

## Network Standard

### NETWORK

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**NS165 SAFETY REQUIREMENTS FOR NON-ELECTRICAL  
WORK IN AND AROUND LIVE SUBSTATIONS**



## ISSUE

For issue to all workers involved with the construction work, including excavation, in Ausgrid's substations and switching stations.

Ausgrid maintains a copy of this and other Network Standards together with updates and amendments on [www.ausgrid.com.au](http://www.ausgrid.com.au).

Where this standard is issued as a controlled document replacing an earlier edition, remove and destroy the superseded document.

## DISCLAIMER

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

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

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

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

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

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

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

## INTERPRETATION

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

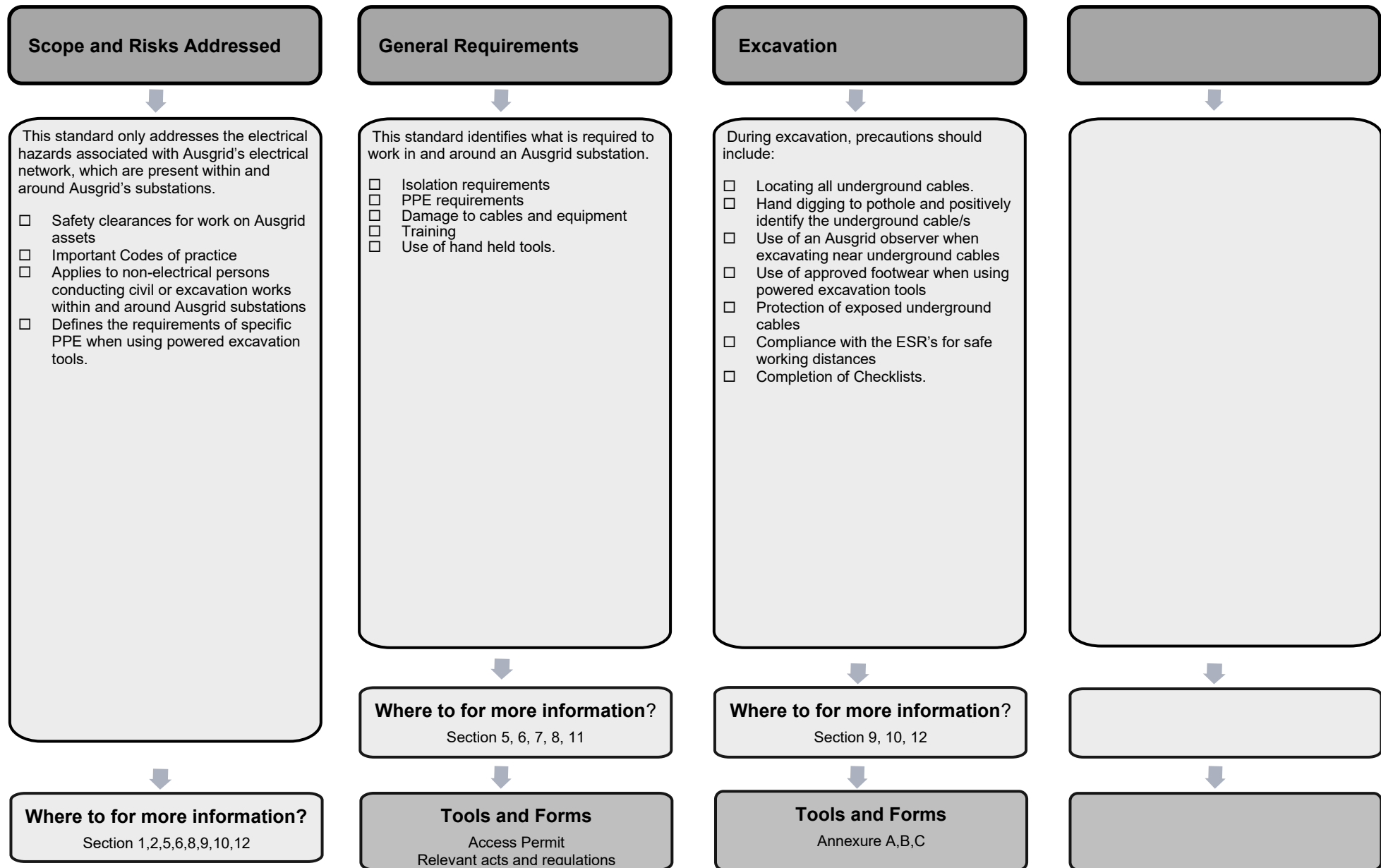
## KEYPOINTS

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

## AMENDMENTS TO THIS STANDARD

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

# KEY POINTS OF THIS STANDARD



# Network Standard NS165 Safety Requirements for Non-Electrical Work in and around Live Substations

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## 1.0 PURPOSE

Network Standard NS165 specifies Ausgrid's requirements for all non-electrical work, including excavation work, in and around Ausgrid's in-service sub-transmission and zone substations, switching stations and other installations where specified in contract documents. The requirements of this Standard shall apply throughout Ausgrid's supply area. This Network Standard applies to employees, contractors and Accredited Service Providers (ASPs) undertaking construction works on or near Ausgrid network assets.

## 2.0 SCOPE

This Network Standard applies to all non-electrical work, including excavation work, in and around Ausgrid's in-service sub-transmission and zone substations and switching stations and other installations where specified in contract documents. It encompasses:

- high risk construction work as per WHS Regulation 2017;
- structural and civil works including scaffolding and fencing work;
- excavation works within substations and immediately outside substation fences;
- construction work on foundations and structures for electrical equipment;
- work on oil containment installations;
- work on substation fences, gates, windows and doors;
- work associated with the installation of barriers, vents and grills associated with substation risk mitigation works, including fire-stopping work;
- maintenance work including roofing works to existing substation buildings; and
- construction of new substation buildings and extension of existing substation buildings, within existing substations, including the associated activities of all building trades.

This Network Standard does not apply to:

- (a) Work involving the installation or removal of electrical equipment, any other electrical installation work, or electrical maintenance or repair work. The Ausgrid Electrical Safety Rules apply to normal maintenance activities, and it is not intended that this Network Standard be applied in those circumstances. All work should be assessed to determine the level of risk and the appropriate Regulations, Codes, Standards and Guidelines that apply to that type of work.
- (b) Routine maintenance work carried out by contractors, such as maintenance of a security system, fire alarm system or water treatment system within substations, where the contractor, having completed substation entry training and related statutory training, is issued with substation keys and authorised to enter substations for the purpose of carrying out a specific maintenance activity.
- (c) Construction work on a new substation which is deemed to be a green field site, prior to that substation being electrically connected to the Ausgrid network.

The requirements of all other relevant Network Standards must also be complied with.

The principal objective of this Network Standard is to specify and achieve a safe system of work, having regard to the electrical hazards in substations.

**WARNING**

Substations are extremely hazardous electrical environments.  
Extreme care must be taken at all times.

## 3.0 REFERENCES

### 3.1 General

All work covered in this document must 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](http://www.ausgrid.com.au).

