# Fibre to the Home



All homes at Blakes Crossing are serviced by optic fibre cable running outside the property boundary. The optic fibre cable is capable of delivering ultra high speed internet, phone services, free to air and pay TV. Traditional copper telecommunications are not available at Blakes Crossing.

The optic fibre network is owned by Opticomm. For more information on Opticomm please visit their website. www.opticomm.com.au

All homes are required to provide the following infrastructure to enable connection to the fibre network.

**Minimum Requirements**

- A common service meter box containing a separate compartment for communications, gas and electricity.
- A conduit as per the detailed specs from the communications pit in the footpath to the meter box.
- An internal power point in a location where the battery may be mounted.
- A figure 8 cable from the battery location to the meter box.

When the home is fitted with the above requirements Opticomm can connect the home to the fibre cable in the footpath. Opticomm will install a network termination device (NTD) inside the meter box and a battery inside the home adjacent the dedicated powerpoint.

To arrange the connection please call 1300 137 800. A connection fee payable to Opticomm will apply at this time.

Attached to this specification is the cable entry guide as published by Opticomm specifying the 30mm conduit and 300mm bending radius. All wiring and conduits are required to be installed as per the attached Cable Entry Guide.

**If you have any queries, please contact the Blakes Crossing Project Office at 1 Roxburgh Crescent, Blakeview on 8209 1300**

## What Services are Available at Blakes Crossing?

Blakes Crossing is supplied with high speed fibre, therefore a traditional phone line system is not installed. As a result a typical home phone line with Telstra cannot be supplied.

Phone services are provided over the fibre through technology known as VOIP. There are a wide number of providers offering phone services over the Opticomm network, often in conjunction with internet packages.

If you choose to have a home phone using the VOIP technology you are still provided with a home phone number and use a typical household phone plugged into the wall socket within your home.

High speed internet is available through many providers offering a wide variety of internet and internet & phone plans. The standard NTD has the ability to locate 1 internet outlet within the home.

Television services are free to use once the home is connected to the fibre network. Television signals are transmitted through the house using standard television cables and antenna points. TV points can be placed in multiple rooms using a standard splitter box.

## Connecting To The Footpath Pit

The communications pit located in the footpath or verge near your property contains the fibre optic network.

The pit has conduit stubs from the pit into the property boundary. The conduit from the meter box is required to be connected to the stub in accordance with the Opticomm Cable Entry Guide.

**ATTACHMENTS: Opticomm Cable Entry Guide**


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# Fibre to the Home



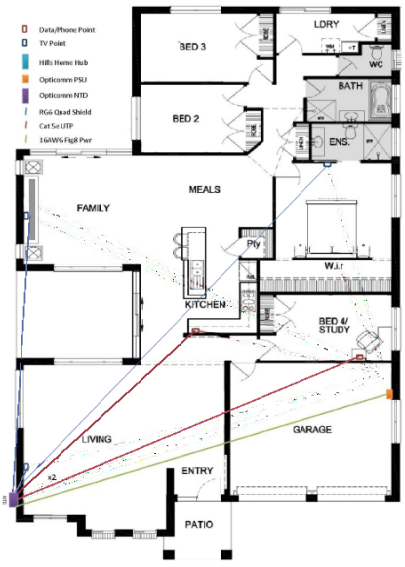
**Internal Wiring**

Internal wiring options to make the most of fibre technology can range from a simple set up to a whole of home smart wiring option. Below are two examples of how you may wish to set up the internals of your home. Your builder or electrician can further advise on internal wiring options.

Option 1:
- 1 telephone point.
- 1 internet point.
- Multiple TV points.

Works and equipment required:
- Minimum requirements and opticomm connection.
- Standard TV splitter to split TV signal.

What you get:
- One phone point located within the home wired back to the meter box.
- One internet point located within the home wired back to the meter box. This internet point can then be used to attach a wireless router to provide wireless internet throughout the home.
- TV splitter located in the ceiling space to split the signal from the meter box into mulitiple rooms.

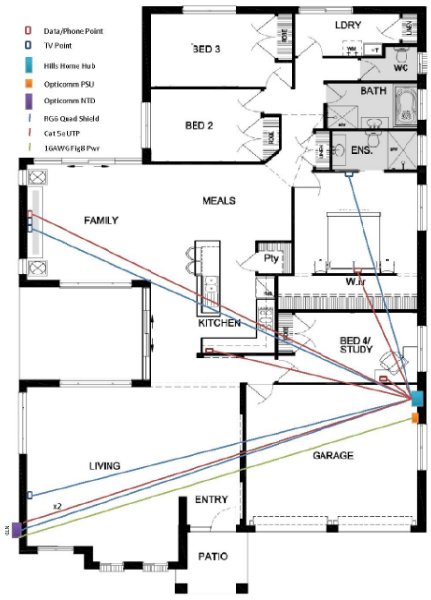



Option 2:
- Multiple telephone points.
- Multiple internet points.
- Multiple TV points.

