

HFC Service Assurance Field Guide

Customer Service and Assurance

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Document control

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1 About this document

1.1 Purpose

This document provides guidelines to nbn Delivery Partners (DPs) to restore the nbn Hybrid Fibre Coaxial (HFC) service at an End User Premises (EUP).

1.2 Scope

1.2.1 In scope

The scope of this document is to restore an End User Premises (EUP) to the **nbn** HFC Network. This includes:

- Reviewing the work order including determining the work order type and priority
- Confirming the appointment to attend the EUP
- Ensuring the EU representative is authorised to sign and is 18 years or older
- Evaluating site access and safety
- Taking photos of the completed work (matching those taken before starting) to support resolution of any future escalations/damage complaints
- Gaining End User's consent
- Diagnosing the End User's HFC service fault
- Replacing, repairing or adjusting cabling, connections and/or equipment to restore the End User's HFC service
- Testing to ensure that the End User's HFC service is restored and functioning to the required standard
- Completing the site visit
- Capturing any artefacts as per contract, operational requirements as outlined in this document, and/or for Business as Usual (BAU) claims process
- Escalating faults to nbn for resolution if unable to restore an End User's HFC service
- Reporting status updates to a Work Management Centre (WMC).

1.2.2 Out of scope

- Resolution of faults from the Transmission Access Point (TAP) back into the HFC network.
- Where civil remediation is required (proceed with BAU process to contact FSO).
- Wall plate relocation
- End User's cabling, equipment and services beyond the:
 - nbn NTD for a standard nbn HFC service
 - Wall plate for a nbn HFC User Rights service



- Resolution of issues with the EU equipment including but not limited to personal computers, Wi-Fi, IP phones, mobile devices or existing non-cable internet connections

1.3 Audience

The audience for this document is DPs that are Competent Contractors – appropriately accredited (as applicable) and otherwise competent to perform the required work or service described by this document.

Note: Competent Contractors include DP resources and Internal Workforce (IWF). This document applies equally to all parties. For convenience, all parties are referred to as Field Contractors throughout this document.

This document is a reference document as referred to within the HFC Service Assurance Activity Scope of the OMMA contract. It should not be relied upon by Field Contractors, or any other party, as a substitute for knowledge, experience, care and skill or any other contractual obligation.

It is the responsibility of all Field Contractors to familiarise themselves with and comply with all applicable laws and contractual obligations.

Nothing in this document will affect any rights **nbn** has (whether at law or under contract), or any obligations or warranties given by the DPs to **nbn**.

1.4 Contacts and escalations

Field Contractors should contact **nbn** using the appropriate means of communication such as telephone, email, or other electronic methods. Contact with other parties may also be required, for example, when arriving on site.

The following table lists some contact numbers:

Who	Contact
nbn Helpdesk	1800 626 225 (1800-NBN-CBL)
	Option 1 – nbn HFC Customer Service Centre for registering a replacement NTD as part of restoration.
	Option 4, then 1 for Held/Incomplete orders
	Option 4, then 2 for General enquiries

The following table lists escalation paths:

Who	When	Initial Contact	Escalations (if required)
Field Contractor	For issues such as: <ul style="list-style-type: none"> • Report appointment jeopardy • Indicate problems related to nbn specified equipment • Report work order in jeopardy on the day 	Field Service Operations (FSO)	nbn HFC FSO will escalate internally if required
Field	During assurance if unable to restore an	Diagnose, Prioritise	DP&A will escalate



Who	When	Initial Contact	Escalations (if required)
Contractor	End User's HFC service	and Assign (DP&A	internally if required

1.5 Related documents

nbn Documents	Document ID
[1] <i>Material, Tools & Test Equipment Approved for Use at Customer Premises</i>	NBN-0288
[2] <i>HFC Performance Metrics – nbnCo (Note: under development)</i>	F0002-59-9094
[3] <i>HFC RF Testing Standard for Optus Network</i>	F0002-59-1792
[4] <i>Customer Premises Wiring</i>	NBN-0284
[5] <i>Aerial Lead-in Cables</i>	NBN-0015
[6] <i>Underground Lead-In Cables</i>	NBN-0283
[7] <i>MDU Customer Connections</i>	NBN-0286
[8] <i>Cabling of Multiple Dwelling Units</i>	NBN-0250
[9] <i>Broadband HFC Cable Network Design Rules for Lead-In and Customer Premises Wiring</i>	NBN-0309
[10] <i>NBN Co Construction Standards - Hybrid Fibre Coaxial (HFC)</i>	NBN-NTO-EDS-389
[11] <i>NBN Co Construction Standards - Multi Dwelling Units HFC Telstra</i>	NBN-CON-STD-1915
[12] <i>NBN Co Construction Standards - Multi Dwelling Units HFC Optus</i>	NBN-CON-STD-1916
[13] <i>Working with or near Asbestos Containing Materials – Attaching NBN Co Equipment to Premises (Network Operations)</i>	NBN-HSE-SSW-GDE-001
[14] <i>Viavi ONX620 RF Meter – HFC Broadband Cable Network</i>	NBN-0396
[15] <i>CM2800 and Sunrise System Editor operations</i>	NBN-0274
[16] <i>CM2800E General RF Measurements and Setup Procedures (1)</i>	NBN-0275
[17] <i>MDU Customer Connections - HFC Broadband Cable Network</i>	NBN-0286
[18] <i>Fitting Connectors - RG6 and RG11 Cables - HFC Broadband Cable Network</i>	NBN-0287
[19] <i>Sunrise CM2800E 3000E RF Signal Analyser - Customer Premises Application - HFC Broadband Cable Network</i>	NBN-0292
[20] <i>RF Plans, Symbols and Device Description - HFC Broadband Cable Network</i>	NBN-0313
[21] <i>Trilithic Seeker Lite2 - RF Signal Leakage Detector</i>	NBN-0294



nbn Documents	Document ID
[22] <i>RF Signal Leakage Detection Using Trilithic Seeker Lite2 – HFC Broadband Network</i>	NBN-0277
[23] <i>Suggested HFC Equipment List</i>	F0002-59-1901
[24] <i>Telstra Premises RF Testing</i>	F0002-59-1773
[25] <i>HFC TAP- down- installation and testing requirements</i>	P0223-11-9979

Standards and External Documents	Owner
[26] <i>AS/CA S009 Installation Requirements for Customer Cabling (ACMA Wiring Rules)</i>	Standards Australia
[27] <i>AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)</i>	Standards Australia
[28] <i>Telecom Cabling Provider Rules 2014</i>	ComLaw website
[29] <i>AS / NZS 1367:2007: Coaxial cable and optical fibre systems for the RF distribution of analogue and digital television and sound signals in single and multiple dwelling installations</i>	Standards Australia
[30] <i>Material, Tools & Test Equipment Approved for Use at Customer Premises</i>	NBN-0288
[31] <i>HFC RF Testing Standard for Optus Network</i>	F0002-59-1792
[32] <i>Customer Premises Wiring</i>	NBN-0284
[33] <i>Aerial Lead-in Cables</i>	NBN-0015
[34] <i>Underground Lead-In Cables</i>	NBN-0283
[35] <i>MDU Customer Connections</i>	NBN-0286
[36] <i>Cabling of Multiple Dwelling Units</i>	NBN-0250
[37] <i>Broadband HFC Cable Network Design Rules for Lead-In and Customer Premises Wiring</i>	NBN-0309
[38] <i>NBN Co Construction Standards - Hybrid Fibre Coaxial (HFC)</i>	NBN-NT0-EDS-389
[39] <i>NBN Co Construction Standards - Multi Dwelling Units HFC Telstra</i>	NBN-CON-STD-1915
[40] <i>NBN Co Construction Standards - Multi Dwelling Units HFC Optus</i>	NBN-CON-STD-1916
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[42] <i>Viavi ONX620 RF Meter – HFC Broadband Cable Network</i>	NBN-0396



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[44] <i>CM2800E General RF Measurements and Setup Procedures (1)</i>	NBN-0275
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[46] <i>Fitting Connectors - RG6 and RG11 Cables - HFC Broadband Cable Network</i>	NBN-0287
[47] <i>Sunrise CM2800E 3000E RF Signal Analyser - Customer Premises Application - HFC Broadband Cable Network</i>	NBN-0292
[48] <i>RF Plans, Symbols and Device Description - HFC Broadband Cable Network</i>	NBN-0313
[49] <i>Trilithic Seeker Lite2 - RF Signal Leakage Detector</i>	NBN-0294
[50] <i>RF Signal Leakage Detection Using Trilithic Seeker</i>	NBN-0277

1.6 What's changed in this release

This version of the *HFC Service Assurance Field Guide* describes the updated process required to be performed by Field Contractors to restore the **nbn** HFC service at an End User Premises (EUP).



2 Before you start

nbn takes HSE and risk management very seriously, so we suggest that you familiarise yourself with the guidelines outlined in this section.

The tools you use are also important, and if used properly can contribute to the quality of the work you perform and prevent unnecessary risks.

Every Field Contractor must comply with the **nbn** Code of Conduct whenever they are conducting an installation. For more information, see [Nbn code of conduct](#).



