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#### Energex

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Customer Service</td>
<td>13 12 53 E-mail request can be sent to <a href="mailto:custserve@energex.com.au">custserve@energex.com.au</a></td>
</tr>
<tr>
<td>Loss of Supply</td>
<td>13 62 62</td>
</tr>
<tr>
<td>Emergencies</td>
<td>13 19 62</td>
</tr>
<tr>
<td>Technical Information and QECM advice.</td>
<td>1300 762 397 Electrical Contractor Hotline (EC Use Only) <a href="mailto:qecmtechadvice@energyq.com.au">qecmtechadvice@energyq.com.au</a></td>
</tr>
<tr>
<td>Dispensation Requests as per Section 1.4</td>
<td><a href="mailto:tech.enquiries@energex.com.au">tech.enquiries@energex.com.au</a></td>
</tr>
</tbody>
</table>

#### Ergon Energy

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Customer Service</td>
<td>13 74 66</td>
</tr>
<tr>
<td>For all areas - New Applications, Point of Attachment Site Visits, Breaking Meter Seals.</td>
<td>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></td>
</tr>
<tr>
<td>24 Hour Faults and Emergencies</td>
<td>13 22 96</td>
</tr>
<tr>
<td>Metering Locks</td>
<td>1300 323 301 toll free number. Metering Locks can be purchased from API Locksmiths (Queensland Locksmiths) by phone or online at <a href="http://www.queenslandlocksmiths.com.au">www.queenslandlocksmiths.com.au</a> .</td>
</tr>
<tr>
<td>Technical Information and QECM enquiries.</td>
<td>1800 237 466 Electrical Contractor Hotline (EC Use only) <a href="mailto:qecmtechadvice@energyq.com.au">qecmtechadvice@energyq.com.au</a></td>
</tr>
<tr>
<td>Dispensation Requests as per Section 1.4</td>
<td><a href="mailto:tech.enquiries@ergon.com.au">tech.enquiries@ergon.com.au</a></td>
</tr>
</tbody>
</table>
LOOK UP AND LIVE

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 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

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) or Ergon Energy website (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).

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
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
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 abolition); 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;

submit 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

Customer or customer’s representative arranges electricity supply with distributor.

Electrical contractor (EC) completes electrical installation work, inspects and tests.

EC sends EWR to distributor.

EC advises customer to contact retailer and metering provider (MP) where applicable.

Customer contacts retailer for a 'New Connection request' and MP where applicable.

Retailer sends Service Order Request (SOR) to distributor and MP for connection to be completed.

Can connection be completed?

If No: Distributor or MP advises customer/owner/EC of defects.

EC rectifies defects and sends another EWR to the distributor.

If Yes: Distributor and MP complete connection and advise customer/owner/EC of any defects.

Customer/owner ensures EC has provided Certificate of Testing and Compliance.

Note: This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.
2) Initial Connection - LV Current Transformer Metering

Customer or customer’s representative arranges electricity supply with distributor.

Electrical contractor (EC) calculates maximum demand and identifies CT size from QEMM

EC sends LV CT Advice Form to distributor at least 10 working days before connection required.

EC completes work and sends EWR to distributor.

EC advises customer to contact retailer and metering provider (MP) where applicable.

Customer contacts retailer and MP.

Retailer sends SOR to distributor and MP for connection to be completed.

Can connection be completed?

No

EC rectifies defects and sends another EWR to the distributor.

Yes

Distributor or MP advises customer/owner/EC of defects.

Distributor and MP complete connection and advise customer/owner/EC of any defects.

Customer/owner ensures EC has provided Certificate of Testing and Compliance.

Customer appoints an electricity retailer.

Retailer/Customer appoints metering coordinator

Metering Coordinator appoints metering provider and metering data provider.

Note: This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.

Note: The distributor requires the submission of Switchboard Layout and Single Line Diagrams with the LV CT Metering Advice Form (Section 6.16).
3) Electrical Installation Work Involving Metering Changes

**Electrical contractor (EC)** completes work and inspects and tests.

EC sends EWR to distributor.

EC advises customer to contact retailer and metering provider (MP) if applicable.

Customer contacts retailer and MP.

Retailer sends SOR to MP for metering work to be performed.

Can metering changes be completed?

- **No**
  - MP advises customer/owner/EC of defects.
  - EC rectifies defects and sends another EWR to the distributor.

- **Yes**
  - MP completes metering work and advises customer/owner/EC of any defects.
  - MP advises retailer of changes.

Customer/owner ensures EC has provided Certificate of Testing and Compliance.

**Note:** This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.
4) Service and Metering Change - Additional Phases

**Is 2 or 3 phase supply available?**

- **No**
  - **EC contacts distributor**
  - **Distributor arranges 2 or 3 phase supply.**

- **Yes**
  - **Electrical contractor (EC) completes electrical work, inspects and tests.**
  - **EC sends EWR to distributor.**
  - **EC advises customer to contact retailer and metering provider (MP) if applicable.**
  - **Retailer sends SOR to distributor and MP to carry out work.**
  - **EC arranges changeover date with customer, distributor and MP to minimise outage.**
  - **MP performs meter alteration and distributor upgrades service. MP or distributor advises customer/owner/EC of any defects.**
  - **MP advises retailer of completion.**
  - **Customer/owner ensures EC has provided Certificate of Testing and Compliance.**

**Note:** This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.
5) Service Alteration - No Metering Changes

**Note:** This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.

* A temporary connection may be required between the old and new points of attachment.

---

Customer or customer's representative arranges service change with distributor.

Electrical Contractor (EC) completes work, inspects and tests.

EC sends EWR to distributor.

EC advises customer to contact retailer.

Retailer sends SOR to distributor to carry out work.

---

Are the new position and attachments suitable?

- **Yes**
  - Distributor replaces service, connects to new connection point and advises customer/owner/EC of any defects.
  - Distributor advises retailer of completion.
  - Customer/owner ensures EC has provided Certificate of Testing and Compliance.

- **No**
  - Distributor advises customer/owner/EC of defects.
  - EC repairs defects and sends another EWR to distributor.

---

Distributor advises retailer of completion.

EC repairs defects and sends another EWR to distributor.
6) Small IES EG Connection to the Distribution Network

Customer lodges application with distributor for connection of Small IES.

Customer completes agreement with distributor for Small IES EG Connection.

EC ensures installation, inverter and grid protection comply with the distributor’s standards.

EC ensures safety signage of Small IES and switchboards comply with AS/NZS 4777.1

EC tests installation and equipment to comply with AS/NZS 4777.2

EC sends EWR to distributor.

Customer contacts retailer advising that Small IES EG connection is complete.

Retailer sends SOR to distributor and MP to carry out work.

Can metering be completed?

Yes

Distributor and MP complete connection and advise customer/owner/EC of any defects.

Customer/owner ensures EC has provided Certificate of Testing and Compliance.

No

Distributor or MP advises customer/owner/EC of defects.

EC rectifies defects and sends another EWR to the distributor.

MP advises retailer of changes.

Note: This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.

Note: Where the cost of installation is subsidised by a government grant the installer must be a government approved installer.

