

# Distribution overhead to underground conversion standard

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## FOREWORD

Welcome to Western Power's Ninth edition, as revised (October 2021), of the Distribution overhead to underground conversion (OUC) standard (previously known as the Distribution pole to *pillar* (P2P) standard).

The document has been updated, to reflect the various aspects of Western Power's involvement in the delivery and installation processes for *consumer* underground connections and small *subdivision developments*.

Content includes independent stand-alone sections for policies, processes, *design requirements*, *installation requirements* and materials and is further supported by Western Power's web page.

The structure also allows the user easier access to other Western Power documents referenced within *these requirements*, including the Distribution customer connection requirements (DCCR), Underground distribution schemes manual (UDS) and the WA Service and installation requirements (WASIR).

The Standard is a 'living document', reviewed and updated on a regular basis to meet the evolving needs of *consumers* and industry.

The information in this Standard is intended to be beneficial to all stakeholders and we hope you find it easy to read and understand. It reflects Western Power's commitment to continuous improvement and our desire to work closely with the community and relevant industry participants.

In keeping with this philosophy, we value your feedback on any aspect of this document and ongoing support.

**Ben Bristow**

**Head of Function Grid Transformation**

**Western Power**

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## 1. Purpose

This document specifies the conditions under which Western Power will provide a domestic *underground service* within an existing overhead electricity *distribution network*.

## 2. Application

This Standard applies to the Western Power's electricity *distribution network* within South West Interconnected System (SWIS). Application of these *requirements* and subsequent amendments shall apply to all new or *altered* connection and supply arrangements. The *requirements* are not retrospective unless an existing arrangement, connection or *electrical installation* or part thereof is *altered*, modified, upgraded or constitutes a safety issue as determined by an authorised inspector designated under the Energy Coordination Act 1994.

### 2.1 Date of application

These *requirements* shall be progressively applied from this document's *date of publication*.

### 2.2 References

This Standard is to be read in conjunction with the latest versions of the following reference documents:

- [Australian standard AS/NZS 3000 –Electrical Installations Wiring rules](#) (Where nominated)
- [Distribution customer connections requirements.](#) (DCCR)
- [Electricity Networks Access Code \(ENAC\) 2004.](#)
- [Embedded generation technical requirements.](#) (EG) (Refer to WASIR clause 1.6.2)
- [Switchboard arrangement for small strata lot developments guideline.](#) – (SASSLD)
- [Underground distribution schemes manual.](#) (UDS)
- [Utility providers code of practice.](#) (UPCoP)
- [Western Australian Service and installation requirements.](#) (WASIR)
- [Western Australian Electrical Requirements.](#) (WAER)

## 3. Definitions and abbreviations

The italicised words, phrases and abbreviations shown in the first column of the following tables have the corresponding meaning shown in the second column of the associated table. Where the word, phrase or abbreviation is shown in italics but not specifically referenced, the word, phrase or abbreviation shall have the same meaning as that referenced in the WASIR.



### 3.1 Definitions

#### Terms and definitions used in this document

Term	Definition
<i>date of publication</i>	Shall be the date nominated on the front cover of this document.
<i>hosting capacity</i>	Hosting capacity as defined by Western Power's Embedded generation EG technical requirements (Refer to WASIR clause 1.6).
<i>overhead area</i>	A location where low voltage (415v three-phase or 240v single-phase) overhead mains exist.
<i>overhead mains</i>	Network wires strung overhead between Western Power's poles to distribute electricity to consumers which excludes overhead services.
<i>overhead service</i>	A network service cable strung overhead between a network distribution pole and the consumer's point of attachment, connected to the overhead mains and point of supply(connection).
<i>standard dwelling(dwelling)</i>	A dwelling used for domestic residential non-commercial purposes where the network connection does not exceed a standard supply import and/or standard hosting capacity export limits; and The connection does not require the electrical contractor to notify the network operator of either load changes or connection of distribution energy sources (DER) that may initiate an investigation of the network method of connection and or capacity.
<i>standard location</i>	A site within the applicant's property at the junction of the front property and common property boundaries (exclusion zone) unless an acceptable, accessible underground service already exists on an adjacent property. (Refer to WASIR Section12)  Note: Exclusion zone is a 1m by 1m parcel of land clear of all utility services, except electrical, and of all obstacles inclusive of vegetation and associated root systems, retaining/boundary walls, fences, concrete, asphalt, paving or structures. Non-electrical utility services shall not pass through or be located within the exclusion zone. (Refer to the WAER, WASIR and UPCoP).
<i>standard supply</i>	Has the same meaning as a "standard connection service" defined by the WASIR
<i>strata or survey strata scheme</i>	Strata scheme commonly known as built strata or survey strata schemes as defined by the Strata Titles Act. "built strata" shall have the same meaning as survey strata for the purposes of this Standard. Note: an strata, underground service located in a non-standard location will be charged at the quoted amount for the requested installation.
<i>switchboard</i>	An assembly of circuit protective devices, with or without switchgear, instruments or connecting devices, suitably arranged and mounted for distribution to, and protection of, one or more submains or final sub-circuits, or a combination of both. (AS/NZS 3000)
<i>switchboard, main</i>	A switchboard from which the supply to the whole electrical installation can be controlled. (AS/NZS 3000 –)
<i>underground service</i>	A ground mounted pillar or similar network approved apparatus forming part of Western Power's electricity distribution network, to which the consumer mains cable for the site or dwelling is to be connected.

