

WORKING NEAR HORIZON POWERS UNDERGROUND & OVERHEAD ELECTRICAL NETWORK

Horizon Power 2018

Prepared by Field Practices

Safety and Health

Corporate Services & Company Secretary

DOCUMENT CONTROL

<p align="center">Document Owner <i>(May also be the Process Owner)</i></p>	<p>Name: Mark Van Vuuren Position: Field Practices Coordinator Date: May 2015</p>
<p align="center">Approved By *</p>	<p>Name: Mark Van Vuuren Position: Field Practices Coordinator Date: May 2015</p>
<p align="center">Authorisation ** <i>Process Owner is hereby vested with authority and responsibility to manage the process end to end.</i></p>	<p>Name: Lance Roberts Position: Manager Safety and Health Date: May 2015</p>
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* *Must be the Process Owner and is the person assigned authority and responsibility for managing the whole process, end-to-end, which may extend across more than one division and/or functions, in order to deliver agreed business results.*

** *This person will have the power to grant the process owner the authority and responsibility to manage the process from end to end.*

*** *Frequency period is dependent upon circumstances– maximum is 5 years from last issue, review, or revision whichever is the latest. If left blank, the default will be 1 year unless otherwise specified.*

STAKEHOLDERS	NOTIFICATION LIST
The following positions must be consulted if an update or review is required:	The following positions must be notified of any authorised change:
CUSTOMER SERVICES	DISTRICT OPERATIONS OFFICERS
DISTRICT BUSINESS MANAGERS	WORKS DELIVERY COORDINATORS

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1 Overview

1.1 Introduction

This document provides information on how to manage risks when working in the vicinity of Horizon Power's overhead and underground electrical networks.

From time to time, it may be necessary to carry out excavation work near Horizon Powers' underground and overhead electrical networks.

This document provides:

- a) The minimum requirements for excavation work near underground and overhead electrical networks.
- b) Information to assist in creating a safe work environment and to prevent damage to the electrical networks.

Compliance with this document will ensure:

- a) An appropriate level of information is available
- b) A safe work environment is created and maintained
- c) Horizon Power's electrical networks are not damaged
- d) The consistent practices in notifying Horizon Power of pending works
- e) No undue delays to projects

1.2 Scope

1.2.1 Extent

These requirements apply to all Horizon Power Workers, and including Workers operating, servicing, and/ or maintaining (SPS) Standalone Power Systems electrical equipment (inclusive of all generating methodologies) who carry out excavation work on or near Horizon Power underground and overhead electrical networks where the proposed excavation:

- a) Is greater than 600 mm deep and;
- b) Is Within 3 metres of Horizon Powers electrical network or;
- c) The Contractor requires Horizon Powers electrical network to be supported.

1.2.2 Exclusions

These requirements do not apply when installing reticulated services such as gas, communication, water or electricity and where the width of the excavation does not exceed 400 mm and the depth does not exceed 600 mm.

These requirements do not substitute for or override any legislation, regulation or code of practice implemented by Worksafe Western Australia.

1.3 Legislative Requirements

The Occupational Safety and Health Act 1984 and the Occupational Safety and Health Regulations 1996 in general prescribes obligations upon employers to ensure the health, safety and welfare of their employees and require the employer to provide and maintain safe places and systems of work, without risk to health of both workers and others.

Excavation work is not a hazard in itself, but can create hazards that may result in serious injury or death.

In order to comply with the various Acts and Regulations it is necessary that excavation work be carried out in accordance with the Code of Practice 'Excavation' published by WorkSafe Western Australia.

Information on the Code of Practice can be found at the WorkSafe website at: www.safetyline.wa.gov.au

2 Definitions

Although some definitions may be commonly used, the following definitions have been written for the specific purpose of these guidelines.

Authorised Person means a person with technical knowledge or sufficient experience who has been approved, or has the delegated authority to act on behalf of the Network Operator, to perform the duty concerned.

Collapsible Area means the area surrounding an excavation that may be subject to collapse due to the excavation work.

Contractor means for the purpose of these guidelines any person adequately advised or supervised by an authorised person to enable them to avoid the dangers which electricity may create when working near Horizon Power underground and overhead electrical networks.

Danger Zone means an area around the electrical network into which no part of a person (body), conducting object, tool or equipment being held or carried, mobile plant and/or its load or vehicle and/or its load may encroach.

Electrical Apparatus means any electrical equipment, including overhead lines and underground cables, the conductors of which are live or can be made live.

Electrical Network means overhead and underground transmission and distribution systems consisting of electrical apparatus, which are used to convey or control the conveyance of electricity.

Equipotential Mat means a mat that has been designed to place an operator at the same potential as the electrical equipment being operated, thus minimising a voltage potential between the operators feet and hands.

Near means a situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming within the relevant Safe Approach Distances.

Recipient in Charge means the Authorised Person who is responsible for the work permit.

