Network Standard

NETWORK	Document No : NW000-S0121 Amendment No : 1 Approved By : Chief Engineer Approval Date : 23/11/2015

Minor amendments approved on 01/07/2022

NW000-S0121 **NS235 TELECOMMUNICATIONS UNDERGROUND TO OVERHEAD TRANSITION**

ISSUE

For issue to all Ausgrid and Accredited Service Providers' staff involved with the design and installation of telecommunications cables in Ausgrid premises, 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Where this standard is issued as a controlled document replacing an earlier edition, remove and destroy the superseded document.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

Scope and Risks Addressed

This standard is Ausgrids specification for Telecommunications UGOH design and construction:

- ☐ Applies to all instances where a Telecommunications UGOH is to be designed and constructed.

Where to for more information?

Section 1

UGOH Design and Construction – Poles

This section provides the information required to design and construct a UGOH on a timber or concrete pole:

- ☐ Pit requirement for the UGOH
- ☐ Conduit Installation lining the UGOH to the associated communications pit
- ☐ Cable cover guard to provide physical protection from impact and UV light.
- ☐ Splice closure locations to join the aerial cable to underground network.

Where to for more information?

Section 6

UGOH Design and Construction – Towers

This section provides the information required to design and construct a UGOH on a steel lattice tower:

- ☐ Pit requirement for the UGOH
- ☐ Conduit Installation lining the UGOH to the associated communications pit.
- ☐ Splice closure locations to join the aerial cable to underground network

Where to for more information?

Section 7

Record Keeping

This section details the location of approved and draft standards, including supportive and feedback correspondence.

- ☐ BMS sub processes.
- ☐ BMS folders and retention periods.

Where to for more information?

Section 9

Network Standard
NS235
Telecommunications Underground to Overhead Transition

Contents

1.0 PURPOSE

This document details the minimum requirements for constructing an underground to overhead (UGOH) telecommunications transition on Ausgrid and approved TransGrid assets.

Ausgrid's optical cable network must provide a very high service reliability level for continuity of both internal control networks and other services. Installation must be carried out in accordance with this standard by experienced personnel in a professional manner in order to minimise the risk of subsequent failure.

2.0 SCOPE

The intent of this document is to provide technical compliance requirements that must be addressed in the design and construction of communication UGOH's on Ausgrid assets. It is neither practical nor possible to cover every issue that may arise during a network rollout. In the event that clarification is required the reader must contact the Manager, Communications Engineering. This standard only covers UGOH design and construction for Ausgrid's telecommunication assets.

The UGOH is to be designed and constructed to provide an optical fibre cable transition from an overhead to underground network. This transition will comprise of an optical fibre cable termination on the UGOH pole, the cable will then transition down the structure to a splice closure and pit via conduit housing.

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 Form (Governance) - Network Document Endorsement and Approval
- Company Procedure (Governance) - Network Document Endorsement and Approval
- Company Procedure (Network) - Production / Review of Network Standards
- Customer Installation Safety Plan
- Drawing 212393 Ausgrid Fibre Network Fibre and Duct Arrangement
- Drawing 227403 Standard Construction 33kV UGOH for 3 Core Flexible
- Drawing 93090 LV Service UGOH Cable Cover
- Drawing 185404 OPGW through termination arrangement with fibre optic splice case using Fibrelign fittings for steel tower feeders
- Electrical Safety Rules
- Electricity Network Safety Management System Manual
- NEG TC01 All Dielectric Self Supporting (ADSS) Cable on Poles - Design Guidelines
- NS100 Field Recording of Network Assets
- NS130 Laying of Underground Cables up to and including11kV
- NS135 Construction of Overhead Subtransmission Lines
- NS145 Pole Inspection and Treatment Procedures
- NS174C Environmental Handbook for Construction and Maintenance
- NS181 Approval of Materials and Equipment and Network Standard Variations
- NS201 All Dielectric Self Supporting Fibre Optic Cabling for Installation on Distribution Assets
- NS203 Telecommunications Network: Master Policy Document
- NS204Communications Pits – Specifications and Installation

- NS211 Working with Asbestos
- NS212 Integrated Support Requirements for Ausgrid Network Assets
- NS220 Overhead Design Manual
- NS245 Telecommunications Approved List of Materials
- Public Electrical Safety Awareness Plan
- Public Lighting Management Plan
- Tree Safety Management Plan

3.3 Other standards and documents

- AS7000 Overhead Line Design
- ENA Doc 001-2008 National Electricity Network Safety Code

3.4 Acts and regulations

- Electricity Supply (General) Regulation 2014 (NSW)
- Electricity Supply (Safety and Network Management) Regulation 2014
- Work Health and Safety Act 2011 and Regulation 2017

4.0 DEFINITIONS

Refer to NS001 Glossary of Terms.

