

Network Standard

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NS156

Title:

Excavating Near Ausgrid Underground Cables or Conduits.

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Table of Contents

Scope	3
Reference Documents.....	3
Ausgrid Documents	3
Other Standards and Documents	3
Acts and Regulations.....	3
1 Obtaining Ausgrid plans.	4
2 Notifying Ausgrid	4
3 Excavating	6
4 Protecting assets after excavation.....	8
5 Directional drilling and boring	9
6 Work near submarine cables.	10
7 Use of explosives near Ausgrid assets	10
8 Damage to Ausgrid assets	11
9 Hazardous materials across Ausgrid network.....	11
10 Bedding and reinstatement requirements after excavation of trenches	11
11 Emergency situations	11

Scope

This Network Standard applies to excavation work near Ausgrid's underground cables or conduits including any work which alters the surface level or places a structure above any cable or conduit.

Reference Documents

All work covered in this standard must conform to all relevant Legislation, Standards, Codes of Practice and Network Standards.

Ausgrid Documents

Guide To Working Near Ausgrid Assets

Electrical Safety Rules

Reading Ausgrid Plans (Supplied with Ausgrid plans or from Ausgrid website)

NS001 Glossary of Terms

NS130 Specification for Laying Underground Cables up to and Including 11kV.

NS143 Easements, Leases and Rights of Way

NS174 Environmental Procedures

NS193 Ground Movement, Vibration and Pressure Limits for Buried Cables

NS211 Working with Asbestos Products

Other Standards and Documents

SafeWork NSW Code of Practice – Construction Work

SafeWork NSW Code of Practice – Excavation Work

WorkCover NSW Code of Practice – Work Near Overhead Power Lines

SafeWork NSW Guide – Work Near Underground Assets

NSW Streets Opening Coordination Council - Guide to Codes and Practices for Street Opening.

Acts and Regulations

Work Health and Safety Act 2011 and Regulation 2017

Clause Standard Requirements

1 Obtaining Ausgrid plans.

- 1.1 To determine if Ausgrid cables or conduits exist in the proposed work location, the person in charge of the work site shall contact Before You Dig Australia (BYDA) Service @www.byda.com.au or telephone 1100 before commencing any work on site.
- 1.2 Once Ausgrid plans have been received, the person in charge of the work shall assess whether the proximity of the Ausgrid underground cables or conduits located within the proposed work site, requires a BYDA certified service locator to identify and mark these Ausgrid assets on the ground surface.
- 1.3 If Ausgrid cables or conduits are located within the proposed work site, the requirements of this standard shall be followed to ensure the safety of all workers and maintain the integrity of the Ausgrid electrical network.



Figure 1: BYDA Logo

2 Notifying Ausgrid

2.1 General

- 2.1.1 There are certain work activities near Ausgrid assets where Ausgrid requires notification and needs to provide written approval before work can commence on-site.
- 2.1.2 Ausgrid will acknowledge your notification via an email within 48 hours of receipt.
- 2.1.3 This work includes any work activity:
 - Within 2m of a transmission cable asset;
 - Within 20m of a submarine cable;
 - That causes the undermining of an Ausgrid cable for more than 1m;
 - Using directional drilling/boring, where the drill/bore may pass within 2m of any Ausgrid cable or conduit;
 - Using explosives near any Ausgrid cable or conduit;
 - That does not provide the required separation between Ausgrid distribution cables, conduits and other utilities as detailed in the NSW Streets Opening Coordination Council;
 - Near distribution cables where the controls of this standard cannot be implemented; and
 - That identifies unrecorded or incorrectly recorded cables.

2.2 Ausgrid contact details.

When planning to work in the above situations, and where stipulated in this standard that Ausgrid shall be contacted, the following shall apply:

- External workers shall use the contact list in Table 1;
- Planners of work to be undertaken by Ausgrid work groups shall contact the respective internal Ausgrid departments directly;
- Accredited Service Providers (ASP's) shall contact their respective Ausgrid Compliance Officer; and

- Ausgrid partners shall contact their respective Ausgrid Project Officer.

