# Network Standard

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**NW000-S0158** **NS162 INSTALLATION OF FIBRE OPTIC COMMUNICATION CABLES IN AUSGRID CONDUIT NETWORK AND SUBSTATIONS**

## ISSUE

For issue to all Ausgrid and Accredited Service Providers' staff involved with installing Third-Party Carrier fibre optic or non-conductive communication cables in Ausgrid's Pit and Conduit Network and the leasing of fibre units, 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Where this Network Standard is issued as a controlled document replacing an earlier edition, remove and destroy the superseded document.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, accredited service provider 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 anything 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. All 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 Work Health and Safety Regulation 2017 (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 Network 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 Type (Category) Document No. Amendment No.*").

## Scope and Risks Addressed

This standard is limited to scope identified below and provides controls for associated risks as listed below:

- ☐ Applies to the installation of fibre optic communication cables in Ausgrid's pit and duct network and substations.
- ☐ Applies to Ausgrid and Third-Party Carriers as well as Ausgrid contractors and ASPs
- ☐ Applies to the use of Ausgrid fibre units by Third-Party Carriers, however Third-Parties Carriers will be subject to a Facilities Access Agreement with Ausgrid.
- ☐ Addresses the following risks: electrical safety, confined spaces, fall arrest, asbestos hazards, traffic management, safety in design.
- ☐ Does not apply to copper communication cables.

**Where to for more information?**

Clauses 1, 2 & 3

## Approval and Access Requirements

- ☐ Third-Party Carriers must:
  - make a "Preliminary Enquiry",
  - submit a duct study,
  - follow Ausgrid's Contestable Connections process for certification of detailed design.
- ☐ Utilisation of existing ducts is to be prioritised in the following order: 63mm or 50mm, empty 20mm, ducts with existing distribution power cables installed, spare power cable ducts.
- ☐ The use of the last remaining spare duct space is reserved exclusively for Ausgrid cable.
- ☐ If duct contains the maximum number of cables/sub-ducts, an additional cable/sub-duct may be installed however this must replace one of the pre-existing cable/sub-ducts.
- ☐ Access to Ausgrid's substations is restricted to Ausgrid staff or Ausgrid contractors only.
- ☐ Access to "legacy" substations by Third-Party Carrier personnel may require an Ausgrid stand-by person.

**Where to for more information?**

Clauses 4 & 5

**Tools and Forms**

Ausgrid website: https://www.ausgrid.com.au/Connections/Get-connected/Apply-for-a-connection

## Design Requirements

- ☐ General:
  - Cables may need to be LSZH and duct/sub-duct may need to be non-flame propagating and halogen free to AS2053.
  - All materials must be approved by Ausgrid.
  - Cables to be labelled
  - No Third-Party Carrier splice enclosures, fibre termination boxes, fibre storage loops, etc in Ausgrid pits or substations.
- ☐ Pit & duct network:
  - Pit entry/exit sub-ducts must be sealed.
  - Pit break-outs only at the ends of pit and subject structural assessment.
  - Cable to be installed in continuous duct/sub-duct with no exposed cable.
- ☐ Substations:
  - Fire-stopping and moisture blocking are required - refer to NS171.

**Where to for more information?**

Clause 6

**Tools and Forms**

N/A

## Post-construction and Dark Fibre Requirements

- ☐ Third-Party Carriers must follow application process for cable augmentation or rearrangement.
- ☐ Third-Party Carriers shall remove communication cable/s that are no longer required.
- ☐ Ausgrid shall inspect cable installations and notify of any non-conformances.
- ☐ Third-Party Carrier defects to be rectified as per FAA.
- ☐ Non-conformances relating to contestable projects will be managed in accordance with the Contestability Process.
- ☐ Non-conformances relating to Ausgrid contracts will be managed according to the relevant contract.
- ☐ As-builts to be returned to Ausgrid, within 2 weeks from completion date.
- ☐ In an emergency, Ausgrid may adjust, remove or alter Third-Party Carrier cables as is necessary.
- ☐ POI between Ausgrid and the Third-Party Carrier fibre network is to be in the external environment.

**Where to for more information?**

Sections 7, 8 & 9

**Tools and Forms**

N/A

# Network Standard
# NS162
# Installation of Fibre Optic Communication Cables in Ausgrid Conduit Network and Substations

## Contents

# 1.0 PURPOSE

This Network Standard details the policy and operational requirements for the installation of fibre optic communication cables in Ausgrid's pits, conduit network and substations. It also extends to the use of Ausgrid pits, conduits and substations and fibre units by Third-Party Carriers.

The installation of fibre optic communication cables in Ausgrid's pits, conduit network and substations, or the use of Ausgrid fibre units by Third-Party Carriers will be subject to a Facilities Access Agreement with Ausgrid.

This Network Standard also applies to the installation of fibre optic communication cables for Ausgrid either by Ausgrid contractors, or as part of contestable works.

# 2.0 SCOPE

This Network Standard applies to the installation of fibre optic communication cables in Ausgrid's pit and conduit network and substations. It applies to Ausgrid and Third-Party Carriers as well as the use of Ausgrid fibre units by Third-Party Carriers, however Third-Parties Carriers will be subject to a Facilities Access Agreement with Ausgrid.

This Network Standard does not apply to copper communication cables

# 3.0 RESPONSIBILITIES

Communication cables may be installed in Ausgrid pits, conduit network and substations by:

- Ausgrid when installing communication cables for their own purposes,
- a contractor installing communication cables on behalf of Ausgrid,
- an ASP on behalf of a Third-Party Carrier installing communication network cables or using Ausgrid fibre units subject to a Facilities Access Agreement,
- an ASP on behalf of a contestable works customer required to install communication cables, which will become Ausgrid assets, as part of a contestable construction project.

Whichever of these parties installs the communication cables shall be responsible for meeting the following requirements, as appropriate.

## 3.1 Facilities access agreement

Third-Party Carriers, prior to accessing Ausgrid's pits, conduit network and substations (if applicable) for the purpose of installing communication cable/s must enter into a Facilities Access Agreement (FAA) with Ausgrid.

## 3.2 Authorisation to work on or near Ausgrid assets

Whilst carrying out the installation of communication cables it is essential that all work on Ausgrid assets and sites is performed in a safe manner and to no less a standard than that specified in Ausgrid's:

- Electrical Safety Rules
- relevant Network Standards including but not limited to:
    - NS130 – Specification for Laying Underground Cables up to and Including 11kV,
    - NS156 – Working Near or Around Underground Cables,

- NS199 – Safe Electrical Work on Low Voltage Underground Assets,

as well as any relevant Act, Regulation and SafeWork NSW requirement applicable at the time. The conditions stated as a requirement of accreditation under the Accredited Service Provider Scheme, administered by the NSW Department of Planning, Industry and Environment must be adhered to.

