

ELECTRICITY

SAFELY CONTROLLING WORK CRITICAL RISK CONTROL DOCUMENT



We are always licenced and competent when operating plant



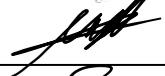
We always isolate all energy sources before working on equipment and systems



We come to work free from impairment, alcohol and drugs



We ensure plant and equipment is safe to use

DOCUMENT CONTROL			
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DOCUMENT REVIEW			
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1-Jun-2022	1	First document	AE, MJ, OG, AVR, JB

Electricity

Electricity is a form of energy caused by the movement of electrons which causes an electric current within an atom.

Some activities on our construction sites that involves use of electricity include:

- Supply power to work site (e.g. tower crane, hoist, office, welfare, etc..)
- Main switch board installation
- Temporary distribution board installation
- Use of portable/nonportable RCDs
- Use of power tools, leads and welding set
- Temporary lighting installation
- Use of generators
- Underground and overhead services
- Equipment maintenance

Related safely controlling work documents:

- Cranes, hoists and other lifting activities
- Underground and overhead services

Risks - What could go wrong?

- Electrocutation/Electric shock causing fatality/s or a potentially major injury such as burns, muscle spasm, cardiac arrhythmia, respiratory distress, seizure, damage to the nervous system or delayed organ damage
- Electrical fire due to faulty electrical item, incorrect installation or overloading causing fatality/s or a potentially major injury such as burns, cardiac arrest, organ damage or respiratory distress
- Explosion causing fatality/s or a potentially major injury such as dislocation, burns, crushing, strains/sprains, bruising/lacerations, fractures or organ damage
- Adverse weather conditions (wet conditions) leads to sparks, flame or short circuits causing fatality/s or a potentially major injury such as burns, muscle spasm, cardiac arrhythmia, respiratory distress, seizure, damage to the nervous system or delayed organ damage

Controls – How do I keep safe?

The identification of risks associated with electricity 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 involving electricity. The SWMS will be reviewed by the Work Manager (e.g. Foreman or Site Manager) with support for the Health and Safety team member.

Can I eliminate the risk?

Wherever work can be completed without the need to use electricity, this should be the first consideration in eliminating risk.

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

Electricity controls include but are not limited to:

	Control Type	Control Measure	Control Level
	Elimination	Remove risk by not using electricity to power an item/equipment (e.g. consider using hand tool instead of an electrical power tool)	Most Effective Control
	Substitution	Substitute electrical items for other electrical items that present less risk (where applicable) – e.g. using battery powered tool or design build with an alternative distribution arrangement that poses a lower risk	
	Isolation	Isolate the electricity. Isolate an electrical board with Lock Out Tag Out (LOTO), use an isolating transformer or use a lock on the electrical board. Place signs and hard barriers where practicable to ensure no access to live electrical work areas etc	
	↑ WORK ABOVE THE LINE WHERE POSSIBLE TO CONTROL RISK ↑		
Minimization	Engineering	<p>Engineer switch boards and distribution boards with robust material that can withstand mechanical and environmental damage. Use insulation/insulated electrical items. Use a Residual Current Device (RCD) or circuit breaker to shut off the current if there is a spike/abnormality.</p> <p>An emergency-stop control to stop electrical current when pressed</p>	↓
	Administrative	<p>Communication and planning such as pre-start meetings and delivery schedules</p> <p>Inspection and maintenance of all electrical items. Having an electrical test and tag for each electrical item</p> <p>Obtain approval from the Site Electrical Foreman or Electrical PM before accessing an energized electrical board</p> <p>LOTO PTW/procedure in place</p>	
	PPE	This includes the use of PPE, task specific insulated gloves	
		Least Effective Control	

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

Commissioning

The subcontractor must provide commissioning procedure prior to electrical item energization or installation.

Energization or installation

Minimum Control Requirements for energization or installation

- A Certificate of compliance must be produced to ensure electrical appliances are safe to connect and available for all electrical installations prior to their use. A copy will need to be provided to the correct Ryman personnel
- Electrical item and wiring must be installed, inspected, tested and commissioned in accordance to AS/NZS 3012 and AS/NZS 3000
- Ensure safe working on or near Low-Voltage (LV) electrical installation and equipment in accordance to AS/NZS 4836
- All energy sources must be identified prior to commissioning works (Low voltage and extra low voltage)
- All electrical conductors/appliances are to be considered “Live” until an electrician deems it safe. Live work is NOT permitted on any Ryman Sites. To ensure Safety all works must be isolated (LOTO) prior to commencing works. Live work is not permitted unless authorized by the Electrical Foreman or Electrical PM
- Establish exclusion zone to complete required isolations
- Ensure all electrical testing items (e.g. multimeters) are calibrated with functionality tested prior to each use. Apply the Prove-Test-Prove method
- Ensure adequate warning signs are in place and protective devices are locked when electric boards are energized
- Provide an emergency plan to ensure all personnel are safe
- Ensure all mechanical protection devices are firmly connected and proven to be secure before energizing

Decommissioning

The subcontractor must provide decommissioning procedure prior to electrical item de-energization or isolation.

