

Developer Trade Installation Guide



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1. Document Management

1.1. Document Identification

File Name	TFF504_Developer Trade Installation Guide
Version	2.0
Document Author(s)	Kevin Park (Engineering Standards & Materials Specialist)
Review Frequency	Annually for the first 2 years, then subject to periodic review under the responsibility of document approver.

1.2. Authorities

Action	Name	Role/Function	Date
Approved by:	Damian Williams	Engineering Standards & Compliance Manager	19/5/2021

1.3. Version History

Version	Date	Author	Remarks
1.0		Kevin Park	First Release
1.1	15/5/2019	Kevin Park	Introduction of Flat LSZH 2core cable & discontinuity of using LSZH microduct.
2.0	7/05/2021	Kevin Park	Marker post, LSZH microduct and service clearances updated.

1.4. Contribution (C) and Distribution (D) List

Name	C/D	Organisation	Title
Ian Cameron	C	TFF	Regional Asset Team Lead Network Operations



2. General

2.1. Purpose

This document is to provide a quick installation guideline on any premises to be designed/constructed and to maintain the integrity of the Tuatahi First Fibre Network and safeguard from the introduction of unapproved materials.

2.2. Glossary

LSZH – Low Smoke Zero Halogen

ETP – External Termination Point

OPSO Regulator – Over Pressure Shut-Off Regulator

PVC Pipe – Polyvinyl Chloride Pipe

HDPE – High Density Polyethene

ONT – Optical Network Terminal

SDU – Single Dwelling Unit

MDU – Multi Dwelling Unit

2.3. Products

Developers and Electricians can request a free issue of material via email to

Developments@tuatahifibre.co.nz

The use of any consigned material from a technician employed on the Tuatahi First Fibre network must only be sourced directly from Tuatahi First Fibre.

Photo	Product	SAP	BOM
	<ul style="list-style-type: none"> Lateral Microduct Red HDPE outer jacket for external use only Run from property boundary to the ETP 	3031001	52400079
	<ul style="list-style-type: none"> Ruggedised Microduct UV & High impact resistant outer jacket for external use only Run from property boundary to the ETP 	3031011	80003906
	<ul style="list-style-type: none"> Flat LSZH 2core cable Run from ETP to Star Wiring Box for internal use only 	3023001	N/A
	<ul style="list-style-type: none"> LSZH Microduct Run from ETP to Star Wiring Box for internal use only 	3032006	80001606

Table 1 – Approved Product List



Why LSZH for internal premises wiring?

There are several reasons why flame-retardant Low Smoke Zero Halogen (LSZH) duct/cable is used over Non LSZH duct/cable;

- Non-LSZH such as HDPE has been raised as a major fire concern. HDPE duct melts in a fire, turning into molten liquid. This allows the fire to spread more quickly between rooms (acts as a wick).
- Burning PE will not only generate almost 3 times more heat but also consume almost 3 times more oxygen and produce significantly more carbon monoxide.
- Most deaths in a fire are due to inhaling dangerous smoke or gas not the flames themselves.



Note: TFF LSZH duct/cable use materials that do not create halogens or caustic acids, produce little or no smoke, and significantly reduce flame spreading.

Non-Approved Product

All duct that has not had prior TFF approval must go through the TFF Dispensation Authority approval process. On discovering that the internal duct is a non-approved material the contractor must provide TFF with the following information for further assessment;

- Photo of any printing on the duct sheath.
- Details of the trade or developer that has installed the duct.
- Where the duct has been installed. i.e. how far the duct has penetrated the premises.
- Where the duct is accessible can it be swapped with the TFF approved product.