Other relevant safety guidelines are also available from the Energy Supply Association of Australia such as:

- ISSC 14 - Guide to Electrical Workers' Safety Equipment.

All Personnel must have appropriate and current authorisations.

## 3.3 ASP accreditation and authorisation

The minimum requirements for Authorisation for the installation of communication cables in Ausgrid conduits, pits and substations can be found in Ausgrid ASP Level 1 Authorisation Agreement.

Details of how ASP Level 3 accreditations apply to the design of communication cables in Ausgrid conduits, pits and substations can be found in Ausgrid's ES4 - Accredited Service Provider Authorisation document (ES4).

## 3.4 Electrical Safety Rules

All authorised Personnel will be required to be appropriately trained for the work concerned and will need to have a thorough knowledge of the applicable parts of Ausgrid's Electrical Safety Rules (ESR). Training requirements are covered more fully in ES4 Annexure B – ASP/1 Individual Competency Requirements (available from the Ausgrid website).

Ausgrid's Electrical Safety Rules are designed to ensure compliance with statutory requirements which apply to all works on or near high voltage and low voltage electrical apparatus. They apply to persons who enter electrical substations, to people employed by electricity supply authorities, electrical contractors and ASPs working on electrical apparatus, and to any other employee or person, including visitors.

## 3.5 Confined Spaces

Many Ausgrid pits and substations may be classified as Confined Spaces as defined in the Work Health and Safety Regulation 2017 (NSW). As their primary function, these Confined Spaces contain electrical assets with inherent electrical safety and network reliability security considerations.

Current WHS Regulations also impose a number of obligations on persons conducting a business or undertaking in connection with such Confined Spaces and on personnel who access the Confined Spaces. Accordingly, all entry to and work in these Confined Spaces must comply with:

- the Ausgrid Electrical Safety Rules,
- Chapter 4, Part 4.3, Division 9 of the Work Health and Safety Regulation 2017 (NSW), and
- the requirements of the Australian Standard AS 2865 – Safe Working in a Confined Space.

Some examples of Confined Spaces within Ausgrid are listed in the Electrical Safety Rules.

Ausgrid staff shall also comply with Ausgrid Hazard Guideline HG-02 – Confined Spaces.

## 3.6 Fall arrest

Many pits and substations require access by vertical ladders. Suitable controlled descent equipment must be used when there is a risk of falling more than 2 meters. The use of fall arrest equipment must comply with Chapter 4, Part 4.3, Division 6 of the Work Health and Safety Regulation 2017. Ausgrid staff shall also comply with Ausgrid Hazard Guideline HG-17 – Working at Heights.

## 3.7 Asbestos hazards

Persons working on the installation of communication cables must be informed that asbestos materials may have been used in the construction of conduits and as insulation on electrical equipment in substations.

Appropriate care must be taken in the identification and safe handling of asbestos, by suitably qualified persons in accordance with all relevant legislation, standards and Codes especially:

- Ausgrid Network Standard NS211 – Working with Asbestos Products,
- Safe Work NSW Code of Practice “How to Manage and Control Asbestos in the Workplace” and
- Safe Work Practice 4 – Replacing Cabling in Asbestos Cement Conduits or Boxes.

Work involving the remediation or removal of asbestos must comply with the requirements of Safe Work NSW Code of Practice “How to Safely Remove Asbestos”.

Ausgrid staff shall also comply with Ausgrid Hazard Guideline HG-01 – Asbestos.

Prior to cable installation the conduit/s to be used must be inspected and any necessary remedial work undertaken, including repairs and relining of the conduits.

Note: Refer to Clause 6.1.6, detailing the controls that must be applied prior to and after cable installation.

## 3.8 Traffic management

Communication cable installations must be carried out safely with the least possible obstruction to traffic, both vehicular and pedestrian. Where required, a traffic management plan for each project must be prepared and implemented in accordance with statutory requirements.

Vehicular and pedestrian access to properties must be maintained wherever possible. Notice of 48 hours shall be provided to residents whose access will be restricted by the proposed works.

Useful references to traffic related guides are:

- Ausgrid Technical Guide T0033 – Traffic Management
- AS 1742 – Manual of Uniform Traffic Control Devices
- Roads and Traffic Authority guide: Traffic Control at Worksites.

ASPs must comply with the requirements of ES4 regarding traffic control.

Ausgrid staff shall also comply with Ausgrid Hazard Guideline HG-15 – Traffic Management.

## 3.9 Safety in design

The designer (including ASP/3s) must consider “safety in design” principals when designing a conduit cable route which best fits the project need with due regard for “all of life” hazards and risks, including construction, commissioning, operations, maintenance, decommissioning and demolition/removal in the future as required as an integral part of safety in design as per AS5577 – Electrical Network Safety Management Systems.

In addition, the “whole of life” costs must also be considered and minimised.

## 3.10 Technical and operations manual

All Third-Party Carriers installing communication cables in Ausgrid facilities, conduit network and substations (if applicable) must generate a Technical and Operational Manual, inclusive of an approved list of materials (BOM) as per the relevant Facilities Access Agreement.

The manual must include, but not limited to, the following:

- Safety in Design principals;
- Accreditation of Carrier ASPs;
- Cable and technology to be installed;
- MRW, and installation criteria;
- Maintenance and operations;
- Removal, alteration, augmentation or decommissioning of Third-Party Carrier asset;
- Third-Party Carrier emergency contacts.

This manual is to be approved by Ausgrid and is intended to be “evolving” and subject to change when new technology is introduced.

# 4.0 APPROVALS TO USE AUSGRID CONDUITS

## 4.1 Use of Ausgrid Conduits - General

The use of Ausgrid conduits for the installation of communication cables by both Ausgrid and Third-Party Carriers shall be subject to the following:

- The utilisation of existing conduits is to be prioritised in the following order:

1 communication conduits (63mm or 50mm),

2 communication conduits (20mm) with no existing communication cables installed,

3 conduits with existing power cables installed,

4 spare (empty) power cable conduits,

Notes:

a) Sub-transmission (33kV & above) conduits are not to be used for the installation of communication cables.

b) Fibre optic communication cables typically have a maximum temperature tolerance of 70$^{o}$C, which must be taken into account if considering installation in the same conduit as power cables, which can have an operating temperature of 90$^{o}$C.