Safety Observer means a competent person assigned by the Recipient in Charge and whose sole function is to observe and warn against unsafe approach to electrical apparatus.

Shoring means a structural method of stabilising or supporting the sides or walls of an excavation.

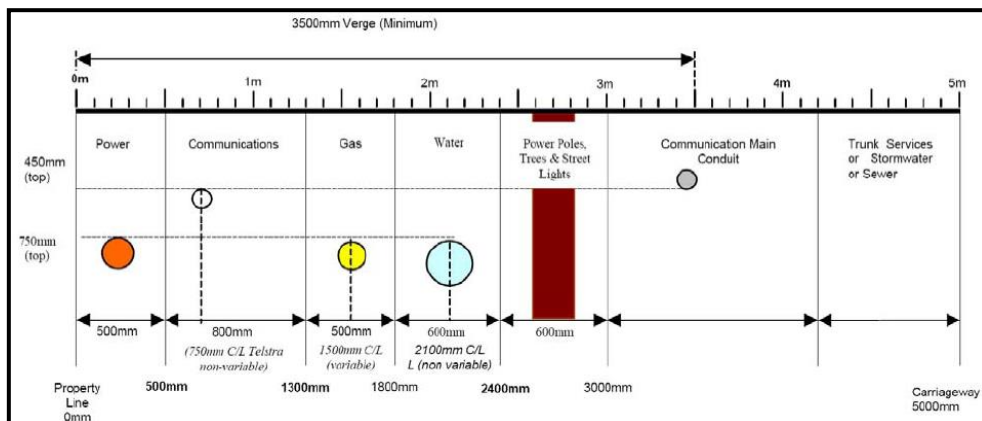
Work Permit means a written authorisation issued by Horizon Power with specific safety conditions that allow work to be undertaken near the underground and overhead electrical network

3 Requirements

3.1 Normal Service Allocations for Utility Providers

For installations of assets in road reserves, Utility Providers have adopted standard installation arrangements specified in the Main Roads WA Publication: Utility Providers Code of Practise for Western Australia.

Details of the Standard alignments, together with the service and pipe colours are shown below;



3.2 Before Starting Excavation Work

Before starting work careful planning and preparation is essential to ensure work is done safely, this can include:

- Understanding important stages of the planned work and how to deal with changes as the work proceeds.
- Understanding what plant will be used in the operations.
- Identifying possible hazards and risks associated with the work.
- Talking to the Electricity Supply Authority or asset owner about the proposed work if there is a risk of people, plant or things coming within an unsafe distance of an overhead or underground electric line.
- Ensuring compliance with all conditions imposed by the Electricity Supply Authority for the work.
- A competent person inspecting visual indicators on electric lines like tiger tails before starting operations each day—if visual indicators have moved or been damaged the Electricity Supply Authority should be contacted so they are replaced or relocated in the correct position.
- Ensuring an effective communication system is in place between workers at the site.
- Providing training and verifying qualifications and competency of workers.
- Providing information and instruction to operators and other workers about control measures to eliminate or minimise electrical risks.
- Supervising workers to ensure safe work procedures are followed
- Checking the plant and equipment including limiting devices are working properly.
- Checking proximity of people, cranes, mobile plant, material and tools to overhead electric lines.
- Checking proximity of people to cranes and mobile plant.
- Ensuring safe workplace entry and exit.
- Checking emergency plan and rescue procedures.
- Ensuring emergency equipment is provided and readily accessible on site including first aid kits and fire-fighting equipment suitable for electrical fire.
- Ensuring approach distances are relevant for the authorisation levels of the workers doing the work.
- Ensuring a safety observer is used to warn people and plant operators when they are likely to come closer than the approach distances and zones, and
- Managing the impact of environmental factors including storms and lightning in the area.

When preparing for the work you should ensure no new hazards are created.

In the planning stages of every project involving excavation work the Contractor shall:

- a) Comply with the requirements of section four (4) of the **'Utility Providers Code of Practice for Western Australia'**.
- b) Make contact with **'Dial Before You Dig'** to obtain a cable location plan
- c) Carry out a **Risk Assessment** to determine if the excavation is within 3 metres of any underground and/or overhead electrical network
- d) Determine the **Collapsible Area** of the proposed excavation
- e) Determine if any part of the underground and/or overhead electrical network will be inside the collapsible area of the proposed excavation
- f) Determine if plant or machinery will be operated near overhead power lines.

Note: When determining the collapsible area, consideration shall be given to the localised soil conditions and the imposed loads immediately adjacent the edge of the excavation.

The Contractor shall make contact with Horizon Power local depots see (*Working in the Vicinity of this document*) where the risk assessment determines that:

- g) Any part of the electrical network is at risk of being destabilised
- h) Plant or machinery may enter the Danger Zone when operated near overhead power lines
- i) Blasting is to take place with 30 metres of underground cables

The local Horizon Power depot will forward an application form **"Request to Work near Horizon Powers' Underground and Overhead Electrical Network"** and all relevant information to the Contractor. The process for handling a Contractor request is contained within the Appendices of this document.

