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BULLER ELECTRICITY LTD
ELECTRICITY NETWORK CONNECTION STANDARD

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GENERAL

1.1 Scope

Buller Electricity Ltd is committed to providing Consumers with a safe, reliable and efficient Network having regard to good industry practice. In order to achieve this goal Buller Electricity Ltd needs to apply its approved design, construction and operating standards throughout the network, including the area of connecting new load to the Network.

Prior to energising or upgrading a network connection, there are Retailer requirements and Network requirements that need to be fulfilled. This standard sets out Buller Electricity Ltd's requirements as a Network.

This document covers all Points of Supply to the Buller Electricity Ltd's electricity network and specifically covers:

- (a) The technical criteria to be met by the Consumer's Installation;
- (b) The network access controls through which Buller Electricity Ltd carries out its Duties of Principals under the *Health and Safety in Employment Act* to ensure personal safety; and
- (c) The requirement for the supply of Connection information, including as-built information relating to the Connected Consumer's Installation, for Buller Electricity Ltd's records.

This standard excludes Distributed Generation, which is subject to the *Distributed Generation Regulations* and Buller Electricity Ltd's *Distributed (DG) Generation Policy*

1.2 Application

This standard applies to new Points of Supply or the upgrade of existing Points of Supply on Buller Electricity Ltd's electricity network. This standard applies to Buller Electricity Ltd employees, Contractors, Retailers and End-Consumers.

1.3 Referenced Documents

1.3.1 Legislation

- Electricity Act 1992
- Electricity Governance Rules 2003 and pursuant Codes of Practice
- Electricity Regulations and pursuant Codes of Practice (NZECP)
- Electricity (Hazards from Trees) Regulations 2003
- Health and Safety in Employment (HSE) Act 1992
- Unit Titles Act 1972
- NZECP 35:1993 - Power Systems Earthing
- NZECP 36:1993 - Harmonic Levels

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1.3.2 Industry Standards

Electricity Commission	Guidelines for Metering, Reconciliation and Registry Arrangements for Embedded Networks
SM-EI	Safety Manual - Electricity Industry (SM-EI) – Parts 1 – 3 inclusive, latest versions
IEC 354	Loading Guide for Oil-Immersed Power Transformers
BS CP1010	Loading Guide for Oil-Immersed Transformers
AS/NZS 61000.3.6:2001	Electromagnetic Compatibility (EMC) - Limits - Assessment of emission limits for distorting loads in MV and HV power systems (IEC 61000-3-6:1996) NB: Supersedes AS 2279.2-1991 Disturbances in Mains Supply Networks - Limitation of Harmonics Caused by Industrial Equipment
AS / NZS 3000:2007	Electrical Installations (known as the Australian / New Zealand Wiring Rules)
AS/NZ 4360:2004	Risk Management
NZS 6108	Accommodation for Electrical Supply Substations in Customers Buildings

1.3.3 Buller Electricity Ltd Documents

	Use of System Agreement between Buller Electricity Ltd Limited and Energy Retailers
	Buller Electricity Ltd's Vegetation Control Policies
150S016	Selection Use and Maintenance of Safety Equipment
170S001	Permanent Disconnections Electricity Network
173S003	Distributed Generation (DG) Policy
220S002	NOC standard– Section 2 – Definitions
220S007-A 220S007-B	Network Equipment Commissioning Standard – Parts 1 and 2 [NB these standards are under development]
310S011	Electricity Lines Ownership Policy
310S035	Environmental Management Plan
370S006	Buller Electricity Ltd Predecessors
392S002	Health And Safety Requirements For Contractors
392S006	Buller Electricity Ltd Investment into Customer Initiated Work
392S007	Contractor Guide to Customer Initiated Work
392S011	Buller Electricity Ltd's Network Easements Policy
393S004	Equipment Numbering and Labelling Requirements
393S008	Overhead Line Design Standard
393S009	Underground Line Design Standard
393S010	Overhead Line Construction Standard
393S011	Underground Lines Construction Standard

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393S012	Standard for Connection of >10kW Generation to Buller Electricity Ltd's Network
393S017	Permanent Earthing Standard [NB: This standard represents a combination of earthing standards 393S017 – Hazards, 393S018 – Testing and 393S033 – Installations.]
393S024	Network Fuse Protection Standard
393S040	High Voltage Metering Units Specification Guidelines
393S089	Micro Embedded Generation Standard

1.4 Definitions

Unless stated otherwise, all words and phrases used in this document shall have the meaning defined in: -

- Electricity Act 1992
- Electricity Regulations
- AS/NZS 300:2007 - Electrical Installations (known as the Australian / New Zealand as Wiring Rules)
- Buller Electricity Ltd's NOC standard 220S002 – Section 2 – Definitions
- Common English language definitions

Advanced Metering	Means an electronic meter that measures electricity, records consumption, and meter event information, have two way communications, can be remotely read, and may have additional functionality such as remote disconnection/reconnection, tamper detection, outage detection etc.
Certificate Of Compliance (Electrical)	Means a form that provides a means of compliance with Electricity Regulations 1997.
Consumer / Customer	This term has the same definition and meaning as defined in the Electricity Act 1992, namely "...any person who is supplied, or who applies to be supplied, with electricity."
Consumer's Installation	For the purposes of this standard Consumer's Installation means any items which are used or designed or intended for use in, or in connection with the conversion, transformation, transportation or use of electricity and which are owned by a Consumer and that form part of a system for transporting electricity between the Networks Network and the ICP, and excludes the Network's equipment.
Consumer's Premises	For the purposes of this standard Consumer's Premises means the land and buildings owned or occupied by a Consumer, and any land over which the Consumer has an easement or right to pass electricity, including: - <ul style="list-style-type: none"> (a) The land within the boundary where the electricity is consumed; (b) The whole of the property, if the property is occupied wholly or partially by tenants or licensees of the owner or occupier; and (c) The whole of the property that has been subdivided under the Unit Titles Act 1972.
Data Logger	Means an electronic device that records data over time or in relation to

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(Data recorder)	location either with a built in instrument or sensor or via external instruments and sensors. The information stored within the loggers memory can be downloaded either locally or remotely.
De-energise	As defined in SM-EI and means the process of disconnecting the Consumer's Installation or equipment from The Network by removing a fuse or link or the opening of a switch in order to prevent further transportation of electricity to or from an ICP.
Distribution Network	Means the distribution system controlled by Buller Electricity Ltd and includes the 110kV, 33kV, 11kV, and LV portions of this system.
Network	As defined in the Electricity Act and means "...a person who supplies line function services to any other person or persons."
Embedded Network	An Embedded Network is an electricity distribution network that is owned by someone other than the local network owner, where Consumers have ICPs allocated and managed by the Embedded Network owner (or another Network appointed for that purpose), and the electricity traded is reconciled at the Point of Supply between the Embedded Network and the local network. <u>Network Extensions</u> can exist within an Embedded Network. In these situations an electricity distribution network that is owned by someone other than the local network owner, where Consumers have ICP's allocated and managed by the local network owner, the electricity traded is reconciled at the Point of Supply for the local network at the grid exit point (GXP). Consumers connected to them are switchable and therefore have a choice of retailer. <u>Consumer Networks</u> are an electricity distribution network that is owned by someone other than the local network owner. Consumers connected to these networks are not switchable and therefore have no choice of retailer.
Energising	As per the meaning defined in the SM-EI and includes the process of electrically livening, and/or energising an Installation to The Network.
Exclusive Fittings	Means fittings used or intended to be used for the purpose of supplying electricity exclusively to that property
Feeder	Means a high voltage circuit served by automatic switchgear at 11kV and above.
Generator	Means any person that has assets that have the capability to generate electricity.
GXP	Means Grid Exit Point. Point of Supply on the National electricity grid where electricity may flow out of the grid.
HV (High Voltage)	As defined in SM-EI and means any voltage exceeding 1000 Volts a.c. or 1500 Volts d.c.
Installation	As defined in the Electricity Act. (a) Means all fittings: - <ul style="list-style-type: none"> ▪ That form part of a system for conveying electricity; and ▪ That form part of such a system at any point from the point of supply to a Consumer to any point from which electricity conveyed through that system may be consumed; and (b) Includes any fittings that are used, or designed or intended for use, by

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	any person, or in connection with the generation of electricity for that person's use and not for supply to any other person; but
	(c) Does not include any electrical appliance.
Installation Control Point (ICP)	Means a Point of Supply on a local network or an embedded network which the Network nominates as the point at which a retailer will be deemed to supply electricity to a Consumer.
Load	<p>“Load” means an Installation: -</p> <ul style="list-style-type: none"> ▪ An electrical impedance connected to the network. ▪ The total electrical demand for electrical energy on Buller Electricity Ltd's network.
Load Control Equipment	As defined by the Electricity Commission - <i>Model Use of System Agreement – Interposed (December 2005)</i> means the equipment (which may include, but is not limited to Ripple Receivers and Relays) which is from time to time installed in, over, or upon a Consumer's Premises for the purposes of receiving Load Management Service signals.
Load Management Service	As defined by the Electricity Commission - <i>Model Use of System Agreement – Interposed (December 2005)</i> a “Load Management Service” means providing a signal for the purpose of reducing or interrupting delivery to all or part of a Consumer's Premises, including as an example, but without limitation, delivery to a water heater, on a basis agreed between the Network and the Retailer. In this document this means a Buller Electricity Ltd approved “Suitable Interruptible Load”.
Load Control Ripple Receiver or Relay	Means a device used to decode a signal injected onto The Network by the Load Control System. The purpose of this equipment is to activate, or deactivate an appropriate Ripple Receiver or Relay in order to perform specific functions.
LV (Low Voltage)	As defined in SM-EI and means any voltage exceeding 50 Volts a.c. or 12 Volts ripple free d.c. but not exceeding 1000 Volts a.c. or 1500 Volts d.c.
Metering Equipment	Means any apparatus for the purpose of measuring the quantity of electricity transported through an ICP along with associated communications facilities to enable the transfer of metering information.
Network (The)	Means a collective term commonly used as an abbreviation to mean the whole of the electricity distribution system - i.e., high voltage or low voltage delivery systems. In this document, The Network is taken to mean Buller Electricity Ltd's network (or Buller Electricity Ltd's Works as defined in the Electricity Act 1992)
Network User	Means an electricity Generator or Retailer who has a valid Use Of System Agreement with the Network; or a Consumer who has a valid Network Connection Agreement with Buller Electricity Ltd.
Paralleling	For the purpose of this document, parallel means the connection of two or more circuits that are supplied from separate sources of electrical energy that are of the same output voltages and phasing.
Point of capacity	Means point of which Buller Electricity has sufficient capacity to supply the requested load
Point of Isolation	In this document the Point of Isolation refers to the physical location of a

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	device (e.g., a switch, fuse or link) which enables de-energisation of the connection from the Network.
Point of Supply	As defined in the Electricity Amendment Act 2001. Point of Supply in relation to a property means the point(s) on the boundary of the property at which exclusive fittings enter that property except that: <ul style="list-style-type: none"> a) If there are both High Voltage lines and a Transformer owned by the electricity Network on the property, the Point of Supply is the point at which electricity from the Transformer enters exclusive fittings; or b) If there are non-exclusive fittings on the property, the Point of Supply is the point at which those fittings become exclusive fittings; or c) If the exclusive fittings on the property are owned by a Consumer that is a tenant or licensee of the owner or occupier of the property, the Point of Supply is the point at which those exclusive fittings enter the area leased or licensed by the owner; or d) If there is a specific agreement that any other point on the property is the Point of Supply, the Point of Supply is the agreed point.
Price Category/Tariff Option	Means the charges levied by the Network on the Retailer for Distribution Services provided by the Network.
Residential	Means areas that are zoned residential in the Local Authority District Plan.
Retailer (of Electricity)	Means a person who supplies electricity to another person or persons for any purpose other than for resupply by the other person or persons; and “electricity retailing” has a corresponding meaning.
Rights of Access	Means safe and unobstructed access to and within a Consumer’s premise; <u>and</u> Reasonable use of facilities and amenities available to the network User or the Consumer and ordinarily used in association with the Network’s Equipment at the Consumer’s premise.
Ripple Receiver	See definition above for Load Control Ripple Receiver or Relay.
Rural	Means Areas zoned rural in the Local Authority District Plan.
Service Main	For the purposes of this standard a Service Main has the meaning as defined in the (now revoked) Electrical Supply Regulations 1984, namely; “...that portion of an electric line between the distribution line (i.e., the Network’s supply system) or distribution main as the case may be, and the Consumer’s main switchboard and which is used exclusively to supply electricity”.
System Operator	Means the System Operator appointed pursuant to the Electricity Governance Rules 2003 including any Codes of Practice issued pursuant to the Rules.
TOU	Means an abbreviation of the words Time of Use.
U/G	Means an abbreviation for the word Underground.
Urban	Means areas that are not zoned rural in the Local Authority District Plan.