### 3.2 Ausgrid documents

- Company Procedure (Network) - Production / Review of Engineering Technical Documents within BMS
- Electrical Safety Rules
- NS130 Specification for Laying Underground Cables Up to and Including 11kV
- NS156 Excavating Near Ausgrid Underground Cables or Conduits
- NS174 Environmental Procedures
- NS211 Working with Asbestos Products
- NS222 Major Substation Earthing Design

### 3.3 Other standards and documents

- AS/NZS 1892.3 Portable Ladders part 3: Reinforced plastic
- AS/NZS 3012 Electrical Installations – Construction and Demolition Sites
- ISSC14 Guide to Electrical Workers' Safety Equipment

### 3.4 Acts and regulations

- Work Health and Safety Act 2011 and Regulation 2017

## 4.0 DEFINITIONS

Refer to NS001 Glossary of Terms.

## 5.0 INTRODUCTION

### 5.1 General

This Network Standard only addresses the electrical hazards, associated with Ausgrid's electrical network, which are present within Ausgrid's substations. This Network Standard is not intended to cover other hazards, including construction hazards, for which persons working in substations should also address in their Site Safety Plan, Safe Work Method Statements and written risk assessments as appropriate.

The roles and responsibilities for addressing electrical hazards in substations and for providing safe work methods to address these hazards must be included. Persons working in substations must include the safe work method requirements of this Network Standard in their own Site Specific Safety Management Plans, Safe Work Method Statements and written risk assessment.

As it is not always reasonably practicable to eliminate all risks associated with electrical hazards in substations, contractors and construction workers must use control measures to minimise the risks to As Low As Reasonably Practicable (ALARP) in accordance with the following hierarchy of controls:

1. Substitute the risk by using an alternative item of equipment which would be of a lesser hazard.
2. Isolate the source of hazard from the persons put at risk.
3. Design the work to minimise the risk. This measure provides opportunity to control the risk and is addressed by this Network Standard.
4. Implement appropriate safe working practices in accordance with the Ausgrid Electrical Safety Rules including Safe Work Method Statements, Safe Operating Procedures, training, and instruction.
5. Use personal protective equipment (PPE).

Variations from this Network Standard are not permitted, unless written approval has been given by Ausgrid before the revised work method is adopted and implemented. Where revised work methods are approved, Ausgrid will require compliance with all safety precautions outlined in this document. All work methods must comply with the Ausgrid Electrical Safety Rules.

Control measures as specified in this Network Standard must be implemented when work is done in the vicinity of mains and apparatus. Any additional control measures specified by Ausgrid must also be implemented.

High voltage power lines or electrical conductors must always be treated as energised or 'live', unless isolated, proved de-energised, earthed and short circuited by approved means and under access permit.

Low voltage power lines or electrical conductors must always be treated as energised or 'live', unless isolated and proved de-energised. This includes control, protection or communication cables.

All persons must comply with the requirements of the Ausgrid Electrical Safety Rules. Refer in particular to the sections on minimum safe working distances, High Voltage work and Low Voltage work.

In addition, all work must be carried out in accordance with appropriate Safe Work Method Statements (SWMS) which must be prepared by the work team undertaking the job and then reviewed by Ausgrid prior to the start of each job.

## 5.2 Responsibilities

### 5.2.1 General

Responsibilities of persons referred to in this document are indicated in the following sections.

### 5.2.2 Contractors and construction workers

Contractors and construction workers must comply with all of the requirements of this Network Standard.

Where required by the contract, contractors must appoint a contractor's Designated Officer. Ausgrid must approve the appointment of the contractor's Designated Officer before that person undertakes the responsibilities and performs the duties as the contractor's Designated Officer.

The construction worker must follow the directions given by the stand-by person (see Clause 5.2.4), access permit recipient and the contractor's Designated Officer on the site.

Where specified by Ausgrid, the contractor will be responsible for preparing, submitting for approval, displaying and ensuring that the works comply with:

- an Environmental Management Plan;
- a Site Specific Safety Management Plan; and
- a Site Specific Risk Management Plan.

### 5.2.3 Access permit recipient

The access permit recipient must be suitably trained and authorised to carry out the duties of a recipient under the Ausgrid Electrical Safety Rules.

### 5.2.4 Stand-by person (provided by Ausgrid)

Ausgrid will appoint a stand-by person where required to be present on site at all times whilst work is being undertaken.

The stand-by person's role is as follows:

- act as the stand-by person as defined in the Ausgrid Electrical Safety Rules;
- confirm that the construction worker has a current Safe Work Method Statement (SWMS) for the work;
- confirm that all relevant training for the construction worker is current;
- monitor worker compliance with the requirements of this standard and the Ausgrid Electrical Safety Rules;
- stop all works on site immediately if any member of the work party is not conforming to any of the requirements of this Network Standard or the Ausgrid Electrical Safety Rules; and
- Maintaining the security of the substation as per the Ausgrid Electrical Safety Rules to confirm the substation is fully secured throughout the duration of the work to prevent public access to the substation and to live equipment.

### 5.2.5 Contractor's designated officer

The contractor's Designated Officer must be responsible for all work carried out by the construction worker and any sub-contractors on the site.

The contractor's Designated Officer must confirm that the persons who may be making deliveries to the site of plant, materials or equipment and all visitors to the site are inducted on the site having all hazards clearly explained and are instructed in the safe working methods and systems of work

for that site. The contractor's Designated Officer must keep written records of those inductions and must have all persons sign the induction register or visitor's book. The contractor's Designated Officer must also strictly supervise those persons until they leave the work site.

The contractor's Designated Officer must be responsible for the general WHS requirements for any person on the site including persons who are visiting the site on behalf of the contractor or Ausgrid.

The contractor's Designated Officer must be aware of and must review for compliance the method of work of any persons coming on to the site.

The contractor's Designated Officer must not permit any persons on site who cannot produce an Ausgrid identification card and a Network Passport that proves mandatory training is current.

The contractor's Designated Officer must supervise the work on site at all times. While performing this task, the contractor's Designated Officer must not operate any machinery or equipment and must not perform any other task that would prevent ensuring that all work on site is performed in accordance with Safe Work Method Statements for each scope of work.

The contractor's Designated Officer must notify Ausgrid before leaving the site for any reason. Ausgrid may decide that some or all work on site is to be suspended during this absence. Under these circumstances the site must be made safe, the site must be completely vacated, and all gates and doors must be locked, until another suitably trained, qualified and inducted contractor's Designated Officer is made available by the contractor to supervise the work.

If it is deemed by Ausgrid that the contractor's Designated Officer is not performing the duties adequately, then Ausgrid may direct that any or all of the works on that site are to be suspended until the contractor provides a suitable competent replacement.