2.1 Health, safety, and environment (HSE)

This document provides guidance to assist Field Contractors to exercise due diligence and safe work practices. Field Contractors are expected to comply with their HSE management systems.


The safety-related information in this document is intended as guidance only and should not be relied upon. Companies engaged to undertake nbn work must satisfy themselves that they understand the risks associated with their work and their controls.


2.2 Important HSE symbols


Error! Reference source not found. The following table shows the symbols displayed in this guide whenever there are potential hazards when performing an installation.

Symbol	Description
	<p>The nbn network is often located near electrical circuits in Premises and on or near the electrical distribution network. Contact with electricity can cause serious injury or death.</p> <p>Safe work practices must always control the risk of contact with electricity. This includes maintaining safe distances from live circuits, isolation of power when working on or near live circuits, having required training, licences and registrations, and complying with relevant standards.</p> <p>If a pit is within an Earth Potential Rise (EPR) zone, such as within 15 m of a high voltage transformer or switch, then there is a possibility that a person may receive an electric shock. This can occur when the person is working on a metal cable or fittings attached to the cable while they are also in contact with the local surrounding within the EPR zone. Whilst it is preferable not to locate assets within an EPR zone, if this cannot be avoided then appropriate HSE and PPE procedures should be implemented when working in the EPR zone.</p>
	<p>Asbestos is a hazardous substance.</p> <p>Legislation determines that particular processes must be followed when working with asbestos or asbestos containing materials.</p>



Symbol	Description
	<p>Personal Protective Equipment (PPE) is clothing and equipment used to offer protection against hazards. PPE should never be treated as a substitute for safe behaviour and following working practices, but as a last line of defence.</p> <p>Examples of PPE include:</p> <ul style="list-style-type: none"> • Eye goggles • Covered footwear • Hi-visibility vests • Sunglasses • Sunscreen • P2 face mask • Gloves • Hearing protection

	<p>Working on a construction site. As a general comment, HSE laws, regulations, standards, codes of practice, etc. require a range of risk control measures when working at heights (e.g. safe work platforms, fall arrest devices, etc).</p>
---	---

	<p>Working in confined space or hazardous atmosphere. As a general comment, HSE laws, regulations, standards, codes of practice, etc. require a range of risk control measures when working in confined spaces (e.g. work permits, training, atmospheric monitoring, restriction of ignition sources, working in teams rather than alone, etc).</p>
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2.3 Risk management

When performing field activities as part of HFC service restoration, ensure that you take the following hazards into consideration:

Services such as electricity, gas, water and rail	Fire
Radiation	Inadequate egress
Working alone	Working at heights
Dangerous goods and hazardous substances, including asbestos	Confined Space
Machinery	Hazardous Atmosphere
Open trenches associated with excavations	Mobile plant such as vehicles
Flora and fauna	Manual handling



Working environment

Slippery or uneven work surfaces



All active equipment that remains energised poses a risk of electric shock to any worker.

Consider the electrical hazards highlighted in the following table **Error! Reference source not found..**

2.3.1 Electrical Hazards

Isolation of power (i.e. turning all power off)	This is the most effective way to minimise electrical risks. Consider power isolation for the duration of work in roof and sub-floor spaces, consistent with your company’s safe systems of work and with the approval of the End User. Effective isolation should involve physically turning all power off (at the switchboard), attaching a completed Danger Tag, physical locking of the main switch or switchboard enclosure, and positively proving (i.e. testing) electrical power is isolated. Additionally, consider power isolation for drilling into walls where electrical services exist as per your company’s safe systems of work.
Residual electrical risks	These may still be present even after power isolation. For example, power in solar panels and associated cabling, and the electrical lead-in to the Premises, which remains live between the power pole/pillar and the back of the switchboard.
Electrical circuit breakers or fuses	Ensure that they are clearly and correctly labelled and fitted or capable of being fitted with a lockout device to isolate every source of electrical energy from the circuit.
Double insulation and earthing	All 240 V electrical cables are double insulated and earthed in accordance with applicable network standards and Error! Reference source not found..
Labelling	All electrical equipment is clearly and correctly labelled.
Wear and abrasions	All cables are free of wear and abrasions.
Safety and security	All power sockets are securely fastened, fit for purpose, and free from wear or damage.
Metallic enclosures	Ensure that metallic enclosures with a 240 V Power Outlet are earthed. Use a non-contact voltage indicator to ensure metallic enclosures are not live before use.
Adherence to standards	All correct power cable to communications cable separations are maintained according to Error! Reference source not found. and Error! Reference source not found.



Note: This information is provided to assist in the hazard identification process. You must review these hazards and determine their relevance and, if appropriate, manage the risk via your own risk management process, which should refer to relevant legislation, codes of practice, industry information and any guidance materials provided by **nbn**.

2.4 Reporting hazards and incidents

All hazards and incidents (including near misses) occurring or identified during any work on behalf of **nbn** must be reported according to the process and timing defined by **nbn** under the contract or **nbn** policy.

Where a hazard presents an immediate risk, you should stop work, or implement an immediate interim control measure and contact your Workforce Management Centre (WMC) for guidance on further responses, including permanent control of the hazard.

Where required, **nbn** can facilitate communication of relevant information arising from hazard and incident reports to the End User.

2.5 Training and competency

As part of the evaluation process, **nbn** takes into account the Field Contractor's processes for ensuring training and competency of Field Contractor. For example, legislative requirements, risk based training and industry training are considered relevant. Contracted companies are expected to comply with their HSE management system's training and competency requirements.

The Field Contractor must adhere to any induction, training, or competency requirements of the building within which they are working.

Field Contractors undertaking work activities on Premises require the following training and competency as a minimum:

- Open cabler's registration with an ACMA accredited registrar as per the **Error! Reference source not found.**
- White card – CPCCOHS1001A Work Safely in the Construction Industry qualification

Note: In addition to the above industry qualification and competency requirements, all Field Contractors must register for, and complete, the mandatory online training courses on the nbn enAble™ accreditation portal.

Where Field Contractors are undertaking specific tasks associated with drop work or on-premises work, additional training and competency may be required. For example, training and licensing in the operation of elevate platforms.

3 About nbn HFC service installations

Figure 1 displays the nbn HFC network trail from the CMTS through to the End User Premises (EUP) with the network boundary for:

- A standard nbn HFC service terminated at the nbn NTD. This allows a Retail Service Provider (RSP) to provide a broadband service at an EUP.
- An nbn HFC Use Right (NHUR) service terminated at a wall plate. This allows Foxtel/Telstra to provide a Pay TV and/or broadband service at an EUP.

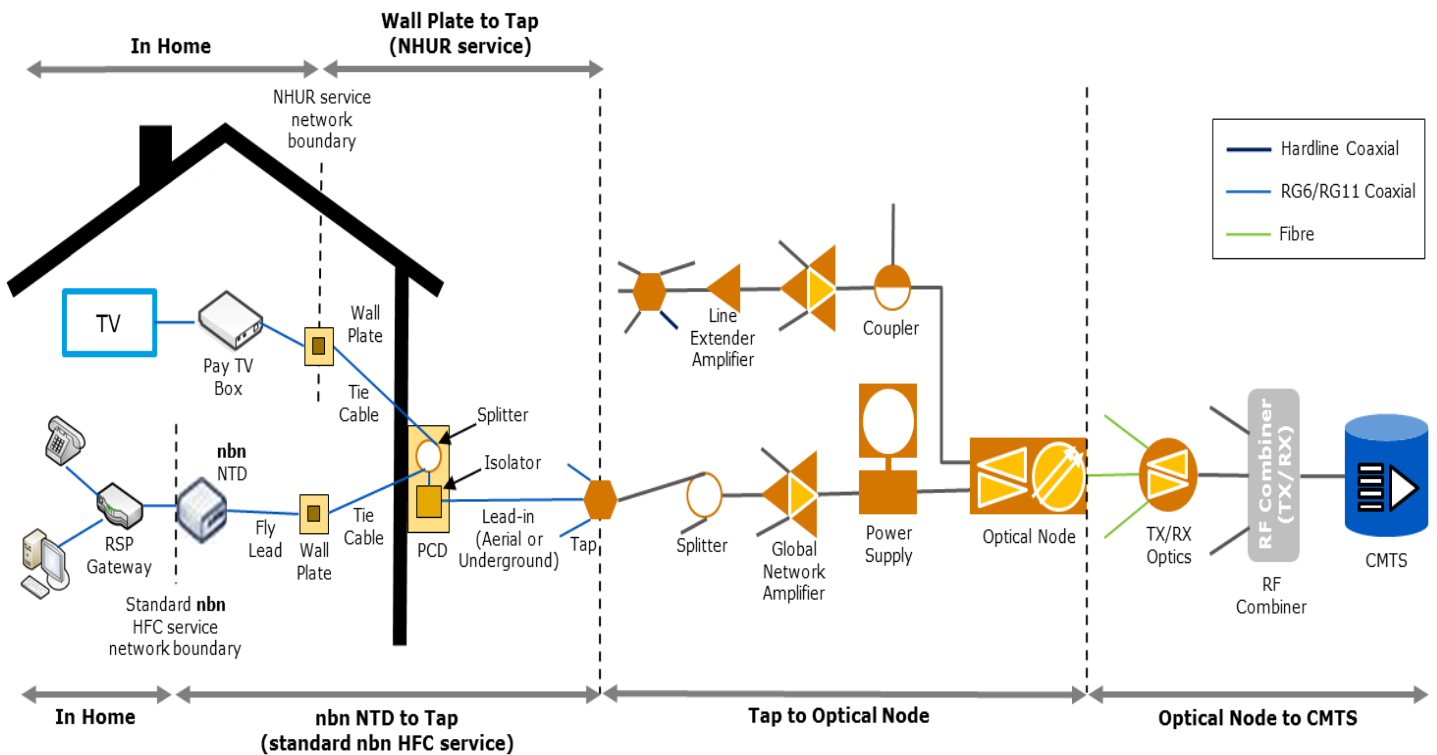


Figure 1 nbn HFC network trail

3.1 Single Dwelling Unit (SDU) HFC service overview

An EU HFC service for an SDU includes the provision of an End User’s HFC service from the TAP to the:

- nbn NTD for a standard nbn HFC service
- Wall plate for an NHUR service.