5.0 SAFETY AND THE ENVIRONMENT

5.1 General

All works must be completed in accordance with, but not limited to Ausgrids Electrical Safety rules & Environmental Handbook.

Ensure Hazards assessments are completed prior to any design or construction works and any relevant controls put in place prior to works commencing.

5.2 Work Health and Safety legislation

All designs must comply with the requirements of the Work Health and Safety Act 2011 (NSW) and the Work Health and Safety Regulation 2011 (NSW). Ausgrid considers that electricity networks consist of both plant and structures and it requires designers to observe the provisions of the legislation that relate to both.

The designer must give adequate information to each person who is provided with the design plan for the purpose of giving effect to it. The information must include:

- Each purpose for which the plant, substance or structure was designed.
- The results of any calculations, analysis, testing or examination.
- Any precautions necessary to make sure that the plant, substance or structure is without risks to health and safety when used for a purpose for which it was designed or when carrying out any activity related to it, such as construction, maintenance and demolition.

In this context, Ausgrid requires the designer to provide adequate information regarding any plant, substance or structure associated with the design of any network asset, including overhead or underground distribution mains, overhead or underground sub-transmission mains, distribution substations, street lighting, etc. In so doing, the designer must:

(a) Identify hazards that may arise in the application of the design.

(b) Assess the risks to health and safety arising from each hazard.

(c) To the extent possible, eliminate or minimise all risks that may arise during the design development process by designing suitable control measures.

(d) Review the control measures as required and control any residual risks. Provide each person who receives the design all necessary information regarding the safe use of the plant, substance or structure, including the information required by Items (a) to (c) above.

(e) Provide a Designer Safety Report that identifies any unusual or atypical features of the design and all hazards and risks that are unique to the particular design.

(f) Include in the Designer Safety Report an assessment of risks arising throughout the all construction, operation and maintenance phases of all components of the design plan.

(g) Include in the Designer Safety Report appropriate information on the identified hazards, assessment of risks, adopted control measures and the residual risks of all plant and structure comprising the design plan.

The designer must comply with the provisions of the WHS 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 to be presented to Ausgrid.

The Designer Safety Report must be prepared and presented to Ausgrid when the design development process is complete. It must identify all hazards relating to the design that create a

risk to the health or safety of persons who will carry out any activity on the plant, substance or structure, and are unique the particular design. This makes sure that the risks posed will be properly accounted for by persons constructing or using the designed assets, even though they do not usually arise in relation to similar assets.

In complying with Ausgrid's requirements set out in this Standard, designers must rely on their own understanding of the requirements imposed on designers by the WHS legislation, not on any reference to it by Ausgrid in this Standard or elsewhere.

6.0 UGOH DESIGN AND CONSTRUCTION - POLES

6.1 General

The majority of Ausgrid poles are desapped or treated hardwood poles. Some poles may also be a spun concrete construction with internal metal strength members or steel lattice towers.

Telecommunications UGOH's are to be only installed on Ausgrid poles. No UGOH shall be installed on a reinforced (nailed), defective or condemned pole. No UGOH shall be installed on Ausgrid poles that have either reclosers, pole top transformer or an air brake switch attached.

All poles must be inspected to confirm the poles structural integrity prior to UGOH construction.

UGOHs are to utilise approved easement corridors, or land which is approved through standard development agreement or land access agreement process as per the design. The installation must minimise the aesthetic impact, in accordance with community consultation.

Construction shall not commence until the design has been submitted and approved by Ausgrid.

Construction area is to be sufficiently barricaded off to prevent injury to the general public and do not create a security risk to Ausgrid assets at any stage of construction.