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1.5 Health and Safety Hazard Identification and Management

Contractors and Service Providers to Buller Electricity Ltd shall obey the requirements of Buller Electricity Ltd standard *Health And safety Requirements For Contractors – 392S002*.

A systematic method of identifying all hazards shall be applied to all projects and worksites, generally as required by *Safety Manual – Electricity Industry (SM-EI) Parts 1, 2 & 3*. Appropriate hazard mitigation methods shall then be implemented before work commences.

This process is particularly important when selecting materials and equipment for use on Buller Electricity Ltd electricity network.

Particular attention shall be given to the ability to apply effective worksite earthing equipment and any equipotential bonding requirements, to comply with all SM-EI earthing requirements.

Personnel shall use personal protective equipment (PPE) as per the requirements of: -

- Buller Electricity Ltd standard *Selection Use and Maintenance of Safety Equipment 150S016*. This standard outlines where and when staff, contractors and Service Providers alike should be wearing personal protective equipment (PPE).
- *Safety Manual – Electricity Industry (SM-EI) – Parts 1 – 3 inclusive*.

When working with materials such as insulating oils, gases and other hazardous substances the requirements of Section 7 of the SM-EI shall be adhered to.

1.6 Environmental Considerations

Environmental considerations shall be in accordance with the requirements of Buller Electricity Ltd's *Environmental Management Plan 310S035*.

1.7 Risk Identification and Management

A systematic method of identifying all risks shall be applied to all design, construction and maintenance projects undertaken on the Buller Electricity Ltd network, generally as required by *Risk Management Standard AS/NZ 4360:2004*. Appropriate risk mitigation or reduction methods shall then be implemented before work commences on any network asset.

1.8 Copyright

The copyright of this publication is the property of Buller Electricity Ltd Limited. No part of this publication may be reproduced by photocopying or by any other means without the prior written permission of Buller Electricity Ltd Limited.

1.9 Enquiries Regarding this Document

Contact Person: Operations Manager

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**SERVICE PROVIDER TO BULLER ELECTRICITY LTD –
RESPONSIBILITY**

1.10 Working on the Network

All parties working on Buller Electricity Ltd's network shall:-

- Be responsible for ensuring that all Installations that they connect to the Network comply with the requirements of this standard.
- Not connect any new Installation that does not comply with the requirements of this standard or the connection has not been approved for connection by Buller Electricity Ltd according to the requirements of Buller Electricity Ltd's *Contractor Guide to Customer Initiated Work 392S007*.
- For all prescribed electrical LV works: -
 - Ensure that a Certificate of Compliance (COC) has been issued for that work according to the requirements of the *Electricity Regulations* before the Installation is connected or reconnected to the network.
 - Ensure that any work requiring inspection is inspected and the appropriate section of the COC has been filled in by an Electrical Inspector.
- Comply with the requirements of Buller Electricity Ltd standards: -
 - *220S007A Network Equipment Commissioning Standard – Part 1 – Process.*
 - *220S007B Network Equipment Commissioning Standard – Part 2 – Technical Policies And Minimum Testing Practices.*
- Ensure that permanent disconnections of Installations comply with the requirements of Buller Electricity Ltd standard *Permanent Disconnections – Electricity Network 170S001*.

1.11 Connection Prerequisites

Prior to the energising of an Installation from the Network, the party connecting (or reconnecting) the Installation shall ensure that the following requirements have been met.

- (a) The Consumer's Installation shall have a certified Electrical Certificate of Compliance issued in accordance with the *Electricity Regulations*.
- (b) Metering shall have been installed, inspected and approved by the meter owner and meets: -
 - The relevant standards determined with good industry practice.
 - Section 6 – Technical Criteria – Retail Equipment of this standard.
 - And any other relevant and accepted industry standards
- (c) A main earth system shall exist for the installation
- (d) The Service Main and Installation shall be correct with respect to polarity
- (e) The service fuse shall be correctly rated with respect to the Service Main size, fault level, and connection capacity of the installation per the requirements of the *Electricity Regulations* and Buller Electricity Ltd's *Network Fuse Protection Standard 393S024*.
- (f) The contractor must have approval from the Consumer's Energy Retailer to energise the Installation in accordance with the Use of System Agreement which is in effect between Buller Electricity Ltd and the Retailer.
- (g) The Retailer must have approval from Buller Electricity Ltd prior to energising the ICP.

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- (h) Where a Consumer owned Service Main (LV) runs across a third party's property, then the Consumer shall arrange to obtain an easement in favour of their property.
- (i) Where any HV supply owned by or to be owned by Buller Electricity Ltd runs across private property or land other than road reserve the line or cable route shall have an easement in favour of Buller Electricity Ltd.
- (j) Any specific terms and conditions as required by Buller Electricity Ltd and accepted by the Consumer must be met prior to livening.

(k) Standard Connection Fees:

A standard connection fee payable to Buller Electricity Ltd is required in the following situations. Standard connection fees reduce future reapportionment issues thus simplifying and encouraging connection to Buller Electricity's Network.

These fees exclude any work or materials that form part of the Service Main Connection

Situation	Explanation	SCF	Work BEL will be accountable for.
3ph Connection above 60A per phase 1ph Connection above 60A	Full costs to consumer or Capital Contribution Fee	N/A	Each connection application will be considered individually and the most appropriate connection method determined by Buller Electricity Ltd.
No 11kV line or cable within 350mt of proposed metering point. Requested total load is 60A or less per phase.	Full costs to consumer or Capital Contribution Fee	N/A	Each connection application will be considered individually and the most appropriate connection method determined by Buller Electricity Ltd.

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<p>No existing transformer or connectable LV reticulation but there is an existing BEL owned 11kV line within 350mt of proposed metering site Requested total load is 60A or less per phase .</p>	<p>Standard Connection Fee towards cost of installing 15KVA Transformer, 1ph or 3ph if existing 3ph 11kV Confirm no current reapportionment and if easement required</p>	<p>\$1,725.00</p>	<p>Install 15kVA transformer, HV fusing and earthing</p>
<p>Existing BEL owned transformer or existing adequate LV reticulation. Requested total load is 60A or less per phase. Confirm no existing reapportionment and if easement required</p>	<p>Existing supplying transformer 50 KVA or less:</p>	<p>\$1,725.00 per phase</p>	<p>Carry out capacity capabilities of existing transformer. Upgrade if required</p>
	<p>Existing supplying transformer greater than 60KVA but less than 105KVA:</p>	<p>\$920.00 per phase</p>	
	<p>Existing supplying transformer greater than 105KVA:</p>	<p>\$517.00 per phase</p>	
<p>Existing BEL owned transformer or existing adequate LV reticulation. Requested 3ph load above 60A per phase. Confirm no existing reapportionment and if easement required</p>	<p>Existing supply</p>	<p>\$103.50 per KVA</p>	<p>Carry out capacity capabilities of existing transformer and reticulation. Upgrade if required</p>
<p>Existing BEL owned Transformer but no LV reticulation or the existing LV reticulation requires an upgrade to supply the requested load.</p>	<p>Full study undertaken to forecast future requirements. SCF based on connecting transformer size as</p>	<p>N/A</p>	<p>Carry out capacity capabilities of existing transformer. Upgrade if required. Install service cable to Point of Capacity or install additional LV circuits to extend the Point of Capacity, this portion of the work</p>

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Requested total load is 60A or less per phase.	above.		may incur a capital contribution fee.

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GENERAL TECHNICAL REQUIREMENTS

1.12 General

While the standard supply to most new Consumers will be a single phase, 230-volt, 60-amp supply, larger or other special supply requirements can be arranged (e.g., three phase (400/230 volt)).

The type of network connection provided for a Consumer will be dependent upon the network connection capacity required, the position of the Consumer's main switchboard and the location and nature of the Consumer's Installation.

Before being connected to Buller Electricity Ltd's network all Consumer Installations and appliances shall have been designed, constructed, configured and installed to comply with the requirements of this standard and the following: -

- All applicable electricity Acts and Regulations
- SM-EI Parts 1 & 2, latest versions
- AS / NZS 3000:2007
- *Overhead Line Design Standard 393S008*
- *Overhead Lines Construction 393S010*
- *Underground Line Design Standard 393S009*
- *Underground Line Construction standard 393S011*

1.13 Network Point of Supply and Point of Isolation

The Network Point of Supply is the point at which electricity may flow between the Network and the Consumer's Installation (Connection) – i.e., where Buller Electricity Ltd's Network ends.

A unique Installation Control Point (ICP) means the point at which the retailer is deemed to supply electricity to the Consumer.

The Network Point of Isolation is determined by the Network so as to ensure Isolation (de-energisation) without affecting the integrity of the Network or that of other Points of Supply, or the conveyance of Electricity to any other Point of Supply. It is at the Point of Isolation that a connection is energised or de-energised or in other words, isolated from the Network.

The examples in Appendices A to L detail the Point of Supply and Point of Isolation in various connection scenarios. In circumstances not covered by examples, the Network shall determine the Point of Supply and the associated Point of Isolation and where applicable, its Metering requirements.

Existing connections may be treated on a case by case basis, due to the cost implications for existing Consumers, in order to comply with the Network's isolation requirements.

For any Point of Supply where, as of 1 September 2008, there is no singular Point of Isolation, the Network will agree to an alternative measure for an agreed period of time. Existing connections may be treated on a case by case basis, due to the cost implications for existing Consumers, in complying with the isolation requirements.

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Each new ICP created after 7 October 2002 must be able to be de-energised without de-energisation of any other ICP, as determined by the Network so as to ensure that the Point of Supply can be De-energised or Disconnected without affecting the integrity of the Network or that of other Points of Supply, or the conveyance of Electricity to any other Point of Supply.

An exception to the isolation requirements detailed above are ICP's that represent the consumption calculated by difference between the total consumption for the Embedded Network and all other ICP's on that Embedded Network.

1.14 Consumer's Point of Supply

The Consumer's Point of Supply is the location in the electrical circuit where ownership of the equipment relating to the supply of Electricity changes between the Network and the Consumer. Refer to Section 1.4 – Definitions.

In some instances the Network will own Fittings on the Consumer's premise that is on the Consumer side of the Point of Supply. This may, but is not limited to include equipment such as switches, transformers, Metering Equipment, and Load Control Equipment.

Examples of Point of Supply demarcation are detailed in the examples in Appendices A to L.

1.15 Requirements for Connection of Installations to the Network

- New Service Mains and Installations must meet the requirements of this standard and the associated Technical Standards referred to in this standard.
- If existing connections don't meet the requirements, then: -
 - Either Buller Electricity Ltd will be responsible for grandfathering them into compliance.
 - Or the Consumer is responsible.
- Rights of access must be allowed to the Network's Equipment on the Consumer's Premises.
- The Point of Isolation must be located as close as possible to the Point of Supply unless otherwise approved in writing by Buller Electricity Ltd.
- Metering Data for each ICP will be provided by means of a single meter register or data logger channel for each variable Price Category or Tariff Option.

1.15.1 Low Capacity Connections

The minimum connection capacity for new connections is usually a 60-amp single-phase supply.

1.15.2 Streetlight Connections

To be supplied by a suitable rated fuse (maximum of 40-amps per phase) that is capable of supplying a highly inductive/capacitive load.

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1.15.3 Unmetered Connections

To qualify for an unmetered supply the load shall be less than 1kVA and use less than 3,000kWh per annum and consist of fixed wired equipment. Note: The connection must be in place for a minimum of 12 months. All privately owned street lighting and under veranda lighting loads shall be metered as per the requirements of clause 6.3 - Privately Owned Street Lighting (including Under Veranda).

In such cases Buller Electricity Ltd reserves the right to require the installation of a sealable load limiting circuit breaker at the Consumer's expense. Buller Electricity Ltd must approve all unmetered loads and allocate an ICP where applicable to ensure suitable traceability of the connection and ensure adherence to Electricity Governance Rules.

