b) Be provide with adequate space around the switchboard on all sides where persons are to pass to enable all electrical equipment to be safely and effectively operated and adjusted; and

c) Be provide with sufficient exit facilities to enable a person to leave the vicinity of a switchboard under emergency conditions

Sufficient access and exit facilities are considered to be the provision of the following:

i) Unimpeded space of at least 0.6m around switchboard with switchgear doors in any position and large circuit-breakers racked out.

CONSTRUCTION (Clause 2.9.3)

Suitability (Clause 2.9.3.2)

Switchboards shall be suitable to withstand the mechanical, electrical and thermal stresses that are likely to occur in service.

Minimum clearance and creep age distance (Clause 2.9.3.3)

Orientation of circuit-breakers (Clause 2.9.3.4)

Screw-in fuses (Clause 2.9.3.5)

Bars and links (Clause 2.9.4) Bars and links shall be provided with facilities for securely terminating conductors in accordance with clause 3.7

Tunnel-Type terminals (Clause 2.9.4.2) all screws that are in direct contact with conductors in tunnel-type terminals shall be of the type designed not to cut the conductor. Where tunnel-type terminals having calming screws that are in direct contact with the conductors are provided for connection of-

a) The main incoming neutral conductor, or

b) The main earthing conductor; or

c) The connection between the main earthing terminal/connection or bar and the neutral bar (MEN connection); or

d) A neutral conductor used as c combined protective earthing and neutral (PEN) conductor for protective earthing of any portion of an electrical installation,

The terminal shall be of a type having-

i) Two screws; or

ii) One screw with an outside diameter not less than 80% of the tunnel diameter

Neutral bar or link (Clause 2.9.4.3) every switchboard, to witch a neutral conductor is connected, shall be provided with a neutral bar or link that abides by that Service rule's provision's a) b), c) and d).

Equipment identification (Clause 2.9.5)

General (Clause 2.9.5.1)

All equipment installed on switchboard shall be identified in accordance with the requirements of clause 2.9.5.2 to 2.9.5.6 including the relationship of electrical Equipment, Bars and Links, Terminals of switchboard equipment, common neutral and fuses.

Wiring (Clause 2.9.6)

Switchboard wiring shall be designed and installed to withstand any thermal and magnetic effects on the conductors. Provisions a), b) and c)

Fire-protective Measures (Clause 2.9.7)

Wiring associated with switchboards shall be installed in such a manner that, in the event of fire originating at the switchboard, the spread of fire will be kept to a minimum.

b) Be provide with adequate space around the switchboard on all sides where persons are to pass to enable all electrical equipment to be safely and effectively operated and adjusted; and

c) Be provide with sufficient exit facilities to enable a person to leave the vicinity of a switchboard under emergency conditions

Sufficient access and exit facilities are considered to be the provision of the following:

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Fire-protective Measures (Clause 2.9.7)

Wiring associated with switchboards shall be installed in such a manner that, in the event of fire originating at the switchboard, the spread of fire will be kept to a minimum.

Main Switch Board Wiring

A Phase

B Phase

C Phase

Bus Bar Connected From Transformer

25 mm sq Main Neutral

25 mm sq Main Supply Cables

100 amp Un-Metered Service Fuses

Meter Bases

Service Neutral Link

25 mm sq Active Feeds

Meter Neutral link

Consumer Neutral Link

Main Switches

Sub-Main Conductors Supplying switchboards (Separate Occupancies)

6 mm sq Earth

25 mm sq Sub-Main

Sub-Board

EARTHING SYSTEM PARTS (Clause 5.3)

General (Clause 5.3.1)

The protective earthing arrangement for an electrical installation providing protection by means of automatic disconnection of supply and connected to the MEN system of distribution shall include the following parts;

a) Protective earthing conductors connecting exposed conductive parts as required'
b) Main earthing conductor.
c) MEN earthing terminal, connection or bar.
d) MEN connection the main earthing terminals, connection or bar and the supply neutral bar.
e) Earthing electrode.
f) Equipotential bonding of extraneous and other parts as required

Earthing Conditions Material and Type (Clause 5.3.2)

Conductor material **(Clause 5.3.2.1)** Copper Conductors **(Clause 5.3.2.1.1)**

Copper earthing conductors shall be of high conductivity copper and shall be in the form of-

a) Stranded conductors; or
b) Circular braided conductors; or
c) Solid conductors having a cross-sectional area not less than 10 mm sq. and a thickness not less than 1.5 mm.

Special Conditions (Clause 5.3.2.3) all provisions must comply with all standards in this Clause

Insulation (Clause 5.3.2.4)

Earthing conductors shall be provided with insulation.

Exception: The following forms of earthing conductors need not be provided with insulation:

a) Aerial conductors.
b) Flat braided conductors
c) Busbars
d) Sheaths of MIMS cable
e) Conductive framework and wiring enclosures deemed to be an earthing conductor, in accordance with **Clause 5.3.2.2**
f) Copper earthing conductors buried in the ground in accordance with **Clause 5.5.5.5**
g) Catenary wires.

Identification (Clause 5.3.2.5)

Insulated earthing conductors shall be identified in accordance with Clause 3.8

Earthing Conductors Size (cross-sectional area) (Clause 5.3.3)

Protective Earthing Conductors (Clause 5.3.3.1)

General (Clause 5.3.3.1.1)

The cross-sectional Areas of a protective earthing shall ensure-

a) Adequate current-caring capacity for prospective faults currents for a time a least equal to the operating time of the associated overcurrent protective device; and
b) Appropriate earth fault-loop impedance **(see Clause 5.7);** and
c) Adequate mechanical strength and resistance to external influences; and
d) For parts of the protective earthing conductor that do not consist of cables, or parts of cables, that there is allowance for subsequent deterioration in conductivity that may reasonably be expected.

Selection of Cables (Clause 5.3.3.1.2)

The cross-selection area of any copper protective earthing conductor required for the protection of any portion of an electrical installation shall be determined either-

a) From Table 5.1 in relation to the cross-sectional area of the largest active conductor supplying the portion of an electrical installation shall to be protected; or
b) By calculation, in accordance with **Clause 5.3.3.1.3** all provisions must comply with the exceptions.

Main earthing terminal/connection or bar (Clause 5.3.4)

In every electrical installation, a main earthing terminal/connection or bar shall be provided at the main switchboard. The following conductors shall be connected, either directly or indirectly, to form an equipotential bonding network of such conducted to that main earthing terminal/connection or bar:

a) **Protective earthing conductors.**
b) **Main earthing conductor.**
c) **MEN connection.**
d) **Equipotential bonding conductors.**
e) **Functional earthing conductors, if required**

Note: A main earthing terminal/connection may not be a soldered connection.

MEN CONNECTION (Clause 5.3.5)

In every electrical installation there shall be an MEN connection (also known as the MEN link) at the main switchboard. Provisions must also comply with the rest of the clause in relation to clauses 5.3.5.2 **Size** and 5.3.5.3 **Identification**

Earth Electrodes (Clause 5.3.6) General (Clause 5.3.6.1)

The connection of the electrical installation earthing system to the general mass of earth shall be achieved by means of an earth electrode.

EARTHING OF EQUIPMENT (Clause 5.4) GENRAL (Clause 5.4.1)

Exposed conductive parts (Clause 5.4.1.1)

The exposed conductive parts of electrical equipment shall be earthed where the electrical equipment is-

a) Installed or could operate in an earthed situation; or
b) Not installed in an earthed situation but exposed conductive part of the electrical equipment continuous with an extraneous conductive part that is located in an earthed situation.

Labelling (Clause 5.5.1.3)

The main earthing conductor shall have a permanent label attached at the connection to the earth electrode with a legible warning against disconnection in the following form.

Resistance (Clause 5.5.1.4)

The resistance of the main earthing conductor, measured between the main earthing terminal/connection and bar and earth electrode, including the connection to the earth electrode, shall be not more than 0.5 ohms.

Protective earthing conductors (Clause 5.5.2) Arrangement (Clause 5.5.2.1)

All subman and sub circuit protected earthing conductors shall be directly connected to the main earthing conductor or to another point on an earthing system that is connected to the main earthing conductor. All provisions must comply with this standard.

Earthing Facilities for Distribution Boards (Clause 5.5.2.2.3)

A protective earthing conductor that originates at a distribution board, in accordance with **Clause 5.5.2.1 (c)** or **(d),** shall not be used for the provision of earthing facilities for another distribution board.

Wiring Systems (Clause 5.5.3.2)

a) Conductive wiring enclosure exposed conductive parts of wiring enclosure shall be earthed at the end adjacent to the switchboard or accessory at which the wiring enclosure originates
b) Conductive sheaths, armours and screens of cables or cords. The conductive sheathing, armouring or screening of cables or cords required to be earthed shall be earthed at the end adjacent to the switchboard or accessory at which the cable or cord originates. All provision must comply with these standards.

Earthing of Electrical equipment supplied by flexible cable. (Clause 5.5.3.3)

Switchboards (Clause 5.5.3.4)

Unprotected consumer's mains (Clause 5.5.3.3) and comply with requirements of the standards.

Equipotential Bonding (Clause 5.6) **General (Clause 5.6.1)**

Equipotential bonding is intended to minimise the risk associated with the occurrence of voltage differences between exposed conductive parts of electrical equipment and extraneous conductive parts. The provisions comply with the standards.

