

Department of Communications Energy and Natural Resources

Consultation Paper

**“Recommendations For Open Access Fibre Ducting and
Interior Cabling for New Residential Buildings
- *Making Homes Fibre Ready*”**

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**All responses to this consultation should be clearly marked:-
“Reference: Submission re DCENR 11/01”
as indicated above, and sent by post, facsimile, or e-mail
to arrive on or before 5pm on 16th May, 2011 , to:**

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Please note DCENR will publish all respondents’ submissions with the Response to this Consultation

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Introduction

- 1.1 The Department of Communications, Energy and Natural Resources has identified high speed broadband connectivity as a critical element in the development of a competitive Smart Economy and inclusive Knowledge Society. The Department's policy in this area is set out in the paper "Next Generation Broadband – Gateway to a Knowledge Ireland", 2009.
- 1.2 One of the actions in the 2009 policy paper is the requirement for new residential buildings to have open access fibre connections installed, where practicable. The paper states that it makes economic sense to wire a building for high speed technologies at new build stage rather than having to retro-fit, at greater expense, at a later date.
- 1.3 A Working Group was established, with representatives from the Department of Communications, Energy and Natural Resources, the Department of the Environment, Heritage and Local Government and the Commission for Communications Regulation (ComReg), to oversee the implementation of this action. The Department of Communications, Energy and Natural Resources has consequently developed these recommendations relating to:
 - Open Access Fibre Ducting and
 - Internal Structured Cabling for New Residential Buildings.
- 1.4 Although it is unlikely that multiple FTTH networks will be rolled out in Ireland, due to the high cost of civil works and the low population density, the Working Group also explored the challenges involved in providing open access fibre to the home (FTTH), which would be required to enable users to change service providers. Possible rules for maintenance and repair of installed open access networks were also considered. Given the low probability of multiple FTTH network rollout and the operational complexity to which co-location of facilities at local level would give rise, this consultation paper focuses on the manageable, controllable, aspects of the 2009 policy paper action. It is for this reason that these recommendations address Open Access Fibre Ducting and Internal Structured Cabling for New Residential Buildings extending from the curtilage¹ of new residential buildings to the interior of the building.

Scope of the Recommendations

- 1.5 These recommendations are intended to be a reference document for the provision of open access fibre ducting extending from the curtilage of a new residential building to the interior of the building. The recommendations apply to new residential buildings such as detached, semi-detached and terraced houses and apartments. As explained the recommendations will be referred to by developers. The recommendations are not intended for commercial buildings.

¹ An area of land attached to a house and forming one enclosure with it (Oxford Dictionary)

- 1.6 The recommendations address the need in formal planning policies and regulation in relation to the specification of physical access to new buildings for open access fibre ducts.
- 1.7 The recommendations are detailed later in the document and in summary consider the following:
- An Open Access Meet-Me Chamber providing access at the curtilage of a new residential building (e.g.; this could include access from a point within a garden adjacent to the footpath. As specified in paragraph 1.24, the Meet-Me Chamber should be a low-cost, European standard (EN standard), off-the-shelf plastic AJ Chamber, such as those commonly used for drainage systems.)
 - An External Underground Open Access Fibre Duct providing access to the structure of the building (e.g.; from the Meet-Me Chamber to the side of a house)
 - An External Terminating Unit (ETU) on the exterior of the building (e.g.; an enclosure mounted on the exterior wall of a house)
 - Should there be no enclosed area of land immediately surrounding a new residential building, (e.g.; in infill residential developments in inner city areas), then there may be no need for an Open Access Meet-Me Chamber or for an External Underground Open Access Fibre Duct. In such a case the External Terminating Unit on the exterior of the building should become the point of open access.
 - An Internal Open Access Fibre Duct providing access from the External Terminating Unit (ETU) to an internal Communications Panel (e.g.; from an enclosure mounted on the exterior wall of a house to a point within the house where there will be a connection to the internal structured cabling of the house. This is commonly done by means of a Communications Panel, though not in every case.)
 - A Knock-Out Box on which the Internal Open Access Fibre Duct terminates and to which the FTTH Outlet Box and Communications Panel are connected, as explained later.
 - A Minimum Internal Structured Cabling Standard
 - Implementing Open Access
- 1.8 The recommendations do not address retro-fitting of buildings and are intended for new-build only.
- 1.9 These recommendations refer to fibre ducting and do not refer to the fibre itself which can be installed separately.
- 1.10 The recommendations do not address the method of deployment of Internal Structured Cabling.
- 1.11 While the recommendations refer to fibre ducting, the open access ducts may be used not only for fibre but also for coaxial cable or twisted pair copper as appropriate, as shown in Figure 5.

Publication of the Recommendations

- 1.12 It is intended that the recommendations will be published in their final form on the website of the Department of Communications, Energy and Natural Resources, alongside the existing “Recommendations for Underground Telecommunication Cable Works for Road, Commercial and Residential Schemes”, Dept Public Enterprise

(2001) [Now DCENR], which contains physical recommendations for laying and installing ducts and cables. Links will be provided to/from the Department of Environment, Heritage and Local Government website where a copy of the recommendations will also be posted.

Overview of the Recommendations and Where They Apply

- 1.13 The intention is to make it possible, at a suitable date, for Optical Fibre to be blown or pulled through a multi-way External Open Access Duct, (i.e.; not less than 3-way), incorporating mini/micro-tubes. The duct is to be accessed by means of an open access Meet-Me Chamber located within the curtilage of a new residential building and close to the footpath. The External Open Access Duct will be terminated at an External Terminating Unit (ETU) on the exterior of the building. An Internal Open Access Duct is to be accessible within the ETU. Similarly, optical Fibre can be blown or pulled through a multi-way Internal Open Access Duct, (i.e.; not less than 3-way), incorporating mini/micro-tubes contained within a flexible internal access duct. This duct will be routed to the Knock-Out-Box adjacent to the Communications Panel in the interior of each building. This would enable fibre to be connected with the minimum splicing of fibre joints, using lesser skilled labour and least-cost, off-the-shelf, components.
- 1.14 These recommendations address the challenge of deploying a standard configuration for fibre access ducting to new residential buildings. The recommendations are intended to provide specifications for the provision of physical access to newly constructed residential buildings for open access fibre ducts.
- 1.15 The fibre itself is not part of the recommendations. The ducting is provided only from the curtilage of a new residential building to the interior of the building. The recommendations do not extend beyond this boundary. For clarity and convenience, Figure 1 shows where the recommendations apply and the various interface points:

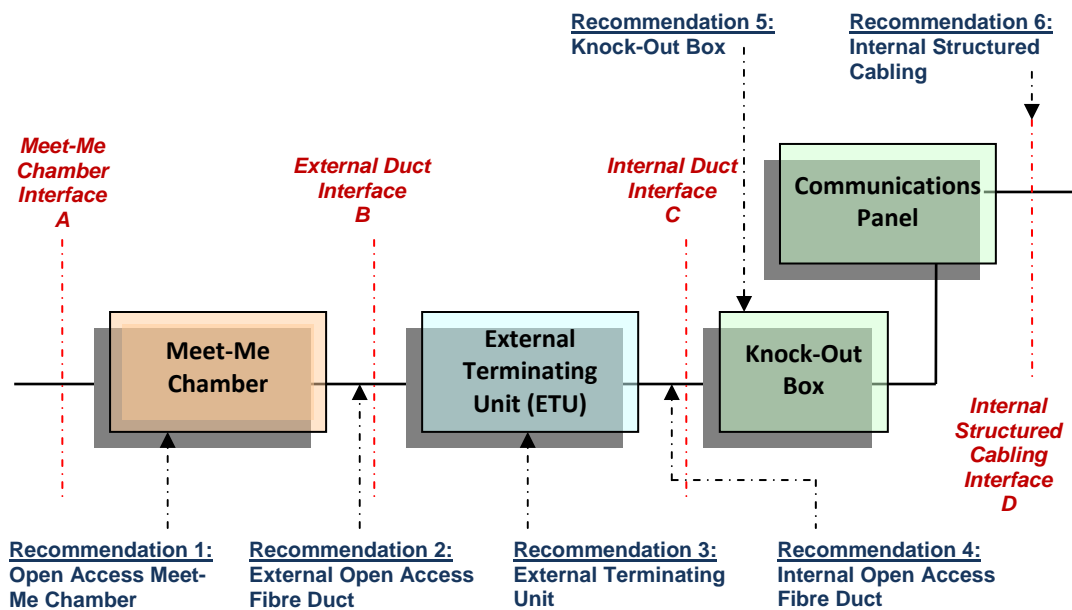


Figure 1. Overview of the Recommendations

- 1.16 “*Meet-Me Chamber Interface: A*”, the *Meet-Me Chamber Interface* lies at the curtilage of a new residential building, for example this could be at the boundary of a garden. This is the starting point for these recommendations. Interface A is addressed in Recommendation 1, “Open Access Meet-Me Chamber”.
- 1.17 “*External Duct Interface: B*”, the *External Duct Interface* lies between the Meet-Me Chamber and the External Terminating Unit (ETU). Interface B is addressed in Recommendation 2, “External Underground Open Access Fibre Duct”.
- 1.18 “*Internal Duct Interface: C*”, the *Internal Duct Interface* lies between the External Terminating Unit and the Knock-Out Box/Communications Panel within the building. Interface C is addressed in Recommendation 4, “Internal Open Access Fibre Duct.”
- 1.19 “*Internal Structured Cabling Interface: D*”, the *Internal Structured Cabling Interface* lies between the Communications Panel and the internal service access points within the building. Interface D is addressed in Recommendation 6, “A Minimum Internal Structured Cabling Standard”.

Recommendation 1: Open Access Meet-Me Chamber

General Access Configuration

1.20 Figures 2 and 3 show the general access configuration for connecting open access fibre ducts to new residential buildings. The chamber and ducting from the curtilage of a new residential building to the interior of the building are shown. Ducting beyond the boundary is not within the scope of these recommendations. The reasons for this are set out in section 1.4.

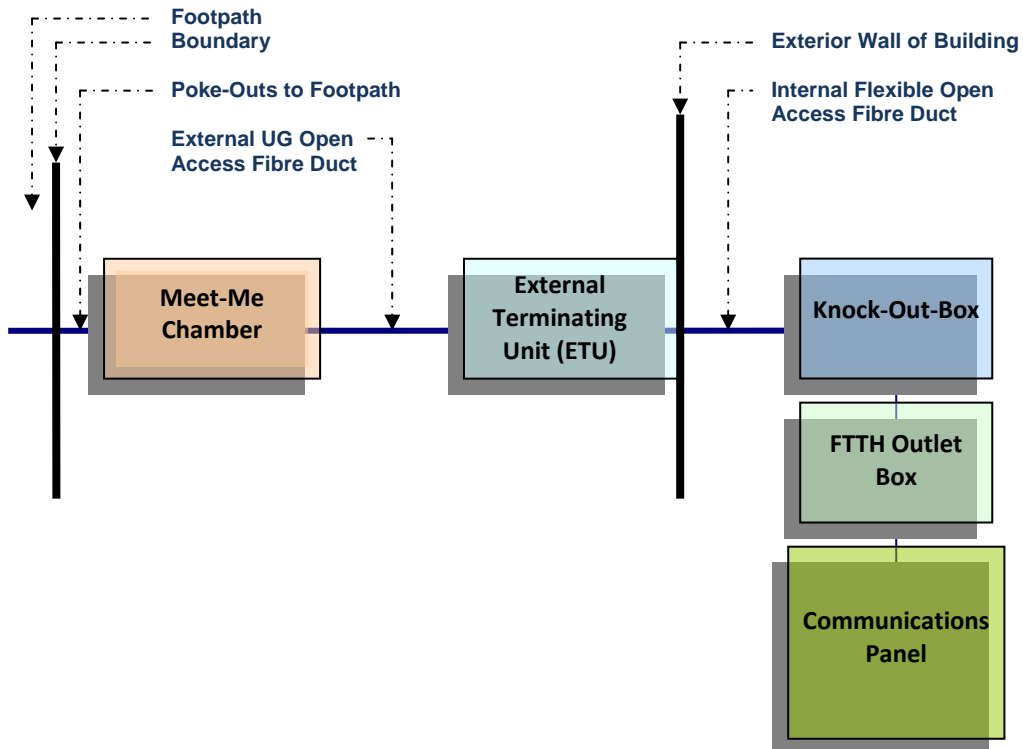


Figure 2. General Access Configuration

Open Access Meet-Me Chamber

1.21 An open access Meet-Me Chamber should be provided within the curtilage of the new residential building, as close to the footpath as possible, as shown in Figures 2, 3 and 4. The Meet-Me Chamber is to be the carrier-neutral point of access for service providers to the shared external underground open access duct.

