

INSTRUCTIONS FOR ERECTING

KVC

SOUTHERN CROSS

GALVANISED STEEL AERIAL TOWERS



Making Concrete Foundations

1. The Foundation Plan on the General Arrangement Illustration shows the centre distances of the holes for different tower heights. Mark the centres of the holes on the ground.
2. As this tower does not use guy wires to support it, it is necessary to make sure the concrete foundations are of ample weight. The table below is given as a guide only, and shows the weight of concrete required for each leg to comply with the Structural Engineer-

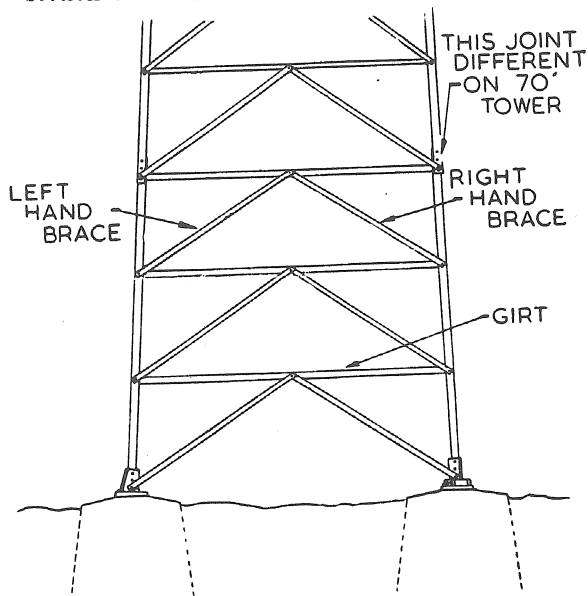
ing Code. The dimensions given are for blocks of concrete which will provide this required weight per leg. No allowance has been made in this table for soil resistance.

The shape of each block (i.e., a shallow, large diameter block, or a deep, small diameter block) is to be fixed from consideration of the Safe Bearing Pressure of the soil. Where there is doubt about the Bearing Capacity of the soil, a large diameter block will provide increased footing.

Aerial Towers — Foundations

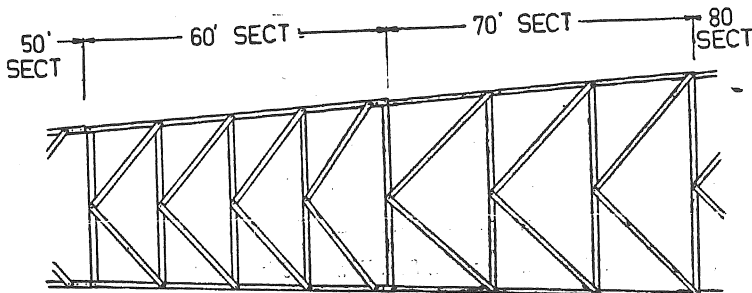
Tower	Weight of Block for Each Leg	DIMENSIONS OF BLOCK FOR EACH LEG TO GIVE REQUIRED WEIGHT				Materials for Complete Foundations		
		3 ft.	4 ft.	5 ft.	6 ft	Cement	Sand	Metal
30ft.	1,950 lbs.	x 2ft. 6in. Dia.	x 2ft. 3in. Dia.	x 2ft. 0in. Dia.	x 1ft. 9in. Dia.	6 bags	19 c.ft.	38 c.ft.
40ft.	2,700 lbs.	x 3ft. 0in. Dia.	x 2ft. 6in. Dia.	x 2ft. 3in. Dia.	x 2ft. 0in. Dia.	9 bags	27 c.ft.	53 c.ft.
50ft.	3,650 lbs.	x 3ft. 3in. Dia.	x 3ft. 0in. Dia.	x 2ft. 9in. Dia.	x 2ft. 6in. Dia.	12 bags	36 c.ft.	72 c.ft.
60ft.	4,750 lbs.	x 3ft. 6in. Dia.	x 3ft. 3in. Dia.	x 3ft. 0in. Dia.	x 2ft. 9in. Dia.	15 bags	46 c.ft.	93 c.ft.
70ft.	5,900 lbs.	x 4ft. 3in. Dia.	x 3ft. 9in. Dia.	x 3ft. 3in. Dia.	x 3ft. 0in. Dia.	19 bags	57 c.ft.	115 c.ft.
80ft.	7,150 lbs.	x 4ft. 9in. Dia.	x 4ft. 0in. Dia.	x 3ft. 6in. Dia.	x 3ft. 3in. Dia.	23 bags	70 c.ft.	140 c.ft.
90ft.	8,500 lbs.	x 5ft. 0in. Dia.	x 4ft. 6in. Dia.	x 4ft. 0in. Dia.	x 3ft. 9in. Dia.	27 bags	83 c.ft.	166 c.ft.
100ft.	11,000 lbs.	x 5ft. 9in. Dia.	x 5ft. 0in. Dia.	x 4ft. 6in. Dia.	x 4ft. 3in. Dia.	35 bags	107 c.ft.	215 c.ft.