In all cases, the Consumer's Energy Retailer must also approve the adoption of the proposed unmetered connection prior to its connection to the network.

1.15.4 Urban Areas

Connection capacities up to 3 phase 60 amps are usually available from the LV distribution system. Connection capacities between 100 and 400 amps may require the installation of a shared or dedicated transformer on the Consumer's property. A capital contribution is normally required by a Consumer requiring an upgrade.

1.15.5 Rural Areas

In some rural areas the network distribution system consists of two (2) wire HV. In those instances only single-phase 230-Volt or split phase 240/480-Volt supplies are available.

In these areas the largest capacity connection available without upgrading the HV distribution to a three (3) wire network is 30-kVA single phase. A capital contribution will be required by a Consumer requiring an upgrade to three phase supply.

In rural areas the large distances between Consumers often requires Consumers to be supplied via a shared or dedicated transformer installed specifically for the Consumer.

A prospective Consumer requiring a 60 amp supply and further than 350 metres from an existing transformer, a new closer transformer may be required. This transformer can be located on a pole in the road reserve with the Consumer taking supply via LV Service Main. In situations where the Consumer's main switchboard is further than 350 metres from an HV line in the road reserve the most economic solution is usually the installation of an HV line across the Consumer's property to a transformer close to the main switchboard. Buller Electricity Ltd may require a capital contribution from the Consumer.

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1.16 Overloads And Protection Requirements

1.16.1 General Overloads and Protection Requirements

For Consumers supplied via LV fuse the connection capacity is generally determined by the protection rating of the service fuse. If the Consumer's load exceeds the protection rating, protection operation can result.

For Consumers supplied at LV via direct connection to the LV terminals of a transformer, the nominal capacity of the connection is the transformer rating or the protection rating on the Consumers' main switchboard. Transformers have some overload capacity and Consumers are permitted to utilise this subject to the following conditions: -

- The Consumer's installation shall have suitable protection devices capable of isolating the Installation from the network.
- Where the incoming circuit breaker is owned by the Consumer and it is used as to limit over-currents, then the circuit breaker's protection relay/relays shall be limited to the maximum line current allowed by the Consumers Price Category or Tariff Option. The current adjusting mechanisms of aforementioned relays shall be sealed to prevent any adjustment of these settings unless the prior approval of Buller Electricity Ltd has been obtained.
- The Consumer's Service Main and main switch must be rated to carry the overload.
- The loading on the transformer shall not exceed the appropriate values for normal cyclic duty defined in British Standard Code of Practice *CP1010 "Loading Guide for Oil-Immersed Transformers"*, or *IEC 354 "Loading guide for oil-immersed power transformers"*, as appropriate.

1.16.2 Regulations Compliance

Any installation connected to Buller Electricity Ltd's electricity network shall be protected against short circuits or earth faults as per *Electricity Regulations* and *AS / NZS 3000*.

1.16.3 High Voltage Network Protection

For Consumers supplied via HV fuses the connection capacity shall comply with the requirements of Buller Electricity Ltd's *Network Fuse Protection Standard 393S024*.

1.16.4 Protection Discrimination

In order to ensure satisfactory operation of Buller Electricity Ltd's and the Consumer's protection systems, operating times, discrimination, and sensitivity at the point of supply shall be agreed between Buller Electricity Ltd and the Consumer. These settings may be reviewed by Buller Electricity Ltd from time to time.

1.17 Multiple Connections and Isolation

If there is more than one Installation Control Point (i.e., ICP) at or upon any Consumer's premises, no interconnection will be made between those Connections at any time without the written consent of the Network, unless the Connections are made to the Network's network through a single metered Point of Supply and each Installation is allocated a single ICP.

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In all cases, each ICP must be able to be separately de-energised from the Network without affecting the electricity supply to any other ICP's present upon the same property.

If the Consumer has more than one Point of Supply to the Network when there are multiple ICP's present at the same premises, the Consumer shall not parallel or tie the Installations or install any facilities that allows those ICP's supplies to be paralleled. This is to avoid the possibility of back feeds creating potentially hazardous situations on the Buller Electricity Ltd Network.

Building Fire Regulations should also be considered when planning multiple connections to Consumer premises.

Where a Consumer's premise has made more than one Point of Supply to the Network (i.e., more than one ICP) then each connection point must have a separate isolation point so that each Installation can be de-energised.

1.18 Generation Connections

All Generators connected to Buller Electricity Ltd's Network, or to an Installation connected to Buller Electricity Ltd's Network, shall comply with the following requirements: -

- *Distributed Generation (DG) Policy Standard 173S003*, which is available on request or on Buller Electricity Ltd's website.
- *Micro Embedded Generation Standard 393S089*.
- *Standard for Connection of >10kW Generation to Buller Electricity Ltd's Network 393S012*.

Where a Consumer has generating equipment installed for emergency power supply purposes, suitable interlocks shall be provided that prevent the generator being connected to the network and exporting energy.

Enquiries regarding Distributed Generations should be directed to Operations Manager, Buller Electricity Ltd, PO Box 243, Westport

Any Consumer can take supply at 11kV but it is generally only economic for capacities in excess of 1MVA or when the Consumer has a special need for an HV supply.

Typical configurations for HV network connections will be via an incoming isolation device such as dropout fuses, circuit breaker, isolator, or fuse switch. The incoming isolation device will be supplied and maintained by Buller Electricity Ltd but the Consumer shall provide suitable accommodation for this equipment. HV Consumers shall ensure they comply with the *Electricity Regulations* and all other relevant regulations and codes of practice in relation to any HV equipment owned and operated by themselves.

When supply is required from paralleled HV feeders to meet loading or security requirements, special protection facilities will be required – refer to section 3.7 Multiple Connections And Isolation for details.

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1.19 Earthing

The Installation's earthing system shall be designed to comply with the relevant regulations of the *Electricity Regulations* and associated Electrical Codes of Practice - in particular *NZECP 35*. Reference shall also be made to Buller Electricity Ltd's *Permanent Earthing Standard 393S017*.

Deviations from these requirements require prior written approval from Buller Electricity Ltd.

1.20 Fault Level Considerations

1.20.1 Short Circuit Rating

The short circuit rating of Consumers' equipment at the Point of Supply should be not less than maximum prospective fault level of the Distribution Network to which it is connected.

The choice of equipment for connection at low voltage may take into account reduction in the fault level caused by the Service Main.

Consumers can obtain the maximum prospective short circuit current at their point of supply on request to Buller Electricity Ltd.

1.20.2 Consumer Contribution to Fault Levels

The design of the Network may need to take into account the contribution to fault level by the Consumer's apparatus such as large motor loads.

In order to permit these assessments to be carried out, information should be exchanged on prospective fault-power in-feed at the connection point.

1.21 Trees Near Lines

For safety reasons, Consumers must ensure that the trees and shrubs on their property are kept well clear of all overhead power lines. Where trees or shrubs may cause safety concerns, Buller Electricity Ltd may temporarily disconnect power to the Consumer. This will be arranged through the Consumer's Electricity Retailer.

Buller Electricity Ltd's website <http://www.bullernetwork.co.nz> provides guidance on how to avoid Power Outages through the management of trees near power lines.

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**TECHNICAL REQUIREMENTS FOR CONSUMER INSTALLATIONS
AND APPLIANCES**

1.22 Load Power Factor

The power factor of a Consumer's load measured at the metering point shall not be less than 0.95 (lead or lag). The following table gives guidance for typical electric motors as to the required capacitance required to meet 0.95. Non typical motors and those with capacities of greater than 10kW require individual engineering analysis to determine their load power factor.

Capacity of Motors		Sync Speed 3,000rpm	Sync Speed 1,500rpm	Sync Speed 1,000rpm
kW	hp	(kVAr)	(kVAr)	(kVAr)
0.75	1	0.5	0.75	1.0
1.5	2	0.5	1.25	1.75
2.2	3	0.75	1.5	1.75
3.0	N/A	0.75	2.0	2.0
N/A	5	1.0	2.25	2.5
4.0	5.5	1.25	2.5	2.75
N/A	6	1.25	2.5	3.0
5.0	N/A	1.5	2.5	3.0
5.5	7.5	1.75	2.5	3.25
7.5	10	2.0	3.0	3.5
N/A	12.5	2.75	3.25	4.0
10	N/A	3.0	3.5	4.5
N/A	15	3.5	3.75	5.0

1.23 Voltage Fluctuations

Some electric appliances such as motors with fluctuating loads and welders can cause voltage fluctuations in the distribution network resulting in annoyance to other Consumers. The Consumer's Installation or electrical appliances shall not cause voltage fluctuations at the point of supply in excess of the threshold of irritability in the *Electricity Regulations* and its associated Electrical Codes of Practice.

1.24 Motor Starting

The starting of electric motors can cause severe voltage dips on the network resulting in irritation to other Consumers.

The motor starting limitations of this standard are those recommended in the NZ Electrical Supply Authority Engineers Institute Committee report on Motor Starting Currents for a.c. motors. Motor starting limitations are summarised in the following paragraphs.

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1.24.1 Exempt Motor Sizes

AC motors up to and including the ratings listed in the following table are not subject to starting current limits and may be started direct on line without specific permission to connect.

1.24.1.1 Table 1 - Schedule of Exempt Motor Sizes

Location and Rating	Rural	Urban Residential	Urban Non-Residential
Single Phase (not exceeding)	0.75kW	1.5kW	2.2kW
Three Phase (not exceeding)	2.5kW	4.0kW	7.5kW

1.24.2 Non Exempt Motors

All AC motors above the ratings specified in Table 1 shall be approved by Buller Electricity Ltd Network Group prior to connection. The criteria used for approval is that the relative voltage changes on motor start-up shall not exceed the values in Table 2.

1.24.2.1 Table 2 - Schedule of Allowable Relative Voltage Change

Frequency of Starting	At PCC	At Zone Substation 11kV Bus
In excess of 10 starts per hour	1%	0.5%
In excess of 3 starts per day but not more than 10 starts per hour	3%	1.0%
Not more than 3 starts per day including not more than 1 start between the hours of 5pm and 11pm on any day	6%	1.5%
Emergency equipment started infrequency (e.g. fire pumps)	12%	2%

NB: PCC = Point Of Common Coupling - refer to section 1.4 – Definitions

1.24.3 Multiple Motor Installations

In installations where several large motors start automatically, the effect of these motors starting simultaneously when supply is restored after a power interruption needs to be considered.

Should several motors on a Consumer's installation start automatically when supply is restored after an interruption, then unless delayed starting is installed to the satisfaction of Buller Electricity Ltd, the relative voltage change will be assessed on the basis of all motors on automatic control starting simultaneously.

1.25 Harmonic Disturbances

Harmonic voltages and currents introduced into the network by a Consumer's installation or appliances shall not exceed the levels specified in *NZECF 36*.

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1.26 Capacitors

Capacitors are generally installed in a Consumer's installation or appliances to provide power factor correction. They can be part of a power factor correction unit or associated with individual appliances such as motors or fluorescent light fittings.

The excessive absorption of ripple control signals by capacitors shall be prevented by the installation of suitably rated blocking chokes on the network side of individual capacitors or groups of appliances containing capacitors.

Consumers are permitted to install unblocked capacitor kVAR capacity up to 2% of connection kVA capacity.

Note:

For 3 phase connections the maximum kVAR per phase is 1/3 the total kVAR allowed. For capacitor loads exceeding the limit above, specific permission to connect shall be obtained from Buller Electricity Ltd. The Consumer shall be responsible for the provision and correct operation of the blocking chokes.

Consumers installing fluorescent lighting loads are advised to use fittings with lead-lag ballasts which will provide power factor correction without the risk of ripple signal absorption. Electronic fluorescent lighting ballasts do not require capacitors for power factor correction; hence they also will not absorb ripple control signals.

1.27 Load Control Policies

As from 1 November 2010 the following interruptible load (i.e., load control) policies shall apply.

The purpose of these policies is to minimise constraints on Buller Electricity Ltd's distribution system and the electricity transmission system. They will also allow Buller Electricity Ltd to respond to system emergencies that can occur on Buller Electricity Ltd's distribution network or on Transpower's grid as and when they arise by controlling that load.

1.27.1 New Connections To Buller Electricity Ltd's Network.

All new installations comprising suitable interruptible loads (per clause 4.6.3 Suitable Interruptible Loads) shall be capable of being controlled by Buller Electricity Ltd's Load Control System by means of an approved Ripple Receiver or Relay (refer clause 4.6.4 below). The purpose of this equipment is to allow Buller Electricity Ltd to interrupt both commercial and residential connections.