Note: The customer must decide whether a Gross or Net Energy Scheme is to be used. EC to consult the QECM and QEMM before work is commenced.

Note: The Queensland Government Solar Bonus Scheme or Feed-in-Tariff requires the installation of a Net Energy scheme.

Note: Where the customer must decide whether a Gross or Net Energy Scheme is to be used. EC to consult the QECM and QEMM before work is commenced.

Note: The Queensland Government Solar Bonus Scheme or Feed-in-Tariff requires the installation of a Net Energy scheme.

Note: This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.
7) Initial Connection - High Voltage Installation

- Customer Discusses project with distributor.
- Appoints competent person to manage or design project.
- Distributor provides customer with connection agreement.
- Designer discusses project with distributor.
- HV accredited auditor is appointed by the customer, designer or EC.
- Installation of HV equipment is completed.
- HV accredited auditor visits site and issues report.
- EC rectifies any defects found by accredited auditor and submits EWR to distributor.
- EC advises customer to contact retailer.
- Appoints an electricity retailer.
- Retailer/Customer appoints metering coordinator.
- Metering Coordinator appoints metering provider and metering data provider.

**Note:** This diagram represents a general description of the process. Some of the steps may occur at different times depending on the situation.
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


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.
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.
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).

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>
<thead>
<tr>
<th>Nominal Supply Voltage</th>
<th>Power Factor Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>50kV - 250kV</td>
<td>0.95 lagging to unity</td>
</tr>
<tr>
<td>1kV &lt;50kV</td>
<td>0.90 lagging to 0.90 leading</td>
</tr>
<tr>
<td>&lt;1kV*</td>
<td>&gt;0.8 lagging but not leading</td>
</tr>
</tbody>
</table>

* Electricity Regulation 2006.

At all other voltage ranges the requirements are as specified by the National Electricity Rules, unless detailed in a contract.

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;

(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.
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

<table>
<thead>
<tr>
<th>Device</th>
<th>Switching Arrangements</th>
<th>Phase</th>
<th>Limit (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>230V Uncontrolled equipment</td>
<td>1 (line to neutral)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases not switched simultaneously</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases switched simultaneously</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>230V Controlled Equipment</td>
<td>1 (line to neutral)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases not switched simultaneously</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases switched simultaneously</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Commercial Cooking Equipment</td>
<td>1 (line to neutral)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases not switched simultaneously</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phases switched simultaneously</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>MOTOR VOLTAGE</th>
<th>MOTOR SIZE</th>
<th>ALLOWABLE STARTING CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>230V</td>
<td>All Sizes</td>
<td>I = 45 Amps</td>
</tr>
<tr>
<td>400V</td>
<td>Not exceeding 7.5kW</td>
<td>I = (17.5 x Motor rating in kW) Amps</td>
</tr>
<tr>
<td></td>
<td>Exceeding 7.5kW</td>
<td>Shall not be connected.</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>MOTOR SIZE</th>
<th>ALLOWABLE STARTING CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not exceeding 1.5kW</td>
<td>I = 26 Amps</td>
</tr>
<tr>
<td>Exceeding 1.5kW and up to 3.75kW</td>
<td>I = (Motor rating in kW x 17.5) Amps</td>
</tr>
<tr>
<td>Exceeding 3.75kW and up to 10kW</td>
<td>I = (53 + 3.3 x Motor rating in kW) Amps</td>
</tr>
<tr>
<td>Exceeding 10kW</td>
<td>Contact <em>distributor</em>.</td>
</tr>
</tbody>
</table>

**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:

\[ Z = 0.2 + j0.2 \text{ ohms (phase - neutral)}; \]
\[ Z = 0.1 + j0.1 \text{ ohms (line impedance per phase)}. \]

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).
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 will 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>
<thead>
<tr>
<th>Distributor</th>
<th>Cable Type (ABC)</th>
<th>Service Rating (A)</th>
<th>Maximum Fuse Size (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergon Energy Network</td>
<td>2*25mm Al XLPE</td>
<td>105</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>4*25mm Al XLPE</td>
<td>97</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>2*50mm Al XLPE</td>
<td>150</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>4*50mm Al XLPE</td>
<td>140</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>2*95mm Al XLPE</td>
<td>230</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>4*95mm Al XLPE</td>
<td>215</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Parallel 4*95mm Al XLPE</td>
<td>430</td>
<td>315</td>
</tr>
<tr>
<td>Energex</td>
<td>2*6mm Al XLPE</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>2*25mm Al XLPE</td>
<td>105</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>4*25mm Al XLPE</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>4*35mm Al XLPE</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>2*95mm Al XLPE</td>
<td>230</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>4*95mm Al XLPE</td>
<td>215</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Parallel 4*95mm Al XLPE</td>
<td>430</td>
<td>315</td>
</tr>
</tbody>
</table>
5.8.4 Overhead Service Line Attachments

(a) Standard service cables used are XLPE insulated aluminium in sizes 25mm², 35mm² (Energex only), 50mm² (Ergon Energy only) and 95mm². Paralleling of standard service cables is not permitted for residential connections. Paralleling of 4 core 95mm² is permitted for commercial/industrial connections however it is not the preferred arrangement. The preferred arrangement is 240mm² Al 4 core underground cables with a Commercial & Industrial pillar as the connection point. A 6mm² 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 25mm² and 35mm² (Energex only) overhead service lines shall have a load rating of 1kN working load. (Refer to Drawing QECM 5.12).

(ii) 50mm² (Ergon Energy only) and 95mm² services shall have a load rating of 3.5kN working load and parallel (twin) 95mm² 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 25mm². (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>
<thead>
<tr>
<th>UV RESISTANT INSULATED ENCLOSURE</th>
<th>PVC Enclosure Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single 35 or 50mm² LV ABC service</td>
<td>360mm X 270mm X 205mm*</td>
</tr>
<tr>
<td>Single &amp; Parallel (Twin) 95mm² LV ABC service</td>
<td>540mm X 360mm X 220mm</td>
</tr>
</tbody>
</table>

* Certain manufacturers utilise a spacer to achieve 220mm depth.

Notes:
1. Suitable mains connection boxes are available for conductors up to 95mm². 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 35mm2 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

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 240mm² 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 striple fuse unit in a padmount transformer permits a maximum of 2*300mm² 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.
# SERVICE CLEARANCE TABLE

