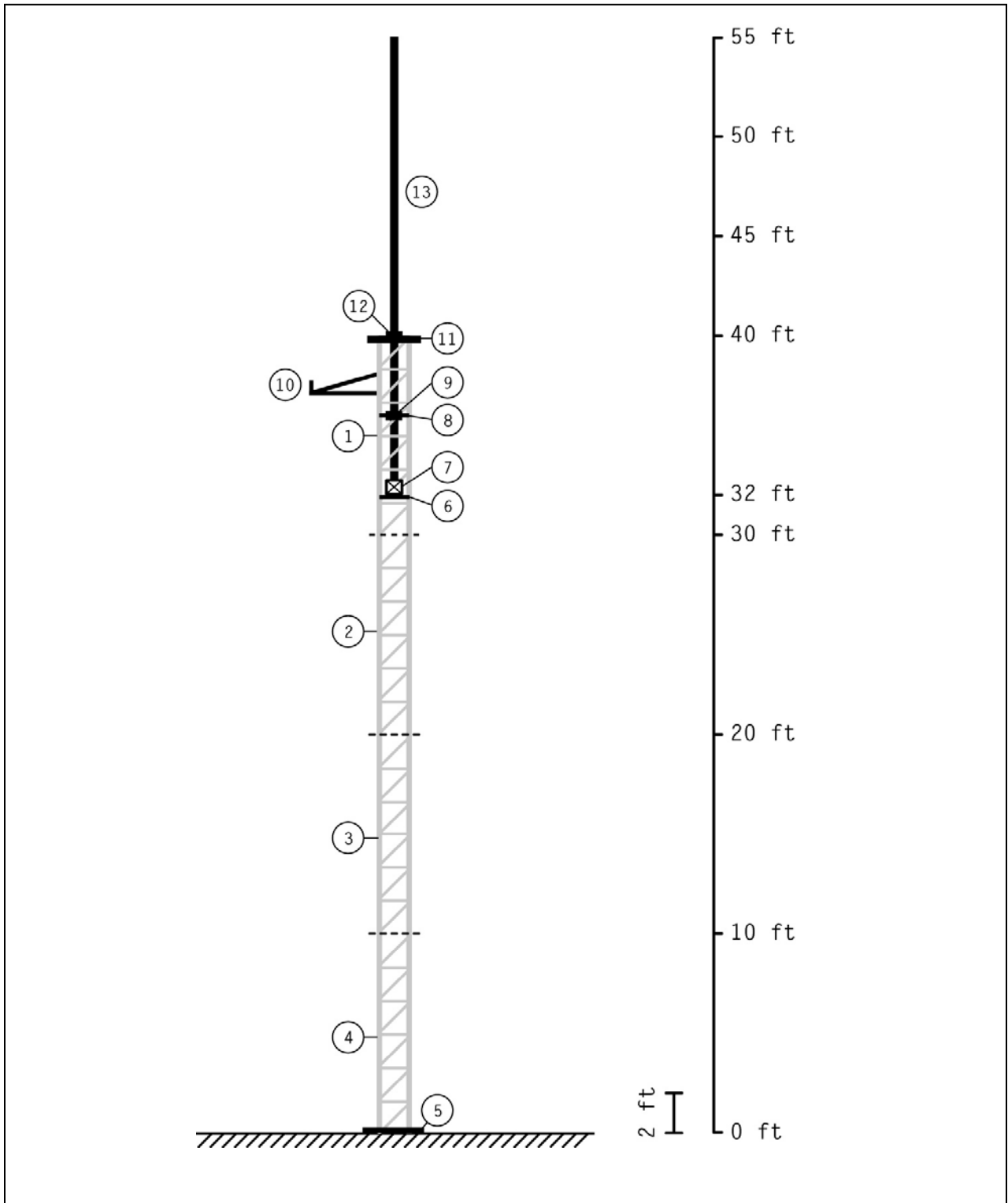


The University of Michigan Amateur Radio Club Tower

Tower, antenna, and related equipment data

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Diagram #1: Tower structure



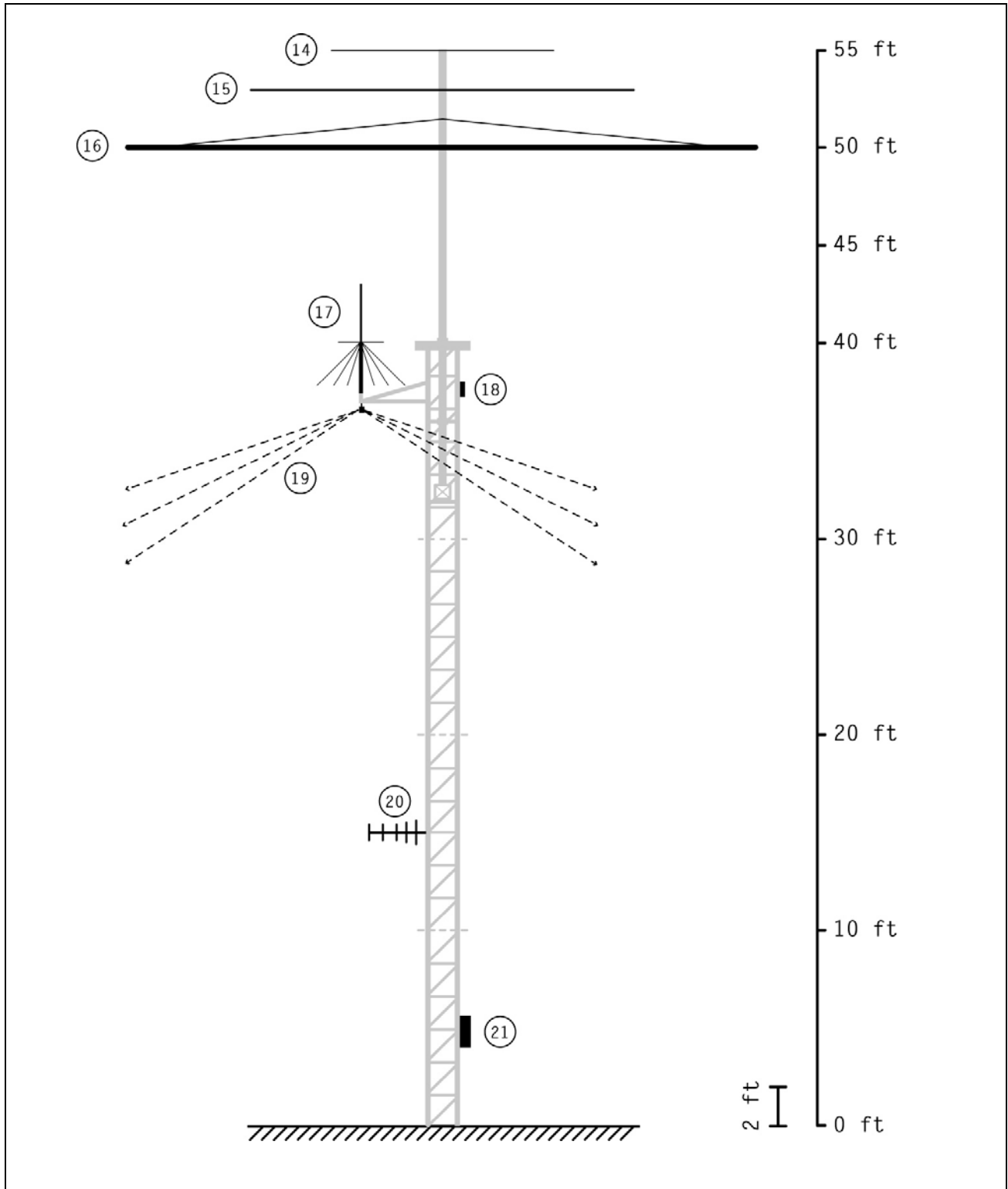
Parts list #1: Tower structure

#	Description	Mounting height above roof level
1-4.	Rohn 55G 10 ft tower sections	0, 10, 20, and 30 ft
5.	Rohn BPC55G tower base	0 ft
6.	Rohn AS455G accessory shelf (1/2)	32 ft
7.	M ² OR2800 rotator	32 ft
8.	Rohn AS455G accessory shelf (2/2)	36 ft
9.	Rohn TB-4 thrust bearing (1/2)	36 ft
10.	W9IIX antenna mounting bracket	37 ft
11.	Rohn TA-55 guy bracket	39 ft
12.	Rohn TB-4 thrust bearing (2/2)	40 ft
13.	Mast, 3.00 in O.D., 23.50 ft length, chromoly	31.5 ft

Not included in diagram:

Coaxial cable, Times Microwave LMR-400, total length of 307 ft in 6 separate lengths of 17 ft, 42 ft, 43 ft, 60 ft, 70 ft, and 75 ft.

