

Network Standard

Document No.

NS288

Title:

Telecommunications Antenna on Poles

Approved Date	22/05/2025	Revision	1
Lifecycle Stage	Plan; Design; Construct	Internal Use	☒ External Use ☒
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Revision

No	Date	Description	Technical Approver	Authorised By
0	22/05/2025	New issue	Duminda Thenuwara	Jacob Bayley
1	10/10/2025	Amendment to Figure 2 clearance	Duminda Thenuwara	Jacob Bayley

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Scope

This network standard sets requirements for the attachment of telecommunication antenna (small cells, microcells and macro cells) on Ausgrid's poles and streetlighting columns.

Telecommunications equipment, including small cells, microcells, macro sites and broadband cable services and NBN may be installed on Ausgrid poles under a licensing agreement negotiated with Ausgrid.

This standard provides requirements to customers, carriers, utilities, accredited service providers and third parties who are seeking access to Ausgrid assets/poles for the purpose of installing telecommunications equipment i.e. antennas and remote radio units (RRU's), including associated cabling and consumables.

This Standard does not specify the requirements for pole-mounted communications cabling. Refer NS232 for Telecommunications Cables on Ausgrid poles.

This Standard does not specify the electrical requirements for pole-mounted Special Small Services, which is covered under Ausgrid's electricity supply standard ES1- Premises Connection Requirements.

Reference Documents

All work covered in this document shall conform to all relevant Legislation, Standards, Codes of Practice and Network Standards. Current Network Standards are available on Ausgrid's Internet site at www.ausgrid.com.au.

Ausgrid Documents

Electrical Safety Rules

ES1 Premises Connection Requirements

NS145 Pole inspection and treatment

NS232 Telecommunications cables on Ausgrid Poles

Clause	Standard Requirements
1	Pole selection
1.1	The customer or carrier shall nominate a specific Ausgrid pole as part of their submission, if the pole is deemed unsuitable by Ausgrid, the customer or carrier may request Ausgrid to nominate an alternate pole in the immediate vicinity. Refer to Annexure A for contact information.
1.2	Selected poles shall have LV mains attached for continuous operation of antennae.
1.3	Selected poles shall have suitable clearance as per defined equipping zones in clause 4 shall be used.
1.4	Telecommunications equipment must not be installed within safe working distances, zones as detailed in the current version of the Ausgrid Electrical Safety Rules. Equipment must not impede or impact routine electrical and street lighting maintenance activities.
1.5	Telecommunications equipment shall not be installed above bare “live” LV conductors. Equipment may be installed above “bundled ABC” insulated LV conductors.
1.6	Mechanical load of an antenna attachment shall not exceed the strength of the pole. A structural assessment shall be undertaken, refer to Annexure B.
1.7	The following poles shall not be selected: • Poles which are condemned (i.e. a visible “X” marked on pole); • Poles which are reinforced (i.e. supported by steel galvanised nails or splints at base); • Visibly are unsuitable (i.e. timber fungal decay, termite infestation or metal corrosion);
1.8	Equipment on pole shall not encroach the minimum clearance to the transport lane or roadway of 500mm.
1.9	LV Poles shall not be selected if they have the following equipment: • under-slung links (USL), IDT links, LV ABC link boxes attached; • LV distributor UGOH cables attached.
1.10	11kV Poles shall not be selected if they have the following equipment: • UGOH cable attached; • air break switches (ABS) attached; • transformers attached; • Are considered to be ‘busy’ i.e. substantial existing infrastructure or require extensive make ready works. • installations in between LV & HV conductors where LV conductors are bare
1.11	Small Cell and Macro Cell on (Legacy) WiMAX Rocla Poles
1.11.1	Three equipment zones shall be available to carriers i.e., Slot 1, 2 and 3, Slot 1 being located at the very top of pole.
1.11.2	Existing “entry” or “exit” holes shall be utilised and no additional holes shall be drilled into pole.
1.11.3	All cabling shall be installed “internally” to the pole.
1.11.4	Antenna brackets and UGOH cable covers shall be installed via bandit straps.
1.11.5	No external cable trays or support strutting shall be permitted.
1.11.6	The removal of the existing Ausgrid antennas shall be the responsibility of the carrier.
1.11.7	The disconnection and coiling of the existing Ausgrid fibre cable shall be the responsibility of the carrier.

