

DESIGN NO. 1359	STA. 1077+41.84 - ON IOWA 64
SECTION NO. 14	STA. 573+79.44 - ON U S 30
RELOCATION	WASHINGTON TOWNSHIP
282' x 30' CONTINUOUS I-BEAM BRIDGE	
38°-14' SKEW	
ESTIMATE OF QUANTITIES	
ITEM	TOTAL
Concrete	513.7 Cu.Yds.
Reinforcing Steel	114,818 Lbs.
Structural Steel	270,880 Lbs.
Aluminum Rail (E- & End Posts)	551.75 Lin.Ft.
Creosoted Piles 13 @ 45', 74 @ 35'	3153.1 <del>3175</del> Lin.Ft.
Excavation Class 20	446 Cu.Yds.
Rigid Steel Conduit	314 Lin.Ft.
4" Tile Drain	186 Lin.Ft.
10 BP42 Steel Piles	740.1 <del>750</del> Lin.Ft.
Drive 10 @ 75'	718.7 <del>750</del> Lin.Ft.
Concrete Slope Protection	553 Sq.Yds.
Granular Backfill Material	186 Tons

In Letting of July 11, 1961

STATE OF IOWA  
STATE HIGHWAY COMMISSION  
DESIGN FOR  
**BRIDGES AND CULVERTS**  
PRIMARY ROAD SYSTEM  
PROJECT NO. F-1065 (I)  
**MARSHALL COUNTY**  
MARCH 1961

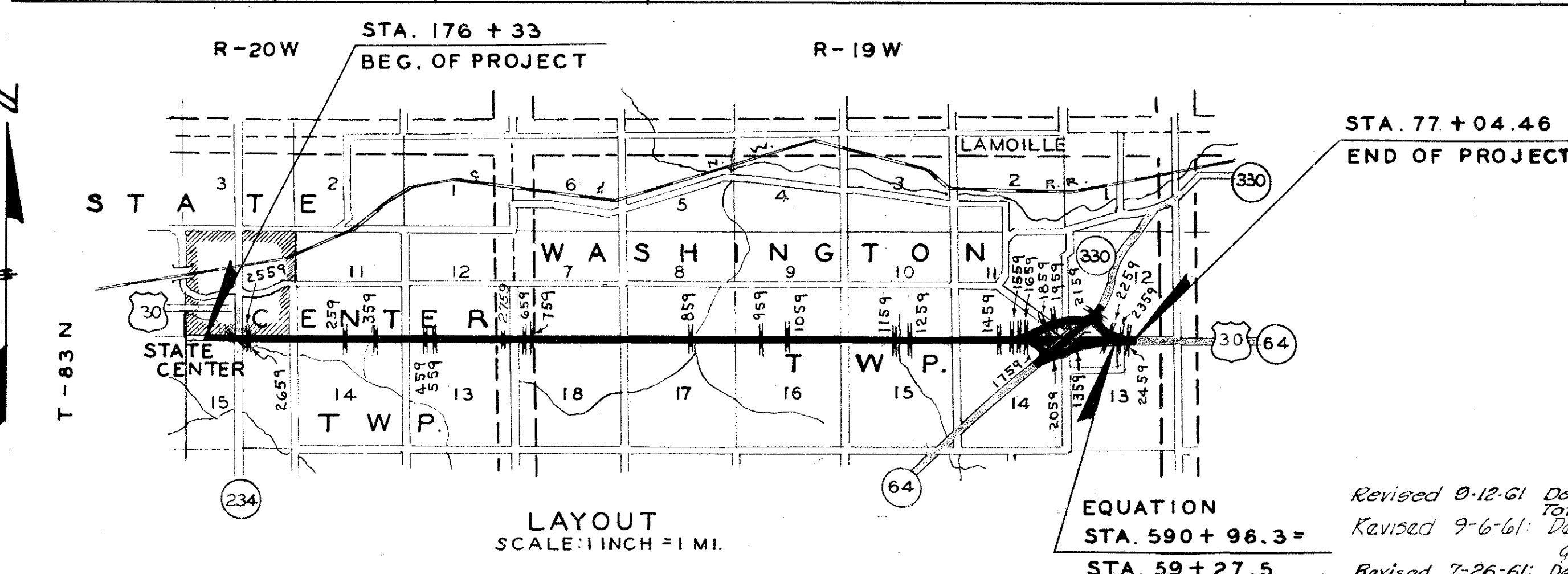
FED. ROAD DIST. NO.	STATE	S. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA				

CONSTRUCTION PLANS  
SHOWING PROJECT AS BUILT  
THREE COPIES PREPARED BY *John L. Peterson*  
RESIDENT ENGINEER  
ONE COPY APPROVED AND SENT TO AMES  
*Steiner Silance* APR 5 1963  
DISTRICT ENGINEER DATE  
TWO COPIES TO BE MADE AND RETURNED TO  
STEINER SILENCE DISTRICT ENGINEER  
WILLIAM BUSS MAINTENANCE ENGINEER  
NO COPIES PREPARED 3

