

**This document is superseded and is  
information purposes only**

# Queensland Electricity Connection Manual

Service and Installation Rules

Effective date 1st July 2020



Part of Energy Queensland

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## DISTRIBUTORS CONTACT DETAILS

### Energex

Web Address	<a href="http://www.energex.com.au">www.energex.com.au</a>
LV CT Metering Advice Form	<a href="https://www.energex.com.au/contractors-And-service-providers/document-library/forms">https://www.energex.com.au/contractors-And-service-providers/document-library/forms</a>
General Customer Service	13 12 53 E-mail request can be sent to <a href="mailto:custserve@energex.com.au">custserve@energex.com.au</a>
Loss of Supply	13 62 62
Emergencies	13 19 62
C&I Substation Manual	Available from Technical Documents section of Energex website: <a href="http://www.energex.com.au">www.energex.com.au</a>
Metering Locks	<a href="https://www.energex.com.au/home/our-services/meters/energex-locks">https://www.energex.com.au/home/our-services/meters/energex-locks</a>
Technical Information and QECM advice.	1300 762 397 Electrical Contractor Hotline (EC Use Only) <a href="mailto:gecmtechadvice@energyq.com.au">gecmtechadvice@energyq.com.au</a>
Dispensation Requests as per Section 1.4	<a href="mailto:tech.enquiries@energex.com.au">tech.enquiries@energex.com.au</a>

### Ergon Energy

Web Address	<a href="http://www.ergon.com.au">www.ergon.com.au</a>
EWR and LV CT Metering Advice Form	<a href="https://www.ergon.com.au/network/contractors-and-industry/electrical-contractors/forms,-manuals-and-standards">https://www.ergon.com.au/network/contractors-and-industry/electrical-contractors/forms,-manuals-and-standards</a>
General Customer Service	13 74 66 For all areas - New Applications, Point of Attachment Site Visits, Breaking Meter Seals. E-mail requests can be sent to <a href="mailto:networkenquiries@ergon.com.au">networkenquiries@ergon.com.au</a> or by completing the Contact Form as provided under "Contact Us" on Ergon Energy's Web site: <a href="http://www.ergon.com.au">www.ergon.com.au</a>
24 Hour Faults and Emergencies	13 22 96
Metering Locks	1300 323 301 toll free number. Metering Locks can be purchased from API Locksmiths (Queensland Locksmiths) by phone or on-line at <a href="http://www.queenslandlocksmiths.com.au">www.queenslandlocksmiths.com.au</a> .
Technical Information and QECM enquiries.	1800 237 466 Electrical Contractor Hotline (EC Use only) <a href="mailto:gecmtechadvice@energyq.com.au">gecmtechadvice@energyq.com.au</a>
Dispensation Requests as per Section 1.4	<a href="mailto:tech.enquiries@ergon.com.au">tech.enquiries@ergon.com.au</a>



## LOOK UP AND LIVE

# Lookupandlive.com.au

Business owners, machinery operators, and other workers working near powerlines should take appropriate actions to work safely near powerlines.

Our [Look up and live mapping application](#) can help you plan work near powerlines. This tool may help minimise contact and reduce the risk of injury or death from electrocution and damage to equipment and our electricity network.

It's a simple tool can be found at [www.lookupandlive.com.au](http://www.lookupandlive.com.au) to assist you to safely plan and/or perform work around the electricity network by providing:

- Overhead powerline locations and imagery via an interactive geospatial map
- Powerline safety guidelines, including powerline exclusion zones
- Options for planning or performing work e.g. powerline visual indicators
- Information on de-energisation or relocation of powerlines
- Safety advice and high load forms.
- Supply abolishments
- Dial Before You Dig enquiry

## DIAL BEFORE YOU DIG



Phone 1100 - free call (except from mobiles) Fax 1300-652-077

Website [www.1100.com.au](http://www.1100.com.au)

Dial Before You Dig is the national referral service for information on the location of underground infrastructure.

Australia's major service providers have a single web-enabled information service for information on the location of underground communications, gas, water and electricity infrastructure.

The Dial Before You Dig online service is available 24 hours a day and enables users to have more control over their enquiry as you detail the dig site on the mapping software yourself.

Use the website to ensure that you 'Dial Before You Dig' before any excavation work.

When calling the 1100 phone number the operator may require the following:

- your name and address
- name of company
- contact telephone number
- fax number for return information
- contact name on site
- site address and both nearest cross streets
- start date of proposed work
- type of work being carried out

**Note:** It is an offence under section 68 of the Electrical Safety Regulation 2013 (QLD) to come within an unsafe distance of overhead and underground electric lines.

## FOREWORD

The Queensland Electricity Connection Manual (QECM) has been compiled in conjunction with *Energex* and *Ergon Energy* and is the same jurisdictional document referred to as the Electricity Connection and Metering Manual (ECMM) in the Metrology Procedure: Part A National Electricity Market.

**Note:** Printed versions of the QECM are “uncontrolled copies” - the latest version is available on the *Energex* website ([www.energex.com.au](http://www.energex.com.au)) or *Ergon Energy* website ([www.ergon.com.au](http://www.ergon.com.au)).

### Safety

In all activities undertaken, the safety of our employees, contractors, *customers* and the community is paramount. Safety is our number one value and there is a commitment to ensuring that "safety must come first" to achieve a no injuries workplace. In accordance with legislative requirements we have developed Policies, Standards and Work Practices that our workers are required to follow to ensure the safety of themselves, other workers, *customers* and the community. We trust that electrical contractors and persons in control of sites will appreciate that our workers will not undertake any work in a situation where there are uncontrolled risks inconsistent with our safe systems of work.

### Disclaimer

Whilst the QECM contains material relevant to the electricity industry legislation, codes of practice and standards, it is not intended to provide legal advice on how *electrical contractors* can meet their own statutory obligations or comply with legislation, codes of practice or industry standards such as AS/NZS 3000 (Wiring Rules).

The QECM does not provide advice for the purposes of section 68 of the *Electrical Safety Regulation 2013*(Qld). The *Electrical Safety Act 2002* (Qld), *Electrical Safety Regulation 2013* (Qld) and associated codes of practice establish requirements for electrical safety and place obligations on employers, self-employed persons and others. These documents may be obtained from the Queensland Government website ([www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)).

Whilst care has been taken in the preparation of the QECM, the distribution entities do not guarantee that the information contained in the QECM is accurate, complete or up to date at time of publication. To the extent permitted by the relevant legislation the *distributor* will not be responsible for any loss, damage, cost or expense incurred as a result of any error, omission or misrepresentation in relation to the information contained in the QECM.

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## PURPOSE AND SCOPE

The purpose of this manual is to promote industry uniformity through standardisation of practices throughout Queensland. The document is for use by *Electrical Contractors*, Consulting Engineers, Architects, *Metering Providers* and others directly concerned with electrical installations that are connected, or are to be connected, to the relevant supply network.

Electrical installation compliance and obligations contained in this manual form part of the (Queensland) *Electricity Distribution Network Code* and the *National Electricity Rules*.

## DEFINITIONS, ABBREVIATIONS AND ACRONYMS

Unless otherwise stated definitions, abbreviations and acronyms used in AS/NZS 3000 (Wiring Rules) and the current Legislation referenced in the *QECM* have the same meaning when used in this document.

Refer to the Glossary of Terms for general definitions.

**Note:** Words and terms defined in the Glossary are identified within the text by italicising (e.g. *distributor*).

## REFERENCES

### Referenced Legislation, Regulations & Codes:

*Electricity Act 1994* (Qld)

*Electricity Regulation 2006* (Qld)

Electricity Distribution Network Code (made under the Electricity Act 1994 (Qld))

*Electrical Safety Act 2002* (Qld)

*Electrical Safety Regulation 2013* (Qld)

Electrical Safety Code of Practice 2020 – Working near overhead and underground electric lines

Electrical Safety Code of Practice 2020 - Works

Queensland Government Gazette – Notified Prices (Tariff Gazette, <http://www.qca.org.au>)

*Work Health and Safety Act 2011* (Qld)

*National Electricity Rules*

### Referenced Standards:

AS 1243	Voltage transformers for measurement and protection
AS/NZS 1269.1	Occupational noise management - Measurement and assessment of noise immission and exposure
AS 1284.4	Electricity metering Socket mounting system
AS 1397	Steel sheet and strip - hot dip zinc-coated or aluminium/zinc-coated
AS 1657	Fixed platforms, walkways, stairways and ladders - Design construction and installation
AS 2067	Substations and high voltage installations exceeding 1kV ac
AS/NZS 3000	Wiring Rules
AS/NZS 3012	Electrical installations - Construction and demolition sites
AS 4645.1	Gas distribution networks – Network management
AS/NZS 4777.1	Grid connection of energy systems via inverters - Installation requirements
AS/NZS 4777.2	Grid connection of energy systems via inverters - Inverter requirements
AS 5601	Australian Gas Code
AS 6002	Domestic electricity meter enclosures

AS 60044 series	Instrument transformers
AS/NZS 60079.10.1	Classification of hazardous areas - Examples of area classification - Flammable gases
AS 60269 series	Low-voltage fuses
AS 60529	Degrees of protection provided by enclosures (IP Code)
AS 60974.6	Arc welding equipment - Welding power sources
AS/NZS 61000 Series	Electromagnetic compatibility (EMC)
AS/IEC 62196	Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles
<a href="#">STNW1170</a>	Standard for Small IES Connections
<a href="#">STNW1174</a>	Standard for Low Voltage Embedded Generating
<a href="#">STNW1175</a>	Standard for Connection of Embedded Generating Systems to a Distributor's HV Network

## RESPONSIBILITIES

### The *Customer*:

- selects an electricity *retailer*;
- where applicable, negotiates or nominates an agent to negotiate provision of the electricity supply with the *distributor*;
- contacts their *retailer* when advised by an *electrical contractor*;
- for initial connections, the *customer* is responsible to ensure trees are cut/trimmed to provide clear access for an overhead service;
- provides a safe working environment for the *electrical contractor*, meter reader, etc;
- ensures the meter enclosure is accessible at all times. If behind a locked gate ensures that the gate is fitted with the *distributor's* metering lock;
- ensures the meter enclosure is clear of vegetation and that the meter reader can read the meter without stepping on, or damaging valuable plants etc;
- ensures that the *connection point* is clear at all times to allow safe access by the *distributor's* personnel;
- is responsible for ensuring that anything connected to the *distributor's* electricity network at the *connection point* is operated in a manner that is compliant with the *QECM* and any other requirements
- notifies the *retailer*, *distributor* and *metering provider* where applicable, when supply is to be permanently disconnected from a *premises* (supply abolishment); and
- contacts the *retailer* prior to any work being done that may impact on the metering installation.

### The Relevant *Distributor*:

- negotiates provision of the electricity supply with the *customer* or the *customer's* agent (generally an *electrical contractor*);
- transports and delivers electricity which is purchased by *retailers* and sold to *customers*;
- examines and tests the *consumer mains*, main switchboard and main earth of a *customer's* installation before it is initially connected to the *distributor's* electricity network;
- may be the *metering provider*, where the transitional provisions apply
- provides the *Distributor Network Devices*;
- connects the electricity supply to a *customer's* installation up to the load side of the Metering Isolation Links (subject to rectification of any defects) and subject to the *customer* selecting a *retailer*, and the *retailer* requesting the connection;

- is responsible for the reliability and quality of the electricity supply at the *connection point*;
- is responsible for the issue of *NMIs* for each *metering installation* (other than at a *child connection point* in an *embedded network*) (refer to local *distributor's* web site for guidelines).

## The *Metering Provider*:

The *metering provider* must be accredited by *AEMO* and shall comply with the following responsibilities;

- when appointed by the *metering coordinator*, they are to supply, install and maintain the metering equipment on a *customer's* premises in accordance with this *QECM*,
- to ensure all *customer* energy is metered and to notify by the appropriate notification form to the *distributor* any unmetered circuits identified,
- notify the *distributor* immediately and cease any work if evidence of tampering of metering or control equipment is detected,
- retain or utilise *distributor's* network devices where the *customer* requires controlled tariffs,
- where the distributor is the metering *provider*, comply with *distributor's* requirements for installation, sealing and testing of metering equipment,
- where the *metering provider* is not the *distributor*, notify the *distributor* by the appropriate process prior to conducting any onsite works,
- the *metering provider* shall attach a label to the metering installation detailing the *NMI*, the *metering provider* and *metering provider* contact details,
- ensure that all safety and security requirements are maintained for all types of metering installations,
- inspect and confirm the metering installation is compliant with this *QECM* and relevant safety requirements, and issue corrective action notices if defects exist.

## The *Relevant Retailer*:

- purchases electricity and sells it to *customers*;
- nominates prices and negotiates contracts where applicable, for the sale of electricity to *customers*;
- where the *distributor* is not the *metering provider*, provides the *distributor* with details of the *metering coordinator* and/or *metering provider*;
- requests the *distributor* to connect, disconnect or alter the *customer's* installation in accordance with the *customer's* contract (*Service Order Request* if applicable).

## The *Electrical Contractor*:

- ensures all electrical work is in accordance with Queensland Legislation, AS/NZS 3000 (Wiring Rules), other relevant Standards and the requirements of the *QECM* (in particular ensuring that unterminated cables cannot be energised by inserting a fuse or link or by closing a switch or circuit breaker);
- where 'exceptional circumstances' occur, ensures that permission is obtained by submitting a written request to the *distributor* for a variation;
- ensures that the *distributor* is advised when there is a significant increase in the electrical load at an installation;
- advises the *customer* when increases in load require changes to the electrical installation including meter changes;
- must not work on or remove metering equipment unless they are the appointed *metering provider*;
- on completion of electrical work that involves metering or metering alterations, advises the *customer* that they must contact the *retailer* and notify that the work is complete (See note in Section 2.2);

- issues the *customer* with a certificate of testing and compliance;
- submits appropriate forms in a timely manner and ensures that the information on the forms is accurate (e.g. correct address);
- notifies the *metering provider* of any broken metering seals;
- notifies the *distributor* of any broken *network device* seals; and
- rectifies any departures from this manual that have been identified by the *distributor/metering provider*;

## The Electrical Consultant:

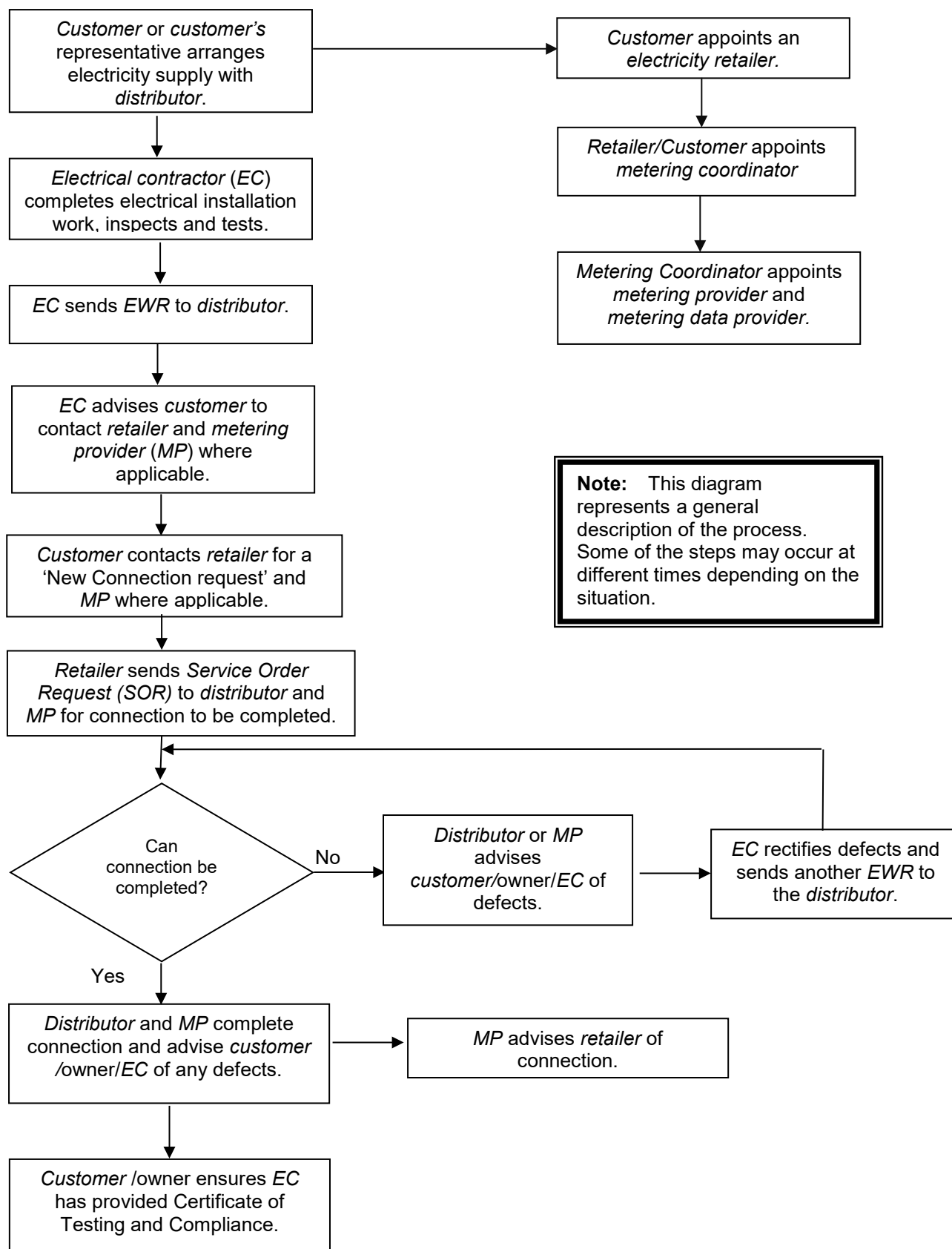
- designs the electrical installation in accordance with Queensland Legislation, AS/NZS 3000 (Wiring Rules), other relevant Standards and the requirements of this manual;
- where 'exceptional circumstances' occur, ensures that permission is obtained by submitting a written request to the *distributor* for a variation;
- on large projects liaises with the *distributor* to ensure adequate supply is available when required;
- ensures that the *distributor* is advised when there is a significant increase in the electrical load at an installation;
- advises the *customer* when increases in load require changes to the electrical installation including meter changes.

## Stakeholder Interaction Diagrams:

The following diagrams have been included as a guide to assist the users of this manual to understand the process interaction between the *customer*, *electrical contractor*, *retailer*, *distributor* and *metering provider*:

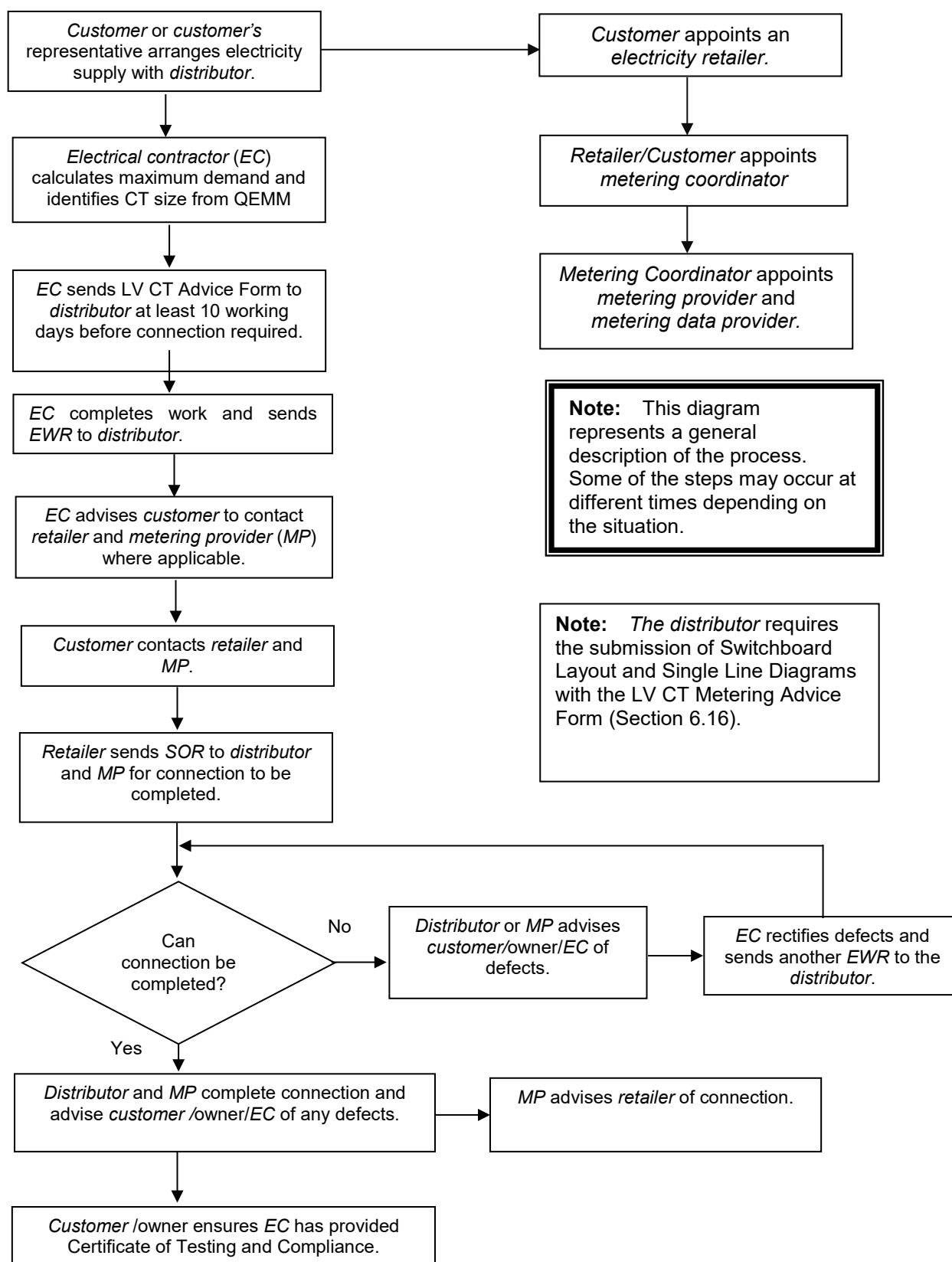
- 1)Initial Connection - *Direct Connected Metering*;
- 2)Initial Connection - *Current Transformer Metering*;
- 3)Electrical Installation Work Involving Metering Changes;
- 4)Service and Metering Change - Additional Phases;
- 5)Service Alteration - No Metering Changes;
- 6)*Small IES EG Connection* to the Distribution Network;
- 7)Initial Connection - High Voltage Installation.

## 1) Initial Connection - Direct Connected Metering

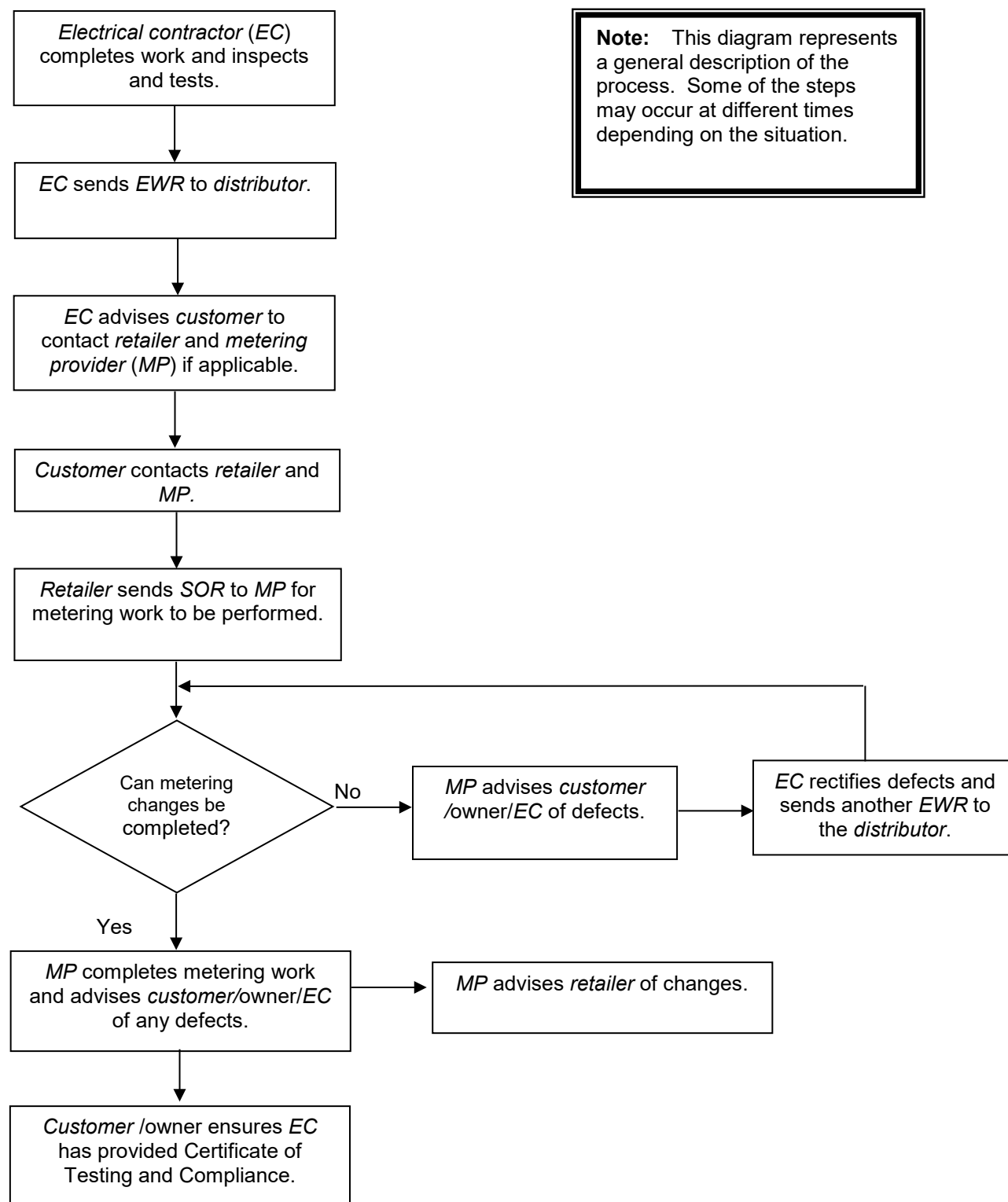




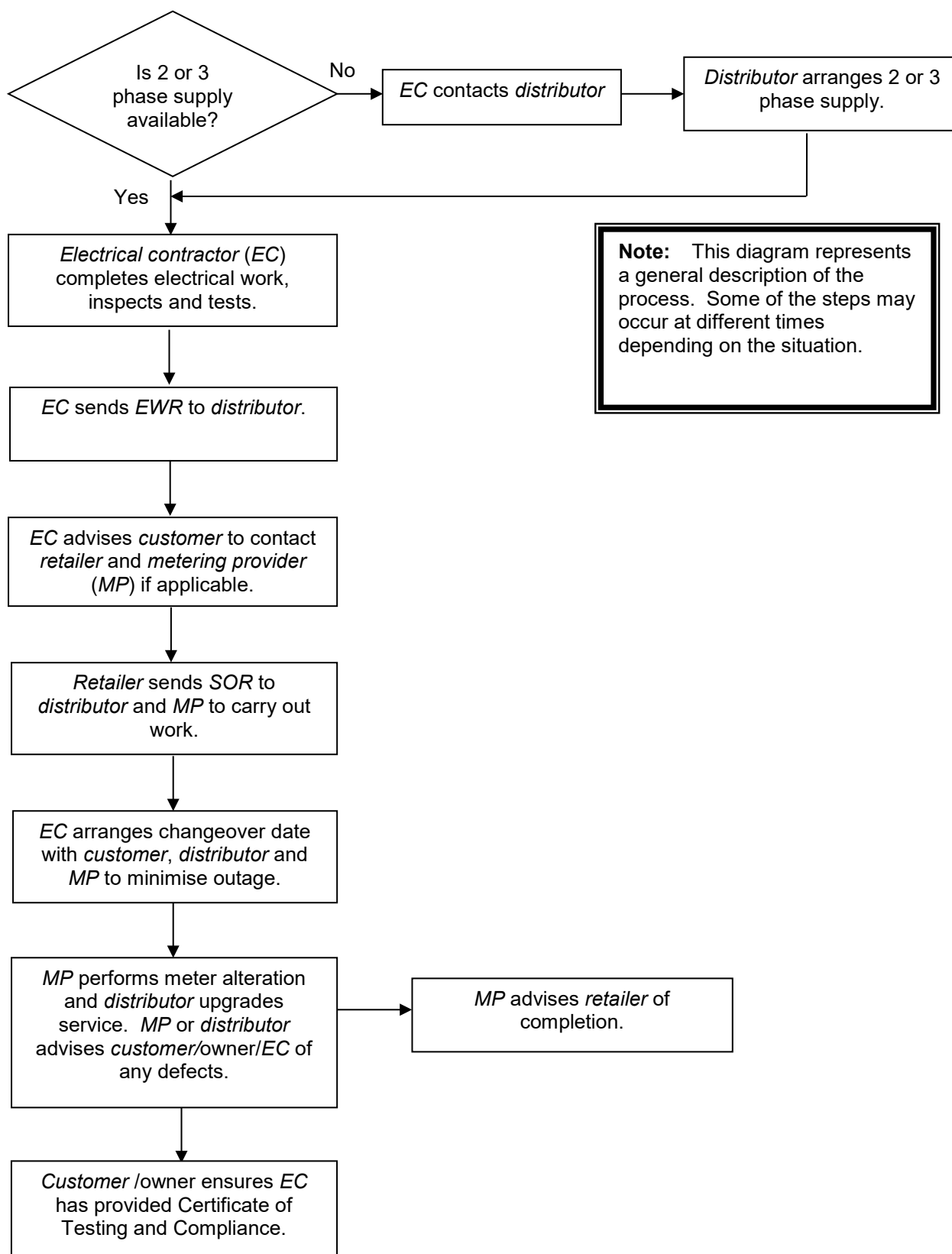
## 2) Initial Connection - LV Current Transformer Metering



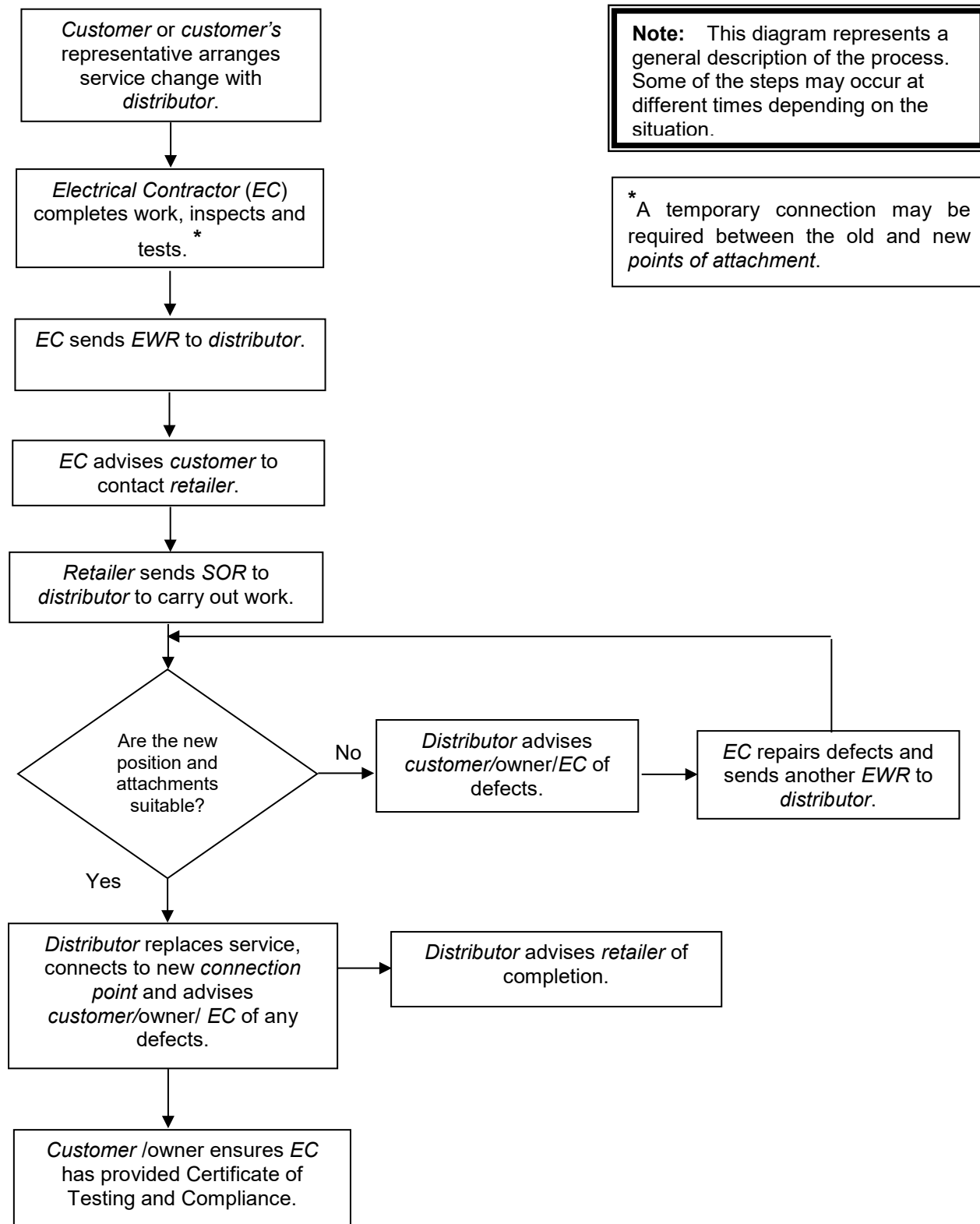
## 3) Electrical Installation Work Involving Metering Changes



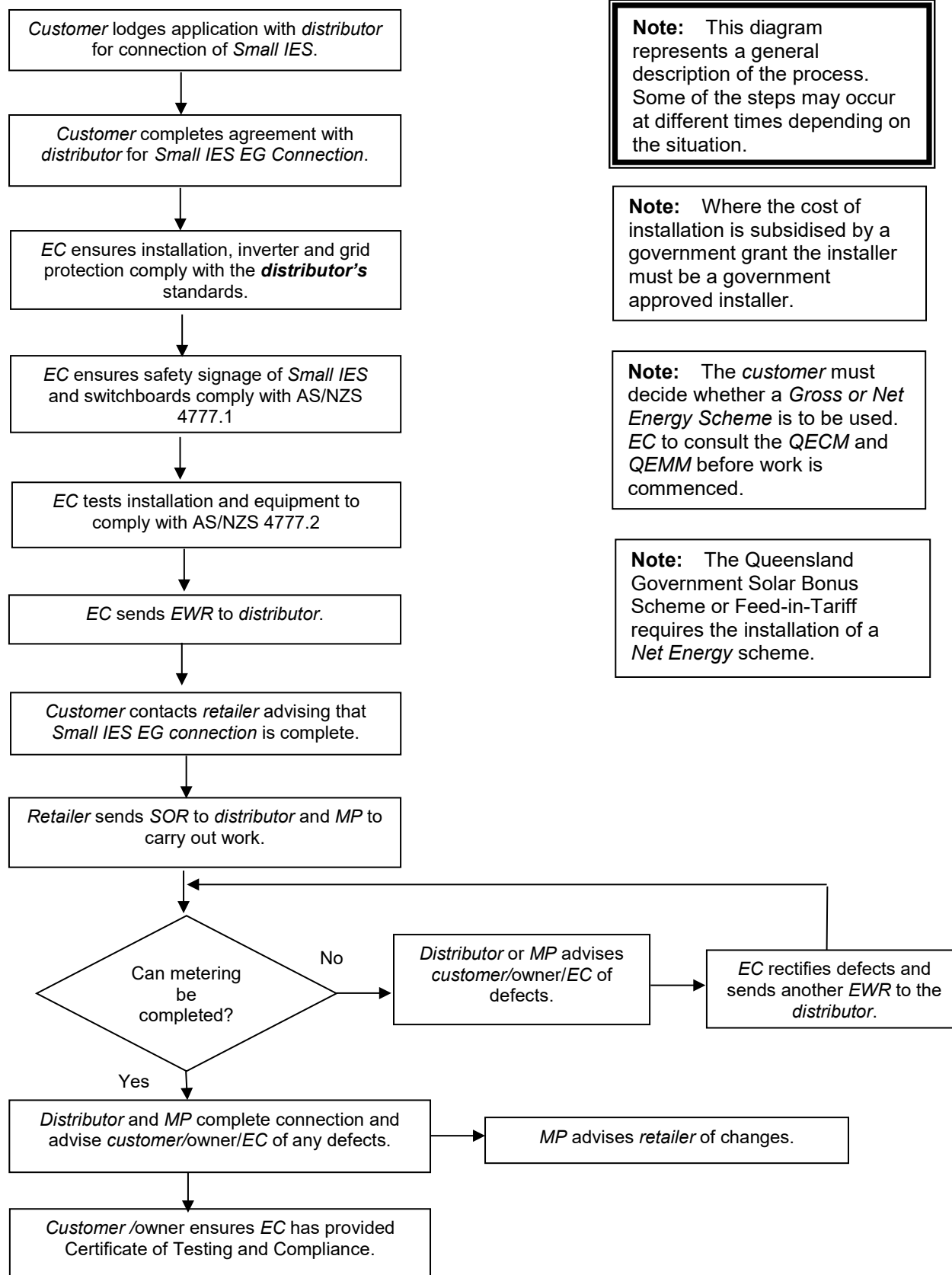
## 4) Service and Metering Change - Additional Phases



## 5) Service Alteration - No Metering Changes

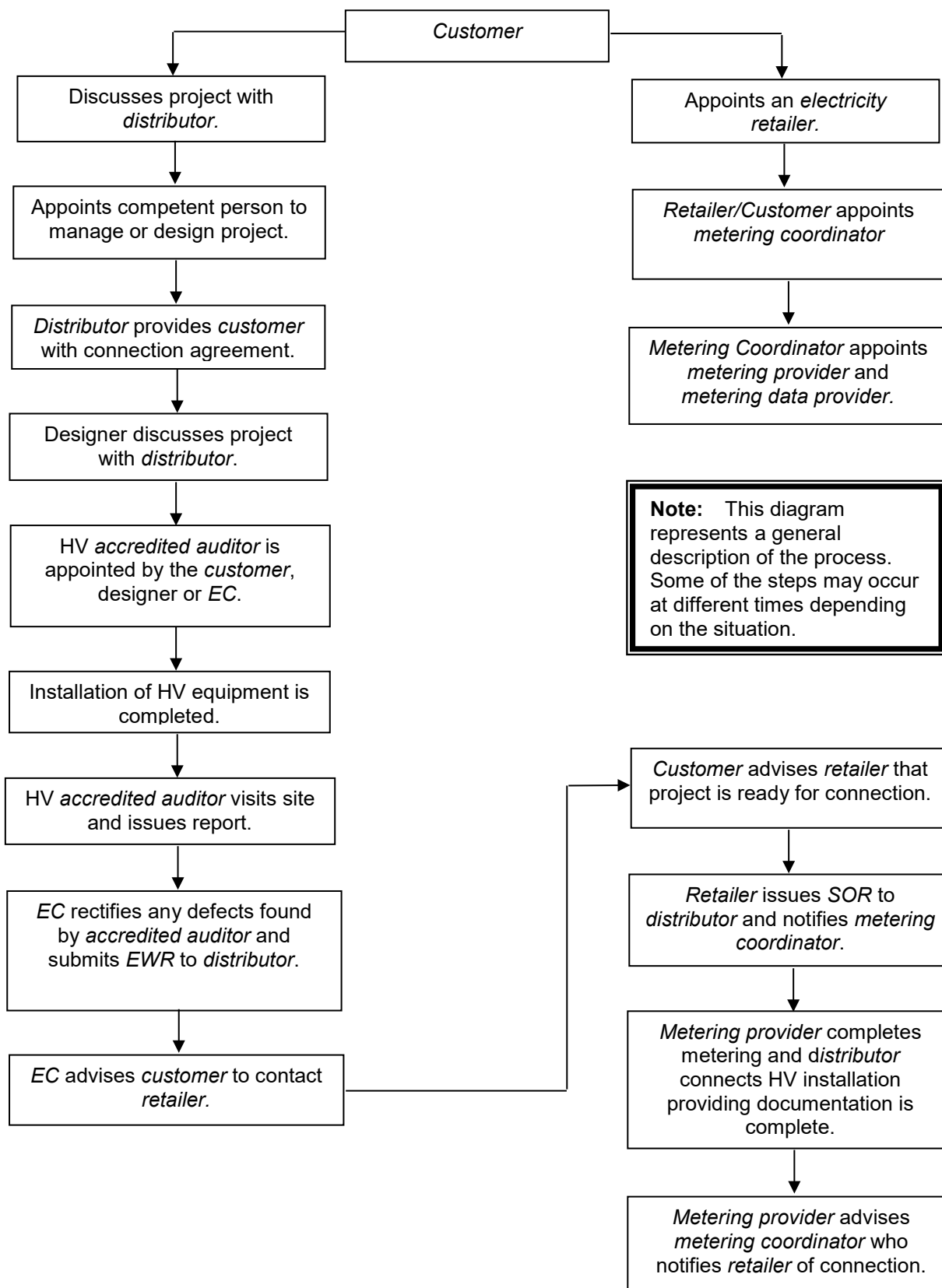


## 6) Small IES EG Connection to the Distribution Network





## 7) Initial Connection - High Voltage Installation



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## 1. IMPORTANT INFORMATION

### 1.1. Use of this document

This document is to be read in conjunction with the current:

- (a) Australian Standards, in particular AS/NZS 3000 (Wiring Rules).
- (b) Relevant Legislation and respective Regulations and Codes (see References pg. 5).
- (c) The *National Electricity Rules*.
- (d) *QECM* addendums published in relation to specific topics (on and from the date they are published).
- (e) Queensland Electricity Metering Manual (*QEMM*)

**Note:** The requirements of the Queensland Electricity Legislation are to be considered in the design, installation, operation and maintenance of the *customer's* electrical installation

This is a self-contained document except where it specifically refers to other related documents and supersedes previous versions of both the *Energex* and *Ergon Energy* Electricity Connection and Metering Manuals.

