MODOT BRANSON TOWER

EXISTING TOWER

AS BUILT DRAWINGS, C. 1967

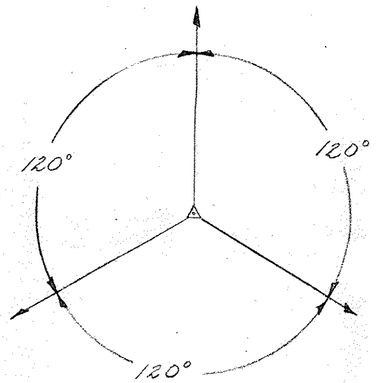
The following drawings are provided for information purposes only and to the best of our knowledge represent the existing radio tower structure, foundations and shelter. Exact locations of existing antennas, feed lines, lighting and other attachments have changed.

BILL OF MATERIAL				
ITEM	QUAN.	MARK NO.	DESCRIPTION	DWG. NO.

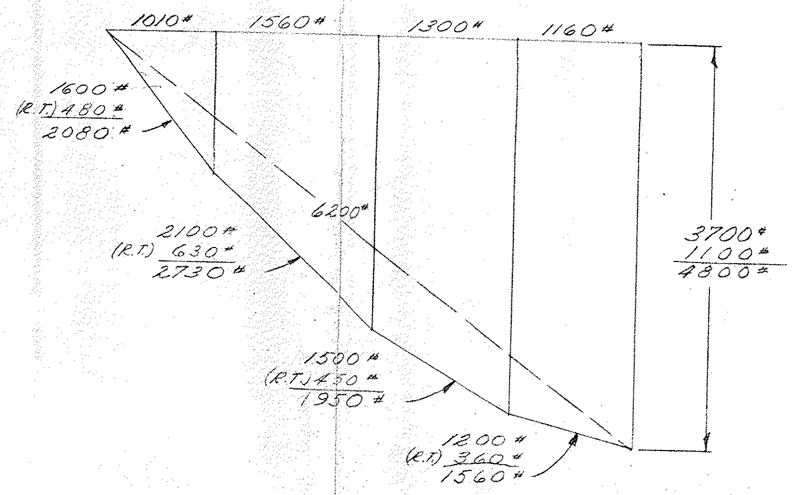
WIND LOADING
30 P.S.F. w/ $\frac{1}{2}$" R. ICE
E.I.A.

#45 TOWER = 19.6 #/FT.
LINES = 6.0 #/FT.
TOTAL = 26 #/FT

WIND ON GUYS = 2 #/FT.