Diagram #2: Antennas and related hardware



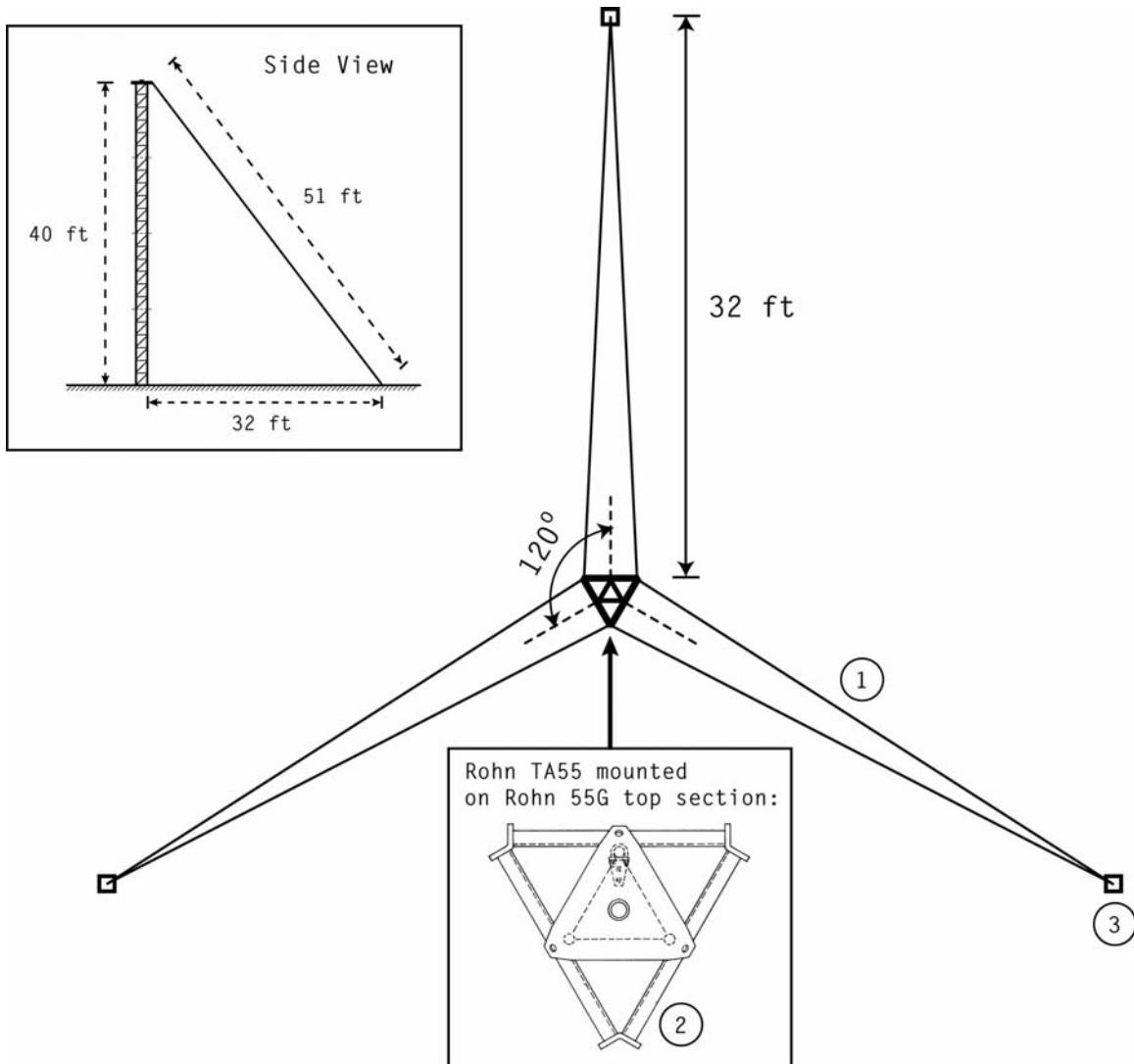
Parts list #2: Antennas and related hardware

#	Description	Mounting height above roof level
14.	M ² 440-18 Yagi-Uda antenna	55 ft
15.	M ² 2M12 Yagi-Uda antenna	53 ft
16.	SteppIR MonstIR Yagi-Uda antenna	50 ft ¹
17.	Diamond D130JN discone antenna	37.5 ft
18.	Grounding assembly consisting of (Qty 2) ICE grounding blocks (393-2/N) and tower leg mounting fixture (395-55G)	37.5 ft
19.	Inverted-vee wire dipole antenna, with six wire elements extending to roof-top mounting positions—elements are in sets of 33 ft, 64 ft, and 67 ft insulated AWG14 wire.	36.5 ft
20.	Antenex YS4305 Yagi-Uda antenna	15 ft
21.	Enclosure, 16 in x 14 in x 8 in, plastic, weatherproof, and tower mounting bracket	4 ft

Notes:

1. This antenna can be mounted lower on the mast if required, to a minimum level of 45 ft above roof level.

Guying System Diagram – Top and Side Views

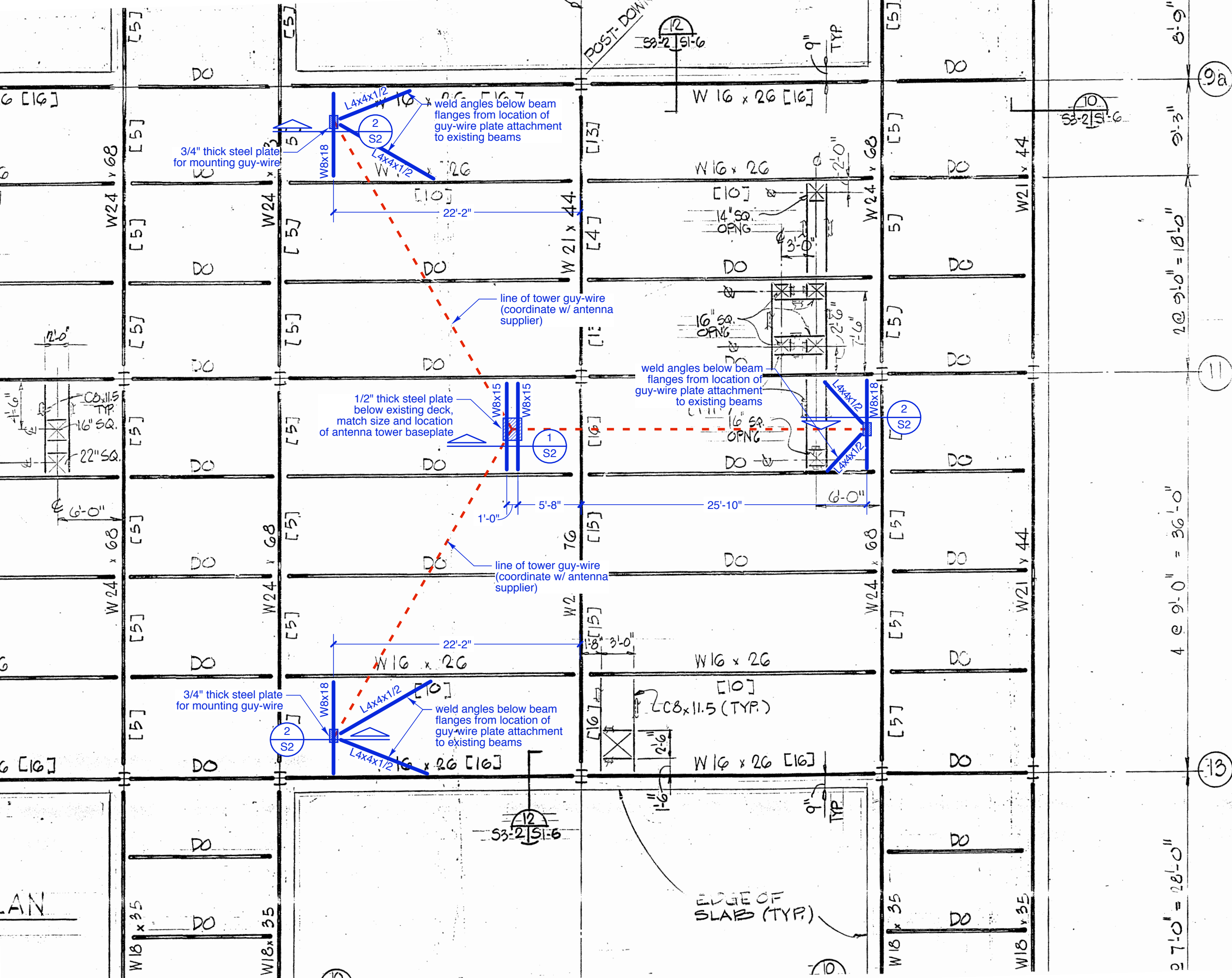


Guying system description:

- All guy wires are 1/4 inch diameter “EHS” (1).
- Guy wires are arranged in sets of two ~ 32 ft lengths attached to each face of a Rohn TA55 torque arm assembly (2).
- Each guy wire set is attached to the building via a custom-manufactured guy anchor (3) which penetrates the roof.

