



# Service and Technical Installation Rules Connected Energy


CE-ALL-AM-NA-PLN-000001

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## 1. GENERAL

### 1.1 Scope

These Rules apply to all new and altered installations connected to the Zenith Connected Energy (ZCE) networks. All proposals for the establishment or modification of private customer electrical installations within the networks of: Peel Renewable Energy, Eglinton Village Energy or any future locations for Zenith Connected Energy networks/microgrids, will generally be required to demonstrate, and be undertaken in compliance with these Rules.

Most applicable arrangements and necessary details are described within these Rules. However, unique situations and unusual conditions may arise that have not been fully contemplated or covered, including those arising from changes to applicable legislation, codes, guidelines and standards. Should these situations occur, or where any doubt exists, Connected Energy should be contacted to discuss and agree on suitable arrangements.

These Rules represent an adjunct to the Western Australia Electrical Requirements (WAER) published by the WA Department of Mines, Industry Regulation and Safety. Additional requirements are also contained in other related codes, legislation and regulations including, but not limited to:

- Code of Conduct for the Supply of Electricity to Small Use Customers 2022,
- Electricity Networks Access Code 2004
- the Electricity Industry (Customer Transfer) Code 2016,
- the Electricity Industry (Metering) Code 2012,
- the Electricity Industry (Network Quality and Reliability of Supply) Code 2005,
- Western Australia Service and Installation Requirements (WASIR)

Where a proposed connection or alteration to an electrical installation occurs and is likely to affect ZCE's microgrid connection to Western Power, then additional consultation and conditions may be applicable. In these situations, further detailed assessments and consultation with Western Power will be necessary before any proposals are finalised or implemented.

Related information and requirements are also contained in the following Zenith Connected Energy generic or microgrid specific documentation:


- Customer Connection and Contribution Guidelines,
- Customer Self Supply Guidelines,
- Network Performance and Planning Criteria Manual,
- Connection and Supply Contract,

To the extent allowable, where an electrical installation also consists of a distribution system (as defined in the Electricity Industry Act 2004 (WA)) the requirements of these Rules apply to the operator of the distribution system (parent) and their electrical installation. A downstream distribution system customer (sub-metered) must liaise with the operator of the distribution system for conditions relating to their supply.

### 1.2 Objective


The key objective of these Rules is to provide Zenith Connected Energy (ZCE) customers, their agents and registered electrical workers with the technical requirements for electrical installations connected to the Zenith Connected Energy distribution networks (micro-grids). These requirements are intended to comply with relevant Australian Standards, legislation and other applicable rules and codes.

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

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### 1.3 Definitions

Term	Description
ZCE	Zenith Connected Energy Pty Ltd. Parent company of the individual microgrids, and a subsidiary of Zenith Energy Operations Pty Ltd. Zenith Connected Energy Pty Ltd.
Consumer Terminals	The junction at which the consumer mains connect to the Zenith Connected Energy Distribution Network Service Main or conductors
Connection Offer	An offer from Zenith Connected Energy 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).
CT	Current Transformer
Deemed	Regarded, considered or judged.
Distributor	For the purpose of these Rules Zenith Connected Energy is the Distributor
Distribution Network Distribution System Embedded Network Microgrid	For the purposes of these Rules refers to the electrical infrastructure, including cables, transformers, substations and related equipment, operated by Zenith Connected Energy, which transports electricity to a Customer's Connection Point within Zenith Connected Energy.
HV	High Voltage
LV	Low Voltage
Network	Unless identified otherwise this refers to the Zenith Connected Energy distribution network
RMU	Ring Main Unit (typically for 22kV switching).
Rules	these Service and Technical Installation Rules, unless otherwise specified.
WP	Western Power. The upstream distributor of electricity to the Zenith Connected Energy embedded network.
Service Protection Device (SPD)	A device provided by Zenith Connected Energy, generally a fuse or circuit-breaker, to protect the Zenith Connected Energy service to a customer's installation.
Service Main	Mains owned by Zenith Connected Energy that are generally dedicated to a customer and run from the ZCE Microgrid to the Point of Supply (as defined in AS/NZS 3000).
STIR	These '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 Zenith Connected Energy.
UPS	Uninterruptible Power Supply
WASIR	Western Australian Service and Installation Requirements
WAER	Western Australia Electrical Requirements

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## 1.4 Competency and Use

This document is intended for use by Zenith Connected Energy, ZCE microgrid subsidiaries, 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 Western Australia.

The Electricity (Licensing) Regulations 1991 (WA) requires all electrical work carried out on electrical installations connected to or intended to be connected to the Zenith Connected Energy distribution network will be performed by registered Electrical Worker(s) who are suitably licensed by the WA Electrical Licensing Board.

## 1.5 Contact Information

Contact for any matters related to the content of these Rules may be made through written correspondence to Zenith Connected Energy. Any enquiries relating to a specific installation matters should be directed to the Zenith Connected Energy General Manager.

### Responsible Person:


**Jason Good** : General Manager – Zenith Connected Energy

**Email:** [JasonGood@ZenithEnergy.com.au](mailto:JasonGood@ZenithEnergy.com.au)

**Address:** 52 Belmont Avenue, Rivervale WA, 6103

## 2. FORWARD

The Service & Technical Installation Rules apply to all connections to the electricity supply networks operated by Zenith Connected Energy. The Rules lessen the need to reference the complex, extensive and expanding range of regulations and documentation relating to connection of installations. All installations connected, or to be connected, to Zenith Connected Energy networks must comply with the Rules as a condition to acquiring and maintaining an electricity supply. The Rules may not cover all circumstances. These may include unusual connections, inadvertent omissions or changes to legislation and codes. Zenith Connected Energy management does not accept responsibility where this occurs. Zenith Connected Energy must be consulted in these circumstances.

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### 3. DESCRIPTION OF THE OPERATION

#### 3.1 Introduction

Zenith Connected Energy (ZCE) own a number of network operator operating multiple grid connected microgrids around Perth, Western Australia.

Each microgrid usually takes supply at 22kV from Western Power and incorporates an internal 22kV cable network supplying several 22kV/433V distribution substations. Individual sites within the ZCE are typically supplied via radial low voltage supplies from these distribution substations.

#### 3.2 Distribution Network Overview

The ZCE distribution network supplies customers within microgrid and most common structure has the following general features:

- One Main 22kV Switchboard - with incoming 22kV supply from the Western Power network and outgoing circuits supplying the microgrid 22kV ring feeders,
- Associated 22kV ring-feed reticulation network,
- Several 22kV/LV distribution substations with associated HV RMU's and LV distribution boards (typical transformer: 1MVA and 630kVA),
- Several standalone LV kiosk switchboards for various customer and miscellaneous supplies,
- LV service main cabling to various customer installations within the precinct.

