



LBNCo Pty Ltd
LBNCo FttP Connection Guidelines for
Owners and Builders

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Issue 1

Document Control

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INFORMATION FOR BUILDERS AND HOMEOWNERS:

CONNECTION TO THE LBNC_o FIBRE TO THE PREMISES TELECOMMUNICATIONS NETWORK

INTRODUCTION

The purpose of this guide is to assist home owners and builders in understanding what needs to be done to connect to the LBNC_o *Fibre to the Premises* (FttP) network.

It also provides some information and suggestions on wiring of the new home to take full advantage of the services that are available over the network. This document does not provide detailed specifications for home wiring, but provides ideas so that the owner can decide what they want out of the network.

In summary, there are things that you need to ensure are done to be able to connect to the LBNC_o FttP network and there are things such as internal cabling that should be done to enable you to maximise the benefits of a connection to the FttP network.

This document is a brief summary of a separate LBNC_o document '*Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers*' which provides the detail required to ensure the installation meets requirements and compliance.

THE NETWORK AND HOW IT WORKS

The LBNC_o FttP network utilises state-of-the-art optical fibre technology to provide services such as, superfast broadband, telephone and television over a single optical fibre to each premise.

LBNC_o operates the network on a wholesale open access basis with Retail Service Providers (RSPs) providing the actual telecommunications services to the end-user. Free-to-air digital television from the local television networks, and in some estates pay-TV (Foxtel), is distributed on the fibre network to allow reception without an external antenna.

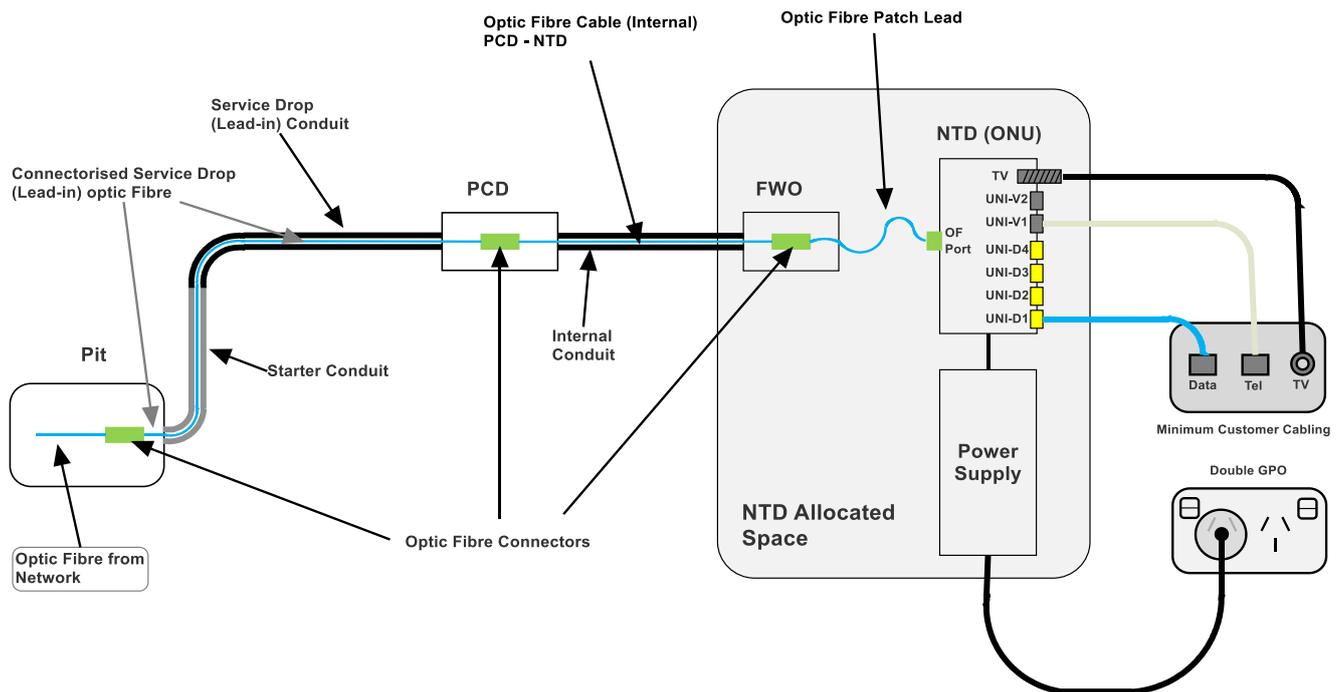
To enable you to connect to these services LBNC_o provides and operates the network up to a network interface, in this case the equipment called the Network Termination Device (NTD), mounted in a location specified by the owner of the premises based on criteria summarised in this document. Cabling and distribution beyond this point is provided by the owner because they know where and how they will utilise the services provided.

