Isolation Lockout Tagout | Mirvac Minimum Requirements

1. Purpose & Scope

The purpose of this document is to eliminate or minimise the risk of injury when either working on plant or equipment that has the potential to be energized or under pressure or carrying out demolition, strip out or decommissioning activities, so far as is reasonably practicable.

This document applies to all workplaces under the management or control of a Mirvac entity.

2. Minimum Requirements

Mirvac personnel and Service Providers must have processes in place to ensure compliance with:

- the Critical Controls (refer Section 3);
- relevant Forms (refer Section 4);
- all relevant Legislation, Codes of Practice and Standards (refer Section 7); and
- product guidelines for installation, use or maintenance from the Original Equipment Manufacturer.

3. Critical Controls

- **Risk Assessment:** Prior to commencing work on plant or equipment or carrying out demolition, strip out or decommissioning activities, a risk assessment must be conducted for that task. The hierarchy of controls must be applied in determining the most appropriate method of controlling risks across all work activities covered in this document (refer examples in the Hierarchy of Controls Triangles in Section 9). [
- **Isolation Principles:** All isolation points must be capable of being locked and tagged and there must be no duplicate key for any lock.

  Locks are to be not used for any other purpose other than their designated purpose (i.e. Equipment Locks to isolate equipment and Personal Locks for individuals working on plant).

  Isolation is required where there is removal of guards, protective shields or dismantling of equipment components, where the restoration of energy may expose personnel working on the equipment to risk.

  Control circuit devices such as push buttons, selector switches, limit switches, interlocks or similar devices cannot be used for isolation.
- **Work Practices:** Do not perform work on energised (live) equipment or parts. Unless undertaking testing, systems and equipment must be de-energised and be proven to have a zero energy state and isolation points must be secure (locked and tagged) before work is performed on them.

  Each exposed part must be treated as energised until it is isolated and verified not to be energised; and for high-voltage work, each exposed part is to be earthed after being de-energised.

  Damaged or faulty electrical equipment, tools, appliances or installations must be taken out of service immediately and an ‘Out of Service’ tag applied to the energy source and reported to the Workplace Manager.

  The tag/lock must only be removed by the tag/lock’s owner. Never remove or destroy another person’s Lock/Tag or an Equipment Lock/Tag unless approved in writing by the appropriate Authorised Isolator.

  No vehicle, machine, equipment or process is to be operated when any tag or lock (Personal, Isolation, Out of Service) is attached.

  Tags and their method of attachment must be made of materials which can withstand the environmental conditions of the workplace.

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Specific risk assessment procedures must be in place to address software and IT over rides. All testing and verification equipment must be within date and comply with recognised standards.

- **Isolation Steps:**

Who	Steps	Note
Authorised Isolator	1) <u>Identify Required PPE and Equipment</u> Prior to any work on electrical or pressurised equipment determine through the risk assessment and the JSEA/SWMS review process the minimum required PPE and detection equipment required for the task (consult the relevant standards).	Consider the following: • Rescue provisions (LV rescue kits); • Standby personnel; • Arc flash; • Type of testing equipment.
Authorised Isolator	2) <u>Identify All Energy Sources</u> Identify potential sources of energy supplying or within the plant or equipment. The energy supply may have more than one source and supply line and there may be more than one energy source (e.g. electricity as well as moving mechanical parts). **When High Voltage or radiation sources are involved an appropriately competent specialist is required to ensure compliance with legislative requirements** (refer Section 6. Training and Competency)**.** 3) Complete an Isolation/Demolition/Decommissioning Permit detailing the work to be done and the isolations required. 4) Make sure it is safe to isolate the equipment.	Associated plant may also need to be locked out to prevent inadvertent activation. Review Permit to ensure all energy sources and isolation method have been accurately identified on the permit. For Residential Development sites a lockable meter box is considered a single isolation point if it is the only electrical / energy source and can be locked to secure all points within.
	5) <u>Shut Down Equipment</u> Use normal stop processes to shut down equipment.	e.g. stop switch / button, close valve / drain down, etc.
	6) <u>Turn off and De-energise Each Isolation Point.</u> For single residence meter boxes: All load isolated /switched off (all circuit breakers turned off) Isolate the main switch / turn off and test for zero energy state. Remove all service fuses (this must isolate all power to the panel only leaving the service fuses and mains cable behind the panel live). For process lines:	Emergency stop buttons, pull (stop) lanyards or similar stop devices are not to be used for isolation. Associated plant may also need to be locked out to prevent inadvertent activation or valves on pipes and lines supplying gases or fluids under pressure may need to be locked shut or blanked off. Valves on pipes and lines supplying gases or fluids under pressure must be blanked off and locked.