- Refer to Clause 6.1.7 regarding the maximum number of communication cables/sub-ducts to be installed in any conduit.
- Cables shall be installed in communication 63mm or 50mm conduits in accordance with NS234.
- Cables shall be installed in power cable conduits as follows:
  - The use of the last remaining spare conduit space is reserved exclusively for Ausgrid cable.
  - Where a conduit contains the maximum number of communication cables/sub-ducts:
    - Ausgrid may install an additional cable/sub-duct however this cable/sub-duct must replace one of Ausgrid’s pre-existing cable/sub-ducts. The new cable must have a fibre count to match the pre-existing Ausgrid cable plus 60 as a minimum. The pre-existing cable/sub-duct must be removed, and services must be spliced at either end to cut-over onto the new cable.

- A Third-Party Carrier may install an additional cable/sub-duct however this cable/sub-duct must replace one of the Third-Party Carrier's pre-existing cable/sub-ducts. The pre-existing cable/sub-duct must be removed, and services must be spliced at either end to cut-over onto the new cable. Where the new cable has a greater fibre count than the pre-existing cable refer also to Clause 7.1.

## 4.2 Applications by Third-Party Carriers

Unless otherwise agreed in writing, a Third-Party Carrier who proposes to access and install communications cables in Ausgrid's pits, duct network and substations (if applicable) must, in addition to having a Facilities Access Agreement, for each project:

- obtain Ausgrid approval to use specific ducts, pits and substations, and then
- follow Ausgrid's Contestable Connections process to obtain Ausgrid certification of the detailed design.

The application process for obtaining approval will be as follows:

### 4.2.1 Preliminary enquiry

The Third-Party Carrier or their ASP will submit a "Preliminary Enquiry" application, to the Ausgrid Customer Connections Group via the Ausgrid website, i.e.

https://www.ausgrid.com.au/Connections/Get-connected/Apply-for-a-connection

Within the online preliminary enquiry, the first sentence of 'Your Questions' field is to state: "FAA – Duct Leasing Request"

The application must include a plan/map showing the area and preferred conduit route, which will enable Ausgrid to provide an appropriate extract from Ausgrid's underground records.

### 4.2.2 Preparation of Duct Study

Based on the extract from Ausgrid's underground records, the Third-Party Carrier's ASP will prepare a Duct Study and submit it to Ausgrid for approval. The Duct Study shall include the following details:

- the overall path required,
- the specific Ausgrid conduits, pits & substations required,
- details of the ASP/3 Designer,
- the estimated conduit length - which is to be revised and confirmed at the as built stage,
- type of works to be performed (e.g. type of cable/s to be installed)
- the Third-Party Carrier project reference,
- Third-Party Carrier cable reference/s,
- a commitment to application fees where applicable and any additional fees as per the Facilities Access Agreement.

### 4.2.3 Ausgrid assessment of Duct Study

Ausgrid will assess the Duct Study subject to the following:

- Compliance with Ausgrid standards.
- Ausgrid reserves the right to request further pit/conduit design detail if required prior to confirming availability e.g. specific conduit identification or determining spare capacity.
- Ausgrid may require a site survey, or other investigation, to obtain additional information. This will incur costs which must be paid by the Third-Party Carrier/ASP. These costs will be according to the Australian

Energy Regulator (AER) rates which will be notified to the Third-Party Carrier/ASP prior to incurring the costs.

Ausgrid will either notify the ASP of approval or of necessary amendments to the Duct Study. The preparation and assessment of the Duct Study may be an iterative process.

### 4.2.4 Approval of Duct Study & reservation of conduits

Once approval of the Duct Study is obtained from Ausgrid, Ausgrid will issue a Design Offer which will include fees for the design certification process. The ASP will follow Ausgrid's Contestable Connections process to prepare a detailed design for certification by Ausgrid, and subsequent construction, etc. whilst adhering to all of Ausgrid's requirements as set out in the Master Agreement, Ausgrid Standards and any conditions specified in the approval.

Ausgrid will issue a cable number for each communication cable approved for installation, and this number must be used to label the relevant cable when installed – see Clause 6.1.10 below.

Conduits which have been approved by Ausgrid for Third-Party Carrier use will be reserved for three calendar months from the date of approval of the Duct Study by Ausgrid to allow preparation and submission of the detailed design for certification.

## 4.3 Use of ducts by Ausgrid for communications cables

Where an Ausgrid designer proposes to install communication cables in Ausgrid's pits, conduit network and substations (if applicable), the Ausgrid designer shall prepare a duct study and submit it to the relevant group for approval.

The Duct Study shall include the following details:

- the overall path required,
- the specific Ausgrid conduits, pits & substations required,
- type of works to be performed (e.g. type of cable/s to be installed)
- the Ausgrid project reference,
- Ausgrid cable reference/(s).

## 4.4 Ausgrid groups responsible for approving conduit usage

Approval is to be sought from the relevant Ausgrid Group as shown in Table 1, before any Ausgrid conduits are used for the installation of either Third Party Carrier or Ausgrid communication cables.

**Table 1 - Responsibilities for approving conduit usage**

| Conduit type | Ausgrid approval authority |
|---|---|
| Communication cable conduit (63mm, 50mm or 20mm) | Ausgrid Asset Engineering Policy & Standards (Secondary Systems) |
| Ausgrid power cable (11kV and below) conduit | Ausgrid Asset Investment Planning (Distribution Planning) |

# 5.0 ACCESS TO AUSGRID PIT AND CONDUIT NETWORK AND SUBSTATIONS

## 5.1 Mandatory requirements

Contractors, and ASPs seeking to access Ausgrid pit and conduit network and substations (if applicable) must provide Ausgrid with the following:

- Proposed access date/time;
- Contact details including relevant accreditations & authorisations of all Personnel seeking access;
- "Safe Work Method Statement" (SWMS) for the activity to be performed;
- Expected duration of activity.

ASPs seeking access on behalf of a Third-Party Carrier will also be subject to the relevant Facilities Access Agreement.

## 5.2 Access to sub-transmission, zone, & distribution substations

Access to Ausgrid's Sub-Transmission, Zone and Distribution substations is restricted. ASPs and Third-Party Carriers and their Personnel are not permitted to access Ausgrid Sub-Transmission, Zone and Distribution substations. Only Ausgrid staff or Ausgrid contractors can install communication cables in Sub-Transmission, Zone and Distribution substations.

## 5.3 Access to legacy distribution substations

Access may be granted to "legacy" Distribution substations where Third-Party Carrier telecommunication equipment already exists.

Ausgrid will determine whether an Ausgrid stand-by person will be required to supervise access and/or works.

The cost of attending site by the Ausgrid stand-by person will be the responsibility of the Third-Party Carrier as per the relevant Facilities Access Agreement.

