be maintained at all times.

Construction is to be carried out so that the substructure is completed before the bridge is restricted to one way traffic.

Flood lights shall be placed on the sides shown on the Situation Plan and remain there until construction has been completed.

Reinforcing steel shall be securely wired in place before concrete is placed.

All exposed corners 90° or sharper are to be formed with a $\frac{3}{4}$ " dressed and beveled strip.

The bid item "Removal of Old Concrete" shall include:
removing the existing rail, curb, part of the wings and a portion of
the approach pavement. The broken concrete is to be disposed of
as directed by the Engineer.

The Bridge Contractor is to complete the roadway approach grade around the ends of the new wings as shown on the Situation Plan with Class 24 excavation. Class 24 excavation is to be obtained near the bridge site and within the right of way.

Red lines on tracing and faint lines on print indicate the existing structure.

The contractor is to provide traffic control signals in accordance with Specification 566.

DESIGN STRESSES.

Design stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1957 and T1(58):

Reinforcing steel in accordance with Section 1.4.12 "Reinforcement for Intermediate, Hard or Rail Steel Grade."

Cast in place concrete in accordance with
Section 1.4.11 $f'_c = 3500$ psi.

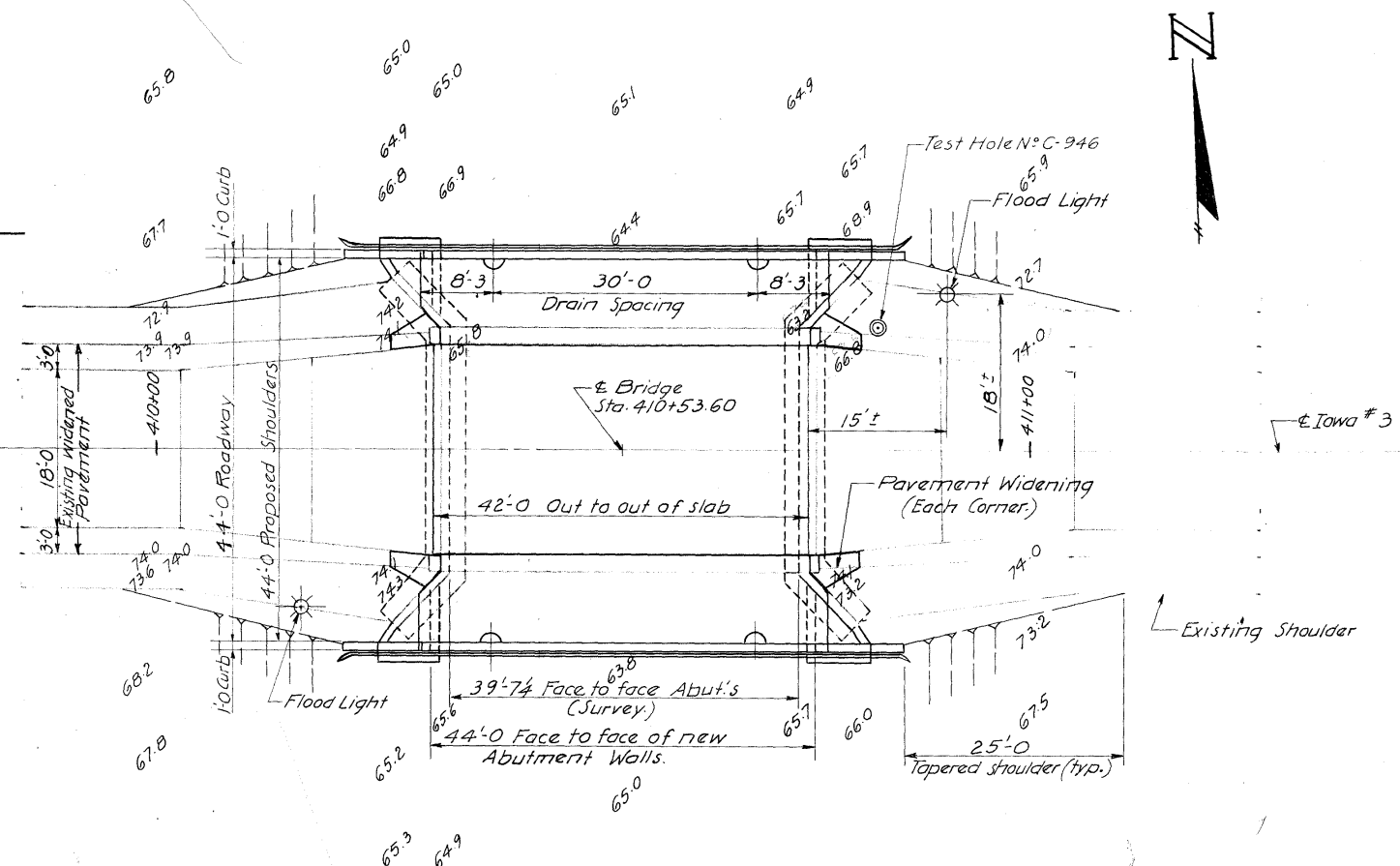
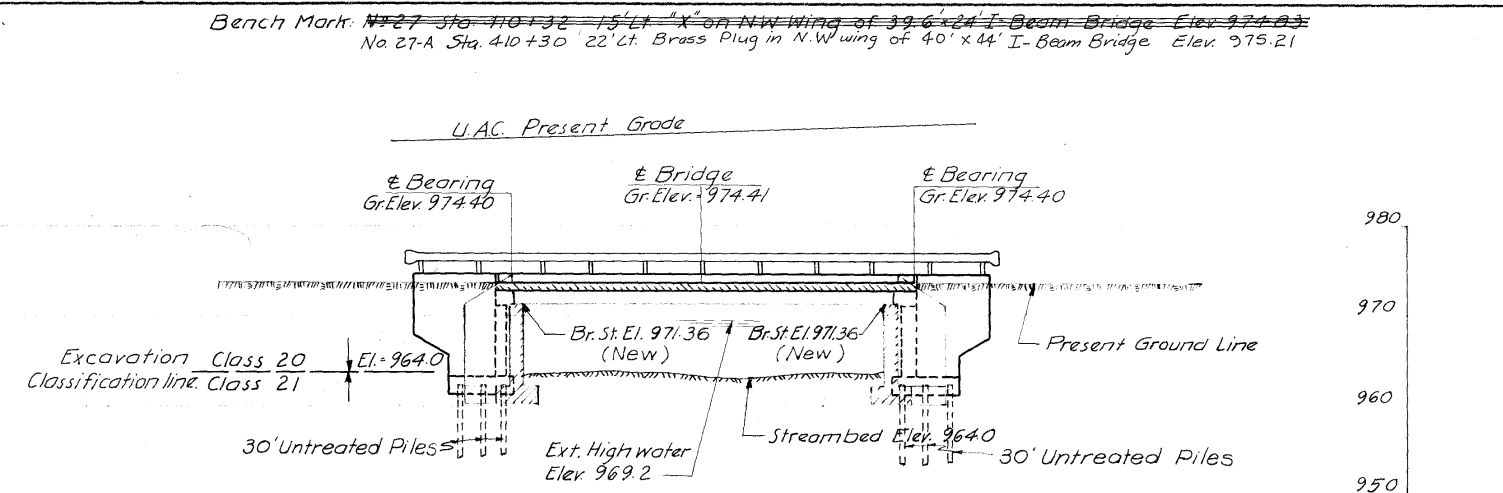
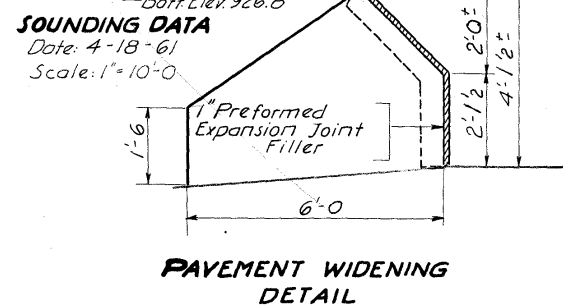
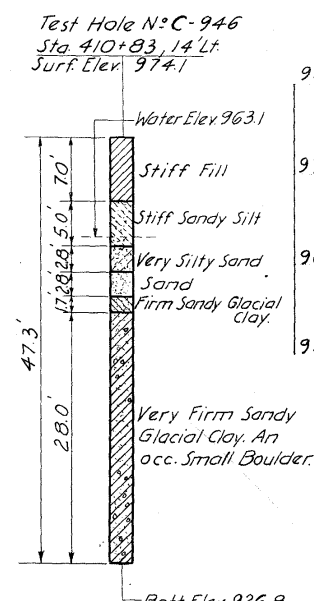
1.13.7 $f_s' = 250,000$ psi.