1.12 Macro Cell Pole Installations on timber poles.

- 1.12.1 Selected poles shall be approved by Ausgrid and satisfy Ausgrid's pole structural assessment criteria.
- 1.12.2 Installation must not impede the operation and/or maintenance of the Ausgrid electrical network both via EWP access and manual ladder methods (from non-roadside).
- 1.12.3 Installation must not impede the inspection of the pole as per requirements given in NS145.
- 1.12.4 External cables trays shall not be permitted. External cabling must be bundled together via the use of appropriate galvanised saddles and fixed via screws.
- 1.12.5 Excess loops of cables shall not be permitted.
- 1.12.6 The following poles shall not be used for Macro antenna installations:
 - Steel streetlight poles;
 - Transmission poles (33kV to 132kV);
 - Transformer poles;
 - Line deviation poles (more than 10°); or
 - Stay poles.

2 Equipment mounting on timber poles.

- 2.1 Equipment shall be mounted via through bolts and appropriate coach screws.
- 2.2 Cable management shall be installed directly up the pole. Cable must not snake around the pole.

3 Earthing**3.1 Small cells sites**

- 3.1.1 Small cell site earthing shall be carried out as follows:
 - an electrode installed adjacent to the pole; or
 - an electrode installed in a designated earth pit >1m from the face of the pole.

3.2 Macro cell site

- 3.2.1 Earthing shall be installed adjacent to the ground cabinet (ODU's).

4 Equipping zone

The equipment shall be installed in the Ausgrid defined equipping Antenna Zone as follows:

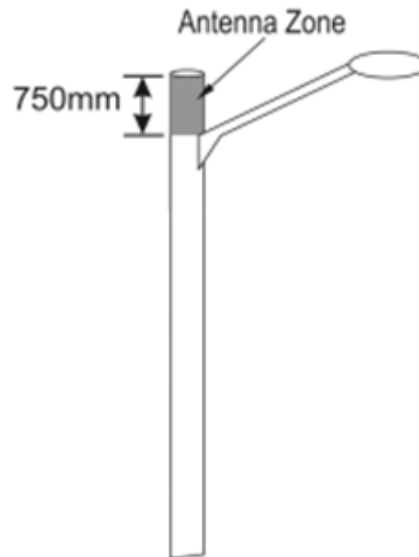


Figure 1: Lighting column Antenna Zone

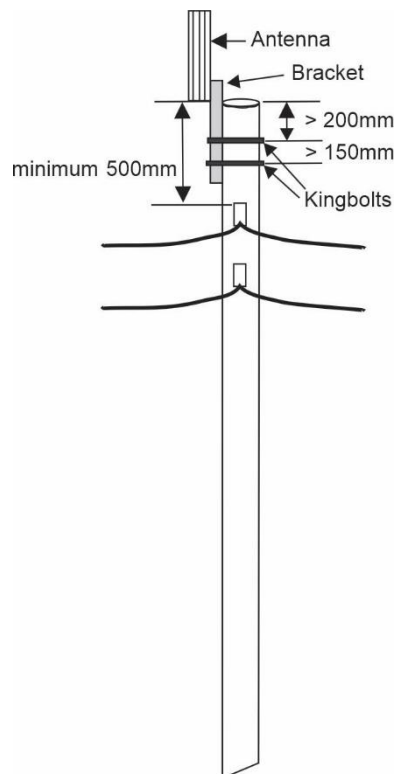


Figure 2: LV ABC pole Antenna Zone 1

Note: A separation of 150mm or more shall be maintained between king bolt holes (whether it is for antenna bracket installation or between antenna bracket and LV ABC).

