

QUEENSLAND URBAN UTILITIES

LUGGAGE POINT TREATMENT PLANT

Replace Substation 2 & Feeder Cable 25



PREPARED BY:

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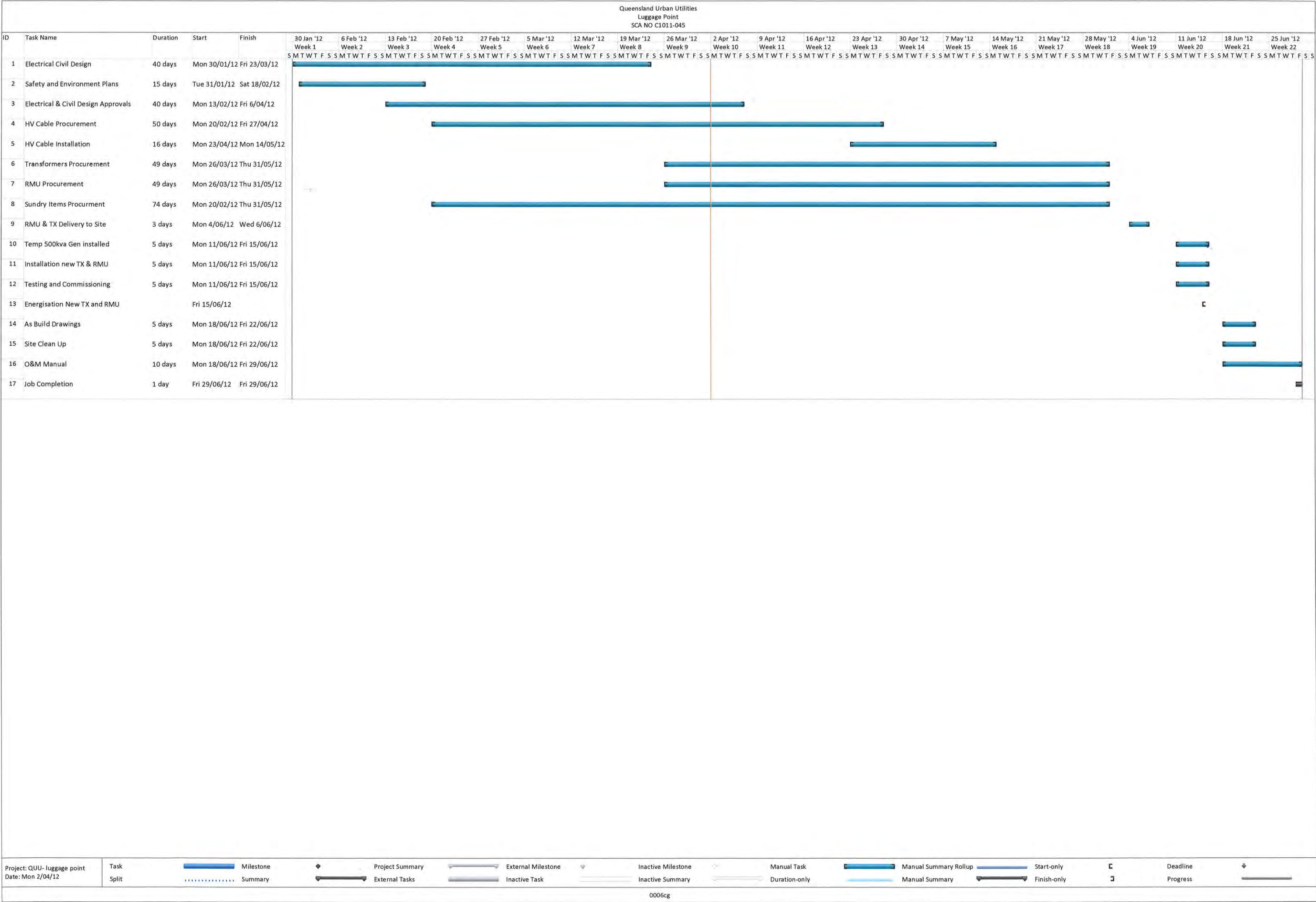
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Section 1 Work Plan



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Section A: DETAILS OF THE JOB AND/OR CONTRACT

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**PRINCIPAL CONTRACTOR SAFETY AND ENVIRONMENTAL PLAN****Scope of Works:**

Client: Queensland Urban Utilities		Worksite address: Main Beach Road, Myrtletown	
Contract No:	JPR Job No: C55094	Expected Commencement Date: 2 / 2 / 2012	Expected Completion Date: 30 / 5 / 2012

Work to be Performed: Upgrade of HV transformer and HV mains

To be Provided by the Client or Others:
(Dial before you dig information, common plant etc)

Sub- Contractor: *(Complete this Part if JPR have engaged a sub-contractor to perform work)*

Company Name: Hector the Erector	Contact Person: Phil Herbohn	Phone Number: 38930939
Safety and Environment Documents to be provided by JPR Sub-Contractor:		JSA to be provided

Key Personnel: *(Who are the persons with authority to control the job)*

JPR Key Personnel: <i>(List the names of the JPR staff who will be managing the work at this site)</i>	Job Supervisor: Colin Gleadhill	Phone Number: 3271 2911
	Group Leader: James Dwyer	Phone Number: 0457 004 859

Safety Committee: *(Must be compiled when a Safety Officer is appointed to the job or if 30 or more workers are onsite in any 24 hour period)*

Safety Advisor:		Phone Number	Committee Members: <i>(Record Below)</i>		
<u>Name</u>	<u>Company</u>	<u>Name</u>	<u>Company</u>	<u>Name</u>	<u>Company</u>

Approvals: *(This Part must be signed before being implemented)*

Job Supervisor:	Name: Colin Gleadhill	Signature:	Date: 02 / 02 / 2012
JPR WHSA:	Name: Paul Rogers	Signature:	Date: 02 / 02 / 2012

Section B: EMERGENCY AND INCIDENT MANAGEMENT

All emergencies and incidents must be verbally reported as soon as possible after the event and followed up in writing by completing the appropriate form. The contacts and direction details in case of an emergency or injured worker for this worksite can be found in the site file (inside front cover)

Section C: ACTIVITIES TO BE PERFORMED AT THE WORKSITE *Identify (✓ the box) the activities that will be conducted at this work-site***Part 1: High Risk Activities** *(Work Method Statements must be used for each high risk activity identified)*

No	✓	ACTIVITY	No	✓	ACTIVITY
1		Work where asbestos will be disturbed	2		Work where there is the risk of falling 2 meters
3	✓	Work in or near a confined spaces	4		Work in or near a trench over 1.5M deep or a tunnel
5	✓	Working near moving powered mobile plant	6		Work on a telecommunication tower
7	✓	Work on or adjacent to a road, railway or other corridor that is in use by traffic other than pedestrians	8	✓	Work on or near an energised electrical installation or service
9		Work in or near water or other liquid where there is a risk of drowning	10		Work on or near pressurised gas distribution main and consumer piping
11		Work in an area where there are artificial extremes of temperature	12		Work in an area that may have a contaminated or flammable atmosphere
13		Work on or near a chemical, fuel or refrigerant line	Other		

Part 2: Other Activities *(Refer to Section E of this document for the control measures to be installed)*

No	✓	ACTIVITY	No	✓	ACTIVITY
14	✓	Work where there is a risk of falling objects	15		Working in cable joining pits
16		Working with declared pests and/or environmental issues	17		Perform survey work or scope a job
18	✓	Working Indoors	19	✓	Working outdoors
20	✓	Work involving manual handling	21	✓	Installing or removing a switchboard or transformer
22	✓	Perform HV switching	23	✓	Using hazardous chemicals
24	✓	Work on de-energised HV conductors and/or equipment	25	✓	Work on de-energised LV conductors and equipment
26	✓	Winching and/or tensioning activities	27		Direct/Indirect contact with biological hazards
28		Joining fibre optic cable	29	✓	Operate hand, power and/or air tools
30	✓	Perform hot work	31	✓	Work while supervising apprentices
32	✓	Installation of cable tray or ladder and supports	33		Perform PLC testing in an energised LV MCC using all plug in connections

Part 3: Additional Activities *(Describe any additional activities to be performed at this site that are not adequately covered in 1 to 33 above and record the control measures in the JSA Section C)*

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Section D: HAZARDS ASSOCIATED WITH THIS CONSTRUCTION WORK: (Select the hazards by ✓ the box, if you are unsure contact the JPR Safety Dept)
Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION

Documentation or Information	✓	Consultation or Communication	✓	Supervision	✓
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Part 2: HAZARDS ASSOCIATED with ACTIVITIES

Manual Handling	✓	Hazardous Substance	✓	Gravitation	
Excavations		Confined Space	✓	Water	
Mobile Plant	✓	Power and Hand Tools or Equipment	✓	Traffic	✓
Electrical Energy	✓	Artificial Conditions	✓	Pets and Animal Stock (e.g. Cattle)	✓
Optic Fibre		Worker Comfort	✓		

Part 3: ENVIRONMENTAL HAZARDS

Insufficient Documentation or Information	✓	Land Degradation		Soil Management	
Hazardous Substance	✓	Air Pollution		Flora and Fauna	
Noise Management	✓	Waste Management	✓	Declared Pests	
Atmospheric Conditions					

Part 4: BIOLOGICAL

Diseases	✓	Discarded and Used Sharps			

Section E: ASSESSING THE RISK OF THE HAZARDS: *(Parts 1, 2, 3 and 4 of this Section must be referred to when completing this document)*
Process:

Step 1 - Select the hazards (**refer to Section D**) that are known to exist with the scope of work being performed or occurring naturally at this site.

Step 2 - Delete the hazards that do not exist at this site when performing the activities (**refer to Section C for guidance**).

Step 3 - Identify the elements within the hazards that are known to exist with the activity being performed or occurring naturally at this site.

Step 4 - From the list of control measures recorded for each element identified delete those controls that are not applicable to this site.

Step 5 - Where the control measures listed for the activity are insufficient you can draft your own and include these into this document.

Assessing the Level of Risk:

You must now assess the level of risk that people will be exposed to from the hazard while at the site this is a two (2) tier process.

Step 1 - The pre-determined maximum level of risk for each hazard (**this is shown as R1**), if you do not agree with the pre-determined level of risk, use the risk calculator (**Attached to the end of this Section**) and re-assess.

Step 2 - Use the risk calculator to determine the remaining level of risk people will be exposed to when at this site after the control measures have been installed (**this is shown R2**)
The consequence of a hazard will remain the same until the hazard is removed from the work area, the likelihood of the hazard become a risk will change when the controls are installed.

Determining the Action Required:

Now that the remaining level of risk (**R2**) is known, refer to the Risk Calculator for the **action required** to be taken before the activity can be started.

Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION

Documentation or Information Provided	R1	6M
Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	4L
Consultation or Communication	R1	6M
JPR workers must comply with the requirements listed in the Employee Safety and Procedures Manual Ensure all workers onsite attend the daily toolbox meeting Ensure all workers onsite are involved in the development of the documents to be used at the site Ensure workers are aware that the task may require a permit to be obtained before the work starts		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	4L

Supervision		R1	10H
Ensure all apprentices and trainees performing electrical work are supervised in accordance with JPR procedures Refer to the document "Guide for Apprentices", located in the Procedure Manual, for the competencies required by an apprentice to perform a specified task The Group Leader shall monitor the action of all workers onsite and recommend any corrective action required to the job supervisor The Group Leader shall ensure that all relevant site documents are completed before and during (if required) the work			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Part 2: HAZARDS ASSOCIATED with ACTIVITIES			
Manual Handling		R1	15H
General	JPR manual handling procedure to be adhered to at all times		
Restricted and/or Awkward work areas	Do not overreach or work with your back twisted for extended periods Move to a more suitable work area		
Lifting	Ensure the worker assesses the weight to be lifted is within the workers capacity to handle manually Whenever possible use team lifting practices Vary tasks to reduce exposure to lifting and bending Heavy masses to be lifted by using mechanical aid		
Personal Protective Equipment	Wear suitable hand protection Wear suitable clothing to maintain working comfort		
Transformers	The use of rollers, skates, turfor jacks and crow bars shall be in accordance with the Safe Work Procedure for installing or removing switchboards When installing or removing a switchboard or transformer manually it shall not be tilted more than 5° Floor surface shall be cleaned before attempting to move equipment into location Establish clear access to and around the work area Seek help or use mechanical aids to move heavy or awkward objects		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M
Hazardous Substance		R1	12H
General	Consult the Principal Contractor for guidance on possible flammable substance or contaminance that may be encountered onsite Ensure that a current SDS for the substance is readily available before work starts Ensure contact details of emergency response providers is available onsite		
Use	Hazardous substances used following SDS requirements JPR Hazardous Substance Guide shall be referred to confirm whether a substance is hazardous and what action required if uncontrolled exposure is experienced JPR procedure for the use of a hazardous substance shall be strictly adhered to Ensure work area is well ventilated		
Fire and Explosion	Ensure contact details of emergency response providers is available onsite Define the marshalling area in the event of an evacuation		
Personal Protective Equipment	Ensure PPE required for the substance to be used is available and used onsite Personal washing facilities to be made available on site Wear the required PPE for the activity		
Environment	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M

Confined Spaces		R1	20A
General	Entry is restricted to competent and authorized persons		
Safety Observer	Competent safety observer shall be assigned to remain outside and in close proximity to the confined space entrance Safety Observer shall be in communication with the workers in the space		
Monitoring	Monitor the space for oxygen deficiencies and contaminants		
Plant use	Do not use petrol engines near or in confined spaces		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M
Mobile Plant		R1	20A
General	Comply with the manufacturers, industry and site specific requirements Operators manual must be available for reference Check site for hazards prior to setting up and operating mobile plant Ensure the Mobile Plant has been maintained in accordance with the manufacturers specifications		
Inspections	Perform a Safety Check of the plant before using on site Perform a daily pre start inspection of mobile plant to be used on site Check that the vehicle is in a serviceable condition (Tyres, Lights etc) Perform the pre-use maintenance checks (Check all fluids)		
Load carrying	Ensure the Gross Vehicle Mass is not exceeded Plant shall be loaded within the excess dimension guidelines Secure loads in accordance with load restraint regulations		
Instability	Use the necessary dunnage to ensure stability Ensure the vehicle is not loaded in such a way that it will become unstable		
Crush or Pinch	Identify potential crush or pinch areas with the particular item of plant Inform all workers to keep clear of the crush or pinch areas while the plant is operating		
Operator	Ensure the operator has a current license (where mandatory) for the mobile plant Ensure the operator is competent to operate the mobile plant where a license is not required Ensure the worker is licenced to drive that class of vehicle Ensure the worker is familiar with the operation of the mobile plant		
Registration	Ensure the plant is registered (if applicable)		
Exclusion Zones	Define and Maintain an exclusion zones around the mobile plant when in use		
Safety Observer	Safety Observer must be in communication and in clear view of the driver/operator Competent safety observer to be engaged if electrical exclusion zones could be encroached The mobile plant shall not be driven in reverse on site unless a safety observer is used		
<i>(The use of an apprentice in the first 12months of service as a safety observer must be assessed and approved by the Electrical Safety Manager)</i>			
Disturbing the neighbours	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible		
Environmental	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M

Power and Hand Tools or Equipment		RI	20A
General	All equipment to be used on site shall comply with legislation and standards Operators manual must be available for reference		
Operation	Tools and equipment shall be operated by a competent person Rotate workers using equipment that causes vibrations to limit exposure to this risk The exhaust from equipment must be directed away from all workers including the operator		
Storage and Transport	Tools and equipment shall be stored and transported in an appropriate manner to minimize damage		
Safety Features	Tools must have all handles and guards fitted as supplied by the manufacturer Tools must be fitted with a dead man or quick release trigger		
Inspections	Equipment must be undergo a safety inspection before use All tools shall undergo a pre-use check Tools and equipment shall be fit for purpose, maintained in a serviceable condition, be in current test Defective tools shall be tagged "out of service" and removed from the work site		
Winching	Powered winch shall only be operated by competent persons Personal to remain clear of the operating zone or winch rope when under tension Equipment matched to conductor or cable and the SWL shall not be exceeded Exclusion zone to be defined and maintained while the winching operation is in process		
Electrical Energy	Refer to Electrical Energy for the control necessary to minimise the risk of this hazard		
Hydraulic Energy	Power source for the hydraulic equipment shall be compatible with the equipment Gloves should be worn when using hydraulic powered equipment to compensate for the heat generated		
Pneumatic Energy	Air tools shall be isolated from the energy supply before changing discs, bits or blades		
Hot Work	Ventilate work area and/or extract welding fumes Establish safe work zone around/under hot work area including removing all flammable material or substances Obtain a "Hot Work Permit" before starting the activity at a construction site Follow the requirements of the Hot Work Permit Ensure a serviceable fire extinguisher is close to the work area Use a safety observer to watch for and extinguish spot fires When cutting and drilling wear medium impact safety glasses		
Changing Consumables	Power and Air tools shall be isolated from the energy supply before changing discs, bits or blades		
Crush or Pinch	Identify potential crush or pinch areas with the particular item of equipment Inform all workers to keep clear of the crush or pinch areas while the equipment is being used		
Projectiles	Define and maintain an exclusion zone during the activity Perform a pre-use inspection of all equipment to ensure they are fit for purpose Required PPE shall be worn at all times		
Instability	Position equipment to be used on a stable surface All equipment to be used on site shall be assessed for suitability and serviceability Equipment maintained in a serviceable condition Ladders shall only be used on a stable surface		

<i>Airborne Particles created</i>	Required PPE shall be worn Use in a well ventilated area Wear a face shield or medium impact safety glasses		
<i>Disturbing the neighbours</i>	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible		
<i>Environmental</i>	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	8M
Traffic		R1	20A
<i>General</i>	Traffic management shall be in accordance with company procedures		
<i>Signage</i>	Install traffic control devices to define the work area Ensure traffic control signs are regularly checked to ensure they are still visible to traffic Install signage to direct pedestrians around the worksite		
<i>Install devices</i>	Install screens to prevent people from welding flashes Devices shall be installed in accordance with the MUTCD		
<i>Pedestrians</i>	Control pedestrian movement through or around the work area		
<i>Personal Protective Clothing</i>	Wear high visibility clothing Wear high visibility clothing with reflective stripes when working at night		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	8M
Electrical Energy		R1	30A
<i>General</i>	Ensure emergency contact details are available onsite Live Low Voltage risk assessment completed Comply with JPR Live Low Voltage work procedures Work performed by licensed electrical workers or adequately supervised electrical apprentices		
<i>Isolation of Supply</i>	Positively identify the equipment to be isolated Isolation, tag and lockout procedures carried out in accordance with JPR and Customer procedures Workers to be briefed on the isolation method to be used Adjacent exposed live components shall be identified and isolated or insulated		
<i>Exclusion Zone</i>	Exclusion zone clearances to be maintained for unauthorised persons or plant		
<i>Safety Observer</i>	Safety observer to be in control of the site where exclusion zones are in place		
<i>Test</i>	Test before you touch to prove de-energised		
<i>Tools and Equipment</i>	Ensure a maintained first aid kit is available onsite Ensure an in test rescue kit is available when working live All test equipment, tools and working earths to be in current test Working earths shall be correctly positioned All electrical extension leads and tools shall be used through an RCD (not required when attached to a generator with floating secondary winding) Electrical extension leads shall not be placed on the ground or floor surface when in use Devices used to support extension leads shall be non-conductive and not cause damage to the lead		

High Voltage	Comply with industry High Voltage isolation, Access procedures and JPR work procedures HV switching performed by authorized and competent persons Pre approved switching sheet shall be obtained before the work starts Safe work zone established and Access Permit requirements adhered to		
Personal Protective Equipment	Required PPE shall be worn and be in current test		
Apprentices	Only 3 rd and 4 th year electrical apprentices shall be exposed to live electrical work under direct supervision		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	5M
Artificial Conditions		R1	15H
General	Obtain and follow site specific procedures		
Cold	Take periodic rest breaks outside the refrigerated area Drink warming fluids (if needed)		
Heat	Take periodic rest breaks away from the heat source Drink sufficient quantity of cool water		
Personal Protective Equipment	Wear suitable protective clothing and all necessary PPE		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M
Pets and Animal Stock (e.g. Rats)		R1	4L
General	Confirm with the Client if animals are at the worksite before entering		
Isolate	Animals should be separated or restrained before entering the work area		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L
Worker Comfort		R1	12H
Air Flow	Use mechanical ventilation to ensure adequate air flow when required		
Fatigue	Take periodic rest breaks to maintain alertness Driving times shall be in accordance with the “Driver Fatigue Management Legislation” Monitor alertness and dexterity of the driver		
Dehydration	Maintain an adequate intake of fluids to prevent dehydration Drink sufficient cooling or warming fluids		
Personal Protective Equipment	Wear suitable clothing to maintain working comfort Monitor alertness and dexterity of other workers on site		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Part 3: ENVIRONMENTAL HAZARDS			
Insufficient Environment Documentation or Information Provided		R1	20A
Confirm with the Principal Contractor or Client if there are environmental issues known to be at the site Ensure a copy of the “Environmental Management Guide is available for reference			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	8M

Hazardous Substance		R1	12H
Substance spilt	Spill kits of adequate size to contain any potential spill must be available on site at all times Notify the Principal Contractor when a spill has occurred Minimum quantity to be stored onsite		
Accidental release	Notify the job supervisor immediately who will take control of the rectification process If possible take action to prevent further release Evacuate the worksite if a risk to health and safety exists		
Stored on site	Substances stored in a bunded area Ensure adequate bunding is available onsite (if required) Substances to be stored in a shaded area Substance to be stored in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) Storage shall be in accordance with the SDS requirements		
Disposal	Disposal shall be in accordance with the SDS Containers to be disposed in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) Must be disposed of at an approved facility		
Fire and Explosion	To be kept clear of ignition sources Substance to be handled in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) SDS requirement to be adhered to at all times		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M
Noise Management		R1	3L
General	Wear appropriate hearing protection Activities creating noise should be performed during daylight hours		
Mobile plant onsite	Restrict vehicle and mobile plant movement onsite to a minimum whenever possible Any mobile plant that creates noise should only be run when needed and not left running continuously Ensure that all mobile plant with noise attenuation devices are maintained and kept in a fit for purpose condition		
Vibrations	Rotate the task between workers when using equipment that create vibrations Any equipment that creates vibrations should be run only when needed and not left running continuously The use should be kept to short periods whenever possible Operators should take regular breaks away from the vibration source		
Portable equipment in use	Reduce the noise level at the work area by shifting the noise source Ensure that all equipment supplied with noise attenuation devices are maintained and kept in a fit for purpose condition		
Powered hand tools in use	Required PPE shall be worn where required Where possible substitute the power tool with another with a lower operating noise level		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L

Waste Management		R1	4L
Liquid waste	Shall be stored in approved containers Disposal shall be at an approved facility		
Hazardous substance waste	Disposal shall be in accordance with the MSDS requirements Disposal shall be at an approved facility		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L
Part 4: BIOLOGICAL			
Diseases		R1	20A
Vaccinations	Ensure the employee vaccinations are current for the identified hazards		
Personal Protective Equipment	Appropriate PPE available at the work area and worn where required Personal washing facilities to be available at the work site		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	5M

RISK CALCULATION; The **Consequences** have been rated in Levels 0 to 5, the lower the number the lower the risk level and **Likelihood** has been categorised in Level 1 to 6 also. The risk rate is determined by multiplying the Level No. X the Category No. e.g. **Level 2 X Category 3 = 6** which is a **moderate** risk.

Note: Once the consequence level is selected, the likelihood within that level of the consequence happening before and after the controls are installed must be calculated.

The consequence levels of 1 and 0 are the only levels that can be combined unless the hazard has been removed from the work area then the consequence will change.

When assessing electricity, the Consequence will always be Catastrophic but the Likelihood of it happening will change when controls are installed.

LIKELIHOOD How likely will it happen?	Category	CONSEQUENCES (How severe the injury, loss or damage will be if it happens)?					
		CATASTROPHIC <i>Fatalities or long term Environmental Impact Financial Loss >\$10M</i>	MAJOR <i>Extensive injuries and/or long term Environmental Impact Financial Loss >\$1M</i>	MODERATE <i>Medical treatment or Environmental Impact rectified with outside help Financial Loss >\$100K</i>	MINOR <i>First aid treatment or Environmental Impact easily rectified Financial Loss >\$10K</i>	INSIGNIFICANT <i>Action required to minimise the risk of Incidents or environment impact Financial loss < \$10K</i>	NEGLIGIBLE <i>No impact upon objectives or outcomes, No incidents or Environmental Impact</i>
		Level 5 Risk	Level 4 Risk	Level 3 Risk	Level 2 Risk	Level 1 Risk	Level 0 Risk
ALMOST CERTAIN <i>Is expected to happen</i>	6	30-A	24-A	18-A	12-H	6-M	0-VL
LIKELY <i>Will occur in most cases</i>	5	25-A	20-A	15-H	10-H	5-M	
POSSIBLE <i>May occur at sometime</i>	4	20-A	16-H	12-H	8-M	4-L	
UNLIKELY <i>Might happen at sometime</i>	3	15-H	12-H	9-M	6-M	3-L	
RARE <i>May occur only in exceptional circumstances</i>	2	10-H	8-M	6-M	4-L	2-L	
VERY RARE <i>Not expected to happen</i>	1	5-M	4-L	3-L	2-L	1-VL	
DETERMINE THE ACTION REQUIRED							
RISK RATE	ACTION REQUIRED						
0-1 = VERY LOW (VL)	NO ACTION REQUIRED – Reassess if an incident of any nature occurs where objectives or outcomes can’t be achieved						
2-4 = LOW (L)	OK FOR NOW – Monitor and review when performing task/s						
5-9 = MODERATE (M)	FOLLOW COMPANY PROCEDURES						
10-16 = HIGH (H)	SAFETY MANAGEMENT DECISION – Required urgently Safety refer to WH&S Manager, Electrical refer to Electrical Safety Manager						
18-30 = ACUTE (A)	URGENT – Stop the Task or Activity and make safe. Senior Management decision required before the Task or Activity can recommence.						

Section F: SITE SPECIFIC REQUIREMENTS (Signage, PPE, Common Plant, Competencies, Tools and Equipment Etc)							
CONSULTATION REQUIREMENTS (Place a ✓ in the box and/or describe as appropriate, 'E' evidence is required)							
Construction Industry Induction	E	JPR Site Specific Induction	✓	Client Site Specific Induction	✓	Daily Pre-start Tool Box Meeting	✓
Other:							
SITE SIGNAGE (Tick ✓ the box to indicate the signs required at this site)							
JPR Principal Contractor		Vehicle Parking Area		Fire Extinguisher		Eye Protection	
Construction Site	✓	Deep Excavation		First Aid		Hearing Protection	
Visitors Report to Site Office		Moving Machinery		Safety Footwear		Hard Hat	
Authorised Entry Only		Workers Above		High Visibility Clothing			
Emergency Assembly Point		Spill Kit		Confined Space			
PPE REQUIRED TO BE WORN AND/OR USED AT THIS SITE							
Part 1: Mandatory (Tick ✓ the box for mandatory; 'U' use as required)							
High Visibility Clothing	✓	Lace-up Safety Footwear		Fall Arrest		Sun Screen	U
Long Pants & Long Sleeves	✓	Safety Glasses (Medium impact rated)	U	Flotation Device		Insect Repellent	U
Safety Helmet (Hard Hat)	U	Safety Glasses (UV & Medium impact rated)	U	Hand Protection			
Sun Brim for Hard Hat		Full Face Shield		Gas Monitoring Equipment	✓		
Safety Footwear (any)	✓	Hearing Protection	U	P2 Dust Masks			
Part 2: Additional Personal Protective Equipment (Record what additional PPE is required for this site)							
COMMON PLANT AND AMENITIES TO BE USED AND/OR AVAILABLE ONSITE (Tick ✓ the box for mandatory; 'U' use as required)							
First Aid Kit	✓	Temporary Fencing		Plastic Sheeting to cover ASS		Yellow/Black Striped Tape (reflective)	
Scaffolding		Orange Para fencing		Site Office		Yellow/Black Striped Safety Tape	
Ladders	✓	Star-pickets and caps		Portable Toilet		Substance Bunding	
Formwork		Witches Hats		Shaded area for rest breaks			
Mobile Generator	✓	Edge Protection		Rubbish Bins with fitted lids			
Mobile Welder		Silt containment fence		Mini Skip			
Flashing Lights		Silt Socks		Site Container			

LICENCES & COMPETENCIES REQUIRED TO PERFORM THE SELECTED ACTIVITIES

Part 1 – Licence required to construct, perform, operate or enter (Tick ✓ the box where required; S-C = Sub Contractor)

Required for	JPR	S-C	Required for	JPR	S-C
Enter a Confined Space	✓		Operate a Fork Lift (Not required for pedestrian operated)		
Operate a Mobile Elevating Work Platform over 11m boom length			Operate an Excavator (With an engine capacity of more than 2L)		
Operate a Vehicle Loading Crane over 10m/t lifting capacity.		✓	Operate a Skid Steer Loader (With an engine capacity of more than 2L)		
Drive a Heavy Vehicle (Record the minimum required) HC, HR, MR, LR	HR	✓	Operate a Backhoe (With an engine capacity of more than 2L)		
Construct Scaffold over 4m high			Perform Dogger activities	✓	✓
Electrical Tradesperson	✓				
Electrical Linesperson					

Part 2 – Competency required to construct, perform, operate or enter (Tick ✓ the box where required; S-C = Sub Contractor)

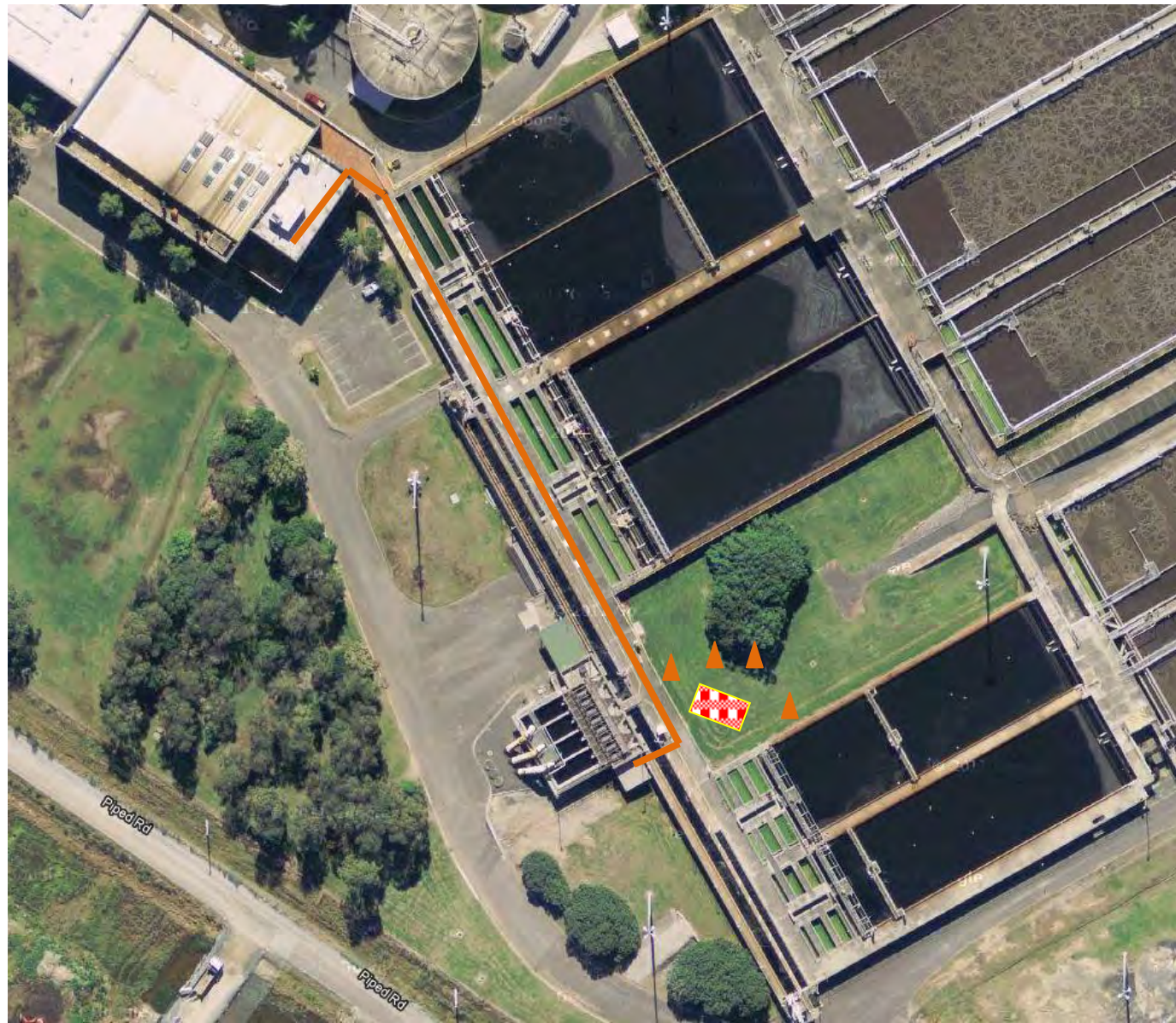
Required for	JPR	S-C	Required for	JPR	S-C
Working at Heights			Construct Scaffold under 4m high		
Operate a Mobile Elevating Work Platform under 11m boom length			Operate a Vehicle Loading Crane under 10m/t lifting capacity.		
Installing temporary edge protection					

Part 3 – Competent Safety Observer (Tick ✓ the box where required; S-C = Sub Contractor)

Required for	JPR	S-C	Required for	JPR	S-C
Performing Live Electrical work	✓		Work being performed in a Confined Space	✓	
Working at heights from a Mobile Elevating Work Platform			Working in close proximity to Mobile Plant	✓	✓

SITE LAYOUT *(Insert sketches or drawing)*

● = WH&S signs, ● = MUTCD signs, = Cable Jinker, = Crane truck, ▲ = Traffic cones, = Cable run in tunnel



- Crane operating location is approximate.
- Work Area shall be kept to a minimum size without jeopardising safety
- Signs are to be installed at both ends of the work area.
- Orange Para fence to be supported by capped star picked posts or portable bollards.
- Workers must not stand where a load can be passed directly above them.
- The spotter must be in contact with the crane operator during the lift.
- Advance warning signs to be 15 to 30m after each end of the worksite.
- End road work signs shall be placed on the same size as the approaching traffic and be 15m after the advanced warning signs at that end of the worksite.

Section G: SITE RULES

Part 1: Mandatory Site Rules (Tick ✓ the box to indicate the rules that are mandatory at this site)

All workers must show evidence of General Construction Induction	✓
All workers must be site inducted and attend the daily pre-start toolbox meeting	✓
Alcohol or Illegal drugs are not permitted onsite	✓
The Group Leader shall conduct a daily toolbox meeting to allocate tasks and discuss any necessary changes to the site documents	✓
The controls detailed in this Safety and Environmental Plan shall be discussed/referred to at the daily pre-start toolbox meetings	✓
A copy of this Safety and Environmental Plan shall be onsite at all times while work is being performed	✓
The Group Leader in consultation with the Workers shall compile a daily pre-start JSA	✓
The Group Leader shall discuss with all workers onsite of any changes required to minimize risks identified in the daily pre-start JSA	✓
All workers must be familiar with the contents of their employers safety documents used at this worksite	✓
The Group Leader shall ensure that all workers are to be consulted in the development of WMS to be used onsite	✓
JPR Group Leader must confirm the controls are used effectively at least daily and when tasks change	✓
The Group Leader shall ensure that all mobile plant used onsite is checked daily by a competent person before use	✓
Common Plant installed onsite shall not be tampered with	✓
PPE listed in Section F must be worn as instructed	✓
Defective Plant shall be tagged “out of service” and not used	✓

Part 2: Additional Site Specific Rules (Tick ✓ the box to indicate the rules that are to be followed at this site)

All workers must sign the acknowledgement form/s	
Vehicles must park in allotted areas	
Visitors must report to the Site Office	
All hired mobile plant brought onto site must undergo a safety inspection before use	
The Supervisor and Group Leader shall liaise with the client and other Contractors where work areas overlap	
Sub-contractor documentation shall be approved by a JPR Safety staff member before work is permitted to proceed	
Traffic Management used at this site shall be checked by the Group Leader to ensure it is in accordance with the Plan, Guidance Schedule or Company Procedure	
Signage for Traffic Control shall be checked every 3 hours to ensure it is still visible to the oncoming traffic	
JPR Safety Section will periodically conduct inspections of this site	Frequency:
The Job Supervisor shall perform a Safety and Environmental check to ensure the necessary controls have been installed (Use Form F1260)	

Section H: CONFIRMATION OF SITE SAFETY BY THE GROUP LEADER (✓ the box)
Part 1: Before the job starts *(The Group Leader must complete this Section before the job starts)*

The Group Leader confirms that the Job Supervisor has completed Sections A to F before the work starts	
The Group Leader confirms that the requirements listed in Sections A to J have been acted upon and will be adhered to at all times	
The Group Leader confirms that a pre-start tool box meeting will be conducted to discuss the contents of this Safety and Environmental Plan	
The Group Leader confirms that all workers at the worksite have received a General Construction Induction and has supporting evidence <i>(have their induction card onsite)</i>	
The Group Leader confirms that all workers onsite will be advised of the requirements of this Safety and Environmental Plan	
The Group Leader confirms that all workers onsite have signed the acknowledgement section of this Safety and Environmental Plan (refer to Section I)	

Part 2: Before work starts *(The Group Leader must complete this Section before work at the site starts and act upon these points at the daily tool box meeting)*

The Group Leader confirms that a pre-start tool box meeting will be conducted to consult and advise workers if this Safety and Environmental Plan is changed	
The Group Leader confirms that a JSA will be compiled in consultation with all workers using the JSA for the particular work area	
The Group Leader confirms that all workers will sign the daily tool box meeting form and the JSA in use at the particular work area	
The Group Leader confirms that the WMS's in use at this site are reviewed at the daily toolbox meeting and any changes are noted in the appropriate JSA's	
The Group Leader confirms that the control measures listed in Section E are installed and used effectively	
The Group Leader confirms that all hired plant to be used onsite will be subjected to a safety inspection (use Form F1275) before use	
The Group Leader confirms that all mobile plant used onsite is checked by a competent person before use	
The Group Leader confirms that all workers at the worksite have received a Site Specific Induction	

Part 3: Signatures to confirm compliance *(The Job Supervisor and the Group Leader must sign where indicated)*

Directions	Signatures
The Group Leader must sign to confirm that the requirements of Part 1 and 2 of this section have been acted upon as directed	
The Job Supervisor must sign to confirm that the requirements of Part 1 and 2 of this section have been acted upon by the Group Leader	

Section I: REFERENCE MATERIAL *(Reference material must be used then developing a WMS)*

Part 1 – Acts

Work Health & Safety Act - 2011	Electrical Safety Act - 2002	Vegetation Management Amendment Act - 2008
Environmental Protection Act - 1994	Mining and Quarrying Safety and Health Act - 1999	Land Protection (Pest and Stock Route Management) Act - 2002
Land Act - 1994	Building Act - 1975	Transport Operations (Road Use Management) Act - 1995
Nature Conversation Act - 1992	Vegetation Management Act - 1999	Plant Protection Act - 1989

Part 2 – Regulations

Work Health & Safety Regulations - 2011	Mining and Quarrying Safety and Health Regulation - 2001
Environmental Protection Regulations - 2008	Transport Operations (Road Use Management – Vehicle Standards and Safety) Regulations - 2010
Traffic Regulations - 1962	Transport Operations (Mass, Dimensions and Loading) Regulation - 2005
Fatigue Management Regulations - 2008	Transport Operations (Road Use Management – Dangerous Goods) Regulation - 2000
Electrical Safety Regulations - 2002	Transport Operations (Road Use Management – Road Rules) Regulations - 2009

Part 3 – Codes of Practice

Electrical Safety Code of Practice – Electrical Work - 2010	Code of Practice – How to manage Work Health and Safety Risks - 2011
Electrical Safety Code of Practice – Works - 2010	Code of Practice – Traffic Management for Construction or Maintenance Work - 2012
Code of Practice – Hazardous Chemicals - 2003	Code of Practice – Management and control of Asbestos at the Workplace - 2005
Code of Practice – First Aid - 2004	Code of Practice – Managing Noise and Preventing Hearing Loss at Work - 2004
Code of Practice – Scaffolding - 2009	Code of Practice – Prevention of Workplace Harassment - 2004
Code of Practice – Plant - 2005	Electrical Safety Code of Practice – Risk Management - 2010
Code of Practice – Hazardous Manual Tasks - 2011	Electrical Safety Code of Practice – Working Near Exposed Live Parts - 2010
Code of Practice – Mobile Crane - 2006	Code of Practice – How to Safely Remove Asbestos - 2011
Code of Practice – Confined Space - 2011	Code of Practice – Managing the Risk of Falls at Workplaces - 2011
Code of Practice – Induction for Construction Work - 2007	

Part 4 – Standards

AS/NZS 4801 OH&S Management	AS2550.11 – Vehicle Loading Cranes Safe Use	
AS2550.10 – Elevating Work Platform Safe Use	AS/NZS 4836 – Safe Working On or Near Low Voltage Electrical Installations and Equipment	
AS/NZS ISO 14001 Environmental Management		

Part 5 – Manuals

HSE Management System Manual	Employee Safety & Procedures Manual	Manual of Uniform Traffic Control Devices - 2010

[illegible]

Section 3 Work Method Statements

J & P RICHARDSON INDUSTRIES PTY. LTD

F1228/11

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 114 Campbell Avenue, WACOL QLD 4076
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 E-mail: jpr@jpr.com.au

WORK METHOD STATEMENT
SAFETY HEALTH & ENVIRONMENT RISK ASSESSMENT

Section A – Development Details <i>(All Parts of this Section must be completed)</i>						WMS No: CG 55094		
Part 1 – Type of Activity <i>(Place a ✓ to indicate as appropriate)</i>							Yes	No
Is this a declared high risk construction activity as per OH&S Legislation?							✓	
Will the Scope of Work involve any/other declared high risk activities? <i>(If YES record what they are in Section H)</i>							✓	
Part 2 – Scope of Works <i>(What is to be performed?)</i>								
Fitting up cable tray brackets, cable tray and pull in new HV cable with winch then lay cable in cable tray.								
Part 3 – Work Site and Site Safety Management Details			JPR Client : QUU			Principal Contractor: J & P Richardson		
Worksite Address: Main Beach Road, Myrtletown								
Part 4 – Hazard Exposure <i>(How many people will be exposed to risk while this activity is being performed?)</i>								
Number of people at risk:			JPR Employees	4	Sub-contractors		Others	
Part 5 – Reference Material		The material referenced when producing safety documents is listed in Section J at the end of this document.						
Part 1 lists the Acts that have been referenced.			Part 2 lists the Regulations that have been referenced.			Part 3 lists the Codes of Practice that have been referenced.		
Part 4 lists the Standards that have been referenced.			Part 5 lists the Manuals that have been referenced.					
Part 6 – Development Participant <i>(Details of all persons who participated in the development of this WMS and assessment)</i>								
<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>	<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>	
James Dwyer	Group Leader			Colin Gleadhill	Job Supervisor			
Paul Rogers	OH&S							
Part 7 – Principal Contractor Approval <i>(Where appointed the PC must approve for use at the site)</i>				<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>	
					OH&S Mgr			
					Project Mgr			

Section B – Work Method *(Describe how the activity will be performed)*

1. Worksite conditions to be assessed before the activity commences

The Group Leader shall compile a JSA with the assistance of all workers onsite to identify any additional hazards at the site not covered in **Section D** and implement the control measures needed to minimise risk.

The work area layout must be assessed to ensure workers will not be placed in the travel path or work area of Plant.

2. Workers Acknowledgement of this Work Method Statement and daily JSA compiled for the work area

The Group Leader must ensure during the daily pre start tool box meeting that all workers performing this activity sign **Section I** of this document and onto the daily JSA compiled for the work area at which they will be working to confirm acknowledgement of, and agreement with the contents of both documents.

3. Preparing the work area

The Group Leader shall ensure that the requirements recorded in **Section C** are acted upon or implemented before work is permitted to start.

The Group Leader must ensure that a copy of the Employee Safety and Procedures Manuals is available for reference at each work area.

The Group Leader must consult with the PC and/or other Contractors on site where the work to be performed and/or equipment to be used needs to traverse other work areas.

4. Identify the environmental impact this activity could have

Where a Safety Plan is produced for the site the environmental issues that need to be addressed will be recorded in that document.

If there is NO Safety Plan the supervisor should refer to the “Environmental Management Guide” for assistance in identifying the environmental issues.

5. Installing the control measures

The Group Leader shall ensure that the control measure recorded in **Section D** and any additional control measures required as identified in the JSA are installed before work is permitted to start.

6. Monitor and Review

The Group Leader and Workers will monitor the effectiveness of the control measures installed during the work activity and where required stop the work if they are proving inadequate and in consultation with the workers install additional controls before restarting the activity.

The effectiveness of this WMS will be reviewed during the daily pre-start tool box meeting and/or if worksite conditions change.

The Group Leader must ensure any additions are recorded on the JSA for the work area.

When temporary changes are required to this WMS the alterations shall be recorded in the daily **JSA – Section C** for the work area where this WMS is to be used.

The Job Supervisor or Group Leader shall stop the activity immediately when evidence indicates that this WMS and associated documents are not being adhered to and not to allow the activity to restart until the workers performing the activity have given an assurance that they will follow the requirements of the documents.

The Safety and Environmental Manager shall ensure that this WMS is reviewed if requested by the Group Leader, Job Supervisor or Principal Contractor.

The content of this WMS can only be altered by a member of the JPR Safety Team after consultation with the workers using the document.

Section B – Work Method (Cont)

7. *Performing the Work*

- a) Install brackets to tunnel wall for new cable tray from switch room to where the cable goes underground to the transformer yard.
- b) Mount new cable tray to the new brackets from step ladders. (with care to ensure ladder has a sure footing)
- c) Set up Winch and cable drum Jinker. (ensure all persons working in and around the area are notified and an exclusion zone is set up and monitored to prevent any unauthorised persons entering the area)
- d) Set up cable rollers along the cable tray for support while pulling in the new cable.
- e) Feed in cable draw rope along the path of the cable tray.

f) The Group Leader shall oversee the preparation of the equipment for use

- The Group Leader shall ensure the winch is anchored before use by a minimum of two (2) frame anchors and the winching angle should be no more than 10°
- The Group Leader shall ensure that the rear wheels of the vehicle are chocked if the winch is attached to the vehicle in any way.
- The Group Leader shall ensure that all persons involved in the winching process have adorned the required PPE.
- The Group Leader shall ensure that an exclusion zone is set up as shown in and be clearly defined by witches' hats before winching starts.

g) The Safety Observer must ensure

- Before winching starts ensure that the communication system is operational between all persons involved in the winching process.
- That no person enters the exclusion zone during the winching operation or when the equipment is under tension.

h) The Winch Operator must ensure that

- The Safety Observer is in clear sight when operating the winch
- Only 14mm (minimum dia.) non stretch non rotating wire rope is used
- A visual on the winch is maintained when in use
- The maximum allowable force applied to the cable is never exceeded

i) The Person assisting the Winch Operator must ensure that

- The communication system is operational before the winching process starts
- The cable is sufficiently lubricated to reduce friction within the conduit

Section B – Work Method (Cont)

Winch electrical cable through conduit

1. Place Jinker trailer/truck with cable drum at the end of cable tray that the electrical cable is to be layed into. Place the winch at the other end of the cable tray
Position both trucks/trailers and equipment to ensure the least resistance to the pull.
2. Use previously installed drawstring to pull either a heavier duty draw-string or the actual winch cable along the tray, depending on the length to be pulled.
3. Minimise the risk of draw string breaking creating extra work.
 - Winch operator visually checks the condition of the winch rope as it runs out.
4. At the Cable drum end connect 'sock' to the electrical cable to be pulled and to the winch cable via a shackle.
 - Select the correct diameter size sock for the cable being used
 - Note down length marker on cable
 - Attach cable ties and tape as secondary slip prevention
5. Via two-way communication the winch driver slowly takes up slack while at the Cable drum end the cable is guided into the roller on the tray
6. After the connecting sock has passed the entrance roller of the cable tray.
7. Two-way communication is maintained as the cable is continued to be guided around the cable rollers and winched to the other end.
 - Winch operator visually checks the condition of the winch rope as it is retrieved.
8. The winch operator stops the pull when the cable has passed out the end of the cable tray to the amount required for termination.
 - Advises cable drum end that pull is completed via two-way
 - Removes sock and seals end of cable with tape or dedicated cap
 - Completes retraction of winch cable and puts gear away

Section C: – Requirements needed to be used, installed or held before starting the activity

For this Section use the following: ✓ = Mandatory, R = Recommended, U = Use when necessary, S = Site requirement

The PPE indicated below are to be used or worn when performing this activity.