Mass Budget

Component	Unit Mass (kg)	Quantity	Total Mass (kg)
Rohn 55-G Section	45.36	4	181.44
BPC55G	18.14	1	18.14
TA-55	27.22	1	27.22
TB-4	1.36	2	2.72
BPL55G	15.88	1	15.88
AS455G	4.54	2	9.07
OR2800	19.05	1	19.05
Mast	77.11	1	77.11
440-18	2.27	1	2.27
2M-12	3.63	1	3.63
MonstIR	98.00	1	98.00
W9IIX bracket	2.00	1	2.00
D130J	1.00	1	1.00
Echolink Antenna	1.00	1	1.00
Inverted-V	5.00	1	5.00
LMR400	0.10	300	30.00
Misc. hardware	20.00	1	20.00
Grounding	25.00	1	25.00
		Total (kg)	538.52



**University of Michigan
EECS Roof Mounted Antenna**

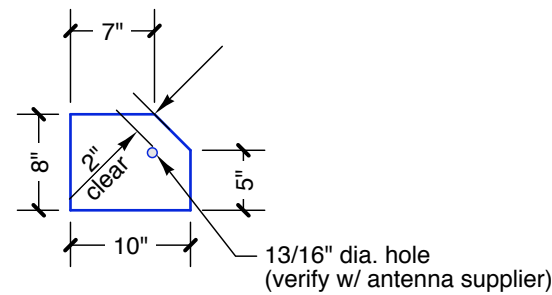
SEPTEMBER 8, 2006

steel framing notes

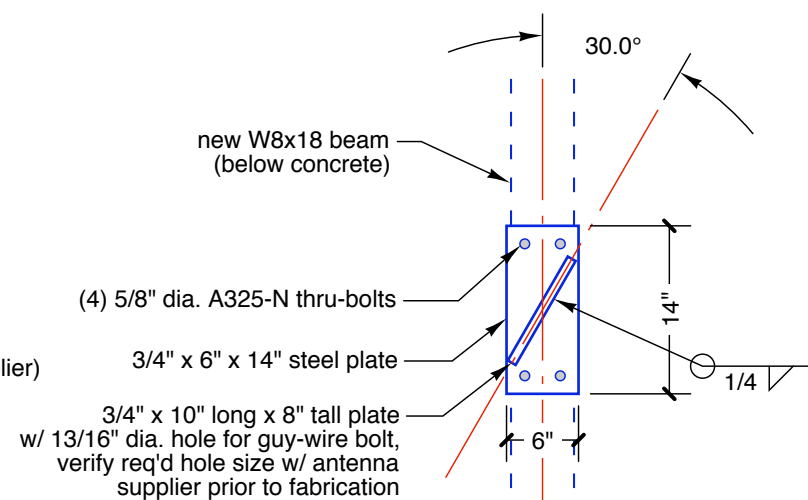
these framing modifications and details are to coordinate with a 40-foot tall model 55 tower by Rohn Products. any tower that deviates from this and/or and changes that are required of this design must be coordinated with both the engineer-of-record and the antenna supplier.

MATERIALS

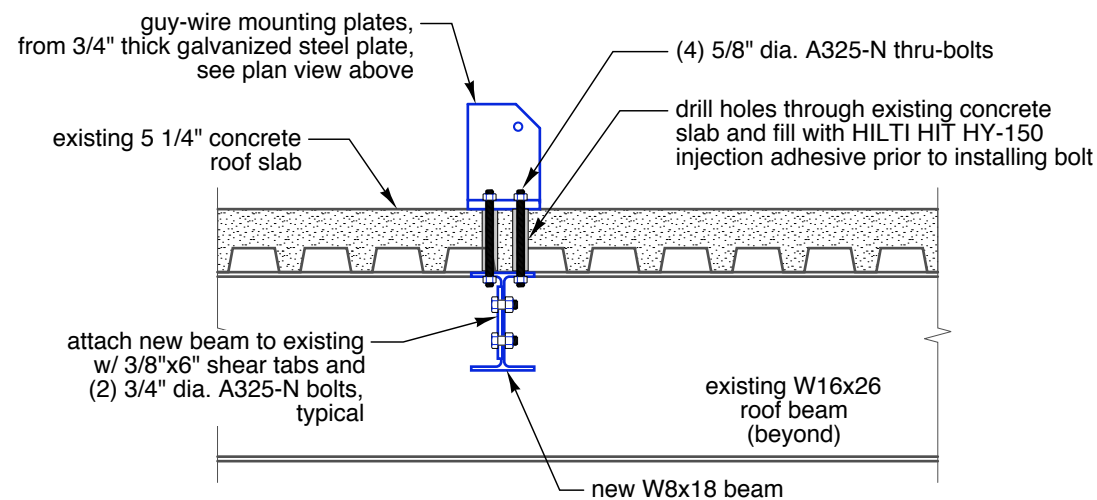
Grout below plates	Non-shrink, non-metallic (5000 psi)
Structural steel	
W-shapes:	ASTM A572 - 50 ksi
other rolled shapes:	ASTM A36 - 36 ksi
Structural steel bolts	ASTM A325-N
Washers	ASTM F436 hardened washer
Nuts	ASTM A563
Welding electrodes (E-70 series)	ASTM A233
Epoxy	Hilti HIT HY 150 Injection Adhesive, or equal