6.2 Telecommunications pit

A telecommunications pit is to be located in the vicinity of each communications UGOH. This pit shall be located within a maximum distance of 40m from the proposed UGOH pole.

The telecommunications pit shall be a locked, size 8 concrete communications pit as per NS204. Conduit shall enter the pit from the designated ends, and not via the side walls, (i.e. through the shorter end(s), not the longer)

6.3 Conduit installation

The communications conduit shall be installed with the HV conduits as per NS130. This communications conduit shall deviate out from the HV conduit configuration as per TDMS drawing 212393 to a communications pit installed as per section 6.1 above. The conduit between the pit & UGOH riser is to be identified with cable markers as per NS205. The communications conduit is to then proceed from the pit to the UGOH pole maintaining its depth of 600mm minimum cover below ground level.

The communications conduit shall be a 50mm OD conduit high density orange PVC conduit for UGOH's. The conduit will not have no more than 270 degrees of total bends between the pit and pole. All bends shall have a minimum bend radius of 600mm.

The PVC conduit is to ascend the pole to the same height as the riser cover. The riser conduit is to be located where possible on the down traffic side of the pole. This riser conduit is then to be enclosed in a metallic cable cover.

Excavations are to be reinstated in order to minimise the visible "scar" and the likelihood of erosion.

6.4 UGOH cable cover

The cable cover is to be installed over the riser conduit to provide physical and mechanical protection to the conduit and cable. The cover is to be metallic. The cover is to extend to a minimum height of 3m above and 200mm below ground level.

6.4.1 Timber poles

For timber poles a minimum 3mm thick mild steel cover is to be utilised, (refer to drawing 93090). This cover is to fit securely over the conduit to provide support to the riser as it ascends the pole, removing the need to saddle the conduit to the pole. The cover is to be secured to the timber pole with M12 x 50mm galvanised coach screws through the lug holes.

6.4.2 Concrete poles

Where a communications UGOH coincides with a sub-transmission UGOH, communications UGOH construction is to be as per drawing 227403. Communications UGOH's shall not be installed on concrete poles that have an 11kV UGOH present.

For stand-alone communications UGOH's on concrete poles, these will utilise the same cable cover as would be used for a wooden pole. This cover is to be secured to concrete pole via 12.7mm band-it straps. The band-it strap is to be threaded through the lug holes so as to allow the strap to pass under the curved section of the cover guard and the riser conduit as per figure 1 below.

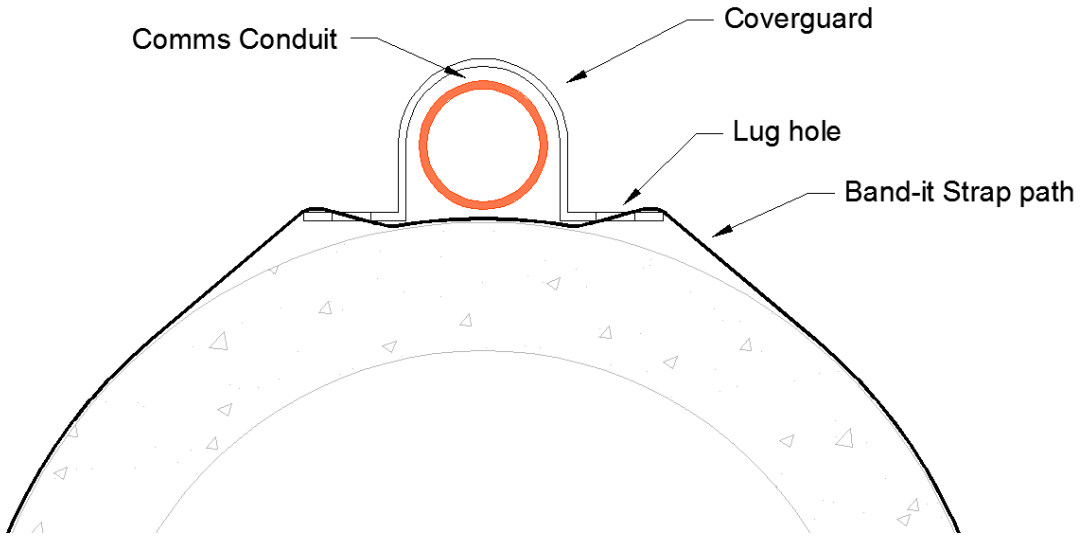

Figure 1 – Cover guard attached to concrete pole via band-it strap

6.5 Splice closure locations

Where the cable transitions from an underground fibre optical cable a splice closure is required. As underground fibre cable are not UV stabilised the locations of the splice closure will vary depending upon which cable the underground cable joins, i.e. ADSS or OPGW.