High Visibility Clothing	✓	Safety Glasses (Medium Impact)	✓	Sun Screen		P2 Dust Mask	
Long Clothing	✓	Safety Glasses (UV & Medium Impact)	✓	Insect Repellent		Disposable Overalls	
Safety Helmet (Hard Hat)	✓	Fall Arrest Harness and Lanyard		Riggers Gloves		Hair Net	
Sun Brim for Hard Hat	✓	Gas Monitoring Equipment	✓	Rubber Gloves		Welding Helmet	
Safety Footwear (Any type)	✓	Hearing Protection	U	Face Shield		Leather Apron	
Safety Footwear (Lace-up)		Flotation Device		Gas Mask		Wide Brim Hat	

Additional PPE required for this work area: (Other than site specific or listed above)

The signs indicated below shall be installed before the activity starts

Workers above		Maritime Advisory		Speed Restriction		Pedestrians watch your step		Live Overhead Lines	
Workers (Symbolic)	✓	Police Advisory		Authorised Entry Only		Deep Excavation		End Road Works	
Use Other Footpath		Water Police Advisory		Asbestos Work Hazard		Live work in progress		Confined Space	

The licenses or competencies indicated below are required to perform this activity

EWP over 11M		Mobile Crane		Excavation Awareness		Vacuum Digger		Boat	
EWP under 11M		Dogger		Trench Entry		Scaffold		Level 1 Traffic Management Awareness	
Heavy Vehicle		Borer / Lifter		Winch Operator	✓	Skid Steer Loader		Level 2 Traffic Management Awareness	
Motor Vehicle		VLC under 10m/t		Electrical Worker	✓	Electrical Linesperson			
Fork Lift		VLC over 10m/t		Electrical Safety Observer		Confined Space Entry	✓		
Working at Height		Hazardous Area		Engineering Tradesperson		Asbestos Awareness			

The permits or approvals indicated below are to be used or obtained before this activity starts

Confined Space Entry	✓	High Voltage Access	✓	Asbestos Removal		Fire Ants		Police - General		Local Council	
Hot Work		Switching Sheet		Excavation		Dial before you dig		Main Roads		Temporary work	

Persons performing this activity must be vaccinated as indicated below									
Q - Fever	<input type="checkbox"/>	Hepatitis B	<input checked="" type="checkbox"/>	Hepatitis A	<input checked="" type="checkbox"/>	Tetanus	<input checked="" type="checkbox"/>		
The specific test equipment recorded below is required when performing this activity <i>(Multimeters, Test lamps)</i>									
The Plant and Equipment listed below will be used when performing this activity									
Ladders	<input type="checkbox"/>	Borer / Lifter	<input type="checkbox"/>	Star Pickets and Caps	<input type="checkbox"/>	Plastic Sheeting	<input type="checkbox"/>		
Pole Straps	<input type="checkbox"/>	Lifting Chains or Slings	<input type="checkbox"/>	Traffic Cones (Witches Hats)	<input checked="" type="checkbox"/>	Duct Tape	<input type="checkbox"/>		
Generator	<input type="checkbox"/>	External Auger	<input type="checkbox"/>	Temporary bollards	<input checked="" type="checkbox"/>	Disposable Cleaning Rags	<input type="checkbox"/>		
Welder	<input type="checkbox"/>	Elevating Work Platform	<input type="checkbox"/>	Barrier Tape	<input type="checkbox"/>	Asbestos Vacuum Cleaner	<input type="checkbox"/>		
Welding Screens	<input type="checkbox"/>	Ventilation Fan – Intrinsically Safe	<input type="checkbox"/>	Reflective Barrier Tape	<input type="checkbox"/>	Water Bucket/Misting Spray Bottle	<input type="checkbox"/>		
Fire Extinguisher/Blanket	<input type="checkbox"/>	Scaffolding	<input type="checkbox"/>	Danger Tags	<input type="checkbox"/>	Temporary/Additional Lighting	<input type="checkbox"/>		
Chain Saw	<input type="checkbox"/>	Flashing Lights	<input type="checkbox"/>	Out of Service Tags	<input type="checkbox"/>	Confined Space Retrieval Equipment	<input type="checkbox"/>		
Fuel Containers	<input type="checkbox"/>	LV Rescue Kits	<input type="checkbox"/>	Vacuum Digger	<input type="checkbox"/>	Sharps Container	<input type="checkbox"/>		
Winch	<input checked="" type="checkbox"/>	Insulated Mat	<input type="checkbox"/>	2-Way Radio	<input checked="" type="checkbox"/>	Portable Toilet	<input type="checkbox"/>		
Winch rope swivel	<input checked="" type="checkbox"/>	Extension Leads and Stands	<input type="checkbox"/>	Silt Containment Fence	<input type="checkbox"/>	Fork Lift	<input type="checkbox"/>		
Cable Sock	<input checked="" type="checkbox"/>	Portable RCD	<input type="checkbox"/>	Silt Socks	<input type="checkbox"/>	Hired Mobile Plant	<input type="checkbox"/>		
Conduit Draw Cord (Rope)	<input type="checkbox"/>	Edge Protection	<input type="checkbox"/>	Rubbish Bins or Skips	<input type="checkbox"/>		<input type="checkbox"/>		
Vehicle loading crane	<input type="checkbox"/>	Orange Para Fencing	<input checked="" type="checkbox"/>	Asbestos Disposal Bags	<input type="checkbox"/>		<input type="checkbox"/>		
The mobile plant listed below must be subjected to a daily pre-use inspection before use <i>(Complete plant log book)</i>									
EWP over 11M	<input type="checkbox"/>	VLC over 10m/t	<input type="checkbox"/>	Borer / Lifter	<input type="checkbox"/>	Fork Lift	<input type="checkbox"/>		
EWP under 11M	<input type="checkbox"/>	VLC under 10m/t	<input type="checkbox"/>	Vacuum Digger	<input type="checkbox"/>	Hired Mobile Plant	<input type="checkbox"/>		
Provide details of any additional information that is to be attached to this WMS: <i>(Traffic Management Plan etc)</i>									
Hazardous Substances to be used during this activity: <i>(A MSDS must be readily available for each substance used)</i>									
Environmental issues identified with this activity: <i>(Fire Ants, Declared weeds or Acid Sulfate Soils (ASS) etc)</i>									
Are there any environmental issues that need controlling?				<input checked="" type="checkbox"/>	No	If "Yes" record in Section "D"			

Section D – Hazards and Control Measures			
Hazards	List the hazards associated with the task	Hierarchy of Controls (No. 1 is the best option and, No. 5 should be used as a last resort)	
R1	Establish the risk level before controls are implemented (Use the calculator in Section F)	1. Eliminate	Modify the material, substance or process to eliminate the hazard completely
Controls	Describe the controls used to minimise the risks the hazard creates (remember hierarchy of controls)	2. Substitute	Replace the material, substance or process with a less hazardous one
R2	Establish the risk level after the control are implemented and follow the guidance in Section G	3. Engineering Controls	Redesign or modify the plant or process to reduce or eliminate the risk
		4. Administration	Adjust the time or conditions or process by training, procedures, signs etc.
		5. PPE	Worker to use PPE to minimise exposure to the risks.

Section D: HAZARDS ASSOCIATED WITH THE ACTIVITIES <i>(Parts 1, 2, 3 and 4 of this Section must be referred to when completing this document)</i>												
<p>Process:</p> <p><i>Step 1</i> - Select the hazards (bronze shading) that are known to exist with the activity being performed or occurring naturally at this site.</p> <p><i>Step 2</i> - Delete the hazards that do not exist at this site when performing this activity.</p> <p><i>Step 3</i> - Identify the risks or elements within the hazards that are known to exist with the activity being performed or occurring naturally at this site.</p> <p><i>Step 4</i> - From the list of control measures recorded for each risk or element identified delete those controls that are not applicable to this site.</p> <p><i>Step 5</i> - Where the control measures listed for the activity are insufficient you can draft your own and include these into this document.</p> <p>Assessing the Level of Risk:</p> <p>You must now assess the level of risk that people will be exposed to while at the site, this is a two (2) tier process.</p> <p><i>Step 1</i> - The determined maximum level of risk or element for each hazard has been calculated and is shown as R1, if you do not agree with the level shown use the risk calculator (Attached to the end of this Section) and re-assess.</p> <p><i>Step 2</i> - Use the risk calculator to determine the remaining level of risk people will be exposed to when at this site after the control measures have been installed (this is shown R2)</p> <p>Determining the Action Required:</p> <p>Now that the remaining level of risk (R2) is known, refer to Section G of the Risk Calculator for the action required to be taken before the activity can be started.</p> <tr style="background-color: #e0f0ff;"> <td colspan="3" style="padding: 5px;"> Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION </td> </tr> <tr> <td style="padding: 5px;"> Documentation or Information </td> <td style="background-color: #ff0000; color: white; text-align: center; padding: 5px;"> R1 </td> <td style="background-color: #ff0000; color: white; text-align: center; padding: 5px;"> 6M </td> </tr> <tr> <td colspan="3" style="padding: 5px;"> Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed </td> </tr> <tr> <td style="padding: 5px;"> <i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i> </td> <td style="background-color: #00ff00; color: white; text-align: center; padding: 5px;"> R2 </td> <td style="background-color: #00ff00; color: white; text-align: center; padding: 5px;"> 4L </td> </tr>	Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION			Documentation or Information	R1	6M	Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed			<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	4L
Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION												
Documentation or Information	R1	6M										
Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed												
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	4L										

Section D (Cont) – Hazards and Control Measures

Consultation or Communication		R1	6M
JPR workers must comply with the requirements listed in the Employee Safety and Procedures Manual Ensure all workers onsite attend the daily toolbox meeting Ensure all workers onsite are involved in the development of the documents to be used at the site Ensure workers are aware that the task may require a permit to be obtained before the work starts			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Supervision		R1	10H
Ensure all apprentices and trainees performing electrical work are supervised in accordance with JPR procedures Apprentices and trainees supervision for all work activities should be as per F1316 – Supervision of Apprentices The Group Leader shall monitor the action of all workers onsite and recommend any corrective action required to the job supervisor The Group Leader shall ensure that all relevant site documents are completed before and during (if required) the work			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Part 2: HAZARDS ASSOCIATED with ACTIVITIES			
Manual Handling		R1	15H
General	JPR manual handling procedure to be adhered to at all times		
Restricted and/or Awkward work areas	Do not overreach or work with your back twisted for extended periods Move to a more suitable work area		
Lifting	Ensure the worker assesses the weight to be lifted is within the workers capacity to handle manually Whenever possible use team lifting practices Vary tasks to reduce exposure to lifting and bending Break bundles down into manageable amounts Heavy masses to be lifted by using mechanical aid		
Personal Protective Equipment	Wear suitable hand protection Wear suitable clothing to maintain working comfort		
Switchboards and Transformers	The use of rollers, skates, turfor jacks and crow bars shall be in accordance with the Safe Work Procedure for installing or removing switchboards When installing or removing a switchboard or transformer manually it shall not be tilted more than 5° Floor surface shall be cleaned before attempting to move equipment into location Establish clear access to and around the work area Seek help or use mechanical aids to move heavy or awkward objects		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M

Section D (Cont) – Hazards and Control Measures

Hazardous Substance		R1	12H
General	Consult the Client for guidance on possible flammable substance or contaminance that may be encountered onsite Ensure that a current SDS for the substance is readily available before work starts Ensure contact details of emergency response providers is available onsite		
Use	Hazardous substances used following SDS requirements JPR Hazardous Substance Guide shall be referred to confirm whether a substance is hazardous and what action required if uncontrolled exposure is experienced JPR procedure for the use of a hazardous substance shall be strictly adhered to Ensure work area is well ventilated		
Transport	Substances shall be secured during transport Substances shall be placed where their containers can't be damaged during transport		
Location of Pipes	Obtain the location of underground services before work starts Advise all personal onsite off the location of the services Mark the mains or pipes to make them easily identified		
Isolation	Identify the nearest isolation points before the job starts Obtain the service provider contact details if isolation is required Obtain the service provider isolation procedure before starting work on or in close proximity to the pipes		
Fire and Explosion	Ensure contact details of emergency response providers is available onsite WMS No 12 shall be used when working in a contaminated or flammable atmosphere after review Define the marshalling area in the event of an evacuation		
Exclusion Zones	Implement an exclusion zone and clearly define the work area Define the work area and keep entry to the work area to the bare minimum		
Personal Protective Equipment	Ensure PPE required for the substance to be used is available and used onsite Personal washing facilities to be made available on site Wear the required PPE for the activity		
Environment	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	6M
Confined Spaces		R1	20A
General	WMS No 3 shall be used after review to confirm suitability for the site Entry is restricted to competent and authorized persons		
Safety Observer	Competent safety observer shall be assigned to remain outside and in close proximity to the confined space entrance Safety Observer shall be in communication with the workers in the space		
Monitoring	Monitor the space for oxygen deficiencies and contaminants		
Plant use	Do not use petrol engines near or in confined spaces		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M

Section D (Cont) – Hazards and Control Measures

Mobile Plant		R1	20A
General	Comply with the manufacturers, industry and site specific requirements Operators manual must be available for reference Check site for hazards prior to setting up and operating mobile plant Ensure the Mobile Plant has been maintained in accordance with the manufacturers specifications		
Inspections	Perform a Safety Check of the plant before using on site Perform a daily pre start inspection of mobile plant to be used on site Check that the vehicle is in a serviceable condition (Tyres, Lights etc) Perform the pre-use maintenance checks (Check all fluids)		
Load carrying	Ensure the Gross Vehicle Mass is not exceeded Plant shall be loaded within the excess dimension guidelines Secure loads in accordance with load restraint regulations		
Crush or Pinch	Identify potential crush or pinch areas with the particular item of plant Inform all workers to keep clear of the crush or pinch areas while the plant is operating		
Operator	Ensure the operator has a current license (where mandatory) for the mobile plant Ensure the operator is competent to operate the mobile plant where a license is not required Ensure the worker is licenced to drive that class of vehicle Ensure the worker is familiar with the operation of the mobile plant		
Registration	Ensure the plant is registered (if applicable)		
Exclusion Zones	Define and Maintain an exclusion zones around the mobile plant when in use		
Safety Observer	Safety Observer must be in communication and in clear view of the driver/operator Competent safety observer to be engaged if electrical exclusion zones could be encroached The mobile plant shall not be driven in reverse on site unless a safety observer is used		
<i>(The use of an apprentice in the first 12months of service as a safety observer must be assessed and approved by the Electrical Safety Manager)</i>			
Disturbing the neighbours	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible		
Environmental	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M
Power and Hand Tools or Equipment		R1	20A
General	All equipment to be used on site shall comply with legislation and standards Operators manual must be available for reference		
Operation	Tools and equipment shall be operated by a competent person Rotate workers using equipment that causes vibrations to limit exposure to this risk The exhaust from equipment must be directed away from all workers including the operator		

Section D (Cont) – Hazards and Control Measures

Storage and Transport	Tools and equipment shall be stored and transported in an appropriate manner to minimize damage
Safety Features	Tools must have all handles and guards fitted as supplied by the manufacturer Tools must be fitted with a dead man or quick release trigger
Inspections	Equipment must be undergo a safety inspection before use All tools shall undergo a pre-use check Tools and equipment shall be fit for purpose, maintained in a serviceable condition, be in current test Defective tools shall be tagged “out of service” and removed from the work site
Winching	Powered winch shall only be operated by competent persons Personal to remain clear of the operating zone or winch rope when under tension Equipment matched to conductor or cable and the SWL shall not be exceeded Exclusion zone to be defined and maintained while the winching operation is in process
Electrical Energy	Refer to Electrical Energy for the control necessary to minimise the risk of this hazard
Hydraulic Energy	Power source for the hydraulic equipment shall be compatible with the equipment Gloves should be worn when using hydraulic powered equipment to compensate for the heat generated
Pneumatic Energy	Air tools shall be isolated from the energy supply before changing discs, bits or blades
Hot Work	Ventilate work area and/or extract welding fumes Establish safe work zone around/under hot work area including removing all flammable material or substances Obtain a “Hot Work Permit” before starting the activity at a construction site Follow the requirements of the Hot Work Permit Ensure a serviceable fire extinguisher is close to the work area Use a safety observer to watch for and extinguish spot fires When cutting and drilling wear medium impact safety glasses
Changing Consumables	Power and Air tools shall be isolated from the energy supply before changing discs, bits or blades
Crush or Pinch	Identify potential crush or pinch areas with the particular item of equipment Inform all workers to keep clear of the crush or pinch areas while the equipment is being used
Instability	Position equipment to be used on a stable surface All equipment to be used on site shall be assessed for suitability and serviceability Equipment maintained in a serviceable condition Ladders shall only be used on a stable surface
Airborne Particles created	Required PPE shall be worn Use in a well ventilated area Wear a face shield or medium impact safety glasses
Disturbing the neighbours	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible
Environmental	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard	

R2 8M

Section D (Cont) – Hazards and Control Measures

Traffic		R1	20A
General	Traffic management shall be in accordance with company procedures		
Traffic Plans	Ensure the Guidance Scheme or Management Plan complies with the MUTCD Ensure traffic control is in accordance with the Guidance Scheme or Plan		
Signage	Install traffic control devices to define the work area Ensure traffic control signs are regularly checked to ensure they are still visible to traffic Install signage to direct pedestrians around the worksite		
Install devices	Install screens to prevent people from welding flashes Devices shall be installed in accordance with the MUTCD		
Pedestrians	Control pedestrian movement through or around the work area		
Personal Protective Clothing	Wear high visibility clothing Wear high visibility clothing with reflective stripes when working at night		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M
Electrical Energy		R1	20A
General	Ensure emergency contact details are available onsite Live Low Voltage risk assessment completed Comply with JPR Live Low Voltage work procedures Work performed by licensed electrical workers or adequately supervised electrical apprentices		
Isolation of Supply	Positively identify the equipment to be isolated Isolation, tag and lockout procedures carried out in accordance with JPR and Customer procedures Workers to be briefed on the isolation method to be used Adjacent exposed live components shall be identified and isolated or insulated		
Exclusion Zone	Exclusion zone clearances to be maintained for unauthorised persons or plant		
Safety Observer	Safety observer to be in control of the site where exclusion zones are in place		
Test	Test before you touch to prove de-energised		
Tools and Equipment	Ensure a maintained first aid kit is available onsite Ensure an in test rescue kit is available when working live All test equipment, tools and working earths to be in current test Working earths shall be correctly positioned All electrical extension leads and tools shall be used through an RCD (not required when attached to a generator with floating secondary winding) Electrical extension leads shall not be placed on the ground or floor surface when in use Devices used to support extension leads shall be non-conductive and not cause damage to the lead		
High Voltage	Comply with industry High Voltage isolation, Access procedures and JPR work procedures HV switching performed by authorized and competent persons Pre approved switching sheet shall be obtained before the work starts Safe work zone established and Access Permit requirements adhered to		

Section D (Cont) – Hazards and Control Measures

Personal Protective Equipment	Required PPE shall be worn and be in current test		
Apprentices	Only 3 rd and 4 th year electrical apprentices shall be exposed to live electrical work under direct supervision		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	5M
Atmospheric Conditions		R1	5M
General	Obtain and follow site specific procedures		
Cold	Take periodic rest breaks outside the refrigerated area Drink warming fluids (if needed)		
Heat	Take periodic rest breaks away from the heat source Drink sufficient quantity of cool water		
Personal Protective Equipment	Wear suitable protective clothing and all necessary PPE		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	2L
Worker Comfort		R1	12H
Poor Natural Light	Use extra lighting to improve visibility Reschedule task to another time		
Air Flow	Use mechanical ventilation to ensure adequate air flow when required		
Fatigue	Take periodic rest breaks to maintain alertness Driving times shall be in accordance with the “Driver Fatigue Management Legislation” Monitor alertness and dexterity of the driver		
Dehydration	Maintain an adequate intake of fluids to prevent dehydration Drink sufficient cooling or warming fluids		
UV Radiation	Long clothing shall be worn Utilized wide brim head protection or sun screen and eye protection Use 30+ SPF Sun Screen on exposed skin areas		
Personal Protective Equipment	Wear suitable clothing to maintain working comfort Monitor alertness and dexterity of other workers on site		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	4L
Part 3: ENVIRONMENTAL HAZARDS			
Environment Documentation or Information		R1	6M
Confirm with the Principal Contractor or Client if there are environmental issues known to be at the site Ensure a copy of the “Environmental Management Guide is available for reference			
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	2L

Section D (Cont) – Hazards and Control Measures

Hazardous Substance		R1	12H
Substance spilt	Spill kits of adequate size to contain any potential spill must be available on site at all times Notify the Client when a spill has occurred Minimum quantity to be stored onsite		
Accidental release	Notify the job supervisor immediately who will take control of the rectification process If possible take action to prevent further release Evacuate the worksite if a risk to health and safety exists		
Stored on site	Substances stored in a bunded area Ensure adequate bunding is available onsite (if required) Substances to be stored in a shaded area Substance to be stored in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) Storage shall be in accordance with the SDS requirements		
Disposal	Disposal shall be in accordance with the SDS Containers to be disposed in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) Must be disposed of at an approved facility		
Fire and Explosion	To be kept clear of ignition sources Substance to be handled in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) MSDS requirement to be adhered to at all times		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M
Air Pollution		R1	8M
Dust	Restrict vehicle and mobile plant movement onsite to a minimum whenever possible Install a dust barrier fence when practical Eye protection shall be worn Wear respiratory protection When drilling masonry use P2 dust mask All unsealed roads and any other disturbed areas should be regularly watered where the activities may create dust and when the wind is strong enough to cause soil erosion		
Plant emissions	Ensure plant emissions are directed away from workers Do not use emission producing plant in or near a trench or excavation Do not use emission producing plant in a confined space or near the entrance to a confined space Ensure that vehicles and any other engine driven equipment are maintained to manufacturer's specifications Ensure that exhaust fume do not enter manholes, pits, tunnels or confined spaces		
Asbestos particles	When working on asbestos containing material it must be done strictly in accordance with the Company Asbestos Safety and Handling Procedure (refer to the Employee Procedure Manual – Section 10)		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L

Section D (Cont) – Hazards and Control Measures

Noise Management		R1	3L
General	Wear appropriate hearing protection Activities creating noise should be performed during daylight hours		
Mobile plant onsite	Restrict vehicle and mobile plant movement onsite to a minimum whenever possible Any mobile plant that creates noise should only be run when needed and not left running continuously Ensure that all mobile plant with noise attenuation devices are maintained and kept in a fit for purpose condition		
Vibrations	Rotate the task between workers when using equipment that create vibrations Any equipment that creates vibrations should be run only when needed and not left running continuously The use should be kept to short periods whenever possible Operators should take regular breaks away from the vibration source		
Portable equipment in use	Reduce the noise level at the work area by shifting the noise source Ensure that all equipment supplied with noise attenuation devices are maintained and kept in a fit for purpose condition		
Powered hand tools in use	Required PPE shall be worn where required Where possible substitute the power tool with another with a lower operating noise level		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L
Waste Management		R1	4L
Solid waste	Ensure solid waste is placed in bins or at the waste storage location Install a containment fence around the waste storage area to prevent spreading by the elements Solid waste shall be transported to a suitable landfill for disposal		
Liquid waste	Shall be stored in approved containers Disposal shall be at an approved facility Concrete agitators shall empty their liquid waste into the skip provided at the worksite A suction vehicle is available to collect any liquid waste when required		
Hazardous substance waste	Disposal shall be in accordance with the SDS requirements Disposal shall be at an approved facility		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L

Section D (Cont) – Hazards and Control Measures

Part 4: BIOLOGICAL		
Diseases		R1 20A
<i>Vaccinations</i>	Ensure the employee vaccinations are current for the identified hazards	
<i>Personal Protective Equipment</i>	Appropriate PPE available at the work area and worn where required Personal washing facilities to be available at the work site	
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2 5M
Discarded and Used Sharps		R1 20A
<i>General</i>	Check the site for evidence of discarded sharps before work starts	
<i>Disposal</i>	Sharps container to be available at the work area Sharps container shall be disposed of in the approved manner	
<i>Personal Protective Equipment</i>	When handling discarded sharps wear rubber gloves Wear a full face shield if the sharps contain fluid	
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2 5M

Section E – Training Notes on the Process of Risk Management

Part 1 – What is Required when Assessing Risk

Use the risk calculator (**refer to Section “G”**) to establish the level of risk associated with the task and/or the environmental issue you are assessing. Assess each step separately or where appropriate, an element within a step.

You will do TWO (2) calculations for each step or element within a step:

1. The first calculation assesses the risk *as if nothing was done* to control the risk; and
2. The second calculation assesses the risk *after all the controls selected to minimise the risk have been implemented*.

Note: It is important to keep your frame of mind within the scenario you are assessing (1 or 2 above) and not confuse them.

Assessing a risk involves considering the likelihood of harm arising from a hazard and the severity of the consequences that could result:

- Risk assessment/management is often an imprecise science, the greatest benefit that can be derived from the process is that someone has had a good look at what is to be done including researching and implementing available and effective controls to minimise harm.
- When assessing an existing task, try and observe the task being performed.
- It is also important to consider what occurs when things go wrong, including short cuts and improvisations, not just when procedures are correctly followed. Foreseeable misuse must be considered and addressed appropriately.
- Disagreements on the results of the assessment occur occasionally; separate assessments conducted reflecting the differing views, will in most instances end up with results that are not that far apart.
- If a hazard is locked up or isolated such that it can never come in contact with a person or the environment, it will never become a risk
- The level of risk is dictated by the amount or degree of exposure to the hazard/s

Part 2 - Definitions

A hazard: Is something with the potential to cause harm.
This can include substances (both hazardous and dangerous), plant, work processes or other aspects of the workplace and/or environment.

Risk: Is the likelihood that a harmful consequence (death, injury, illness or negative environmental impact) might result when exposed to the hazard.

Risk Assessment: Is a process of evaluating the severity of a risk, for the purposes of prioritising and taking action to control the risk.

Part 3 - Action Required

When the risk score and/or level is known the direction given in **Section “H”** must be strictly adhered to.

Section F: RISK CALCULATION; The **Consequences** have been rated in Levels 0 to 5 , the lower the number the lower the risk level and **Likelihood** has been categorised in Level 1 to 6 also. The risk rate is determined by multiplying the Level No. X the Category No. e.g. **Level 2 X Category 3 = 6** which is a **moderate** risk)

Note: Once the consequence level is selected, the **likelihood** within that **level of the consequence** happening before and after the controls are installed must be calculated.

The consequence levels of 1 and 0 are the only levels that can be combined unless the hazard has been removed from the work area.

When assessing electricity, the Consequence will always be Catastrophic but the Likelihood of it happening will change when controls are installed.

LIKELIHOOD <i>How likely will it happen?</i>	Category	CONSEQUENCES (How severe the injury, loss or damage will be if it happens)?					
		CATASTROPHIC <i>Fatalities or long term Environmental Impact Financial Loss >\$10M</i>	MAJOR <i>Extensive injuries and/or long term Environmental Impact Financial Loss >\$1M</i>	MODERATE <i>Medical treatment or Environmental Impact rectified with outside help Financial Loss >\$100K</i>	MINOR <i>First aid treatment or Environmental Impact easily rectified Financial Loss >\$10K</i>	INSIGNIFICANT <i>Action required to minimise the risk of Incidents or environment impact Financial loss < \$10K</i>	NEGLIGIBLE <i>No impact upon objectives or outcomes, No incidents or Environmental Impact</i>
		Level 5 Risk	Level 4 Risk	Level 3 Risk	Level 2 Risk	Level 1 Risk	Level 0 Risk
ALMOST CERTAIN <i>Is expected to happen</i>	6	30-A	24-A	18-A	12-H	6-M	0-VL
LIKELY <i>Will occur in most cases</i>	5	25-A	20-A	15-H	10-H	5-M	
POSSIBLE <i>May occur at sometime</i>	4	20-A	16-H	12-H	8-M	4-L	
UNLIKELY <i>Might happen at sometime</i>	3	15-H	12-H	9-M	6-M	3-L	
RARE <i>May occur only in exceptional circumstances</i>	2	10-H	8-M	6-M	4-L	2-L	
VERY RARE <i>Not expected to happen</i>	1	5-M	4-L	3-L	2-L	1-VL	

Section G: DETERMINE THE ACTION REQUIRED

RISK RATE	ACTION REQUIRED
0-1 = VERY LOW (VL)	<i>NO ACTION REQUIRED – Reassess if an incident of any nature occurs where objectives or outcomes can't be achieved</i>
2-4 = LOW (L)	<i>OK FOR NOW – Monitor and review when performing task/s</i>
5-9 = MODERATE (M)	<i>FOLLOW COMPANY PROCEDURES</i>
10-16 = HIGH (H)	<i>SAFETY MANAGEMENT DECISION – Required urgently Safety refer to WH&S Manager, Electrical refer to Electrical Safety Manager</i>
18-30 = ACUTE (A)	<i>URGENT – Stop the Task or Activity and make safe. Senior Management decision required before the Task or Activity can recommence.</i>

Section H: High risk activities involved when performing this activity

A WMS for the declared high risk activities indicated below must be attached, if the risks associated with the activity are not adequately controlled by the contents of this document.

(✓ to indicate the activity being performed and tick the box when the risk for the activity is adequately controlled) – (Ad/C = Adequately controlled)

Declared High Risk Activity	✓	Ad/C	Declared High Risk Activity	✓	Ad/C
Using a hazardous substance			Work on or near a pressurised gas distribution mains and consumer piping		
Perform work where a person could fall at least 2 meters			Work on or near a chemical, fuel or refrigerant line		
Perform work which involves entering a confined space	✓		Work near an exposed electrical installation		
Entering a trench more than 1.5 meters deep			Work in an area that may have a contaminated or flammable atmosphere		
Working on or near mobile plant	✓		Work in an area where there are artificial extremes of temperature		
Work on or near a road or railway			Work on a roof with a pitch of more than 26°		
Work on a telecommunications tower					
Work in, over or adjacent to water where there is a risk of drowning					

Section I – Workers Acknowledgement

All workers performing the work must record their name, code and signature before the activity is started.

Codes (C): **T** = Tradesperson, **A** = Apprentice, **L** = Labourer, **SO** = Safety Observer, **GL** = Group Leader, **S** = Supervisor, **E** = Engineer

Part 1 – JPR Employees

Name	C	Signature	Name	C	Signature	Name	C	Signature

Part 2 – Sub-Contractors working for JPR

All workers performing the work must record their name, code and signature before the activity is started.

Codes (C): **T** = Tradesperson, **A** = Apprentice, **L** = Labourer, **SO** = Safety Observer, **GL** = Group Leader, **S** = Supervisor, **E** = Engineer

Name	C	Signature	Name	C	Signature	Name	C	Signature

Section J: REFERENCE MATERIAL <i>(Reference material must be used then developing a WMS)</i>		
Part 1 - Acts		
Work Health & Safety Act - 2011	Electrical Safety Act - 2002	Environmental Protection Act - 1994
Building Act - 1975	Land Act - 1994	Mining and Quarrying Safety and Health Act - 1999
Mining and Quarrying Safety and Health Act - 1999	Nature Conversation Act - 1992	Transport Operations (Road Use Management) Act - 1995
Vegetation Management Act - 1999	Vegetation Management Amendment Act - 2008	
	Land Protection (Pest and Stock Route Management) Act - 2002	
Part 2 - Regulations		
Work Health & Safety Regulations - 2011	Electrical Safety Regulations - 2002	Environmental Protection Regulations - 2008
Fatigue Management Regulations - 2008	Mining and Quarrying Safety and Health Regulation - 2001	Traffic Regulations - 1962
Transport Operations (Road Use Management – Vehicle Standards and Safety) Regulations - 2010		
Transport Operations (Mass, Dimensions and Loading) Regulation - 2005		
Transport Operations (Road Use Management – Dangerous Goods) Regulation - 2000		
Transport Operations (Road Use Management – Road Rules) Regulations - 2009		
Part 3 – Codes of Practice		
Electrical Safety Code of Practice – Electrical Work - 2010	Code of Practice – Risk Management - 2007	Electrical Safety Code of Practice – Works - 2010
Code of Practice – Risk Management Supplement 1 - 2007	Code of Practice – Hazardous Substances - 2003	Code of Practice – Risk Management Supplement 2 - 2007
Code of Practice – First Aid - 2004	Code of Practice – Risk Management Supplement 3 - 2007	Code of Practice – Scaffolding - 2009
Code of Practice – Safe Removal of Asbestos - 2005	Code of Practice – Plant - 2005	Code of Practice – Mobile Crane - 2006
Code of Practice – Manual Tasks - 2010	Code of Practice – Noise - 2004	
Electrical Safety Code of Practice – Working Near Exposed Live Parts - 2010		Electrical Safety Code of Practice – Risk Management - 2010
Code of Practice – Traffic Management for Construction or Maintenance Work - 2008		Code of Practice – Management and control of Asbestos at the Workplace - 2005
Code of Practice – Induction for Construction Work - 2007		Code of Practice – Manual Tasks Involving the Handling of People - 2001
Code of Practice – Prevention of Workplace Harassment - 2004		
Part 4 - Standards		
AS/NZS 4801 OH&S Management	AS/NZS ISO 14001 Environmental Management	AS2550.10 – Elevating Work Platform Safe Use
AS2550.11 – Vehicle Loading Cranes Safe Use	Manual of Uniform Traffic Control Devices - 2010	
AS/NZS 4836 – Safe Working On or Near Low Voltage Electrical Installations and Equipment		
Part 5 - Manuals		
HSE Management System Manual	Employee Safety & Procedures Manual	

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WORK METHOD STATEMENT
SAFETY HEALTH & ENVIRONMENT RISK ASSESSMENT

Section A – Development Details <i>(All Parts of this Section must be completed)</i>						WMS No: CG 02A	
Part 1 – Type of Activity <i>(Place a ✓ to indicate as appropriate)</i>						Yes	No
Is this a declared high risk construction activity as per OH&S Legislation?						✓	
Will the Scope of Work involve any/other declared high risk activities? <i>(If YES record what they are in Section H)</i>						✓	
Part 2 – Scope of Works <i>(What is to be performed?)</i>							
Replacement of Sub S2 HV RMU and transformer							
Part 3 – Work Site and Site Safety Management Details		JPR Client : QUU			Principal Contractor: J & P Richardson		
Worksite Address: Main Beach Road, Myrtletown							
Part 4 – Hazard Exposure <i>(How many people will be exposed to risk while this activity is being performed?)</i>							
Number of people at risk:		JPR Employees	4	Sub-contractors	8	Others	2
Part 5 – Reference Material		The material referenced when producing safety documents is listed in Section J at the end of this document.					
Part 1 lists the Acts that have been referenced.		Part 2 lists the Regulations that have been referenced.			Part 3 lists the Codes of Practice that have been referenced.		
Part 4 lists the Standards that have been referenced.		Part 5 lists the Manuals that have been referenced.					
Part 6 – Development Participant <i>(Details of all persons who participated in the development of this WMS and assessment)</i>							
<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>	<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>
James Dwyer	Group Leader	15/06/2012		Alan Goodwin	Job Supervisor	15/06/2012	
Paul Rogers	OH&S	15/06/2012					
Part 7 – Principal Contractor Approval <i>(Where appointed the PC must approve for use at the site)</i>				<u>Name</u>	<u>Function</u>	<u>Date</u>	<u>Signature</u>
					OH&S Mgr		
					Project Mgr		

Section B – Work Methodology *(Describe how the activity will be performed)*

1. *Worksite conditions to be assessed before the activity commences*

The Group Leader shall compile a JSA with the assistance of all workers onsite to identify any additional hazards at the site not covered in **Section D** and implement the control measures needed to minimise risk.

The work area layout must be assessed to ensure workers will not be placed in the travel path or work area of Plant.

2. *Workers Acknowledgement of this Work Method Statement and daily JSA compiled for the work area*

The Group Leader must ensure during the daily pre start tool box meeting that all workers performing this activity sign **Section I** of this document and onto the daily JSA compiled for the work area at which they will be working to confirm acknowledgement of, and agreement with the contents of both documents.

3. *Preparing the work area*

The Group Leader shall ensure that the requirements recorded in **Section C** are acted upon or implemented before work is permitted to start.

The Group Leader must ensure that a copy of the Employee Safety and Procedures Manuals is available for reference at each work area.

The Group Leader must consult with the PC and/or other Contractors on site where the work to be performed and/or equipment to be used needs to traverse other work areas.

4. *Identify the environmental impact this activity could have*

Where a Safety Plan is produced for the site the environmental issues that need to be addressed will be recorded in that document.

If there is NO Safety Plan the supervisor should refer to the “Environmental Management Guide” for assistance in identifying the environmental issues.

5. *Installing the control measures*

The Group Leader shall ensure that the control measure recorded in **Section D** and any additional control measures required as identified in the JSA are installed before work is permitted to start.

6. *Monitor and Review*

The Group Leader and Workers will monitor the effectiveness of the control measures installed during the work activity and where required stop the work if they are proving inadequate and in consultation with the workers install additional controls before restarting the activity.

The effectiveness of this WMS will be reviewed during the daily pre-start tool box meeting and/or if worksite conditions change.

The Group Leader must ensure any additions are recorded on the JSA for the work area.

When temporary changes are required to this WMS the alterations shall be recorded in the daily **JSA – Section C** for the work area where this WMS is to be used.

The Job Supervisor or Group Leader shall stop the activity immediately when evidence indicates that this WMS and associated documents are not being adhered to and not to allow the activity to restart until the workers performing the activity have given an assurance that they will follow the requirements of the documents.

The Safety and Environmental Manager shall ensure that this WMS is reviewed if requested by the Group Leader, Job Supervisor or Principal Contractor.

The content of this WMS can only be altered by a member of the JPR Safety Team after consultation with the workers using the document.

Section B – Work Methodology (Cont)

7. *Performing the Work*

- a) Tool Box discussion with all on site associated with the isolation of supply, disconnection, removal and replacement of RMU and transformer.
- b) QUU electrical personal to have arranged the switching sheet, for isolation of supply for transformers associated with this job.
- c) To complete the isolation of supply JPR authorised workers will assist QUU electrical personal with the switching.
- d) When confirmation of supply isolation proceed to set up for connection of temporary generator.
- e) Disconnect transformers HV and LV cables from transformer terminals, with care to move cables out transformer removal path. (*to prevent cable damage*)
- f) Removal and replacement of RMU and transformers. (*see JMW Cranes and Hector the Erector's SWMS*)
- g) Once new RMU and transformer is in place, testing of the installation will be performed by JPR authorised personal.
- h) Reconnection of HV and LV cables to new transformer.
- i) Removal of temporary generator connections.
- j) Re-establishment of HV supply to be performed by QUU electrical personal with the assistance of JPR authorised workers.
- k) Testing of final installation.
- l) Hand installation back to the customer.

Section C: – Requirements needed to be used, installed or held before starting the activity

For this Section use the following: ✓ = Mandatory, R = Recommended, U = Use when necessary, S = Site requirement

The PPE indicated below are to be used or worn when performing this activity.

High Visibility Clothing	✓	Safety Glasses (Medium Impact)	U	Sun Screen	U	P2 Dust Mask	
Long Clothing	✓	Safety Glasses (UV & Medium Impact)	U	Insect Repellent	U	Disposable Overalls	
Safety Helmet (Hard Hat)	✓	Fall Arrest Harness and Lanyard		Riggers Gloves	✓	Hair Net	
Sun Brim for Hard Hat	✓	Gas Monitoring Equipment		Rubber Gloves		Welding Helmet	
Safety Footwear (Any type)	✓	Hearing Protection	U	Face Shield		Leather Apron	
Safety Footwear (Lace-up)		Flotation Device		Gas Mask		Wide Brim Hat	

Additional PPE required for this work area: (Other than site specific or listed above)

The signs indicated below shall be installed before the activity starts

Workers above		Maritime Advisory		Speed Restriction		Pedestrians watch your step		Live Overhead Lines	
Workers (Symbolic)		Police Advisory		Authorised Entry Only		Deep Excavation		End Road Works	
Use Other Footpath		Water Police Advisory		Asbestos Work Hazard		Live work in progress		Confined Space	

The licenses or competencies indicated below are required to perform this activity

EWP over 11M		Mobile Crane	✓	Excavation Awareness		Vacuum Digger		Boat	
EWP under 11M		Dogger	✓	Trench Entry		Scaffold		Level 1 Traffic Management Awareness	
Heavy Vehicle		Borer / Lifter		Winch Operator		Skid Steer Loader		Level 2 Traffic Management Awareness	
Motor Vehicle		VLC under 10m/t		Electrical Worker	✓	Electrical Linesperson		Specific Tool Competency	
Fork Lift		VLC over 10m/t		Electrical Safety Observer	✓	Confined Space Entry			
Working at Height		Hazardous Area		Engineering Tradesperson		Asbestos Awareness			

The permits or approvals indicated below are to be used or obtained before this activity starts

Confined Space Entry		High Voltage Access	✓	Asbestos Removal		Fire Ants		Police - General		Local Council	
Hot Work		Switching Sheet	✓	Excavation		Dial before you dig		Main Roads		Temporary work	

Persons performing this activity must be vaccinated as indicated below									
Q - Fever	<input type="checkbox"/>	Hepatitis B	<input checked="" type="checkbox"/>	Hepatitis A	<input checked="" type="checkbox"/>	Tetanus	<input checked="" type="checkbox"/>		
The specific test equipment recorded below is required when performing this activity <i>(Multimeters, Test lamps)</i>									
The Plant and Equipment listed below will be used when performing this activity									
Ladders	<input type="checkbox"/>	Borer / Lifter	<input type="checkbox"/>	Star Pickets and Caps	<input type="checkbox"/>	Plastic Sheeting	<input type="checkbox"/>		
Pole Straps	<input type="checkbox"/>	Lifting Chains or Slings	<input checked="" type="checkbox"/>	Traffic Cones (Witches Hats)	<input checked="" type="checkbox"/>	Duct Tape	<input type="checkbox"/>		
Generator	<input checked="" type="checkbox"/>	External Auger	<input type="checkbox"/>	Temporary bollards	<input checked="" type="checkbox"/>	Disposable Cleaning Rags	<input type="checkbox"/>		
Welder	<input type="checkbox"/>	Elevating Work Platform	<input type="checkbox"/>	Barrier Tape	<input type="checkbox"/>	Asbestos Vacuum Cleaner	<input type="checkbox"/>		
Welding Screens	<input type="checkbox"/>	Ventilation Fan – Intrinsically Safe	<input type="checkbox"/>	Reflective Barrier Tape	<input type="checkbox"/>	Water Bucket/Misting Spray Bottle	<input type="checkbox"/>		
Fire Extinguisher/Blanket	<input type="checkbox"/>	Scaffolding	<input type="checkbox"/>	Danger Tags	<input type="checkbox"/>	Temporary/Additional Lighting	<input checked="" type="checkbox"/>		
Chain Saw	<input type="checkbox"/>	Flashing Lights	<input type="checkbox"/>	Out of Service Tags	<input type="checkbox"/>	Confined Space Retrieval Equipment	<input type="checkbox"/>		
Fuel Containers	<input type="checkbox"/>	LV Rescue Kits	<input type="checkbox"/>	Vacuum Digger	<input type="checkbox"/>	Sharps Container	<input type="checkbox"/>		
Winch	<input type="checkbox"/>	Insulated Mat	<input type="checkbox"/>	2-Way Radio	<input type="checkbox"/>	Portable Toilet	<input type="checkbox"/>		
Winch rope swivel	<input type="checkbox"/>	Extension Leads and Stands	<input checked="" type="checkbox"/>	Silt Containment Fence	<input type="checkbox"/>	Fork Lift	<input type="checkbox"/>		
Cable Sock	<input type="checkbox"/>	Portable RCD	<input type="checkbox"/>	Silt Socks	<input type="checkbox"/>	Hired Mobile Plant	<input checked="" type="checkbox"/>		
Conduit Draw Cord (Rope)	<input type="checkbox"/>	Edge Protection	<input type="checkbox"/>	Rubbish Bins or Skips	<input type="checkbox"/>	Specific tool as recorded in Section A	<input type="checkbox"/>		
Vehicle loading crane	<input type="checkbox"/>	Orange Para Fencing	<input checked="" type="checkbox"/>	Asbestos Disposal Bags	<input type="checkbox"/>		<input type="checkbox"/>		
The mobile plant listed below must be subjected to a daily pre-use inspection before use <i>(Complete plant log book)</i>									
EWP over 11M	<input type="checkbox"/>	VLC over 10m/t	<input type="checkbox"/>	Borer / Lifter	<input type="checkbox"/>	Fork Lift	<input type="checkbox"/>		
EWP under 11M	<input type="checkbox"/>	VLC under 10m/t	<input type="checkbox"/>	Vacuum Digger	<input type="checkbox"/>	Hired Mobile Plant	<input checked="" type="checkbox"/>		
Provide details of any additional information that is to be attached to this WMS: <i>(Traffic Management Plan etc)</i>									
Hazardous Substances to be used during this activity: <i>(A MSDS must be readily available for each substance used)</i>									
Environmental issues identified with this activity: <i>(Fire Ants, Declared weeds or Acid Sulfate Soils (ASS) etc)</i>									
Are there any environmental issues that need controlling?				<input checked="" type="checkbox"/>	No	If "Yes" record in Section "D"			

Section D – Hazards and Control Measures			
Hazards	List the hazards associated with the task	Hierarchy of Controls (No. 1 is the best option and, No. 5 should be used as a last resort)	
R1	Establish the risk level before controls are implemented (Use the calculator in Section F)	1. Eliminate	Modify the material, substance or process to eliminate the hazard completely
Controls	Describe the controls used to minimise the risks the hazard creates (remember hierarchy of controls)	2. Substitute	Replace the material, substance or process with a less hazardous one
R2	Establish the risk level after the control are implemented and follow the guidance in Section G	3. Engineering Controls	Redesign or modify the plant or process to reduce or eliminate the risk
		4. Administration	Adjust the time or conditions or process by training, procedures, signs etc.
		5. PPE	Worker to use PPE to minimise exposure to the risks.