Existing equipment (e.g. termination enclosures, fibre splices, etc) should be removed from substations whenever opportunities permit.

# 6.0 DESIGN & INSTALLATION OF COMMUNICATION CABLES

Prior to the commencement of cable installation, the approval and access requirements as detailed in Clauses 4 and 5 of this Standard must be adhered to.

In accordance with Australian Standards such as AS/NZS 3000 – Electrical Installations and, AS/NZS 3085 – Telecommunications Installations – Administration of Communications Cabling Systems, communication cables are required to be segregated from electrical power installations/infrastructure. For this reason, all communication cables installed in Ausgrid power cable (11kV & below) conduits, pits and substations are to be installed in conduits/sub-ducts. The conduits/sub-ducts shall have a maximum outside diameter of 20mm. No exposed cable is permitted in the main power cable conduit, pits or substations.

Communication cables may be installed in Ausgrid's communication conduits (63mm, 50mm or 20mm), without a sub-duct, however the cable must transition to a conduit/sub-duct wherever the cable enters a pit or substation.

No Third-Party Carrier equipment such as cable loops, splicing enclosures, power supplies, etc are permitted in Ausgrid's conduits, pits or substations.

As discussed below, installation of communication cables within Ausgrid's network falls into three categories.

- Pit and conduit network;
- Distribution substations;
- Sub-Transmission and Zone substations.

## 6.1 Installation in pit and conduit network

### 6.1.1 Make ready works (MRW) in pit and conduit network

Prior to the commencement of the cable installation, empty conduits intended to be used shall be thoroughly cleaned and mandrelled in accordance with Ausgrid Network Standard NS130. Conduits with pre-existing cables installed shall be rodded, roped and proved.

If a blocked conduit cannot be cleared, an alternate conduit must be identified, and approval sought from Ausgrid in accordance with Clause 4. Where there are no alternatives to a blocked conduit, Ausgrid may allow further investigation for work to be done to clear the blockage however for Third-Party Carriers this will attract fees (monopoly works) given the risk to other surrounding conduits & associated infrastructure.

MRWs may also extend to the de-watering and cleaning of Ausgrid pits.

MRW's for asbestos conduit are detailed in Clause 6.1.6.

### 6.1.2 Pit entry and exit sub-ducts

Incoming and exiting sub-ducts (within the conduit) which enter and exit pits must be sealed against water and gas ingress in accordance with NS130. Seals on conduits that have been removed to accommodate the installation of cables and sub-ducts are to be reinstated.

### 6.1.3 Pit conduit breakouts

Where there is a requirement to install a new conduit and penetrate an Ausgrid pit, the conduit must only enter at the ends of the pit. A structural assessment will be required to be submitted to Ausgrid to ensure the subject pit is structurally adequate prior to core drilling the pit end walls.

Breaking into the Ausgrid conduit network is only allowed at Ausgrid pit locations, not at mid-route locations.

### 6.1.4 Materials to be installed in pit and conduit network

To minimise the impact of fire:

- in the CBD of Sydney within the Ausgrid pit and conduit network and in all other areas where communication cables are installed in power cable pits and conduits, irrespective of whether power cables presently exist:
    - all communication cables within pits and conduits must be Low Smoke Zero Halogen (LSZH) and
    - all communication conduit/sub-duct within pits must comply with an appropriate standard such as AS2053 or AS/NZS 4130. The conduit/sub-duct must be non-flame propagating or coated with a fire-retardant Cable Coating product approved by Factory Mutual for such use.
- In other situations, i.e., communication cables/conduits/sub-ducts installed in Ausgrid dedicated communication conduits and pits, it is recommended that communication cables installed in Ausgrid conduits should be Low Smoke Zero Halogen (LSZH) and conduit/sub-duct should be non-flame propagating and halogen free however this is not mandatory.

All materials used must be approved by Ausgrid.

Third-Party Carrier cables shall be detailed in the Technical and Operations Manual.

### 6.1.5 Cable installation in pit and conduit network

All communication cables installed within the Ausgrid pit and conduit network must adhere to the following installation criteria:

- Cables installed in power cable conduits (11kV & below) must be installed within a sub-duct which is continuous and transits through the conduit and pits and substations with no exposed cable at any point;
- Cables installed in 63mm 50mm or 20mm communication conduits must transition to conduit/sub-duct at pits or substations such that there is no exposed cable at any point within the pit or substation.
- Conduit/sub-duct joins to be located in pits using approved conduit/sub-duct joiners;
- Installation of cables/subducts in conduits containing live power cables should be avoided wherever practicable however if unavoidable ensure all due diligence and precautions are taken.
- Also refer to Clause 6.1.9 regarding the securing of conduits/sub-ducts.

### 6.1.6 Cable Installation in asbestos conduits

When installing cables through asbestos conduits the following controls must be applied:

- Visual inspection of the conduit to determine its condition, asbestos conduits that are damaged must be repaired or remediated prior to installing cables;
- Installation of cables must be in accordance with all relevant legislation, standards and Codes, particularly SafeWork NSW Code of Practice - How to Manage and Control Asbestos in the Workplace", and SafeWork NSW Safe Work Practice 4 – Replacing Cabling in Asbestos Cement Conduits or Boxes with particular attention to the following as required:
    - Air monitoring by a Licenced Asbestos Assessor during cable installation work;
    - Pits along the cable route are to be inspected by a Licenced Asbestos Assessor after the cable installation and an Asbestos Clearance Certificate issued, and a copy issued to Ausgrid;
    - Pits along the cable route are to be cleaned after cable installation.

### 6.1.7 Maximum number and diameter of communication cables/sub-ducts per conduit

The maximum number and diameter of communication cables/sub-ducts to be installed in any conduit shall be as shown in Table 2.

**Table 2 – Number of cables/sub-ducts per conduit**

| Conduit diameter (mm) | Maximum communication sub-duct outside diameter (mm) | Maximum number of communication cables/sub-ducts |
|---|---|---|
| 20 | N/A (no sub-duct necessary) | 1 cable |
| 63 or 50 | N/A (Maxcell textile sub-duct is optional) | 3 cables/sub-ducts |
| 100 | 20 | 1 cable/sub-duct |
| 125 | 20 | 2 cables/sub-ducts |
| 150 | 20 | 3 cables/sub-ducts |

### 6.1.8 Cable installation in occupied or shared conduits

Where communication cables are to be installed in a conduit already used or reserved for use by other communication cables or power cables, the size of sub-duct or fibreoptic cable shall be such that it does not prevent the subsequent removal or installation of other communication or power cables in the same conduit.

If required by Ausgrid, Third Party Carriers shall, at no cost to Ausgrid, temporarily remove their communication cable & sub-ducts from Ausgrid's conduits to facilitate the installation of Ausgrid cables.

