AlanDick

# Structure Solutions

## Communication Infrastructure Solutions

Structures

This brochure provides an introduction to the broad and diverse range of the most popular antenna supporting structures within the AlanDick global portfolio. Bespoke designs available on request.

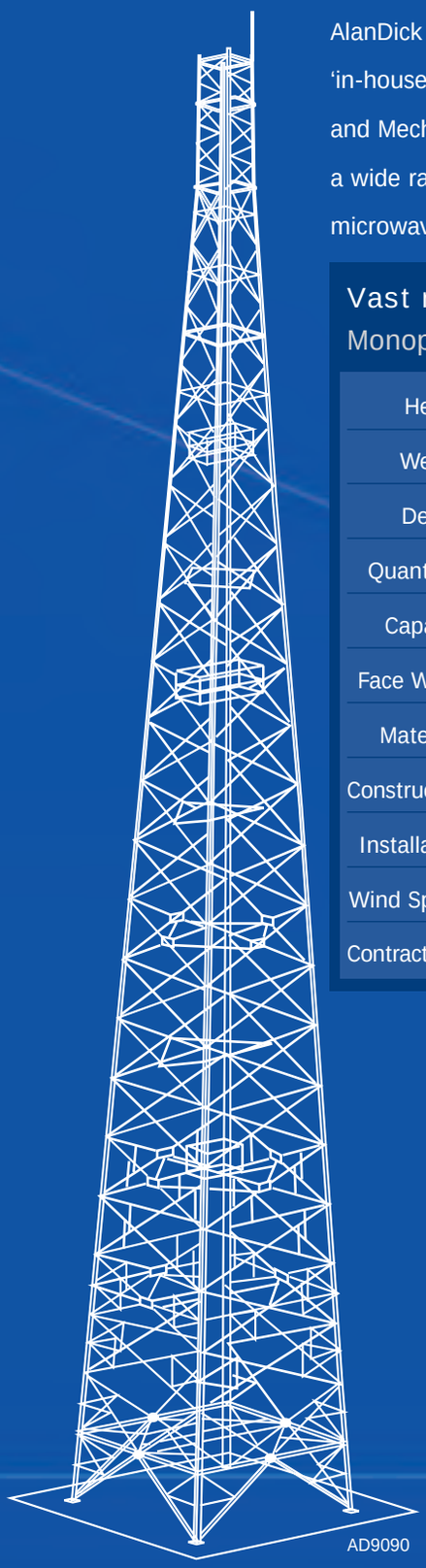
## Contents



# AlanDick Group

- Independent World Leader in Communication Infrastructure Solutions
- **5** offices on 5 continents, global project delivery capability
- Unique portfolio of products & services – including RF technology, Telecom services, Structural engineering
- Proven record of innovative solutions to global clients

# Design

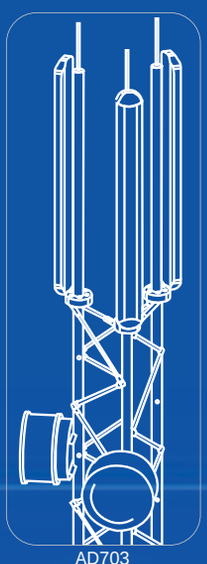


AD9090

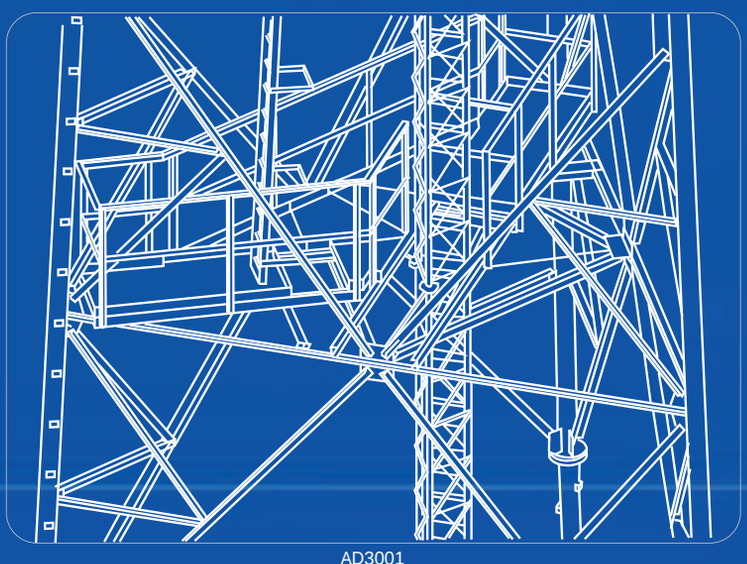
AlanDick has been a specialist tower engineering company since 1971. Our worldwide ‘in-house’ design team comprise of over 30 designers including Chartered Structural, Civil and Mechanical Engineers who offer a wealth of experience and the capability to produce a wide range of different types of structures commonly used in the cellular, broadcast, microwave, radar and rail markets.

