

Network Standard

NETWORK

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NW000-S0033

**NS124 SPECIFICATION FOR OVERHEAD SERVICE CONNECTIONS
UP TO 400 AMPS**



ISSUE

For issue to all Ausgrid and Accredited Service Providers' staff involved with the overhead service connections and is for reference by field, technical and engineering staff.

Ausgrid maintains a copy of this and other Network Standards together with updates and amendments on www.ausgrid.com.au.

Where this standard is issued as a controlled document replacing an earlier edition, remove and destroy the superseded document

DISCLAIMER

As Ausgrid's standards are subject to ongoing review, the information contained in this document may be amended by Ausgrid at any time. It is possible that conflict may exist between standard documents. In this event, the most recent standard shall prevail.

This document has been developed using information available from field and other sources and is suitable for most situations encountered in Ausgrid. Particular conditions, projects or localities may require special or different practices. It is the responsibility of the local manager, supervisor, assured quality contractor and the individuals involved to make sure that a safe system of work is employed and that statutory requirements are met.

Ausgrid disclaims any and all liability to any person or persons for any procedure, process or any other thing done or not done, as a result of this Standard.

All design work, and the associated supply of materials and equipment, must be undertaken in accordance with and consideration of relevant legislative and regulatory requirements, latest revision of Ausgrid's Network Standards and specifications and Australian Standards. Designs submitted shall be declared as fit for purpose. Where the designer wishes to include a variation to a network standard or an alternative material or equipment to that currently approved the designer must obtain authorisation from the Network Standard owner before incorporating a variation to a Network Standard in a design.

External designers including those authorised as Accredited Service Providers will seek approval through the approved process as outlined in NS181 Approval of Materials and Equipment and Network Standard Variations. Seeking approval will ensure Network Standards are appropriately updated and that a consistent interpretation of the legislative framework is employed.

Notes: 1. Compliance with this Network Standard does not automatically satisfy the requirements of a Designer Safety Report. The designer must comply with the provisions of the Workplace Health and Safety Regulation 2011 (NSW - Part 6.2 Duties of designer of structure and person who commissions construction work) which requires the designer to provide a written safety report to the person who commissioned the design. This report must be provided to Ausgrid in all instances, including where the design was commissioned by or on behalf of a person who proposes to connect premises to Ausgrid's network, and will form part of the Designer Safety Report which must also be presented to Ausgrid. Further information is provided in Network Standard (NS) 212 Integrated Support Requirements for Ausgrid Network Assets.

2. Where the procedural requirements of this document conflict with contestable project procedures, the contestable project procedures shall take precedent for the whole project or part thereof which is classified as contestable. Any external contact with Ausgrid for contestable works projects is to be made via the Ausgrid officer responsible for facilitating the contestable project. The Contestable Ausgrid officer will liaise with Ausgrid internal departments and specialists as necessary to fulfil the requirements of this standard. All other technical aspects of this document which are not procedural in nature shall apply to contestable works projects.

INTERPRETATION

In the event that any user of this Standard considers that any of its provisions is uncertain, ambiguous or otherwise in need of interpretation, the user should request Ausgrid to clarify the provision. Ausgrid's interpretation shall then apply as though it was included in the Standard, and is final and binding. No correspondence will be entered into with any person disputing the meaning of the provision published in the Standard or the accuracy of Ausgrid's interpretation.

