



# Preparing a home for TransACT fibre-to-the-premise (FTTP) services

A guide for builders, telecommunications  
cablers and home owners

[transact.com.au](http://transact.com.au)

For more information call TransACT's FTTP Sales Manager,  
Rohan Untersteiner on **02 6161 8316** or email [fttp@transact.com.au](mailto:fttp@transact.com.au)





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# Section 1: Introduction

## Overview

*TransACT's fibre-to-the-premise (FTTP) network is the first of its kind in the ACT, providing unparalleled broadband communications performance. It offers the home owners unlimited opportunities to take full advantage of the broadband superhighway.*

## Services provided by TransACT

The following services will be available to customers provisioned off TransACT's FTTP network:

- telephone services
- high speed data connections
- pay TV services
- local broadcast television retransmission.

## Who is responsible for what aspects?

In addition to the access network deployed within the road verges throughout the estate.

### TransACT is responsible for the supply and installation of:

- a conduit lead-in stub which is, a small diameter telecommunications conduit from the TransACT pit and pipe network in the street verge to the property boundary
- a TransACT electronics unit known as an Optical Network Terminator (ONT) is to be installed in a utilities box located near the metre box (this equipment converts the fibre optic signals from the access network to electrical signals for reticulation throughout the house)
- an optic fibre lead-in cable to connect the access network located in the street with the electronics unit
- an Uninterrupted Power Supply (UPS) unit to ensure that the ONT can continue to function in the event of a mains power failure
- a TransACT supplied set-top-box
- the testing of all services.

### The builder and home owner are responsible for the supply and installation of:

- a telecommunications conduit which connects the lead-in stub provided by TransACT with the utilities box mounted on the external wall of the house, and draw string
- a utilities box located on the external wall of the house near the meter box to accommodate the TransACT ONT and UPS
- a double General Purpose Outlet (GPO) within the utilities box to provide power to the UPS unit and earth cable from electricity earth.

It should be noted that the TransACT network boundary point is the position on the TransACT ONT (located in the utilities box) where the house-side cabling is terminated. Services will be tested and verified by TransACT at this point.

TransACT will work closely with the owner and/or builder during the final design and construction of the home to ensure that the internal wiring has been installed in accordance with TransACT requirements for FTTP services. Generic internal wiring layouts are included within this document, you can see examples in figures 3, 4 and 5.

You can also visit [smarthouse.com.au](http://smarthouse.com.au) for more wiring options.

# Section 2: How does the TransACT network connect to each residence?

## Outline of the network path provided by TransACT

The network path provided by TransACT consists of the following components, sequentially from the TransACT trunk network to the block being serviced:

- TransACT's optic fibre trunk network, which links TransACT services to the estate
- a small splitter cabinet suitably located within the estate which distributes the fibre cable across several different cable paths within the estate

- a conduit linking communications pits throughout the road verges of the estate used for the distribution of the estate optic fibre cables, distribution cables
- a communications pipe lead-in stub which tees-off from the pits located in the road verges and stops at the property boundary, for later connection with the equivalent telecommunications conduit installed by the builder to the house to accommodate the small lead-in cable (figure 1).

### Estate reticulation

During the development of the estate, TransACT arranged for a pit and pipe network to be installed along the road verges, inside which the optic fibre cable for the estate were deployed (known as distribution cable). This conduit linked a series of communications pits which serve as the connection points for the customer service conduit.

### Lead-in stub

During the development of the estate TransACT installed a lead-in stub conduit from the nearby communications pit to the property boundary, in the same location as the electrical lead-in stub. TransACT's lead-in stub PVC communications pipe is connected from the side of the pit and is capped in the ground at the property boundary. The TransACT conduit has a draw string which is to be connected to the customers string securely.

### Multi-dwelling units

For Multi-Dwelling Units (MDU), the developer should be in direct contact with TransACT prior to or at the design/development stage, to ensure the correct fibre optics reticulation access solutions within the building are incorporated so TransACT services can be provided.

## Section 3: In-home wiring recommendation

TransACT will install the Optical Network Terminator (ONT) unit and the Uninterrupted Power Supply (UPS) at the home owners premises in the location as specified within the builders specifications section of this document.

Services will be tested and verified upon installation and commissioning at the customer side of the ONT.