**Vast range of structure types** – Self Supporting Towers, Guyed Masts, Monopoles, Trees, Rooftops, Lamp Posts, Rapid Deployment Solutions

| | | |
|---|---|---|
| Height | 2m | 450m |
| Weight | 50kg | 500 Tonnes |
| Design | Guyed Masts | Self Supporting |
| Quantities | 1-off Specials | Cellular Network Rollout |
| Capacity | Single Cellular Antenna | Multiple Operators, Broadcast Antennas |
| Face Width | 150mm | 30m |
| Materials | Mild Steel | GRP Composites |
| Construction | Bolted Joints | Welded Units |
| Installation | Piece Small Components | Whole Sections |
| Wind Speed | 30m/s | 75m/s |
| Contract Size | Simple Design Check | Full Turnkey Projects |



AD703



AD3001

# Manufacture & Install

## Manufacture

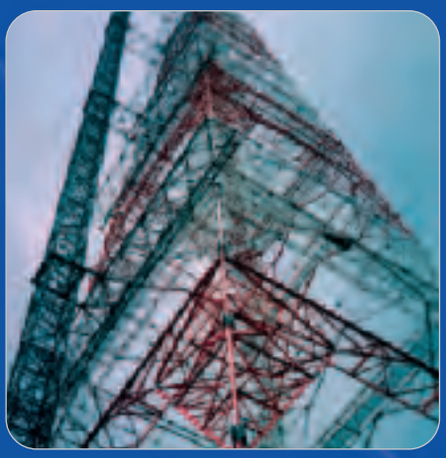
- 3500+ Towers & Masts built worldwide
- 10,000 Tonnes of fabricated steel annually

Project Management

Production

Procurement

Assembly



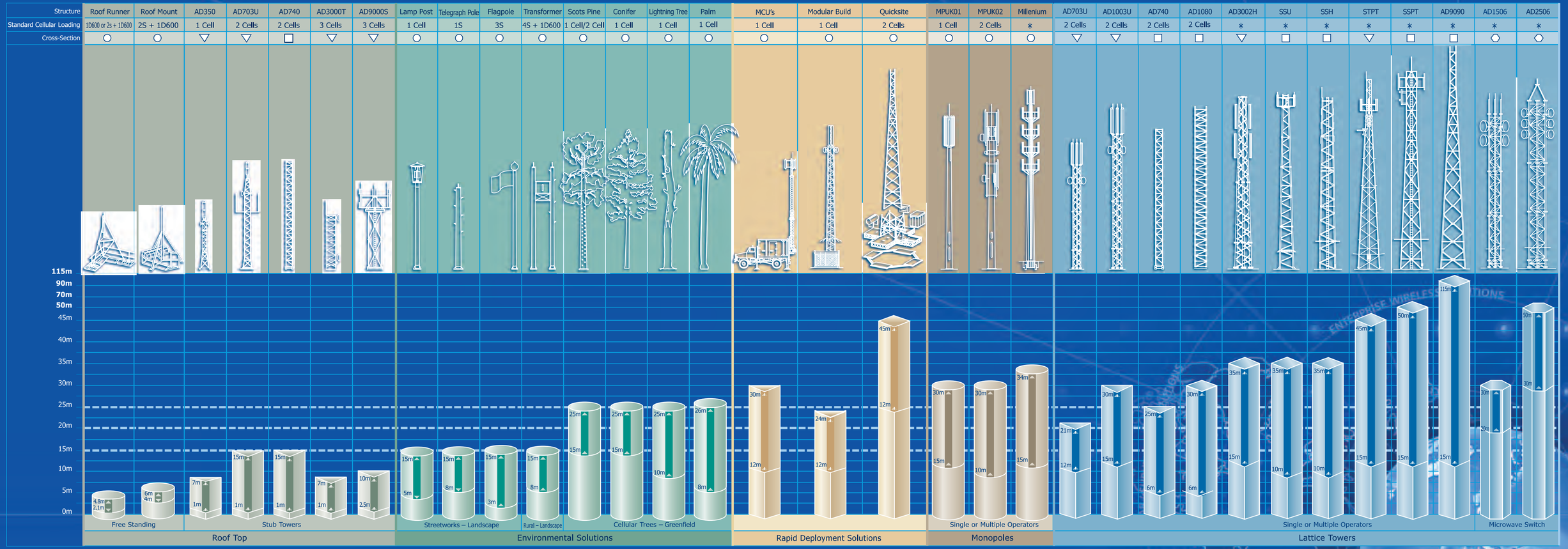
## Features Include:

Rest platforms, ladders, antenna mounting brackets, anti-climb systems, aircraft warning lights, feeder cable brackets, galvanised or painted finish, holding down bolts, cast-in stubs, templates, lightning protection, feeder gantries, radomes.

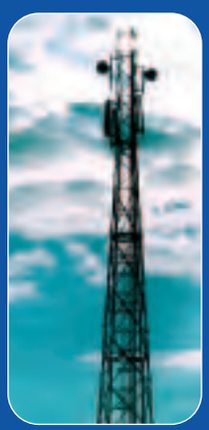
- Civils & Foundations
- Tower Build
- Strengthening
- Site Share
- Multiple Operators
- Rigging
- Commissioning

# Cellular Selection Chart

* Capacities stated on technical specification tables, see pages 10 to 17



# Cellular Selection Chart



There are a number of factors that are used to determine the optimum structure type for each site:

- Site category – Roof Top, Greenfield, Streetworks, Rapid Deployment, Temporary or Permanent
- Site available space
- Structure height
- Structure shape
- Number of Operators
- Structure capacity – number of antennas, microwave dishes, feeders, TMA's
- International design codes/design wind speed

The selection chart over the page provides this information for all standard structures within the comprehensive AlanDick portfolio. Designed for and approved by major cellular operators and planning authorities worldwide.

# Cellular – Roof Top

## Roof Top – Modular Roof Runner Solution

- Free Standing
- Non-Penetrative
- Rapid Deployment
- Installation Options
- Load Distribution
- Upgradeable

### Antenna Mounts

Free standing pole mount system for antennas, MHA's & microwave dishes providing a quick & easy alternative to traditional stub towers that require secure attachment & modification of existing concrete plinths.

### Cabinet Platforms

Free standing mounting system designed to locate several equipment cabinets in close proximity on one easily accessible platform whilst spreading the load evenly & safely across the roof structure.

### Safety Guardrail

Personnel safety system arranged to suit any space & layout of roof top sites, either independently or in conjunction with antenna mounts and/or cabinet platforms.

AD9000S

### Roof Top – Stub Towers

A range of high capacity towers for permanent and secure attachement to structural roof beams.

AD9000S

| Structure | Height Range m | Profile | Cross-Section | Top face width m | Design code & wind speed m/s | Capacity in standard cells |
|---|---|---|---|---|---|---|
| FREE STANDING | | | | | | |
| Roof Runner – PVC Blocks | 2.1 | – | ● | 0.09 | – | 1D600 |
| Roof Runner – PVC Blocks | 3.0, 3.9, 4.8 | – | ● | 0.09 | – | 2S +1D600 |
| Roof Mount – Concrete Blocks | 4.0, 5.0, 5.5, 6.0 | – | ● | 0.05 to 0.114 | – | – |
| STUB TOWERS | | | | | | |
| AD350 | 1 to 7 | Parallel | s | 0.35 | CP3, 52m/s, 25m rooftop | 1 Cell |
| AD703U | 1 to 15 | Parallel | s | 0.7 | CP3, 52m/s, 25m rooftop | 2 Cells |
| AD740 | 1 to 15 | Parallel | n | 0.7 | CP3, 42m/s, 25m rooftop | 2 Cells |
| AD3000T | 1 to 7 | Parallel | s | 1.5 | CP3, 52m/s, 25m rooftop | 3 Cells |
| AD9000S | 2.5, 5, 7.5, 10 | Parallel | s | 1.45 | CP3, 44m/s, 25m rooftop | 3 Cells |

STANDARD CELLULAR LOADING (1 Cell) is taken as one 3 sector array plus two 600mm dishes
Stated capacity for antennas and microwave dishes is strictly for guidance only. S=Sector; D=Dish

## Environmental Solutions

A series of innovative antenna supporting structures that improve the visual impact of mobile communications sites in sensitive rural areas (National Parks) and urban environments (streets and roof tops).