### 1.2. Scope

This document provides guidelines for the connection of supply, metering and load control arrangements of a *customer's* installation that apply in respect of the establishment or alteration of the connection, and in respect of the ongoing connection to the relevant *distributor's* network .

Where departures from these guidelines may be necessary, prior consultation with the *distributor* will be required (Refer to Section 1.4, Exceptional Circumstances).

**Note:** If there is any inconsistency between the requirements and obligations under this *QECM* and:

- (a) any applicable legislation (i.e. the *Electricity Act 1994*, the *Electrical Safety Act 2002* and their respective Regulations or Codes of Practice), AS/NZS 3000 (Wiring Rules) and the *National Electricity Rules*; or
- (b) the terms contained in the *distributor's* connection offer, or the applicable connection agreement,

then the relevant legislation set out above (at Section 1.2(a)), shall prevail in the first instance, followed by any applicable connection offer or agreement for connection (referred to in Section 1.2(b)).

#### 1.2.1 Small Customers

The conditions of supply and metering requirements detailed in this document apply for all *customers* who consume less than 100MWh per annum (i.e. a *Small Customer*) and are connected to the *distributor's* electricity network.

#### 1.2.2 Large Market Customers

The conditions of supply and metering for *customers* who are Registered Participants according to *National Electricity Rules*, consume 100MWh or more annually and have an Electricity Sales Contract with a *retailer* are detailed in the *National Electricity Rules* Chapter 5 - Network Connection.

Where specific detail is not covered by the *National Electricity Rules* the requirements of this document apply. Connections for new *large customers* must comply with the *Queensland Electricity Regulation 2006*.

## 1.2.3 Un-metered Supplies

The conditions of supply for *customers* whose *connection point* is not metered, and are connected to the distribution network, are detailed in this document.

## 1.2.4 Remote Generated Areas

The conditions of supply and metering requirements detailed in this document apply to all *customers*' installations and are to be read in conjunction with *Ergon Energy* document PW000202R114 - "Guidelines for Electrical Installations at Isolated Systems." Call *Customer Service* (refer page 1).

## 1.3. Failure to comply with this manual

Should an installation not satisfy the requirements of these and/or other applicable rules, the connection of electricity supply may be **delayed** or **withheld**, and installations with supply may be **disconnected**, until such time as the non-compliance(s) has been rectified.

## 1.4. Exceptional Circumstances

In exceptional circumstances a *customer* may request that a requirement specified in the *QECM* be waived and/or modified by submitting a written request to the relevant *distributor*.

The request for dispensation/variation from the *QECM* requirements shall include the following:

- (a) A detailed statement and explanation justifying why a dispensation from or variation of the *QECM* requirements is being sought.
- (b) Full details and diagrams, as necessary, showing the specific aspect of the requested dispensation/variation to the *QECM* requirements.
- (c) Property location details.

The relevant *distributor* will consider the request and determine in its absolute discretion whether a dispensation or variation to the *QECM* requirements will be granted, including any conditions associated with such a dispensation or amendment. Under no circumstances may a *customer* take any action or proceed on an assumption that a dispensation or variation will be granted prior to receiving written approval from the relevant *distributor*.

**Note:** Any approval to dispense or vary the *QECM* requirements granted by the relevant *distributor* will only apply to the individual property as listed in the request (i.e. it does not cover, or set any precedent, for any other installation). Nor can a previous dispensation or variation be used to justify a subsequent request (irrespective of whether the request relates to the same property or another).

Requests shall be made by email to:

*Energex:* Email tech.enquiries@energex.com.au

Write to: Energex Limited QECM Request  
GPO Box 1461  
BRISBANE Qld 4001

*Ergon Energy:* Email: tech.enquiries@ergon.com.au

Write to: Ergon Energy QECM Request  
PO Box 308  
ROCKHAMPTON Qld 4700

A reply will be provided within 10 working days from receipt of the written request.

## 1.4.1 Request for an *QECM* amendment

A request for an amendment of the *QECM* must be made in writing to the relevant *distributor*. Acknowledgement of receipt of the amendment will be provided within 10 working days from receipt of the written request.

## 1.5. Interpretation Enquiries

A request for an interpretation of the *QECM* must be made in writing (preferably by email) to the relevant *distributor* (except for circumstances described in section 1.4). Unless specified otherwise in this section 1.5, a reply will be provided by the *distributor* within 10 working days from receipt of the written request.

### 1.5.1 Enquiries before the work commences or while the work is underway.

Contact the *EC* Hotline for the relevant *distributor*, the phone numbers can be found on page 1 of the *QECM*.

### 1.5.2 Enquiries regarding defects identified by the *distributor*

Contact the phone numbers or email addresses found on page 1 of the *QECM* for the relevant *distributor*.

All interpretation enquiries are to include (or have available where by telephone) the following details:

- (a) *Customer* name, address and *NMI* (if available);
- (b) Reference number on the *distributor's* document;
- (c) Details of the nature of the enquiry;
- (d) *Electrical contractor's* number and return address details (if applicable).

If the installation has not been connected to supply a reply will be provided within 2 working days from receipt of the interpretation enquiry.

If the installation has been connected to supply a reply will be provided within 5 working days from receipt of the interpretation enquiry.

Please note that an interpretation enquiry is not a request for dispensation, which must be made in accordance with Section 1.4.

## 1.6. Historic Buildings and Flora with Vegetation Protection Orders

The *electrical contractor* should consult the owner if the building appears to have historical significance. Historic buildings may require the requirements of this manual be waived and/or modified for attachment of overhead services, meter positions etc.

Similarly, flora protected by a Vegetation Protection Order may require special arrangements for the erection or alteration of overhead or underground services.

Where the requirements of this *QECM* cannot be complied with due to these factors, *electrical contractors* should contact the *distributor* before starting work and shall comply with the process in Section 1.4 for Exceptional Circumstances.

## 1.7. Revisions and alterations

*Energex* and *Ergon Energy* reserve the right to revise this publication. The current edition of this document is available on the *Energex* website at [www.energex.com.au](http://www.energex.com.au) or the *Ergon Energy* website at [www.ergon.com.au](http://www.ergon.com.au).

## 1.8. Drawings

The drawings have been placed in the body of the document after the section to which they are most relevant but may be referred to in more than one section.



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## 2. CUSTOMERS INSTALLATIONS

### 2.1. Request for Electrical Connection

An application for supply must be made to an electricity *retailer* licensed to operate in Queensland.

The *distributor* cannot energise a *customer's* installation unless:

- (a) The *customer* has a retail sales contract; and
- (b) The *retailer* has then requested the *distributor* to connect the *customer* via a *SOR* transaction; and
- (c) An *Electrical Work Request (EWR)* has been submitted.

(NB the above requirements may differ for a Market Participant)

Where possible, and to assist with progressing the connection, the *customer* should provide the *National Metering Identifier* to the *retailer*.

#### 2.1.1 Large Customers

A *large customer* who consumes 100MWh or more per annum and requires an initial connection by the *distributor* must also arrange for the metering to be installed by an accredited *metering provider*. They must also request their initial connection via their chosen *retailer*.

To enable the connection to be completed to schedule, a *customer* will be required to advise the *distributor* of their expected annual consumption.

### 2.2. Request for Initial Connection, Service Alteration, Metering Change or Inverter change

*Electrical Contractors* shall submit an *Electrical Work Request (EWR)* when they:

- (a) Require an initial supply at an installation; or
- (b) Require service alterations. Where alterations to an installation are to be carried out, the *distributor* shall be advised of any of the following situations:
  - i. Where the electricity service may be over or in the vicinity of a swimming pool or hazardous area as defined in AS/NZS 3000 (Wiring Rules);
  - ii. Any proposal for new or additions to an existing HV installation (i.e. the *connection point* and or the metering transformer may need upgrading). For major changes or load increases the *customer*, or their *electrical contractor* or consultant, should contact the *distributor* at the earliest opportunity to obtain an estimate of the time that may be required to modify the network to accommodate the changes or load increases; or
- (c) Complete work that requires additional metering or a change to existing metering when the *distributor* is the *metering provider*; or
- (d) Complete work that requires additional load control equipment or a change to existing load control equipment; or
- (e) Require *EG system* Inverter additions, upgrades or replacement.

Within the *Ergon Energy* distribution area, an *Electrical Work Request (EWR)* must be submitted when there is an upgrade or replacement of an existing *EG system* inverter, or when an inverter is added to an existing inverter. A new meter will not be required but normal system compliance checking is still required.

A new connect application must be lodged for any *EG System* change or addition including *ESS* and *PV* panels within both *Ergon Energy* and *Energex* distribution areas (Refer to Section 08).

## 2.3. Alterations and Additions

The *electrical contractor* shall submit an *Electrical Work Request (EWR)* in adequate time for the modification to the *distributor's* service and or network to be completed before supply is required.

Examples of alterations and/or additions to the *customer* electrical installation that require submission of an *EWR* may include (but not limited to):

- (a) The installation of additional phase/s or removal of phase/s;
- (b) The relocation of the *connection point*;
- (c) Any increase in loading that requires an increase in the capacity of the service or changes to the distribution network;
- (d) The installation of a service following repair works (e.g. repair works after storm damage).

**Note:** *Customers* with a *NMI Classification Code - Large*, are to provide the contact details of their *metering provider*.

## 2.4. Breaking of Metering Terminal Cover/Metering Isolation Link/Metering Neutral Link Seals

In the interests of electrical safety and to ensure the integrity of metering and *network devices* the *metering provider* and/or the *distributor* will seal this equipment.

Approval will be given for the metering terminal cover/metering isolation link/metering neutral link seals only, to be removed by an *electrical contractor* provided notification is given to the *distributor* or the *metering provider* either before the removal of the seals or as soon as practicable after the event.

An *Electrical Work Request (EWR)* must be submitted to the *distributor* as soon as possible after metering alterations are completed.

Within the *Ergon Energy* distribution area, notification of broken seals (for Network Device bridging only) can be done via a phone call to General Customer Service for Ergon Energy (per the contact details listed at page 1).

Where the metering terminal cover has been damaged or alterations to the metering cable entry point allows contact with live parts, the *electrical contractor* shall leave the installation in a safe state (e.g. fill/cover holes with a suitable material) and submit an *EWR* that advises a new metering terminal cover is required. Alterations to metering terminal covers are not permitted.

**Note:** For remotely read interval meter installations, the *customer* is to provide the contact details of their *metering provider*. The nominated *metering provider* is responsible to ensure the metering installation complies with the requirements of Chapter 7, of the *National Electricity Rules* and this document where applicable.

## 2.5. Examination, Test and Connection

The *distributor's* electricity connection officer is required to examine and test the *consumer mains* and main switchboard of an installation before the initial connection to supply (up to the load side of the Metering Isolation Link and Metering Neutral Link).

The examination, test, and connection **does not** imply, suggest, indicate or endorse that the work performed complies with any specification. The *electrical contractor* (and where applicable, *customer*) remains responsible for the standard and compliance of the work, regardless of whether an officer from the *distributor* examines, or tests, the whole or part of the installation.

The re-energisation of an installation after *customer* requested switching **does not** imply, suggest, indicate or endorse that the work performed **complies** with any specification. The *electrical contractor* (and where applicable, *customer*) remains responsible for the standard and compliance of the work, regardless of whether an officer from the *distributor* examines, or tests, the whole or part of the installation.

## 2.6. Unmetered Supplies

*Unmetered supply* may be available where the *distributor* considers it impractical to read or maintain metering equipment or where metering equipment would be susceptible to damage. Approval must be obtained from the *distributor* prior to the installation of an *unmetered supply*. Where the *distributor* consents to an *unmetered supply* (e.g. telephone cabinet, bus shelter, traffic signals, etc.) the following general conditions will apply:

- (a) Approval must be gained (as appropriate) from any relevant authority for equipment installed in the road reserve. (Refer to the *Electricity Regulation 2006*);
- (b) Prior approval must be obtained for any load changes or any deviation from the connection agreement **before** those changes being made to the loading of the installation; and
- (b) The installation shall consist of a small steady uniform load. (Refer to Section 5.10(a) for installation of *consumer mains* on the *distributor's* pole).

## 2.7. Identification in Multiple Installations

Each individually metered section of a multiple installation shall be clearly identifiable (e.g. shop, unit or factory number). The number shall be permanently marked on the main switchboard, distribution board (if applicable), meter, isolator and front door of the individual shop/unit so that the *distributor* may install the required connection for the installation. A site plan of the overall layout of the site shall also be permanently displayed on the inside door of the main switchboard.

An electrical test must be carried out to ensure that the meter wiring does supply that particular part of the installation that is identified by the switchboard and unit marking. This is required to confirm the relationship between the national metering identifier (NMI), the meter number/s and the address are correct.

## 2.8. Protective Fault Current Devices

Protective devices installed by the *customer* shall have an interrupting capacity adequate for the prospective short circuit current at the point of installation.

In the event of the fault current being increased at any point on an installation because of provisions for additional load, the *customer* shall be responsible for the upgrading of all equipment not rated for the prospective fault level.

Prospective fault level details may be obtained by contacting the *distributor*. (Refer to page 1 for contact details).

### Notes:

1. The *distributor's* (HRC) low voltage service fuse rated up to 100A will provide suitable fault current limiting for a *customer's* installation.

2. For low voltage supplies the *distributor's* service fuse shall not be considered as overload protection for the *consumer mains*.
3. Installation of fault current limiters may be required to protect *direct connected metering* on the *customer's* installation. (Refer to Section 6.5.2).

Information on high fault currents can be found in the Electrical Safety Office - Code of Practice for Electrical Work and on Electrical Safety Office web site. ([www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)).

## 2.9. Power Factor

A *customer* must ensure that the power factor of any electrical installation measured at the *connection point* under normal load conditions is compliant with the applicable range in TABLE 2.1 (and must not be less than 0.8 lagging).

If the power factor falls outside the power factor range specified in TABLE 2.1 at the *connection point*, the *customer* will be responsible for taking appropriate action to ensure compliance (as agreed with the *distributor*).

TABLE 2.1 provides the power factor performance standard.

TABLE 2.1

POWER FACTOR PERFORMANCE STANDARD	
Nominal Supply Voltage	Power Factor Range
50kV - 250kV	0.95 lagging to unity
1kV <50kV	0.90 lagging to 0.90 leading
<1kV*	>0.8 lagging but not leading
<p>* <i>Electricity Regulation 2006.</i></p> <p>At all other voltage ranges the requirements are as specified by the <i>National Electricity Rules</i>, unless detailed in a contract.</p>	

*Customers* shall ensure that shunt capacitors installed for power factor correction are designed to avoid attenuating the *distributor's* audio-frequency signals used for load control. The *distributor* will supply the details of the audio-frequency signals in any region upon request. *Customers* are also required to meet the harmonic emission limits specified for their installation even under resonant conditions due to their capacitor bank.

## 2.10. Interference with Supply of Electricity to Other Customers

*Customers* shall take reasonable precautions to prevent transformer arc welding machines, motor starting, fluorescent lighting, *Small IES EG Connections* and any other equipment from interfering with the satisfactory operation of the *distributor's* network or interfering with the *distributor's* supply of electricity to other *customers* etc.

The requirements of AS/NZS 61000 series standards "Electromagnetic Compatibility (EMC)" shall always be observed.

The fact that the *distributor* may have connected the apparatus or equipment causing the interference shall not exempt the *customer* from this requirement. Also see Chapter 4 of this manual.

**Note:** *Customers* with an electrical installation or equipment which may be sensitive to voltage variation, transients, loss of one or more phases of supply or due to leakage current are advised to install protective equipment to limit possible damage.



## 2.11. Supply Beyond Property Boundary

The distributor shall be contacted prior to finalising any proposal to install an electrical installation on public land or extending wiring and equipment from an electrical installation across any property boundary.

Section 24(1) of the *Electricity Regulation 2006* (Qld) states a person may install and operate, on a place beyond the person's property (including on a public controlled place), a low voltage electric line forming part of the person's electrical installation if –

- (a) the person as consulted with all entities who may have an interest in the proposed location of the electric line; and
- (b) the entities have stated in writing that they have no objection to the installation or operation of the electric line; and
- (c) the installation and operation of the electric line is not likely to cause fire or a person to suffer an electric shock.

The *customer* must obtain the approval of the relevant authorities to install an electrical installation in the road reserve and provide any approvals to the distributor before proceeding with the installation and operation of the proposed low voltage electric line (unless otherwise agreed in writing with the *distributor*). Additionally, the proposed low voltage electric line must be installed in accordance with AS/NZS 3000 and in accordance with any requirements or conditions imposed by an applicable authority or the *distributor*.

This shall be considered an exceptional circumstances to which Section 1.4 applies.

## 2.12. High Voltage Installations

Any person intending to install high voltage equipment at a *premise* shall consult the *distributor* before taking steps to obtain or install such equipment.

Where the *distributor* agrees with a *customer's* request for a high voltage connection, and subject to certain conditions (such as a minimum demand being met), the agreed voltage is the standard voltage for the supply (Refer to the *Electricity Regulation 2006* for standard voltages). The *distributor* will provide a connection offer or connection agreement outlining the applicable conditions and requirements.

The *Electrical Safety Act 2002* (Qld) requires all new or altered high voltage electrical installations to be inspected by an *Accredited Auditor* before connection to supply. For additional information on *Accredited Auditors* contact the Electrical Safety Office. The auditor should be involved in the project at an early stage.

More information in relation to high voltage installations is included in Chapter 9 of this manual

## 2.13. Customer's Generating Systems

### 2.13.1 General

The installation of *customer's* generating systems shall comply with AS/NZS 3000 (Wiring Rules). The *consumer mains* neutral shall not be switched or broken on the distribution supply side of the MEN connection. The generating system neutral is required to be clearly identified at the main neutral link.

### 2.13.2 Non-Parallel Operation with *Distributors* Supply

*Customer's* generating system for emergency supply

This section applies for the installation of generating system on a *customer's premises* to provide a supply of electricity to the *customer's* electrical installation, during an interruption to the supply of electricity.

- (a) The *customer* shall ensure that, when the generating system is operating to give emergency supply, it is installed with effective isolation between: —

- (i) all active conductors of the part of the electrical installation or electrical installations to which the generating system is connected; and
  - (ii) the part of the electrical installation still connected to the supply from the *distributor*.
- (b) The connection of the generating system shall be so arranged that the *metering provider's* revenue meters do not meter the alternate supply and all metering equipment, including CTs are able to be isolated to enable access whilst the generating system is in service (i.e. the changeover switch must be installed on the load side of the meter).

### 2.13.3 Parallel Operation with *Distributor's* Supply

*Customer's EG System* for interconnection to supply network

- (a) A *customer* shall not install generating plant for interconnection with the *distributor's* supply network without prior agreement, which is to be documented in a written agreement.
- (b) The agreement shall include the conditions for securing safe and stable parallel operation of the supply network and the generating system. (refer to section 28 of the *Electricity Regulation 2006(Qld)*).
- (c) The generating system shall only be connected to a single tariff. A generating system shall not be enabled to connect and supply equipment which is being supplied on an alternate tariff. Similarly, equipment connected to a control tariff shall not be connected to a tariff other than the control tariff.

**Note:** Embedded generation is allowable from all forms of alternative energy supplies such as solar panel (photovoltaic), wind turbine, diesel generation etc.

Refer to Chapter 8 for details of the metering schemes for interconnection of *Embedded Generating systems* connected to the distribution network.

Appropriate revenue metering will be installed in accordance with the negotiated supply arrangements.

## 2.14. Determination of Maximum Demand

Unless limited by a fixed setting circuit breaker, the determination of the maximum demand of an installation shall be calculated, measured or assessed in accordance with the guidelines set out in AS/NZS 3000 (Wiring Rules).

## 2.15. Requirement for Circuit Breakers in Rural/Isolated Areas

The *distributor* requires circuit breaker/s for main switch/s as part of the *customer's* installation and these circuit breaker/s are required to coordinate with the service fuse/circuit breaker. The *distributor* may require the *customer's* protective device to be changed or altered to provide adequate discrimination. (Refer also to sections 29 and 30 of the *Electricity Regulation 2006, (Qld)*).

### Notes:

1. These regulations refer to the *customer* owned circuit breaker main switch/s provided as part of the *customer's* installation and not to the *customer's* sub-circuit protection or the *distributor's* service fuse/circuit breaker.
2. Refer to Glossary of Terms for definition of *rural/isolated area*.

## 3. SUPPLY APPLICATIONS

### 3.1. General

At the earliest opportunity, negotiations should commence with the *distributor* in respect of the costs and availability of supply to:

- a new electrical installation
- a change of load, generation or storage capacity
- a new or altered *connection point*.

For a new or altered supply, the service capacity available to the customer shall be detailed in the connection offer and/or connection agreement.

### 3.2. Types of Connection Offer

#### 3.2.1 Basic Connection

The maximum permitted supply across the *connection point* from the distribution system is:

- (a) For urban premises connected to lines other than SWER lines is 100 A per phase;
- (b) For rural premises connected to lines other than SWER lines is 80 A per phase; and
- (c) for SWER lines is 40 A;

Unless otherwise approved by the distributor in your connection application a maximum of 80 A fuse will be fitted. Refer to Chapter 6 for *direct connected* or *current transformer metering* requirements.

#### 3.2.2 Negotiated Connection

Where the connection service sought is not a basic connection service, or the *customer* elects to have a negotiated connection contract, then the negotiated connection process will apply. Further information on the negotiated connection process is available from the *distributor*.

### 3.3. Determination of the Number of Phases to be Installed

The number of phases provided to supply load at an installation shall be the number required by Chapter 4 of this manual for individual switched equipment or the number determined by this section, whichever is the greater.

**Note:** The *electrical contractor* or designer should consult with the *customer* to determine future loading requirements. Provision for additional phases or larger *consumer mains* may be required (e.g. air conditioning load, *Small IES*, *EVSE*).

#### 3.3.1 Single Customer Installations

Where only single-phase loads are installed on the *premises*, if the maximum demand as calculated in accordance with AS/NZS 3000 (Wiring Rules) is:

- (a) not greater than 100 A, then supply shall be via single-phase, 2-phase or 3-phase network connection as requested;
- (b) greater than 100 A, then supply shall be 3-phases and neutral network connection.

The *distributor* approves the use of 3-phase underground or overhead supply where 3-phase loads (e.g. air conditioner or pump) is connected and the remainder of the installation is balanced across the 3-phases.

## 3.3.2 Multi *Customer* Installations

Where only single-phase loads are installed on the *premises* with multi *customers* the number of phases shall be determined by the following methods:

- (a) A maximum of two individually metered units may be connected to a single-phase network connection if the maximum demand calculated in accordance with AS/NZS 3000 (Wiring Rules) does not exceed 100 A.
- (b) Where two individually metered units maximum demand exceeds 100 A then supply shall be 3-phases and neutral network connection.
- (c) Where there are more than two individually metered units, the installation shall be arranged for a three-phase network connection (e.g. three units - one per phase) unless otherwise advised by the *distributor*.

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## 4. BALANCING OF LOAD AND LIMITATION ON EQUIPMENT

### 4.1. General

The load of an installation (including all primary and secondary tariff loads), or separately metered portion of an installation supplied by separate *consumer mains* or submains, shall be so balanced that at the time of maximum demand on such installation or portion of such installation the current in any phase does not exceed the current in any other phase by more than 20 A (unless otherwise approved in writing by the *distributor*). The principal tariff load (and secondary tariff load where possible) shall be balanced across all supplied phases and the use of controlled or time of use tariffs to balance another tariff across phases will not be accepted.

The *distributor* may apply additional conditions when large loads are connected in rural (non-urban) areas.

### 4.2. Switched Loads

The equipment may be restricted by the change in current that occurs when the equipment is switched on and off or between operational settings. Where controlled equipment is to be installed it is to be permanently connected to a controlled supply as per the requirements in Section 7. All equipment designed to operate at 230V that is installed in electrical installations of 100A or less shall be installed in accordance with Table 4.1:

Table 4.1

Device	Switching Arrangements	Phase	Limit (A)
230V Uncontrolled equipment		1 (line to neutral)	20
	Phases not switched simultaneously	2 or 3 (line to neutral)	20
	Phases switched simultaneously	3 (line to neutral)	40
230V Controlled Equipment		1 (line to neutral)	35
	Phases not switched simultaneously	2 or 3 (line to neutral)	35
	Phases switched simultaneously	3 (line to neutral)	50
Commercial Cooking Equipment		1 (line to neutral)	35
	Phases not switched simultaneously	2 or 3 (line to neutral)	35
	Phases switched simultaneously	3 (line to neutral)	40

#### Note for Section 4.2:

1. When assessing domestic cooking equipment for compliance to 230V Uncontrolled equipment limits or 230V Controlled equipment limits assessments may be completed in accordance with AS/NZS3000 Appendix C2.5.3 for Domestic Cooking Appliances.
2. For the suitability of water heaters for controlled or night rate supplies reference should be made to the Network Tariff Guide (available from the *distributor's* web site) e.g. where the heating unit rating exceeds 1800W, it shall not exceed 13.5W per litre of heat storage volume for heat exchange type water heaters or 15.5W per litre of rated hot water delivery for other storage type water heaters.
3. Electric vehicle supply equipment shall be compliant with AS/IEC 62196

## 4.3. Equipment Having Fluctuating Loads.

Examples of equipment having fluctuating loads are: Welding Machines, X-Ray equipment, furnaces etc.

The *distributor* reserves the right to specify the conditions under which an electricity supply will be given for equipment having rapidly fluctuating loads such as welding machines (other than welding machines complying with AS 60974.6, or previous standards superseded by this standard, and marked "Limited Input"), X-ray equipment and furnaces.

No work should be carried out by a *customer* until advice has been received on the terms on which supply will be given. (Refer to Section 2.10 "Interference with Supply of Electricity to Other Customers").

## 4.4. Harmonic Interference or Wave Form Distortion

The *distributor* reserves the right to specify the conditions under which an electricity supply will be given for equipment which would cause excessive distortion to the wave form of the supply system voltage. (e.g. rectifiers, frequency converters, load control devices using thyristors or saturable reactors).

## 4.5. Rectifiers

Alternating to direct current rectifying equipment shall not be connected to the *distributor's* system unless:

- (a) the rectifier is of the full-wave type; or
- (b) a double-wound transformer is interposed between the rectifier and the supply system; or
- (c) the rectifier is used in conjunction with an electrical measuring instrument or in similar applications where the rectified current does not exceed 100 mA.

**Note:** Further information regarding general limits may be obtained from AS/NZS 61000 series "Electromagnetic Compatibility (EMC)".

Additional limits apply to avoid harmonic interference to the *distributor's* audio frequency load control system. (Refer to Section 2.9 of this manual).

## 4.6. Connection of Equipment - Voltage Limitations

All equipment must be able to operate satisfactorily within the voltage limits detailed in the applicable legislation or regulation.

## 4.7. Connection of Equipment - Isolated Generation Localities

Load restrictions on electric motors, welders, air conditioners and other electrical equipment in excess of 2.4kW may apply in isolated remote generation areas throughout *Ergon Energy*. Call General Customer Service (contact details are listed at page 1) to clarify any restrictions contained in the *Ergon Energy* document PW000202R114 - "Guidelines for Electrical Installations at Isolated Systems".

## 4.8. Limitations on Starting Currents of AC Motors

### 4.8.1 General Requirements

All requirements shall be calculated where the *Motor rating in kW* is the continuous rating of the largest motor in the installation. Except as required by Section 4.8.4 motor installations and any associated starting devices shall be so designed and operated as to comply with either of the following conditions:



## Single-phase Motors 230 Volts and 400 Volts

TABLE 4.2

MOTOR VOLTAGE	MOTOR SIZE	ALLOWABLE STARTING CURRENT
230V	All Sizes	$I = 45 \text{ Amps}$
400V	Not exceeding 7.5kW	$I = (17.5 \times \text{Motor rating in kW}) \text{ Amps}$
	Exceeding 7.5kW	Shall not be connected.

**Note:** The *distributor* must be contacted before motors are installed in SWER areas of supply. (Refer to page 1 for contact details).

## Three-phase Motors 400 Volts

TABLE 4.3

MOTOR SIZE	ALLOWABLE STARTING CURRENT
Not exceeding 1.5kW	$I = 26 \text{ Amps}$
Exceeding 1.5kW and up to 3.75kW	$I = (\text{Motor rating in kW} \times 17.5) \text{ Amps}$
Exceeding 3.75kW and up to 10kW	$I = (53 + 3.3 \times \text{Motor rating in kW}) \text{ Amps}$
Exceeding 10kW	Contact <i>distributor</i> .

### **Exception:**

1. No limitation may be placed on the starting current of any motor that is not frequently started and the rated output does not exceed 10% of the total motor load connected for a *customer* to the one service.
2. In *premises* which are supplied directly from a substation or in other appropriate supply conditions as determined by the *distributor*, starting currents in excess of those laid down may be permitted provided that written approval is obtained from the *distributor*. (Refer to page 1 for contact details).

**Note:** Motors should not be started simultaneously, and the starting current of the motors should be limited to 2 to 3 times full rated current by fitting with an appropriate starter.

## 4.8.2 Fall in Voltage

The starting current shall not cause a fall in Voltage of more than 5% of the nominal voltage at the *connection point* for more than 0.02 seconds when connected to a typical 400/230V, 3-phase, 50Hz supply system which for this purpose shall be considered to have the following impedance:

$Z = 0.2 + j0.2$  ohms (phase - neutral);

$Z = 0.1 + j0.1$  ohms (line impedance per phase).

## 4.8.3 Test Methods

- (a) Fall in Voltage shall be measured by instrumentation with a high-speed measurement capability.
- (b) Starting currents shall be measured by instrumentation with a high-speed measurement capability or by the locked rotor method, with the rated voltage and frequency applied to the terminals of the motor.
- (c) In any case where the test methods specified in paragraphs (a) and (b) above cannot conveniently be applied, another test method that conforms to recognised practices in the electrical industry may be used.

**Note:** The *distributor* will accept test results from a recognised testing laboratory or manufacturer's certified test results.

## 4.8.4 Special Provisions

For both three-phase and single-phase motors the *distributor* may require maximum starting currents lower than those set out or may limit the rating of any motor to be connected if such lower starting currents or limits of motor capacity are necessary to prevent interference with supply to other *customers*.

For isolated generation areas within the *Ergon Energy* distribution area, special limitations may be applied on starting currents of electric motors (including air conditioners) and may require time delay controls on motor starting circuits after a power outage. Any special requirements are outlined in the *Ergon Energy* document PW000202R114 - "Guidelines for Electrical Installations at Isolated Systems" which is available on request by contacting *Ergon Energy* Customer Service. (Refer to page 1 for contact details).

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## 5. SERVICE LINES AND CONNECTION POINT

### 5.1. General

Each individual electrical installation (as defined in AS/NZS 3000 (Wiring Rules)) shall have a separate and individual connection to the supply network (i.e. separate *connection point* - *service line*, *point of attachment*, *consumer mains* etc).

**Note:** The *distributor* will not accept any "Joint Use" arrangements where two or more *customers* with separate freehold land lots requiring separate connections (e.g. small lot subdivisions). The sharing of the same property pole and/or property line and/or overhead service shall not be permitted.

### 5.2. Connection point

The distributor provides only one *service line*/connection point to a customer's premises. Unless otherwise determined or approved by the *distributor*, the *connection point* shall be located as detailed in Sections 5.2.1 and 5.2.2.

#### 5.2.1 Low Voltage

The *connection point* shall be located -

- (a) at the termination of the overhead *service line* onto a building or structure where the *service line* is installed without the use of property poles (i.e. typically the first span of *service line* to the first structure); or
- (b) on the first property pole (termination pole) from the point of origin of the *service line* where supply is connected by means of a property line.

The property pole shall be located a maximum of 20m from the property boundary. Where the *service line* does not cross a property boundary the first property pole shall not be located more than 20m from the origin of the *service line*.

In the case where the *service line* crosses a road reserve and extends into private property, the total length of the *service line* from the *distributor's* supply pole to the first property pole shall not exceed 50m; or

**Note:** To comply with this requirement, the distance that the first property pole is located within the property may need to be reduced so that the 50m limit of the *service line* is not exceeded (in special situations the service length may be increased at the discretion of the *distributor*).

- (c) in a service pillar or pit at the *customer's* property boundary in underground residential distribution areas and non - CBD commercial and industrial areas; or
- (d) at the termination of the underground *service line* on the *customer's premises*. This arrangement is generally restricted to the CBD; or
- (e) at the low voltage terminals of a distribution transformer installed at the *customer's premises* or at the load terminals of any switch or circuit protective device that may be installed by the *distributor* at such transformer. (Refer to Section 5.11 "Substations on *Customer's Premises*").

#### 5.2.2 High Voltage

The *connection point* shall be as agreed by the *distributor* and another *Registered Participant*, *Non-registered customer* or *Franchise Customer* and documented in the connection agreement.

### 5.3. Multiple Occupancy Connection Point

The *distributor* may consider a request to provide more than one *connection point* to a property that satisfies the following conditions:

- (i) separate individual domestic dwellings where each portion has a separate freehold title; and
- (ii) the land associated with each of the domestic dwellings directly abuts a public road reserve; and
- (iii) the buildings are separated by an area as per AS/NZS 3000 MEN requirements;

**Note:** Refer also to Section 6.9.7 for Community Title Scheme Arrangements and Drawing 6.6 for more detail. Refer to page 1 for the contact details for the relevant *distributor*.