Prestressed Concrete in accordance with
 T1(58)1.13.7, $f'_c = 5000$ psi.

Struct. Steel in accordance with Section 1.4.2 "Structural Carbon Steel".

SPECIFICATIONS.

Design: AASHTO, Series of 1957 & T1(58)
Construction: Standard Specifications of
the Iowa State Highway Commission
Series of 1964, plus current special provisions
and supplemental specifications including
Supplemental Specifications for Bridge re-modeling
Projects, Spec. 567, dated Nov. 3, 1964.



TOTAL ESTIMATED QUANTITIES				
Item	Unit	2 Abut.'s	Superstr.	Total
* Structural Concrete	c. y.	35.6	29.8	65.4
Reinforcing Steel	lbs.	2664	5323	7987
Prestensioned Prestressed Conc. Beams, 45'-0 by 2'-4	Nº		4	4
Untreated Piling 16 @ 30'-0	L.F.	480		480
Structural Steel	lbs.		1390	1390
Formed Beam Steel Rail (E & End Post)	L.F.		125	125
Excavation Class 20	c. y.	30.920		30
" " 21	c. y.	30.280		30
" " 24	c. y.			20
Removal of Old Concrete	L. S.			Lump Sum
Cleaning & Painting Structural Steel	L. S.			Lump Sum
Flood Lighting	L. S.			Lump Sum
P.C. Concrete Pavement Widening	Sq. Yd.			8.0

* 29.8 c.y of Class D Structural Concrete for Superstructure and 35.6 c.y of Class C for Substructure.

HYDRAULIC DATA.

Drainage Area - Overflow

LOCATION.

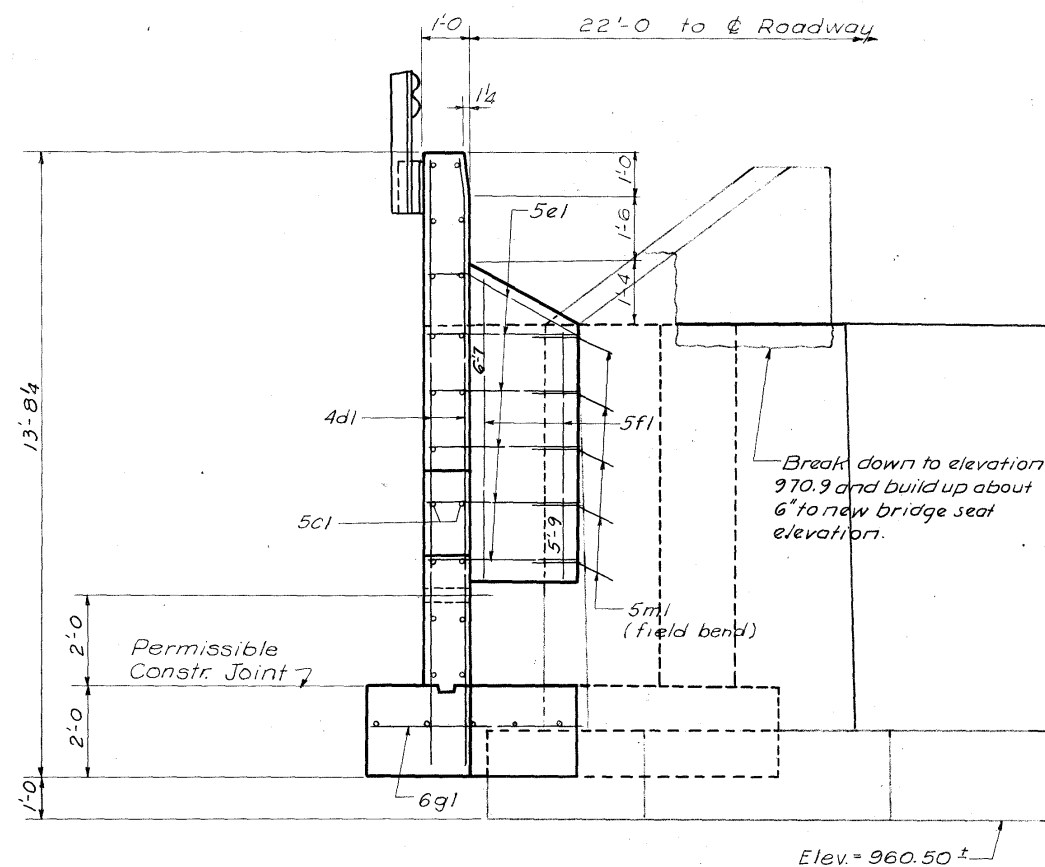
On Iowa No 3
Sections 6 & 7
T-91N R11W
Franklin Twp.
Bremer County

Design for Widening under Traffic
40' x 24' I-BEAM BRIDGE
TO
40' x 44' I-BEAM BRIDGE
GENERAL & SITUATION PLAN
Station: 410+53.60 Project No F-88(3)
BREMER COUNTY