#### 3.3 Typical Service Connections

##### 3.3.1 Low Voltage Services

LV services to customers within ZCE networks are typically one of the following:

- Direct Substation Supply – consisting of customer mains running directly to a Type 2 LV Kiosk within a distribution substation.
- Standalone Kiosk Supply – consisting of customer mains running to a Standalone Type 1 LV Kiosk.
- Uni-pilar (green pilar, green dome) – usually consisting of two customer mains connected to LV ring network fed from LV distribution board.

Further details are also provided in Sections 5,6 and 7 of these Rules.

##### 3.3.2 High Voltage Services

High voltage connections will only be considered in exceptional circumstances. Where customers are seeking or require supply at high voltage then specific arrangements will need to be determined subject to specific requirements.


Requirements for high voltage installations will generally be consistent with the WA Electrical Requirements. Also refer to Section 8 of these Rules for further details.

#### 3.4 General Information

These Rules will be maintained and administered by Zenith Connected Energy specifically for installations connecting or connected to the ZCE distribution networks. The key objective is to ensure all technical and safety requirements relevant to customer electrical installations are complied with prior to connection and supply of electricity.

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,

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- Ensuring an appropriate quality of supply is maintained for all users of the distribution network,
- Ensuring a clear understanding and delineation of responsibility between customers and Zenith Connected Energy 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.

### **3.4.1 Organisational Context**

Zenith Connected Energy is a wholly owned subsidiary of Zenith Energy Operations Pty Ltd.

Zenith Energy Operations Pty Ltd employs over 220 permanent employees and engages consultants and sub- contractors for a range of planning, design, operating, maintenance and construction activities on an as required basis.

Zenith Energy Operations Pty Ltd staff assist the on-site 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.

Zenith Connected Energy's General Manager is responsible for administering these Rules in consultation with relevant personnel including the Engineering and Safety and Compliance Managers.

### **3.4.2 External Stakeholders**

A number of stakeholders external to Zenith Connected 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 distribution network,
- Tenants, landholders and general public within each ZCE microgrid,
- Electrical contractors, subcontractors, consultants, designers and other service providers operating within ZCE microgrids,
- Electricity Retailers,
- Relevant regulatory and government authorities including Development WA, WA Department of Mines, Industry Regulation and Safety (DMIRS), WA Director of Energy Safety and WA Economic Regulation Authority, Energy and Water Ombudsman of Western Australia,
- Western Power (WP)

Zenith Connected Energy 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.

### **3.4.3 Update and Revision**

In line with Zenith Connected Energy standard Document Control procedures this document will be reviewed at least every 2 years. A range of considerations will apply in preparing future revisions outside of the standard document review process 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 Western Power and related requirements,
- Ongoing practical experience in managing the network, connecting installations and other operational aspects.

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### **3.4.4 Availability and Distribution**

The most recent revision of these Rules will be readily available to the general public free of charge through the Zenith Connected Energy microgrid websites.

### **3.4.5 Failure to Comply with These Rules**

Where an installation connected or intending to connect to the distribution network is deemed to not satisfy these Rules, connection of electricity 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 Zenith Connected Energy to confirm the installation's compliance with these Rules. Re-inspection fees may apply as outlined in the connection charges documentation available on the Zenith Connected Energy website. Failure to comply could also result in prosecution under the Electricity (Licensing) Regulations 1991.

### **3.4.6 Exemptions**

These Service and Technical Installation Rules may not cover all circumstances, including unusual situations, inadvertent omissions or recent changes to legislation and codes. Zenith Connected Energy 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 2.4.3.

In other exceptional circumstances specific requirements may be formally waived or modified by submission of a request in writing to the Zenith Connected Energy 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.

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

### **3.4.7 Related Offences**


Offences under the various regulations and legislation may include, but not limited to:

1. Work on the Zenith Connected Energy network assets without authorisation from Zenith Connected Energy.
2. 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.
3. Unauthorised entry to Zenith Connected Energy substations or assets.

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

### **3.4.8 Employing a Licensed Person**

The Electricity (Licensing) Regulations 1991 (WA) requires all electrical work carried out on electrical installations connected to or intended to be connected to the Zenith Connected Energy distribution network will be performed by registered Electrical Worker(s) who are suitably licensed by the WA Electrical Licensing Board.

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## 4. SUPPLY, APPLICATION, CONNECTION & DISCONNECTION

### 4.1 Related Documents

In addition to these Rules, customers and their agents are also referred to the following Zenith Connected Energy documents which provide a range of information applicable to supply, application and connection to the ZCE distribution network – refer to Section 1.1.

### 4.2 Conditions of Supply

It is a condition of supply that compliance is demonstrated with the WA Electricity Act 1945, Electricity Industry Act 2004, Electricity (Licensing) Regulations 1991 and all other relevant acts, regulations 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 or network augmentation 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 contained in the various Acts, Regulations, codes of practice and guidelines enabled by those Acts).

A person who wishes to connect a new installation, alter an existing installation or extend the distribution network for supply to multiple installations, must first complete an Application for Connection describing their requirements.

Following receipt of the application, Zenith Connected Energy will review the details and may request additional information where necessary. A response and/or connection offer will then be provided by Zenith Connected Energy outlining details of the proposed supply, and the Authorised Service Capacity, until such time as it is varied by agreement with Zenith Connected Energy or the connection is removed.

Zenith Connected Energy should be consulted as early as possible, particularly in complex situations, such as high voltage connections or situations that may require extension or augmentation to the distribution network (such as a new distribution substation).


Further information relating to application requirements is provided in the microgrid specific Customer Connection and Contributions Guidelines available from the Zenith Connected Energy relevant microgrid websites.

Valid notifications of electrical work must also be submitted for successful energisation of a customer’s installation. Notifications considered to be invalid or inadequate will be denied or may need to be withdrawn. Information regarding notification requirements within ZCE is provided in Section 4.6 of these Rules.

### 4.3 Negotiations and Premature Expenditure

Connection process may be different to a different type of the Customers: Residential, Commercial, Industrial.

Residential Customers need to follow standard connection application/process however Commercial/Industrial Customers should approach ZCE to start discussion/negotiations as soon as possible to have their premises connected to the ZCE networks.

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Zenith Connected Energy may provide a connection offer or (residential customers) for the proposal as outlined in section 3.4 & 3.5. All connection offers will be conditional on compliance with these Rules.

For Commercial/Industrial Customers 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 or augmentation of the distribution system to supply one or more separate electrical installations.

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 Zenith Connected Energy 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 Zenith Connected Energy describing the terms and conditions of the connection and customer supply contracts that will apply to the supply of electricity.