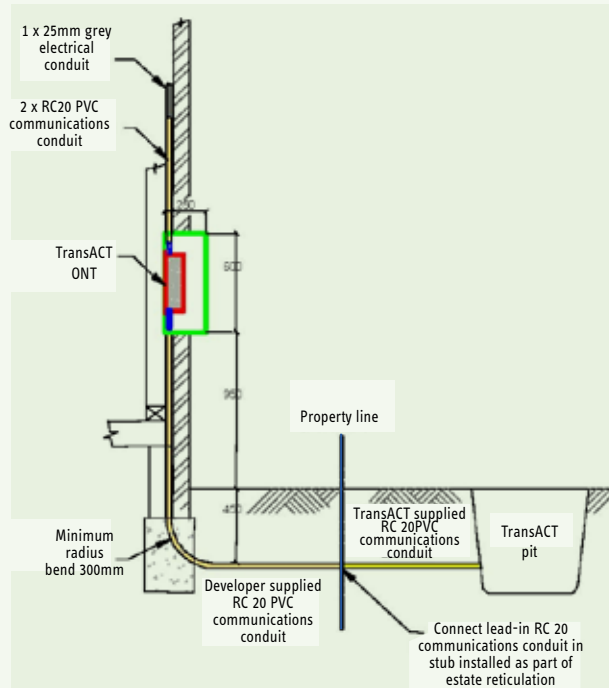
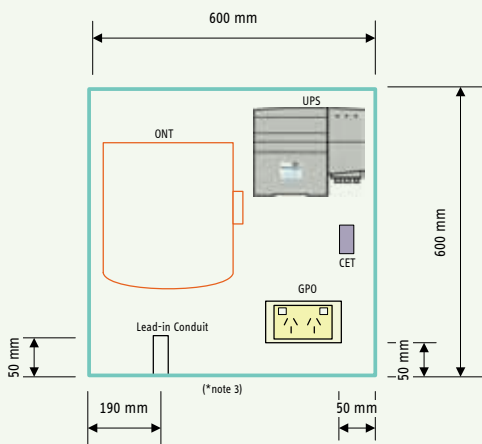
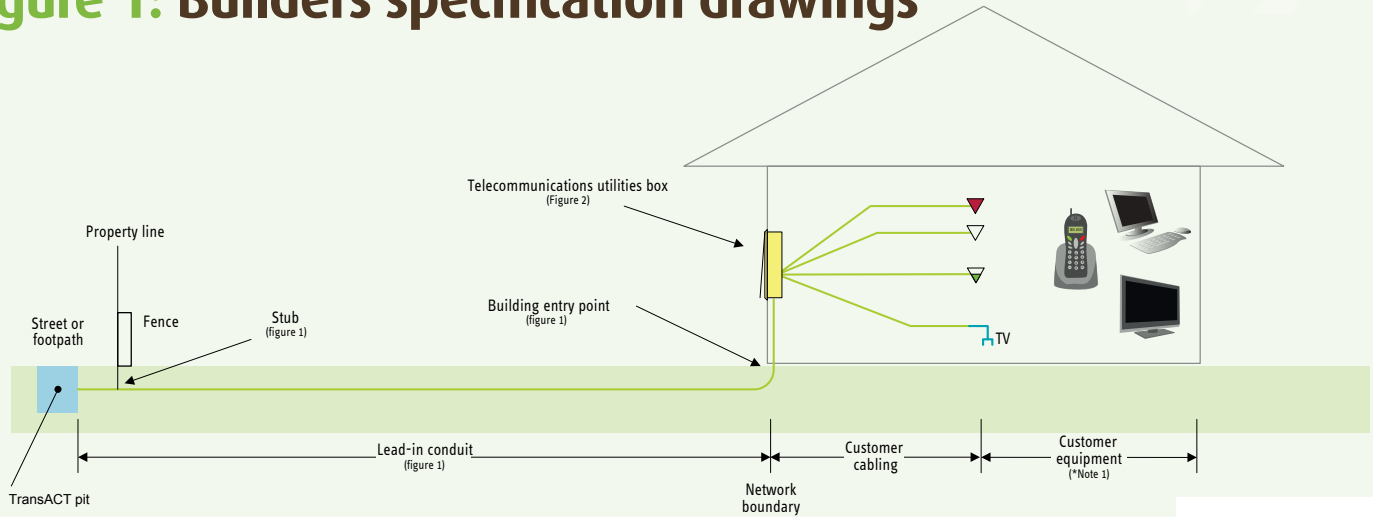
Connection from the ONT, as to the home owner's specifications is the home owner's responsibility. This recommendation is generic in nature, and as such TransACT recommends the builder liaise with a qualified telecommunications cabling company or licensed cabler prior to building commencement to establish an internal wiring plan that meets the end users requirements.

Some in-home wiring recommendations can be viewed in figures 3,4 and 5 (on pages 10, 11 and 12). These can be expanded by the home owner and the builder. Figure 3 is the minimum requirement and should be adhered to for in-home wiring for telephone, data, TransACT's television service and local television retransmission via the RF overlay facility.