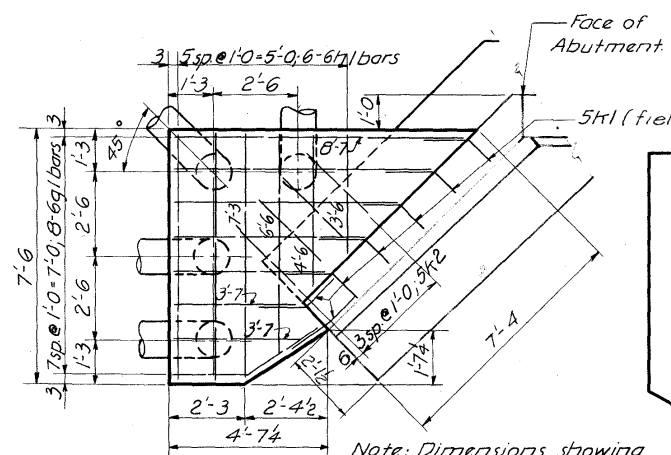
Iowa State Highway Commission
April 1961 Sheet 1 of 4
Design No 365 Bremer Co. File No 21230

Designed by: GWS Traced by: *TF* Checked by: *RCW*

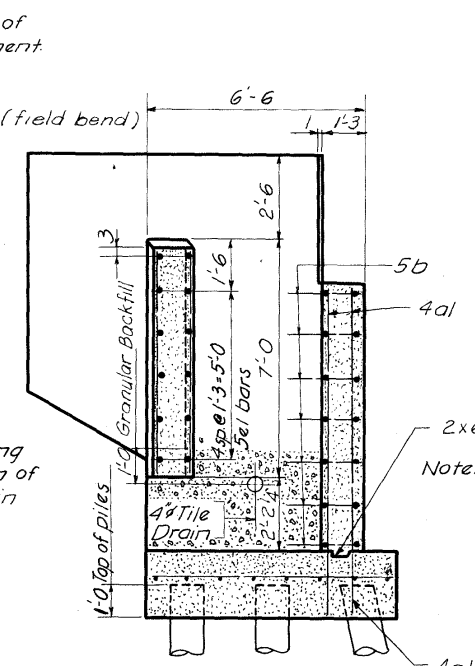
Bench Mark: 27 Sta 410+32, 15 ft "X" on NW wing of 39.6' x 24' I-Beam Bridge Elev 974.83
No. 27-A Sta 410+30 22' Lt. I.H.C. in N.W. Wing of 40' x 44' I-Beam Bridge Elev 975.21



PART REAR ELEVATION
Scale: 1/2" = 1'-0"

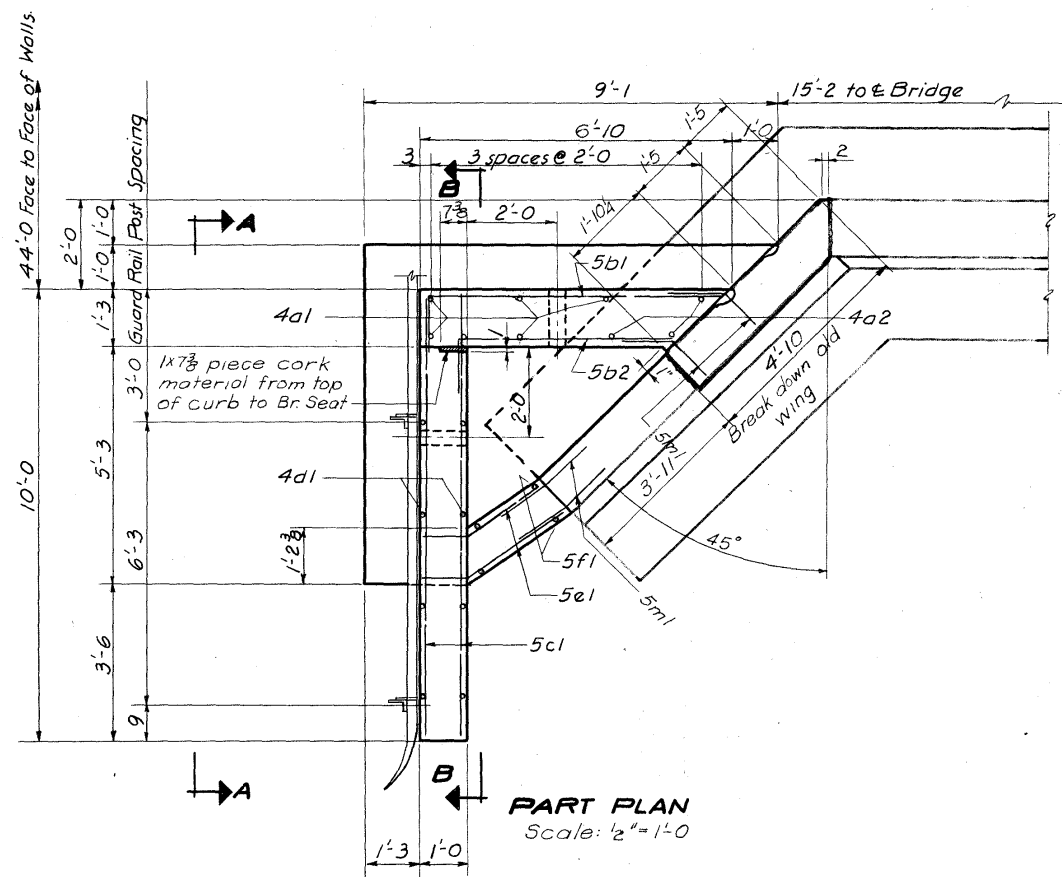
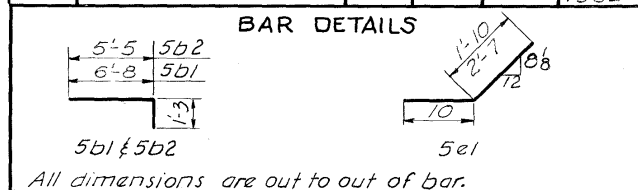