Table 1: Ausgrid contact information.

Asset Type/Work Activity	Contact Details Phone	Email	Notification time before commencement of work – for all workgroups.
Transmission cables (including pilot and fibre optic cables). Any work within 2m.	(02) 49519200	development@ausgrid.com.au	4 weeks
Distribution cables Any work where the controls of this standard cannot be implemented.	131365	servicesupport@ausgrid.com.au	4 weeks
Submarine cables. Any work within 20m.	131365	servicesupport@ausgrid.com.au	4 weeks
Ausgrid plans. Reporting unrecorded or incorrectly recorded cables	(02) 4951 0899	GIS@ausgrid.com.au	Immediately
Ausgrid assets Damaged or deterioration.	131388		Immediately
Ausgrid asset. Use of explosives near any asset.	131365	servicesupport@ausgrid.com.au	4 weeks
Emergencies	131388		Immediately
General Enquiries	131365	servicesupport@ausgrid.com.au	

2.3 [Ausgrid's representative on site for External Parties only.](#)

2.3.1 Where an Ausgrid representative is required to attend a work site due the proximity of the work activity to Ausgrid cables or conduits, the representative shall not be supervising the work, nor providing safe work methods for undertaking the work. These tasks are the responsibility of the person in charge of the works.

2.3.2 All workers on-site shall follow the requirements of the Ausgrid representative.

3 Excavating

3.1 General

3.1.1 The type of excavation methodology employed near Ausgrid's cables or conduits will depend on the operating voltage of the cable and the separation distance of the planned activity from the Ausgrid cables or conduits.

3.1.2 The person in charge of the work shall assess the risk of electric shock to the workers, arising from damage to cable insulation, and implement appropriate controls. (Refer to the Ausgrid Electrical Safety Rules for further information).

3.1.3 Any excavation work which causes the cables or conduits to be unsupported for a distance greater than 1m shall require an engineered cable support design approved by Ausgrid.

3.2 Potholes

3.2.1 Prior to excavating near Ausgrid's underground distribution cables or conduits, workers shall dig potholes to positively locate the assets within the proposed work site. Potholes shall consist of small holes that are dug by hand excavation using non-conductive handled shovels or aero/hydro vacuum excavation.

3.2.2 The potholes shall be used to establish the depth and location of Ausgrid's underground cables or conduits prior to commencing further excavation. The spacing of potholes shall be close enough to identify all cables, conduits and services and to establish the profile between potholes with high confidence.

3.2.3 For the purpose of potholing, mechanical excavation is permitted only to lift the road or footpath surface before commencing the pothole process.

3.2.4 Potholing within 2m of any transmission cable or conduit shall only proceed with the written consent of Ausgrid.

3.3 Hand Excavation

Hand excavation methods shall not cause damage to any Ausgrid cable or conduit.

3.4 Aero/Hydro vacuum excavation

If planning to use Aero/Hydro vacuum excavation equipment near Ausgrid's underground cables or conduits, the operator shall ensure that:

- The pressure wand tip shall be rotary or fan style only;
- A minimum distance of 200mm shall be maintained from the tip of the pressure wand to the cable or cable cover strips/tiles;
- The maximum working pressure for the water excavator shall be 13,800 kilopascals (2,000 pounds per square inch). At higher pressures it is possible to damage cables;
- The device shall not be used where asbestos containing material is known or suspected to be present;
- The excavation does not damage the cable or conduit; and
- If the excavation process inadvertently exposes Ausgrid's cables where cover strips do not exist, the cable bedding shall be re-instated in accordance with the requirements of Ausgrid's Network Standard NS130.

3.5 Mechanical excavation.

3.5.1 General

Where mechanical excavation is being performed within the limits permitted by this standard, excavator buckets fitted with exposed teeth or ripper tines shall not be used.