1.27.2 Existing Connections To Buller Electricity Ltd's Network.

All existing installations comprising Suitable Interruptible Loads (per clause 4.6.3 Suitable Interruptible Loads) shall continue to be capable of being controlled by Buller Electricity Ltd's Load Control System by means of an approved Ripple Receiver or Relay (refer clause 4.6.4 below). In this regard "controlled" means switched On or Off. The

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purpose of this equipment is to allow Buller Electricity Ltd to interrupt that load. This policy applies to both commercial and residential installations.

1.27.3 Suitable Interruptible Loads.

All Interruptible Loads should be able to deliver satisfactory service when being controlled under Buller Electricity Ltd's normal load control strategies.

Interruptible Loads that commonly fit these criteria include: -

- Electric water-heater of between 100 to 500 litres storage capacity and fitted with a heating element of 1.2kW or more.
- Electric storage heaters (non water) fitted with a heating element of 3kW or more.
- ICP's with a total irrigation load capacity above 50kW.
- Cool Store refrigeration load.

Should a Consumer choose not to have any of the above appliances controllable, the Consumer shall pay the appropriate Price Category or Tariff Option (i.e., the Consumer shall be ineligible for a Controlled Price Category or Tariff Option).

Buller Electricity Ltd may switch other loads than those listed above for the purpose of minimising Network constraints in accordance with specific contracts with the Consumers Retailer.

Buller Electricity Ltd may also control load at its discretion for purposes other than minimising Network constraints in accordance with specific contracts with Individual Consumers.

Where Advanced Metering is installed, the unit must either have, or be installed, in conjunction with a Ripple Receiver or other receiving device, capable of receiving a Ripple Control Signal from the Network.

A Residential Consumer will be allocated to the relevant, or Consumer elected Controllable Tariff as appropriate by their electricity Retailer. Where a Consumer elects an Uncontrolled tariff, the 'Controllable' load will be Controlled in emergency situations only, being under System Operator instruction.

1.27.4 Approved Buller Electricity Ltd Ripple Receiver or Relays.

The following load control Ripple Receiver or Relay are approved for use in their designated network regions

Network Region	Frequency	Code
Buller	317	Decabit

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1.28 Signalling

The Network may not be used for the purpose of conveying signals unless express and prior approval is given in writing by Buller Electricity Ltd.

Should the Consumers use their own electrical installation to convey signals, Buller Electricity Ltd will not provide any warranty as to the electrical characteristics or signalling properties of the Network, or the Network's capability or suitability in that regard. The signals shall not cause any interference or damage to the Network or to other Consumers connected to the Network, and the Consumers shall be responsible for installing suitable blocking filters to ensure any signals do not interfere with the Network or other Consumers installations.

1.29 Radio and Television Interference

Consumers' installations and appliances shall not impose interference on the network that affects the operation of radios or television or other communication systems.

1.30 Consumer Disturbances

Consumer initiated disturbances shall be managed according to *AS/NZS 61000.3.6:2001* as appropriate.

1.31 Unbalanced Loads

All polyphase loads connected to the network shall be evenly balanced across all phases of the distribution network as can be practically achieved.

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TECHNICAL CRITERIA - SERVICE MAINS

1.32 General

The Service Main provides the linkage between the network works and the Consumers Installation. All Service Mains shall be rated and installed in accordance with AS / NZS 3000.

1.33 Low Voltage Connections

Low voltage connections can be made by connection of an LV Service Main onto the network LV distribution system or by connection to the LV side of a transformer located on the Consumer's premises. The requirement for a transformer is dependent upon; the connection capacity required, the capacity and present loading on any existing LV distribution in the vicinity and the distance from the Consumer's property boundary to the Consumer's main switchboard.

Each connection application will be considered individually and the most appropriate connection method determined by Buller Electricity Ltd.

1.33.1 Service Main Neutral Size

All Service Main neutral conductors should be the same size as the phase conductors. This will reduce the chance of neutral conductor overloads due to unbalanced loads and harmonics.

1.33.2 Pilot Wires

A pilot wire for water heating/space heating/night supply control may be required to be included in the service/distribution main.

Where the pilot wire is one of the cores of a composite cable, the minimum cross sectional area is 2.5mm² (copper).

The minimum cross-sectional area shall be 4mm² (copper) if the pilot is a separate conductor and when underground, it must have additional protection against mechanical damage and the outer covering be suitable for direct burial.

1.33.3 Isolation Points

Isolation of each individual Service Main must be possible, and will generally be carried out using the LV fuses. Contractors must ensure that removing LV Service Main fuses to disconnect one Consumer will not also isolate another Consumer.

1.33.4 Structural Requirements

A Service Main should not add a physical force or bending moment to the Network beyond what the design allowance built into the network equipment can safely withstand – refer Buller Electricity Ltd's *Overhead Line Design Standard 393S008* as a means of compliance with this requirement.

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1.34 Aerial LV Service Main

Aerial Service Mains shall comply with *Electricity Regulations and the Buller District Council resource management plan*. Where open pair Service Mains are permissible the phase conductors shall be covered with black PVC and the neutral conductor shall be bare. The Consumer is responsible for providing solid supports for conductor insulators and terminations for their Installation.

It is recommended where possible, neutral screened cable is used for aerial Service Main due to the enhanced safety this provides, for all parties.

1.35 LV Underground Service Mains

1.35.1 General

Underground service/distribution main cables may share the same trench as other services. It is recommended for good working practice that the following clearances are observed, although this should be confirmed with the owners of the other services.

- (a) 150mm from neutral screened cables to Telecom cables (*confirm with the cable owner*)
- (b) 450mm from cables other than neutral screened cables to Telecom cables (*confirm with the cable owner*)
- (c) 300mm from sewers and water pipes

Cables laid in road reserves are required to be plotted to sufficient accuracy for future location. The details shall be provided to Buller Electricity Ltd.

No Buller Electricity Ltd records are kept of service/distribution main cable routes on private property. It is recommended that Contractors either provide details to the Consumer or advise the Consumer to make their own records. Both Buller Electricity Ltd and Telecom operate cable locating services for a nominal charge.

Buller Electricity Ltd's own practice and recommendation is that all service/distribution Service Main shall be buried at a depth not less than 600mm.

Both ends of each phase conductor of an underground service/ distribution main must be colour coded in accordance to the colour/s stated on the wiring application.

1.35.2 LV Underground Service Mains in LV Underground Areas

LV Service Main in areas with underground LV distribution will be connected to the distribution network via an LV pillar box of appropriate size located on the property boundary.

1.35.3 Pillar Boxes

Pillar boxes are special purpose junction boxes that accommodate LV service fuses and provide facilities for connection to the LV underground distribution cables.

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Pillar boxes are normally located on the street side of the Consumer's property boundary. Buller Electricity Ltd will, after consulting with the Consumer or developer, determine the position of the pillar box. In residential areas, pillar boxes are generally placed on the street frontage at the junction of two property boundaries allowing the box to serve two Consumers.

Pillar boxes must be of a type approved of by Buller Electricity Ltd.

1.35.4 Connection of Service Mains into Pillar Boxes

The connection of LV Service Main into pillar boxes will be physically undertaken either by Buller Electricity Ltd or by Buller Electricity Ltd approved contractors.

The Consumer is responsible for fitting any Service Main tails and for the provision of suitable cable lugs.

1.36 LV Underground Service Mains in an Overhead Area

1.36.1 Pole Top Supply

In areas where the existing LV distribution network is overhead, Consumers can be connected via an underground Service Main running direct from a pole top to meter box or main switchboard by having the Service Main buried to the base of a nearby pole, attached to the pole and terminated onto a pole top fuse subject to the following conditions:

1. A suitable pole must be available on the same side of the street as the Consumer and within 2 metres of the Consumer's boundary if not the service cable must be installed to the nearest suitable pole, this could mean additional trenching or tunnelling.
2. The physical circumstances such as ground levels and footpath conditions are suitable for the installation of an underground cable.
3. All Service Main cables shall be copper neutral screened. If the phase conductors are aluminium then appropriate bi-metallic stalk lugs shall be supplied by the Consumer.
4. The cable in the road reserve will be laid parallel to or at right angles to the street. The cable shall be installed in accordance with the requirements of *AS / NZS 3000*.
5. The cable shall cross the Consumer's property boundary at a location determined by Buller Electricity Ltd that results in the minimum trenching in the road reserve. All trenching and reinstatement shall be in accordance with the requirements of the local roading authority.
6. The cable shall be appropriately mechanically protected above the ground level in accordance with the requirements of Buller Electricity Ltd's *Underground Line Construction Standard 393S011*.
7. The cable length shall allow for 9 metres of cable up the pole.

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8. Where a connection is to be made to a pole mounted fuse the cable shall be terminated in such a way that the cable is sealed against moisture ingress and the conductor insulation is protected against the effects of UV light.

For **Neutral Screen Cable** the following is required; a sealed breakout boot, blocked connectors/sleeves on each phase conductor and the neutral, UV stabilized heatshrink over the phase conductor, sealed heatshrink over the connectors/sleeves on the phase conductors and sealed heatshrink over the connector/sleeve on the neutral conductor which is to extend over the neutral conductor down to the breakout boot.

For **Multi Core Cables** the following is required; a sealed breakout boot, blocked connectors/sleeves on each core, UV stabilised heatshrink over each core, sealed heatshrink over the connectors/sleeves.

The cores of the cable shall be clearly marked at both ends to avoid any confusion. Labelling shall comply with Buller Electricity Ltd's *Equipment Numbering and Labelling Requirements 393S004*.

1.36.2 Pillar Box Supply

In circumstances where an underground connection is required and the conditions for a pole top supply cannot be met, an underground supply can be provided in an overhead area via a boundary pillar box in the road reserve.

1.37 HV Service Mains and Substations

When it is necessary to install a substation on a Consumer's premises, the Consumer shall make available on the Consumer's premises suitable space to accommodate the transformer, HV cable or lines and associated switchgear. The Consumer shall grant an easement in Buller Electricity Ltd's favour for access to the transformer and all fittings that are associated with the conveyance of electricity to both the Consumer and other Consumers.

Substations shall generally comply with *NZS 6108 Accommodation for Electrical Supply Substations in Customers Buildings*.

All substations and HV circuits on the Consumer's property shall be designed and constructed in accordance with the requirements of the following Buller Electricity Ltd documents: -

- *Underground Line Design Standard 393S009*
- *Underground Line Construction Standard 393S011*
- *Overhead Line Design Standard 393S008*
- *Overhead Line Construction Standard 393S010*.
- *High Voltage Metering Units Specification Guidelines 393S040*

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CRITERIA FOR METERING EQUIPMENT

1.38 Metering Requirements

Metering Equipment is to be provided in accordance with requirements of Buller Electricity Ltd and the Consumers Electricity Retailer, and:

- Shall not rely on summated meter readings from multiple meters on the Consumer's premises.
- Must conform with Buller Electricity Ltd's Isolation requirements.
- Where associated with an Embedded Network, comply with the Electricity Commissions "Guidelines for Metering, Reconciliation and Registry Arrangements for Embedded Networks".
- In accordance with the drawings contained within the Appendices of this document as they relate to Connection and Metering.
- From 1st March 2009, all upgrades of existing Points of Supply require a separate Metering point to be installed for each Point of Supply for each Consumer.
- All connections over 3000 kWh shall be metered so that the installation complies with Rule 3.2 of part D of the Electricity Governance Rules, where the Rule requires "...that where the quantity of electricity conveyed at a single Point of Supply is not quantified using a metering installation; the amount of electricity conveyed per annum must not exceed 3,000 kWh".

1.39 Metering Required By Buller Electricity Ltd

Buller Electricity Ltd may install an additional set of metering equipment at or after, any Consumer's Point of Supply for checking and Distribution Network management purposes.

Consumers shall provide appropriate space within their premises to accommodate the metering equipment.