## 5.4. Service Lines

The service provided will be designed to accommodate the *customer's* determined maximum demand as agreed in the applicable connection agreement.

### 5.4.1 Working on or near the Distributor's Assets

It is the responsibility of the *electrical contractor* to obtain permission to work on or near the *distributor's* assets. (refer to *Electricity Act 1994 (Qld)*) Examples where authorisation is required include, work on or near the *point of attachment*, accessing standard underground pillars or work at the low voltage end of a distribution transformer. Information on the requirements for becoming an authorised person can be obtained from the *distributor's* call centre or can be found on the relevant *distributor's* website. (refer to page 1 for contact details).

An authorised person is not permitted to:

- (a) replace a blown LV fuse after loss of supply to a customer's connection.
- (b) replace an LV service fuse that has been removed by the distributor
- (c) alter, remove or relocate the distributors overhead LV service line or LV pillar connections
- (d) climb or work aloft on our pole or electricity assets.

### 5.4.2 General

Unless otherwise advised, the *distributor* will provide either an overhead *service line* or an underground *connection point* (typically an underground service pillar). For further details on each *service line* type refer to Sections 5.8 and 5.9.

For *service lines* in general:

- (a) A charge may be applied by the *distributor* for the installation and removal of a temporary *service line*.
- (b) A charge may be applied by the *distributor* for any additional *service line* or additional phases for hobby or other purposes.
- (c) Where a *customer* requests that a type of *service line*, other than that proposed by the *distributor*, be installed and the *distributor* agrees to install such type of *service line*, the *customer* will be required to pay additional costs in line with the applicable *Connection Policy*.
- (d) Where a *customer* requests that an existing *service line* be altered, and the *distributor* agrees to make such alteration, the *customer* will be required to pay all costs.
- (e) Where the *customer* requests an alternate point of origin for a *service line*, a capital contribution may be required for any extension of the *distributor's* mains.
- (f) The *customer* shall ensure sufficient clear unobstructed access to, around, and below the *point of attachment* and *connection point* to allow the *distributor* to safely maintain the service. Note the requirements of Section 5.8.

- (g) The *customer* via their *electrical contractor* is required to provide the means of connection for either an underground or overhead connection, e.g. a *suitable mains connection box* or suitably sized enclosure with insulating shrouds to suit, complete with 12mm stainless steel bolts, nuts, washers and spring washers. The *electrical contractor* shall lug the conductors. Where aluminium cable is used for underground *consumer mains*, cable ends are required to be terminated with suitable bi-metallic connectors, for connection to fuses and neutral link.

## 5.5. Additional Service Lines in Urban Areas

The *distributor* shall install only one *service line* to supply one building or group of buildings occupied by one *customer* on one property.

**Exception:** Where two or more *customers* occupy one property, supply by more than one *service line* shall be at the discretion of the *distributor*.

Where the *distributor* agrees to install an additional *service line*, the *customer* may be required to pay all costs of the second *service line*.

## 5.6. Additional Service Lines in Non-Urban Areas

In non-urban areas, more than one *service line* may (at the *distributor's* absolute discretion) be provided to a *customer* provided that:

- (a) The second *service line* is a considerable distance (e.g. more than 200m) from the first *service line* measured along the *customer's* property alignment and the load to be supplied is a considerable distance (e.g. more than 100m) from any building supplied by the first *service line*;
- (b) In the opinion, and at the discretion of the *distributor*, it is more practical to supply the load on the property through more than one *service line*.

Where the *distributor* agrees to install an additional *service line*, the *customer* may be required to pay all costs of the second *service line*.

## 5.7. Alterations to Service Lines

Any alteration to a *service line* shall only be made by a person authorised by the *distributor*. The *customer* may be required to pay all costs of a *service line* alteration, unless the alteration is required for the *distributor's* purposes.

Before commencing building alterations or the erection of structures in proximity to *service lines*, the *customer* or *customer's* representative shall contact the *distributor* to ensure electrical safety is not compromised. (Refer to page 2 for details on Look Up and Live).

## 5.8. Overhead Service Lines

The *distributor* shall determine the point of origin, the route, the *point of attachment* and the facilities required for the attachment and connection of the *service line*. A direct route is the preferred option, and this may include the provision of a *customer* property pole as a suitable *point of attachment*. The *customer* or their *electrical contractor* shall consult the *distributor* prior to planning the installation.

The *distributor* will not erect or connect a *service line* that crosses an adjacent property or *premises*. Only the *distributor* shall install and connect an overhead *service line* to the *customer's* installation.

The *distributor* shall determine the type of overhead *service line* and shall supply, install and maintain the *service line* at its own cost (the *service line* will be installed from the *distributor's* works to the *connection point*), except that:

- (a) The Standard Control Service (SCS) installed shall be a maximum of 20m as per Section 5.2.1. All clearance distances required for an overhead *service line* is detailed in Drawings QECM 5.1 and QECM 5.2.

- (b) All poles or other structures on the *customer's premises* for the attachment of an overhead *service line* and overhead *consumer mains* shall be provided and maintained by the *customer*.
- (c) The *distributor* will not erect an overhead *service line* at any height over a hazardous area or pool zone as defined in AS/NZS 3000 (Wiring Rules). (Refer to Drawing QECM 6.5)
- (d) A *customer* shall provide suitable facilities on their *premises*, acceptable to the *distributor* for the attachment and connection of a *service line*. This may require the *customer* to install a property pole.
- (e) A *customer* must ensure (in accordance with all applicable requirements) that the route for a new overhead *service line* is cleared of trees and other flora that may contact the line and that the line clearances remain unaffected by subsequent works on the *premises*. (e.g. building alterations, land fill, driveways, trafficable areas, changes in landscape etc).
- (f) Overhead conductors after the *connection point* are the responsibility of the *customer*.
- (g) Flying fox services are at the discretion of the *distributor* and prior written approval is mandatory.

Prior approval for a flying fox service arrangement is essential; the *distributor* will not approve any flying fox arrangement without prior consultation.

Additional costs associated with the flying fox service connection (refer Section 5.4.2 (c) and (d)) will be payable in full prior to connection.

**Note:** Any special considerations or deviations from the requirements of Section 5.8 will require the approval of the *distributor's* applicable Customer Standards Manager and Network Manager.

## 5.8.1 Cross Road Service Poles

The *distributor* shall only install cross road service poles:

- (a) Where required to maintain statutory clearances across the roadway; and
- (b) Where no property pole would be required if the *distributor's* mains poles were erected on the same side of the road as the property (consultation with the *distributor* required).

## 5.8.2 Property Poles

- (a) Precautions must be taken to prevent both internal and external corrosion in steel property poles. Due to the difficulties of assessing the extent of internal corrosion of steel in ground poles a rag bolt assembly is mandatory where a steel pole is used for the first property pole.

Where a 1.0kN SWL design is required refer to drawing:

- QECM 5.3
- QECM 5.4
- QECM 5.5

Where a 3.5kN SWL design is required refer to drawing:

- QECM 5.6
- QECM 5.7
- QECM 5.8

These drawings have prior *RPEQ* certification and if this design is used exactly as detailed in the drawings then additional *RPEQ* certification is not required.

If ANY modification is made to this design (including simple welding of attachments) then *RPEQ* certification is required for that modification hence *electrical contractors* must not be making on-site modifications without obtaining *RPEQ* sign off. Similarly pole manufacturers should not change the design of the drawings without obtaining *RPEQ* sign off.



These drawings are not mandatory but provided as an example of an approved design for property pole structure. *Electrical contractors* can use other designs but must have *RPEQ* certification for the pole and foundation and provide a copy of the *RPEQ* certificate with the pole for approval by the *distributor* connection officer prior to connecting supply.

- (b) Timber property poles are to be suitably treated and have a minimum SWL rating of 5kN (as indicated on the pole disc). Other types of timber property poles are acceptable provided they meet the requirements of AS/NZS 3000 (Wiring Rules) Appendix D.

Within the *Ergon Energy* distribution area, it is required that all *customer* property poles be a minimum of 5.0m out of the ground.

- (c) Other types of property poles are acceptable that have an *RPEQ* certificate and are rated fit for use i.e. (1kN, 3.5kN or 7kN) and must also comply with Section 5.8.6.
- (d) Private equipment can be installed on a property pole, provided that the private equipment must not be located above the *service line*, shall be at least 1.2m below the *point of attachment* (does not include *consumer mains/sub mains*) and must be in a position that does not limit access to the *point of attachment*.

## 5.8.3 Standard Service Cables

The minimum requirements for overhead service cables full details including fuse sizes can be found in the *distributor's* overhead construction manual. Table 5.1 shows the service cables that may be used for various service ratings specified in the *customer's* connection agreement. When a customer applies for the connection of additional loads the existing overhead service line must be replaced where the load (comprising the existing and additional load) will exceed the current carrying capacity of the overhead service line.

Table 5.1

<i>Distributor</i>	<i>Cable Type (ABC)</i>	<i>Service Rating (A)</i>	<i>Maximum Fuse Size (A)</i>
Ergon Energy Network	2*25mm Al XLPE	105	80
	4*25mm Al XLPE	97	80
	2*50mm Al XLPE	150	125
	4*50mm Al XLPE	140	100
	2*95mm Al XLPE	230	125
	4*95mm Al XLPE	215	200
	Parallel 4*95mm Al XLPE	430	315
Energex	2*6mm Al XLPE	50	30
	2*25mm Al XLPE	105	80
	4*25mm Al XLPE	100	80
	4*35mm Al XLPE	120	100
	2*95mm Al XLPE	230	200
	4*95mm Al XLPE	215	200
	Parallel 4*95mm Al XLPE	430	315

## 5.8.4 Overhead Service Line Attachments

- (a) Standard service cables used are XLPE insulated aluminium in sizes 25mm<sup>2</sup>, 35mm<sup>2</sup> (*Energex* only), 50mm<sup>2</sup> (*Ergon Energy* only) and 95mm<sup>2</sup>. Paralleling of standard service cables is not permitted for residential connections. Paralleling of 4 core 95mm<sup>2</sup> is permitted for commercial/industrial connections however it is not the preferred arrangement. The preferred arrangement is 240mm<sup>2</sup> Al 4 core underground cables with a Commercial & Industrial pillar as the *connection point*. A 6mm<sup>2</sup> copper *service line* may be used for small *unmetered supplies* such as telephone cabinets etc.
- (b) The following safe working loads (SWL) apply:
  - (i) Attachments for 25mm<sup>2</sup> and 35mm<sup>2</sup> (*Energex* only) overhead *service lines* shall have a load rating of 1kN working load. (Refer to Drawing QECM 5.12).
  - (ii) 50mm<sup>2</sup> (*Ergon Energy* only) and 95mm<sup>2</sup> services shall have a load rating of 3.5kN working load and parallel (twin) 95mm<sup>2</sup> overhead *service lines* (refer above condition) shall have a load rating of 7kN working load. Safe working loads shall be multiplied by 2.0 to convert to limit state principles.

For overhead *service lines* requiring a 3.5kN design for the eye bolt, raiser bracket or service pole, (other than hardwood timber which requires 5kN), the *customer* must provide certification from a suitably qualified person (i.e. an *RPEQ*) that the structure is suitable for the application. (Refer to Drawing QECM 5.15).

- (c) The method of attachment of an overhead *service line* to a structure shall be such that mechanical load is transmitted to the frame of the structure. Details of approved attachment details for 1kN and 3.5kN service attachments are contained in Drawings QECM 5.12; 5.13; 5.14 and 5.15.
- (d) 'J' Hooks are not permitted on fascias or poles. For 1kN services a minimum M12 open eye screw or eye bolt is acceptable. For other services up to 3.5kN a minimum M16 closed eye bolt is required
- (e) Where any electric line or electrical article of a *customer's* electrical installation is to be supported by any structure, other than a wooden or steel pole conforming to the requirements of AS/NZS 3000 (Wiring Rules), the *customer* must provide certification from a suitably qualified person (i.e. an *RPEQ*) that the structure is suitable for the application.
- (f) The maximum height of the *point of attachment* of any overhead *service line* on a *customer's premises* shall not exceed 8m above ground or floor level and shall have ready and safe access by ladder. This maximum height may only be exceeded in special situations where the *distributor* has approved the arrangement and given this approval in writing.
- (g) Where raiser brackets or eyebolts are used, the design and installation is to make provision for work to be carried out safely. (Refer to the applicable workplace health and safety legal requirements).
- (h) The *point of attachment* must not be positioned such that the *distributor's* personnel need to climb on roofs or enter swimming pool areas. (Refer to Drawing QECM 6.5).

## 5.8.5 Raiser Brackets

Proprietary raiser brackets (not exceeding 1.2m in height), certified by an *RPEQ*, tested to a suitable SWL (e.g. 1kN or 3.5kN minimum rating for raiser brackets), and approved by the relevant *distributor* are deemed suitable.

- (a) Within the *Ergon Energy* distribution area, the maximum size overhead *service line* that will be erected to 1kN rated brackets is 3 phase 25mm<sup>2</sup>. (Refer to Clause 5.8.4(a) for 3.5kN bracket requirements).
- (b) Refer to Drawing QECM 5.12 for examples of acceptable service raiser bracket designs i.e. brackets that display an SWL and are fitted with a means of attachment that will retain the service in high wind conditions (e.g. a pigtail or closed loop).
- (c) Where timber is used as an anchorage for 1kN raiser brackets and eye bolts it is to be a minimum of 100mm X 75mm and securely fastened to or part of the building structural frame. (NB A bracket mounted on a fascia without suitable bracing to the structural frame is not considered to be an effective method).
- (d) Through (rafter) roof mounted service raiser brackets shall be positioned no further than 0.5m back from the edge of the roof or guttering.
- (e) All service raiser brackets shall be positioned so that any backstay attached to the roof is in line with the direction of the service pull +/- 20 degrees.
- (f) Where an approved side pull type service raiser bracket is installed, and the angle of the *service line* from the *point of attachment* to the *connection point* exceeds 60 degrees or is greater than that recommended by the manufacture, a service raiser bracket designed for this application shall be installed. The height of this bracket shall not exceed 1.2m.

## 5.8.6 Connection Point Overhead Service Lines

- (a) The *connection point* shall be no more than 600mm from the *point of attachment*.
- (b) The *point of attachment* and the *connection point* are to be positioned on the building or structure where the *distributor's* personnel have unobstructed ready and safe access from the same common ladder position. That is, it must be positioned where personnel do not climb on roofs, enter adjoining properties, or carry ladders through structures, and or buildings for access.
- (c) Clear level and safe access to the *point of attachment* shall be maintained by the *customer* to allow the *distributor* to maintain the service. A clear level area below the *point of attachment* that allows a ladder ratio of 4:1 vertical to horizontal is deemed suitable.
- (d) The *customer* shall, at their expense, relocate the *point of attachment* to an acceptable position complying with the Section 5 when the existing *point of attachment* is located in an unsuitable location where:
  - Electrical work is performed at an existing installation resulting in a major alteration as per section 6.4 or;
  - Building works are carried out at premises that results in the requirements of section 5.8.6 (b) or (c) not being satisfied.

## 5.8.7 Connection Arrangements at Connection point

The following arrangements are required at a *connection point*:

- (a) A *suitable mains connection box*, complete with house service connectors, shall be provided by the *customer* for the connection of overhead *service lines* to *consumer mains*.
- (b) *Suitable mains connection boxes* shall be mounted to provide adequate support by brackets or similar and not be reliant on rigid conduit for support. (Refer to Drawings QECM 5.13; 5.14 and 5.15).

- (c) If *consumer mains* are replaced or upgraded on an existing installation, a *suitable mains connection box* or an insulated enclosure shall be installed to the same standard as for a new service.
- (d) Where an overhead *service line* is to be connected to overhead *consumer mains*, clamps suitable for this application shall be provided. This does not apply where parallel overhead *service lines* or parallel *consumer mains* are installed.
- (e) Where the conductors of either the *service line* or *consumer mains* are of a size not suitable for a *mains connection box*, the method of connection shall be such that the *consumer mains* are terminated with cable lugs within a UV resistant insulated enclosure. (Refer to Note 1 below and to Drawings QECM 5.13, 5.14 and 5.15). The *customer* (via their *electrical contractor*) is required to provide an approved UV resistant insulated enclosure and crimp lugs complete with shroud, 12mm stainless steel bolts, nuts, washers and spring washers fitted onto the *consumer mains*.

**Exception:** The requirement for a *suitable mains connection box* or UV enclosure is waived where the *distributor's service line* is terminated onto aerial overhead *consumer mains*.

TABLE 5.2 below gives the suitable sizes of UV resistant insulated enclosures:

TABLE 5.2

UV RESISTANT INSULATED ENCLOSURE	
Service Type	PVC Enclosure Size
Single 35 or 50mm <sup>2</sup> LV ABC service	360mm X 270mm X 205mm *
Single & Parallel (Twin) 95mm <sup>2</sup> LV ABC service	540mm X 360mm X 220mm

\*

Certain manufacturers utilise a spacer to achieve 220mm depth.

## Notes:

1. *Suitable mains connection boxes* are available for conductors up to 95mm<sup>2</sup>. Where double insulated sheathed cables are used for the *consumer mains*, the sheathing must be removed in accordance with the manufacturer's instructions before termination into the IPC connector.
2. Refer to Section 6.7 for phase identification requirements.
3. It is recommended that these enclosures be mounted vertically with entry of *consumer mains* positioned low, through the bottom of the enclosure.

## 5.8.8 Builder's Temporary Supply (BTS)

For a Builder's Temporary Supply (BTS), where a steel reusable pole is used, refer to Drawings QECM 5.9, 5.10 and 5.11 for details of an approved design. The connection of the overhead *service line* can be facilitated with the use of a suitable mains connection box suitable for conductors. All BTS must be metered.

The *point of attachment* is to be mounted within 600mm from the top of the pole (however this distance can be increased to ensure the point of attachment is no higher than 8m from the ground) and the *connection point* is to be as per Section 5.8.6 (a).

## 5.9. Underground Service Lines

The *distributor* shall determine the point of origin, the route and the *point of entry* of the *service line*. The *customer* or *electrical contractor* shall consult the *distributor* prior to planning the installation.

For underground *service lines*:

- (a) Where supply is by either a low voltage or a high voltage underground *service line*, the *customer* shall be charged all costs for the length of *service line* in excess of 7m from the point -
  - (i) where it crosses the *customer's* property alignment; or-
  - (ii) where such a *service line* does not cross the property alignment in excess of 7m from the point of origin of the *service line*, except as provided for in Section 5.2.1(c).
- (b) Underground *service lines* will not be provided in rural areas due to the risk of vehicle impacts and fire damage. Proposal to locate pillars in non-urban location require the prior approval of the *distributor's* Line Standard Manager and the Network Manager for the applicable area. .
- (c) Where required by the *distributor* for commercial or industrial installations, *customers* shall provide suitable facilities on their *premises* for the entrance, support, protection and termination of an underground *service line*. (Refer to the *Energex* Commercial and Industrial Substation Manual for details or the *Ergon Energy* Indoor Distribution Substation Design Standard).

### 5.9.1 Underground Pit Systems

In areas where an underground pit system has been installed (e.g. In the *Energex* distribution area at Northlakes, Inala and Runaway Bay and at various locations in the *Ergon Energy* distribution area) special requirements apply to the installation/upgrade of the *consumer mains*. (Contact the relevant *distributor* for details).

### 5.9.2 Site Selection

Pillars shall not be installed in or within 1 metre of areas that are designed to permanently capture and store water, floodways or other locations where likely to sustain significant and repetitive damage due to water inundation. Pillars should not be installed where they may be subject to tidal inundation, storm surge or flooding events exceeding an 10% Annual Exceedance Probability (AEP).

Where a *customer* in an overhead service area requests the installation of an underground service, and the *distributor* agrees to this request, supply shall be taken from a service pillar or pit installed on the footpath in line with the side property boundary. This service pillar or pit will be available to provide future underground supply to the adjoining property if required. Full recovery of costs for the additional assets will apply. A typical arrangement for an underground LV service pillar is shown in FIGURE 5.1.

### 5.9.3 Underground Pillars

It is the responsibility of the *electrical contractor* to install the *consumer mains* and conduit into the service pillar for termination by the *distributor's* personnel. (Refer to Section 5.4.1 for access details). FIGURE 5.1 shows a typical LV service pillar arrangement. The route of the consumer mains is to be identified in accordance with AS/NZS 3000 (Wiring Rules).

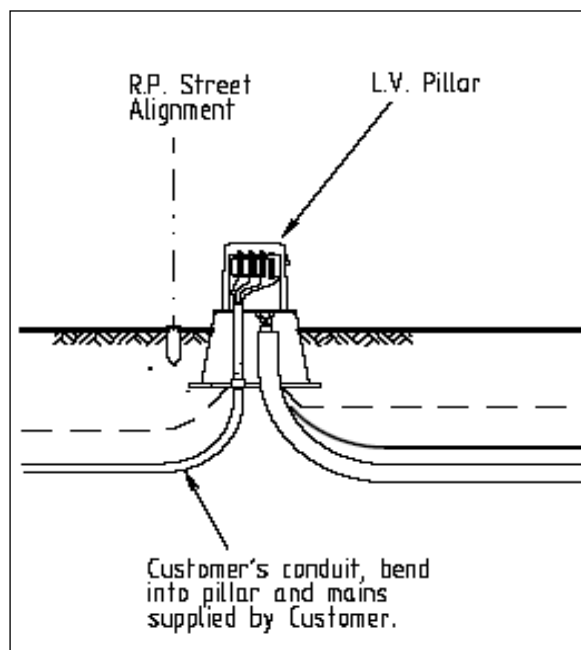
#### 5.9.3.1 Supply or Service Pillar

There are also limits on the size of *consumer mains* to be connected to the service fuse in service pillars. Single aluminium or copper cables no greater than 35mm<sup>2</sup> PVC insulated and PVC sheathed cables. To prevent damage to the *distributors* service,



fuse the conduit shall not protrude past the pillar base and shall be positioned to the rear of the fuse panel. The minimum length of the *consumer mains* shall be sufficient to reach the top of the fuse panel +300mm.

FIGURE 5.1



## Ergon Energy Distribution Area

In Ergon Energy a 40mm Lead In (service) conduit is provided for the Electrical Contractor to use for the installation of consumer mains. Each Lead In conduit exits the pillar at a 45 degree angle, is installed 600mm deep and is identifiable with Orange Caution Tape tied to the end of the conduit extending to ground level for ease of location. A 25mm reducer is provided on each Lead In conduit. The reducer can be removed and replaced as necessary. Consumer mains shall only be installed via the Lead In (service) conduits provided. Alternative installation of mains to the pillar without the use of the conduits supplied can result in the pillar being undermined and de-stabilised and can result in damage to the supply cables.

### 5.9.3.2 Commercial and Industrial Pillar

There are also limits on the size of *consumer mains* to be connected to the CFS Unit in C&I pillars. Single aluminium or copper cables no greater than 240mm<sup>2</sup> PVC insulated and PVC sheathed cables. A lug with a maximum width of 38mm is able to be connected to a CFS unit.

## 5.10. Consumer mains on the Distributor's Poles

In general, *consumer mains* shall not be installed on the *distributor's* poles. However, the *distributor* (in its absolute discretion) may approve such an arrangement in the circumstances described in 5.10(a) and (b) below. All such requests for approval are to be evaluated as exceptional circumstances to which Section 1.4 applies.

Where existing *consumer mains* are installed on the *distributor's* pole and works are being completed that comply with major category of work as per Section 6.4.1 the *customer* shall be connected by service line as per Section 5.2.1.

## (a) Unmetered Installations

Unmetered installations are generally owned by a telecommunications company, public body (or affiliated operator) or other companies (approved by a public body) and installed on public land. (Refer to Section 2.6).

When the installation does not meet the requirements of an *unmetered supply* (e.g. council public parks) it will be treated as a metered installation.

In no case shall the maximum demand of these installations exceed the rating of a standard overhead service (i.e. 100A per phase). This arrangement generally applies only to Rate 3 Public Lighting where a standard charge per light applies. The *customer* and *distributor* must also enter into a connection agreement.

Where the above has been satisfied, approval may be granted for the public body (or affiliated operator) or other companies (approved by a public body) to install the *consumer mains* on poles designated by the *distributor*.

**Note:** Specific requirements apply (particular pole types are unsuitable). The *customer* must contact the *distributor* for details and prior approval. For information on the minimum requirements for construction please refer to drawing QECM 5.16. For more detailed construction drawings refer to the *distributors' Underground Construction Manual*.

## (b) Metered Installations:

In all cases this arrangement is at the absolute discretion of the *distributor* and the following criteria must be satisfied:

- (i) The supply network is within the boundaries of the *customer's* property; and
- (ii) The installation actual demand is above 400A (i.e. in excess of a standard overhead service arrangement); or
- (iii) The electrical installation is owned by a Public Body or other companies (approved by a public body) and complies with the following -
  - the installation is for the use of the general public; and
  - the installation is installed on public land; and
  - the public body or other companies (approved by a public body) is able to demonstrate that there is a community benefit in not installing a property pole (e.g. supply to parkland etc.); and
  - the *distributor's* network is within a reasonable distance from the *connection point* (i.e. not more than 20m); and
  - the network is on the same side of the road as the installation; and
  - the installation maximum demand is not greater than 100A per phase.

**Note:** Special conditions apply for all the above and the *distributor's* approval, as well as the details of any conditions/requirements, must be obtained prior to the commencement of any design or installation work. The *customer* shall meet all associated costs. For information on the minimum requirements for construction please refer to Drawing QECM 5.16. For more detailed construction drawings refer to the *distributors' Underground Construction Manual*

## 5.11. Substations on Customer's Premises

Where the aggregate maximum demand exceeds or is reasonably estimated to exceed 100 kVA as determined by AS/NZS 3000 (Wiring Rules), the *distributor* may require a *customer* to provide (free of charge) the space necessary for a substation in accordance with the *Electricity Regulation 2006 (Qld)*.



## 5.11.1 Consumer Mains Connections to Transformer Terminals

Where *consumer mains* originate at the terminals of a transformer, they shall be adequately supported and shall be connected to the transformer terminals by flexible braid connectors and adaptor plates.

The *electrical contractor* is responsible for the supply and installation of the low *voltage support stand/terminal cover, flexible braid connectors, adaptor plates and consumer mains*, plus any equipment required by the *distributor's* Commercial and Industrial Substation Manual. (Refer to page 1 for details).

## 5.11.2 Consumer Mains Connection to LV Switchgear

Where *consumer mains* are to be connected at the LV terminals of the LV transformer fuses or LV isolator in the LV compartment of a padmount transformer the *consumer mains* size shall be restricted to maintain clearances between phases when physically connected. The standard stripe fuse unit in a padmount transformer permits a maximum of 2\*300mm<sup>2</sup> aluminium or copper cables per phase. If you require a different *connection point* or *consumer mains* size, please seek advice from the *distributor* before installing the *consumer mains*.

## 5.11.3 Multiple Transformers

Where multiple transformers supply a single switchboard, each transformer must be connected to a separate bus section, however, a bus-tie switching arrangement is permitted provided:

- (a) The bus-tie switches are fitted with fail safe interlocking devices to prevent paralleling of the supplies; and
- (b) If the bus-tie switches are a type that cannot be operated under load, fitted with a warning label to indicate the operating requirements; and
- (c) Be installed and identified in accordance with AS/NZS 3000 (Wiring Rules).

In general, where the *distributor* agrees to provide more than one *connection point* to an installation, the *customer* must ensure that the supplies cannot be connected in parallel. Electronically controlled interlocking systems may be allowed (at the discretion of the *distributor*) upon approval of a functional design and operational specification certified by an RPEQ in the application stage.

## 5.11.4 Buried Earthing Systems

Provision of a high voltage substation requires the installation of buried earthing systems. These earthing systems are generally installed within 5m of the substation, however in some cases additional earthing cables may be required. These additional earthing cables would generally be located under the line and may extend some distance away from the substation. For safety reasons, it is important that building foundations, *customers'* low voltage earths or other metallic structures be located a distance of at least 5m or more away from the high voltage earthing system. The *distributor* will provide advice on the location of the earthing system for specific installations if required.

## 5.12. Joints in Consumer mains

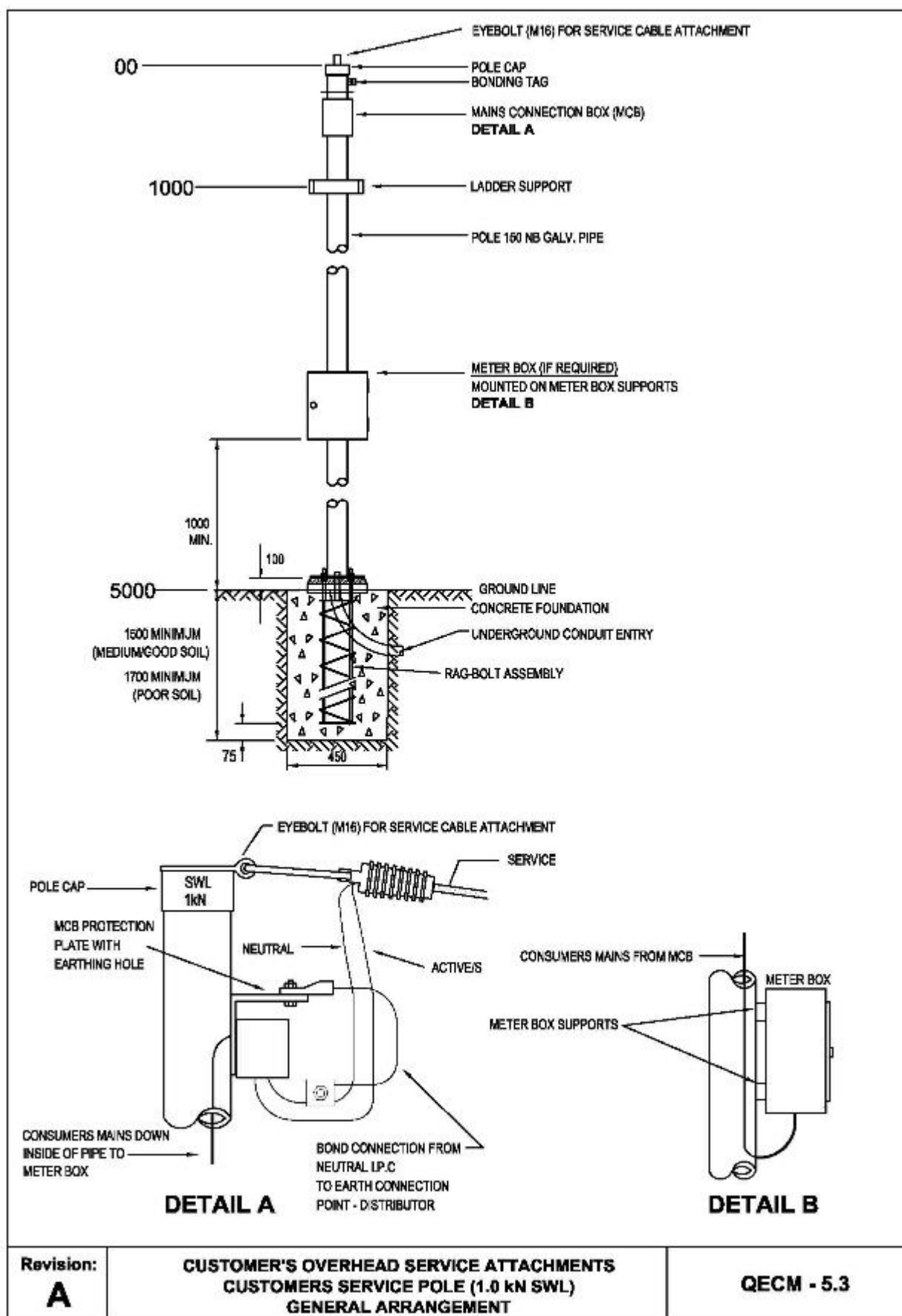
Joints in un-metered *consumer mains* are permitted provided they comply with AS/NZS 3000 (Wiring Rules) and are not vulnerable to tampering by re-instating insulation to equivalent of an unbroken cable.

<div><div><div>OVERHEAD SERVICE CLEARANCES</div><div>USE IN CONJUNCTION WITH SERVICE CLEARANCES TABLE ON DRAWING QECM 5.2</div><div><div><div><div><div>MAXIMUM OF 500mm TO RISER BRACKET</div><div><div><div><div><div>N</div><div>D or E</div><div>A</div><div>B</div><div>C</div><div>N</div><div>D or E</div></div></div><div><div><div><div><div>C</div><div>D or E</div></div></div></div></div></div></div><div><div><div>MAXIMUM OF 500mm TO RISER BRACKET</div><div><div><div><div>D or E</div><div>J</div><div>A</div><div>B</div><div>C</div><div>E</div></div></div><div><div><div><div><div>J</div><div>D or E</div></div></div></div></div></div></div><div><div><div>NO CLEARANCE LIMITS IN VICINITY OF POA (NOTE 3)</div><div><div><div><div><div>J</div><div>L</div><div>M</div><div>N</div><div>K</div><div>G</div><div>H</div><div>F</div></div></div><div><div><div><div><div>D or E</div><div>J</div><div>A</div><div>B</div><div>C</div><div>E</div></div></div></div></div></div></div><div><div><div>MINIMUM 3.0M EXCLUSION ZONE</div><div><div><div><div><div>P</div><div>Q</div><div>R</div><div>S</div></div></div><div><div><div><div><div>U</div><div>V</div><div>W</div><div>X</div></div></div></div></div></div><div><div><div>CUSTOMER PROPERTY POLE</div></div></div></div><div><div><div>* Applies from where a person is <u>LIKELY</u> to stand as determined by site risk assessment.</div></div></div></div></div></div></div></div></div></div></div></div></div></div>		OVERHEAD SERVICE CLEARANCES	QECM - 5.1
Revision: <b>B</b>			

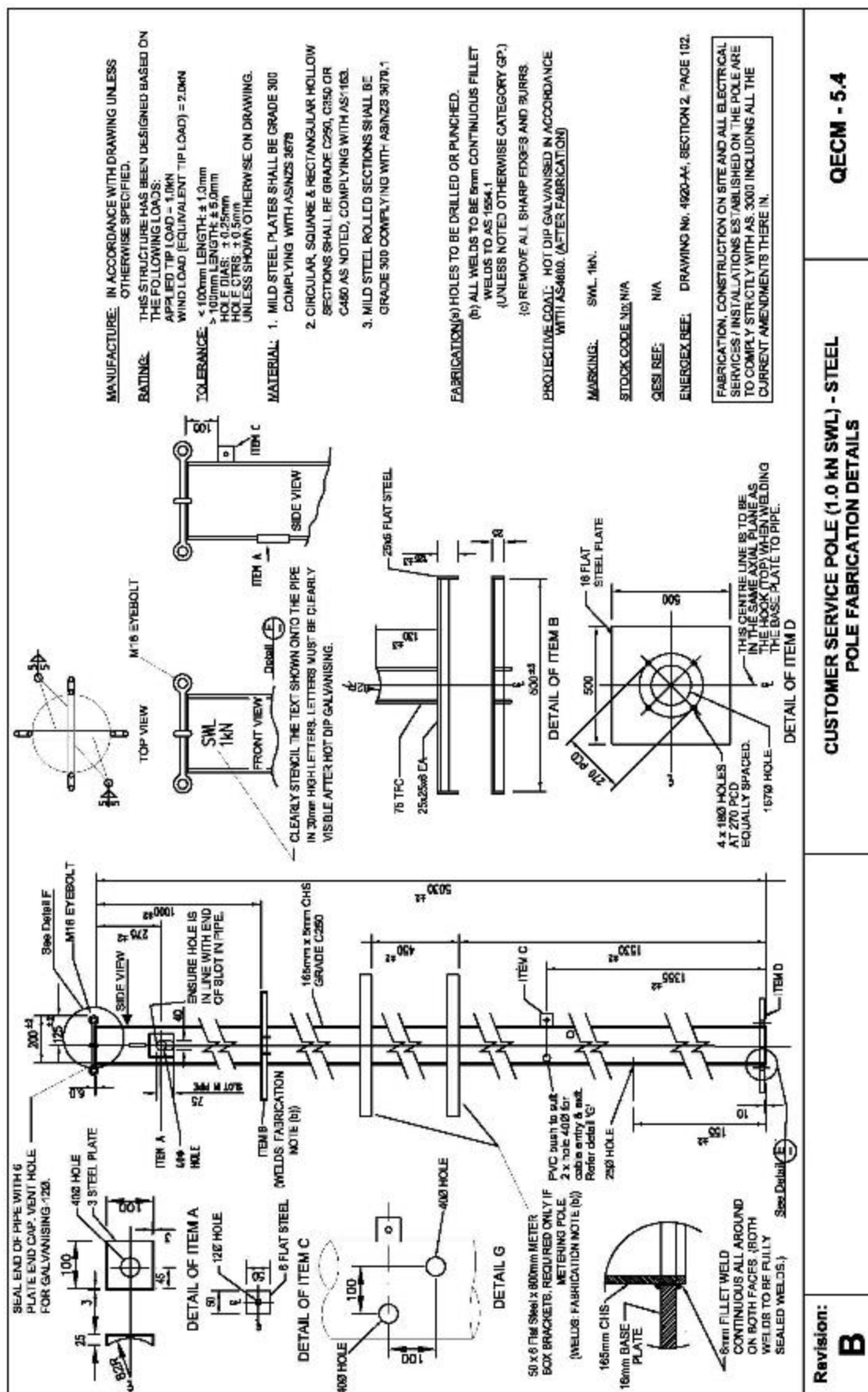
SERVICE CLEARANCE TABLE Neutral Screened and Insulated Cables				Revision: <b>B</b>		SERVICE CABLE CLEARANCES FROM GROUND & STRUCTURES		QECM - 5.2
CATEGORY	CODE	LOCATION	DIRECTION	INSULATED SERVICE CABLE				
ROADS	A	At centre-line of the carriageway	VERTICALLY	5.5m				
	B	At kerb line (bottom of kerb)	VERTICALLY	4.9m				
	C	At fence alignment	VERTICALLY	3.7m				
OTHER	D	Private driveways and areas including elevated areas used by vehicles	VERTICALLY	4.5m				
	E	Areas not normally used by vehicles	VERTICALLY	2.7m				
	F	Road cuttings, embankments and other similar places.	HORIZONTALLY	1.5m				
MINIMUM CLEARANCE FROM STRUCTURES AND BUILDINGS	G	Unroofed terraces, balconies, sun-decks, paved areas, and similar areas that are subject to pedestrian traffic only, that have a hand rail or wall surrounding the area and on which a person is likely to stand (Note 2) must be-	VERTICALLY ABOVE	1.2m				
	H		VERTICALLY BELOW	0.9m				
	I		HORIZONTALLY (Note 1)					
	J	Roofs or similar structures not used for traffic or resort but on which a person is likely to stand (Note 2) must be-	VERTICALLY	2.4m				
	K	or resort but on which a person is likely to stand, and for parapets surrounding roofs or similar structures not used for traffic or resort but on which a person is likely to stand (Note 2) must be-	HORIZONTALLY (Note 1)	0.5m				
				0.2m				
	L	Covered places of traffic or resort including for example windows which are capable of being opened, roofed open verandahs and covered balconies must be (Note 6)	IN ANY DIRECTION	1.2m				
	M	Blank walls, windows which cannot be opened (Note 2) must be-	HORIZONTALLY	0.2m				
	N	Other structures not normally accessible to persons (Note 2) must be-	IN ANY DIRECTION	1.2m				
	P	Customer property poles accessible to persons (Note 2) must be-	IN ANY DIRECTION	3.0m				

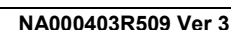
## NOTES :

- Either the vertical clearance or the horizontal clearance stated must be maintained. Also in, the zone outside the vertical alignment of the building or structure, either the horizontal clearance from the vertical alignment, or vertical clearance above the horizontal level on which a person is likely to stand must be maintained.
- For the purpose of the service clearance determination a person is considered LIKELY TO STAND ON:
  - A part of a structure that is strong enough to support a person's weight; and
  - A surrounding wall or handrail where the wall or handrail is at least 200mm wide.
- Stated clearances apply to a service line not attached to the part of the building described.
- The clearance stated does not apply to the part of the low voltage overhead service line not under tension. Drip loops are excluded and consideration should be given to drip loop positioning. (Note: Point of supply is to be not more than 600mm from the point of attachment).
- Where there is no formed footpath, the kerb line means:
  - the kerb line of a proposed footpath; or
  - where no footpath is proposed, the edge of the existing carriageway or any proposed widening thereof;
  - where there is a formed footpath with kerb and channel the kerb line means to the bottom of the channel.
- In situation where the eye screw on a consumer's installation is not provided with an earth tag and it is close proximity to metalwork, (eg. the metalwork of a fascia) the eye screw shall be bonded to the earth tail of the house service neutral connector.
- Where a window sill is determined as not being a place a person is likely to stand (eg. hopper windows, security screened windows and sitting windows) a clearance of 2.4m vertically from floor or 1.2m horizontally shall apply.
- For this table a conductor is taken to be insulated if it is insulated in accordance with AS/NZS 5000.1 (Electric cables - Polymeric Insulated - For working voltage up to and including 0.6 / 1.0 kV) or AS/NZS 3500.1 (Electric cables - Cross-linked polyethylene insulated - Aerial bundled - For working voltages up to and including 0.6 / 1 (1.2) kV). Otherwise it is taken to be uninsulated.