### 5.3 Major work hazards in substations

Major work hazards in substations include, but are not limited to the following:

- Contact with, or close approach to overhead live busbars, insulators and conductors;
- Damage to underground cables by excavation, movement, or incorrect bedding materials and compaction techniques;
- Damage to control cables (short term and longer-term hazard created, as electrical system protection equipment may not operate when required or may malfunction);
- Damage to earthing grid (may result in structures becoming live in substation and unequal ground potentials in substation yard);
- Damage to fibre optic cables, including injury resulting from glass splinters;
- The presence of induced voltages in live substations and close proximity to overhead conductors;
- Low voltage cables with an exposed conductive sheath or armour.

The consequences of these hazards may include explosions, burns, electric shock and death.

This Network Standard has been prepared to assist the contractor in managing, reducing and eliminating the above work hazards and to specify work methods to eliminate or reduce the risks that may be associated with these hazards.

### 5.4 Asbestos

All materials and equipment used for construction and maintenance of Ausgrid's assets must be free from asbestos or asbestos related products. Suppliers must comply with the Work Health and Safety Act 2011 (NSW) together with the Work Health and Safety Regulation 2011 (NSW) and must confirm in writing that all products supplied to Ausgrid contain no asbestos containing materials.

All work must also comply with NS211 Working with Asbestos Products.

## 6.0 GENERAL REQUIREMENTS

### 6.1 Access permits – general

The four types of access permits or authorities used by Ausgrid are:

- access permit for work;
- access permit for test and ancillary work;
- restricted access permit for work; and
- clearance to work.

The access permit for work is generally used for routine maintenance and repair work on Ausgrid's high voltage network where the work requires workers to come within minimum safe working distances of exposed high voltage conductors. This is the usual form of access permit provided to both authorised workers and contractors and is the form of access permit which will be issued, when required.

The contractor responsible for planning or scheduling the work must confirm that arrangements have been made for the appropriate permits to be issued. Access permits may require more than four (4) weeks' notice to obtain.

#### 6.1.1 When access permits are required

The need for access permits is determined by Ausgrid and the contractor's Designated Officer may also be consulted.

If required by Ausgrid, temporary or permanent barriers may need to be installed to safely isolate the work site and work activities from live equipment in the substation. The design of these barriers, together with their installation, must be approved by Ausgrid prior to use near any live equipment.

A determination will be made on a case by case basis if the isolation of any equipment and the issue of an access permit is required prior to excavating around secondary cables for that equipment. If isolation is required, the following instructions will apply for Ausgrid employees:

- (a) Access permit required on equipment nominated;
- (b) Isolate DC on protection panel and VR supplies (for a transformer coming out of service) before construction worker starts excavation;
- (c) Before restoring the equipment, reinstate the protection and Megger test the AC and DC wiring to earth.

**Note:** Further information on access permits can be found in the Ausgrid Electrical Safety Rules.

### 6.2 Personal protective equipment (PPE)

**All PPE must comply with the Ausgrid Electrical Safety Rules.**

### 6.3 Ladders

Portable metal ladders or wooden ladders with wire reinforcement must not be used in substations. Special purpose, non-conductive ladders approved by Ausgrid are accepted, provided their usage complies with the requirements of both the Ausgrid Electrical Safety Rules and AS/NZS 1892.3:1996 Portable ladders Part 3: Reinforced plastic.

### 6.4 Split conduits for cables

Where split conduits are required to be placed around cables, the contractor must contact Ausgrid to arrange for split conduits to be placed. Ausgrid will either arrange for placement of the split conduits to be carried out by Ausgrid, or by the contractor to the satisfaction of Ausgrid. The split conduits will be supplied by Ausgrid and installed in accordance with the precautions and

requirements of the Ausgrid Electrical Safety Rules and NS130 Specification for Laying Underground Cables Up to and Including 11kV and NS156 Working Near or Around Underground Cables.

## 6.5 Damage to equipment or installations

Damage to electrical equipment and damage to installations and buildings must be reported immediately to Ausgrid. This includes damage by excavation, explosion, fire, flood, storm, lightning strike, accident or vandalism and includes broken walls, doors or windows. Ausgrid may instruct a person to remain at the location of the damage until assistance arrives.

### 6.5.1 Damage to electrical conductors

The contractor must notify Ausgrid immediately if any cables are stolen, scraped or damaged in any way, no matter how minor it may seem. The contractor must notify Ausgrid immediately if the earthing grid is damaged in any way. This includes damage to earthing straps and earthing rods.

In the event that any incident occurs that results in damage to the network, then the contractor must cease work immediately and the construction workers must move to a safe location until the damage can be assessed by Ausgrid.

The above requirements are essential to maintain safe electrical controls for the network and for persons working in the substation yard. There are serious implications for safety in the substation if any cable or earthing grid damage is not reported. These circumstances could result in yard structures becoming live and electrical protection for equipment not working, possibly causing electrocution, explosion and fire. Ausgrid will carry out random audits to check for cable damage. Contractors must meet the costs, as determined by Ausgrid, for the repair of damaged cables.

## 6.6 Low voltage rescue kit

A Low Voltage Rescue Kit must be located on-site in accordance with the Ausgrid Electrical Safety Rules before commencement of the works. The kit must be easily accessible to persons working in the substation.

Where not supplied by Ausgrid under a contract arrangement or other agreement, a Low Voltage Rescue Kit may be purchased from Ausgrid's Logistics Branch or, from other suppliers, provided that they are compliant with Ausgrid's specifications.

Low Voltage Rescue Kits must only be used by workers trained in low voltage Release and Rescue techniques.

There is no safe technique for rescue from energised High Voltage apparatus.

## 6.7 Electrical equipment and installations

Any electrical equipment or installations used in association with the work must comply with the WHS Regulation. Activities that are considered to be "construction or demolition" must comply with AS/NZS 3012. Electrical equipment used in "hostile operating environments" as defined by the WHS Regulation must be protected by suitably maintained and tested RCDs.

## 7.0 TRAINING REQUIREMENTS

### 7.1 General

A prerequisite for any other Ausgrid training will be the SafeWork accredited Construction Industry Induction Training and Ausgrid General Induction Training.

It is a requirement that all construction workers attend the appropriate training as determined by a site and task specific risk assessment whilst complying with the training requirements detailed in the Ausgrid Electrical Safety Rules.

All training will be competency based and assessments will be carried out to confirm competence.

These courses may include but are not necessarily limited to:

- Written risk assessment;
- Low Voltage Release and Rescue;
- CPR (Cardiopulmonary Resuscitation);
- Substation Entry;
- Electrical Safety Rules;
- Safely Working Near Live Power Cables in Ausgrid's Network;
- Environmental Awareness;
- Cable Diagram Reading (GIS map reading).

It is the responsibility of the contractor to ensure all their employees have currency with respect to Ausgrid's training before they can commence work on site.

## 7.2 Cable drawings

When excavation is to be undertaken on site, the contractor's Designated Officer must be able to read Ausgrid cable drawings. The contractor's Designated Officer must be responsible for reviewing the cable drawings in the vicinity of excavation work and directing the construction workers.