While LBNC_o provides the fibre and termination equipment, there are some things that owner must provide on their property, to enable LBNC_o to install that equipment. These are prerequisites to being connected.

The actual installation of LBNC_o equipment and subsequent connection to the network must be done by LBNC_o approved installers.

All cabling work performed on the customer side of the Network Boundary Point, at the ports of NTD, is subject to the Australian Communications and Media Authority (ACMA) administered *Telecommunications Cabling Provider Rules 2014 (CPRs)* and must be cabled according to the standard *AS CA S009-2013 Installation requirements for customer cabling (Wiring Rules)*. Cabling work includes the connection, installation or maintenance (repair) of Customer cabling.

The following Diagram shows the components of the network connection from the Street Pit:



LBNCo Fibre-to-the Premises (FttP) Customer End Installation

WHAT LBNCO PROVIDES

Apart from infrastructure in the street, including a telecommunications pit usually on your front boundary where your premises are connected to the network, LBNCo provides:

- the Starter Conduit from the pit to just inside the boundary of the Lot
- an optical fibre, known as the *Service Drop Fibre* or lead-in fibre, that is run in conduit provided by the owner or builder, from the pit to the *Premises Connection Device* (PCD)
- the PCD equipment
- an *Internal Fibre* from the PCD to the NTD location within the premises
- a *Fibre Wall Outlet* (FWO) at the NTD location
- the NTD
- a low voltage power supply unit for the NTD (an *optional* battery backup power supply, or Uninterruptable Power Supply (UPS) unit that will keep the NTD operational for a few hours in case of a mains power interruption can be purchased)
- the installation of this equipment

