MAIN SWITCH BOARD

- Label all MCB appropriately (by location)
- Located in accessible area and not in wet location
- Height of 2m maximum
- Sized cable accordingly, minimum of 10mm for 63A MSB
- Used of appropriate cable size for link as BUSBAR or use COMB-BUSBAR
- Circuit arrangement and load balancing.

MEN Link to be in MSB only,

MSB for residential installation to be used only for residential installation and not for commercial or industrial purposes.

Wire termination at busbar to be one wire per slot.

Color code for wiring to be maintained, green wire shall not be used for any other purposes other than earth.

WIRING INSTALLATION

- Use wiring support like saddle, clip and catenary wire (8 wire per catenary line)
- Clip all wire
- Arrange and organize wiring installation in a professional manner,
- ensuring that wire are not zigzagging all over the place
- Use wire connector for every connection.
- All wire termination to be done in junction box , devices or fixtures
- Use proper size and type of cable according protective devices and installation conditions. (exterior, interior, surface, underground)

  Wiring and installation to be installed as per specifications and drawings.

  All cable to have protective earth wire (PE), twin core cable are not allowed for wiring installation.

EARTHING INSTALLATION

- Earth rod to be driven 1.2 m minimum into ground
- Minimum earth wire to be 4mm
- Earth conductor to be green in color
- All wiring cable to have protective earth (PE)
- All metallic enclosure, including Meterbox to have a protective earth (PE)
- Main Earth cable from main earth BUSBAR to Earth Rod to be continuous.

  Earth continuity to be maintain in all final sub-circuits.

  Use appropriate nuts, bolts, lugs and washer for Earth bonding, no self tapping screws are allowed .

  Generator Earthing requirements

TABLE B1
MAXIMUM CIRCUIT LENGTHS, IN METRES, FOR DIFFERENT SIZES OF CONDUCTORS AND PROTECTIVE DEVICES USING APPROPRIATE MEAN TRIPPING CURRENTS (I_a)*

Conductor size		Protective device rating	Circuit-breaker (see Note 1)			Fuses (see Note 2)
Active	Earth		Type B	Type C	Type D	
mm^2	mm^2	A	Maximum circuit length, L_{max}, m			
1	1	6	170	91	55	204
1	1	10	102	55	33	114
1.5	1.5	10	153	82	49	170
1.5	1.5	16	96	51	31	82
2.5	2.5	16	160	85	51	136
2.5	2.5	20	128	68	41	93
4	2.5	25	126	67	40	90
4	2.5	32	98	52	31	70
6	2.5	40	90	48	29	60
10	4	50	117	62	37	73
16	6	63	142	76	45	85
16	6	80	112	59	36	59
25	6	80	124	66	40	66
25	6	100	99	53	32	47
35	10	100	159	85	51	75
35	10	125	127	68	41	58
50	16	125	198	106	63	90
50	16	160	155	83	50	71
70	25	160	235	126	75	108
70	25	200	188	100	60	84

* See B4.5 for values of I_a.

NOTES:

1 The types of circuit-breakers (Type B, C or D) are based on the types described in AS/NZS 60898.

2 Fuses based on AS/NZS 60269.1 are also known as BS 88 type fuses.

3 The maximum lengths are circuit route lengths and are related to a disconnection time of 0.4 s.

4 When the nominal phase voltage of the electrical installation is not 230 V, the maximum length may be determined by multiplying by a factor of U_o/230. For a nominal phase voltage of 240 V, the factor would be ~1.04.

5 Lengths of circuits may also be limited by voltage drop, particularly for single-phase arrangements.

6 The maximum length obtained only satisfies the fault protection requirements of Clause 1.5.5.3. The overload, short-circuit and voltage drop requirements will need to be considered independently.