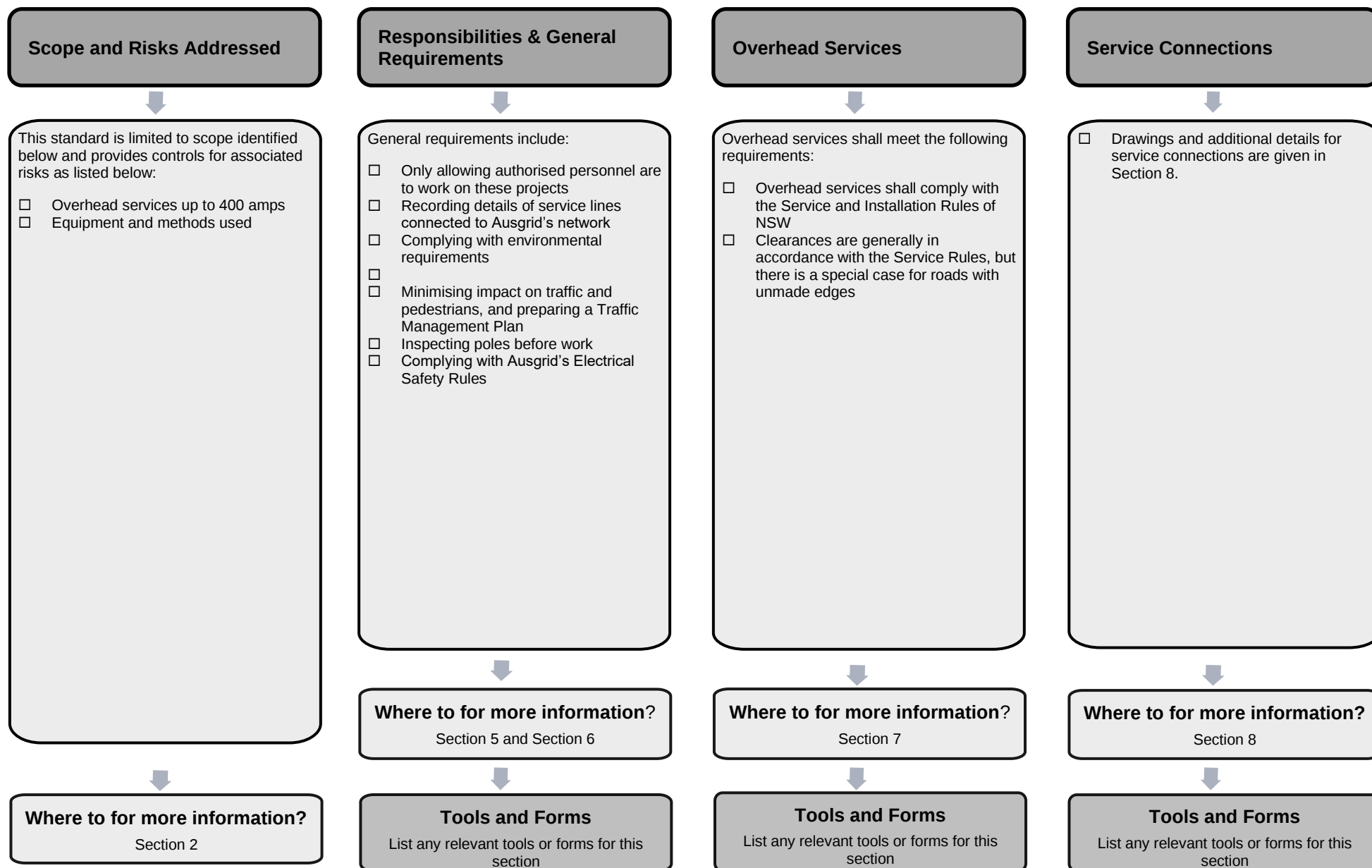
KEYPOINTS

This standard has a summary of content labelled "KEYPOINTS FOR THIS STANDARD". The inclusion or omission of items in this summary does not signify any specific importance or criticality to the items described. It is meant to simply provide the reader with a quick assessment of some of the major issues addressed by the standard. To fully appreciate the content and the requirements of the standard it must be read in its entirety.

AMENDMENTS TO THIS STANDARD

Where there are changes to this standard from the previously approved version, any previous shading is removed and the newly affected paragraphs are shaded with a grey background. Where the document changes exceed 25% of the document content, any grey background in the document is to be removed and the following words should be shown below the title block on the right hand side of the page in bold and italic, for example, Supersedes – document details (for example, "Supersedes Document Type (Category) Document No. Amendment No.").

KEY POINTS OF THIS STANDARD



Network Standard NS124 Specification for Overhead Service Connections up to 400 Amps

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1.0 PURPOSE

The requirements for Overhead Service Connections has been established to meet the needs of Ausgrid, Accredited Service Providers, Developers, Customers, Local Councils and other service utilities. The requirements specified in this Network Standard are supplementary to the Service and Installation Rules of NSW (hereinafter the 'Service Rules'), which is the industry standard for service connections.

A copy of the Service Rules is available from electrical wholesalers or the NSW Department of Trade and Investment website.

2.0 SCOPE

This Network Standard describes the requirements for connecting overhead services up to 400 amps to Ausgrid's overhead electricity distribution network, including equipment and methods to be used.

This Network Standard should be read in conjunction with the Service Rules and Ausgrid's publication ES1 Premises Connection Requirements for Level 2 Service work as defined in ES4.

The requirements of this standard must always be adhered to. Any departures from this standard or the Service Rules must be submitted to Ausgrid for approval prior to their implementation.

Work on Ausgrid's supply system can only be performed by authorised personnel, as detailed in Ausgrid's publication ES4 Service Provider Authorisation.

3.0 REFERENCES

3.1 General

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.

3.2 Ausgrid documents

- Bushfire Risk Management Plan
- Company Procedure (Governance) - Production / Review of Network Standards
- Company Procedure (Governance) - Network Document Endorsement and Approval
- Company Form (Governance) - Network Document Endorsement and Approval
- Connection Policy – Connection Charges
- Customer Installation Plan
- Electrical Safety Rules
- Electricity Network Safety Management System Manual
- ES1 Premises Connection Requirements
- ES4 Service Provider Authorisation
- NEG-OH21 Vegetation Safety Clearances
- NS100 Field Recording of Network Assets
- NS102 Working on Poles with Mobile Phone Transmitter Installations
- NS125 Specification for Low Voltage Overhead Conductors
- NS127 Specification for Low Voltage Cable Joints and Terminations
- NS146 Safety Inspection Procedure for Working on Poles
- NS174 Environmental Procedures
- NS181 Approval of Materials and Equipment and Network Standard Variations

- NS199 Safe Electrical Working on Low Voltage Assets
- NS212 Integrated Support Requirements for Ausgrid Network Assets
- NS220 Overhead Design Manual
- Policy for ASP/1 Premises Connections
- Public Electrical Safety Awareness Plan
- Tree Safety Management Plan

3.3 Other standards and documents

- AS1742 – Manual of Uniform Traffic Control Devices
- AS/NZS 3000:2007 Wiring Rules
- AS/NZS 3560 Electric cables – cross linked polyethylene insulated - aerial bundled - for working voltages up to and including 0.6/1kV
- ENA Doc 001-2008 National Electricity Network Safety Code
- ISSC3 - Guideline for Managing Vegetation Near Power Lines
- ISSC 14 – Guide to Electrical Workers' Safety Equipment
- WC01394 – Working near Overhead Power Lines – WorkCover Code of Practice

3.4 Acts and Regulations

- All pertinent Environmental Regulations and Acts.
- Electrical (Consumer Safety) Regulation 2006
- Electricity Safety Act 1945
- Electricity Supply (General) Regulation 2014 (NSW)
- Electricity Supply (Safety and Network Management) Regulation 2014
- Work Health and Safety Act 2011 and Regulation 2011