16-Sheets

In Letting of July 11, 1961

DESIGN	LOCATION			DESCRIPTION	ESTIMATE OF QUANTITIES																	REMOVALS		
	SECTION	TOWNSHIP	STATION		SIZE & TYPE	CONCRETE CU.YDS.	REINF. STEEL LBS.	EXCAVATION CU.YDS.		F-I CONC. PIPE LIN. FEET				CONC. APRONS				F-I T-SEC EACH	CLASS "C" GRAVEL CU.YDS.					
								CL. 20	CL. 24	CL. 10	24"	30"	36"	42"	48"	24"	30"			36"	42"		48"	
259	11	State Center	228+50-37' Rt.	42" F-1 Conc. Pipe Culv. & 30.94' Stub Flume - 20° Skew	10.0	562	104	31						108										
359	11	"	244+82-37' Rt.	4' x 5' x 107' R.C.B. Culvert	67.0	6100	49																	
459	12	"	274+20-37' Rt.	4' x 4' x 126' R.C.B. Culvert - 30° Skew	77.3	7493	74																	
559	12	"	278+00-37' Rt.	24" F-1 Conc. Pipe Culv. & 31.08' Flume - 25° Skew	5.4	402	66	7		74							1-inlet							
659	7	Washington	316+50-37' Rt.	2' x 2' x 162' R.C.B. Culvert - 30° Skew	52.4	3066	60																	
759	7	"	318+76-37' Rt.	2' x 3' x 149' R.C.B. Culvert - 15° Skew	56.1	3388	40																	
859	17	"	401+00	Twin 8' x 8' x 117' R.C.B. Culvert - 7° 30' Skew	357.2	35,735	458															392		
959	16	"	426+28-37' Rt.	24" F-1 Conc. Pipe Culv. & 30.60' Stub Flume - 15° Skew	5.5	406	20	230		84							1-inlet							
1059	16	"	439+25-37' Rt.	4' x 5' x 71' R.C.B. Culv. & 57.19' Stub Flume - 30° Skew	64.7	5574	99																	
1159	10	"	494+00-37' Rt.	36" F-1 Conc. Pipe Culv. & 50.67' Stub Flume - 15° Skew	14.1	789	57	181				104					1-inlet							
1259	10 & 15	"	501+00-37' Rt.	30" F-1 Conc. Pipe Culv. & 56.44' Flume - 45° Skew	11.3	773	72	257				128					1-inlet							
1459	11	"	547+00	24" F-1 Conc. Pipe Culv. & 30.75' Flume - 15° Skew	5.4	400	164			128							1-inlet							
1559	11 & 14	"	554+29	4' x 4' x 273' R.C.B. Culvert - 45° Skew	164.4	16,213	139																	
1659	11	"	554+63-114' Lt.	24" F-1 Conc. Pipe Culv. & 33.45' Stub Flume	6.0	446	43			22							1-inlet							
1759	11	"	556+27-188' Lt.	5' x 5' x 41' R.C.B. Culvert & 41.15' Stub Flume	48.7	4064	74	20	136															
1859	11 & 14	"	563+65	36" F-1 F-1 Conc. Pipe Culv. & 28.02' Stub Flume	8.4	474	70					176					1-inlet				1 @ 4'			
1959	11	"	3569+30	4' x 4' x 45' R.C.B. Culv. & 80.68' Stub Flume	53.7	3972	65	971																
2059	14	"	1073+00	2' x 2' x 261' R.C.B. Culvert	82.78	4637	102																	
2159	12	"	1091+50.5	3' x 4' R.C.B. Culv. Ext. & 30.67' Flume	27.6	1832	35		99															As per plan
2259	12 & 13	"	585+19+	30" F-1 Conc. Pipe Culv. Ext. - 37° Skew	0.2	5	13	69		130							1-inlet							
2359	12 & 13	"	64+65	48" F-1 Conc. Pipe Culv. Ext.	0.4	8	16	33				66					1-inlet		1-inlet					
2459	12 & 13	"	66+99	30" F-1 Conc. Pipe Culv. Ext.	0.2	5	24			44							1-inlet							
2559	15	State Center	180+60	Twin 8' x 8' x 216' R.C.B. Culvert - 45° Skew	470.5	56,204	1229																	Present 8' x 6' x 26' R.C.B. Culv.
2659	10 & 15	State Center	189+26	6' x 5' x 164' R.C.B. Culvert - 25° Skew	134.4	13,389	276																	
2759	12	"	304+30 37' Rt.	5' x 7' x 52' R.C.B. Stockpass	60.5	6,527	122																	



SPECIFICATIONS:  
All materials and construction to be in accordance with Iowa State Highway Commission Standard Specifications, Series 1960, plus current special provisions.

These bridges will require Bridge Sign Assemblies, furnished and placed by others, as specified in S. & T. Instructions No. 11. Revised March 1, 1956.

MILEAGE SUMMARY:  
Bridge at Sta. 1077+41.84 = 287.094' = .054 Mi.  
Bridge at Sta. 573+79.44 = 25.45' = .004 Mi.  
Total .058 Mi.

APPROVED  
*R.M. Tilton* MAY 25 1961  
DEPUTY CHIEF ENGINEER  
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS  
APPROVED  
DIVISION ENGINEER  
DATE

Revised 9-12-61 Design No. 2059 Concrete quantity corrected.  
Revised 7-6-61 Design 859 Class 20 Excavation quantities corrected.  
Revised 7-26-61 Design 2759 added. Quantities changed accordingly.