AS/NZS3010

Electrical Installation – Generating Sets

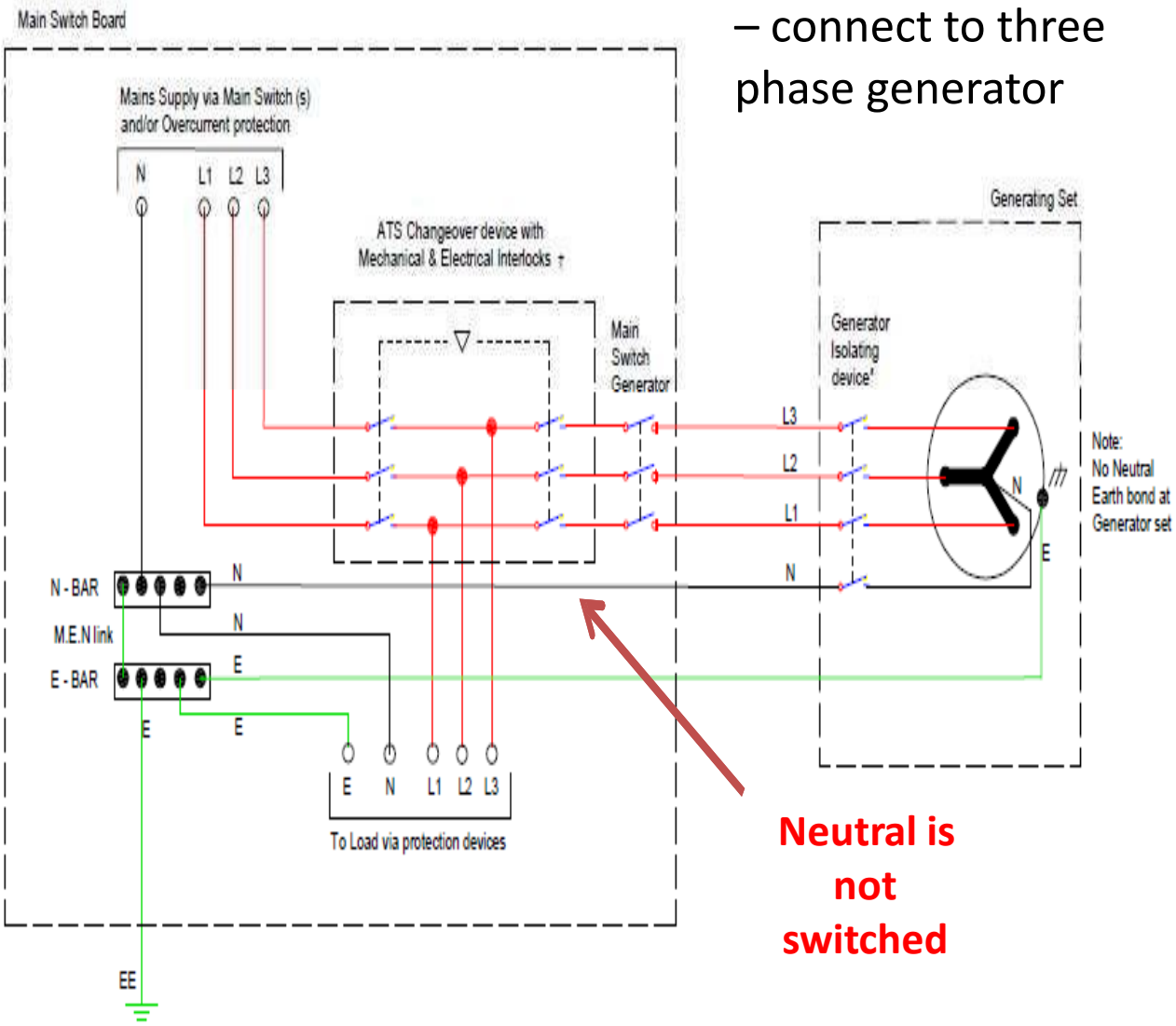
Updated Wiring for Standby Generator.

Revised showing neutrals NOT being switched.
That is because you don't have to switch the neutral and the protective earth neutral (PEN) conductor **shall not** be switched or isolated