TransACT Optical Network Terminator (ONT) Installation

# Figure 1: Builders specification drawings



## LEGEND

- Telephone outlet (TransTalk)
- Data outlet (TransWEB)
- Data outlet (TransTV)
- TV outlet Coax free-to-air
- Telecommunication utilities box
- Customer telephone
- Customer TV
- Customer PC
- Uninterrupted Power Supply (UPS)
- Optical Network Termination (ONT)
- GPO (Double)
- Communications earth terminal

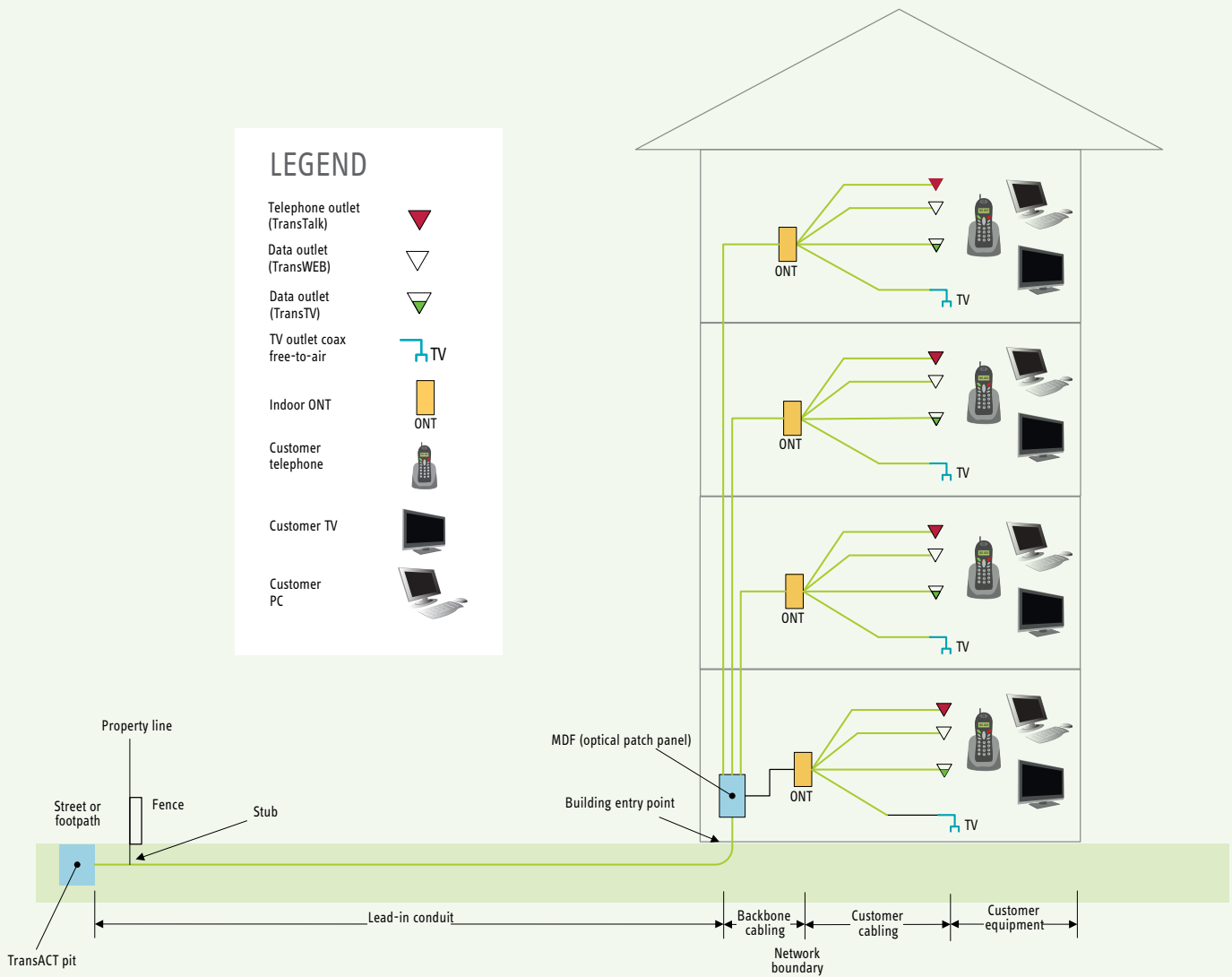
**Note 1** - TransACT will supply a set-top-box for TransTV services.

Refer to section 4 (page 7) for required details on lead-in conduits.

**Note 2** - The height from the ground to the base of the telecommunication box is the minimum height or should be mounted at the same height as the electrical switch/meter board or in accordance to AS/NZS 3000:2007 or its relevant update.