3. Dig the holes and then assemble the bottom 10 foot section of the tower over them as follows:—



Bottom Section of 70ft., 80ft., 90ft. & 100ft. Towers

4. The tower is packed in bundles which are numbered, commencing at the top of the tower. Bundles Nos. 1 and 2 together are for the top 20ft. of the tower and each remaining bundle is for a 10ft. section.
5. Remove the legs from the bottom bundle and bolt the soleplates to the bottom of them. The top of the leg is the end with the corner cut away. The two locking setscrews in each of the hinged soleplates must be tightened securely.
6. Hang the anchor bolts from the soleplates screwing the nuts on one full nut, place heavy pieces of timber across the holes, and then assemble the bottom section of the tower with the soleplates resting on the timber. The anchor bolts will prevent the soleplates slipping off the timber. The two soleplates, which are hinged, should be placed to allow the bottom section to be tipped over after the foundations are complete and further tower sections, up to 70 feet, added on the ground.
7. The girts are bent both ends and fit inside the legs. The flange which is mitre cut at the ends should be fitted at the top. The braces are bent at one end only and are supplied in both right and left hands. They fit outside the tower.
8. When the bottom 10ft. section is completed, tighten all the bolts.



General Arrangement of 60ft & 70ft. Sections.

NOTE.—The 20ft., 30ft., 40ft. & 50ft. Sections have the same general arrangement as the 60ft. section.

(Where the 60ft. and 70ft. sections join, there are no holes in the 60ft. leg section flanges to match one 9/16in. hole in each 70ft. leg section flange.)

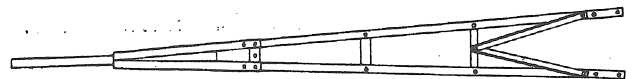
9. Place heavy pieces of timber across under the bottom girts near each leg and place drums or strong wooden cases under them to take the weight of the tower section. Slip timber out from under soleplates.
10. See that tower section is standing vertical by trying a spirit level on each of the bottom girts and packing under the timber cross pieces, if necessary.
11. Mix concrete, using 6 parts metal, 3 parts sand, and 1 part cement. Fill the concrete into the holes ramming it well and putting in old steel bars as reinforcement. Fill the holes to the bottom of the soleplates, shaping the top so water will not lie around the soleplates.
12. Allow the concrete to set for at least 24 hours before removing the supporting crosspieces from under the girts.

