skeelectrical pty ltd

SAFE WORK METHOD STATEMENT

neca SAFE
national electrical and communications association

Electrical SWMS

Safe working on or near (within 500mm of) low-voltage electrical installations including general electrical safety, isolation (LOTO), testing, fault finding, energised work, cutting and removing electrical equipment and arc flash controls.

Organisational Details	Company Name:	SKE Electrical Pty Ltd		Approval Date:			
	Company Address:	Unit 2, 51 Pacific Highway, Bennetts Green NSW 2290		Next Review Date:			
	Director / Manager Name:			Contact Number:			
	Type of SWMS:	Generic (multiple projects, jobs, or work requests)	☐	Site specific (complete section below)		☐	
Site Specific Details	Principle Contractor:		n/a ☐	Contact Number:		n/a ☐	
	Site Manager or Supervisor Name:		n/a ☐	Other PCBU's:		n/a ☐	
	Site Address:		n/a ☐			n/a ☐	
SWMS Details	What high risk work activities are covered by this SWMS?	Work on or near energised electrical installations or services					
	What is the scope of the works?	Scope of work includes the physical work of installing, maintaining, repairing, altering, removing, or adding to an electrical installation.					
	Who else was consulted/involved in preparing this SWMS?	Workers / employees	☐	Principle Contractor	☐	NECA	☐
	Additional compliance measures:	Pre-start Hazard Risk Assessment	☐	Toolbox Talk	☐	Workplace Safety Inspection	☐
Sign off	Person responsible for ensuring compliance with SWMS:			Responsible persons signature:			
	Contact Number:						
	Date:						

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Training / Licencing Requirements	Construction industry general induction (White Card)	☐	Senior First Aid Training	☐	LVR/CPR	☑
	Working at Heights	☐	Asbestos Awareness	☐	Working with Asbestos of a Minor nature	☐
	Elevated Work Platform class SL	☐	Elevated Work Platform class VL	☐	Elevated Work Platform class TL	☐
	Elevated Work Platform class BL	☐	Elevated Work Platform Licence class WP	☐	Scaffolding	☐
	Electrical trades Licence	☑	Air Conditioning / Refrigeration Trade Licence	☐	Accredited Service Provider Authorisation / permit / rescue	☐
	(Other):	☐	(Other):	☐	(Other):	☐
	(Other):	☐	(Other):	☐	(Other):	☐
Personal Protective Equipment	Arc Rated clothing HRC 1 (ATPV 4cal/cm^2 min)	☐	Arc Rated clothing HRC 2 (ATPV 8cal/cm^2 min)	☐	Arc Rated clothing HRC 3 (ATPV 25cal/cm^2 min)	☐
	Arc Rated clothing HRC 4 (ATPV 40cal/cm^2 min)	☐	Double insulated gloves	☐	Insulated gloves	☐
	Low Voltage Rescue Kit	☐	Defibrillator	☐	First Aid Kit	☐
	Insulated Mat	☐	Insulated barriers	☐	Lock Out Tag Out kit	☐
	Safety boots	☐	Eye protection	☐	Respiratory equipment	☐
	Safety Helmet	☐	Hearing protection	☐	Barricading and signage	☐
	Communication equipment	☐	Torch / lighting	☐	Harness and other fall protection equipment	☐
	(Other):	☐	(Other):	☐	(Other):	☐
	(Other):	☐	(Other):	☐	(Other):	☐

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Chemicals	PVC Cement	☐	Diesel Fuel	☐	Petrol Fuel	☐
	Silicone Spray	☐	Multi-Purpose Grease	☐	Silicone	☐
	MAPP Gas / LPG	☐	Oxygen / Acetylene	☐	Multi-Use Lubricant Spray (WD-40)	☐
	Nitrogen	☐	Refrigerants	☐	(Other):	☐