Works and equipment required:
- Minimum requirements and opticomm connection.
- A Home Distribution Unit (HDU). The HDU will split the internet, phone and TV points enabling multiple access points.
- An additional power point for the HDU.
- 2 Cat5e cables from the meter box to the HDU location. (phone and data)
- One Quad Shield RG6 cable from the meter box to the HDU. (TV)

What you get:

- Multiple phone points located within the home wired back to the HDU.
- Multiple internet points located within the home wired back to the HDU.
- Multiple TV points within the home wired back to the HDU.





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# Cable Entry Guide

Document No: TG-001

Issue Date: 14/01/2009

Version: 2.0

# Document Control Sheet

## Record of Issue

| Issue | Date | Description |
|---|---|---|
| A | 16-Nov-08 | First draft document issued for discussion |
| 1.0 | 14-Jan-08 | |
| 2.0 | 14-Feb-09 | Removed references to different types of conduit size. |
| 2.1 | 20-Mar-09 | General updates. Telecommunications Cabling Advice. |
| 2.2 | 2-Sep-2009 | Update of Conduit sizing & Pay TV requirements |
| | | |
| | | |

## Acceptance and Approval

| Issue | Name | Position | Signature | Date |
|---|---|---|---|---|
| A | S. Davies | GM, Operations | | 16-Nov-08 |
| 1.0 | S. Davies | GM, Operations | | 14-Jan-08 |
| 2.0 | S. Davies | GM, Operations | | 14-Feb-09 |
| 2.1 | S. Davies | GM, Operations | | 20-Mar-09 |
| | | | | |

In the event of any enquiries with respect to this document, please contact:

| Name | Position | Phone | Email |
|---|---|---|---|
| S. Davies | GM, Operations | - | sdavies@opticomm.net.au |

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## 1.0 PURPOSE

The aim of this document is to outline what is required for homeowners and their builders, or developers to connect to telecommunication networks based on Fibre to the Home (FTTH) technology.

## 2.0 SCOPE

This document extends to detached or semi-detached buildings that are being built for residential or small business use. It covers requirements of connection from the telecommunications pit to the Home Distribution Unit.

## 3.0 THINGS YOU SHOULD KNOW

### *3.1 Introduction*

Modern technology has brought many changes to the way we live, specifically in communications where many new services are being introduced that require high-speed delivery infrastructure. New Digital Telephone, Ultra-High Speed Internet and Television Services (including pay and free to air) offer greatly enhanced performance when compared to older technology. To accommodate these changes, residential developments must move forward with technology and provide infrastructure that will have the capacity for not only today but also for future technological advancements.

In standard residential areas, the incumbent carrier meets the basic communication needs of the community. At OptiComm, our commitment is about being at the forefront of the education and broadband revolution, and as such we provide advanced fibre optic communication infrastructure as a replacement for the traditional copper network.

### *3.2 Services*

Fibre communication network will provide a range of services, including reticulation of the analogue and digital free to air television signals, Pay TV, Ultra-HighSpeed Internet, and a Standard Telephone Service. Additional services, such as Community Intranet, security monitoring, gate control, and new entertainment services such as IPTV and Video-on-Demand, are all possibilities with this latest technology. These may be introduced in the future.

### *3.3 Connection*

A fibre optic enabled community allows for you to connect to the network that runs past your property. A fibre optic lead in cable connects to a device on the external wall of your home. This is called a Network Termination Device (NTD) and it is where the optical signal (light) is converted to an electrical signal and retransmitted on twisted pair and coaxial cable to your Home Distribution Unit (HDU).