ESTIMATE OF REINFORCING										
MARK	LOCATION	SHAPE	No.	Q	LENGTH	LINEAR FEET				
						4	5	6	7	
45° SKEW HEADWALL - INLET										
5a1	Barrel Walls Vert. B.F.	—	3	1'-0"	9'-8"				290	
5b1	Wing Horiz. F.F. (long)	—	7	1'-0"	11'-6"				183.1	
5b2	" " " (short)	—	7	1'-0"	7'-8"				114.9	
5b3	" " " (long)	—	1	—	23'-11"				43.9	
5b4	" " " (short)	—	1	—	26'-7"				266	
4b5	" " " B.F. (long)	—	6	1'-0"	18'-3"				185.0	
4b6	" " " (short)	—	6	1'-0"	12'-9"				112.7	
4b7	" " " (long)	—	1	—	26'-9"				45.8	
4b8	" " " (short)	—	1	—	28'-0"				28.7	
5b9	Center wing Horiz.	—	9	1'-0"	Listed				748	
5c1	Wing Vert. B.F. (long)	L	25	1'-0"	9'-6"				3000	
5c2	" " " (short)	L	21	—	7'-6"				229.3	
5c3	Center Wall Vert.	I	22	1'-0"	Listed				114.2	
5c4	Wing B.F. Vert. (both)	L	18	1'-0"	9'-0"				162.0	
5c5	" " " (long)	I	15	1'-0"	25'-5"				58.7	
5c6	" " " (short)	I	3	1'-0"	2'-7'-3"				8.7	
4c7	" " F.F. " (long)	I	40	1'-0"	26'-10'-6"				2600	
4c8	" " " (short)	I	24	1'-0"	2'-7'-10'-5"				166.0	
4d1	Apron Long. Bott	—	2	—	24'-6"				49.0	
4d2	" " " "	—	2	—	19'-8"				39.3	
4d3	" " " "	—	2	—	20'-6"				41.0	
6f1	Apron Long. Top	—	14	1'-3"	22'-0"				308.0	
4i1	Parapet Vert.	L	24	1'-0"	5'-7"				134.0	
5i1	Parapet Trans.	—	4	—	24'-9"				99.0	
7m1	Apron Trans. Top	—	40	8'	Listed				6963	
5m2	" " Bott	—	12	1'-0"	26'-2'-5"				316.5	
6p1	Curtain Horiz.	—	4	—	23'-8"				94.7	
6p2	" " "	—	4	—	22'-3"				89.0	
6p3	" " "	—	4	—	8'-6"				34.0	
6s1	Wing Slope (long)	—	2	—	44'-2"				88.3	
6s2	" " (short)	—	2	—	27'-7"				55.2	
6s3	" " F.F. (long)	—	1	—	44'-9"				44.8	
6s4	" " (short)	—	1	—	27'-11"				27.9	
6s5	Center Wing Slope	—	2	—	22'-9"				45.5	
5t1	Curtain Vert	L	37	1'-3"	6'-4"				294.3	
* 20 dia. Lap included					TOTAL LENGTH		10585	1995.0	7824	6963
					WEIGHT		707.0	2080.7	1182.6	1423.2
					TOTAL WEIGHT		5393.5 LBS.			
216' OF TWIN 8'x8' BARREL										
6a2	Walls & Slab	L	371	1'-2"	4'-10"				1793.2	
4a3	Side Walls Floor B.F. Vert	L	742	7'	10'-1"				740.8	
4a4	Side Walls Vert. F.F.	I	290	1'-6"	9'-8"				280.33	
4a6	Center Wall Vert	I	217	1'-0"	9'-8"				209.7	
5r1	Slab Dowels	—	102	1'-0"	2'-6"				255.0	
5b5	Center Wall Horiz	—	63	1'-0"	18'-7"				1926.0	
5b6	Side Walls Horiz.	—	56	1'-0"	14'-0"				1712.0	
5e1	Slab Bott.	—	84	1'-2"	2'-6"				2568.0	
4e2	Slab Top Long.	—	56	—	16'-0"				1712.0	
6f3	Floor Top Long.	—	98	1'-3"	12'-0"				2396.0	
4f4	Floor Bott Long.	—	42	—	12'-0"				1296.0	
6k1	Slab Bott Trans.	—	371	7"	17'-8"				6554.3	
5k2	" " Top	—	389	6 1/8"	7'-7"				3025.7	
5m5	Floor Top Trans.	—	371	7"	13'-0"				6814.1	
6m6	" " Bott	—	348	7 1/2"	5'-6"				1903.0	
					TOTAL LENGTH		15378.8	16300.8	13246.5	
					WEIGHT		10773.9	12001.7	12806.2	
					TOTAL WEIGHT		47170.9 LBS.			