Neural Screened and Insulated Cables

<table>
<thead>
<tr>
<th>CATEGORY FROM GROUND</th>
<th>CODE</th>
<th>LOCATION</th>
<th>DIRECTION</th>
<th>INSULATED SERVICE CABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROADS</td>
<td>A</td>
<td>A centre line of the carriageway</td>
<td>VERTICALLY</td>
<td>5.5m</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Kerb line (bottom of kerb)</td>
<td>VERTICALLY</td>
<td>4.9m</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Kerb line (top of kerb)</td>
<td>VERTICALLY</td>
<td>3.7m</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Private driveways and areas including elevated areas used by vehicles</td>
<td>VERTICALLY</td>
<td>4.5m</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Areas not normally used by vehicles</td>
<td>VERTICALLY</td>
<td>2.7m</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Road cuttings, embankments and other similar places</td>
<td>HORIZONTALLY</td>
<td>1.5m</td>
</tr>
<tr>
<td>MINIMUM CLEARANCE FROM STRUCTURES &amp; BUILDINGS</td>
<td>G</td>
<td>Unroofed terraces, balconies, sun-decks, paved areas, and similar areas that are subject to pedestrian traffic only, that have a hard mail or wall surrounding the area and on which a person is likely to stand (Note 2) must be horizontal</td>
<td>VERTICALLY ABOVE</td>
<td>1.2m</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td></td>
<td>VERTICALLY BELOW</td>
<td>0.9m</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Roof or similar structures not used for traffic or resort but on which a person is likely to stand (Note 2) must be horizontal</td>
<td>VERTICALLY</td>
<td>2.4m</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>Roof or similar structures not used for traffic or resort but on which a person is likely to stand (Note 2) must be horizontal</td>
<td>HORIZONTALLY</td>
<td>0.8m</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>Covered places of traffic or resort including for example windows which are capable of being opened, roofed open verandahs and covered balconies must be horizontal</td>
<td>IN ANY DIRECTION</td>
<td>1.2m</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>Blank walls, windows which cannot be opened (Note 2) must be horizontal</td>
<td>HORIZONTALLY</td>
<td>0.2m</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>Other structures not normally accessible to persons (Note 2) must be</td>
<td>IN ANY DIRECTION</td>
<td>1.2m</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Customer property poles accessible to persons (Note 2) must be</td>
<td>IN ANY DIRECTION</td>
<td>3.0m</td>
</tr>
</tbody>
</table>

**NOTES:**

1. 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.

2. 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.

3. Stated clearances apply to a service line not attached to the part of the building described.

4. The clearance stated does not apply to the part of the low voltage overhead service line not under tension. Drop loops are excluded and consideration should be given to the loop positioning. (Note: Pole of supply is to be not more than 600mm from the point of attachment).

5. Where there is no formed kerb, the kerb line means:
   - the kerb line of a proposed kerb or
   - where no kerb line is proposed, the edge of the existing carriageway or
   - any proposed widening thereof.

6. Where a window sill is determined as not being a place a person is likely to stand (e.g. opend windows, screens removed, screens open, windows and sliding windows) a clearance of 2.5m vertically from floor or 1.2m horizontally shall apply.

7. Where a window sill is determined as not being a place a person is likely to stand (e.g. opend windows, screens removed, screens open, windows and sliding windows) a clearance of 2.5m vertically from floor or 1.2m horizontally shall apply.

8. For this table a conductor is taken to be insulated if it is insulated in accordance with AS/NZS 3600:1 (Electric cables - Polymeric insulated - For working voltage up to and including 0.6/1.0 kV) or AS/NZS 3600:1 (Electric cables - Cross-linked polyethylene insulated - Aerial bunched - For working voltages up to and including 0.6/1.0 (1.2) kV). Otherwise it is taken to be uninsulated.
Queensland Electricity Connection Manual

Revision: B
CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS
CUSTOMERS SERVICE POLE (3.5 kN SWL)
GENERAL ARRANGEMENT

QECM - 5.6
Queensland Electricity Connection Manual

Energex Limited ABN 40 078 849 055

Ergon Energy Corporation Limited ABN 50 087 646 062

Revision: B

CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS
BUILDERS TEMPORARY SERVICE POLE (1.0 kN SWL)
GENERAL ARRANGEMENT

QECM - 5.9
# MATERIAL LIST

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>No. Off</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pole</td>
<td>1</td>
<td>80 N.B. x 4.0 Thk. x 6500Lg. Std. Galv. Pipe</td>
</tr>
<tr>
<td>2</td>
<td>Cap or Disc</td>
<td>1</td>
<td>To suit 50N.B. Pipe</td>
</tr>
<tr>
<td>3</td>
<td>Service Attachment Ring</td>
<td>1</td>
<td>M10 Eyebolt</td>
</tr>
<tr>
<td>4</td>
<td>Mains connection Box Baseplate</td>
<td>1</td>
<td>FL 75 3 x 200 Lg. 3nt 60° as shown on drawing</td>
</tr>
<tr>
<td>5</td>
<td>Mains Connection Box</td>
<td>1</td>
<td>3 terminal clipel Cat. No. IP23</td>
</tr>
<tr>
<td>6</td>
<td>Threaded PVC Bush</td>
<td>1</td>
<td>To suit MCB</td>
</tr>
<tr>
<td>7</td>
<td>Screw (Drl &amp; tap item-4 to suit MCB)</td>
<td>2</td>
<td>M5 x 12Lg. S/S Grade 304</td>
</tr>
<tr>
<td>8</td>
<td>Ladder Support Bracket</td>
<td>1</td>
<td>Taper-flange Channel</td>
</tr>
<tr>
<td>9</td>
<td>Ladder Support Member</td>
<td>1</td>
<td>L 25x26x6x600Lg</td>
</tr>
<tr>
<td>10</td>
<td>Ladder Step</td>
<td>2</td>
<td>L 26x6x125Lg</td>
</tr>
<tr>
<td>11</td>
<td>Strut Attachment Lug</td>
<td>3</td>
<td>FL 50 x 10 x 75Lg</td>
</tr>
<tr>
<td>12</td>
<td>Strut Members</td>
<td>3</td>
<td>25NB. x 3150Lg Std. Galv. Pipe</td>
</tr>
<tr>
<td>13</td>
<td>Meter Box Supports</td>
<td>2</td>
<td>FL 50 x 6 x 400Lg</td>
</tr>
<tr>
<td>14</td>
<td>Earthing Lug</td>
<td>1</td>
<td>FL 50 x 6 x 50Lg</td>
</tr>
<tr>
<td>15</td>
<td>Stabilising fin</td>
<td>1</td>
<td>FL 50 x 6 x 1450Lg</td>
</tr>
<tr>
<td>16</td>
<td>Peg</td>
<td>3</td>
<td>L 38 x 38 x 3 x 900Lg. (See Detail 3)</td>
</tr>
<tr>
<td>17</td>
<td>Striking Plate</td>
<td>3</td>
<td>FL 50 x 10 x 50Lg</td>
</tr>
<tr>
<td>18</td>
<td>Bolt &amp; Nut</td>
<td>6</td>
<td>M12 x 40 Lg. Hex. Galv.</td>
</tr>
</tbody>
</table>

# SPECIFICATIONS

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

**TOLERANCE:**
All tolerances to be ± 0.

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

**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

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

**TEMPORARY SERVICE POLE (1.0 kN SWL)**
**FABRICATION AND CONSTRUCTION DETAILS**
QECM - 5.11
Queensland Electricity Connection Manual

RAISER BRACKET - STAY DETAIL

RAISER BRACKET THROUGH (RAFTER) ROOF TYPE

RAISER BRACKET - FASCIA TYPE

RAISER BRACKET PARAPET TYPE

DIRECTION OF SERVICE - RAISER BRACKET/OPEN EYE SCREW
RAISER BRACKET: The raiser bracket is to be installed in accordance with Manufacturers instructions.