**4.4 Typical Connection Process**

**4.4.1 New Connections**


An overview of the steps typically followed during the connection process is provided below;

1. The Customer considers supply requirements to suit their intended electrical installation in consultation with their agent (such as an electrical consultant and/or electrical contractor).
2. Customer or Customer’s Agent applies to Zenith Connected Energy for supply as outlined further below.
3. Zenith Connected Energy undertakes necessary technical assessments and determines the connection requirements.
4. Zenith Connected Energy and the Customer may negotiate conditions for supply and Zenith Connected Energy prepares and provides a Connection Offer or standard connection condition (as per *Customer Connection and Contribution Guidelines*) which upon acceptance becomes a connection agreement.
5. Customer’s Agent determines electrical installation requirements, including associated metering arrangements in consultation with Zenith Connected Energy.
6. Electrical Contractor submits a Preliminary Notice (via eNotice) with at least 3 working days before any work begins.
7. Electrical Contractor completes the electrical installation and submits a Notice of Completion (via eNotice).
8. Zenith Connected Energy installs associated meters, connects and energises the electrical installation upon receipt, review and acceptance of the Notice of Completion.
9. The Electrical Contractor is also responsible for submitting/providing an Electrical Safety Certificate to DMIRS and the customer within 28 days of completing the electrical work.

**4.4.2 Alterations and Reconnections**

Alterations to existing installations will generally follow similar steps to those outlined in clause 4.4.1 above, with the exception of the metering aspects unless required.

Zenith Connected Energy will also generally require a new Notice of Completion prior to reconnection of any electrical installations that have been disconnected for an extended period of time.

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## 4.5 Agreed Maximum Demand and control

### 4.5.1 Agreed Maximum Demand

Subject to tariff arrangements the Agreed Maximum Demand may be used to calculate the demand component of a customer’s network demand charge and should not exceed the Authorised Service Capacity. A customer may re-negotiate their agreed maximum demand subject to the various conditions of supply outlined earlier and the associated connection contract.

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

Maximum Demand for Residential Customers is set by size of a Customer Main Circuit Breaker – refer to Customer Connection and Contribution Guidelines.

### 4.5.2 Control of Customer Demand

In some situations, new electrical installations may be required to provide demand limiting control to ensure the Agreed Maximum demand is not exceeded. Where applicable, details will be negotiated and advised in response to an associated Application for Connection.

## 4.6 Proposed Electrical Installations on Public Land

Zenith Connected Energy 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.

## 4.7 Notification of Electrical Work

A range of statutory obligations and requirements apply to notification of electrical work, as outlined in Section 8 of the WA Service and Installation Requirements (WASIR). These requirements also apply to all electrical work undertaken within the Zenith Connected Energy networks/microgrids.


Zenith Connected Energy uses the eNotice system administered by DMIRS for submission of Preliminary Notices and Notices of Completion. Any notices considered invalid or inadequate will be denied and the notice may need to be withdrawn. Each notice has to be network/microgrid specific. Network operator’s name should correctly chosen from the list given within eNotice system.

Preliminary and Completion Notices are required for all electrical installation work with the exception of the following:

- Maintenance activities not requiring disconnection of supply, reconnection of supply or the replacement of service apparatus,
- Alteration of a final sub-circuit
- Addition of single final sub-circuit

Preliminary Notices must be submitted sufficiently early to allow Zenith Connected Energy to review and fully consider the requirements for making supply available, noting larger, more complex or unusual situations may require considerable assessment and planning. Preliminary Notices must also include a valid Customer ID Number (CID) as provided by the customer’s Retailer. Completion Notices and Electrical Safety Certificates should also be submitted using the DMIRS eNotice system. Also refer to Section 8 of the WA Service and Installation Requirements for further information.

These statutory obligations are in addition to the application for connection requirements described in clause 3.5 of these Rules.

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Additional notifications may also be required, including the Notification 70A to Landgate described in clause 3.6.2 of the WAER and clause 12.3.2 of the WASIR in situations where multiple supplies may exist.

#### 4.8 Forms

All eNotice forms are available on-line through the DMIRS website. In addition, the following forms are available from Zenith Connected Energy Customer Service Department upon request :

- Application for Connection
- Request for Supply Disconnection (Abolishment)
- Request for Reconnection

Most of the forms can be downloaded from microgrid related websites. Please contact Customer Service if required.

#### 4.9 Charges

Works relating to the establishment 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 required 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 ZCE microgrid specific websites. Details of charges should be assessed and confirmed with Zenith Connected Energy by the Customer or their Agent prior to the commencement of work. Zenith Connected Energy 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.


### 5. GENERAL RULES

#### 5.1 Safety

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

Any conductors or wires that form part of the customer’s electrical installation are not to be connected to the Zenith Connected Energy distribution network prior to formal energisation of the connection by Zenith Connected Energy.

Where Zenith Connected Energy 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 applicable notices and reconnection requests as necessary).

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Zenith Connected Energy 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.

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.

## 5.2 Network Access and Excavation

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

- Joining of any electrical assets to the Zenith Connected Energy Distribution Network,
- Excavating in close vicinity to distribution network assets,
- Entering an Zenith Connected Energy 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 Zenith Connected Energy assets,
- Accessing distribution network earth-grids and associated earthing systems.

Prior to the commencement of any underground excavations, a "Before You Dig Australia" 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 "pot-holing") must be carried out to positively confirm location of any identified underground assets. Zenith Connected Energy should be contacted prior to proceeding with any excavations in the vicinity of their assets.

### 5.2.1 Supply Isolation

In circumstances where appropriate isolation is not possible within a customer's electrical installation (such as the main isolation switch), Zenith Connected Energy 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 Zenith Connected Energy then charges may apply. Details of applicable fees and charges are available from the Zenith Connected Energy microgrid website.


### 5.2.2 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.

## 5.3 Compliance with Regulations, Codes of Practices, Guidelines and these Rules

Compliance with these Rules as well as all relevant legislation, codes and guidelines is required for any connection or re-connection to the Zenith Connected Energy Distribution network. Applicable references include but are not limited to:

- Electricity Industry Act 2004 (WA),
- Electricity Network (Safety) Regulations 2015 (WA)

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- Electricity (Licensing) Regulations 1991 (WA)
- Occupational Safety and Health Act 1984 (WA)
- Electricity Networks Access Code 2004 (WA)
- Electricity industry (Customer Transfer) Code 2016 (WA)
- Electricity Networks Quality and Reliability of Supply Code 2005 (WA)
- Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013 (WA)
- Electricity Industry (Metering) Code 2012 (WA),
- Western Australian Electrical Requirements (WAER),
- Western Australian Service and Installation Requirements (WASIR),
- Zenith Connected Energy Customer Connection and Contribution Guidelines,
- Zenith Connected Energy Customer Self Supply Guidelines,
- Zenith Connected Energy Network Performance and Planning Criteria Manual,
- AS/NZS 3000 Electrical Installations (Wiring Rules),
- AS 4741 Testing of Connections to Low Voltage Networks
- AS 2067 Substations and High Voltage Installations exceeding 1 kV a.c.
- Other applicable Australian Standards.

