Standard Operating Procedure

Electricity Service and Technical Rules – CPE Tonsley

31 August 2026

Version 6.0

Document History

Version No.	Published Date	Description of Change
1.0	04 August 2020	New document
2.0	6 October 2023	Updated CPE structure.
3.0	23 October 2023	Section 6.2.3 Supply protection to reflect amendments to SAPN service and installation rules clause 7.5.2 (May 2023).
4.0	31 August 2024	Include power quality detail. Annual update.
5.0	31 August 2025	Annual Update
6.0	31 August 2026	Updates to include changes to SAPN rules 2025

References

Cited in this Document

Title
The Plumbers, Gas Fitters and Electricians Act 1995
South Australian Electricity (General) Regulations 2012
(SA) Electricity Metering Code
Electricity Distribution Code, Connection and Supply Contract
Electricity Act 1996 (SA)
Electricity (Principles of Vegetation Clearance) Regulations 2010
Work Health and Safety Act 2012 and Regulations 2012
National Electricity Rules
SAPN Service and Technical Installation Rules May 2025
AS/NZS 2067 Substations and High Voltage Installations exceeding 1 kV a.
AS/NZS 3000 Electrical Installations (Wiring Rules)
NICC-270 Guide for Connecting Large Embedded Generation
TS130 Technical Standard for Inverter Energy Systems (IES)- Capacity up to or equal to 200kVA
TS131 Technical Standard for Large Inverter Energy Systems above 200kW or Rotating Generating Systems
AS 60038-2000 Standard Voltages
AS/NZS 61000 Part 3.3:2012 Electromagnetic compatibility (EMC) Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current =16 A per phase and not subject to conditional connection
AS/NZS 61000 Parts 3.5 Electromagnetic compatibility (EMC) Limits - Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 16 A
AS/NZS 61000 Parts 3.7 Electromagnetic compatibility (EMC) Limits - Assessment of emission limits for fluctuating loads in MV and HV power systems (IEC 61000-3-7:1996, MOD)
AS/NZS 61000 Parts 3.2 Electromagnetic compatibility (EMC) Limits - Limits for harmonic current emissions (equipment input current =16 A per phase)
AS/NZS 61000 Parts 3.6:2012 Electromagnetic compatibility (EMC) Generic standards - Emission standard for residential, commercial and light-industrial environments

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1. PREFACE

The CPE Tonsley Service and Technical Installation Rules incorporate the Technical Installation Rules referred to in Regulation 76 of the Electricity (General) Regulations 2012 under the Electricity Act 1996 (SA).

These Service and Technical Installation Rules may also include information that is not part of the Technical Installation Rules. The Technical Installation Rules within this document are denoted by the symbol [TIR] adjacent to the relevant clause. If a provision of the Tonsley Service and Technical Installation Rules that is not part of the Technical Installation Rules is inconsistent with the Technical Installation Rules, the Technical Installation Rules shall prevail, and the provision shall, to the extent of the inconsistency, be invalid.

These Service and Technical Installation Rules may not cover all circumstances. This may include unusual connections, inadvertent omissions or changes to applicable legislation and codes. In these circumstances, CPE Tonsley must be consulted for further advice or information.

1.1 Licensee details

CPE Tonsley holds an electricity distribution licence issued by the Essential Services Commission of South Australia on 17 August 2018 for the operation of the Network located at the Tonsley Innovation District.

1.2 Company Details

Business Name:	Clean Peak Energy
Registered Address:	Level 21,
	201 Miller Street
	North Sydney

1.3 Scope

These Service and Technical Installation Rules (TIR) have been prepared to satisfy the requirements of the South Australian Electricity (General) Regulations 2012 which require the operator of a distribution network to make publicly available a set of Technical Installation Rules for customers connected to that distribution network.

These Service and Technical Installation Rules apply to new installations and altered installations connected to the Tonsley Distribution Network. These rules are not intended to apply to existing original installations and equipment, which complied with previous installation requirements prior to January 1, 2019. However, any modification to these installations will generally need to be undertaken in compliance with these Rules.

These Rules cover many of the typical arrangements for connection and alteration of electrical installations on the Network. However, there may be unique situations the Rules do not cover including unusual conditions, situations not contemplated in the Rules, grandfathered installation arrangements and changes to the applicable legislation, codes and standards. Should these situations arise or where any doubt exists, CPE Tonsley should be contacted to discuss suitable arrangements. Additional requirements may also be contained in the Electricity Distribution Code, Connection and Supply Contract and the Electricity Metering Code.

To the extent allowable, where an electrical installation consists of an embedded network (as defined in the (SA) Electricity Metering Code) the requirements of these Rules apply to the operator of the embedded network (parent) and their electrical installation. An embedded network customer (sub-metered) must liaise with the operator of the embedded network for conditions relating to their supply.

For consistency, these Rules are intended to harmonise with the South Australian Power Networks (SAPN) Service and Installation Rules as far as possible. Where a connection or alteration to an electrical installation occurs and is likely to affect the CPE Tonsley connection to SA Power Networks then additional consultation and conditions may be applicable. In these, situations CPE Tonsley should be consulted, and further assessments may need to be undertaken.

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SA Power Networks also currently maintain electricity distribution assets within the Tonsley Innovation District. Any direct connections to these assets, that are not through the CPE Tonsley Network, will need to be managed by SA Power Networks and subject to their Service and Installation Rules.

1.4 Objective

The key objective of the CPE Tonsley Service and Technical Installation Rules is to provide Tonsley distribution network electricity customers and their related agents and registered electrical workers with the technical requirements for electrical installations connected to the Tonsley distribution network. These requirements are intended to comply with Australian Standards, legislation and other rules/codes applicable to the Tonsley network.

CPE Tonsley is committed to the safe and efficient operation of the Network in compliance with all statutory legislation. This will be achieved through adherence to the elements described in these Rules, reflecting the goal of achieving operations which can be confidently claimed as best practice for operations of a similar purpose, size and technology.

1.5 Definitions

Term	Description
CleanPeak Energy (CPE)	CleanPeak Energy Pty Ltd includes, but is not limited to, the following subsidiaries: • CPE Funding Pty Ltd • CPE Central Park • CPE Funding No. 2 Holdings Pty Ltd • CPE Tonsley • CPE Mascot
Consumer Terminals	The junction at which the consumer mains connect to the CPE Tonsley Distribution Network Service Main or conductors.
Connection Officer	An offer from CPE Tonsley to enter into a contract to provide Connection Services.
Connection Service	A service relating to a new connection or connection alteration for premises (as defined in Chapter 5A of the National Electricity Rules).
Deemed	Regarded, considered or judged.
Distributor	For the purpose of these Rules CPE Tonsley is the Distributor
Distribution Network	For the purposes of these Rules references to Distribution Network means the network cables, transformers, substations and related equipment, operated by CPE Tonsley, which transports electricity to a Customer's Connection Point.
COC	Certificate of Compliance a service relating to a new connection or connection alteration for premises (as defined in Chapter 5A of the National Electricity Rules).
MAB	Main Assembly Building of the former Mitsubishi Motor Works.
Network	Unless identified otherwise this refers to the CPE Tonsley Distribution Network
Rules	these Tonsley Service and Technical Installation Rules, unless otherwise specified.
SAPN	South Australia Power Networks. The upstream distributor of electricity to the CPE Tonsley Network.
Service Protection Device	A device provided by CPE Tonsley, generally a fuse or circuit-breaker, to protect the CPE Tonsley service to a customer's installation.
Service Main	Mains owned by CPE Tonsley that are generally dedicated to a customer and run from the Network to the Point of Supply as defined in AS/NZS 3000.
S&TIR	These CPE Tonsley Service and Technical Installation Rules.
Temporary	The term temporary shall mean for a period no longer than 12 months, unless otherwise agreed in writing by CPE Tonsley.
TIR	A specific Technical Installation Rule, as referred to in the Electricity (General) Regulations, denoted within this document by the symbol (TIR) adjacent to the relevant clause.
UPS	Uninterruptible Power Supply

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1.6 Competency and Use

This document is intended for use by CPE Tonsley, Retailers, their customers, customer's agents, and associated industry parties and personnel.

Users of this document should have general familiarity with systems, equipment and practises commonly used for electrical installations as well as associated distribution systems, particularly in South Australia.

The Plumbers, Gas Fitters and Electricians Act 1995 requires that all electrical work carried out on electrical installations connected to or intended to be connected to the Tonsley Network will be performed by registered Electrical Worker(s) who are suitably licensed for such work in South Australia.

1.7 Contact Information

Contact for any matters related to the content of these Rules may be made through written correspondence to CPE Tonsley. Any enquiries relating to specific installations are to be directed to the CPE Tonsley Asset and Growth Manager.

Responsible Person:

Jason Carcatsis: Tonsley Asset and Growth Manager

Mobile: +61 0438 429 491

Email: Jason.carcatsis@cleanpeakenergy.com.au

Address: Suite 8 Tenancy 8
6 MAB Eastern Promenade
Tonsley SA 5042

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2. DESCRIPTION OF THE OPERATION

2.1 Introduction

The Tonsley Innovation District (Tonsley) is a 61-hectare development located on the site of the former Mitsubishi Motors plant approximately 5km south of Adelaide CBD. The site includes mixed use commercial, light industrial and educational facilities as well as a developing residential precinct.

The electrical network of the site is shown in Figure 1 below:



Figure 1 Tonsley Innovation District Electrical Network

A prominent central feature is the 5-hectare Main Assembly Building (MAB) previously used in vehicle production. Several other larger Mitsubishi Motors legacy structures also remain and have been re-purposed for commercial/industrial use.

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CPE Tonsley owns and operates the distribution network supplying most customers within Tonsley. However, there are also some customers suppled directly from SA Power Networks (SAPN), particularly in the eastern precinct. Customers in these areas will have the opportunity to connect to the CPE Tonsley network as it expands and ultimately reticulates throughout the entire site.

Where customers are directly supplied from SA Power Networks assets, then these Rules are not intended to provide technical coverage and SAPN should be contacted.

2.2 Distribution Network Overview

The CPE Tonsley distribution network currently supplies customers within the following facilities:

- MAB internal infrastructure
- TAFE SA
- Line Zero and Western Plant
- Northwest Residential Precinct
- Admin and LCC buildings (via an LV service from SA Power Networks)
- Flinders University
- North Commercial Precinct

This represents a combined load of approximately 12 GWh. The majority of customers are presently tenancies within the MAB taking supply at low voltage. The single largest customer is TAFE SA, taking supply at 11kV.

The distribution network has the following general features:

- One Main HV Switchboard - with the two incoming 11kV supplies from the SAPN network and eight outgoing circuits-breakers for control/protection of the Network
- 31 single-transformer 11kV/LV distribution substations - ranging from 750kVA to 2500kVA with associated LV switchboards
- 3 km of 11kV HV cabling (approximately)
- Several LV switchboards for miscellaneous facility supplies
- 3 km of LV service main cabling (approximately).

2.3 Typical Service Connections

A summary of the typical service connections that apply to the CPE Tonsley network is provided below. Further details are provided in Sections 7, 8 and 10.