Communication cables which are to be installed within Ausgrid 63mm or 50mm communication conduits in which an existing communication cable (or communication cable in sub-duct) is installed, may be installed via the use of a flexible textile duct i.e. Maxcell Milliken Inner Duct product or approved similar alternative. Refer also to NS234 Telecommunications Underground Physical Plant Installation.

### 6.1.9 Cable security in Ausgrid pits

Communication cable conduits/sub-ducts are to be attached to pit walls, such that they do not damage or inhibit the operation or maintenance of the Electrical Distribution Network or reduce its capacity, reliability or safety including Ausgrid's ability to safely and easily access the electrical infrastructure without interfering with or damaging the communication cable installation.

Communication cable conduits/sub-ducts must be secured to the pit walls and kept clear of power cables and other electrical infrastructure in pits to maintain clear access to the power cables and for jointing work on the power cables.

This includes avoiding the creation of restrictions to access to the pit, such as cables being passed too close to access ladders.

The communication cable conduits/sub-ducts shall be attached to the walls or roof of pits by use of a re-enterable fixture, such as the following or approved similar:

- Hilti bunched-cable holder: X-ECH-S U37 #386235 (for use with 10-15 cables (10mm dia.))
- Hilti bunched-cable holder: X-ECH-M U37 #386236 (for use with 15-25 cables (10mm dia.) or storage coils etc).

Refer Figure 1 below.

The fixture should be capable of holding more than one conduit/sub-duct, and future communication conduits/sub-ducts shall use existing fixtures where possible.

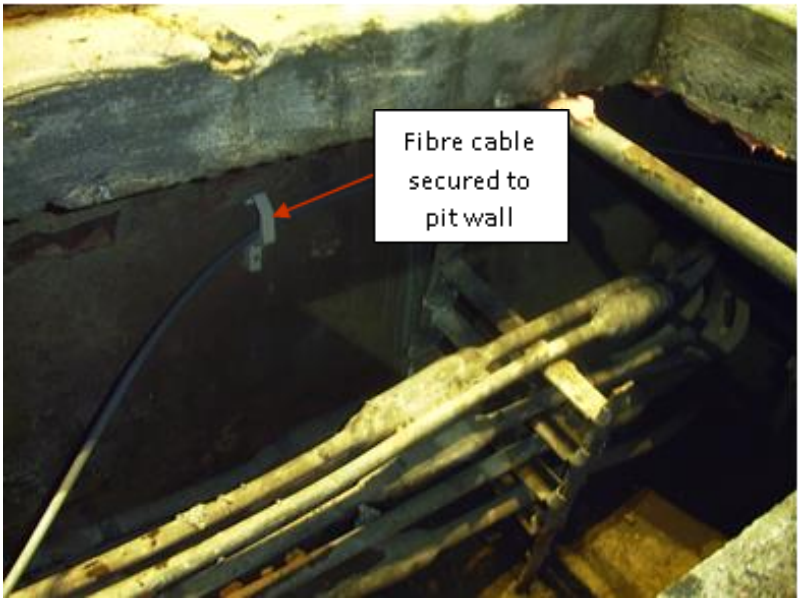


**Figure 1 - Fibre cable secured to pit wall**

### 6.1.10 Cable labelling in pit and conduit network

Ausgrid will issue a cable number for each communication cable to be installed. The cable number will take the form of three letters followed by six numbers e.g. FXX 123456. Communication cables must be clearly identified with this number by an embossed label at regular intervals along the entire length. Permanently attached labels must be attached to each conduit/sub-duct at the entry and exit points within an Ausgrid pit.

Labels are also to be marked with the source and destination. If the cable/conduit/sub-duct is re-routed in future, all labels in the affected section are to be re-marked to correctly identify the route.

### 6.1.11 Related communication equipment in pit and conduit network

Third-Party Carrier equipment such as splice enclosures, fibre termination boxes and fibre storage loops are not permitted in Ausgrid pits. Third-Party Carrier communication cables are to be installed in one continuous length.

Ausgrid equipment associated with communication cables (cable loops, splice enclosures etc) in Ausgrid pits shall be installed such that they are suitably segregated from the electrical infrastructure and do not damage or inhibit the operation or maintenance of the Electrical Distribution Network or reduce its capacity, reliability or safety including Ausgrid's ability to safely and easily access the electrical infrastructure without interfering with or damaging the communication installation.

## 6.2 Installation in sub- transmission, zone and distribution substations

New Third-Party Carrier installations in Distribution Substations will be limited to cable/conduit /sub-ducts only. New Third-Party Carrier installations are not permitted in Sub-Transmission or Zone substations unless a segregated (through appropriate fencing and locks) communications room has been provided for this equipment. Third-Party Carriers shall only have access to the designated communications room.

In all other instances, ASPs, Third-Party Carriers and their Personnel are not permitted to access Ausgrid Sub-Transmission, Zone and Distribution Substations. Only Ausgrid staff or Ausgrid contractors can install communication cables in Sub-Transmission, Zone and Distribution substations.

In some cases, Ausgrid may authorise ASPs, Third-Party Carriers and their Personnel to install the cable within the substation, with all work within the substation continuously supervised by an Ausgrid stand-by person.

**Note**: a stand-by person is required where an Ausgrid contractor also acts as an ASP for a Third-Party Carrier. In such cases the stand-by person must be independent of the Ausgrid contractor i.e. the stand-by person must be Ausgrid personnel or an independent (different) Ausgrid contractor.

### 6.2.1 Cable type to be installed in substations

To minimise the impact of fire, all communication cable/conduit/sub-duct installed within Ausgrid Sub-Transmission, Zone and Distribution substations must be either:

- fire segregated from power cables and be installed such that the cable/conduit/sub-duct will not propagate fire along Ausgrid conduits entering the substation, or
- Low Smoke Zero Halogen (LSZH) cable and non-flame propagating and halogen free conduit/sub-duct complying with an appropriate standard such as AS2053 or AS/NZS, or
- Low Smoke Zero Halogen (LSZH) cable installed in conduit/subduct which is coated with a fire-retardant Cable Coating product approved by Factory Mutual for such use.

All materials used must be approved by Ausgrid.

Third-Party Carrier cables shall be detailed in the Technical and Operations Manual.

### 6.2.2 Cable installation in substations

Communication cables/conduit/sub-ducts installed in distribution substations must adhere to the following installation criteria:

- Be installed within rigid (typically HDPE) communication conduit;
- Be neatly and securely attached to substation walls at one metre intervals, such that they maintain all specified clearances and do not damage or inhibit the operation or maintenance of substation equipment or the Electrical Distribution Network or reduce its capacity, reliability or safety including Ausgrid's ability to safely and easily access the electrical infrastructure without interfering with or damaging the communication cable installation.