1.22 The Open Access Meet-Me Chamber should be installed by the builder.

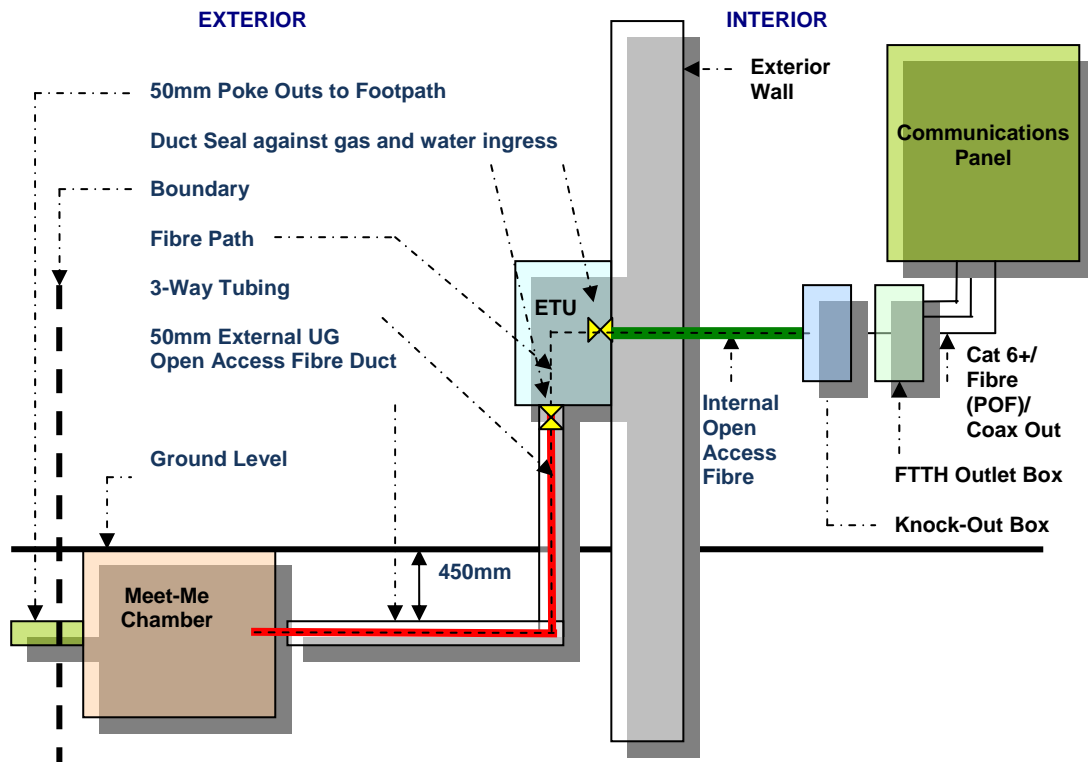


Figure 3. General Access Configuration: Section

- 1.23 The Meet-Me Chamber should be a low-cost, off-the-shelf plastic AJ Chamber, such as those commonly used for drainage systems, with an opening not less than 450mm x 450mm or diameter of not less than 550mm, to appropriate European standard (EN standard). This space should be sufficient to ensure that an operator accessing the chamber does not damage existing infrastructure or prohibit subsequent access.

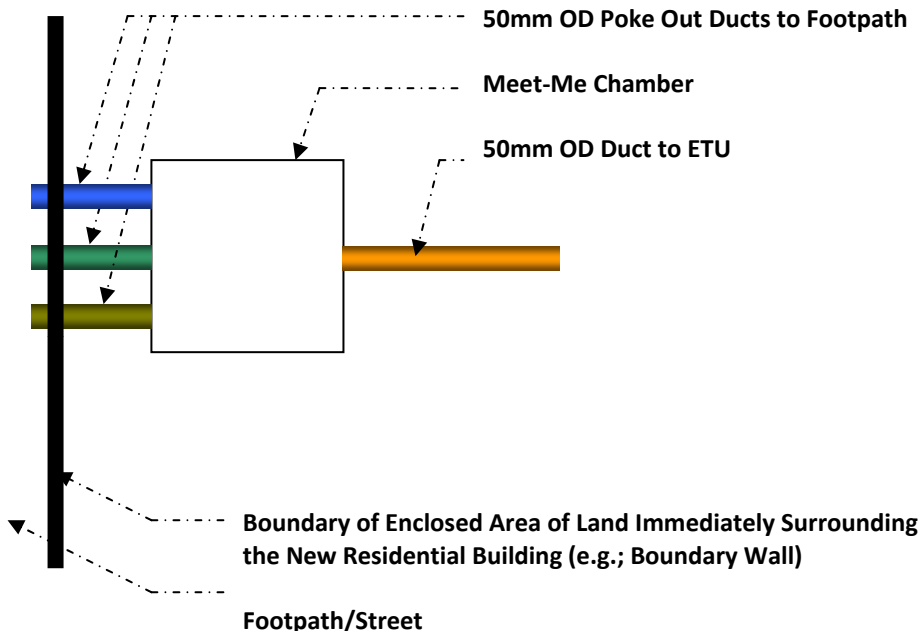


Figure 4. Meet-Me Chamber Location: Plan

- 1.24 The Chamber should have no less than 3 “poke-outs” on the side facing the footpath. The poke outs should be made of 50mm Outer Diameter (OD) ducts which should be run under the boundary wall out to the footpath. This will serve to reduce or remove the cost of civil works at a later stage when service providers are connecting from their own chambers in the footpath to the Meet-Me Chamber. The Meet-Me Chamber configuration is shown in Figure 5. As a natural evolution of this configuration, recommendations could be considered to locate Meet-Me Chambers in the footpath and to connect these to a co-location facility. These recommendations therefore make provision for existing plant and infrastructure build while at the same time looking to the future.
- 1.25 This will save significant costs for Service Providers who will be able to provide inexpensive drop joints from their own chambers in the footpath to the Meet-Me Chamber using, for example, standard pre-terminated single fibre. This will greatly simplify fibre installation to the home and allow for less skilled labour to be used, saving significant further costs.