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.

Zenith Connected Energy may request an inspection of an electrical installation or occupancy to review general compliance with these Rules. Such a request should not be unreasonably withheld.

## 5.4 Testing

All electrical work must be appropriately tested by the installing electrical contractor prior to connection to the Zenith Connected Energy distribution network in accordance with the Electricity (Licensing) Regulations 1991. Further details on testing requirements for the various types of installation are provided in Section 6 and Section 8.

## 5.5 Acceptance of Connection Equipment and Arrangements

Equipment and arrangements used for interfacing to overhead distribution systems will not generally apply or be accepted for use given the nature of the Zenith Connected Energy distribution network. Otherwise, equipment and connection requirements outlined in Section 5 of the WAER and Section 12.5 of the WASIR also apply to underground connections to the Zenith Connected Energy distribution network.


Zenith Connected Energy should be consulted where there is any doubt whether equipment or arrangements are accepted for use and may refuse to connect equipment considered not to be acceptable.

## 5.6 Service Labelling

The requirements outlined in clause 3.5 of the WAER also apply to all service labelling used within Zenith Connected Energy.

## 5.7 Access to Distributors' Equipment

Zenith Connected Energy representatives must be provided with suitable, safe and unhindered access to Zenith Connected Energy equipment and assets at all times, as required to ensure Zenith Connected Energy can undertake all necessary work and activities associated with:

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- 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

### 5.8 Sealing and Locking

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

All portions of a customer installation on the Zenith Connected Energy supply side of the main supply meters shall be installed ready for sealing using an authorised industry participant security seal, including but not limited to access panels, junction boxes, metering equipment, lockable isolators, fuse boxes, enclosures and escutcheon panels.

Zenith Connected Energy metering equipment must have restricted access through the use of an approved lock compatible with the Zenith Connected Energy locking system. Where a Zenith Connected Energy lock is used to secure unmetered portions of an electrical installation, then this shall also be regarded as a suitable security seal.

Where any doubt exists for a given situation, Zenith Connected Energy should be consulted for details of applicable sealing and locking requirements.

Any un-authorized tampering or breaking of a Zenith Connected Energy seal or lock may lead to substantial fines, prosecution and a compensation order for any damages or losses incurred.

### 5.9 Private Electricity Assets or Installations on Public Land

Zenith Connected Energy must be contacted prior to installing a private electrical installation or any associated private wires, lines or cables on public land. All such installations are required to comply with the WAER, WASIR and these Rules, as well as any specific Zenith Connected Energy requirements (such as termination and labelling requirements). Also refer to clause 13.10 of the WASIR.

### 5.10 Attachment of Other Equipment to Poles or Assets


The Zenith Connected Energy network does not include 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.

Zenith Connected Energy must be contacted for pre-approval if attachment of third-party equipment to any of their assets is being considered.

### 5.11 Multiple Occupancy Buildings and Subdivisions

A range of specific requirements relating to multiple occupancy buildings and subdivisions are provided within these Rules including Sections 6.8. It is the responsibility of the electrical designer and licensed electrical contractor to ensure all associated design and installations work is undertaken in accordance with all relevant standards and legislation, including the Electricity Industry Act 2004 and Electricity Network (Safety) Regulations 2015.

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

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## 6. SUPPLY TYPES, USE AND PROTECTION

### 6.1 Network Supply

#### 6.1.1 Supply Characteristics

Section 3 of the ZCE Network Performance and Planning Criteria Manual outlines the various supply characteristics and limits applying within ZCE including applicable voltage, frequency and short-circuit fault currents. Adherence to defined limits may be assessed where considered necessary, and in response to user requests or complaints.

#### 6.1.2 Sensitive Customer Equipment

Transient voltages, fluctuations and frequency disturbances may occur on the upstream network at any time and Zenith Connected Energy can't always control or limit these disturbances. Customers are advised to provide suitable protective devices, such as phase failure, over/under voltage and over/under frequency protection, to help minimise effects on their installation or any sensitive equipment.

#### 6.1.3 Prospective Short Circuit Current

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.

Prospective LV short-circuit currents within the Zenith Connected Energy distribution network could be as high as 63kA in close proximity to large distribution substations. In all cases (including supply at HV) Zenith Connected Energy must be contacted to provide prospective short-circuit currents and associated durations when designing any electrical installations to be supplied from the Zenith Connected Energy network.

#### 6.1.4 Protective Earthing Systems

Zenith Connected Energy 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 AS 2067 and be suitably maintained to ensure ongoing adequacy. Suitable accessibility for inspection and testing of earthing systems must also be maintained.

### 6.2 Connection Point (Point of Supply)

#### 6.2.1 General

Zenith Connected Energy will nominate the required location and arrangement for the connection point, in accordance with applicable regulations and the Electricity Networks Access Code. This will be in response to an Application for Connection as outlined in Section 4 of these Rules and described further in the ZCE Customer Connection and Contribution Guidelines.


#### 6.2.2 Number of Services

Each lot will generally be provided with a single point of supply only. This requirement may only be waived under exceptional circumstances following a detailed submission from the customer or their agent outlining applicable safety considerations and measures, and only in situations where the requirements of clause 3.5 (and applicable subclauses) of the WAER have also been met.

#### 6.2.3 Number of Phases

Service connections within ZCE for Commercial and Industrial Customers will generally comprise balanced three-phase supplies only. Single or two-phase LV connections may only be permitted at the discretion of Zenith Connected Energy in unusual situations subject to specific requirements and conditions.

Residential Customers may have a choice of either single-phase or three-phase connection.

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**6.2.4 Location**

Location of the connection point will be nominated by Zenith Connected Energy in response to an Application for Connection. Typical arrangements for various types of connection are described in Section 6 and Section 8 of these Rules as well as the ZCE Customer Connection and Contributions Guidelines.

**6.3 Consumer Mains**

Consumer mains must be designed, configured and installed in accordance with relevant clauses of the WASIR and all applicable ZCE documents. Where relevant, clauses 9.2, 9.3 and 9.4 of the WAER also apply. Further details and requirements are provided in Sections 6 and 8 of these Rules.

**6.4 Zone Diagrams**

Suitable zone diagrams for all customer sites must be prepared and posted in accordance with the WAER and clause 12.3.1 of the WASIR. Proposed arrangements and associated diagrams should be provided for review by Zenith Connected Energy during the application process, prior to finalising any site arrangements.