Equipotential Bonding (Clause 5.6) **General (5.6.1)**

Equipotential bonding is intended to minimise the risk associated with the occurrence of voltage differences between exposed conductive parts of electrical equipment and extraneous conductive parts. This provision must comply with the standards and take in to account the following clauses; **Clause 5.6.2** Arrangement, **Clause 5.6.2.1** General they must also be provide in accordance with **Clause 5.6.2.2** to **5.6.2.6** to avoid to avoid any potential difference that may occur between electrical equipment connection to the electrical installation earthing systems and any conductive piping (and including taps, etc.) that may independently be in contact with the mass of earth (see **Figures 5.4 and 5.5)**

Note: Additional equipotential bonding requirements apply for=

a) Patient areas of area of hospitals, medical and dental practices and dialyzing locations, in accordance with **AS/NZS 3003;** and
b) Explosive atmosphere locations, in accordance with **AS/NZS 2381** and **AS/NZS 61241** series standards; and
c) Telecommunication installation, in accordance with **AS/NZS 3015**; and
d) Film, video and television sites, in accordance with **AS/NZS 4249**; and
e) Photovoltaic arrays, in accordance with **AS/NZS 5033;** and
f) Generating access floors (elevated floors), in accordance with **AS 4154;** and
g) Generating system, in accordance with **Clause 7.3** and
h) Separated circuits, in accordance with **Clause 7.4**

Conductive water piping that is both-

a) Installed and accessible within the building containing the electrical installation; and
b) Continuously conductive form inside the building to a point of contact with the ground.

All provisions shall comply with all standards within these Clauses.

INSTALLATION REQUIREMENTS (Clause 3.9)

General (Clause 3.9.1)

Wiring system shall be installed in accordance with the generally accepted principles of safe and sound practice, using methods that will protect the electrical installation against mechanical or electrical failure under ordinary use, wear and tear, and any abnormal conditions that may reasonably be anticipated.

METHODS OF INSTALLATION (Clause 3.9.2)

Examples of acceptable types of wiring systems and methods of installation of wiring systems in relation to particular types of conductors or cables are depicted drawing table 3.1 in AS/NZS 3000:2007

Supported and Fixing (Clause 3.9.3)

General (Clause 3.9.3.1)

Wiring systems shall be supported by suitable means, in accordance with Clause 3.3.2.8

Wiring systems shall be fixing in position, in accordance with the standard, by suitable clips, saddles or clamps or by means that will not damage the wiring systems and that will not be affected by the wiring system material or any external influences.

For wiring systems installed in building elements, the positioning and size of opening and checks shall not reduce the structural strength of those building elements below the levels required by National Building Codes.

NOTES:

1 Limits for sizes of openings and checks made in structural members are contained in National Building Codes.

2 In New Zealand, this information may also be found in **NZS 3604**

Measures undertaken to minimize damage may include the following:

a) Provision of supports, continuous or at appropriate intervals suitable for the mass of the cable
b) Use of suitable fixing for the cable size and type that hold cable in position without damage.
c) Use of suitable connections for the cables size and type that reduce mechanical strain at the joints and terminations.
d) Attention to minimum bending radius limits of cables.
e) Provision of flexibility to accommodate any movement or tension stresses.

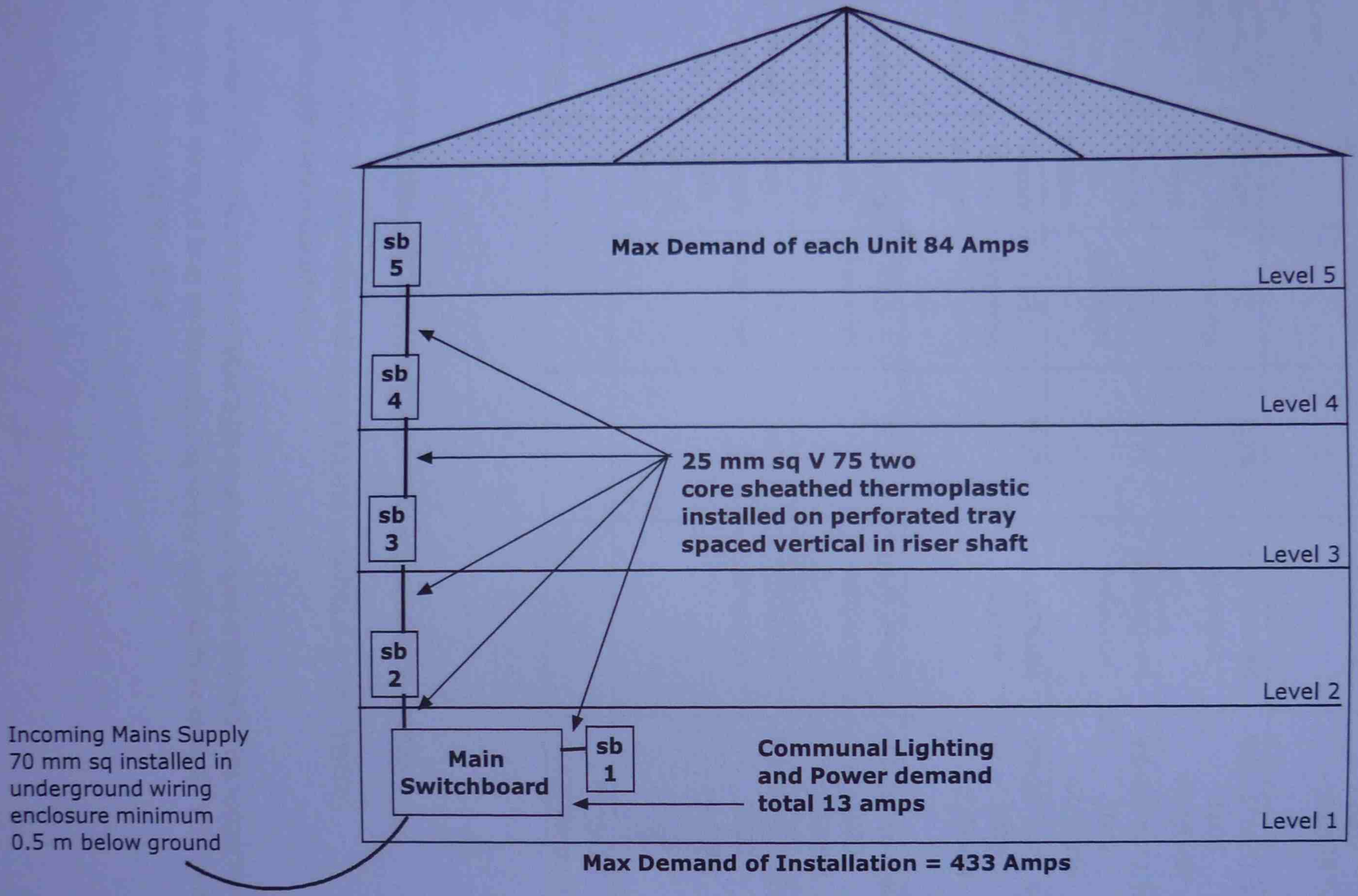
SUSPENDED CEILINGS (Clause 3.9.3.2)

The following conditions apply to the installation of wiring systems in suspended celling's-

a) Wiring systems may be supported by the suspended celling systems unless this is not permitted by the suspended celling manufacture; and
b) Cables shall be provided with additional protection against mechanical injury where in contact with conductive celling support runners; and
c) Wiring systems installed above suspended celling's shall be fixed at suitable intervals to prevent undue sagging of cables

Notes:

1 Suspended celling's referred to in this Clause do not include timber systems to AS/NZS 2589.1 and timber building standards.



AS/NZS 3008.1.1 2009 Electrical Installation and Selection of Cables
All sub-main cables selected from Table 3 (1) Item 9 Colum 4 table 10 (b) supported on perforated cable tray. De rating table 24 item 10 five cables de rating factor 0.75. Vc table 42 V 75 muilticore circular copper conduction 25 mm sq Vc = 1.54

MAXIMUM DEMAND OF EACH UNIT

SUBMAIN	LENGTH	CURRENT DEMAND	DERTAING FACTOR	CALCULATION	VOLTAGE DROP CALCULATION	CABLE REQUIREMANTS
Sub-main One Ground Level	Five Meters	63 Amperes	0.75	63/075=84 Amperes	Vd= 5*84*1.54/ 1000 =0.6468	113 Amperes 70mm sq.
Sub-main Two Level One	Thirtee n Meters	63 Amperes	0.75	63/0.75=84 Amperes	Vd=13*84*1.54/ 1000 =1.68168	113 Amperes 70 mm sq.
Sub-main Three Level Two	Eightee n Meters	63 Amperes	0.75	63/0.75=84 Amperes	Vd=18*84*1.54/ 1000 =2.32848	113 Amperes 70 mm sq.
Sub-main Four Level Three	Twenty Three Meters	63 Amperes	0.75	63/0.75=84 Amperes	Vd=23*84*1.54/ 1000 =2.97528	113 Amperes 70 mm sq.
Sub-main Five Level Five	Twenty Eight Meters	63 Amperes	0.75	63/0.75=84 Amperes	Vd=28*84*1.54/ 1000 =3.62208	113 Amperes 70 mm sq.
Communal Load	Run Directly from Switch Board	13 Amperes	1.00	13/1.00 Amperes	Vd=20*13*15.6/ 1000 =4.056	23 Amperes Table 10 2.5 mm sq.
Total Demand					84*5+13 =433 Amperes	144.3 Amperes Per Phase

AS/NZS 3008.1.1 2009 ELECTRICAL INSTALLATION SELECTION OF CABLES

Part 1.1: Cables for alternating voltages up to and including 0.6/1 kV- Typical Australian Installation Conditions

All sub main cable selected from **Table 3 (1) item 9 column 4 tables 10 (b)** supported on perforated cable tray**. De rating 24 item 10** five cables de rating factor **0.75 Vc table 42 V 75** multicore circular conductor **25 mm sq. Vc = 1.54**

Where a wiring system consisting of sheathed cables is installed through metallic structural members, any aperture through which the cable passes shall be bushed or shaped to minimize abrasion of cable. Where likely to be disturbed the cable shall be fixed in position at a point adjacent to the aperture.