Section D: HAZARDS ASSOCIATED WITH THE ACTIVITIES <i>(Parts 1, 2, 3 and 4 of this Section must be referred to when completing this document)</i>									
<p>Process:</p> <p><i>Step 1</i> - Select the hazards (bronze shading) that are known to exist with the activity being performed or occurring naturally at this site.</p> <p><i>Step 2</i> - Delete the hazards that do not exist at this site when performing this activity.</p> <p><i>Step 3</i> - Identify the risks or elements within the hazards that are known to exist with the activity being performed or occurring naturally at this site.</p> <p><i>Step 4</i> - From the list of control measures recorded for each risk or element identified delete those controls that are not applicable to this site.</p> <p><i>Step 5</i> - Where the control measures listed for the activity are insufficient you can draft your own and include these into this document.</p> <p>Assessing the Level of Risk:</p> <p>You must now assess the level of risk that people will be exposed to while at the site, this is a two (2) tier process.</p> <p><i>Step 1</i> - The determined maximum level of risk or element for each hazard has been calculated and is shown as R1, if you do not agree with the level shown use the risk calculator (Attached to the end of this Section) and re-assess.</p> <p><i>Step 2</i> - Use the risk calculator to determine the remaining level of risk people will be exposed to when at this site after the control measures have been installed (this is shown R2)</p> <p>Determining the Action Required:</p> <p>Now that the remaining level of risk (R2) is known, refer to Section G of the Risk Calculator for the action required to be taken before the activity can be started.</p>									
Part 1: DOCUMENTATION, CONSULTATION, COMMUNICATION and SUPERVISION									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #f0f0e0;"> <td style="padding: 5px;">Documentation or Information</td> <td style="width: 10%; text-align: center; background-color: #ffcccc;">R1</td> <td style="width: 10%; text-align: center; background-color: #ffcccc;">6M</td> </tr> <tr> <td colspan="3" style="padding: 5px;"> Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed </td> </tr> <tr style="background-color: #e0ffe0;"> <td style="padding: 5px;"><i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i></td> <td style="text-align: center; background-color: #e0ffe0;">R2</td> <td style="text-align: center; background-color: #e0ffe0;">1VL</td> </tr> </table>	Documentation or Information	R1	6M	Work Method Statement shall be provided to workers for all designated High Risk Construction Activities Develop a Site Specific Safe Work Procedure for other activities A copy of the JPR Safety and Procedures Manual must be onsite for workers to reference as required Manufacturers installation or operators manual must be available for reference Ensure a Job Safety Analysis (JSA) is provided to workers for compiling onsite for particular work areas within the worksite Job Safety and Environmental Plan shall be compiled and be onsite while work is being performed			<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	1VL
Documentation or Information	R1	6M							
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<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>	R2	1VL							

Section D (Cont) – Hazards and Control Measures

Consultation or Communication		R1	6M
JPR workers must comply with the requirements listed in the Employee Safety and Procedures Manual Ensure all workers onsite attend the daily toolbox meeting Ensure all workers onsite are involved in the development of the documents to be used at the site Ensure workers are aware that the task may require a permit to be obtained before the work starts			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	1VL
Supervision		R1	10H
Ensure all apprentices and trainees performing electrical work are supervised in accordance with JPR procedures Apprentices and trainees supervision for all work activities should be as per F1316 – Supervision of Apprentices The Group Leader shall monitor the action of all workers onsite and recommend any corrective action required to the job supervisor The Group Leader shall ensure that all relevant site documents are completed before and during (if required) the work			
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Part 2: HAZARDS ASSOCIATED with ACTIVITIES			
Manual Handling		R1	15H
General	JPR manual handling procedure to be adhered to at all times		
Restricted and/or Awkward work areas	Do not overreach or work with your back twisted for extended periods Move to a more suitable work area		
Lifting	Ensure the worker assesses the weight to be lifted is within the workers capacity to handle manually Whenever possible use team lifting practices Vary tasks to reduce exposure to lifting and bending Break bundles down into manageable amounts Heavy masses to be lifted by using mechanical aid		
Personal Protective Equipment	Wear suitable hand protection Wear suitable clothing to maintain working comfort		
Transformers	The use of rollers, skates, turfor jacks and crow bars shall be in accordance with the Safe Work Procedure for installing or removing transformers When installing or removing a transformer manually it shall not be tilted more than 5° Floor surface shall be cleaned before attempting to move equipment into location Establish clear access to and around the work area Seek help or use mechanical aids to move heavy or awkward objects		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	6M

Section D (Cont) – Hazards and Control Measures

Hazardous Substance		R1	12H
General	Consult the Client for guidance on possible flammable substance or contaminance that may be encountered onsite Ensure that a current SDS for the substance is readily available before work starts Ensure contact details of emergency response providers is available onsite		
Use	Hazardous substances used following SDS requirements JPR Hazardous Substance Guide shall be referred to confirm whether a substance is hazardous and what action required if uncontrolled exposure is experienced JPR procedure for the use of a hazardous substance shall be strictly adhered to Ensure work area is well ventilated		
Transport	Substances shall be secured during transport Substances shall be placed where their containers can't be damaged during transport		
Fire and Explosion	Ensure contact details of emergency response providers is available onsite Define the marshalling area in the event of an evacuation		
Exclusion Zones	Implement an exclusion zone and clearly define the work area Define the work area and keep entry to the work area to the bare minimum		
Personal Protective Equipment	Ensure PPE required for the substance to be used is available and used onsite Personal washing facilities to be made available on site Wear the required PPE for the activity		
Environment	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	4L
Mobile Plant		R1	20A
General	When working around mobile plant when reviewed to confirm suitability for the site Comply with the manufacturers, industry and site specific requirements Operators manual must be available for reference Check site for hazards prior to setting up and operating mobile plant Ensure the Mobile Plant has been maintained in accordance with the manufacturers specifications		
Inspections	Perform a Safety Check of the plant before using on site Perform a daily pre start inspection of mobile plant to be used on site Check that the vehicle is in a serviceable condition (Tyres, Lights etc) Perform the pre-use maintenance checks (Check all fluids)		
Load carrying	Ensure the Gross Vehicle Mass is not exceeded Plant shall be loaded within the excess dimension guidelines Secure loads in accordance with load restraint regulations		
Instability	Use the necessary dunnage to ensure stability Ensure the vehicle is not loaded in such a way that it will become unstable		
Crush or Pinch	Identify potential crush or pinch areas with the particular item of plant Inform all workers to keep clear of the crush or pinch areas while the plant is operating		

Section D (Cont) – Hazards and Control Measures

Operator	Ensure the operator has a current license (where mandatory) for the mobile plant Ensure the operator is competent to operate the mobile plant where a license is not required Ensure the worker is licenced to drive that class of vehicle Ensure the worker is familiar with the operation of the mobile plant
Registration	Ensure the plant is registered (if applicable)
Exclusion Zones	Define and Maintain an exclusion zones around the mobile plant when in use
Safety Observer	Safety Observer must be in communication and in clear view of the driver/operator Competent safety observer to be engaged if electrical exclusion zones could be encroached The mobile plant shall not be driven in reverse on site unless a safety observer is used
<i>(The use of an apprentice in the first 12 months of service as a safety observer must be assessed and approved by the Electrical Safety Manager)</i>	
Disturbing the neighbours	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible
Environmental	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard	
Power and Hand Tools or Equipment	
General	All equipment to be used on site shall comply with legislation and standards Operators manual must be available for reference
Operation	Tools and equipment shall be operated by a competent person Rotate workers using equipment that causes vibrations to limit exposure to this risk The exhaust from equipment must be directed away from all workers including the operator
Storage and Transport	Tools and equipment shall be stored and transported in an appropriate manner to minimize damage
Safety Features	Tools must have all handles and guards fitted as supplied by the manufacturer Tools must be fitted with a dead man or quick release trigger
Inspections	Equipment must be undergo a safety inspection before use All tools shall undergo a pre-use check Tools and equipment shall be fit for purpose, maintained in a serviceable condition, be in current test Defective tools shall be tagged “out of service” and removed from the work site
Electrical Energy	Refer to Electrical Energy for the control necessary to minimise the risk of this hazard
Hydraulic Energy	Power source for the hydraulic equipment shall be compatible with the equipment Gloves should be worn when using hydraulic powered equipment to compensate for the heat generated

Section D (Cont) – Hazards and Control Measures

Hot Work	Ventilate work area and/or extract welding fumes Establish safe work zone around/under hot work area including removing all flammable material or substances Obtain a “Hot Work Permit” before starting the activity at a construction site Follow the requirements of the Hot Work Permit Ensure a serviceable fire extinguisher is close to the work area Use a safety observer to watch for and extinguish spot fires When cutting and drilling wear medium impact safety glasses		
Changing Consumables	Power and Air tools shall be isolated from the energy supply before changing discs, bits or blades		
Crush or Pinch	Identify potential crush or pinch areas with the particular item of equipment Inform all workers to keep clear of the crush or pinch areas while the equipment is being used		
Projectiles	Define and maintain an exclusion zone during the activity Perform a pre-use inspection of all equipment to ensure they are fit for purpose Required PPE shall be worn at all times		
Airborne Particles created	Required PPE shall be worn Use in a well ventilated area Wear a face shield or medium impact safety glasses		
Disturbing the neighbours	Neighbouring residents should be informed if an activity could cause excessive noise Neighbouring residents must be informed if any work is to be conducted outside the nominated working hours Locate equipment such as generators and compressors away from neighbours where possible		
Environmental	Ensure that the appropriate environmental controls are selected and installed (refer to Part 3 of this Section)		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M
Traffic		R1	20A
General	When working on or near a road or railway Traffic management shall be in accordance with company procedures		
Signage	Install traffic control devices to define the work area Ensure traffic control signs are regularly checked to ensure they are still visible to traffic Install signage to direct pedestrians around the worksite		
Install devices	Install screens to prevent people from welding flashes Devices shall be installed in accordance with the MUTCD		
Pedestrians	Control pedestrian movement through or around the work area		
Personal Protective Clothing	Wear high visibility clothing Wear high visibility clothing with reflective stripes when working at night		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M

Section D (Cont) – Hazards and Control Measures

Electrical Energy		R1	20A
General	Ensure emergency contact details are available onsite Live Low Voltage risk assessment completed Comply with JPR Live Low Voltage work procedures Work performed by licensed electrical workers or adequately supervised electrical apprentices		
Isolation of Supply	Positively identify the equipment to be isolated Isolation, tag and lockout procedures carried out in accordance with JPR and Customer procedures Workers to be briefed on the isolation method to be used Adjacent exposed live components shall be identified and isolated or insulated		
Exclusion Zone	Exclusion zone clearances to be maintained for unauthorised persons or plant		
Safety Observer	Safety observer to be in control of the site where exclusion zones are in place		
Test	Test before you touch to prove de-energised		
Tools and Equipment	Ensure a maintained first aid kit is available onsite Ensure an in test rescue kit is available when working live All test equipment, tools and working earths to be in current test Working earths shall be correctly positioned All electrical extension leads and tools shall be used through an RCD (not required when attached to a generator with floating secondary winding) Electrical extension leads shall not be placed on the ground or floor surface when in use Devices used to support extension leads shall be non-conductive and not cause damage to the lead		
High Voltage	Comply with industry High Voltage isolation, Access procedures and JPR work procedures HV switching performed by authorized and competent persons Pre approved switching sheet shall be obtained before the work starts Safe work zone established and Access Permit requirements adhered to		
Personal Protective Equipment	Required PPE shall be worn and be in current test		
Apprentices	Only 3 rd and 4 th year electrical apprentices shall be exposed to live electrical work under direct supervision		
Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard		R2	8M

Section D (Cont) – Hazards and Control Measures

Atmospheric Conditions		R1	12H
Poor Natural Light	Use extra lighting to improve visibility Reschedule task to another time		
UV Radiation	Long clothing shall be worn Utilized wide brim head protection or sun screen and eye protection Use 30+ SPF Sun Screen on exposed skin areas		
Inclement Weather	Wear suitable clothing to maintain working comfort Do not work outdoors when a thunder storm is overhead and a lightning strike is possible		
Personal Protective Equipment	Wear suitable clothing to maintain working comfort Monitor alertness and dexterity of other workers on site		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L
Worker Comfort		R1	12H
Poor Natural Light	Use extra lighting to improve visibility Reschedule task to another time		
Air Flow	Use mechanical ventilation to ensure adequate air flow when required		
Fatigue	Take periodic rest breaks to maintain alertness Driving times shall be in accordance with the “Driver Fatigue Management Legislation” Monitor alertness and dexterity of the driver		
Dehydration	Maintain an adequate intake of fluids to prevent dehydration Drink sufficient cooling or warming fluids		
UV Radiation	Long clothing shall be worn Utilized wide brim head protection or sun screen and eye protection Use 30+ SPF Sun Screen on exposed skin areas		
Personal Protective Equipment	Wear suitable clothing to maintain working comfort Monitor alertness and dexterity of other workers on site		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	4L

Section D (Cont) – Hazards and Control Measures

Part 3: ENVIRONMENTAL HAZARDS		
Environment Documentation or Information		R1 6M
Confirm with the Principal Contractor or Client if there are environmental issues known to be at the site Ensure a copy of the "Environmental Management Guide is available for reference		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2 2L
Hazardous Substance		R1 12H
Substance spilt	Spill kits of adequate size to contain any potential spill must be available on site at all times Notify the Client when a spill has occurred Minimum quantity to be stored onsite	
Accidental release	Notify the job supervisor immediately who will take control of the rectification process If possible take action to prevent further release Evacuate the worksite if a risk to health and safety exists	
Disposal	Disposal shall be in accordance with the SDS Containers to be disposed in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) Must be disposed of at an approved facility	
Fire and Explosion	To be kept clear of ignition sources Substance to be handled in accordance with JPR Procedure (refer to Employee Procedure Manual – Section 10) MSDS requirement to be adhered to at all times	
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2 4L
Air Pollution		R1 8M
Plant emissions	Ensure plant emissions are directed away from workers Do not use emission producing plant in or near a trench or excavation Do not use emission producing plant in a confined space or near the entrance to a confined space Ensure that vehicles and any other engine driven equipment are maintained to manufacturer's specifications Ensure that exhaust fume do not enter manholes, pits, tunnels or confined spaces	
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2 4L

Section D (Cont) – Hazards and Control Measures

Flora and Fauna		R1	4L
General	Seek information from the Client to confirm if endangered species are present at the site No material shall be stored under the drip line of a tree		
Animals	Follow the directions given in the company Environmental Management Guide for possible endangered animals in JPR work locations		
Birds	Follow the directions given in the company Environmental Management Guide for possible endangered birds in JPR work locations		
Reptiles and Spiders	Check the work area for dangerous native wild life (snakes and spiders etc) and have removed by a professional if required		
Plants	Follow the directions given in the company Environmental Management Guide for possible endangered plants at JPR work locations		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L
Noise Management		R1	3L
General	Wear appropriate hearing protection Activities creating noise should be performed during daylight hours		
Mobile plant onsite	Restrict vehicle and mobile plant movement onsite to a minimum whenever possible Any mobile plant that creates noise should only be run when needed and not left running continuously Ensure that all mobile plant with noise attenuation devices are maintained and kept in a fit for purpose condition		
Vibrations	Rotate the task between workers when using equipment that create vibrations Any equipment that creates vibrations should be run only when needed and not left running continuously The use should be kept to short periods whenever possible Operators should take regular breaks away from the vibration source		
Portable equipment in use	Reduce the noise level at the work area by shifting the noise source Ensure that all equipment supplied with noise attenuation devices are maintained and kept in a fit for purpose condition		
Powered hand tools in use	Required PPE shall be worn where required Where possible substitute the power tool with another with a lower operating noise level		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L
Waste Management		R1	4L
Solid waste	Ensure solid waste is placed in bins or at the waste storage location Install a containment fence around the waste storage area to prevent spreading by the elements Solid waste shall be transported to a suitable landfill for disposal		
Liquid waste	Shall be stored in approved containers Disposal shall be at an approved facility		
Hazardous substance waste	Disposal shall be in accordance with the MSDS requirements Disposal shall be at an approved facility		
<i>Use the risk calculator to re-asses the level of risk (R2) remaining now that control measures have been selected and/or developed to control this hazard</i>		R2	2L

Section E – Training Notes on the Process of Risk Management

Part 1 – What is Required when Assessing Risk

Use the risk calculator (**refer to Section “G”**) to establish the level of risk associated with the task and/or the environmental issue you are assessing. Assess each step separately or where appropriate, an element within a step.

You will do TWO (2) calculations for each step or element within a step:

1. The first calculation assesses the risk *as if nothing was done* to control the risk; and
2. The second calculation assesses the risk *after all the controls selected to minimise the risk have been implemented*.

Note: It is important to keep your frame of mind within the scenario you are assessing (1 or 2 above) and not confuse them.

Assessing a risk involves considering the likelihood of harm arising from a hazard and the severity of the consequences that could result:

- Risk assessment/management is often an imprecise science, the greatest benefit that can be derived from the process is that someone has had a good look at what is to be done including researching and implementing available and effective controls to minimise harm.
- When assessing an existing task, try and observe the task being performed.
- It is also important to consider what occurs when things go wrong, including short cuts and improvisations, not just when procedures are correctly followed. Foreseeable misuse must be considered and addressed appropriately.
- Disagreements on the results of the assessment occur occasionally; separate assessments conducted reflecting the differing views, will in most instances end up with results that are not that far apart.
- If a hazard is locked up or isolated such that it can never come in contact with a person or the environment, it will never become a risk
- The level of risk is dictated by the amount or degree of exposure to the hazard/s

Part 2 - Definitions

A hazard: Is something with the potential to cause harm.
This can include substances (both hazardous and dangerous), plant, work processes or other aspects of the workplace and/or environment.

Risk: Is the likelihood that a harmful consequence (death, injury, illness or negative environmental impact) might result when exposed to the hazard.

Risk Assessment: Is a process of evaluating the severity of a risk, for the purposes of prioritising and taking action to control the risk.

Part 3 - Action Required

When the risk score and/or level is known the direction given in **Section “H”** must be strictly adhered to.

Section F: RISK CALCULATION; The **Consequences** have been rated in Levels 0 to 5 , the lower the number the lower the risk level and **Likelihood** has been categorised in Level 1 to 6 also. The risk rate is determined by multiplying the Level No. X the Category No. e.g. **Level 2 X Category 3 = 6** which is a **moderate** risk)

Note: Once the consequence level is selected, the **likelihood** within that **level of the consequence** happening before and after the controls are installed must be calculated.

The consequence levels of 1 and 0 are the only levels that can be combined unless the hazard has been removed from the work area.

When assessing electricity, the Consequence will always be Catastrophic but the Likelihood of it happening will change when controls are installed.

LIKELIHOOD <i>How likely will it happen?</i>	Category	CONSEQUENCES (How severe the injury, loss or damage will be if it happens)?					
		CATASTROPHIC <i>Fatalities or long term Environmental Impact Financial Loss >\$10M</i>	MAJOR <i>Extensive injuries and/or long term Environmental Impact Financial Loss >\$1M</i>	MODERATE <i>Medical treatment or Environmental Impact rectified with outside help Financial Loss >\$100K</i>	MINOR <i>First aid treatment or Environmental Impact easily rectified Financial Loss >\$10K</i>	INSIGNIFICANT <i>Action required to minimise the risk of Incidents or environment impact Financial loss < \$10K</i>	NEGLIGIBLE <i>No impact upon objectives or outcomes, No incidents or Environmental Impact</i>
		Level 5 Risk	Level 4 Risk	Level 3 Risk	Level 2 Risk	Level 1 Risk	Level 0 Risk
ALMOST CERTAIN <i>Is expected to happen</i>	6	30-A	24-A	18-A	12-H	6-M	0-VL
LIKELY <i>Will occur in most cases</i>	5	25-A	20-A	15-H	10-H	5-M	
POSSIBLE <i>May occur at sometime</i>	4	20-A	16-H	12-H	8-M	4-L	
UNLIKELY <i>Might happen at sometime</i>	3	15-H	12-H	9-M	6-M	3-L	
RARE <i>May occur only in exceptional circumstances</i>	2	10-H	8-M	6-M	4-L	2-L	
VERY RARE <i>Not expected to happen</i>	1	5-M	4-L	3-L	2-L	1-VL	

Section G: DETERMINE THE ACTION REQUIRED

RISK RATE	ACTION REQUIRED
0-1 = VERY LOW (VL)	<i>NO ACTION REQUIRED – Reassess if an incident of any nature occurs where objectives or outcomes can't be achieved</i>
2-4 = LOW (L)	<i>OK FOR NOW – Monitor and review when performing task/s</i>
5-9 = MODERATE (M)	<i>FOLLOW COMPANY PROCEDURES</i>
10-16 = HIGH (H)	<i>SAFETY MANAGEMENT DECISION – Required urgently Safety refer to WH&S Manager, Electrical refer to Electrical Safety Manager</i>
18-30 = ACUTE (A)	<i>URGENT – Stop the Task or Activity and make safe. Senior Management decision required before the Task or Activity can recommence.</i>

Section H: High risk activities involved when performing this activity

A WMS for the declared high risk activities indicated below must be attached, if the risks associated with the activity are not adequately controlled by the contents of this document.

(✓ to indicate the activity being performed and tick the box when the risk for the activity is adequately controlled) – (Ad/C = Adequately controlled)

Declared High Risk Activity	✓	Ad/C	Declared High Risk Activity	✓	Ad/C
Work where asbestos will be disturbed			Work on or near pressurised gas distribution mains and consumer piping		
Work where there is a risk of falling 2 meters			Work on or near a chemical, fuel or refrigerant line		
Work in or near a confined space			Work on or near an energised electrical installation or service	✓	✓
Work in or near a trench over 1.5 meters deep or a tunnel			Work in an area that may have a contaminated or flammable atmosphere		
Working near moving powered mobile plant	✓	✓	Work in an area where there are artificial extremes of temperature		
Work on or adjacent to a road, railway or other corridor that is in use by traffic other than pedestrians	✓	✓			
Work on a telecommunications tower					
Work in or near water or other liquid where there is a risk of drowning					

Section I – Workers Acknowledgement

All workers performing the work must record their name, code and signature before the activity is started.

Codes (C): **T** = Tradesperson, **A** = Apprentice, **L** = Labourer, **SO** = Safety Observer, **GL** = Group Leader, **S** = Supervisor, **E** = Engineer, **SA** = Safety Advisor

Part 1 – JPR Employees

Name	C	Signature	Name	C	Signature	Name	C	Signature

Part 2 – Sub-Contractors working for JPR

All workers performing the work must record their name, code and signature before the activity is started.

Codes (C): **T** = Tradesperson, **A** = Apprentice, **L** = Labourer, **SO** = Safety Observer, **GL** = Group Leader, **S** = Supervisor, **E** = Engineer, **SA** = Safety Advisor

Name	C	Signature	Name	C	Signature	Name	C	Signature

Section J: REFERENCE MATERIAL *(Reference material must be used then developing a WMS)***Part 1 – Acts**

Work Health & Safety Act - 2011	Electrical Safety Act - 2002	Vegetation Management Amendment Act - 2008
Environmental Protection Act - 1994	Mining and Quarrying Safety and Health Act - 1999	Land Protection (Pest and Stock Route Management) Act - 2002
Land Act - 1994	Building Act - 1975	Transport Operations (Road Use Management) Act - 1995
Nature Conversation Act - 1992	Vegetation Management Act - 1999	Plant Protection Act - 1989

Part 2 - Regulations

Work Health & Safety Regulations - 2011	Mining and Quarrying Safety and Health Regulation - 2001
Environmental Protection Regulations - 2008	Transport Operations (Road Use Management – Vehicle Standards and Safety) Regulations - 2010
Traffic Regulations - 1962	Transport Operations (Mass, Dimensions and Loading) Regulation - 2005
Fatigue Management Regulations - 2008	Transport Operations (Road Use Management – Dangerous Goods) Regulation - 2000
Electrical Safety Regulations - 2002	Transport Operations (Road Use Management – Road Rules) Regulations - 2009

Part 3 – Codes of Practice

Electrical Safety Code of Practice – Electrical Work - 2010	Code of Practice – How to manage Work Health and Safety Risks - 2011
Electrical Safety Code of Practice – Works - 2010	Code of Practice – Traffic Management for Construction or Maintenance Work - 2012
Code of Practice – Hazardous Chemicals - 2003	Code of Practice – Management and control of Asbestos at the Workplace - 2005
Code of Practice – First Aid - 2004	Code of Practice – Managing Noise and Preventing Hearing Loss at Work - 2004
Code of Practice – Scaffolding - 2009	Code of Practice – Prevention of Workplace Harassment - 2004
Code of Practice – Plant - 2005	Electrical Safety Code of Practice – Risk Management - 2010
Code of Practice – Hazardous Manual Tasks - 2011	Electrical Safety Code of Practice – Working Near Exposed Live Parts - 2010
Code of Practice – Mobile Crane - 2006	Code of Practice – How to Safely Remove Asbestos - 2011
Code of Practice – Confined Space - 2011	Code of Practice – Managing the Risk of Falls at Workplaces - 2011
Code of Practice – Induction for Construction Work - 2007	

Part 4 - Standards

AS/NZS 4801 OH&S Management	AS2550.11 – Vehicle Loading Cranes Safe Use
AS2550.10 – Elevating Work Platform Safe Use	AS/NZS 4836 – Safe Working On or Near Low Voltage Electrical Installations and Equipment
AS/NZS ISO 14001 Environmental Management	

Part 5 - Manuals

HSE Management System Manual	Employee Safety & Procedures Manual	Manual of Uniform Traffic Control Devices - 2010
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SAFE WORK METHOD STATEMENT

TG-OHSE001-1

Company Name: Total Rentals Pty Ltd ABN 79 047 904 519	Should an Emergency Occur on Site Contact: 24hr Duty Officer on phone 1800 064 766	Title: Rental Gen Set Site Install Site: Qld Urban Utilities Sewerage Treatment Plant Luggage Point
Work Activity/Task: Install & Commissioning of Generator on Customer Site.		This SWMS has been developed and Approved by: Ian Donald Position: Consultant Date: 22/02/12

Resources	Trades Involved: Licensed Electrician Equipment Used: Hand tools Maintenance checks: As per Diesel Alternator Maintenance & Testing Report Materials Used: Lubricants and specified oils, distillate fuel
Personal Protective Equipment: Hearing protection, foot wear protection, High Visibility Vest/Uniform	

List relevant OHS Act and Regulations: WH&S Act 2011 and WH&S Regulations 2011 – by Commonwealth & all states List relevant Codes of Practice applicable to your work: Safe Work Aust - Managing Electrical Risks in the Workplace Add additional references as required:AS 3000 AS 3008
--

Risk Score Calculator						
		Consequence				
		Disaster	Very Serious	Serious	Substantial	Minor
Likelihood	Almost certain	1	1	1	2	2
	Likely	1	1	2	2	2
	Possible	1	2	2	2	3
	Remotely Possible	2	2	2	3	3
	Practically impossible	2	3	3	3	3

Likelihood / Consequence	Risk Class
The hazard has the potential to: <ul style="list-style-type: none"> permanently disable or kill cause major damage to the structure have significant impact on the surrounding population and environment 	1
The hazard has the potential to: <ul style="list-style-type: none"> temporarily disable or seriously injure cause minor damage to the structure breach the site boundary and pollute local environment 	2
The hazard has the potential to: <ul style="list-style-type: none"> cause minor injury be contained within the site boundary 	3

SAFE WORK METHOD STATEMENT

TG-OHSE001-1

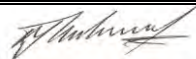

Item	Job Step <i>Break the job down into steps</i>	Potential Hazards <i>Identify the hazards associated with each step. Examine each to find possibilities that could lead to an accident or adverse environmental impact</i>	Hazard Risk Score	Controls <i>Using the previous two columns as a guide, decide what actions are necessary to eliminate or minimise the hazards that could lead to an accident, injury or occupational illness or environmental impact</i>	R/Score after Controls	Person Responsible
1	Go to Security, sign in & ask about any Customer site Induction requirements	Any potential hazards already identified by the Customer on their site	1	<ul style="list-style-type: none"> Complete all Customer site Induction training before proceeding with the task 	3	Electrician or Diesel Mechanic
2	Check Work Area for Potential Hazards	Traffic, Slips, Trips and Falls, Other Works in area	2	<ul style="list-style-type: none"> Check immediate and surrounding work area for any risks. Address on JSA and attach. Ensure all associated Customer OH&S requirements have been addressed. 	3	Electrician or Diesel Mechanic
3	Check Engine fluids, fuel and lubricants	Slip Trip falls, Eye damage and Burns	3	<ul style="list-style-type: none"> Wear eye protection and gloves. Use of trained personnel, MSDS on all engine fluids, fuel and lubricants available. Fire Extinguishers available First Aid Kits available 	3	Electrician or Diesel Mechanic
4	Run Engine to test Mechanical and Controls Operation	Exposure to noise Pinch/crush	3	<ul style="list-style-type: none"> Hearing Protection Required Ensure all guarding is in place and secure Generator must be run with all doors closed. 	3	Electrician or Diesel Mechanic
5	Electrical connection to Generator	Electrical Shock Minor cuts or bruising Slips Trips and Falls	1	<ul style="list-style-type: none"> Lock Out/Tag Out Mechanical and Electrical isolations Test before Touch Use of correct tools for task Ensure all cables are neat and secure Ensure all terminations are secure and adequate contact area is made. 	3	Electrician
6	Generator Refuelling	Burns, fire	2	<ul style="list-style-type: none"> No smoking, Fire extinguisher readily available Spill Kit available MSDS Read and understand controls 	3	Electrician or Diesel mechanic

SAFE WORK METHOD STATEMENT

TG-OHSE001-1

7	Generator set up & operation	Exposure to noise	3	<ul style="list-style-type: none"> Generator only to be run with all doors closed and all covers in place Hearing protection 	3	Electrician or Diesel mechanic
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This SWMS has been developed through consultation with our employees and has been read & signed by all employees involved with this activity

Name	Signature	Name	Signature
Nick Chadwick			
Michael Burwell			
Sharneel Pratap			

Personnel qualifications and experience required to complete the task:	Specific training required to complete this task:	Engineering Details/Certificates/WorkCover Approvals:
Diesel mechanic trade qualifications		Not Required
Licensed Electrician qualifications		
2yrs Generator industry experience		

Section 4 Site Safety Audits

J & P RICHARDSON INDUSTRIES PTY. LTD

A.B.N. 23 001 952 325
 114 Campbell Avenue, WACOL QLD 4076
 Ph: (07) 3271 2911 - Fax: (07) 3271 3623
 E-mail: jpr@jpr.com.au

HEALTH, SAFETY and ENVIRONMENT INSPECTION

Section A: Nature of Inspection. (What are you inspecting, employees, worksite or a specific work area at the worksite?)							
Employee	No.	Employee	No.	Employee	No.	Employee	No.
J GUERRA	597	R VOIGHT	295				
A ROWE	274	S CUNNINGHAM	462				
G CROSS	030						
A BUCHMANN	784						
Tick (✓) the type of Audit		HS&E Audit	✓	Electrical Audit		Both	
Worksite: QUU LUGGAGE POINT				Specific Work Area: PIPE GALLERY			
Address: MAIN BEACH ROAD, MYRTLE TOWN				JPR Job No: C55094			
Job Supervisor: ALAN GOODWIN		Emp No: 161	Group Leader: A BUCHMANN		Emp No: 784		
Principal Contractor: (Is there a PC for this job)		Yes No	P.C. Name: (If you answered Yes) J & P RICHARDSON				
		✓					

Section B: Inspector Details. (The Inspector must complete this section)						Emp No	196
Name: PAUL ROGERS		Signature:		Date: 14/5/12			
Title: (tick ✓)	Group Leader		Project Manager		Supervisor		WHSO
							JPR Auditor
							✓

Section C: Scope of Work (Record what work was being performed at the time of the inspection)
H V CABLE PULL TO SUBSTATION 1

Notes for the Auditor:

This form is to be used at all worksite where an Inspection is to be performed.

Reference must be made to the Safety and Procedures Manuals where clarification is required.

When a "NO" is given to any of the questions asked in Section "G" they are to be cross referenced to the Procedures used in the scope of work at the site, refer to Section "H", "I" and "J".

Record all "NC" in Section "K" so the corrective action can be addressed.

Whenever possible any "NC" recorded should be corrected at the time of the inspection.

A Safety Manager must determine the level of the Non Conformance is **Minor** or **Major**, based on the possible consequence by using the JPR Risk Calculator and record in Section "K".

Inspectors must also have access to the company "Environmental Management Guide" to complete Section "G".

Throughout this Form there is text in *italics* which is there to guide the user on what to look for or what action is to be taken.

The inspector is encouraged to use Section D – Onsite Observations to record any issues that may require attention and/or clarification to minimise the risk of any hazard associated with an issue evolving.

Where an employee is using plant or equipment or acting as a safety observer onsite monitoring of the workers competence can be recorded in Section "P" for the Safety Observer or Section "Q" for a plant operator.

PLEASE NOTE: Sections "G", "J", "N" & "Q" may not be applicable if an Electrical Audit is being conducted.

Inspection No:

Section D - On Site Observations (Conditions at the site that may need to be clarified or addressed at a later date)

REMINDER WORKERS TO BARRICADE AREA TO PREVENT ACCESS WHILE PULLING IN CABLES.

Section E – Audit on Electrical work or Electrical installation work performed.

L.1	Electrical Work. (Refer to the Electrical Safety Act, Section 18)	N/A	C	NC
a	Has an audit of the electrical work performed and its supporting documentation indicated compliance to the Electrical Safety Regulations, Sections 14 & 15 ?	✓		
b	If a "NC" has been recorded please identify which Australian Standard and the clause the "NC" relates to.	Australian Standard		Clause
c	Type of Audit: <div style="display: flex; justify-content: space-around;"> VISUAL <input type="checkbox"/> IN SITU TESTING <input type="checkbox"/> TEST RESULTS ATTACHED <input type="checkbox"/> </div>			
L.2	Electrical Installation Work. . (Refer to the Electrical Safety Act, Section 19)	N/A	C	NC
a	Has an audit of the electrical work performed and its supporting documentation indicated compliance to the Electrical Safety Regulations, Sections 66 & 150 ?	✓		
b	Where a "NC" against AS/NZS 3000 (Wiring Rules) has been identified, please indicate which section of the standard the "NC" relates to.			
	<div style="display: flex; justify-content: space-between;"> Sect 1Sect 2Sect 3Sect 4Sect 5Sect 6Sect 7Sect 8 </div>			
c	Type of Audit: <div style="display: flex; justify-content: space-around;"> VISUAL <input type="checkbox"/> IN SITU TESTING <input type="checkbox"/> TEST RESULTS ATTACHED <input type="checkbox"/> </div>			
Section F – Electrical works constructed for an Electrical Entity.		N/A	C	NC
M.a	Has an audit of the electrical work performed and its supporting documentation indicated compliance with the Electrical Safety Regulations, Part 7 ?	✓		
M.b	Work is conducted in accordance with the Entities Safe Work Procedures	✓		

Section G - Confirmation of Safety, Health and Environmental Controls <i>(The questions in this section relate to Procedures)</i>						
1: General <i>(requirements for all JPR construction worksite, tick ✓ the answer)</i>				N/A	Yes	No
1	Is a copy of the Employee Safety and Procedure Manual on-site for reference?				✓	
2	Is the appropriate site documentation available on site? <i>(refer to Chart A and B)</i>				✓	
3	Do the workers on site have their General Construction Induction Cards with them?				✓	
4	Are the workers on site aware of the contents and use of the site file and acknowledged this?				✓	
5	Is there evidence that a tool-box meeting has been conducted prior to work starting this day?				✓	
6	Have the JSA and WMS controls been implemented for the activities being performed?				✓	
7	Have additional controls been discussed at the tool-box meetings to minimise risk?				✓	
8	Have the requirements of the Site Specific Safety Instructions been fulfilled?				✓	
9	Have all the necessary pre-use inspections been completed before the equipment was used?				✓	
10	Is housekeeping satisfactory? <i>(minimises the risk of slips trips and falls and wind causing airborne objects)</i>				✓	
11	Are site emergency provisions adequate? <i>(Directions to Hospitals; First Aid Kit; Fire Ext etc.)</i>				✓	
12	Is the required PPE being used on site? <i>(including Sunscreen and Insect Repellent as required)</i>				✓	
13	Are the required permits being compiled? <i>(Confined Space, Hot Work, HV Access, Switching Sheet, Fire Ants)</i>				✓	
14	Have the completed permits been returned to JPR for recording?			✓		
15	Do the workers performing the task have all the necessary licenses or competencies?				✓	
16	Are workers onsite using Plant or Equipment in a safe manner?				✓	
17	Are workers acting as a Safety Observer performing the task as per the appropriate procedure?				✓	
2: Additional Requirements <i>(When JPR have been appointed as Principal Contractor, tick ✓ the answer)</i>				N/A	Yes	No
1	Is there evidence that all workers on site been site inducted?				✓	
2	Have all workers onsite signed the attendance register?				✓	
3	Is there evidence that visitors to the site have completed the visitors register?				✓	
4	Has all plant in use been entered in the Site Plant Register?			✓		
5	Has all hazardous substances in use been recorded in the Site Hazardous Substance Register?				✓	
6	Where Hired Plant is used on site, has the 'Plant Safety Checklist' been completed?			✓		
7	Is there evidence that Sub-contractors safety documents been approved for use?			✓		
8	Are site amenities adequate? <i>(Toilets, Hand Washing, Drinking Water, Shaded Area)</i>				✓	
3: Environmental <i>(requirements for all JPR construction worksite, tick ✓ the answer)</i>				N/A	Yes	No
1	Are the requirements for Pest Management being met?			✓		
2	Is the Fire Ant Inspection from DPI still current? <i>(lasts 28 days)</i>			✓		
3	Where endangered flora or fauna has been identified, are protection provisions being followed?			✓		
4	Are the controls for Acid Sulfate Soils Effective? <i>(treatment, storage, covered and/or approved disposal)</i>			✓		
5	Are fire prevention and precautions adequate to minimise the risk to the surrounding area?			✓		
6	Are controls adequate for chemicals, oils and fuels brought to site?			✓		
7	Are controls installed where asbestos is disturbed and/or removed from site?			✓		
8	Are controls in place and adequate to ensure silt does not enter drains and/or waterways?			✓		
9	Are adequate controls in place to minimise dust?			✓		
10	Are adequate controls in place to minimise noise and vibration?			✓		
11	Where vehicles drive over footpaths & parks are protection & rectification procedures adequate?			✓		
12	Is the site clean, rubbish placed in bins or secured at a predetermined location?				✓	
13	Is rubbish including general and site waste being disposed of appropriately?				✓	
14	Have controls to protect the environmental been reinforced at the tool-box meetings?				✓	
If you answer "NO" a "NC" must be recorded in Section "K" against an Employee for the Associated Procedure						

Section H: Use the SAFETY MANUAL for referenced sections. (Record a ✓ in the box for a Non-Conformance)

ES1	Obligations and Responsibilities		ES4	Dress Standard and Electronic Devices	
ES2	Risk Management at the Worksite		ES11	Light Vehicles and Equipment	
ES3	Incident Reporting and Recording				

Section I: Use the PROCEDURE MANUAL for referenced sections. (Record a ✓ in the box for a Non-Conformance)

FS1	Generic Work Method Statement use	FS2	Isolate, Lockout and Tag Out
FS3	Electrical Work Activities	FS4	Field Activities for Electrical Workers
FS5	Gravitation Risks	FS6	Personal Protective Equipment
FS7	Manual Handling	FS8	Vehicles, Mobile Plant and Equipment
FS9	Confined Space	FS10	Hazardous Substances
FS11	Hot Work	FS12	Trenches and other Excavations
FS13	Biological Hazards	FS14	Working Outdoors

Section J: Use the WORKSITE ENVIRONMENTAL MANAGEMENT for referenced sections.

(Record a ✓ in the box for a Non-Conformance)

GS7	Land Degradation		GS8	Soil Management	
GS10	Air Pollution		GS11	Noise Management	
GS12	Waste Management		GS13	Endangered Flora and Fauna	
GS14	Declared Pests		GS15	Site Specific Issues	

Where an ✓ is recorded above, complete **Section "K"** and record the corrective action taken in the **Section "M"**.

Section K – Non- conformances found during the Inspection

"NC" found during the inspection must be recorded below and should be rectified at the time of the inspection and the action taken must be recorded in Section "M" and if Further Action is required record in Section "O".

Note: When accessing the "NC" level rates the Safety Manager shall use the following codes, M = Major, N = Minor.

[illegible]

Corrective Action Codes (For recording purpose use a CA in front of the number)

1	Counsel employee	9	Improve supervision	17	Provide alternative duties
2	Redesign work area	10	Monitor site conditions	18	Toolbox meeting
3	Install guards	11	Provide training	19	Provide instruction onsite
4	Improve guards	12	Develop a procedure	20	Re-issue PPE
5	Upgrade tools	13	Revise procedure	21	
6	Improve equipment	14	Enforce procedure use	22	
7	Improve housekeeping	15	Enforce PPE use	23	Other (<i>Further action required</i>)
8	Improve maintenance	16	Provide alternative PPE	24	Disciplinary action

Section M – Corrective action taken *(Record what action has been taken to prevent re-occurrence for the "NC" recorded in Section K)***Section N - Plant and Equipment** *(All defects must be recorded)*

N/A

Yes

No

Have the defects found during this inspection been recorded using Form F1036? *(Pink Slip)*

✓

Section O – Further Corrective action required *(Record what "NC" still requires action to be taken from Section K)***Record who is responsible for Further Action** *(✓ the necessary boxes below)*

Employee

Supervisor

Safety Officer

Electrical Safety Manager

WHS&E Manager

Senior Management

**"NC"
Sect.****Record what further corrective action has been taken** *(The persons responsible must record what action has been taken)***Confirmation of Corrective Action Taken****Signatures****Date completed**

1:	2:	1: / / 20	2: / / 20
3:	4:	3: / / 20	4: / / 20
5:	6:	5: / / 20	6: / / 20

Section P – Safety Observer <i>(Indicate by ✓ the box for the activity being observed and record the employee details to indicate who is performing the role for the particular activity in the boxes below.)</i>					
What activities are being observed? <i>(record below)</i>					✓
N 1.1	Live electrical work? <i>(Mandatory except for low risk testing and fault finding)</i>				
N 1.2	Working where an exclusion zone may be encroached by persons, plant or equipment? <i>(Mandatory)</i>				
N 1.3	Working at heights? <i>(Not mandatory, site specific requirements)</i>				
N 1.4	Workers in a confined space? <i>(Mandatory)</i>				
N 1.5	Winching operations? <i>(Not mandatory, site specific requirements)</i>				
N 1.6	Lifting or Hoisting materials by mechanical aids? <i>(Not mandatory, site specific requirements)</i>				
N 1.7	Mobile plant moving around the site? <i>(Not mandatory, site specific requirements)</i>				
N 1.8	Work between gaps in traffic or work taking 5 minutes maximum? <i>(Mandatory)</i>				
N 1.9	Work above waterways (creeks or rivers) where marine traffic is a problem? <i>(Not mandatory)</i>				
N 1.10	Other? <i>(record what it is)</i>				
Details		Observer 1	Observer 2	Observer 3	Observer 4
Record the details of the activity being observed and the observer's employee number	Activity:				
	Emp No:				
O 2.0 - Safety Observer has demonstrated competency in performing the role as recorded above. <i>(Circle answer)</i>		Yes / No	Yes / No	Yes / No	Yes / No
Where a YES is achieved the result must be transferred into the data recording and reporting program Where a NO is achieved, indicate the "NC" in Section "O" and what "CA" is required					
Section Q – Competency Monitoring of Plant Operators. <i>(Competency to use EWP's, Cranes, Winches, Forklifts, Chainsaws and Power Tools)</i>					
Details		Operator 1	Operator 2	Operator 3	Operator 4
Plant Operator <i>(Record the details of the person being observed in the space provided)</i>	Name:				
	Emp No:				
	License No.				
Plant Details <i>(What type of plant is in use?)</i>	Type:				
	Make:				
	Model:				
	Plant No:				
O 1.0 - Operator has demonstrated competency in the operation of the plant? <i>(Circle answer)</i>		Yes / No	Yes / No	Yes / No	Yes / No
Where a YES is achieved the result must be transferred into the data recording and reporting program Where a NO is achieved, indicate the "NC" in Section "O" and what "CA" is required					
Section R – Data Checked by the Safety and Environment Manager or Electrical Safety Manager					
Name:		Signature:		Date completed: / / 20	
Section S – Data Entry Completed					
Name:		Signature:		Date completed: / / 20	

J & P RICHARDSON INDUSTRIES PTY. LTD

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 E-mail: jpr@jpr.com.au

HEALTH, SAFETY and ENVIRONMENT INSPECTION

Section A: Nature of Inspection. (What are you inspecting, employees, worksite or a specific work area at the worksite?)							
Employee	No.	Employee	No.	Employee	No.	Employee	No.
J DWYER	475						
S CUNNINGHAM	462						
A BUCHMAN	784						
A MULSMAN	601						
Tick (✓) the type of Audit		HS&E Audit	✓	Electrical Audit		Both	
Worksite: LUGGAGE POINT WWTP				Specific Work Area: SWITCH ROOM / TRANSFORMER YARD			
Address: MAIN BEACH ROAD, MYRTLETOWN				JPR Job No: C55094			
Job Supervisor: ALLAN GOODWIN		Emp No: 161	Group Leader: A BUCHMAN		Emp No: 784		
Principal Contractor: (Is there a PC for this job)		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	P.C. Name: (If you answered Yes) J & P RICHARDSON				

Section B: Inspector Details. (The Inspector must complete this section)							Emp No
Name: PAUL ROGERS		Signature:		Date: 5/6/12			196
Title: (tick ✓)	Group Leader <input type="checkbox"/>	Project Manager <input type="checkbox"/>	Supervisor <input type="checkbox"/>	WHSO <input type="checkbox"/>	JPR Auditor <input checked="" type="checkbox"/>		

Section C: Scope of Work (Record what work was being performed at the time of the inspection)
TERMINATION 11 KV CABLES AND INSTALLATION OF CABLE TRAY.

Notes for the Auditor:

This form is to be used at all worksite where an Inspection is to be performed.

Reference must be made to the Safety and Procedures Manuals where clarification is required.

When a "NO" is given to any of the questions asked in Section "G" they are to be cross referenced to the Procedures used in the scope of work at the site, refer to Section "H", "I" and "J".

Record all "NC" in Section "K" so the corrective action can be addressed.

Whenever possible any "NC" recorded should be corrected at the time of the inspection.

A Safety Manager must determine the level of the Non Conformance is **Minor** or **Major**, based on the possible consequence by using the JPR Risk Calculator and record in Section "K".

Inspectors must also have access to the company "Environmental Management Guide" to complete Section "G".

Throughout this Form there is text in *italics* which is there to guide the user on what to look for or what action is to be taken.

The inspector is encouraged to use Section D – Onsite Observations to record any issues that may require attention and/or clarification to minimise the risk of any hazard associated with an issue evolving.

Where an employee is using plant or equipment or acting as a safety observer onsite monitoring of the workers competence can be recorded in Section "P" for the Safety Observer or Section "Q" for a plant operator.

PLEASE NOTE: Sections "G", "J", "N" & "Q" may not be applicable if an Electrical Audit is being conducted.

Inspection No:

Section D - On Site Observations (Conditions at the site that may need to be clarified or addressed at a later date)

REMINO WORKERS WHEN WORKING IN OR NEAR WATER IN
PITS TO TREAT IT AS SEWAGE, AND PPE, DISINFECT HANDS
AFTER CONTACT.

Section E – Audit on Electrical work or Electrical installation work performed.