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	All appropriate drain valves within the isolation are open and identify at least one appropriate drain valve to lock in the open position. For Roof Spaces: Ensure all electrical installations, other than any service apparatus, are de-energised and isolated.	If refrigerants or other ozone depleting gases are to be removed as part of the de-energisation process they must be prevented from escape to the atmosphere by an automatic pump-down to either a storage tank or other containment system.
	7) <u>Where a single isolation point:</u> • Attach the Equipment Lock and Isolation Tag to the isolation point with a scissor hasp to allow Personal Locks to be attached. • Complete information required on the Isolation Tag. • Note the isolation on the Permit. The Authorised Isolator must personally retain the final Equipment Lock key.	
	8) <u>Where more than one isolation point:</u> • Progressively secure each isolation point by attaching an Equipment Lock and Isolation Tag, completing information required on the Isolation Tag. Note each isolation on the Permit. If third party isolator is required then the Authorised Isolator is responsible to ensure a suitably qualified person notes this on the permit on completion of that isolation (point). • Place the Equipment Lock key/s into a Lock Box which is then locked with a Permit Lock on a scissor hasp. • The Authorised Isolator personally retains the final Permit Lock key.	
	9) <u>Testing and Verifying</u> Test to verify each isolation is at zero energy state. e.g. • operate stop / start buttons, circuit breakers in both local and remote mode. • Inspect the machinery and equipment to make sure all parts have stopped moving. • release the tension on springs or block the movement of spring-loaded parts.	Test to verify zero energy state should be done progressively after each Equipment Lock is attached.

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	• test the circuit again to see that it is dead; then test a known live source again to ensure the meter is still working • air, gas, steam, hydraulic fluid etc. systems, check pressure – test and inspect remaining pressure in piping, accumulators and cylinders. Bleed off or disconnect piping. Operate enough combinations of controls to verify zero stored energy. • pressure lines - break or lock open vent points between two chained & isolated valves • valves / levers - attempt to operate in both manual and remote modes.	
	10) <u>Safeguard the Key</u> The Authorised Isolator personally retains the final Equipment Lock key or Permit Lock key.	If the work continues over a shift, the single Equipment/Permit Lock key is passed to the next Authorised Isolator and noted on the Isolation Permit.

- **Working on Isolated Equipment**

Who	Steps	Note
People working on isolated equipment	1) Place Isolation Permit, JSEA/SWMS in a weatherproof document holder. Attach to the lock box if used.	Where the isolation is only for a confined space entry, the associated documentation and lockbox must be located at the Confined Space Entry Board
	2) Before starting work on the equipment each individual places their own Personal Locks and Personal Danger Tags on the scissor hasp. The person whose name is on the Personal Danger Tag is the only one permitted to work under its protection. If more than one person is involved in the work each must attach their own Personal Lock and Personal Danger Tag. • For single isolation points on the scissor hasp with the single Equipment Lock • Where multiple isolation points) on to the scissor hasp on the lock box.	Locks are not to be piggy backed - scissor hasps must be added if insufficient lock-on space is available. 
	3) Remove their own personal locks and tags from the lock box/hasp when: • the job is complete or has been reassigned and the individual is no longer working on it; • the end of the shift by the individual; or	Individuals are not to leave site with a personal lock / tag in place. Should this occur the Personal Lock/Tag Removal process is to be followed.

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	• the job is incomplete but the individual leaves the area.	