AS/NZS3010

Electrical Installation – Generating Sets

Three phase electrical installation – connect to three phase generator



AS/NZS3010

Electrical Installation – Generating Sets

Single phase electrical installations –connected to portable genset via inlet

Active and neutral switched

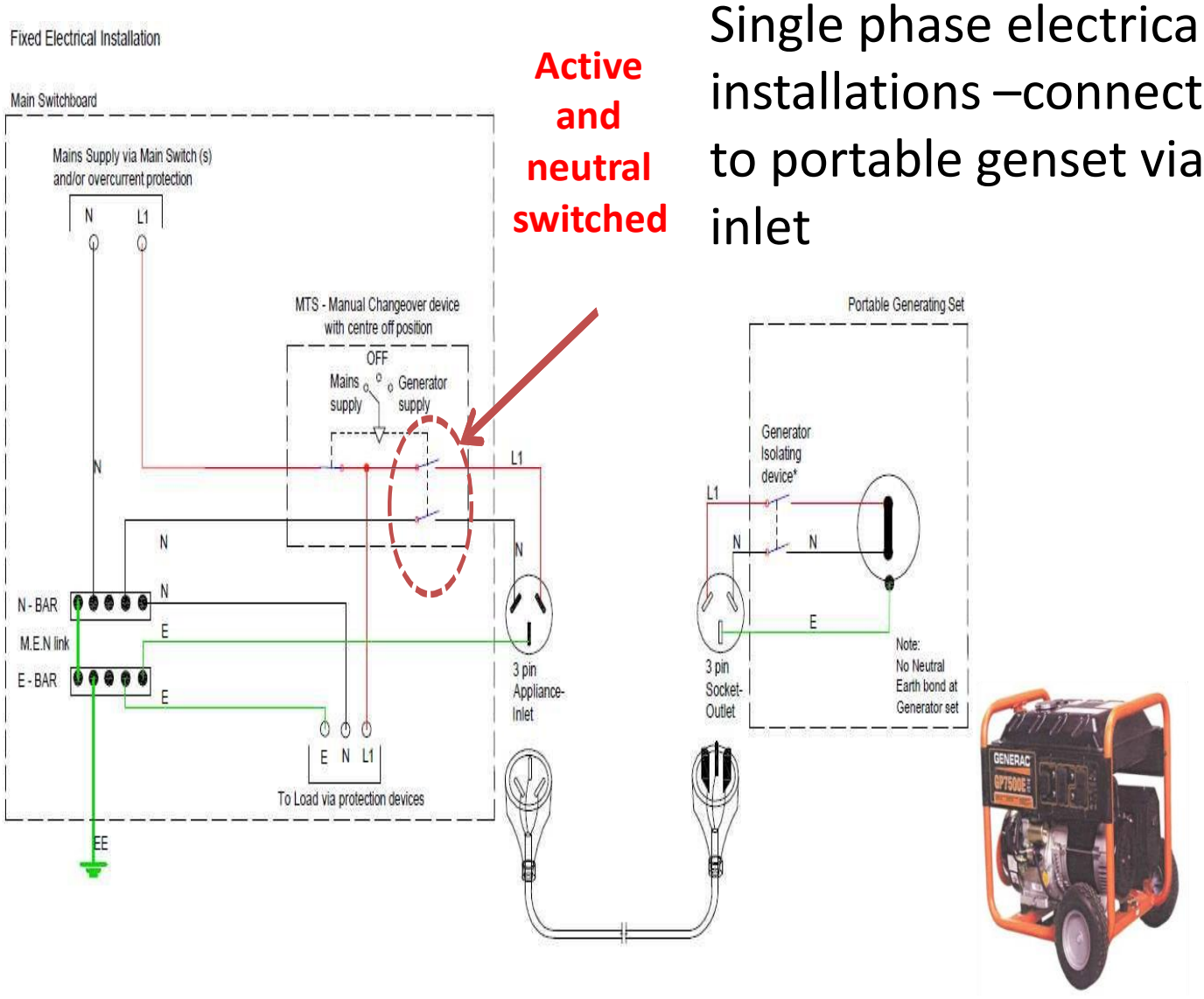
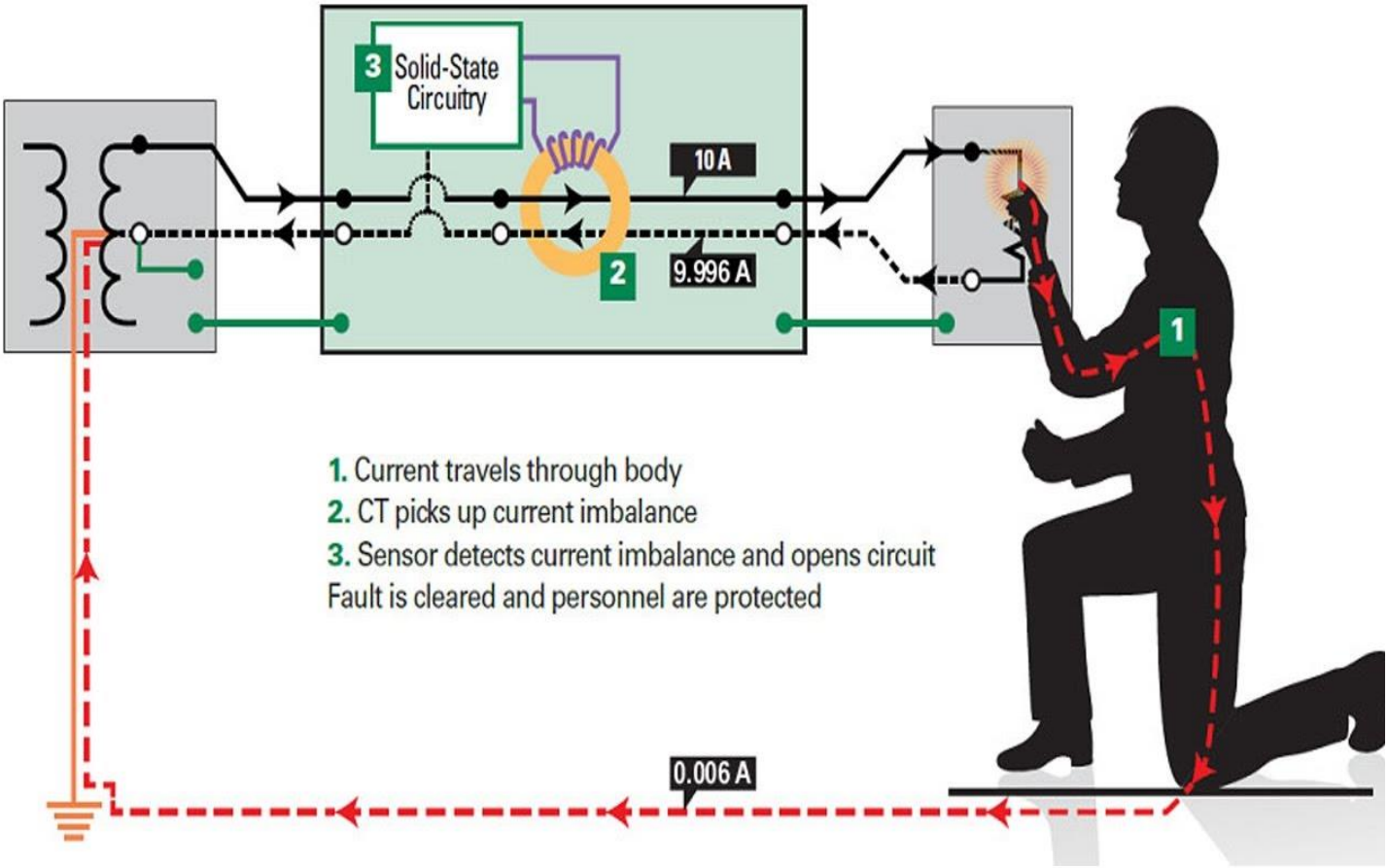