Erecting The Tower

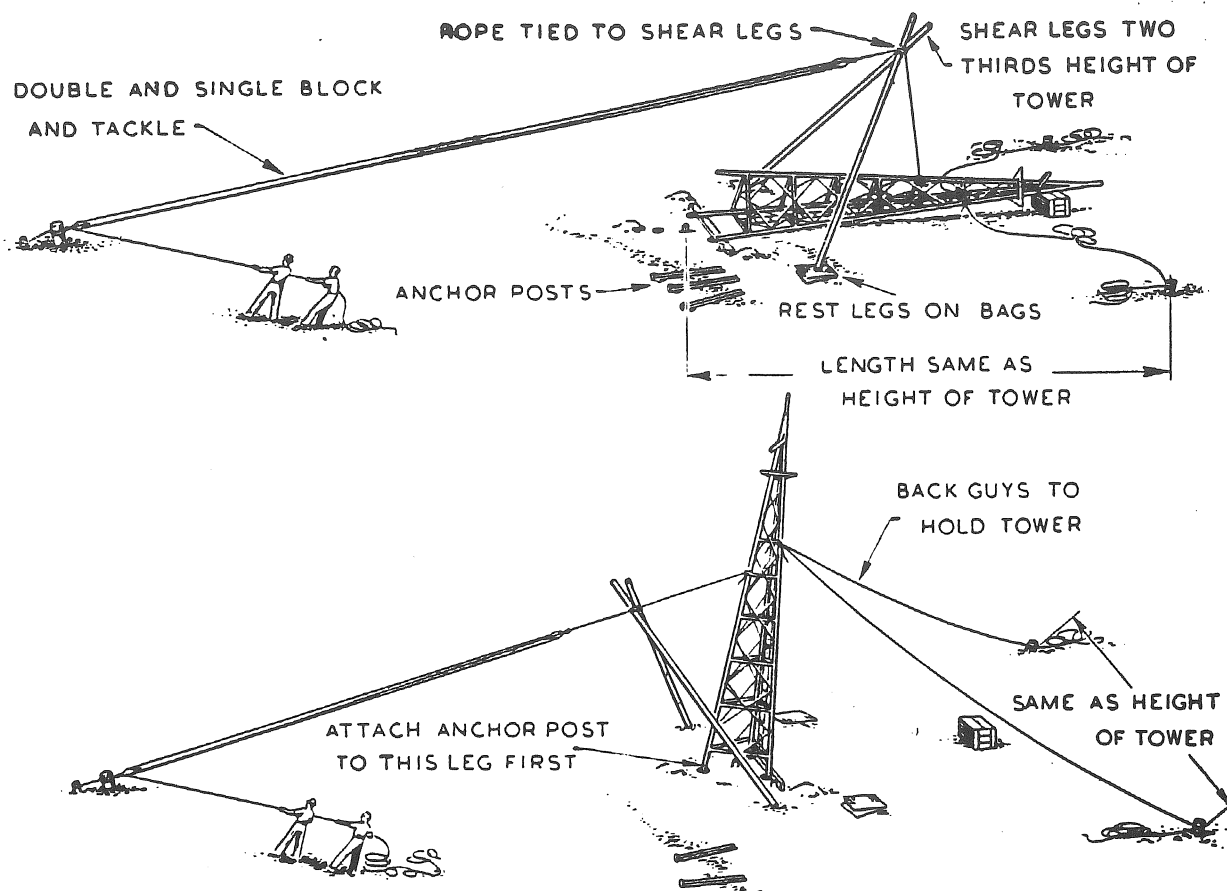
NOTE: No. 1 Girts are attached to the bottom of the stub tower for transit only. Before assembling the tower, remove these girts and assemble the tower as shown in the instructions. Leg Joint bolts and bolts for attaching girts and braces are as shown on the General Arrangement. The three short legs in bundle No. 2 are attached to the stub tower, using 1in. x 3/4in. and 1in. x 1/2in. bolts.