**Table 1: Definition of Terms**

## 3.2 Abbreviations

AS/NZS 3000	Electrical installations “Wiring Rules” as published and amended from time to time by Standards Australia
DCCR	Distribution customer connection requirements as published and amended from time to time by Western Power.
EG	A suite of embedded generation technical and connection requirements as published and amended from time to time by Western Power.
MSB	Main switchboard
SASSLD	Switchboard arrangement for small strata lot development – guideline as published and amended from time to time by Western Power
UDS	Underground distribution schemes manual as published and amended from time to time by Western Power.
UPCoP	Utility providers code of practice as published and amended from time to time by Utility Providers Services Committee
WAER	WA Electrical Requirements as published and amended from time to time by the Department of Mines, Industry Regulation and Safety, (Formerly EnergySafety).
WASIR	WA service and installation requirements as published and amended from time to time by Horizon Power and Western Power. (Previously known as the WA Distribution connections manual WADCM)

**Table 2: Abbreviations**

## 4. Standard

Western Power offers, subject to *consumer* acceptance of the application Terms and Conditions and the *requirements* specified in [clause 6](#), a connection via an *underground service* to a domestic/residential *dwelling* within an existing *overhead distribution network* at a predetermined overhead to underground fixed price.

Connections shall be in accordance with the applicable Australian standards, Western Australian Electrical Requirements ([WAER](#)), Underground distribution schemes manual ([UDS](#)) and the Western Australian Service and installation requirements ([WASIR](#)). Connection/supply arrangements examples are shown in [Appendix 1](#).

### 4.1 Overhead to underground fixed price

The overhead to underground fixed price will be applied in accordance with the *requirements* of [clause 7](#) and based on the principle that the installed *underground service* is wherever possible a shared connection resource to supply adjoining freehold *lots*.

Western Power, at its discretion, reserves the right to withhold the application of the overhead to underground fixed price where either full cost recovery or revenue offset may apply to the *underground service* and connection/supply arrangement.

This may occur in (but is not limited to) instances where a suitable existing connection/supply arrangement exists but the *consumer* requests an arrangement that requires additional *network* assets to be installed, *network* reinforcement or a second *point of supply(connection)* in the case of a multiple *lot development*.

## 4.2 Lots larger than 2500 square metres.

Where the *lot* is larger than 2500m<sup>2</sup>, satisfies all of the conditions specified in [clause 6](#), and the *underground service* is positioned within Western Power's *standard location* then the overhead to underground fixed price may be applied. In all other circumstances the installation of the *underground service* will be charged at the quoted amount for the requested connection/supply.

## 4.3 Existing overhead service connections

Any existing *overhead service cable* connection(s) must be converted to underground. Redundant overhead *consumer equipment*, infrastructure and *poles* shall be removed, or provision made and validated by Western Power, for the removal of same, on completion of the conversion at the *consumer's* cost.

## 4.4 Strata developments

Under this Standard, three and four *lot strata schemes* or freehold *developments*, are not eligible for the overhead to underground fixed price.

Where *lots* are created as a part of a *built strata* or *survey strata scheme* the *consumer* shall:

- I. supply and install, a *site main switchboard* (MSB) connected to the Western Power nominated *point of supply(connection)* via the *consumer mains cable* to the *underground service* within the scheme or *lot*, or to an *underground service* on an adjacent scheme or *lot*; or
- II. where deemed appropriate by Western Power, to an *underground service* in a *non-standard location* to service the *strata development*.

**Note:** Consideration shall be given to the maximum permissible *consumer mains cable* route length from the *point of supply(connection)* to the MSB position within the *strata subdivision*. (Refer to Sections 11 and 12 of the WASIR).

For a complete description of the *network technical/connection requirements* for these types of *developments*, refer to the:

- Switchboard arrangement for small strata lot developments – guideline. (SASSLD)
- Underground distribution scheme (UDS) manual for *subdivision* arrangements.
- WA Service and installations requirements (WASIR) for *connection requirements*.

## 4.5 Connection and Supply arrangements

When selecting a connection and supply arrangement due consideration shall be given to:

- I. The *development* and *lot* minimum *requirements*, ([UDS Section 2](#));
- II. The created of common property and easements to facilitate *consumer* connections of:
  - a. *consumer mains cable* to the *underground service*; and
  - b. sub-main cables to *the site main switchboard*, (WAER Section 5);
- III. The location of the *underground service* and *switchboard* in a position that ensures:
  - a. all *lots* within the *subdivision* have access to the *point of supply/connection*; (UDS and WASIR)
  - b. that multiple *points of supply(connection)* are not created (WAER Section 3);
  - c. the connection arrangement complies with the (WASIR Sections 11 & 12);
  - d. the isolation point (MSB) is relevant to the *dwelling* or *dwellings*;
- IV. The maximum permissible *consumer mains cable* route length from the *point of supply(connection)* to the MSB or *metering point* (position) is not exceeded, (WASIR Section 11);
- V. Ensuring 24/7 access to the *point of supply(connection)*, *metering installation* and *meter protection equipment (device)* is available (WASIR Sections 11, 12 and WAER Section 6);
- VI. Metering and service equipment is located in accordance with (WASIR Section 11);

- VII. Where required, internal private *subdivision* electricity infrastructure is:
- a. installed and completed (UDS Section 2);
  - b. contained within the related property, (WAER Section 9);
  - c. capable of accommodating both *standard supply* and *hosting capacity requirements* to each *lot* within the *development* without exceeding the capacity of the *network* connection.