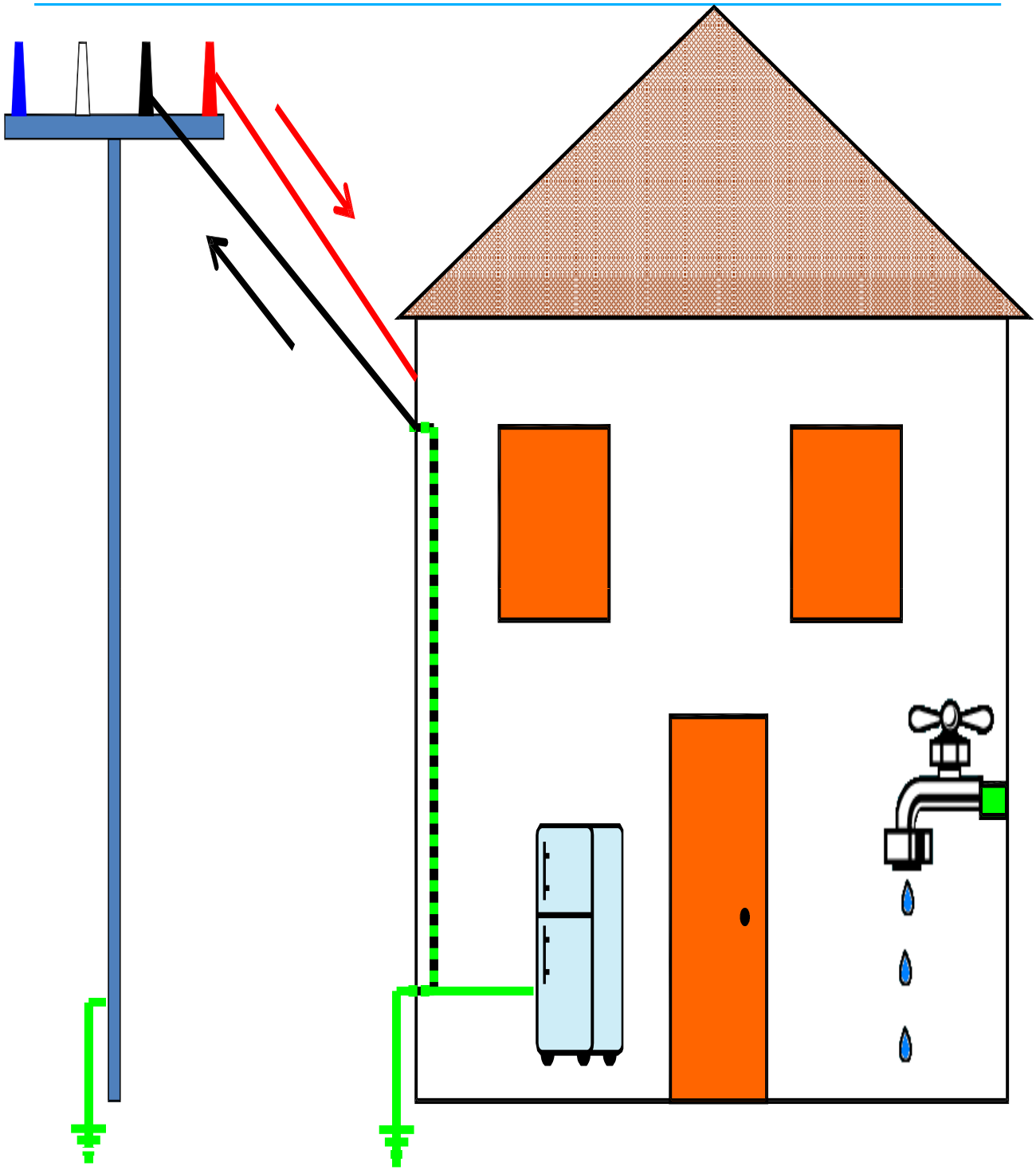
FIGURE 4.1 TYPICAL ONE POLE/TWO POLE MANUAL CHANGEOVER ARRANGEMENT FOR A SINGLE -PHASE PORTABLE GENERATING SET WITH TWO POLE LOCAL ISOLATION INSTALLED AS AN ALTERNATIVE SUPPLY, CONNECTED VIA SOCKET & LEAD TO A SWITCHBOARD WITH AN M.E.N LINK INSTALLED