**6.5 Supply Use Obligations and Load Requirements**

**6.5.1 Consistency with WA Service and Installation Requirements**

Customer’s supplied from the Zenith Connected Energy distribution network are required to comply with the obligations and requirements as set out in the following related clauses and all applicable sub-clauses of the WA Service and Installation Requirements (where references to the Network Operator refer to Zenith Connected Energy):


- 10.5.1 Obligations
- 10.5.2 Maximum demand
- 10.5.3 Noncompliance
- 10.7 Balanced electrical loads
- 10.8.3 Ripple control and blocking systems
- 10.9 Voltage fluctuations - including:
  - 10.9.1 Voltage transients
  - 10.9.2 Flicker
  - 10.9.3 Harmonics
  - 10.9.4 Voltage Drop
  - 10.9.5 Neutral voltage rise
- 10.11 Customer Responsibilities - including:
  - 10.11.1 General
  - 10.11.2 Using equipment from outside Australia
  - 10.11.3 Purchasing and protection of sensitive equipment
  - 10.11.4 Customer with disturbing loads
  - 10.11.7 Insurance and warranty
- 10.12 Customer supply critical installations

**6.5.2 Power Factor**

All customer’s within ZCE are generally required to maintain the power factor of their electrical installation load between, unless otherwise agreed or specified by Zenith Connected Energy.

**6.6 Type of Supply and Load**

Zenith Connected Energy will generally provide various details pertaining to supply within the connection offer and/or supply contract including:

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- Terms and conditions for connection to the Zenith Connected Energy 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 Zenith Connected Energy should be contacted to clarify and document supply arrangements that apply.

Some standard requirements can be found on Zenith Connected Energy microgrids websites.

## 6.7 Supply Capacity and Maximum Demand

Customer’s must ensure the electrical demand on their electrical installation does not exceed the authorised service capacity. In some situations, Zenith Connected Energy may require appropriate load limiting control to be provided within the customer’s installation to ensure agreed limits are not exceeded.

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:

- Maximum demand limiting control,
- Reduction or disconnection of loaded circuits within the installation to below the authorised service capacity,
- Application to Zenith Connected Energy for an increase to the authorised service capacity.

If a customer does not take the appropriate corrective action, Zenith Connected Energy may disconnect the supply until adequate measures have been adopted.

## 6.8 Installation & Supply Protection

### 6.8.1 General Requirements

All services and electrical installations shall have suitable protection devices in accordance with the applicable requirements of the WAER, AS/NZS 3000, and AS 2067 and additional requirements set by Zenith Connected Energy in relation to specific microgrid system specifications.

Customers are also 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 Zenith Connected Energy Distribution Network protection device unless otherwise agreed in writing by Zenith Connected Energy.

### 6.8.2 Low Voltage Services


For low voltage services the requirements set out in clause 6.2 of the WAER (and all associated sub-clauses) as well as clauses 11.11.6 and 12.7.1 of the WASIR also apply to electrical installations within Zenith Connected Energy altogether with any additional ZCE technical standards and requirements related to specific microgrid systems. Customers are advised to engage with electrical contractors and consultants to make sure that specific requirements related to the installation, connection and protection are fulfilled.

Further related information is also provided in Section 6 of these Rules as well as Chapters 11 and 14 of the WASIR.

Specific information can be found on Zenith Connected Energy relevant microgrid websites or by contacting Zenith Connected Energy Customer Service.

### 6.8.3 High Voltage Services

Establishing a high voltage connection to a Zenith Connected Energy network will only be applicable in exceptional circumstances. Where customers are seeking or require supply at high voltage then service arrangements and associated protection requirements will be determined subject to specific details. Requirements will generally be consistent with Section 7 of the WAER and Chapter 13 of the WASIR. Section 8 of these Rules provides further details applicable to high voltage services.

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**6.8.4 Security**

Service protection devices should be located and arranged to limit the ability of unauthorised persons to interfere with and operate the device. One acceptable method to restrict unauthorised interference is to locate the service protection devices in an enclosure fitted with facilities to accommodate a Zenith Connected Energy lock or seal in accordance with Section 4.8 of these Rules.

**6.9 Sources of Alternative Supply**

**6.9.1 General**

Sources of alternative supply represent any source of electricity other than that provided by the Zenith Connected Energy 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).

Alternative supply sources will be generally classified by Zenith Connected Energy 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 includes fully parallel operation as well as sources that may operate in parallel for short periods while transferring over to back-up supply.

Sources of alternative supply are required to comply with a range of applicable standards including (but not limited to) AS/NZS 3000, AS/NZS 3010, AS/NZS 3947.6.1, AS/NZS 4777, AS/NZS 5139 and AS/NZS 5033.

The ZCE Customer Self Supply Guidelines also provide further information relating to the processes and requirements for connections incorporating alternative sources of supply (e.g. customer generation) to the Zenith Connected Energy Microgrids.


It should be noted customer-owned alternative sources of supply will generally be permitted for non-export purposes only. This constrains sources of alternative supply to new or existing customer installations having sufficient load to utilise all generated energy.

**6.9.2 Responsibilities and Requirements**

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

Zenith Connected Energy 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. A range of information will be required including but not limited to the following:

- 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,

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- Technical data and schematics including associated installation.

Further details and associated application requirements for alternative sources of supply are included in the ZCE Customer Connection Self Supply Guidelines available from the Zenith Connected Energy website or the Zenith Connected Energy Operations Office as detailed in section 1.5.

**6.9.3 Consistency with WA Service and Installations Requirements**

The following clauses in Chapter 15 of the WASIR also apply to alternative sources of supply within the Zenith Connected Energy:

- 15 Alternative sources of supply or generation,
- 15.1 Definitions: including all subclauses,
- 15.3 Generation categories: also noting types of systems defined in the ZCE Customer Self Supply Guidelines,
- 15.4 Customer/agent responsibilities: including all associated subclauses,
- 15.5 Customer equipment and appliances,
- 15.6 System designers and installers,
- 15.7 Generation license requirement,
- 15.8 Connection arrangements: including all subclauses,
- 15.9 Fault Protection,
- 15.10 Interlocks and change over,
- 15.11 Islanding prevention and protection schemes,
- 15.12 Metering, monitoring, control and data-acquisition: noting export and buy-pack tariffs will not generally apply,
- 15.13 Power Quality: including all subclauses and noting applicable information included in ZCE Customer Self Supply Guidelines,
- 15.14 Labelling
- 15.15 Commissioning and maintenance: including all subclauses,
- 15.16 Additional requirements for parallel connected generation: including all subclauses and noting applicability of the ZCE Customer Self Supply Guidelines to the PEEL Microgrid,
- 15.17 Additional requirements for inverter connected systems: including all subclauses,
- 15.18 Additional requirements - Portable Generation systems.


Relevant requirements outlined in the following Zenith Connected Energy documents (available on Zenith Connected Energy microgrids websites) should also be reviewed and may be taken into account when assessing connections to the Zenith Connected Energy distribution network:

- these Technical Rules
- Generator and Load Model Guidelines
- Generator Performance Guidelines
- Small Generator User Guide
- Technical Guidance for Solar Installers

**6.9.4 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.

Labelling requirements described in clause 3.5.5 of the WAER and clause 15.13 of the WASIR apply to all installations with alternative sources of supply within the ZCE distribution network.