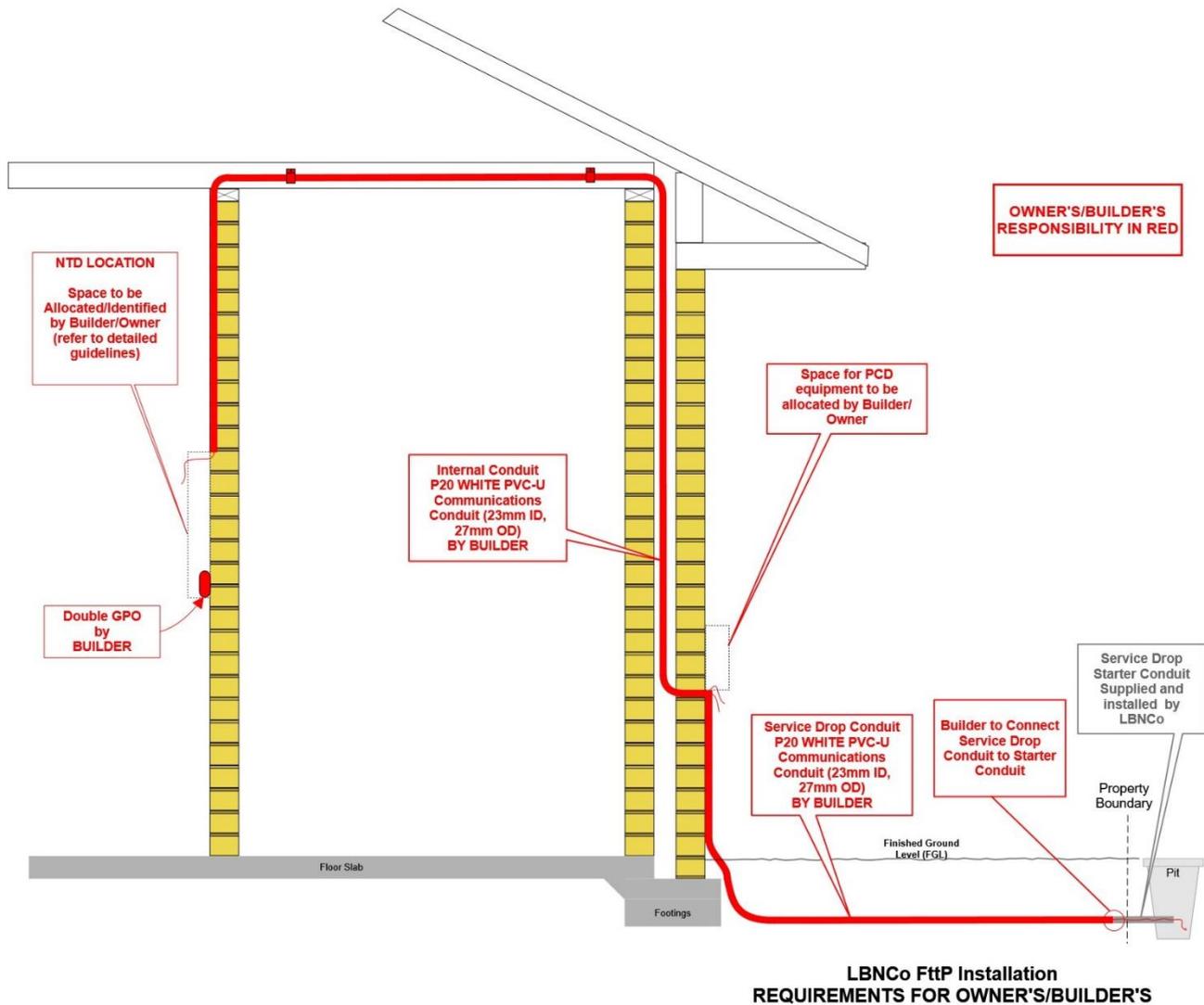
WHAT THE OWNER PROVIDES

To enable connection to the network by having the Service Drop fibre, the PCD and the NTD installed there are some basic things that the Owner must provide:

- the Service Drop Conduit including connection to the Starter Conduit and a draw rope from the Pit to the PCD end of the conduit
- a suitable location for mounting the PCD
- an Internal Conduit from the PCD location to the NTD location
- a suitable location for NTD

- a General Power Outlet (GPO) at the NTD location

This diagram highlights what the Owner must provide in **Red**.



Further detail follows below and detailed technical specifications and requirements are available in a separate LBNC Co document 'FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers'.

LBNC Co recommends that planning starts very early in the building process. Ideally the planning should be done at the same stage that electrical planning is done. The work should be done alongside or at the same time as the electrical work.

PLANNING

The homeowner and builder should agree on how many TV, telephone and data outlets will be required throughout the home. This should include the number and their desired location.

This will determine:

- Number of outlets required to be cabled
- Whether TV splitters or amplifiers are required
- Whether a Home Distributor (HD) will be used
- Suitable location and type for a HD – if required
- Details of patching capability and connection type (whether or not a HD is used)
- The use of routers, switches, Wifi and the like
- Number of power points required in each room, near the NTD location and near the HD

When this has been decided then the location of the PCD and NTD can be decided and pathways for the Service Drop Conduit and the Internal Conduit can be decided and planned.