PLAN VIEW
NO SCALE



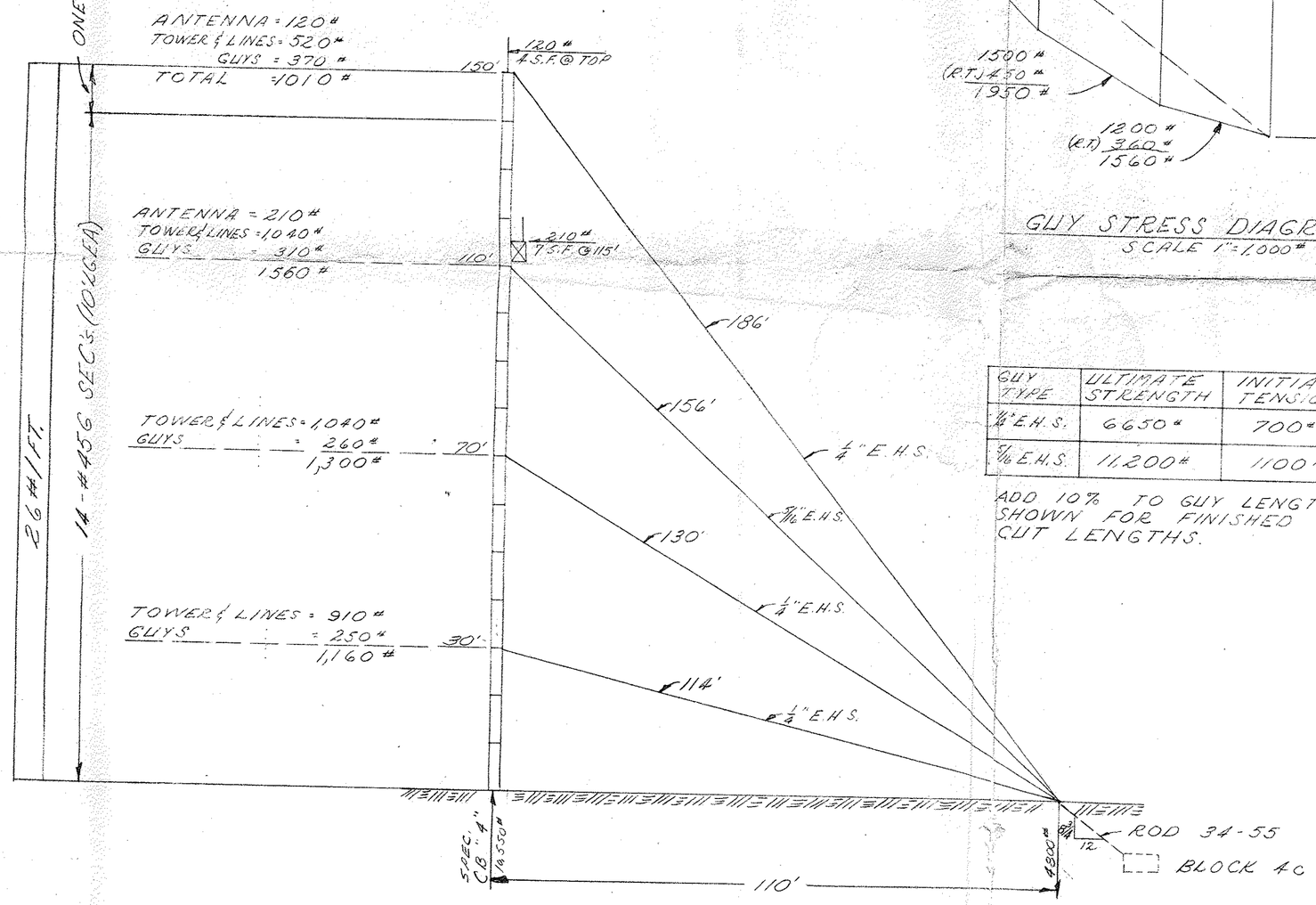
GUY STRESS DIAGRAM
SCALE 1" = 1000#

BASE REACTION
3700 x 2 = 7400#
17 x 150 = 2550# (TOWER WT.)
= 600# (GUYS w/ ICE) ÷ 2
10,550

MAX. LEG STRESS @ LOWER GUY LEVEL
10,550 ÷ 3 = 3,520# (DIRECT)
$\frac{26 \times (35)^2}{10 \times .866 \times 1.42}$ = 2590# (BENDING)
6,110

MODEL 45G LEG CAPACITY = 6,480#

NOTE: RESIDUAL TENSION = 30% OF LIVE LOAD.



TOWER ELEV.
SCALE 1" = 20'

GUY TYPE	ULTIMATE STRENGTH	INITIAL TENSION
1/4" E.H.S.	6650#	700#
5/16" E.H.S.	11,200#	1100#

ADD 10% TO GUY LENGTHS SHOWN FOR FINISHED CUT LENGTHS.

ITEM	DWG. NO.
#45G TOWER SECTION	C-630645-R
BASE PIER DETAILS	A-670710 A-670711
ANCHOR DETAILS	C-620643-R

PAL NUTS TO BE SUPPLIED FOR ALL TOWER BOLTS.

CHAMFER EXPOSED EDGES OF ALL CONC.

SITES: RIDGELY
BRANSON
WARDELL

CHARLES A. MITCHELL 81-2615 REGISTERED STRUCTURAL ENGINEER OF ILLINOIS

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROHN

TITLE STRESS & ERECTION DATA - 150' #45G FOR MOTOROLA FOR MO. STATE HWY.

THIS DRAWING IS THE PROPERTY OF ROHN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRACED IN WHOLE OR IN PART WITHOUT OUR WRITTEN CONSENT.

FILE NO 7894

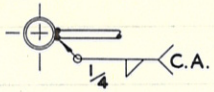
SCALE NOTED	MATERIAL	FINISH	WT.
DWN BY RCM	DATE 6-19-67	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE GIVEN IN INCHES	
CKD BY O.H.	DATE 6-20-67	TOLERANCES DEC. ± FRAC. ± ANGLES ±	DWG NO. C-670616
APP'D CAM	DATE		R1

RCM 7-19-67
R1 - Revised Base Pier Ref. Drwgs

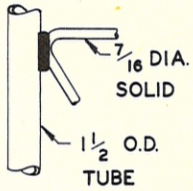
C-630655R

TOWER SPECIFICATIONS

DISTANCE BETWEEN SIDE RAILS (CENTER TO CENTER)	17″
OVERALL LENGTH OF SECTION	10′-5 1/4″
WEIGHT PER SECTION	95 LBS.
SIDE RAIL DIAMETER AND GAUGE	1 1/2″ O.D. 1/8″ TH.
CROSS SECTIONAL AREA — ONE LEG	.5203 SQ. IN.
GROSS ALLOWABLE VERTICAL LOAD ON THE BOTTOM TOWER SECTION	33,570 LBS.
MAXIMUM ALLOWABLE AXIAL COMPRESSION OF THE CROSS SECTION OF ONE SIDE RAIL	11,190 LBS.
MEASURED TENSILE STRENGTH OF ONE SIDE RAIL	37,400 LBS.
MEASURED TENSILE STRENGTH OF ONE BOLTED LEG JOINT	37,400 LBS.
MAXIMUM ALLOWABLE TENSION IN EACH BOLTED LEG JOINT	14,960 LBS.
SAFE MOMENT OF RESTRAINT	13,730 FT. LBS.
L - UNBRACED LENGTH OF SIDE RAIL (DISTANCE BETWEEN CROSSPIECES)	15 1/2″
R - RADIUS OF GYRATION OF SIDE RAIL	.4897″
L/R FOR MAIN LEG MEMBER	31.7
WIND LOAD PER LINEAL FOOT OF TOWER AT THE HORIZONTAL WIND PRESSURES (PER SQUARE FOOT OF FLAT SURFACE) LISTED BELOW:	
30 LBS.	10.03
40 LBS.	13.37
50 LBS.	16.72