3. Installation Guide

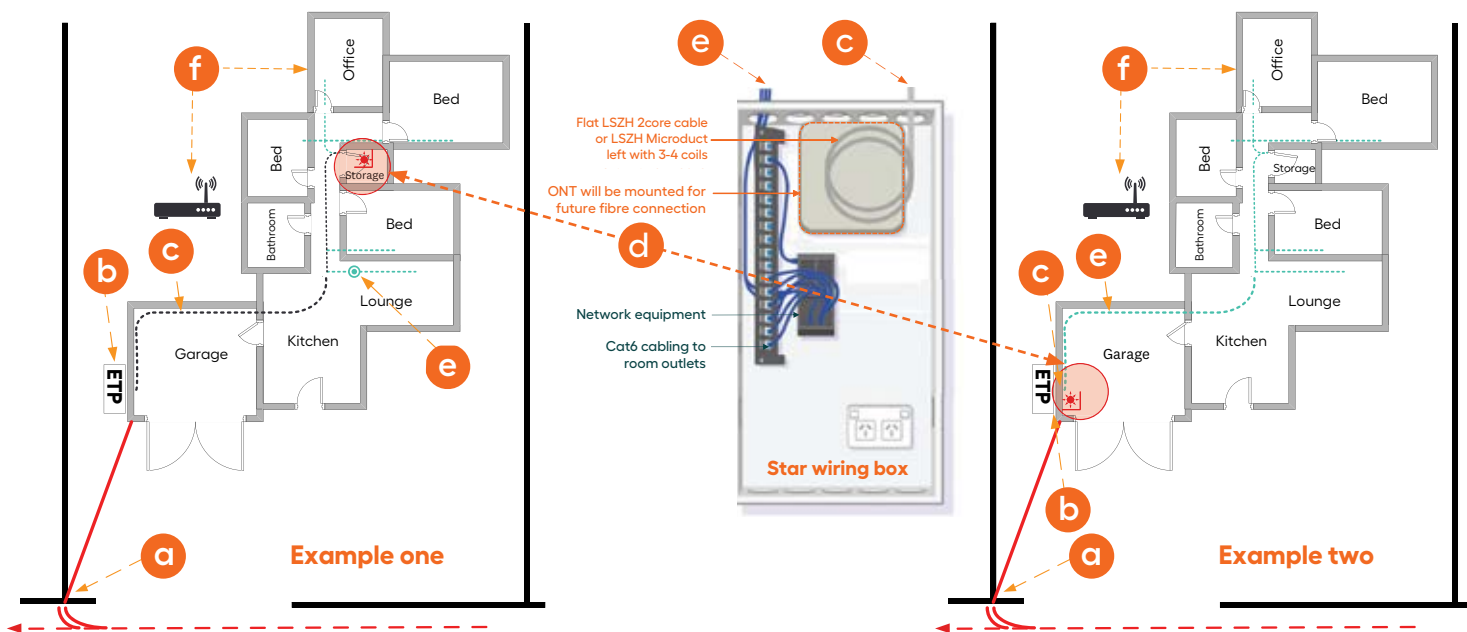


Figure 1 – Generic Cabling System

- a Red or Ruggedised Microduct at boundary drop off**
Typically two microducts are placed behind a marker post at the boundary. You will have to contact TFF so that the boundary drop off can be identified and located before the microduct is laid into the ground. Do not connect to the communal network.
- b ETP**
- c Flat LSZH 2 Core cable or LSZH Microduct** laid in from the Star Wiring Box (or the central distribution point) to the External Termination Point (ETP).
- d Central Distribution Point** dispersed in a “star topology”. On example two the Distribution point is placed back to back e.g. in a garage or to another none intrusive location. This can be either a cabinet or a cupboard with shelving.
- e Distribution structured cabling minimum specification of Cat 6**
Cat 6 (10Gbits/sec) is a good way of preparing the property for future technology.
- f Residential Gateway (RGW)**
Remotely placed wireless router, place the router in a preferred location. Back feed from the LAN port on a separate cable back to the home distributor or star wiring box to provide connectivity to the ONT.



3.1. Lead-In Microduct at Boundary Drop Off

Place the red or ruggedised microduct at the boundary next to the already installed communal network microduct. You may have to contact TFF so that the boundary drop off position can be identified and located before the microduct is laid into the ground.

1. Place the microduct with a marker post by the boundary and cap the microduct with an End Stop Connector (Fig 2).
2. To provide better traceability and mitigate substandard installations, the techs involved in Greenfield or Subdivision are to attach the **LOT # Tag** to the microduct located behind the marker post (Fig 2).
3. Do not attempt to connect the microduct to the TFF communal infrastructure. That would be a job for TFF.
4. The microduct is to be continuous and installed directly to where the flat LSZH 2core cable or LSZH microduct is protruding from the external wall. The duct should protrude from the external wall. The amount of bends in the route must be kept to an absolute minimum, this will help when the Technician installs the fibre.
5. The microduct should be one continuous duct from the boundary drop off to the ETP location and is to be sealed at both ends.



