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NGA - Optical Consolidation Rack (OCR) - Policy

Network Policy

About this document ...

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Content approval

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Table of Content

1 *Openreach Network Policy*

Openreach network policy defines a set of requirements to guide the decisions taken when planning and building a telecommunications network.

These requirements ensure we achieve the required outcomes in terms of meeting the strategic direction, architectural design, financial targets and quality standards for the respective network.

This document forms a part of the authorised portfolio of Openreach network planning policy documentation. Adherence to these standards and policy is mandatory. Any deviation presents a risk to the required outcomes and will be subject to future compliance checking. Network deployments which do not meet network policy will fail any build audit and ultimately jeopardise our ability to provide service to our customers.

Caution: Policies are liable to change. Therefore, you must ensure that this copy/material is from a controlled source e.g. the Book Store Libraries (where you are able to register for email alerts when updates are made, from within the documents you reference), or the Policy & Build App (whereby you can save an ISIS to your favourites). NWK/LNK/C486 - Network Policy and Planning Communications Guide – Policy will also provide guidance on how to use some of the bookstore functionality.

2 *Introduction*

This document contains the mandatory policy and rules with which planners must comply when planning connectivity from the FTTP & FTTC optical network spine fibres to the Head-End electronics (OLT) via an Optical Consolidation Rack (OCR). Specifically this document covers planning rules and policy for:

Note: For information regarding the ODF please refer to ISIS NWK/LNK/C553

- Principles that under pin the OCR functionality
- Planning OCR equipment hardware.
- Principles of planning COF 201 spine fibres on to appropriate positions on an OCR.
- Planning Hydra fibre routing and connectivity on an OCR.

This document is the authorities document for planning OCR and connectivity across an OCR. It replaces the OCR information found in ISIS NWK/LNK/C199, NWK/LNK/C200 & NWK/LNK/C205. The OCR information will be removed from these documents when the document is up issued.

2.1 Warning

> **Warning: NGA FTTC & FTTP subjects are in dynamic evolving phases. Consequently this Planning Policy document is liable to frequent changes. You must ensure that you work to latest version of this document which is available from the BT Bookstore.**

The Bookstore does have the facility of alerting you by email of updated ISIS etc. subject to you registering so.

3 *Scope*

This document provides the definitive Planning Policy and rules for the planning and use of Optical Consolidation Rack (OCR) as used for FTTP and FTTC infrastructure. This document supersedes any similar content in any other related ISIS documents. Where such information exists, it will be removed when the document is up issued.

This document should be used for the planning of in-node connectivity from the COF 201 spine fibres presented to an Optical Consolidation Rack (OCR) to the head-end electronics for FTTx infrastructure in NGA Nodes. The head end electronics available in an NGA node vary according to the chosen supplier (ECI or Huawei) and by equipment release, so references are made to the ISIS documents that contain the relevant information. See Section 8.3 of this document for details.

4 *Rationale*

This policy document provides details to assist planners to successfully complete the planning of connectivity for FTTP & FTTC circuits from spine fibres to OLT ports via an OCR.

NGA uses an OCR rather than the familiar Optical Flexibility Rack (OFR) as a connectivity and consolidation point for connecting spine fibres to Hydra fibres in an NGA node. The reasons for this are:

- reduced rack hardware costs
- greater circuit capacity per rack
- reduced floor space used.
- reduced number of splices per circuit,
- elimination of fibre jumpers.

The OCR is filled from the bottom of the rack to the top with minimum splicing tray capacity wasted on spare fibres. This is achieved by aggregating working

fibres into as few cable elements as possible in the by consolidating fibre circuits within nodes in the external network and presenting only these for splicing. (See ISIS NWK/LNK/C212 for details.) Spare or growth fibres use the fibre storage reels in the Cable Break Out (CBO) facility at the top of the OCR.

4.1 Key Points in the Planning of FTTX Infrastructure

The following is a précis showing the key points for planning the NGA FTTx network infrastructure. Details of the hardware mentioned are presented later in this document.

1. Fibre spine is dimensioned according to ISIS NWK/LNK/C212 & and distribution to NWK/LNK/C199 for FTTC & C201 for FTTP.
2. Route COF 201 FTTC fibres from the CCJ to the OCR. Unused elements or half-elements are stored in the storage area (CBO) at the top of the rack. Day 1 fibres should be routed as half-elements to an OCR Sub Rack tray for splicing.
3. The Hydra cables should be run to the OCR where fibres will be left in the Hydra fibres storage area until splicing is needed.
4. Connectivity is planned between the required external network fibres and the Hydra fibres connecting to the OLT port(s).

5 *Drivers*

The principle driver for NGA FTTx is BT's publicly announced commitment to deployment of Super Fast Broadband.

6 *Roles & Responsibilities*

The external planning community will be responsible for designing, dimensioning and configuring this part of the network.

The equipment planner will be responsible for the active components at the serving exchange.

7 *Stakeholders*

The key stakeholders in no particular order:

- BT Group
- Openreach CE Architect and Strategist
- Openreach Service Delivery Head End Planners

- Openreach Service Delivery Access Network Planners
- NGA Programme Team
- NGA Product Manager
- Communication Providers

8 *Topology*

8.1 Overview of an FTTx Network

Figure 1 shows a schematic diagram of the NGA FTTx network infrastructure. The external components of both FTTC and FTTP are highlighted. Note that both FTTC & FTTP share a common node based electronic shelf albeit using different types of interface cards.