Multi-Jurisdictional Reference Material

Jurisdictions		☑/☒	Safety Legislation	Regulator and Contact Number	Codes of Practice
Harmonised Jurisdictions	NSW	☑	Act: Work Health and Safety Act 2011 (NSW) Regulation: Work Health and Safety Regulation 2017 (NSW)	Regulator: SafeWork NSW Number: 13 10 50	Note: To have legal effect in a jurisdiction a model Code of Practice must be approved as a code of practice in that jurisdiction. To find if a model Code of Practice has been approved in a particular jurisdiction, check with the relevant work health and safety regulator. Managing Electrical Risks in the Workplace Code of Practice.
	ACT	☑	Act: Work Health and Safety Act 2011 (ACT) Regulation: Work Health and Safety Regulation 2011 (ACT)	Regulator: WorkSafe ACT Number: 13 22 81	
	QLD	☑	Act: Work Health and Safety Act 2011 (Qld) Regulation: Work Health and Safety Regulation 2011 (Qld)	Regulator: Workplace Health and Safety Queensland Number: 1300 369 915	
	NT	☑	Act: Work Health and Safety (National Uniform Legislation) Act 2011 (NT) Regulation: Work Health and Safety (National Uniform Legislation) Regulations (NT)	Regulator: NT WorkSafe Number: 1800 019 115	
	SA	☑	Act: Work Health and Safety Act 2012 (SA) Regulation: Work Health and Safety Regulation 2012 (SA)	Regulator: SafeWork SA Number: 1300 365 255	
	TAS	☑	Act: Work Health and Safety Act 2012 (Tas) Regulation: Work Health and Safety Regulation 2012 (Tas)	Regulator: WorkSafe Tasmania Number: 1300 366 322	
	CTH	☑	Act: Work Health and Safety Act 2011 (Cth) Regulation: Work Health and Safety Regulations 2011 (Cth)	Regulator: Comcare Number: 1300 366 979	
	NZ	☑	Act: Health and Safety at Work Act 2015 (NZ)	Regulator: WorkSafe New Zealand Number: 0800 030 040	
VIC		☑	Act: Occupational Health and Safety Act 2004 (Vic) Regulation: Occupational Health and Safety Regulations 2017 (Vic)	Regulator: WorkSafe Victoria Number: 1800 136 089	Preventing electric shocks to electricians.
WA		☑	Act: Occupational Safety and Health Act 1984 (WA) Regulation: Occupational Safety and Health Regulations 1996 (WA)	Regulator: WorkSafe WA Number: 1300 307 877	Code of Practice for Persons working on or near energised electrical installations
Standards			AS/NZS 3000:2018 (Wiring Rules), AS/NZS 4836:2011 (Safe working on Electrical Installations), AS/NZS 3012:2010 (Electrical Installations – Demolition & Construction Sites) AS/NZS 4836:2011 Safe working on or near low-voltage electrical installations and equipment		
SWP			NECA SWP-011 Electrical Isolation (Lockout Tagout) NECA SWP-035 Test for de-energised (DEAD)		

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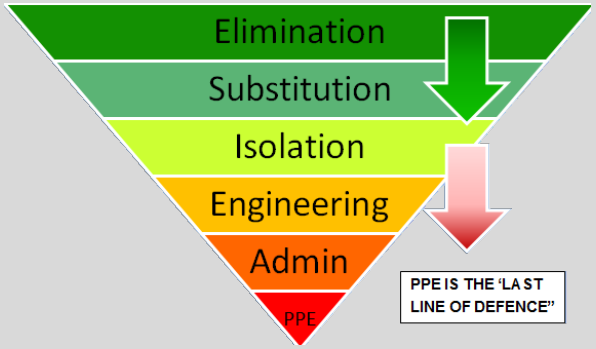
Hierarchy of Controls		Definitions
	**Elimination**	This control measure involves eliminating or removing the risk in its entirety.
	Substitution	This form of control involves substituting a safer process or material for the hazardous process/material found.
	Isolation	This control involves separating the hazard or hazardous work practice from employee's other work areas. This may involve sectioning off the area by erecting barriers or by moving either the hazardous work practice or the „other" employees and their work practices.
	Engineering	This method of control involves designing and/or adding physical safety features to plant or equipment.
	Admin	This type of control is most effective when used in conjunction with measures mentioned above or as an interim control whilst more effective control measures are developed and implemented.
	PPE	PPE is not a particularly effective control method and should only be used: • When all other control measures are impractical; or • In conjunction with other more effective, control measures.