NOTE: Services will not be connected where the bracket is installed incorrectly i.e. service direction altered without permission/agreement by Manufacturer.

DIRECTION OF SERVICE - EYEBOLT
EYEBOLT
Service permitted in any required position. Service must not come in contact with any structure and statutory clearances apply.

NOTES
1. Manufacturers and Registered Professional Engineer Qld (RPEG) Installation instructions are to be followed in all cases - this detail in this drawing is INFORMATIVE ONLY.
2. Raiser brackets and eyebolts are to be HOT DIPPED GALVANISED STEEL and marked with a suitable 'SWL' rating.
3. Raiser brackets are to be certified by an RPEG and approved by the distributor.
4. 1kN raiser brackets must not be used to terminate 50.05mm² LV ABC service. A 3.5kN raiser bracket or an eyebolt/eye screw installed on a suitable portion of the building or a property pole is to be used.
5. If the service bracket/eyebolt is within 25mm of any structural metal work e.g. guirting or metal fascia of the building, the distributor will bond between the service attachment and the neutral conductor of the service.
6. The customer is to provide suitable means to connect bonding conductor i.e. Earth tag with 12mm hole.

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TYPICAL EXAMPLES FOR 25/35mm² LV ABC (1kN) SERVICES ATTACHMENTS ON STRUCTURES - EYEBOLT & RAISER BRACKET
QECM- 5.12

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Joint document between Energex and Ergon Energy
Energex Limited ABN 40 078 849 055   Ergon Energy Corporation Limited ABN 50 087 646 062
CUSTOMER TO PROVIDE THE MEANS FOR ATTACHMENT AND CONNECTION OF THE SERVICE TO THE CUSTOMER'S INSTALLATION

REFER QECM 5.12 FOR SERVICE ATTACHMENT DETAIL PROVIDED BY CUSTOMER.

TERMINATION CLAMP PROVIDED BY DISTRIBUTOR

SERVICE

BOND CONNECTION (IF REQUIRED TO BE EQUIVALENT SIZE OF SERVICE MAINS) PROVIDED BY DISTRIBUTOR

MCB WITH SERVICE CONNECTORS PROVIDED BY CUSTOMER.

THREE PHASE SERVICE ARRANGEMENT SHOWN

FASCIA

25/35 mm² LVABC SERVICE CONNECTION
WOOD OR METAL FASCIA

M12 SERVICE ATTACHMENT
OPEN EYE SCREW HOOK, OPEN EYEBOLT (THREADED), OR CLOSED EYEBOLT (THREADED), PROVIDED BY CUSTOMER.

TERMINATION CLAMP PROVIDED BY DISTRIBUTOR

WOOD POLE

THREE PHASE SERVICE ARRANGEMENT SHOWN

CUSTOMER MAINS

25/35 mm² LVABC SERVICE CONNECTION
CUSTOMER'S WOOD POLE

BOND CONNECTION (IF REQUIRED TO BE EQUIVALENT SIZE OF SERVICE MAINS) PROVIDED BY DISTRIBUTOR

M12 SERVICE ATTACHMENT
OPEN EYE SCREW HOOK, OPEN EYEBOLT (THREADED), OR CLOSED EYEBOLT (THREADED), PROVIDED BY CUSTOMER.

TERMINATION CLAMP PROVIDED BY DISTRIBUTOR

SERVICE

THREE PHASE SERVICE ARRANGEMENT SHOWN

CUSTOMER MAINS

25/35 mm² LVABC SERVICE CONNECTION
CUSTOMER'S CONDUCTIVE POLE

CONDUCTIVE POLE

25/35 mm² LVABC SERVICE CONNECTION
GALVANISED STEEL RAISER BRACKET

RAISER BRACKET (5W. 1W)
PROVIDED BY CUSTOMER

BOND CONNECTION (IF REQUIRED TO BE EQUIVALENT SIZE OF SERVICE MAINS) PROVIDED BY DISTRIBUTOR

TERMINATION CLAMP PROVIDED BY DISTRIBUTOR

SERVICE

THREE PHASE SERVICE ARRANGEMENT SHOWN

STAYWISE PROVIDED BY CUSTOMER

NOTES
1. TO PREVENT CORROSION COPPER CONDUCTORS SHALL NOT BE DIRECTLY CONNECTED TO GALVANISED SURFACES.

2. CUSTOMER TO SUPPLY AND INSTALL APPROVED MAINS CONNECTION BOX OR NON-METALLIC UV STABILISED WEATHERPROOF ENCLOSURE. (REFER TO CLAUSE 6.8.7 SEE DETAIL FOR MIN SIZE.

Revision: B

CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS 1.0kN SWL CONNECTION AND BRIDGING DETAIL

QECM - 5.13
CUSTOMER TO PROVIDE THE MEANS FOR ATTACHMENT AND CONNECTION OF THE SERVICE TO THE CUSTOMER'S INSTALLATION

UP TO 100 AMP

- SERVICE TERMINAL M16 (SWL 1.5kN)
- CONSUMER MAINS
- LVABC

SEE NOTES:

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)

2. CUSTOMER TO SUPPLY LUGS TO SUIT CURRENT RATING OF CABLE AND SHALL ACCOMMODATE A 12MM BOLT. CUSTOMER TO SUPPLY ALD/BRES WHERE REQUIRED. CONSUMER MAINS TO ENTER THROUGH BOTTOM OF ENCLOSURE.

3. ALTERNATE CONNECTIONS METHOD USE APPROPRIATE COPPER SUB EMB.

4. COVER WITH INSULATING SHROUD AND SECURE WITH ZIP TIE.

5. THE BONDING OF EXPOSED METAL WORK (EYEBOLT) MUST USE A CONDUCTOR SIZE THE SAME AS THE LVABC NEUTRAL.

6. PCB'S MUST BE USED TO CONNECT ALL EARTHING CONDUCTORS TO LVABC NEUTRAL.

BOND CONNECTION

- SEE BELOW FOR CONNECTION DETAIL
- NON-METALLIC WEATHERPROOF ENCLOSURE
- MINIMUM SIZE AS PER TABLE 5.2
- MAINS ENTRY

Typical LVABC to Single Consumers Mains Connection Detail

TYPICAL LVABC TO SINGLE CONSUMERS MAINS CONNECTION DETAIL

- LVABC
- BOND CONNECTION
- CONSUMER MAINS

LVABC Connection to Single Consumers Mains

NOTES:

- LVABC
- SHROUD

LVABC Connection to Parallel Consumers Mains

Typical LVABC to Parallel Services Mains Connection Detail

- LVABC
- CONSUMER MAINS

LVABC Connection to Parallel Consumers Mains

- LVABC
- SHROUD

CUSTOMER'S OVERHEAD SERVICE ATTACHMENTS CONNECTION AND BRIDGING DETAIL FOR SINGLE AND PARALLEL LVABC SERVICES FOR C & I INSTALLATIONS (MAX 400 A)

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QECM - 5.14

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NOTES:
1. Customers mains and installation including conduit and mains connection box are the responsibility of the customer and shall be installed by an approved contractor or the distributor in accordance with AS/NZS 3000
2. Customer is responsible for seeking permission from distributor to install customer mains as per clause 5.10
3. Consumer terminal box is optional. For full details see underground construction manual.
4. Consumer terminal box shall be located on the side of the pole which is least hazardous to maintenance personnel (normally facing building line).
5. Customer's mains shall be installed minimum of 3m from pole.
6. An MEN earth is to be installed at the pole unless existing on an adjacent pole.
7. Customer is responsible for seeking permission from road authority to install assets in the road reserve.
8. Excessive excavation at the pole base may disturb pole foundations. Avoid excavating in areas shown.