L.1	Electrical Work. (Refer to the Electrical Safety Act, Section 18)	N/A	C	NC
a	Has an audit of the electrical work performed and its supporting documentation indicated compliance to the Electrical Safety Regulations, Sections 14 & 15 ?	✓		
b	If a "NC" has been recorded please identify which Australian Standard and the clause the "NC" relates to.	Australian Standard		Clause
c	Type of Audit: VISUAL <input type="checkbox"/> IN SITU TESTING <input type="checkbox"/> TEST RESULTS ATTACHED <input type="checkbox"/>			
L.2	Electrical Installation Work. (Refer to the Electrical Safety Act, Section 19)	N/A	C	NC
a	Has an audit of the electrical work performed and its supporting documentation indicated compliance to the Electrical Safety Regulations, Sections 66 & 150 ?	✓		
b	Where a "NC" against AS/NZS 3000 (Wiring Rules) has been identified, please indicate which section of the standard the "NC" relates to.			
	Sect 1 <input type="checkbox"/> Sect 2 <input type="checkbox"/> Sect 3 <input type="checkbox"/> Sect 4 <input type="checkbox"/> Sect 5 <input type="checkbox"/> Sect 6 <input type="checkbox"/> Sect 7 <input type="checkbox"/> Sect 8 <input type="checkbox"/>			
c	Type of Audit: VISUAL <input type="checkbox"/> IN SITU TESTING <input type="checkbox"/> TEST RESULTS ATTACHED <input type="checkbox"/>			
Section F – Electrical works constructed for an Electrical Entity.		N/A	C	NC
M.a	Has an audit of the electrical work performed and its supporting documentation indicated compliance with the Electrical Safety Regulations, Part 7 ?	✓		
M.b	Work is conducted in accordance with the Entities Safe Work Procedures	✓		

Section G - Confirmation of Safety, Health and Environmental Controls *(The questions in this section relate to Procedures)*

1: General <i>(requirements for all JPR construction worksite, tick ✓ the answer)</i>		N/A	Yes	No
1	Is a copy of the Employee Safety and Procedure Manual on-site for reference?		✓	
2	Is the appropriate site documentation available on site? <i>(refer to Chart A and B)</i>		✓	
3	Do the workers on site have their General Construction Induction Cards with them?		✓	
4	Are the workers on site aware of the contents and use of the site file and acknowledged this?		✓	
5	Is there evidence that a tool-box meeting has been conducted prior to work starting this day?		✓	
6	Have the JSA and WMS controls been implemented for the activities being performed?		✓	
7	Have additional controls been discussed at the tool-box meetings to minimise risk?		✓	
8	Have the requirements of the Site Specific Safety Instructions been fulfilled?		✓	
9	Have all the necessary pre-use inspections been completed before the equipment was used?		✓	
10	Is housekeeping satisfactory? <i>(minimises the risk of slips trips and falls and wind causing airborne objects)</i>		✓	
11	Are site emergency provisions adequate? <i>(Directions to Hospitals; First Aid Kit; Fire Ext etc.)</i>		✓	
12	Is the required PPE being used on site? <i>(including Sunscreen and Insect Repellent as required)</i>		✓	
13	Are the required permits being compiled? <i>(Confined Space, Hot Work, HV Access, Switching Sheet, Fire Ants)</i>	✓		
14	Have the completed permits been returned to JPR for recording?	✓		
15	Do the workers performing the task have all the necessary licenses or competencies?		✓	
16	Are workers onsite using Plant or Equipment in a safe manner?		✓	
17	Are workers acting as a Safety Observer performing the task as per the appropriate procedure?	✓		
2: Additional Requirements <i>(When JPR have been appointed as Principal Contractor, tick ✓ the answer)</i>		N/A	Yes	No
1	Is there evidence that all workers on site been site inducted?		✓	
2	Have all workers onsite signed the attendance register?		✓	
3	Is there evidence that visitors to the site have completed the visitors register?		✓	
4	Has all plant in use been entered in the Site Plant Register?	✓		
5	Has all hazardous substances in use been recorded in the Site Hazardous Substance Register?		✓	
6	Where Hired Plant is used on site, has the 'Plant Safety Checklist' been completed?	✓		
7	Is there evidence that Sub-contractors safety documents been approved for use?	✓		
8	Are site amenities adequate? <i>(Toilets, Hand Washing, Drinking Water, Shaded Area)</i>		✓	
3: Environmental <i>(requirements for all JPR construction worksite, tick ✓ the answer)</i>		N/A	Yes	No
1	Are the requirements for Pest Management being met?	✓		
2	Is the Fire Ant Inspection from DPI still current? <i>(lasts 28 days)</i>	✓		
3	Where endangered flora or fauna has been identified, are protection provisions being followed?	✓		
4	Are the controls for Acid Sulfate Soils Effective? <i>(treatment, storage, covered and/or approved disposal)</i>	✓		
5	Are fire prevention and precautions adequate to minimise the risk to the surrounding area?		✓	
6	Are controls adequate for chemicals, oils and fuels brought to site?		✓	
7	Are controls installed where asbestos is disturbed and/or removed from site?	✓		
8	Are controls in place and adequate to ensure silt does not enter drains and/or waterways?	✓		
9	Are adequate controls in place to minimise dust?	✓		
10	Are adequate controls in place to minimise noise and vibration?	✓		
11	Where vehicles drive over footpaths & parks are protection & rectification procedures adequate?	✓		
12	Is the site clean, rubbish placed in bins or secured at a predetermined location?		✓	
13	Is rubbish including general and site waste being disposed of appropriately?		✓	
14	Have controls to protect the environmental been reinforced at the tool-box meetings?	✓		

If you answer "NO" a "NC" must be recorded in **Section "K"** against an Employee for the Associated Procedure

Section H: Use the SAFETY MANUAL for referenced sections. (Record a ✓ in the box for a Non-Conformance)

ES1	Obligations and Responsibilities		ES4	Dress Standard and Electronic Devices	
ES2	Risk Management at the Worksite		ES11	Light Vehicles and Equipment	
ES3	Incident Reporting and Recording				

Section I: Use the PROCEDURE MANUAL for referenced sections. (Record a ✓ in the box for a Non-Conformance)

FS1	Generic Work Method Statement use		FS2	Isolate, Lockout and Tag Out	
FS3	Electrical Work Activities		FS4	Field Activities for Electrical Workers	
FS5	Gravitation Risks		FS6	Personal Protective Equipment	
FS7	Manual Handling		FS8	Vehicles, Mobile Plant and Equipment	
FS9	Confined Space		FS10	Hazardous Substances	
FS11	Hot Work		FS12	Trenches and other Excavations	
FS13	Biological Hazards		FS14	Working Outdoors	

Section J: Use the WORKSITE ENVIRONMENTAL MANAGEMENT for referenced sections.

(Record a ✓ in the box for a Non-Conformance)

GS7	Land Degradation		GS8	Soil Management	
GS10	Air Pollution		GS11	Noise Management	
GS12	Waste Management		GS13	Endangered Flora and Fauna	
GS14	Declared Pests		GS15	Site Specific Issues	

Where an ✓ is recorded above, complete **Section "K"** and record the corrective action taken in the **Section "M"**.

Section K – Non-conformances found during the Inspection

"NC" found during the inspection must be recorded below and should be rectified at the time of the inspection and the action taken must be recorded in Section "M" and if Further Action is required record in Section "O".

Note: When accessing the "NC" level rates the Safety Manager shall use the following codes, M = Major, N = Minor.

[illegible]

Corrective Action Codes (For recording purpose use a CA in front of the number)	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

1	Counsel employee	9	Improve supervision	17	Provide alternative duties
2	Redesign work area	10	Monitor site conditions	18	Toolbox meeting
3	Install guards	11	Provide training	19	Provide instruction onsite
4	Improve guards	12	Develop a procedure	20	Re-issue PPE
5	Upgrade tools	13	Revise procedure	21	
6	Improve equipment	14	Enforce procedure use	22	
7	Improve housekeeping	15	Enforce PPE use	23	Other <i>(Further action required)</i>
8	Improve maintenance	16	Provide alternative PPE	24	Disciplinary action

Section M – Corrective action taken (Record what action has been taken to prevent re-occurrence for the "NC" recorded in Section K)

Section N - Plant and Equipment *(All defects must be recorded)*

N/A

Yes

No

Have the defects found during this inspection been recorded using Form F1036? (*Pink Slip*)

✓

Section O – Further Corrective action required (Record what "NC" still requires action to be taken from Section K)

Record who is responsible for Further Action (☒ the necessary boxes below)

Employee

Supervisor

Safety Officer

Electrical Safety Manager

WHS&E Manager

Senior Management

**“NC”
Sect.**

Record what further corrective action has been taken *(The persons responsible must record what action has been taken)*

[illegible]

Confirmation of Corrective Action Taken

Signatures

Date completed

1:	2:	1: / / 20	2: / / 20
----	----	-----------	-----------

3:	4:	3:	/	/	20	4:	/	/	20
----	----	----	---	---	----	----	---	---	----

5:	6:	5: / / 20	6: / / 20
----	----	-----------	-----------

Section P – Safety Observer <i>(Indicate by ✓ the box for the activity being observed and record the employee details to indicate who is performing the role for the particular activity in the boxes below.)</i>					
What activities are being observed? <i>(record below)</i>					✓
N 1.1	Live electrical work? <i>(Mandatory except for low risk testing and fault finding)</i>				
N 1.2	Working where an exclusion zone may be encroached by persons, plant or equipment? <i>(Mandatory)</i>				
N 1.3	Working at heights? <i>(Not mandatory, site specific requirements)</i>				
N 1.4	Workers in a confined space? <i>(Mandatory)</i>				
N 1.5	Winching operations? <i>(Not mandatory, site specific requirements)</i>				
N 1.6	Lifting or Hoisting materials by mechanical aids? <i>(Not mandatory, site specific requirements)</i>				
N 1.7	Mobile plant moving around the site? <i>(Not mandatory, site specific requirements)</i>				
N 1.8	Work between gaps in traffic or work taking 5 minutes maximum? <i>(Mandatory)</i>				
N 1.9	Work above waterways (creeks or rivers) where marine traffic is a problem? <i>(Not mandatory)</i>				
N 1.10	Other? <i>(record what it is)</i>				
Details		Observer 1	Observer 2	Observer 3	Observer 4
Record the details of the activity being observed and the observer's employee number	Activity:				
	Emp No:				
O 2.0 - Safety Observer has demonstrated competency in performing the role as recorded above. <i>(Circle answer)</i>		Yes / No	Yes / No	Yes / No	Yes / No
Where a YES is achieved the result must be transferred into the data recording and reporting program Where a NO is achieved, indicate the "NC" in Section "O" and what "CA" is required					
Section Q – Competency Monitoring of Plant Operators. <i>(Competency to use EWP's, Cranes, Winches, Forklifts, Chainsaws and Power Tools)</i>					
Details		Operator 1	Operator 2	Operator 3	Operator 4
Plant Operator <i>(Record the details of the person being observed in the space provided)</i>	Name:				
	Emp No:				
	License No.				
Plant Details <i>(What type of plant is in use?)</i>	Type:				
	Make:				
	Model:				
	Plant No:				
O 1.0 - Operator has demonstrated competency in the operation of the plant? <i>(Circle answer)</i>		Yes / No	Yes / No	Yes / No	Yes / No
Where a YES is achieved the result must be transferred into the data recording and reporting program Where a NO is achieved, indicate the "NC" in Section "O" and what "CA" is required					
Section R – Data Checked by the Safety and Environment Manager or Electrical Safety Manager					
Name: L. BRADFORD		Signature: L Bradford		Date completed: 6 / 6 / 2012	
Section S – Data Entry Completed					
Name:		Signature:		Date completed: / / 20	

Section 5 Commissioning Procedures

COMMISSIONING PROCEDURE

As part of the commissioning of the new Substation “2” Ring Main Unit and the replacement of Feeder Cable 25 the following tests will be completed and documented on the test sheets as shown in section 3 of this manual.

- 1 Testing of Transformer - Form 1162/2.
- 2 Insulation Resistance Check @ 10kV of RMU – Form 1154/1
- 3 A.C. HV Pressure Test (Hi-Pot) of RMU – Factory Test Sheet
- 4 Insulation Resistance Check of cables. – Form 1139/3
- 5 Testing of combined Earth grid. – Form 1151/0

Upon completion of the above testing all test sheets will be signed by the appropriate testing officer and the completed and signed sheets will be inserted into section 3 of this manual.

Section 6 High Voltage Test Sheets



J & P RICHARDSON INDUSTRIES PTY. LTD

Form No. F1039/3

114 Campbell Avenue, WACOL QLD 4076
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E-mail: jpr@jpr.com.au

HV CABLE TEST SHEET

Project: QUEENSLAND URBAN UTILITIES							Job No: C55094			
Date of Test: 06/06/2012										
Cable Circuit:		From: SUB STATION S1 BUS A FDR 25			To: SUB 5 RMU 2 CABLE BOX 2					
Type: 3 CORE XLPE		11 kV			150 sq mm					
Reason for Test: CABLE REPLACEMENT		Cable Temperature: COLD								
Loop Resistance in Ohms (is Loop Resistance Applicable?) N/A Yes/No							Phasing: AS WAS			
Measured with No: _____										
Type: _____ Leads: _____ ohms										
Circuit	A-B		B-C		C-A					
	Total	Net	Total	Net	Total	Net				
Insulation Resistance in Megohms								Volts	1 Min	2 Min
Measured with No: MOO131							A-Earth	5000	200000	200000
Type: KYORITSU							B-Earth	5000	200000	200000
							C-Earth	5000	200000	200000
							A - B	5000	200000	200000
							B - C	5000	200000	200000
							C - A	5000	200000	200000
High Voltage Test Sheet			N/A		1 Start; 1 Finish – Leakage Currents in mA					
Connections			Time Mins	Negative			Positive			
-	+	Earth		kV	1 Start	1 Finish	kV	1 Start	1 Finish	
A B C										
A	B	C								
B	C	A								
C	A	B								
Weather Conditions: FINE							Amb. Temp. °C: 22			
Result of Test: PASS							Label Attached at:			
Comments:										
Testing Officer: S.CUNNINGHAM			Date: 06/06/12		Engineer if Required:			Date: / /		



Certificate

Product **SecoRMU SF₆ Insulated Ring Main Units**

Type **SecoRMU - KK - 12/630**

Serial No. 12040083.1 ~ 12040083.2

The product tested meets the requirements of
IEC60265-1, IEC62271-200 and technical specification.



Dilipkumar. Gan

Tested by

Ruan Trezhu

Checked by

2012.5.3

Date



Certificate

Product **SecoRMU SF₆ Insulated Ring Main Units**

Type **SecoRMU - T-12/630**

Serial No. **12040084**

The product tested meets the requirements of
IEC62271-105, IEC62271-200 and technical specification.



Dipang-Gan

Tested by

Ruan Tre 2hm

Checked by

2012.5.3

Date



ROUTINE TEST REPORT

PRODUCT	Load Break Switch Unit	TYPE	SER- <i>KK -12 / 630</i>			<u>K</u> panel	
SERIAL NO.	<i>12040083.1</i>	RATED VOLTAGE	<i>12</i> kV	RATED CURRENT	630A	DATE	<i>2012.5.3</i>
LBS NO.	<i>K12112125 AS</i>		LBS manufacture date		<i>2012.2</i>		
ITEM	TECHNICAL REQUIREMENTS			TEST RESULTS		CONCLUSION	
APPEARANCE INSPECTION	Welding line of gas-tank shall be even, continuous, without break point;			pass		pass	
	Painting of cabinet shall be even, without defect such as sagging, scratch, peeling or corrosion;						
	Components/assemblies shall be good, with certificate of quality, in compliance with requirements of drawing.						
WIRING INSPECTION	Specification, manufacture and assembly main busbar shall comply with requirements of processing and drawing;			pass		pass	
	Marks of auxiliary circuit shall be correct and clear; specification, manufacture and connection of wire shall comply with requirements of processing and drawing.						
PRESSURE GAUGE INSPECTION	The pressure gauge shall be good, pressure of gas shall be 0.03~0.04Mpa at 20℃, 1 standard atmosphere. (Pressure is indicated in the first unit when it is a block version.)			pass		pass	
MECHANICAL CHARACTER TESTS	3-phase closing/opening non-simultaneity: LBS: closing ≤ 3 ms, opening ≤ 3 ms ES: Closing ≤ 3 ms			LBS	Closing: <u>0.8</u> ms	pass	
					Opening: <u>1.2</u> ms		
	ES	Closing: <u>0.8</u> ms					
	LBS	Closing: <u>4.80</u> m/s					
		Opening: <u>3.96</u> m/s					
	ES	Closing: <u>4.42</u> m/s					
MECHANICAL INTERLOCK TESTS	Carry out 5 manual closing/opening operations on LBS and ES respectively, normal performance, all indications shall be correct;			pass		pass	
	While LBS closed, ES cannot be closed, access lid cannot be opened; On the contrary, while ES closed, access lid is not closed, LBS cannot be closed;						
	While access lid not closed, operation on LBS and ES cannot be carried out.						
MECHANICAL OPERATION TESTS	Carry out 5 closing/opening operations on LBS at 100%Ue, normal performance;			pass		pass	
	Carry out 5 closing operations at 110%Ue, 5 opening operations at 120%Ue on LBS, normal performance;						
	Carry out 5 closing operations on LBS at 85%Ue, normal performance.						



GE Enterprise Development (Shanghai) Co., Ltd.

ELECTRICAL TEST	Carry out simulation test according to electrical schematic drawing, normal performance to meet requirements of design.	pass	pass
POWER FREQUENCY TESTS	Main circuit: between phases/earth at <u>28</u> kV/50Hz; between open contacts at <u>32</u> kV/50Hz, for 1 min without breakdown or flashover.	Between phases/earth: <u>28</u> kV/50Hz, 1min Between open contacts: <u>32</u> kV/50Hz, 1min	pass
POWER FREQUENCY TESTS	Auxiliary circuit: power frequency tests to earth/conductor, for 1s without breakdown or flashover: <input type="checkbox"/> 60V < U _i ≤ 300V: Rated withstand voltage at: 2kV <input type="checkbox"/> 12V < U _i ≤ 60V: Rated withstand voltage at: 500V	To earth/conductor: <u>/</u> kV/50Hz, 1s	/
CIRCUIT RESISTANCE	Resistance of left and right busbar bushings ≤ <u>/</u> μΩ	Measurement for left (There is no this item if non-extensible version) A: <u>/</u> μΩ B: <u>/</u> μΩ C: <u>/</u> μΩ	pass
	Resistance of main circuit ≤ <u>175</u> μΩ <input type="checkbox"/> Extensible left/both Extensible left to No. <u>/</u> unit <input checked="" type="checkbox"/> Extensible right Extensible right to No. <u>1</u> unit <input type="checkbox"/> Non-extensible No.1 left to No. <u>/</u> unit	A: <u>98.53</u> μΩ B: <u>110.34</u> μΩ C: <u>121.45</u> μΩ	
LEAKAGE TEST	Leak rate ≤ 5 × 10 ⁻⁶ mbarl/sec	<u>2.5 × 10⁻⁷</u> mbarl/sec	pass
EARTHING RESISTANCE	Earthing resistance ≤ 100mΩ	Gas-tank to earth: <u>14</u> mΩ Mechanism to earth: <u>17</u> mΩ Frame to earth: <u>20</u> mΩ	pass
PROTECTION DEGREE	Gas-tank: IP67; Cabinet: IP3X.	pass	pass

Conclusion: The product tested meets the requirements of IEC60265-1, IEC62271-200 and technical specification.

Tested by: D. q. wang . Gan

Checked by: Ruan Tve zhu Date: 2012.5.3

Quality Control Department (Seal)





ROUTINE TEST REPORT

PRODUCT	Load Break Switch Unit	TYPE	SER- KK -12/630			K panel	
SERIAL NO.	12040083.2	RATED VOLTAGE	12 kV	RATED CURRENT	630A	DATE	2012.5.3
LBS NO.	K1201181 AS		LBS manufacture date		2012.2		
ITEM	TECHNICAL REQUIREMENTS			TEST RESULTS		CONCLUSION	
APPEARANCE INSPECTION	Welding line of gas-tank shall be even, continuous, without break point;			pass		pass	
	Painting of cabinet shall be even, without defect such as sagging, scratch, peeling or corrosion;						
	Components/assemblies shall be good, with certificate of quality, in compliance with requirements of drawing.						
WIRING INSPECTION	Specification, manufacture and assembly main busbar shall comply with requirements of processing and drawing;			pass		pass	
	Marks of auxiliary circuit shall be correct and clear; specification, manufacture and connection of wire shall comply with requirements of processing and drawing.						
PRESSURE GAUGE INSPECTION	The pressure gauge shall be good, pressure of gas shall be 0.03~0.04Mpa at 20°C, 1 standard atmosphere. (Pressure is indicated in the first unit when it is a block version.)			pass		pass	
MECHANICAL CHARACTER TESTS	3-phase closing/opening non-simultaneity: LBS: closing ≤ 3 ms, opening ≤ 3 ms ES: Closing ≤ 3 ms			LBS	Closing: 0.8 ms	pass	
					Opening: 1.0 ms		
	ES	Closing: 0.8 ms					
	LBS	Closing: 4.40 m/s					
		Opening: 3.90 m/s					
	ES	Closing: 4.54 m/s					
MECHANICAL INTERLOCK TESTS	Carry out 5 manual closing/opening operations on LBS and ES respectively, normal performance, all indications shall be correct;			pass		pass	
	While LBS closed, ES cannot be closed, access lid cannot be opened; On the contrary, while ES closed, access lid is not closed, LBS cannot be closed;						
	While access lid not closed, operation on LBS and ES cannot be carried out.						
MECHANICAL OPERATION TESTS	Carry out 5 closing/opening operations on LBS at 100%Ue, normal performance;			pass		pass	
	Carry out 5 closing operations at 110%Ue, 5 opening operations at 120%Ue on LBS, normal performance;						
	Carry out 5 closing operations on LBS at 85%Ue, normal performance.						



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ELECTRICAL TEST	Carry out simulation test according to electrical schematic drawing, normal performance to meet requirements of design.	pass	pass
POWER FREQUENCY TESTS	Main circuit: between phases/earth at <u>28</u> kV/50Hz; between open contacts at <u>32</u> kV/50Hz, for 1 min without breakdown or flashover.	Between phases/earth: <u>28</u> kV/50Hz, 1min Between open contacts: <u>32</u> kV/50Hz, 1min	pass
POWER FREQUENCY TESTS	Auxiliary circuit: power frequency tests to earth/conductor, for 1s without breakdown or flashover: <input type="checkbox"/> 60V < U _i ≤ 300V: Rated withstand voltage at: 2kV <input type="checkbox"/> 12V < U _i ≤ 60V: Rated withstand voltage at: 500V	To earth/conductor: <u>/</u> kV/50Hz, 1s	/
CIRCUIT RESISTANCE	Resistance of left and right busbar bushings ≤ <u>/</u> μΩ	Measurement for left (There is no this item if non-extensible version) A: <u>/</u> μΩ B: <u>/</u> μΩ C: <u>/</u> μΩ	pass
	Resistance of main circuit ≤ <u>150</u> μΩ	<input type="checkbox"/> Extensible left/both Extensible left to No. <u>/</u> unit <input checked="" type="checkbox"/> Extensible right Extensible right to No. <u>2</u> unit <input type="checkbox"/> Non-extensible No.1 left to No. <u>/</u> unit	
		A: <u>74.48</u> μΩ B: <u>88.97</u> μΩ C: <u>100.56</u> μΩ	
LEAKAGE TEST	Leak rate ≤ 5 × 10 ⁻⁶ mbarl/sec	<u>2.5 × 10⁻⁷</u> mbarl/sec	pass
EARTHING RESISTANCE	Earthing resistance ≤ 100mΩ	Gas-tank to earth: <u>/</u> mΩ Mechanism to earth: <u>/</u> mΩ Frame to earth: <u>/</u> mΩ	/
PROTECTION DEGREE	Gas-tank: IP67; Cabinet: IP3X.	pass	pass

Conclusion: The product tested meets the requirements of IEC60265-1, IEC62271-200 and technical specification.

Tested by: Ji.ang. Gao

Checked by: Ruan Treshu

Date: 2012.5.3

Quality Control Department (Seal)





ROUTINE TEST REPORT

PRODUCT	Switch-fuse Combination Unit			TYPE	SER-T-12/630	T panel	
SERIAL NO.	12040084	RATED VOLTAGE	12 kV	RATED Main BUSBAR RCURRENT	630 A	DATE	2012.5.3
				Max Fuse Rate CURRENT	63 A		
LBS NO.	K121112512AS			LBS manufacture date	2012.2		
ITEM	TECHNICAL REQUIREMENTS				TEST RESULTS		CONCLUSION
APPEARANCE INSPECTION	Welding line of gas-tank shall be even, continuous, without break point;				pass		pass
	Painting of cabinet shall be even, without defect such as sagging, scratch, peeling or corrosion;						
	Components/assemblies shall be good, with certificate of quality, in compliance with requirements of drawing.						
WIRING INSPECTION	Specification, manufacture and assembly main busbar shall comply with requirements of processing and drawing;				pass		pass
	Marks of auxiliary circuit shall be correct and clear; specification, manufacture and connection of wire shall comply with requirements of processing and drawing.						
PRESSURE GAUGE INSPECTION	The pressure gauge shall be good, pressure of gas shall be 0.03~0.04Mpa at 20℃, 1 standard atmosphere. (Pressure is indicated in the first unit when it is a block version.)				pass		pass
FUSEHOLDER INSPECTION	If with fuses, 3 fuses shall be of same type, from same manufacturer;				pass		pass
	Carry out 5 tests on striker of 3-phase fuse-holder, any strike shall activate the switch to open, mechanical protection function fulfilled, normal performance with correct indication.						
	Closing/opening indication shall be correct after striking.						
MECHANICAL CHARACTER TESTS	3-phase closing/opening non-simultaneity:				LBS	Closing: 0.14 ms	pass
	LBS: closing ≤ 3 ms, opening ≤ 3 ms					Opening: 0.8 ms	
	ES: Closing ≤ 3 ms				ES	Closing: 0.5 ms	
	LBS: Closing/Opening speed:				LBS	Closing: 4.54 m/s	
	Closing: 4-5.5m/s(Before closing 5ms),					Opening: 3.88 m/s	
	Opening: 3-4.5m/s(Just opening 10ms)						
ES: Closing speed:				ES	Closing: 4.42 m/s		
closing: 4-5.5m/s (Before closing 5ms)							
MECHANICAL INTERLOCK TESTS	Carry out 5 closing, reverse charging, knob-opening and earthing operations respectively, normal performance with correct indications; if not charged after closing, handle cannot be pulled out;				pass		pass
	While LBS closed, ES cannot be closed, access lid cannot be opened; On the contrary, while ES closed, access lid is not closed, LBS cannot be closed;						
	While access lid not closed, operation on LBS and ES cannot be carried out.						



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MECHANICAL OPERATION TESTS	Carry out 5 closing/opening operations on LBS at 100%Ue,normal performance;		pass	pass
	Carry out 5 closing operations at 110%Ue, 5 opening operations at 120%Ue on LBS, normal performance;			
	Carry out 5 closing operations on LBS at 85%Ue, normal performance.			
ELECTRICAL TEST	Carry out simulation test according to electrical schematic drawing, normal performance to meet requirements of design.		pass	pass
POWER FREQUENCY TESTS	Main circuit: between phases/earth at <u>28</u> kV/50Hz; between open contacts at <u>32</u> kV/50Hz, for 1 min without breakdown or flashover.		Between phases/earth: <u>28</u> kV/50Hz,1min	pass
			Between open contacts: <u>32</u> kV/50Hz,1min	
	Auxiliary circuit: power frequency tests to earth/conductor, for 1s without breakdown or flashover: <input type="checkbox"/> 60V<Ui≤300V: Rated withstand voltage at:2kV <input type="checkbox"/> 12V<Ui≤60V: Rated withstand voltage at: 500V		To earth/conductor: <u> / </u> kV/50Hz, 1s	/
CIRCUIT RESISTANCE	Resistance of left and right busbar bushings ≤ <u>30</u> μΩ	Measurement for left (There is no this item if non-extensible version)	A: <u>22.91</u> μΩ B: <u>23.28</u> μΩ C: <u>22.41</u> μΩ	pass
	Resistance of main circuit ≤ <u>800</u> μΩ	<input checked="" type="checkbox"/> Extensible left/both Extensible left to No. <u>1</u> unit	A: <u>451.69</u> μΩ B: <u>475.58</u> μΩ C: <u>455.57</u> μΩ	pass
		<input type="checkbox"/> Extensible right Extensible right to No. <u> </u> unit		
		<input type="checkbox"/> Non-extensible No.1 left to No. <u> </u> unit		
LEAKAGE TEST	Leak rate ≤5×10 ⁻⁶ mbarl/sec		<u>1.4×10⁻⁷</u> mbarl/sec	pass
ERATHING RESISTANCE	Gas-tank to earth:	Earthing reistance ≤100mΩ	<u>11</u> mΩ	pass
	Mechanism to earth:		<u>15</u> mΩ	
	Frame to earth:		<u>18</u> mΩ	
PROTECTION DEGREE	Gas-tank: IP67; Cabinet: IP3X.		pass	pass

Conclusion: The product tested meets the requirements of IEC62271-105, IEC62271-200 and technical specification.

Tested by: Digang Gan Checked by: Ruan Weizhu Date: 2012.5.3

Quality Control Department (Seal)





J & P RICHARDSON INDUSTRIES PTY. LTD

Form No. F1151/0

114 Campbell Avenue, WACOL QLD 4076

Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

EARTH GRIDS / ELECTRODES TEST REPORT

Customer: QUEENSLAND URBAN UTILITIES	Job No: C55094
Location: LUGGAGE POINT SUBSTATION 2	Order No:
Tested By: S.CUNNINGHAM	Date: 06/07/2012

Circuit	Electrode / Grid ID	Resistance (ohms)	Comments
SUBSTATION 2	COMBINED GRID	0.09Ω	

Diagrams: -

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Signature: S.CUNNINGHAM

**J. & P. RICHARDSON INDUSTRIES PTY. LTD.**

114 Campbell Ave WACOL QLD 4076
Ph: (07) 3271 2911 Fax: (07) 3271 3623
E-mail: jpr@jpr.com.au

LV CABLE INSULATION RESISTANCE TEST SHEET

Customer: QUEENSLAND URBAN UTILITIES **Job No:** C55094
Cable ID: SUBSTATION 2 LV MAINS **Test Voltage:** 500V
Voltage Rating: 1000V **Date:** 06/07/2012
Tested By: S.CUNNINGHAM

TEST BETWEEN	RESISTANCE (MEGOHMS)
A - BC & E & N*	>200 MΩ
B - AC & E & N*	>200 MΩ
C - AB & E & N*	>200 MΩ

*WHERE APPLICABLE

Test Instrument No: MOO147

Comments: -

114 Campbell Avenue, WACOL QLD 4076
Ph: (07) 3271 2911 - Fax: (07) 3271 3623
E-mail: ipr@jpr.com.au

[illegible]

114 Campbell Avenue, WACOL QLD 4076
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E-mail: jpr@jpr.com.au

[illegible]



J & P RICHARDSON INDUSTRIES PTY. LTD

114 Campbell Avenue, WACOL QLD 4076

Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

HV CABLE TEST SHEET

Project: QUEENSLAND URBAN UTILITIES							Job No: C55094			
Date of Test: 06/07/2012										
Cable Circuit: From: SUBSTATION 2 RMU FDR 40 To: SUBSTATION 8 RMU FDR 40										
Type: 3 CORE PLY SWA 11 kV 95 sq mm										
Reason for Test: NEW INSTALLATION							Cable Temperature: HOT			
Loop Resistance in Ohms (is Loop Resistance Applicable?) N/A Yes/No Measured with No: _____ Type: _____ Leads: _____ ohms							Phasing: AS WAS			
Circuit	Loop									
	A-B		B-C		C-A					
	Total	Net	Total	Net	Total	Net				
Insulation Resistance in Megohms Measured with No: MOO131 Type: KYORITSU								Volts	1 Min	2 Min
							A-Earth	5000	2500	2500
							B-Earth	5000	2500	2500
							C-Earth	5000	2500	2500
							A - B	5000	5000	5000
							B - C	5000	5000	5000
							C - A	5000	5000	5000
High Voltage Test Sheet N/A 1 Start; 1 Finish – Leakage Currents in mA										
Connections			Time Mins	Negative			Positive			
-	+	Earth		kV	1 Start	1 Finish	kV	1 Start	1 Finish	
A B C										
A	B	C								
B	C	A								
C	A	B								
Weather Conditions: FINE							Amb. Temp. °C:			
Result of Test: PASS							Label Attached at:			
Comments:										
Testing Officer: S.CUNNINGHAM			Date: 06/07/12		Engineer if Required:		Date: / /			



J & P RICHARDSON INDUSTRIES PTY LTD

Form No. F1104/1

114 Campbell Avenue, WACOL QLD 4076

Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

RING MAIN UNIT MAINTENANCE REPORT

Customer: QUEENSLAND URBAN UTILITIES	Job No: C55094
Location: LUGGAGE POINT SUBSTATION 2	Order No:
Tested By: S.CUNNINGHAM	Date: 06/07/2012

Isolation Permits: -			
Equipment:	G.E SECO RMU	ID:	SUBSTATION 2 RMU
Fuse Rating:	40A	Serial No:	1204003
Unit Clean:	YES	Bushing Cleaned:	YES
Inspect for Leaks:	OK	Oil Level Checked:	N/A
Inspect Cable Connection:	OK	Blown Fuse Trips:	N/A
Oil Dielectric Test:	N/A	Earth Device, Clean, Check & Lube	YES
Ductor Fuses:			
	A fuses	Red	_____ milli ohms
		White	_____ milli ohms
		Blue	_____ milli ohms
Insulation resistance check:			
	R-W+B+E:	>200000	Meg ohms
At _____ kV	W-B+R+E:	>200000	Meg ohms
	B-R+W+E:	>200000	Meg ohms
Ductor Earth Switch:			
	Red	_____ milli ohms	
	White	_____ milli ohms	
	Blue	_____ milli ohms	
Comments: - FOR ALL OTHER TEST RESULTS REFER TO FACTORY TEST SHEETS.			

Signature: S.CUNNINGHAM

**J & P RICHARDSON INDUSTRIES PTY. LTD**

Form No. F1162/2

114 Campbell Avenue, WACOL QLD 4076

Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

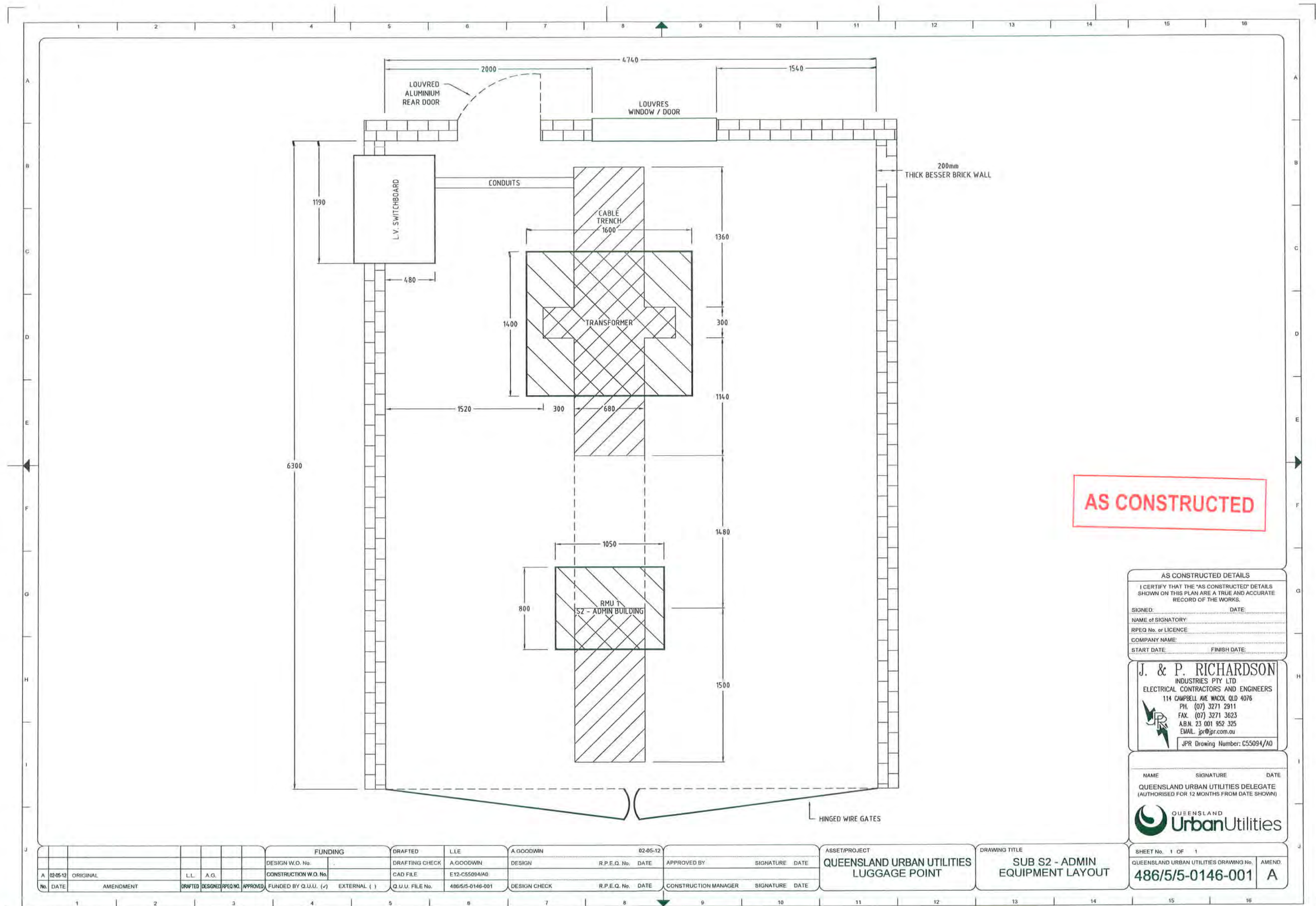
TRANSFORMER TEST/MAINTENANCE REPORT

Customer:	QUEENSLAND URBAN UTILITIES	Job No:	C55094
Location:	LUGGAGE POINT SUBSTATION 2	Order No:	
Tested By:	S.CUNNINGHAM	Date:	06/07/2012

Isolation Permits:	-			
Equipment:	GE DRY TYPE TRANSFORMER	ID:	SUBSTATION 2 G.T	
Transformer Rating:	500/600 KVA	Serial No:	T12125	
Transformer Impedance:	3.91%	Primary/Secondary Volts:	11KV/433V	
Unit Clean:	YES	Bushing Cleaned:	YES	
Inspect for Leaks:	N/A	Oil Level Checked:	N/A	
Inspect Cable Connection:	OK	Transformer Trips:	N/A	
Oil Dielectric Test:	N/A	Moisture Crackle Test:	N/A	
Insulation resistance check:		TESTED BETWEEN	Result	
		From	To	
	At 5 kV	H.V.	EARTH	>200000 M ohms
	At 1 kV	L.V.	EARTH	1900 M ohms
	At 5 kV	H.V	L.V.	>200000 M ohms
D.C. Resistance		HIGH VOLTAGE	Result	
		From	To	
		A	B	0.03ohms
		B	C	0.03ohms
		A	C	0.03ohms
D.C. Resistance		LOW VOLTAGE	Result	
		From	To	
		A	B	0.05ohms
		B	C	0.05Ohms
		A	C	0.05ohms
		A	N	0.05ohms
Comments: -				

Signature: S.CUNNINGHAM

Section 7 Drawings

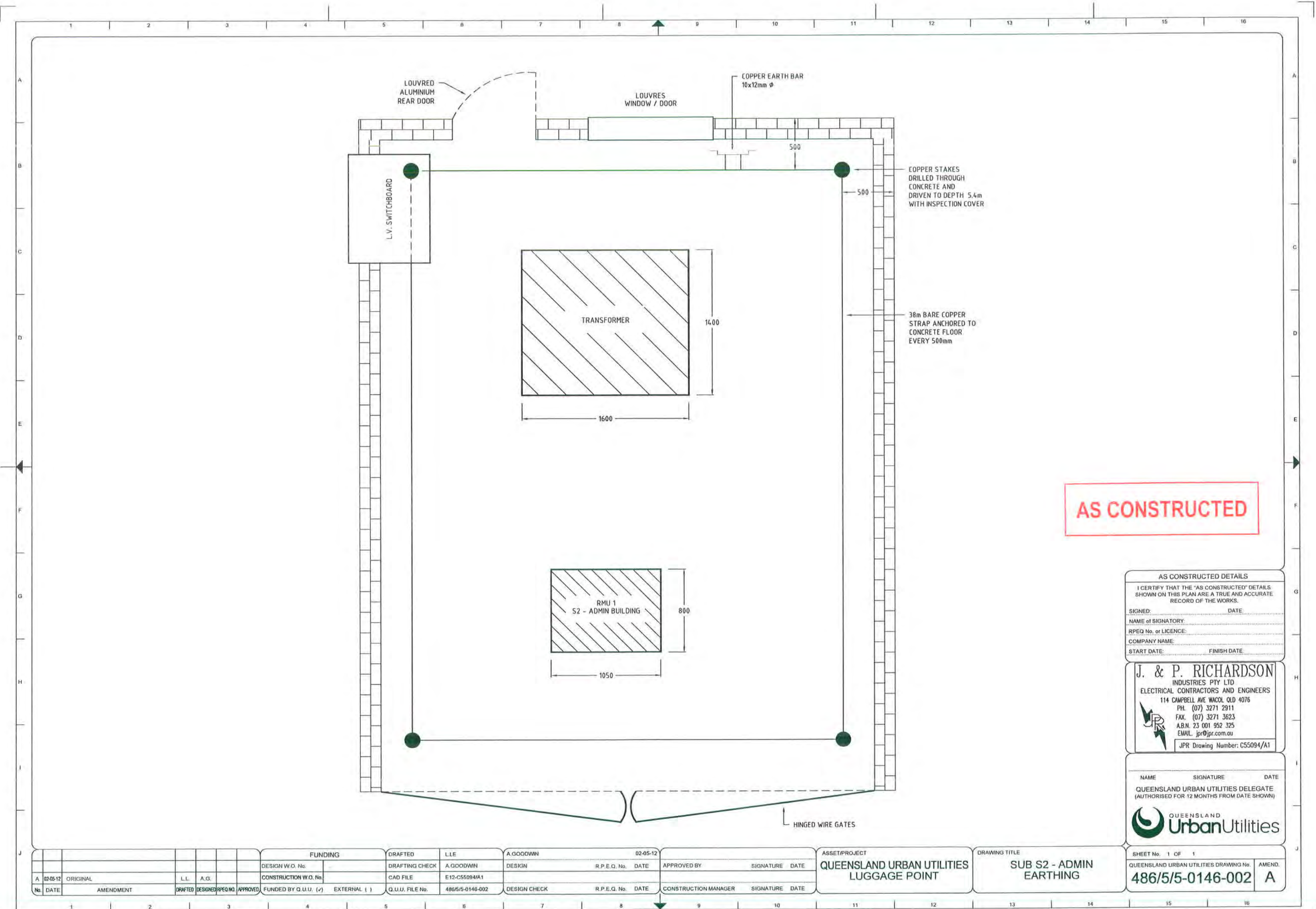


AS CONSTRUCTED

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE:
NAME of SIGNATORY:	
RPEQ No. or LICENCE:	
COMPANY NAME:	
START DATE:	FINISH DATE:
J. & P. RICHARDSON INDUSTRIES PTY LTD ELECTRICAL CONTRACTORS AND ENGINEERS 114 CAMPBELL AVE WACOL QLD 4076 PH. (07) 3271 2911 FAX. (07) 3271 3623 A.B.N. 23 001 952 325 EMAIL: jpr@jpr.com.au JPR Drawing Number: C55094/A0	
NAME	SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)	
SHEET No. 1 OF 1	
QUEENSLAND URBAN UTILITIES DRAWING No.	AMEND.
486/5/5-0146-001	A

FUNDING				DRAFTED		L.L.E		A.GOODWIN		02-05-12	
DESIGN W.O. No.		DRAFTING CHECK		A.GOODWIN		DESIGN		R.P.E.Q. No.		DATE	
CONSTRUCTION W.O. No.		CAD FILE		E12-C55094/A0							
Q.U.U. FILE No.		486/5/5-0146-001		DESIGN CHECK		R.P.E.Q. No.		DATE			

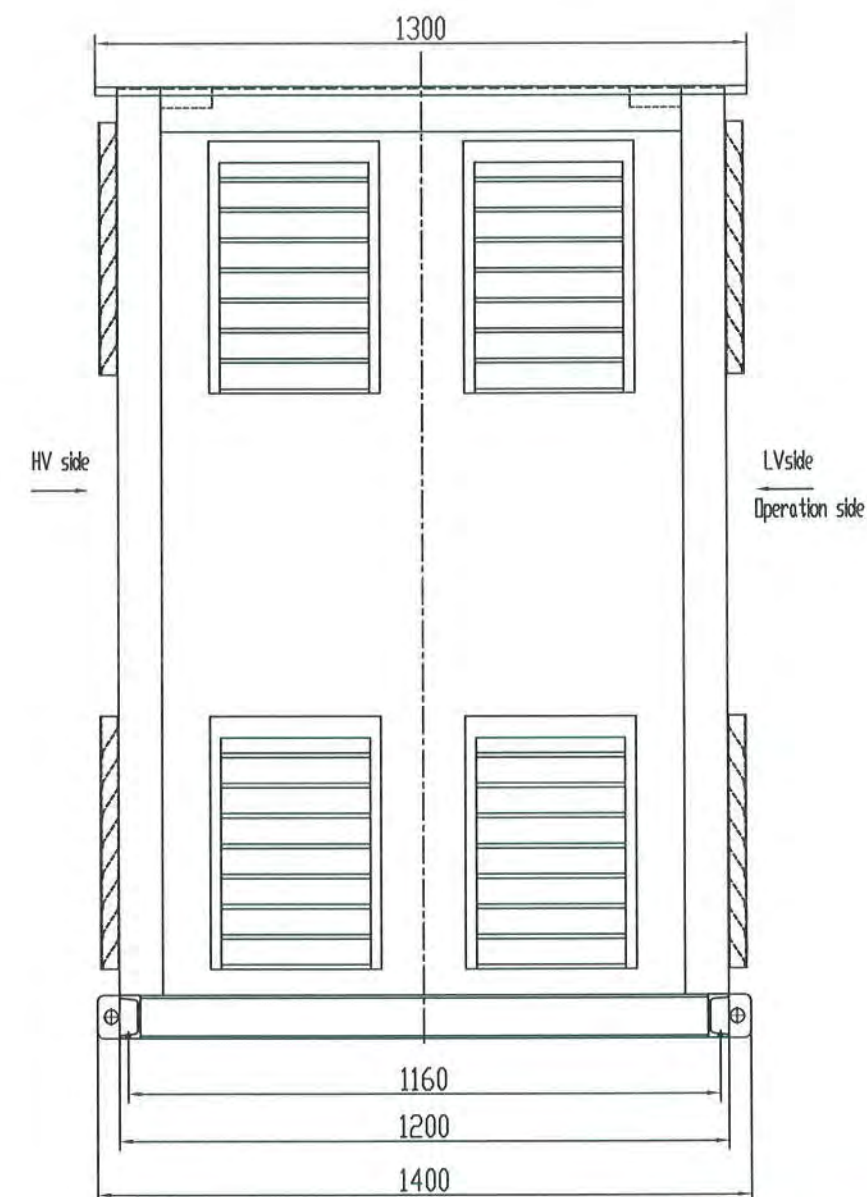
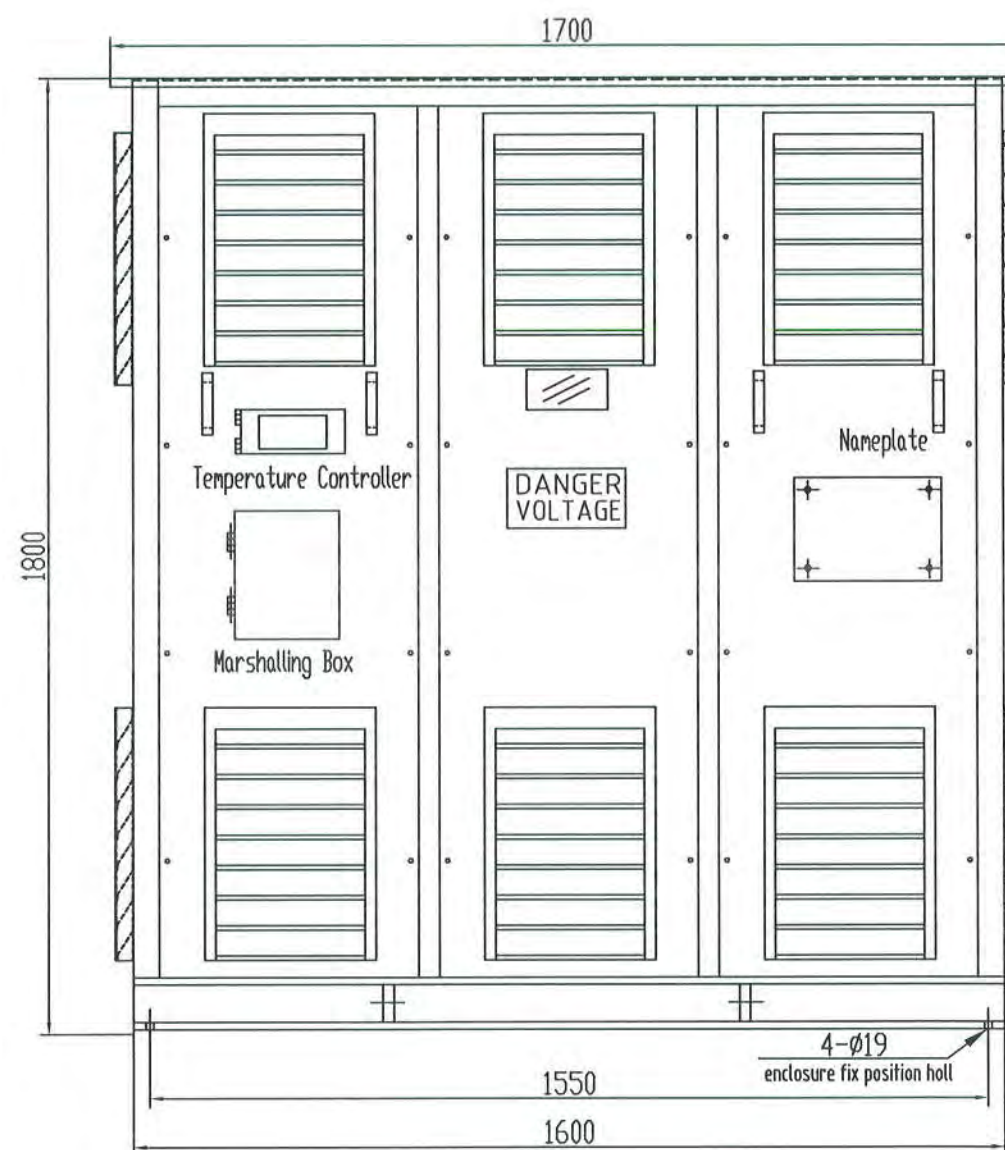
ASSET/PROJECT			DRAWING TITLE		
QUEENSLAND URBAN UTILITIES LUGGAGE POINT			SUB S2 - ADMIN EQUIPMENT LAYOUT		