2.3.1 Main Assembly Building

Within the MAB, cabling is generally run in cable trays within the roof space with service mains running directly to each customer's installation. LV services to customers typically are one of the following two types:

- Direct Substation Supply – consists of an CPE Tonsley service main running to the customer's installation directly from an CPE Tonsley Distribution substation,
- LV Busway Supply – consists of an CPE Tonsley service main running to the customer's installation from the CPE Tonsley LV Busway system.

2.4 External to the Main Assembly Building

External to the MAB the distribution network is of an underground construction and no overhead services are provided. Services will generally be consistent with arrangements described in the SA Power Networks Service and Installation Rules and will typically be one of the following types:

- Low Voltage Residential – standard low voltage services within the north-east residential precinct from the CPE Tonsley underground LV distribution network
- Low Voltage General – low voltage services provided from the CPE Tonsley underground LV distribution network
- Low Voltage Direct – low voltage services provided from the CPE Tonsley underground LV network connected directly to a customer's service protective device

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- Direct substation supply – this is a low voltage connection provided directly from a Distribution Network substation to the customer's installation.

2.4.1 High Voltage Connections

Establishing a high voltage connection to the CPE Tonsley network will only be applicable in exceptional circumstances. Where customers are seeking or require supply at high voltage then service arrangements will need to be determined subject to specific details.

Requirements for any high voltage installations will generally be consistent with the SA Power Networks Service and Installation Rules.

2.5 General

These Rules will be maintained and administered by CPE Tonsley Pty Ltd specifically for installations connecting or connected to the CPE Tonsley distribution network. The key objective is to ensure all technical and safety requirements relevant to customer electrical installations are complied with prior to the supply of electricity through the CPE Tonsley distribution network.

Key fundamental considerations relevant to the ongoing management of these rules include:

- Minimising risk for personal injury or property damage
- Minimising risk of supply interruptions and supply reliability issues
- Ensuring compliance of electrical installations with all relevant standards, codes and guidelines
- Ensuring an appropriate quality of supply is maintained for all users of the CPE Tonsley distribution network
- Ensuring a clear understanding and delineation of responsibility between customers and CPE Tonsley as far as customer electrical installations are concerned
- Providing appropriate uniformity & consistency for efficient operations, repair & maintenance.

Further background and information on how these Rules will be managed and maintained is provided below.

2.6 Organisational Context

CPE Tonsley Pty Ltd is a wholly owned subsidiary of CleanPeak Energy Pty Ltd.

CleanPeak Energy employs 119 permanent employees and engages consultants and sub- contractors for a range of planning, design, operating, maintenance and construction activities on an as required basis.

CleanPeak Energy staff assist the on-site CPE Tonsley team by providing advice, guidance and technical expertise as required in areas such as Asset Maintenance and Engineering, Safety and Compliance, Finance, Human Resources, and Corporate Services.

Appendix A outlines key business units within CleanPeak Energy relevant to the Tonsley operations.

The CPE Tonsley Asset and Growth Manager is responsible for administering these Rules in consultation with relevant personnel including the HSE Manager.

2.7 External Stakeholders

A number of stakeholders external to CleanPeak Energy are relevant to the ongoing maintenance and administration of these Rules including:

- End use customers connected to the distribution network,
- Future customers and existing facilities not connected to the CPE Tonsley distribution network,
- Tenants, landholders and general public within Tonsley,
- Electrical contractors, subcontractors, consultants, designers and other service providers operating within Tonsley.
- Electricity Retailers,

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- Relevant regulatory and government authorities including Essential Services Commission SA (ESCOSA), the Technical Regulator (OTR), SafeWork SA, Energy and Water Ombudsman SA (EWOSA) and Renewal SA (RSA),
- South Australia Power Networks (SAPN)

CPE Tonsley strives to maintain a line of communication with all relevant stakeholders in administering and managing these Rules. All users, stakeholders and interested parties are invited to provide input and suggestions that may contribute to future revisions of these Rules.

2.8 Update and Revision

As per CleanPeak Energy's Document Control process this STR will be reviewed annually.

A range of considerations will apply in preparing future revisions outside the document review process to these Rules including:

- Changing regulatory and legislative requirements
- Changing technical requirements, standards and codes,
- Feedback from applicable stakeholders (including customers and their agents)
- In response to changing requirements as the network develops
- Following associated compliance/review and safety assessments
- Through involvement with industry forums and related consultation
- To help maintain consistency with SA Power Networks and related requirements
- Ongoing practical experience in managing the network, connecting installations and other operational aspects.

2.9 Availability and Distribution

The most recent revision of these Rules will be readily available to the general public free of charge through the CPE Tonsley website.

Printed copies are also available from the CPE Tonsley Asset and Growth Manager for a reasonable fee to cover printing and administration costs.

Tonsley Innovation District
Suite 8, Tenancy 8
6 MAB Eastern Promenade
Tonsley SA 5042

2.10 Failure to Comply with These Rules

Where an installation connected or intending to connect to the Tonsley network is deemed to not satisfy these Rules, connection of electricity to the installation may be delayed, withheld or removed until such time as the non-compliance has been rectified. This may result in a requirement for re-inspection of the installation by CPE Tonsley to confirm the installation's compliance with these Rules. Re-inspection fees may apply as outlined in the connection charges documentation available on the CPE Tonsley website.

2.11 Exemptions

These Service and Technical Installation Rules may not cover all circumstances, including unusual situations, inadvertent omissions or recent changes to legislation and codes. CPE Tonsley must be consulted in these circumstances and a limited exemption to the rules may be granted. Where necessary amendments may be made to the Rules as outlined in Section 2.8.

In other exceptional circumstances specific requirements may be formally waived or modified by submission of a request in writing to the CPE Tonsley Responsible Person including:

- Background statement outlining why non–compliance with these Rules is required,
- Detailed description of the proposed alternative, exclusion or modified condition, including supporting safety and technical assessments,
- Letter from the owner or controlling body of the installation giving their consent to the request.

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No action should be taken until a written reply to such a request has been received from the CPE Tonsley Responsible Person. If suitable exceptional circumstances along with demonstration of safe installation arrangements is not provided CPE Tonsley will be unlikely to approve the request. Similarly, if the requested exemption interferes with ability for CPE Tonsley to satisfy its obligations, then approval of the request will be denied.

2.12 Related Offences

Offences under the various regulations and legislation include:

- Work on the CPE Tonsley network assets without authorisation from CPE Tonsley.

The damage to or interference with distribution network assets including:

- fuse cartridge removal or insertion
- making or breaking of any seals, locks or connections
- dismantling or detaching any Distribution Network cables or equipment
- interference with electricity meters, time switches, equipment and/or service mains
- obtaining electricity by fraud
- Unauthorised entry to CPE Tonsley substations or assets.

The above offences can incur substantial fines together with an order for damages for any losses incurred.

2.13 Employing a Licensed Person

The Plumbers, Gas Fitters and Electricians Act 1995 requires that all electrical work carried out on electrical installations connected to or intended to be connected to the Tonsley Network will be performed by a registered Electrical Worker(s) who is suitably licensed for such work in South Australia.

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3. SUPPLY APPLICATION, CONNECTION & DISCONNECTION

3.1 Conditions of Supply (TIR)

It is a condition of supply that compliance is demonstrated with the Electricity Act 1996, the Electricity (General) Regulations 2012, SA Electricity Distribution Code and all other relevant acts and codes associated with the supply of electricity. This includes compliance with AS/NZS 3000, these Rules and all contracts and agreements applicable to the installation's connection to the Distribution Network.

Conditions of supply will also be specified in various contracts or agreements relevant to an installation including the following:

- an Electricity Supply Contract with a Retailer
- a specific electricity distribution connection agreement or contract
- a deemed electricity distribution connection contract.
- an Extension Agreement with the Distributor
- an electricity distribution demand tariff agreement or contract

All applicable general conditions of supply may not necessarily be included in a specific contract or agreement (such as conditions contained the Electricity Safety Act, the Electricity Industry Act and regulations, codes of practice and guidelines enabled by those Acts). Compliance with the Distributor's Technical Installation Rules (TIR) and the provision of Certificates of Compliance are examples of conditions of supply specified by the Electricity (General) Regulations 2012.

CPE Tonsley uses the electronic Certificate of Compliance (eCoC) system administered by OTR. This includes information provided by a registered electrical worker or licensed contractor confirming a given electrical installation complies with the requirements of AS/NZS 3000 and these Rules. A valid eCoC is required with sufficient notice prior to energisation of a connection to allow CPE Tonsley to review its content. The eCoC must be certified before making the installation available for energisation.

If the Certification of Compliance is considered invalid or does not adequately demonstrate a safe installation, then connection will be denied or may be withdrawn.

The certificate must then be submitted and provided to CPE within 30 days.

- Negotiations and Premature Expenditure
- Negotiations should commence as soon as practical to determine availability of supply for the following:
- Connection of a new electrical installation.
- Additions or alterations to an existing electrical installation.
- Additional load or generation within an existing installation.
- Extension of the distribution system for supply to multiple electrical installations (such as within the residential precinct).

A suitably detailed description of load, installation and other requirements should be submitted with an Application for Connection in accordance with these Rules at the earliest possible opportunity. The customer or developer should be prepared to meet associated costs and allow sufficient time for CPE Tonsley to plan, determine and negotiate appropriate supply arrangements.

Customers/developers are warned not to make any commitments (e.g. contractual arrangements), for works until they receive formal confirmation from CPE Tonsley describing the terms and conditions of the connection and customer supply contracts that will apply to the supply of electricity.

CPE Tonsley will provide a connection offer for the proposal as outlined in section 3.2 and 3.3. All connection offers will be conditional on compliance with these Rules.

3.2 Typical Connection Process

3.2.1 New Connections

The process for connection typically follows the steps outlined below:

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- The Customer determines the supply requirements to suit their intended electrical installation in consultation with their agent (such as an electrical consultant and/or electrical contractor).
- Customer or Customer's Agent applies to CPE Tonsley for supply as outlined further below.
- CPE Tonsley and the Customer negotiate conditions for supply and CPE Tonsley prepares and provides a Connection Offer which upon acceptance becomes a connection agreement.
- Customer selects their Retailer and negotiates associated retail tariffs.
- Customer's Agent determines the electrical installation supply requirements and may need to coordinate metering requirements with the Retailers Metering Provider.
- Electrical Contractor completes the electrical installation and completes an electronic Certificate of Compliance (eCoC).
- Customer or Customers Agent applies to their Retailer for connection.
- Retailer's Meter Provider installs meters and requests CPE Tonsley connect the electrical installation.
- CPE Tonsley connects and energises the electrical installation upon receipt, review and acceptance of the Certificate of Compliance.

3.2.2 Alterations and Reconnections

Alterations to existing installations will generally follow the connection process outlined in 3.2.1 above, with the exception of the Retailer and Metering aspects in situations where not required.

CPE Tonsley will also generally require a valid electrical Certificate of Compliance prior to reconnection of installations that have been disconnected for an extended period of time.

