FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FI. AL.	SHEET NO.	TOTAL SHEETS
5	IOWA			1	110

PROJ. NO. I-IG-380-6(7) 247--04-52
D.O.W. NO. I-380-6(1) 243--01-52

CONVENTIONAL SIGNS

Co. Line
Twp. Line
Sec. Line
Corp. Line
Urban Dstry.
D.O.T. Line — Old / New
Survey Line — Sta. / Ref. Point
Profile Grade
Railroad
Field Tile — Old / New
Underground Lines — Gas / Tel
Culverts — Old / New
Utility Poles — Power / Telephone
Fences — Barb / Mesh
Trees or Brush
Stream
Dike
County Road No. — (H)
Primary Road No. — (153)
U.S. Road No. — (6)
Interstate Road No. — (80)

REVISED PRINT

DETAIL PLANS REDUCED IN SIZE (DO NOT SCALE)

STATE OF IOWA

STATE HIGHWAY COMMISSION

PLAN AND PROFILE OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

JOHNSON COUNTY

BRIDGES AND CULVERTS

ON INTERSTATE 380 FROM A POINT APPROXIMATELY 1400' WEST OF AND 800' NORTH OF THE SE CORNER OF SECTION 3 T-80N, R-7W, NORTHERLY 7.107 MILES TO A POINT ON THE LINN COUNTY LINE APPROXIMATELY 850' WEST OF THE NORTH ¼ CORNER OF SECTION 4 T-81N, R-7W

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR CONSTRUCTION WORK, SERIES OF 1964 SHALL APPLY TO WORK ON THIS PROJECT PLUS CURRENT SUPPLEMENT SPECIFICATIONS AND SPECIAL PROVISIONS

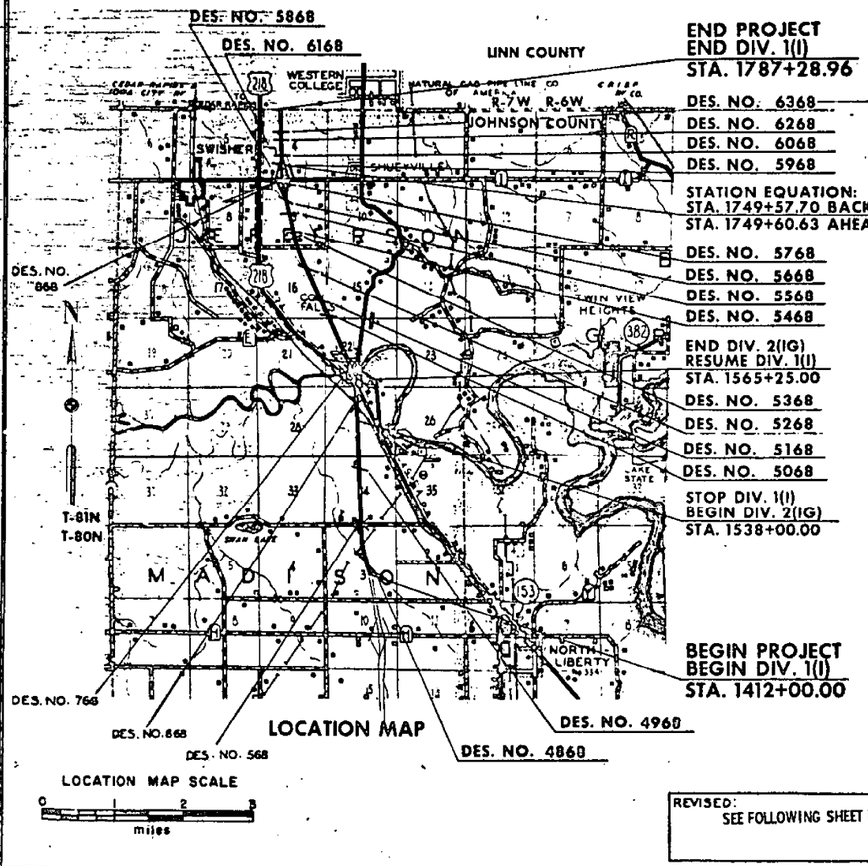
DESIGN STRESSES for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1965.

Concrete in accordance with Section 1.5.1(C) f'c 3500 psi for Slab and Floor and f'c 3000 psi for Walls. Reinforcing Steel in accordance with Section 1.5.1 (D) "Reinforcement" for Intermediate, Hard, or Rail Steel Grade.

Structural Steel in accordance with Section 7 "Structural Steel Design".
ASTM A572 Gr. 50 and ASTM A588 f_s = 27,000 p.s.i.
ASTM A36 f_s = 20,000 p.s.i.

INDEX OF SHEETS (105-2)

NO.	DESCRIPTION
1	TITLE SHEET
1A	REVISION SHEET
2#2B	ESTIMATE SHEET
3	MISCELLANEOUS DETAILS
4	MISCELLANEOUS DETAILS
5	MISCELLANEOUS DETAIL SHEET (RF-1)
6	MISCELLANEOUS DETAIL SHEET (RF-3)
7	MISCELLANEOUS DETAIL SHEET (RF-4)
8-11	CULVERT DESIGN NO. 4868
12-14	CULVERT DESIGN NO. 4968
15#16	CULVERT DESIGN NO. 5068
17#18	CULVERT DESIGN NO. 5168
19#20	CULVERT DESIGN NO. 5268
21#22	CULVERT DESIGN NO. 5368
23#24	CULVERT DESIGN NO. 5468
25#26	CULVERT DESIGN NO. 5568
27-29	CULVERT DESIGN NO. 5668
30	CULVERT DESIGN NO. 5768
31#32	CULVERT DESIGN NO. 5868
33	CULVERT DESIGN NO. 5968
34	CULVERT DESIGN NO. 6068
35	CULVERT DESIGN NO. 6168
36	CULVERT DESIGN NO. 6268 AND DESIGN NO. 6368
37-50	BRIDGE DESIGN NO. 568
51-75	BRIDGE DESIGN NO. 668
76-93	BRIDGE DESIGN NO. 768
94-110	BRIDGE DESIGN NO. 868



MILEAGE SUMMARY (105-1)

DIV.	LOCATION	LIN. FT.	MILES	STATE CONTROL SECTION NO.
1	STRUCTURE AT STA. 1437+47	23.688	0.004	52-1900
	BRIDGE AT STA. 854+48.27	382 -875	0.073	
	BRIDGE AT STA. 1581+22.50	430 .0	0.081	
	TOTAL		0.158	

DES. NO.'S 568, 868

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 4-29 1970 IOWA REG. NO. 2792

PREPARED AND RECOMMENDED BY

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS

KANSAS CITY 700 DES. NO.'S 868 + 4868 THRU 6368 NEW YORK

I hereby certify that this plan, specification or report 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.

Signed Paul L. Heinemann Date 4-29-70

Paul L. Heinemann, P.E., Iowa Reg. No. 2156

REVISED:
SEE FOLLOWING SHEET 1A

DESIGN DESIGNATION INTERSTATE HIGHWAY SYSTEM

1971 AADT	10,750 V.P.D.
1991 AADT	18,100 V.P.D.
1991 DHV	2,114 V.P.H.
DIRECTIONAL	60 %
TRUCKS	13 %
DESIGN V	70 M.P.H.

FULL CONTROL OF ACCESS SHALL BE EXERCISED ON THIS PROJECT.

IOWA STATE HIGHWAY COMMISSION STANDARDS REQUIRED
(AVAILABLE AT THE I.S.H.C. STORE ROOM)

STANDARD	ISSUED	REVISED
C1P	1932	8-25-67
C2P	1932	6-44
C3P	1932	6-44
C4P	1932	6-44
C5P	1932	6-44
C8P	1932	6-44
C6F	1952	5-17-55
C8F	1952	5-17-55
C2J	1959	6-19-64
C3J	1959	6-19-64
C4J	1959	6-19-64
C5J	1959	6-19-64
C6J	1959	6-19-64
C8J	1959	6-19-64
CFP	1945	-
F2J	-	6-19-64
F3J	-	6-19-64
F4J	-	6-19-64
F5J1	-	6-19-64
F8J1	-	6-19-64
CHP 2.5-65	1965	8-25-67
CBH - 00	1960	-
CBH - 45	1960	-

APPROVED
4/29/70
DEPUTY CHIEF ENGINEER — DATE
IOWA HIGHWAY COMMISSION

DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC ROADS
APPROVED
DIVISION ENGINEER — DATE

(R)

(35) Rev.

JOHNSON COUNTY BRIDGES AND CULVERT PROJECT NO. I-IG-380-6(7)247--04-52 LETTING DATE: July 21, 1970

K.J.S. 4-29-70 HK

4-29-70 PLH

FILE NO. 22960 JOHNSON COUNTY PROJECT NO. I-IG-380-6(7) 247--04-52 SHEET NO. 1 of 110

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS
July 2, 70	1A of 110	This Sheet added to Project (Revision Sheet);
	76 of 110	Note concerning the Slope Protection to be Constructed by the Bridge Contractor is deleted. See revised note on Sheet 1A of 18 (Project Sheet No. 76A of 110).
	76A of 110	This Sheet Added.
	1 of 110	Reference added for Revision Sheet 1A. Sheet 1A added to Index of Sheets.
		REASON: Change made in Slope Protection Note to provide a more practical procedure.
July 27, '70		Design 568 & 668
	Sheets 38 & 44 of 110	Design 568 - Concrete quantities corrected.
	Sheet 65 of 110	Design 668 - The 4th paragraph in "Superstructure Notes" is deleted.
	Sheet 51 of 110	Design 668 - Out to out of paving notch dimension corrected.
	Sheet 28 of 110	Design 568 - Concrete quantity corrected.

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS

fold

Johnson COUNTY File No. 2250

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)267--04-52	IOWA	6		1-A	110

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			22	NO.

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

PAUL L. HEINEMAN REG. NO. 5156

DATE Nov 26, 69

IN LETTING OF June 23, 1970

DESIGN NO. 4868
JOHNSON COUNTY
SECTION 3 T-80 N R-7W MADISON TOWNSHIP

STATION 1437+47

45° SKEW

TWIN 8.0'×8.0'×280.0' REINFORCED CONCRETE BOX CULVERT

ESTIMATE OF QUANTITIES

ITEM	UNIT	TOTAL
Structural Concrete Cl. "C"	Cu. Yds.	633.6
Reinforcing Steel	Lbs.	83,422
Cl. 20 Excavation	Cu. Yds.	1,095

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.

PAUL L. HEINEMAN REG. NO. 5156

DATE Dec 26, 1969

IN LETTING OF June 23, 1970

DESIGN NO.	LOCATION: SECTION	TOWNSHIP	STATION	DESCRIPTION: SIZE AND TYPE	STRUC. CONC. CL. "C" CU YDS	REINF. STEEL LBS.	EXCAVATION CU. YDS. CL. 20	EXCAVATION CU. YDS. CL. 24	GRANULAR BLANKET* CU. YDS.	CONC. RDWY. PIPE CULV. 24"	30"	42"	CONC. APRONS NO. 24"	30"	42"	REMOVALS	REMARKS
4868	34	Madison	1499+35	Twin 8'x4'x194.0' R.C. Box Culv.-Skew 30°	304.5	48,480	391										
5058	15	Jefferson	1629+70	4'x4'x220.5' R.C. Box Culv. with 176.96' Flume Outlet-Skew 30°	170.7	14,592	355										Bell Joints
5168	16	Jefferson	1650+25	3'x4'x356.0' R.C. Box Culv. with 85.96' Flume Outlet-Skew 30°	189.8	16,360	292										Bell Joints
5268	16	Jefferson	1664+22	6'x5'x409.0' R.C. Box Culv. with 8'x6' Inlet Taper # 60.67' Flume Outlet-Skew 30°	503.2	65,022	447										Bell Joints
5358	9	Jefferson	1684+53	2'x3'x204.0' R.C. Box Culv. with 88.42' Flume Outlet-Skew 23° 30'	92.0	5,295	177										Bell Joints
5468	9	Jefferson	1689+16	3'x3'x314.0' R.C. Box Culv. with 97.42' Flume Outlet-Skew 31° 30'	151.3	12,032	295										
5568	9	Jefferson	1702+75	4'x5'x296.0' R.C. Box Culv. with 6'x6' Inlet Taper # 41.15' Flume Outlet	217.7	27,225	147	189									Bell Joints
5858	9	Jefferson	1716+90	8'x8'x228.0' R.C. Box Culv. with 12'x10' Inlet Taper # 48.06' Flume Outlet-Skew 30°	414.8	45,507	480										Bell Joints
5768	9	Jefferson	3735+50	2'x3'x171.0' R.C. Box Culv.	60.8	3,882	164										Bell Joints: Ramp "B"
5868	4/9	Jefferson	8+03	5'x5'x173.5' R.C. Box Culv. with 8'x6' Inlet Taper - Skew 15°	148.2	20,974	408									As Per Plan	Bell Joints: Co. Rd "I"
5968	4	Jefferson	1746+57	24"ϕx320.0' Conc. Rdwy. Pipe Culv. with 2'x2'x8.33' Flume Outlet Skew 25°	13.8	979	787		43	320			1 (Inlet)				
6068	4	Jefferson	1750+70	30"ϕx250.0' Conc. Rdwy. Pipe Culv. with 3'x2'x49.26' Flume Outlet	10.7	716	333		29		250'			1 (Inlet)			
6158	4	Jefferson	1754+05 179'Lt.	Outlet Headwall	9.1	1,061	9										
6258	4	Jefferson	1761+20	42"ϕx202.0' Conc. Rdwy. Pipe Culv. with 4'x3'x22.89' Flume Outlet	8.4	438	76	41				202			1 (Inlet)		
6358	4	Jefferson	1767+00	30"ϕx186.0' Conc. Rdwy. Pipe Culv. with 3'x2'x31.56' Flume Outlet	6.9	451	71				186'			1 (Inlet)			
				TOTALS	2,298.9	257,276	4432	230	72	320	436	202	1	2	1		

*See Supplemental Spec. 627

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN BL.M. DATE 6-17-69 TRACED BL.M. DATE 11-20-69
CHECKED DATE SCALE None

ESTIMATE SHEET

FILE NO. 22960

Johnson COUNTY PROJ. NO. I-IG-380-6(7)247--04-52 COUNTY NO. 52 J 10

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 April 28, 1970 — JAMES R. SASSAMAN — REG. NO. 2663

IN LETTING OF JUNE 23, 1970

DESIGN NO. 568 — COUNTY ROAD 56 — STA. 1461+30.58 ℄ I-380
JOHNSON COUNTY — OVER I-380 — STA. 16+00 COUNTY RD. 56
SECTIONS 3 & 34 — T - 80N & 81N — R - 7W — MADISON TOWNSHIP

DESIGN FOR 0°00'
254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	~~476.7~~ 483.3
Reinforcing Steel		Lbs.	103 966
Pretens. Prestr. Concrete Beam	D 40	No.	8
	D 85	No.	8
Creosoted Piling		L.F.	1 500
10 BP42 Steel Bearing Piling	Furnish	L.F.	665
	Drive	L.F.	665
Class 20 Excavation		Cu. Yds.	341
4"ø Tile Subdrain		L.F.	126
Granular Backfill		Cu. Yds.	100
Aluminum Handrail or Steel Handrail		L.F.	536.7
		L.F.	536.7
Concrete Slope Protection		Sq. Yds.	376
Creosoted Test Piling		L. S.	Lump Sum

(1) The pier, abutment footing, and temporary pavement block concrete, 161.3 cu. yds., is to be Class "C" concrete. The remainder, ~~313.0~~ 322.0 cu. yds. is to be Class "D" Concrete.

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.

Revised 7-27-70: Design No. 568 Concrete Quantities Corrected.

IN LETTING OF JUNE 23, 1970

DES. NO. 668 — I-380 OVER EXISTING U. S. RTE. 218 — STA. 1554+46.27
JOHNSON CO. — & C. R. AND I. C. RAILROAD CROSSING NO. 4285 — ℄ I-380
SECTION 27 — T - 81N — R - 7W — MADISON TWP.

DESIGN FOR 54°29' SKEW
DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	1 891.2
Reinforcing Steel		Lbs.	471 414
Structural Steel		Lbs.	835 214
10BP42 Steel Bearing Piling	Furnish	L.F.	5 409
	Drive	L.F.	5 409
Excavation Class 20		Cu. Yds.	1 364
Concrete Slope Protection		Sq. Yds.	2 234
Granular Backfill		Cu. Yds.	663
4"ø Tile Subdrain		L.F.	358
Aluminum Handrail or Steel Handrail		L.F.	1 691.9
		L.F.	1 691.9

(1) 524.6 cu. yds. Class "C" Concrete, 1366.6 cu. yds. Class "D" Concrete.

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

DATE April 28, 1970 — JAMES R. SASSAMAN — REG. NO. 2663

IN LETTING OF JUNE 23, 1970

DESIGN NO. 868 — CO. ROAD 51(I) — STA. 1737+17.89 ℄ I-380 (O. R.)
JOHNSON COUNTY — OVER I-380 — STA. 20+31.56 Co. Rd. 51(I) (O. R.)
SECTIONS 4 & 9 — T - 81N R - 7W

DESIGN FOR 9°55' SKEW
259'-6 x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	559.1
Reinforcing Steel		Lbs.	109 125
Pretensioned Prestressed Concrete Beams	D 40	No.	5
	D 45	No.	5
	D 85	No.	10
Aluminum Handrail		Lin. Ft.	546.7
Steel Handrail		Lin. Ft.	546.7
Creosoted Piling		Lin. Ft.	1 860
Creosoted Test Piling		L. S.	LumpSum
10 BP42 Steel Bearing Piling	Furnish	Lin. Ft.	672
	Drive	Lin. Ft.	672
4"ø Tile Subdrain		Lin. Ft.	100
Class 20 Excavation		Cu. Yds.	408
Granular Backfill		Cu. Yds.	108
Concrete Slope Protection		Sq. Yds.	432
2"ø Rigid Steel Conduit		L.F.	583

(1) The pier, abutment footing and paving block concrete, 194.1 cu. yds. is to be Class "C" Concrete.
The remainder, 365.0 cu. yds. is to be Class "D" Concrete.

IN LETTING OF JUNE 23, 1970

DESIGN NO. 768 — I-380 OVER IOWA RIVER — STA. 1581+22.50
JOHNSON COUNTY — ℄ I-380
SECTION 22 — T - 81N — R - 7W — JEFFERSON TOWNSHIP

DESIGN FOR 0°00' SKEW
DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	2 377.2
Reinforcing Steel		Lbs.	549 084
(2) Structural Steel		Lbs.	1 201 952
10BP42 Steel Bearing Piling	Furnish	L.F.	3 426
	Drive	L.F.	3 426
Excavation, Class 20		Cu. Yds.	68
Excavation, Class 21		Cu. Yds.	1 082
Excavation, Class 22		Cu. Yds.	52
Granular Backfill		Cu. Yds.	588
4"ø Tile Subdrain		L.F.	304
Aluminum Handrail or Steel Handrail		L.F.	1 857.6
		L.F.	1 857.6

(1) Structural Concrete consists of 557.4 cu. yds. of Class "C" and 629.3 cu. yds. of Class "D" for Southbound Lane, and 561.8 cu. yds. of Class "C" and 628.7 cu. yds. Class "D" for Northbound Lane.

(2) 145,687 lbs. of A-36 and Iron Casting, 243,482 lbs. of A-572 Grade 50 and 211,807 lbs. of A-588, typ. each lane.

ESTIMATE SHEET

FILE No. 22960 — JOHNSON COUNTY — PROJECT No. I-IG-380-6(7)247--04--52

STATE	FED. ROAD DIST NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	- 5		28	110

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.

April 28, 1970 — James R. Sassaman — REG. NO. 2663

DATE — JAMES R. SASSAMAN

IN LETTING OF JUNE 23, 1970

DESIGN NO. 568 — COUNTY ROAD S6 — STA. 1461+30.50 ℄ I-380
JOHNSON COUNTY — OVER I-380 — STA. 16+00 COUNTY RD. S6
SECTIONS 3 & 34 — T - 80N & 81N — R - 7W — MADISON TOWNSHIP

DESIGN FOR 0°00'
254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	476.4
Reinforcing Steel		Lbs.	103 966
Preten. Prestr. Concrete Beam	D 60	No.	8
	D 65	No.	8
Creosoted Piling		L.F.	1 500
10 BP42 Steel	Furnish	L.F.	665
Bearing Piling	Drive	L.F.	665
Class 20 Excavation		Cu. Yds.	341
4"ø Tile Subdrain		L.F.	126
Granular Backfill		Cu. Yds.	100
Aluminum Handrail or Steel Handrail		L.F.	536.7
		L.F.	536.7
Concrete Slope Protection		Sq. Yds.	376
Creosoted Test Piling		L.S.	Lump Sum

(1) The pier, abutment footing, and temporary pavement block concrete, 161.3 cu. yds., is to be Class "C" concrete. The remainder, 315.0 cu. yds., is to be Class "D" Concrete.

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 - 1958.

IN LETTING OF JUNE 23, 1970

DES. NO. 668 — I-380 OVER EXISTING U. S. RTE. 218 & C. R. AND I. C. RAILROAD CROSSING NO. 4285 — STA. 1554+46.27 ℄ I-380
JOHNSON CO. — SECTION 27 — T - 81N — R - 7W — MADISON TWP.

DESIGN FOR 54°29' SKEW
DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	1 091.2
Reinforcing Steel		Lbs.	471 414
Structural Steel		Lbs.	835 214
10BP42 Steel	Furnish	L.F.	5 409
Bearing Piling	Drive	L.F.	5 409
Excavation Class 20		Cu. Yds.	1 364
Concrete Slope Protection		Sq. Yds.	2 234
Granular Backfill		Cu. Yds.	663
4"ø Tile Subdrain		L.F.	398
Aluminum Handrail or Steel Handrail		L.F.	1 691.9
		L.F.	1 691.9

(1) 524.6 cu. yds. Class "C" Concrete, 1366.6 cu. yds. Class "D" Concrete.

IN LETTING OF JUNE 23, 1970

DESIGN NO. 768 — I-380 OVER IOWA RIVER — STA. 1581+22.50 ℄ I-380
JOHNSON COUNTY — SECTION 22 — T - 81N — R - 7W — JEFFERSON TOWNSHIP

DESIGN FOR 0°00' SKEW
DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	1 257.2
Reinforcing Steel		Lbs.	549 084
(2) Structural Steel		Lbs.	1 201 952
10BP42 Steel	Furnish	L.F.	3 426
Bearing Piling	Drive	L.F.	3 426
Excavation, Class 20		Cu. Yds.	68
Excavation, Class 21		Cu. Yds.	1 082
Excavation, Class 22		Cu. Yds.	52
Granular Backfill		Cu. Yds.	588
4"ø Tile Subdrain		L.F.	304
Aluminum Handrail or Steel Handrail		L.F.	1 857.6
		L.F.	1 857.6

(1) Structural Concrete consists of 557.4 cu. yds. of Class "C" and 629.3 cu. yds. of Class "D" for Southbound Lane, and 561.8 cu. yds. of Class "C" and 628.7 cu. yds. Class "D" for Northbound Lane.

(2) 145,687 lbs. of A-36 and Iron Casting, 243,482 lbs. of A-572 Grade 50 and 211,807 lbs. of A-588, typ. each lane.

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.

April 28, 1970 — James R. Sassaman — REG. NO. 2663

DATE — JAMES R. SASSAMAN

IN LETTING OF JUNE 23, 1970

DESIGN NO. 868 — CO. ROAD S1(I) — STA. 1737+17.89 ℄ I-380(O. R.)
JOHNSON COUNTY — OVER I-380 — STA. 20+31.56 Co. Rd. S1(I) (O. R.)
SECTIONS 4 & 9 — T - 81N R - 7W

DESIGN FOR 9°55' SKEW
259'-6 x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

ESTIMATE OF QUANTITIES

ITEM		UNIT	TOTAL
(1) Structural Concrete		Cu. Yds.	559.1
Reinforcing Steel		Lbs.	109 125
Pretensioned Concrete Beams	D 40	No.	5
Prestressed	D 45	No.	5
	D 85	No.	10
Aluminum Handrail or Steel Handrail		Lin. Ft.	546.7
		Lin. Ft.	546.7
Creosoted Piling		Lin. Ft.	1 860
Creosoted Test Piling		L.S.	LumpSum
10 BP42 Steel	Furnish	Lin. Ft.	672
Bearing Piling	Drive	Lin. Ft.	672
4"ø Tile Subdrain		Lin. Ft.	100
Class 20 Excavation		Cu. Yds.	408
Granular Backfill		Cu. Yds.	108
Concrete Slope Protection		Sq. Yds.	432
2"ø Rigid Steel Conduit		L.F.	583

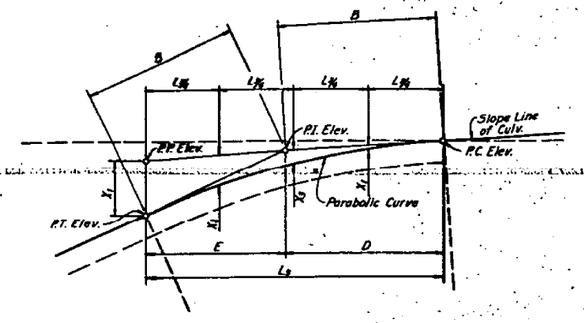
(1) The pier, abutment footing and paving block concrete, 194.1 cu. yds. is to be Class "C" Concrete.
The remainder, 365.0 cu. yds. is to be Class "D" Concrete.

JR

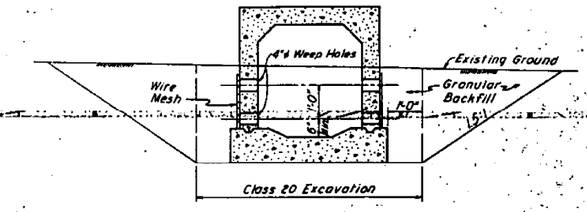
ESTIMATE SHEET

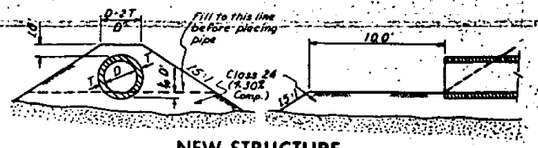
STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	8		20	110

FEDERAL DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			3	

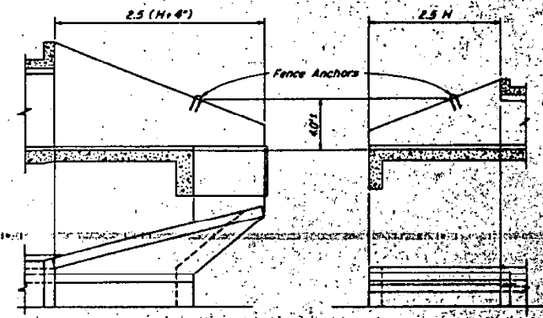


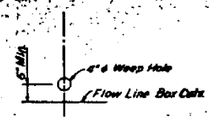
FLUME CURVE DATA DETAIL



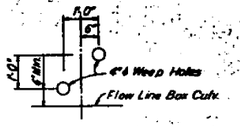


NEW STRUCTURE

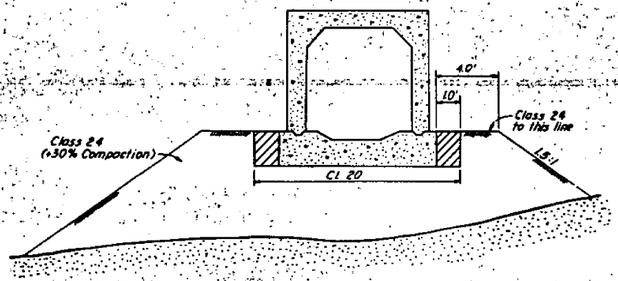


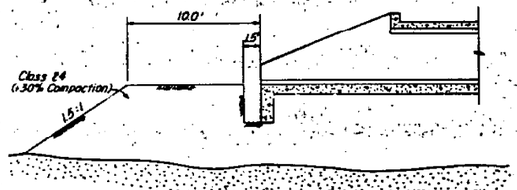


PLACEMENT OF WEEP HOLE SINGLE



PLACEMENT OF WEEP HOLES DUAL





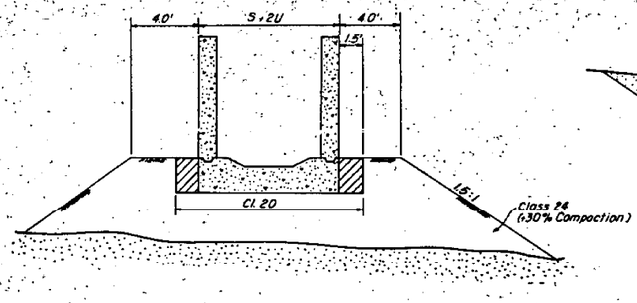
BOX CULVERT



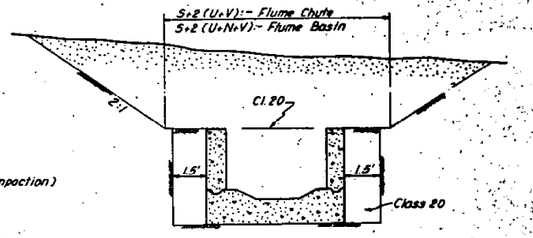
Notes:
1. Culvert Contractor to furnish and place Galvanized Fence Anchors. Weight included in Headwall Reinforcing Steel Quantity.
2. One Fence Anchor to be placed in each wing as shown.
3. Weight of 4 Anchors = 10#.

FENCE ANCHOR DETAILS

Notes:
1. Wire Mesh to be No.4 Mesh, 23 Gauge, Galvanized Hardware Screen Centered on Weep Holes.
   For Single Weep Hole use 12"x12" Wire Mesh.
   For Dual Weep Holes use 24"x24" Wire Mesh.
2. Screen to be firmly attached to concrete on outside face of sidewalls. Cost of labor and material for wire mesh to be included in bid price for concrete.
3. Granular Backfill and all excavation necessary for Weep Holes, other than Class 20 shown, To be done by others.



FLUME



Notes:
1. All fills to conform to Articles 2402.09 & 2402.10 of the 1964 Specifications.
2. Suitable material from Cl. 20 Excavation to be used as Cl. 24. All excavated waste material to be disposed of at the direction of the Engineer in charge.

EXCAVATION, BACKFILL & WEEP HOLE DETAILS

MISCELLANEOUS DETAILS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

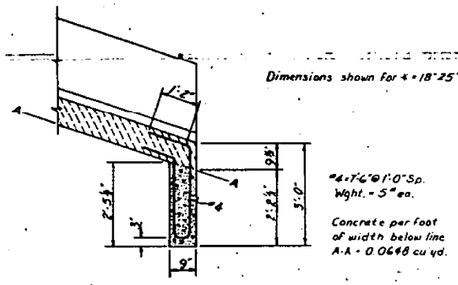
MADE B.L.M.	DATE 10-9-69	TRACED Y.J.	DATE 11-25-69		
CHECKED D.R.M.	DATE 10-10-69	SCALE None			

FILE NO. 22960

Johnson COUNTY

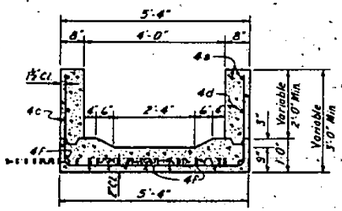
PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 3 OF 48

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			4	



STUB FLUME CURTAIN DETAIL

Size Culvert	Size Flume	Conc.	Number of Bars	Reinf. Steel
24"ø	2'-2'	0.19 c.y.	3	15#
30"ø	3'-2'	0.26 c.y.	4	20#
42"ø	4'-3'	0.34 c.y.	6	30#



SECTION THRU 4'x3' FLUME CHUTE

DESIGN NO. 6268 STA. 1761+20
SCALE: ½"=1'-0"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DESIGN	B.L.M.	DATE	10-9-69	TRACED	B.L.M.	DATE	11-20-69
CHECKED	C.W.S.	DATE	10-10-69	SCALE	As Shown		

MISCELLANEOUS DETAILS

FILE NO. 22960

Johnson COUNTY

PROJECT NO. I-IG-380-6(7)247--04-52

SHEET NO. 4 of 118

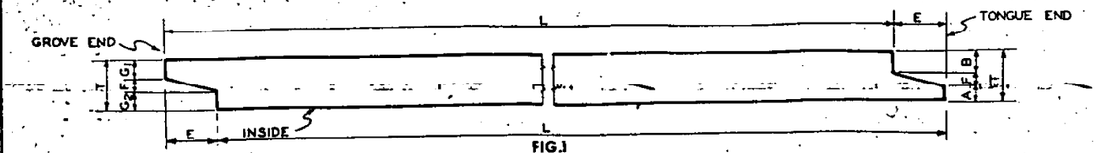


FIG.1

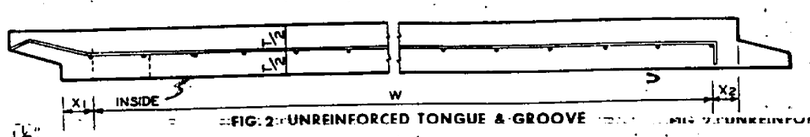


FIG. 2 UNREINFORCED TONGUE & GROOVE

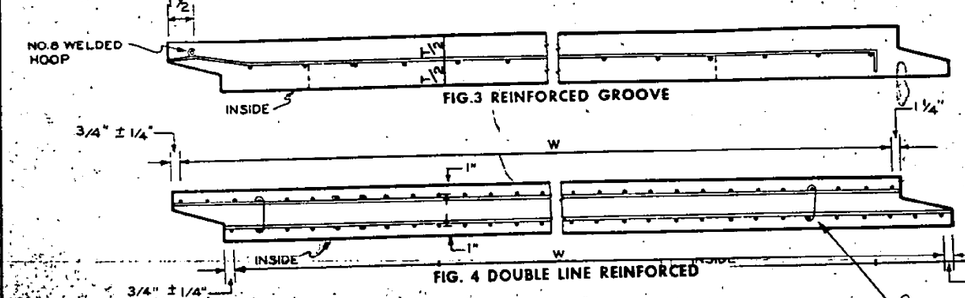
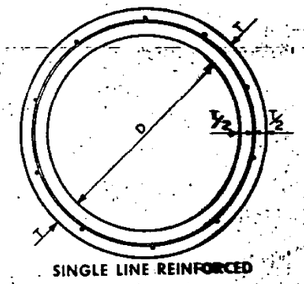


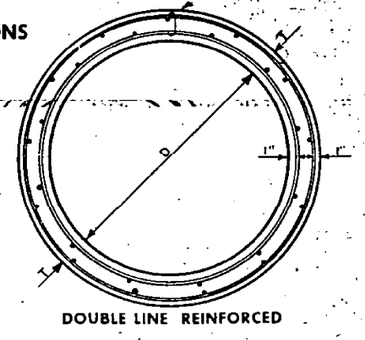
FIG.3 REINFORCED GROOVE

FIG. 4 DOUBLE LINE REINFORCED

LONGITUDINAL SECTIONS



SINGLE LINE REINFORCED



DOUBLE LINE REINFORCED

CROSS SECTIONS

GENERAL DIMENSIONS

D	AREA OF OPENING	2000 AND 3000 D APPR. WT/FT.	2000 AND 3000 D *T	2000 AND 3000 D *A	2000 AND 3000 D *B	2000 AND 3000 D *G1	2000 AND 3000 D *G2	2000 AND 3000 D Cx	2000 AND 3000 D +E	2000 AND 3000 D F	1500 D APPROX WT/FT.	1500 D T	1500 D A	1500 D B	1500 D G1	1500 D G2	1500 D C	1500 D E	1500 D F	D
12	.78	92	2	5/8	3/4	5/8	3/4	1/8	2	5/8										12
15	1.23	127	2 1/4	3/4	1	7/8	7/8	1/8	2	1/2	111	2	3/4	7/8	3/4	7/8	1/8	2	3/8	15
18	1.77	168	2 1/2	7/8	1 1/8	1	1	1/8	2 1/2	1/2	149	2 1/4	7/8	1	7/8	1	1/8	2	3/8	18
21	2.41	210	2 3/4	1	1 3/8	1 1/4	1 1/8	1/8	2 1/2	3/8	192	2 1/2	1	1 1/8	1	1 1/8	1/8	2 1/2	3/8	21
24	3.15	265	3	15/16	1 5/16	1 1/8	1 1/8	3/16	3	3/4	229	2 5/8	1	1 3/16	1	1 3/16	3/16	2 1/2	7/16	24
27	3.98	327	3 1/4	1 1/16	1 7/16	1 1/4	1 1/4	3/16	3 1/4	3/4	280	2 3/4	1 1/16	1 1/4	1	1 1/4	3/16	2 3/4	1/2	27
30	4.91	384	3 1/2	1 3/16	1 9/16	1 3/8	1 3/8	3/16	3 1/2	3/4	324	3	1 1/8	1 5/16	1 1/8	1 5/16	3/16	3	9/16	30
33	5.94	452	3 3/4	1 1/4	1 11/16	1 1/2	1 1/2	1/4	3 3/4	3/4	385	3 1/4	1 1/8	1 3/8	1 1/8	1 3/8	1/4	3 1/4	5/8	33
36	7.07	524	4	1 3/8	1 7/8	1 5/8	1 5/8	1/4	4	3/4	435	3 3/8	1 3/16	1 7/16	1 3/16	1 7/16	1/4	3 1/2	3/4	36
42	9.62	686	4 1/2	1 5/8	2 3/8	1 7/8	1 7/8	1/4	4	3/4	562	3 3/4	1 3/8	1 5/8	1 3/8	1 5/8	1/4	4	3/4	42
48	12.57	867	5	1 5/8	2 5/8	2 3/8	1 7/8	1/4	4	3/4	727	4 1/4	1 5/8	1 7/8	1 5/8	1 7/8	1/4	4	3/4	48
54	15.90	1071	5 1/2	1 13/16	2 15/16	2 11/16	2 1/16	1/4	4 1/2	3/4	888	4 5/8	1 13/16	2 1/16	1 13/16	2 1/16	1/4	4 1/2	3/4	54
60	19.64	1296	6	2	3 1/4	3	2 1/4	1/4	5	3/4	1064	5	2	2 1/4	2	2 1/4	1/4	5	3/4	60
66	23.76	1542	6 1/2	2 1/4	3 1/2	3 1/4	2 1/2	1/4	5	3/4	1272	5 1/2	2 1/4	2 1/2	2 1/4	2 1/2	1/4	5	3/4	66
72	28.27	1810	7	2 1/2	3 3/4	3 1/2	2 3/4	1/4	5	3/4	1532	6	2 1/2	2 3/4	2 1/2	2 3/4	1/4	5	3/4	72
84	38.48	2409	8	2 7/8	4 3/8	4	3 1/4	3/8	5	3/4	2085	7	3	3 1/4	3	3 1/4	1/4	5 1/2	3/4	84

* Permissible variations from dimensions given for old molds (sizes 48" to 84") shall be ± 1/4".

\+ Permissible variations from dimensions given for old molds (sizes 48" to 84") shall be ± 1/2".

x C is clearance between edges of adjacent tongue and groove (G2 - A).

REINFORCEMENT-WELDED STEEL WIRE FABRIC

D	MINIMUM CIRCUMFERENTIAL SQ. INCH PER FT. OF PIPE 1500 D SINGLE	1500 D DOUBLE	2000 D SINGLE	2000 D DOUBLE	3000 D SINGLE	3000 D DOUBLE	MINIMUM CAGE WIDTH (W) +L - (INCHES) SHOWN BELOW 1500 D	2000 D	3000 D	SUGGESTED OVERHANG GROOVE END STD. WALL 2000 D 3000 D	GROOVE END THIN WALL 1500 D	TONGUE END STD. WALL 2000 D 3000 D	TONGUE END STD. WALL 1500 D	TONGUE END THIN WALL 1500 D
12	.062	--	.062	--	.062	--	5	5	5					
15	.062	--	.062	--	.087	--	5	5	5	3 1/2	3 1/2	1 3/8	1 3/8	1 1/4
18	.062	--	.098	--	.116	--	5	5	5	3 3/4	3 1/2	1 1/2	1 1/2	1 3/8
21	.074	--	.116	--	.148	--	5	5	5	3 3/4	3 3/4	1 5/8	1 5/8	1 1/2
24	.087	--	.148	--	.187	--	6	6	6	3 3/4	4 1/4	1 3/4	1 3/4	1 5/8
27	.098	--	.159	--	.216	--	--	6	6	5 3/4	4 7/8	2	1 7/8	1 5/8
30	.116	--	.187	--	--	.174	6	6	3	5 7/8	5 5/8	2	2	1 3/4
33	.148	--	.239	--	--	.174	--	6	3	5 7/8	5 3/4	1 3/4	2 1/8	1 7/8
36	.148	--	--	.174	--	.187	6	3	3	3/4	5 7/8	1 3/8	2 1/4	2
42	--	.174	--	.187	--	.239	3	3	2	3/4	3/4	1 1/2	1 3/8	1 3/8
48	--	.187	--	.239	--	.280	3	2	2	3/4	3/4	1 1/2	1 1/2	1 1/2
54	--	.239	--	.280	--	.325	2	2	2	3/4	3/4	1 1/2	1 3/8	1 3/8
60	--	.280	--	.325	--	.377	2	2	2	3/4	3/4	1 1/2	1 1/2	1 1/2
66	--	.325	--	.377	--	.443	--	2	2	3/4	3/4	1 1/2	1 1/2	1 1/2
72	--	.325	--	.443	--	.443	2	2	2	3/4	3/4	1 5/8	1 1/2	1 1/2
84	--	.377	--	.516	--	.516	2	2	2	3/4	3/4	1 5/8	1 1/2	1 1/2

GENERAL NOTES:

The wall thickness and reinforcement shown are minimum requirements. If the wall thickness is increased, only dimensions indicated by T, B, & G1 shall be changed.
1500 D pipe, in 12", 15", 18" and 21" diameters, when made with wall thickness for 2000 D pipe need not be reinforced if strength requirement can be met. All other 2000 D pipe shall have the minimum reinforcement specified.
No circumferential reinforcement shall be required in tongues or grooves of 12", 15", 18" and 21" pipe of all classes or 24" pipe of 1500 D class. See Fig. 2.
All other pipe with single line reinforcement shall have the grooves reinforced by one welded hoop of not less than 8 gage wire. This hoop shall be secured to the cage by welding or by twisting the transverse wire around the hoop a minimum of 300° as in Fig. 3.
Pipe having two lines of reinforcement shall have circumferential wires extending into tongues and grooves as shown in Fig. 4.
The difference between X1 and X2 shall not be more than 1/2".
The spacing of transverse wires shall not exceed 8" and the size shall be that specified by the U. S. Department of Commerce Simplified Practice Recommendation No. 234-48 effective August 1, 1948. The spacing of circumferential rings shall not exceed 4".
The overhangs specified are approximate and may need to be changed due to the tightness of bends, wire diameter, cage width, and the exact location of cage within the tolerances permitted. The bend as shown in Fig. 2 requires approximately 1/8" extra overhang for all sizes except the 30" pipe which will require about 1/4".
When the groove end hoop is welded to the transverse wires, approximately 1 1/8" less overhang will be required. Tongue end overhang is required only when it is used for placement of reinforcement.
All material and construction to conform to the Iowa State Highway Commission Specifications and welded wire fabric shall conform to A. S. T. M. A-185.

NOTE:

When so specified for individual pipe culvert installations identified within the project plans, the joints between sections of concrete pipe shall be sealed. This seal shall be accomplished by application of a product commercially produced for such purpose. The seal shall be of a type as to remain in a flexible state after application, shall be of a type and manufacture approved by the engineer and shall be installed according to methods recommended by the manufacturer and approved by the engineer.

DATE	REVISION
7-11-67	Change Note for Joint Sealer

IOWA HIGHWAY COMMISSION

STANDARD ROAD PLAN RF-1

RECOMMENDED: ROAD ENGINEER — DATE 7/12/67

DESIGN ENGINEER — DATE

APPROVED: DEPUTY CHIEF ENGINEER — DATE 7/13/67

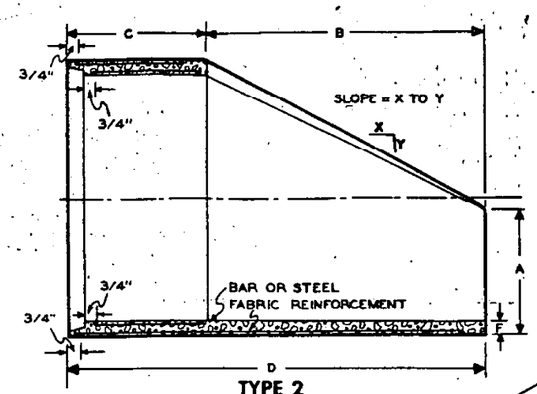
CONCRETE CULVERT PIPE

FILE NO. 22960 JOHNSON COUNTY

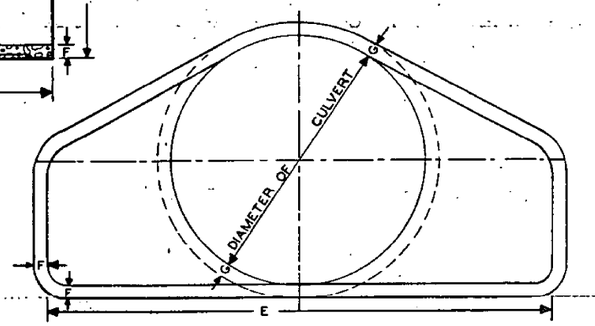
PROJECT NUMBER I-IG-380-6(113)54--04-52

FISCAL YEAR SHEET NO. 5 TOTAL SHEETS 110

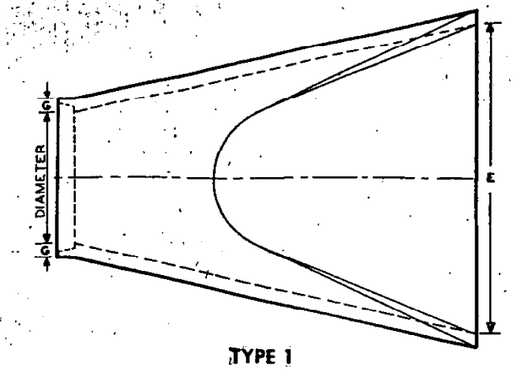
Details are indicated hereon for groove end aprons.
Tongue end aprons are also required.
Details for tongue and groove shall be as indicated on Standard RF-1.



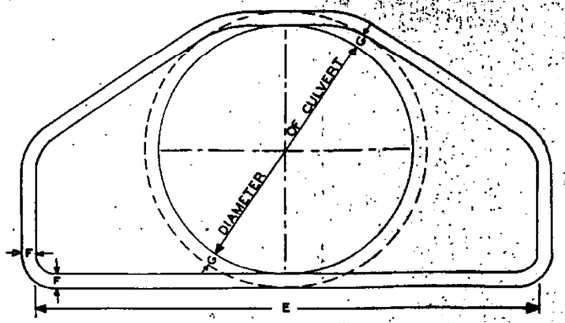
TYPE 2



TYPE 2

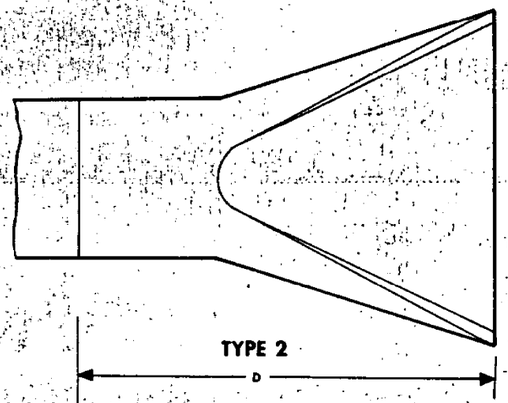


TYPE 1

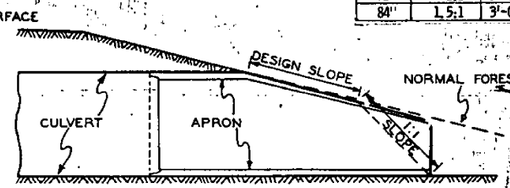


TYPE 1

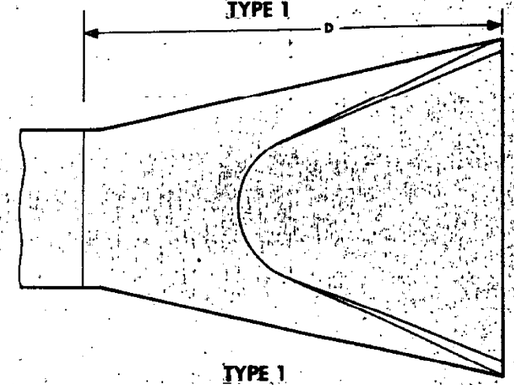
APRON DIMENSIONS								
				MIN.				
DIAM.	SLOPE	A	B	C	D	E	F	G
12"	3:1	6"	2'-0"	4'-7/8"	6'-7/8"	2'-0"	2"	2"
15"	3:1	8 1/4"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	2 1/4"
18"	3:1	11 1/2"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"	2 1/2"
24"	3:1	12 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	3"
30"	3:1	1'-3 1/2"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	3 1/2"
36"	3:1	1'-7"	5'-3"	2'-9"	8'-0"	6'-0"	4"	4"
42"	3:1	2'-1 1/2"	5'-3"	2'-9"	8'-0"	6'-6"	4 1/2"	4 1/2"
48"	3:1	2'-5"	6'-0"	2'-0"	8'-0"	7'-0"	5"	5"
54"	2.5:1	2'-8 1/2"	5'-0"	3'-0"	8'-0"	7'-6"	5 1/2"	5 1/2"
60"	2:1	2'-11"	5'-0"	3'-0"	8'-0"	8'-0"	5 1/2"	6"
72"	2:1	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"	7"
84"	1.5:1	3'-0"	6'-9"	2'-6 1/2"	9'-3 1/2"	10'-0"	6 1/2"	8"



TYPE 2

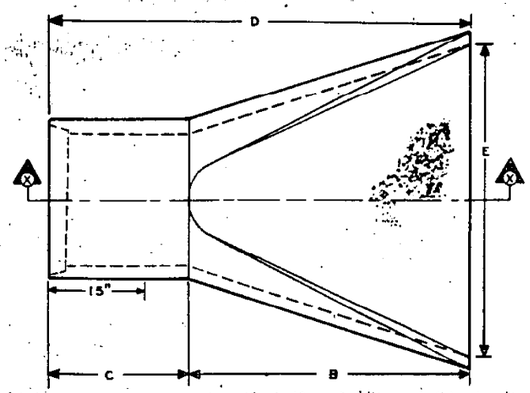


TYPE 1 or 2

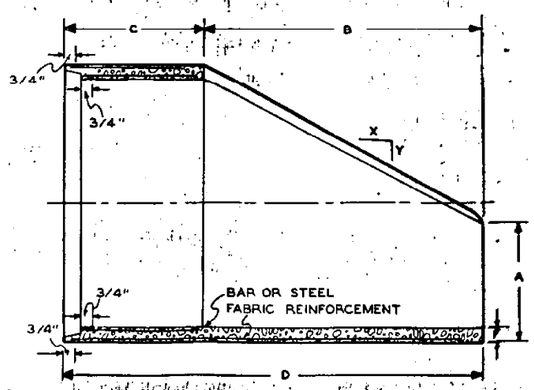


TYPE 1

APRON DIMENSIONS								
				MIN.				
DIAM.	SLOPE	A	B	C	D	E	F	G
12"	3:1	6"	2'-0"	4'-7/8"	6'-7/8"	2'-0"	2"	2"
15"	3:1	8 1/4"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	2 1/4"
18"	3:1	11 1/2"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"	2 1/2"
24"	3:1	12 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	3"
30"	3:1	1'-3 1/2"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	3 1/2"
36"	3:1	1'-7"	5'-3"	2'-9"	8'-0"	6'-0"	4"	4"
42"	3:1	2'-1 1/2"	5'-3"	2'-9"	8'-0"	6'-6"	4 1/2"	4 1/2"
48"	3:1	2'-5"	6'-0"	2'-0"	8'-0"	7'-0"	5"	5"
54"	2.4:1	2'-6"	5'-5"	2'-7"	8'-0"	7'-6"	5 1/2"	5 1/2"
60"	2:1	2'-6"	5'-0"	3'-0"	8'-0"	8'-0"	5 1/2"	6"
72"	1.86:1	2'-6"	6'-6"	1'-9"	8'-3"	9'-0"	6"	7"
84"	1.5:1	2'-6"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"	6 1/2"	8"



TYPE 2



NOTES: (ALL TYPES)

Design of barrel portion of concrete aprons shall conform to standard reinforced sectional concrete culvert pipe. See Design Standard RP1. If double line reinforcing is required in the barrel, only single line reinforcing is required in the flare of the apron.

Tie bolts and bolt holes if necessary, are required only when specified in the detail plans.

Alternate designs for concrete pipe aprons may be submitted for approval.

Any difference between length of concrete aprons installed, and the dimensions indicated hereon shall be appropriately adjusted for the length of concrete pipe furnished.

IOWA HIGHWAY COMMISSION

STANDARD ROAD PLAN RF-3

DATE: 11-16-60

LAST REVISION: Latest Issue

RECOMMENED — DESIGN ENGINEER — DATE

ROAD ENGINEER — DATE

APPROVED — [illegible] — DATE

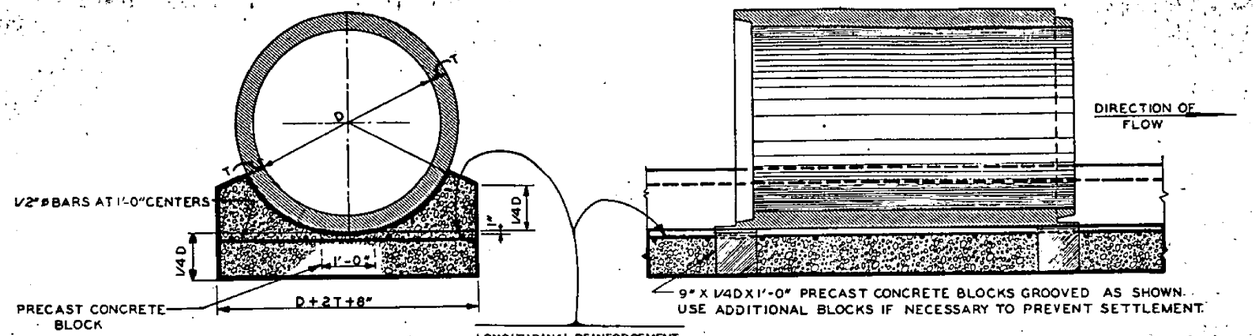
CONCRETE PIPE APRONS

FILE NO. 22960

JOHNSON COUNTY

I-IG-380-6(7)241--04-52

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	6		6	110



CROSS SECTION OF PIPE CRADLE

TYPE "B"

LONGITUDINAL REINFORCEMENT:
For 21" pipe use 4 1/2" bars.
For 24" and 30" pipe use 4 5/8" bars.
For 36" pipe use 6 5/8" bars.
For 42" pipe use 10 5/8" bars
For 48" pipe use 12 5/8" bars.
For 54" pipe use 13 5/8" bars.
For 60" pipe use 14 5/8" bars.
For 66" pipe use 15 5/8" bars.
For 72" pipe use 16 5/8" bars.

LONGITUDINAL SECTION OF PIPE CRADLE

TYPE "B"

DEPTH TABLE				
CLASS PIPE	NORMAL		IMPERFECT TRENCH	
	MAX. COVER	MIN. COVER	MAX. COVER	MIN. COVER
1500 D	15'	6'	20'	6"
2000 D	20'	1'	28'	1'
3000 D	30'	2'	42'	2'

GENERAL NOTES:

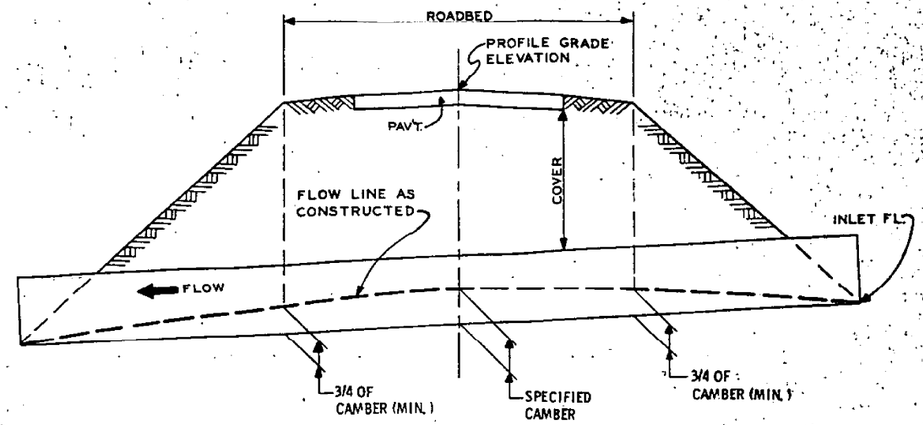
Pipe of the 1500 D class may be used for entrance culverts only. Pipe of the 2000 D and 3000 D class may be used for roadway culverts, or for farm entrance culverts, where the fill conditions require pipe of this class. See Standard RF-1 for details of pipe.

In general, pipe laying is to proceed upstream, starting at outlet end with tongue (top) end always downstream.

Where available, boulders or old concrete may be used to pave outlet and lay up rubble headwalls.

All material and construction to conform to the current Standard Specifications of the Iowa State Highway Commission.

Maximum depth of cover may be made 75% greater than given in maximum depth table by using pipe cradles. For type B the pipe is to be supported in correct alignment on precast concrete blocks before concrete is placed. The concrete is to be carefully worked under the pipe to secure complete embedment and prevent formation of air pockets.



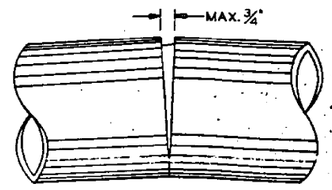
NOTE:
Where pipe culverts are installed on yielding soil conditions, the pipe culvert should be placed on a cambered flow line as shown. Camber amounts of not more than the "normal" values indicated may be used to fit various soil conditions, unless a particular camber is specified as part of detail project plans, in which case that value shall be used. Camber may be accomplished by placing abutting pipe sections tight at the bottom of the joint with not more than 3/4" opening at the top of any joint.

TYPICAL CAMBERED FLOW LINE

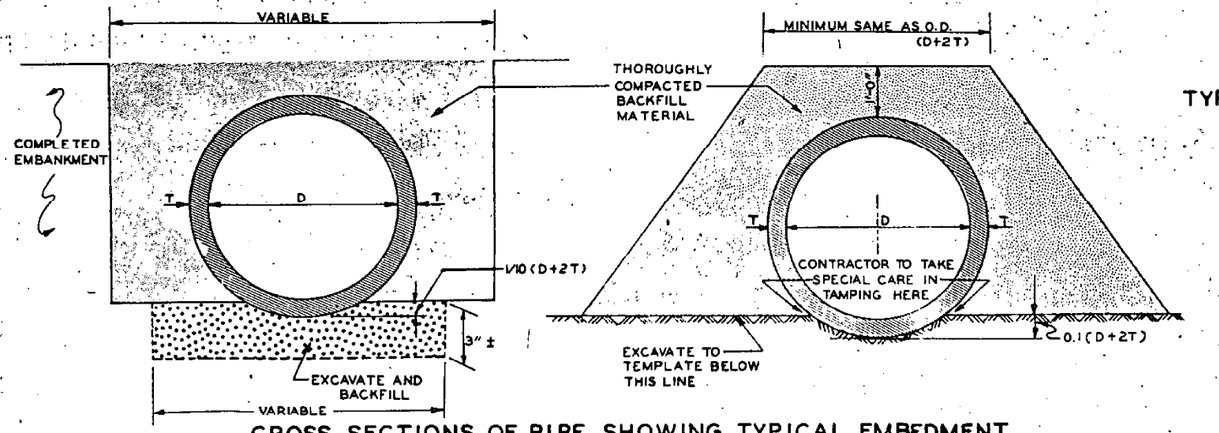
COVER	NORMAL CAMBER
5'	.08'
10'	.17'
15'	.25'
20'	.33'
25'	.42'
30'	.50'
35'	.58'

PIPE SIZE D	MAX. CAMBER FT.
24"	1.1'
30"	1.2'
36"	1.3'
42"	1.4'
48"	1.5'

Camber is to be attained by adjustment of joint openings as indicated throughout length of pipe.



TYPICAL JOINTS IN CAMBERED PIPE



CROSS SECTIONS OF PIPE SHOWING TYPICAL EMBEDMENT

TYPE 1 TYPE 2

IOWA HIGHWAY COMMISSION
STANDARD ROAD PLAN RF-4

DATE	3-4-68	
LAST REVISION	Modify Camber Diagram Remove Type D	
RECOMMENDED	Jane C. Dallenbach, ENGINEER	3/8/68 DATE
	E. McLaughlin, DESIGN ENGINEER	3/4/68 DATE
APPROVED	T. H. Boyd, CHIEF ENGINEER	3/8/68 DATE

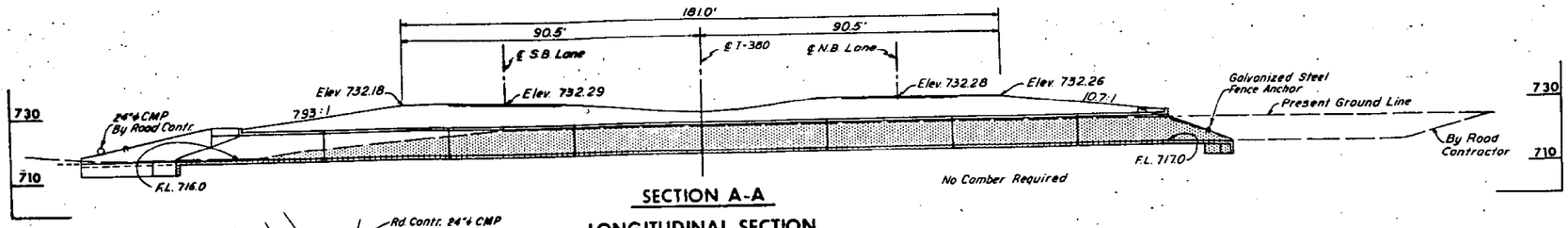
CONCRETE PIPE CULVERT DETAILS

FILE NO. 22960 JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOT. SHEETS
I-IC-380-6(7)247--04-52	Iowa	5		7	22

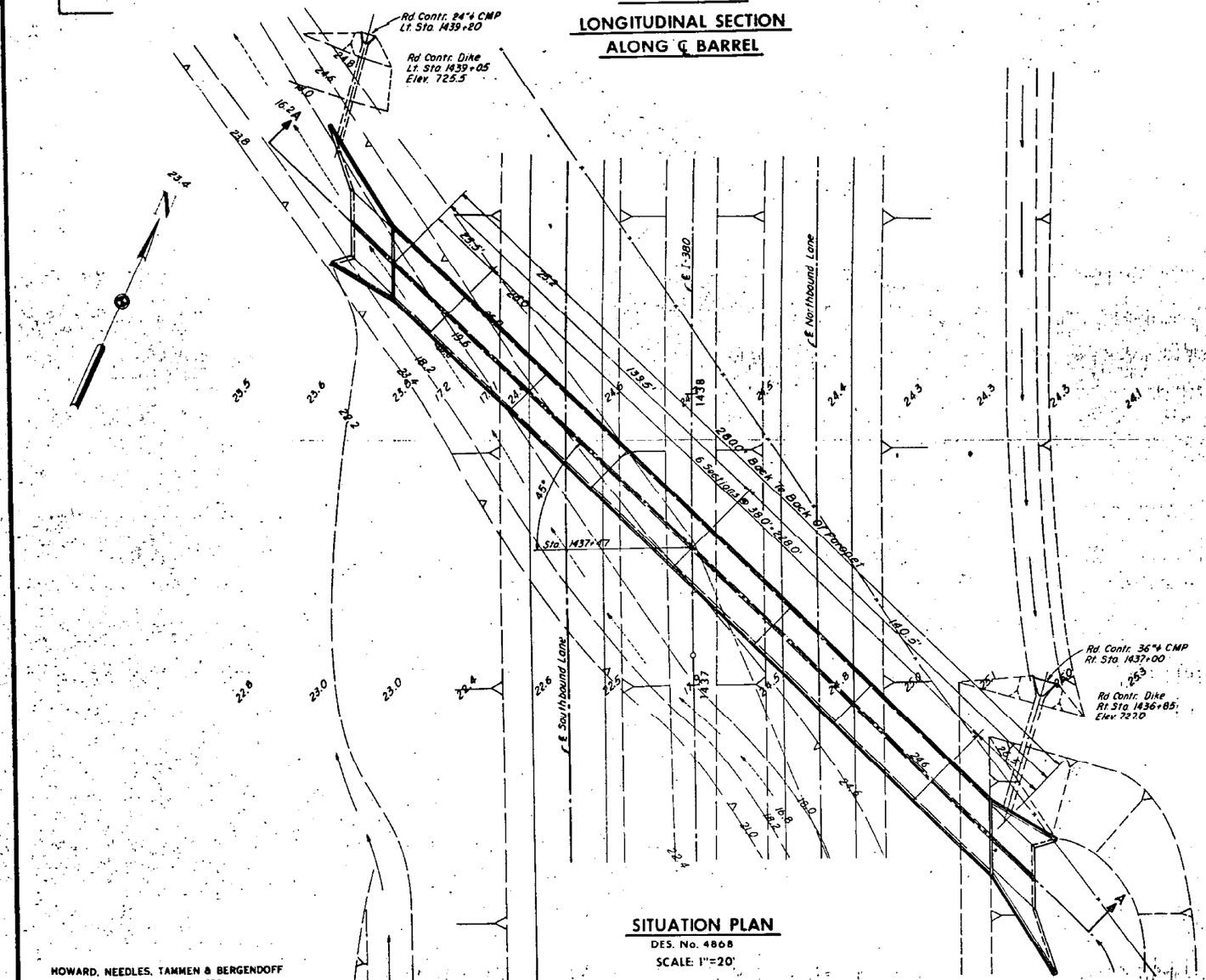
Bench Mark No. 48: 330' Rt. Sta. 1432+50 Set R.R. Spk. in Fence Post Elev. 727.46

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			8	



SECTION A-A

LONGITUDINAL SECTION ALONG ℄ BARREL



SITUATION PLAN

DES. No. 4868

SCALE: 1"=20'

Notes

1. For Excavation Details see sheet No. 3 of 11b
2. For Fence Anchor Details & Notes, see sheet No. 3 of 11b. An additional 10 lbs. has been included in Headwall Steel Quantities
3. 5 lbs. has been included in Headwall Steel Quantities for 2 Anchors for 24"ϕ CMP. See sheet No. 10of 11b
4. Structural Analysis based on 9 ft. Fill for an HS20-44 Loading
5. For General Notes and Details not shown, see Iowa State Highway Commission Standard C.B.H-00

ESTIMATE OF REINFORCING STEEL - BARREL

MARK	LOCATION	SHAPE	No.	LENGTH	LINEAR FEET 4	5	6
4a	Exterior Walls; F.F.V.	—	374	9'-8"	3,615.4		
4a1	Center Wall; Both Faces Vert	—	374	9'-8"	3,615.4		
5a2	Ext Walls; B.F.V.	—	562	7'-2"		4027.7	
4b	Ext. Walls; Both F.H., Inlet	—	12	17'-8"	212.0		
4b	Ext. Walls; Both F.H., Inlet	—	12	34'-10"	418.0		
4b10	Ext Walls; Both F.H., Outlet	—	12	33'-10"	406.0		
4b10	Ext Walls; Both F.H., Outlet	—	12	16'-8"	200.0		
4b11	Ext Walls; Both F.H., Middle Sect.	—	144	37'-8"	5,424.0		
4b12	Ctr. Wall; Both F.H., Inlet	—	13	26'-2"	340.2		
4b13	Ctr. Wall; Both F.H., Outlet	—	13	25'-2"	327.2		
4b14	Ctr Wall, Both F.H., Middle Sections	—	78	37'-8"	2,938.0		
5e	Slab, Longit. Bott., Inlet	—	12	Shown		327.5	
5e1	Slab, Longit. Bott., Outlet	—	12	Shown		319.5	
5e2	Slab, Longit. Bott., Middle Sections	—	72	37'-8"		2,712.0	
4e3	Slab, Longit. Top, Inlet	—	10	Shown	272.9		
4e4	Slab, Longit. Top, Outlet	—	10	Shown	262.9		
4e5	Slab, Longit Top, Middle Sections	—	60	37'-8"	2,260.0		
6f	Floor; Longit Top, Inlet	—	14	Shown			368.7
6f2	Floor, Longit. Top, Outlet	—	14	Shown			354.7
6f3	Floor, Longit. Top, Middle Sections	—	84	37'-8"			3,164.0
4f4	Floor, Longit. Bott, Inlet	—	10	Shown	272.4		
4f5	Floor; Longit. Bott., Outlet	—	10	Shown	262.9		
4f6	Floor; Longit Bott., Middle Sections	—	60	37'-8"	2,260.0		
5k	Slab; Transv Bottom	—	481	17'-11"		8,617.9	
5k	Slab, Transv Bottom, Inlet & Outlet	—	*50	3'-6" to 17'-6"		325.0	
6k1	Slab; Transv Top	—	420	5'-11"			2,485.0
6k2	Slab; Transv Top	—	141	17'-11"			2,526.2
6k3	Slab & Top Corners	⌐	518	4'-11"			2,546.8
5m	Floor, Transv. Top	—	561	18'-5"		10,339.8	
6m6	Floor & Bott. Corners	⌐	558	4'-7"			2,557.5
6m7	Floor; Transv Bott	—	141	18'-5"			2,596.8
6m8	Floor; Transv. Bott.	—	420	5'-7"			2,345.0
5r	Slab Dowel	—	119	2'-6"		297.5	
				LENGTH	23,086.9	27,152.9	14,944.7
				WEIGHT	15,427.0	28,322.6	28,454.9

* 2 Bars each length

TOTAL WEIGHT 72,176.9 lbs.

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K.W.Y	BELOW K.W.Y	TOTAL	
Headwalls (2)	37.1cy	62.9cy	100.0cy	11,245 lbs
Barrel	534.0cy	199.6cy	533.6cy	72,177 lbs
TOTAL	371.1cy	262.5cy	633.6cy	83,422 lbs

Sheet 1 of 4

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. C.B.H-00 & C.B.H-45 Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 633.6 C.Y.

REINFORCING STEEL 83,422 LBS.

PIPE CULV., ——— LIN. FT.

PIPE APRONS, ——— ONLY

EXCAVATION C.Y.

CL. 20 1095 CL. 24 ——— CL. 10 CHANNEL ———

Twin 8'-8" x 280'-0" RC

SIZE AND TYPE Box Culv Sk 45°

DRAINAGE AREA 1.252 Ac. R FILL 9'

SECTION 3 TWP. 80 N RANGE 7 W

CIVIL TOWNSHIP Madison

COUNTY Johnson

STATION 1437+47

PROJECT NO. I-16-380-6(7)247--04-52

DESIGN 4868 DATE Dec. 68

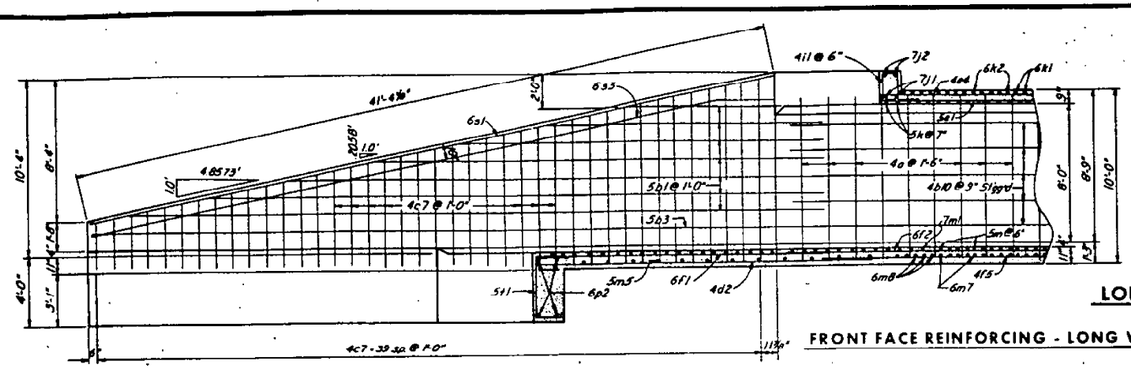
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

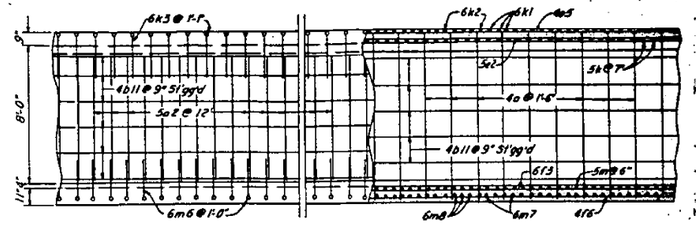
DRAWN BLH DATE 12-13-68 TRACED ——— DATE 11-20-69
CHECKED CWS DATE 9-11-69 SCALE As Shown

DESIGN NO. 4868 FILE NO. 22960 Johnson COUNTY PROJECT NO I-16-380-6(7)247--04-52 SHEET NO 8

Bench Mark No 48: 330'Rt Sta 1432+50 Set R.R. Spk in Fence Post Elev 727.46

FEDERAL DIST. NO	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			3	



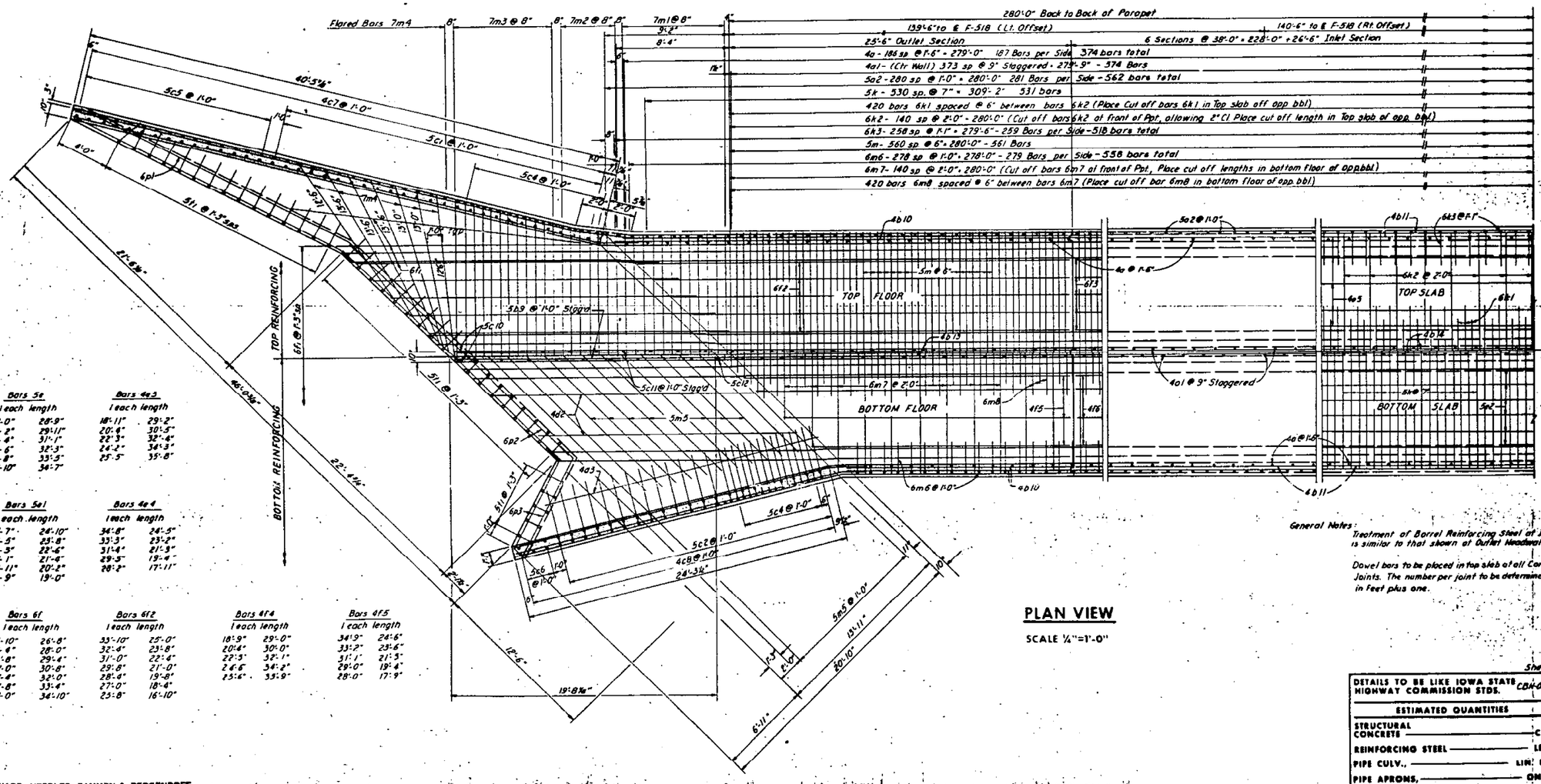


LONGITUDINAL SECTION

FRONT FACE REINFORCING - LONG WING

BACK FACE REINFORCING

FRONT FACE REINFORCING



280'-0" Back to Back of Parapet

139'-6" to ℄ F-518 (Lt. Offset) — 140'-6" to ℄ F-518 (Rt. Offset)

2'-6" Outlet Section — 6 Sections @ 38'-0" = 228'-0" — 26'-6" Inlet Section

4a - 186 sp @ 1'-6" = 279'-0" 187 Bars per Side 374 bars total

4a1 - (Ctr Wall) 373 sp @ 9" Staggered = 279'-9" = 374 Bars

5a2 - 280 sp @ 1'-0" = 280'-0" 281 Bars per Side = 562 bars total

5k - 530 sp. @ 7" = 309'-2" 531 bars

420 bars 6k1 spaced @ 6" between bars 6k2 (Place Cut off bars 6k1 in Top slab off opp bbl)

6k2 - 140 sp @ 2'-0" = 280'-0" (Cut off bars 6k2 at front of Pot, allowing 2" Cl Place cut off length in Top slab of opp. bbl)

6k3 - 258 sp @ 1'-1" = 279'-6" = 259 Bars per Side = 518 bars total

5m - 560 sp @ 6" = 280'-0" = 561 Bars

6m6 - 278 sp @ 1'-0" = 278'-0" = 279 Bars per Side = 558 bars total

6m7 - 140 sp @ 2'-0" = 280'-0" (Cut off bars 6m7 at front of Pot, Place cut off lengths in bottom floor of opp bbl)

420 bars 6m8 spaced @ 6" between bars 6m7 (Place cut off bar 6m8 in bottom floor of opp. bbl)

Bars 5s

I each	length
20'-0"	28'-9"
21'-2"	29'-11"
22'-4"	31'-1"
23'-6"	32'-3"
24'-8"	33'-5"
25'-10"	34'-7"

Bars 4a3

I each	length
18'-11"	29'-2"
20'-6"	30'-5"
22'-3"	32'-4"
24'-2"	34'-3"
25'-5"	35'-8"

Bars 5a1

I each	length
33'-7"	24'-10"
32'-5"	23'-8"
31'-3"	22'-6"
30'-1"	21'-4"
28'-11"	20'-2"
27'-9"	19'-0"

Bars 4a4

I each	length
34'-8"	24'-5"
33'-3"	23'-2"
31'-4"	21'-3"
29'-3"	19'-4"
28'-2"	17'-11"

Bars 6f

I each	length
17'-10"	26'-8"
19'-6"	28'-0"
20'-8"	29'-4"
22'-0"	30'-8"
23'-4"	32'-0"
24'-8"	33'-4"
26'-0"	34'-10"

Bars 6f2

I each	length
33'-10"	25'-0"
32'-4"	23'-8"
31'-0"	22'-4"
29'-8"	21'-0"
28'-4"	19'-8"
27'-0"	18'-4"
25'-8"	16'-10"

Bars 6f4

I each	length
18'-9"	29'-0"
20'-4"	30'-0"
22'-3"	32'-1"
24'-6"	34'-2"
25'-6"	33'-9"

Bars 4f5

I each	length
34'-9"	24'-6"
33'-2"	23'-6"
31'-1"	21'-5"
29'-0"	19'-4"
28'-0"	17'-9"

PLAN VIEW

SCALE ¼"=1'-0"

General Notes:

Treatment of Barrel Reinforcing Steel at Inlet Headwall is similar to that shown at Outlet Headwall

Dowel bars to be placed in top slab at all Construction Joints. The number per joint to be determined by span in feet plus one.

Sheet 2 of 4

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-004 CBH-45 Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE ——— C.Y.

REINFORCING STEEL ——— LBS.

PIPE CULV., ——— LIN. FT.

PIPE APRONS, ——— ONLY

EXCAVATION C.Y.

CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

Twin 8'-8" x 280.0' R.C.

SIZE AND TYPE Box Culv Sk. 45°

DRAINAGE AREA 1,252 Ac. R FILL 9"

SECTION 3 TWP. 80 N RANGE 7 W

CIVIL TOWNSHIP Madison

COUNTY Johnson

STATION 1437+47

PROJECT NO. I-IC-380-6(79)207--04-52

DESIGN 4868 DATE Dec. 68

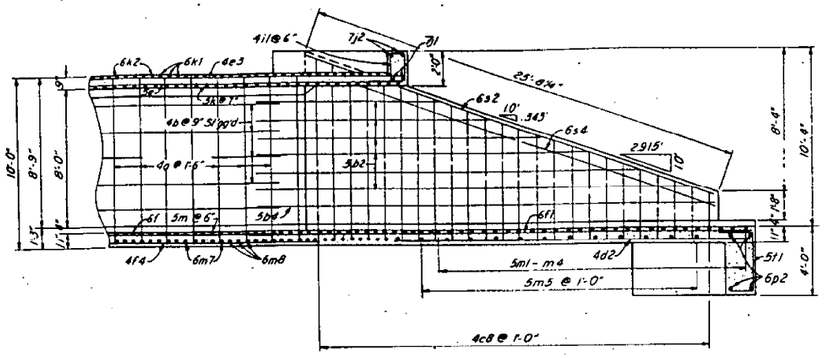
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE BLM DATE 12-23-68 TRACED YJ DATE 11-20-69
CHECKED CWS DATE 9-11-69 SCALE As Shown

DESIGN NO. 4868 FILE NO. 22960 Johnson COUNTY PROJECT NO. I-IC-380-6(79)207--04-52 SHEET NO. 3 of

Bench Mark No 48: 330' Rt. Sta. 1432+50 Set R.R. Spk. in Fence Post Elev 727.46

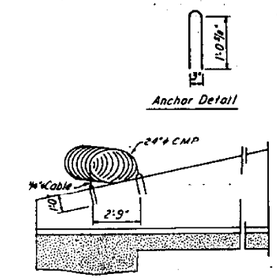
FEDERAL DIST NO	STATE	FED AID PROJ NO	FINAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			10	



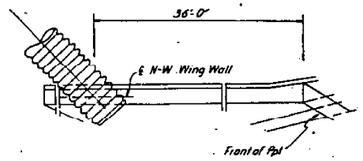
LONGITUDINAL SECTION - SHORT WING

FRONT FACE REINFORCING

SCALE ¼"=1'-0"

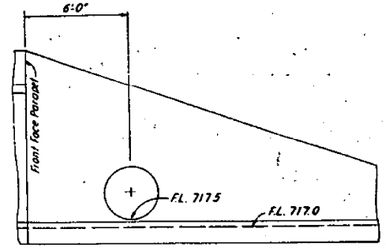


Rd Contr. to furnish and place 24"ø C.M.P., ¼"ø Cable and clamps.



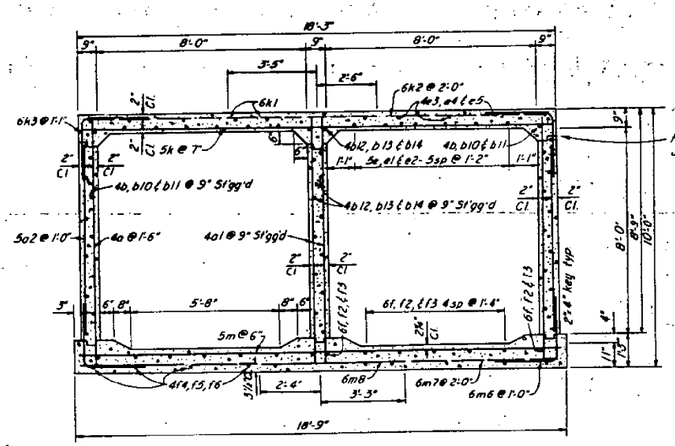
Culvert Contractor to furnish and place 2-⅝"ø x 2'-6" Galvanized Steel Anchors as Shown Wght of two anchors = 5 lbs, included in Headwall Reinf. Steel Estimate.

GALVANIZED STEEL ANCHORS FOR 24" CORRUGATED METAL PIPE OVER N-W WING



SECTION ALONG BACK FACE N-E WING

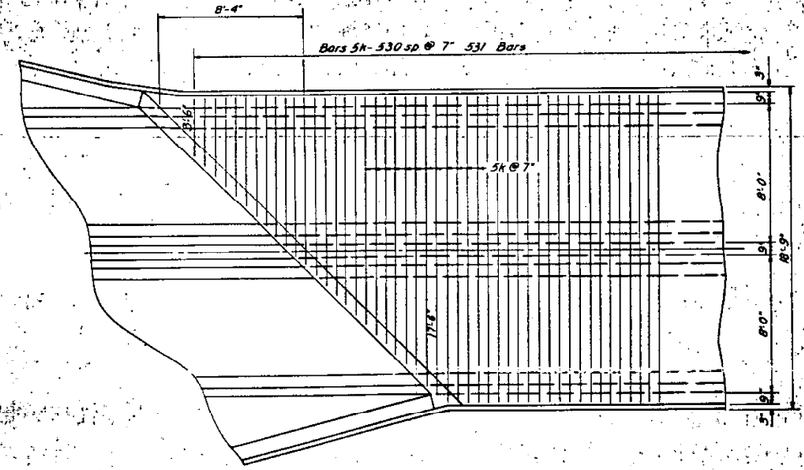
Culvert Contractor to provide 1-36"ø opening at location shown above



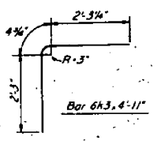
SECTION THRU BARREL

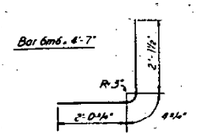
SCALE: 3/8"=1'-0"

CONC. PER FOOT BARREL	
Above keyway	
Slab:	0.568 c.y.
Walls:	0.625 c.y.
Below keyway	
Floor:	0.713 c.y.
Total	1.906 c.y.



BARS 5K - BOTTOM SLAB





HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE	S.L.M.	DATE	12-23-68	TRACED	Y.J.
CHECKED	C.W.S.	DATE	9-11-69	SCALE	As Shown

Sheet 3 of 4

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00 & CBH-45 Except as Noted

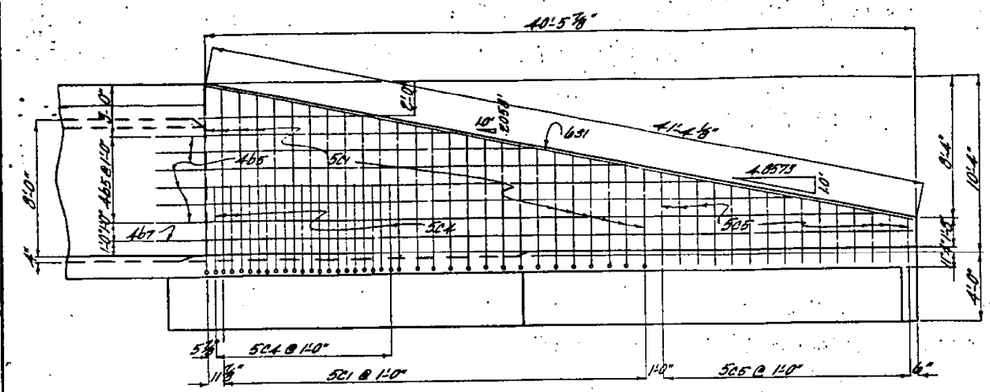
ESTIMATED QUANTITIES	
STRUCTURAL CONCRETE	C.Y.
REINFORCING STEEL	LBS.
PIPE CULV.,	LIN. FT.
PIPE APRONS,	ONLY
EXCAVATION C.Y.	
CL. 20 CL. 24 CL. 10 CHANNEL	

SIZE AND TYPE	Twin 8'-8" x 280.0' R.C. Box Culv. Sk 68
DRAINAGE AREA	1.252 Ac. R FILL 9'
SECTION 3 TWP 80 N RANGE 7 W	
CIVIL TOWNSHIP	Madison
COUNTY	Johnson
STATION	1437+47
PROJECT NO.	I-IG-380-6(77)267--04-52
DESIGN	4868 DATE Dec 68

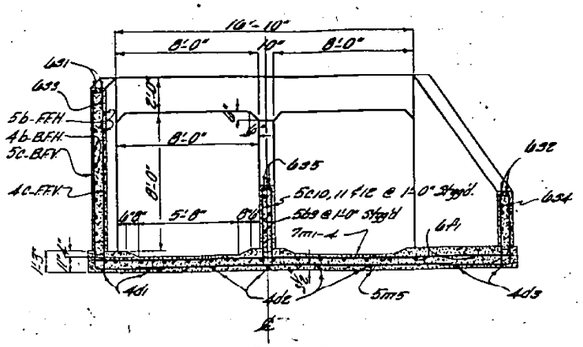
DESIGN NO. 4868 FILE NO 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(77)267--04-52 SHEET NO. 10 of

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	NO.	SHEETS
5	IOWA			11	

BENCH MARK NO: 68 330'Rt. Sta. 1432+50 Set R.R. Spk. in: Fence Post. Elev. 727.46

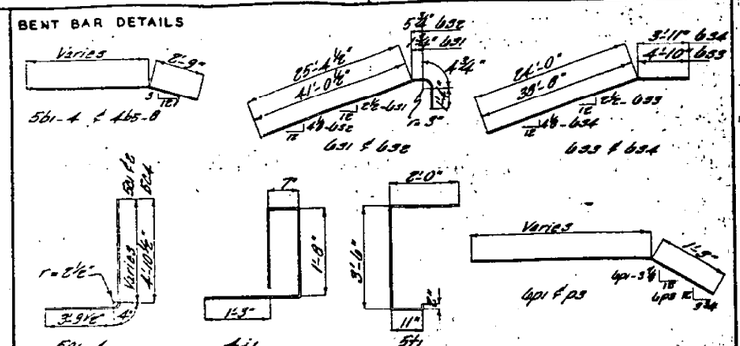


LONG WING
BACK FACE REINFORCING
SCALE 1/4" = 1'-0"



SECTION THRU HEADWALL
SCALE 1/4" = 1'-0"

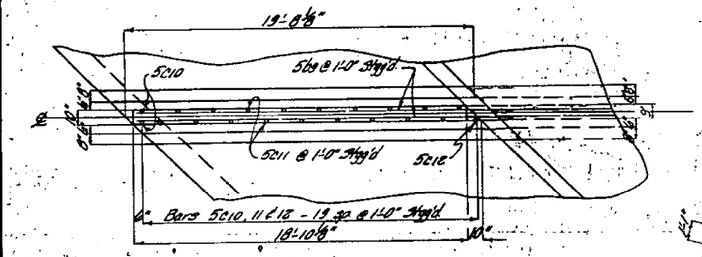
BENT BAR DETAILS



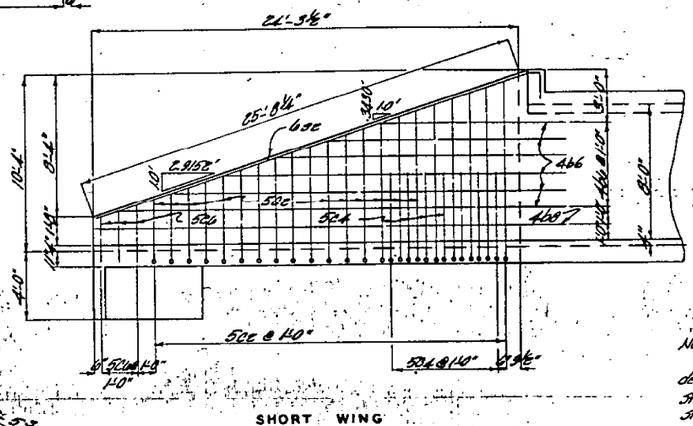
Note: All dimensions are out to out. Radii are to ℄ of bar. Not to scale.

REINFORCING STEEL FOR ONE HEADWALL

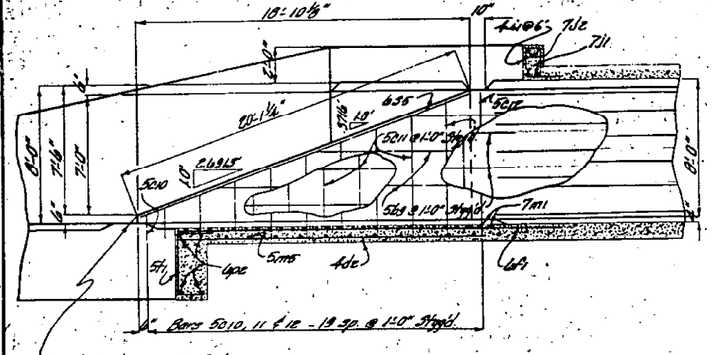
Bar	Location	Shape	No	Length	4	Linear Feet 5	6	7
*5b1	Wingwall: F.F.H. (Long)	——	7	16'-10.6		189.2		
5b2	" " (Short)	——	7	7'-8.2 5		114.9		
*5b3	Wingwall: F.F.H. (Long)	——	1	42'-10"		42.1		
5b4	" " (Short)	——	1	86'-7"		26.6		
*4b5	Wingwall: B.F.H. (Long)	——	6	16'-5.40'-9"	176.5			
4b6	" " (Short)	——	6	10'-10.25-5"	108.8			
*4b7	Wingwall B.F.H. (Long)	——	1	43'-1"	42.1			
4b8	" " (Short)	——	1	26'-10"	26.8			
5b9	Ctr. Wingwall: Both F.H.	——	7	14'-3.6"		81.1		
5c1	Wingwall: B.F.V. (Long)	L	26	9'-5".41.9"		918.9		
5c2	Wingwall: B.F.V. (Short)	L	21	7'-6".14.8		229.9		
5c4	" " (Both Wings)	L	18	9'-0"		166.0		
5c5	Wingwall: B.F.V. (Long)	——	15	8'-6.5.4"		208.8		
5c6	" " (Short)	——	3	6'-7.3.9"		60		
4c7	Wingwall: F.F.V. (Long)	——	41	8'-6".10.9"	571.6			
4c8	" " (Short)	——	24	5'-1".10.5"	156.0			
5c10	Ctr. Wing: Both Faces V.	——	8	1'-6"		9.0		
5c11	" " " " "	——	18	141'-8.9"		91.5		
5c12	Ctr. Wing: V.	——	1	8'-4"		8.9		
4d1	Apron: Bottom (Long)	——	8	24'-6"	49.0			
4d2	Apron: Bottom	——	5	19'-8"	98.3			
4d3	" (Short)	——	2	20'-6"	41.0			
6f1	Apron: Longit. Top	——	16	22'-0"		352.0		
4i1	Parapet: Vertical	L	37	5'-7"	206.6			
7j1	Parapet: Transv. Bott.	——	8	25'-0"				50.0
7j2	" " Top	——	8	25'-0"				50.0
7m1	Apron: Transv. Top	——	12	20'-4.20'-8"				65.6.0
7m2	" "	——	7	22'-6.26'-6"				163.4
7m3	Apron: Transv. Top	——	12	17'-10.12'-4"				181.0
7m4	" " (Flared)	——	7	Shown				91.5
5m5	Apron: Transv. Bottom	——	12	20'-5.32'-0"		313.5		
4p1	Curtain: Horiz. (Long)	——	4	23'-9"			24.7	
4p2	" "	——	4	23'-2"			92.7	
4p3	Curtain: Horiz. (Short)	——	4	8'-6"			34.0	
*4s1	Wing Slope: Bott. F. (Long)	——	8	42'-11"			343.0	
4s2	" " " (Short)	——	8	27'-7"			55.2	
*6g3	Wing Slope: F.F. (Long)	——	1	43'-6"			43.0	
6g4	" " (Short)	——	1	27'-11"			27.9	
6g5	Ctr. Wing Slope: Bott. F.	——	2	21'-4"			42.7	
5f1	Curtain: Vertical	——	98	6'-4"		620.7		
				Length	1174.7	1881.6	2933.0	790.9
				Weight	784.7	1962.5	1251.2	1616.4
				Total Weight			5615.0	Lbs.



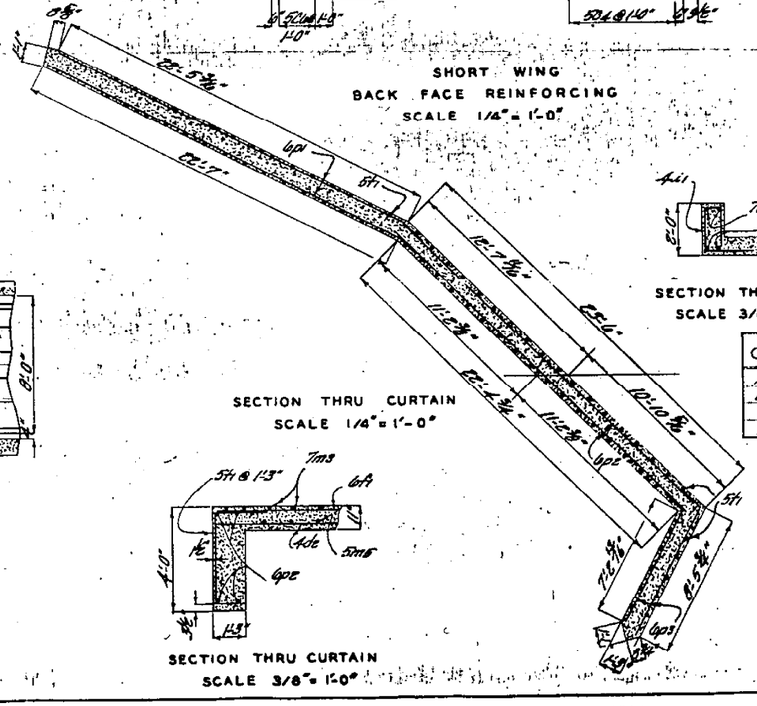
CENTER WING PLAN VIEW
SCALE 1/4" = 1'-0"



SHORT WING
BACK FACE REINFORCING
SCALE 1/4" = 1'-0"



CENTER WING REINFORCING
SCALE 1/4" = 1'-0"



SECTION THRU CURTAIN
SCALE 1/4" = 1'-0"

SECTION THRU PARAPET
SCALE 3/8" = 1'-0"

SECTION THRU CURTAIN
SCALE 3/8" = 1'-0"

CONCRETE FOR ONE HEADWALL		
Above Keyway	18.54	Cu Yds.
Below Keyway	31.44	" "
Total	49.99	Cu Yds.

Note: For general notes and details not shown see Iowa State Highway Commission Standard C701-45.

Note: * Length shown is the "in place" dimension. Bars over 40' long are to be spliced and linear feet shown includes allowance for 24 dia lap.

DETAIL FOR
TWIN 8'X 8' X 110' R.C.B. CULVERT – SKEWED 45°
45° HEADWALL DETAILS

STATION 1437 + 47 ~

PROJECT NO. I-IG-380-6(7)247--04-52

JOHNSON COUNTY

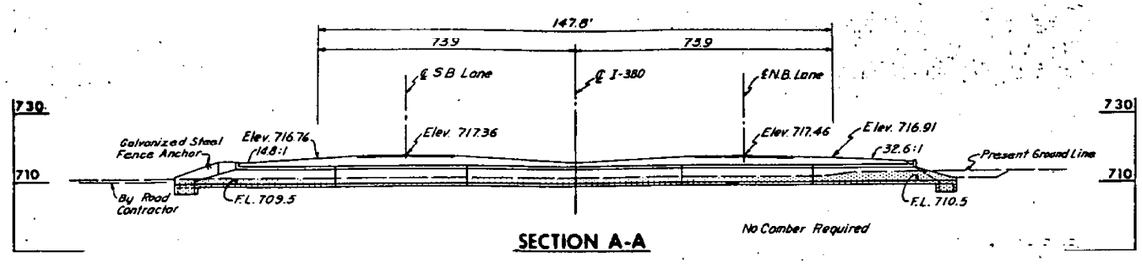
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1968 Sheet 4 of 4 SCALES AS NOTED

DESIGN NO: 4868 JOHNSON COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 FILE NO. 22960 SHEET NO. 11 OF 10.

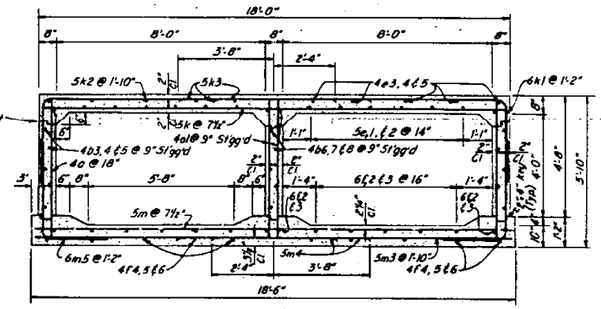
Bench Mark No 55; 50' Rt. Sta. 1496+50; Set H.R. Spk. in W. side 30" Cottonwood Tree; Elev. 713.92

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			12	



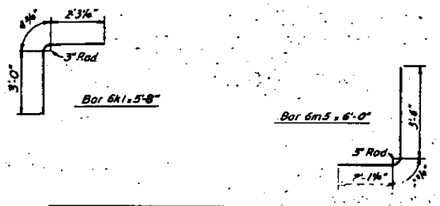
SECTION A-A

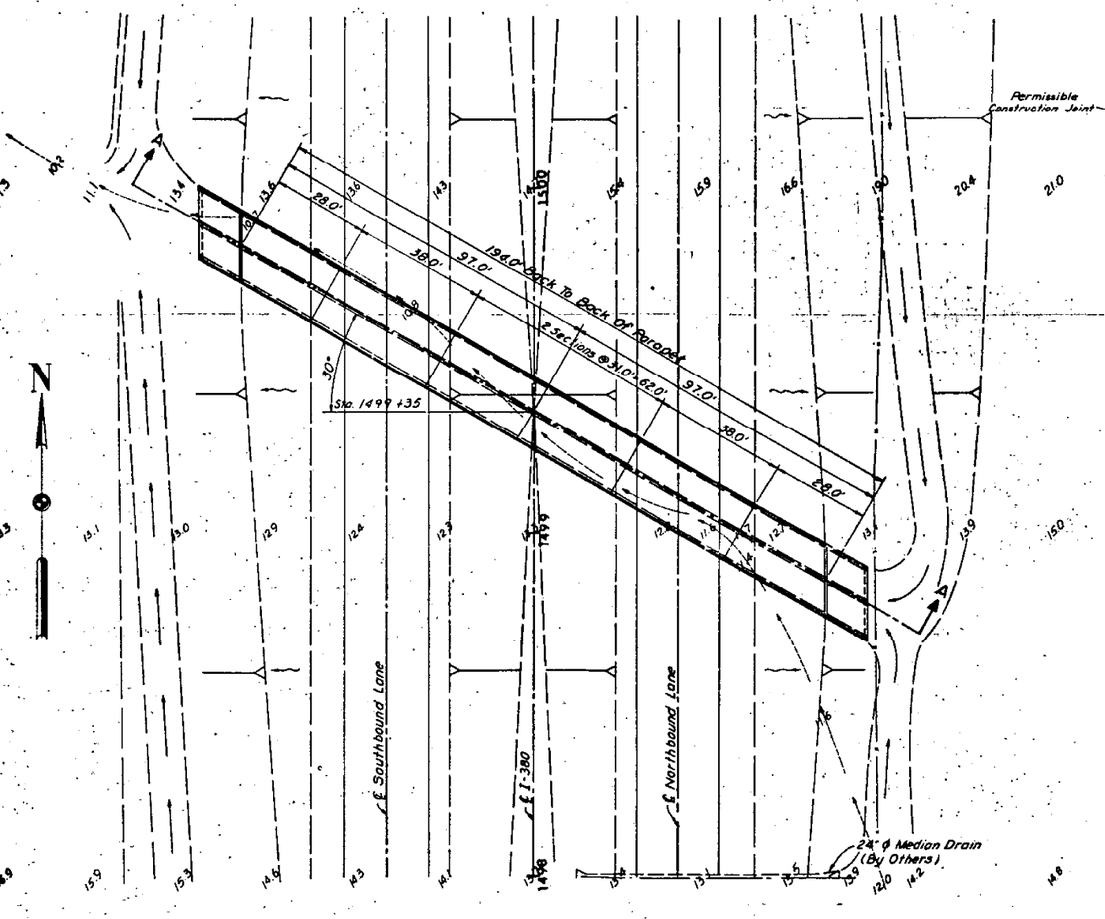
LONGITUDINAL SECTION ALONG ℄ BARREL



SECTION THRU BARREL

SCALE: 3/8"= 1'-0"





SITUATION PLAN

DES. No. 4968

SCALE: 1"=20'

ESTIMATE OF REINFORCING STEEL BARREL

BAR	LOCATION	SHAPE	No	LENGTH	LINEAR FEET 4	5	6
4a	Exterior Walls : F.F.V.		260	5'-6"	1430.0		
4a1	Ctr. Wall : Both Faces, Vert.		259	5'-6"	1424.5		
4b3	Ext. Walls : Inlet, F. ℄ B.F.H.	—	6	22'-10"	137.0		
4b3	Ext. Walls : Inlet, F. ℄ B.F.H.	—	6	32'-10"	197.0		
4b4	Ext. Walls : Outlet, F. ℄ B.F.H.	—	6	22'-10"	137.0		
4b4	Ext. Walls : Outlet, F. ℄ B.F.H.	—	6	32'-10"	197.0		
4b5	Ext. Walls : Interior, F. ℄ B.F.H.	—	24	30'-8"	736.0		
4b5	Ext. Walls : Interior, F. ℄ B.F.H.	—	24	37'-8"	904.0		
4b6	Ctr. Wall : Inlet, Both Faces, H.	—	7	27'-11"	195.4		
4b7	Ctr. Wall : Outlet, Both Faces, H	—	7	27'-11"	195.4		
4b8	Ctr. Wall : Interior, Both Faces H	—	14	30'-8"	429.3		
4b8	Ctr. Wall : Interior, Both Faces, H	—	14	37'-8"	527.3		
5e	Slab : Inlet, Longit., Bott.	—	12	Shown		341.0	
5e1	Slab : Outlet, Longit., Bott.	—	12	Shown		341.0	
5e2	Slab : Interior, Longit., Bott.	—	24	30'-8"		736.0	
5e2	Slab : Interior, Longit., Bott.	—	24	37'-8"		904.0	
4e3	Slab : Inlet, Longit., Top	—	10	Shown	283.1		
4e4	Slab : Outlet, Longit., Top	—	10	Shown	283.1		
4e5	Slab : Interior, Longit., Top	—	20	30'-8"	613.3		
4e5	Slab : Interior, Longit., Top	—	20	37'-8"	753.3		
6f	Floor : Inlet, Longit., Top	—	14	Shown			392.0
6f2	Floor : Outlet, Longit., Top	—	14	Shown			392.0
6f3	Floor : Interior, Longit., Top	—	28	30'-8"			858.7
6f3	Floor : Interior, Longit., Top	—	28	37'-8"			1054.7
4f4	Floor : Inlet, Longit., Bott.	—	10	Shown	278.1		
4f5	Floor : Outlet, Longit., Bott.	—	10	Shown	278.1		
4f6	Floor : Interior, Longit. Bott.	—	20	30'-8"	613.3		
4f6	Floor : Interior, Longit. Bott.	—	20	37'-8"	753.3		
5k	Slab, Transv. Bott.	—	311	17'-8"		5494.3	
6k1	Slab : Top Corners	⌐ ¬	334	5'-8"			1892.7
5k2	Slab : Transv., Top	—	106	17'-8"		1872.7	
5k3	Slab : Transv., Top	—	317	6'-0"		1902.0	
5m	Floor : Transv. Top	—	311	18'-2"		5649.8	
5m3	Floor : Transv., Bott.	—	106	18'-2"		1925.7	
5m4	Floor : Transv. Bott.	—	317	6'-0"		1902.0	
6m5	Floor : Bottom Corners	L ⌋	334	6'-0"			2004.0
5r	Slab Dowel	—	85	2'-6"		212.5	
				LENGTH	10365.5	21,281.0	6.594.1
				WEIGHT	6.924.2	22.196.1	9.904.3
				TOTAL WEIGHT		39.024.6 lbs.	

CONC PER FOOT BARREL

Above keyway	
Slab:	0.500 c.y.
Walls:	0.259 c.y.
Below keyway	
Floor:	0.643 c.y.
Total =	1.402 c.y.

PLACEMENT QUANTITIES

CONCRETE IN PARTS — LOCATION	ABOVE K'W.Y.	BELOW K'W.Y.	TOTAL	REIN-FORCING STEEL
Headwalls (2)	7.6 cy	22.0 cy	29.6 cy	3,717 lbs.
Barrel	147.2 cy	124.7 cy	271.9 cy	39,025 lbs.
TOTAL	154.8 cy	146.7 cy	301.5 cy	42,742 lbs.

Notes:

1. For Excavation Details see sheet No 3 of 110
2. For Fence Anchor Details and Notes see sheet No 3 of 110. An additional 10 lbs. has been included in Headwall Steel Quantities.
3. Structural Analysis based on 4 ft. Fill for an HS20-44 Loading.
4. For General Notes and Details not shown, see Iowa State Highway Commission Standard CHP 2.5-65
5. Dowel bars to be placed in top slab at all Construction Joints. The number per joint to be determined by span in feet plus one

Sheet 1 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. C8P (CHP 2545 Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 301.5 C.Y.