RCD BREAKERS OPERATIONAL FUNCTION
IN FAULT CONDITION.

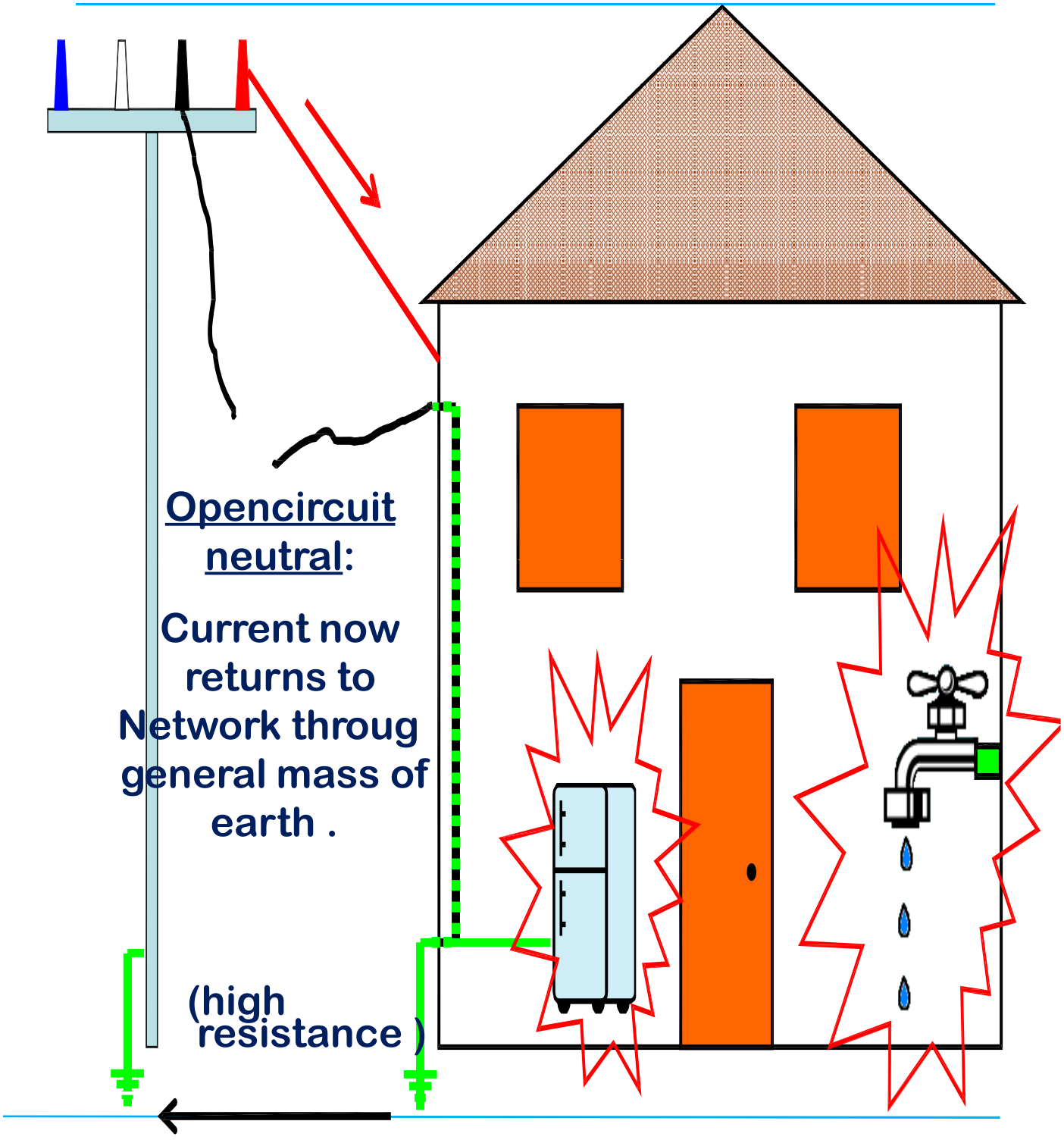
- 30mA RCD for Domestic and General use.
- 10mA RCD for Hospital and critical area.
- Install for Wet Zone Area
  - Bath Room Outlets
  - Kitchen Counter Outlets
  - Exterior Outlets



