

UNDERGROUND AND OVERHEAD SERVICES

SAFELY CONTROLLING WORK CRITICAL RISK CONTROL DOCUMENT



We are always licenced and competent when operating plant



We always isolate all energy sources before working on equipment and systems



We come to work free from impairment, alcohol and drugs



We ensure plant and equipment is safe to use



We always observe walkways, safe zones and exclusion zones



We always follow the Permit process when a Permit is required

DOCUMENT CONTROL			
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Issue Date	01-June-2022		
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DOCUMENT REVIEW			
Date	Revision	Description of Change	Author
1-Dec-2021	1	First document	AE, MJ, OG
1-Jun-2022	2	<ul style="list-style-type: none"> Included page numbers Added a couple of pictures for working near low voltage electric lines with/without consent 	AE, MJ, OG, AVR, JB

Underground and Overhead Services

Underground services are an element of building service, such as an electrical cable or a pipe, that is buried in the ground. Overhead services feeds include power poles that string feeder wires from the utility company's pole.

Activities on our construction sites that involve underground and overhead services include:

- Excavations (of any depth)
- Installation of waratahs
- Crane operations
- Any lifting operations
- Services placement and setup
- Piling work
- Operating mobile plant around services

Related safely controlling work documents:

- [Excavations](#)
- [Elevated Work Platforms \(EWP\)](#)
- [Mobile Plant](#)
- [Cranes, Hoists and Other Lifting Activities](#)
- [Scaffold and Mobile Scaffold](#)

Risks - What could go wrong?

- Contact with overhead powerlines causing electrocution or electric shock causing death or serious injury such as burns, arrhythmia and/or loss of consciousness
- Arcing from close proximity with overhead powerlines causing electrocution or electric shock
- Contact with underground gas lines causing fire and/or explosion resulting in fatality or major injury such as burns or property damage that may also affect the company reputation
- Contact with underground electricity services causing electrocution or electric shock causing death or serious injury such as burns, arrhythmia and/or loss of consciousness or property damage
- Contact with water mains/Fibre lines causing leak and property damage

Controls – How do I keep safe?

The identification of work where there is a risk of contact with underground and overhead services and appropriate control measures are to be fully detailed in a Safe Work Method Statement (SWMS) or similar risk-assessment document prior to commencing any work.

The SWMS must be reviewed by an appropriate Ryman representative prior to any work commencing and following any changes to the task or environment.

Note: Outside consultation may be required for government owned utilities, Vector/Electrix, dial before you dig, etc..

Underground Services

Underground services controls include but are not limited to:

	Control Type	Control Measure	Control Level
	Elimination	Remove risk by not requiring underground services e.g. use of solar powered temporary lighting	Most Effective Control
	Substitution	Hand digging (e.g. using shovel) instead of using machinery for underground services Use trenchless methods for laying services	
	Isolation	Isolation any immediately adjacent services before starting to dig by a trained and competent professional - i.e. lock out tag out Isolate the working area to control unauthorized personnel or plant access. Isolate with fencing where practicable, or cones, barriers, tapes, bunting Encasement/encapsulate of services	
	↑ WORK ABOVE THE LINE WHERE POSSIBLE TO CONTROL RISK ↑		
Minimization	Engineering	Use location detection devices to identify services e.g. CAT, GPR or jet/hydro-vac equipment Place a tracer wire for non-metallic services Toothless buckets used during excavation around services	↓ Least Effective Control
	Administrative	Cable markup/non encroachment lines If working within MAD of underground services, close approach permit/consent and line owner Spotter required. Permit to break ground and obtain plans (plans cannot be relied upon for underground services) Service location e.g. through as-built plans, dial before you dig services Signage – warning or information signs. e.g. live services	
	PPE	This includes the use of mandatory PPE including hard hat (AS/NZS 1801:1997), high visibility vest (to include day/night glow strips) (AS/NZS 4602.1) and safety footwear (AS/NZS 2210.3:2002)	

NOTE: Where the risk cannot be eliminated, a combination of control measures may be appropriate.