NOTE: Fixing of individual cores of cable may be required where the risk of contact with conductive structural building materials exists (see Clause 5.4.6)

Exceptions:

1 Where a wiring system is resting on an immovable continuous surface no further support is required.

2 Any specific methods of fixing outlined in this Standard shall not prohibit the use of alternative methods, provided that an equivalent degree of support and strength is maintained.

LUMINAIRES

Luminaires that are supported by celling panel shall not-

a) Present a mechanical loading that exceeds the capacity of the celling panel; and
b) Operate at a temperature that would cause deformation, discoloration or other forms of deterioration of the celling panel.

NOTE: refer to manufacture's information for limitations on particular celling systems.

2 National Building Codes may restrict the use of suspended celling's to support services.

WIRING SYSTEMS LIKELY TO BE DISTURBED (Clause 3.9.3.3)

Wiring systems installed in the following locations are deemed likely to be disturbed and shall be supported at suitable intervals to prevent the undue sagging of cables;

a) On the surface of a wall or on the underside of a celling or roof.
b) In a space between a floor and ground to which a person may gain entry.
c) In a celling space having an access space exceeding 0.6m high.
d) Within two meters of any access to any space to which a person may gain entry
e) Below raised floors.

Wiring Systems installed Vertically (Clause 3.9.5)

Where wiring systems are installed vertically, they shall be installed in accordance with the requirements of Clause 3.9.2 and 3.9.3 and in such a manner as to avoid damage to any part of the wiring system that may be caused by its own weight or method of support or fixing.

Adequate provision shall be made for the support of cables enclosed in a wiring enclosure installed vertically. Cable supports shall be provided at intervals not exceeding 8m as recommended by the cable manufacturer.

SELECTION AND INSTALLATION TO MINIMISE THE SPREAD OF FIRE (Clause 3.9.9) General 3.9.9.1

a) Precautions shall be taken to minimise the spread of fire by the selection of appropriate materials and installation methods.

b) Where ever electrical equipment contains flammable liquid in significant quantity, precautions shall be taken to prevent burring liquid in significant quantity; precautions shall be taken to prevent burring liquid and the products of combustion of the liquid (flame, smoke, toxic gases) spreading to other parts of the building,

NOTES:

1 Examples of such precautions are-

a) A drainage pit to collect leakages of liquid and ensure their extinction in the event of fire; or

b) Installation of the equipment in a chamber of adequate fire-rating and the provision of sills or other means of preventing burring liquid spreading to other parts of the building, such a chamber being ventilated solely to the external atmosphere.

2 The generally accepted lower lit for a significant quantity is 25L.

c) In structures whose shape and dimensions facilitate the spread of fire, precautions shall be taken to ensure that the electrical installation cannot propagate a fire, e.g. Chimney effect.

NOTE: Fire detectors may be provided that ensures the implementation of measures for preventing propagation of fire, e.g. the closing of fireproof shutters in ducts, troughs or trucking.

ENCLOSURE OF CABLES (Clause 3.10) General 3.10.1.1 INSULATED, UNSHEATHED CABLES

Insulated, unsheathed cables shall be enclosed in a wiring enclosure throughout their entire length.

Exceptions: Wiring enclosures need not be provided for insulated, unsheathed cables installed-

a) As aerial conductors, in accordance with Clause 3.12:

b) Or enclosed or sheathing terminated within 100mm of the hole over or with which the accessory is mounted; or

NOTE: This exception does not apply within a roof space.

c) Within switchboards, metering and similar enclosures, provided that such cables are not exposed to touch during normal switching or meter-reading operations; or

d) As earthing or equipotential bonding conductors installed in accordance with Section 5; or

e) As an extra-low voltage circuit, in accordance with Section 7.5

INSULATED AND SHEATHED CABLES (Clause 3.10.3.5)

Where conductors or cables, including flexible cables and flexible cords, are to be threaded through conduits, tubes or channels, or passed through openings formed in metalwork, such tubes, channels, conduits ends or opening shall be adequate size and shall-

a) Be provided with bushes that are securely fixed in position; or

b) If not bushed, have no sharp angles or projecting edges that would be likely to damage a conductor or the insulation, braiding or sheathing of cable.

TERMINATIONS (Clause 3.10.3.6)

Termination shall be arranged so that wiring enclosures terminate in, and are supported on, electrical equipment in such a manner as to fully protect the enclosed cables as they pass into the electrical equipment.

Each end of flexible conduit shall be securely anchored to the fixed conduit, structure or electrical equipment where it terminates.

SOCKET-OUTLETS (Clause 4.4) General 4.4.1.1

Socket-outlets shall be suitable for the intended application and location of installation and shall comply with requirements of the following standards equivalent thereto.

a) AS/NZS 3112
b) AS/NZS 3123
c) IEC 60309
d) AS/NZS 3131

PROTECTION OF SOCKET-OUTLETS (Clause 4.4.2.2)

Socket-outlets shall be installed so that they will not be subjected to undue mechanical stress or damage on normal service.

In addition:

a) Where installed in a floor or other horizontal surface, socket-outlets shall be designed or arranged to prevent the accumulation of dust or water therein.
b) Where installed within 75 mm of a floor, socket-outlets shall be installed so that any plug used with the socket-outlet is withdrawn in the horizontal plane.

Exceptions: This requirement does not apply to a socket-outlet that complies with items (a) and (d)

c) Socket-outlets shall be so installed that a plug is not likely to become loose or to malfunction because of gravity, vibration or the weight of the flexible cord or cable,
d) Where installed for the connection of a fixed or stationary appliance or a luminaire that is not readily accessible, the socket-outlet shall be securely fixed to a structure or support to ensure that no mechanical strain is placed on the installation wiring connection when inserting or removing a plug to the socket-outlet.
e) The use and location of socket-outlets is restricted in a number of particular situations, including damp situations, in accordance with Section 6 and hazardous areas and other situations, in accordance with section 7.

Where socket-outlets are installed in a building surface that is required to provide fire-resistance or acoustic properties, measures shall be taken to ensure that these properties are maintained.

NOTE: Clause 4.2.2.6 and the National Building CODES have requirements for the installation of socket-outlets in building surfaces providing fire-resistance or acoustic properties.

SWITCHES CONTROLLING SOCKET-OUTLETS SHALL COMPLY WITH CLAUSE 4.4.4.2 AND 4.4.4.3

Exceptions:

1) A single switch may be used for the control of two socket-outlets located immediately adjacent to each other
2) A socket-outlet that is rated at not more than 10A, installed for the connection of a fixed or stationary appliance or luminaire and that is not readily accessible for other purpose, need not be controlled by a switch.
3) A socket-outlet that is switched by the insertion and withdrawal of the plug is deemed to meet the requirements of this Clause.

SMOKE AND FIRE DETECTIORS (Clause 4.6)

National Building Code has requirements for installation of fire and smoke detectors in domestic residence, including location and number required.

Where mains powers smoke or fire detectors are fitted such detectors may be directly connected to the lighting final sub circuit or to an individual final sub-circuit.

COOKING APPLIANCES (Clause 4.7)

Switching Device (Clause 4.7.1)

A circuit for fixed or stationary cooking appliance having an open cooking surface incorporating electric heating elements, e.g. cooktop, deep fat fryer, barbecue griddle or similar, shall be provided with a switch, operating in all active conductors, mounted near the appliance in a visible and readily accessible position.

Exception: Where an electric cooktop is installed in a public park or other open area, the required switch may be installed adjacent to the cooktop and, to prevent damage by vandalism, may be placed under a lockable cover that is located so that it is able to be operated as required for servicing and maintenance purpose of the cooktop.

NOTES:

1) The switch should be mounted within two meters of the cooking appliance, but not on the cooking appliance, in such a position that the user does not have to reach across the open cooking surface.
2) A single switch is permissible for the control of associated cooking appliance in the same room.
3) It is recommended that switches, particularly those in domestic installations, be marked to identify the appliance controlled.
4) This requirement is not intended to apply to enclosed cooking appliances, such as built-in ovens and microwave ovens.

WATER HEATERS (Clause 4.8.2) (4.8.2.1)

Access to easing equipment of pressure-relief and terminals of protective devices.

Every unvented water heater shall be installed so that the following are readily available for operation, inspection and adjustment:

a) **Easing equipment of pressure- relief devices.**
b) **All terminals of the protective devices.**

NOTE: an unvented water heater is one that is intended to operate at the pressure of the water system and the flow of water being controlled by one or more valves in the outlet systems.

