

MASTS & TOWERS

HILLS TOWERS

Hills towers are designed to meet a wide variety of applications in the communications industry, from telescopic, tubular masts to heavy duty self-supporting towers. The choice of a tower will depend on many factors relevant to its proposed use. These notes are provided as a guide to applications for various tower types within the Hills range.

Telescopic Tubular Telomasts

Telomasts are intended to support smaller television antenna. A range of foot mounts permit installation on the roof of a building or at ground level. A full range of rigging hardware is available. Heights from 6m to 15m.

Telescopic Cyclonic Winch-up Towers

Designed to support larger head loadings, at heights from 12.5m to 29.2m. A pivoting base and ratchet safety winch are provided to ease installation.

Standard Butt Section Towers

Butt Section Towers are intended for use in those situations where maintenance of antenna equipment is not normally required. Each section is 4m high and towers from 8m to 32m are available.

Cyclonic Butt Section Towers

Similar to standard Butt Section, but designed in accordance with S.A.A. codes for cyclonic conditions each section is 4.5m high. Towers range from 9m to 63m.

Self Supporting Towers

For maximum head loads where guying is not practicable. Tower heights of 9m to 30m are available in increments of 3 metres. All self supporting towers are designed for use in those areas of Australia where cyclonic winds are not liable to occur.

Hills have consultants available to discuss your tower requirements.

CYCLONIC CONDITIONS

The design features of Hills towers have been specifically evolved to cope with the extreme conditions in areas which experience cyclonic wind conditions.

For the purpose of the design requirements, the area where tropical cyclones are liable to occur shall be taken to be a strip bounded by all the coastline north of Latitude 27°s and extending inland for a distance of 50km from the coastline. (See attached diagram).

Islands off the coast and north of Latitude 27°s are included in the cyclonic area.

In areas where tropical cyclones are liable to occur, the adoption of the wind velocity for a 50 year return period would lead to risk of failure, at overload conditions due to wind, which would be considerably greater than for the other areas of Australia. In order that a risk failure comparable with that for the remainder of the continent should be maintained under cyclone wind loading, an increase in the design wind velocity has been incorporated into the configuration of Hills Cyclonic wind-up towers to comply with the requirements of AS1170/1975 category 1 areas.

However, the occurrence of a tornado or tornadic squall is not restricted to the area north of 27°s, they are possible in virtually any part of Australia.

With this in mind, we offer the attached data for your consideration, in confidence that we can meet your requirements.

Terrain Category

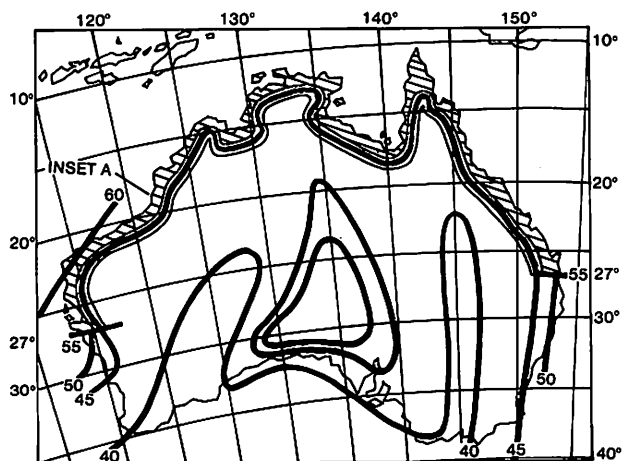
Refers to the physical characteristics of the land surrounding the structure under consideration. There are four categories from which a choice must be made:-

Category 1 - "Exposed, open terrain with few or no obstructions and in which the average height of any objects surrounding the structure is less than 1.5 metres". Examples:- flat, treeless plain; open seacoast.

Category 2 - "Open terrain with well - scattered obstructions having heights generally 1.5 to 10 metres". Examples:- Airfields; open parklands; undeveloped or sparsely built up areas; outskirts of towns and suburbs.

Category 3 - "Terrain with numerous closely - spaced obstructions having the size of domestic houses." Examples:- well - wooded areas; suburbs; towns; low rise industrial areas.

Category 4 - "Terrain with numerous large, high closely spaced obstructions". Examples:- Large city centres; well-developed industrial complexes.





MASTS & TOWERS

Made in Australia by Hills Industries Ltd (Inc in Sth. Aust.)

Branches in all States

Adelaide: Phone 371 0277

Brisbane: Phone 267 5022

Melbourne: Phone 798 7288

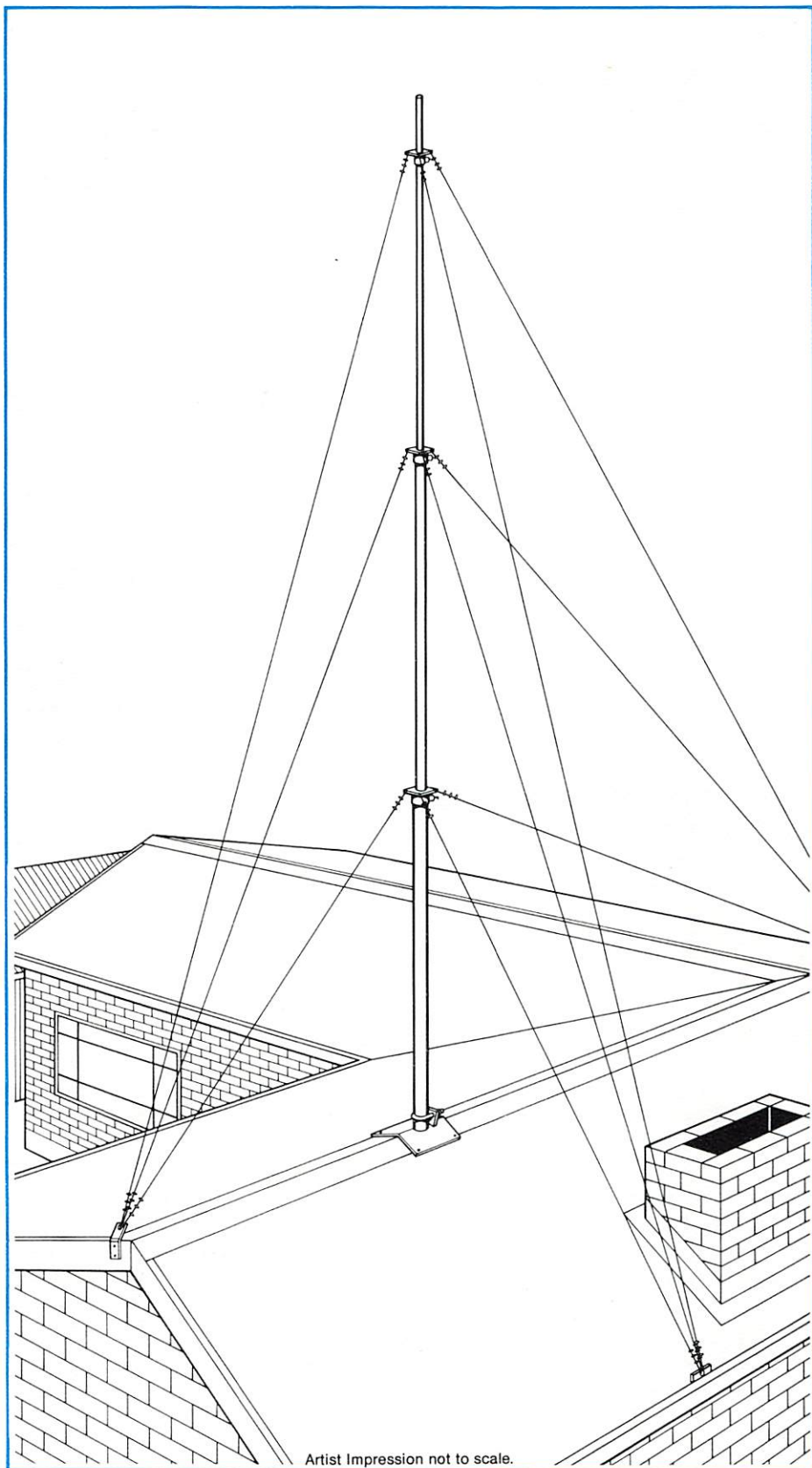
Perth: Phone 279 5999

Sydney: Phone 534 3344

Hobart: Phone: 34 3331

Head Office:

944-956 South Road, Edwardstown, South Australia 5039
Phone 297 3888



Artist Impression not to scale.



TELOMASTS AND ACCESSORIES

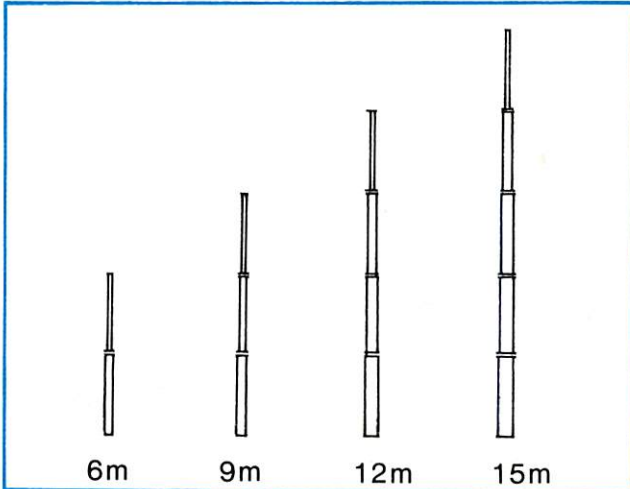
Tubular telescopic guyed masts height, 6, 9, 12 & 15 metres.

Telescopic tubular telomasts

- Tubular telescopic
- Economy - galvabond tubing
- Light weight - ground or roof mounting
- Full range of foot mounts and rigging hardware available.