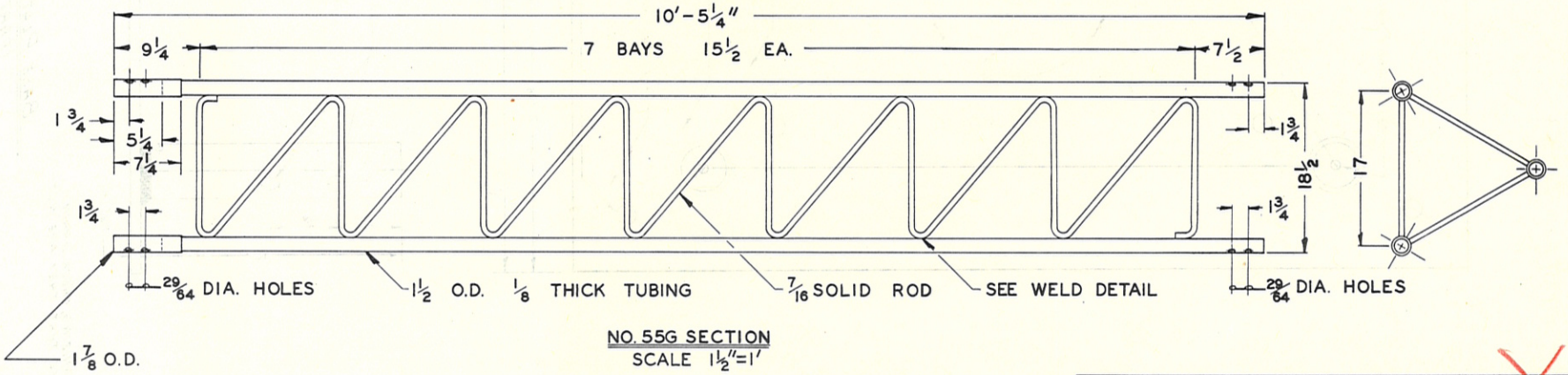


PLAN



ELEVATION

WELD DETAIL
SCALE 3″=1′



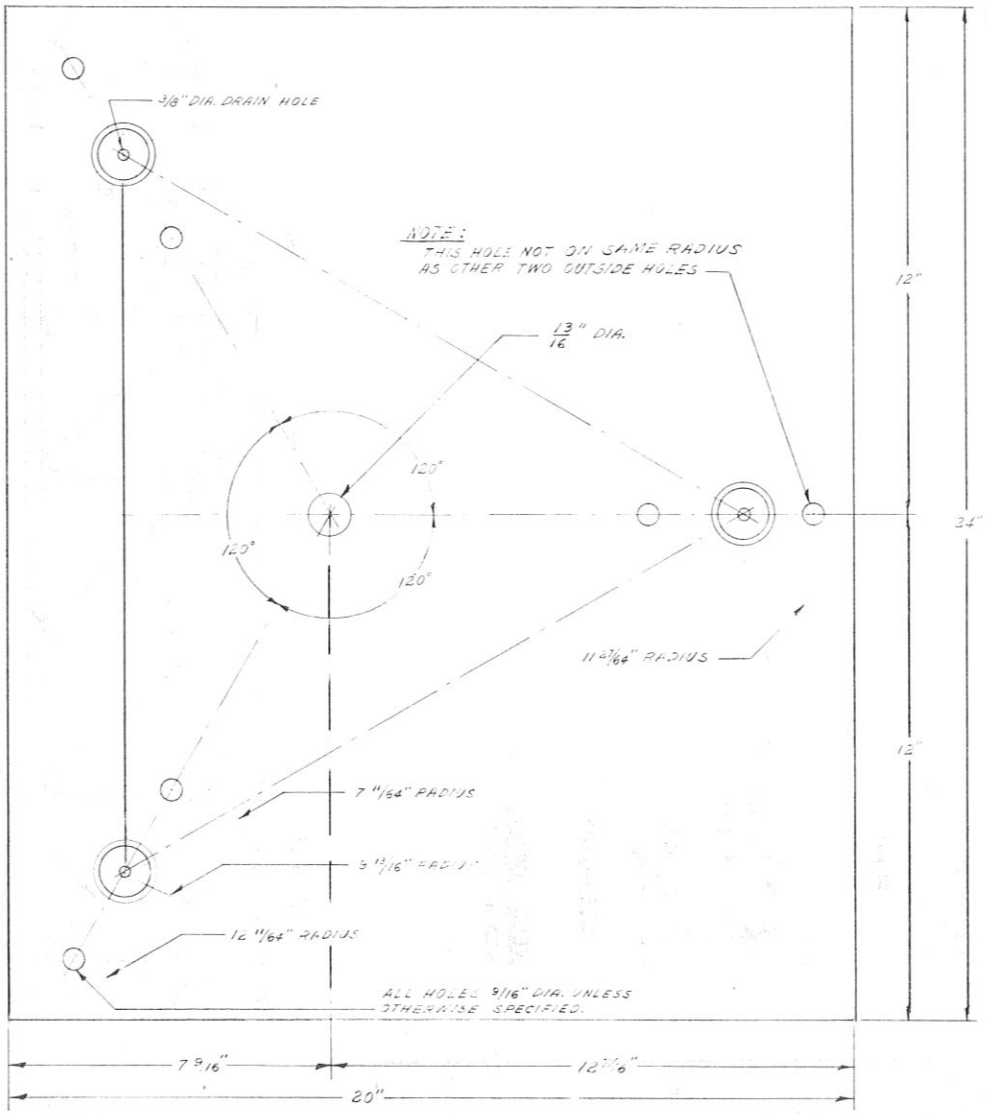
NO. 55G SECTION
SCALE 1 1/2″=1′

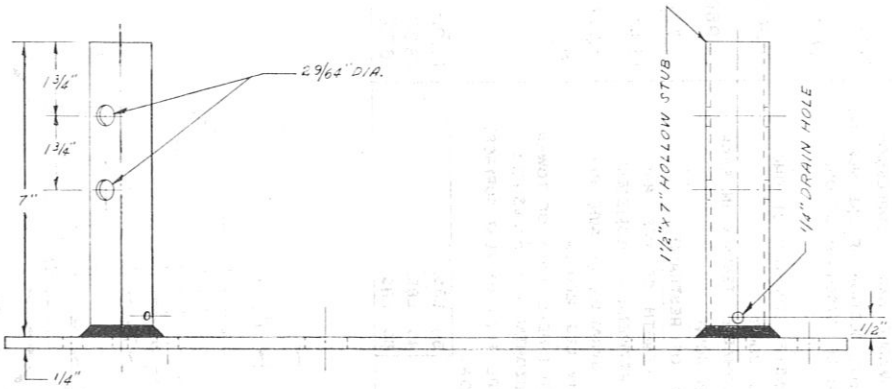
NOTE: ALL DIMENSIONS IN INCHES EXCEPT AS NOTED

