

This guide is for all **property developers, architects or builders** installing fibre optics in a new subdivision.

Fibre on-site

Your guide to installing fibre in a new subdivision

What's inside

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What you need to do

- Read this guide carefully and also familiarise yourself with the Fibre at home guide which provides background information about what the changes will mean to homeowners.
- Pass on the Fibre at home information guides to all purchasers.
- Follow the connection design and installation guidelines explained in this guide.
- Pass on these Fibre on-site guidelines to all contractors and parties involved in the design and build on the properties.
- Go to **brightspark.org.nz** for more information and future updates.

Note: This document has minor alterations made by Visionstream Pty Ltd which is the service company for Chorus Networks from the Bombay Hills north.

All changes made have been identified with the following mark. **VPL**

A revised official version will be released via the brightspark.org.nz website in due course.

If you have any queries please feel free to contact Visionstream on 09 352 1000

Building homes for the future

The future of telecommunications lies in enabling faster, more reliable connections. That's why many of the country's newest subdivisions are now being connected directly to optical fibre – rather than the traditional copper cable which has been used in the past.

This means as a property developer, builder or architect, you'll have new requirements and standards to meet around telecommunication infrastructure for any future build projects of 100 or more residences.

Introducing fibre on-site

Changing to fibre enables a reliable and robust service, future-proofing new homes or office premises for next generation telecommunication services.

We've put together this guide to help you understand what these changes mean for your next building project and what steps you'll need to take to meet the new requirements. We also recommend you look at our user guide Fibre at home to fully understand the changes.

So let's get started and find out what changing to fibre will mean for you and your next building project.

The latest information
will always be found
on our website:
brightspark.org.nz

1.0

Installing fibre

What it means for developers, installers and the building industry

The building and installation requirements for fibre will be new to you and your team. Fibre to the home cabling standards and layout differ significantly to the existing copper network cabling currently being installed in other areas around New Zealand.

You and your contractors will be required to meet the new entry cable and wiring requirements (see the following pages), while Chorus contractors will manage the initial network cabling, pipe installation and connecting customers to their new fibre network.

In order to deliver quality internet and Voice over Internet Protocol (VoIP) solutions to home owners in these new subdivisions, it's crucial that cabling and wiring complies with the Cabling Code of Practice as set out in PTC 106. This code of practice is available to download from www.telepermit.co.nz.

Check out our Connection and Wiring information on the following pages to find out what specific changes you'll need to make.

Need more info?
Contact Telecom's
Subdivisions Group on
0800 SUB DVN or email
tsg@telecom.co.nz

Connection and wiring

In order to prepare the new premises for fibre, all parties involved will have to work together to meet the new requirements.

After the rollout of fibre in the subdivision:

Site contractors will be responsible for:

- Digging a trench for the underground lead in pipe, and arranging for a trench inspection and installation of the lead in pipe
- Installing the pipe through the external wall
- Providing flush boxes on the internal framing
- Providing an AC power outlet
- All internal communications wiring.

Chorus service technicians will be responsible for:

- Trench inspection and installation of the underground lead in pipe through to the External Termination Point (ETP) on the external building wall.

Trench inspection and lead in pipe installation:

Before digging trenches to any residence, check the trenching requirements for urban installations at www.telepermit.co.nz/Urban.pdf. For rural installations refer to www.telepermit.co.nz/rural.pdf. (Note that the contact for trench inspection and pipe installation on these documents is relevant to copper cabling only. Please follow the process below for fibre-optic cabling.)

Once the trench is dug, call WorldxChange on **0800 123 456** to arrange for a trench inspection, fitting an external termination point, and installing a conduit (green) pipe. WorldxChange will arrange for a Chorus service technician to visit, usually on the day the trench will be filled in. A visit requires two to three days notice, and you'll need to advise the length of the trench and the address.

Lead in pipes can share a common trench with other services as long as it has adequate protection against hazards or damage.