Revision: A

CONSUMER MAINS ON DISTRIBUTORS ASSET

QECM - 5.16
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 bimetallic 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 mm² 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>
<thead>
<tr>
<th>Meter and Network Device Details</th>
<th>Height (mm)</th>
<th>Width (mm)</th>
<th>Depth (mm)</th>
<th>Approx. Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network device</td>
<td>190</td>
<td>110</td>
<td>110</td>
<td>0.5</td>
</tr>
<tr>
<td>Metering Isolation Link</td>
<td>90</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

(a) 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.

(b) 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.

(c) The panel within the meter enclosure should be not more than 300 mm from the front of the meter enclosure.

(d) 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

<table>
<thead>
<tr>
<th>Address Where DT Metering Installed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Metering Identifier (NMI) (If known):</td>
</tr>
</tbody>
</table>

### Details of Electrical Mechanic Responsible for Testing of DC Installation:

<table>
<thead>
<tr>
<th>Name:</th>
<th>Licence No:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Clause No.</th>
<th>Checklist</th>
<th>Checked</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>General Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Supply Agreement – new installation or load change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Number of phases to be installed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Overhead Connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2.1</td>
<td>POA maximum 20m from property boundary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8</td>
<td>Service Line does not cross neighbouring property boundary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5 (c)</td>
<td>POA or service line over or within pool zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8.2</td>
<td>POA requirements met</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8.6</td>
<td>Property pole connection RPEQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Underground Connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.9</td>
<td>Confirm availability of supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.9.3</td>
<td>Pillar Connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.11.2</td>
<td>LV Striple in padmount connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Meter Connection Requirements</strong></td>
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<td></td>
</tr>
<tr>
<td>6.1</td>
<td>No customer equipment before the metering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Metering Determination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4</td>
<td>Addition &amp; Alternation Category of Works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5</td>
<td>Metering Isolation Link (MIL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6</td>
<td>Metering Neutral Link (MNL)</td>
<td></td>
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</tr>
<tr>
<td>6.7</td>
<td>Conductor Identification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.9.1</td>
<td>Main Switch and MEN at meter position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.9.2-6.9.9</td>
<td>Meter Panel Location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.11</td>
<td>Spacing Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.12</td>
<td>Meter Panel Mounting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.13</td>
<td>Metering Height</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Additional Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS/NZS 3000</td>
<td>Test continuity to confirm that cabinets are earthed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>All requirements of the QEMM met.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 6.18. LV Current Transformer Metering Check Sheet

Electrical Contractor’s LV CT Metering Check Sheet

**Address Where CT Metering Installed:**

**National Metering Identifier (NMI) (If known):**

**Details of Electrical Mechanic Responsible for Testing of CT Installation:**

**Name:**

<table>
<thead>
<tr>
<th>Clause No.</th>
<th>Checklist</th>
<th>Checked</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switchboard/CT Chamber</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6.3</td>
<td>Lockable isolator on line side of CTs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Dedicated CT chamber provided:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>CT chamber correctly labelled:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Removable CT chamber cover fitted with 2 handles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Transformers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>CT ratio matches expected load:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.12</td>
<td>No exposed live parts within CT chamber:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Primary and secondary polarity is correct:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Removable bus bars allow CTs to be easily replaced:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>CT secondary terminals are accessible:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage Circuit Fuses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Fuses carriers are accessible and easily removable:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Fuses are connected to the line side of the CTs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Cables from bus bars to fuses are ≤ 500mm and a minimum. of 10mm² SDI:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Correct marking of cables from bus bars to fuses (e.g. trace or bell out cables):</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Neutral &amp; Earthing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS/NZS 3000</td>
<td>Test continuity to confirm that cabinets are earthed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Meter neutral is connected to main neutral and meter neutral label is attached:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Panel Wiring &amp; Test Block</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 6</td>
<td>Meter panel located in suitable location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QECM</td>
<td>Meter panel size is minimum 600 x 600mm (or 460 x 600mm for single tariff CT installation):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Meters are mounted at correct height:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Meter panel is hinged:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Meters and wiring spaced from heavy current carrying conductors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Test block is mounted correctly:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Colour coding is correct:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Meter wiring is correct size for circuit length:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>Secondary returns are starred and earthed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sealing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QEMM</td>
<td>CT chamber, voltage circuit fuses and meter panel are sealable:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
METERING ISOLATION LINK

LINK BASE

SIDE VIEW

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 UNDERNATH THE METER.

4. CLEARANCE OF 40mm TO BE LEFT AT EACH END OF LINK TO FACILITATE SEALING.
Queensland Electricity Connection Manual

SINGLE LINE DIAGRAM

TYPICAL CT AND DIRECT CONNECTED
MULTI-CUSTOMER METERING ARRANGEMENTS

NOTES:
1. INSTALL METERING ISOLATION / FUSED LINKS BEFORE EACH WHOLE CURRENT METER SHOWN AS WH.

   USE APPROVED BACK WIRED METERING ISOLATION LINKS FITTED WITH 80 OR 100 AMP HRC FUSE CARTRIDGES (REFER CLAUSE 6.5.1.3) AS PER DRAWING QECM 6.2.

2. ALL ISOLATORS, CIRCUIT BREAKERS AND MAIN SWITCHES BEFORE METERING EQUIPMENT TO BE LOCKABLE (ON & OFF).

   ALSO REFER TO AS/NZS3000 AS SPECIAL REQUIREMENTS APPLY TO THE ARRANGEMENT OF SUPPLY TO SAFETY SERVICES.

3. WHERE CIRCUIT BREAKERS ARE USED IN PLACE OF ISOLATION SWITCHES THEY MUST DISCRIMINATE AND COORDINATE IN ACCORDANCE WITH AS/NZS3000. DASCADING OF CIRCUIT BREAKERS IS TO COMPLY WITH THE MANUFACTURERS REQUIREMENTS AND AS/NZS3000 WHERE REQUIRED.

4. CURRENT LIMITING DEVICE FOR THE PROTECTION OF WHOLE CURRENT METERING CIRCUITS TO COMPLY WITH AS/NZS3000 WHERE REQUIRED.