3.3 Application for Supply Availability

3.3.1 Applications

A person who wishes to connect a new installation or extend the distribution network for supply to multiple installations, or alter an existing installation connected to the CPE Tonsley Distribution Network, should complete an Application for Connection describing their requirements. Application for Connection forms are available from the CPE Tonsley website or from the CPE Tonsley Operations Office.

Following receipt of an application, CPE Tonsley will negotiate the details of electrical supply and may request additional information where necessary. A response and/or connection offer will then be provided by CPE Tonsley outlining details of the proposed supply and the initial Authorised Service Capacity that will apply until such time as it is varied by agreement with CPE Tonsley or the connection is removed.

CPE Tonsley should be consulted as early as possible, particularly in complex situations, such as high voltage connections or installations that may require a new distribution substation (such as within the residential precinct).

3.3.2 Agreed Maximum Demand

The Agreed Service Capacity is the total capacity of the connection point including both firm and flexible load components that the site must not exceed, as agreed with the customer.

The Agreed Maximum Demand is the maximum demand used to calculate the demand component of a customer's network demand tariff charge and cannot exceed the Authorised Service Capacity. A customer may re-negotiate their agreed maximum demand subject to the requirements of the Distribution Code, the Electricity Act and the initial connection contract.

Where a customer requests that the agreed maximum demand is reduced, and any applicable conditions are satisfied, then the new agreed maximum demand will also become the new Authorised Service Capacity.

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3.3.3 *Proposed Electrical Installations on Public Land*

CPE Tonsley must be contacted prior to commencing any proposal to install an electrical installation on public land including extending wiring and equipment from an electrical installation into or across public land.

3.3.4 *Control of Customer Load (TIR)*

New installations within Tonsley will also be required to provide load-limiting control as described in clause 5.13.1 of the SA Power Networks Service and Installation Rules.

The customer is to provide a sealable circuit breaker irrespective of direction of energy flow, of capacity as close as reasonably practical to the agreed maximum demand.

Circuit breakers, including those with adjustable settings, shall be consistent with the requirements of SAPN SIR clauses 5.4. 7.4.1 and 10.4.5. Fuses are not an acceptable means of load control.

3.4 Notification of Completion of Electrical Work

On completion of new or modified electrical installation work the Customer, through their Agent or Retailer, is responsible to provide notification to CPE Tonsley of the completion (or pending completion) of these works and the details of the works carried out.

Notification of completion of electrical work is required prior to connection so that CPE Tonsley can make the necessary arrangements by the appropriate time. Providing suitable notification is the responsibility of the customer, customer's agent and/or Retailer and should be submitted to CPE Tonsley at the earliest opportunity to help avoid delays in connecting new or modified installations.

The necessary notifications will depend on type of work involved and may require completion of one or more of the following:

- Certificate of Compliance (eCoC)
- Electrical Works Request
- Request for Supply Disconnection (Abolishment)
- Request for Reconnection
- Field Works Order
- Retailer's Service Orders

In more complex connection situations, additional information may also be required to allow CPE Tonsley to prepare and review compliance with these Rules, including in the following:

- High Voltage Connections
- Installations requiring new distribution substations
- Connections with multiple occupancies
- Work on or near CPE Tonsley network assets
- Asset relocation works

CPE Tonsley should be further consulted at the earliest possible opportunity in all complex situations. In some cases, an installation inspection by CPE Tonsley may also need to be arranged prior to connection.

3.5 Forms

The Office of the Technical Regulator maintains an electronic Certificate of Compliance (eCoC) system for the recording of Compliance Certificates in South Australia. The OTR website should be referenced for further details noting the following:

- A printed copy of the eCoC form will be required by CPE Tonsley prior to connection or reconnection of a new or modified electrical installation.
- To help minimise delays it also is recommended that a printed copy of the eCoC is also available at the completed worksite.
- Metering Providers must provide a printed eCoC where a new or altered metering installation requires energisation.

The following forms are available from the CPE Tonsley website and Operations Office upon request:

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- Electrical Works Request
- Application for Connection
- Request for Supply Disconnection (Abolishment)
- Request for Reconnection
- Field Works Order

3.6 Charges

Works relating to the connection or modification of a connection requested by a customer may incur charges. This may include charges associated with but not limited to the following:

- Assessing and processing connection applications
- Connecting or altering a customer's supply
- Disconnection works
- Metering works
- Inspection of installations

Additional costs may also be incurred for:

- works required to take place outside normal business hours
- Repeated or cancelled works carried out due to a failure of the customer or their agent to appropriately prepare for these works
- Works require to be carried out as a result of a failure to comply with these rules

Further details of related fees and charges are available from the CPE Tonsley website or Operations Office upon request. Details of charges should be assessed and confirmed with CPE Tonsley by the Customer or their Agent prior to the commencement of work. CPE Tonsley may also require the Customer or their Agent to enter into a written agreement and pay associated charges prior to commencement of the work or connection of supply.

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4. GENERAL RULES

4.1 Safety (TIR)

All work performed must be undertaken safely and in compliance with all relevant acts, regulations, codes of practice, standards and these Rules. SafeWork SA website should also be referenced for further information related to electrical safety and safe work practices.

The Electricity Act 1996 and Electricity (General) Regulations 2012 require specific clearances to be maintained when building or working near the distribution network. The Office of the Technical Regulator is the authority with respect to these requirements and publishes information relating to:

Building safely near powerlines

Working safely near overhead powerlines

Working safely near underground assets

Trees and powerlines

Customers shall consider these requirements when planning any works or building near the distribution network.

Any conductors or wires that form part of the customer's electrical installation are not to be connected to the CPE Tonsley distribution network prior to formal energisation of the connection by CPE Tonsley.

Where CPE Tonsley becomes aware of an immediate risk to safety within an existing connected electrical installation, supply to the installation will be de-energised. Re-energisation will be subject to demonstration that suitable arrangements have been put in place to ensure the electrical installation is safe (including submission of eCoC's and reconnection requests as necessary). CPE Tonsley will endeavour to notify the installation customer as soon as reasonable in these situations. Written notice of the disconnection of supply will also be provided at the customer's installation.

The Electricity (General) Regulation provides for necessary design safety clearances and approach limits to be maintained around electricity assets. All applicable safety clearances and approach limits must be maintained at all times when working on or near electrical equipment. All other appropriate steps must also be taken when working on or near electrical equipment including:

- Provision of suitable protection from adjacent live electrical conductors or adjacent live parts of electrical equipment
- Use of insulated tools and equipment
- Use of appropriate equipment and plant in accordance with recognised electricity industry practice.

Safety signs required by these Rules, AS/NZS 3000 and AS 2067 shall be in English, permanent, legible from normal viewing level and distance, and suitable for the environment for which it is intended for the life of the installation.

Safety signs shall be manufactured of suitable size to comply with AS 1319.

4.2 Network Access and Excavation

Any access to the electrical assets on the CPE Tonsley Distribution Network must be carried out with the approval of CPE Tonsley and in accordance with all CPE Tonsley requirements. This includes:

- Joining of any electrical assets to the CPE Tonsley Distribution Network
- Excavating in close vicinity to distribution network assets
- Entering an CPE Tonsley distribution substation
- Accessing distribution network service pits
- Climbing any distribution network assets or related structures
- Locating new assets electrical or otherwise in close proximity to CPE Tonsley assets
- Accessing distribution network earth-grids and associated earthing systems.

Prior to the commencement of any underground excavations on the Tonsley site, a "Before you Dig Enquiry" must be carried out to confirm the area of excavation is free of assets or other services. Suitable risk assessment and methods (such as potholing) must be carried out to positively confirm

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location of any identified underground assets. CPE Tonsley should be contacted prior to proceeding with any excavations in the vicinity of their assets.

For work that involves excavation or boring with penetration below 300 mm and within 5 metres of

CPE's underground assets, you must:

1. Follow instructions on the BYDA response. Where planned works are within 5.0m of High Voltage electrical assets (above or below ground) you must contact CPE for further advice and an Engineering Assessment to be completed in advance.

2. Engage an accredited cable locator to locate and mark the location of the relevant assets showing

alignment and depth.

3. Develop a safety management plan or Safe Work Method Statement (SWMS), which outlines How the risks associated with cables will be managed and Develop a Permit to Work or a Network Access Permit (NAP) as deemed necessary from the Engineering Assessment.

4 Follow the instructions on the Engineering Assessment and/or Third-Party Works Agreement, and

pothole by hand or use other non-destructive methods to expose the cable and verify location and depth of the assets.

5. CPE must be notified by contacting (0472 871 569) at least 7 days prior to the commencement of the works if:

i) The proposed work is within 5.0 metres of CPE's ground mounted assets

ii) The proposed work is within 3.0 metres of CPE's underground assets, e.g. cables.

6. Include location of the work, dates and time work will commence and finish, work methodology and name of contact person responsible for site safety.

7. CPE will provide a response as to whether the work can be undertaken and any requirements that must be adhered to when undertaking the work. Work cannot proceed without prior written authorisation from CPE.

4.2.1 Supply Isolation

In circumstances where appropriate isolation is not possible within a customer's electrical installation (such as the main isolation switch), CPE Tonsley should be contacted at the earliest opportunity to isolate supply to enable work to be performed safely.

Where the isolation of an installation's supply is required to be carried out by CPE Tonsley then charges may apply. Details of applicable fees and charges are available from the CPE Tonsley website or Operation Office upon request.

4.2.2 Remote De-energisation, Re-energisation

In situations where de-energisation and/or re-energisation of electrical equipment is possible from remote operation (such as through operation of a contactor within a meter) then all suitable safety measures must be implemented to eliminate the risk of contact with live parts, in the event remote re-energisation should occur.

4.3 Compliance with Regulations, Codes of Practices and these Rules (TIR)

Compliance with these Rules as well as all relevant legislation, codes and guidelines is required for any connection or re-connection to the CPE Tonsley Distribution network. Applicable references include but are not limited to those in cited references

Where references included in these Rules (or otherwise) have been superseded then all updated provisions shall apply.

These compliance requirements apply to all of the following:

- New electrical installations
- Alterations to existing installations (as prescribed in AS/NZS 3000)
- Additions to existing installations (as prescribed in AS/NZS 3000)
- Any special electrical installations.

CPE Tonsley may request an inspection of an electrical installation or occupancy to review general compliance with these Service & Installation Rules. Such a request should not be unreasonably withheld.

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4.4 Testing (TIR)

All electrical work must be tested by a registered electrical worker or licensed electrical contractor prior to connection to the CPE Tonsley distribution network in accordance with the Electricity Act 1996 and the Electricity (General) Regulations 2012.

4.5 Equipment Acceptance (TIR)

Equipment used for interfacing to overhead distribution systems will not generally apply or be accepted for use given the nature of the CPE Tonsley distribution network. Otherwise, the equipment acceptance requirements outlined in clause 4.4 of the SA Power Networks Service and Installation Rules generally apply to equipment used to interface to the CPE Tonsley distribution network.