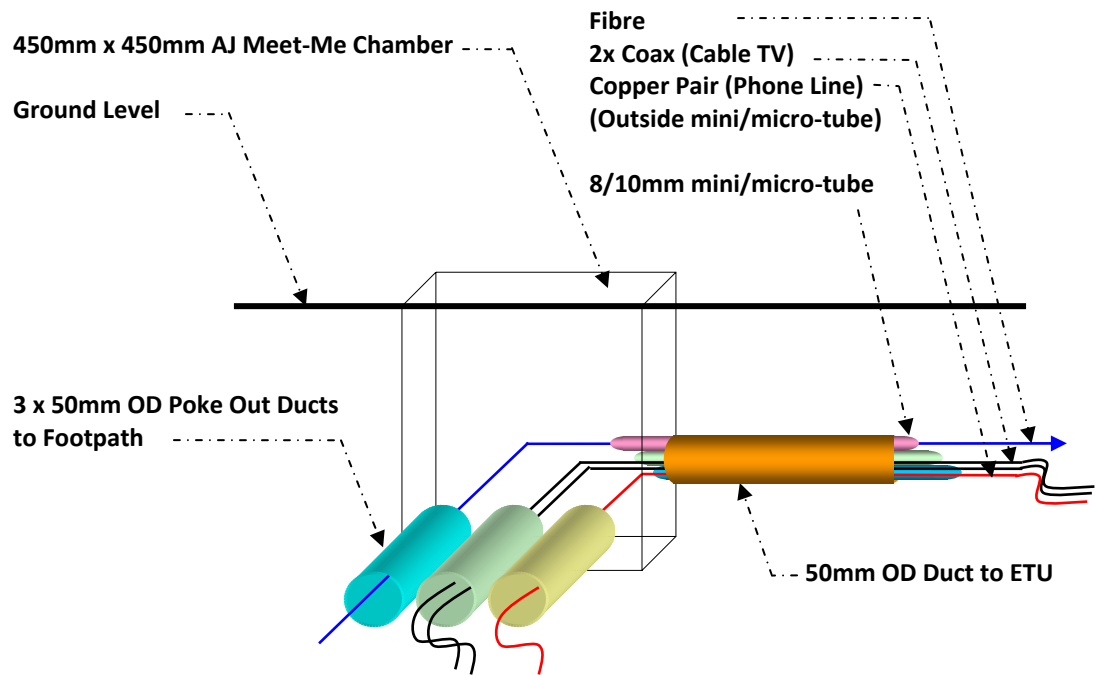


Figure 5. Meet-Me Chamber Configuration

Recommendation 2: External Underground Open Access Fibre Duct

Point of Access

- 1.26 The External Underground Open Access Duct leads from the Meet-Me Chamber to the External Termination Unit (ETU) mounted on the exterior wall of the building. The External Underground Open Access Fibre Duct is terminated within the External Terminating Unit (ETU), as shown in Figure 8. The External Underground Open Access Duct must be sealed to protect against ingress of water and gas.
- 1.27 The External Underground Open Access Duct should be installed by the builder. The mini-tubes and micro-tubes within the duct should be pre-installed and built-in at manufacture.
- 1.28 As shown in Figures 3, the External Underground Open Access Duct should run underground at a sufficient depth to permit a soil cover of 450mm² and be made of appropriate material, typically HDP (High Density Polymer), HDPE or ID polythene, with a thick wall so it will not kink. The External Underground Open Access Duct should be cylindrical with a 50mm nominal³ Outer Diameter (OD) in accordance with the requirements for residential schemes of the “Recommendations for Underground Telecommunication Cable Works for Road, Commercial and Residential Schemes”, Dept Public Enterprise (2001). Direct buried fibre should not be used⁴. The route of the External Underground Open Access Duct should be coordinated with other services routes ie, water, gas, electricity, foul sewer and surface water
- 1.29 Such a 50mm External Underground Open Access Duct should be prefabricated with no fewer than three fibre mini-tubes (3-way) in addition to providing space outside the mini-tubes for at least two coaxial cables (advanced Cable TV) and at least one local loop Copper twisted-pair (POTS). No fewer than six service providers should be capable of sharing the duct simultaneously to provide services to the owner/occupier of the building. The use of prefabricated multi-way duct will avoid the need for operators to install mini-tubes and ensure that existing services in the space are not damaged when new services are installed.
- 1.30 Space should be reserved in the External Underground Open Access Duct to accommodate a single fibre for use by Local Authorities in the provision of possible public services at some future date. One of the tubes should be made clearly identifiable as being reserved for Local Authorities.
- 1.31 The dimensions of the mini-tubes should be no less than 8mm (Inner Diameter) /10mm (Outer Diameter). A duct containing three mini-ducts and three micro-ducts is shown in Figure 6.

² “Recommendations for Underground Telecommunication Cable Works for Road, Commercial and Residential Schemes”, Dept Public Enterprise (2001)

³ “Recommendations for Underground Telecommunication Cable Works for Road, Commercial and Residential Schemes”, Dept Public Enterprise (2001)

⁴ “Recommendations for Underground Telecommunication Cable Works for Road, Commercial and Residential Schemes”, Dept Public Enterprise (2001), section 2.4.2.5, footnotes 11, 12: “The use of directly buried cable is not compliant with these recommendations”

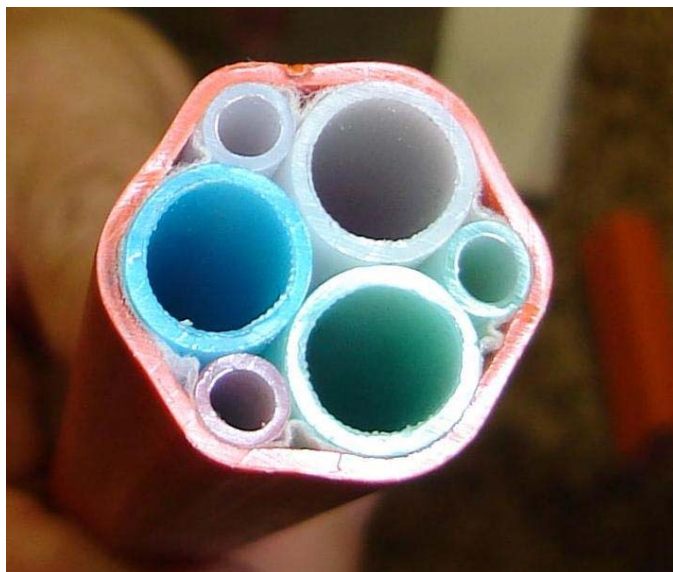


Figure 6. A 50mm (OD) Duct Containing three 10mm (OD), 8mm(ID) mini-tubes and three micro-tubes

1.32 There should be at least three mini-tubes prefabricated within the 50mm External Underground Open Access Duct, leaving sufficient space outside the mini-tubes for at least two coaxial cables (Cable TV) and at least one local loop Copper twisted-pair (POTS). There should be sufficient space within each of the mini-tubes for at least two single fibres to be blown or pulled through from the Meet-Me Chamber to the ETU. An 8mm Inner Diameter (ID), 10mm OD, mini-tube, with a 1mm sheath, housing two single fibres is shown in Figure 7.