guy-wire mounting plate dimensions

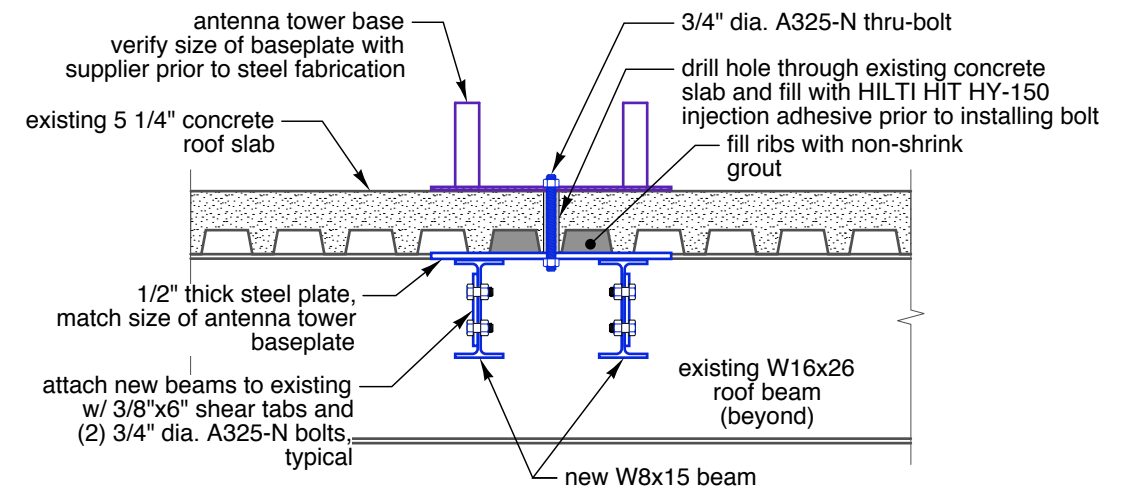


guy-wire mounting plate plan



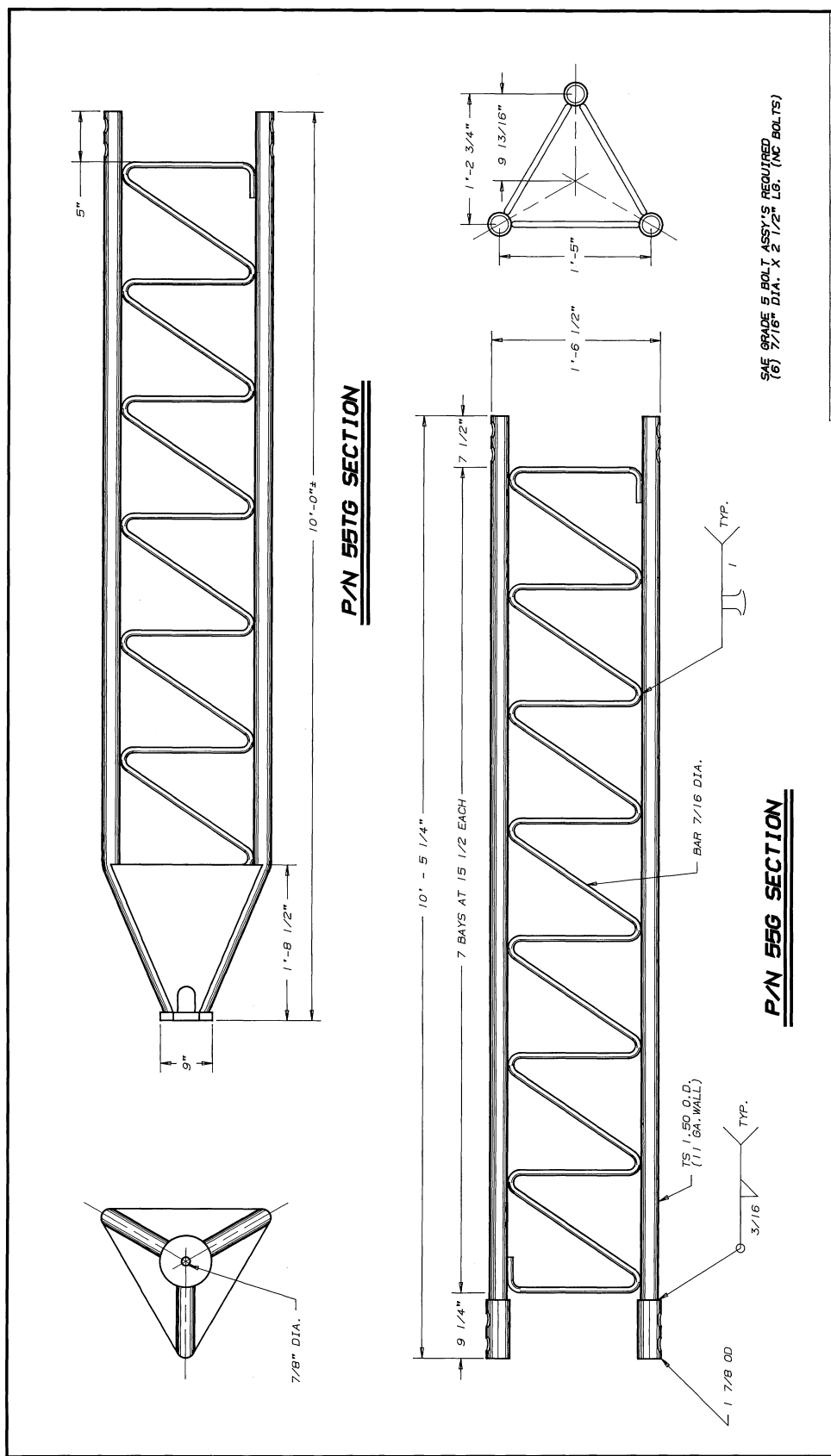
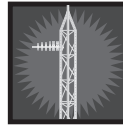
2
S2

3/4" = 1'-0"



1
S2

3/4" = 1'-0"



P/N 55TG SECTION

P/N 55G SECTION

RA	REV D EIA-222-E-1991	9-10-91	RA S
RB	REV AIN AND REVISED SPEC.	02/09/99	WDU
No.	Revision Description	Date	By

UNR-Rohn

55G SECTION ASSEMBLY

Scale: Unless otherwise specified, dimensions are given in inches.

Drawn by	WDU	2/9/99	Material	Finish	Angles	Weight
Checked by	WDU	02-25-99	Material	Finish	Angles	Weight
Approved by	WDU	02-25-99	Material	Finish	Angles	Weight
Approved by	WDU	02-25-99	Material	Finish	Angles	Weight

Approved by Sales: *[Signature]* Date: 2-2-98

Approved by Production: *[Signature]* Date: 2-2-98

Approved by Drawing: *[Signature]* Date: 2-2-98

File Number: C630655 R 9

NOMENCLATURE

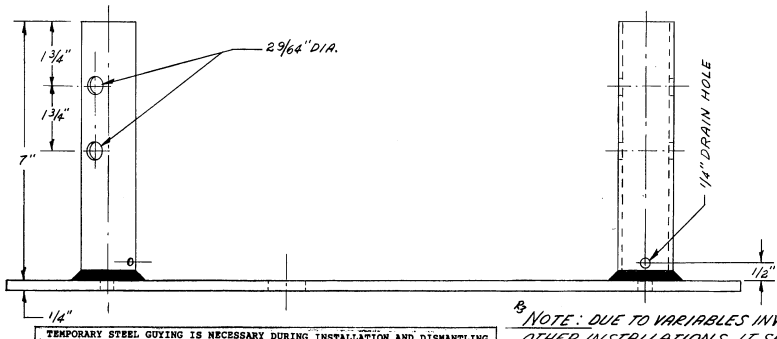
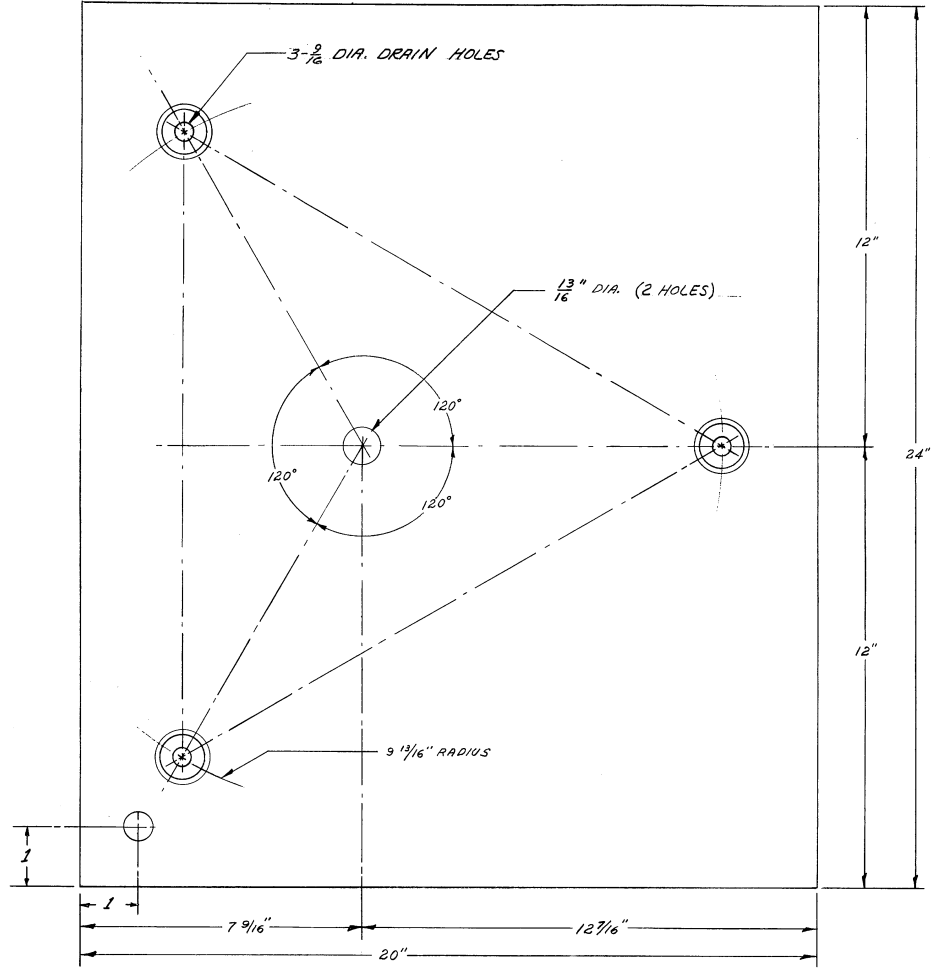
A = CROSS SECTIONAL AREA (SQUARE INCHES)
 C = COMPRESSION CAPACITY WITH 1/3 INCREASE IN ALLOWABLE STRESS (KIPS)
 I = MOMENT OF INERTIA ABOUT CENTROIDAL AXIS (INCHES**4)
 Fy = MINIMUM YIELD STRENGTH (KSI)
 L = UNBRACED LENGTH (INCHES) (DIMENSIONLESS)
 M = MOMENT CAPACITY WITH 1/3 INCREASE IN ALLOWABLE STRESS (FT.-KIPS)
 N/A = NOT APPLICABLE
 S = ELASTIC SECTION MODULUS (INCHES**3)
 T = TENSION CAPACITY WITH 1/3 INCREASE IN ALLOWABLE STRESS (KIPS)
 W = WEIGHT PER FOOT (POUNDS)
 Ws = WEIGHT PER SECTION (POUNDS)

NOTE: CAPACITIES SHOWN ARE BASED ON ANSI/EIA-222-E-1991.