ESTIMATE OF REINFORCING									
MARK	LOCATION	SHAPE	No.	D	LENGTH	LINEAR FEET			
						4	5	6	7
STRAIGHT HEADWALL - OUTLET									
5a1	Barrel Walls Vert.B.F.	—	2	1'-0"	9'-8"			19.3	
5b10	Wing Horiz. F.F.	—	14	1'-0"	6'-11 1/2"			204.8	
5b11	" " " "	—	2	—	23'-5"			46.8	
4b12	" " B.F.	—	12	1'-0"	11'-7 1/4"			216.0	
4b13	" " " "	—	2	—	25'-6"			51.0	
5b14	Center Wing Horiz.	—	9	1'-0"	Listed			632	
5c9	Wing B.F. Vert.	—	30	1'-0"	8'-11 1/4"			348.0	
5c10	" " " "	—	12	1'-0"	2'-7'-4 1/2"			42.5	
4c11	" " F.F. "	—	42	1'-0"	27'-10 1/2"			271.2	
5s12	Center Wing Vert.	—	15	1'-0"	Listed			70.5	
5a13	Wing B.F. Vert.	—	14	1'-0"	9'-0"			126.0	
4d4	Apron Trans. Bott.	—	4	—	14'-6"			58.0	
4d5	Apron	—	2	—	13'-11"			27.8	
6f2	Apron Long. Top	—	14	1'-3"	16'-0"				294.0
4i1	Parapet Vert.	—	17	1'-0"	5'-7"			94.9	
5i2	" " Trans.	—	4	—	17'-8"			70.7	
7m3	Apron Trans. Top	—	21	8'	8'-11 1/2"				4650
6m4	" " Bott.	—	12	1'-0"	16'-6"			197.0	
6p4	Curtain Trans.	—	8	—	10'-1"			80.7	
6p5	" " " "	—	4	—	16'-6"			66.0	
6a6	Wing Slope	—	1	—	24'-9"			39.0	
6a7	" " F.F.	—	2	—	25'-2"			50.3	
6a8	" " Center Wing	—	2	—	16'-6"			39.0	
5t1	Curtain Vertical	—	24	1'-3"	6'-4"			152.0	
TOTAL LENGTH						718.9	1341.8	5533.0	4650.0
WEIGHT						480.2	1999.8	8306.8	3300.0
TOTAL WEIGHT						3,640 LBS.			

CONCRETE IN PARTS			
LOCATION	ABOVE KEYWAY	BELOW KEYWAY	TOTAL
45° SKEW HEADWALL	15.94 CY.	31.19 CY.	47.13 CY.
STRAIGHT HEADWALL	10.68	19.8	30.48 CY.
216' OF BARREL	239.99	152.88	392.87 CY.
TOTAL	266.61 CY.	203.87 CY.	470.48 CY.

TOTAL ESTIMATED QUANTITIES	
CONCRETE	470.5 CY.
REINFORCING	56,204 LBS.
EXCAVATION CLASS 20	1229 CY.

Design stresses for the following materials are in accordance with AASHTO Standard Specifications for Highway Bridges, Series of 1957.

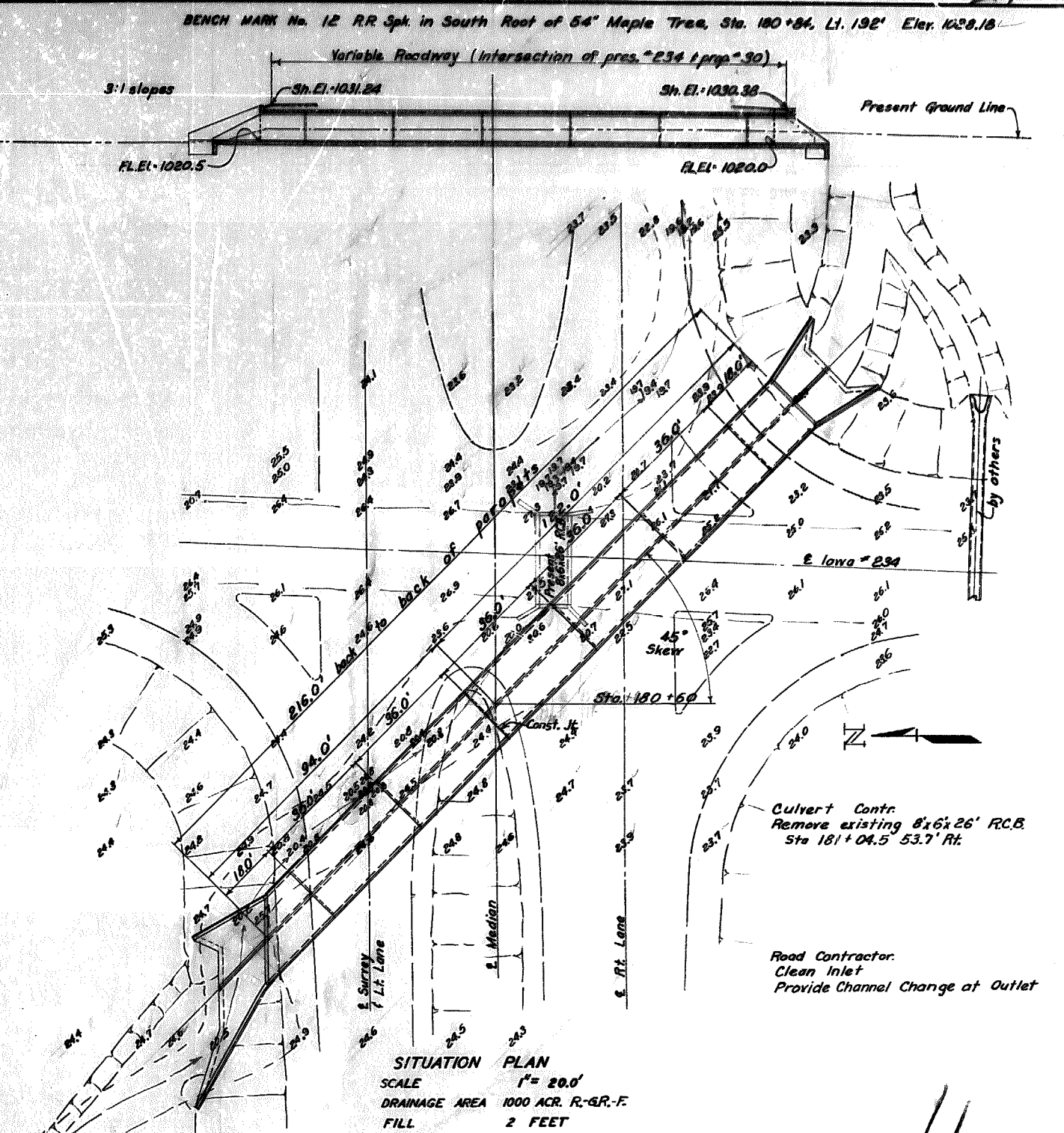
Reinforcing steel in accordance with Section 1.4.12 "Reinforcement" for Intermediate, Hard, or Rail Steel Grade.