FOOTING PLAN

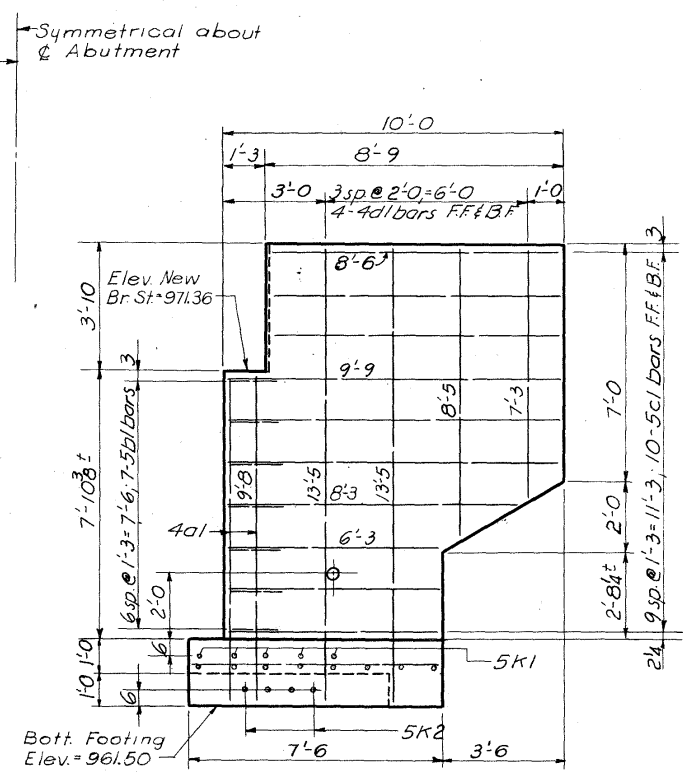


SECTION B-B

REINFORCING BAR LIST-1 ABUT.					
Bar	Location	Shape	Nº	Length	Weight
4a1	Breastwall Vert. FF&BF	—	12	9'-8"	77
4a2	" " " " " "	—	6	8'-8"	35
5b1	" Horiz. FF	—	14	7'-10"	114
5b2	" " " " " "	—	14	6'-7"	96
5c1	Wing Horiz. FF&BF	—	40	Varies	341
4d1	" Vert. " " " "	—	16	Varies	114
5e1	New Wing to Old Wing Horiz.	—	12	2'-5 3/8"	76
5f1	" " " " " " Vert.	—	8	Varies	51
6g1	Footing Transv.	—	16	Varies	136
6h1	" Longit.	—	12	Varies	109
5k1	Footing to Old Wing	—	14	2'-6"	37
5k2	" to Old Footing	—	8	2'-6"	21
5m1	Wing dowels	—	48	2'-6"	125
					1332



PART PLAN
Scale: 1/2" = 1'-0"



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

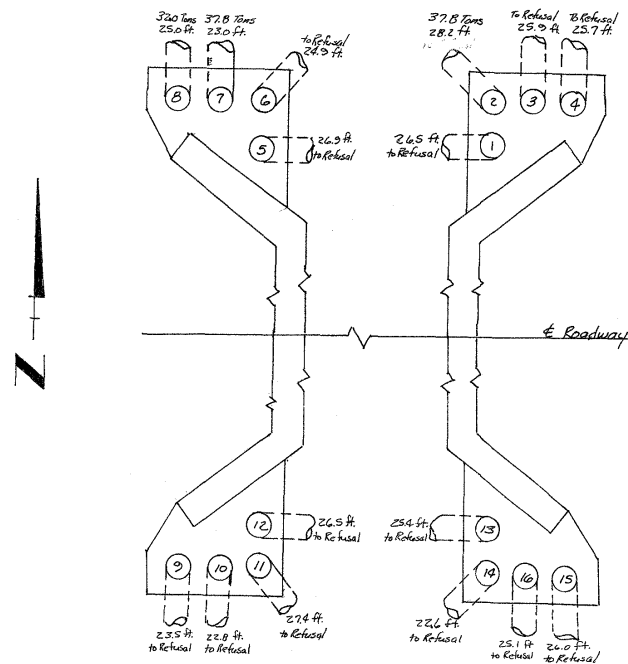
ABUTMENT NOTES.

All exposed corners 90° or sharper are to be formed with a 3/4" dressed and beveled strip.
Reinforcing is to be securely wired in place before concrete is placed.
Clear distance from face of concrete to near reinforcing bar is to be 1 1/2" unless otherwise shown or noted.
All piles are to be driven to full penetration, if practicable, but not less than 20 tons nor more than 40 tons bearing capacity.
The procedure for setting dowels is to be as specified in the supplemental specifications for bridge remodeling projects dated Nov. 3, 1964.
The self expanding cork joint filler shall conform to A.S.T.M. D1752-60T Type III and shall be kept dry until the final adjacent pour is started. The cost of the joint filler shall be included in the price bid for concrete.

CONCRETE PLACEMENT QUANTITIES-1 ABUT.		
Location	Unit	Amount
Above Footing	c.y.	12.5 ✓
Footing	c.y.	5.3 ✓
Total	c.y.	17.8 ✓

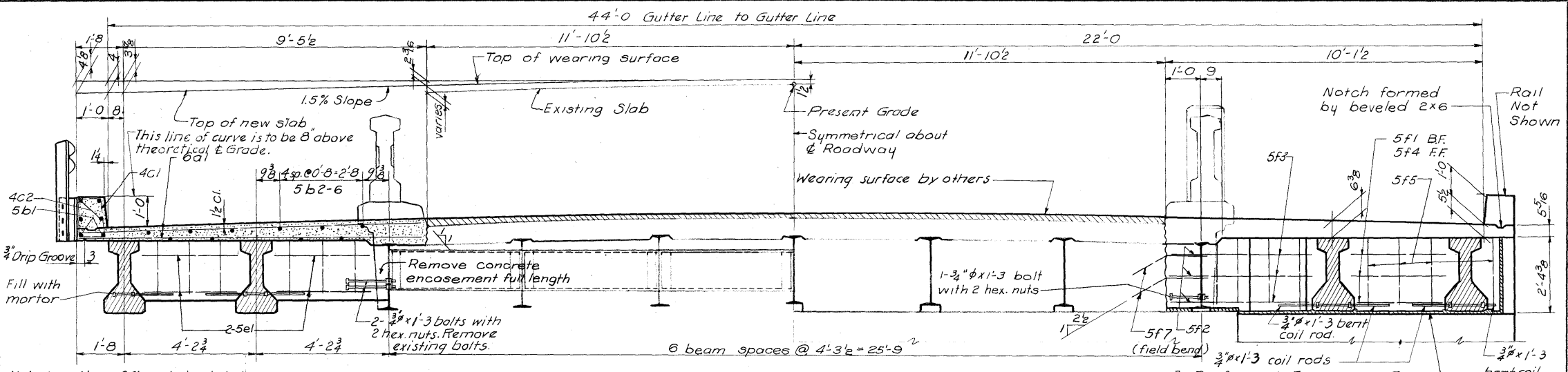
TOTAL ESTIMATED QUANTITIES-TWO ABUTS.		
Item	Unit	Amount
Structural Concrete Class C	c.y.	35.6 ✓
Reinforcing Steel	lbs	2664 ✓
Untreated Piles 16 @ 30'	L.F.	480 442.7
Class 20 Excavation	c.y.	30 92.0
Class 21 Excavation	c.y.	30 28.8

Design for Widening under Traffic
40' x 24' I-BEAM BRIDGE
TO
40' x 44' I-BEAM BRIDGE
ABUTMENT DETAILS
Station: 410+53.60 Project Nº F-88(9)
BREMER COUNTY
Iowa State Highway Commission
April 1961 Sheet 2 of 4
Design Nº 365 Bremer Co. File Nº 21230



Piling Nos. 1 thru 16 are Untreated wood piles
 All piling Battered 1:4 in direction indicated