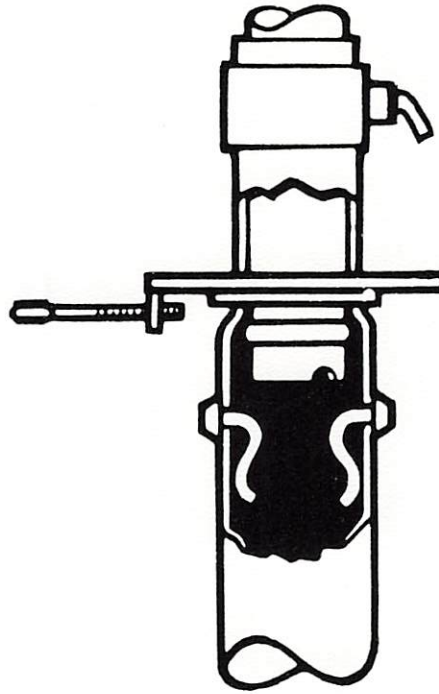
APPLICATIONS:

Light weight T.V. and amateur antenna.



SPECIAL FEATURES

- Ease of installation
- Self locking sections
- Captive sections
- Can be rotated
- Light weight



Specifications

A SECTION (TOP) 31.7mm O.D. x 3.45m
 B SECTION (SECOND) 38.1mm O.D. x 3.35m
 C SECTION (THIRD) 44.5mm O.D. x 3.25m
 D SECTION (FOURTH) 50.8 mm O.D. x 3.18m
 E SECTION (BOTTOM) 57.2 mm O.D. x 3.05m

Installation accessories for 3-way guying on level ground.

TELOMAST SIZE	GUYS LENGTHS	TOTAL LENGTH REQU.	NO. OF GUYS	TURN BUCKLES	THIMBLES	LINE CLAMPS	ANCHOR PLATES
6m	3 x 8m 3 x 5m	42m	6	6	12	12	3
9m	ADD 3 x 12m	80m	9	9	18	18	6
12m	ADD 3 x 15m	125m	12	12	24	24	6
15m	ADD 3 x 17m	180m	15	15	30	30	9

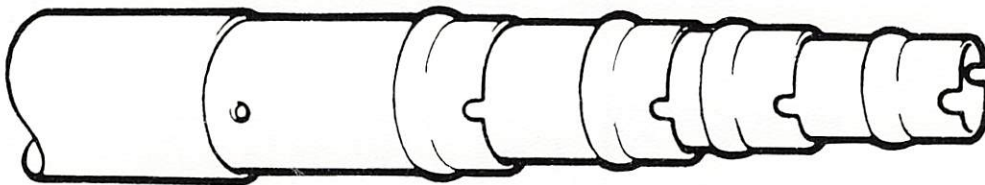
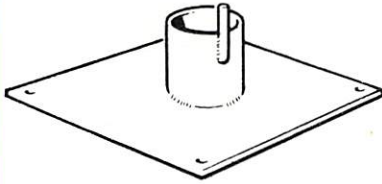
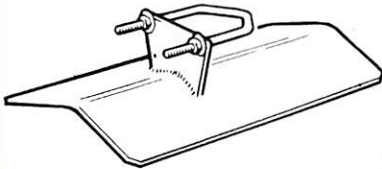


Diagram of mast base end showing grooves & swaging.

Mounts

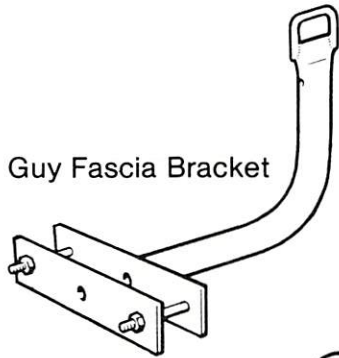


Telomast Base Plate

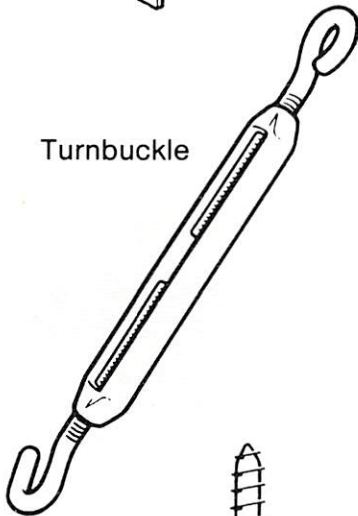


Tile Roof Mount 120°

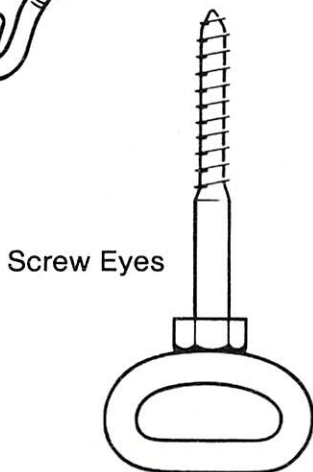
Guying Accessories



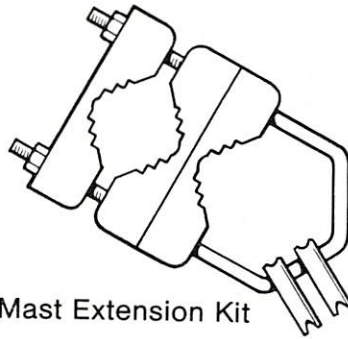
Guy Fascia Bracket



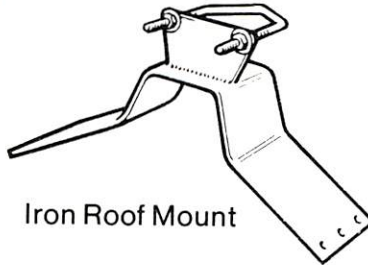
Turnbuckle



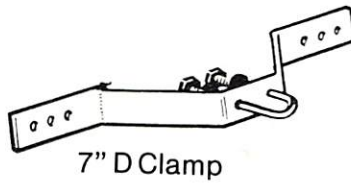
Screw Eyes



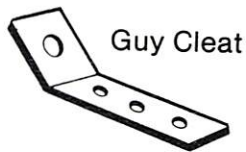
Mast Extension Kit



Iron Roof Mount



7" D Clamp



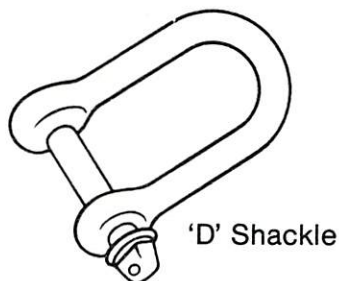
Guy Cleat



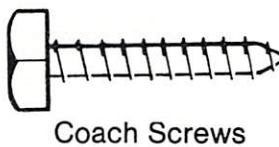
Thimble



Brass Line Clamp

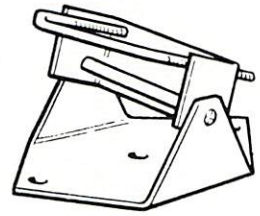


'D' Shackle

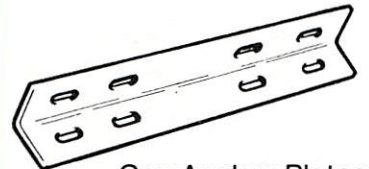


Coach Screws

Accessories



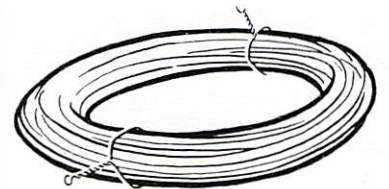
Telomast Foot Mount



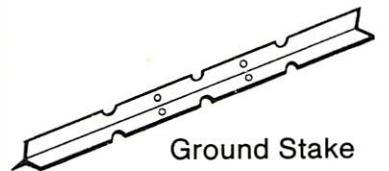
Guy Anchor Plates



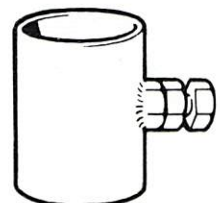
Wire Lashing Clamp



Guy Wire



Ground Stake



Support Tube Assemblies

TELOMAST HEIGHT (M)	MAX. HEAD AREA (M ²)			
	TERRAIN CATEGORY			
	1	2	3	4
6	.16	.19	.26	.35
9	.16	.19	.26	.35
12	.16	.19	.26	.35
15	.16	.19	.26	.35

The above table assumes the following.
 Max. wind speed 145 km/h.
 Mast guyed 500mm from top mast.
 Max. head weight 6.8 kg.

Tubular telescopic masts provide an ideal support for small antennae due to the wide range of foot mountings available, and the light weight of the mast. The use of a ridge cap mounting allows the user to utilise the additional height of the building.

Refer Australian standards AS1170 Part II 1981. Detailed computations are available from Hills sales office in all states.

In determining whether or not a Telomast is suitable in a given application, the following details should be ascertained.

1. The tower height required.
2. The maximum head area of the antenna being installed.
3. The weight of the antenna.
4. The type of locality in which the mast is to be erected.

Note

Ensure that local government approval is granted before installing any mast or tower. Specifications quoted in this brochure are subject to change without notice.

In line with company policy of constantly improving and innovating products, products specification may be changed without notice.

Addresses

South Australia: Hills Industries Ltd.-Electronics Division, 7 Ackland St., Edwardstown, S.A. 5039. Ph: 371 0277. Telex: AA82110. Fax. (08)297 4468.

Victoria: Hills Industries Ltd.-Electronics Division, Cambria Rd., Dandenong, Vic. 3175. Ph: 798 7288. Telex: AA30380. Fax. (03) 798 5722.

New South Wales: Hills Industries Ltd., 12 Wiggs Rd., Riverwood, N.S.W. 2210. Ph: 534 3344. Telex: AA20427. Fax. (02) 534 3588.

Queensland: Hills Industries Ltd.-Electronics Division, Ivedon St., Banyo, Qld. 4014. Ph: 267 5022. Telex: AA40166. Fax. (07) 267 5288.

Western Australia: Hills Industries Ltd.-Electronics Division, 10 Katanning St., Bayswater, W.A. 6053. Ph: 279 5866. Telex: AA92056. Fax. (09) 378 2486.

Tasmania: Hills Industries Ltd., 337 Argyle St., North Hobart, Tas. 7000. Ph: 34 3331. Telex: AA58397.