The lead-in cable for an SDU can be connected to the Premises Connection Device (PCD) at the EUP from a TAP located:

- In an underground infrastructure pit via an:
 - Underground lead-in as shown in Figure 2
 - Aerial lead-in via a street pole infrastructure as shown in Figure 3
- On aerial infrastructure via an:

- Aerial lead-in from a street utility pole infrastructure as shown in Figure 4
- Underground lead-in as shown in Figure 5

The PCD includes:

- An isolator
- A splitter if more than one HFC service is required at the EUP
- An amplifier in the premises with three or more outlets

Connection from the PCD is via a lateral cable to a wall plate for an NHUR service and then on to an **nbn** NTD via a fly lead for a standard **nbn** HFC service.

Important: If installing an NHUR service or standard **nbn** HFC service at an EUP that already has an existing HFC service and wall plate, the preferred method of installation is to connect a fly lead with a splitter to the front of an existing wall plate, rather than install a splitter in the PCD with a separate tie cable and wall plate.

The End User is responsible for all cabling and equipment from the:

- nbn NTD, which becomes the network boundary onward for a standard nbn HFC service
- Wall plate, which is the network boundary for an NHUR service.

3.1.1 SDU nbn HFC installation – underground TAP with underground lead-in cable

Figure 2 displays the underground lead-in cable in conduit connected to the TAP within the pit.

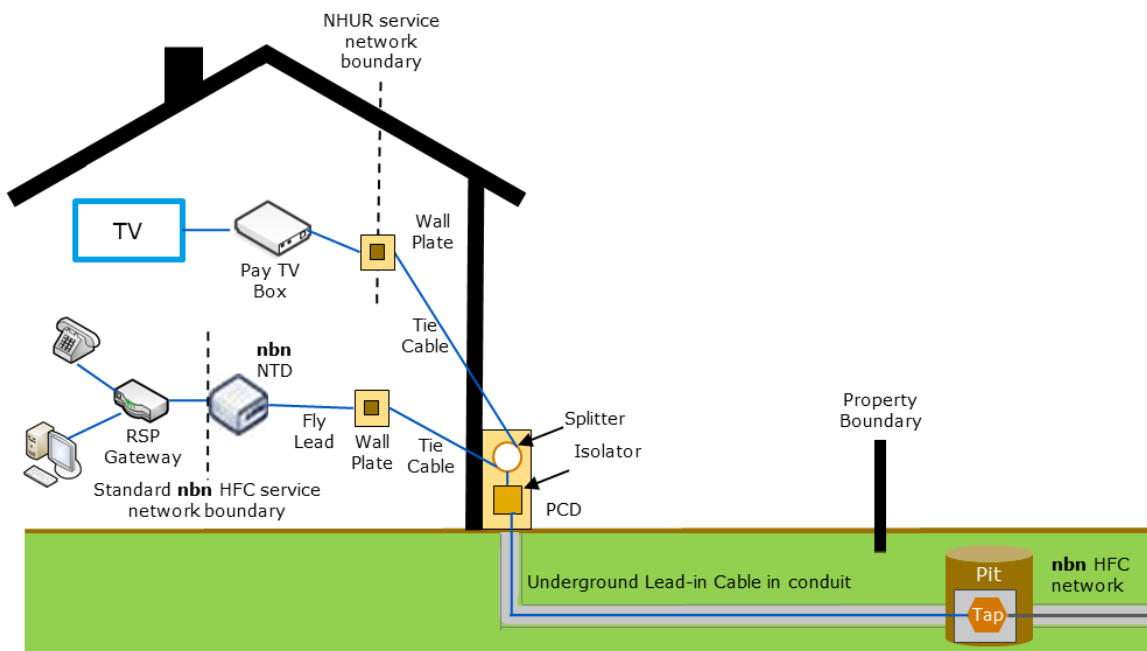


Figure 2 SDU nbn HFC installation – underground TAP with underground lead-in cable

3.1.2 SDU nbn HFC installation – underground TAP with aerial lead-in cable

Figure 3 displays the aerial lead-in cable connected to the TAP within the pit via link pipe and riser pipe.

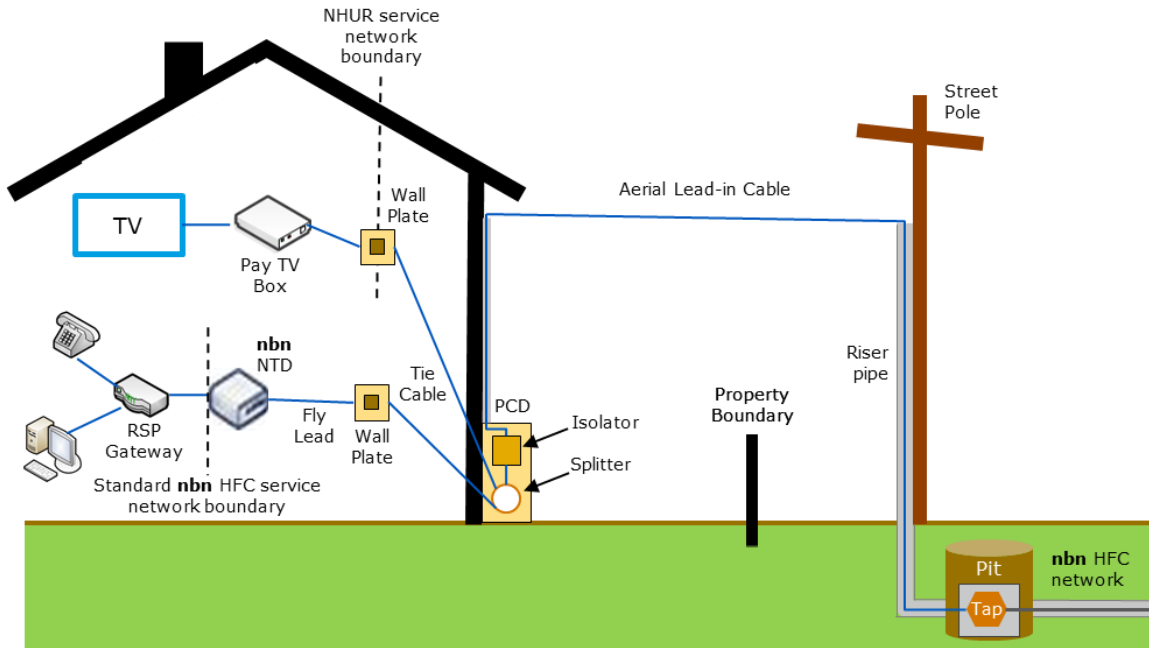


Figure 3 SDU nbn HFC installation – underground TAP with aerial lead-in cable

3.1.3 SDU nbn HFC installation – aerial TAP with aerial lead-in cable

Figure 4 displays the aerial lead-in cable connected to the aerial TAP on street pole infrastructure.