**Note 3** - Refer to section 4 (page 7) for cable lengths and requirements.

## Figure 2: Builders specification drawings



TransACT will supply an Indoor ONT, UPS and a set-top-box for TransTV services.

TransACT to supply and install the fibre optical backbone cabling to the individual units.

## Section 4: Builders specifications

### General outline

*The builder is responsible for the following to be supplied and installed during the construction of the house in order for TransACT to later complete the installation of broadband services (specifications for each of these areas are provided in subsequent paragraphs):*

- a RC20 PVC communications pipe (inside diameter 23mm and outside diameter 27.3mm), one end connecting at the property boundary to the lead-in stub conduit provided by TransACT, and the other end connecting into the bottom of the utilities box, which is similar to, and located near the electrical switchboard/ meter box on the external wall of the house (this conduit will accommodate the lead-in optic fibre cable to be later provided by TransACT as part of the customer installation)
- a standard 600mm x 600mm x 200mm utilities box minus internal panel, mounted externally on the wall of the house, near the electrical switchboard/meter box. This will house the ONT and UPS which are provided later by TransACT as part of the customer installation and commissioning of TransACT services. The utilities box will be referred to as telecommunication utilities box. A TransACT technician will install a Communications Earth Terminal (CET) in accordance to AS/NZS 3000: 2007 & AS/ACIF S009: 2006 or its relevant updates
- a double GPO within the utilities box to provide power to the UPS unit. This is to be mounted at the bottom right hand side or top left of the telecommunication utilities box
- a 6mm<sup>2</sup> green/yellow earth wire from and connected to the electrical switchboard/meter box earth terminal bar or bonding point to the telecommunications utilities box in accordance to AS/NZS 3000:2007 & AS/ACIF S009:2006 or its relevant updates
- Category 5e (minimum requirement) or category 6 (preferred) communications cabling from the telecommunications utilities box to the relevant locations as deemed by the home owner

- RG6 quad shielded coaxial cabling from the telecommunications utilities box to the relevant locations as deemed by the home owner
- wall sockets, including its cable terminations, located throughout the rooms of the premises in accordance with the home owners requirements for telephone, data, pay TV and local television retransmission via the RF overlay.

### Specification details for the lead-in conduit

In order to ensure that surface mounted conduit (e.g. conduits mounted on the external wall of the house) arrangements are avoided, TransACT requires that the underground lead-in conduit be installed prior to the pouring of the footings for the house. This conduit is to provide the link between the lead-in stub conduit, capped at the property boundary, and the telecommunications utilities box, mounted on the wall of the house adjacent to the electrical switchboard/meter box.

**The builder is required to ensure that a RC20 PVC communications pipe is used.**

The builder is to ensure that the following specifications for the lead-in conduit are adhered to:

- the conduit is to be white RC20 PVC communications pipe, which has an outside diameter of 27.3mm and inside diameter of 23mm
- the conduit is to be installed to a depth of 450mm below the finished ground level or in accordance to AS/ACIF S009:2006 or its relevant update
- all conduit joins are to be glued with suitable solvent cement
- the conduit bend which takes change in direction from the horizontal underground alignment to the vertical wall cavity alignment must be a minimum of 300mm radius bend **(installation cannot occur if this is not adhered to)**
- other than the bend described in the previous point, all other bends are to be avoided to ensure that the lead-in cable can be easily drawn through the conduit. **Where the builder assesses and the minimum bend radius of 300mm is not possible due to site conditions or constraints, TransACT is to be notified as both parties will need to agree on a suitable solution**

- the vertical section of the lead-in conduit is to be positioned such that it enters the bottom of the telecommunications utilities box in alignment with the left hand cable entry port located on the ONT (as it is viewed from the front). The centre of the penetration is to be approximately 190mm from the left side of the utilities box and 40mm from the rear wall of the box. The conduit is to penetrate a distance of 50mm into the utilities box, and the cut end of the conduit is to be neat and free of all burs and the like that may damage the lead-in cable. The conduit into the box is to be suitably sealed to ensure that it is vermin proof
- the trenched telecommunications conduit shall be in accordance to section 18, AS/ACIF S009:2006 or its relevant update
- the conduit shall be roped with 3mm orange polypropylene rope. This rope is to be securely tied to the existing rope located in the lead-in stub, using a suitable knot such that it will not come undone when it is used to haul the lead-in cable through, and that it is small enough such that it will readily pass through the lead-in conduit. The other end of the rope is to be securely fastened within the utilities box to ensure that it does not retract into the conduit
- in situations where the telecommunication utilities box is below street level, a drip point will need to be incorporated into the conduit to ensure the free drainage of water, thereby avoiding water within the utilities box, in accordance to section 18, AS/ACIF S009:2006 or its relevant update.