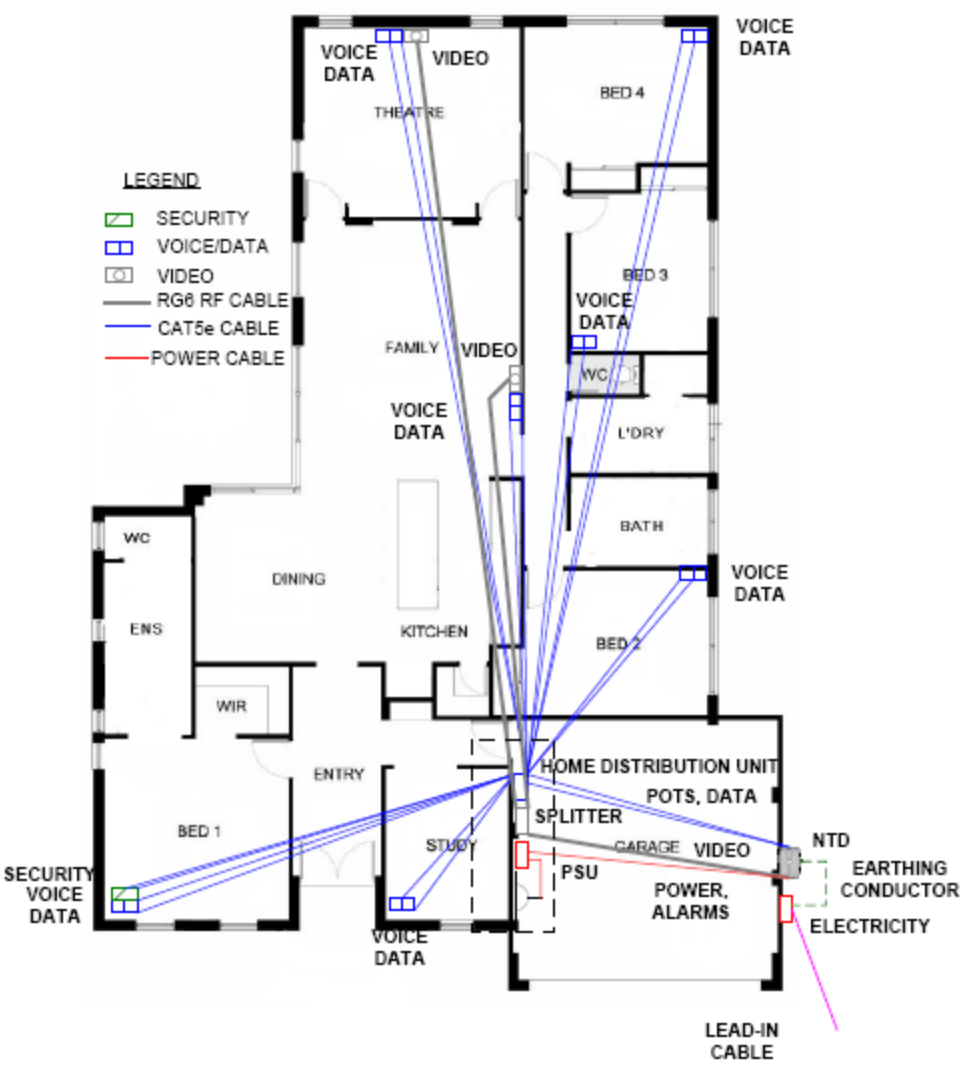



Figure 1 - Example of a typical building cabling system

To be able to connect to the OptiComm's Optical Fibre Network, you must wire your home in accordance with the specifications provided. This specification outlines the materials to use and recommends smart wiring in your home. Your Builder / Telecommunications Contractor must follow the specifications and not substitute "equivalent" materials at any point in time. If you are about to commence construction, wiring your home correctly during initial construction will save you considerable expense when compared to the cost of rewiring your home once you have moved in.

It is also mandatory during construction of your home that your Builder or Telecommunications Contractor provides the appropriate continuous vessel between your home and the communications infrastructure running down the street. This vessel or "conduit" will be used to pull through a fibre optic cable and connect your home to the rest of the world, enabling you to receive telephone, internet and television services.

### *3.5 Outdoor Antennas*

In your community the agreed Local Structure Plan and Restrictive Covenants prevent you from installing any form of outdoor antenna for television reception. However once your

home is connected to the fibre network, you will receive perfect quality analogue and standard and high definition digital television signals which can be reticulated throughout your home.

### *3.6 Satellite Dishes*

As with outdoor antennas the restrictive covenants prevent the installation of satellite dishes. The fibre optic network will reticulate the major Pay-TV channels throughout your estate enabling you to deal directly with your preferred operator and providing superior quality reception.

### *3.7 More Information*

As a homeowner you are responsible for organizing installation of your connection and all costs associated with that connection. For more information contact the people below:

**For more information contact**

**Opticomm on 1300 137 800**

**Or via email helpdesk@opticomm.net.au**

For multi dwelling lots please contact Opticomm as you will require additional services and pipework installed (at your cost) within the property boundary.

## 4.0 EQUIPMENT DESCRIPTION

### *4.1 Conduit*

A "lead in" conduit is required to run from the telecommunications pit in the street to a Network Termination Device (NTD) installed on the outside wall of the house. The conduit used must be ACA approved conforming to AS2053.1:2001. The nominal inside diameter must be 25mm, made of PVC, be white in colour, and marked with "Communications" for easy identification.

***It is the home owner's or builder's responsibility to ensure this lead in conduit is installed prior to Opticomm attending the site for installation of the NTD.***

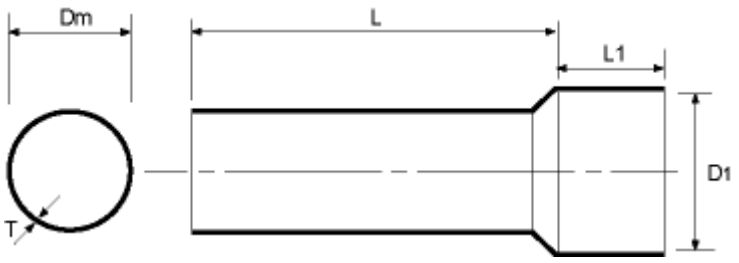



Figure 2 - Rigid conduit(Vinidex, 2008)

Below are details of two vendors who supply conduit meeting the above requirements. However you are free to select any vendor who supplies conduit to the same specification.