#### 4.6 Application Process

Application for an overhead to underground conversion shall be made via an online [Service request](#) available from [Western Power's public website](#).

### 5. Service easement requirements

Where a *strata lot(s)* is created, access to the *underground service* must be available either through the use of common property or a 136C service easement to facilitate the installation of the associated *consumer mains* and sub-main *cables*. Service easements or common property must be a minimum of one metre wide.

If the establishment of common property prevents the *subdivision* from proceeding then, at Western Power's sole discretion, an easement may be created in lieu. The *consumer* is responsible for establishing and all costs associated with the creation of easements.

Under Section 136C of the *Transfer of Land Act 1893*, an easement may be created for *survey strata lots*, to provide for *consumer* owned services such as electrical and plumbing connections to the requisite utility *network*. The easement should contain the following notation:

*"This easement is to allow connection of power to adjoining survey strata lots that forms part of the survey strata scheme. Other services are permitted in this easement provided they do not interfere with the provision of electricity."*

If a *consumer mains cable* exists at the time of *subdivision* then an implied easement over the cable may be deemed to be in place. For further information on implied easements for existing services refer to the Strata Titles Act or Landgate.

In infrequent cases, the location of an existing *underground service* and *consumer mains cable* may mean that access is not an issue and hence no common property or easement need be established. [Appendix 3](#) gives examples of this.

**Note:** Western Power recommends common property or an easement are created in order to minimise the risk of future *consumer* access disputes.

Refer to Landgate's "[Strata titles practice manual](#)" for further information.

## 6. Conditions

The following conditions must be met in order to qualify for the overhead to underground fixed price.

- I. No more than two *standard dwellings* require connection as a result of the *subdivision* including existing connections;
- II. No more than two *lots* are being created as a result of the *subdivision*;
- III. The electricity supply to each *standard dwelling* does not exceed *standard supply* or *hosting capacity* limits;
- IV. The *lot(s)* or *subdivision* is located in an existing *overhead area*;
- V. The proposed *underground service* position is within Western Power's *standard location*;
- VI. There must be no *requirement* as prescribed by the UDS manual to remove or relocate an existing *distribution/transmission network overhead infrastructure* as a result of the *subdivision*;
- VII. A suitable *low voltage overhead distribution network* with adequate capacity exists within 100 metres of the *lot property boundary* and the *standard underground service* location;
- VIII. The route from the existing *low voltage overhead network* to the *standard underground service location* must be suitable for the installation of *low voltage* underground cable;
- IX. The *lots* must be residential;
- X. The same *developer/owner* must not have submitted an overhead to underground application for an adjacent or the same *lot* within the previous 3 (three) years;
- XI. A company, organisation, person or group of persons must not progressively seek overhead to underground conversions for an area that should be developed as an underground residential *subdivision*;
- XII. Supply Extension Scheme (SES) charging is not applicable;
- XIII. Where applicable, common property or a 136C easement is created to allow *consumer mains cable* to be connected to the *underground service* or sub-mains to be connected to the *site main switchboard*. At Western Power's sole discretion, a service easement may be substituted for common property (Refer [clause 5](#));
- XIV. The *site* (exclusion zone and cable route) must be level, free of vegetation, clear of obstructions and ready for the installation of the *underground service*. Note: Existing structures must be of sufficient distance from the *site* to permit excavation in accordance with both the OSH Act 1984 and "Network excavation procedures";
- XV. The *consumer* is required to establish and confirm their *property boundaries* (boundary pegs) in accordance with Western Powers application Terms and Conditions and the *requirements* of the WASIR;
- XVI. In addition to these *requirements*, the installation and connection arrangement shall comply with the regulatory and *network technical/connection requirements* as prescribed by the documents listed at [clause 2](#). For examples of these *requirements*. (Refer to the [Appendices](#))

## 7. Charges

### 7.1 General requirements

Provided the *requirements* (conditions) of this Standard are met, the overhead to underground fixed price will be applied as prescribed by [clause 7.2](#). Additional charges may apply for connections and the extension or upgrade of Western Power's *network*.

If these *requirements* (conditions) cannot be met, Western Power will on request, provide a quotation for the cost of supplying a connection in accordance with the applicable policies and procedures including any costs associated with the connection, extension or upgrade of the *network*.

Where an *underground service* has been installed in an *overhead area*, *consumers* who subsequently seek access to the shared *underground service* will be required to pay the applicable connection fees and charges for each subsequent connection.

### 7.2 Fixed price charging policy

The overhead to underground fixed price charging criteria as described in this clause, is based on a single *standard dwelling per lot* unless otherwise stated. Three and four *lot strata schemes* are not eligible for the overhead to underground fixed price. Refer to [clause 4.4](#) for further information.