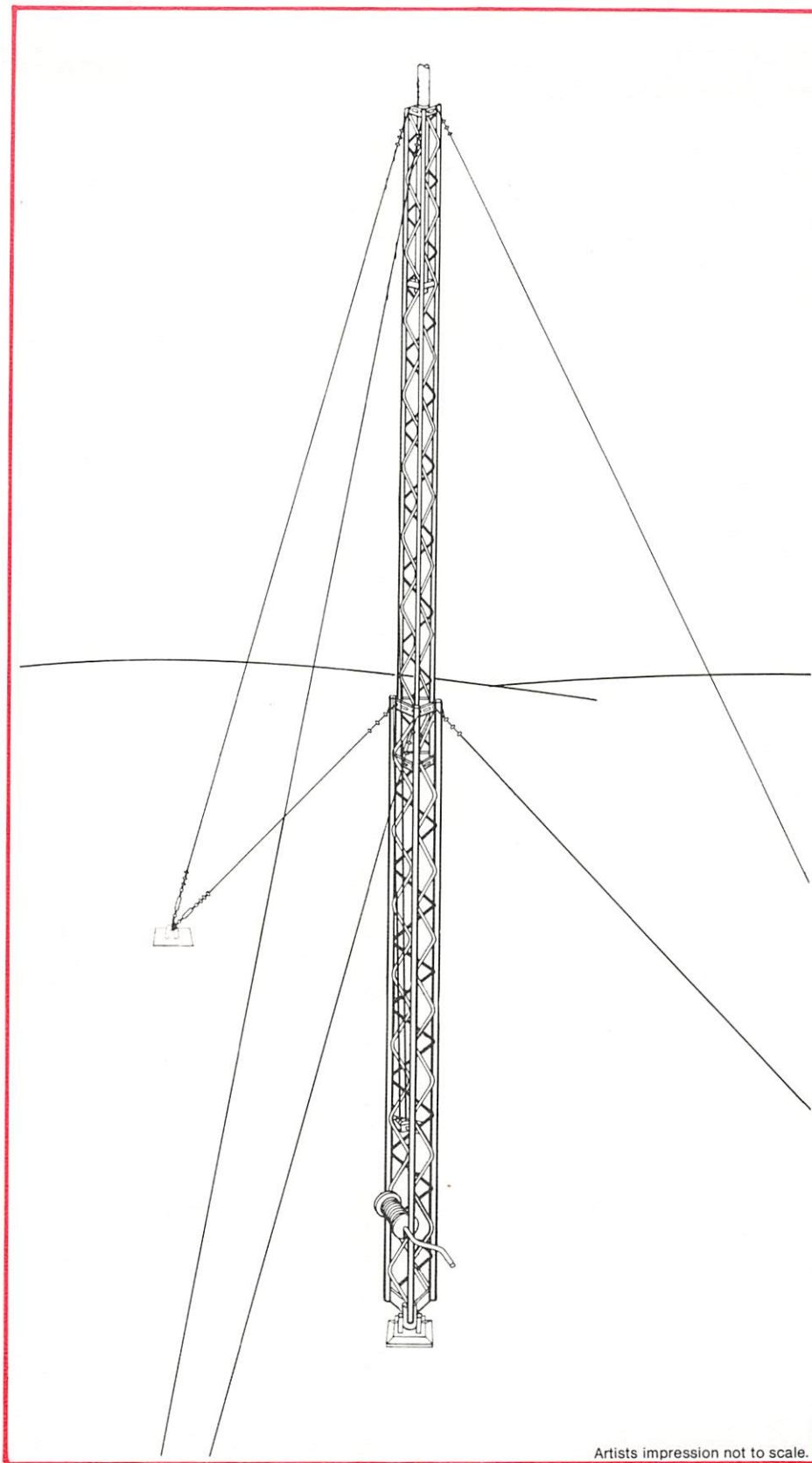
New Zealand: Hills Industries Ltd., 7 Monohan Rd., Auckland 6, N.Z. Ph: 57 7129. Telex: 7460618.

Export Enquiries Head Office:
 944-956 South Rd., Edwardstown, S.A. 5039, Australia.
 Ph: 297 3888. Telex: AA82110. Fax. (08) 297 4468.

H.P.S. 7585 06.87.

Shipping details

HEIGHT (M)	WEIGHT (KG)	CUBIC Cu.M.
6	9	0.0068
9	16	0.0068
12	23	0.0088
15	28	0.0113



WINCH-UP CYCLONIC TELETOWERS

Telescopic, triangular, lattice section, guyed towers heights
12.5; 15.8; 22.5; 29.2m.

Cyclonic winch-up teletowers

A range of telescoping, triangular, lattice section guyed towers available in four standard heights.

Designed to comply with Australian design codes.

Precision built from high quality steel
All towers are hot dip galvanised after fabrication to provide corrosion resistance for all surfaces.

Ease of installation provides labour economies.

A range of optional accessories.

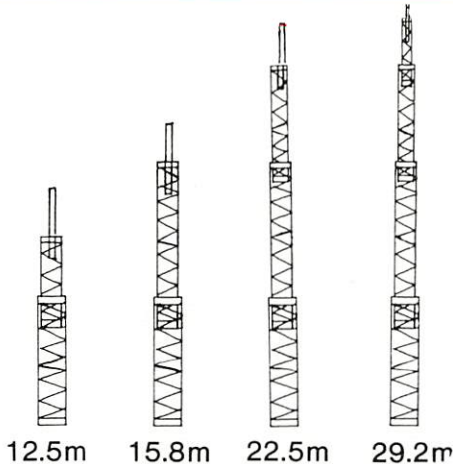
Positive locking of sections by bolts passed through locking plates in each section.

Safety ratchet-locked winch which may be removed after installation to prevent unauthorised use of tower.

Climbing rungs fitted to all bottom sections.

APPLICATIONS

Television antenna, low profile amateur beam antennas and for R.F. radiating towers, when used with optional insulating accessories.

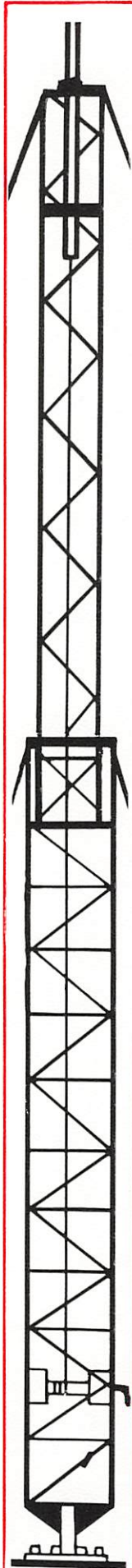


The design features of Hills winch-up teletowers have been specifically evolved to cope with extreme conditions in areas which experience cyclonic wind conditions.

For the purpose of design requirements, the area where tropical cyclones are liable to occur shall be taken to be a strip bounded by all the coastline north of latitude 27°S and extending inland for a distance of 50km from the coastline (see attached diagram).

Islands off the coastline and north of latitude 27°S are included in the cyclone area.

In areas where tropical cyclones are liable to occur, the adoption of the wind velocity for a 50 year return period would lead to risk of failure, at overload conditions due to wind, which would be considerably greater than for the other areas of Australia. In order that the risk

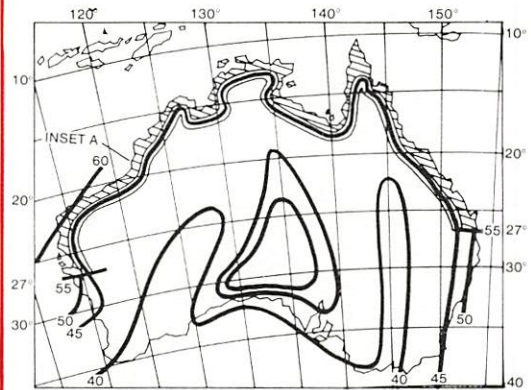


Typical
2 section
tower

of failure comparable with that for the remainder of the continent should be maintained under cyclone wind loading, an increase in the design wind velocity has been incorporated into the configuration of Hills Cyclonic winch up teletowers to comply with the requirements of AS1170/1981 category 1 areas.

However, the occurrence of a tornado or tornadic squall is not restricted to the area north of 27°S . They are possible in virtually any part of Australia.

With this in mind, we have available full data for your consideration, in confidence that we can meet your requirements.



Standards statement

This is to certify that the guyed towers described in this brochure have been designed in accordance with the latest Australian Standards.

As 1170 Part II 1981
S.A.A. Loading Code - Wind Loads.

As 1250 1981
S.A.A. Steel Structures Code.

As 1480 1974
S.A.A. Concrete Structures Codes.

As 1538 1974
S.A.A. Cold Formed Steel Structures Code.

For use under the conditions described in this specification.

For design conditions other than those used herein, additional calculations are required.

Design Specifications

Hills teletowers are designed in rigid compliance with the current S.A.A. codes for cyclonic conditions. Designs, drawings and computations are available for submission to local councils and shire bodies where permits for erection must be obtained.

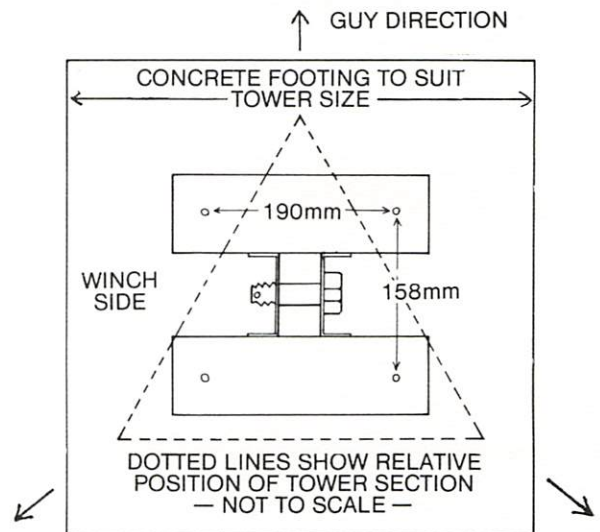
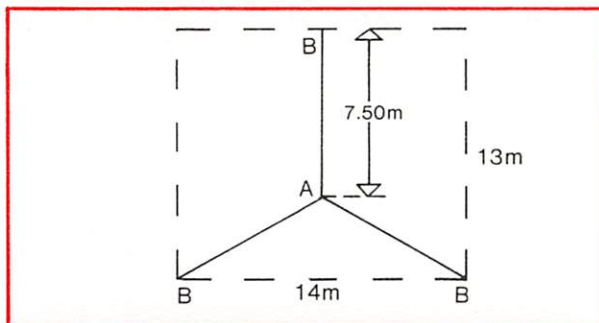
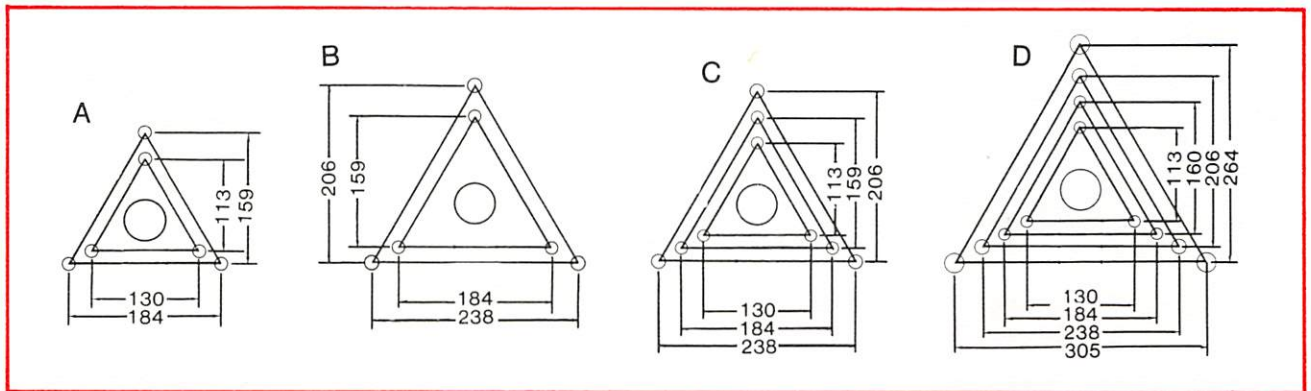
Telescopic winch up towers