Figure 2: Example of excavator bucket without exposed teeth.

3.5.2 Mechanical excavating near transmission cables (including pilot and fibre cables)

3.5.2.1 Mechanical excavation is not permitted within the following distances from a transmission cable, associated pilot or fibre cable:

- Directly above the cable cover strip;
- 2m to the side of the cable; and
- 2m underneath the cable.

3.5.2.2 All excavation work inside this zone shall be approved in writing by Ausgrid before work can commence.

Transmission Cables



Figure 3: Requirements when excavating near Transmission cables.

3.5.3 **Mechanical excavating near distribution cables**

3.5.3.1 Mechanical excavation is not permitted within the following distances from a distribution cable:

- 150mm above the cover strip;
- 300mm to the side of the cable; and
- 300mm underneath the cable.

3.5.3.2 All excavation work inside this zone shall be by hand or aero/hydro vacuum excavation.

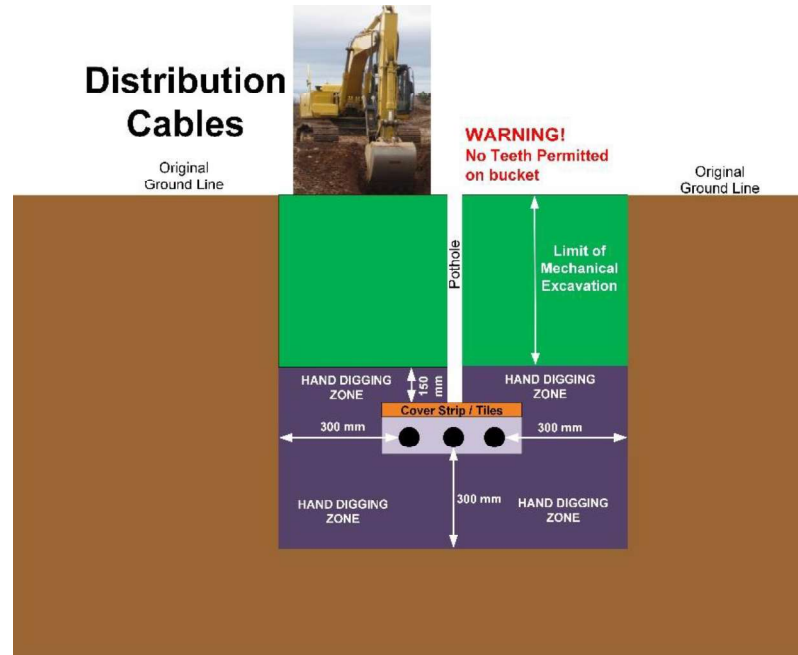


Figure 4: Requirements when excavating near Distribution cables.

4 Protecting assets after excavation

4.1 Cables

4.1.1 If during excavation works, Ausgrid's assets require relocation, or require supporting, the person in charge of the work shall contact Ausgrid.

4.1.2 Workers shall not place any pressure or load on exposed cables and or cable joints or attempt to move any cable.

4.1.3 Workers shall notify Ausgrid where a cable shows visible signs of damage or deterioration.

4.2 Conduits/cover strip.

External workers are not permitted to cut any Ausgrid conduit or cover strip or insert any material into any Ausgrid conduit.

4.3 Earthing cables around substations

If an earthing conductor or grid is disturbed, damaged or broken – workers shall stay clear and immediately contact Ausgrid. Workers shall not attempt to relocate or repair an earthing conductor.

4.4 Operating heavy equipment

4.4.1 Where heavy "Crawler" or "Vibration" type machinery is to operate over the top of Ausgrid's underground assets, the minimum cover requirements in Table 2 shall be maintained whilst the machinery is in operation.