Part A of the request form shall be completed and shall include information on the type of work being undertaken, then returned the relevant Horizon Power depot in the district.

The local Horizon Power depot will assess the request and provide the Contractor with voltage and minimum clearances details for the worksite

The Contractor is required to complete all sections of Part A, and return it to Horizon Power.

For Working in the Vicinity, contact the regional depots:

- Esperance: Esperance@horizonpower.com.au Phone: (08) 90723400
- Carnarvon: cararvon@horizonpower.com.au Phone: (08) 99416299
- Karratha: karratha@horizonpower.com.au Phone: (08) 91597250
- Port Hedland: porthedland@horizonpower.com.au Phone: (08) 91738281
- Broome: broome@horizonpower.com.au Phone: (08) 91929900
- Kununurra: Kununurra@horizonpower.com.au Phone: (08) 91664700

Note: The applicant accepts liability when they accept conditions on the “Applicant Acceptance” section of Part A of the request form. (Refer to section 3.10 of this guideline)

The Horizon Power local depot will make arrangements for an onsite technical assessment.

Note: Horizon Power requires 10 working days to schedule the technical assessment, but may take longer if difficulties exist with the initial assessment.

On completion of the technical assessment, the following information will be forwarded to the Contractor:

- a) Network assets involved (e.g.: HV/LV pole, HV cable pole, Pole top TX, Padmount TX with culvert, Underground cables, Street light standard, etc.)
- b) Conductor loadings
- c) Weight of poles or ground-mounted asset
- d) Weight of hardware attached to pole(s)
- e) Depth of poles in the ground
- f) Condition of the pole and hardware
- g) Work to be completed by Horizon Power to make the network asset safe prior to the commencement of any excavation work

From this information, the Contractor shall design and submit an engineer approved shoring, bracing or support method to Horizon Power.

The Contractor shall ensure that the shoring, bracing or supporting method does not damage any part of the electrical network, and the Danger Zone clearances are maintained.

All plant or machinery used to brace or support the overhead electrical network shall be made inoperative or 'tagged out' to warn against accidental operation.

- Any changes to an Engineer Approved shoring, bracing or supporting method will require a further onsite assessment by Horizon Power and the Contractor will need to make prior arrangements before implementing.
- Horizon Power will need to be notified if blasting takes place within 30 metres of underground cables.

Note: The Contractor may need to obtain a work permit before starting any shoring, bracing or supporting activity.

For full details please refer to Section 10 - Work Permit

3.3 Excavation Work

Dial before You Dig (DBYD) must be undertaken as per Utilities Providers Code of Practice prior to any excavation work being undertaken.

Before commencing excavation work alongside a structure, a risk assessment must be undertaken to determine the stability and soundness of the structure and surrounding material when:

- The length of the excavation is the same as or greater than the structure.
- The excavation is less than 2.0 metres in length.

Where the risk assessment determines the structure is stable or there is no risk of the material at the base of the structure falling or dislodging into the excavation, work can proceed without shoring or bracing.

Where the risk assessment determines the structure is unstable or there is a risk of the material at the base of the structure falling or dislodging into the excavation, work must not commence until the structure or surrounding material has been stabilised.

Do not use mechanical excavators until you have located, identified and protected all underground utilities.

Excavator operators must comply with the SADs for specific underground utilities.

Mechanical excavation is **not** permitted within 500 mm in any direction of any HV underground electrical cables or gas pipe.

Only when you have **LOCATED, IDENTIFIED** and **PROTECTED ALL** underground utilities, can a small excavator be used, attach a smooth edge bucket or a rounded tooth bucket for clay/rock excavation, taking off layers of maximum 50 mm at a time.

3.4 Safety Observer

The safety observer's primary role is to monitor the movement of people or equipment, give timely warnings of any risk or non-compliance with safe work procedures and, where necessary, stop work if a risk situation escalates or cannot be minimised.

The safety observer must have a high regard for safety, be familiar with the task, and be fully aware of the potential risks associated with the work. In addition:

- A safety observer shall be appointed to warn against unsafe approach to overhead power lines during any shoring, bracing or supporting activities.
- A safety observer shall observe only one task at a time, if complex activities are been undertaken, appoint two safety observers.

3.5 Directional Drilling

Directional drilling is becoming the preferred method of installation for underground works due to improvements in technology and minimum installation disruption.

Conduits and cables shall be installed in accordance with the approved construction drawings.

In general, the following principles shall apply:

- a) Each cable shall be installed in a single way conduit.
- b) Cable and conduit installations shall be installed between 900 mm minimum depth and 1500 mm maximum depth unless other requirements of this document (e.g. rail crossings) or local site conditions apply.
- c) Cable spacing's shall meet the requirements of Drawing No. UDS-6-2 in the Underground Distribution Scheme (UDS) Manual or as designed for alternative installations.
- d) Conduits installed by directional drilling shall not require additional cable protection covers or cable marker tapes.