Figure 7 . An 8mm (ID) /10mm (OD) mini-tube housing two single fibres.

1.33 In the case of new residential buildings such as apartments, detached, semi-detached and terraced houses it is not considered necessary to provide for diversity (i.e.; having an alternate duct) in the physical point of access as this is not commonly done for other utilities.

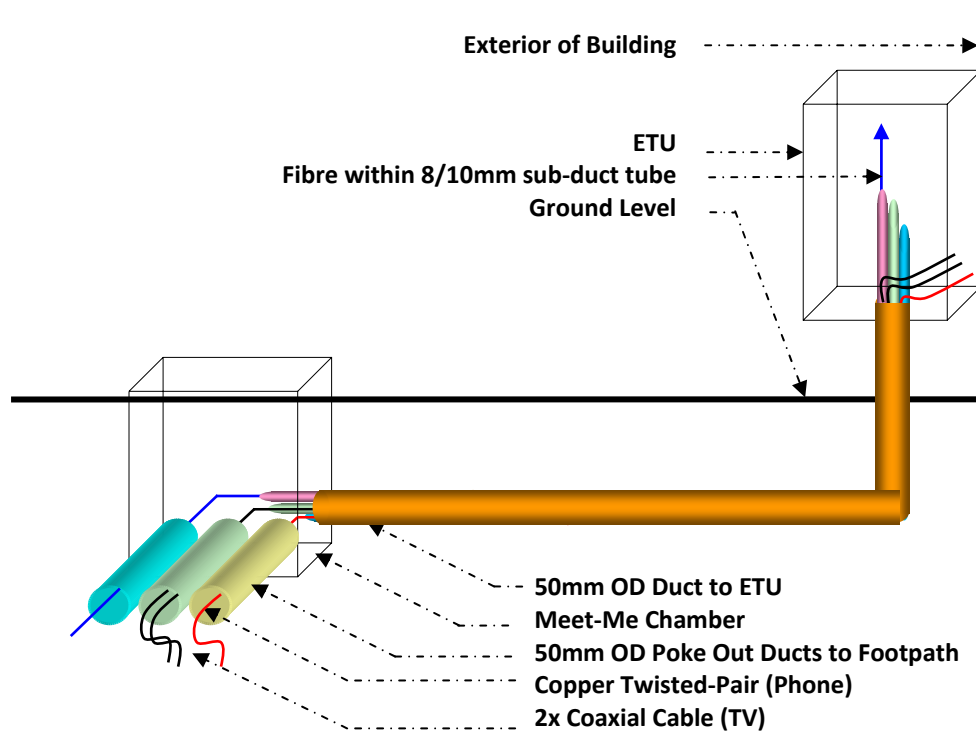


Figure 8. External UG Open Access Ducting From the Meet-Me Chamber to the ETU

Recommendation 3: The External Termination Unit (ETU)

1.34 The ETU should be located in an accessible position on a suitable exterior wall of the building. It may be located adjacent to other utility access points such as those for gas, electricity or other telecommunications services. The ETU enclosure and detailing of fitting to external leaf of building should be weatherproof and resistant to wind driven rain and moisture ingress and should have the ability to be secured with a key to minimise unnecessary exposure. The ETU should house an opening in the structure of the building granting access to the interior. The opening should comply with relevant building regulations and should be large enough to admit a 50mm (OD) Flexible Internal Open Access Fibre Duct. An example of an ETU is shown in Figure 9 (Note: Units in picture are not 1m above ground level as recommended in text).



