Network Standard

Document No.
NS201

Title:
All dielectric self-supporting fibre optic cabling for installation on poles

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Revision

No	Date	Description	Technical Approver	Authorised By
0	15/02/2008	Initial issue	Kristen Maslen	Manager – Standards & Communications
1	10/11/2022	Included requirements for laser hazard warning labelling, splice cannisters, standard construction drawings and ADSS stock codes. New NS template	Alf Freestone	Dean Starkey
2	19/09/2025	Table 1 minimum clearance of ADSS conductor to LV bare conductor was changed to 500mm to be in line with NS232.	Alf Freestone	Jacob Bayley

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Scope

This document specifies the minimum requirements for constructing All Dielectric Self Supporting (ADSS) fibre optic aerial telecommunications cabling systems, attached to poles.

Reference Documents

The design and construction of ADSS cable networks on Ausgrid's poles shall be in accordance with the references listed below.

Ausgrid Documents

Electrical Safety Rules

Electricity Network Safety Management System Manual

NS001 Glossary of Terms

NS100 Field Recording of Network Assets

NS145 Pole Inspection and Treatment

NS148 Overhead Line Support, Street Light Column, Pit and Pillar Numbering

NS179 Vegetation Management

NS181 Approval of Materials and Equipment and Network Standard Variations

NS220 Overhead Design Manual

NS235 Telecommunications – Underground to Overhead Transition

Other Standards and Documents

AS1319 Safety signs for the occupational environment

AS/NZS 7000:2016 – Overhead Line Design – Detailed Procedures

HB 331–2012 – Overhead line design

ENA Doc 001-2019 National Electricity Network Safety Code

IEEE 1222-2011 testing and performance for ADSS fibre optic cable for use on electric utility power lines

ISSC3 - Guideline for the Management of Vegetation in the Vicinity of Electricity Assets

TfNSW Guide to Traffic Control at Worksites.

Service and Installation Rules of New South Wales

Acts and Regulations

Electricity Supply (General) Regulation 2014 (NSW)

Electricity Supply (Safety and Network Management) Regulation 2014 (NSW)

Work Health and Safety Act 2011 (NSW)

Work Health and Safety Regulation 2017 (NSW)

Clause	Standard Requirements

1 Planning, Design and Installation

1.1 Ausgrid ADSS cable shall have the same minimum clearances from ground and structures as required for LV insulated conductors stated in section 10 of NS220 Overhead Design Manual.

1.2 The ADSS cables to be utilised shall be selected from those listed in Ausgrid's Approved Material List, (listed also in Annexure B).

1.3 Geographic and Environmental

1.3.1 Aerial ADSS lead-ins to building attachment points shall not span above locations where flammable or combustible equipment, materials or fluids are located.

1.3.2 Ausgrid ADSS installations and alterations shall comply with NS179 Vegetation Management with the same parameters as defined for LV insulated cables.

1.4 Access and Easements

ADSS cables shall not be installed in area's with access restrictions where reasonably practicable.

1.5 Landing Structures

ADSS cable shall not be attached to HV switchyard landing structures in substations. ADSS cable shall be spliced and / or transitioned to underground installation (UGOH) at the pole immediately outside of the substation.

1.6 New Pole Construction

1.6.1 ADSS cable shall be attached to existing poles with other electrical assets except where it is not practicable.

1.6.2 Where new poles are required exclusively for ADSS cables they shall meet the requirements of NS148 Overhead Line Support, Street Light Column, Pit and Pillar Numbering and NS 220 Overhead Design Manual.

1.7 Shared Use Poles

Coordination shall occur at the design stage for instances where third party assets on shared use poles, would conflict with the standard construction of the new ADSS cable infrastructure. Ausgrid is responsible for liaising with the third party in these cases, in accordance with contractual agreements between Ausgrid and the third party.

1.8 Defective and Condemned Poles

1.8.1 New ADSS cables shall not be attached to poles marked as defective or condemned. Refer to NS145 Pole Inspection and Treatment Procedures for inspection, marking and treatment of Ausgrid defective and condemned poles.

1.8.2 Reinforced poles shall only be used if a full structural assessment of the pole and reinforcement demonstrates that the change in load is within the rating of the reinforcement under all loading conditions.

1.9 Pole Attachment Locations

ADSS shall not be attached to poles with a voltage greater than 33kV.