1. The tower can be built up from the ground piece by piece, or, where there is sufficient space and suitable tackle available, up to 70ft. of the tower can be assembled on the ground and then pulled up into position. The second method is easier and faster than the first one.
The legs of complete towers, 50ft. and over and 70ft. sections of towers must be reinforced at the bottom before the tower is pulled up. Hardwood timber supports, 3in. x 2in., should be wired tightly to each leg, at a number of places, so that the end of the timber is within a few inches of the top sole plate bolthole. When the tower has been pulled up and attached to the foundation, remove the supports.
2. For a tower being assembled up to 70ft. on the ground, allow the concrete to stand for at least 24 hours and then tip the assembled bottom 10ft. section on to its side. To do this, undo the nuts on the anchor bolts on the fixed soleplate and remove the locking setscrews from the hinged soleplates.
3. Continue assembling until a further six 10ft. sections have been added. The arrangement of 100ft., 90ft., 80ft., and 70ft. sections is as shown on the illustration. The arrangement of 60ft., 50ft., 40ft., 30ft., and 20ft. sections is as shown for 60ft. section on illustration, "General Arrangement of 60ft. and 70ft. Sections".

4. To erect the tower the method shown in the illustration, "Erecting the Tower", may be used. The illustration shows the erection of a windmill tower, but the procedure is similar for aerial towers. When the tower is raised, fit nuts to anchor bolts on the fixed soleplates and replace locking setscrews in the two hinged soleplates.



Assembly of the top 10ft. Section.



Erecting the Tower.