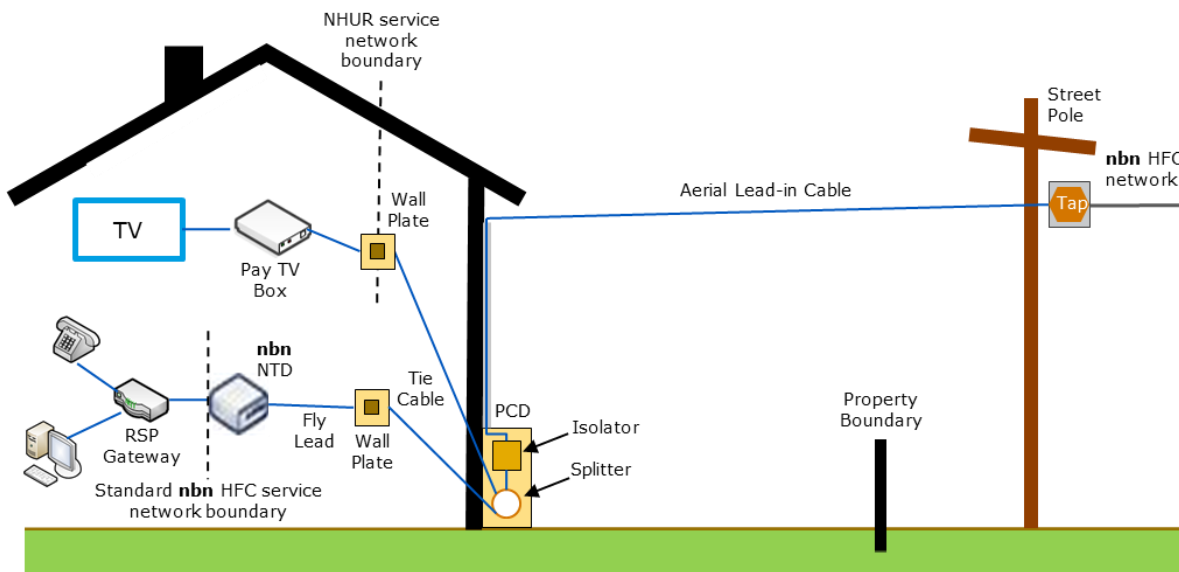


Figure 4 SDU nbn HFC installation – aerial TAP with aerial lead-in cable

3.1.4 SDU nbn HFC installation – aerial TAP with underground lead-in cable

Figure 5 displays the underground lead-in cable in conduit connected to the aerial TAP on street pole infrastructure via a riser pipe.

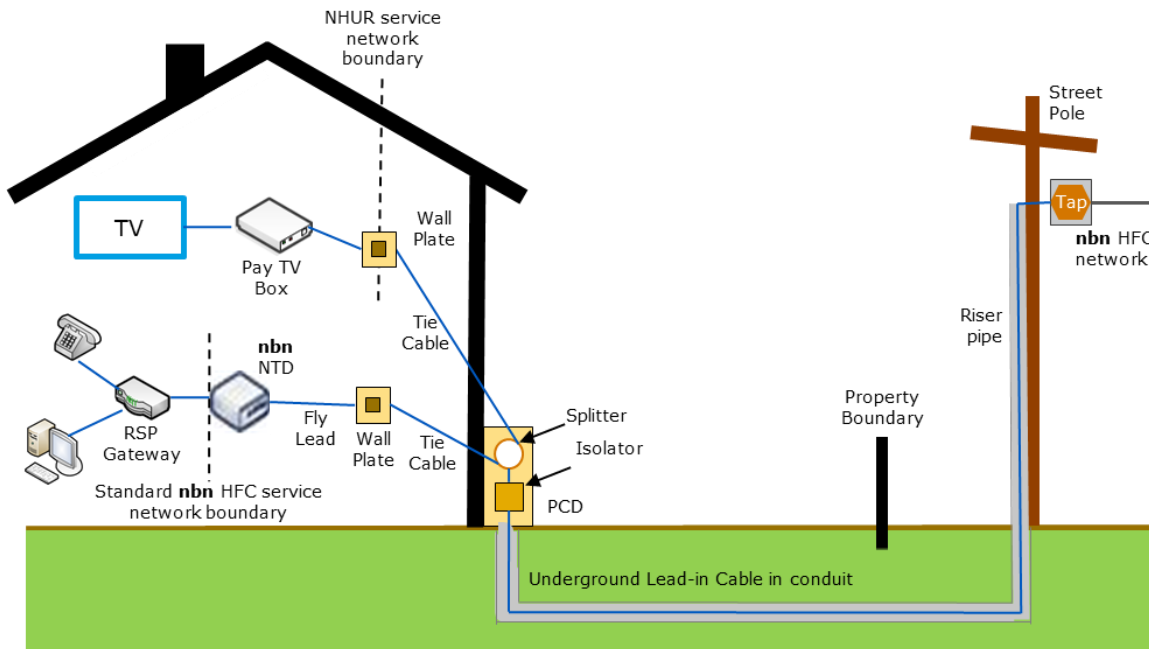


Figure 5 SDU nbn HFC installation – aerial TAP with underground lead-in cable

3.2 Multi Dwelling Unit service overview

An HFC service for a Multi Dwelling Unit (MDU) includes the provision of an End User’s HFC service from the TAP to the wall plate for an NHUR service and from an nbn NTD for a standard nbn HFC service.

Figure 6 displays an example of a vertical development MDU with:

- A security box with a TAP connected to the nbn HFC Network and isolators for each dwelling
- Lateral cables for each dwelling from the TAP port and isolator to an Internal Connection Device (ICD)
- A splitter within the EUP to provide a standard nbn HFC service and an NHUR service
- Lateral cable from each splitter to each wall plate and the fly lead to NTD
- RSP-provided cabling and equipment from the nbn NTD onward for standard nbn HFC service
- Telstra- or FOXTEL-provided Pay TV box for an NHUR service

An MDU can also be configured horizontally (e.g. a group of ground level units) or as a combination of both horizontal and vertical dwellings.

- .

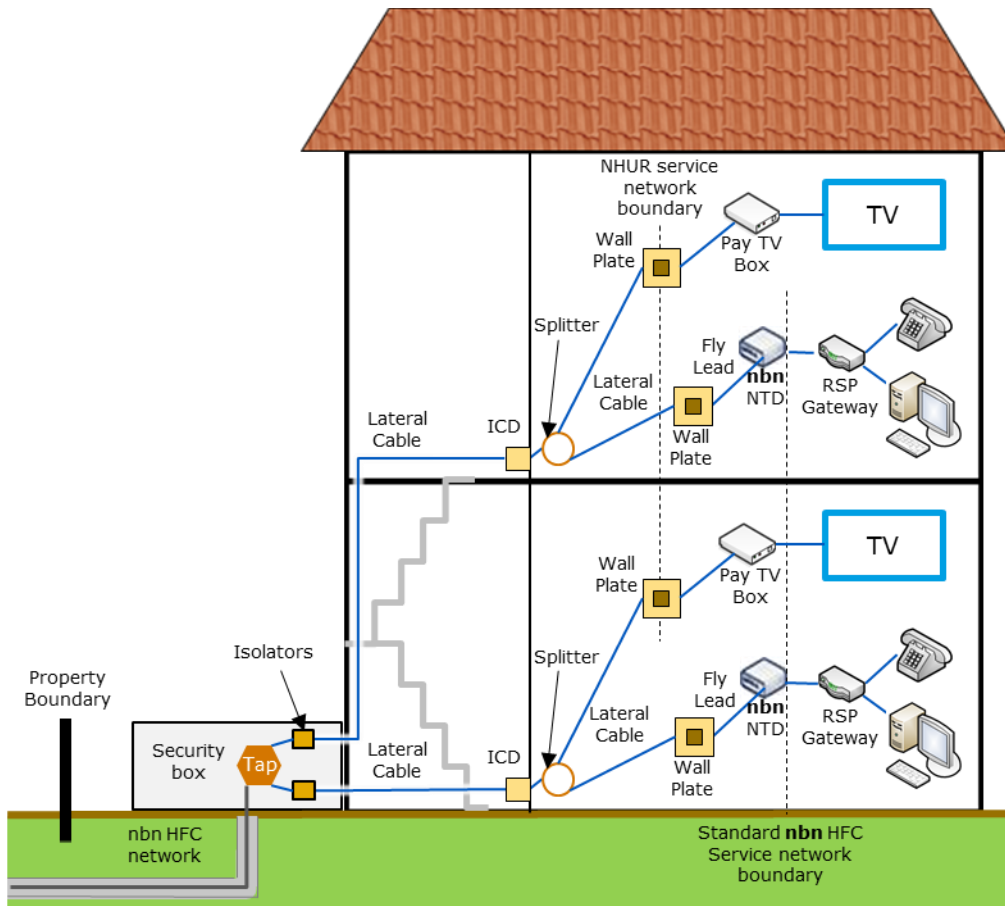


Figure 6 MDU nbn HFC installation

For more information about different types of MDU configurations and construction standards:

- Telstra network, refer to **Error! Reference source not found.**
- Optus network, refer to **Error! Reference source not found.**



4 HFC service restoration work order

A work order (WO) summarises and provides a record of the required Field Contractor service assurance work. When the Field Contractor receives a WO, it triggers the start of a service restoration activity. The Field Contractor then completes service restoration activities as described in this guide and updates the WO.

A service assurance WO is generated under the following circumstances:


- A Retail Service Provider (RSP) validates a service fault reported by an End User and attempts to resolve it.
- If the RSP cannot resolve the service fault, they contact nbn who attempts to resolve the fault remotely.
- If nbn cannot resolve the fault remotely, they raise a work order for a Field Contractor to attend the End User Premises to resolve the fault.

4.1 General information

A WO provides general information required for a service restoration activity. This includes:

- Work order ID (e.g. WOR1234567890123)
- nbn Reference ID (e.g. INC400000001234)
- Appointment date and time, EUP address and contact information.
- Description of fault
- Onsiting information, which includes assessment of the surroundings to ensure it is safe to attend to the job.

Note: Field Contractors must ensure that there are no Health & Safety issues present before starting the job and ensure their activities will **not** create new anticipated and/or unanticipated Health and Safety concerns. Field Contractors must follow Job Safety & Environment Analysis (JSEA) and/or Safe Work Method Statement (SWMS) while on duty.