REINFORCING BAR LIST					
Bar	Location	Shape	Nº	Length	Weight
6a1	Slab Transv. Top & Bott.		170	10'-11"	278.8
6a2-3	" " Bott. Ends		8	Varies	89
6a4-5	" " Top		8	Varies	95
5b1	" Longit. Top & Bott.		28	23'-8"	691
5b2-6	" " " "		20	Varies	472
4c1	Curb Hoops		74	3'-5"	169
4c2	" Longit.		16	23'-6"	251
5e1	Inter. Diaphragm Horiz.		32	3'-0"	100
5e2	" " Vert.		24	4'-11"	123
5f1	Abut. B.F. Horiz.		12	7'-2"	90
5f2	" B.F. " "		12	6'-9"	85
5f3	" F.F. " "		12	4'-1"	51
5f4	" F.F. " "		12	2'-8"	33
5f5	" " Vert.		32	5'-11"	197
5f7	" " Dowels		8	2'-6"	21
4g1	Paving Notch Longit.		8	4'-4"	23
4g2	" " Transv.		20	3'-4"	45
TOTAL					5323

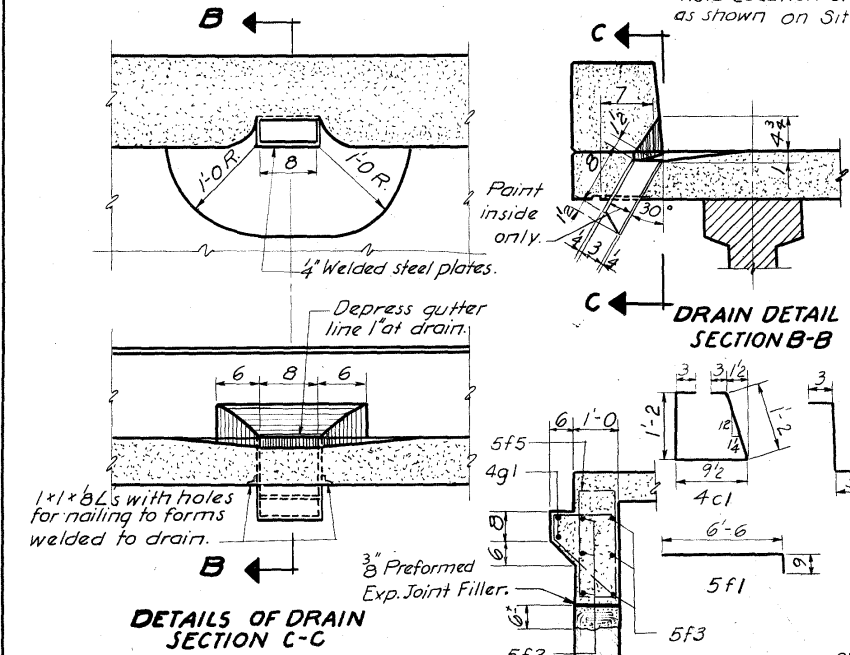


Note: Location of floor drains is to be as shown on Situation Plan.

HALF INTERMEDIATE SECTION
Scale: 1/2"=1'-0"

HALF SECTION NEAR ABUTMENT

NOTE: Beams are to be set on 6x8x1'-2 1/2" Fabric Bearing Pads. See detail on Sheet 4.



Note: Rolled tube with outside dimensions 4x8 with 4 wall thickness may be substituted. Weight of one floor drain is 17lbs.

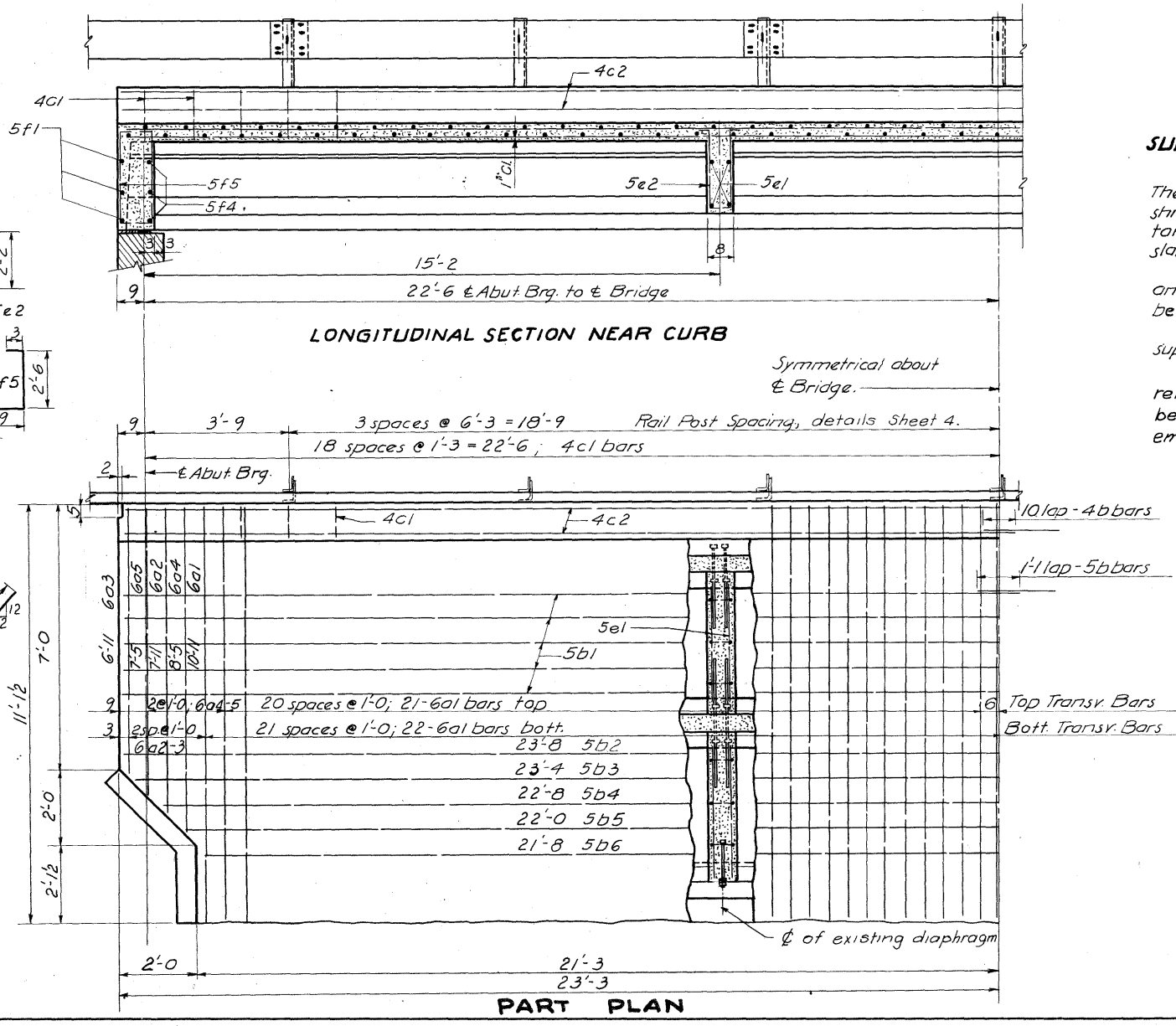
SECTION A-A

SECTION B-B

BAR DETAILS
All dimensions are out to out.