There may be situations where there is no wall cavity in which to route the lead-in conduit, such as when the telecommunications utilities box is located on a garage wall. In this scenario, the communications conduit may need to be surface mounted on the outside or inside of the garage wall, unless the garage internal wall is gyprock lined, similar to the arrangements for the electrical lead-in. Additional protection such as a steel cable guard may need to be considered if there is a risk of physical damage.

### **Telecommunications utilities box**

TransACT currently specifies a standard 600mm x 600mm x 200mm utilities box minus the internal panel to house its ONT and UPS.

Installation of the telecommunications utilities box shall comply with AS/NZS 3000:2007 or its relevant update.

### **Earthing of the TransACT Optical Network Terminator**

The builder shall install a 6mm green/yellow earth wire from and connected to the electrical switchboard/meter box earth terminal bar or bonding point to the telecommunications utilities box in accordance to AS/NZS 3000:2007 & AS/ACIF S009:2006 or its relevant updates.

A TransACT technician shall install a CET in accordance to AS/NZS 3000: 2007 & AS/ACIF S009: 2006 or its relevant updates, to earth the ONT.

### **Power supply for the Optical Network Terminator**

TransACT will provide a UPS for the ONT during the customer installation and commissioning. The UPS plugs into a 240V GPO and converts the supply to 12V to power the ONT.

The builder shall provide a double socket general power outlet. This is to be mounted at the bottom right hand side or top left of the telecommunications utilities box.

The UPS contains a battery back-up that will supply several hours of standalone power to the ONT in the event of mains failure. The ONT monitors various aspects of operation of the electronics unit, for example, battery in operation, battery replacement required, battery charge level and battery missing.





## **Communication cabling linking the telecommunication utilities box within the premises.**

The following individual Category 5e (minimum requirement), Category 6 (preferred) and coax (RG6) cables shall run between the telecommunications utilities box and to the various locations within the house.

The communication cabling linking the telecommunications utilities box shall be the minimum requirement regardless of what in-home-wiring option was chosen by the home owner.

The following applies:

- single category 5e or category 6 cable for telephone services
- single category 5e or category 6 cable for high speed broadband
- single category 5e or category 6 cable for pay TV services
- single coaxial quad shielded cable (RG6) for free-to-air television retransmission.

The builder shall arrange a minimum of 1500mm of cable tail to be available in the telecommunications utilities box for each of the cables.

If figure 3 is chosen, the builder shall arrange for the cables to be terminated as per the specific requirements of the wall outlets sockets including coax splitters.

If a central location is chosen as seen in figure 4 and figure 5, the builder shall arrange for the various cables to be terminated as per the specific requirements of the patch panel including the coax splitters.

The purpose of the central patch panel unit is to route the various incoming signals for telephone, data, pay TV and free-to-air television retransmission to specific rooms within the house at the resident's discretion.