Once work is complete and customers are ready for service to be connected:

- Contact WorldxChange on **0800 123 456** to arrange a site visit by a Chorus service technician.
- The Chorus service technician will:
 - > provide and install an Optical Fibre Termination (ONT) in the Star Wiring Box (this will already be set up – see page 5 of this guide) and connect the incoming fibre to the ONT.
 - > install the Residential Gateway (RGW).

The outgoing Cat5 (this is the minimum specification) cables from the ONT will connect into the Residential Gateway (RGW), via the Home Distributor patch panels in the Star Wiring Box.

Star wiring (home distributor) box

The following information provides the best way to set up the Star Wiring (Home Distributor) Box. Be sure to read it carefully and if you have any problems, feel free to contact Telecom's subdivision group on **0800 SUB DVN**, or email **tsg@telecom.co.nz**

**PLEASE REFER TO
VISIONSTREAM DIAGRAM ON
FOLLOWING PAGE.**

Step 1

To begin, ensure your box meets the minimum Star Wiring Box dimensions:

> 365mm (W) x 710mm (H) x 80mm (D).

Note: The door on the Star Wiring Box should have louvers to facilitate air movement for equipment cooling.

Step 2

The External Termination Point (ETP) position will ideally be located on the external wall of the garage.

Step 3

- > Ensure that a plastic pipe is installed through the brickwork at the ETP position and up into the Star Wiring Box.
- > A minimum of 15mm diameter pipe must be used for this purpose.
- > Use a 300mm 90 degree bend. Do not use an elbow bend.