PART PLAN
SHOWING PAVING NOTCH

SECTION THRU
ABUT. DIAPHRAGM



SUPERSTRUCTURE NOTES.

The slab concrete is to contain no class II aggregate. The concrete is to be placed as dry as practicable to reduce shrinkage to a minimum and special precaution is to be taken to secure a complete bond between the beam and slab.

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

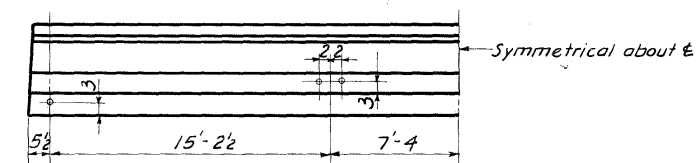
Forms for the slab and for the curb are to be supported by the beams.

All existing slab reinforcing exposed while removing curb and beam encasement shall not be cut off but shall be straightened and embedded in new slab.

TOTAL ESTIMATED QUANTITIES-SUPERSTR.		
Item	Unit	Amount
Structural Concrete Class D	c.y.	29.8 ✓
Reinforcing Steel	lbs.	5323 ✓
Structural Steel	lbs.	1390 ✓
Prestressed Prest. Conc. Bms. 45'-0"	Nº	4 ✓
Formed Steel Beam Rail	L.F.	125.0 ✓

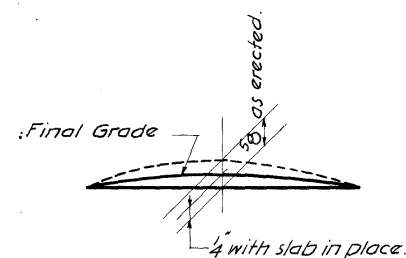
① Length is to E. of end posts.
Price bid for this item shall include 4 curved and sections and special 3/8" bolts necessary for erection.

Design for Widening under Traffic
40' x 24' I-BEAM BRIDGE
TO
40' x 44' I-BEAM BRIDGE
SUPERSTRUCTURE DETAILS
Station 410+53.60 Proj. N° F-88(9)
BREMER COUNTY
Iowa State Highway Commission
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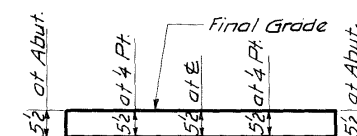


LOCATION OF BEAM COIL TIES

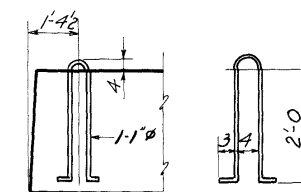
BEAM DATA	
Span	45'-0"
Initial Prestress	303 Kips
Strands	16- $\frac{7}{8}$ " ϕ
Camber	$\frac{3}{8}$ "
Deflection Due to Slab	$\frac{3}{8}$ "
Reinforcing Steel	478 lbs
Concrete	3.06 c.y.



BEAM CAMBER & DEFLECTION

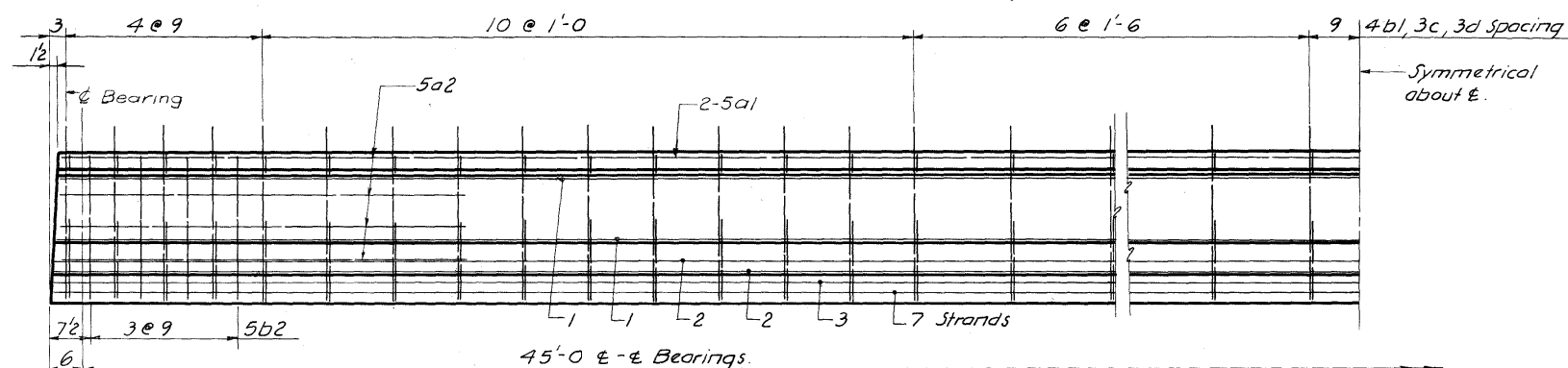


SLAB THICKNESS
(at gutter line)



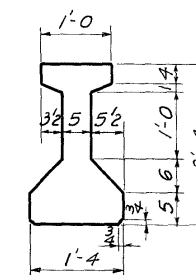
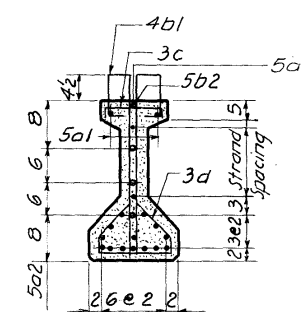
LIFTING LOOP DETAILS

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



45'-0 BEAM

NOTE: Bars 4b1 and 3d are to be placed in pairs.



BEAM NOTES.

An allowance of .0005L is to be made for shrinkage and elastic shortening.

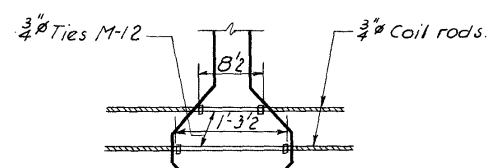
Tops of beams are to be scored transversely at about 3" centers with a pointed tool. Scores to be 1/8" deep.

The costs of bearing pads, coil ties, coil rods and lifting loops are to be included in the price bid for prestressed concrete beams. The strands are to be cut leaving a 1" protection.

DESIGN STRESSES.

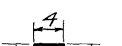
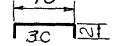
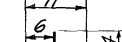
Design stresses are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges Series of 1957 and T1(58):

Concrete in accordance with T1(50) 1.13.7 $f'_c = 5000$ psi.
 Prestressing Steel in accordance with T1(50) 1.13.7 $f'_s = 250,000$ psi.
 Reinforcing Steel in accordance with Section 1.4.12 "Reinforcement"
 for Intermediate, Hard or Rail Steel Grade.