- Low visual impact solutions which blend in with local landscape
- Composite material moulded to shape, size and colour to replicate the features of original structure to the satisfaction of the local planning authority
- Material type, number and thickness of composite layers calculated for optimum strength whilst minimising RF signal loss
- GRP radome protects antenna from exposure to climatic conditions

Lightning Tree

## Landscape – Streetworks

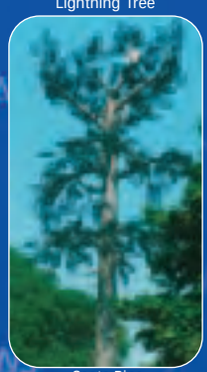
- Telegraph Pole
- Lampost
- Flagpole

Telegraph Pole

## Greenfield – Cellular Trees

- Scots pine
- Conifer
- Palm
- Lightning Tree

Palm



Scots Pine

## Landscape – Rural

- Grain Silo
- Windmill
- Transformer Pole
- Obelisk

| Structure | Height Range m | Profile | Cross-Section | Top face width m | Design code & wind speed m/s | Capacity in standard cells |
|---|---|---|---|---|---|---|
| STREETWORKS | | | | | | |
| Lamp Post | 5 to 15 | Taper | ● | 0.22 | 33m/s | 1 Cell |
| Telegraph Pole | 8, 10, 12, 15 | Parallel | ● | 0.22 | CP3, 46m/s | 1 Cell |
| Flagpole | 3 to 15 | Parallel | ● | 0.22 to 3.5 | CP3, 46m/s | 3S |
| RURAL | | | | | | |
| Transformer Pole | 8, 10, 12, 15 | Twin Pole | ● ● | 0.22 | CP3, 46m/s | 4S+1D600 |
| CELLULAR TREES | | | | | | |
| Scots Pine | 15, 20, 25 | Taper | ● Irregular | 0.46 | CP3, 51m/s | 1 Cell(2 Cells option) |
| Conifer | 15, 20, 25 | Taper | ● Irregular | 0.275 | CP3, 51m/s | 1 Cell |
| Lightning Tree | 10, 15, 20, 25 | Parallel | ● Irregular | 1 | BS6399, 30m/s | 1 Cell |
| Palm | 8 to 26 | Taper | ● Irregular | 0.61 | CP3, 45m/s | 1 Cell |

STANDARD CELLULAR LOADING (1 Cell) is taken as one 3 sector array plus two 600mm dishes
Stated capacity for antennas and microwave dishes is strictly for guidance only. S=Sector; D=Dish

## Roof Top

- Church louvres
- Chimney
- Church Spire
- Mosque minaret
- Brick effect panelling

# Cellular – Rapid Deployment Solutions

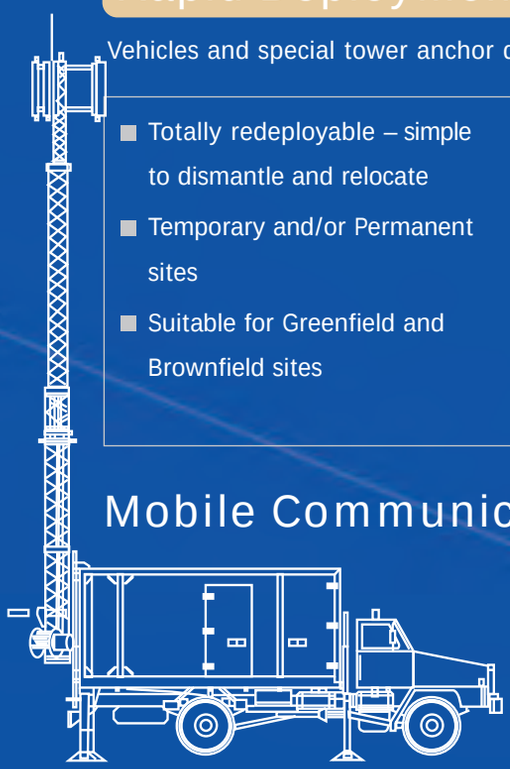
## Rapid Deployment Solutions

Vehicles and special tower anchor designs (alternatives to traditional concrete foundations).