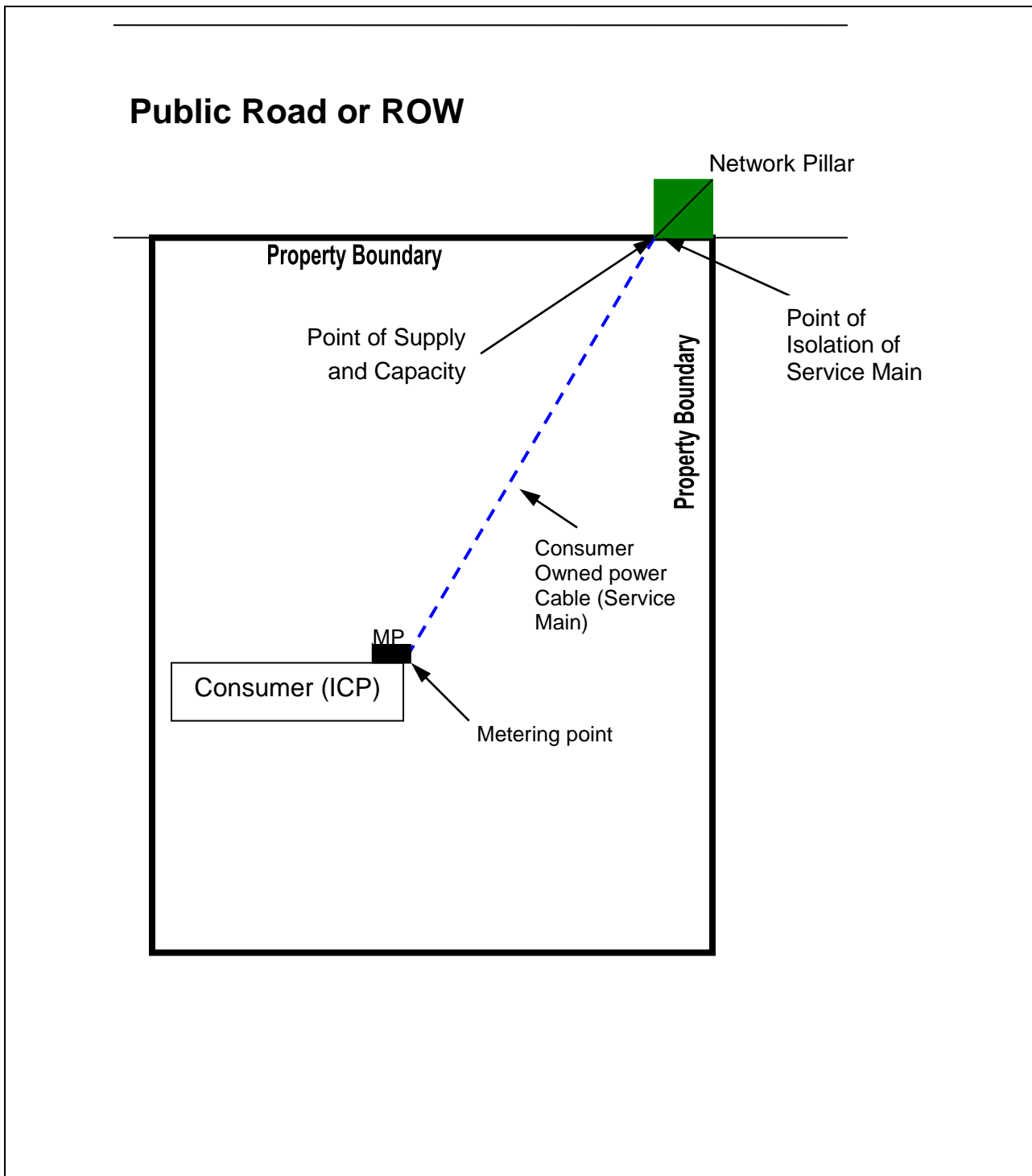
1.40 Privately Owned Street Lighting (including Under Veranda)

All privately owned street lighting and under veranda lighting loads (sometimes also called community lighting) shall be metered.

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APPENDICES - NETWORK CONNECTION EXAMPLES

1.41 Appendix A - 400V / 230V Supply to One Consumer From Distribution Pillar Located On Property Boundary



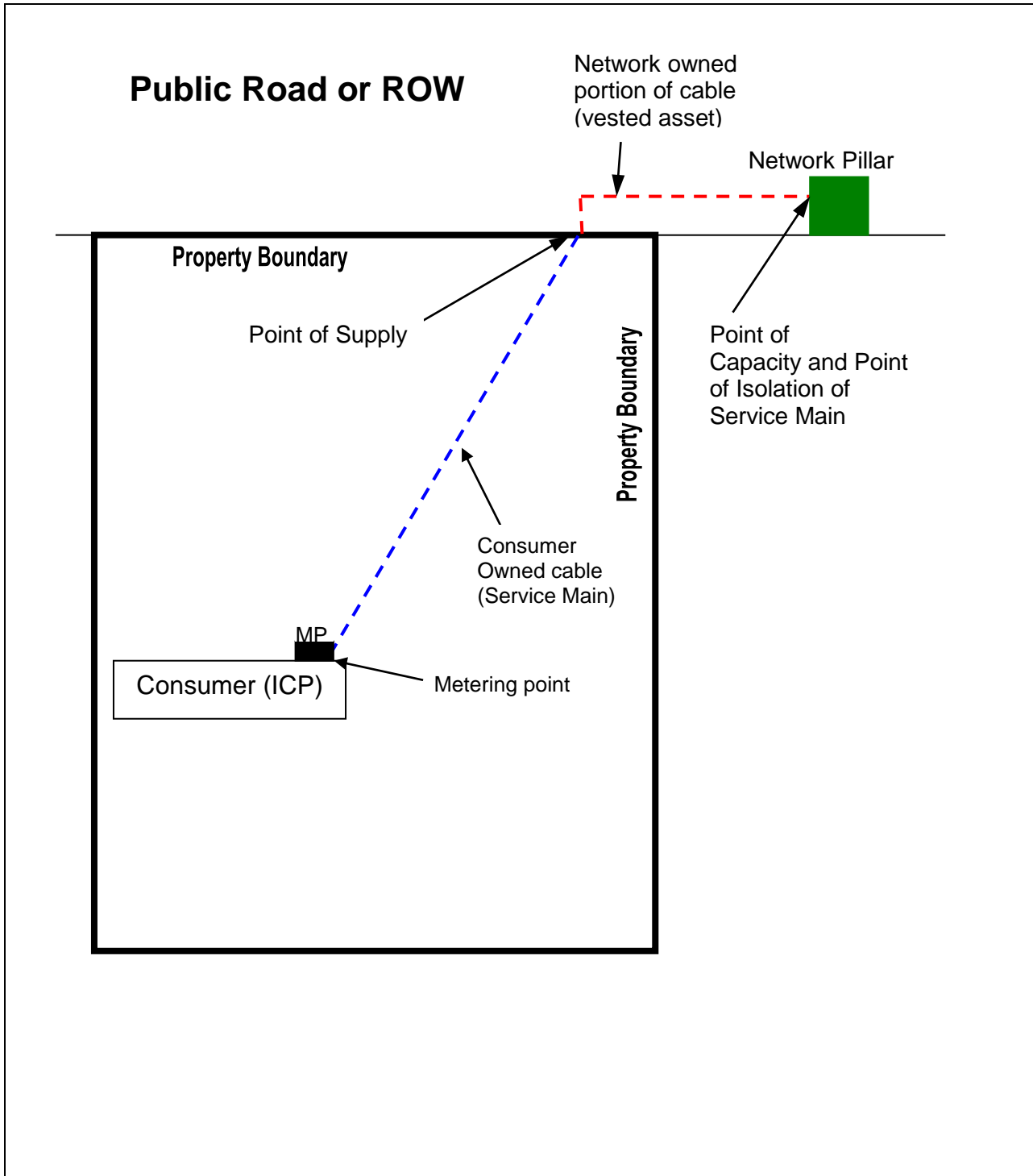
Location of Point of Supply	At the property boundary
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Location of Point of Capacity	At the Pillar Box
Points of Isolation	At the Distribution pillar
Number of Consumers (ICP's)	One
Service Main installation and connection costs	Consumer pays for full cost of cable from metering point to pillar. BEL treats the portion of service cable from the Point of Supply to Network pillar as a vested asset

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1.42 Appendix B - 400V / 230V Underground Cable to One Consumer From Distribution Pillar Not Located On Property Boundary



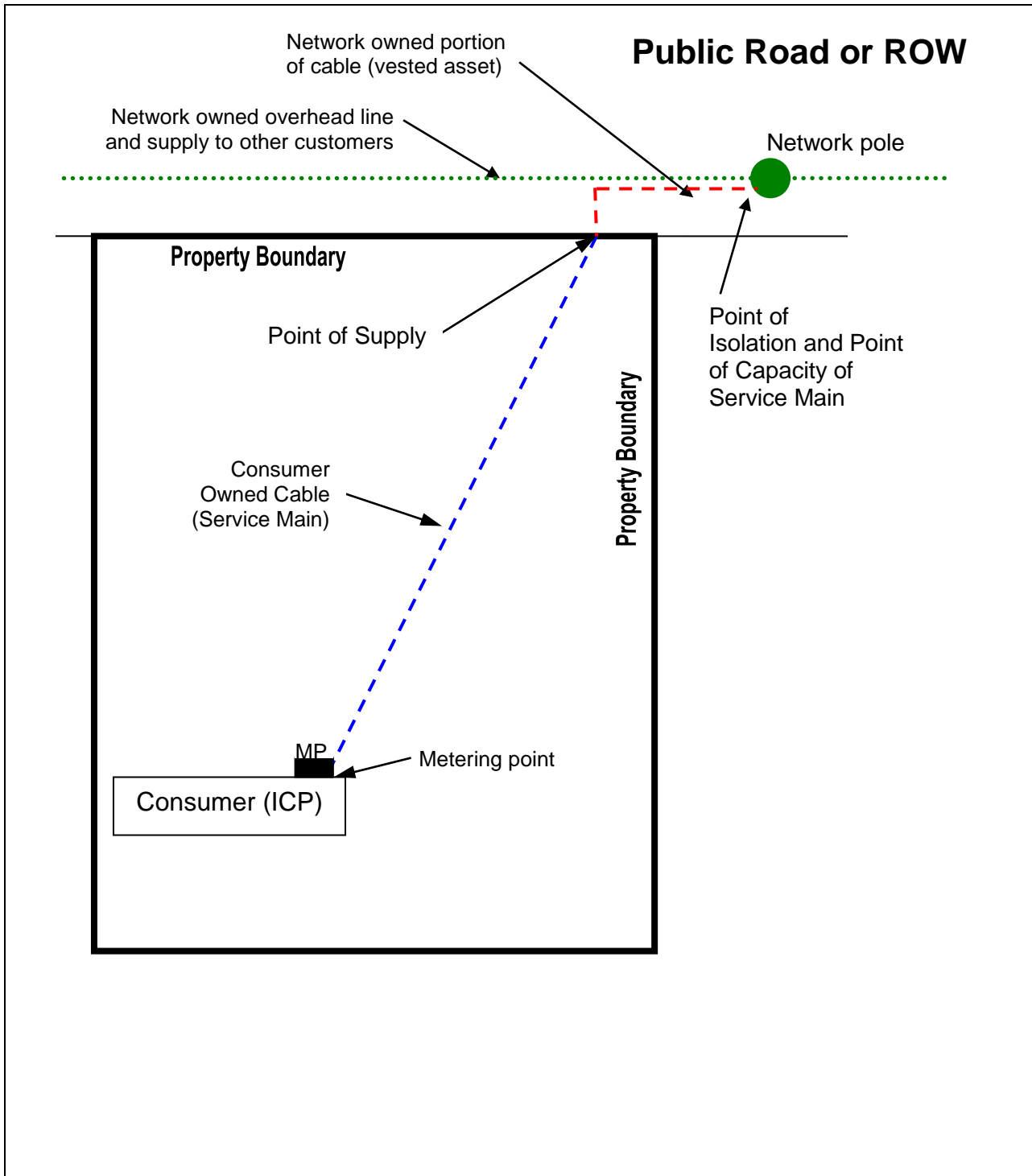
Location of Point of Supply	At the property boundary
Location of Point of Capacity	At the Pillar box

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Points of Isolation	At the Distribution Pillar
Number of Consumers (ICP's)	One
Service Main installation and connection costs	Consumer pays for full cost of cable from metering point to pillar. BEL treats the portion of service cable from the Point of Supply to Network pillar as a vested asset (red section)

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ELECTRICITY NETWORK CONNECTION STANDARD

1.43 Appendix C - 400V / 230V Underground Cable to One Consumer From Overhead Network Pole Not Located On Property Boundary