4.0 DEFINITIONS

Accredited Service Provider (ASP)	An individual or entity accredited by the NSW Department of Planning and Environment, Energy, Water and Portfolio Strategy Division, in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 (NSW).
Business Management System (BMS)	An Ausgrid internal integrated policy and procedure framework that contains the approved version of documents.
Authorised Personnel	Persons employed by an ASP who have been personally granted permission in writing by Ausgrid after demonstrating to the authorising officer that they have the necessary safety training, qualifications and competence to perform Authorised Work.
Authorised Work	Specified works on or near Ausgrid's network.
Client	A Client is an individual or an entity who has applied for a new or altered connection to the network and who enters into an agreement or contractual arrangement with an ASP, who may be internal or external to Ausgrid, for designing and constructing the contestable work. A Client could be a developer, an accredited service provider or a customer. Accredited parties include designers and service providers.
Contestable Work	Works (including design) funded by the Client required to enable a new or altered connection where the Client may choose the Accredited Service Provider to carry out the works.
Customer	A Customer is an individual or an entity that is an end-user of electricity.

Document control	Ausgrid employees who work with printed copies of document must check the BMS regularly to monitor version control. Documents are considered “UNCONTROLLED IF PRINTED”, as indicated in the footer.
Electricity Distributor	Electricity Distributor means an electricity distributor constituted as a body corporate under the Electricity Safety Act 1945 (as amended). It is the party setting conditions under which assets shall be constructed, and will eventually take over ownership, control, and maintenance responsibility for these assets.
Network Standard	A document, including Network Planning Standards, that describes the Company's minimum requirements for planning, design, construction, maintenance, technical specification, environmental, property and metering activities on the distribution and transmission network. These documents are stored in the Network Category of the BMS repository.
Overhead Service Mains	The dedicated overhead mains extending from the overhead low voltage distribution network (connection point) to the customer's point of supply.
Review date	The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.
Service Rules	The Service and Installation Rules of NSW.

5.0 RESPONSIBILITIES

5.1 Clients

It is the responsibility of Clients to ensure that only authorised personnel are engaged on projects involving Ausgrid's distribution network as detailed in Ausgrid's publication ES4 Service Provider Authorisation.

5.2 Accredited Service Providers

Accredited Service Providers (ASPs) are responsible for ensuring the safety of their employees and the public in general whilst carrying out contestable work. It is essential that all contestable work, including authorised work, (as defined in ES4 Service Provider Authorisation.) is performed in a safe manner and in accordance with Ausgrid's:

- Network Management Planning documents
- Electrical Safety Rules
- Network and Supply Standards

as well as the Service Rules, any relevant Acts and Regulations, and NSW WorkCover requirements applicable at the time. The conditions stated as a requirement of accreditation under the NSW Accredited Service Provider Scheme administered by the Office of fair Trading must be adhered to.

Safety codes and guidelines relevant to this document include (but are not limited to) the following:

- ENA Doc 001 - 2008 – National Electricity Network Safety Code
- ISSC 14 – Guide to Electrical Workers' Safety Equipment
- WC01394 – Working near Overhead Power Lines – WorkCover Code of Practice

ASPs must also ensure that their employees' authorisations are current at all times.

5.3 Recording

Detailed records of overhead service lines connected to Ausgrid's network shall be provided to Ausgrid in accordance with the requirements of the Notification of Service Work form and NS100 Field Recording of Network Assets.

6.0 GENERAL

6.1 Environmental requirements

All work must be carried out in accordance with environmental requirements in a manner that will prevent pollution and environmental damage. ASPs shall comply with all applicable laws, ordinances, rules, regulations and contract provisions regarding environmental protection measures. Refer to NS174 Environmental Procedures.

6.2 Traffic management

All contestable service work shall be carried out safely with the least possible obstruction to traffic and pedestrians. A traffic management plan must be prepared for each project in accordance with statutory requirements.

Vehicle and pedestrian access to properties shall be maintained wherever possible.

Useful references to traffic related guides are:

- AS1742 Manual of Uniform Traffic Control Devices
- Roads and Traffic Authority guide 'Traffic Control at Worksites'

6.3 Pole safety inspection

Before working on any pole, personnel must satisfy themselves that it is safe to do so and that there is no danger of the pole collapsing during the course of work. Particular care must be taken where the pole loading is to be significantly altered. Refer to NS146 Safety Inspection Procedure for Working on Poles for full explanation of the pre-climbing procedures.

6.4 Electrical safety rules

All authorised personnel are required to be appropriately trained for the work concerned, and must have a thorough knowledge of the applicable parts of Ausgrid's Electrical Safety Rules.

7.0 OVERHEAD SERVICES

7.1 General

Overhead services shall comply with the requirements of Section 3 of the Service Rules.

7.2 Cable requirements

All new and replacement service cables must comply with AS/NZS 3560 Electric cables – cross linked polyethylene insulated - aerial bundled - for working voltages up to and including 0.6/1kV.

The requirements for overhead service cables are given in Table 1.

Table 1

Number of Phases	Nominal Load	Cable No./Size/Type
1	100 A	1 x 25 mm ² Two Core Stranded Aluminium XLPE Insulated
2	100 A	1 x 25 mm ² Four Core Stranded Aluminium XLPE Insulated
3	100 A	1 x 25 mm ² Four Core Stranded Aluminium XLPE Insulated
	200 A	1 x 95 mm ² Four Core Stranded Aluminium XLPE Insulated
	400 A	2 x 95 mm ² Four Core Stranded Aluminium XLPE Insulated

All new and replacement services must be constructed using new materials only. Use of second hand or used service cable is not permitted. Service cables shall be of uniform construction between the connection point and point of supply and must not contain joints. The joining of one or more short lengths of service cable to form an overhead service is not permitted.