DRAWN RM	CUSTOMER	TITLE
CHECKED AEQ		MODEL 55 TOWER SECTION
APPROVED DWC.		
DATE 6-25-63	ROHN MANUFACTURING CO. PEORIA, ILLINOIS	DRAWING NO.
REVISED 9-24-64	SCALE NOTED	C-630655-R

ILLINOIS B/P 1000-H

C-640655-R





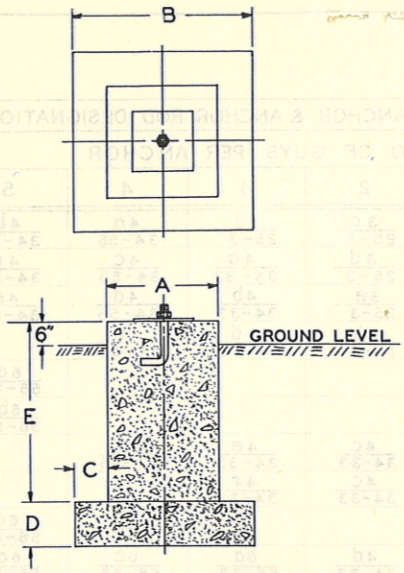
NOTE:
AFTER GALVANIZING, CHECK DRAIN HOLES TO SEE THAT THEY ARE NOT PLUGGED.

BASE PLATE FOR CONCRETE PIER
(PART NO. BPC-55)

REVISED 4-19-65

CUSTOMER	TITLE: BASE PLATE FOR MODEL 55 TOWER
DRAWN	DRAWING NO. C640655-R
CHECKED	ROHN MANUFACTURING CO. PEORIA, ILLINOIS
APPROVED	
DATE	
SCALE	

ILLINOIS B/P 1000-11



CONCRETE BASE DETAIL

NOTE:
REINFORCING RODS ARE RECOMMENDED TO BE USED IN ALL CONCRETE BASES. RODS SHOULD HAVE A MINIMUM DIAMETER OF ½" WITH MAXIMUM SPACING OF 12".

CONCRETE BASE SCHEDULE

"CB" NO.	DOWNWARD FORCE "F", LBS.	CONCRETE		DOWNWARD FORCE "F_T", LBS.	DIMENSIONS				
		CU. YDS.	LBS.		A	B	C	D	E
1	14,040	.52	1,960	16,000	2'-0"	2'-0"	0"	0"	3'-6"
2	21,940	.81	3,060	25,000	2'-6"	2'-6"	0"	0"	3'-6"
3	32,310	.98	3,690	36,000	2'-6"	3'-0"	3"	6"	3'-6"
4	44,060	1.31	4,940	49,000	2'-6"	3'-6"	6"	8"	4'-4"
5	58,260	1.52	5,740	64,000	2'-6"	4'-0"	9"	1'-0"	4'-0"
6	74,180	1.81	6,820	81,000	2'-6"	4'-6"	1'-0"	1'-3"	3'-9"
7	89,640	2.74	10,360	100,000	3'-0"	5'-0"	1'-0"	1'-3"	4'-9"
8	108,980	3.18	12,020	121,000	3'-0"	5'-6"	1'-3"	1'-6"	4'-6"
9	130,130	3.67	13,870	144,000	3'-0"	6'-0"	1'-6"	1'-8"	4'-4"
10	149,980	5.03	19,020	169,000	3'-6"	6'-6"	1'-6"	1'-8"	5'-4"
11	172,610	6.19	23,390	196,000	4'-0"	7'-0"	1'-6"	1'-8"	5'-4"
12	198,050	7.13	26,950	225,000	4'-0"	7'-6"	1'-9"	2'-0"	5'-0"
13	223,500	8.60	32,500	256,000	4'-0"	8'-0"	2'-0"	2'-2"	5'-10"
14	250,520	10.18	38,480	289,000	4'-6"	8'-6"	2'-0"	2'-2"	5'-10"
15	278,990	11.91	45,010	324,000	5'-0"	9'-0"	2'-0"	2'-2"	5'-10"

ABOVE VALUES BASED ON SOIL BEARING PRESSURE OF 4000 POUNDS PER SQUARE FOOT.

DRAWN L. HOFFMAN	CUSTOMER	TITLE
CHECKED		CONCRETE BASE SCHEDULE
APPROVED		
DATE JUN. 24, 1961	ROHN MFG. CO. PEORIA, ILLINOIS	DRAWING NO.
SCALE NONE		C-610621