A maximum of two LV cables of 185 mm², including streetlight cables can be installed in a common directional drilling bore if there will be no tee or service joints along the cables.

One 35 mm² HV transformer cable and one LV cable of 185 mm² or less can be installed in a common directional drilling bore if there will be no tee or service joints along the LV cable.

Multiple high voltage feeder cables (185 mm², 240 mm² or 400 mm²) shall not be combined into a single directional drilling bore.

Separate directional drilling bores shall be used between 900 mm minimum depth and 1500 mm maximum depth.

3.6 Drilling

During construction, continuous monitoring and plotting of the pilot drill and back reamer progress shall be recorded to ensure compliance with the required alignment and installation depth. Refer to Field Instruction Manual FI 6.4 Excavation Work and Directional Drilling.

The monitoring may be accomplished either by manual plotting based on the location and depth readings provided by the tracking system or by computer-generated track logs fed by this information. The tracking system shall provide information on:

- a) Clock and pitch.
- b) Alignment and Depth.
- c) Position (x-y).
- d) Azimuth - is defined as the direction of cable where a walkover is not possible.

The bore logs shall show a depth and bore position from a known boundary every 3m along the bore line. These records shall be made available to Horizon Power electronically as a permanent record.

To prevent collapse of the borehole, drilling mud or similar material rather than just water shall be used for both drilling and back reaming operations.

Drilling, back-reaming speeds and fluid flow shall be set to ensure spoil is removed without putting unacceptable pressure on the surrounding soil (e.g. surface humping).

During conduit and/or cable installation, pull-back tension shall be set so as to not exceed conduit/cable manufacturers' maximum pulling tensions.

3.7 Drilling Fluids Management Plan

A drilling fluids management plan shall be completed prior to the commencement of directional drilling work. The plan shall contain the following:

- a) Method of slurry containment.
- b) Method of recycling drilling fluids and spoil if applicable.
- c) Method of transporting drilling fluids and spoil off site.
- d) Drilling fluid pressures.
- e) Measures to contain and clean the affected area for inadvertent return of drilling or hydraulic fluids.
- f) Measures to adequately clean-up of surface seepage of drilling fluids and spoils.

3.8 Emergency Excavation

3.8.1 Before commencing unplanned work

Before commencing unplanned work (emergency repairs) the Contractor shall contact Horizon Power on **08 9159 7264** if the Contractors' risk assessment determines:

- a) The unplanned work is within 3 metres of the electrical network,
- b) and all or part of the electrical network is inside the collapsible area;
- c) The electrical network is at risk of falling.
- d) Plant or machinery may enter the Danger Zone when operated near overhead power lines.

A Horizon Power representative shall be sent to site to determine the action required to make the site safe.

3.8.2 Site Emergency Response

If any part of the electrical network has fallen or is at risk of falling,

- a) Call HP Emergency Response **08 9159 7264**
- b) Immediately secure the area to prevent public access
- c) Arrange traffic management control measures
- d) Install temporary barriers and warning signs or use the police by calling **000** if required.

3.9 Works near Underground Cables

3.9.1 General

As a safety precaution:

DANGER
All cables shall be regarded as LIVE until proven isolated at the worksite by Horizon Power

Where plant, equipment or persons are required to carry out excavation work in the vicinity of underground cables, there is a risk of serious injury or fatal electric shock.

Although a risk assessment will outline specific safeguards to be employed at the worksite, difficulties can arise due to:

- Difficulties in identifying the operating voltage of the cable;
- Multiple cable circuits in the vicinity of the worksite, including those of other utilities.

For these reasons, all PERSONS are required to maintain a **Minimum Safe Approach Distance** to ALL cables until additional precautions are taken at the excavation site.

3.9.2 Minimum Safe Approach Distance to Underground Cables

Where the presence of underground cables has been identified, **Minimum Safe Approach Distances shall be maintained** as detailed in Table A below, until the following steps are taken and approval is given by Horizon Power to carry out work closer;

- Due care shall be taken to identify the cable(s) location(s) and not to make contact with any underground cables.
- A Horizon Power representative shall supervise any excavation work required to be closer than 500 mm (0.5 metres), a Vicinity Authority (VA) is required for High Voltage cable/s within the relevant Safe Approach Distance.
- And/or that will disturb the soil beneath the cables, thus allowing them to be unsupported and unprotected.

A minimum of **10 working days'** notice is required where a Horizon Power representative is required to supervise the works.

The Contractor is to make contact with the Horizon Power Customer Services, who will arrange for a Horizon Power representative to be sent to the worksite.

Where underground cables have been identified the minimum approach distances **above and beside** underground cables, as shown in '**Table A**' shall be maintained.