Colour cored multicore overhead service cables are not to be used for new service line installations.

7.3 Suspended services/in-span take-offs

A suspended service or mid-span take-off is only permitted as a last resort and with written authorisation from Ausgrid. Where permitted, these services must be installed in accordance with clause 3.2.4 of the Service Rules and drawings 22A and 22B.

7.4 Clearances

The clearances from overhead services to ground, structures, communications services, and vegetation shall be maintained in accordance with clause 3.5 of the Service Rules.

The requirements of ISSC3 Guideline for Managing Vegetation Near Power Lines and NEG-OH21, Vegetation Safety Clearances must also be satisfied.

7.4.1 Roads with unmade edges

Item 3 of Table 3.4 of the Service Rules refers to the clearance over any part of a carriageway other than the centre. For services that span from the overhead line to a customer across a road, this will often mean the lowest point over the road occurs at the kerb line on the customer's side. This clearance is required on both sides of the road, but is usually only a limitation on one side.

Where the line between a public road and a footway is not clearly defined by a kerb or gutter, and the land is traversable by vehicles, the clearance in Table 2 shall apply.

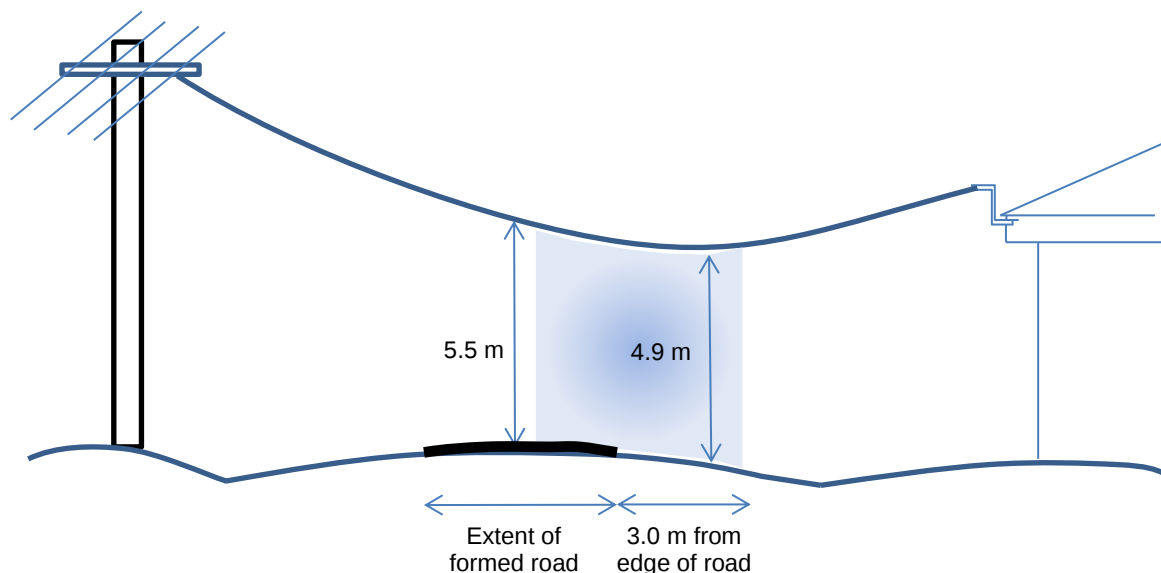
This allows for vehicles to pass or for vehicles to park off the main road surface without impeding other traffic or making contact with overhead services.

Table 2 – Additional clearances not specified in the Service Rules

From the insulated service conductors to the surface of:	Minimum clearance (metres)
Land within 3 metres of the tarred or formed surface of a road where: - there is no kerb or gutter, and - the land is traversable by vehicles, and - there are no obstacles to prevent vehicular access (such as trees, fences, guardrails, ditches or cliffs).	4.9 vertically

Where there are features or obstacles that prevent the access or movement of vehicles, the specified ground clearance is required up to the obstacle, but not beyond it. Similarly, the additional clearance is not required beyond the property boundary.

In all other situations, the normal clearances for insulated service conductors given in the Service Rules shall apply. Bare services shall meet the requirements of NS220.

**Figure 1 - Clearance for overhead services over roads with unmade edges**

7.5 Service connections at pole transformers

Service connections (new or upgraded) at pole transformers (PTs) are only permitted as a last resort. A new private Pole A or mid-span connected service (where LV ABC distribution mains exist) shall be installed, where this would avoid a service connection at a PT.

The Application for Connection form must include whether a service line connection at a PT is being proposed. Ausgrid shall assess these particular applications and the project may only proceed where Ausgrid gives approval (monopoly charges apply; refer to Ausgrid's Connection Policy – Connection Charges document).

Note: The ASP must provide a minimum of ten working days prior notice to Ausgrid's local Customer Service office (Region staff) to provide the assessment / approval of the proposed service.

Where Ausgrid approves a proposed service connection at a PT, the service cables shall be provided by the ASP (refer to Ausgrid's policy for ASP/1 Premises Connections as amended) for other requirements).

For PTs located on a customer's premises, a maximum of one set of consumers mains (either underground or overhead) to the customer and one set of service mains (either underground or overhead) to an adjoining property (as a last resort and in suitable easement as per the Service Rules), is permitted from the PT pole.

7.6 Redundant hardware

Redundant hardware resulting from service work that is carried out on Ausgrid poles must be removed from the pole. This includes shackles, line taps, insulators, service clamps and cabling.

8.0 SERVICE CONNECTIONS

8.1 General

The following section provides detailed schematics or 'Construction Modules' for the service connection methods permitted in Ausgrid's supply area. The required module for a given service type can be accessed through Table 3.