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Further details of labelling requirements are provided in AS 1319, AS 3000, AS 4777 and other Australian Standards applicable to generation systems.

**6.9.5 Reverse Power Protection**

In addition to the requirements outlined elsewhere in these Rules, the WAER, WASIR, alternative sources of supply within ZCE may be required to install suitable protection systems to ensure export of power from the installation is always prevented (reverse power protection).

**6.9.6 Metering**

Despite limited scope for export of power, installations with alternative sources of supply that may operate in parallel with the network are required to abide by the bi-directional metering requirements described in clause 11.16 of the WASIR and applicable standards.

**7. CONNECTING TO THE LOW VOLTAGE (LV) NETWORK**

**7.1 Distribution LV Network and Connection**

**7.1.1 General**

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

**7.1.2 Consistency with WA Service and Installation Requirements**

Zenith Connected Energy adopts the approach and requirements set out in the following related clauses of the WASIR (where all references to the Network Operator refer to Zenith Connected Energy):


- 12.2.3 Connection of services,
- 12.2.4 Number of connections (and associated subclauses),
- 12.2.6 Underground (point of supply) noting residential lots don't apply,
- 12.2.7 Location,
- 12.2.8 Access, noting Zenith Connected Energy contact details given in Section 1.5.
- 12.3 Multiple points of connection (supply); and associated subclauses,
- 12.7 Protection (and associated subclause),
- 12.8 Cable ducts and conduits,
- 12.9 Labelling,
- 12.11 Other LV supply arrangements (and all associated subclauses),

But additional requirements may be presented in relation to technical system configuration of a specific microgrid.

**7.2 Underground Services**

**7.2.1 General**

All areas within ZCE are underground service areas, and only underground services will apply, unless specifically agreed in writing by Zenith Connected Energy under exceptional circumstances.

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### **7.2.2 Consistency with WA Service and Installation Requirements**

Zenith Connected Energy adopts the approach and requirements set out in the following related clauses of the WASIR (where all references to the Network Operator refer to Zenith Connected Energy):

- 12.5.1 General
- 12.5.2 Point of supply (connection) (PoS)
- 12.5.3 Location
- 12.5.4 Incorrect point of supply connection
- 12.5.5 Access (and all associated subclauses)
- 12.5.6 Network pillar identification (where applicable)
- 12.5.7 Pillar or pit not installed (and associated subclauses where applicable)
- 12.5.8 Network equipment not energised (and associated subclauses where applicable)

But additional requirements may be presented in relation to technical system configuration of a specific microgrid.

### **7.2.3 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.

The requirements detailed in clause 6.2 (and all associated subclauses) of the WAER also apply to LV services within ZCE. In addition, all related protection requirements outlined in Chapters 11 and 15 of the WASIR also apply including, but not limited to:

- 11.4 Metering equipment/protection switchboards and enclosures (and all applicable subclauses)
- 11.5 Metering equipment location (and all applicable subclauses)
- 11.6.4 Meter protection and main switch or switches (and all associated subclauses)
- 11.9.4 Direct connected metering - Protection
- 11.11.6 Multiple master metering - Protection
- 11.12.5 Distributed master metering - Protection
- 11.13.5 LV CT Metering - Protection


### **7.3 Overhead Services**

There are no overhead distribution areas within ZCE. Overhead services will not apply unless specifically reviewed and agreed in writing by Zenith Connected Energy under exceptional circumstances. Any specific requirements will be advised during the application/review process.

### **7.4 Segregation**

All installations and services 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)

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## 7.5 Consumer’s Mains & Sub Mains

### 7.5.1 General

It is the customer’s responsibility to provide, prepare and maintain consumer mains and sub-mains in accordance with the WAER, AS/NZS 3000, AS/NZS 3008 and these Rules. In particular, Section 9 of the WAER details specific requirements for consumers mains that apply in WA.

Zenith Connected Energy 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.

### 7.5.2 Consistency with WA Service and Installation Requirements

Zenith Connected Energy adopts the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of the WA Service and Installation Requirements (where references to Network Operator should be to Zenith Connected Energy):

- 12.6.1 General
- 12.6.2 Consumer main sizes (noting domestic situations will not generally apply)
- 12.6.3 Voltage drop/rise
- 12.6.4 Acceptable wiring systems (and all applicable subclauses)
- 12.6.5 Location
- 12.6.6 Separation from other services
- 12.6.7 Identification of consumer mains (and all associated subclauses)
- 12.6.8 Jointing consumer mains
- 12.6.9 Termination of consumer mains (and all applicable subclauses, adopting Western Power termination references)
- 12.6.10 Minimum insulation resistance
- 12.6.11 Notification
- 11.11.5 Multiple master metering - Wiring configurations
- 11.12.4 Distributed master metering - Wiring configurations

But additional requirements may be presented in relation to technical system configuration of a specific microgrid.

## 7.6 LV Isolating Devices

Suitable LV isolating devices must be provided in accordance with section 6 of the WAER and all applicable requirements detailed through Chapters 11, 12, 14 and 15 of the WASIR.


## 7.7 Builder’s and Temporary Supplies

### 7.7.1 General

Zenith Connected Energy should be contacted at the earliest opportunity in situations where temporary or construction supplies may be required from the ZCE distribution network. Where available Zenith Connected Energy may provide supply subject to the conditions and all applicable requirements described in the WAER, WASIR and these Rules.

Builder’s and temporary supplies are only available as LV connections and must not have any connected alternative sources of supply such as batteries, or solar inverter energy systems or other forms of generation.

It is the responsibility of the customer and/or their agents to make an application and confirm whether a temporary supply can be made available, and any specific conditions that might apply (including the agreed

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period) before planning the construction work. Any temporary supply must be disconnected prior to connection of permanent supplies and/or before expiry of an agreed period.

In situations where a temporary supply is proposed within a lot or site already having an existing point of supply, the minimum requirements described in clause 3.6.9 of the WAER must also be satisfied at all times. Requirements for builder’s supplies given in clause 6.2.3.1 of the WAER also apply.

**7.7.2 Consistency with WA Service and Installation Requirements**

Zenith Connected Energy adopts the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of the WA Service and Installation Requirements (where references to Network Operator should be to Zenith Connected Energy):

- 12.11.2 Standby/emergency supply
- 12.11.4 Short term events
- 12.11.5 Builders supplies (and all applicable subclauses except 12.11.4.4)
- 7.7.4 Temporary supplies

But additional requirements may be presented in relation to technical system configuration of a specific microgrid.

**7.8 Multiple Occupancy Buildings and Subdivisions (Supply Arrangements)**

**7.8.1 General**

Zenith Connected Energy 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 Zenith Connected Energy as early as possible to help ensure supply can be made available within required timeframes.