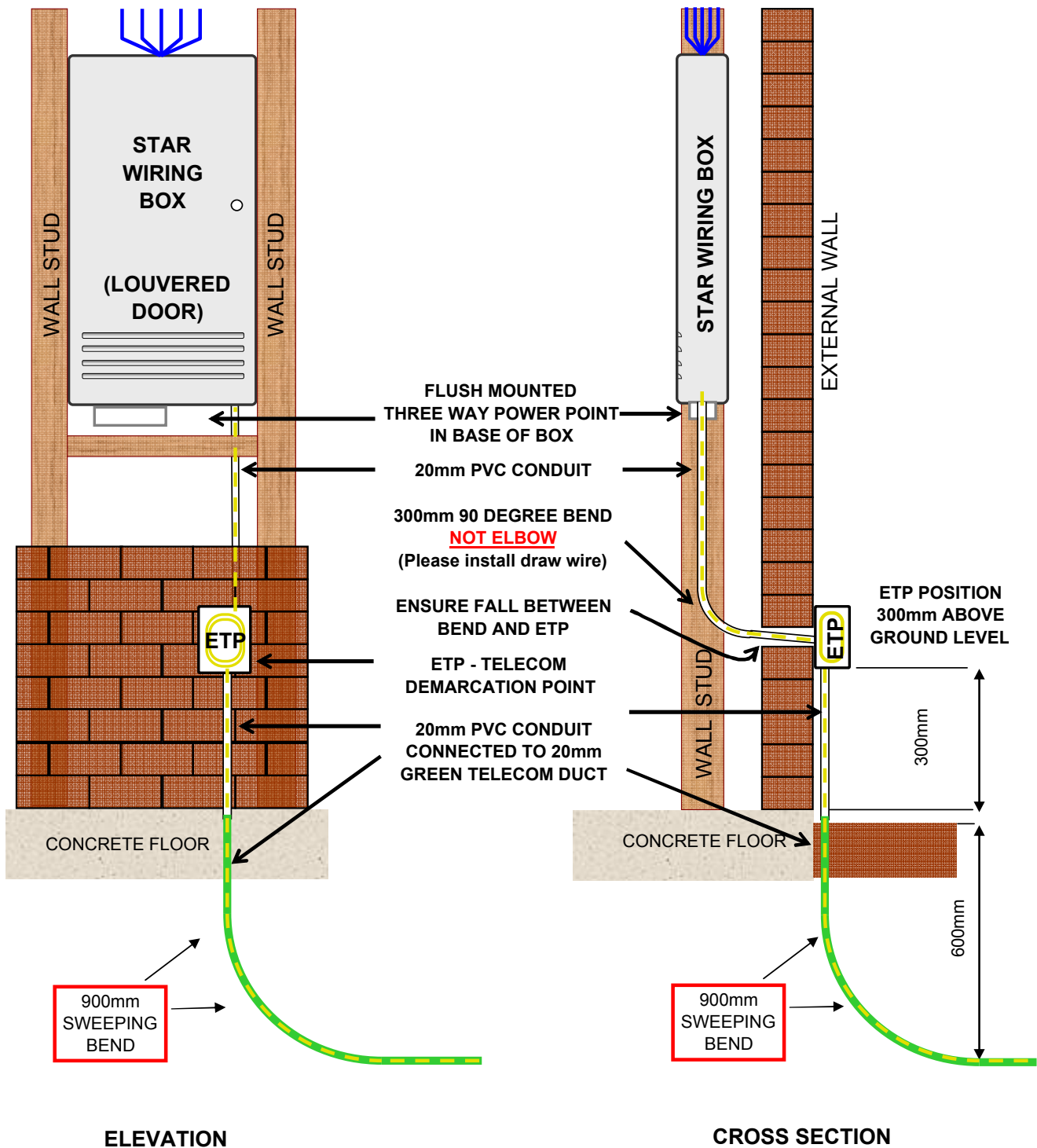
Step 4

Run a draw wire **VPL** from the Star Point to the ETP position.

Step 5

Leave at least 1000mm of slack loop at the Star Wiring Box and at least 500mm slack at the ETP position.

STAR WIRING (HOME DISTRIBUTOR) BOX DRAFT WIRING DIAGRAM



For queries or to arrange a site meeting to discuss, please contact:
 Matt Daly
 Project Manager - Subdivisions
 Visionstream Pty Ltd
 Ph: 021 489 468
matt.daly@visionstream.co.nz