SECTION 6 DAMP SITUATIONS General (Clause 6.1)

Application (Clause 6.1.1)

The provisions of section 6 from the minimum standard in relation to the section and installation of electrical equipment in locations subject to the effects of water or high humidity (damp situations), that must be achieved to satisfy Part 1 of this standard.

SELECTEION AND INSTALLATION (Clause 6.1.2)

In addition to the requirements of Sections 2 to 5 of this Standard, electrical equipment used in damp situations shall be selected and installed to perform the following functions associated with the proper design, correct construction and safe operation of the electrical installation:

a) **Provide enhanced protection against electric shock in locations where the presence of water or high humidity presents an increased risk.**

NOTE: This increased risk of electrical shock is generated by reduction in body resistance and the likelihood of contact of the body with earth potential.

b) **Provide adequate protection against damage that might reasonably be expected from the presence of water or high humidity.**

NOTE: Appendix G describes the IP system of classification of degrees of protection for electrical equipment.

The requirements for specific damp situations are as follows

i) Baths showers and other fixed water containers.

ii) Swimming [pools, padding pools and spa pools or tubs.

iii) Fountains and watery features

iv) Saunas

v) Refrigeration rooms. Sanitization and general hosing-down operations.

CLASSIFICATION OF ZONES (Clause 6.2.2) BTHS AND SHOWERS (CLAUSE 6.2.2.1)

c) Zone 1 for a bath shall be the area limited-

i) By Zone 0; and

ii) By the vertical protection of the internal rim of the bath above zone 0; and

iii) When the bath contains a shower, by the vertical plane 1.2m radius from the shower fixed plumbing connection; and

iv) In Australia, by the floor and horizontal plane 2.5m above the floor; or

v) In New Zealand, by the floor and a horizontal plane 2.25m above the floor; or

vi) The height of the fixed plumbing connection, if higher than the horizontal plane specified in (iv) or (v).

NOTE: A barrier of a height at which the shower connection is made to the fixed plumbing, or 1.8m, whichever is the greater, may be used to reduce the 1.2m dimension item (b) (iii).

SOCKET-OUTLETS (Clause 6.2.4.2)

Socket-outlets shall not be installed within 0.3m of the floor of a bathroom, laundry or other similar location where the floor is likely to become wet.

Regardless of the degree of protection provide by the equipment, the following conditions shall apply to the installation of socket-outlets in classification zones:

SWITCHBOARDS (Clause 6.4.6)

A switchboard shall not be installed within any classified zone.

MAIN SWITCH (Clause 7.2.3.1)

Each part of an electrical installation supplying a safety service shall be controlled by main switch that is separate from main switches used to control-

a) Any part of the general electrical installation; and

b) Other types of safety services.

NUMBER OF MAIN SWITCHES (Clause 7.2.3.2)

There shall be no limit to the number of main switches installed for the control of safety services.

H2.5 CENTRAL EMERGANCY LIGHTING CIRCUITS.

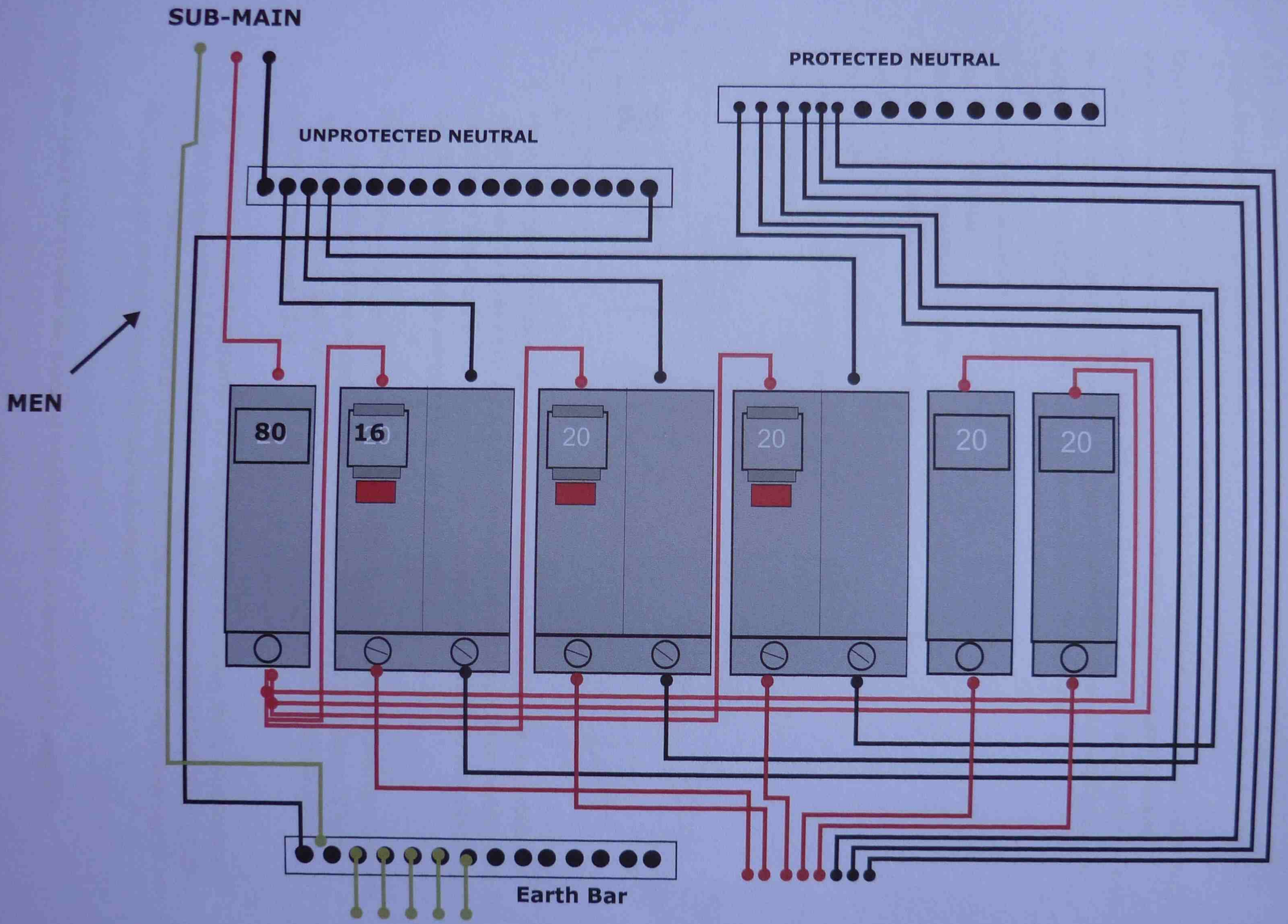
AS 2293 Emergency escape lighting and exit signs in buildings.

AS 2293.1 Part 1: System design, installation and operation, requires a rating of not less than WS4X for sub mains and certain final sub circuits supplying central emergency lighting circuits in buildings required to be constructed if fire-resisting elements.

Main Switch Board
Ground Level

H
W

$55.1m^2$
Floor Area


SUB-MAIN
PROTECTED NEUTRAL
UNPROTECTED NEUTRAL
MEN
80
16
20
20
20
20
Earth Bar

POWER QUALITY ASSESSMENT

This form is required if ANY piece of Low Voltage equipment has a rating of greater than 75A per phase or any High Voltage Connection Application.

List ALL proposed / expected equipment in the installation that may result in voltage fluctuations or distortion.

NOTE: The installation WILL NOT be energised unless all the information required on this form has been provided and processed.

Submit in conjunction with an Application for Connection or as requested by Ausgrid

Please complete this form in BLOCK LETTERS.

PART A INSTALLATION ADDRESS

Property Name

Floor **Unit** **Street No.** **RMB/Lot**

Street **Suburb**

Cross Street **Existing Meter ID** **Pole Pillar ID**

PART B INSTALLATION NON LINEAR/ FLUCTUATION LOAD DETAILS

Description	kVA/kW	Amp	Number of operations/hr	Design Standard	Mitigation Measures
DISTORTING LOADS					
1 Phase capacitor-filtered or conventional rectifier					
3 Phase 6-pulse capacitor filtered rectifier / Variable Speed Drives					
3 Phase 6 pulse capacitor filtered rectifier with series inductor > 3% or DC drive / VSD					
3 Phase 6 pulse inductor filtered rectifier / VSD					
3 Phase 12 pulse rectifier / VSD					
AC voltage regulator					
Variable voltage variable frequency (VVVF) Drive					
Switch mode power supplies					
Power Factor Correction					
Unknown					
FLUCTUATING LOADS					
Rating of the largest motor					
Rating of the second largest motor					
Rating of other frequently fluctuating loads:					
Other:					
SPECIAL EQUIPMENT					
X-Ray or Magnetic Resonance Imaging Devices					
Welding plant rating					
Arc furnaces rating					
Unbalanced loads (e.g PH-N / PH-PH loads)					
Other:					
TOTAL APPARENT POWER RATING					

PART C REFERENCES TO SIMILAR INSTALLATIONS OR COMMENTS

6kA transformer supply. outpt 415v / 240v.
output. 625 / 750 Amp.

EMAIL to - nemsrpops@ausgrid.com.au
or FAX to - 02 9277 3560
Ten days minimum notice is required from the submission of this form

Ausgrid

Site and Customer details for installations requiring CT Metering

It is a prerequisite that this form be submitted to the above fax or email address for the connection of supply to sites requiring 100 amps or greater . A separate form is required for each CT connection point.