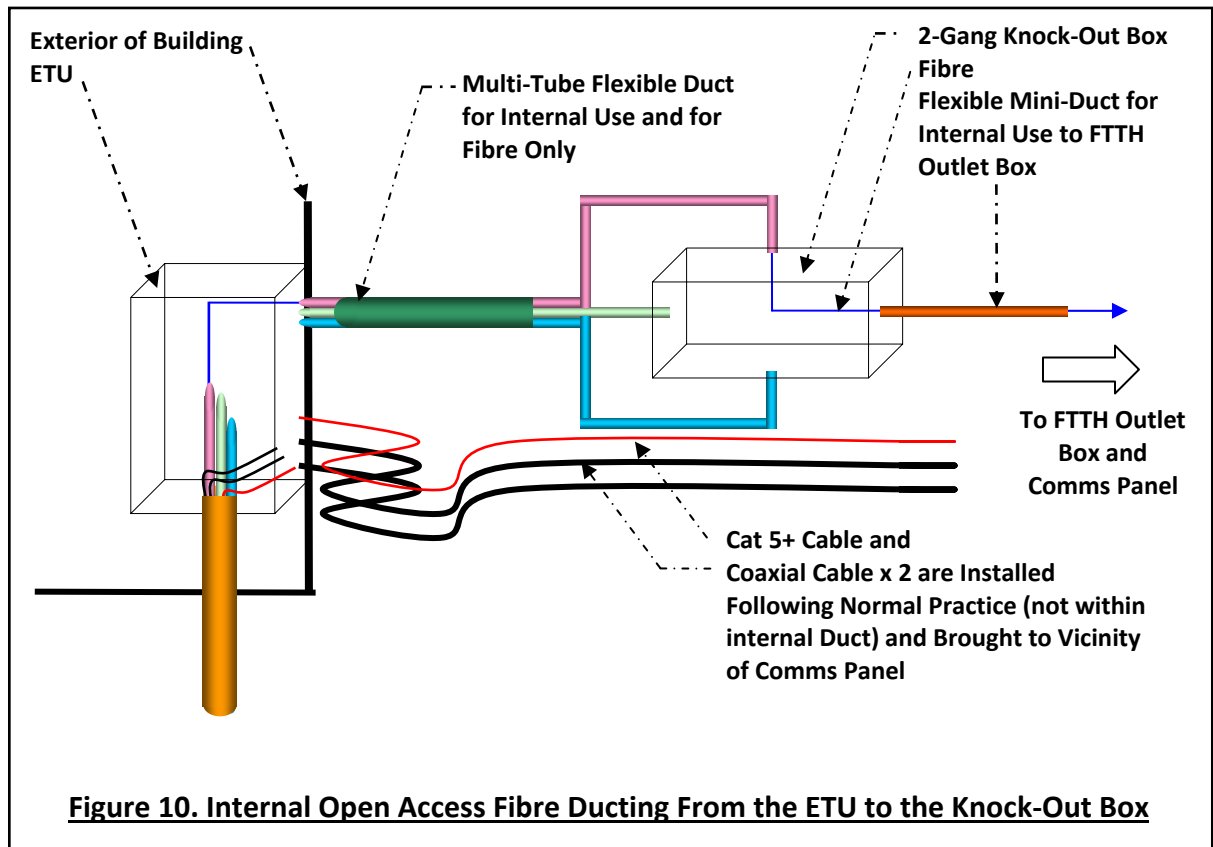
Figure 9 . Example of an ETU

- 1.35 The ETU should be installed by the builder.
- 1.36 In the case of apartment buildings, in the absence of an ETU, the External Underground Open Access Duct should be brought to the vicinity of the Communications Panel. In apartment buildings the Communications Panel is frequently located in the basement. In such instances the open access duct must be sealed to protect against ingress of water and gas.
- 1.37 Positioning the ETU on the exterior of the building protects the interior from any flooding that may occur in the Meet-Me Chamber and underground ducts. Appropriate duct seals should be fitted to protect the interior from any gases or water that may accumulate in the Meet-Me Chamber and underground ducts. The underground plant stops at the ETU while still external to the house. To provide some protection against flood damage the ETU should be installed at a height not less than 1m above ground level.
- 1.38 The ETU will be fed by a single 50mm OD External UG Open Access Duct from the exterior of the building and a single 50mm OD Flexible Internal Open Access Fibre Duct from the interior, as shown in Figure 10.

Recommendation 4: Internal Open Access Fibre Duct

Internal Duct Routing

1.39 The Internal Flexible Open Access Duct leads from the ETU to the Knock-Out Box located adjacent to the FTTH Outlet Box and Communications Panel as shown in Figure 10. The Internal Flexible Open Access Fibre Duct is terminated within the Knock-Out Box.



1.40 The Internal Open Access Fibre Duct, containing the mini/micro-tubes, should be installed by the builder. The Internal Open Access Fibre Duct must be sealed to protect against ingress of water and gas.

1.41 The Internal Open Access Fibre Duct should be routed through the interior of the building and be made of appropriate flexible Low smoke zero Halogen material such as thermoplastic or thermoset compounds. PVC materials should be sleeved in conduit when passing through polystyrene insulation, to safeguard against chemical reaction between PVC on cables and polystyrene insulation and melts. The Internal Open Access Fibre Duct should be flexible and incorporate no fewer than three fibre mini/micro-tubes within it (i.e.; 3-way ducting). No fewer than six service providers should therefore be capable of sharing the Internal Open Access Fibre Duct simultaneously to provide services to the owner/occupier of the building.

1.42 Apart from the 50mm OD dimension, the design of the Internal Open Access Fibre Duct and mini/micro-tubes should be left to the market to decide as this technology continually evolves. An example of micro-tube technology is shown in Figure 11.

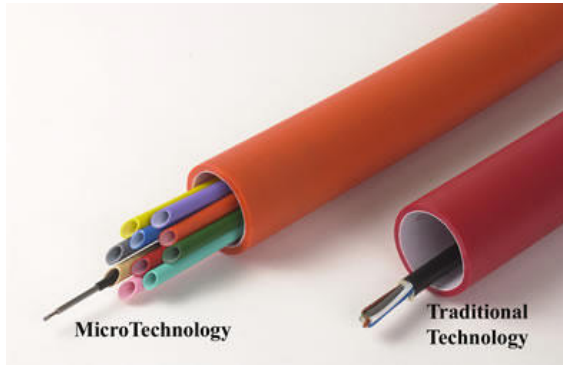


Figure 11. Example of Micro Tube Technology⁵

- 1.43 The Internal Open Access Fibre Duct and its three mini/micro-tubes should be terminated on the Knock-Out Box, as shown in Figure 10.
- 1.44 2 x Coaxial Cables and a single Category 5 (or higher) Cable should be provided at the ETU box by the builder. This will enable service providers to pull Copper Twisted-Pair and Coaxial cabling through from the Meet-Me Chamber to the ETU, where they can then connect to the internal CAT5 (or higher) and Coaxial cabling at the ETU.
- 1.45 The Coaxial Cables and Category 5 (or higher) Cable should be routed to the Communications Panel and be brought down to hang adjacent to it. No less than two coaxial cables should be provided to support advanced TV services.
- 1.46 The Coaxial Cables and Category 5 (or higher) Cable should not be routed through the Internal Open Access Fibre Duct but should be installed without ducting as per current standard practice. The Internal Open Access Fibre Duct is for fibre only.
- 1.47 Category 5 (or higher) cable is recommended here as it is adequate for connecting to the Copper Twisted Pair (if any) and routing it from the ETU to the Communications Panel. Note that Category 6 (or higher, such as POF) cabling is recommended for the internal structured cabling of the building.
- 1.48 If there is no Communications Panel then the internal structured cabling should be brought to the ETU.

⁵ FuturePath® Fiber Optic Technology Microduct innerduct
http://www.google.ie/imgres?imgurl=http://www.midsouthcable.com/EC_BWC9.jpg&imgrefurl=http://www.midsouthcable.com/YC_Patch_Cables_Crimp_Molded.htm&usg=__N-5fCns1vWMqhAW2ufoFnINELPw=&h=251&w=394&sz=13&hl=en&start=3&um=1&itbs=1&tbnid=byMwl2tnbplbSM:&tbnh=79&tbnw=124&prev=/images%3Fq%3Dmini%2Bduct%2Bcabling%26um%3D1%26hl%3Den%26sa%3DN%26rlz%3D1T4GGLJ_en%26tbs%3Disch:1

Recommendation 5: Knock-Out Box

Knock-Out Box

- 1.49 The Internal Open Access Fibre Duct should be routed from the ETU and be anchored at a 2-Gang Knock-Out Box which should be located adjacent to the FTTH Outlet Box and Communications Panel, as shown in Figure 12. This will enable fibre to be blown or pulled through the mini/micro-tubes from the Meet-Me Chamber via the ETU to the 2-Gang Knock-Out Box, where it will then be in position for subsequent connection to the FTTH Outlet Box.
- 1.50 The 2-Gang Knock-Out Box should be installed by the builder. Detailing with respect to providing for air permeability around knock out boxes is provided in DEHLG document Acceptable Construction Details – Section 1 Introduction and general theory of insulation continuity and air tightness.