4.4.2 Refer to NS193 for acceptable ground movement, vibration and pressure limits near buried cables.

Table 2: Heavy plant operating distances

Asset Type	Minimum Operating Distance
Transmission cable.	As directed by Ausgrid
High voltage cable or conduit with no cover strip or marker tape.	600mm to top of cable or conduit
High voltage cable or conduit with cover strip or marker tape.	300mm to top of cover strip or marker tape.
Low voltage cable or conduit with no cover strip or marker tape.	450mm to top of cable or conduit
Low voltage cable or conduit with cover strip or marker tape.	300mm to top of cover strip or marker tape

5 Directional drilling and boring

5.1 General

Directional drilling, boring or the installation of soil/rock anchors shall comply with clauses 5.2, 5.3 & 5.4 below.

5.2 Transmission cables

Directional drilling, boring or installation of soil/rock anchors within 2m of any Ausgrid transmission cable including pilot or fibre cables, shall not commence until the person in charge of the work contacts Ausgrid and receives written confirmation of Ausgrid's requirements.

5.3 Distribution cables – Parallel bores

5.3.1 Directional drilling, boring or installation of soil/rock anchors in parallel to existing Ausgrid distribution cables or conduits shall require a minimum separation of 2 metres between the Ausgrid cable and the bore head. **Exception:** When the boring machine is laser guided, with daily calibration by a registered surveyor, the separation may be reduced to 1m.

5.3.2 Potholes shall be excavated every 10 metres along the cable route to confirm the cable location.

5.3.3 Observation trenches (slit trenches) a minimum of 1 metre wide, shall be excavated every 10 metres along the route, to confirm that the bore is maintained its alignment. Refer to Figure 5 below.

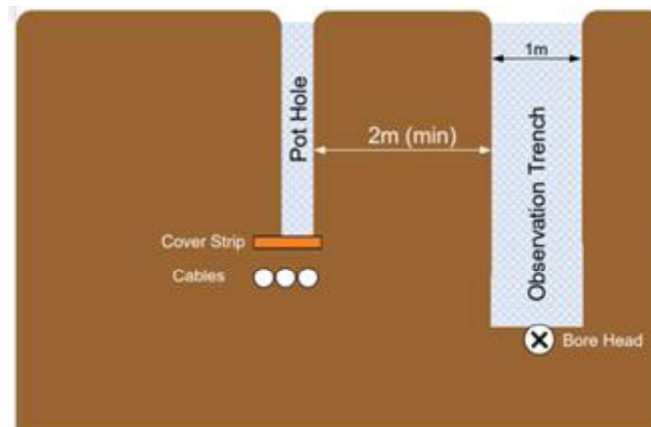


Figure 5: Requirements when boring in parallel to Ausgrid distribution cables.

5.4 **Distribution cables – Under bores**

Directional drilling, boring or installing soil/rock anchors under existing Ausgrid distribution cables or conduits shall require a minimum separation of 2 metres between the Ausgrid cable and the bore head. An observation trench on the entry side shall be excavated to confirm that the bore maintains its nominated separation from the cables or conduits. Refer to Figure 6 below.