Table 'A' Minimum Safe Approach Distances to underground cables

Nominal Voltage	Minimum Approach Distance (mm)	
	Powered Tool or Plant	Hand Tools (Un-powered)
Low voltage, up to and including 1000v (1kV)	300	<p>Closer than 300 mm (0.3 metres):</p> <p>Hand dig (maintain physical clearance - <u>no contact</u>)</p> <p>Horizon Power representative not required</p>
Greater than 1000v, up to and including 33 kV	500	<p>Closer than 500 mm (0.5 metres):</p> <p>Hand dig - Horizon Power representative to supervise the works, other than potholing</p>
Greater than 33 kV, up to and including 132 kV	3000 (see note)	<p>Closer than 3000 mm (3.0 metres)</p> <p>Horizon Power representative to supervise the works (see note)</p>

Note: Powered tools may be used up to 1.0 metre from underground cables between 33 kV and 132 kV **only when**:

- a) The Horizon Power representative is supervising the works and
- b) Pot-holing has identified the relevant cable/s.

Un-powered hand tools can then be used from 1.0 metre to the relevant cable/s.

3.10 Near Overhead Power lines

Under WorkSafe WA Regulation 3.64 the area around overhead power lines is known as the **Danger Zone** and shall not be entered at any time during the work process unless authorisation has been given by Horizon Power.

Danger Zone clearances vary depending on the voltage of the overhead power line, as shown in **Table 'B'**

Table 'B'

Type of Power Line	Voltage	Danger Zone (m)
Insulated low voltage including aerial bundled cable (ABC)	Less than 1000 volts	0.5
Un-insulated (bare) low voltage	Less than 1000 volts	1.0
High voltage	1000 – 33,000 volts	3.0
Transmission line	More than 33,000 volts	6.0

Plant or machinery being operated near overhead power lines should be positioned so that no component of the plant or machinery, or any part of the load it is carrying, can enter the **Danger Zone**.

Note: For details on the overhead power line voltage and the relevant **Danger Zone** clearance, applications shall be made in accordance with section 3.2 of this guideline.

3.11 Work Permit

A work permit is a written authorisation with specific safety conditions that allows work to be undertaken near the underground and overhead electrical network.

A work permit will be required when:

- The excavation is not shored, within 3 metres of the electrical network and part of or the entire electrical network is inside the collapsible area.
- The excavation is shored, within 1.5 metres of the electrical network and part of or the entire electrical network is inside the collapsible area.
- The electrical network requires bracing/supporting or
- Plant, machinery, tools or equipment is at risk of reducing or is required to go within the relevant **Safe Approach Distances of Table “A”** or enter **the Danger Zone clearances of Table “B”**
- As determined by Horizon Powers’ representative

A representative of Horizon Power will issue the work permit to the Contractor or their representative prior to the commencement of the work.

The person who receives this work permit is known as a Recipient in Charge, any person, who is responsible for accepting and cancelling a work permit, must have completed and met the outcomes of the “Recipient in Charge” training course prior to receiving a work permit.

The safety conditions stated on the work permit shall be read and understood by the Contractor or their representative prior to signing on as the Recipient in Charge of the work permit.

The Recipient in Charge shall ensure that:

- work is carried out in accordance with the conditions of the work permit
- all members of the work team understand the conditions of the work permit
- all members of the work team are informed of any change in the conditions under which the work team is working
- any person who joins the work team after work has commenced is made fully aware of the current work conditions
- any member of the work team who leaves the work site and returns is made aware of the current work conditions before recommencing work

To ensure that all work is carried out in accordance with the conditions of the work permit the Recipient in Charge shall remain on-site at all times while the work is being undertaken.

On the completion of the excavation work, the Contractor shall contact Horizon Power to have the work permit cancelled.

3.12 EMERGENCY SITUATIONS

The following instructions are intended only as a guide to Contractors and their personnel.

Note: In life-threatening emergency situations, immediately contact:

- 000
- 112 from a mobile or
- Horizon Power on **13 23 51**.

If contact is made or arcing occurs between live electrical apparatus and any plant, machinery and or person(s) then the following actions should be taken:

- Cease all work immediately.
- Instruct the operator to remain inside the cab or at the operator's station.
- If it is essential to leave the cab or operator's station because of fire or other life-threatening reason, keep your feet together and jump clear of the plant or machinery. **DO NOT** touch the plant or machinery as your feet come in contact with the ground?
- Continue to hop or take short shuffle steps away from the plant or machinery until you are at least 10 metres from the nearest part of the plant or machinery.
- Warn all other personnel/public to keep at least 10 metres clear of the plant or machinery and **DO NOT** approach the vehicle until the relevant authorities have determined the site is safe.
- Facilitate First Aid treatment and seek medical aid as required.
- Advise your organisations' emergency contact and have them immediately contact Horizon Power on **13 23 51**
- Initiate your organisation's incident investigation process.