Service fuse enclosures, MSB and whole current metering enclosures, and hinged switchboard frames that are commonly distributed by electrical wholesalers and similar distributors or manufactured are required to be identified as approved for use in South Australia. In all cases approved equipment shall;

- have recognised certification and/or test reports, and
- comply with relevant AS/NZS standards

CPE Tonsley should be consulted where there is any doubt whether equipment is accepted for use and may refuse to connect equipment considered not to be acceptable.

4.6 Labelling (TIR)

The requirements outlined in clause 5.17 of the SA Power Network Service and Installation Rules also apply to applicable labelling used within Tonsley.

4.7 Access to Distributors' Equipment (TIR)

CPE Tonsley representatives and metering coordinators must be provided with suitable, safe and unhindered access to CPE Tonsley equipment and assets at all times, as required to ensure CPE Tonsley can undertake all necessary work and activities associated with:

- Supply, metering or billing of electricity
- Inspection and testing of customers electrical installations
- Connection, disconnection or reconnection of supply
- Operation, maintenance and inspection of the distribution network
- Low voltage installations connection points, main switch, meter isolators and metering
- High voltage installations connection points, main switch, meter isolators and metering.
- Building and Structures shall not be built within 1.2 m of a service pillar or pit.

4.8 Sealing and Locking (TIR)

Suitable sealing and locking provisions that restrict unauthorised access to un-metered terminals and other equipment must be implemented where required by these Rules.

Provisions for sealing shall be in accordance with clause 5.3, 5.4, 5.5 of the SA Power Network Service and Installation Rules.

CPE Tonsley metering equipment must have restricted access through the use of an approved lock compatible with the CPE Tonsley locking system. CPE Tonsley should be consulted for locking system details.

4.9 Unauthorised Interference with Infrastructure

Any unauthorised interference with CPE infrastructure or any unmetered section of an installation may be in breach of the Electricity Act 1996 which may result in prosecutions under the Act.

This includes, but not limited to:

- service fuse removal and replacement
- unauthorised removal of CPE locks, and electricity industry security seals installed by CPE, Metering Providers, or other delegated authorities
- dismantling or detachment of any CPE cables or equipment,

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- interference with electricity meters, time switches and unmetered wiring
- unauthorised entry of CPE assets, substations, transformers, pits, and pillars.

4.10 Private Electricity Assets on Public Land

CPE Tonsley must be contacted prior to installing a private electrical installation or any associated private wires, lines or cables, on public land. The requirements and limitations outlined in section 7.5.4 of these Rules will generally apply subject to specific consultation and agreement with CPE Tonsley.

4.11 Multiple Occupancy Buildings and Subdivisions

A range of specific requirements relating to multiple occupancy buildings and subdivisions are provided within these Rules including Section 7.1.2

It is the responsibility of the electrical designer and licensed electrical contractor to ensure all design and installations work is undertaken accordance with the Electricity Act 1996, the Electricity (General) Regulations 2012 and these Rules.

All appropriate information, including copies of proposed and final building and/or subdivision plans, should be provided and discussed with CPE Tonsley throughout the planning, design and implementation stages to help ensure delays and any unnecessary expenditure is avoided.

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5. SUPPLY TYPES, USE AND PROTECTION

5.1 Network Supply (TIR)

5.1.1 Supply Systems (TIR)

The supply information and recommendations laid out in clause 6.1 (and associated subclauses) of the SA Power Networks Service and Installation Rules also apply to the CPE Tonsley distribution network.

The SAPN electricity supply is in the form of alternating current of approximately sinusoidal waveform at a frequency of 50Hz.

The nominal supply voltage is 230/400V, maintained at steady state of +10% and -10%, measured over a 10-minute average, in accordance with AS 60038 and AS 61000.

5.1.2 Prospective Short Circuit Current (TIR)

Electrical installations are to be designed with consideration for the prospective short-circuit currents that may exist within the electrical installation. Short circuit currents (or fault levels) at the customer's terminals will vary dependant on the location of the installation with respect to the upstream source of supply.

Where the prospective fault current increases at the connection point due to an upgrade of supply, the customer shall be responsible for upgrading all their equipment to the revised prospective fault current.

Prospective low voltage short-circuit currents within the CPE Tonsley distribution network could be as high as 50kA in close proximity to larger distribution substations (e.g. within the MAB). Significantly lower values will apply where LV supply is taken at greater distances and/or from smaller distribution substations.

In all cases (including supply at high voltage) CPE Tonsley must be contacted to provide prospective short-circuit currents and associated durations when designing any electrical installations to be supplied from the CPE Tonsley network.

It is the customer's responsibility to ensure a circuit breaker with suitable fault current rating is installed in the main switchboard

5.1.3 Protective Earthing Systems (TIR)

The CPE Tonsley LV distribution network may employ either a common multiple earth neutral (CMEN) or multiple earth neutral (MEN) system.

The service is supplied without an earth conductor. The neutral conductor performs the multiple functions of distribution network neutral and distribution network earth. The consumer mains neutral shall be installed as the Protective Earth Neutral (PEN) conductor as per AS/NZS 3000.

CPE Tonsley should be contacted to confirm the earthing system employed for a given location or proposed installation. Earthing of all installations must comply with AS/NZS 3000 and be suitably maintained to ensure ongoing adequacy. Suitable accessibility for inspection and testing of earthing systems should also be maintained.

5.2 Connection Point (Point of Supply)

5.2.1 General

CPE Tonsley will nominate the required location and arrangement for the connection point, in accordance with applicable regulations and the Electricity Distribution Code, in response to an Application for Connection as outlined in section 3.3.

CPE Tonsley will provide a connection point. Contained within the connection point will be the connection terminals for the termination of the consumer mains.

The type of connection provided shall be determined by the;

- requested service capacity, and

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- configuration and limitations of the local distribution network.

Connection equipment (e.g. transformers, service pits and pillars, SPD etc.) supplied by CPE Tonsley generally remain the property of and are maintained CPE Tonsley.

Additional connection points may be considered in the following circumstances.

Multiple occupancy;

- comprising separate individual domestic installations intended to be occupied by different customers and does not include any common property assigned for MSB and group metering position, and
- the land associated with each of the domestic installations directly abuts a road reserve, and meets the earthing requirement of SAPN rules clause 6.1.3.

EV chargers;

- Separation shall be maintained between the installation of different connection points and shall comply with the requirements for identification in SAPN rules clause 7.1.3 and the earthing requirements of clause 6.1.3.

5.2.2 Multiple connection points

A prominent warning sign, (refer to clause 7.1.3), provided and installed by the customer, alerting to the presence of multiple connection points shall be installed on the exterior of each MSB and all relevant sub boards and fire panels.

This applies where;

- more than one connection point is provided to a property, and/or
- more than one set of consumer mains are connected within a connection point to the same property.

The requirements for multiple connection points are;

- site diagrams showing the location of the connection points, unmetered wiring and additional metering points, and
- the customer is responsible for the provision and maintenance of diagrams and labels to ensure they are permanent, legible, and current.

5.2.3 Connection point for short term supply

SA Power Networks may provide a connection point for an installation for a short-term, e.g., temporary building supply and event type situations. The type of connection point will be determined by the load requested by the customer and the limitations of the distribution network.

All reticulation beyond the connection point, including temporary switchboard arrangements and consumer mains, will be the customer's responsibility

Where a short-term connection is provided, it shall be disconnected at the time of connection of the permanent supply or conclusion of the event. In some situations.

5.2.4 Consistency with SA Power Networks

CPE Tonsley also adopts the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of the SA Power Networks Service and Installation Rules (where references to SA Power Network should be to CPE Tonsley):

- Number of Services
- Number of Phases
- Location

5.2.5 The Main Assembly Building

Within the MAB individual occupancies (or tenancies) will be treated as separate electrical installations requiring a single point of supply. These connections will generally be provided through dedicated

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service mains with the connection point located at the supply side terminals on the customer's main switchboard.

Where multiple customers are intended to reside within a single occupancy, CPE Tonsley may treat the installation as a multiple occupancy development and provide supply in accordance with this classification. Noting that due to the availability of common property and general access within the MAB, such as supply will generally require a single connection point.

5.3 Consumer Terminals (TIR)

Consumer terminals (and associated consumer mains) must be installed and labelled in accordance with applicable requirements outlined in clause 7.5 of the SA Power Network Service and Installation Rules.

5.4 Supply Arrangement Diagrams (TIR)

Where there is any risk of confusion or errors in identification of any supply arrangements, including segregation between electrical installations, occupancies unmetered wiring and switchboards and metering, then supply arrangement diagrams shall be installed and maintained.

5.5 Supply Use Obligations and Load Requirements (TIR)

5.5.1 Consistency with SA Power Networks

Customer's supplied from the CPE Tonsley distribution network are required to comply with the obligations and requirements as set out in 6.1 related clauses and associated sub-clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Network should be to CPE Tonsley):

- Obligations (TIR)
- Non-Compliance (TIR)
- Power Factor (TIR)
- Harmonics (TIR)
- Load Balance (TIR)
- Disturbing Loads (TIR)
- Switched Loads (TIR)
- Voltage Drop (TIR)
- Equipment Requiring Special Consideration (TIR)
- Starting Current of Motors (TIR)
- Test Method for Measurement of Motor Starting Current (TIR)
- Restart Delay (TIR)
- Installations with Generators, Alternative or Parallel Supplies (TIR)

5.6 Type of Supply and Load

CPE Tonsley will generally provide various details pertaining to supply within the connection offer and/or supply contract including:

- Terms and conditions for connection to the CPE Tonsley distribution network
- Type of supply including the applicable voltage and number of phases
- Capacity details including the authorised service capacity and agreed maximum demand

Where details are unavailable, then CPE Tonsley should be contacted to determine and document the supply arrangements that apply.

5.7 Supply Capacity (Maximum Demand Limitation)

Customer's must ensure the electrical demand on their electrical installation does not exceed the authorised service capacity. Unless otherwise agreed CPE Tonsley requires customer's provide appropriate load limiting control in accordance with clause 5.13 of the SA Power Network Service and Installation Rules.

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Where the demand of an installation is identified as exceeding the authorised service capacity, the customer must take appropriate corrective action which may include one or more of the following:

- Changes to maximum demand limit settings
- Reduction or disconnection of loaded circuits within the installation to below the authorised service capacity
- Application to CPE Tonsley for an increase to the authorised service capacity

If a customer does take the appropriate corrective action, CPE Tonsley may disconnect the supply until adequate measures have been adopted.

5.8 Installation & Supply Protection (TIR)

5.8.1 General Requirements

Service lines are required to be protected with protection equipment that can isolate each active conductor supplying an installation. For installations less than 500kVA CPE Tonsley will generally provide the service fuses and carriers for the protection of a service line. For larger installations (500kVA and greater) the customer will be required to provide their own Service Protective Device (SPD) where the SPD provides short circuit protection to prevent detrimental effects on the distribution network. The principal function of this device is to disconnect the electricity distribution network from the customer's installation.

AS/NZS 3000 has specific requirements for consumer mains installed as either protected or un-protected. In all situations overload protection shall be provided by the customer at the main switchboard.