GUY WIRE				CABLE CLAMPS		CONCRETE ANCHOR & ANCHOR ROD DESIGNATION					TURN-BUCKLE SIZE,* IN.
						NO. OF GUYS PER ANCHOR					
SIZE AND TYPE	ULTIMATE STRENGTH, LBS.	INITIAL TENSION, LBS.	WEIGHT, LBS./FT.	SIZE IN.	NO. PER CONN.	1	2	3	4	5	
3/16" H.S.-7	2,850	300	.073	3/16		3a/25-3	3c/25-3	3e/25-3	4a/34-55	4b/34-55	3/8
3/16" E.H.S.-7	3,990	400				3b/25-3	3d/25-3	4a/34-33	4c/34-55	4d/34-55	
1/4" H.S.-7	4,750	500	.121	1/4		3c/25-3	3e/25-3	4b/34-33	4d/34-55	4e/34-55	1/2
1/4" E.H.S.-7	6,650	700				3d/25-3	4b/34-33	4d/34-33	4e/34-55		
										6a/56-55	5/8
5/16" H.S.-7	8,000	800	.205	5/16	3					6b/56-55	
						3e/25-3	4c/34-33	4e/34-33	4f/34-55		1/2
9/32" E.H.S.-7	8,950	900	.164			3e/25-3	4c/34-33	4f/34-33			
									6b/56-55	6c/56-55	5/8
3/8" H.S.-7	10,800	1,100	.273	3/8		4a/34-33	4d/34-33	6a/56-33	6c/56-55	6d/56-55	
5/16" E.H.S.-7	11,200	1,200	.205	5/16		4b/34-33	4e/34-33	6a/56-33	6c/56-55	6d/56-55	
7/16" H.S.-7	14,500	1,500	.399	7/16		4c/34-33	4f/34-33	6c/56-33	6e/56-55		
										8a/57-55	3/4
3/8" E.H.S.-7	15,400	1,600	.273	3/8		4c/34-33	4f/34-33	6d/56-33	6e/56-55		5/8
										8a/57-55	3/4
1/2" H.S.-7	18,800	1,900	.517	1/2		6a/56-33	6b/56-33	6e/56-33	8a/57-55	8c/57-55	
7/16" E.H.S.-7	20,800	2,100	.399	7/16		6a/56-33	6b/56-33	6e/56-33	8b/57-55	8d/57-55	
9/16" H.S.-7	24,500	2,500	.671	9/16		6a/56-33	6d/56-33	8a/57-33	8c/57-55	8e/57-55	
1/2" E.H.S.-7	26,900	2,700	.517	1/2	4	8a/57-33	8a/57-33	8b/57-33	8d/57-55		7/8
										10a/58-55	1 1/4
5/8" H.S.-7	29,600	3,000	.813	5/8						10a/58-55	
						8a/57-33	8a/57-33	8c/57-33	8e/57-55		7/8
9/16" E.H.S.-7	35,000	3,500	.671	9/16		8a/57-33	8a/57-33	8d/57-33			
									10a/58-55	10c/58-55	1 1/4
5/8" E.H.S.-7	42,400	4,300	.813	5/8	5			10a/58-33	10c/58-55	10e/58-55	
						8a/57-33	8b/57-33				1
9/16" B.S.-19	38,000	3,800	.660	9/16		8a/57-33	8a/57-33	8e/57-33			1
									10b/58-55	10d/58-55	1 1/4
5/8" B.S.-19	48,000	4,800	.810	5/8	5	10a/58-33	10a/58-33	10a/58-33	10d/58-55	10e/58-55	
3/4" B.S.-19	68,000	6,800	1.160	3/4		10a/58-33	10a/58-33	10e/58-33	12b/59-55	12d/59-55	1 1/2
7/8" B.S.-19	92,000	9,200	1.560	7/8		10a/58-33	10c/58-33	12c/59-33	12e/59-55		
1" B.S.-19	122,000	12,200	1.070	1		10a/58-33	10e/58-33	12e/59-33			1 3/4

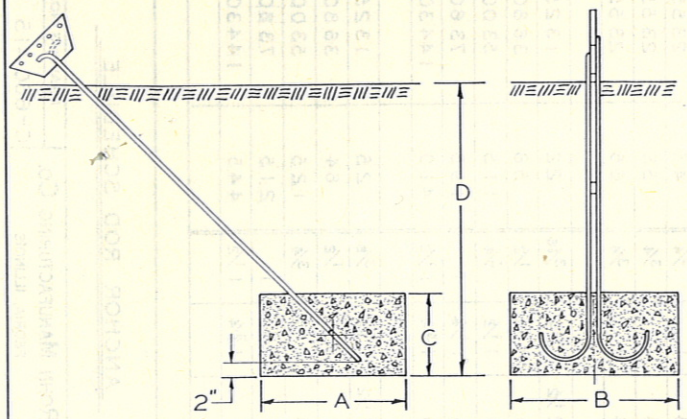
* ALL TURNBUCKLES ARE EYE-AND-JAW TURNBUCKLES

EXAMPLE FOR ABOVE:

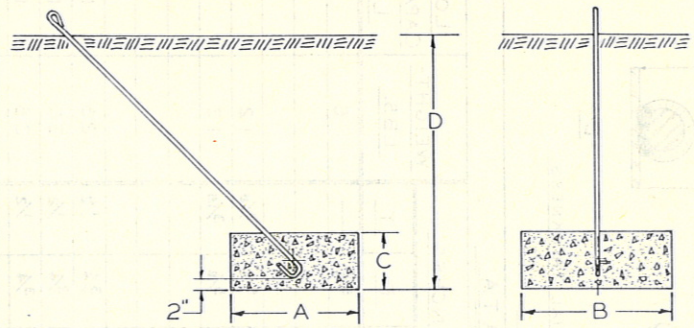
6b ← CONCRETE ANCHOR 6b (DWG.NO. C-620643-R)
56-55 ← ANCHOR ROD GAC 56-55 (DWG.NO. C-620642-R)

NOTE: THE ABOVE CHART IS TO SERVE AS A GUIDE ONLY. THE CONCRETE ANCHORS AND ANCHOR RODS LISTED ABOVE ARE BASED UPON MAXIMUM STRENGTHS OF GUY WIRES AND DO NOT NECESSARILY INDICATE THOSE WHICH WOULD BE RECOMMENDED AS A RESULT OF A TOWER DESIGN. THEREFORE, IN MANY CASES, THE RECOMMENDED ANCHORS AND RODS WILL BE SMALLER THAN THOSE GIVEN ABOVE.