3.13 TRAINING

Any person who is responsible for:

- Operating plant and machinery near Horizon Powers overhead or underground electrical networks.
- Supervising work near Horizon Powers overhead or underground electrical networks.
- Undertaking the duties of a safety observer or

Shall be aware of the requirements for operating plant and equipment near or no Horizon Power electrical apparatus; refer to The Utilities Code of Practice Western Australia, WorkSafe 'Code of Practice Excavation' and Dial Before You Dig requirements.

Any person, who is responsible for accepting and cancelling a work permit, must have completed and met the outcomes of the "Recipient in Charge" training.

3.14 AUDITS

The quoted work shall be subject to periodical audits carried out by Horizon Power on all sites where safety conditions will be in place for greater than four weeks, these audits are to ensure:

- All safety conditions are still in place.
- LV & HV covers are still in the correct position.
- There is no damage to LV & HV covers.
- There is no damage to the shoring, bracing or support methods.

3.15 COSTS

All costs associated with the technical assessments, site supervision and works undertaken by Horizon Power to make the worksite safe will be charged to the Contractor.

Horizon Power will advise the Contractor by way of a quote where the technical assessment identifies that work needs to be completed to make the electrical network safe.

3.16 LIABILITY

Whilst permission may be given to a person to work near the underground or overhead electrical network, Horizon Power cannot control the person's method of work. Therefore Horizon Power cannot accept any liability for incident or damage caused by that person when working near its underground or overhead electrical network.

The Contractor accepts liability when they sign the "Applicants Acceptance" section of the "Request to Work near Horizon Powers Underground and Overhead Electrical Network" form.

DANGER

Contact Horizon Powers Fault Centre - 13 23 51 - immediately where damage occurs

4. Supporting Information

4.1 TYPICAL POLE & TOWER STRUCTURE ARRANGEMENTS

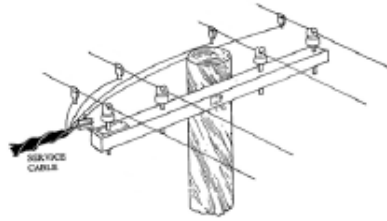
These are the most commonly found pole and tower structures within the overhead electrical networks. However, there may be many variations to the voltages on these structures.

Prior to commencing any work near the overhead electrical networks, confirmation of the line voltage and Worksafe WA Danger Zone clearances shall be ascertained by contacting the Horizon Powers regional depots.

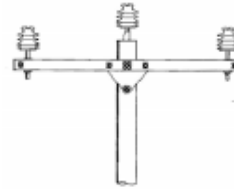
For Working in the Vicinity, contact the regional depots:

- Esperance: Esperance@horizonpower.com.au Phone: (08) 90723400
- Carnarvon: carbarvon@horizonpower.com.au Phone: (08) 99416299
- Karratha: karratha@horizonpower.com.au Phone: (08) 91597250
- Port Hedland: porthedland@horizonpower.com.au Phone: (08) 91738281
- Broome: broome@horizonpower.com.au Phone: (08) 91929900
- Kununurra: Kununurra@horizonpower.com.au Phone: (08) 91664700

Distribution lines – low voltage (below 1,000 volts) and high voltage (between 1,000 and 33,000 volts)