Western Power's public website provides further financial details of the overhead to underground fixed price.

Overhead to underground Price structure		
Lot description	WP standard location/position	
	Yes	No
Existing <i>dwelling</i> converted from overhead to underground	Fixed price	Quoted price
2 <i>lot strata scheme</i> via a <i>site</i> MSB	Fixed price	Quoted price
Subsequent <i>subdivision</i> (up to 4 <i>lots</i> ) of existing small <i>strata development</i> via a <i>site</i> MSB including conversion of the existing <i>overhead service</i>	Quoted price	
3 & 4 <i>lot strata scheme</i> connected via a <i>site</i> MSB (Subject to <i>load</i> constraints)	Quoted price	
A single freehold title <i>lot</i>	Fixed price	Quoted price
2 freehold title <i>lots</i>	Fixed price	Quoted price
3 & 4 freehold title <i>lot development</i>	Quoted price	
Separate freehold title <i>lots</i> connected via a <i>site main switchboard</i> (MSB)	Not permitted	

Table 2: Pricing Policy

## 7.3 Examples

The following limited examples have been provided to illustrate the application of the overhead to underground fixed price schedule.

**Note <sup>1</sup>:** “Connections - one” means only one connection to the existing *dwelling*. Adjacent properties may connect to the *network* subject to payment of the applicable fees.

**Note <sup>2</sup>:** “Network connection costs” means that where the final connection to the *network* is completed by Western Power additions costs may apply.

**Note:** Locations are generally selected to optimise the existing and future use of *pillars* or similar *network* apparatus to ensure the most economical overall outcome in relation to existing Western Power infrastructure.

### 7.3.1 Single freehold lot connection

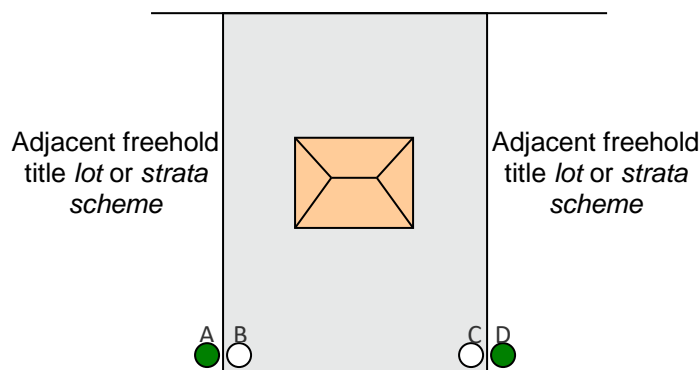


Figure 1

#### Case 1 - There is an existing *pillar* at A or D

- Connections: - One<sup>1</sup>
- Charge: - Connection costs<sup>2</sup>
- Common property or service easement: - Not required

#### Case 2 - There is no *pillar* at A or D, and a new *pillar* is required at B or C

- Connections: - One<sup>1</sup>
- Charge: - Fixed price plus connection costs<sup>2</sup>
- Common property or service easement: - Not required

#### Case 3 - A new *pillar* is requested at B or C and a suitable *pillar* exists at A or D

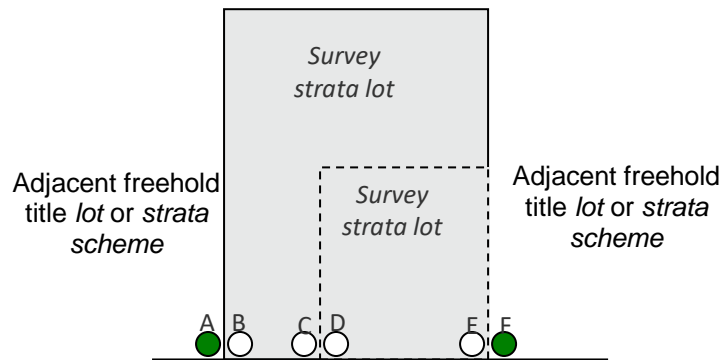
- Connections: - One<sup>1</sup>
- Charge: - Quoted price
- Common property or service easement: - Not required



### 7.3.2 Two strata lots created in a built/survey strata scheme

**Note**<sup>2</sup>: “Network connection costs” means that where the final connection to the *network* is completed by Western Power additions costs may apply.

**Note**: Western Power does not generally permit, a second or multiple *points of supply(connection)*. Where a property has multiple access/entrance points and effective isolation is deemed by Western Power to be a safety concern, a second *point of supply(connection)* may only be considered subject to compliance with the WAER and WASIR requirements.