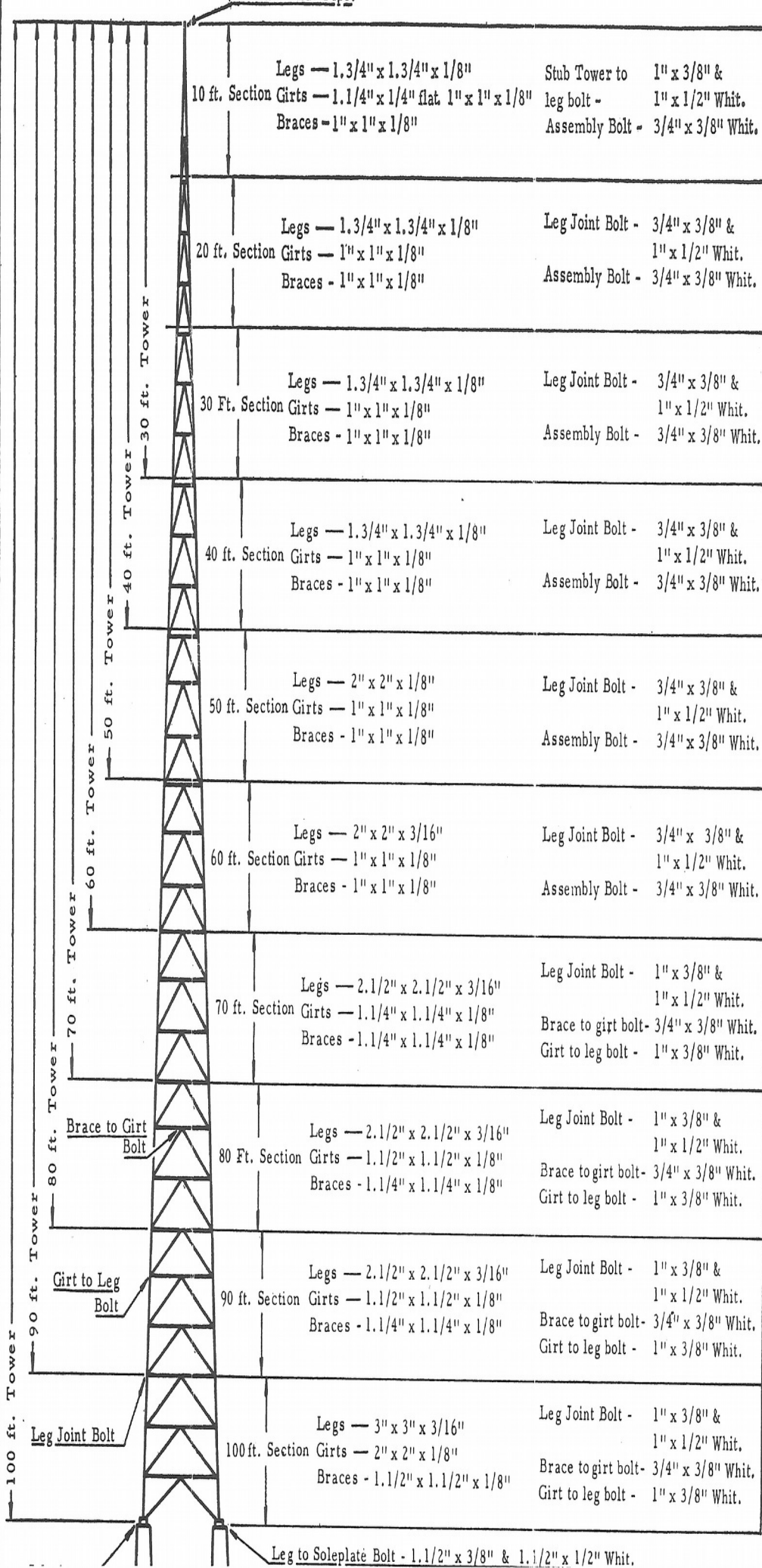
Towers Over 70ft. Only

5. The assembly of the rest of the tower will be the same irrespective of the height. Attach a gin pole to the top of the completed section and, by means of pulley block and rope, the next section of the tower (previously assembled on the ground) is raised and bolted in position. The gin pole is then raised and attached to this section and the same procedure repeated with the next section, and so on.
6. The top 10ft. section (or apex) of the tower has a 2ft. length of 2in. pipe protruding from the top so that the aerial can be attached to it by means of bolts or clamps.
The aerial can be attached to this section before it is placed in position, if convenient.
7. After six months, check all bolts to make sure they are still tight.

To Lower Tower

If required, towers 70ft. and under may be lowered to the ground for alterations to the antenna. To lower the tower, arrange tackle as shown in the lower section of the illustration, "Erecting the Tower", before removing the setscrews from the hinged soleplates and the nuts from the anchor bolts on the fixed soleplate. Lower the tower.

2 ft. x 2" dia. Pipe.



Maximum Vertical and Horizontal Load

Combinations which can be applied to Apex of Tower

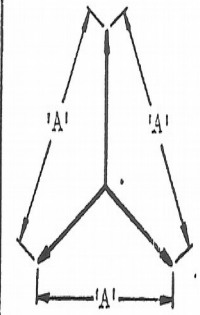
Horizontal	Vertical	Equiv. Exposed Area of Load to give Max. Horizontal Load
0 lbs.	1509 lbs.	0 sq. ft.
15 lbs.	990 lbs.	.74 sq. ft.
30 lbs.	471 lbs.	1.48 sq. ft.
43.7 lbs.	0 lbs.	2.16 sq. ft.

Foundations are Reinforced Concrete

Tower	Max. Uplift at Base of Tower	Max. Thrust at Base of Tower
30 ft.	2225 lbs.	2375 lbs.
40 ft.	3161 lbs.	3399 lbs.
50 ft.	4187 lbs.	4533 lbs.
60 ft.	5288 lbs.	5752 lbs.
70 ft.	6442 lbs.	7038 lbs.
80 ft.	7668 lbs.	8432 lbs.
90 ft.	9020 lbs.	9980 lbs.
100 ft.	10437 lbs.	11643 lbs.

NOTE: Above figures are the reactions at the base of the tower legs (above foundation blocks) for full wind load and dead load, and should be used in conjunction with foundation information (passive earth pressures, allowable bearing pressures etc.) to determine block weight and dimensions.

Tower	Weight
30 ft.	549 lbs.
40 ft.	692 lbs.
50 ft.	857 lbs.
60 ft.	1043 lbs.
70 ft.	1267 lbs.
80 ft.	1525 lbs.
90 ft.	1829 lbs.
100 ft.	2235 lbs.



Foundation Plan

TOWER	'A'
30 ft.	3 ft.
40 ft.	4 ft.
50 ft.	5 ft.
60 ft.	6 ft.
70 ft.	7 ft.
80 ft.	8 ft.
90 ft.	9 ft.