- **De-isolation/ Re-energisation/Commissioning**

Who	Steps	Note
Authorised Isolator	1) Ensure work team members have signed off any Permits and removed all Personal Locks and Tags. 2) Check the work is complete and the equipment is safe to be returned to service. 3) Where a lock box is used unlock with the Permit Key. 4) Use the Equipment Lock key/s to remove the Equipment Lock/s and Isolation Tags from the equipment. 5) When all locks and tags have been removed, sign off the Isolation Permit.	
	6) <u>Re-energisation and Commissioning</u> A planned process must be in place for all energisation and commissioning. The Energisation Commissioning Permit must be used when identified as necessary in the JSEA/SWMS.	The use of the permit may not be required for simple isolations (e.g. single source isolations) but should be used for situations where there are sequencing or handover complexities).

- **Personal Lock/Tag Removal**
  Employees must not remove a Personal Lock or Tag other than their own. Should a Lock and Tag be found attached where the equipment is required for use then an Authorised Isolator must follow these steps:

Who	Steps	Note
Authorised Isolator	1) Investigate the equipment and ensure it is safe for use. 2) Take all reasonable steps to locate the owner of the lock/tag, including: 3) Search the area/department for the person and if not found; a. determine if the person is still on site; and if not found; b. attempt to contact the owner at home. 4) If contactable request the person to remove their lock and tag – if offsite, request them to return. 5) If the person is unable to do so – obtain permission to remove their personal lock/tag. 6) Should permission not be given or the person is not contactable, contact the person's immediate supervisor for permission. 7) The lock and tag can only be removed under the direction and supervision of an appropriate Mirvac representative who has authority and	Lock cutters may be used to remove locks however this Personal Lock/Tag procedure must be used to ensure the integrity of the Isolation Lockout Tagout Program. There must be communication, education, and auditing for adherence to rules prohibiting the removal of another person's lock except as part of this process. Be very specific on how the lock is removed, by whom and communication processes

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	knowledge (or advice from a specialist) of the equipment and work being undertaken. 8) Remove the lock and tag 9) Report and complete an Incident Investigation Report (refer Incident Management Procedure).	

- **Emergency Preparedness / Rescue:** Emergency procedures must be established for potential situations - electrical fault/contact/explosion - relevant to the scope of works being undertaken, including the safe rescue of persons if working near live parts. Where relevant and according to the risk of the activity, emergency procedures should be documented in the JSEA/SWMS and/ or the Workplace Emergency Response Plan.

4. Mirvac Forms

Checklists and Permits are to be completed and then authorised by Mirvac representative prior to work
Isolation/Demolition/Decommissioning Permit – used for demolition/decommissioning/strip-out and used where there is more than one isolation point or the isolation is required longer than one shift.
Energisation Commissioning Permit – used for re-energisation or commissioning of equipment (typically used for complex situations).

5. Roles and Responsibilities

The Mirvac workplace Manager of each workplace over which Mirvac has control is responsible to ensure workers at the site are aware of and adhere to the performance requirements of this document and responsible to ensure workers are equipped with adequate tools, training, competency and licensing to undertake the work.

6. Training and Competency

Initial induction training for all employees and contractors must include key components of the Isolation Lockout Tagout program (e.g. the meaning of locks and tags). Additionally, the minimum training requirements set out below must be implemented:

Minimum Training Requirements for Isolations Lockout Tagout	
Activity	**Required Training/Qualification**
Isolation of any energy sources	Isolation Lockout Tagout Training and Competent in recognition of applicable hazardous energy sources, the type and magnitude of the energy and the methods and means necessary for isolation and control
Electrical	Licenced electrician
Radiation	Competent and authorised radiation safety officer
Permit Issuer	Mirvac Permit Training (Internal)
Persons undertaking Isolation and Lockout Tag out process including Supervisors	Isolation Lock Out Training Hold the required legislated certificates / licensing for the region