- Job activities, including activities to resolve the fault.
- Network trail information including:
 - Network resource name of the Amplifier feeding the EUP
 - Name and location (latitude, longitude) of the tap and other network assets leading to the EUP
 - Lead-in type as either Aerial or Underground.
- WO type including:
 - Service Restoration
 - NHUR Service Restoration
- Additional address details (including MDU identifier if applicable)
- Whether it is a Priority Assist WO. If it is, the Priority Assist value is 1 and a heart icon in ATLAS:Operate 
- Whether it has an Enhanced Service Restoration SLA (either 12 or 12 (24/7))
- Service information including:



- Service type as standard nbn HFC service, NHUR or both

4.2 Job requirements

For an HFC service restoration activity, the job requirements in the WO outline the Fault Type, which could include:

- Complete loss of service
- Speed degradation
- Drop-outs



5 Tools and equipment

It is recommended that Field Contractors should:

- Undertake a risk assessment in accordance with relevant legislation for each tool and piece of equipment. As a result of the assessment, procedures should be in place for their safe use and maintenance, and training provided to users in these requirements.
- Access and maintain an inventory of items sufficient to complete the restoration activity.
- Ensure all equipment is protected in transit by suitable packaging and restraints and is not exposed to the weather during the restoration activity.
- Label and identify their equipment including recording serial numbers to prevent theft.
- Protect all equipment from theft.

5.1 Tool calibration and maintenance

All tools must be regularly maintained and test equipment must be calibrated in accordance with the manufacturer's recommendations.

All hand-held power equipment must be electrically tested and tagged in accordance with all applicable legislation and local requirements.

5.2 Standard equipment

It is recommended that Field Contractors have the following tools and support materials in the service vehicle at all times:

Note: The following list is indicative only. A full list of Field Contractor equipment (including specialist tools required for assurance) is available from the *Suggested HFC Equipment List*.

- Insulated pliers and side cutters
- Insulated screwdrivers (Flat/Phillips/Torx)
- Soldering iron
- Jointing torch and relevant PPE
- Common keys generic to the telecommunications industry (e.g. NMB key, TEL key, ABLOY key, MLV key, 219 key, 331 key etc)
- F-connector Torque spanner
- Madison diversified star key (MDU connection)
- Security Torx Driver
- Gas torch
- Electrical multimeter
- RF leakage detection meter

5.3 Safety equipment

It is suggested that Field Contractors have the following safety equipment in the service vehicle at all times:

- Safety folder with procedures, technical specifications, and assessments



- Dry chemical powder fire extinguisher
- First-aid kit and burns kit
- Asbestos Safety kit, only to make an area safe if required. See **Error! Reference source not found.**
- P2 mask and fitting instructions
- Gas detector
- Protective eyewear
- Hearing protection
- Riggers gloves
- Electrical rubber safety gloves
- Reflective safety vest, shirt or jacket
- Approved traffic management aids including 'Workmen Ahead' signs, pedestrian (arrow) signs, witches hats, and manhole guards
- Rubber earth mat for working in pits in an EPR zone
- Rubber work boots

5.4 Testing equipment

Field Contractors are required to have and maintain their own testing equipment. **nbn** also expects Field Contractors to have:

- Suitable coaxial cable test leads
- **nbn**-approved RF testing meter (Viavi ONX620 or CM3000)
- Electrical multimeter
- RF leakage detection meter

Note: This list is indicative only. A full list of testing equipment (including specialist tools required for assurance) is available from the *Suggested HFC Equipment List*.



5.5 Nbn-specified equipment and cables

nbn-specified equipment and cables includes the equipment, cables and consumables that:

- Delivery Partners have to source themselves
- nbn will supply to Delivery Partners
- Are based on Telstra and Optus HFC network requirements

A full list of HFC-specific equipment is available in the *Suggested HFC Equipment List*.

Note: The following list is indicative only and includes the minimum required equipment to do the job.

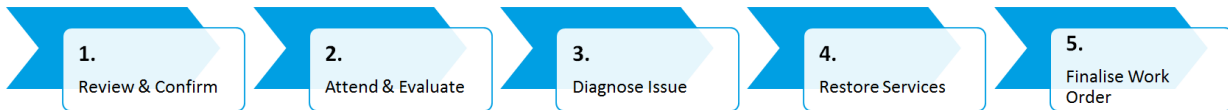
- Network Termination Device (NTD)
- F connector RG6
- F connector RG11
- Stripping tools
- Compression tools
- Isolators
- Splitters
- Attenuators
- 75 ohm terminators
- Thread moisture seal
- Foil
- Heat shrink
- Ladder

Note: If using the CM3000, see the document Sunrise CM2800E 3000E RF Signal Analyser - Customer Premises Application - HFC Broadband Cable Network (**NBN-0292**).



6 Restore HFC service

This section covers the activities, process and procedures that a Field Contractor must perform to restore an HFC service.



6.1 Review and confirm

This section describes how to check the details of the work order and confirm customer availability after receiving the work order from your Workforce Management Centre (WMC).

6.1.1 Review work order

Check that the work order is complete and contains all the necessary information including:

- EU contact information
- EU Address/building information
- Work order type, e.g. standard **nbn**/NTD or NHUR/wall plate
- Description of the service Incident (and any required network tests)
- Priority Assist flag/icon (requiring urgent response or attendance)

Note: For RF specifications, see *HFC Tap Down/Installation & Assurance Test Requirements*.

Important: Review the notes in the work order to ensure that you are aware of any special requirements or conditions.

If the WO contains	Then
All the necessary information to complete a job	If you received the WO: <ul style="list-style-type: none"> • Before the scheduled date, go to Confirm appointment. • Same day as scheduled, go to Call on approach.
Incorrect, incomplete or missing information	Contact Field Service Operations (FSO) on 1800 626 225 to provide clarification on the required detail.



6.1.2 Confirm appointment

If you received the WO before the scheduled date:

- Contact the End User 24 hours prior to the start of the scheduled appointment to confirm that they will be available and have organised access (in consultation with the Building Manager) to the communications/MDF room/cabinet (if required) on the day.
- Advise the End User that an adult over the age of 18 must be onsite who is authorised to make decisions regarding the work required and supervise any children present.
- Check the address provided, as well as any other relevant information from the work order (e.g. visitor parking or special equipment requirements).

If	Then
No answer (End User not contacted)	Do not leave a voicemail message for the End User. Attempt to contact the End User later in the day. If you still cannot contact the End User on the day, contact your WMC to provide a status update.
End User cancels appointment	Contact Field Service Operations (FSO) on 1800 626 225 to provide a status update End of procedure
End User wants to reschedule to early/late day visit	Ask the customer to contact their RSP to reschedule the appointment. Contact Field Service Operations (FSO –WOM) on 1800 626 225 (Option 4, then Option 2) to provide a status update. End of procedure

6.1.3 Call on approach

On the day of the appointment, contact the End User 15-30 minutes before the appointment using the contact information from the work order.

If	Then
The End User confirms appointment	Go to Attend site .
No answer (not contacted)	Do not leave a voicemail message for the End User. Go to Attend site .
The End User cancels appointment	Contact Field Service Operations (FSO) on 1800 626 225 to provide a status update End of procedure



If	Then
<p>The End User wants to reschedule to early/late day visit</p>	<p>Ask the customer to contact their RSP to reschedule the appointment.</p> <p>Contact Field Service Operations (FSO) on 1800 626 225 to provide a status update.</p> <p>For a DP-managed reschedule: Contact your WMC and inform them the End User has cancelled the appointment. Ask them to attempt to reschedule the appointment with the End User</p> <p>End of procedure</p>

6.2 Attend and evaluate

This section describes the steps you take when you arrive on-site and before you commence any work.

6.2.1 Attend site

After arriving at the End User premises, make contact with the End User to advise them you are onsite and need to complete a site assessment to confirm that the information provided regarding the external cabling etc. is correct.

If	Then
<p>The detail (including address) on WO is incorrect</p>	<p>Contact DP&A via ATLAS:Operate to clarify the correct information and update the WO.</p>
<p>The End User is not in attendance</p>	<p>Remain on site for 15 minutes before calling FSO on 1800 626 225.</p> <p>For a DP-managed reschedule: Contact your WMC and inform them the end user is not in attendance (NIA). Ask them to attempt to reschedule the appointment with the End User.</p> <p>Leave a Not In Attendance (NIA) card.</p> <p>Note: Please ensure you have NIA cards before starting your work each day.</p> <p>End of procedure</p>
<p>The End User wishes to cancel the appointment</p>	<p>Contact FSO on 1800 626 225 to provide clarification on required detail.</p>
<p>The End User is in attendance</p>	<p>Using ATLAS:Operate, change the status of the WO to ON SITE.</p>



6.2.2 Evaluate the site

Evaluate the site to determine if site access is adequate/safe and rule out non-approved work on heritage listed premises.

If	Then
Site access available	Record job safety information on the WO as appropriate. Go to Explain and gain End User consent .
No site access available	Check ATLAS:Operate for additional information including site details, contacts and attachments. If you cannot find the information necessary to access the site, work cannot proceed. Contact FSO on 1800 626 225 to provide a status update. End of procedure

6.2.3 Explain and gain End User consent

Inform the End User that, with their permission, you can proceed with resolving the issue. Tell them that you will be performing fault finding and proactive maintenance activity including equipment and signal checks from the premise to the network boundary.

