

UNIFIBER Reference Offer Commercial B2C

Annex 3

Service Description & Working Level Agreement - WIP

20th of September 2023



- This document should still be considered as WIP as:
- operational processes are still being defined,
 - IT specifications and IT development are ongoing and
 - subcos for both Homes Passed and Homes Connect build are still to be selected.

Contents

1. General Provisions	5
2. Glossary	5
3. Introduction	6
4. Service & Product Description	7
4.1. Service Description	7
4.2. Product Description	8
4.3. Service Orders	10
5. Network Specifications	11
5.1. Network Assumptions	11
5.2. Network Specifications	12
5.3. Network Ownership and Protection	13
6. Homes Passed Network Deployment	14
6.1. Network Planning	14
6.2. Network Engineering	16
6.3. Network Delivery	17
6.4. Operator Equipment Installation	17
7. Homes Connect Network Deployment	18
8. Overall Accountability	19
9. Wholesale ODF Access Ordering and Provisioning	19
9.1. Service Order Types	19
9.2. General Principles	22
9.3. Access Portability	22
9.4. Planning & Timelines	23
9.5. Forecasting	23
9.6. Forecasting Procedure	24
10. Area and/or Central POP Services	26
11. Communication	27
11.1. Monthly Service Delivery Meeting	27
11.2. Escalations	27
12. Information Exchange & IT landscape	27
13. Financial process	30
14. Incident Management Process	31
14.1. General	31

14.2. Incident Management Process.....	31
14.3. Escalations.....	32
15. Planned Work Process.....	33
16. Appendices.....	33
Appendix 1: Technical Specifications.....	34
Appendix 2: Forecasting Template for Wholesale ODF Access	41
Appendix 3: Acoustic Simulation Cooling Unit	42

1. General Provisions

This Service Description (SD) and Working Level Agreement (WLA) is designed to create a common understanding about the service & product offering of Company and all procedures and responsibilities between Operator and Company concerning the delivery of Services. The WLA aims to provide the required level of details for the working procedures between both parties and will be updated or adjusted upon needs and in mutual understanding with Operators.

2. Glossary

In this document, some additional terms above the ones listed in Annex 1, Definitions and Interpretation, are used. They are defined below.

- **“Distribution Network”** means the Point-to-Point network between the Area POP and Distribution Points/Handholes at street level
- **“Fiberzone”** means an area of 2.500 Homes Passed around an Area POP
- **“Feeder Network”** means the network part between Central POP and Area POP's
- **“Patch order”** means an order related to patching / depatching at Central POP or Area POP
- **“Planned Work”** means the process entailing the coordination of all deployment and maintenance activities that take place on the Company's network with (potential) impact on customer connectivity.
- **“PON”** means Passive Optical Network
- **“POP-ring”** means the connectivity between Central POP and Area POPs
- **“Wholesale ODF Access Order”** means an order related to Wholesale ODF access from the Customer's FTU up to the Company ODF in the Central POP

Any other capitalized term in this Service Description & Working Level Agreement shall have the meaning as set out in Annex 1, Definitions and Interpretation, of the Agreement.

3. Introduction

Growing demand for high-speed internet is the primary driver for new access technologies that enable experiencing true broadband. Dedicated FTTx access networks are necessary to support this demand. Fiber-to-the- Home, or simply FTTx, is a technology that uses optical fiber directly from a Central POP to the customer's premises. It allows to provide uninterrupted high-speed internet service.

The Company will build, operate and grant access to its passive FTTx Network without providing the active layer (i.e. the electronic network equipment, as well as the operational support systems for service commercialization). It is the Company's responsibility to build out the Feeder and Distribution Network (resulting in a Homes Passed network) and the Access Network (Homes Connected). In case of MDUs, the Homes Passed network is terminated in front of (small MDU) or inside the building at a floor box or similar solution (large MDU) based on the available efficient solutions.

To be ahead of the market and create occupancy in municipalities, Company aims to roll out the FTTx Network in two stages:

1. Initially, a so-called **Homes Passed network** will be built, covering cities and urban areas with a potential of at least 7.000 - 10.000 Homes Passed. At this stage, the Feeder (1) and the Distribution Network (2) are built (see Figure 1). The roll-out of this Homes Passed network will be split up in smaller batches, so called "Fiberzones" that cover approximately 2.500 Homes Passed.
2. As soon as the Feeder and Distribution Network are in place, the Homes Passed network (including introduction in MDUs depending on MDU structure) is ready to allow for individual Wholesale ODF Access orders to be connected and the **Homes Connect** network is gradually built up.

The operator will decide himself when to set up a marketing campaign. Individual Wholesale ODF Access orders will be accepted and realized taking into account the Delivery Date by the Company of the Deployment Area.

Operator will be informed of the **Initial Delivery** date, aiming at delivering 80% of a Deployment Area. **Final Delivery** of a Deployment Area is reached when 95% of the Homes in a Deployment Area are passed.

Above roll-out strategies allow for flexibility in roll-out and/or allow also to gradually adapt and fine-tune the roll-out process to the selected area and/or to reduce time between order and implementation (reducing order cancellation) and/or mitigate financial risks.

The scope of this document relates to all FTTx cases, being understood that diverse commercial agreements may settle the commercial conditions under which specific services are provided.

