



# **UNDERGROUND DROP CABLE CONDUIT INSTALLATION AND SPECIFICATION GUIDELINES FOR SINGLE DWELLING RESIDENTIAL APPLICATIONS**

## **1. SPECIFICATIONS**

This document details the specifications for the installation of underground conduit for providing Optus HFC network services. Where any components of the underground installation fail to meet these minimum specifications, the proposed installation of Optus service/s may not proceed until the non-compliant components are rectified to meet these specifications.

### **1.1 CONDUIT**

#### **1.1.1 Specifications**

The following list of components required in an underground situation is provided as a guide only, substitute materials may be used. It is the responsibility of the person/s installing or supervising the work to ensure any substitute component is of the same quality, or better, and meets the required minimum specifications. Conduit must be of 32mm minimum outside diameter, with a minimum wall thickness of 2.1mm and comply with AS/ACIF\_S008:2010 Section 5.3. All conduit, bends and continuous pipe will be white and clearly labeled 'Communications' to comply with afore mention standard.

#### **1.1.2 Length**

The maximum recommended length of 32mm conduit to suit RG-6 Siamese cable is 50 meters. If the distance is greater than 50 meters, 50mm conduit is to be installed to a recommended maximum of 65 meters, this will allow easy installation of RG11 cable. Each case would need to be investigated, with calculations performed on expected losses after taking tap readings. The use of any other conduit will result in the installation being unable to take place until the correct conduit is in place.

#### **1.1.3 Conduit Bends**

All bends must have sweeping radius of no less than 305mm. If sharp bends are used the cable will be unable to be installed to manufacturers specifications. The maximum amount of bends to be installed on any underground conduit installation is three, this is inclusive of the conduit entry and exit bends, after three bends at the next change of direction a pit must be installed.

#### **1.1.4 Bore Pipe**

If directional boring and continuous pipe is utilised it will be either 40mm or 63mm in outside diameter, with a minimum wall thickness of 2.7mm and 3.75mm respectively.



### 1.1.5 Pits and Enclosures

All pit installations must comply with AS/ACIF\_S008:2010 Section 5.8.1. Pit and lid recommended sizes are P1 type for residential properties and J5 type, which are usually used for properties with two or more residences to the plot of land.

### 1.1.6 Fasteners

Where conduit exits the ground it will be attached to walls by galvanized saddles and suitable screws, tap in type fasteners may be used on brickwork or masonry to retain saddle.

Use only 10mm ramplug with a 7g to 14g screw if attaching to a mortar course.

### 1.1.7 Conduit Route

Any conduit installed for Optus must not cross roadways, footpaths or nature strips diagonally. Conduit can only be installed perpendicular or parallel to roadways.

The conduit must be installed to the non-traffic facing side of the power pole servicing the property where possible, it must also exit the bore/trench from a 90 degree sweep bend, rising 300mm out of the ground.

The conduit at the customer premises side must exit the bore/trench externally from a 90 degree sweep bend, this must then be secured to a height of 300mm above ground level by using galvanized saddles. Optus will extend both ends of the conduit installation when installing the cable, **the conduit needed to perform this is to be left on site by the contractor/customer for the installing technician to utilize.** The ends of the conduit must be sealed using either correct size caps or PVC ducting or electrical tape.

A nylon cord drawstring of 3mm minimum thickness must be left in the conduit to facilitate cable installation, this draw string must be attached securely at both ends to avoid accidental removal.

## 1.2 DROP CONDUIT DEPTH OF COVER

The table below specifies the minimum depth of cover over the conduit.

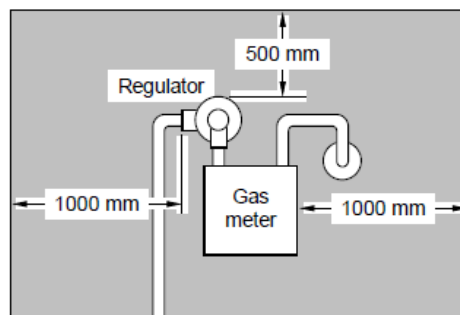
| Location         |          | Minimum Depth of Cover (mm) |
|------------------|----------|-----------------------------|
| Outside Boundary | Property | 450                         |
| Within Boundary  | Property | 300                         |

## 1.3 MINIMUM CLEARANCES FROM OTHER SERVICES

The intended location for the Optus Termination Enclosure must be outside of the exclusion zone for gas meters and in-situ gas cylinders. However, the drop cable contained in conduit may encroach on exclusion zone provided -