Discuss the detail of the work required including:

- The need for the adult (over 18) contact to remain on site for the duration of the appointment
- Outages to the electricity supply and other services
- Taking of ‘before and after’ photos (for quality assurance/network administration)

Note: Work cannot proceed if consent has not been provided. If the EU does not own the property, it is the EU’s responsibility to obtain and show permission from the owner/landlord before you can proceed with the work.

If the End User	Then
Provides consent for the work to proceed	Go to Confirm status of existing HFC service .
Does not provide consent for the work to proceed	Work cannot proceed. Contact FSO on 1800 626 225 to update the WO as incomplete. End of procedure



6.2.4 Confirm status of existing HFC service

If the End User has other services currently provided on the HFC network (e.g. Foxtel, BigPond), it is important to check and record the current status of these services.

6.3 Diagnose issue

To diagnose the issue the Service Incident was raised for, you must start at the end-point of the service (wall plate or NTD), go to the TAP and work back to the premises.

6.3.1 Confirm issue with End User

In ATLAS:Operate, review the Fault Details section on the WO. Because only a finite amount of detail can be provided on the work order, confirm with the End User any additional information regarding the issue including:

- Date the service was activated
- Date when fault was identified
- Services that are affected
- If the issue is persistent or intermittent
- Recent work completed or previous attempt to restore service
- The type of HFC infrastructure

If	Then
Standard nbn service	Check the status of the NTD. Go to Check the NTD status and lights.
NHUR service	Go to Check signal levels at the wall plate.

6.4 Restore services

This section describes the actions to take, based on results of the completed diagnosis and troubleshooting.

Important: The following assumes that you have followed the *check site and make it safe* steps and determined that site access is adequate and safe per HSE criteria.

For RF specifications, see *HFC Tap Down/Installation & Assurance Test Requirements*.

To ensure that the End User's services are restored to **nbn** standards, you must run tests at the following points. These tests can then be referred to in the event of any future service faults.

- TAP port
- PCD/ICD
- Wall plate
- NTD



Important: To identify any RF leakage, you must perform egress testing after you have completed all activities between the TAP and wall plate. If testing identifies RF leakage, remediate as required (e.g. replace lead or lateral etc). If necessary, contact your field supervisor for assistance.

6.4.1 Check the in-home amplifier

If the End User has other HFC services, check for the presence of an amplifier inside the PCD and ensure that it is powered on from an internal GPO with the poser inserter in place using the first port.

6.4.2 Check the NTD status and lights

To confirm the current status of the NTD do the following:

1. Use the NTD Status Test in ATLAS:Operate to check the status of the NTD.

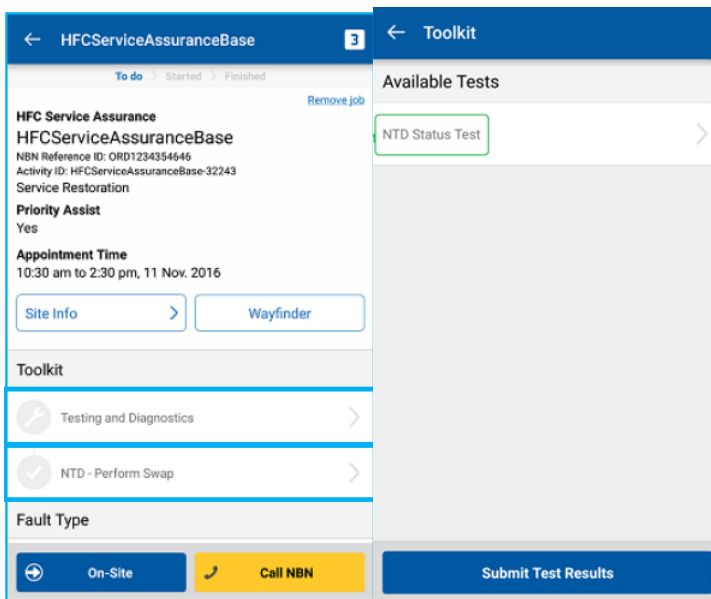


Figure 7 NTD status test

2. Check the indicator lights to show the current status:



Figure 8 nbn NTD front panel

3. Confirm the RF connection at the rear of the NTD is correctly connected and there is no corrosion or visible damage. The position of the connector is shown below:



Figure 9 nbn NTD back panel

4. Ensure the NTD is connected directly to a power point because performance may be impacted when connected to power boards.



If	Then
The status of the NTD is active	Go to Remove internal splitter .
The NTD cannot be powered on	Perform all the following steps then go to Replace the NTD .
The NTD is not the latest nbn-approved model	Perform all the following steps then go to Replace the NTD .

6.4.3 Remove internal splitter

If End User has an internal splitter:

1. Check the connection of the second output.
2. If the second output is not connected to an active secondary service (e.g. Foxtel, BigPond), remove the internal splitter.
3. If the second output is connected to an active secondary service (e.g. Foxtel, BigPond), leave the splitter in place. Check the splitter for damage and replace if required.

6.4.4 Check signal levels at the wall plate

This section describes RF signal testing based on the Viavi ONX620 test meter. You must save the OneCheck tests for TAP, PCD and wall plate once signal readings are within specification and uploaded to StrataSync. Complete this step at the end of each work order. You do not need to save “before” tests.

Note: If using the CM3000, see the document, *Sunrise CM2800E 3000E RF Signal Analyser - Customer Premises Application - HFC Broadband Cable Network (NBN-0292)*. At the end of each work order, you must save and send photos of the signal readings (when they are within specification at TAP, PCD and wall plate) to fieldsupport_hfc@nbnco.com.au.

For RF specifications, see *HFC TAP-Down - installation and assurance testing requirements*.

To check signal levels at the wall plate:

1. Use the fly lead to connect Port 1 of Viavi meter to wall plate.
2. Check the Viavi test meter and ensure that it is synced to the Viavi application on the mobile phone so that the geolocation can be captured.
3. Launch the OneCheck test app in the Viavi test meter.
4. Select test location as **CPE** on the OneCheck test, input the child work order and start test.
5. Check test results. Signal readings at wall plate are required to be within specification as per *HFC TAP-down – installation and testing requirements*.
6. Record signal levels for reference.
7. Install 75 ohm terminators on unused wall plates (if applicable).

Important: When checking the connectors throughout the service, ensure that:



- No moisture is present in the internal coaxial cable
- The cable is not kinked and bend radius is not comprised
- There is no corrosion present on the connectors
- Connectors are compressed/tensioned correctly
- Centre dielectric and conductor are at the correct length (with insulating plastic removed).

6.4.5 Check and replace F connector at the TAP

To check and replace the F connector at the TAP:

1. Locate the TAP (if possible).

Important: If the TAP cannot be accessed due to HSE issues (e.g. condemned pole, water ingress in the pit), send photos of the TAP and the pole number to your WMC.

If you are uncertain about any aspect and need advice or clarification, contact your Field Supervisor for additional troubleshooting or testing that can be completed onsite.

2. Locate the TAP connected to the lead-in cable.
3. Disconnect the lead-in cable from the TAP.
4. Check the condition of the F connector at the lead-in cable.
5. If there is any degradation (e.g. blackened, corroded), replace the F connector on the lead-in cable.
6. Confirm that the cable bend radius is correct.
7. Confirm the F connectors are compressed and tensioned correctly.

6.4.6 Check signal levels at TAP

To check signal levels at the TAP:

1. Connect Port 1 of the Viavi meter to the TAP port and connect lead-in cable to Port 2.
2. On the Viavi meter, select TAP as the test location and perform OneCheck test.
3. Check the test results. Signal readings at the TAP must be within specification as per *HFC Tap Down/Installation & Assurance Requirements*.
4. Save the test using the simplified child work order ID followed by "T1" to indicate TAP testing file e.g. "12345678T1".

Important: Save the test result in the exact format as indicated above, ensuring the child work order number is correct. **Nbn** audits the signal reading evidence.

Note: If using the CM3000 meter, photograph the signal reading at the TAP.

5. Install 75 ohm terminators to unused TAP ports (if applicable).
6. If signal levels at the TAP are not within specification or the TAP appears to be faulty, network remediation is required. Contact Diagnose, Prioritise & Assign (DP&A) at 1800 626 662 (Option 1, Option 1) to inform them of the issue and provide the following details:



- If there is a spare TAP port, confirm that the signal level is within specification.
- nbn reference ID on the WO.
- Signal level at the TAP and any inconsistencies or intermittent issues as per the guidelines.
- Any damage or corrosion present.
- Safety hazards or issues with the installation or previous restoration works.
- Additional information or observations that may assist in restoring the network.
- Photograph the faulty TAP and send to customersupport_hfc@nbnco.com.au.
- Ensure the TAP test results are saved using the simplified child work order ID followed by "T1" to indicate TAP testing file e.g. "12345678T1" to illustrate TAP up signal issues.

Note: if using the CM3000 meter, capture photo of signal readings and send to customersupport_hfc@nbnco.com.au.