Minimum control requirements for identification and management of underground services

(see 'Excavations' for information on safe excavation practices):


- Existing services should be identified prior to commencing works on site wherever possible. This may be done, but not limited to the following:
 - Dial before you dig services (0800 248 344)
 - Underground service scanning to identify location of all services. This may require a number of scanning methods including radar detection and CAT scanning. Personnel scanning must be trained (e.g. CAT/jenny trained)
 - Obtain services 'as-built' drawings from facility/landowner/occupiers.
 - Non-destructive digging or potholing
- An underground Services Drawing must be marked up showing the location of all underground services and prominently displayed onsite. Remember, drawings and service plans may be different (location and depth) from what is underground. This plan should be made available to all workers that may penetrate the ground (excavator operators, mobile crane and concrete boom pump operators etc)
- Accurately trace and mark out underground services. Underground services should be marked onsite to identify their location to others wherever deemed necessary e.g. spray-painting footpath. Remember, drawings and service plans may be different from what is underground
- The 'No Go' zones for each underground service must be determined before commencing work in the location of the service. This can be obtained by contacting the asset owner

Introduction of or discovery of uncharted services:

- Maintain the Ryman Underground Service Plan which identifies all as laid services during construction including temporary services. If they are not Ryman services, notify the council so services can be chartered
- Permit to break ground must be in place for all excavation activities or other activities that break ground e.g. installation of waratahs (regardless of depth). Permit to break ground identifies the requirements for identifying underground services. See 'Permit to Work Procedures' for information
- Close approach permit/consent required if within the minimum approach distance (MAD) of services. If working within MAD a spotter may be required as per the electricity act/regulations. 48 hours notice is required for electricity service owner/spotter and up to 10 days notice is required for gas service owner/spotter
- Isolate any immediately adjacent services before starting to dig (wherever possible) - i.e. lock out tag out. All electrical work, live or dead, must be carried out by electrically trained and competent workers to ensure the work is completed safely. Isolation to be verified through means of written confirmation and/or use of service detection device
- Isolate the working area to control unauthorized personnel or plant access the working area. Isolate with fencing where practicable, or cones, barriers, tapes, bunting etc..
- Hand tools and/or hydro/jet-vac excavation method must be used within a minimum of 2.0m distance of any services
- Potholing method used to confirm the location of any underground services as per as-built plans

Overhead Services

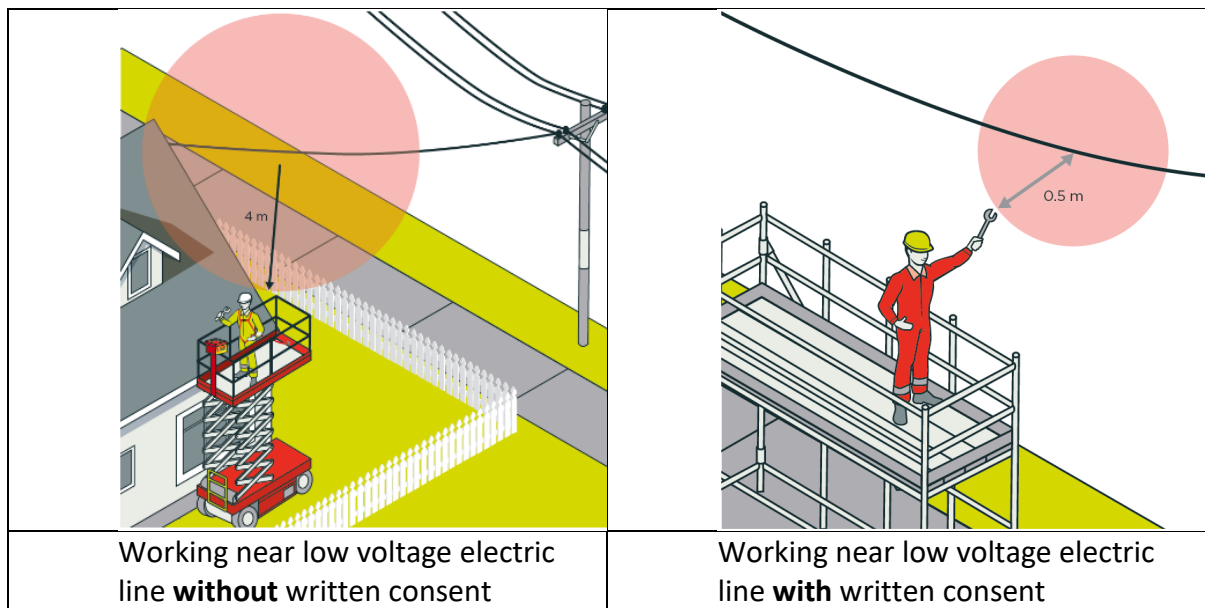
Overhead service controls include but are not limited to:

	Control Type	Control Measure	Control Level
Minimization	Elimination	Remove risk by designing building clear of pre-existing overhead services Remove the overhead services prior to construction (via enquiring with the line owner)	Most Effective Control  Least Effective Control
	Substitution	Select mobile plant or equipment that poses less risk when working near overhead services	
	Isolation	Maintain minimum approach distance (MAD) to overhead power and/or transmission lines from all directions i.e. vertical, horizontal, diagonal Isolate the working area to control unauthorized personnel or plant access and collision with other plant. Isolate with fencing where practicable, or cones, barriers, tapes, bunting etc Isolate the areas below the power lines where access is not required. Calculating the (MAD) and the size and reach of any machinery or equipment to be used near the overhead line can isolate machinery from encroaching unnecessarily close to power lines Isolate the power temporarily while work is being completed (via enquiring with the line owner)	
	↑ WORK ABOVE THE LINE WHERE POSSIBLE TO CONTROL RISK ↑		
	Engineering	Insulated plant and machinery attachments Earthed plant and machinery	
	Administrative	A trained and competent Spotter in place to monitor operators distance to overhead services. If working within MAD of overhead power lines, close approach permit/consent and line owner Spotter required. Demarcate service area - for example goal posts or bunting indicated the MAD near power lines Emergency plan in place in case of contact with lines or arching Signage warning of overhead power lines in proximity	

Control Type	Control Measure	Control Level
PPE	This includes the use of mandatory PPE including hard hat (AS/NZS 1801:1997), high visibility vest (to include day/night glow strips) (AS/NZS 4602.1) and safety footwear (AS/NZS 2210.3:2002)	
NOTE: Where the risk cannot be eliminated, a combination of control measures may be appropriate.		

Minimum Control Requirements for Overhead Services

- Maintain a minimum approach distance (MAD) from any powerlines and/or transmission lines
 - If required to work within the MAD a close approach permit must be obtained from the electrical company, and approval to continue work obtained from the Project Manager. Minimum safe distances for working near overhead lines or power poles are set out in the [New Zealand Electrical Code of Practice for Electrical Safe Distances \(NZECP 34\)](#)



- Apply for a Close Consent Permit if you intend to
 - Work within 4m of overhead lines
 - Excavate within 5m of a power pole or within 12m of a tower or pylon
 - Excavate within 2m of strategic gas mains
- Inspect ground conditions are suitable prior to any work commencing using mobile plant near overhead services. Ground instability could result in an unplanned movement of the plant causing contact or arching from the overhead services
- Isolate the working area to control unauthorized personnel or plant access the working area and collision with other plant. Isolate with fencing where practicable, or cones, barriers, tapes, bunting etc
- Emergency plan in place in case of contact with lines or arching

Training and Competency for Working around Underground and Overhead Services

When using mobile plant around underground or overhead services, operators must be trained and competent. Refer to the Mobile Plant document for information on training and competency for mobile plant.

When using a lifting appliance around overhead services, operators must be trained and competent. Refer to the Crane, Hoists and Other Lifting Activities document for information on training and competency for mobile plant.

All electrical work, live or dead, installation or decommissioning, must be carried out by a competent registered Electrician to ensure the work is completed safely.

References and Resources:

- [New Zealand Code of Practice for Electrical Safe Distances](#)
- [Vector Close approach consent](#)
- [Vector Guide to working safely around Vectors Electricity, gas and communications networks](#)
- [Vector - Building Near Overhead Lines](#)
- [Vector – Gas Pipeline Safety Guide](#)