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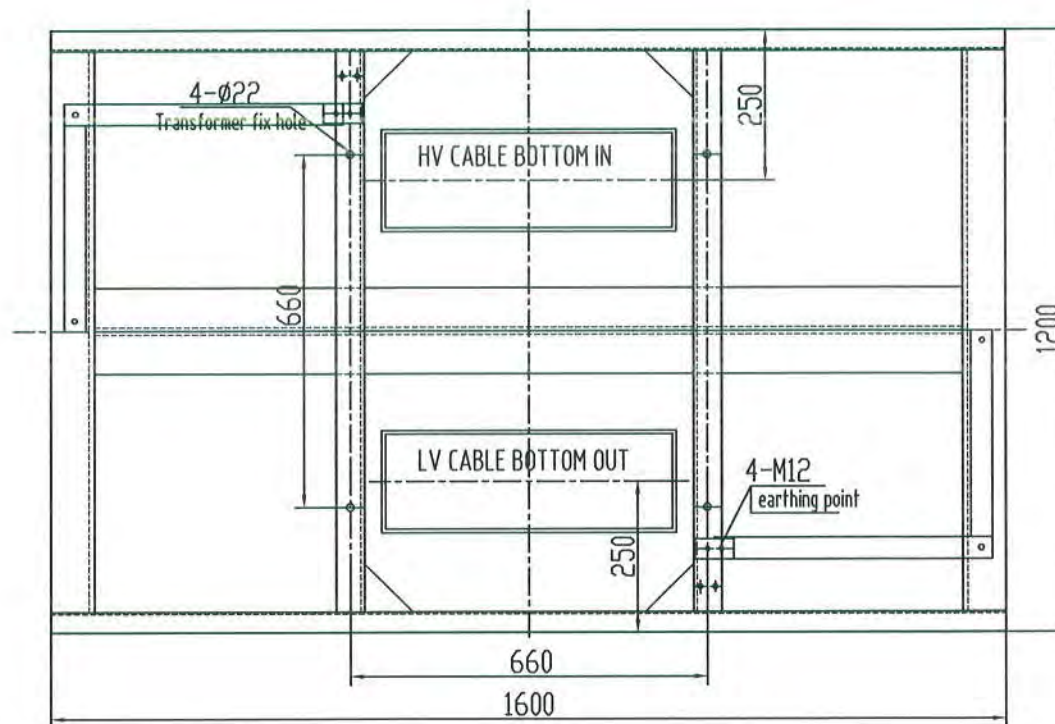
Note:

1. Only for Customer Approval Purpose.
2. Enclosure Protection Class: IP23 (indoor)
3. Enclosure Material: Steel Sheet.
4. Enclosure Color: RAL7032.
5. HV cable come in from bottom and LV cable go out from bottom.
6. Removable bolted doors
7. Slope roof

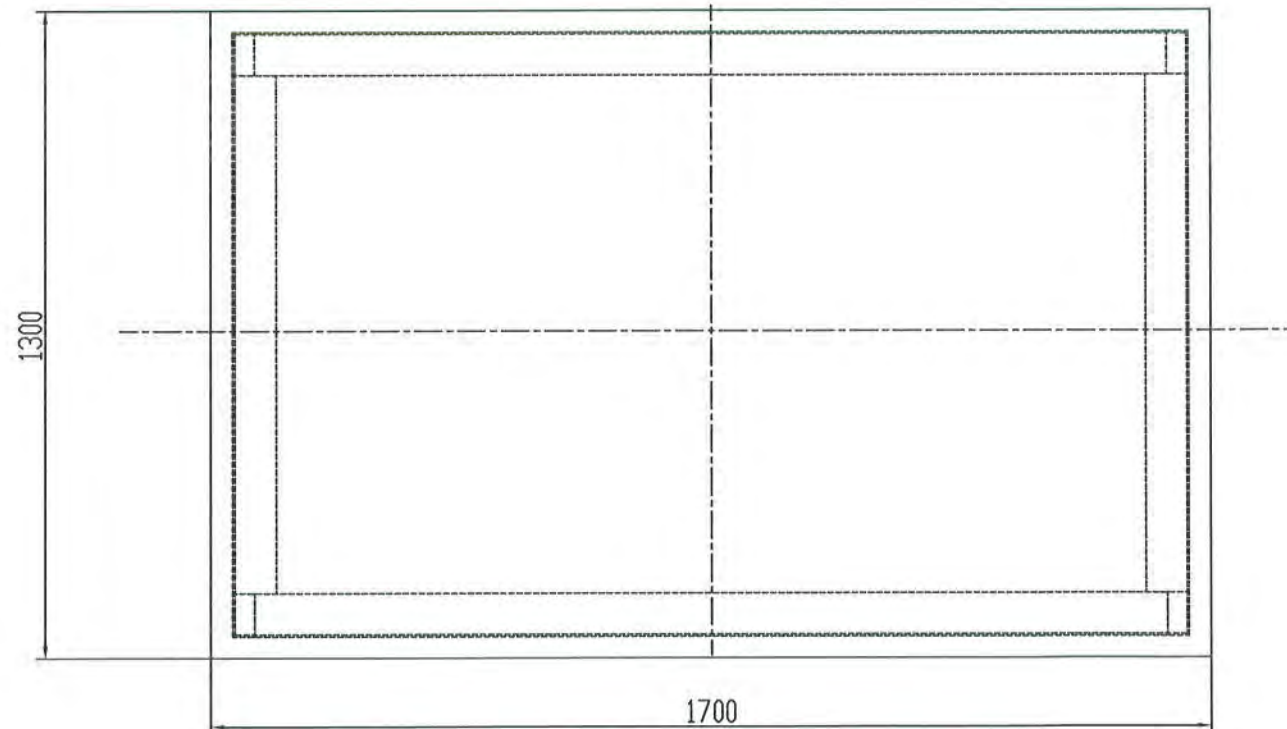


AS CONSTRUCTED

					DRAWN	B.YZ	PROJECT NAME : QUU Luggage Point	TITLE : ENCLOSURE OUTLINE SCLB-500/11/0.433	 GE Energy Industrial Solutions	上海通用电气广电有限公司 Shanghai GE Guangdian CO., LTD	SCALE	—	PO NO. —	
					CHECKED	Y.Y					FILE	—		
					APPROVED	X.ZJ					DRAWING NO. T-120104-01-3-A		SHEET 1 2 SHEETS	
REV.	DESCRIPTION	BY	APP 'D	DATE	DATE	Feb/1/2012								



Foundation

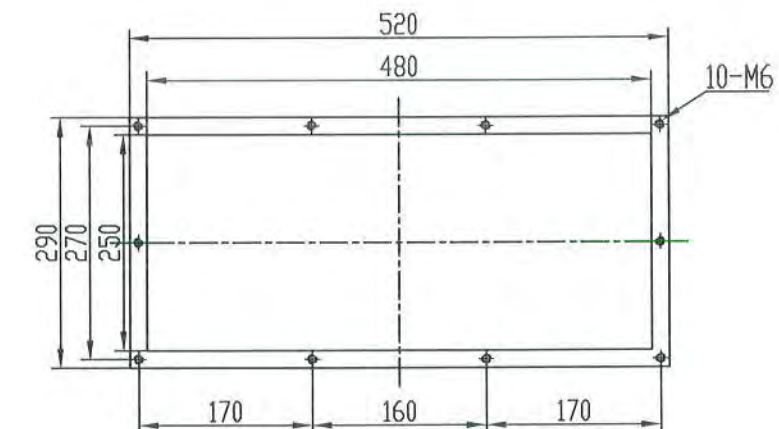


Cover

Note:

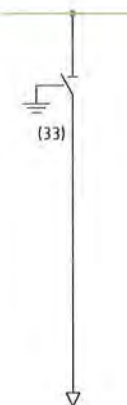

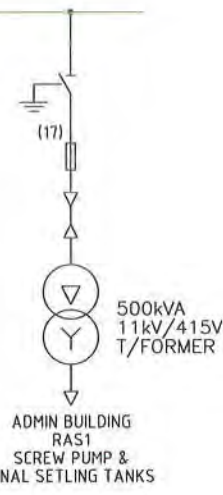
1. Only for Customer Approval Purpose.
2. Enclosure Protection Class: IP23 (Indoor)
3. Enclosure Material: Steel Sheet.
4. Enclosure Color: RAL7032.
5. HV cable come in from bottom and LV cable go out from bottom.
6. Removable bolted doors
7. Slope roof

LV&HV Flange



AS CONSTRUCTED

					DRAWN	B.YZ	PROJECT NAME : QUU Luggage Point	TITLE : ENCLOSURE OUTLINE SCLB-500/11/0.433	 GE Energy Industrial Solutions 上海通用电气广电有限公司 Shanghai GE Guangdong CO., LTD	SCALE	—	PO NO. —
					CHECKED	Y.Y				FILE	—	
					APPROVED	X.ZJ				DRAWING NO. T-120104-01-3-A		
REV.	DESCRIPTION	BY	APP 'D	DATE	DATE	Feb/1/2012				2 SHEETS		

MANUFACTURING No.			
RMU No.	RMU 1	RMU 1	RMU 1
DESIGNATION	LOAD BREAK SWITCH UNIT	LOAD BREAK SWITCH UNIT	LOAD FUSE UNIT
RATING VOLTAGE MAIN BUSBAR			
SINGLE LINE DIAGRAM			
TYPE	SER-KK-12/630D		SER-T-12/630D
RATED CURRENT OF MAIN BUSBAR	630A	630A	630A
RATED CURRENT OF FEEDER	630A	630A	TBD
RATED SHORT-TIME WITHSTAND CURRENT (3s)	20kA	20kA	-
MAKING CURRENT (PEAK)	50kA	50kA	125kA
OPERATING MECHANISM	-	-	1400A
OPERATING MECHANISM	MOTOR	MANUAL	MANUAL
	OPENING COIL	-	-
	CLOSING COIL	-	MANUAL
MAIN COMPONENTS	VCB	-	-
	THREE POSITION LBS	LBS-K1-12/630	LBS-K1-12/630
	THREE POSITION DES	-	-
	POTENTIAL INDICATOR	DXN-12/TED	DXN-12/TED
	FAULT INDICATOR	EKL4	EKL4
	PROTECTION RELAY	-	-
	CT	-	-
	PT	-	-
	LA	-	-
	HV FUSE	-	XRNT1-24/7A 50kA
FRONT-PLUG CABLE PLUG (SHIELDED TYPE)	CUSTOMER TO PROVIDE	CUSTOMER TO PROVIDE	CUSTOMER TO PROVIDE
REAR-PLUG CABLE PLUG (SHIELDED TYPE)	-	-	-
CONDENSATION MONITOR	CX-SK(TH) AC230 WITH SILICONE RUBBER HEATER 50W	CX-SK(TH) AC230 WITH SILICONE RUBBER HEATER 50W	CX-SK(TH) AC230 WITH SILICONE RUBBER HEATER 50W
DIMENSIONS (WxDxH)mm	350x800x1380	350x800x1380	350x800x1380
GAS TANK (WxDxH)mm	675x480x600		325x480x850
INTERNAL SPACE OF ENCLOSURE (WxDxH)mm	1150x900x1450		

No.	ITEM	PARAMETER	REMARK
1	ALTITUDE	<1000m	
2	OPERATION	MANUAL	POWER SUPPLY HAS TO BE SPECIFIED BY SPECIFIC PROJECTS
3	MECHANICAL INTERLOCKS FOR FEEDERS	NO	
4	PRESSURE GAUGE WITH DENSITY RELAY	NO	
5	BRAND		
6	MANUFACTURER	GE ENTERPRISE DEVELOPMENT (SHANGHAI) Co. Ltd.	
7	BUSBAR CONNECTOR	1 SET	
8	END COVER	1 SET	
9	END PLUG	1 SET	
10	CONDENSATION MONITOR	YES	
11	INDOOR/OUTDOOR	OUTDOOR	
12	GAS TANK REQUIREMENT	IAC GAS TANK, LASER WELDING, GOOD APPEARANCE	
13	OTHER REQUIREMENTS	GE STANDARD APPEARANCE AND ASSEMBLY	
14	CABLE CONNECTOR (Cu/Al CORE)	COPPER CORE CABLE CONNECTOR	
15	OTHER REQUIREMENTS	IAC CUBICLE	
16	ORDER NUMBER	YK-GE (AUS) -149-1111-P	

TECHNICAL REQUIREMENTS:

- EQUIPMENT RATED VOLTAGE: 12kV
- RATED OPERATING FREQUENCY: 50Hz
- POWER FREQUENCY WITHSTAND VOLTAGE (1min):
 - PHASE TO PHASE & PHASE TO EARTH: 28kV
 - ACROSS ISOLATING DISTANCE: 32kV
- LIGHTNING IMPULSE WITHSTAND VOLTAGE:
 - PHASE TO PHASE & PHASE TO EARTH: 75kV
 - ACROSS ISOLATING DISTANCE: 85kV
- RATED CURRENT: 630A
- PROTECTION DEGREE: IP67 (GAS TANK & FUSE COMPARTMENT) / IP3X (ENCLOSURE)
- ANNUAL LEAKAGE RATE: <0.1%
- LINE-UP IS RIGHT SIDE EXTENSIBLE. FAULT INDICATOR IN ALL PANELS.
- CABLE PLUG IS PROVIDED BY CUSTOMER.
- ALL DOCUMENTS IN ENGLISH
- QTY: 1 SET ?
- HEATER AND CONTROLLER PROVIDED. INTERLOCK SOLENOID IS PROVIDED IN AH1 & AH2 (K) PANEL. POWER SUPPLY AC230V IS TO BE PROVIDED BY CUSTOMER.
- EQUIPPED WITH OUTDOOR ENCLOSURE AND USING Alu-Zinc PLATE 2.0mm THICK COLOR GREY (CUSTOMER TO PROVIDE SAMPLE FOR IT) IP DEGREE: IP33

AS CONSTRUCTED

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED: _____	DATE: _____
NAME of SIGNATORY: _____	
RPEQ No. or LICENCE: _____	
COMPANY NAME: _____	
START DATE: _____	FINISH DATE: _____
J. & P. RICHARDSON INDUSTRIES PTY LTD ELECTRICAL CONTRACTORS AND ENGINEERS 114 CAMPBELL AVE WACOL QLD 4076 PH. (07) 3271 2911 FAX. (07) 3271 3623 A.B.N. 23 001 952 325 EMAIL: jpr@jpr.com.au Project Number: C55094	

NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		
		
SHEET No. 1 OF 1		
QUEENSLAND URBAN UTILITIES DRAWING No. 486/5/5-0146-003		
AMEND. A		

FUNDING				DRAFTED		LLE		A GOODWIN		02-05-12		ASSET/PROJECT		DRAWING TITLE	
DESIGN W.O. No.				DRAFTING CHECK				DESIGN		R.P.E.Q. No.	DATE	APPROVED BY	SIGNATURE	DATE	
CONSTRUCTION W.O. No.				CAD FILE				E12-C55094/A2							
Q.U.U. FILE No.				Q.U.U. FILE No.				486/5/5-0146-003				DESIGN CHECK	R.P.E.Q. No.	DATE	
CONSTRUCTION MANAGER															

QUEENSLAND URBAN UTILITIES LUGGAGE POINT				SUB S2 - ADMIN SINGLE LINE DIAGRAM & EQUIPMENT SCHEDULE			
DESIGN				486/5/5-0146-003			

Product Serial No.	12040083.1	12040083.2	12040084
RMU No.	AH1	AH2	AH3
Main Circuit	Load break switch unit	Load break switch unit	Switch fuse unit
Busbar rated voltage			
Primary system			
Type	SBR-KK-12/630D		SER-T-12/630ID
Busbar rated current	630A	630A	630A
Rated short time withstand current 3s	20kA	20kA	
Making current (peak)	50kA	50kA	50kA
Transfer current			1400A
Drive	Motor		
	Closing coil		
	Opening coil		
Main Components	CB		
	LBS	LBS-K1-12/630	LBS-K1-12/630
	DS		
	Voltage indicator	DXN-12/TBD	DXN-12/TBD
	Earth fault indicator	BKL4	BKL4
	Relay protection		
	CT		
	VT		
	Lightning arrester		
	HY fuse		XRNT1-12/63A 50kA
	Active meter		
	Inactive meter		
Cable connector(front shield type)	provided by user	provided by user	provided by user
Cable connector(back shield type)			
Dimensions(WxDxH) mm	350 × 800 × 1380	350 × 800 × 1380	350 × 800 × 1380
Gastank(WxDxH) mm	675 × 480 × 600		325 × 480 × 850
Packing inner dimensions(WxDxH) mm	1550 × 1300 × 1850		

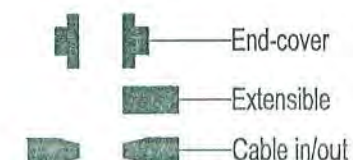
No.	Description	Value	Remark
1	Altitude	<1000m	
2	Manual/Electrical	Manual	
3	Mechanical interlock between 2 incomings	No	
4	SP6 density relay	No	
5	Brand name		
6	Manufacturer	GE Enterprise Development (Shanghai) Co., Ltd.	
7	Busbar connector	1set	
8	End-cover	1set	
9	End-plug	1set	
10	Dew controller	Yes	AC230V
11	Indoor/Outdoor	Outdoor	
12	Gastank requirement	IAC version, laser welding, good appearance	
13	Other requirement	GE's sticker and cubicle;Secondary wiring in accordance with manufacturer's standard	
14	Cable connector(Cu/Al)	Cable connector of Cu core(provided by user)	

Technical requirement:

- Rated voltage: 12kV; IAC version;
- Rated frequency: 50HZ;
- Power frequency withstand voltage(1min):between phases/earth:20kV;between isolating contacts:32kV;
- Impulse withstand voltage: (K & V): between phases/earth:75kV;between isolating contacts:85kV;
(T): between phases/earth:75kV;between isolating contacts:85kV;
- Rated current:630A;
- Protection degree:IP67 (for gas tank and fuseholder);IP3X(for cubicle);
- Leakage rate per year:<0.02%;
- Load switchgear configured with interlock module and interlock earthing switch, the power supply AC230V provided by user
- Quantity: 1 set.
- Outdoor kiosk serial No.: 1204003

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Legend:



GE Energy
Industrial Solution

GE Enterprise
Development Co. Ltd.

No. 1 Hua Tuo Rd. Zhangjiang Hi-Tech
Park, Pudong, Shanghai, China
201203

TEL: +86 21 3877 7888
FAX: +86 21 3877 7405
WEB: www.ge.com

STAMP:

REV	DATE	SUBJECT	APPROVAL	DATE
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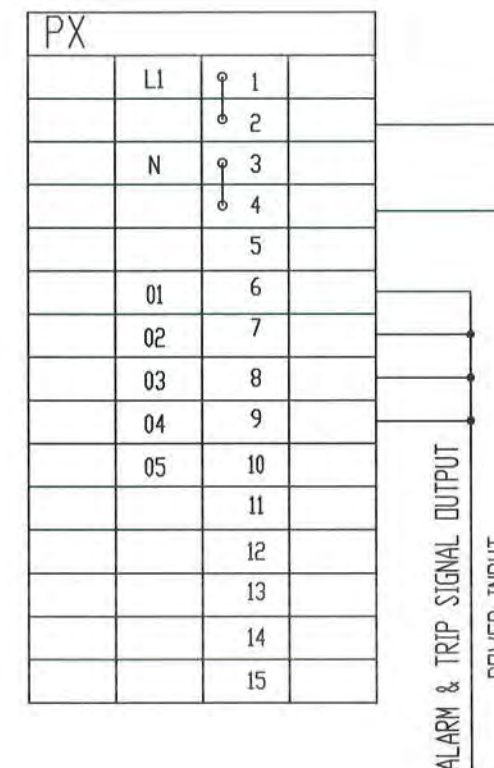
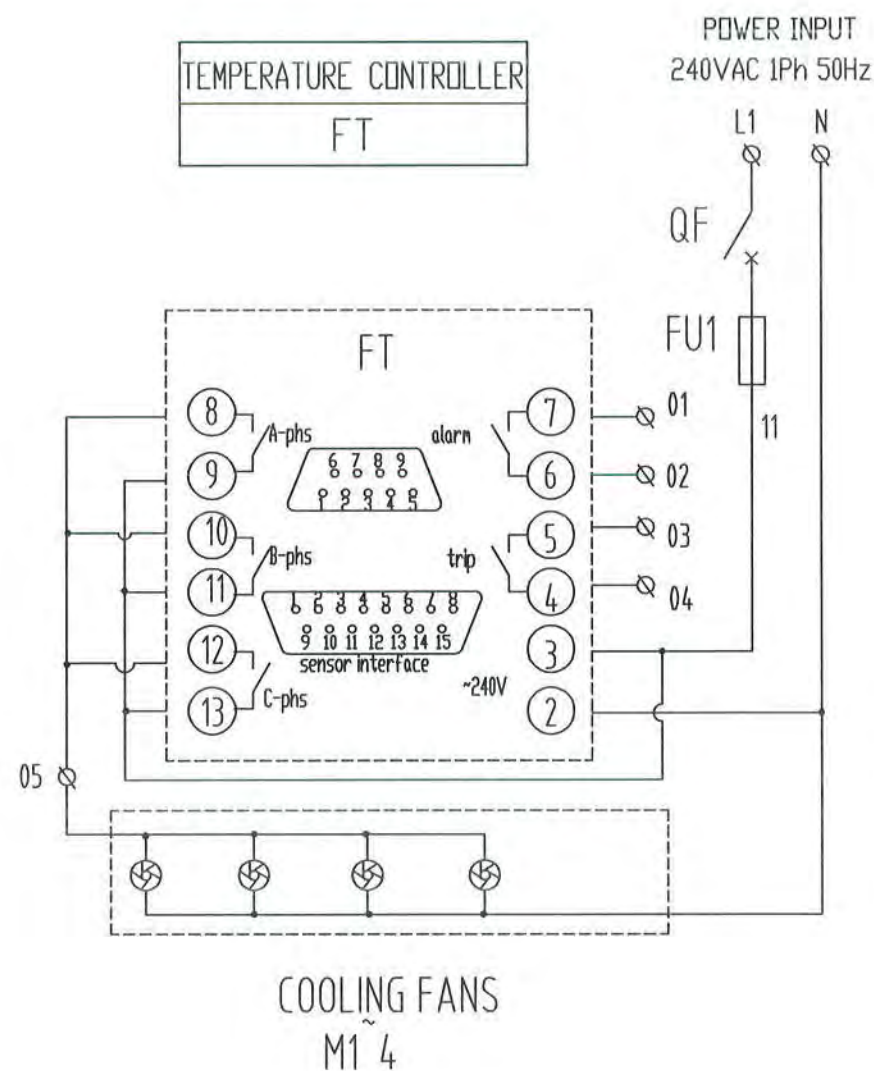
FUNCTION	NAME	SIGNATURE
DRAWN		
DESIGNED		
CHECKED		
DISCIPLINE LEAD		
APPROVED		

CLIENT:

PROJECT:

QUU Luggage

TITLE	10kV SecoRMU Primary System		
DWG NO.	YK-GE (Australia) -011-1204-A1		
SCALE		SHT NO.	1/5



Technical Requirements and comments:

1. 240VAC from customer power supply .

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5	QF	MCB	G61C06	1	
4	M1~4	FANS	GFDD620-110	4	
3	PX	TERMINAL	SAK2.5EN	15	
2	FU1	FUSIBLE CUTOFF	HG30-32/1P-10X38-(HG3032110)	1	RT14-6A/10X38(RT14061A)
1	FT	TEMPERATURE CONTROLLER	BWD-3K130A	1	
No.	Symbol	Name	Type	Qty	Power Consumption

DRAWN		B.YZ		PROJECT NAME :		TITLE :	
CHECKED		Y.Y		QUU Luggage Point		Electrical connection	
APPROVED		X.ZJ		Feb/1/2012		SCLB-500/11/0.433	
REV.	DESCRIPTION	BY	APP'D	DATE	DATE	Feb/1/2012	

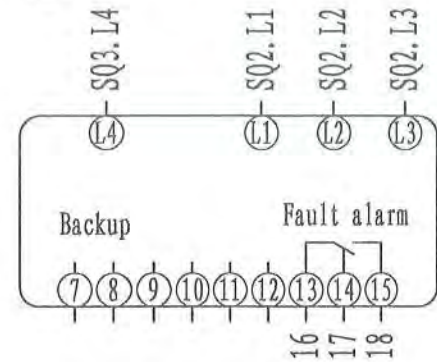


上海通用电气广电有限公司
Shanghai GE Guangdong CO., LTD

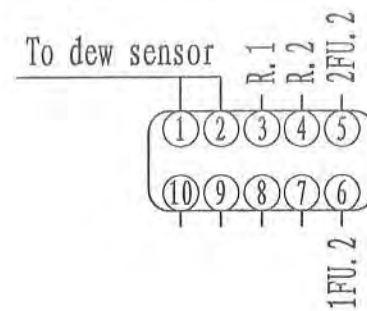
SCALE	—	PO NO.	—
FILE	—		
DRAWING NO.	T-120104-01-4-A		
	1	SHEETS	

Rear view of main plate

(PS) EKL4 Short-circuit&Earth fault indicator



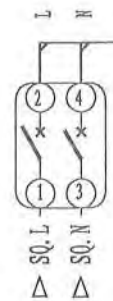
(CX) SK (TH) AC230V



Components in Instrument Compartment

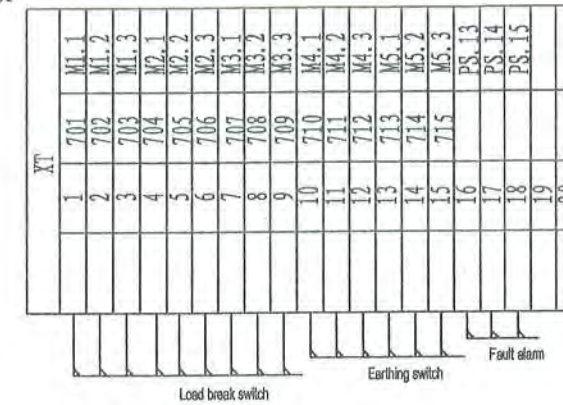
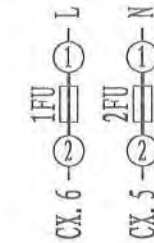
(1ZK) EP102UCC06

To AC230V



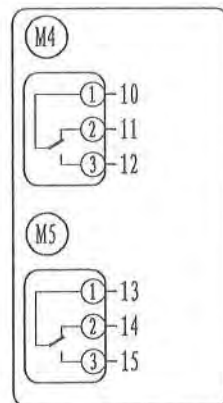
(FU) RT14-20/6A

to the power supply AC230V, take short circuit to the front fuse of same type dew monitors

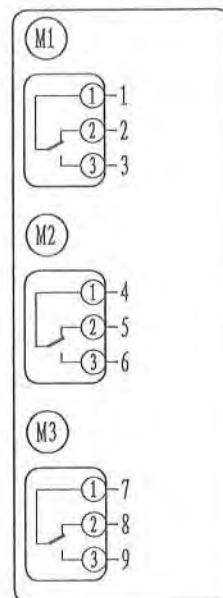


Components in Drive Compartment

ES (open)

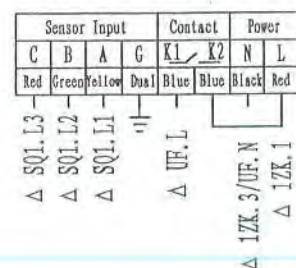


LBS(open)

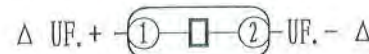


(SQ) DXN-12/TBD AC230V

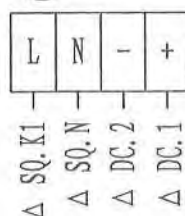
Installed on supporter of potential indicator



(DC) Interlock solenoid AC230V interlock earthing switch

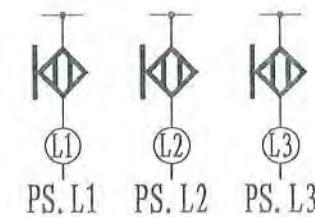


(UF) Rectifier module



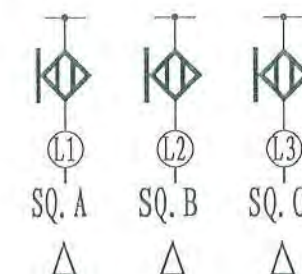
Components in Cable Compartment

(SQ2) Short-circuit sensor



Note: These sensors enclose on Phase A, B and C respectively, signal to indicator through optical cable.

(SQ1) HV sensor



(SQ3) Earthing sensor



This sensor encloses on 3-core cable, signal to indicator through optical cable.

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(R) silicone rubber heater 50W



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WEB: www.ge.com

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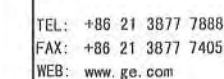
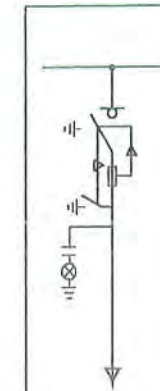
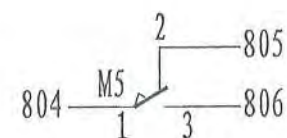
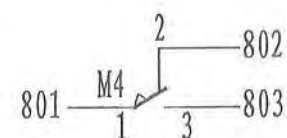
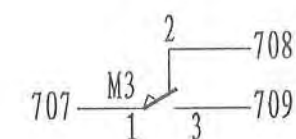
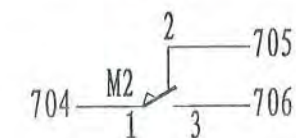
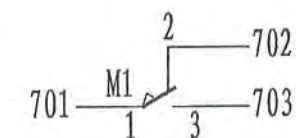
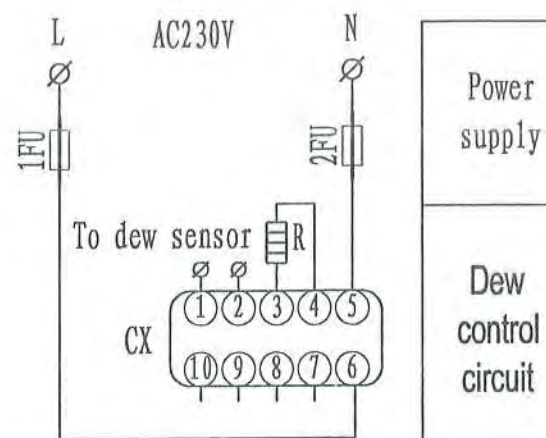
REV	DATE	SUBJECT	APPROVAL	DATE
FUNCTION	NAME	SIGNATURE		
DRAWN				
DESIGNED				
CHECKED				
DISCIPLINE LEAD				
APPROVED				

CLIENT:

PROJECT:

QUU Luggage

TITLE	AH1, AH2 Wiring Diagram
DWG NO.	YK-GE (Australia) -011-1204-A3
SCALE	SHT NO. 3/5



STAMP:

REV	DATE	SUBJECT	APPROVAL	DATE
-----	------	---------	----------	------

FUNCTION	NAME	SIGNATURE
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DRAWN	<i>[Signature]</i>	
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DESIGNED	<i>[Signature]</i>	2012
CHECKED	<i>[Signature]</i>	2012

DISCIPLINE LEAD	1	1	1
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APPROVED *[Signature]* 15/11/2015

CLIENT:

PROJECT:

QUU Luggage

TITLE	AH3 Schematic Diagram
-------	--------------------------

DWG NO.	YK-GE (Australia) -011-1204-
---------	------------------------------

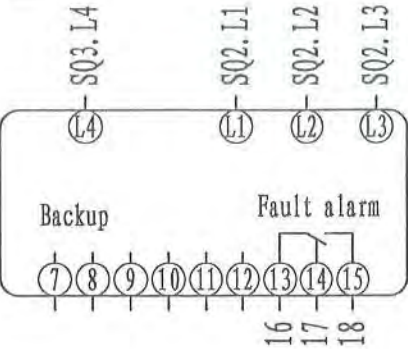
SCALE	SHT NO.	4/5
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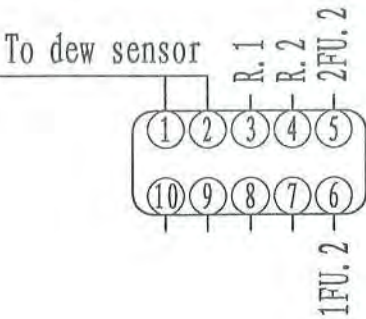
7					
6					
5					
4	CX	Dew controller	SK (TH) AC230V	1	
3	SQ	Voltage indicator	DXN-12/TM1	1	
2	PS	Earth fault indicator	BKL4	1	
1	M1-M5	Limit switch	LXW16-11A	5	
No.	Code	Description	Type	Quantity	Remark

Rear view on small plate

PS EKL4 Short-circuit&Earth fault indicator



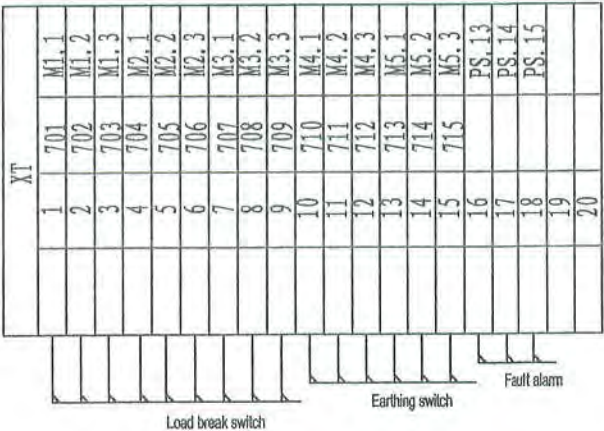
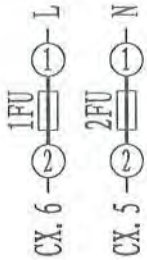
CX SK (TH) AC230V



Components in Instrument Compartment

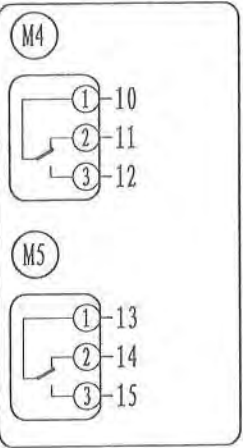
FU RT14-20/6A

to the power supply AC230V, take short circuit to the front fuse of same type dew monitors

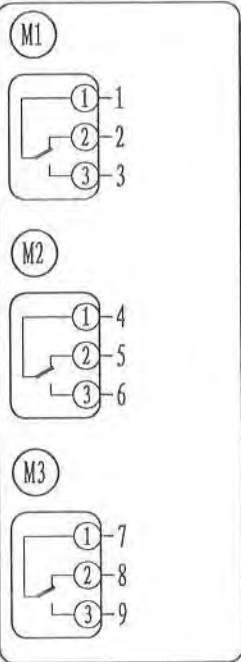


Components in Drive Compartment

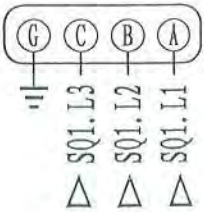
ES (open)



LBS(open)

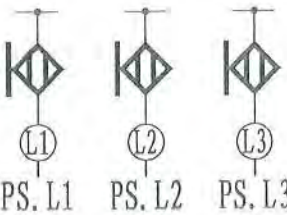


SQ DXN-12/TM1
Mounted on a support



Components in Cable Compartment

SQ2 Short-circuit sensor



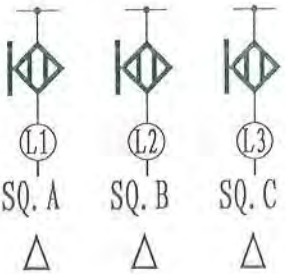
Note: These sensors enclose on Phase A, B and C respectively, signal to indicator through optical cable.

SQ3 Earthing sensor



This sensor encloses on 3-core cable, signal to indicator through optical cable.

SQ1 HV sensor



R silicone rubber heater 50W



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FUNCTION		NAME	SIGNATURE	
DRAWN				
DESIGNED				
CHECKED				
DISCIPLINE				
LEAD				
APPROVED				

CLIENT:

PROJECT:

QUU Luggage

TITLE	AH3 Wiring Diagram
DWG NO.	YK-GE (Australia) -011-1204-A5
SCALE	SHT NO. 5/5

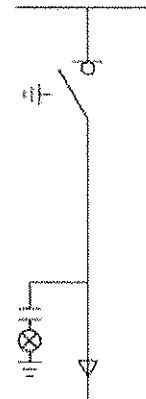
Section 8 Manufacturers Manuals



Ring Main Unit

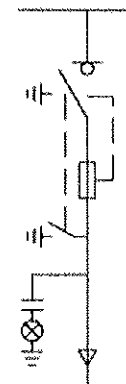
Load Break Switch Unit

- Three position load break switch
- Spring operation mechanism
- Load break switch and earth switch
- Position indicator
- Live display
- SF6 gas pressure meter
- 630A busbar
- Earthing busbar
- Earth switch and gate/operation shaft interlock
- Outlet wire bushing with sensor function
- Panel padlock device
- Dimension: 350 (w) x 800 (d) x 1380 (h)
- Weight: 160kg



Fusible Load Break Switch Unit

- Three position load break switch
- Spring operation mechanism
- Load break switch and earth switch
- Position indicator
- Triangle fuse tank subassembly
- 3-sets of fuse, 63A for 500kVA transformer load
- Live display
- SF6 gas pressure meter
- 630A busbar
- Earthing busbar
- Earth switch and gate/operation shaft interlock
- Outlet wire bushing with sensor function
- Panel padlock device
- Dimension: 350 (w) x 800 (d) x 1380 (h)
- Weight: 180kg





SecoRMU

Item	Unit	Load Break Switch Unit	Switch & Fuse Unit
Rated Voltage	kV	12	12
Rated Power Frequency withstand voltage	kV	42	42
Rated Power Frequency Voltage across isolating distance	kV	48	48
Rated lightning impulse withstand voltage	kV	85	85
Rated lightning impulse withstand voltage across isolating distance	kV	110	110
Rated Frequency	Hz	50	50
Rated Current	A	630	*
Rated Short-Circuit Breaking Current	kA		
Rated Short time withstand current 3sec	kA	20	
Rated peak value withstand current	kA	50	
Rated Active Load Breaking current	A	630	630
Rated loop breaking Current	A	630	630
Rated Transfer Current	A		
5% rated active breaking current	A	31.5	31.5
Weight	Kg	160	180
Dimensions	mm	350 x 800 x 1380	300 x 800 x 1380
Mechanism Endurance	Times	5000	5000
Stainless steel thickness of gas tank	mm	3.0	
SF6 gas pressure	Mpa	0.03	
Arc Control Test	kA	20 / 1sec	
Immersion Test		12kV 24 hours (30kPa under water)	
Fuse Chamber IP		67	
RMU IP		3X without Mild Steel Enclosure	

(*) Rated current & closing current (peak value) of the fused switch unit is not bigger than the fused assembled



SECTION-3: COMMENTS & DEPARTURES

Dry Transformer

1. Offered Transformers are designed, manufactured and tested in accordance with IEC Standards.
2. Transformer offered are dry, cast resin type.
3. Factory Routine test plan is inclusive of the following items. Witnessing factory routine tests is not allowed in this offer but can be provided at additional cost if required.
 - Insulation resistance measurement
 - Separate-source power-frequency voltage withstand test
 - Voltage ratio measurement
 - Checking of connection group
 - Measurement of winding resistance
 - Measurement of No-load loss and No-load current
 - Induced over voltage withstand test
 - Measurement of Impedance voltage and Load loss
 - Partial discharge measurement
4. Scope of supply is for supply and delivery of the specified transformer. Installation, supervision, testing and commissioning are not offered.
5. Type tests and/or special tests are not included in this offer. Additional cost for testing in the factory is as follows:
 - Lightning Impulse Test: \$ 1500 per Transformer
 - Sound Level Test: \$ 1000 per Transformer
 - Temperature Rise Test: \$ 2000 per Transformer
6. Offered transformer is equipped with Microcomputer temperature controller, type BWD-3K130A.
7. Offered Transformers comply with MEPS requirements in accordance with AS2374.1.2-2003.



SECTION-2: SPECIFICATION

Dry Transformer

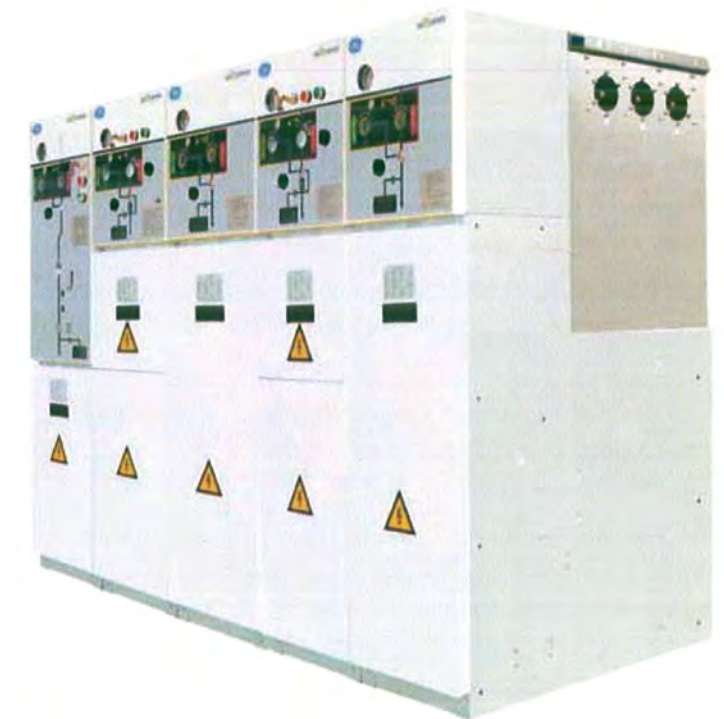
Unit kVA	500
Cooling class	AN
Phase	3
Frequency	50Hz
High voltage	11kV (Delta) with $\pm 2 \times 2.5\%$ off-load tap changing
Low voltage	0.433kV (Wye)
BIL	LI75AC28/ AC3
Phase relation	Dyn11
Conductor	Aluminum
Impedance	4%, IEC standard tolerance
Insulation class	155 °C (F class)
Temp. Rise	95K
Ambient	25 Avg/45 Max
Altitude	1000m and below
No load	1200W
Load loss@75deg	4350W
BWD-3K130 microcomputer temperature controller included	
Wheels included	
IP23 Enclosure	

SecoRMU

12kV-24kV

New Compact Gas

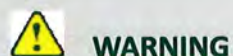
Insulated Ring Main Unit User Manual



GE imagination at work

Important recommendations to begin with focusing on safety:

- Switchgear should be installed in a clean, dry, ventilated room suitable for electrical equipment.
- Installation, operation and maintenance should be carried out by licensed electricians.
- Fully comply with the applicable standards (e.g. IEC), the utility connection requirements and the applicable safety regulations.
- Observe the relevant instructions in the instruction manual for all actions in relation to the switchgear.
- Pay attention to the hazard notes in the instruction manual marked with this ⚠ warning symbol.
- Make sure that the operating limits of the switchgear are not exceeded.
- Keep the instruction manual accessible to all personnel involved in installation, operation and maintenance.
- The users must act responsibly in all matters affecting safety at work and correct handling of the switchgear.



WARNING

Always follow the instruction manual and respect the rules for good engineering practice! Hazardous voltage can cause electrical shocks and burns.

Disconnect power, then earth and short-circuit before proceeding with any work on the equipment!

If you have any further questions about this instruction manual, our field team will be pleased to provide the required information.

We reserve all rights to this publication. We do not accept any responsibility for the information provided, which is subject to alteration.