Show pier type footings

TOWER HEIGHT	SECT	PLAN	DISTANCE BASE TO GUY ANCHOR	AREA REQUIRED TO ENCLOSE GUY ANCHORS		MINIMUM SIZE-FOOTINGS		
						BASE CUBE	GUY ANCHOR DIA. x DPTH.	CONE VOL.
(M)			(M)	(M)	(Sq.M)	(m)	(m) x (m)	Cu. M.
12.5	2	A	6.5	13 x 11	143	0.30	0.50 x 1.45	1.11
15.8	2	B	7.5	14 x 13	182	0.30	0.50 x 2.05	1.56
22.5	3	C	12.0	22 x 19	418	0.35	0.65 x 1.45	1.88
29.2	4	D	15.0	27 x 24	648	0.40	0.75 x 1.55	2.68

NOTE: All towers are supplied with a top mast 3 metres in length, and 51 mm diameter, 1.5 metres of which is available for antenna mounting.

Plan diagrams



Area required to enclose guy anchors

A. Base of 15.8 metre tower.
B. Guy anchor points at specified distance from mast base. Broken line indicates minimum area required to enclose guys.

Material specifications

Relationship of tower base footing, base, tower and winch.

TOWER SECTION	12.5 METRE		15.8 METRE		22.5 METRE		29.2 METRE	
TUBULAR CHORDS	OUTSIDE DIAM.	WALL THICKNESS	OUTSIDE DIAM.	WALL THICKNESS	OUTSIDE DIAM.	WALL THICKNESS	OUTSIDE DIAM.	WALL THICKNESS
BASE SECTION	16mm	1.6mm	19mm	1.6mm	19mm	1.6mm	25.4mm	1.6mm
2ND SECTION	16mm	2.0mm	16mm	1.6mm	16mm	1.6mm	19mm	1.6mm
3RD SECTION					16mm	2.0mm	16mm	1.6mm
4TH SECTION							16mm	2.0mm
BRACINGS								
BASE SECTION	8mm		8mm		8mm		10mm	
2ND SECTION	6.3mm		8mm		8mm		8mm	
3RD SECTION					6.3mm		8mm	
4TH SECTION							6.3mm	
TOP MTG POLE	Ø51 x 2.5		Ø51 x 2.5		Ø51 x 2.5		Ø51 x 2.5	

Conforms to latest Australian standards

Loading code, concrete structures code, cold formed steel structures for use in Terrain Category 1 with head loading less than 15kg weight and 0.4sq. metres, acting 0.75 metres above the uppermost guying point.

Sectional Locking, guy fixing

As each section is winched to correct level, it is locked in position with M12 bolts fitted through steel plates integrated with the inner and outer sections on all three sides of the tower. The hazard of snapping guy rings is eliminated in favour of fixing around each vertical member for a stronger, safer attachment.

Wind-up safety winch

The type of safety winch used is recognised as giving the easy convenient and safe means of elevation necessary in tower systems. Continuous locking by ratchet prevents back lash - reducing the possibility of injury should the operator lose his grip while elevating sections.

Foot mounting

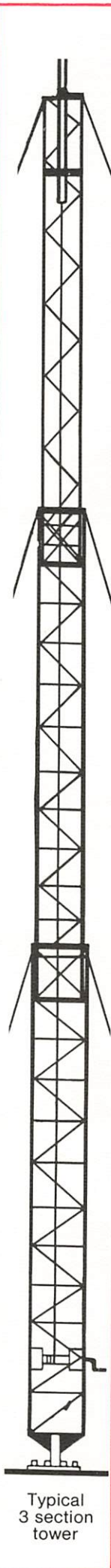
The foot mount is designed to allow pivoting of mast from horizontal position for ease of erection. The base mount is designed to support the full downward thrust of the combined forces on the tower.

Construction

Triangular lattice steel sections. Heavy hot dipped galvanised after construction, Telescopes down to convenient length for transportation (6 to 7 metres according to tower type).

Ease of installation

The convenient peg base and built-in winch incorporated in Hills teletower design allows you to work to preselected base and guy points for fast and easy installations. Complete instruction sequence step by step are included with every tower to help you spend a minimum of time on the job. A full range of hardware, rigging kits and accessories is available to complete an installation.



Typical
3 section
tower

Installation summary

1. With tower horizontal, fit base plate, winch and guy wires.
2. Extend and lock top mast section and fit antenna facing the correct direction.
3. Raise to vertical and tie-off guys for bottom section.
4. Winch up other sections ensuring that the top section is elevated first, followed by remaining sections.
5. When installation is complete, ensure that each section is vertical and straight and that guy pretensions are correct.

Full installation instructions are provided with each tower.

Note

Ensure that local government approval is granted before installing any mast or tower. Specifications quoted in this brochure are subject to change without notice.

In line with company policy of constantly improving and innovating products, products specification may be changed without notice.

Shipping details

HEIGHT (M)	WEIGHT (KG)	CUBIC (Cu.M.)
12.5m	64	0.28
15.8m	91	0.41
22.5m	131	0.57
29.2m	179	0.76

Addresses

South Australia: Hills Industries Ltd.-Electronics Division, 7 Ackland St., Edwardstown, S.A. 5039. Ph: 371 0277. Telex: AA82110. Fax: (08)297 4468.

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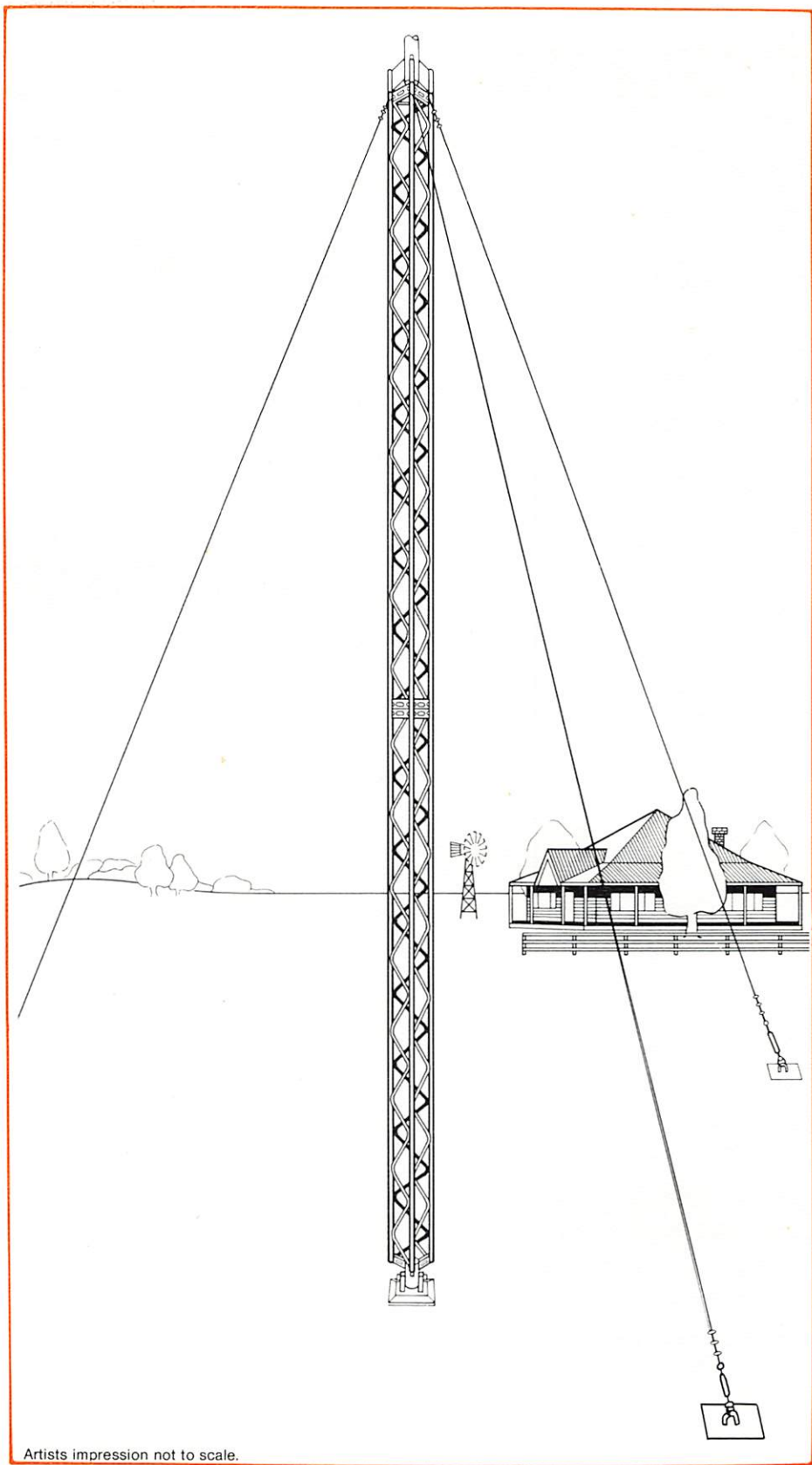
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Tasmania: Hills Industries Ltd., 337 Argyle St., North Hobart, Tas. 7000. Ph: 34 3331. Telex: AA58397.