Step 6

VPL

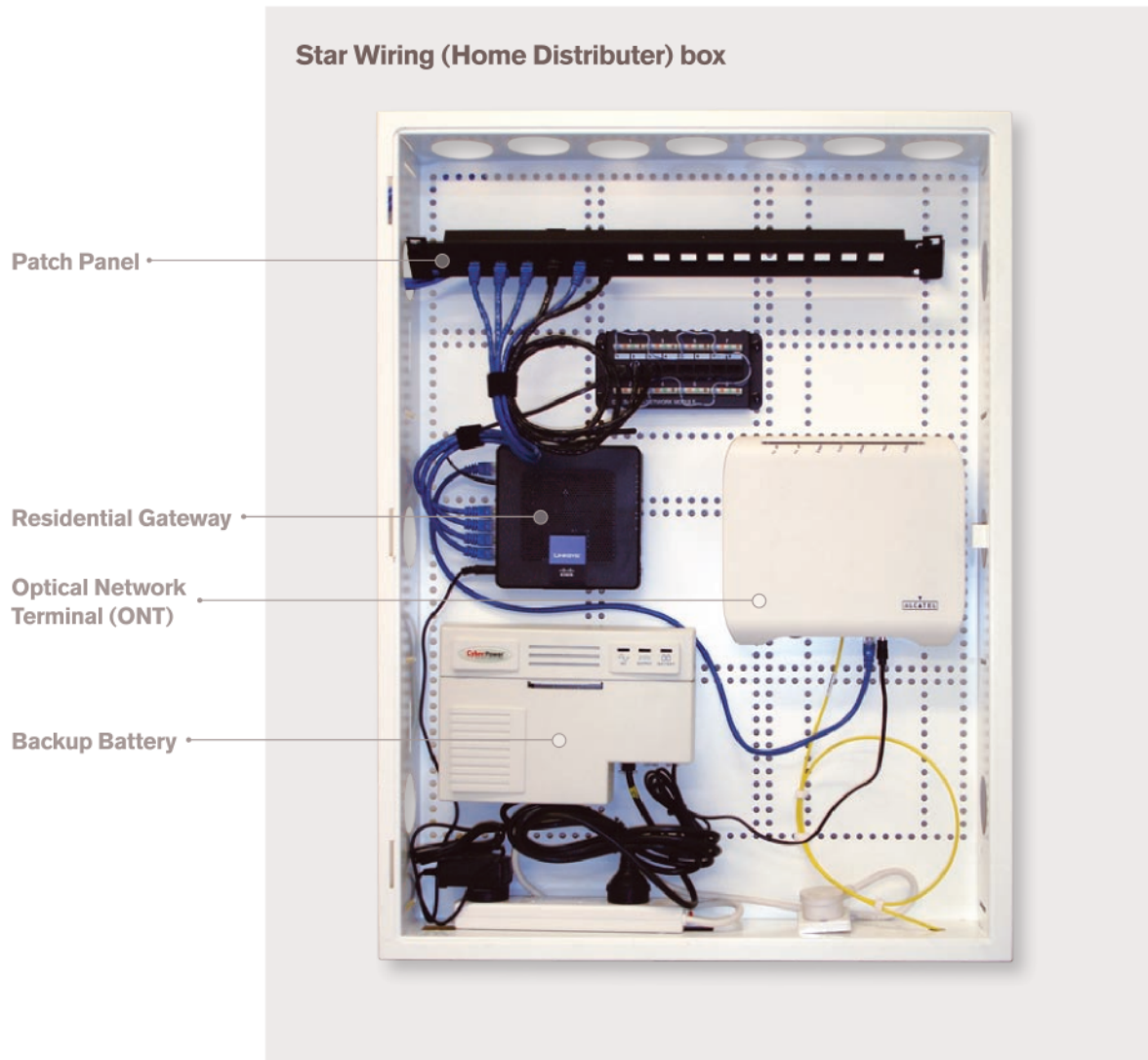
Install a 3 way power outlet in the bottom of the Star Wiring Box to power the equipment.

Step 7

The Star Wiring Box must be installed in the inside wall above the ETP position – about eye level is ideal.

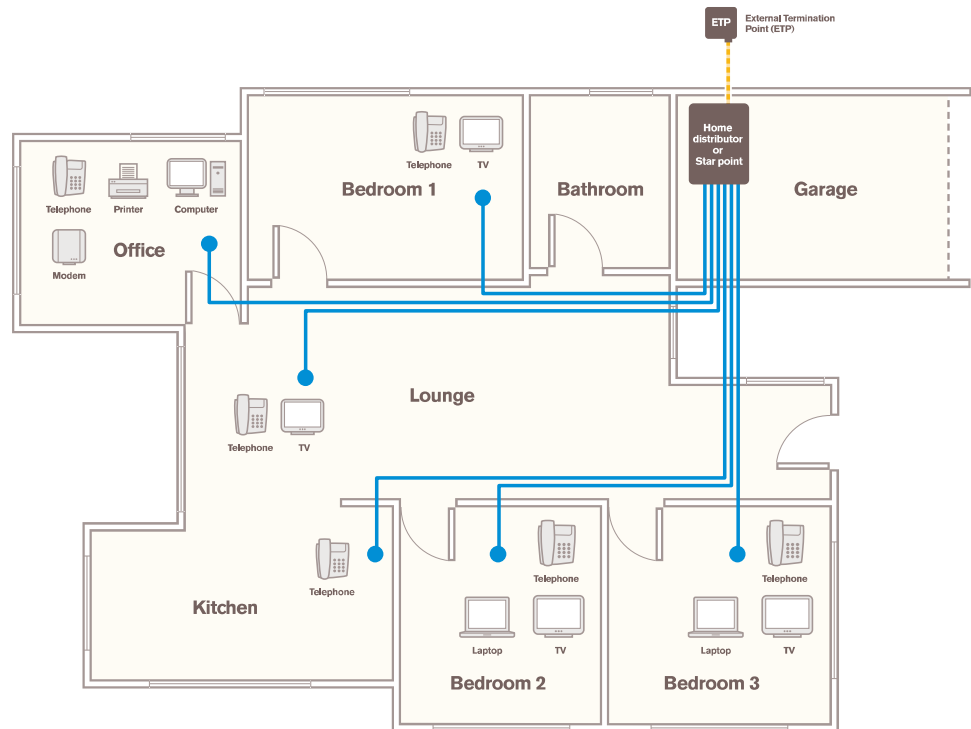
Below is an example of how a Home Distributer box looks.