Detailed Installation Address	
Address variables - cnr upstairs - west - rear etc	
NMI №	Installation or Job No
Site Load description - CT Ratio & detail major appliances eg Air Cond	

ELECTRICAL CONTRACTOR DETAILS

Electrical Contractor Licence № & Email — Adam Salam.	EC Phone & Email — 0415 686585. adamamp13@Gmail.com.

DETAILS OF ALL METERS TO BE REMOVED IF UPGRADING AN EXISTING SITE

List all Meter numbers to be removed — meters 1, 2, 3, 4, 5, 6, 7.	
Name of Meter Provider removing meters — Adam Salam.	Date to be removed

RETAILER AND METER PROVIDER DETAILS

Electrical Retailer (Seller of Electricity) — —	
Retailer contact if contract in place	Phone
Metering Supplier installing new meters	Date Requested for Inspection & Metering

DETAILS AND SIGNATURE OF CUSTOMER REQUESTING ELECTRICITY CONNECTION

Electricity Customer's Name:	Customer's ABN No
Customer's Signature	Date Signed
Printed Name of Signatory	Phone Numbers
Position in Company	Email or Fax
Customer's Postal Address for Accounts	

OFFICE USE ONLY

Inspection Appointment date — Adam Salam.	Time	Service Order No

IMPORTANT NOTICE: By signing this form the Customer certifies to Ausgrid Network the accuracy of all details provided including correct identification of the *Meter Provider, Contractor and Retailer as stipulated in ES1 Clause 4.4*

SUPPLEMENTARY

APPLICATION FOR CONNECTION

To be lodged with the Application for Connection. Refer to document ES1.

FAX
Tuggerah (02) 43998007
Email to
ea.datanorth@ausgrid.com.u
Free Call 1300 662089
(Not to be used for Muswellbrook)
Muswellbrook (02) 65429037
Email to
ea.datamuswellbrook@ausgrid.com.au

This form is required for:

- ☐ New electrical work over 20kW (Part A, B, C);
- ☐ Multiple living unit developments (more than 6 units) (Part A, B, C);
- ☐ For services greater than 100 Amps (Part A, B, C);
- ☐ CT metered installations. **NOTE: The installation WILL NOT be energised unless all the information required on the CT Metering form has been provided and processed (Clause 4.5 of ES1).** (Part A, B, C);
- ☐ Rural or outlying areas (Part A, B & C);
- ☐ New HV installations and those requiring more than 100kW or additional load (Part A, B, C, D);
- ☐ Work where the proposed equipment may cause excessive distortion, fluctuation or unbalance of voltage (Part A,B,C,D);
- ☐ All new and altered Solar Grid Connected generation installations (Part A, E)
- ☐ All other new and altered Grid Connected generation Installations (Part A, C, E)

Please complete this form in BLOCK LETTERS.

PART A INSTALLATION ADDRESS

Property Name

Floor **Unit** **Street No.** **RMB/Lot**

Street **Suburb**

Cross Street **Existing Meter ID** **Pole Pillar ID**

PART B INSTALLATION LOAD DETAILS

Residential Portion

No living units:
No of bedrooms per unit:
Gas hot water (yes/no):
Lift(s) and start current:
Car park ventilation current rating:
Air conditioning (yes/no):
Air conditioning rating:

Commercial Portion

Total floor area with air/con: m^2
Total office floor area without air/con: m^2
Car park floor area: m^2
Warehouse floor area: m^2
Commercial areas for food handling (yes/no):

Industrial Portion

Number of factory units:
Total floor area of all factory units: m^2

PART C DIAGRAM

All installation and units must comply with the forms provided.

Part D – Power Quality. Attach Power Quality Assessment form if any of the following are proposed:

Variable Speed Drives, switched-mode power supplies or other rectifiers > 75A per phase	☐
Motors exceeding the limits set out in the Service and Installation Rules of NSW	☐
Arc furnaces, welders or harmonic filters	☐
Unbalanced loads (Phase-Phase connected or single phase > 75A)	☐
Power Factor Correction capacitor banks	☐
Other voltage distorting or fluctuating equipment > 75 per phase, or installation with a large deployment of computer servers or IT equipment	☐
High Voltage Connections	☐

Part E- Grid Connected Generation Systems. Full details of any Grid Connected Generation Systems (Refer to Section 8 of the Service & Installation Rules of NSW)

Make/Model:			
Inverter Details			
Size of Inverter: (Nominal Rating)	kW	Is Inverter an Approved Type? (CEC) YES ☐ NO ☐ If No, Attach Certificate of Suitability	
No. of Phases:	1☐ 3☐	CEC Accredited Installer Number	
No. of Inverters:		Solar Panel Details Number _____ Total Rating _____kW	Other Generator details (Wind etc.) Type_____ Total Rating _____kW
Total kW's to be Connected (Single Phase)	kW's		

Note: The Metering Configuration must be Net Metering

The installation must be: -

a) Designed and installed by a CEC accredited person

b) Comply with all CEC guidelines

Part F - Additional Comments

APPLICATION FOR CONNECTION

Ausgrid

To be completed in BLOCK LETTERS by the electrical contractor or agent, on behalf of the customer.

A **Site Establishment Fee** as detailed in ES5 may apply to this installation. You will be notified if a Site Establishment Fee applies to this installation when your Job Number is issued. The Site Establishment Fee is charged when the Notification of Service Work is received.

Fax Sydney and Tuggerah (02) 4399 8007

Email to: ea.datanorth@ausgrid.com.au

Fax Local Call 1300 662 089
(Not to be used for Muswellbrook)

Fax Muswellbrook (02) 6542 9037

Email to ea.datamuswellbrook@ausgrid.com.au

RETAILER

NMI

INSTALLATION ADDRESS

Property Name

Pole/Pillar ID

Floor | Unit | Street | Lot/RMB

Existing Meter ID

Street

Office Use Only

Job Number

Nearest Cross Street

Suburb | Postcode

Site Establishment Fee to be applied ☐

CUSTOMER AND POSTAL ADDRESS

First Name (or Company Name)

Phone

Last Name

Mobile

Floor | Unit | Street No | PO Box | Street

Street (cont) | Suburb | Postcode

ELECTRICAL CONTRACTOR/AUTHORISED SERVICE PROVIDER

Electrical Contractor Name: Adam Salm.

Licence Number

Contact Phone Number

Authorised Service Provider Name

Licence Number

Contact Phone Number

Email Address (Preferred Option of Returning Job Number): adamsupply@gmail.com.

Fax Number

E/C or ASP Postal Address

SERVICE, DEMAND AND LOAD DETAILS (please tick)

Connection Type
- New ☐
- Alteration ☐
- Upgrade ☐
- Separation ☐
- Amalgamatio ☐
- Grid Connected Genration System ☐

Service Type
- Overhead ☐
- Underground ☐
- UGOH ☐
- Off Pole Transformer ☐
- Upgrade to TOU [Y]

Service Size
- 100A ☐
- 200A ☐
- 400A ☐
- Other A

Number of Installations
- Single Installation ☐
- Multiple Installation ☐
- Number of House Services
- Number of Units

Premise Type
- Domestic — Torrens ☐ Strata ☐
- Commercial ☐
- Builders Service Perm ☐
- Special Small Service (Indicate type of SSS below) ☐
- Other .....

Supplementary AFC

If the installation is one of the following types you must also complete and attach the **Supplementary Application for Connection.**

- New electrical work over 20kW ☐
- Services greater than 100 Amps ☐
- CT metered installations (CT Metering Form MUST be submitted) ☐
- New HV installations and those requiring more than 100 Amps of additional load ☐
- Multiple living unit developments (more than six units) ☐
- Installations located in rural or outlying areas ☐
- Work where the proposed equipment may cause excessive fluctuation of voltage (eg welders, x-ray machines) ☐
- Equipment > 75A per phase (Power Quality Form MUST be submitted) ☐
- Grid Connected Generation System ☐

Calculated Maximum Demand in Each Phase (Amps)

	A	B	C
Proposed			
Existing			

Service Length

Existing Service Rating

Details of Job:

Print Name ..... Signature ..... Date .....

Ausgrid

Deed of Agreement for Easement

Instructions for completion

- ☐ **Ausgrid recommends you obtain legal advice before signing this document.**
- ☐ Complete Items 1, 2 and 3 of the Reference Schedule on pages 2 and 3.
- ☐ Select the appropriate execution clause in Item 5 of the Reference Schedule on pages 4, 5 and 6 and execute the document.
- ☐ Attach a draft plan of the proposed easement site behind the Annexure A cover sheet on page 16.
- ☐ An interested party (for example a mortgagee or caveator) must provide their consent to this document by providing a letter on their letterhead on the same terms as the draft letter in Annexure B on page 17. Generally, if the property is subject to a lease, the lessee's consent to this document is not required, however, may be required to register the easement.

What must be returned to Ausgrid

- ☐ Deed of agreement for easement:
  - if the contracting party is the owner of the property – return 2 copies of the deed signed by the contracting party;
  - if the contracting party is not the owner of the property – return 3 copies of the deed signed by the contracting party and the landowner.
- ☐ Letter of consent signed by mortgagee and caveator (if any).
- ☐ If clause 5.2 applies the Deed of agreement for easement in respect of Works on Other Land.