Third-Party Carrier communication cables must be installed within conduit/sub-duct for its entire route through the substation, no exposed cable will be permitted. No Third-Party Carrier fibre storage loops, splice enclosures, etc permitted in Ausgrid substations.

### 6.2.3 Substation entry and exit conduits

Where the conduits (housing communication cables/sub-ducts) enter and leave the substation, Ausgrid's specifications for fire stopping and moisture blocking shall be followed refer to NS171 Fire Stopping in Substations.

### 6.2.4 Cable/Conduit labelling in substations

Communication cables/conduits within Ausgrid Distribution substations must be clearly identified by an approved communication label at regular intervals along the cable/conduit length.

## 6.3 Installation in legacy distribution substations

Third-Party Carrier owned communication cables and associated fibre equipment i.e. splice enclosures have already been installed in numerous Ausgrid Distribution substations throughout the Sydney Central Business District.

This equipment may remain in place, and Third-Party Carrier ASP's may be permitted to enter these substations to carry out maintenance activities only under the direct supervision of an authorised Ausgrid stand-by person.

The following rules apply regarding future Third-Party Carrier activities within these substations:

- no additional equipment is to be installed i.e. terminations, splice enclosures etc;
- no additional fibre splicing is to be performed;
- existing terminations, splice enclosures, etc should be removed whenever opportunities present themselves.

# 7.0 CABLE AUGMENTATION, RE-ARRANGEMENT AND REMOVAL

## 7.1 Cable augmentation

Where a Third-Party Carrier wishes to augment an existing communication cable (i.e. replace with a larger count cable), the Third-Party Carrier must go through the application process as detailed in Clause 4 of this Network Standard. The new cable must be installed along the identical conduit route as per the current Facilities Access Agreement. Ausgrid will not allow a Third-Party Carrier to install multiple cables in the same conduit.

## 7.2 Cable re-arrangement

Where a Third-Party Carrier wishes to re-arrange an existing communication cable (i.e. relocate along an alternate or entirely different conduit route), the application, must be submitted via the

application process as detailed in Clause 4 of this Network Standard as if the application were for a new installation.

### 7.3 Cable removal or abandonment

Third-Party Carriers shall remove communication cable/s that are no longer required. Cables shall also be removed at the end of the current Facilities Access Agreement, unless a new Facilities Access Agreement is entered into via the application process detailed in Clause 4 of this standard.

Communication cable/s that are considered to be “abandoned”, (i.e. not in use), are not to remain in the Ausgrid conduit network. Facility leasing charges will be payable by the party responsible for the cable, until the cable and associated equipment is completely removed from the conduit/s.

## 8.0 COMPLIANCE, AS-BUILTS AND RECORDS

### 8.1 Inspections

The Ausgrid Compliance Officer will inspect the installation and report on any installations that do not comply with Ausgrid requirements and standards.

### 8.2 Non-conformance

Ausgrid will notify Third-Party Carriers of any non-conformance issues. Rectification of defects are to be addressed as per the relevant Facilities Access Agreement.

Non-conformances relating to contestable projects will be managed in accordance with the Contestability Process.

Non-conformances relating to Ausgrid contracts will be managed according to the relevant contract.

### 8.3 As-builts and records

Communication cables and conduits/sub-ducts, including Third-Party Carrier cables, that are installed in Ausgrid’s pit and conduit network or substations must be recorded in Ausgrid’s GIS system. The recording should indicate the ownership of each asset for clarification and be in accordance with NS100 Field Recording of Network Assets and Technical Guide T0005, Field Recording Guide.

Note: Third-Party Carrier assets that do not interact with Ausgrid assets do not need to be recorded but may be referenced on field recordings if their location improves locating company assets and/or is a safety risk if not documented.

As-built documentation must be returned to Ausgrid, within 2 weeks from the installation completion date.

Information must include:

- Detail of the installation route and conduit usage specifically highlighting any differences to the designed route and Ausgrid approval of such;
- Detail any non-compliance to standards and Ausgrid approval of such;
- Date of installation;
- Route map;
- “A” and “B” ends (pole, pit, substation, building);
- Project reference name;
- Cable name;

- Ausgrid Facilities Access Agreement reference;
- Cable type/count;
- Calculation of total metres in Ausgrid conduit;
- Cable drum metre marks at all ends;
- Photos of pit and conduit entries at each pit alternately pit cross sections at least detailing which conduit is in use.

# 9.0 OPERATIONS AND MAINTENANCE

In addition to the requirements of Facilities Access Agreement, Third-Party Carriers must ensure their assets (i.e. cable within Ausgrid's pit and conduit network and substations) are maintained with respect to condition, operation, security and safety.

Third-Party Carriers must also ensure that their cables maintain all specified clearances, do not damage, inhibit the operation or maintenance of the Electrical Distribution Network or reduce its capacity, reliability or safety including Ausgrid's ability to safely and easily access the electrical infrastructure without interfering with or damaging the communication cable installation.

## 9.1 Emergency situations

In addition to the requirements of the Facilities Access Agreement, in the case of an emergency, Ausgrid may adjust, remove or alter Third-Party Carrier cables as is necessary to minimise the effects of a safety matter upon the Electrical Distribution Network or any persons effected by the emergency. Ausgrid will retrospectively notify the Third-Party Carrier of the action taken.

# 10.0 DARK FIBRE UNITS

Third-Party Carriers currently lease Ausgrid fibre units (RFU's).

In the Sydney CBD these fibres are within Ausgrid cables nominally labelled as "intermediate" and "radial" cables which were installed to cater for the Ausgrid SCADA network.

The following items relate to any future activities or installations.

## 10.1 Points of interconnect

The demarcation or Points of Interconnect (i.e. POI) between Ausgrid and the Third-Party Carrier fibre network is to be in the external environment i.e. designated Third-Party Carrier pit in the streetscape. Any cable between Ausgrid infrastructure and the POI will be Ausgrid's asset.

## 10.2 Legacy distribution substations

Where Third-Party Carrier equipment is already installed in Ausgrid Distribution substations, patching of fibre will be conducted by Ausgrid.

# 11.0 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 Engineering Technical Documents within BMS. The responsibilities of persons for the design or construction work detailed in this Network Standard are identified throughout this Network Standard in the context of the requirements to which they apply.