Note: Actual unit may vary.



Minimum communication cabling

The following information provides minimum wiring requirements for all new homes with fibre. For full details, please refer to the Cabling Code of Practice PTC 106, which can be downloaded from www.telepermit.co.nz.



The minimum cable installation requirements for fibre to the home are:

1. The cabling must be Star configuration.
2. A “Home Distributor” is located at the Star Point to provide crossconnect and testing facilities.
3. This Star Point must be internal, accessible and located just above the External Termination Point (ETP) position. The Star Point will typically be on the side wall of the garage, set into a wall.
4. Cables must be a minimum specification of Cat5.
5. Two Cat5 cables must connect from the Star Point to each outlet position.
6. You must leave at least 300mm of cable slack at each outlet.
7. A draw wire ^{VPL} should run from the Star Point to the External Termination Point. You should leave at least 500mm of cable slack at the ETP.
8. Cable running through the brickwork at the External Termination Point must be protected in a short length of plastic pipe.
9. You must ensure all clearances between communication cables and power cables are maintained.
10. The Star Point Wiring box must be large enough to house devices such as a router. It must also have integrated power sockets for these devices.

Recommended outlets

When you're looking at where to install outlets or jack points in the new premises, be sure to consider the following:

- At least one dual RJ45 type jack point (co-axial outlets can also be on the same faceplate) in each bedroom and normally occupied room.**
- Avoid wet areas such as bathrooms and laundries. Two or more outlets are recommended in the lounge, rumpus room and study.**
- At the Star Point, the cables should ideally be terminated on RJ45 type modular sockets mounted in a patch panel. This will allow for simple patching to and from routers and easy replacement if one gets a fault.**

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Next generation telecommunications

The world of telecommunications is moving fast. Companies like Amazon are already preparing to offer full length, high-definition movies for download. Television broadcasters are looking to supply programming via the Internet. These and many other great new services will require world-class, high-bandwidth connections.

In other words, fibre.

About fibre technology

Optical fibre is more reliable and consistent than traditional copper wiring because the high-bandwidth signals are transmitted by light instead of electricity. This means signals are far less prone to degradation, and much faster too.

In fact, you could say fibre was light years ahead.

Understanding next generation telecommunications

Digital voice services

New homeowners with fibre will make phone calls through digital voice technology, sometimes called Voice over Internet Protocol or VoIP. This exciting technology digitises conversations, sending them through dedicated broadband channels. This means that phone conversations are separated from, and prioritised over, ordinary internet traffic.

As well as crisp, clear sound quality, this allows for competitive calling rates when making international and long distance calls.

What's more, digital voice technology is compatible with most modern telepermitted phones, so in most cases homeowners can take their existing phone with them when moving into a new home.

Using the digital voice service is as simple as using a regular phone. They'll have a phone number, a dial tone when they pick up the handset and they won't need to dial any special numbers before making a call. Also, if the property they're moving to is within the same area, then it's likely they'll be able to keep their existing phone number, although this should be checked with their service provider.