Electric Shock (M.E.N)



Electric Shocks (M.E.N)



FORM – 1

ELECTRICITY COMMISSION

Tu'atākilangi, P.O. Box 23, Nuku'alofa, Kingdom of Tonga, Ph : 23-632

APPLICATION FOR PERMIT TO CARRY OUT ELECTRICAL WORKS

Name of Electrical Contractor :……

Owner/Occupier of Premises:……

Address of Premises: ……
(give full postal address and adequate location details) ……

Type of Works *(Check as appropriate)*	**Nature of Works** *(Check as appropriate)*	After completion of these Works, **Maximum Electricity Demand** atthe premiseswill be **……kWh/day**and **……. Amps.**
Temporary ……..	**New Premises ……..**	
Domestic ……....	**Addition to Premises ……....**	**Distribution Line**
Commercial ……	**Renovations ……**	**Overhead ……**
Industrial ……	**Others ……**	**Underground ……..**
Community ……	**Single Phase ……**	**Phase ……..**
Reconnection……	**Two Phase ……**	**Distance to nearest Pole/URD Box ……..**
	Three Phase ..……..……	

I, the Electrical Contractor named above Certified that the information given above and overleaf, in the Plans and Diagrams lodge with Electricity Commission, and otherwise as supplied to Electricity Commission in respect of this Application are correct, and that a copy of this Application has been served on the Electricity Distribution Company.

Date :……**Signature :**…….

See Overleaf for more Details

Details of Installation *(use separate sheet of paper if necessary)*	**Contractors Figure**	**Commission Figures** *(based on information supplied , but subject to adjustment after inspection)*
• **Switches, Lighting, Convenience Outlets**		
• **Remote Control Master Switches**		
• **Special Purpose Outlets of 20 Amps +**		
• **Time Switches**		
• **Ranges and Heaters**		
• **Refrigerators, Freezers**		
• **Washing Machines, Dryers**		
• **Commercial Hair Dryers / Curling Apparatus**		
• **Electric Typewriters, Cash Registers, Adding Machines**		
• **Air Conditioning Units**		
• **Other Appliances**		
• **Fire Alarm Units, Neon Signs Unit/ Transformer**		
• **Data, Telephone, Intercoms**		
• **Electric Bell Enunciators, Flasher, Beacon Lights, Trunk Lines**		
• **Arc Lamp, X-Ray Equipment, Battery Charging Rectifiers, Telephone Switch-Boards**		
• **Electric Welders**		
• **Slave Units**		
• **Commercial TV Cameras**		
• **Motion Picture Projectors (give mm of each)**		
• **Own use Generators (Separate S3 Licencerequired)**		
• **Stand-By Generators (Separate S3Licence required)**		
• **Motors and Controlling Apparatus**		
• **All Other electrical apparatus / appliances not specifically listed above.**		

FORM – 6

ELECTRICITY COMMISSION

Tu'atākilangi, P.O. Box 47, Nuku'alofa, Kingdom of Tonga

CERTIFICATE OF COMPLETION OF ELECTRICAL WORKS

Under and in terms of the Electrical Contractor By-Laws 1985 made under the authority of the Tonga Electric Power Board Act (as amended), and in respect of a report from _____, the Electrical Contractor to whom an Electrical Wiring **Permit Number 11649/18** was issued to undertake electrical works at premises located at **Kameli - Vavau** owned / occupied by Fifita Netane.

