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Electricity Consumption Metering Safety Requirements (Tasmania)

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Metering

1.1 General

The customer shall provide and maintain adequate mounting and installation facilities for metering equipment in the location/s approved by the Metering Provider.

The customer shall ensure that access is not subsequently restricted or the location otherwise rendered unsuitable. Should this occur, the customer shall restore suitable access or arrange for the relocation of the metering equipment by an electrical contractor.

All electrical workers either installing or preparing enclosures and wiring for electricity consumption metering, shall ensure that any electrical work performed does not create a risk of electric shock or failure of the electrical installation.

This document does not address electricity supply arrangements. Electrical contractors should contact the Distribution Network Service Provider or be aware of their requirements regarding electricity supply arrangements.

The ownership of meter panels and metering equipment is to be in accordance with the arrangement between the customer and the Retailer or Metering Provider. The requirements of this document apply to any person performing electrical work in relation to consumption metering.

1.2 Location and accessibility of metering equipment

The metering position is the location provided for the installation of metering equipment. Meters shall be located in a position with unhindered access for installing, reading, testing, adjustment and removal, without difficulty or hazard.

The area in which the metering is installed shall be adequately illuminated and kept clear, clean and free of rubbish and equipment.

Access to meter locations via platforms, walkways, stairways or ladders shall comply with Australian Standard (AS 1657). If there is any dispute about the suitability of the structure, the Metering Provider may request a certificate of compliance from a building surveyor.

1.2.1 Numbering of metering positions per property

Unless prior approval is given in writing by the Metering Provider only one metering position will be approved per property. More than one metering position may be granted if it makes sound engineering practice.

1.2.2 General Requirements

Generally, the metering position shall be on the front or side wall, within 1.2 metres of the front wall of the premises, facing the nearest access road. This will provide easy and safe access for installers, readers and for maintenance work.

Consideration should be given to future changes such as walls, fences, gates, landscaping and future building additions may affect access after metering equipment has been installed.

All-weather pedestrian access should be provided to every metering position for reasons of safety.

A multiple customer metering position shall be located in an area designated as "common property". "Common property" is an area accessible by all of the customers involved without the need for any customer to cross private property.

Height restrictions

1. Metering enclosures shall be installed within normal height limits of 1200mm (taken from bottom edge of the meter panel) and 1800mm (to the top edge of the meter panel).
2. If the width of a metering position cannot accommodate all the metering requirements, then approval may be given for a metering enclosure to be installed outside the approved normal height limits.

Note: Measurements for conditions (1) and (2) above shall be taken from the nearest normal standing position within 600mm from the front of the meter enclosure door in the closed position.

All metering positions shall have 600mm unrestricted access in front of them, which include opening the door to at least an angle of 120°.

If a major alteration takes place such as an upgrade of the consumer's mains or relocation of the switchboard, the metering, in the Metering Provider may require relocation of the meters to a suitable position.

In cases where the switchboard remains in its original position and the meters are relocated to a new position, electrical contractors shall be aware of both the requirements in AS/NZS3000 (particularly earthing and protection) as well as any requirements of the Metering Provider (such as security of unmetered cables)

All metering and associated equipment shall be electrically, mechanically and environmentally, protected in accordance with AS/NZS 3000.

Metering equipment supplied by the customer shall be of the type specified by the Metering Provider.

1.2.3 Multi-Tenanted premises

These include commercial, industrial and residential premises. The Metering Provider or their requirements should be considered before the metering enclosure and associated wiring is installed.

If more than one Metering Provider is associated with the installation the electrical contractor shall liaise with each and every Metering Provider regarding metering requirements.

1.2.4 Stratum title developments

Approval will be considered for multi metering position for stratum title development upon application to the Metering Provider. Documentation to be supplied shall include a copy of site planning documentation and if available, documentation of acceptance from the local council.

1.3 Protection and security of metering equipment

The metering enclosure shall be constructed in a manner to prevent the spread of fire in accordance with AS/NZS3000 as for the construction of switchboard enclosures and surrounds.

Metering enclosures shall have appropriate degree of protection in regard to climatic conditions and be constructed from appropriate materials to prevent corrosion.

1.3.1 Location of customer's equipment

Reasonable separation shall be maintained between the metering and the customer's switchboard or circuit protection device/s.