GE Energy

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F: +61 2 8788 7234

Indonesia

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Jakarta 10210
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F: +62 21 574 7089

India

The Millenia, 8F, Tower B, #162
Murphy Road, Union Square
560 098
T: +91 80 4143 4000
F: +91 80 4143 4199

HongKong

8F, The Lee Gardens, 33 Hysan
Avenue Causeway Bay, HongKong
T: +852 2100 6800
F: +852 2376 0013

Japan

11F, Akasaka Park Bldg, 5-2-20
Akasaka Minato-ku, Tokyo
107-0052
T: +81 3 5544 6788
F: +81 3 3529 3372

Korea

3F, GE Tower, 71-3, Chungdam-
Dong, Kangnam-Gu, Seoul 135-100
T: +82 2 6201 4501
F: +82 2 6201 4545

Malaysia

Level 6, 1, Sentral, Jalan Travers,
Kuala Lumpur 50470
T: +603 2273 9788
F: +603 2273 3481

New Zealand

Level 1, 8 Tongihua Street
Auckland, North Island
T: +64 9 353 6708
F: +64 9 353 6707

Philippines

8F, Net Cube Building, 30th Street
Corner 3rd Avenue, Crescent West Park
Global City Taguig 1634
T: +63 2 877 7000
F: +63 2 846 0629

Singapore

240 Tanjong Pagar Road
#06-02 GE Tower
Singapore 088540
T: +65 6326 3404
F: +65 6326 3015

Taiwan

6F, No.8, Sec. 3, Minsheng E. Road
Taipei 10480
T: +886 2 2183 7000
F: +886 2 2516 6829

Thailand

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9 Routine test

9.1 Dielectric test

ITEM	Load break switch unit	Switch Fuse unit	Breaker Unit
Rated Voltage:	24kV	24kV	24kV
Rated Frequency:	50 Hz	50 Hz	50 Hz
Rated power Freq withstand voltage (1 min):	50kV	50Kv	50kV
Rated power Freq withstand voltage (1 min): Across isolating distance	64kV	64kV	64 kV

9.2 Mechanical character test

ITEM	Load break switch unit	Switch Fuse unit	Breaker Unit
Opening Time	-	-	15 ~ 55 ms
Closing Time	-	-	30 ~ 60 ms
Opening speed	3 – 4.5 m/s	3 – 4.5 m/s	1.2-1.8m/s
Closing speed	4 – 5.5 m/s	4 – 5.5 m/s	0.8-1.3m/s
Contact Gap in Vacuum Interrupter	-	-	12±1mm
Over travel of contacts	-	-	3-5 mm
Contact Bounce time	-	-	≤2 ms
Non simultaneous closing of contacts	-	-	≤2 ms
Non simultaneous opening of contacts	-	-	≤2 ms

10 Recycling regulations

When SecoRMU reaches the end of its life, recycling for the products shall be done under the compliance of relative standards in order to protect the environment.

If customer wants recycling service, please consult the manufacturer for more information.

8.2 Motor Replacement

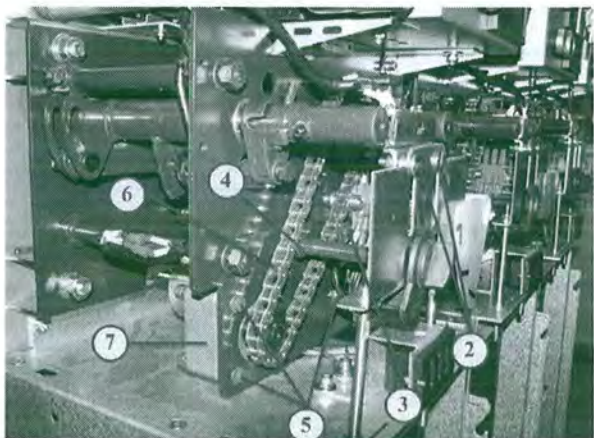
To replace the motor of Load break switch unit and fuse switch unit.

Dismantle steps

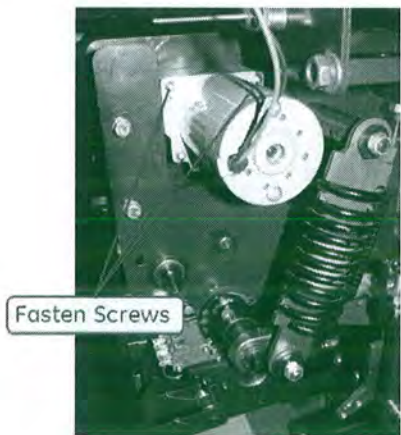
- Remove the following two screws (label 1). Take away the front panel. Remove the connection plug of the power supply from the motor.



- Dismantle 2, 3, 4, 5, 6 (chain) one by one, and then remove 7 (motor)



- To install the new motor, please follow the above steps in reverse order and fasten the screws.



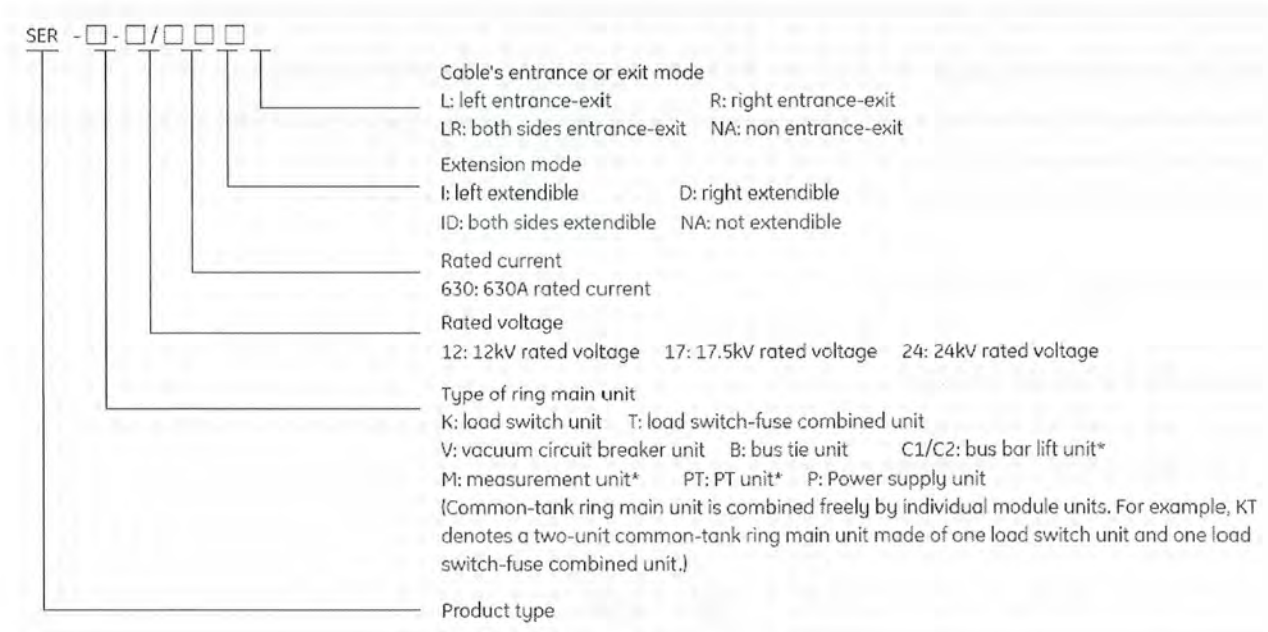
1 General

1.1 Summary

SecoRMU Series switchgear is an extendable SF6 gas insulated metal enclosed switchgear, the rated voltage is 12kV/17.5kV/24kV. All primary parts of the high voltage are sealed in a gas tank welded with 3mm thick stainless steel plate. Compact in design and small size, it can ensure safe, reliable, and maintenance-free operation. The switchgear can be versatile extended with extendable busbar connection. The extendable busbar is completely insulated and shielded, and has passed testing of dynamic thermal stability to ensure high reliability and safety. The SecoRMU meets the requirement of IEC62271-2000.

SecoRMU series switchgear can be used in utility substations and wind power plants, small industries, commercial building, mining, airport etc.

Product Type



For example:

- SER-V-12/630ID is a vacuum circuit breaker unit with 12kV rated voltage and 630A rated current, both sides extendible.
- SER-KKT-12/630 is a three-unit common-tank ring main unit, made of two load switch units and one load switch-fuse combined unit, with 12kV rated voltage and 630A rated current, not extendible.

* Note: C1/M/PT Air insulated
C2 Gas insulated

1.2 Standard and Specification

SecoRMU complies with the standards and specifications for factory-assembled, metal enclosed and type tested high voltage switchgear to IEC publications as given below.

IEC62271-200	High-voltage switchgear and controlgear – Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 52 kV
IEC60265-1	High-voltage switches – Part1: Switches for rated voltages above 1 kV and less than 52 kV
IEC62271-100	High-voltage switchgear and controlgear – Part 100: High-voltage alternating-current circuit-breakers
IEC62271-105	High-voltage switchgear and controlgear – Part 105: Alternating current switch-fuse combinations
IEC60282-1	High Voltage Fuses –Part 1 Current limiting fuses
IEC62271-102	High-voltage switchgear and controlgear – Part 102: Alternating-current disconnectors and earthing switches
IEC62271-1	The Common specifications for high-voltage switchgear and control gear standards
IEC376-1971	Specification and acceptance of new Sulfur Hexafluoride
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60694	Common specifications for high voltage switchgear and controlgear standards

The switchgear has the following degrees of protection: IP 67 is for the gas tank and IP3X for the partitions.

All other corresponding IEC publications, national or local safety regulations must be followed during the installation and operation of the switchgear. In addition, any project specific advice from GE must be considered.

1.3 Operating Conditions

1.3.1 Normal Operating Conditions

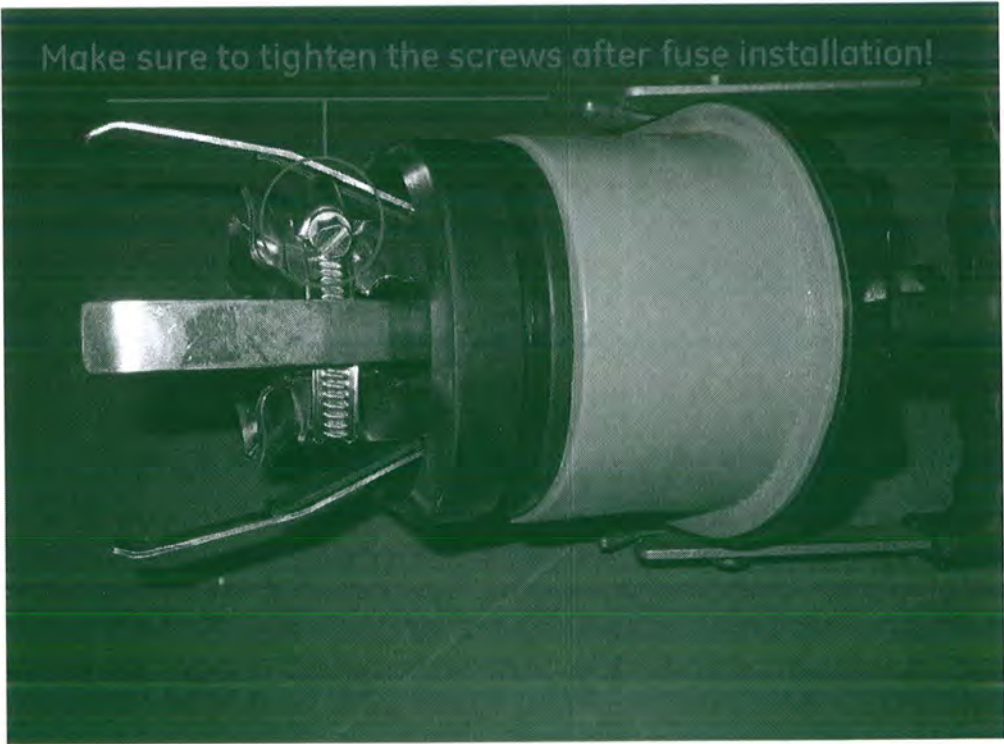
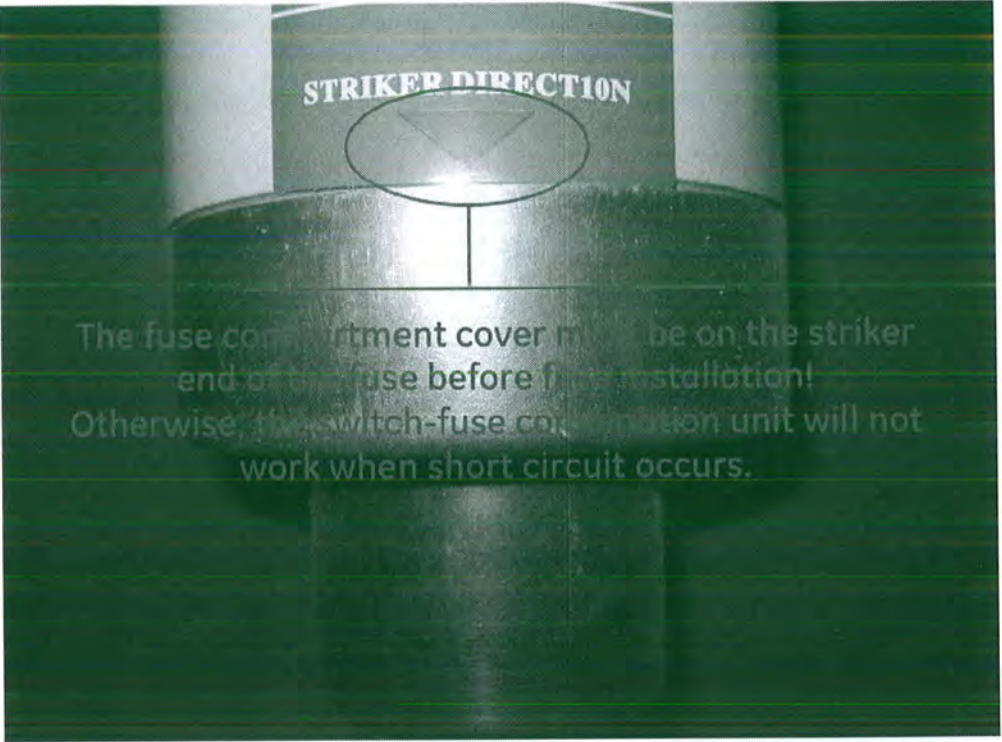
The switchgears are fundamentally designed for the normal service conditions for indoor switchgears to IEC Publication 60694. The following limit values, among others, apply.



- Ambient temperature
 - Maximum + 40°C
 - 12h-Average +35°C
 - Minimum -25°C
- Humidity
 - Highest average value measured over 12 hours
 - Relative humidity 95 %
 - Highest average value measured over 1 month



Notes:



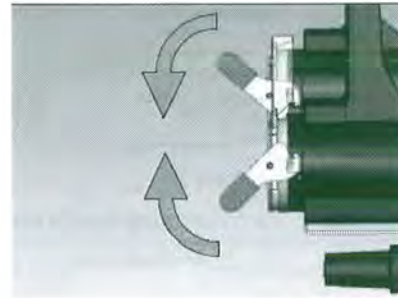
8.1 Fuse Combined Panel Core Installation and Replacement

Diagram



When any phase fuse has blown, all three-phase fuses need to be replaced.
Make sure fuse switch is in maintenance status (refer 7.1.2).

1) Release cover handles and remove fuses



2) Install or replace fuse and pilot sleeve



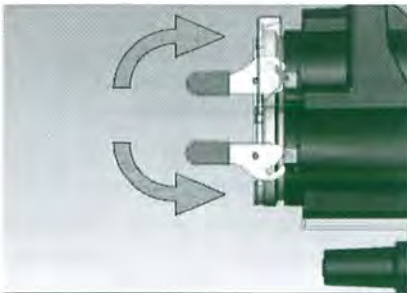
pilot sleeve

3) Pay attention to the direction of lever. If needs to be in the vertical position.



Trip Lever

4) Reinstall handle



5) Push fusion compartment in service position



o Relative humidity 90 %

- The maximum site altitude is 1000 m above sea level (4000m high altitude RMU is available.)

1.3.2 Special Operating Conditions

This switchgear is suitable for operation in the indoor type and outdoor box-type transformer substation according to IEC standard.

Special operating conditions for indoor or outdoor application must be discussed with the manufacturer in advance.

Increased ambient temperatures must be compensated for in the design of the busbar and branch; otherwise the current carrying capacity will be reduced. Fitting additional ventilation facilities can assist heat dissipation in the switchgear panel.

1.3.3 Note On Any Special Climatic Operating Conditions

When the switchgear is operated in areas with high humidity and/or major rapid temperature fluctuations, there is a risk of condensation, which must remain an exception in normal operating conditions for indoor switchgear. Preventive action (e.g. fitting the electric heaters) must be taken in consultation with the manufacturer to avoid this condensation phenomenon and any resulting corrosion or other adverse effects.

1.4 Safety and Environment Protection Requirement

1.4.1 Safety Procedure



- Wear the safety clothing according to electric safety regulations before entering the site
- Comply with industry work procedure. Power supply shall be operated by authorized staff.

1.4.2 Environment Protection Requirements

The manufacturer has a product recycle policy in accordance with related law and ISO14001. Local laws shall be observed when the switchgear is due for disposal as this product contains SF6 gas

1.5 Handling and Storage

1.5.1 Condition on Delivery

At the time of dispatch, the factory assembled SecoRMU. Panels are verified in the factory for completeness as per order requirement, and also passed routine testing as per IEC 62271-200:2003.

The busbars are not assembled; they are packed separately with fasteners and accessories.

1.5.2 Packing

Based on the kind of transportation and country of destination, the packing may vary. To protect against moisture a drying agent bag is provided. IEC62271-1:2007 guidelines are followed.

- Panels with basic or no packing
- Panels with seaworthy or similar packing (including packing for containerized shipments)

- Sealed in polyethylene sheeting
- Transport drying agent bags included
- Moisture indicator included
- Observe the directions for use of the drying agent bags. Note the following
 - Drying agent color observed blue indicates the packaged equipment is dry condition
 - Drying agent color observed pink indicates the packaging contains moisture (relative humidity above 40%). Please contact the manufacturer in this case before installation

1.5.3 Transport

The transport units normally comprise of individual panels and, in exceptional cases, small groups of panels. The panels are equipped with two lifting eyebolts.

Only carry out loading operations when all precautionary measures to protect personnel and materials have been taken, with the following equipment:

- Crane of suitable capacity; the minimum capacity shall be 235Kg.
- Fork-lift truck and/or manual trolley
- Lifting slings of appropriate load capacity with shackles
- Maintain an angle of at $60^{\circ} \leq \theta \leq 110^{\circ}$ from the front for the ropes leading to the crane hook (Figure 1/1)

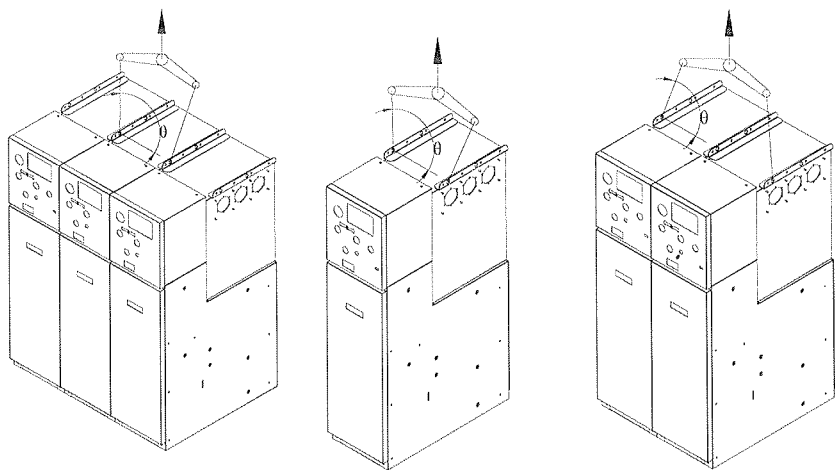


Figure 1/1: Handling by crane

1.5.4 Upon Receipt

The responsibilities of the consignee when the switchgear arrives at the site include, but are not limited to, the following:

Check the consignment is complete and without damage (e.g. look for any adverse effect caused by moisture). In case of doubt, the packing must be opened and then properly resealed with new drying agent bags (when intermediate storage is necessary).

8 Common faults and troubleshooting

Failure phenomenon	Check processing
All types RMU	
Load switch doesn't close	<div>1. Check whether switch is already open</div> <div>2. Check whether interlock selecting handle is in operation position 1</div> <div>3. Turn operating handle clockwise</div>
Load switch doesn't open	<div>1. Check whether switch is already close</div> <div>2. Check whether interlock selecting handle is in operation position 1</div> <div>3. Turn operating handle counter-clockwise</div>
Earth switch doesn't close	<div>1. Check whether switch is already open</div> <div>2. Check whether interlock selecting handle is in operation position 3</div> <div>3. Turn operating handle clockwise</div>
Earth switch doesn't open	<div>1. Check whether switch is earthing</div> <div>2. Check whether interlock selecting handle is in operation position 3</div> <div>3. Turn operating handle counter-clockwise</div>
The door of cable compartment doesn't open or close	Check whether switch is earthed
Load switch unit with motor operation	
Load switch doesn't close or open	<div>1. Check whether switch is earthed</div> <div>2. Check whether interlock selecting handle is in operation position 1</div> <div>3. Check whether auxiliary power supply is on</div>
Load switch - Fuse combined panel	
Load switch doesn't close	<div>1. If switch is opened, it means fuse wire has been blown, or the shaft notch of the motor operation mechanism turned downward before the closing operation.</div> <div>2. Replace fuse</div>
Fuse wire has been fused before operation	Check whether fuse installation is correct, the disconnect indicating indicator should be upward
Instrument transformer	
The second winding of transformer can't be metered	<div>1. Check whether all the short circuit terminals are opened</div> <div>2. Check the wiring splice of second winding</div>

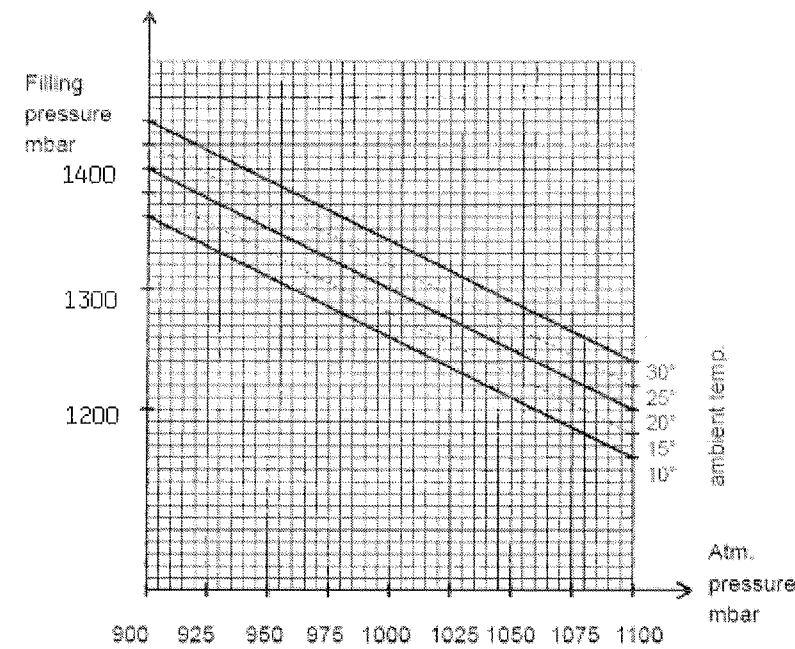


Figure 7/7: Filling pressure-Atm pressure curve

7.6.3 Refill the gas tank

SecoRMU have an interface that can be used for recycling and filling SF6 gas. SF6 recycling device can be used to suck, store SF6 gas from SecoRMU. Reverse the process can also fill the gas tank from the store vessel.

If any quantities are short, or defects or transport damage are noted, these must be;

- Documented on the respective shipping document
- Notified to the relevant carrier or forwarding agent immediately in accordance with the relative liability regulations

Note: Always take photographs to document any major damage.

Please check all the delivery documentations and accessories.

- Packing List
- User manual
- Routine test report
- Other documents required

1.5.5 Intermediate Storage

Intermediate storage should follow the following practices to avoid any negative consequences:

1.5.5.1 Panels with basic packing or without packing

- A dry, well-ventilated storeroom with a climate in accordance with IEC62271-1:2007
- Store the panels upright
- Do not stack panels

Panels with basic packing;

- Open the packing, at least partially

Panels without packing;

- Loosely covered with polythene
- Ensure that there is sufficient air circulation


Check regularly for any condensation during storage.

1.5.5.2 Panels with seaworthy or similar packing with internal protective covers

- Store the transport units;
 - Protected from the weather
 - In a dry place
 - Safe from any damage
- Check the packing for damage
- Check the drying agent;
 - On arrival of the consignment
 - Subsequently at regular intervals

1.5.5.3 When the maximum storage period (starting from the date of packing) has been exceeded

- The protective function of the packing can no longer be guaranteed
- Take suitable action if intermediate storage needs to be continued

	<p>Warning:</p> <p>Do not walk on the top of the panels (due to rupture points in pressure relief devices)! The pressure relief devices can be damaged!</p>
---	--

1.6 Floor Preparation & Fixing

In order to obtain an optimum installation sequence and ensure high quality standards, site installation of the switchgear should only be carried out by specially trained, or supervised, personnel and monitored by responsible persons.

On commencement of installation on site, the switch-room must be fundamentally finished, provided with lighting and the electricity supply, lockable, dry and with facilities for ventilation. It is also required that the basic frame and indoor ground for the switchgear should be checked and accepted before the construction.

The unit should have a minimum distance of 100 mm to rear wall, with the dimensional drawing for the number of modules or units as appropriate.

Tolerances for laying the floor frame are:

Evenness tolerance: ± 1mm within a measuring length of 1m.

Straightness tolerance: 1mm per 1m, but not more than 3mm over entire length of frame.

1.6.1 Individual Unit Dimension and Installation Diagram

All the dimension units are mm

4. Push interlock selecting handle to the middle position and lock the padlock.
5. Insert breaker storage operating handle to the energy charging aperture, turn clockwise to charge the spring. Press the closing button after charged. Then the VCB is in closed position.
6. Turn the knob on the cable cover clockwise, while lifting and pulling the lug of the cable cover at the same time, to open the cable cover.

7.6 Monitor/Refill SF6 Gas Tank

7.6.1 Pressure gauge (standard configuration)

The gas tank is equipped with a pressure gauge to indicate its inner pressure. At the normal reference temperature (20 °C), the rated SF6 gas pressure is 0.03MPa. See figure 2/2.

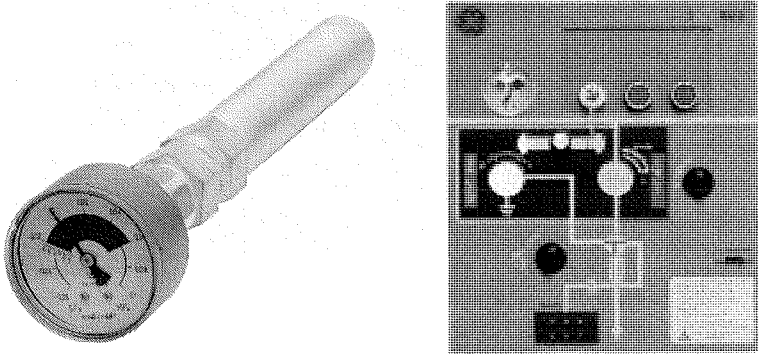


Figure 7/5: Pressure Gauge

7.6.2 Density relay (Optional configuration, need to be specified by projects)

SF6 density relay is a temperature compensated gauge to show the SF6 gas density. The indicated pressure shows the density value at 20 °C.

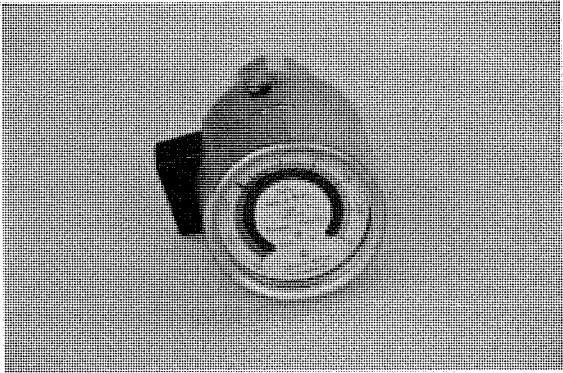
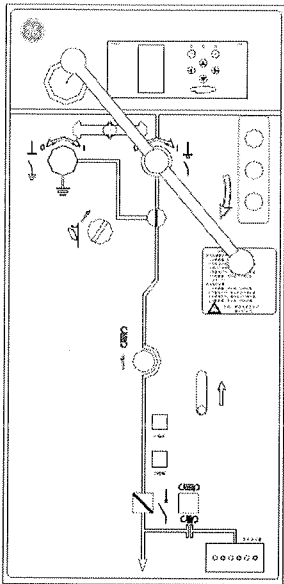
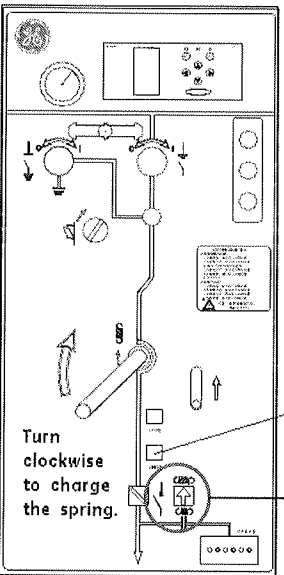


Figure 7/6: Density Relay



5. Push interlock selecting handle right to middle position and lock the padlock.
6. Insert breaker storage operating handle to the energy charging aperture, turn clockwise to charge the spring. Press the closing button after spring charged. Then the VCB is in closed position.



Charging the spring:

Insert breaker storage operating handle to the energy charging aperture, turn clockwise to charge the spring. When hear “Ka” sound, the spring is fully charged, and the indicator shows the arrow is up. Please be noted that you can’t continue to turn the breaker storage operating handle when the spring is fully charged.

7.5.2 Interruption maintenance operation steps

1. Press breaker switching opened button to open the vacuum circuit breaker.
2. Push interlock selecting handle left to expose disconnecter operating shaft. Insert the operating handle into the disconnecter operation aperture, while pulling the interlock bar up at the same time. Turn counter-clockwise to open the disconnecter.
3. Push interlock selecting handle right to expose earthing switch operating shaft. Insert the operating handle into the earthing switch operation aperture, while pulling the interlock bar up at the same time. Turn clockwise to close the earthing switch.

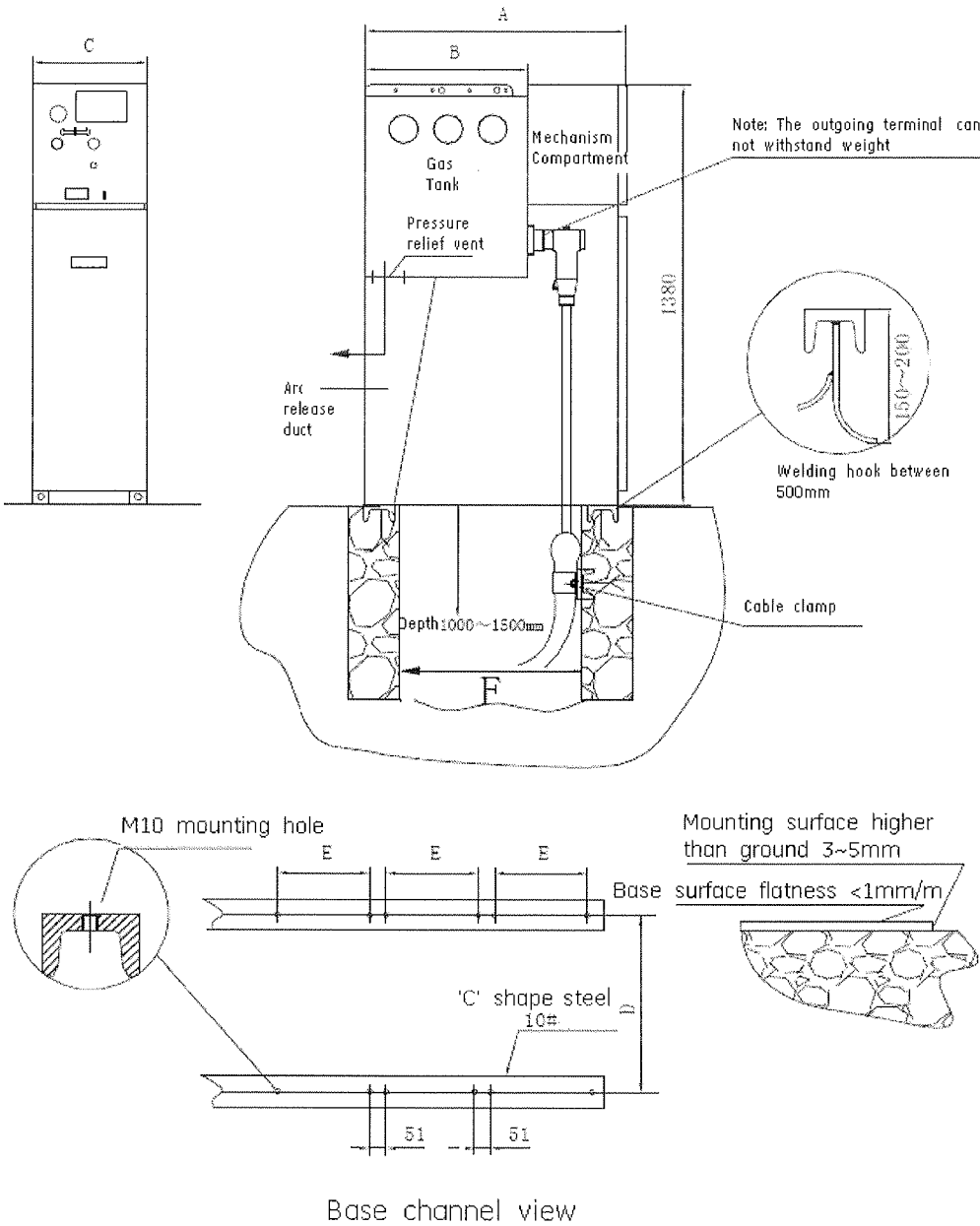


Figure1/2: Individual unit dimension and installation diagram

Parameter table 1

Rated voltage	A(mm)	B(mm)	D(mm)	F(mm)
12-24kV	800	480	720	680

Parameter table 2

Rated voltage /unit	K	T	V	B	C	M	PT	KPT
12-24kV	C(mm)	350		400	350		600	
	E(mm)	300		350	300		550	
	Weight(kg)	160	180	200	160	100	180	300

- 1) The install base is composed by two 100mm channel steel.
- 2) The cable channel depth is decided by cable type and meet relative specification require.
- 3) All units are the same depth. Distances between holes are the same 720mm long in both channel irons. It is acceptable for RMU to fix by spot welding.

1.6.2 Outdoor Switchgear Station Installation Diagram

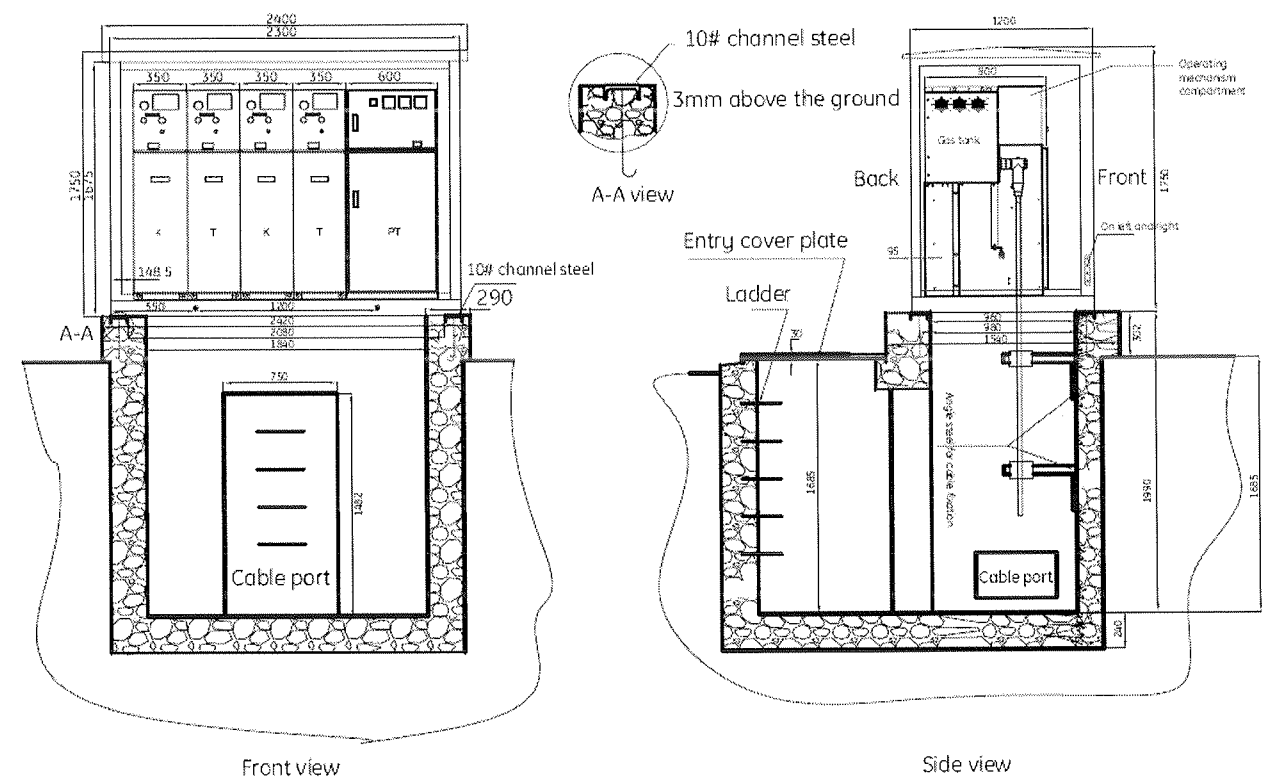
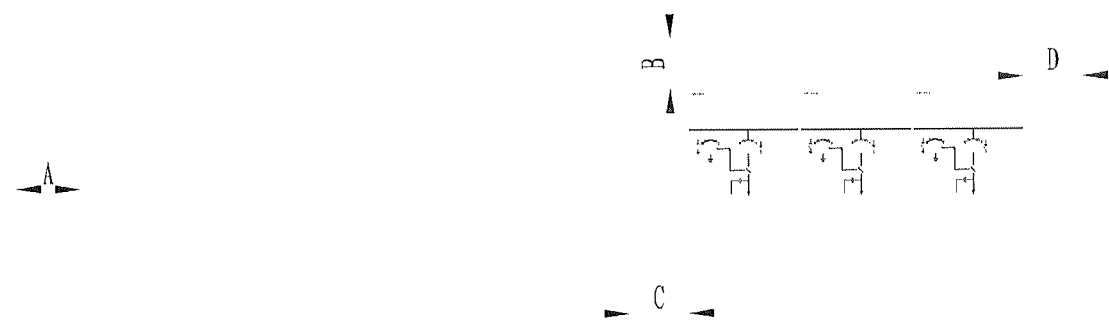


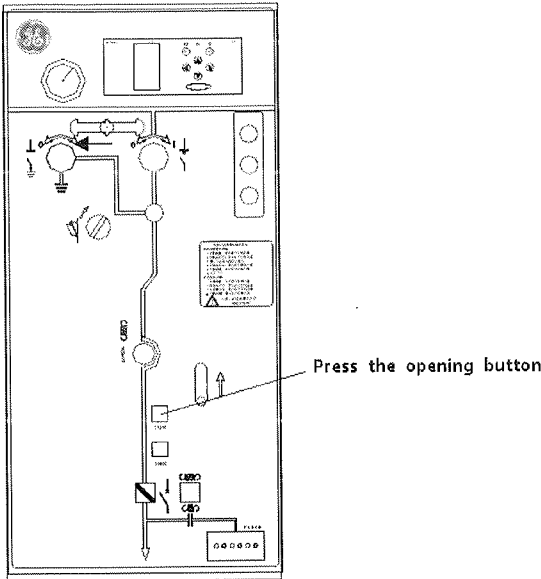
Figure1/3: Outdoor switchgear station installation diagram

1.6.3 Reserved Space For Installation

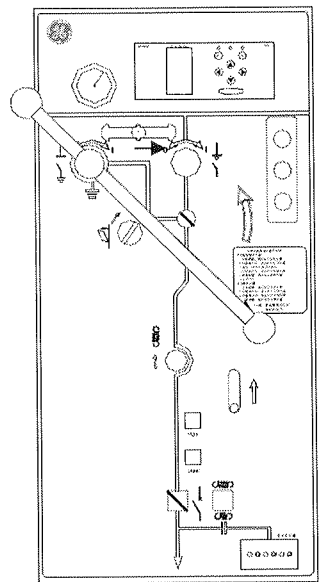


$A, C, D \geq 50\text{mm}$ $B \geq 100\text{mm}$

Figure1/4: Reserved space for installation



3. Push interlock selecting handle right to expose earthing switch operating shaft. Insert the operating handle into the earthing switch operation hole, while pulling the interlock bar up at the same time. Turn anticlockwise to open the earthing switch.



4. Push interlock selecting handle left to expose disconnector operating shaft. Insert the operating handle into the disconnector operation hole, while pulling the interlock bar up at the same time. Turn clockwise to close the disconnector.

Insert the key and turn to open position →press switching opened button → push interlock selecting handle right to expose earth switch operating shaft →Insert operating handle into the earth switch operation aperture and turn clockwise (close earth switch) → Turn the knob on the cable cover clockwise, while lifting and pulling the lug of the cable cover at the same time, to open the cable cover.

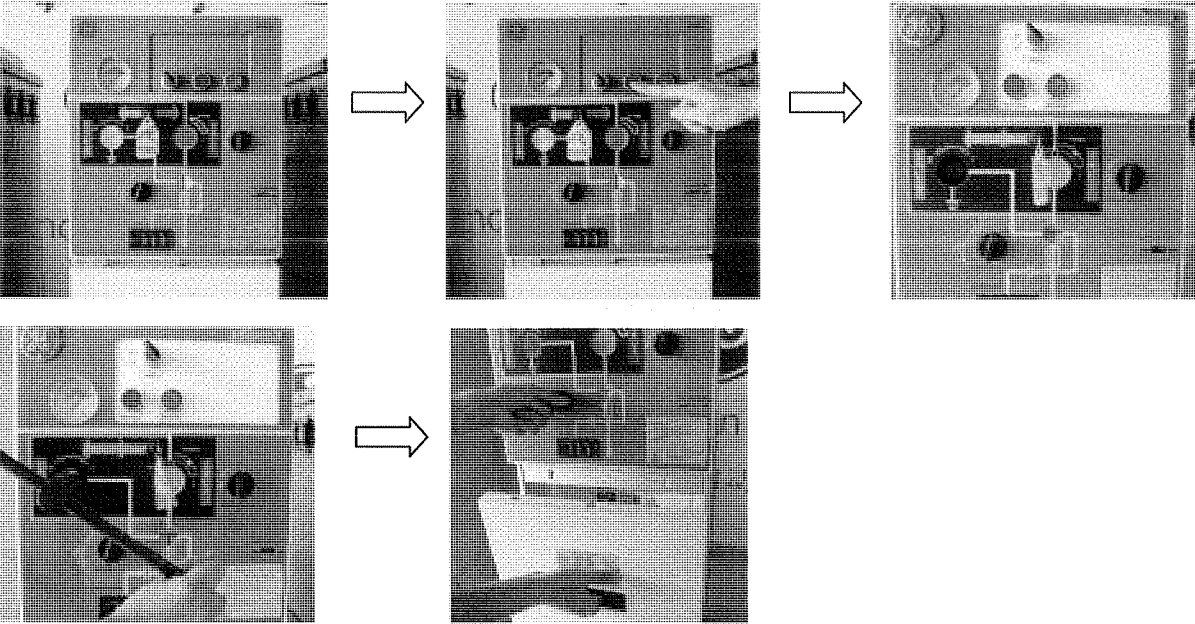


Figure 7/4: Motor Transmission operation sequence

7.5 Vacuum Circuit Breaker Unit Operation Procedure(V)

7.5.1 Energizing operation steps

1. Make sure the cable cover is in closed position.
2. Press the opening button to open the vacuum circuit breaker.

1.6.4 Preparation Before Installation

- Make completed installation plan
- Installation should be carried out by licensed operators
- Cable trench and installation foundation is ready
- HV cable layout is finished
- Controlling power supply is ready
- Lifting equipment, testing equipment, and installation tools are well prepared

Notice:

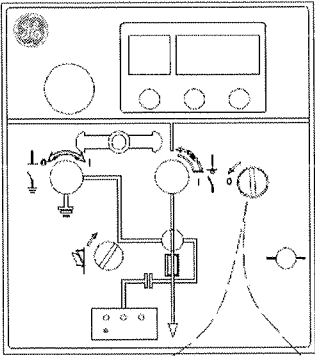
- Upon receiving the SecoRMU products, please check that the delivered equipment has not been damaged during transport. If any damage has occurred, a claim must be submitted to the carrier immediately
- Clean the dust caused by transportation
- Check the pointer on the pressure indicator is in the green position

2 Technical Specification

2.1 Technical Specification For SecoRMU

Table 2/1

No.	Description		Unit	Load Break Switch Unit	Switch Fuse Unit	VCB Unit	Bus Tie Unit
1	Rated voltage		kV	12/17.5/24	12/17.5/24	12/17.5/24	12/17.5/24
2	Rated current		A	630	(1)	630	630
3	Rated frequency		Hz	50/60	50/60	50/60	50/60
4	Power frequency withstand voltage /1min	Phase to phase and phase to earth	kV	28/38/50	28/38/50	28/38/50	28/38/50
		Across isolating distance	kV	32/45/60	32/45/60	32/45/60	32/45/60
5	Lightning impulse withstand voltage	Phase to phase and phase to earth	kV	75/95/125	75/95/125	75/95/125	75/95/125
		Across isolating distance	kV	85/110/145	85/110/145	85/110/145	85/110/145
6	Rated short circuit making current (peak)		kA	52	82	52	52
7	Rated short time withstand current (main circuit)		kA	20 -3s	-	20 -3s	20 -3s
8	Rated short-circuit breaking current		kA	-	31.5	20	-
9	Rated peak value withstand current		kA	52	-	52	52
10	Operating Sequence		-	-	-	O-0.3s-CO-180s-CO O-0.3s-CO-15s-CO	-
11	Electrical endurance capability class		-	E2 for load switch	E2 for load switch	E2 for breaker	E2 for load switch
12	Rated transfer current		A		1400		
13	Rated mainly active load-breaking current		A	630	(1)	630	630
14	Rated closed-loop breaking current		A	630	-	-	630
15	Rated cable –charging breaking current		A	16	-	31.5	16
16	Rated earth fault breaking current		A	10	-	-	-
17	Rated cable- and line-charging breaking current under earth fault conditions		A	45	-	-	45
18	Mechanism endurance		times	5000	5000	10000	5000



Turn the knob counter-clockwise to open the load break switch

2. Push interlock selecting handle right to expose earth switch operating shaft → Insert operating handle into the earth switch operation aperture, turn clockwise to close the earthing switch → Push interlock selecting handle right to middle position and lock the padlock. Turn the knob on the cable cover clockwise, while lifting and pulling the lugs of the cable cover at the same time, to open the cable cover.

(The steps above are same as K panel. Pls. refer to 7.1.2 step 3,4,5 for reference.)

Note:

Make sure to open the fuse compartment door first, then open the cable compartment door.
Make sure to close the fuse compartment door after the cable compartment door is closed.



Only when the cable is on the earth position can personnel be allowed to access the cable compartment.

7.4 Switch Fuse Unit Motor Operation Procedure (T with motor)

1. After installation, make sure the load switch is in the open position.
2. Connect the power to motor mechanism
3. Energizing operation steps

Insert the key and turn to enable position →press switching on button (green), to close the switch and charge the spring (approx. 10s) →Turn the key to disable position and remove the key.