REINFORCING STEEL " 42,742 LBS.

PIPE CULV., LIN. FT.

PIPE APRONS, ONLY

EXCAVATION C.Y.

CL. 20 391 CL. 24 CL. 10 CHANNEL

Twin 8'-4"x 194.0' R.C.

SIZE AND TYPE Box Culvert Sk 30°

DRAINAGE AREA 551 Ac. R. FILL 4'

SECTION 34 TWP 81 N RANGE 7 W

CIVIL TOWNSHIP Madison

COUNTY Johnson

STATION 1499+35

PROJECT NO. I-IG-380-6(7)247--04-52

DESIGN 4968 DATE Jan. 69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

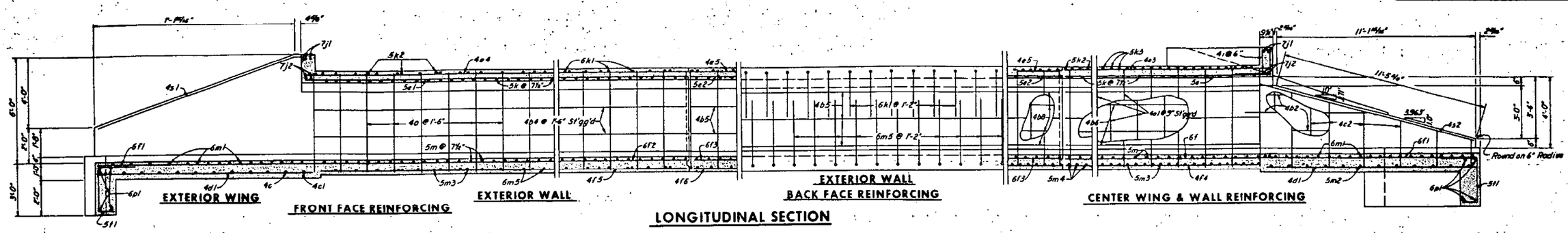
DRAWN B.L.M. DATE 8-12-69 TRACED Y.J. DATE 11-20-69
CHECKED C.W.S. DATE 9-17-69 SCALE As Shown

DESIGN NO. 4968 FILE NO 22960

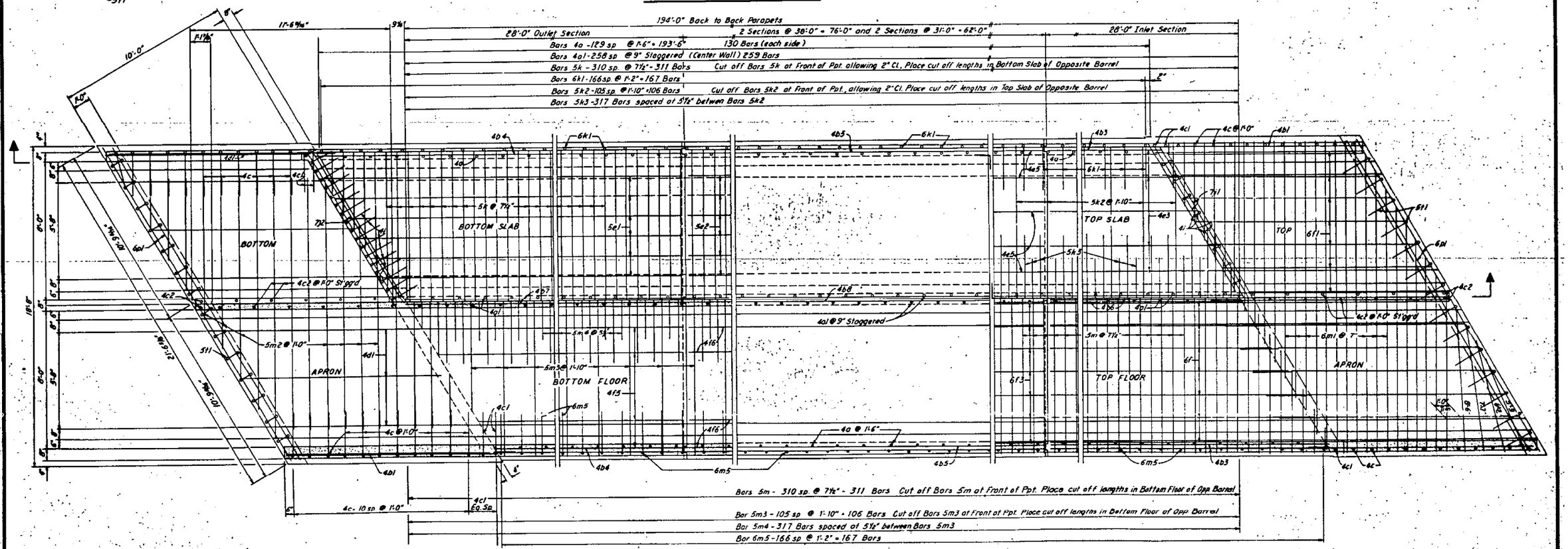
Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 12 of 110

Bench Mark No 55 ; 50 Ft Sta 1886+50; set RR Spk in W. side 30" Cottonwood Tree; Elev. 713.92

FEDERAL DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			13	



LONGITUDINAL SECTION



194'-0" Back to Back Parapets

28'-0" Outlet Section — 2 Sections @ 38'-0" = 76'-0" and 2 Sections @ 31'-0" = 62'-0" — 28'-0" Inlet Section

Bars 4a - 129 sp @ 1'-6" = 193'-6" — 130 Bars (each side)

Bars 4a1 - 258 sp @ 9" Staggered (Center Wall) 259 Bars

Bars 5k - 310 sp. @ 7½" - 311 Bars — Cut off Bars 5k at Front of Ppt. allowing 2" Cl. Place cut off lengths in Bottom Slab of Opposite Barrel

Bars 6k1 - 166 sp @ 1'-2" = 167 Bars

Bars 5k2 - 105 sp @ 1'-10" = 106 Bars — Cut off Bars 5k2 at Front of Ppt, allowing 2" Cl. Place cut off lengths in Top Slab of Opposite Barrel

Bars 5k3 - 317 Bars spaced at 5½" between Bars 5k2

Bars 5m - 310 sp @ 7½" - 311 Bars Cut off Bars 5m at Front of Ppt. Place cut off lengths in Bottom Floor of Opp Barrel

Bar 5m3 - 105 sp @ 1'-10" = 106 Bars Cut off Bars 5m3 at Front of Ppt. Place cut off lengths in Bottom Floor of Opp Barrel

Bar 5m4 - 317 Bars spaced at 5½" between Bars 5m3

Bar 6m5 - 166 sp @ 1'-2" = 167 Bars

OUTLET

PLAN VIEW

SCALE: 3/8=1'-0"

INLET

bar 5e 1 bar 5e1	
24'-3"	29'-3"
24'-11"	29'-11"
25'-7"	30'-7"
26'-3"	31'-3"
26'-11"	31'-11"
27'-7"	32'-7"

bar 6f 1 bar 6f2	
23'-2"	28'-8"
24'-0"	29'-0"
24'-9"	29'-9"
25'-6"	30'-6"
26'-3"	31'-3"
27'-0"	32'-0"
27'-10"	32'-10"

bar 4e3 1 bar 4e4	
23'-5"	29'-2"
24'-4"	30'-1"
25'-5"	31'-2"
26'-7"	32'-3"
27'-6"	33'-2"

bar 4f4 1 bar 4f5	
22'-9"	28'-8"
23'-8"	29'-7"
24'-10"	30'-7"
26'-0"	31'-11"
26'-11"	32'-10"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
DRAWN B.L.M. DATE 8-12-69 TRACED Y.J. DATE 11-20-69
CHECKED C.W.S. DATE 9-17-69 SCALE As Shown

Sheet 2 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBP&CHP 2-5-65 Except as Noted

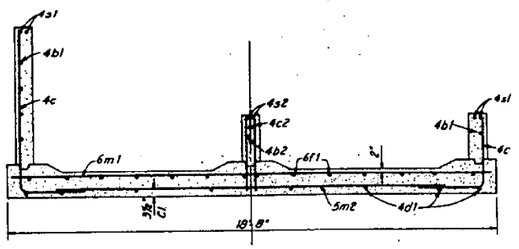
ESTIMATED QUANTITIES	
STRUCTURAL CONCRETE	C.Y.
REINFORCING STEEL	LBS.
PIPE CULV.,	LIN. FT.
PIPE APRONS,	ONLY
EXCAVATION C.Y.	
CL. 20 — CL. 24	CL. 10 CHANNEL

Twin 6'-4", 194.0" R.C.
SIZE AND TYPE Box Culv 38° 30°
DRAINAGE AREA 551 Ac.R. FILL 6'
SECTION 36 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Madison
COUNTY Johnson
STATION 1499+36
PROJECT NO I-IG-380-6(17)247--04-52
DESIGN 4968 DATE Jan 69

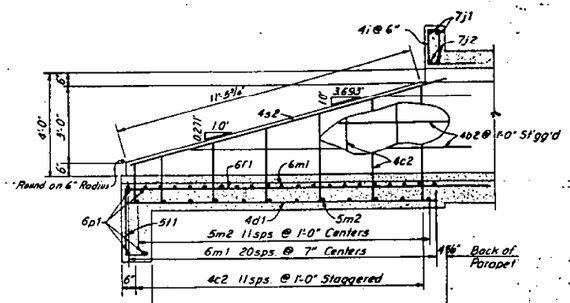
DESIGN NO 4968 FILE NO 22960 Johnson COUNTY PROJECT NO I-IG-380-6(17)247--04-52 SHEET NO. 13 of

Bench Mark No 55 ; 50'Rt Sta 1496+50; set R.R. Spk. in W. side 30" Cottonwood Tree; Elev 713.92

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			14	

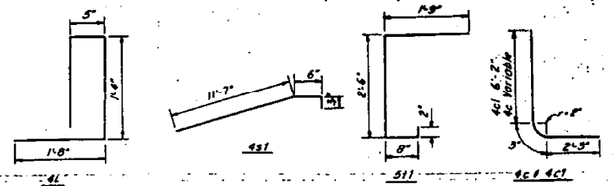


SECTION THRU WINGS NORMAL TO ℄



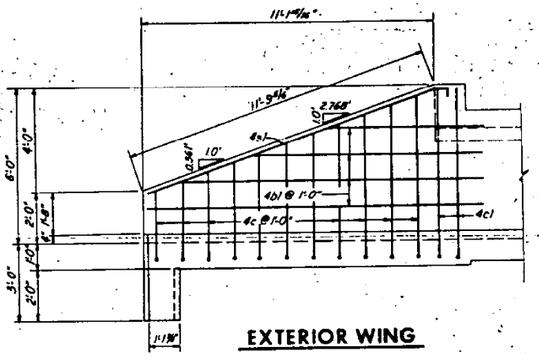
LONGITUDINAL SECTION

Center Wingwall Bars 4b2
3'-3"
7'-0"
10'-9"



BAR DETAILS

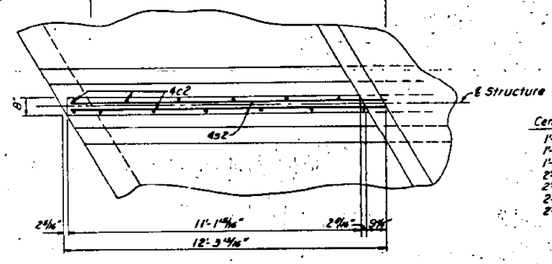
All dimensions are out to out. Radii are to ℄ bar.



EXTERIOR WING BACK FACE REINFORCING

Wingwall Bars 4b1
(℄ each Length)
6'-1"
8'-10"
11'-8"
12'-11"

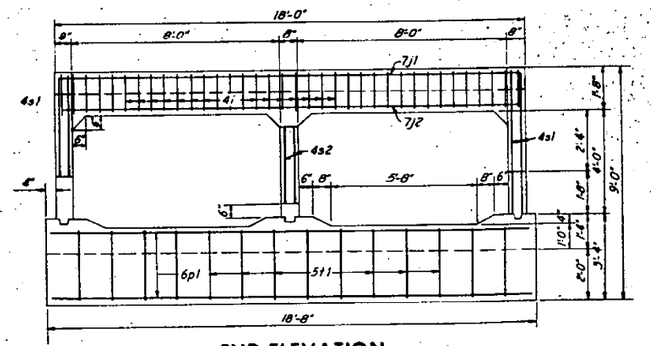
Wingwall Bars 4c
11 per set (2 each length)
Short 5'-1"
Long 8'-8"



CENTER WING REINFORCING

Center Wingwall Bars 4c2

1'-6"	3'-1"
1'-6"	3'-4"
1'-9"	3'-8"
2'-0"	3'-11"
2'-3"	4'-2"
2'-7"	4'-5"
2'-10"	



END ELEVATION NORMAL TO ℄

CONCRETE: ONE HEADWALL
ABOVE KEYWAY= 38 cy
BELOW KEYWAY= 110 cy
TOTAL CONCRETE= 148 cy

REINFORCING STEEL ESTIMATE - ONE HEADWALL

BAR	LOCATION	SHAPE	No.	LENGTH	LINEAR FEET 4	5	6	7
4b1*	Outside Wingwall, B.F. Horiz.	—	8	Shown	79.0			
4b2*	Center Wingwall, Both Faces H	—	3	Shown	21.0			
4c**	Outside Wingwall, B.F. Vert	L	22	Shown	151.2			
4c1	Outside Wingwall, B.F. Vert	L	4	8'-8"	34.7			
4c2	Center Wingwall, Both Faces V.	T	13	Shown	37.0			
4d1	Apron, Floor, Longit, Bottom	—	8	11'-8"	93.3			
6f1*	Apron, Floor, Longit, Top	—	14	13'-10"			193.7	
4i	Parapet Vertical	⊓	36	4'-7"	165.0			
7j1	Parapet, Transv, Top	—	2	20'-5"				40.8
7j2	Parapet, Transv, Bottom	—	2	20'-5"				40.8
6m1	Apron, Transv Top	—	4	18'-4"			73.5	
6m1	Apron, Transv Top	—	6	Shown			28.5	
6m1	Apron, Transv. Top	—	15	2'-10" to 17'-0"			148.8	
6m1	Apron, Transv. Top	—	9	17'-5" to 10'-6"			126.0	
5m2	Apron, Transv. Bottom	—	3	15'-6"		46.5		
5m2	Apron, Transv. Bottom	—	8	9'-8" to 15'-6"		76.7		
5m2	Apron, Transv. Bottom	—	7	5'-6" to 13'-8"		60.1		
6p1	Curtain, Transv	—	4	21'-2"			84.7	
4s1	Outside Wingslope	◥	4	12'-4"	49.3			
4s2	Center Wingslope	◢	2	12'-4"	24.7			
5i1	Curtain, Vertical	⊐	14	5'-1"		71.2		
				LENGTH	655.2	234.5	655.0	81.6
				WEIGHT	437.7	265.4	989.8	162.8
				TOTAL WEIGHT	1853.7 lbs			

*Includes 24 diameter extension into barrel.
**See Exterior Wing Reinforcing, this Sheet.

HEADWALL DETAILS

Sheet 3 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. C&PI CHP 2-5-65 Except as Noted.

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE ——— C.Y.
REINFORCING STEEL ——— LBS.
PIPE CULV., ——— LIN. FT.
PIPE APRONS, ——— ONLY
EXCAVATION C.Y.
CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

SIZE AND TYPE Twin 8'-6"x 194.0" R.C. Box Culv. Sk. 30"
DRAINAGE AREA 551 Ac R FILL 6'
SECTION 34 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Madison
COUNTY Johnson
STATION 1499+35
PROJECT NO. I-IG-380-6(77)247--04-52
DESIGN 4968 DATE Jan 69

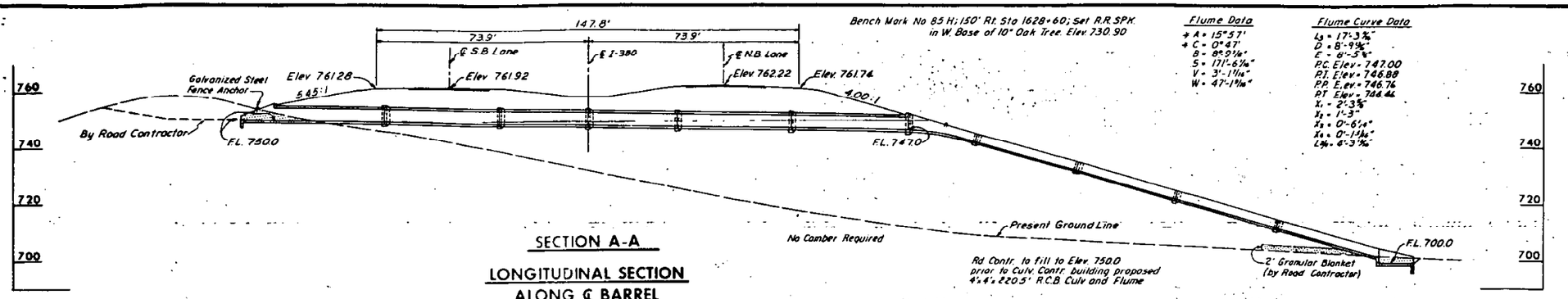
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE	B.L.M	DATE	8-12-69	TRACED	Y.J.
CHECKED	C.W.S.	DATE	9-17-69	SCALE	3/8"=1'-0"

DATE 11-20-69

DESIGN NO. 4968 FILE NO 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(77)247--04-52 SHEET NO. 14 of

FEDERAL DIN'T NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			15	



Bench Work No 85 H; 150' Rt. Sta 1628+60; Set R.R. SPK. in W. Base of 10" Oak Tree. Elev. 730.90

Flume Data

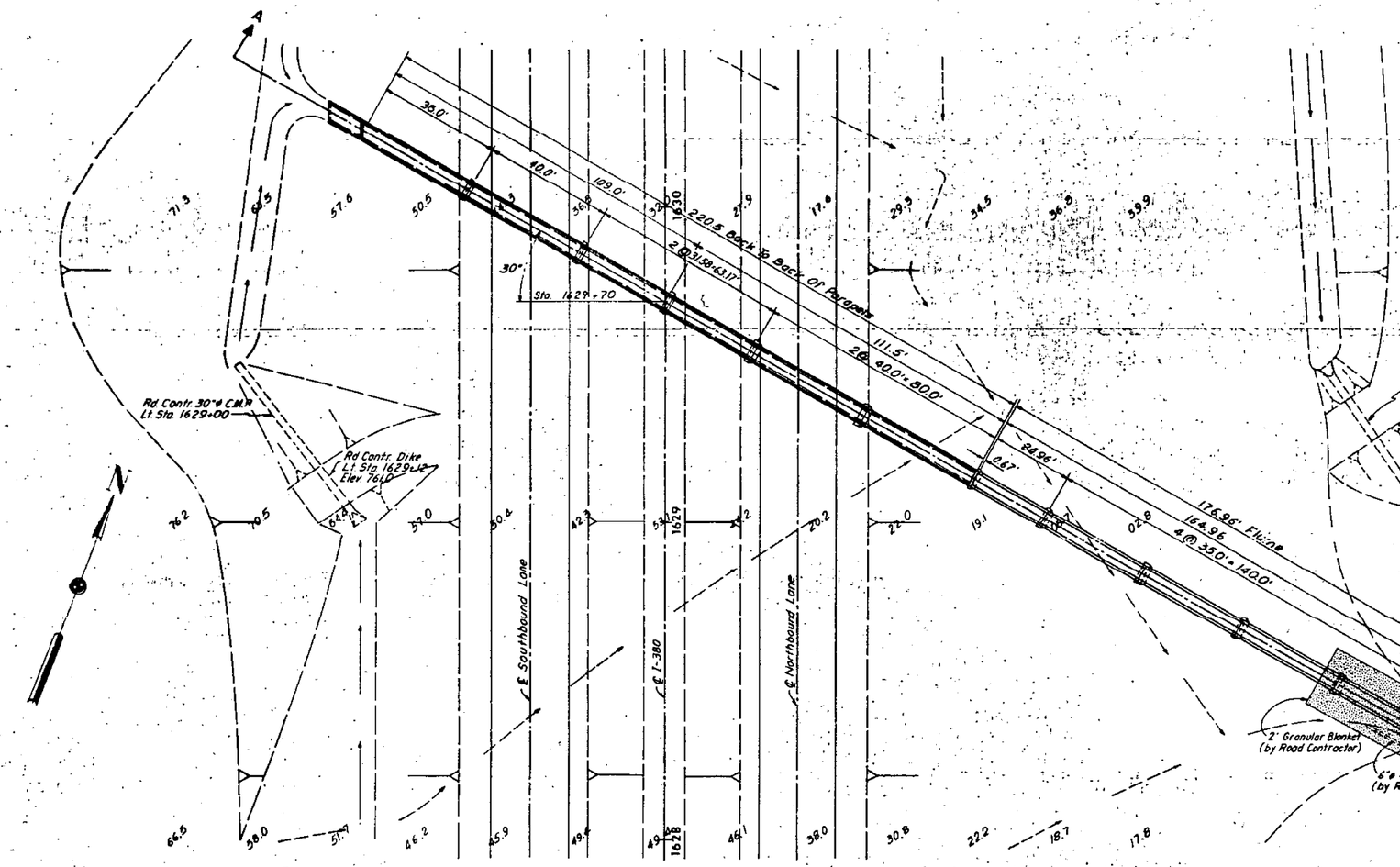
- Δ A = 15°57'
- Δ C = 0°47'
- B = 8°02½"
- S = 17'-6¾"
- V = 3'-1⅛"
- W = 47'-1⅛"

Flume Curve Data

- L_S = 17'-3⅜"
- D = 8°-9½"
- C = 6'-5⅛"
- P.C. Elev. = 747.00
- P.T. Elev. = 746.88
- P.P. Elev. = 746.76
- P.T. Elev. = 746.64
- X_1 = 2'-3⅝"
- Y_1 = 1'-3"
- X_2 = 0'-6¼"
- X_3 = 0'-1⅜"
- $L_{1/2}$ = 6'-3⅛"

SECTION A-A

LONGITUDINAL SECTION ALONG ℄ BARREL



SITUATION PLAN

DES. No. 5068

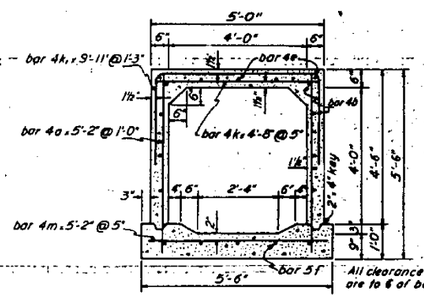
SCALE: 1"=20'

QUANTITIES PER FOOT BARREL

CONCRETE:

- ABOVE KEYWAY= 0.250 c.y.
- BELOW KEYWAY= 0.177 c.y.
- TOTAL CONCRETE= 0.427 c.y.

REINFORCING STEEL = 41.882 lbs.



SECTION THRU BARREL

SCALE: ½"=1'-0"

Notes:

1. For Excavation Details see sheet No. 3 of 110
2. For Fence Anchor Details and Notes see sheet No. 3 of 110. An additional 5 lbs. has been included in Headwall Steel Quantities.
3. Fence Anchors in Flume to be placed at the direction of the Engineer. An additional 5 lbs. has been included in Flume Chute Quantities.
4. For Flume Curve Data Detail see Miscellaneous Detail Sheet 3 of 110.

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	
Headwall	2.2 cy	3.0 cy	5.2 cy	385 lbs.
Barrel - Outlet Parapet	55.4 cy	39.1 cy	94.5 cy	9,263 lbs.
Barrel Bell Joints (5)	5.0 cy	3.4 cy.	8.4 cy	1,046 lbs.
Flume Bell Joint at Junction	0.4 cy	0.4 cy.	0.8 cy	91 lbs.
Flume Chute	24.1 cy	29.5 cy	53.6 cy	3,205 lbs.
Flume Basin	2.2 cy	3.3 cy	5.5 cy	313 lbs.
Flume Bell Joints (4)	1.0 cy	1.7 cy	2.7 cy	289 lbs.
TOTAL	90.3 cy.	80.4 cy	170.7 cy.	16,592 lbs.

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHP2.5-65, C4P, C4J, F4J, & CFP Except as Noted

ESTIMATED QUANTITIES

- STRUCTURAL CONCRETE — Class "C" 170.7 — C.Y.
- REINFORCING STEEL — 16,592 — LBS.
- PIPE CULV., — LIN. FT.
- PIPE APRONS, — ONLY
- EXCAVATION C.Y.
- CL. 20 555 CL. 24 — CL. 10 CHANNEL —

SIZE AND TYPE: 40'-40'=280.3 R.C. Box Culv. with 176.96' Flume Outlet Sk. 30°

DRAINAGE AREA 38 Ac. M — FILL 9'

SECTION 15 — TWP 81 N — RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1629+70

PROJECT NO. I-IG-380-6(7)247--0d-52

DESIGN 5068 — DATE Sept 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE B.L.M. DATE 9-3-68 — TRACED T.V. DATE 11-20-69

CHECKED C.W.S. DATE 9-18-69 — SCALE As Shown

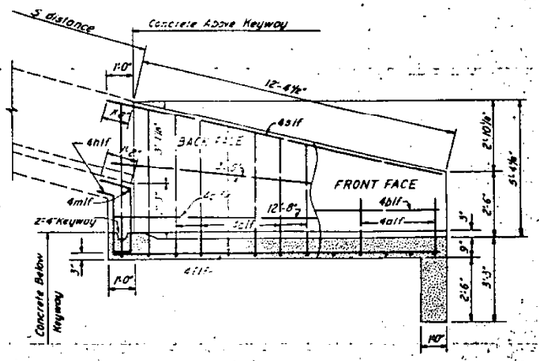
DESIGN NO. 5068 FILE NO. 22960

Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--0d-52

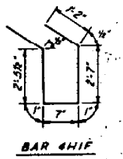
SHEET NO. 15 of 71

Bench Mark No 85 H; 150' Rt Sta 1628+60; Set R.R. Spk. in W Base of 10" Oak Tree. Elev. 730.90

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			16	



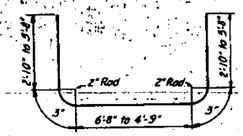
LONGITUDINAL SECTION



BAR 4H1F

ESTIMATE OF REINFORCING STEEL FLUME

BAR	LOCATION	SHAPE	No	LENGTH	LIN.FT.B4	Vari. Bars 4c
4a	Walls; F.F.V.		110	2'-0"	220.0	16'-8" 12'-11"
4b	Walls; F.F.H.; Bott.		2	37'-10"	75.7	16'-1" 12'-8"
4b	Walls; F.F.H.; Mid.		6	36'-1"	216.5	15'-7" 12'-3"
4b	Walls; F.F.H.; Top		2	24'-6"	49.0	15'-1" 12'-3"
4c	Walls & Floor; B.F.V.		18	Listed	243.3	14'-8" 12'-2"
4c	Walls & Floor; B.F.V.		147	12'-0"	1,764.0	14'-3" 12'-1"
4d	Walls; B.F.H.; Bott.		4	Listed	150.8	13'-10" 12'-0"
4d	Walls; B.F.H.; Mid.		12	36'-1"	433.0	13'-6" 12'-0"
4d	Walls; B.F.H.; Top		4	Listed	101.0	13'-2" 12'-0"
4f	Floor; Long; Bott		5	38'-2"	190.8	
4f	Floor; Long; Mid		15	36'-1"	541.2	bars 4d @ each length Bott Top
4f	Floor; Long; Top		5	24'-2"	120.8	
4s	Walls; Bott.		4	37'-3"	149.0	37'-10" 25'-5"
4s	Walls; Mid.		12	36'-1"	433.0	37'-7" 25'-1"
4s	Walls; Top		4	25'-8"	102.7	
				LENGTH.	4,790.8	
				WEIGHT	3,200 lbs.	

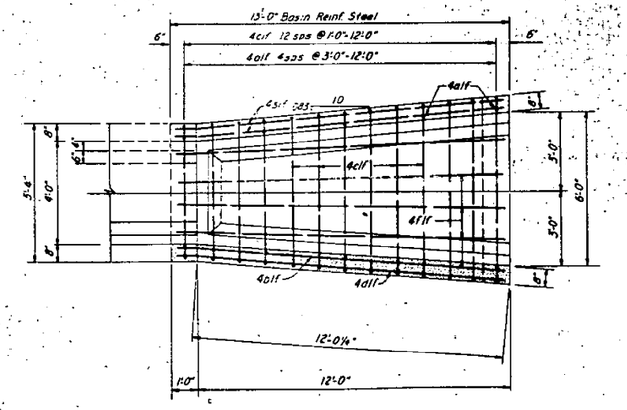


BAR 4C1F

long - 16'-7" short - 12'-10"

EST. OF REINF. STEEL FOR 4'×4' FLUME BASIN

BAR	LOCATION	SHAPE	No.	LENGTH	LIN FT B4
4a1f	Walls F.F.V.		10	2'-0"	20.0
4a1f	Walls F.F.H.		2	12'-3"	23.3
4c1f	Walls B.F.V.		13	Shown	191.2
4d1f	Walls B.F.H.		4	Shown	51.3
4f1f	Floor Longit.		6	12'-8"	76.0
4h1f	Back Wall		6	7'-9"	46.5
4m1f	Back Wall		1	5'-0"	5.0
4s1f	Wing Slope		4	13'-3"	53.0
				LENGTH	468.3
				TOTAL WEIGHT	312.8

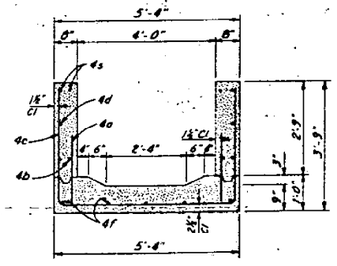


4'×4' REINF. CONC. FLUME BASIN

PLAN VIEW

SCALE: 3/8"=1'-0"

CONCRETE: FLUME BASIN
ABOVE KEYWAY= 2.185 cy
BELOW KEYWAY= 3.279 cy
TOTAL CONCRETE= 5.462 cy



SECTION THRU FLUME CHUTE

SCALE: ½" = 1'-0"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE	B.L.M.	DATE	9-3-68	TRACED	V.J. DATE 11-20-69
CHECKED	C.W.S.	DATE	9-18-69	SCALE	As Shown

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHP 25-65, C4P, C4J, F4J, & CFP Except as Noted

ESTIMATED QUANTITIES

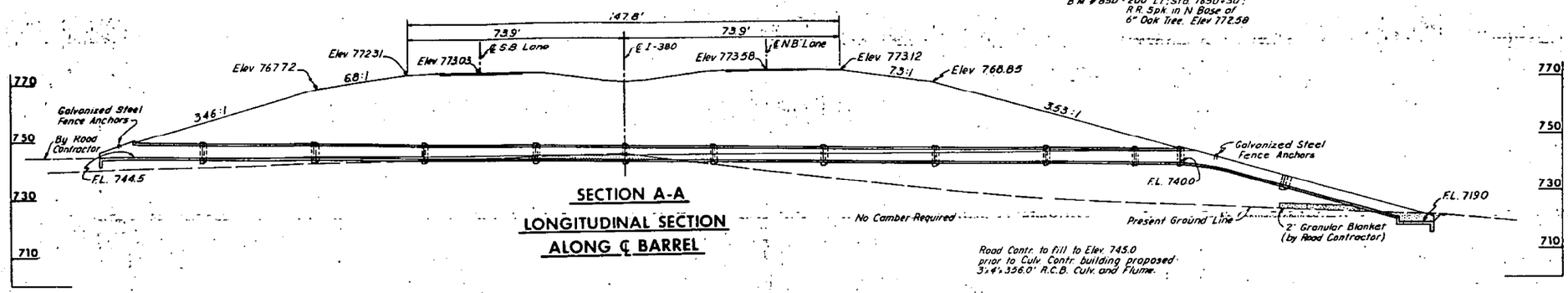
STRUCTURAL CONCRETE	C.Y.
REINFORCING STEEL	LBS.
PIPE CULV.,	LIN. FT.
PIPE APRONS,	ONLY
EXCAVATION C.Y.	
CL. 20 CL. 24	CL. 10 CHANNEL

SIZE AND TYPE	40'-40'-320.9' R.C. Box Culv. with 176.96' Flume Outlet Sk. 50"
DRAINAGE AREA	38 Ac. H FILL 8'
SECTION 15	TWP 81 N RANGE 7 W
CIVIL TOWNSHIP	Jefferson
COUNTY	Johnson
STATION	1629+70
PROJECT NO.	I-IG-380-6(7)247--04-52
DESIGN 5068	DATE Sept. 68

DESIGN NO. 5068 FILE NO 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 16 of

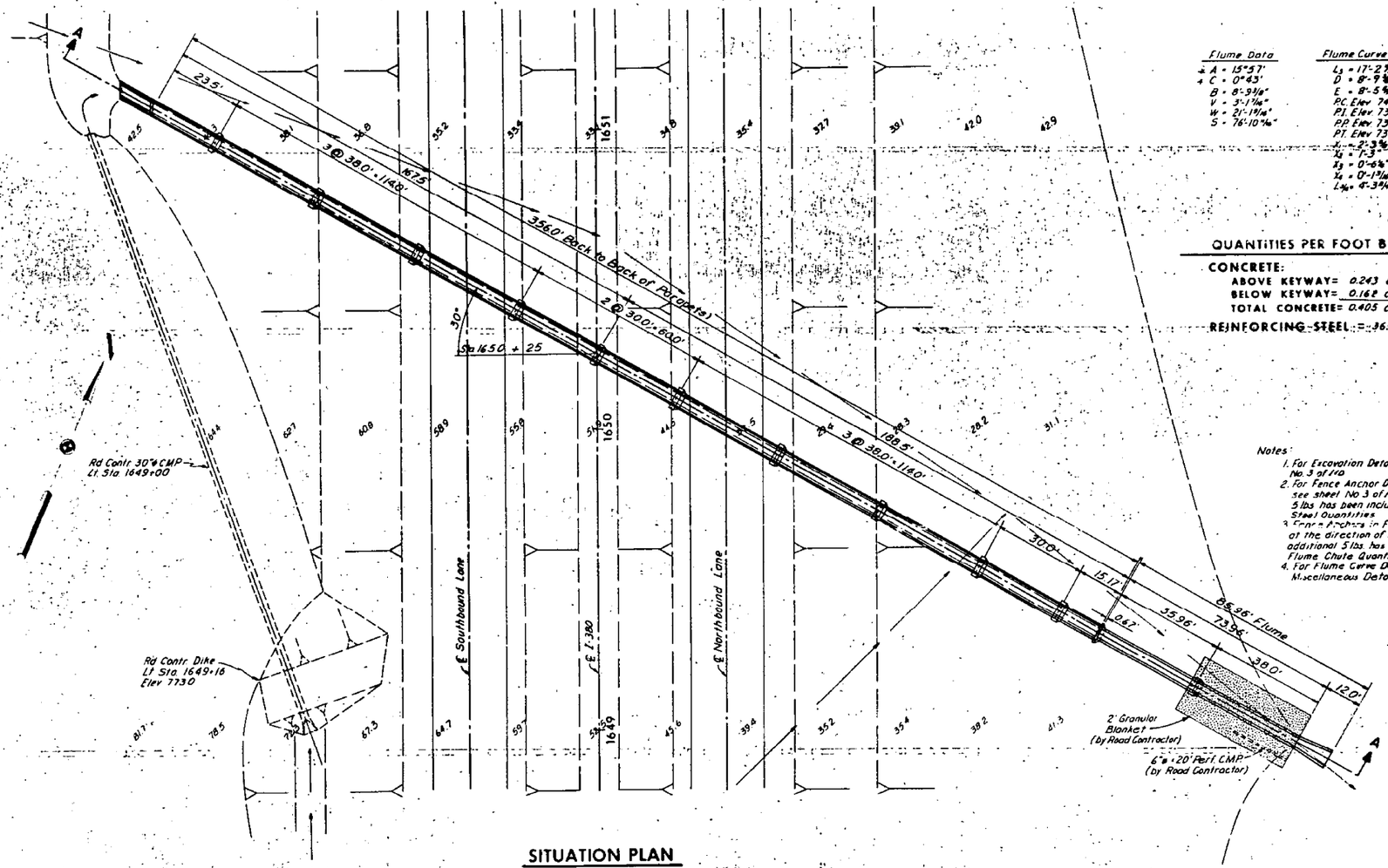
FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			17	

BM # 850 - 200' Lt. Sta. 1650+30 ; RR Spk. in N Base of 6" Oak Tree. Elev 772.58



SECTION A-A
LONGITUDINAL SECTION ALONG ℄ BARREL

Road Contr. to fill to Elev. 745.0 prior to Culv. Contr. building proposed 3-4'x 356.0' R.C.B. Culv. and Flume.



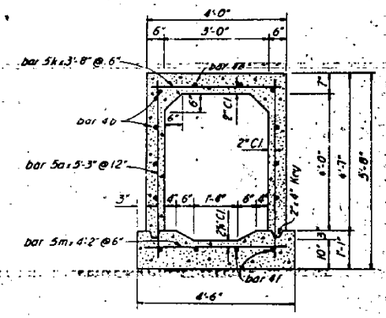
SITUATION PLAN
DES. No. 5168
SCALE: 1"=20'

Flume Data	Flume Curve Data
∠ A = 15°57'	L_3 = 17'-2⅜"
∠ C = 0°43'	D = 8°-9⅜"
B = 8'-9⅛"	E = 8'-5⅝"
V = 3'-1⅛"	P.C. Elev 740.00
W = 2'-1⅛"	P.I. Elev 739.89
S = 76°-10⅛"	P.P. Elev 739.78
	P.T. Elev 737.48
	X_1 = 2'-3⅜"
	X_2 = 1'-3"
	X_3 = 0'-6⅜"
	X_4 = 0'-1⅜"
	$L_{1/2}$ = 8'-3¾" ±

QUANTITIES PER FOOT BARREL

CONCRETE:
ABOVE KEYWAY= 0.243 cy
BELOW KEYWAY= 0.162 cy
TOTAL CONCRETE= 0.405 cy

REINFORCING STEEL = 36.659 lbs



SECTION THRU BARREL
SCALE: ½"=1'-0"

Notes:
1. For Excavation Details, see sheet No. 3 of 17.
2. For Fence Anchor Details and Notes see sheet No. 3 of 17. An additional 5 lbs has been included in Headwall Steel Quantities.
3. Fence Anchors in Flume to be placed at the direction of the Engineer. An additional 5 lbs has been included in Flume Chute Quantities.
4. For Flume Curve Data Detail see Miscellaneous Detail Sheet 3 of 17.

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	
Headwall	2.2 cy	2.4 cy	4.6 cy	297 lbs
Barrel + Outlet Parapet	86.7 cy	57.1 cy	143.8 cy	13,075 lbs
Barrel Bell Joints (10)	7.6 cy	5.0 cy	12.6 cy	1,130 lbs
Flume Bell Joint at Junction	0.4 cy	0.4 cy	0.8 cy	85 lbs
Flume Chute	11.2 cy	11.2 cy	22.4 cy	1,617 lbs
Flume Basin	2.2 cy	2.8 cy	5.0 cy	290 lbs
Flume Bell Joint	0.2 cy	0.4 cy	0.6 cy	66 lbs
TOTAL	110.5 cy	79.3 cy	189.8 cy	16,360 lbs

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CWD2.5-65, C3P, C3J, F3J, & CFP. Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE	Class "C" 189.8	C.Y.
REINFORCING STEEL	16,360	LBS.
PIPE CULV.,		LIN. FT.
PIPE APRONS,		ONLY
EXCAVATION C.Y.		
CL. 20 292 CL. 24	CL. 10 CHANNEL	

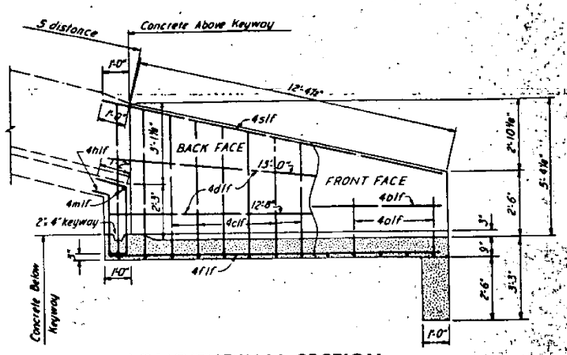
SIZE AND TYPE 30'-40'-356.0' R.C. Box Culv. with @5.96' Flume Outlet 3% 30"
DRAINAGE AREA 28 Ac. M FILL 27'
SECTION 16 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1650+25
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5168 DATE Sept. 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

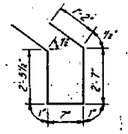
DES.	CHKD.	TRACED	DATE	11-20-69	
DETAILED	CHKD.	9-19-69	SCALE	As Shown	

Bench Mark # 850-200' Lt.; Sta 1650+30; R.R. Spk. in N Base of 6" Oak Tree Elev 772.58

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			18	



LONGITUDINAL SECTION

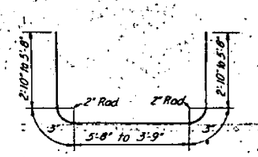


BAR 4HIF

ESTIMATE OF REINFORCING STEEL FLUME

BAR	LOCATION	SHAPE	No	LENGTH	LIN. FT #4	Vari. Bars C	
4a	Walls, F.F.V.		50	2'-0"	100.0	15'-8"	11'-11"
4b *	Walls, F.F.H.; Bott. Sect.		2	42'-0"	84.0	15'-1"	11'-8"
4b	Walls; F.F.H., Top Sect.		2	36'-0"	72.0	14'-7"	11'-5"
4c	Walls & Floor, B.F.V.		18	Listed	225.3	14'-1"	11'-3"
4c	Walls & Floor, B.F.V.		56	11'-0"	616.0	13'-8"	11'-2"
4d *	Walls; B.F.H., Bott. Sect.		4	Listed	167.2	13'-3"	11'-1"
4d	Walls, B.F.H.; Top Sect.		4	Listed	146.5	12'-10"	11'-0"
4f *	Floor, Bott. Sect.		5	42'-4"	211.7	12'-6"	11'-0"
4f	Floor, Top Sect.		5	35'-8"	178.3	12'-2"	11'-0"
4s *	Walls, Bott. Sect.		6	41'-6"	165.3	bars 4d	
4s	Walls; Top Sect.		6	37'-0"	148.0	2 bars each length	
				LENGTH	2114.3	Bott	Top
				WEIGHT	1,412 lbs	41'-8"*	36'-6"
						41'-11"*	36'-9"

*Includes 24 d lap.

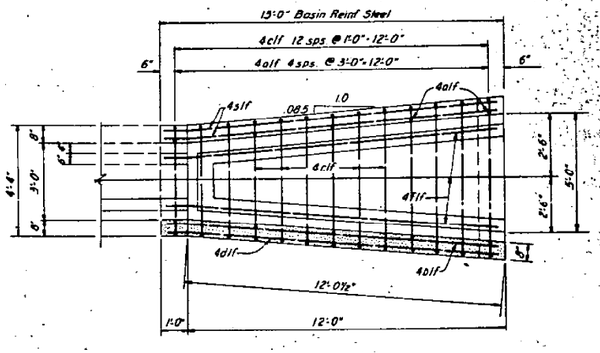


BAR 4CIF

long - 15'-7" short 11'-10"

EST. OF REINF. STEEL FOR 3'×4' FLUME BASIN

BAR	LOCATION	SHAPE	No	LENGTH	LIN. FT #4
4alf	Walls-F.F.V.		10	2'-0"	20.0
4blf	Walls F.F.H.		2	12'-8"	25.3
4clf	Walls B.F.V.		13	Shown	178.2
4dlf	Walls B.F.H		4	Shown	51.3
4flf	Floor Langit		5	12'-8"	63.5
4hlf	Backwall		5	7'-9"	38.8
4mlf	Chute in Basin		1	4'-0"	4.0
4slf	Wing Slope		4	13'-3"	53.0
				LENGTH	433.9
				TOTAL WEIGHT	289.8

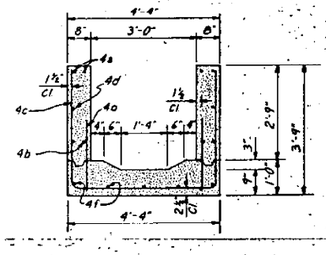


3×4' REINF. CONC. FLUME BASIN

PLAN VIEW

SCALE: 3/8=1'-0"

CONCRETE: FLUME BASIN
ABOVE KEYWAY= 2.183 cy
BELOW KEYWAY= 2.813 cy
TOTAL CONCRETE= 4.996 cy



SECTION THRU FLUME CHUTE

SCALE: ½"=1'-0"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE BLM	DATE 9-1-69	TRACED VV	DATE 11-20-69
CHECKED CWS	DATE 9-19-69	SCALE AS Shown	

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHD 25-65, C3P, C3J, F3J, & CFP Except as Noted

ESTIMATED QUANTITIES

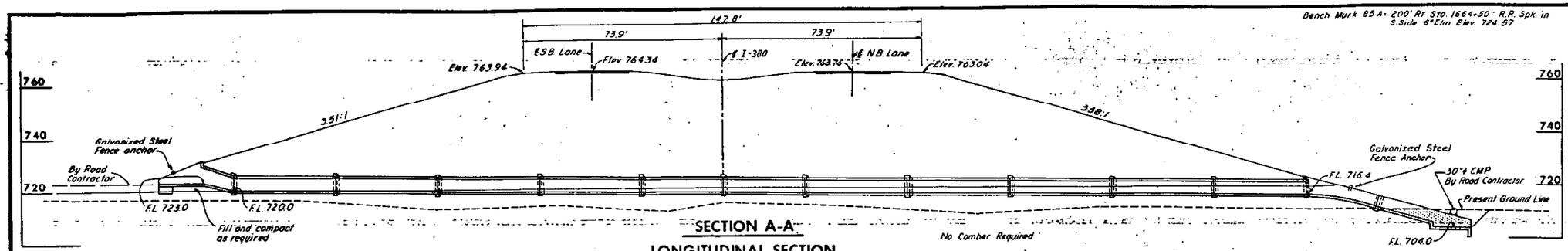
STRUCTURAL CONCRETE ——— C.Y.
REINFORCING STEEL ——— LBS.
PIPE CULV. ——— LIN. FT.
PIPE APRONS ——— ONLY
EXCAVATION C.Y.
CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

SIZE AND TYPE 30"-40"-33'-0" R.C. Box Culv with 85°-96° Flume Outlet 24"-30"
DRAINAGE AREA 28 Ac. M FILL 27'
SECTION 16 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1650+25
PROJECT NO I-IG-380-6(7)247--04-52
DESIGN 5168 DATE Sept. 69

DESIGN NO 5168 FILE NO 22960 Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO. 18 of

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			19	

Bench Mark 85 A = 200' Rt. Sta. 1664+50 : R.R. Spk. in S Side 6" Elm Elev. 724.57

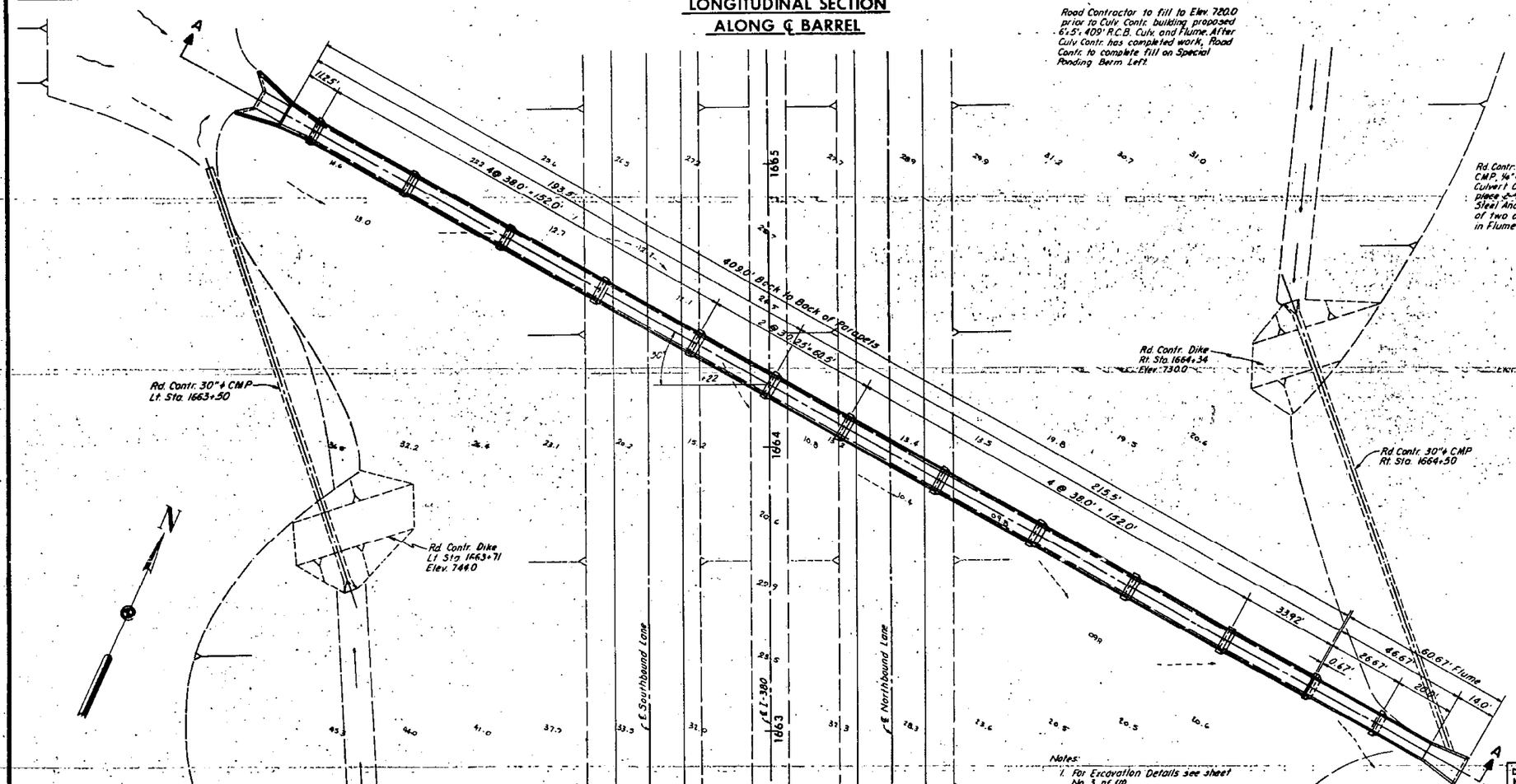


SECTION A-A

LONGITUDINAL SECTION ALONG ℄ BARREL

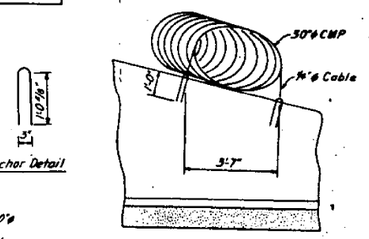
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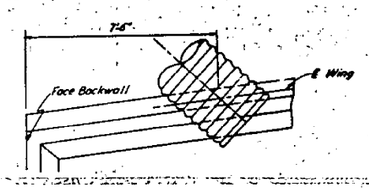
Road Contractor to fill to Elev. 720.0 prior to Culv. Contr. building proposed 61.5'± 400' R.C.B. Culv. and Flume. After Culv. Contr. has completed work, Road Contr. to complete fill on Special Ponding Berm Left.



Notes:
1. For Excavation Details see sheet No. 3 of 118.
2. For Fence Anchor Details and Notes see sheet No. 3 of 118. An additional 5 lbs. has been included in Headwall Steel Quantities.
3. Fence Anchors in Flume to be placed at the direction of the Engineer. An additional 5 lbs. has been included in Flume Chute Quantities.
4. For Flume Curve Data Details see sheet No. 3 of 118

Rd. Contr. to furnish and place 30"ϕ C.M.P., ¾"ϕ Cable, and clamps. Culvert Contr. to furnish and place 2-16"x2'-6" Galvanized Steel Anchors as shown. Wght of two anchors = 5 lbs., included in Flume Basin Reinf. Steel





CONNECTION DETAILS 30" ϕ C.M.P.

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	
6'x6' Inlet H'dw'l	5.2 cy.	9.6 cy.	14.8 cy.	1,063 lbs.
Barrel Inlet Section	4.8 cy.	3.8 cy.	8.6 cy.	798 lbs.
Barrel Bell Joint at Inlet	2.2 cy.	1.4 cy.	3.6 cy.	539 lbs.
Barrel+Outlet Parapet	234.0cy	176.1 c.y.	410.1c.y.	34,161 lbs.
Barrel Bell Joints (10)	20.1cy	14.1 c.y.	34.2 c.y.	5394 lbs.
Flume Bell Joint at Junction	0.5cy.	0.5 cy.	1.0 cy.	113 lbs.
Flume Chute	9.6cy	12.0 cy.	21.6 cy.	1452 lbs.
Flume Basin	3.0 cy.	5.5 cy.	8.5 cy.	609 lbs.
Flume Bell Joint	0.3 cy.	0.5 cy.	0.8 cy.	95 lbs.
TOTAL	279.7c.y	223.5c.y	503.2c.y.	65,022 lbs.

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, C6F, C6J, F6JI, & CFP Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 503.2 C.Y.

REINFORCING STEEL 65,022 LBS.

PIPE CULV., LIN. FT.

PIPE APRONS, ONLY

EXCAVATION C.Y.

CL. 20 447 CL. 24 CL. 10 CHANNEL

SIZE AND TYPE 60'-30'± 405.0' R.C. Box Culv. with 80'x60' Inlet H'dw'l & 60.67' Flume Outlet Sk. 30"

DRAINAGE AREA 223 Ac. H FILL 40'

SECTION 16 TWP. 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1664+22

PROJECT NO. I-IG-380-6(7)247--04-52

DESIGN 5268 DATE Sept. 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE B.L.M	DATE 9-3-69	TRACED Y.J.	DATE 11-20-69
CHECKED C.W.S.	DATE 9-25-69	SCALE As Shown	

SITUATION PLAN

DES. No. 5268

SCALE: 1"=20'

DESIGN NO. 5268 FILE NO 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 19 of

FEDERAL DIST. NO	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			20	

Bench Mark B5-A = 200' Rt. Sta 1664+50 : R.R. Spk. in S. side 6" Elm. Elev 724.57

Flume Data
- ∠A = 19° 5' 7"
- ∠C = 0° 31'
- B = 12'-5⅛"
- V = 3'-10 12/16"
- W = 13'-4"
- S = 48'-6⅛"

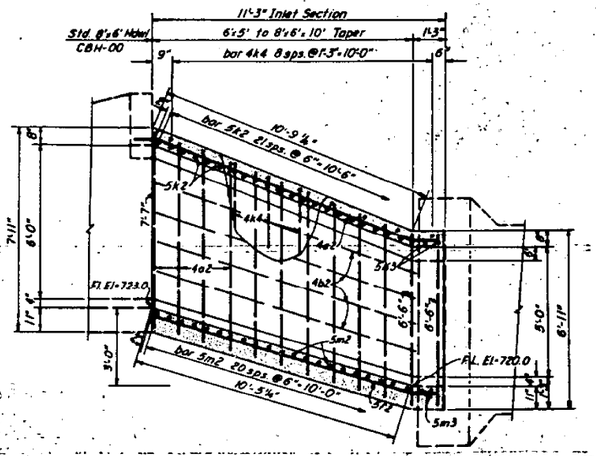
Flume Curve Data
- L_3 = 24'-5 ¼"
- D = 13°-5 ⅛"
- E = 11'-11 ¼"
- P.C. Elev = 716.40
- P.T. Elev = 716.29
- P.P. Elev = 716.18
- P.I. Elev = 712.87
- X_1 = 3'-3 ¾"
- X_2 = 11'-9 ⅛"
- X_3 = 0'-9 ¼"
- X_4 = 0'-1 ⅜"
- L_4 = 6'-1 ⅜"

REINF. STEEL 11'-3" INLET SECTION

BAR	LOCATION	SHAPE	No.	LENGTH	LINEAR FEET #4	LINEAR FEET #5
4a2	Walls F.F.V.		24	Shown	167.9	
4b2	Walls F.F.H.		10	Shown	115.8	
4e2	Slab Longit.		7	12'-7"	88.1	
5f2	Floor Longit.		7	11'-7"		79.9
5k2	Slab Trans. Bott.		22	Shown		168.7
5k3	Slab Trans. Bott.		2	6'-8"		13.3
4k4	Slab Trans. Top		9	Shown	123.6	
5m2	Floor Trans. Top		21	Shown		171.6
5m3	Floor Trans. Top		2	7'-2"		14.3
				LENGTH	495.4	447.8
				WEIGHT	330.9	467.1
				TOTAL WEIGHT	798.0 #	

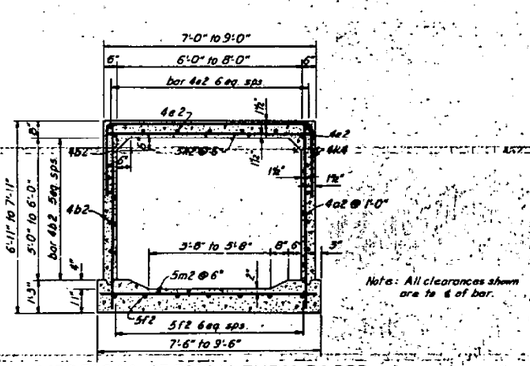
ESTIMATE OF REINF. STEEL FOR 6'×5' FLUME-BASIN

BAR	LOCATION	SHAPE	No.	LENGTH	LINEAR FEET #6	LINEAR FEET #5
4alf	Walls, F.F.V.		16	2'-10"	45.3	
4blf	Walls, F.F.H.		2	14'-9"	29.5	
4clf	Walls, B.F.V.		15	Shown	279.4	
4dlf	Walls, B.F.H.		6	Shown	90.3	
4f3f	Floor Longit. Top		6	14'-8"	88.0	
4f4f	Floor Longit. Bott.		2	14'-8"	29.3	
4glf	Curtain		4	5'-2"	20.7	
4hlf	Backwall		7	8'-3"	57.8	
4mlf	Chute in Basin		2	7'-0"	14.0	
4m2f	Floor Trans. Top		15	Shown	126.2	
5slf	Wing Slope: Both Faces		4	15'-4"		61.3
4rlf	Curtain		18	3'-11"	94.8	
				LENGTH	815.9	61.3
				WEIGHT	543.0	63.9
				TOTAL WEIGHT	609 #	



LONGITUDINAL SECTION

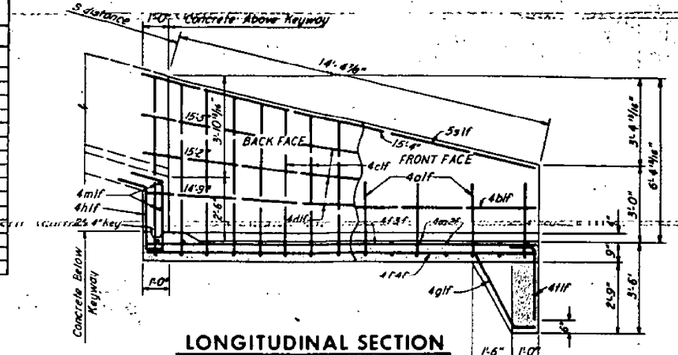
SCALE 3/8"=1'-0"



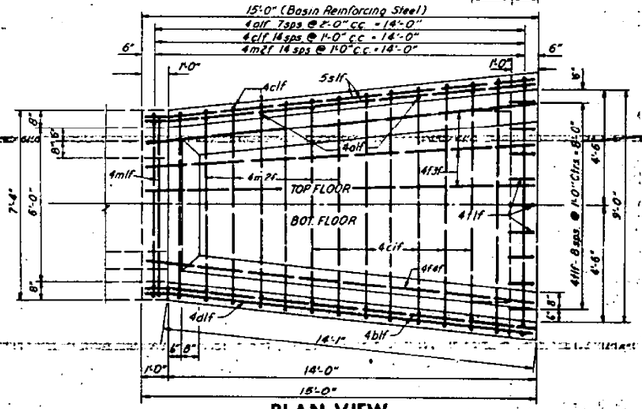
Note: All clearances shown are to ℄ of bar.

VERTICAL SECTION THRU TAPER

SCALE 3/8"=1'-0"

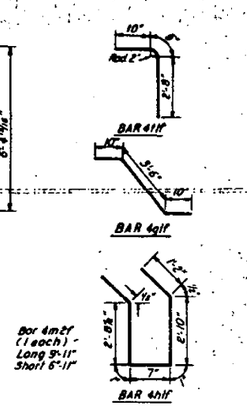


LONGITUDINAL SECTION



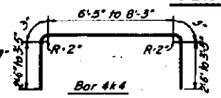
PLAN VIEW

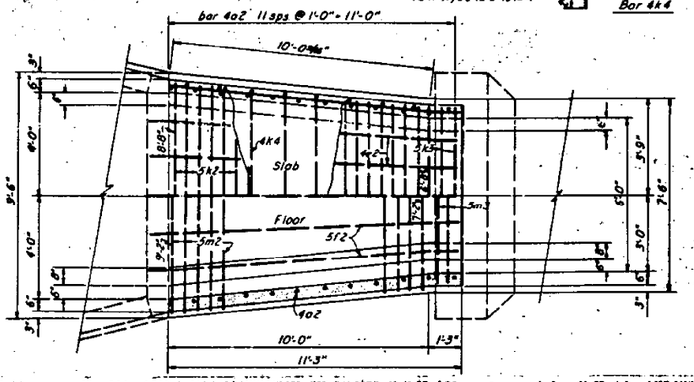
SCALE: 3/8"=1'-0"



CONCRETE: FLUME BASIN
- ABOVE KEYWAY= 3.06 cu yd
- BELOW KEYWAY= 5.54 cu yd
- TOTAL CONCRETE= 8.58 cu yd

Variable bars:
bar 4b2
2 each length 11'-5" to 11'-9"
bar 4k4
1 @ 11'-11", 8 @ 12'-3" to 15'-7"

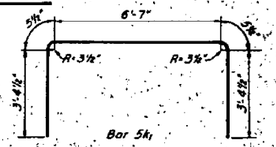


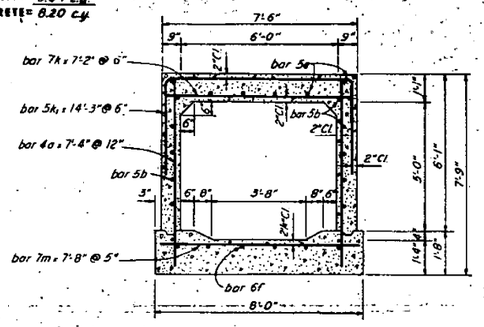


PLAN VIEW

SCALE 3/8"=1'-0"

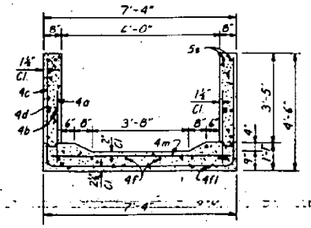
CONCRETE:
11'-3" Inlet Section
- ABOVE KEYWAY= 4.36 c.y.
- BELOW KEYWAY= 3.64 c.y.
- TOTAL CONCRETE= 8.20 c.y.





SECTION THRU BARREL

SCALE 3/8"=1'-0"



SECTION THRU FLUME CHUTE

SCALE 3/8"=1'-0"

ESTIMATE OF REINFORCING STEEL FLUME

BAR	LOCATION	SHAPE	No.	LENGTH	LIN. FT. #4	LIN. FT. #5	Vari. bars 4c 25 bars
4a	Wall; F.F.V.		48	2'-10"	135.8		22'-3" 17'-0"
4b	Wall; F.F.H.; Bott. Sect.		2	2'-3"	44.5		21'-9" 16'-9"
4b	Wall; F.F.H.; Top Sect.		2	26'-3"	52.5		27'-3" 16'-6"
4c	Wall & Floor; B.F.V.		22	15'-6"	341.0		20'-9" 16'-4"
4c	Wall & Floor; B.F.V.		25	Listed	446.2		20'-3" 16'-3"
4d	Wall; B.F.H.; Bott. Sect.		6	Listed	133.5		19'-10" 16'-0"
4d	Wall; B.F.H.; Top Sect.		6	Listed	160.8		19'-5" 15'-10"
4f	Floor, Top; Bott. Sect.		6	21'-7"	129.5		19'-0" 15'-8"
4f	Floor; Top, Top Sect.		6	25'-7"	153.5		18'-7" 15'-7"
4f1	Floor, Bott; Bott Sect.		2	21'-7"	43.3		18'-8" 15'-7"
4f1	Floor; Bott; Top Sect.		2	25'-7"	51.2		17'-10" 15'-6"
4m	Floor; Trans; Top		24	7'-0"	168.0		17'-6" 15'-6"
5s	Walls, Top; Bott. Sect.		4	21'-9"		87.0	17'-3"
5s	Walls, Top; Top Sect.		4	27'-5"		109.7	Bars 4d (2 Each)
				LENGTH	1859.8	196.7	Bott 22'6", 22'3"
				WEIGHT	1,242	205	22'-0" Top 26'-6"
				TOTAL WEIGHT	1,447 lbs.		26'-10", 27'-1"

QUANTITIES PER FOOT BARREL

CONCRETE:
- ABOVE KEYWAY= 0.647 c.y.
- BELOW KEYWAY= 0.442 c.y.
- TOTAL CONCRETE= 1.109 c.y.

REINFORCING STEEL = 146.330 lbs.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN B.L.M.	DATE 9-1-69	TRACED V.J.	DATE 11-20-69
CHECKED C.W.S.	DATE 9-25-69	SCALE As shown	

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, C6F, C6J, F6H, & CFP Except as Noted

ESTIMATED QUANTITIES
- STRUCTURAL CONCRETE — C.Y.
- REINFORCING STEEL — LBS.
- PIPE CULV., — LIN. FT.
- PIPE APRONS, — ONLY
- EXCAVATION C.Y.
- CL. 20 — CL. 24 — CL. 10 CHANNEL —

SIZE AND TYPE 6.0'×5.0'×60.0 RC Box Culv. with 8.0'×6.0' Inlet 11'-3" Part ℄ 60.67' Flume Outlet Sk. 30°

DRAINAGE AREA 523 Ac. M. FILL 40' 7

SECTION 16 TWP 81 N RANGE 6 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1664+22

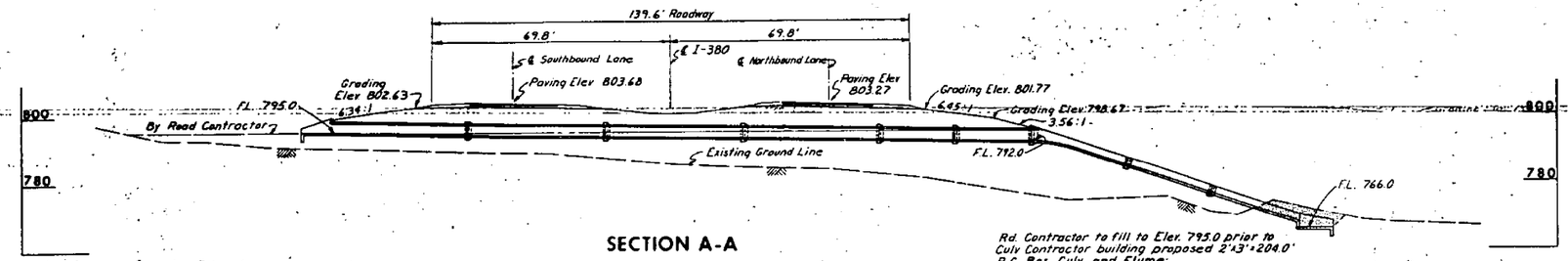
PROJECT NO. I-IG-380-6(7)247--04-52

DESIGN 5268 DATE Sept. 68

DESIGN NO. 5268 FILE NO 22960 Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO 20 of

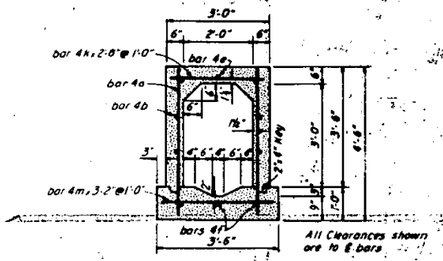
FEDERAL DIST. NO	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			21	

BENCH MARK NO. 84: Sta. 1682+66; R.R. Spk in P. Pole with transformer; 338' Lt.; Elev. 830.91'

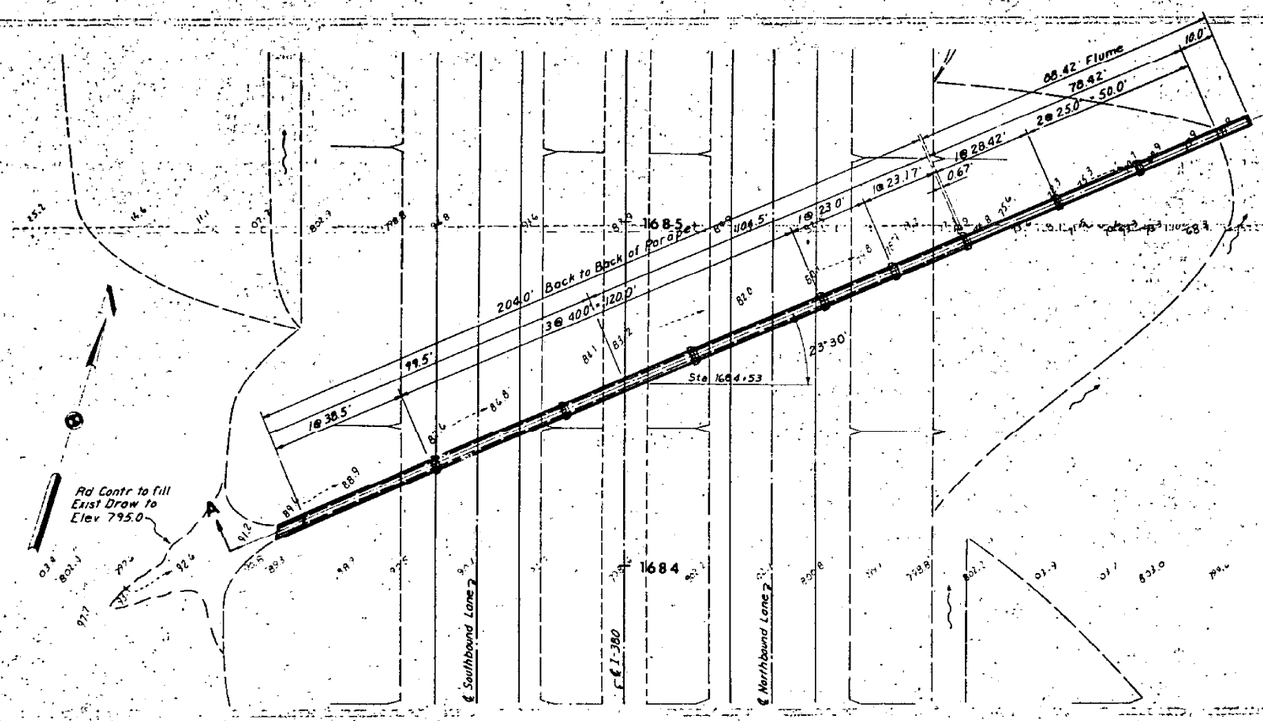


SECTION A-A
LONGITUDINAL SECTION ALONG ℄ BARREL

Rd. Contractor to fill to Elev. 795.0 prior to Culv Contractor building proposed 2'-3"x204.0' R.C. Box Culv. and Flume:



SECTION THRU BARREL
SCALE: ½"=1'-0"



SITUATION PLAN
DES. No. 5368
SCALE: 1"=20'

QUANTITIES PER FOOT BARREL

CONCRETE:
- ABOVE KEYWAY= 0.176 c.y.
- BELOW KEYWAY= 0.122 c.y.
- TOTAL CONCRETE= 0.298 c.y.

REINFORCING STEEL = 14.260 lbs

Notes:
1. For Excavation Details see sheet No 3 of 110
2. For Flume Curve Data Detail see sheet No. 3 of 110

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN. FORCING STEEL
LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	
Headwall - 30'	.4 c.y	1 c.y	3.4 c.y	128 lbs.
Barrel + Outlet ppt.	36.1 c.y	25.0 c.y	61.1 c.y	3328 lbs.
Flume Chute	9.1 c.y	9.6 c.y	18.7 c.y	1001 lbs.
Flume Basin	1.4 c.y	1.5 c.y	2.9 c.y	147 lbs.
Bell Joints - 5 in D'b'l	3.0 c.y	1.7 c.y	4.7 c.y	458 lbs
Bell Joint at Junction	0.3 c.y	0.3 c.y	0.6 c.y	69 lbs
Bell Joints - 2 in Chute	0.4 c.y	0.6 c.y	1.0 c.y	109 lbs
TOTAL	51.7 c.y	40.3 c.y	92.0 c.y	5295 lbs

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CPH 25-65, C2P, C2J, F5J & CFP Except as Noted

ESTIMATED QUANTITIES	
STRUCTURAL CONCRETE Class 'C' 92.0	C.Y.
REINFORCING STEEL 5,295	LBS.
PIPE CULV.	LIN. FT.
PIPE APRONS,	ONLY
EXCAVATION C.Y.	
CL. 20 177 CL. 24	CL. 10 CHANNEL

20'+30'+204.0' RC Box Culv 'F'
SIZE AND TYPE 68.42' Flume 23°30' Skew
DRAINAGE AREA 3 Ac H. FILL 7'
SECTION 7 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1684+53
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5368 DATE Mar. 69

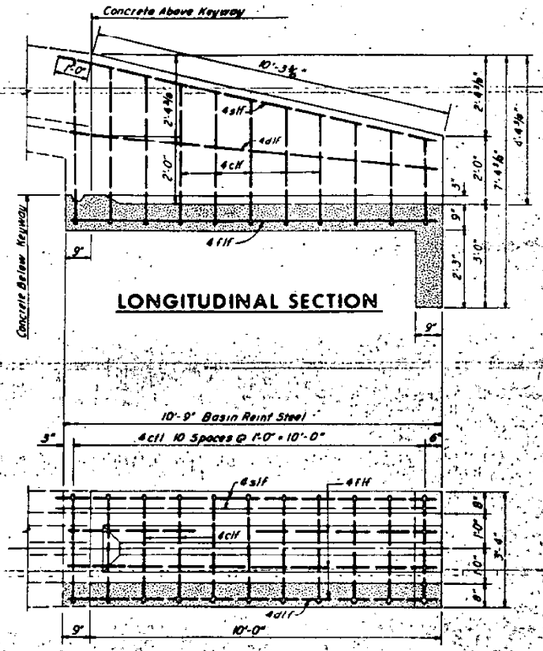
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DES. BLM	DATE 3-21-69	TRACED BLM	DATE 11-20-69
CHECKED CWS	DATE 9-25-69	SCALE As Shown	

DESIGN NO. 5368 FILE NO. 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO 21 of

BENCH MARK NO. B4 : Sta 1682+66 ; R.R. Spk. in P. Pole with transformer; 338' Lt. ; Elev. 830.91 .

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			22	

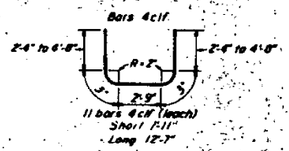


LONGITUDINAL SECTION

PLAN VIEW BASIN

2'×3' REINF. CONC. FLUME

SCALE: ½"=1'-0"



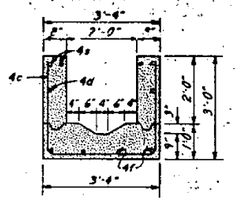
QUANTITIES IN FLUME BASIN

CONCRETE:

ABOVE KEYWAY=	1.4 c.y.
BELOW KEYWAY=	1.5 c.y.
TOTAL CONCRETE=	2.9 c.y.

EST. OF REINF. FOR 2'×3' FLUME BASIN

MARK	LOCATION	SHAPE	NO.	LENGTH	LIN. FT. 4
4clf	Walls: B.F.V.	⌴	11	Shown	112.8
4dlf	Walls: B.F.H.	——	2	10'-8"	21.3
4flf	Floor: Long.	——	4	10'-5"	41.7
4slf	Wing Slope	——	4	11'-1"	44.3
				LENGTH	220.1
				TOTAL WEIGHT	147 lbs.



SECTION THRU FLUME CHUTE

SCALE 1/2"=1'-0"

EST. OF REINFORCING STEEL-FLUME

MARK	LOCATION	SHAPE	NO.	LENGTH	LIN. FT. 4	VARIABLE BARS 4C	
4c	Walls & Floor: B.F.V.	⌴	65	8'-4"	541.7	12'-7"	9'-2"
4c	Walls & Floor: B.F.V.	⌴	14	Shown	136.5	11'-11"	8'-11"
4d	Wall: B.F.H.; Bott Sect	——	2	27'-5"	54.8	11'-4"	8'-8"
4d	Wall: B.F.H.; Mid. Sect.	——	2	26'-0"	52.0	10'-9"	8'-6"
4d	Wall: B.F.H.; Top Sect.	——	2	29'-3"	58.5	10'-3"	8'-5"
4f	Floor: Long.; Bott. Sect.	——	4	26'-9"	107.0	9'-10"	8'-4"
4f	Floor: Long.; Mid. Sect.	——	4	26'-0"	104.0	9'-6"	8'-4"
4f	Floor: Long.; Top Sect.	⌒	4	28'-3"	113.0		
4s	Wing: Bott. Sect.	——	4	27'-2"	108.7		
4s	Wing: Mid. Sect.	——	4	26'-0"	104.0		
4s	Wing: Top Sect.	——	4	29'-7"	118.3		
				LENGTH	1,498.5		
				TOTAL WEIGHT	1,001.0 lbs.		

FLUME DATA

- Δ A = 18° 25'
- Δ C = 0° 51'
- D = 6'-1½"
- V = 2'-4⅜"
- W = 26'-1⅝"
- S = 86'-7½"

FLUME CURVE DATA

- L_s = 13'-2½"
- D = 6'-9⅝"
- L = 8'-4⅜"
- P.C. Elev. = 792.00
- P.I. Elev. = 791.90
- P.P. Elev. = 791.81
- P.T. Elev. = 789.76
- λ_1 = 2'-0⅝"
- λ_2 = 1'-1⅝"
- λ_3 = 0'-5½"
- λ_4 = 0'-1⅝"
- $\frac{L_s}{4}$ = 3'-3½" ±

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE BLM	DATE 3-21-67	TRACED BLM	DATE 11-20-69
CHECKED CWS	DATE 9-25-69	SCALE As Shown	

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHP 25-65, C2P, C2J, F3J & C.F.P. Except as Noted

ESTIMATED QUANTITIES

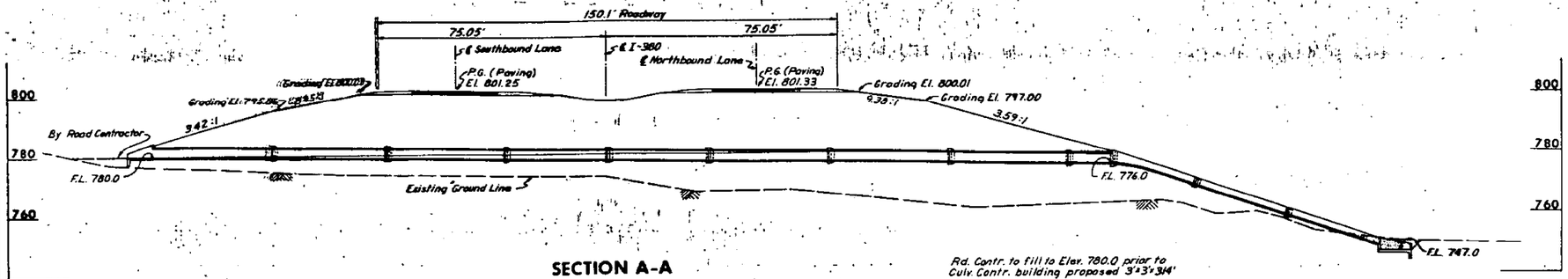
STRUCTURAL CONCRETE ——— C.Y.
REINFORCING STEEL ——— LOS.
PIPE CULV., ——— LIN. FT.
PIPE APRONS, ——— ONLY
EXCAVATION C.Y.
CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

SIZE AND TYPE 2.0'×3.0'×204.0' R.C. Box Culv with 68°42' Flume 23°30' Skew
DRAINAGE AREA 3 Ac. H. FILL 7'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1484+53
PROJECT NO. I-IC-380-6(7)247--04-52
DESIGN 5368 DATE Mar. 69

DESIGN NO. 5368 FILE NO. 22960 Johnson COUNTY PROJECT NO. I-IC-380-6(7)247--04-52 SHEET NO. 22 of

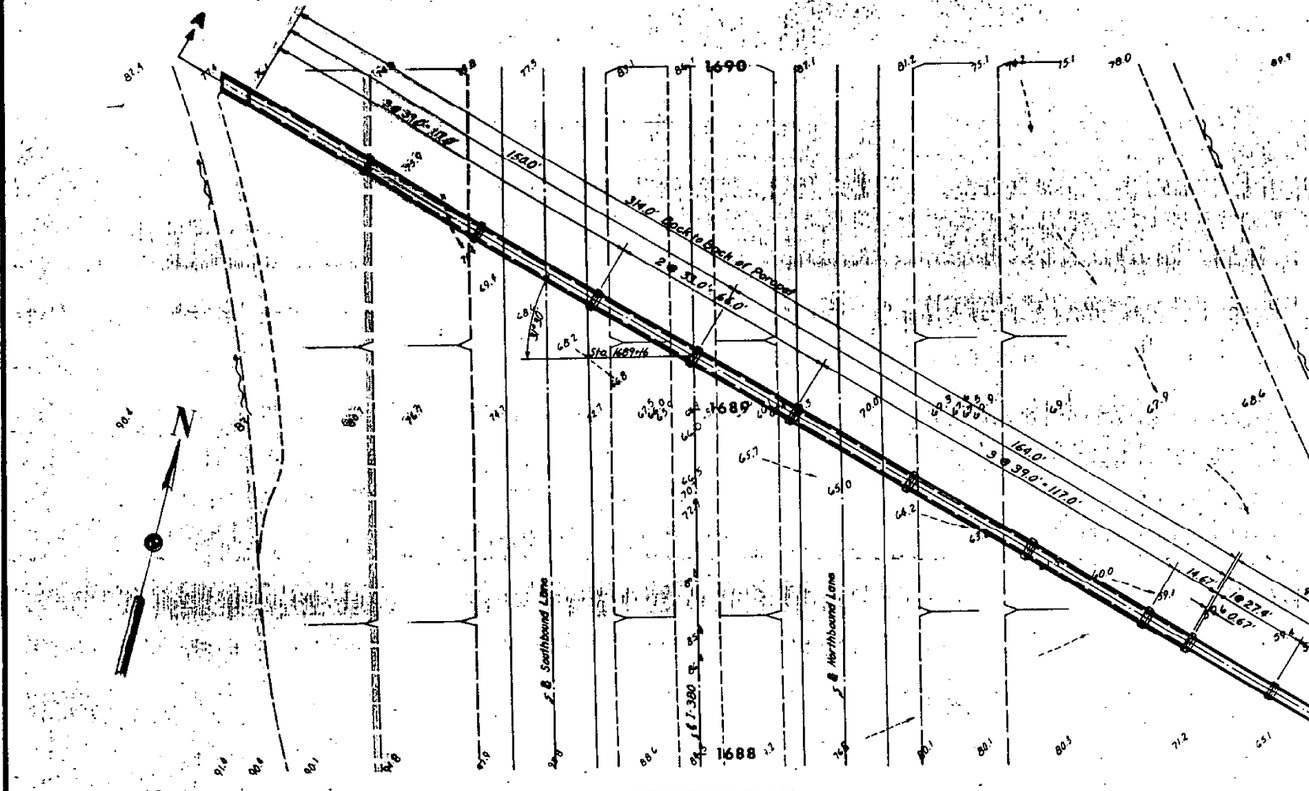
FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			23	

BENCH MARK NO. 83: Sta. 1687+00, R.R. Spk. in Fe. Post. 600' Lt., Elev. 828.05



SECTION A-A
LONGITUDINAL SECTION ALONG ℄ BARREL

Rd. Contr. to fill to Elev. 780.0 prior to Culv. Contr. building proposed 3'x3'x 3\4' R.C. Box Culv. and Flume



SITUATION PLAN
DES. No. 5468
SCALE: 1"=20'

ESTIMATE OF REINF. STEEL - BARREL

MARK	LOCATION	SHAPE	NO.	LENGTH	LIN. FT. 4	LIN. FT. 5
4a	Walls: F.F.V.		630	4'-2"	2627.1	
4b	Walls: F.F.H.; Inlet	—	3	37'-8"	113.0	
4b	Walls: F.F.H. Inlet	—	3	39'-8"	119.0	
4b	Walls: F.F.H.; 5-39' Sect.	—	30	38'-8"	1160.0	
4b	Walls: F.F.H.; 2-33' Sect.	—	12	32'-8"	392.0	
4b	Walls: F.F.H.; Outlet	—	6	14'-4"	86.0	
4e	Slab: Long; Bott 6-39' Sect.	—	12	38'-8"	464.0	
4e	Slab: Long; Bott. 2-33' Sect.	—	4	32'-8"	130.7	
4e	Slab: Long; Bott; Outlet	—	2	14'-4"	28.7	
4f	Floor: Long; Top; Inlet	—	4	38'-8"	154.7	
4f	Floor: Long; Top; 5-39' Sect.	—	20	38'-6"	773.4	
4f	Floor: Long; Top; 2-33' Sect.	—	8	32'-8"	261.4	
4f	Floor: Long; Top; Outlet	—	4	14'-4"	57.3	
4i	Outlet Parapet: Vert.	J	3	1'-9"	5.2	
4j	Outlet Parapet: Transv.	—	1	3'-8"	3.7	
5k	Slab: Transv.; Top	—	630	3'-8"		2312.1
5m	Floor: Transv: Top	—	629	4'-2"		2622.9
				LENGTH	6378.2	4935.0
				WEIGHT	4260.6	5147.2
				TOTAL WEIGHT	9407.8 lbs.	

Notes:
1. For Excavation Detail see Sheet No. 3 of ---
2. For Flume Curve Data Detail see sheet No. 3 of ---

PLACEMENT QUANTITIES

CONCRETE IN PARTS — LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	REIN-FORCING STEEL
Headwall - 30° Skew	1.9 cy.	1.9 cy.	3.3 cy.	213 lbs.
Barrel & Outlet P'pt.	64.8 cy.	47.2 cy.	112.0 cy.	9408 lbs.
Flume Chute	9.2 cy.	13.3 cy.	22.5 cy.	1294 lbs.
Flume Basin	1.4 cy.	1.9 cy.	3.3 cy.	161 lbs.
Bell Joints - 8 in B'b'l.	5.3 cy.	3.1 cy.	8.4 cy.	826 lbs.
Bell Joint - Junction	0.3 cy.	0.4 cy.	0.7 cy.	75 lbs.
Bell Joints - 2 in Chute	0.4 cy.	0.8 cy.	1.2 cy.	115 lbs.
TOTAL	82.8 cy.	68.5 cy.	151.3 cy.	12,032 lbs.

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHP. 2.5-65, C3P, C3J, F3J, & C.F.P. (Except as noted)

ESTIMATED QUANTITIES
- STRUCTURAL CONCRETE Class 'C' 151.3 C.Y.
- REINFORCING STEEL 12,032 LBS.
- PIPE CULV., ——— LIN. FT.
- PIPE APRONS, ——— ONLY
- EXCAVATION C.Y.
- CL. 20 295 CL. 24 ——— CL. 10 CHANNEL ———

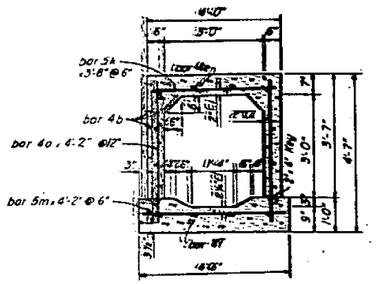
SIZE AND TYPE 30"x30"x3'4.8" R.C. Box Culv. 9° 97.42' Conc. Flume 3'-3" 30° Skew
DRAINAGE AREA 24 Ac. H. FULL 21'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1689+16
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5468 DATE May. 69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
DRAWN B.L.M. DATE 3-22-69 TRACED B.L.M. DATE 11-20-69
CHECKED C.W.S. DATE 4-28-69 SCALE As Shown

DESIGN NO. 5468 FILE NO. 22960 Johnson COUNTY I-IG-380-6(7)247--04-52 PROJECT NO SHEET NO. 23 of ---

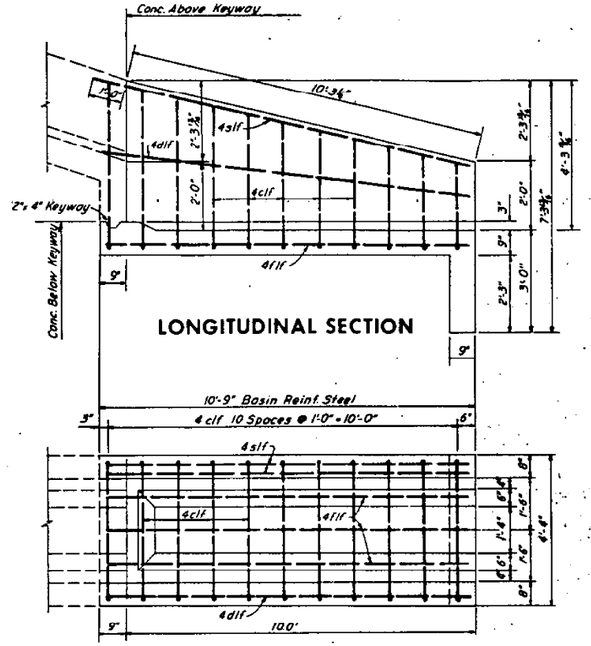
FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			24	

BENCH MARK NO. 83: Sta. 1687+00, RR. Spk. in Fe. Post 600' Lt., Elev. 828.05



SECTION THRU BARREL

SCALE: ½"=1'-0"



LONGITUDINAL SECTION

PLAN VIEW BASIN

3' × 3' REINF. CONC. FLUME

SCALE: ½"=1'-0"

EST. OF REINFORCING STEEL - FLUME

MARK	LOCATION	SHAPE	NO.	LENGTH	LIN. FT. 4	VAR. BARS 4C
4c	Walls & Floor: B.F.V.	⌊_⌋	13	Shown	141.1	13'-7"
4c	Walls & Floor: B.F.V.	⌊_⌋	75	9'-6"	700.0	12'-11"
4d	Walls: B.F.H.; Bott. Sect.	—	2	32'-9"	65.5	12'-4"
4d	Walls: B.F.H.; Mid Sect.	—	2	31'-3"	62.5	11'-9"
4d	Walls: B.F.H.; Top Sect.	—	2	28'-1"	56.2	11'-3"
4f	Floor: Long.; Bott. Sect.	—	5	32'-2"	160.8	10'-9"
4f	Floor: Long.; Mid Sect.	—	5	31'-3"	156.2	10'-6"
4f	Floor: Long.; Top Sect.	—	5	27'-2"	135.8	10'-2"
4s	Wing Slope: Bott Sect.	—	4	32'-5"	129.7	9'-11"
4s	Wing Slope: Mid Sect.	—	4	31'-3"	125.0	9'-8"
4s	Wing Slope: Top Sect.	—	4	28'-5"	113.7	9'-6"
						9'-5"
						9'-4"
				LENGTH	1846.5	
				TOTAL WEIGHT	1233.5 lbs.	

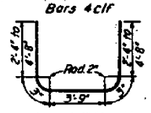
QUANTITIES PER FOOT BARREL

CONCRETE:

ABOVE KEYWAY= 0.194 c.y.

BELOW KEYWAY= 0.150 c.y.

TOTAL CONCRETE= 0.344 c.y.



11 bars 4clf (each)
Short = 8'-11"
Long = 13'-7"

VARIABLE BARS

QUANTITIES IN FLUME BASIN

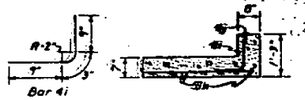
CONCRETE:

ABOVE KEYWAY= 1.4 c.y.

BELOW KEYWAY= 1.8 c.y.

TOTAL CONCRETE= 3.2 c.y.

EST. OF REINF. FOR 3'x3' FLUME BASIN					
BAR	LOCATION	SHAPE	No.	LENGTH	LIN. FT #4
4clf	Walls B.F.V.	⌊_⌋	11	Shown	123.8
4dlf	Walls B.F.H.	—	2	10'-8"	21.3
4flf	Floor Long	—	5	10'-5"	52.1
4slf	Wing Slope	—	4	11'-1"	44.3
				Length	241.5
				Total Weight	161.1 lb.



SECTION THRU OUTLET PARAPET

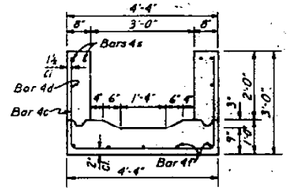
SCALE ½"=1'-0"

FLUME DATA

+A = 18°25'
+C = 0°44'
B = 6'-8½"
V = 2'-1½"
W = 29'-1½"
S = 67'-5"

FLUME CURVE DATA

L = 13'-0"
D = 6°-8½"
E = 6'-4"
RC. Elev. = 776.00
P.I. Elev. = 775.92
P.P. Elev. = 775.84
P.T. Elev. = 773.80
L_1 = 2'-0½"
L_2 = 1'-1½"
L_3 = 0'-5½"
L_4 = 0'-1½"
L_5 = 3'-3½" ±



SECTION THRU FLUME CHUTE

SCALE: ½" = 1'-0"

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CHP 2.5-65, C3P, C3J, F3J, & C.F.P. (Except as Noted)

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE ——— C.Y.

REINFORCING STEEL ——— LBS.

PIPE CULV., ——— LIN. FT.

PIPE APRONS, ——— ONLY

EXCAVATION C.Y.

CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

SIZE AND TYPE 3.0'x3.0'x340' RC Box Culv. 7° 97.4° Conc. Flares 31° 30' Skew

DRAINAGE AREA 24 Ac. H. FILL 21'

SECTION 9 TWP. 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1689+16

PROJECT NO. I-IG-380-6(7)247--04-52

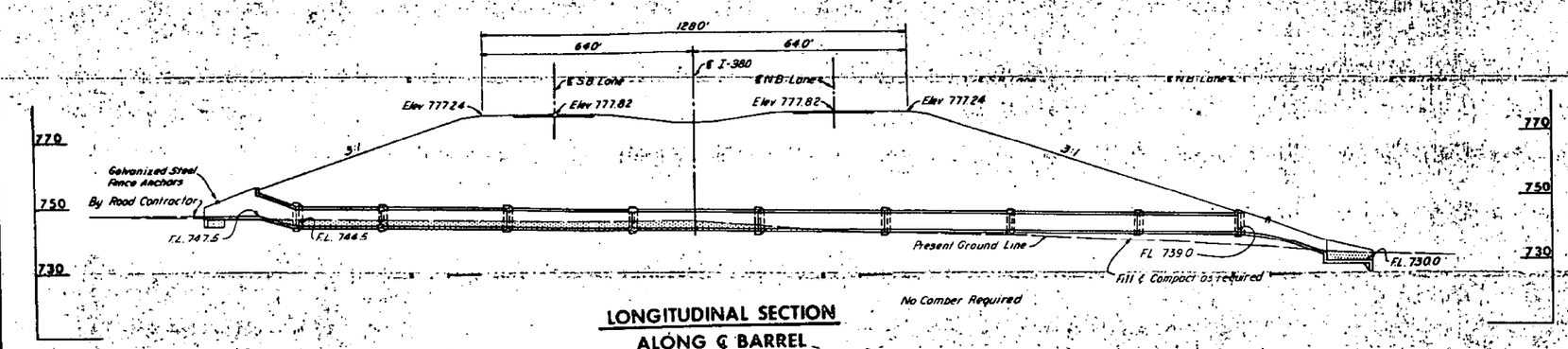
DESIGN 5468 DATE Mar. 69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE B.L.M.	DATE 3-20-69	TRACED B.L.M.	DATE 11-22-69
CHECKED C.W.S.	DATE 9-24-69	SCALE As Shown	

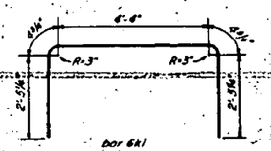
FEDERAL DIST NO	STATE	F&D AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			25	

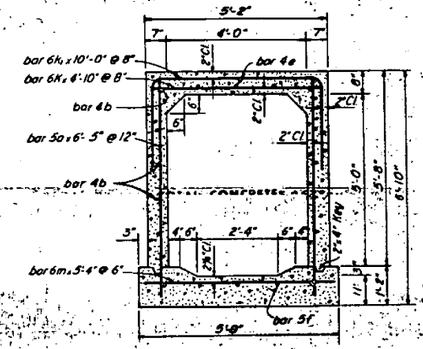
Bench Mark B1; 300' Lt Sta. 1701+40; R.R. Spk in 30" Hickory; Elev. 752.59.



LONGITUDINAL SECTION ALONG ℄ BARREL

Flume Data	Flume Curve Data
∠A = 18°25'	L_S = 16'-0⅜"
∠C = 1°06'	D = 6°-3"
B = 8'-3"	E = 7'-9⅞"
S = 88°-7¼"	P.C. Elev. = 739.00
V = 3'-11⅞"	P.I. Elev. = 736.86
W = 9'-0⅛"	P.R. Elev. = 738.60
	P.T. Elev. = 736.23
	X_1 = 8'-5⅛"
	X_2 = 7'-3⅛"
	Y_1 = 0'-6⅝"
	Y_2 = 0'-1⅝"
	$L_{1/2}$ = 4'-0⅝"





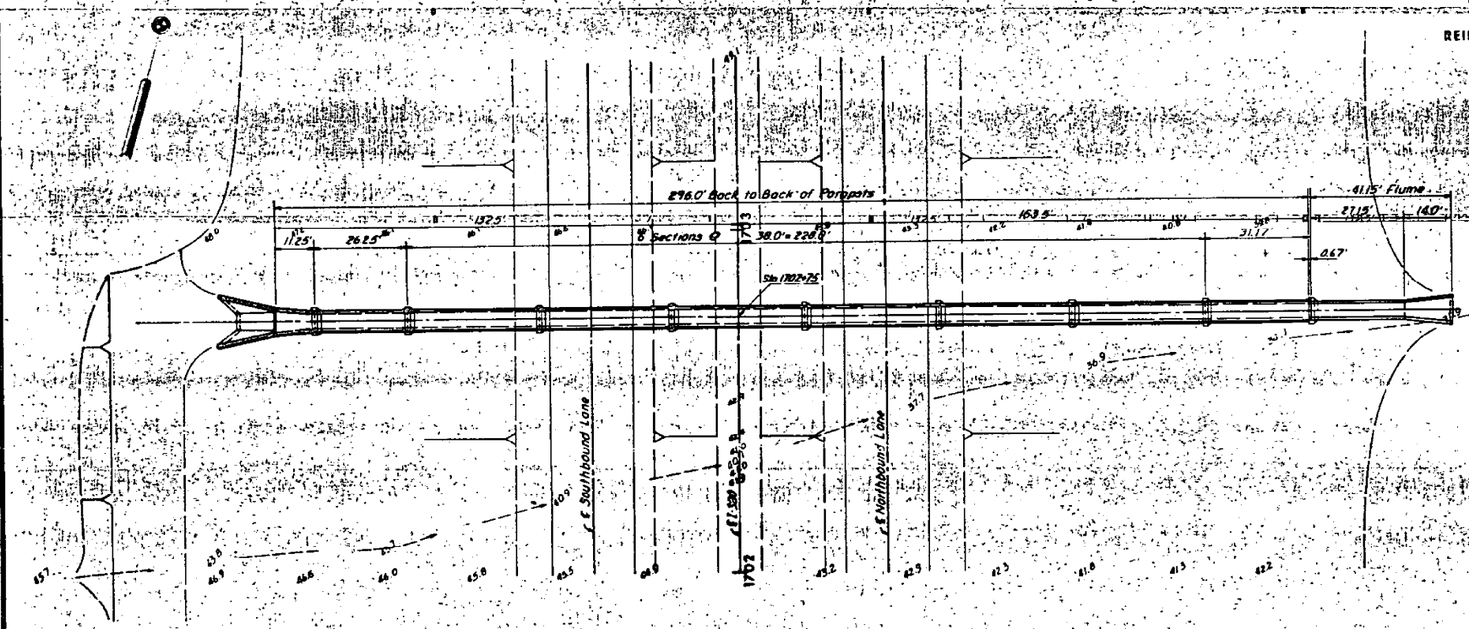
SECTION THRU BARREL

SCALE: ½"=1'-0"

QUANTITIES PER FOOT BARREL

CONCRETE:
ABOVE KEYWAY= 0.352 cy
BELOW KEYWAY= 0.220 cy
TOTAL CONCRETE= 0.572 cy

REINFORCING STEEL = 76.7 lbs



SITUATION PLAN

DES. No. 5568

SCALE: 1"=20'

Notes:
1. For Excavation Details, see Sheet No. 3 of 11a
2. For Fence Anchors Details and Notes see Sheet No. 3 of 11a. An additional 5 lbs has been included in Headwall Steel Quantities.
3. Fence Anchors in Flume to be placed at the direction of the Engineer. An additional 5 lbs. has been included in Flume Chute Quantities.
4. For Flume Curve Data Detail see sheet No. 3 of 11a
5. Use suitable excess Class 20 Excavation for Fill Material. Additional fill material is to be obtained from within Right of Way Limits by the Engineer in charge and is listed as Class 2A Excavation.

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	
6.6' Inlet Headwall	5.0 cy	8.2 cy	13.2 cy	1,625 lbs.
Barrel Inlet Section	4.5 cy	2.9 cy	7.2 cy	545 lbs.
Barrel Bell Joint at Inlet	1.2 cy	0.7 cy	1.9 cy	228 lbs.
Barrel + Outlet Parapet	100.5 cy	62.3 cy	163.3 cy	21,896 lbs.
Barrel Bell Joints (7)	8.1 cy	5.0 cy	13.1 cy	1,596 lbs.
Flume Bell Joint at Junction	0.5 cy	0.4 cy	0.9 cy	100 lbs.
Flume Chute	5.7 cy	5.1 cy	10.8 cy	780 lbs.
Flume Basin	3.1 cy	4.2 cy	7.3 cy	455 lbs.
TOTAL	128.4 cy	89.3 cy	217.7 cy	27,228 lbs.

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, C4P, C4J, F4J, CFP Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 217.7 C.Y.
REINFORCING STEEL 27,225. LBS.
PIPE CULV., ____ LIN. FT.
PIPE APRONS, ____ ONLY
EXCAVATION C.Y.
CL. 20 147 CL. 24 189 CL. 10 CHANNEL

SIZE AND TYPE 4'-5" x 7'-8" R.C. Box Culv. on 6'-6" Inlet H'wall & 41.15' Flume Outlet
DRAINAGE AREA 132 Ac. HYDROLOGY RUN 7
SECTION 9 TWP. 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1702+75
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 45&A DATE Sept 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE	B.L.M	DATE	9-5-68	TRACED	V.W.
CHECKED	C.W.S	DATE	9-30-69	SCALE	As Shown

DATE 11-20-69

Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 25

DESIGN NO. 5568 FILE NO. 22960

Bench Mark B1: 300' Lt. Sta. 1701+40; R.R. Spk. in 30" Hickory; Elev 752.39

FEDERAL DIST NO	STATE	FED AID PROJ NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			26	

11'-3" Inlet Section

Std. 6'-6" Hdwl CBH-00

4'-5" to 6'-6"; 10° Taper

bar 4k4 8sps @ 1'-3" - 10'-0"

bar 4k3 21sps @ 6" - 10'-6"

bar 4k2

bar 4k4

bar 4e2

bar 4k3

bar 4m2

bar 4m2 20sps @ 6" - 10'-0"

10'-9⅛"

10'-5⅜"

FL. El 747.5

FL. Elev. 744.5

7'-11"

6'-0"

3'-0"

6'-10"

5'-10"

LONGITUDINAL SECTION

Variable Bars

Bar 4b2
2 each length 11'-7" to 11'-9"

Bar 4k4
18 @ 11'-11" @ 10'-0" to 13'-7"

CONCRETE:
11'-3" Inlet Section
ABOVE KEYWAY= 43cy
BELOW KEYWAY= 29cy
TOTAL CONCRETE= 72cy

5'-0" to 7'-0"

4'-0" to 6'-0"

bar 4e2-4eq sps

bar 4b2

bar 4e2

bar 4k4 @ 1'-3"

4k2 @ 6"

bar 4b2

bar 4a2 @ 1'-0"

2'-4" to 3'-8"

bar 4m2

bar 5f2

bar 5f2-4eq sps

5'-6" to 7'-6"

6'-10" to 7'-1"

5'-0" to 6'-0"

Note:
All clearances shown are to ℄ of Bar

VERT. SECTION THRU TAPER

SCALE: 3/8"=1'-0"

4'-5" to 6'-3"

R-2"

Bar 4k4

5' Distance

Concrete Above Keyway

Back Face

Front Face

5slf

4clf

4dlf

4flf

4glf

2'-4" key

Concrete Below Keyway

LONGITUDINAL SECTION

Chute Reinf Steel

15'-0" (Basin Reinf Steel)

4dlf - 7sps @ 2'-0" c's = 14'-0"

4clf - 14sps @ 1'-0" c's = 14'-0"

5slf

4clf

4dlf

4flf

Variable Bars

4clf (15 bars)
1 each
long 18'-6"
short 14'-10"

PLAN VIEW BASIN 4'×5' REINF. CONC. FLUME

SCALE: 3/8"=1'-0"

bar 4a2 11sps @ 1'-0" = 11'-0"

10'-0⅝"

bar 4k4

bar 4a2

bar 4e2

bar 4k3

bar 4m2

bar 5f2

bar 4m3

7'-8"

5'-0"

6'-8"

7'-2"

6'-8"

5'-8"

4'-0"

2'-9"

5'-9"

10'-0"

11'-3"

1'-3"

PLAN VIEW

SCALE: 3/8"=1'-0"

REINF. STEEL 11'-3" INLET SECTION

BAR	LOCATION	SHAPE	No	LENGTH	LINEAR FEET #4	LINEAR FEET #5
4a2	Walls, F.F.V.		24	Shown	167.9	
4b2	Walls, F.F.H.		10	Shown	116.6	
4e2	Slab, Longit.		5	12'-7"	62.9	
5f2	Floor, Longit		5	11'-7"		57.9
4k2	Slab, Trans., Bott		22	Shown	124.7	
4k3	Slab, Trans., Bott		2	4'-8"	9.3	
4k4	Slab, Trans., Top		9	Shown	104.2	
4m2	Floor, Trans., Top		21	Shown	129.6	
4m3	Floor, Trans., Top		2	5'-2"	10.3	
				LENGTH	725.6	57.9
				WEIGHT	484.6	40.4
				TOTAL WEIGHT	525.0 lbs.	

ESTIMATE OF REINFORCING STEEL FLUME

BAR	LOCATION	SHAPE	No	LENGTH	LINEAR FEET #4	LINEAR FEET #5	Vari Bar 4c
4a	Walls, F.F.V.		28	2'-10"	79.2		18'-7" 14'-10"
4b	Walls, F.F.H.		2	28'-1"	56.2		17'-11" 14'-7"
4c	Walls, B.F.V.		11	13'-8"	150.4		17'-6" 14'-4"
4c	Walls, B.F.V.		16	Shown	246.4		16'-10" 14'-1"
4d	Walls, B.F.H.		6	29'-6"	177.0		16'-4" 13'-11"
4f1	Floor, Top		5	27'-8"	138.3		15'-9" 13'-10"
4f2	Floor, Bott		2	27'-8"	55.3		15'-6" 13'-8"
4m	Floor, Trans		16	5'-2"	72.4		15'-2" 13'-8"
5s	Wall, Top		4	29'-6"		118.0	
				LENGTH	975.3	118.0	
				WEIGHT	651.5	123.1	
				TOTAL WEIGHT	775 lbs.		

SECTION THRU FLUME CHUTE

SCALE: 3/8"=1'-0"

5'-4"

8"

4'-0"

5s

bar 4c

bar 4d

bar 4b

bar 4a

bar 4m

1'-6" Cl

1'-9" Cl

4'-6"

2'-4"

4"

3'-3"

3'-9"

1'-4"

CONCRETE:
ABOVE KEYWAY= 3.082 cy
BELOW KEYWAY= 4.237 cy
TOTAL CONCRETE= 7.319 cy

EST. OF REINF. STEEL FOR 4'×5' FLUME BASIN

BAR	LOCATION	SHAPE	No	LENGTH	LIN FT #4	LIN FT #5
4a1f	Walls F.F.V.		16	2'-10"	45.3	
4b1f	Walls F.F.H.		2	14'-9"	29.5	
4c1f	Walls & Floor B.F.V.		15	Shown	250.0	
4c1f	Walls & Floor B.F.V.		6	Shown	96.3	
4f1f	Floor Longit		6	14'-8"	88.0	
4g1f	Curtain		4	5'-8"	22.7	
4h1f	Backwall		6	8'-3"	49.5	
4m1f	Chute In Basin		2	5'-0"	10.0	
5s1f	Wing Slope		4	15'-4"		61.3
				LENGTH	585.3	61.3
				WEIGHT	391.0	63.9
				TOTAL WEIGHT	455 lbs	

Vari 4'-8" to 7'-8"

4c1f

4g1f

Bar 4h1f

BAR DETAILS

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, C4P, C4J, F4J, CFP Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE ——— C.Y.
REINFORCING STEEL ——— LBS.
PIPE CULV., ——— LIN. FT.
PIPE APRONS, ——— ONLY
EXCAVATION C.Y.
CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL

4'-5" x 6'-6" RC Box Culv. with 6'-6" Inlet Hdwl. C4J15 AND 33'-6" Apron C4F15 STRUCTURAL CONCRETE ——— C.Y.