De-energization or isolation

Minimum Control Requirements for de-energization or isolation

- The electrician must identify all electrical/mechanical apparatuses that require de-energization or isolation before commencing work
- The electrician must identify all potential health and safety risks caused by de-energizing or isolating the electrical item or circuit
- A Permit To Work (PTW) must be in place as per the Ryman Lock Out Tag Out (LOTO) procedure before isolating an electrical item or an electrical circuit. LOTO can also be used for faulty electrical items/appliances. To ensure safety, these faulty items/appliances must be removed from any form of supply as they are deemed to be unsafe

- All conductors and electrical items/appliances are considered “Live” until a qualified electrician deems it safely isolated. Live work is NOT permitted. Live work is not permitted unless authorized by the Electrical Foreman or Electrical PM
- The electrician must inspect the distribution board and deem safe prior to decommissioning and recommissioning
- All Main and Submain cables must be traced to the source and confirmed to be safe
- Provide an emergency plan to ensure all personnel are safe
- Ensure all mechanical protection devices are firmly connected and proven to be secure before energizing

High Voltage Systems

Minimum Control Requirements for high voltage systems

- Electrical equipment must be dead, earthed, isolated
- Written confirmation & visual signage must be provided by the HV contractor to Ryman.
- Isolated by barriers with signage in place
- High voltage indicator with current calibration/certification confirming that the electrical equipment is dead
- No exposed live parts on any electrical equipment

Underground and overhead services

Refer to the Underground and Overhead Services Safely Controlling Work document for all risks associated.

Electrical items

Minimum Control Requirements for electrical items

Electrical items include electric power tools, charger units, battery powered tools, leads:

- Electrical items/appliances must be inspected prior to use and only be used as per the manufacturers instruction
- Any damaged electrical item must be Locked Out or Tagged Out as per the LOTO procedure and/or removed from any electrical ignition source
- All electrical items must have a current inspection Test and Tag as per AS/NZS 3760, AS/NZS 3012 and AS/NZS3000
- Extension leads must comply with the manufactures ratings and be safe to use. Electrical cords must not be coiled while in use thus eliminating magnetic field interface. Leads are to be kept off the ground using mechanical protection (e.g on stands or hooks)
- All electrical items must be protected from water, traffic, mobile scaffold and ignition sources to comply with current regulations
- All electrical items must be RCD, RCBO protected. Any tripped RCD must be reset by an electrician with a current Certificate of Competency (CoC). All RCDs must be checked monthly in accordance with the AS/NZS standards
- All life guard cables must be connected via screwed type socket & plug top

Temporary Electrical Supply and Wiring

Minimum Control Requirements for temporary electrical supply and wiring:

- Site plan and layout available showing temporary electrical boards, life guards, supply and wiring map
- ELCB provided for all electrical supply
- Electrical wiring suspended by catenary wiring and complying with AS/NZS 3000 and AS/NZS 3008
- Mechanical protection in place for cables that may be damaged
- Inspection of temporary wiring as per AS/NZS 3760 and AS/NZS 3012

Electrical Boards

All electrical boards (switch board and distribution board) including life guards must comply with AS/NZS 3439.4 and AS/NZS 3012. The electrical board must be built with a robust material that can withstand mechanical and environmental damage. The electrical board must be designed with clear access and have an Earth Leakage Circuit Breaker (ELCB) that is designed to detect current leakage and automatically disconnect supply.

Minimum Control Requirements for electrical boards

- Electrical Distribution boards must be installed by competent personnel
- Electrical Distribution board works must be completed by a qualified electrician
- Fitted with a robust door that can withstand mechanical and environmental damage. The door must be a lockable door that can remain open if required
- Incorporated with insulated stands that support cables
- Have clear access/egress and is secured with mechanical protection
- Have an ELCB
- Must be clearly labelled as per AS/NZS 3012

Lighting

Minimum Control Requirements for lighting

- Sufficient Lighting must be available for all access, emergency and work areas as per AS/NZS 3012
- No halogen lights or fittings are permitted in Ryman Construction sites. Halogen lighting must be replaced by LED lighting
- Portable lighting must comply with AS/NZS 60598
- All lights must be protected with a protective material from environmental or mechanical damage
- Lighting that heats up must not be located near ignition source or combustible materials
- Task lighting must be taken into account for early or late work that has insufficient daylight