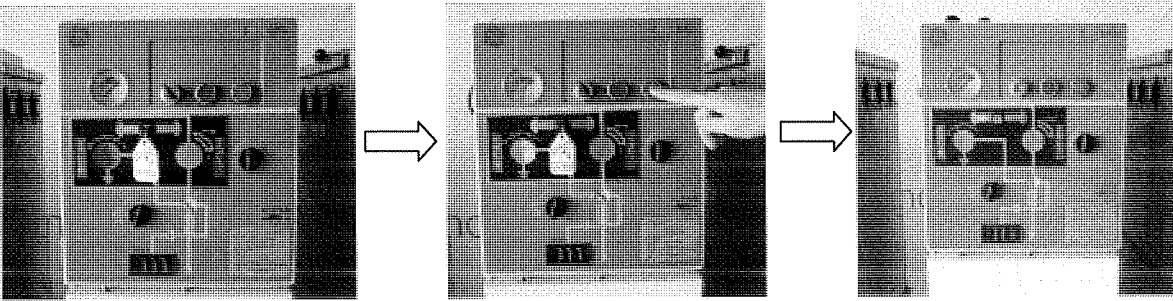


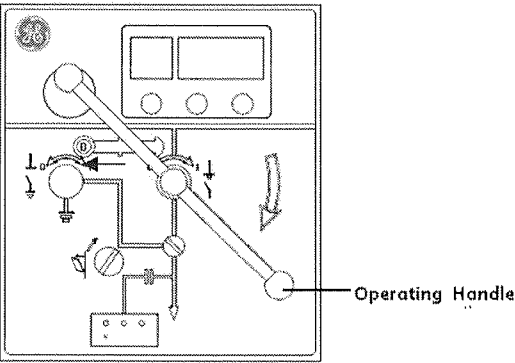
Figure 7/3: Motor Transmission operation sequence

4. Interruption maintenance operation steps

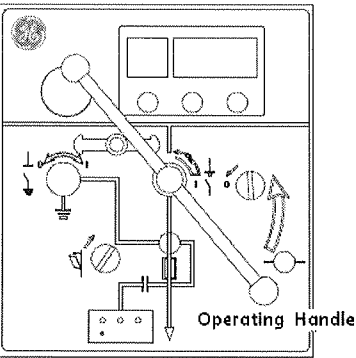
7.3 Switch Fuse Unit Manual Operation Procedure (T)

7.3.1 Energizing operation steps

- 1. Make sure the fuse is correctly fixed in fuse compartment (Please refer to 8.1 for details).
- 2. Close the cable compartment and fuse compartment door.
- 3. After installation, make sure load switch is in the open position.
- 4. Push interlock selecting handle to the left to expose load switch operating shaft →insert operating handle into the load switch operation aperture, turn clockwise to close the load break switch.



- 5. Then, turn the operating handle anticlockwise to charge the spring.



- 6. Draw out operating handle→push interlock selecting handle to the middle position and lock the padlock.

7.3.2 Interruption maintenance operation steps

- 1. Turn the knob counter-clockwise to open the load break switch

19	Dimension (W×D×H)	mm	350×800×1380	350×800×1380	350×800×1380	350×800×1380
20	Weight	kg	160	180	200	160
21	Internal arc degree	Cable compartment	20kA -1s			
		Gas tank	20kA -1s			
22	IP degree	Enclosure	IP3X			
		Gas tank	IP67			
23	Rated SF ₆ gas pressure	MPa	0.03 (relative)			
24	SF6 gas annual leakage rate		<0.1%			
25	Thickness of stainless steel gas tank	mm	3.0			
26	Electric operation control voltage		24/48/110/220V DC			
			110/220V AC			

Remark:
(1) Rated current of load break switch and fuse combination panel limited by fuse

2.2 Fuse Selection

The load break switch and fuse combination panel possess three phase high breaking capacity and current-limiting fuses. When short-circuit fault occurs, the fuse will melt, thus triggering the striker pin to trip the load break switch open to protect the transformer. Please see fuse selection Table 2/2 and Table 2/3. The tables are based on using EFEN type fuses.

Table 2/2, Recommended Fuse Ratings for Transformer
(Normal operating with no overload, -25 °C < Φ < 40 °C)

Service voltage U _n	Transformer output(KVA)														Rated voltage range of fuse-link
	50	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	
10/12kV	10	16	20	20	25	31.5	40	40	50	63	80	100	*	*	6/12KV
15/17.5kV	4	10	16	16	20	20	25	31.5	40	40	50	63	*	*	
20/24kV	4	10	10	16	16	20	20	25	31.5	40	40	50	63	80	

Note:
* Please contact GE for further information.

Table 2/3, Recommended Fuse Ratings for Transformer
(Normal operating with 20% overload, -25 °C < Φ < 40 °C)

Service voltage U _n	Transformer output(KVA)														Rated voltage range of fuse-link
	50	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	
10/12kV	10	16	20	20	25	31.5	40	40	50	63	80	100	*	*	6/12KV
15/17.5kV	4	10	16	16	20	20	25	31.5	40	40	*	*	*	*	
20/24kV	4	10	10	16	16	20	20	25	31.5	40	40	50	*	*	

Note:
* Please contact GE for further information.

The dimension of the fuse-link (all the dimension units are mm)
EFEN type fuse is according to IEC 60282-1 dimensional standard, with striker pin.

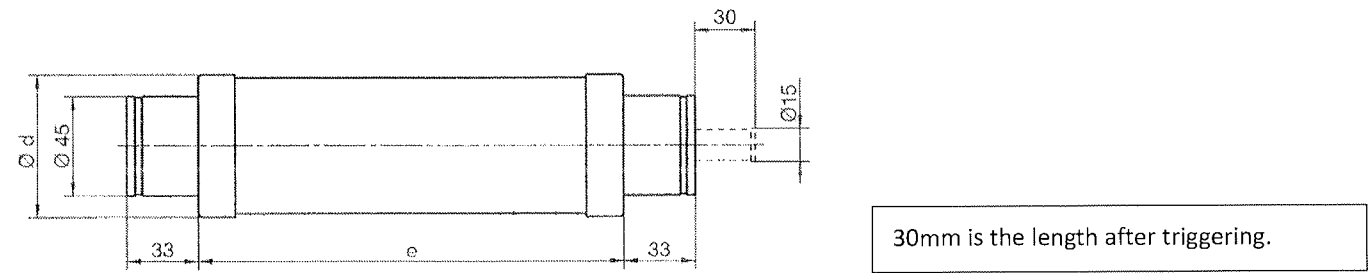


Figure2/1

The dimension of “e” and “d” varies depending on the rated voltage of HV fuse-links. See Table 2/4.

7.2 Load Break Switch Unit Motor Operation Procedure (K with motor)

- 1. After installation, make sure load switch is in the open position.
- 2. Connect the power of motor mechanism
- 3. Energizing operation steps

Insert the key and turn to enable position →press switching on button (green) to close the load break switch → Turn the key to disable position and remove the key.

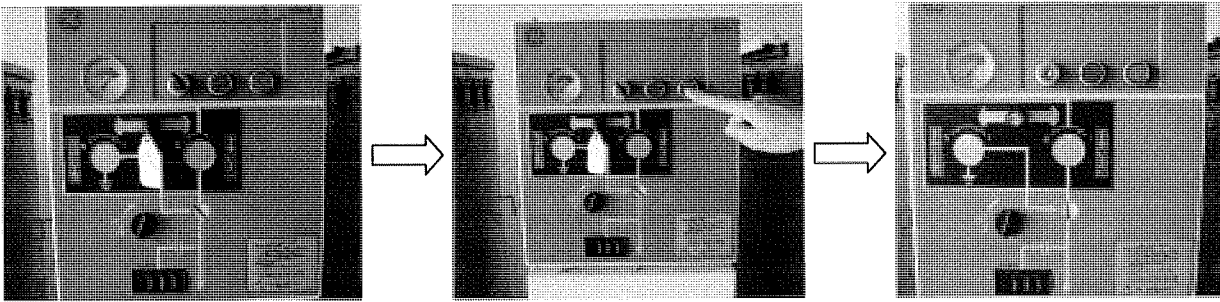


Figure 7/1: Motor transmission operation sequence

- 4. Interruption maintenance operation steps (load switch is closed)

Insert the key and turn to enable position →press switching opened button (red) to open the load break switch → push interlock selecting handle to the right to expose earth switch operating shaft →Insert operating handle into the earth switch operation aperture to close the earthing switch →Turn the knob on the cable cover clockwise, while lifting and pulling the lugs of the cable cover at the same time, to open the cable cover.

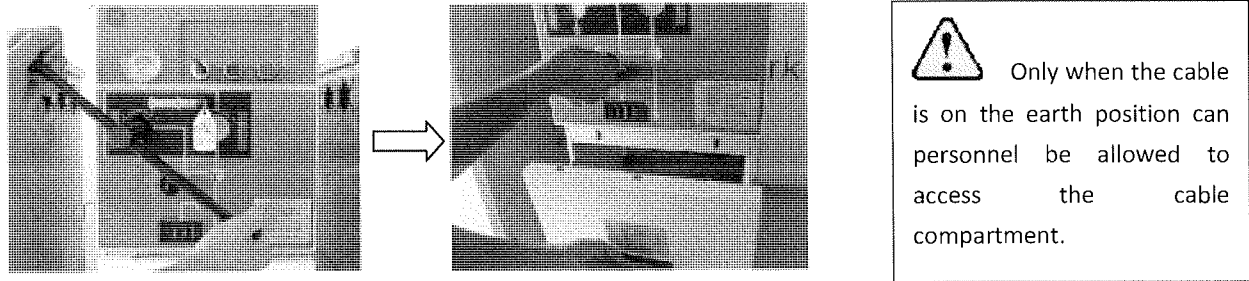
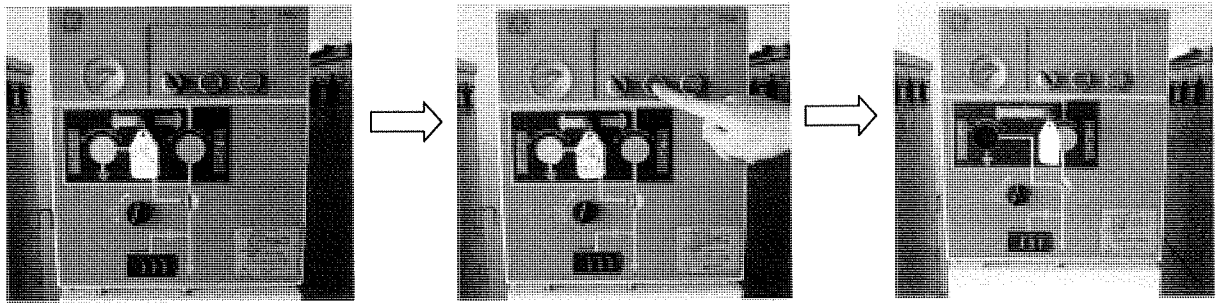
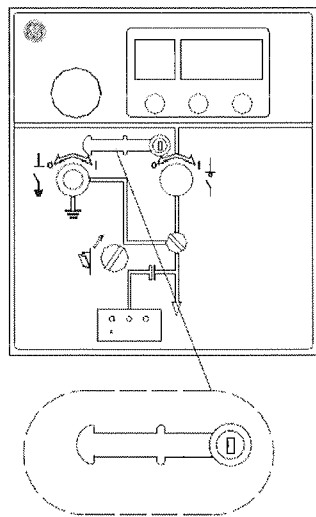
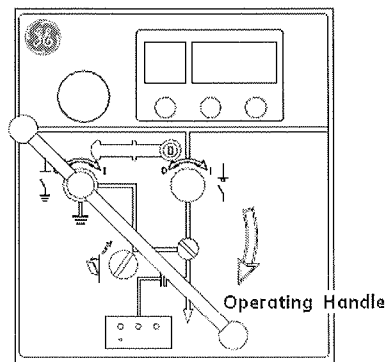


Figure 7/2: Motor maintenance operation sequence

shaft.



4. Insert operating handle into the earth switch operation aperture, turn clockwise to close the earthing switch.



5. Push interlock selecting handle right to middle position and lock the padlock. Turn the knob on the cable cover clockwise, while lifting and pulling the lug of the cable cover at the same time, to open the cable cover.

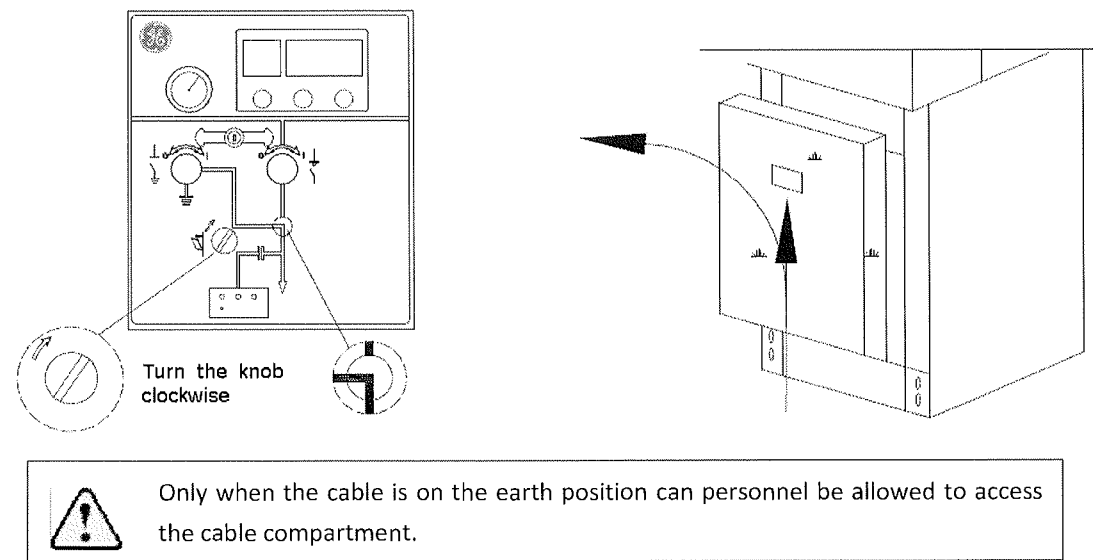
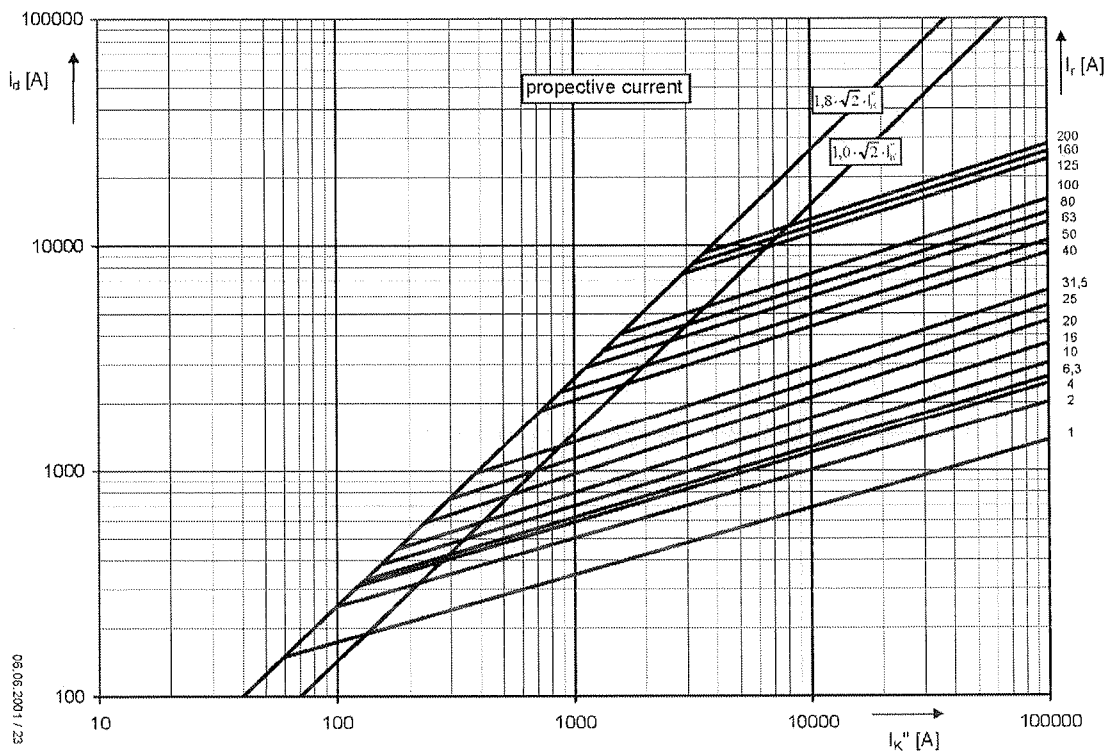


Table 2/4

Rated current (A)	1	2	4	6.3	10	16	20	25	31.5	40	50	63	80	100	Rated voltage range of fuse-link(KV)
e (mm)	442														6/12, 10/24
d (mm)	56														6/12
	56														10/24



Lab-No. 01170 6/12 KV 1 A - 200 A acc. to IEC 60282-1 / VDE 0670 Teil 4
Order-No.: 67220.0019 to 67220.2009
Cut-off characteristics of H.V. back-up fuse-links
with ŨLA (controlled power dissipation)

Figure2/2: (6-12KV fuses) Current limiting curves

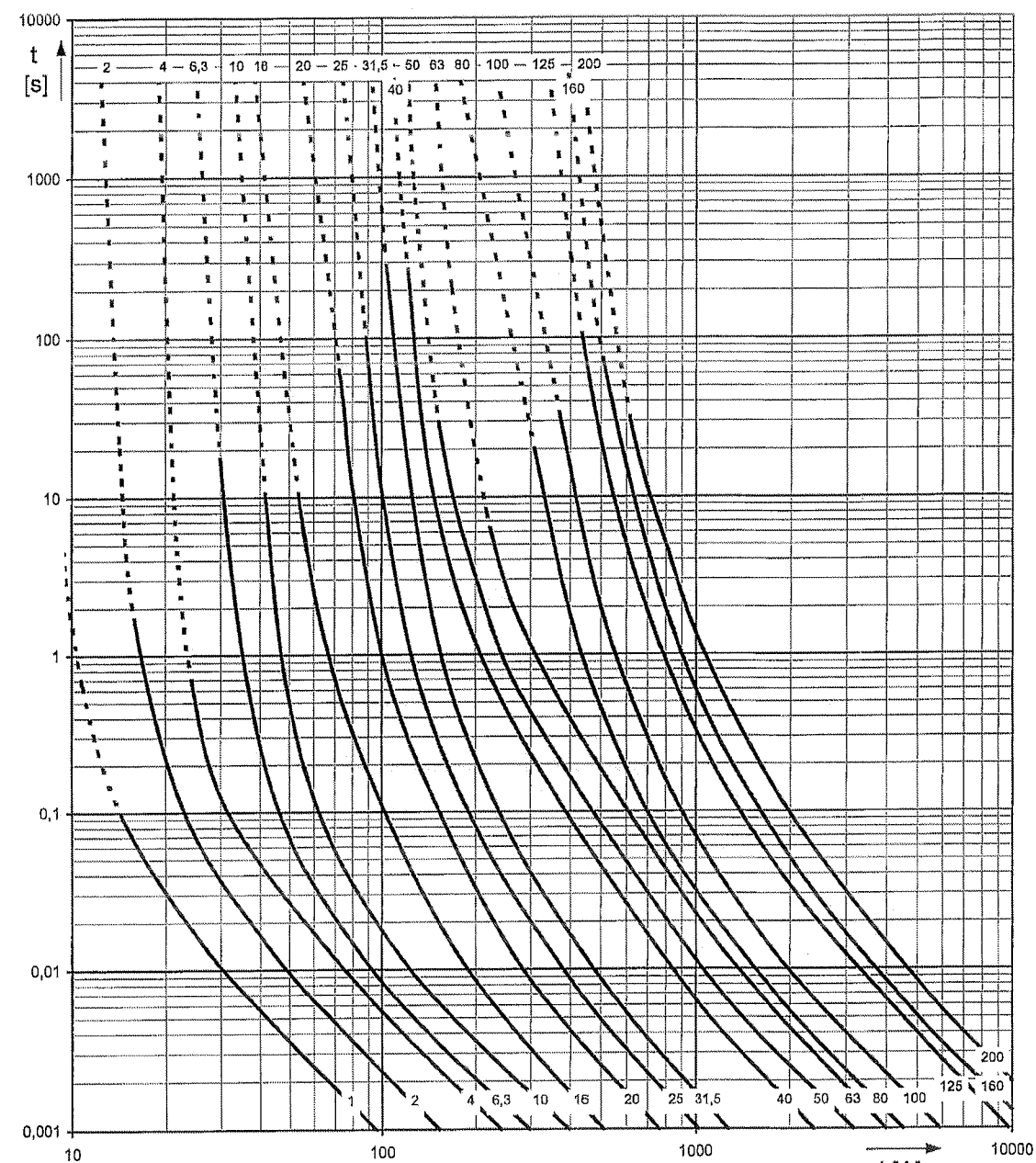
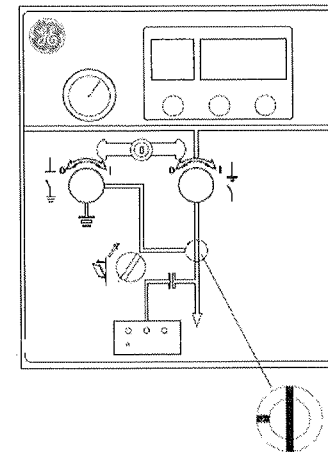


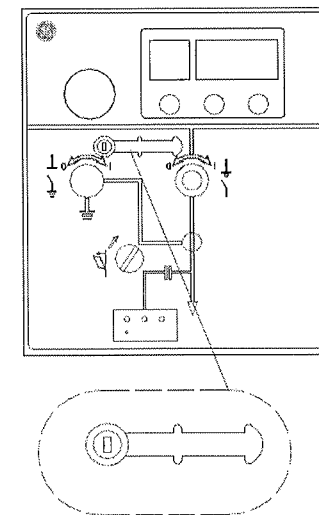
Figure2/3: (6-12KV fuses) Current limiting curves

5. Push interlock selecting handle right to middle position and lock the padlock.

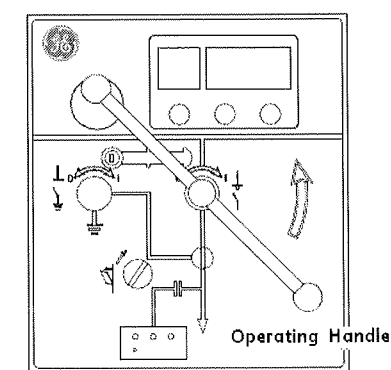


7.1.2 Interruption maintenance operation steps (load switch is closed)

1. Push interlock selecting handle left to expose load switch operating shaft.



2. Insert operating handle into the load switch operation hole, turn counter-clockwise to open the load break switch.



3. With the load break switch open, push interlock selecting handle to the right to expose earth switch operating

7 Operation Procedure

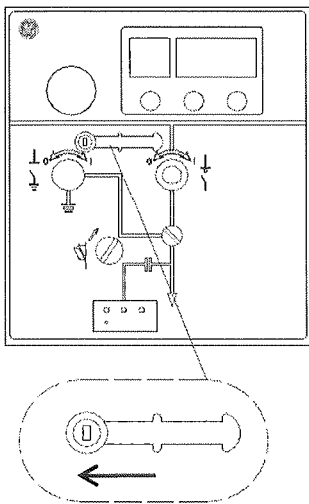


- Check the gauge pressure of SF6 gas tank before live operation.
- If operation can't be finished by normal force, please check whether the operation is permitted.
- If operation should be permitted but still can't be execute by normal force, please contact GE.

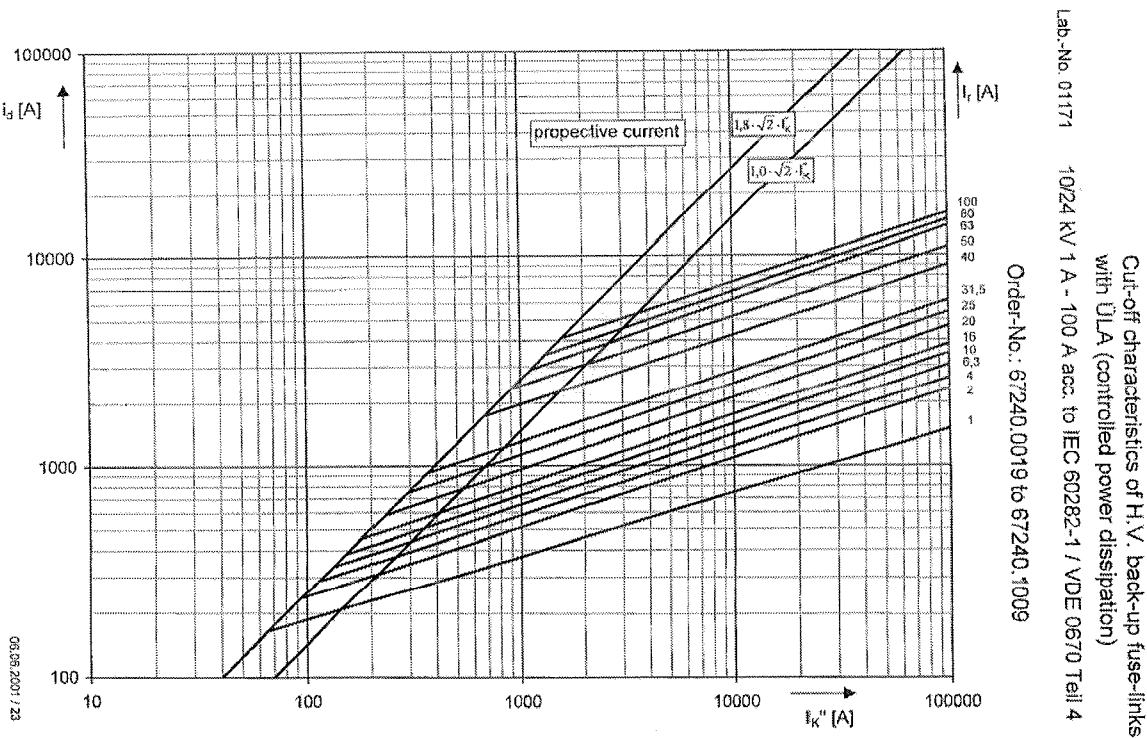
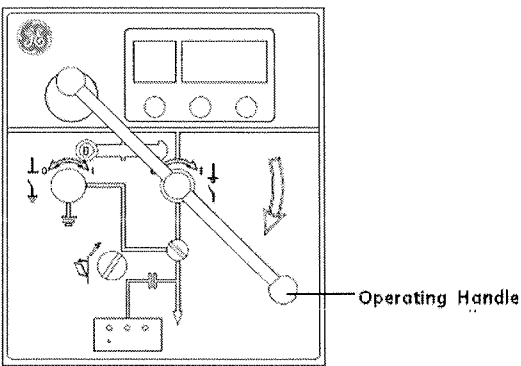
7.1 Load Break Switch Unit Manual Operation Procedure (K)

7.1.1 Energizing operation steps

1. After installation or maintenance, make sure the cable cover is in the closed position.
2. Make sure the load break switch is in the open position.
3. Push interlock selecting handle left to expose load break switch operating shaft. (with the load break switch open)



4. Insert operating handle into the load break switch operation aperture, turn clockwise to close the load break switch.



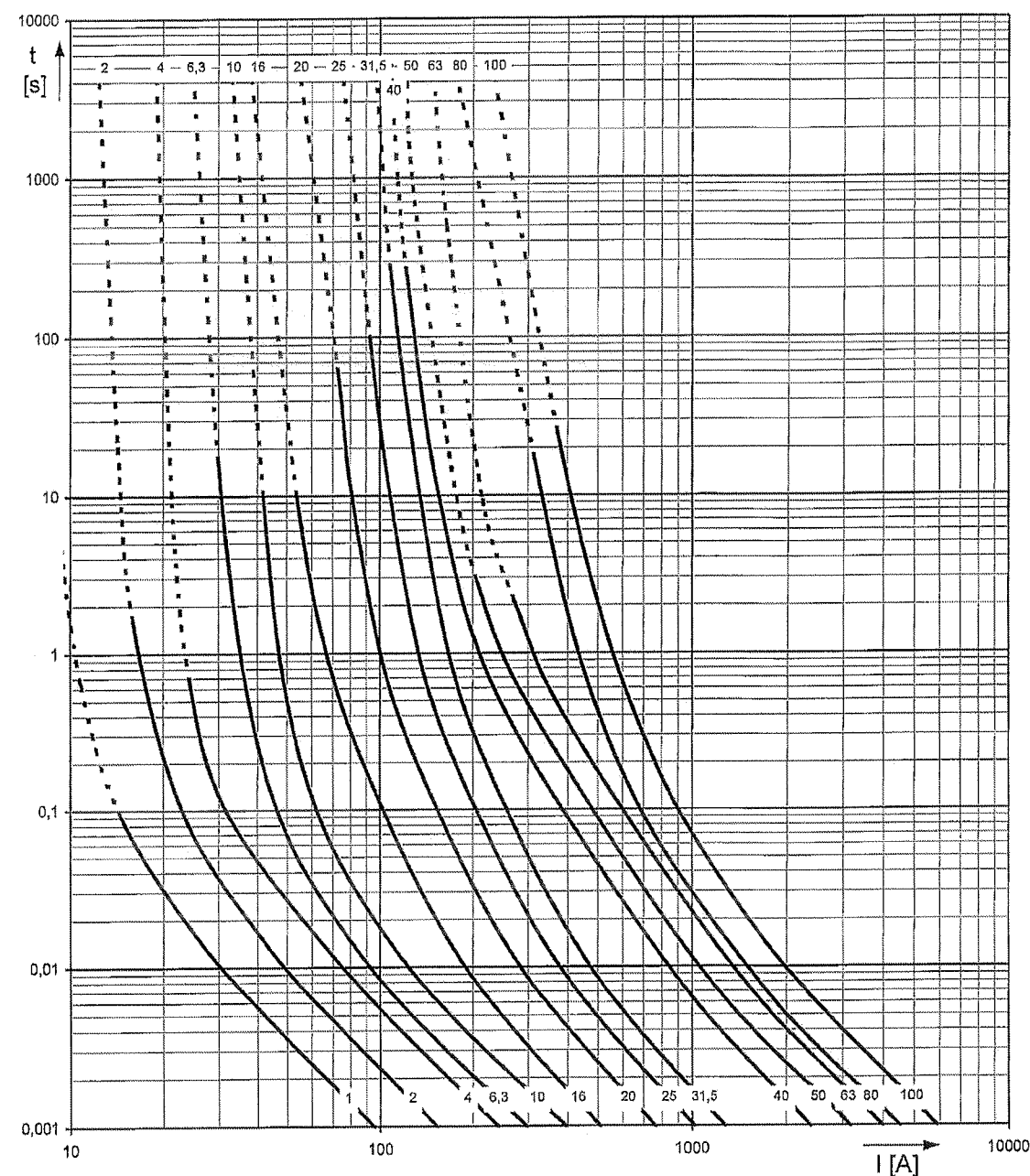


Figure 2/5: (10-24KV Fuse) Time-current characteristic curves

6.2.3 Earthing switch operation position

Earthing switch can be opened and earthed. When it's on earth position, cable compartment door can be opened.

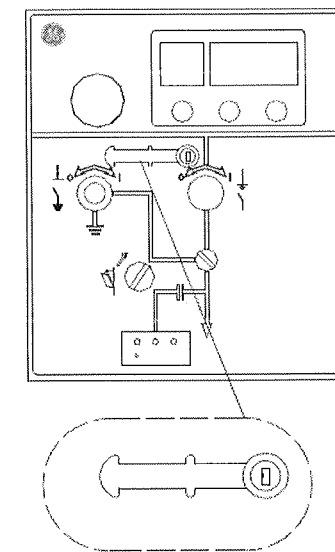


Figure 6/3: Position 3

6.3 Key Interlocking

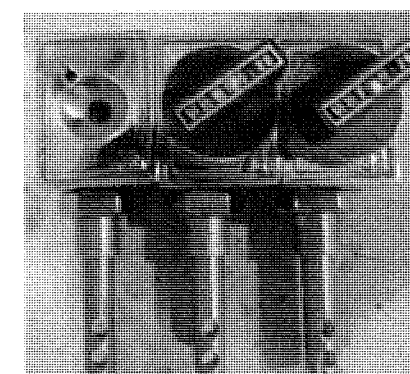


Figure 6/4: Three locks and two keys

This key interlock solution is designed for two incoming cabinets which can't be simultaneously into power grid at same time, so they require a key interlock.

- **Three locks:**

Can be installed on two incoming cabinets and one bus tie cabinet respectively.

- **Two keys:**

When load break switch is open, can take out the key (lock operating shaft).

When load break switch is closed, can't take out the key (can't lock operating shaft).

6.2.1 Load break switch operation position

Load switch can be opened and closed while the cable compartment door can't be opened.

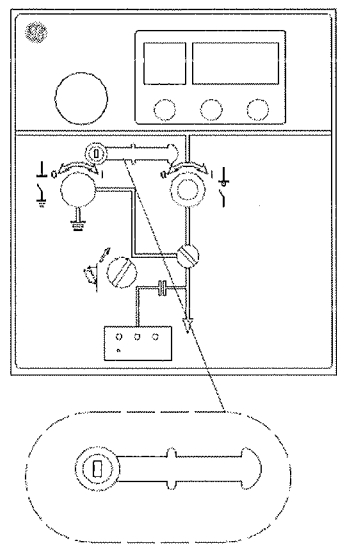


Figure 6/1: Position 1

6.2.2 Locking position

Load switch and earthing switch can't operate in this position. Cable compartment door can't open.

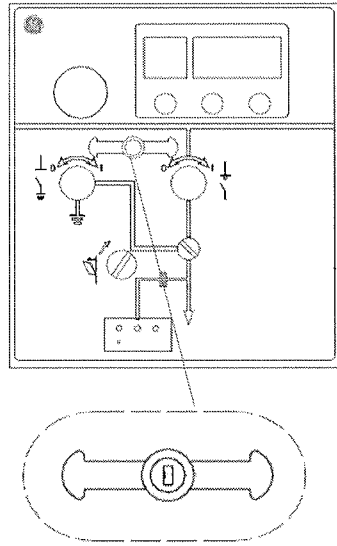
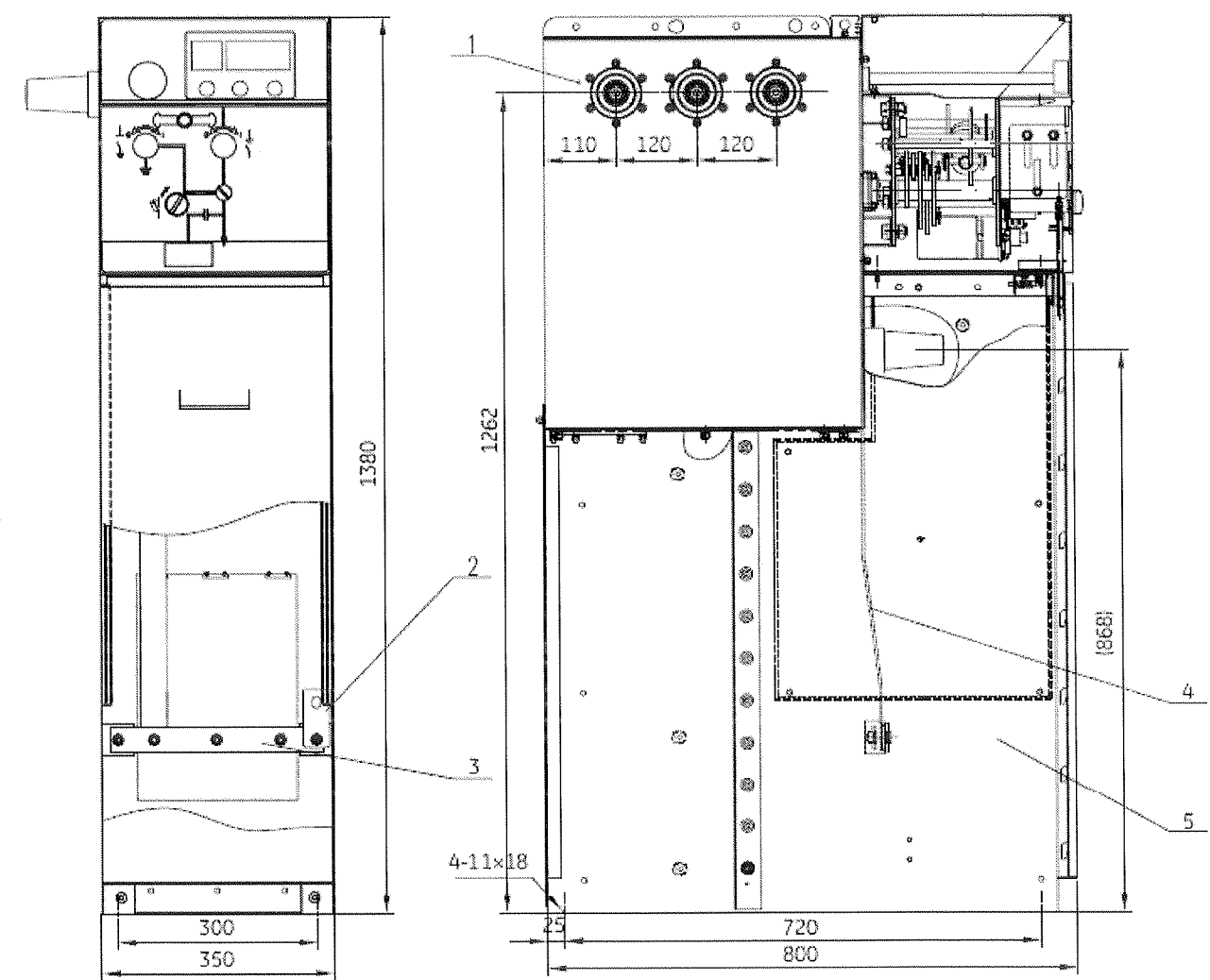


Figure 6/2: Position 2

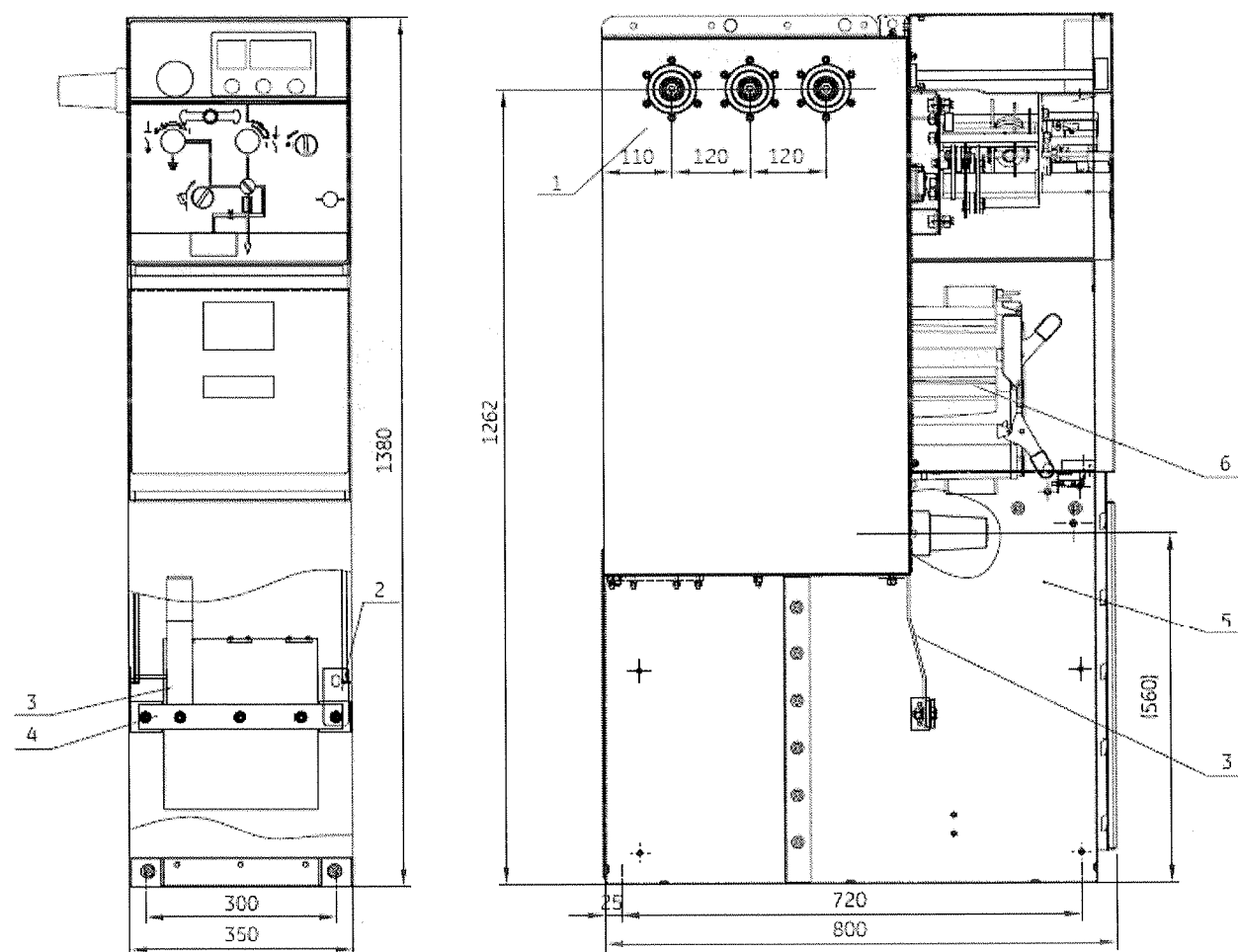
3 SecoRMU Design and Structure

3.1 Dimension and Configuration



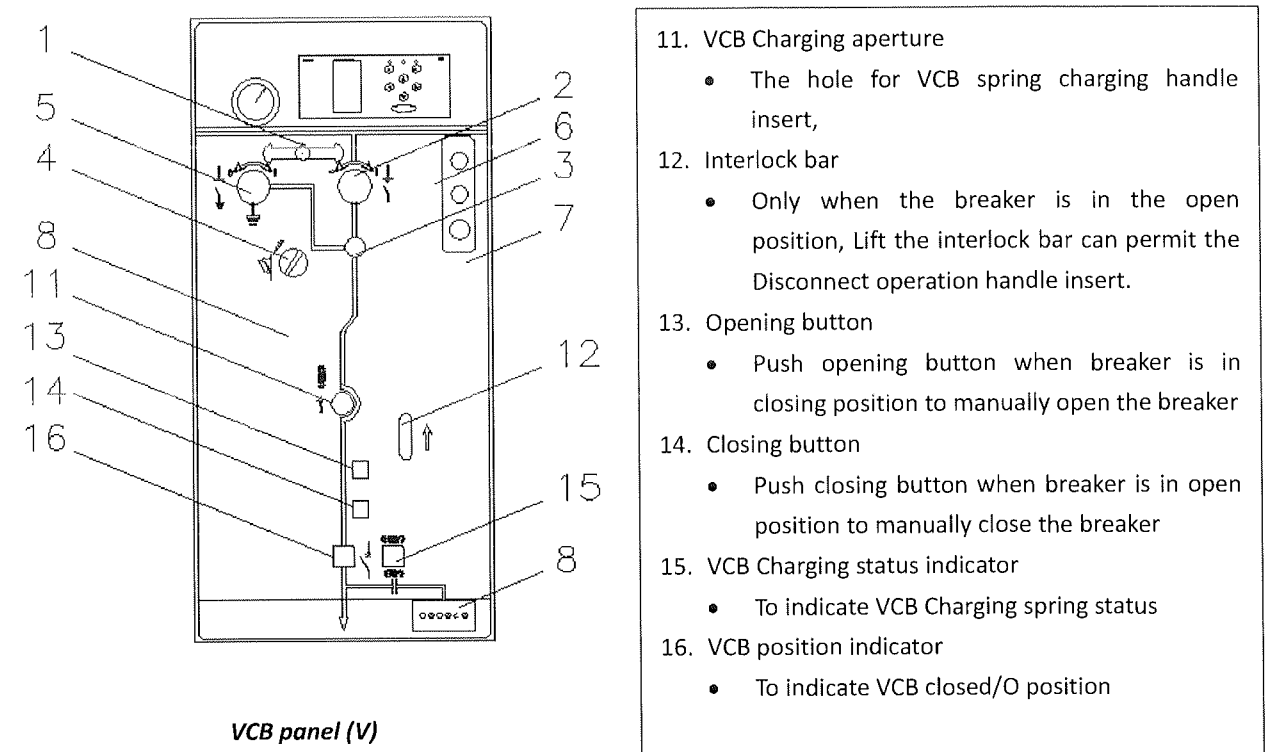
NO.	Title
1	K gastank assembly
2	Earthing copper bar between panels
3	Earthing bar
4	Vertical earthing copper bar
5	Assembly of K frame
6	

Figure3/1: Load break switch panel



NO.	Callout	Title
1		T gastank assembly
2		Earthing copper between panels
3		Vertical earthing copper
4		Earthing copper
5		Assembly of T frame
6		Fuse holder

Figure3/2: Switch Fuse Combination Panel



VCB panel (V)

6.2 Interlock Selector Function and Interlock Specification

Position 1: Load switch operation	Open load switch operation hole. Load switch can be opened and closed while the cable compartment door can't open
Position 2: Padlock	Load switch and earthing switch can't operate by closing the hole. Cable compartment door can't open
Position 3: Earthing Switch operation	Open earthing switch operation hole, it can open and be earthed. When it's on earth position, cable compartment door can open

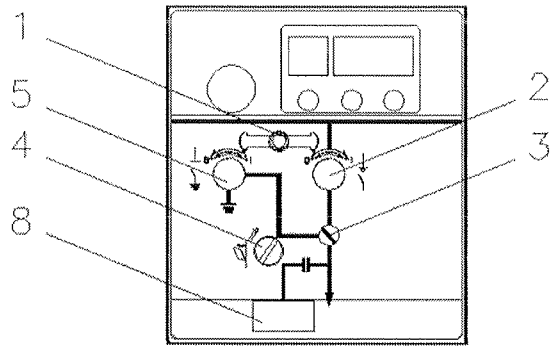
	Earthing switch position	Load break switch operation	Door Condition
Position Select			
Switch position			Door Closed
			Door Open

6 Operation and Interlock

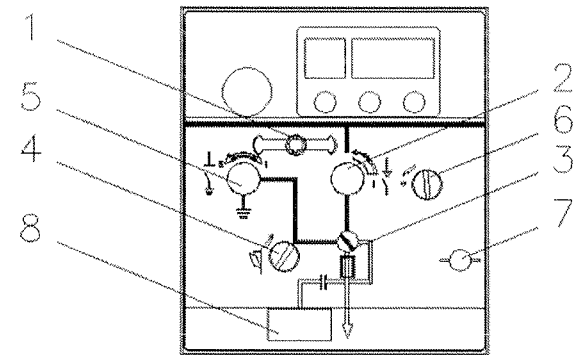
6.1 Function and Interlock Specification

There is a main circuit mimic diagram and switch position indicator at the top of each unit's front cover. The highly reliable indicator connects with main spindle without an intermediate mechanism.

Carry out the operation through interlock selector. Adopt mechanism interlock to prevent mis-operation.