Risk Level Matrix

		Consequence				
		1	**2**	**3**	**4**	**5**
Likelihood	**5**	**M**	**H**	**H**	**H**	**H**
	4	**M**	**M**	**M**	**H**	**H**
	3	**L**	**M**	**M**	**H**	**H**
	2	**L**	**L**	**M**	**M**	**H**
	1	**L**	**L**	**L**	**M**	**M**

Risk Analysis

	Likelihood		Consequence	
1	Rare	1	Insignificant
2	Unlikely	2	Minor
3	Moderate	3	Moderate
4	Likely	4	Major
5	Almost Certain	5	Catastrophic

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Notes / Definitions

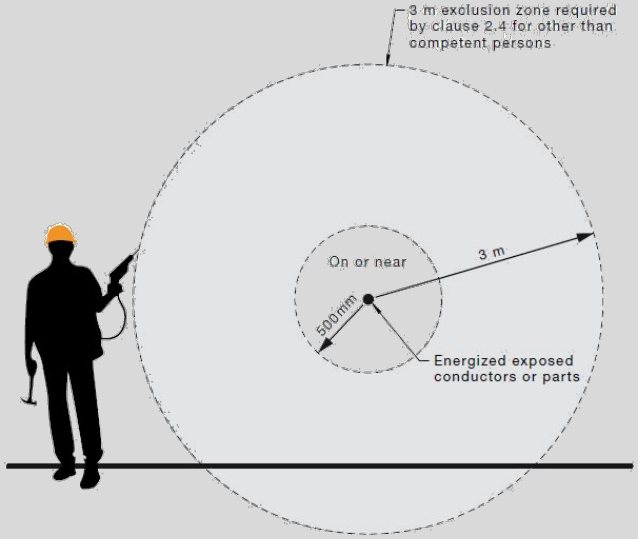
On or near: AS/NZS 4836:2011 (Safe working on Electrical Installations) defines 'on or near' as: A situation where an electrical worker is working on or near exposed energised conductors or live conductive parts and there is a reasonable possibility that the electrical worker's body, or any conducting medium the electrical worker may be carrying or touching during the course of the work, may come closer to the exposed energised conductors or live conductive parts than 500 mm. The term 'on or near exposed energised conductors or live conductive parts' does not apply if the uninsulated and energised part is safely and securely shielded by design or segregated and protected with barricades or insulated shrouding or insulating material to prevent inadvertent or direct contact.

Electrical work on energised electrical equipment—when permitted (NSW, ACT, QLD, NT, SA, Tas & Cth): Model WHS Regulation clause 157 - A person conducting a business or undertaking must ensure that electrical work on energised electrical equipment is not carried out unless:

a) it is necessary in the interests of health and safety that the electrical work is carried out on the equipment while the equipment is energised, for Example. It may be necessary that life-saving equipment remain energised and operating while electrical work is carried out on the equipment,
b) it is necessary that the electrical equipment to be worked on is energised in order for the work to be carried out properly,
c) it is necessary for the purposes of testing to ensure the equipment is de-energised,

there is no reasonable alternative means of carrying out the work.

Illustration of 500mm 'On or near' and 3m exclusion zone



Reference: AS/NZS4836:2011

Typical tags, personal red lock, and multi-lock device



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Preparation for Electrical Work

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
1	Awareness	• Lack of situational awareness • Physically or psychologically and/or mentally impaired	3	4	H	L	• All persons, including electrical workers, supervisors, safety observers and those assisting electrical workers working on or near electrical installations or equipment, shall understand the scope of the work and the potential hazards involved in working on or near electrical installations or equipment. • They should be capable of always maintaining an adequate physical and mental ability when working on or near electrical installations and equipment. • If personnel are temporarily or permanently physically, psychologically and/or mentally impaired, e.g., under the influence of alcohol, drugs, stress, distraction, fatigue or are injured to a level that adversely affects their work performance, they shall not participate in the work.	All Workers
2	Areas of reduced mobility	• Restriction of movement • Inability to readily escape	3	5	H	L	• Care should be taken when working in areas of reduced mobility because of restriction of movement and the inability to readily escape from the area. Examples of areas of reduced mobility can be as follows: a) Awkward positions such as kneeling or laying down. b) Restricted areas in and around switchboards c) Ceiling and roof spaces d) Spaces under floors e) Ladders, scaffolds, or elevated work platforms. f) Trenches g) Pits or tunnels h) Confined spaces • If work on or near energised electrical equipment is carried out in an area of reduced mobility, ensure a Safety Observer/rescuer is present.	Electrician
3	Trafficable areas	• Exposure to an electrical source • Electric shock • Electrocution • Flash burns	2	3	M	L	• Persons working near traffic areas, including vehicular and pedestrian, should employ approved traffic management procedures, install suitable screens, barriers, signage and, if necessary, lighting for personnel safety and protection. • Caution should be exercised, and appropriate preventive action taken when working in a passageway or narrow access area, e.g., where a door might be inadvertently opened or closed and propel persons into an energised electrical source, it should be restrained while work is being undertaken.	All Workers