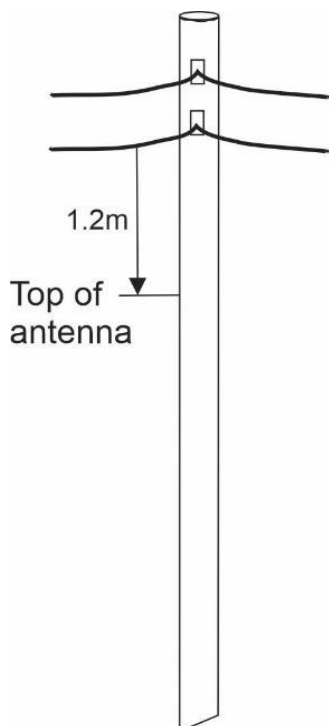


Figure 3: LV ABC pole Antenna Zone 2

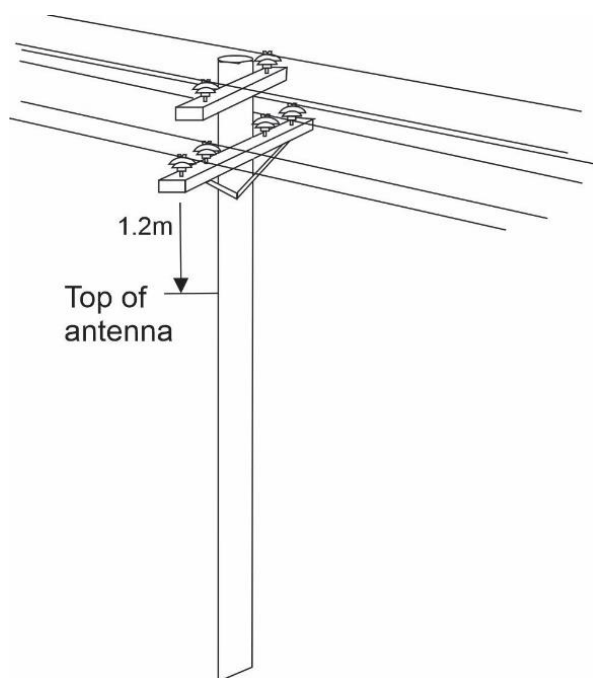


Figure 4: LV bare mains Antenna Zone 2

5 Radio Frequency Plume

- 5.1 Radio Frequency EME levels shall be below the level set by ARPANSA's Radiation Protection Standard for limiting exposure to radiofrequency Fields – 100 kHz 300 GHz. A plume diagram shall be provided identifying the RF exclusion zone where the EME levels may exceed the ARPANSA standard reference levels.

6 Warning Signs

- 6.1 Warning signs shall be installed on the pole as per Ausgrid's requirements.



Figure 5: Warning Sign Examples

7 Definitions

Table 1: Definitions

Antenna type	Description
Microcell	is a cell in a mobile phone network served by a low powered base station, covers a limited area.
Small cell	are low-powered cellular radio access nodes that operate in spectrum that have a range of 10MHz to 3GHz.
Macro cell	Cellular base station that sends and receives radio signals via large antennas.
Repeater	Radio communications devices that transmit a mobile signal, they improve the reliability of a mobile network.
Microwave dish/antenna	transmission device used to broadcast microwave transmissions between two locations.

Annexure A: Approval process

Contact Ausgrid Facilities Access team (FacilitiesAccess@ausgrid.com.au).

A1 Approved antennas

Only approved antenna can be installed on Ausgrid poles.