Unless it is a circuit protective device for the consumer's mains or metering equipment, the customer's switchboard equipment shall be installed on a physically separate panel or enclosure to that of the meter panel. Wiring that is not intended for the connection to the metering panel/s shall not be located in the wiring space directly behind the meter panel/s, unless contained within a physically separate duct or conduit located in a rear corner of the enclosure such that it does not obstruct the meter wiring space.

1.3.2 Security of equipment

Metering equipment shall have provision for application of security seals. Sealing holes shall have a minimum diameter of 2mm for the sealing ties to pass through.

Wherever possible, equipment shall be "back entry connected" so that conductors are not exposed.

Electrical equipment or connections requiring general access by an electrical contractor (such as MEN connections), shall not be located behind a sealed panel.

Provision shall be made to prevent unrestricted access to unmetered supplies or interference in accordance with the Metering Provider's requirements.

Typical security methods

Incoming un-metered cables within easy access shall be enclosed in conduit or covered by panels. Un-metered mains cables passing through the customer's switchboard shall be enclosed in conduit.

Access shall not be readily available to un-metered mains, and the following measures shall be implemented where necessary:

1. The use of a sealable escutcheon panel to cover front connected wiring.
2. Free-standing support frames shall have the sides and top covered with sealable panels.
3. Bare conductors and bus bars shall be enclosed with provision made for security sealing.

1.4 Installation of metering equipment

1.4.1 Metering enclosure locks

If a meter enclosure is required to be locked then the lock shall meet the requirements approved by the Metering Provider and any AS/NZS 3000 requirements regarding access to main switches and switchboards.

1.4.2 Enclosure requirements

Metering enclosures shall comply with the minimum requirements in this section for construction, size and protection against physical and environmental conditions.

Metering equipment shall not be installed if any requirements for metering enclosures are not met

With regard to installations where smaller metering enclosures were installed and there is now a need to provide extra space to install metering equipment e.g., for an additional tariff, then the following options are allowed:

1. Enlarge or replace the existing metering enclosure (preferred practice), particularly for a major change to the customers electrical installation.

2. Add on an adjacent metering enclosure. In this case the electrical contractor shall provide wiring access (25mm min. dia. hole) between the adjacent metering enclosures.

For reasons of safety, electrical contractors should discuss issues with the Metering Provider if a meter panel is intending to be wider than 1 metre.

In general, metering enclosures shall cater for the following dimensional requirements:

1. Metering enclosures installed at new domestic installations shall cater for a standard panel.
2. The meter cleats shall be arranged such that:
 - a. A standard size 350mm wide panel can be installed and;
 - b. The meter cleats, especially if metallic, shall be installed in accordance with AS/NZS 3000 (earthing and depth in relation to bending radius).
3. A minimum clearance of at least 600mm shall be maintained in front of metering enclosures.
4. The door shall at least be capable of being opened to an angle of 120°.

If an enclosure is installed in a seaside location, consideration should be given to the metering enclosure being made of stainless steel or plastic.

1.4.3 Fire-proofing meter enclosures

In existing wooden meter enclosures, the area containing wires shall be made fire-resistant in accordance with the following diagram:

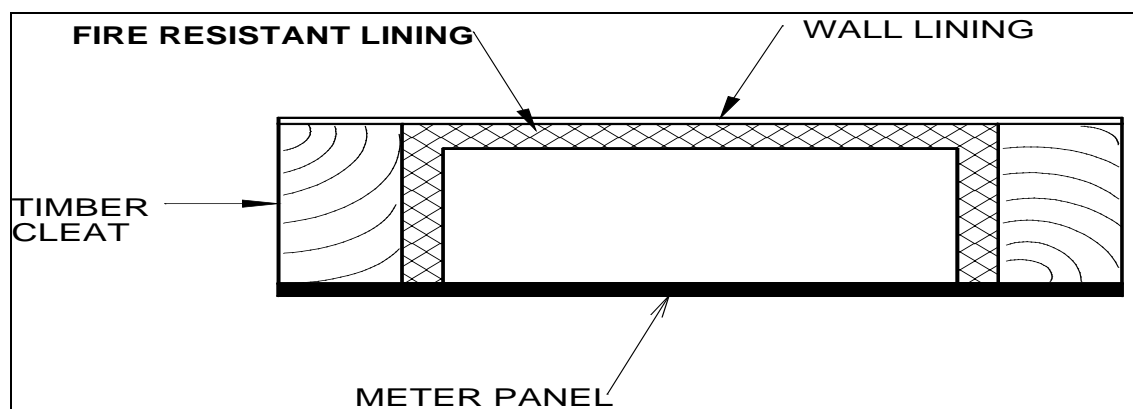


Figure 1.0 Fire-resistant lining

1.5 Metering enclosure sizes

For all metering enclosures a minimum depth of 175mm shall be provided from the front of the meter panel to the inside back of the metering enclosure door. This distance excludes any door stiffening.

The depth behind and thickness of meter panels shall comply with the Australian Standards regarding the bending radius of the cables.

Electrical contractors and customers should consider future needs and tariffs when planning their electrical installation.

1.5.1 Minimum requirements for remote meter enclosures

Metering enclosures which are remote from customer switchboards shall accommodate at least one standard meter panel with dimensions of 300mm (height) x 350mm (width). This allows for one single phase dual tariff meter or one polyphaser meter on one panel and any additional accessories required by the Metering Provider.

1.5.2 Enclosures for multiple tariffs

Metering enclosures for three tariffs shall accommodate at least two panels with dimensions of 300mm (height) x 350mm (width), or one panel of 600mm (height) x 350mm (width)

1.5.3 Metering enclosures non-standard sizes

Electrical contractors shall ensure that non-standard meter panels will meet the requirements of the Metering Provider.

1.5.4 Meter cleats

Meter cleats shall be minimum 50mm in width, and a depth of 50mm or an equivalent support to provide for a safe metering installation. The depth of meter cleats shall provide for a minimum bending radius of the cables in accordance with AS/NZS 3000.

1.5.5 Installation requirements

On all new installations, and where possible on existing installations, Electrical Contractors will install meter panels and, connect the consumers mains.

Electrical Contractors are to ensure that the following metering installation requirements are met:

1. Install sufficient length of consumer's mains and load conductors to bring out the meter panel 450mm with the mains / load-ends connected to the meter panel.
2. If the consumer's mains are not colour-coded, sleeving or other similar material, shall be used to identify the consumer's mains active as red, white or blue and the neutral as black.
3. The maximum conductor size terminated on removable meter panels is 35mm. All larger (un-metered) conductors shall be terminated in sealable links or another acceptable tamper-proof method, located behind the meter panel or sealable panel.
4. Install the tariff load conductor ends through the appropriate terminal holes in the meter panel. Each conductor shall:
 - a. be clearly marked to identify the tariff to be connected to and
 - b. have sufficient length provided for meter installers to connect to meter terminals.
5. Check for correct wiring and consumer's mains polarity and then fix the meter panels securely in place with supply left un-connected.

If a hinged meter panel is used, the meter enclosure shall allow the panel to fully open without restriction to allow metering staff to gain access behind so that metering work can be carried out in a safe manner.

Hard drawn conductors should not be used for consumer mains or metering terminal ends. If hard drawn conductors are used, they shall be terminated in sealed links located behind the metering panel and connected to soft-drawn copper, stranded conductors that can then be connected to the meter terminals.

The installation of meter panels and accessories associated with metering, such as components to disconnect, isolate, test or short-circuit CTs; shall comply with the relevant parts of AS/NZS 3000 and the manufacturer's requirements.

For installations greater than 100amps (CT metering), the metering neutral conductor shall be connected with one of the following options:

- Soldered directly to the main neutral (preferred)
- Sealable where it joins the main neutral bar
- Crimped in the same lug as the main neutral

1.6 Metering panels and wiring

Meter panel material shall comply with AS/NZS 3439.3.

It is important to ensure that the metering panel area is adequate, so as to cater for both immediate and future metering requirements.

If more than one meter panel is required, they shall be mounted adjacent to each other.

Non-standard meter panels (known as special panels) shall be approved.

The identification of switches/fuses and tariff meters on a meter panel shall be installed so that each switch/fuse and each meter are clearly identified either by fixed labelling or appropriate long lasting pen marker.

The Metering Provider may require a larger panel to be installed or an additional panel to be installed to provide the extra area required.