Customers are advised to install supplementary protective equipment to limit possible damage to their electrical installation in the event of voltage variation, transients, and loss of one or more phases of supply. All customer protective equipment is required to grade with the upstream CPE Tonsley Distribution Network protection device.

5.8.2 Low Voltage Services

For low voltage services CPE Tonsley adopts the approach and requirements set out in the following related clauses and associated sub-clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Network should be to CPE Tonsley):

- Customers Protective Equipment (TIR)
- Application of SA Power Networks Protection Devices (TIR)
- Operation (TIR)
- Service Protection Devices
- Acceptable Applications (following subclauses only apply):
- Underground Supply
- Supply Direct from Transformers

A set of more specific requirements may also apply to services within the MAB, for which CPE Tonsley should be contacted for further details.

5.8.3 High Voltage Services

Establishing a high voltage connection to the CPE Tonsley network will only be applicable in exceptional circumstances. Where customers are seeking or require supply at high voltage then service arrangements will need to be determined subject to specific details.

Requirements for any high voltage installations will generally be consistent with Chapter 10 of the SA Power Networks Service and Installation Rules (also refer to section 10 of these Rules for further details).

5.8.4 Security

Service protection devices should be located and arranged to limit the ability of unauthorised persons to interfere with and operate the device. An acceptable method to restrict unauthorised interference

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is to locate the service protection devices in an enclosure fitted with facilities to accommodate an CPE Tonsley lock or seal in accordance with section 4.8.

5.9 Sources of Alternative Supply (TIR)

5.9.1 General

Sources of alternative supply represent any source of electricity other than that provided by the CPE Tonsley distribution network and include, but not limited to:

- Embedded generators (diesel, gas, photovoltaic, wind etc)
- Standby generators
- Regenerative braking equipment
- Uninterruptible power supplies (UPS)
- Energy storage systems (batteries etc).

Sources of alternative supply are required to comply with a range of applicable regulations, standards and rules including (but not limited to):

- The National Electricity Rules
- Electrical (General) Regulation
- Work Health and Safety Act
- All relevant Australian Standards (including AS/NZS 3000, AS/NZS 3010, AS/NZS 3947.6.1 and AS/NZS 4777).

Alternative supply sources will be generally classified by CPE Tonsley as either:

- Independent: generators or supply sources that operate separate to, and independent of, the distribution network. These are not, and cannot, physically connected to the distribution network, such as portable generators used for temporary supply at a construction site
- Standby: sources of supply that provide back-up when supply from the distribution network has become unavailable and may include UPS facilities. By definition standby supplies are not capable of parallel operation with the distribution network and must have facilities to ensure paralleling cannot occur (such as mechanical interlocks)
- Embedded generators: are capable of operating in parallel and synchronising with the distribution network. This include fully parallel operation as well as sources that may operate in parallel for short periods while transferring over to back-up supply.

5.9.2 Responsibilities and Requirements

All proposals for the connection of standby or embedded generating equipment to the CPE Tonsley distribution network (including within installations supplied from the distribution network) are required to be assessed and formally agreed by CPE Tonsley prior to connection.

CPE Tonsley must be consulted in the earliest stages of planning and design when considering any generation that may be required to connect or operate in parallel with the distribution network. An Application for Connection will also be required which includes the following information:

- Details of the proposed connection arrangement
- General details for the proposed generator
- Proposed protection arrangements
- The power transfer requirements
- Proposed power factor and reactive power capability
- Technical data and schematics including associated installation.

The connection of embedded generation will require consideration of a range of factors including but not limited to metering, protection and control, fault levels, power quality and performance standards. Generators will be reviewed by CPE Tonsley to determine that suitable protection arrangements have been put in place which may include:

- Synchronisation and related checking
- Under / Over voltage

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- Under / Over frequency
- Neutral voltage displacement
- Rate of change of frequency (ROCOF) and/or voltage vector shift (VVS) protection
- Fuse size should be rated to 32A.

Additional information may also be required and requested subject to specific details.

5.9.3 Consistency with SA Power Networks

CPE Tonsley also adopts the approach and requirements set out in the following related clauses and associated sub-clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley and associated website):

- Installations with Generators, Alternative or Parallel Supplies (TIR)
- Connection of Break before Make Stand-by Gen-Unit (TIR)
- Requirements for Parallel Embedded Generating Unit (TIR)
- Networks Connection of Inverter Energy Systems (TIR)
- Storage Systems

Relevant requirements outlined in the following SA Power Network technical standards (available on SA Power Networks website) should also be reviewed and will be considered when assessing connections to the CPE Tonsley distribution network:

- NICC-270 Guide for Connecting Large Embedded Generation,
- TS130 Technical Standard for Inverter Energy Systems (IES)- Capacity up to or equal to 200kVA,
- TS131 Technical Standard for Large Inverter Energy Systems above 200kW or Rotating Generating Systems.

5.9.4 Labelling

All switchboards associated with alternative supply sources must be clearly and permanently labelled as having alternative power systems connected. The circuit breaker, fuse or switch must also be similarly labelled. A suitable label shall also be fitted at the meter position and main switchboard.

Further details of labelling requirements are provided in AS 3000, AS 4777 and other Australian Standards applicable to generation systems.

Phase Identification - In the case of multiphase supplies, active conductors forming part of consumer mains shall be permanently identified red, white, and blue

5.9.5 Standby Generation

The inadvertent paralleling of Standby Generation with the Distribution Network represents a safety issue to electrical installations and the Distribution Network. A UPS may be considered standby generation. A UPS usually comprises an energy storage device such as a battery or flywheel supplying an inverter with the storage device charged by the Distributor's supply. A UPS does not (and will not be permitted to) generate energy back to the Distribution Network but provides a limited backup supply to downstream loads. While standby generators are not intended to parallel the Distribution Network, CPE Tonsley will review the installation arrangements to ensure that suitable facilities have been installed to ensure paralleling and back feeding of energy does not occur.

Standby Generators are required to be connected downstream of the installations supply meters and have a suitable interlocking system with the Distribution Network to ensure interlocking devices "break" or opens off from the Distribution Network before "Making" or closing on the Standby Generator. This may occur via automatic or manually switched means. However, the interlocking device will be required to be mechanical in nature. The use of electronic switches will not be permitted.

For UPS systems with interconnections to the distribution network "break-before-make" arrangements will be required. If parallel interconnections do not exist and all UPS loads are connected directly to the UPS, then labelling/identification of the UPS supplied loads will be required.

The switching of the generator neutral may be required to avoid multiple MEN connections. The normal supply neutral must not be switched. Correct sizing of the earth and neutral conductors for a

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permanently connected generator set is essential as these conductors form the loop that carries the earth fault currents.

5.9.6 Metering

All embedded generation installations will be required to have bi-directional metering installed to ensure energy flow is recorded during both forward and reverse power flow conditions. CPE Tonsley will generally require the use of net metering for all embedded generation installations.

The customer should also discuss and coordinate metering requirements with their Retailer at the earliest possible opportunity.

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6. CONNECTING TO THE LOW VOLTAGE (LV) NETWORK

6.1 Distribution LV Network and Connection

6.1.1 General

CPE Tonsley will provide an appropriate connection to each low voltage installation in accordance with the Electricity Act, the Electricity (General) Regulations, the Electricity Distribution Code and these Rules. The customer is responsible for providing suitable facilities for accommodating applicable CPE Tonsley service equipment at their cost. The customer is also responsible for the installation and all equipment beyond the connection point (with the exception of Retail meters).

For up to 100A connections from pits, pillars the following cable types are deemed not suitable for termination directly into CPE Tonsley infrastructure.

Neutral Screen marked UNDERGROUND Hard drawn copper

XLPE

Mineral insulated metal-sheathed cables (MIMS) Armoured cables

Armoured Cable

Aluminium cables

Flexible cables.

6.1.2 Consistency with SA Power Networks

CPE Tonsley adopts the approach and requirements set out in the following related clauses of the SA Power Networks Service and Installation Rules (where all references to SA Power Networks should be to CPE Tonsley):

- Type of Service: (with reference to clause 7.2 of these Rules) and noting that overhead services are not generally applicable to Tonsley
- Connections to Services

6.2 Underground Service Areas

6.2.1 General

With the exception of supplies within the Main Assembly Building, all areas within Tonsley will be treated as underground distribution areas, and underground services will generally apply.

6.2.2 Consistency with SA Power Networks

Within these areas CPE Tonsley adopts the approach and requirements set out in 7.2.5.2 and the following related clauses of the SA Power Networks Service and Installation Rules (where all references to SA Power Networks should be to CPE Tonsley):

- Consumer Terminals
- Underground Service

6.2.3 Supply Protection

As outlined in section 5.8 all services will be required to be protected by a suitable Service Protection Device. This will normally be a supply fuse or a circuit breaker and is required to be located as close to the property boundary as possible. Clause 7.3 SAPN Service and Installation Rules has been amended (May 2025) to help mitigate the risk of damaged consumer mains.

A fused connection point can be provided in the public land/footpath with the use of submersible fuses. These submersible fuses up to and including 100A can be installed within a P7 or P8 pit.

Additional requirements for unprotected LV consumer mains (no short circuit protection at the connection point) include:

- Minimum cable size shall be 16mm2

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- Cables to be double insulated as per AS/NZS 3000 requirements

Further detail can be found in the SAPN service and installation rules clause 7.3 (May 2025).

Where a SPD is installed in a MSB or metering enclosure with other control protection it shall:

- comply with the requirements of AS/NZS 3000, and
- meet the sealing requirements of clause 5.4. and
  - metal conductive MSBs and metering enclosures shall be bonded to the neutral or earthed in accordance with AS/NZS 3000 and labelled as "Unprotected mains bonding conductor" and,
  - in situations where the MSB or metering enclosure has been bonded to the neutral, the enclosure shall not be attached electrically continuous to any conductive structure connected to the installations MEN.

6.2.4 Customer Isolating devices

For the purposes of safety, load control and consumer mains overload protection, an installation shall have a lockable isolating device installed between the SPD and the revenue metering.

The isolating device shall be;

- installed to the requirements of AS/NZ 3000 if used as a main switch, and
- a circuit breaker with its operational status always visible, and
- appropriately sized in accordance with the agreed maximum demand, and
- accessible as per clause 7.4.3, and
- capable of being “Locked” in the “OFF” position only, (for meter isolators only), and
- orientated and spaced so any industry locks do not obstruct the operation of other protection devices or obscure labelling, and capable of being sealed.

Main Switches shall be located, arranged, and labelled, to allow their effective operation in an emergency.

Main Switches shall be labelled as follows:

a) All Main Switches throughout the entire installation, shall have a permanent reference at the Main Switchboard e.g. inside the switchboard door, and

b) Shall be numbered corresponding with the total amount of Main Switches on the installation.

6.3 Overhead Service Areas

There are no conventional overhead distribution areas within Tonsley. The distribution network within the Main Assembly Building (MAB), although run in an overhead cable-tray system, does not constitute a conventional overhead network consistent with this terminology. Low voltage services within the MAB are outlined separately in section 6.4 of these Rules.