- Totally redeployable – simple to dismantle and relocate
- Temporary and/or Permanent sites
- Suitable for Greenfield and Brownfield sites

| | VEHICLE/ANCHOR DESIGN | COMPLETE INSTALL TIME | TOWER HEIGHT | FOOTPRINT |
|---|---|---|---|---|
| MCU | Trailer or Vehicle Mounted with Outriggers & Self Guying System | 2 Hours | Up to 30m | 10m x 11m with riggers |
| Modular Build | Structural Frame Bolted to Helical Screwpiles | 2 Days | Up to 24m | 4.2m x 3m |
| Quicksite | Structural Frame with Hardcore Ballast | 6 Days | Up to 45m | 13.5 x 13.5m |

## Mobile Communication Unit (MCU) – Special Events



## Modular Build – Screwpile

## Quicksite – Ballast

## Monopoles – Single or Multiple Operators

A range of slimline tubular self-supporting structures with a slight taper or stepped profile, designed for low visual impact.

Millenium

| MONOPOLES | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structure | Height Range m | Profile | Cross-Section | Top face width m | Design code & wind speed m/s | Design wind area $m^2$ | Capacity in standard cells |
| MPUK01 | 15 to 30 | Taper | ● | 0.286 | BS8100, 30m/s | – | 1 Cell |
| MPUK02 | 10 to 30 | Taper | ● | 0.34 | BS8100, 29m/s | – | 2 Cells |
| Millennium | 34 | Taper | ● | 0.5 | CP3, 37m/s | 38 over 15m | – |

STANDARD CELLULAR LOADING (1 Cell) is taken as one 3 sector array plus two 600mm dishes
Stated capacity for antennas and microwave dishes is strictly for guidance only. S=Sector; D=Dish

# Cellular – Lattice Towers

SSU

## Lattice Towers – Single or Multiple Operators

A comprehensive range of self-supporting towers of various shapes, heights and capacities.

AD3002H

AD1003U

AD703U

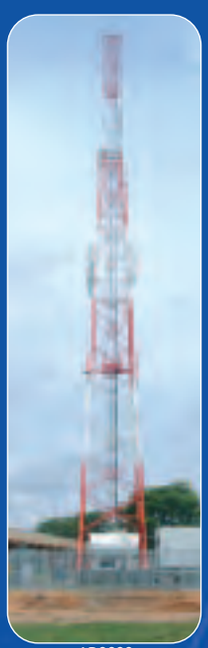
| LATTICE TOWERS Structure | Height Range m | Profile | Cross-Section | Top face width m | Design code & wind speed m/s | Design wind area $m^2$ | Capacity in standard cells |
|---|---|---|---|---|---|---|---|
| AD703U | 12 to 21 | Parallel | s | 0.7 | CP3, 52m/s | – | 2 Cells |
| AD1003U | 15 to 30 | Parallel | s | 1 | CP3, 52m/s | – | 2 Cells |
| AD740 | 6 to 25 | Parallel | n | 0.7 | CP3, 42m/s | – | 2 Cells |
| AD1080 | 6 to 30 | Parallel | n | 1 | CP3, 42m/s | – | 2 Cells |
| AD3002H | 15 to 35 | Taper | s | 0.6 to 0.9 | BS8100, 27.5m/s | 5 to 10 | – |
| SSU | 10 to 35 | Taper | n | 1 | BS8100, 27.5m/s | 20 over 15m | – |
| SSH | 10 to 35 | Taper | n | 1 | BS8100, 27.5m/s | 35 over 15m | – |
| STPT | 15 to 45 | Taper | n | 1 | BS8100, 27.5m/s | 30 over 15m | – |
| SSPT | 15 to 50 | Taper | n | 0.9 | BS8100, 27.5m/s | 30 over 15m | – |
| AD9090 | 15 to 115 | Taper | n | 0.9 | CP3, 40m/s | 10 to 20 over 12m | – |

STANDARD CELLULAR LOADING (1 Cell) is taken as one 3 sector array plus two 600mm dishes
Stated capacity for antennas and microwave dishes is strictly for guidance only. S=Sector; D=Dish

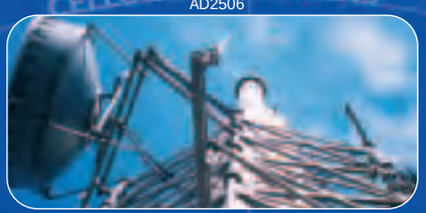
## Lattice Towers – Microwave Switch

A range of tall and wide self-supporting towers offering high capacity for multi-function applications. These include special six leg 'interleave' designs (see below), AD9090 (page14) and broadcast type towers AD3000, AD5000, AD7000 and AD9140 (page 16).