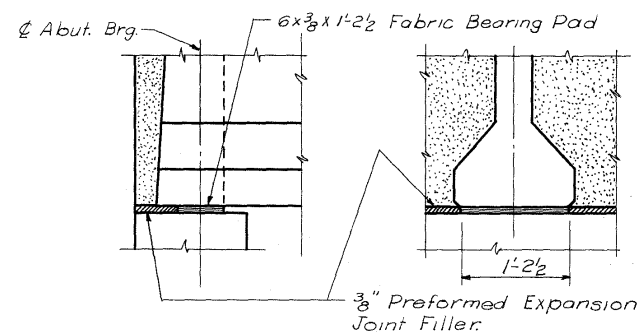


COIL TIE DETAILS

Coil ties and anchors are to be as manufactured by the Superior Concrete Products Co, Richmond Screw Anchor Co. or an approved equal.

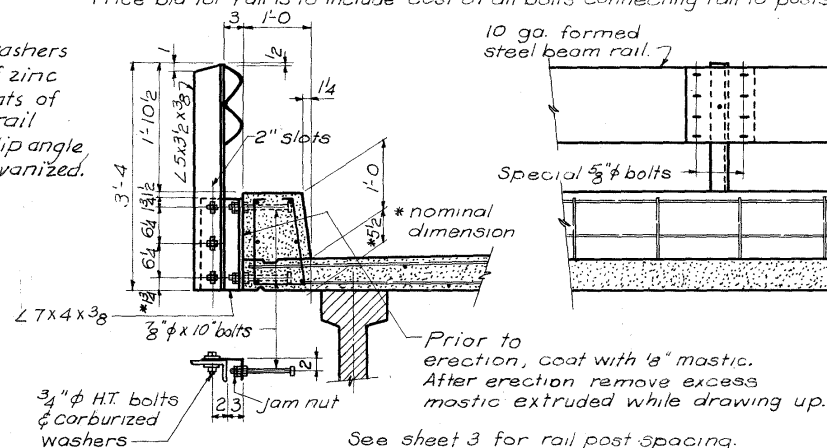
REINFORCING STEEL - ONE BEAM					BAR DETAILS	
Bar	Shape	Nº	Length	Weight		
5a1		4	23'-5"	98		
5a2		8	6'-0"	50		
4b1		84	3'-8"	206		
5b2		8	4'-6"	38		
3c		42	1'-1"	17		
3d		84	2'-2"	69		
TOTAL			478			

Price bid for rail is to include cost of all bolts connecting rail to posts.



BEARING DETAILS

Note: The $\frac{3}{4}$ " H.T.S. bolts and washers are to be painted one coat of zinc chromate followed by two coats of aluminum paint. All other rail components (the rail, post, clip angle, bolts and nuts) are to be galvanized.



RAIL POST DETAILS

Design for Widening under Traffic
40' x 24' I-BEAM BRIDGE
TO

40' x 44' I-BEAM BRIDGE
SUPERSTRUCTURE DETAILS

Station 410+53.60 Project N° F-88

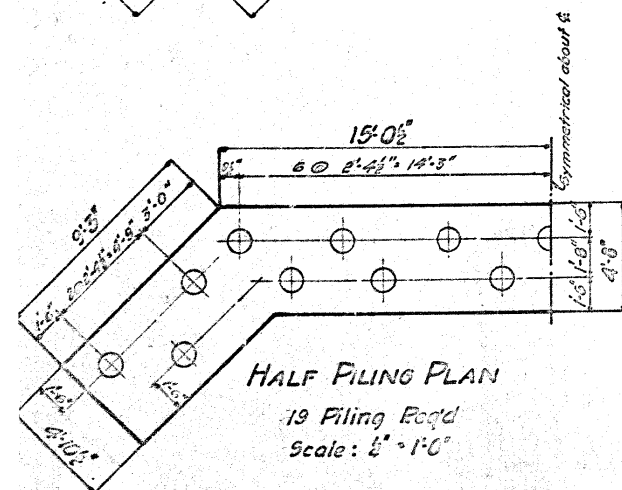
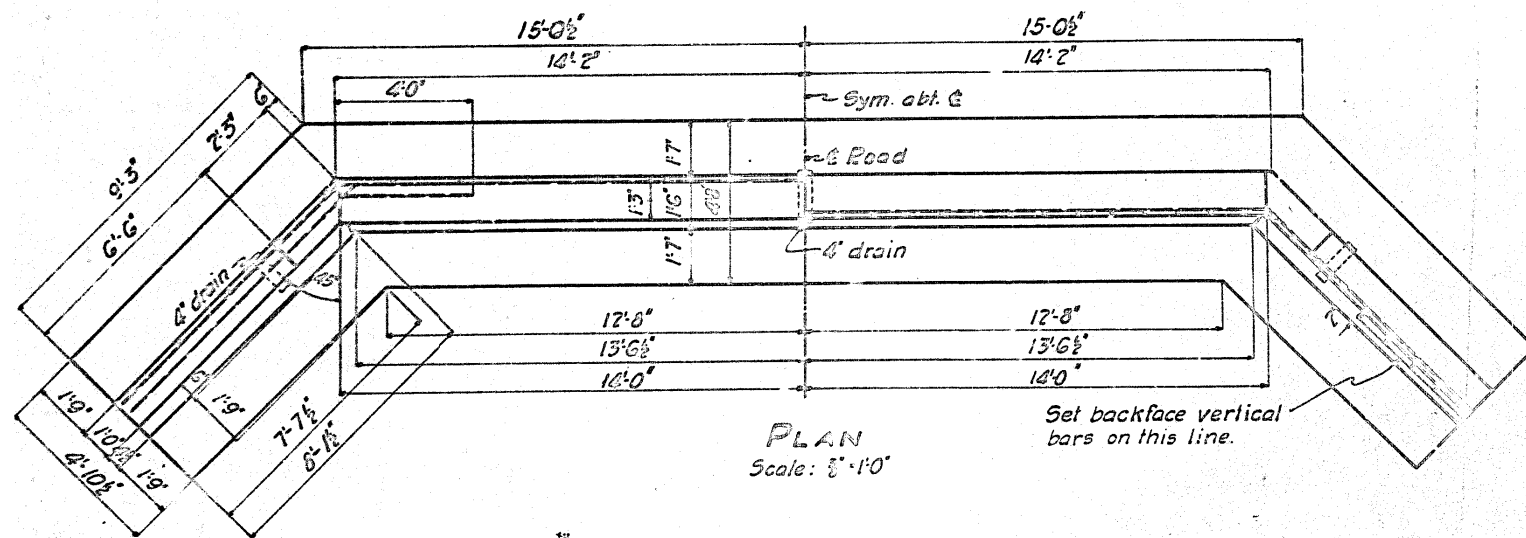
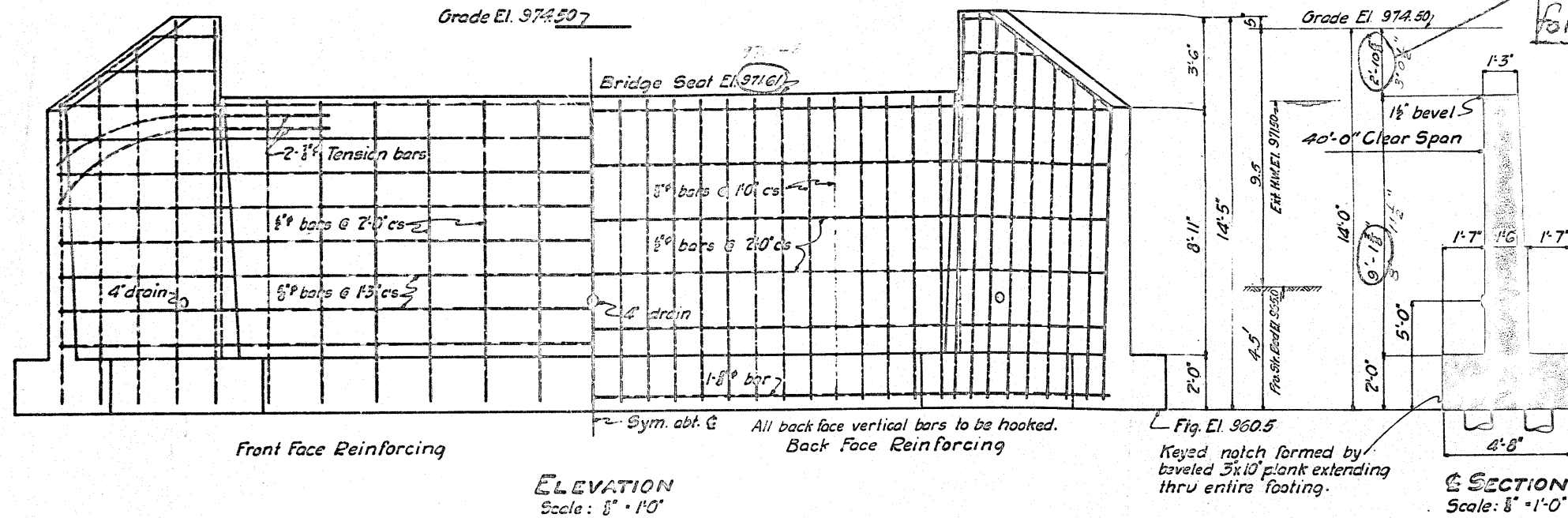
BREMER COUNTY