DRAINAGE AREA 152 Ac. H. ——— MILL SI
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1702+75
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5568 DATE Sept 1968

Sheet 2 of 2.

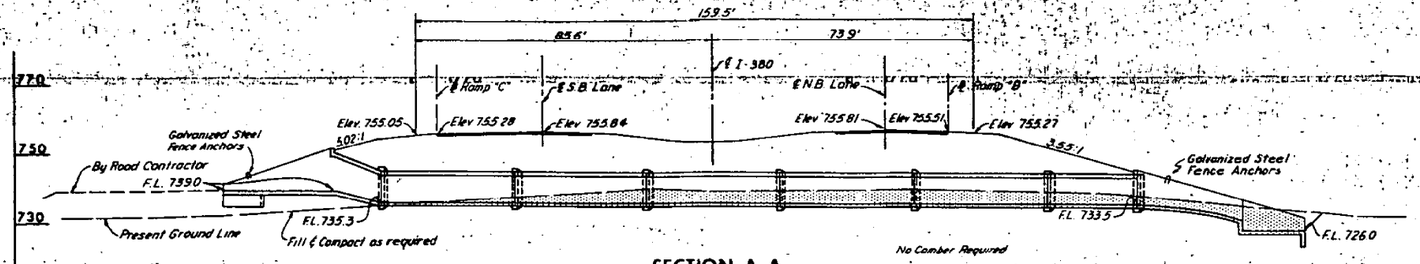
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

CHKD. W.S. DATE 9-30-69 | SCALE As Shown

DESIGN NO 5568 FILE NO 22960 Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO. 26 of

Bench Mark No 75 : 15' Rt. Sta. 1718+70 : R.R. Spk. in Cor. Fe Post. Elev. 740.48

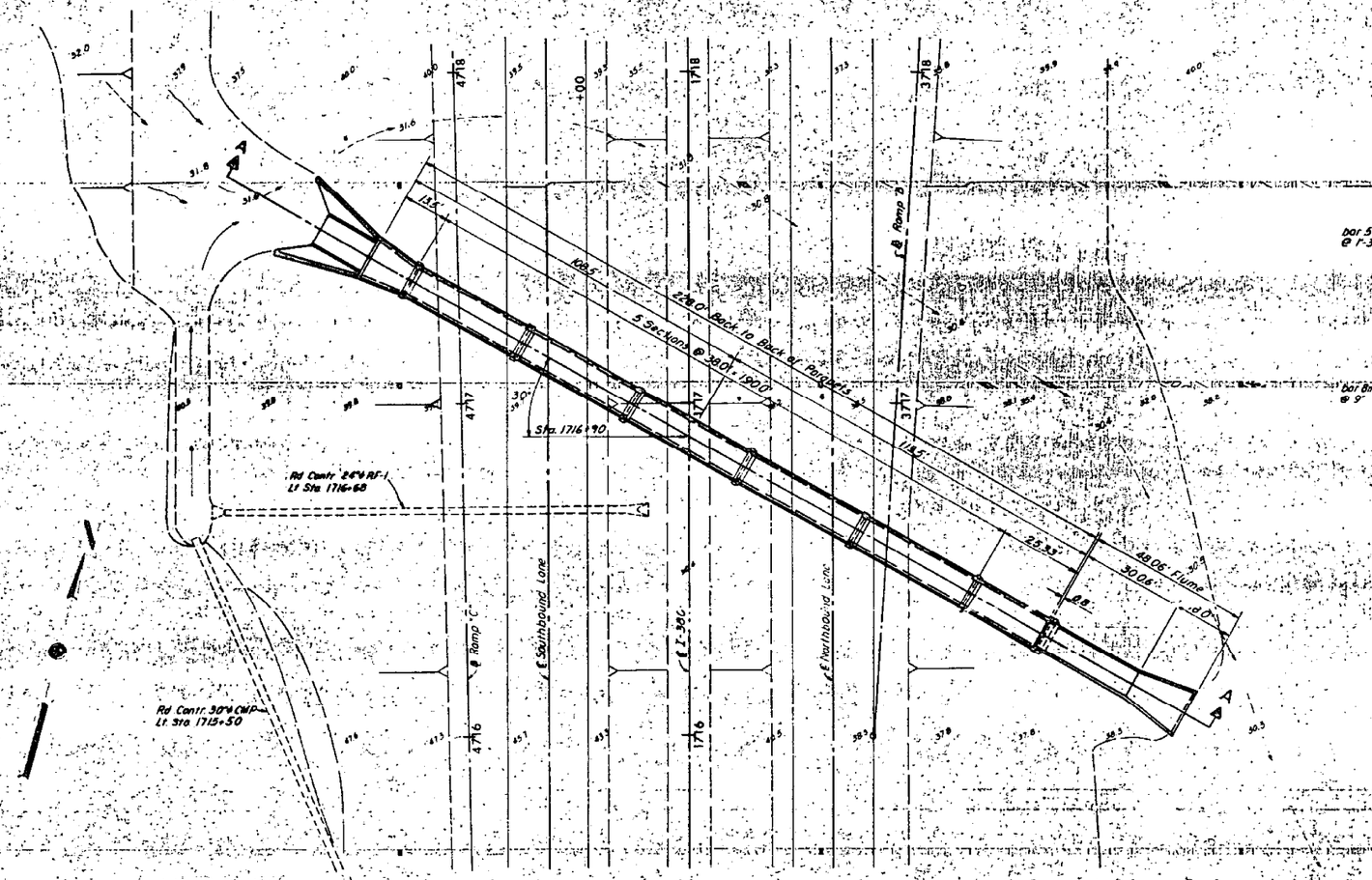
IOWA | 27



SECTION A-A

LONGITUDINAL SECTION ALONG ℄ BARREL

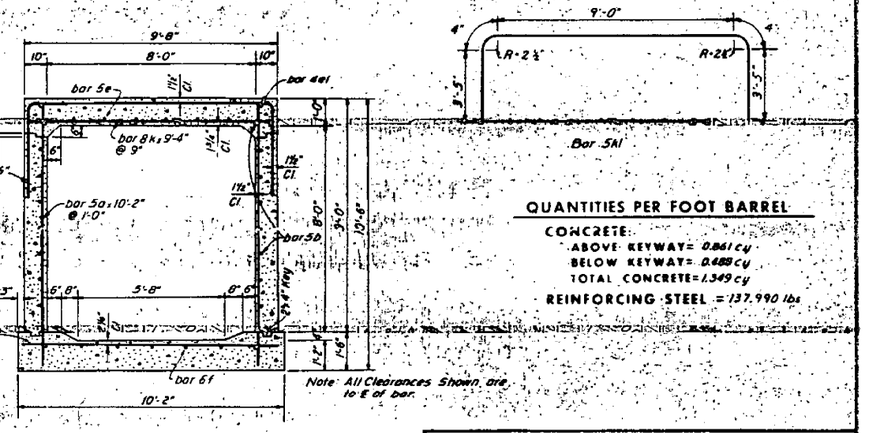
Flume Data	Flume Curve Data
∠A = 15° 57'	L_t = 29'-1⅛"
∠C = 0° 29'	D = 14° 9 ⅜"
B = 14'-0"	C = 28°-3¼"
V = 6'-2¼"	PC Elev. = 733.50
W = 8'-7⅛"	PI Elev. = 735.38
S = 31'-5⅛"	PP Elev. = 733.26
	PT Elev. = 729.30
	X_1 = 3'-11⅜"
	X_2 = 2'-2⅝"
	Y_3 = 0'-11 ⅜"
	X_4 = 0'-2⅛"
	$L_{4'}$ = 7'-3 ⅝" ±



SITUATION PLAN

DES. No. 5668

SCALE: 1"=20'



SECTION THRU BARREL

SCALE: 3/8" = 1'-0"

QUANTITIES PER FOOT BARREL

CONCRETE:
ABOVE KEYWAY = 0.861 cy
BELOW KEYWAY = 0.488 cy
TOTAL CONCRETE = 1.349 cy
REINFORCING STEEL = 137.990 lbs

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K'WY	BELOW K'WY	TOTAL	
12'x10' Inlet Headwall	130 cy	249 cy	379 cy	4,666 lbs.
Barrel Inlet Section	14.3 cy	7.9 cy	22.2 cy	2,282 lbs
Barrel Bell Joints (6)	16.3 cy	3.7 cy	20 cy	4,138 lbs
Barrel + Outlet Parapet	185.7 cy	105.1 cy	290.8 cy	29,713 lbs
Flume Bell Joint at Junction	0.8 cy	0.6 cy	1.4 cy	194 lbs
Flume Chute	10.8 cy	9.1 cy	19.9 cy	2,783 lbs
Flume Basin	5.6 cy	10.8 cy	16.4 cy	1,729 lbs
TOTAL	246.7 cy	168.1 cy	414.8 cy	45,507 lbs
* Includes Bell Joint at Inlet Taper				

Notes:
1 For Excavation Details see sheet No 3 of 110
2 For Fence Anchor Details & Notes see sheet No 3 of 110 An additional 5 lbs has been included in Headwall Steel Quantities
3 Fence Anchors in Flume to be placed at the direction of the engineer. An additional 5 lbs. has been included in Flume chute quantities.
4 For Flume Curve Data Details see sheet 3 of 110

Sheet 1 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, CBF, CBJ, FBJI, CFP Except as Noted

CBH-8; 228"ø C.M. Culvert with 12'x10' Inlet Hdwl & 480 Flume Outlet Sk 30°

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE	Class "C" 414.8	C.Y.
REINFORCING STEEL	45,507	LBS.
PIPE CULV.		LIN. FT.
PIPE APRONS		ONLY
EXCAVATION C.Y.		
CL. 20 480 CL. 24		CL. 10 CHANNEL

SIZE AND TYPE
DRAINAGE AREA 1406 Ac R FILL 13'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1716+90
PROJECT NO I-16-380-6(7)267--04-52
DESIGN 5668 DATE Sept 68

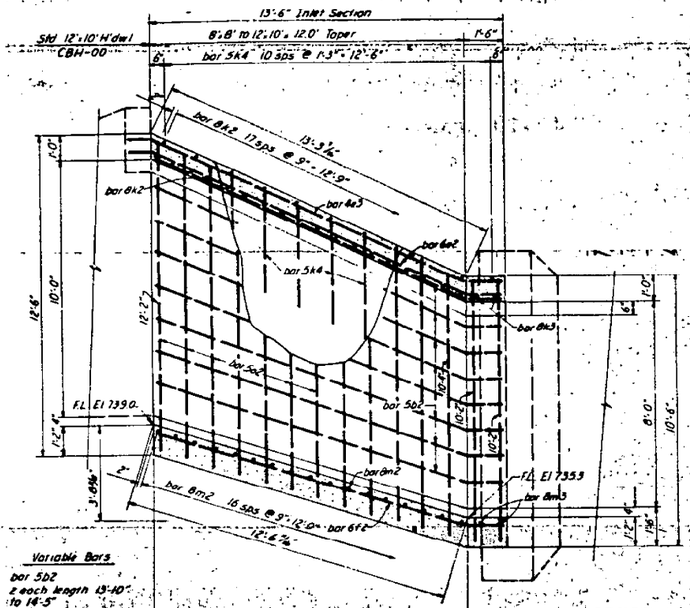
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DESIGNED B.L.H. DATE 9-9-68 | TRACED V.J. DATE 11-20-69
CHECKED C.W.S. DATE 10-1-69 | SCALE As Shown

DESIGN NO 5668 FILE NO 22060 Johnson COUNTY I-16-380-6(7)267--04-52 SHEET NO 27

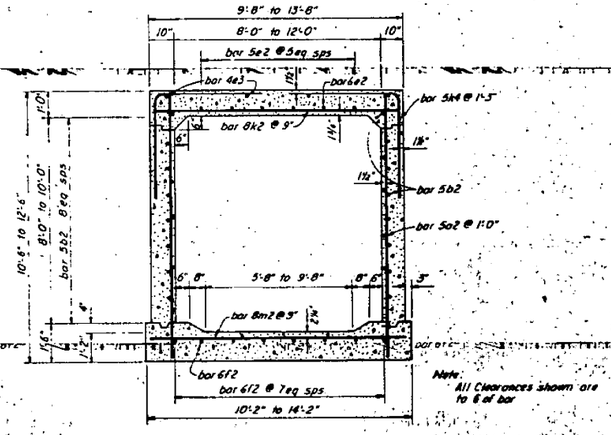
Bench Mark No 78-15 Rt Sta 1718+70; RR Spk in Car Fe Post Elev 740.48

FEDERAL DIST NO	STATE	FED AID PROJ NO	FINAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			88	



Variable Bars
bar 5b2
2 each length 13'-10" to 14'-5"

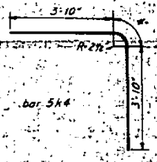
LONGITUDINAL SECTION



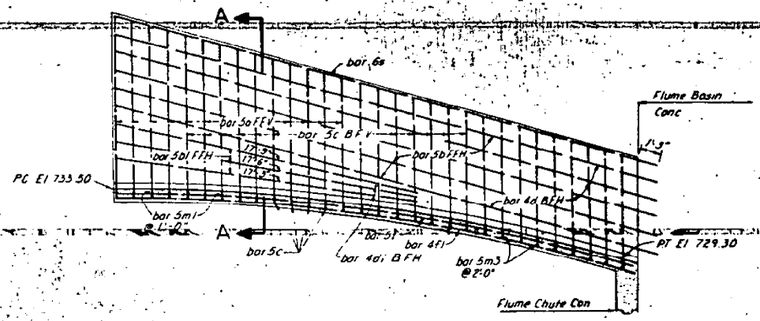
Note: All Clearances shown are ½ of bar

VERT. SECTION THRU TAPER

SCALE: 3/8"=1'-0"

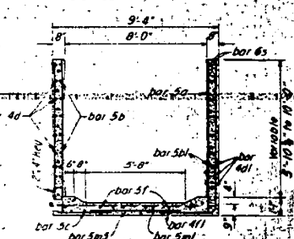


CONCRETE
13'-6" Inlet Section
ABOVE KEYWAY= 14.3 cy.
BELOW KEYWAY= 7.9 cy.
TOTAL CONCRETE= 22.2 cy.



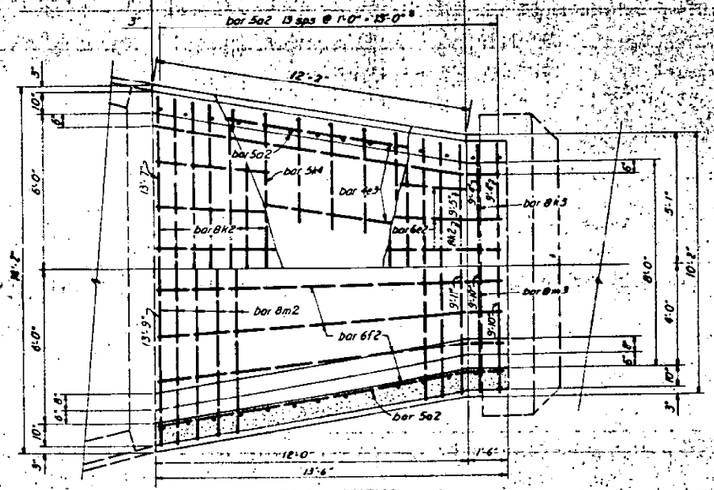
LONGITUDINAL SECTION
FLUME CHUTE WALL

SCALE 1/4"= 1'-0"



SECTION A-A
SECTION THRU FLUME CHUTE

SCALE 1/4"= 1'-0"



PLAN VIEW
INLET TAPER DETAILS

SCALE: 3/8"=1'-0"

REINF. STEEL 13'-6" INLET SECTION

BAR	LOCATION	SHAPE	No.	LENGTH	LINEAR FEET			
					4	5	6	8
5a2	Walls; F.F.V.	|	28	Shown		310.7		
5b2	Walls; F.F.H.	—	16	Shown		226.0		
6e2	Slab; Longit; Bott	—	6	15'-6"			93.0	
4e3	Slab; Longit; Top	—	4	15'-6"	62.0			
6f2	Floor; Longit.	—	8	13'-9"			110.0	
8k2	Slab; Trans; Bott	—	18	Shown				207.0
8k3	Slab; Trans; Bott	—	2	9'-4"				18.7
5k4	Slab & Walls; Transv Top	⌐	22	8'-0"		176.0		
8m2	Floor; Trans; Top	—	17	Shown				201.2
8m3	Floor; Trans; Top	—	2	9'-10"				19.7
				LENGTH	62.0	712.7	203.0	446.6
				WEIGHT	41.4	743.3	304.9	1,192.4
				TOTAL WEIGHT	2,282 lbs			

ESTIMATE OF REINF. STEEL FLUME

BAR	LOCATION	SHAPE	No	LENGTH	LINEAR FEET			Var. Bars 5c 2 each length	Var Bars 5a 2 each length
					#4	#5	#6		
5a	Walls; F.F.V.	|	60	Listed		479.7		13'-10" 10'-8"	10'-8" 7'-6"
5b	Walls; F.F.H.	—	10	32'-3"		322.5		15'-7" 10'-7"	10'-5" 7'-5"
5b1	Walls; F.F.H.	—	6	Shown		105.0		13'-4" 10'-5"	10'-2" 7'-3"
5c	Walls & Floor; B.F.V.	L	60	Listed		669.7		13'-1" 10'-4"	9'-11" 7'-2"
4a	Walls; B.F.H.	—	10	32'-3"	322.5			12'-10" 10'-3"	9'-8" 7'-1"
4d1	Walls; B.F.H.	—	6	Shown	105.0			12'-7" 10'-2"	9'-5" 7'-0"
5f	Floor; Longit; Top	/	8	30'-1"		240.6		12'-4" 10'-1"	9'-2" 6'-11"
4f1	Floor; Longit; Bott	—	2	30'-1"	60.2			12'-3" 10'-0"	9'-0" 6'-10"
5m1	Floor; Trans; Top	—	30	9'-0"		270.0		11'-11" 10'-0"	8'-9" 6'-10"
5m3	Floor; Trans; Bott	—	15	5'-2"		77.5		11'-9" 9'-11"	8'-7" 6'-9"
6s	Walls, Top	/	4	32'-4"			129.3	11'-6" 9'-10"	8'-4" 6'-8"
				LENGTH	487.7	2165.0	129.3	11'-4" 9'-10"	8'-2" 6'-8"
				WEIGHT	325.8	2,258.1	194.2	11'-2" 9'-10"	8'-0" 6'-8"
				TOTAL WEIGHT	2,778 lbs			11'-0" 9'-10"	7'-10" 6'-8"
								10'-10" 9'-10"	7'-8" 6'-8"

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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN	B.L.M.	DATE	9-9-68	TRACED	Y.W.	DATE	11-20-69
CHECKED	C.W.S.	DATE	10-1-69	SCALE	As Shown		

Sheet 2 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, CBF, CBJ, FBJI, CFP, Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE	C.Y.
REINFORCING STEEL	LBS.
PIPE CULV.	LIN. FT.
PIPE APRONS	ONLY
EXCAVATION C.Y.	
CL. 20 — CL. 24 — CL. 10 CHANNEL	

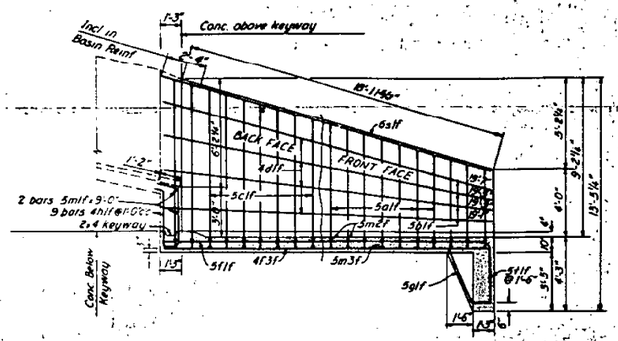
SIZE AND TYPE: 8'-8.228" R.C. Box Culv with 12'-10" Inlet Metal End Sec & Flume Outlet SB 30°

DRAINAGE AREA 1406 Ac. R. FILL 13'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1716+90
PROJECT NO I-IG-380-6(7)247--04-52
DESIGN 5668 DATE Sept. 68

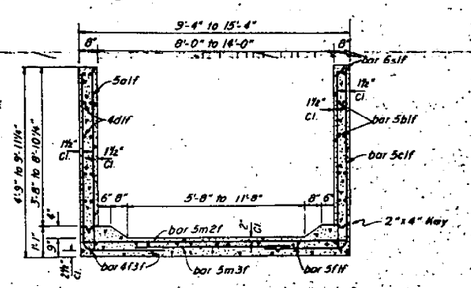
DESIGN NO. 5668 FILE NO. 22960 JOHNSON COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO 28

Bench Mark No 78: 15'Rt Sta 1718+70; RR Spk in Cbr. Fe, Post Elev. 740.48

FEDERAL DIST NO	STATE	FED. AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			29	



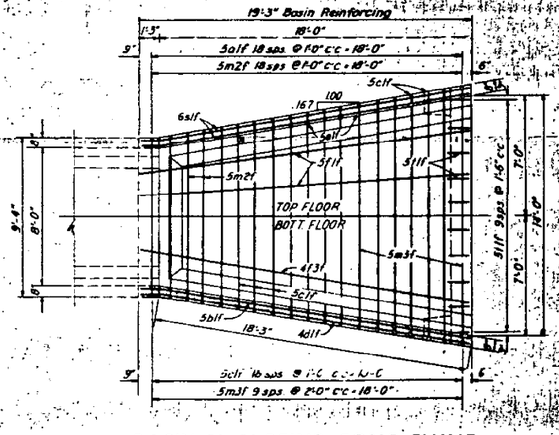
LONGITUDINAL SECTION



SECTION THRU FLUME BASIN

SCALE: 3/8"= 1'-0"

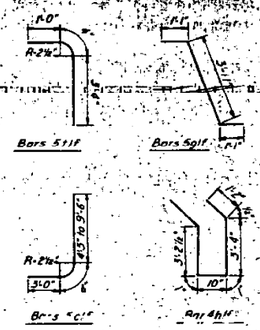
EST. OF REINF. STEEL FOR 8'×8' FLUME BASIN							
BAR	LOCATION	SHAPE	No.	LENGTH.	LIN. FT. 4#	5-8	6-9
5a1f	Walls F.F.V.	⌊	38	4'-7" to 9'-9"		272.3	
5b1f	Walls F.F.H.	—	8	Shown		154.7	
5c1f	Walls & Floor: B.F.V.	⌊⌋	38	7'-9" to 12'-10"		391.1	
4d1f	Walls B.F.H.	—	8	Shown	154.7		
5f1f	Floor Longit. Top	—	7	18'-11"		132.4	
4f3f	Floor Longit. Bott.	—	4	18'-11"	75.7		
5g1f	Curtain	⌐	4	6'-1"		24.3	
4h1f	Backwall	⌐	9	9'-8"	87.0		
5m1f	Chute in Basin	—	2	9'-0"		18.0	
5m2f	Floor Trans. Top	—	19	8'-10" to 14'-10"		224.8	
5m3f	Floor Trans. Bott.	—	10	Shown		76.0	
6s1f	Wing Slope	—	4	19'-9"			79.0
5f1f	Curtain	⌐	10	4'-8"		46.7	
				LENGTH	317.4	1340.3	79.0
				WEIGHT	615.0	1809.0	316.7
				TOTAL WEIGHT	1729	lbs.	



BASIN 8'×8' REINF. CONC. FLUME

PLAN VIEW

SCALE 1/4"= 1'-0"



BAR DETAILS

CONCRETE: FLUME BASIN
ABOVE KEYWAY= 5.64 c.y.
BELOW KEYWAY= 10.75 c.y.
TOTAL CONCRETE= 16.39 c.y.

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CONSULTING ENGINEERS
KANSAS CITY — NEW YORK

DESIGN B.L.M.	DATE 9-9-68	TRACED Y.J.	DATE 11-20-69
CHECKED C.W.S.	DATE 10-3-69	SCALE As Shown	

Sheet 3 of 3

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, CBF, CBJ, FBJI, CFP. Except as Noted

ESTIMATED QUANTITIES

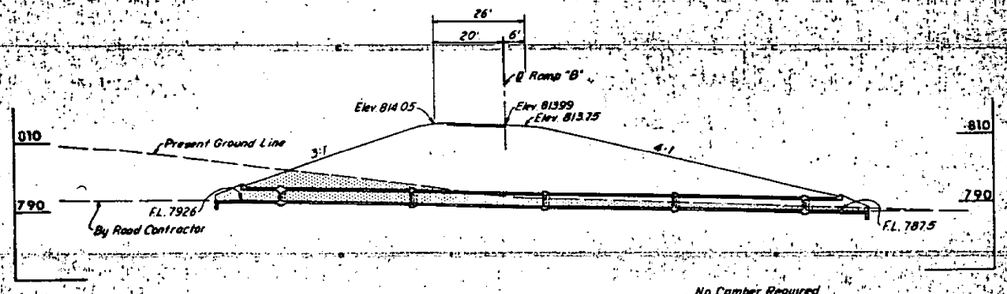
STRUCTURAL CONCRETE	C.Y.		
REINFORCING STEEL	LBS.		
PIPE CULV.	LIN. FT.		
PIPE APRONS.	ONLY		
EXCAVATION C.Y.			
CL. 20 — CL. 24		CL. 10 CHANNEL	

SIZE AND TYPE 8'-8'-228' R.C. Box Culv with 12'-10' Inlet Hood & Apron Flume Outlet Sk 30"
DRAINAGE AREA 1606 Ac. R. FILL 13'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1716+90
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5668 DATE Sept 68

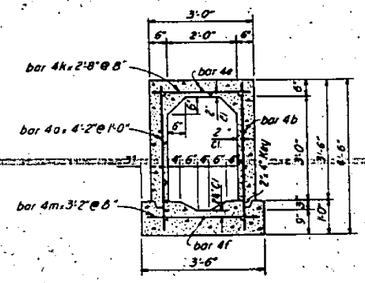
DESIGN NO 5668 FILE NO 27960 Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO 29 of

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			30	

Bench Mark No. "B" ; 1050' Rt Sta 1734+35 (I-380); RR Spk in P.P. on S Side Co Rd F-51 ; Elev = 802.85



LONGITUDINAL SECTION ALONG ℄ BARREL

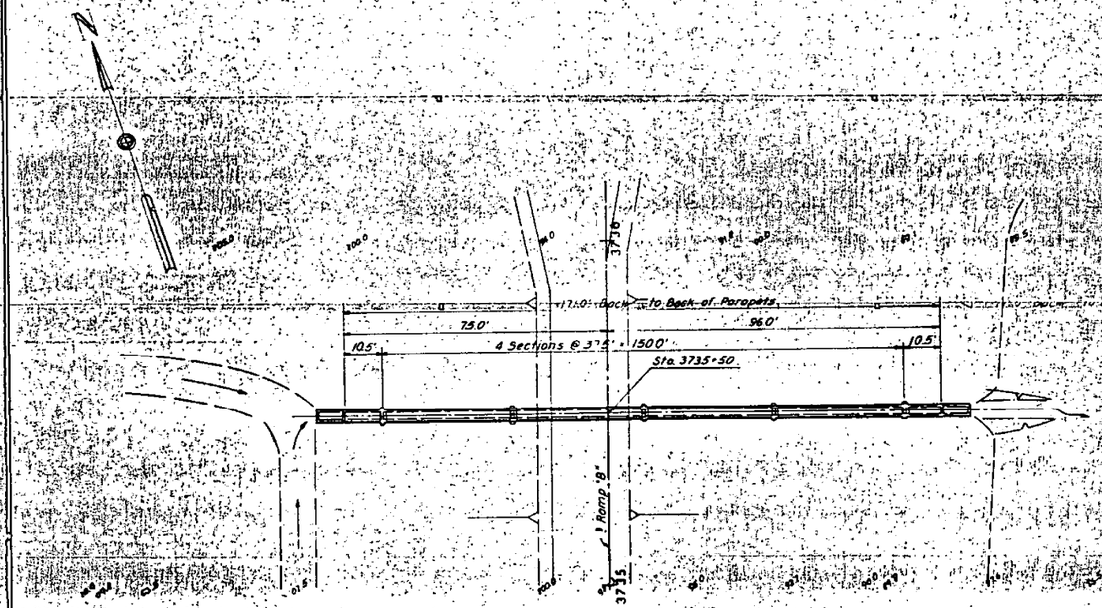


SECTION THRU BARREL

SCALE: ½"=1'-0"

QUANTITIES PER FOOT BARREL

CONCRETE:
ABOVE KEYWAY= 0.176 cy
BELOW KEYWAY= 0.122 cy
TOTAL CONCRETE= 0.300 cy
REINFORCING STEEL = 18.092 lbs.



SITUATION PLAN

DES. No. 5768
SCALE: 1"=20'

Notes:
1 For Excavation Details see sheet No. 3 of 118

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE KWY	BELOW KWY	TOTAL	
Headwalls, (2)	24 cy	27 cy	51 cy	330 lbs.
Barrel	301 cy	209 cy	510 cy	3,098 lbs
Barrel Bell Joints (5)	30 cy	17 cy	47 cy	458 lbs
TOTAL	355 cy	253 cy	608 cy	3,882 lbs

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. C2P&CHP 25-65 Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 60.8 C.Y.
REINFORCING STEEL 3.882 LBS.
PIPE CULV. ——— LIN. FT.
PIPE APRONS. ——— ONLY
EXCAVATION C.Y.
CL. 20 164 CL. 24 ——— CL. 10 CHANNEL ———

SIZE AND TYPE 2-3.17'0" RC Box Culv.
DRAINAGE AREA 3 Ac FR FILL 21'
SECTION 9 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 3735+50
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5768 DATE Sept 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

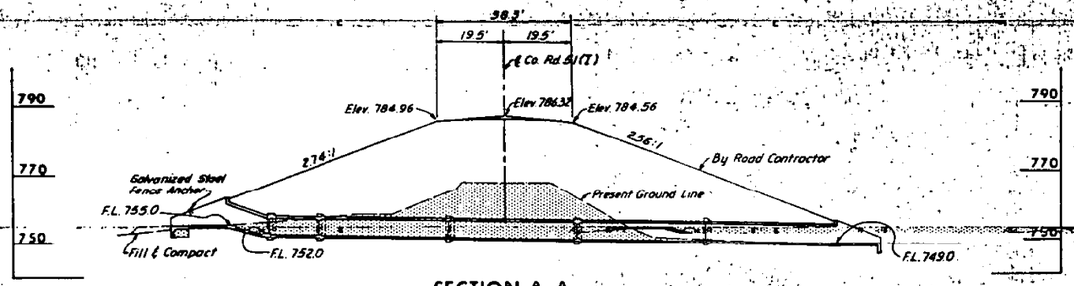
DESIGNED B.L.M. DATE 9-10-68 | TRACED T.J. DATE 11-20-69
CHECKED C.W.S. DATE 10-2-69 | SPECS A.J. SPOONER

DESIGN NO 5768 FILE NO 27960

Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO. 30 of

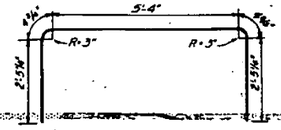
FEDERAL DIST NO	STATE	FED. AID PROJ. NO	FINAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			31	

Bench Mark No "B" - 1,370'Lf Sta 1744+40 (1-380), R.R. Spk. in N. Side of Tel. Pole on S. Side of Co. Rd. "I" Elev 772.93

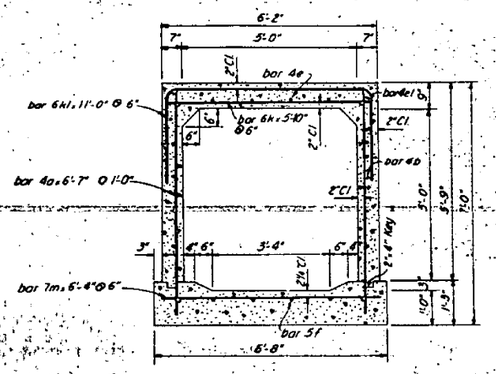


SECTION A-A

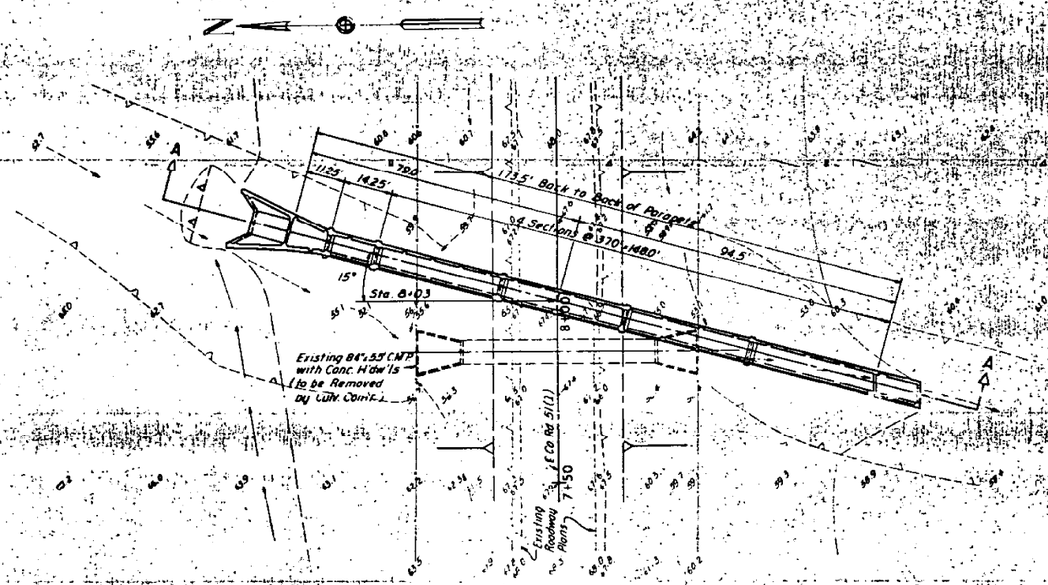
LONGITUDINAL SECTION ALONG ℄ BARREL



Bar 6kl



Notes:
1. For Excavation Details see sheet No. 3 of 1/6
2. For Fence Anchor Details and Notes see Sheet No. 3 of 1/6. An additional 10 lbs. has been included in Headwall Steel Quantities.



SITUATION PLAN

DES. No. 5868

SCALE: 1"=20'

SECTION THRU BARREL

SCALE: ½"=1'-0"

QUANTITIES PER FOOT BARREL

CONCRETE:
- ABOVE KEYWAY= 0.397 cy
- BELOW KEYWAY= 0.273 cy
- TOTAL CONCRETE= 0.670 cy

REINFORCING STEEL = 102.171 lbs

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE KEYWAY	BELOW KEYWAY	TOTAL	
8'6" Inlet Headwall	52 cy	96 cy	148 cy	1,063 lbs
Barrel Inlet Section	44 cy	34 cy	78 cy	770 lbs
Barrel	64.6 cy	44.3 cy	108.7 cy	16,577 lbs
Barrel Bell Joints (5)	6.2 cy	3.8 cy	10.0 cy	1,242 lbs
Outlet Headwall	2.8 cy	4.1 cy	6.9 cy	522 lbs
TOTAL	83.0 cy	65.2 cy	148.2 cy	20,974 lbs

Sheet 1 of 2

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. CBH-00, CSP, CSJ, & CHP 25-65 Except as Noted

OFFICIAL ESTIMATED QUANTITIES

STRUCTURAL CONCRETE	Class "C" 148.2 C.Y.
REINFORCING STEEL	20,974 LBS
PIPE CULV.	LIN. FT.
PIPE APRONS	ONLY
EXCAVATION C.Y.	
CL. 20 308 CL. 24	CL. 10 CHANNEL
Removals - As Per Plan - Lump Sum	

SIZE AND TYPE 5'5"x173.5' AC Rd. Culv. with 8'6" Inlet H'dwl Sk 15°

DRAINAGE AREA 320 Ac R FILL 30'

SECTION 19 TOWNSHIP 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 8+03 Co Rd S.I(I)

PROJECT NO I-IG-380-6(7)247--04-52

DESIGN 5868 DATE Sept 68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN BLH DATE 9-10-68 TRACED YJ DATE 11-20-68
CHECKED CWS DATE 10-2-69 SCALE As Shown

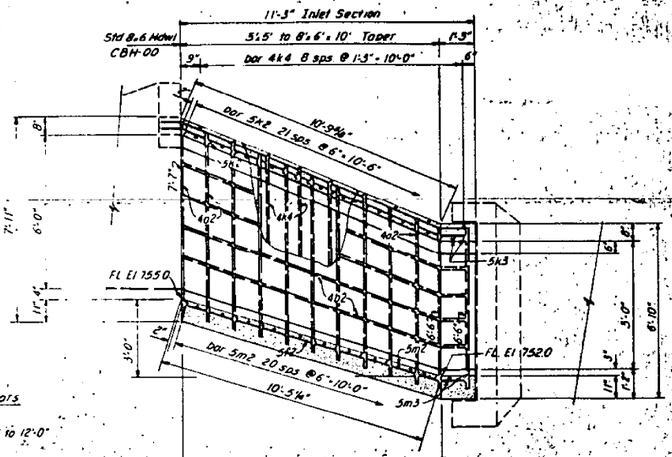
DESIGN NO. 5868 FILE NO. 22960

Johnson COUNTY I-IG-380-6(7)247--04-52 PROJECT NO.

SHEET NO. 31 of

Bench Mark No "B": L370' Lt Sta 1744+40 (1-380); R.R. Spk in N side of Tel Pole on S side of Co Rd "E" Elev 772.53

FINAL DIS. NO.	STATE	FED. AID PROJ. NO.	FINAL YEAR	SHEET NO.	TOTAL SHEETS
-	IOWA			32	



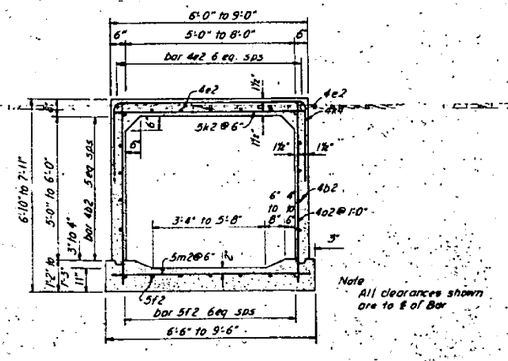
Variable Bars

bar 4b2
2 each length 11'-9" to 12'-0"

bar 4k4
18 @ 11'-1" 8@ 11'-1" to 15'-5"

LONGITUDINAL SECTION

Note:
Reinforcement bar clearances shown from face of concrete to ℄ bar.



Note
All clearances shown are to ℄ of Bar

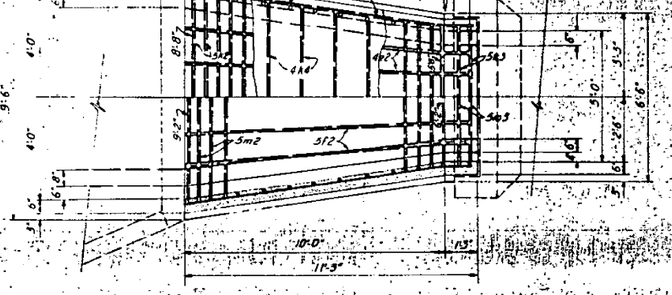
VERT. SECTION THRU TAPER

SCALE: 3/8"=1'-0"

CONCRETE: 11'-3" Inlet Section
ABOVE KEYWAY= 4.61 cu yds
BELOW KEYWAY= 3.34 cu yds
TOTAL CONCRETE= 7.75 cu yds

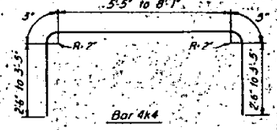
REINF. STEEL 11'-3" INLET SECTION

BAR	LOCATION	SHAPE	No	LENGTH	LIN FEET 4	LIN FEET 5
4o2	Walls F.F.V.		24	Shown	167.9	
4b2	Walls F.F.H.		10	Shown	118.8	
4e2	Slab Longit		7	12'-7"	88.1	
5f2	Floor Longit		7	11'-7"		81.1
5h2	Slab Trans Bott		82	Shown		137.1
5h3	Slab Trans Bott.		2	5'-8"		11.3
4k4	Slab Trans Top		9	Shown	116.9	
5m2	Floor Trans Top		21	Shown		161.0
5m3	Floor Trans Top		2	6'-2"		12.3
				LENGTH	491.7	423.4
				WEIGHT	328.5	441.6
				TOTAL WEIGHT	770 lbs	



PLAN VIEW

SCALE: 3/8"=1'-0"



INLET TAPER DETAILS

Sheet 2 of 2

DETAILS TO BE LIKE IOWA STATE CBM 00, CSP, CSJ, & CHP 23-65 HIGHWAY COMMISSION STDS. except as Noted "HIGHWAYS"

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE ——— C.Y.
REINFORCING STEEL ——— LBS.
PIPE CULV., ——— LIN. FT.
PIPE APRONS, ——— ONLY
EXCAVATION C.Y.
CL. 20 ——— CL. 24 ——— CL. 10 CHANNEL ———

5'-5" to 7'-3" RC Box Culv with 8'-6" Inlet Hdwl Sa 15°

SIZE AND TYPE
DRAINAGE AREA 320 Ac R FILL 30'
SECTION 419 TWP 81 RANGE 7
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION B-03 to Ro-51 (1)
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 5868 DATE Sept 68

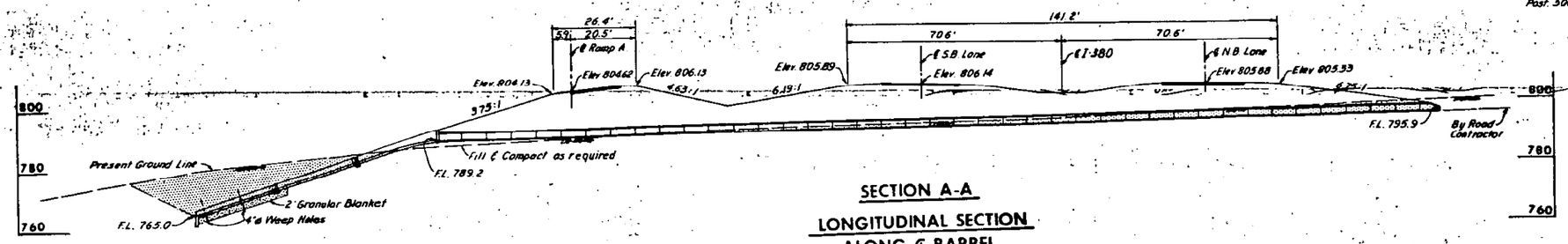
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

D.L.W. DATE 9-10-66 TRACED K.J. DATE 11-20-68
C.W.S. DATE 10-2-67 SCALE As Shown

DESIGN NO. 5868 TITLE NO. 22980 Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 32 of 110

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			33	

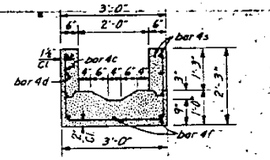
Bench Mark #87- Sta 1748+50 Set RR Spk. in Cor. Fence Post 500' Rt. Elev 827.36



SECTION A-A

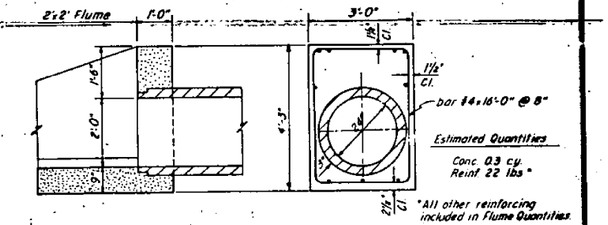
LONGITUDINAL SECTION ALONG ℄ BARREL

Flume Data	Flume Curve Data
∠A = 18°-25"	L = 12'-1¼"
∠C = 1°-10"	D = 6'-2⅝"
B = 6'-2⅝"	E = 5'-10¾"
V = 1'-7"	PC Elev = 789.20
W = 26'-1⅛"	PI Elev = 789.07
S = 82°-8¾"	PT Elev = 787.11
	X = 1'-10⅛"
	X1 = 0'-11⅞"
	X2 = 0'-4⅛"
	X3 = 0'-0⅞"
	La = 3'-0¼"



SECTION THRU FLUME CHUTE

SCALE ½" = 1'-0"



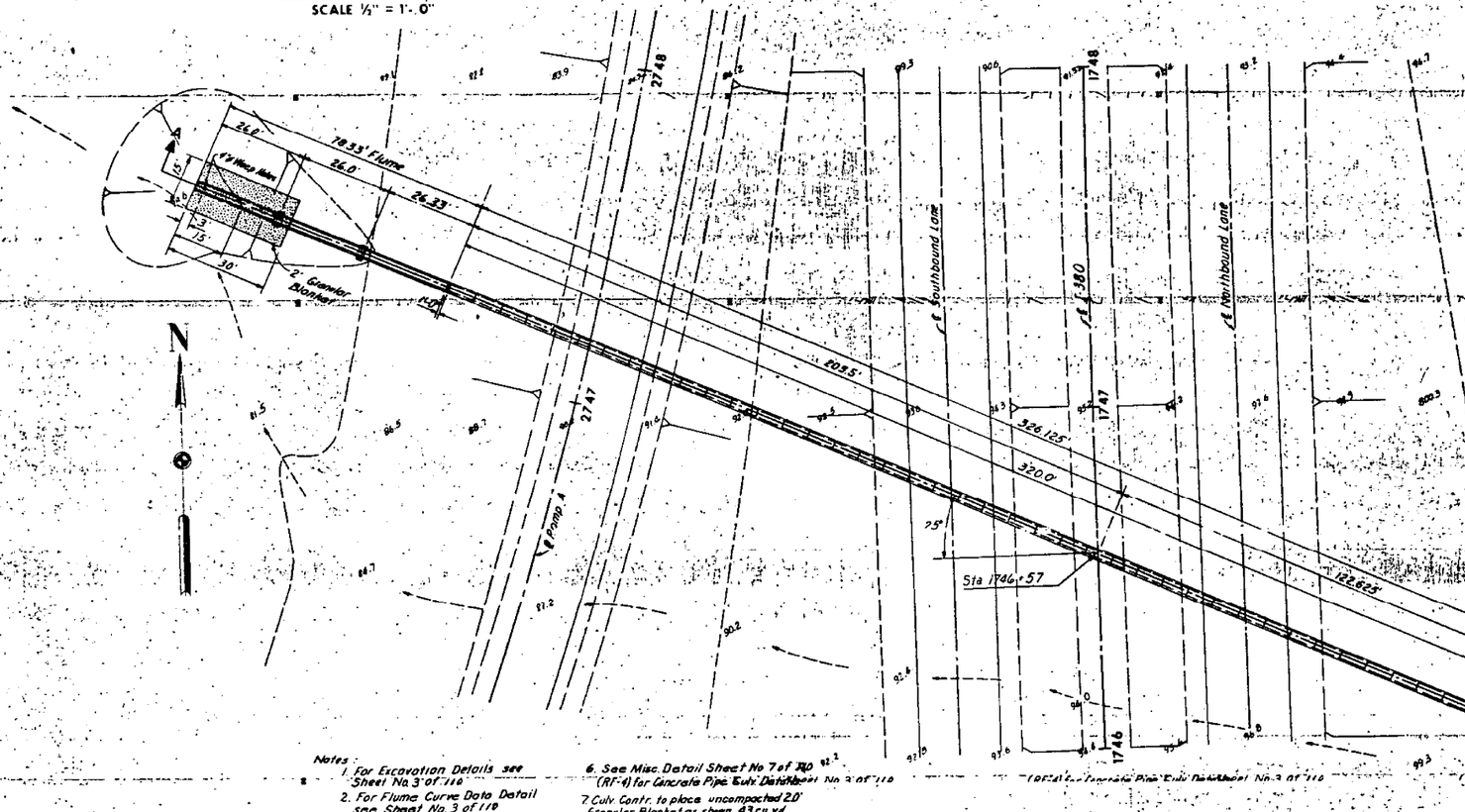
Estimated Quantities

Conc. 0.3 cy
Reinf 22 lbs *

*All other reinforcing included in Flume Quantities.

CONNECTION DETAILS

SCALE: ½"= 1'-0"



SITUATION PLAN

DES. No. 5968

SCALE: 1"=20'

ESTIMATE OF REINFORCING STEEL FLUME

BAR	LOCATION	SHAPE	No	LENGTH	LIN.FT	Bar 4c
4c	Wall & Floor; B.F.V.	⌊_⌋	15	Shown	99.9	10'-4" 6'-7"
4c	Wall & Floor; B.F.V.	⌊_⌋	66	6'-7"	434.3	9'-8" 6'-7"
4d	Wall B.F.H. Top Sec.	/	2	28'-2"	56.3	9'-0" 6'-7"
4d	Wall B.F.H. Mid. Sec.	/	2	27'-1"	54.2	8'-6"
4d	Wall B.F.H. Bott. Sec.	/	2	27'-2"	54.3	8'-0"
4f	Floor; Top Sec.	/	3	27'-3"	81.8	7'-6"
4f	Floor; Mid Sec.	/	3	27'-3"	81.8	7'-2"
4f	Floor; Bott. Sec.	/	3	27'-7"	82.7	6'-9"
4h	Curtain	⌒	3	7'-6"	22.5	6'-8"
4s	Wing; Top Sec.	/	4	28'-4"	113.3	6'-7"
4s	Wing; Mid. Sec.	/	4	27'-1"	108.3	
4s	Wing; Bott. Sec.	/	4	27'-1"	108.3	
				LENGTH	1297.1	
				WEIGHT	866.5#	

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE R'WY	BELOW R'WY	TOTAL	
Connection	-	-	0.3 cy	32 lbs.
Stub Flume	4.1 cy	8.7 cy	12.8 cy	867 lbs.
Flume Ball Joints (2)	0.2 cy	0.5 cy	0.7 cy	90 lbs
TOTAL			13.8 cy	979 lbs.

Notes:

1. For Excavation Details see Sheet No. 3 of 110
2. For Flume Curve Data Detail see Sheet No. 3 of 110
3. For Stub Flume Curtain Detail See Sheet No. 4 of 110
4. See Misc. Detail Sheet No. 5 of 110 (RF-1) For Concrete Pipe Culv. Data
5. See Misc. Detail Sheet No. 6 of 110 (RF-3) for Concrete Pipe Apron Data.
6. See Misc. Detail Sheet No. 7 of 110 (RF-4) for Concrete Pipe Culv. Data Sheet No. 3 of 110
7. Culv. Contr. to place uncompacted 2.0' Granular Blanket as shown. 43 cu yd Granular Material to be obtained from areas designated by Engineer in charge.
8. For notes pertaining to Weep Hole installation, see Sheet No. 3 of 110

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. F2J & CFP Except as Noted

ESTIMATED QUANTITIES		
STRUCTURAL CONCRETE	Class "C" 13.8	C.Y.
REINFORCING STEEL	979	LBS
24"ø CONC RDWY PIPE CULV	320	LIN. FT.
24"ø CONC APRONS	(Inlet) 1	ONLY
EXCAVATION C.Y.		
CL. 20 787 CL. 24	CL. 10 CHANNEL	
GRANULAR BLANKET	43 cu yd	

SIZE AND TYPE 24"ø & 36" Conc. Rib Pipe Culv. with 20'x 20' Stub Flume

DRAINAGE AREA 5 Ac. ft. FILL —

SECTION 6 TWP 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1746+57

PROJECT NO. I-IC-380-6(7)247--04-52

DESIGN 5968 DATE Oct 1968

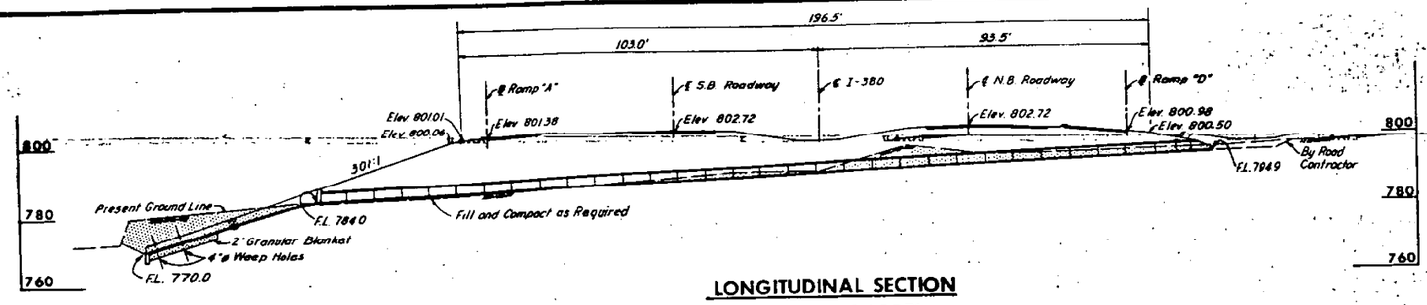
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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN	B.L.W	DATE 10-2-68	TRACED Y.J. DATE 11-20-68
CHECKED	C.W.S.	DATE 10-3-68	SCALE As Shown NO.

DESIGN NO. 5968 FILE NO 22960 Johnson COUNTY PROJECT NO. I-IC-380-6(7)247--04-52 SHEET NO 33 of

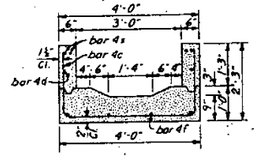
FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA			3d	

Bench Mark No 87-S10 1748+50 Set P.K. Spk. in Cor. Fence Post 500' Rt. Elev. 827.36

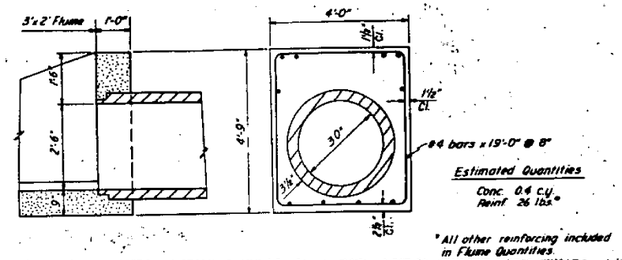


LONGITUDINAL SECTION
ALONG ℄ BARREL

Flume Data	Flume Curve Data
A = 18°-25'	L_a = 16'-7½"
C = 2°-26'	D = 8'-6½"
B = 8'-6½"	E = 8'-6"
V = 1'-7"	P.C. Elev = 784.00
W = 16'-5"	P.I. Elev = 793.64
S = 51'-11¾"	P.P.I. Elev = 793.29
	P.T. Elev = 790.95
	X_1 = 2'-4 3/16"
	X_2 = 1'-2 5/16"
	X_3 = 0'-4 13/16"
	X_4 = 0'-3/8"
	L_t = 9'-1 3/8"



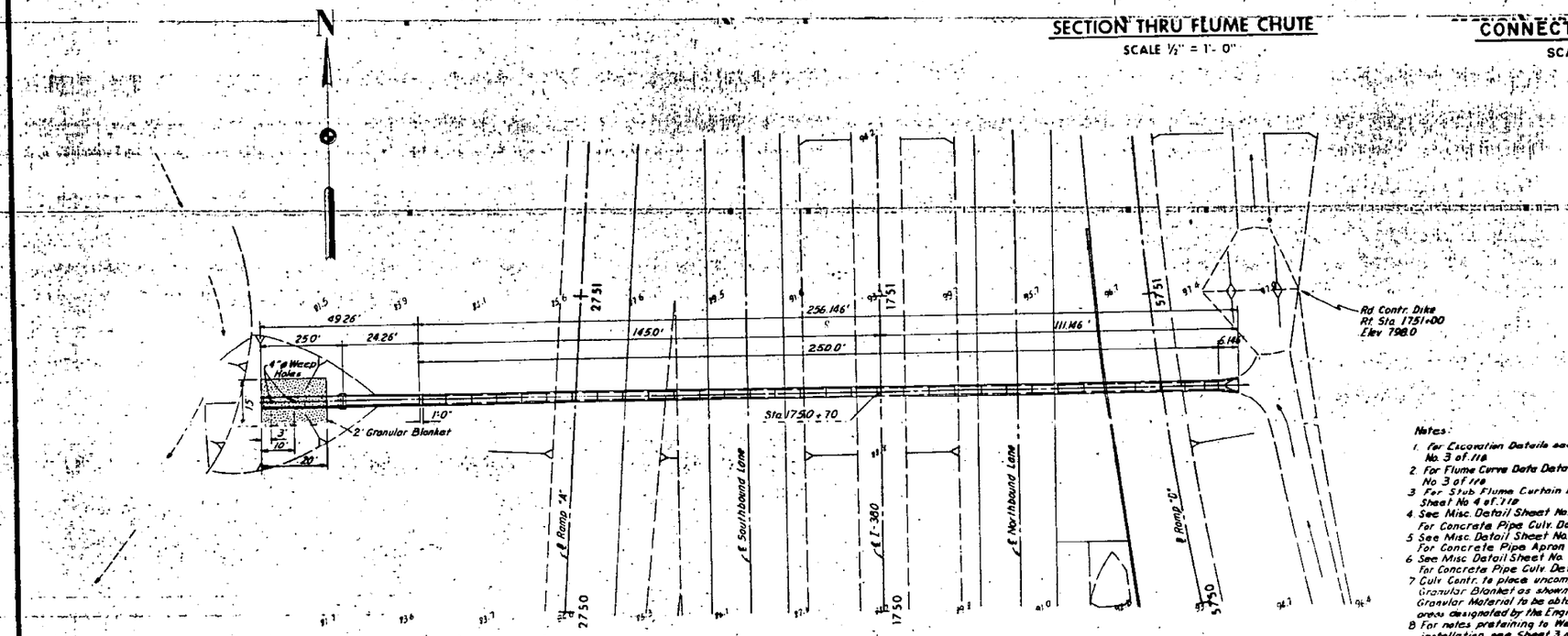
SECTION THRU FLUME CHUTE
SCALE ½" = 1'-0"



Estimated Quantities
Conc. 0.4 c.y.
Reinf. 26 lbs.*

*All other reinforcing included in Flume Quantities.

CONNECTION DETAILS
SCALE: 1/2"=1'-0"



SITUATION PLAN
DES. No. 6068
SCALE: 1"=20'

Notes:
1. For Excavation Details see Sheet No. 3 of 118
2. For Flume Curve Data Detail see Sheet No 3 of 118
3. For Stub Flume Curtain Detail see Sheet No 4 of 118
4. See Misc. Detail Sheet No 5 of 118 (RF-1) For Concrete Pipe Culv. Data
5. See Misc. Detail Sheet No 6 of 118 (RF-3) For Concrete Pipe Apron Data
6. See Misc. Detail Sheet No. 7 of 118 (RF-4) for Concrete Pipe Culv. Details
7. Culv. Contr. to place uncompacted 2.0' Granular Blanket as shown, 29 cu yd Granular Material to be obtained from areas designated by the Engineer in charge
8. For notes pretaining to Weep Hole installation, see Sheet 3 of 118.

ESTIMATE OF REINFORCING STEEL FLUME

B.I.R.	LOCATION	SHAPE	No.	LENGTH	LIN. FT.	Bar 4c.
4c	Wall & Floor; B.F.V.	⌊⌋	17	Shown	155.8	12'-4" 8'-5"
4c	Wall & Floor; B.F.V.	⌊⌋	33	7'-7"	250.1	17'-10" 8'-3"
4d	Wall B.F.H. Top Sect.	—	2	25'-3"	50.5	11'-9" 8'-1"
4d	Wall B.F.H. Bott. Sect.	—	2	26'-3"	52.5	10'-8" 7'-9"
4f	Floor; Top Sect.	—	4	25'-2"	104.7	10'-0" 7'-9"
4f	Floor; Bott. Sect.	—	4	25'-1"	104.3	9'-10" 7'-9"
4h	Curtain	⊏	4	7'-6"	30.0	9'-4" 7'-7"
						8'-11" 7'-7"
4s	Wing; Top Sect.	—	4	26'-2"	104.7	8'-7"
4s	Wing; Bott. Sect.	—	4	26'-1"	104.3	
				LENGTH	956.9	
				WEIGHT	639.2 lbs.	

PLACEMENT QUANTITIES

CONCRETE IN PARTS				REINFORCING STEEL
LOCATION	ABOVE K'W'S	BELOW K'W'S	TOTAL	
Connection	-	-	0.4 c.y.	26 lbs.
Stub Flume	2.9 cy	7.0 cy	9.9 cy	639 lbs.
Flume Bell Joint	0.1 cy	0.3 cy	0.4 cy	81 lbs.
TOTAL	-	-	10.7 cy	746 lbs.

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. F2J, F3J & CFP Except as Noted

ESTIMATED QUANTITIES

STRUCTURAL CONCRETE Class "C" 10.7 C.Y.
REINFORCING STEEL 716 LBS.
30"ø CONC. RDWY PIPE CULV. 250 LIN. FT.
20 ø CONC. APRONS (Inlet) 1 ONLY
EXCAVATION C.Y.
CL. 20 333 CL. 24 — CL. 10 CHANNEL
GRANULAR BLANKET 29 cu yd

SIZE AND TYPE 30"ø x 256' Conc. Rdwy. Pipe Culv. with 30'x20' Stub Flume
DRAINAGE AREA 12 Ac. R + — FILL 7
SECTION 9 TWP. 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1750+70
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 6068 DATE Oct. 1968

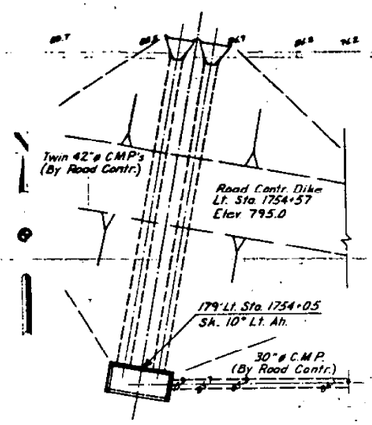
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN	B.L.M.	DATE	10-2-68	TRACED	T.J.	DATE	11-20-69
CHECKED	C.W.S.	DATE	10-6-69	SCALE	As Shown		

DESIGN NO. 6068 FILE NO. 22960 Johnson COUNTY PROJECT NO. I-IG-380-6(7)247--04-52 SHEET NO. 3d OF 4d

BENCH MARK NO. 88: Sta 1755+00 Set R.R. Spk. in Fe. Post 600' Rt Elev 836.67

FEDERAL DIST. NO	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			35	



SITUATION PLAN

DES. No. 6168

SCALE: 1"=20'

EST. OF REINFORCING STEEL

MARK	LOCATION	SHAPE	NO.	LENGTH	LIN. FT. 4	LIN. FT. 5
4b	Wing; B.F.H.	⌐	2	9'-6"	19.0	
4b1	Wing; B.F.H.	⌐	6*	5'-3" to 8'-4"	34.7	
5b2	Headwall; B.F.H.	—	4	17'-2"		68.7
4c	Wing & Floor; B.F.V.	⌐	16*	3'-9" to 6'-7"	82.6	
4c1	Wing & Floor; B.F.V.	⌐	2	6'-10"	13.7	
5c2	Hdwall & Floor; B.F.V.	⌐	18	13'-6"		243.0
5f	Floor; Top, Longit.	—	17	10'-7"		179.9
5m	Floor; Top, Transv.	—	13	17'-8"		229.7
5m1	Floor; Bott. Transv.	—	8	17'-8"		141.4
4s	Wing; Slope	⌐	4	9'-3"	37.0	
5s1	Headwall; Top	—	12	17'-2"		206.4
				Total Length	187.0	897.0
				Weight	124.9	935.6
				Total Weight	1,060 Lbs.	

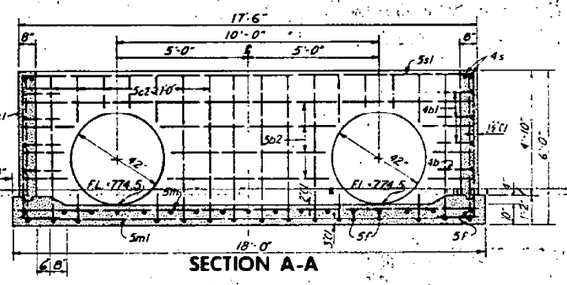
* Two Each Length

HEADWALL CONC.

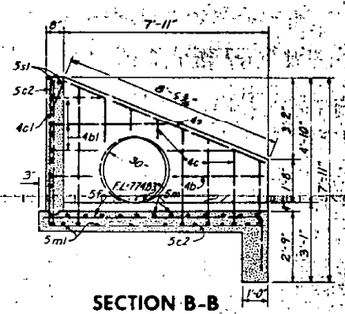
CONCRETE:
ABOVE KEYWAY= 2.6 c.y.
BELOW KEYWAY= 6.5 c.y.
TOTAL CONCRETE= 9.1 c.y.

Notes

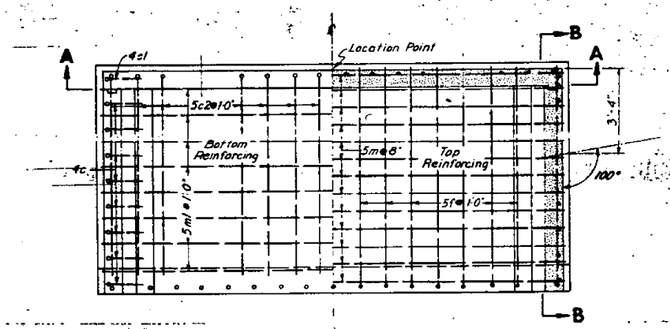
1. Culv. Contr. to provide openings in Headwall at locations shown on detailed plans.
2. Reinforcing bars shall be cut and/or bent at pipe openings and shall be securely tied together and fastened to secure against any possible displacement during the placing of concrete.



SECTION A-A

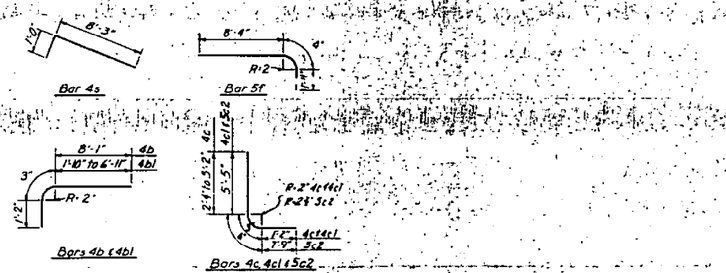


SECTION B-B



PLAN VIEW

SCALE: 3/8"=1'-0"



BENT BAR DETAILS

CONCRETE IN PARTS

LOCATION	ABOVE K'W'Y	BELOW K'W'Y	TOTAL	REIN-FORCING STEEL
Headwall	2.6 cy.	6.5 cy.	9.1 cy.	1,061 lbs
TOTAL	2.6 cy.	6.5 cy.	9.1 cy.	1,061 lbs

SPECIAL OUTLET HEADWALL

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN D.L.M. DATE 5-24-69 TRACED T.J. DATE 11-20-69
CHECKED C.W.S. DATE 10-8-69 SCALE As Shown

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS.

ESTIMATED QUANTITIES

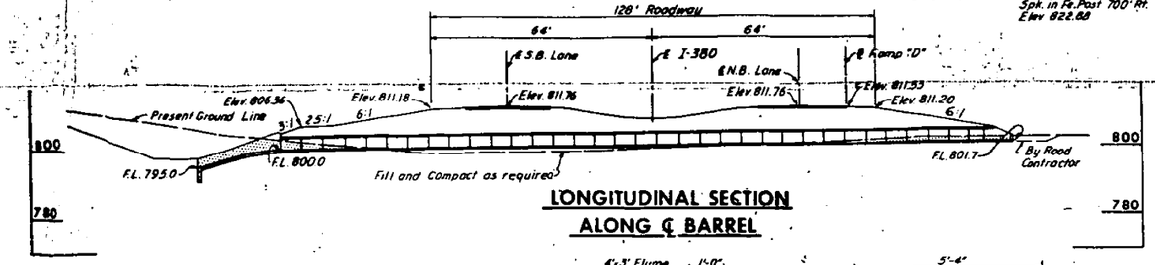
STRUCTURAL CONCRETE — Class "C" 9.1 — C.Y.
REINFORCING STEEL 1,061 LBS.
PIPE CULV., LIN. FT.
PIPE APRONS, ONLY
EXCAVATION C.Y.
CL. 20 9 CL. 24 CL. 10 CHANNEL

SIZE AND TYPE Special Outlet Headwall
DRAINAGE AREA — FILL —
SECTION 4 TWP 81 N RANGE 7 W
CIVIL TOWNSHIP Jefferson
COUNTY Johnson
STATION 1754+05 - 179'Lt
PROJECT NO. I-IG-380-6(7)247--04-52
DESIGN 6168 DATE Dec. 68

DESIGN NO. 6168 FILE NO. 22960 Johnson COUNTY PROJECT NO I-IG-380-6(7)247--04-52 SHEET NO. 35 of 110

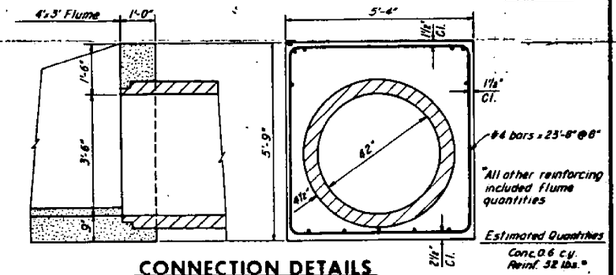
FEDERAL DIST NO	STATE	FED. AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA			36	

Bench Mark No 89: Sta 1760+50 Set R.R. Spk. in Fe. Post 700' Rt. Elev. 822.88



LONGITUDINAL SECTION ALONG ℄ BARREL

ESTIMATE OF REINFORCING STEEL FLUME						
BAR	LOCATION	SHAPE	No	LENGTH	LIN. FT	Vert. Bars 4c
4c	Wall & Floor; B.F.V.		16	Shown	196.3	15'-8" 11'-7"
4c	Wall & Floor; B.F.V.		7	10'-6"	73.5	15'-0" 11'-3"
4d	Wall; B.F.H		2	24'-3"	48.5	14'-5" 11'-0"
4f	Floor; Bott.		6	24'-2"	145.0	13'-10" 10'-10"
4h	Curtain		6	7'-6"	45.0	13'-3" 10'-9"
						12'-9" 10'-8"
4s	Wing		4	24'-11"	99.7	12'-4" 10'-7"
						11'-11" 10'-6"
				LENGTH	608.0	
				WEIGHT	406.1 lbs.	



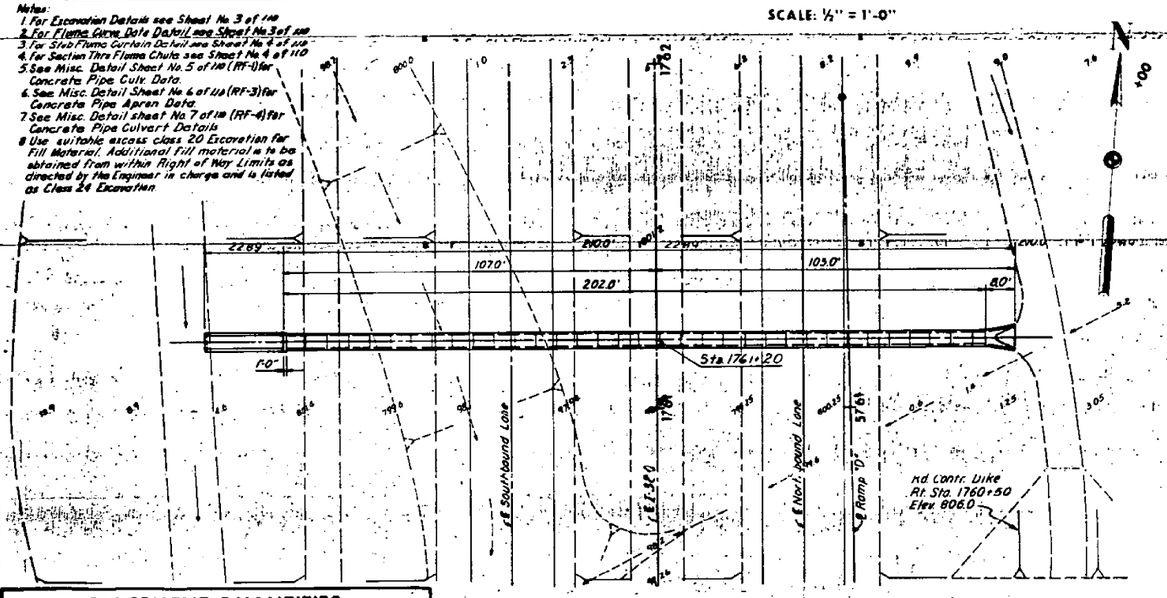
"All other reinforcing included Flume quantities

Estimated Quantities
Conc. 0.6 cy.
Reinf. 52 lbs.*

CONNECTION DETAILS

SCALE: ½" = 1'-0"

Notes:
1. For Excavation Details see Sheet No. 3 of 110
2. For Flume Curve Data Detail see Sheet No. 3 of 110
3. For Stub Flume Curtain Detail see Sheet No. 4 of 110
4. For Section Thru Flume Chute see Sheet No. 4 of 110
5. See Misc. Detail Sheet No. 5 of 110 (RF-1) for Concrete Pipe Culv. Data.
6. See Misc. Detail Sheet No. 6 of 110 (RF-3) for Concrete Pipe Apron Data.
7. See Misc. Detail sheet No. 7 of 110 (RF-4) for Concrete Pipe Culvert Details
8. Use suitable excess class 20 Excavation for Fill Material. Additional fill material is to be obtained from within Right of Way Limits as directed by the Engineer in charge and is listed as Class 24 Excavation.



SITUATION PLAN

DES. No. 6268

SCALE: 1"=20'

PLACEMENT QUANTITIES				
CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K.W.Y.	BELOW K.W.Y.	TOTAL	
Connection	-	-	06 cy	32 lb
Stub Flume	31 cy	47 cy	78 cy	406 lb
TOTAL	-	-	84 cy	438 lb

Flume Data
∠A = 18°25'
∠C = 0°24'
B = 8'-1⅝"
V = 2'-4⅛"
W = 7'-7⅛"
S = 24'-1⅞"

Flume Curve Data
L_3 = 15'-10⅛"
D = 8'-1⅛"
E = 7'-8⅞"
P.C. Elev = 800.00
P.T. Elev = 799.94
PP Elev = 799.88
PT Elev = 797.37
X_1 = 2'-6⅛"
X_2 = 1'-4⅞"
X_3 = 0'-7⅜"
X_4 = 0'-1⅝"
L_2 = 3'-11⅜"

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. F4J ℄ CFP Except as Noted

ESTIMATED QUANTITIES	
STRUCTURAL CONCRETE	Class "C" 84 cy C.Y.
REINFORCING STEEL	438 lb LBS.
42" ℄ CONC RDWY PIPE CULV.	202 LIN. FT.
42" ℄ CONC APRONS	(Inlet) 1 ONLY
EXCAVATION C.Y.	
CL. 20 76 CL. 24 41 CL. 10 CHANNEL	

42"ϕ-210.0' Conc. Ribby Pipe Culv. with 40:30 Stub Flume

SIZE AND TYPE

DRAINAGE AREA 55 Ac R FILL —

SECTION 4 TWP 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

COUNTY Johnson

STATION 1761+20

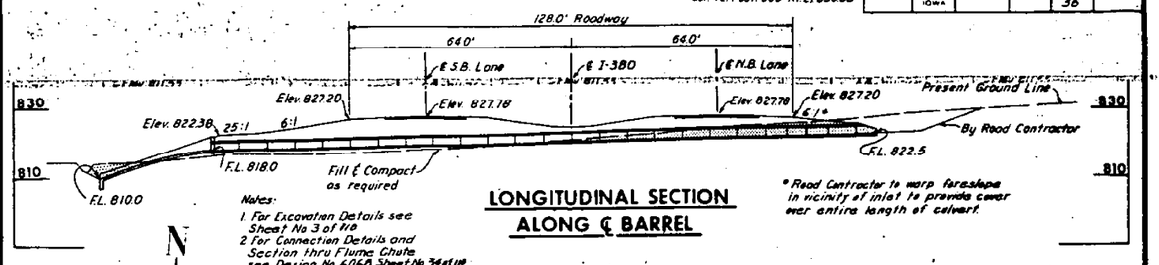
PROJECT NO. I-16-380-6(7)247--04-52

DESIGN 6268 DATE Oct 1968

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DESIGNED B.L.H. DATE 10-7-68
CHECKED C.W.S. DATE 10-7-68
TRACED Y.J. DATE 11-20-69
SCALE As Shown

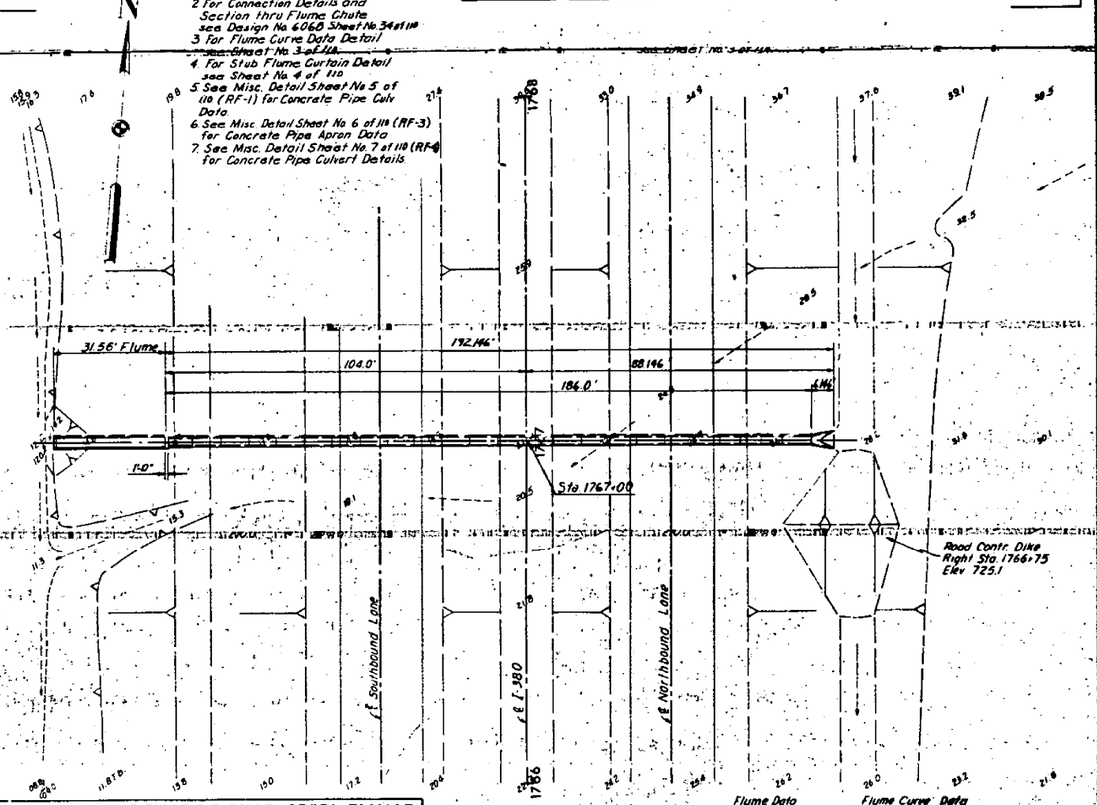
Bench Mark No 90: Sta 1766+00 Set R.R. Spk in Cor. Fe. Post 800' Rt. Elev 850.88



* Road Contractor to warp foreslope in vicinity of inlet to provide cover over entire length of culvert.

LONGITUDINAL SECTION ALONG ℄ BARREL

Notes:
1. For Excavation Details see Sheet No. 3 of 110
2. For Connection Details and Section thru Flume Chute see Design No. 6068 Sheet No. 34 of 110
3. For Flume Curve Data Detail see Sheet No. 3 of 110
4. For Stub Flume Curtain Detail see Sheet No. 4 of 110
5. See Misc. Detail Sheet No. 5 of 110 (RF-1) for Concrete Pipe Culv. Data.
6. See Misc. Detail Sheet No. 6 of 110 (RF-3) for Concrete Pipe Apron Data
7. See Misc. Detail Sheet No. 7 of 110 (RF-4) for Concrete Pipe Culvert Details.



ESTIMATE OF REINFORCING STEEL FLUME						
BAR	LOCATION	SHAPE	No	LENGTH	LIN. FT	Vert. Bars 4c
4c	Wall & Floor; B.F.V.		16	Shown	147.9	12'-4" 8'-5"
4c	Wall & Floor; B.F.V.		16	7'-7"	121.3	11'-9" 8'-3"
4d	Wall; B.F.H		2	33'-5"	66.8	11'-2" 8'-1"
4f	Floor; Bott.		4	33'-5"	133.7	10'-8" 7'-9"
4h	Backwall		4	7'-6"	30.0	10'-2" 7'-7"
						9'-9" 7'-7"
4s	Wing		4	34'-0"	136.0	9'-4" 7'-7"
				LENGTH	635.7	8'-11"
				WEIGHT	4246 lbs	8'-7"

SITUATION PLAN

DES. No. 6368

SCALE: 1"=20'

Flume Data
∠A = 18°25'
∠C = 1°.20'
B = 7'-10⅜"
V = 1'-7"
W = 10'-6¼"
S = 33°-3⅝"

Flume Curve Data
L_3 = 15'-9⅝"
D = 7'-10⅜"
E = 7'-6⅜"
P.C. Elev = 818.00
P.T. Elev = 818.82
PP Elev = 818.64
P.T. Elev = 815.32
X_1 = 2'-3⅜"
X_2 = 1'-2⅛"
X_3 = 0'-5⅜"
X_4 = 0'-1"
L_2 = 3'-10⅜"

DETAILS TO BE LIKE IOWA STATE HIGHWAY COMMISSION STDS. F2J ℄ CFP Except as Noted

PLACEMENT QUANTITIES				
CONCRETE IN PARTS				REIN-FORCING STEEL
LOCATION	ABOVE K.W.Y.	BELOW K.W.Y.	TOTAL	
Connection	-	-	04 cy	26 lb
Stub Flume	2.0 cy	4.5 cy	6.5 cy	425 lb
TOTAL	-	-	6.9 cy	451 lb

ESTIMATED QUANTITIES	
STRUCTURAL CONCRETE	Class "C" 6.9 cy C.Y.
REINFORCING STEEL	451 LBS.
30" ϕ CONC RDWY PIPE CULV.	186 LIN. FT.
30" ϕ CONC APRONS	(Inlet) 1 ONLY
EXCAVATION C.Y.	
CL. 20 71 CL. 24 CL. 10 CHANNEL	

30"ϕ-192' Conc. Ribby Pipe Culv. with 30:20 Stub Flume

SIZE AND TYPE

DRAINAGE AREA 12 Ac R FILL —

SECTION 4 TWP 81 N RANGE 7 W

CIVIL TOWNSHIP Jefferson

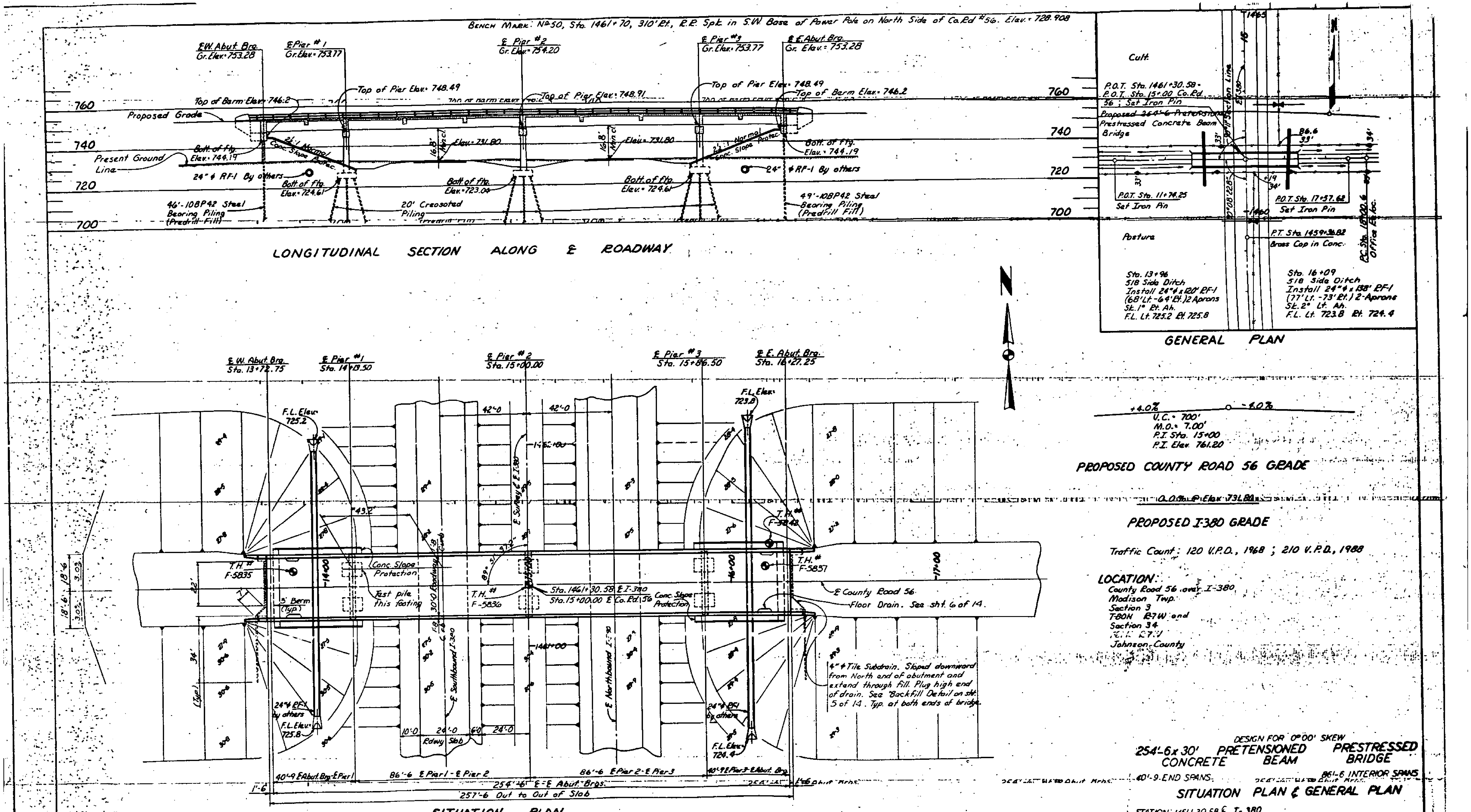
COUNTY Johnson

STATION 1767+00

PROJECT NO. I-16-380-6(7)247--04-52

DESIGN 6368 DATE Oct 1968

DESIGN NO 6268 & 6368 FILE NO 22960 Johnson COUNTY PROJECT NO. I-16-380-6(7)247--04-52 SHEET NO. 36 of 110



* Minimum clear distance from face of column to ℄ Roadway

Traffic Count: 120 V.P.D., 1968 ; 210 V.P.D., 1988

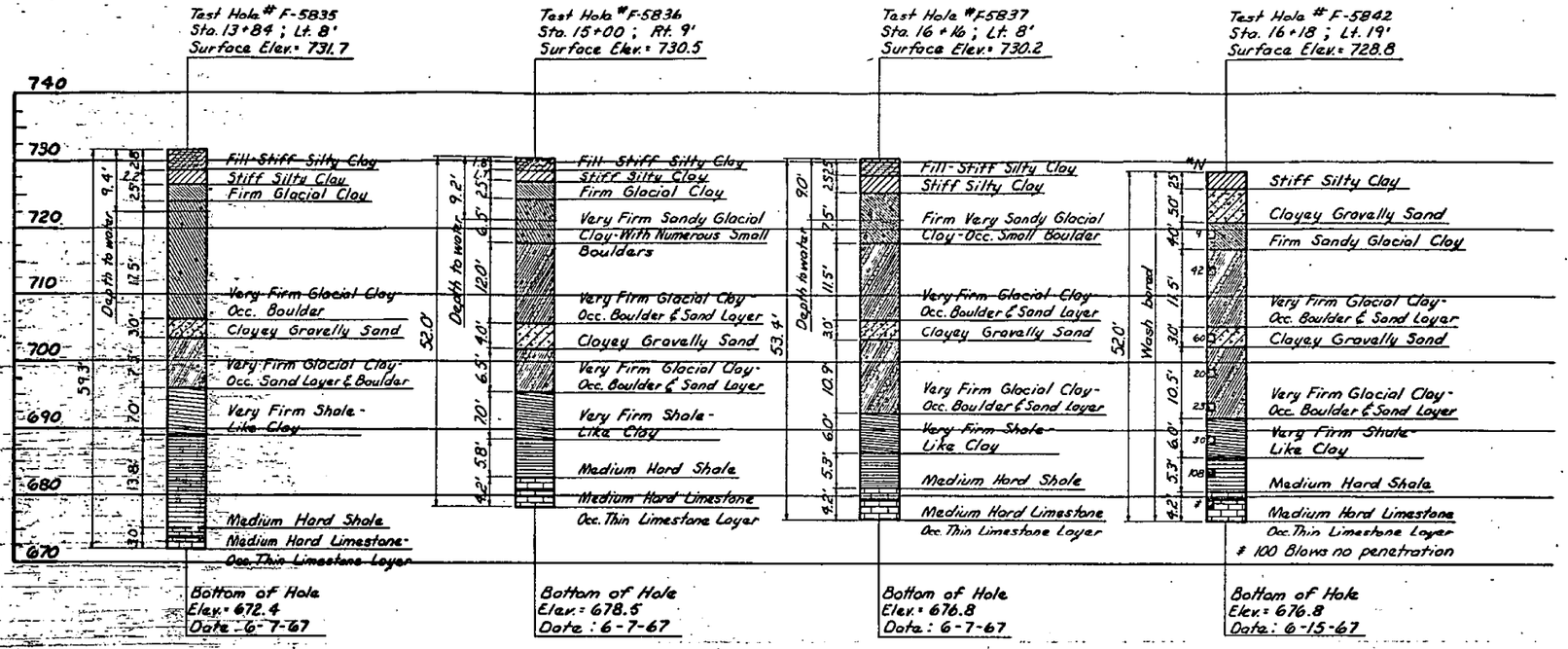
LOCATION:
County Road 56 over I-380
Madison Twp.
Section 3
T-80N R-7W and
Section 34
T-81N R-7W
Johnson County

DESIGN FOR 0°00' SKEW
254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 END SPANS. 86'-6 INTERIOR SPANS
SITUATION PLAN & GENERAL PLAN

STATION: 1461+30.58 ℄ I-380
STATION: 16+00 COUNTY RD 56
AUGUST 1969
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DES. SHT. NO. 1 OF 14 FILE NO. 22960 DES. NO. 568

DESIGNED BY: E. Gaerta
DETAILED BY:
TRACED BY:
CHECKED BY: M. L. Ellermann
SECTION LEADER James R. Sassaman
JOHNSON COUNTY
PROJECT NUMBER I-IG-380-6(7)249--04-52
STATE IOWA

Bench Mark: No 50, Sta. 1461+70, 310' Rt., R.R. Spk. In S.W. Base of Power Pole on North Side of Co. Rd. #56. Elev.= 728.908.



SOUNDING DATA

SCALE ~ 1" = 10' Dated as shown

*N = Number of blows per foot of penetration

TOTAL ESTIMATED QUANTITIES

ITEM		UNIT	3 PIERS	SUPERSTR. & INTEG. ABUTS	TOTAL
Structural Concrete *		cu.yds	125.5	~~350.8~~ 357.81	~~476.3~~ 483.3
Reinforcing Steel		lbs.	22,681	81,285	103,966
Pretens. Prestr.	D 40 (40'-0)	No		8	8
Concrete Beam	D 85 (85'-0)	No		8	8
Creosoted Piling		lin.ft.	75@20'		1500
10 BP 42 Steel	Furnish	lin.ft.		7@46' & 7@49'	665
Bearing Piling	Drive	lin.ft.		7@46' & 7@49'	665
Class 20 Excavation		cu.yds.	231	110	341
4" ϕ Tile Subdrain		lin.ft.			126
Granular BackFill		cu.yds.			100
Aluminum Handrail or Steel Handrail		lin.ft.			536.7
Concrete Slope Protection		sq.yds.			376
Creosoted Test Piling		L.S.	1@30'		Lump Sum

* The Pier, abutment footing, and temporary pavement block concrete, 161.3 cu. yds., is to be class "C" concrete. The remainder, ~~314~~ 322.0 cu.yds., is to be class "D" concrete.

Revised 7-27-70 Concrete Quantities corrected.

DESIGNED BY: E. Ohrts TRACED BY: R. Rupprecht

DETAILED BY: R. Rupprecht CHECKED BY: T.M.O. H. Hammen

JOHNSON COUNTY

PROJECT NUMBER	STATE	SEC. ROAD DIST. NO.	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	6		39	110

GENERAL NOTES:

This bridge is designed for H20-44 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 slopes outside the 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 through the fill to Elev. 731.7± for West abutment and to Elev. 730.2± for East abutment. The minimum diameter of the drilled holes is to be 16". Voids around the piles are to be filled with dry sand except for the top 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 construct "Concrete Slope Protection" as shown on sheet 1 of 14 and as detailed on sheet 14 of 14.

The Bridge Contractor is to install tile subdrain behind each abutment as noted or shown on sheets 1 & 5 of 14. The price bid for "4" ϕ Tile Subdrain" is to include all the labor and the excavation necessary for the installation.

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

The portion 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 methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

The test piling is to help determine proper pile length.

TEST PILE NOTE:

The lengths shown for Creosoted Piling are estimated lengths for bidding purposes only and one test pile shall be driven before ordering any additional piling. Before driving the Test Pile the area at the test pile site is to be excavated to the proposed footing elevation. Pile lengths will be determined from test pile results. The price bid for "Creosoted Test Piling" is to include all cost of furnishing and driving the test piles in the location shown on the plans and as directed by the Engineer. The test pile is to be incorporated into Pier 1 as one of the piles for the completed structure.

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. f_s = 20,000

See Sheet 11 of 14 for Design Stresses for the prestressed beams.

SPECIFICATIONS:

Design: AASHO, Series of 1969.

Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1964, plus current Special Provisions and Supplemental Specifications.

DESIGN FOR 0°00' SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 END SPANS 86'-6 INTERIOR SPANS

- SOUNDING DATA

STATION: 1461 30.58 ℄ I-380

STATION: 16+00 COUNTY ℄ 0.56

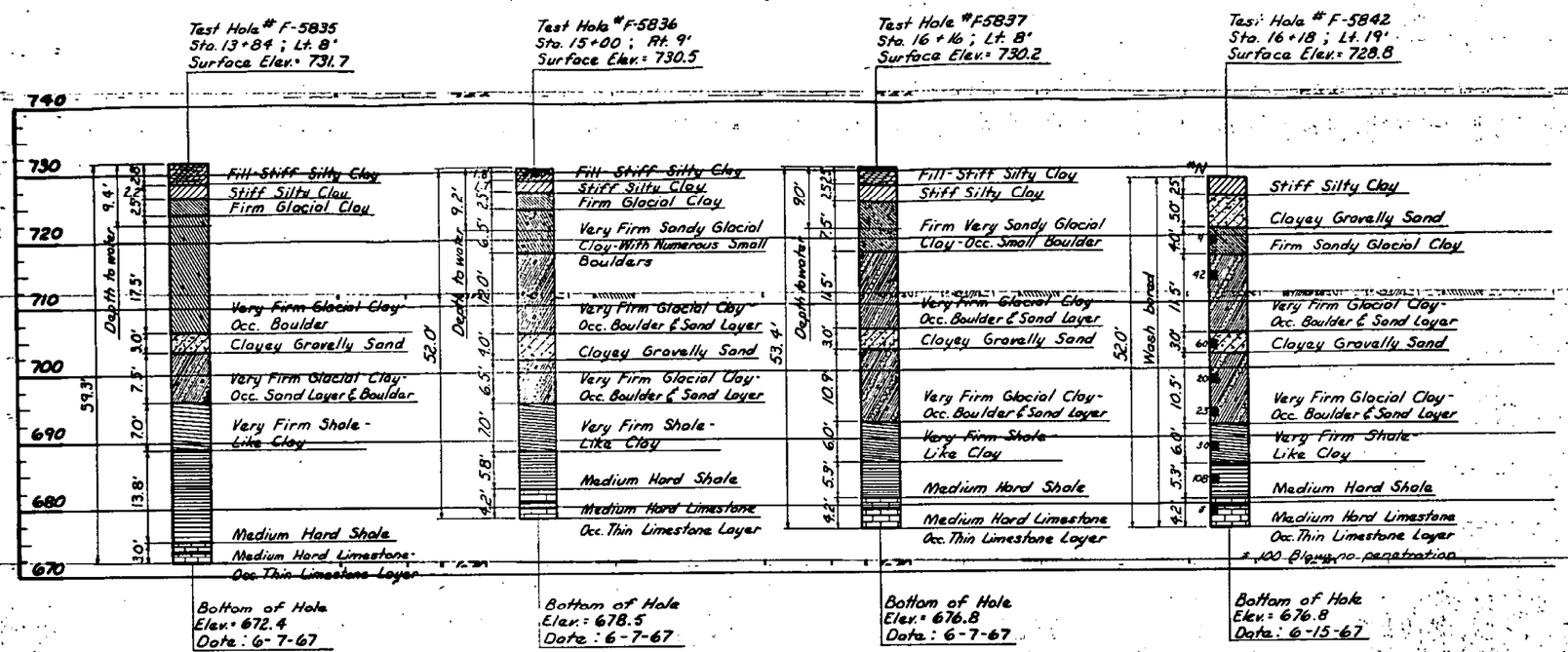
AUGUST 1969

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 2 OF 14 FILE NO. 22960 DES. NO. 568

Bench Mark: N° 50, Sta. 1461+70, 310' Rt., R.R. Spk. In S.W. Base of Power Pole on North Side of Co. Rd. #56. Elev.= 728.908.



SOUNDING DATA

SCALE ~ 1" = 10' Dated as shown

*N = Number of blows per foot of penetration

GENERAL NOTES:

This bridge is designed for H20-44 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 slopes outside the 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 through the fill to Elev. 731.7± for West abutment and to Elev. 730.2± for East abutment. The minimum diameter of the drilled holes is to be 16". Voids around the piles are to be filled with dry sand except for the top 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 construct "Concrete Slope Protection" as shown on sheet 1 of 14 and as detailed on sheet 14 of 14.

The Bridge Contractor is to install tile subdrain behind each abutment as noted or shown on sheets 1 & 5 of 14. The price bid for "4" Tile Subdrain" is to include all the labor and the excavation necessary for the installation.

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

The portion 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 methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

The test piling is to help determine proper pile length.

TEST PILE NOTE:

The lengths shown for Creosoted Piling are estimated lengths for bidding purposes only and one test pile shall be driven before ordering any additional piling. Before driving the Test Pile the area at the test pile site is to be excavated to the proposed footing elevation. Pile lengths will be determined from test pile results. The price bid for "Creosoted Test Piling" is to include all cost of furnishing and driving the test piles in the location shown on the plans and as directed by the Engineer. The test pile is to be incorporated into Pier 1 as one of the piles for the completed structure.

TOTAL ESTIMATED QUANTITIES

ITEM		UNIT	3 PIERS	SUPERSTR. & INTEG. ABUTS.	TOTAL
Structural Concrete *		cu. yds	125.5	350.8	476.3
Reinforcing Steel		lbs.	22,681	81,285	103,966
Preten. Prestr.	D 40 (40'-0)	NO		8	8
Concrete Beam	D 85 (85'-0)	NO		8	8
Creosoted Piling		lin. ft.	75@20'		1500
10 BP 42 Steel	Furnish	lin. ft.		7@46' & 7@49'	665
Bearing Piling	Drive	lin. ft.		7@46' & 7@49'	665
Class 20 Excavation		cu. yds.	231	110	341
4" ϕ Tile Subdrain		lin. ft.			126
Granular Backfill		cu. yds.			100
Aluminum Handrail Steel or Handrail		lin. ft.		Aluminum Handrail	690.7
Concrete Slope Protection		sq. yds.			376
Creosoted Test Piling		L.S.	1@30'		Lump Sum

* The Pier, abutment footing, and temporary pavement block concrete, 161.3 cu. yds., is to be class "C" concrete. The remainder, 315.0 cu. yds., is to be class "D" concrete.

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. f_s = 20,000

See Sheet 11 of 14 for Design Stresses for the prestressed beams.

SPECIFICATIONS:

Design: AASHO Series of 1969.

Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1964, plus current Special Provisions and Supplemental Specifications.

DESIGN FOR 0°00' SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 END SPANS 86'-6 INTERIOR SPANS

- SOUNDING DATA

STATION 1461+30.58 ℄ I-380

STATION 16+00 COUNTY RD 56

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

AUGUST 1969

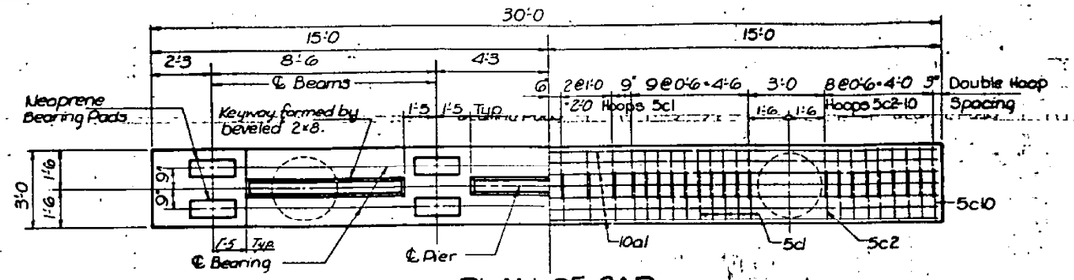
DES. SHT. NO. 2 OF 14 FILE NO. 22960 DES. NO. SEE

DESIGNED BY: E. Crowe DETAILED BY: Rayburn TRACED BY: Rayburn CHECKED BY: D.M.D. Hemmer

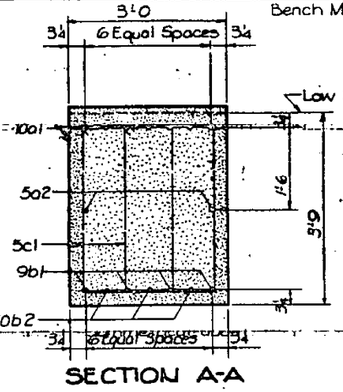
JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--09-52	IOWA	5		39	110

Bench Mark: N.P. 30, Sta. 1461+70, 510' Rt., R.P. Spk. in S.W. Base of Power Pole on North Side of Co. Rd. #56. Elev. = 728.908

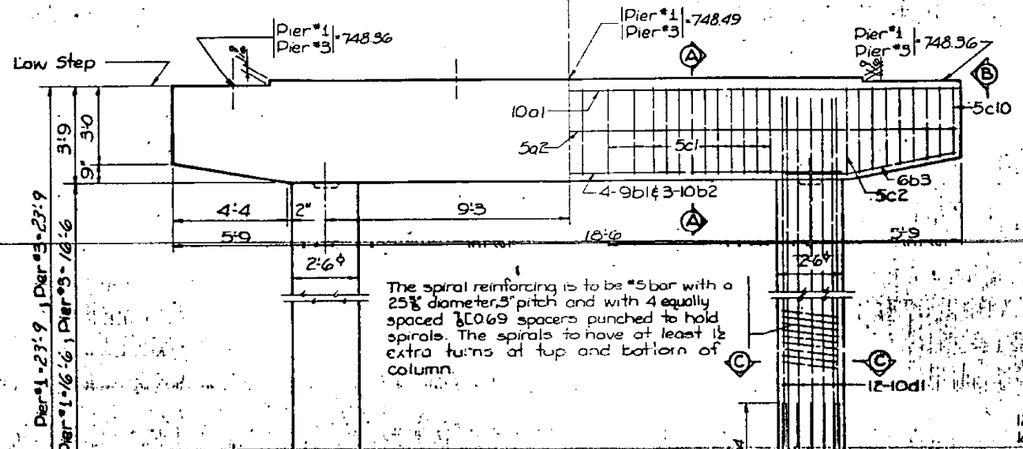


PLAN OF CAP

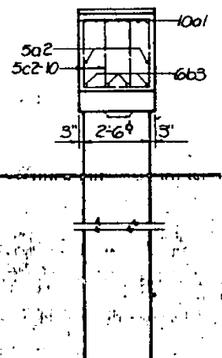


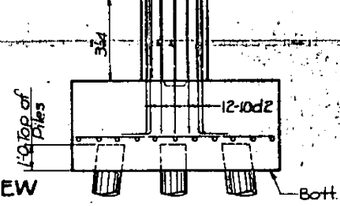
SECTION A-A

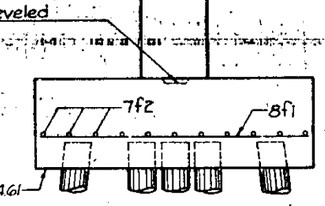
Symmetrical about ℄ Roadway



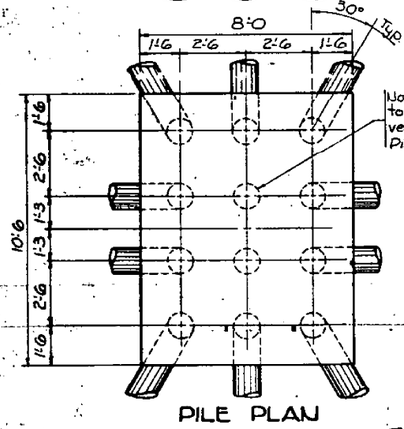
ELEVATION VIEW PIERS 1 & 3



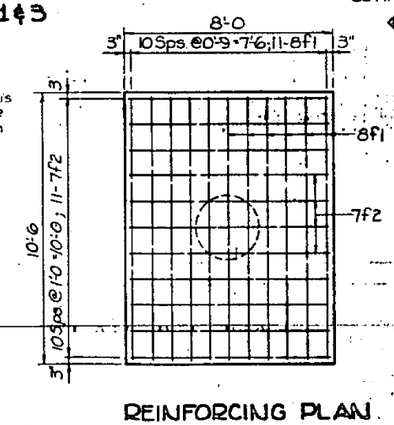




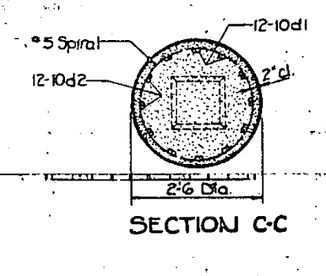
VIEW B-B



PILE PLAN



REINFORCING PLAN



SECTION C-C

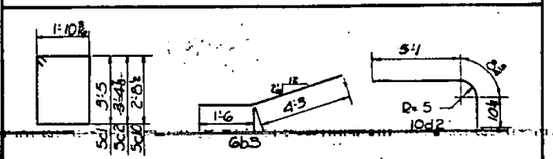
FOOTING PLAN

Note: Pile spacing is at bottom of footing. Batter piles 1:8 in the direction shown. 12 piles are required in each footing.

REINFORCING BAR LIST - PIERS 1 & 3

Bar	Location	Shape	No.	Length	Pier 1, Wt.	Pier 3, Wt.
10a1	Top of Pier Cap, Longitudinal	—	7	29'-8	894	894
5a2	Pier Cap Longitudinal, Sides	—	2	29'-8	62	62
9b1	Bott. of Pier Cap, Longitudinal	—	4	21'-6	290	290
10b2	Bott. of Pier Cap, Longitudinal	—	5	21'-4	275	275
6b3	Bott. of Pier Cap, Longit. Ends	—	8	5'-9	69	69
5c1	Pier Cap Hoops	⊓	52	11'-3	610	610
5c2-10	Pier Cap Hoops	⊓	36	Varies	395	395
10d1	Column Vertical Pier #1	—	24	19'-9	2040	
10d1	Column Vertical Pier #3	—	24	19'-9		2040
10d2	Column Dowels Pier #1	⊓	24	6'-8	689	
10d2	Column Dowels Pier #3	⊓	24	6'-8		689
8f1	Footing, Longitudinal	—	22	10'-2	597	597
7f2	Footing, Transverse	—	22	7'-8	545	545
#5 Spl	Column Spiral Pier #1	▨	2	450'-2	959	
#5 Spl	Column Spiral Pier #3	▨	2	450'-2		959
℄C069	Column Spacers Pier #1	—	8	16'-6	91	
℄C069	Column Spacers Pier #3	—	8	16'-6		91
				Total (lbs)	7296	7296

BENT BAR DETAILS



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

CONCRETE PLACEMENT QUANTITY

Location	Pier #1	Pier #3
Footing	21.1	21.1
Column	6.0	6.0
Cap	12.3	12.3
Total (Cu. Yds.)	39.4	39.4

The spiral reinforcing is to be #5 bar with a 25⅝" diameter, 5" pitch and with 4 equally spaced ⅞C069 spacers punched to hold spirals. The spirals to have at least 1½ extra turns at top and bottom of column.

PIER NOTES:

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

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

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

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 at splices is to be included in the price bid for other reinforcement. The #5 spirals shall be of a material permitted for #4 spirals.

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.

The test piling is to help determine proper pile length.