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4	Identify the safe area of work	• Exposure to an electrical source • Electric shock • Electrocution • Flash burns	2	3	M	L	• The safe area of work should be identified by erecting barriers or warning signs or by other approved means if necessary. • All personnel who are to work in the safe area shall be advised of its limits and the location of any adjacent exposed energised conductors or live conductive parts.	All Workers
5	Illumination	• Poor visibility • Electric shock • Electrocution • Flash burns	2	3	M	L	• Work areas shall be provided with lighting that is both adequate and suitable for the work and emergency evacuation. • Lamps should be protected against breakage.	All Workers
6	Work permit system	(Intentionally left blank)	1	1	L	L	• Some electrical installations may have a work permit system to control access to any work being performed on or near electrical installations or equipment where potential hazards of injury to personnel or equipment damage exist. • The work permit system should set out relevant conditions of accessing electrical equipment, electrical or mechanical isolation of equipment, use of safety observers, use of safety equipment, conditions of restoring operational status and other relevant matters.	Electrician
7	Use of tools, electrical equipment, or plant with exposed conductive parts	• Contact with electricity • Electric shock • Electrocution • Flash burns	2	4	M	L	• Conductive items such as tape measures, rules, reinforced tapes, ladders, elevating work platforms, scaffolding and guards on portable lamps, shall not be used on or near exposed energised conductors or live conductive parts. • NOTE: AS/NZS 1892 specifies requirements for ladders. • Insulated tools and equipment shall be of an approved type and shall be in good order, regularly maintained and tested where required. Tools and equipment shall not be used if any doubt exists that their insulation might not be adequate	All Workers
8	Maintain separation from earth	• Contact with electricity • Electric shock • Electrocution • Flash burns	3	5	H	L	• Before starting any work, check your surroundings and equipment. Voltages between phases and earth (including metal work, damp situations, other conductive surfaces, and persons nearby) can result in electric shock. • Use insulated barriers or mats, PPE (such as insulated safety boots), insulated tools, fiberglass ladders and look for loose cable connections. • If separation between yourself and earth is not possible, ensure a Safety Observer/rescuer is present.	Electrician

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9	Protective clothing	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	5	H	L	• Protective clothing worn by electrical workers working on or near exposed energised conductors or live conductive parts shall be appropriate for the purpose, fit correctly, cover the full body (including the arms and legs) and be in good condition while the work is being performed. • All personal protective equipment (PPE) shall be selected in accordance with a risk assessment and with the type of work being performed. • The PPE Table below provides guidance on the selection of PPE.	Electrician Safety Observer
10	Conductive items	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	4	M	L	• Bracelets, rings, neck chains, exposed metal zips, watches and other conductive items shall not be worn while working on or near exposed energised conductors or live conductive parts. • If worn, earplugs or earmuffs shall not be conductive.	All Workers

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11	Safety Observer - triggers and requirements.	• Inadequate rescue plan. • Inability to readily escape or initiate rescue. • Supply CPR or first aid after emergency.	3	3	M	L	Where this SWMS, risk assessments, procedures, or legislative requirements determine that a safety observer is necessary for any work on or near exposed energized conductors or live conductive parts, then work shall not be undertaken without the presence of a Safety Observer. The triggers for the requirement of a Safety Observer are: 1. Work areas/sites of reduce mobility. 2. Separation from earth cannot be maintained. 3. Work on high fault level equipment and situations, greater than 20kA. 4. Existing wiring in aged and /or poor condition, poorly installed and 'messy' and generally non-compliant. 5. Work on exposed energised conductors or live conductive parts. • The Safety Observer shall: a) be able to warn and, if necessary, stop the work before the risks become too high b) not carry out any other work or function that compromises their role as a Safety Observer, i.e., the Safety Observer shall not observe more than one task at a time. c) be able to communicate quickly and effectively with the electrical workers performing the work. d) be capable of helping in the case of emergency as well as being competent to perform electrical rescue and cardiopulmonary resuscitation, as required. On an energised electrical installation, the safety observer shall be competent to perform their task and shall also be competent in electrical rescue and cardiopulmonary resuscitation (CPR). e) be suitably attired in personal protective equipment appropriate to the situation. f) not have any known temporary or permanent disabilities that would adversely affect their role and performance. • The presence of a Safety Observer is one of the risk control measures to ensure electrical safety when electrical work on energised circuits and electrical equipment is being carried out.	Electrician, Safety Observer