Iowa State Highway Commission

April 1961 Street 4 of 4

Росгидро- № 265 п

Bench Mark: #27- Sta. 403+65 Spike in Tel. pole 33'-0" Lt. Elev. 973.45



General Notes:

All exposed corners of 90° or sharper to be filleted with a 1" dressed beveled strip.

Horizontal reinforcing bars may be spliced at or near the E. Use a 5/8" diameter lap on all splices and a 1/2" diameter hook on all hooked bars.

Use piling as shown in plan.

For details of Superstructure see Standard V 3A Standard Specifications of the Iowa Highway Commission, Series of 1925.

Fig. E1. 960.5
Keyed notch formed by
beveled 3x10 plank extending
thru entire footing.

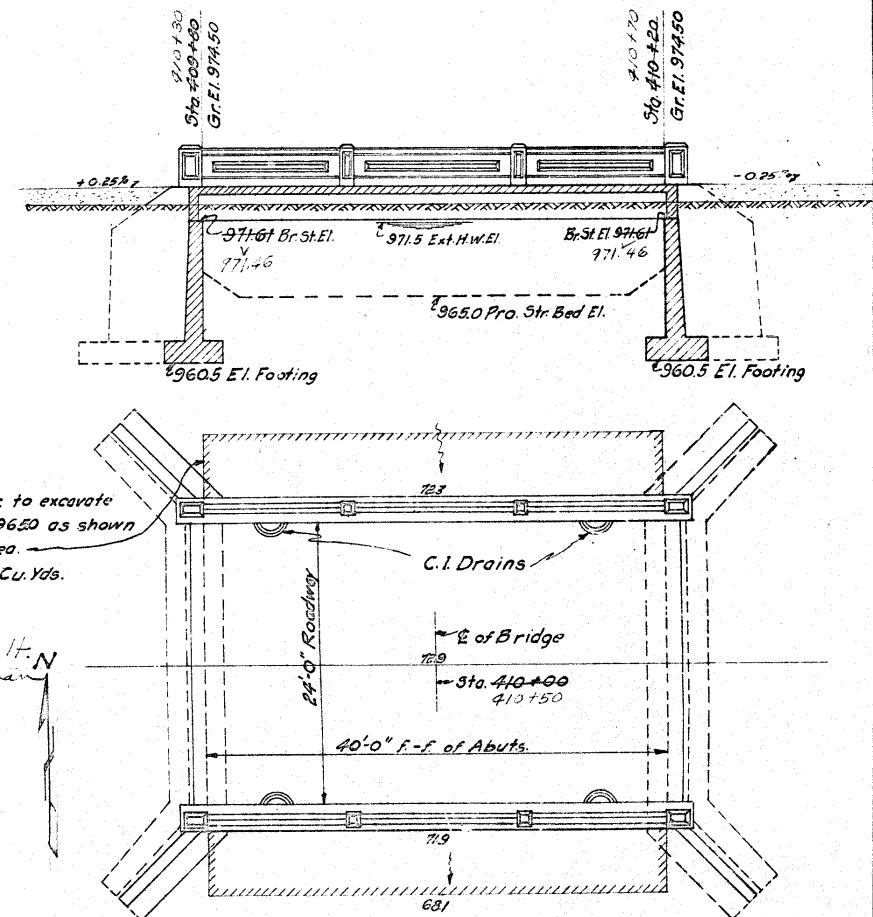
SECTION
Scale: $\frac{1}{8}'' = 1'-0''$

Note:
Bridge Contr. to excavate
channel to El. 96.50 as shown
by shaded area. —————
Approx. 400 Cu. Yds.

Construction plan showing bridge as built.
Prepared by Earl M. Matthews, Instrumentman
F.B. Thullen Res. Engineer
Date Nov. 29 1930

ESTIMATED QUANTITIES				
Item	Concrete	Rein. Steel	Str. Steel	Piling
Superstructure	4723 Cu.Yds	6690 [#]	29580	
Substructure	140	3480		32@20'
Floor of Pier, Retain- er & Abutment	83			
Abutment	1223 Cu.Yds	10170 [#]		38@20'

Bridge No.
Section 6-7
Franklin Twp.
Deer Co.



SITUATION PLAN
Scale: $\frac{1}{8}'' = 1'-0''$

Design for
40' x 24' I-BEAM BRIDGE
 Concrete Floor and Abutments
ABUTMENT DETAILS
 Sta. 410+00 Prim. Proj. No. 483
GREYER COUNTY
 Iowa Highway Commission
 Nov. 1929 Scales as noted

Design No. 929 Bremer Co.