1.9.1 Minimum Clearance

The minimum clearance ADSS shall be from conductors is stated in Table 1.

Table 1 Minimum ADSS conductor clearance

Voltage / Category	At pole (min clearance)	Midspan (min clearance)
33kV	1000mm	600mm
11kV	700mm	400mm
LV ABC	500mm	100mm
LV bare	500mm	100mm
Existing ADSS / Third Party Assets	300mm	100mm

1.9.2 ADSS shall be located on the same side of the pole as existing Ausgrid ADSS cables or other third-party assets.

1.9.3 Where LV ABC is attached to the pole, the ADSS shall be installed on the same side of the pole as the LV ABC (where there is no other communications cable attached to the pole) The ADSS shall be installed below the LV ABC, except where greater ADSS ground clearances are required, e.g. road crossings.

1.9.4 ADSS installation shall be on the property side of the pole if no other communications and LV ABC cables are attached to the pole, and if line deviation angles permit.

1.9.5 The ADSS shall be sagged to ensure minimum mid-span vertical clearance is maintained at maximum conductor operating temperature in accordance with Table 1.

1.9.6 When attaching to HV poles, allowance shall be made for the future installation of LV mains wherever this is reasonably likely.

1.9.7 ADSS cable shall be installed consistently on the same one side of the poles such that it does not zig-zag from one side of one pole to the other side of the next pole, so long as line deviation angles permit.

1.9.8 At pole substations ADSS shall be attached to a communications cross arm below the transformer as shown on Ausgrid standard construction drawings 228821 and 228831.

1.9.9 Parallel pole lines within the same easement, shall have the ADSS cable attached on the side of the pole closest to the other pole line, to make it easier for asset relocation to the other pole line if necessary.

1.10 Cable Coils

1.10.1 To facilitate repairs, relocations and future break-outs, a minimum 40m folded ‘figure 8’ ADSS cable coil must be installed at every 500 metres in urban areas and every 1000 metres in rural areas averaged over the end-to-end aerial section (or link, for where the aerial component is continuous from site to site). Splice enclosures are inclusive of the average.

1.10.2 If two separate fibre links are to have cable coils on the one pole, then each cable shall be separately ‘figure 8’ coiled and bound with stainless steel ties. If the coil bracket is sufficiently strong and large enough to house both coils, then both coils may be supported by the one pole mounted bracket.

1.10.3 For new ADSS cable installation works, a coil shall be left when passing near Ausgrid depots, offices and major substation sites, strategic locations as identified by Ausgrid, and in areas planned for future road widening.

1.10.4 ADSS cable coils shall be located at,

- Each cable termination pole, except where there are consecutive terminations, in which case a coil shall be located on one only;

- On at least one side of all major infrastructure crossings, eg highway, rail, HV transmission line;
- Strategic locations as advised by Engineering; and
- Where an ADSS splice is located.

1.10.5 As per standard construction drawings 234576, 234577, 234587 and 234588, coil installations shall have a double cable termination fitting.

1.10.6 The bottom of the ADSS cable coil shall be a minimum of 4m from the finished ground surface. and,

1.10.7 The maximum height of the top of the ADSS cable coil shall be 7m from the finished ground surface.

1.10.8 The height at which coils are placed must also comply with the clearances stated in NS220 for live line work such that splices and coils are able to be removed from pole structures without necessitating an electrical outage.

1.10.9 Coil brackets for Ausgrid telecommunications cable storage shall not cause the cable to bend beyond the manufacturer's minimum no-load bend radius and shall be structurally suitable for the coil weight and dimension to be applied.

1.10.10 The coil bracket shall be mounted below a splice enclosure as per standard construction drawings 234578 or 234589, with approximately 90 degrees rotation around the pole between the two fixtures.

1.10.11 Cable coils must be secured to the bracket with stainless steel cable ties and the bottom of the coil must be secured to avoid swinging in the wind. In road reserves, coils must be attached to the property side of the pole where pole space permits.

1.10.12 The design shall clearly show proposed coil storage points, and that the cable is not to be cut at these locations. Refer to section 1.11 below regarding cutting the cable at splice points.

1.10.13 If the cable is to be cut and coiled for future use, any exposed cable ends shall be sealed with a suitable heat shrink cap.