**Figure 2**

#### Case 1 - There is an existing *pillar* at A or F

- Connections: - One, MSB required with sub-mains to each *survey strata*
- Charge: - Connection costs<sup>2</sup>
- Common property or service easement: - Is required

#### Case 2 - A new *pillar* is required at A, B, C, D, E or F (no existing *pillar*)

- Connections: - One, MSB required with sub-mains to each *survey strata*
- Charge: - Fixed price plus connection costs<sup>2</sup>
- Common property or service easement: - Is required (except for C or D)

#### Case 3 - A new *pillar* is requested at C or D and a suitable *pillar* exists at A or F

- Connections: - One, MSB required with sub-mains to each *survey strata*
- Charge: - Quoted price
- Common property or service easement: - Not required

#### Case 4 - New *pillar* is requested at B or E with a suitable existing *pillar* at A or F

- Connections: - One, MSB required with sub-mains to each *survey strata*
- Charge: - Quoted price
- Common property or service easement: - Is required

#### Case 5 - A second *point of supply (pillar)* is requested in accordance with the WAER and WASIR

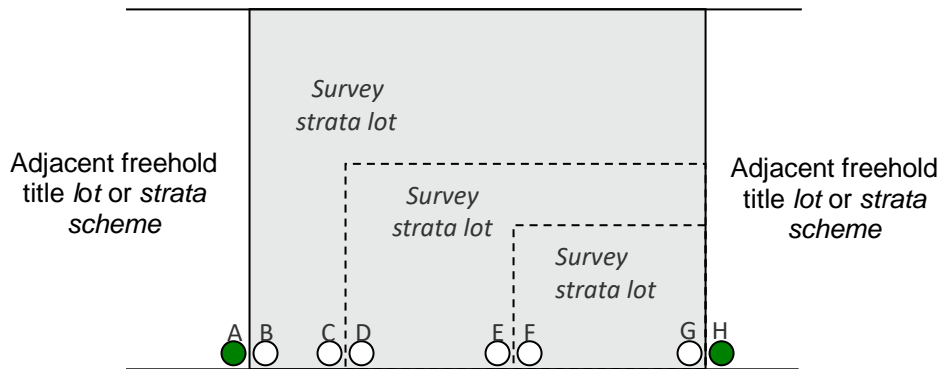
- Connections: - Two
- Charge: - Quoted price
- Common property or service easement: - Maybe require

**Note**: Provision of a 2<sup>nd</sup> POS (multiple *point of supply/connection*) is subject to *network operator* approval.



### 7.3.3 Three strata lots created in a built/survey strata scheme

**Note**<sup>2</sup>: “Network connection costs” means that where the final connection to the *network* is completed by Western Power additions costs may apply.



**Figure 3**

#### Case 1 - There is a suitable existing *pillar* at A or H

- Connections: - One, MSB required with sub-mains to each *survey strata lot*. (Subject to *load*/generation constraints)
- Charge: - Connection costs<sup>2</sup>
- Common property or service easement: - Is required

#### Case 2 - A new *pillar* is required at B or G and no *pillar* exists at A or H

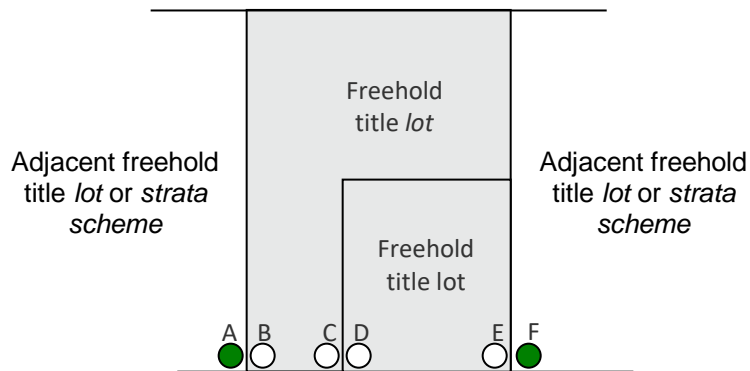
- Connections: - One, MSB required with sub-mains to each *strata lot*
- Charge: - Quoted price
- Common property or service easement: - Is required

#### Case 3 - A new *pillar* is requested at B, C, D, E, F or G and a suitable *pillar* exists at A or H.

- Connections: - One, MSB required with sub-mains to each *strata lot*;
- Charge: - Quoted price
- Common property or service easement: - Is required

### 7.3.4 Two freehold title lots created

**Note**<sup>2</sup>: “Network connection costs” means that where the final connection to the *network* is completed by Western Power additions costs may apply.



**Figure 4**

**Case 1 - There is an existing *pillar* at A and F and no new *pillar* is required.**

- Connections: - Two, one for each *lot*
- Charge: - Connection costs<sup>2</sup>
- Common property or service easement: - Not required

**Case 2 - A new *pillar* is required at A, B, C, D, E and F (no *pillar* exists at A, B, C, D, E or F).**

- Connections: - Two, one for each *lot*
- Charge: - Fixed price plus connection costs<sup>2</sup>
- Common property or service easement: - Not required

**Case 3 - There is an existing *pillar* at A and F and new *pillar* is required at B or E.**

- Connections: - Two, one for each *lot*
- Charge: - Quoted price,
- Common property or service easement: - Not required

**Case 4 - There is an existing *pillar* at A but not at F and new *pillar* is required at C, D or E.**

- Connections: - Two, one for each *lot*
- Charge: - Fixed price plus connection costs<sup>2</sup>
- Common property or service easement: - Not required

### 8. Existing overhead service

An existing freehold title *lot* is subdivided into a *strata* or *survey strata scheme* with two *strata lots*. There is one *dwelling* with existing *overhead service*.