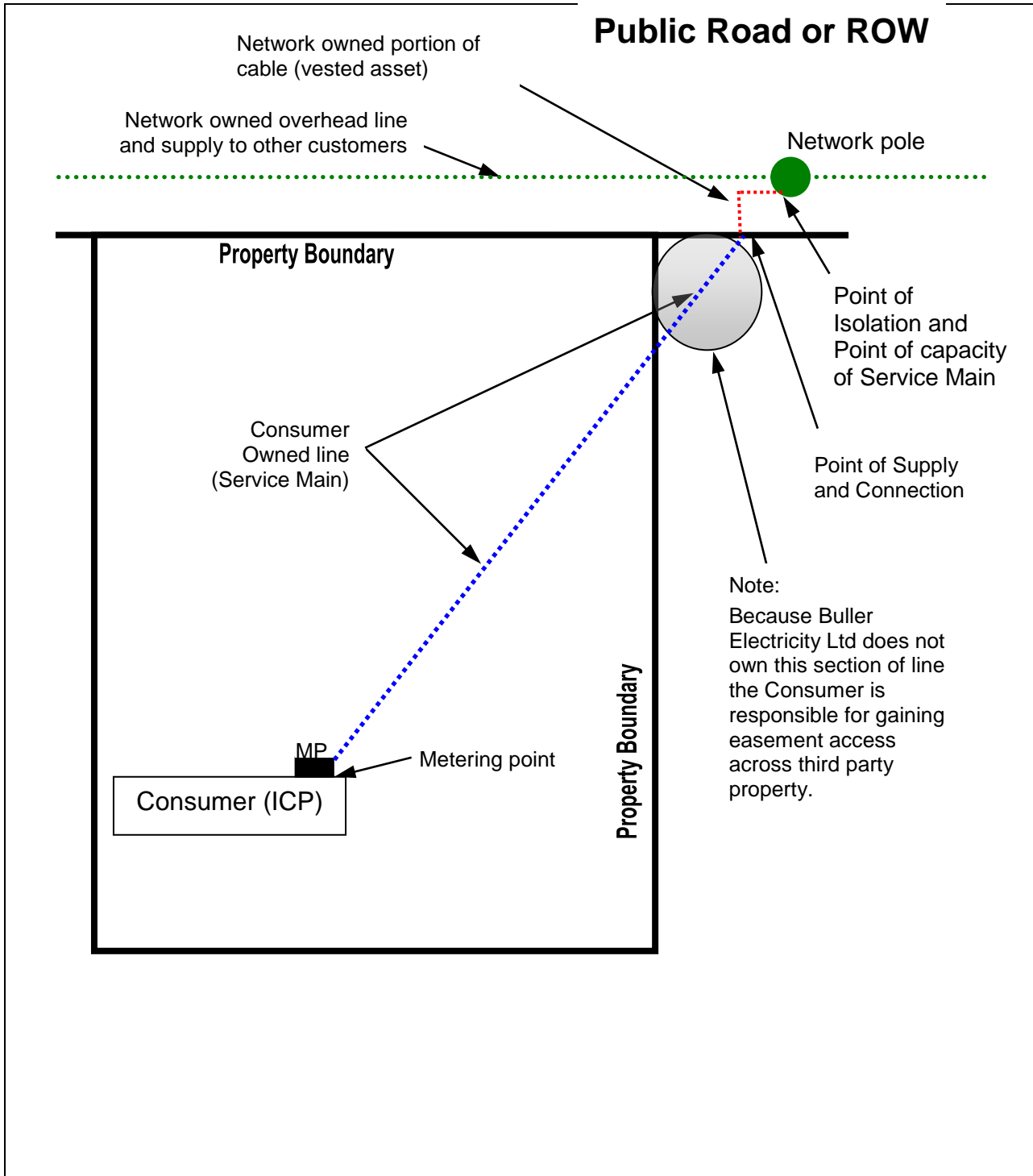
Location of Point of Supply	On the property boundary
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Location of Point of Capacity	At the Pole
Points of Isolation	At the Network pole
Number of Consumers (ICP's)	One
Service Main installation and connection costs	Consumer pays for full cost of cable from metering point to pillar. BEL treats the portion of service cable from the Point of Supply to Network pillar as a vested asset (red section)

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1.44 Appendix D - 400V / 230V Overhead Connection to Overhead Network Supplied Across Third Party Owned Property



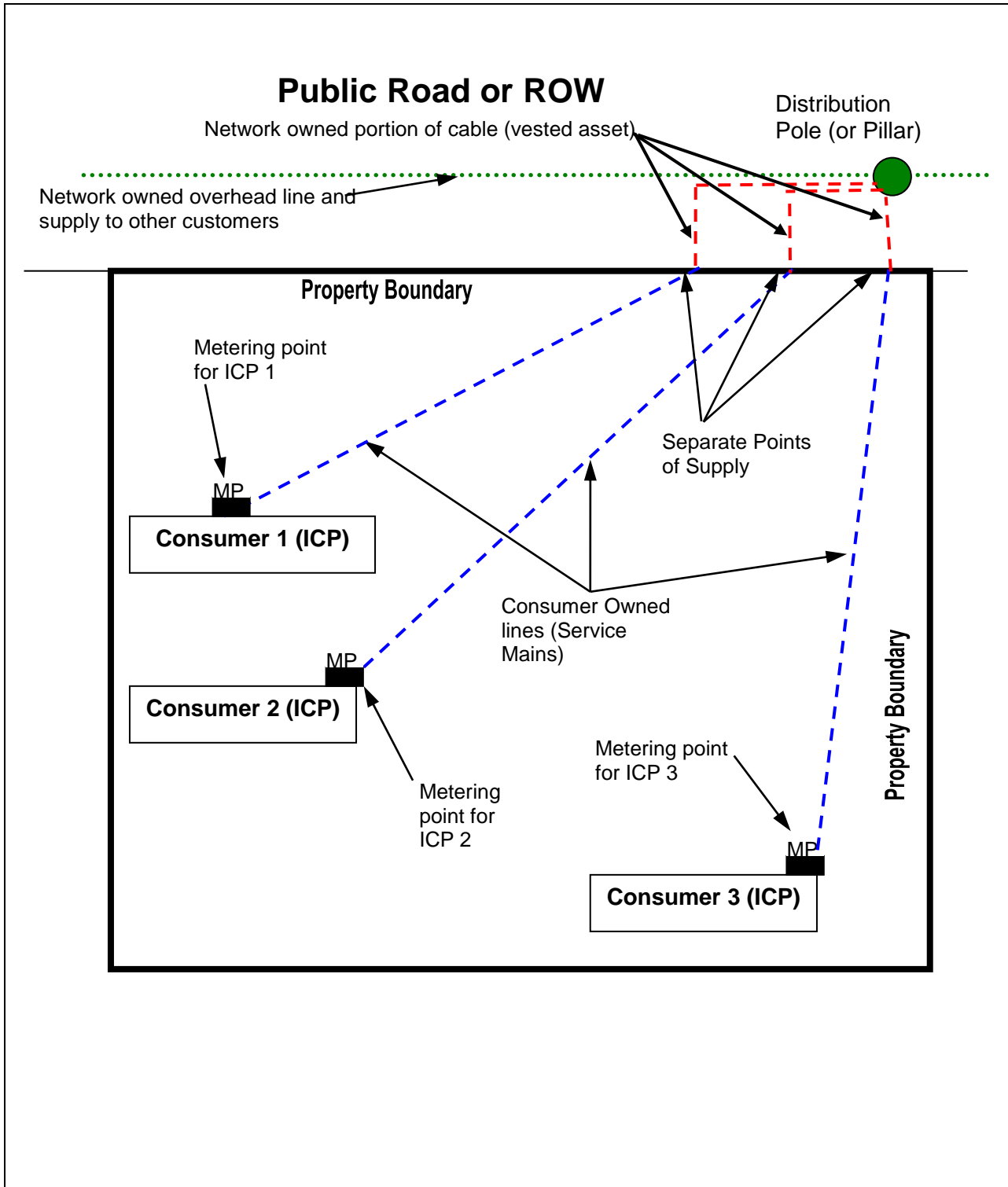
Location of Point of Supply	On the road boundary
Location of Point of Capacity	At the Network Pole

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Points of Isolation	At the Network pole
Number of Consumers (ICP's)	One
Service Main installation and connection costs	Consumer pays for full cost of cable from metering point to pillar. BEL treats the portion of service cable from the Point of Supply to Network pillar as a vested asset (red section)

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1.45 Appendix E - 230/400Volt Multiple Connections From The Network To Multiple Installations All Located On Common Property



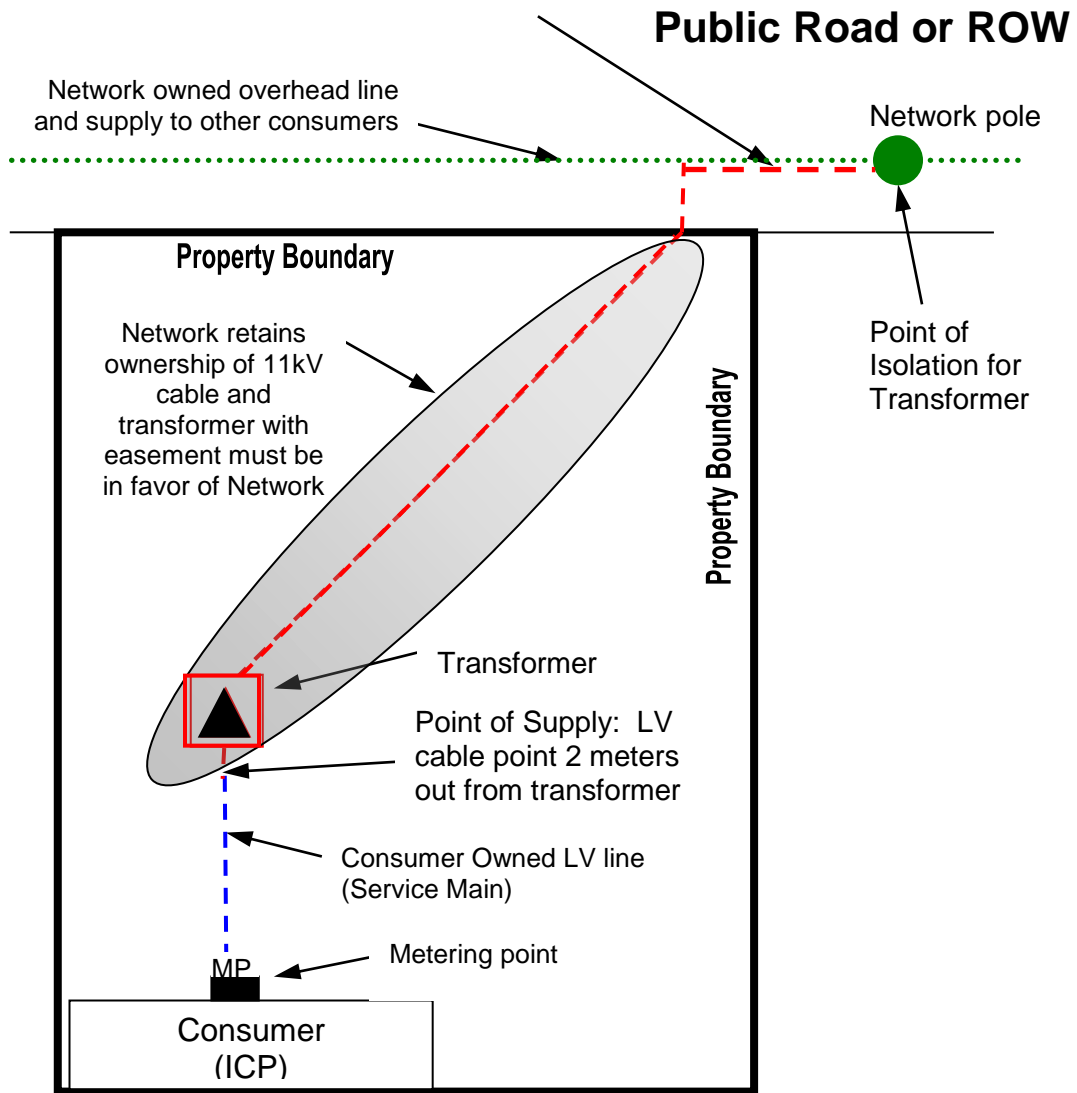
Location of Point of Supply	At the property boundary
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Location of Point of Capacity	At the Distribution Pole
Points of Isolation	At the Network Pole or Distribution Pillar for each Consumer owned line.
Number of Consumers (ICP's)	Multiple - one for each Consumer (ICP).
Service Main installation and connection costs	Consumer pays for full cost of cable from metering point to pillar. BEL treats the portion of service cable from the Point of Supply to Network pillar as a vested asset (red section)