AD2506



AD9090



| LATTICE TOWERS Structure | Height Range m | Profile | Cross-Section | Top face width m | Maximum Payload kN | Capacity Range |
|---|---|---|---|---|---|---|
| AD1506 | 20 to 30 | Parallel | ⬣ | 1.75 | 25 | Medium |
| AD2506 | 30 to 50 | Parallel | ⬣ | 2.9 | 50 | Heavy |

Note: The interleaved towers offer six tubular legs upon which many dishes can be easily mounted

# Broadcast – Towers & Guyed Masts

## Towers

A comprehensive range of self-supporting lattice towers for mounting terrestrial broadcast antenna systems; DVB-T, FM & DAB radio.

| TOWERS Structure | Height Range m | Profile | Cross-Section | Top face width m | Design code & wind speed m/s | Design wind area $m^2$ | Capacity Range |
|---|---|---|---|---|---|---|---|
| AD3000 series | to 175 | Taper | s | 0.3/1.5 | CP3, 36 to 45 | 5 to 20 | Light-Medium |
| AD5000 Series | to 75/65/55 | Taper | n | 0.75/1.5/2.4 | CP3, 40/45/50 | 5/15/25 | Medium-Heavy |
| AD7000 Series | to 150 | Taper | n | 1.1/2.2 | CP3, 36 to 45 | 15 to 40 | Medium-Heavy |
| AD9140 | 42.5 | Taper | n | 1.4 | CP3, 36 | 10 to 15 | Light-Medium |
| SPECIALS | to 300 | Taper | s n | – | CP3, EIA-222, BS8100 & others | – | – |

## Guyed Masts

Parrallel structure used or same applications as above.

Also used as a MW mast radiator.

AD2500

| GUYED MASTS Structure | Height Range m | Profile | Cross-Section | Top face width m | Maximum Payload kN | Capacity Range |
|---|---|---|---|---|---|---|
| AD440-450 | 15 to 75 | Parallel | s | 0.44/0.45 | 10 | Light |
| AD600 | 25 to 100 | Parallel | s | 0.6 | 15 | Light |
| AD700 | 35 to 100 | Parallel | s | 0.7 | 25 | Medium |
| AD1050 | 50 to 200 | Parallel | s | 1.05 | 50 | Light-Medium |
| AD1300 – AD1307 | 75 to 250 | Parallel | s | 1.3 | 75 | Medium |
| AD1500 – AD1507 | 100 to 300 | Parallel | s | 1.5 | 100 | Medium-Heavy |
| SPECIALS | 100 to 450 | Parallel | s | 1.5/3 | 125 | Light-Heavy |
| Parallel Square Masts | | | | | | |
| SPECIALS | 15 to 250 | Parallel | n | 1.2 to 2.5 | 125 | Medium-Heavy |

Capacity is a function of height, wind speed and pay load. Payload varies from individual antenna or pull off stay level to several antenna apertures with distributed or concentrated loads. At 160km/h /100mph/44.5mps the equivalent factored area is 80% of the loads shown

# Custom Designed Structures

| RADAR TOWERS<br>Structure | Height Range m | Profile | Cross-Section | Top face width m | Maximum Payload kN |
|---|---|---|---|---|---|
| AD4450 | 10 to 40 | Parallel | n | 4.5 | 50 |
| AD4600 | 10 to 40 | Parallel | n | 6 | 75 |
| AD4900 | 10 to 40 | Parallel | n | 9 | 100 |

Note: These are high performance towers designed to limit deflection, typically to around 0.1 degrees tilt and 1.5 minutes of twist. They can accommodate top platforms for large Radomes, and have stair access.

- Rail GSM-R
- Wind Farms
- Oil & Gas
- Radar & Surveillance

AD3002

AD7000

AD5000

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- CELLULAR SOLUTIONS
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"From a single product or service to a complete turnkey communication infrastructure solution"

With more than 30 years' experience, AlanDick is at the leading edge of communications technology, in engineering exceptional quality, innovative celluar, broadcast, enterprise, radar and surveillance products, systems and services

AlanDick plan, deploy, maintain, manage and upgrade communication networks on a global basis by offering products and services for network operators, technology manufacturers and integrators.

Wireless
- GSM
- UMTS
- Tetra
- Microwave
- W-LAN
- CDMA

Fixed Line
- Optical
- DSL
- DWDM
- ATM
- IP

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