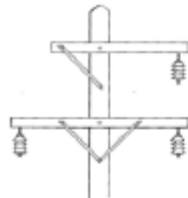


Typically 415 volts

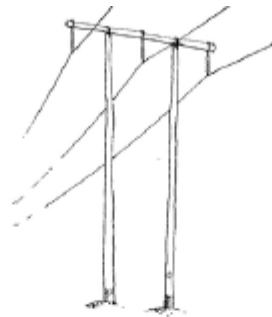


Typically 6600 to 33000 volts

Transmission Lines – high voltage above 33,000 volts



Typically 66000 volts



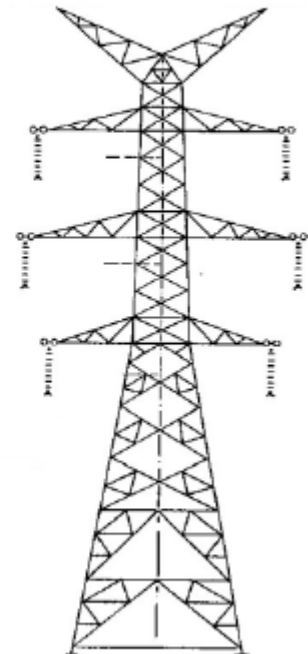
Typically 132000 volts



Typically 132000 volts



Typically 132000 volts



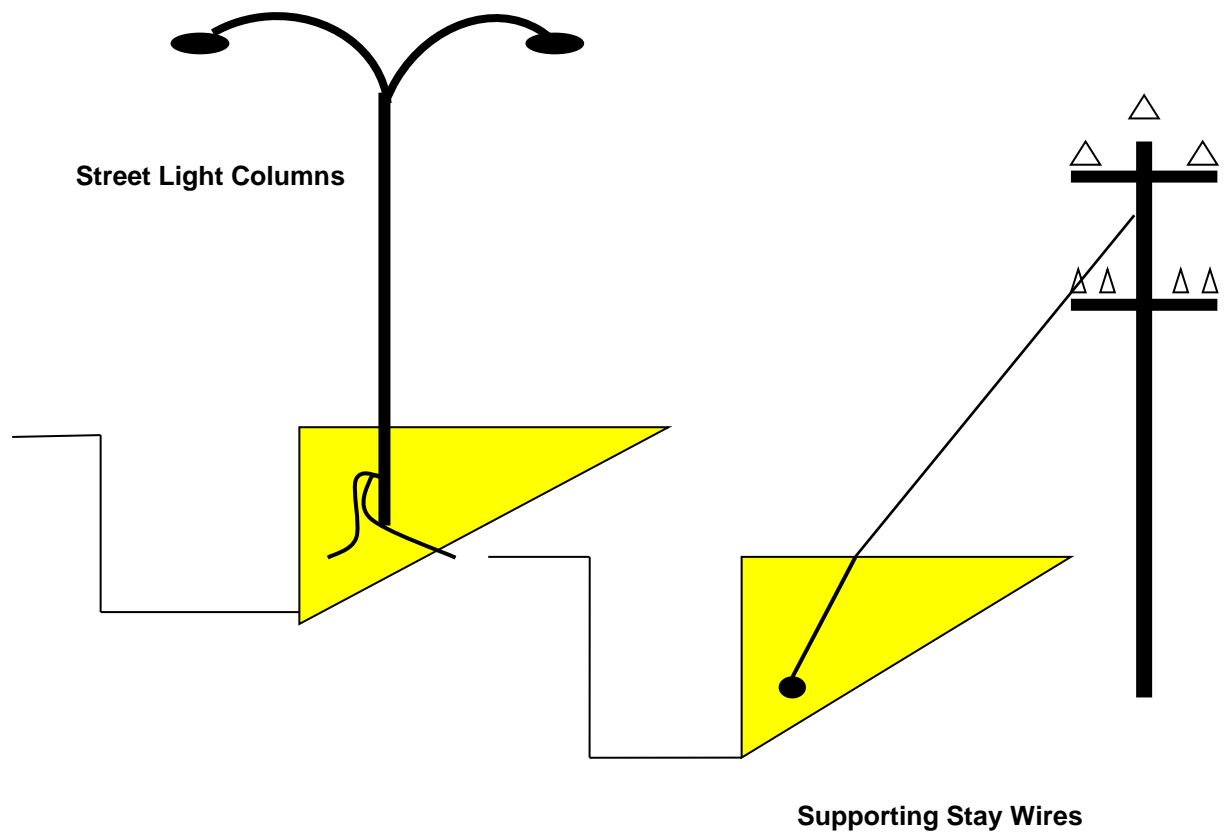
Typically 330000 volts

4.2 TYPICAL ELECTRICAL NETWORKS IN COLLAPSIBLE AREA

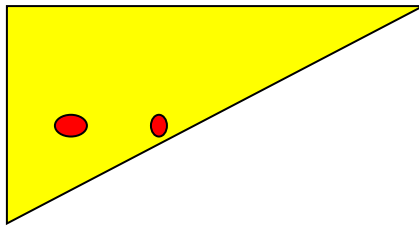
These are examples of the typical underground and overhead electrical network structures that may be located within the collapsible area.



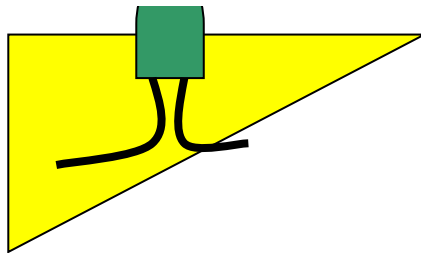
Collapsible



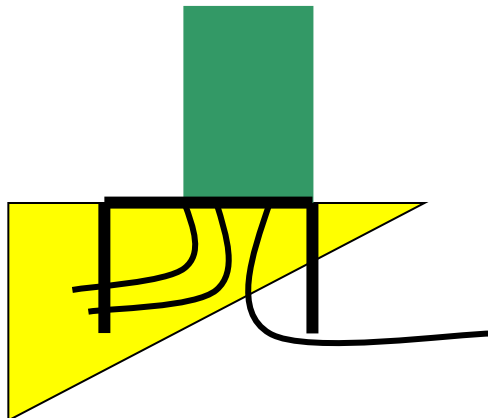
Underground



Underground Cables Pillar



Ground Mounted Transformers



4.3 Work Safe Regulation 3.64

Restrictions on working in the vicinity of overhead power lines

3.64. In this regulation –

“**Danger zone**” means anywhere that –

- Is within 0.5 metres of a live insulated overhead power line or aerial bundled conductor line of a voltage of not more than 1000 volts;
- Is within 1.0 metre of a live uninsulated overhead power line of a voltage of not more than 1000 volts;
- Is within 3.0 metres of a live overhead power line, whether insulated or not, of a voltage exceeding 1000 volts but not more than 33000 volts.
- Is within 6.0 metres of a live overhead power line, whether insulated or not, of a voltage exceeding 33 000 volts;