Table of contents

Reference Schedule

ITEM 1	Parties details	
	Ausgrid	
	Name	Ausgrid
	ABN	ABN 67 505 337 385
	Address	570 George Street, Sydney NSW 2000
	Facsimile	
	Representative	
	Contracting Party[1]	
	Name	Adam Salim
	ABN/ACN	
	Address	
	Facsimile	
	Representative	

Note:

1 In this document, the Contracting Party is the developer/customer that signs the Agreement. If the Contracting Party is not the owner of the Property, then the owner of the Property must be joined as a party to this deed and the owner's details will be inserted below under the heading 'Landowner'.

2 If the Contracting Party is the owner of the Property, then the 'Landowner' section below should be struck out.

	Landowner[2]	
	Name	
	ABN/ACN	
	Address	
	Facsimile	
	Representative	
ITEM 2	**Property details**	
	Address	
	Title Particulars	

ITEM 3	Agreement	
	Definition of Agreement	ES9 Agreement or Conditions and Arrangement Letter

Note: If an ES9 Agreement will be entered into at the same time as this deed, the words "Conditions and Arrangements Letter" should be struck out. If a Conditions and Arrangements Letter will be entered into at the same time as this deed, the words "ES9 Agreement" should be struck out.

ITEM 4	Date	
	Date of this deed	

ITEM 5 Execution clauses

Ausgrid

Signed sealed and delivered for and on behalf of **Ausgrid** by its Attorney, who declares that the Attorney has not received any notice of the revocation of such Power of Attorney, in the presence of:

Signature of Attorney

Signature of Witness

Name of Attorney in full

Name of Witness in full

Power of Attorney Book No.

Contracting Party

Note: If the Contracting Party is an individual use the execution clause below and if not, the clause should be struck out.

Signed sealed and delivered by

.....

[Note: insert name of Contracting Party above]

in the presence of:

Adam Sarkis.

Signature

Signature of Witness

Name of Witness in full

Note: If the Contracting Party is a corporation use the execution clause below and if not, the clause should be struck out.

Executed by

.....

[Note: insert name of Contracting Party above]

in accordance with section 127 of the *Corporations Act* by or in the presence of:

Signature of Secretary/other Director

Name of Secretary/other Director in full

Signature of Director or Sole Director and Secretary

Name of Director or Sole Director and Secretary in full

Note: If the Contracting Party signs under power of attorney use the execution clause below and if not, the clause should be struck out.

Signed sealed and delivered for

.....

[Note: insert name of Contracting Party above]

under power of attorney in the presence of:

_____

Signature of attorney

_____

Signature of witness

_____

Name

_____

Name

_____

Date of power of attorney

Landowner

Note: If the Landowner is a party to this deed (in addition to the Contracting Party) and the Landowner is an individual use the execution clause below and if not, the clause should be struck out.

Signed sealed and delivered by

.....

[Note: insert name of Landowner above]

in the presence of:

_____

Signature of Witness

_____

Name of Witness in full

_____

Signature

Note: If the Landowner is a party to this deed (in addition to the Contracting Party) and the Landowner is a corporation use the execution clause below and if not, the clause should be struck out.

Executed by

.....

[Note: insert name of Landowner above]

in accordance with section 127 of the *Corporations Act* by or in the presence of:

Signature of Secretary/other Director

Signature of Director or Sole Director and Secretary

Name of Secretary/other Director in full

Name of Director or Sole Director and Secretary in full

Note: If the Landowner is a party to this deed (in addition to the Contracting Party) and the Landowner signs under power of attorney use the execution clause below and if not, the clause should be struck out.

Signed sealed and delivered for

.....

[Note: insert name of Landowner above]

under power of attorney in the presence of:

Signature of attorney

Signature of witness

Name

Name

Date of power of attorney

Deed of Agreement for Easement

Details

A. The Contracting Party has the right to carry out certain works on the Property as contemplated by the Agreement.

B. Ausgrid and the Contracting Party have entered, or will enter, into the Agreement.

C. The Agreement requires the Contracting Party to procure the carrying out and completion of the Works which are to be transferred to Ausgrid upon Electrification of the Works.

D. Electrification of the Works by Ausgrid will only occur once Ausgrid, acting reasonably, is satisfied that it has an enforceable interest in the Easement Site and, if Works On Other Land are required, in the Other Land.

E. The Landowner as the registered proprietor of the Property has agreed to grant the Easement on the terms of this deed.

Operative provisions

1. Definitions and interpretation

1.1 Definitions

Unless otherwise specified in this clause 1.1, in this deed a capitalised term is to have the same meaning as given to that term in the Agreement and otherwise, in this deed:

"Agreement" means either:

(a) if the words "ES9 Agreement" appears in Item 3, the meaning given to "ES9 Agreement in this clause 1.1; or

(b) if the words "Conditions and Arrangements Letter" appears in Item 3, the meaning given to "Conditions and Arrangements Letter" in this clause 1.1.

"Agreement for Lease" means Ausgrid's standard pro-forma document entitled 'Agreement for Lease'.

"Authority" means a government, semi government, local government, statutory, public, ministerial, civil, administrative, fiscal or judicial body or authority.

"Business Day" means a day, not being a Saturday, Sunday or public holiday, on which banks are generally open for business in New South Wales.

"Conditions and Arrangements Letter" means the letter from Ausgrid to the Contracting Party setting out the conditions and arrangements for the provision of connection services accepted by the Contracting Party on or about the date of this deed.

"Consent Letter" means a letter entered into by a mortgagee or other interested person as contemplated by clause 6, in the form, or substantially in the form, of the Draft Letter of Consent.

"Contracting Party" means the person described as the 'Contracting Party' in Item 1 of the Reference Schedule.

"Draft Plan" means the draft plan annexed to this deed as Annexure A which generally describes the Proposed Easement Site.

"Draft Letter of Consent" means the pro-forma letter attached as Annexure B.

"Easement" means the easements, restrictive covenants, rights of way or other rights or entitlements to be granted or created pursuant to this deed on the terms of the Instrument.

"Easement Site" means that part of the Property over which the Easement is to be granted to Ausgrid under the Instrument.

"Ausgrid" means the entity described as Ausgrid in Item 1 of the Reference Schedule.

"ES9 Agreement" means the agreement entitled "ES9 Agreement for Connection of Developments" between Ausgrid, the Contracting Party and others dated on or about the date of this deed.

"Interested Person" has the meaning given in clause 6.1.

"Instrument" means the transfer granting easement, section 88B instrument or any other instrument by which the Easement is granted to Ausgrid over the Easement Site under this deed, the terms of which will include those set out in registered memorandum number AC289041S and any other terms required by Ausgrid under clause 2.3(b).

"Landowner" means the registered owner of the Property being either:

(a) the person described as the 'Landowner' in Item 1 of the Reference Schedule; or

(b) the person described as the 'Contracting Party' in Item 1 of the Reference Schedule, if the Contracting Party is the owner of the Property.

"LPI" means Land and Property Information NSW.

"Other Deed" has the meaning given in clause 5.2.

"Other Land" means that part of the Property or that part of the Other Landowners land on which the Works On Other Land will be or are located together with such additional land as Ausgrid requires consistent with its usual operating requirements.

"Other Landowners" means the owners of land (other than the Landowner) on which the Works On Other Land will be or are located.

"Property" means the land described in Item 2 of the Reference Schedule.

"Proposed Easement Site" means the land shown in the Draft Plan as the land intended to be the Easement Site, as adjusted by the Site Boundary Adjustments.

"Site Boundary Adjustment" means those adjustments, alterations or enlargements of the Proposed Easement Site required by Ausgrid under clause 2.2(a).

"Works" means the works subject to the Agreement between the parties.

"Works On Other Land" means those parts of Ausgrid's distribution system or electricity works that are or will be located on land not part of the Easement Site in order to provide Customer Connection Services to the Property.

1.2 Interpretation

Unless expressed to the contrary, in this deed:

(a) words importing:

(i) the singular include the plural and vice versa; and

(ii) any gender includes the other genders;

(b) an obligation or a liability assumed by, or a right conferred on, 2 or more persons binds or benefits them jointly and severally;

(c) a reference to:

(i) a person includes a firm, unincorporated association, corporation and a government or statutory body or authority;

(ii) a person includes its legal personal representatives, successors and assignees;

(iii) legislation, a statute, ordinance, code or other law includes regulations and other statutory instruments under it and consolidations, amendments, re-enactments or replacements of any of them;

(iv) a right includes a benefit, remedy, discretion, authority or power;

(v) an obligation includes a warranty or representation and a reference to a failure to observe or perform an obligations includes a breach of warranty or representation;

(d) the Reference Schedule of this deed is binding on the parties and forms part of this deed; and

(e) notes and instructions for completion are included for guidance only and do not form part of this deed.

---

2. Draft Plan, Survey Plan and Subdivision

2.1 Acknowledgement

The parties acknowledge and agree that:

(a) the Draft Plan generally describes the Proposed Easement Site;

(b) it is intended that some or all of the Works will be carried out on the Proposed Easement Site; and

(c) Ausgrid may require, acting reasonably, the Proposed Easement Site to be altered, adjusted or enlarged, having regard to the actual location of the Works and the use of the Easement Site contemplated by the Instrument.

