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# ELECTRICAL SAFETY

AT BEC WORKSITES AND WORKSHOP

## **PREFACE**

**Electricity is an essential energy source in construction sites for purposes from temporary lighting to powered electrical equipment.**

**Though useful in many applications, working with electricity can cause significant danger if it is not handled properly.**

**Electrical accidents can occur to anyone and can cause minor and even fatal injuries. There are numerous potential electrical hazards includes damaged cords, over-loaded plugs, defective equipment and wet surroundings.**

**Employees shall understand the importance of electrical safety and take necessary precaution when working with or near electricity.**

## BEC Electrical Safety Policy

Balanced Engineering and Construction Pte Ltd

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Document Name:	ELECTRICAL SAFETY POLICY	Issue Date :	8 Oct 2016
Document No:	SM 0001 – APPENDIX H	Pages :	1 of 1

BEC is committed to the safe installation, operation and maintenance of electrical appliances, tools and equipments.

This Policy has been written for the protection of those personnel, whose employment involves them in using or carrying out work on the worksite and any other personnel who may be affected by the activities of the electrical works.

In order to comply the requirements, Electrical Engineer and associates are assigned to monitor this policy, and ensure its effectiveness of them is managed without giving rise to danger.

It is the duty of all persons who may be concerned with the operation of, or work upon, the electrical appliance and equipment of BEC to: -

- a. Comply with this Policy;
- b. Adhere local electrical and safety regulations;
- c. Be thoroughly conversant with local legislation governing the work they may be called upon to undertake.

No employee will work on any electrical works unless authorised and instructed to do so by the Project Manager or Electrical Supervisor in the worksite. Only employees with the adequate knowledge, skills and training will be authorised or instructed to work on electrical works. All electrical works will be carried out in associate with risk assessment and safe work procedure (SMP1008-08 – Control of Electrical Hazard).

Where appropriate, safety training and instruction will be given together with the provision of safety devices, instruments and personal protection equipment to carry out the work in a safe and proper manner.



IAN MORRISON  
CEO



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# ELECTRICAL SAFETY

A documented risk assessment related electrical work shall be made available on site.

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## RISK ASSESSMENT



### RISK CLASSIFICATION MATRIX

CONSEQUENCES CLASS					PROBABILITY CLASS (INCREASING LIKELIHOOD)				
Severity	People (Health & Safety)	Assets	Environment	Reputation	1	2	3	4	5
					Never heard of in the industry	Heard of in the industry	Has happened in the organization or in that company in the industry	Has happened at the Location or in that company in the Organization	Has happened > than once/year at the location
1	No Health Effect / Injury	No Damage	No Effect	No Impact	1	2	3	4	5
2	Slight health Effect / Injury	Slight Damage	Slight Effect	Slight Impact	2	4	6	8	10
3	Minor health Effect / Injury	Minor Damage	Minor Effect	Limited Impact	3	6	9	12	15
4	Major Health Effect / Injury	Moderate Damage	Moderate Effect	Considerable Impact	4	8	12	16	20
5	Fatality, PTSD or Serious Occupational Disease	Major Damage	Major Effect	International Impact	5	10	15	20	25

Project : Construction Projects in Singapore Location : Singapore Task : Electrical Works Reference : SMP1001-15	RA Leader RA Member 1 RA Member 2 RA Member 3 RA Member 4 RA Member 5	Who's Who (Safety Manager) [1] Kevin Smith (R.Occ Manager) Rajesh (QA/QC Manager) Paul Peter (SMH Supervisor) Jose Antonio (Electrical Engineer)	Approved By: Peter Green  Projects Director
PPE Required: Safety Helmet, Safety Shoes, Full Body harness, Hearing Protection, hand gloves, Long Sleeve Clothing, 2-Wirey Radio Required for Fall Protection: Lanyards, Independent Lifelines with Fall Arrestors Construction Equipment and Lifting Equipment: Power tools and hand tools			Legend: <span style="color:blue">L</span> - Low <span style="color:yellow">M</span> - Medium <span style="color:red">H</span> - High PTSD - Permanent Total Disabilities

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Ref: SMP1005-08

Rev: B

Date: 28 Apr 2015

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### SAFE WORK PROCEDURE

#### TITLE: CONTROL OF ELECTRICAL HAZARD

#### 1. Purpose

To define a procedure to control electrical hazards so as to protect personnel from electrocution, fire and other possible injuries; and to prevent damage to assets and properties.