6.5.1 OPGW

OPGW to UGFO slice closures are to be located on the UGOH pole above the riser conduit. The splice closure will be located a minimum 4.4m above ground level, while maintaining minimum safe working distances from conductors.

The underground fibre cable is to have a 40m cable coil to be stored in the communications pit at the base of the UGOH. Cable coil must not kink the optical fibre cable and must not compromise

the minimum bend radius of the cable. The underground fibre cable is to be installed in a flexible conduit once it exits the communications conduit riser on the pole to provide UV protection. A conduit reducer is to be installed to allow the rigid conduit to transition to the flexible conduit. The corrugated conduit is to continue over the UGFO up to the splice enclosure and then fixed to desired port in the base.

The OPGW cable will terminate on the UGOH pole and descend down the pole to OPGW cable coil bracket. The cable shall be attached to the pole using approved down lead cushion clamps spaced at a maximum distance of 900mm between clamps. If ferrules are not available to attach the cushion clamps to the pole then the clamps are to be attached using 10mm band-it straps. At no point should the concrete pole be drilled without specific Ausgrid approval.

Sufficient UGFO and OPGW cable is to be coiled on the pole bracket to allow the splice closure to descend to ground level plus an additional 10m. Coils shall be secured to cable bracket utilising approved stainless steel cable tie.

6.5.2 ADSS

ADSS to UGFO splices are to be located in the communications pit at the base of the UGOH pole.

The ADSS cable will terminate on the UGOH pole and descend down the pole to riser conduit. The cable shall be attached to the pole using approved down lead cushion clamps spaced at a maximum distance of 900mm between clamps.

A minimum of 20m of ADSS and 20m of UGFO cable is to be coiled in the pit at the base of UGOH pole. Cable coils must not kink the optical fibre cables and must not compromise the minimum bend radius of the cable.

It is at the designers/constructors discretion if an ADSS cable coil is left on the pole in addition to the coil in the pit.

7.0 UGOH DESIGN AND CONSTRUCTION – TOWERS

7.1 General

In some instances a telecommunications UGOH may be required on a lattice tower. OPGW is the preferred optical fibre cable construction for lattice towers. If an ADSS cable is utilised on the tower then Communications Engineering is to be consulted prior to design and construction.

UGOHs are to utilise approved easement corridors, or land which is approved through standard development agreement or land access agreement process as per the design. The installation must minimise the aesthetic impact, in accordance with community consultation.

Construction shall not commence until design has been submitted and approved by Ausgrid.

Construction area is to be sufficiently barricaded off to prevent injury to the general public and do not create a security risk to Ausgrid assets at any stage of construction.

7.2 Telecommunications pit

A telecommunications pit is to be located in the vicinity of each communications UGOH. This pit shall be located within a maximum distance of 40m from the proposed UGOH tower.

The telecommunications pit utilised shall be a locked, size J8 concrete communications pit as per NS204. Conduit shall enter the pit from the designated ends, and not via the side walls, (i.e. through the shorter end(s), not the longer)

7.3 Conduit installation

The communications conduit shall be installed with the HV conduits as per NS130. This communications conduit shall deviate out from the HV conduit configuration as per TDMS drawing 212393 to a communications pit installed as per section 7.1 above. The conduit between the pit & UGOH riser is to be identified with cable markers as per NS205. The communications conduit is to then proceed from the pit to the UGOH pole maintaining its depth of 900mm minimum cover below ground level.

Excavations are to be reinstated in order to minimise the visible “scar” and minimise the likelihood of erosion.

The communications conduit shall be a 50mm OD galvanised steel conduit. The conduit will not have no more than 270^{8} of total bends between the pit and tower. All bends shall have a minimum bend radius of 600mm.