DESIGN FOR 0° 00' SKEW

254'-6 x 30' CONCRETE PRETENSIONED BEAM PRESTRESSED BRIDGE

40'-9 END SPANS 86'-6 INTERIOR SPANS

PIERS Nº 1 & 3 DETAILS

STATION 1461+30.58 ℄ I-380
STATION 15+00 COUNTY RD 56

AUGUST 1969

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

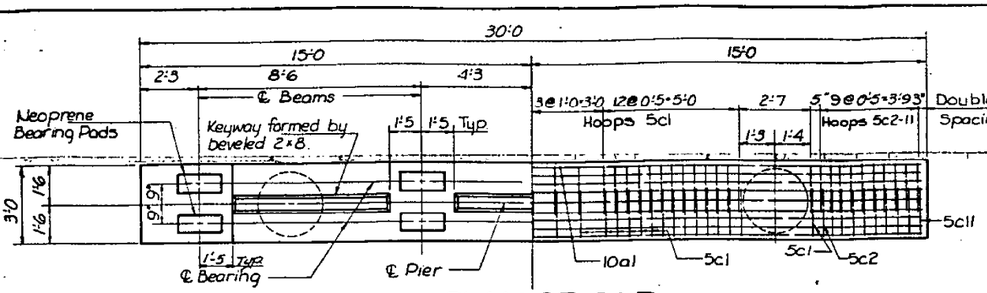
Design Sheet No.: 3 Of 11 File No.: 22960 Design No.: 568

DESIGNED BY: E. Rogers
DETAILED BY:
TRACED BY:
CHECKED BY:

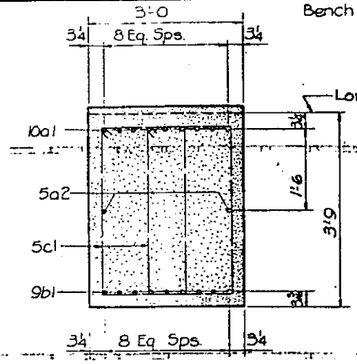
JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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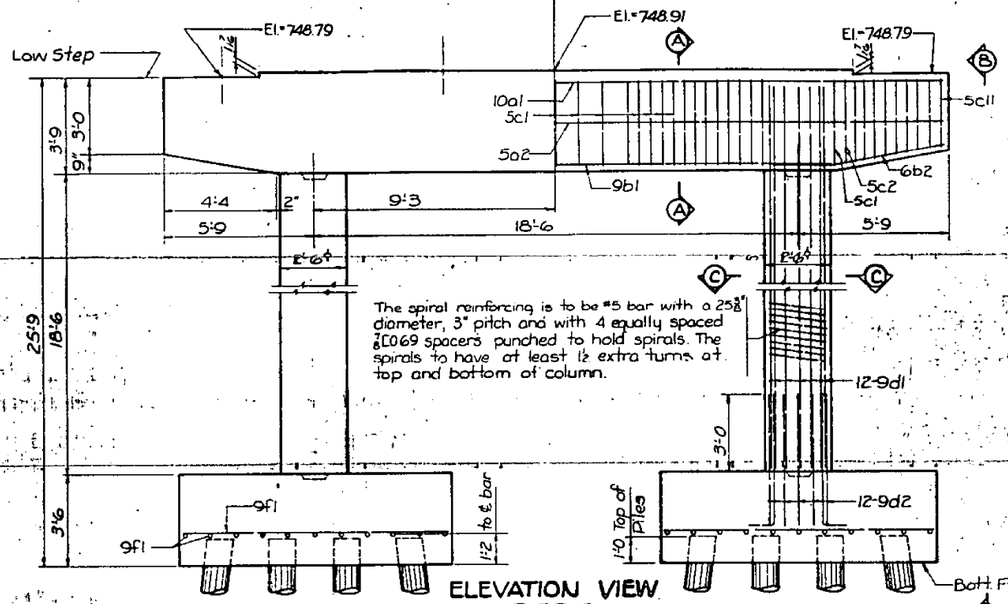
Bench Mark: Nº 30, Sta. 1461+70, 310' Rt., R.R. Spk. in S.W. Base of Power Pole on North Side of Co. Rd #56
Elev. = 728.908



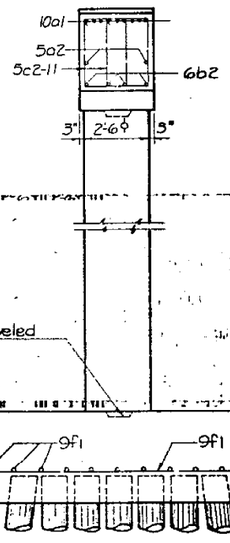
PLAN OF CAP



SECTION A-A

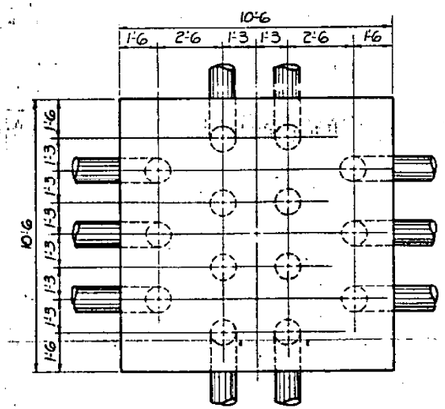


ELEVATION VIEW PIER 2

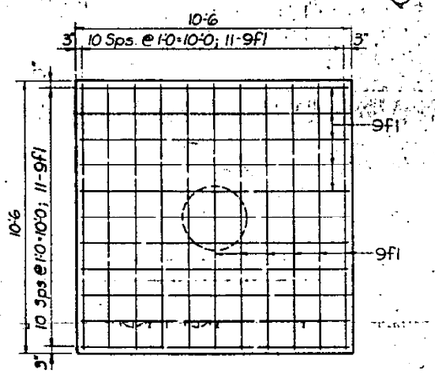


VIEW B-B

The spiral reinforcing is to be #5 bar with a 25⅜" diameter, 3" pitch and with 4 equally spaced ⅜ C069 spacers punched to hold spirals. The spirals to have at least 1½ extra turns at top and bottom of column.

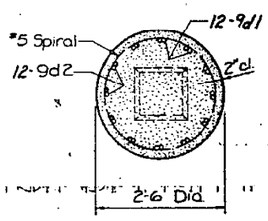


PILE PLAN



FOOTING PLAN

REINFORCING PLAN



SECTION C-C

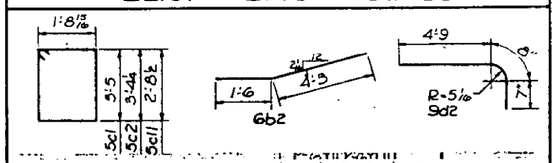
Note: Pile spacing is at bottom of footing. Batter piles 1:8 in the direction shown. 14 piles are required in each footing.

REINFORCING BAR LIST - PIER 2

Bar	Location	Shape	Nº	Length	Weight
10a1	Top of Pier Cap, Longitudinal	—	9	29'-8	1149
5a2	Pier Cap Longitudinal, Sides	—	2	29'-8	89
9b1	Batt of Pier Cap, Longitudinal	—	9	21'-4	865
6b2	Batt of Pier Cap, Longit. Ends	⌐	8	5'-9	69
5c1	Pier Cap Hoops	□	66	11'-1	765
5c2-11	Pier Cap Hoops	□	40	Varies	428
9d1	Column Vertical	—	24	21'-9	1775
9d2	Column Dowels	⌐	24	6'-0	490
9f1	Footing, Longitudinal & Transverse	—	44	10'-2	1521
*5 Spl	Column Spiral	⌀	2	303'-4	1050
℄C069	Spiral Spacers	—	8	Varies	50
				Total (lbs.)	8089

* Structural Grade

BENT BAR DETAILS



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

CONCRETE PLACEMENT QUANTITY - PIER 2

Location	Quantity
Footing	27.7
Column	6.7
Cap	12.3
Total (Cu. Yds.)	46.7

ESTIMATED QUANTITIES - THREE PIERS

Item	Unit	Quantity Pier 1	Pier 2	Pier 3	Total
Structural Concrete Class "C"	Cu Yds	39.4	46.7	39.4	125.5
Reinforcing Steel	lbs.	7296	8089	7296	22,681
Excavation Class 20	Cu Yds	85	61	85	231
Creosoted Piling	Lin. Ft.	23@20'	28@20'	24@20'	1500
Creosoted Test Piling	L.S.	1@30'			Lump Sum

See Sheet 3 of 14 for Pier Notes.

DESIGN FOR 0°00' SKEW

254'-6 x 30' CONCRETE PRETENSIONED BEAM PRESTRESSED BRIDGE

40'-9 END SPANS 86'-6 INTERIOR SPANS

PIER Nº 2 DETAILS

STATION: 1461+30.58 ℄ I-380
STATION: 15+00 COUNTY RD. 56

AUGUST, 1969

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

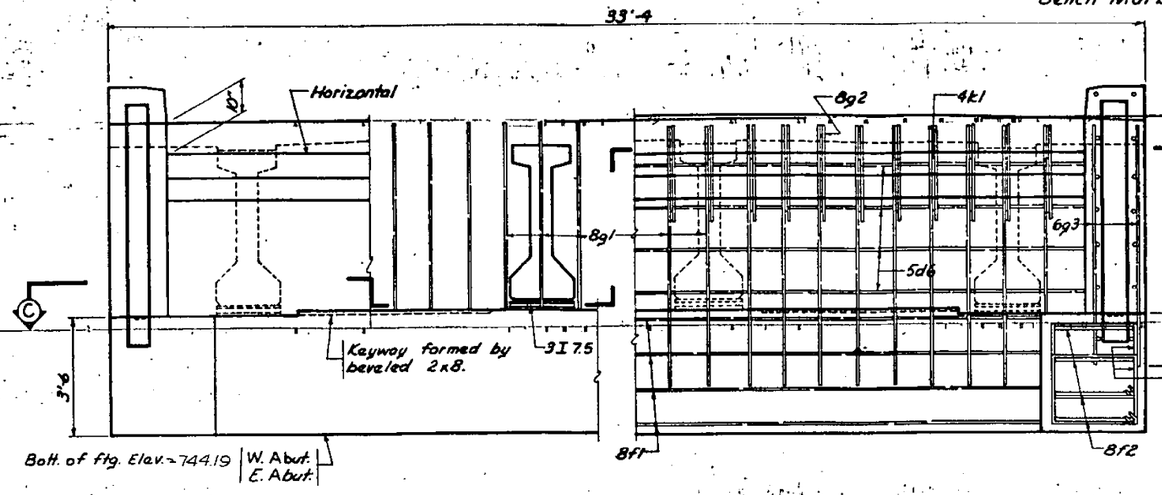
Design Sheet No.: 4 Of 14 File No.: 22960 Design No.: 568

DESIGNED BY: E. Ojeda
DETAILED BY:
TRACED BY: Ray
CHECKED BY: M.L. Clements

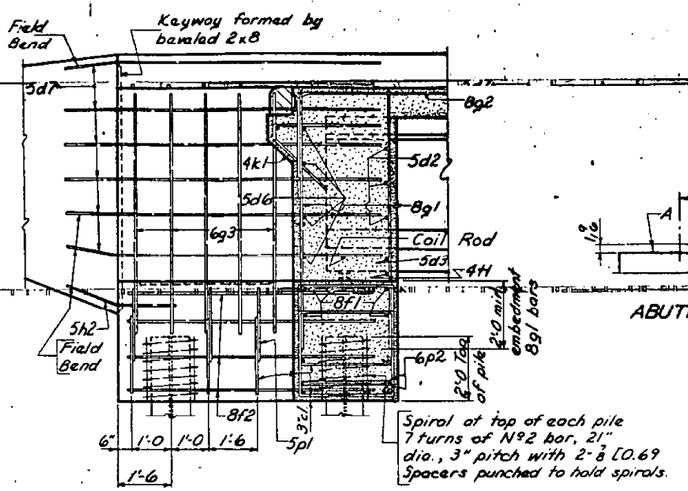
JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	6		90	110

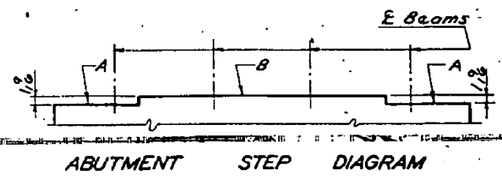
Bench Mark: N° 50, Sta. 1461+70, 310' Rt., R.R. Spike in S.W. Base of Power Pole on North Side of Co. Rd. #56 Elev.=728.908



PART REAR ELEVATION AT ABUTMENT

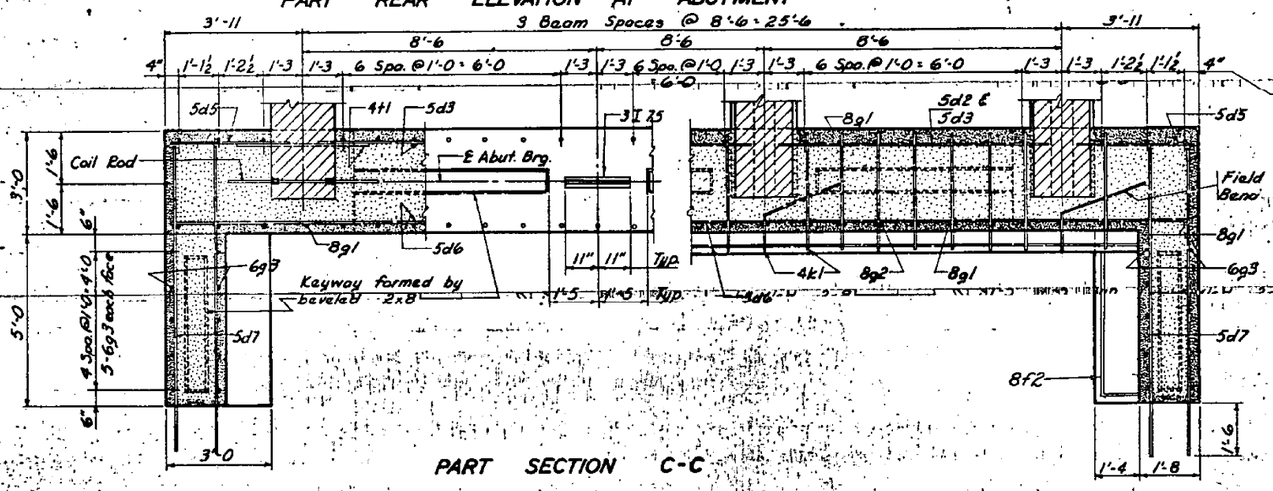


SECTION THROUGH ABUTMENT



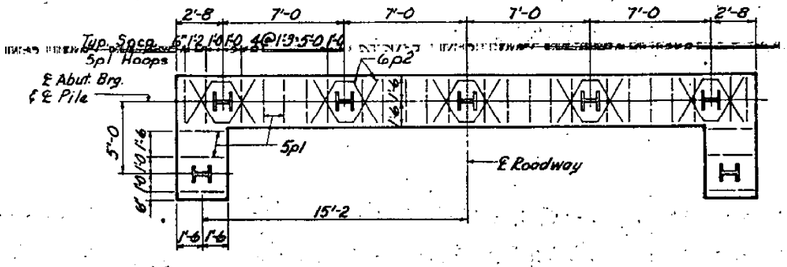
ABUTMENT STEP DIAGRAM

ABUT. STEP ELEVATIONS		
POINT	W. ABUT.	E. ABUT.
A	747.69	747.69
B	747.82	747.82



PART SECTION C-C

Spacing for:
- 31-8g1 Back face
- 27-8g1 Front face
- 27-8g2 Back face
- 27-4k1 Back face



ABUTMENT PILE PLAN

ABUTMENT NOTES:

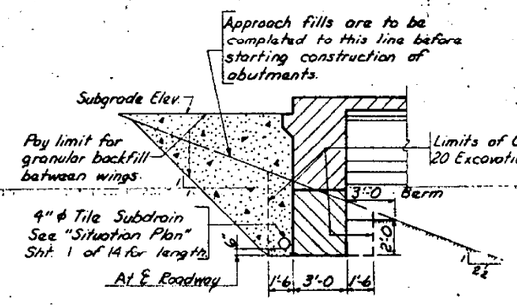
All exposed corners of 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

Reinforcing steel is to be securely wired in place 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 37 tons bearing value per pile.



BACKFILL DETAIL

DESIGN FOR 0° SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 END SPANS 85'-6 INTERIOR SPANS

ABUTMENT DETAILS

STA. 1461+30.58 ℄ I-380 AUGUST, 1969

STA. 15+00 ℄ CO. RD. #56

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 5 Of 14 File No.: 22960 Design No.: 568

DESIGNED BY: E. Squire	TRACED BY:	JOHNSON COUNTY	PROJECT NUMBER	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
DETAILED BY: Rigsby	CHECKED BY: M.L. Glenn		I-IG-380-6(7)297--04-52	IOWA			41	110

Holes for 8" ϕ bolts are to be formed with 1" ϕ (normal dia.) St'd steel pipe sleeves which are to be galvanized after cutting to proper length. The pipe sleeves shall be securely fixed in exact location as shown before concrete is placed. The cost of pipe sleeves is to be included in the price bid for concrete. The 8" ϕ bolts are to be furnished and placed by others.

268'-10 Face to Face of Concrete End Posts (See Sheets 12 & 13 of 14 for Rail Post Spacing).

4 Spaces @ 1'-7 = 6'-4 | 8" 6 Equal Spaces (Typ. between Rail Post #1 & Rail Post #2) | 6 Equal Spaces (Typ. between Rail Posts) | 8" 8" 6 Equal Spaces (Typ. between Rail Post #3 & Rail Post #4) | 4 Spaces 1'-24

Field Bend | 5s2 | 5s3 | 6c2 | Detail "1" | 5c1 | 5c3 | 5c4 | 8b1 | 5c3 & 5c4 Bars | Double 5c4 Bars | Double 5c4 | 6b5 | 5b4 | 6c2 (One @ Each Rail Post) | 5b | 8g2 | 6a1 | 5d2 | 4t1 | 5d7 | 5d3 | 5d1 | 5a1 | 5a2 | 5d4 | 5e3 | 5d5 | 5d6 | 3I75 | 8g1 | 6g3 | 5h1 | 5h2 | Coil Rod | 8g1 | 1'-3 Min. Lap | Field Bend | 5s1 | 4h3 | 5s4 | 5h1

℄ Pier | 1'-6 | ℄ Bearings | 9" 9" | 85'-0 ℄-℄ Bearings | 86'-6 ℄-℄ Piers

40'-0 ℄-℄ Bearings
40'-9 ℄ Abutment Bearing - ℄ Pier
254'-6 ℄-℄ Abutment Bearings

PART LONGITUDINAL SECTION NEAR CURB

PART END VIEW AT ABUTMENT

Edge to 8" radius | Approx. ½ x 3 indentation Gutter to Gutter | Face of Paving Notch

DETAIL "1"

7'-0 | 8'-0 | 3" | 6 Sps. @ 1'-1 = 6'-6"; 14-5s1 | 6-5s3 & 10-5s2 | 6c2 @ each rail post | ℄ Rail Post #3 | ℄ Rail Post #4 | 1'-6 | 5'-6 Curb Opening | 1'-6 | 5s3 | 5s2 | 6c2 | 5d7 | 5c1 | 5c4 | 8b1 | 5b | 5s1 | 5h1 | 4h3 | 5c3 | R = 1'-0 | R = 6" | 1'-0

Field Bend this end of 6c2

5b or 5d7 | Edge of Curb | 5c3 or 5c1 | 6c2 | Anchor Bolts for Rail Posts. | 8b1 | Gutter Line | 30'-0 Roadway

8" | 1'-6 | 1'-6 | ℄ Abut. Brg. | ℄ Beams | Gutter Line | 5'-6 | 1'-6 | 8"

PART PLAN

1'-0 | 5b4 | 8b1 | 5c4 | 6b5 | 5c4 | Depression 1" 5" 7" | 6" | ℄ Bearing

SECTION C-C

Fill with mortar (Typ.) | 3" ϕ x 1'-6 Adj. Coil Rods (Bent) | 5e1 | 5d8 | 5e3 | 5d2 | 3/4" ϕ Coil Rods | 5e2 | 5d1 | 5e2 | 3 Spa @ 2'-0 = 6'-0 | 4-5e2 | 5d3 | 5e1 | 5e3 | 3 Spa @ 2'-0 = 6'-0 | 4-5e2 | 10" | 2'-0

PART SECTION A-A

1'-4 | 1'-8 | 6" | 1'-1 | 1" | 1'-4 | 8b1 | 5d7 | 5c1 | 6g3 | 5h2 | 6'-5 8 | 3'-6 | 12 Spa @ 1'-4½" = 4'-6" | 6-5d7 Each Face

SECTION B-B

4 Sections @ 7'-6 = 30'-0 | Wood Spacers | 5r1 Centered in Section

PLAN OF TEMPORARY PAVING BLOCK

Note: Line paving notch with tarpaper before placing temporary paving block.

DESIGN FOR 0° SKEW
254'-6" x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 END SPANS | 86'-6 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STA. 1461+30.58 ℄ I-380
STA. 15+00 ℄ CO. RD. "56"

AUGUST, 1969

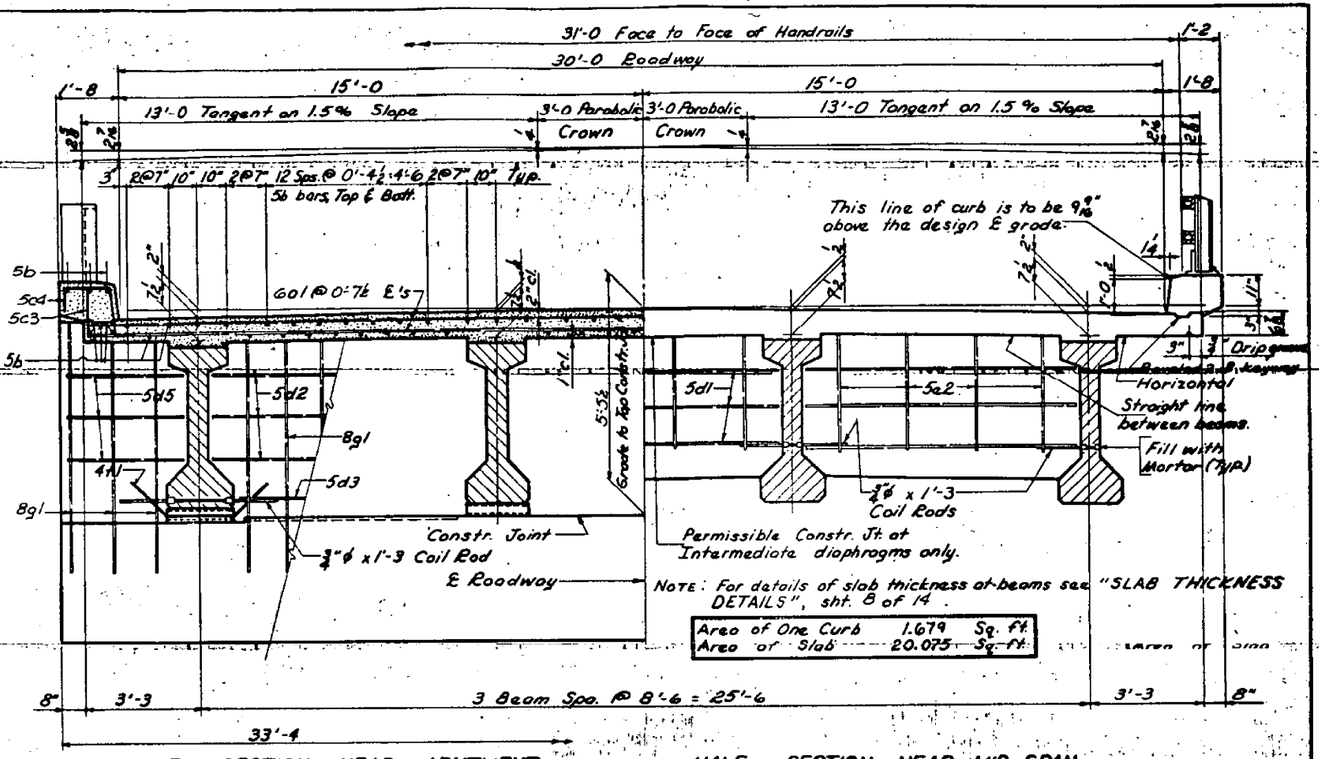
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 6 Of 14 File No.: 22960 Design No.: 568

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	8		6C	14

DESIGNED BY: E. Ogara | TRACED BY: Ramsey | CHECKED BY: M. E. Lonsway | DETAILED BY:

JOHNSON COUNTY



HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR MID-SPAN

SUPERSTRUCTURE NOTES:

This bridge is designed for H20-44 loading plus an allowance of 20 lbs. per square foot of roadway for future wearing surface.

The floor slab as shown includes 1/2" 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 all preformed joint and compressible materials is to be included in price bid for concrete.

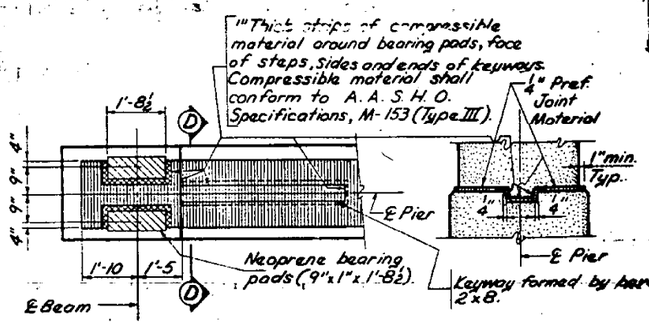
All beams are to be set vertical.

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.

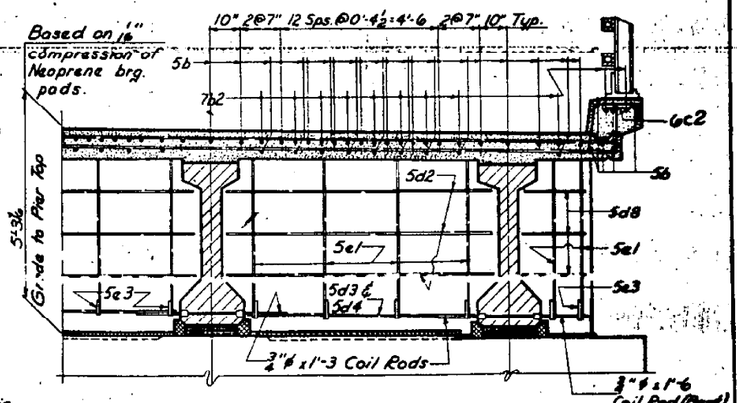
Clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted or shown. All reinforcing bars are to be securely wired in place and adequately supported on bar chairs before concrete is placed.

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



PART PLAN

SECTION D-D



HALF SECTION NEAR PIER

PIER TOP DETAILS

DESIGN FOR 0° SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 END SPANS — 86'-6 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STA. 1461+30.58 S.I. 380 & CO RD. *56

STA. 15+00

AUGUST, 1969

JOHNSON COUNTY

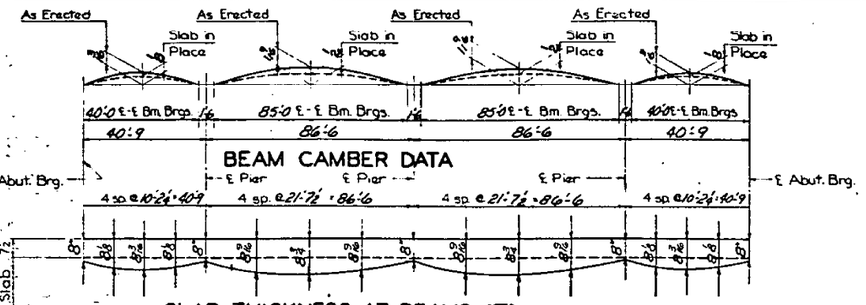
IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 7 Of 14 File No.: 22960 Design No.: 568

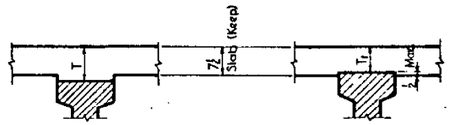
DESIGNED BY: C. Jones DETAILED BY: [illegible] TRACED BY: CHECKED BY: M. A. Thomas

STANDARD SHEET | JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04--52	IOWA	5		49	118

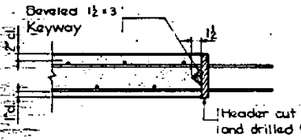


SLAB THICKNESS AT BEAMS (T)

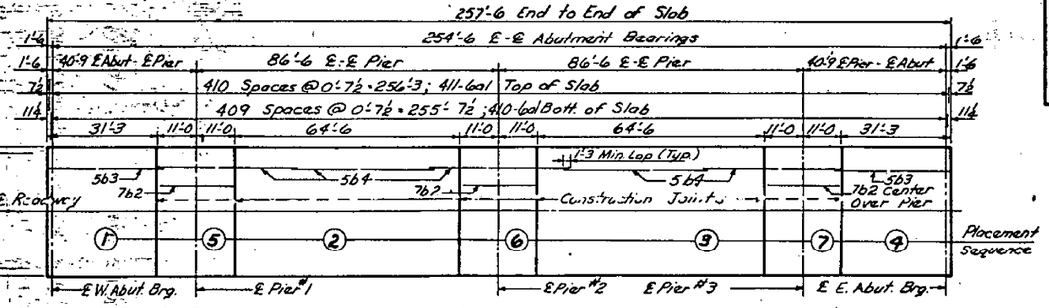


SLAB THICKNESS DETAILS

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) may be decreased to a maximum of ½" embedment of the beam (T1). If more than ½" embedment is required, or if the haunch exceeds 2", the grade line is to be revised.



TRANSVERSE CONSTR. JOINT



CONCRETE PLACEMENT DIAGRAM SHOWING SLAB REINFORCING

Note: Roadway slab shall be placed in sections and sequences indicated and preferably at intervals not exceeding 24 hours. Alternate procedures for placing slab 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 results. Curbs may be placed continuously.

CONC. PLACEMENT QUANT. - SUPERST. & 2 ABUTS.

Item	Quantity
Abutment Footing 2@17.2	34.4
" Wings 4@1.95	7.8
End Posts 4@0.4	1.6
*Paving Block 2@0.7	1.4
Curbs 2@16.4	32.8
Slab, Sections 1&4 2@~~45.6~~ 46.9	938 ~~912~~
Slab, Sections 2&3 2@54.9	109.8
Slab, Sections 5, 6 & 7 3@25.4	76.2
Total-Cu Yds.	~~3508~~ 357.8

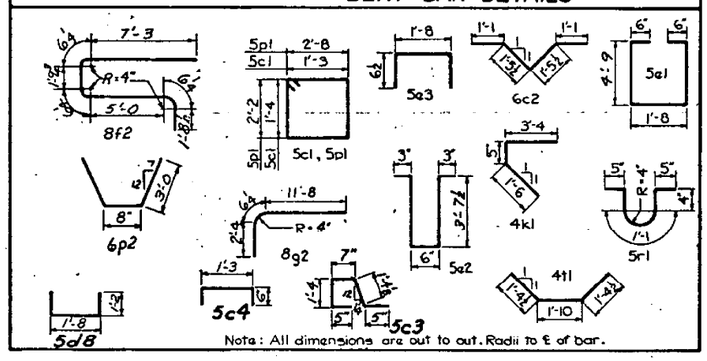
*May be Class "C" or Class "D" at contractor's option.

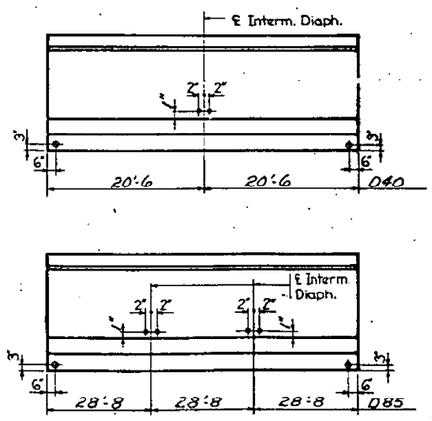
ESTIMATED QUANT. - SUPERST. & 2 ABUTS.

Item		Quantity
Structural Concrete**		~~3508~~ 357.8 C.Y.
Reinforcing Steel		81,285 Lbs.
Class 20 Excavation		110 C.Y.
Granular Backfill		100 C.Y.
Prestressed Concrete Beams	040 (40'-0)	8 Nº
	085 (85'-0)	8 Nº
10 BP 42 Steel Bearing Piling	Furnish 7@46' & 7@49'	665 L.F.
	Drive 7@46' & 7@49'	665 L.F.
		322.0

** The slab, curbs, wings and end posts, ~~315.6~~ cu., are Class "D" concrete. The remainder, 35.8 cy., is Class "C" concrete.

BENT BAR DETAILS





BEAM COIL TIE LOCATION

REINF. STEEL - ONE SUPERST. & TWO ABUTS.

Bar	Location	Shape	Nº	Length	Weight
6a1	Slab Transverse, Bottom & Top	—	821	31'-8	39050
8b1	Curb, Top & Ends	—	12	28'-6	913
7b2	Slab & Curb, Longit. over Piers	—	90	21'-8	3986
5b3	" & " , Longit.	—	146	32'-4	4924
5b4	" ℄ " "	—	365	40'-0	15228
6b5	Curb, Longit., over Curb drain	—	16	8'-6	204
5c1	Curb Hoops - at abutment	⊡	24	5'-11	148
6c2	Curb @ Rail Posts	⊡	64	5'-0	481
5c3	Curb Hoops	⊡	394	3'-9	1541
5c4	Curb Transverse	⊓	434	2'-1	943
5d1	Intermediate Diaph., Longit.	—	108	7'-7	854
5d2	Pier & Abut. Diaph., Longit.	—	72	7'-7	569
5d3	" & " " "	—	24	6'-4	159
5d4	Pier Diaph. Longit.	—	3	28'-8	90
5d5	Abut. Diaph. Ends	—	12	2'-8	33
5d6	" " Longit.	—	10	33'-0	344
5d7	" " Extension, Longit.	—	48	9'-4	467
5d8	Pier " Ends	⊔	18	3'-10	72
5e1	Pier Diaphragm Hoops	⊡	48	11'-10	592
5e2	Intermediate Diaphragm Hoops	⊔	72	7'-6	563
5e3	Pier Diaphragm Ties	⊔	48	2'-7	129
8f1	Abutment Longit.	—	18	33'-0	1586
8f2	Abutment Extension, Longit.	⊓	16	17'-4	740
8g1	Abutment Vertical, B.F. & F.F.	—	116	7'-3	2245
8g2	Abut. Diaph., Vertical B.F.	⊓	54	14'-6	2091
6g3	" Extension, Vertical	—	40	6'-8	401
5h1	Abut. Wing & End Post, Horiz.	—	72	6'-8	501
5h2	" to Wing Dowels	—	8	3'-0	25
4h3	End Post, Horiz.	—	8	4'-0	21
4k1	Paving Notch, Transv.	⊏	54	5'-2	186
5p1	Abutment Hoops	⊡	120	10'-5	1304
6p2	Abutment, Bott. @ Piles	⊔	20	6'-6	195
5r1	Paving Block Lifting Hoops	⊔	8	2'-5	20
5s1	Wing, Vertical	—	56	Varies	300
5s2	End Post - Wing, Vertical	—	40	3'-9	156
5s3	" " - " "	—	24	3'-0	75
4t1	Under Beams at Abutments	⌣	8	4'-6	24
	Pile Spiral 4" ϕ rod	⌀	14	38'-6	90
	Spiral Spacers, 6 @ 0.69	—	28	1'-10	35
	Total-Lbs.				81,285

DESIGN FOR 0° SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9. END SPANS 86'-6 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STA.: 1461+30.58 ℄ I-380
STA.: 15+00 ℄ CO RD "S6"

AUGUST, 1969

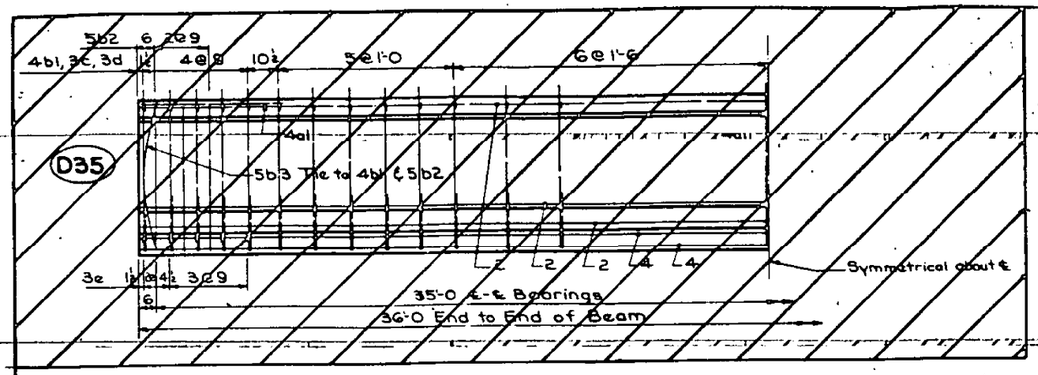
JOHNSON COUNTY

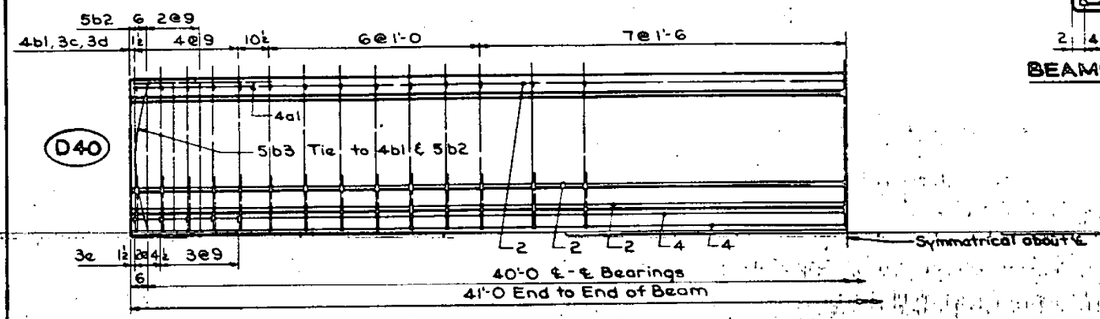
IOWA STATE HIGHWAY COMMISSION

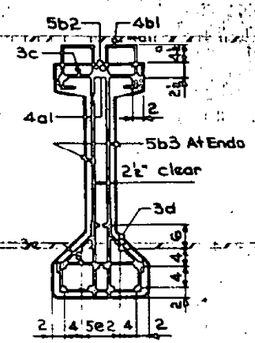
DESIGN SHEET Nº 8 OF 14 FILE Nº 22960 DESIGN Nº 568

Revised 7-27-70: Concrete Quantities corrected.

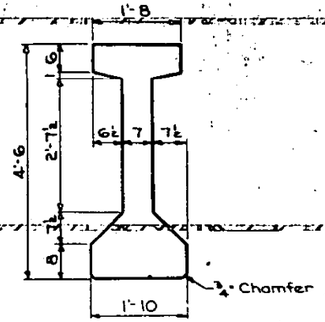
DESIGNED BY:	TRACED BY:	STANDARD SHEET	JOHNSON COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
DETAILED BY:	CHECKED BY:			I-IG-380-6(7) 247--04-52	IOWA	1		44	110







BEAMS ~~D35~~ & D40



TYPICAL "D" BEAM
CROSS SECTION

Area = 638.75 in.²
$\bar{Y}_b$ = 24.35 in.
I = 214,975 in.⁴

○ Keap

Revised 3-6-69 : Beam designation nun bars changed.

DESIGN FOR 0° SKEW
254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 END SPANS 86'-6 INTERIOR SPANS
BEAM DETAILS
STA. 1461+30.58 ℄ I-380 AUGUST, 1970
STA. 15+00 ℄ CO RD. S56
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
Design Sheet No 9 Of 14 File No 22960. Design No 5168.

DESIGNED BY: E. Gaus
DETAILED BY:
TRACED BY: Bonny
CHECKED BY: M. L. Edmonds

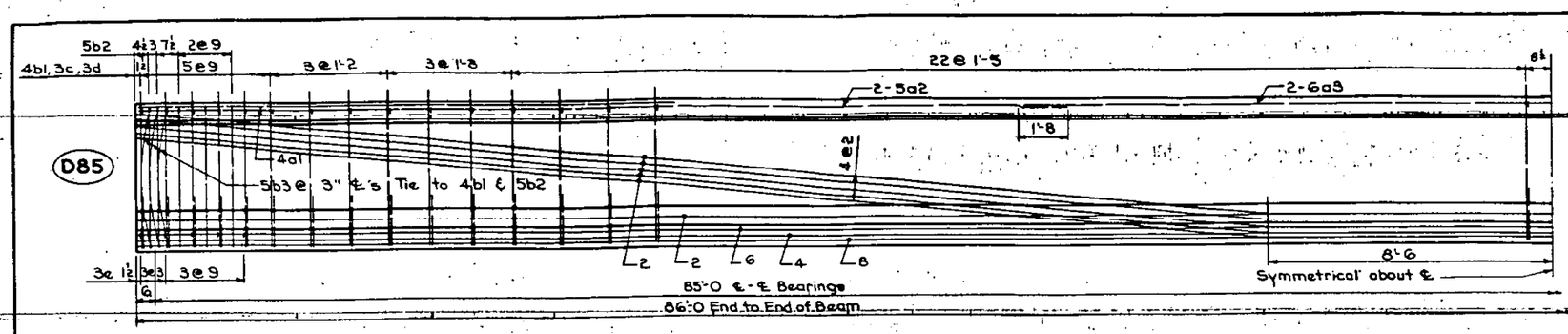
PRESTRESSED BEAM DETAILS - PC68D

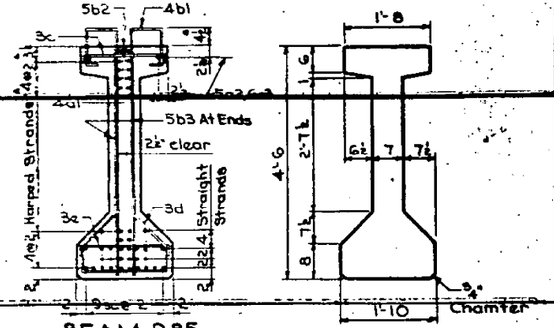
STANDARD SHEET 4066

JOHNSON COUNTY

PROJECT NUMBER: I-IG-380-6(71)247--04-52

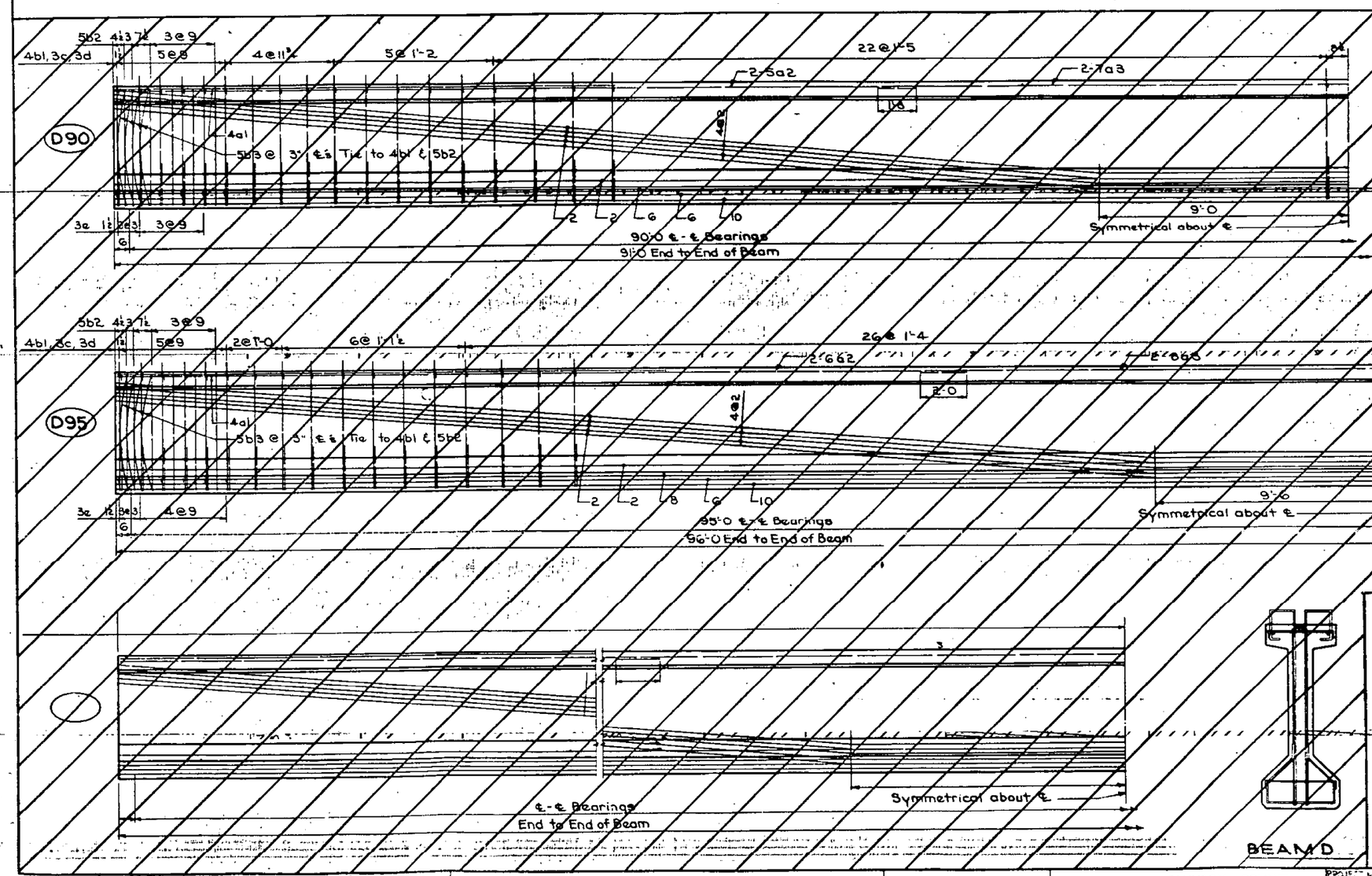
STATE	FED ROAD DIST NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
IOWA	7		69	118

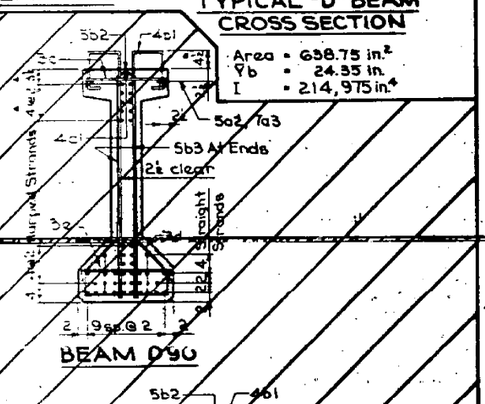


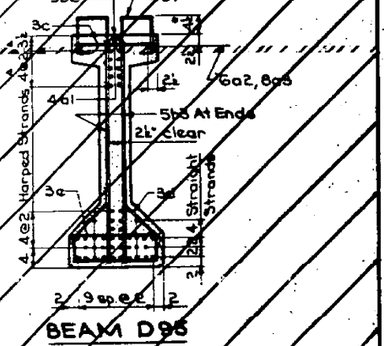


TYPICAL "D" BEAM CROSS SECTION

Area = 638.75 in.²
$\bar{y}_b$ = 24.35 in.
I = 214,975 in.⁴







BEAM D

△ DIMENSIONS AT END OF BEAM
* KEEP

DESIGN FOR 0° SKEW
254'-6 × 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 END SPANS 86'-6 INTERIOR SPANS

BEAM DETAILS

STA 1461-3058 ℄ I-380
STA. 15+00 ℄ CO. RD. "S"
AUGUST 1969
JOHNSON COUNTY

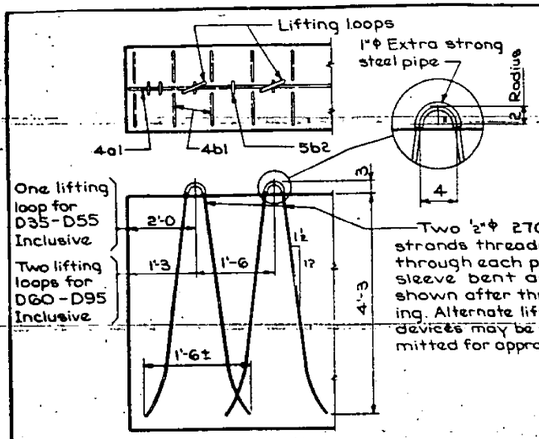
IOWA STATE HIGHWAY COMMISSION
Design Sheet № 10 Of 14 File № FZ960 Design № 568

Revised (2-1-69): Number of strands in D11, D12 and D13 changed.
Revised 3-6-69: Beam designation numbers changed.
Revised 8-22-69: Length of Bar 4a1 in Beams D85, D90 and D85 changed.

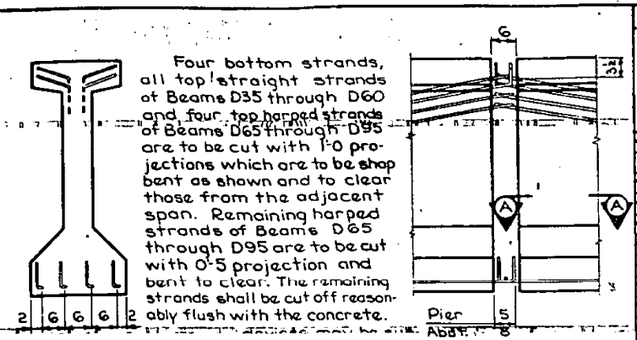
DESIGNED BY: [illegible] TRACED BY: [illegible]
DETAILED BY: [illegible] CHECKED BY: [illegible]

PRESTRESSED BEAM DETAILS - PC 68D | STANDARD SHEET 4069 | JOHNSON COUNTY | PROJECT NUMBER: I-G-380-6(7)247--04-52

STATE	PLAN ROAD DIST. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
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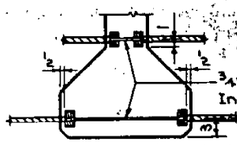


LIFTING LOOP DETAIL

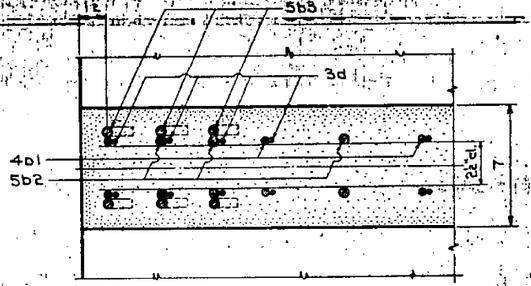


STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

Number and exact location of coil ties to be as detailed on specific bridge design.



COIL TIE DETAIL



SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

BEAM DATA

Beam	Span Length c to c Bearing	Overall Beam Length (L)	Strand Size	No Of Strands Straight	No Of Strands Harped	Total Initial Prestress Kips	Hold Down Force - Kips	Camber (in.) At Release	Camber (in.) After Losses	Deflection (in.) Δ D Immediate① (Elastic) Δ I	Deflection (in.) Δ D Time② (Plastic) Δ T	Permissible Spacing H20 Loading	Permissible Spacing HS20 Loading	Weight (Tons)		Concrete (C.Y.)	Reinforcing Steel (lb.)
~~D35~~	~~35'-0~~	~~36'-0~~	~~½"Φ~~	~~14~~	~~—~~	~~404.6~~		~~0.08~~	~~0.12~~	~~0.02~~	~~0.01~~	~~8'-6~~	~~7'-6~~	~~12.0~~		~~5.9~~	~~447~~
D40	40'-0	41'-0	½"Φ	14	—	404.6	—	0.10	0.15	0.04	0.01	8'-6	7'-6	13.6		6.7	490
~~D45~~	~~45'-0~~	~~46'-0~~	~~½"Φ~~	~~14~~	~~—~~	~~404.6~~		~~0.11~~	~~0.16~~	~~0.07~~	~~0.02~~	~~8'-6~~	~~7'-6~~	~~13.5~~		~~7.6~~	~~511~~
~~D50~~	~~50'-0~~	~~51'-0~~	~~½"Φ~~	~~16~~	~~—~~	~~482.4~~		~~0.16~~	~~0.22~~	~~0.11~~	~~0.03~~	~~8'-6~~	~~7'-6~~	~~17.0~~		~~8.4~~	~~566~~
~~D55~~	~~55'-0~~	~~56'-0~~	~~½"Φ~~	~~19~~		~~549.1~~		~~0.18~~	~~0.26~~	~~0.17~~	~~0.04~~	~~8'-6~~	~~7'-6~~	~~10.6~~		~~9.2~~	~~651~~
~~D60~~	~~60'-0~~	~~61'-0~~	~~½"Φ~~	~~21~~		~~606.9~~		~~0.23~~	~~0.32~~	~~0.23~~	~~0.06~~	~~8'-6~~	~~7'-6~~	~~20.3~~		~~10.0~~	~~674~~
~~D65~~	~~65'-0~~	~~66'-0~~	~~½"Φ~~	~~12~~	~~6~~	~~520.8~~	~~21.9~~	~~0.40~~	~~0.58~~	~~0.33~~	~~0.08~~	~~8'-6~~	~~7'-6~~	~~22.0~~		~~10.8~~	~~866~~
~~D70~~	~~70'-0~~	~~71'-0~~	~~½"Φ~~	~~16~~	~~6~~	~~655.0~~	~~20.1~~	~~0.62~~	~~0.91~~	~~0.44~~	~~0.11~~	~~8'-6~~	~~7'-6~~	~~23.6~~		~~11.7~~	~~966~~
~~D75~~	~~75'-0~~	~~76'-0~~	~~½"Φ~~	~~16~~	~~8~~	~~693.6~~	~~25.7~~	~~0.68~~	~~1.00~~	~~0.57~~	~~0.14~~	~~8'-6~~	~~7'-6~~	~~25.5~~		~~12.5~~	~~1030~~
~~D80~~	~~80'-0~~	~~81'-0~~	~~½"Φ~~	~~18~~	~~8~~	~~750.4~~	~~28.3~~	~~0.85~~	~~1.25~~	~~0.72~~	~~0.18~~	~~8'-6~~	~~7'-6~~	~~28.0~~		~~13.3~~	~~1096~~
D85	85'-0	86'-0	½"Φ	20	10	867.0	27.5	1.09	1.56	0.93	0.22	8'-6	7'-6	28.6		14.1	1134
~~D90~~	~~90'-0~~	~~91'-0~~	~~½"Φ~~	~~24~~	~~10~~	~~982.6~~	~~24.7~~	~~1.40~~	~~2.01~~	~~1.16~~	~~0.29~~	~~8'-6~~	~~7'-6~~	~~30.4~~		~~15.0~~	~~1280~~
~~D95~~	~~95'-0~~	~~96'-0~~	~~½"Φ~~	~~26~~	~~10~~	~~1040.4~~	~~23.4~~	~~1.69~~	~~2.36~~	~~1.42~~	~~0.36~~	~~8'-6~~	~~7'-6~~	~~31.9~~		~~15.8~~	~~1479~~

① Deflections due to weight of slab and diaphragm. The deflections shown are for a slab weight of 703 #/ft. (7½" slab and 7'-6 beam spacing) and diaphragm weight of 2556 lb. at ℄ of span for D35 to D60 inclusive and at ⅓ points for D65 to D95 inclusive. For different slab and diaphragm weights, deflections will be directly proportional.

② Total beam deflection at ℄ of span, Δ D, due to weight of slab and diaphragms for detailing purpose:
(A) Δ D = Δ I + Δ T for simple span.
(B) Δ D = Δ I + ¾ Δ T for end spans of continuous bridge.
(C) Δ D = Δ I + ½ Δ T for interior spans of continuous bridge.

NOTES:

~~These beams are designed for AASHO live loads as~~ indicated in above table with an allowance of 20 lb. per square foot of roadway for future wearing surface.

All prestressing strands are to be ½" Φ 270K grade.

Unless otherwise noted all beams are to be increased in length by .00055 L to compensate for elastic shortening, creep and shrinkage.

Hold down points for harped strands may be moved toward ends of beam a distance of .025 L maximum at producers option.

Tops of beams are to be struck off level and artificially roughened as directed by the Iowa Highway Commission Materials Department.

Bearings shall be as detailed on other design sheets.

Beams to be used in bridges made continuous by the poured in place floor are to be at least 28 days old before the floor is placed unless a shorter curing time is approved by the Bridge Engineer.

Contact surfaces between beam and abutment and pier diaphragms shall be roughened by sand blasting or other approved means to improve bond.

DESIGN STRESSES:

Design Stresses for the following materials are to be in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1965:
Reinforcing Steel in accordance with Section 1.5.1 "Reinforcement" for Intermediate, Hard or Rail Steel Grade.
Prestressing Steel and Concrete in accordance with Section 1.6.7 f_s = 270,000 psi.; f'_c = 5000 psi.

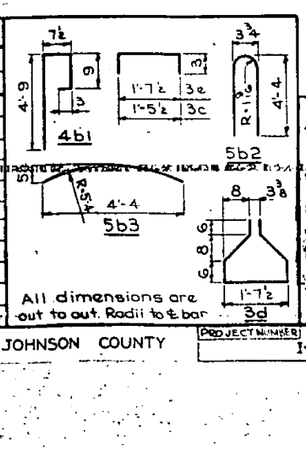
SPECIFICATIONS:

CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, Series of 1964, with current applicable Special Provisions and Supplemental Specifications.
DESIGN: AASHO, Series of 1965, with minor modifications.

REINFORCING BAR LIST

Beam / Bar	Span / Shape	D35 35'-0 Nº	Length	D40 40'-0 Nº	Length	D45 45'-0 Nº	Length	D50 50'-0 Nº	Length	D55 55'-0 Nº	Length	D60 60'-0 Nº	Length	D65 65'-0 Nº	Length	D70 70'-0 Nº	Length	D75 75'-0 Nº	Length	D80 80'-0 Nº	Length	D85 85'-0 Nº	Length	D90 90'-0 Nº	Length	D95 95'-0 Nº	Length
4a1	—	2	4'-0	2	4'-0	2	4'-0	2	4'-0	—	—	—	—	2	4'-0	2	4'-0	2	4'-0	2	4'-0	2	16'-0	2	18'-0	2	20'-0
a2	—	—	—	—	—	—	—	—	—	—	—	—	—	5/4	22'-1	5/4	23'-7	5/4	25'-1	5/4	26'-7	5/4	28'-7	5/4	30'-1	5/4	31'-11
a3	—	—	—	—	—	—	—	—	—	—	—	—	—	6/2	25'-0	6/2	27'-0	6/2	29'-0	6/2	31'-0	5/2	32'-0	7/2	34'-0	8/2	36'-0
4b1	□	66	6'-2	74	6'-2	74	6'-2	86	6'-2	94	6'-2	102	6'-2	106	6'-2	114	6'-2	124	6'-2	132	6'-2	136	6'-2	148	6'-2	160	6'-2
5b2	═	6	8'-9	6	8'-9	6	8'-9	6	8'-9	8	8'-9	8	8'-9	8	8'-9	10	8'-9	10	8'-9	10	8'-9	10	8'-9	12	8'-9	12	8'-9
5b3	═	4	4'-5	4	4'-5	4	4'-5	4	4'-5	8	4'-5	8	4'-5	8	4'-5	12	4'-5	12	4'-5	12	4'-5	12	4'-5	16	4'-5	16	4'-5
3c	⌐	33	1'-11	37	1'-11	39	1'-11	43	1'-11	47	1'-11	51	1'-11	53	1'-11	57	1'-11	62	1'-11	66	1'-11	68	1'-11	74	1'-11	80	1'-11
3d	△	33	5'-5	37	5'-5	39	5'-5	43	5'-5	47	5'-5	51	5'-5	53	5'-5	57	5'-5	62	5'-5	66	5'-5	68	5'-5	74	5'-5	80	5'-5
3e	⌐	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	14	2'-1	14	2'-1	14	2'-1	14	2'-1	16	2'-1

A-Size
B-Nº



All dimensions are out to out. Radii to ℄ bar

DESIGN FOR 0° SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9" END SPANS — 60'-0" INTERIOR SPANS

BEAM DETAILS

STA. 1461+50.58 ℄ I-380
STA. 15+00 ℄ CO RD *56

AUGUST, 1969

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION
Design Sheet Nº 11 Of 14 File Nº 22960. Design Nº 568.

PROJECT NUMBER	STATE	FED ROAD DIST. Nº	FISCAL YEAR	SHEET Nº	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA			67	110

DESIGNED BY: E Jensen
DETAILED BY:
TRACED BY: Ramsey
CHECKED BY: M L Ehmen

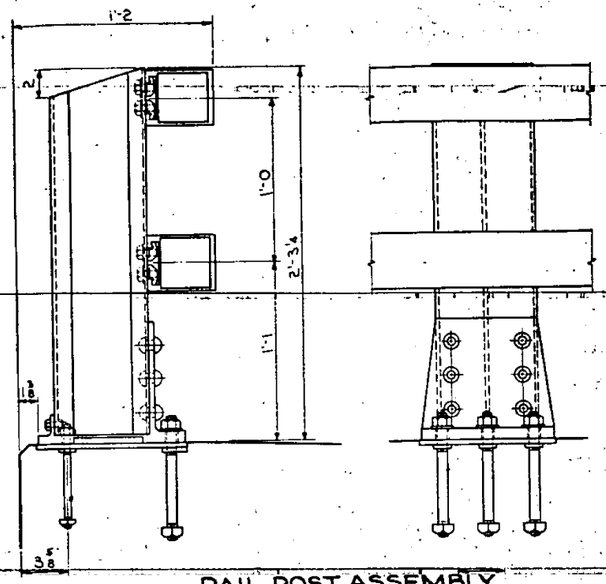
PRESTRESSED BEAM DETAILS - PC68D

STANDARD SHEET 4070

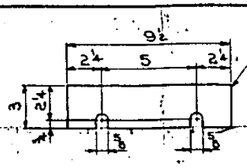
JOHNSON COUNTY

Revised (21-69): Section A-A added. Beam data and Reinforcing Bar List revised.
Revised 3-6-69: Beam designation numbers change.
Revised 8-22-69: Length of Bar 4a1 and total reinforcing steel quantities for Beams D75, D90 and D95 changed.

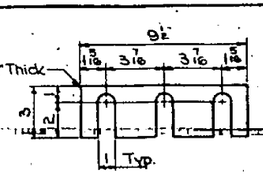
Revised 12-26-68: Added explanation for material for clamp bar bolt.
Revised 6-7-67: Red lead shop coat paint note added.
Revised 5-21-67: Material specifications for aluminum and stainless steel changed.
Revised 10-13-66: Note concerning ¼"ϕ drain holes added.
Revised 9-23-66: Gage of holes in Post 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.



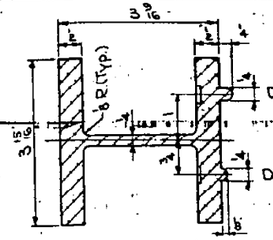
RAIL POST ASSEMBLY



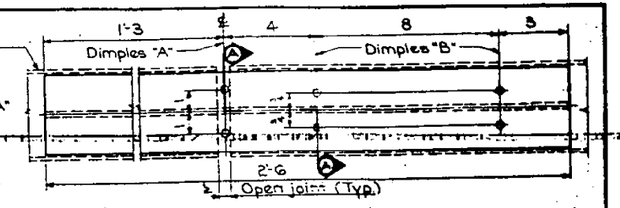
SHIM "A" DETAIL



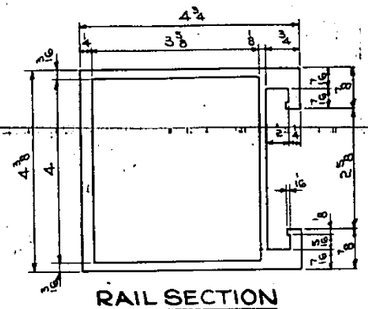
SHIM "B" DETAIL



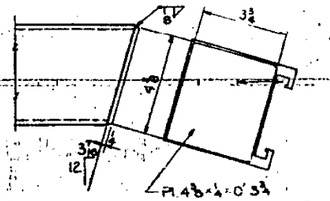
SECTION A-A



RAIL SPLICE DETAIL

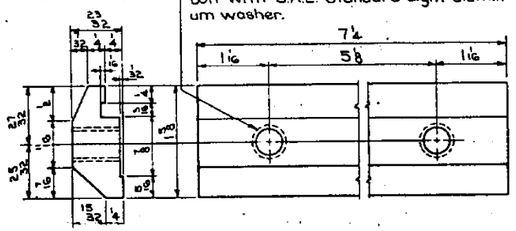


RAIL SECTION

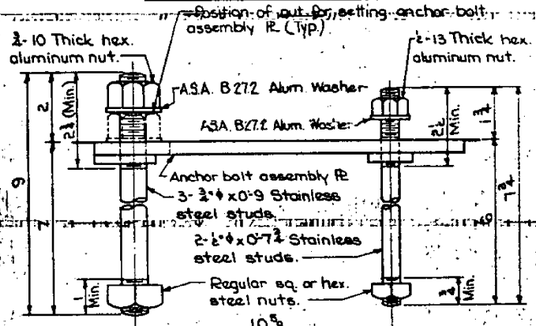


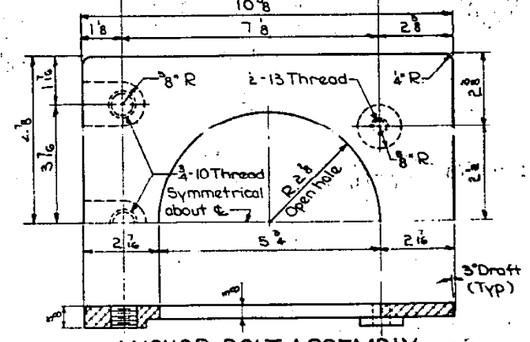
RAIL END CAP DETAILS

½-13-UNC-2B Thread for ½-13-UNC-2A x1" stainless steel A.S.A. B-18.2 hex.head bolt with S.A.E. standard light aluminum washer.

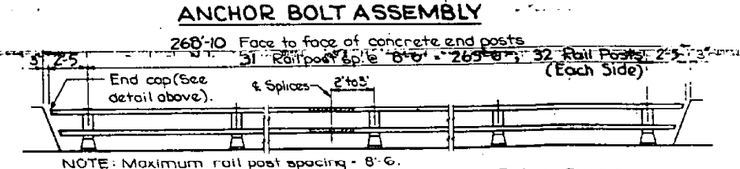


CLAMP BAR DETAILS



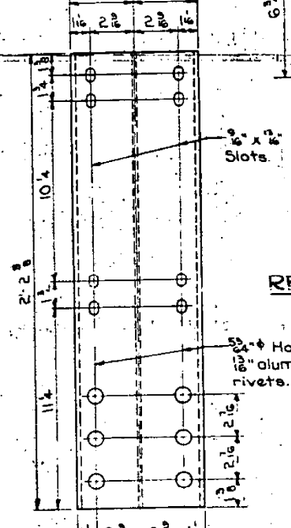


ANCHOR BOLT ASSEMBLY



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

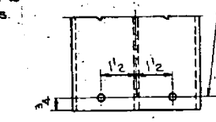
TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT



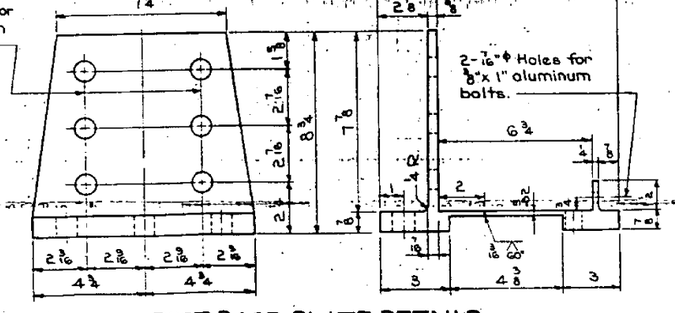
POST



POST SECTION



REAR VIEW OF POST



POST BASE PLATE DETAILS

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 Alclad 2024-T3 for washers and Alloy 1100-O for shims.

Material for anchor studs shall be an 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-1.1 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. The aluminum nuts shall be thick hexagonal, finished and shall comply with A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 for UNC threads series, class 2B fit.

Material for steel nuts shall be A.S.T.M. A-307 Grade A, and shall conform to A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 for UNC threads series, class 2B fit.

The anchor bolt assembly plate shall be cast and true aluminum alloy permanent mold casting complying with ASTM B-108 Alloy SG70 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).

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

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 ¼"ϕ drain hole is to be provided 3 inches in from the end, at the bottom side of the end sections of all rails.

DESIGN SPECIFICATIONS:

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

ALUMINUM HANDRAIL QUANTITIES	
Aluminum handrail	536.7 Lin.Ft

DESIGN FOR 0°00' SKEW

254'-6 x 30' PRETENSIONED CONCRETE BEAM PRESTRESSED BRIDGE

~~30'-0 EXTERIOR BEAMS~~ 30'-0 INTERIOR BEAMS

ALUMINUM HANDRAIL DETAILS

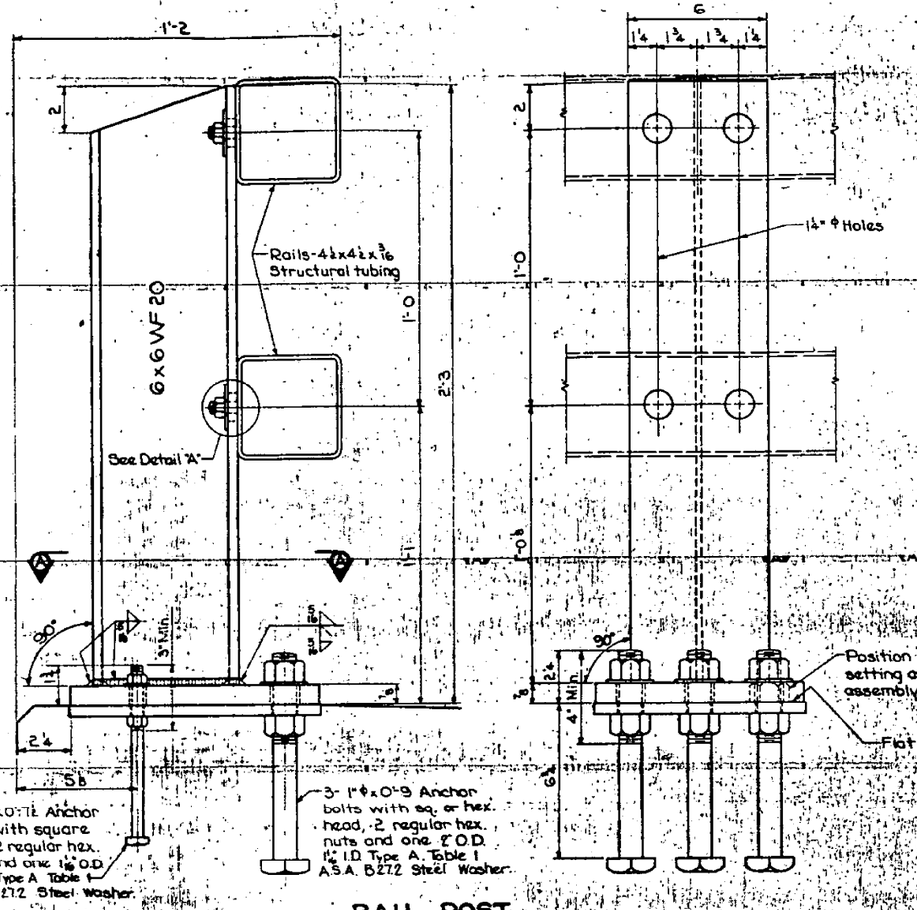
STATION 2451+30.58 & I-380
STATION 15+00 COUNTY RD. S6
JOHNSON COUNTY HIGHWAY COMMISSION
IOWA STATE
DES. SHT. NO. 12 OF 14 FILE NO. 22960 DES. NO. 568
AUGUST, 1969

DESIGNED BY: E. Sorum
DETAILED BY:
TRACED BY: W. Thayer
CHECKED BY: M. L. Elmore

1012A

JOHNSON COUNTY

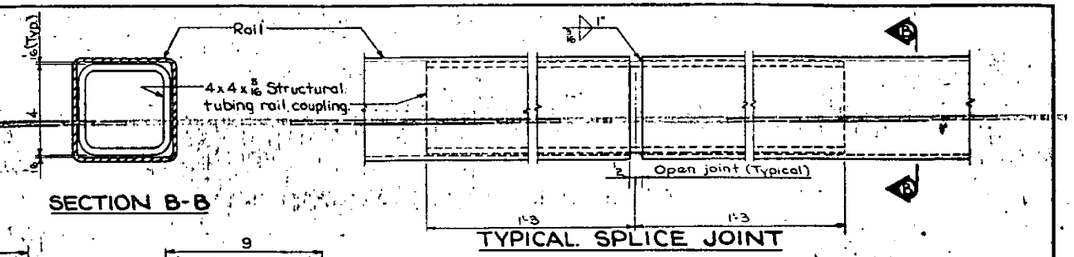
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	5		64	110

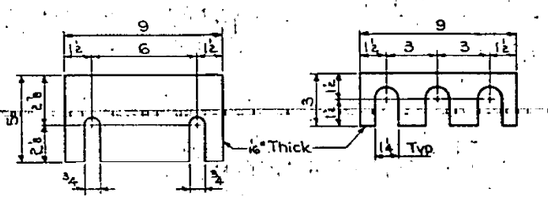


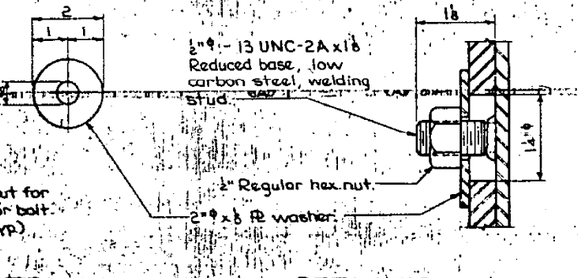
RAIL POST

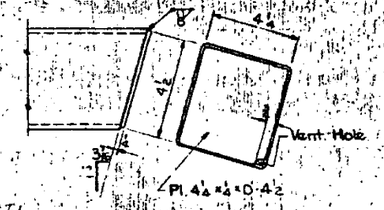
SECTION A-A

ANCHOR CAGE DETAILS

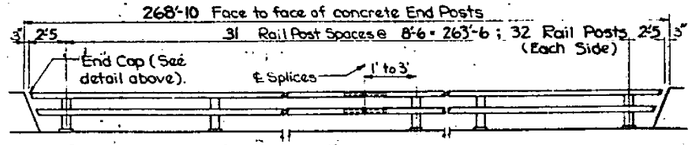








RAIL END CAP DETAILS



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

TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

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 - GIT, 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 ⅛".

No painting will be required.

Rail studs shall be provided with adequate protection during shipment.

DESIGN SPECIFICATIONS:

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

STEEL HANDRAIL QUANTITIES		
Steel Handrail	536.7	Lin. Ft.

DESIGN FOR 0°00' SKEW

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 END SPANS — 86'-6 INTERIOR SPANS

STEEL HANDRAIL DETAILS

STATION: 1461+30.58 ℄ I-380
STATION: 15+00 COUNTY RD 56

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

AUGUST, 1969

DES. SHT. NO. 13 OF 14 — FILE NO. 22960 — DES. NO. 568

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

DESIGNED BY: E. Jaquith
DETAILED BY:
TRACED BY: W. Krupa
CHECKED BY: M. L. Thomas

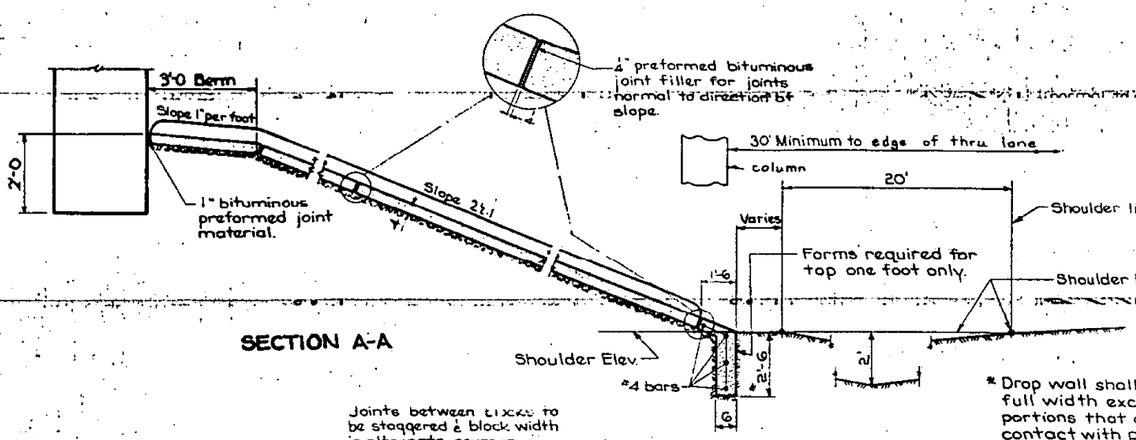
1013A

JOHNSON COUNTY

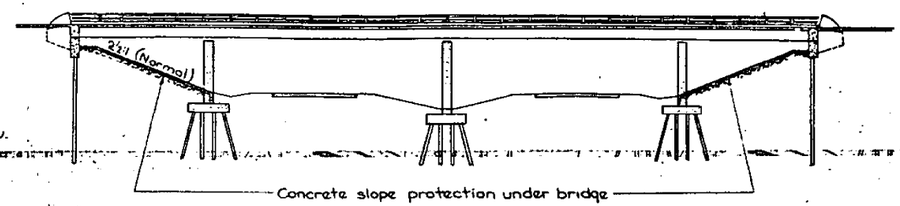
PROJECT NUMBER	STATE	FED ROAD DIST NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	5		69	110

Revised 9-19-68 - Column clearance dimension changed from edge of shoulder to edge of thru lane.
Revised 9-18-68 - Form-out around column and crushed stone added.
Revised 6-1-68 - Toe of slope protection changed and ditch and column clearances dimensions added.

Revised 6-20-67 Dowel bar length changed and note added.
Revised 3-2-65 Cure added.
Revised 10-30-64 Revised for 1964 Standard Specs.
Revised 1-19-61 Curb dowel bars added.
Revised 7-21-60 Corrected for 1960 Standard Specifications.
Revised 2-15-60 Pre-cast block construction deleted. Curb added to sides.
Revised 9-15-59 Statement concerning erosion control added.
Revised 9-4-59 Statement concerning disposal of excess earth added.

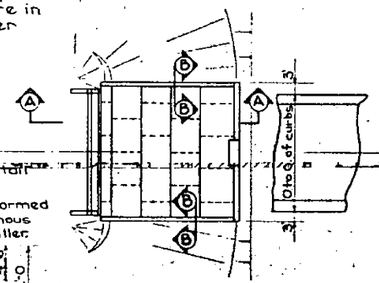


SECTION A-A

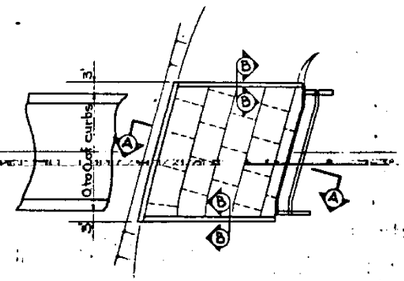


LONGITUDINAL SECTION ALONG ℄ OF ROADWAY

* Drop wall shall be 2'-6 full width except for portions that are in contact with pier footings.



SLOPE PROTECTION LAYOUT 0° SKEW



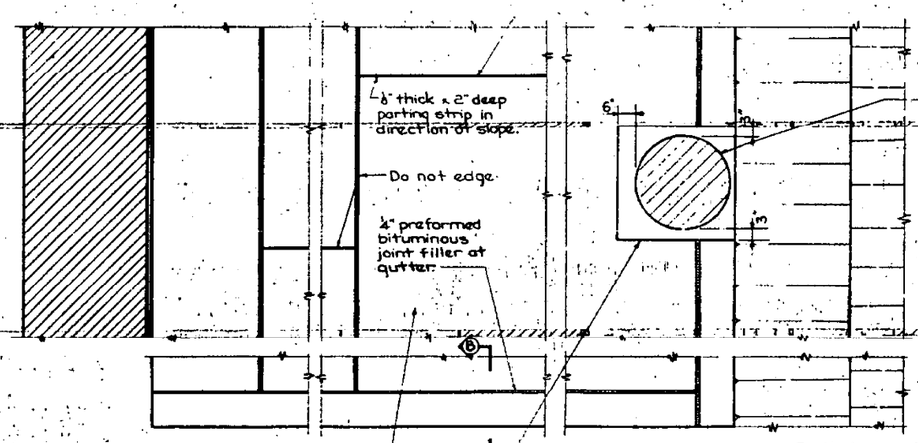
SLOPE PROTECTION LAYOUT 15° SKEW

Joints between blocks to be staggered ½ block width in alternate courses.

½" thick x 2" deep parting strip in direction of slope.

Do not edge.

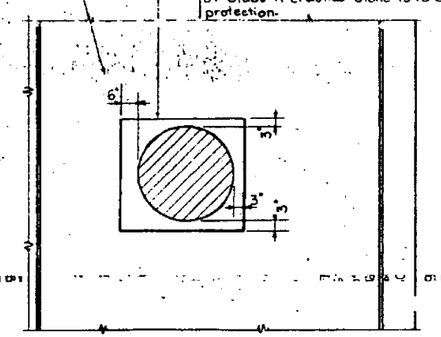
¼" preformed bituminous joint filler at gutter.



Nominal dimension of cast in place concrete blocks = 10' x 10'

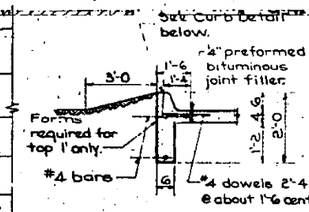
Omit drop wall along pier column as shown.

Slope protection is to be formed out around column to this line and Class A crushed stone 4" thick is to be placed in the area between column and slope protection. Cost of Class A crushed stone is to be included in the cost of slope protection.

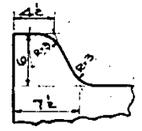


PART SLOPE PROTECTION PLAN (0° SKEW) FOR COLUMNS IN SLOPE
Scale: ½" = 1'-0

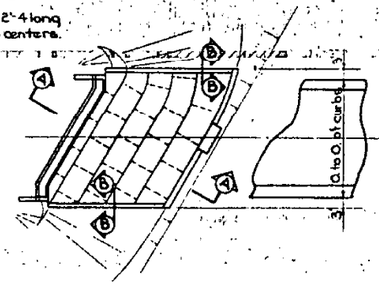
See Curb detail below.



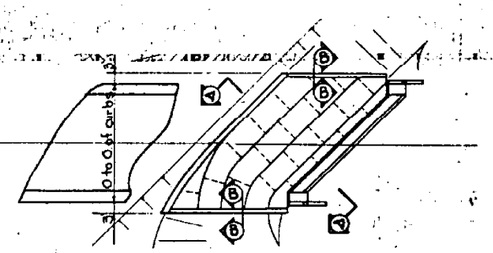
SECTION B-B



CURB DETAIL



SLOPE PROTECTION LAYOUT 30° SKEW



SLOPE PROTECTION LAYOUT 45° SKEW

GENERAL NOTES:

This sheet shows details for placing portland cement concrete slope protection under overhead structures.

The current specifications of the Iowa Highway Commission shall apply with modifications or additions listed below:

Concrete - Class C Structural

Finish - Class 1, Floated Surface Finish.
Cure - Cure as per current Specifications.
Subgrade Preparation - The subgrade is to be shaped and compacted so that finished slope protection will be similar to examples shown on this sheet. The subgrade shall be firm when concrete is placed. Sprinkling required shall be done early enough so that concrete is not placed on a muddy subgrade. No subgrade paper will be required.

The cast in place concrete is to be poured in approximately 10' wide courses, but all courses on one slope should have approximately equal widths. Adjacent courses shall not be poured within 15 hours of one another. The joints in the direction of the slope are to be staggered about ½ block width.

Basis of payment: Payment will be made on a square yard basis for slope protection constructed. The unit price bid per square yard is to include costs of all materials and labor required to construct this protection as shown or intended by these plans. The subgrade preparation including any necessary excavation or filling required to shape the slope to the lines shown on the plans and disposal of excess earth excavated as directed by the Engineer, are considered incidental to placing the concrete slope protection.

Pay quantities are to be based on field measured out to out dimensions.

Where erosion control work is completed the Contractor shall be responsible for any plant materials destroyed adjacent to slope protection area. The Contractor shall replant, reseed and remulch all areas disturbed adjacent to slope protection areas in accordance with section 2601 of Standard Specifications, Series of 1964, at his expense.

DESIGN FOR 0°00' SKEW

SLOPE PROTECTION QUANTS.	
West - slope	188
East - slope	188
Total (Sq. Yds.)	376

254'-6 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

401-9 END SPANS 861-6 INTERIOR SPANS

CONCRETE SLOPE PROTECTION

STATION: 1461+30.58 ℄ I-380
STATION: 154+00 COUNTY RD. S6

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES SHT NO. 14 OF 14 FILE NO. 22980 DES NO. 568

AUGUST 1969

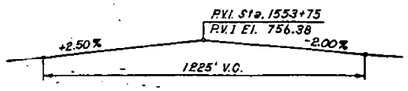
DESIGNED BY: E. Squire
DETAILED BY:
TRACED BY: K. Hayes
CHECKED BY: M. F. Ilmer

100G A

JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	3		50	110

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



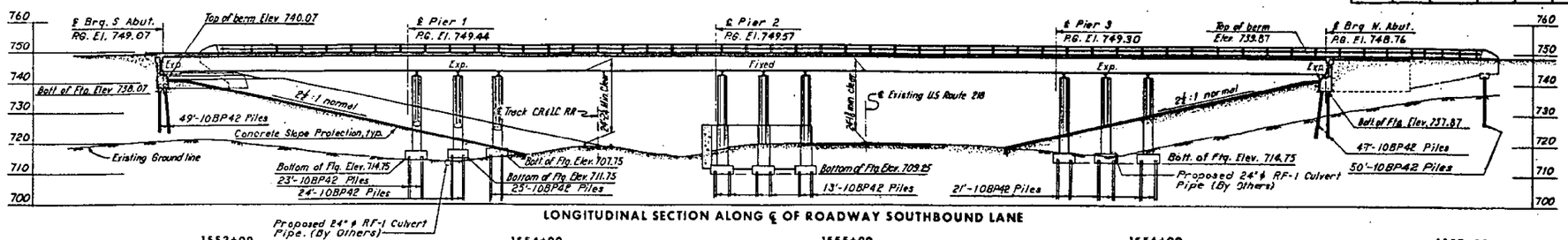
I-380 GRADE

BENCH MARK

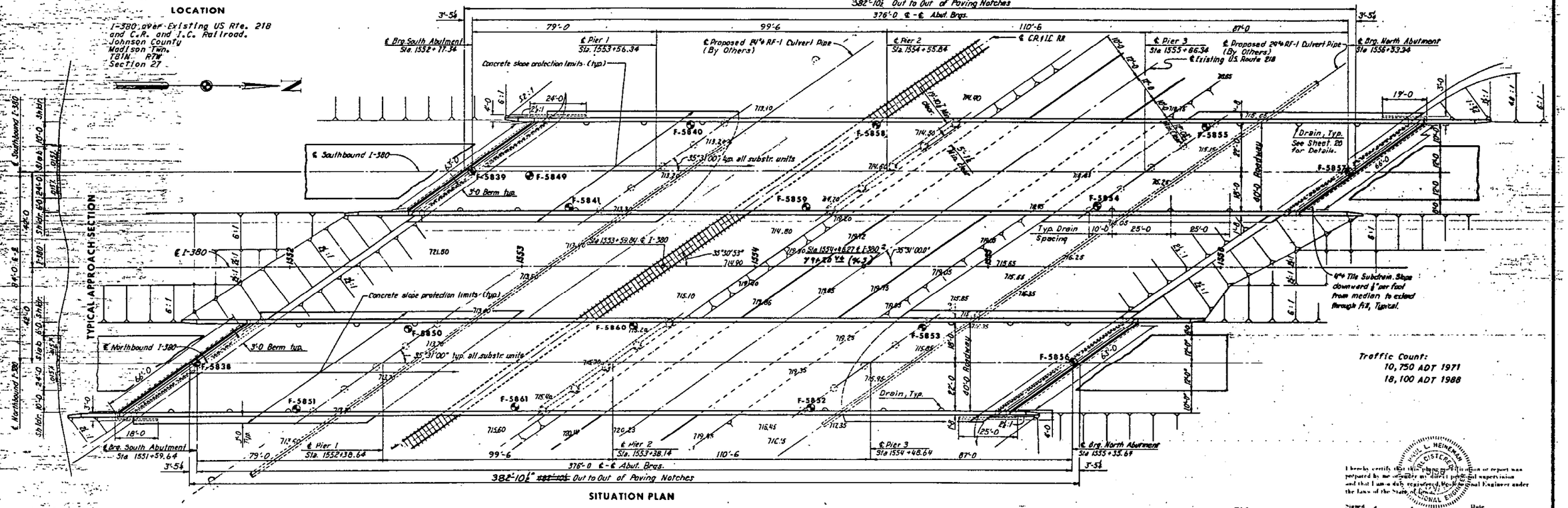
B.M. 62: 85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

LOCATION

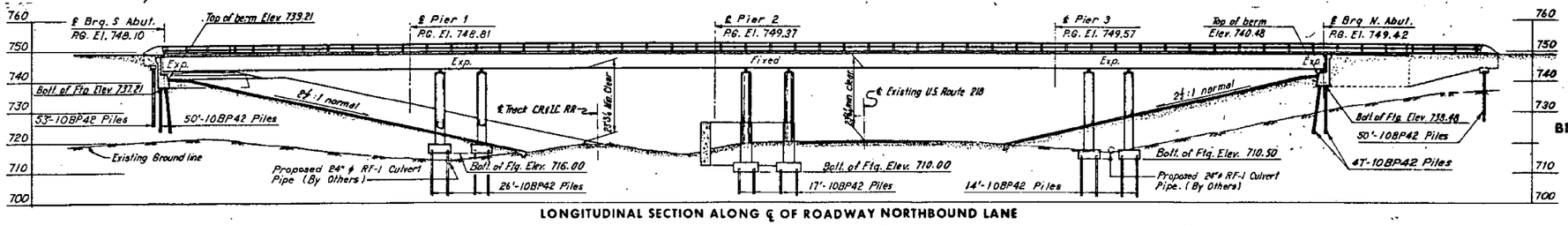
I-380 over Existing US Rte. 218 and C.R. and I.C. Railroad.
Johnson County
Madison Twp.
T81N. R7W.
Section 27



LONGITUDINAL SECTION ALONG ℄ OF ROADWAY SOUTHBOUND LANE



SITUATION PLAN



LONGITUDINAL SECTION ALONG ℄ OF ROADWAY NORTHBOUND LANE

1552+00 1553+00 1554+00 1555+00 1556+00

I hereby certify that this plans, specification or report 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.

Signed ..... Date Dec. 17 19 69

Paul L. Heineman, P.E. Iowa Reg. No. 5156

BRIDGE NO. 10 — **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SITUATION PLAN

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IO-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER-1969 Crossing No. 4285 SHEET 1 OF 25

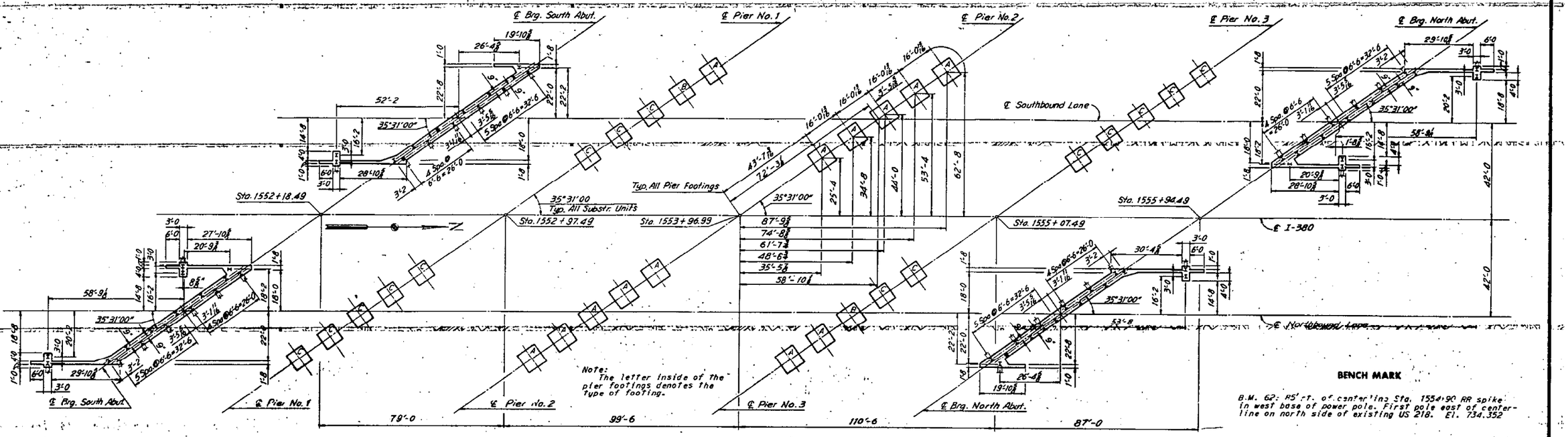
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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KANSAS CITY NEW YORK

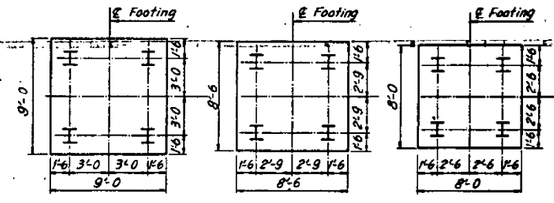
MADE L.J.R. DATE 8-26-69 CHECKED P.T.A. DATE 09-08-69

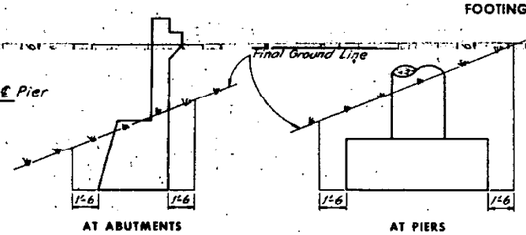
Revised: 7-27-70 North bound lane out to out of paving length corrected.

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



FOOTING PLAN





EXCAVATION DETAILS

SPECIFICATIONS:

Design Stresses for the following materials are in accordance with AASHO Standard Specifications for Highway bridges, Series of 1969.

Structural steel in accordance with Section 7 "Structural Steel Design." ASTM A36 fs=20,000 psi.

Reinforcing steel in accordance with Section 1.5.1 "Reinforcement" fs=20,000 psi.

Concrete in accordance with Section 1.5.1 f'c = 3500 psi.

Construction: Standard Specifications of the Iowa State Highway Commission Series of 1964, plus current Special Provisions and current Supplemental Specifications.

Welding: 1969 American Welding Society Specifications, except as modified in Standard Specifications.

GENERAL NOTES:

These bridges are designed for HS20-44 and alternate loading designated in P.P. M. 20-4, Section 4-c with allowance of 20 lbs. per sq. ft. of roadway for future wearing surface.

Drawings shall not be scaled.

Utilities are to be relocated by others.

The bridge contractor is to install the tile subdrains behind each abutment as detailed. The price bid for "4" ϕ Tile Subdrain" is to include excavation necessary for installation.

The bridge contractor is to level off and shape the berms to elevations and dimensions shown.

All dimensions are horizontal, unless otherwise shown.

The 10BP42 steel piles at abutments and piers shall be driven to a minimum bearing value of 35 tons per pile with a diesel hammer of adequate capacity. Piles shall be driven to practical refusal and seated in limestone. Seating shall be done with a diesel hammer of at least 26,000 foot-pounds of rated energy operating at full capacity, or a gravity hammer having an effective weight of at least 6,000 pounds, and driving energy of not less than 38,000 foot pounds nor more than 40,000 foot-pounds.

* 524.6 Cu. Yds. Class C Concrete
1366.6 Cu. Yds. Class D Concrete

** 20 @ 13', 8 @ 14', 4 @ 15', 4 @ 16', 24 @ 17', 4 @ 18', 4 @ 20', 20 @ 21', 4 @ 23', 4 @ 24', 4 @ 25', 20 @ 26', 26 @ 47', 13 @ 49', 19 @ 50', 2 @ 52', 4 @ 53'.

TOTAL ESTIMATED QUANTITIES

ITEM		UNIT	SOUTHBOUND LANE SUBSTR.	SOUTHBOUND LANE SUPERSTR.	SOUTHBOUND LANE TOTAL	NORTHBOUND LANE SUBSTR.	NORTHBOUND LANE SUPERSTR.	NORTHBOUND LANE TOTAL	TOTAL
*Structural Concrete		Cu. Yds.	462.9	481.7	944.6	464.9	481.7	946.6	1,891.2
Reinforcing Steel		Lbs.	75,897	159,626	235,523	76,265	159,626	235,891	471,414
Structural Steel		Lbs.		417,607	417,607		417,607	417,607	835,214
**10BP42 Steel	Furnish	Lin. Ft.	2,664		2,664	2,745		2,745	5,409
Bearing Piling	Drive	Lin. Ft.	2,664		2,664	2,745		2,745	5,409
Excavation, Class 20		Cu. Yds.	689		689	675		675	1,364
Concrete Slope Protection		Sq. Yds	1,125		1,125	1,109		1,109	2,234
Granular Backfill		Cu. Yds.	333		333	330		330	663
4" ϕ Tile Subdrain		Lin. Ft.	179		179	179		179	358
Aluminum Handrail		Lin. Ft.		845.7	845.7		846.2	846.2	1,691.9
Steel Handrail		Lin. Ft.		845.7	845.7		846.2	846.2	1,691.9

Existing U. S. 218 will be open to traffic during bridge construction but all traffic through the work area will be halted during the time that is required to erect the beams spanning the existing roadway. The Bridge Contractor, at the direction of the Engineer, will furnish sufficient personnel to stop and park the through traffic which may assemble during the erection of the beams. Signing requirements will be in accordance with Specification 583.

BENCH MARK

B.M. 62: 85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE SCC DATE 8-14-69 CHECKED I.J.R DATE 9-29-69

2312-21-00

BRIDGE NO. 10 C.R. & I.C. RR AND EXISTING U.S. ROUTE 218
DESIGN FOR 54°29' SKEW
DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE
79'-0, 99'-6, 110'-6, 87'-0 SPANS

GENERAL NOTES

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 2 OF 25
DESIGN NO. 668 JOHNSON COUNTY FILE 22960
52 of 110

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				

721.8	Surface Elevation
713.8	Stiff silty clay
	Very firm glacial clay – occ. boulder and sand layer
696.3	Gravel and broken limestone
693.6	Medium hard limestone
687.8	

F-5849

40'Lt. Sta. 1553+03, ℄ I-380

720.6	Surface Elevation
	Stiff silty clay
707.1	
698.1	Firm glacial clay
696.1	Very firm glacial clay – occ. boulder
692.9	Very firm bouldery clay
691.6	Broken limestone
686.1	Medium hard limestone – occ. thin limestone layer

F-5838

42'Rt. Sta. 1551+60, ℄ I-380

721.4	Surface Elevation
	Stiff silty clay
707.4	
699.9	Firm glacial clay – occ. small boulder
697.4	Very firm glacial clay – occ. boulder
695.9	Broken limestone
693.4	Medium hard limestone – occ. thin
691.9	limestone layer
690.4	Limestone
	Medium hard limestone

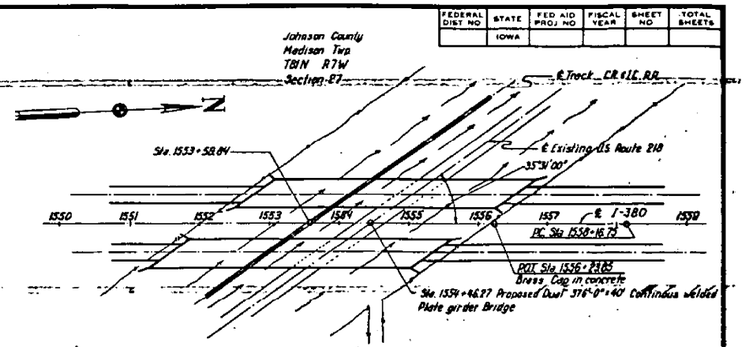
F-5839

42'Lt. Sta. 1552+78, ℄ I-380

716.8	Surface Elevation
715.6	Stiff sandy silty clay
708.8	Stiff very sandy clay
703.3	Sand – some clay content
698.5	Firm sandy clay
692.3	Very firm glacial clay – with
691.3	numerous boulders
687.3	Broken limestone
	Medium hard limestone – occ. thin limestone layer

F-5840

62'Lt. Sta. 1553+73, ℄ I-380



GENERAL PLAN

718.0	Surface Elevation
716.5	Stiff sandy silty clay
708.0	Stiff very sandy clay
703.5	Sand – some clay content
701.1	Firm sandy clay
696.5	Very firm glacial clay – occ. boulder
692.0	Medium hard limestone – occ. thin limestone layer

F-5841

26'Lt. Sta. 1553+20, ℄ I-380

717.6	Surface Elevation
713.6	Stiff silty clay
	Clayey sand
705.1	
699.6	Firm glacial clay
693.8	Very firm glacial clay
692.8	Broken limestone
688.1	Medium hard limestone

F-5850

27'Rt. Sta. 1552+51, ℄ I-380

718.2	Surface Elevation
710.7	Stiff silty clay
	Clayey sand – occ. clay layer
704.2	
700.7	Firm sandy glacial clay
695.7	Very firm glacial clay
693.7	Broken limestone
689.2	Medium hard limestone

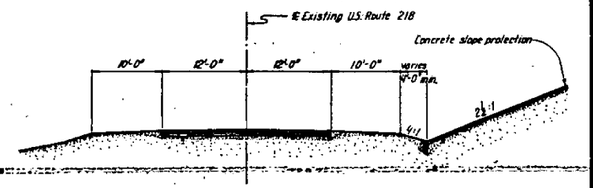
F-5851

62'Rt. Sta. 1552+03, ℄ I-380

716.7	Surface Elevation
714.7	Stiff sandy loam
711.2	Sand – some clay content
708.7	Clayey sand
704.2	Firm glacial clay
700.4	Very firm glacial clay
696.2	Medium hard limestone

F-5852

62'Rt. Sta. 1554+24, ℄ I-380



NORMAL CROSS-SECTION EXISTING U.S. ROUTE 218 UNDER BRIDGE

715.9	Surface Elevation
714.9	Stiff sandy loam
711.9	Sand – some clay content
707.4	Clayey sand – occ. small boulder
703.4	Firm glacial clay
699.6	Very firm glacial clay
695.4	Medium hard limestone

F-5853

27'Rt. Sta. 1554+72, ℄ I-380

715.5	Surface Elevation
714.3	Stiff sandy loam
710.5	Sand – some clay content
707.5	Clayey sand
702.5	Firm glacial clay
695.9	Very firm glacial clay
692.0	Medium hard limestone

F-5854

27'Lt. Sta. 1555+47, ℄ I-380

715.6	Surface Elevation
714.1	Stiff sandy loam
710.6	Sand – some clay content
707.1	Clayey sand – occ. small boulder
701.6	Firm sandy glacial clay
697.3	Very firm glacial clay
692.1	Medium hard limestone

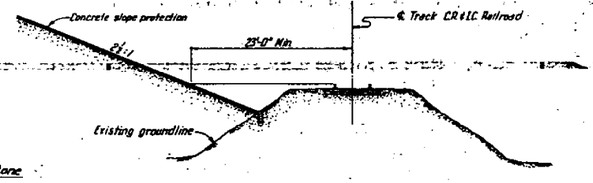
F-5855

62'Lt. Sta. 1555+94, ℄ I-380

729.7	Surface Elevation
	Stiff silty clay
720.7	
711.7	Sand – some clay content
710.5	Gravel and small boulders
704.7	Firm sandy glacial clay
697.7	Very firm glacial clay – occ. small boulders
695.2	Broken limestone in clay
690.7	Medium hard limestone

F-5856

42'Rt. Sta. 1555+37, ℄ I-380



NORMAL CROSS-SECTION RAILROAD UNDER BRIDGE

729.8	Surface Elevation
	Stiff silty clay
720.3	
	Sand – some clay content
710.3	
703.8	Firm sandy glacial clay
696.3	Very firm glacial clay
694.8	Broken limestone in clay
690.8	Medium hard limestone

F-5857

42'Lt. Sta. 1556+55, ℄ I-380

715.6	Surface Elevation
714.1	Stiff sandy loam
707.1	Sand – some clay content
700.6	Firm glacial clay
698.1	Very firm glacial clay
697.1	Broken limestone in clay
693.6	Medium hard limestone

F-5858

62'Lt. Sta. 1554+52, ℄ I-380

715.5	Surface Elevation
713.5	Stiff sandy loam
706.5	Sand – some clay content
700.2	Firm glacial clay
696.5	Medium hard limestone

F-5859

26'Lt. Sta. 1554+22, ℄ I-380

715.5	Surface Elevation
712.0	Stiff silty clay
707.0	Sand – some clay content
703.0	Firm glacial clay
700.7	Broken limestone in clay
698.0	Medium hard limestone

F-5860

26'Rt. Sta 1553+48, ℄ I-380

715.3	Surface Elevation
711.8	Stiff silty clay
705.8	Sand – some clay content
702.3	Firm sandy glacial clay
697.8	Firm sandy clay – pieces of limestone
696.3	Broken limestone
691.8	Medium hard limestone

F-5861

62'Rt. Sta. 1552+97, ℄ I-380

SOUNDING DATA

Note:
Figures inside boring log diagram indicate number of blows required to drive 2" O.D. split barrel sampler one foot.

BENCH MARK

B.M. 62: 85' rt. of centerline Sta. 1554+90. RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SOUNDING DATA

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 3 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

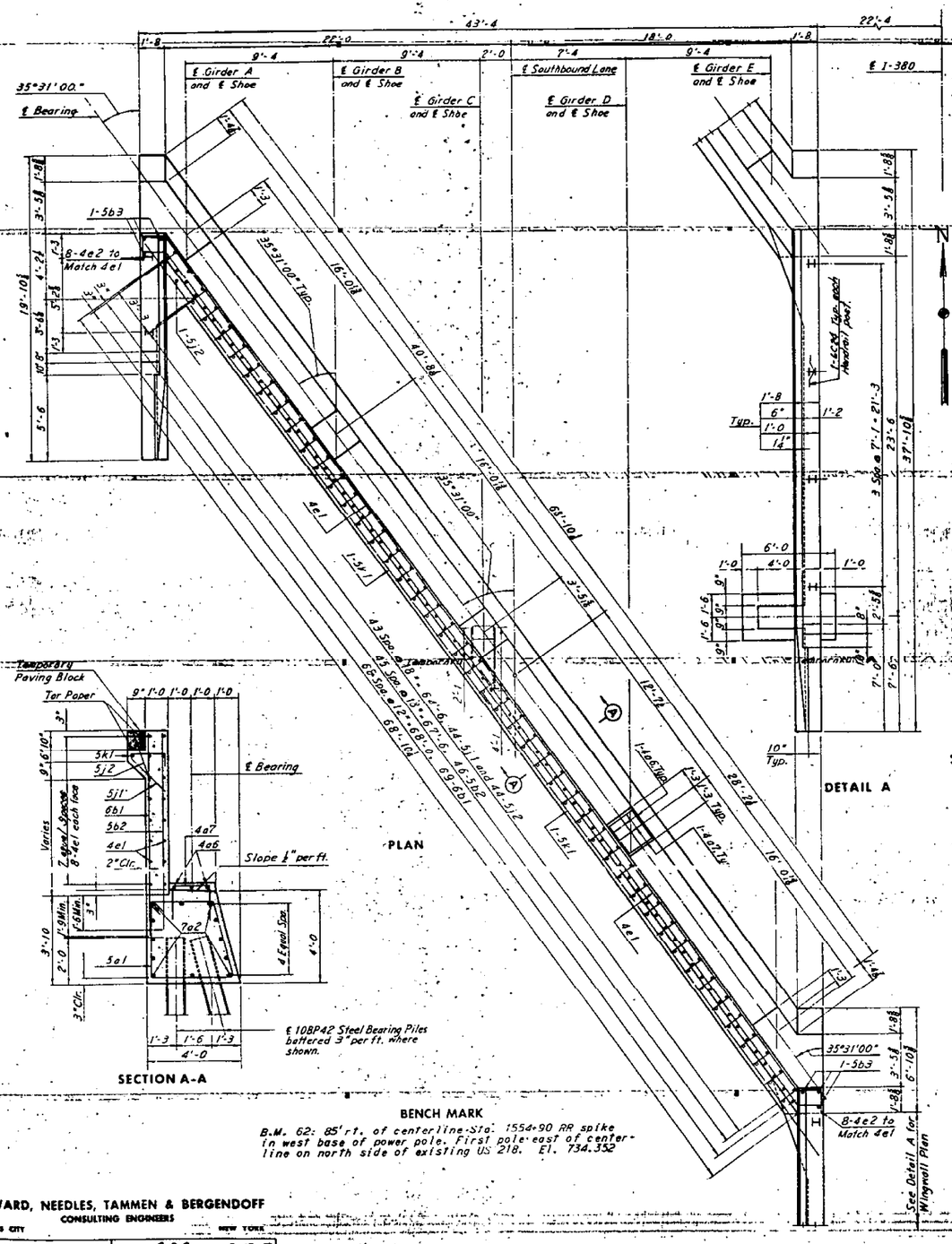
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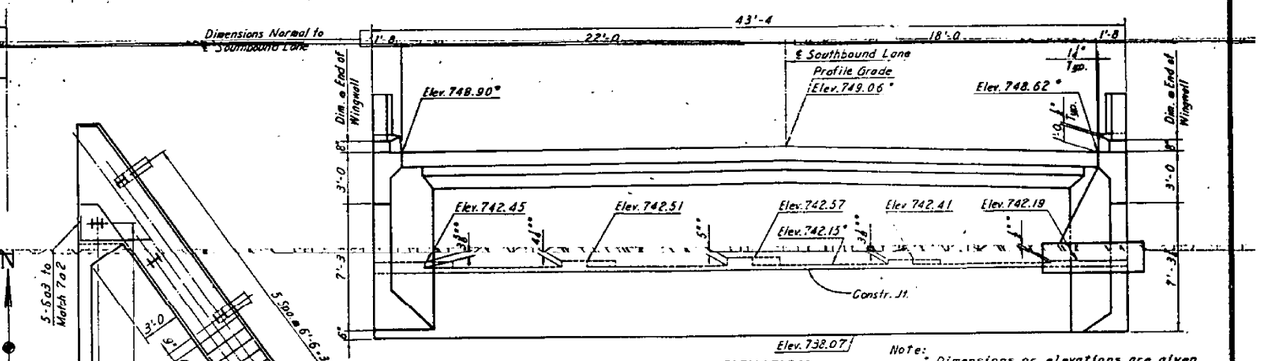
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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN LJR DATE 8-1-69 CHECKED JSH DATE 8-12-69

2312-27-00

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				





ELEVATION

Note: Dimensions or elevations are given at front face of backwall. Piles are not shown in "Plan" or "Elevation".