DURING THE BUILDING PHASE

In a typical home, the builder/owner is responsible for the following:

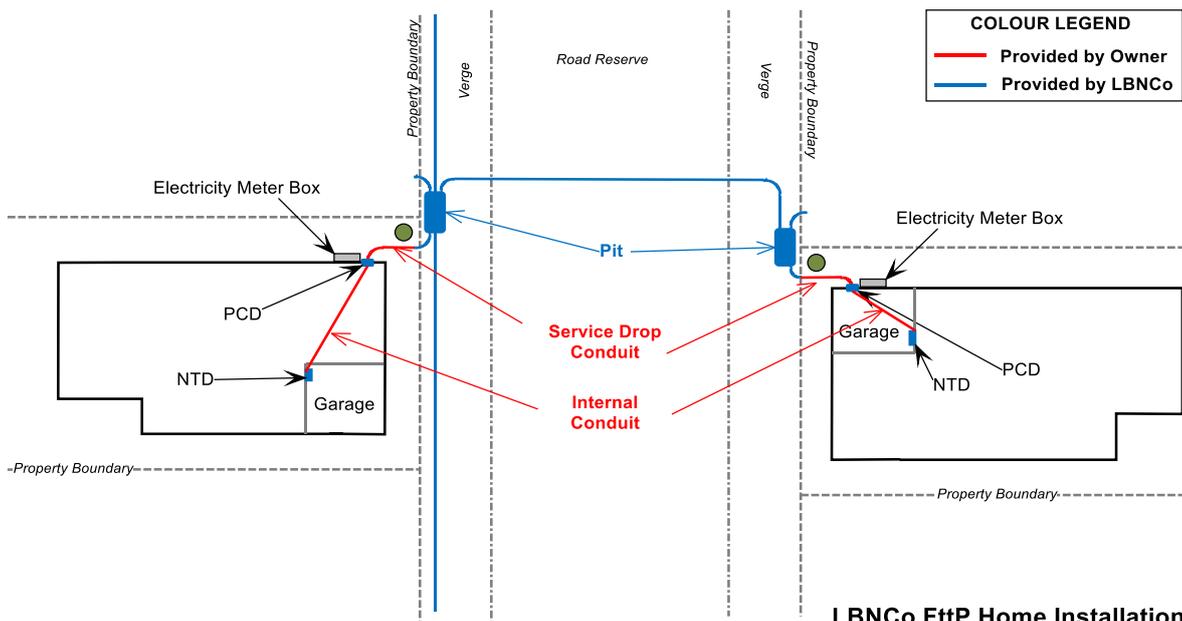
Connection to the network (**pre-requisites**):

- Supply and install the Service Drop Conduit from the telecommunications pit in the street to the PCD location (near to the power meter box). This includes:
 - Connecting to the Starter Conduit
 - Installing a draw rope from the Pit to the PCD location
- Supply and install the Internal Conduit from the PCD location to the NTD location including installation of a draw rope
- Supply and install a double GPO at the NTD location

Distribution and connectivity within the home (these are suggestions):