Revision: B

QECM - 6.3
SINGLE CT CUSTOMERS

PREFERRED ARRANGEMENT FOR ALL SINGLE CT CUSTOMERS
(MANDATORY FOR SPECIFIC CUSTOMERS DETAILED IN 6.5.3.1)

ALTERNATIVE ARRANGEMENT FOR NON-SPECIFIC CUSTOMERS
(REFER 6.5.3.3)

MULTIPLE CT CUSTOMERS

LOCKABLE ISOLATOR

CT

MAIN SWITCHES

MAIN SWITCH

CT

CIRCUIT PROTECTION

MULTIPLE CT & DIRECT CONNECTED METERED CUSTOMERS

LOCKABLE ISOLATOR

CT 'A'

CUSTOMER 'A'

LOCKABLE ISOLATOR

CT 'B'

CUSTOMER 'B'

METERING

ISOLATION LINK

MULTIPLE DIRECT CONNECTED METERED CUSTOMERS

METERING

ISOLATION LINK

METER 'A'

METER 'B'

METER 'C'

SEALABLE
ACTIVE LINK

TYPICAL EXAMPLES OF MAIN SWITCHBOARD METERING ARRANGEMENTS

NOTE:
WHERE THE SERVICE FUSES ARE 110A OR GREATER, THE METERING PROVIDER CAN REPLACE THE METERING
ISOLATION LINKS WITH 80 OR 100A HRC FUSE CARTRIDGES AS REQUIRED (REFER CLAUSE 6.5.2.3).

Revision: B

SINGLE LINE DIAGRAM

TYPICAL CT & DIRECT CONNECTED
MULTI-CUSTOMER METERING ARRANGEMENTS

QECM - 6.4

Page 84 of 127
SINGLE STREET FRONTAGE

PLAN VIEW OF PREMISES

PLAN VIEW OF PREMISES

POOL

STREET

PLAN VIEW OF PREMISES

PLAN VIEW OF PREMISES

DRIVEWAY

STREET

SHADING SHOWS SUITABLE LOCATION FOR METER BOX. (NOT BEYOND PROPERTY FENCE),

SHOWS PEDESTRIAN ACCESS.

PROPERTY FENCE.

Revision: B

SUITABLE LOCATION OF METERING PANELS

SINGLE DOMESTIC

QECM - 6.5-1
DOUBLE STREET FRONTAGE

PLAN VIEW OF PREMISES

STREET

PLAN VIEW OF PREMISES

PEDESTRIAN ACCESS FROM ONE STREET

PEDESTRIAN ACCESS FROM TWO STREETS

SHADING SHOWS SUITABLE LOCATION FOR METER BOX (NOT BEYOND PROPERTY FENCE).

SHOWS PEDESTRIAN ACCESS.

PROPERTY FENCE.

NOTES:
1. Meters shall be erected on the side of the premises facing a street from which there is pedestrian access or within the first 2 metres along an adjacent side of the premises. (Unless otherwise approved in writing by the Distributor).

2. Point of attachment for the service and point of supply MUST NOT be positioned such that the Distributor's personnel need to climb on roofs or enter swimming pool areas.

Revision: B

SUITABLE LOCATION OF METERING PANELS
SINGLE DOMESTIC

QECM - 6.5-2
<table>
<thead>
<tr>
<th><strong>OH/UG</strong></th>
<th><strong>Community Title Scheme</strong></th>
<th><strong>Customer Reticulated community title schemes</strong></th>
<th><strong>Distributor’s Reticulation</strong></th>
<th><strong>Single unit dwellings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meter Position</strong></td>
<td>1 meter position on common property</td>
<td>The MBS and first meter position on common property plus 1 additional meter position for every additional 12 customers if required</td>
<td>1 meter position per dwelling opposite from the point of supply</td>
<td>1 meter position per unit</td>
</tr>
<tr>
<td><strong>Point of Supply</strong></td>
<td>1 Point of supply per community title scheme</td>
<td>1 Point of supply per community title scheme</td>
<td>1 Point of supply per unit</td>
<td>1 Point of supply per unit</td>
</tr>
</tbody>
</table>

**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, i.e., 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 Clauses 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 i.e., Granny flats, sheds, dependent persons accommodation.

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

**Revision:**

**SUITABLE LOCATION OF METERING PANELS**

**COMMUNITY TITLE**

**QECM - 6.6**
R.M LOCK CYLINDER

TYPE 201 CYL FOR USE IN NIGHTLATCH/STREAMLATCH/DEADLATCH/(CYLINDER ONLY PROVIDED.)

MORTICE LOCK CYLINDER

TYPE 370 CYL FOR USE IN CYLINDER MORTICE LOCKS AND LATCHES.
(CYLINDER ONLY PROVIDED.)

KEY - IN - KNOB CYLINDER

TYPE 538 CYL FOR USE IN KEY-IN-KNOB AND KEY-IN-LEVER LOCKSETS.
(CYLINDER ONLY PROVIDED.)

BRASS PADLOCK

TYPE 234 FOR USE IN ERGON ENERGY
TYPE 334/39 FOR USE IN ENERGEX
234/45/10 - 19mm SHACKLE
234/45/13 - 38mm SHACKLE
234/45/146 - 45mm SHACKLE
234/45/150 - 90mm SHACKLE
(COMPLETE LOCK PROVIDED.)

METER CUBICLE LOCK

TYPE "L" HANDLE OR "T" HANDLE TO BE USED AS A METER CUBICLE LOCK.
(COMPLETE LOCK PROVIDED.)

NOTES:
1. USE "EX" PREFIX TO INDICATE ENERGEX METERING KEY SYSTEM EG ENERGEX RIM LOCK CYLINDER USE TYPE EX201 CYL.
2. A LIST OF APPROVED LOCKSMITHS IS AVAILABLE ON THE DISTRIBUTORS WEBSITE - SEE CONTACTS PAGE FOR DETAILS.
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 IMMCT, METERING
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 sub mains 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 4mm² and shall not exceed 6mm².

Aluminium cables are not permitted for connection directly into network device terminals.
WIRING DIAGRAM - DIRECT CONNECTED METERING
SINGLE PHASE PRINCIPAL SUPPLY PLUS
NIGHT RATE OR CONTROLLED SUPPLY

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 P4C AREAS.
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 CONTACOR CONTROLLED BY THE NETWORK DEVICE
4. METERING ARRANGEMENT INDICATIVE FOR PVC AREAS.
# 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 PCC AREAS.

Revision: A

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

QECEM - 7.3
WIRING DIAGRAM - DIRECT CONNECTED METERING
SINGLE PHASE/PRINCIPAL SUPPLY PLUS
NIGHT RATE OR CONTROLLED SUPPLY
MUTLIPLE INSTALLATIONS

QECM • 7.4

NOTES:
1. TERMINAL CONNECTIONS "TO BE MADE ACCORDING TO THE TYPE
   OF NETWORK DEVICE."
2. WHERE POSSIBLE THE INDIVIDUAL SWITCHES OF EACH MULTI SWITCH
   NETWORK DEVICE SHOULD BE CONNECTED TO THE SAME PHASE.
3. INSTALL APPROVED BACK WIRED METERING ISOLATION LINKS.
   NOTE: WHERE METER NOT INSTALLED REMOVE SOLID LINK TO ENSURE NO EXPOSED LIVE TAIL.
4. WHERE SERVICE FUSES ARE 100 AMPS OR GREATER, THE METERING PROVIDER CAN REPLACE THE
   METERING ISOLATION LINKS WITH 80 OR 100A HINGE FUSE CARTRIDGES AS REQUIRED (REFER CLAUSE 8.5.2.3).
5. AN INSTALLATION ISOLATOR OR LOCKABLE CB MAIN SWITCH IS REQUIRED ON THE LINE SIDE OF THE METERING. REFER
   CLAUSE 5.5.2.2 AND DRAWING QECM 8.3.
6. METERING ARRANGEMENT INDICATIVE FOR POC AREAS.
WIRING DIAGRAM - DIRECT CONNECTED METERING
TWO PHASE PRINCIPAL SUPPLY PLUS
SINGLE PHASE NIGHT RATE OR CONTROLLED SUPPLY