CONCRETE PLACEMENT QUANTITIES

Front Footing and Steps	(Class C)	Cu. Yds.	39.8
Wingwalls below const. Jt.	(Class C)	Cu. Yds.	2.2
Backwall and wingwalls above const. Jt. (Includes 5 C.Y. for end posts) (Cl. D)			37.5
Wingwall footings	(Class C)	Cu. Yds.	1.2
Temporary paving block	(Class C)	Cu. Yds.	1.6
	Total	Cu. Yds.	82.3

ESTIMATED QUANTITIES

ITEM		UNIT	QUANTITY
Structural Concrete**		Cu. Yds.	82.3
Reinforcing Steel		Lbs.	9,268
10BP42 Steel Bearing Piling	Furnish	Lin. Ft.	741
13 @ 49', 2 @ 52'	Drive	Lin. Ft.	741
Excavation, Class 20		Cu. Yds.	95
Granular Backfill		Cu. Yds.	167
4" ⌀ Tile Subdrain		Lin. Ft.	91

** Structural Concrete consists of 44.8 Cu. Yds. of Class C and 37.5 Cu. Yds. of Class D.

Notes:
All exposed corners of 90° or sharper are to be filleted with a 2" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
All backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil. See Sheet 5 for "Bill of Reinforcement".
See Sheet 10 for "Backfill Detail".
The abutment backwall and the remainder of the wingwalls are to be placed after the Superstructure is in place.
See Sheet 11 for "End Post Detail".
Batter piles 3" per foot in direction shown.
All piles are to be driven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes on Sheet 2.
Pile spacing shown is at bottom of footing.

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 34°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SOUTH ABUTMENT-SOUTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 4 OF 23

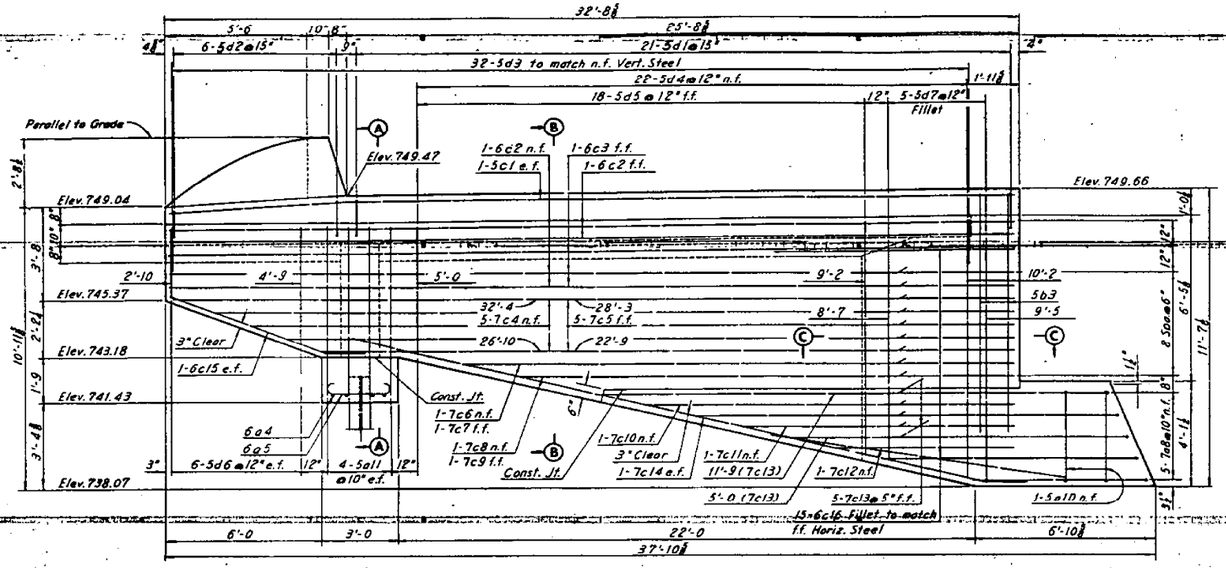
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

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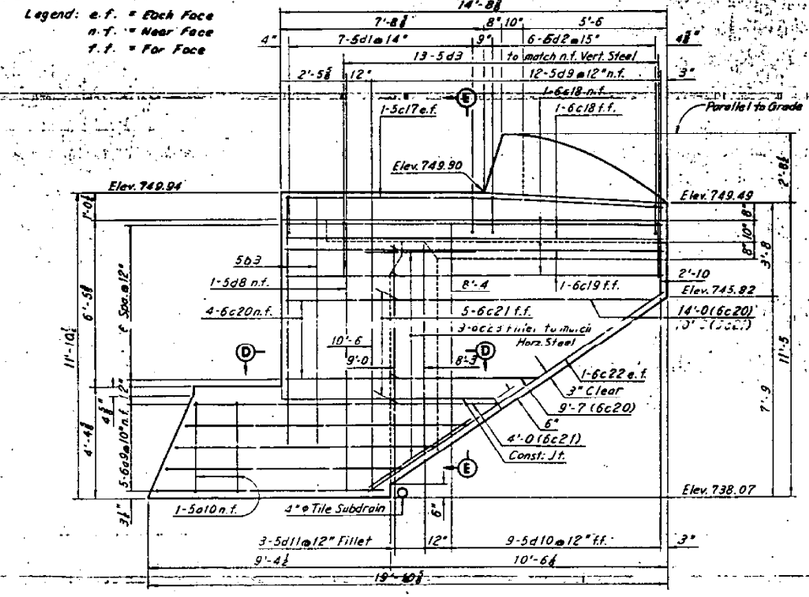
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12-21-00

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



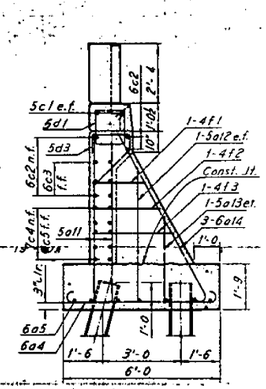
ELEVATION EAST WINGWALL



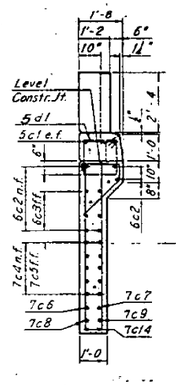
ELEVATION WEST WINGWALL

BENCH MARK

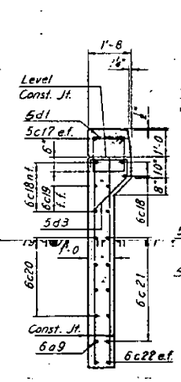
B.M. 62: 85' rt. of centerline Sta. 1554+90 spike in west base of power pole. First pole east of centerline on north side of existing US 218. El: 754.352



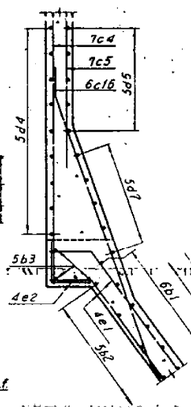
SECTION A-A



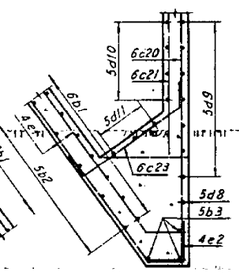
SECTION B-B



SECTION E-E

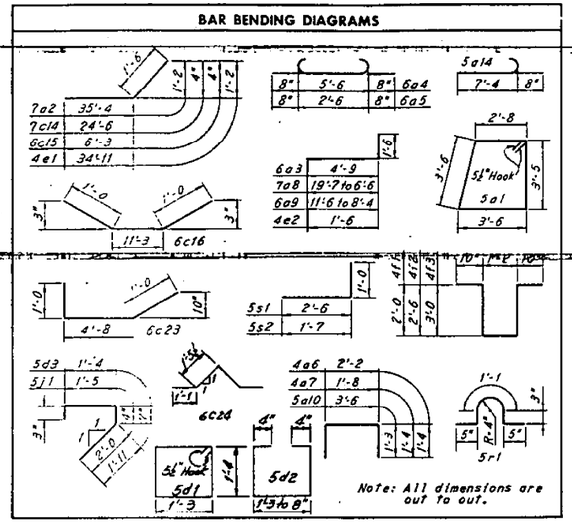


SECTION C-C



SECTION D-D

BAR BENDING DIAGRAMS



Note: All dimensions are out to out.

BILL OF REINFORCEMENT
SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Barrel		60	13'-9	860
7a2	Barrel		24	36'-10	1807
6a3	Barrel		5	6'-2	46
6a4	Wingwall Footing		4	6'-10	41
6a5	Wingwall Footing		7	3'-10	40
4a6	Pads		15	4'-8	47
4a7	Pads		15	4'-2	42
7c8	Barrel		1Ser.5	Varies	149
5a9	Barrel		1Ser.5	Varies	85
5a10	Barrel		4	5'-10	24
5a11	Wingwall Footing		8	6'-9	56
5a12	Wingwall Footing		2	5'-3	11
5a13	Wingwall Footing		2	3'-3	7
6a14	Wingwall Footing		3	8'-0	36
6b1	Backwall		69	8'-9	907
5b2	Backwall		46	8'-6	408
5b3	Backwall		6	9'-7	60

BILL OF REINFORCEMENT
SOUTH ABUTMENT-SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5c1	Curb		2	32'-4	67
6c2	Wingwall		6	32'-4	291
6c3	Wingwall		3	28'-3	127
7c4	Wingwall		1Ser.5	Varies	302
7c5	Wingwall		1Ser.5	Varies	261
7c6	Wingwall		1	21'-0	43
7c7	Wingwall		1	16'-11	35
7c8	Wingwall		1	18'-9	38
7c9	Wingwall		1	14'-8	30
7c10	Wingwall		1	14'-0	29
7c11	Wingwall		1	10'-6	21
7c12	Wingwall		1	6'-9	14
7c13	Wingwall		1Ser.5	Varies	86
7c14	Wingwall		2	26'-0	106
6c15	Wingwall		2	7'-9	23
6c16	Fillet		15	13'-3	300
5c17	Curb		2	14'-4	30
6c18	Wingwall		5	14'-4	108
6c19	Wingwall		5	10'-3	77
6c20	Wingwall		1Ser.4	Varies	71
6c21	Wingwall		1Ser.5	Varies	53
6c22	Wingwall		2	13'-6	41
6c23	Fillet		9	6'-7	89
6c24	Post Anchor		6	5'-0	45
5d1	Curb		28	5'-10	170
5d2	Curb		2Ser.6	Varies	50
5d3	Wingwall		45	3'-11	184
5d4	Wingwall		1Ser.22	Varies	174
5d5	Wingwall		1Ser.18	Varies	133
5d6	Wingwall		2Ser.6	Varies	47
5d7	Fillet		1Ser.5	Varies	47
5d8	Wingwall		1	10'-5	11
5d9	Wingwall		1Ser.12	Varies	83
5d10	Wingwall		1Ser.9	Varies	52
5d11	Fillet		1Ser.3	Varies	27
4e1	Backwall		32	36'-5	778
4e2	Backwall		16	2'-11	31
4f1	Counterfort		1	6'-6	4
4f2	Counterfort		1	7'-6	5
4f3	Counterfort		1	8'-6	6
5j1	Slab Seat		44	3'-10	176
5j2	Slab Seat		45	2'-4	110
5k1	Backwall		2	37'-3	78
5r1	Paving Block		9	2'-3	21
5s1	End Post		20	5'-3	71
5s2	End Post		12	2'-6	31
5s3	End Post		8	6'-4	53
4s4	End Post		4	5'-0	13
	Total				9,268

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK

MAIN MHH DATE 8-8-69 CHECKED GCC DATE 8-11-69

23/2-21-60

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 84°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SOUTH ABUTMENT DETAILS - SOUTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-10-380-6(7) 247--04-52

JOHNSON COUNTY

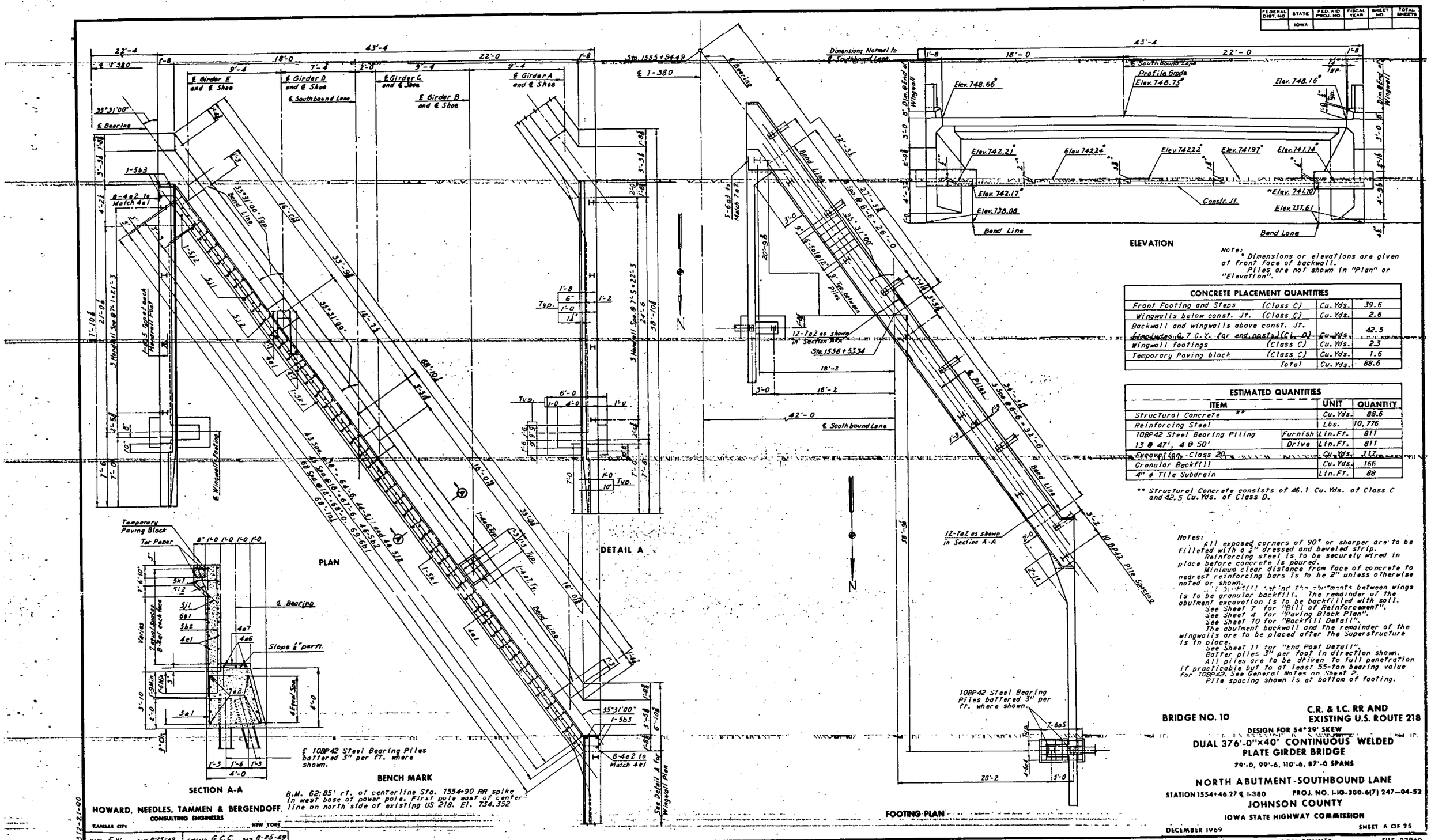
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 5 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

85 of 110

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				



Note:
* Dimensions or elevations are given at front face of backwall. Piles are not shown in "Plan" or "Elevation".

CONCRETE PLACEMENT QUANTITIES			
Front Footing and Steps	(Class C)	Cu.Yds.	39.6
Wingwalls below const. Jt.	(Class C)	Cu.Yds.	2.6
Backwall and wingwalls above const. Jt. (Includes 0.7 C.Y. for end posts)	(Class C)	Cu.Yds.	42.5
Wingwall footings	(Class C)	Cu.Yds.	2.3
Temporary Paving block	(Class C)	Cu.Yds.	1.6
	Total	Cu.Yds.	88.6

ESTIMATED QUANTITIES			
ITEM		UNIT	QUANTITY
Structural Concrete **		Cu.Yds.	88.6
Reinforcing Steel		Lbs.	10,776
10BP42 Steel Bearing Piling	Furnish	Lin.Ft.	811
13 @ 47', 4 @ 50'	Drive	Lin.Ft.	811
Excavation - Class 20		Cu.Yds.	117
Granular Backfill		Cu.Yds.	166
4" ϕ Tile Subdrain		Lin.Ft.	88

** Structural Concrete consists of 46.1 Cu.Yds. of Class C and 42.5 Cu.Yds. of Class D.

Notes:
All exposed corners of 90° or sharper are to be filleted with a 3" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
Backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.
See Sheet 7 for "Bill of Reinforcement".
See Sheet 4 for "Paving Block Plan".
See Sheet 10 for "Backfill Detail".
The abutment backwall and the remainder of the wingwalls are to be placed after the Superstructure is in place.
See Sheet 11 for "End Post Detail".
Batter piles 3" per foot in direction shown.
All piles are to be driven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes on Sheet 2.
Pile spacing shown is at bottom of footing.

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

NORTH ABUTMENT - SOUTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 6 OF 25

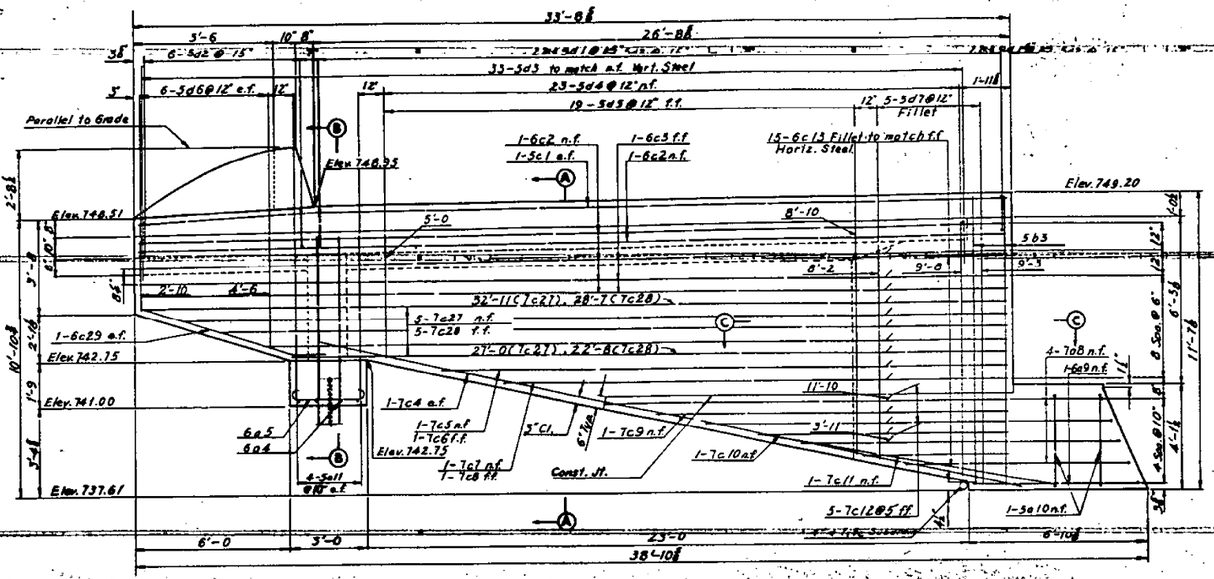
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

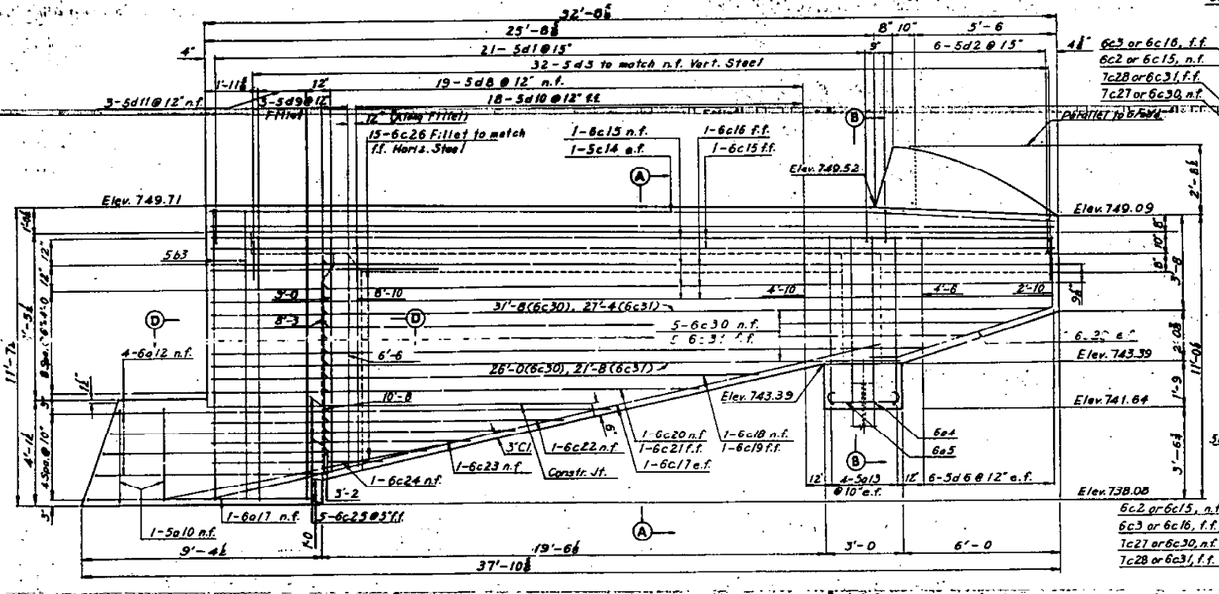
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8-12-21-00

FEDERAL DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				

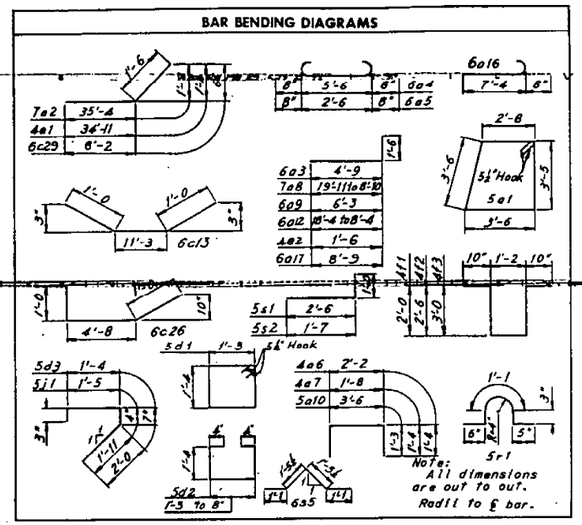


ELEVATION WEST WINGWALL



ELEVATION EAST WINGWALL

BAR BENDING DIAGRAMS



BILL OF REINFORCEMENT

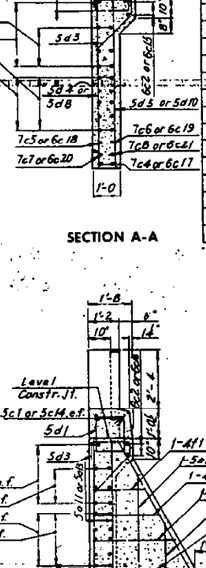
NORTH ABUTMENT - SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6b1	Backwall	——	69	8'-10	915
5b2	Backwall	——	46	8'-7	412
5b3	Backwall	——	6	11'-2	70
5c1	Curb	——	2	33'-4	70
6c2	Wingwall	——	6	33'-4	300
6c3	Wingwall	——	3	29'-2	131
7c4	Wingwall	——	2	26'-9	109
7c5	Wingwall	——	1	22'-2	45
7c6	Wingwall	——	1	19'-8	40
7c7	Wingwall	——	1	15'-0	31
7c8	Wingwall	——	1	14'-3	29
7c9	Wingwall	——	1	10'-4	21
7c10	Wingwall	——	1	6'-5	13
7c11	Wingwall	——	1	6'-5	13
7c12	Wingwall	——	1 Ser. 5	Varies	80
6c13	Fillet	⌒	15	13'-3	299
5c14	Curb	——	2	32'-4	67
6c15	Wingwall	——	6	32'-4	291
6c16	Wingwall	——	3	28'-2	127
6c17	Wingwall	——	2	25'-10	78
6c18	Wingwall	——	1	20'-6	31
6c19	Wingwall	——	1	16'-4	25
6c20	Wingwall	——	1	18'-2	27
6c21	Wingwall	——	1	14'-0	21
6c22	Wingwall	——	1	13'-3	20
6c23	Wingwall	——	1	9'-5	14
6c24	Wingwall	——	1	5'-9	9
6c25	Wingwall	——	1 Ser. 5	Varies	52
6c26	Fillet	⌒	15	6'-7	148
7c27	Wingwall	——	1 Ser. 5	Varies	306
7c28	Wingwall	——	1 Ser. 5	Varies	262
6c29	Wingwall	⌒	4	7'-9	47
6c30	Wingwall	——	1 Ser. 5	Varies	217
6c31	Wingwall	——	1 Ser. 5	Varies	184
5d1	Curb	⊓	43	5'-10	262
5d2	Curb	⊓	2 Ser. 6	Varies	50
5d3	Wingwall	——	65	3'-11	266
5d4	Wingwall	——	1 Ser. 23	Varies	176
5d5	Wingwall	——	1 Ser. 19	Varies	137
5d6	Wingwall	——	4 Ser. 6	Varies	92
5d7	Fillet	⌒	1 Ser. 3	Varies	45
5d8	Wingwall	——	1 Ser. 19	Varies	137
5d9	Fillet	⌒	1 Ser. 3	Varies	23
5d10	Wingwall	——	1 Ser. 18	Varies	122
5d11	Wingwall	——	3	10'-2	32
4a1	Backwall	——	32	36'-5	778
4a2	Backwall	⌐	16	2'-11	31
4f1	Counterfort	⌐	2	6'-6	9
4f2	Counterfort	⌐	2	7'-6	10
4f3	Counterfort	⌐	2	8'-6	11
5j1	Slab Seat	——	1	7'-10	176
5j2	Slab Seat	——	45	2'-4	110
5k1	Slab Seat	——	2	36'-9	77
5r1	Paving Block	⌐	9	2'-3	21
5s1	End Post	⌐	20	3'-5	71
5s2	End Post	⌐	12	2'-6	31
5s3	End Post	——	8	6'-4	53
4s4	End Post	——	4	5'-0	13
6s5	Wingwall	⌒	8	5'-0	60
	Total				10,776

BILL OF REINFORCEMENT

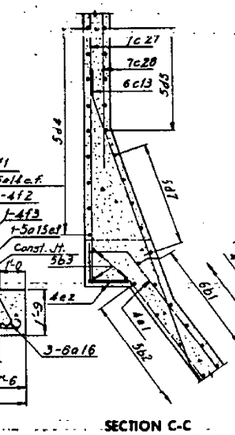
NORTH ABUTMENT - SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Barrel	⊓	60	13'-9	860
7a2	Barrel	⌐	24	36'-10	1807
6a3	Barrel	⌐	5	6'-2	46
6a4	Wingwall Footing	⊂⊃	8	6'-10	82
6a5	Wingwall Footing	⊂⊃	14	3'-10	81
4a6	Pads	⊓	15	4'-8	47
4a7	Pads	⊓	15	4'-2	42
7a8	Barrel	⌐	1 Ser. 4	Varies	130
6a9	Barrel	⌐	1	7'-8	12
5a10	Barrel	⌐	4	5'-10	24
5a11	Wingwall Footing	——	8	6'-4	53
6a12	Barrel	⌐	1 Ser. 4	Varies	89
5a13	Wingwall Footing	——	8	6'-5	54
5a14	Wingwall Footing	——	4	5'-3	22
5a15	Wingwall Footing	——	4	3'-5	14
6a16	Wingwall Footing	⊂⊃	6	8'-0	72
6a17	Barrel	⌐	1	10'-2	15

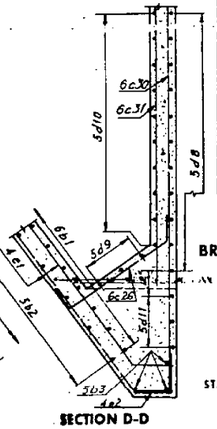


SECTION A-A

SECTION B-B



SECTION C-C



SECTION D-D

BENCH MARK

B.M. 62:85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK
MADE F.W. DATE 8-25-69 CHECKED G.C.C. DATE 8-25-69

2312-21-00

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

NORTH ABUTMENT DETAILS-SOUTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

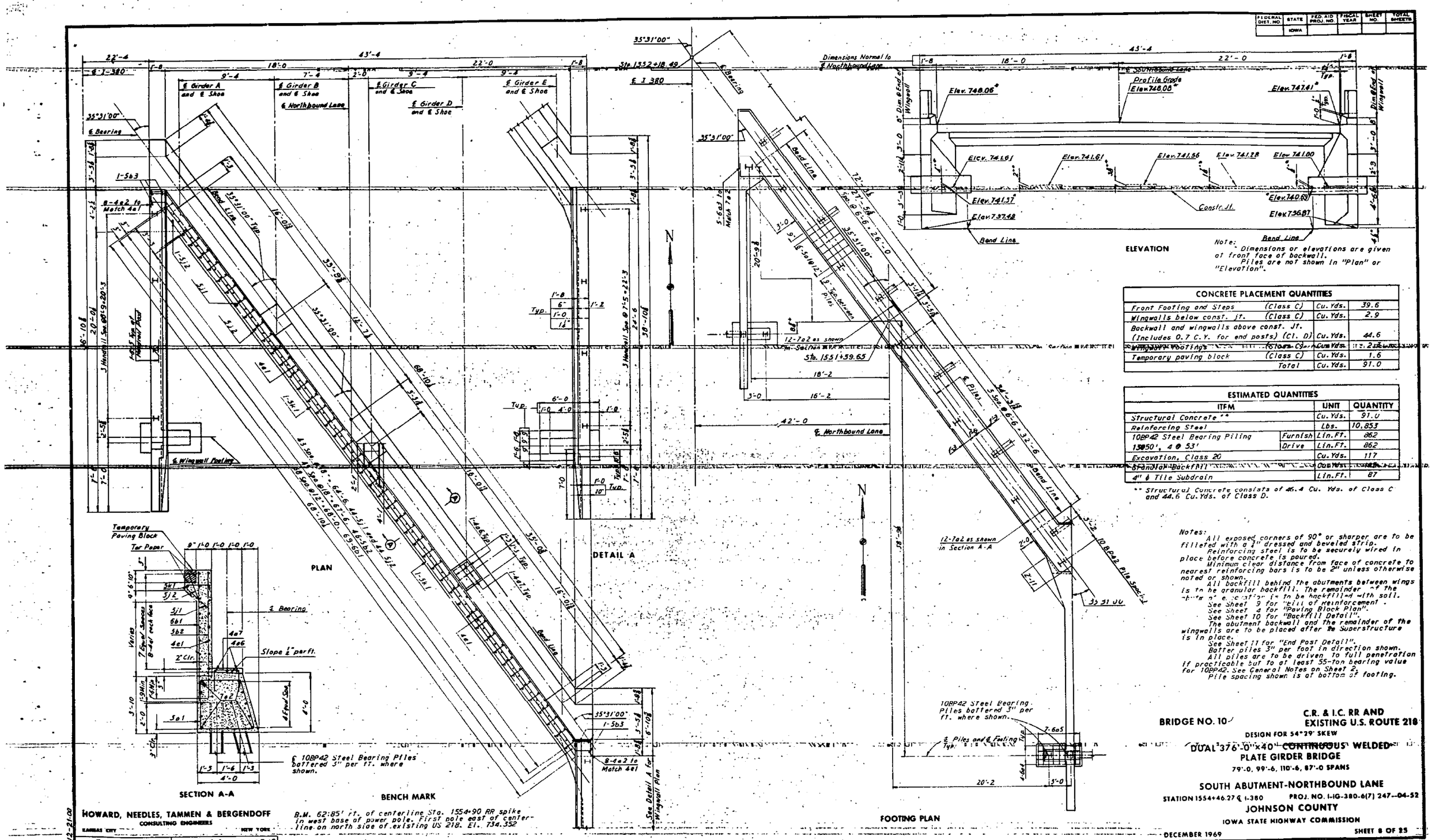
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 7 OF 25

DESIGN NO. 568 JOHNSON COUNTY FILE 22960

57 of 112

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



Note: * Dimensions or elevations are given at front face of backwall. Piles are not shown in "Plan" or "Elevation".

CONCRETE PLACEMENT QUANTITIES			
Front Footing and Steps	(Class C)	Cu. Yds.	39.6
Wingwalls below const. jt.	(Class C)	Cu. Yds.	2.9
Backwall and wingwalls above const. Jt. (Includes 0.7 C.Y. for end posts)	(Cl. D)	Cu. Yds.	44.6
Wingwall Footings	(Class C)	Cu. Yds.	2.2
Temporary paving block	(Class C)	Cu. Yds.	1.6
	Total	Cu. Yds.	91.0

ESTIMATED QUANTITIES			
ITEM		UNIT	QUANTITY
Structural Concrete **		Cu. Yds.	91.0
Reinforcing Steel		Lbs.	10,853
10BP42 Steel Bearing Piling	Furnish	Lin.Ft.	862
13@50', 4@53'	Drive	Lin.Ft.	862
Excavation, Class 20		Cu. Yds.	117
Granular Backfill		Cu. Yds.	44
4" ϕ Tile Subdrain		Lin.Ft.	87

** Structural Concrete consists of 46.4 Cu. Yds. of Class C and 44.6 Cu. Yds. of Class D.

Notes:
All exposed corners of 90° or sharper are to be filleted with a 1" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
All backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.
See Sheet 9 for "Bill of Reinforcement".
See Sheet 4 for "Paving Block Plan".
See Sheet 10 for "Backfill Detail".
The abutment backwall and the remainder of the wingwalls are to be placed after the superstructure is in place.
See Sheet 11 for "End Post Detail".
Batter piles 3" per foot in direction shown.
All piles are to be driven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes on Sheet 2.
Pile spacing shown is at bottom of footing.

BRIDGE NO. 10 — **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 54°29' SKEW

DUAL 376'-0" x 40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SOUTH ABUTMENT-NORTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

SHEET 8 OF 25

DECEMBER 1969

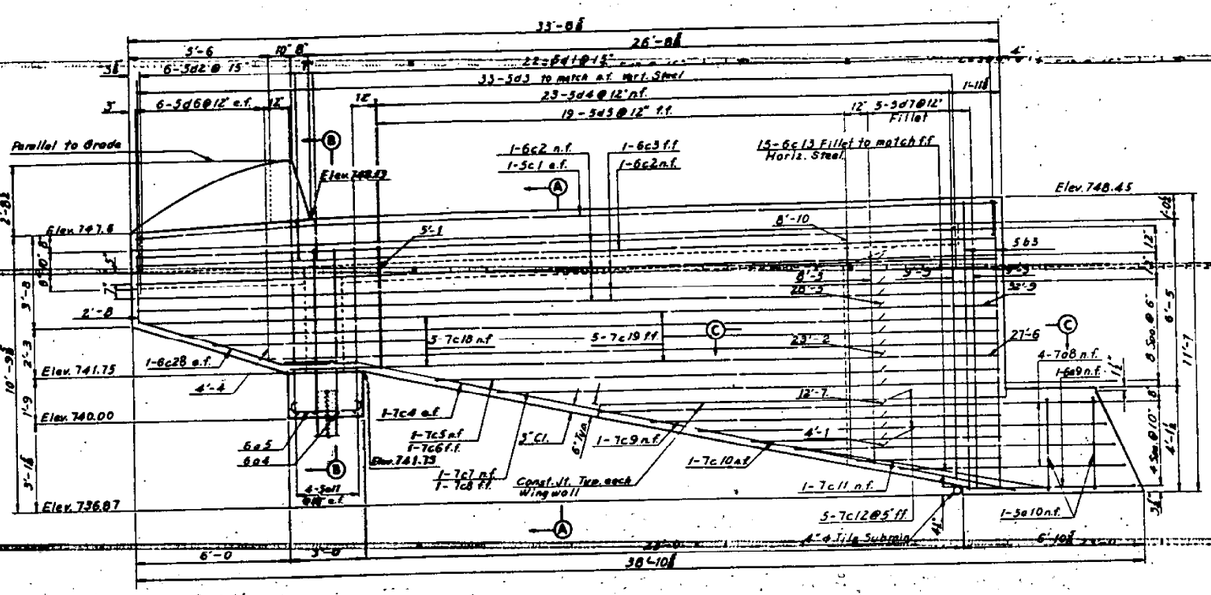
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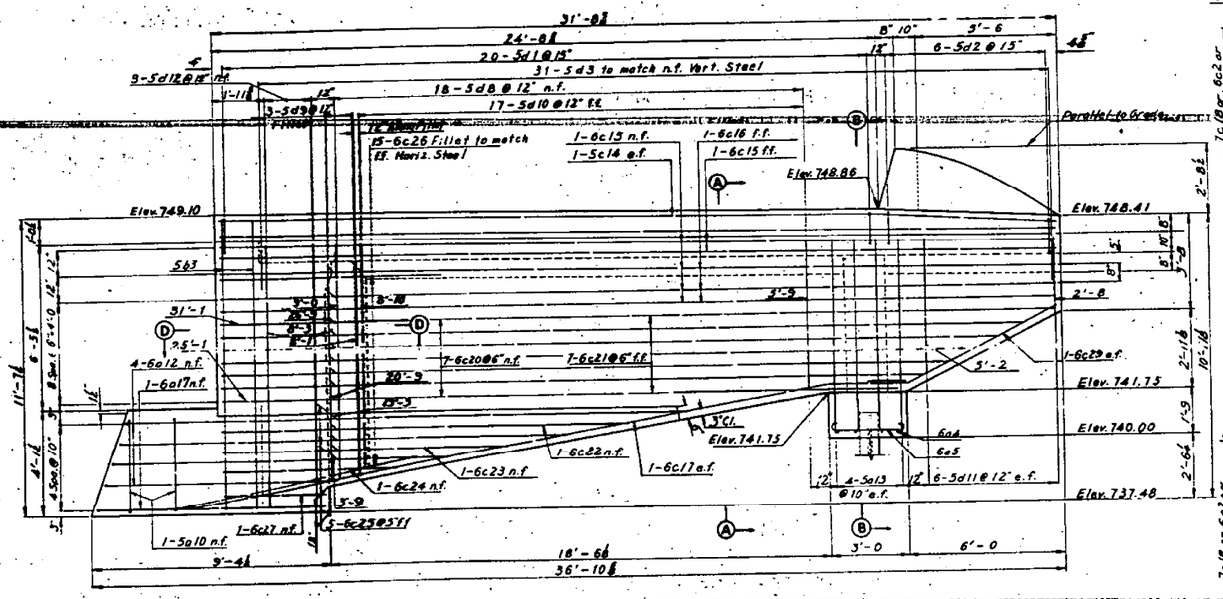
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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KANSAS CITY NEW YORK

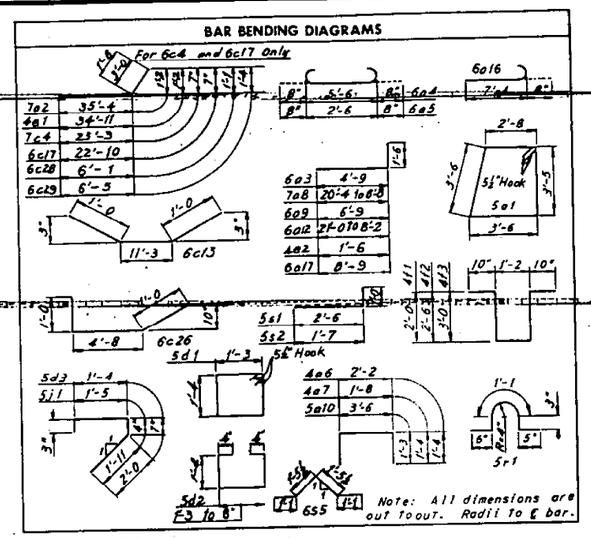
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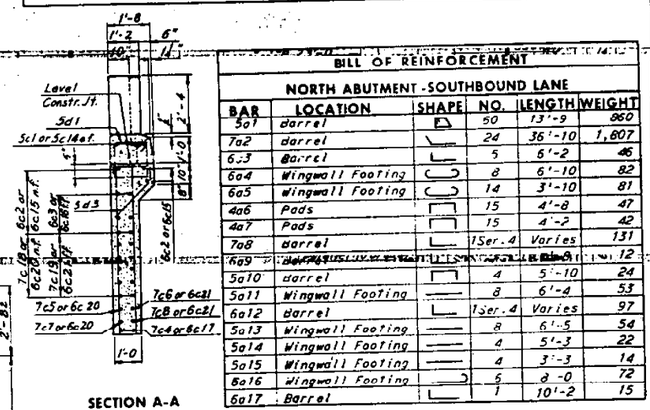
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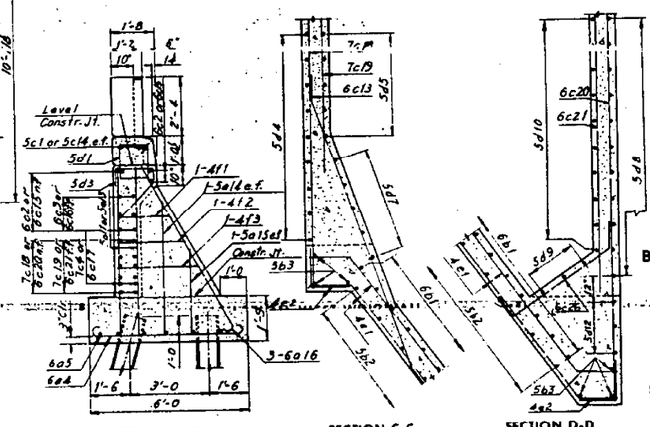
FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				











BILL OF REINFORCEMENT
NORTH ABUTMENT - SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	darrel		50	13'-9	860
7a2	darrel		24	36'-10	1,607
6a3	Barrel		5	6'-2	46
6a4	Wingwall Footing		8	6'-10	82
6a5	Wingwall Footing		14	3'-10	81
4a6	Pads		15	4'-8	47
4a7	Pads		15	4'-2	42
7a8	darrel		1Ser. 4	Varies	131
6a9	darrel		1	6'-9	12
5a10	darrel		4	5'-10	24
5a11	Wingwall Footing		8	6'-4	53
6a12	darrel		1Ser. 4	Varies	97
5a13	Wingwall Footing		8	6'-5	54
5a14	Wingwall Footing		4	5'-3	22
5a15	Wingwall Footing		4	3'-3	14
8a16	Wingwall Footing		5	8'-0	72
6a17	Barrel		1	10'-2	15

BILL OF REINFORCEMENT
SOUTH ABUTMENT-NORTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6b1	Backwall		69	8'-10	915
5b2	Backwall		46	8'-7	412
5b3	Backwall		6	11'-2	70
5c1	Curb		2	33'-4	70
6c2	Wingwall		6	33'-4	300
6c3	Wingwall		3	29'-2	131
7c4	Wingwall		2	28'-3	115
7c5	Wingwall		1	22'-9	47
7c6	Wingwall		1	18'-8	38
7c7	Wingwall		1	20'-2	41
7c8	Wingwall		1	16'-1	33
7c9	Wingwall		1	14'-9	30
7c10	Wingwall		1	10'-9	22
7c11	Wingwall		1	6'-4	13
7c12	Wingwall		1Ser. 5	Varies	85
6c13	Fillet		15	13'-3	299
5c14	Curb		2	31'-4	65
6c15	Wingwall		6	31'-4	282
6c16	Wingwall		3	27'-2	122
5c17	Wingwall		2	25'-10	78
7c18	Wingwall		1Ser 5	Varies	308
7c19	Wingwall		1Ser 5	Varies	264
6c20	Wingwall		1Ser 7	Varies	295
6c21	Wingwall		1Ser 7	Varies	250
6c22	Wingwall		1	15'-2	23
6c23	Wingwall		1	10'-6	16
6c24	Wingwall		1	5'-10	9
6c25	Wingwall		1Ser 5	Varies	64
6c26	Fillet		15	6'-7	148
6c27	Wingwall		1	4'-0	6
6c28	Wingwall		2	7'-7	23
6c29	Wingwall		2	7'-11	24
5d1	Curb		42	5'-10	256
5d2	Curb		2Ser 6	Varies	50
5d3	Wingwall		64	3'-11	261
5d4	Wingwall		1Ser 23	Varies	178
5d5	Wingwall		1Ser 19	Varies	138
6d6	Wingwall		2Ser 6	Varies	44
5d7	Fillet		1Ser 5	Varies	44
5d8	Wingwall		1Ser 18	Varies	138
5d9	Fillet		1Ser 3	Varies	26
5d10	Wingwall		1Ser 17	Varies	129
5d11	Wingwall		2Ser 6	Varies	49
5d12	Wingwall		3	10'-2	32
4e1	Backwall		32	36'-5	778
4e2	Backwall		16	2'-11	31
4f1	Counterfort		2	6'-6	9
4f2	Counterfort		2	7'-6	10
4f3	Counterfort		2	8'-6	11
5j1	Slab Seat		44	3'-10	176
5j2	Slab Seat		45	2'-4	110
5k1	Slab Seat		2	46'-9	72
5r1	Paving Block		9	2'-3	21
5s1	End Post		20	3'-5	71
5s2	End Post		12	2'-6	31
5s3	End Post		8	6'-4	53
5s4	End Post		4	5'-0	13
6s5	Post Anchor		6	5'-0	60
	Total				10,853

BENCH MARK

B.M. 62:85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 37'-0" x 40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SOUTH ABUTMENT DETAILS - NORTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969

SHEET 9 OF 25

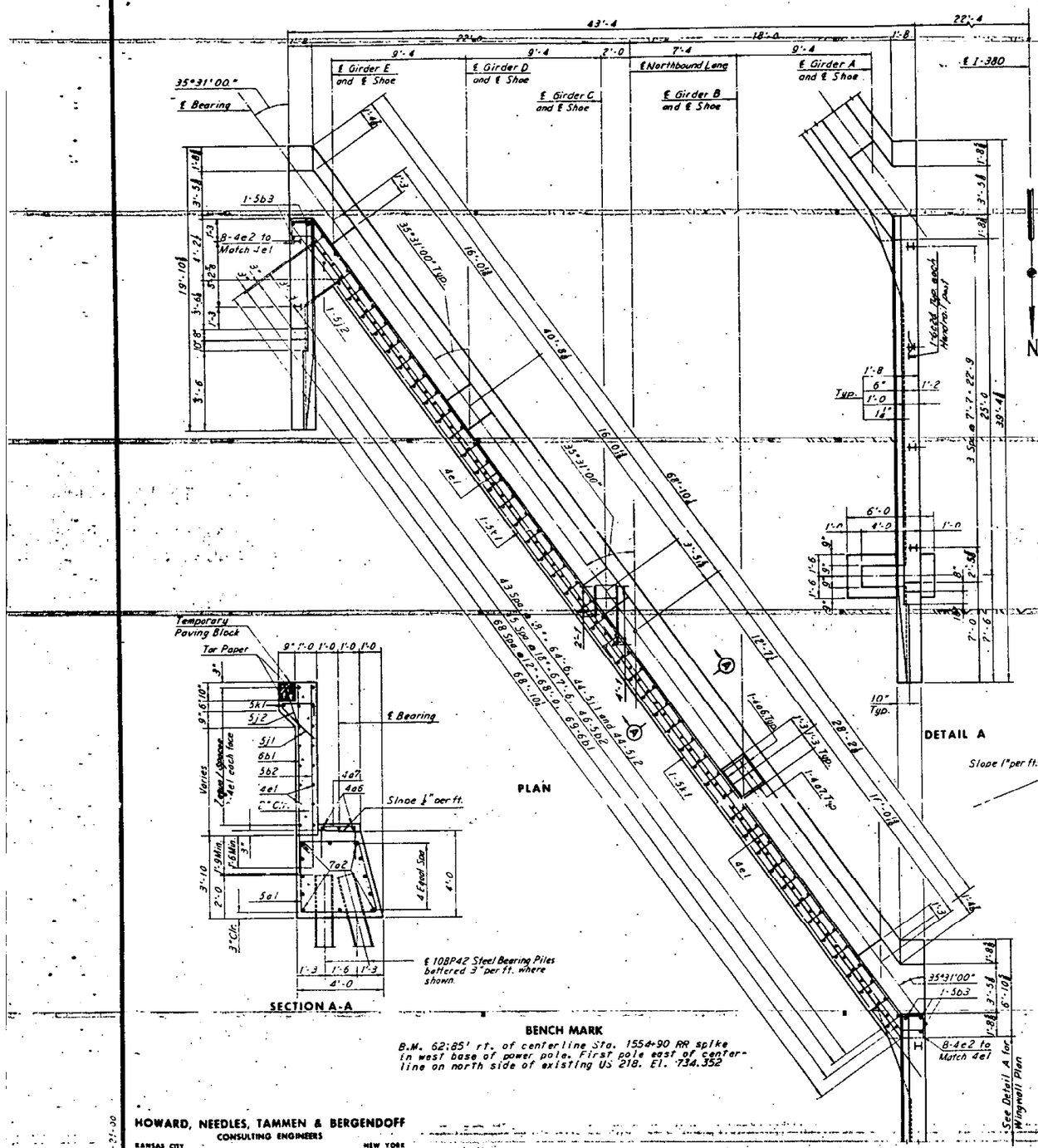
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN F.W. DATE 8-27-69 CHECKED G.C.C. DATE 8-27-69

2312-21-00

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



CONCRETE PLACEMENT QUANTITIES			
Front Footing and Steps	(Class C)	Cu. Yds.	39.7
Wingwalls below const. Jt.	(Class C)	Cu. Yds.	2.3
Backwall and wingwalls above const. Jt. (Includes 0.7 C.Y. for end posts)	(Class C)	Cu. Yds.	38.2
Wingwall footings	(Class C)	Cu. Yds.	1.2
Temporary paving block	(Class C)	Cu. Yds.	1.6
	Total	Cu. Yds.	83.0

ESTIMATED QUANTITIES			
ITEM		UNIT	QUANTITY
Structural Concrete		Cu. Yds.	83.0
Reinforcing Steel		Lbs.	9,392
10BP42 Steel Bearing Piling	Furnish	Lin. Ft.	711
13 @ 47', 2 @ 50'.	Drive	Lin. Ft.	711
Excavation, Class 20		Cu. Yds.	96
Granular Backfill		Cu. Yds.	165
4" ø Tile Subdrain		Lin. Ft.	92

** Structural Concrete consists of 44.8 Cu. Yds. of Class C and 38.2 Cu. Yds. of Class D.

Notes:
All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
Backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.
See Sheet 11 for "Bill of Reinforcement".
See Sheet 4 for "Paving Block Plan".

The abutment backwall and the remainder of the wingwalls are to be placed after the Superstructure is in place.
See Sheet 11 for "End Post Detail".
Batter piles 3" per foot in direction shown.
All piles are to be dreiven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes on Sheet 2.
Pile spacing shown is of bottom of footing.

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

NORTH ABUTMENT-NORTHBOUND LANE

STATION 1554+46.37 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 10 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

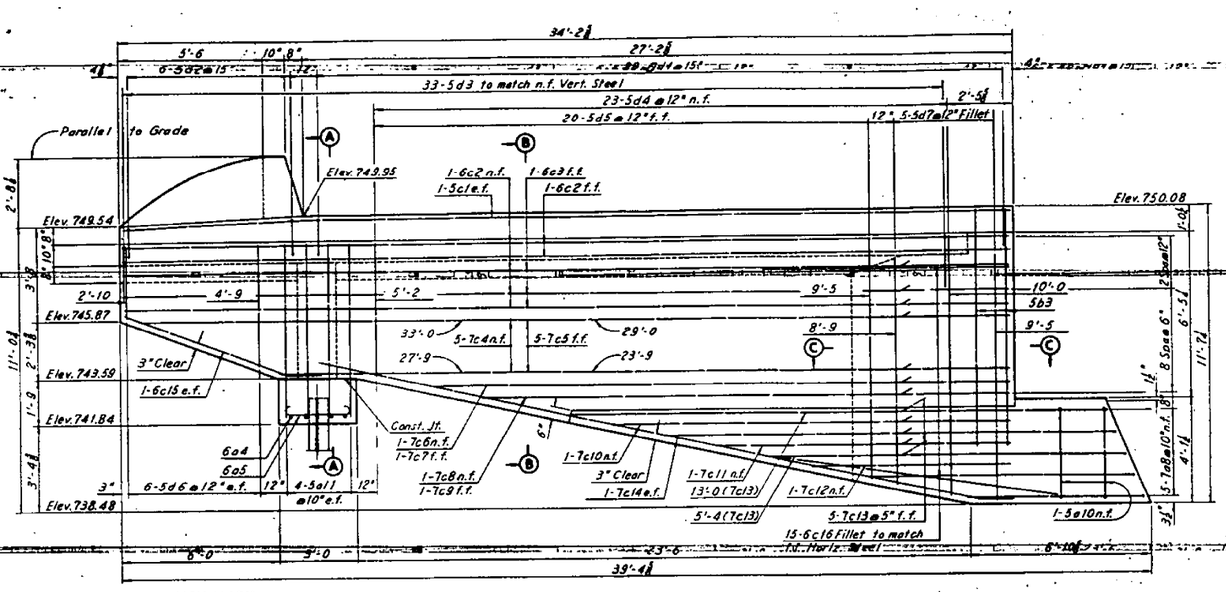
60 of 110

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

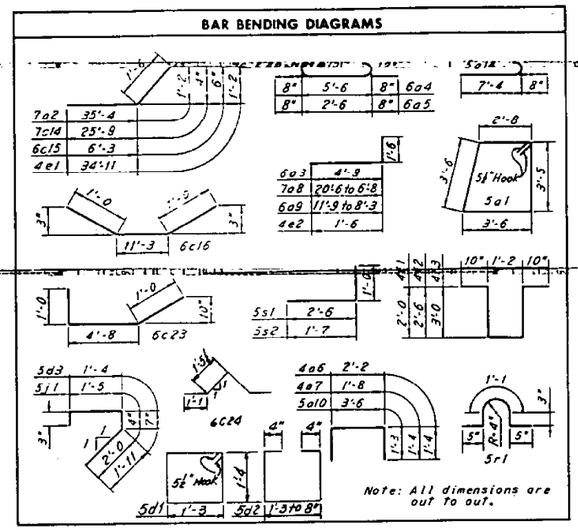
MADE MHH DATE 8-13-69 CHECKED GCC DATE 8-13-69

12-25-30

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				



BAR BENDING DIAGRAMS



BILL OF REINFORCEMENT

NORTH ABUTMENT - NORTHBOUND LANE

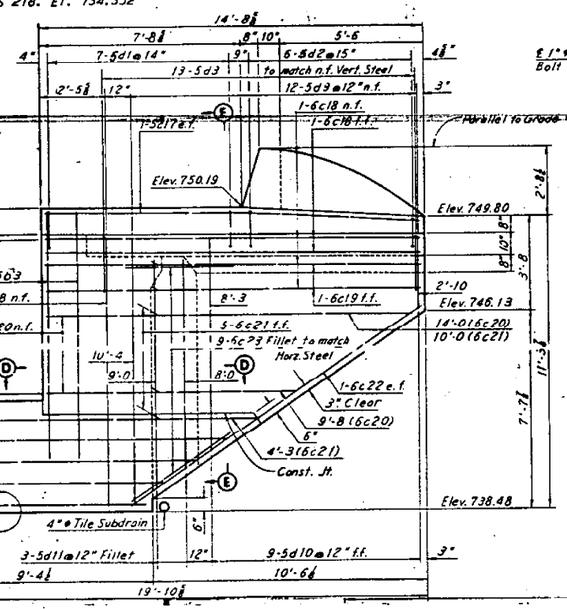
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5c1	Curb		2	33'-10	71
6c2	Wingwall		6	33'-10	305
6c3	Wingwall		3	29'-9	134
7c4	Wingwall		1Ser5	Varies	310
7c5	Wingwall		1Ser5	Varies	270
7c6	Wingwall		1	22'-5	46
7c7	Wingwall		1	18'-4	37
7c8	Wingwall		1	20'-1	41
7c9	Wingwall		1	16'-0	33
7c10	Wingwall		1	15'-1	31
7c11	Wingwall		1	11'-3	23
7c12	Wingwall		1	7'-6	15
7c13	Wingwall		1Ser5	Varies	94
7c14	Wingwall		2	27'-3	111
6c15	Wingwall		2	7'-9	23
6c16	Fillet		15	13'-3	299
5c17	Curb		2	14'-4	30
6c18	Wingwall		5	14'-4	108
6c19	Wingwall		5	10'-3	77
6c20	Wingwall		1Ser4	Varies	71
6c21	Wingwall		1Ser5	Varies	54
6c22	Wingwall		2	13'-6	41
6c23	Fillet		9	6'-7	89
6c24	Post Anchor		6	5'-0	45
5d1	Curb		29	5'-10	177
15a2	Curb		26@6 1@Varies	Varies	59
5d3	Wingwall		46	3'-11	188
5d4	Wingwall		1Ser23	Varies	182
5d5	Wingwall		1Ser20	Varies	152
5d6	Wingwall		2Ser6	Varies	47
5d7	Fillet		1Ser5	Varies	47
5d8	Wingwall		1	10'-4	11
5d9	Wingwall		1Ser12	Varies	82
5d10	Wingwall		1Ser9	Varies	52
5d11	Fillet		1Ser3	Varies	27
4e1	Backwall		32	36'-5	778
4e2	Backwall		16	2'-11	31
4f1	Counterfort		1	6'-6	4
4f2	Counterfort		1	7'-6	5
4f3	Counterfort		1	8'-6	6
5j1	Slab Seat		44	3'-10	176
5j2	Slab Seat		45	2'-4	110
5k1	Backwall		2	37'-3	78
5r1	Paving Block		9	2'-3	21
5s1	End Post		20	3'-5	71
5s2	End rost		2	2 5	31
5s3	End Post		8	6'-4	53
4s4	End Post		4	5'-0	13
	Total				9,392

BENCH MARK

B.M. 62:85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

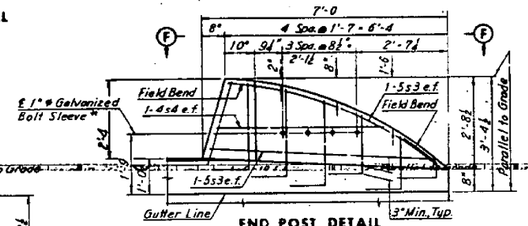
Legend:
e.f. = Each Face
n.f. = Near Face
f.f. = Far Face

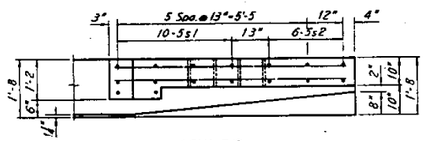
ELEVATION WEST WINGWALL

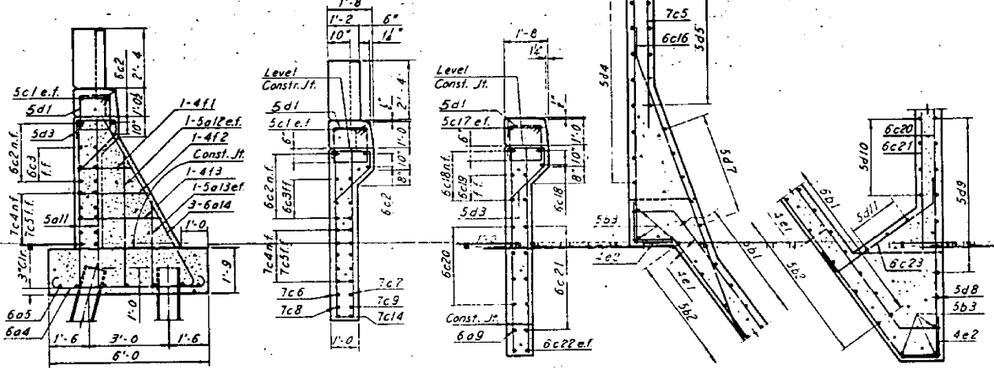


ELEVATION EAST WINGWALL

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







BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0" x 40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

NORTH ABUTMENT DETAILS - NORTHBOUND LANE

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IQ-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

SHEET 11 OF 25

DECEMBER 1969

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

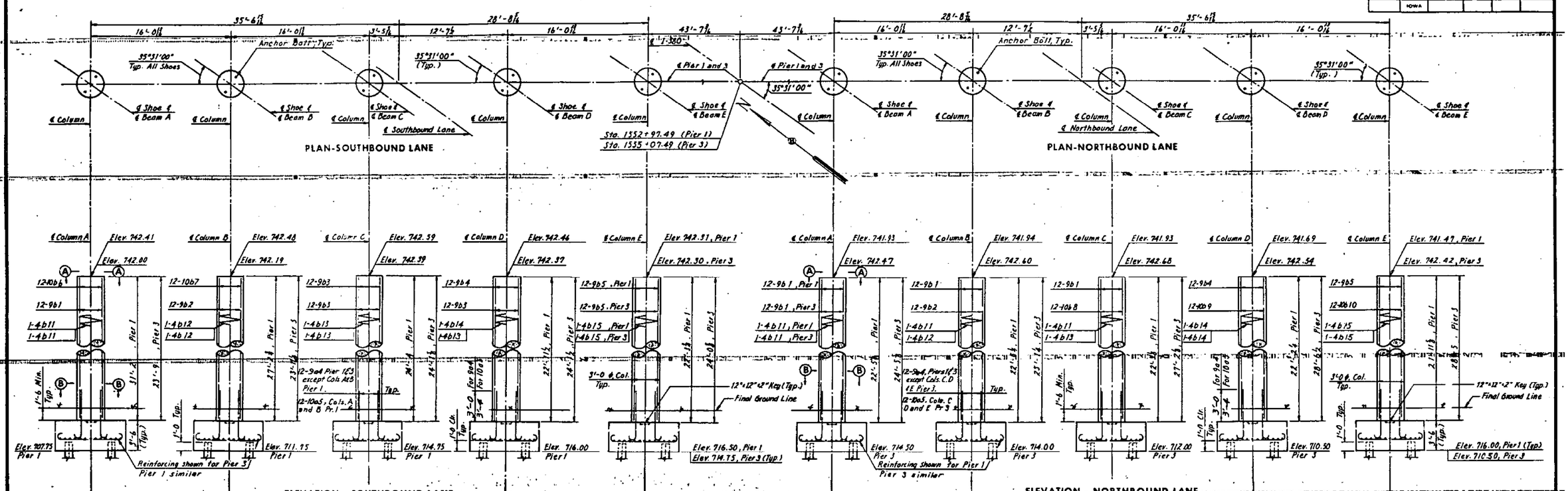
61 of 110

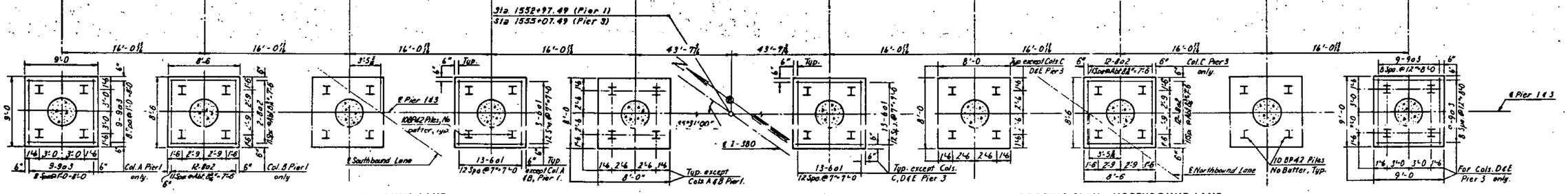
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE MHH DATE 8-13-69 CHECKED C.C.C DATE 8-13-69

2312-81-00

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				





BENCH MARK

B.M. 62: 85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of center-line on north side of existing US 218. El. 734.352

Notes:

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

Use 2 inches clear on all reinforcing unless shown otherwise.

Columns may be formed with Iowa Highway Commission approved fiber pulp board tube such to produce a seamless finish.

Column Spirals may be plain structural Grade Steel.

Pile dimensions shown are at bottom of footings. All piles are 10BP42.

All piles are to be driven to full penetration if practicable but at least to a 55 ton bearing value. See General Notes Sheet 2.

See Sheet 14 for View A-A and Section B-B.

See Sheet 14 for Bill of Reinforcement.

The shoe anchor bolts are preset. See Sheet 14 for Anchor Bolt Setting Plan.

The cost of the anchor bolt templates is incidental to the unit bid price for concrete. See Sheet 22 for detail of the Anchor Bolt Template.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK

DRAWN Y.C.P DATE 6-11-69 CHECKED G.C.C DATE 8-15-69

2312-21-00

BRIDGE NO. 10 — **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

PIERS 1 AND 3

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

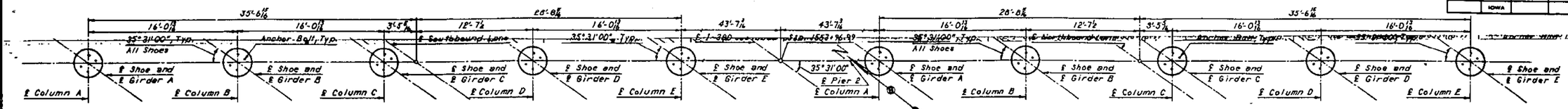
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 12 OF 25

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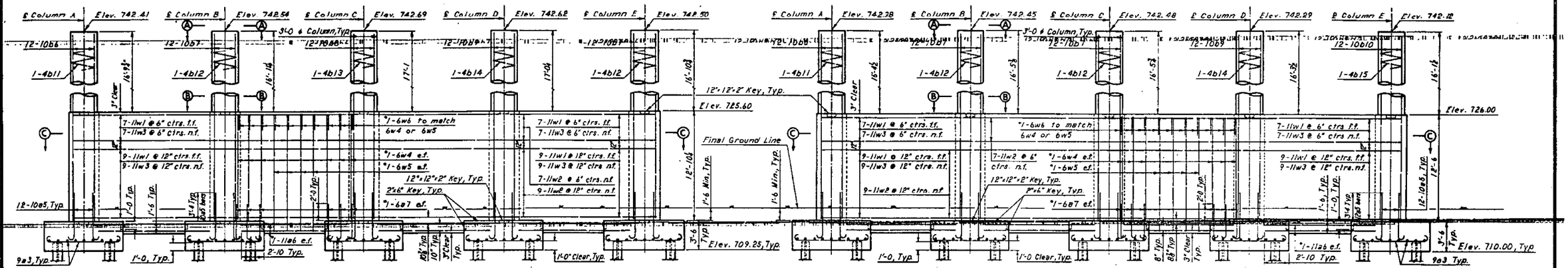
62 of 110

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



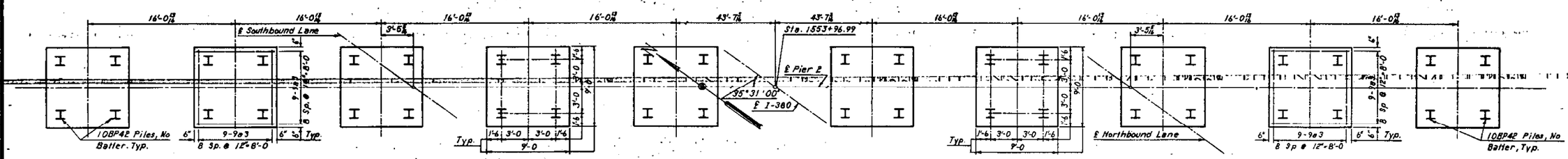
PLAN-SOUTHBOUND LANE

PLAN-NORTHBOUND LANE



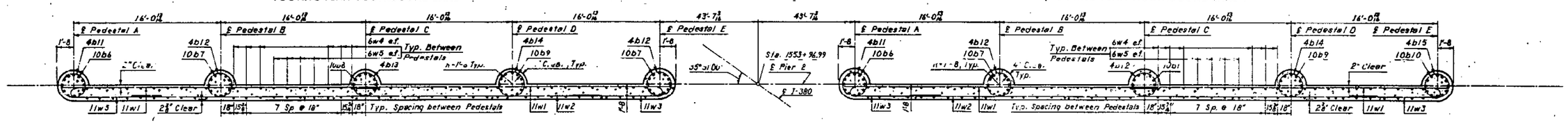
ELEVATION-SOUTHBOUND LANE

ELEVATION-NORTHBOUND LANE



FOOTING PLAN-SOUTHBOUND LANE

FOOTING PLAN-NORTHBOUND LANE



SECTION C-C -SOUTHBOUND LANE

SECTION C-C -NORTHBOUND LANE

Legend:
n.f. = near face
f.f. = far face
e.f. = each face
* Typical reinforcement between pedestals or footings.

BENCH MARK

B.M. 62: 85' rt. of centerline Sta. 1554+90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352

Notes:
All exposed corners of 90° or sharper are to be filleted with a ¾-inch dressed and beveled strip.
Use 2 inches clear on all reinforcing unless shown otherwise.
Columns may be formed with Iowa Highway Commission approved fiber pulp board tube such to produce a seamless finish.
Column spirals may be plain Structural Grade Steel.
Pile dimensions shown are ~~at bottom of footings.~~ — All piles shown [illegible] bottom of footings. All piles shown are at bottom of footings.
10BP42.
All piles are to be driven to full penetration if practicable but at least to a 55 ton bearing value. See General Notes Sheet 2.
See Sheet 14 for View A-A and Section B-B.
See Sheet 14 for Bill of Reinforcement.
The shoe anchor bolts are preset. See Sheet 14 for Anchor Bolt Setting Plan.
The cost of the anchor bolt templates is incidental to the unit bid price for concrete. See Sheet 22 for detail of the Anchor Bolt Template.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN J.J.R. DATE 12-19-69 CHECKED C.C.C. DATE 12-11-69

BRIDGE NO. 10 C.R. & I.C. RR AND EXISTING U.S. ROUTE 218
DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

PIER 2

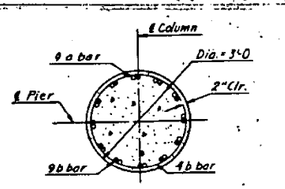
STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IQ-380-6(7) 247--04-52

JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 13 OF 25

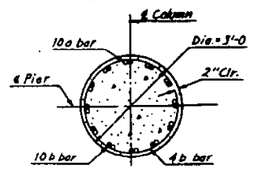
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



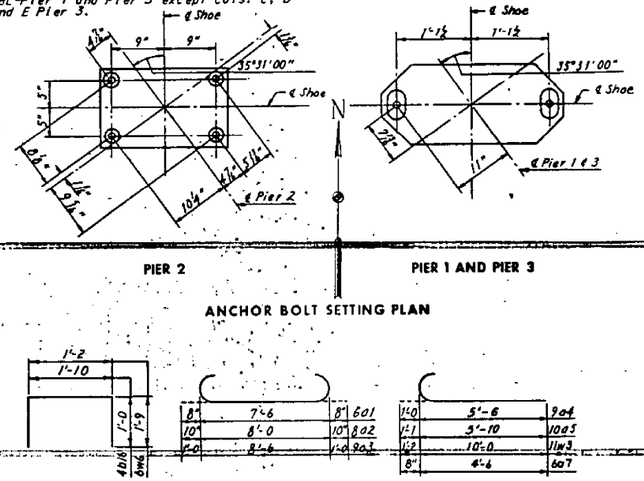
SECTION B-B

SBL-Pier 1 and Pier 3 except Cols. A & B Pier.
NBL-Pier 1 and Pier 3 except Cols. C, D and E Pier 3.



SECTION B-B

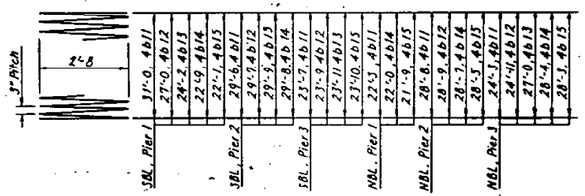
SBL-Pier 2 and Cols. A & B Pier 3.
NBL-Pier 2 and Cols. C, D and E Pier 3



PIER 2

PIER 1 AND PIER 3

ANCHOR BOLT SETTING PLAN

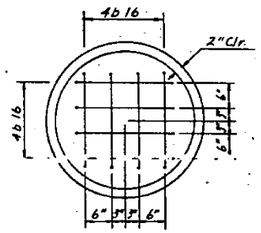


BAR BENDING DIAGRAMS

Notes:
Make 1½ full turns top and bottom and 1¼ turns of splices. Clip 4 vertical spacers to spiral before placing concrete. Length of spiral does not include the lapped length at splices. Cost of laps at splices to be included in price bid for other reinforcing.
All bar dimensions are given out to out and radius to ℄ of bars.

BENCH MARK

B.M. 62: 85' rt. of centerline Sta. 1554-90 RR spike in west base of power pole. First pole east of centerline on north side of existing US 218. El. 734.352



VIEW A-A

BILL OF REINFORCEMENT

BAR	LOCATION	SHAPE	SOUTHBOUND LANE									NORTHBOUND LANE								
			PIER 1			PIER 2			PIER 3			PIER 1			PIER 2			PIER 3		
			NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6a1	Footing Horiz.		78	8'-10	1,035				130	8'-10	1,725	130	8'-10	1,725				52	8'-10	690
6a2	Footing Horiz.		24	9'-8	619													24	9'-8	619
9a3	Footing Horiz.		18	10'-6	643	90	10'-6	3,213							90	10'-6	3,213	36	10'-6	1,285
9a4	Footing Vert.		36	6'-6	796				50	6'-6	1,326	60	6'-6	1,326				24	6'-6	530
10a5	Footing Vert.		24	6'-11	714	60	6'-11	1,786							60	6'-11	1,786	36	6'-11	1,071
11a6	Footing Horiz.					16	12'-9	1,084							16	12'-9	1,084			
6a7	Footing Vert.					48	5'-2	372							48	5'-2	372			
9b1	Column Vert.								12	23'-7	962	36	22'-3	2,723				12	24'-3	989
9b2	Column Vert.								12	23'-9	969							12	24'-11	1,017
9b3	Column Vert.		12	24'-2	986				24	23'-11	1,952									
9b4	Column Vert.		12	22'-9	928							12	22'-0	898						
9b5	Column Vert.		12	22'-1	901				12	23'-10	972	12	21'-9	887						
10b6	Column Vert.		12	31'-0	1,601	12	29'-6	1,523							12	28'-8	1,480			
10b7	Column Vert.		12	27'-0	1,394	24	29'-7	3,055							24	28'-9	2,969			
10b8	Column Vert.					12	29'-9	1,536										12	27'-0	1,394
10b9	Column Vert.					12	29'-8	1,532							12	28'-7	1,476	12	28'-4	1,463
10b10	Column Vert.														12	28'-5	1,467	12	28'-3	1,459
4b11	Column Spiral		1	1047'-10	670	1	998'-4	667	1	803'-1	536	3	759'-0	1,521	1	970'-10	648	1	825'-0	551
4b12	Column Spiral		1	915'-10	612	2	934'-9	1,249	1	808'-6	540				2	973'-7	1,300	1	847'-1	566
4b13	Column Spiral		1	822'-5	549	1	1006'-7	672	2	814'-1	1,088							1	915'-10	612
4b14	Column Spiral		1	775'-6	518	1	1003'-10	672				1	750'-9	502	1	968'-1	647	1	959'-9	641
4b15	Column Spiral		1	753'-6	503				1	827'-9	553	1	742'-6	496	1	962'-7	643	1	957'-1	639
[illegible]	Col. A Spacer		4	31'-0	86	4	29'-8	81	2	24'-3	66				4	28'-8	79	4	28'-8	79
℄ 0.69	Col. B Spacer		4	27'-0	75	4	29'-7	82	2	24'-3	66	4	22'-3	61	4	28'-9	79	4	24'-11	69
℄ 0.69	Col. C Spacer		4	24'-2	67	4	29'-9	82	2	24'-5	67	4	22'-3	61	4	28'-9	79	4	27'-0	75
℄ 0.69	Col. D Spacer		4	22'-9	63	4	29'-8	82	2	24'-5	67	4	22'-0	60	4	28'-7	79	4	28'-4	78
℄ 0.69	Col. E Spacer		4	22'-1	61	4	29'-7	82	4	24'-4	67	4	21'-9	60	4	28'-5	79	4	28'-3	78
4b16	Top of Column		40	3'-8	98	40	3'-8	98	40	3'-8	98	40	3'-8	98	40	3'-8	98	40	3'-8	98
11w1	Wall, Horiz.					32	34'-10	5,922							32	34'-10	5,922			
11w2	Wall, Horiz.					16	51'-0	4,335							16	51'-0	4,335			
11w3	Wall, Horiz.					32	11'-2	1,899							32	11'-2	1,899			
6w4	Wall, Vert.					48	12'-8	913							48	12'-4	889			
6w5	Wall, Vert.					32	14'-0	673							32	13'-8	657			
6w6	Wall, Vert.					40	4'-6	270							40	4'-6	270			
			Total		12,919		Total	31,880		Total	11,054		Total	10,479		Total	31,550		Total	13,991

CONCRETE PLACEMENT QUANTITIES SOUTHBOUND LANE

LOCATION	UNIT	PIER 1	PIER 2	PIER 3
Footings	Cu.Yds.	44.8(C)	52.5(C)	41.5(C)
Columns	Cu.Yds.	33.5(C)	22.2(D)	31.4(D)
Wall and Pedestals	Cu.Yds.		66.1(D)	
Total	Cu.Yds.	78.3	140.8	72.9

CONCRETE PLACEMENT QUANTITIES NORTHBOUND LANE

LOCATION	UNIT	PIER 1	PIER 2	PIER 3
Footings	Cu.Yds.	41.5(C)	52.5(C)	47.0(C)
Columns	Cu.Yds.	29.2(C)	21.4(D)	35.0(D)
Wall and Pedestals	Cu.Yds.		64.3(D)	
Total	Cu.Yds.	70.7	138.2	82.0

Note:
(C) denotes Class C concrete.
(D) denotes Class D concrete.

TOTAL ESTIMATED QUANTITIES SOUTHBOUND LANE

ITEM		UNIT	PIER 1	PIER 2	PIER 3
Structural Concrete		Cu.Yds.	78.3	140.8	72.9
Reinforcing Steel		Lbs.	12,919	31,880	11,054
Excavation, Class 20		Cu.Yds.	170	151	156
10BP42 Steel Bearing	Furnish	Lin.Ft.	432	260	420
Piling	Drive	Lin.Ft.	432	260	420

TOTAL ESTIMATED QUANTITIES NORTHBOUND LANE

ITEM		UNIT	PIER 1	PIER 2	PIER 3
Structural Concrete		Cu.Yds.	70.7	138.2	82.0
Reinforcing Steel		Lbs.	10,479	31,550	13,991
Excavation, Class 20		Cu.Yds.	150	149	163
10BP42 Steel Bearing	Furnish	Lin.Ft.	520	340	312
Piling	Drive	Lin.Ft.	520	340	312

Notes:
10BP42 Piles Consist of the following.
Southbound Lane Pier 1:
Col. A Ftg. 4816', Col. B Ftg. 4820', Col. C Ftg. 4823', Col. D Ftg. 4824', and Col. E Ftg. 4825' = 432'.
Southbound Lane Pier 2:
20813' = 260'.
Southbound Lane Pier 3:
20821' = 420'.
Northbound Lane Pier 1:
20826' = 520'.
Northbound Lane Pier 2:
20817' = 340'.
Northbound Lane Pier 3:
Col. A Ftg. 4818', Col. B Ftg. 4817', Col. C Ftg. 4815', Col. D Ftg. 4814', and Col. E Ftg. 4811' = 312'.

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DRAWN Y.C.P DATE 6-11-69 CHECKED G.C.C DATE 8-18-69

2512-21-00

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

Southbound Lane Pier 2:

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

PIERS 1,2 AND 3 DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

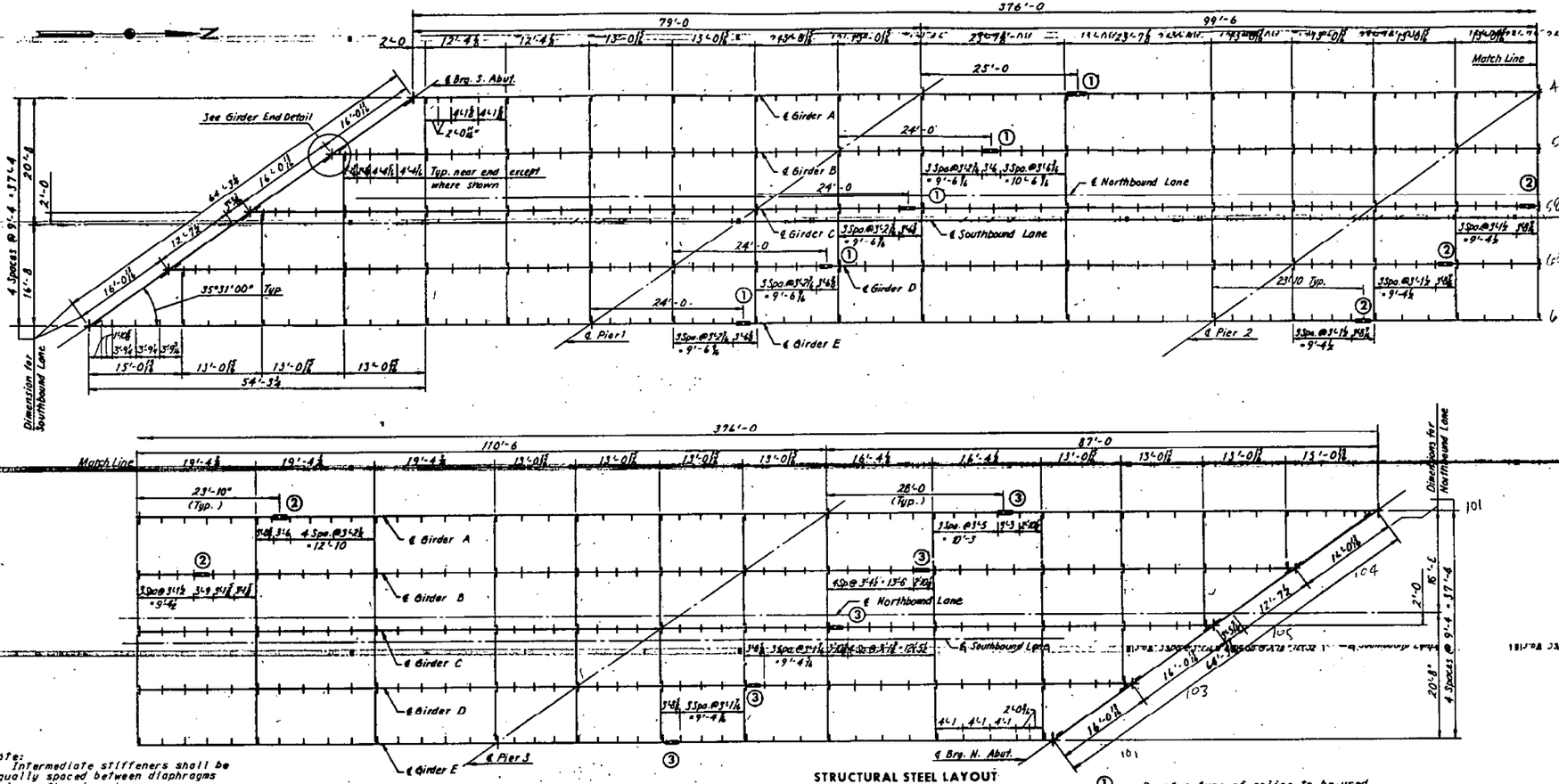
JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 14 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

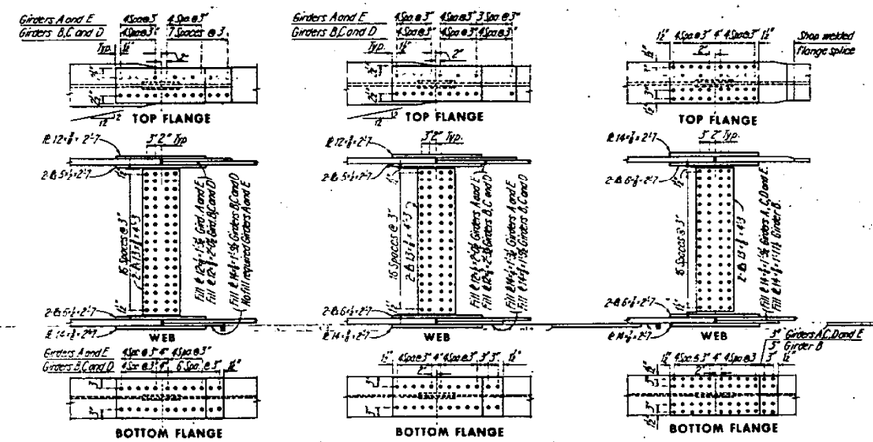
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	IOWA				



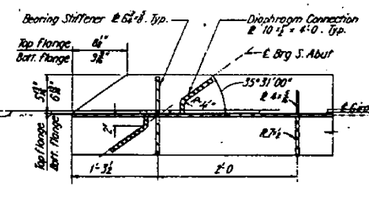
STRUCTURAL STEEL LAYOUT

① ___ Denotes type of splice to be used

Note:
Intermediate stiffeners shall be equally spaced between diaphragms unless otherwise shown.



FIELD SPLICE DETAILS



GIRDER END DETAIL

SUPERSTRUCTURE ESTIMATED QUANTITIES

ITEM	UNIT	SOUTHBOUND LANE	NORTHBOUND LANE
Structural Concrete (Class D)	Cu. Yds.	481.7	481.7
Reinforcing Steel	Lbs.	159,626	159,626
Structural Steel	Lbs.	417,607	417,607

SPECIFICATIONS:

Design stresses for the following materials are in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1969.

Structural steel in accordance with 1.7.1 "Structural Carbon Steel" - Unit Stresses.

Reinforcing steel in accordance with Section 1.5.1 "Reinforcement".

Concrete in accordance with Section 1.5.1 f'c = 3500 psi.

Construction: Standard Specifications of the Iowa State Highway Commission Series of 1964, plus current Special Provisions and current Supplemental Specifications.

Welding: 1969 American Welding Society Specifications, except as modified in Standard Specifications.

Welds shall have no cracks, no incomplete fusion or penetration and regardless of the method of inspection, shall have no other defects exceeding those in A.W.S. Specification Par. 409b.

SUPERSTRUCTURE NOTES:

These bridges are designed for HS20-44 and alternate loading designated in P.P.M. 20-4, Section 4-c with allowance of 20 lbs. per sq. ft. of roadway for future wearing surface

The floor slab as shown includes ½-inch wearing surface.

The field connections are to be bolted with "High Tensile Strength Bolts." The estimated structural steel weight for these connections is based on "High Tensile Strength Bolts." Unless otherwise noted, all holes are to be punch prepared and all bolts are to be ¾-inch ϕ.

Girder splices are to be sub-punched or sub-drilled and reamed. Before reaming, all girders are to be assembled for inspection. After inspection, holes are to be reamed and all parts match marked.

Flame cutting shall be in accordance with Art. 2408.14 of the Standard Specifications except that edges of flame cut plates shall have their corners rounded to 4" radius by grinding after flame cutting.

Field splice points are to be supported by falsework or other approved means as directed by the Engineer, and adjusted as closely as possible to dimensions shown on the "Beams As Fabricated And Erected Diagram" before bolting is completed.

Shop coat of paint is to be omitted on top of top flanges and other steel surfaces in contact with concrete. Parts inaccessible after erection are to be given three coats of paint in shop.

Structural steel shall conform to Specifications for ASTM A-36 steel.

Stud shear connectors are not required at ℄ piers or ℄ abutments or on field splice plates. See Art. 2.10.23 AASHO 1966-1967 Int. Spec. for welding of stud shear connectors.

All dimensions are horizontal.

Bearing surfaces of rockers are to be faced in accordance with Art. 2.10.25 AASHO (Series 1969). Masonry plates shall be set in paint and canvas.

Bearing surfaces of unfinished plates shall be flat and true.

Forms for slab and curbs are to be supported by the girders.

Bottom flanges are to be true perpendicular to webs at the reaction points.

Fill thicknesses shown on plans are based on the nominal girder dimensions. These thicknesses are to be verified or adjusted during fabrication to secure a close fit. Each fill plate shall fit to the nearest ⅛" in thickness and single plates are required at any fill location. Girders are to be truly square at splice points with flanges perpendicular to webs.

Faying surfaces of diaphragm connections are to be given the shop coat of paint.

BRIDGE NO. 10 — **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

FRAMING PLAN

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IQ-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 15 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

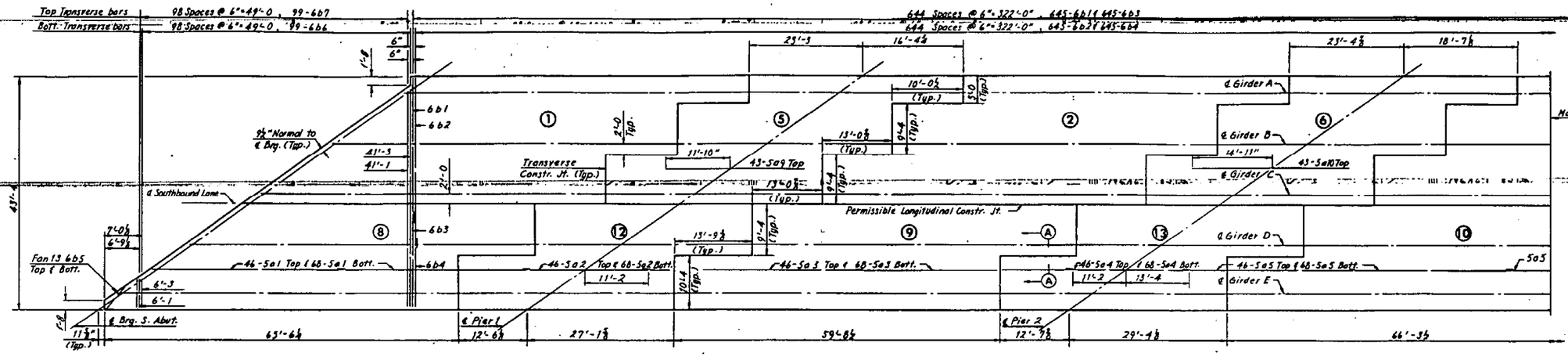
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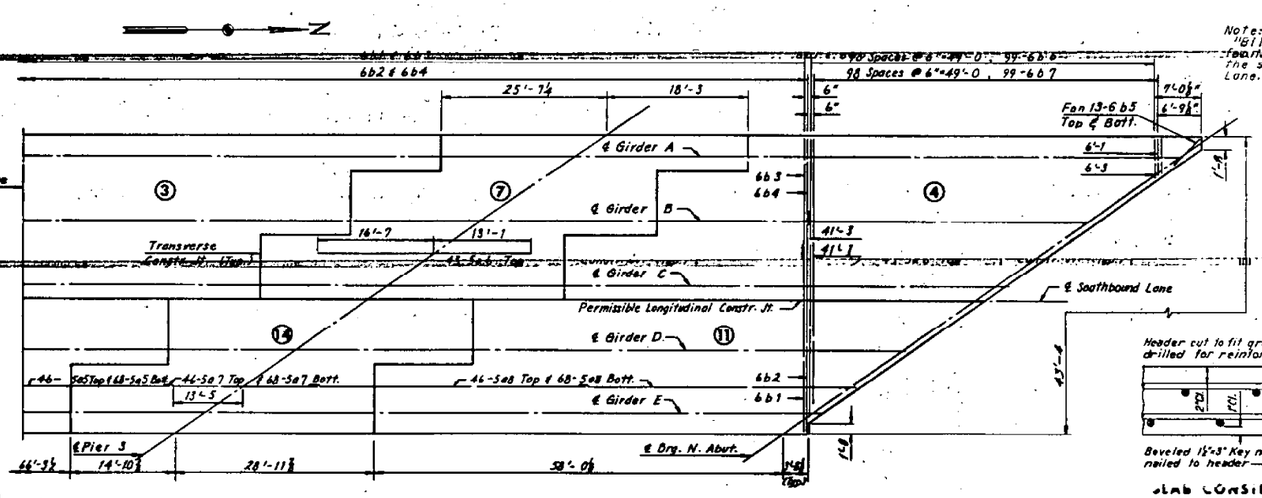
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE Y.C.P DATE 8-7-69 CHECKED DATE 8-6-69

2312-21-00

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				





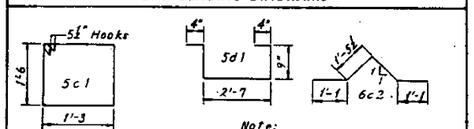
SLAB REINFORCING PLAN - SOUTHBOUND LANE

Note:
"Bill Of Reinforcement" for N. Bound Lane is the same as Southbound Lane.

CONCRETE PLACEMENT QUANTITIES	
POUR	CU. YDS.
1	39.0
2	37.3
3	41.4
4	42.4
5	24.7
6	26.0
7	27.0
8	32.2
9	30.9
10	34.3
11	35.1
12	20.4
13	21.6
14	22.4
W. Curb	23.5
E. Curb	23.5
TOTAL	481.7

Notes:
Roadway slab shall be placed in sections and in sequence indicated by circled numbers 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 results.
Lap No. 5 bars a minimum of 1'-3 and No. 6 bars a minimum of 1'-6.
For details of longitudinal bar spacing, see Sheet 21.

BAR BENDING DIAGRAMS



SLAB CONSTRUCTION JOINT DETAIL
SECTION A-A

BILL OF REINFORCEMENT
SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Slab, Long.	——	228	33'-5	7,947
5a2	Slab, Long.	——	114	27'-0	3,210
5a3	Slab, Long.	——	228	39'-10	9,472
5a4	Slab, Long.	——	114	25'-9	3,062
5a5	Slab, Long.	——	340	29'-2	10,404
5a6	Slab, Long.	——	43	29'-8	1,331
5a7	Slab, Long.	——	114	30'-8	3,646
5a8	Slab, Long.	——	228	37'-4	8,878
5a9	Slab, Long.	——	43	26'-9	1,200
5a10	Slab, Long.	——	43	31'-6	1,413
6b1	Slab, Trans.	——	645	26'-9	25,915
6b2	Slab, Trans.	——	645	31'-4	30,355
6b3	Slab, Trans.	——	645	17'-9	17,196
6b4	Slab, Trans.	——	645	13'-2	12,756
6b5	Slab, Trans.	——	26	6'-0	234
6b6	Slab, Trans.	——	2Ser 99	Varies	7,063
6b7	Slab, Trans.	——	2Ser 99	Varies	7,013
5c1	Curb Trans.	⌐	732	6'-2	4,708
6c2	Post Anchor	⌒	92	5'-0	691
5c3	Curb Long.	——	40	39'-0	1,627
5c4	Curb Long.	——	4	26'-9	112
5c5	Curb Long.	——	4	3'-5	3
5c6	Curb Long.	——	4	29'-8	124
5d1	End Diaph, Vert.	⌐	80	4'-5	369
6d2	End Diaph, Horiz.	——	24	15'-9	568
6d3	End Diaph, Horiz.	——	4	33'-6	201
	Total (Lbs.)				159,626

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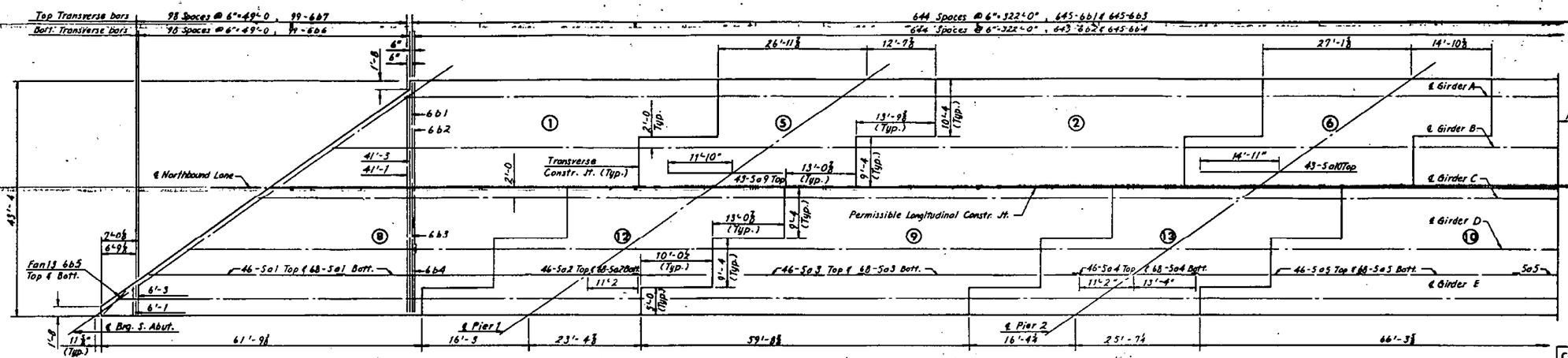
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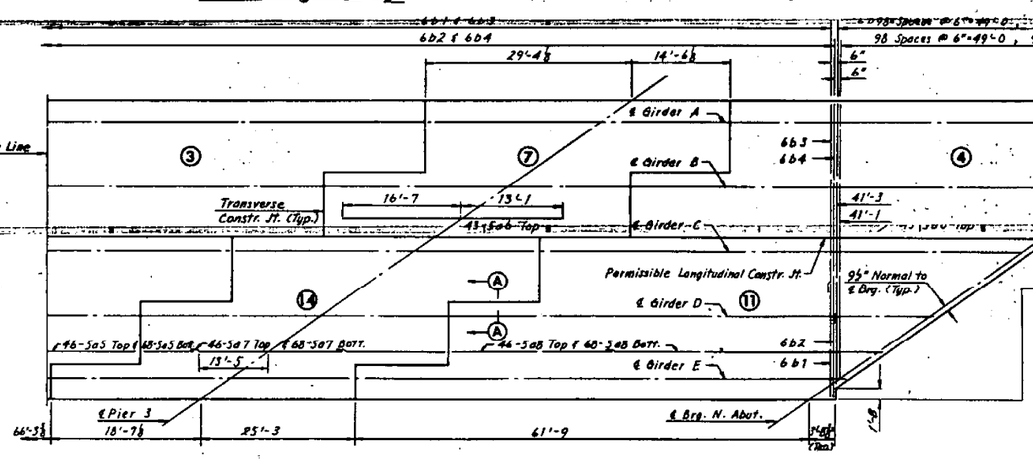
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BRIDGE NO. 10
C.R. & I.C. RR AND EXISTING U.S. ROUTE 218
DESIGN FOR 54°29' SKEW
DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE
79'-0, 99'-6, 110'-6, 87'-0 SPANS

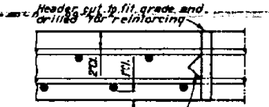
SLAB PLAN-SOUTHBOUND LANE
STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 16 OF 25
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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SLAB REINFORCING PLAN - NORTHBOUND LANE



SLAB CONSTRUCTION
JOINT DETAIL
SECTION A-A

CONCRETE PLACEMENT QUANTITIES	
POUR	CU. YDS.
1	32.1
3	34.3
4	35.3
5	20.4
6	21.6
7	22.4
8	38.5
9	37.3
10	41.4
11	42.7
12	24.7
13	26.0
14	27.0
W. Curb	23.5
E. Curb	23.5
TOTAL	481.7

TOP OF SLAB ELEVATIONS - SOUTHBOUND LANE

GIRDER	SOUTH ABUTMENT		PIER 1		PIER 2		PIER 3		NORTH ABUTMENT	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
A	1553+06.29	748.92	1553+85.29	749.20	1554+84.79	749.23	1555+95.29	748.84	1556+82.29	748.21
B	1552+93.22	748.99	1553+72.22	749.31	1554+71.72	749.39	1555+82.22	749.05	1556+69.22	748.47
C	1552+80.14	749.06	1553+59.14	749.42	1554+58.64	749.54	1555+69.14	749.25	1556+56.14	748.71
D	1552+67.06	748.90	1553+46.06	749.29	1554+45.56	749.46	1555+56.06	749.23	1556+43.06	748.73
E	1552+53.99	748.67	1553+32.99	749.10	1554+32.49	749.32	1555+42.99	749.14	1556+29.99	748.68

TOP OF SLAB ELEVATIONS-NORTHBOUND LANE

GIRDER	SOUTH ABUTMENT		PIER 1		PIER 2		PIER 3		NORTH ABUTMENT	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
A	1551+83.00	748.08	1552+62.00	748.72	1553+61.50	749.20	1554+72.00	749.31	1555+59.00	749.08
B	1551+69.92	748.09	1552+48.92	748.77	1553+48.42	749.30	1554+58.92	749.46	1555+45.92	749.27
C	1551+56.84	748.04	1552+35.84	748.76	1553+35.34	749.33	1554+45.84	749.54	1555+32.84	749.40
D	1551+43.77	747.76	1552+22.77	748.51	1553+22.27	749.14	1554+32.77	749.40	1555+19.77	749.30
E	1551+30.69	747.47	1552+09.69	748.26	1553+09.19	748.94	1554+19.69	749.25	1555+06.69	749.19

TOP OF SLAB ELEVATIONS-SOUTHBOUND LANE

GIRDER	S.A.	¼	½	¾	FS-1	¼	½	¾	FS-2	¼	½	¾	FS-3	¼	½	¾	N.A.
A	748.92	749.04	749.13	749.20	749.25	749.26	749.26	749.23	749.19	749.10	748.99	748.84	748.67	748.57	748.46	748.34	748.21
B	748.99	749.12	749.23	749.31	749.36	749.40	749.40	749.39	749.35	749.28	749.18	749.05	748.89	748.80	748.69	748.58	748.47
C	749.06	749.20	749.32	749.41	749.48	749.52	749.54	749.54	749.52	749.46	749.37	749.26	749.11	749.02	748.93	748.82	748.71
D	748.90	749.05	749.18	749.29	749.37	749.42	749.45	749.46	749.45	749.41	749.34	749.23	749.10	749.02	748.93	748.83	748.73
E	748.67	748.84	748.98	749.10	749.19	749.26	749.30	749.32	749.32	749.29	749.23	749.14	749.02	748.95	748.87	748.78	748.68

TOP OF SLAB ELEVATIONS-NORTHBOUND LANE

GIRDER	S.A.	¼	½	¾	FS-1	¼	½	¾	FS-2	¼	½	¾	FS-3	¼	½	¾	N.A.
A	748.08	748.32	748.53	748.72	748.88	749.01	749.12	749.20	749.26	749.31	749.32	749.31	749.27	749.23	749.19	749.14	749.08
B	748.09	748.34	748.56	748.76	748.93	749.08	749.20	749.30	749.37	749.43	749.46	749.46	749.43	749.40	749.37	749.32	749.27
C	748.04	748.30	748.53	748.74	748.93	749.08	749.22	749.33	749.42	749.49	749.53	749.54	749.53	749.51	749.48	749.44	749.40
D	747.76	748.03	748.28	748.50	748.70	748.87	749.01	749.13	749.23	749.32	749.38	749.40	749.40	749.39	749.36	749.33	749.30
E	747.47	747.76	748.02	748.25	748.46	748.64	748.80	748.93	749.04	749.14	749.21	749.25	749.26	749.26	749.24	749.22	749.19

LEGEND
F.S. denote Field Splice
N.A. denote North Abutment
S.A. denote South Abutment

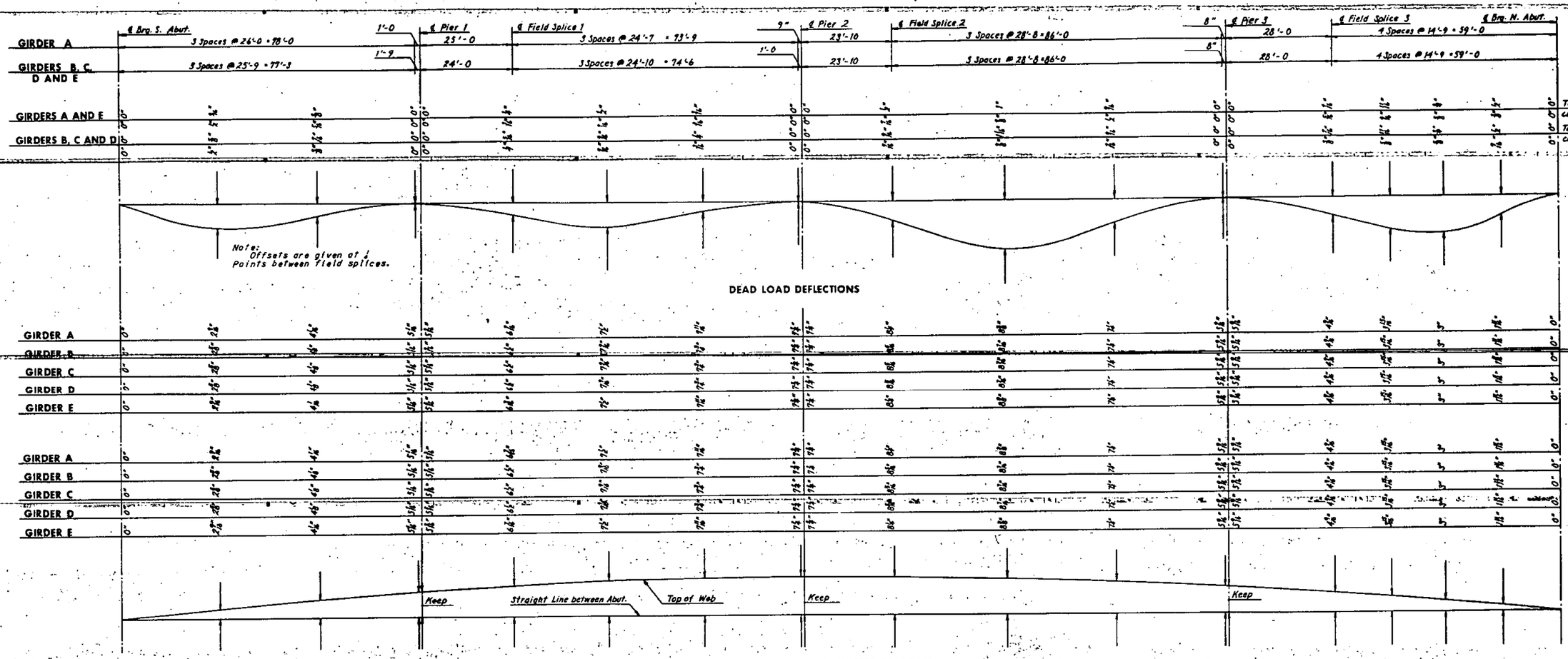
Notes:
Roadway slab shall be placed in sections and in sequence indicated by circled numbers at intervals not [illegible] Alternate procedures for placing concrete may be submitted for approval together with a statement of the proposed method and evidence that the contractor possesses the necessary equipment and facilities to accomplish the required results.
Lap No. 5 bars a minimum of 1'-6.
For details of longitudinal bar spacing, see Sheet 21.
For "Bill Of Reinforcement", see Sheet 16.