Ausgrid will provide the contractor's Designated Officer with the necessary cable drawings prior to the commencement of work on site. The contractor's Designated Officer must confirm that the cable diagrams provided by Ausgrid are examined and that all of the construction workers are fully aware of all aspects relevant to their work.

## 7.3 Requirements for additional cable identification

In addition to using other information on cables, contractors must use all visible signs of cables entering the ground to help determine if any cables are present in the vicinity of the works.

This may include cables entering the ground from structures, from cable chases and pits, from light poles and from yard general purpose outlets.

Ausgrid does not guarantee that all cables present have been located and the contractor and construction workers must allow for circumstances where some cables may have been missed.

Contractors must review all cable drawings before excavation to determine the extent of cables in the area. If it appears that Ausgrid has not located all the cables, contractors must request that Ausgrid visit the site and check the location in the immediate vicinity of the works for additional cables.

## 8.0 EARTHING

### 8.1 General

The most common earthing construction hazards and appropriate controls for those hazards at Ausgrid Major Substations are documented in Annexure C of NS222. Those controls shall be implemented during construction work at major substations unless a site-specific earthing report is provided. In that case the site-specific earthing report shall take precedence.

Refer also to the Ausgrid Electrical Safety Rules regarding clearances and operating requirements for plant, equipment or appliances, together with requirements for trailing earth leads. Also refer to any earthing reports supplied by Ausgrid and to Annexure C of NS222.

During excavation works any excess water must be pumped out to reduce any electric shock hazards as a result of an Earth Potential Rise (EPR).

## 8.2 Shoring and formwork

Timber or other non-conductive materials must be used for shoring and formwork. Contractors must obtain the written approval of Ausgrid before arranging for any shoring or formwork materials not complying with this requirement.

Contractors must also comply with all other relevant legislation, codes and standards for shoring and formwork and must comply with SafeWork NSW requirements.

## 8.3 Trailing earths

This requirement is in addition to the requirements specified in the Ausgrid Electrical Safety Rules.

All plant and equipment on site must, if required by site conditions, be electrically bonded to the substation earth grid using trailing earth leads while stationary and in use. The contractor is responsible for complying with this requirement. Ausgrid will supply the trailing earth leads as considered necessary to comply with this requirement, will make the required connections to the substation earth grid and provide earth tails at sufficient points for connection of the trailing earth leads by the contractor. Clamps for the connection of trailing earth leads will be equivalent to the clamps used for substation portable earth leads. This requirement applies to all plant and equipment and includes backhoes, concrete delivery trucks, concrete pump trucks and vehicles with Hiabs or cranes.

A trailing earth lead for trucks and plant will be a copper or aluminium conductor capable of carrying the maximum prospective fault current to the earth grid. The earth lead will be insulated and flexible with extra PVC sheathing for abrasion resistance and have the following minimum cross sectional area:

- copper - 70 mm<sup>2</sup>
- aluminium - 135 mm<sup>2</sup>

No clamp to clamp connections are allowed between earth leads. The earth leads must comply with the requirements for earthing and short circuiting equipment in ISSC14 Guide to Electrical Workers' Safety Equipment.

Ausgrid will be responsible for providing the trailing earth leads and ensuring that they are correctly connected to locations on the earthing grid and the equipment.

For plant and equipment located outside of the substation earth grid, it is recommended to contact Ausgrid's Earthing and Insulation Co-ordination group or refer to site specific construction safety documentation, to determine the correct procedure for the application of trailing earths.

## 8.4 Low Voltage supplies

Three zones about a substation are defined as follows:

- Inside a substation earth grid;
- The intermediate zone between a switchyard fence or the earth grading ring (whichever is the outermost) and up to 10 metres beyond; and
- Beyond 10 metres from a switchyard fence or the earth grading ring (whichever is the outermost).

Low voltage power supplies, regardless of whether they are fixed or portable, must remain within a single zone and must NOT cross between different zones UNLESS an isolation transformer is connected.

For works that are entirely within the substation earth grid, the substation LV supply or generators may be used. Where generators are used, they must be connected to the earth grid via a trailing earth lead.

Generators used outside the substation earth grid in the intermediate zone must be earthed to a local electrode.

The generator and any lead or other attachment connected to the generator must be contained within a zone no further than 2 metres either side of the local earth electrode and parallel to the earth grid.

Portable Residual Current Devices (RCDs) are to be used on ALL Low Voltage power supply points in accordance with the Ausgrid Electrical Safety Rules and appropriate earthing installed (if required) to enable the RCD to operate correctly.

## 9.0 EXCAVATION

### 9.1 General requirements

In addition to the requirements of this Network Standard, all persons must also comply with the requirements of:

- the Ausgrid Electrical Safety Rules;
- NS130 Specification for Laying Underground Cables Up to and Including 11kV;
- NS156 Excavating Near Ausgrid Around Underground Cables or Conduits; and
- SafeWork Excavation Work Code of Practice.

In relation to excavation in the vicinity of cables and excavation within substations, the requirements of this Network Standard are more stringent than those in NS130 and NS156 and the requirements of this Network Standard take precedence over the requirements prescribed in NS130 and NS156. For environmental requirements refer to NS174 Environmental Procedures.

Placing any pressure or load on exposed cables and or cable joints is not permitted. This is inclusive of stepping onto or using the cable or cable joint for support whilst working on or near the asset. If this is physically impractical, Ausgrid must be consulted on an alternate work method.

Prior to commencement of excavation, construction workers must positively identify all electrical cables as per the Ausgrid Electrical Safety Rules and NS156 to confirm the location and depth of all existing buried services and cables in the vicinity of the proposed works. Measures to provide protection to these cables must be provided. The contractor must seek advice from Ausgrid for the type of protection of these services. Refer also to Clauses 6.4, 9.6 and 9.7 regarding protection and support of cables.

The location of cables on Ausgrid's drawings cannot be guaranteed. Hand excavate (pot hole) along the excavation route at one metre intervals to at least 0.9 metres depth for all excavations to confirm no cables exist in the area.

**Note:** Earth grids can extend beyond the substation fence. Written confirmation of the location of the earth grid must be provided prior to the commencement of excavation.

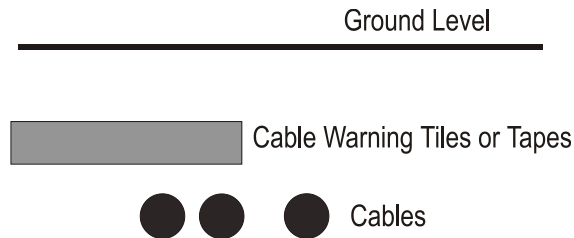
Hand or Aero/Hydro Vacuum excavation greater than 0.9 metres may be required in areas adjacent to retaining walls, creeks or other areas where cables may have been placed deeper to avoid obstructions. Cable drawings must be checked for an indication of the depth of cables.

Greater care is required when excavating around known existing cables and only excavate by hand or Aero/Hydro Vacuum to locate the cables. Excavations within two metres of a known sub-transmission cable route or within a one metre radius of other known cable locations, including earthing conductors, must be done carefully with shovels or vacuum pump only and using small scraping motions in consultation with Ausgrid.