Concrete in accordance with section 1.4.11  $f'_c = 3500$  psi

This culvert is designed for H20-S16 loading and earth fill of 100 lbs per cu foot.

For General Notes and details not shown refer to Iowa State Highway Commission Standards CBH-001 CBH-45.

Material and construction in accordance with Iowa State Highway Commission Specifications, Series 1900, plus current special provisions.



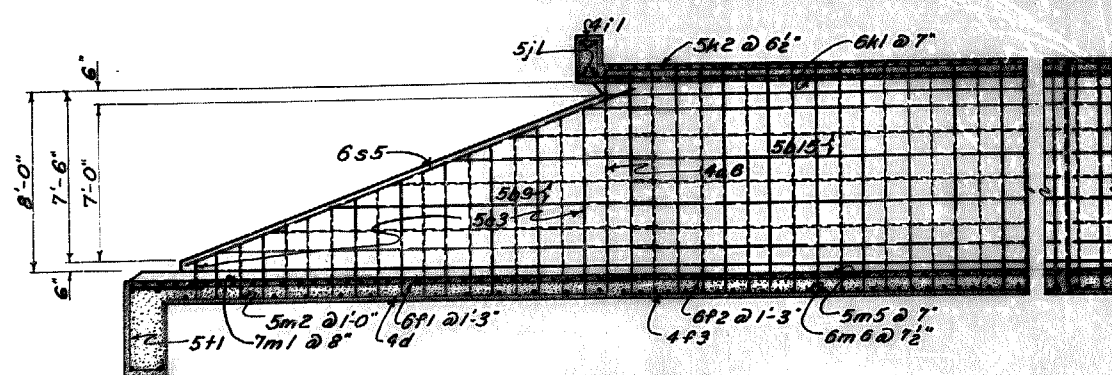
LOCATION:  
T-83-N R-20-W  
SECTION 15  
STATE CENTER TOWNSHIP  
MARSHALL COUNTY

DESIGN FOR  
TWIN 8'x8'x216' BOX CULVERT 45° SK. HDWL. ON INLET  
0° SK. HDWL. ON OUTLET

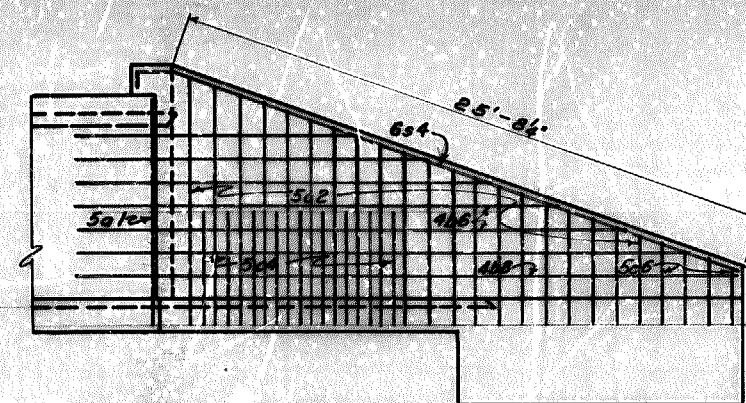
REINFORCED CONCRETE  
STATION 180+80  
PROJECT No. F-1065 (1)  
MARSHALL COUNTY  
IOWA STATE HIGHWAY COMMISSION  
MAY 1961  
SHEET 1 OF 4  
SCALE 1" = 20.0'