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MADE Y.C.P DATE 5-23-69 CHECKED G.C.C DATE 8-5-69

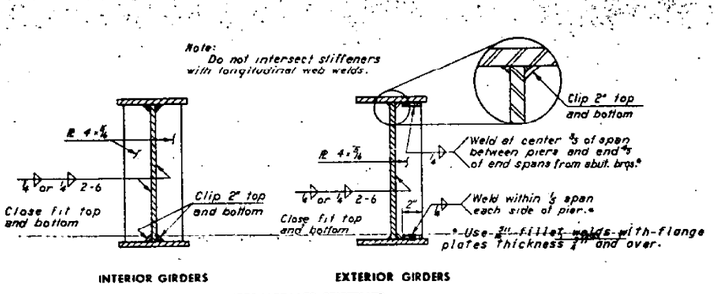
BRIDGE NO. 10
C.R. & I.C. RR AND EXISTING U.S. ROUTE 218
DESIGN FOR 54°29' SKEW
DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE
79'-0, 99'-6, 110'-6, 87'-0 SPANS
SLAB PLAN-NORTHBOUND LANE
STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IO-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 17 OF 25
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

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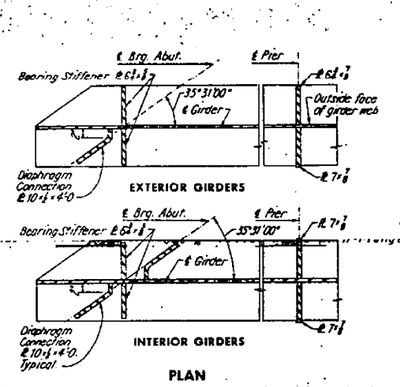
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	IOWA				

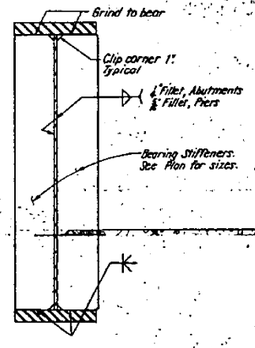


GIRDERS AS FABRICATED AND ERECTED DIAGRAM



TYPICAL INTERMEDIATE STIFFENER





TYPICAL BEARINGS STIFFENER DETAIL

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KANSAS CITY — NEW YORK

MADE Y.C.P DATE 8-12-69 CHECKED JSH DATE 8-13-69

2/12 - 21 - 00

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 5°4'29" SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

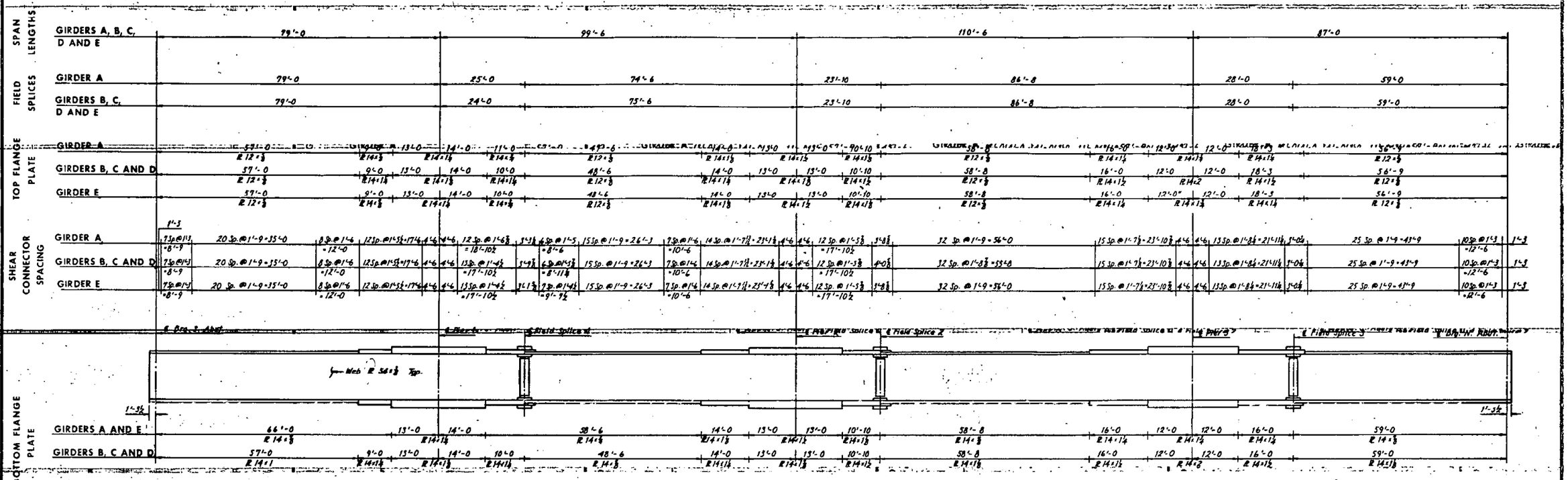
JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

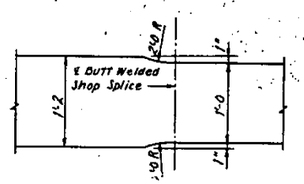
DECEMBER 1969 SHEET 19 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

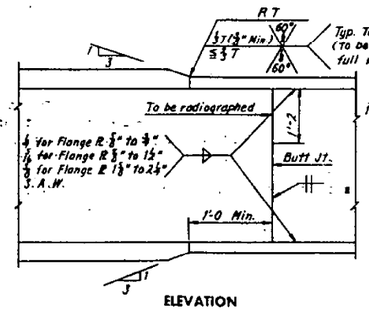
FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



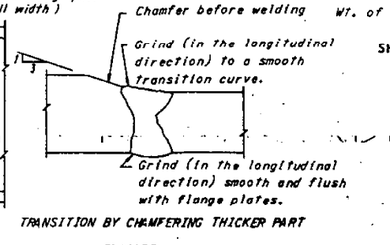
GIRDER DETAILS



FLANGE WIDTH TRANSITION WELDED PLATE GIRDER



ELEVATION

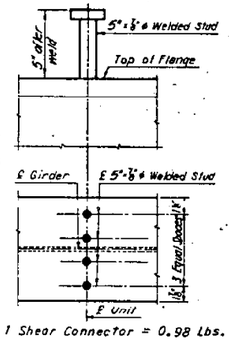


FLANGE

TRANSITION BY CHAMFERING THICKER PART

TRANSITION OF THICKNESSES

TYPICAL WELDED SHOP SPLICE DETAILS



Wt. of 1 Shear Connector = 0.98 Lbs.

SHEAR CONNECTOR DETAIL

Note:
Positive moments due to Dead Load B, Live Load and Impact are resisted by composite action. Dead Load A includes weight of slab and girders. Dead Load B includes weight of curbs, rails and future wearing surface. Moments and reactions shown are for normal Live Load loadings. HS 20-44 Truck Loading governs for positive moments and abutment reactions. Equivalent Lane Loading governs for negative moments and reactions at piers.

Note
There shall be no shear stud groups located at the ℄ Bearing of Abutments or ℄ of Piers.

Note:
Weight of shear connectors are included in structural steel quantities.

TABLE OF MOMENTS AND REACTIONS IN FOOT KIPS AND KIPS

GIRDERS	ITEM	MAXIMUM POSITIVE MOMENT				MAXIMUM NEGATIVE MOMENT			REACTIONS				
		SPAN 1	SPAN 2	SPAN 3	SPAN 4	PIER 1	PIER 2	PIER 3	S. ABUT.	PIER 1	PIER 2	PIER 3	N. ABUT.
A and E	Dead Load A	394	288	419	433	861	1004	1169	28	97	104	112	30
	Dead Load B	100	87	126	115	176	214	229	7	22	24	25	7
	Live Load	686	713	792	772	664	782	772	45	70	76	75	46
	Impact	169	160	171	183	156	170	173	11	17	16	17	11
	Total	1349	1248	1508	1503	1857	2170	2343	91	206	220	229	94
B, C and D	Dead Load A	457	329	482	504	1019	1181	1381	33	114	121	132	34
	Dead Load B	130	113	164	149	227	277	296	9	29	31	33	9
	Live Load	791	823	916	892	766	903	892	52	81	87	86	53
	Impact	195	185	195	210	180	195	199	13	19	19	20	13
	Total	1573	1450	1757	1755	2192	2556	2768	107	243	258	271	109

Notes:
The Contractor shall submit for approval the welding procedure and detail of shop welded girder splice.
Shop splices and web to flange welds shall be welded by the submerged arc process.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK

MADE Y.C.P. DATE 5-23-69 CHECKED JSH DATE 8-12-69

2512-51-09

BRIDGE NO. 10 — **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 54°29' SKEW

DUAL 376'-0"×40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

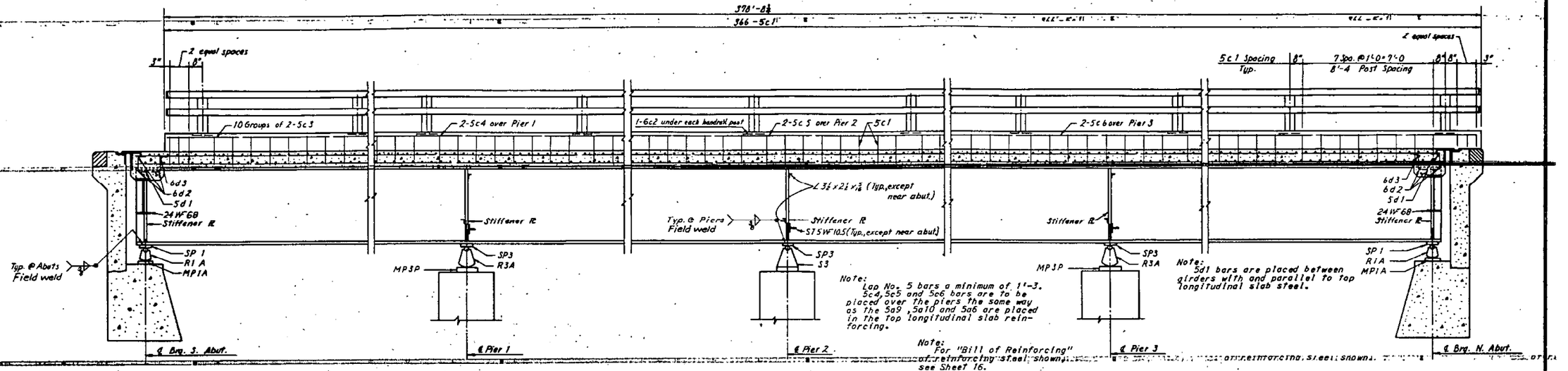
IOWA STATE HIGHWAY COMMISSION

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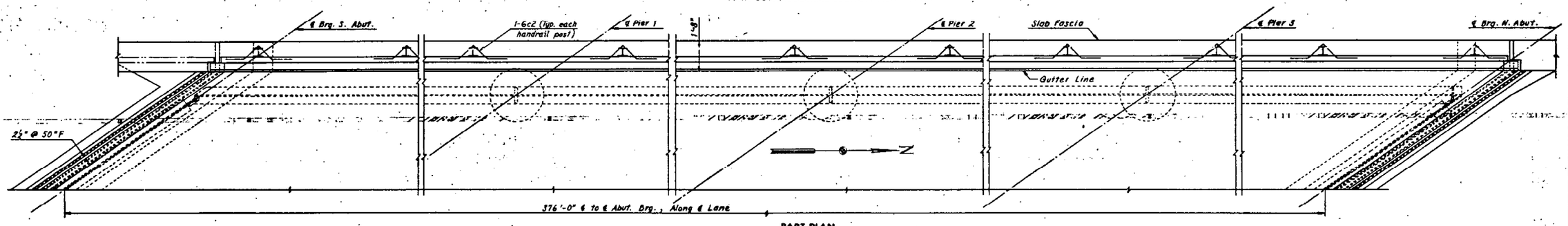
FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



Note:
Lap No. 5 bars a minimum of 1'-3. 5c4, 5c5 and 5c6 bars are to be placed over the piers the same way as the 5a9, 5a10 and 5a6 are placed in the top longitudinal slab reinforcing.

Note:
For "Bill of Reinforcing" of reinforcing steel shown, see Sheet 16.

PART LONGITUDINAL SECTION NEAR CURB



PART PLAN

Note:
Rockers are to be set vertically at 50°F. For temperatures above 50°F, set masonry plate toward fixed shoe (+). For temperatures below 50°F, set masonry plate away from fixed shoe (-). Settings for other temperatures are proportional to those shown for a 40° temperature change.

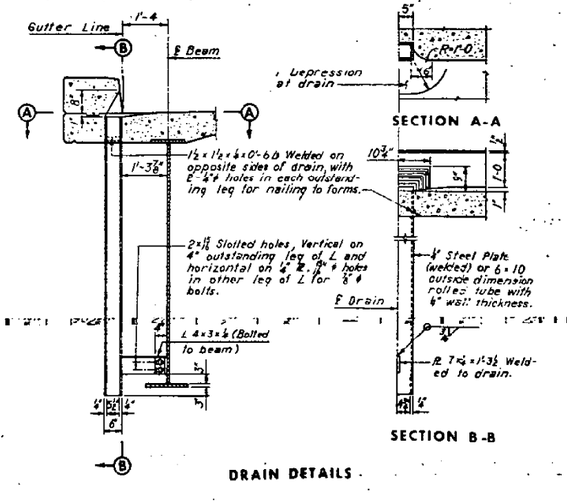
TYPICAL ROCKER SETTING

Temperature at time of setting	S. ABUTMENT		PIER 1	PIER 2	PIER 3	N. ABUTMENT	
	D						D
90°F	-2½"	-1"	-½"	—	-1"	-½"	-2½"
50°F	2½"	0	0	—	0	0	2½"
10°F	2½"	-1"	-½"	—	-1"	-½"	2½"

Note:
For detail showing dimension D see Section A-A Sheet 21.

NOTE: Do not paint in the shop for a distance of two inches from each side of the outside lines of field weld. After the field welding has been completed, paint the bare surface of steel with one coat of shop coat paint then with first and second field coat paint.

Drain Notes:
Reinforcing steel is to be shifted or cut in the field to miss drains.
Drains are to be galvanized.
See Sheet 1 for location of drains.
Weight of each drain = 159 lbs.
12 drains required per. bridge.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN Y.C.P DATE 8-5-69 CHECKED JSH DATE 8-6-69

2312-21-00

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

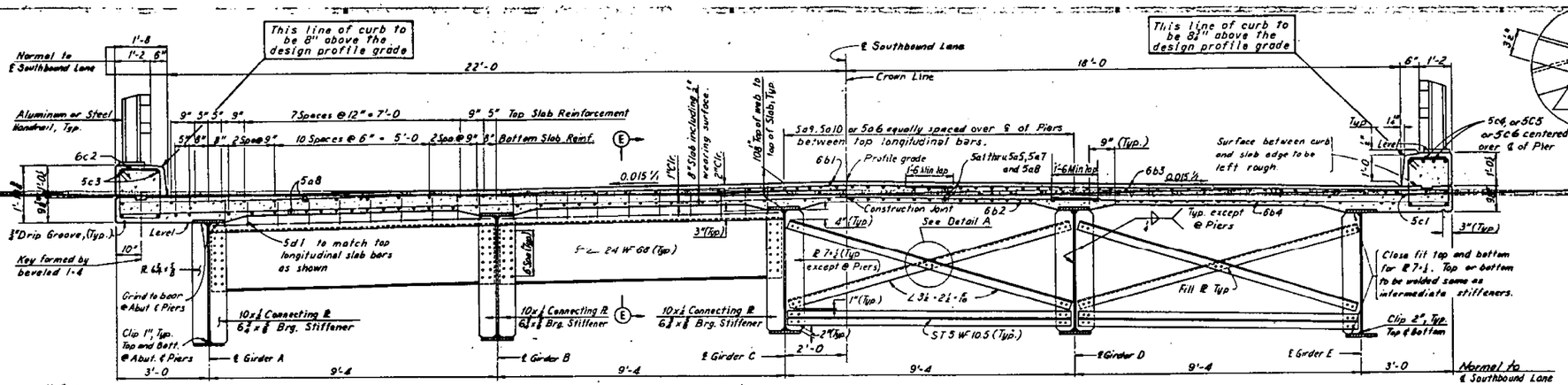
JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

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DESIGN NO. 668 JOHNSON COUNTY FILE 22960
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FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



Note: For Stiffener Detail at Piers and Abutments, see Sheet 19.

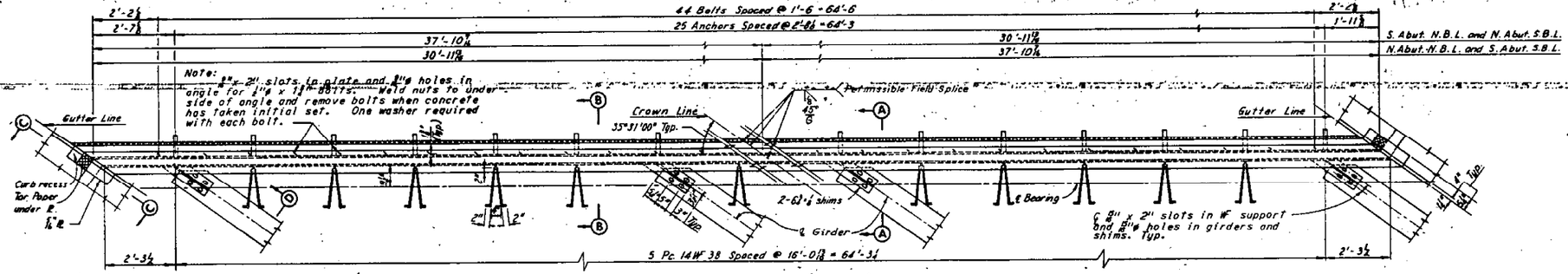
PART SECTION NEAR ABUTMENT

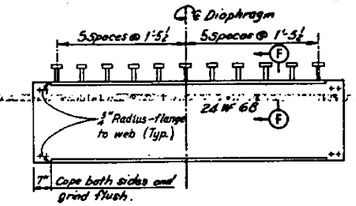
PART INTERMEDIATE SECTION

TYPICAL INTERMEDIATE AND PIER DIAPHRAGM

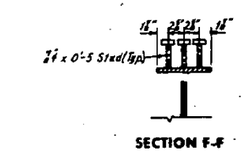
Note: Top transverse reinforcing steel is to be parallel to and 2" clear below top of slab. Bottom longitudinal reinforcing steel is to be parallel to and 1" cl. above bottom of slab. Top and bottom reinforcing steel is to be supported by individual bar chairs spaced at not more than 3'-0 centers longitudinally and transversely.

Note: Typical Section shown for Southbound Lane, Northbound Lane similar.

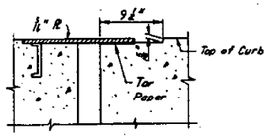




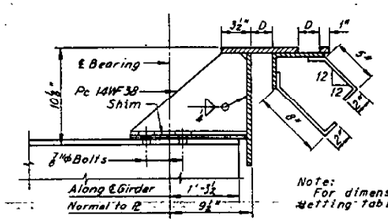
ABUTMENT DIAPHRAGM DETAIL



SECTION F-F

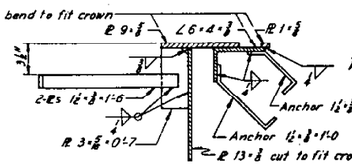


SECTION C-C



SECTION A-A

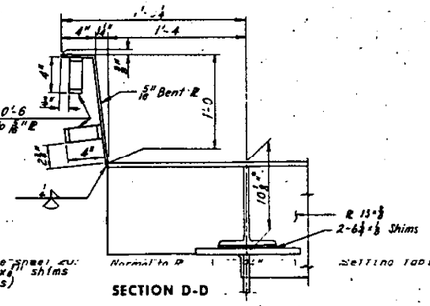
Note: For dimension D, see Rocker Setting Table sheet 20.



SECTION B-B

Setting Table Sheet 20: Normal to ℞ 1'-0½"

* Includes 2 - 6¾ x ⅜ shims (Furnish 4 shims)



SECTION D-D

Setting Table Sheet 20: Normal to ℞ 1'-0½"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE FW DATE 7-17-68 CHECKED JSH DATE 7-8-69

2312-21-00

BRIDGE NO. 10 **C.R. & I.C. RR AND EXISTING U.S. ROUTE 218**

DESIGN FOR 84'-0" SKEW

DUAL 376'-0" x 40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IO-380-6(7) 247--04-52

JOHNSON COUNTY

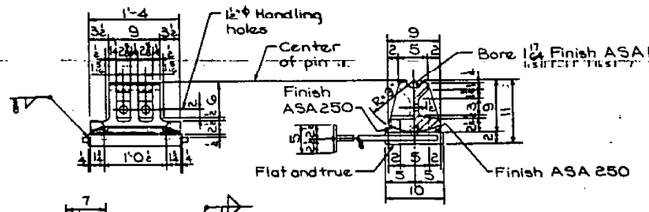
IOWA STATE HIGHWAY COMMISSION

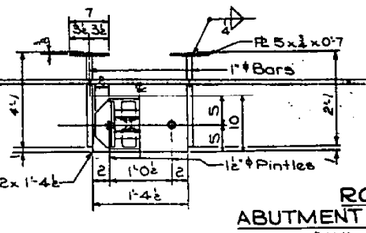
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DESIGN NO. 668 JOHNSON COUNTY FILE 22960

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FEDERAL DIST NO	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				

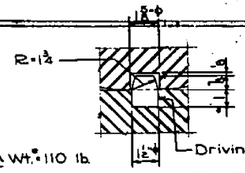




ROCKER R1A Wt.= 143 lb

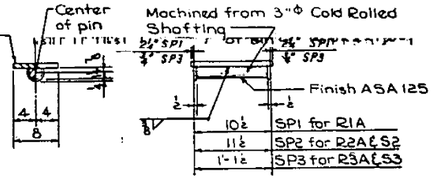
ABUTMENT MASONRY PLATE MP1A Wt.* 110 lb

* Wt. does not include 1"ϕ bars



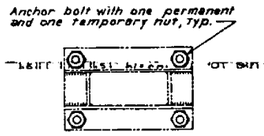
TYPICAL PINTLE DETAIL

SP1 - Fl 8x¾x1'-3
SP2 - Fl 8x¾x1'-10½
SP3 - Fl 8x¾x1'-3



SOLE PLATE SP1, SP2 & SP3

Wt. { SP1 = 40 lb. SP2 = 37 lb. SP3 = 44 lb.



ANCHOR BOLT TEMPLATE

BEARING NOTES:

The casting of R1A, R2A, S2, R3A and S3 shall comply with Article 4153.04 of the I.H.C. Standard Specifications.

The masonry plates marked MP1A, MP2A, MP2P, MP3A and MP3P shall comply with the requirements of ASTM A-36 steel.

The pins shall comply with Article 4153.02 of the I.H.C. Standard Specifications and with the requirements of ASTM A-108 steel.

All bearings are to be set in paint and canvas.

Anchor bolts shall be set in accordance with Article 2408.47 of the I.H.C. Standard Specifications.

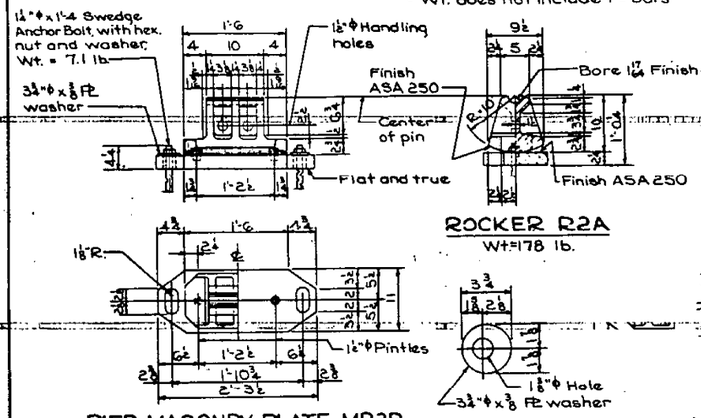
After masonry plates, rockers and shoes are in correct location, place mortar around anchor bolts to fill the slotted holes.

The weight of bearings shown does not include the weight of paint.

Surfaces finished with an ASA 125 finish shall be shop coated with an application of white lead and tallow as soon as the surfacing process is done. The shop coated surfaces are to be wiped clean and then a field coat of white lead and tallow is to be applied just before the erection of structural steel in the field.

Sole plates shall be field welded to girder flange, see sheet 20 for weld size.

See sheet 14 for "Anchor Bolt Setting Plan".

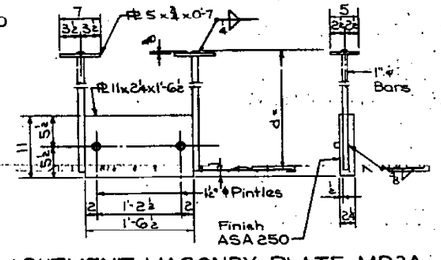


ROCKER R2A

Wt=178 lb.

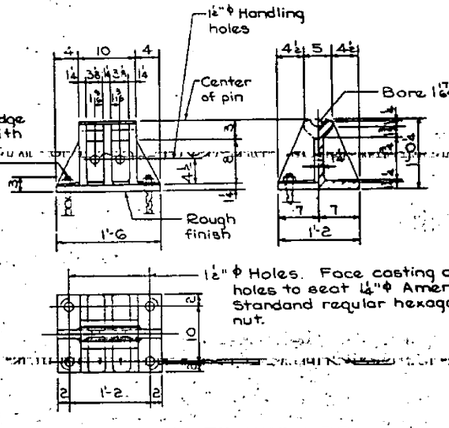
PIER MASONRY PLATE MP2P

Wt. = 160 lb.



ABUTMENT MASONRY PLATE MP2A

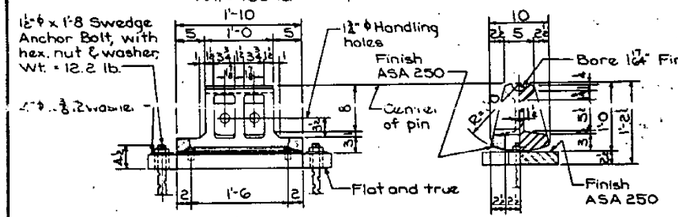
Wt. 146 lb. (Does not include 1"ϕ bars)



FIXED SHOE S2

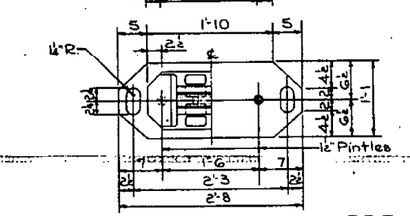
Wt.=222 lb.

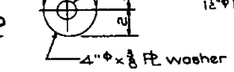
(Similar to S2 V12-1)



ROCKER R3A

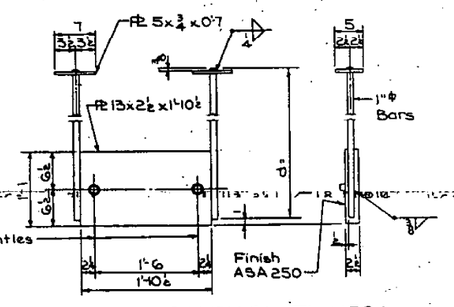
Wt.= 259 lb.





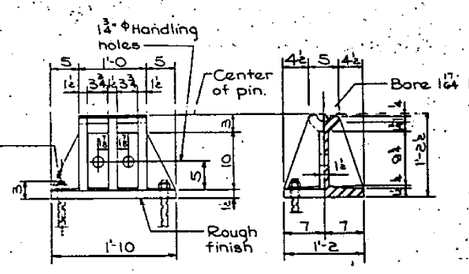
PIER MASONRY PLATE MP3P

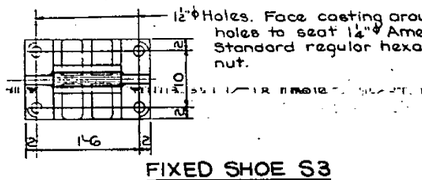
Wt. = 249 lb.



ABUTMENT MASONRY PLATE MP3A

Wt. = 224 lb. (Does not include 1"ϕ bars)





FIXED SHOE S3

Wt. = 349 lb.

(Similar to S1 V10A-7)

DISTANCE FROM TOP OF SOLE PLATE TO BRIDGE SEAT

Rockers & Fixed Shoes	D*
R1A	1'-0 1/16
R2A & S2	1'-1 13/16
R3A & S3	1'-4 5/16

* Including 1/16" paint and canvas.

MAXIMUM REACTION (In Kips)		
R1A	R2A S2	R3A S3
132	171	263

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN LJR DATE 8-6-69 CHECKED JSH DATE 8-11-69

2512-21-00

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 8'-6"-0"x4'-0" CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

BEARING DETAILS

STATION 1554+46.27 & I-380 PROJ. NO. I-IO-380-6(7) 247--04-52

JOHNSON COUNTY

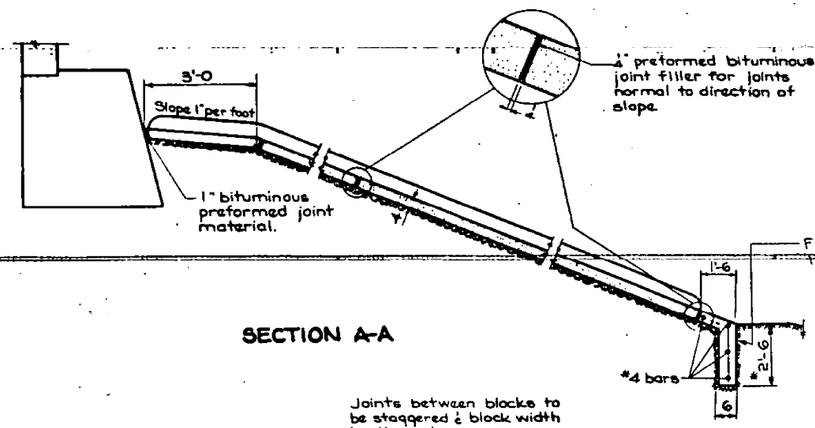
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 22 OF 25

DESIGN NO. 668 JOHNSON COUNTY FILE 22960

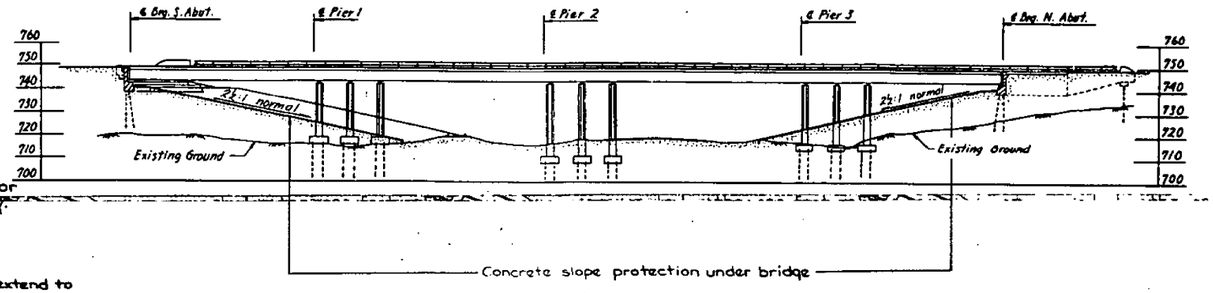
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FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				

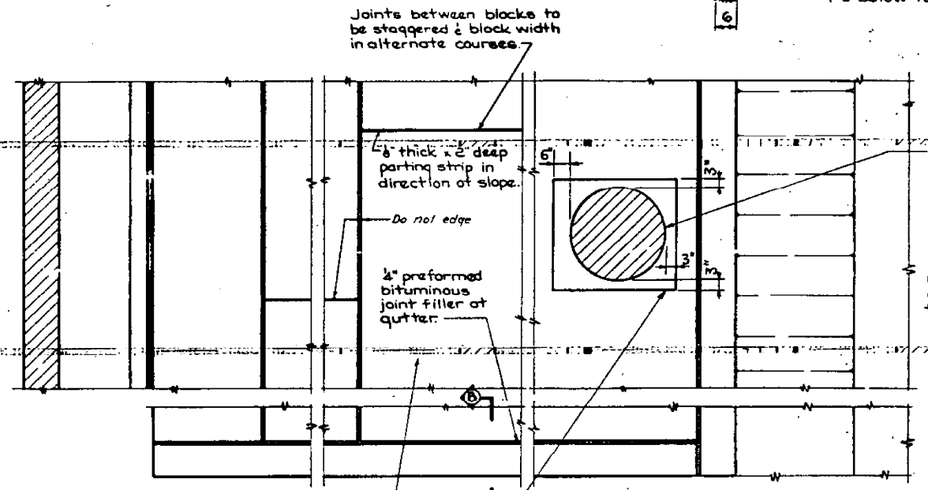


SECTION A-A

* Drop wall is to extend to top of pier footing when top of footing is less than 1'-6 below toe of slopes.

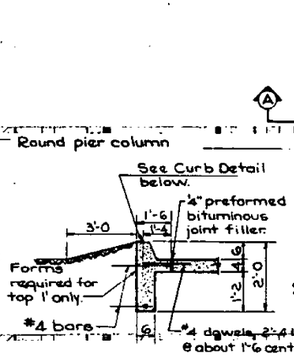


LONGITUDINAL SECTION ALONG ℄ OF ROADWAY

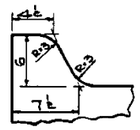


PART SLOPE PROTECTION PLAN (0° SKEW) FOR COLUMNS IN SLOPE

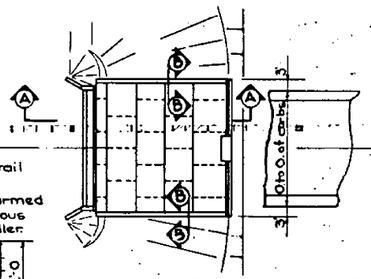
Scale: ½"-1'-0"



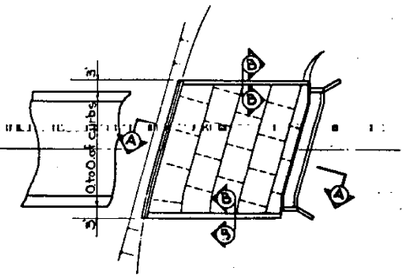
SECTION B-B



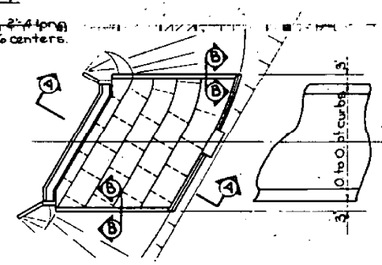
CURB DETAIL



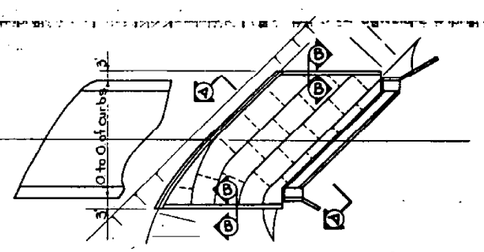
SLOPE PROTECTION LAYOUT 0° SKEW



SLOPE PROTECTION LAYOUT 15° SKEW



SLOPE PROTECTION LAYOUT 30° SKEW



SLOPE PROTECTION LAYOUT 45° SKEW

GENERAL NOTES:

This sheet shows details for placing portland cement concrete slope protection under overhead structures.

The current specifications of the Iowa Highway Commission shall apply with modifications or additions listed below:

Concrete - Class C Structural.

Finish - Class 1, Floated Surface Finish.
Cure - Cure as per current Specifications.
Subgrade Preparation - The subgrade is to be shaped and compacted so that finished slope protection will be similar to examples shown on this sheet. The subgrade shall be firm when concrete is placed. Sprinkling required shall be done early enough so that concrete is not placed on a muddy subgrade. No subgrade paper will be required.

The cast in place concrete is to be poured in approximately 10' wide courses, but all courses on one slope should have approximately equal widths. Adjacent courses shall not be poured within 15 hours of one another. The joints in the direction of the slope are to be staggered about ½ block width.

Basis of payment: Payment will be made on a square yard basis for slope protection constructed. The unit price bid per square yard is to include costs of all materials and labor required to construct this protection as shown or intended by these plans. The subgrade preparation including any necessary excavation or filling required to shape the slope to the lines shown on the plans and disposal of excess earth excavated as directed by the Engineer, are considered incidental to placing the concrete slope protection.

ESTIMATED QUANTITIES (from when concrete to

	SOUTHBOUND LANE	NORTHBOUND LANE
South Abutment	533 Sq. Yds.	630 Sq. Yds.
North Abutment	592 Sq. Yds.	479 Sq. Yds.
Total	1125 Sq. Yds.	1109 Sq. Yds.

Where erosion control work is completed the Contractor shall be responsible for any plant materials destroyed adjacent to slope protection area. The Contractor shall replant, reseed and remulch all areas disturbed adjacent to slope protection areas in accordance with section 2601 of Standard Specifications, Series of 1964, at his expense.

Pay quantities are to be based on field measured out to out dimensions.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE LJP DATE 8-14-69 CHECKED JSH DATE 8-14-69

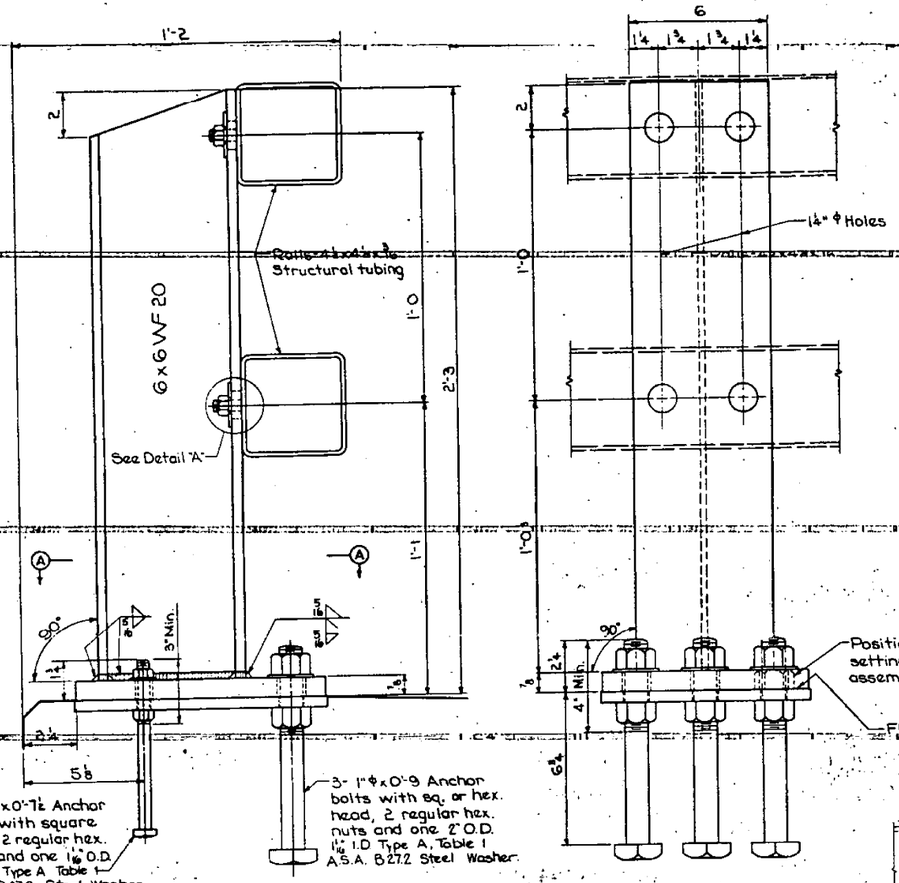
C.R. & I.C. RR AND EXISTING U.S. ROUTE 218
DESIGN FOR SLOPE PROTECTION when concrete to
Transportation Corridor
BRIDGE NO. 10

DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE
79'-0, 99'-6, 110'-6, 87'-0 SPANS

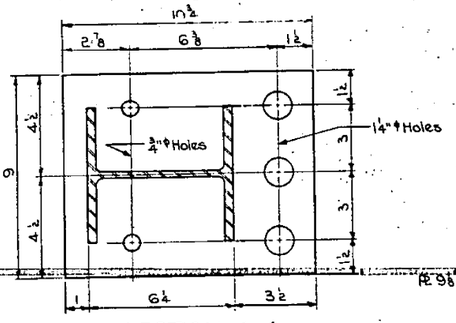
CONCRETE SLOPE PROTECTION

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-10-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 23 OF 25
DESIGN NO. 668 JOHNSON COUNTY FILE 22960
78 of 100

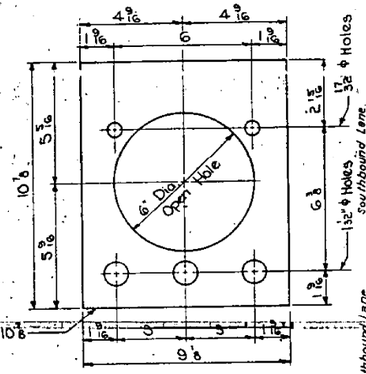
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	IOWA				



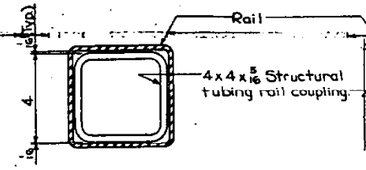
RAIL POST



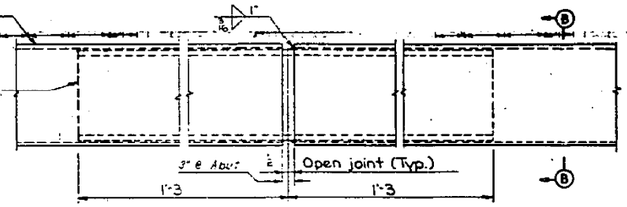
SECTION A-A



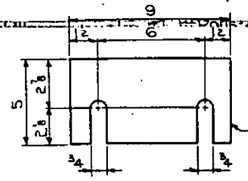
ANCHOR CAGE DETAILS



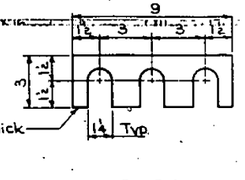
SECTION B-B



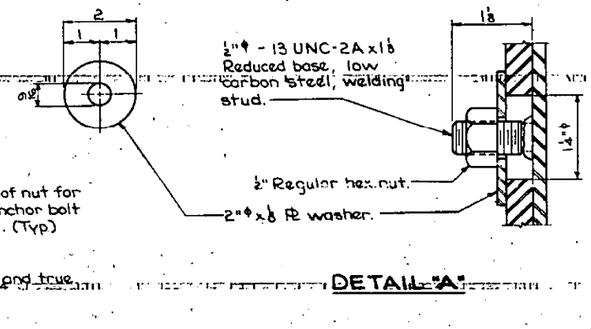
TYPICAL SPLICE JOINT



SHIM "A" DETAIL



SHIM "B" DETAIL



DETAIL "A"

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 End Cap "B" shall be galvanized malleable iron casting or galvanized steel casting.

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" are 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 1/8".

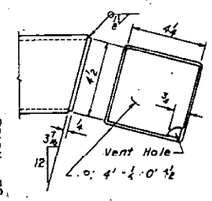
No painting will be required.

Rail studs shall be protected with adequate protection during shipment.

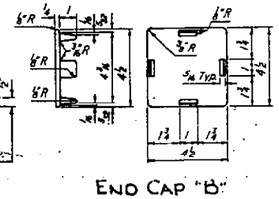
A 1/4" ϕ drain hole is to be provided 3" from the end, at the bottom side of the end section of all rails.

Handrail dimensions are measured along a line 1'-0" from the outside face of the curb.

Material for anchor bolts and nuts, and rail to post attachment nuts shall be A.S.T.M. A-307-61T, Grade A.

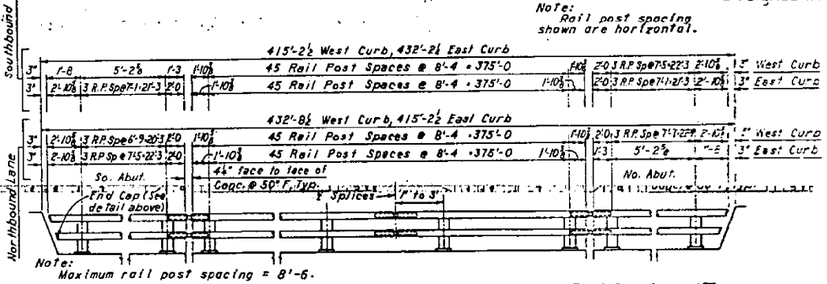


END CAP "A"



END CAP "B"

RAIL END CAP DETAILS



TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

DESIGN SPECIFICATIONS:

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

STEEL HANDRAIL QUANTITIES	
Southbound Lane	845.7 Lin. Ft.
Northbound Lane	846.2 Lin. Ft.

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 276'-0" x 40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

STEEL HANDRAIL DETAILS

STATION 1554+46.27 ℄ I-380 PROJ. NO. I-IQ-280-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 24 OF 25

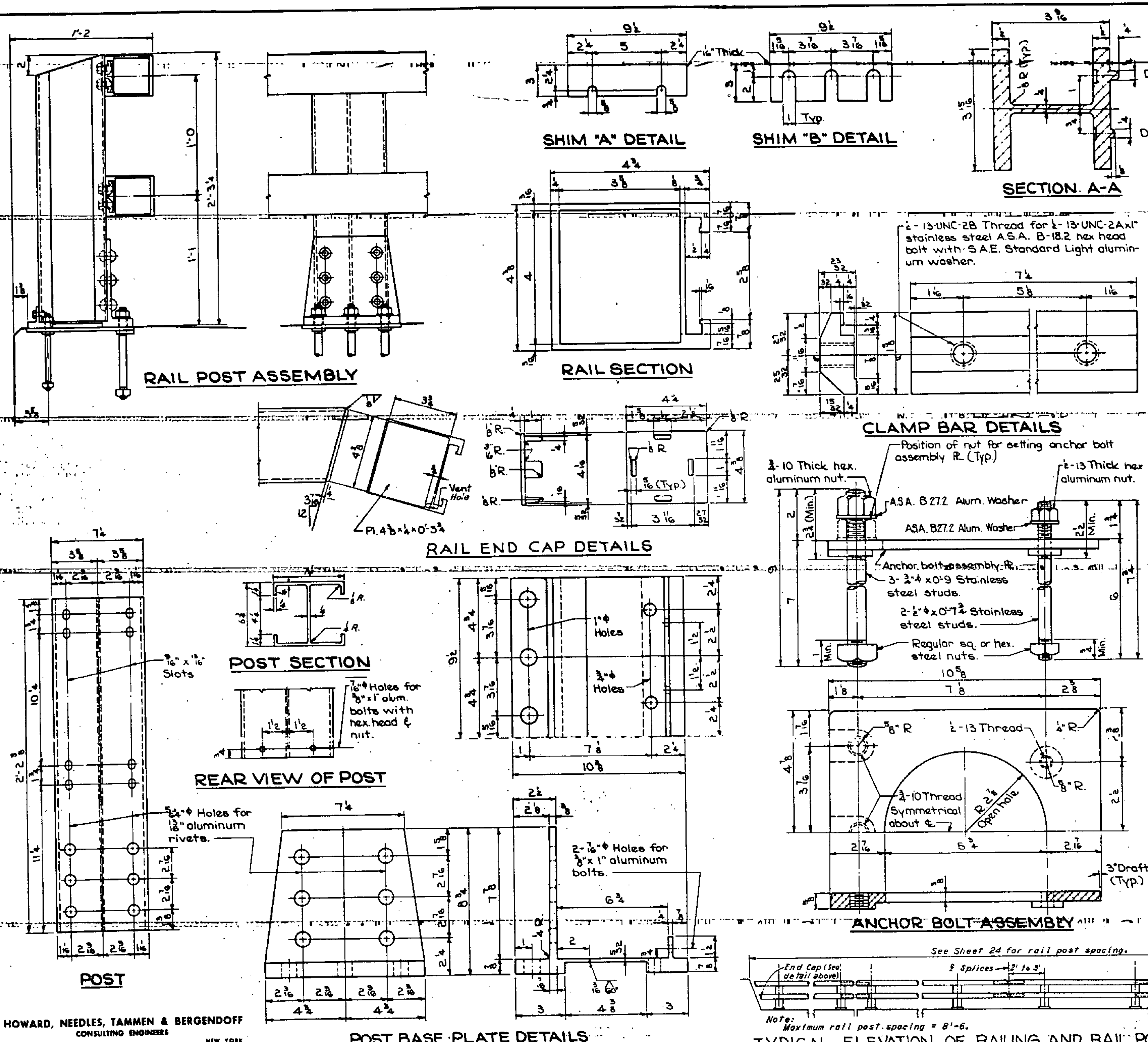
DESIGN NO. 668 JOHNSON COUNTY FILE 22960

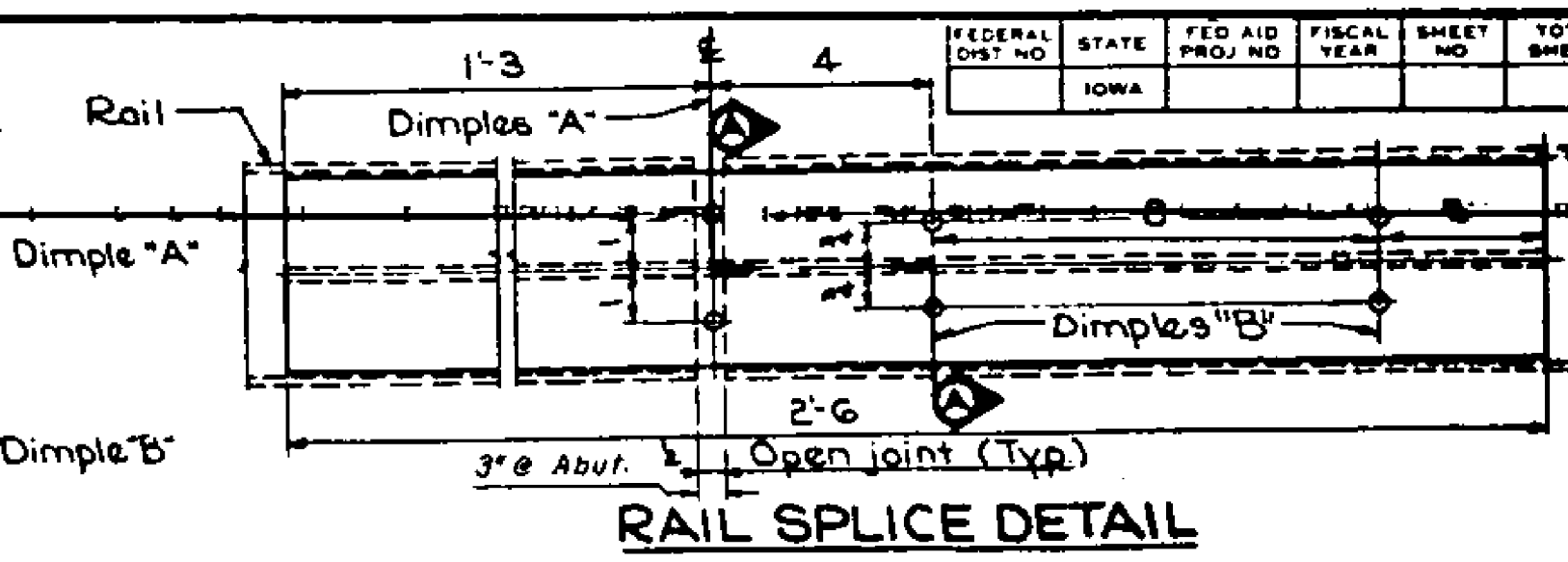
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE LJR DATE 8-2-69 CHECKED JSH DATE 8-5-69

2318-21-00





FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				

ALUMINUM HANDRAIL NOTES:

The aluminum handrail is to be bid on a lineal 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 Alclad 2024-T3 for washers and Alloy 1100-0 for shims.

Material for anchor studs shall be an ASTM A 276 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. The aluminum nuts shall be thick, 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.

Material for steel nuts shall be A.S.T.M. 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 SG70 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 ... shop coat paint.

One shim "A" and one shim "B" are 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).

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

Rail end caps may be either aluminum alloy permanent mold casting or sand mold casting.

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 1/4" φ drain hole is to be provided, 3 inches in from the end, at the bottom side of the end sections of all rails.

Handrail dimensions are measured along a line 1'-0" from the outside face of the curb.

DESIGN SPECIFICATIONS:

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

ALUMINUM HANDRAIL QUANTITIES	
Southbound Lane	*845.7 Lin. Ft.*
Northbound Lane	*846.2 Lin. Ft.*

BRIDGE NO. 10

C.R. & I.C. RR AND EXISTING U.S. ROUTE 218

DESIGN FOR 54°29' SKEW

DUAL 376'-0"x40' CONTINUOUS WELDED PLATE GIRDER BRIDGE

79'-0, 99'-6, 110'-6, 87'-0 SPANS

ALUMINUM HANDRAIL DETAILS

STATION 1554+46.27 ℄ I-380 **PROJ. NO. I-IG-380-6(7) 247--04-52**

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 **SHEET 25 OF 25**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

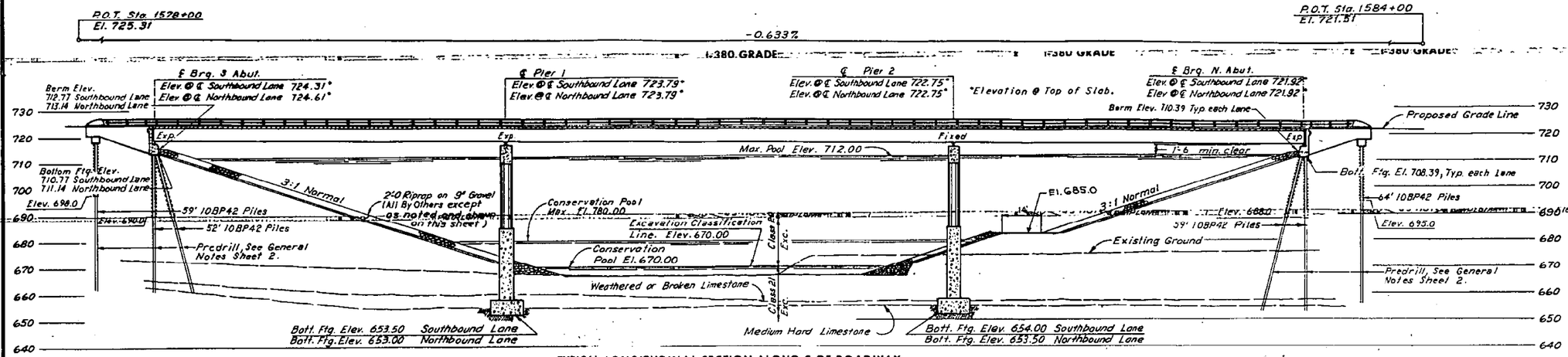
MADE L.J.R. DATE 8-2-69 CHECKED J.S.H. DATE 8-5-69

2312-21-00

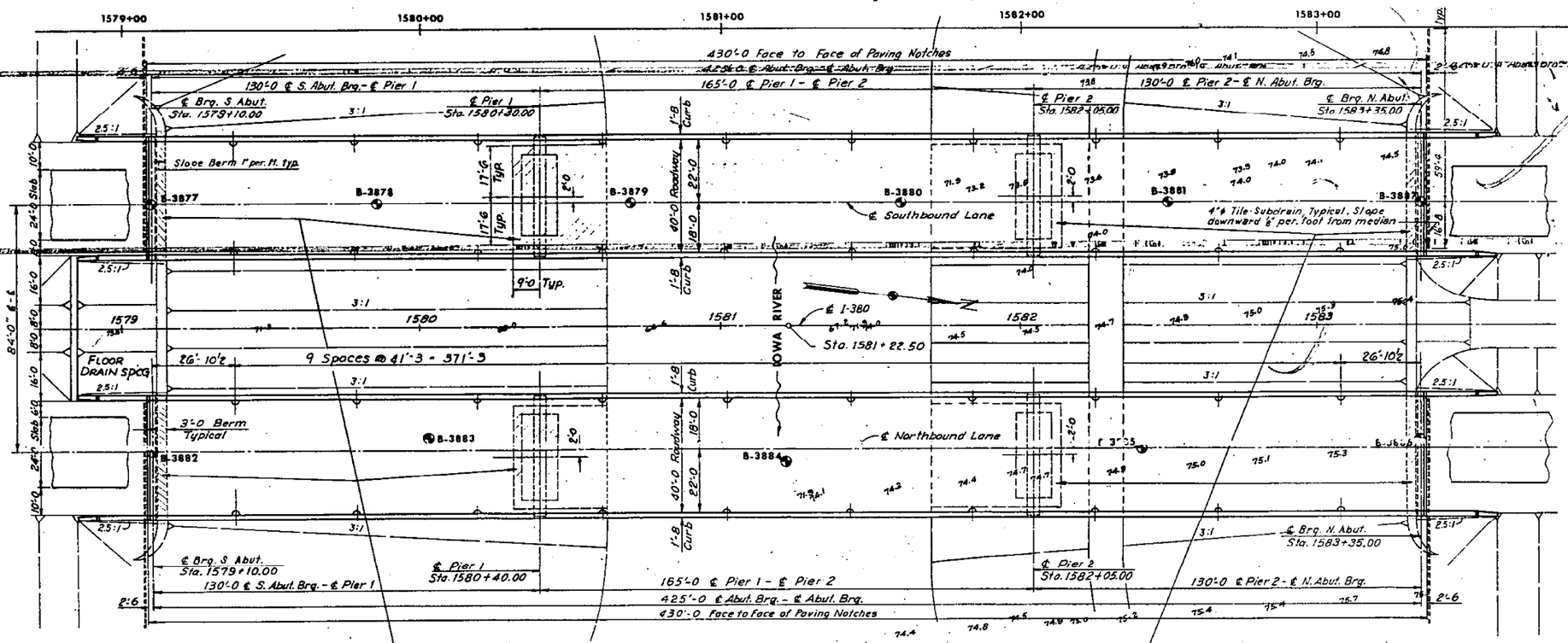
DESIGN NO. 668 **JOHNSON COUNTY** **FILE 22960**

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FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				



TYPICAL LONGITUDINAL SECTION ALONG ℄ OF ROADWAY



TYPICAL APPROACH SECTION (AHEAD OF STA. 1579+86.70)

SITUATION PLAN

Upon completion of the substructure-, the Bridge Contractor shall place the slope protection in the shaded areas around piers and in front of abutments in accordance with the details shown on Sh. #2, using the riprap and gravel stockpiled near the bridge by the Road Contractor. Cost of this work is considered incidental to price bid for other items

LOCATION

I-380 over Iowa River
Johnson County
Jefferson Twp.
T81N R7W
Section 22

BENCH MARKS

B.M. No. 65-"□" in north corner of small concrete foundation, 200 ft. east of Centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66-"□" [illegible] destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

I.N.R.C. Approval #68-326 (Dec. 4, 1968)
Traffic Count 10,751 ADT 1971
18,100 ADT 1991

I hereby certify that this plan, specification or report was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signed [signature] No. 5156 Date Oct. 31, 1969
Paul L. Hennessey, P.E. Reg. No. 5156

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE L.J.R. DATE 9-9-69 CHECKED J.S.H. DATE 9-10-69

2312-81-00

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SITUATION PLAN

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-10-380-6(7) 247--04-52

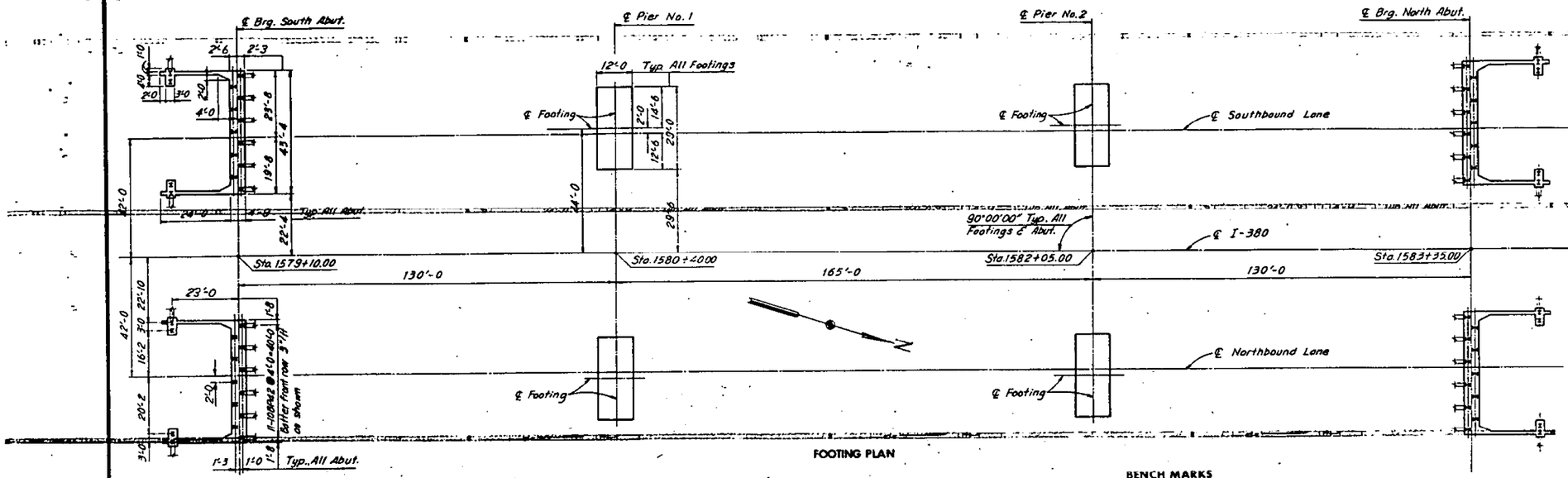
JOHNSON COUNTY

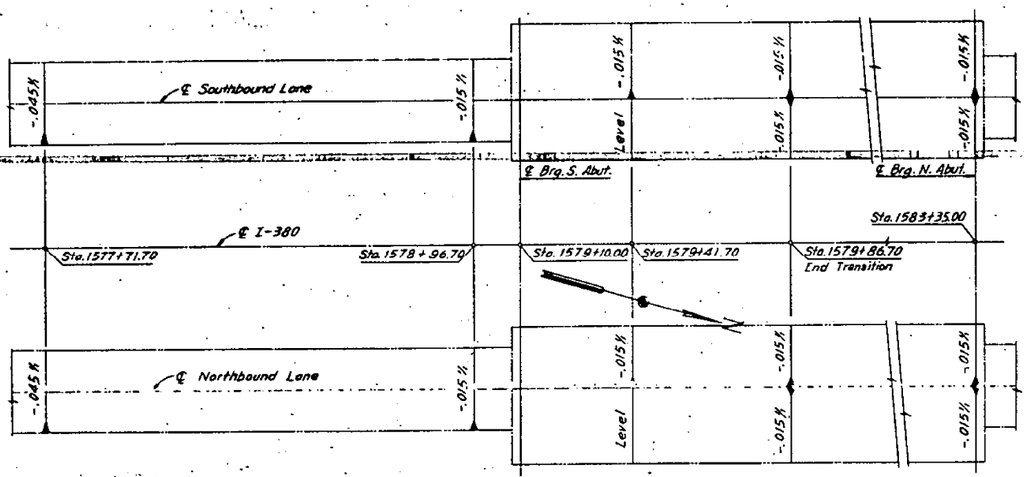
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 1 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

FEDERAL DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				

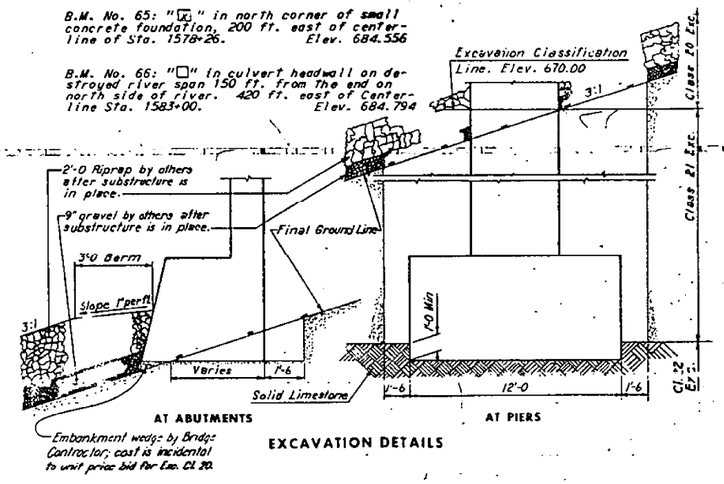




BENCH MARKS

B.M. No. 65: "X" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66: "□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794



SPECIFICATIONS:

Design stresses for the following materials are in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1969.

Structural steel in accordance with Section 7 "Structural Steel Design." ASTM A572 Gr. 50 and ASTM A588 $f_s = 27,000$ psi; ASTM A36 $f_s = 20,000$ psi

Reinforcing steel in accordance with Section 1.5.1 "Reinforcement" $f_s = 20,000$ psi.

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

Construction: Standard Specifications of the Iowa State Highway Commission Series of 1964, plus current Special Provisions and current Supplemental Specifications.

Welding: 1969 American Association State Highway Officials Standard Specifications, except as modified in Standard Specifications and as shown on Sheet 11.

GENERAL NOTES:

These bridges are designed for HS20-44 and alternate, loading designated in P.P.M. 20-4, Section 4-c with allowance of 20 lbs. per sq. ft. of roadway for future wearing surface.

Drawings shall not be scaled.

Utilities are to be relocated by others.

All dimensions are horizontal, unless otherwise shown.

The bridge contractor is to install the tile subdrains behind each abutment as detailed and it is his responsibility to see that it extends unobstructed through the riprap, after the riprap has been placed. The price bid for "4" ϕ Tile Subdrain" is to include excavation necessary for installation.

The berm is to be leveled off and shaped to the dimensions and elevations shown or others. With the exception of the erosion control areas as shown in Situation Plan on Sh."1, the riprap and gravel as shown on Sh."3 will be placed by others.

The 10BP42 steel piles at abutments shall be driven to a minimum bearing value of 55 tons per pile with a diesel hammer of adequate capacity. The abutment piles are to be driven in oversized holes drilled through the fill to elevations shown. The minimum diameter of the drilled holes shall be 16". Voids around the steel piles shall be filled with dry sand. No separate payment will be made for drilling of holes or filling voids, as the items are considered incidental to driving piles. Piles shall be driven to practical refusal and seated in limestone. Seating shall be done with a diesel hammer of at least 26,000 foot-pounds of rated energy operating at full capacity, or a gravity hammer having an effective weight of at least 6,000 pounds, and driving energy of not less than 38,000 foot pounds nor more than 40,000 foot-pounds.

TOTAL ESTIMATED QUANTITIES

ITEM		UNIT	SOUTHBOUND LANE SUBSTR.	SOUTHBOUND LANE SUPERSTR.	SOUTHBOUND LANE TOTAL	NORTHBOUND LANE SUBSTR.	NORTHBOUND LANE SUPERSTR.	NORTHBOUND LANE TOTAL	TOTAL
Structural Concrete *		Cu. Yds.	641.2	545.5	1,186.7	645.0	545.5	1,190.5	2,377.2
Reinforcing Steel		Lbs.	95,067	179,175	274,242	95,667	179,175	274,842	549,084
Structural Steel **		Lbs.		600,976	600,976		600,976	600,976	1,201,952
10BP42 Steel Piling ***	Furnish	Lin. Ft.	1,713		1,713	1,713		1,713	3,426
	Drive	Lin. Ft.	1,713		1,713	1,713		1,713	3,426
Excavation, Class 20		Cu. Yds.	34		34	34		34	68
Excavation, Class 21		Cu. Yds.	534		534	548		548	1,082
Excavation, Class 22		Cu. Yds.	26		26	26		26	52
Granular Backfill		Cu. Yds.	294		294	294		294	588
4" ϕ Tile Subdrain		Lin. Ft.	152		152	152		152	304
Aluminum Handrail		Lin. Ft.		928.8	928.8		928.8	928.8	1,857.6
Steel Handrail		Lin. Ft.		928.8	928.8		928.8	928.8	1,857.6

* Structural Concrete Consists of 557.4 Cu.Yds. of Class C and 629.3 Cu.Yds. of Class D for Southbound Lane, and 561.8 Cu.Yds. of Class C and 628.7 Cu.Yds. of Class D for Northbound Lane.

** 145,607 Lbs. of A-36 and Iron Casting, 243,482 Lbs. of A-572 Grade 50 and 211,887 Lbs. of A-588 Type.

*** 11 @ 52', 15 @ 59' and 4 @ 64' Southbound Lane and 11 @ 52', 15 @ 59' and 4 @ 64' Northbound Lane.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE S.C.C. DATE 9-2-69 CHECKED GH DATE 9-9-69

23/2-21-00

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

GENERAL NOTES AND FOOTING PLAN

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(71) 247--04-52

JOHNSON COUNTY

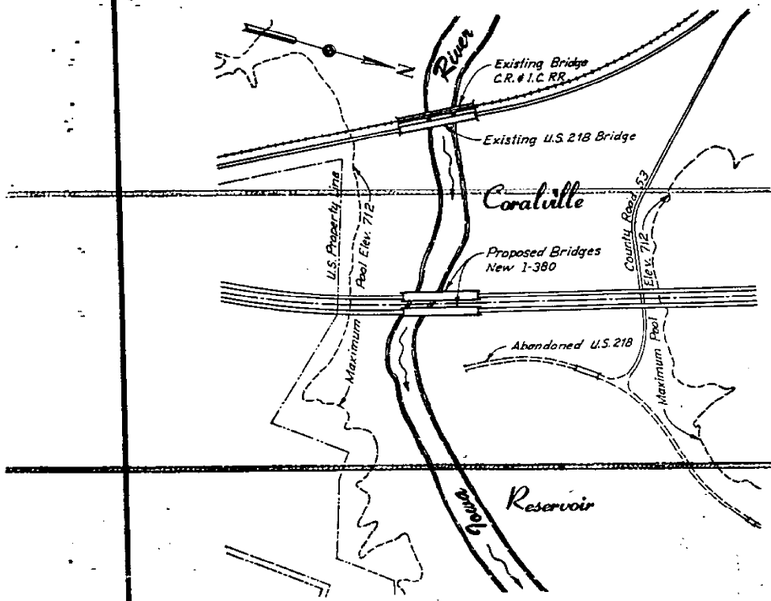
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 2 OF 18

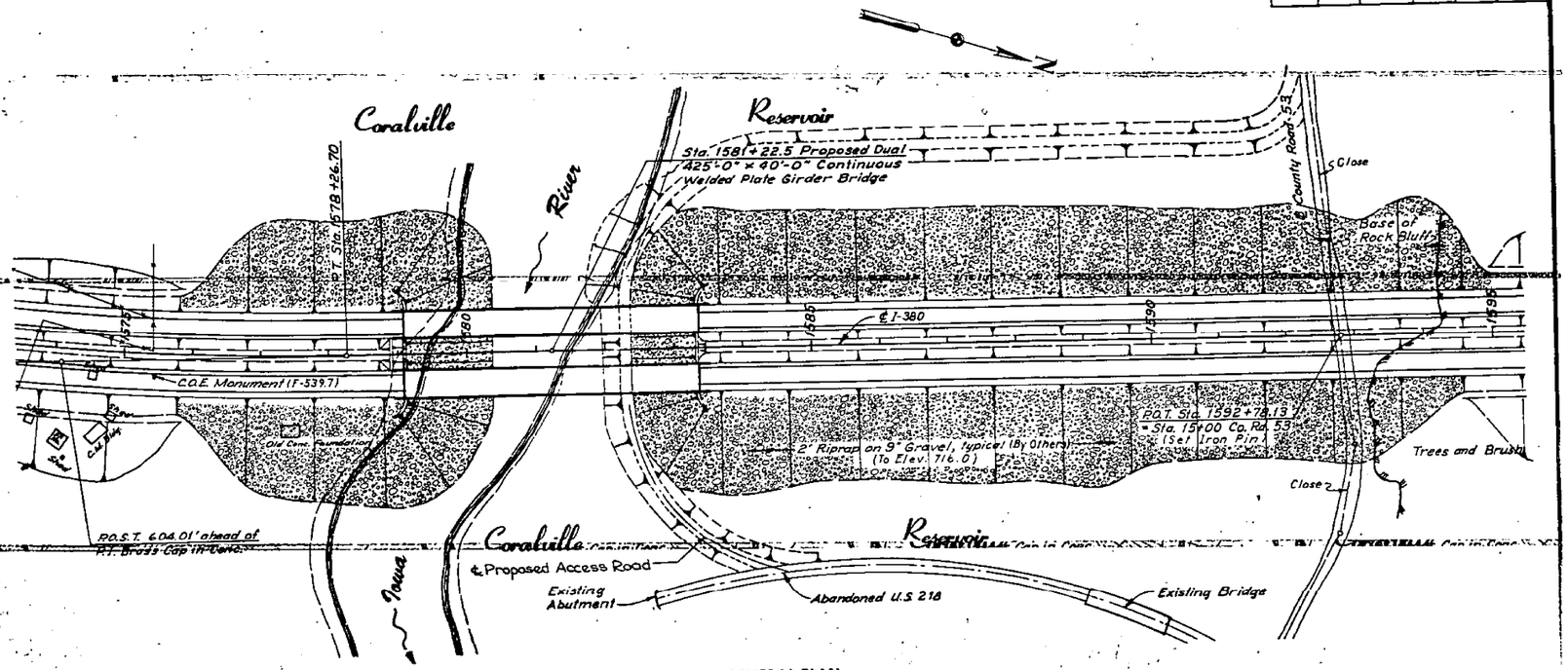
DESIGN NO. 768 JOHNSON COUNTY FILE 22960

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FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				



LOCATION PLAN



GENERAL PLAN

684.3 Surface Elevation
674.9 Water
670.2 Soft sandy silty clay
665.3 Sand - occ. traces of gravel
664.0 Broken limestone
662.9 Weathered limestone
659.9 Medium hard limestone

B-3877
42' Lt. Sta. 1579+10 ℄ I-380

684.3 Surface Elevation
671.9 Water
669.9 Soft sandy silty clay
661.9 Sand - occ. traces of gravel
660.4 Bouldery gravel
654.9 Weathered limestone
651.9 Medium hard limestone

B-3878
42' Lt. Sta. 1579+86 ℄ I-380

684.3 Surface Elevation
669.6 Water
664.9 Soft sandy silty clay
659.9 Sand - traces of gravel
654.4 Weathered limestone
651.9 Medium hard limestone

B-3879
42' Lt. Sta. 1580+70 ℄ I-380

684.3 Surface Elevation
669.6 Water
664.8 Soft sandy silty clay
656.9 Sand - traces of gravel
655.4 Broken limestone
652.9 Medium hard limestone

B-3880
42' Lt. Sta. 1581+60 ℄ I-380

684.3 Surface Elevation
676.4 Water
662.4 Soft sandy silty clay
657.4 Sand - traces of gravel
654.9 Broken limestone
652.9 Medium hard limestone

B-3881
42' Lt. Sta. 1582+50 ℄ I-380

684.1 Surface Elevation
672.4 Water
669.2 Soft sandy silty clay
664.7 Sand - traces of gravel
663.7 Broken limestone
660.2 Medium hard limestone

B-3882
42' Rt. Sta. 1579+10 ℄ I-380

684.1 Surface Elevation
670.5 Water
667.2 Soft sandy silty clay
661.2 Sand - traces of gravel
659.7 Broken limestone
654.7 Weathered limestone
652.7 Hard limestone

B-3883
38' Rt. Sta. 1580+03 ℄ I-380

684.1 Surface Elevation
675.2 Water
Soft sandy silty clay
661.8
656.7 Sand - traces of gravel
653.7 Weathered limestone (broken)
651.7 Medium hard limestone

B-3884
46' Rt. Sta. 1581+22 ℄ I-380

684.1 Surface Elevation
676.2 Water
Soft sandy silty clay
665.2
657.6 Sand - traces of gravel
654.2 Medium hard limestone

B-3885
42' Rt. Sta. 1582+41 ℄ I-380

684.1 Surface Elevation
676.7 Water
Soft sandy silty clay
664.7
657.2 Sand - traces of gravel
655.0 Broken limestone
653.7 Med. hard to hard limestone

B-3886
39' Rt. Sta. 1583+35 ℄ I-380

684.1 Surface Elevation
676.9 Water
Soft sandy silty clay
665.0
657.7 Sand - trace of gravel
654.7 Broken limestone
652.7 Medium hard limestone

B-3887
42' Lt. Sta. 1583+35 ℄ I-380

SOUNDING DATA
Date: 10-27-67

BENCH MARKS

B.M. No. 65: "⊠" in north corner of small concrete foundation, 200 ft. east of center-line of Sta. 1578+26. Elev. 684.556

B.M. No. 66: "□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of center-line Sta. 1583+00. Elev. 684.794

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SOUNDING DATA

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 3 OF 18

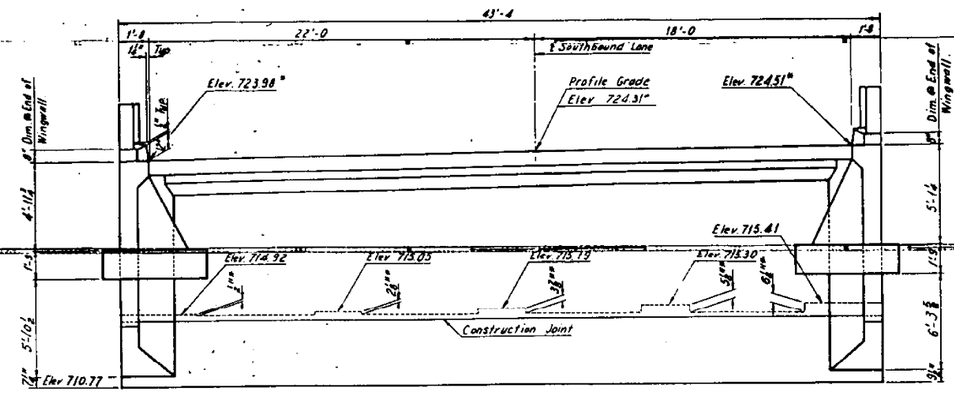
DESIGN NO. 768 JOHNSON COUNTY FILE 2296 78

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

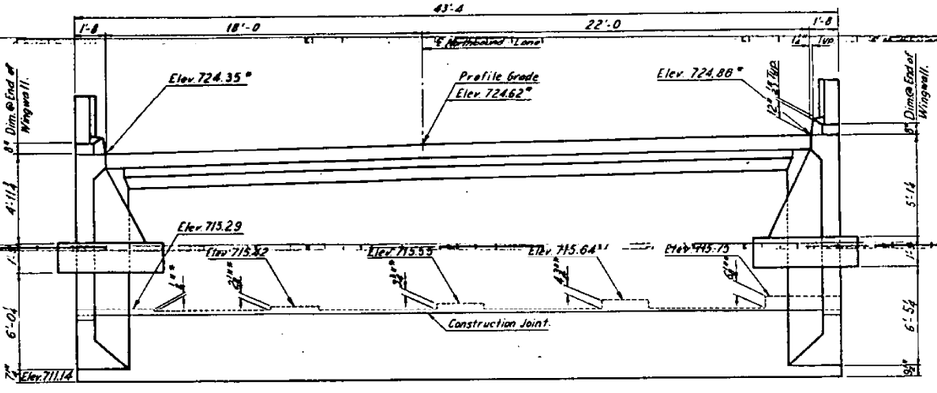
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23/2-21-00

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	IOWA				

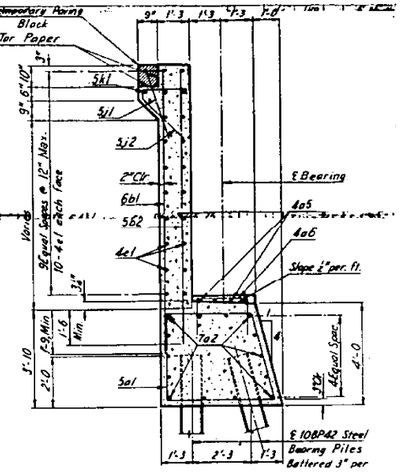


ELEVATION
SOUTHBOUND LANE

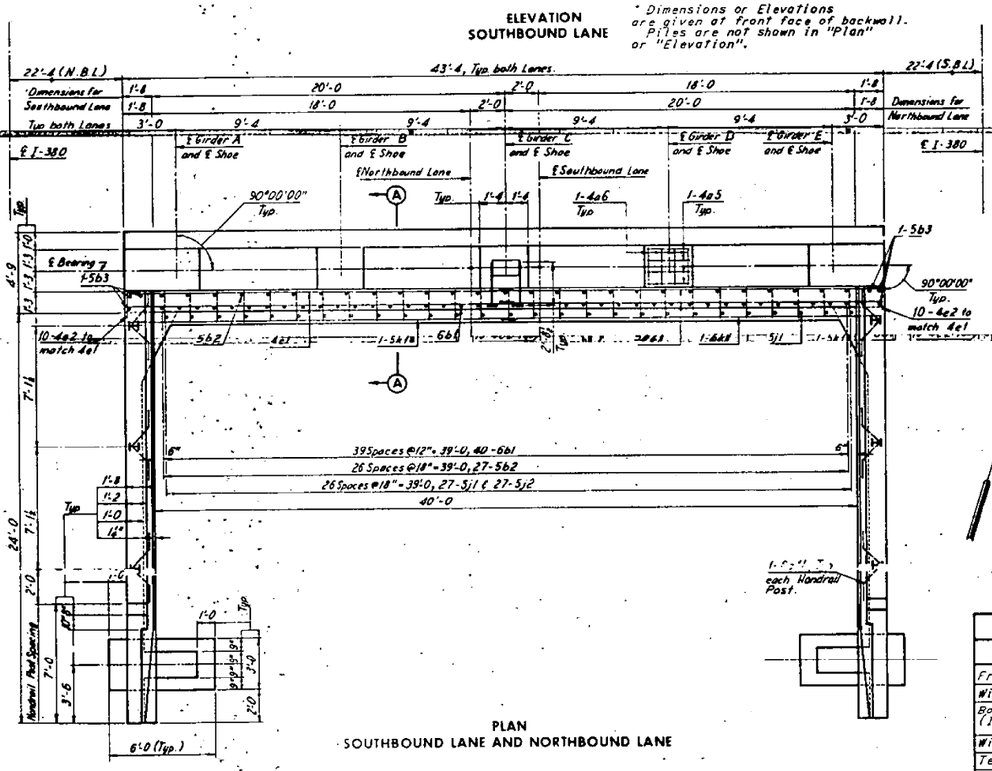


ELEVATION
NORTHBOUND LANE

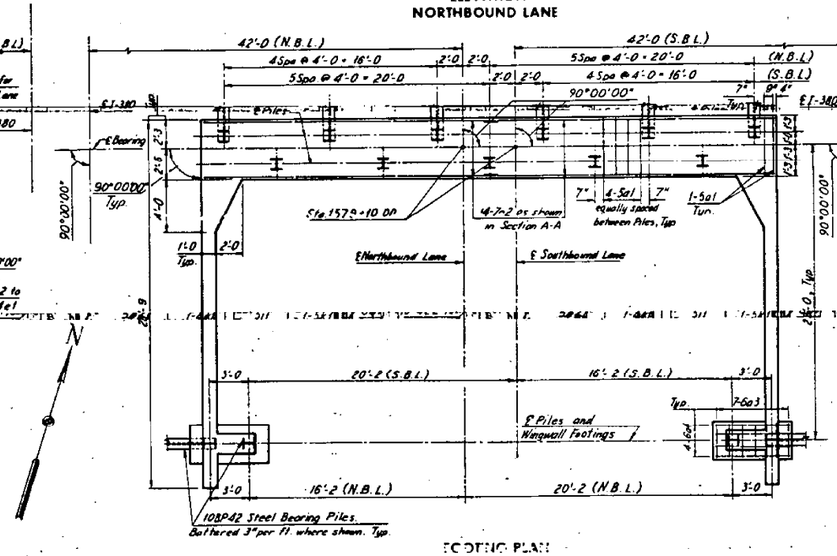
* Dimensions or Elevations are given at front face of backwall. Piles are not shown in "Plan" or "Elevation".



SECTION A-A



PLAN
SOUTHBOUND LANE AND NORTHBOUND LANE



FOOTING PLAN
SOUTHBOUND LANE AND NORTHBOUND LANE

Notes:
All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
All backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.
See Sheet 5 for "Pill of Reinforcement."
See Sheet 7 for "Paving Block Plan."
See Sheet 7 for "Backfill Detail."
The abutment backwall and the remainder of the wing walls are to be placed after the superstructure is in place.
See Sheet 5 for "End Post Detail."
Batter piles 3" per foot in direction shown.
All piles are to be driven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes, Sheet 2.
Pile spacing shown is at bottom of footing.

BENCH MARK

B.M. No. 65="□" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.555

B.M. No. 66="□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

CONCRETE PLACEMENT QUANTITIES

			SOUTHBOUND LANE	NORTHBOUND LANE
Front Ftg. and Steps	(Class C)	Cu. Yds	27.6	27.6
Wingwalls below Const. Jt.	(Class C)	Cu. Yds	1.6	1.6
Backwall and wingwalls above const. jt. (Includes 0.7 C.Y. for End Posts) (Cl. D)		Cu. Yds	42.1	41.5
Wingwall footings	(Class C)	Cu. Yds	2.3	2.3
Temporary paving block	(Class C)	Cu. Yds	0.9	0.9
	Total	Cu. Yds	74.5	73.9

ESTIMATED QUANTITIES

ITEM		UNIT	QUANTITY
Structural Concrete **		Cu. Yds.	74.5(S.B.L) 73.9(N.B.L)
Reinforcing Sheet		Lbs.	7,885 each lane
10BP42 Steel Bearing Piling 116@52', 4959'	Furnish	Lin. Ft.	808 each lane
	Drive	Lin. Ft.	808 each lane
Excavation, Class 20		Cu. Yds	16 each lane
Granular Backfill		Cu. Yds	148 each lane
4" ø Tile Subdrain		Lin. Ft.	76 each lane

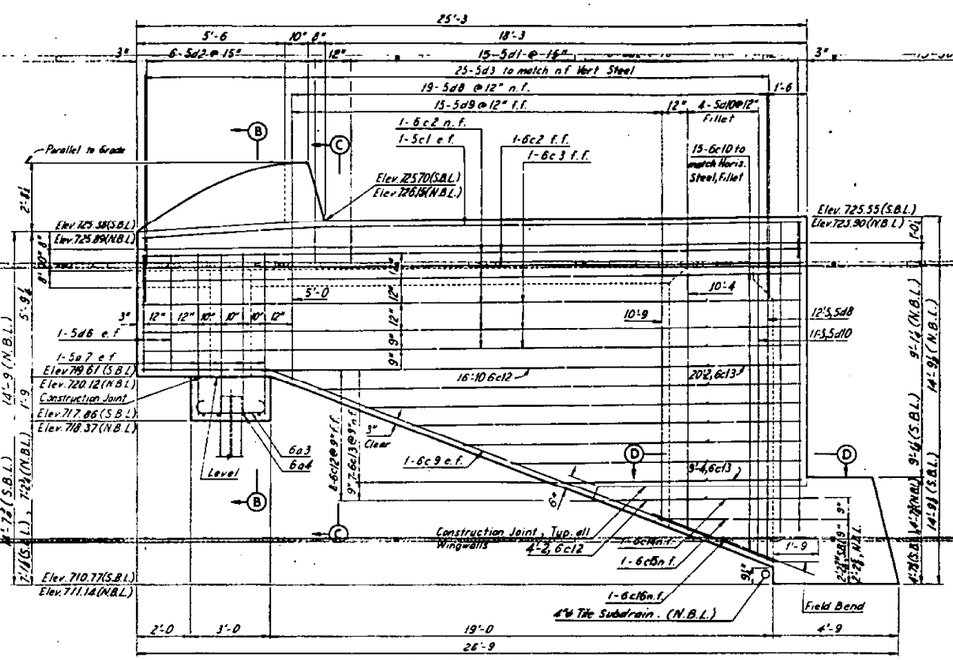
**Structural Concrete consists of 32.4 Cu. Yds. of Class C each lane and 42.1 Cu. Yds. of Class D S.B. Lane, and 41.5 Cu. Yds. of Class D N.B. Lane.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MAIN PTA DATE 08-29-69 CHECKED JSH DATE 9-8-69

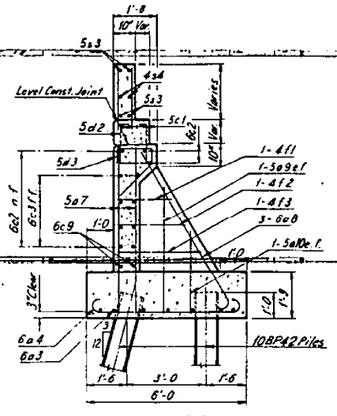
BRIDGE NO. 11 I-380 OVER IOWA RIVER
DESIGN FOR 0°00' SKEW
DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE
130'-0, 165'-0, 130'-0 SPANS
SOUTH ABUTMENTS
STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 4 OF 18
DESIGN NO. 768 JOHNSON COUNTY FILE 22960

2V2-81-00

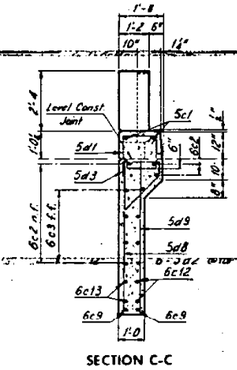
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	IOWA				



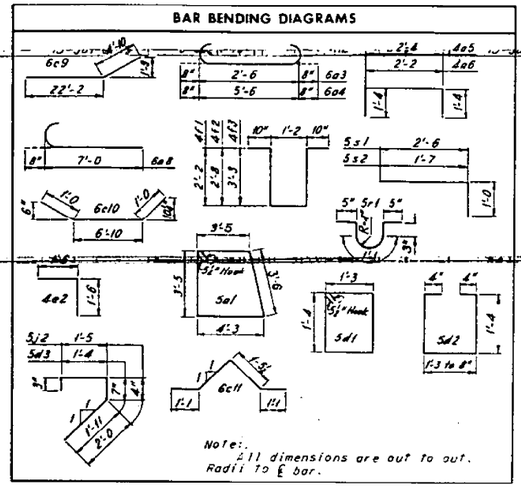
ELEVATION EAST WINGWALL
SOUTHBOUND LANE AND NORTHBOUND LANE



SECTION B-B



SECTION C-C



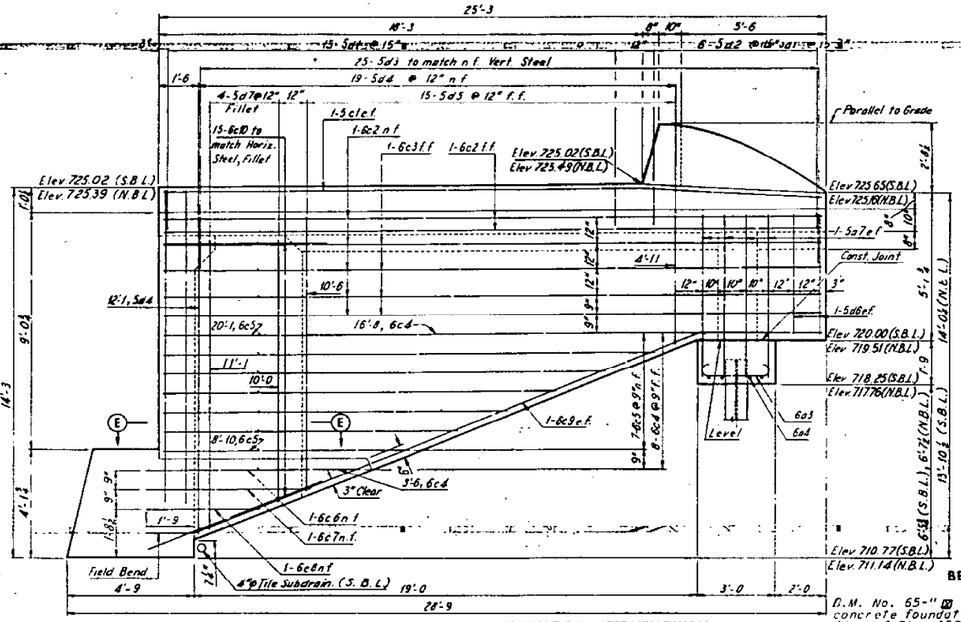
BILL OF REINFORCEMENT
SOUTH ABUTMENT - SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Barrel		44	15'-2	696
7a2	Barrel		28	22'-6	1,288
6a3	Wingwall Footing		14	3'-10	81
6a4	Wingwall Footing		6	6'-10	82
4a5	Pads		20	4'-10	65
4a6	Pads		20	4'-8	62
5a7	Wingwall Footing		16	6'-5	107
6a8	Wingwall Footing		6	7'-8	69
5a9	Wingwall Footing		4	4'-9	20
5a10	Wingwall Footing		4	5'-0	13
6b1	Backwall		40	11'-6	691
5b2	Backwall		27	11'-3	317
5b3	Backwall		6	12'-4	77

BILL OF REINFORCEMENT
SOUTH ABUTMENT - SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	Curb		4	24'-11	104
6c2	Wingwall		14	24'-11	524
6c3	Wingwall		8	21'-5	257
6c4	Wingwall		1Ser8	Varies	121
6c5	Wingwall		1Ser7	Varies	152
6c6	Wingwall		1	7'-8	12
6c7	Wingwall		1	5'-10	9
6c8	Wingwall		1	3'-11	6
6c9	Wingwall		4	27'-0	162
6c10	Fillet		30	8'-10	398
6c11	Post Anchor		6	5'-0	45
6c12	Wingwall		1Ser8	Varies	126
6c13	Wingwall		1Ser7	Varies	155
6c14	Wingwall		1	8.-3	12
6c15	Wingwall		1	6'-5	10
6c16	Wingwall		1	4'-7	7
5c1	Curb		30	5'-10	183
5d2	Curb		2Ser6	Varies	50
5c3	Wingwall		50	3'-11	204
5c4	Wingwall		1Ser19	Varies	168
5c5	Wingwall		1Ser15	Varies	121
5c6	Wingwall		8	4'-8	39
5c7	Fillet		1Ser4	Varies	44
5c8	Wingwall		1Ser19	Varies	173
5c9	Wingwall		1Ser15	Varies	123
5c10	Fillet		1Ser4	Varies	45
4e1	Backwall		40	22'-1	590
4e2	Backwall		20	2'-11	39
4f1	Counterfort		2	6'-10	9
4f2	Counterfort		2	7'-10	10
4f3	Counterfort		2	9'-0	12
5g1	Slab Seat		27	2'-4	66
5g2	Slab Seat		27	4'-1	115
5h1	Slab Seat		2	22'-3	46
5i1	Paving Block		5	2'-3	12
5s1	End Post		20	3'-5	71
5s2	End Post		12	2'-6	31
5s3	End Post		8	6'-4	53
4s4	End Post		4	5'-0	13
	Total				7,885

Note: "Bill of Reinforcement" same for south abutment Northbound Lane.

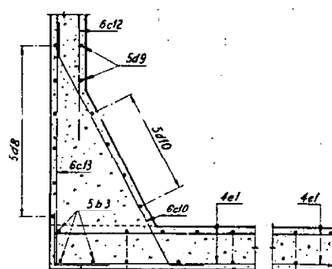


ELEVATION WEST WINGWALL
SOUTHBOUND LANE AND NORTHBOUND LANE

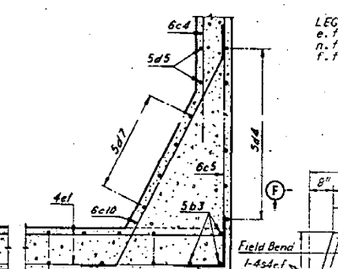
BENCH MARK

B.M. No. 65-"⊠" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66-"□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

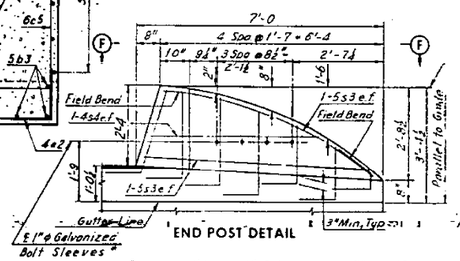


SECTION D-D

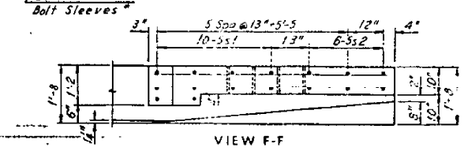


SECTION E-E

LEGEND:
e.f. = each face
n.f. = near face
f.f. = far face



END POST DETAIL



VIEW F-F

* Holes for 6"ϕ bolts are to be formed with 1"ϕ (nominal dia.) Std. steel pipe sleeves which are to be galvanized after cutting to proper length. The pipe sleeves shall be securely fixed in exact location as shown before concrete is poured. The cost of pipe sleeves is to be included in the price bid for concrete. The 6"ϕ bolts are to be furnished and placed by others.

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0 00 SKEW 3'-Min. Typ.

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SOUTH ABUTMENT DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 5 OF 18

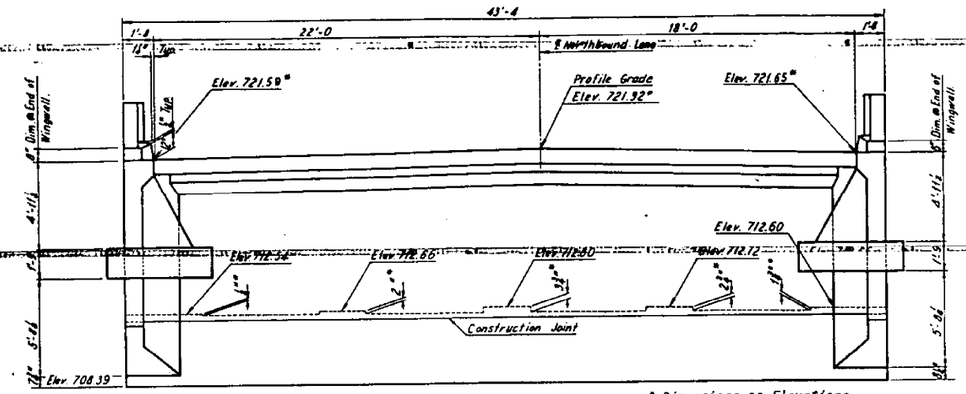
DESIGN NO. 768 JOHNSON COUNTY FILE 22960

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

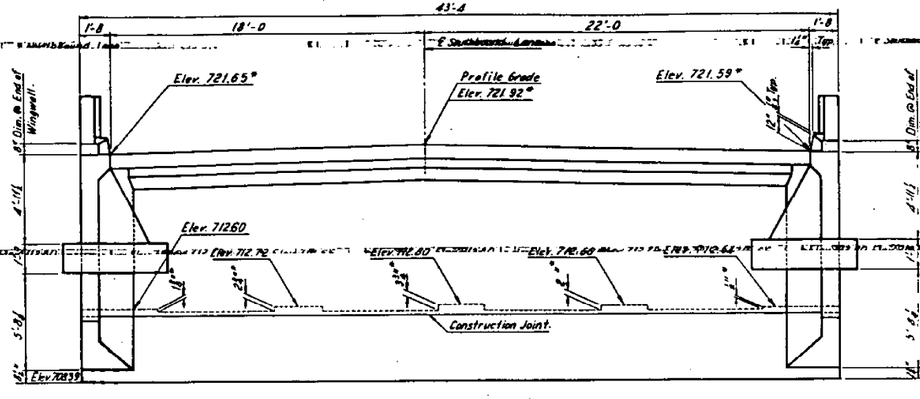
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	IOWA				

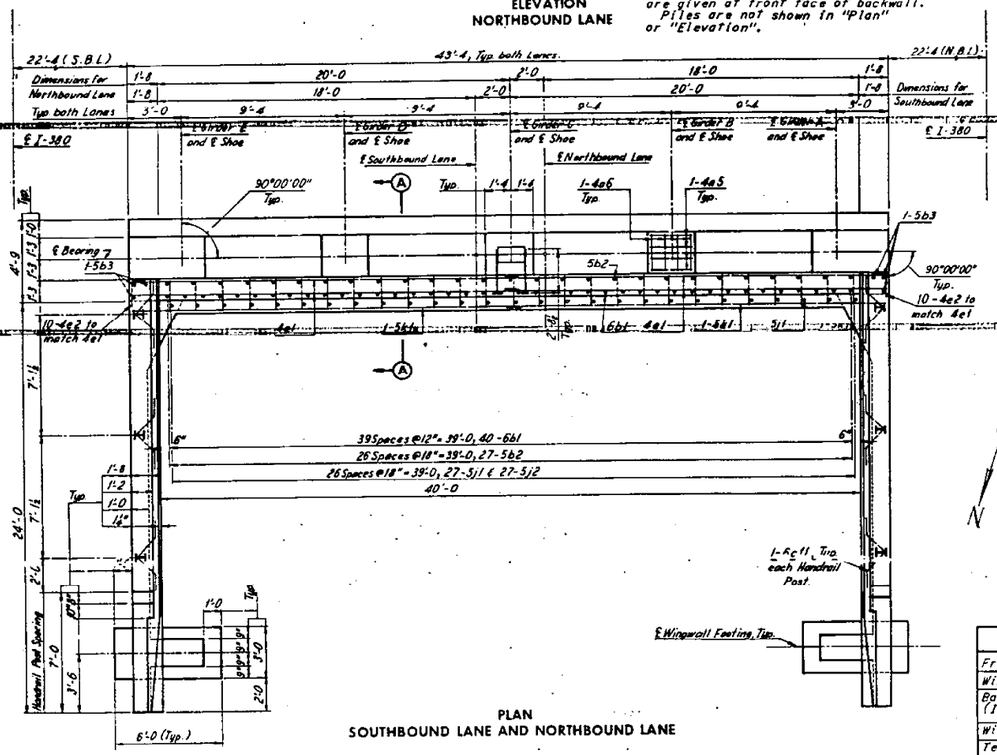


ELEVATION
NORTHBOUND LANE

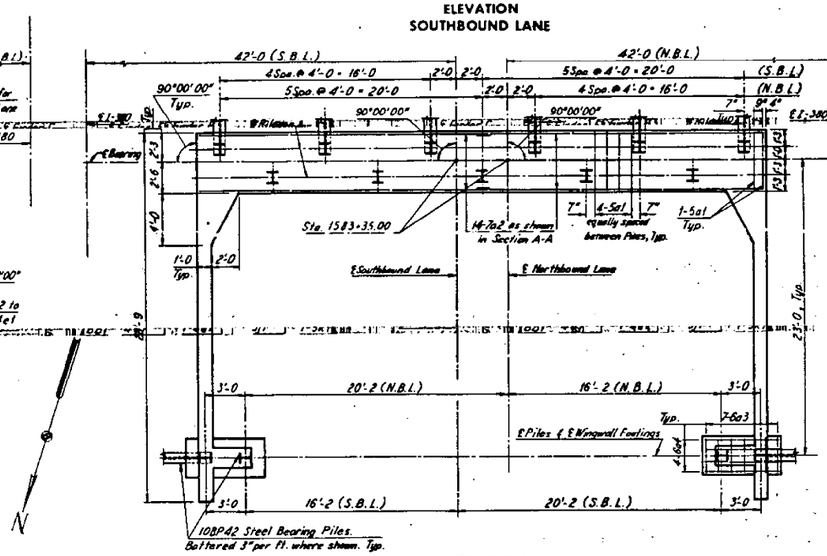


ELEVATION
SOUTHBOUND LANE

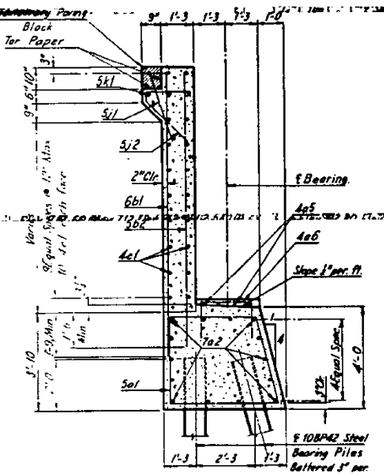
* Dimensions or Elevations are given at front face of backwall. Piles are not shown in "Plan" or "Elevation".



PLAN
SOUTHBOUND LANE AND NORTHBOUND LANE



FOOTING PLAN
SOUTHBOUND LANE AND NORTHBOUND LANE



SECTION A-A

Notes:
All exposed corners of 90° or sharper are to be filleted with a 1" dressed and beveled strip.
Reinforcing steel is to be securely wired in place before concrete is poured.
Minimum clear distance from face of concrete to nearest reinforcing bars is to be 2" unless otherwise noted or shown.
All backfill behind the abutments between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.
See Sheet 5 for "Pill of Reinforcement."
See Sheet 7 for "Paving Block Plan."
See Sheet 7 for "Backfill Detail."
The abutment backwall and the remainder of the superstructure can be placed after the bearings are in place.
See Sheet 5 for "End Post Detail."
Batter piles 3" per foot in direction shown.
All piles are to be driven to full penetration if practicable but to at least 55-ton bearing value for 10BP42. See General Notes Sheet 2.
Pile spacing shown is at bottom of footing.

CONCRETE PLACEMENT QUANTITIES

Front Ftg. and Steps	(Class C)	Cu. Yds	27.3
Wingwalls below Const. Jt.	(Class C)	Cu. Yds	1.7
Backwall and wingwalls above const. jt. (Includes 0.7 C.Y. for End Posts) (Cl. D)		Cu. Yds	41.7
Wingwall footings	(Class C)	Cu. Yds	2.3
Temporary paving block	(Class C)	Cu. Yds	0.9
	Total	Cu. Yds	73.9

ESTIMATED QUANTITIES

ITEM		UNIT	QUANTITY
Structural Concrete **		Cu. Yds.	73.9
Reinforcing Steel		Lbs.	7,847
10BP42 Steel Bearing Piling 11859', 4964'	Furnish	Lin. Ft.	905
	Drive	Lin. Ft.	905
Excavation, Class 20		Cu. Yds	18
Granular Backfill		Cu. Yds	146
4" ø Tile Subdrain		Lin. Ft.	76

Note: "Concrete Placement Quantities" and "Estimated Quantities" same for both Southbound Lane and Northbound Lane.

** Structural Concrete consists of 32.2 Cu. Yds. of Class C and 41.7 Cu. Yds. of Class D.

BENCH MARKS

B.M. No. 65-"⊠" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66-"□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

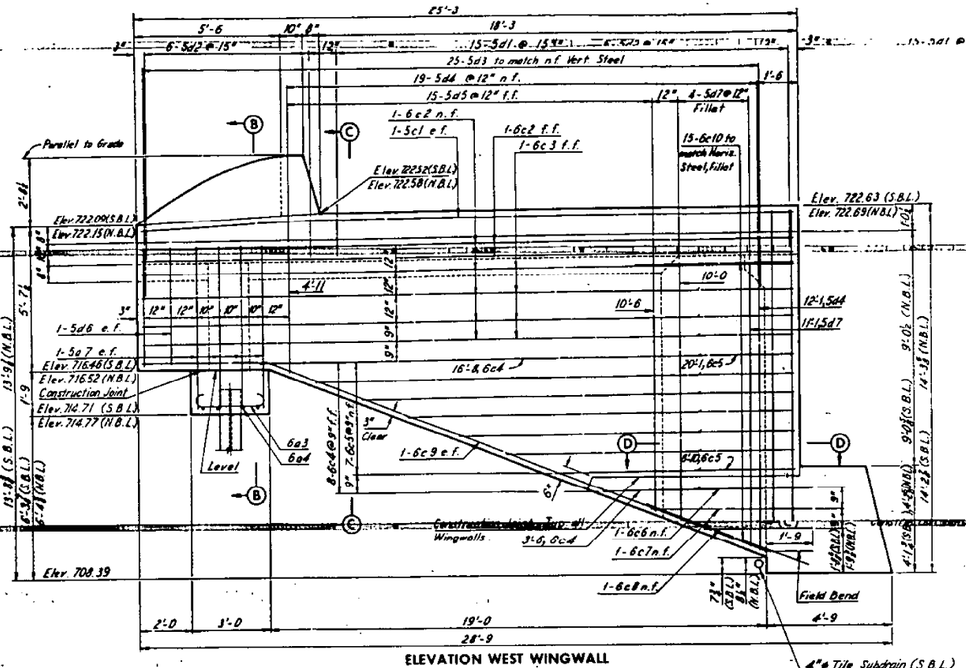
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BRIDGE NO. 11 I-380 OVER IOWA RIVER
DESIGN FOR 0°00' SKEW
DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE
130'-0, 165'-0, 130'-0 SPANS
NORTH ABUTMENTS
STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DECEMBER 1969 SHEET 6 OF 18

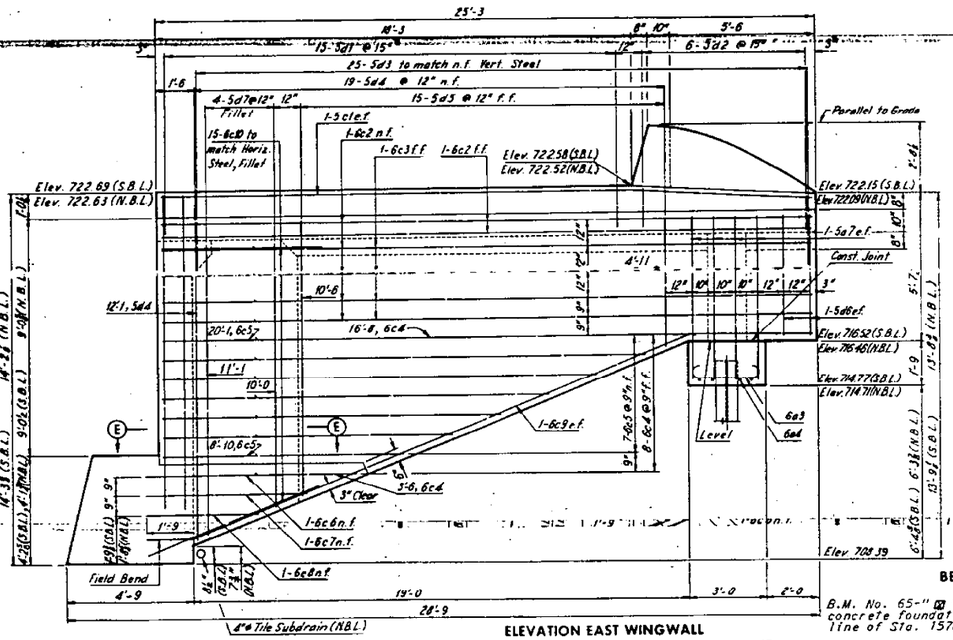
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81 of 118

23-12-21-00

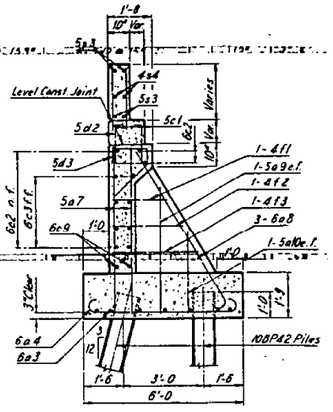
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	IOWA				



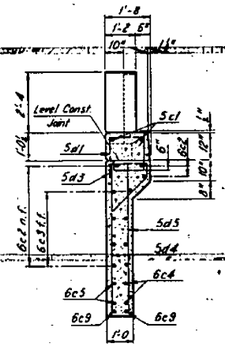
ELEVATION WEST WINGWALL
SOUTHBOUND LANE AND NORTHBOUND LANE



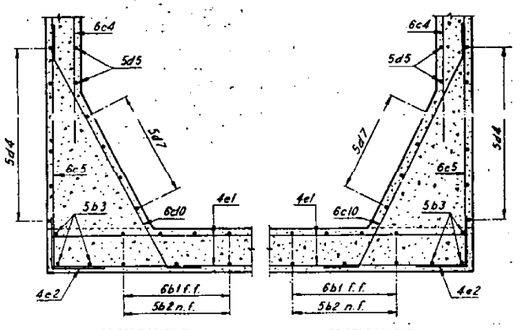
ELEVATION EAST WINGWALL
SOUTHBOUND LANE AND NORTHBOUND LANE



SECTION B-B



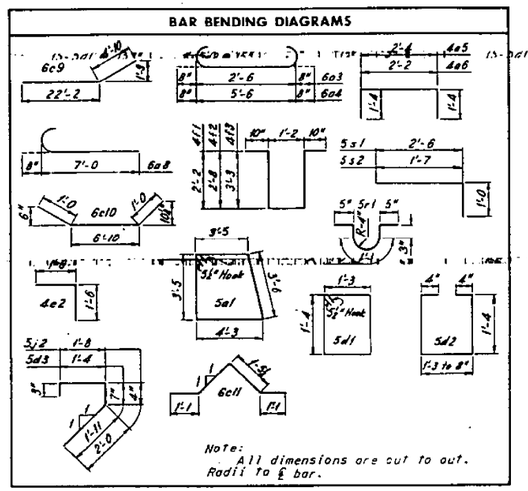
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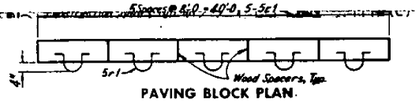
SECTION D-D

SECTION E-E

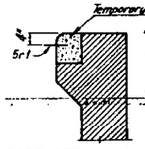
BAR BENDING DIAGRAMS



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



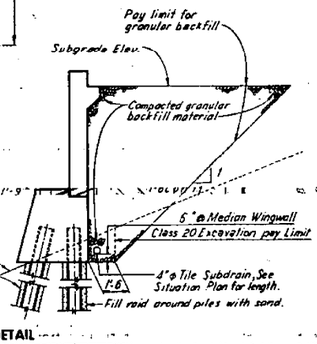
PAVING BLOCK PLAN



PART SECTION OF BACKWALL
PAVING BLOCK DETAIL

Notes:
The concrete paving block is to be poured after the backwall is in place. Bend down 5j1 bars and line the notch with tar paper to prevent bond. Block is to be removed and 5j1 bars straightened before paving is poured.
Wood spacers shown are to be included in price bid for concrete.