DRAWN AED		TITLE
CHECKED ck		GUY ACCESSORY SCHEDULE
APPROVED RAK		
DATE 8-4-64	ROHN MFG. CO.	DRAWING NO.
SCALE NONE	PEORIA, ILLINOIS	C-640717



ANCHOR DETAIL FOR GAC-34-57-58-59
(FOR GAC-56 SEE DWG. NO. C-620642-R)



ANCHOR DETAIL FOR GAC-25

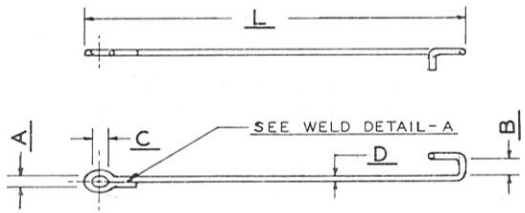
NOTE: REINFORCING RODS ARE RECOMMENDED TO BE USED IN ALL ANCHORS. RODS SHOULD HAVE A MINIMUM DIAMETER OF 1/2" WITH A MAXIMUM SPACING OF 12".

CONCRETE ANCHOR DATA

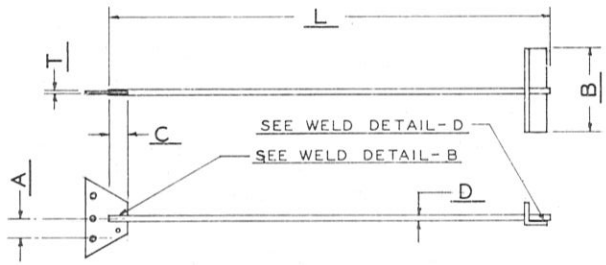
DEPTH D, FT.	ROD NO.	BLOCK NO.	ANCHOR DIMENSIONS, FT. A	B	C	WEIGHT LBS.	CONCRETE CU. YDS.	HOLDING POWER, LBS.
3	GAC-25	3 a	1.5	1.5	1	310	.08	1,810
		3 b	2	2	1	560	.15	2,640
		3 c	2.5	2.5	1	870	.23	3,630
		3 d	3	3	1	1,260	.33	4,800
		3 e	3	4	1	1,680	.44	6,050
4	GAC-34	4 a	3	3	1.5	1,890	.50	7,000
		4 b	3	4	1.5	2,520	.67	8,500
		4 c	3	5	1.5	3,150	.84	10,400
		4 d	3	6	1.5	3,780	1.00	12,000
		4 e	4	6	1.5	5,050	1.33	15,200
		4 f	5	6	1.5	6,300	1.67	18,300
6	GAC-56	6 a	3	4	1.5	2,520	.67	20,100
		6 b	3	5	1.5	3,150	.84	23,200
		6 c	3	6	1.5	3,780	1.00	26,300
		6 d	4	6	1.5	5,050	1.33	31,700
		6 e	5	6	1.5	6,300	1.67	36,600
8	GAC-57	8 a	3	5	1.5	3,150	.84	44,300
		8 b	3	6	1.5	3,780	1.00	49,400
		8 c	4	6	1.5	5,050	1.33	57,000
		8 d	5	6	1.5	6,300	1.67	64,500
		8 e	6	6	1.5	7,550	2.00	72,100
10	GAC-58	10 a	3	6	1.5	3,780	1.00	83,500
		10 b	4	6	1.5	5,050	1.33	94,100
		10 c	5	6	1.5	6,300	1.67	104,800
		10 d	6	6	1.5	7,550	2.00	115,200
		10 e	6	8	1.5	10,080	2.67	136,400
12	GAC-59	12 a	4	6	1.5	5,050	1.33	144,800
		12 b	5	6	1.5	6,300	1.67	158,700
		12 c	6	6	1.5	7,550	2.00	172,500
		12 d	6	8	1.5	10,080	2.67	200,500
		12 e	8	8	1.5	13,440	3.56	233,200

DRAWN M. BUENDIA		TITLE
CHECKED ck		DETAILS OF CONCRETE ANCHORS
APPROVED DAA		DRAWING NO.
DATE 7-22-64	ROHN MFG. CO. PEORIA, ILLINOIS	C-620643-R
SCALE NONE		