# ITEMS SUPPLIED BY METERING PROVIDER.
% ITEMS SUPPLIED BY DISTRIBUTOR.
* SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

NOTES:
1. METERING ARRANGEMENT INDICATIVE FOR PGC AREAS.
METERING AS SUPPLIED BY MP

kWh METER
PRINCIPAL SUPPLY
A B C

kWh METER
NIGHT RATE OR CONTROLLED SUPPLY
A B C

NETWORK DEVICE

% TO NIGHT RATE OR CONTROLLED SUPPLY HOT WATER LOAD MAIN SWITCH

ACTIVE
METERING ISOLATION LINKS / CB'S

# ITEMS SUPPLIED BY METERING PROVIDER.
% ITEMS SUPPLIED BY DISTRIBUTOR.
★ SWITCH POSITION AND NUMBER OF SWITCHES DETERMINED BY SUPPLY AND LOAD TYPE.

TO NEUTRAL LINK

NOTES:

1. ## CURRENT LIMITING DEVICES FOR THE PROTECTION OF WHOLE CURRENT METERING CIRCUITS SHALL BE NO GREATER THAN A 100A HRC FUSE OR EQUIVALENT (REFER CLAUSE 6.5.2.3).

2. 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.

3. METERING ARRANGEMENT INDICATIVE OF PeC AREAS (REFER CLAUSE 6.5.2.3).

Revision: B

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

QECM - 7.6
WIRING DIAGRAM - DIRECT CONNECTED METERING
THREE PHASE PRINCIPAL SUPPLY PLUS
SINGLE PHASE NIGHT RATE OR CONTROLLED SUPPLY

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NOTES:
1. OTHER CONTROLLED SUPPLY LOAD CANNOT BE CONNECTED IN CONJUNCTION WITH NIGHT RATE LOAD ON THE ONE METER (REFER TO DRAWING OECM7.3).
2. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.

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Joint document between Energex and Ergon Energy
Energex Limited ABN 40 078 849 055  Ergon Energy Corporation Limited ABN 50 087 646 062
# 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 CONTACOR.
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 PCC AREAS.
WIRING DIAGRAM - CURRENT TRANSFORMER METERING
THREE PHASE PRINCIPAL SUPPLY PLUS
THREE PHASE NIGHT RATE OR CONTROLLED SUPPLY

% ITEMS SUPPLIED BY DISTRIBUTOR

SWITCH POSITION DETERMINED BY SUPPLY AND LOAD TYPE.

NOTES:
1. BRIDGING LINK FOR STAR CONNECTION ON TEST BLOCK REPLACES PREVIOUS STAR & EARTH LINK.
2. SPECIFIC SINGLE CUSTOMER ISOLATION SHOWN. REFER TO CLAUSE 6.2.3 FOR OTHER ISOLATION ARRANGEMENTS.
WIRING DIAGRAM - DIRECT CONNECTED METERING
SINGLE PHASE PRINCIPAL SUPPLY PLUS
NIGHT RATE OR SMART ELECTRICAL PRODUCT

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 P&G AREAS.
5. ACTUAL TERMINALS USED FOR SECOND ELEMENT ARE AS PER METERING PROVIDER DIRECTION.
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 CONTACOR CONTROLLED BY THE NETWORK DEVICE

4. METERING ARRANGEMENT INDICATIVE FOR PGC AREAS.
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. METERING ARRANGEMENT INDICATIVE FOR PVC AREAS.
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:

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

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.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A - ACTIVE IN</td>
</tr>
<tr>
<td>2</td>
<td>N - NEUTRAL IN</td>
</tr>
<tr>
<td>3</td>
<td>Lm - ELEMENT 1 (MAIN - PRIMARY LOAD)</td>
</tr>
<tr>
<td>4</td>
<td>Li - ELEMENT 2 (UNSITCHED - IES SUPPLY)</td>
</tr>
<tr>
<td>5</td>
<td>S1 - NOT USED</td>
</tr>
</tbody>
</table>

4. METERING ARRANGEMENT INDICATIVE FOR POC AREAS.
NOTES:
1. INVERTER ENERGY SYSTEM (IES), COMPLIANT TO AS4777, CONNECTED WITHIN THE INSTALLATION ON THE CUSTOMERS SIDE OF THE IES SUPPLY MAIN SWITCH.
2. METERING ARRANGEMENT INDICATIVE FOR PoC AREAS.
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
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:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MINIMUM THICKNESS (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Steel</td>
<td>Enclosure Type A 1.0</td>
</tr>
<tr>
<td></td>
<td>Enclosure Type B 1.2</td>
</tr>
<tr>
<td>Aluminium</td>
<td>To be equivalent in strength and rigidity to the above mild steel requirements</td>
</tr>
<tr>
<td>Other Materials</td>
<td>To be approved</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Metal Enclosure</th>
<th>Minimum Thickness Mild Steel</th>
<th>Minimum Space Required For Metering Equipment</th>
<th>Clearance From Back of Meter Panel to Back of Enclosure</th>
<th>Clearance From Back of Meter Panel to Inside of Door</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>1.0mm</td>
<td>480mm x 460mm (high) (wide)</td>
<td>75mm</td>
<td>185mm</td>
</tr>
<tr>
<td>Type B</td>
<td>1.2mm</td>
<td>600mm x 550mm (high) (wide)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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## APPENDIX B - GLOSSARY OF TERMS

### Accredited Auditor
A person appointed under section 129 of the *Electrical Safety Act 2002* to audit high voltage or hazardous area installations before connection to supply.

Further information may be obtained from the Electrical Safety Office.

### AEMO
‘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.

### AF Receiver
See “Network Device”

### Capital Contribution
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 distributor from the connection service.

### Card Operated Meter
A meter that contains control equipment that switches on and off in accordance with the amount of credit stored in the meter.

### Common Property
*Common property* means so much of a parcel as from time to time is not comprised in any lot. Refer to *Building Units and Group Titles Act 1980*(Qld)

### Community Title Development
A subdivision of land in which individual lots do not necessarily have immediate access to a dedicated road serve and which comply with the *Body Corporate and Community Management Act (Qld)*.

### Connection Point
The agreed point of supply established between Network Service Provider(s) and another Registered Participant, Non-Registered Customer or franchise customer.

**Note (1):** 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’.

**Note (2):** The *Queensland Electricity Regulation 2006* uses the definition ‘consumer’s terminals’.

**Note (3):** The *National Electricity Rules* uses the definition ‘connection point’.

**Note (4):** This is the point which differentiates the responsibilities of the Network Service Provider and the application of AS/NZS 3000.