If an electrical cable or earthing grid is found, excavation work must cease and must not recommence until Ausgrid has attended the site and given written direction. If hand excavation is unachievable the construction workers must notify Ausgrid immediately.

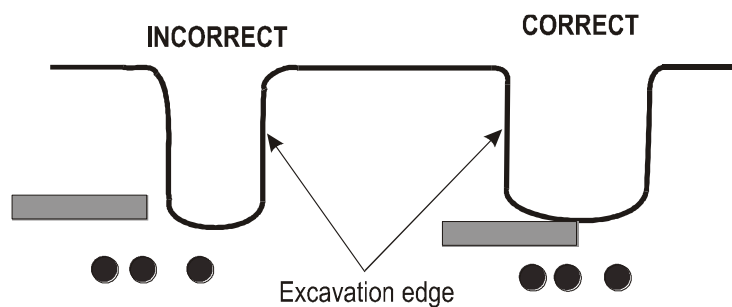
If any existing services are likely to be affected as a result of the works, Ausgrid must be advised immediately and if required by Ausgrid, the contractor must liaise with relevant authorities as required.

Attention is drawn to the possibility that cables may be located to the side of cable warning devices such as tiles or tapes, as shown in the diagram below.



**Figure 1**

To avoid hitting cables which are offset from warning tiles or tapes, excavations must be made wide as indicated in the following diagram. Localised deep excavations must be avoided as they may not allow for tiles or tapes to be located and identified before cables are hit. Trial holes must be dug to determine full width of cable installation before main excavation begins.



**Figure 2**

## 9.2 Footwear within excavated areas

Safety footwear must be worn when working within an excavated area. If moisture on the footwear is likely to extend above the upper edge of the sole, the worker must wear safety gumboots compliant with Clause 6.2.4 whilst in the excavated area. This requirement only applies to excavated areas, not to other undisturbed parts of a substation.

## 9.3 Areas identified as cable crossing excavations

Before construction workers excavate within a one metre radius of ANY cable, Ausgrid must consider whether it is required to issue an access permit on that cable during the work.

**Note:** Refer to the Ausgrid Electrical Safety Rules.

1. Where an access permit is required, work must not proceed until the permit has been issued and, all construction workers in the work party have signed onto the permit and the work is under the direction of the permit recipient.
2. Where it is agreed in writing by Ausgrid that an access permit is not required, excavation may be carried out around the cables with extreme care. Prior to commencing this excavation, a Safe Work Method Statement must be prepared by the contractor and submitted to and reviewed by Ausgrid. The stand-by person will then oversee all work until cables are exposed, identified, secured and protected.

Extreme care must be taken when excavating at locations where cables cross excavations. Locations where cables are known to cross proposed excavations may be highlighted on drawings. However, only hand digging or use of a vacuum pump is permitted in all circumstances where cables cross excavations.

#### **9.4 Hand excavation beneath cable warning signs and within a one metre radius of a cable**

All excavation beneath any cable warning signs such as tiles, polymeric cable cover, tape etc. and within a one metre radius of a cable must be done carefully with shovels or a vacuum pump only and only using small scraping motions.

#### **9.5 Stand-by person**

An Ausgrid stand-by person will be required to stand-by and monitor an excavation within a one metre radius of cables operating at high voltage (ie. higher than 1,000 Volts AC). The construction workers must never excavate around cables operating at high voltage without the attendance of the stand-by person, under any circumstances. The construction workers must comply with all instructions given by the stand-by person.

In addition, where the proposed excavation is within two metres of any sub-transmission cables (nominal system voltage 33,000 volts or above), Ausgrid must be contacted, and none of the proposed excavation work can be undertaken until Ausgrid has provided authorisation in writing.

#### **9.6 Mechanical protection of cables**

Where cables have been exposed, the construction workers must contact Ausgrid for direction on the mechanical protection and support required for the cables before proceeding with work below the cables. The mechanical protection is achieved with structures and/or split conduits designed for the purpose. Refer also to Clause 6.4 for split conduit placement arrangements.

#### **9.7 Support of cables**

If it is necessary for a cable to be supported to allow excavation beneath the cable, the construction workers must stop work and request directions from Ausgrid.

Where an excavation is parallel with cables, the excavation must be shored so that any ground movement will be prevented. Any ground movement could cause undue stress on the cables, leading to possible cable failure.

Live cables must not be moved without the prior written approval of Ausgrid, as movement of the cable could cause stress, which could lead to cable failure. In the case of high voltage cables, Ausgrid will be responsible for deciding whether an access permit is required. In the case of low voltage cables, only authorised Ausgrid workers are permitted to move live cables.

#### **9.8 Stock piles of materials**

Spoil from the excavation of cable trenches must not be placed under overhead conductors. Spoil from excavations must be stockpiled in locations specified by Ausgrid and compliant with NS174.

The existing ground levels in a switchyard must not be altered unless there is a requirement to do so as indicated on the project drawings. Spoil must not be re-distributed on site.

Equipment or materials must not be stored under overhead conductors and should not be stored or stockpiled above known underground utility locations. The proposed locations for all material storage areas and site sheds on the substation site must be approved by Ausgrid and environmental controls must be implemented on all stockpiled material.

#### **9.9 Backfilling over cables**

Ausgrid must be contacted prior to backfilling over the cables. Ausgrid will indicate the backfilling requirements and the work method to be used as per NS130.

Ausgrid must be contacted for details of the requirements for replacement of cable covers, including warning tiles and tapes.

### 9.10 Demolition of ground surface materials

- (a) An access permit is required before the demolition of ground surface materials (e.g. concrete, bitumen, bricks, pavers or other hard-stand surfaces) in the vicinity of underground cables.
- (b) Concrete slab cuts must not be deeper than the thickness of the slab. Some cables may be located in concrete encased duct lines. If the concrete pavement is demolished and concrete is encountered below the slab, work must be stopped and Ausgrid must be notified because the concrete below the slab may be part of a concrete encased cable duct line.

### 9.11 Buried cables under busbars

Where cables are located under busbars, the hand excavation restrictions apply as well as the requirements set out in Section 10.0.

### 9.12 Cable warning signs

Careful observation of the spoil can alert the construction workers to the presence of cables. Poured concrete slabs, 'electric' bricks, polymeric cable covers, warning tapes, conduits or troughing are warning signs of proximity to electric cables. Not all of these will exist in any one location. A change in the type of excavation spoil, to sand or other backfill material, may provide a further indication of the presence of cables.

**Note:** Underground electrical cables are not necessarily covered with slabs, marker tapes or other indicators of their presence. Hence care and caution must be taken when carrying out any excavation work.

If, during excavation work, the construction workers find any warning signs that cables may be present, work must stop in the vicinity and the contractor must contact Ausgrid immediately for further instructions. If any 'electric' bricks, polymeric cable covers, warning tapes, or cable warning slabs are dislodged or removed, Ausgrid will arrange for them to be replaced.