**7.8.2 Multiple Occupancies**

A suitable plan shall be submitted to Zenith Connected Energy for agreement as part of the application process and prior to commencement of any installation work. The plan must show applicable property boundaries, general building layouts, meter locations as well as schematic details for proposed isolation, protection and metering arrangements.


All associated control, isolation, protection and metering facilities must be installed in accordance with AS/NZS 3000, the Electricity Industry (Metering) Code, WAER, Chapter 11 of the WASIR and these Rules. All unmetred parts, conductors and terminals must be appropriately segregated, secured, sealed or locked in accordance with AS/NZS 3000, WASIR and clause 4.8 of these Rules.

Suitable labelling and zone diagrams must be provided and maintained in accordance with AS/NZS 3000, the WAER and WASIR, with sufficient details to ensure clear identification of control, protection and metering arrangements for all occupancies across the site.

**7.8.3 Subdivisions**

Plans of subdivision should be prepared with due consideration for general supply arrangements and requirements described in these Rules such as points of supply, substation and switchboard/metering requirements.

Associated plans and allotments should be confirmed by the relevant authorities prior to submission to Zenith Connected Energy as part of the application process (as described in Sections 3 of these Rules). Once arrangements have been confirmed and agreed, it is the responsibility of the developer to advise prospective purchasers of proposed electrical and servicing arrangements within the subdivision.

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## 7.9 Unmetered Supplies

Un-metered supplies are not generally available from the Zenith Connected Energy distribution network unless for special approved services/agencies or under emergency situations. Zenith Connected Energy must be consulted for formal approval and requirements for any proposed unmetered supplies. Further related information is also included in clauses 7.7.5 and 9.3.9 of the WASIR.

## 7.10 Substation Requirements

The requirements in situations where a Zenith Connected Energy substation may need to be installed, modified or upgraded in order to accommodate a connection, are consistent with Chapter 14 of the WASIR (noting MPS type substations may not typically apply within ZCE).

# 8. LOW VOLTAGE METERING

## 8.1 Scope

This section sets out Zenith Connected Energy 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 8 of these Rules. Where any doubt exists, Zenith Connected Energy should be contacted for any clarifications relating to the requirements contained in these Rules.

## 8.2 Tariffs & Metering

The customer or their agent should consult with Zenith Connected Energy to determine applicable tariffs and establish an account for a given installation. Once an account is established the Customer Service Department should provide the customer with a Customer ID Number (CID). The CID is required in order to submit a Preliminary Notice as part of the connection process described in Section 3 of these Rules.

## 8.3 Metering Obligations

### 8.3.1 General


Suitable metering must be installed at each connection point to the Zenith Connected Energy network (microgrid network) (with the exception of any specifically approved unmetered supplies as outlined in Section 6.9).

All metering facilities must comply with AS/NZS 3000, the Electricity Industry (Metering) Code, WAER, WASIR and these Rules. The customer is responsible for providing suitable arrangements and facilities to accommodate the installation, operation and maintenance of the associated Zenith Connected Energy meters. Zenith Connected Energy should be consulted as early as possible in the planning, design and construction of new electrical installations to ensure suitability of metering facilities.

### 8.3.2 Consistency with the WA Service and Installation Requirements

The general obligations and requirements given in the following clauses of the WASIR) equally apply within the Zenith Connected Energy (where references Network Operator refer to Zenith Connected Energy):

- 11.1.1 Metering obligations
- 11.1.2 Alterations and additions
- 11.1.4 Maintenance, repairs and replacement
- 11.1.5 Metering installation
- 11.1.6 Installing metering equipment
- 11.1.7 Unauthorised access to metering equipment
- 11.1.8 Responsibilities
- 11.16 Metering for inverter energy systems
- 11.19 National meter identifier (NMI)

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- 11.20 Meter and installation energisation
- 11.22 Meter distribution

## 8.4 Protection against Damage, Interference and Personal Injury

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.

## 8.5 Limits of Operation and Fault Levels

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.

All metering facilities and equipment must also be capable of withstanding the maximum prospective fault levels applicable for the location (also refer to clause 11.7 of the WASIR).

## 8.6 Metering Types

### 8.6.1 General

A range of metering configurations and types may be employed subject to the specific installation requirements. This section outlines the various systems and configurations that are generally available, also noting:

- CT metering must be provided where the maximum demand could exceed 100A for any active conductor being metered (also refer to clause 11.13 of the WASIR),
- The maximum load that can be LV metered is 2MVA,
- In multiple metered situations (such multi-occupancy developments) mixed metering systems are not permitted on the same site (e.g. combination of “multiple master” and “distributed master” metering).

### 8.6.2 Consistency with WA Service and Installation Requirements


Zenith Connected Energy adopts the approach and applicable requirements as set out in the following related clauses (and associated sub-clauses and diagrams) of the WA Service and Installation Requirements (where references to Network Operator should be to Zenith Connected Energy):

- 11.8.1 General metering types
- 11.8.2 Un-acceptable metering types
- 11.8.3 Existing meter locations

## 8.7 Metering Facilities

The requirements as set out in the following clauses (and associated sub-clauses and diagrams) of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 11.3 Meter panels
- 11.4 Metering equipment/protection switchboards and enclosures
- 11.6 Equipment
- 11.11 Multiple master metering
- 11.12 Distributed master metering
- 11.14 Automated meter reading systems
- 11.17 Subsidiary metering guidelines

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### 8.8 Location and Access

The requirements as set out in the following clauses (and associated sub-clauses and diagrams) of the WASIR equally apply to metering facilities within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 11.5.1 General
- 11.5.2 Access requirements
  - 11.5.2.1 Single domestic/commercial lots (noting domestic lots will not generally apply)
  - 11.5.2.2 Battle-axe block lots
  - 11.5.2.4 Multiple domestic/commercial lots (noting domestic lots will not generally apply)
  - 11.5.2.7 Remote metering
- 11.5.3 Unsuitable locations
- 11.18 Relocation of existing metering point

### 8.9 Direct Connected Metering


The requirements as set out in the following clauses (and associated sub-clauses and diagrams) of the WASIR equally apply to metering facilities within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 11.9.1 General
- 11.9.2 Meter panels
- 11.9.3 Panel wiring configurations
- 11.9.4 Protection
- 11.9.5 Conversion of subsidiary meters to master meters

### 8.10 LV Current Transformer Metering

The requirements as set out in the following clauses (and associated sub-clauses and diagrams) of the WASIR equally apply to metering facilities within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 11.13.1 General
- 11.13.2 Sourcing of materials
- 11.13.3 Meter panels
- 11.13.4 Wiring configurations
- 11.13.5 Communications equipment for LV CT meter installations
- 11.13.6 Protection
- 11.13.7 Current transformers (and all associated subclauses)
- 11.13.8 Voltage circuit protection (and all associated subclauses)
- 11.13.9 Safety
- 11.13.10 Conversion of whole current meters to CT metering (and all associated subclauses)
- 11.13.11 Multiple master CT metered installations

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## 9. HIGH VOLTAGE SUPPLY AND ELECTRICAL INSTALLATIONS

### 9.1 General

The Zenith Connected Energy microgrids includes high voltage distribution system operating at 22kV. High voltage connections to the Zenith Connected Energy network will only be considered under exceptional circumstances and may not be available or agreed - subject to specific requirements.