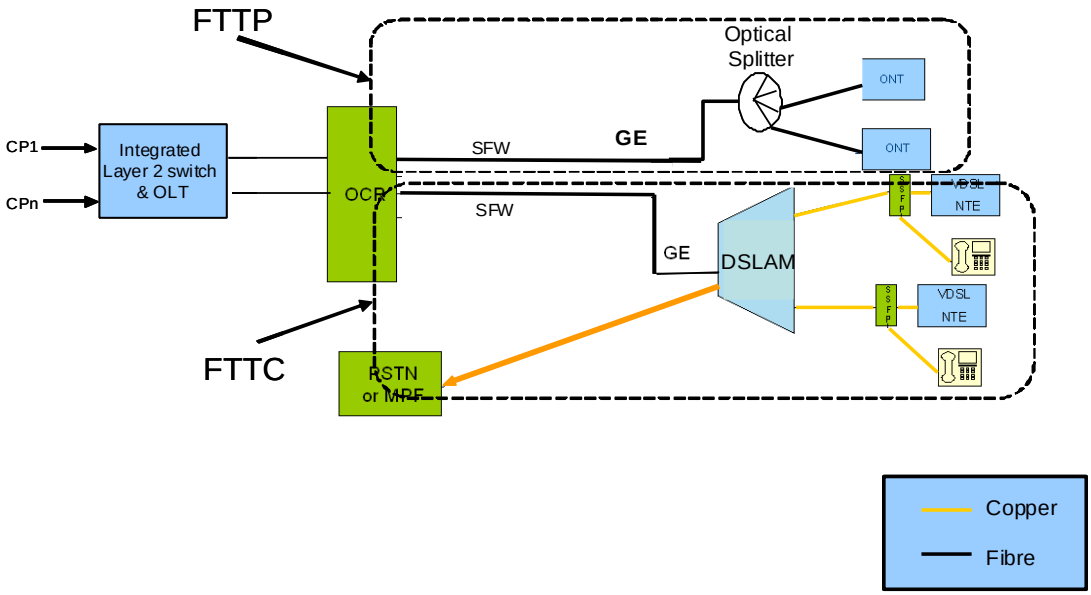

Figure 1 – FTTx network components.

The **Integrated Layer 2 Switch & OLT** (IL2S/OLT) is the node based electronic equipment that provides the line interface cards for FTTC, FTTP and for CP connectivity. The DCN connection for network management of the shelf (element) and all dependent items also connects to the IL2S /OLT.

The **OCR (Optical Consolidation Rack)** is the consolidation point at which the connectivity is made between the electronics and the street fibres.

The **Optical Splitter** is a passive device located in the network. For each serving fibre from the NGA node a splitter provides fibre connectivity to 30 customers via a 32 way split.

The **DSLAM** is a street cabinet based electronic device that accepts data from the IL2S/OLT over fibre and provides the DSL data to customers over copper pairs.

8.2 Network Elements within an NGA Node

Figure 2 shows the Network Elements and the connectivity requirements within an NGA node for Phases 2 and 3 FTTC. Note that in later equipment phases the Layer 2 Switch and OLT are physically combined into a single shelf which is referred to as an Integrated Layer 2 Switch and OLT.

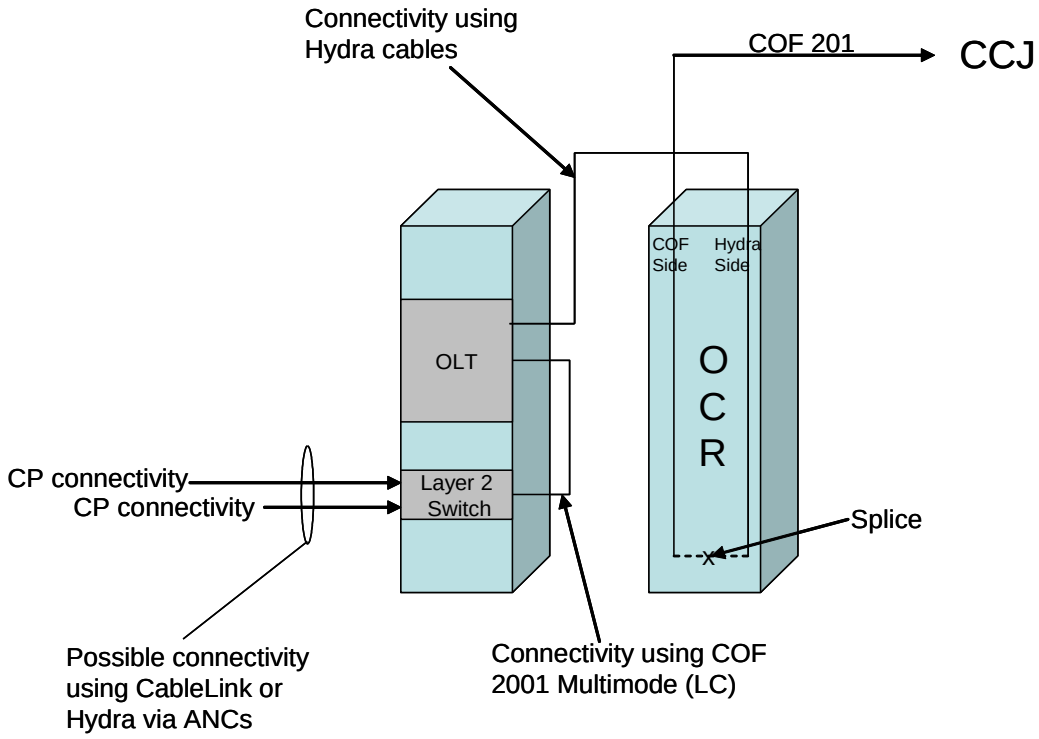

Figure 2 - Nodal Connectivity for FTTx (Phases 2 & 3).

8.3 Planning the Node Electronic Equipment

FTTx is being installed and rolled out in different phases, each of which could use electronics differing according to the equipment release(s) and the supplier (Huawei or ECI).

Irrespective of equipment supplier or release, the method used for connections between the electronics and the co-located OCR will always use multiple fibre Hydra cables. For each phase or equipment release, the number of Hydra cables will be different as will the number of fibres per Hydra cable. Table 1 provides the references of ISIS documents that should be

referred to for the specific details of the Hydra cable connectivity as well as port details for connectivity to the OLT in the head – end electronics.