1.11 Splices

1.11.1 Pole mounted splices shall be attached within the same height range as that of coils detailed in section 1.10.

1.11.2 Each ADSS cable tail leading to a splice enclosure shall have sufficient cable length coiled in 'figure 8' style and attached to the bracket on the pole to allow the splice cannister to reach the ground plus a minimum of 10 metres, or 20 metres, whichever is greater. A splice with two fibre optic cables entering the enclosure would therefore have no less than 40m cable length in a 'figure 8' coil attached to the bracket on the pole, i.e. 2 x 20m tails minimum. All cables entering the splice shall be taped together and then 'figure 8' coiled on the pole together.

1.11.3 Upon splicing, if a telecommunications cable has not been weatherproofed with a suitable heat shrink end cap, then a 1m length of the cable shall be cut away and discarded before the cable is spliced.

1.11.4 Splice placement shall not dictate the electrical design of the pole and associated line(s).

1.11.5 Pole-mounted telecommunications splice enclosures shall be located on the side of the pole away from oncoming traffic, however, if other assets prevent this location, then the splice may be positioned on the property side of pole. Splices shall be located where a service vehicle can be parked next to or near the pole.

1.11.6 The design must clearly specify splice locations and the cable length to coil on the pole.

1.12 Vibration Dampers

1.12.1 Aeolian vibration dampers shall be installed in accordance with manufacturers' recommendations.

1.12.2 The number and location of vibration dampers applied per span shall be in accordance with the cable manufacturer's recommendations.

1.13 Cable Down-Leads

1.13.1 Cable down-leads associated with UGOHs, cable coils and splice enclosures shall be secured to the pole with down-lead cushion clamps as per standard construction drawing 212386.

1.13.2 A minimum of two down-lead cushions shall be used on each cable requiring a down-lead. The distance between down-lead cushions shall be no greater than 900mm.

1.14 UGOHs

1.14.1 ADSS UGOHs shall be in accordance with NS235 Telecommunications UGOH Transition, and standard construction drawing 212386.

1.14.2 At ADSS UGOH transitions, splices and cable coils shall be located in the locked pit at the base of the pole.

1.15 Building Attachment

1.15.1 ADSS may be attached to Ausgrid buildings for lead-ins.

1.15.2 Clearance to fences, signs, rising sewer vents, aerials, trees and other mid-span structures shall be sufficient such that the ADSS cannot be used as a means of climbing over fences, or into the building.

1.15.3 Building attachment brackets shall be metal in composition and selected to withstand the load from the ADSS span in all conditions reasonably expected in the area.

1.15.4 The ADSS cable shall be terminated on the first pole before the building with an accompanying cable coil, and then slack spanned onto the building attachment.

1.15.5 The bracket/s shall be located and installed in accordance with building structural assessment.

1.15.6 Bracket attachment shall not cause degradation or allow moisture leakage through the wall or reduce the wall's structural strength.

1.15.7 When planning and designing for lead-in span height, brackets shall be selected that either allow for direct span to the building wall or have a riser bracket to raise the ADSS lead-in span height.

1.15.8 Ausgrid ADSS cable must not be attached to buildings and structures that are not owned by Ausgrid, unless it is for the purpose of an optical connection and performed in accordance with a commercial agreement between Ausgrid and the third party.

1.16 Abrasion Protection

1.16.1 Ausgrid ADSS cables must not touch, clash or abrade mid span against cables or structures including, but not limited to spreader bars, stay wires, stay poles and wires, signs, traffic lights, flag poles, awnings, buildings or fences through the range of wind and environmental conditions reasonably expected in the area.

1.16.2 Abrasion protection is required at the pole for ADSS at dead end points as per applicable standard construction drawings, i.e. 234574, 234575, 234576, 234585, 234586 and 234588.

1.17 Cross Arms

1.17.1 Where cross arms are required to maintain the necessary clearance between ADSS cable and other structures including, but not limited to pole substations, cross arm designs for pole substations shall be in accordance with standard construction drawings 228823 and 228833.

1.18 Railway Crossings

1.18.1 Ausgrid ADSS cables shall not be spliced or coiled on poles or in pits located within rail property due to access restrictions.

1.18.2 Relevant approvals from the Rail authority and Ausgrid shall be obtained for Railway crossings prior to construction.

1.19 Labelling

1.19.1 Each group of ADSS cables coiled together on the one pole mounted bracket shall have a UV stabilised laser hazard warning sign compliant with AS1319 attached to the base of the coil at a location which is clearly visible, and of a size that is easily readable from ground, to warn workers and the general public of the hazard associated with the cable.