7. If the TAP needs to be upgraded because there are not enough ports, contact Field Service Operations (FSO) on 1800 626 225.
8. Clean up the site and make it safe (e.g. close the pit if it's an underground network).

6.4.7 Check F connector at the PCD

To check the F connector at the Premises Connection Device (PCD):

1. Locate and open the PCD.
2. Check the condition of the F connector at the end of the lead-in cable that is connected to the isolator and replace the F connector if required.
3. Connect port 1 of the Viavi meter to the end of the lead-in cable and connect port 2 to the network in-port on the isolator.
4. Select **Ground Block** on the OneCheck test and run the test.
5. Check the test results. Signal levels must be with specification as per *HFC TAP-down – installation and testing requirements*.
6. Replace the lead-in cable if signal loss from the TAP is outside acceptable levels.
7. When signal strength is within specifications, use a gas torch to bind and heat shrink the F connector at the TAP (if required).

When checking the connectors throughout the service, ensure that:

- No moisture is present in the internal coaxial cable.
- The cable is not kinked and bend radius is not comprised.
- There is no corrosion present on the connectors.
- Connectors are compressed/tensioned correctly.
- The centre dielectric and conductor are at the correct length (with insulating plastic removed).



6.4.8 Check signal levels at the isolator

To check signal levels at the isolator:

1. Confirm that the isolator is an **nbn**-approved model.
2. If the model of the isolator is different from current nbn approved model:
 - a. Disconnect EU internal tie cable from “Customer-Out” port.
 - b. Replace isolator unit.
 - c. Reconnect EU internal tie cable to “Customer-Out” port.
 - d. Compress and tension the connectors as required
3. Connect Port 1 of the Viavi meter to the Customer Port on the isolator in the PCD. Connect existing internal cabling to Port 2 of the test meter.
4. Select Ground Block on the OneCheck test.
5. Check test results.
6. Replace isolator if signal strength has dropped beyond acceptable levels as per *HFC TAP-down – installation and testing requirements*.

6.4.9 Check/replace the splitter in the PCD

To check the splitter:

1. Check the model of the splitter in the PCD.
2. If the splitter model is not a current nbn-approved model, remove and replace the splitter between the lateral cable and the isolator-out cable.
3. If there are vacant ports in the splitter, change the splitter to align with existing connected laterals in the PCD, for example, change from a 3-way to a 2-way splitter.
4. Connect to Port 1 of the Viavi meter to the output of the splitter in the PCD. Connect existing internal lateral cable to Port 2 of the test meter.
5. Select **Ground block** on the OneCheck test.
6. Check the test results.
7. Replace the splitter if signal strength has dropped beyond acceptable levels as per *HFC TAP-down – installation and testing requirements*.
8. When the test results at the PCD are within specification, save the test using the simplified child work order ID, followed by ‘P1’ to indicate PCD testing file, e.g. ‘12345678P1’.

Note: If using the CM3000 meter, take a photograph of the signal reading.

Note: If there is still a high signal loss after replacing the isolator and splitter, then replace the lead-in cable.



6.4.10 Verify signal levels at the wall plate

To check the signal levels at the wall plate:

1. Check connector on the back of wall plate and the tie cable to the PCD and replace if required.
2. Connect the Viavi meter to the wall plate.
3. Select **CPE** on the OneCheck test.
4. Check test results. Signal readings at the wall plate are required to be within specification as per *HFC TAP-down – installation and testing requirements*.
5. If there is a large drop in signal or the signal levels are not within specification, check the barrel connector on the back of the wall plate and the tie cable to the PCD.
6. Replace tie cable and/or connector if required.

Important: When checking the connectors throughout the service, ensure that:

- No moisture is present in the lead-in cable
- The cable bend radius and drip loop are correct
- There is no corrosion present on the connectors
- Connectors are compressed and tensioned correctly
- The End User's internal coaxial cable is not compromised (replace if required)
- The centre dielectric and conductor are at the correct length (with insulating plastic removed)

6.4.11 Remove attenuator and check condition of the fly lead

To remove the attenuator and check the condition of the fly lead:

1. Check for any in-line attenuators.
2. If an attenuator is present, remove it and check the signal level at the wall plate.
3. If signal strength is within specification as per *HFC TAP-down – installation and testing requirements* without attenuator, then remove the attenuator.
4. If signal strength is not within specifications, replace the attenuator and rerun OneCheck test at the wall plate.
5. Check the condition of the fly lead and replace as required.
6. When the test results at the wall plate are within specification, save the test using the simplified child work order ID, followed by 'W1' to indicate PCD testing file, e.g. '12345678W1'.

Note: If using the CM3000 meter, take a photo of the signal reading.

6.4.12 Reconnect the NTD and confirm the connection

To reconnect the NTD and confirm the connection:

1. Reconnect the NTD and fly lead and confirm that all 4 status lights are solid green.



2. Reset the NTD by either holding down the reset button for 5 seconds, or by removing the power supply for 5-10 seconds before reconnecting.
3. Take note of the below sequence of indicator lights during the reset:

Sequence	Description	Power	DS	US	Online
1	NTD performs a self-test				
2	NTD performs downstream search				
3	NTD performs an upstream search				
4	NTD ready for CMAC address registration				

Figure 12 NTD indicator light sequence

Important: If the NTD does not progress past sequence 2 or 3 and the DS/US LED flashes continually, check the connection to ensure there is no signal issue.

If	Then
All 4 lights are solid green when the reset completes	<ul style="list-style-type: none"> • Use ATLAS:Operate to perform diagnostics tests.
The <i>online</i> light continues to flash	<ul style="list-style-type: none"> • Replace the NTD. • Perform an NTD Swap in ATLAS. • Perform diagnostic tests using ATLAS.
The NTD still fails to register	<ul style="list-style-type: none"> • Replace the NTD.
The NTD is not the latest nbn-approved model	<ul style="list-style-type: none"> • Replace the NTD.

6.4.13 Replace the NTD

If it is necessary to replace the NTD, do the following:

1. Ensure that the replacement NTD is the current model (DOCSIS 3.1 model CM8200B).
2. Note the unique CMAC address.
3. Ensure the cables are connected and tightened correctly.

Important:

- Do not mount the NTD on the wall.
- Ensure the ventilation holes on the side of the unit are not blocked.
- If the modem swap fails in Atlas:Operate, contact DP&A to complete modem swap.

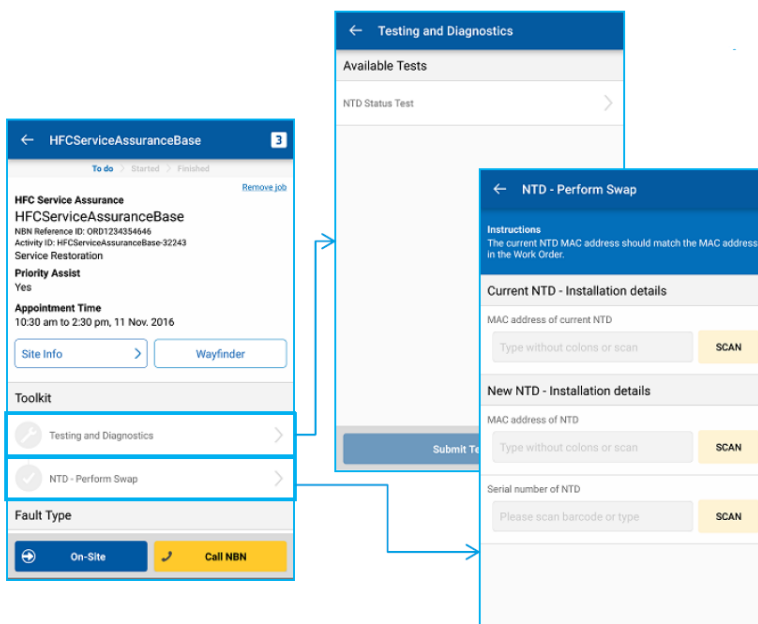


CM820B (Old Model)



CM8200B (New, DOCSIS 3.1 model)

CMAC location and example
Model number



6.4.14 Test End User’s HFC service

If the End User has existing HFC services (e.g. Bigpond, Foxtel), check that the work has not affected these services:

1. Run diagnostic tests using ATLAS:Operate. If you experiences issues with ATLAS:Operate, contact DP&A for assistance.
2. If existing services are impacted, attempt to restore them.
3. If the HFC service (e.g. Bigpond, Foxtel) still does not work ask the End User to contact their RSP.

6.4.15 Address additional causes

There may be cases where the cause of the issue is not exclusively related to the network infrastructure. The causes may include:

- End User behaviour (e.g. tampering or attempting to service on-site equipment)
- External interference (e.g. wildlife or vandalism)



- Environmental (e.g. tree branches disconnecting aerial lead-ins)

To address these causes, you may need educate the End User on correct use, or suggest measures that they could take to minimise impact to their service.

Important: Ensure that any suggestions made to the End User are included in the completed work order.

6.4.16 Tidy the job site

When the job is complete:

- Clean up the job site, ensuring that any waste associated with the job is disposed of properly. Do not dispose of waste at the End User Premises or in a public bin.
- Take photos of the completed work (matching those taken before starting) to assist with future escalations or damage complaints.