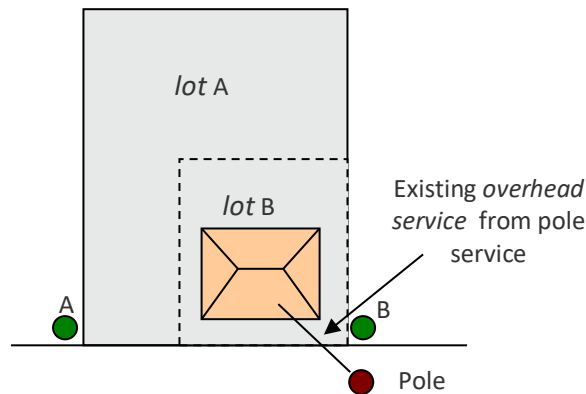


Figure 5

The connection of *strata lot A* to *pillar A* or *pillar B* requires the existing *overhead service cable* to *lot B* to be removed and the *dwelling* on *lot B* to be connected via a *MSB* to same *pillar* as *lot A*.

### 9. Appendix 1: Western Australian Electrical Requirement (WAER) examples

#### 9.1 Example 1

An existing freehold title *lot* is subdivided into a *strata* or *survey strata scheme* with two *strata lots*. There is one *dwelling* with an existing *underground supply*. These examples show situations where an additional *pillar cannot* be installed on the new *strata development* unless the existing *underground supply* is diverted to the new *pillar* via a *site main switchboard*.

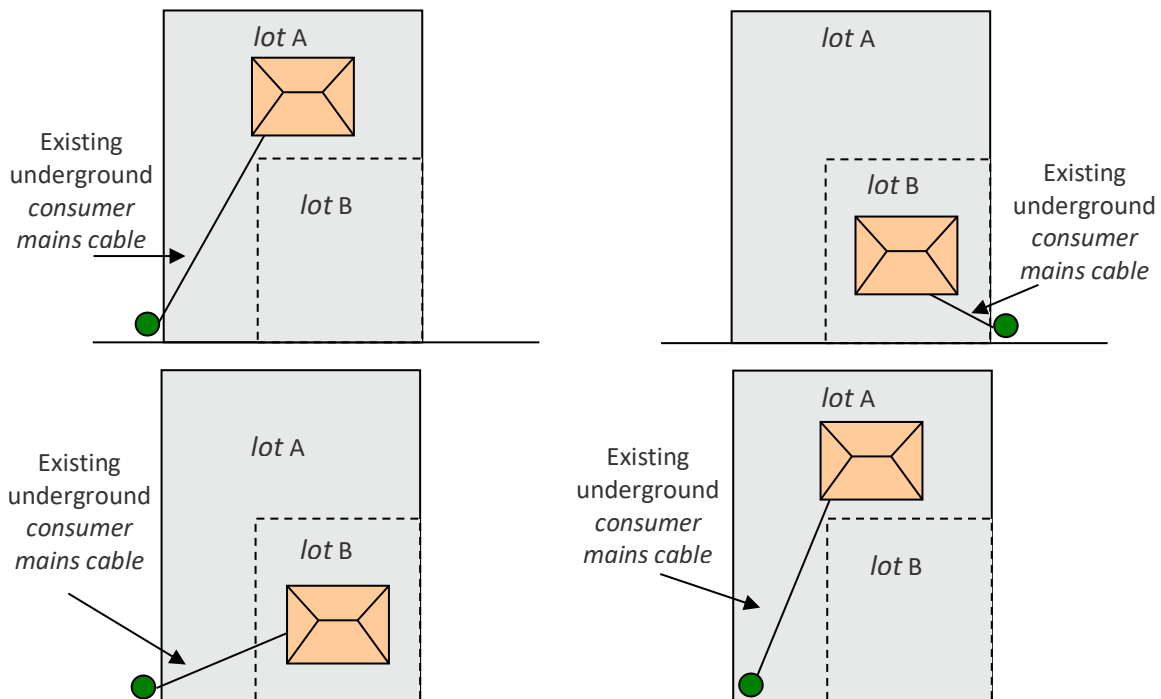


Figure 6

### 9.2 Example 2

An existing freehold title *lot* is subdivided into a *strata* or *survey strata scheme* with two *strata lots*. There is one *dwelling* with an existing underground supply. These examples show where new connections **cannot** be made to an adjacent freehold title *lot* or adjacent *strata scheme*.