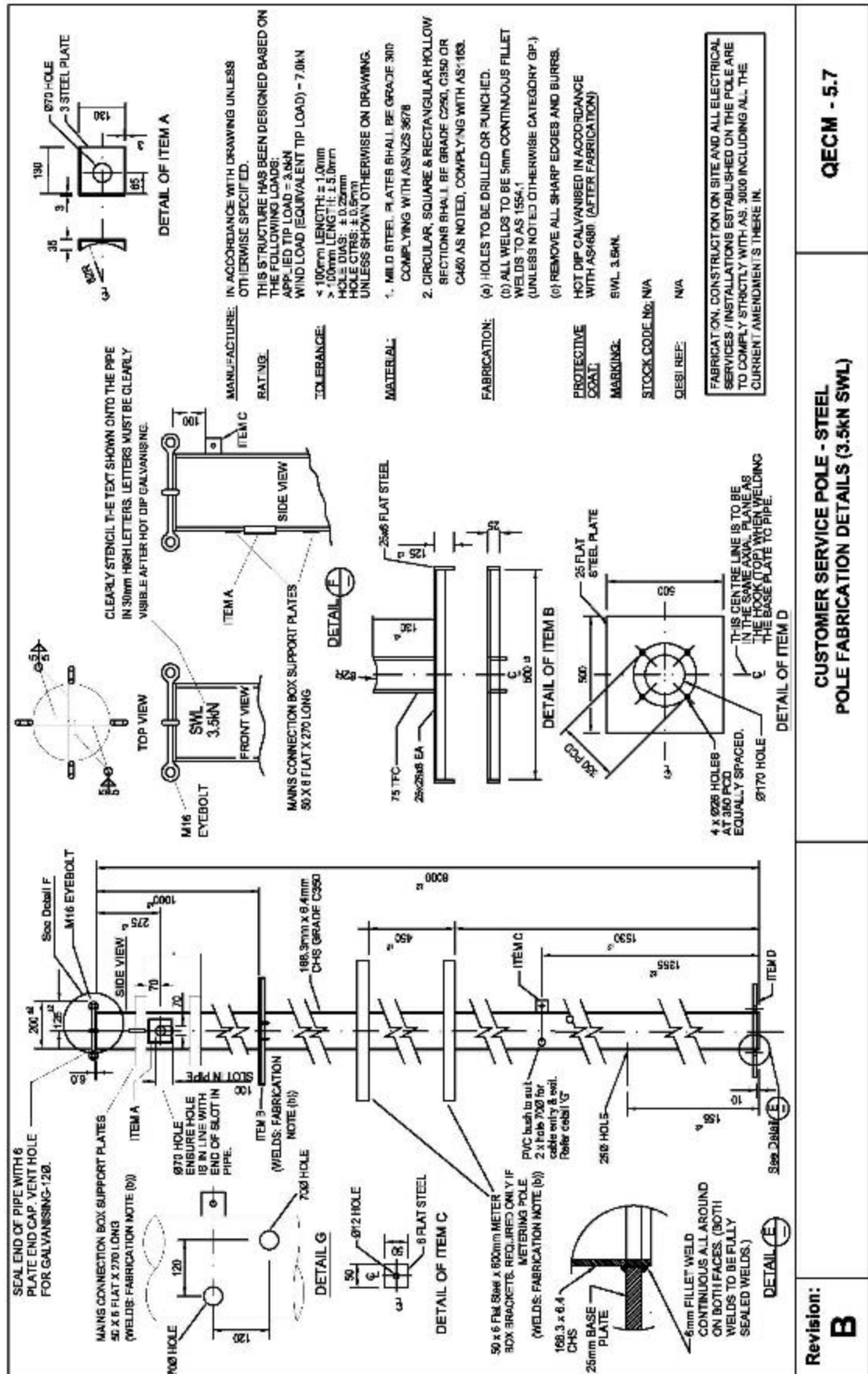








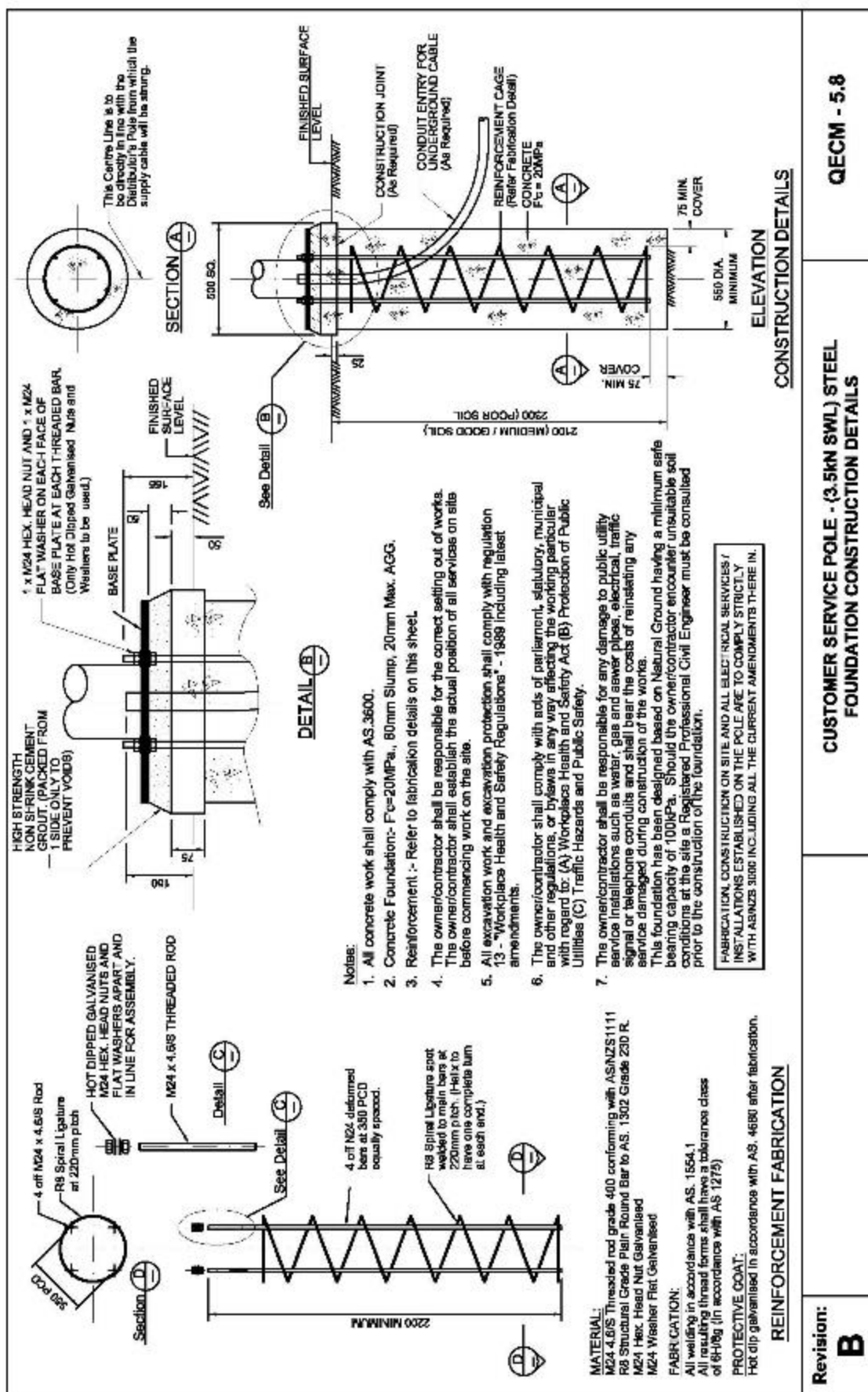


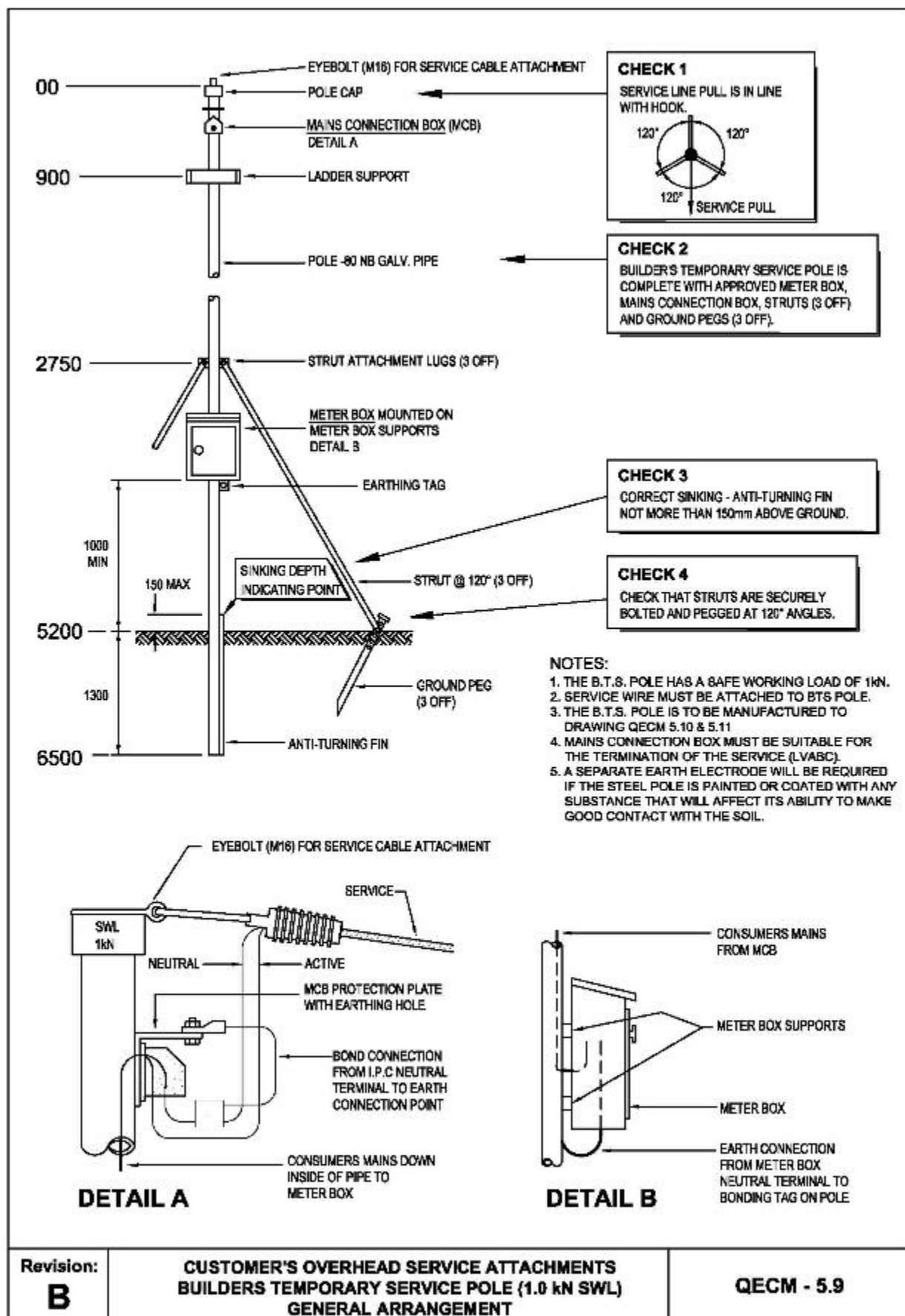


QECM - 5.7

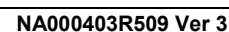
CUSTOMER SERVICE POLE - STEEL  
 POLE FABRICATION DETAILS (3.5kN SWL)

Revision: **B**









<b>MATERIAL LIST</b>			
Item	Description	No. Off	Description
①	Pole	1	80 N.B. x 4.0 Thk. x 6500Lg. Std. Galv. Pipe
②	Cap or Disc	1	To suit 80N.B. Pipe
③	Service Attachment Ring	1	M16 Eyebolt
④	Mains connection Box Baseplate	1	FL 75.3 x 200 Lg. Bent 90° as shown on drawing
⑤	Mains Connection Box	1	3 terminal clipseal Cat. No. IP23
⑥	Threaded PVC Bush	1	To suit MCB
⑦	Screw (Drill & tap item-4 to suit MCB)	2	M5 x 12Lg. S/S Grade 304
⑧	Ladder Support Bracket	1	Taper-flange Channel
⑨	Ladder Support Member	1	L 25x25x6x600Lg
⑩	Ladder Stope	2	L 25x6x125Lg
⑪	Strut Attachment Lug	3	FL 75 x 10 x 75Lg.
⑫	Strut Members	3	25N.B. x 3150Lg. Std. Galv. Pipe
⑬	Meter Box Supports	2	FL 50 x 6 x 400Lg.
⑭	Earthing Lug	1	FL 50 x 6 x 50Lg.
⑮	Stabilising fln	1	FL 50 x 6 x 1450Lg.
⑯	Peg	3	L38 x 38 x 6 x 900Lg. (See Detail 3)
⑰	Striking Plate	3	FL 50 x 10 x 50 Lg.
⑱	Bolt & Nut	6	M12 x 40 Lg. Hex. Galv.

**NOTES:**  
 1. FOR CONSTRUCTION AND DETAILS REFER TO DRAWING QECM 5.10  
 2. NB = NOMINAL BORE

**SPECIFICATIONS**

**RATING:** This structure has been designed based on the following loads:  
 Applied tip load - 1.0 kN.

**TOLERANCE:** All tolerances to be  $\pm 5.0$

**MATERIAL:** Structural steel in accordance with AS 4100.

**MATERIAL:** Structural Steel In Accordance with AS 1204 Grade 250.  
 See material list for details.

**FABRICATION:**  
 (a) Holes to be drilled or punched undersize & reamed.  
 (b) Welding to be in accordance with AS 1554.1  
 (c) All sharp edges and burrs to be removed.

**PROTECTIVE COAT:** All steelwork to be effectively corrosion protected.

**MARKING:** SWL 1 kN

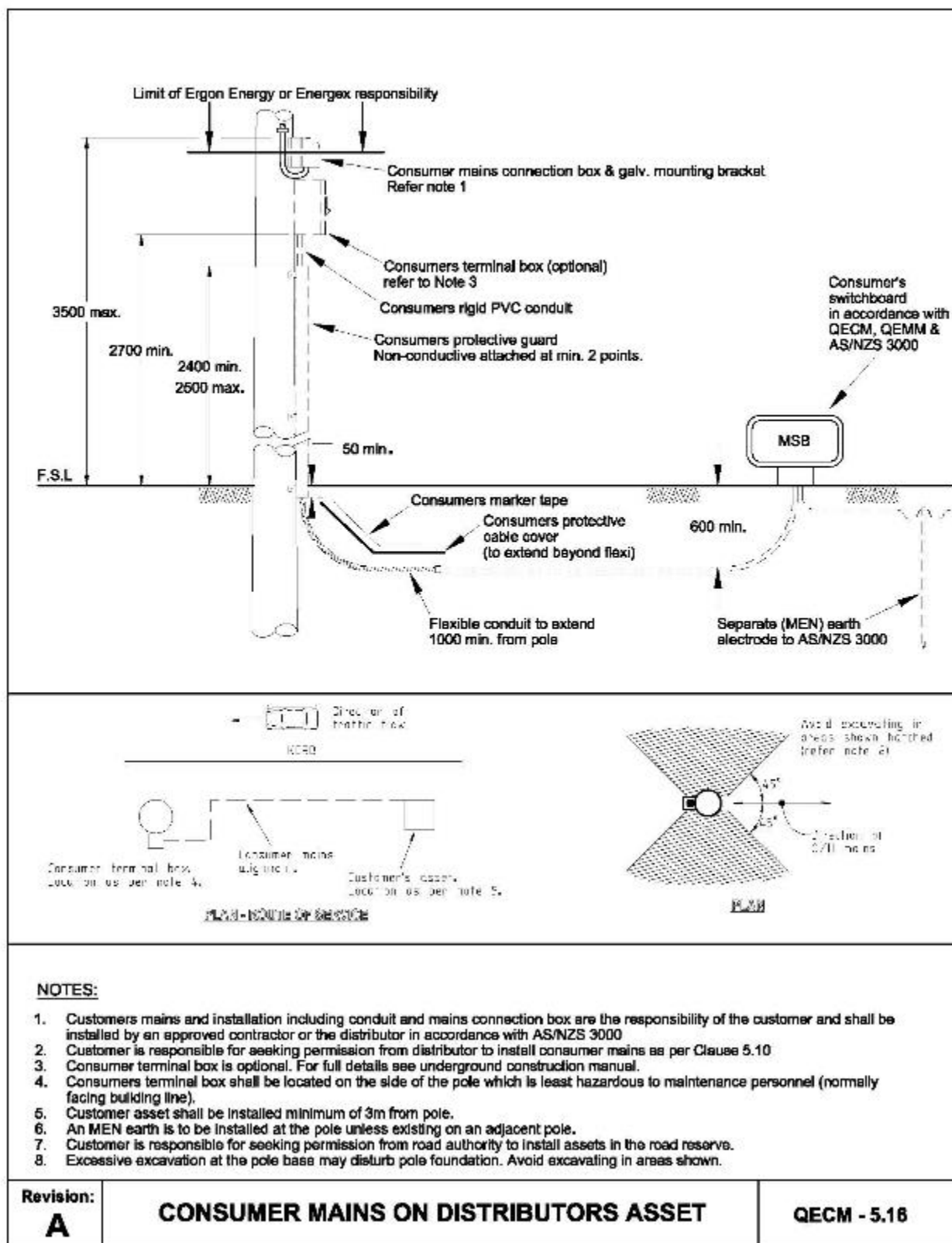
<b>Revision:</b> <b>B</b>	<b>TEMPORARY SERVICE POLE (1.0 kN SWL) FABRICATION AND CONSTRUCTION DETAILS</b>	<b>QECM - 5.11</b>
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<p><b>Eyebolt/open eye screw to Manufacturers requirement</b></p> <p><b>DETAIL 'A'</b></p> <p>IRON ROOF</p> <p>TILE ROOF</p> <p>SEALANT</p> <p>ROOF SHEETING</p> <p>BATTEN</p> <p>RAFTER</p> <p>WASHER</p> <p>TILE</p> <p>BATTEN</p> <p>RAFTER</p> <p>Position back stay in line with service <math>\pm 20^\circ</math></p> <p>Main connection box must be mounted on raiser bracket</p> <p><b>RAISER BRACKET - STAY DETAIL</b></p>	<p><b>EYEBOLT - TYPE 1</b></p> <p><b>EYEBOLT - TYPE 2</b></p>	
<p><b>RAISER BRACKET THROUGH (RAFTER) ROOF TYPE</b></p>	<p><b>RAISER BRACKET - FASCIA TYPE</b></p>	<p><b>RAISER BRACKET PARAPET TYPE</b></p>
<p><b>DIRECTION OF SERVICE - RAISER BRACKET/OPEN EYE SCREW</b></p> <p><b>RAISER BRACKET:</b> The raiser bracket is to be installed in accordance with Manufacturers Instructions.</p> <p><b>NOTE:</b> Services will not be connected where the bracket is installed incorrectly i.e. service direction altered without permission/agreement by Manufacturer.</p>	<p><b>DIRECTION OF SERVICE - EYEBOLT</b></p> <p><b>EYEBOLT</b> Service permitted in any required position. Service must not come in contact with any structure and statutory clearances apply.</p>	
<p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>Manufacturers and Registered Professional Engineer Qld (RPEQ) installation instructions are to be followed in all cases - the detail in this drawing is INFORMATIVE ONLY.</li> <li>Raiser brackets and eyebolts are to be HOT DIPPED GALVANISED STEEL and marked with a suitable 'SWL rating'.</li> <li>Raiser brackets are to be certified by an RPEQ and approved by the distributor.</li> <li>1kN raiser brackets must not be used to terminate 50/95mm<sup>2</sup> LVABC service. A 3.5kN raiser bracket or an eyebolt/open eye screw installed on a suitable portion of the building or a property pole is to be used.</li> <li>If the service bracket/eyebolt is within 25mm of any structural metal work e.g. guttering or metal fascia of the building, the distributor will bond between the service attachment and the neutral conductor of the service.</li> <li>The customer is to provide suitable means to connect bonding conductor, i.e. Earth tag with 12mm hole.</li> </ol>		
<p>Revision:</p> <p><b>B</b></p>	<p><b>TYPICAL EXAMPLES FOR 25/35mm<sup>2</sup> LVABC (1kN) SERVICES ATTACHMENTS ON STRUCTURES - EYEBOLT &amp; RAISER BRACKET</b></p>	<p><b>QECM- 5.12</b></p>



CUSTOMER TO PROVIDE THE MEANS FOR ATTACHMENT AND CONNECTION OF THE SERVICE TO THE CUSTOMER'S INSTALLATION		
<p>THREE PHASE SERVICE ARRANGEMENT SHOWN</p> <p><b>25/35 mm² LVABC SERVICE CONNECTION WOOD OR METAL FASCIA</b></p>	<p>THREE PHASE SERVICE ARRANGEMENT SHOWN</p> <p><b>25/35 mm² LVABC SERVICE CONNECTION GALVANISED STEEL RAISER BRACKET</b></p>	
<p>THREE PHASE SERVICE ARRANGEMENT SHOWN</p> <p><b>25/35 mm² LVABC SERVICE CONNECTION CUSTOMER'S WOOD POLE</b></p>	<p>THREE PHASE SERVICE ARRANGEMENT SHOWN</p> <p><b>25/35 mm² LVABC SERVICE CONNECTION CUSTOMER'S CONDUCTIVE POLE</b></p>	
<p><b>NOTES</b></p> <p>1. TO PREVENT CORROSION COPPER CONDUCTORS SHALL NOT BE DIRECTLY CONNECTED TO GALVANISED SURFACES.</p> <p>2. CUSTOMER TO SUPPLY AND INSTALL APPROVED MAINS CONNECTION BOX OR NON-METALLIC UV STABILISED WEATHERPROOF ENCLOSURE. (REFER TO CLAUSE 5.8.7 SEE DETAIL FOR MIN SIZE.</p>		
<p>Revision:</p> <p><b>B</b></p>	<p><b>CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS 1.0kN SWL CONNECTION AND BRIDGING DETAIL</b></p>	<p><b>QECM - 5.13</b></p>

<b>CUSTOMER TO PROVIDE THE MEANS FOR ATTACHMENT AND CONNECTION OF THE SERVICE TO THE CUSTOMER'S INSTALLATION</b>		
<p><b>UP TO 200 AMP</b></p> <p style="text-align: center;"><b>TYPICAL LVABC TO SINGLE CONSUMERS MAINS CONNECTION DETAIL</b></p> <p style="text-align: center;"><b>LVABC CONNECTION TO SINGLE CONSUMER MAINS</b></p>	<p><b>200/400 AMP</b></p> <p style="text-align: center;"><b>TYPICAL LVABC TO PARALLEL SERVICES MAINS CONNECTION DETAIL</b></p>	
<p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1. CUSTOMER TO SUPPLY AND INSTALL APPROVED MAINS CONNECTION BOX OR NON-METALLIC UV STABILISED WEATHERPROOF ENCLOSURE AND SUITABLE LUGS. (REFER TO CLAUSE 5.8.7). SEE DETAIL FOR MIN SIZE)</li> <li>2. CUSTOMER TO SUPPLY LUGS TO SUIT CURRENT RATING OF CABLE AND SHALL ACCOMMODATE A 12MM S/S BOLT. CUSTOMER TO SUPPLY LUG DIES WHERE REQUIRED. CONSUMER MAINS TO ENTER THROUGH BOTTOM OF ENCLOSURE.</li> <li>3. ALTERNATE CONNECTIONS METHOD USE APPROPRIATE COPPER BUS BAR.</li> <li>4. COVER WITH INSULATING SHROUD AND SECURE WITH ZIP TIE.</li> <li>5. THE BONDING OF EXPOSED METALWORK (EYEBOLT) MUST USE A CONDUCTOR SIZE THE SAME AS THE LVABC NEUTRAL.</li> <li>6. IPC'S MUST BE USED TO CONNECT ALL EARTHING CONDUCTORS TO LVABC NEUTRAL.</li> </ol> <div style="text-align: right; margin-top: 20px;"> <p style="text-align: center;"><b>LVABC CONNECTION TO PARALLEL CONSUMER MAINS</b></p> </div>		
<p><b>Revision:</b></p> <p style="font-size: 2em; font-weight: bold; text-align: center;">B</p>	<p><b>CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS CONNECTION AND BRIDGING DETAIL FOR SINGLE AND PARALLEL LVABC SERVICES FOR C &amp; I INSTALLATIONS (MAX 400 A)</b></p>	<p><b>QECM - 5.14</b></p>



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## 6. METERING REQUIREMENTS

### 6.1. General

Metering installations are to comply with this document (*QECM*) and the requirements set out in the *QEMM*. Only the appointed *Metering Provider* can work on or remove metering equipment (refer to the responsibilities section).

Where a *customer* directs a *retailer* to request metering or tariff changes, any alterations to the *customer's* switchboard installation or meter enclosure shall be the *customer's* responsibility (e.g. removal of asbestos contaminated waste) (Refer to Section 6.4).

*Network devices* deemed to be necessary to control electricity consumption shall be supplied and maintained by the *distributor* and shall remain their property. All meter and *network device* active terminals shall be connected directly to the Metering Isolation Link or Metering Active Link for direct connected installations.

All phases of a service line are required to be connected at the initial connection of the premises. All metering and control equipment shall be back-wired and mounted on a side hinged panel attached to a metering enclosure or a switchboard frame.

All the *Customer's* ancillary equipment including (but limited to) surge diverters, voltmeters, phase failure relays, shall be connected on the load side of the revenue metering equipment. *Customer* owned current transformers for energy management are permitted on the line side of revenue metering equipment at multiple tenancy installations.

### 6.2. Metering Determination

Calculated loads greater than 100 A per phase or measured loads greater than 80 A per phase shall require *current transformer metering*. Contact the *metering provider* for further information or refer to the *QEMM*.

### 6.3. Controlled loads

Where *controlled loads* are required (Controlled Supply/Night Rate tariffs), provision for a separate *network device* shall be made (Refer to Drawing QECM 6.1 for cable access drilling details). The *network device* will only be installed when the *customer* has requested *controlled load* as part of the EWR for the installation.

Section 7 contains further detail on the requirements for connecting *controlled loads*.

### 6.4. Additions & Alterations Category of Works

Where work is performed on an existing electrical installation, it shall be classified under the following descriptions;

#### 6.4.1 Major Electrical Additions & Alterations

Where major upgrades are carried out to a *customers'* installation the metering installation shall comply with all requirements of the *QECM*. Major alteration works being undertaken include (but are not limited to):

- where *consumer mains* are replaced;
- connection of additional phase/s;
- where the meter enclosure is replaced or relocated;
- where the meter panel is not housed in an enclosure;
- where the metering is changed from *direct connected* to *current transformer* or vice versa;
- where an additional tenancy/metering point is added;

Note: refer also to Section 5.8.6(d) for requirements to relocate overhead service *point of attachment* where major alterations are carried out.

## 6.4.2 Minor Electrical Additions & Alterations

Where minor upgrades are carried out to a *customer* installation the meters may be left in the existing location provided the metering location is suitable to the *distributor* and *metering provider*. Refer to Section 6.9.2 & 6.9.9 for details on unsuitable locations. Minor alteration works being undertaken include (but are not limited to):

- Additional tariff requested e.g. Controlled supply tariff
- Customer requested meter change
- Load Centre changed
- The replacement of meter panel within an enclosure where the enclosure is not being replaced
- Where *point of attachment* is relocated for safety and no other works being completed;

## 6.4.3 Addition of *Small IES EG Connection*

Where a *customer* installs a *Small IES* at their *premises* allowance shall be made for the metering equipment to be mounted on a hinged panel that does not contain asbestos with metering isolation links and metering neutral links.

Refer to Section 6.5.2, 6.6.2 and 6.12 for requirement details.

## 6.4.4 Multiple Tenancy Alterations

Where building alterations are being carried out and fall into major category of works as per Section 6.4.1 then all tenancies must be upgraded to comply with the requirements of the *QECM* and *QEMM* including the requirement for isolation of the building and each customer.

Where a single tenant of a multiple tenancy connection requires works that fall under minor category of works (Section 6.4.2) or the addition of *Small IES* (Section 6.4.3) and is unable to gain support from the body corporate to upgrade metering they may:

Install a second meter board directly next to existing non-compliant meter panel. Alternatively, if the existing meter board is hinged with no asbestos, then they will be able to use the existing meter position however will be required to install metering active and neutral links.

## 6.4.5 Building Renovations / Alterations

Where building alterations or similar works are carried out to *premises* which results in the metering equipment no longer being in a position that is suitable to the *metering provider* (refer to Section 6.9.9 for unsuitable locations), the *customer* shall, at their expense, relocate the metering equipment to an acceptable position complying with Section 6.

## 6.4.6 Other Repairs & Damage caused outside a person's control (e.g. Natural Disaster)

Compliance with Section 6 is required where the metering is located in an unsuitable location (refer to Section 6.9.9). In instances where the metering is not located in an unsuitable location, repairs may be carried out by "using methods that were acceptable when that part of the electrical installation was originally installed", provided those methods satisfy the fundamental safety principles of Part 1 of AS/NZS 3000.

## 6.5. Metering Isolation

To facilitate the requirements of the *Electrical Safety Act 2002(Qld)* and *Electrical Safety Regulation 2013(Qld)* for performing electrical work, and the *Electricity Act 1994 (Qld)* and



*Electricity Regulation 2006 (Qld)*, supply to the revenue metering equipment for each *customer* must be capable of being individually isolated.

All metering shall be connected with suitable active isolation devices connected to the line side of the metering to allow safe access to the metering equipment. The requirement to install meter isolator applies to all new installations including *direct connected metering* and *current transformer metering*. Refer to Section 6.5.2.4 for existing installations requirements.

## 6.5.1 Metering Isolation Links/Circuit Breakers

Metering Isolation Links (MIL)/Circuit Breakers (CB) shall be installed in accordance with the following:

- (a) metering isolation links shall be clear cased type that comply with AS 60269, sealable, back wired, fitted with a tubular link and installed on the line side of all *direct connected metering* equipment; and
- (b) all metering isolation links/CBs on a metering panel shall be connected in the same line - load sequence; and
- (c) the metering isolation links shall be mounted horizontally or vertically on the front of the metering panel and if not obvious, clearly labelled to indicate the meter and portion of the installation that they control. Clearance around the ends of metering isolation links shall be 40mm; and
- (d) the load through a MIL/CB shall not exceed 125A. In multiple supply applications (e.g. general and *controlled supplies*), where the load exceeds 125A, additional metering isolation links/CBs shall be required. Where a fuse is used to replace the solid link (Refer to Section 6.5.2.3) the maximum load through the metering isolation link shall not exceed the rating of the fuse; and
- (e) on multiple installations MIL/CB shall be provided for each *network device* and installed on or adjacent to the relevant meter/metering equipment; and
- (f) for *customers* with three-phase supply the MIL/CB are to be grouped together and if not obvious, permanent labelling must be applied to the meter panel to show the meter(s) and installation that they control.

Aluminium cables are not suitable for connection directly into Metering Isolation Link terminals unless fitted with a suitable means of termination, such as a soft-form bi-metallic sleeve or ferrule that is compatible with the Metering Isolation Link terminal metal.

Where cables of these types are used as *consumer mains*, they shall comply with the requirements of the electrical component/cable manufacturers and AS/NZS 3000 (Wiring Rules), particularly in respect of termination and bending.

## 6.5.2 Isolation of Direct Connected Metering

### 6.5.2.1 Single Installations

A metering isolation link per phase shall be connected to the line side of the metering. This arrangement maintains supply to electronic meters. (Refer to Section 6.5.1 and Drawing QECM 6.2).

#### Exception:

Where overload protection for the *consumer mains*, in accordance with AS/NZS 3000 (Wiring Rules), cannot be achieved by the positioning of the installation's circuit breaker main switches on the load side of the metering the following shall apply:

A metering isolation D curve circuit breaker connected on the line side of the metering and sized for overload protection of the *consumer mains*, shall be installed on the front of the meter panel in place of the metering isolation link. The circuit breaker shall be enclosed in a sealable non-metallic enclosure with a clear cover to allow the *customer*

to determine if the circuit breaker is in the open or closed position without removing the cover and shall comply with rating limitations as per the *QEMM*.

**Notes:**

1. Enclosures that are lockable only are not acceptable.
2. The *distributor's* service fuse shall not be considered as overload protection (refer to Section 2.8).
3. Where metering isolation circuit breakers are used in a three-phase installation, all three phases must have circuit breakers. If individual CBs are installed it is requirement to comply with Section 6.5.1.

If the marking on the circuit breaker is not legible when the cover is in place, the open and closed positions are to be identified by additional marking on the enclosure.

A permanent indelible label shall be fixed on or adjacent to the circuit breaker enclosure stating the following:

**Metering isolation circuit breaker**  
Contact an Electrical Contractor if in off position.

## 6.5.2.2 Multiple Installations

A lockable load-break isolator (with facility for locking off) that is capable of isolating supply to the entire electrical installation shall be installed for all multiple *customer* installations including multiple *customers* fed from remote metering points. Where a circuit breaker main switch is installed for overload protection of the *consumer mains* in accordance with AS/NZS 3000 (Wiring Rules), it shall be lockable, connected on the line side of the metering and can be used in place of the building isolator (Refer to Drawings QECM 6.2 and QECM 6.3).

Metering isolation links are required for individual *customers*. (Refer to Section 6.5.1).

## 6.5.2.3 Existing Installations

All meters at the one-meter location must follow the same sequence (i.e. be either all "before" or all "after" the main switch/s or any lockable isolator).