| Pipe size (mm) | Product Code | | Outer Diameter (min) | Wall Thickness (min) | Bore (mm) |
|---|---|---|---|---|---|
| | Vinidex | Iplex | | | |
| 20 | 11715 | CTCO20 | 26.7 | 1.8 | 23.3 |

Table 1 - Conduits available

| Product | Product Code | | Size (mm) | Degree | Centreline Radius (mm) | Length (mm) |
|---|---|---|---|---|---|---|
| | Vinidex | Iplex | | | | |
| Bends | 32570 | CT73271 | 20 | 90 | 305 | 572 |
| Slip Couplings | 30205 | P00720 | 20 | | | 70 |

Table 2 - Conduit Fittings

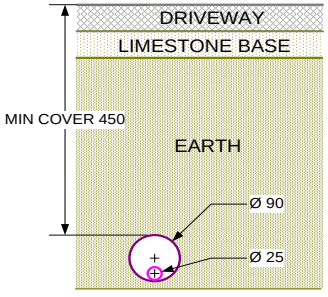
Any bends required in the “lead in” must be 90-degree sweep bends (not elbow bends) with a minimum radius of 300mm. The conduit must be a single continuous vessel between the pit and the location on the side of the house where the NTD will be installed.

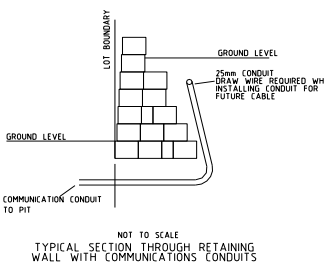
Opticomm normally installs a 1 metre stub conduit 20mm in size leading out of the telecommunications pit. The builder should locate this stub and couple the conduit they are installing.

During building construction, conduits should be installed for the NTD cabling at the owner’s cost. These must be ready for use but not provide a path for water or termites to enter the building.

If the lead in conduit is to be installed under a driveway or retaining wall, it is recommended being place within a 90mm storm water or irrigation pipe. This functions for two purposes;

- To protect the communications conduit from damage;
- To allow the future installation of other services (e.g. water reticulation pipes and wires)