The design, construction, commissioning, operations and maintenance requirements for high voltage installations are significant and must only be undertaken by personnel who are suitably skilled, qualified and trained. Proponents are also referred to “Guidelines for the Safe Management of High Voltage Installations” issued by the WA Director of Energy Safety.

Zenith Connected Energy requirements for high voltage installations and associated connection are set out in this section of the Rules and are in addition to the requirements of the WAER and WASIR, AS/NZS 3000, AS 2067 and other applicable standards. The requirements of Section 7 of the WAER specifically apply to HV installations.

### 9.2 Connection Application and Design Submissions

#### 9.2.1 Considerations and General Requirements

Zenith Connected Energy must be consulted at the earliest possible opportunity where customers are considering supply at high voltage. The general connection process and application requirements outlined in Section 3 of these Rules will need to be followed for all new or altered HV connections, including conversion of an existing installation from an LV to HV supply.

Connection arrangements will need to be determined subject to specific requirements and could take extensive negotiations and a considerable time for finalisation. An associated connection agreement with Zenith Connected Energy and contract for the supply of electricity with Zenith Connected Energy, will also be required as described further in Section 3 of these Rules.

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

The approach and general requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):


- 13.2 Responsibilities and contractual arrangements
- 13.3 Customer expenditure
- 13.6 Conversion from low voltage to high voltage supply

#### 9.2.2 Initial Application Submission

As part of the connection application process a range of supporting information will be required. As a minimum the following preliminary information should be provided with the initial Application for Connection:

- 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
- Outline of any proposed generation or energy storage equipment
- Outline of any proposed disturbing loads, large motors and the like
- Intended general metering, protection and earthing arrangements

Following an initial feasibility review by Zenith Connected Energy, additional information will be required as the process progresses, including a more detailed HV design submission.

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**9.2.3 HV Design Submission**

In the event a proposed HV connection is initially considered feasible by Zenith Connected Energy, a detailed HV design submission will need to be prepared by the customer’s agent after appropriate consideration of applicable network parameters and installation requirements.

The associated approach and requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 13.7.2 HV Submission and design (“submission”)
- 13.7.3 Standard format for submission of HV proposal (and all associated subclauses)
- 13.7.4 HV submission outline (and all associated subclauses)

**9.3 Installation Requirements**

**9.3.1 General**

The approach and general requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 13.4 Supply parameters
- 13.5 Connection arrangements (and all associated subclauses)
- 13.10 Consumer’s installations on Public Land

**9.3.2 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 Zenith Connected Energy. Alternative arrangements may be considered by Zenith Connected Energy in exceptional circumstances.

**9.3.3 Power Factor**

The power factor of all high voltage installations connected to the Zenith Connected Energy distribution network must be maintained between 0.9 leading and 0.9 lagging.

**9.3.4 Supply Quality and Disturbances**

The Zenith Connected Energy 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 limits 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.

**9.3.5 Protection Discrimination**

The customer’s protection systems must be designed to suitably discriminate with the distribution network protection systems. The Zenith Connected Energy 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 unplanned operation of upstream protection systems do not occur.

Customers 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

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documentation of protection studies and proposed settings must be provided to Zenith Connected Energy at the earliest possible opportunity.

High voltage protection settings must be accepted by Zenith Connected Energy and the main protection devices shall have suitable facilities in place such as a security seal (refer section 4.8) and suitable labelling to ensure that protection settings are not altered without prior consultation and approval by Zenith Connected Energy. Any necessary modifications or settings changes on the Zenith Connected Energy protection systems may be required to be undertaken at the customer's expense.

Also refer to clause 13.9.5 of the WASIR for related protection setting requirements.

### **9.3.6 Earthing Systems**

The approach and earthing requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

13.9.7 Earthing systems (and all associated subclauses)

### **9.3.7 Insulation Coordination**

Safety clearances, separation of live parts and insulation levels (impulse strength) across HV installations must comply with requirements in AS 2067 and AS 1824.1.

## **9.4 HV Equipment Requirements**

The approach and equipment requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy):

- 13.9.1 Equipment requirements
- 13.9.2 Substation installation requirements
- 13.9.3 Main switch or switches
- 13.9.4 Circuit breakers
- 13.9.6 Cabling (and all associated subclauses except 13.9.6.2 Overhead lines)
- 13.5.2 Power factor correction (and all associated subclauses)

## **9.5 Metering**

The approach and metering requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy).


- 11.15 HV metering (and all associated subclauses)
- 13.9.8 High voltage metering

## **9.6 Inspection, Testing and Commissioning**

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 the requirements of the WAER, Director of Energy Safety, equipment suppliers, AS/NZS 3000, AS 2067 and these Rules.

Clause 13.11 of the WASIR applies, also noting that these requirements apply to the Zenith Connected Energy high voltage connections to the Western Power distribution system. Sufficient notice must be provided for Zenith Connected Energy to review details, consult with Western Power and provide acceptance or request further information/clarifications where necessary. Review and witnessing may also be required from Western Power in situations where associated setting changes or modifications to the Zenith Connected Energy high voltage system is required.

Where any testing may be required to be undertaken by Zenith Connected Energy, the customer will be required to contribute to the cost. Zenith Connected Energy may consider, on application from the customer, carry out other specific testing of high voltage equipment at the customer's expense. Any testing

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by Zenith Connected Energy will only be done under conditions that allow personnel to use standard Zenith Connected Energy isolation and safe working procedures. This may involve upstream de-energising and isolation of the electrical installation, if proper provision has not been made for safe operation or isolation.

**9.7 Acceptance of HV Installations**


A range of documentation will need to be provided to Zenith Connected Energy prior to acceptance and connection of a high voltage installation. The details and requirements are set out in clause 13.13 of the WASIR must be adhered to, noting that these requirements also apply to the Zenith Connected Energy high voltage connection to the Western Power distribution system.

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

**9.8 HV Installation Safety, Operation & Maintenance**

The approach and requirements set out in the following clauses of the WASIR equally apply within ZCE (where references to the Network Operator refer to Zenith Connected Energy).

- 13.12 Safety (and all associated subclauses)
- 13.14 Maintenance
- 13.15 Customer HV installation audits

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