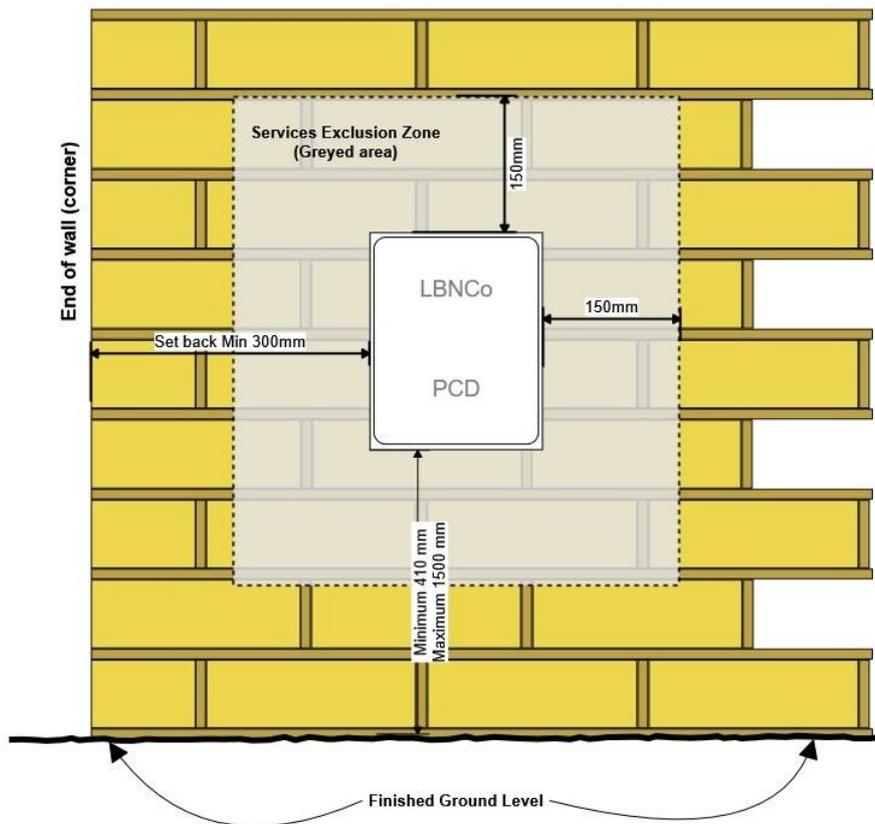
- Supply and install a HD inside the home – this is optional but recommended
- Supply and install the following cables to the HD (or direct to wall outlets)
 - Television cable from the NTD (RG6 quad shielded coaxial cable recommended with compression “F” connectors)
 - Minimum of one telephone Cat5e/6 cable from the NTD (max = 2)
 - Minimum of one Data Cat5e/6 cable from the NTD (max = 4 although each RSP will use only one because the NTD is not a customer router/switch)
 - Telephone, data and TV cables to required locations in the home from the HD or the NTD if an HD is not used
 - Necessary patch cables for the HD (if required)
- A TV signal splitter if more than one TV point is required
- A TV signal amplifier may be required if more than four TV points are required

MORE DETAIL



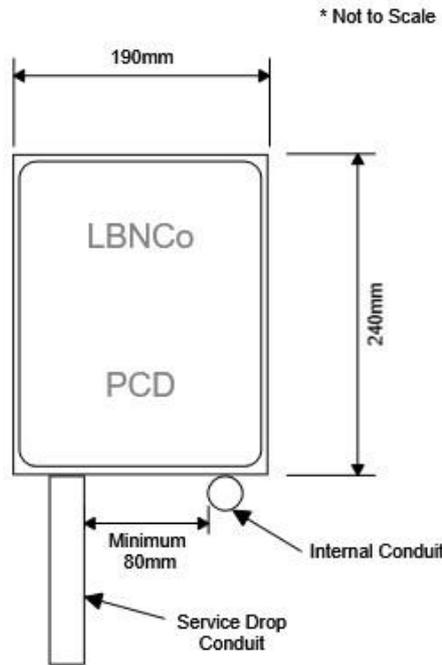
PCD Location

Space needs to be allocated near the electrical meter/distribution enclosure (Meter Box) to the following specifications. LBNCo will supply and install the PCD equipment.