8.2 Connection point

Weather loops are not to be installed at the connection point on the distributors.

8.3 Attachment to distributor pole

Where a barley/coach screw hook is attached to a pole, the direction of pull of the service should not be less than 45 degrees with respect to the hook.

8.4 Aerial bundled cable (ABC) service precautions

Additional precautions must be taken when installing aerial bundled cable (ABC) services to ensure insulation integrity and that adequate electrical connections are made.

(a) Insulation piercing connectors (IPCs) - services up to 100 amps

- The correct size spanner must be used at all times when tightening IPC bolts.
- The bolts must not be tightened too rapidly to ensure that the bolts shear at the correct stress. Tightening of a bolt should take about one minute.
- Each IPC must be inspected after shearing to ensure it sheared cleanly. If faulty shearing is discovered, the IPC must be removed and a replacement installed. A replacement IPC must not be installed at the same location as the original.
- Pull Test. A pull test shall be carried out to ensure that the service wire to IPC connection is sound. On inspecting the correctly sheared connection above, a firm tug on the service wire should be given to confirm a satisfactory connection. Service connections failing the pull test must be reported prior to repair.

(b) Bolted connections – services greater than 100 amps

- For services greater than 100 amps, connections at the point of attachment shall be made using M12 x 35mm stainless steel bolt, nut and washer assemblies and heat shrink insulation kit as per drawings OS-37 and OS-38.

(c) Insulation integrity check

- Care must be taken during installation to not damage the insulation of the cable cores.
- Cables shall be cleaned, degreased and inspected closely for signs of damage. Damaged insulation shall be repaired and sealed against moisture using an approved UV resistant vinyl mastic tape (eg Scotch 2210).
- End cores not terminated within a sealed connector must be sealed with approved heatshrink or cable end cap.

(d) Bargeboard fuse installations

- Bargeboard fuses are customer installation fuses mounted at the connection point (point of supply) adjacent to the fascia or Bargeboard of a house. These fuses are installed between the Ausgrid service line and the customer's consumer mains upstream of the switchboard mounted Service Protective Device (fuses). These requirements also apply to customer installation fuses located on a customer's 'A' pole.
- Where Bargeboard fuses are being installed or replaced with Sicame PFV100 (or equivalent) fuse units, the installation must include Sicame HSC435 (or equivalent) connector with integrated 1m 16mm² XLPE copper cable (refer to Section 7.7) Incoming service mains must not be connected directly to the fuse unit.

8.5 Connection of bare private LV aerial mains

Customers must not install new or replacement bare private aerial mains or reconnect existing disused bare private aerial mains unless specific approval has been given by Ausgrid (refer to clause 3.12.2.1 (c) of AS/NZS 3000:2007 Wiring Rules). In bush fire prone areas (as defined in Ausgrid's Bush Fire Risk Management Plan), bare aerial mains are not permitted. These mains must be XLPE insulated, complying with AS/NZS 3560.

Note: 'Disused' refers to installations that have been disconnected by removal of either the service fuses, metering or service mains bonds, or a period greater than three months.

For electrical safety reasons, Ausgrid strongly recommends that customers consider the installation of XLPE insulated aerial mains (complying with AS/NZS 3560) in lieu of bare aerial mains (where bare aerial mains are otherwise permitted).

8.6 Neutral bonding at service supports

Neutral conductors in service cables are not permitted to be bonded to service supports (metallic or otherwise) in new installations. Where a service cable is being replaced, all conditions of clause 3.1.5.1 of the Service Rules shall apply.

8.7 Bargeboard fuses at customer premises

At premises where bargeboard fuses are to be installed or replaced, Sicame PFV100 series fuse units are currently approved for use. It should be noted that a Sicame HSC435 (or equivalent) connector and 1m cable assembly must be installed in conjunction with the fuse unit to create a Connection Link in accordance pending changes to the Service and Installation Rules (refer to Drawing No. 233215).

At new premises, these fuses are usually installed to avoid the requirement for mechanical protection of 'unprotected consumer mains'. Consideration should be given to whether a bargeboard fuse is required, to avoid possible grading issues by having two in-line fuses. Guidance on whether a fuse is required to protect consumer mains is provided Clause 3.9.7.1.2 of AS/NAZ 3000:2007 and associated frequently asked question 020/2009). In most new installations, a bargeboard fuse will not be required.

The bargeboard fuse unit shall be secured via an approved bracket and connected in accordance with the manufacturer's instructions

8.8 Structural requirements of service supports

Service supports provided at the customer's point of attachment must satisfy the strength requirements prescribed in Section 3.7.6 of the Service Rules. Services that are to be anchored to concrete and brick walls must comply with the requirements of 3.7.6.4 of the Service Rules. All anchor bolts shall be installed in such a manner as to transfer the load to a structurally adequate portion of the building otherwise approval from a structural engineer is required.