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Isolation / LOTO

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
12	Isolation principles	• Contact with electricity. • Arc blast. • Electric shock • Electrocution • Flash burns	4	5	H	L	• Work shall not be carried out on or near de-energised exposed conductors and parts until an electrical worker has: a) Positively identified the relevant electrical equipment and conductors, all of their energy sources and the isolation points. b) Isolated electrical equipment and conductors from all energy sources. c) Secured the isolation. d) Discharged, where necessary, any stored energy. E.g., capacitors. e) Proved the de-energization of all relevant electrical equipment and conductors. (Please note that de-energisation will not be undertaken or proved under any circumstances, through means of a "Volt Stick" and or proximity tester. Only the use of approved Voltage Meters will be allowed to prove de-energisation) f) Identified the limits of the safe area of work.	Supervisor, Workers
13	Identification of electrical equipment and isolation points	• Inadvertent operation. • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	2	L	L	• The electrical equipment to be worked on, and the proper points of isolation and all its energy sources shall be positively identified. • Control circuits or control systems (PLCs, emergency stops, control selector switches, etc.) shall not be used as a means of isolation, e.g., by operation of a stop button. • Find all alternative power supplies connected to the electrical installation. • Isolation procedures should include steps to ensure isolation of all alternative supplies.	Supervisor, Workers
14	Secure the isolation for electrical work	• Inadvertent operation. • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	2	L	L	• Isolating devices shall be secured in the open position or zero energy state in such a manner as to prevent inadvertent operation of the isolator. • The padlocks should be uniquely keyed to prevent inadvertent removal by others. Each personal lock shall indelibly identify the person's name, company, and contact details, and if required, the date of application. • If more than one person is working on the same de-energised electrical installation, individuals (electricians, apprentices and/or trades assistants) should ensure their own personal lock is applied to the isolation point.	Electrician first and then All Workers

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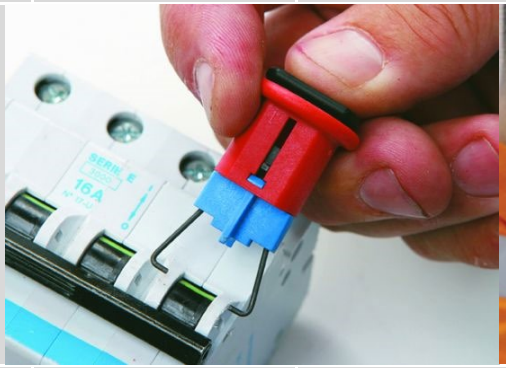
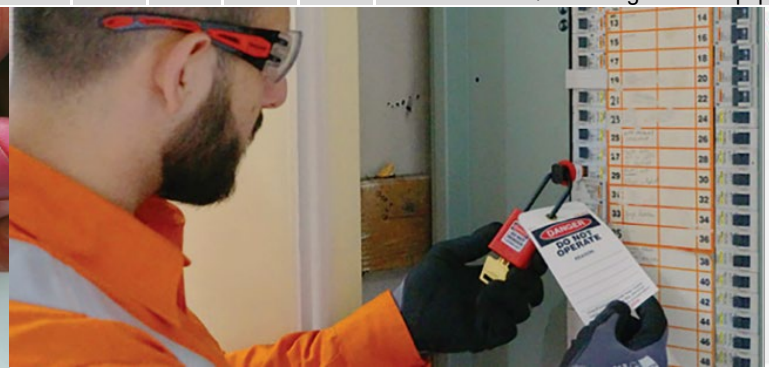
15	Identification of isolation using a danger tag	• Inadvertent operation. • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	2	L	L	• Isolation involves using suitable warning or safety signs as well as locks or other controls to secure the isolation. • Where possible, a tag should be attached to normal locks at all points of isolation used to de-energise electrical equipment from its electricity supply. • Danger tags are not required when using dedicated personal isolation locks. • Danger tags are used for the duration of the electrical work to warn persons at the workplace that: a) the electrical equipment is isolated, b) the electricity supply must not be switched back on or reconnected, c) reconnecting electricity may endanger the life of the electrical worker/s working on the equipment.	Electrician first and then All Workers
	   							
16	Proving de-energization	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	3	5	H	L	• All electrical equipment and conductors shall be treated as energised, unless proven to be de-energised. Any voltage tests used to prove de-energisation shall be conducted in the following sequence: a) Test the voltage tester on a known voltage source for correct operation. b) Test between all conductors and a known earth. c) Test between all conductors. d) Retest the voltage tester on a known voltage source for correct operation. (Please note that de-energisation will not be undertaken or proved under any circumstances, through means of a “Volt Stick” and or proximity tester. Only the use of approved Voltage Meters will be allowed to prove de-energisation) • Only competent persons shall perform the tests	Electrician first and then All Workers