This galvanised conduit shall act as a cover guard for the fibre cable, avoiding the need to install any additional cover guard attachments to the tower.

This conduit shall continue from the pit to the nearest leg of the tower which has the OPGW splice closure attached. The galvanised conduit shall then ascend the tower leg to a minimum height of 3m above ground level. The galvanised conduit is to be secured to the outside of the leg of the tower with stainless steel zip ties spaced at a maximum spacing of 500mm.

This construction will not obstruct any nuts or bolts on the leg of the tower. The conduit shall be bent to go around / over the tower footings. All care must be taken so as not to damage / compromise the footing of the tower. The lattice tower must not be drilled at any stage of construction.

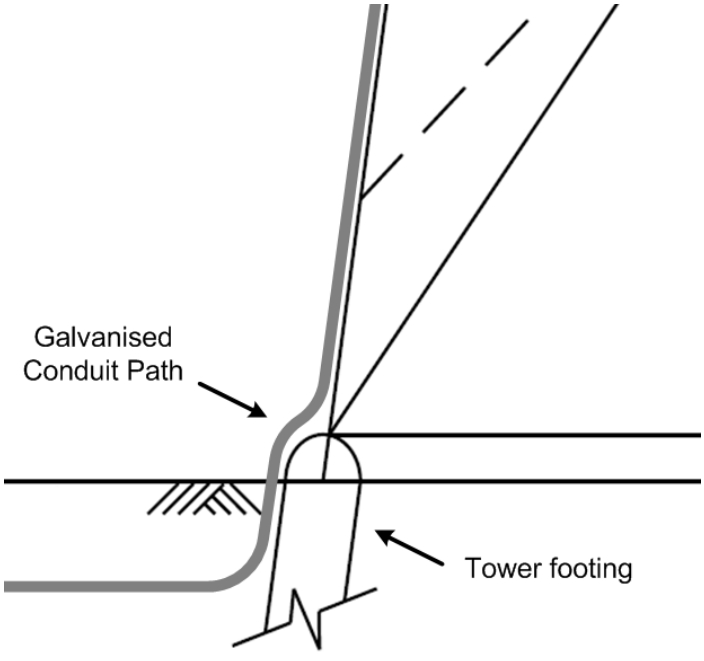

Figure 2 – Conduit path over tower footing

7.4 Splice closure locations

Where the cable transitions from an underground fibre optical cable a splice closure is required. This splice closure is to be located on the pole as per drawing 185404.

The OPGW cable will terminate on the tower and descend down to the OPGW cable coil bracket and splice closure as per drawing 185404. The cable shall be attached to the pole using approved

down lead cushion clamps spaced at a maximum distance of 1500mm between clamps. At no point should the steel tower be drilled.

Sufficient UGFO and OPGW cable is to be coiled on the pole bracket to allow the splice closure to descend to ground level plus an additional 10m. Coil to be secured to pole bracket with stainless steel cable ties.

The underground fibre cable is to have a 40m cable coil to be stored in the communications pit at the base of the UGOH. Cable coil must not kink the optical fibre cable and must not compromise the minimum bend radius of the cable. The underground fibre cable is to be installed in a flexible conduit once it exits the communications conduit riser on the pole to provide UV protection. A conduit reducer is to be installed to allow the rigid conduit to transition to the flexible conduit. The corrugated conduit is to continue over the UGFO up to the splice enclosure and then fixed to desired port in the base.

8.0 SECURITY

The UGOH must be secured to the pole in such a manner so as to not create a security risk. The UGOH must be installed in such a manner to reduce the climb-ability of the pole.

All pits must be locked and lids secured to ensure no unauthorised access to pit.

All trenching must be completed as per NS234 to ensure the “scar” will not create a depression or erode along the excavation path.

9.0 RECORDKEEPING

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

Table 1 – 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	Work Folder for Network Standards (Trim ref. 2014/21250/164)	Unlimited
Working documents (emails, memos, impact assessment reports, etc.)	Records management system Work Folder for Network Standards (Trim ref. 2014/21250/164)	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.

10.0 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.