6.4 Services within the Main Assembly Building

6.4.1 General

Within and below the MAB structure, LV services are generally provided through a direct service connection to either:

- An LV Busway System or
- A Distribution Substation

In both cases a dedicated service main installed via a cable-tray system, to the customer’s main distribution board is generally required. This service main will be part of the CPE Tonsley distribution

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network with the connection point and consumers terminals located at the supply side terminals on the customer's main LV switchboard (unless otherwise advised or agreed by CPE Tonsley).

Protection of the service main will generally be provided by a fuse-switch or dedicated circuit-breaker located on the LV Busway or at the distribution substation main LV switchboard. Customers are also required to have suitable protection on the incoming supplies at their main switchboard.

Availability of either type of service is dependent on location of the installation within the MAB, relative proximity to either a distribution substation or an LV busway system, as well as the specific load requirements such as maximum demand.

Necessary arrangements, responsibilities and available capacity for a given installation will be subject to an assessment by CPE Tonsley in response at an Application for Connection and specific details will be confirmed in a subsequent connection offer.

6.4.2 Busway LV Service

The LV Busway in current used at CPE Tonsley utilises the Schneider Electric I-Line II busbar trunking system. This system provides for a range of fuse-switch and circuit-breaker plug-in units for connecting associated services. At Tonsley services up to a maximum of 400A might typically be provided from the busway system.

Figure shows a general arrangement for an LV busway service to a smaller tenancy within the MAB. Figure shows a short section of busway and associated plug-in unit.

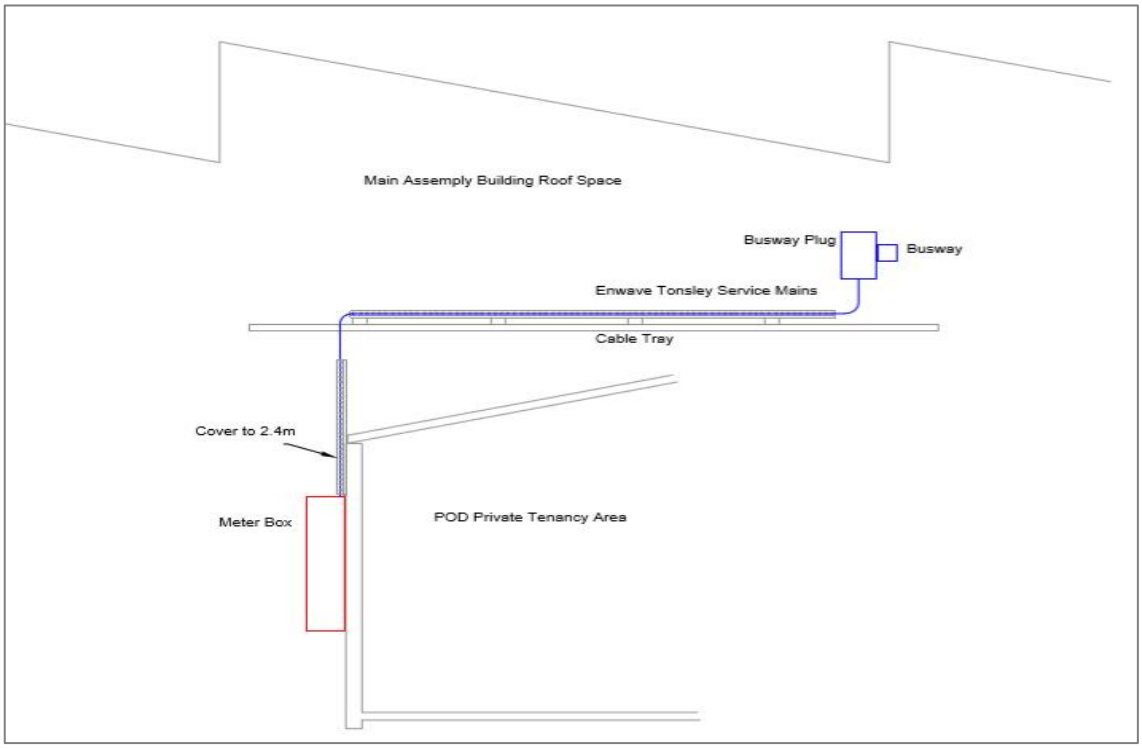


Figure 2 LV Busway Service



Figure 3 LV Busway and Plug-In Unit

6.4.3 Distribution Substation LV Service

These services are provided from a direct connection to a distribution substation located within the MAB. An LV circuit-breaker located at one of the MAB Service Cores will typically be used for connecting the associated service mains. Services up to a maximum of 1200A might typically be provided from a MAB distribution substation. Arrangements will be subject to the specific requirements and will typically involve dedicated service mains installed within cable-trays terminating at the customers main switchboard.

6.4.4 Segregation

Installations will be required to meet the conditions of AS/NZS 3000 for segregation of cables to avoid unwanted voltages and equipment interference. This includes demonstration of suitable segregation between:

- High Voltage cables
- Low Voltage cables
- Telecommunication cables
- Other assets (including conductive assets, water and gas)

6.4.5 Supply Protection and Earthing

All service connections will be protected by a suitable circuit-breaker or plug-in unit at the distribution substation or LV busway and will be located as close to the customer's installation as possible. Access to these protection devices will be limited to authorised personnel only and will be maintained by CPE Tonsley and their representatives. Customers should also provide suitable protection on the incoming supplies at their main switchboard.

All cables-trays shall include suitable earthing systems to ensure no dangerous potentials exist on the cable-tray and related structures. Customer's cable tray equipment and other associated equipment requiring earthing must be earthed through the installation earthing system without direct connection to the MAB common earth grid. Connection of the customer's earthing system to the MAB common earth must be at the connection point.

6.5 Consumer's Mains & Sub Mains

6.5.1 General

It is the customer's responsibility to provide, prepare and maintain consumer's mains and sub-mains that interface and terminate with CPE Tonsley equipment in accordance with these Rules.

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These requirements apply to the majority of situations within the CPE Tonsley distribution area. However, some specific situations may arise (such as various fire rated and earth sheath return systems) that may not be covered.

CPE Tonsley must be consulted where the suitability of proposed cables and conductors and their termination are not covered by these Rules or there is any ambiguity or doubt about requirements in a particular situation.

Consumer mains shall:

- Have the route of underground consumer mains clearly displayed within the MSB/enclosure of which they terminate.

- Meet the requirements of other authorities for use of a common trench including clearances to other services and minimum depth.

- be completely enclosed in an approved conduit or ducting. Enclosures will not be required for metal armoured cable, metal sheathed cable, neutral screened cable or where other types of cables or conductors are readily open to view or located in normally inaccessible places or underground.

6.5.2 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of section 7.5 SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General (TIR)
- Size of Consumer Mains (TIR)
- Identification of Consumer Mains (TIR)
- Joints in Un-Metered Consumer Mains
- Terminations (TIR)
- Underground Consumer Mains (TIR)
- Minimum Insulation Resistance (TIR)
- Wiring Systems (TIR)
- Connections (TIR)
- Isolating Devices

6.5.3 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in the section 7.4 and related clauses (and associated sub-clauses) of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- Meter Isolators (TIR)
- Location and Access to Isolation Devices

6.5.4 Alterations to existing installations

Typically, there are three areas of an installation where an alteration involves CPE Tonsley. These are:

- CPE Tonsley connection point
- The customer's consumer mains
- The customer's MSB, including the main Earth electrode, MEN point and unmetered sections.

For the intent of this clause each area can be considered separately. This means, an alteration to any one of the above areas, does not mean the other areas need to meet the current TIR requirements, as they are still considered compliant to the version at that time. It is only the area which work is being performed on that shall meet the current TIR requirements. However, all electricians have a duty of care to ensure the installation operates in the manner intended and does not pose a safety risk or have a negative impact on the network

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6.5.5 *Repairs to existing installations*

A repair can be considered for the work required after damage has occurred or deterioration.

Repairs carried out as per the below will not be required to meet the full requirements for new installations per these Rules. A repair is considered the work to restore the installation to safe and compliant condition equivalent to the requirements of the Service and Installation Rules and AS/NZS 3000, at the date when the installation was initially energised.

6.5.6 *Mechanical Protection of consumer mains*

For consumer mains installations, in addition to AS/NZS 3000 wiring systems mechanical protection requirements, 3mm mechanical protection at a minimum thickness of 1.6mm galvanised steel shall be installed over all exposed consumer mains HD wiring enclosures up to a height of 2m.

To provide a degree of flexibility to connect into the CPE Tonsley connection point, installed at a minimum height of 2.4 metres, mechanical protection is not required within 400mm of the connection point entry.

6.5.7 *Egress Path and Clearances*

In a single domestic installation, egress to the MSB of at least 600mm wide and 2m high shall be provided in at least one direction. If the egress path is via the MSB door side, the door shall be easily removable or be able to be secured in the fully open position (180°).

For non-domestic group meter boards, and installations with NPUs, the above applies but the egress shall be at least 900mm wide.

MSB/group meter boards and NPUs mounted on an elevated platform of any height, shall have barriers installed to prevent falls, and be accessed via stairs. Stairs shall be installed to comply with the National Construction Code.

Single domestic installation a minimum horizontal clearance of not less than 600mm shall be provided in front of the MSB.

APA Networks National Standard for domestic gas meter installations requires that there is 500mm clearance between gas and electric meter boxes, gas regulator/gas boxes, main earth electrodes, communications cable terminations or any other source of ignition.

6.6 Builder's Supply in a Permanent Position

CPE Tonsley should be contacted at the earliest opportunity in situations where construction supplies may be required from their distribution network.

Where supply is available, CPE Tonsley may provide supply for construction purposes in situations where the permanent consumer's mains and metering facilities are installed and fixed in their final position. These facilities will be considered permanent and must meet all relevant regulations, codes and standards as well as these Rules.

The installation must be weatherproof including the associated metering enclosure and/or switchboards and be securely supported in its permanent position and suitably installed such that effects from any vibration or movement do not occur.

In these situations, the installation should also be arranged to avoid the need for CPE Tonsley to revisit the site for any re-termination or modifications at a later date.

6.7 Builder's Supply in a Non-Permanent Position

CPE Tonsley should be contacted at the earliest opportunity in situations where temporary construction supplies may be required from their distribution network.

Where supply is available, CPE Tonsley may provide a temporary connection for construction purposes. It is the responsibility of the customer and/or their agents to confirm whether a temporary can be made available, and specific conditions that might apply (including the agreed period) before planning the construction work. Any temporary supply must be disconnected prior to connection of permanent supplies and/or before expiry of the agreed period.

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The Electricity Act 1996 and Electricity (General) Regulations 2012 requires all construction works to be carried out safely, whether new (under construction), altered or being demolished and to comply with the requirements of AS/NZS 3000. The electrical installation shall be suitably weatherproof and constructed in accordance with the servicing and metering arrangements as detailed in AS/NZS 3000 and these Rules. Adequate protection must be provided to prevent damage to service and metering equipment.

6.8 Main Switch Board location during building construction

CPE Tonsley is generally consistent with the 7.4 SAPN rules May 2025 for this section.