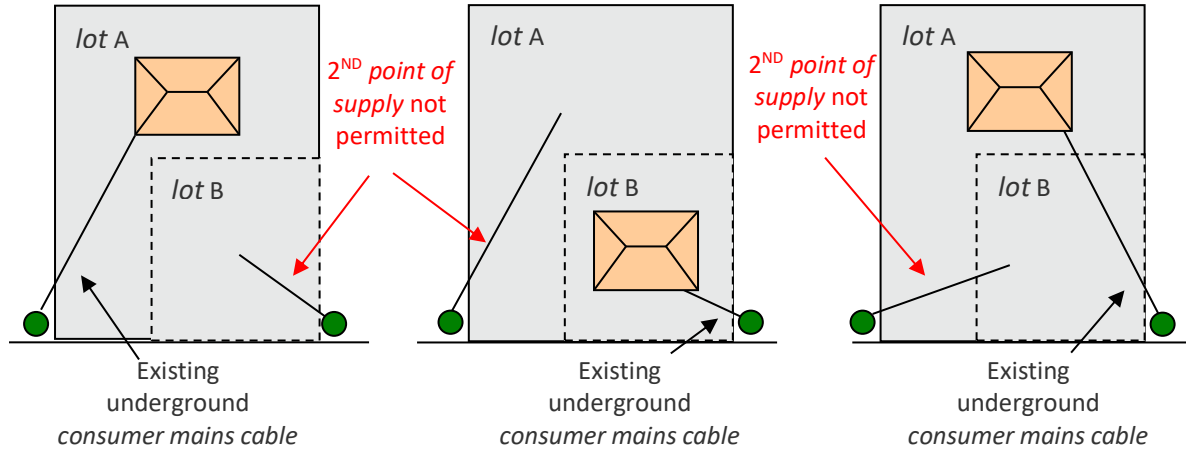


Figure 7

**Note:** For each case shown in **Examples 1 and 2**, a MSB must be installed with any retained existing connections redirected underground and connected to the MSB installed for the *development*.

### 9.3 Example 3

An existing freehold title *lot* is subdivided into *strata* or *survey strata scheme* with three or more *strata lots*. A *main switchboard (MSB)* is required in order to prevent more than one *consumer mains* or *submain cable* being connected to the *network* from any one *strata* or any one freehold title *lot*.

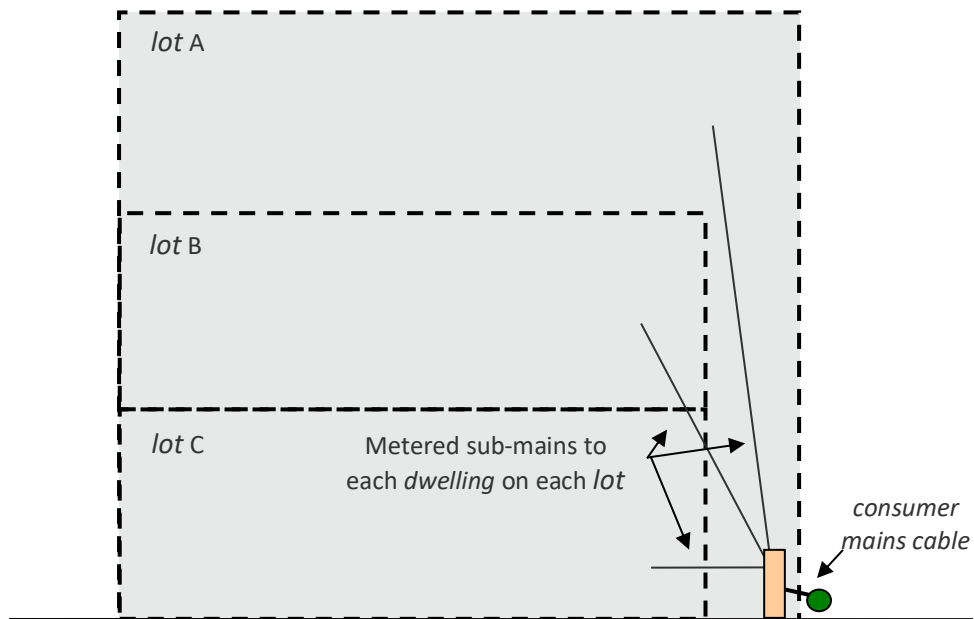
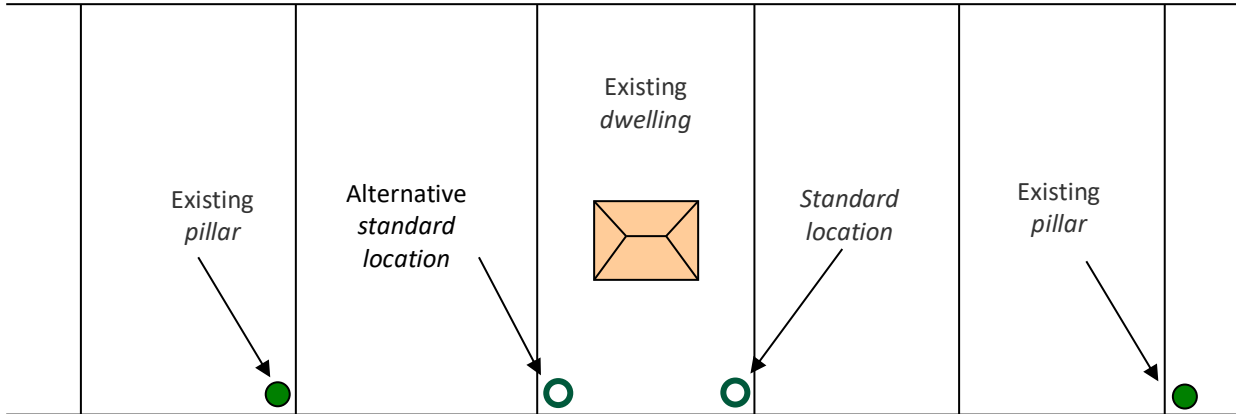