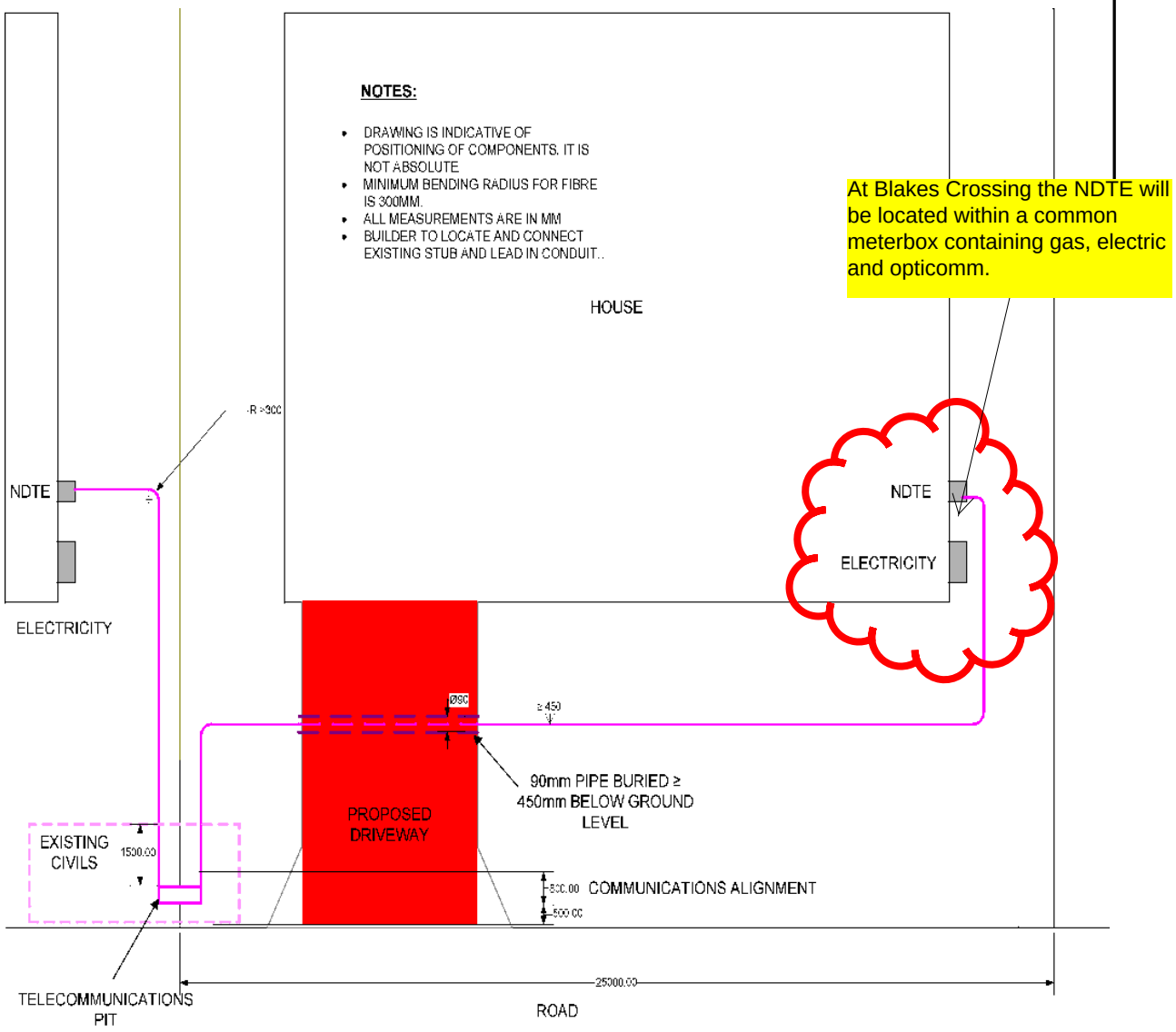



Fig 3 - A Typical lead in arrangement from street to house

Flexible 25mm Inside Diameter conduit may be used where the cable is above ground, such as running up the wall. The minimum bend radius must be observed, as well as having an inside diameter of 25mm. It must be grey or white in colour and non-metallic. It can be purchased from any electrical supplier.

### *4.2 Network Termination Device Enclosure (NTDE)*

This is the box required to house the NTD. It is normally located near the electricity enclosure on the far side from the street. This enclosure will be supplied by Opticomm at time of installation.

### 4.3 Network Termination Device (NTD)

Network Termination Device is also known as an Optical Network Termination (ONT). This marks a network boundary point connecting the homeowner's equipment to the fibre optic enabled community.

### 4.4 Power Supply Unit (PSU)

The homeowner must supply a 10 Amp 240 Volt General Purpose Outlet (GPO) to power a basic plug pack or PSU for the NTD. The PSU is usually located near the Home Distribution Unit located in the garage and uses the cabling low voltage cable installed between the HDU and NTD.

The PSU must be installed between 1700mm and 350mm above the floor level of the building. 1000m to 1300mm is ideal. For adequate ventilation and access to the unit allow a space of 340W x 295H x 125D inside the HDU.

### 4.5 Fibre Optic Cable

A pre-connectorised fibre cable will be installed from the network to the customer premises. This cable will be supplied and installed by [provider] at time of connecting the house to the reset of the network.

## 5.0 BUILDING ENTRY ARRANGEMENTS

### 5.1 Conduit

The conduit must enter the NTD to be terminated before it enters the house via a cavity in the brick wall. The rigid lead-in pipe can be replaced with flexible corrugated conduit near the NDT if it can be sealed from water and termite damage. Otherwise a conduit bending tool can be used to shape the rigid conduit to be installed. Either condition must provide a smooth path for the fibre with bends having minimum radius of 305mm.

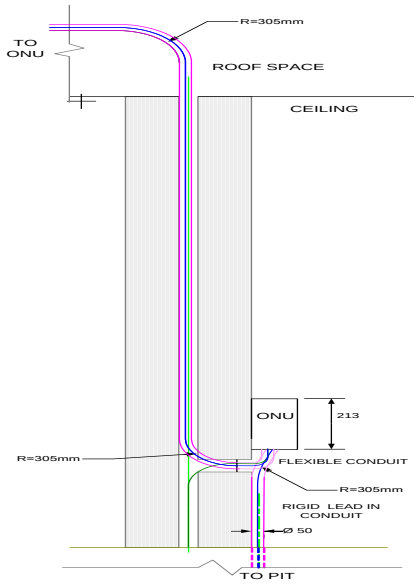



Figure 4 - Conduit entry to house

### 5.2 Lead in

The lead in is not to go through the concrete slab. Underground, it is to be rigid pipe and must connect properly to the existing 1 .5m of lead in from the communications pit. A coupler or bell end must be used to connect the pipe together with appropriate solvent cement. Bends with a minimum radius of 305mm must be used.