Openreach Phase	Physical Deployment	Associated Releases	Services supported	Physical Differences	ISIS Document
Phase 2	Tactical 1	R3, R3.1	FTTC	Separate Layer 2 Switch and OLT . Dual Fibre Working	NWK/LNK/ C200 Issue 2 & 3
Phase 3	Tactical 1	R3, R3.1	FTTC	Separate Layer 2 Switch and OLT. Single Fibre Working to DSLAMs	NWK/LNK/ C200 Issue 3
Early Phase 4	Strategic 1	R4 / EMP1200	FTTC & FTTP	Integrated Layer 2 switch and OLT. SCUL switch cards	NWK/LNK/ C205 Issue 1 & 2
Later Phase 4	Strategic 2	R5 / EMP1300	FTTC & FTTP	Integrated Layer 2 switch and OLT. SCUN switch cards	NWK/LNK/ C205 Issue t.b.a.

Table 1- Electronics releases or phases

Note that the Hydra cables are installed when the OLT cards are fitted in the shelf. On installation all Hydra cables are routed to the OCR where their fibres are stored in the Hydra storage area appropriate to the OCR Sub Rack where the network fibres are/will be routed.

8.4 Basic Principles of an OCR

Compared to OFRs, there are some fundamental differences that must be understood before commencing the planning and routing of fibres across an OCR. The use of dedicated storage areas for fibres that are not immediately required at Day 1 is one such fundamental difference.

8.4.1 Storage of COF Fibres

On an OCR, COF 201 unused or spare fibres are stored using the storage capability at the top of the rack in the CBO; unused Hydra Cables are stored in reels in the storage area on the right side of each Sub Rack.

To illustrate this difference between an OFR and an OCR on this point, consider current techniques used on an OFR: A COF 201 cable is routed to a group of splice trays and all fibres - those to be spliced and spares, are laid into a sequence of splicing trays, normally in ascending positions. The fibres in the COF that are immediately required (Day 1 fibres) are spliced, the fibres that are not immediately required remain in the splice trays as spare fibres for later use.
This is **not** the case for an OCR. In the similar scenario to that above, the

principle used for an OCR is that when a COF 201 is routed to it, only the "Day 1" fibres are routed to Sub Rack, Splice Modules and Splice Trays. The spare fibres in the COF 201 are stored in the fibre storage facility in the CBO at the top of the OCR on half element storage reels until they are required. When these fibres are required they are removed from the storage reel and all six fibres are routed down the rack to the next available Splice Module where they are spliced.

8.4.2 Storage of Hydra Cable Fibres

For Hydra cables on the OCR, the same principle of fibre storage applies. The storage area for the Hydra fibres is in the right hand side of each OCR Sub Rack rather than at the top of the rack as it is for COF. This can be seen in diagrams appearing in Section 8.5.1 of this document:

As is the case for COF fibres, the Hydra fibres required on "Day 1" are routed to the splice trays where they are spliced. The routing for these fibres is along the front of the Splice Module. Spare fibres in the Hydra cable are routed to the Hydra storage areas. When these spare fibres are required they will need to be routed to a Splice Module for splicing.
The Hydra storage capacity per Sub-Rack comprises 3 storage bays; each storage bay containing 12 storage reels so a total of 36 Hydra fibres can be stored per Sub-Rack. Note that installation practices will ensure that sufficient length of fibre is left so that it can be routed or another Sub Rack if it is required. See Section 8.8 of this document for the routing rules for Hydra fibres.

An obvious consequence of this technique of storing spare fibres as applied on the OCR is that the Splice Modules contain only used or "Day 1" fibres, that are spliced.

Note: In practical terms the routing of COF fibres to a Splice Module has to take place as a minimum group of 6 fibres (half element). So for example, if only two of the fibres in a half element are required at Day 1 then the 4 fibres contained within it will be stored as spares on the splicing trays in the same Splice Module. These will be picked up and used later.

8.4.3 Flexibility for the Connection of COF to Hydra Cable Fibres

Another difference when comparing an OFR with an OCR is that on the OFR the flexibility-point feature by which any external fibre can be connected to any internal/node fibre uses optical jumpers in a jumper field. On an OCR there is no jumper required.
On an OCR, the consolidation feature by which any COF 201 spine fibre is connected to any Hydra Cable fibre is achieved via various routing options offered for the COF and Hydra fibres. The respective fibres are routed to a common splicing tray where they are spliced.
On the COF side the routing of the required fibres to any Sub Rack / Splicing

Module is achieved by using the appropriate pre routed - tubing fixed to the back-panel of the rack and accessed at the top of the rack.
On the Hydra side, there is similar flexibility for the routing of the required Hydra Cable fibre(s) to appear in the Sub Rack / Splicing Module where the COF fibres appear so they can be spliced. This is achieved by routing the Hydra down the right hand side of the OCR into the required Hydra manifold on the identified OCR Sub Rack and on to the splicing tray. One splice per fibre then connects the incoming COF fibre to the required Hydra cable fibre. Using this technique provides the feature on the OCR of permitting the connecting any COF fibre to any Hydra fibre using only one splice per fibre and no requirement for a jumper.

8.5 Component Parts of an Optical Consolidation Rack (OCR)

The OCR comprises a 900x300x2200mm rack which can accommodate up to 8 OCR Sub Racks. The rack can be accommodated under 21C ironwork or RACCs of any manufacturer Figure 3 shows a fully populated OCR.