### Connection Policy
The distributor’s connection policy provides an outline of connection services, when connection charges may be payable by customers and how those charges are calculated.
<table>
<thead>
<tr>
<th><strong>Consumer Mains</strong></th>
<th>The conductors between the connection point and the main switchboard.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer’s Terminals</strong></td>
<td>See connection point.</td>
</tr>
<tr>
<td><strong>Controlled Load, Controlled Supply</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Current Transformer Metering</strong></td>
<td>A metering arrangement where electricity flow is measured by a meter using current transformers (CTs).</td>
</tr>
<tr>
<td><strong>Customer</strong></td>
<td>A person, including a relevant body corporate, who receives, or wants to receive, a supply of electricity for a premise from an electricity entity or special approval holder.</td>
</tr>
<tr>
<td><strong>Direct Connected Meter</strong></td>
<td>A meter where the electricity flow is directly measured by the meter i.e. the current under measurement passes through the meter itself.</td>
</tr>
<tr>
<td><strong>Distribution Entity, Distributor</strong></td>
<td>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 Electricity Act 1994 (Qld). (Refer to definition for Relevant Distribution Entity).</td>
</tr>
<tr>
<td><strong>EG system (s)</strong></td>
<td>One or more embedded generating units and auxiliary equipment that are interconnected with a distributor’s network.</td>
</tr>
<tr>
<td><strong>Electrical Contractor (EC)</strong></td>
<td>A person licensed under the Electrical Safety Act 2002 to conduct a business or undertaking that includes the performance of electrical work.</td>
</tr>
<tr>
<td><strong>Electrical Work Request (EWR)</strong></td>
<td>The request from the customer’s electrical contractor to a distributor to perform a distribution service e.g. (i) Energex - Form 2; or (ii) Ergon Energy - Form 2 - Request for Initial Connection, Metering Change or Service Alteration</td>
</tr>
<tr>
<td><strong>Energex</strong></td>
<td>Energex Limited - ABN 40 078 849 055</td>
</tr>
<tr>
<td><strong>Enhanced Metering</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Ergon Energy</strong></td>
<td>Ergon Energy Corporation Limited ABN 50 087 646 062</td>
</tr>
<tr>
<td><strong>Energy Storage System (ESS)</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>EVSE</strong></td>
<td>Electric Vehicle Supply Equipment as defined in AS/IEC 62196</td>
</tr>
<tr>
<td><strong>Excluded Customer</strong></td>
<td>A customer who cannot choose their retailer. For example, customers connected to isolated power systems.</td>
</tr>
</tbody>
</table>
Gross Energy Scheme  The Gross Energy Scheme separately meters the full energy output of the Small IES EG Connection. The energy consumed at the premises is metered normally.

High Voltage Metering  A high voltage metering arrangement where electricity flow is measured by a meter using current transformers and voltage transformers.

Interconnected  Connection of an EG system capable of parallel operation with a distributor’s network.

Isolated Power System  A supply network that does not form part of and is not connected to the national grid and may include an isolated feeder.

Large Customer  A customer whose annual consumption is equal to, or greater than, 100MWh, and is connected to the distributor’s network.

Large Non-market Customer  A large non-market customer, for premises, is a large customer for the premises who is also a non-market customer for the premises.

Metering Coordinator  A person who has been registered by AEMO under Chapter 2 of the National Electricity Rules to engage in the coordination and provision of metering services at a connection point in accordance with Chapter 7 of the National Electricity Rules.

Metering Data Agent  An agent appointed by AEMO to undertake the collection, processing and transfer of metering data to AEMO and other registered participants.

Metering Data Provider  A person who meets the requirements listed in schedule 7.3 of the National Electricity Rules 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.

Metering Provider (MP)  A person who meets the requirements listed in schedule 7.2 of the National Electricity Rules and has been accredited and registered by AEMO to undertake the provision, installation and maintenance of metering installations.

Note: The distributor is the metering provider in non-NEM areas.

NATA  The National Association of Testing Authorities.

National Electricity Rules  The rules under which the National Electricity Market operates.

National Metering Identifier (NMI)  A National Metering Identifier (NMI) is a unique national identifier that relates to the metering installation at a customer’s premises.
**Net Energy Scheme**

The **Net Energy Scheme** provides for the separate measurement of the energy supplied from the LV network to the customer’s installation in excess of the *Small IES* generation, and the excess energy supplied to the LV network from the premises by the *Small IES* after the energy needs at the premises are met.

**Network Device, AF Receiver**

Apparatus or equipment that: (a) enables a distributor 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 customer.

**NMI Classification Code**

In accordance with the *Market Settlement and Transfer Solution Procedures*:
- Small - annual consumption less than 100MWh
- Large - annual consumption equal to, or greater than 100MWh.

**Point of Attachment**

The point at which aerial conductors of a service line or aerial consumer mains are terminated on a customer’s structure.

**Point of Entry**

The point at which the consumer mains or the underground service cable enters a structure.

**Premises**

*Premises 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.

*Premises, of a customer, means premises owned or occupied by the customer. Queensland Electricity Act 1994*

**QECM**

Queensland Electricity Connection Manual

**QEMM**

Queensland Electricity Metering Manual

**QECMM**

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.

**Relevant Distribution Entity, Distributor**

The relevant distribution entity for a premises, means the distribution entity to whose supply network the premises are, or will be, connected.

*Note:* For the purposes of this document the relevant distribution entity will be referred to as the ‘distributor’.

**Relevant Retail Entity, Retailer**

The relevant retail entity for a premise, means the retail entity who, under a retail contract, supplies or has agreed to supply electricity to the premises.

*Note:* For the purposes of this document the relevant retail entity will be referred to as the ‘retailer’.

**Retail Entity**

A person who holds a retail authority to sell electricity and retail services (a ‘retail authority’ authorises its holder to provide customer retail services under the terms of the authority).
RPEQ
Registered Professional Engineer Queensland.

Rural/Isolated Area
A rural/isolated area is defined as one with a density of less than 5 lots per hectare (i.e. would generally have a dedicated supply transformer).

Note: This definition is only applicable within the Ergon Energy distribution area.

Service Line
An electric line that-
(a) forms part of the works of an electricity entity; and
(b) connects consumer terminals to -

(i) other parts of the works of the electricity entity; or
(ii) the works of another electricity entity.

Schedule 9 of the Queensland Electricity Regulation 2006.

Small Customer
A customer who consumes less than 100MWh per annum and is connected to the distributor’s network.

Small IES
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.

Small IES Embedded Generation Connection
A connection between Small IES and a distribution network.

SOR
Service Order Request - This is a request from a Retailer to a Distributor to perform a distribution service (e.g. New Connections, Metering Alterations and Service Upgrades). It is also referred to as a B2B request.

Suitable Mains Connection Box
A mains connection box that is deemed to be compliant with the distributor’s technical specifications. Details are available by contacting the distributor via the methods listed on page 1.

Two element Meter
A single phase two element device which includes both metering and load switching within one meter.

Type 1-7 Metering Installation
As defined in the National Electricity Rules.

Unmetered Supply
A Type 7 metering installation classification (NER) 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.

Urban
A residential area with a system of street lighting.
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

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