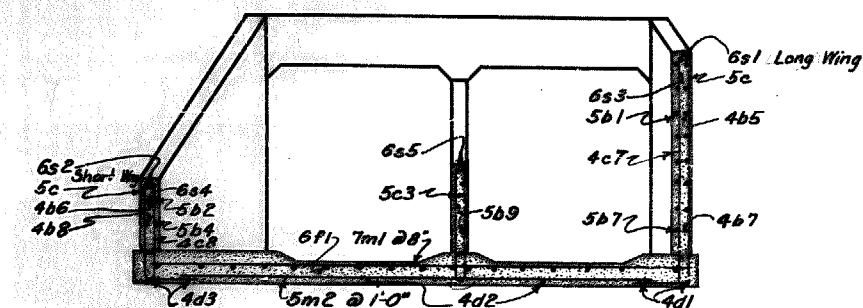




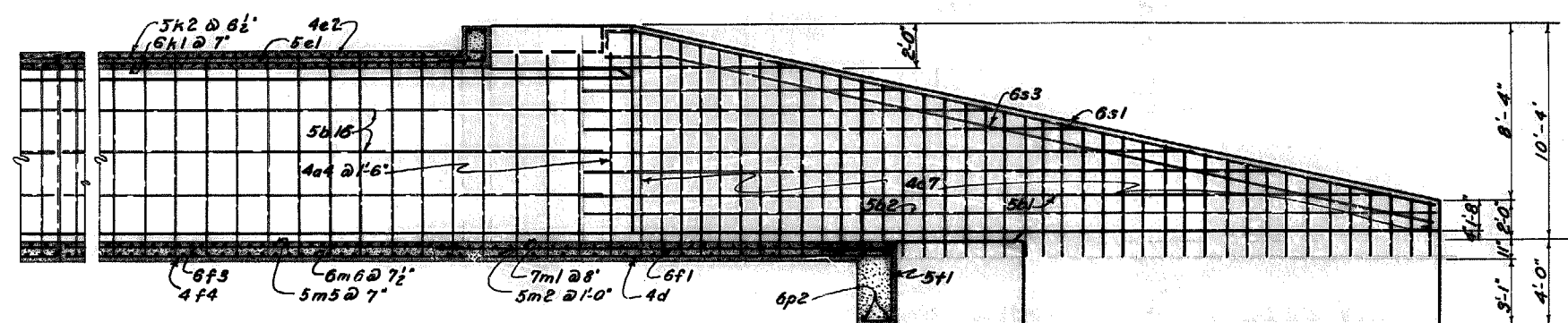
CENTER WALL  
WING & BARREL  
SCALE  $\frac{1}{4}'' = 1'-0''$



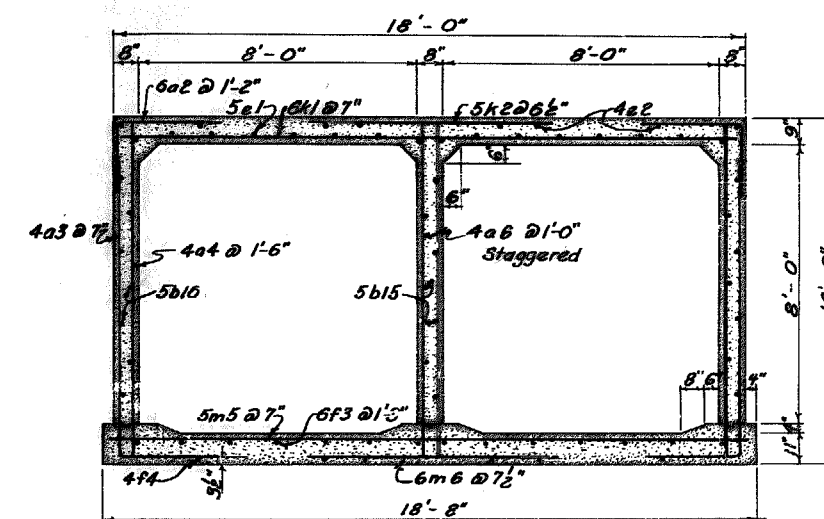
BACK FACE REINFORCING  
SHORT WING  
SCALE  $\frac{1}{4}" = 1'-0"$



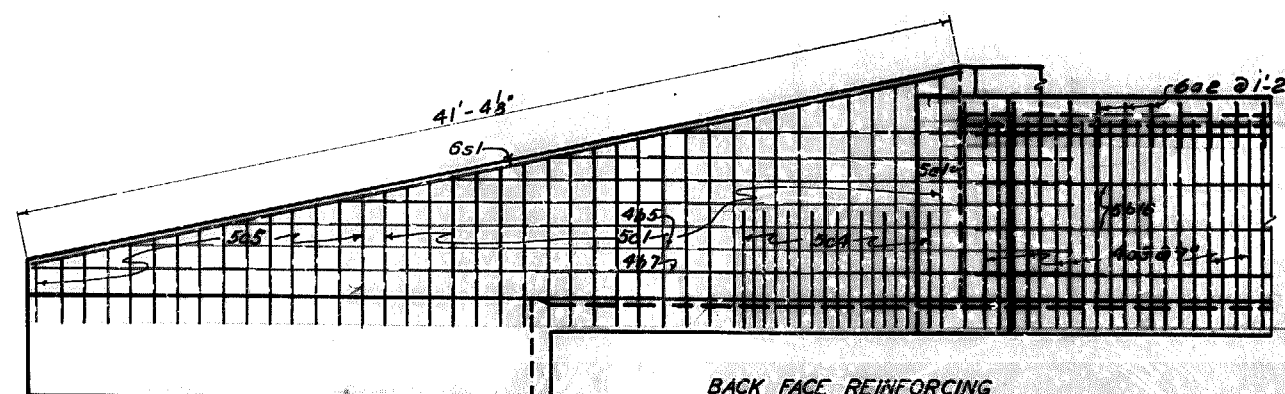
### HEADWALL SECTION



FRONT FACE REINFORCING  
SIDE WALL & LONG WING  
SCALE  $\frac{1}{4}" = 1'-0"$



BARREL SECTION  
SCALE  $\frac{3}{8}" = 1' - 0"$



BACK FACE REINFORCING  
LONG WING  
SCALE  $\frac{1}{4}" = 1'-0"$

DESIGN FOR  
TWIN 8' x 8' x 216' BOX CULVERT 45° SK. HDWL. ON INLET  
0° SK. HDWL. ON OUTLET

**STATION 180 + 60**

REINFORCED CONCRETE

PROJECT No. F-1065 (1)