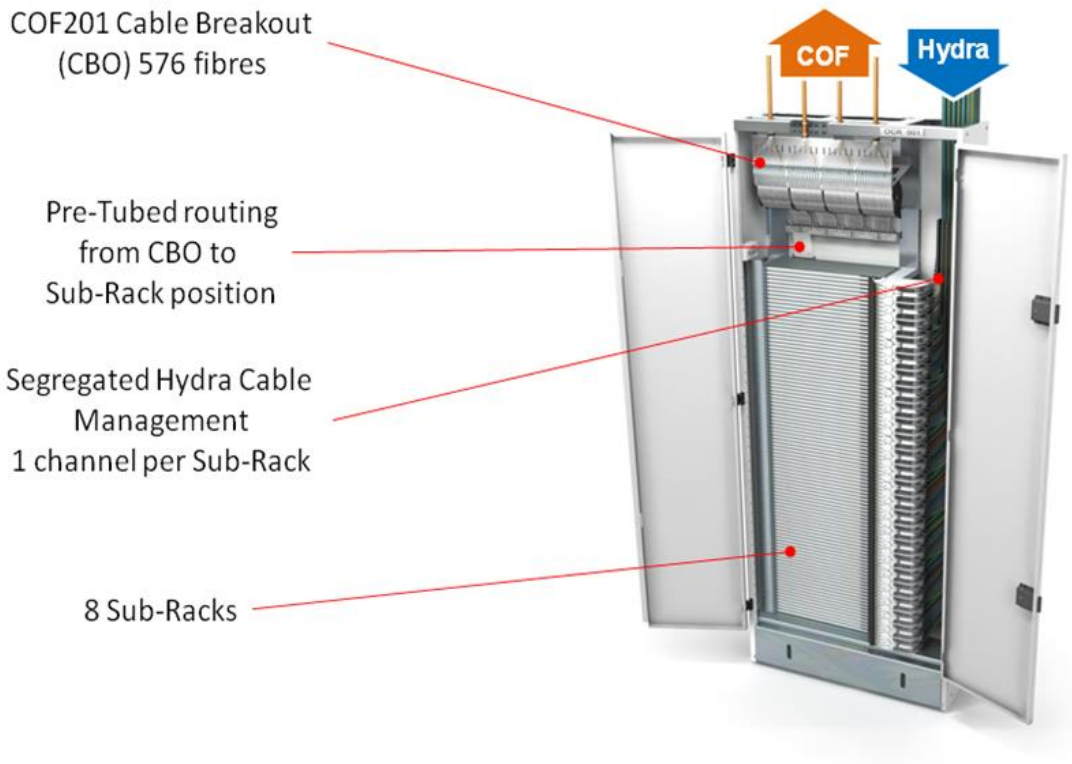

Figure 3 - The OCR rack and its component parts

8.5.1 OCR Sub-Rack 1A

The OCR Sub-Rack 1A is shown in Figure 4.

Figure 4 - The OCR Sub-Rack

Each OCR Sub-Rack contains 12 Splice Modules (shelves). Each Splice Module houses 6 pre-fitted Single Output Fibre Splice Trays.

Each Sub Rack has the capability to store Hydra cables if immediate splicing of these fibre(s) is not required. These can be found on the right hand side of each Sub-Rack. There are the 3 Hydra Cable Input Bays, each with 12 storage reels to store the fibres per Sub Rack. The Hydra Cable Input Bays, which are illustrated in are an integral part of each OCR Sub-Rack assembly and do not require ordering separately.

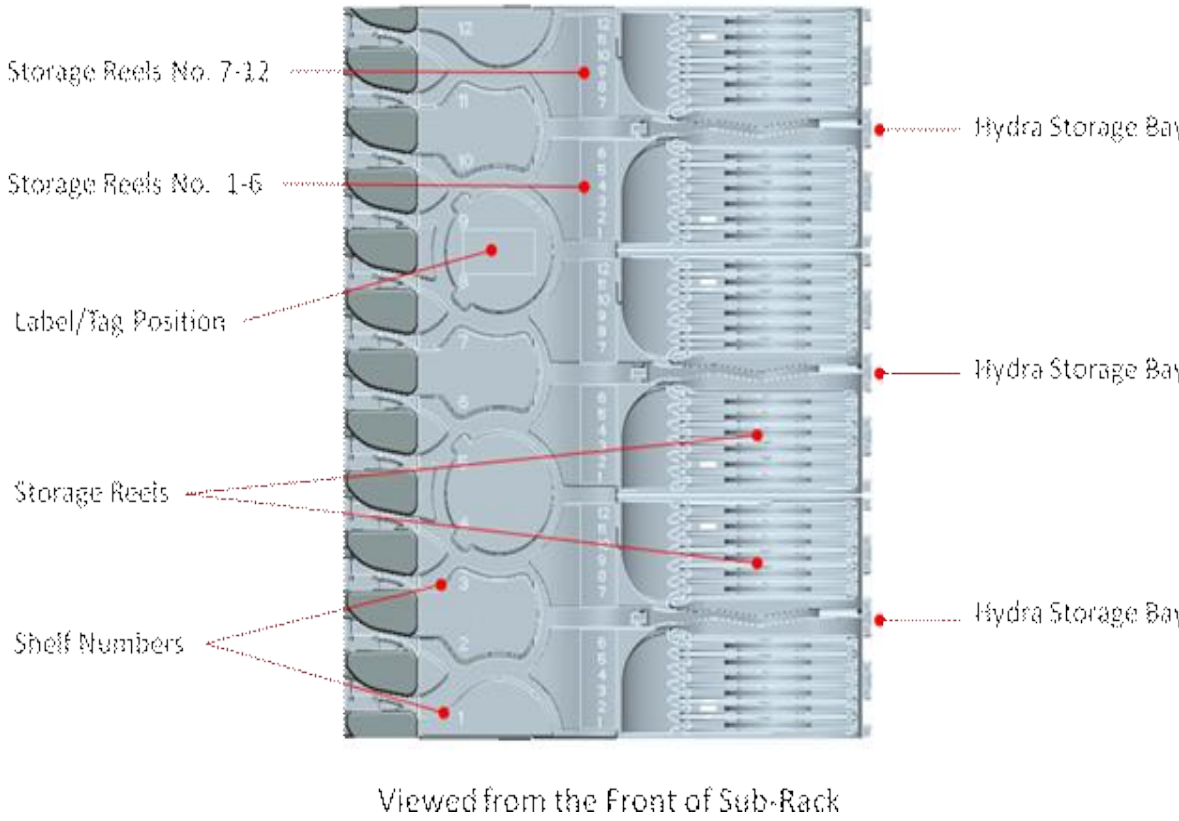

Figure 5 - The OCR Sub-Rack Hydra Storage Reels.