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H.P.S. 7585 06.87.



Artists impression not to scale.

 **STANDARD BUTT
SECTION TOWERS**

Triangular, lattice section, guyed towers heights up to 32 mtrs.

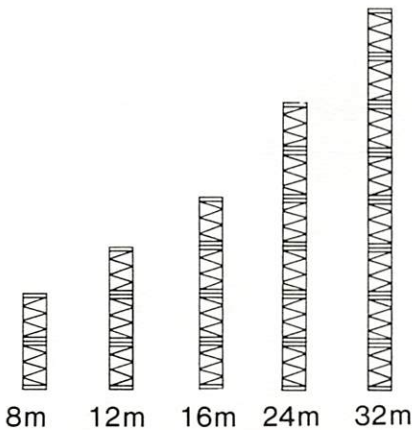
Standard Butt Section Towers

A range of triangular section, non-tele-scoping towers up to 32 metres in height.

- Tubular steel used for all members.
- Designed to comply with Australian Design Codes.
- Precision built from high quality steel.
- All tower sections are hot dip galvanised after fabrication to give corrosion resistance to all exposed surfaces.
- Standard 4.0 metre sections allow economical transport to difficult sites, and on site construction.
- Pivoting tower base adaptor to ease installation.
- Top Mast adaptor available for circular cross-section top mast.
- Climbing rungs fitted to all sections.
- Wide range of accessories are available including mast base insulators.

APPLICATION:

Television receiving antenna, radio communication base station antenna and all types of H.F. communication antenna, when cyclonic conditions are not likely to occur.



Standards statement

This is to certify that the Guyed Towers described in this catalogue have been designed in accordance with the appropriate Australian Standards.

AS 1170 Part II 1981 S.A.A. Loading Code - Wind Loads.

AS 1250 1981 S.A.A. Steel Structures Code.

AS 1538 1974 S.A.A. Cold Formed Steel Structure Code.

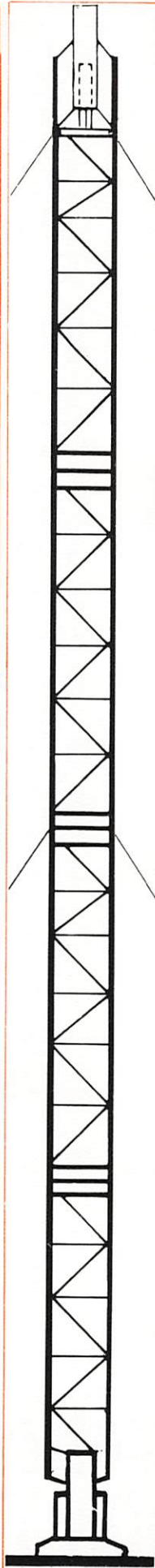
AS 1480 1974 S.A.A. Concrete Structures Code.

For use under the conditions described in this specification.

Head Loading Area 0.4 square metres.

Height above top guying point 1 m.

Regional wind velocity 45 metres per second. Terrain category 1.



Typical 16m Tower

Corrosion resistance of the structure is obtained by Hot Dip Galvanising. All fabricated sections and loose pieces of mild steel shall be Hot Dip galvanised and meet the requirements of AS 1650.

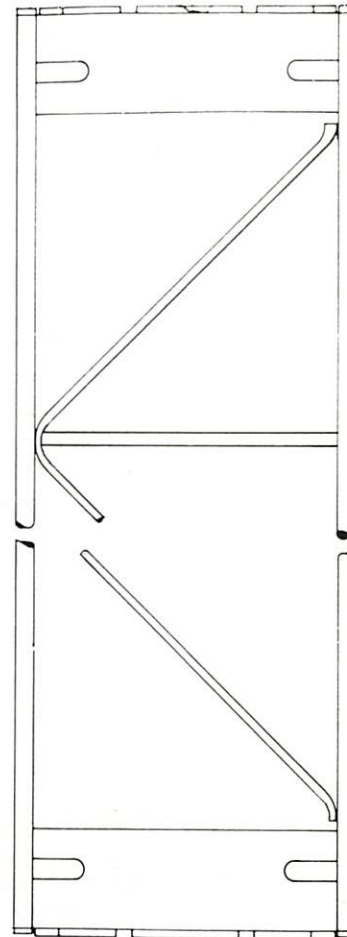
Basic engineering computations are available for towers of 8m, 12m, 16m, 24m, 32m, heights. Many permutations are possible when providing for different head loading conditions.

Full consultation services are provided by Hills, including:-

- Computer calculations.
- Special application computations.
- Drafting services.
- Special hardware design service.

Note

In areas where cyclonic conditions can be expected, consideration should be given to the use of a cyclonic tower.

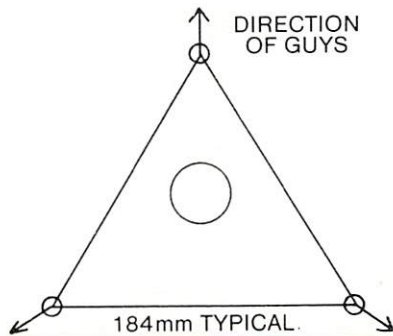


TOWER SECTION

Standard Butt Section Towers

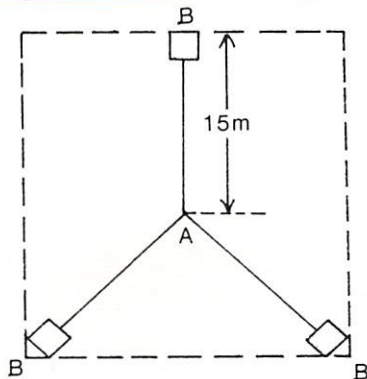
TOWER HEIGHT	DESCRIPTION	GUYING LEVELS	TOWER BASE TO GUY ANCHOR POINTS
8m	2 x 4m sections	1	4m
12m	3 x 4m sections	2	5m
16m	4 x 4m sections	2	8m
24m	6 x 4m sections	3	15m
32m	8 x 4m sections	4	15m

All sections are fitted with 12mm diameter climbing rungs.



All tower sections are of identical construction. Dimensions are as shown below.
 Chord Diameter: 16mm x 1.6mm
 Lattice: 8mm Rod
 Climbing Rungs: 12mm Rod

Area taken up by guying points



TOWER HEIGHT	AREA REQUIRED	
8m	7m x 8m	56squ.m
12m	9m x 10m	90squ.m
16m	13m x 15m	195squ.m
24m	24m x 27m	648squ.m
32m	24m x 27m	648squ.m

Footings — specified dimensions

TOWER HEIGHT	MAST BASE M	BASE VOLUME Cu.M.	GUY ANCHORS 3 REQUIRED	VOLUME M ³	TOTAL CONCRETE Cu.M.
8	CUBE 0.30m	.027	CUBE 0.58m	0.195	0.61
12	CUBE 0.30m	.027	CUBE 0.65m	0.275	0.85
16	CUBE 0.30m	.027	CUBE 0.64m	0.262	0.81
24	CUBE 0.30m	.027	CUBE 0.66m	0.287	0.89
32	CUBE 0.30m	.027	CUBE 0.79m	0.493	1.50

Typical Specification Summary

Hills standard 32m Butt Section Tower
 Top guy height:- 32 metres
 Regional wind velocity:-
 45 metres per second
 Headload area: 0.5 square metres.

Concentrated forces on mast

FORCE (kN) 1.0

HEIGHT (M) 32.9

VERTICAL FORCE (kN) 0.5

Forces at mast base
 Horizontal force 0.36kN
 Vertical force 10.1kN

Concrete base for mast:-
 Assumes base is a cube
 Soil bearing pressure 100 KPa
 Minimum size of concrete is
 0.30m square and 0.30 deep.

Guy forces

GUY NO	DIA (MM)	ANGLE (DEG)	MAX TENSION (kN)	BREAK LOAD (kN)	SAFETY FACTOR
1	4	64.9	5.4	8.4	1.55
2	3	58.0	2.9	4.7	1.63
3	3	46.8	2.0	4.7	2.30
4	3	28.1	1.6	4.7	3.01

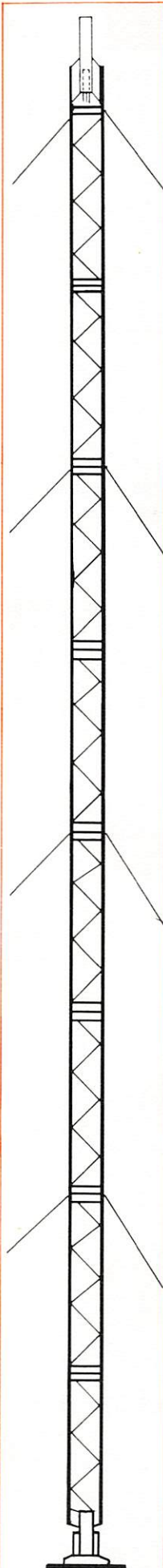
Guy bases

All guys use one common guy base.
 Concrete block data is based on
 density - 23.5 kN/cu M. Ratio of block
 mass to vertical lift:- 1.1.

BASE NO.	BASE DIST.(M)	VERT. FORCE (kN)
1	15.0	9.58
HORIZ. FORCE (kN)	CONCRETE BLOCK (M CUBE) MIN. SIZE	
6.61	0.79	HORIZ. SOIL BEARING (KPa)
		10.64

Note

Ensure that local government approval is granted before installing any mast or tower.
 Specifications quoted in this brochure are subject to change without notice.



Typical 32m Tower

Installation summary

1. Two or more people are required to complete assembly.
2. Gin pole or crane method can be used.
3. The site should be prepared well in advance of installation.
4. The tower is assembled from the bottom section and each second section should be Guyed off as it is installed.
5. Guys must be fitted to each second section prior to lifting.
6. When tower is fully installed ensure that all sections are vertical and straight. Guy pre-tensions must be observed.