#### 2. Scope

This procedure is applicable to all construction sites, fabrication workshop and maintenance project.

#### 3. Definition

3.1 "Licensed Electrician" means a person who has sufficient experience and training to perform the work required to be carried out, and has passed such training course as the local Authority may require for that work.

3.2 Electrical equipment means any machine, appliance, apparatus or lighting fitting which consumes or utilises electricity in its operation or use includes any cable, wire and other device necessary to enable it to be connected to a source of electricity supply.

3.3 Temporary electrical installation means any electrical installation used for the purpose of supplying electricity for any building operation or work of engineering construction and includes an extension socket-outlet or an extension cable, comprising either a connector or a socket-outlet which is joined to a cable.

3.4 Socket-outlet means a device, provided with female contacts, which is intended to be installed with the fixed wiring, and intended to receive a plug.

#### 4. Responsibility

4.1 Project Manager shall seek approval from relevant authorities prior to all temporary electrical installation.

4.2 Project Manager shall ensure that all electrical connection & installation including materials are approved by the clients.

4.3 Licensed Electrician shall ensure that all the connections and tools used on site are of correct type and shall comply with local regulations and other legal requirement.

#### 5. Procedure

5.1 Procedure for Temporary Electricity supplies on site

A documented safe work procedure related electrical work shall be made available on site.

A documented risk assessment and safe work procedure shall be made available on site

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# **ELECTRICAL SAFETY**



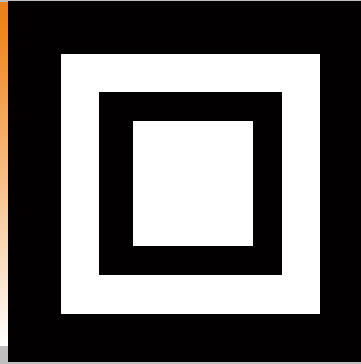
**Conduct regular electrical inspection by competent electrician**

**Only competent electrician shall perform installation, repair and maintenance electrical works**



**Appoint Competent Electrician on site who shall be formally trained with sufficient experience**

Double insulated is a product that has been designed in a way so as not to require a safety connection to earthing



Earthing system shall be tested and certified fit for use by competent electrician

Double Insulated & Earthing System



It is dangerous to allow worker to contact the live part



ELCB/ RCCB and Insulation board are being installed inside electrical distribution board



Electrical distribution board (DB) is installed with insulation board and ELCB/ RCCB





Without display  
electrician's  
name and contact  
on electrical  
distribution board  
(DB)



Electrical distribution  
board (DB) shall be  
locked and displayed  
with appointed  
electrician contact

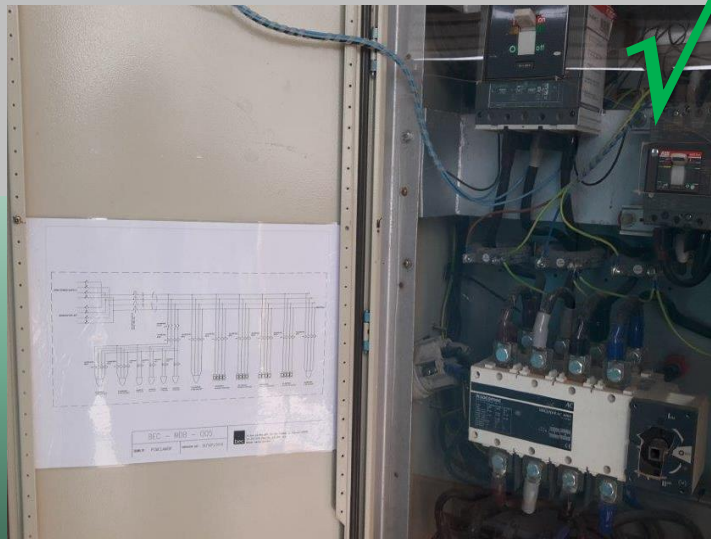
Electrical distribution board shall be displayed  
with appointed electrician's contact for emergency