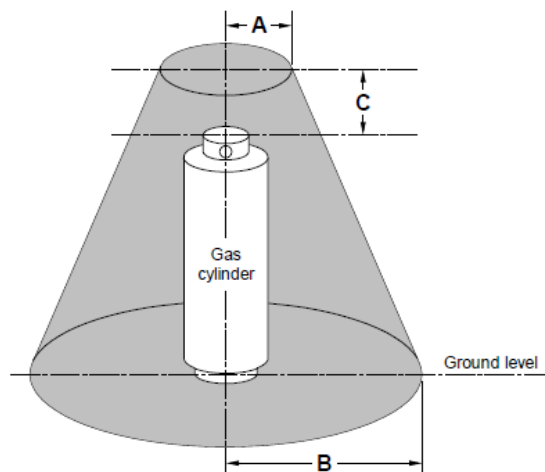
- The cable shall not contain any breaks or joints
- Cabling is contained within conduit
- Provide a minimum 150mm separation from gas meter/cylinder, gas regulator or any gas fitting

### Gas Meter



Note 1: Gas Meter & Gas Cylinder: The distances are measured from the surface of the gas meter, gas regulator or any gas fitting whichever is outer most.

Note 2: The hazardous area does not extend outside an approved gas enclosure.



*Continued over page*



| <b>Dimension</b> | <b>Exchange cylinder</b> | <b>In-situ fill cylinder</b> |
|------------------|--------------------------|------------------------------|
| A                | 500 mm                   | 1500 mm                      |
| B                | 1500 mm                  | 3500 mm                      |
| C                | 500 mm                   | 500 mm                       |

Note 3 – Diagrams and tables have been extracted from AS/CA S009-2013

The table below specifies the minimum clearance that must be observed between the drop conduit and other services.

| <b>Service</b>       | <b>Minimum Radial Clearance (mm)</b> |                                 |
|----------------------|--------------------------------------|---------------------------------|
|                      | <b>Outside Property Boundary</b>     | <b>Within Property Boundary</b> |
| Gas Pipe             |                                      | 150                             |
| Large Main (>110mm)  | 300                                  |                                 |
| Small Main           | 150                                  |                                 |
| Water Main           |                                      | 150                             |
| High Capacity Main   | 300                                  |                                 |
| Local Reticulation   | 150                                  |                                 |
| Sewer                |                                      | 150                             |
| Mains                | 300                                  |                                 |
| Connections to Mains | 150                                  |                                 |
| Power Service Line   |                                      | 100 <sup>1</sup>                |
| High Voltage         | 300                                  |                                 |
| Low Voltage          | 100                                  |                                 |
| Other Carriers       | 100                                  | 100 <sup>1</sup>                |

Note 4: Drop cable conduit may share a common trench within the property boundary without specified separation provided it can be clearly identified.

## **DROP CONDUIT INSTALLATION**

### **1.3.1 General**

The following general requirements apply to drop conduit installation:

- All conduit and fittings must meet the requirements of AS/ACIF\_S008:2010
- Conduits must take the most direct route possible from the pit, enclosure or pole to the customer's house
- Conduits must not cross roadways, footpaths or nature strips diagonally ie the conduit must only be installed perpendicular or parallel to roadways
- All conduit joints must be kept free of foreign matter between the surfaces and glued to the manufacturer's specifications so they are watertight
- Reasonable care must be taken to ensure the conduit is not damaged during reinstatement of the excavation
- There must be no more than three sweeping bends in a conduit before installing a pull point
- All conduits must be capped as they are installed to prevent entry of dirt and water
- All conduits must have the inside end beveled with a knife or beveling tool where conduit connectors are used

### **1.3.2 Installing Conduit to a Pit, Pedestal or Turrets**

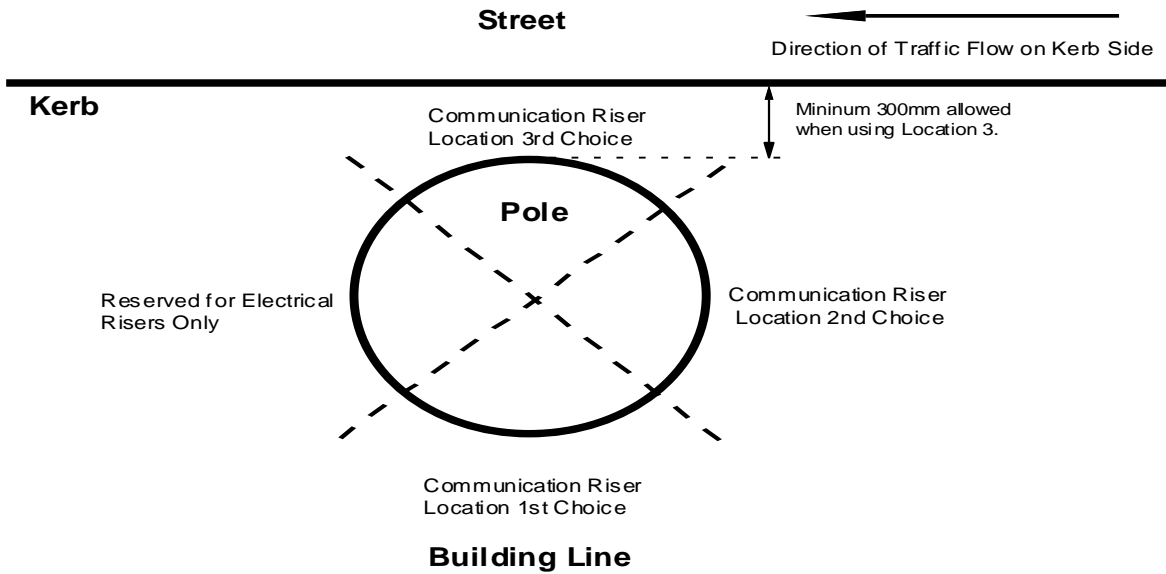
The following rules apply when installing drop cable conduit from pits, pedestals and turrets:

- Where possible, the conduit should originate from the designated pit, pedestal or turret (prior approval must be sort from RF design before using non-designated pits/enclosures).
- The conduit should be connected to the pit, pedestal or turret using one of the existing 'lead' conduits.

### **1.3.3 Installing Conduit from a Pole**

The following rules apply when installing drop cable conduit from a pole:

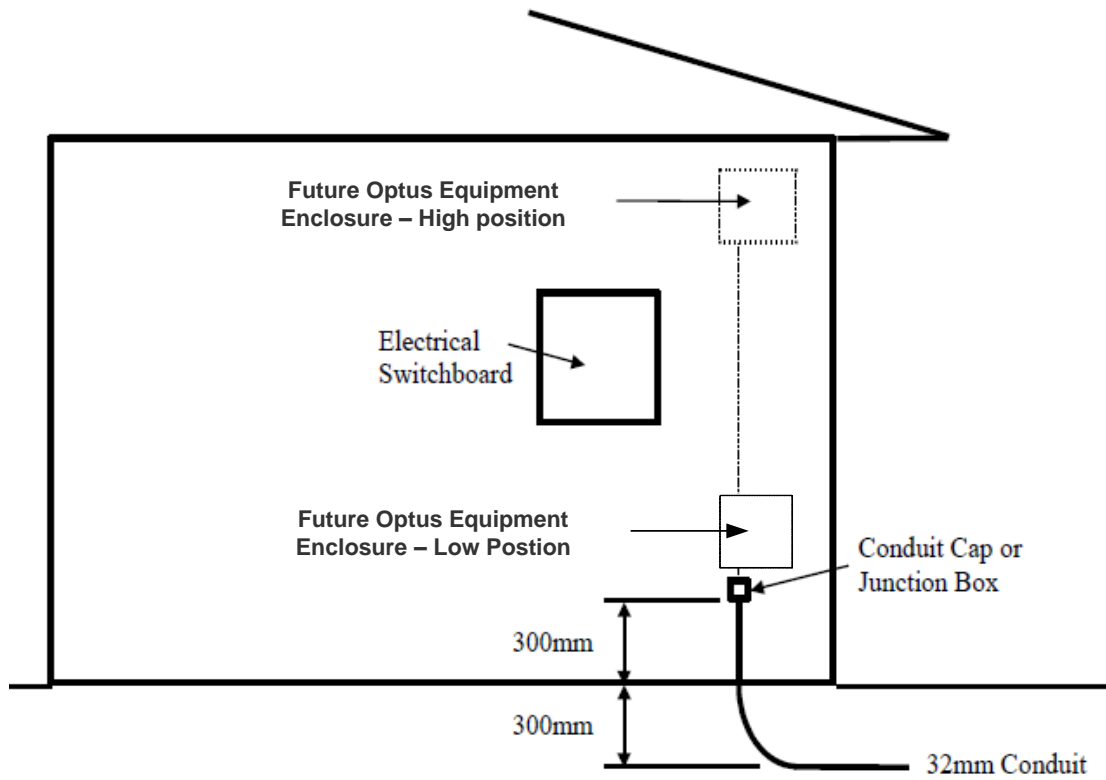
- The conduit should be installed to the building line quadrant of the pole as first choice or the other quadrants in the order indicated in figure over page.
- The conduit must be installed up the pole to within 100 mm of the strand.



### 1.3.4 Positioning the Conduit at the House

The following rules apply to the position of the drop cable conduit at the house:

- The conduit should be terminated in the vicinity of the electrical switchboard as shown in diagram over page. If this is not possible, it should be terminated at a location that is within 10m of the electrical switchboard.
- The conduit should be installed to an accessible side of the house.
- The conduit should be installed in a position that allows Optus equipment to be located directly above it, either in the low mount position, 450mm from the ground level (homes on a slab) or greater than 2 meters from ground level, as shown over page.
- The conduit must rise 300mm out of the ground and be attached to the building using galvanized saddles.
- The conduit must terminate in either an external junction box with dimensions 77mm x 77mm x 54mm (eg Clipsal adaptable box no. 565/1 or equivalent) as shown over page with the spare entry port weatherproofed appropriately or be capped with a conduit cap. Taping the end of the conduit as a termination method is not permitted.



Preferred Position of Optus Conduit and Junction box at the House