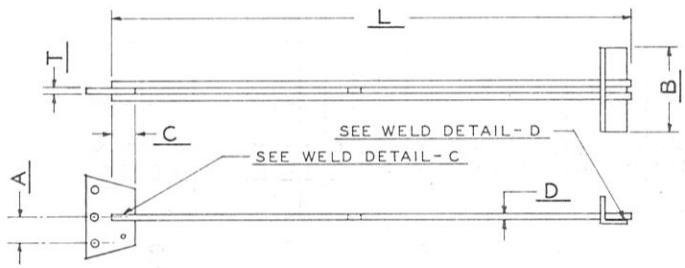
REVISED AND REDRAWN 7-22-64



TYPES- GAR-25 & GAC-25

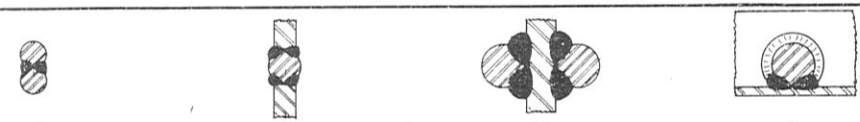


TYPES- GAC- 75, 100, 34, 56 & 57



TYPES- GAC- 58 & 59

ANCHOR ROD DETAILS



NOTE: WELD SIZE TO BE ONE-HALF OF MATERIAL THICKNESS

WELD DETAILS

C-660415 A

ANCHOR ROD DATA

PART NUMBER	EQUALIZER PLATE TYPE	DIMENSIONS IN INCHES						WEIGHT-LBS.	LOAD CAPACITY-LBS.
		L	A	B	C	D	T		
GAR-25	EYE	64	3/4	4	1 1/2	5/8	—	8	9200
GAC-25-3	EE	64	2	4	1 1/2	5/8	3/16	12	9200
GAC-25-5	EE	64	2	4	1 1/2	5/8	3/16	13	9200
GAC-75-1	EJ	120	11/16	12	3	3/4	1/2	25	13250
GAC-75-3	EJ	120	2 1/2	12	3	3/4	1/2	30	13250
GAC-75-5	EJ	120	2 1/2	12	3	3/4	1/2	35	13250
GAC-100-1	EJ	120	15/16	12	4	1	3/4	45	23550
GAC-100-3	EJ	120	3	12	4	1	3/4	55	23550
GAC-100-5	EJ	120	3	12	4	1	3/4	65	23550
GAC-34-33	EJ	84	2	12	2 1/2	3/4	3/16	22	13250
GAC-56-33	EJ	120	2 1/2	12	3	1 1/4	1/2	58	36800
GAC-57-33	EJ	168	3	12	4	1 1/2	3/4	115	53000
GAC-58-33	EJ	192	4	12	6	1 1/4	1	195	73600
GAC-59-33	EJ	240	4	12	6	1 3/4	1 1/2	410	144300
GAC-34-55	EJ	84	2	12	2 1/2	3/4	3/8	25	13250
GAC-56-55	EJ	120	2 1/2	12	3	1 1/4	1/2	64	36800
GAC-57-55	EJ	168	3	12	4	1 1/2	3/4	125	53000
GAC-58-55	EJ	192	4	12	6	1 1/4	1	215	73600
GAC-59-55	EJ	240	4	12	6	1 3/4	1 1/2	445	144300

7)
6)
5) TYPE-EJ EQUALIZER PLATES ARE USED WITH EYE & JAW TURNBUCKLES.
4) TYPE-EE EQUALIZER PLATES ARE SUPPLIED IN PAIRS FOR EYE & EYE TURNBUCKLES.
3) PART NO. SUFFIXES- 1, 3, 5, 33 & 55 DENOTES- 1, 3 OR 5 HOLES IN PLATE.
2) TYPE GAC-25 RODS ARE SUPPLIED WITH TYPE 2534-EE EQUALIZER PLATES.
1) SEE DRAWING NO. C-660416 FOR EQUALIZER PLATE DETAILS.

NO.	REVISION	BY	DATE
1	REDRAWN	ck	7-26-66

DRAWN ck
CHECKED [illegible]
APPROVED [illegible]
DATE 7-26-66
SCALE NONE

THIS DRAWING IS THE PROPERTY OF ROHN MANUFACTURING CO. IT IS NOT TO BE REPRODUCED, COPIED, OR TRACED IN WHOLE OR IN PART WITHOUT OUR WRITTEN CONSENT.

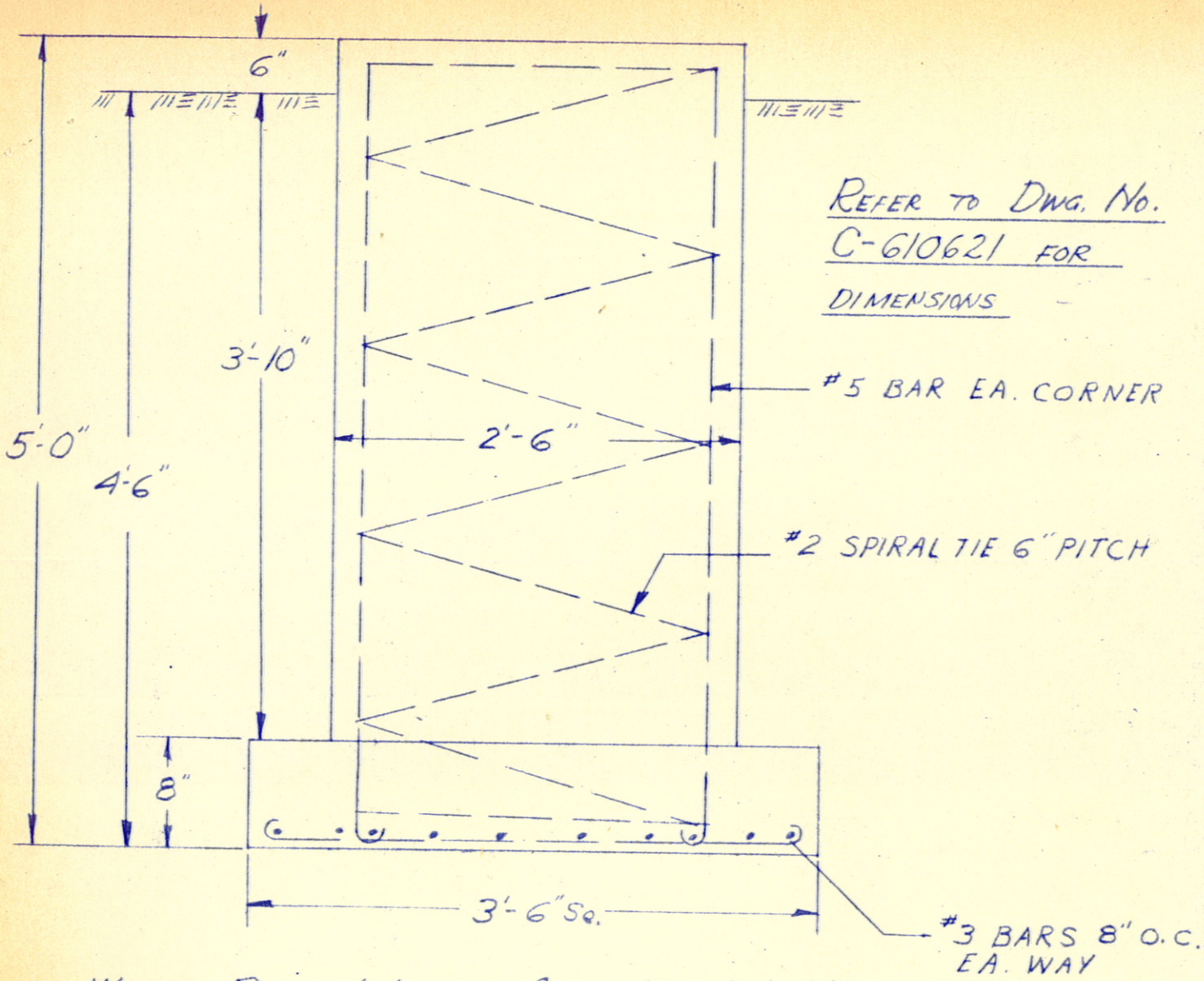
ANCHOR ROD SCHEDULE

ROHN MANUFACTURING CO.
PEORIA, ILLINOIS

DRAWING NO. C-660415 A

ILLINOIS B/P CO. 199M

CB-4 BASE PIER



WT. OF PIER $= (3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{12} + 2\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{3})\,140$