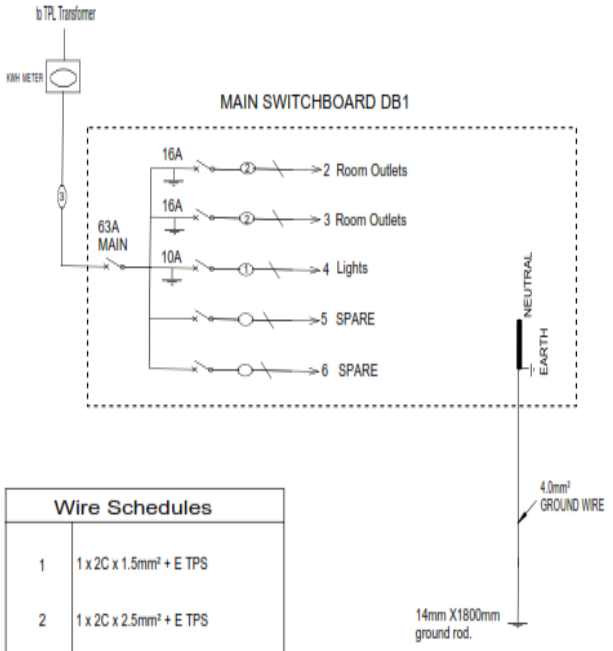
Now therefore I do hereby certify [1] that I have inspected said premises and [2] that the electrical works authorized by said Permit have been completed in a satisfactory manner, in accordance with said Permit and the requirements of said By Laws.

Issued at Nuku'alofa, Kingdom of Tonga on the **18/12/2018** upon the authority of the Electricity Commission.

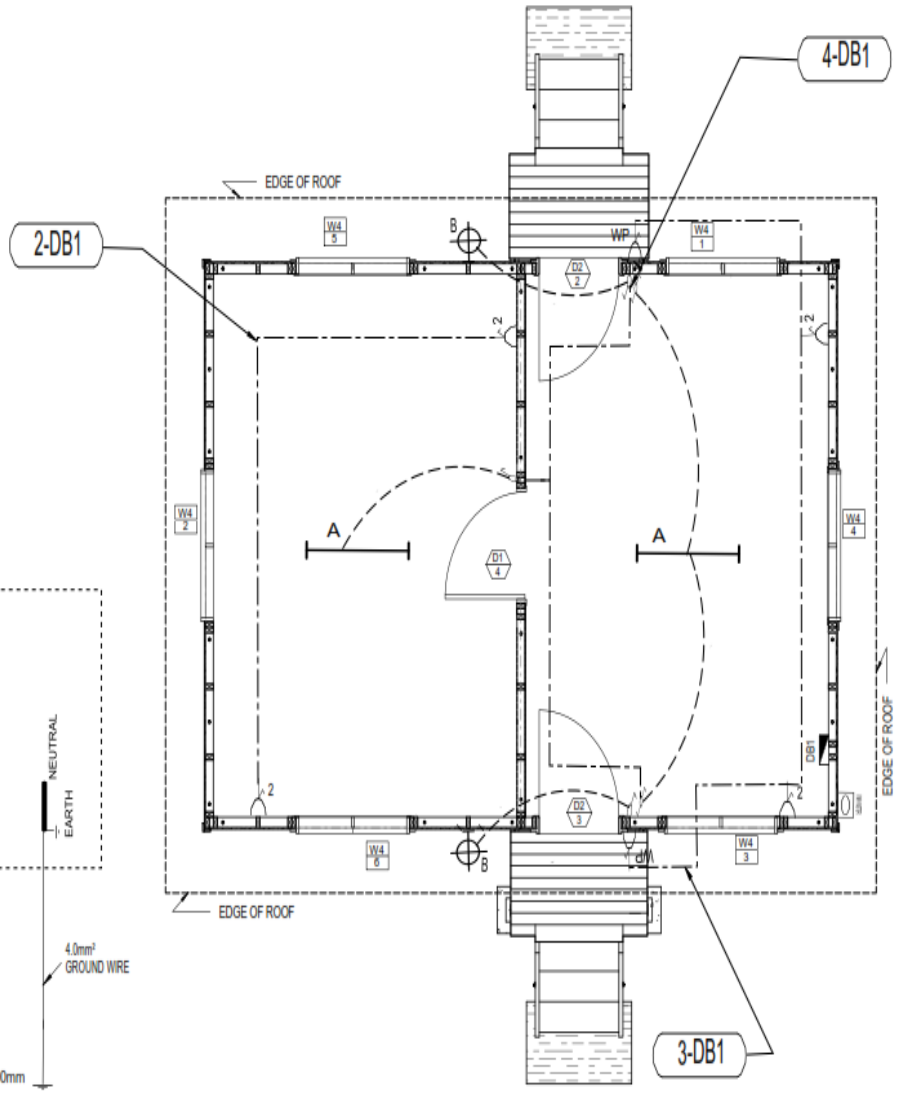
……..
Technical Manager/Deputy Technical Manager

(This Certificate is issued in three original copies, 1 copy is retained by Electricity Commission, copy 2 is issued to the Electrical Contractor, and copy 3 is issued to Tonga Power Limited as authority to them to connect electrical power to the Premises named above).