7. Relevant Legislation, Codes of Practice and Standards

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NSW:	Work Health and Safety Act 2011 (NSW) Work Health and Safety Regulation 2017 (NSW) including Chapter 4, Part 4.7 - General electrical safety in workplaces and energised electrical work; Chapter 5 - Plant and Structures
Vic:	Occupational Health and Safety Act 2004 (Vic) Occupational Health and Safety Regulations 2017 (Vic) including Part 3.5, Plant Electrical Safety Act 1998 and various regulations
Qld:	Work Health and Safety Act 2011 (Qld) Work Health and Safety Regulation 2011 (Qld), including Chapter 5 - Plant and Structures Electrical Safety Act 2002 (Qld) Electrical Safety Regulation 2013 (Qld)
ACT:	Work Health and Safety Act 2011 (ACT) Work Health and Safety Regulation 2011 (ACT) including Chapter 4, Part 4.7 - General electrical safety in workplaces and energised electrical work; Chapter 5 - Plant and Structures
WA:	Occupational Safety and Health Act 1984 (WA) Occupational Safety and Health Regulations 1996 (WA) including Part 4, Plant; Part 3, Division 6 - Electricity
AS 4024.1603 *Safety of machinery Design of controls, interlocks and guards - Prevention of unexpected start-up*	
SafeWork Australia - Managing risks of plant in the workplace: Code of Practice 2016	
WorkCover NSW - Managing the risks of plant in the workplace: Code of Practice 2014	
NSW Govt Dept of Industry & Investment - Electrical Engineering Safety Electrical Isolation: Information Sheet 6 2010	
WorkSafe Vic - Compliance code – Plant	
WorkSafe Qld - Managing risks of plant in the workplace: Code of Practice	
WorkSafe Qld - Electrical safety - Managing electrical risks in the workplace: Code of Practice	
WorkSafe Qld - Guide to machinery and equipment safety	
WorkSafe WA - Safeguarding of machinery and plant: Code of Practice	
WorkSafe WA - Isolation of plant: Guidance Note	
EnergySafety WA - Persons working on or near energised electrical installations: Code of Practice	
WHS COP – Electrical Safety in the Workplace	

8. Additional Information

Working with Electricity MMR
Working with Services MMR

9. Hierarchy of Controls Triangle – Isolation Lockout Tagout

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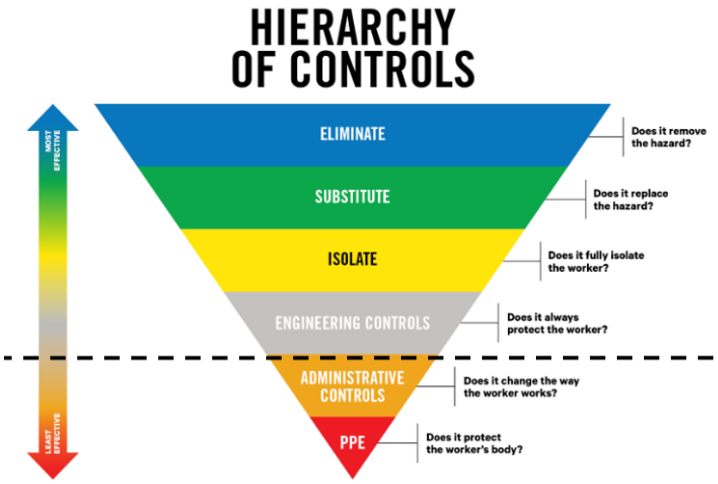

- Design systems to avoid high voltage or high pressure
- Complete the work before power connected
- Redesign to eliminate need to access energised components

- Replace old distribution boards with newer, protected boards with covers

- De-energise, isolate and zero energy test prior to starting
- Personal and group locking out tag out systems
- Physical barriers - prevent inadvertent contact with live parts

- Switchboard interlocks (de-energises when opened)
- Residual Current Devices (RCDs)

- Isolation, permits, (LOTO)
- Distribution boards, signage, circuit maps
- Electrical equip testing/tagging
- Licenses and VOC
- Live work prohibition/permit

- Personal isolation locks
- Insulated gloves, mats/covers; Non-conductive footwear; Non-conductive & flame resistant clothing;

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