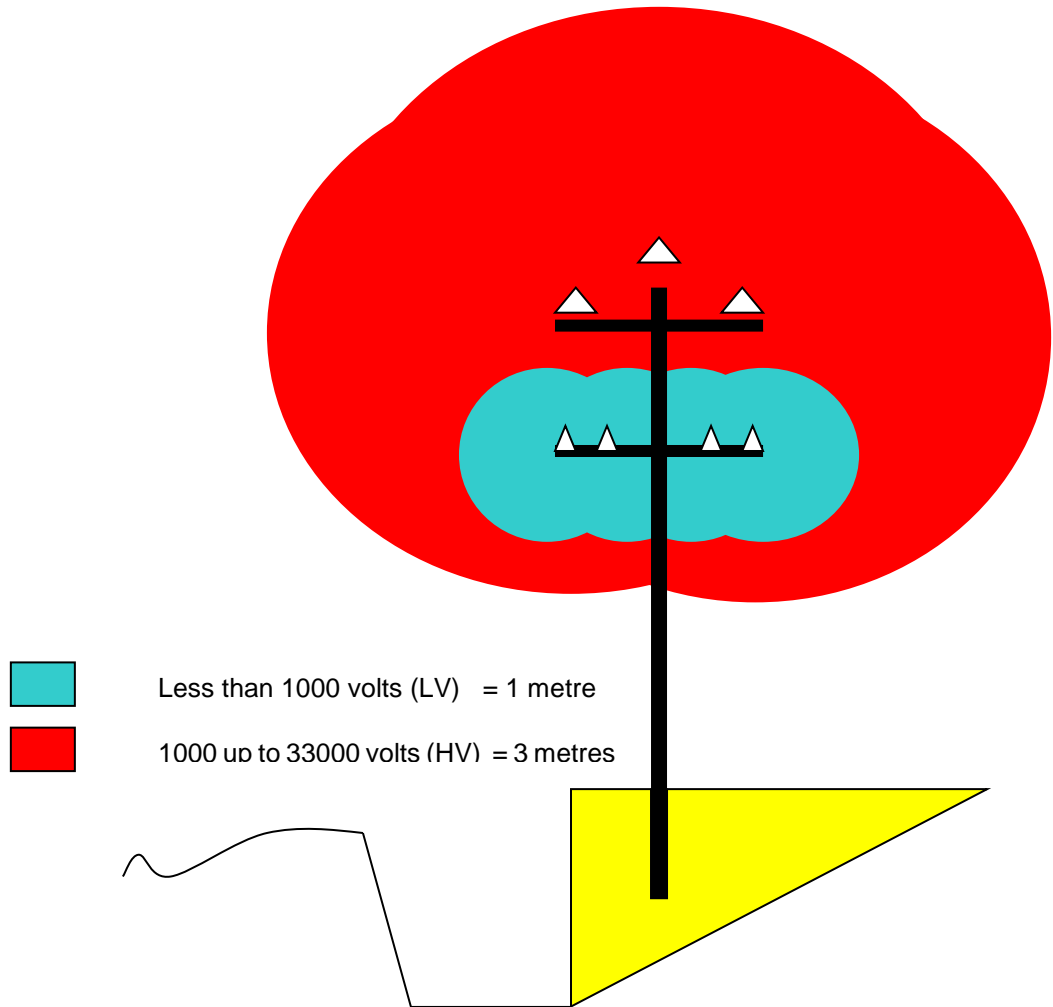
“**Overhead power line**” means an overhead line for the transmission of electrical energy.

Subject to sub regulation (3), without limiting clause 2.5.7 of AS/NZS 3012, a person who, at a workplace, is an employer, the main contractor, a self-employed person or a person having control of the workplace shall ensure that an employee or any plant or material used or controlled by an employee does not enter the danger zone of an overhead power line. Penalty: \$25,000

A person does not commit an offence under sub regulation (2) if, proof of which is on the person:

- The overhead power line has been adequately insulated and effectively cordoned off to protect the safety of persons or otherwise made safe, as the case requires.
- The employee is authorised to carry out electrical work under the Electricity Act 1945.

4.4 Example of Danger Zone for Distribution Systems



4.6 References

- WorkSafe 'Code of Practice Excavation'
- Occupational Safety and Health Act 1984
- Occupational Safety and Health Regulations 1996
- 'Utility Providers Code of Practice for Western Australia'.
- Dial Before You Dig

Horizonpower's Instruction Manual: **Section 4** Underground Work

- Field Instruction FI 6.4 Excavation Work and Directional Drilling