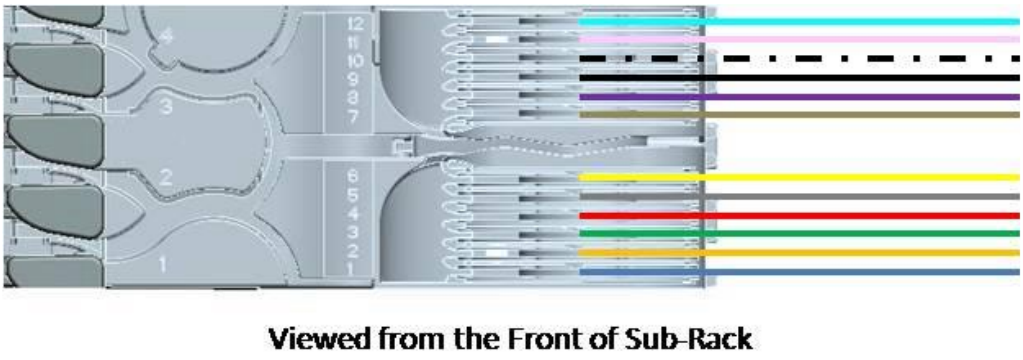

Figure 6 - Hydra Cable Input Bay Viewed from the front (12 fibres shown).

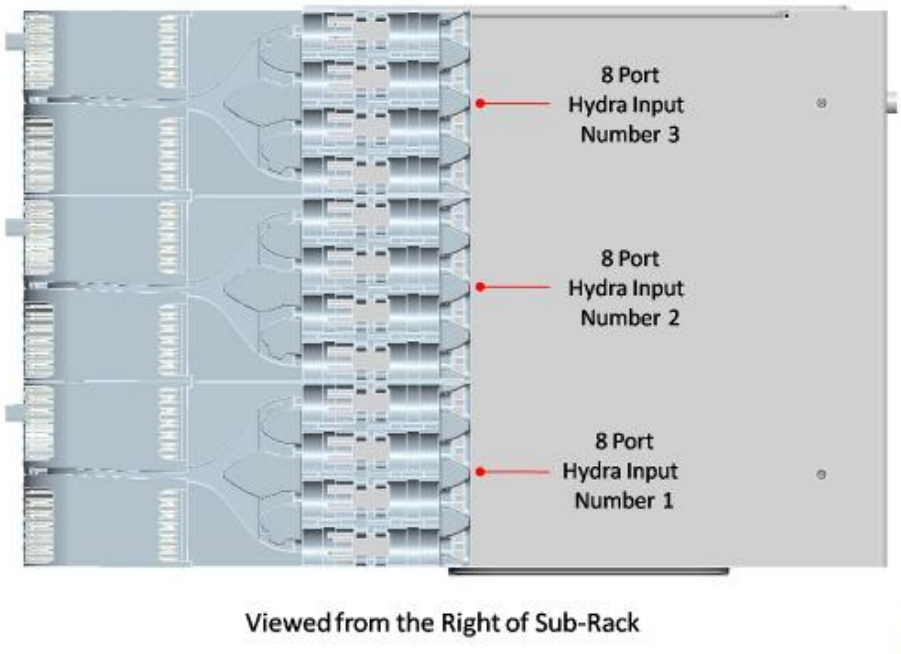

Figure 7 – Hydra Storage Area on the Sub Rack

8.5.1.1 Hydra Storage Rules

At any one time fibres from **only one** Hydra Cable can be stored in the reels of any one Hydra Cable Input Bay.

Once all the reels of a Hydra Cable Input Bay are empty a further Hydra Cable can be terminated in that Bay; up to the maximum of 8 cables per Hydra Cable Storage Bay

The ports for each bay are presented in 2 rows of 4, one at the front and back (Figure 7).

Only the ports at the back should be used on *Day 1*, the front ports are reserved for the Hydra Cables serving the WDM upgrade leg, to ensure access to all Sub-Rack levels.

8.5.2 Sub Rack Splice Modules (Shelf)

Each Splice Module contains 6 single circuit splice trays as shown below.

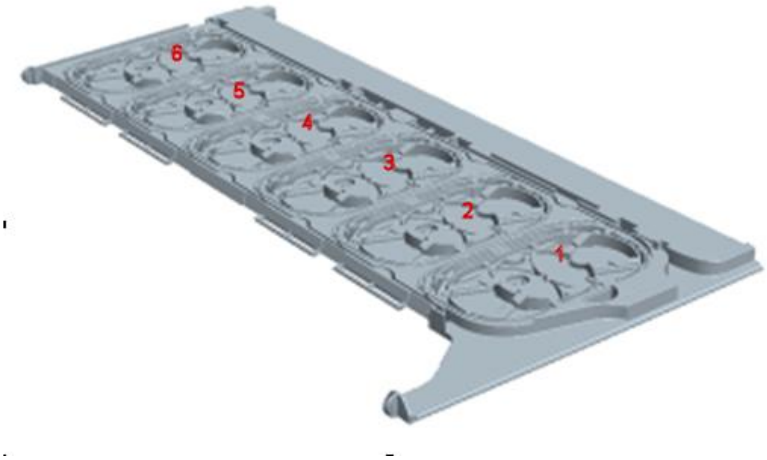

Figure 8 - The OCR Splice Module with the cover removed for clarity

Note: each individual tray can be replaced with a WDM device tray if required before a circuit is spliced through

The Splice Trays number 1 – 6 right to left and each tray will contain one fibre from the half element of COF fibres. Consequently a tray will be loaded either with COF fibres 1 – 6 (Blue, Orange Green, Red, Grey & Yellow) or COF fibres 7-12 (Brown, Violet, Black, White, Pink & Turquoise). This is shown below:

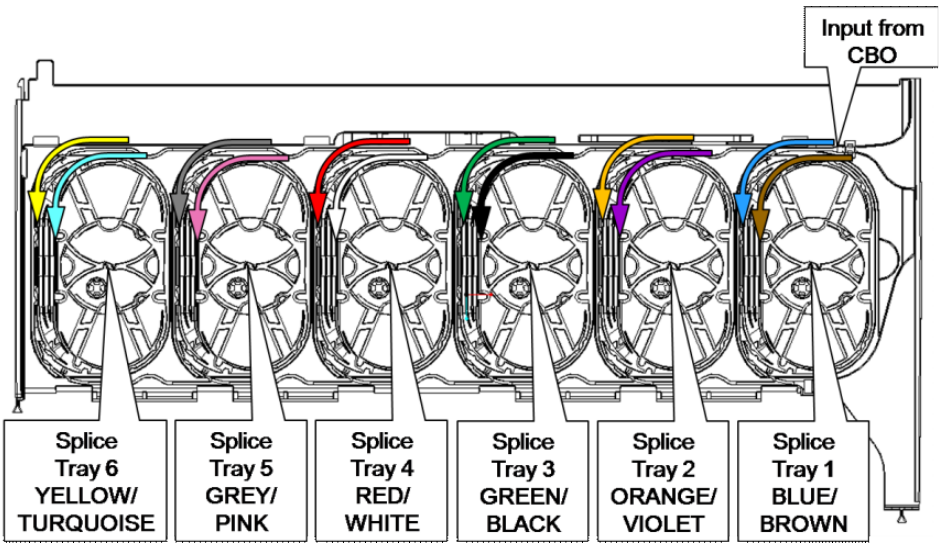

Figure 9 – COF fibres in Splicing Tray

8.6 Capacity of an OCR

The capacity of a single OCR is calculated as:

8 Sub-Racks x 12 Splice Modules x 6 Splice trays =

576 single circuit managed positions.

8.7 Variants of Hydra Cables

Figure 10 shows an example of an eight fibre Hydra cable as used for FTTC GigE links.

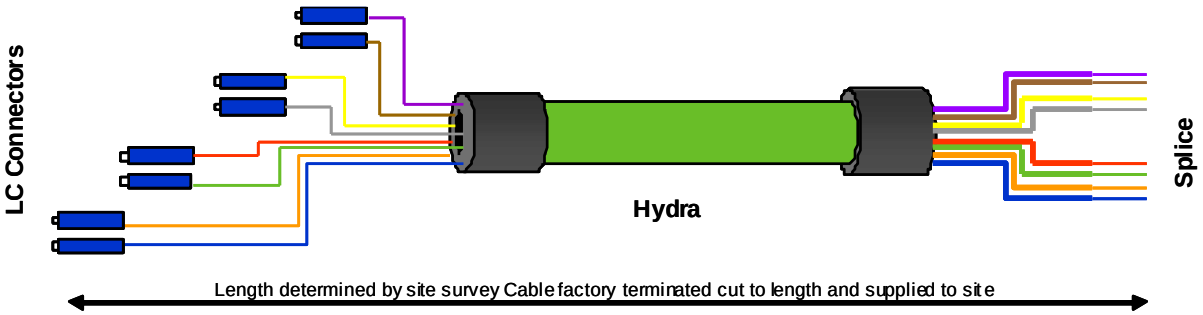

Figure 10 - Hydra cable for connection to OLT ports

Hydra cables are factory terminated one end for connection to OLT ports and bare fibre for splicing on the OCR.

Hydra cables are available with variations in **cable sheath colour, fibre count per cable** and **cable length.** They are also available as Single Mode fibre or multimode fibre.

8.7.1 Variants of Cable Sheath Colour for Hydra Cables

Hydra cables are available in the sheath colours as shown in the following table. Note that the colours denote the function of the cable and consequently should be used without variation.

Application	Sheath Colour
GPON	Blue
FIRS	Grey
FTTC GE Links	Green
Point to Point	Yellow
CP Cables	Purple

Table 2 – Hydra Cable Sheath Colour Code

8.7.2 Variants of Fibre Count per Hydra Cable

The number of fibres per cable varies according to the type of OLT interface unit (card) to which the cable is connected albeit Single Fibre or Dual Fibre Working is used. The number of fibres required within Hydra cable(s) depends on the usable ports on the OLT that is planned for the slot in the OLT.

At the time of writing the largest fibre count Hydra cable used is 12 fibres. Currently if the number of usable ports per card/slot exceeds 12, then this requires a combination of Hydra cables to be used. For example a combination of 8 and 12 hydra cables for a 20 port OLT card.

Migration to higher port count cards from existing interface cards by replacement of existing cards will require further study as to identify a method of utilising the new ports. This information will detail here when available.

The colours used to designate the number of the fibre within the Hydra cable is shown below. Lower fibre count Hydra cables will contain only the colours of fibres for the quantity of fibres within the cable.

Fibre Number	Hydra fibre Cable colour
1	Blue
2	Orange
3	Green
4	Red
5	Grey
6	Yellow
7	Brown
8	Violet
9	Black
10	White
11	Pink
12	Turquoise

Table 3 – Fibre number and respective colour

8.7.3 Variations in Length of Hydra Cables

The variations in Hydra cable length are to accommodate the different distances between the equipment rack and the OCR. The cables should be installed from the equipment rack (connectorised end) and cut to length when stored/terminated on the OCR (bare fibre end). Table 4 gives details of the lengths that are available.