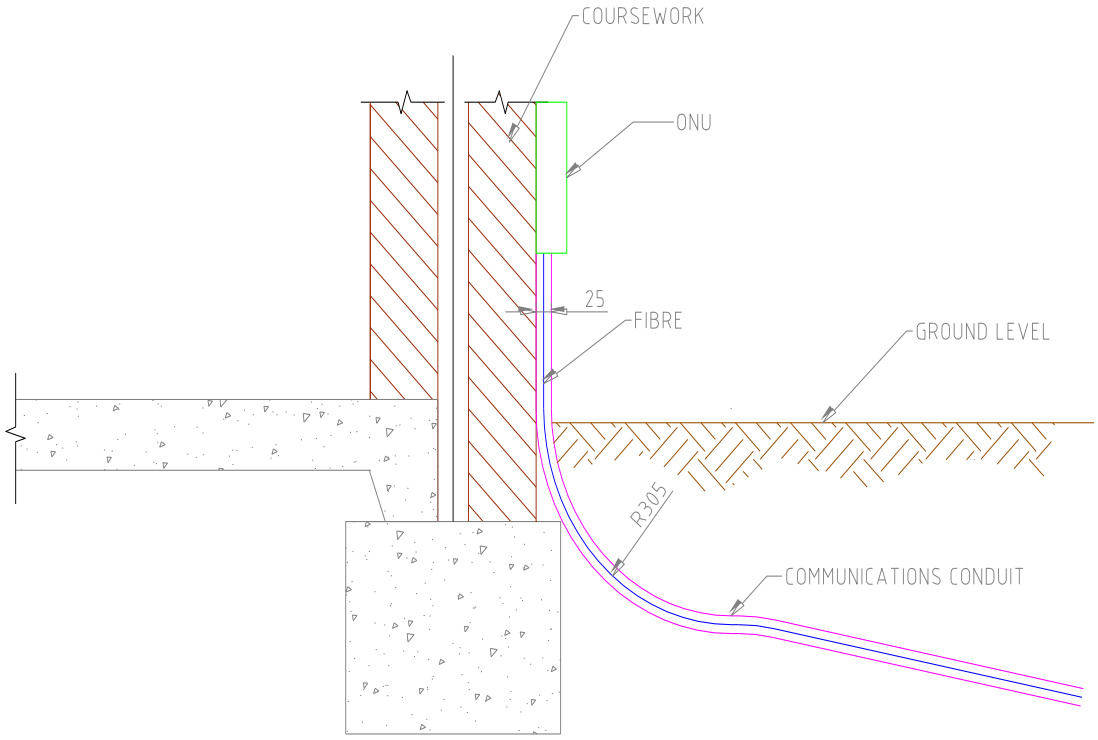



Figure 5 - Lead In

The lead in must be installed in such a way that it has minimal impact on the property. Whenever possible, the path must be underground until it is close to the NDT. Conduit must not cross over the top of structures like retaining walls.

### *5.3 Communications Pit*

Every effort should be made to keep the communications pit on the boundary easement accessible at all times. This will aid installation and maintenance of the network. Consider landscaping of the property and the level of the ground. Contact Opticomm if you wish to raise the ground level above the pit level.

Any damage to the pit servicing your property will be repaired by Opticomm at your cost, so ensure your builder takes care not to cover, damage or cause disruption to the telecommunications pit.

### *5.4 NTD Position*

After construction of the building is complete, Opticomm will install the NTD on your home, near the meter box. ← At Blakes Crossing this will be installed within the meterbox.

The NTD must be installed outside the building that the services are to be provided to. This cannot be a separate structure such as a detached building, separate garage or fence. Your builder should install the inside telecommunication cabling and present the cables at an approximate location near the meter box for termination onto the NTD.