### 9.13 New pipes or structures in the vicinity of cables

Where pipes or structures are installed and they cross under or over cables, contractors must contact Ausgrid for instructions on the requirements for the backfilling and protection of the cables. As a guide, a minimum of 150 mm of sand fill, or other backfill as stipulated by Ausgrid, should be maintained between the cable and any pipe or any other structure. If this is not possible because of requirements for pipe falls or pipe inverts, contractors must contact Ausgrid for instructions.

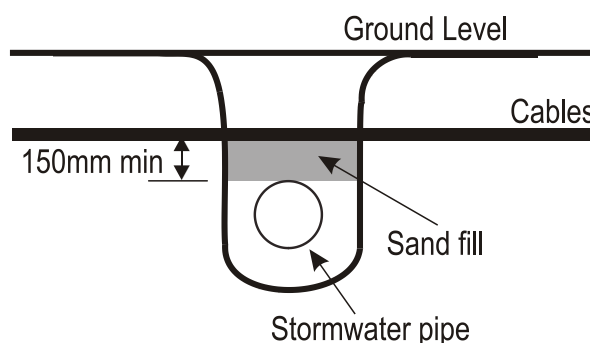


Figure 3

### 9.14 Services affecting the proposed design

If any service, cable or conduit is discovered which interferes with the proposed designs or design levels for the construction work, work must stop immediately and Ausgrid must be notified. Ausgrid will then issue instructions which must be complied with.

## 9.15 Requirements for the use of powered excavation tools

### 9.15.1 General

Pneumatic powered tools must not be used for any works covered by this document, ie. for any excavation work in or around a live substation.

Where practical, isolation of persons from local earth potential is achieved by the use of wooden work platforms covered with 15 kV insulating matting. Where wooden platforms are not practical, 15 kV insulating matting must be used by itself. Pit sides and metal shoring can provide a low impedance contact between a tool operator's body and earth. If an operator is bodily within an excavated area (or cannot maintain clearance from the excavation sides) and could contact any part of the sides of an excavation, the sides must be covered with insulating mats, especially if the sides of the excavation are wet.

Portable electrical tools must be regularly tested and maintained at the intervals specified in the Ausgrid Electrical Safety Rules and AS3012 – Electrical Installations – Construction and Demolition Sites.

### 9.15.2 Jackhammer safety requirements

There are a series of controls that are required to ensure appropriate risk management for the use of a jackhammer within a live substation. The controls work as a system and should be employed together. It is important to note that all of the following controls contribute to reducing the risk of using the jackhammer to As Low As Reasonably Practicable (ALARP). The controls that are required are as follows and do not remove the need for any other controls described elsewhere in this document or the Ausgrid Electrical Safety Rules:

- 1 Only progress to the use of a jackhammer where it is not feasible to perform the excavation without using the jackhammer, for example an excavator or hand tools.
- 2 Where jackhammers are used, they must be electric powered only.
- 3 Positively identify all buried services and cables (including earth conductors) in the proposed excavation area. This must include:
  - use of drawings and photos and other records available from Ausgrid;
  - visual tracing and deductions from on-site observations;
  - cable location testing/services; and
  - hand excavation to expose cables and services in the proposed excavation area and also to expose entry/exit points to conduits and to concrete slabs.
- 4 The extent of the excavation must be demarcated into two metre sections along the excavation route. The need for use of the jackhammer must be re-evaluated for every two metre section of excavation. Stop all use of the jackhammer where hand digging becomes viable again or where hand held tools are required as specified in Section 11.
- 5 Safety gumboots which are in good condition must be worn and must comply with the requirements of Clause 6.2.4.
- 6 Low voltage electrical insulating gloves with leather outers must be worn when operating jack hammers inside a live substation. The low voltage electrical insulating gloves must be inspected and tested prior to use as per the Ausgrid Electrical Safety Rules.
- 7 Plastic mouldings on jackhammer handles must be in good condition. If they are cracked or damaged, the jackhammer is not to be used until they are replaced.
- 8 When working within excavations or close to adjacent structures the tool operator must not touch the sides of the excavation or the adjacent structures.

Where there is a risk of inadvertent contact with excavation sides or adjacent structures, the provision of insulating mats or other available forms of rubber, polymeric or polycarbonate barrier must provide adequate protection. Use of insulating mats on the side of the excavation is

required where the operator of the jackhammer is unable to maintain a clearance to the side of the excavation or shoring.

- 9 Pump/remove excess water from the excavation in accordance with NS174

### 9.15.3 Concrete cutting saw / concrete corer safety requirements

There are a series of controls that are required to ensure safe use of a powered concrete cutting saw or a concrete corer within a live substation. The controls work as a system and should be employed together. It is important to note that all of the following controls contribute to reducing the risk of using the concrete cutting saw or concrete corer to acceptable levels. The controls that are required are as follows and do not remove the need for any other controls described elsewhere in this document or the Ausgrid Electrical Safety Rules;

- 1 Positively identify all buried services and cables (including earth conductors) in the proposed cutting / coring area. This must include:
  - use of drawings and photos and other records available from Ausgrid;
  - visual tracing and deductions from on-site observations;
  - cable location testing/services; and
  - hand excavation to expose cables and services in the proposed excavation area and also to expose entry/exit points to conduits and to concrete slabs.
- 2 Set the depth of cut to the thickness of concrete being cut as unknown cables or services may be installed directly under the slab.
- 3 Safety gumboots which are in good condition must be worn and must comply with the requirements of Ausgrid Electrical Safety Rules.
- 4 Low voltage electrical insulating gloves with leather outers must be worn when operating powered concrete cutting saw or concrete corer inside a live substation. The low voltage electrical insulating gloves must be inspected and tested prior to use as per the Ausgrid Electrical Safety Rules.
- 5 The saw operator must consult with Ausgrid as to the appropriate controls to be implemented when charged water hoses are to be used within the substation.
- 6 Sediment run off must be controlled as per Ausgrid's Environmental Procedures NS174.

## 10.0 EXPOSED MAINS AND APPARATUS (INCLUDING OVERHEAD CONDUCTORS)

### 10.1 General

Where the location of exposed live mains and apparatus or overhead conductors is such that the minimum safe working distances cannot be maintained, Ausgrid must be contacted to arrange for access permits to be issued.

Persons must not under any circumstances bring any part of their body, or any tools or objects they are working with, any closer than minimum safe working distances.

Long objects such as ladders, conduits, earthing rods and construction materials must be handled carefully, particularly in the vicinity of live exposed mains and apparatus and in outdoor substation switchyards. Long objects must be carried by two people holding the object below shoulder height in a horizontal position and as close as practicable to the ends of the object so as to maintain maximum control. When long conductive objects are being carried by two or more employees into the substation yard, these objects must be carried parallel to the fence line.

## 10.2 Minimum safe working distances

Refer to the Ausgrid Electrical Safety Rules for minimum safe working distances. Construction workers must maintain minimum safe working distances at all times, including for any tools or objects that are used. Clearances and other requirements for scaffolding as specified in the Ausgrid Electrical Safety Rules should also be implemented when erecting, dismantling or moving steel fence components, metal pipe and reinforcing bars within substations.