For hinged meter panels or removable fixed meter panels, where the panel area is less than 0.2 square metres, the minimum clearance behind each panel to the inside back wall of the metering enclosure shall be 50mm for conductor sizes up to 16mm². For larger conductor sizes, the minimum clearance shall be in accordance with AS/NZS 3000 for cable bending radiuses.

Switches, links, protective devices mounted on, and wiring of, meter panels, shall meet the requirements of the Metering Provider.

Due to terminal tunnel sizes of typical metering equipment, the smallest conductor for metering purposes shall be 4mm².

1.7 Low voltage installations up to 100 amps/phase

1.7.1 Standard size meter panel

The standard size meter panel for residential premises shall be 300mm (height) x 350mm (width). This allows for one single phase dual tariff meter or one polyphaser meter on one panel and any additional accessories required by the Metering Provider. Standard size meter panels, approved by the Metering Provider, are available to cater for most residential metering layout requirements.

Select the panel(s) required for each metering position by taking into account the following:

1. Number of tariffs per customer
2. Commercial or residential tariffs involved
3. The amount of space required for:
 - a. metering control equipment
 - b. line-side control and protection equipment. If any tariff requires a two-phase supply, space shall be provided for one polyphase meter unless approved otherwise by the Metering Provider.

A hinged panel may be used instead of a standard panel or combination of fixed panels provide that:

1. Sufficient lengths of conductors are provided to allow the panel to be opened to at least 120 degrees.

2. If installed within a metering enclosure, the panel(s) shall be hinged at a minimum of 170 mm away from the sidewall so that the tariff meters will not jam against the side wall when the panel is swung open.

In general the maximum size of a meter panel shall be 0.5m² unless approved by the Metering Provider.

Consideration for future requirements or expansion is the responsibility of the customer and electrical contractor. Typical meters space allocation is as follows:

Meter and Distributor Load Control Device Details	Height (mm)	Width (mm)	Depth (mm)	Approx. Weight (kg)
Single Phase 2 Element Meter	255	150	130	1.5
Polyphase Meter	285	180	135	2.1
Meter Protection Device	90	45		
Neutral Link	60	100		

20mm separation between the above equipment. Any other requirements shall be confirmed with the Metering Provider.

1.7.2 Customer identification

Consumers shall be able to clearly identify meters relevant to their account as well as any switches, fuses or circuit breakers on the meter panel relevant to their installation.

With all multi-customer installations, labelling of the meter panel and switchboard shall clearly identify the individual flats, units or shops, and associated meter and switch/fuse/circuit breaker.

1.7.3 Current Transformer (CT) connected metering

This section provides the electrical contractor or design consultant with the Metering Provider requirements to ensure that adequate provision is made for the installation of CTs and associated equipment.

CTs are required where a three-phase load on any tariff is greater than 100 amps per phase.

Electrical contractors shall discuss CT installation requirements with the Metering Provider. Provisions shall include verification that CTs are appropriately certified.

The electrical contractor or their switchboard manufacturer installs the current transformers during switchboard alteration/construction.

1.7.4 Transformer connected metering approval

For all transformer-connected metering, the proposed electrical and metering arrangements shall be approved by the Metering Provider before electrical works are initiated.

1.7.5 Transformer connected metering equipment installation requirements

Installers of CTs and associated equipment shall comply with the following requirements.

1. All current transformers shall be mounted on the load side of the main circuit breaker unless approval has been given by the Metering Provider.
2. Multiple current transformers installations shall have individual isolation and sealing points.
3. Typical dimensions of current transformers are listed under this section.

4. If busbars are used, the section passing through the current transformer window shall be easily removable. (minimum length of 300 mm).
5. If insulated cables are used to pass through windows, joints or terminations shall be made near the current transformers to allow for easy removal of the current transformers.
6. Metal cable sheaths shall be terminated prior to conductors passing through current transformers windows.
7. No cable joints are to be made within the tunnel of the current transformers window.
8. Meters may be mounted remote from the current transformers in a more accessible metering position.
9. Test blocks shall incorporate provision to isolate potential feeds and short circuit CTs to prevent excessively high voltages
10. Relevant parts of a switchboard shall not be energised unless CTs are either; connected to a meter or short-circuited.
11. The size of CT wiring shall be matched to the CT, wire length and meter so as not to effect the accuracy of the meter recordings.