Item Code	Fibre count	Cable length (metres)	Connectors	Used for	Comments
050643	8	15	LC/UPC	FTTC - Huawei ETHA	1 Hydra per slot for SWF, 2 Hydras per slot for DFW
053880	8	15	LC/UPC	FTTC -Huawei SPUA	8 x 1 GigE ports
TBA	?	?	LC/UPC	FTTC - Huawei E48	
TBA	?	?	LC/UPC	FTTC ECI TENI 18U	10 ports used
TBA	8	?	SC/PC	FTTP Huawei GPBD	
TBA	8	?	SC/PC	FTTP ECI GPLT-8	
TBA	?	?	SC/PC	FIRS Huawei	
TBA	?	?	SC/PC	FIRS ECI	

Table 4 – Hydra cable details

8.8 Hydra Fibre Routing Rules for an OCR

Hydra fibres presented to an OCR have sufficient length stored as spare to allow termination in any position of any Sub Rack within the OCR to which spine fibres can be routed. Each fibre has 2.2 metres length of fibre stored. Routing of the fibre(s) takes place through the Hydra Cable manifold on the Right Hand Side of each Sub Rack. Good practice will require that routing of any Hydra cable fibres takes the shortest possible route to pick up the required spine fibre. Planners should be aware that ill considered routing of Hydra fibres could cause severe congestion in the Hydra routing area of the OCR and should be avoided. See Section 8.10 of this document for guidance.

8.8.1 Faulty Hydra Cable Replacement

Please refer to link: Network Policy Policy Briefing 423

8.9 Provisioning Policy for OCR(s)

Openreach and BT Operate have agreed an amount of pre-build for NGA nodes. Planners should refer to ISIS CCN/IMP/E016 0 – 21C FTTx Power and Infrastructure Policy as the definitive document for this information. In the absence of any guiding information from this source planners should apply the following policies:

Positioning an OCR(s) should:

- Occupy agreed area inside the MUA of the node.

Dimensioning of OCR(s) capacity should:

- Be based upon all the NGA products that are to be provided from the node as clusters.
- Typically the initial provision will be 1 OCR which will then be capacity managed to trigger subsequent provision however some NGA schemes will require more due to the number of spine cane to be deployed.
- Where multiples of OCRs are required account must be made of the OLT positions and BT Operates exchange planning policies See Core Planning Guides in the Bookstore.
- Equipment Rack(s) for each NGA Product will use Hydra cables routed to an OCR.
- Be situated ideally adjacent to the rack(s) that contain the NGA “Head End” electronics (Layer 2 Switch and OLT - IL2S/OLT). If this is not possible then OCR(s) should be located as close as possible to the IL2S/OLT preferably in the same suite line. The maximum distance between these should be within

the connectivity of the maximum length of Hydra cables used for connecting these items. See Table 4 for details.

8.10 Principles of Planning Connectivity on an OCR for FTTx

Refer to Figure 2 for information showing the fibre connectivity requirements within an NGA node.

8.10.1.1 COF 201 Fibres (Line side)

Caution: Due to safety standards COF201 has now been replaced by COF950. COF950 must be used as the installation option.

Ensure that the working fibres in the COF 201 (from the CCJ) are presented to the OCR as elements containing consolidated NGA Day 1 fibres and growth fibres. This consolidation is achieved in the external network using fibre and circuit aggregation techniques in a node. See ISIS NWK/LNK/C212.

Day 1 spine fibres should be routed to appropriate Splice Modules for splicing in line with the following rules.

The fibres from the spine cables are routed to the CBO as single element and if necessary stored as half elements on the storage reels:

The first spine cable presented to the OCR should be positioned in the furthest right position that suits the cable capacity. Successive cables must be positioned using the next available free position working right to left.

Note: Any combination of 24, 48, 72, 96 & 144 fibre cables can be accommodated, it is permissible to install across 2 CBO sections.

When any Day 1 fibre(s) needs to be routed directly for splicing or removed from storage, all 6 fibres within the “half-element” must be routed to a Splice Module via a patch tube used to connect from the storage reel to the next available (free) port in the Splice Module Port Array. The Splice Module Port Array is shown in Figure 11 and Figure 12 below.

The rule for using Splice Modules and Sub Racks are as follows:

- The COF201 spine fibres are routed as half elements (6 fibres) to the lowest positioned and available (free) Splice Module
- Splice Modules must be used sequentially and contiguously (no gaps). (Note that isolated spare fibres within half- element(s) are permitted within a Splice Module providing the fibre aggregation function has been as effective as possible.)
- All Splice Modules in a Sub-Rack must be used before an additional Sub-Rack is planned.
- The patch tubing can be routed from any CBO storage reel to any Sub-Rack Port in the Port Array.

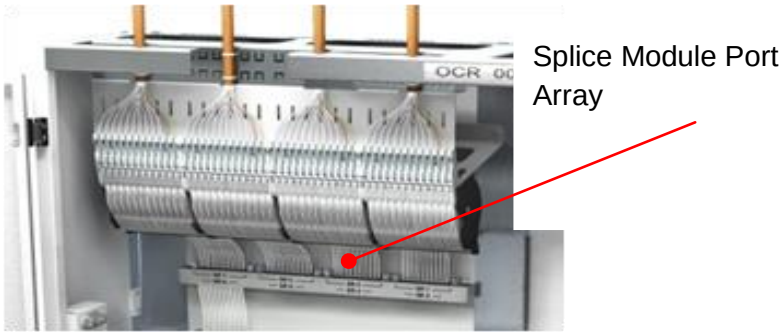

Figure 11 – OCR showing CBO area and the ports to Splice Modules

Figure 12 - OCR Splice Module Port numbering

Figure 13 - Splice Module access ports to designated Sub Rack positions

Note: Once the CBO is full the OCR is deemed to be at maximum capacity, even if it is not fully populated with Sub-Racks. A new OCR should be installed in line with the OCR provisioning policies contained in Section 8.9 of this document.

8.10.1.2 Hydra Fibres (OCR Equipment Side)

Hydra cables are installed at the same time as the OLT interface cards are installed. The Hydra Cables are routed to the required Sub-Rack using the Hydra Segregation Units which are fitted down the right hand side of the OCR (see Figure 3). This comprises 8 channels, each channel serving a single Sub-Rack position.