**MARSHALL COUNTY**  
IOWA STATE HIGHWAY COMMISSION

MAY 1961

SCALES AS NOTED

**SHEET 3 OF 4**

MARSHALL COUNTY

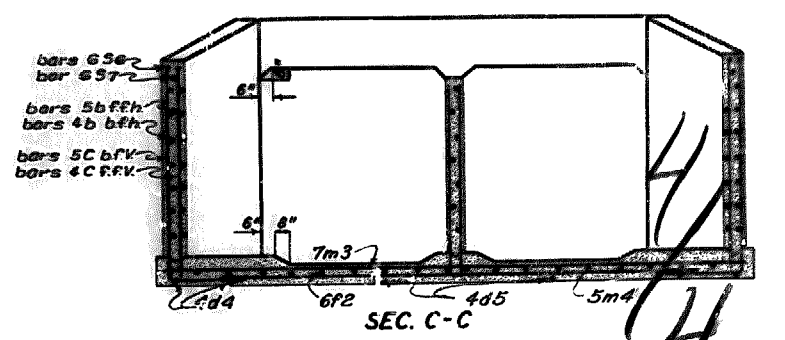
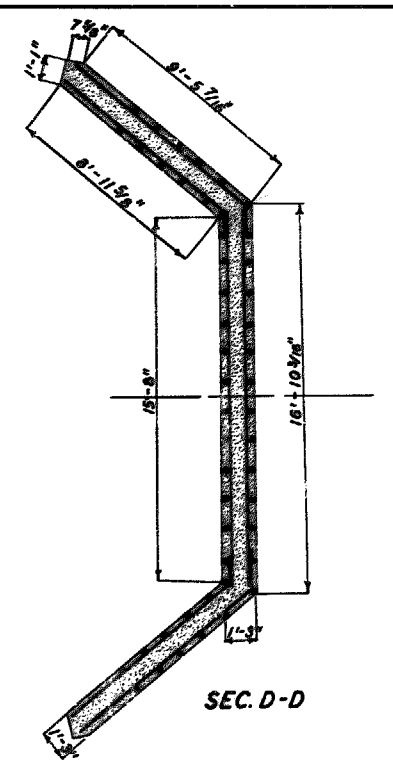
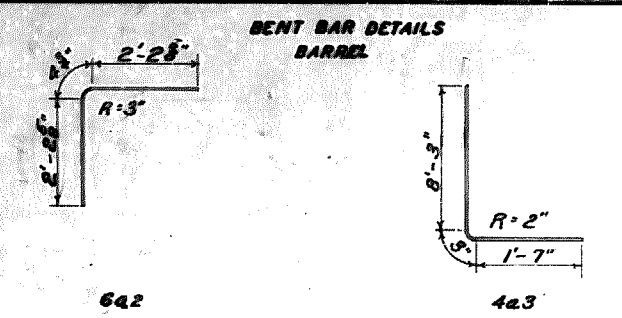
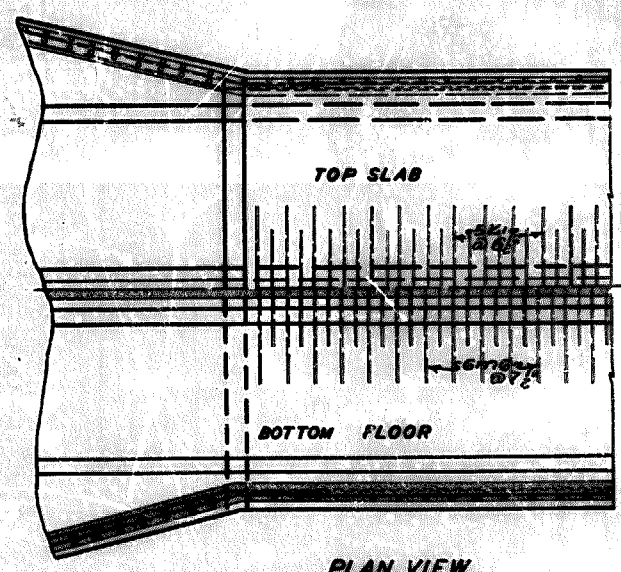
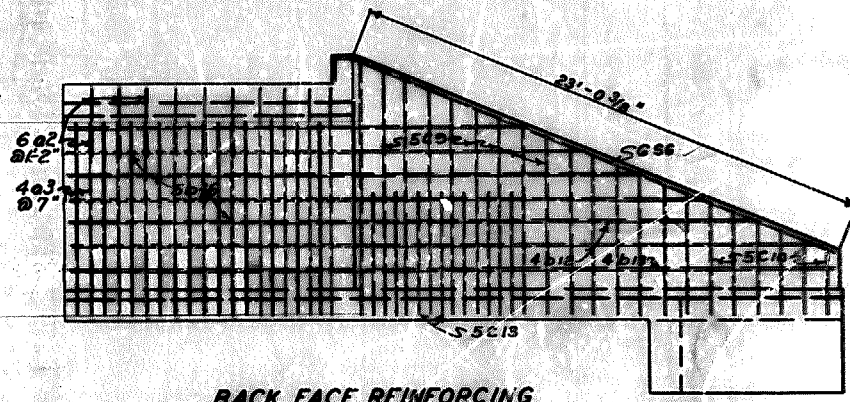
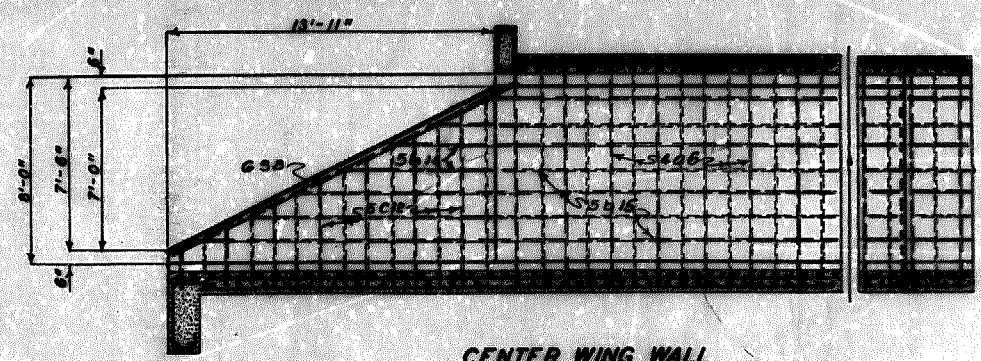