Shipping details

	VOLUME	MASS (kg.)
8m	.22 m ³	34
12m	.29 m ³	51
16m	.37 m ³	68
24m	.52 m ³	102
32m	.67 m ³	136

In line with company policy of constantly improving and innovating products, products specification may be changed without notice.

Addresses

South Australia: Hills Industries Ltd.-Electronics Division, 7 Ackland St., Edwardstown, S.A. 5039. Ph: 371 0277. Telex: AA82110. Fax: (08)297 4468.

Victoria: Hills Industries Ltd.-Electronics Division, Cambria Rd., Dandenong, Vic. 3175. Ph: 798 7288. Telex: AA30380. Fax: (03) 798 5722.

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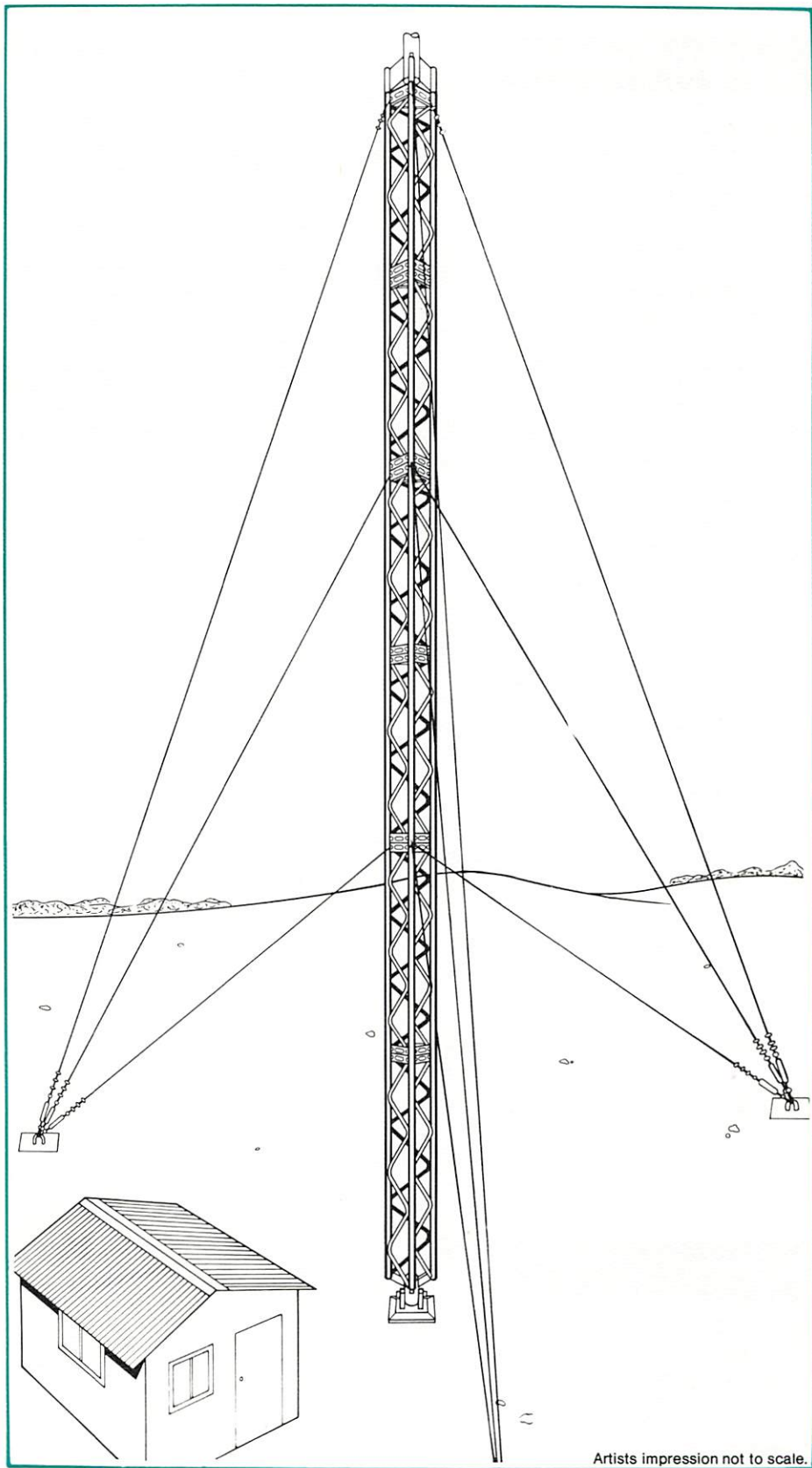
Western Australia: Hills Industries Ltd.-Electronics Division, 10 Katanning St., Bayswater, W.A. 6053. Ph: 279 5866. Telex: AA92056. Fax: (09) 378 2486.

Tasmania: Hills Industries Ltd., 337 Argyle St., North Hobart, Tas. 7000. Ph: 34 3331. Telex: AA58397.

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 Ph: 297 3888. Telex: AA82110. Fax: (08) 297 4468.

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Artists impression not to scale.



BUTT SECTION CYCLONIC TELETOWERS

Triangular, lattice section, guyed towers heights up to 63m in 9m steps.

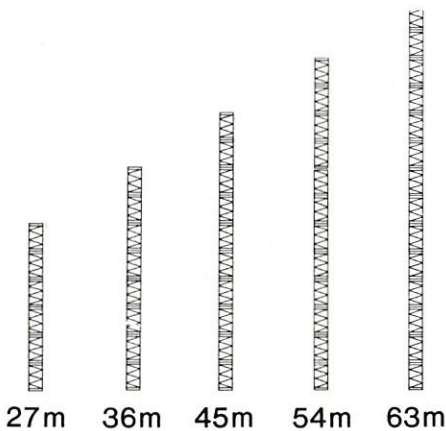
Butt Section Cyclonic Teletowers

A range of triangular section, non-telescoping guyed towers up to 63 metres in height.

- Designed to comply with Australian Design Codes.
- Precision built from high quality steel
- All tower sections are hot dip galvanised after fabrication to give corrosion resistance to all exposed surfaces.
- Standard 4.5 metre sections allow economical transport to difficult sites, and on site construction.
- Pivoting tower base adaptor to ease installation.
- Top Mast adaptor available for circular cross-section top mast.
- Climbing rungs fitted to all sections.
- Wide range of accessories are available.

APPLICATION:

Television receiving antenna, radio communication base station antenna and all types of H.F. communication antenna.



Standards Statement

This is to certify that the Guyed Towers described in this catalogue have been designed in accordance with the appropriate Australian Standards.

AS 1170 Part 2 1981 S.A.A. Loading Code - Wind Loads.

AS 1250 1981 S.A.A. Steel Structures Code.

AS 1480 1974 — S.A.A. Concrete Structures Code.

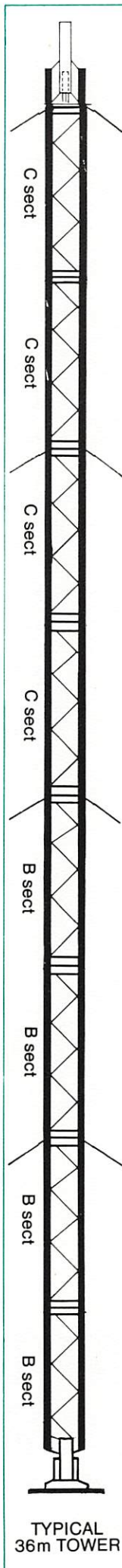
AS 1538 1974 — S.A.A. Cold Formed Steel Structures Code.

For use under the conditions laid down in this specification.

Head Loading Area 0.4 square metres.
Mass 30 KG.

Height above top guying point 5m

Regional wind velocity 63 metres per second. Terrain category rating 1.



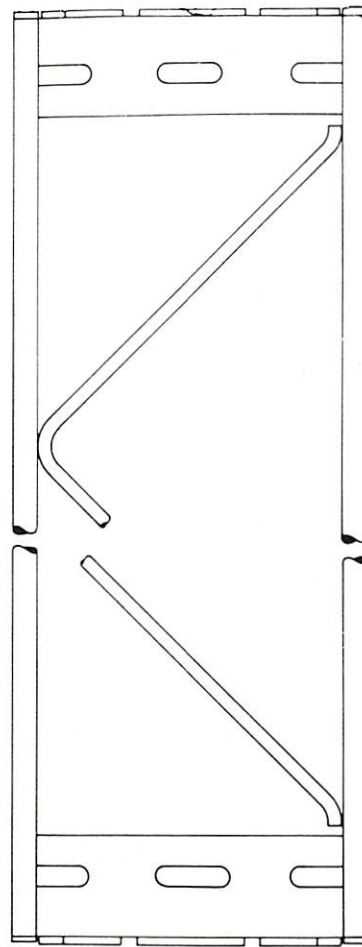
Bolts, nuts and washers shall conform to AS 1111, AS 1112 and AS 1237 respectively.

Corrosion resistance of the structure is obtained by Hot Dip Galvanising. All fabricated sections and loose pieces of mild steel shall be Hot Dip Galvanised and meet the requirements of AS 1650.

Basic engineering computations are available for towers of 27m 36m 45m 54m 63m heights. Many permutations are possible when providing for different head loading conditions.

Full consultation services are provided by Hills, including:-

- Computer calculations.
- Special application computations.
- Drafting services.
- Special hardware design service.