Once presented to a Sub Rack, the Hydra fibres will be either:

- Routed to splices trays to which splicing to the Day 1 COF 201 spine fibres is required. *or*
- Stored in the Hydra storage area of the Sub Rack. (The storage area occupied should preferably be in the same Sub Rack that will contain the spine fibres when splicing is required.)

  At any one time, fibres from **only one** Hydra Cable can be stored in any one Hydra Cable Input Bay on a Sub-Rack.
  Identification or mapping of an appropriate OLT port and hence Hydra fibre depends upon the supplier and release of the equipment provided in the NGA node. See Table 1 for details of the ISIS document to which planners should refer for this information.

Note: Once all the reels on a Hydra Cable Input Bay are empty of stored fibres a further Hydra Cable can be terminated in that Bay; up to the maximum of 8 Hydra Cables per Bay

8.11 Managing Changes on an OCR

The principles that under-pin the design an OCR assumes that churn of fibres will significantly reduce as the penetration of FTTx increases. Managing any forced changes in the interim will require careful consideration. The following rules should be applied.

8.11.1 If the planned job needs changing at the stage where no physical work has been done (hence no physical constraints on what can be done):

Spine fibre(s) no longer required for the planned connection need to be recorded as spare and available for other use. If the planning activity caused the routing the half element to the splicing tray solely for the fibre that is no longer required then the half element should be recorded as being stored in the CBO COF storage area of the OCR.

Hydra fibres no longer required for the planned connection need to be recorded as available for use and in Hydra storage

All other planned connectivity (mapping) for other Slams / Ports and FTTP should remain unchanged (i.e. no need to re-map to fill OCR). Opportunities to use the freed-up Spine fibres and the Hydra fibres according to the existing planning rules must be taken as the first option rather than planning new capacity.

8.11.2 If the planned job needs changing at the stage where the physical work has been completed:

Splicing of spine fibre to Hydra fibre should be the **last operation** in the build sequence of the FTTX network. This eliminates many of reasons that may cause re-routing of Hydra fibres on the OCR.

Once spliced, if developments occur such that the spine fibre to Hydra fibre connection is not required then the planning changes should record spine fibre and Hydra fibre as spliced but available for use. The re-routing of spine fibres or Hydra fibres is not possible after installation on the OCR, so the physical connection will need to remain. When this connectivity is required to be used this should be done by planning new fibre connectivity in the external network.

8.11.3 Migration to OLT ports on high capacity cards:

This activity will be required upon the introduction of the Huawei High Capacity OLT card. Investigations into how this will be achieved are being undertaken at the time of writing. However it is expected that the migration activity will be managed at the equipment end of the Hydra cables such that there is no requirement to re-splice on the OCR. Details will be published when they become available.

9 *Re-stocking Exhausted Capacity*

Where OCR capacity is reaching exhaustion the location of a new rack should be planned proactively before exhaustion occurs. It is recommended that a trend analysis be adopted to predict likely exhaustion dates. Installation of new OCR capacity allowing for typical leads times will ensure installation in readiness for the next cable/equipment.

The position of any rack should allow for interconnectivity between spare capacity with an existing OLT and any new that may be planned. The position should also align with where any new street cable is planned.

Where a Fundamental Capacity Plan is in place, consideration for all known future cables must be given including OCR and electronics equipment. It should be acknowledged that planning of reserving a suite may incur accommodation rental cost head of any actual installation.

10 *OCR Used as a Replacement for OFR for all New Work*

Investigations are progressing to determine the feasibility of this initiative. Details will be presented here once the results of the evaluation are known.

Also under investigation is a practice of cabling from an OCR to existing legacy equipment as well as other external cable head.

11 *Risks and Opportunities*

Not applicable in this case.

12 *Links to other Guidance*

This document should be read in conjunction with the following ISIS documents:

- NWK/LNK/C199 – Fibre to the Cabinet Planning Policy (Distribution Fibre)
- NWK/LNK/C200 – Planning Electronics for NGA FTTC Tactical (Huawei)
- NWK/LNK/C201 – Fibre to the Premises Planning Policy (Distribution Fibre)
- NWK/LNK/C205 – Planning Electronics for NGA FTTx (Huawei)
- NWK/LNK/C206 - Planning Electronics for NGA FTTx (ECI)
- NWK/LNK/C553 – ODF Policy
- Network Policy Briefing 423 - Faulty Hydra Cable Replacement

13 *Glossary*

Glossary of Terms

Abbreviation	Explanation
ANC	Ancillary Network Connection
BFB	Blown Fibre Bundle
BFT	Blown Fibre Tubing
CBO	Cable Break Out
CCJ	Cable Chamber Joint
COF	Cable Optical Fibre

CP	Combs Provider
DCN	Data Comms Network
DFW	Dual Fibre Working
DSLAM	Digital Subscriber Line Access Multiplexer
EES	Ethernet Edge Switch
EOI	Equivalence of Input (TSR requirement)
EU	End-Users (Customers)
FTTC	Fibre to the Cabinet
FTTP	Fibre to the Premises
FTTx	Fibre to the Cabinet or Premises – generic term
GEA	Generic Ethernet Access
GPON	Gigabit Passive Optical Network
GigE	Gigabit Ethernet
GIU	Graphical Interface Unit
IDC	Insulation Displacement Connection
IL2S/OLT	Integrated Layer 2 Switch and OLT
LAG	Link Aggregation Group
L2C	Lead to Cash
NGA	Next Generation Access
OCR	Optical Consolidation Rack
OFR	Optical Flexibility Rack
OLT	Optical Line Termination
OSS	Operational Support Systems
PDU	Power Distribution Unit
POTS	Plain Old Telephony
SFFB	Super Fast Broadband
SFP	Small Form–factor Pluggable
SFW	Single Fibre Working
TSR	Telecoms Strategic Review
VDSL	Very high bit rate digital subscriber line
VLAN	Virtual Local Area Network

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