8.9 Service connection arrangement drawings

Table 3 - Service connection arrangement drawings

CONNECTION POINT	SERVICE SUPPORT	ARRANGEMENT	DRAWING No.
CUSTOMER'S PREMISES	WALL	100A -1 PHASE	152472
		100A - 2 PHASE	152497
		100A - 3 PHASE	152473
		200A – 3 PHASE	162003
		400A – 3 PHASE	162004
	RAISER BRACKET / STRUT	100A -1 PHASE	152493
		100A - 2 PHASE	152498
		100A - 3 PHASE	152494
		200A – 3 PHASE	162005
		400A – 3 PHASE	162007
	BARGEBOARD BRACKET	100A -1 PHASE	152495
		100A - 2 PHASE	152499
		100A - 3 PHASE	152496
	BARGEBOARD FUSE	100A -1 PHASE	233215
ABC MAINS	POLE	100A -1 PHASE	152474
		100A - 2 PHASE	152500
		100A - 3 PHASE	152475
		200A – 3 PHASE	168793
		400A – 3 PHASE	168792
	ABC	100A -1 PHASE	152476
		100A - 2 PHASE	167458
		100A - 3 PHASE	152477
BARE WIRE MAINS	POLE	100A -1 PHASE	152478
		100A - 2 PHASE	167459
		100A - 3 PHASE	152479
		200A – 3 PHASE	168790
		400A – 3 PHASE	168791
	CROSS ARM	100A -1 PHASE	152480
		100A - 2 PHASE	167460
		100A - 3 PHASE	152481
	IN-SPAN TAKE OFF (100A) Note: Drawings 167461, 152487 and 192104 to be read as a set.	"LIVE END"	167461
		"DEAD END"	152487
Ausgrid LEAD-IN POLE	TIMBER POLE (100A)	1, 2 & 3 PHASE	192104
CUSTOMER POLE	STEEL POLE	4 CORE – 4 CORE	152488
		4 CORE - 2x4 CORE	152489
		100A -1 PHASE	170349
		100A - 2 PHASE	TBD
		100A - 3 PHASE	170350
	TIMBER POLE	200A – 3 PHASE	162009
		400A – 3 PHASE	164378
		100A -1 PHASE	162001
		100A - 2 PHASE	TBD
		100A - 3 PHASE	162002

8.10 Service connection drawings index

Table 4 - Service connection drawings index

Drawing number	Description
152472	100 Amp House Service Connection 1 Phase - Wall
152497	100 Amp House Service Connection 2 Phase - Wall
152473	100 Amp House Service Connection 3 Phase - Wall
162003	200 Amp 3 Phase Service Connection - Wall
162004	400 Amp 3 Phase Service Connection - Wall
152493	100 Amp House Service Connection 1 Phase – Raiser Bracket
152498	100 Amp House Service Connection 2 Phase – Raiser Bracket
152494	100 Amp House Service Connection 3 Phase – Raiser Bracket
162005	200 Amp 3 Phase Service Connection – Bracket / Strut
162007	400 Amp 3 Phase Service Connection – Bracket / Strut
152495	100 Amp House Service Connection 1 Phase – Barge Board
152499	100 Amp House Service Connection 2 Phase – Barge Board
152496	100 Amp House Service Connection 3 Phase – Barge Board
152474	100 Amp ABC Mains Support from Pole – 1 Phase
152500	100 Amp ABC Mains Support from Pole – 2 Phase
152475	100 Amp ABC Mains Support from Pole – 3 Phase
168793	200 Amp ABC Mains Support from Pole – 3 Phase
168792	400 Amp ABC Mains Support from Pole – 3 Phase
152476	100 Amp ABC Mains Support from ABC – 1 Phase
167458	100 Amp ABC Mains Support from ABC – 2 Phase
152477	100 Amp ABC Mains Support from ABC – 3 Phase
152478	100 Amp Open Wire Mains Support from Pole – 1 Phase
167459	100 Amp Open Wire Mains Support from Pole – 2 Phase
152479	100 Amp Open Wire Mains Support from Pole – 3 Phase
168790	200 Amp Open Wire Mains Support from Pole – 3 Phase
168791	400 Amp Open Wire Mains Support from Pole – 3 Phase
152480	100 Amp Open Wire Mains Support from Cross Arm – 1 Phase
167460	100 Amp Open Wire Mains Support from Cross Arm – 2 Phase
152481	100 Amp Open Wire Mains Support from Cross Arm – 3 Phase
	* Read as a set:
167461	* 100 Amp Open Wire Mains – In Span Take Off System [“Live End”]
152487	* 100 Amp Open Wire Mains Suspended Service – In Span Pole End Termination [“Dead End”]
192104	* 100 Amp Open Wire Mains Suspended In Span Service 1Phase/2Phase/3 Phase
152488	100 Amp Ausgrid Lead In Pole Timber – 4 Core In 4 Core Out
152489	100 Amp Ausgrid Lead In Pole Timber – 4 Core In 2x100A 4 Core Out
170349	100 Amp Customer Pole Steel – 1 Phase
TBD	100 Amp Customer Pole Steel – 2 Phase

Drawing number	Description
170350	100 Amp Customer Pole Steel – 3 Phase
162009	200 Amp 3 Phase Service Connection Customer Steel Pole
164378	400 Amp 3 Phase Service Connection Steel Customer Pole
162001	100 Amp Customer Pole Timber – 1 Phase
TBD	100 Amp Customer Pole Timber – 2 Phase
162002	100 Amp Customer Pole Timber – 3 Phase
233215	100 Amp House Fuse Connection 1-Phase Barge Board

9.0 QUALITY ASSURANCE

9.1 General

All Overhead Service Mains Work shall be carried out in accordance with the Service Rules and applicable Network Standards. Any associated work on a customer's installation is also to be carried out in accordance with the requirements of AS/NZS 3000. CCEW and NOSW forms are to be submitted where appropriate.

9.2 Warranty

The Accredited Service Provider is to warrant all works carried out in accordance with this Network Standard free of defects for a period of 3 years after the date of acceptance by Ausgrid, and will be required to pay for or carry out any required repairs within that period.

10.0 STORES AND MATERIALS

Accredited Service Providers and Contractors must use only new approved products on the network. Ausgrid should be contacted regarding approved products. Alternative products may be submitted to Ausgrid for approval. A fee for the approval of alternative products for use on the network will be negotiated. All materials used for network projects must be new.