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17	Work on de-energised electrical equipment	• Inadvertent operation • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	5	5	H	L	• Work on de-energised electrical equipment shall only go ahead if the electrical equipment is isolated and any other exposed conductors or conductive parts in the work area are either: a) de-energised and isolated; or b) Separated by barriers or an appropriate distance based on a risk assessment.	Supervisor, Workers
18	Leaving unfinished work	• Inadvertent operation • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	4	5	H	L	• If work is left unfinished, you must ensure that the workplace is left in a safe state: a) terminate or bond to earth (strip, twist, and tape) any exposed conductors, b) take any necessary precautions to ensure that electrical equipment cannot become inadvertently re-energised, c) Replace personal danger tags and personal (red) isolation locks with yellow and black out-of-service tags or yellow locks. d) hand over adequate information to workers taking up the unfinished work to allow them to continue the work safely	Supervisor, Workers
			Note: Out-of-service tags or yellow locks may also be used to identify an isolation supervisor and left in place for the duration of the job. If this is the case, then the isolation supervisor needs to also use a personal (red) isolation lock when working on the electrical equipment					

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19	Restoring Power	• Inadvertent operation • Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	3	5	H	L	• For re-energisation the following steps shall be carried out. They should be done in the order listed below: a) All relevant persons shall be notified that testing is about to begin or supply is about to be restored, b) A visual inspection shall be conducted to ensure that all tools, surplus material, and wastes have been removed and the work site has been reinstated. c) Visual inspection and tests required by AS/NZS 3000 shall be carried out. d) AS/NZS 3017 provides guidance on testing of low voltage electrical installations, e) Applicable work permits shall be cancelled. f) Applicable personal tags and locks shall be removed. g) Re-energisation as appropriate is carried out. h) Functional testing as needed, e.g., phase rotation, are carried out, i) Confirmation that all guards and covers are reinstated is obtained.	Supervisor, Workers

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Fault Finding or Testing

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
20	Fault finding or testing	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	5	5	H	L	• Any persons undertaking fault-finding work on or near exposed energised conductors or live conductive parts shall be competent in the work to be carried out. • When fault-finding work is to be carried out on or near exposed energised conductors or live conductive parts, precautions shall be taken, or procedures put into place to prevent the possibility of simultaneous contact with conductors at different voltages or to earth. • Personal protective equipment (PPE) that is appropriate and suitable for the task shall be worn. PPE shall be of correct fit and in good condition. (See PPE table below for selection.) • All fault-finding work on exposed energised conductors or live conductive parts shall be done from a stable work position. • Before beginning work, confirm suitability and check for correct operation of test equipment. • Use approved test equipment for the application and ensure that the proper operating range is selected. • Consider the effects at the work site and remotely of: i. bridging out of safety and control circuit interlocks. ii. inadvertent initiation of equipment operation. iii. inadvertent energisation of electrical equipment. iv. bridging of terminals. v. forcing of contactors and interlocks; and vi. forcing of software interlocks, e.g., programmable logic controllers. • Extreme caution is required not to open circuit the secondary winding of a current transformer (CT) because high voltages may be generated. • Caution must be taken when inserting fuses or closing links carrying full load current or under a suspected fault condition. • When work is left unfinished, leave the workplace in a safe state for access by others. • Ensure the electrical equipment is returned to service in its original state or that changes made have been approved. • After electrical testing of cables, a considerable buildup of capacitive charge can occur and remain on the cable. Care must be taken to ensure that such cables are properly discharged to earth for a reasonable period to ensure all the capacitive charge is removed before persons handle the cables.	Electrician

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21	Testing plug-in electrical equipment	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	1	5	M	L	• When performing energised fault finding or testing on electrical equipment that plugs into a 3-pin flat-pin socket outlet rated at up to and including 20 A, a residual current device (RCD) or an isolating transformer shall be used.	Supervisor, Workers