Where *direct connected* meters are installed to facilitate a *customer* requested supply/tariff change, additional tariffs (e.g. controlled supply tariff) or installation of a *Small IES* on an existing single *customer* installation, they shall be connected on the line side of the individual installation's switchgear and provision for MIL is required in accordance with Section 6.5.2.1

On existing multi-tenancy installations where the individual tenancy main switch is connected on the line side of the meters, a new meter shall be connected on the line side of the individual tenancy main switch. A means of isolation in accordance with Section 6.5.2.1 must be provided to allow isolation of the meter without interrupting supply to other *customers*. Where *customer* works are major alterations as per Section 6.4.1 a means of isolation in accordance with Section 6.5.2.2 shall be provided.

**Exception:**

On existing single-phase multi-tenancy installations utilising plug-in meters, the need to fit isolation link/s is not required in situations where a replacement plug-in meter is to be used. These include a single-phase tenancy with a *Small IES* or a tenancy with Time of Use metering (TOU)

**Notes for Clause 6.5.2.3:**

1. Where the *distributor's* service fuse is greater than 80A, fault current limiting devices (supplied and installed by the *customer*) complying with AS/NZS 3000

(Wiring Rules), are required to protect any *direct connected meters*. Fault current limiting devices shall be installed as per AS/NZS3000. (Refer to Drawings QECM 6.3 and QECM 6.4).

2. Standard practice in multiple tenancy *direct connected metering* installations, where the service fuse protection is greater than 80A, is to install an 80A fuse in the metering isolation link in place of the solid link. Where fuses are installed, the *metering provider* will provide the fuse and place a label on the panel adjacent to the metering isolation links stating: "WARNING - The metering isolation links have been fused for protection of *metering provider* Equipment".
3. Where the *metering provider* determines that the meter requires an 80A fuse for adequate overload/fault protection, *metering providers* can install an 80A fuse in the metering isolation link provided the Maximum Demand of the installation does not exceed 80A. Should a 100A supply be required, the *metering provider* shall ensure the meter used is suitably rated for, and protected by, the 80A service fuse. All other requirements of Notes 1 and 2 above remain applicable.

### 6.5.3 Isolation of Current Transformer Metering

Current Transformer metering shall be capable of being individually isolated by a suitable isolator or main switch. All isolation equipment shall be clearly identified and readily accessible and shall be installed and maintained by the *customer*.

Where *direct connected metering* is installed at the same switchboard as *current transformer* metering, the *direct connected metering* is to comply with Section 6.5.2.

#### 6.5.3.1 Specific Single Customer Current Transformer Metered Installations

Specific single *customer current transformer metered* installations include installations where:

- (i) Supply to the installation is interrupted for extended continuous periods of time (>2 days) e.g. irrigation pumps, flood lifters, grain silos etc. (i.e. where the main switch is used to control the installation and leave the electronic meter without supply so that it cannot be read); or
- (ii) "Safety Services" are installed and require supply to be maintained.

**Note:** AS/NZS 3000 (Wiring Rules) permits lockable isolators for installations supplying "Safety Services".

In these specific single *customer current transformer metered* installations, the *customer* shall install a lockable load-break isolator (with facility for locking on and off) on the line side of the *current transformer metering* chamber with the main switch(s) installed on the load side. In these specific installations, the isolator may be locked in the on position. (Refer to Drawing QECM 6.4).

Where the metering current transformers are installed remote from the main switchboard, the isolator shall be marked "Metering Isolator".

#### 6.5.3.2 Other Single Customer Current Transformer Metered Installations

This includes all other single *customer current transformer metered* installations where supply to the meter will not be interrupted for extended continuous periods of time.

The preferred arrangement is to connect all single *customer current transformer metered* installations as per (a) above, however, in the interests of reducing costs to the *customer*, a main switch used as the lockable isolator installed on the line side of the *current transformer metering* is permitted provided isolation of customer outgoing circuits is still provided on the same switchboard as the CTs. The main switch shall be capable of being locked in the off position. (Refer to Drawing QECM 6.4).

## 6.5.3.3 Multiple Customer Current Transformer Metered Installations

### (i) Isolation of entire installation (Building Isolator).

A lockable load-break isolator (with facility for locking off) that is capable of isolating supply to the entire electrical installation is required.

**Note:** A charge will be made where the *distributor* is required to isolate supply.

### (ii) Isolation of individual customers.

A lockable load-break isolator (with facility for locking off) shall be installed on the line side of each set of revenue metering current transformers with the *customer's* main switch(s) installed on the load side located on the same switchboard as the CTs. (Refer to Drawings QECM 6.3 and 6.4).

## 6.6. Metering Active and Metering Neutral Requirements

### 6.6.1 Metering Active Links

Where common *consumer mains* are installed for the purpose of supplying more than one customer, metering active links shall be used. Metering active links may be required to facilitate the ease of connecting large cables to metering isolation links in multi-tenancy installations or when there are more than two meters connected to single-phase.

### 6.6.2 Metering Neutral Links

The metering neutral shall be connected to a dedicated terminal of a metering neutral link (MNL). All meter and *network device* neutral terminals shall be connected to a dedicated terminal of the metering neutral link via a separate neutral conductor.

Soldered meter and *network device* neutral connections are not permitted.

### 6.6.3 Construction

Metering active and metering neutral links shall -

- (a) incorporate a separate connecting device for the incoming and each outgoing circuit; and
- (b) consist of tunnel terminals for termination of the conductors using one of the following methods (i); (ii) or (iii) for termination of the conductors.
  - i. Two screws shall be provided for each terminal; or
  - ii. One screw, the outside diameter of which is not less than 80% of the tunnel diameter; or
  - iii. One screw, which is arranged so that the conductor is clamped by suitable ferrules or plates in direct contact with the conductor.
- (c) must be sealable or where this facility does not exist (for larger sized *consumer mains*), the links must be installed within a suitable dedicated enclosure fitted with a sealable cover.

### 6.6.4 Connection of Metering Neutral Conductors to Main Neutral

The neutral conductor of the *consumer mains* is not to be joined or looped through the terminals of a revenue meter or metering neutral link. Metering neutral conductors shall not be looped between metering equipment and when alterations or additions are required on existing installations with neutral looping, the looping must be removed and metering neutral link installed.

The metering neutral shall be connected to the main neutral in such a manner that it cannot be disconnected or removed, for instance:

- (a) soldered or crimped to the main neutral;
- (b) a flag lug under the main neutral connection. Slotted lugs shall not be used;
- (c) a sealable terminal or bolt on the neutral link/bar where -
  - (i) the *consumer mains* are a busway or busbar arrangement;
  - (ii) the installation main switchboard is supplied by more than one *connection point* and a bus-tie arrangement is in place (the *consumer mains* neutrals shall be connected to a common neutral link/bar);
- (d) where the main neutral conductor is 25 mm<sup>2</sup> or larger a sealable terminal may be used;
- (e) under a stud fitted with a suitable nut that is drilled and tapped into the *consumer mains* neutral lug, provided the arrangement can be sealed.

**Note:** In domestic installations where parallel *consumer mains* are used the metering neutral conductor shall be soldered to one conductor only.

## 6.6.5 Accessibility of Neutral Connections

The metering neutral connection is to be readily accessible and shall not be located behind a panel where access requires isolation of supply.

On heavy current switchboards (refer to AS/NZS 3000 (Wiring Rules)) the main neutral and MEN connections to the busbar shall be located in an accessible position with a minimum of 600mm clearance from exposed live parts. If a minimum clearance of 600mm cannot be achieved, the use of a permanent barrier or location within a chamber separate from that of the main switch or other exposed live parts is acceptable.

The arrangement must allow the main neutral and MEN connections to be safely accessed without isolating the supply to the switchboard or moving other cables. (refer to AS/NZS 3000 (Wiring Rules)).

The use of shrouds over cable connections is not a sufficient barrier as the shrouds need to be removed during polarity testing (unless access to conductors is provided via test probe holes without the need to remove the shrouds).

## 6.6.6 Metering Active and Metering Neutral Link Mounting

Metering active and metering neutral links shall be mounted on the rear of the meter panel or meter enclosure. Where metering active and neutral links are mounted on the rear of the meter panel, they shall be mounted in such a way that they do not interfere with the mounting of the metering equipment.

To not interfere with metering equipment (normally mounted on the upper or middle section of the meter panel) it is preferable for the metering active and neutral links to be mounted as close as practical to the bottom of the meter panel.

Where metering active and neutral links are mounted on the rear of the meter enclosure and the material on which they are mounted is conductive, they shall be mounted on insulating material with low water absorption properties that will extend past the live parts of the link by a minimum of 25mm in all directions. This mounting arrangement is not required where the link has been specifically designed and type tested for installation onto metal surfaces.

Access to metering links must not be obstructed by any structure or wiring within the switchboard.

## 6.6.7 Metering Active and Neutral Link Labelling

A permanent label is required on the front of the meter panel to indicate the location of the metering active and metering neutral links.



Metering active and neutral links shall be identified as such and marked to identify which meter is fed from each outgoing circuit of the metering link. Labelling must be legible and durable in accordance with AS/NZS 3000 (Wiring Rules).

## 6.7. Conductor Identification

To assist in identification of conductors and correct phase sequence of polyphase meters, the individual conductors of *consumer mains* shall be clearly identified at both ends (including up to each set of Meter Isolation Links) by colour coding of the conductor insulation (e.g. red, white and dark blue to identify active conductors). This identification may be achieved by installation of 150mm minimum of colour coded sleeving installed at the conductor terminations (e.g. at the service pillar, mains connection box, transformer terminals, switchboard/metering panel MIL etc). Insulation tape is not an acceptable means of identification.

## 6.8. Metering and Control Equipment - Accommodation

The *customer* shall provide and maintain at their expense, suitable space, housing, mounting and connecting facilities to accommodate meters and control equipment for each supply arrangement (e.g. general and *controlled supplies*).

Unless otherwise specified and agreed with the *distributor*, the minimum space requirements for *high voltage metering* panels shall be as specified in Section 9.

## 6.9. Metering and Control Equipment - Position

### 6.9.1 General

Meters and control equipment shall be positioned so that they are not subjected to mechanical damage, vibration, high temperature or other environmental situations that might affect their correct operation (e.g. exposure to direct sunlight). Where security of a meter enclosure is necessary, a metering lock must be purchased to allow access. (refer to Section 6.14).

The *customer* shall provide safe and ready access so that meters and control equipment may be fixed, read, tested, adjusted and removed without difficulty at any reasonable time but generally between the hours of 8.00am to 5.00pm Monday to Friday. The minimum access requirements for a meter enclosure shall be as per the requirements for switchboards as detailed in AS/NZS 3000 (Wiring Rules).

Unless otherwise approved by the *distributor*, or as varied by Section 6.9.4, all meters and control equipment supplied for any one installation (as defined in the National Electricity Rules) shall be located in one readily accessible position, preferably on an outside wall at the front of the building.

*Current transformer* meters should be installed towards the front of the building on a readily accessible outside wall.

*Direct connected* meters shall be positioned in the same location as the Main switch and MEN point to allow required testing to be undertaken by the *distributor*.

**Note:** Where a property or building is of a type that may be subdivided, the meters and wiring should be located in an area that would be set aside as *common property* or within each individual lot.

### 6.9.2 Residential Properties

On single or multiple residential *premises* a meter position suitable to the *distributor* shall satisfy the following criteria:

- (a) unless otherwise approved in writing by the *distributor*, meters shall be erected on the side of the *premises* facing a street from which there is pedestrian access or within the first 2 m along an adjacent side of the *premises*. (refer to Drawing QECM 6.5); and-



- (b) meters shall not be located behind any fence in an urban area, other than the perimeter fence located at the extremities of the property boundary.

Where access to meters is through locked gates in the perimeter fence, the *distributor's* metering lock purchased from an authorised locksmith must be installed. The lock must be accessible from outside the gate. (Refer to Section 6.12).

**Note:** Key/security card boxes or dual locking bars are acceptable.

- (c) on domestic rural or *urban* properties greater than half a hectare, the metering equipment shall be situated in a readily accessible position in accordance with (a) and or (d) of this clause.
- (d) for acreage and farm properties the metering equipment shall be accessible by motor vehicles.

**Note:** The preferred meter position is at the main residence, central meter position or at the front property boundary.

- (e) where customer installs meter enclosure on the front boundary fence facing road reserve, it is not permitted to install meter enclosure on a side or shared boundary fence.

## 6.9.3 Single Non-Residential Properties

All metering equipment shall be located at one position located in an exterior location as near as practical to the connection point where the *distributor* and *metering provider* has unimpeded access. The meter position shall satisfy the requirements set out in Section 6.9.8 and shall not be located behind any fence other than the perimeter fence located at the extremities of the property boundary.

Consideration should also be given to selecting a location that does not compromise the customer's quarantine or security requirements.

## 6.9.4 High Rise Buildings

For buildings up to four floors, a single meter position on common property on the ground floor is approved.

For high rise buildings in excess of four floors, one-meter position on every floor is approved.

## 6.9.5 Shopping Centres

For shopping centres, other than high rise buildings complying with Clause 6.9.4, an additional metering point for every twelve *customers* will be permitted.

## 6.9.6 Multiple Non-Residential

Where an installation with multiple tenancies other than shopping centres complying with Section 6.9.5 and Community Title Developments complying with Section 6.9.8, the metering shall be located in one readily accessible location.

An additional metering point for every twelve *customers* will be permitted.

## 6.9.7 Unmetered Submains

### 6.9.7.1 General

*Customers'* equipment, including devices that consume or measure electricity, must not be connected to any *unmetered* conductor. Details of the proposed meter positions, *unmetered* submains and their circuit protective devices shall be submitted to the *distributor* for approval before their installation. Where *unmetered* sub-mains are intended to supply any additional meter position, then a lockable circuit breaker shall be provided at the origin of the *unmetered* sub-mains.

**Exception:** Approval is not required where the *unmetered* submains comply with Clauses 6.9.4 to 6.9.5.

Voltage drop on *unmetered* submains shall not exceed 2.5% of the supply voltage (voltage drop calculations must be included with the submission). (Refer to page 1 for contact details).

## 6.9.7.2 Meter Positions – Multiple Metering Points

Installations with multiple metering points as detailed in Clauses 6.9.4 and 6.9.5 are to have community metering (where required) located on the main switchboard.

Where there is a risk of incorrect identification of the occupancies supply arrangement, including segregation between the electrical installations, occupancies *unmetered* wiring and switchboard location and metering, supply arrangement diagrams shall be installed and maintained.

## 6.9.8 Community (Strata) Title Developments

For reticulation in community title that is not owned by the *distributor*, in general the *distributor* will provide one *connection point* to the installation. Unless otherwise approved by the *distributor*, all community metering shall be located at one position. Where additional Community Metering points are approved, each shall be treated as a separate *NMI* (Refer to Drawing QECM 6.6).

Where a cluster or community title scheme development consists of a number of multi-tenanted buildings, additional meter position/s located on common property may be permitted.

The following meter positions will also be acceptable:

### (a) Overhead Reticulation

- (i) The main switchboard located on *common property* and all metering equipment installed at this position.
- (ii) The main switchboard and the first metering point located on *common property* and subsequent metering points located on *common property* or as otherwise approved by the *metering provider*.

### (b) Underground Reticulation

- (i) Arrangements described in either Section 6.9.7(a)(i) or (ii) above
- (ii) The individual *consumer mains* (for each unit) installed on *common property* and connected to the *distributor's* reticulation with the metering equipment located at the unit.

Note: Where more than 3 sets of *consumer mains* are to be connected to a *distributor's* pillar, approval must be obtained from the *distributor*

- (iii) Where multiple *premises* (unit cluster) are constructed under Building Format Plan, a 3-phase supply from *distributors* reticulation to supply one metering point shall be installed on *common property*

**Note:** A general arrangement is for twelve *customers* or units per metering point or as otherwise approved by the *distributor*.

The *Energex* Subdivision Standards - Developer Design & Construct Estates Manual provides further information regarding Community Title and Cluster Developments in the *Energex* distribution area. It is available for download on the *Energex* website.

## 6.9.9 Unsuitable Locations

The following locations are unsuitable for the installation of all metering equipment:

- (a) Within or at any height above any pool zone as defined in AS/NZS 3000 (Wiring Rules).
- (b) Locations where the only point of access is through the fenced area around the pool.
- (c) Within any hazardous area defined in AS/NZS 3000 (Wiring Rules) or within a gas emitting device (gas meter regulator) exclusion zone defined by AS 5601-2004 (Australian Gas Code) and AS 4645.1. In particular, *electrical contractors* should be aware of the hazardous areas associated with exchange or in-situ fill LPG gas cylinders. (Refer to AS/NZS 3000 (Wiring Rules) and AS/NZS 2430.3.4).
- (d) Over stairways or ramps, in narrow passageways, toilets or fire isolated stairways.
- (e) In vehicle docks, driveways, factory walkways etc. where the equipment, or a person working on the equipment would not be adequately protected.
- (f) In close proximity to machinery.
- (g) Locations where exposure to fumes, dust or dampness may result in unsatisfactory working conditions.
- (h) In positions where the ambient temperature exceeds 50° C (e.g. boiler rooms).
- (i) In areas with insufficient light.
- (j) In confined spaces.
- (k) In areas where the integrity of a security system will be affected by entry of the *metering provider's* personnel, (refer to Section 6.14), or where access is normally restricted for health or other reasons.
- (l) In multiple installations, the meter position is not to be situated within any lockable portion of an individual tenancy (i.e. shall only be located in a common area).
- (m) Within enclosed carports or verandahs.
- (n) In areas enclosing dogs.

Note: Area enclosing dogs defined by secondary fence not the road reserve perimeter fence. Where only road reserve perimeter fence installed options for the *customer* include installation of secondary fence separating dogs from meter position or providing restraint point.
- (o) Behind a property perimeter fence without an adjacent gate. (Refer to Clause 6.9.2 for meter positions on domestic properties).
- (p) In areas subject to varying high intensity magnetic fields. (Refer to *QEMM* for current transformer meter panels in the vicinity of heavy current carrying conductors).
- (q) On the *distributor's* works. (For exception details refer to Section 5.10).
- (r) Secured private areas.
- (s) Where the noise level exceeds the LAeq,8h level of 85dB(A) as per the Qld Health and Safety Regulation and the Standard AS/NZS 1269.1 Occupational noise management - Measurement and assessment of noise immission and exposure.
- (t) In areas where the *distributor's* staff require inductions to access the site (permanent sites only, building sites/builders temporary supplies are exempt from this item). This item is a recommendation only and may not be possible in all instances.
- (u) Where access may require any additional provisions e.g. EWP or scissor lift to perform a rescue of an injured worker.



## 6.10. Metering and Control Equipment - Housing

### **ASBESTOS WARNING**

Older type switchboard and meter panels may contain asbestos. Electrical workers who are required to work on these panels need to identify if this hazard is present and, if necessary, take appropriate action. Old Zelemite (black) electrical switchboards can contain up to 20% asbestos. When working on an electrical switchboard that is aged (pre 1987), assume the presence of asbestos, even if it is not marked as such.

Asbestos information including codes of practice and legislative requirements is available on the Workplace Health and Safety Queensland web site [www.asbestos.qld.gov.au](http://www.asbestos.qld.gov.au) under the heading "laws and prosecutions".

### **6.10.1 Mechanical Protection**

Where meters and control equipment are erected in a position exposed to the effects of the weather, direct sunlight, corrosive atmosphere and the like they shall be enclosed in a suitable meter enclosure. Meter reading windows in meter enclosures are not permitted.

Meters, control equipment and their enclosures shall be protected from mechanical damage, by either their location or the manner of mounting.

Note: Where a meter enclosure is installed on a temporary structure, the supporting structure shall be mechanically sound. Where the temporary structure is used for building purposes it shall comply with the requirements of AS/NZS 3012 (Electrical Installations-Construction and Demolition Sites) (e.g. includes the connection of permanent supply for domestic building purposes in a URD estate).

### **6.10.2 Enclosure Mounting**

Where meters and control equipment are accessible only from the outside of a building, they shall be enclosed in a suitable meter enclosure mounted on or recessed into the outside wall of the building. Meter enclosures shall not be installed where they protrude or open across a property boundary.

**Exception:** Meter enclosures mounted on the front boundary may open towards the footpath. It is recommended that meter enclosures mounted in these positions be locked. (Refer to Section 6.14 for metering lock details).

### **6.10.3 Pole Mounted Enclosure**

Where a meter enclosure used to house revenue metering equipment is erected on a pole, it shall be constructed of an approved material (not timber), be adequately fixed in position and where necessary, suitably treated against corrosion.

### **6.10.4 Earthing**

All metallic meter enclosures shall be earthed. Where double insulation is maintained throughout the meter enclosure (in accordance with the requirements of AS/NZS 3000 (Wiring Rules)), earthing is not required.

## **6.11. Metering and Control Equipment – Spacing Requirements**

Item A.3 of the "Specification for Metallic Enclosures for Meters in Direct Connected Installations" in Appendix A, specifies minimum space requirements for metering equipment on direct connected installations.

*QEMM* minimum space requirements for meter panels for low voltage *current transformer metering*.

Minimum space requirements for mounting of meters and control equipment are shown in TABLE 6.1.

TABLE 6.1

Meter and Network Device Details	Height (mm)	Width (mm)	Depth (mm)	Approx. Weight (kg)
Network device	190	110	110	0.5
Metering Isolation Link	90	45		

A minimum clearance of 25mm is required between any item of metering or control equipment. The minimum clearance around the ends of metering isolation links shall be 40mm minimum. All metering enclosures shall include provision for Installation of an Antenna/Aerial.

**Exception:** Metering isolation links associated with each NMI can be mounted side by side with no clearance between provided the minimum clearance around the ends of metering isolation links is 40mm minimum.

## 6.12. Metering and Control Equipment - Mounting

### 6.12.1 Mounting Arrangement

All meters, *network devices* and metering isolation links must be mounted on a side hinged panel so that the metering and control equipment always remains in the vertical plane. Meters and *network devices* must be mounted vertically with cable connections at the bottom.

### 6.12.2 Panel Fixings

- Meter panels shall be constructed of a durable, non-conducting, fire resistant material with low water absorption properties and shall not contain asbestos. Alterations requiring a replacement meter panel shall comply with the above. Existing meter panels in good condition that do not contain asbestos do not require replacement however insulated fire-retardant backing boards with low water absorption properties and not containing asbestos must be installed behind all new and retrofitted electronic equipment associated with the customers metering and control equipment on existing panels that are not constructed of fire resistant material.
- Bolts/screws used to mount and fix equipment on insulated meter panels shall be fit for purpose. Where mounting bolts/screws protrude through the meter panel and can be contacted, a non-conducting bolt/screw (e.g. nylon or plastic) shall be used.

**Note:** Metal screws with needle points and self-drilling tips are not permitted. The insulating of metal screws using silicone or other material is not permitted.

- The panel within the meter enclosure should be not more than 300 mm from the front of the meter enclosure.
- The meter panel is dedicated for revenue metering equipment and *network devices*. *Customer* owned equipment (including GPOs, Contactors etc) shall not be installed on the meter panel (this excludes metering isolation links/CBs as this equipment is part of the revenue metering). *Customer* owned metering neutral and active links should also be mounted on the rear of the meter panel or meter enclosure and shall not be mounted on the front of the meter panel (refer to Section 6.6.6).

**Note:** Where a larger panel is used, it is permissible for *customer* owned equipment to be installed on the same panel outside of an area dedicated for use for metering equipment provided the meter panel area meets the minimum size specified in



Appendix A, is indelibly marked with a demarcation line and is labelled to indicate the meter panel section is dedicated for metering equipment

Meter panels on temporary builder's supplies do not need to be dedicated to revenue metering equipment unless they are intended to be installed in the permanent position.

## 6.13. Metering and Control Equipment – Mounting Height

The top of any metering equipment shall have a maximum height of 2000mm above floor or ground level. The bottom of the meter, *network device* or item of metering equipment shall not be less than 900 mm above floor or ground level when not installed in an enclosure or dedicated switch room or meter room. This height may be reduced to 700mm (500mm for metering isolation links) above floor or ground level when installed within an enclosure or dedicated switch room or meter room.

For clearances in front of the metering enclosure doors refer to AS/NZS 3000 (Wiring Rules) (i.e. minimum clearances of 600mm).

### 6.13.1 Use of Platforms

Where the *customer* is required to provide a platform to access a meter installation, it shall be designed to AS 1657(Fixed Platforms, Walkways, Stairways and Ladders), be certified by a RPEQ that the structure is suitable for the application and be designed to support a minimum load of 200kg. A certificate of approval shall be submitted to the *distributor* prior to connection of supply.

Where meters and switchboards are installed on service poles, the platform shall be self-supporting and permanently mounted.

The service pole shall not be used to support any platform structure, and any step-type ladder access shall be clear of any fences or sharp objects that may be considered a fall hazard.

For clearances in front of the metering enclosure doors refer to AS/NZS 3000 (Wiring Rules) (i.e. minimum clearances of 600mm).

For existing installations where access is considered unsafe, the *metering provider* may refuse to read the meters until the unsafe condition has been rectified by the *customer* or may repair the access at the *customer's* cost. (*Electricity Regulation 2006(Qld)*).

## 6.14. Metering Locks

Where the *distributor* agrees to meters being erected in an enclosure within an area which may be locked for security reasons, or where meters may be subject to vandalism, the *distributor's* metering lock must be purchased and installed to permit access. (Refer to page 1 for purchasing details and Drawing QECM 6.7 for lock types). The installation of "Private Locks" is not permitted for providing access to metering equipment.

Where the *distributor's* metering lock is installed, all tenants who require access to the meter panel shall be provided with such access.

**Note:** If the *distributor's* personnel are requested to open the metering lock for tenant access, the *customer* will be charged a call out fee.

Metering locks shall not be used on a garage door, verandah door or similar doors that provide access to private areas. (Refer to Section 6.9.9 and Drawing QECM 6.7).

The *distributor* may provide master metering lock keys to *metering providers* when requested in accordance with their procedures. *Metering providers* will keep master keys secure and return them to the *distributor* when no longer required or when requested by the *distributor*.

## 6.15. Current Transformer Metering – Housing

- (a) Each set of current transformers and meter voltage fuses are required to be mounted in a separate dedicated metering chamber. This chamber is to enclose only the *metering provider's* equipment.

- (b) To allow commissioning and testing of *current transformer metering* installations to be performed safely, all live low voltage parts within current transformer chambers are to be individually insulated (insulation must completely cover all live parts). Heat shrink insulation is acceptable for insulating busbars. All bolted busbar or cable connections are to be covered with non-adhesive insulation secured in place by cable ties.

A non-conductive insulated barrier alone (removable cover over CT chamber) is not an acceptable method of insulation.

## 6.16. Current Transformer Metering Installations

*The distributor* requires **all** LV *current transformer metering* installation designs to have prior approval for the metering arrangement. Please submit form LV CT Advice Form available from the distributor's website, see page 1 for details. This form requires the submission of Switchboard Layout and Single Line Diagrams as early as possible to allow design modifications to be carried out if necessary, prior to switchboards being built.

If this information is not provided *the distributor* cannot guarantee supply will be connected if the switchboard does not comply.

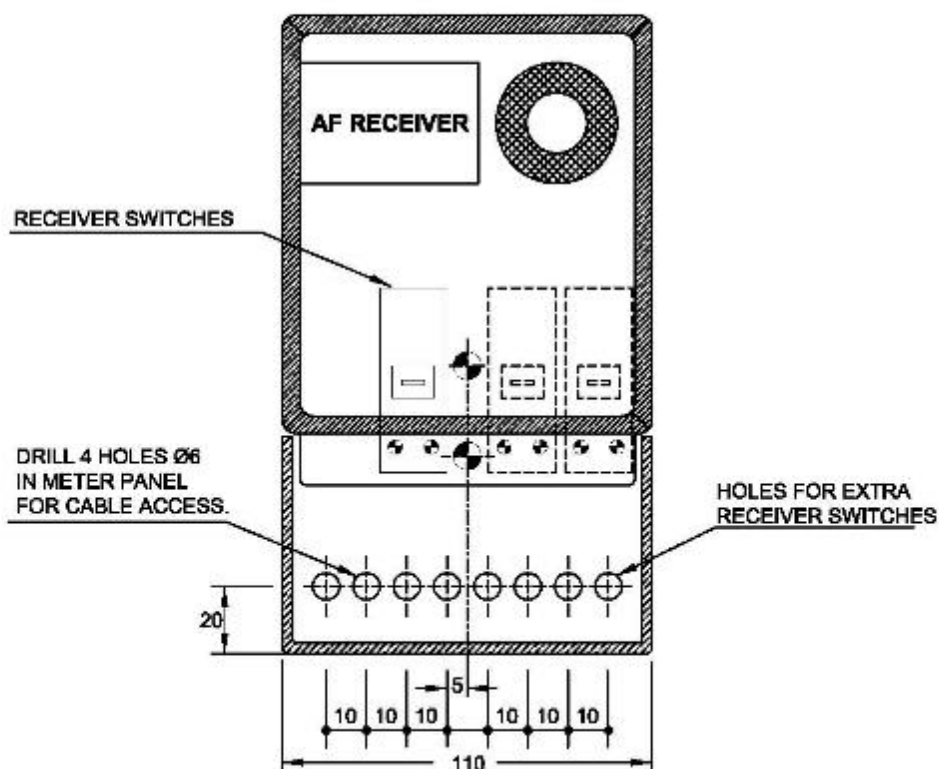
Early submission of drawings will assist in reducing the time and costs for all parties and avoid late modifications of *current transformer metering* switchboards.

## 6.17. LV Direct Current Metering Guide

Electrical Contractor's LV Direct Current Metering Check Sheet			
<b>Address Where DT Metering Installed:</b>			
<b>National Metering Identifier (NMI) (If known):</b>			
<b>Details of Electrical Mechanic Responsible for Testing of DC Installation:</b>			
<b>Name: Licence No:</b>			
Clause No.	Checklist	Checked	Comments
<b>General Requirements</b>			
3.1	Supply Agreement – new installation or load change		
3.3	Number of phases to be installed		
<b>Overhead Connection</b>			
5.2.1	POA maximum 20m from property boundary		
5.8	Service Line does not cross neighbouring property boundary		
5.5 (c)	POA or service line over or within pool zone		
5.8.4-5.8.6	POA requirements met		
5.8.2	Property pole connection RPEQ		
<b>Underground Connection</b>			
5.9	Confirm availability of supply		
5.9.3	Pillar Connection		
5.11.2	LV Striple in padmount connection		
<b>Meter Connection Requirements</b>			
6.1	No customer equipment before the metering		
6.2	Metering Determination		
6.4	Addition & Alternation Category of Works		
6.5	Metering Isolation Link (MIL)		
6.6	Metering Neutral Link (MNL)		
6.7	Conductor Identification		
6.9.1	Main Switch and MEN at meter position		
6.9.2-6.9.9	Meter Panel Location		
6.11	Spacing Requirements		
6.12	Meter Panel Mounting		
6.13	Metering Height		
<b>Additional Requirements</b>			
AS/NZS 3000	Test continuity to confirm that cabinets are earthed:		
QEMM	All requirements of the QEMM met.		

## 6.18. LV Current Transformer Metering Check Sheet

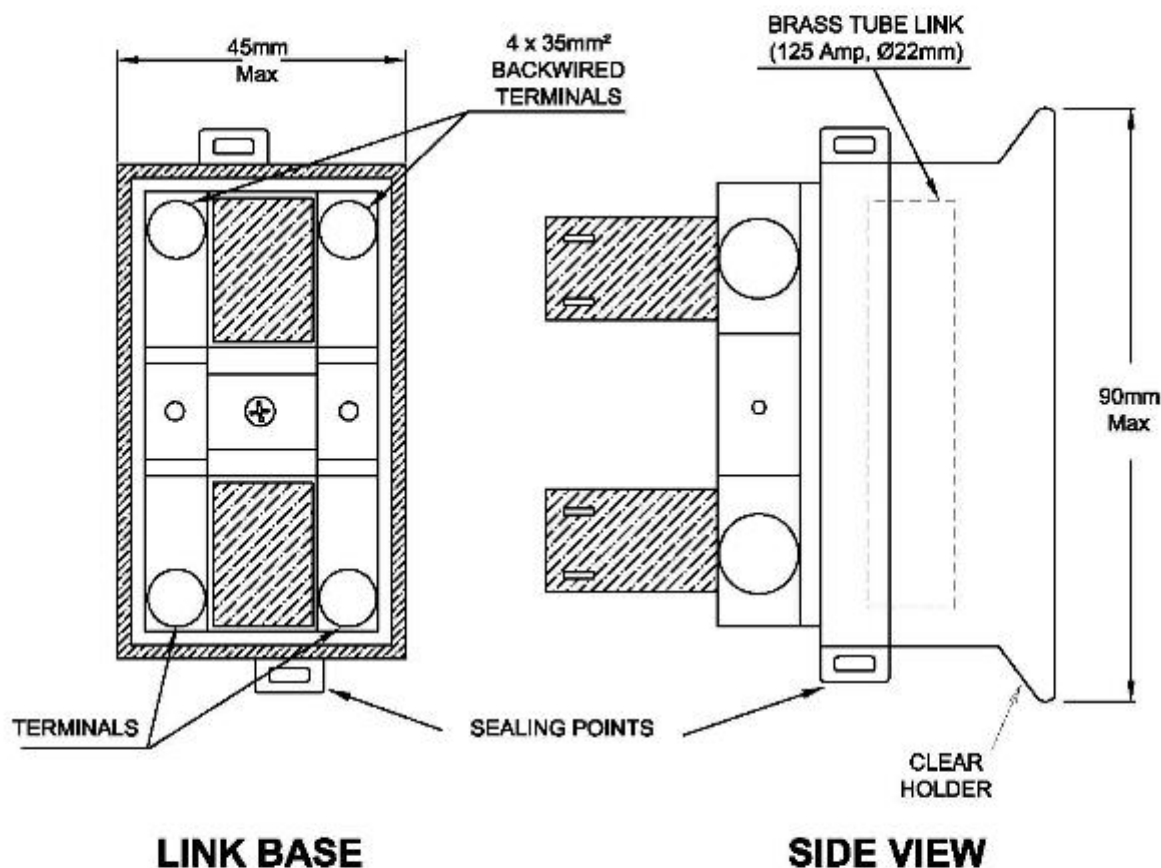
Electrical Contractor's LV CT Metering Check Sheet			
<b>Address Where CT Metering Installed:</b>			
<b>National Metering Identifier (NMI) (If known):</b>			
<b>Details of Electrical Mechanic Responsible for Testing of CT Installation:</b>			
<b>Name: Licence No:</b>			
Clause No.	Checklist	Checked	Comments
<b>Switchboard/CT Chamber</b>			
6.6.3	Lockable isolator on line side of CTs:		
QEMM	Dedicated CT chamber provided:		
QEMM	CT chamber correctly labelled:		
QEMM	Removable CT chamber cover fitted with 2 handles:		
<b>Current Transformers</b>			
QEMM	CT ratio matches expected load:		
6.12	No exposed live parts within CT chamber:		
QEMM	Primary and secondary polarity is correct:		
QEMM	Removable bus bars allow CTs to be easily replaced:		
QEMM	CT secondary terminals are accessible:		
<b>Voltage Circuit Fuses</b>			
QEMM	Fuses carriers are accessible and easily removable:		
QEMM	Fuses are connected to the line side of the CTs:		
QEMM	Cables from bus bars to fuses are $\leq 500\text{mm}$ and a minimum of $10\text{mm}^2$ SDI:		
QEMM	Correct marking of cables from bus bars to fuses (e.g. trace or bell out cables):		
<b>Meter Neutral &amp; Earthing</b>			
AS/NZS 3000	Test continuity to confirm that cabinets are earthed:		
QEMM	Meter neutral is connected to main neutral and meter neutral label is attached:		
<b>Meter Panel Wiring &amp; Test Block</b>			
Section 6 QECM	Meter panel located in suitable location		
QEMM	Meter panel size is minimum $600 \times 600\text{mm}$ (or $460 \times 600\text{mm}$ for single tariff CT installation):		
QEMM	Meters are mounted at correct height:		
QEMM	Meter panel is hinged:		
QEMM	Meters and wiring spaced from heavy current carrying conductors:		
QEMM	Test block is mounted correctly:		
QEMM	Colour coding is correct:		
QEMM	Meter wiring is correct size for circuit length:		
QEMM	Secondary returns are starred and earthed:		
<b>Sealing</b>			
QEMM	CT chamber, voltage circuit fuses and meter panel are sealable:		



Revision: <b>A</b>	<b>DRILLING DETAILS FOR CABLE ACCESS AF RECEIVER</b>	<b>QECM - 6.1</b>
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## METERING ISOLATION LINK



### NOTES:

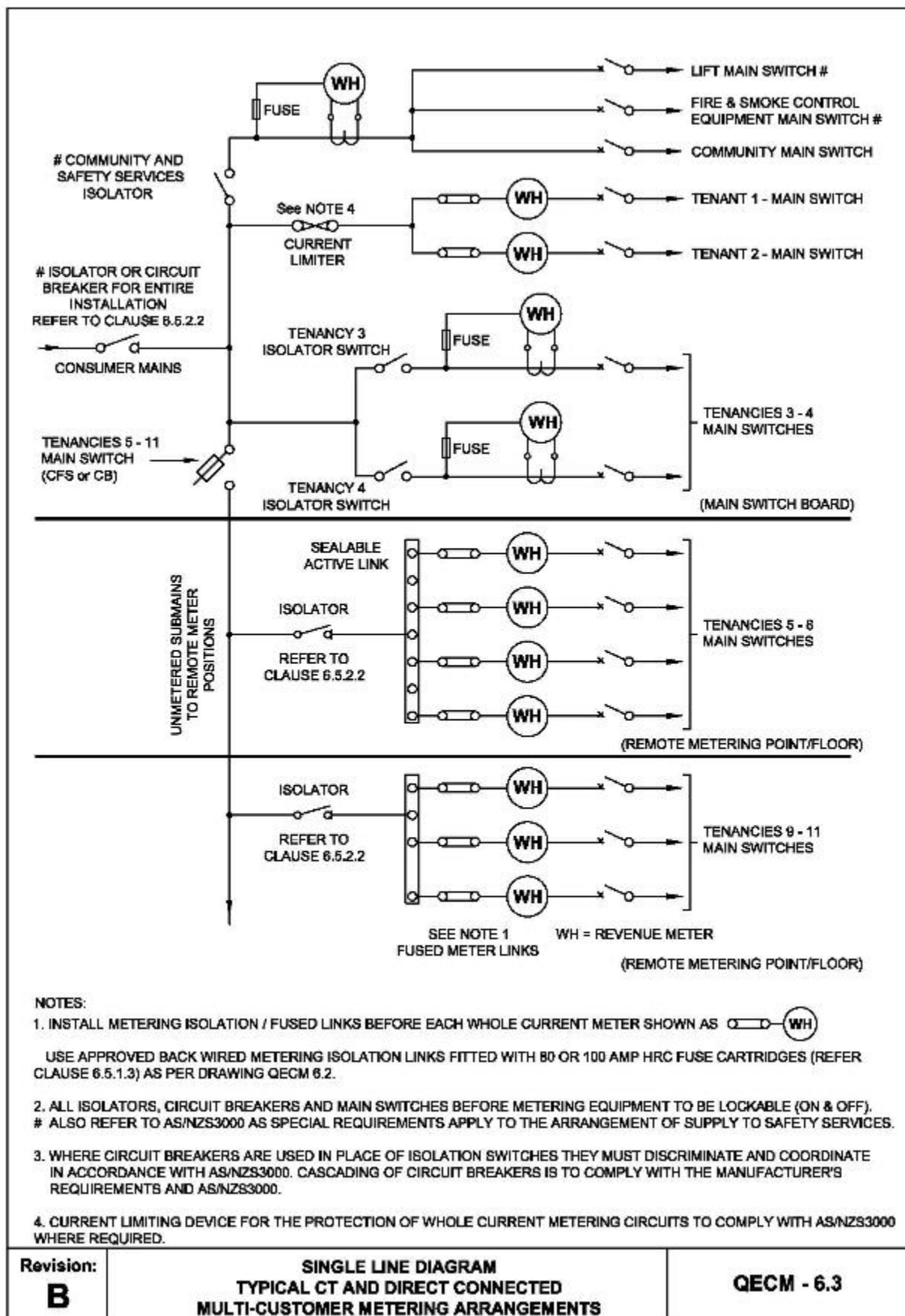
1. USE APPROVED METERING ISOLATION LINK, SUPPLIED WITH A 125 AMP BRASS TUBE LINK AND INSTALLED ON THE FACE OF THE METERING PANEL.
2. FOR POLYPHASE METERING - THE THREE METERING ISOLATION LINKS ARE TO BE GROUPED TOGETHER.
3. IT IS RECOMMENDED THAT THE METERING ISOLATION LINKS ARE MOUNTED HORIZONTALLY UNDERNEATH THE METER.
4. CLEARANCE OF 40mm TO BE LEFT AT EACH END OF LINK TO FACILITATE SEALING.