A MSB in a domestic application of less than 100A shall be located and secured as close as practical to its permanent position and meet these requirements. As these locations are building sites, additional controls are required to help prevent injury to persons or damage to the MSB, consumer mains or earthing systems during construction. For these installations:

- the IP rating of the MSB is appropriate for the location, and
- the MSB shall be fixed to the permanent framing, support or walling of the building, and
- shall only be connected to a protected connection point, and
- shall only be supplied from underground consumer mains
- the consumer mains shall be installed in HD conduit along the entire length, and
- the consumer mains entering the MSB are shall be installed in either a HD rigid and/or flexible/corrugated conduit properly secured to the MSB with a locknut and meet the requirements of AS NZS 3000 and 3012 have sufficient length to reach the permanent MSB position
- exposed conduit below the MSB shall have additional protection, such as minimum 16 mm thick MDF sheet or minimum 6mm cement sheet
- and the main earth conductor shall be installed in conduit along its entire length and also have the same protection as the consumer mains, and to prevent damage during construction
- the MSB shall be properly installed in its permanent position within 12 months

6.9 Attachment of Other Equipment to Poles or Assets

The CPE Tonsley network does not include conventional overhead distribution systems and associated poles for attachment of third-party assets. Any poles and standards used for public lighting will not generally be made available for attachment of other assets except under exceptional circumstances.

CPE Tonsley must be contacted if attachment of third-party equipment to any of their assets is under consideration.

6.10 Electrical Installations on Public Land (TIR)

CPE Tonsley must be contacted when considering any proposal to install an electrical installation on public land, proposed to be supplied from the CPE Tonsley distribution network. All such installations are required to comply with CPE Tonsley requirements and these Rules.

For consistency CPE Tonsley has adopted the approach and applicable requirements as set out in7.5.4 and related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should also be made to CPE Tonsley):

- Points of Supply and Consumer Terminals (TIR)
- Labelling (TIR)

6.10.1 Size and Length of consumer mains

Consumer mains shall be sized to meet the customer's load requirements, and the requirements of AS/NZS 3000, SAPN rules 7.5.2. The length of the customers consumer mains shall be correctly sized;

- to operate SPD or customer SPD under short circuit conditions, (protected situations only), and
- to limit the voltage drop on the consumer mains to no greater than 2% of the maximum demand of the installation. (This is from the connection point which shall include both

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unprotected and protected consumer mains). The rating of the meter isolator/ load control device circuit breaker shall be considered the maximum demand for this calculation.

Additional requirements for unprotected consumer mains, (no short circuit protection at the connection point)

- Minimum cable size shall be 16mm2, and
- Cables shall be double insulated, as per AS/NZS 3000 requirement

For services supplied from CPE Tonsley padmount and ground level transformers greater than 100A the total cable route length shall not exceed 10 metres, without prior consultation with CPE Tonsley.

6.10.2 Consumer Mains on public lands including road reserve

In situations where a connection point is located on public lands and where underground consumer mains are located within public land, the customer should obtain Council, Department of Infrastructure and Transport (DIT) or the relevant authority's approval prior to the installation of underground electrical cables. CPE Tonsley may request confirmation of this approval prior to making the connection.

The consumer mains should be installed on the same side of the road as the customer's installation. The route length of protected consumer mains installed on road reserve shall be no more than 100m and be generally consistent with SAPN rules clause 7.5.2.

6.10.3 Consumer mains installed near gas services

Consumer mains can only be installed externally on a building if they are greater than 250mm from the gas mains and/or gas meter box,

6.10.4 Consumer Mains installed into CPE Tonsley pits and pillars

Where consumer mains enter a service pit/pillar, they shall;

- enter through the aperture or ducting/conduit system provided. If no ducting/conduit is available, please consult CPE Tonsley
- only be one cable per phase and neutral
- labelled and identified
- have reinforced insulation on the end (electrical tape is not acceptable) to prevent inadvertent contact with live conductors within the service pit/pillar
- already be terminated at the switchboard or LOAD end
- be a minimum cable tail of 600mm to extend beyond the top of the pit/pillar at the farthest end from the entry point. This length is required for the connection
- have a cable gland or non-flammable sealer installed in the conduit to prevent the transmission of liquids, termites and vermin.

Armoured cables, mineral insulated metal-sheathed cables, neutral screened cables and metallic piping shall not enter CPE Tonsley service pit/pillar.

6.10.5 Mechanical protection

The consumer mains shall be mechanically protected in accordance with AS/NZS 3000. For the purposes of these rules. The minimum requirement for mechanical protection systems

- Installed on road reserve/public lands shall be a minimum 3mm galvanised steel covering consumer mains and installed in HD conduit.
- Installed on private property shall be a minimum of 1.6mm galvanised steel covering consumer mains installed in HD conduit.

Mechanical protection shall be a minimum height of 2.4m and a maximum height of 2.6m from ground level. The installation shall be installed in a manner that does not cause a hazard to pedestrians or animals.

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6.11 Multiple Occupancy Buildings and Subdivisions (Supply Arrangements)

6.11.1 General

CPE Tonsley should be contacted at the earliest opportunity where supply may be required to multiple occupancy buildings and subdivisions. In addition to provision of applicable details and plans an Application for Connection should also be submitted to CPE Tonsley as early as possible to help ensure supply can be made available within required timeframes.

6.11.2 Multiple Occupancies and Consistency with SA Power Networks

For consistency CPE Tonsley has adopted the approach and applicable requirements as set out in 7.1 and related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- Plan
- Subdivision
- Unmetered Conductors
- Metering
- Control (TIR)
- Supply Arrangement Diagrams (TIR)
- Labelling (TIR)

6.11.3 Subdivisions and Consistency with SA Power Networks

For consistency CPE Tonsley has adopted the approach and applicable requirements as set out in 7.1 and related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General
- No Existing Electrical Installation or Supply
- Existing Electrical Installations or Supply
- Multiple Occupancies

6.12 Unmetered Services

Un-metered supplies will not generally be approved for connection to the CPE Tonsley distribution network unless absolutely necessary in extreme circumstances (such as emergency situations). CPE Tonsley must be contacted in situations where the need for any unmetered supplies is being considered.

Where approved, the provisions outlined in clause 7.8 of the SA Power Networks Service and Installation Rules will also generally apply.

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7. LOW VOLTAGE METERING

7.1 Scope

All metering must be in accordance with requirements included in the National Electricity Rules, Electricity Metering Code, National Metrology Procedure and the Electricity Act. The customer's retailer is responsible for all metering and should be consulted as early as possible in the planning, design and construction of any new electrical installations.

CPE Tonsley is generally consistent with section 8.4, SAPN Rules 2025 metering requirements.

This section sets out CPE Tonsley requirements related to low voltage metering and associated switchboards and service equipment connected to their distribution network.

Details of metering and associated requirements for high-voltage installations is provided in Section 10 of the SAPN rules.

CPE Tonsley should be contacted for any clarifications relating to the requirements contained in these Rules.

7.2 Tariffs & Metering

The customer or their agent should consult with their Retailer to determine applicable tariffs and metering arrangements for a given installation. CPE Tonsley may also need to be consulted in situations where network tariffs may require clarification (refer to the CPE Tonsley website for further information).

7.3 Metering Obligations

7.3.1 Consistency with SA Power Networks

For consistency CPE Tonsley has adopted the approach and requirements as set out in the following related clauses of the SA Power Networks Service and Installation Rules:

- General (TIR)
- Alterations & Additions

7.4 Meter Type

CT type metering must be provided in all situations where the maximum demand has been determined to exceed 80A for any active conductor being metered.

7.5 Metering Facilities (TIR)

7.5.1 Consistency with SA Power Networks

For consistency CPE Tonsley has adopted the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General (TIR)
- Meter panels (TIR)
- Metering Surrounds & Enclosures (TIR)
- Acceptance (TIR)
- On Meter Panels or Within Enclosures (TIR)
- Security Seals
- Customer's Equipment
- Meter Panel Labelling (TIR)
- CT Wiring

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7.5.2 Requirements to install a meter isolator

A meter isolator with an accompanying sealable metering neutral link shall be installed:

- For all new installations including whole current, CT and high voltage.
- To existing installations where an additional tariff is requested. Refer to Notes below.
- Where metering configurations are changed due to changes in authorised service capacity.
- Customer initiated meter change.
- To any additional tenancy or landlord meter.
- For installations requiring reconnection to the distribution network after being disconnected for safety reasons

Where a Meter Isolator has been installed and labelled correctly, prior to attendance by a Metering Coordinator, and has not been connected, then it shall be locked and tagged "Not in Service".

The Meter Isolator shall be connected by the Metering Coordinator prior to, or at the same time of remotely programming the meter, reconfiguring the metering or a meter change occurs.

7.6 Metering Access (TIR)

7.6.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 8.1 and related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

7.7 Location (TIR)

7.7.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 8.1, 8.3 and related clauses (and associated diagrams) of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General
- Single Residential
- Single Non-Residential
- Multiple Residential Installations
- Multiple Non-Residential
- Combined Residential – Non-Residential Use
- Public Land
- Unsuitable Metering Locations (including SA Power Networks and CPE Tonsley Easements)

7.8 Protection against Damage, Interference and Personal Injury (TIR)

7.8.1 General

The customer must provide suitable methods of protecting against damage to metering equipment and injury to persons working on metering equipment. This shall include, but not limited to, the protection against vehicles, normal and adverse weather conditions, spread of fire and unauthorised access.

Metering equipment shall be located in a suitable enclosure to protect the equipment from weather and shall be locked in accordance with these Rules and clause 8.1. Positioning and location of the metering enclosure shall be in accordance with these Rules and allow for safe access and ability for opening all hinged doors and panels without obstruction or injury. This includes a minimum horizontal clearance of flat ground of not less than 0.6 metres in front of the meter panel and the provision of an

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egress path of at least 600mm from the enclosure. All meter equipment shall be accessible from the ground level in front of the enclosure without the use of ladders or platforms.

7.8.2 Consistency with SA Power Networks

CPE Tonsley has also adopted the approach and applicable requirements as set out clause 8.12 of the SA Power Networks Service and Installation Rules (with reference to clause 8.4 of these Rules).

7.8.3 Metering Equipment - Limits of Operation (TIR)

Direct connected meters must not be utilised in situations where phase current can exceed 100A. The maximum demand must be limited to ensure the current rating of direct connected meters cannot be exceeded. In situations where the maximum demand cannot be limited then CT metering shall also be required.

All metering facilities, enclosures and panels shall be designed so that meters are not subject to conditions or temperatures in excess of their specified operating range and in accordance with NMI M6-1 (as published by the National Measurements Institute) and the National Measurements Act.

Appropriate air circulation, ventilation, shading or siting of the metering equipment should be considered in meeting the applicable operating limits.