Where control equipment for fire alarms and lifts etc. is connected from the line side of the metering current transformers, the conductors shall pass through the current transformers windows as shown in the following diagram.

Note: As conductors for fire alarms and lifts etc. are normally connected prior to the main circuit breaker, Electrical Contractors shall give special consideration to providing fault protection in the form of a fault current limiter or circuit breaker as well as mechanical protection, segregation and enclosure of cables.

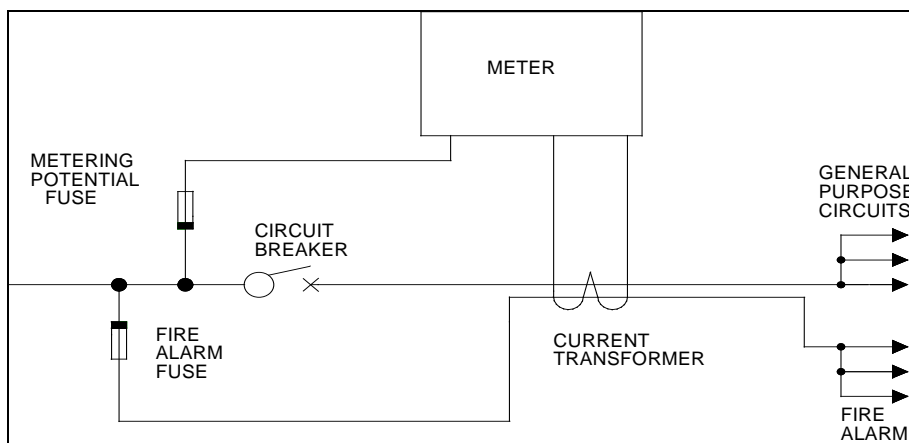


Figure 2.0 Metering fire alarms

Provision shall be made for sealing escutcheon panels and removable panels that allow access to un-metered conductors or current transformers.

Current transformers shall be mounted behind a removable panel. The words "CURRENT TRANSFORMERS" shall be marked on the front of the panel.

Main switches, either in the ON or OFF position, or any other latching mechanism, shall not restrict the removal of the panel(s) covering current transformers and associated equipment. If the main switch has this sort of latching or panel retaining mechanism, the current transformers shall be in a separate accessible sealed cubicle.

Electrical Contractors and authorised switchboard / meter panel manufacturers shall install potential fuses on the line-side of the current transformers in accessible locations under the following conditions.

1. On the bus bar (preferred practice).
2. Adjacent to the bus bar installation
3. Adjacent to insulated cables, being used as mains conductors.
4. Where potential fuses cannot be mounted as per 1, 2 or 3, the meter panel manufacturer would mount them on a meter panel. Potential fuse cable size shall adhere to Wiring Rules.
5. Meet the requirements of the AS/NZS 3000 in relation to fault currents and protection.

Notes:

1. Under the above conditions, potential fuses shall be installed on an insulated panel before fixing and connection to the bus bars or cables.
2. The insulated panel(s) shall have sufficient area so that the fuses can be accessed without touching live parts.
3. Connections for potential fuses and other tariffs using direct connect (whole current) meters shall be taken from the line side of the current transformers.
4. In accordance with AS/NZS 3000, it may be necessary to install current limiters to protect the direct connect line conductors.

1.7.6 Installation and protection of line side equipment

Potential fuses shall have provision for sealing. If these fuses are located behind a door or panel, then the door or panel shall be sealable and labelled "**POTENTIAL METERING FUSES BEHIND**".

The metering neutral conductor for current transformers installations shall be connected with one of the following options:

1. Soldered directly to the main neutral (preferred)
2. Sealable where it joins the main neutral bar
3. Crimped in the same lug as the main neutral

1.7.7 Current transformer sizes

Ranges normally available are shown in the following table:

Main Switch (Amps)	Up to 400	500,630,800,1250	1000,1250,1600 to 3000
Normal C. T. extended size range	200/5	800/5	1500/5

The following diagram shows the dimensions of typical current transformers previously used in Tasmania. Please confirm approved types with the Metering Provider.