Note: The ground cover for Red Microduct is Min. 400mm and Min. 250mm for Ruggedised Microduct inside boundary.

The minimum bend radius for both microducts is 110mm.

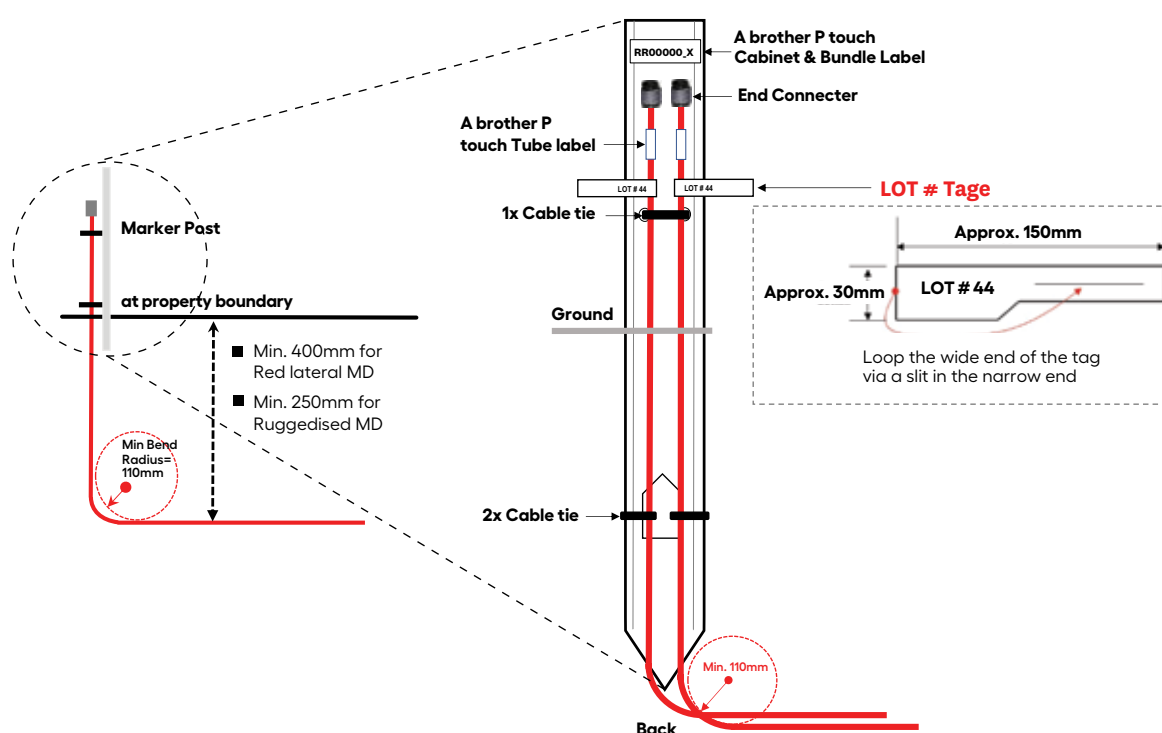


Figure 2 – Lead-In Microduct Location with Marker post



3.2. Underground Clearance & Minimum Cover

The minimum clearances are as shown in Fig 3 below:

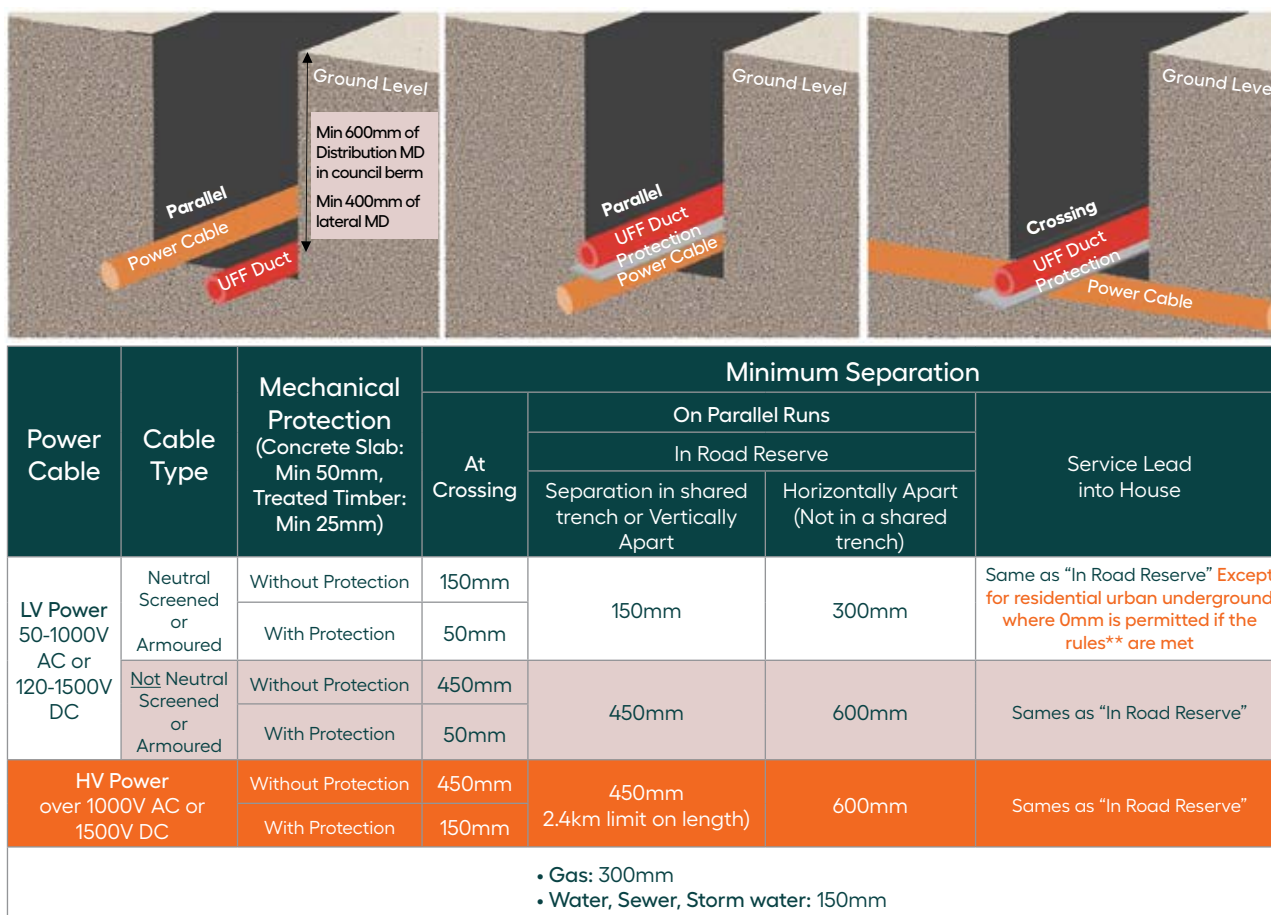


Figure 3 – Clearances

** For residential urban undergrounding projects, the 150mm/300mm separation from "LV neutral screened or armoured" cables on parallel runs can be reduced to a "nil" separation for service leads into houses, provided:

- i. the power cable serves an urban residential property
- ii. the power cable is 230V single phase neutral screened cable (not 230V single phase armoured, unscreened ones)
- iii. the power cable is protected by an HRC fuse (or similarly fast acting protection)
- iv. the telecommunication cable is in a continuous sub-duct (no joints), with a (subduct) insulation rating in excess of the highest voltage present in the power cable
- v. the length of parallel, at this reduced separation, is <50m.



NOTE: The 150mm/300mm minimum separation is still required in the road reserve.

3.3. ETP Location Rules

The ETP (Flat LSZH 2core cable or LSZH microduct protrusion) must not be placed in such a location where it can be prone to damage.

The ETP/LSZH shall not be placed in a location close to a hose tap where it is subject to excessive moisture, high pedestrian traffic or vulnerable damage.