Note:
For End Post Details, see Sheet 5.



BACKFILL DETAIL

BENCH MARKS

B.M. No. 65-"⊠" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66-"□" in culvert headwall on destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

Approach fills to be completed to this line, before starting construction of abutment.

Predrill holes through fill for abutment piles, see "General Notes" and "Longitudinal Section" Sheets 1 and 2.

BILL OF REINFORCEMENT

NORTH ABUTMENT-SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Barrel		44	15'-2	696
7a2	Barrel		28	22'-6	1,288
6a3	Wingwall Footing		14	3'-10	81
6a4	Wingwall Footing		8	6'-10	82
4a5	Pads		20	4'-10	65
4a6	Pads		20	4'-8	62
5a7	Wingwall Footing		16	6'-4	106
6a8	Wingwall Footing		6	7'-8	69
5a9	Wingwall Footing		4	4'-9	20
5a10	Wingwall Footing		4	3'-0	13
6b1	Backwall		40	11'-4	681
5b2	Backwall		27	11'-1	312
5b3	Backwall		6	12'-0	75
5c1	Curb		4	24'-11	104
6c2	Wingwall		14	24'-11	524
6c3	Wingwall		8	21'-5	257
6c4	Wingwall		2Ser8	Varies	242
6c5	Wingwall		2Ser7	Varies	304
6c6	Wingwall		2	7'-8	23
6c7	Wingwall		2	5'-10	18
6c8	Wingwall		2	3'-11	12
6c9	Wingwall		4	27'-0	162
6c10	Fillet		30	8'-10	398
6c11	Post Anchor		6	5'-0	45
5d1	Curb		30	5'-10	183
5d2	Curb		2Ser6	Varies	50
5d3	Wingwall		50	3'-11	204
5d4	Wingwall		2Ser19	Varies	337
5d5	Wingwall		2Ser15	Varies	241
5d6	Wingwall		8	4'-7	38
5d7	Fillet		2Ser4	Varies	88
4e1	Backwall		40	22'-1	590
4e2	Backwall		20	2'-11	39
4f1	Counterfort		2	6'-10	9
4f2	Counterfort		2	7'-10	10
4f3	Counterfort		2	9'-0	12
5j1	Slab Seat		27	2'-4	66
5j2	Slab Seat		27	4'-1	115
5k1	Slab Seat		2	22'-3	46
5r1	Paving Block		5	2'-3	12
5s1	End Post		20	3'-5	71
5s2	End Post		12	3'-6	31
5s3	End Post		8	6'-4	53
4s4	End Post		4	5'-0	13
	Total				7,847

Note:
"Bill of Reinforcement" same for North Abutment Northbound Lane.

"HOWARD, NEEDLES, TAMMEN & BERGENDOFF"
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN	P.T.A	DATE	08-27-69	CHECKED	L.J.S	DATE	9-3-69

2312-21-00

BRIDGE NO. 11 I-380 OVER IOWA RIVER
DESIGN FOR 0°00" SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE
130'-0, 165'-0, 130'-0 SPANS

NORTH ABUTMENT DETAILS

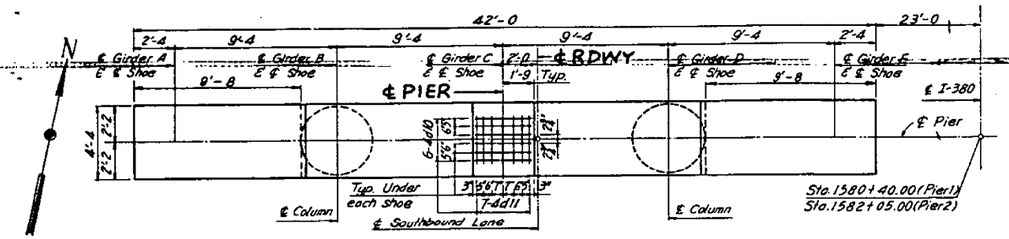
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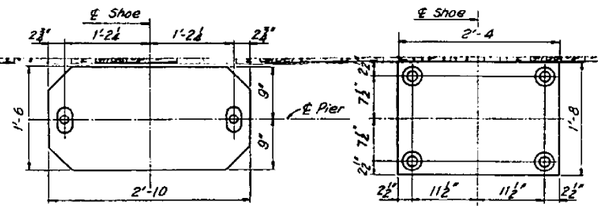
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 7 OF 18

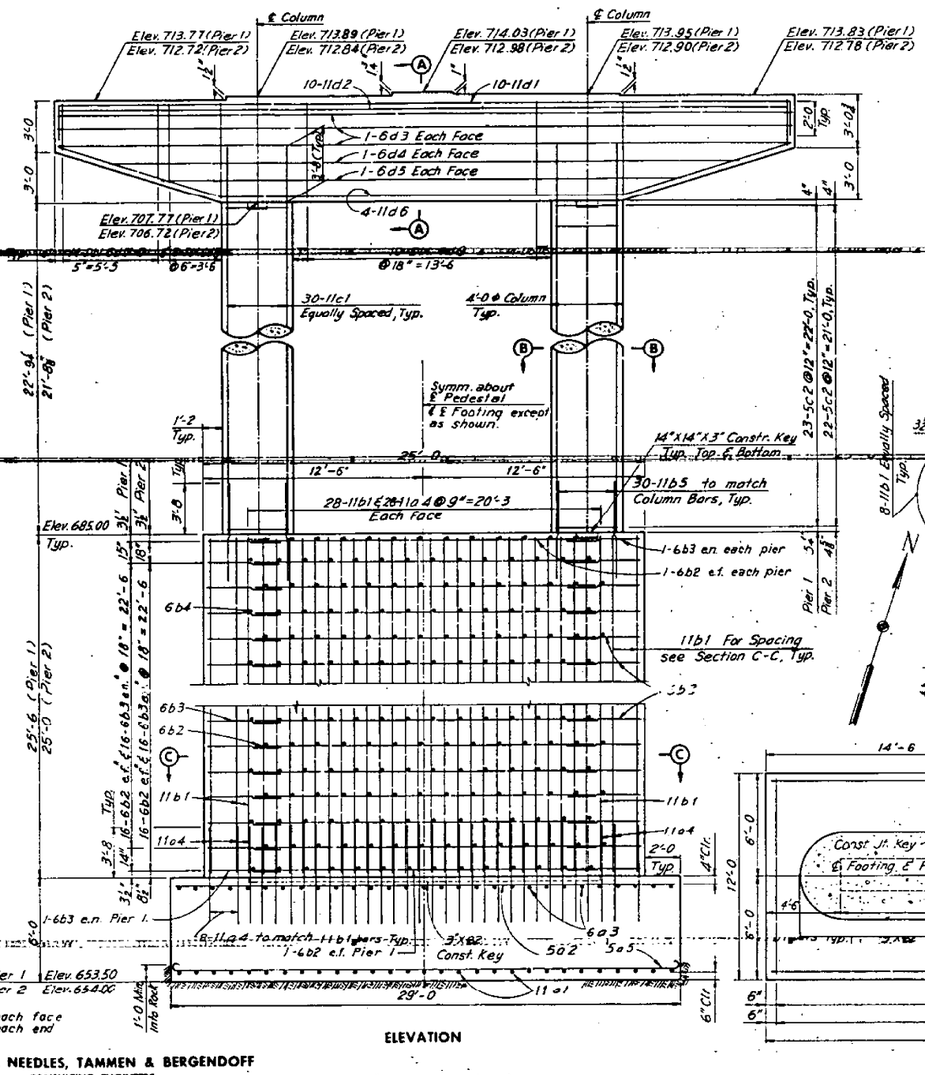
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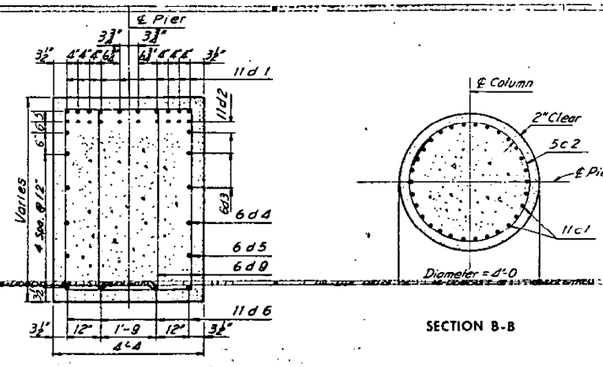
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	IOWA				

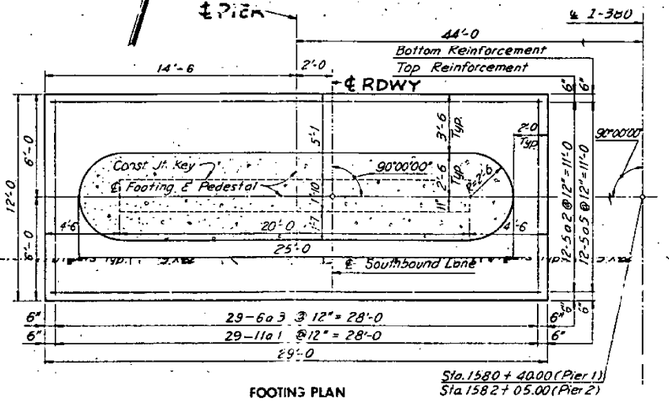




PLAN OF PIER CAP





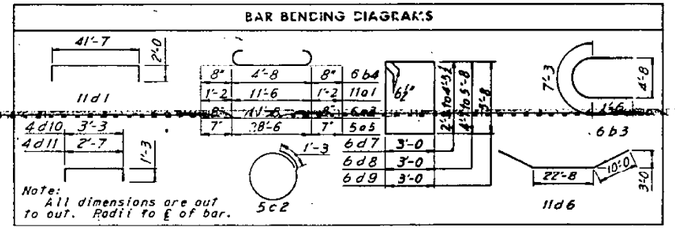


BILL OF REINFORCEMENT

SOUTHBOUND LANE

BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT
11a1	Footing, Horiz.		29	13'-10	2,131	29	13'-10	2,131
5a2	Footing, Horiz.		12	28'-6	357	12	28'-6	357
6a3	Footing, Horiz.		29	12'-10	559	29	12'-10	559
11a4	Footing, Vert.		72	7'-4	2,805	72	7'-4	2,805
5a5	Footing, Horiz.		12	29'-8	371	12	29'-8	371
11b1	Pedestal, Vert.		72	25'-4	9,691	72	24'-10	9,500
6b2	Pedestal, Horiz.		36	20'-3	1,095	34	20'-3	1,034
6b3	Pedestal, Horiz.		36	10'-3	554	34	10'-3	523
6b4	Pedestal, Horiz.		252	6'-0	2,271	238	6'-0	2,145
11b5	Pedestal, Vert.		60	7'-4	2,338	60	7'-4	2,338
11c1	Column, Vert.		60	26'-5	8,421	60	25'-4	8,076
5c2	Column, Horiz.	○	46	12'-7	604	44	12'-7	577
11d1	Cap Beam, Horiz.		10	45'-5	2,413	10	45'-5	2,413
11d2	Cap Beam, Horiz.		10	41'-4	2,196	10	41'-4	2,196
6d3	Cap Beam, Horiz.		6	41'-8	376	6	41'-8	376
6d4	Cap Beam, Horiz.		2	35'-7	107	2	35'-7	107
6d5	Cap Beam, Horiz.		2	29'-1	87	2	29'-1	87
11d6	Cap Beam, Horiz.		4	42'-8	907	4	42'-8	907
6d7	Cap Beam, Vert.	□	4 Ser 14	Varies	1,181	4 Ser 14	Varies	1,181
6d8	Cap Beam, Vert.	□	4 Ser 8	Varies	821	4 Ser 8	Varies	821
6d9	Cap Beam, Vert.	□	20	18'-2	546	20	18'-2	546
4d10	Pads		30	3'-3	112	30	3'-3	112
4d11	Pads		35	4'-11	115	35	4'-11	115
	Total (Lbs.)				40,058			39,277

BAR BENDING DIAGRAMS



BENCH MARKS

B.M. No. 65: "☒" in north corner of small concrete foundation, 200 ft. east of center-line of Sta. 1578+26. Elev. 684.556

B.M. No. 66: "□" in north corner of small concrete foundation of destroyed river span 150 ft. from the end on north side of river. 420 ft. east of Center-line Sta. 1583+00. Elev. 684.794

CONCRETE PLACEMENT QUANTITIES

LOCATION	UNIT	PIER 1 QUANTITY	PIER 2 QUANTITY
Footing - Class C	Cu. Yds.	77.0	77.0
Pedestal - Class C	Cu. Yds.	113.3	111.1
Columns - Class C	Cu. Yds.	21.2	20.2
Cap Beam - Class C	Cu. Yds.	36.5	36.5
Total	Cu. Yds.	248.0	244.8

ESTIMATED QUANTITIES

ITEM	UNIT	PIER 1 QUANTITY	PIER 2 QUANTITY
Structural Concrete	Cu. Yds.	248.0	244.8
Reinforcing Steel	Lbs.	40,058	39,277
Excavation, Class 21	Cu. Yds.	269	265
Excavation, Class 22	Cu. Yds.	13	13

Notes:
All exposed corners of 90° or sharper are to be filleted with a 2-inch dressed and beveled strip.
Use 2 inches clear on all reinforcing unless shown otherwise.
Columns may be formed with Iowa Highway Commission approved fiber pulp board tube such to produce a seamless finish.
All footings are to be poured.
Design bearing pressure = 20 Kips per. Sq. Ft.

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0° SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

PIERS 1 AND 2 - SOUTHBOUND LANE

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 8 OF 18

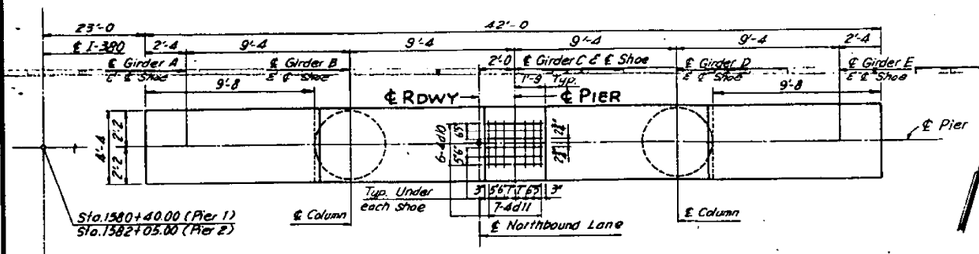
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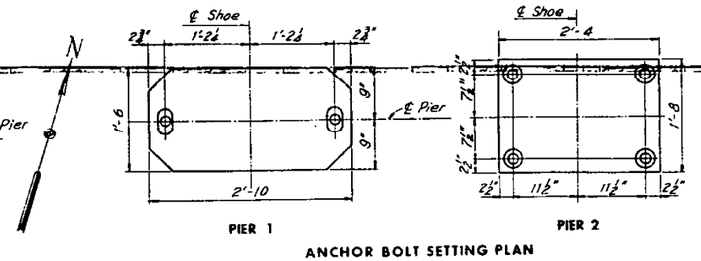
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE S.C.C. DATE 8-5-69 CHECKED JSH DATE 9-6-69

2312-81-100

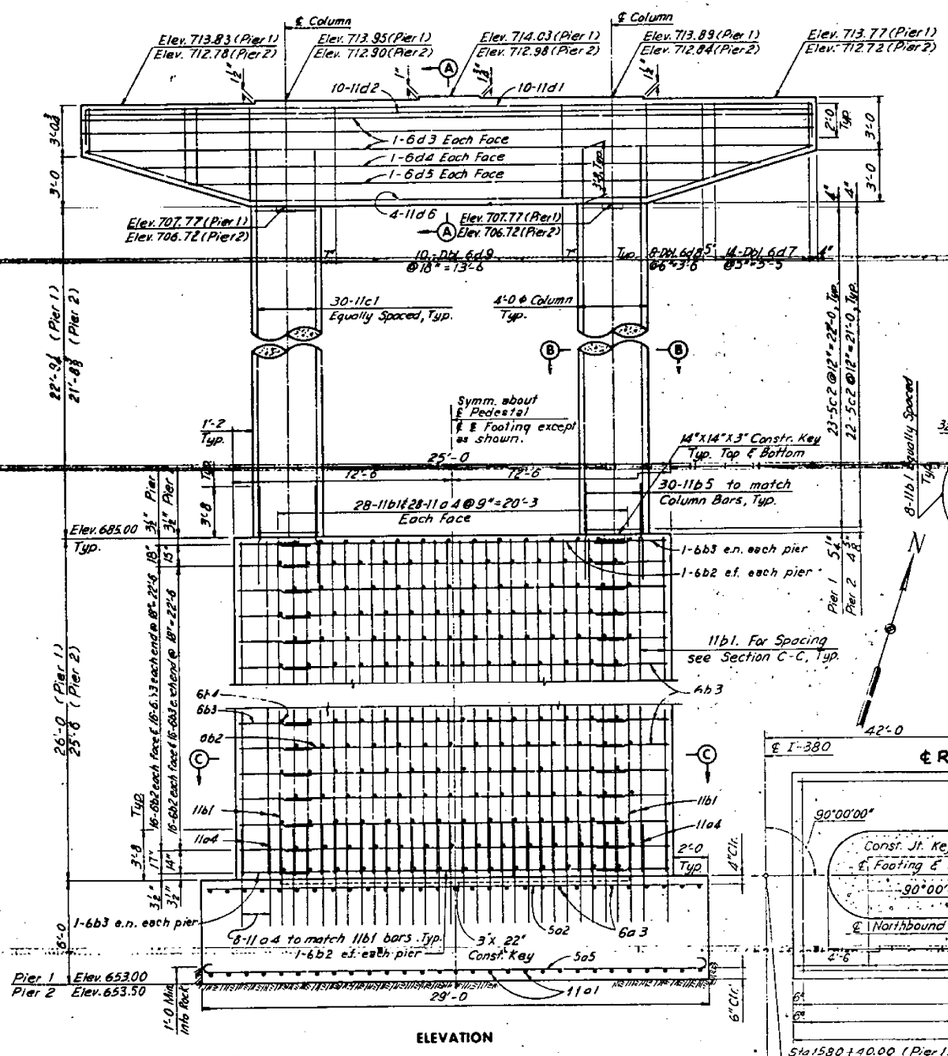
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	IOWA				



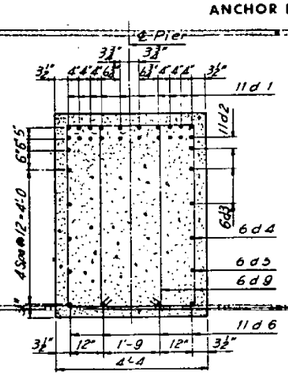
PLAN OF PIER CAP



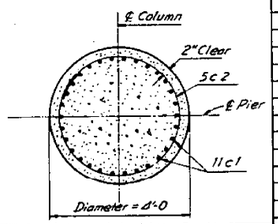
ANCHOR BOLT SETTING PLAN



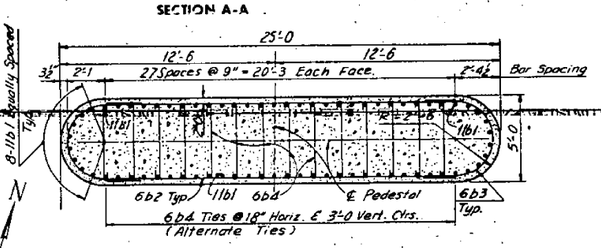
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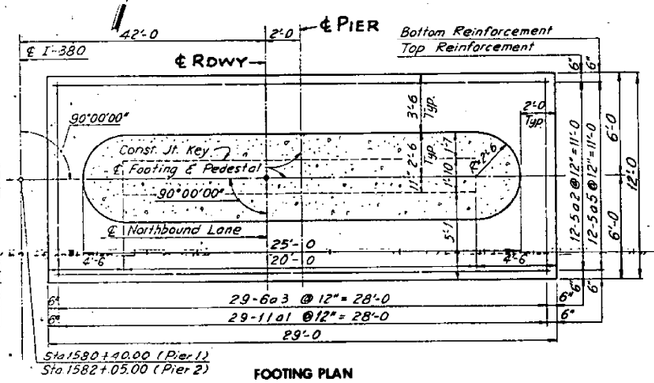
SECTION A-A



SECTION B-B



SECTION C-C



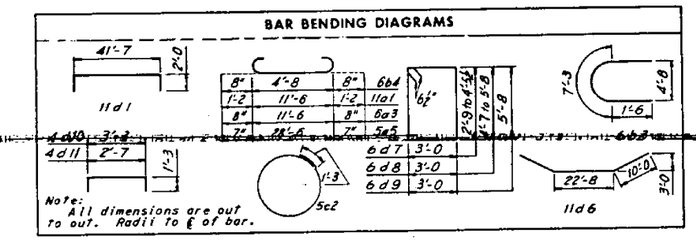
FOOTING PLAN

BILL OF REINFORCEMENT

NORTHBOUND LANE

BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT
11a1	Footing, Horiz.		29	13'-10	2,131	29	13'-10	2,131
5a2	Footing, Horiz.		12	28'-6	357	12	28'-6	357
6a3	Footing, Horiz.		29	12'-10	559	29	12'-10	559
11a4	Footing, Vert.		72	7'-4	2,805	72	7'-4	2,805
5a5	Footing, Horiz.		12	29'-8	371	12	29'-8	371
11b1	Pedestal, Vert.		72	25'-10	9,882	72	25'-4	9,691
6b2	Pedestal, Horiz.		36	20'-3	1,095	36	20'-3	1,095
6b3	Pedestal, Horiz.		36	10'-3	554	36	10'-3	554
6b4	Pedestal, Horiz.		252	6'-0	2,271	252	6'-0	2,271
11b5	Pedestal, Vert.		60	7'-4	2,338	60	7'-4	2,338
11c1	Column, Vert.		60	26'-5	8,421	60	25'-4	8,076
5c2	Column, Horiz.		46	12'-7	604	44	12'-7	577
11d1	Cap Beam, Horiz.		10	45'-5	2,413	10	45'-5	2,413
11d2	Cap Beam, Horiz.		10	41'-4	2,196	10	41'-4	2,196
6d3	Cap Beam, Horiz.		6	41'-8	376	6	41'-8	376
6d4	Cap Beam, Horiz.		2	35'-7	107	2	35'-7	107
6d5	Cap Beam, Horiz.		2	29'-1	87	2	29'-1	87
11d6	Cap Beam, Horiz.		4	42'-8	907	4	42'-8	907
6d7	Cap Beam, Vert.		4 Ser 14	Varies	1,181	4 Ser 14	Varies	1,181
6d8	Cap Beam, Vert.		4 Ser 8	Varies	821	4 Ser 8	Varies	821
6d9	Cap Beam, Vert.		20	18'-2	546	20	18'-2	546
4d10	Pads		30	5'-7	112	30	5'-7	112
4d11	Pads		46	4'-11	226	36	4'-11	176
	Total (Lbs.)				40,249			39,686

BAR BENDING DIAGRAMS



BENCH MARK

B.M. No. 65: "⊡" in north corner of small concrete foundation, 200 ft. east of centerline of Sta. 1578+26. Elev. 684.556

B.M. No. 66: "□" in culvert headwall on destroyed river span 150 ft. from the east end of north side of river. 420 ft. east of Centerline Sta. 1583+00. Elev. 684.794

CONCRETE PLACEMENT QUANTITIES

LOCATION	UNIT	PIER 1 QUANTITY	PIER 2 QUANTITY
Footing - Class C	Cu. Yds.	77.0	77.0
Pedestal - Class C	Cu. Yds.	115.5	113.3
Columns - Class C	Cu. Yds.	21.2	20.2
Cap Beam - Class C	Cu. Yds.	36.5	36.5
Total	Cu. Yds.	250.2	247.0

ESTIMATED QUANTITIES

ITEM	UNIT	PIER 1 QUANTITY	PIER 2 QUANTITY
Structural Concrete	Cu. Yds.	250.2	247.0
Reinforcing Steel	Lbs.	40,249	39,686
Excavation Class 21	Cu. Yds.	280	260
Excavation, Class 22	Cu. Yds.	13	13

Notes:
All exposed corners of 90° or sharper are to be filleted with a 3-inch dressed and beveled strip.
Use 2 inches clear on all reinforcing unless shown otherwise.
Columns may be formed with Iowa Highway Commission approved fiber pulp board tube such to produce a seamless finish.
Design bearing pressure = 20 Kips per. Sq. Ft.

BRIDGE NO. 11 **I-380 OVER IOWA RIVER**

DESIGN FOR 0°00' SKEW

DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

PIERS 1 AND 2 - NORTHBOUND LANE

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 9 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

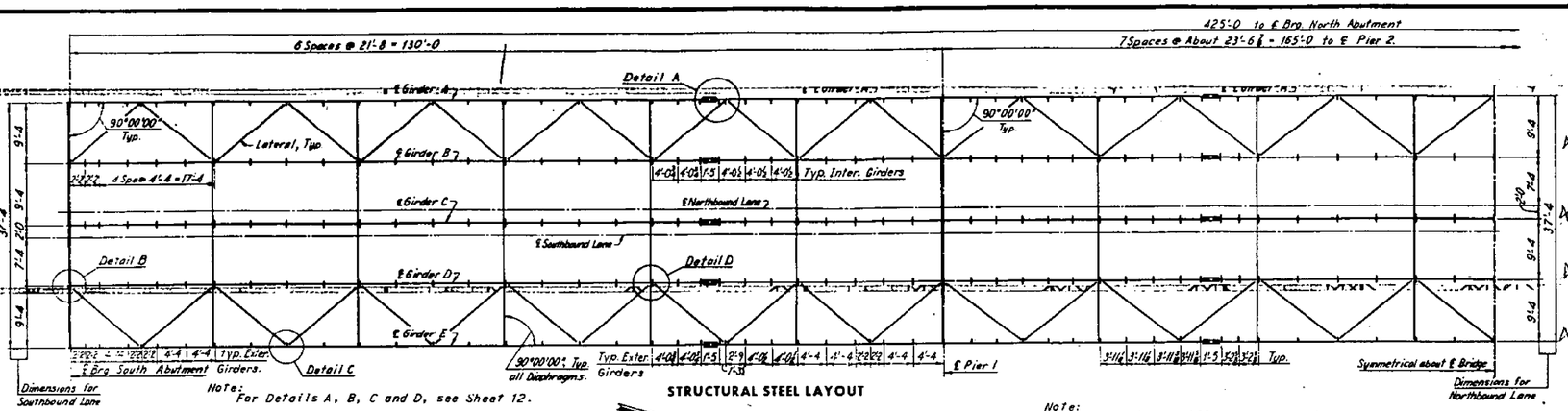
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CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE S.C.C. DATE 8-8-69 CHECKED JSH DATE 9-10-69

2312-21-00

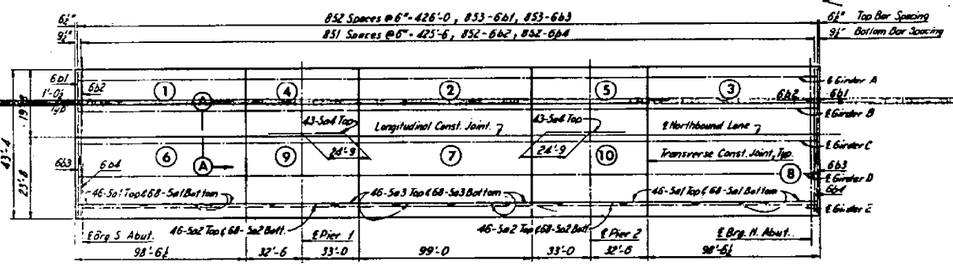
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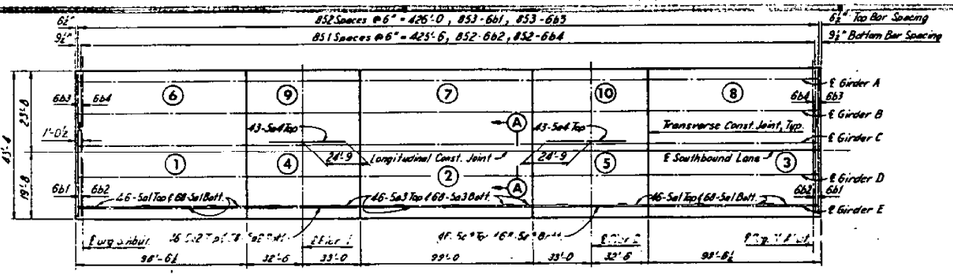
Note:
For Details A, B, C and D, see Sheet 12.

STRUCTURAL STEEL LAYOUT

Note:
Intermediate stiffeners are equally spaced between diaphragms if not otherwise shown.



SLAB REINFORCING PLAN - NORTHBOUND LANE



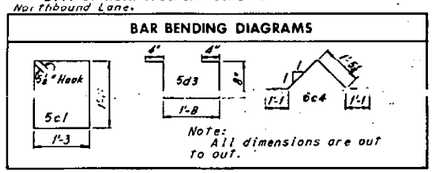
SLAB REINFORCING PLAN - SOUTHBOUND LANE

BILL OF REINFORCEMENT
SOUTHBOUND LANE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Slab, Long.	——	684	38'-2	27,229
5a2	Slab, Long.	——	228	40'-0	9,512
5a3	Slab, Long.	——	456	32'-10	15,616
5a4	Slab, Long.	——	86	44'-6	3,992
6b1	Slab, Trans.	——	853	26'-11	34,486
6b2	Slab, Trans.	——	852	31'-7	40,417
6b3	Slab, Trans.	——	853	17'-7	22,528
6b4	Slab, Trans.	——	852	12'-11	16,530
5c1	Curb, Trans. Hoop		812	6'-2	5,223
5c2	Curb, Long.	——	44	40'-0	1,836
5c3	Curb, Long.	——	8	44'-6	371
6c4	Post Anchors		102	3'-0	766
6d1	End Diaph, Horiz.	——	24	8'-10	318
6d2	End Diaph, Horiz.	——	4	19'-5	117
5d3	End Diaph, Vert.		64	3'-6	234
	Total				179,175

Note:
Bill of Reinforcement same for Northbound Lane.

BAR BENDING DIAGRAMS



Note:
All dimensions are out to out.

Notes:
Roadway slab shall be placed in sections and in sequence indicated by circled numbers at intervals not exceeding 24 hours. Curbs may be placed continuously.

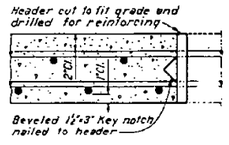
Alternate procedures for placing concrete may be submitted for approval together with a statement of the proposed method and evidence that the contractor possesses the necessary equipment and facilities to accomplish the required results.

Lap No. 5 bars a minimum of 1'-3 and No. 6 bars a minimum of 1'-6.

For Details of Longitudinal Bar Spacing, see Sheet 14.

CONCRETE PLACEMENT QUANTITIES
SOUTHBOUND LANE

POUR	CU. YDS.
1	52.0
2	51.6
3	52.0
4	34.0
5	34.0
6	62.7
7	62.5
8	62.7
9	40.6
10	40.6
West Curb	26.4
East Curb	26.4
Total (Cl. D)	545.5



TYPICAL SLAB CONSTRUCTION JOINT
SECTION A-A

Note:
Concrete Placement Quantities same for Northbound Lane.

SUPERSTRUCTURE ESTIMATED QUANTITIES

ITEM	UNIT	SOUTHBOUND LANE	NORTHBOUND LANE
Structural Concrete (Class D)	Cu. Yds.	545.5	545.5
Reinforcing Steel	Lbs.	179,175	179,175
Structural Steel*	Lbs.	600,976	600,976

* Structural Steel consists of 145,687 Lbs. of A-36 and iron castings, 243,482 Lbs. of A-572 and 211,807 Lbs. of A-588.

SPECIFICATIONS:

Design stresses for the following materials are in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1965 with 1969 Interim Specifications.

Structural steel in accordance with 1.7.1 "Structural Carbon Steel" - Unit Stresses. ASTM A-572 Grade 50, and A-588 fs = 27,000 psi
ASTM A-36 fs = 20,000 psi

Reinforcing steel in accordance with Section 1.5.1, "Reinforcement" fs = 20,000 psi.

Concrete in accordance with Section 1.5.1, F'c = 3500 psi.

Construction: Standard Specifications of the Iowa State Highway Commission Series of 1964, plus current Special Provisions and current Supplemental Specifications.

Welding: 1969 American Welding Society Specifications, except as modified in Standard Specifications and shown on Sheet 11.

Welds shall have no cracks, no incomplete fusion or penetration and regardless of the method of inspection, shall have no other defects exceeding those in A.W.S. Specification Par. 409b.

SUPERSTRUCTURE NOTES:

These bridges are designed for HS20-44 and alternate loading designated in P.P.M. 20-4, Section 4-c with allowance of 20 lbs. per sq. ft. of roadway for future wearing surface.

The floor slab as shown includes ½-inch wearing surface.

The field connections are to be bolted with "High Tensile Strength Bolts". The estimated structural steel weight for these connections is based on "High Tensile Strength Bolts". Unless otherwise noted, all open holes are to be ¾ inch ø, and all bolts are to be ¾ inch ø.

Girder splices are to be sub-punched or sub-drilled and reamed. Before reaming, all girders are to be assembled for inspection. After inspection, holes are to be reamed and all parts match marked.

Flame cutting shall be in accordance with Art. 2408.14 of the Standard Specifications except that edges of flame cut plates shall have their corners rounded to a ¼" radius by grinding or equivalent flat surface at a suitable angle after flame cutting.

Field splice points are to be supported by falsework or other approved means as directed by the Engineer, and adjusted as closely as possible to the dimensions shown on the "Girders As Fabricated And Erected Diagram" before bolting is complete.

Shop coat of paint is to be omitted on top of top flanges of girders and other steel surfaces in contact with concrete. Parts inaccessible after erection are to be given three coats of paint in shop.

Stud shear connectors are not required at ℄ piers or ℄ abutments or on field splice plates.

All dimensions are horizontal.

Bearing surfaces of rockers are to be faced in accordance with Art. 2.10.25 AASHO (Series 1969). Masonry plates shall be set in paint and canvas.

Bearing surfaces of unfinished plates shall be flat and true.

Forms for slab and curbs are to be supported by the girders.

Bottom flanges are to be true perpendicular to webs at the reaction points.

Fill thicknesses shown on plans are based on the nominal girder dimensions. These thicknesses are to be verified or adjusted during fabrication to secure a close fit. Each fill plate shall fit to the nearest ⅛" in thickness and single plates are required at any fill location. Girders are to be truly square at splice points with flanges perpendicular to webs.

Faying surfaces of diaphragm connections are to be given the shop coat of paint.

Structural steel shall conform to the following A.S.T.M. Designations. A-572 Grade 50 for the girder webs, A-588 for the girder flanges; the remainder of the structural steel shall be A-36. Splice material shall be the same as parts spliced.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE P7A DATE 08-22-69 CHECKED JSH DATE 9-2-69

2312-81-00

BRIDGE NO. 11 **I-380 OVER IOWA RIVER**

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SLAB PLAN AND FRAMING PLAN

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

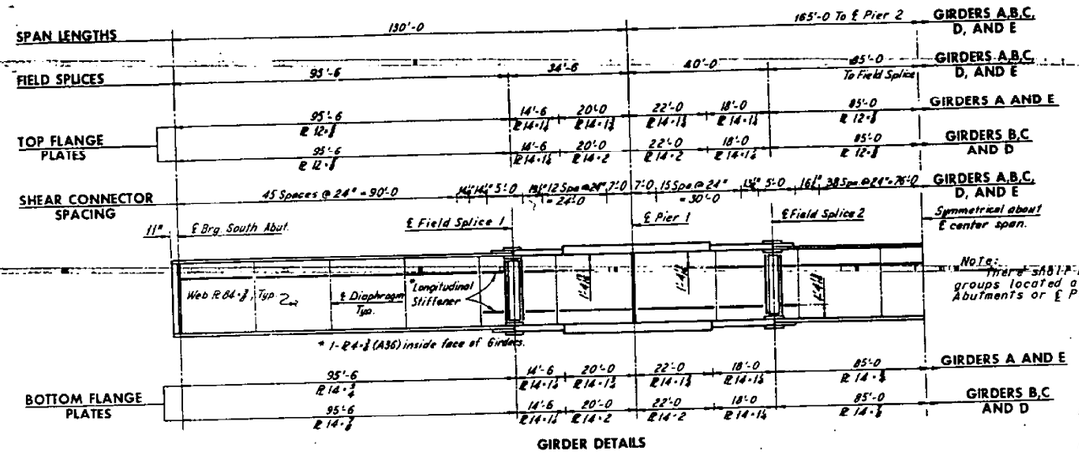
JOHNSON COUNTY

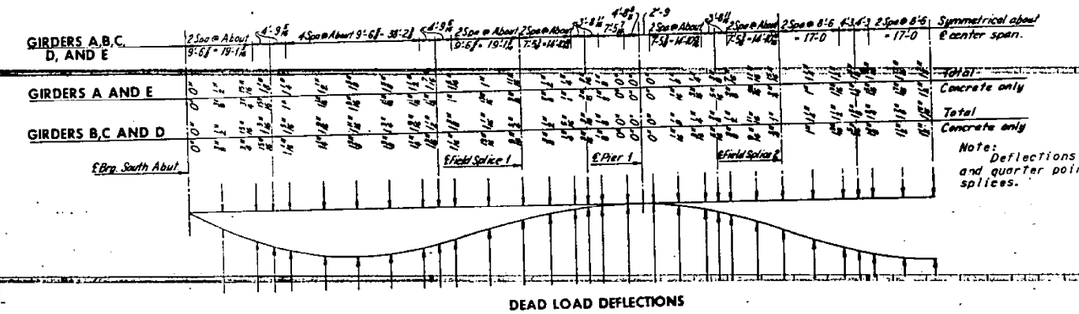
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 10 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960
85 of 110

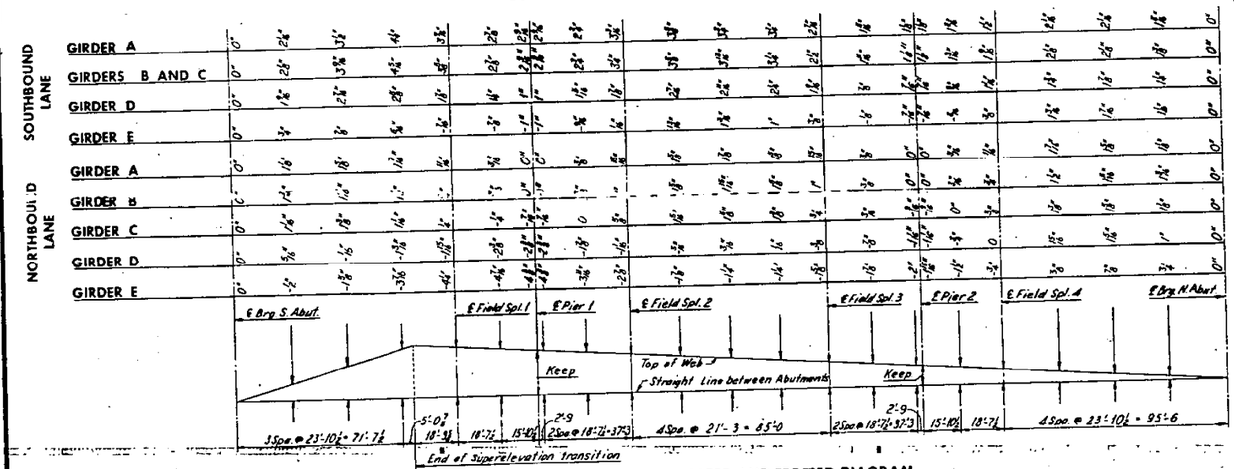
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	IOWA				
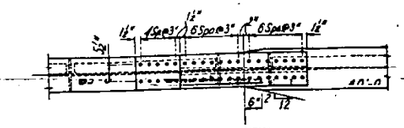




Note: Deflections are given at tenth and quarter points between field splices.

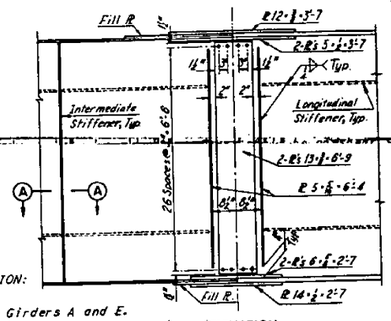
DEAD LOAD DEFLECTIONS



GIRDERS AS FABRICATED AND ERECTED DIAGRAM

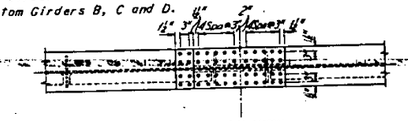
Notes:
Negative values designate that top of web is below straight line between abutments.
Offsets are given at 4 points between field splices and at piers.



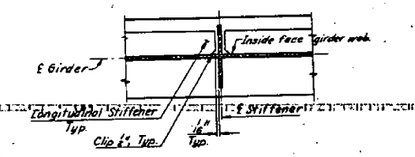


FILL PLATE TABULATION:

Pl. 12x⅜x3'-0½ Top Girders A and E.
Pl. 14x½x1'-9½ Bottom Girder A and E.
Pl. 12x⅜x3'-0½ Top Girders B, C and D.
Pl. 14x⅜x1'-9½ Bottom Girders B, C and D.



FIELD SPLICE DETAILS



WELDING REQUIREMENTS:

Welding shall be in accordance with AWS D 2.0-69 except modified herein:

(1) Filler metal requirements for fillet weld and complete penetration butt welds:

(a) Shielded Metal Arc E 7016, 18 or -28 — ASTM A 233

(b) Submerged Arc F71, F72, F73 or F74 - XXXXX — ASTM A 558

(c) The filler metal shall produce a weld metal having an impact strength of at least 20 ft-lb. (Charpy v-notch) at 0°F.

(2) Flux used for submerged arc welding shall be non-hygroscopic, dry and free of contamination from dirt, mill scale, or other foreign material. All flux shall be purchased in moisture-proof packages capable of being stored under normal conditions for at least six months without such storage affecting its welding characteristics or weld properties. Flux from packages damaged in transit or handling shall be discarded or shall be dried before use at a minimum temperature of 250° F for one hour. Flux shall be placed in the dispensing system immediately upon opening a package. If flux is used from an opened package or an open hopper that has been inoperative for four hours or more, the top one inch shall be discarded. Flux that has been wet shall not be used. Flux fused in welding shall not be reused.

(3) Minimum preheat and interpass temperatures shall be as follows, based on the thickness in inches of the thickest part at point of welding.

¾" and under	50°F
Over ¾" but not over 1½"	70°F
Over 1½" but not over 2½"	150°F
Over 2½"	225°F

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE PTA DATE 08-27-69 CHECKED JJH DATE 8-28-69

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 11 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

3121-21-00

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				

TOP OF SLAB ELEVATIONS-NORTHBOUND LANE

GIRDER	S.A.	¼	½	¾	FS-1	¼	½	¾	FS-2	¼	½	¾	FS-3	¼	½	¾	FS-4	¼	½	¾	N.A.
A	724.36	724.21	724.06	723.91	723.76	723.64	723.52	723.41	723.29	723.15	723.02	722.88	722.75	722.63	722.52	722.40	722.28	722.13	721.98	721.83	721.67
B	724.50	724.35	724.20	724.05	723.90	723.78	723.66	723.55	723.43	723.29	723.16	723.02	722.89	722.77	722.66	722.54	722.42	722.27	722.12	721.97	721.81
C	724.64	724.47	724.30	724.13	723.98	723.86	723.74	723.63	723.51	723.37	723.24	723.10	722.97	722.85	722.74	722.62	722.50	722.35	722.20	722.05	721.89
D	724.73	724.49	724.25	724.01	723.84	723.72	723.60	723.49	723.37	723.23	723.10	722.96	722.83	722.71	722.60	722.48	722.36	722.21	722.06	721.91	721.75
E	724.83	724.52	724.20	723.88	723.70	723.58	723.46	723.35	723.23	723.09	722.96	722.82	722.69	722.57	722.46	722.34	722.22	722.07	721.92	721.77	721.61

TOP OF SLAB ELEVATIONS-SOUTHBOUND LANE

GIRDER	S.A.	¼	½	¾	FS-1	¼	½	¾	FS-2	¼	½	¾	FS-3	¼	½	¾	FS-4	¼	½	¾	N.A.
A	724.00	723.94	723.89	723.83	723.70	723.58	723.46	723.35	723.23	723.09	722.96	722.82	722.69	722.57	722.46	722.34	722.22	722.07	721.92	721.77	721.61
B	724.14	724.08	724.03	723.97	723.84	723.72	723.60	723.49	723.37	723.23	723.10	722.96	722.83	722.71	722.60	722.48	722.36	722.21	722.06	721.91	721.75
C	724.28	724.22	724.17	724.11	723.98	723.86	723.74	723.63	723.51	723.37	723.24	723.10	722.97	722.85	722.74	722.62	722.50	722.35	722.20	722.05	721.89
D	724.38	724.27	724.16	724.04	723.90	723.78	723.66	723.55	723.43	723.29	723.16	723.02	722.89	722.77	722.66	722.54	722.42	722.27	722.12	721.97	721.81
E	724.48	724.29	724.11	723.92	723.76	723.64	723.52	723.41	723.29	723.15	723.02	722.88	722.75	722.63	722.52	722.40	722.28	722.13	721.98	721.83	721.67

TOP OF SLAB ELEVATIONS-SOUTHBOUND LANE

GIRDER	SOUTH ABUTMENT		PIER 1		PIER 2		NORTH ABUTMENT	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
A	1579+10.00	724.00	1580+40.00	723.48	1582+05.00	722.44	1583+35.00	721.61
B	1579+10.00	724.14	1580+40.00	723.62	1582+05.00	722.58	1583+35.00	721.75
C	1579+10.00	724.28	1580+40.00	723.76	1582+05.00	722.72	1583+35.00	721.89
D	1579+10.00	724.38	1580+40.00	723.68	1582+05.00	722.64	1583+35.00	721.81
E	1579+10.00	724.48	1580+40.00	723.54	1582+05.00	722.50	1583+35.00	721.67

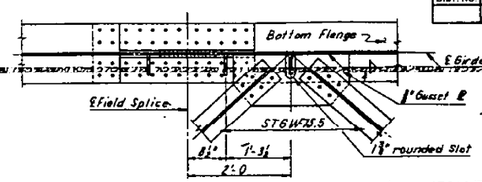
TOP OF SLAB ELEVATIONS-NORTHBOUND LANE

GIRDER	SOUTH ABUTMENT		PIER 1		PIER 2		NORTH ABUTMENT	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
A	1579+10.00	724.36	1580+40.00	723.54	1582+05.00	722.50	1583+35.00	721.67
B	1579+10.00	724.50	1580+40.00	723.68	1582+05.00	722.64	1583+35.00	721.81
C	1579+10.00	724.64	1580+40.00	723.76	1582+05.00	722.72	1583+35.00	721.89
D	1579+10.00	724.73	1580+40.00	723.62	1582+05.00	722.58	1583+35.00	721.75
E	1579+10.00	724.83	1580+40.00	723.48	1582+05.00	722.44	1583+35.00	721.61

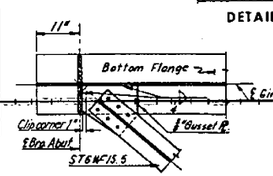
TABLE OF MOMENTS AND REACTIONS IN FOOT KIPS AND KIPS

GIRDERS	(TRUCK)	MAXIMUM POSITIVE MOMENT SPAN 1 ℄ SPAN 3	MAXIMUM POSITIVE MOMENT SPAN 2	MAXIMUM NEGATIVE MOMENT PIER 1	MAXIMUM NEGATIVE MOMENT PIER 2	REACTIONS S. ABUT. & N. ABUT.	REACTIONS PIER 1 & PIER 2
Girders A and E	Dead Load A	1,150	1,008	2,909	2,909	51.8	191.5
	Dead Load B	279	291	539	539	11.7	40.1
	Live Load	1,251	1,283	1,532	1,532	48.6	101.9
	Impact	245	221	282	282	9.5	18.7
	Total	2,925	2,803	5,262	5,262	121.6	352.2
Girders B, C and D	Dead Load A	1,276	1,116	3,223	3,223	57.4	212.2
	Dead Load B	304	318	588	588	12.8	43.7
	Live Load	1,436	1,473	1,760	1,760	55.8	117.1
	Impact	282	254	324	324	10.9	21.5
	Total	3,298	3,161	5,895	5,895	136.9	394.5

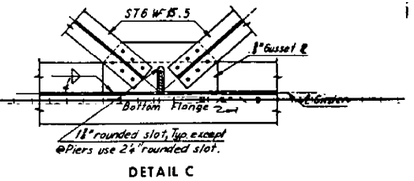
Note:
Positive moments due to Dead Load B, Live Load and Impact are resisted by composite action. Dead Load A includes weight of slab and girders. Dead Load B includes weight of curbs, rails and future wearing surface. Moments and reactions shown are for normal Live Load loadings. HS 20-44 Truck Loading governs for positive moments and abutment reactions. Equivalent Lane Loading governs for negative moments and reactions at piers.



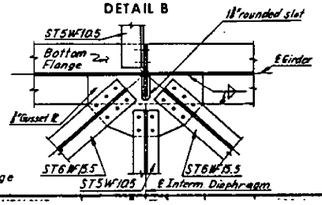
DETAIL A



DETAIL B

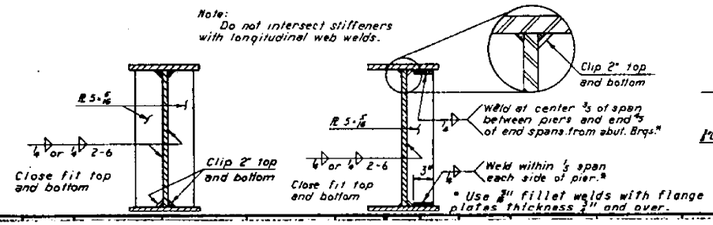


DETAIL C



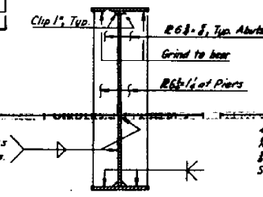
DETAIL D

Note:
For location of Details A, B, C and D, see Sheet 10.



INTERIOR GIRDERS EXTERIOR GIRDERS

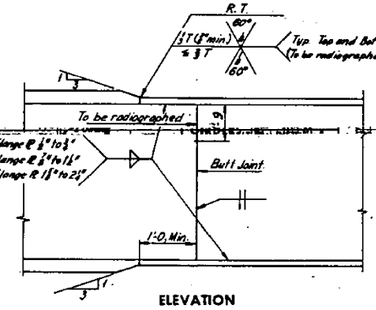
TYPICAL INTERMEDIATE STIFFENER



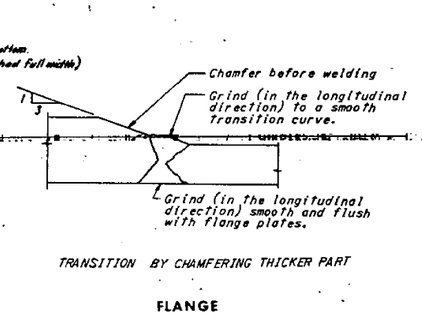
PLAN ELEVATION

TYPICAL BEARINGS STIFFENER DETAIL

Note:
F.S. denotes Field Splice
N.A. denotes North Abutment
S.A. denotes South Abutment



ELEVATION



TRANSITION BY CHAMFERING THICKER PART

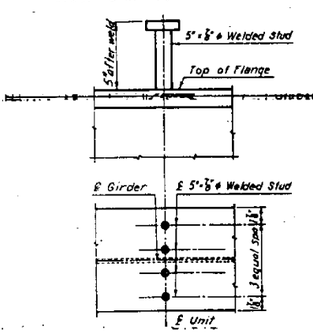
FLANGE

TRANSITION OF THICKNESSES

TYPICAL WELDED SHOP SPLICE DETAILS

Note:
Magnetic particle inspection of welds in accordance with Art. 2408.15 of the Standard Specifications will be required for the web to flange welds and bearing stiffener welds.
The Contractor shall submit for approval the welding procedure and detail of shop welded girder splice.
Shop splices and web to flange welds shall be welded by the submerged arc process.

Note:
Weight of shear connectors are included in structural steel quantities.



Wt. of 1 Shear Connector = 0.98 Lbs.

SHEAR CONNECTOR DETAIL

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

DRAWN PTA DATE 08-26-69 CHECKED JSH DATE 8-29-69

2312-21-00

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

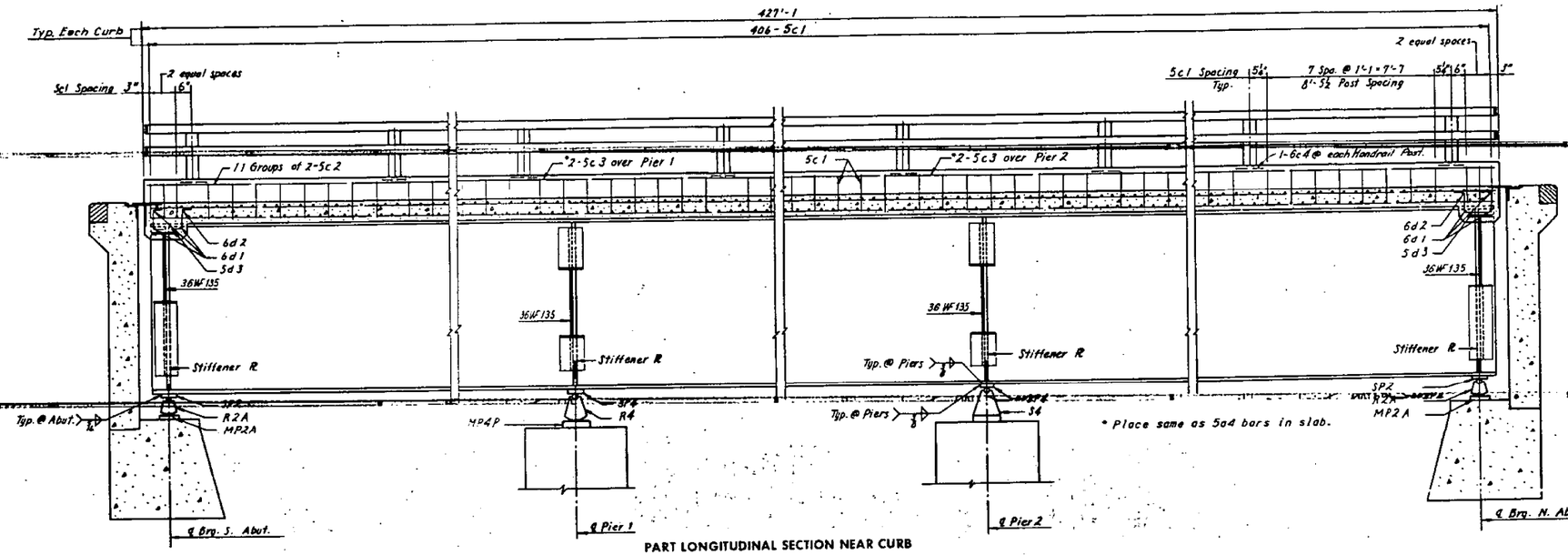
IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 12 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

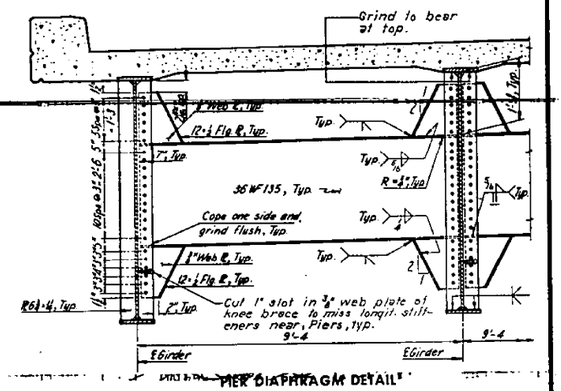
87 of 1

FEDERAL DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



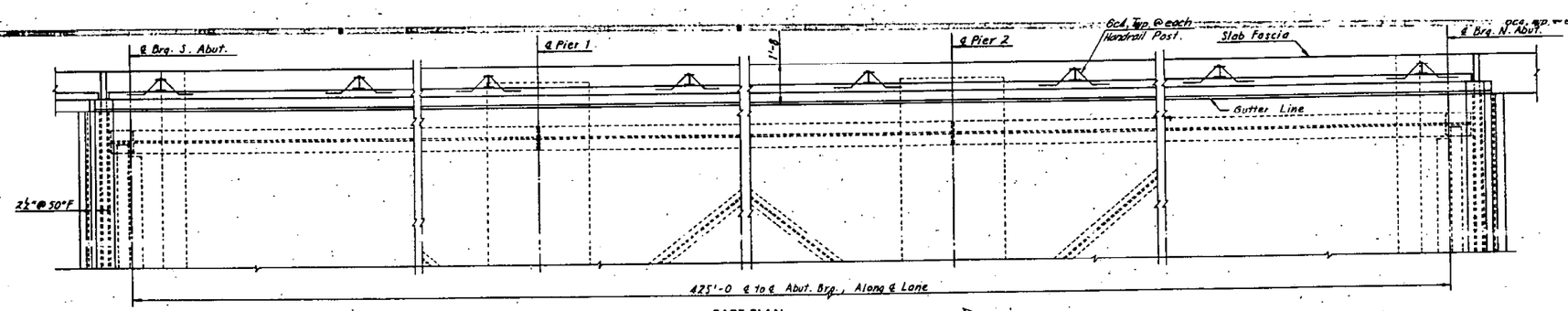
PART LONGITUDINAL SECTION NEAR CURB

* Place same as 5a4 bars in slab.



PIER DIAPHRAGM DETAIL

Note:
Laterals not shown in "Pier Diaphragm Detail".

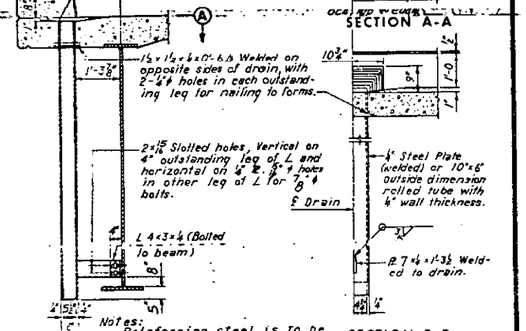


PART PLAN

TYPICAL ROCKER SETTING						
Temperature at time of setting	S. ABUT.		PIER 1	PIER 2	N. ABUT.	
	D					D
90°F	1⅜"	2"	1"	—	⅜"	2⅜"
50°F	2⅜"	0	0	—	0	2⅜"
10°F	3⅜"	-2"	-1"	—	-⅜"	2⅜"

Note:
Rockers are to be set vertically at 50°F. For temperatures above 50°F, set masonry plate toward fixed shoe (+). For temperatures below 50°F, set masonry plate away from fixed shoe (-). Settings for other temperatures are proportional to those shown for a 40° temperature change.

Note:
For detail showing dimension D, see Section A-A Sheet 14.



SECTION A-A

SECTION B-B

Notes:
Reinforcing steel is to be shifted or cut in the field to miss drains.
Drains are to be galvanized.
See Sheet 1 for location of drains.
20 drains required per bridge.

DRAIN DETAILS

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 SHEET 13 OF 18

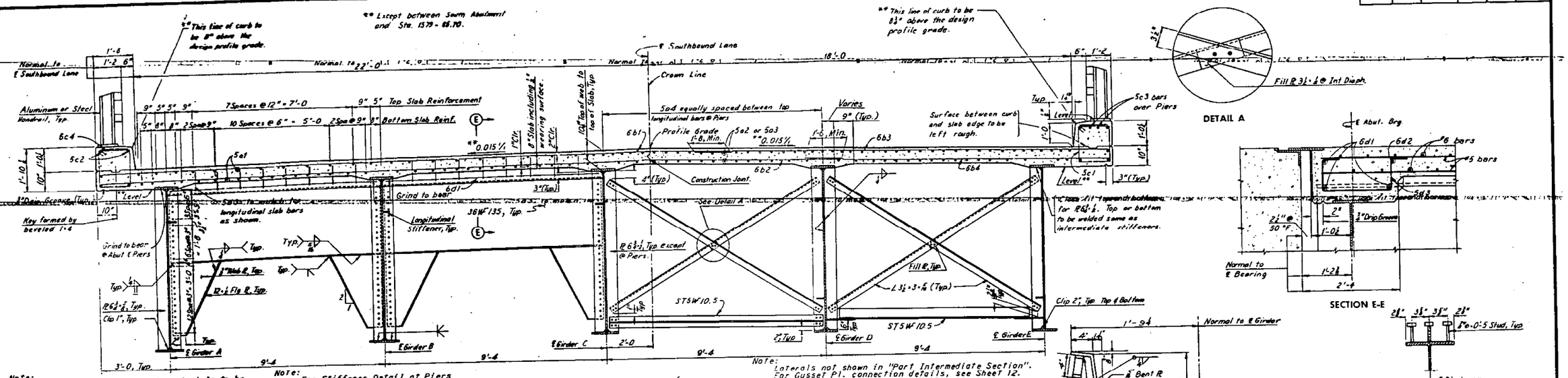
DESIGN NO. 768 JOHNSON COUNTY FILE 22960 89 of 118

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE PTA DATE 08-20-69 CHECKED JSH DATE 9-2-69

231-21-00

FEDERAL DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA				



HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

MADE PTA DATE 08-09-69 CHECKED JSH DATE 8-29-69

231P-81-00

BRIDGE NO. 11 **I-380 OVER IOWA RIVER**

DESIGN FOR 0°00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

SUPERSTRUCTURE DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

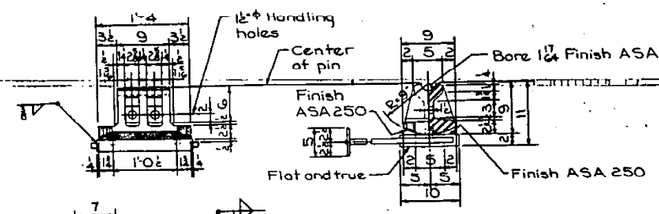
IOWA STATE HIGHWAY COMMISSION

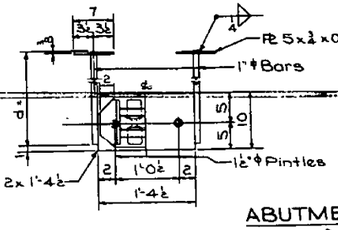
DECEMBER 1969 SHEET 14 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

69 of 110

FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				

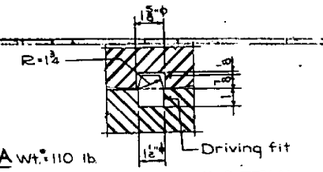




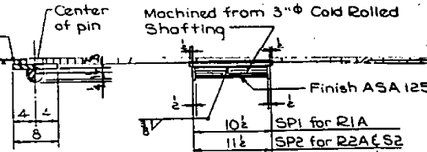
ROCKER R1A Wt.= 143 lb

ABUTMENT MASONRY PLATE MP1A Wt.* 110 lb

* Wt. does not include 1"ϕ bars



TYPICAL PINTLE DETAIL



SOLE PLATE SP1, SP2 & SP3

Wt. { SP1 = 34 lb. SP2 = 37 lb. SP3 = 43 lb.

BEARING NOTES:

The casting of R1A, R2A, S2, R3A and S3 shall comply with Article 4153.04 of the I.H.C. Standard Specifications.

The masonry plates marked MP1A, MP2A, MP2P, MP3A and MP3P shall comply with the requirements of ASTM A-36 steel.

The pins shall comply with Article 4153.02 of the I.H.C. Standard Specifications and with the requirements of ASTM A-108 steel.

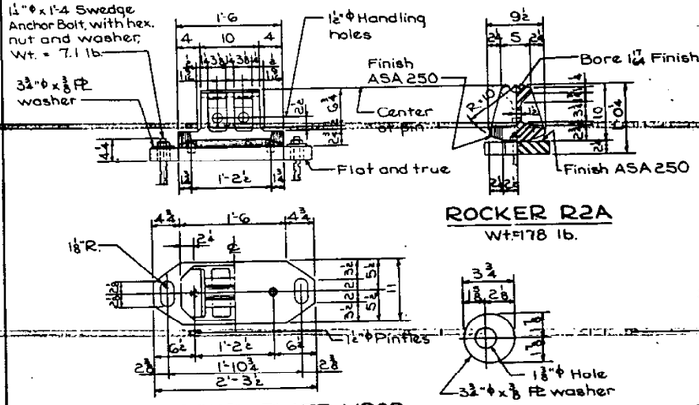
All bearings are to be set in paint and canvas.

Anchor bolts shall be set in accordance with Article 2408.47 of the I.H.C. Standard Specifications.

After masonry plates, rockers and shoes are in correct location, pour mortar around anchor bolts to fill the slotted holes.

The weight of bearings shown does not include the weight of paint.

Surfaces finished with an ASA 125 finish shall be shop coated with an application of white lead and tallow as soon as the surfacing process is done. The shop coated surfaces are to be wiped clean and then a field coat of white lead and tallow is to be applied just before the erection of structural steel in the field.

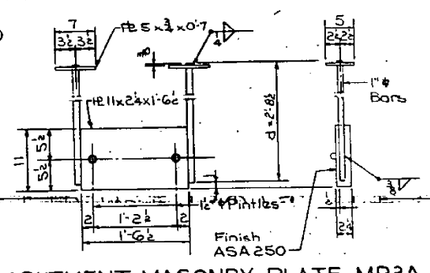


ROCKER R2A

Wt.=178 lb.

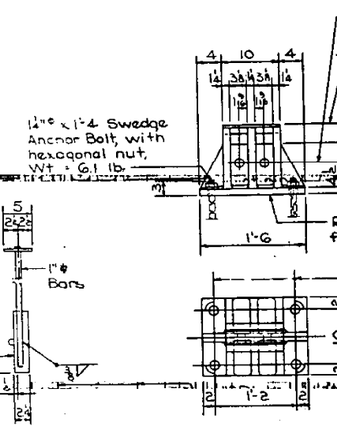
PIER MASONRY PLATE MP2P

Wt. = 160 lb.



ABUTMENT MASONRY PLATE MP2A

Wt. 146 lb. (Does not include 1"ϕ bars)



FIXED SHOE S2

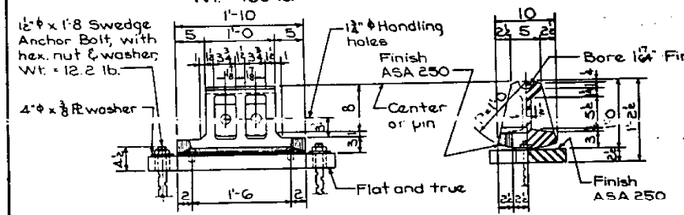
Wt.=222 lb.

(Similar to S2 V12-1)

DISTANCE FROM TOP OF SOLE PLATE TO BRIDGE SEAT

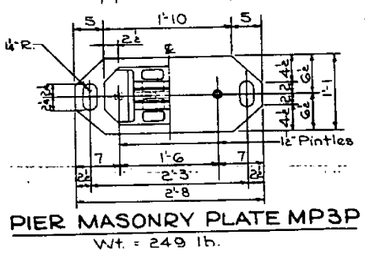
Rockers & Fixed Shoes	D*
R1A	1'-0 7/16
R2A & S2	1'-1 15/16
R3A & S3	1'-4 3/16

* Including 1/16" paint and canvas.



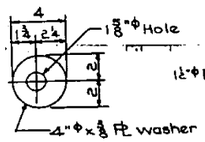
ROCKER R3A

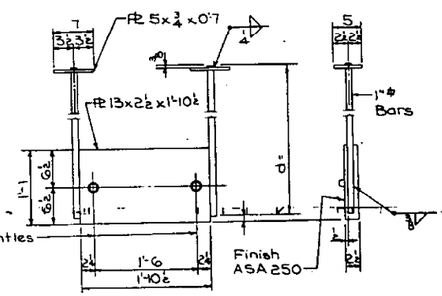
Wt.= 259 lb.



PIER MASONRY PLATE MP3P

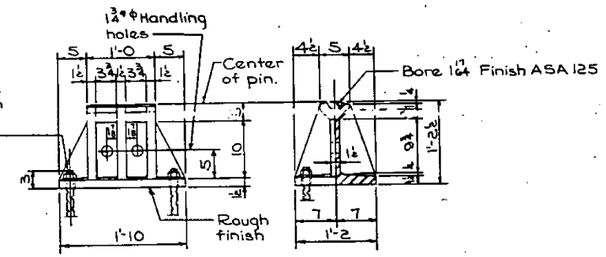
Wt. = 249 lb.

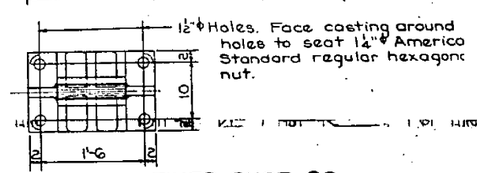




ABUTMENT MASONRY PLATE MP3A

Wt = 224 lb. (Does not include 1"ϕ bars)





FIXED SHOE S3

Wt.= 349 lb.

(Similar to S1 V10A-7)

MAXIMUM REACTION (In Kips)

R1A	R2A S2	R3A S3
132	171	263

HOWARD, NEEDLES, TAMMEN & BERGENDOFF

CONSULTING ENGINEERS

KANSAS CITY NEW YORK

MADE L.J.R. DATE 9-2-69 CHECKED J.S.H. DATE 9-2-69

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

BEARING DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

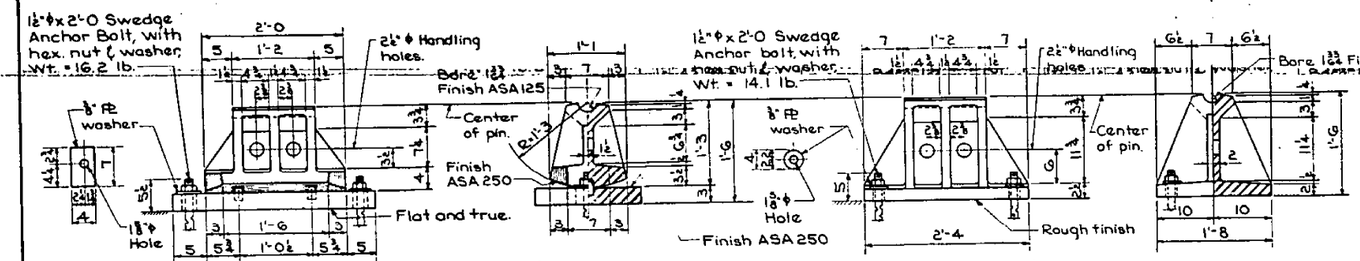
DECEMBER 1969 SHEET 15 OF 18

DESIGN NO. 768 JOHNSON COUNTY FILE 22960

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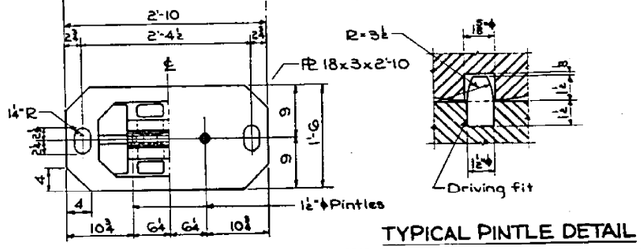
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FEDERAL DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	IOWA				



ROCKER R4

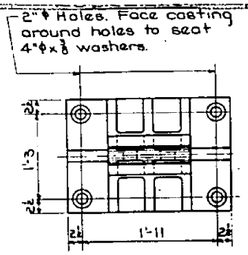
Wt.=464 lb.



TYPICAL PINTLE DETAIL

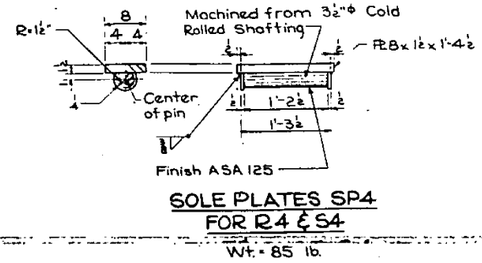
PIER MASONRY PLATE MP4P

Wt.=470 lb



FIXED SHOE S4

Wt.=735 lb.



SOLE PLATES SP4 FOR R4 & S4

Wt.= 85 lb.

BEARING NOTES:

Nodular Iron Castings shall comply with Article 4153.04 of the Standard Specifications except ASTM A-339, Grade 65-45-12 will be required in lieu of ASTM A-339, Grade 60-45-10. The following shall be Nodular Iron Castings:

R4 MP4P S4
R5 MP5P S5

All plates and bars shall comply with ASTM A-36. Pins shall comply with Article 4153.02 of the Standard Specifications and with ASTM A-108.

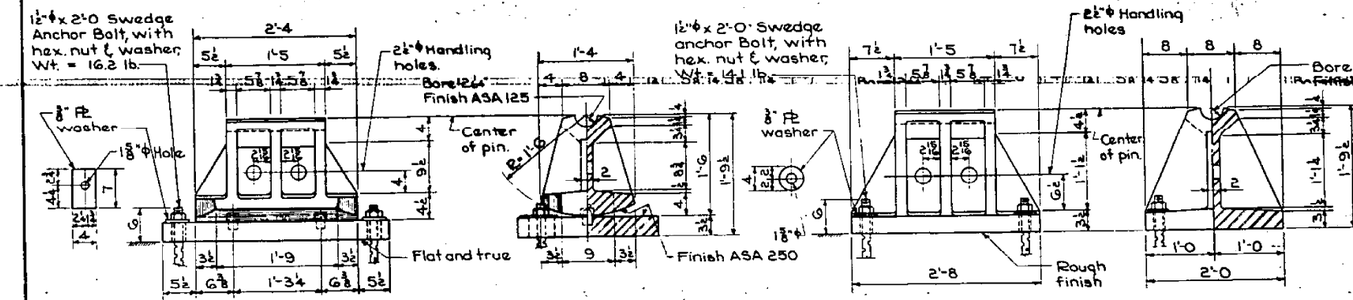
All bearings are to be set in paint and canvas.

Anchor bolts shall be set in accordance with Article 2408.47 of the Standard Specifications.

After masonry plates, rockers and shoes are in correct location, pour mortar around anchor bolts to fill slotted holes.

The weight of bearings shown does not include the weight of paint.

Surface finished with an ASA 125 Finish shall be shop coated with an application of white lead and tallow as soon as the surfacing process is done. The shop coated surfaces are to be wiped clean and then a field coat of white lead and tallow is to be applied just before the erection of structural steel in the field.



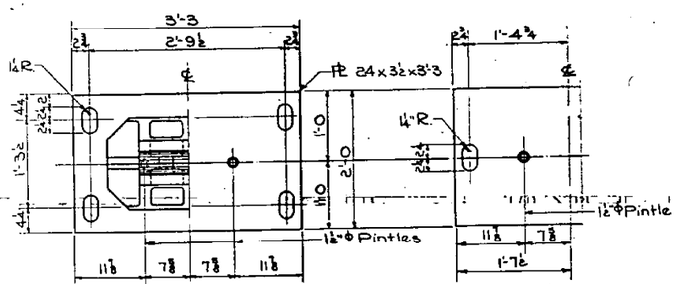
ROCKER R5

Wt.=776 lb.

DISTANCE FROM TOP OF SOLE PLATE TO BRIDGE SEAT	
Rockers & Fixed Shoes	* D
R4 & S4	1'-8 9/16
R5 & S5	2'-0 13/16

* Including 1/16" paint and canvas.

MAXIMUM REACTION (In Kips)	
R4 S4	R5 S5
475	650

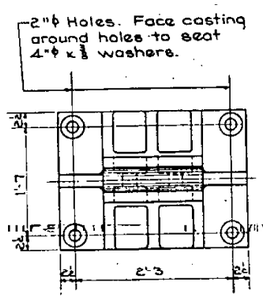


PIER MASONRY PL MP5Pa FOR SPAN LENGTH GREATER THAN 150'

Wt.= 877 lb.

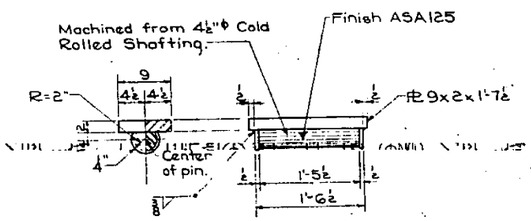
PIER MASONRY PL MP5Pb FOR SPAN LENGTH 101' TO 150'

Wt.= 897 lb.



FIXED SHOE S5

Wt.= 1274 lb.



SOLE PLATES SP5 FOR R5 & S5

Wt. = 159 lb.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
DES. JJR DATE 4-2-69
CHECKED JJH DATE 3-2-69

23'12"-21'-00

BRIDGE NO. 11 I-380 OVER IOWA RIVER

DESIGN FOR 0°00' SKEW

DUAL 425'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

BEARING DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

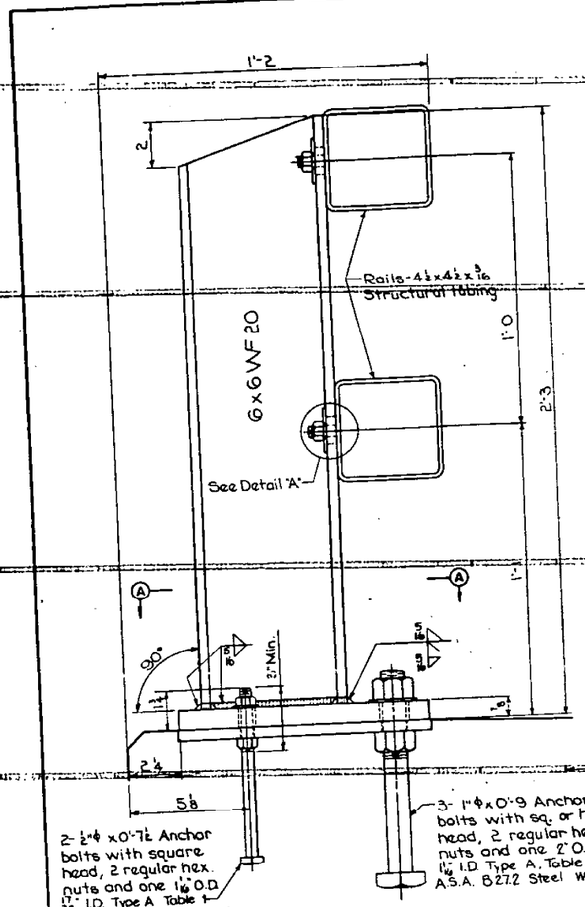
JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

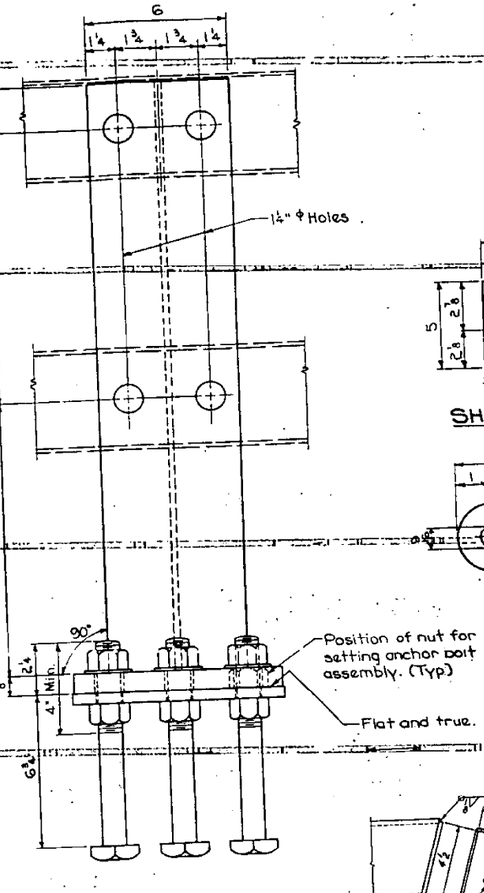
DECEMBER 1969 SHEET 16 OF 18

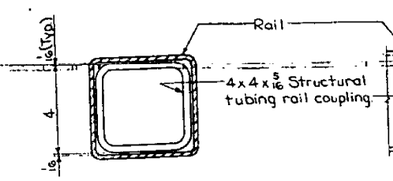
DESIGN NO. 768 JOHNSON COUNTY FILE 22960

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	IOWA				

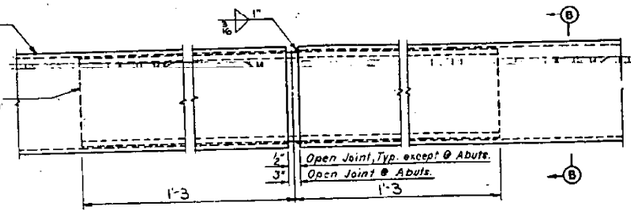


RAIL POST

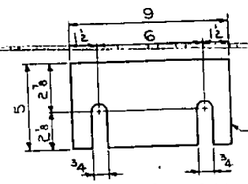




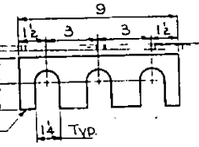
SECTION B-B



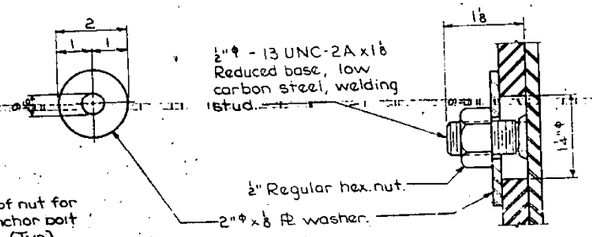
TYPICAL SPLICE JOINT



SHIM "A" DETAIL



SHIM "B" DETAIL



DETAIL "A"

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 End Cap "B" shall be galvanized malleable iron casting or galvanized steel casting.

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" are 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 ⅛".

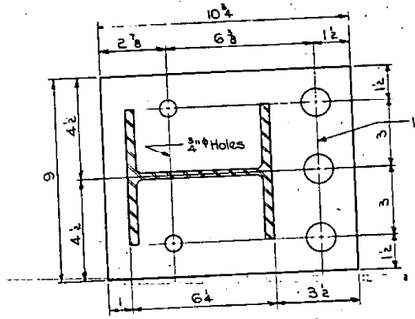
No painting will be required.

Rail studs shall be provided with adequate protection during shipment.

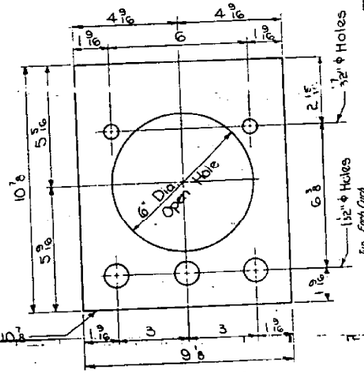
A ½" ϕ drain hole is to be provided 3" from the end, at the bottom side of the end section of all rails.

Handrail dimensions are measured along a line 1'-0" from the outside face of the curb.

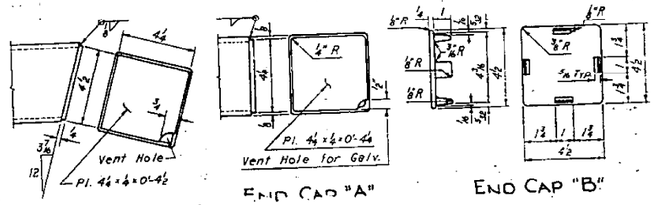
Material for anchor bolts and nuts, and rail to post attachment nuts shall be A.S.T.M. A307-61T, Grade A.



SECTION A-A

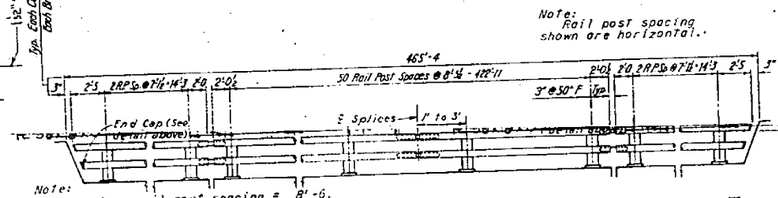


ANCHOR CAGE DETAILS



END CAP "A" END CAP "B"

RAIL END CAP DETAILS



TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

DESIGN SPECIFICATIONS:

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

STEEL HANDRAIL QUANTITIES	
Southbound Lane	928.8 Lin. Ft.
Northbound Lane	928.8 Lin. Ft.

BRIDGE NO. 11 — I-380 OVER IOWA RIVER

DESIGN FOR 0° 00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

STEEL HANDRAIL DETAILS

STATION 1581+22.50 ℄ I-380 PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 — SHEET 17 OF 18

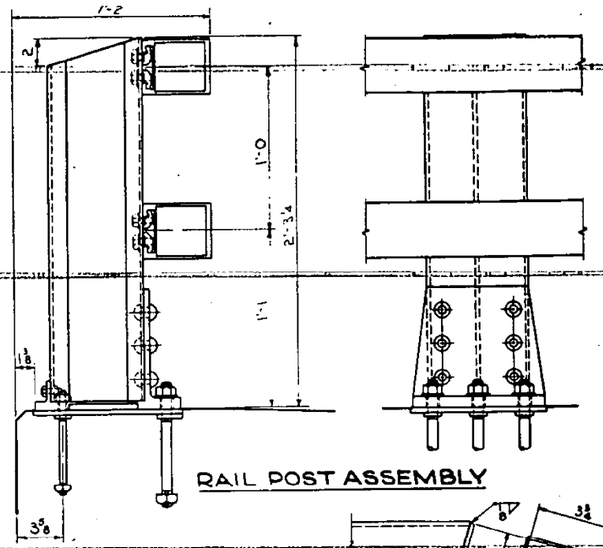
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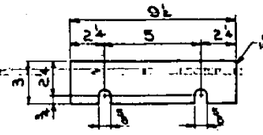
MADE JSH DATE 8-8-69 CHECKED LJR DATE 8-9-69

2312-21-00

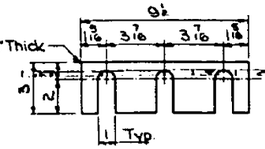
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	IOWA				



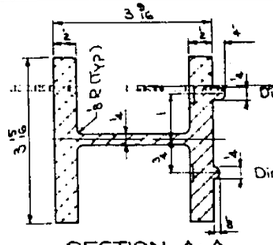
RAIL POST ASSEMBLY



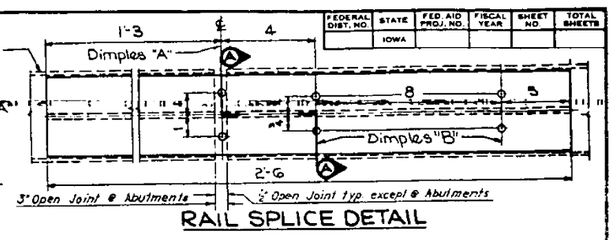
SHIM "A" DETAIL



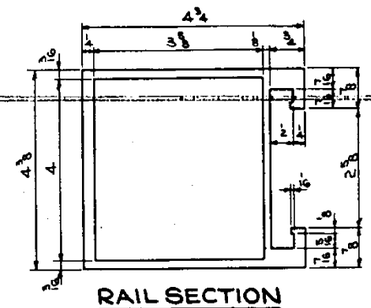
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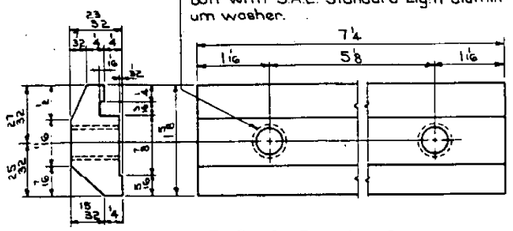
SECTION A-A



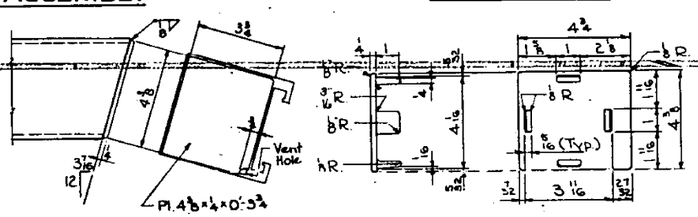
RAIL SPLICE DETAIL



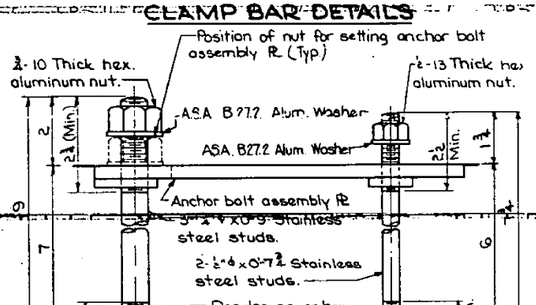
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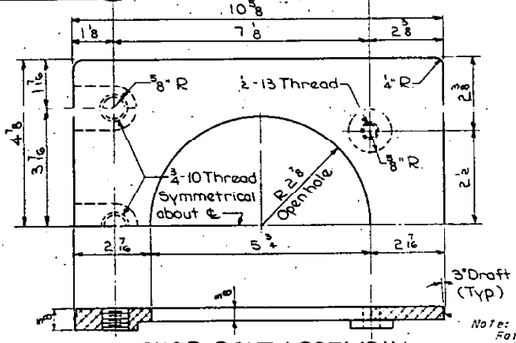


CLAMP BAR DETAILS



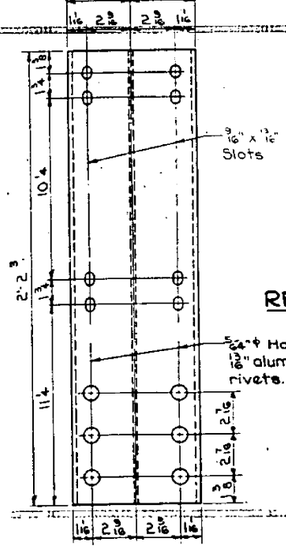
RAIL END CAP DETAILS



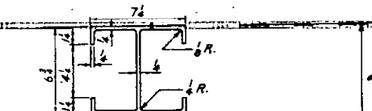


ANCHOR BOLT ASSEMBLY

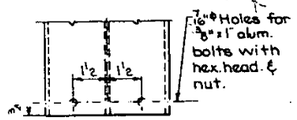
Note: Rail post spacing are shown horizontal.



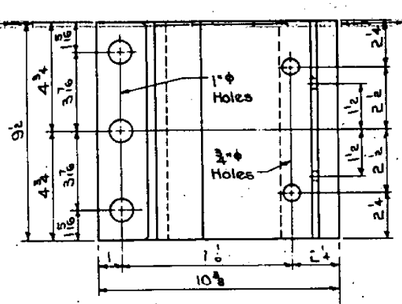
POST

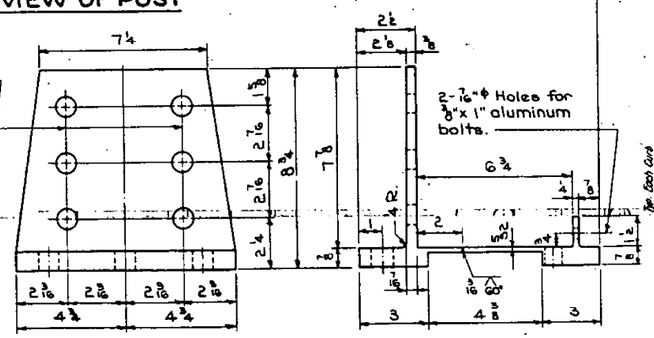


POST SECTION

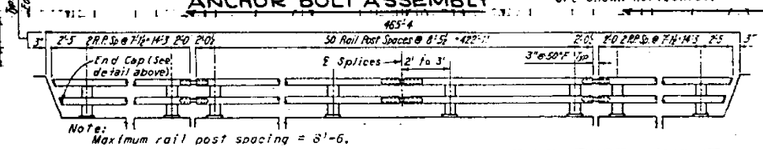


REAR VIEW OF POST





POST BASE PLATE DETAILS



TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

ALUMINUM HANDRAIL NOTES:

The aluminum handrail is to be bid on a lineal 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 Alclad 2024-T3 for washers and Alloy 1100-0 for shims.

Material for anchor studs shall be an ASTM A 276 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. The aluminum nuts shall be thick, 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.

Material for steel nuts shall be A.S.T.M. 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 SG70 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" are 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).

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

Rail end caps may be either aluminum alloy permanent mold casting or sand mold casting.

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 ¼" ϕ drain hole is to be provided, 3 inches in from the end, at the bottom side of the end sections of all rails.

Handrail dimensions are measured along a line 1'-0" from the outside face of the curb.

DESIGN SPECIFICATIONS:

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

ALUMINUM HANDRAIL QUANTITIES	
Southbound Lane	928.8 Lin. Ft.
Northbound Lane	928.8 Lin. Ft.

BRIDGE NO. 11 — I-380 OVER IOWA RIVER

DESIGN FOR 0°-00' SKEW

DUAL 425'-0 × 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

130'-0, 165'-0, 130'-0 SPANS

ALUMINUM HANDRAIL DETAILS

STATION 1581+22.50 ℄ I-380 — PROJ. NO. I-IG-380-6(7) 247--04-52

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DECEMBER 1969 — SHEET 18 OF 18

DESIGN NO. 768 — JOHNSON COUNTY — FILE 22960

93 of 110

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK

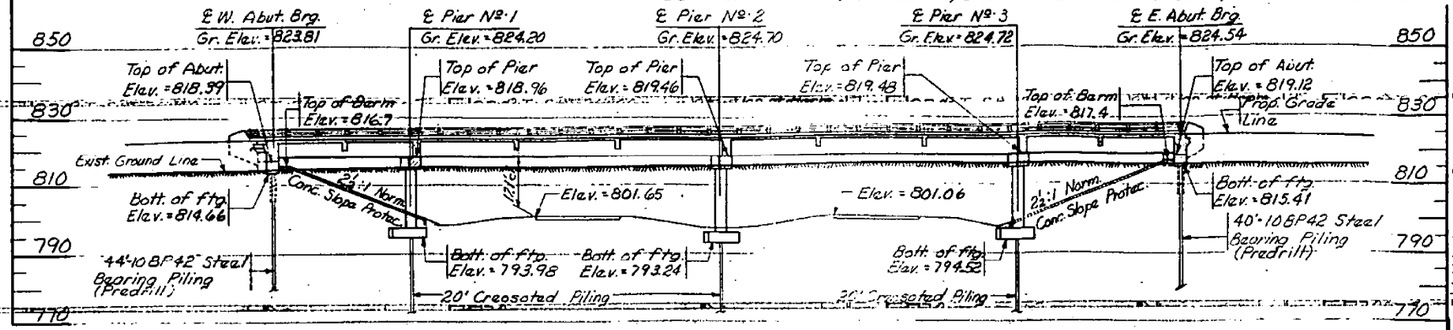
MADE JSH DATE 8-8-69 — CHECKED LJR DATE 8-9-69

2812-21-00

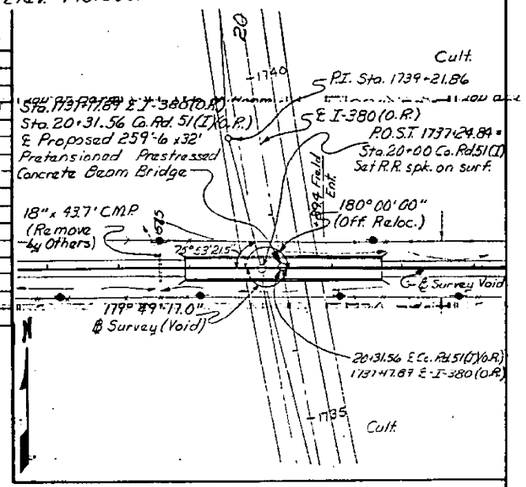
Bench Mark: No 77, Sta 1726+50, 200' Rt., Spk. in Choke Cherry Tree in Fence Line. Elev. 795.335.

+4.0% -3.0%
1100' V.C.
P.I. Sta. 1739+00
M.O. = 9.62'
P.I. Elev. = 834.20
PROPOSED COUNTY ROAD 51 (I) GRADE

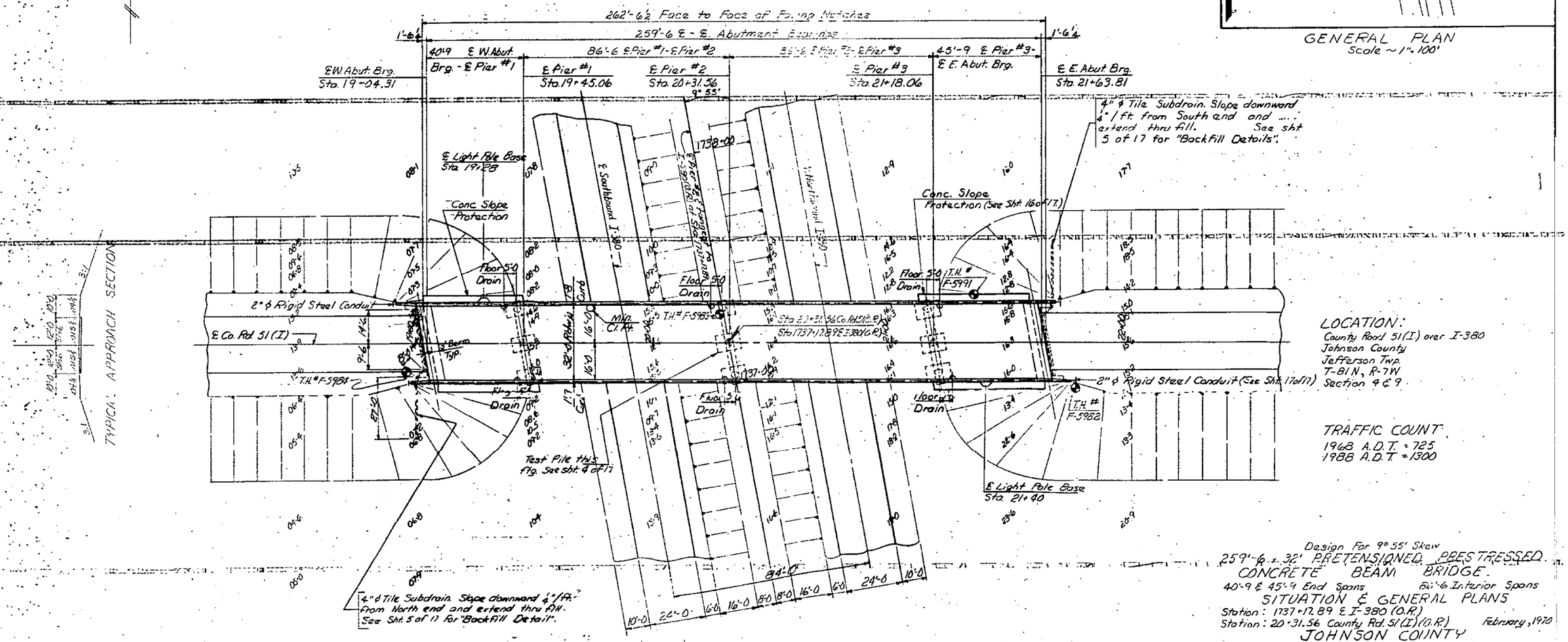
+2.84% -1.00%
1800' V.C.
P.I. Sta 1740+00
M.O. = 8.64'
P.I. Elev. = 813.41
PROPOSED I-380 GRADE



LONGITUDINAL SECTION ALONG ℄ OF ROADWAY



GENERAL PLAN
Scale ~ 1" = 100'



SITUATION PLAN.
SCALE ~ 1" = 20'

TYPICAL APPROACH SECTION

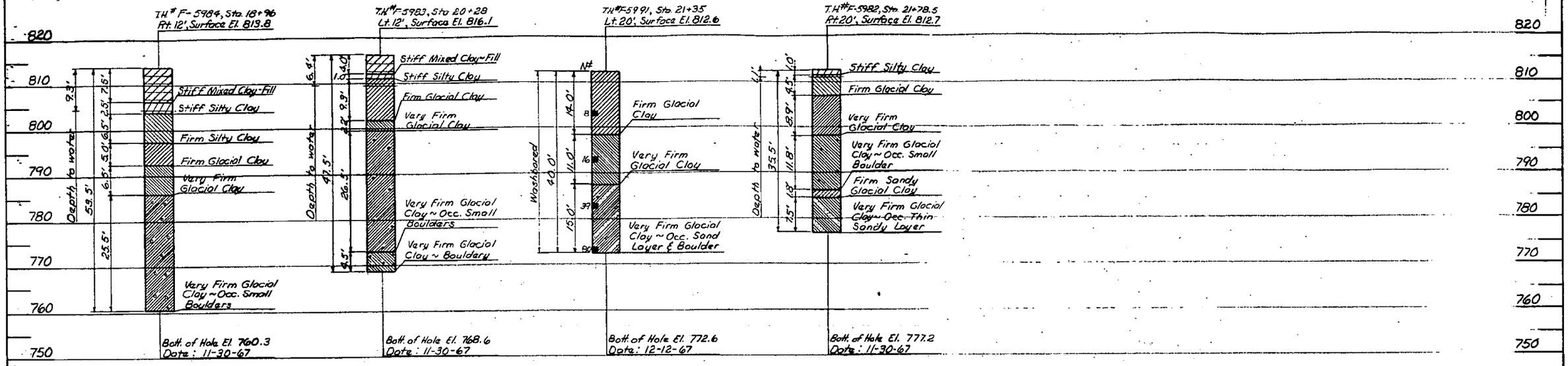
LOCATION:
County Road 51(I) over I-380
Johnson County
Jefferson Twp.
T-81N, R-7W
Section 4 & 9

TRAFFIC COUNT
1968 A.D.T. = 725
1988 A.D.T. = 1300

Design For 9° 55' Skew
259'-6 x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 & 45'-9 End Spans 86'-6 Interior Spans
SITUATION & GENERAL PLANS
Station: 1737+17.89 ℄ I-380 (O.R.)
Station: 20+31.56 County Rd. 51(I) (O.R.)
February, 1970
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
Des. Sht. No. 1 of 17 File No. 22-96-0 Des. No. 868

DESIGNED BY: TRACED BY: SECTION LEADER J.N.W. JOHNSON COUNTY T-78-380-1(3)247--64-52

BENCH MARK: Nº 77, Sta. 1726+50, 200' Rt., Spk. in Choke Cherry Tree in Fence Line. Elev. = 795.335.



SOUNDING DATA

N# = Number of blows per foot.
Dated as shown

GENERAL NOTES:

This bridge is designed for two lanes of HS20-44 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 slopes outside the 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 through the fill to Elev. 806.6 for West abutment and to Elev. 807.4 for East abutment. The minimum diameter of the drilled holes is to be 16". Voids around the piles are not to be filled. No separate payment will be made for drilling holes since it is considered incidental to driving piles.

The Bridge Contractor is to construct "Concrete Slope Protection" as shown on sheet 1 of 17 and as detailed on sheet 16 of 17.

The Bridge Contractor is to install tile subdrain behind each abutment as noted or shown on sheets 1 and 5 of 17. The price bid for "4" Tile Subdrain" is to include all the labor and the excavation necessary for the installation.

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

The portion 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 methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the Specifications.

The test pile for Pier 2 is to help determine proper pier pile lengths.

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 f_s = 20,000 psi
See sht. 10 of 17 for Design Stresses for prestressed beams.

SPECIFICATIONS:

Design: AASHO, Series of 1969 (except designed for 2 lanes)
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1964, plus current Special Provisions and Supplemental Specifications.

TEST PILE NOTE:

The lengths for Creosoted Piling are estimated lengths for bidding purposes only and one test pile shall be driven before ordering any additional piling. Before driving the Test Pile the area at the test pile site is to be excavated to the proposed footing elevation. Pile lengths will be determined from test pile results. The price bid for "Creosoted Test Piling" is to include all cost of furnishing and driving the test pile in the location shown on the plans and as directed by the Engineer. The test pile is to be incorporated into Pier 2 as one of the piles for the completed structure.

TOTAL ESTIMATED QUANTITIES

ITEM		UNIT	3 Piers	Superstructure	TOTAL
* Structural Concrete		Cu. Yds.	155.9	403.2	559.1
Reinforcing Steel		lbs.	24,633	84,692	109,325
Pretensioned Prestressed Concrete Beams	D40 (40'-0)	Nº		5	5
	D45 (45'-0)	Nº		5	5
	D85 (85'-0)	Nº		10	10
Aluminum Handrail -or- Steel Handrail		Lin. Ft.			546.7 or 546.7
Creosoted Piling		Lin. Ft.	93 @ 20'		1260
Creosoted Test Piling		L.S.	1 @ 30'		Lump Sum
10 BP 42 Steel Bearing Piling	Furnish	Lin. Ft.		8@44'; 8@40'	672
	Drive	Lin. Ft.		8@44'; 8@40'	672
4" ϕ Tile Subdrain		Lin. Ft.			100
Class 20 Excavation		Cu. Yds.	298	110	408
Granular Backfill		Cu. Yds.		108	108
Concrete Slope Protection		Sq. Yds.			432
2" ϕ Rigid Steel Conduit		Lin. Ft.			589

* The pier, abutment footing and paving block concrete, 194.1 Cu. Yds., is to be Class "C" Concrete. The remainder, 365.0 Cu. Yds., is to be Class "D" Concrete.

DESIGN FOR: 9° 55' SKEW
259'-6" - 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE
40'-9" & 45'-9" END SPANS 86'-6" INTERIOR SPANS
SOUNDING DATA
STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. S1 (I) (O.R.)
February 1970
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DES. SHT. NO. 2 OF 17 FILE NO. 2-2960 DES. NO.