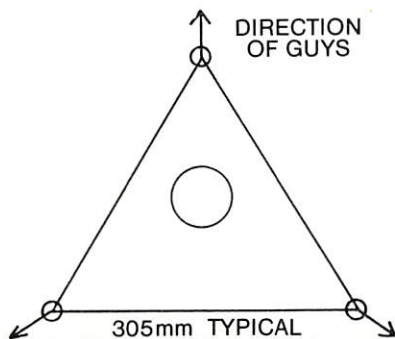


TOWER SECTION

Butt section towers

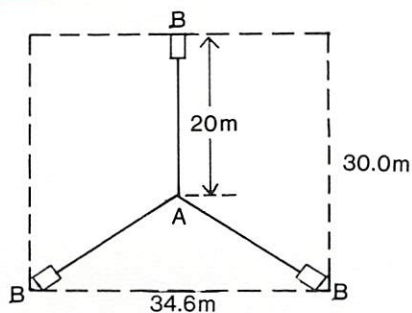
TOWER HEIGHT	DESCRIPTION	NUMBER OF SECTIONS TYPE C	NUMBER OF SECTIONS TYPE B	NUMBER OF SECTIONS TYPE A	GUYING LEVELS	TOWER BASE TO GUY ANCHOR POINTS
27m	6 x 4.5m SECTIONS	6			3	ALL 15m
36m	8 x 4.5m SECTIONS	TOP 4	LOWER 4		4	TOP 2 20m LOWER 2 15m
45m	10 x 4.5m	TOP 2	LOWER 8		5	TOP 3 25m LOWER 2 18m
54m	12 x 4.5m		TOP 6	LOWER 6	6	TOP 3 30m LOWER 3 20m
63m	14 x 4.5m		TOP 6	LOWER 8	7	TOP 4 35m LOWER 3 30m

*ALL SECTIONS FITTED WITH 12mm DIAMETER CLIMBING RUNGS.



TOWER SECTION	TUBULAR CHORDS		BRACING RODS DIAMETER
	CHORD DIAM	CHORD GAUGE	
TYPE A	26.9mm	2.5mm	12mm
TYPE B	25.4mm	2.0mm	12mm
TYPE C	19mm	2.0mm	10mm

Area taken up by guying points



A. Base of 36metre Butt Section Tower.
B. Guy points at specified distance from tower base. 20 metres.
Broken line shows area taken up by guys at specified distance.

TOWER HEIGHT	AREA REQUIRED
27m	28m x 25m
36m	37m x 32m
45m	46m x 40m
54m	55m x 47m
63m	63m x 55m

Footings — specified dimensions

Minimum for 100KPa soil bearing pressure.

TOWER HEIGHT	TOWER BASE	GUY ANCHORS 3 EACH REQUIRED	TOWER BASE VOLUME Cu.M.	GUY ANCHORS 3 REQU. Cu.M.	TOTAL VOLUME CONCRETE Cu.M.
27	CUBE 0.40m	CUBE .92m	.06	.78	2.40
36	CUBE 0.50m	CUBE .92m CUBE .74 m	.13	.78 .49	3.94
45	CUBE 0.60m	CUBE 1.10m CUBE .73 m	.21	1.33 .39	5.65
54	CUBE 0.70m	CUBE 1.15m CUBE .91m	.34	1.52 .75	7.15
63	CUBE 0.75m	CUBE 1.26 m CUBE 0.81m	.42	2.00 .59	8.20

Typical Specification Summary

Hills standard 63m Butt Section Tower
 Top guy height:- 63 metres
 Regional wind velocity:-
 63 metres per second
 Headload area: 0.4 square metres.

Concentrated forces on mast

FORCE (kN) 1.7

HEIGHT (M) 63.5m

VERTICAL FORCE (kN) .3

Forces at mast base
 Horizontal force 1.29kN
 Vertical force 49.75kN

Concrete base for mast:-
 Assumes base is a cube
 Soil bearing pressure 100 KPa
 Minimum size of concrete is
 0.75m square and 0.75. deep

Guy forces

GUY NO.	DIA (mm)	ANGLE (Deg)	MAX. TENS. (kN)	BREAK LOAD (kN)	SAFETY FACTOR
1	7	60.9	13.8	25.5	1.85
2	7	57.1	14.5	25.5	1.76
3	6	52.1	10.6	18.7	1.77
4	6	45.8	9.2	18.7	2.03
5	6	42.0	8.1	18.7	2.31
6	6	31.0	6.3	18.7	2.97
7	6	16.7	5.6	18.7	3.36

Guy bases

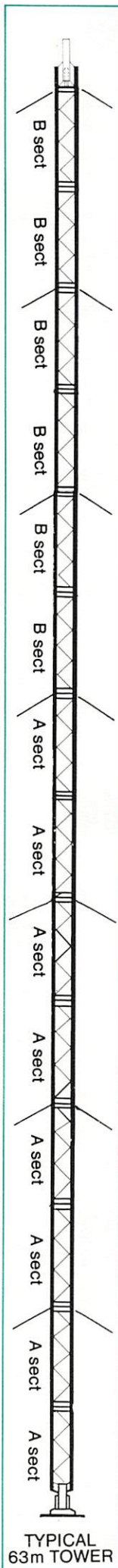
Guys are numbered inwards from outer base. Concrete block data is based on density - 23.5 kN/cu M. Ratio of block mass to vertical lift:-1.1

BASE NO.	BASE DIST. (M)	VERT. FORCE (kN)
1	35.0	39.17
2	30.0	10.26

HORIZ. FORCE (kN)	CONCRETE BLOCK	
	(M CUBE) MIN. SIZE	HORIZ SOIL BEARING KPa
27.50	1.26	17.33
16.75	0.81	25.77

Note

Ensure that local government approval is granted before installing any mast or tower.
 Specifications quoted in this brochure are subject to change without notice.



Installation summary

1. Two or more people are required to complete assembly.
2. Gin pole or crane method can be used.
3. The site should be prepared well in advance of installation.
4. The tower is assembled from the bottom section and each second section should be guyed off as it is installed.
5. Guys must be fitted to each second section prior to lifting.
6. When tower is fully installed ensure that all sections are vertical and straight. Guy pretensions must be observed.

Shipping details

EACH SECTION	WEIGHT (KG)	CUBIC Cu.M.
A	46	0.4
B	40	0.4
C	29	0.4

Addresses

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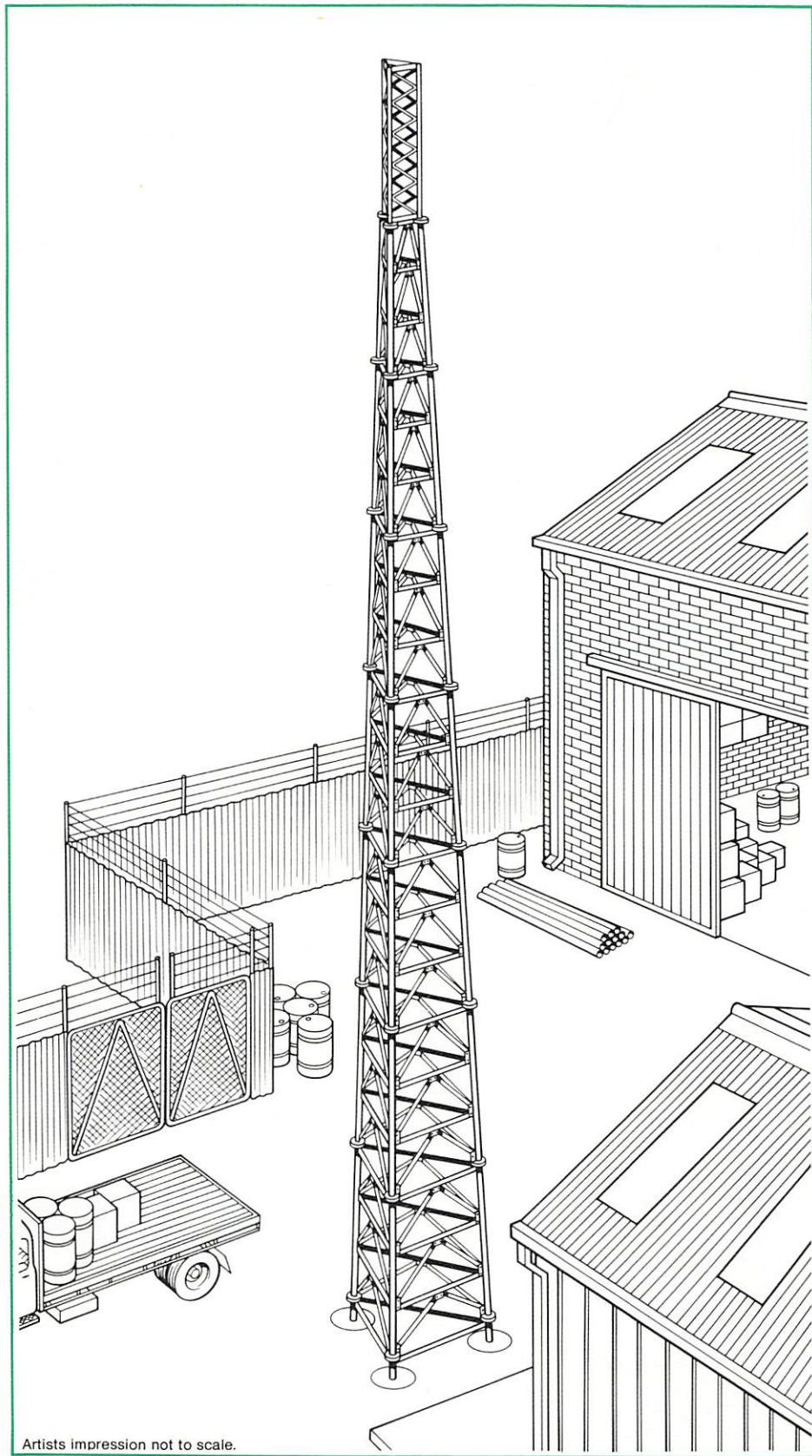
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SELF SUPPORTING TOWERS

(SS45 Series)

Triangular section, free standing. Heights from 9 to 30m.

SS-45 Series self supporting towers

- Triangular section, self supporting towers.
- Tubular steel used for all members.
- No guying required.
- Each section and all rigging materials hot dip galvanised after construction for corrosion resistance to all surfaces.
- On-site assembly of tower allows convenient transport on site.
- Parallel top section common to all tower heights.
- Top mast adaptor available.
- Wide range of standard heights.

APPLICATIONS:

Microwave dish assemblies, multiple communication antenna arrays, heavy duty stacked antennas.

Standards statement

This is to certify that the free standing towers described in this catalogue have been designed in accordance with the appropriate Australian Standards.

AS 1170 Part 2 1981 SAA loading code - wind loads.

AS 1250 1981 SAA steel structures code.

AS 1480 1974 — S.A.A. Concrete Structures Code.

AS 1538 1974 — S.A.A. Cold Formed Steel Structures Code.