To purchase materials from Ausgrid, the Project Manager must contact the 'Project Officer Network Procurement' on telephone number (02) 9394 6034. All materials will be made available for the Client to pick up from:

Somersby Warehouse
Lot 11, 33 Kangoo Road
Cnr Wella Way
Somersby NSW 2250

Alternatively, the ASP may obtain material from other sources provided the quality assurance and environmental management system requirements are met. Materials must comply with Ausgrid's relevant specifications.

11.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Table 5 – Recordkeeping

Type of Record	Storage Location	Retention Period*
Approved copy of the network standard	BMS Network sub process Standard – Company	Unlimited
Draft Copies of the network standard during amendment/creation	TRIM Work Folder for Network Standards (Trim ref. 2014/21250/68)	Unlimited
Working documents (emails, memos, impact assessment reports, etc.)	TRIM Work Folder for Network Standards (Trim ref. 2014/21250/68)	Unlimited

* The following retention periods are subject to change eg if the records are required for legal matters or legislative changes. Before disposal, retention periods should be checked and authorised by the Records Manager.

12.0 AUTHORITIES AND RESPONSIBILITIES

For this network standard the authorities and responsibilities of Ausgrid employees and managers in relation to content, management and document control of this network standard can be obtained from the Company Procedure (Network) – Production/Review of Network Standards. The responsibilities of persons for the design or construction work detailed in this network standard are identified throughout this standard in the context of the requirements to which they apply.

13.0 DOCUMENT CONTROL

Content Coordinator : Transmission and Distribution Mains Engineering Manager

Distribution Coordinator : Senior Engineer – Guidelines, Policies and Standards

Annexure A – Stockcodes of Approved Items

Cables	Stockcode
2 x 25mm ² Aluminium XLPE Cable	H109298
4 x 25mm ² Aluminium XLPE Bundled Cable	H109280
4 x 95mm ² Aluminium	67959

Pre-Insulated Sleeve	Manufacturer	Part Number	Stockcode
6mm ² Cu or Al non-tension	Sicame	MJPB6CG	H109389
	Michaud	K30	-
16mm ² Cu non-tension	Sicame	MJPB16CG	H109371
	Michaud	K39	-
25mm ² Cu full-tension	Sicame	MJPT25SF	176655
	Michaud	K103	-
25mm ² Cu non-tension	Sicame	MJPB25CG	176654
	Michaud	K42	-
95mm ² LVABC full-tension	Sicame	MJPT95-21SF	73361
	Michaud	K170	-
95mm ² LVABC non-tension	Sicame	MJPT95SF	H19073
150mm ² LVABC full-tension	Sicame	MJPT150SF	150987
	Michaud	K185	-

Bi-Metal Pre-Insulated Lug M12	Manufacturer	Part Number	Stockcode
25mm ² LVABC	Sicame	CPTAU25A	H117325
95mm ² LVABC	Sicame	CPTAU95A	58743
150mm ² LVABC	Sicame	CPTAU150A	150441

Strain Clamps	Manufacturer	Part Number	Stockcode
2 & 4 core 95mm ²	Michaud	IBST95150	176652
	Sicame	BCTC-4150-3S	-
2-4 core 6-25mm ² 1kN	Michaud	IBST435	-
	Sicame	PC63F27	H102491
2x16 - 4x25mm ² 4.8kN	Sicame	PA5D	H113464

Suspension Clamps	Manufacturer	Part Number	Stockcode
2 x 25mm ² LVABC	Sicame	PS5T	H113480
	Michaud	IBTC21635	-
4 x 25mm ² LVABC	Michaud	IBSC425	H113472
	Sicame	SC435	-
2 x 95mm ² LVABC	Michaud	IBSC470	H78238
	Sicame	SC470	-
4 x 95mm ² LVABC	Michaud	IBSC495	63057

Suspension Clamps	Manufacturer	Part Number	Stockcode
	Sicame	SC495	-
4 x 95mm ² LVABC 6kN breakaway	Michaud	BISL95F	150961
4 x 150mm ² LVABC	Sicame	SC4150	148072
	Michaud	IBSL150N	-
4 x 150mm ² LVABC 8kN breakaway	Michaud	IBSL150F	150979

Insulation piercing Connectors – Bare to ABC	Manufacturer	Part Number	Stockcode
95 LVABC/7-120 bare Cu	Michaud	K472	176580
	Sicame	NTD301FAX	-
95-150 LVABC/50-150 bare Cu	Michaud	K474	148387
	Sicame	NTD401FX	-
95-150 LVABC/50-240 bare Al	Michaud	K475	73569
	Sicame	NTD451AFX	-
25-120mm ² bare Al/6-25 Al/Cu insulated service	Sicame	CAW35	175051
	Michaud	R236	-
25-120mm ² bare Al/2 x 6-25 Al/Cu insulated service	Sicame	CAW235	H109678
	Michaud	R237	-
7-100mm ² bare Cu/6-25 insulated service	Sicame	CCW35	H109694
	Michaud	R235	-
7-100mm ² bare Cu/2 x 6-25 insulated service	Sicame	CCW235	176653

Insulating Piercing Connectors – ABC to ABC	Manufacturer	Part Number	Stockcode
95 LVABC/95 LVABC	Michaud	K445	H19104
	Sicame	TTD201FAX	-
95-150 LVABC/95-150 LVABC	Michaud	K446	176591
	Sicame	TTD401FX	-
25-95 LVABC/1.5-6 Al/Cu insulated service	Michaud	K440	73585
	Sicame	TTD051FX	-
25-95 LVABC/6-25 Al/Cu insulated service	Michaud	K441	73593
	Sicame	TTD151FAX	-
95-150 LVABC/1.5-25 Al/Cu insulated service	Michaud	K442	143891
95-150 LVABC/6-25 Al/Cu insulated service	Michaud	K443	143891
	Sicame	TTD241FX	-
95-150 LVABC/2 x 6-25 Al/Cu insulated service	Michaud	K390	143909
	Sicame	TT2D87F3x	-