Electrical distribution board (DB) without circuit diagram

Display circuit diagram in electrical distribution board (DB)



Electrical distribution board (DB) shall be displayed with circuit diagram



Damaged socket and outlets shall not be used

Use electrical socket and outlet that are in good working condition



Use industrial plugs and outlets that are in a good working condition



An original lock was broken in electrical distribution board

A padlock is replaced to lock electrical distribution board (DB) in case of original lock is broken



All electrical distribution boards shall be locked at all times





Do not use a multi socket-outlet assembly to tap electricity supply

In HK and SG, use a proper socket-outlet assembly (SOA) that must be fully enclosed with MCB & RCCB



1 to 3 SOA must be approved type with safety mark. Ban to use in SG and HK. Other countries, subject to local legislative & contract requirements. Do not allow multi spit further.

Do not use a multi-adaptor for your hand-held tools, it may become overloaded and catch fire



Do not use domestic plugs and sockets on worksite

## Only use weather-proof industrial plugs & sockets

Operating Voltage	Colour
110 ~ 120	Yellow
220 ~ 240	Blue
380 ~ 480	Red



Only weather proof industrial plugs and sockets are permitted to use on worksite and workshop

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# ELECTRICAL SAFETY



Do not use an electrical cable with frail insulation



Only approved industrial cable with good working condition is allowed to use on site



Only approved industrial electrical cable is allowed to use on site





Portable electrical tool without regular electrician's inspection

Regular inspection conducted by competent electrician



Regular electrical inspection by competent electrician is required



Do not leave long trailing cables on the ground



Electrical cable hanged with insulated hooks/stands



Electrical cable shall be hanged with insulated hooks



Electrical equipment terminal box without proper cover

All electrical equipment terminal boxes shall be properly covered



All electrical equipment terminal boxes shall be properly covered





Generator  
without  
barricaded &  
shelter

Do not enter  
into barricaded  
area without  
permission



For safety reasons, a generator shall be barricaded with shelter to prevent unauthorized access