2.2 Preparation of Survey Plan

(a) This clause 2.2(a) and clause 2.2(b) only apply if the words "ES9 Agreement" appear in Item 3 of the Reference Schedule. The parties acknowledge and agree that:

(i) prior to the Contracting Party procuring preparation of the Survey Plan, the Contracting Party must enquire, by written notice, if Ausgrid requires a Site Boundary Adjustment; and

(ii) if Ausgrid confirms within 10 Business Days after receipt of the Contracting Party's enquiry under clause 2.2(a)(i) that it requires a Site Boundary Adjustment, then the Contracting Party must ensure the adjustment required by Ausgrid is incorporated into the Survey Plan.

(b) In accordance with the Agreement, the Contracting Party must engage a Registered Surveyor to prepare and provide to Ausgrid:

(i) a Survey Plan of the Proposed Easement Site;

(ii) prior to electrification a copy of the Survey Plan showing in red ink Ausgrid's assets including poles and the centre line of the electricity cables (or cable ducts if used) as installed with offsets to the Easement, signed by the Registered Surveyor; and

(iii) a statement (addressed to Ausgrid) accompanying the copy of the Survey Plan referred to in clause 2.2(b)(ii) certifying that that Survey Plan is correct and that the information shown in red ink on that plan has been accurately located to the Registered Surveyor's satisfaction.

(c) This clause 2.2(c) only applies if the words "Conditions and Arrangements Letter" appear in Item 3 of the Reference Schedule. Ausgrid must procure at its cost the preparation of a survey plan of the Proposed Easement Site.

2.3 Pro-forma Instrument

(a) At the same time as Ausgrid is provided with the Survey Plan under clause 2.2(b) or when requested by Ausgrid, the Contracting Party must provide to Ausgrid a draft of the form of Instrument the Contracting Party proposes to be granted to Ausgrid.

(b) Promptly after receiving the draft form of Instrument, Ausgrid agrees to advise the Contracting Party if the draft form of Instrument is acceptable and if it requires any changes, provide details of those changes to the Contracting Party.

2.4 Landowner Consent

The Landowner must, promptly after any request from the Contracting Party or Ausgrid, sign any document or do any thing required of the owner of the Property to carry out, complete or perfect any thing contemplated under this deed, including without limitation, signing any application as landowner to be submitted to any Authority.

3. Easement

3.1 Grant of Easement

The Landowner must grant to Ausgrid the Easement, within five Business Days after the later of:

(a) the date Ausgrid confirms its approval of (or otherwise provides details of changes required to) the draft form of Instrument as contemplated in clause 2.3(b); and

(b) the date that all the requirements set out in either the Conditions and Arrangements Letter or clause 4.4 of the ES9 Agreement (which ever is applicable) (other than those requirements which relate to the granting of certain leases and easements) have been satisfied in relation to Electrifying the Works.

3.2 Execution of Instrument

(a)

In accordance with the times stipulated in clause 3.1, the Contracting Party must execute (if it is the owner of the Property), or procure execution of the Instrument by the Landowner, and give Ausgrid two original copies (duly executed) of the Instrument (such Instrument must have been completed by the Contracting Party as contemplated in clause 3.2(c)).

(b) Not more than 10 Business Days after Ausgrid receives the executed Instrument from the Contracting Party, Ausgrid must return both original copies of the Instrument executed by Ausgrid.

(c) Ausgrid authorises the Contracting Party to insert into the Instrument:

(i) any amendments required by Ausgrid under clause 2.3(b);

(ii) all details necessary to complete the Instrument so that after execution and stamping it is in registrable form; and

(iii) title particulars of the Easement Site and attach, where relevant, a plan in registrable form identifying the land intended to be the Easement Site for the purposes of the Instrument.

(d) Promptly following execution of the Instrument by all the relevant parties, the Contracting Party must procure registration of the Instrument with the LPI and, if relevant, stamping of the Instrument by the NSW Office of State Revenue.

3.3 Easement binding

The Landowner and Ausgrid are bound by the Easement from and including the date that the Easement must be granted under clause 3.1 even though the Easement may not have been executed, stamped or registered at that date.

3.4 Return documents to Ausgrid

Promptly following registration and stamping of the Instrument, the Contracting Party must return one original copy of the Instrument to Ausgrid and provide evidence of its registration.

4. Ausgrid may lodge caveat

4.1 Caveat - the Property

(a) The Contracting Party (and if applicable, the Landowner) acknowledge and agrees that upon execution of this deed by the parties, Ausgrid has a caveatable interest in the Property and the Contracting Party (or if applicable, the Landowner) will not do anything or omit to do anything that will impede those rights.

(b) The Contracting Party (and if applicable, the Landowner) acknowledges that Ausgrid may lodge a caveat against the Property after the date of this deed to give notice of its rights under this deed.

(c) If after the Survey Plan has been prepared and provided to Ausgrid, the Contracting Party requests in writing that Ausgrid partially withdraw the caveat for any part of the Property other than the Easement Site (and provide Ausgrid with such documentation required to effect that partial withdrawal), then Ausgrid agrees to promptly sign and return any such documentation

(d) If a caveat is lodged under this clause 4.1, Ausgrid agrees to promptly consent to any dealing which relates to the Property which does not adversely affect Ausgrid's interest in the Property.

5. Compulsory Acquisition and Works On Other Land

5.1 Compulsory acquisition

The parties agree that:

(a) if

(i) any Works On Other Land are proposed to be or are located on any Other Land, and if Ausgrid compulsorily acquires any estate or interest in that land; or

(ii) Ausgrid compulsorily acquires any estate or interest in the Proposed Easement Site and the Contracting Party is in breach of its obligations under this deed,

then the Contracting Party must reimburse Ausgrid for all costs, expenses or payments associated with that compulsory acquisition promptly after written demand from Ausgrid;

(b) the Contracting Party is liable for, and indemnifies Ausgrid against, any liability, loss, claim, damages, costs and expenses arising from or incurred in connection with the compulsory acquisition of any land that is compulsorily acquired as provided for in clause 5.1(a); and

(c) Ausgrid makes no representation or warranties in relation to whether or not it may compulsorily acquire any land and is under no obligation to compulsorily acquire any land.

5.2 Other Land

Despite any other clause in this deed, if at any time it becomes apparent that Works On Other Land are to be located on Other Land, then (as applicable):

(a) the Contracting Party must (at its cost and risk) enter into an Agreement for Easement upon the basis that the "Easement Site" for the purposes of such Agreement for Easement will be determined by Ausgrid taking into account the location and nature of the Works On Other Land and on a basis consistent with its usual operating requirements; or

(b) the Contracting Party (at its cost and expense) must procure the Other Landowner to either enter into:

(i) a deed substantially on the same terms and conditions as this deed (except that the Draft Plan shall be deemed to be such plan as Ausgrid requires, taking into account the location and nature of the Works on Other Land and on a basis consistent with its usual operating requirements); or

(ii) enter into an Agreement for Easement upon the basis that the "Easement Site" for the purposes of such Agreement for Easement will be determined by Ausgrid taking into account the location and nature of the Works On Other Land and on a basis consistent with its usual operating requirements,

or in each case, on such other terms and conditions as Ausgrid reasonably requires (**"Other Deed"**).

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6. Consent required

6.1 Consent of mortgagee and interested persons

(a) If, at the date of this deed, the Property is subject to a mortgage or if any person has an interest in the Property (whether or not it is noted or registered on the title to the Property) (**"Interested Person"**), the Contracting Party must, on or before the date of this deed:

(i) obtain the mortgagee's or the Interested Person's (as applicable) consent to the granting to Ausgrid of rights under this deed and to the proposed Instrument;

(ii) procure the mortgagee or the Interested Person (as applicable) to sign a Letter of Consent substantially in the form of the Draft Letter of Consent; and

(iii) provide to Ausgrid any Letter of Consent required under this clause signed by the mortgagee or the Interested Person (as applicable).

(b) If, after the date of this deed, the Landowner proposes to grant a mortgage or otherwise encumber the Property or if the Contracting Party becomes aware of any person having an interest in the Property after the date of this deed, then promptly

upon becoming aware of such a person or prior to such dealing (as applicable) the Landowner or Contracting Party (as applicable) must:

(i) obtain Ausgrid's consent (acting reasonably);

(ii) procure any mortgagee or interested person (as applicable) to sign a Letter of Consent substantially in the form of the Draft Letter of Consent; and

(iii) provide to Ausgrid any Letter of Consent required under this clause signed by the mortgagee or interested person (as applicable).

7. General

7.1 Notices

All communications (including notices, consents, approvals, requests and demands) under or in connection with this deed:

(a) must be in writing; and

(b) must be addressed as shown in Item 1 of the Reference Schedule to this deed (or as otherwise notified by that party to each other party from time to time).

7.2 Governing law

This deed is governed by and must be construed according to the law applying in New South Wales.

7.3 Jurisdiction

Each party irrevocably:

(a) submits to the non-exclusive jurisdiction of the courts of New South Wales and the courts competent to determine appeals from those courts, with respect to any proceedings which may be brought at any time relating to this deed; and

(b) waives any objection it may now or in the future have to the venue of any proceedings, and any claim it may now or in the future have that any proceedings have been brought in an inconvenient forum, if that venue falls within clause 7.3(a).

7.4 Expenses

(a) Subject to clauses 7.4(b) and 7.4(c), each party must pay their own costs, charges and expenses (including legal costs) in relation to preparing, negotiating and executing this deed.