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1.46 Appendix F - 11kV Underground Cable Connected to Overhead Network Supplying One Consumer Crossing Privately Owned Property



Location of Point of Supply	LV service Main point 2 meters out from transformer
Location of Point of Capacity	At the Network Pole

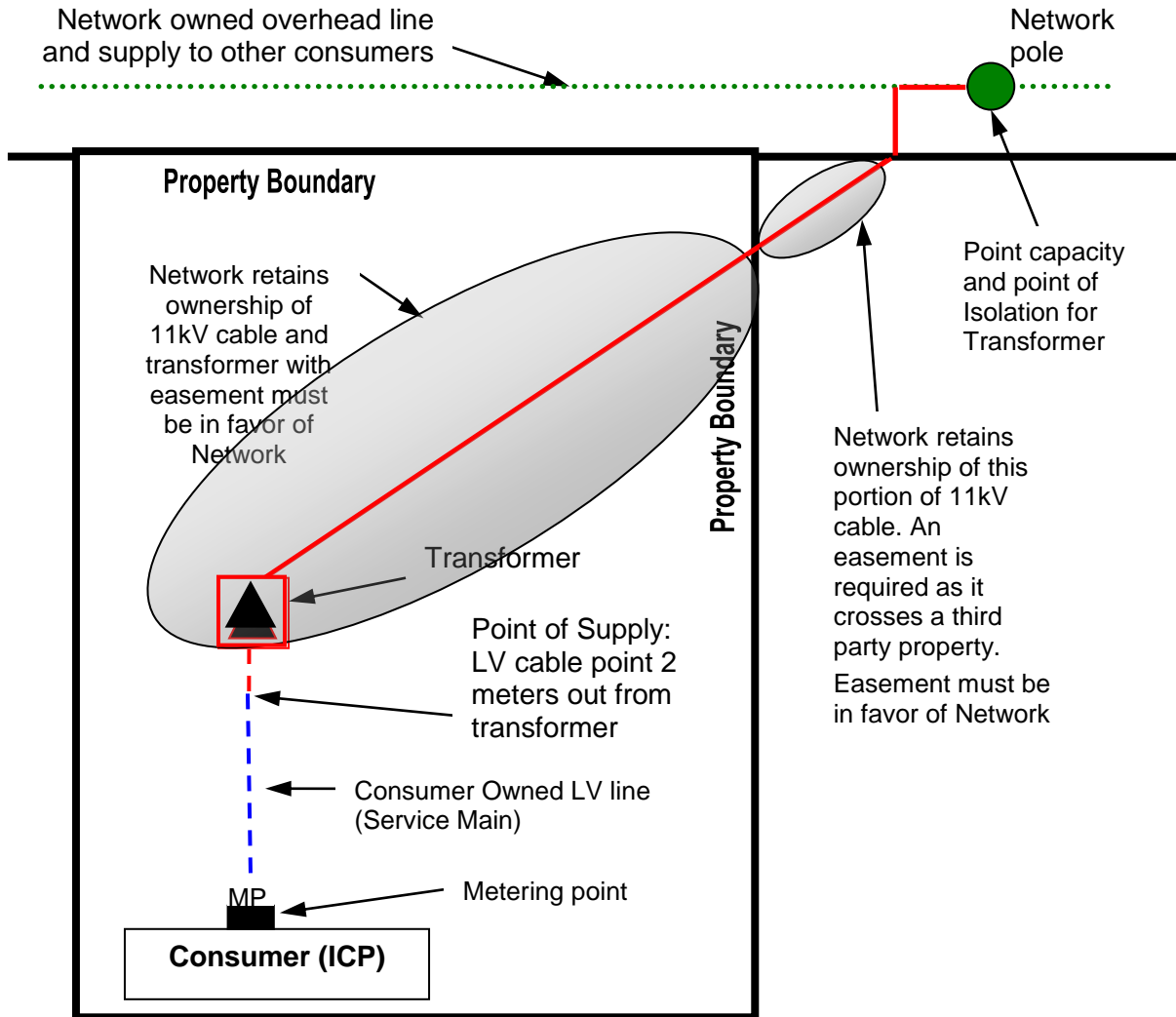
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Points of Isolation	<ul style="list-style-type: none"> ▪ HV line - at the Network pole ▪ On the low voltage terminals of the transformer
Number of Consumers (ICP's)	One
11kV cable, transformer and LV cable up to 2 meters out from transformer	<p>Consumer pays for full cost of 11kV cable, transformer and Service Mains.</p> <p>BEL treats the portion of service cable up to 2 meters from transformer as a vested asset</p> <p>BEL treats the HV cable, transformer and installation as:</p> <ul style="list-style-type: none"> • Capital Contribution if installed by BEL staff • Vested Asset if installed by 3rd

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1.47 Appendix G - 11kV Overhead Connection to Overhead Network Supplied Across Privately Owned Property

Public Road or ROW



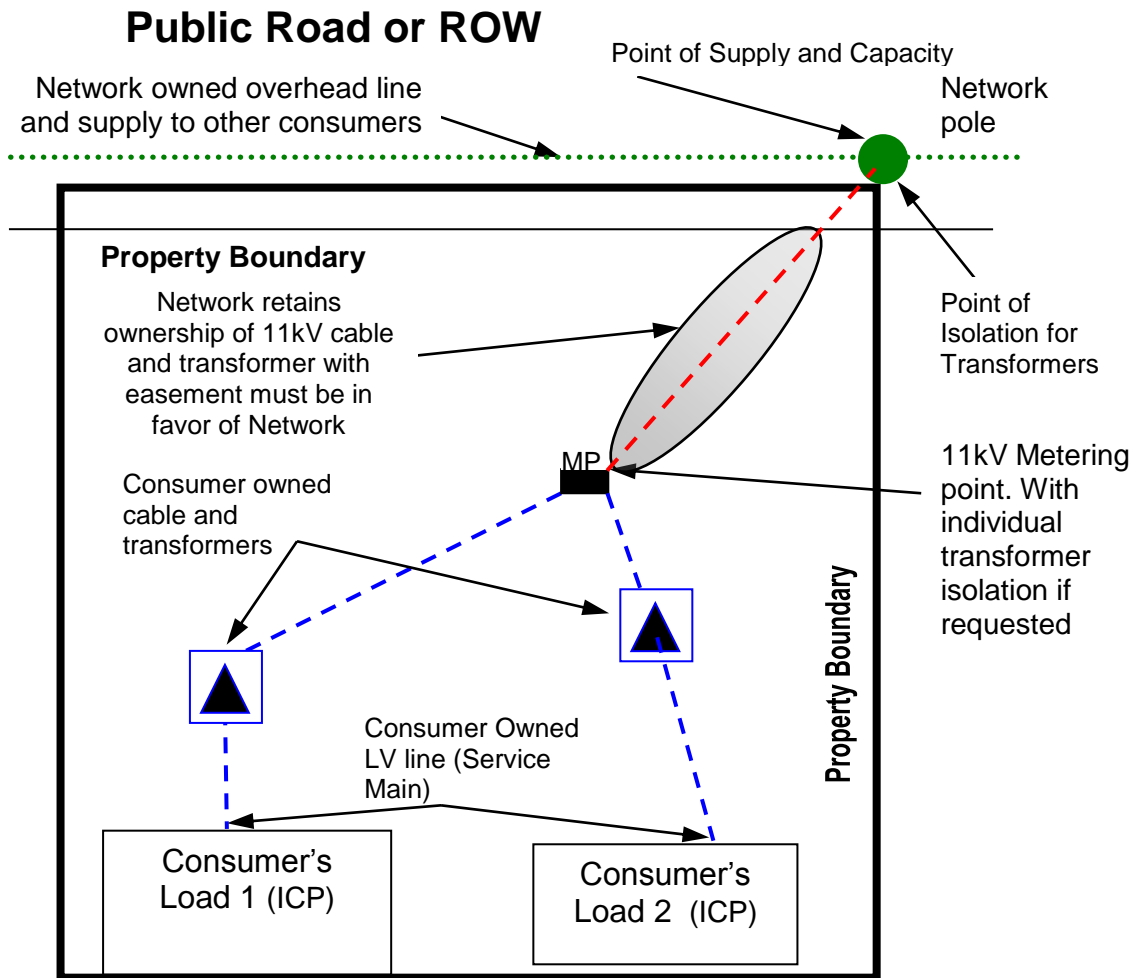
Location of Point of Supply	LV cable, 2mt out from transformer
Points of Isolation	<ul style="list-style-type: none"> ▪ HV line - at the Network pole ▪ On the low voltage terminals of the transformer

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Number of Consumers (ICP's)	One
11kV cable, transformer and LV cable up to 2 meters out from transformer	<p>Consumer pays for full cost of 11kV cable, transformer and Service Mains.</p> <p>BEL treats the portion of service cable up to 2 meters from transformer as a vested asset</p> <p>BEL treats the HV cable, transformer and installation as:</p> <ul style="list-style-type: none"> • Capital Contribution if installed by BEL staff • Vested Asset if installed by 3rd

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1.48 Appendix H – 11kV Consumer Owned Supply With Multiple Transformers Located On Common Property Owned By The Same Consumer



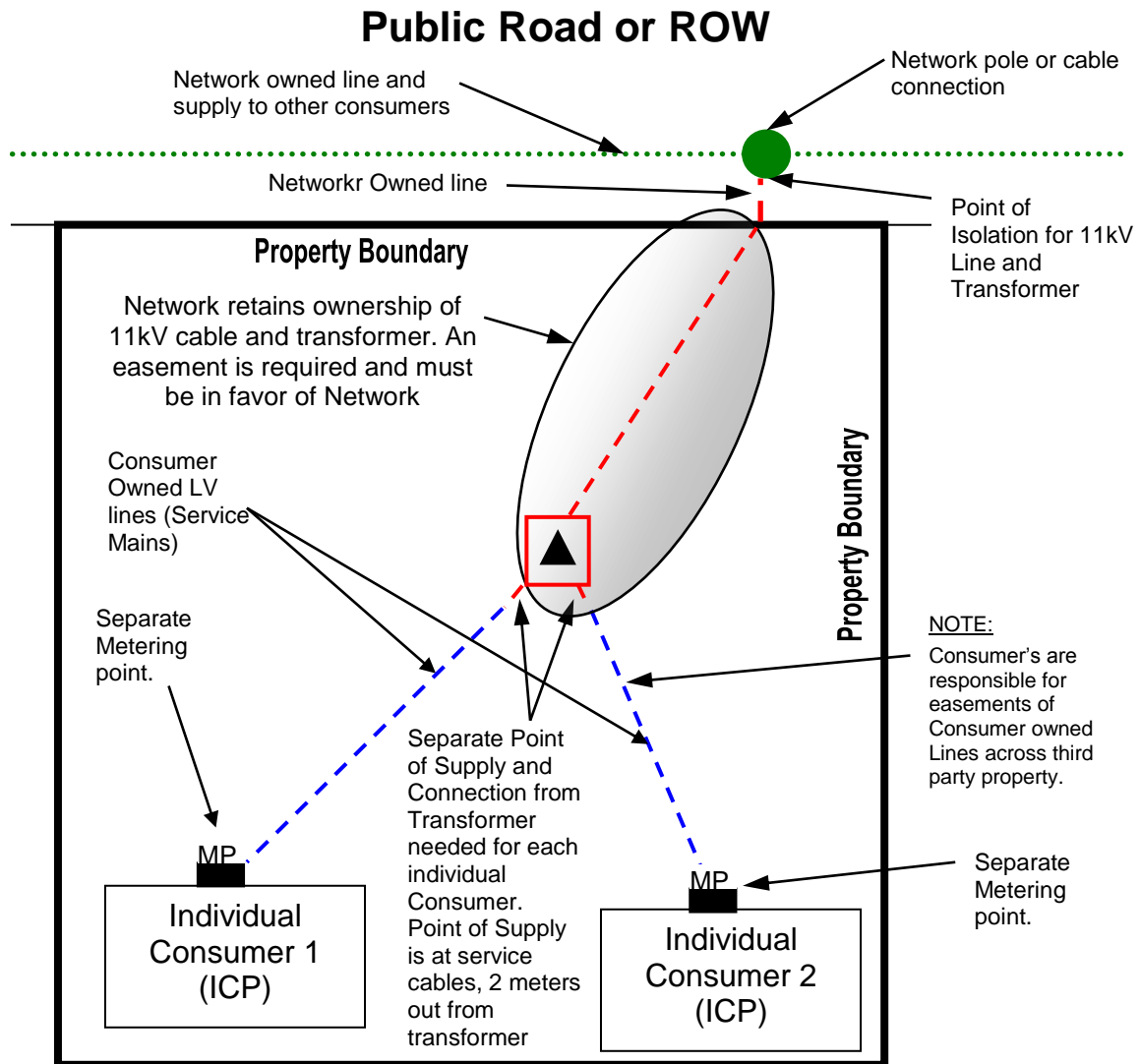
Location of Point of Supply	At the Property boundary
Location of Point of Connection	At the Network pole