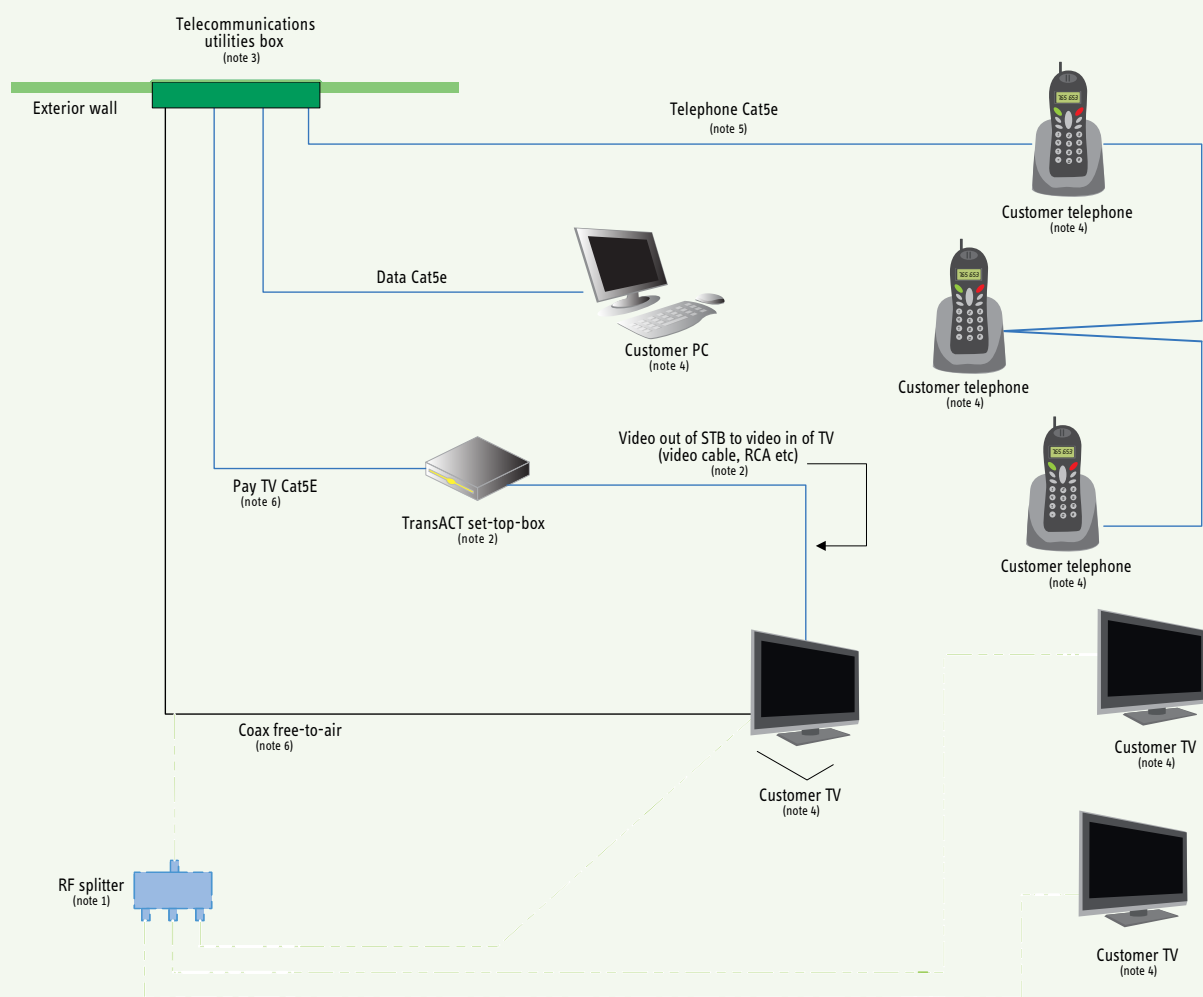
There are many different types of central patch panel units, with a wide range of capabilities. TransACT is happy to consult with builders regarding the patch panel options, and would also recommend consultation with a qualified telecommunications cabling company or licensed cabler.

Builders should note that it is very likely that there will be a requirement for several different items of customer owned electronics equipment to be placed either inside or in the vicinity of the central patch panel, so adequate power outlets will need to be provided to cater for these.



## Figure 3: In-home wiring recommendations drawings

### Option 1



**Note 1** - Connection of multiple FTA outlets is optional and based on home owners needs. Amplification may be required for more than four FTA outlets. Splitter, extra cabling and wall outlets including cable terminations are to be supplied and completed by the builder.

**Note 2** - The TransACT set-top-box including RCA video cabling to the customer TV, will be supplied, installed and commissioned by TransACT.

