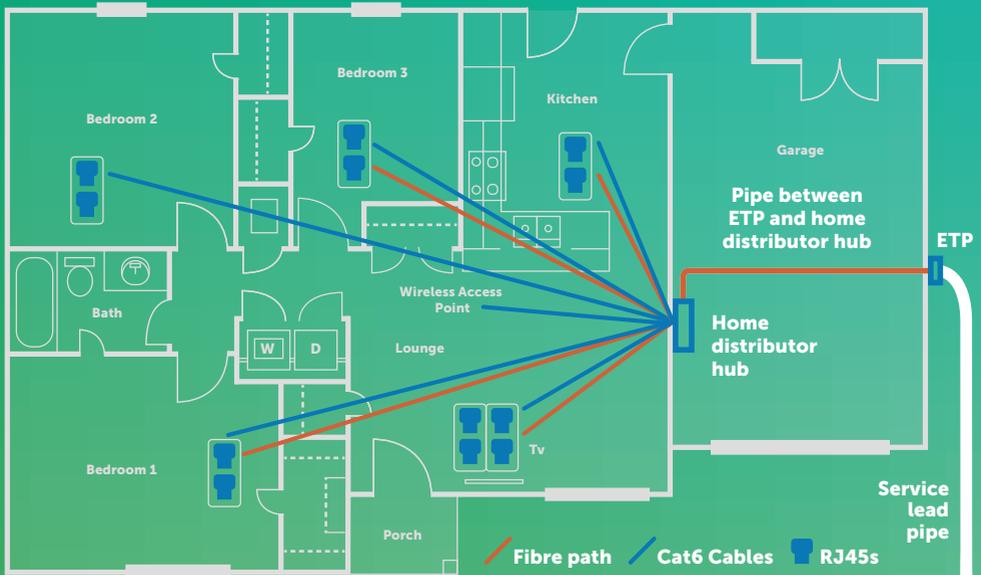


# Guide to wiring homes for fibre

C H ● R U S

# Best practice internal wiring (star wiring distribution) looks like this:



This standard has been developed by the industry through the NZ Telecommunications Forum, of which Chorus is a member.

For full details, go to [tcf.org.nz](http://tcf.org.nz). This site has lots of useful information, including 'Are you wiring for a smart home?' and Wiring Installer Guidelines.

# About this brochure

When building a new home, or completing a major renovation, getting the home wiring right is critical to making the most of our congestion-free fibre network and enjoying the best broadband experience.

This is a handy guide to help get a dwelling ready for fibre. The internal wiring also applies to homes currently connected to our copper network but are being prepared for fibre in the future.

This brochure is predominately for single dwelling homes or premises like townhouses, flats, etc. The information relating to the home distributor hub and internal wiring also applies to apartments/tenancies within a multi dwelling building.

Before you undertake any work, please read our Technical Requirement documents for completing a new property development with Chorus.

All technical documents and other guides are available at

**[chorus.co.nz/develop-with-chorus](https://chorus.co.nz/develop-with-chorus)**

## Who does what?

**Developer/homeowner** – to install:

- 20mm green lead-in pipe from boundary to external termination point (ETP) position, with a draw-tape inside
- 20mm conduit from ETP to home distributor hub or optical network terminal (ONT) location, with a draw-tape inside
- Home distributor hub with patch panel and patch cables to multiple outlets throughout the house. Ideally also a LSZH microduct to allow for future fibre changes
- Products are available from electrical wholesalers or [hexatronic.co.nz](https://hexatronic.co.nz)

**Chorus** – either as part of pre-built fibre, or when a connection order is placed:

- Will install an ETP – unless you have chosen to install one earlier
- Will install the fibre cable from the ETP to the home distributor hub or ONT location via the 20mm conduit
- Will supply and install the ONT, terminate the fibre in the ONT and test the connection

**Broadband provider:**

- The home-owner's broadband provider will supply the modem (if required)

# Handy stuff to know

## 1. The external termination point (ETP)

The ETP is a small box on the outside of a dwelling and marks the point where our fibre network from the street is carried to the dwelling before it is connected to a home's internal cabling. The ETP helps to prevent water getting into your home where the external lead-in pipe needs to transition through the wall to the internal conduit. It also allows Chorus access for maintenance if required.