SEC. >>	55G TOWER SECTION PROPERTIES	BRACES	SECTION
SIZE	TS 1.5 00X.120 WALL	BAR 7/16 DIA.	N/A
Fy	50.0	36.0	N/A
A	0.5203	0.1503	1.56
S	0.1664	0.0082	7.12
I	0.1248	0.0018	75.2
r	0.4897	0.1094	6.94
L	15.5	21.9	VARIES
K	1.0	0.70	1.0
KL/r	31.6	140.3	VARIES
C	18.6	1.52	N/A
T	17.2	N/A	N/A
M	N/A	N/A	N/A
W	1.77	0.512	21.1
Ws	56.0	39.0	95.0



C640655-R5



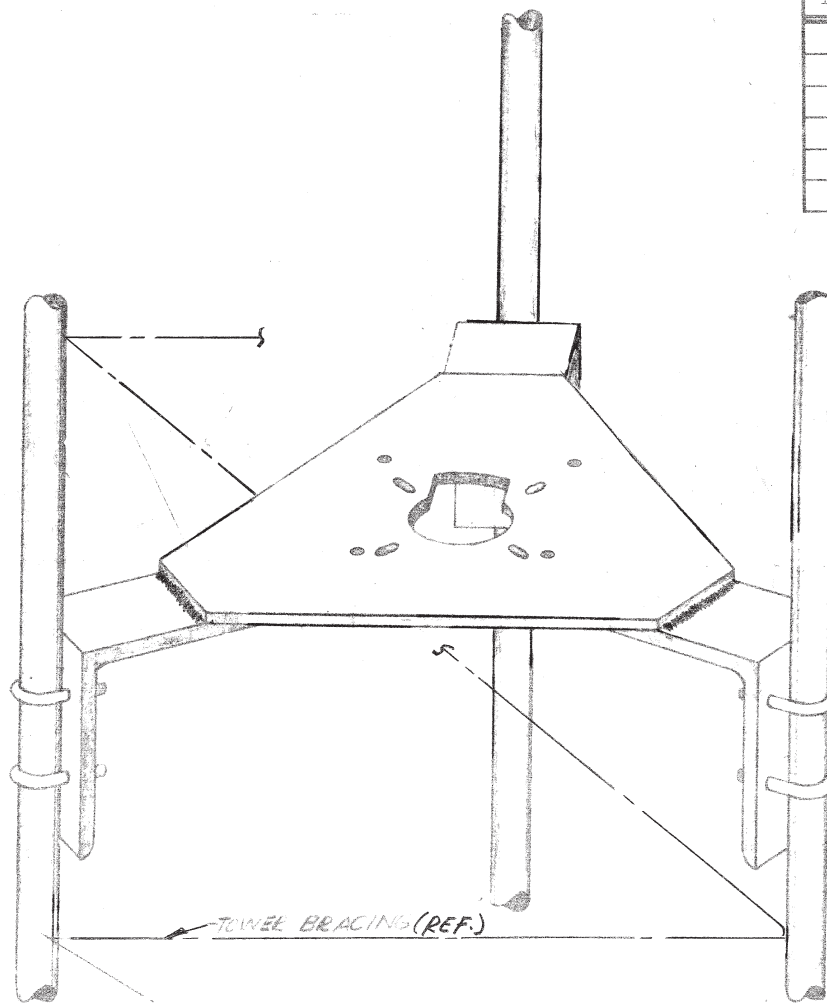
NOTE:
AFTER GALVANIZING, CHECK DRAIN HOLES TO SEE THAT THEY ARE NOT PLUGGED.

NOTE:®
FOR USE WITH GUYED AND BRACKETED TOWERS ONLY.

BASE PLATE FOR CONCRETE PIER
(PART NO. BPC556)

NOTE: DUE TO VARIABLES INVOLVED IN ROOF AND OTHER INSTALLATIONS, IT SHALL BE THE CUSTOMER'S OR INSTALLER'S RESPONSIBILITY TO PROVIDE STRUCTURALLY ADEQUATE SUPPORTS FOR PIER & ANCHOR CONNECTIONS. IT MAY ALSO BE NECESSARY FOR THE CUSTOMER OR INSTALLER TO SECURE THE SERVICE OF A LOCAL ENGINEER TO DETERMINE THAT INSTALLATION COMPLIES WITH LOCAL BUILDING CODES.

DRAWN BY: BUEHORN		TITLE: BASE PLATE FOR MODEL 55 TOWER	
REV. 12-5-88	EDM	CHECKED: CEA	CUSTOMER: ROHN MANUFACTURING, PEORIA, ILLINOIS
R5	ADDED TEMP. GUYING NOTE	APPROVED: [Signature]	DRAWING NO. C640655-R5
R4	DELETE EXCESS HOLES	DATE: 6-30-64	
R3	ADDED NOTE	SCALE:	
R2	ZOBIN HOLE WAS 3/8 DIA	SCALE:	
R1	ADDED NOTE INDICATED	SCALE:	



ASS'Y P/N AS455G

BILL OF MATERIAL (ASS'Y. P/N AS455G)

ITEM	QUAN.	PART NO.	DESCRIPTION	DWG. NO.
1	1	KH12Z	ACCESSORY SHELF	C800367
2	6	JRS1A	U-BOLT ASSY	B651028 Rev

NOTE: AS455G CAN BE USED FOR 45G OR 55G TOWERS.

R3	REVISED QUANTITY OF U-BOLT'S	11-25-80	JHD
R2	CHANGED TO WELDED ASSY	4-15-80	JEB
R1	PC20 WAS KH125J	3-14-80	JHD
NO	DESCRIPTION	DATE	BY

REVISIONS

Unarco-Rohn

Division of Unarco Industries, Inc.

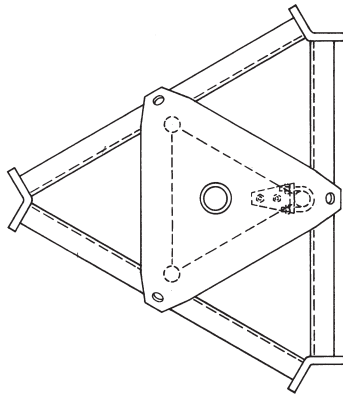
6

TITLE AS455G ACCESSORY SHELF ASSY
FOR 45G, 55G TOWERS

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.

SCALE	NONE	MATERIAL	FINISH	WT
DRAWN BY	JEB	DATE	2-26-80	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE GIVEN IN INCHES
CHKD BY	JHD	DATE	2-28-80	DWG. NO.
APP'D	TS	DATE	3-1-80	B800120 R3

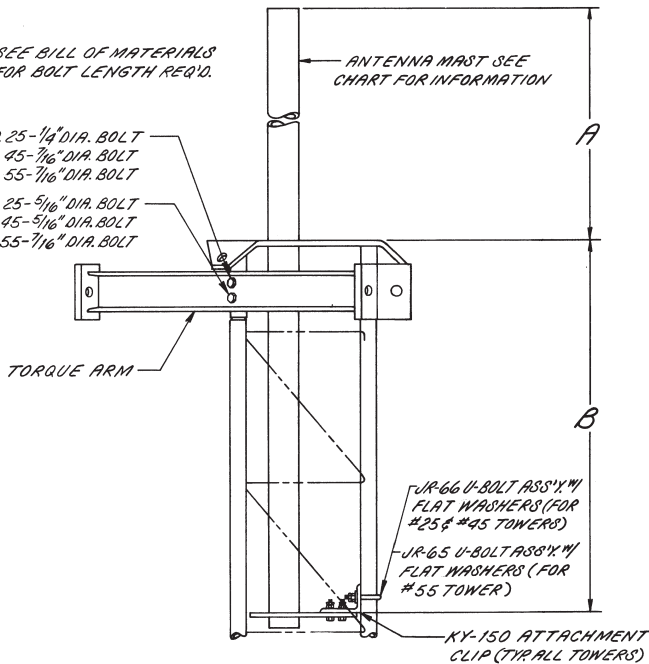
TORQUE ARM & DISH MOUNT MUST BE ORDERED SEPARATELY



PLAN

* SEE BILL OF MATERIALS FOR BOLT LENGTH REQ'D.