They can also add another phone line or take advantage of recognised features like call waiting and voicemail.

Broadband over fibre

Fibre to the home is an important part of the future of telecommunications. In New Zealand it's a new way of providing vastly higher bandwidth to users for more robust video, internet and voice services.

Broadband

You can expect speeds of up to 30Mbps downstream and 6Mbps upstream from the new broadband over fibre service. Be aware though that as with copper, there are several other factors that can affect the web browsing experience, such as the computer in use, the server being accessed and how 'busy' the internet is at the time of browsing.

Digital voice calls

As with the analogue phone service homeowners can make local, national and international calls. They'll also have access to enhanced services including call forwarding, call waiting, do not disturb, anonymous call rejection, three way calling, voicemail and more.

Fax services

Most modern faxes should work perfectly over fibre. However, should you experience any problems with a particular model of fax please contact the service provider in the first instance. Service providers are unable to guarantee successful fax operation.

Household alarm services

For monitored alarm services we recommend an IP-based house alarm is installed. Currently (at May 2008) the only provider of IP-based alarms in New Zealand is Alarm NZ.

Details of approved IP-based alarms and battery backups are listed on Alarm NZ's website.

If the property is protected with an analogue alarm remote monitoring over the phone line will not be available without upgrading the alarm. For more details contact the service provider.

Monitored medical services

If someone in the property needs a medical alarm the provider will need to confirm that the service will work over a fibre connection. Contact the service provider in the first instance.

Details of approved IP-based medical alarm solutions are listed on Alarm NZ's website.

World-wide technology trends: fibre for the future

Fibre is universally acknowledged as the way of the future. Internationally, more and more countries are investing in fibre infrastructure over copper as the most efficient and reliable way of providing high-bandwidth to the home or office.

New Zealand is part of this global change and Telecom is proud to be creating these possibilities for future generations of New Zealanders.

And of course, it's not just about downloading movies quickly. Fibre-based communication opens up all kinds of new avenues across everything from distance learning to telemedicine. Opportunities for telecommuting and working from home will increase. And experience tells us that next generation broadband will inspire further innovations that we haven't yet imagined.

3.0

Delivering the service

Who is involved?

Delivering new telecommunications services over fibre has been a huge task. A number of parties are involved, each covering a different aspect of the service.

These include:

Telecom Wholesale

Telecom Wholesale is responsible for building the core product used by the service provider to connect their broadband and digital voice services. Telecom Wholesale was also tasked with finding a retail partner for the pilot programme.

Chorus

Chorus is the network arm of Telecom, which is separated from Telecom's retail and wholesale businesses. Chorus is responsible for laying the physical fibre and maintaining the network infrastructure. It will be Chorus engineers – in Chorus branded vehicles – who carry out installations, repairs and maintenance to the network elements of the service.

WorldxChange

WorldxChange was founded in 1996 and is now a 100% New Zealand owned, full service telecommunications carrier. During the pilot stage of the fibre roll-out, services for broadband and phone will be provided by WorldxChange.

If you'd like to know more about any of these companies, please go to the About Us section on brightspark.org.nz

4.0

Contact us

If you have any questions about this material, in the first instance, please contact Telecom's Subdivisions Group on **0800 SUB DVN**, or email tsg@telecom.co.nz

It's important to be aware that fibre technology and connectivity is not 'owned' by one company. The following table outlines the 'ownership' of the different hardware and services that make fibre to the home possible.

| Equipment/ Connectivity | Owner | Supplier | Installer |
|--------------------------------------|----------|------------------|-----------------|
| Star Wiring (Home Distributer) box | End User | Builder | Builder |
| ONT and Connectivity (cables) | Chorus | Chorus | Service Company |
| Residential Gateway (RGW) and cables | End User | Service Provider | Service Company |

For more information
and latest updates visit

brightspark.org.nz