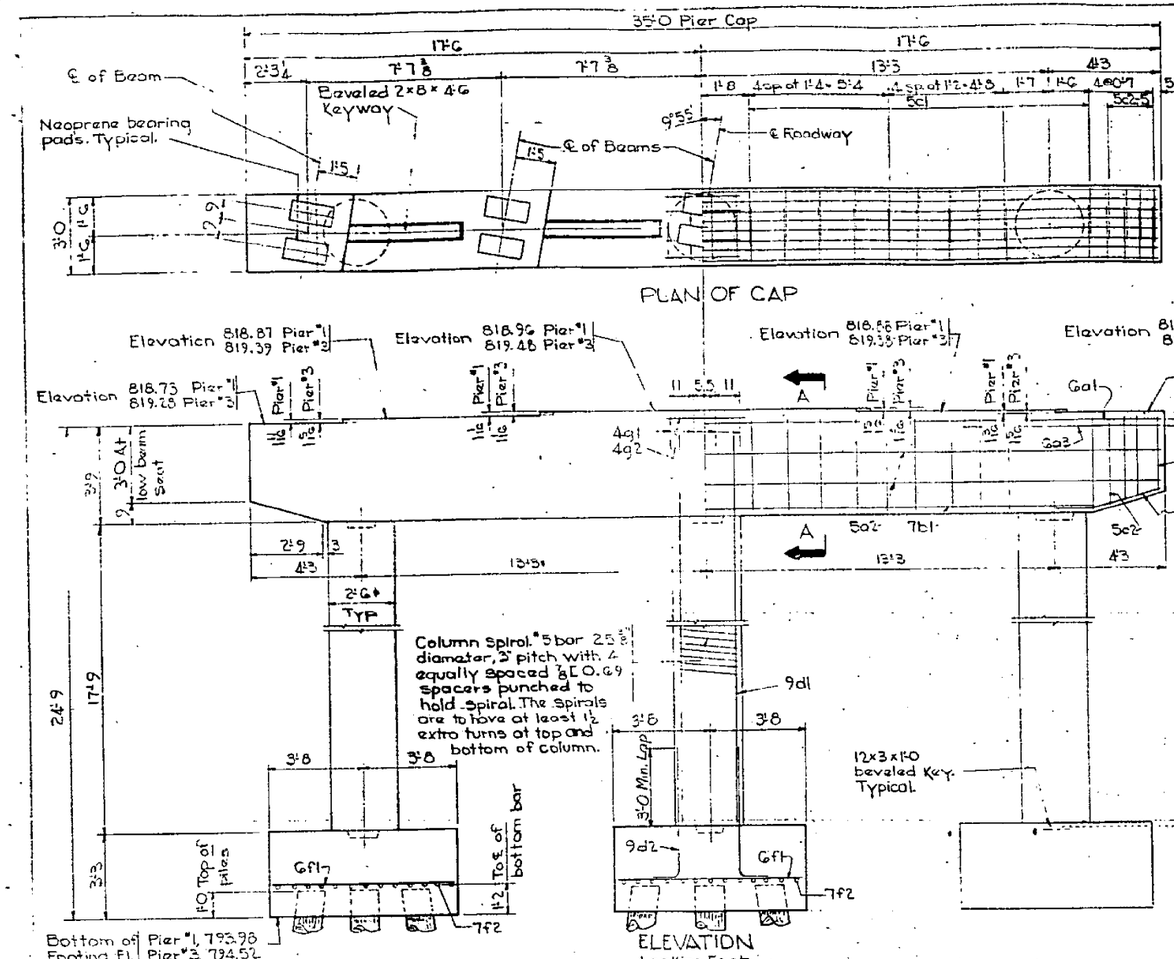
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DETAILED BY: [illegible] CHECKED BY: [illegible]

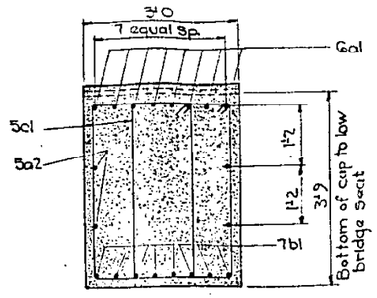
JOHNSON COUNTY

PROJECT NUMBER: I-IG-380-6(7)247--04-52

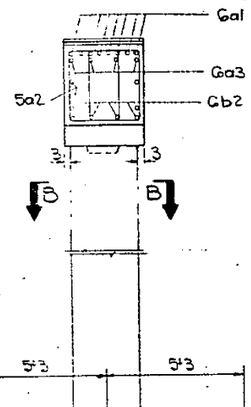
STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	3		95	110

Bench Mark "77 Sta. 1726+50, 200' Rt. RR. Spike in choke cherry Tree in fence line. El. 795.335



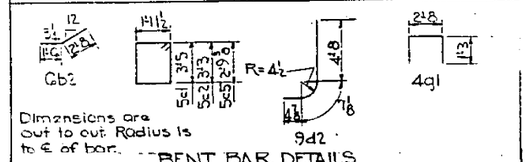


SEC. A-A



VIEW C-C

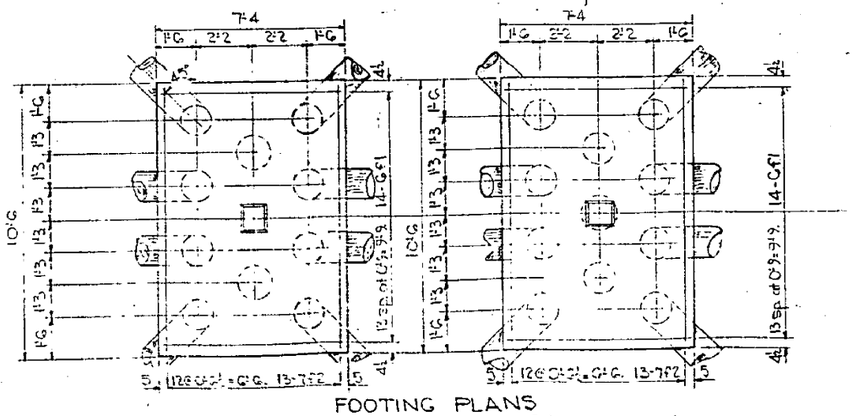
REINFORCING STEEL—PIER No. 1 or PIER No. 3					
Bar	Location	Shape	No.	Length	Weight
Ga1	Top of cap, longitudinal	—	6	34'-8	417
5a2	Pier cap, longitudinal, at sides	—	4	34'-8	145
Ga3	Top of cap, longitudinal, at ends	—	8	7'-0	84
7b1	Bottom of cap, longitudinal	—	8	29'-6	482
Gb2	Bottom of cap, longit. at ends	—	8	4'-2	50
5c1	Pier cap hoops	[]	40	11'-6	460
5c2-5	" "	[]	16	Variable	175
9d1	Columns, vertical	—	36	21'-0	2570
9d2	Footing to column dowels	J	36	3'-8	692
Gf1	Column footings, transverse	—	42	7'-6	442
7f2	Column footings, longitudinal	—	39	10'-2	810
#5 bar	Column Spiral	~~~	3	45'-5"	151 lb
	Spiral Spacer, ℄ O.G.9	—	12	1'-9	14 lb
4g1	Beam Seat at center beam	⊓	4	5'-0	13
4g2	" " " "	—	4	3'-0	8 lb
				One Pier - Total lb.	8035



BENT BAR DETAILS

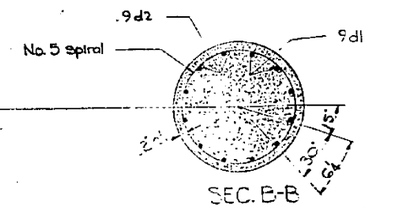
CONCRETE PLACEMENT QUANTITIES		
Location / Item	Quantity: Pier "1	Pier "3
Cap	14.9 C.Y.	14.8 C.Y.
Column	9.7 C.Y.	9.7 C.Y.
Footings	26.9 C.Y.	26.9 C.Y.
Total C.Y.	51.5 C.Y.	51.4 C.Y.

ESTIMATED QUANTITIES—THREE PIERS				
Item	Pier 1	Pier 2	Pier 3	Total
Structural Conc. Class "C"	51.5	53.0	51.4	155.9 C.Y.
Reinforcing Steel	8033	8507	8033	24,033 lb
Class 20 Excavation	125	70	103	298 C.Y.
Creosoted Piling	31@20'	31@20'	31@20'	1860 L.F.
Creosoted Test Piling		1@30'		Lump Sum



FOOTING PLANS

With pile and reinforcing layouts shown. Pile spacing is at the bottom of the footing. Battered piles are 1:8 in the direction shown.



SEC. B-B

12-9d1 and 12-9d2 are required at each column.

VIEW C-C

PIER NOTES:

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

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

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

The spiral reinforcing may be made of a material permitted for #4 spirals and 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 at splices is to be included in the price bid for other reinforcement.

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.

A test piling is to be driven at pier #2 to help determine proper pile lengths.

DESIGN FOR 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

40'-9 ℄ 45'-9 END SPANS 86'-6 INTERIOR SPANS

PIERS 1 & 3 DETAILS

STATION 1737+17.89 ℄ I-380 (O.R.)
STATION 20+31.56 COUNTY RD. 51 (J) (O.R.)

February, 1970

JOHNSON COUNTY

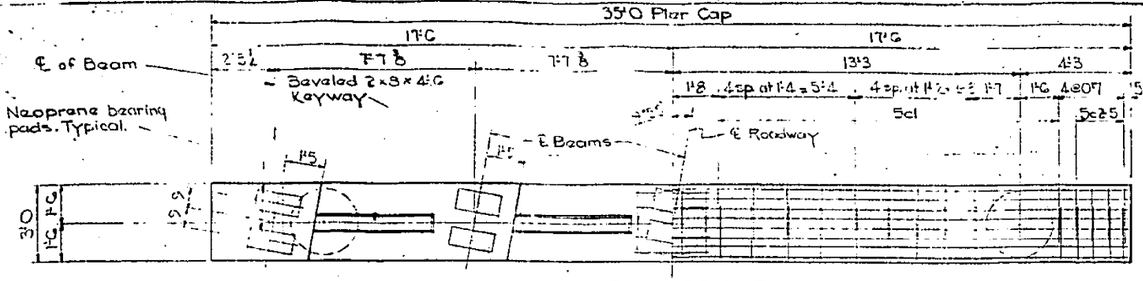
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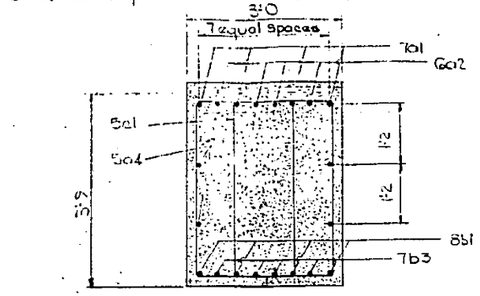
DES. SHT. NO. 3 OF 17 FILE NO. 22960 DES. NO. 868

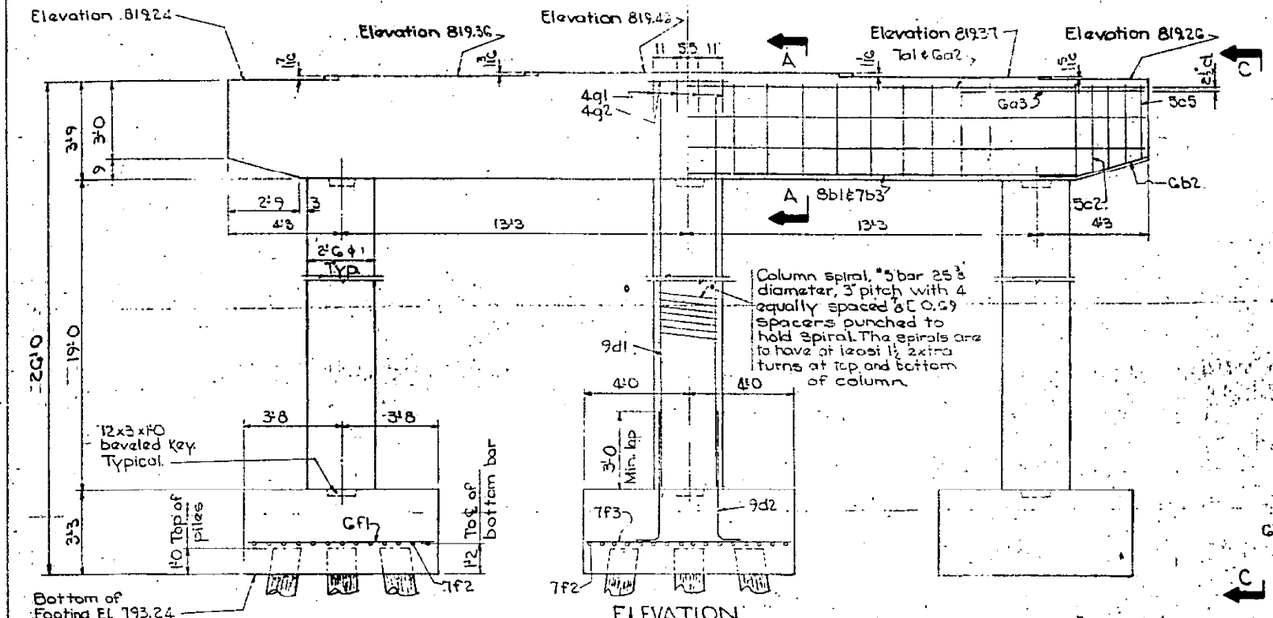
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DETAILED BY: E. Nacey
TRACED BY:
CHECKED BY: T. Sinclair

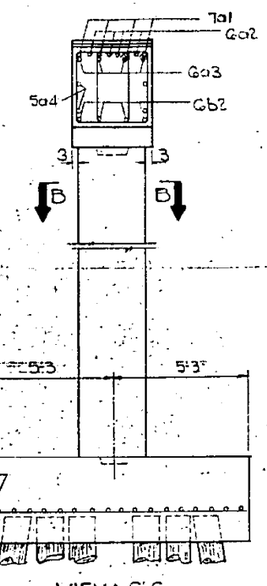
JOHNSON COUNTY

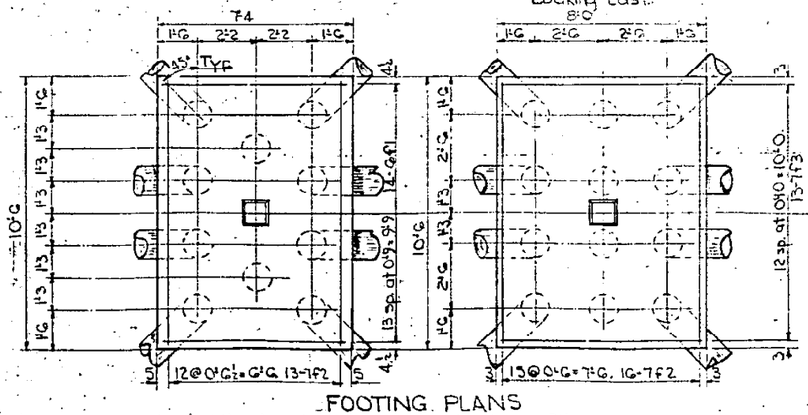
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247-09-52	IOWA	8		02	110

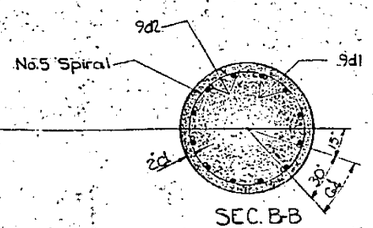






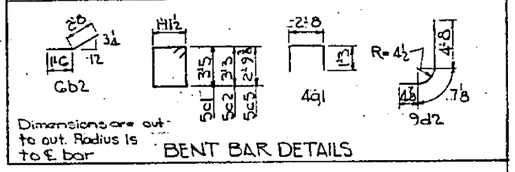






REINFORCING STEEL — PIER No. TWO

Bar	Location	Shape	No.	Length	Weight
7a1	Top of cap, longitudinal	—	4	34'8	283
Ga2	" " "	—	4	34'8	208
Ga3	Top of cap, longit. at ends	—	8	T.O	84
5a4	Pier cap, longit. at sides	—	4	34'8	145
8b1	Bottom of cap, longitudinal	—	4	29'6	315
Gb2	Bottom of cap, longit. at ends	—	8	4'2	50
7b3	Bottom of cap, longitudinal	—	4	29'6	241
5c1	Pier cap hoops	□	40	11'6	480
5c2-5	" " "	□	16	Variable	178
9d1	Columns, vertical	—	36	22'3	2723
9d2	Footing to column dowels	J	36	5'8	694
Gf1	Exterior footings	—	28	T.O	294
7f2	" Interior footings	—	42	10'2	873
7f3	Interior footing	—	13	7'8	204
#5 bar	Column Spiral	WWW	3	510'8	1617
	Spiral Spacer, ℄ 0.G9	—	12	1'90	157
4g1	Beam Seat at center beam	⊓	4	5'0	13
4g2	" " " " "	—	4	3'0	8
				Total lb.	8567



CONCRETE PLACEMENT QUANTITIES

Location	Quantity
Footings	27.7 C.Y.
Columns	10.4 C.Y.
Cap.	14.9 C.Y.
Total, C.Y.	53.0 C.Y.

Note: See Sheet 3 of 17 for: Pier Notes and Estimated Quantities.

DESIGN FOR: 9° 55' SKEW

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

45'-0 & 32'-0 END SPANS — 86'-6 INTERIOR SPANS

PIER 2 DETAILS

STATION 1727+17.89 ℄ I-380 (O.R)
STATION 20+31.56 COUNTY RD. S1 (I) (O.R)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

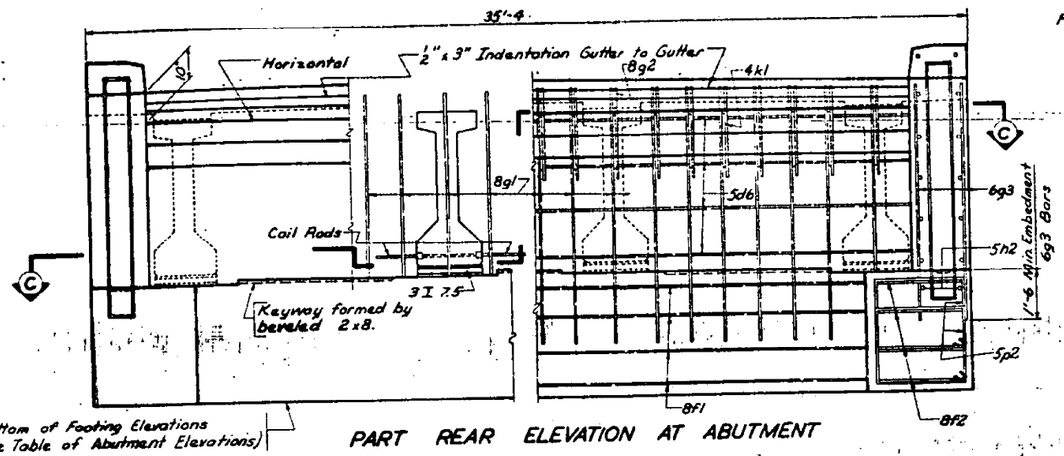
SHT. SYM. NO. 4 OF 17 — FILE NO. 22960 — DES. NO. 868

DESIGNED BY: R. Mowry
DETAILED BY: E. Mowry
TRACED BY:
CHECKED BY: L. Rd II

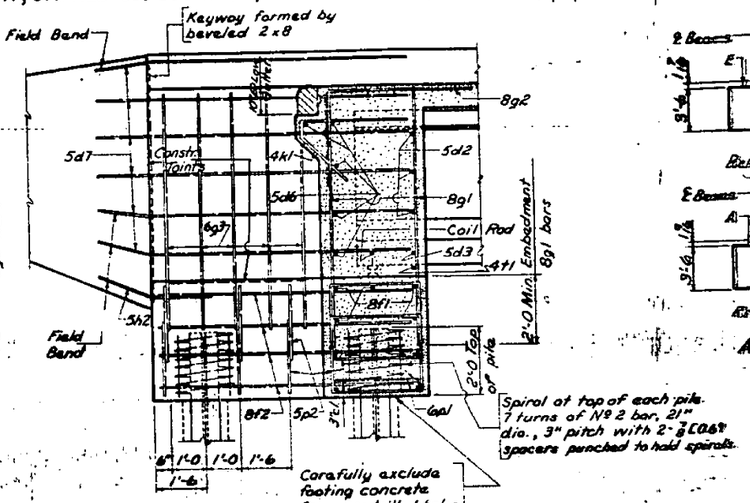
JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-115-380-6(7)247-04-52	IOWA	9		92	110

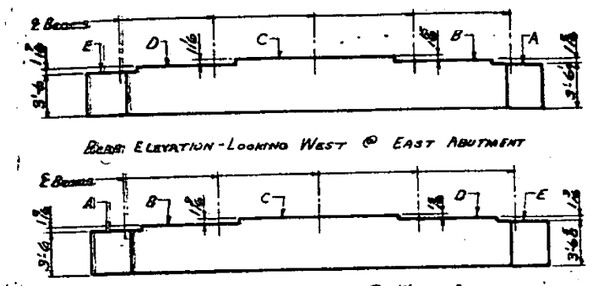
BENCH MARK: No 77, Sta. 1726+50, 200' Rt., Spk. in Choke Cherry Tree in Fence Line. Elev 795.335



PART REAR ELEVATION AT ABUTMENT



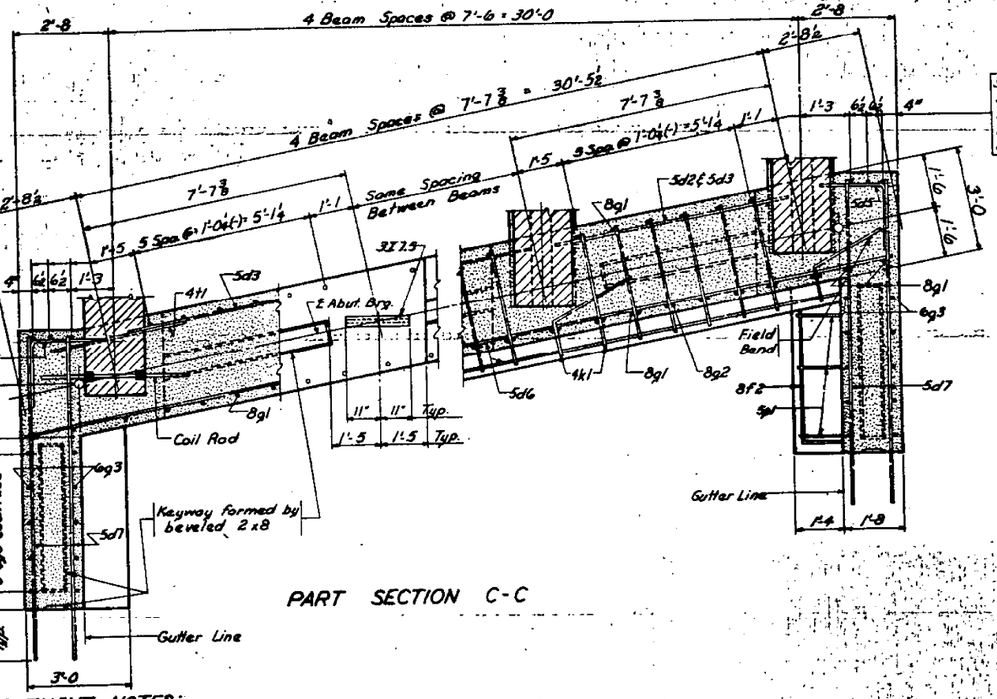
SECTION THROUGH ABUTMENT



ABUTMENT STEP DIAGRAM

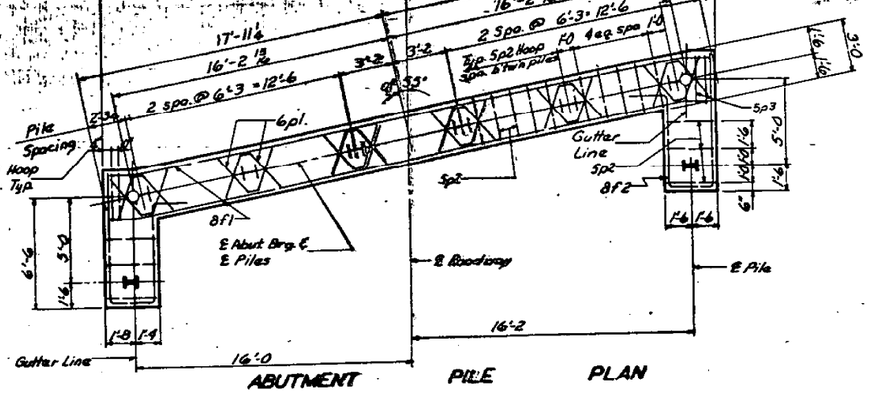
TABLE OF ABUTMENT ELEVATIONS

Point	West Abut.	East Abut.
A	818.16	818.99
B	818.29	819.04
C	818.39	819.12
D	818.31	819.03
E	818.21	818.91
Bott. of Pile Elev.	814.66	815.41



PART SECTION C-C

Spacing for:
33-8g1-Back Face
30-8g1-Front Face
29-8g2-Back Face
29-4k1-Back Face



ABUTMENT PILE PLAN

ABUTMENT NOTES:

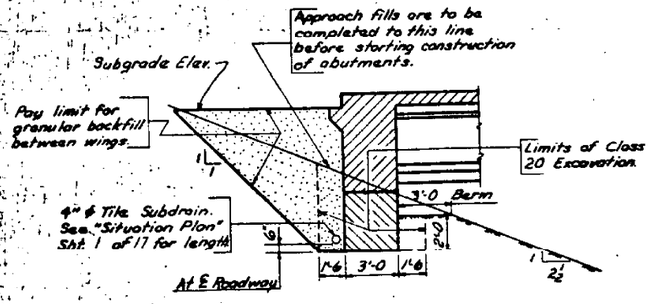
All exposed corners of 90° or sharper are to be filleted with a ¾" dressed and beveled strip.

Minimum clear distance from face of concrete to near reinforcing is to be 2" unless otherwise noted or shown.

Reinforcing steel is to be securely wired in place 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 37 tons bearing value per pile.



BACKFILL DETAIL

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

60'-9 & 45'-9 END SPANS 88'-6 INTERIOR SPANS

ABUTMENT DETAILS

STATION: 1737+17.89 ℄ T-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (I) (O.R.)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 5 OF 17 FILE NO. 22960 DES. NO. 868

DESIGNED BY	TRACED BY	CHECKED BY	32' R'DW'Y - PPCB "D" BEAMS	ABUTMENT DETAILS	(R.A.) 7°31' - 15°00' SKEWS	STANDARD SHEET	JOHNSON COUNTY	I-IG-380-6(7)247--04-52	IOWA	98	118

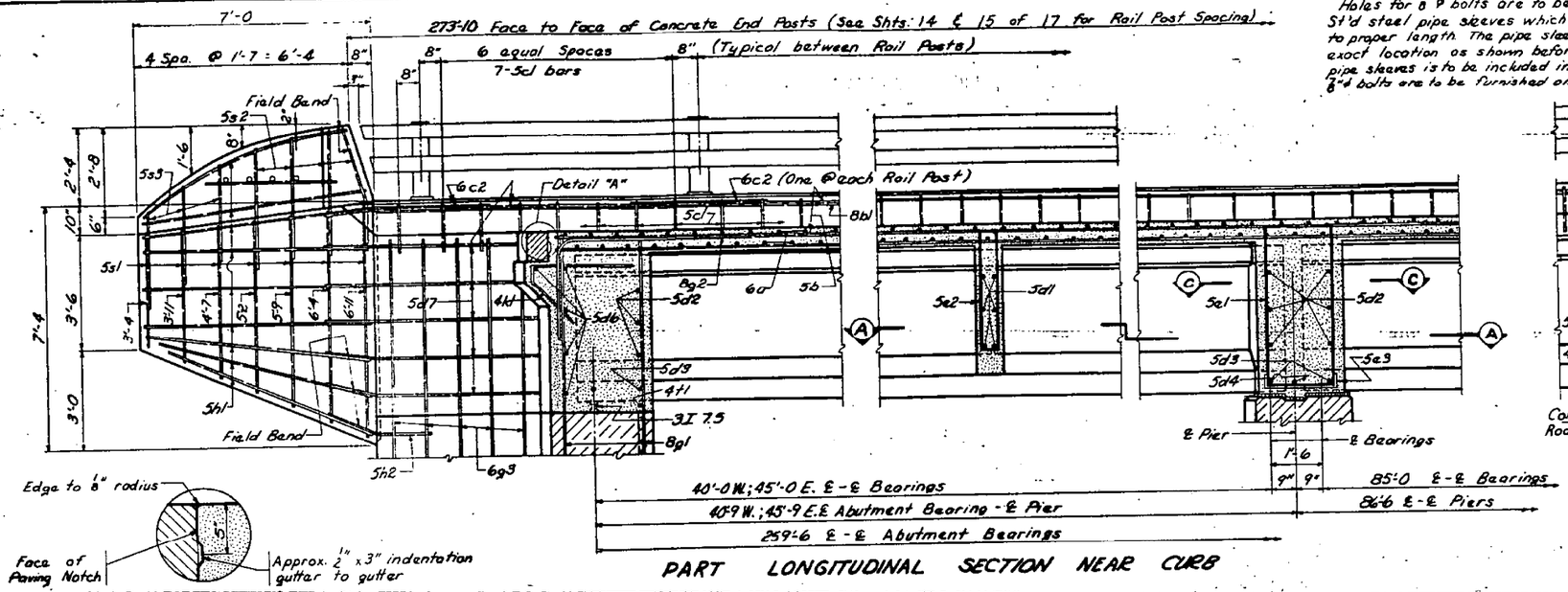


TABLE "I"

LOCATION	POINT A	POINT B
N.W. Corner	5'-5 1/16	5'-4
S.W. Corner	5'-5 1/16	5'-4
N.E. Corner	5'-5	5'-4 7/16
S.E. Corner	5'-5	5'-6 1/16

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

40'-9 ℄ 45'-9 END SPANS — 86'-6 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STATION: 1797+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. S1 (I) (O.R.)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 6 OF 17 FILE NO. 22960 DES. NO. 868

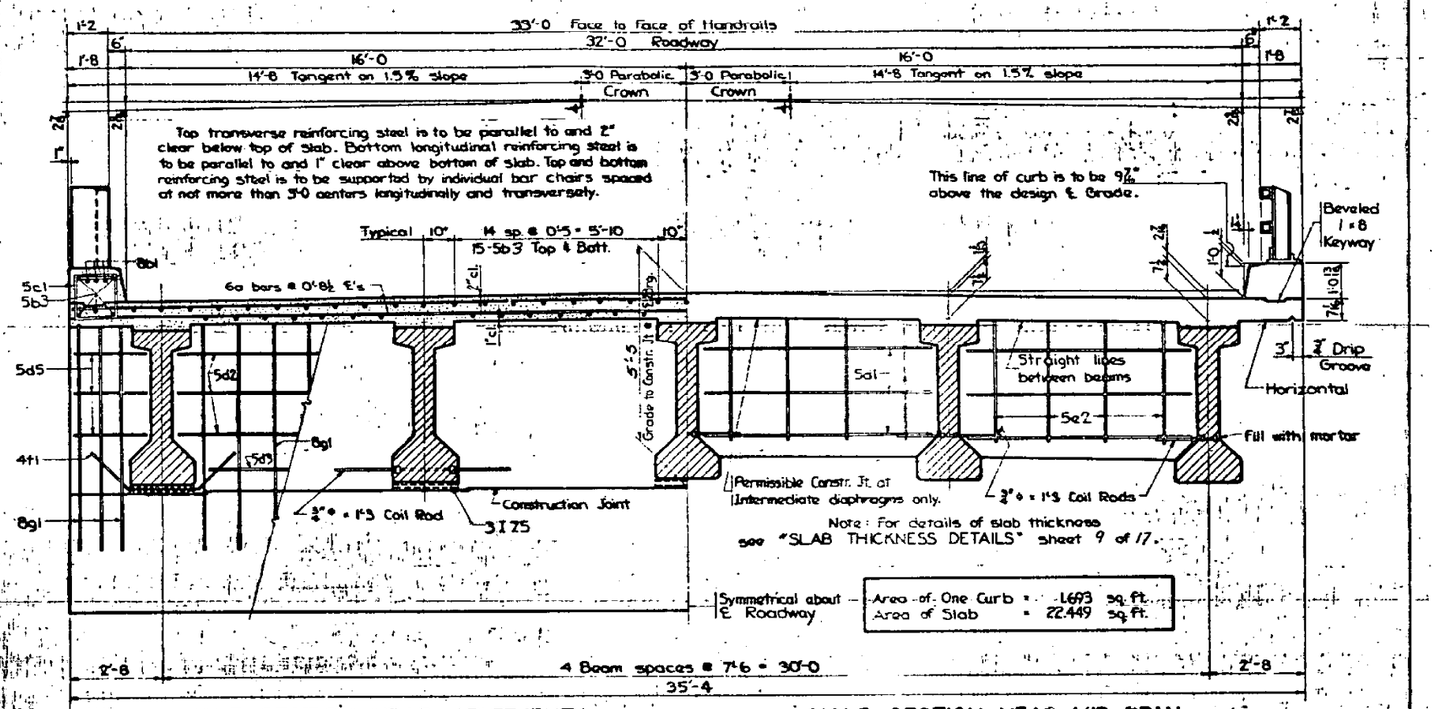
DESIGNED BY R. Rigsby
DETAILED BY R. Rigsby
TRACED BY R. Rigsby
CHECKED BY J. Phillips

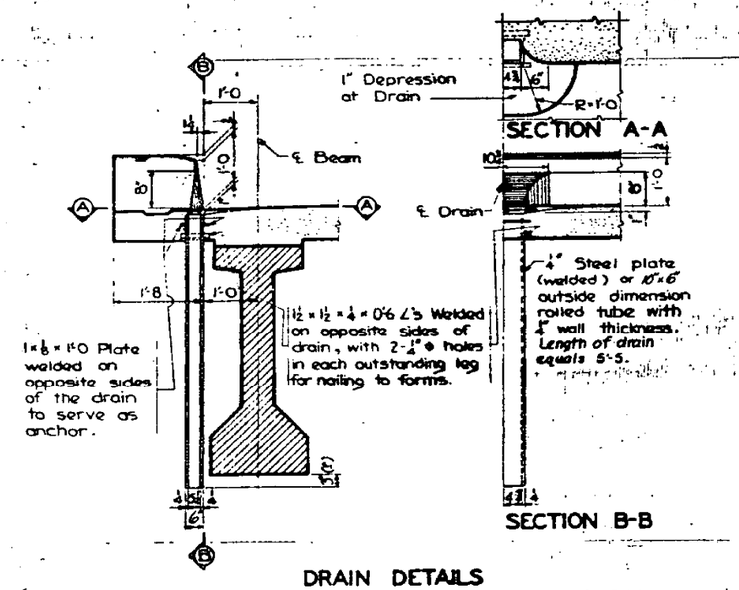
32' RDWY-PPCB "D" BEAMS PART PLAN & LONGIT. SECTION (R.A.) 7°31'-5°00' SKEWS STANDARD SHEET

JOHNSON COUNTY

PROJECT NUMBER I-IG-380-6(7)247--04-52

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		99	110



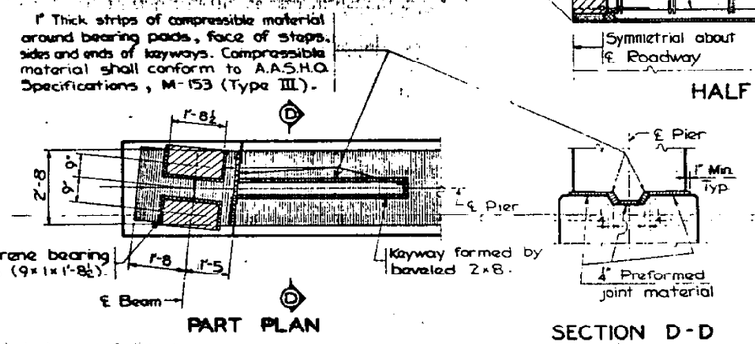


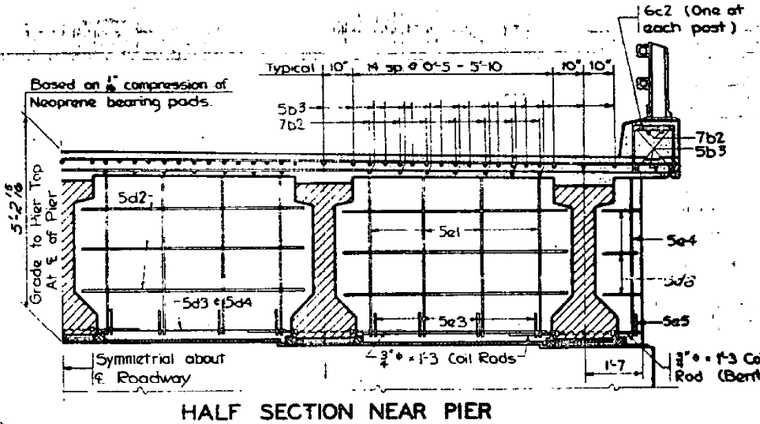
DRAIN DETAILS

6 Drains required. See "Situation Plan" on sheet 1 of 17 for location. Drains are to be galvanized. Cost of drains is to be included in the price bid for "Structural Concrete". Weight of each drain = 146 lbs.

SUPERSTRUCTURE NOTES:

This bridge is designed for two lanes of HS20-44 loading plus an allowance of 20 lbs. per square foot of roadway for future wearing surface.
The floor slab as shown includes 1/2" integral wearing surface.
The pier and abutment diaphragm concrete is to be placed monolithically with the floor slab.
Cost of bearing material is to be included in price bid for "Pretensioned Prestressed Concrete Beams".
Cost of all preformed joint and compressible materials is to be included in price bid for "Structural Concrete".
All beams are to be set vertical.
Forms for slab and curb are to be supported by the prestressed concrete beams.
All exposed corners 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.
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.





PIER TOP DETAILS

DESIGN FOR 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE
40'-9 & 45'-9 END SPANS 86'-6 INTERIOR SPANS

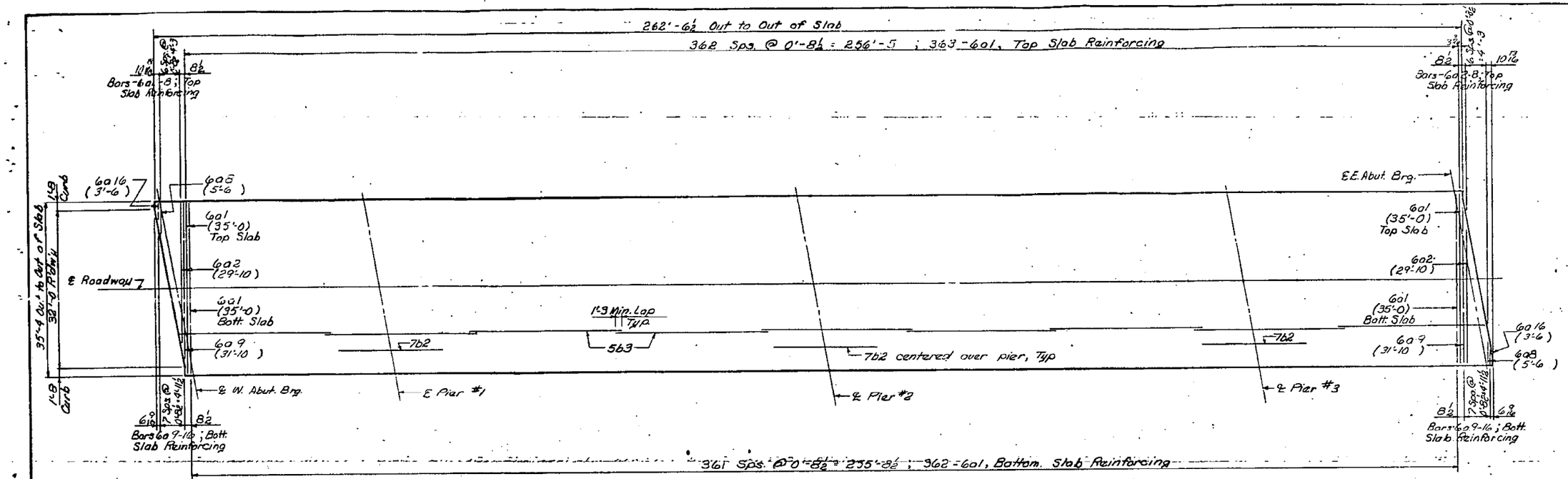
SUPERSTRUCTURE DETAILS

STATION 1737+17.89 ℄ I-380 (O.R.)
STATION 20+31.56 COUNTY RD. 51 (I) (O.R.)
February 1970
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DES. SHT. NO. 7 OF 17 FILE NO. 22960 DES. NO. 1968

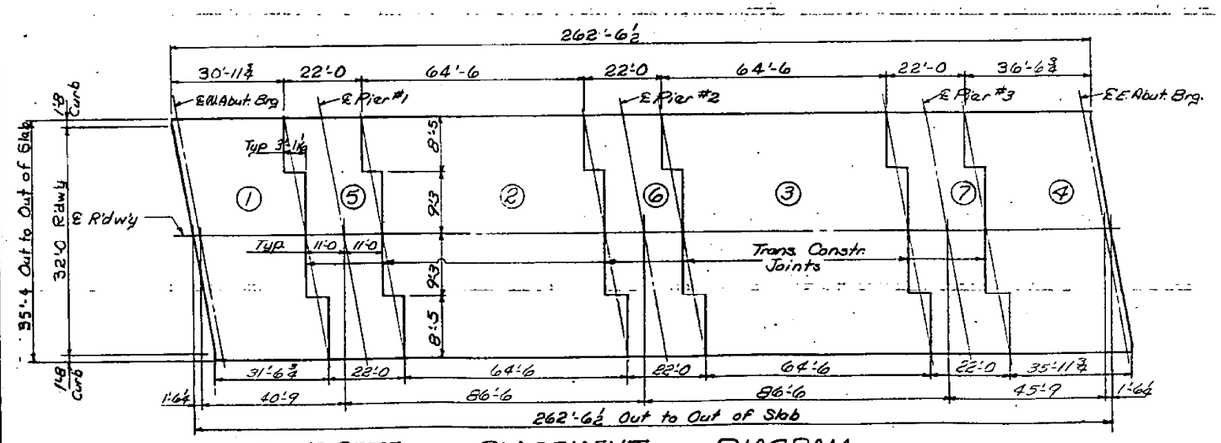
DESIGNED BY
DETAILED BY
TRACED BY
CHECKED BY

32'-RDW'Y - PPCB "D" BEAMS	CROSS SECTION	(R.A.) SKEWS	STANDARD SHEET	JOHNSON COUNTY	I-IG-380-6(7)247--04-52

STATE	SEC. ROAD SYS. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA				



TRANSVERSE AND LONGITUDINAL REINFORCING DIAGRAM



CONCRETE PLACEMENT DIAGRAM

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. All slab reinforcing steel is to be in place before any section is placed. 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 results.

DESIGNED BY: [illegible] TRACED BY:
DETAILED BY: [illegible] CHECKED BY: L. Rollins

DESIGN FOR: 9° SKEW

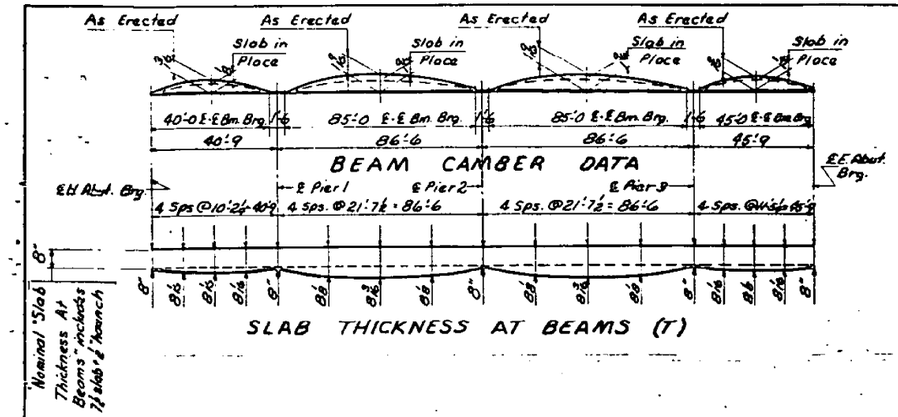
39'-6 to 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 & 45'-9 END SPANS 63'-6 INTERIOR SPANS

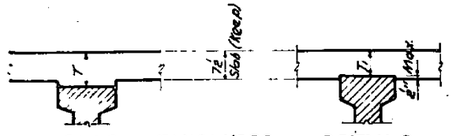
SUPERSTRUCTURE DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. S1 (3) (O.R.)
February 1970
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION
DES. SHT. NO. 8 OF 17 FILE NO. 22900 DES. NO. 868

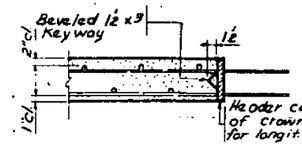
JOHNSON COUNTY

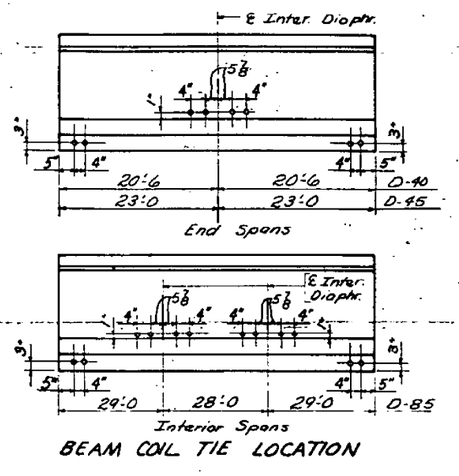
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	3		121	170



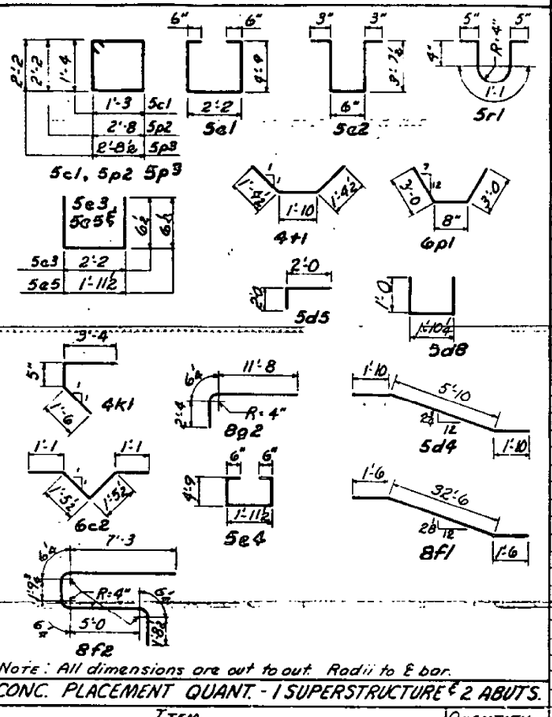


Note: The slab thickness (T) of beams is based on the anticipated beam camber remaining after placing the slab, but is not guaranteed for construction. If beam is under cambered, increase slab thickness (T) at beams to compensate. If beam is over cambered, the slab thickness (T) may be decreased to a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





BENT BAR DETAILS



CONC. PLACEMENT QUANT. - 1 SUPERSTRUCTURE ℄ 2 ABUTS.

ITEM		QUANTITY
Abutment Footing	2@ 18.4	36.8
" Wings	4@ 1.95	7.8
End Posts	4@ 0.4	1.6
*Paving Block	2@ 0.7	1.4
Curbs & Light Pole Base	2@ 17.5	35.0
Slab, Sections	1	51.0
" "	2 & 3 2@60.1	120.2
" "	4	55.2
" "	5 6 & 7 3@ 31.4	94.2
TOTAL - Cu. Yds.		403.2

*May be Class "C" or Class "D" at contractors option.

ESTIMATED QUANT. - 1 SUPERSTRUCTURE ℄ 2 ABUTS.

ITEM		QUANTITY
Structural Concrete **		403.2 Cu. Yds.
Reinforcing Steel		88,412 lbs.
Class 20 Excavation		110 Cu. Yds.
Granular Backfill		108 Cu. Yds.
Pretensioned Prestressed Concrete Beams	D40 (40'-0")	5 Nº
	D45 (45'-0")	5 Nº
	D85 (85'-0")	10 Nº
10BP42 Steel Bearing Piling	Furnish @ 40'-9" & 45'-9" E. Abut. w. Abut.	672 L.F.
	Drive @ 40'-9" & 45'-9" E. Abut. w. Abut.	672 L.F.

** The slab, curbs, wings and end posts, 36.0 cu. yds. are Class "D" concrete. The remainder, 38.2 cu. yds. is Class "C" concrete.

REINF. BAR LIST - 1 SUPERSTRUCTURE ℄ 2 ABUTS.

BAR	LOCATION	SHAPE	Nº	LENGTH	WEIGHT
6g1	Slab Transverse, Top & Bottom		725	35'-0	38113
6g2-8	" " , Top		14	Varies	372
6g9-16	" " , Bottom		16	Varies	425
8b1	Curb, Top @ Abutments		12	19'-0	609
7b2	Slab & Curb, Longit. over Piers		96	21'-8	4252
5b3	" & " , Longitudinal		693	30'-3	21865
5c1	Curb Hoops	13	452	5'-11	2789
6c2	" @ Rail Posts	V	66	5'-0	496
5d1	Intermediate Diaphr., Longit.		144	6'-7	989
5d2	Pier & Abut. Diaphragm, Longit.		96	6'-8	668
5d3	" & " " " "		32	5'-5	181
5d4	Pier Diaphragm, Longitudinal		12	9'-6	119
5d5	Abut. Diaphragm, Ends		12	3'-11	49
5d6	" " , Longitudinal		10	35'-7	371
5d7	" " Extension, Longit.		48	9'-3	463
5d8	Pier Diaphragm, Ends		18	3'-8	69
5e1	Pier Diaphragm Hoops		48	12'-4	617
5e2	Intermediate Diaphr. Hoops		96	7'-11	793
5e3	Pier Diaphragm Hairpins		48	3'-1	154
5e4	" " Hoops, Ends		6	12'-2	76
5e5	" " Hairpins, Ends		6	2'-11	18
8f1	Abut., Longitudinal		18	35'-6	1706
8f2	" Extension, Longitudinal		16	17'-4	740
8g1	Abut. Vertical, B.F. & F.F.		126	7'-3	2439
8g2	" Diaphr., Vertical, B.F.		58	14'-6	2245
6g3	" Extension, Vertical		40	6'-10	411
5h1	Abut. Wing & End Post, Horiz.		72	6'-8	501
5h2	" to Wing Anchor		8	3'-0	25
4h3	End Post, Horizontal		8	4'-0	21
4k1	Paving Notch, Transverse		58	5'-2	200
6p1	Abutment, Bottom @ Piles		24	6'-8	240
5p2	" , Hoops		124	10'-5	1347
5p3	" , " , Ends		16	10'-6	175
5r1	Paving Block Lifting Hoops		8	2'-5	20
5s1	Wing, Vertical		56	Varies	900
5s2	End Post - Wing, Vertical		40	3'-9	156
5s3	" " - " , "		24	3'-0	75
4f1	Under Beams @ Abutments		10	4'-6	90
10BP42	Pile Spiral ½" ø Rod		16	38'-6	103
	Spiral Spacers, @ 10.69		32	1'-10	40
	Two Light Pole Bases (Sht 12 of 17)				230
				TOTAL - lbs	84,392

DESIGN FOR: 9° 55' SKEW

259'-6 ± 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

40'-9 & 45'-9 END SPANS — 86'-6 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (I) (O.R.)
JOHNSON COUNTY

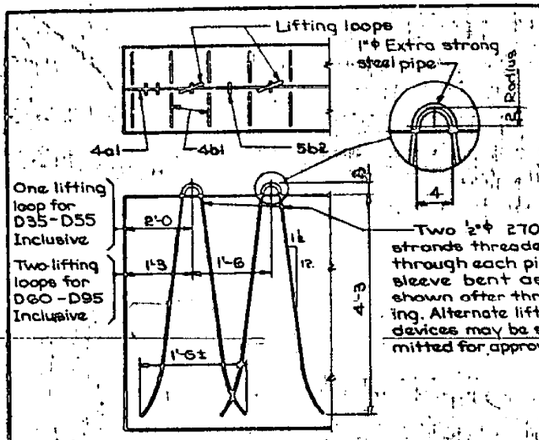
ZONE — STATE HIGHWAY COMMISSION

DES. SHT. NO. 9 OF 17 — FILE NO. 22960 — DES. NO. 6310

DESIGNED BY: — TRACED BY: R. Gregory
DETAILED BY: — CHECKED BY: T. Stallings

32' RDWY - PPCB "D" BEAMS | BAR LIST & SUPERSTR. DETAILS | 7°31'-15°00' SKEWS | STANDARD SHEET 4188 | JOHNSON COUNTY | Proj. Number I-IG-380-6(7) 247--09-52

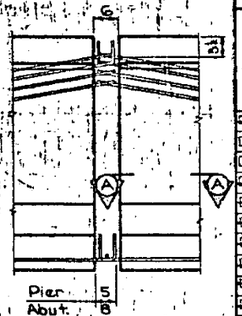
Revised 8-22-69 Length of Bar 4a1 and total reinforcing steel quantities for Beams D85, D90 and D95 changed.
Revised 8-6-69 Beam designation numbers changed.
Revised 6-17-69 Section A-A added, Beam data and Reinforcing Bar List revised.



LIFTING LOOP DETAIL



Four bottom strands, all top straight strands of Beams D35 through D60 and four top harped strands of Beams D65 through D95 are to be cut with 1'0 projections which are to be shop bent as shown and to clear those from the adjacent span. Remaining harped strands of Beams D65 through D95 are to be cut with 0'-5 projection and bent to clear. The remaining strands shall be cut off reasonably flush with the concrete.



STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

BEAM DATA

Beam	Span Length c/c Bearing	Overall Beam Length (L)	Strand Size	No. of Strands: Straight	No. of Strands: Harped	Total Initial Prestress Kips	Hold Down Force - Kips	Camber (in.) At Release	Camber (in.) After Looseo	Deflection (in.) Δ0: Immediate① (Elastic) Δ1	Deflection (in.) Δ0: Time② (Plastic) Δ7	Permissible Spacing: H20 Loading	Permissible Spacing: H520 Loading	Weight (Tons)	Concrete (C.Y.)	Reinforcing Steel - (lb)
D35	35'-0	36'-0	½"ϕ	14	—	404.6	—	0.08	0.12	0.02	0.01	8'-6	7'-6	12.0	5.9	547
D40	40'-0	41'-0	½"ϕ	14	—	404.6	—	0.10	0.15	0.04	0.01	8'-6	7'-6	13.6	6.7	490
D45	45'-0	46'-0	½"ϕ	14	—	404.6	—	0.11	0.16	0.07	0.02	8'-6	7'-6	15.3	7.6	511
D50	50'-0	51'-0	½"ϕ	16	—	462.4	—	0.16	0.22	0.11	0.03	8'-6	7'-6	17.0	8.4	565
D55	55'-0	56'-0	½"ϕ	19	—	549.1	—	0.18	0.26	0.17	0.04	8'-6	7'-6	18.6	9.2	631
D60	60'-0	61'-0	½"ϕ	21	—	606.9	—	0.23	0.32	0.23	0.06	8'-6	7'-6	20.3	10.0	674
D65	65'-0	66'-0	½"ϕ	12	6	520.2	21.9	0.40	0.58	0.33	0.08	8'-6	7'-6	22.0	10.8	868
D70	70'-0	71'-0	½"ϕ	16	6	635.8	20.1	0.62	0.91	0.44	0.11	8'-6	7'-6	23.6	11.7	980
D75	75'-0	76'-0	½"ϕ	18	8	693.6	23.7	0.88	1.00	0.57	0.14	8'-6	7'-6	25.3	12.5	1090
D80	80'-0	81'-0	½"ϕ	18	8	751.4	23.3	0.85	1.22	0.74	0.18	8'-6	7'-6	27.0	13.3	1086
D85	85'-0	86'-0	½"ϕ	20	10	867.0	27.5	1.09	1.56	0.93	0.22	8'-6	7'-6	28.6	14.1	1134
D90	90'-0	91'-0	½"ϕ	24	10	982.6	24.7	1.40	2.01	1.16	0.28	8'-6	7'-6	30.4	15.0	1286
D95	95'-0	96'-0	½"ϕ	26	10	1040.4	23.4	1.59	2.36	1.42	0.35	8'-6	7'-6	31.9	15.8	1478

① Deflections due to weight of slab and diaphragm. The deflections shown are for a slab weight of 703 #/ft. (7½" slab and 7'-6 beam spacing) and diaphragm weight of 2556 lb. at ℄ of span for D35 to D60 inclusive and at ⅓ points for D65 to D95 inclusive. For different slab and diaphragm weights, deflections will be directly proportional.

② Total beam deflection at ℄ of span, Δ0, due to weight of slab and diaphragms for detailing purpose:
(A) $\Delta_0 = \Delta_1 + \Delta_T$ for simple span.
(B) $\Delta_0 = \Delta_1 + \frac{3}{4}\Delta_T$ for end spans of continuous bridge.
(C) $\Delta_0 = \Delta_1 + \frac{1}{2}\Delta_T$ for interior spans of continuous bridge.

NOTES:

These beams are designed for AASHO live loads as indicated in above table with an allowance of 20 lb. per square foot of roadway for future wearing surface.

All prestressing strands are to be ½"ϕ 270K grade.

Unless otherwise noted all beams are to be increased in length by .00055 L to compensate for elastic shortening, creep and shrinkage.

Hold down points for harped strands may be moved toward ends of beam a distance of .025L maximum at producer's option.

Tops of beams are to be struck off level and artificially roughened as directed by the Iowa Highway Commission Materials Department.

Bearings shall be as detailed on other design sheets.

Beams to be used in bridges made continuous by the poured in place floor are to be at least 28 days old before the floor is placed unless a shorter curing time is approved by the Bridge Engineer.

Contact surfaces between beam and abutment and pier diaphragms shall be roughened by sandblasting or other approved means to improve bond.

DESIGN STRESSES:

Design Stresses for the following materials are to be in accordance with AASHO Standard Specifications for Highway Bridges, Series of 1969:

Reinforcing Steel in accordance with Section 1.5.1.D
$f_s = 20{,}000$ psi.

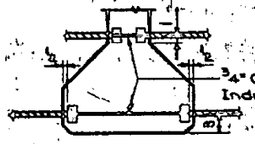
Prestressing Steel and Concrete in accordance with Section 1.6.7 $f'_s = 270{,}000$ psi.; $f'_c = 5000$ psi.

SPECIFICATIONS:

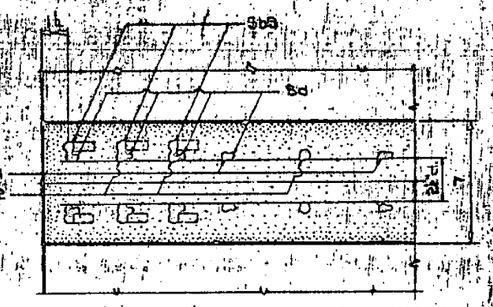
CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, Series of 1964, with current applicable Special Provisions and Supplemental Specifications.

DESIGN: AASHO, Series of 1969, with minor modifications.

Number and exact location of coil ties to be as detailed on specific bridge design.



COIL TIE DETAIL

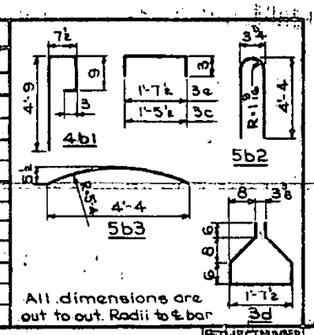


SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

REINFORCING BAR LIST

Beam / Span	D35 35'-0		D40 40'-0		D45 45'-0		D50 50'-0		D55 55'-0		D60 60'-0		D65 65'-0		D70 70'-0		D75 75'-0		D80 80'-0		D85 85'-0		D90 90'-0		D95 95'-0	
Bar / Shape	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length
4a1	2	4'-0	2	4'-0	2	4'-0	2	4'-0	—	—	—	—	2	4'-0	2	4'-0	2	4'-0	2	4'-0	2	16'-0	2	18'-0	2	20'-0
a2	—	—	—	—	—	—	—	—	—	—	—	—	5/2	22'-1	5/2	23'-7	5/2	25'-1	5/2	26'-7	5/2	28'-7	5/2	30'-1	6/2	31'-11
a3	—	—	—	—	—	—	—	—	—	—	—	—	6/2	25'-0	6/2	27'-0	6/2	28'-0	6/2	30'-0	6/2	32'-0	7/2	34'-0	8/2	36'-0
4b1	66	6'-2	74	6'-2	74	6'-2	86	6'-2	94	6'-2	102	6'-2	106	6'-2	114	6'-2	124	6'-2	132	6'-2	136	6'-2	148	6'-2	160	6'-2
5b2	6	8'-9	6	8'-9	6	8'-9	6	8'-9	8	8'-9	8	8'-9	8	8'-9	10	8'-9	10	8'-9	10	8'-9	10	8'-9	12	8'-9	12	8'-9
5b3	4	4'-5	4	4'-5	4	4'-5	4	4'-5	8	4'-5	8	4'-5	8	4'-5	12	4'-5	12	4'-5	12	4'-5	12	4'-5	16	4'-5	16	4'-5
8c	33	1'-11	37	1'-11	39	1'-11	43	1'-11	47	1'-11	51	1'-11	53	1'-11	57	1'-11	62	1'-11	66	1'-11	68	1'-11	74	1'-11	80	1'-11
8d	33	5'-5	37	5'-5	39	5'-5	43	5'-5	47	5'-5	51	5'-5	53	5'-5	57	5'-5	62	5'-5	66	5'-5	68	5'-5	74	5'-5	80	5'-5
8e	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	12	2'-1	14	2'-1	14	2'-1	14	2'-1	14	2'-1	14	2'-1	16	2'-1

A/B
A=Bar Mk
B=Bar №



All dimensions are out to out. Radii to ℄ bar

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

40'-9 ℄ 45'-9 END SPANS — 86'-6 INTERIOR SPANS

BEAM DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. S1 (I) (O.R.)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES SHT. NO. 10 OF 17 — FILE NO 22960 — DES NO. 860

DESIGNED BY: R. Rogers
DETAILED BY:
TRACED BY: R. Rogers
CHECKED BY: L. Wilson

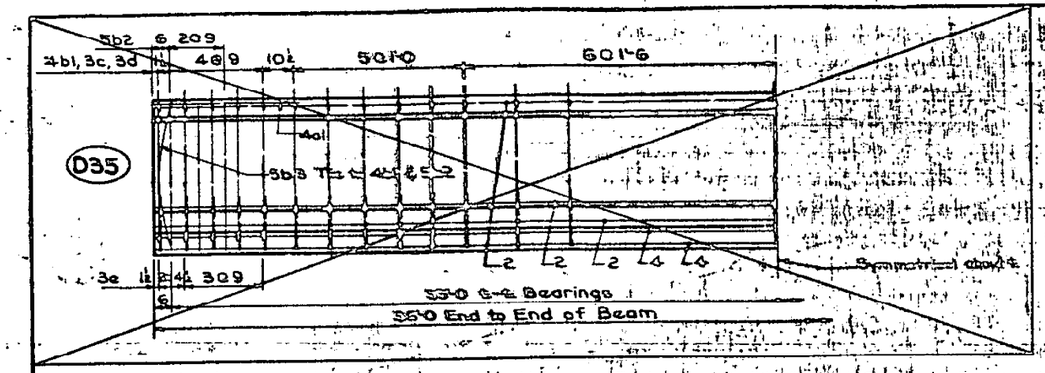
PRESTRESSED BEAM DETAILS - PC68D

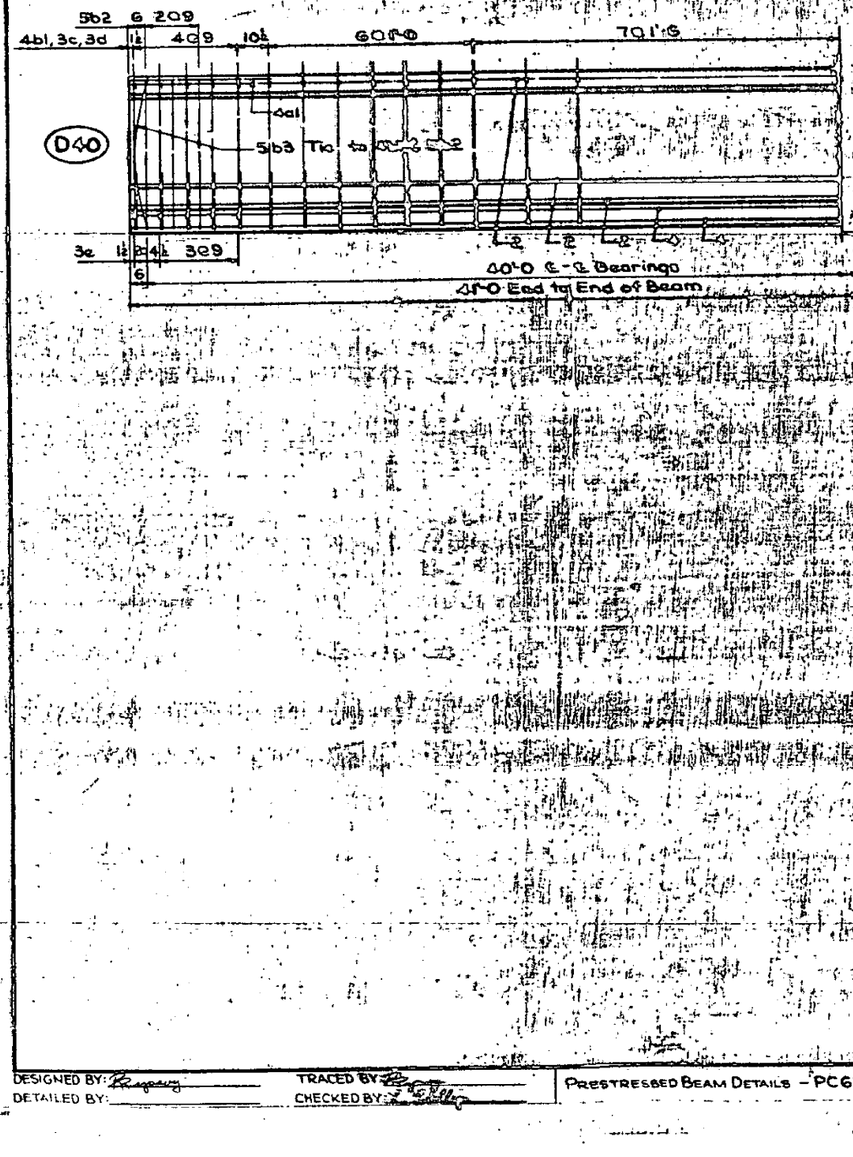
STANDARD SHEET 4070

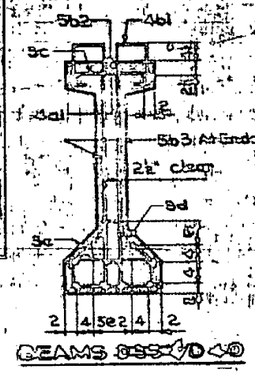
JOHNSON COUNTY

PROJECT NUMBER: I-IG-380-6(7)247--04-52

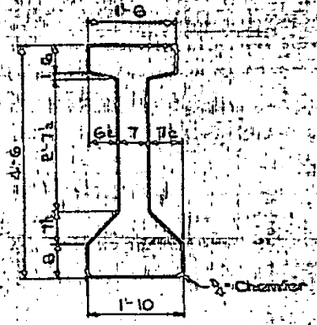
STATE	FED ROAD DIST. №	FISCAL YEAR	SHEET №	TOTAL SHEETS
IOWA	5		109	110







BEAMS @ ENDS



TYPICAL "D" BEAM CROSS SECTION

Area = 638.75 in²
ȳb = 24.85 in
I = 214,975 in⁴

DESIGN FOR: 8" 59' SPACE

859-6 @ 52' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

60'-9 & 45'-9 END SPANS — 60'-6 INTERIOR SPANS

BEAM DETAILS

STATION 1737+17.89 & I-380 (O.R.)
STATION 20+31.56 COUNTY RD. S1(E) (O.R.)

JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION — STATE HIGHWAY COMMISSION

DES. SHT. NO. 11 OF 17 — FILE NO. 22960 — DES. NO. 630

February 1976

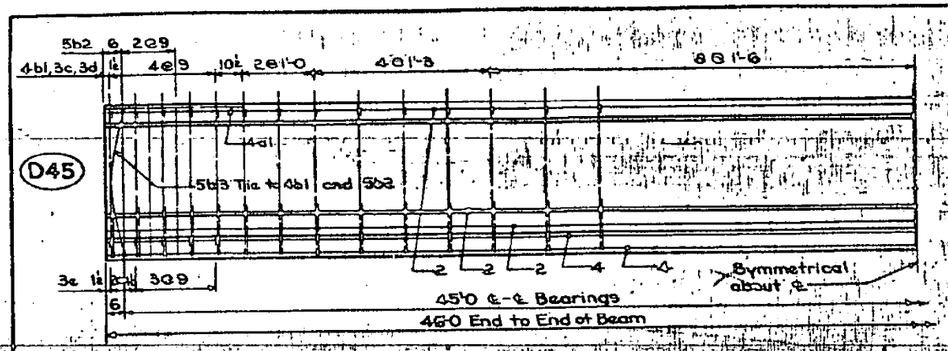
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DETAILED BY: [illegible] CHECKED BY: [illegible]

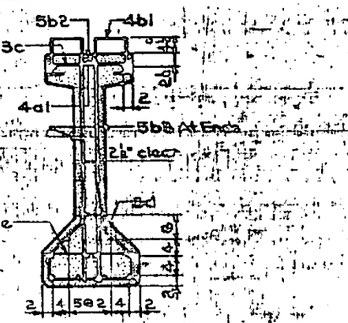
PRESTRESSED BEAM DETAILS - PC68D

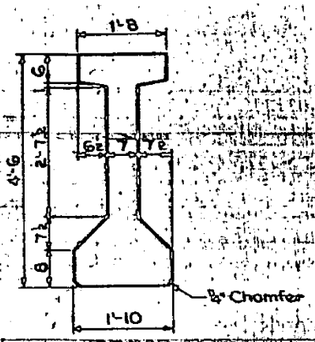
STANDARD SHEET 4066

JOHNSON COUNTY

PROJECT NUMBER	STATE	FED ROAD DIST. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
I-IG-380-6(7)247--04-52	TOWA	5		166	170

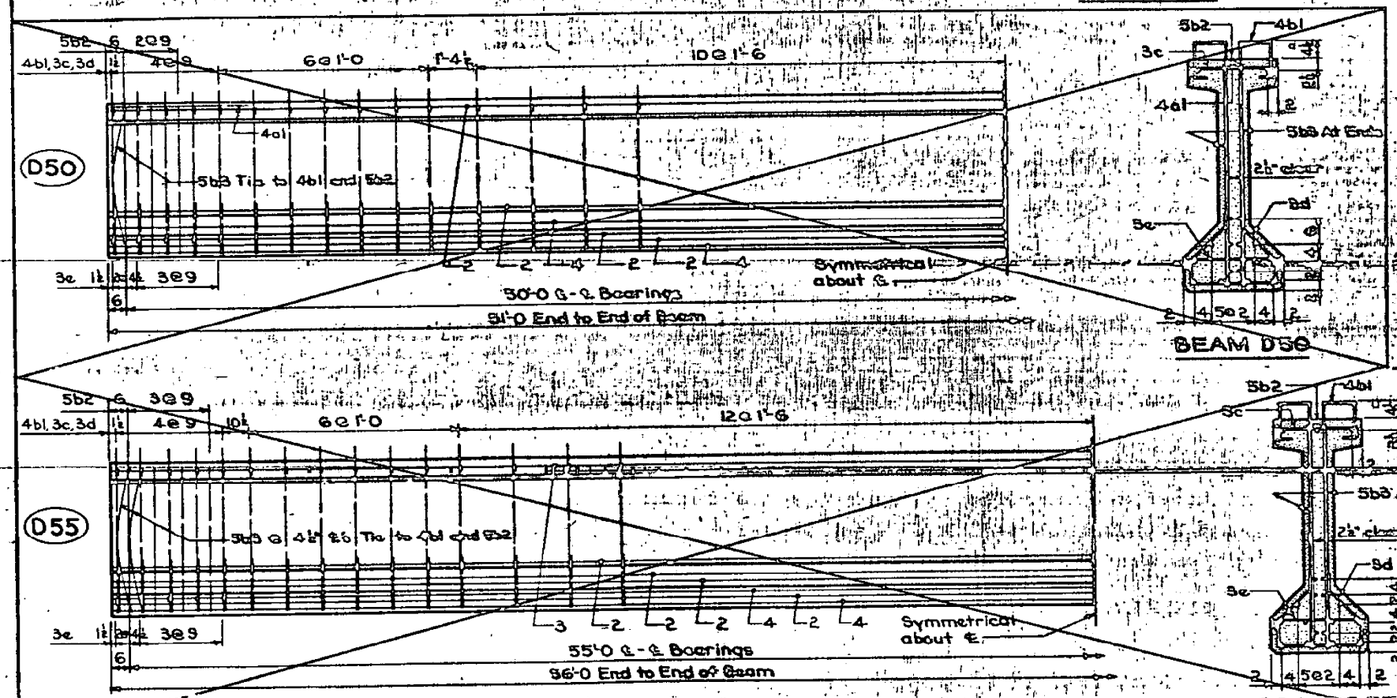


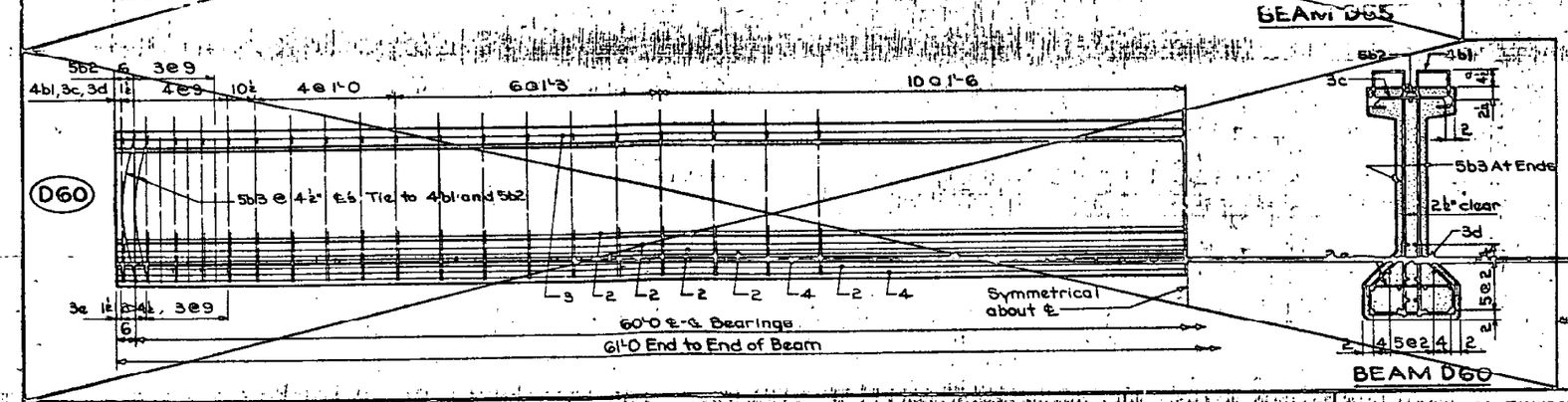




TYPICAL "D" BEAM CROSS SECTION

Area = 638.75 in.²
$\bar{Y}_b$ = 24.35 in.
I = 214,975 in.⁴





DESIGN FOR: 9° 55' SKEW

259'-6 & 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

DR-6 INTERIOR SPANS

BEAM DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (I) (O.R.)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 12 OF 17 FILE NO. 22960 DES. NO. 868

Keep

Revised 3-6-68: Beam designation numbers changes.

DESIGNED BY: [illegible] TRACED BY: [illegible]
DETAILED BY: CHECKED BY: [illegible]

PRESTRESSED BEAM DETAILS - PC 680

STANDARD SHEET 4067

JOHNSON COUNTY

PROJECT NUMBER: I-IG-380-6(7)247--04-52

STATE	FED ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	6		145	148

Revised (2-1-69): Number of strands in D11, D12 and D15 changed.
Revised 3-6-69: Beam designation numbers changed.
Revised 8-22-69: Length of Bar 4a1 in Beams D85, D90 and D95 changed.

D85

5b2 4@3½ 2@9 5@9 8@1'-2 30 @ 8 22@1'-8

4b1, 3c, 3d

2-5a2 2-6a3

4a1

5b3 @ 3" ctrs to 4b1 & 5b2

4a2

L2 L2 L6 L4 L0

3a 1½ 3@3 3@9

6

8'-6

Symmetrical about ℄

85'-0 ℄-℄ Bearings

85'-0 End to End of Beam

BEAM D85

TYPICAL "D" BEAM CROSS SECTION

5b2 4b1 5c 4a2 3a 2½ 2½ 5a2, 6a3 4a1 5b3 At Ends 2½" clear 3c 3d 22-4 Straight Strands 40-2 Harped Strands 2 9sp @ 2 2

1'-8 4'-6 2'-7 6½ 7 7½ 8 7½ 3/4" Chamfer 1'-10

D90

5b2 4@3½ 8@9 5@9 4@11⅝ 5@1'-2 22@1'-5

4b1, 3c, 3d

2-8a2 2-7a8

4a1

5b3 @ 3" ctrs to 4b1 & 5b2

4a2

L2 L2 L6 L6 L10

3a 1½ 3@3 3@9

6

Symmetrical about ℄

90'-0 ℄-℄ Bearings

91'-0 End to End of Beam

BEAM D90

Area = 638.75 in²
Yb = 24.35 in
I = 214,915 in⁴

5b2 4b1 3c 4a2 3a 2½ 2½ 5a2, 6a3 4a1 5b3 At Ends 2½" clear 3c 3d 22-4 Straight Strands 40-2 Harped Strands 2 9sp @ 2 2

D95

5b2 4@3½ 8@9 5@9 2@1'-0 ℄ 1'-1½ 26 @ 1'-4

4b1, 3c, 3d

2-6a2 2-8a3

2'-0

4a1

5b3 @ 3" ctrs to 4b1 & 5b2

4a2

L2 L2 L8 L6 L10

3a 1½ 3@3 4@9

6

9'-6

Symmetrical about ℄

85'-0 ℄-℄ Bearings

86'-0 End to End of Beam

BEAM D95

5b2 4b1 3c 4a2 3a 2½ 2½ 4a1 5b3 At Ends 2½" clear 3c 3d 22-4 Straight Strands 40-2 Harped Strands 2 9sp @ 2 2

D

℄-℄ Bearings
End to End of Beam

Symmetrical about ℄

BEAM D

▲ DIMENSIONS AT END OF BEAM
◇ KEEP

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

40'-9 ℄ 45'-9 END SPANS 48'-8 INTERIOR SPANS

BEAM DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (I) (O.R.)

February 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 13 OF 17 FILE NO. 22960 DES. NO. 680

DESIGNED BY: R. Young
DETAILED BY:
TRACED BY: R. Young
CHECKED BY: J. Phillips

PRESTRESSED BEAM DETAILS - PC68D

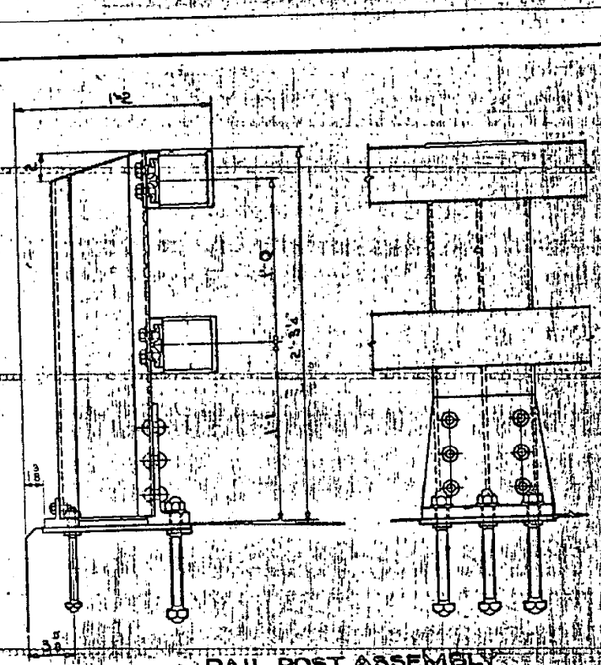
STANDARD SHEET 4069

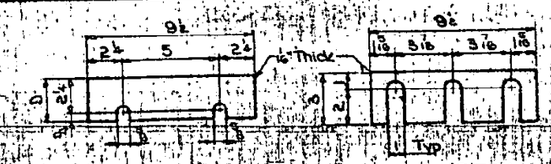
JOHNSON COUNTY

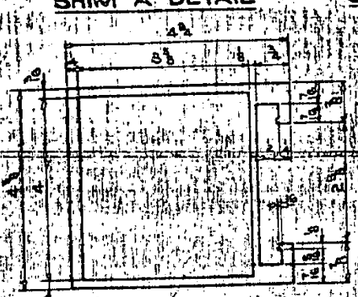
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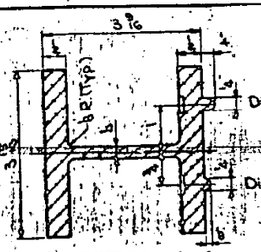
STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		106	170

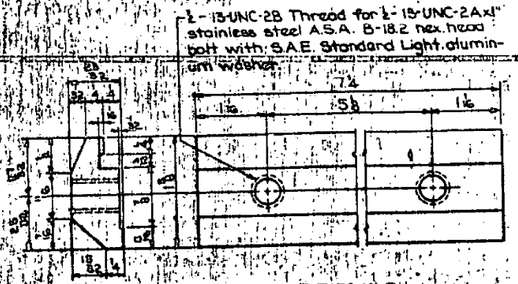
Revised 12-26-68: Added explanation for material for clamp bar bolt.
Revised 6-7-67: Red lead shop coat paint note added.
Revised 5-22-67: Material specifications for aluminum and stainless steel changed.
Revised 10-19-66: Note concerning 2"ø drain holes added.
Revised 9-23-66: Gage of holes in Post 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.

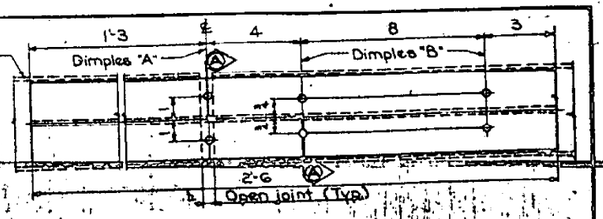


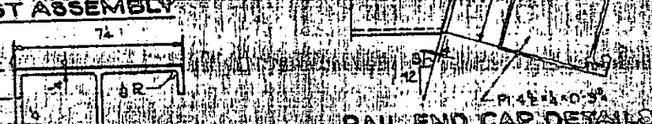


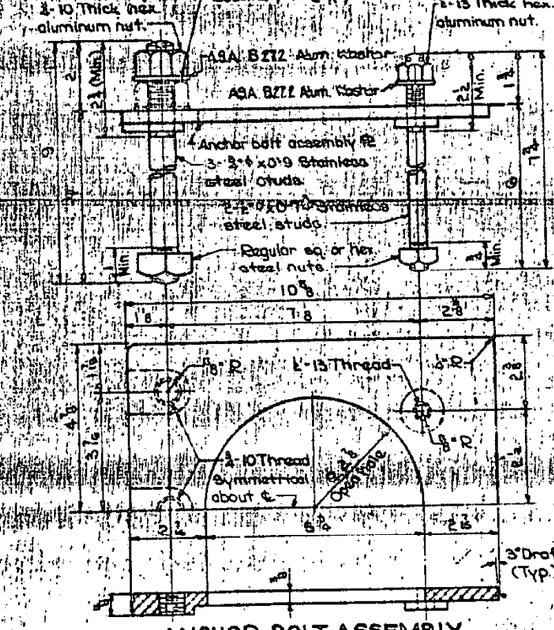


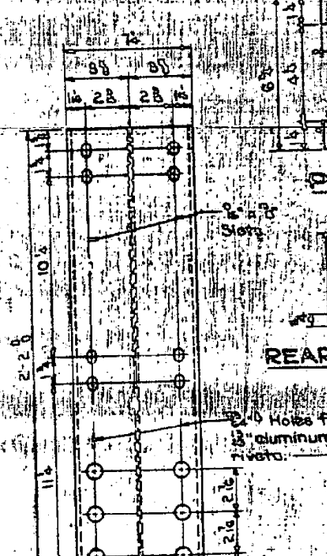


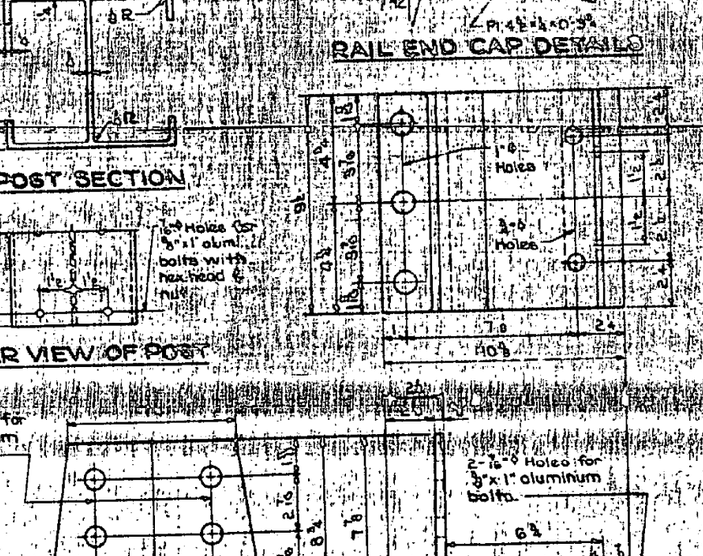


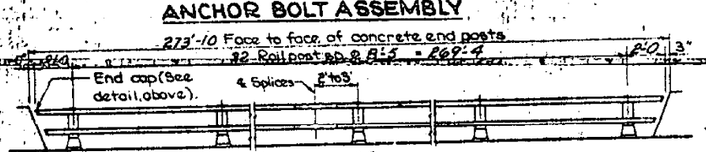












ALUMINUM HANDRAIL NOTES:

The aluminum handrail is to be bid on a lineal 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 Alclad 2024-T3 for washers and Alloy 1100-0 for shims.

Material for anchor studs shall be an 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-1.1 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. The aluminum nuts shall be thick, hexagonal, finished and shall comply with A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 for UNC threads series, class 2B fit.

Material for steel nuts shall be A.S.T.M. A-307 Grade A, and shall conform to A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 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 5G70 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).

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

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

DESIGN SPECIFICATIONS:

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

ALUMINUM HANDRAIL QUANTITIES	
Aluminum Handrail	546.7 Lin.Ft.

DESIGNED BY: R. Young
DETAILED BY:
TRACED BY: R. Young
CHECKED BY: L. Phillips

1012A

JOHNSON COUNTY

DESIGN FOR: 9"-55' SLAB

259-6 & 321 CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

(259-6 & 321-9 END SPANS) (4-5 INTERIOR SPANS)

ALUMINUM HANDRAIL DETAILS

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (T) (O.R.)

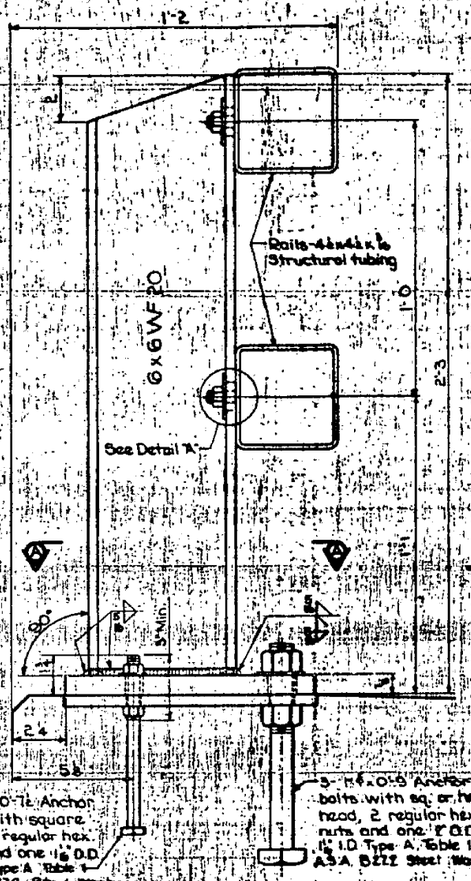
February 1970

JOHNSON COUNTY

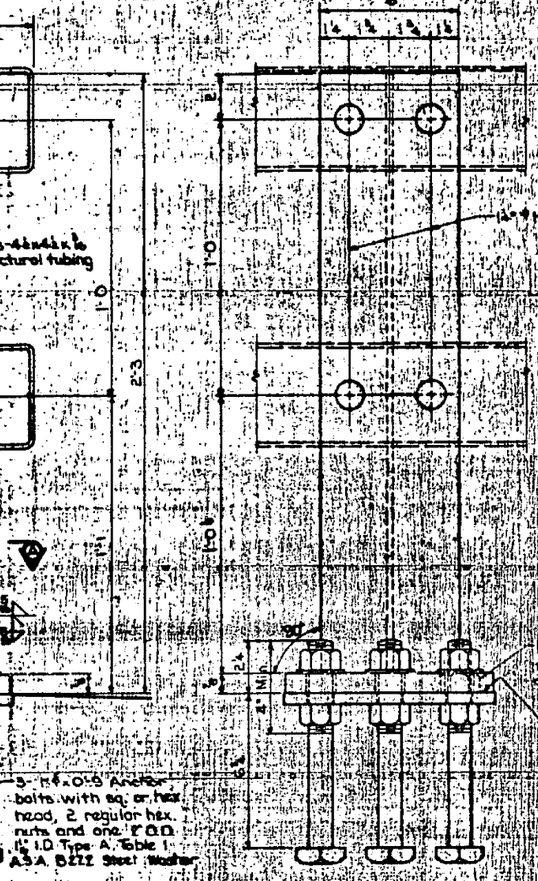
IOWA STATE HIGHWAY COMMISSION

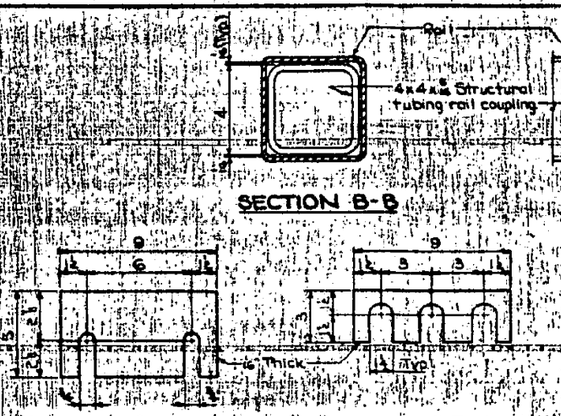
DES. SHT. NO. 14 OF 17 FILE NO. 22960 BDS NO. 630

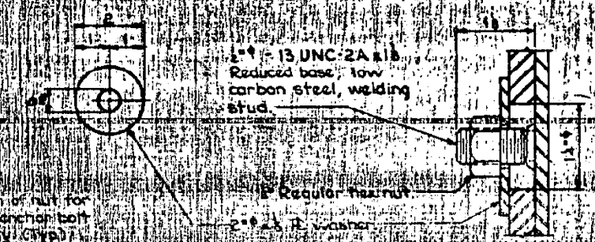
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	5		107	110



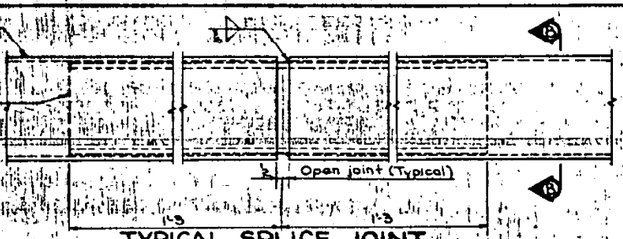
RAIL POST







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 - GIT, 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 square to axis. 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 ⅛".

No painting will be required.

Rail ends shall be provided with adequate protection during shipment.

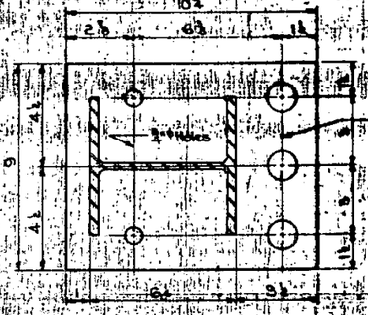


RAIL END CAP DETAILS

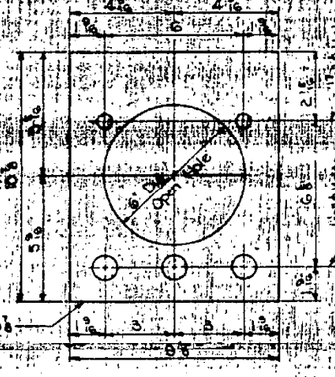
DESIGN SPECIFICATIONS:

(Designed in accordance with 1964 Interim A.A.S.H.O. Specifications.)

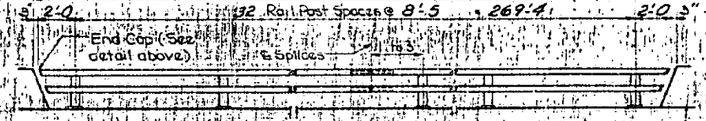
STEEL HANDRAIL QUANTITIES	
Steel Handrail	546.7 Lin. Ft.



SECTION A-A



ANCHOR CAGE DETAILS



TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

'DESIGN FOR 9° 55' SKEW'

259'-6 x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9" & 45'-9" END SPANS — 86'-6" INTERIOR SPANS

STEEL HANDRAIL DETAILS

STATION: 737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (I) (O.R.)
JOHNSON COUNTY
IOWA STATE HIGHWAY COMMISSION

February, 1970

DES. SHT. NO. 15 OF 17 | FILE NO. 22960 | DES. NO. 868

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

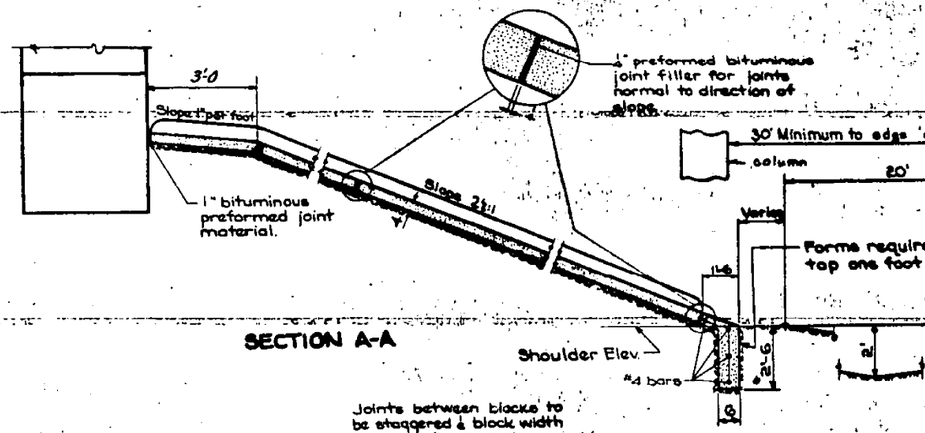
DESIGNED BY: | DETAILED BY: | TRACED BY: | CHECKED BY:

1015A JOHNSON COUNTY

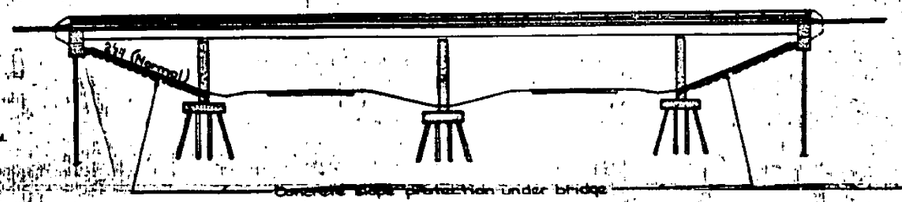
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	5		128	170

Revised 9-19-68 - Column clearance dimension changed from edge of shoulder to edge of thru lane.
Revised 9-18-68 - Form-out around column and crushed stone added.
Revised 6-1-68 - Toe of slope protection changed and ditch and column clearances dimensions added.

Revised 6-20-64 Dowel bar length changes and note added.
Revised 3-2-65 Curb added.
Revised 10-30-64 Revised for 1964 Standard Spec's.
Revised 1-19-61 Curb dowel bars added.
Revised 7-21-60 Corrected for 1960 Standard Specifications.
Revised 2-18-60 Pre-cast block construction deleted. Curb added to sides.
Revised 9-15-59 Statement concerning erosion control added.
Revised 9-4-59 Statement concerning disposal of excess earth added.

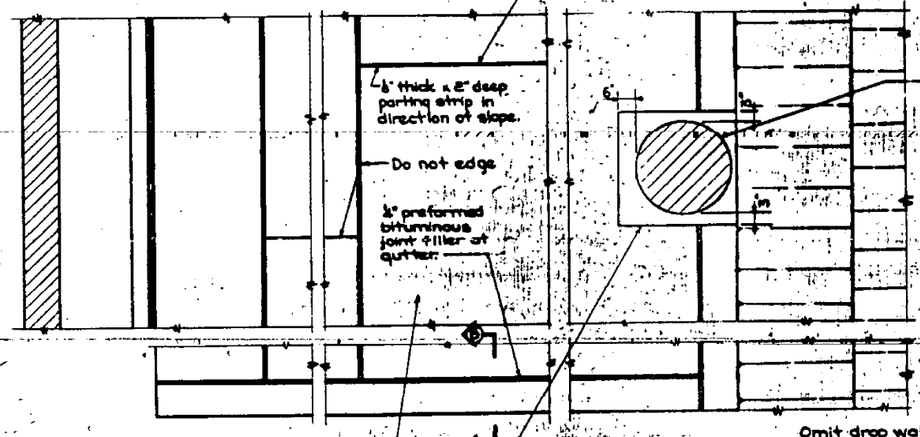


SECTION A-A

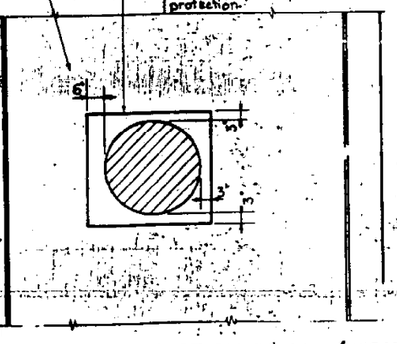


LONGITUDINAL SECTION ALONG ℄ OF ROADWAY

* Drop wall shall be 2'-6" full width except for portions that are in contact with pier footings.



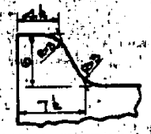
SECTION B-B



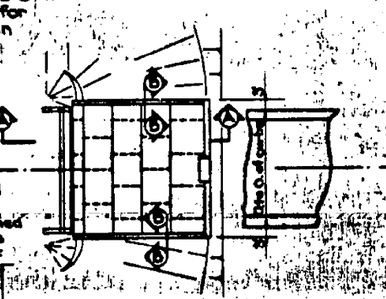
PART SLOPE PROTECTION PLAN (0°SKEW) FOR COLUMNS IN SLOPE
Scale: ½"=1'-0

Omit drop wall along pier column as shown.

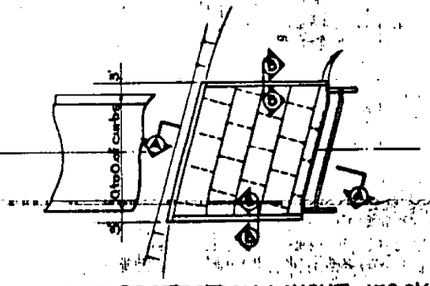
Slope protection is to be formed out around column to this line and Class A crushed stone 4" thick is to be placed in the area between column and slope protection. Cost of Class A crushed stone is to be included in the cost of slope protection.



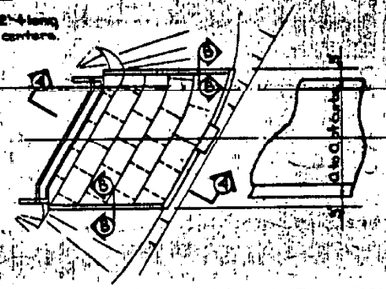
CURB DETAIL



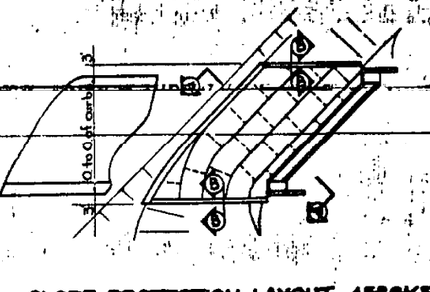
SLOPE PROTECTION LAYOUT 0°SKEW



SLOPE PROTECTION LAYOUT 15° SKEW



SLOPE PROTECTION LAYOUT 30°SKEW



SLOPE PROTECTION LAYOUT 45°SKEW

GENERAL NOTES:

This sheet shows details for placing portland cement concrete slope protection under overhead structures.

The current specifications of the Iowa Highway Commission shall apply with modifications or additions listed below:

Concrete - Class C Structural.

Finish - Class 1, Floated Surface Finish.
Cure - Cure as per current Specifications.
Subgrade Preparation - The subgrade is to be shaped and compacted so that finished slope protection will be similar to examples shown on this sheet. The subgrade shall be firm when concrete is placed. Sprinkling required shall be done early enough so that concrete is not placed on a muddy subgrade. No subgrade paper will be required.

The cast in place concrete is to be poured in approximately 10' wide courses, but all courses on one slope should have approximately equal widths. Adjacent courses shall not be poured within 15 hours of one another. The joints in the direction of the slope are to be staggered about ½ block width.

Basis of payment: Payment will be made on a square yard basis for slope protection constructed. The unit price bid per square yard is to include costs of all materials and labor required to construct this protection as shown or intended by these plans. The subgrade preparation including any necessary excavation or filling required to shape the slope to the lines shown on the plans and disposal of excess earth excavated as directed by the Engineer, are considered incidental to placing the concrete slope protection.

Pay quantities are to be based on field measured out to out dimensions.

SLOPE PROTECTION QUANT.	
Location	Quantity
East Berm	226.
West Berm	206
Total Sq. Yds.	432

Where erosion control work is completed the Contractor shall be responsible for any plant materials destroyed adjacent to slope protection area. The Contractor shall replant, reseed and remulch all areas disturbed adjacent to slope protection areas in accordance with section 2601 of Standard Specifications, Series of 1964, at his expense.

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
40'-9 CURB TO CURB SKEW 90°-0" INTERIOR SPANS

CONCRETE SLOPE PROTECTION

STATION: 1737+17.89 ℄ I-380 (O.R.)
STATION: 20+31.56 COUNTY RD. 51 (T) (O.R.)
JOHNSON COUNTY
February 1970

IOWA STATE HIGHWAY COMMISSION
DES. SHT. NO. 16 OF 17
FILE NO. 22960 DES. NO. 860

DESIGNED BY: Bgmuy
DETAILED BY:
TRACED BY: Bgmuy
CHECKED BY: L Bollinger

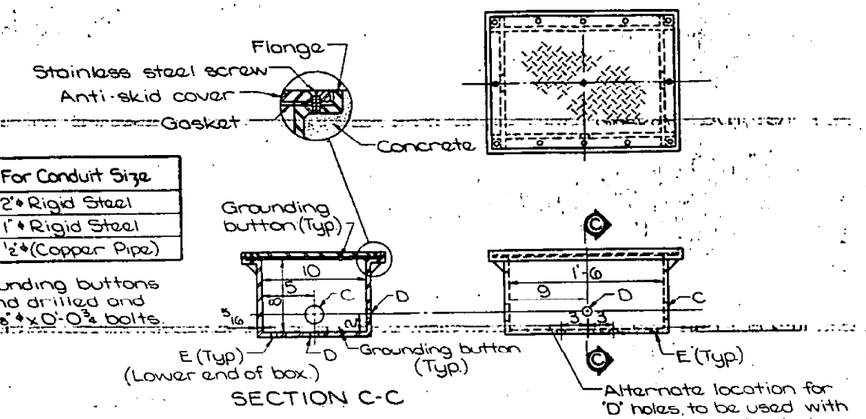
1006

JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04-52	IOWA	5		169	170

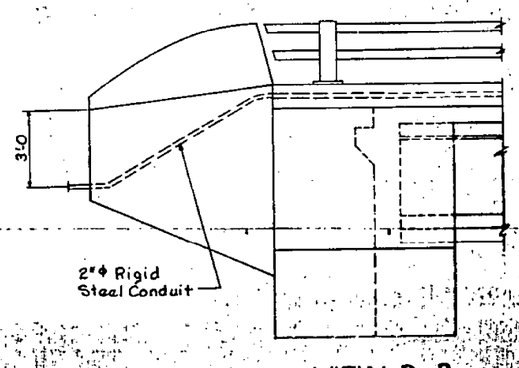
Bossed For	Hole	For Conduit Size
5 Threads	C	2"ϕ Rigid Steel
None	D	1"ϕ Rigid Steel
None	E	½"ϕ (Copper Pipe)

NOTE: The grounding buttons are to be blind drilled and tapped for $\frac{3}{8}$"ϕ x 0'-0$\frac{3}{4}$" bolts.



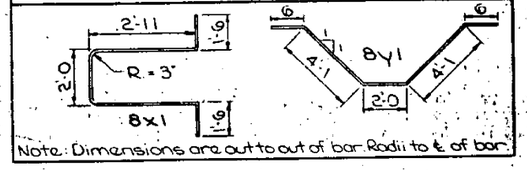
RM-9, TYPE 1 JUNCTION BOX

W/ WEATHERTIGHT, CAST IRON – FLUSH MOUNT

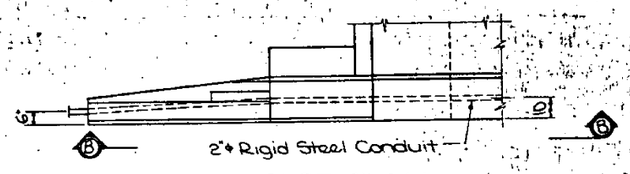


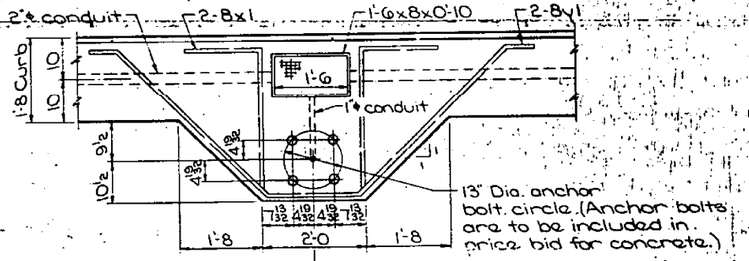
VIEW B-B

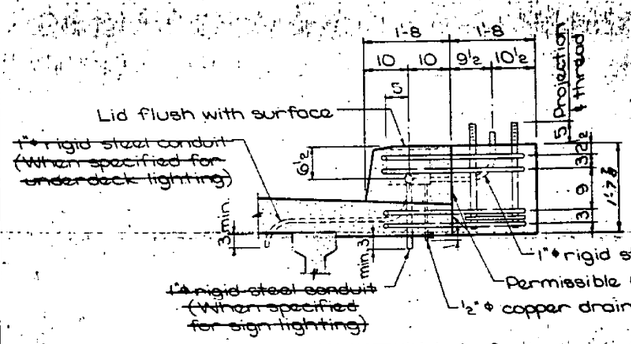
REINFORCING BAR LIST — ONE BASE					
Bar	Location	Shape	No.	Length	Weight
8x1	Pole Anchors		2	10'-3	55
8y1	Curb Anchors		2	11'-2	60
				Total lbs.	115

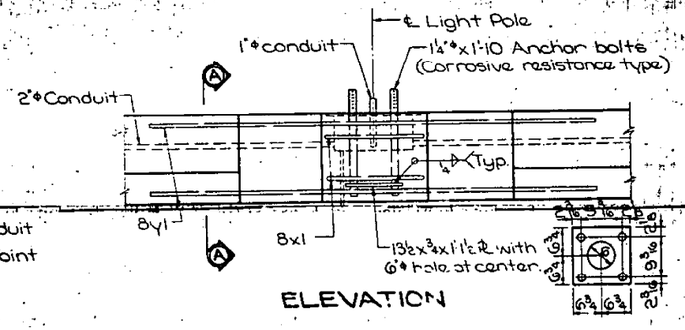


Note: Dimensions are out to out of bar. Radii to ℄ of bar.









LIGHTING NOTES:

Construction shall conform with the current Iowa State Highway Commission Standard Specifications plus current Special Provisions and current Supplemental Specifications for Highway Lighting.

~~Anchor bolts shall be corrosive resistant type~~ as specified. Stainless steel stud shall not be less than six inches in length.

After conduit runs have been installed a stiff, oversize wire brush or mandrel shall be pulled through the conduit to make certain that no appreciable foreign material remains in the conduit, and that the conduit has not been flattened or otherwise blocked during construction. Each open end of the conduit shall be threaded. Threads shall be protected with an approved bituminous compound. ~~Temporary caps or plugs shall be installed to exclude~~ dirt and moisture.

All entrance holes in junction boxes except for drain pipes shall be tapped for the specified conduit size. Grounding buttons shall be located approximately 3" from the inside surface of the box wall, and not closer than 3" to the edge of any hole in the box floor. Holes for drain pipe shall be placed in the low corner of the box, with a minimum clearance of 1" between the edge of the hole and the inside surface of the box wall. Typical details are shown on this sheet.

Location of the ℄ of light pole may be shifted ±1'-0 so that the location of the junction box does ~~not interfere~~ with the rail post anchor bolts and base plate.

The contract unit price per lineal foot of conduit shall be full compensation for furnishing all material (including junction boxes and fittings), labor and any work incidental to the installation. The concrete and weight of reinforcing steel is included in the Superstructure Estimated Quantities.

The length of conduit installed shall be measured in feet by the Engineer.

Cost of furnishing and installing poles, lights and lighting conductor is not a part of this estimate.

Note: See "Situation Plan", sheet 1 of 17 for light pole base locations.

TOTAL ESTIMATED QUANTITIES — TWO BASES	
Item	Amount
2"ϕ Rigid Steel Conduit *	583 L.F.

* Quantity includes 576 L.F. of 2"ϕ conduit and 7 L.F. of 1"ϕ conduit.

Note: Quantities for concrete and reinforcing steel for light pole bases are included in superstructure quantities.

DESIGN FOR: 9° 55' SKEW

259'-6 x 32' CONCRETE PRETENSIONED PRESTRESSED BEAM BRIDGE

~~40'-9" C-C 45°-9" END SPANS 88'-6" INTERIOR SPANS~~

LIGHTING DETAILS

STATION 1737+17.89 ℄ I-380 (O.R.)
STATION 20+31.56 COUNTY RD. S1 (I) (O.R.)

February, 1970

JOHNSON COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 17 OF 17 FILE NO. 22960 DES. NO. 866

DESIGNED BY: [illegible] TRACED BY: [illegible]
DETAILED BY: CHECKED BY: L. Phillips

1014 JOHNSON COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-IG-380-6(7)247--04:52	IOWA	5	71	A19	A19