# 12.0 RELATED DOCUMENTS

## 12.1 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.

## 12.2 Ausgrid documents

- Bushfire Risk Management Plan
- Company Form (Governance) - Network Technical Document Endorsement and Approval
- Company Procedure (Governance) - Network Technical Document Endorsement and Approval
- Company Procedure (Network) – Network Standards Compliance
- Company Procedure (Network) - Production / Review of Engineering Technical Documents within BMS
- Customer Installation Safety Plan
- Electrical Safety Rules
- Electricity Network Safety Management System Manual
- ES4 – Accredited Service Provider Authorisation
- Hazard Guideline HG-01 - Asbestos
- Hazard Guideline HG-02 – Confined Spaces
- Hazard Guideline HG-17 – Working at Heights
- Level 1 ASP Authorisation Agreement
- NS100 Field Recording of Network Assets
- NS113 Site Selection and Construction Design Requirements for Chamber Substations

- NS130 Specification for Laying of Underground Cables Up to and including 11kV
- NS156 Working Near or Around Underground Cables
- NS171 Fire Stopping in Substations
- NS181 Approval of Materials and Equipment and Network Standard Variations
- NS199 Safe Electrical Work on Low Voltage Underground Assets
- NS211 Working with Asbestos Products
- NS212 Integrated Support Requirements for Ausgrid Network Assets
- NS234 Telecommunications Underground Physical Plant Installation
- Public Electrical Safety Awareness Plan

## 12.3 Other standards and documents

- Australian Standard AS 5577 – 2013 Electricity Network Safety Management Systems
- Australian Standard AS/ACIF S009:2001 Installation Requirements for Customer Cabling (wiring rules)
- Australian/New Zealand Standard AS/NZS 2053 – Conduits and Fittings for Electrical Installations
- Australian/New Zealand Standard AS/NZS 2865 – Safe Working in a Confined Space Australian/New Zealand Standard AS/NZS 3000 – Electrical Installations
- Australian/New Zealand Standard AS/NZS 3085 – Telecommunications Installations – Administration of Communications Cabling Systems
- ENA Doc 001-2008 National Electricity Network Safety Code
- Industry Safety Steering Committee (ISSC) 14 - Guide to Electrical Workers' Safety Equipment
- AS 1742 – Manual of Uniform Traffic Control Devices
- NSW Accredited Service Provider (ASP) Scheme Rules
- Roads and Traffic Authority guide "Traffic Control at Worksites"
- SafeWork NSW Code of Practice - How to Manage and Control Asbestos in the Workplace
- SafeWork NSW Safe Work Practice 4 – Replacing Cabling in Asbestos-Cement Conduits or Boxes

## 12.4 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)

# 13.0 DEFINITIONS

| | |
|---|---|
| **Accredited Service Provider (ASP)** | An individual or entity accredited by the NSW Department of Planning, Industry and Environment, Division of Resources and Energy, in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 (NSW). |
| **Confined Space** | As defined in the Work Health and Safety Regulation 2017 (NSW) |
| **Document control** | Ausgrid employees who work with printed copies of document must check the document repository regularly to monitor version control. Documents are considered "UNCONTROLLED IF PRINTED", as indicated in the footer. |
| **Factory Mutual** | An insurance organisation that provides testing and approvals for firestopping products to be used for specific applications. |
| **Make Ready Work (MRW)** | The work which is required to be carried out prior to or at the time when equipment is being installed in order to ensure compliance with the |

| | |
|---|---|
| | requirements of this document or the requirements of other relevant authorities |
| **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 Sub-Transmission network. These documents are stored in the Network Category of the document repository. |
| **Personnel** | The respective officers, employees, contractors, consultants, advisers or agents, etc. of the party installing communication cables in Ausgrid pits, conduits or substations. |
| **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. Potential needs for a review include changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice and/or identification of efficiency improvements. |
| **Third-Party Carrier** | A communications carrier company (e.g. Telstra, Optus, Vodaphone, NBN Co., etc) that installs their communication cables in Ausgrid pit and conduit network or substations or uses an Ausgrid communication fibre unit under a Facilities Access Agreement with Ausgrid. |

# 14.0 RECORDKEEPING

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

**Table 3 - Recordkeeping**

| Type of Record | Storage Location | Retention Period* |
|---|---|---|
| Approved copy of the Network Standard | Document repository Network sub process Standard – Company | Unlimited |
| Draft Copies of the Network Standard during amendment/creation | Records management system Work Folder for Network Standards (HPRM ref. 2014/21250/307) | Unlimited |
| Working documents (emails, memos, impact assessment reports, etc.) | Records management system Work Folder for Network Standards (HPRM ref. 2014/21250/307) | Unlimited |

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

# 15.0 DOCUMENT CONTROL

**Content Coordinator** : Head of Asset Engineering Policy & Standards

**Distribution Coordinator** : Manager Asset Engineering Standards

# Annexure A –Sample Compliance Checklist

## Network Standard Checklist Form

## NS162 Installation of Fibre Optic Communication Cables in Ausgrid Conduit Network and Substations

| | |
|---|---|
| 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 document repository as a separate form that can be amended as required, completed and saved in the records management system 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.

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** | | |
| | Applies to the installation of fibre optic communication cables in Ausgrid's pit and conduit network and substations. It applies to Ausgrid and Third-Party Carriers as well as the use of Ausgrid fibre units by Third-Party Carriers, however Third-Parties Carriers will be subject to a FAA. Does not apply to copper communication cables or to the ongoing operation and management of communication cables in Ausgrid conduit network and substations. Emergency situations requiring unique solutions are not covered. | 2.0 | |
| | **Responsibilities** | 3 | |
| 1 | Third-Party Carriers, prior to accessing Ausgrid's pits, conduit network and substations must enter into a FAA with Ausgrid. | 3.1 | Yes/No/NA |
| 2 | All work to be to safe standards no less than ENSMS, ESRs NS130, NS156, NS199, ISSC14, relevant Acts, Regulations, SafeWork NSA requirement, appropriate and current authorisations. | 3.2 | Yes/No/NA |