Insulating Piercing Connectors – Insulated Services to Consumers Mains	Manufacturer	Part Number	Stockcode
Neutral bonding kit (consists of 16mm ² lugged Cu cable and one 25/16-25 IPC)	Sicame	TTD101NBKX	H118760
House Service Connector for 10-25mm ² Cu or Al service cable to 6-35mm ² Cu consumer's mains	Sicame	HSC435	H109686
	Michaud	K96	-

Insulating Piercing Connectors – Multiple Service Connections	Manufacturer	Part Number	Stockcode
95-150mm ² ABC/4 service tap offs	Sicame	MSCI/50150X	175052
	Michaud	K385	-
7-95mm ² bare Cu/4 service tap offs	Sicame	MSCC/795X	175053
	Michaud	K387	-
50-150mm ² bare Al/4 service tap offs	Sicame	MSCA/50150X	175054
	Michaud	K389	-

Insulating Piercing Connectors – Other	Manufacturer	Part Number	Stockcode
Orange 'G' clamp	Sicame	PPI514	H78444
End Caps - Push-on 25mm ²	Sicame	CES3	-
	Michaud	K01	H109447
End Caps - Push-on 95mm ² and 150mm ²	Michaud	K03	H77222
Heatshrink Kit – 16mm ² UGOH	Raychem	AUST-SY2	74104

Façade Mounting Mains Cable Support brackets	Manufacturer	Part Number	Stockcode
4 core 95mm ² & 150mm ² LVABC with 10mm offset	Michaud	BRPF1T	H19219
	Sicame	PSC83-2	-

Miscellaneous Items	Stockcode
S/S Bolt 40mm – M12	45146
S/S Flat Washer – M12	49429
S/S Spring Washer – M12	143859
S/S Nut 12mm	
King Bolt – 20mm – Gal – 350mm	H37920
Bolt & Nut – M20 x 350mm	47159
Bolt & Nut – M20 x 400mm	
Bolt & Nut – M20 x 450mm	
Weak Link	H81976
J Spike(Barley) – Gal	1370
Right Angle Bracket Mount – Gal	66571
Service Take Off Bracket	H12568
Termination Bracket to suit ABC Strain Clamp	66571
Eye Nut – Gal – 12mm	H39281
Eye Nut – Gal – 20mm	H38853
12mm Gal Nut	9118
16mm Gal Nut	9100
20mm Gal Nut	175361
Gal Washer 16mm	177984
Gal Washer 20mm	177986



Annexure B – Sample Compliance Checklist



Network Standard Checklist Form

NS124 Specification for Overhead Service Connections up to 400 Amps

Project Identification:	
Prepared by: <Name & Position Title>	Date:

This checklist is for internal Ausgrid use only and does not apply to ASPs or contractors who have specific compliance requirements in relation to Contestable project works. The checklist is unique for each network standard and is available within BALIN and the BMS as a separate form that can be amended as required, completed and saved in TRIM with the other project documentation.

This section is used to identify compliance checks that when applied to the work associated with this Network Standard will satisfy an audit process to establish that the requirements of the standard have been followed. It is expected that applicable items would normally be checked as Comply (Yes) as non-compliance is generally not tolerated.

Where non-compliance is the result of specific site conditions or design decisions this needs to be identified in the notes section of the form for each non-compliance and approval sought from an appropriately authorised Ausgrid manager responsible for design approval per NS261 Compliance Framework for Network Standards.

Should additional information be available to document non-compliance decisions, these can be attached to the checklist form. The checklist and any attached explanatory notes should be saved in the project document repository.

Item	Description	Refer Clause	Completed/ Actioned
	Scope		
	This Network Standard describes the requirements for connecting overhead services up to 400 amps to Ausgrid's overhead electricity distribution network, including equipment and methods to be used.		
	Overhead services		
1	Work complies with the requirements of Section 3 of the Service Rules	7.1	Yes/No/NA
2	New cable is used, selected from Annexure A	7.2	Yes/No/NA
3	No joints in service	7.2	Yes/No/NA
4	Where a suspended service is used, meets requirements of 7.3	7.3	Yes/No/NA
5	Clearances to ground and structures meet requirements of the Service Rules	7.4	Yes/No/NA
6	Clearances to vegetation meet requirements of ISSC3 and NEG-OH21	7.4	Yes/No/NA
7	Clearances over roads with unmade edges meet requirements of 7.4.1	7.4.1	Yes/No/NA
8	No service connections at pole transformers, unless approved.	7.5	Yes/No/NA
9	Redundant hardware removed.	7.6	Yes/No/NA
	Service connections		
10	No weather loops present at the connection point on distributors.	8.2	Yes/No/NA
11	Direction of pull on hook is not less than 45°.	8.3	Yes/No/NA

Item	Description	Refer Clause	Completed/ Actioned
12	IPCs used for services up to 100 amps.	8.4	Yes/No/NA
13	Bolted connections used for services greater than 100 amps.	8.4	Yes/No/NA
14	Where bargeboard fuses are installed, meet the requirements of 8.4(d) and 8.7	8.4, 8.7	Yes/No/NA
15	Bare private LV mains are not used.	8.5	Yes/No/NA
16	For new services, neutral conductors are not bonded to supports.	8.6	Yes/No/NA
17	Service supports are structurally adequate.	8.8	Yes/No/NA
	Quality assurance		
18	NOSW forms submitted	9.1	Yes/No/NA

Notes:

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has been removed for privacy
considerations. The remainder of the
document is unchanged.