Figure 8

## 10. Appendix 2 - Examples of Western Power standard equipment locations

### 10.1 Example 1

A single existing *dwelling* is converting to underground

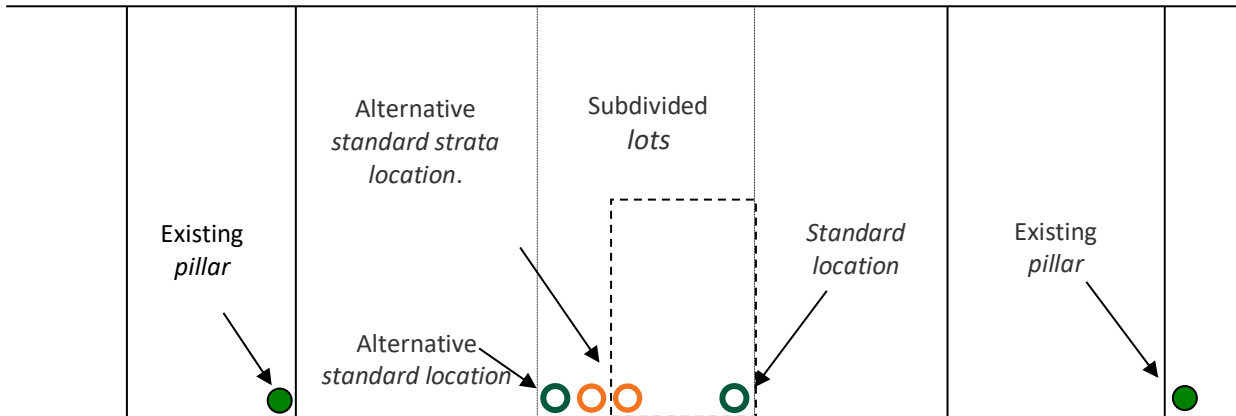


*Pillars* are generally located at every second *lot property boundary* to ensure effective utilisation of *network assets*.

Figure 9

### 10.2 Example 2

Two new *strata lots* are created on an existing freehold title *lot*.



The *standard location* maximises the level of unit utilisation while minimising installation costs therefore ensuring the overhead to underground fixed price is maintained as low as possible. *Non-standard locations* limit the level of *network utilisation*.

Figure 10

### 11. Appendix 3 –Where common property or 136c easement is not required

As stated in [clause 5](#) “Service easement requirements”, common property or an easement must be established across *survey strata lots* to ensure all *lots* have access to the *network* with their *consumer mains* or submain *cables*. In some instances, the location of the existing *network* and the existence of *consumer mains* or submain *cables* may mean that access is not required for the new *lot* and hence no common property need be established. The Strata Title Act provides implied easements for the existing *consumer mains* and submain *cables* in these situations. The following drawings provide examples of such instances.

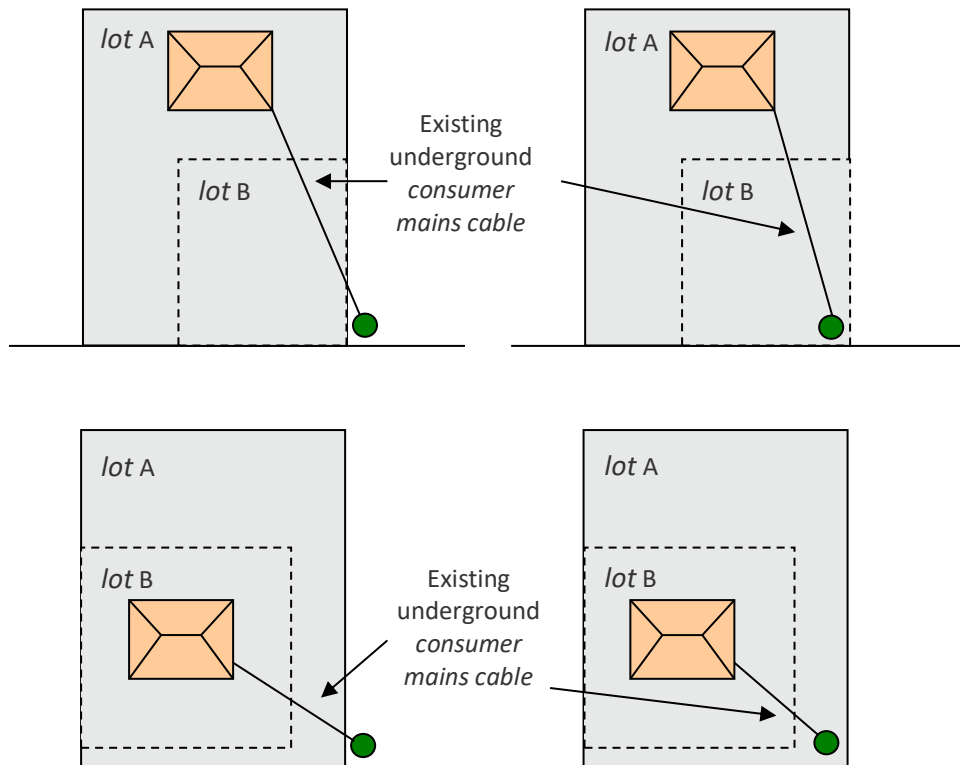


Figure 11

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