- * NO. 25 - 1/4" DIA. BOLT
- * NO. 45 - 3/16" DIA. BOLT
- * NO. 55 - 7/16" DIA. BOLT
- * NO. 25 - 5/16" DIA. BOLT
- * NO. 45 - 5/16" DIA. BOLT
- * NO. 55 - 7/16" DIA. BOLT



ELEVATION

BILL OF MATERIALS

NO. 25 TOWER				
TOP DISH MOUNTS				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
25TDM 2	KY-151	1	ANTENNA MAST	C-750049R
	KY-150	3	ATTACHMENT CLIP	C-750049R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	220029 240009 240016	3	1/4 x 1 1/2 BOLT & NUT	
	220037 240016	3	5/16 x 1 1/2 BOLT & NUT	
25TDM 2SP	KY-152	1	ANTENNA MAST	C-750049R
	KY-150	3	ATTACHMENT CLIP	C-750049R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	220029 240009 240016	3	1/4 x 1 1/2 BOLT & NUT	
	220037 240016	3	5/16 x 1 1/2 BOLT & NUT	
25TDM 2EH	KY-153	1	ANTENNA MAST	C-750049R
	KY-150	3	ATTACHMENT CLIP	C-750049R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	220029 240009 240016	3	1/4 x 1 1/2 BOLT & NUT	
	220037 240016	3	5/16 x 1 1/2 BOLT & NUT	
25TDM 25SP	KY-154	1	ANTENNA MAST	C-750049R
	KY-150	3	ATTACHMENT CLIP	C-750049R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	220029 240009 240016	3	1/4 x 1 1/2 BOLT & NUT	
	220037 240016	3	5/16 x 1 1/2 BOLT & NUT	
TORQUE ARM				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
TA25	KC 90	1	TORQUE ARM (STAMP PIN TA25)	B-760795
	2100754 230014	3	1/4 x 2 BOLT & NUT	
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	

ANTENNA MAST CHART				
ASS'Y. NO.	MAST SIZE	A	B	
25TDM 2	T.S. 2" O.D. x 11GA.	2'-0"	2'-9 1/2"	
25TDM 2SP	PIPE 2" STD.	3'-0"	2'-9 1/2"	
25TDM 2EH	PIPE 2" X-STR.	3'-0"	2'-9 1/2"	
25TDM 25SP	PIPE 2 1/2" STD.	3'-0"	2'-9 1/2"	
45TDM 2	T.S. 2" O.D. x 11GA.	3'-0"	2'-11"	
45TDM 2SP	PIPE 2" STD.	3'-0"	2'-11"	
45TDM 2EH	PIPE 2" X-STR.	5'-0"	2'-11"	
45TDM 25SP	PIPE 2 1/2" STD.	5'-0"	2'-11"	
45TDM 25EH	PIPE 2 1/2" X-STR.	5'-0"	2'-11"	
55TDM 2	T.S. 2" O.D. x 11GA.	3'-0"	3'-1"	
55TDM 2SP	PIPE 2" STD.	5'-0"	3'-1"	
55TDM 2EH	PIPE 2" X-STR.	5'-0"	3'-1"	
55TDM 25SP	PIPE 2 1/2" STD.	5'-0"	3'-1"	
55TDM 25EH	PIPE 2 1/2" X-STR.	5'-0"	3'-1"	

NO. 45 TOWER				
TOP DISH MOUNTS				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
45TDM 2	KY-157	1	ANTENNA MAST	C-750050R
	KY-150	3	ATTACHMENT CLIP	C-750050R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	
	2100164 230009	3	7/16 x 2 1/2 BOLT & NUT	
45TDM 2SP	KY-158	1	ANTENNA MAST	C-750050R
	KY-150	3	ATTACHMENT CLIP	C-750050R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	
	2100164 230009	3	7/16 x 2 1/2 BOLT & NUT	
45TDM 2EH	KY-159	1	ANTENNA MAST	C-750050R
	KY-150	3	ATTACHMENT CLIP	C-750050R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	
	2100164 230009	3	7/16 x 2 1/2 BOLT & NUT	
45TDM 25SP	KY-160	1	ANTENNA MAST	C-750050R
	KY-150	3	ATTACHMENT CLIP	C-750050R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	
	2100164 230009	3	7/16 x 2 1/2 BOLT & NUT	
45TDM 25EH	KY-161	1	ANTENNA MAST	C-750050R
	KY-150	3	ATTACHMENT CLIP	C-750050R
	JR66AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404

TORQUE ARM				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
TA45	TA45	1	TORQUE ARM	B-760796
	2100036 230002	3	5/16 x 2 3/8 BOLT & NUT	
	2100164 230009	3	7/16 x 2 1/2 BOLT & NUT	

- GENERAL NOTES**
- THE TOP DISH MOUNTS AND THE TORQUE ARMS ARE SEPARATE UNITS, AND MAY BE USED IN CONJUNCTION WITH EACH OTHER, AS SHOWN, OR AS SEPARATE UNITS. THE TORQUE ARM MAY BE INSTALLED AT THE LEVEL OF ANY TOWER JOINT. WHEN THE TORQUE ARM IS INSTALLED AS SHOWN, THE GUYS ARE ATTACHED TO THE TORQUE ARM ONLY.
 - FLAT WASHERS ARE PROVIDED FOR ALL SLOTTED HOLES.
 - ALL DRAWING NO.'S REFERENCED ARE FABRICATION DRAWINGS FOR SHOP USE ONLY.
 - PAL NUTS ARE PROVIDED WITH 3/8" BOLTS & U-BOLTS ONLY.

NO. 55 TOWER				
TOP DISH MOUNTS				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
55TDM 2	KY-162	1	ANTENNA MAST	C-750051R
	KY-150	3	ATTACHMENT CLIP	C-750051R
	JR65AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100164 230009	6	7/16 x 2 1/2 BOLT & NUT	
	55TDM 2SP	KY-163	1	ANTENNA MAST
KY-150		3	ATTACHMENT CLIP	C-750051R
JR65AW		3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
2100058A		6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
2100164 230009		6	7/16 x 2 1/2 BOLT & NUT	
55TDM 2EH		KY-164	1	ANTENNA MAST
	KY-150	3	ATTACHMENT CLIP	C-750051R
	JR65AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
	2100164 230009	6	7/16 x 2 1/2 BOLT & NUT	
	55TDM 25SP	KY-165	1	ANTENNA MAST
KY-150		3	ATTACHMENT CLIP	C-750051R
JR65AW		3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
2100058A		6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404
2100164 230009		6	7/16 x 2 1/2 BOLT & NUT	
55TDM 25EH		KY-166	1	ANTENNA MAST
	KY-150	3	ATTACHMENT CLIP	C-750051R
	JR65AW	3	U-BOLT ASS'Y. W/ WASHERS	B-651028R
	2100058A	6	3/8 x 1 1/4 BOLT ASS'Y.	C-770404

TORQUE ARM				
ASS'Y. NO.	PART NO.	QUAN.	DESCRIPTION	DRAWING NO.
TA55	TA55	1	TORQUE ARM	B-760797
	2100164 230009	6	7/16 x 2 1/2 BOLT & NUT	

UNARCO-ROHN
Division of Unarco Industries, Inc.

TOP DISH MOUNT & TORQUE ARM ASS'Y. FOR TOWER MODELS - NO. 25, 45 & 55

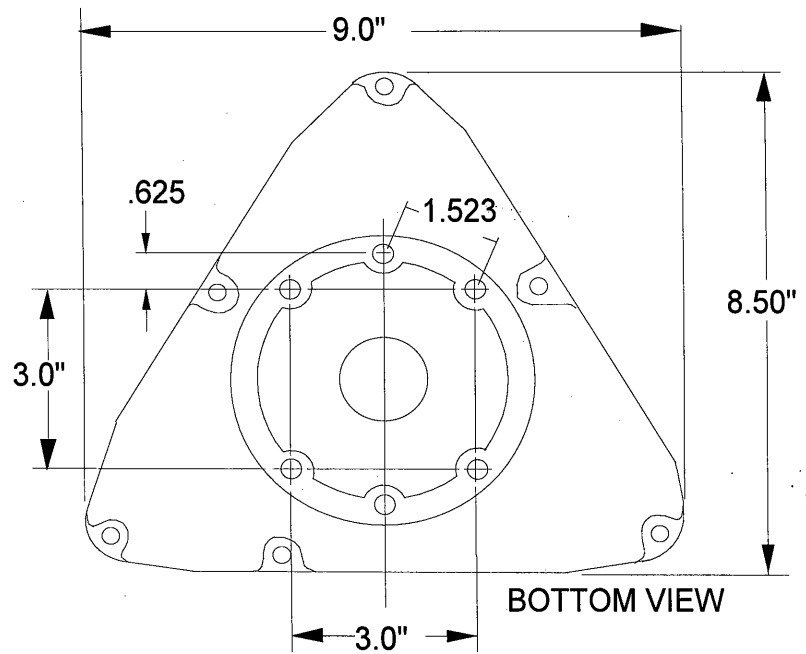
123 SAME PIN# TA45 & TA55 TO ASS'Y OF
R2 REVISE PART NUMBERS 3-3-82 RKS
R. ADD BOLT ASS'Y. PIN'S 11-9-76 GJS

No. 4 Revision Description Date By

None
Drawn by MEH 10-12-76
Checked by WJL 10-14-76
Approved by Engineering CW 10-14-76
Approved by Production Date

Approved by Sales Date Drawing Number
PAW 10-15-76 C-760786 R 3

OR-2800DC POSITIONER HARDWARE AND DIMENSIONS



NOTE: FOR MAST DIAMETERS
OVER 2-1/2" CONTACT
M2 FOR LONGER BOLTS

3/8-24 X 4"
BOLT & FLATWASHER - 6X

3/8 FLATWASHER &
3/8-24 LOCKNUT - 6X

CENTER GUIDE: (OPTIONAL)
USED TO KEEP MAST
CENTERED. PLACE IT
OVER THE BOLT AND
SPACER.