Work on exposed energised conductors or live conductive parts

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
22	Before commencing any work on exposed energised conductors or live conductive parts	*(Intentionally left blank)*	*(Intentionally left blank)*				• Working on or near exposed energised conductors or live conductive parts, shall be considered only when an adequate risk assessment indicates: a) the work is necessary in the interests of safety and the risk of harm would be greater than working de-energised. b) the work follows local legislative requirements that allows work on energised electrical installations and equipment under mandatory risk controls; and c) the preparations specified in this SWMS have been carried out.	Supervisor, Workers
23	Work permit system	*(Intentionally left blank)*	*(Intentionally left blank)*				• Use a work permit system to control access to any work being performed on exposed energised conductors or live conductive parts. • The work permit system should set out relevant conditions of accessing electrical equipment, electrical or mechanical isolation of equipment, use of Safety Observers, use of safety equipment, conditions of restoring operational status and other relevant matters.	Supervisor, Workers

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24	Safety observer	• Inadequate rescue plan • Inability to readily escape or initiate rescue. • Provide CPR or first aid after emergency	3	5	H	M	• Refer to 11 above. • A safety observer is necessary for any work on exposed energised conductors or live conductive parts. Work shall not be undertaken without the presence of a safety observer. a) The safety observer shall be able to warn and, if necessary, stop the work before the risks become too high. b) The safety observer shall not carry out any other work or function that compromises their role as a safety observer, i.e., the safety observer shall not observe more than one task at a time. c) The safety observer shall be able to communicate quickly and effectively with the electrical workers performing the work. d) The safety observer shall be capable of helping in the case of emergency as well as being competent to perform electrical rescue and cardiopulmonary resuscitation, as needed. On an energised electrical installation, the safety observer shall be competent to perform their task and shall also be competent in electrical rescue and cardiopulmonary resuscitation (CPR). e) The safety observer shall be suitably attired in personal protective equipment appropriate to the situation. f) The safety observer shall not have any known temporary or permanent disabilities that would adversely affect their role and performance. g) The presence of a safety observer is one of the risk controls measures to ensure electrical safety when electrical work on energised circuits and electrical equipment is being carried out.	Supervisor, Workers Safety Observer

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25	Commencing work on exposed energised conductors or live conductive parts	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	5	5	H	L	• When work is to be carried out on exposed energised conductors or live conductive parts, precautions shall be taken, or procedures put into place to prevent the possibility of simultaneous contact with conductors at different voltages. a) Personal protective equipment (PPE) that is appropriate and suitable for the task shall be worn. PPE shall be of correct fit and in good condition. (See PPE Table below.) b) All work on exposed energised conductors or live conductive parts shall be done from a stable work position. c) When working on energised electrical equipment that has earthed metal, precautions shall be taken to ensure earthing continuity is always maintained to any component of the electrical equipment at all times, or work shall be carried out to an approved procedure. Temporary protective earthing conductors may be required to be installed when removing electrical equipment from earthed metal, e.g., an electrical component separated from its normal earthing medium. Temporary protective earthing conductors shall be rated to withstand the prospective short-circuit current of the primary protection without failing. d) Particular care should be taken when removing neutral connections because tests may have indicated a de-energised situation. However, when these connections are removed, a voltage may be present between conductors or between conductors and earth. • Only conductors at the same voltage should be worked on at any one time. Insulating barriers, covers or mats shall be used in the work area between conductors of different phases or voltage, or work shall be carried out to an approved procedure.	Supervisor, Workers
26	Conductive path separation	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	5	5	H	L	• The conductive path between electrical workers and conductors and between electrical workers and earth (including building materials such as concrete and steel that may be earthed), or between electrical workers should be broken by one or more of the following methods: a) Insulating barriers, covers or mats, b) Insulating tools, c) Insulating gloves.	Supervisor, Workers
27	Completing work	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	3	5	H	L	• Ensure the electrical equipment is returned to service in its original state or that changes made have been approved.	Supervisor, Workers

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Cutting and removing electrical & data equipment (Strip out)

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
28	Cutting cables or wiring enclosures	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	3	5	H	L	• When carrying out work that involves cutting cables or wiring enclosures, the cables or cables within a wiring enclosure shall be treated as energised and the procedures for working on energised electrical equipment adhered to, until positive tests can be made at the point where the cable is to be cut that prove the cable is de-energised.	Supervisor, Workers
29	Removing out-of-service electrical equipment and cables	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	3	5	H	L	• Before removal of out-of-service or decommissioned electrical equipment, the electrical equipment and cables shall be isolated from all sources of supply and proper tests made to ensure the electrical equipment and cables are de-energised.	Supervisor, Workers
30	Control measures when leaving work unfinished	• Contact with electricity • Arc blast • Electric shock • Electrocution • Flash burns	2	5	H	L	• The work site shall be left in a safe state for access by others. • Means of making the work site safe should include the following: a) Terminating exposed conductors in a manner that provides a degree of protection of IP 2X following AS 60529 and, where necessary, providing appropriate mechanical protection or restraint. b) Affixing of safety or information tags as required. c) Installation of barriers or barrier tape or other means necessary to keep unauthorised persons out of the work site. d) Where proper, informing relevant parties that the work is not complete and advising of potential hazards. e) Taking any necessary precaution to ensure that electrical installations and equipment cannot become energised. f) Ensuring that switchboards and equipment are clearly and correctly labelled in relation to their status. g) Providing sufficient information for workers to allow them to safely continue the work.	Supervisor, Workers