- The ETP is typically positioned on an external wall e.g. garage or utility room
  - it should be situated on the side of a building near where other utility services are located
- Must be at a height between 300mm and 1500mm above the final ground level
- Make sure the ETP is installed away from any gas regulator/cylinder exclusion zone, and not under a water tap or in line with the incoming power cable
- Without an ETP, it may not be possible to be connected to the Chorus network

## 2. Pipe between ETP and home distributor hub

- Install 20mm conduit from the ETP position through the wall and into the home distributor hub. Do not use flexible conduit
- The route should not have more than three swept bends and should not have any elbow bends
- Include a draw-tape inside the conduit so that our technician can pull through the fibre cable
- As an absolute last resort, if there is no possible way to install the 20mm conduit because the distance from the ETP to the home distributor hub is too far, or the route too complex, use either an internal rated low smoke zero halogen (LSZH) microduct OR a composite Prysmian OptiC@t™5e cable. Run this from the ETP to the home distributor hub leaving at least 1.5m of slack at each end, making sure there are no tight bends or kinks.

## 3. The home distributor hub

The home distributor hub (also known as star wiring box) is a hub inside the dwelling that connects your fibre broadband service to other devices throughout the rest of the home either through Wi-Fi or interior cabling. It must be large enough to house devices such as the ONT, a router or modem, an ethernet switch and patch panel. An example of a generic hub is shown in this guide.

- Ideally the hub will be made of non-metallic (e.g., plastic) material as Wi-Fi capable equipment may be housed in there
- If possible, install the home distributor hub in a recess on the inside wall near the ETP position, about eye level is best
- We recommend minimum dimensions of 350mm wide x 700mm high x 80mm deep
- It must also have integrated power sockets for devices. Two dual power outlets as a minimum is recommended, positioned so that the hub door can close when in use. The bottom of the lowest plug is to be no lower than 50mm from the base of the hub to allow for vertical 'wall wort' plugs
- The hub door must have louvers or vents so air can circulate to keep the equipment cool.

#### 4. ONT Location if not in a home distributor hub

- Easily accessible for the customer, and ideally centrally located to where the internet will be used the most, i.e., living room (preferably not a bedroom where the flashing lights can be an issue)
- Clean and dry with good ventilation i.e., not in a hot water cupboard, bathrooms, toilets, under floors or in ceilings
- Near a power point or multi-board, but not a double adaptor and adjacent to at least 2 ethernet outlets

#### 5. Internal wiring

To get a good Wi-Fi experience, install ethernet access points to any fixed devices within the dwelling (desktop computer, TV etc). This includes the modem if it's not going to be sited in the home distributor hub. This will leave your Wi-Fi capacity for the mobile devices within the dwelling.

We recommend 2 x Cat6 cables from the home distributor hub to each outlet position, and a RJ45 socket at the end of each Cat6 cable.

Ideally, 4 x RJ45 sockets should be installed next to the television to make sure there is enough connectivity back to the rest of the home.

Additional fibre pathways are also recommended to allow fibre to be installed further into the dwelling beyond the home distributor hub. Internal rated Low Smoke Zero Halogen (LSZH) microduct with an outer sheath is preferred.

It is important that cabling is compatible and compliant with the New Zealand Telecommunications Forum recommendations ([tcf.org.nz](http://tcf.org.nz)) and international standards.

Testing and verifying the data cabling throughout the house is highly recommended. Data cabling has different installation constraints than electrical cabling and performance can be impacted by:

- too much cable insulation being removed
- cabling being too close to electrical cabling, causing interference
- cable bend radius being exceeded
- wiring being incorrectly terminated
- copper pairs not kept twisted as close as possible to the point of termination
- poor quality cables and components being used