(b) The Contracting Party must pay any costs, charges and expenses in connection with:

(i) everything it must do under this deed, unless this deed expressly says otherwise;

(ii) obtaining all consents (including without limitation Ausgrid's consent) in relation to this deed;

(iii) lodging any partial withdrawal of caveat contemplated under clause 4.1(c);

(iv) if applicable, everything the Landowner must do under this deed unless the Landowner and Contracting Party agree otherwise; and

(v) all costs associated with the Other Deed.

(c) The cost and lodgement fees of withdrawing the caveat referred to in clause 4.1 together with all related incidental costs will be borne by the Contracting Party.

(d) Each party agrees to promptly pay (after written demand) to the other party any costs payable by that party.

7.5 Amendments

This document may only be varied or replaced by a document duly executed by the parties.

7.6 Counterparts

This deed may be executed in any number of counterparts and by the parties on separate counterparts. Each counterpart constitutes the deed of each party who has executed and delivered that counterpart.

7.7 Consents

A consent required under this deed from a party may be given or withheld, or may be given subject to any conditions, as that party (in its absolute discretion) thinks fit, unless this deed expressly provides otherwise.

7.8 Parties acknowledgement

The parties acknowledge that no relationship of agency, partnership or joint venture shall arise under this deed.

7.9 Entire understanding

No oral explanation provided by any party to another shall:

(a) affect the meaning or interpretation of this deed; or

(b) constitute any collateral agreement warranty or understanding between any of the parties.

7.10 Waiver

Failure (or delay) to exercise, or partial exercise of a right, power or remedy provided by law or under this deed by a party, does not preclude the exercise of that or any other right, power or remedy provided by law or under this deed. A waiver or consent under this deed must be in writing.

Annexure A - Draft Plan
(clause 1.1)

Annexure B - Draft Letter of Consent
(clause 6)

[ON LETTERHEAD OF INTERESTED PARTY]

Ausgrid
570 George Street
SYDNEY NSW 2000

Dear Sir/Madam

Consent to easement to Ausgrid
Property: (*insert address of property*)

[Insert details of Interested Party] consents to the grant to Ausgrid of the Easement as contemplated in the Deed of Agreement for Easement between Ausgrid and ***[Insert details of Contracting Party and if applicable, the Landowner]*** dated ***[Insert Date]*** and acknowledges the rights of Ausgrid under the Deed of Agreement for Easement.

[Insert details of Interested Party] agrees to sign or do anything to facilitate registration of the Easement.

Signed by an Authorised Representative

_____

Dated

_____

Estimation over View Project Management

- State Superintendent
- Estimator
- Bookkeeper

Owner / Project Manager

- Prepare the company long term plan, weekly monthly, yearly plan
- Review the monthly progress
- Verify major activity is assigned to particular individuals
- Make sure that each individual meets their responsibility's and objectives
- Review the major jobs on a weekly basis
- Keep all employees happy with the level of employment
- Stay in touch with customers and building management
- Meet the construction , attorney, insurance, sales person at least once a month

Estimator

- Prepare the list of materials equipment , man power and expenses
- Review the usage of materials and work on re-supply she dual
- Co-operate with the buyer to achieve the required materials
- Update company's budget and allocation of cost
- Work with superintendent to assess the required equipment
- Work with project manager on material requirements scheduling

Site supply scheduling

- Visit the site everyday highlight the technical matter
- Discuss with site fore man in technical matters
- Discuss with project manager related to work progress and participate in any change management and matters
- Prepare the weekly/ monthly project/ site work review
- Assist the site personal in technical matters

Bookkeeper

- Maintain financial records
- Maintain pay roll, purchase ladder, payment file, documents
- Work with accountant in company's financial analysis

A forecast of the expected labours a material components and associated cost to contractor to perform a specific project. The price offered to the client must include all appropriate conditions of trading.

Adjusted Hour= Estimated hours for standard productivity/Adjusted factors.

Calculating Wage Costs

Base Electrician $32/hr. = $ 2445.38 per week

Licences Allowance $ 30 wk.

Total Allowance $23/ wk.

Special skill allowance $ 2.70 $ 87.38/wk.

Construction Allowance $ 64/ wk.

Training time allowance $ 80/38

Hourly rate = 2445.38/40hr= $61.2 per hr.

5 Employees Installing the Electrical Installation

2 licenced electricians at the above allowance and

3 traineeships at $ 25.00's per hour

Total Allowance $23/ wk.

Special skill allowance $ 2.70 $ 87.38/wk.

Construction Allowance $ 64/ wk.

Training time allowance $ 80/38

Hourly rate = 1258.38/40 = $ 31.50 per hr.

Therefore total pay rate per week equals $ 8665.60 per wk.

Construction time is estimated to take 18 weeks.

Therefore $ 8665.60 * 18 = $ 155,980

Material cost equals $ 35,262.27

Total cost equals $ 35,262.27 + $ 155,980 = **$ 191,243.03**

The mark up on supply and installation in at 30 %

The overhead allows and mark up on price of 25 %

Additional costs and mark up allows a 10 % increase in cost

30 % increase equals $ 57372.90

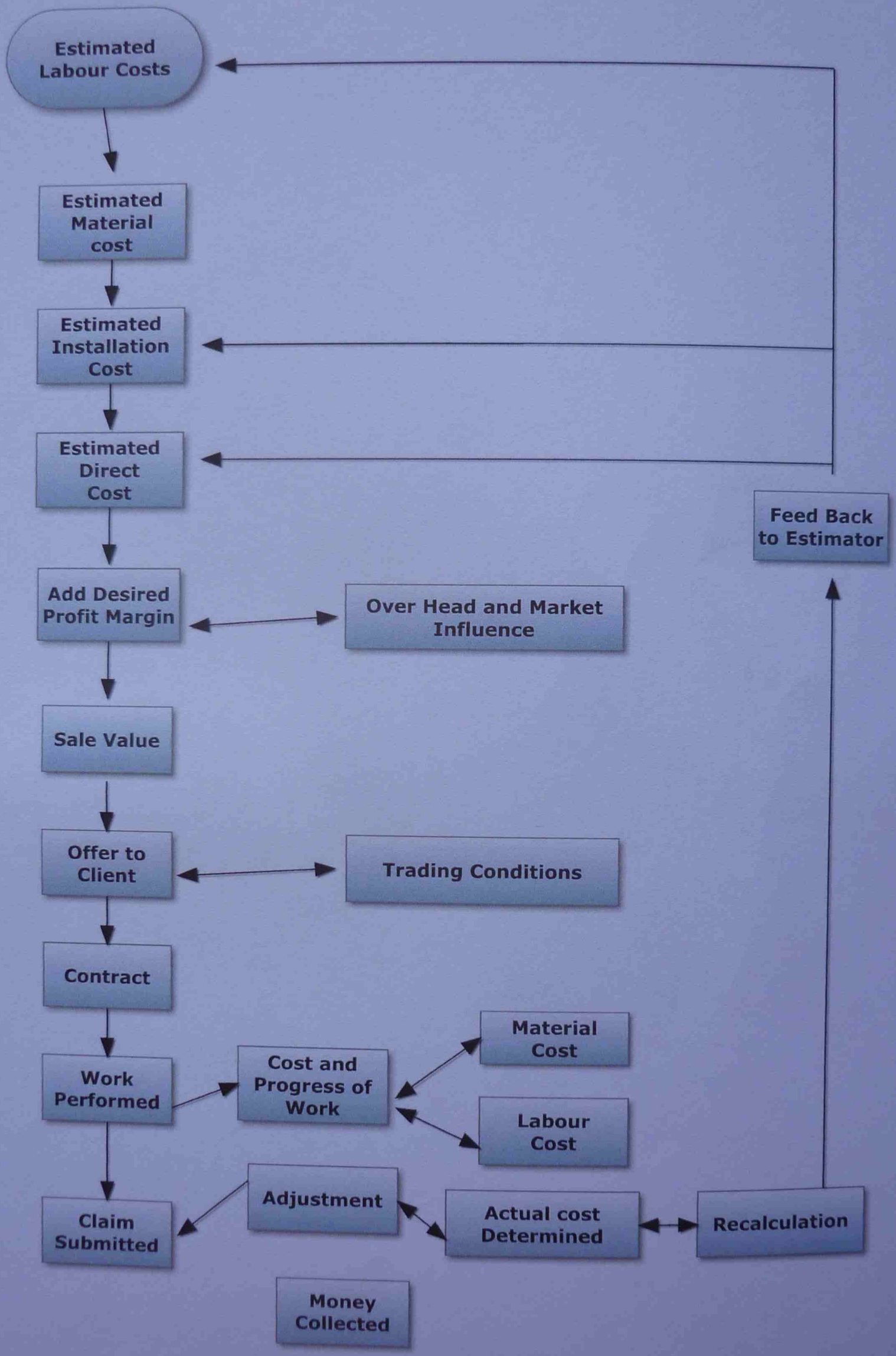
25 % increase $ 47810.80

15 % increase $ 19124.30

Total Estimated cost of installation = $ 315551.03

Payments to made on four week bases the payments to made by the customer equals to $ 70122.50 per month.

All payments must be scheduled and filed in order to keep up to date the payment order.


Estimated Labour Costs
Estimated Material cost
Estimated Installation Cost
Estimated Direct Cost
Feed Back to Estimator
Add Desired Profit Margin
Over Head and Market Influence
Sale Value
Offer to Client
Trading Conditions
Contract
Material Cost
Work Performed
Cost and Progress of Work
Labour Cost
Adjustment
Claim Submitted
Actual cost Determined
Recalculation
Money Collected