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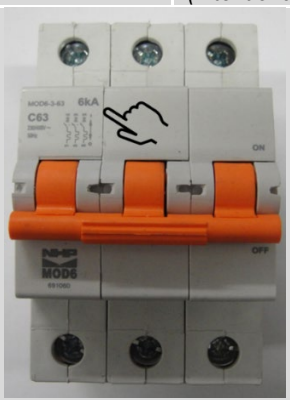
Low Voltage Arc Hazard Controls

#	Job Step / Process / Activity	Identify Hazards	Risk Level (R) and the Residual Rating (RR)				Identify Controls / Action Required	Person Responsible
			L	C	R	RR		
31	Quantify the hazard	*(Intentionally left blank)*	*(Intentionally left blank)*				• Estimating the Incident Energy - The incident energy, to which an individual may be exposed, should be estimated by one of the following methods: a) Calculations based on the formulae in Appendix B of ENA NENS-09. b) Calculations based on the IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations, or; c) If minor switchboard, control panel or metering work, make an estimation about fault Levels using the below step.	Electrician
32	Make an estimation about fault Levels	*(Intentionally left blank)*	*(Intentionally left blank)*				• To make the estimation of fault levels use the kA (kilo amps) rating of the main up stream circuit breaker in the switchboard or equipment that you are working on. • The value of the kA rating determines how much current the circuit breaker can withstand under fault conditions. • Line up your kA rating with the PPE table below and utilize the PPE as described. The hazard column in these steps will also provide an estimate of incident energy cal/cm^2). This can be used to determine minimal Arc Thermal Performance Value (ATPV). Your ATPV value of your PPE needs to be greater than your estimated cal/cm^2. • If you cannot determine the kA rating refer to another method of calculation	Electrician
			Example of the kA (kilo amps) rating on a circuit breaker.					

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PPE Table

kA (kilo amps) rating	Hazard Risk Category (HRC) Minimum Arc Thermal Performance Value (ATPV)	Clothing / PPE Requirements
<10KA	HRC 0 ATPV 0 cal/cm^2	• Long sleeve shirt & pants (natural fibres) • Safety glasses or goggles • Insulated gloves
10KA to 20KA	HRC 1 ATPV 4 cal/cm^2	• Arc rated shirt & pants or coverall min ATPV 4 cal/cm2. • Arc rated face shield with chin cup. • Insulated or arc rated gloves. • Insulated mat. • ISSC 14 Electrical First Aid kit
>20KA to 40KA	HRC 2 ATPV 8 cal/cm^2	• Arc rated shirt & pants or coverall min ATPV 8 cal/cm2. • Arc rated face shield with chin cup. • Insulated gloves with leather or fire-resistant outers gloves. • Safety Observer • LV rescue kit • ISSC 14 Electrical First Aid kit • Insulated mat
>40KA to 80KA	HRC 3 ATPV 25 cal/cm^2	• layers of arc rated shirt & pants or coverall and arc rated suit that combined meets a minimum of ATPV 25 cal/cm2. • Hood min ATPV 25 cal/cm2 • Insulated gloves with leather or fire-resistant outers gloves. • Safety Observer • Low voltage rescue kit • ISSC 14 Electrical first aid kit • Insulated Mat
>80KA or high voltage work	HRC 4 ATPV 40 cal/cm^2	• layers of Arc Rated FR Shirt & FR Pants or FR Coverall and Arc Flash Suit that Meets Minimum Arc Rating • Hood ATPV min 40 cal/cm2 • Insulated gloves with leather or fire-resistant outers gloves. • Safety Observer • LV Rescue Kit • ISSC 14 Electrical First Aid kit • Rubber Mat

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SWMS Employee Sign off

This SWMS has been developed in consultation and has been read, understood, and signed by all workers undertaking the scope of works:

Print Names:	Signatures:	Dates:

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