11.0 DOCUMENT CONTROL

Content Coordinator : Control & Protection Engineering Manager

Distribution Coordinator : Manager Asset Standards

Annexure A – Design Compliance Checklist

Network Standard Design Checklist Form

NS235 Telecommunications UGOH Transition

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		
	The intent of this document is to provide technical compliance requirements that must be addressed in the design and construction of communication UGOH's on Ausgrid assets.		
	Design Responsibilities		
1.	Design compliance with Ausgrid Electrical Safety Rules as well as WHS Act 2011 & associated Regulation	4.1	Yes/No/NA
2.	Design compliance with NUS174 and all relevant laws, rules, regulations and guides for environmental impact assessment	3.0	Yes/No/NA
3.	Design assesses & recommends mitigation of risks associated with asbestos in the work place in accordance with Ausgrid's NUS211 Working With Asbestos Products and all relevant laws, rules, regulations and guides	3.0	Yes/No/NA
4.	Installation is designed to utilize approved easement corridors, or land which is approved through standard development agreement or land access agreement process	6.0 & 7.0	Yes/No/NA
5.	The installation is designed to minimize aesthetic impact, in accordance with community consultation	6.0 & 7.0	Yes/No/NA
6.	Design specifies reinstatement to minimize scar & prevent subsidence	6.2 & 7.2	Yes/No/NA
7.	Designed works do not create security risks for Ausgrid assets, or safety	6.0 & 7.0	Yes/No/NA

Item	Description	Refer Clause	Completed/ Actioned
	hazards		
8.	Design specifies the end-to-end enclosure of cables which are not UV stabilized, such that the entire cable length shall be out of direct sunlight	6.4.1 & 7.3	Yes/No/NA
9.	Design accounts for conduit reducers to change from 50mm UGOH conduit to corrugated flexible conduit to protect cable that is not UV stabilized through to the sealed pole mounted splice enclosure entry port, or sealed building entry point	6.4.1 & 7.3	Yes/No/NA
10.	Corrugated flexible conduit is secured to the pole mounted coil bracket by stainless steel ties	6.4.1 & 7.3	Yes/No/NA
11.	Mechanical protection for UGOH conduit/s is designed to extend from 200mm below ground surface to 3000mm above ground	6.3	Yes/No/NA
12.	ADSS cable is designed to be cushion clamped down the pole at 900mm intervals through to the riser conduit	6.4.2	Yes/No/NA
13.	Design specifies 50mm OD orange conduit for UGOH transitions	6.2	Yes/No/NA
14.	Conduits are designed to enter the end wall of the J8 telecommunications pit (smaller dimension wall), not the side wall (larger dimension wall)	6.1 & 7.1	Yes/No/NA
15.	Design minimizes the number of conduit bends for UGOH transitions	6.2 & 7.2	Yes/No/NA
16.	Design specifies conduit installation at 900mm depth of cover or more	6.2 & 7.2	Yes/No/NA
17.	Designs for UGOH transitions in road reserve specify attaching the UGOH riser to the side of the pole furthest away from oncoming traffic	6.2	Yes/No/NA
18.	Protection fibre cable is designed such that it is only installed through securely locked pit infrastructure fitted with Ausgrid substation type padlocks as per NS204	6.1 & 7.1	Yes/No/NA
19.	Designs preferably install fibre cable splices in the pit at the base of UGOH transitions rather than on the pole for enclosures that do not splice to OPGW	6.4	Yes/No/NA
20.	Designs account for route locatability according to NS205	6.2 & 7.2	Yes/No/NA
21.	Designs specify Ausgrid approved materials	3.0	Yes/No/NA
22.	Design documentation is sent to Ausgrid for review & approval prior to construction release	6.0 & 7.0	Yes/No/NA
23.	Design allows for a pit to be installed at the base of each UGOH transition or no more than 40m from the base of the pole	6.1 & 7.1	Yes/No/NA

All check list items marked '×' above shall be referenced & submitted for approval in the below variation table along with supporting documentation, prior to design release.

Design variations to standard materials &/or Network Standards	Signature
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____

Design variations to NS235 must be submitted to Ausgrid's Senior Engineer responsible for Telecommunications Area Planning for approval and signature prior to construction release.