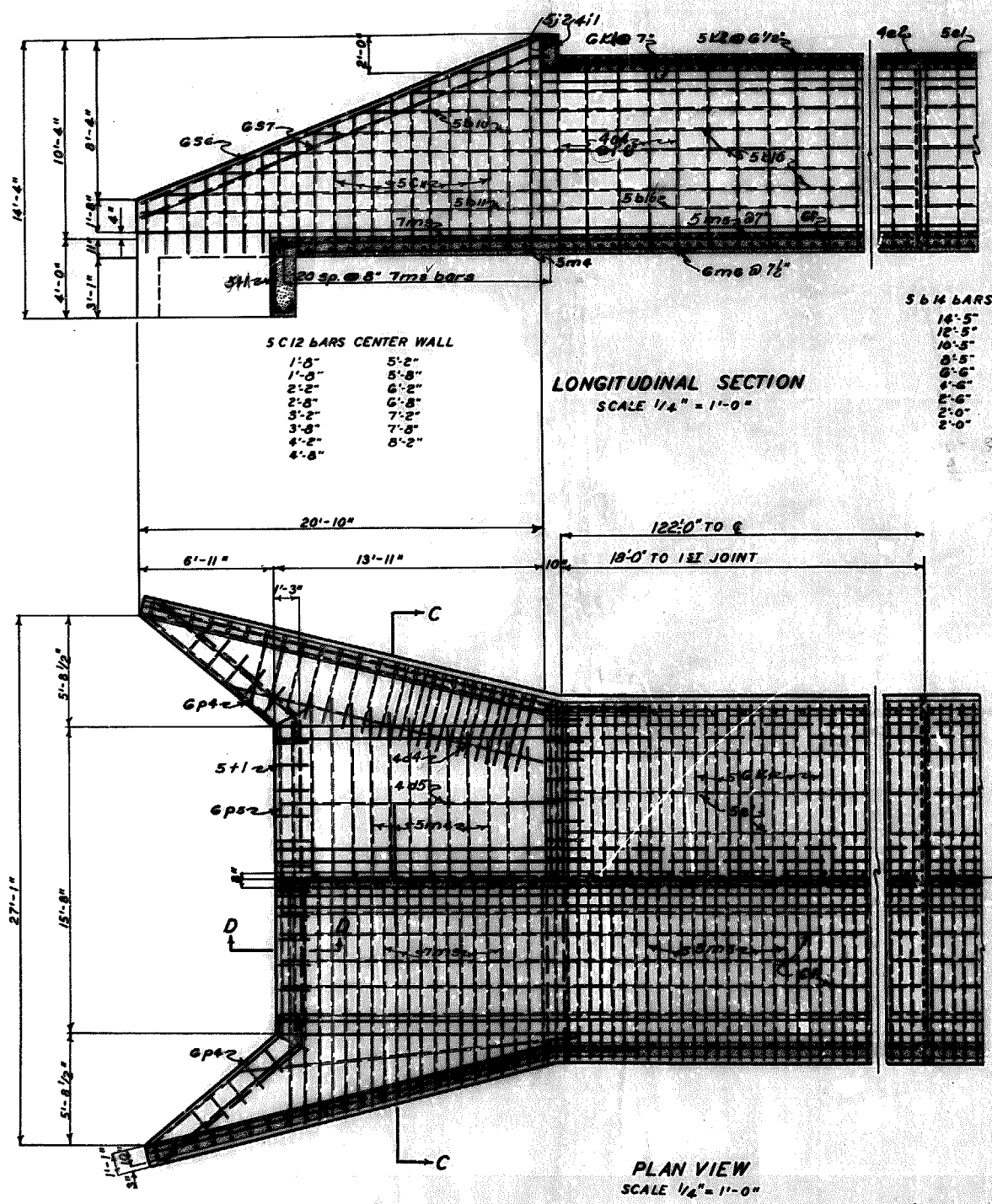
DESIGN No 2559

FILE No. 18290

JN ML

\_\_\_\_\_





DESIGN FOR  
**TWIN 8'x 8'x21/16' BOX CULVERT 45° SK. HDWL. ON INLET**  
**0° SK. HDWL. ON OUTLET**

REINFORCED CONCRETE

**MARSHALL COUNTY**  
IOWA STATE HIGHWAY COMMISSION

STATION: 180+60

MAY 1961

PROJECT NO. F-1065(1)

SCALES AS NOTED

SHEET 4 OF 4