**Note 3** - The telecommunications utilities box is to be supplied and installed by the builder.

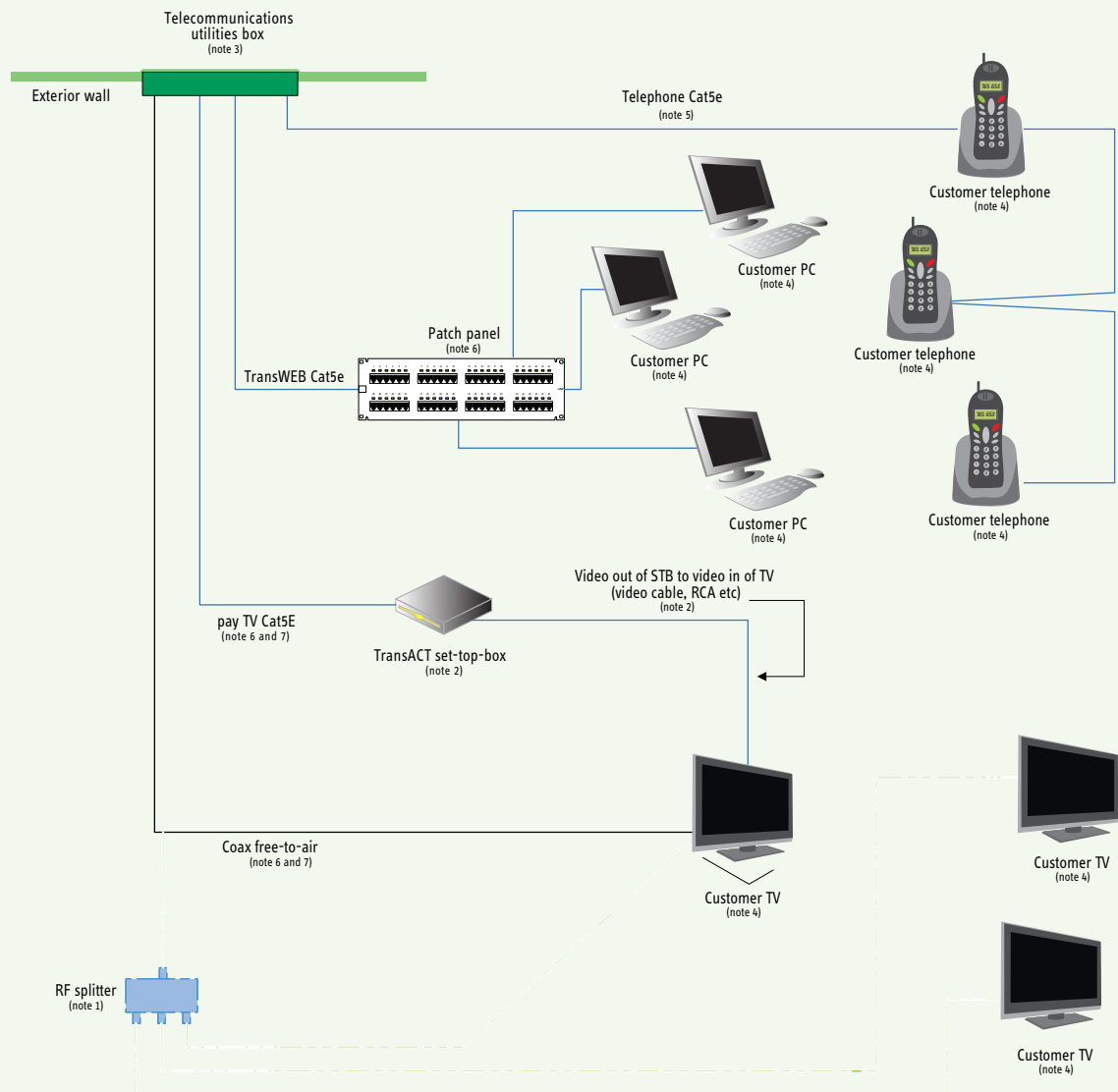
**Note 4** - Customer TV, PC, telephones and other equipment deemed to be non TransACT Customer Premise Equipment (CPE) are to be supplied by the customer or builder.

**Note 5** - Telephone cabling and outlets are to be wired in a daisy chain configuration. If there is a alarm system present, the alarm system panel will be the first telephone outlet and connected in a mode 3 configuration or according to the alarm panel supplier/installer recommendation. The remaining telephone outlets are to be wired as mentioned above.

**Note 6** - The TransTV Cat5e and Coax FTA is to be installed where the main or primary viewing TV is located.

## Figure 4: In-home wiring recommendations drawings

### Option 2



**Note 1** - Connection of multiple FTA outlets is optional and based on home owners needs. Amplification may be required for more than four FTA outlets. Splitter, extra cabling and wall outlets including cable terminations are to be supplied and completed by the builder.

**Note 2** - The TransACT set-top-box including RCA video cabling to the customer TV, will be supplied, installed and commissioned by TransACT.

**Note 3** - The telecommunications utilities box is to be supplied and installed by the builder.

**Note 4** - Customer TV, PC, telephones and other equipment deemed to be non TransACT CPE are to be supplied by the customer or builder.