1/4-20 x 1-1/4" BOLT
1/4" SPLIT RING LW
1/2" X 1/2" SPACER

3/8-24 X 2" BOLT,
FLATWASHER,
& LOCKNUT 4X

TOP PLATE
SPLINED SHAFT
AND HUB



CAUTION

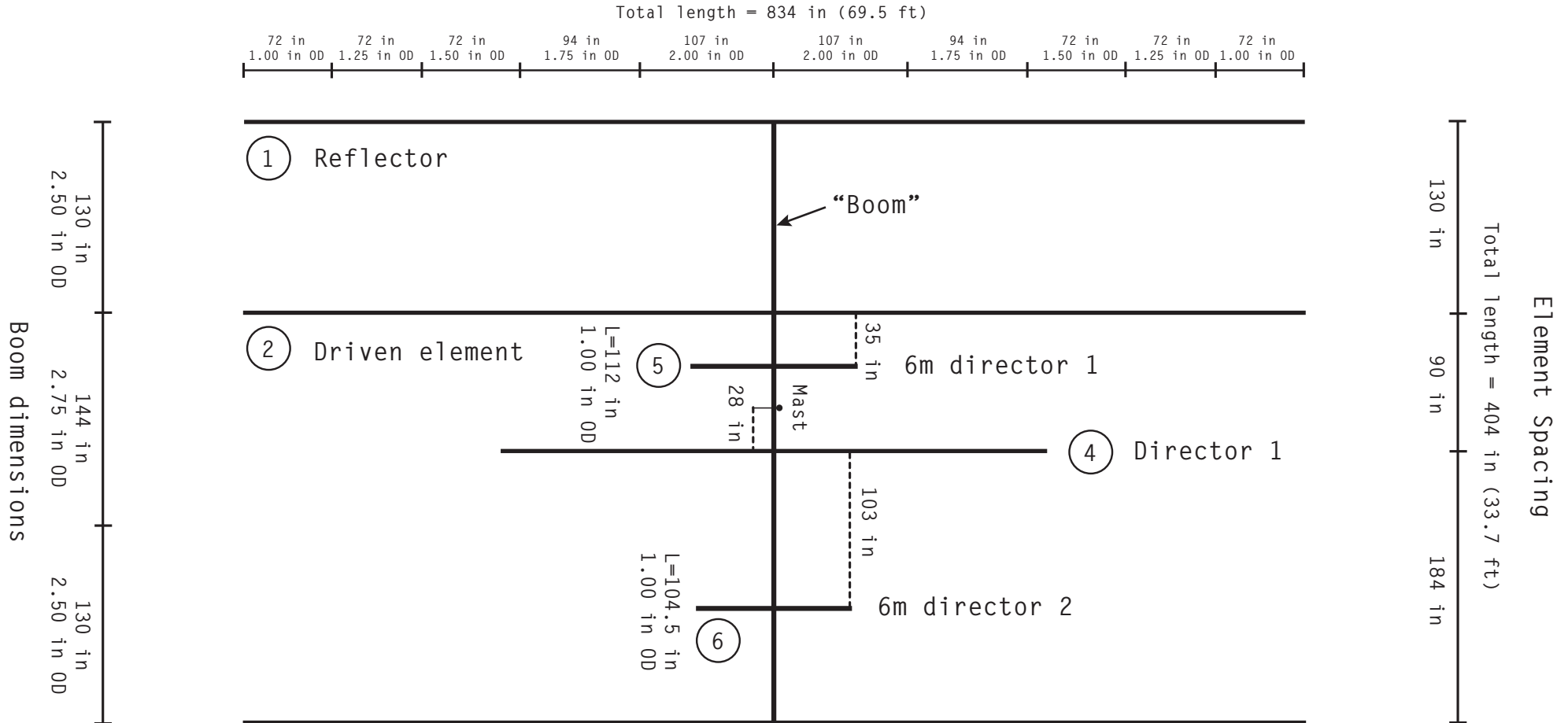
TIGHTEN CENTER BOLT COMPLETELY!
THIS BOLT LIFTS THE SHAFT & OUTPUT
GEAR TO THE PROPER OPERATION HEIGHT
INSIDE THE POSITIONER. WITH THE SPACER
IT ALSO FORMS A LOOSE BEARING THAT THE
CENTER GUIDE USES TO STAY CENTERED.

3/8-24 x 3/4" BOLTS AND
LOCKWASHERS
QTY 6

1/4" MAX. WITH
3/4" BOLT

SteppIR MonstIR Yagi-Uda Antenna Dimensions

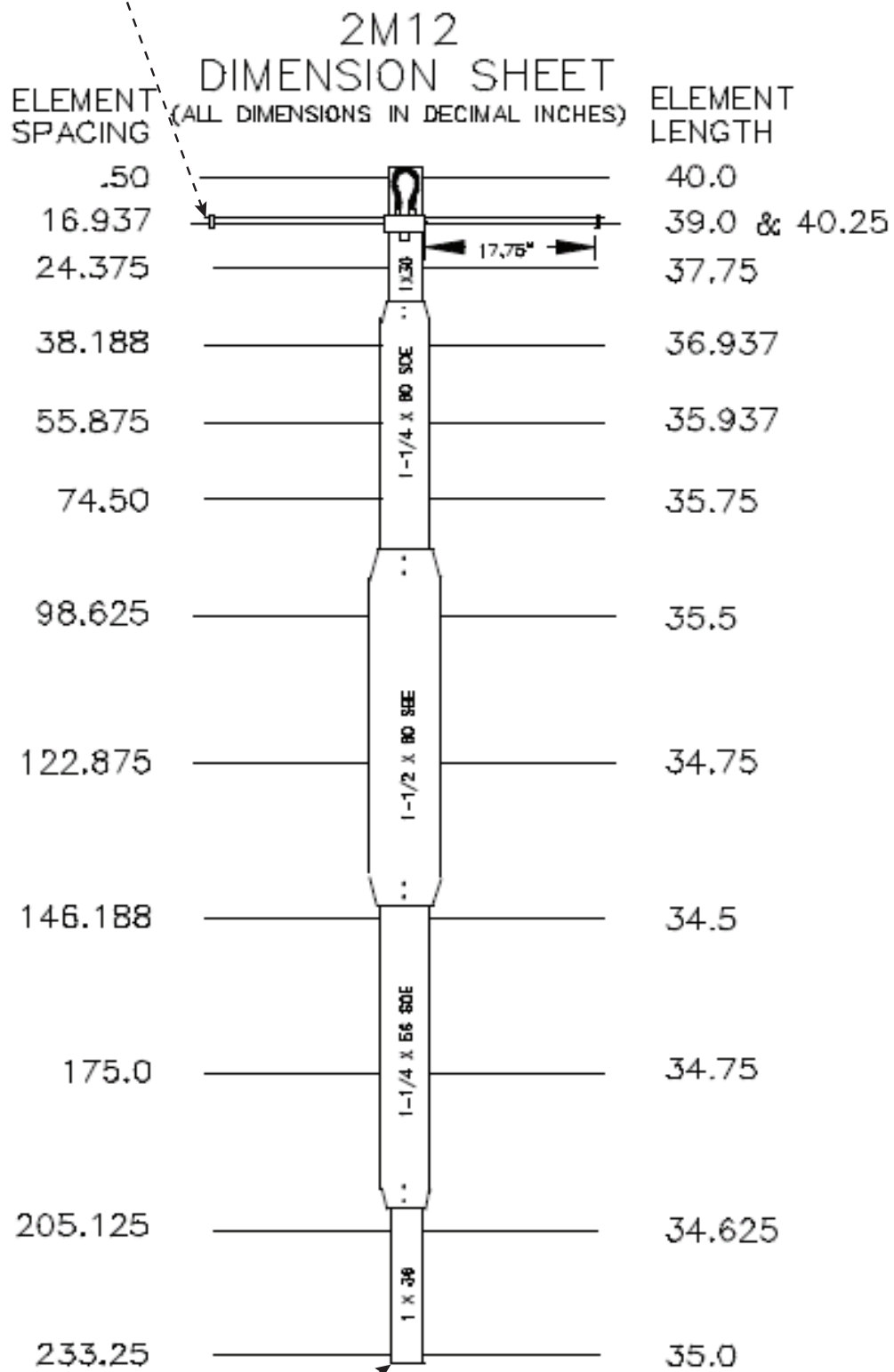
Element Dimensions for elements 1 through 3