The following details summarise the requirements for construction workers, including other contractor employees and site visitors.

If the minimum safe working distance from live exposed conductors cannot be maintained, the contractor must contact Ausgrid to arrange for an access permit.

There are specific minimum safe working distances, as well as training and other requirements, for work being carried out by persons in or on plant or equipment. Refer to the Ausgrid Electrical Safety Rules.

**Note:** In this document, 'plant and/or equipment' is as defined for 'plant' in Chapter 5 of the Work Health and Safety Regulation 2011 and includes conveyors, cranes, hoists and plant. 'Plant' includes, but is not limited to, elevating work platforms, earth moving and excavating machinery, borer/erectors and trucks.

## 10.3 Plant and equipment

### 10.3.1 General

Operation of plant and equipment within substations must comply with Ausgrid Electrical Safety Rules.

### 10.3.2 Warning signs

All excavation plant must display appropriate warning signs in an appropriate location in the cabin to warn the operator that there are overhead and exposed conductors on site.

**Note:** Complying warning signs must be displayed on ALL excavation plant whether the plant is in close proximity or not to electrical apparatus.

### 10.3.3 Minimum requirements for Safe Work Method Statements (SWMS)

Safe Work Method Statements covering work at construction sites where plant and equipment will be used must detail all precautions to be taken to achieve the required minimum safe working distances from overhead busbars and conductors as detailed in the Ausgrid Electrical Safety Rules.

The following list includes the minimum factors that must be considered and documentation that must be produced for work with plant and equipment in locations where live and exposed overhead busbars or conductors are present:

- (a) All travel paths for the plant and equipment;
- (b) The intended location of the plant and equipment;
- (c) The location of the plant and equipment with respect to any excavation;
- (d) A drawing that shows the path and set up of the plant and equipment and clearances with respect to overhead busbars and conductors and their associated structures;
- (e) A review of the stability of the plant and equipment with regard to load and position of plant and equipment, including an evaluation of failure scenarios for crane operation and an evaluation of machinery incorrect or faulty operation;
- (f) Consideration of the type of plant and equipment to minimise the possibility of coming within clearances;

- (g) For cranes, the contractor must contact Ausgrid to arrange for an Ausgrid representative to be on site. Services must be checked and located so that outriggers are not placed on top of weak points, such as storm-water pipes located close to the surface. Operation of cranes is subject to the Ausgrid Electrical Safety Rules.;
- (h) Special precautions are required for concrete trucks, including control of the pump hose, so that the hose or concrete cannot come within the specified minimum clearances from overhead busbars and conductors.

The contractor must provide the Safe Work Method Statement to Ausgrid and it must be reviewed by Ausgrid before work proceeds.

## 11.0 HAND HELD TOOLS

All work must be adequately planned and hazards identified and risks addressed in the Site Safety Plan and Site Specific Risk Assessment.

The use of hand tools for excavation and other work must be as directed below.

Tools must not be lifted above head height. All tools must have non-conductive handles or handles covered by non-conductive materials.

The following tools are allowable:

**For work greater than 2m from Transmission and greater than 1m from any other cables:**

- shovels;
- vacuum suction tools;
- mattocks, crow bars and picks.

**For work within 2m of Transmission and within 1m of any other cables:**

- shovels using small chipping or scraping actions from small arm movements;
- vacuum suction tools.

## 12.0 SAFE WORKING DISTANCES FOR NON-ELECTRICAL WORK IN SUBSTATIONS

### 12.1 General

This section describes the minimum safe working distances for all persons for work near live exposed conductors.

**Note:** Where work is being carried out by persons in or on plant or equipment, safe working distances must be determined by reference to the Ausgrid Electrical Safety Rules.

### 12.2 Minimum safe working distances

When the construction worker is working in the vicinity of live exposed conductors, no persons, plant or equipment is permitted within the minimum safe working distance for the nominal network voltage involved. Minimum safe working distances for ordinary persons, are detailed in the Ausgrid Electrical Safety Rules.

If it is necessary to work within the minimum safe working distances, the construction worker must contact Ausgrid to arrange for an access permit.

In some circumstances, it may also be necessary to erect a suitable temporary or permanent screen or barrier to guard against the minimum safe working distances not being maintained from live mains and apparatus during the work. An access permit may be necessary to allow for safe

fitting or removal of the screen or barrier. Screening and barrier construction must be carried out by competent and authorised workers.

The construction worker must erect warning signs where there is any risk that persons may accidentally come closer than the minimum safe working distance from exposed high voltage mains and apparatus. Ausgrid will supply the necessary signs when requested by the construction worker.

**IMPORTANT**

The minimum safe working distances specified in the Ausgrid Electrical Safety Rules apply to any part of your body and any tools or objects you are working with.

## 12.3 Daily Checklists

### 12.3.1 Daily written risk assessments

All workers must include at least the following electrical hazard assessments in their daily hazard written risk assessments:

- (a) Identify overhead conductor voltage and the nominated minimum safe working distance that persons with hand tools must maintain.
- (b) Identify minimum safe working distance for plant and equipment (Refer to Clause 10.3).
- (c) Identify the work methods for the day's work, to either eliminate or reduce these hazards to As Low As Reasonably Practicable (ALARP), as outlined in this Network Standard.

These hazards are identified as the minimum electrical hazards to be included in the daily written risk assessments. They do not include all other site hazards that the construction worker must assess.

### 12.3.2 Checklists

The construction worker or contractor's Designated Officer must complete all checklists (as appropriate) prior to commencement of work or operation of equipment.

The following checklists must be completed:

- daily cable excavation checklist (see Annexure A) – must be completed every day when excavation is planned;
- daily checklist for operating powered excavation tools (see Annexure B) – must be completed each day that powered excavation tools are used;
- daily checklist for operating plant and equipment (see Annexure C) – must be completed each day that mobile plant and equipment is used.

Completed checklists must be available on-site.

## 13.0 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
Reference documents used during amendment/creation process	Records management Work Folder for Network Standards (HPRM ref. 2014/21250/219	Unlimited
Working documents such as, impact assessment key changes and approval form	Records management Work Folder for Network Standards (HPRM ref. 2014/21250/219	Unlimited

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

## 14.0 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 document repository. 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.