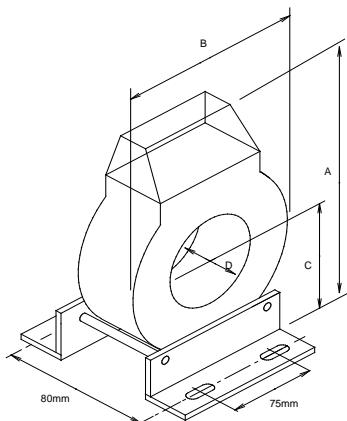


Figure 3.0 current transformer dimensions (mounting slot dimensions are 25mm x 10mm)

Type	Ratio	Height A (mm)	Width B (mm)	Window Position C (mm)	CT Width D (mm)
S	200/5 Ip = 400 Amp max	170	115	65	45
T	800/5 Ip = 1600 Amp max	210	165	85	85
W	1500/5 Ip = 3000 Amp max	270	200	85	112

1.7.8 Transformer connected energy metering - low voltage

Typical options for meter panels on CT installation. For meter panels of a different size, confirm with the Metering Provider.

Option (a) - Meter space 335 mm high x 525 mm wide

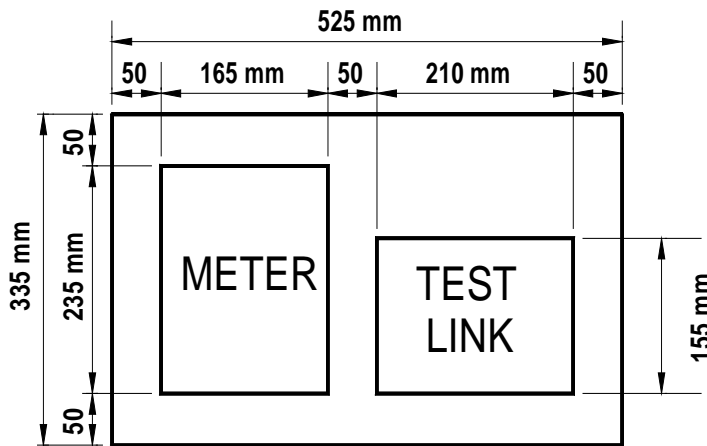


Figure 4 - Current transformers panel dimensions – option (a)

Option (b) for space 540mm high x 210mm wide

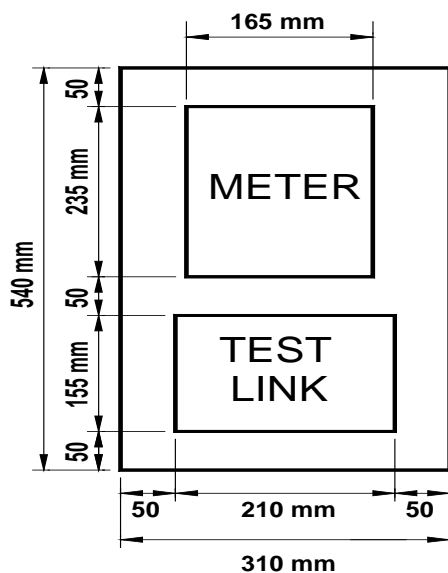


Figure 5 - Current transformer panel dimensions – option (b)

Note: Clearance between equipment & panel perimeter to be a minimum of 50mm. Clearance between meter panel and door (if fitted) to be 140mm.

Appendix I

Glossary of Terms

All relative terms in the Occupational Licensing Act 2005, *The Occupational Licensing (Electrical Work) Regulations 2008* and AS/NZS 3000 shall apply to this document.

- a) “AEMO” means the Australian Energy Market Operator Limited.
- b) “approved” or “approval” when stated in this document means approved by the Metering Provider.
- c) “CT” means current transformer as a measuring component to be connected to an electricity consumption meter.
- d) “all-weather” in relation to accessibility, means all types of weather conditions for the area but not including extreme conditions or where there is a need for specialised clothing greater than standard worker clothing and shoes.
- e) “Metering Coordinator” means a person or business that meets the requirements of the National Electricity Rules, is registered by AEMO and who engages in the coordination and provision of metering services at a connection point.
- f) “Metering Provider” means a person or business that meets the requirements of the National Electricity Rules and is accredited by and registered as such with AEMO.
- g) “Retailer” means a person or business authorised by the Australian Energy Regulator to engage in the retail sale of electricity.
- h) “shall” means the requirement is mandatory to comply with this document.
- i) “should” means the requirement is strongly recommended.

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