NOTE: Only Flat LSZH 2core cable or LSZH Microduct is to be installed internally, never place them near a hose tap.

In Greenfield, subdivision or infill area, the red lateral or ruggedised microducts can be installed either behind the cladding or on the external wall to feed the ETP as shown in Fig 5.



Figure 4 – Substandard installation

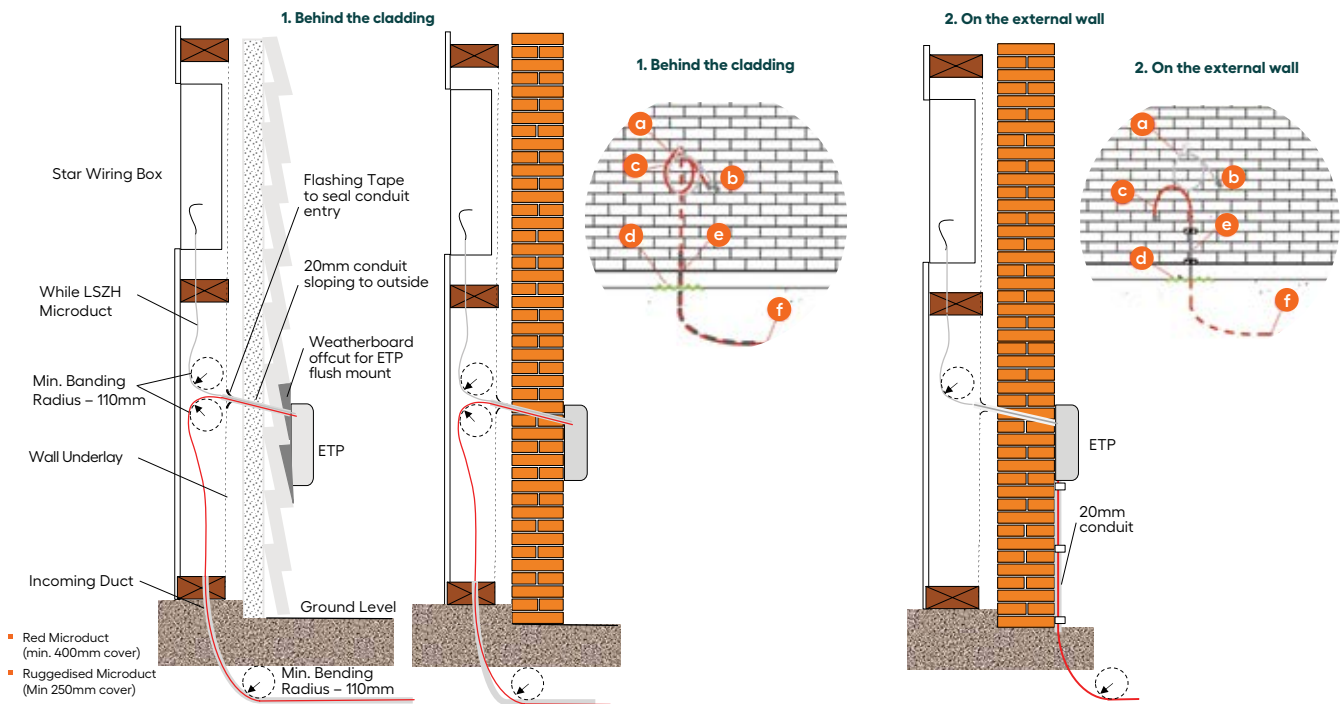


Figure 5 – ETP Location Rule

- a** Flat LSZH 2 core cable or LSZH Microduct. Height of the cable is between 300-1500mm from finished ground level. Leave around 2 meter coils.
- b** Seal the end of microduct with mastic tape.
- c** Red or Ruggedised Microduct. Enough slack to allow the ETP to be placed at 300-1500mm.
- d** Finished ground level.
- e** Conduit.
- f** Red microduct is set at Min. 400mm, Ruggedised Microduct is Min. 250mm from the ground.