## 15.0 DOCUMENT CONTROL

**Content Coordinator** : Electrical Safety Manager

**Distribution Coordinator** : Manager Asset Standards

## Annexure A – Daily Cable Excavation Checklist

DATE: \_\_\_/\_\_\_/\_\_\_

AREA OF WORK: \_\_\_\_\_

Tick appropriate box

	Yes	No	
1.	<input type="checkbox"/>	<input type="checkbox"/>	Check cable layout drawings.
2.	<input type="checkbox"/>	<input type="checkbox"/>	Check Surveyed Cable Location Drawings.
3.	<input type="checkbox"/>	<input type="checkbox"/>	If a cable is not identified on a Surveyed Cable Location Drawing, undertake further surveys or call Network Test for further surveys.
4.	<input type="checkbox"/>	<input type="checkbox"/>	Check cable depths.
5.	<input type="checkbox"/>	<input type="checkbox"/>	If excavating around high voltage cables (ie. higher than 1,000 volts), arrange for access permit recipient.
6.	<input type="checkbox"/>	<input type="checkbox"/>	If excavating under busbars or other live conductors, check that the minimum safe working distances can be maintained. If the minimum safe working distances cannot be maintained, apply for an access permit. The minimum safe working distance for this substation is ___ metres.
7.			If excavating within a one metre radius of a cable (two metres for sub-transmission cables)
	<input type="checkbox"/>	<input type="checkbox"/>	(a) Has an access permit or permission in writing been obtained from Ausgrid to start work?
	<input type="checkbox"/>	<input type="checkbox"/>	(b) Has the construction worker provided a Safe Work Method Statement to Ausgrid for review before any work in relation to the Safe Work Method Statement commences? (See Notes below)
	<input type="checkbox"/>	<input type="checkbox"/>	(c) Are all excavations within one metre of live cables (two metres for sub-transmission cables) excavated by hand, with a shovel, using short scraping motions, pulling the shovel and earth towards the operator?
	<input type="checkbox"/>	<input type="checkbox"/>	(d) If sub-transmission cable, notify Ausgrid on (02) 4951 9200
8.	<input type="checkbox"/>	<input type="checkbox"/>	Excavate in areas where cables are known to cross the path of excavations first, to enable cables to be sighted thereby allowing greater certainty when excavating elsewhere in the yard.
9.	<input type="checkbox"/>	<input type="checkbox"/>	Visually assess the location of yard lights, yard GPOs, service boards, control cables to equipment etc. Arrange with Ausgrid to disconnect power if practicable to these localised items if there is a possibility of cables existing in the area.
10.	<input type="checkbox"/>	<input type="checkbox"/>	Hand excavate (pot hole) along the excavation route at one metre intervals to at least 0.9 metres depth for all excavations to confirm no cables exist in the area. Assess localised areas to evaluate the likely depth of cables and hand excavate past 0.9 metres depth if necessary.
11.	<input type="checkbox"/>	<input type="checkbox"/>	If required to excavate under cables, contact Ausgrid about mechanical protection and support of cables.
12.	<input type="checkbox"/>	<input type="checkbox"/>	Has a Safe Work Method Statement for backfilling and use of cable warning tiles or polymeric cable cover been developed through consultation with Ausgrid?
13.	<input type="checkbox"/>	<input type="checkbox"/>	Has the Safe Work Method Statement for backfilling and use of cable warning tiles or polymeric cable cover been authorised by Ausgrid? (See Notes below)
14.	<input type="checkbox"/>	<input type="checkbox"/>	Are the stand-by person and contractor's Designated Officer on site?

**IMPORTANT**

If any **NO** box is ticked above, do not commence any work.

- Note 1:** If there is new work or conditions on the site requiring a new hazard identification and risk evaluation, a new written risk assessment must be completed.
- Note 2:** If weather conditions have changed requiring a re-evaluation of the risks associated with the work, a new written risk assessment must be completed.

## Annexure B – Daily Checklist for Operating Powered Excavation Tools (Including Jackhammers, Concrete Cutting Saws and Concrete Corers)

DATE: \_\_/\_\_/\_\_

AREA OF WORK: \_\_\_\_\_

Tick appropriate box

	Yes	No	
1.	<input type="checkbox"/>	<input type="checkbox"/>	Check cable layout drawings.
2.	<input type="checkbox"/>	<input type="checkbox"/>	Check Surveyed Cable Location Drawings.
3.	<input type="checkbox"/>	<input type="checkbox"/>	If a cable is not identified on a Surveyed Cable Location Drawing, undertake further surveys or call Network Test for further surveys.
4.	<input type="checkbox"/>	<input type="checkbox"/>	Check depth of cables.
5.	<input type="checkbox"/>	<input type="checkbox"/>	If concrete saw cutting, coring or jackhammering within a one metre radius of a cable (or two metres from sub-transmission cable) obtain an access permit. Note: Pneumatic tools are not permitted to be used within a substation
6.	<input type="checkbox"/>	<input type="checkbox"/>	Visually assess location of yard lights, yard GPOs, services boards, control cables to equipment etc. Arrange with Ausgrid to disconnect power if practicable to these localised items if there is a possibility of cables being in the area.
7.	<input type="checkbox"/>	<input type="checkbox"/>	Has the construction worker provided a Safe Work Method Statement to Ausgrid for review before any work in relation to the Safe Work Method Statement has commenced?
8.	<input type="checkbox"/>	<input type="checkbox"/>	Set depth of saw, corer or jackhammer to depth of slab only. Stop and call Ausgrid if additional concrete is found beneath the pavement as this could be concrete encasing cables.
9.	<input type="checkbox"/>	<input type="checkbox"/>	Are the stand-by person and contractor's Designated Officer on site?
10.	<input type="checkbox"/>	<input type="checkbox"/>	For the operation of a jackhammer, concrete cutting saw or concrete corer, low voltage electrical insulating gloves with leather outers and safety gumboots will be worn

**IMPORTANT**If any **NO** box is ticked, do not commence any work.

## Annexure C – Daily Checklist for Operating Plant and Equipment

DATE: \_\_\_/\_\_\_/\_\_\_

AREA OF WORK: \_\_\_\_\_

Tick appropriate box

	Yes	No	
1.	<input type="checkbox"/>	<input type="checkbox"/>	Review proximity to overhead conductors and busbars with respect to travel paths, final operating position and work to be undertaken.
2.	<input type="checkbox"/>	<input type="checkbox"/>	Obtain an access permit if the minimum clearance for plant and equipment cannot be maintained. (Refer to Clause 10.3.)
3.	<input type="checkbox"/>	<input type="checkbox"/>	If the plant and equipment during its normal operation of work can maintain the minimum safe working distance for plant and equipment but may accidentally or possibly come closer than this, the person in charge of the plant and equipment must arrange for an observer to watch and direct the work.
4.	<input type="checkbox"/>	<input type="checkbox"/>	Has the contractor's employee provided a Safe Work Method Statement to Ausgrid for review before any work in relation to the Safe Work Method Statement commences?
6.	<input type="checkbox"/>	<input type="checkbox"/>	Install earth leads to plant and equipment.
7.	<input type="checkbox"/>	<input type="checkbox"/>	Have failure scenarios for crane operation been evaluated and appropriate safety measures taken?
8.	<input type="checkbox"/>	<input type="checkbox"/>	Have machinery incorrect or faulty operation scenarios been evaluated and appropriate safety measures taken?
9.	<input type="checkbox"/>	<input type="checkbox"/>	Are the stand-by person and contractor's Designated Officer on site?

**IMPORTANT**

If any **NO** box is ticked, do not commence any work.