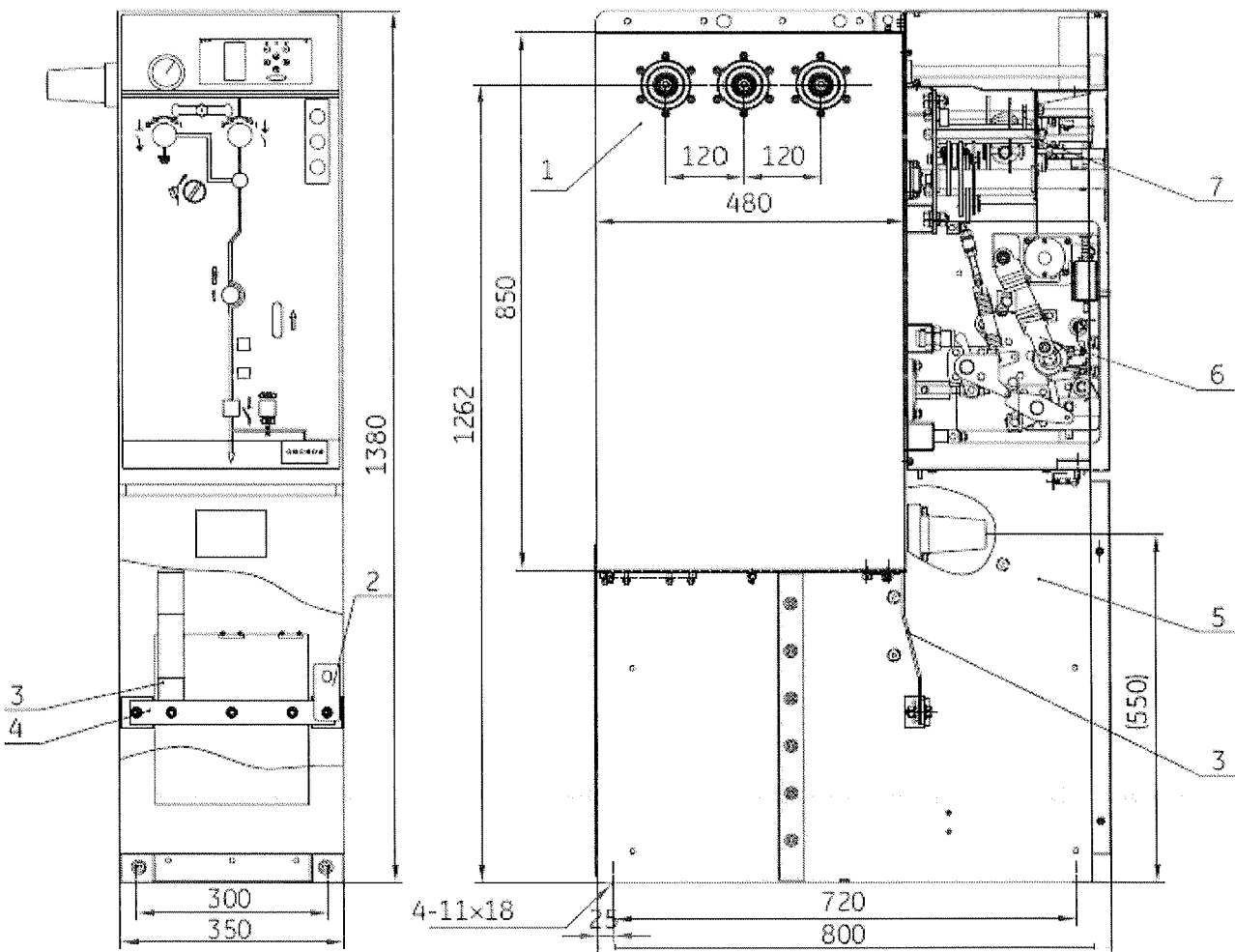


Load switch panel (K)



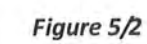
Combined panel (T)

- 1. Interlock select handle
 - Push left/right to expose the corresponding operation holes to operate earth switch or load switch.
 - With interlock function to prevent operation
 - Able to install padlock to prevent operation
- 2. Load switch / disconnect switch operation aperture
 - For load switch operating handle to insert for manual operation
- 3. Position indicator
 - Indicating switch status
- 4. Cable compartment operator
 - Open the lower door after turning clockwise in place
 - Mechanism interlock: can't turn before earthing switch is closed
- 5. Earth switch operation aperture
 - For earth switch operating handle to insert
- 6. Load switch emergency breaking operator
 - To break load switch manually rapidly
- 7. Fuse status indictor
 - Green in normal condition
 - Red after the fuse fused
- 8. Voltage display device



NO.	Title
1	V gastank assembly
2	Earthing copper between panels
3	Vertical earthing copper
4	Earthing copper
5	Assembly of V frame
6	CB operating device
7	Operate machine(manual)

Figure3/3: Vacuum Circuit Breaker Panel



-

Figure 5/3

5 HV Cable Installation



The cable boot installation and cable terminations assembly should be performed by an experienced operator who has received training, and be performed as per cable termination user manual or assembly instructions.

SecoRMU is equipped with outer cone type cable bushings which comply with EN 50181, DIN47636 interface.

The manufacturer’s installation instructions must be followed:

Be sure to lubricate the bushings thoroughly with the silicone provided.

- 1. HV cable can be installed only after the panels have been fixed on the foundation.
- 2. Make sure the depth of cable trench is deep enough, otherwise the cable will bend too much and bear long-term force, which will reduce the reliability. Pay attention to the phase sequence while laying out cables. Make sure the gravitational force and pulling force of cables should be endured by cable clamps.
- 3. Make sure the cable terminals are dry and free from dirt inside the bushing. When the ring main unit is placed in an outdoor switchgear station enclosure, it’s forbidden to install cable terminals during conditions of high humidity such as fog or rain.
- 4. When crimping cable lug, take care that installation holes and bushing holes on the units align with the centre line. Polish any burrs and oxide off the lug and make sure lug is close to the bronze surface of bushing. (As shown in Figure 5/1).

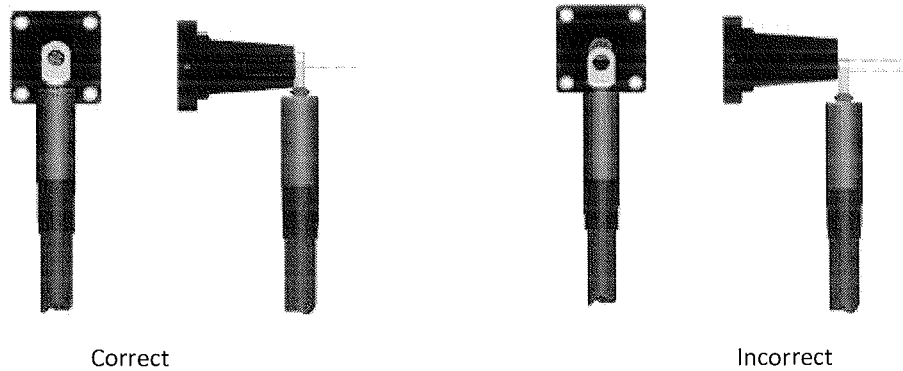


Figure 5/1

- 5. The process of assembling cable terminal from strip cable set should be completed as quickly as possible to reduce the exposure time of insulating layer. Cable core and insulating layer shouldn’t be damaged while stripping and cutting cable. The length should be adjusted based on each phase, especially three-phase core (As shown below in Figure 5/2).

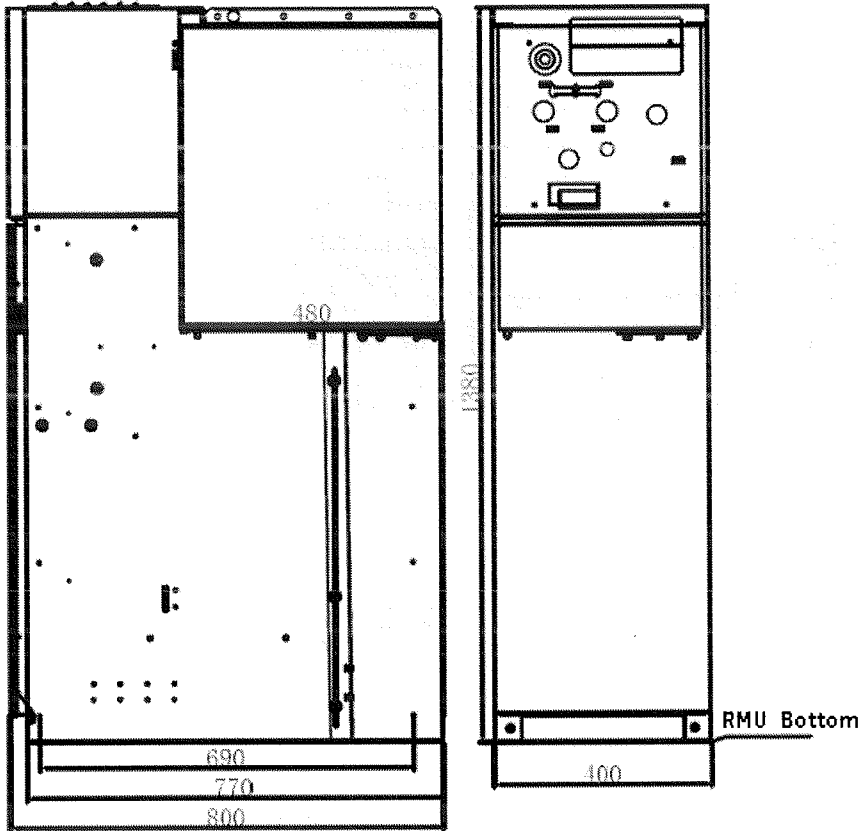


Figure3/5: Bus Tie Panel

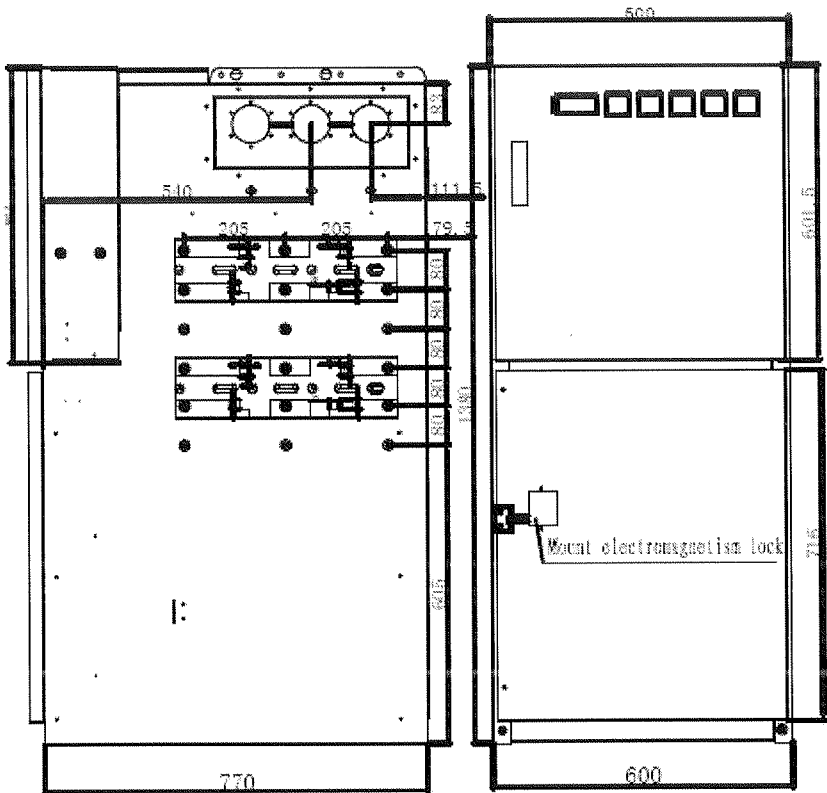


Figure3/6: PT Panel

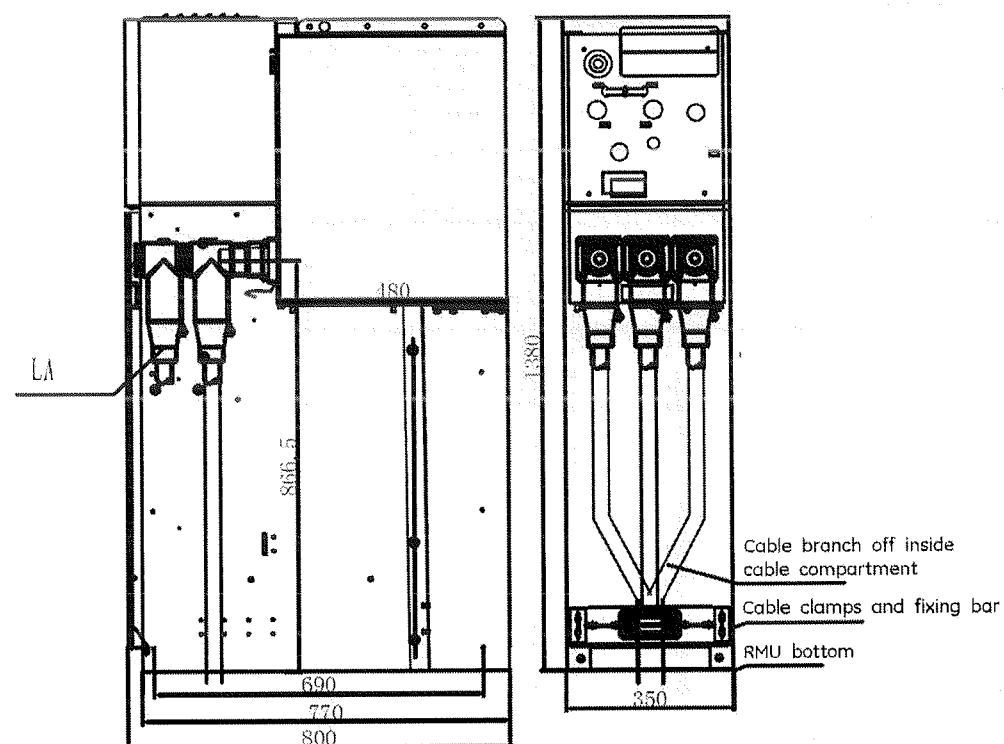


Figure3/7: Bus Lifting Panel (C2 - Gas Insulated)

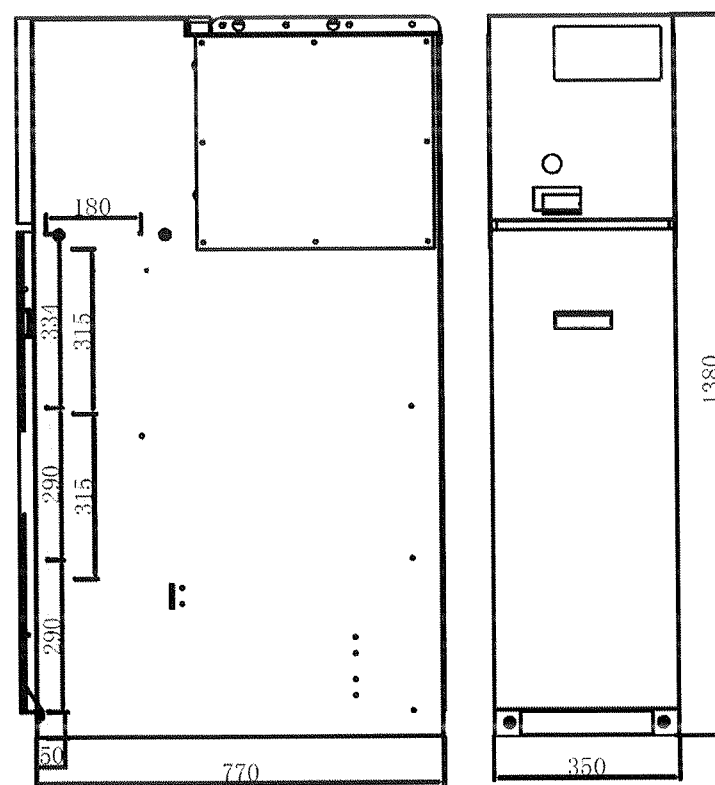


Figure3/8: Bus Lifting Panel (C1 - Air Insulated)

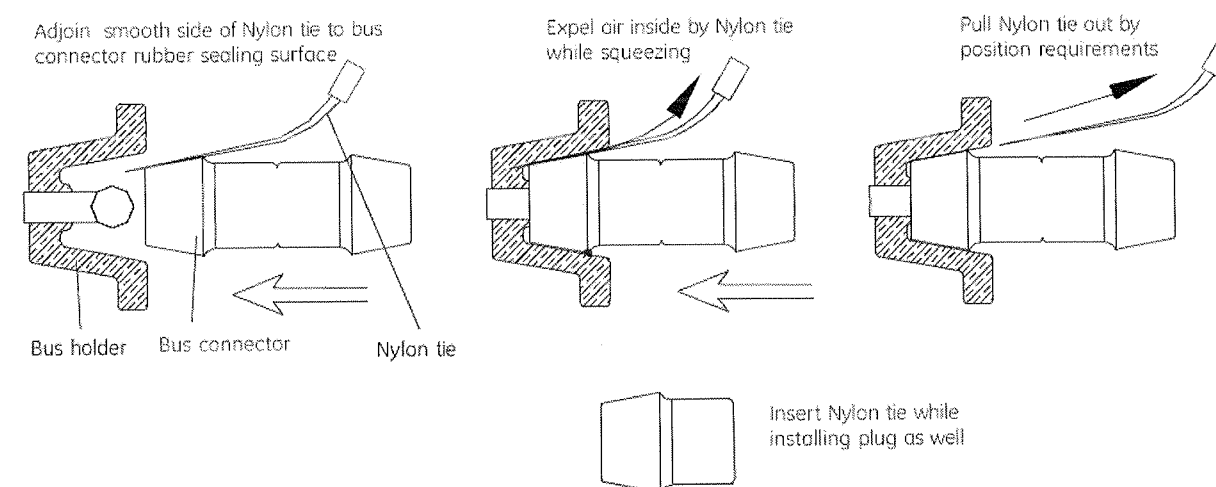


Figure 4/7: Use nylon tie to expel the air

4.4 Earthing Busbar Connection

- The earth busbar connectors are supplied with panels. Connect all the panels' earth busbar one by one, make sure all the connector surface are clean and all the bolts are tightened
- Connect the units' earth busbar with the earth system of transformer substation. The section of earth system may not be smaller than units' earth busbar

4.5 Control Cable Connection

Installation process:

- Send the control cable into the unit
- Strip cable set, fix the cable on the top of channel and put control cable into LV compartment
- Connect control cable to terminal according to diagram
- Send control cable to adjacent unit through bushing hole

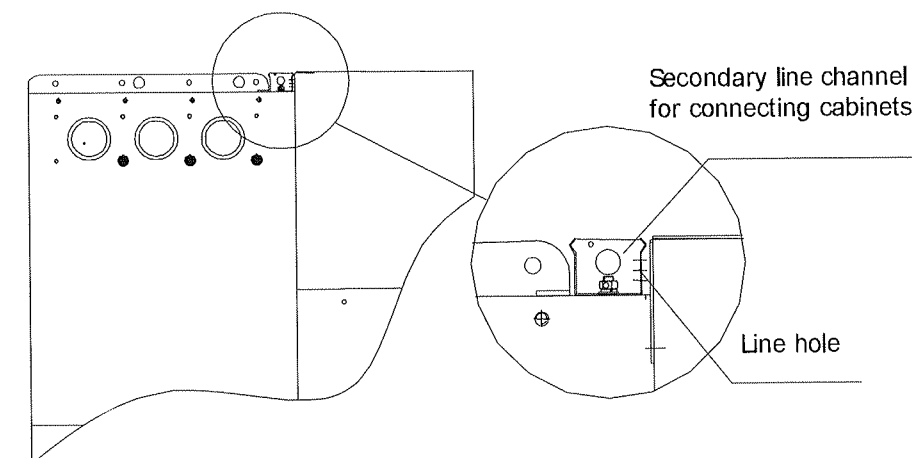
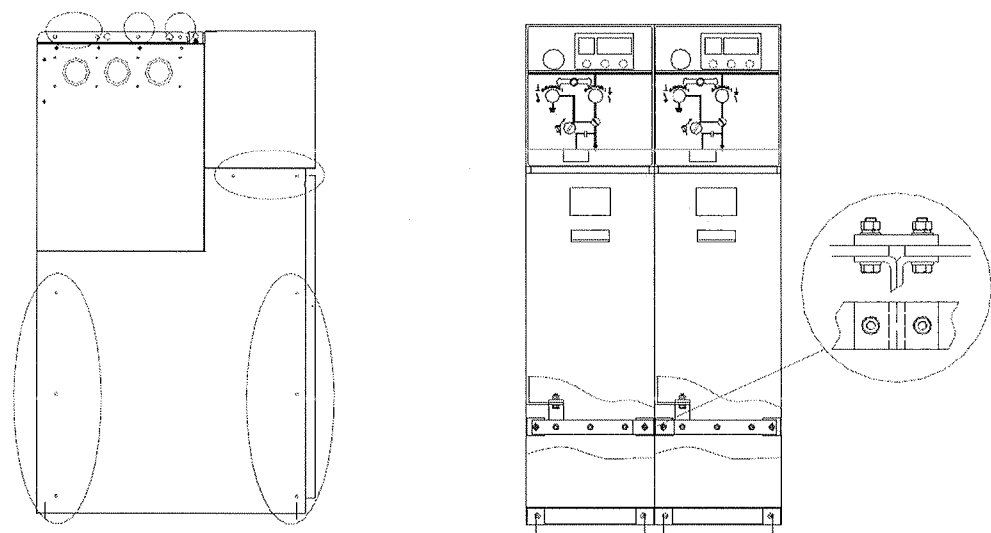


Figure 4/8: Control cable connection

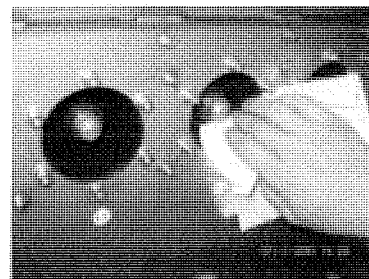


Circled are assembly bolt holes. Connect earthing busbar between panels.

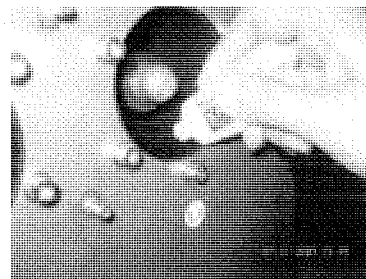
Figure 4/5: Joining process

4.3 Plug Installation

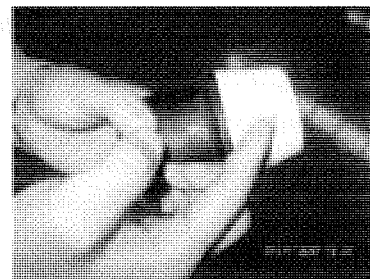
1) Clean the bus connector holder



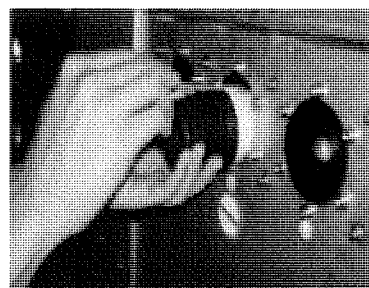
2) Put silicone on the inner surface of holder



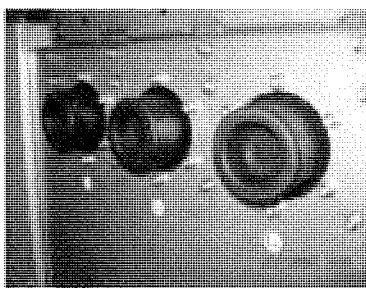
3) Clean plug and put silicone on it



4) Insert plug



5) Insert plug one by one



6) Tighten the plug block

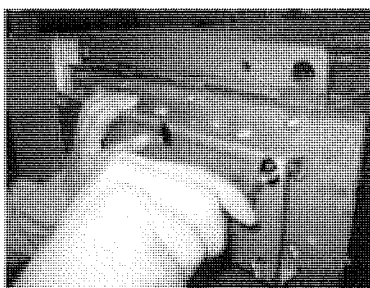


Figure 4/6: Terminal plug installation



Notes: Insert nylon tie while installing busbar connector/ end plugs. When the distance piece between the side walls is 3-6mm, pull out the Nylon strip to expel air from the busbar extension. Since air inside might decrease the insulating performance, such process will prevent partial discharge on the busbar connector/ end plugs.

3.2 Wiring of Internal Device

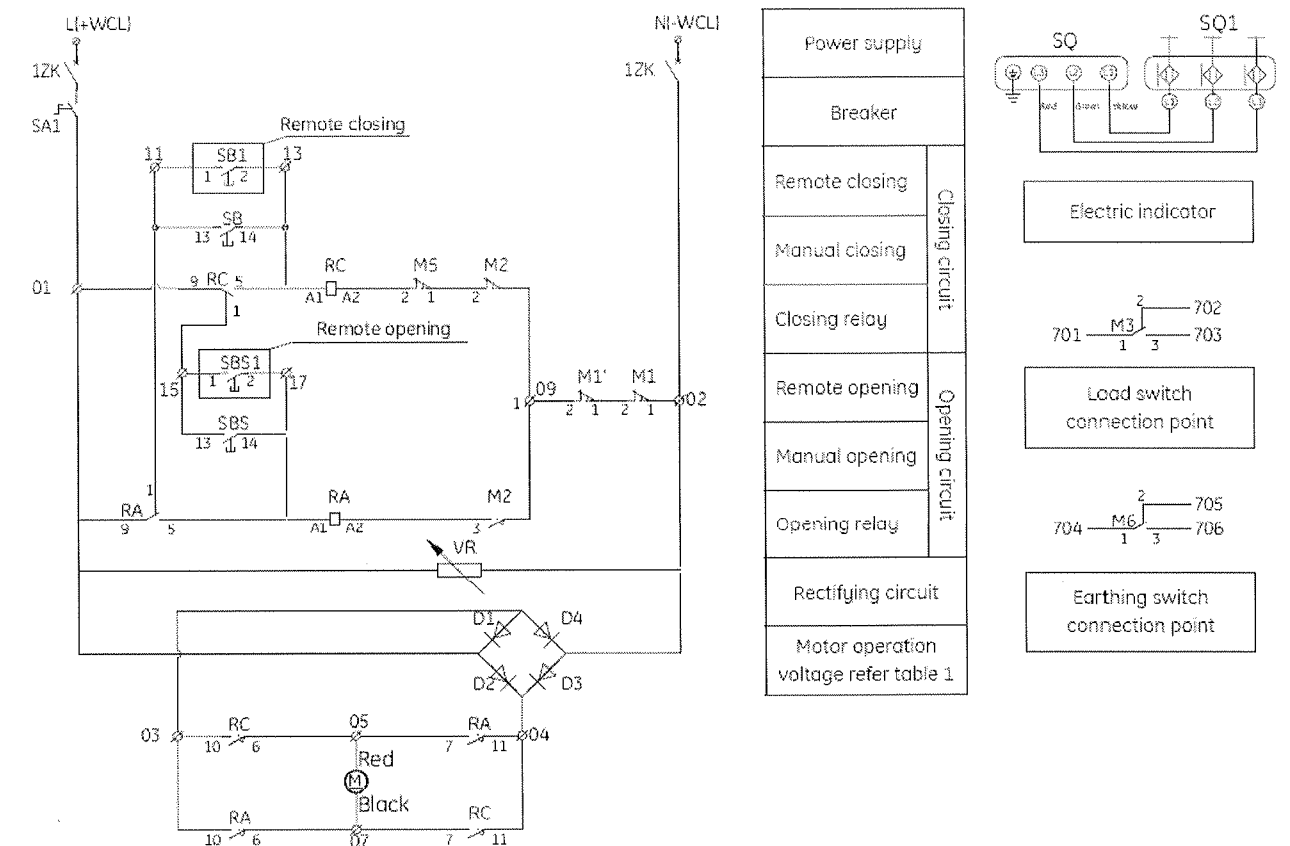
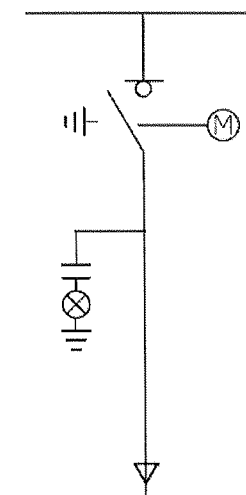
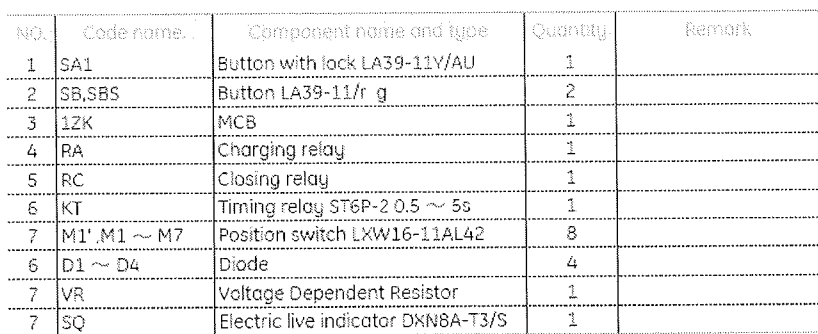
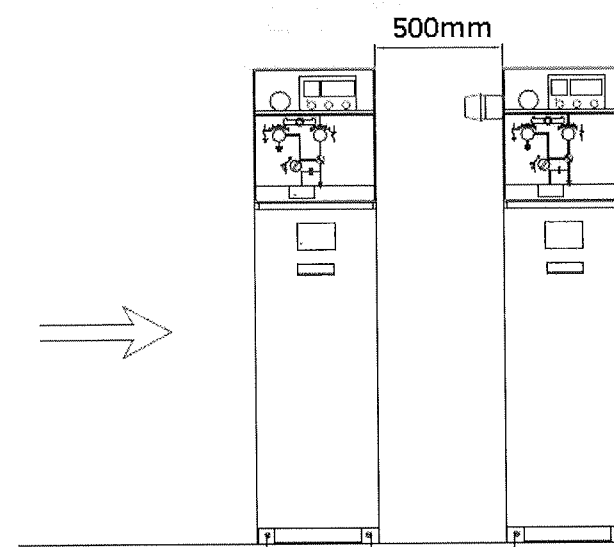


Figure3/9: Control Circuit Principle Drawing for SER-K Panel






M5~M6: Micro switch for Earthing switch position

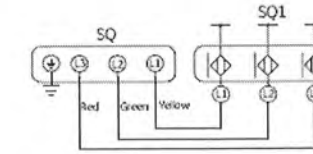


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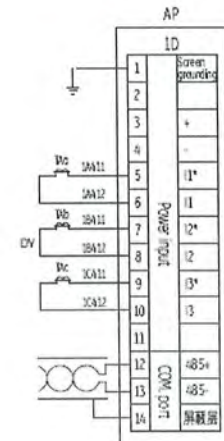
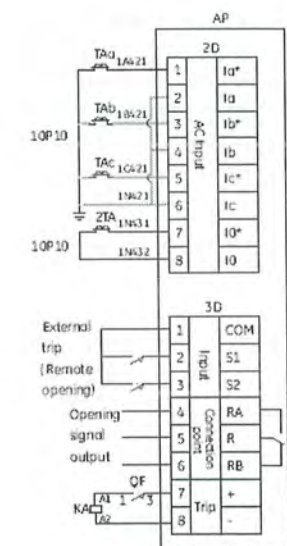


 Extension to be done only on de-enabled and earthed RMU.

Technical drawing of the front panel of the device. It features a control interface at the top with a small display, several buttons, and a large rectangular area labeled "panel". A circular inset provides a magnified view of a small component at the bottom right corner of the panel.

[illegible]

Power supply
Breaker
Remote closing
Manual opening
Remote opening
Manual opening
Protect opening
Rectifying circuit
Motor charging



NO.	Code name.	Component name and type	Quantity	Remark
1	SA1	Button with lock LA39-11V/AU	1	
2	SB.SBS	Button LA39-11/r g	2	
3	1ZK	MCB	1	
4	M1' .M1 ~ M6	Position switch LXW16-11AL42	7	
5	D1 ~ D4	Diode	4	
6	VR	Voltage-dependent resistor	1	
7	KA	Relay SCM 4C0/DC24V 5A	1	
8	AP	Relay protect equipment ST260	1	

Remark: In figuration, The VCB is at opening position/Uncharging and 3P
 Disconnecter at Earthing position

HQ: Closing Coil

TQ: Opening coil

QF: VCB Auxiliary switch

M1': 3P switch operation handle interlock switch

M1: Earthing switch operation handle interlock switch

M2~M4: Micro switch for load switch position

M5~M6: Micro switch for Earthing switch position

CK1~CK3: VCB Charging position switch

3.3 Load Break Switch

The load break switch has three positions: Closed, Open, Earthed, makes natural interlocking. The three-position switch can be operated by either handle or electrical motor.

The closing speed is determined by the closing spring in operation mechanism, the speed of closing is independent of operator.

(Note: Two-position load switch-opening and closed is normally used for busbar section panel)

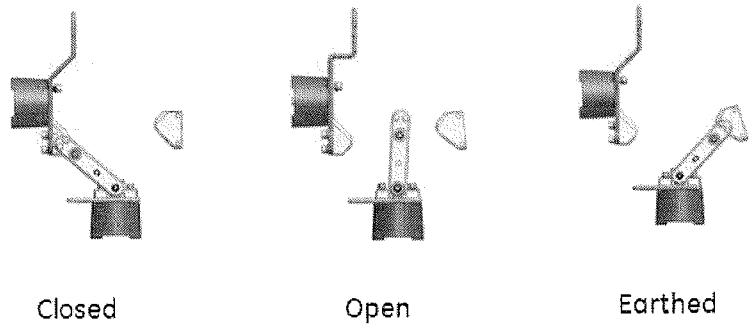


Figure 3/12: Three position of load switch

The three position load break switch operation mechanism has independent operation axes for load break switch closing and earthing operation. There is reliable interlock between two axes to avoid load switch and earthing switch closing at the same time. The three position switch mechanism lifetime is 5000 times.

With trip function for load switch: the fuse striker pin will make load switch open when one of the fuses operates in load switch and fuse combination panel, and it is not possible to close the load break switch.

Only when the cause of fuse operation is found and a new fuse is replaced, should the load switch be closed.

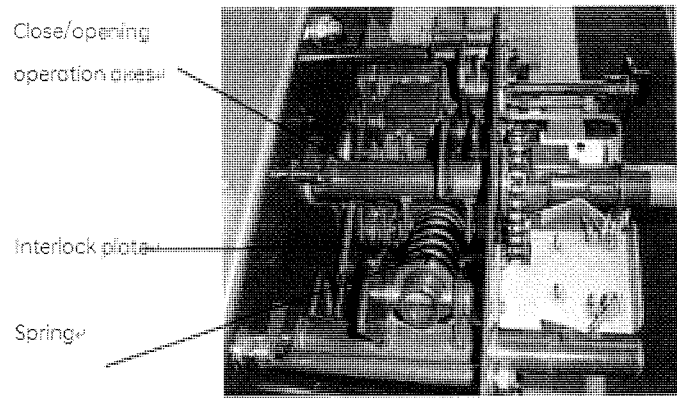


Figure 3/13: Operation mechanism

The electrical operation mechanism, the electric operation motor and auxiliary part can be mounted on the existing manual operation mechanism to realize electrical operation. With reliable interlocks, the load break switch can't be operated while the operating handle was kept inserting in the operating hole.

The earthing operation only can be operated manually; there's no electrical operation.

4 Extending the RMU

The panels are extended by the busbar connector. The busbar extension is an inner cone type; with a rated current of 630A. The shielded silicone rubber keeps the main busbar and busbar extension fully sealed and insulated. The copper bar with silver plating in the busbar connector is 80mm in length, with solid design that offers little resistance. See Figure 4/1.

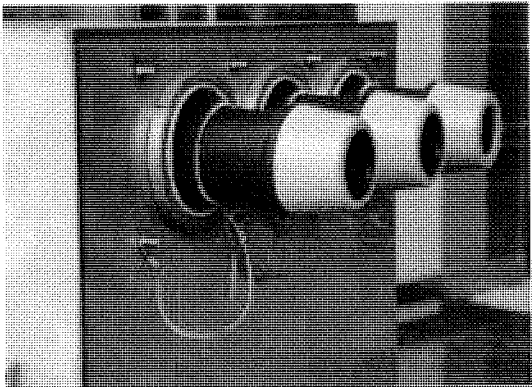
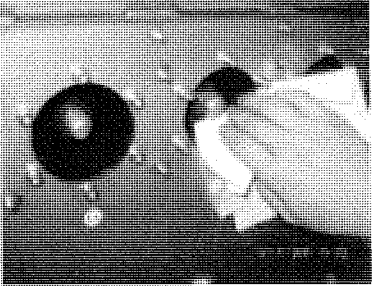


Figure 4/1: Switchgear extension

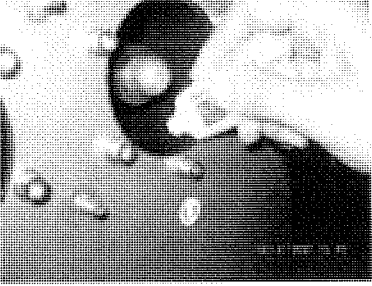
4.1 Busbar Connector Installation

Before installing the silicone rubber busbar connectors, first use a non-woven cloth dipped in alcohol to clean the surface. Then carefully check the surface of the silicon rubber busbar extension is not damaged or has any other kind of defect.

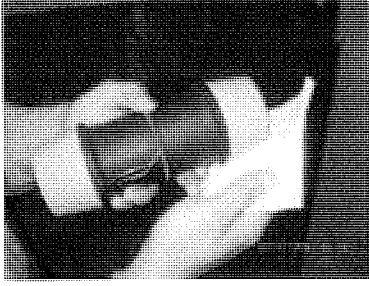
1) Clean the bus connector holder



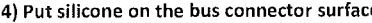
2) Spray silicone on the inner surface of holder



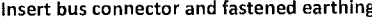
3) Clean connector surface



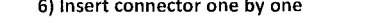
4) Put silicone on the bus connector surface



5) Insert bus connector and fastened earthing wire



6) Insert connector one by one



Terminal plug

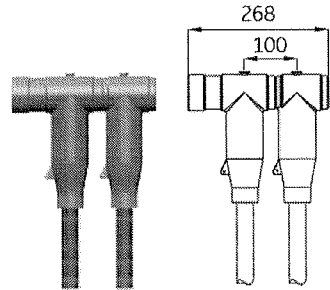
If the extendable panel is not going to connect to another panel, but there is the possibility, this terminal plug is used for future extension. The terminal plug should be mounted on the busbar extension to keep to provide insulation.



Cable Plug

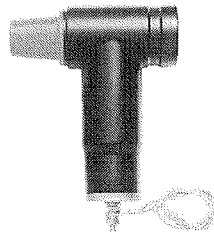
Applicable standards: EN50181 DIN47636

- Shielded type (touchable), non-shielded type (untouchable)
- Front-plug cable connector, rear-plug cable connector, rear-plug lightning conductor
- Cross section of cable: 35mm² × 400mm²
- A standard unit can be connected to at most 2 cables (Front-plug cable connector + rear-plug cable connector, or front-plug cable connector + rear-plug arrester). If 3 cables or more is required (non-standard panel), please contact GE



Surge Arrester

Screen separable rear connector w/arrester provides high-voltage lightning and switching surge protection of transformers, cable, equipment and other components typically located on power distribution systems. M16 studs, silicon grease, connecting rods are provided in the arrester package.



3.4 Sealing Performance

The traditional “O” shaped seal ring is used for fixed type seal in the gas tank. The “O” shape seal ring is mounted on the terminal bushing, pressure relief flange, and busbar extension, keeping the SF6 gas sealed in tank. A shaft-shape seal ring is mounted between the operating shaft and gas tank to ensure a very small leakage ratio.

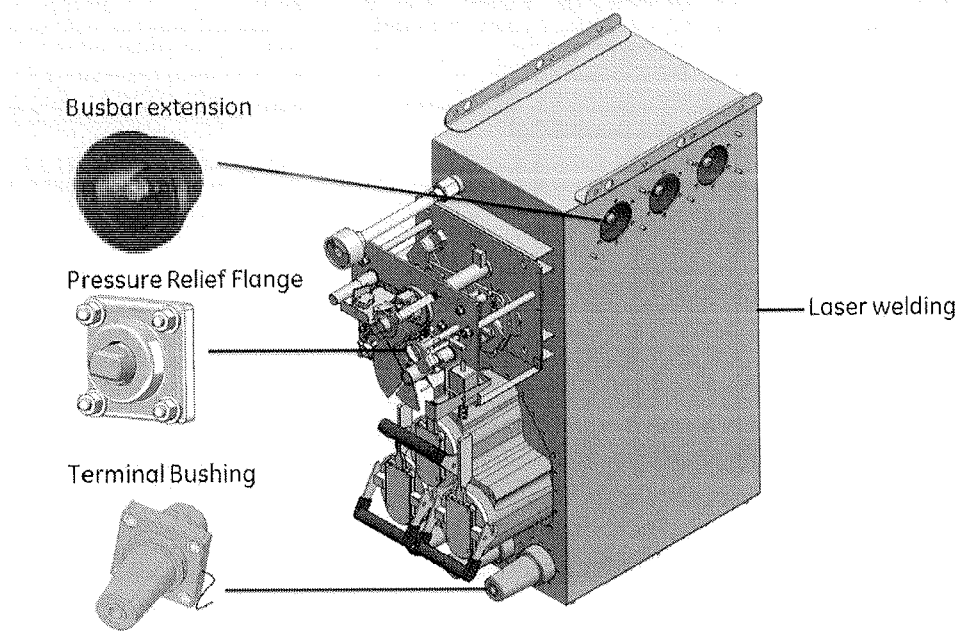


Figure 3/14: Sealing performance

3.5 Resistance to Internal Arc Faults

In order to ensure maximum personal safety, SecoRMU can withstand internal arc 20kA/1s for both gas tank and cable compartment per IEC 62271-200 standard, appendix A.IAC AFL class.

For gas tank, there is arc release device mounting at the bottom of gas tank, It can open when over pressure due to internal arc. The hot gas is released to the rear or to the bottom of the SecoRMU without affecting conditions in the front.

For cable compartment, there is arc relief flap mounting on the rear cover of cable compartment. It is fixed by a hinge and the lower side is fastened by a plastic screw and nut. Overpressure will push the flap open and release gas to the rear or to the bottom of SecoRMU. See Figure 2/1.

12-24kV IAC AFLR 20kA 1s

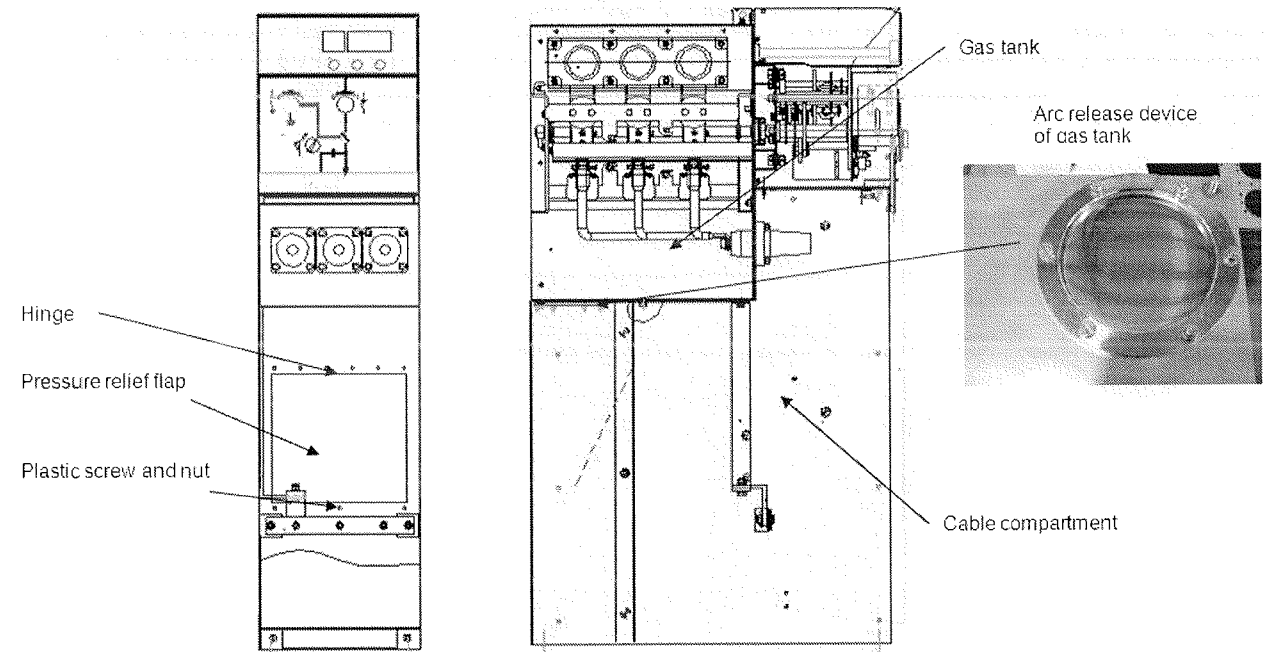
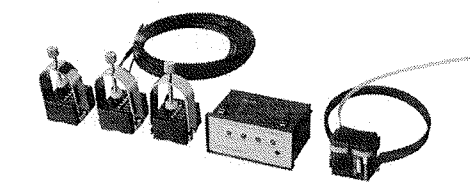


Figure 3/15: IAC rating panel layout

3.6 Accessories

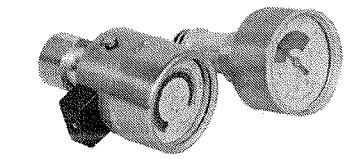
Short-circuit & earthing fault indicator (Optional):

The short-circuit / earthing fault indicator could be installed in each unit and is a convenient way to detect these types of faults.



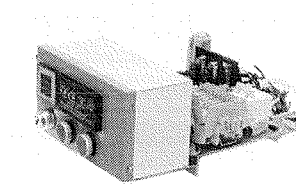
Pressure gauge/density relay

One pressure gauge is mounted on each gas tank to indicate the gas pressure within the correct range.



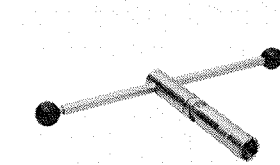
Motor operating mechanism:

A remote- controlled motor mechanism can be supplied in the load switch panel. This is mounted inside the mechanical compartment and no changes to the dimensions of the enclosure are necessary. Other auxiliary parts, such as relay, connection terminal, fuse, etc. can still be accommodated inside the control compartment – no height change to the panel is necessary.



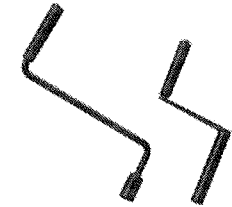
Operating handle

Used for operating the mechanism manually.



Operating handle

Used for charging the spring of the VCB mechanism.



Busbar connector

Busbar connector includes connecting bar, used for connection between two panels.



Section 9 Authority to Energise & H.V. Audit Report

ELECTRICAL INSTALLATION REPORT

Issued in accordance with the *Electrical Safety Regulation 2002* (Qld) Section 153 for electrical work in a Hazardous Area.

Privacy Disclaimer: This report is for the purpose of providing information to the occupier, installer and regulator as to the compliance of the electrical installation work to relevant standards.

Details of the Occupier

Name

Queensland Urban Utilities

ABN

86 673 835 011

Address

Luggage Point WWTP Main Beach Road Myrtletown 4008

Details of the installer of the electrical work

Name

J&P Richardson Industries

ECL. #

756

Scope of the electrical work

Substation 2 [Admin Building]

Replacement of 500kVA transformer, RMU, Feeder 17. Join and extend Feeder 40,

Install substation earthing

Limitations of the audit**Inherent Limitations**

Because of the inherent limitations of any internal control structure, it is possible non-compliance with standards may occur and not be detected.

An audit is not designed to detect all weaknesses in compliance as an audit is not performed continuously throughout the period of installation.

Scope Limitations**Auditors Statement**

I advise that the audit of the hazardous area installation work described above was successfully executed and compliance with AS/NZS60079.14 is demonstrated (subject to the audit limitations) at the time of the audit.

From the evidence provided, conclusion can be drawn that the onsite test results recorded by the installer satisfy the minimum test requirements of AS/NZS60079.14, AS/NZS3000 and other relevant standards.

It is reasonable to believe that the electrical installation is electrically safe to connect.

Auditor's Signature



Date

24/08/12

Auditor's Number 02/0114

Observations/Comments