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UNDERGROUND AND OVERHEAD SERVICES

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PURPOSE AND SCOPE	
<p>The purpose of this procedure is to ensure a safe work environment for work conducted in the vicinity of underground and overhead services. This procedure applies to all overhead and underground essential services in pipes or lines at a Hansen Yuncken project. Essential Services include the supply of gas, water, sewerage, telecommunications, electricity, chemicals, fuel and refrigerant in pipes or lines.</p>	

RESPONSIBILITIES

HY PROJECT TEAM:

- Ensure existing services are identified and isolated where possible prior to commencing work on impacted areas
- Ensure temporary services and permanent services are updated on the site As-built drawings
- Ensure applicable Work Permits and authority permits are implemented prior to commencing work
- Ensure only trained and competent persons perform work on site
- Ensure worker competencies and qualifications are verified prior to commencing work
- Ensure that SWMS are provided for any work that is carried out on or near:
 - pressurised gas distribution mains or piping; or
 - chemical, fuel or refrigerant lines; or
 - energised electrical installations or services

HAZARD IDENTIFICATION RISK ASSESSMENT AND CONTROL (HIRAC)

All risks associated with working in the vicinity of essential services must be included in the project risk register. This includes risks associated with:

- Ground disturbance (e.g. excavating, piling, bulk earthworks)
- Ground penetration (e.g. star pickets)
- Surface penetration (e.g. vertical walls, floors slabs, ceilings)
- Movement of plant below or adjacent to services (e.g. crane operations, mobile plant, material haulage, excavators)

IDENTIFICATION OF SERVICES

Prior to work commencing, all essential services at or near the work location, that could create a risk if contacted or damaged, must be accurately identified and recorded.

UNDERGROUND AND CONCEALED SERVICES

Available information on underground and concealed services should be reviewed as part of planning work. This includes:

- Existing service locations (including temporary services and permanent energised services) and site layout plans
- Building plans and surveys
- Utility plans
- Locations of pit lids, marker posts and meters
- As-builts

Dial Before You Dig (DBYD) must be contacted prior to any work that involves ground disturbance. DBYD documents should be obtained at the beginning of the project prior to work commencing. It should be noted that:

- DBYD documents must be reviewed and within date
- Not all infrastructure asset owners and networks are DBYD members
- Information provided does not pinpoint the exact location of services

In some cases, there may be a requirement to verify the exact location, pathways, depths, and dimensions of services. HY, in consultation with the Subcontractors involved, will determine the need to engage a service provider to use inground services locating technologies and provide documentation confirming the nature of existing inground services.

As services are installed or removed from site, a services location plan must be marked up accordingly and kept up to date. This documentation can be used for groundworks permits.

NOTIFICATIONS AND AUTHORISATION

When work needs to be undertaken near an underground asset, the asset owner must be consulted in regard to the work to be conducted and the controls to be implemented for the following:

- Within 3m of electricity conductors greater than 66kV
- Within 500mm of all other services

Where a permit is issued by the Asset Provider, works must be conducted strictly in accordance with the permit.

PROTECTION OF SERVICES

Essential services must be protected from damage while work is being undertaken at site. This may include:

- Visual identification of services (e.g. tiger tails, location marked on walls, location marked with coloured paint on the ground, signage)
- Physical protection of services (e.g. enclosures, cable trays, bollards)
- Use of exclusion zones

ISOLATION OF SERVICES

Where possible, essential services must be isolated prior to undertaking work in the vicinity of them. This includes underground, concealed, adjacent and/or overhead essential services. Asset owners must be consulted prior to performing any isolation or de-energisation works. Services must be isolated as per the Isolation procedure.

WORKING NEAR OVERHEAD SERVICES

Before undertaking work within the designated exclusion zone of overhead lines, the asset owner must be consulted in regard to controls to be implemented. All works must be carried out as per the asset owner's requirements which are usually found on the permit to work.