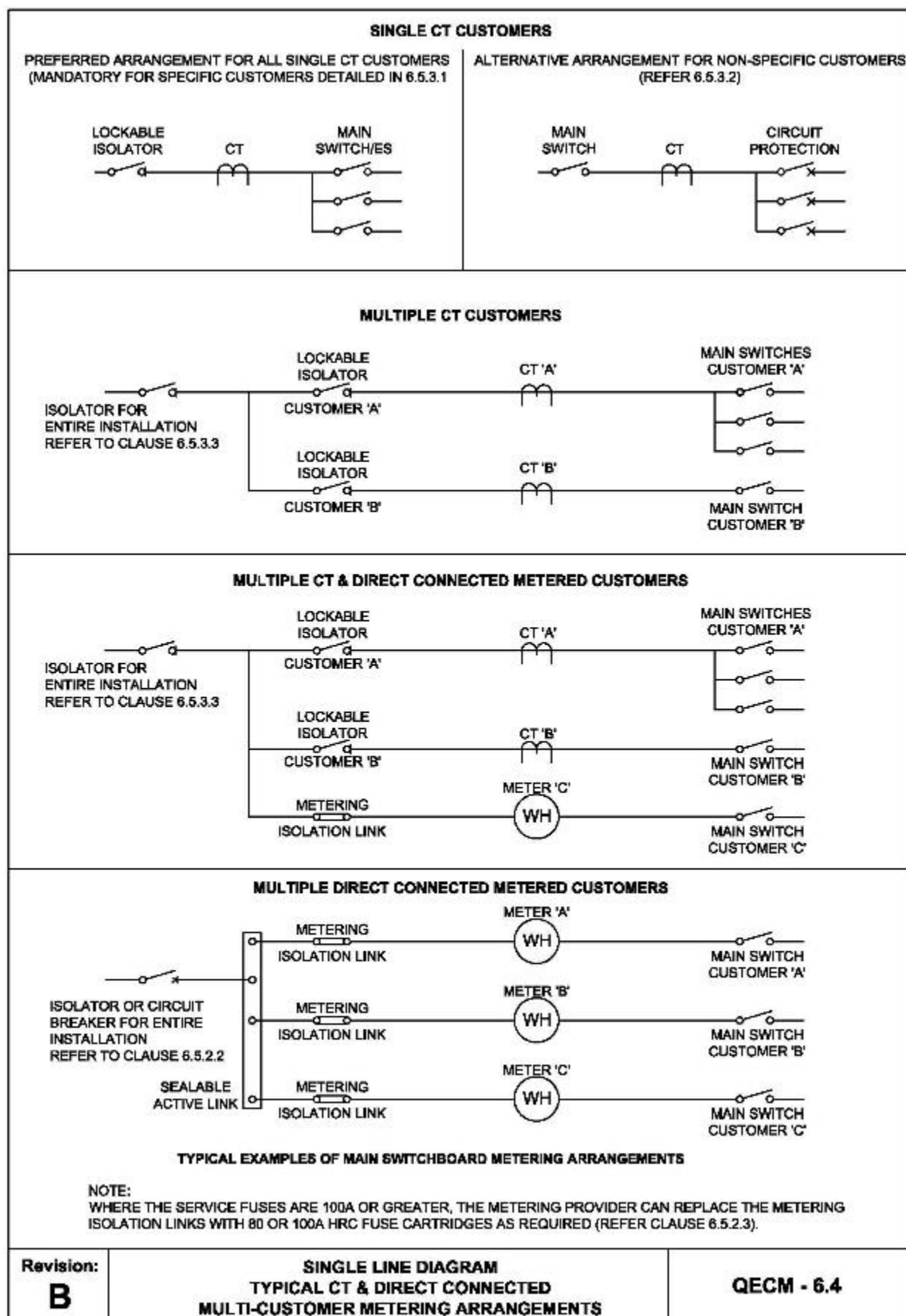
Revision:

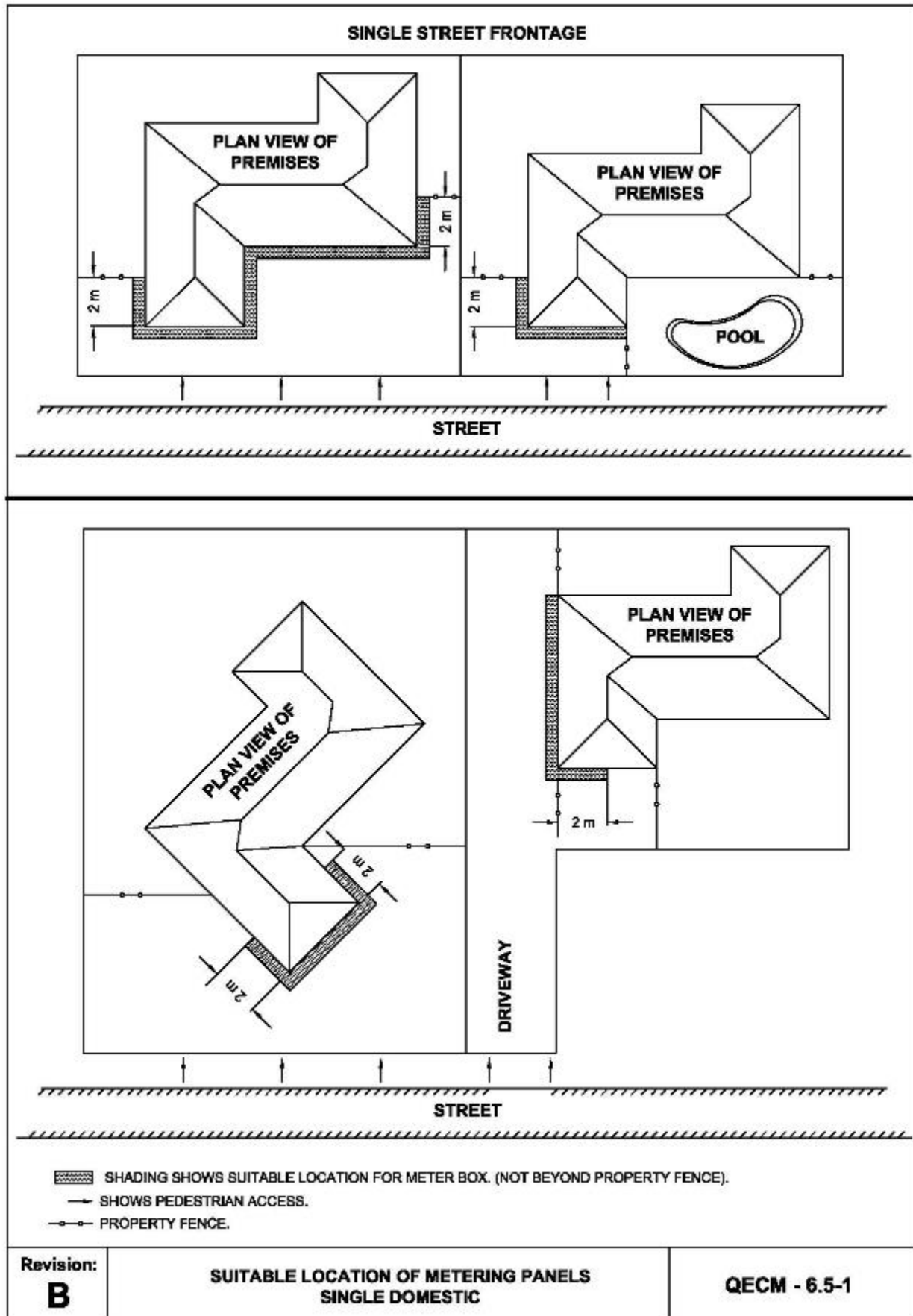
**A**

**GENERAL DIMENSIONS  
METERING ISOLATION LINK**

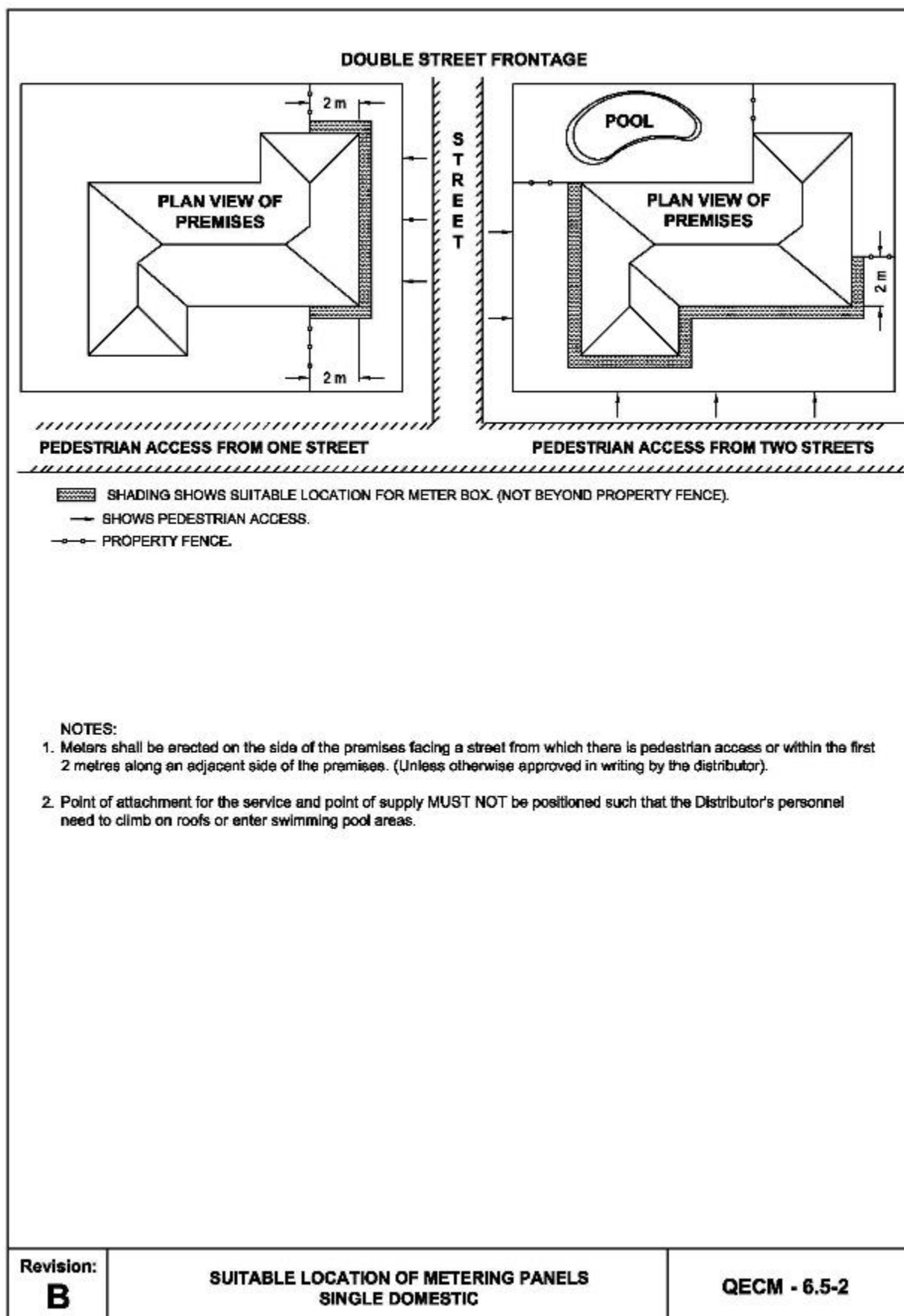
**QECM - 5.2**













OH/UG

	Community Title Scheme / Multi unit dwellings	Customer Reticulated community title schemes	Distributor's Reticulation community title schemes	Single unit dwellings
Meter Position	1 meter position on common property	The MSB and first meter position on common property plus 1 additional Meter position for every additional 12 customers if required	1 meter position per dwelling fed from the point of supply	1 meter position per unit
Point of Supply	1 Point of supply per community title scheme	1 Point of supply per community title scheme	1 Point of supply per unit	1 Point of supply per unit
	refer DWG A (I), (II).	refer DWG C	refer DWG D	refer DWG E

**NOTES:**

**1. Common Property made exclusive use. DWG B**

Where the area of common property has been designated for the exclusive use to each lot, ie. Fenced off and prohibiting access to other owners or occupiers to their metering position, service line and/or consumers terminals.

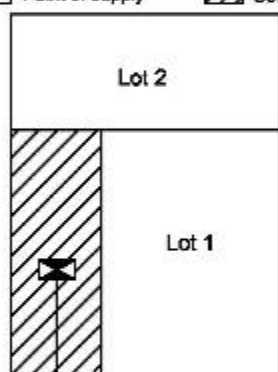
A separate point of supply & metering position shall be required for each unit and conform to Clause 6.9.8

Under no circumstances shall the service line or consumer mains be permitted to cross or enter the area of exclusive use in order to service another lot.

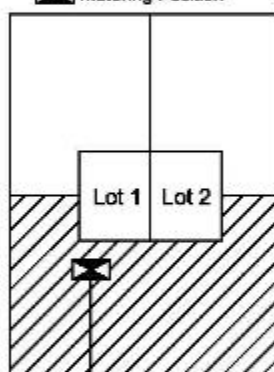
**2. Dual occupancy developments shall only be entitled to have one point of supply and one metering position. ie. Granny flats, sheds, dependant persons accommodation.**

Note: Point of supply and metering positions shown on diagrams are indicative only.

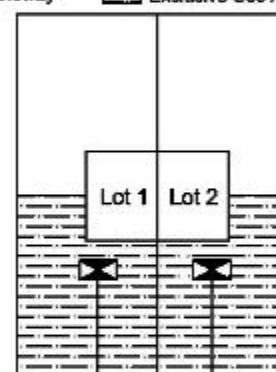
Point of supply    
 Common Ground    
 Metering Position    
 Street/Laneway    
 Exclusive Use Area



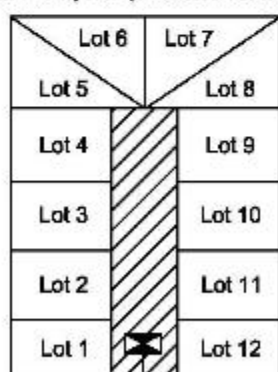
DWG A(I)  
Community Title (Small Subdivisions)



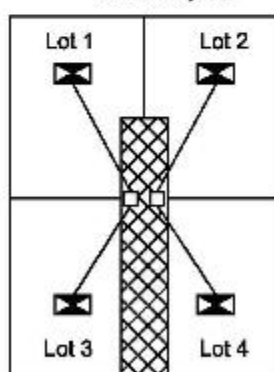
DWG A(II)  
Community Title



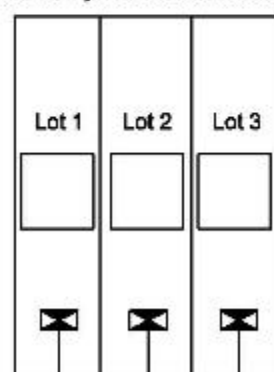
DWG B  
Community Title with exclusive use areas



DWG C  
Customer Reticulated Community Title



DWG D  
Distributor Reticulation




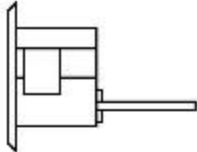
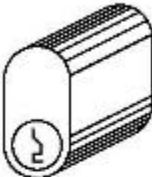


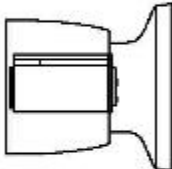

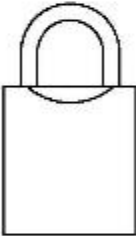


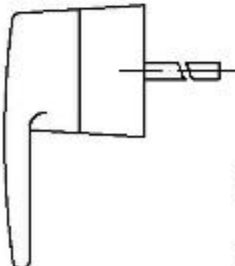
DWG E  
Distributor Reticulation. No common ground Single Unit Dwellings

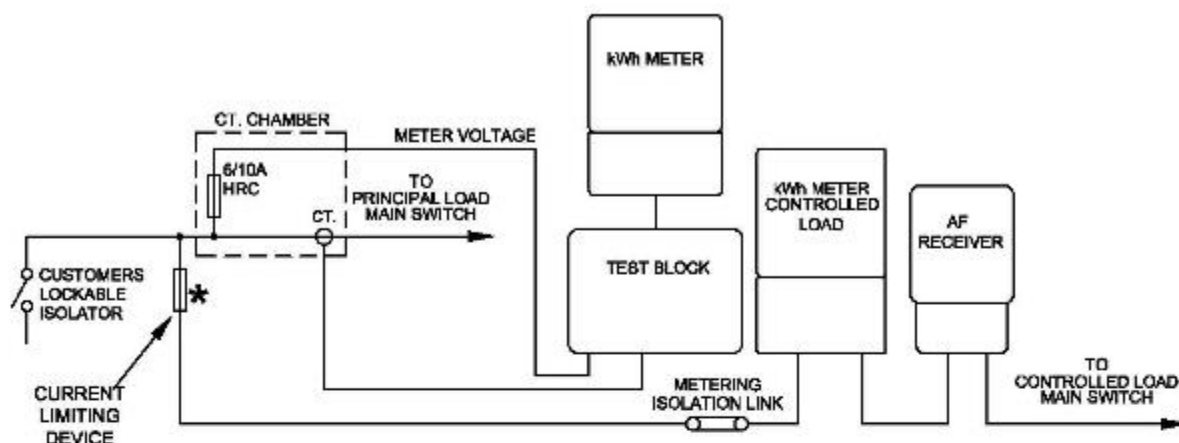
Revision:

**B**

**SUITABLE LOCATION OF METERING PANELS  
COMMUNITY TITLE**

**QECM - 6.6**

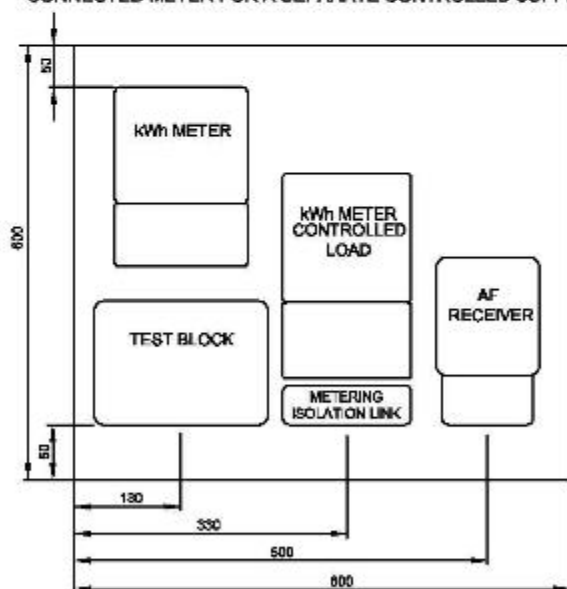
<p><b>RIM LOCK CYLINDER</b></p> <div>   </div> <p><b>TYPE 201 CYL</b> FOR USE IN NIGHTLATCH/STREAMLATCH/DEADLATCH TYPE LOCKSETS. (CYLINDER ONLY PROVIDED.)</p>		
<p><b>MORTICE LOCK CYLINDER</b></p> <div>   </div> <p><b>TYPE 570 CYL</b> FOR USE IN CYLINDER MORTICE LOCKS AND LATCHES. (CYLINDER ONLY PROVIDED.)</p>		
<p><b>KEY - IN - KNOB CYLINDER</b></p> <div>   </div> <p><b>TYPE 530 CYL</b> FOR USE IN KEY-IN-KNOB AND KEY-IN-LEVER LOCKSETS. (CYLINDER ONLY PROVIDED.)</p>		
<p><b>BRASS PADLOCK</b></p> <div>    </div> <p><b>TYPE 234</b> FOR USE IN ERGON ENERGY <b>TYPE 234/SS</b> FOR USE IN ENERGEX</p> <p>234/45/119 - 19mm SHACKLE 234/45/138 - 38mm SHACKLE 234/45/148 - 48mm SHACKLE 234/45/190 - 90mm SHACKLE</p> <p>(COMPLETE LOCK PROVIDED.)</p>		
<p><b>METER CUBICLE LOCK</b></p> <div>   </div> <p><b>TYPE 'L' HANDLE OR 'T' HANDLE</b> TO BE USED AS A METER CUBICLE LOCK. (COMPLETE LOCK PROVIDED.)</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. USE 'EX' PREFIX TO INDICATE ENERGEX METERING KEY SYSTEM EG ENERGEX RIM LOCK CYLINDER USE TYPE EX201 CYL.</li> <li>2. A LIST OF APPROVED LOCKSMITHS IS AVAILABLE ON THE DISTRIBUTORS WEBSITE - SEE CONTACTS PAGE FOR DETAILS.</li> </ol>		
<p>Revision:</p> <p><b>A</b></p>	<p><b>MASTER KEYED METERING LOCK DETAILS</b></p>	<p><b>QECM - 6.7</b></p>



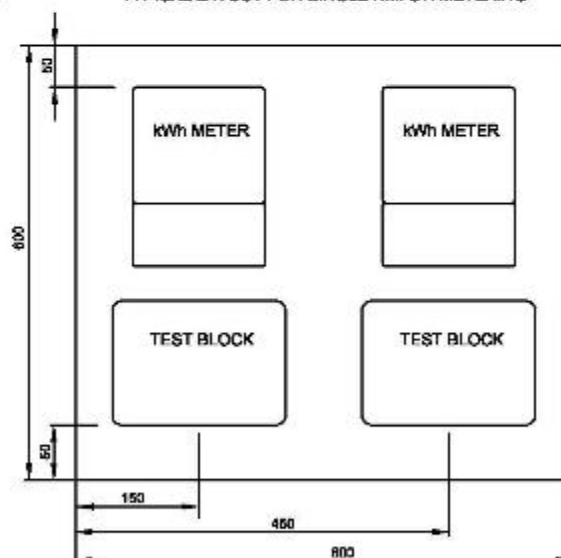
## NOTES:

1. \* CURRENT LIMITING DEVICES FOR THE PROTECTION OF WHOLE CURRENT METERING CIRCUITS SHALL COMPLY WITH AS3000 AND IN NO CASE SHALL BE RATED GREATER THAN A 100A HRC FUSE OR EQUIVALENT.
2. THE METERING PROVIDER MAY USE AN INTEGRATED METER IN PLACE OF THE SEPARATE CONTROLLED LOAD METER AND AF RECEIVER.

TYPICAL LAYOUT OF A CURRENT TRANSFORMER OPERATED METER PANEL INCORPORATING A DIRECT CONNECTED METER FOR A SEPARATE CONTROLLED SUPPLY.



TYPICAL LAYOUT FOR SINGLE NMI CT. METERING



Revision:

**A**

**TYPICAL PANEL LAYOUT & SINGLE LINE DIAGRAM  
CT. OPERATED METER PANEL**

**QECM - 6.8**

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## 7. CONTROLLED SUPPLIES - METHOD OF CONTROL

### 7.1. General

*Network devices* deemed to be necessary to control electricity consumption shall be supplied and maintained by the *distributor* and shall remain their property. All meter and network device terminals shall be connected directly to the Metering Isolation Link or Metering Active Link for direct connected installations.

Where *controlled loads* are required, provision for a separate network device shall be made. Refer to drawing QECM 6.1 for cable access drilling details. The *network device* will only be installed when the *customer* has requested *controlled load* as part of the EWR for the installation.

Two and three switch *network devices* will be utilised for the following situations:

(a) For single installations where a combination of water heating and other *controlled loads* are connected. (Refer to Drawings QECM 7.1, 7.3, 7.5, 7.6 and 7.7).

(b) For multiple installations, such as flats and home units. (Refer to Drawing QECM 7.4)

The *electrical contractor* shall install all *network device* wiring.

The *electrical contractor* shall install all meter wiring unless an agreement has been negotiated with the *metering provider*.

Equipment connected to a *controlled supply* is to be permanently connected however specific equipment may be connected via a socket outlet at the *distributor's* discretion. Where a socket outlet is provided for this purpose, it shall be dedicated to the *controlled supply* equipment (spare *controlled supply* outlets are not permitted). A permanent indelible label shall be fixed on or adjacent to the socket outlet stating the following:

**Controlled Supply Only**

### 7.2. Network Devices

#### i. Connections

Where equipment other than water heating, is to be connected to a controlled supply, this equipment is to be connected via a dedicated circuit and connected to a dedicated switch in a multi-switch network device.

**Note:** On existing installations where submains are installed from the main switchboard/metering point to a distribution switchboard other equipment can be connected to the *controlled supply*, however, it will be switched at the same time as the hot water supply. This shall only be permitted provided the main switchboard/metering point and distribution switchboard are not located within proximity (within 20 meters) or back to back with each other.

#### ii. Single-Phase

Single-phase installations with *controlled supplies* shall be connected in accordance with Drawings QECM 7.1 - 7.3

#### iii. Multiple-Phases

Multiple installations where multi-switch *network devices* are utilised must be provided with a *network device* switch per *customer* in accordance with Drawing QECM 7.4. Switching of individual *customer's* hot water using contactors is not permitted.

#### Notes:

1. Connections to multi-switch *network devices* shall be clearly labelled to identify the switch applicable to each *customer*.



2. A separate metering isolation link is to be used for supply to the *network device(s)*. Where more than one switch per *customer* is required then an individual *network device* per *customer* shall be used as per Section 7.2.2.
- iv. Poly phase installations with direct connected meters shall be connected in accordance with Drawings QECM 7.5 – 7.8.

**Note:** Three phase loads (e.g. motors) shall be controlled via a *network device* switching a contactor. (Refer Drawing QECM 7.8).

## 7.3. Contactor for Control of Non-Continuous Load

Where the single-phase load to be controlled exceeds 30A resistive (e.g. electric water heaters), 20A inductive (e.g. motors) or a combination of resistive and inductive load (e.g. air conditioners), a contactor is required. Where a contactor is required it shall be supplied by the *customer*, be of a type acceptable to the *distributor* and shall be installed in an accessible position within the Main Switchboard, in a sealable fit for purpose enclosure (if required). (Refer to Drawings QECM 7.2, 7.6, 7.8 and 7.9).

In the Energex distribution area, an additional switch of a multi switch *network device* may be used in place of a contactor in domestic installations provided the load on each switch complies with that given above. Paralleling of switches is not permitted.

Contactors with no external moving parts are suitable for use without further protection and do not require provision for sealing.

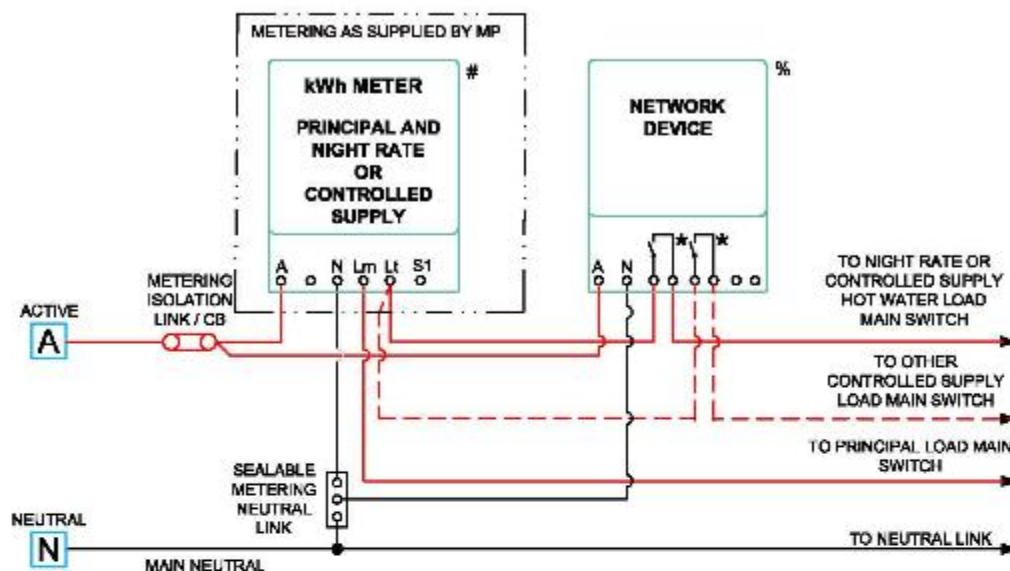
Three phase installations requiring a contactor shall have the *network device* connected in accordance with Drawing QECM 7.8 for *direct connected meters* and Drawing QECM 7.9 for *current transformer metering*.

The contactor shall not be used for automatic load control (e.g. it shall not have a humidistat, a flow switch, a thermostat, a pressure switch or the like connected in its control circuit).

## 7.4. Size of Network Device Wiring

The wiring from a *controlled supply* meter to a *network device* (or controlled load main switch) and all meter neutral wiring shall be PVC insulated stranded copper cable of no more than 7 strands, a minimum of 4mm<sup>2</sup> and shall not exceed 6mm<sup>2</sup>.

Aluminium cables are not permitted for connection directly into *network device* terminals.



# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

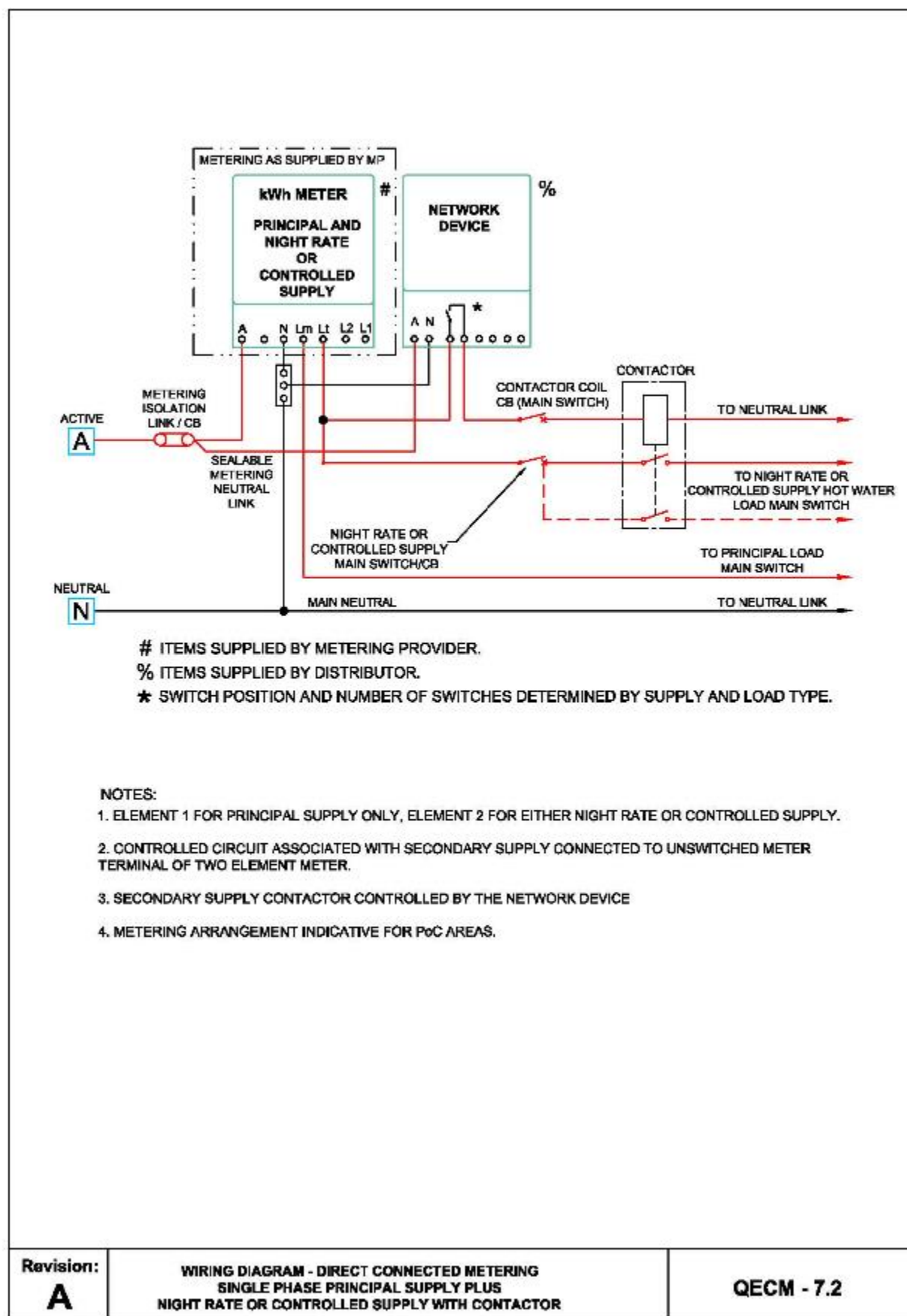
1. ELEMENT 1 FOR PRINCIPAL SUPPLY ONLY, ELEMENT 2 FOR EITHER NIGHT RATE OR CONTROLLED SUPPLY.
2. CONTROLLED CIRCUIT ASSOCIATED WITH SECONDARY SUPPLY CONNECTED TO UNSWITCHED TERMINAL OF TWO ELEMENT METER.
3. SECONDARY SUPPLY SWITCHING IS DONE BY THE NETWORK DEVICE.
4. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

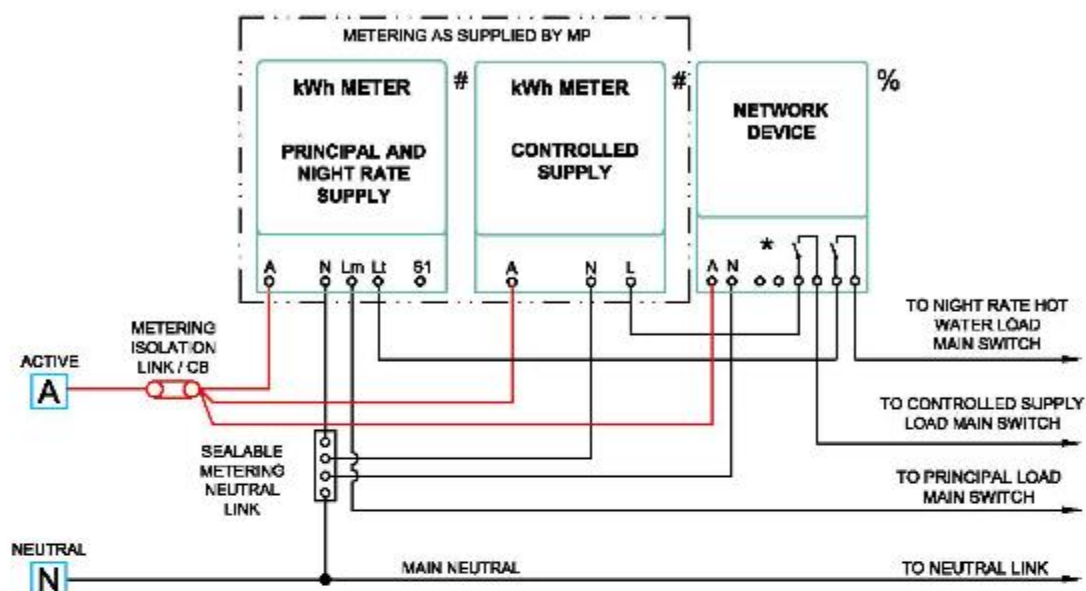
Revision:

A

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
SINGLE PHASE PRINCIPAL SUPPLY PLUS  
NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 7.1**





# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

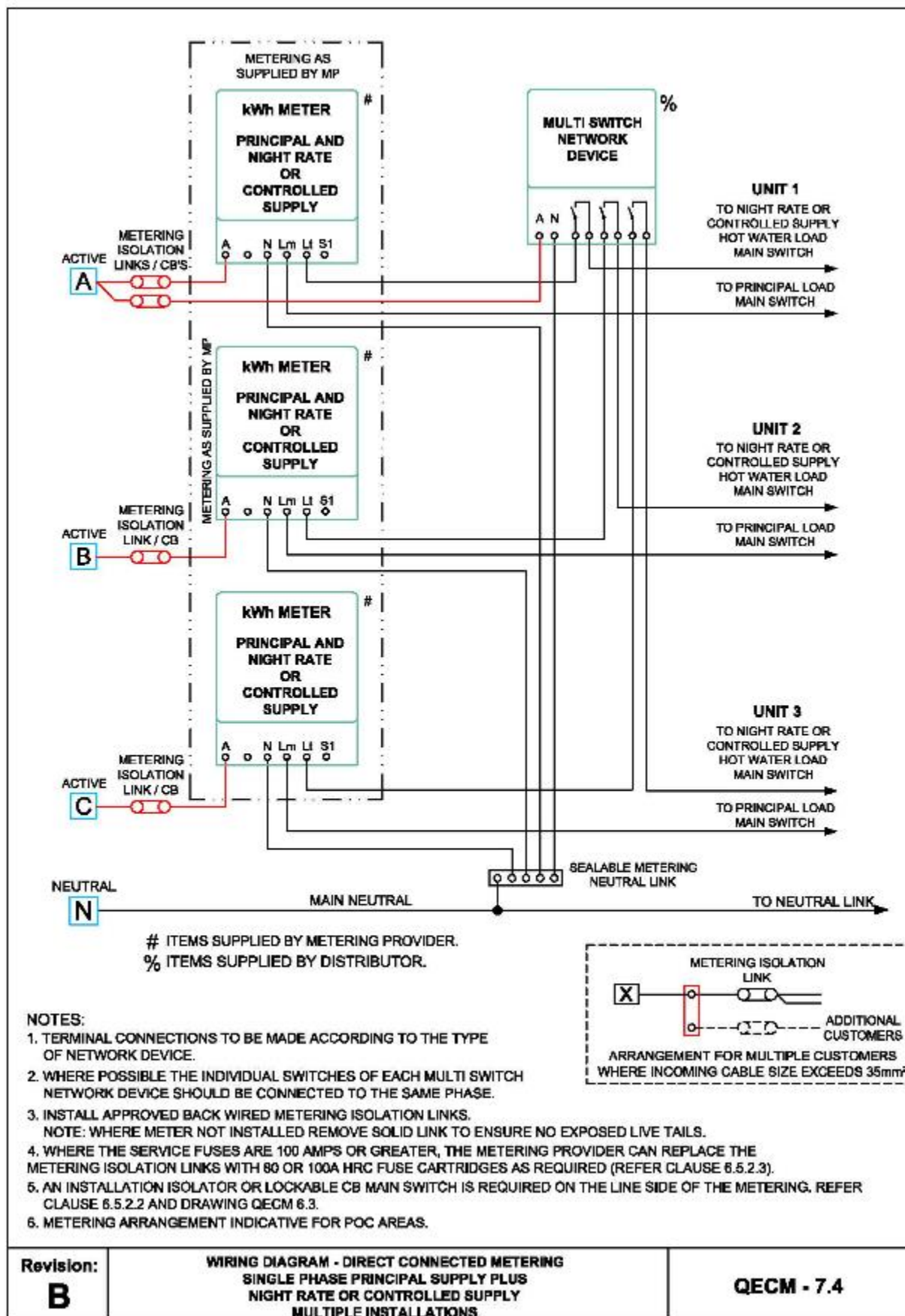
1. ELEMENT 1 FOR PRINCIPAL SUPPLY ONLY, ELEMENT 2 FOR EITHER NIGHT RATE OR CONTROLLED SUPPLY.
2. CONTROLLED CIRCUIT ASSOCIATED WITH NIGHT RATE SUPPLY CONNECTED TO UNSWITCHED TERMINAL OF TWO ELEMENT METER.
3. SECONDARY SUPPLY SWITCHING IS DONE BY THE NETWORK DEVICE.
4. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

Revision:

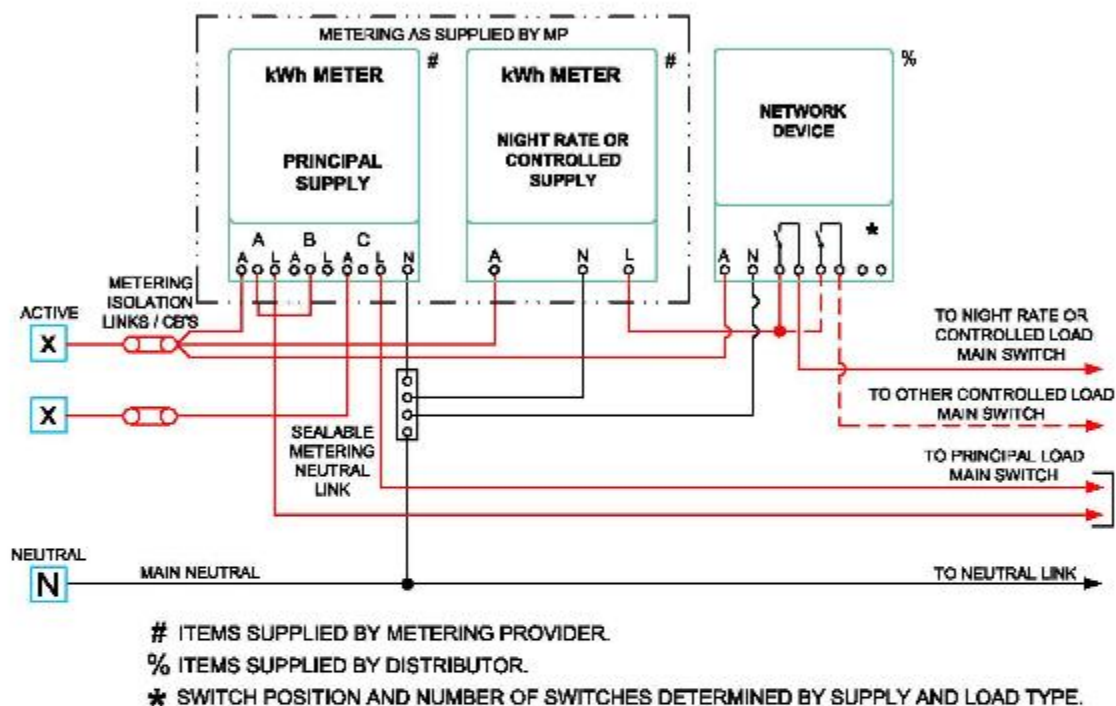
**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
SINGLE PHASE PRINCIPAL SUPPLY PLUS  
NIGHT RATE AND CONTROLLED SUPPLIES**

**QECM - 7.3**







## NOTES:

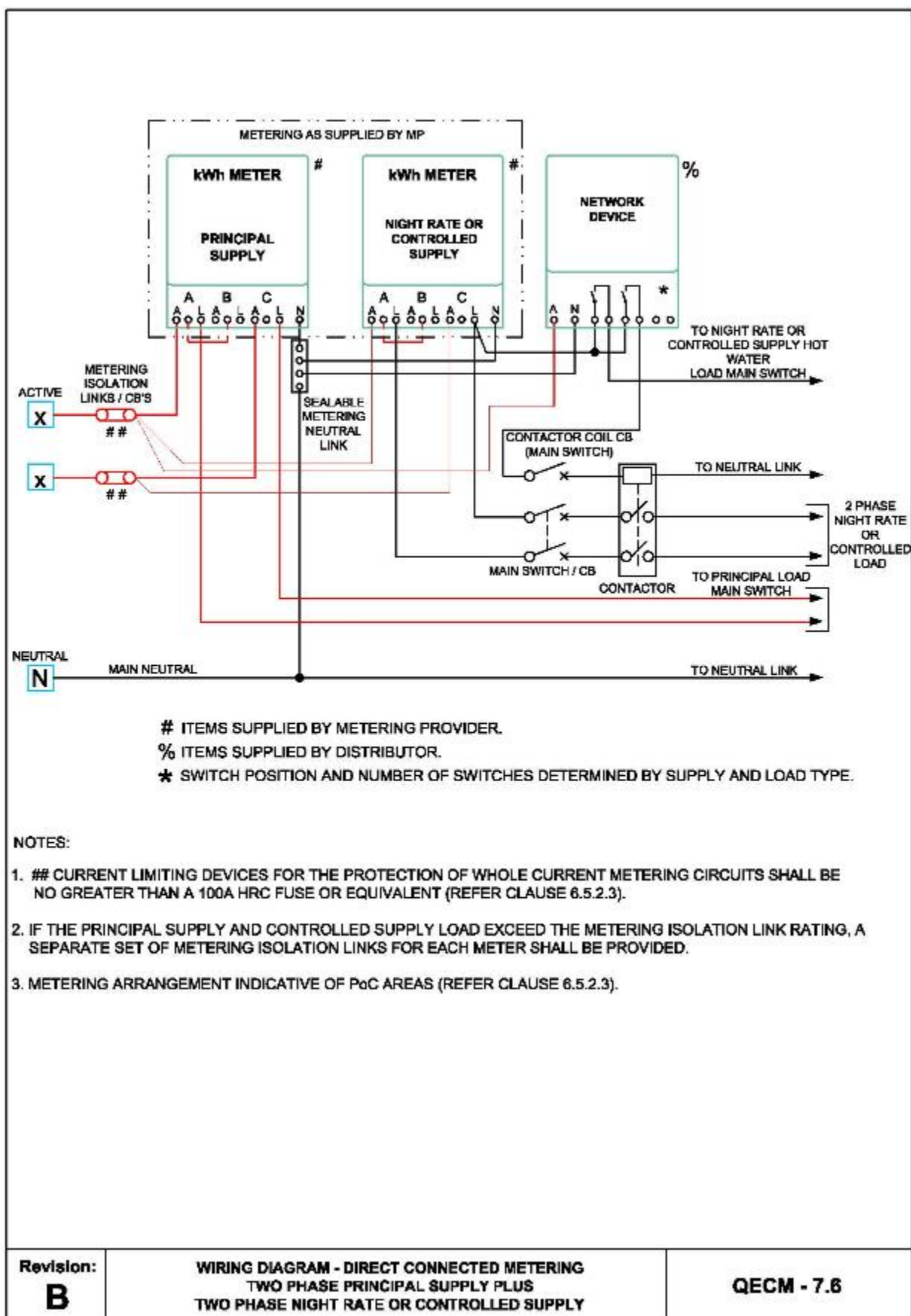
1. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

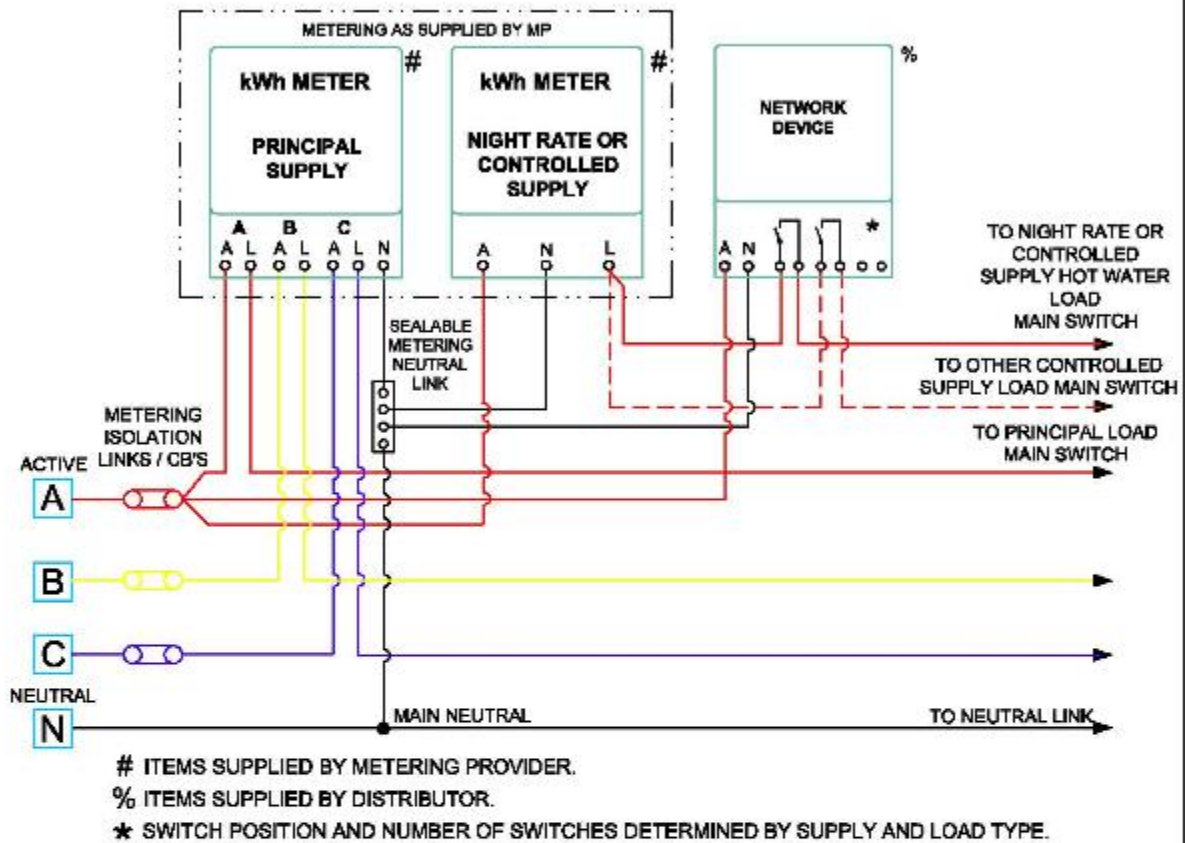
Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
TWO PHASE PRINCIPAL SUPPLY PLUS  
SINGLE PHASE NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 7.5**





## NOTES:

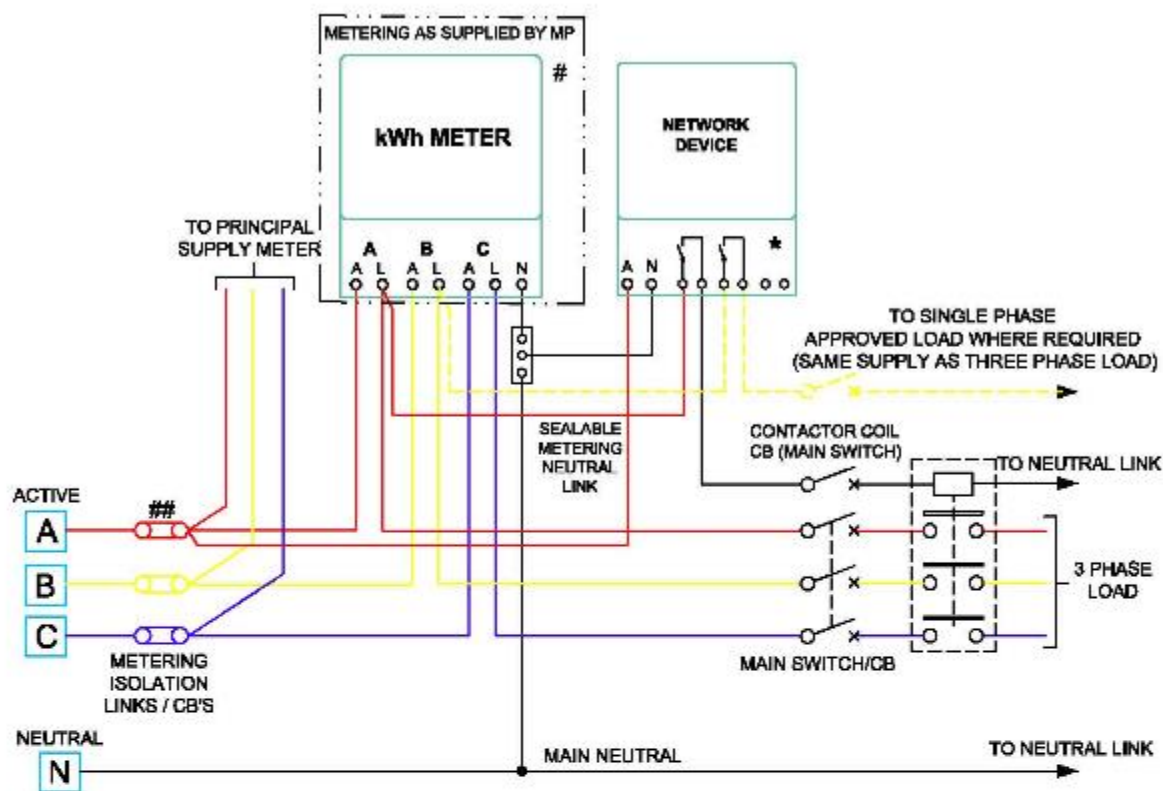
1. OTHER CONTROLLED SUPPLY LOAD CANNOT BE CONNECTED IN CONJUNCTION WITH NIGHT RATE LOAD ON THE ONE METER (REFER TO DRAWING QECCM 7.3).
2. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
THREE PHASE PRINCIPAL SUPPLY PLUS  
SINGLE PHASE NIGHT RATE OR CONTROLLED SUPPLY**

**QECCM - 7.7**



# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

1. TWO SWITCH NETWORK DEVICE WITH SEPARATE SUPPLY AND SWITCH CIRCUITS IS TO BE USED TO CONTROL CONTACTOR.

2. INSTALL APPROVED BACK WIRED METERING ISOLATION LINKS.

NOTE: WHERE METER NOT INSTALLED REMOVE SOLID LINKS TO ENSURE NO EXPOSED LIVE TAILS.

3. ## CURRENT LIMITING DEVICES FOR THE PROTECTION OF WHOLE CURRENT METERING CIRCUITS SHALL BE NO GREATER THAN A 100A HRC FUSE OR EQUIVALENT.

4. IF THE PRINCIPAL SUPPLY AND CONTROLLED SUPPLY LOAD EXCEED THE METERING ISOLATION LINK RATING, A SEPARATE SET OF METERING ISOLATION LINKS FOR EACH METER SHALL BE PROVIDED.

5. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

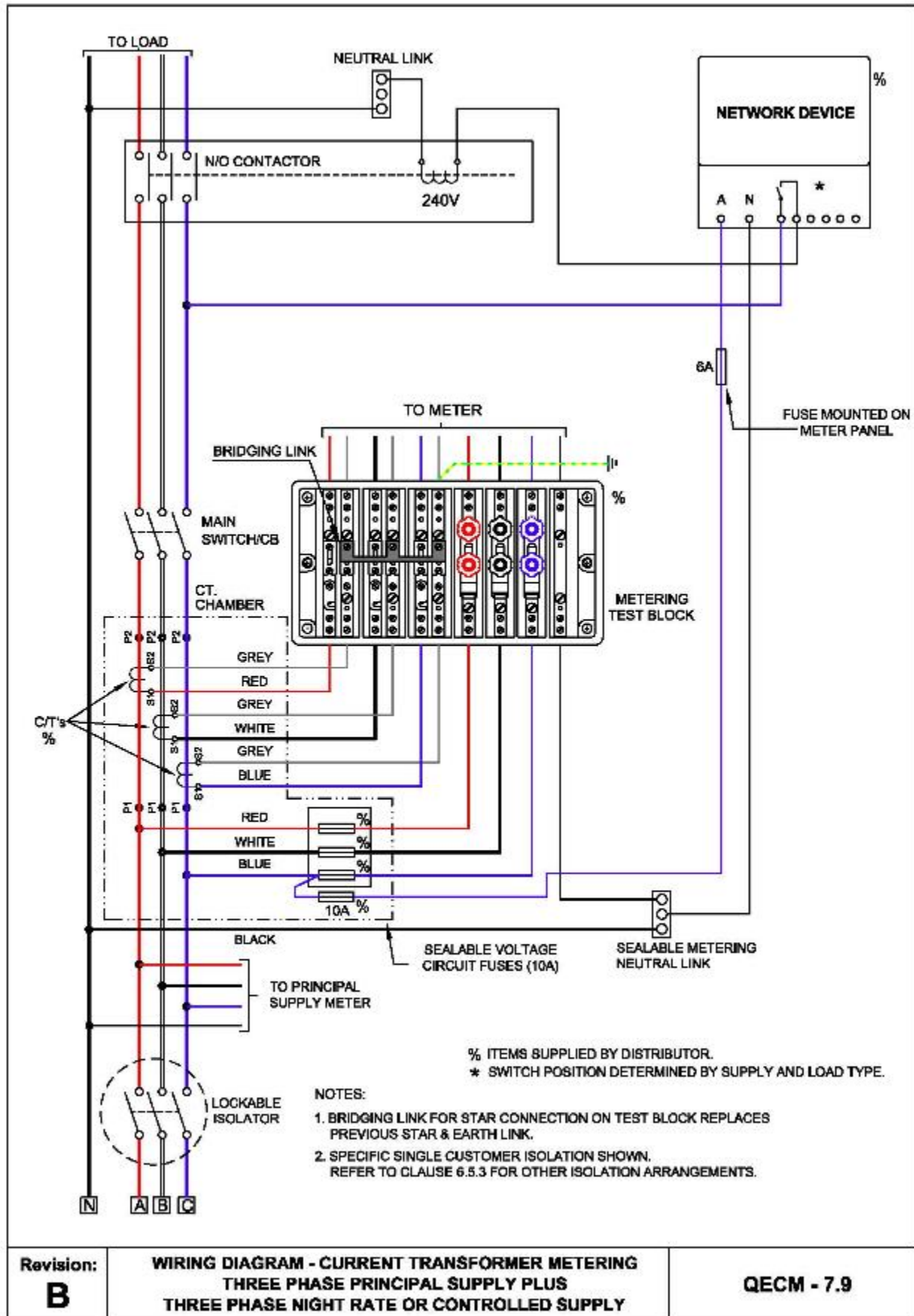
Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
THREE PHASE PRINCIPAL SUPPLY PLUS  
THREE PHASE NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 7.8**



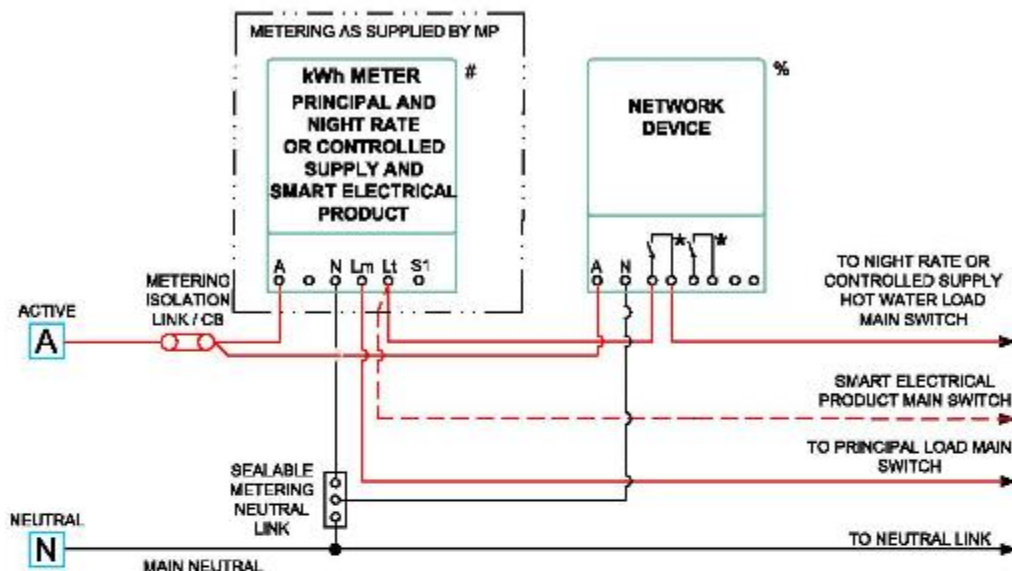


Revision:  
**B**

**WIRING DIAGRAM - CURRENT TRANSFORMER METERING  
THREE PHASE PRINCIPAL SUPPLY PLUS  
THREE PHASE NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 7.9**





# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

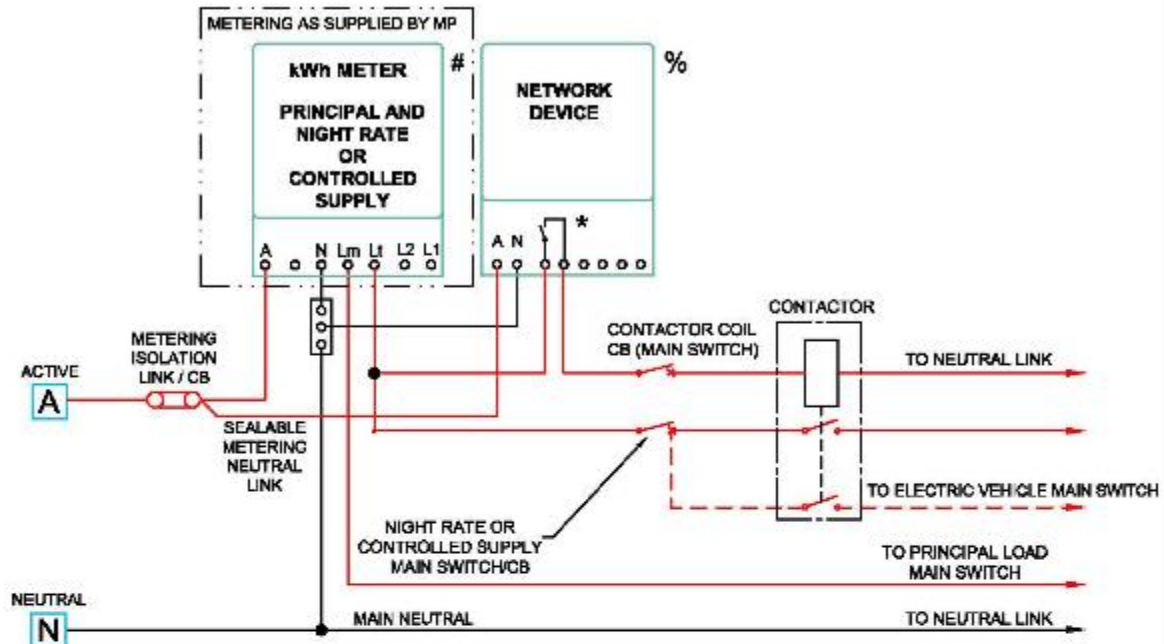
1. ELEMENT 1 FOR PRINCIPAL SUPPLY ONLY, ELEMENT 2 FOR EITHER NIGHT RATE OR CONTROLLED SUPPLY.
2. CONTROLLED CIRCUIT ASSOCIATED WITH SECONDARY SUPPLY CONNECTED TO UNSWITCHED TERMINAL OF TWO ELEMENT METER.
3. SECONDARY SUPPLY SWITCHING IS DONE BY THE NETWORK DEVICE OR INTEGRAL IN SMART ELECTRICAL PRODUCT UNDER T.7300
4. METERING ARRANGEMENT INDICATIVE FOR POC AREAS.
5. ACTUAL TERMINALS USED FOR SECOND ELEMENT ARE AS PER METERING PROVIDER DIRECTION.

Revision:

A

WIRING DIAGRAM - DIRECT CONNECTED METERING  
SINGLE PHASE PRINCIPAL SUPPLY PLUS  
NIGHT RATE OR SMART ELECTRICAL PRODUCT

QECM - 7.10



# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

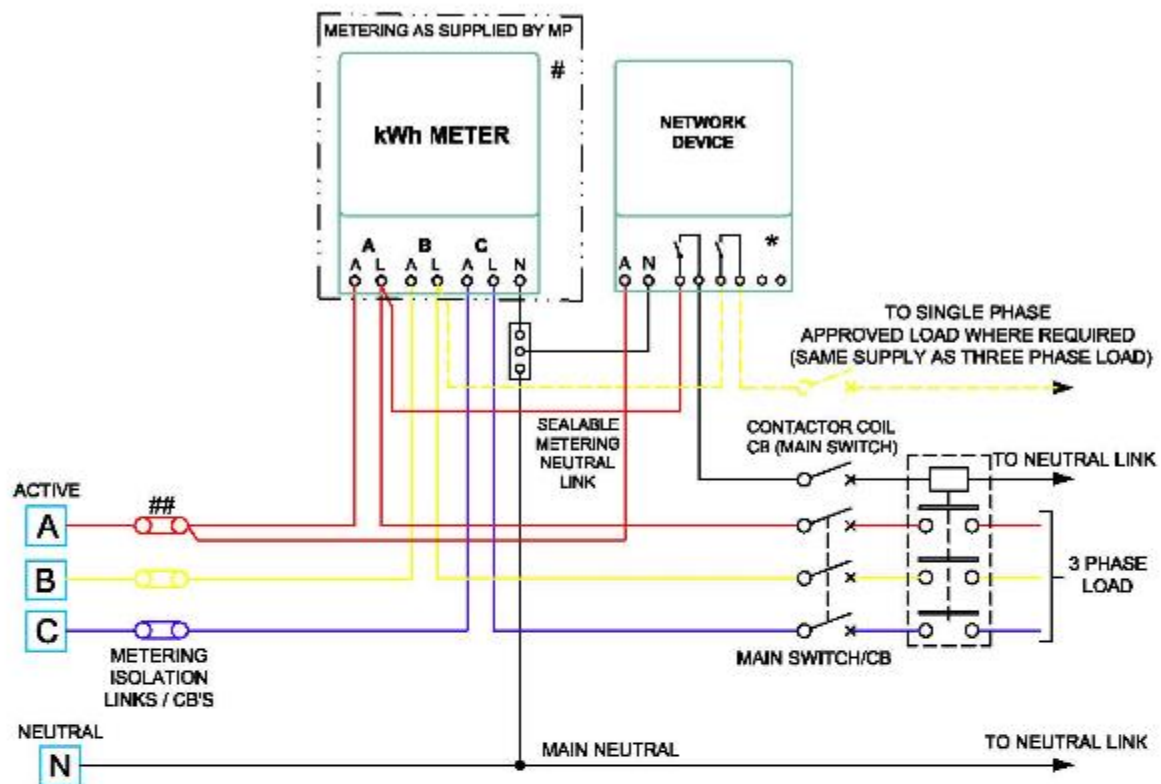
1. ELEMENT 1 FOR PRINCIPAL SUPPLY ONLY, ELEMENT 2 FOR EITHER NIGHT RATE OR CONTROLLED SUPPLY.
2. CONTROLLED CIRCUIT ASSOCIATED WITH SECONDARY SUPPLY CONNECTED TO UNSWITCHED METER TERMINAL OF TWO ELEMENT METER.
3. SECONDARY SUPPLY CONTACTOR CONTROLLED BY THE NETWORK DEVICE
4. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
SINGLE PHASE PRINCIPAL SUPPLY PLUS  
ELECTRIC VEHICLE CONTROLLED SUPPLY TARIFF WITH CONTACTOR**

**QECM - 7.11**



# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

1. TWO SWITCH NETWORK DEVICE WITH SEPARATE SUPPLY AND SWITCH CIRCUITS IS TO BE USED TO CONTROL CONTACTOR.

2. INSTALL APPROVED BACK WIRED METERING ISOLATION LINKS.

NOTE: WHERE METER NOT INSTALLED REMOVE SOLID LINKS TO ENSURE NO EXPOSED LIVE TAILS.

3. ## CURRENT LIMITING DEVICES FOR THE PROTECTION OF WHOLE CURRENT METERING CIRCUITS SHALL BE NO GREATER THAN A 100A HRC FUSE OR EQUIVALENT.

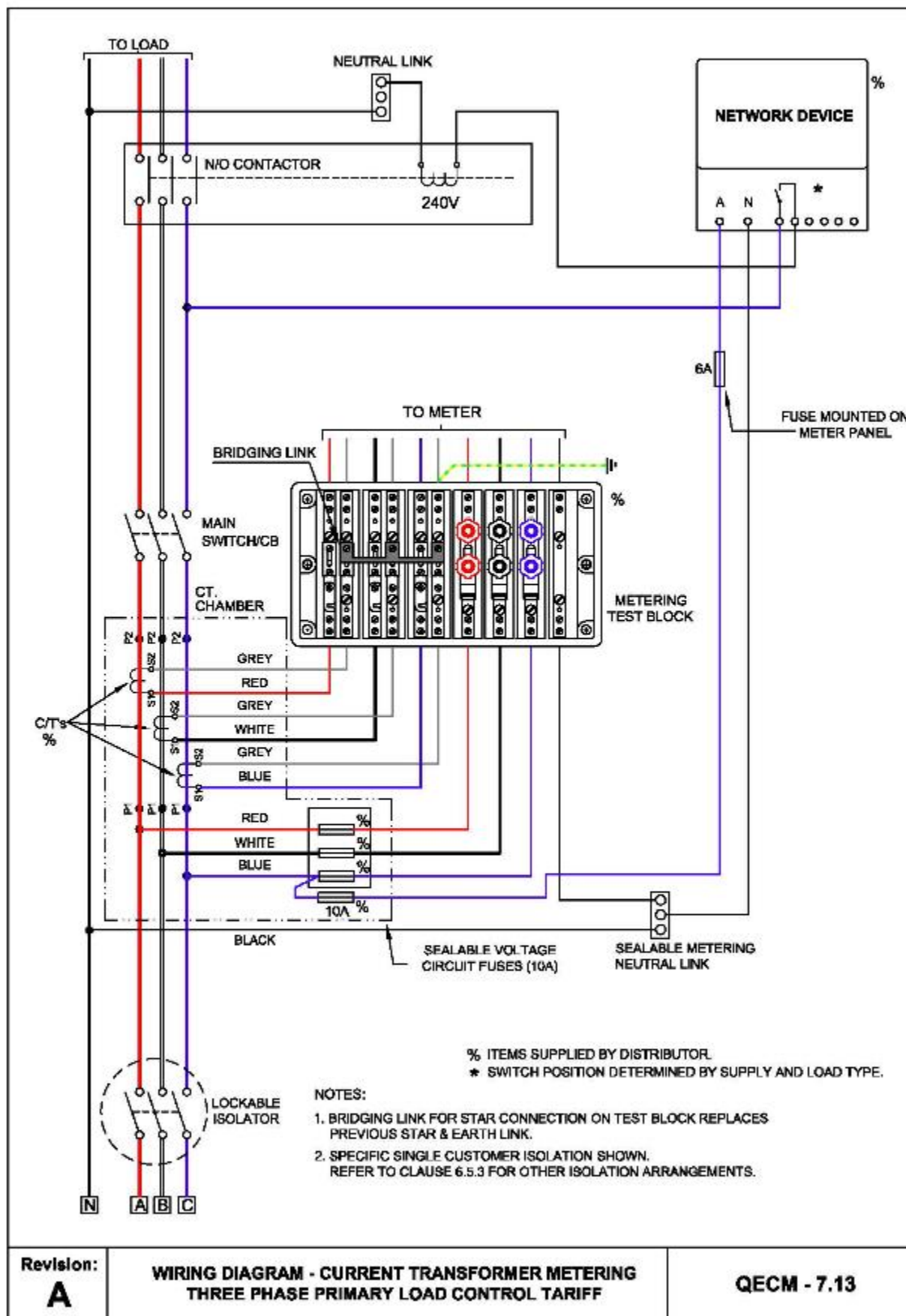
5. METERING ARRANGEMENT INDICATIVE FOR POC AREAS.

Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
THREE PHASE PRIMARY LOAD CONTROL TARIFF**

**QECM - 7.12**



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## 8. EMBEDDED GENERATING (EG) SYSTEMS

An Embedded Generating (EG) System is agnostic to the Distributed Energy Resource that connects to the distribution network via an inverter. Where there are multiple *EG systems* connected at a *premise* through a connection point, the system capacity is the aggregate of all generation (unless agreed otherwise with the *distributor* and documented in a connection agreement).

### 8.1. Explanation of Metering Schemes Available

Two metering schemes are available for the grid-connected Embedded Generating (EG) systems, known as the “*Net Energy*” and the “*Gross Energy*” schemes. All *EG systems* installations must be compliant with the *distributor’s* connection standards.

The Queensland Government Solar Bonus Scheme or Regional Feed-in Tariff requires the installation of a *Net Energy* metering solution.

The *Net Energy* metering scheme has a single import/export meter installed in the place of the existing general supply energy consumption meter(s).

The *Gross Energy* metering scheme may require an additional import/ export meter installed on the meter panel to record the *EG system* supply energy generation only.

### 8.2. Agreements

All *customers* with an EG system must have a Connection Agreement for the *EG system* in place with the *distributor* before the *EG system* can be connected to the *distributor’s* supply network. This includes systems that are configured as minimal-export or non-export back to the distribution network.

The *customer* or their agent shall nominate the metering scheme on the application form for network connection of an *EG system*, and the *electrical contractor* shall nominate the metering scheme on their *Electrical Work Request* sent to the *distributor*.