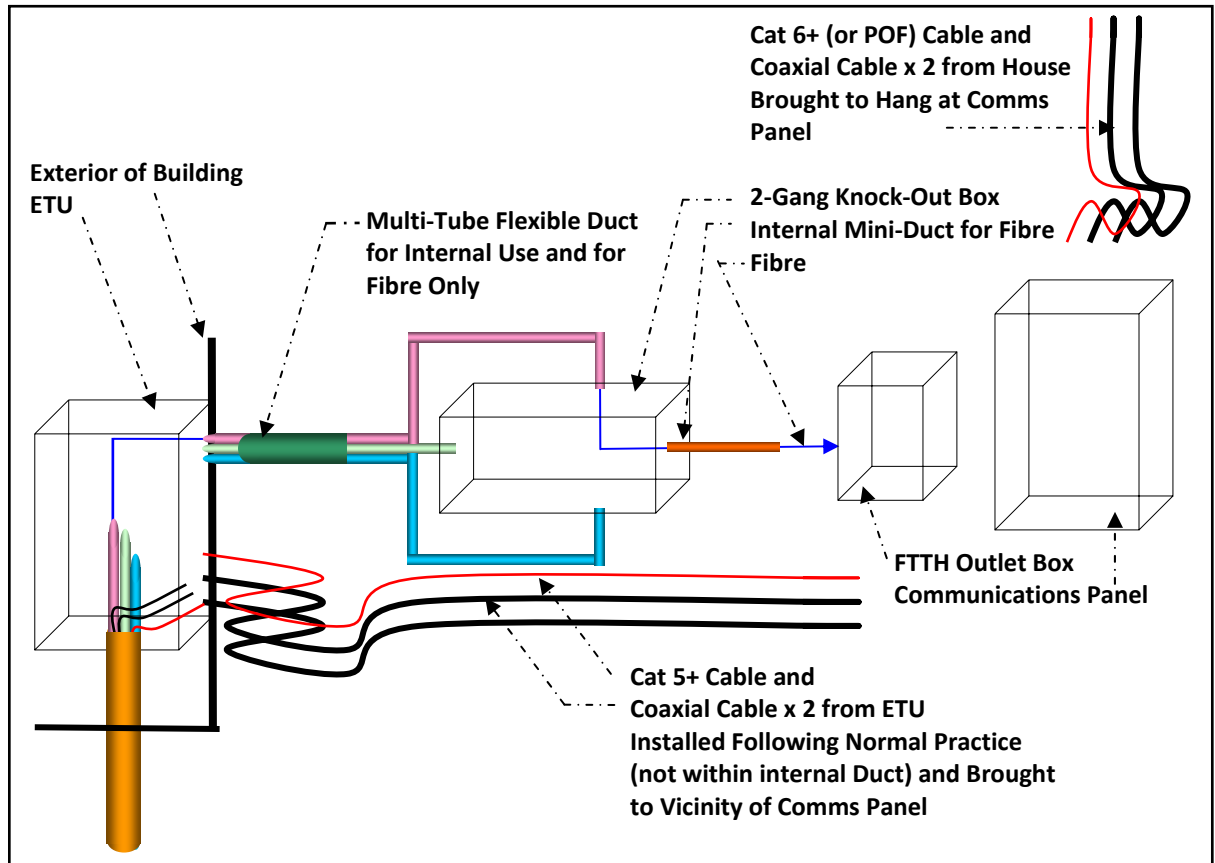


Figure 12. Internal Open Access Ducting From ETU to the Knock-Out Box

- 1.51 As shown in Figure 12, the 2-Gang Knock-Out Box should have at least 3 x 20mm Glands to accommodate the 3-way mini/micro-tubes at its input. It should have one 3 x 20mm Gland and for output, to allow access to the FTTH Outlet Box. The 2-Gang Knock-Out Box should be fitted with a blank plate. An example of a 2-Gang Knock-Out Box is shown in Figure 13.



Figure 13. Example of a 2-Gang Knock-Out Box

FTTH Outlet Box

- 1.52 The FTTH Outlet Box terminates the optical fibre prior to its connection to the internal structured cabling within the building. The FTTH Outlet Box is situated adjacent to the Communications Panel and is provided by the service provider. An example of an FTTH Outlet Box is shown in Figure 14.



Figure 14. Example of an FTTH Outlet Box

1.53 Fibre which has been blown or pulled through the Mini/Micro-Tubes from the Meet-Me Chamber to the 2-Gang Knock-Out Box, is now terminated at the FTTH Outlet Box by the service provider. In a final step, the FTTH Outlet Box is connected to the Communications Panel by the service provider and services may now be delivered to the owner/occupier of the building.

Communications Panel

1.54 The Communications Panel is generally installed at a suitable central location within the building where all low-voltage⁶ wiring converges (some examples include the ground floor WC, kitchen cupboard, downstairs store or upstairs wardrobe). It controls and manages connectivity to the internal structured cabling network in the building. An example of a Communications Panel as shown in Figure 15. The Communications panel should be the network provider's termination point.