| | | | |
|---|---|---|---|
| 3 | ASP details in Ausgrid ASP Level 1 Authorisation Agreement and ES4 | 3.3 | Yes/No/NA |
| 4 | All designs by ASP/3s | 3.3 | Yes/No/NA |
| 5 | All personnel required to be trained in Electrical Safety Rules | 3.4 | Yes/No/NA |
| 6 | All entry to and work in Confined Spaces must comply with: ESRs, Work Health and Safety Regulation 2017 (NSW), AS 2865. Ausgrid staff shall also comply HG-02. | 3.5 | Yes/No/NA |
| 7 | Fall arrest equipment must be used and comply with: Work Health and Safety Regulation 2017 (NSW). Ausgrid staff shall also comply with HG-17. | 3.6 | Yes/No/NA |
| 8 | Appropriate care to be taken in the identification and safe handling of asbestos, by suitably qualified persons in accordance with all relevant legislation, standards and Codes. | 3.7 | Yes/No/NA |
| 9 | Where required, a traffic management plan for each project must be prepared and implemented in accordance with statutory requirements and related guides. | 3.8 | Yes/No/NA |
| 10 | The designer (including ASP/3s) must consider “safety in design” principals. | 3.9 | Yes/No/NA |
| 11 | All Third-Party Carriers must generate a Technical and Operational Manual. | 3.10 | Yes/No/NA |
| | **Approvals to Use Ausgrid Conduits** | 4 | |
| 12 | Use of conduits subject to:<br>• utilisation of conduits in nominated priority;<br>• maximum number of cables in accordance with Clause 6.1.7;<br>• cables in 63mm or 50mm conduits in accordance with NS234.<br>• cables shall be installed in other size conduits as follows:<br>• last remaining spare conduit space is reserved exclusively for Ausgrid cable.<br>• if a conduit contains maximum number of cables:<br>○ Ausgrid may replace one of Ausgrid’s pre-existing cable/sub-ducts. The new cable must have a fibre count to match the pre-existing Ausgrid cable plus 60 as a minimum.<br>○ Third-Party Carrier may replace one of their pre-existing cables however if the new cable has a greater fibre count than the pre-existing cable refer also to Clause 7.1. | 4.1 | Yes/No/NA |
| 13 | A Third-Party Carrier must in addition to a FAA: obtain Ausgrid approval to use specific conduits, pits and substations, and then follow Ausgrid’s Contestable Connections process in accordance with Clause 4.2. | 4.2 | Yes/No/NA |
| 14 | Ausgrid designers shall prepare a duct study and submit it to the relevant group for approval | 4.3 | Yes/No/NA |
| 15 | Ausgrid groups responsible for approving conduit usage:<br>• 63mm or 50mm: Ausgrid AEPS (Secondary Systems),<br>• 11kV and below: Ausgrid Asset Investment Planning (Distribution Planning) | 4.4 | Yes/No/NA |
| | **Access to Pits, Conduits and Substations** | 5 | |
| 16 | Contractors, and ASPs and Third-Party Carriers seeking to access Ausgrid pit and conduit network and substations must provide: proposed date/time; contact details, SWMS, duration of activity. ASPs also subject to the relevant FAA. | 5.1 | Yes/No/NA |
| 17 | Access to Ausgrid’s Sub-Transmission, Zone and Distribution substations is restricted to Ausgrid staff or Ausgrid contractors. | 5.2 | Yes/No/NA |
| 18 | Third-Party access to “legacy” substations may require Ausgrid stand-by person. | 5.3 | Yes/No/NA |
| | **Design & Installation** | 6 | |
| 19 | MRW: empty conduits to be cleaned and mandrelled in accordance with NS130, conduits with pre-existing cables to be rodded, roped and proved. | 6.1.1 | Yes/No/NA |
| 20 | Pit entry/exit conduits to be sealed in accordance with NS130 | 6.1.2 | Yes/No/NA |
| 21 | New conduits must only enter pits at the ends of the pit and subject to structural assessment. No mid-route conduit breakouts | 6.1.3 | Yes/No/NA |
| 22 | LSZH cables & non-flame propagating and halogen free sub-ducts: mandatory in Sydney CBD and all power cable pits & conduits; recommended for all communication conduits outside Sydney CBD. | 6.1.4 | Yes/No/NA |
| 23 | Cables in power conduits to be installed in continuous sub-duct. | 6.1.5 | Yes/No/NA |
| 24 | Cables in 63mm, 50mm or 20mm conduit shall transition to conduit/sub-duct at pits or substations. | 6.1.5 | Yes/No/NA |

| | | | |
|---|---|---|---|
| 25 | Extra precautions with asbestos conduits | 6.1.6 | Yes/No/NA |
| 26 | Maximum number and diameter of cables/sub-ducts as per Clause 6.1.7 | 6.1.7 | Yes/No/NA |
| 27 | Cable installation must not prevent subsequent removal or installation of other cables | 6.1.8 | Yes/No/NA |
| 28 | Cables to be secured to pit walls and kept suitably clear of other infrastructure | 6.1.9 | Yes/No/NA |
| 29 | Cables to be clearly identified and labelled | 6.1.10 | Yes/No/NA |
| 30 | No Third-Party Carrier equipment such as splice enclosures, fibre termination boxes, fibre storage loops etc permitted in Ausgrid pits. | 6.1.11 | Yes/No/NA |
| 31 | Cable/conduit/sub-duct in Ausgrid substations to be either fire segregated from power cables or LSZH cable and non-flame propagating and halogen free conduit/sub-duct | 6.2.1 | Yes/No/NA |
| 32 | In substations cable must be installed in rigid conduit and neatly installed to not interfere with other infrastructure | 6.2.2 | Yes/No/NA |
| 33 | Substation entry/exit conduits to be fire stopped | 6.2.3 | Yes/No/NA |
| 34 | Communication cables/conduits in substations to be labelled | 6.2.4 | Yes/No/NA |
| 35 | Legacy substation installations in accordance with Clause 6.3 | 6.3 | Yes/No/NA |
| | **Cable Augmentation, Rearrangement and Removal** | 7 | |
| 36 | Third-Party Carrier must follow application process for cable augmentation and re-arrangement | 7.1, 7.2 | Yes/No/NA |
| 37 | Third-Party Carriers shall remove cable/s that are no longer required. | 7.3 | |
| | **Compliance, As-Builts and Records** | 8 | |
| 38 | Installations to be inspected by Ausgrid Compliance Officer Non-conformances will be reported for rectification as appropriate. | 8.1, 8.2 | Yes/No/NA |
| 3916 | As-built documentation must be returned to Ausgrid, within 2 weeks from the installation completion date | 8.3 | Yes/No/NA |
| | **Operations & Maintenance** | 9 | |
| 40 | Third-Party Carriers must ensure their assets are properly maintained | 9.0 | Yes/No/NA |
| 41 | In an emergency, Ausgrid may adjust, remove or alter Third-Party Carrier cables to minimise the effects of a safety matter | 9.1 | Yes/No/NA |
| | **Dark Fibre Units** | 10 | |
| 42 | POIs to be external to Ausgrid pits, conduits and substations | 10.1 | Yes/No/NA |
| 43 | Fibre patching of existing Third-Party Carrier equipment in Ausgrid Distribution substations, will be conducted by Ausgrid. | 10.2 | Yes/No/NA |

Notes: ……

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