Generator

Minimum Control Requirements for generators

- All generators must comply with AS/NZS 6104
- Nameplate details are available, legible and visible
- Electrical connections must be designed, installed and tested by an electrician with a current practicing license. The electrical connection must be confirmed with a certificate of compliance
- Include the manufacturers manual and servicing reports
- Setup at a safe distance from flammable material (e.g. oil, fuel etc.), traffic and water
- Rotating parts must have mechanical protection
- Maintained and serviced as per the manufacturers recommendation
- Ensure servicing of generators is completed to adhere to warranties

Welding Sets

Minimum Control Requirements for welding sets

- All welding sets must be RCD protected and fitted with a Voltage Reduction Device (VRD)
- Welding sets must be earthed

Site Office/Relocatable Buildings

Minimum Control Requirements for office/relocatable buildings

- Must have a distribution box with RCD protection. All RCDs must correctly operate in all circumstances. Monthly checks are required as per AS/NZS3000
- Connects to a special socket-outlet that is protected by RCD and carried out by a licensed electrician.
- Must have a current Electrical Warrant of Fitness (EWOFF) that is valid for 4 years
- Use a supply cord that does not need test and tag if RCD protected. The supply cord must be kept away from sharp edges and raised on insulated support, or buried in a conduit with a location marker

Rescue Procedure

Minimum Control Requirements for rescue

- Must have a fully replenished first aid kit on site
- Must have information on what to do if someone has been electrocuted. The surroundings need to be deemed safe before help is administered
- Any person who receives an electric shock must go to the nearest medical facility for monitoring

Training and Competency

All electricians shall be licensed and competent to the electrical requirements set out by WorkSafe under section 36 of the Electricity Act and also any additional requirements specified by Ryman Healthcare.

Contractors must provide necessary training and competency requirements related to other safely controlling work documents (e.g. mobile plant, EWP, working at height, dropped objects and temporary work platforms, scaffold and mobile scaffold, cranes, hoists and other lifting activities). Any person who undertakes electrical installation work must be licensed and registered with Electrical Workers Registration Board (EWRB). Proof of electrical licenses shall be given when asked by Ryman employees

Workers who use electrical power tool should be trained in the tool and NZQA 23281 - Use and care for hand-held power tools used in civil construction. All power tools shall be tested and tagged in accordance with AS/NZS3760:2010

Supervision

A trainee will remain under supervision until the time the trainee becomes qualified and is able to practice electrical works under the Electricity Act

Persons training, or supervising inexperienced workers, must have a current practicing license and is deemed competent in training others.

When assessing the level of supervision required by a trainee, the supervisor or trainer must assess several factors, including but not limited to;

- The worker's experience and competency
- The nature of the work
- The nature of the risks associated with the work including the worksite
- The control measures in place while the worker being supervised is carrying out the work

Inexperienced workers require 'close supervision', this means there must be direct and constant one-on-one management in place.

Ryman site project Managers must be notified when electrical apprentices are undertaking prescribed electrical works and will be supervised by a trained and qualified registered electrician.

Notifiable Work:

Notifications must be made by Ryman and the contractor. Ryman is not required to make a new notification for each stage of the project, if an all-encompassing hazardous work notification is in place for the project for Notifiable Work.

Any work that meets this criteria must be notified to WorkSafe via the online form: <https://forms.worksafe.govt.nz/hazardous-work-notification>.

Excavation works may require to be notified to WorkSafe New Zealand the requirement is listed below:

- Work in any pit, shaft, trench, or other excavation in which any person is required to work in a space more than 1.5 meters deep and having a depth greater than the horizontal width at the top
- Work in any drive, excavation, or heading in which any person is required to work with a ground cover overhead
- Work in any excavation in which any face has a vertical height of more than 5 meters and an average slope steeper than a ratio of 1 horizontal to 2 verticals

Notify WorkSafe where height work is 5 metres or higher notify WorkSafe if there is a risk of falling. Notifications can be made via the [WorkSafe website](#). Exclusions include:

- Work in connection with a residential building up to and including 2 full storeys;
- Work on overhead telecommunication or electric lines;
- Work carried out from a ladder only; or
- Maintenance and repair work of a minor or routine nature

References and Resources:

- Electricity Act
- Electricity (Safety) Regulations 2010
- New Zealand Electrical Codes of Practice
- Registered electrical contractors and licensed electricians must comply with duties specifically under the
- following and most recent standards:
- AS/NZS 3000 Electrical Installations (Wiring Rules)
- AS/NZS 3012 Electrical installations- Construction and demolition sites (incorporated by reference in AS/NZ 3000)
- AS/NZS 3760 In-service Safety Inspection & Testing of Electrical Equipment
- Best Practice Guidelines – Safe Use of Machinery
- Factsheet issued by Department of Labour: Electrical safety on Construction and Demolition Sites