Figure 15 . Example of a Communications Panel

⁶ Low voltage electronics signals rather than large voltage electrical signals

Recommendation 6: A Minimum Internal Structured Cabling Standard

Internal structured cabling

- 1.55 The Internal structured cabling should satisfy, at a minimum, the performance requirements of Coaxial Cable and Category 6 cable, as defined in the relevant standards (e.g.; ANSI/TIA-568-B.2-1 specification⁷), or higher specification (such as plastic optical fibre (POF) cabling).
- 1.56 2 x Coaxial Cables and Category 6 (or higher, such as POF cabling) Cable may be routed to the Communications Panel and be brought down to hang adjacent to it. Typically two coaxial cables are provided to support advanced TV services. This will leave the Internal structured cabling ready for subsequent connection to the fibre, Category 5 (or higher) and Coaxial cabling which has been routed from the ETU also to an area adjacent to the Communications Panel. The connections will take place on the Communications Panel.
- 1.57 The cabling and ducting methods used for internal wiring should comply with all relevant building regulations and take account of health and safety issues concerning access to cabling⁸. Sufficient capacity should be provided to meet potential increases in future requirements. There should be multiple access points fitted in each room to allow for a possible doubling of the number of devices, such as TVs, Computers, Music platforms etc, that the user may wish to interconnect in the future. An example of an access point is shown in Figure 14.



Figure 14. Example Of An Access Point

- 1.58 While high-speed wireless routers are available and useful for creating wireless LANs, having an internal cable network allows devices of any type such as TVs and sound systems etc, to be interconnected without requiring wireless interfaces. Internal network cabling should be provided within the house to support a minimum speed of 100 Mbit/s.

⁷ This standard comes from the from the Telecommunications Industry Association

⁸ This consultation paper is not a binding legal document and also does not contain legal, commercial, financial, technical or other advice. The Department of Communications Energy and Natural Resources is not bound by it, nor does it necessarily set out the Department's final or definitive position on particular matters. To the extent that there might be any inconsistency between the contents of this document and the due exercise by it of its functions and powers, and the carrying out by it of its duties and the achievement of relevant objectives under law, such contents are without prejudice to the legal position of the Department of Communications Energy and Natural Resources. Inappropriate reliance ought not therefore to be placed on the contents of this document.

Recommendation 7: Implementing Open Access

Terms of Access

- 1.59 All of the physical infrastructure involved in these recommendations is the property of the owner/occupier of the building. From the Meet-Me Chamber to the Knock-Out Box it is the owner/occupier who can decide how the open access duct is to be used by service providers.
- 1.60 The owner/occupier can insist, for example, that a service provider must remove any unwanted fibre should this be preventing other operators from providing services to the owner/occupier. An example of the type of sub-ducting “tubes” that the market can currently provide within a 50mm duct is shown in Figure 6. Should the owner/occupier wish to change service providers they can require the former service provider to remove its fibre from the duct (or the new service provider could remove it and leave it coiled up within the Meet-Me Chamber) and thereby leave the Mini/Micro-Tube clear for the new service provider.
- 1.61 Physical access to external and internal areas of the building is required for service providers to provide services to the owner/occupier. The key access requirement in this regard is the Open Access Duct from the Meet-Me Chamber to the Knock-Out Box. Access to this infrastructure should not be restricted to any one service provider but should be open to all. The Meet-Me Chamber, ducting, ETU and Knock-Out Box shall remain the property of the building owner/occupier and its use will be determined by the building owner/occupier. The building owner/occupier should manage all aspects of access to the Meet-Me Chamber, ducting, ETU and Knock-Out Box.
- 1.62 The owner/occupier should be made aware of the control they have over this infrastructure and how to ensure that it offers them the most open access environment possible for the provision of competing services.

Appendix A – Consultation Questions

Overall approach

- 1.63 Are there any other issues that need to be considered that may not have been addressed in this document?
- 1.64 Are recommendations necessary for the installation of fibre ducting to the home?
- 1.65 Do you agree with the non mandatory approach of issuing recommendations rather than mandating construction ?
- 1.66 Should the open access fibre ducting be mandatory to install but not mandatory to use?
- 1.67 Should another approach be adopted
- 1.68 Are the recommendations overlooking anything?
- 1.69 What is the best way to ensure that the recommendations are easily accessible and well known to developers?

Impact

- 1.70 What groups or individuals will be impacted by these recommendations?
- 1.71 What impact will the draft recommendations that are being consulted on have either positive or negative? - explain giving reasons.
- 1.72 How significant will the impacts described in question 3 be?
- 1.73 Do you believe that that the scope of what is being proposed is too broad or narrow – explain?
- 1.74 Will the recommendations be implementable for developers? Is there sufficient information for developers to implement them?
- 1.75 Do the recommendations go far enough to be make a difference to the provision of FTTH at a future date? In what way could they be improved?
- 1.76 Do the recommendations address the various types of residential buildings (apartments, terraced, semi-detached, detached) adequately?
- 1.77 Should the recommendations apply to commercial buildings?

Cost/Benefits

- 1.78 Please identify any significant costs or benefits that you believe may arise from these proposals
- 1.79 Do you believe the scope of what is being proposed strikes the right balance between costs imposed and benefits to be gained?

1.80 Is there an unreasonable cost burden for developers?

Technical Issues

1.81 Q6. Are the technical issues set out in the regulation clear – please highlight any issues that require clarification

1.82 Q7. Is the approach set out in the standards correct – please highlight any general or specific issue that you believe may need to be clarified, modified corrected or changed.

1.83 Is the minimum specification of Coaxial Cable and Category 6 cabling adequate?

1.84 Should wireless routers be included and how?

Appendix B – Acronyms

ANSI: American National Standards Institute

Cat n: Category n Cable (n is typically 5,6 or 7)

Cat 6: Coaxial Cable and Category 6 cable is a cabling standard for Gigabit Ethernet. The cable standard provides performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T / 1000BASE-TX (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet).

DCENR: Department of Communications Energy and Natural Resources

DP: Distribution Point

EIA: Electronic Industries Alliance

ETU: External Termination Unit

HDPE: High Density Polyethylene

ID: tbd

IEEE: Institute of Electrical and Electronics Engineers

FTTH: Fibre to the Home

LAN: Local Area Network

MDF: Main Distribution Frame

OD: Outer diameter

POTS: Plain Old Telephony System

TIA: Telecommunications Industry Association

100BASE-T: A networking standard that supports transmission speeds up to 100 Mbps (100 megabits per second). 100BASE-T is based on the original Ethernet standard and is also known as IEEE 802.3u. 100BASE-TX refers to two pairs of high-quality twisted-pair wires. 100BASE-FX refers to fiber optic cables. 100BASE-T4 refers to four pairs of normal-quality twisted-pair wires

1000BASE-T: A networking standard that supports transmission speeds up to 1000 Mbps (1 Giga bit per second) for gigabit Ethernet over copper wiring and is also known as IEEE 802.3ab. 1000BASE-T requires four wire pairs.