* Not to scale

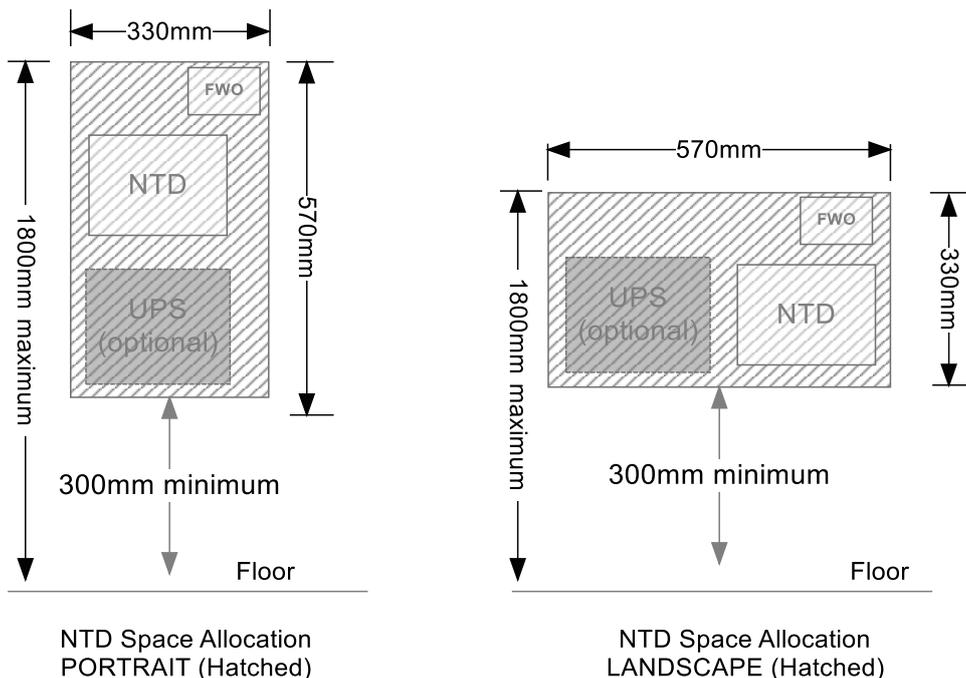
The ends of the Service Drop and Internal Conduits need to be located as per the following drawing:



PCD Space Allocation and Conduit Location

NTD Location

Space needs to be allocated by the Owner/Builder to accommodate the NTD equipment. The following diagram shows the size of the space required and the approximate layout of the LBNC Co equipment within it. This is for where the NTD is mounted on a flat surface. The double GPO needs to be toward the bottom of the allocated space on either side or directly underneath the space (taking into account the path for the electrical cabling not through the allocated NTD space).

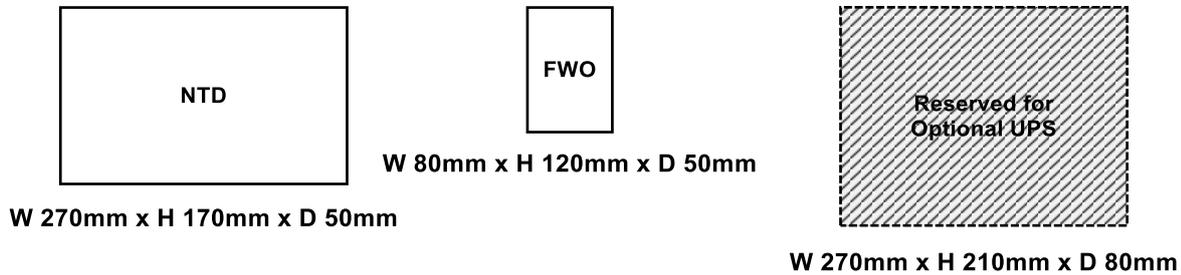


The general requirements for the space are:

- Internal to the building under the main roof
- Not exposed to weather (including under open windows)
- Not exposed to consistent high temperatures above 40° C
- Space above and below for ventilation to dissipate heat generated by the equipment
- In a location (room) that is sufficiently ventilated (refer to LBNCo document '*FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers*')
- Unobstructed; permanent or temporary obstructions (nothing in contact or likely to be in contact with or be within 200mm of any of the LBNCo equipment)
- Accessible for installation and maintenance
- Not in a wet area (see below for examples)
- Safety; the location must not present potential trip, choking, electrical shock, exposure to laser light or physical injury hazards from the equipment, including cables, when installed
- Permitted locations:
 - Enclosed garage under the main roof (LBNCo preferred location).
 - Storage room or cupboard of sufficient volume to accommodate the ventilation requirements and meets the clearance requirements.
 - Walk-in wardrobe of sufficient volume to accommodate the ventilation requirements and meets the clearance requirements.
 - Office or study.
 - Living room provided it meets safety requirements (equipment should not be accessible by children).
 - Theatre/multimedia room
- Locations NOT permitted for safety and environmental reasons:
 - Wet areas
 - Bathroom
 - Toilet
 - Laundry
 - Kitchen
 - Safety hazards
 - Children's bedroom
 - Play area
 - Anywhere cables could present a choke or trip hazard
 - Exposure
 - Under a window that opens to the outside
 - Carport
 - Patio
 - Veranda
 - Balcony
 - Anywhere not fully enclosed and internal to the building
 - Other technical
 - Standalone sheds
 - Standalone garage (not under main roof)
 - Coolroom, freezer
 - Sauna

The NTD equipment can be installed within a HD enclosure of sufficient size and which meets the following requirements:

- Sufficient space to accommodate the three LBNCo components as per below as well as the customer distribution equipment and cabling.



LBNCo NTD Equipment Sizes

* For size only not layout

- Minimum surface area 0.25m²
- Minimum depth 100mm
- Sufficient clearance needs to be allowed around the devices to accommodate access by cables and fibre optic leads.
- The GPO can be located within the enclosure provided it is accessible.
- The optional Uninterruptable Power Supply (UPS) can be mounted outside the enclosure provided space is allocated and a path for a cable from the UPS to the NTD is provided.
- Ventilation of the enclosure is required (refer to LBNCo document 'FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers')

Service Drop Conduit

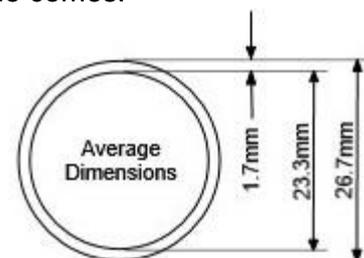
The Owner/Builder needs to install the Service Drop conduit from the Starter Conduit, installed by LBNCo from the Pit, to the location you have allocated for the PCD (near the Power Meter Box).

The Starter Conduit will be found approximately 800mm inside the Lot boundary where the Pit is located. It is between 300mm and 500mm below the finished ground level (FGL). There are other options for the location of the Starter Pipe and/or the Pit such as where there is a retaining wall on the boundary or the Lot is rear-loaded meaning the utility services enter the Lot from a laneway. If this is the case refer to LBNCo document 'FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers'

Installation of the Service Drop conduit includes connecting the Service Drop conduit to the Starter Conduit and pulling a draw rope into the conduit from the Pit to the PCD to allow the Service Drop fibre cable to be pulled from the pit to the PCD by LBNCo when the time comes.

Conduit Specification:

P20 **White** PVC-U Telecommunications Conduit with nominal Inside Diameter (ID) 23mm and nominal Outside Diameter (OD) 27mm. The conduit will carry the markings Communications, Telecommunications, Telstra.



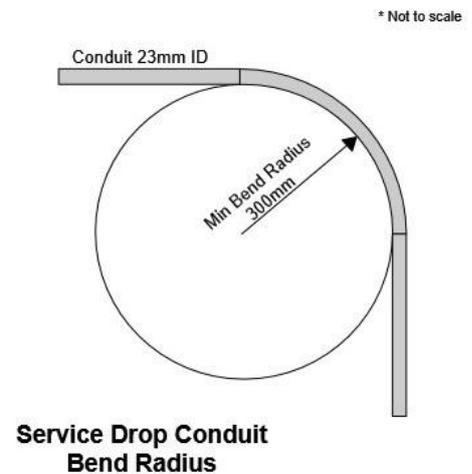
P20 Communications Conduits Dimensions

Bends and fittings:

All fitting must suit the conduit above and be factory fabricated rigid white PVC-U. 90 degree bends will have a minimum 300mm bend radius and the total angle of all bends from end to end, for the Service Drop Conduit, will not exceed 270 degrees.