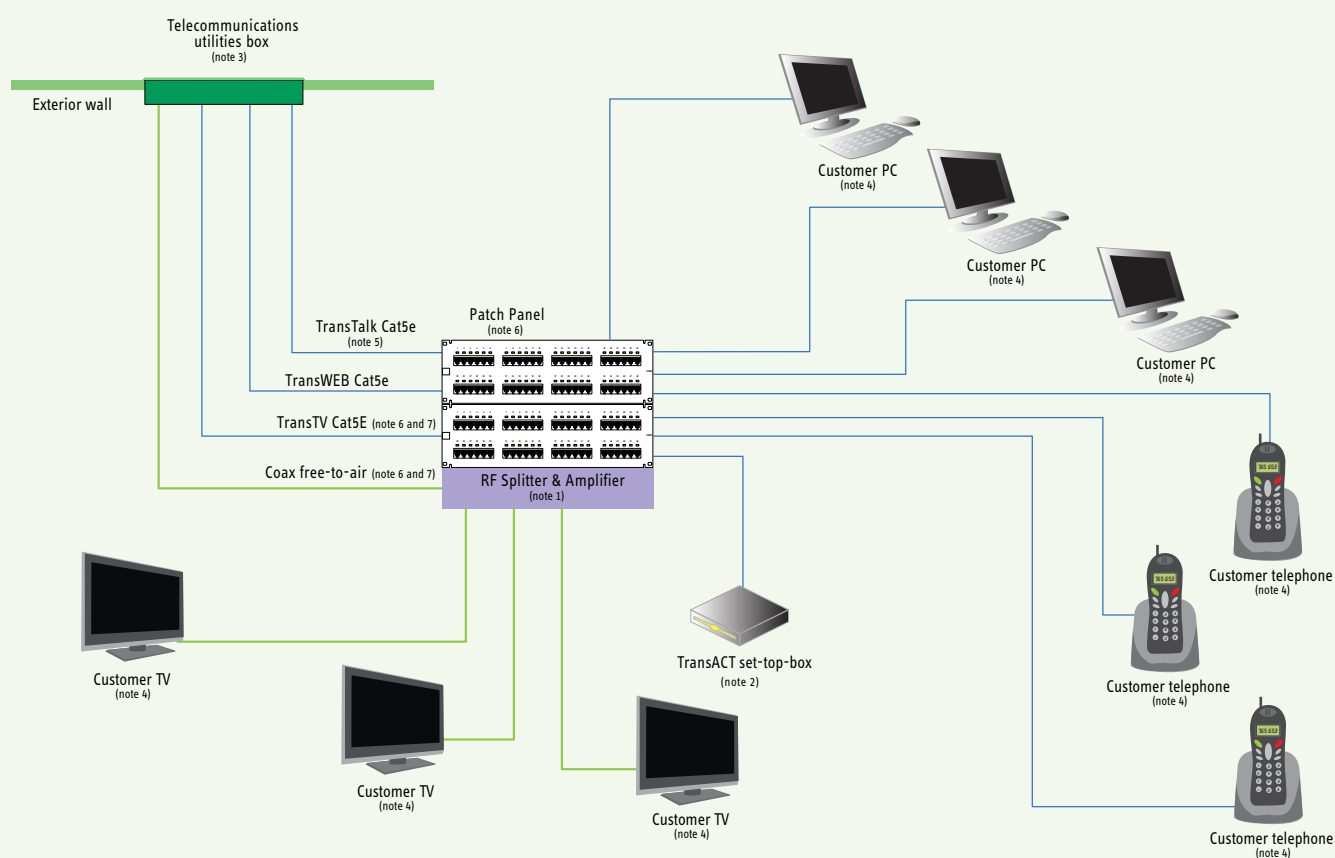
**Note 5** - Telephone cabling and outlets are to be wired in a daisy chain configuration. If there is a alarm system present, the alarm system panel will be the first telephone outlet and connected in a mode 3 configuration or according to the alarm panel supplier/installer recommendation. The remaining telephone outlets are to be wired as mentioned above.

**Note 6** - This figure represents an installation with multiple data outlets only. If the customer supplied PCs are to have access to TransWEB, a router or switch is to be installed as it allows the connected PCs to be configured as a home network. The patch panel, router or switch is to be supplied and configured by the home owner or builder.

**Note 7** - The TransTV Cat5e and Coax FTA is to be installed where the main or primary viewing TV is located.

## Figure 5: In-home wiring recommendations drawings

### Option 3



**Note 1** - Connection of multiple FTA outlets is optional and based on home owners needs. Amplification may be required for more than four FTA outlets. Splitter, extra cabling and wall outlets including cable terminations are to be supplied and completed by the builder.

**Note 2** - The TransACT set-top-box including RCA video cabling to the customer TV, will be supplied, installed and commissioned by TransACT and installed where the main or primary viewing TV is located.

**Note 3** - The telecommunications utilities box is to be supplied and installed by the builder.

**Note 4** - Customer TV, PC, telephones and other equipment deemed to be non TransACT CPE are to be supplied by the customer or builder.

**Note 5** - Telephone cabling and outlets are to be wired into Patch Panel as individual point to point outlets. If there is a alarm system present, the alarm system panel will be the first telephone outlet and connected in a mode 3 configuration or according to the alarm panel supplier/installer recommendation. The remaining telephone outlets are to be wired as mentioned above.

**Note 6** - This figure represents an installation with multiple data outlets in various locations within the premises. All TransACT services can be organised and swapped via the patch panel. If the customer supplied PCs are to have access to TransWEB, a router or switch is to be installed as it allows the connected PCs to be configured as a home network. The patch panel, router or switch is to be supplied and configured by the home owner or builder.

**Note 7** - The TransTV Cat5e and Coax FTA is to be installed where the main or primary viewing TV is located.