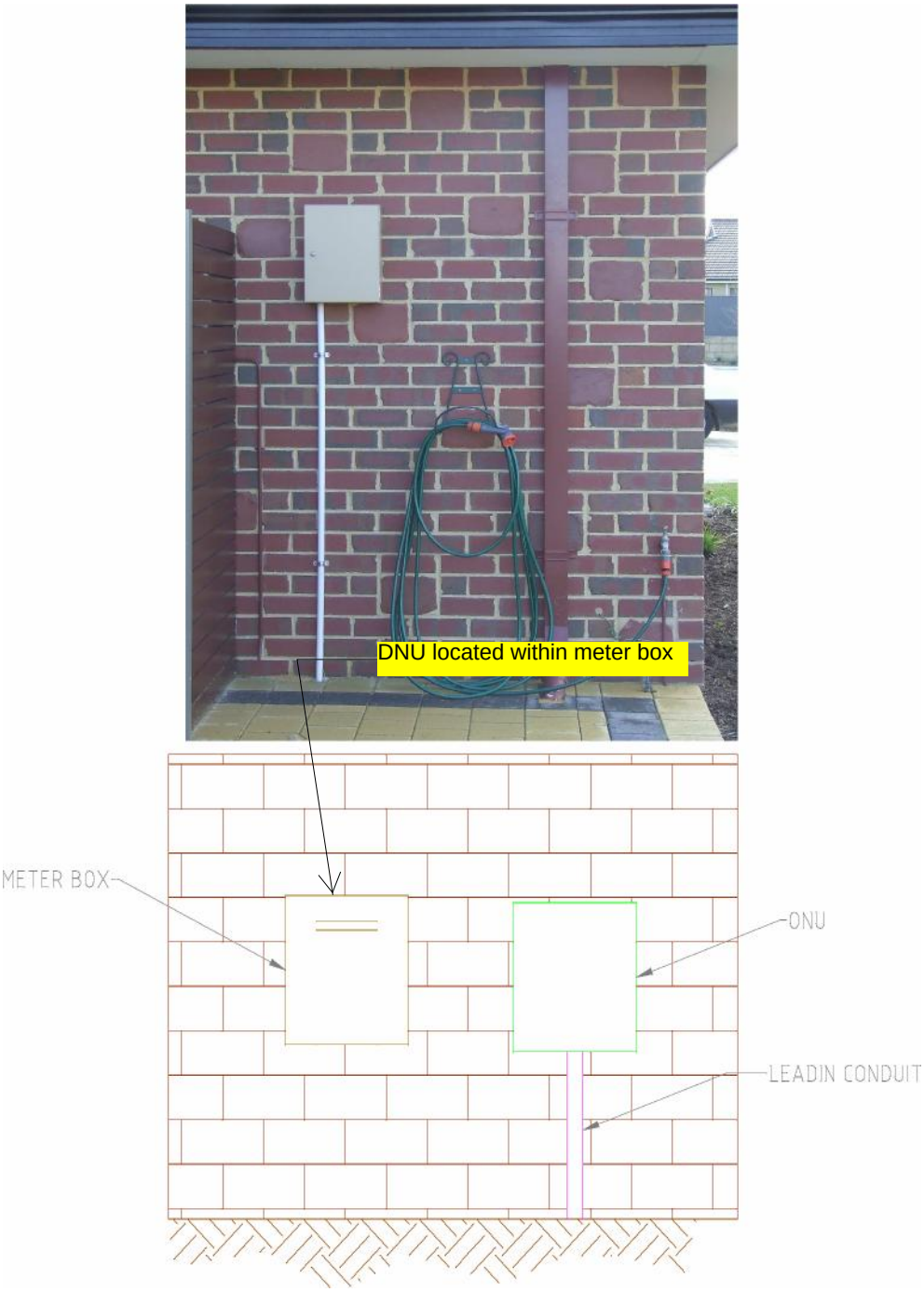



Figure 6 - House NDT Connection

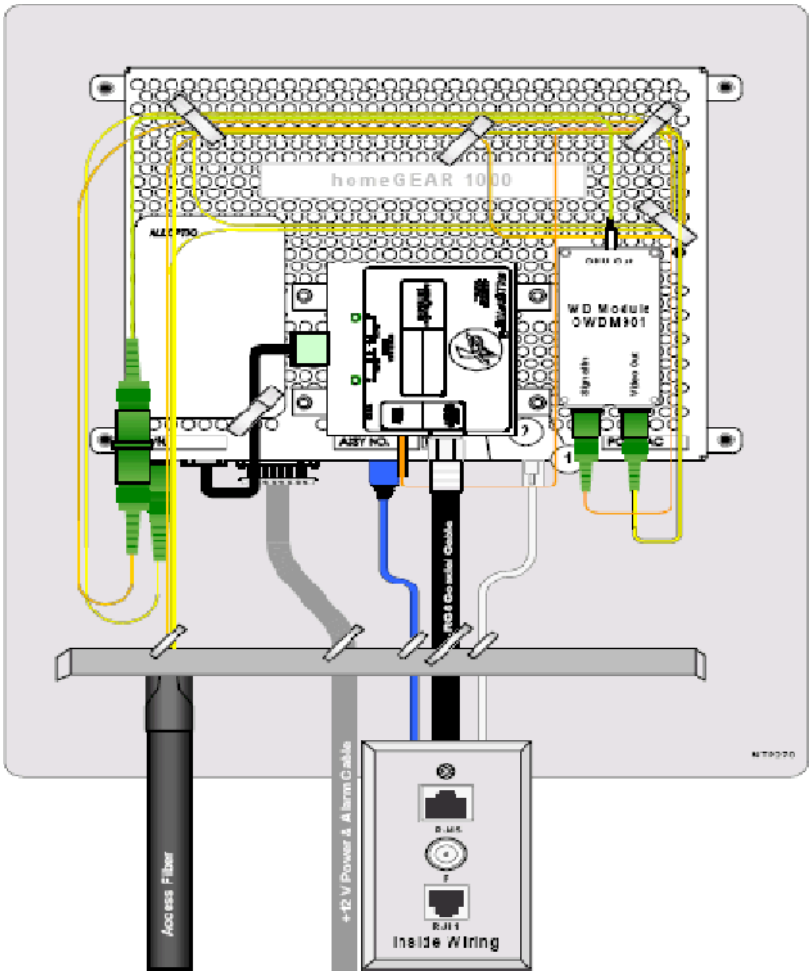



Figure 7 - NTD Detail (Image © Alloptic, 2004)

### *5.5 Multi Dwelling Lots*

Multi dwelling lots require a different installation. If it is a duplex or triplex it may be as simple as running two lead-ins to the pit and treating them as separate buildings. However if it is a large complex like a lifestyle village or an apartment block, there may need to be more civil infrastructure (such as conduit and pits) and design changes made to the network. It is best to contact Opticomm before construction to discuss requirements.

# 6.0 CABLING REQUIREMENTS TO NTD

## *6.1 Introduction*

It is the home owner's / builder's responsibility to ensure all appropriate cabling is provided from the Home Distribution Unit to the Network Termination Device. While not necessary, these cables can be run inside a flexible or rigid conduit.