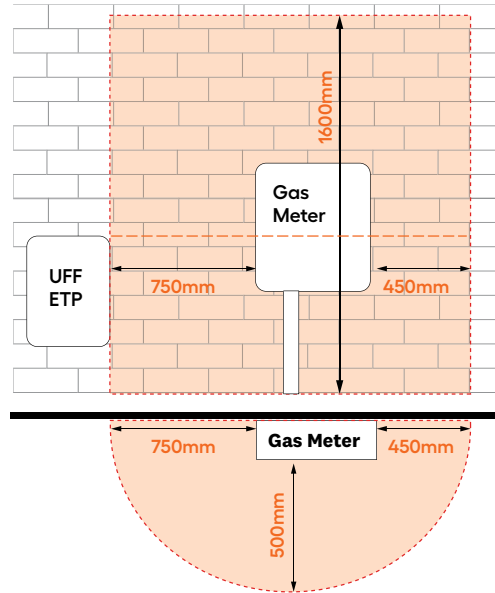


3.4. Minimum Clearances for External Gas Meters and Cylinders

When placing the flat LSZH 2core cable or LSZH Microduct externally (ETP Position). The following must be considered. Exclusion zone(s) are defined in Fig 6 and Fig 7 and are applicable to all TFF where a gas connection is present or proposed.



Figure 6 – Gas Vented Regulator

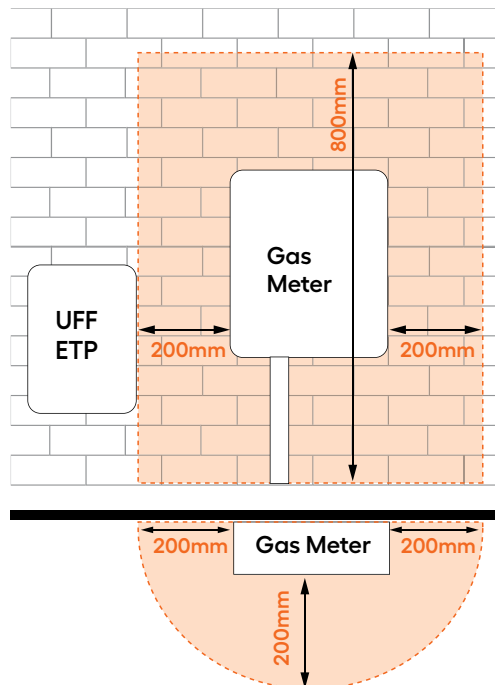


Gas Vented Regulator:

The minimum clearance required for the ETP or other TFF owned terminating devices is 1600mm vertically and / or 750mm – 450mm horizontally from the location of an existing or proposed gas meter. Note the vented regulator is colour coded light brown. Installation personnel shall not position TFF equipment in this exclusion zone.



Figure 7 – OPSO Regulator



OPSO Regulator:

The minimum clearance required for the ETP or any other TFF owned terminating devices is 800mm vertically and/or 200mm horizontally from the location of an existing or proposed gas meter. The OSPO regulator is colour coded light grey. Installation personnel shall not position TFF equipment in this exclusion zone.

Before installing an ETP at the limit of the 200mm exclusion zone, absolute identity of the type of regulator must be established. If the installer is unsure at any point during the installation, contact an TFF Regional Asset Specialist, TFF Contactor's Team leader for confirmation.

Cylinder Regulator:

The minimum clearance required for the ETP or other TFF owned terminating devices is as described in Fig 8 for either an Exchange or In-situ type gas cylinder. Installation personnel shall not position TFF equipment in this exclusion zone. All dimensions are measured from the top of any cylinder valve.

- a** Within space 500mm above the top of the cylinder valve
- b** ¹ 500mm laterally from any cylinder valve.
² 1500mm laterally from any cylinder valve.
- c** ¹ 1500mm laterally at the base of the cylinder. ²
3500mm laterally at the base of the cylinder.

¹ = Exchange cylinder

² = In Situ fill cylinder

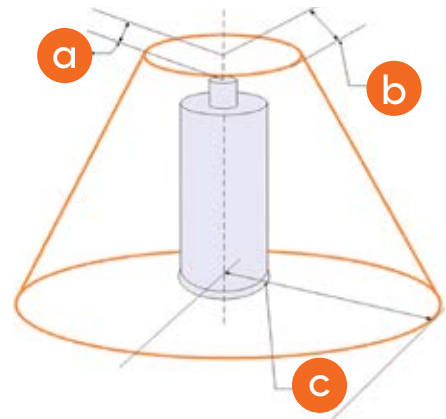


Figure 8 – Cylinder Regulator

3.5. Flat LSZH 2 Core Cable or LSZH Microduct Internal Routes

Internal routes should be installed within the following guidelines.