Safe systems of work must be implemented when working in close proximity to overhead services, including:

- Where possible, de-energising or isolating the service
- Using plant that has controls in place that prevent it from entering the No Go Zone
- Using non-conductive barriers
- Fitting plant with limiting or slowing devices
- Installing signage to warn of the overhead hazards
- Having authorised persons along with Safety Observers/Electrical Spotters in place when entering an exclusion zone

APPROACH DISTANCES TO OVERHEAD POWER LINES

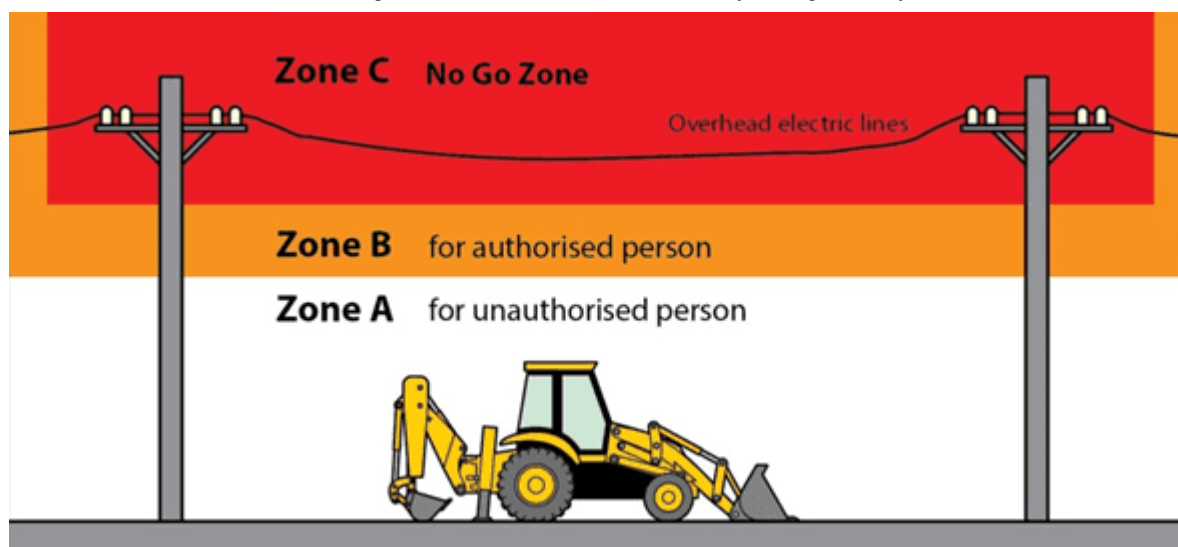
Approach distances and work zones must be established for overhead power lines. The approach distance for each work zone will vary depending on the voltage of the overhead electric line and the level of authorisation of each person doing the work. As the risk increases a greater approach distance is required. The distance and reach of the plant being operated must also be taken into account.

The three categories of work zones are as follow:

- **Zone C** – No Go Zone closest to and surrounding the electric line where Electricity Supply Authority approval is required. A 'permit to work' will be required.
- **Zone B** – surrounds the electric line and is further away than Zone C. It is for authorised persons. Authorised persons are workers who have successfully completed a recognised training course in overhead line electrical hazards so are permitted to work in Zone B.
- **Zone A** – is furthest away from the electric line and is for unauthorised persons