7.9 Whole Current Metering

7.9.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in the following related clauses and associated subclauses of the SA Power Networks Service and Installation Rules:

- Clearances
- Meter Panels
- Equipment (TIR)
- Isolation of Metering Equipment

7.10 LV Current Transformer Metering

7.10.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 8.4 and related clauses and associated subclauses of the SA Power Networks Service and Installation Rules:

- General
- Meter Panel

7.11 Group revenue metering

The MSB/group meter board, group metering equipment shall;

- be in a position to allow all occupants to have common right of access to their occupancy's revenue metering and circuit protection equipment
- be grouped at the MSB/group meter board for the installation or at the origin of each tenancy submain or be grouped at a number of group meter boards.
- the door(s) of rooms and enclosures housing revenue metering equipment shall be labelled

'Electricity Meters'. If the door is to be locked, it shall be locked in accordance with clause 5.5.

A minimum horizontal clearance of 600mm, from any part of the MSB/group meter board, including the doors, in any open position, shall be maintained. For MSB/group meter boards with removable lift off doors a minimum clearance of 1000mm shall be maintained from the MSB/group meter board. SAPN rules reference 8.1.5, 8.3.

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8. HIGH VOLTAGE ELECTRICAL INSTALLATIONS

8.1 General (TIR)

The CPE Tonsley network includes high voltage distribution system operating at 11kV. The need for establishing a 11kV high voltage connection to the CPE Tonsley network will only be considered under exceptional circumstances and may not be available or agreed subject to specific requirements.

The operating and maintenance requirements and associated obligations for high voltage installations are significant and must only be undertaken by personnel who are suitably skilled, qualified and trained.

CPE Tonsley requirements for high voltage installations and associated connection are set out in this section and are generally consistent with requirements of the SA Power Networks Service and Installation Rules. These requirements are in addition to those included in the Distribution Code and AS/NZS 3000 Electrical Installations.

Supply at high voltage will also require an associated connection agreement with CPE Tonsley and contract for the supply of electricity with a Retailer as outlined in section 3.2 of these Rules.

CPE Tonsley should be consulted at the earliest possible opportunity where customers are considering supply at high voltage. Connection arrangements will need to be determined subject to specific requirements and could take extensive negotiations and a considerable time for finalisation.

Customers are warned not to make any commitments (e.g. contractual arrangements), for commencement of works until they receive formal confirmation from CPE Tonsley describing the terms and conditions of the connection and contracts that apply to the supply of electricity.

8.2 Connection Application Information (TIR)

In addition to an Application for Connection, additional supporting information will also be required. As a minimum the following preliminary information should be provided:

- A proposed Single Line Diagram of the installation identifying all HV assets
- A proposed site plan identifying the physical location of all HV assets (including cabling)
- Details of a preferred point of supply
- The anticipated maximum demand of the installation
- Details of any proposed generation or energy storage equipment
- Details for any proposed disturbing loads, large motors and the like
- Proposed HV metering arrangements
- Proposed protection schemes and arrangements (including a preliminary protection schematic diagram)
- Proposed earthing arrangements

Additional information may also be required and requested by CPE Tonsley subject to the specific requirements for the proposal and associated connection.

8.3 Installation Design (TIR)

8.3.1 General

Design of the installation should take into account the following parameters for the HV distribution network:

- System Nominal Voltage – 3 phase 50Hz, 11kV rms phase/phase
- Earthing arrangement – either a multiple earth neutral (MEN) or a Common Multiple Earth Neutral (CMEN)

Where a CMEN system is employed the installation's high voltage and low voltage earthing systems shall:

- Be installed separately and

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- Have a single bonding point between the high voltage and low voltage earthing system at each transformer and be connected to the distribution network's common neutral conductor via the customers neutral conductor

Where a MEN system is employed the customer's high voltage and low voltage earthing systems shall be kept separate. Reference SAPN rules 10.2.2 May 2025.

- Maximum Fault Level – 20kA (unless otherwise advised by CPE Tonsley)
- Fault Withstand Time – 3 seconds (unless otherwise advised by CPE Tonsley)
- Power Frequency withstand voltage – 28kV rms
- Impulse withstand voltage – 75kV peak, 95 above

The installation shall be designed to perform under fault conditions.

The short-circuit which may occur in the customer's installation is dependent on.

- the prospective fault level at the connection point, and
- contributions made by rotating electrical plant or other connected systems connected to
- the installation, and
- impedances within the installation.

The fault level generally given will be higher than that which initially exists to provide for system development. The maximum ultimate fault level rating will be used to determine the minimum equipment fault ratings of the installation. The maximum fault level rating will allow the determination of the protection relay settings and anticipated voltage fluctuations.

The design of the HV installation shall comply with the requirements of the Metering Code, the National Electricity Rules, all applicable Regulations and Australian Standards including AS 2067. Additionally, the installation must comply with these rules and compliance will be required to be confirmed during the application and approval process.

8.3.2 Consistency with SA Power Networks

CPE Tonsley has also adopted the approach and applicable requirements as set out in section 10 and related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley:

- Power Transformers (TIR)
- Protective Equipment (TIR)
- Insulation Coordination (TIR)
- Short Time Withstand Current (TIR)

8.4 General Design (TIR)

8.4.1 Circuit Connections

High voltage supply will generally be provided through a single connection. In situations where more than one connection is requested and agreed, they will be required to terminate onto a common busbar and/or have suitable interlocking facilities to the satisfaction of CPE Tonsley. Alternative arrangements may be considered by CPE Tonsley in exceptional circumstances.

8.4.2 Power Factor

Power factor of all high voltage installations connected to the CPE Tonsley distribution network must be maintained between 0.9 leading and 0.9 lagging.

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8.4.3 Supply Quality and Disturbances (TIR)

The CPE Tonsley distribution network is designed, installed, operated and maintained so that supply of electricity to our customers is of a suitable quality in accordance with:

- Voltage requirements set out in AS 60038
- Voltage fluctuations limit as set out AS/NZS 61000 Parts 3.3, 3.5 and 3.7
- Harmonic distortion limits outlined in AS/NZS 61000 Parts 3.2 and 3.6.

High voltage customers must ensure their electrical installations do not cause unacceptable disturbances or quality of supply for other customers, and their load is sufficiently balanced across all phases. All high voltage installations will be required to comply with the AS 60038 and AS/NZS 61000.

In addition, these processes and procedures have been designed to ensure interference caused by our Network is less than the limits set out in AS/NZS 61000 Parts 3.5 and AS/NZS 2344.

CPE Tonsley recognises that power quality is influenced by a wide range of factors including:

- Network scale, configuration and associated equipment.
- Customer installations and associated equipment.
- Customer and overall network load characteristics.
- Various network parameters including fault levels and impedances.
- Network switching and operating arrangements.
- Protection systems and settings.
- Type/scale of embedded generation and associated equipment.
- Phase balance and associated load distribution.
- Maintenance practises and procedures.

Accordingly, the various requirements for achieving suitable quality of electricity are included across a range of plans, processes and procedures.

8.4.4 Consistency with SA Power Networks

CPE Tonsley has also adopted the approach and applicable requirements as set out in the following related clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- Control of Incoming High Voltage Supply (TIR) (with reference to clause 10.2 of these Rules)
- Safety Signs 5.18 (TIR)

8.5 Protection and Discrimination (TIR)

Customers connecting at high voltage will be required to undertake a full and detailed study of protection requirements for their installation including discrimination studies with the upstream distribution network protection. Full documentation of protection studies and proposed settings must be provided to CPE Tonsley at the earliest possible opportunity.

The customer's protection systems must be designed to suitably discriminate with the distribution network protection systems. The CPE Tonsley protection systems shall not be required to protect any customer's equipment beyond their main supply circuit breaker. The customer's protection systems shall have suitable selectivity and discrimination to ensure mal operation of upstream protection systems do not occur.

Associated requirements as set out in clause 10.4.9 of the SA Power Network Service and Installation Rules must be considered in the design and setting of protection systems, noting that these requirements also apply to the CPE Tonsley high voltage connections to the SA Power Networks distribution system.

High voltage protection settings must be accepted by CPE Tonsley and the main protection devices shall have suitable facilities in place such as a security seal and suitable labelling to ensure that protection settings are not altered without prior consultation and approval by CPE Tonsley. Any necessary modifications or settings changes on the CPE Tonsley protection systems may be required to be undertaken at the customer's expense.

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8.6 Earthing (TIR)

8.6.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 10.2.3, 10.2.4, 10.2.5 clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General (TIR)
- Size of Earthing Conductors (TIR)
- Earthing of Metering Equipment (TIR)

The distribution network employs either;

- multiple earth neutral (MEN), or
- common multiple earth neutral (CMEN) earthing system

In areas where a MEN earthing system is used, the clearances between the customer's;

- main earth electrode and associated wiring system, or
- structural metalwork or metallic cladding, which is in contact with the installation earthing system, including switchboards, metering enclosures, generators, opened doors etc., shall be a minimum of 4.0m from the CPE Tonsley high voltage distribution ground mounted transformers, switching cubicles, and associated earthing system.

8.7 Acceptance of HV Installations (TIR)

A range of documentation will need to be provided to CPE Tonsley prior to acceptance and connection of a high voltage installation. The details set out in clause 10.5, 10.6, 10.7 of the SA Power Network Service and Installation Rules must be provided, noting that these requirements also apply to the CPE Tonsley high voltage connections to the SA Power Networks distribution system.

Sufficient notice must be provided for CPE Tonsley to review details, consult with SA Power Networks and provide written acceptance or request further information/clarifications where necessary. Written acceptance may also be required from SA Power Networks in situations where associated setting changes or modifications to the CPE Tonsley high voltage system is required.

8.8 Metering (TIR)

8.8.1 General

High voltage metering requirements set out below apply to high voltage installations with a single connection and no associated generation facilities. The requirements are consistent with National Electricity Rules, the SA Metrology Procedures and the Electricity Metering Code. Additional requirements may apply in more complex situations.

8.8.2 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 10.4.11 clauses (and associated subclauses and diagrams) of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- General Requirements
- Metering Instrument Enclosure Requirements
- Metering Transformers

8.9 Testing and Commissioning (TIR)

A range of inspections and tests are required prior to commissioning of any new or altered high voltage installations. This shall include all applicable testing and inspections required to ensure compliance with AS/NZS 3000, AS/NZS 2067 and these Rules.

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The details set out in clause 10.6 of the SA Power Network Service and Installation Rules apply and should be provided to CPE Tonsley, also noting that these requirements also apply to the CPE Tonsley high voltage connections to the SA Power Networks distribution system.

Sufficient notice must be provided for CPE Tonsley to review details, consult with SA Power Networks and provide acceptance or request further information/clarifications where necessary. Acceptance may also be required from SA Power Networks in situations where associated setting changes or modifications to the CPE Tonsley high voltage system is required.

8.10 Customer's HV Installation Operation & Maintenance (TIR)

8.10.1 Consistency with SA Power Networks

CPE Tonsley has adopted the approach and applicable requirements as set out in 10.7 clauses of the SA Power Networks Service and Installation Rules (where references to SA Power Networks should be to CPE Tonsley):

- Operating Procedures (TIR)
- Trained Operators (TIR)
- Maintenance (TIR)

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Appendix A – Clean Peak Energy Structure