## *6.2 Earthing*

The Network Termination Device must be earthed separately to the building's electrical earthing system (See fig 4.0). An electrician must provide a suitable earthing conductor if the earth electrode is not accessible at the Network Termination Device.

## *6.3 General Purpose Outlet*

To power the NTD, Opticomm contractors will install a UPS inside your home, near the wiring cabinet. It is a requirement to ensure you have a 240 volt GPO installed next to your wiring cabinet so it can power the NTD and the equipment inside your cabinet.

## *6.4 Power Cable*

The Network Termination Device requires a 12 Volt direct current (12Vdc) supply to operate correctly. This supply is provided by the Power Supply Unit located near the Home Distribution Unit. A two core cable is required to be run from the HDU to the NTD. As 12Vdc suffers from voltage drop over long distances please refer to the table below on appropriate cable types and sizes:

| Distance | AWG | $mm^2$ |
|---|---|---|
| Less than 10m | 16 | 1.31 |
| 10-20m | 14 | 2.08 |
| 20-30m | 12 | 3.31 |

Table 3 - Power cabling

If the distance between the HDU and NTD is greater than 30 metres, you will need to consider relocation of the PSU.

**Please Note Builders** are required to install low voltage cable (as above) from garage power outlet to NTD location to power NTD. OptiComm installers will install UPS power pack to low voltage cable in garage and terminate other end at NTD.

## *6.4 Television*

There needs to be one RG6 Quad cable installed between the HDU and the NTD. From the HDU one RG6 Quad cable needs to be installed to each TV/PAYTV point. Both TV and PAYTV are available at each point however PAYTV providers require a dedicated point for connection to their set top box.

### 6.5 Telephone

There needs to be one Cat5e cable installed between the HDU or telephone point and the NTD to provide telephone services. The one cable can be used for up to 4 telephone lines.

### 6.6 Internet

There needs to be at least one Cat5e cables installed between the HDU or activity room/office and the NTD to provide data services. One is dedicated to Internet service; a second can be installed for future services.

# Checklist

**The following is a checklist of what must be performed by the builder or home owner prior to Opticomm installing the NTD at the premises. Failure to make these arrangements will result in additional costs to the home owner.**

- ☐ Installation of a continuous 20mm (nom ID 25mm) (and undamaged) conduit from the stub conduit leading out of the telecommunications pit to the area near the meter box.
- ☐ Ensure use of rounded bends when installing the lead in conduit.
- ☐ Installation of an earth stake for the NTD equipment near the meter box.
- ☐ Install a minimum of two Cat5e, one RG6 and a Figure of 8 16AWG power cable between the HDU and the NTD.
- ☐ If no Smart Wiring system used, install a Cat5e through to the office for the internet, a Cat5e through to the kitchen (or other location) for the telephone, a RG6 to the living room for the TV and a 16AWG Fig8 cable to a point near a GPO in the garage
- ☐ Complete the Telecommunications cabling Advice notice

**Warning!** All customer cabling work MUST be performed by a registered cabler. If a cabler is registered, they will have a card which proves that they can legally perform cabling work.

The cabling work must comply with the Wiring Rules, which detail the minimum requirements for cabling installations to ensure that network integrity and the health and safety of end-users, other cablers and carrier personnel is protected.

The cabling is required to have adequately separation or segregation from electrical cabling to avoid creating a dangerous situation.

Failure to use a registered telecommunications cabler may result in fines of up to $13,200.

# Telecommunications cabling advice (TCA1)

Australian Government
Australian Communications and Media Authority

Copies required for customer, cabler and employer (if applicable)

## Instructions for completion

**Requirements**

A registered cabling provider must complete this form after each cabling job (except for certain exemptions). Cablers must retain a copy of this form for at least 12 months and pass a copy to the customer and/or employer.

Print clearly. Illegible, unclear or incomplete application forms may delay processing.

Where proposed works may be compromised by existing cabling, a TCA2 form should be completed.

**Enquiries**

For advice on completing this form, please go to ACMA's website at www.acma.gov.au (go to For licensees & industry: Service & technical requirements > Telecommunications : Cabling requirements > TCA forms > How to complete TCA forms).

Technical enquiries about cabling should be directed to:

Email: cablingqueries@acma.gov.au

Tel: 1300 850 115

## Registered cabling provider

Name

SURNAME

GIVEN NAMES

Address

Contact details

WORK ( )

MOBILE

Registration number

Name of registrar

## Employer (IF APPLICABLE)

Name of company

Contact details

WORK ( )

MOBILE

Address

POSTCODE

## Description of work (INCLUDING ANY SUPERVISION)

## Customer details

Name

Address

POSTCODE

Contact details

WORK ( )

FAX ( )

## Certification

I hereby certify that the cabling work described in this advice complies with the Wiring Rules (AS/ACIF S009:2006 or its replacement).

SIGNATURE

DATE

PRINT FULL NAME