For use under the conditions laid down in this specification. Allowable regional wind velocity 45 metres per second.

Terrain category type: 1

Head loadings:

Area: -4 square metres.

Mass: 30KG.

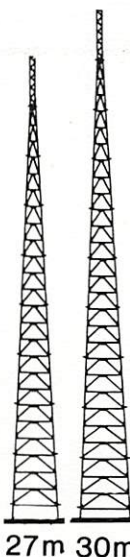
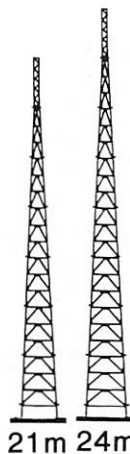
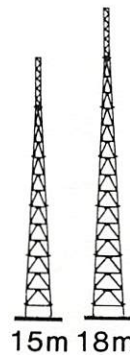
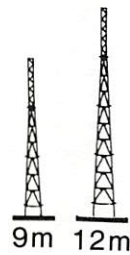
Bolts, nuts and washers shall conform to AS1111, AS 1112 and AS 1237 respectively. Corrosion resistance of the structures is obtained by hot dip galvanising. All fabricated sections and loose pieces of mild steel shall be hot dip galvanised and meet the requirements of AS 1650.

Basic engineering computations are available for towers of 9, 12, 15, 18, 21, 24, 27, 30 metre heights. Many permutations are possible when providing for different head loading conditions.

Full consultation services are provided by Hills including:-

- Computer calculations
- Special application computations.
- Drafting services.
- Special hardware design services.

NOTE: Ensure that local government approval is granted before installing any mast or tower.



NOTE: Sections A B and C are common to all towers in the range. A top mast adaptor and 50mm tube is available to allow a round section pole to be used at the top of the tower for mounting antennae.

Installation summary

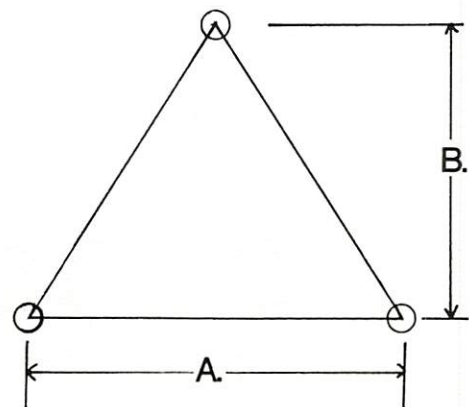
1. Bore holes (use layout)
2. Assemble bottom tower section.
3. Assemble legs to bottom section.
4. Locate in holes, support vertically.
5. Ensure legs are not touching sides or bottom of holes.
6. Pour concrete. Cure for 48 hours minimum.

Slab foundations

1. Excavate hole.
2. Assemble bottom section.
3. Cut bottom 1.5m from base pack legs and cut offcut into equal thirds.
4. Weld pieces to foundation legs 100mm apart.
5. Assemble legs to bottom section.
6. Assemble mesh in hole 75mm from bottom.
7. Locate in hole, support vertically.
8. Ensure legs are not touching sides or bottom of holes.
9. Pour concrete, cure for 48 hours minimum.

Full installation instructions are available for each tower.

Plan diagram



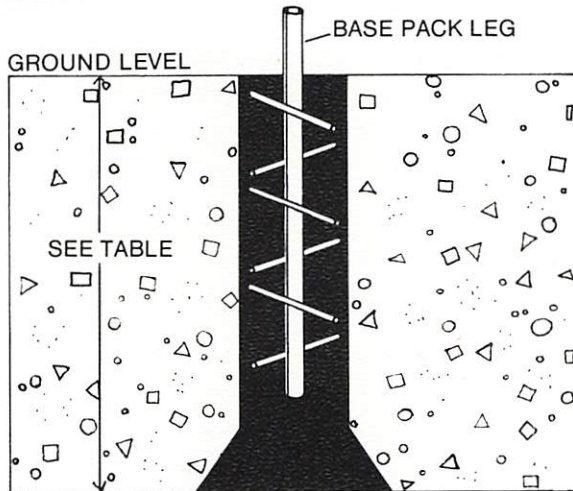
Refer base dimensions on opposite page.

Self supporting Teletower specifications

Footing design for 250KPa. soil bearing strength. Concrete grade 15.

TOWER HEIGHT (M)	COMPOSITION	PIER DEPTH (M)	PIER DIA (M)	FOOT DIA (M)	TOTAL CONCRETE VOLUME Cu.M.	BASE DIMENSION (mm)	
						A.	B.
9	SECTIONS A to C	1.5	0.3	0.50	0.33	900 x 779	
12	SECTIONS A to D	1.6	0.3	0.50	0.36	1200 x 1039	
15	SECTIONS A to E	1.8	0.3	0.50	0.39	1500 x 1299	
18	SECTIONS A to F	2.0	0.3	0.6	0.45	1800 x 1559	
21	SECTIONS A to G	2.0	0.3	0.6	0.45	2100 x 1819	
24	SECTIONS A to H	2.2	0.3	0.6	0.51	2400 x 2078	
27	SECTIONS A to I	2.2	0.3	0.7	0.54	2700 x 2338	
30	SECTIONS A to J	2.5	0.3	0.75	0.63	3000 x 2598	

Each section is 3 metres high.



(SEE TABLE) SPECIFIED PIER ON EACH BASE PACK LEG.

Alternative concrete slab foundations

TOWER HEIGHT	BASE SIZE (M)	MINIMUM THICKNESS	BASE VOLUME Cu.M
9m	1.5 x 1.5	0.63m	1.43
12m	2.0 x 2.0	0.5m	2.0
15m	2.3 x 2.3	0.5m	2.64
18m	2.5 x 2.5	0.60m	3.75
21m	3.0 x 3.0	0.5m	4.5
24m	3.5 x 3.5	0.4m	4.9
27m	3.5 x 3.5	0.54m	6.61
30m	4.0 x 4.0	0.5m	8.0

Material specifications

TOWER SECTION	LEGS (MM)	HORIZONTAL MEMBERS (MM)	DIAGONAL MEMBERS (MM)	WEB MEMBERS		LEGS FLANGES	
				BOLT	GUSSETT	BOLT	FLANGE
B	35 x 3.0	19 x 2.0	19 x 2.0	10mm	5mm	3x10mm	8mm
C	35 x 3.0	19 x 2.0	19 x 2.0	10mm	5mm	3x10mm	8mm
D	35 x 3.0	19 x 2.0	19 x 2.0	10mm	5mm	3x10mm	8mm
E	51 x 2.5	35 x 3.0	25.4 x 2.0	12mm	5mm	4 x 12mm	10mm
F	51 x 2.5	35 x 3.0	25.4 x 2.0	12mm	5mm	4 x 12mm	10mm
G	51 x 2.5	35 x 3.0	25.4 x 2.0	12mm	5mm	4 x 16mm	12mm
H	60 x 3.0	51 x 2.5	35 x 3.0	16mm	6.5mm	4 x 16mm	12mm
I	60 x 3.0	51 x 2.5	35 x 3.0	16mm	6.5mm		
J	60 ∅ x 3.0	51 x 2.5	35 x 3.0	16mm	6.5mm		

Specification Summary

Typical

Hills standard self-supporting tower - 18m
 Total tower height:- 18m
 Regional wind velocity:- 45 metres/second
 Terrain category rating:- 1
 Headload area:- 4 square metres.

Concentrated forces

FORCE NO.1

HEIGHT (M) 18.0

VALUE (kN) 0.70

VERT. FORCE (kN) 0.30.

Total tower mass:- 2.8kN
 Equivalent weight:- 0.3 tonne force

Foundation details

PIER FOUNDATIONS

Pier depth-2.0m
 Pier diameter-0.3m
 Foot diameter-0.6m
 Total depth-2.0m

Pier volume-0.45 Cu.M

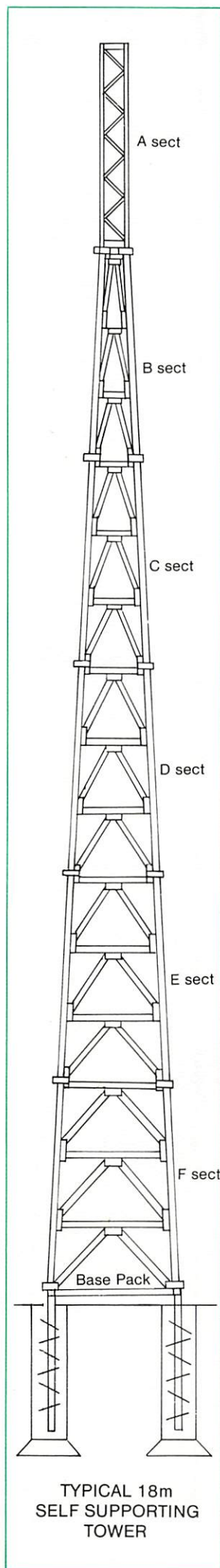
SLAB FOUNDATIONS

Base size:-2.5m square
 Min. base thickness-0.6m
 Base volume-3.75 Cu. M
 Max. soil pressure 46.1 KPa.
 Horiz. soil pressure-6.5 KPa.

Installation summary

1. Layout individual packs from top to bottom.
2. Check square plates on both ends of the section upright side tubes, to ensure they are facing correctly.
3. Horizontal braces have plates welded at centres.
4. The longest braces are positioned at the bottom of each section.
5. The horizontal and diagonal braces are positioned to the inside of the plates on the legs and horizontal braces.
6. A crane may be required to complete assembly of upper sections.

Full installation instructions are available for each tower.



TYPICAL 18m
 SELF SUPPORTING
 TOWER

Note

Ensure that local government approval is granted before installing any mast or tower

Specifications quoted in this brochure are subject to change without notice.

In line with company policy of constantly improving and innovating products, products specification may be changed without notice.

Shipping details

HEIGHT (M)	WEIGHT (KG)	VOLUME (M ³)
19	225	0.81
12	282	0.97
15	372	1.19
18	471	1.41
21	579	1.63
24	771	1.91
27	970	2.19
30	1180	2.47

Addresses

South Australia: Hills Industries Ltd.-Electronics Division, 7 Ackland St., Edwardstown, S.A. 5039. Ph: 371 0277. Telex: AA82110. Fax: (08)297 4468.

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