6.4.17 Confirm outcome with the End User

When the job is completed and the site tidied up:

1. Explain to the End User the outcome of the work that was completed.
2. Confirm restoration of service with EU.
3. If work was not completed, explain to the End User the reason including:
 - Additional investigation or work required on the network
 - Work that the End User may need to undertake independently
 - Timeframes of delays (if known)

6.5 Finalise work order

This section describes the tasks you must complete after work has been completed and before you leave the site.

6.5.1 Save and synchronise test results

Important: Ensure you have saved the test results for TAP, Ground block and CPE.

To synchronise test results:

1. Connect the Viavi test meter to the internet.
2. Click on the StrataSync application in the Viavi test meter to upload test results.

Important: If using the CM3000 meter, save photos of the signal readings at the TAP, PCD and wall plate and submit them to fieldsupport_hfc@nbnco.com.au with the child work order number included in the subject line prior to completion of each work order.

3. Check to see that the test results have been successfully uploaded.

Note: If you experience issues when uploading the test results to StrataSync, you can attempt to sync the results at a later time, or photograph the test results and submit them to the fieldsupport_hfc@nbnco.com.au inbox with the child work order number in the subject line.



6.5.2 Close the work order

To close the work order:

1. Complete required fields in the work order.
2. Use ATLAS:Operate to complete the work order.

Depending on the type of assurance job, you may need to provide or confirm:

- Confirmation of End User agreement to the methods undertaken and resolution of the issue
 - As-built details for items installed as part of the work order (for more information, see [As-built details](#))
 - The Schedule of Rate items relevant to the job (including item IDs and units of measures for each)
 - If not all work has been completed, the reasons why and any additional escalations that may be required.
3. Submit artefacts using your DP-specific business-as-usual claims process.
 4. If there are HSE issues, report them as per your BAU process

Note: If unable to complete the work order in ATLAS:Operate, contact Field Service Operations (FSO) on 1800 626 225.



7 As-built details

The following table outlines the as-built details you can provide to your WMC for items you have replaced as part of the service assurance job.

As Built attributes	Valid details
Lead-in Installation Type	Aerial Underground with new Lead-in Conduit Underground with existing Lead-in Conduit
Lead-in replaced	Yes No
Lead-in As Built Length	Length in metres
Lead-in Cable Type	RG6 RG11
Lead-in Conduit Installation Status	Installed Not Installed
Lead-in Conduit As Built Length	Length in metres
Lead-in Conduit Material	Plastic or PVC
Lead-in Conduit Size	Diameter in millimetres
Cable between PCD/ICD and wall plate As Built Length	Length in metres
NTD Serial Number	NTD Serial Number
NTD MAC address	NTD MAC address



8 Glossary

Term	Description
Access Seeker	An organisation seeking the supply of a product from nbn.
ATLAS:Operate	The nbn mobile app that allows Field Contractors to automate many work tasks when connecting an End User Premises to the nbn HFC Network.
CE	Customer Equipment. Equipment owned or operated by the End User. Outside the scope of nbn.
CMTS	Cable Modem Termination System
Competent Contractor	Party who is appropriately accredited (as applicable) and otherwise competent to perform the required work or service.
Contractor	See Competent Contractor.
Customer	nbn’s customers, including RSPs and WSPs. They have signed the WBA and have been provided with access to the NBN. To End Users, a Customer is variously called an Internet Service Provider (ISP), Service Provider, etc.
Customer Cabling	Cabling downstream of the nbn network boundary (the User Network Interface (UNI) ports on the NTD). Outside the scope of nbn.
Customer Equipment	Customer Equipment means any equipment that is: used by Customer in connection with the nbn Network, the nbn Platform, the National Test Facility or any Ordered Product; or Provided by or on behalf of Customer to any Downstream Customer to whom it supplies Customer Products for use in connection with the nbn Network or any Customer Product, but excludes all nbn Equipment and Common MDU Site Equipment.
Downstream Customer Equipment	Any equipment that is used by any Downstream Customer in connection with the nbn Network or any Downstream Product.
DP	Delivery Partner. Company with whom nbn has a direct contractual relationship. A DP: Provides services according to nbn processes and guidelines, as per the DP’s contract. Either completes work using their own resources, or engages Field Contractors to do the work as per the DP’s contract. DP resources and Field Contractors must be Competent Contractors. Ensures Field Contractors, if engaged by the DP, follow nbn processes and



Term	Description
	guidelines, as per the DP's contract.
DP&A	Diagnose, Prioritise and Assistance (Service Assurance Call Centre)
End User Equipment	Any equipment used by any End User in connection with the nbn Network or any Downstream Product, including residential gateways, routers and personal computers
EU	End User. The End User to whom a Customer supplies or proposes to supply a carriage service or content service. The customers of Customers have no direct commercial relationship with nbn.
EUP	End User Premises.
Field Contractor	Party engaged by a DP to perform required work or services. A Field Contractor must be a Competent Contractor.
HFC	Hybrid fibre-coaxial.
HSE	Health Safety and Environment.
ICD	Internal Connection Device
MDU	Multi-Dwelling Unit. A multi-dwelling unit site with an MDU which comprises more than one Premise in a single location, whether those Premises are used for business, residential or other purposes.
NBN	National Broadband Network.
nbn	nbn Limited.
nbn HFC Network	TBC
NB	Network Boundary. The physical point where a network ends, often the first socket in an End User Premises or a point in an MDF (Main Distribution Frame).
NHUR	nbn HFC Use Right
NTD	Network Termination Device
PCD	Premises Connection Device
POI	Point Of Interconnect. Point at which Customer connects to the NBN, a physical port on an nbn



Term	Description
	Ethernet fan-out switch at which Customer connects to exchange traffic with the NBN.
PPE	Personal Protective Equipment
Premises	Addressable location currently used on an ongoing basis for residential, business (whether for profit or not), government, health or educational purposes.
RSP	Retail Service Provider. Third party provider of retail broadband services to End Users.
SDU	Single Dwelling Unit.
Service Class	The classification of a Premise according to the status of the physical infrastructure applicable to that Premises.
Site Owner	The legal owner of the Premises at the time of pre-installation.
TAP	Terminal Access Point
WBA	Wholesale Broadband Agreement. Contract between nbn and RSPs or WSPs.
WO	Work Order. Item detailing required installation tasks. Provides trigger to start an installation in the field, and is used by the Field Contractor to check off completion of work items, and returned as 'As Built' information to the MAC.



9 Nbn code of conduct

When at an End User's Premises, the End User sees the Field Contractor as representing not only the Delivery Partner, but also **nbn** and the respective Retail Service Provider.

On arrival and before entering the Premises, the Field Contractor should identify any hazards such as dogs or any other visible risk on the property. If such risks are visible, they should ring the owner or occupier of the Premises and request any assistance to mitigate any risks.

They should knock at the front door and identify themselves by their official ID card (which has the company logo, their name, an ID number and expiry date clearly visible) and confirm which Customer they are installing on behalf of.

For example, a typical greeting would be, *'Hello, my name is xyz, I work for ABC Company and I'm here today to install your NBN services on behalf of (Customer's name)'*.

The Customer's name is identified by the Customer ID on the WO.

The Field Contractor should also confirm:

- That an adult will be present during the installation or service assurance activity.
- They are the owner of the Premises or have the owner's authority.
- They are responsible for the supervision of any persons under the age of 18.

Once permission to start work has been given the following should be remembered and applied at all times:

- Always be polite and friendly but not too familiar.
- No smoking on the Premises.
- Avoid more than normal familiarity with the user or their children, remember you are a professional.
- Be courteous at all times.
- Only enter the Premises by invitation. Where entry is required to the internal areas of the Premises industrial work boots must NOT be removed but you must use over-boot covers to ensure that carpet and floor coverings are not damaged. If returning after a period of being outside, please re-announce your presence.
- Don't allow others to use your tools for domestic work whilst you are there.
- Don't instruct the End User to undertake any work associated with, or to assist with the installation.
- Please take extreme care when working in/near shrubbery/flowering borders.
- If refreshment is offered, please accept or decline politely. Alcohol in any form is never to be accepted.
- When all work is complete please remove all evidence of your presence and remove any cardboard cartons, empty cable spools, cable sheathing, wire cut-offs, etc. back to the service vehicle.
- Always leave gates the way you found them.
- If you need to use the End User's phone (because you are in a non-mobile service area) do ask first and confirm it is only a local call.



- Do not leave the End User without confirming completion, handing over copies of any appropriate documentation and answering any questions.
- If the job cannot be completed, re-instate all pre-existing broadband internet and Pay TV services that have been affected by this job before leaving the EUP. This is so that the EU is not adversely impacted by the installation until the work can be completed.



10 End User interactions

The following table describes some interactions between a Field Contractor and an End User during installation:

Item	Field Contractor Activity
Work Procedure	Explain work procedure including expected duration and any outage time if relevant. Explain where you will do the work. Explain result of restoration work.
Terms	Explain terms used for items to be repaired. For example: Wall plate NTD
Network Boundary	Explain the network boundary. Explain that nbn is not responsible for remediation of wiring beyond the network boundary.