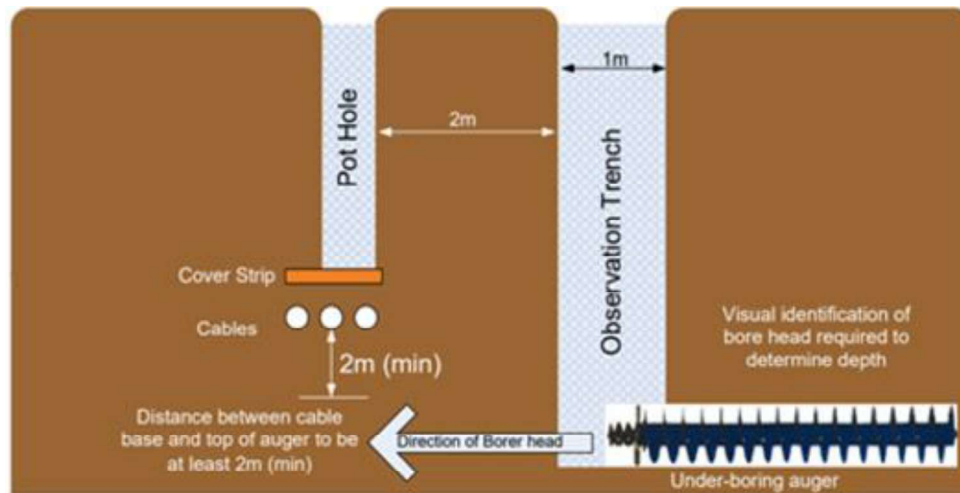


Figure 6: Requirements when boring under Ausgrid distribution cables.

6 Work near submarine cables.

- 6.1 The location of Ausgrid’s submarine cables are recorded on Ausgrid BYDA plans and are identified on site by the presence of signage, similar to Figure 7 below.
- 6.2 If submarine cables are identified as being within 20m of the proposed work site, contact Ausgrid before commencing work on site.



Figure 7: Typical Submarine Cable Warning Signs

7 Use of explosives near Ausgrid assets

- 7.1 The proposed use of explosives near Ausgrid’s assets requires notification to Ausgrid before work can commence on-site. Refer to Clause 2.
- 7.2 Refer to Ausgrid’s Network Standard NS193 for acceptable ground vibration limits near buried cables.

8 Damage to Ausgrid assets

- 8.1 Any damage no matter how small or large, even though not immediately causing failure, shall be reported to Ausgrid.
- 8.2 All work shall be stopped until assessed by Ausgrid and direction given to proceed.



Figure 8: Example of damaged Ausgrid asset

9 Hazardous materials across Ausgrid network

9.1 Asbestos

If asbestos is suspected of being present, refer to Ausgrid's Network Standard NS211.

9.2 Organochlorine Pesticides (OCP)

If Ausgrid is notified of proposed work within 2m of a transmission cable, around which may be soil containing Organochloride Pesticides (OCP), Ausgrid will provide information on managing the possible presence of OCP to the notifying person.

10 Bedding and reinstatement requirements after excavation of trenches

10.1 Backfilling

The bedding and backfilling of excavations near distribution cables and conduits shall be carried out in accordance with Ausgrid's Network Standard NS130. The bedding of transmission cables and conduits shall be as indicated by Ausgrid's representative.

10.2 Reinstatement

- 10.2.1 Temporary reinstatement of trenches shall be carried out in accordance with the requirements of the appropriate road authorities.
- 10.2.2 Responsibility for the maintenance of the temporary reinstatement shall rest with the party responsible for the excavation work until permanent reinstatement is completed.
- 10.2.3 Permanent reinstatement work shall be arranged by the work group responsible for the excavation after consultation with the appropriate road authority.

11 Emergency situations

11.1 Make Safe.

- 11.1.1 Machinery (including hand operated plant such as jack hammers) may become live if it contacts or damages electrical assets. In the event that a cable or electrical equipment is damaged, all workers shall be instructed to keep at least 8m away from machinery and the work site area.
- 11.1.2 Work shall not resume on site until Ausgrid has assessed the damage and given approval to continue work.

11.2 **Contact Ausgrid and Emergency Services.**

11.2.1 Ausgrid workers shall report any incident immediately to their supervisor. External workers shall contact Ausgrid and provide information on the location and the extent of the damage and provide the contact details of the person in charge of the worksite.

11.2.2 Contact other emergency services according to the nature of the incident and the relevant company work practices.

11.3 **Others dealing with emergencies which may be close to Ausgrid assets.**

If emergency work is being carried out and it is believed that Ausgrid assets may be located in the vicinity of the emergency, the manager of the incident shall contact Ausgrid in order to arrange for an Ausgrid representative to provide any necessary assistance as soon as practicable.