$= \underline{4{,}940^{\#}}$

CHARLES A. MITCHELL
81-2615
REGISTERED STRUCTURAL ENGINEER OF ILLINOIS

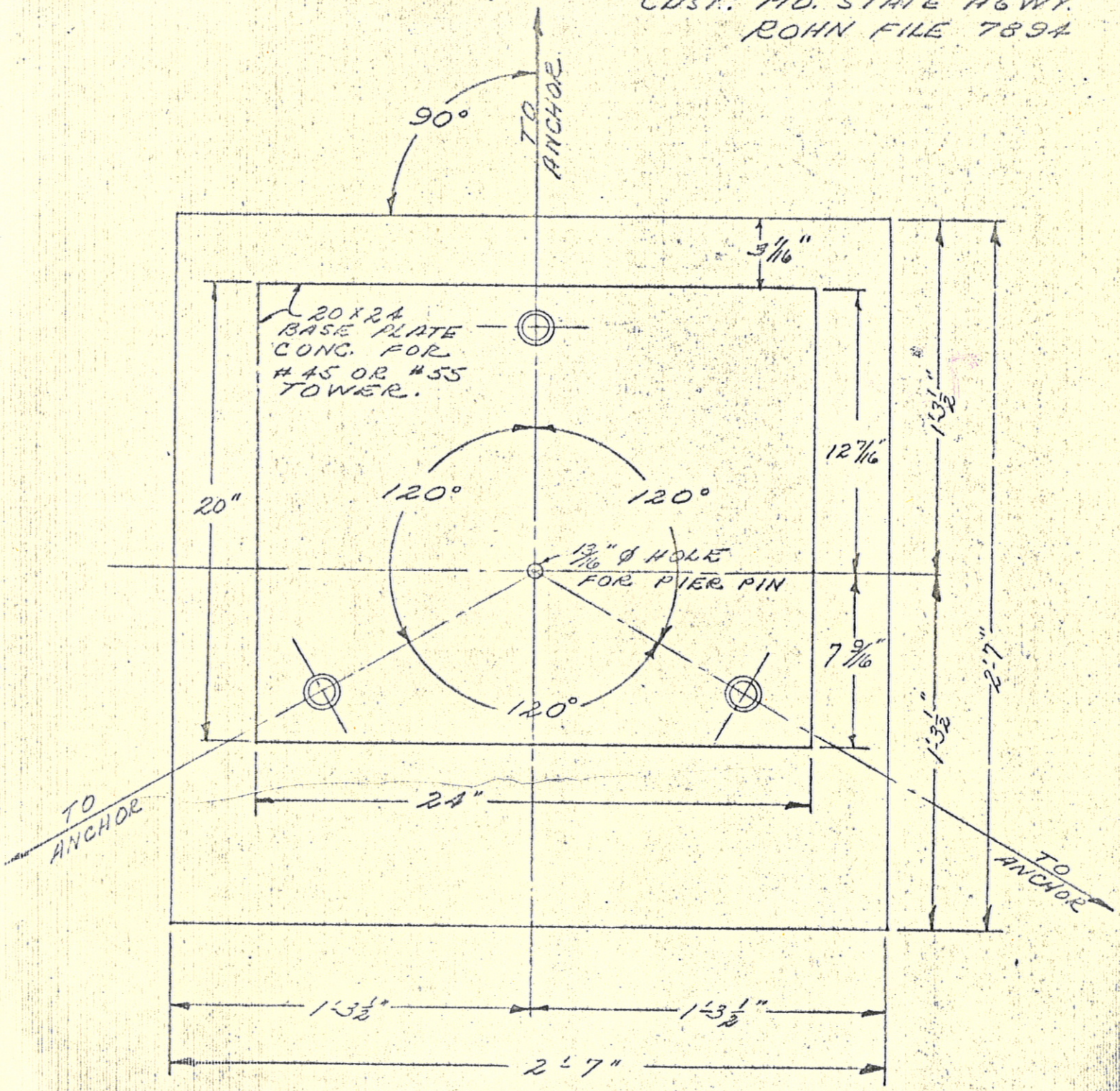
USING SOIL BEARING PRESSURE OF 3000 PSF:

ALLOWABLE BASE REACTION = TOTAL ALLOW. BEARING − WT.

$= 3\frac{1}{2} \times 3\frac{1}{2} \times 3000 - 4940$

$= 36{,}750 - 4{,}940 = \underline{\underline{31{,}810^{\#}}}$

CUST: MO. STATE HGWY.
ROHN FILE 7894



NOTE: CHAMFER ALL EXPOSED EDGES OF CONC.

PLAN VIEW OF TOP
OF SPECIAL CB-4 BASE
SCALE 1" = 6"

SITES: FLAT; RIDGELY; WARDELL; BRANSON.

DWN: R.A.M. 7-19-67
CHKD: W.D.D. 7-19-67
APPVD:

ROHN MFG CO.
DWG. A-670710

NOTE: SEE DWG. A-670711
FOR ELEV. VIEW.