Element Dimensions for element 4 (Director 1)

2M12 Dimension Sheet (Page 1/2)

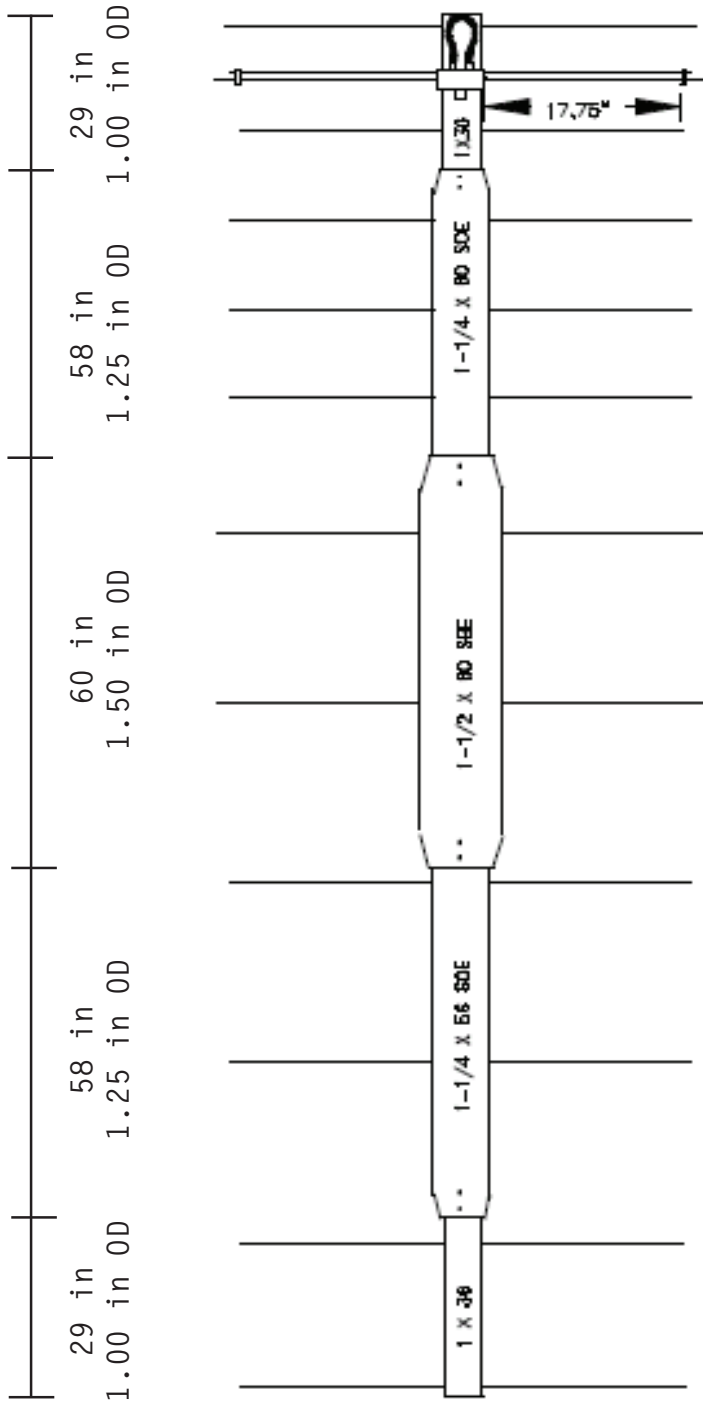
All elements are 3/16 in solid aluminum rod except for this 1/4 in element



The support element is made of aluminum tubing with outside diameters as noted

2M12 Dimension Sheet (Page 2/2)

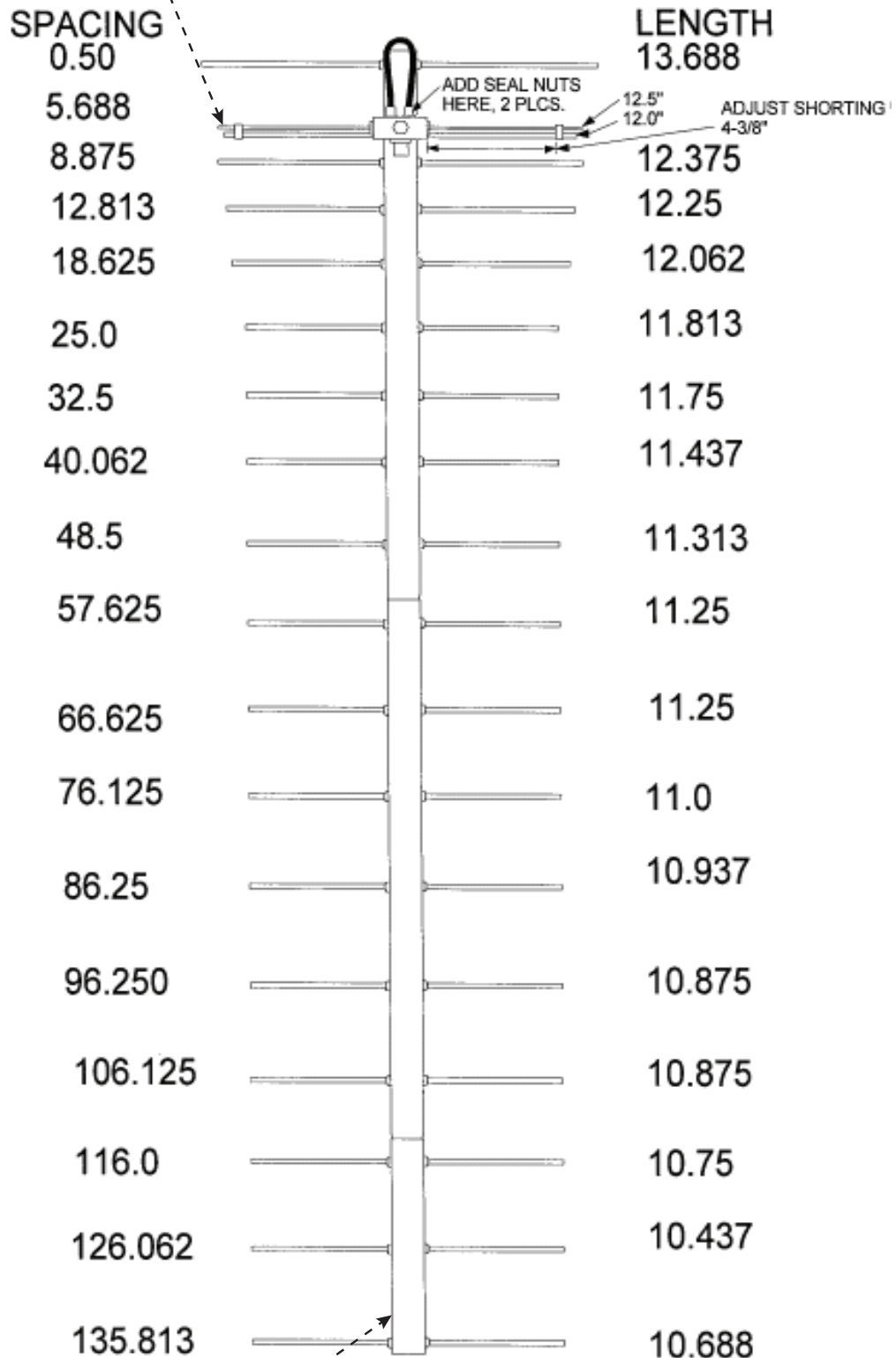
Total length = 19.50 ft



440-18 Dimension Sheet (Page 1/2)

All elements are 3/16 in solid aluminum rod
except for this 1/8 in element

440-18 DIMENSIONS



The support element is made of 1.00 in OD aluminum tubing

440-18 Dimension Sheet (Page 2/2)

Total length = 11.33 ft

136 in
1.00 in OD

SPACING

0.50

5.688

8.875

12.813

18.625

25.0

32.5

40.062

48.5

57.625

66.625

76.125

86.25

96.250

106.125

116.0

126.062

135.813

LENGTH

13.688

12.375

12.25

12.062

11.813

11.75

11.437

11.313

11.25

11.25

11.0

10.937

10.875

10.875

10.75

10.437

10.688