*Customers* wishing to be compensated for any electricity exported by the *EG system* to the *distributor’s* supply network other than through the Queensland Government Solar Bonus Scheme must also have a Power Purchase Agreement in place with their *retailer*. Details on how feed-in tariffs works and determining eligibility for the retention of Queensland Government Solar Bonus Scheme can be found at the Queensland Government website <https://www.qld.gov.au/housing/buying-owning-home/feed-in-tariffs>.

### 8.3. Approval of Equipment

Typical *direct connected metering* arrangements have been developed in line with *EG system* requirements and *retailer* offered supply types however it is up to the *metering provider* to install suitable metering arrangement to meet site requirements

#### Notes:

1. Exceptions to the above standards may be approved upon receipt of a written application in exceptional circumstances. Applications shall be made in writing to the *distributor*. Standard charges will apply for such arrangements.
2. It must be noted that the “*Gross Scheme*” may require an additional meter, and the end user must be made aware that provision of this space is required at the current metering location.
3. In a “*Net Scheme*”, if the principal metering has more than one phase, it is a requirement that a polyphase meter must be used.

## 8.4. Connection Requirements for EG Systems

Connection requirements associated with *EG systems* connected to the distribution network shall be in accordance with:

Total Generator System Rating (kVA)	Connection Standard
Up to and including 30kVA (see Note 1)	STNW1170
Greater than 30 kVA to 1,500 kVA where <i>connection point</i> with <i>distributor</i> is at low voltage (LV) (See Note 2)	STNW1174
Greater than 30 kVA and less than 5MVA where <i>connection point</i> with <i>distributor</i> is at high voltage (HV)	STNW1175

Note 1: Applies to Inverter Energy Systems only

Note 2: Applies to rotating machines 0 kVA to 1500 kVA

### 8.4.1 Electric Vehicle Chargers

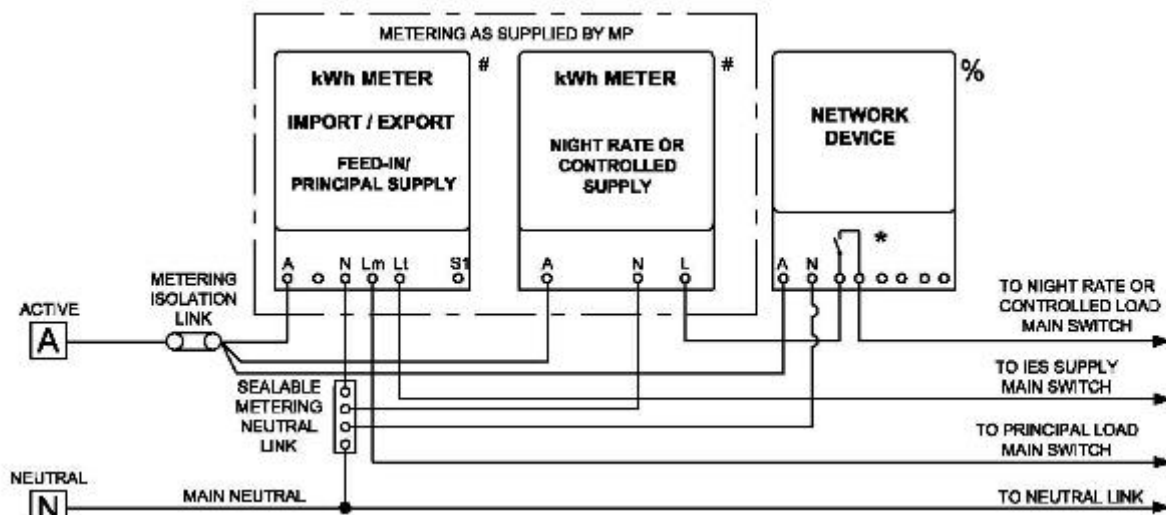
Electric Vehicles that are only capable of charging from the grid are not considered a Small IES but rather a load and the requirements are set out in Section 4.2

### 8.4.2 Electric Vehicles as IES

An electric vehicle shall be considered part of a Small IES EG Connection when it is capable of exporting energy into the customers premises or the distribution network. This is referred to Vehicle-to-Building and Vehicle-to-Grid and shall be connected under the requirements set out in the Connection Standard STNW1170.

## 8.5. Labelling and signage

Labels and signs on the *Small IES*, including cables, shall meet the requirements of AS/NZS4777.1, AS/NZS 30000, AS/NZS 5033 and AS/NZS 5139.



# ITEMS SUPPLIED BY METERING PROVIDER.

% ITEMS SUPPLIED BY DISTRIBUTOR.

\* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

## NOTES:

1. BI-DIRECTIONAL SINGLE PHASE ELECTRONIC METER REQUIRED FOR IMPORT / EXPORT ENERGY REGISTRATION.
2. INVERTER ENERGY SYSTEM (IES) COMPLIANT TO AS4777 CONNECTED WITHIN THE INSTALLATION ON THE CUSTOMERS SIDE OF THE IES SUPPLY MAIN SWITCH.
3. TWO ELEMENT METER TERMINAL DESCRIPTION.

1	A - ACTIVE IN
3	N - NEUTRAL IN
4	Lm - ELEMENT 1 (MAIN - PRIMARY LOAD)
5	Lt - ELEMENT 2 (UNSWITCHED - IES SUPPLY)
6	S1 - NOT USED

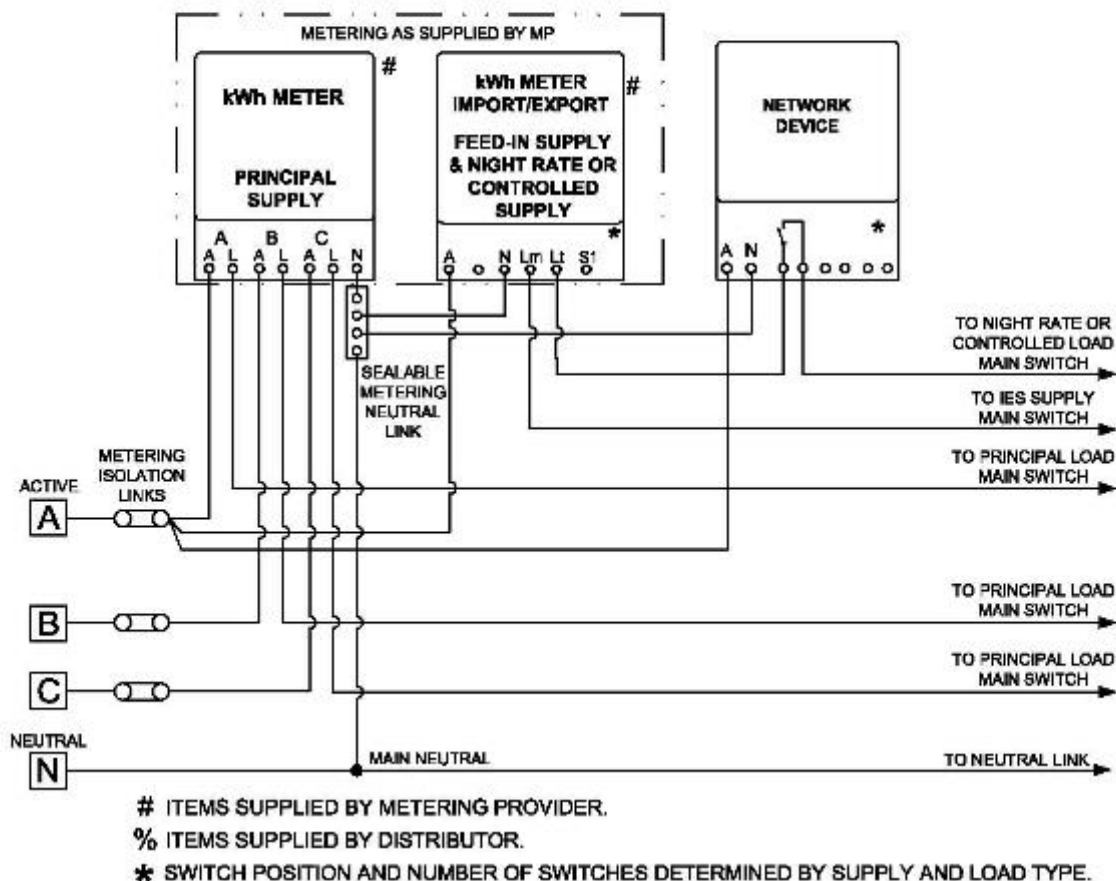
4. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
GROSS METERING SCHEME  
SINGLE PHASE PRINCIPAL SUPPLY PLUS  
NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 8.1**



## NOTES:

1. INVERTER ENERGY SYSTEM (IES), COMPLIANT TO AS4777, CONNECTED WITHIN THE INSTALLATION ON THE CUSTOMER'S SIDE OF THE IES SUPPLY MAIN SWITCH.
2. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

Revision:

**A**

**WIRING DIAGRAM - DIRECT CONNECTED METERING  
GROSS METERING SCHEME  
THREE PHASE PRINCIPAL SUPPLY PLUS  
SINGLE PHASE NIGHT RATE OR CONTROLLED SUPPLY**

**QECM - 8.2**

## 9. HIGH VOLTAGE METERING

### 9.1. General Requirements

The *customer* is required to supply, install and maintain all electrical equipment supplied by the *customer*. All high voltage equipment must be compatible with the *distributor's* supply. Relays, current transformers and other protective equipment must have characteristics compatible with the *distributor's* existing protective system.

The design, construction and installation of all high voltage equipment shall comply with the appropriate Australian Standards (e.g. AS/NZS 3000 (Wiring Rules) and AS 2067) or other equivalent Standards (e.g. IEC Standards). Plans, drawings and relevant details describing the proposed installation and its operating conditions shall be provided.

The *distributor* will advise the *customer* of the prospective fault level and the normal fluctuations of supply voltage for which provisions should be made.

### 9.2. Testing Requirements

The *customer* shall meet the cost of any high voltage testing as required by AS 2067 and auditing in accordance with the *Electrical Safety Act 2002 (Qld)*.

The metering coordinator shall ensure that high voltage revenue metering instrument transformers are tested and maintained in accordance with the National Electricity Rules.

### 9.3. Operation of High Voltage Equipment

The *customer* is responsible for ensuring that the high voltage installation is operated in accordance with the requirements of the *Electrical Safety Act 2002 (Qld)*, the *Electrical Safety Regulation 2013 (Qld)* and the Code of Practice for Electrical Work.

The *customer* has an obligation to ensure all persons who are involved in the high voltage isolation and access procedures have been trained and assessed as competent to perform the roles for which they are responsible.

Testing, earthing and safety equipment suitable for operation of the high voltage equipment shall be readily available on site.

For high voltage installations consisting of more than one item of switchgear, an operating diagram in the form of a single line schematic of the complete installation is to be permanently displayed adjacent to the main switch or switches.

Where items of switchgear are remote from the main switchboard, it is recommended that the operating diagram also be permanently displayed at these locations.

### 9.4. Maintenance and Repairs of High Voltage Equipment

A *customer* who takes supply at high voltage shall ensure that the high voltage installation is maintained so that any malfunction will not create a hazard or cause interference to the *distributor's* supply.

All costs associated with the maintenance or repairs of the *customer's* high voltage installation shall be met by the *customer*.

**Note:** The *customer* must be prepared for power interruptions during high voltage testing procedures, maintenance or repairs.

### 9.5. Conversion from Low Voltage Supply to High Voltage Supply

A *customer* planning to convert from supply at low voltage to supply at high voltage shall negotiate with the *distributor* before commencement of work.

Options to be considered may include the following:

- (a) Replacement of the *distributor's* substation and other assets or purchase of this equipment from the *distributor*; and



- (b) Any costs associated with converting the installation for compliance with AS/NZS 3000 (Wiring Rules) and AS 2067.

## 9.6. Metering Requirements

The *customer* or *customer's* representative (electrical contractor or consultant) must contact the *distributor* prior to commencing any project that may require high voltage metering. High voltage metering is complex and the following may need to be considered:

- (a) Specialised metering design (voltage change-over schemes etc.).
- (b) Compliance with the *National Electricity Rules*.
- (c) Equipment with long lead times (e.g. 6 to 12 months) may be required.
- (d) Full or partial check metering requirements for large loads.
- (e) Generator connections and import/export load flows.
- (f) Test certificates for metering instrument transformers from an accredited laboratory.

The relevant metering requirements in previous chapters also apply to high voltage installations. Where there are differences between the information in Section 9 and the remainder of the *QECM*, the requirements of Chapter 9 prevail in relation to *high voltage metering*. The additional details contained in Chapter 9 are specific to *high voltage metering* installations. The *distributor* or *metering provider* can be contacted for additional information.

## 9.7. Establishing a Network Connection and NMI

For high voltage connections the process of metering the site, data collection and settlement of energy requires the following steps:

1. The *customer* is required to engage an electricity *retailer* licensed to operate in Queensland.
2. The *retailer* is required to appoint a *metering coordinator*.
3. The *metering coordinator* is required to appoint the *metering data provider* and the *provider*.
4. The *retailer* (as the financially responsible Market Participant) is required to submit a *SOR* to the *distributor* to make the network connection.
5. The Local Network Service Provider must then issue a unique NMI for each metering installation on its network.

The above process will establish a *NMI* per *connection point* in line with the *distributor's* policies and the *AEMO* "National Metering Identifier Procedure" (refer to Flowchart 7 – Initial Connection – High Voltage Installation in Responsibilities Section).

## 9.8. Connection Offer and/or Network Connection Agreement

The *distributor* will negotiate a connection agreement detailing the conditions for the high voltage supply. This correspondence will include network requirements and the responsibility for providing the *high voltage metering*.

## 9.9. Connection point

Refer to Section 5.2.2 for *connection point* arrangements.

The revenue metering point shall be located as close as practicable to the *connection point*.

## 9.10. Revenue Metering

The arrangement for the high voltage revenue metering installation will be determined during the connection enquiry and application process:

- (a) A Type 1-3 metering installation; as required for HV connections is an unregulated distribution service in Queensland and the *customer* is responsible for supplying, installing, maintaining and testing the metering installation including the instrument transformers.
- (b) The metering installation contains the metering current transformers and the metering voltage transformers (revenue metering instrument transformers). Wherever practicable this equipment shall be located within the *customer's* installation and be accessible to the *metering provider*. The metering installation shall comply with the requirements outlined in the AEMO Metrology Procedure Part A and the *National Electricity Rules* Chapter 7 and be approved by the *metering coordinator*.
- (c) The *customer* shall provide revenue metering instrument transformers, associated equipment and plant. The equipment must be ready for the nominated *metering provider* to connect metering and communication equipment.
- (d) Revenue metering instrument transformers will remain the *customer's* property, and the *customer* will be responsible for maintaining, servicing and if failure occurs, replacing the metering instrument transformers in accordance with the requirements of the *National Electricity Rules*.

**Note:** Any fault or defect is required to be rectified within 2 business days or the *metering coordinator* must obtain an exemption from AEMO.

- (e) The revenue metering instrument transformers are to be specified, installed, tested and maintained in accordance with the requirements of the *National Electricity Rules*, relevant Australian Standards (AS/NZS 3000 (Wiring Rules), AS 2067, AS 1243, AS 60044 series) and the *QECM*
- (f) Instrument Transformer test certificates in accordance with the requirements of the *National Electricity Rules* Schedules 7.2 and 7.3 shall be provided to the *metering provider* prior to installation of the equipment.
  - i) Where revenue metering instrument transformers are tested in Australia, endorsed reports from a laboratory accredited by NATA are required; or
  - ii) Where revenue metering instrument transformers are tested overseas, endorsed reports from a laboratory accredited by an organisation recognised by ILAC (International Laboratory Accreditation Cooperation) are required.
- (g) Metering installation designs that are approved by a *metering provider* or *metering coordinator* shall also be provided to the *distributor* prior to connection. The *customer* shall supply a single line diagram, HV switchboard layout, and a schematic diagram showing the wiring details from the instrument transformers (current and voltage transformers) to the metering panel.
- (h) The *customer* is required to supply, install and test the secondary wiring and meter enclosure/panel and terminate the secondary wiring at the meter panel and the metering instrument transformers.
- (i) The *customer* is responsible for ensuring that all requirements and steps in the metering installation process are coordinated in an efficient and timely manner to allow supply to be connected when required.

- (j) The *customer* shall provide readily accessible high voltage test points on either side of the metering instrument transformers, in the specification/design of their switchgear. This will enable the *metering provider* to conduct the periodic high voltage metering instrument transformer accuracy tests (e.g. primary injection tests), required by the *National Electricity Rules*, with minimal power outages and disruption to the *customer* and their equipment.
- (k) For metering installations greater than 1000 GWh pa per connection point, the current transformer core and secondary wiring associated with the meter(s) shall not be used for any other purpose unless otherwise agreed by AEMO.
- (l) For metering installations less than 1000 GWh pa per connection point the current transformer core and secondary wiring associated with the meter(s) may be used for other purposes (e.g. local metering or protection) provided the *metering coordinator* demonstrates to the satisfaction of AEMO that the accuracy of the metering installation is not compromised and suitable procedures/measures are in place to protect the security of the metering installation.
- (m) The metering voltage instrument transformers may be used to supply *customers* metering at the discretion and approval of the *metering provider* on a case by case basis. The secondary voltage supply from the voltage transformers will be separately fused with fuses located in an accessible position as near as practicable to the voltage transformer secondary connection. The revenue metering instrument transformers' secondary wiring is to be earthed at one point only in accordance with the *metering provider's* requirements.
- (n) The minimum spacing between the meter wiring and other current carrying conductors shall comply with *QEMM*
- (o) Adequate and safe access must be provided for the installation, routine and corrective maintenance of revenue metering equipment in accordance with *AEMO* requirements
- (p) The revenue metering instrument transformers may be used to supply the *distributor's* power quality monitoring equipment at the discretion and approval of the *customer* and *metering provider* on a case by case basis.

## 9.11. Meter Enclosure

The following requirements apply to *high voltage metering* enclosures:

- (a) Unless otherwise detailed in the supply agreement the *customer* must supply a pre-wired meter panel and enclosure to the requirements of the *metering provider*. Wiring diagrams can be obtained from the *metering provider*.
- (b) Any metering enclosure mounted externally must have an appropriate IP rating and be positioned so that adequate mechanical protection is provided.
- (c) A hinged panel with minimum dimensions of 600mm x 600mm is required for the mounting of meters and metering test block on the same vertical surface.
- (d) A metering enclosure installed on a pole in association with a *distributor* owned metering unit, will be supplied and maintained by the *distributor*.
- (e) No *customer* owned equipment is to be installed within the *metering provider's* dedicated metering enclosure.
- (f) The supply and wiring of the meter panel may be carried out by the *metering provider* as part of a negotiated agreement.

- (g) The *customer* is responsible for earthing of the metering enclosure in accordance with relevant standards and practices including consideration for earth potential rise.
- (h) The *customer* should consider providing lockable front meter doors in locations where security may be an issue.

## 9.12. Secondary Wiring

The following requirements apply to metering units supplied by the *metering provider* and revenue metering instrument transformers owned and installed by the *customer*.

- (a) The *customer* shall supply and install the secondary wiring between the revenue metering instrument transformers and the test block or terminal strip.
- (b) Revenue metering instrument transformer secondary wiring is to follow the most direct route and the number of terminations and links must be kept to a minimum.
- (c) Revenue metering instrument transformer secondary wiring is to be PVC insulated stranded cable of no more than 7 strands.
- (d) The secondary wiring shall be sized to ensure that the burden on the revenue metering instrument transformers is not exceeded.
- (e) All taps of multi-tap CTs to be brought out to the marshalling box or metering enclosure (in the absence of a marshalling box).
- (f) Any connection point in the revenue metering instrument transformers' secondary circuit (terminals, links, fuses etc.) that is accessible must be identified as "Revenue Metering" and must be able to be covered and sealed.

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## APPENDIX A - SPECIFICATION FOR METALLIC ENCLOSURES FOR METERS IN DIRECT CONNECTED INSTALLATIONS

### Foreword

This specification provides for metallic enclosures only. The use of other materials, such as fibreglass or plastic is subject to the approval of the *distributor*. In such cases, the general requirements of this specification may provide guidance.

### A.1 Scope and General

#### A.1.1 Scope

This specification provides standard requirements for metallic enclosures for revenue meters and control equipment used in Direct Connected installations.

#### A.1.2 Definitions

**A.1.2.1** *Approved* - means approved by the *metering provider*.

**A.1.2.2** *Direct Connected Installation* - means an installation that is metered by Direct Connected meters.

**A.1.2.3** *Meter Enclosure* - means an enclosure used for the purpose of housing revenue metering equipment.

**A.1.2.4** *Meter Panel* - means a panel to be mounted in the meter enclosure and on which metering equipment is fixed.

**A.1.2.5** *Metering Equipment* - means the equipment used for measuring or controlling the supply of electrical energy.

**A.1.2.6** *Weatherproof* - means so constructed and installed as to exclude rain, hail and external splashing so that the safe and efficient operation of the equipment contained therein shall not be impaired. (e.g. IP23).

### A.2 Design and Construction

#### A.2.1 Materials

The meter enclosure may be constructed from the following:

MATERIAL	MINIMUM THICKNESS (mm)
Mild Steel	Enclosure Type A 1.0 Enclosure Type B 1.2
Aluminium	To be equivalent in strength and rigidity to the above mild steel requirements
Other Materials	To be approved

## A.2.2 Construction

- A.2.2.1** The enclosure should be constructed free of burrs at the opening.
- A.2.2.2** The enclosure, if of steel construction, shall be of galvanised or zincalume material and shall comply with the requirements of AS 1397 "Steel sheet and strip - hot dip zinc-coated or aluminium/zinc-coated".
- A galvanised steel meter enclosure shall have all galvanised surfaces repaired with a suitable zinc rich coating. All exterior surfaces of the enclosure should be painted with one coat of "etch primer".
- A.2.2.3** The use of aluminium shall be restricted to corrosion resistant alloys as recommended for the exposure to be encountered in service (stainless steel is an acceptable alternative).
- A.2.2.4** Rivets shall be of a material that is compatible with the case material and must not react to set up points of corrosion.
- A.2.2.5** Where additional mechanical strength is required stiffening ribs may be utilised. Such ribs must not in any way reduce the minimum internal dimensions.

## A.2.3 Door

- A.2.3.1** The meter enclosure is to be fitted with a hinged door of sufficient strength to prevent buckling or warping.
- A.2.3.2** The door shall be side hinged, unless otherwise approved by the *metering provider*, and fitted with a suitable non-corroding chain or other approved means to limit the door travel to approximately 100 degrees. The door may be hinged at either the left or right side of the meter enclosure and shall be fitted with a simple self-latching device.
- A.2.3.3** Hinges provided shall be of non-corroding material and so designed or fitted with non-corroding pins as to prevent seizing.

## A.2.4 Door Latch

The latching device provided shall engage automatically and hold the door firmly closed.

## A.2.5 Entry of Wiring

Adequate provisions shall be made for knockouts or slots for the entry of wiring to the meter enclosure. (Refer to AS/NZS 3000 (Wiring Rules) for fire protection requirements).

Entries may be provided in the top of the enclosure but in this case the final assembly should withstand the test in Item A.2.7 of Appendix A.

## A.2.6 Earthing

To ensure an effective Earth of the Switchboard Surround an earthing stud or terminal complying with the requirements of AS/NZS 3000 (Wiring Rules) shall be provided for the connection of an earthing conductor within the enclosure. The stud or terminal shall not obstruct equipment within the enclosure.

## A.2.7 Weatherproofing

The enclosure is to comply with AS/NZS 60529 "Degrees of Protection Provided by Enclosures" to a minimum of IP23.

The enclosure shall provide adequate ventilation to minimise condensation and be capable of draining any moisture that may collect within the enclosure.

## A.2.8 Meter Panel

**A.2.8.1** Meter panels shall be constructed of durable, non-conducting, fire resistant material with low water absorption properties and shall not contain asbestos.

**A.2.8.2** The meter panel shall be side hinged on a vertical axis so that the metering equipment always remains in the vertical plane.

**A.2.8.3** Panel hinges should be of the double off-set type that allows for the panel to be swung into the fully opened position and shall be of adequate strength to support the meter panel and associated metering equipment.

The hinges shall be constructed of a suitable non-corroding material. When the meter panel is opened at an angle of 90 degrees, the design of the enclosure and hinges should be such to withstand without undue distortion a weight of 25kg suspended vertically at a position 25mm from the outer edge of the panel.

## A.3 Dimensions

### A.3.1 General

Two basic types of meter enclosures are provided for, the dimensions of which are to be suitable for recessing into brick, block or framed walls. Other meter enclosures of adequate size to house the meters with recommended clearances and suitable construction may be used. The meter panel must meet the minimum size set out in the table below. This table is indicative of the most commonly supplied metering enclosures that comply with the QECM.

Metal Enclosure	Minimum Thickness Mild Steel	Minimum Space Required For Metering Equipment	Clearance From Back of Meter Panel to Back of Enclosure	Clearance From Back of Meter Panel to Inside of Door
Type A	1.0mm	480mm x 460mm (high) (wide)	75mm	185mm
Type B	1.2mm	600mm x 550mm (high) (wide)		

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## APPENDIX B - GLOSSARY OF TERMS

<b>Accredited Auditor</b>	<p>A person appointed under section 129 of the <i>Electrical Safety Act 2002</i> to audit high voltage or hazardous area installations before connection to supply.</p> <p>Further information may be obtained from the Electrical Safety Office.</p>
<b>AEMO</b>	<p>'Australian Energy Market Operator' is responsible for the day to day management of wholesale and retail energy market operations and emergency management protocols; on-going market development required to incorporate new rules, infrastructure and participants; and long term market planning through demand forecasting data and scenario analysis.</p>
<b>AF Receiver</b>	<p>See "Network Device"</p>
<b>Capital Contribution</b>	<p>A contribution towards costs associated with a standard control service, such as any necessary augmentation of connection assets at the connection point, extension or augmentation of the shared distribution network to accommodate the connection/modification. A capital contribution will only be levied where there is a difference between the cost to provide the connection service and the revenue that will be earned by the <i>distributor</i> from the connection service.</p>
<b>Card Operated Meter</b>	<p>A meter that contains control equipment that switches on and off in accordance with the amount of credit stored in the meter.</p>
<b>Common Property</b>	<p><i>Common property</i> means so much of a parcel as from time to time is not comprised in any lot. Refer to <i>Building Units and Group Titles Act 1980(Qld)</i></p>
<b>Community Title Development</b>	<p>A subdivision of land in which individual lots do not necessarily have immediate access to a dedicated road serve and which comply with the <i>Body Corporate and Community Management Act (Qld)</i>.</p>
<b>Connection Point</b>	<p>The agreed point of supply established between Network Service Provider(s) and another Registered Participant, Non-Registered <i>Customer</i> or franchise <i>customer</i>.</p> <p><b>Note (1):</b> AS/NZS 3000 refers to the 'Connection Point' as the 'Point of Supply'. Previous editions of AS/NZS 3000 referred to the 'Connection Point' as the 'consumer's terminals'.</p> <p><b>Note (2):</b> The <i>Queensland Electricity Regulation 2006</i> uses the definition 'consumer's terminals'.</p> <p><b>Note (3):</b> The <i>National Electricity Rules</i> uses the definition 'connection point'.</p> <p><b>Note (4):</b> This is the point which differentiates the responsibilities of the Network Service Provider and the application of AS/NZS 3000.</p>
<b>Connection Policy</b>	<p>The <i>distributor's</i> connection policy provides an outline of connection services, when connection charges may be payable by <i>customers</i> and how those charges are calculated.</p>



<b>Consumer Mains</b>	The conductors between the <i>connection point</i> and the main switchboard.
<b>Consumer's Terminals</b>	See <i>connection point</i> .
<b>Controlled Load, Controlled Supply</b>	Those loads that are wired separately from other appliances, are controlled by means of frequency injection receiver or time clock and are separately metered from the remaining load at the metering point.
<b>Current Transformer Metering</b>	A metering arrangement where electricity flow is measured by a meter using current transformers (CTs).
<b>Customer</b>	A person, including a relevant body corporate, who receives, or wants to receive, a supply of electricity for a <i>premise</i> from an electricity entity or special approval holder.
<b>Direct Connected Meter</b>	A meter where the electricity flow is directly measured by the meter i.e. the current under measurement passes through the meter itself.
<b>Distribution Entity, Distributor</b>	A distribution entity is a person who holds a distribution authority that authorises its holder to supply electricity using a supply network within its distribution area. See sections 37, 38 and 39 of the <i>Electricity Act 1994 (Q/d)</i> . (Refer to definition for Relevant Distribution Entity).
<b>EG system (s)</b>	One or more embedded generating units and auxiliary equipment that are <i>interconnected</i> with a <i>distributor's</i> network.
<b>Electrical Contractor (EC)</b>	A person licensed under the <i>Electrical Safety Act 2002</i> to conduct a business or undertaking that includes the performance of electrical work.
<b>Electrical Work Request (EWR)</b>	The request from the <i>customer's</i> electrical contractor to a <i>distributor</i> to perform a distribution service e.g. (i) Energex - Form 2; or (ii) Ergon Energy - Form 2 - <i>Request for Initial Connection, Metering Change or Service Alteration</i>
<b>Energex</b>	Energex Limited - ABN 40 078 849 055
<b>Enhanced Metering</b>	A scheme, which is not normally considered to be part of standard metering as described in this manual (e.g. has pulse inputs, outputs, or remote communications). Additions that are above and beyond the metering provided in this manual.
<b>Ergon Energy</b>	Ergon Energy Corporation Limited ABN 50 087 646 062
<b>Energy Storage System (ESS)</b>	A system comprising one or more batteries that store electricity generated by Distributed Energy Resource or directly from the grid, and that can discharge the electricity to loads.
<b>EVSE</b>	Electric Vehicle Supply Equipment as defined in AS/IEC 62196
<b>Excluded Customer</b>	A <i>customer</i> who cannot choose their <i>retailer</i> . For example, <i>customers</i> connected to isolated power systems.

<b>Gross Energy Scheme</b>	The Gross Energy Scheme separately meters the full energy output of the <i>Small IES EG Connection</i> . The energy consumed at the <i>premises</i> is metered normally.
<b>High Voltage Metering</b>	A high voltage metering arrangement where electricity flow is measured by a meter using current transformers and voltage transformers.
<b>Interconnected</b>	Connection of an <i>EG system</i> capable of parallel operation with a <i>distributor's</i> network.
<b>Isolated Power System</b>	A supply network that does not form part of and is not connected to the national grid and may include an isolated feeder.
<b>Large Customer</b>	A <i>customer</i> whose annual consumption is equal to, or greater than, 100MWh, and is connected to the distributor's network.
<b>Large Non-market Customer</b>	A <i>large non-market customer</i> , for <i>premises</i> , is a <i>large customer</i> for the <i>premises</i> who is also a non-market <i>customer</i> for the <i>premises</i> .
<b>Metering Coordinator</b>	A person who has been registered by AEMO under Chapter 2 of the <i>National Electricity Rules</i> to engage in the coordination and provision of metering services at a connection point in accordance with Chapter 7 of the <i>National Electricity Rules</i> .
<b>Metering Data Agent</b>	An agent appointed by <i>AEMO</i> to undertake the collection, processing and transfer of metering data to <i>AEMO</i> and other registered participants.
<b>Metering Data Provider</b>	A person who meets the requirements listed in schedule 7.3 of the <i>National Electricity Rules</i> and has been accredited and registered by AEMO to undertake the collection, processing, storage and delivery of metering data and the management of NMI Standing Data.
<b>Metering Provider (MP)</b>	<p>A person who meets the requirements listed in schedule 7.2 of the <i>National Electricity Rules</i> and has been accredited and registered by AEMO to undertake the provision, installation and maintenance of metering installations.</p> <p><b>Note:</b> The <i>distributor</i> is the <i>metering provider</i> in non-NEM areas.</p>
<b>NATA</b>	The National Association of Testing Authorities.
<b>National Electricity Rules</b>	The rules under which the National Electricity Market operates.
<b>National Metering Identifier (NMI)</b>	A <i>National Metering Identifier (NMI)</i> is a unique national identifier that relates to the metering installation at a <i>customer's premises</i> .

<b>Net Energy Scheme</b>	The <i>Net Energy Scheme</i> provides for the separate measurement of the energy supplied from the LV network to the <i>customer's</i> installation in excess of the <i>Small IES</i> generation, and the excess energy supplied to the LV network from the <i>premises</i> by the <i>Small IES</i> after the energy needs at the <i>premises</i> are met.
<b>Network Device, AF Receiver</b>	Apparatus or equipment that: (a) enables a <i>distributor</i> to monitor, operate or control the network for the purposes of providing network services, which may include switching devices, measurement equipment and control equipment; and (b) is located at or adjacent to a metering installation at the connection point of a <i>customer</i> .
<b>NMI Classification Code</b>	In accordance with the <i>Market Settlement and Transfer Solution Procedures</i> : Small - annual consumption less than 100MWh Large - annual consumption equal to, or greater than 100MWh.
<b>Point of Attachment</b>	The point at which aerial conductors of a <i>service line</i> or aerial <i>consumer mains</i> are terminated on a <i>customer's</i> structure.
<b>Point of Entry</b>	The point at which the <i>consumer mains</i> or the underground service cable enters a structure.
<b>Premises</b>	<i>Premises</i> includes - (a) a building or other structure; and (b) a part of a building or other structure; and (c) land where a building or other structure is situated.  <i>Premises, of a customer, means premises owned or occupied by the customer. Queensland Electricity Act 1994</i>
<b>QECM</b>	Queensland Electricity Connection Manual
<b>QEMM</b>	Queensland Electricity Metering Manual
<b>QECMM</b>	Queensland Electricity Connection and Metering Manual. On 24 <sup>th</sup> August 2018 the QECMM content was separated into two new documents, the QECM and the QEMM and the QECMM was withdrawn.
<b>Relevant Distribution Entity, Distributor</b>	The <i>relevant distribution entity</i> for a <i>premises</i> , means the <i>distribution entity</i> to whose supply network the <i>premises</i> are, or will be, connected.  <b>Note:</b> For the purposes of this document the relevant <i>distribution entity</i> will be referred to as the ' <i>distributor</i> '.
<b>Relevant Retail Entity, Retailer</b>	The <i>relevant retail entity</i> for a <i>premise</i> , means the retail entity who, under a retail contract, supplies or has agreed to supply electricity to the <i>premises</i> .  <b>Note:</b> For the purposes of this document the <i>relevant retail entity</i> will be referred to as the ' <i>retailer</i> '.
<b>Retail Entity</b>	A person who holds a retail authority to sell electricity and retail services (a ' <i>retail authority</i> ' authorises its holder to provide <i>customer</i> retail services under the terms of the authority).

<b>RPEQ</b>	Registered Professional Engineer Queensland.
<b>Rural/Isolated Area</b>	<p>A <i>rural/isolated area</i> is defined as one with a density of less than 5 lots per hectare (i.e. would generally have a dedicated supply transformer).</p> <p><b>Note:</b> This definition is only applicable within the <i>Ergon Energy</i> distribution area.</p>
<b>Service Line</b>	<p>An electric line that-</p> <ul style="list-style-type: none"><li>(a) forms part of the works of an electricity entity; and</li><li>(b) connects <i>consumer terminals</i> to -</li></ul> <ul style="list-style-type: none"><li>(i) other parts of the works of the electricity entity; or</li><li>(ii) the works of another electricity entity.</li></ul> <p>Schedule 9 of the <i>Queensland Electricity Regulation 2006</i>.</p>
<b>Small Customer</b>	A <i>customer</i> who consumes less than 100MWh per annum and is connected to the <i>distributor's</i> network.
<b>Small IES</b>	Micro-embedded generators of the kind contemplated by Australian Standard AS/NZS 4777 (Grid connection of energy system via inverters) up to 30kVA for which a Small IES EG Connection is appropriate.
<b>Small IES Embedded Generation Connection</b>	A connection between <i>Small IES</i> and a distribution network.
<b>SOR</b>	Service Order Request - This is a request from a <i>Retailer</i> to a <i>Distributor</i> to perform a distribution service (e.g. New Connections, Metering Alterations and Service Upgrades). It is also referred to as a B2B request.
<b>Suitable Mains Connection Box</b>	A mains connection box that is deemed to be compliant with the <i>distributor's</i> technical specifications. Details are available by contacting the <i>distributor</i> via the methods listed on page 1
<b>Two element Meter</b>	A single phase two element device which includes both metering and load switching within one meter.
<b>Type 1-7 Metering Installation</b>	As defined in the National Electricity Rules
<b>Unmetered Supply</b>	A Type 7 metering installation classification ( <i>NER</i> ) where a metering installation does not require a meter to measure the flow of electricity in a power conductor and accordingly there is a requirement to determine by other means the energy data that is deemed to flow in the power conductor and managed by the relevant Distribution Entity.
<b>Urban</b>	A residential area with a system of street lighting.

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## APPENDIX C - AMENDMENT RECORD

**Please note:** It is not possible to cover all of the changes in the following list, nor can the changes be covered in the detail and context as they appear within the manual. As an *Electrical Contractor* it is the responsibility of you and your endorsees to be fully conversant with the content and requirements of the Queensland Electricity Connection Manual.

Date 18/06/2020      Previous Version: Version 02 of the *QECM*

Section	Description
	Addition of Look Up and Live Details
1	Updated contact details for dispensations
2	Additional details provided around Embedded Generation and supply beyond boundaries.
3	Clarity around connection process and maximum demands – Alignment of Connection Policy
4	Changes to standard requirements for switched loads and addition of motor requirements
5	Minor changes
6	Clearer definitions of category or works. Clearer expectation on works to be performed.
7	Tariff Reform Alignment
8	Minor Changes
9	Minor Changes



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