One Line Diagram



Wire Schedules	
1	1 x 2C x 1.5mm² + E TPS
2	1 x 2C x 2.5mm² + E TPS
3	1 x 2C x 10mm² TPS
4	

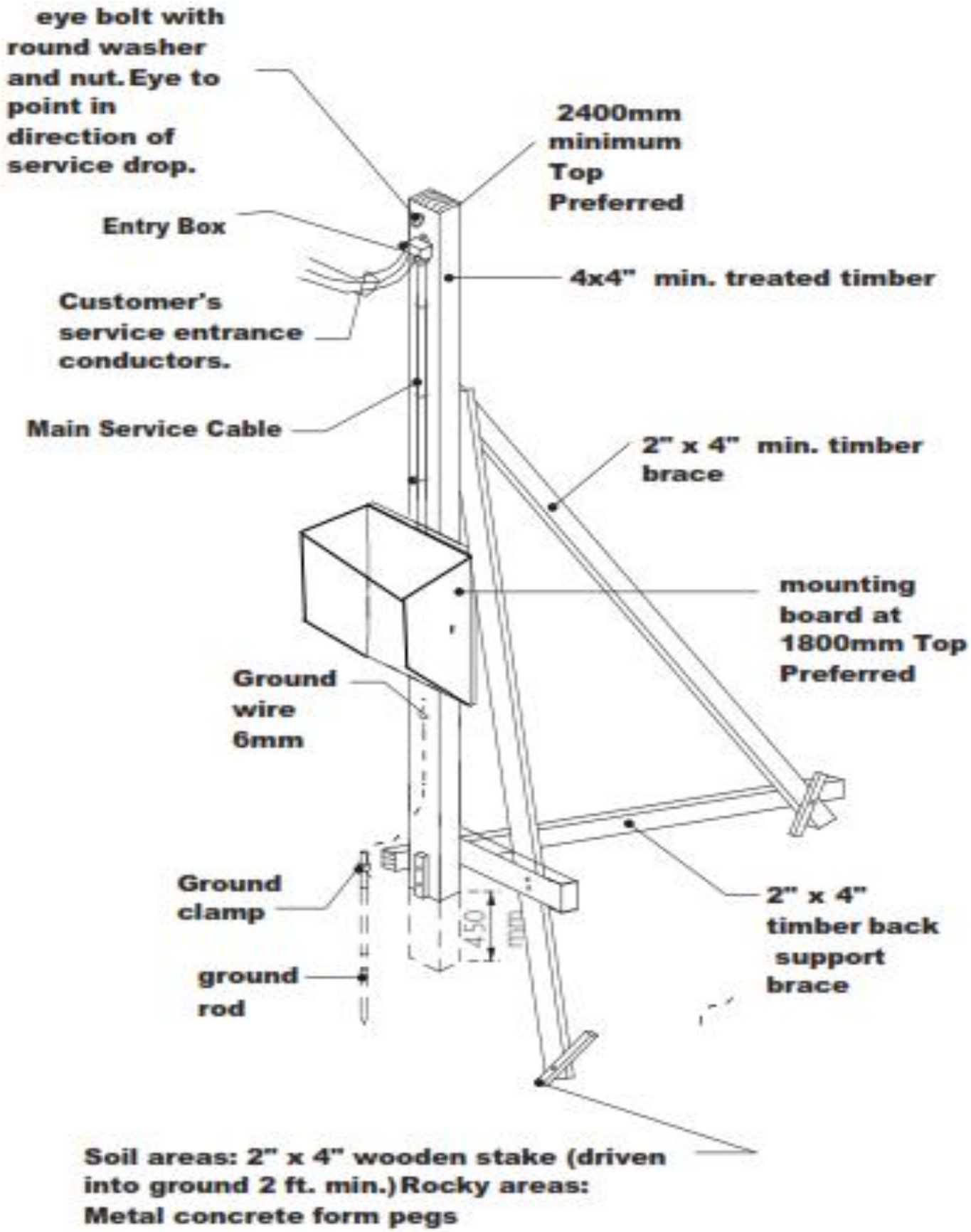


ELECTRICAL PLAN
SCALE : NTS

IMPORTANT: Do not scale off this drawing. All dimensions should be checked on site prior to construction.

ID	AMMENDMENTS	DATE

PROJECT		TITLE	ELECTRICAL PLAN
		DRAWN BY	DRAWING NUMBER
LOCATION		CHECKED BY	E02
		DATE	
CLIENT		DRAWING STATUS	
		PROJECT NUMBER	



Temporary overhead service stand, isometric view.

MAIN SWITCHBOARD WIRINGS