1. To protect the cable, the safest route must be chosen where the possibility of accidental interference is limited. If installed into the attic space, the cable must not run along the floor (where the cable is prone to damage or being stood on).
2. Avoid areas used for storage, chimneys, flues, heating ducts, water tanks, and plumbing.
3. The cable should follow a common route with Cat6 horizontal cable.
4. For sub floor installations, the cable should run clear of any potential wet surfaces, such as the ground and along areas at the bottom of external walls, bathroom, laundrette, or any place where any unintentional water leakage or dampness may occur.
5. The cable must be installed in the least intrusive location possible. Where possible surface cables should be installed in a location that is likely to offer some protection.
6. Observe the correct bend radius (x15 the cable diameter).



3.6. Star Wiring Box or Home Distributor Location Rules

The Star Wiring Box or Home Distributor is a common connection point where incoming feed and multiple distribution meet. This allows for a cross connect facility for voice, video, and data services.

1. The Home Distributor can be housed inside the Garage (Example One) for ease of installation, however a location where the cables can be centrally distributed (Example Two) from should be considered. This will aid in a lower consumption of horizontal cable and will aid in Wi-Fi signal distribution if the router is to be housed into the star box.
2. Ensure that the location is supplied with at least a double gang 230v AC power source for connection to supply the ONT and enough power sources to power a router, alarm and hub if desired.
3. Ensure that the **flat LSZH 2 Core cable or LSZH Microduct** is installed between the home distributor, star wiring box or ONT location to the ETP location.
4. The Home Distributor is not to be located outside and is to be internal only.

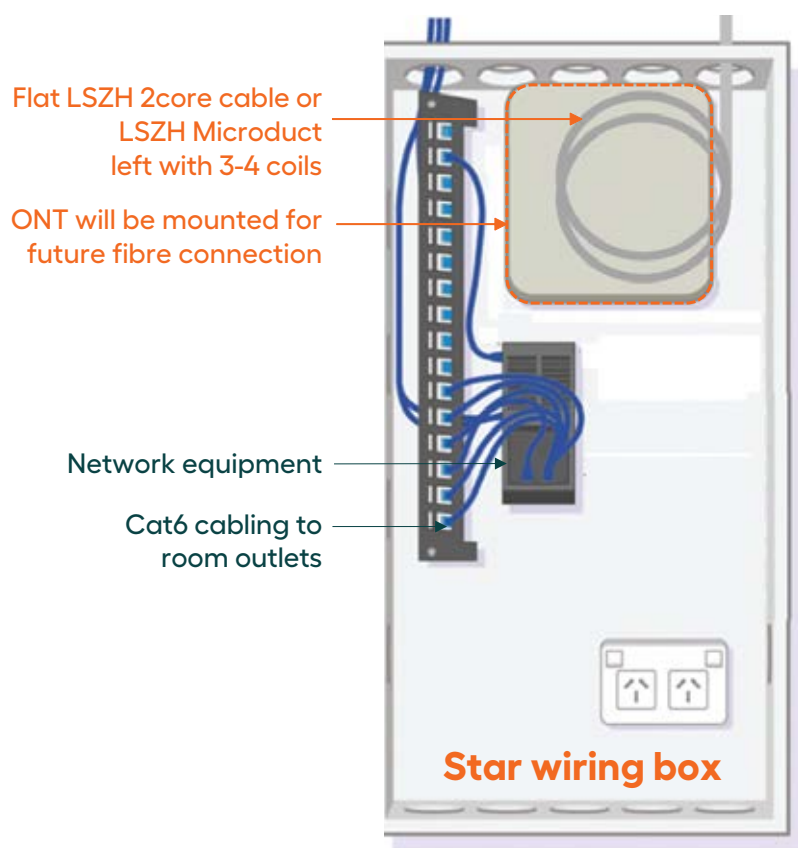


Figure 9 – Star Wiring Box