It is dangerous to use a generator without proper earthing

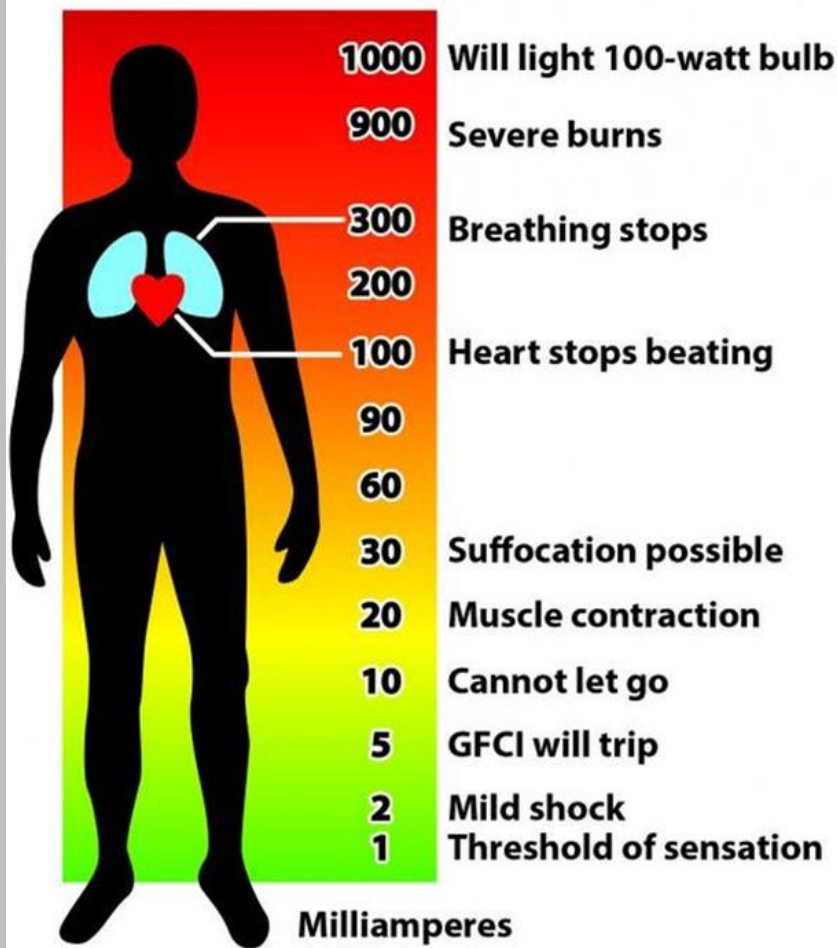
Ensure generator is properly earthed



Generator as an alternate electricity supply source should be properly earthed

Do not work with live equipment

## Electricity's Effects



Do not work with live equipment



## First aid treatment for electrical shocks:

- Your 1<sup>st</sup> priority is to ensure your own safety.
- Do not touch the casualty if they are still in contact with the appliance that has caused the shock. If they are still in contact with electrical source, they will be 'live' and you risk electrocution to yourself.
- Turn off electricity source, if possible, to break contact between the casualty and electrical supply.
- Switch off the supply at the mains or meter point if possible, otherwise remove the plug or wrench cable free.
- Alternatively, you can move the source of the shock away from you and the casualty.
- Stand on dry and insulating material such as a wooden box or plastic mat, etc. Using a wooden pole or broom, push the casualty's limb away from electrical source or push the source away from them.
- If not possible to break the contact using a wooden pole or broom, loop a length of rope around the casualty's ankles or under their arms.
- Take great care not to touch them while you are doing this. Once you have looped the rope around them, use this to pull them away from the source of electrical current.
- Once you have broken the contact between the casualty and the source of the shock, conduct primary survey - response, airway, breathing, circulation - and treat any urgent condition found.
- Call emergency services






# ELECTRICAL SAFETY

All electrical installations & equipment are of good construction, sound material and free from defects.

Monthly joint inspection of temporary electrical installations by competent Electrician & Safety Officer.

Tagged the temporary electrical installations or power tools if they are in good working condition.



Form No: SMF1012-09  
 Rev D1  
 Updated: 16 April 2015

**PROJECT TOOL INVENTORY RECORD**

Project: \_\_\_\_\_ Company: \_\_\_\_\_ Inspected by: \_\_\_\_\_

Location: \_\_\_\_\_ Trade: \_\_\_\_\_ Date: \_\_\_\_\_

S/N	Type of Electric Winch/ Power Tool/ Hand Tool/ Lifting Equipment	Model No.	Serial No.	Proper plug used*	Condition*	No broken parts*	Proper guards*	Cord Condition*	Out of Use*	In Repair*	Remarks
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

\* Remark V = Satisfactory / Yes  
 X = Not provided / Unsatisfactory / No  
 NA = Not Applicable

**Conduct monthly electrical inspection by  
Competent Electrician**

**PLEASE REPORT ALL ELECTRICAL HAZARD  
AT BEC WORKSITE OR WORKSHOP TO YOUR  
SUPERVISOR OR ELECTRICIAN  
IMMEDIATELY**



**Procedures and requirements highlighted in this handbook are as accurate as possible and up to date as at the time of circulation.**

**Compliance with Electrical Guide Book does not confer immunity from relevant local legal requirements.**

**Subject to local electrical and safety legislative and authority requirements.**



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