1.19.2 Warning signs must not obstruct equipment installation, maintenance, alteration or removal, nor shall they impede EWP movement or pole access.

1.19.3 All Ausgrid ADSS cables shall be identified and labelled with the assigned fibre designation number at entry to all splice enclosures. The label shall be UV stabilised PVC, attached to the cable near the splice port, and the label shall have clearly written on it the fibre cable designation and splice enclosure name that has been assigned to it by Ausgrid.

Annexure A: Standard Construction Drawings

A1 ADSS fibre optic cable retrofit on concrete poles

Table 2 ADSS on concrete poles

Drawing number	Description
234579	ADSS suspension construction 30 deg max line deviation with span lengths up to 150m
234580	ADSS suspension construction 30 deg max line deviation with span lengths between 150m & 350m
234581	ADSS suspension construction 30 deg max line deviation with span lengths between 350m & 600m
234582	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths up to 150m
234583	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths between 150m & 350m
234584	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths between 350m & 650m
234585	ADSS through termination construction span lengths up to 150m
234586	ADSS through termination construction span lengths between 150m & 600m
234587	ADSS through termination construction with cable storage span lengths up to 150m
234588	ADSS through termination construction with cable storage span lengths between 150m & 600m
234589	ADSS through termination construction with cable storage & splice enclosure span lengths up to 150m
234590	ADSS through termination construction with cable storage & splice enclosure span lengths between 150m & 600m

A2 ADSS fibre optic construction on timber poles

Table 3 ADSS on timber poles

Drawing number	Description
234569	ADSS suspension construction 30 deg max line deviation with span lengths up to 150m
234570	ADSS suspension construction 30 deg max line deviation with span lengths between 150m & 350m
234571	ADSS suspension construction 30 deg max line deviation with span lengths between 350m & 600m
234572	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths between 150m & 350m
234573	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths between 350m & 650m
234574	ADSS through termination construction span lengths up to 150m
234575	ADSS through termination construction span lengths between 150m & 600m
234576	ADSS through termination construction with cable storage span lengths between 150m & 600m
234577	ADSS through termination construction with cable storage span lengths up to 150m
234578	ADSS through termination construction with cable storage & splice enclosure span lengths up to 150m
235546	ADSS through termination construction with cable storage & splice enclosure span lengths between 150m & 600m
235705	ADSS suspension construction 30 to 60 deg line deviation angle with span lengths up to 150m

A3 Communications UGOHs

Table 4 ADSS Communications UGOHs

Drawing number	Description
212386	Standard Construction – Telecommunications External Plant

Annexure B: ADSS Cables and Accessories

B1 Approved cables

Table 5 Stock Codes and description of ADSS cables

Material	Material Description	Comments
185253	72 SM ADSS - 150m span, Standard	
185254	72 SM ADSS - 150m span, Option 1	ADSS Option 1 – Rodent Resistant
185256	72 SM ADSS - 150m span, Option 2	ADSS Option 2 - Anti-tracking
185257	72 SM ADSS - 400m span, Standard	
185268	72 SM ADSS - 400m span, Option 1	ADSS Option 1 – Rodent Resistant
185269	72 SM ADSS - 400m span, Option 2	ADSS Option 2 - Anti-tracking
185270	144 SM ADSS - 150m span, Standard	
185271	144 SM ADSS - 150m span, Option 1	ADSS Option 1 – Rodent Resistant
185272	144 SM ADSS - 150m span, Option 2	ADSS Option 2 - Anti-tracking
185273	144 SM ADSS - 400m span, Standard	
185274	144 SM ADSS - 400m span, Option 1	ADSS Option 1 – Rodent Resistant
185275	144 SM ADSS - 400m span, Option 2	ADSS Option 2 - Anti-tracking

B2 Splice enclosures and accessories

Table 6 ADSS splice enclosure and accessories

Item	Description	Application	Manufacturer	Part Number
1	Splice Enclosure - 7 Port Entry - FIBERGUARD 800 10 X 48 FIBRE TRAYS	ADSS / UGFO	PLP	FG650-348-P
2	Grommet - DROP PORT KIT 1 HOLE GROM 3 SIZES	ADSS / UGFO	PLP	FG-DNA