Design check sheet verified & approved by:_____

Signature:_____ Date:_____

Annexure B – Construction Compliance Checklist

Network Standard Construction Checklist Form

NS235 Telecommunications UGOH Transition

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		
	The intent of this document is to provide technical compliance requirements that must be addressed in the design and construction of communication UGOH's on Ausgrid assets.		
	Construction Responsibilities		
1.	Construction compliance with WHS Act 2011 & associated Regulation as well as Ausgrid Electrical Safety Rules	4.1	Yes/No/NA
2.	Construction compliance with NUS174 and all relevant laws, rules, regulations and guides for environmental impact assessment	3.0	Yes/No/NA
3.	Construction assesses & mitigates risks associated with asbestos in the work place in accordance with Ausgrid's NUS211 Working With Asbestos Products and all relevant laws, rules, regulations and guides	3.0	Yes/No/NA
4.	Installation utilizes approved easement corridors, or land which is approved through standard development agreement or land access agreement process as per the design	6.0	Yes/No/NA
5.	The installation minimizes aesthetic impact, in accordance with community consultation	6.0	Yes/No/NA
6.	Route reinstatement is performed to minimize scar & prevent subsidence	6.2 & 7.2	Yes/No/NA
7.	Construction works do not create security risks for Ausgrid assets, or safety	6.0 & 7.0	Yes/No/NA

Item	Description	Refer Clause	Completed/ Actioned
	hazards at any stage of the installation process		
8.	Cables which are not UV stabilized are enclosed & out of direct sunlight for the entire route	6.4.1 & 7.3	Yes/No/NA
9.	Conduit reducers are installed to change from 50mm UGOH conduit to corrugated flexible conduit to protect cable that is not UV stabilized through to the sealed pole mounted splice enclosure entry port, or sealed building entry point	6.4.1 & 7.3	Yes/No/NA
10.	Corrugated flexible conduit is secured to the pole mounted coil bracket by stainless steel ties	6.4.1 & 7.3	Yes/No/NA
11.	Mechanical protection for UGOH conduit/s extends from 200mm below ground surface to 3000mm above ground	6.3	Yes/No/NA
12.	ADSS cable is cushion clamped down the pole at 900mm intervals through to the riser conduit	6.4.2	Yes/No/NA
13.	50mm OD orange conduit is used for UGOH transitions	6.2	Yes/No/NA
14.	Conduits enter the end wall of the J8 telecommunications pit (smaller dimension wall), not the side wall (larger dimension wall)	6.1 & 7.1	Yes/No/NA
15.	The number of conduit bends for UGOH transitions is minimized	6.2 & 7.2	Yes/No/NA
16.	Conduits are installed at 900mm depth of cover or more	6.2	Yes/No/NA
17.	UGOH transitions in road reserve attach the UGOH riser to the side of the pole furthest away from oncoming traffic	6.2	Yes/No/NA
18.	Protection fibre cable is only installed through securely locked pit infrastructure fitted with Ausgrid substation type padlocks as per NS204	6.1 & 7.1	Yes/No/NA
19.	Where possible, fibre cable splices are installed in the pit at the base of UGOH transitions rather than on the pole for enclosures that do not splice to OPGW	6.4	Yes/No/NA
20.	Pit alignment & installation is in accordance with NS204	6.1	Yes/No/NA
21.	Only Ausgrid approved materials are used	3.0	
22.	Designs account for route locatability according to NS205		
23.	A pit is installed at the base of each UGOH transition or no more than 40m from the base of the pole	6.1 & 7.1	
24.	Telecommunications infrastructure "as built' documentation is in compliance with NUS100 and includes GPS coordinates which are sent to Ausgrid at the earliest possible convenience & no more than one week from construction completion, whereby acceptance of the 'as built' infrastructure will be assessed by Ausgrid	3.0	

All check list items marked '×' above shall be referenced & submitted for approval in the below variation table along with supporting documentation, prior to construction commencement.

Construction variations to standard materials &/or Network Standards	Signature
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____
Cross reference to check sheet & explanation of non-conformance	Name:_____ Title:_____ Signature:_____ Date:_____

Construction variations to NS235 must be submitted to Ausgrid's Senior Engineer responsible for Telecommunications Area Planning for approval and signature prior to construction release.

Construction check sheet verified & approved by:_____

Signature:_____ Date:_____