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Points of Isolation	<ul style="list-style-type: none"> • HV line - at the Network pole • At Metering Point if requested • On the low voltage terminals of the transformer
Number of Consumers (ICP's)	One or Multiple
11kV cable, transformer and LV cable up to 2 meters out from transformer	<p>Consumer pays for full cost of 11kV cable, transformer and Service Mains.</p> <p>BEL treats the portion of service cable up to 2 meters from transformer as a vested asset</p> <p>BEL treats the HV cable, transformer and installation as:</p> <ul style="list-style-type: none"> • Capital Contribution if installed by BEL staff • Vested Asset if installed by 3rd

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1.49 Appendix I – 11kV Supplied Connection To Single Transformer Supplying Multiple Consumers on Same Common Property



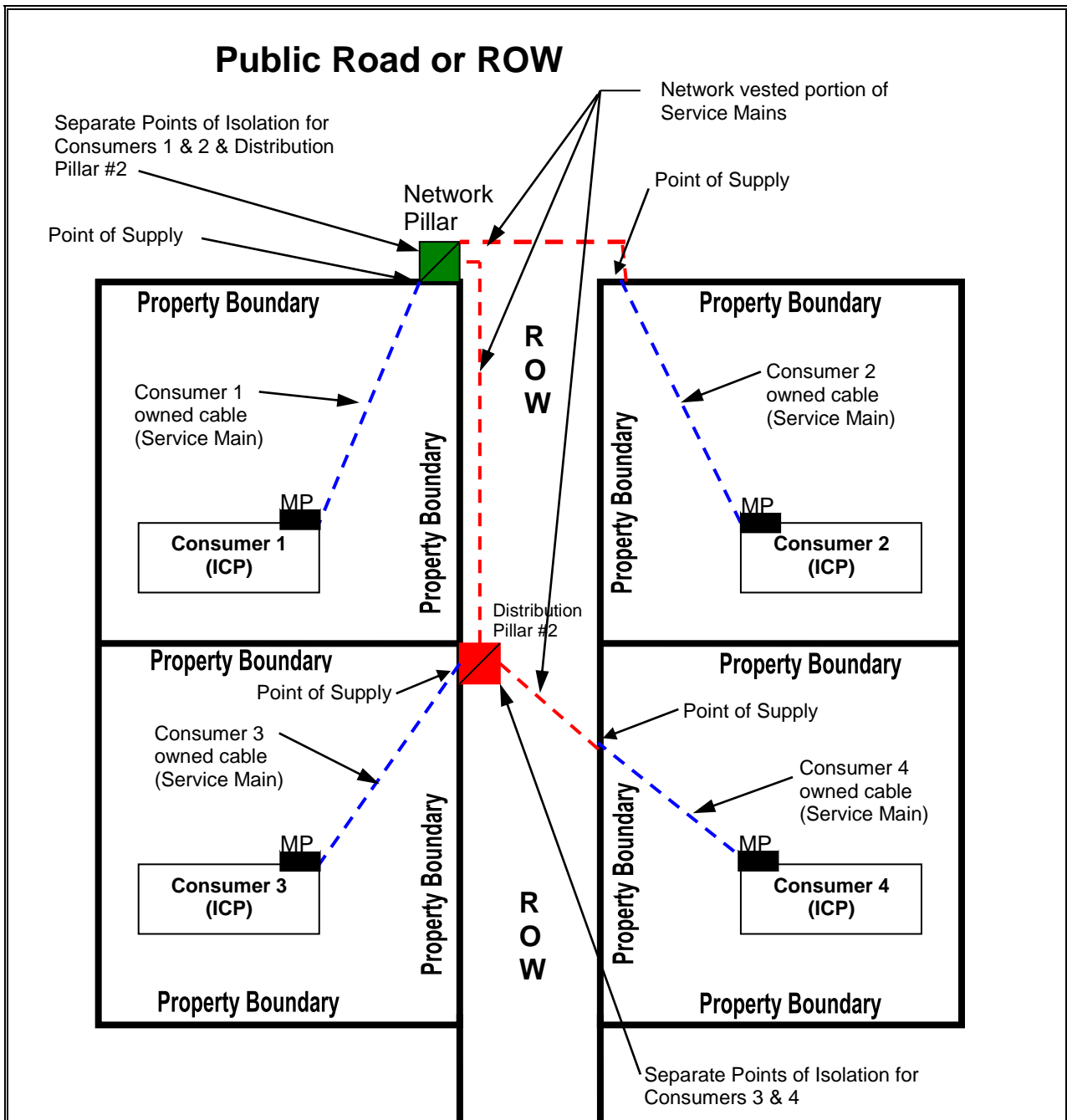
Location of Point of Supply	LV Service Cable 2meters out from transformer
Points of Isolation	<ul style="list-style-type: none"> • HV Collectively At the Network Pole • Individually at each Consumers LV side of

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	Transformer.
Point of Capacity	Network pole or switch unit
Number of Consumers (ICP's)	Multiple Connections
11kV cable, transformer and LV cable up to 2 meters out from transformer	<p>Consumer pays for full cost of 11kV cable, transformer and Service Mains.</p> <p>BEL treats the portion of service cable up to 2 meters from transformer as a vested asset</p> <p>BEL treats the HV cable, transformer and installation as:</p> <ul style="list-style-type: none"> • Capital Contribution if installed by BEL staff • Vested Asset if installed by 3rd

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1.50 Appendix K - Multiple LV Connections To The Network, Through A Single Point of Supply (More Than Two Connections, Right Of Way)



Notes: Network requires easement in favor of Network over length of its Vested cable and pillars in Right of Way (ROW)

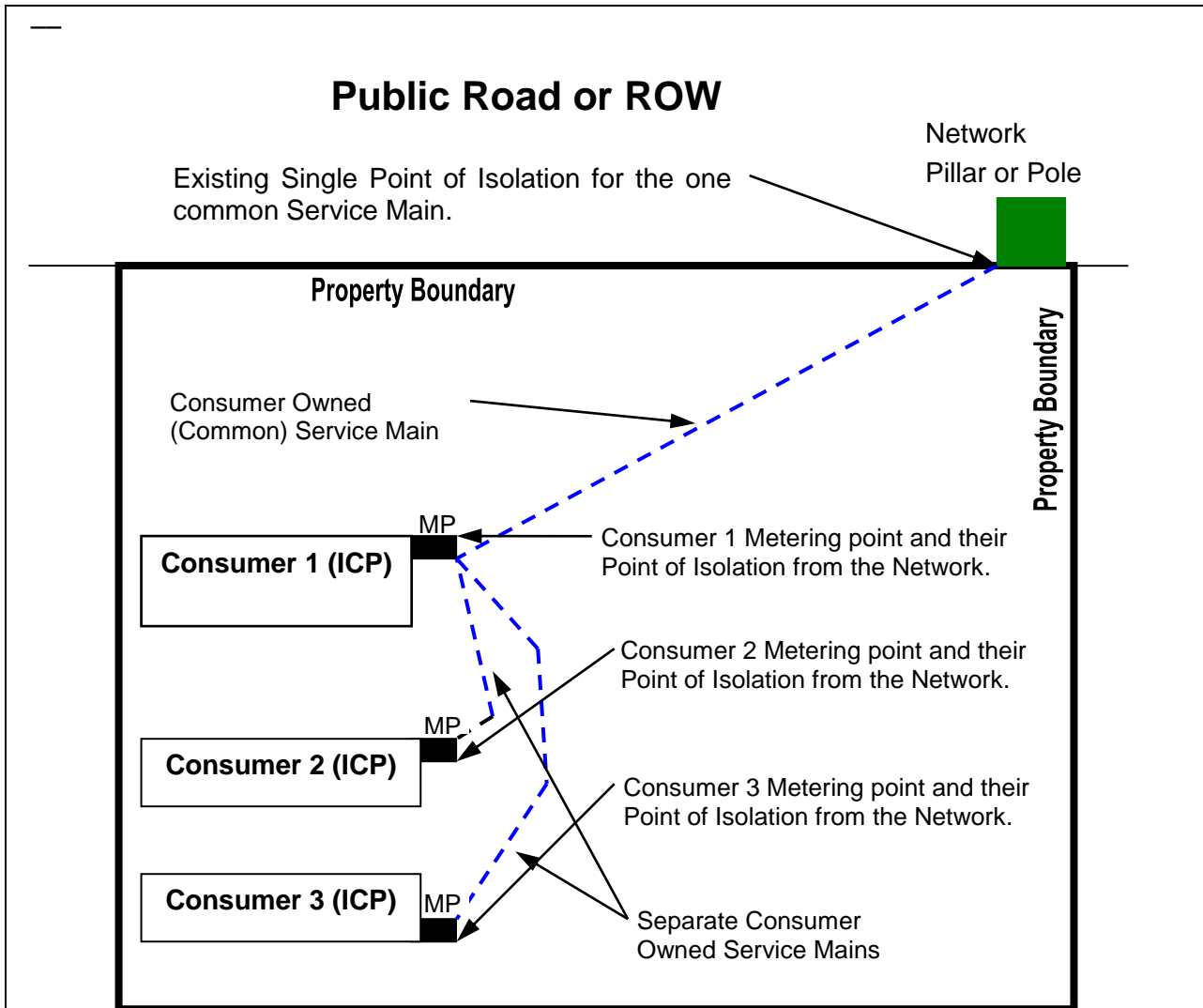
Location of Point of Supply	At property boundaries
Location of Point of Capacity	At Network pillar

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Points of Isolation	As indicated for each Consumer
Number of Consumers (ICP's)	Multiple

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1.51 Appendix L - 400V / 230V - Existing Single LV Connection To The Network Supplying Multiple Existing Installations On A Common Property.



NOTE: -This situation only applies in existing Installations *where* there is an individual Metering Point for each Consumer and there is a *separate* Point of Isolation for each Consumer, to which Buller Electricity Ltd has access rights and *each* individual Consumer can be separately Isolated from the Network without affecting the supply to any of the other Consumers. All New or Altered Installations must comply with requirements of section 7.5 Appendix E.

Location of Point of Supply	At the Common property boundary collectively for each and every
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	Consumer
Location of Point of Capacity	At the Network Pillar or Pole
Points of Isolation	<ul style="list-style-type: none"> ▪ Collectively at the Distribution pillar or pole for the common mains. ▪ Individually at each Consumers Metering Point.
Number of Consumers (ICP's)	Multiple – each ICP attracts individual Buller Electricity Ltd Line Charge.

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DOCUMENT REVIEW HISTORY:

Version Number	Reviewed By.	Review Date	Reason



**BULLER ELECTRICITY LTD
ELECTRICITY NETWORK CONNECTION STANDARD**

**BULLER ELECTRICITY LTD STANDARD - DOCUMENT CHANGE
REQUEST**

**Memo To: Operations Manager.
 Buller Electricity Ltd**

Change Details:

(Attach separate sheets
as necessary).

**Paragraphs
Affected:**

Priority:

Urgent

(Within 1 week)

Routine

(Within 12 months)

Low

(Next Review)

Submitted By (Print Name)	Date
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Document Change Request - Acknowledgement

Dear

Thank you for your suggestion regarding changes to the above mentioned document.

Your request has been noted and added to our works program. Should we require any additional information regarding your notification then we will be in contact with you.

Thank you for your contribution to improving the quality of Buller Electricity Ltd’s documentation.

Regards,

.....
Operations Manager

.....
Date