Table 2: Approved antennas

Antenna Type	No. Units	Approval Criteria/Examples
Telecommunications microcell antenna	2	Omni (whip), Pad Appropriate radiation warning and power down instruction labels to be installed
Telecommunications macrocell antenna/parabolic dish	2	In accordance with ARPANSA Radiation Protection Standard 2002 Appropriate radiation warning signs to and carrier contact details to be installed
Telecommunications small cell antenna	3	In accordance with ARPANSA Radiation Protection Standard 2002 Appropriate radiation warning signs to and carrier contact details to be installed

Annexure B: Structural Analysis

B1 Structural assessment shall be carried out for design life of 50 years in accordance with AS/NZS 7000.

B2 Timber poles (with or without conductors)

The assessment of telecommunication equipment on timber poles is a two (2) tiered process.

B2.1 Tier 1

The customer or carrier shall provide certified calculations (produced by a structural engineer) for the additional equivalent pole loading for the proposed installation due to a site-specific wind load with a 50 year return period in accordance with AS/NZS 7000 and AS/NZS 1170.2.

The additional load shall take into account only the proposed installation and any other non-electrical items such as cable TV attachments, signs or flags etc. The wind load on all of these items shall be 'summed' to give an additional base moment and then presented as an equivalent additional pole loading as shown in the following table.

Table 3: Equivalent additional pole loading table

Item	Average height	Drag force	Moment from base
Conductors	Excluded		
Pole			
Sign 1			
Sign 2			
Antenna 1			
Antenna 2			
Other			
Total Moment (ex-conductors)			
Equivalent Tip Load = $\left[\frac{\text{Total Moment}}{\text{Pole Height}} \right]$			

Notes:

- Add additional rows, equipment if applicable
- Ausgrid will then take this information and review it using knowledge of standard loading situations to determine if the loading on the pole is acceptable.

B2.2 Tier 2

If the initial assessment determines that the additional loading is not appropriate, then there are two options for the customer or carrier.

Option 1 - Find an alternate location for the proposed telecommunications equipment.

Option 2 - Undertake a detailed assessment which will involve gathering information (i.e. geotechnical, conductor type and stringing tensions) and accurately modelling the pole with the proposed equipment to determine realistic values for load capacity and loading and thereby, determine if the proposed installation is acceptable.

This option may not be available where the sinking depth for a given pole is unknown (i.e. no manufacturer pole disc on a pole).

A higher return period will be required if voltages greater than 11 kV are present on the pole.

B3 Steel streetlight standards

This assessment is only appropriate for standards having the configuration shown on Ausgrid Drawings 66272 and 66273. Streetlight standards which do not have this configuration are out of scope.

A structural assessment (for standards with the configuration shown on Drawings 66272 and 66273) shall then be made using the following steps.

B3.1 Step 1 - Load capacity

It is to be assumed that Ausgrid streetlight standards with the configuration shown on Drawings 66272 and 66273, as installed, have a capacity that is adequate for a design wind speed of $V_{des,\Theta} = 44\text{m/s}$ (refer Clause 2.4.1 of AS1170.2).

Loading and drag areas on the streetlight standard are to be calculated using Drawings 66272, 66273 and 118244 and shall be used with the design wind speed to determine the load capacity of the standard.

B3.2 Step 2 - Site Specific Loading

The loading on the standard shall be assessed with the proposed additional equipment and any other items that are installed. The total load shall be determined using the site specific direction, terrain and topographic factors.

B3.3 Step 3 - Statement of Compliance

The customer's or carrier's structural engineer shall provide certified calculations clearly stating that the loading determined in Step 2 does not exceed the capacity as determined in Step 1. If this is not the case, the streetlight standard shall be deemed "unsuitable" for the proposed installation.

All telecommunications equipment and associated cabling will be installed "external" on steel streetlight standards. Any variances to this must be approved by Ausgrid.



Figure 6: Small Cell antenna installation on steel streetlight standard. Cable installation is external to the pole

Annexure C: Typical antenna and earthing installations



Earthing adjacent to the pole



Small cell antenna



Macrocell site



Small cell (Omni) antenna

Figure 7