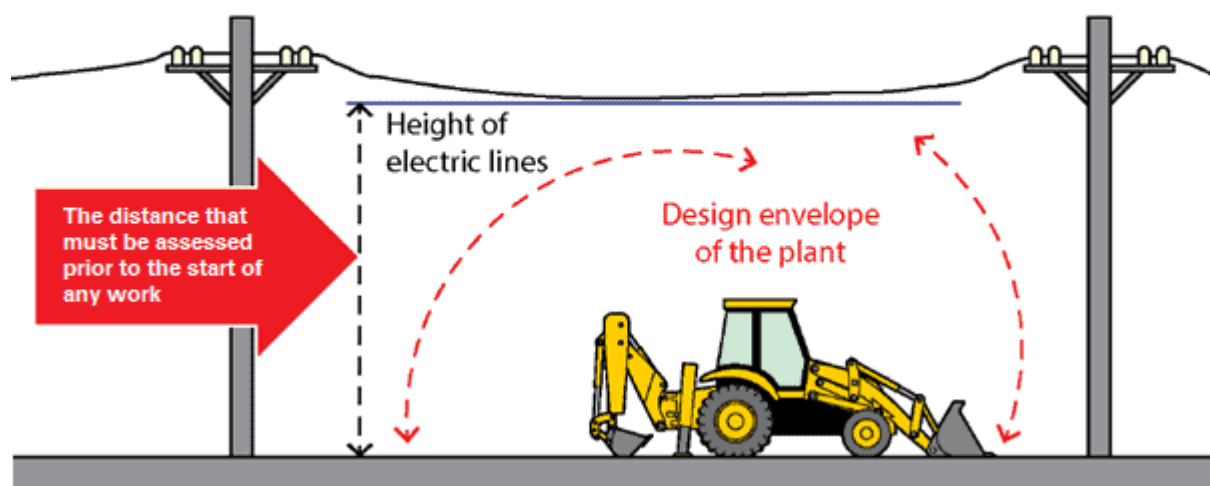
Unauthorised persons are workers who have not received training in overhead line electrical hazards and do not have sufficient training or experience to enable them to avoid the dangers from overhead electric lines and associated electrical equipment.

Plant operating in the vicinity of overhead services that has the capacity to reach Zone C must be fitted with limiting/slowing devices.



(<https://www.hyworkzone.com.au/wp-content/uploads/powerlines.png>)

Approach distances and work zones in each state and territory vary for people, plant and vehicles depending on the voltage of the overhead electric line, whether the electric lines are insulated or bare, and in some states with or without consultation with the person in control of the energised overhead electric line or exposed part.



(<https://www.hyworkzone.com.au/wp-content/uploads/powerlines-2.png>)

For more information the relevant state or territory Electricity Supply Authority or Electricity Regulator must be contacted.

WORKING NEAR UNDERGROUND SERVICES

Safe systems of work must be implemented when working in close proximity to underground services, including:

- Positive identification of the service by hand tool or potholing
- Use of excavators only up to the distance from the service as specified by state legislation and the asset owner
- Use of “competent spotters” within 500mm of an asset

Available information about existing underground essential services may not be accurate. An initial examination may be required by exposing a short section of underground services using methods such as water pressure and a vacuum system to excavate or ‘pothole’ the area. If it cannot be determined exactly where an underground cable is, potholing (i.e. hand digging to pre-determined depth) must be used to identify the cable location. Insulated hand digging tools suitable for the voltage concerned must be used or a vacuum pumping in the potholing process.

EMERGENCY PROCEDURES

Where work is undertaken at a site near, adjacent to or below essential services, the procedures for the response to an emergency related to essential services must be included in the Emergency Response Plan and SWMS. When establishing emergency procedures, the following must be considered:

- Underground and overhead service strikes
- Notification of relevant asset owners and authorities
- Shutting off and restoring essential services

DEFINITIONS AND ABBREVIATIONS

Essential Services – include the supply of gas, water, sewerage, telecommunications, electricity, chemicals, fuel and refrigerant in pipes or lines

REFERENCES

- NSW Electricity Supply (Safety and Network Management) Regulation 2014 – Part 4
- NSW Gas Supply (Safety and Network Management) Regulation 2013 – Part 5
- Construction work (Model Code of Practice)
- Demolition work (Model Code of Practice)

- Excavation work (Model Code of Practice)
- Managing the risks of plant in the workplace (Model Code of Practice)
- General Guide for Working in the Vicinity of Overhead and Underground Electric Lines (SWA) July 2014

ASSOCIATED DOCUMENTS

- HYer Standard – Underground and Overhead Services
- Isolation Procedure (<https://www.hyworkzone.com.au/isolation-procedure/>)
- Electrical Supply and Equipment Procedure (<https://www.hyworkzone.com.au/electrical-supply-and-equipment-procedure/>)

Last Modified: December 21, 2023

ANIMATION

HANSEN YUNCKEN (https://www.hyworkzone.com.au/wp-content/uploads/HY_Wordmark_Black_transparent.png)

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