Tight bending of the conduit will cause distortion of the profile of the conduit and restrict the passage of the Service Drop fibre cable, which is fitted with a connector, when it is pulled through the conduit. Producing 45° or 90° from conduit using heat has the same effect of distorting the profile and is not accepted.

All connections and joins will be glued to the manufacturer's specification to prevent separation or snagging while the Service Drop fibre cable is pulled through the conduit and to limit moisture ingress.



Coverage (depth below finished ground level):

- Minimum 300mm
- Maximum 500mm
- Under driveways etc. recommended minimum is 450mm

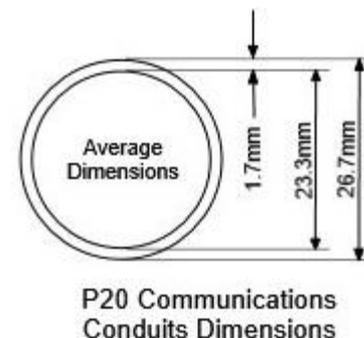
For further detail refer to LBNCo document '*FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers*'.

Internal Conduit

The Internal Conduit carries a fibre optic lead, provided and installed by LBNCo, from the PCD to the NTD location. Installation of the Internal Conduit includes installation of a draw rope from one end to the other to allow the optic fibre lead to be pulled through the conduit when the time comes.

Conduit Specification:

P20 **White** PVC-U Telecommunications Conduit with nominal Inside Diameter (ID) 23mm and nominal Outside Diameter (OD) 27mm. The conduit will carry the markings Communications, Telecommunications, Telstra.

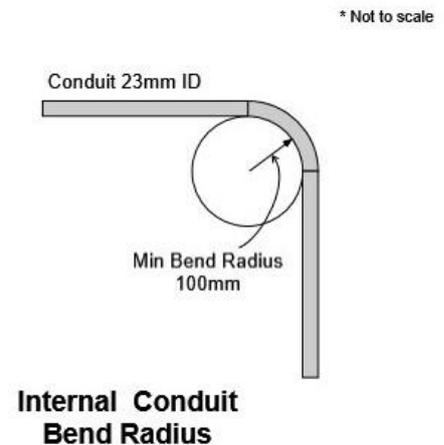


Bends and fittings:

All fitting must suit the conduit above and be factory fabricated rigid white PVC-U. 90 degree bends will have a minimum 100mm bend radius and the total angle of all bends from end to end, for the Service Drop Conduit, will not exceed 270 degrees.

Tight bending of the conduit will cause distortion of the profile of the conduit and restrict the passage of the Service Drop fibre cable, which is fitted with a connector, when it is pulled through the conduit. Producing 45° or 90° from conduit using heat has the same effect of distorting the profile.

All connections and joins will be glued to the manufacturer's specification to prevent separation or snagging while the Service Drop fibre cable is pulled through the conduit and to limit moisture ingress.



Once again for further detail refer to LBNC Co document 'FttP Network – Detailed Specifications, Requirements and Guidelines for Builders and Cabling Providers'.

REQUIREMENTS CHECK LIST

When you have completed the following requirements, your home is ready for connection to the fibre-to-the-premises network by LBNC Co and you need to contact the Retail Service Provider (RSP) of your choice to get things underway.

- NTD location has been allocated
- PCD location has been allocated
- Service Drop Conduit is installed from the Pit to the PCD
- Internal Conduit is installed from the PCD to the NTD
- A dual GPO has been installed to power the NTD
- Your home has been wired for telephone, data (internet) and TV points/outlets