4. Service & Product Description

4.1. Service Description

Access to the Company FTTx Network is made up out of several components (see Figure 1):

1. **Access Network (1):** Point-to-Point connection between the nearest Handhole and an Access Point, equipped with a termination box at the customer's premises (Fiber Termination Unit - FTU).
2. **Distribution Network (2):** Point-to-Point network between an Area POP and the Distribution Points / Handholes at street level.
3. **Feeder Network (3):** also called POP-ring (or Feeder Ring) which connects the Central POP and a number of Area POPs in a redundant ring network.

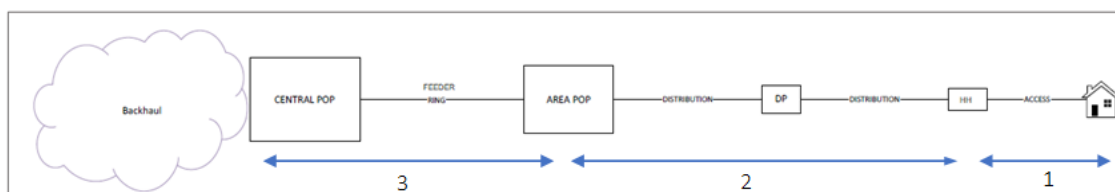


Figure 1: Schematic overview of Company FTTx Network concept

Operator is able to order the following services:

1. Wholesale ODF access to each available Access Point (FTU to Area POP), including a patch in the Area POP
2. Standard rack space in the POPs for the installation of its active equipment (optical, backhaul, ...).
3. POP-ring capacity, including patches in the Area and the Central POP

4.2. Product Description

The Company FTTx Network offers the opportunity to order and use a full Point-to-Point network topology and connect equipment based via one of the available technologies (e.g. Ethernet, PON, etc.).

The **basic Wholesale ODF Access product** covers the physical fiber connection from the customer's FTU to the Area POP, including a patch which provides connectivity at the Area POP to a passive splitter or directly to Operator Equipment (depending on the architecture).

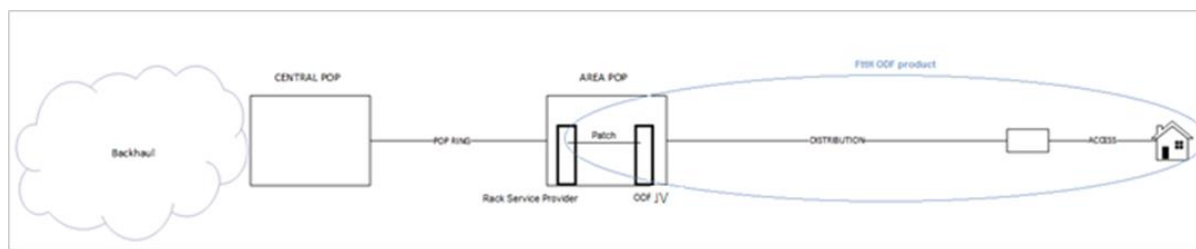


Figure 2: Schematic overview of Company FTTx Network concept

Depending on Operators' connectivity solution, the connection can be built up via Ethernet, PON, Point-to-Point (e.g. in case of B2B customers), etc.

A more specific solution description for Ethernet and PON is given below:

Ethernet solution

Operator places Ethernet equipment in its rack, requiring additional DC power to the basic rack provisions. Each individual Wholesale ODF Access order will be connected to the rack via a patch, allowing each individual fibers to be terminated at the Ethernet switch. Operator either provides for backhaul connectivity at the Area POP themselves or orders a POP-ring connection to allow for active connectivity via the Central POP.

PON solution

As shown in Figure 3 below, all individual Wholesale ODF Access ordered lines are terminated at Company's splitters rack. At this splitters rack, Company places splitters and depending on splitter capacity, every 32 (based on a 1:32 splitter ratio) orders a separate POP-ring connection is ordered by Operator simultaneously. Company's FTTx Network capacity is standardly dimensioned at 1:32 splitter ratio.

The Operator is responsible for managing the splitter capacity. Operator shall monitor capacity and I order additional splitter capacity when the splitter reaches maximum capacity. The Operator must indicate to which splitter an end customer will be connected. To assist the Operator, the Company's IT system will notify the Operator when a splitter is used at 80%.

The splitter ratio may be adjusted according to Operators' specific network design and dimensioning strategy. The Company will comply and dimension accordingly. This can either be done by adjusting the splitter in use (and ordering additional feeder capacity) or ordering new feeder capacity with a new (other dimensioned) splitter.

Operator shall have the possibility to use a 1:2 splitter ratio in its own Operator's rack. Company shall start installation of the OLT and backhauling in the Central POP, and may allow decentralized OLT installation in all POPs (so both Central and Area POPs) if that would be the strategy of the operator.

Backhaul has first to come to the Central POP and only if the number of customers of the operator sufficiently large or if connection to the central POP is operationally not possible the connection to an Area POP, the Company may allow decentral backhauling.

Since decentral backhauling may for some Operators not be economically feasible, the Company defined a limit of 14 km per Deployment Area between the central POP and the most distant customer. The Company has set a maximum of 25dB in 1625nm as tolerance measured at the FTU (end customer)



Figure 3: PON Solution with equipment in Central POP

In the event the PON equipment is placed in the Area POP, connectivity towards the Central POP is made via an (optional) direct Point-to-Point fiber pair as shown in Figure 4 below. At the Central POP, Operator needs to foresee his own backhauling. Another option (not shown in the Figure) would be to connect a backhaul connection directly to the Area POP where a patch from the incoming ODF is placed to the Operator backhaul equipment. Also, in this case, the splitter is provided by Company.

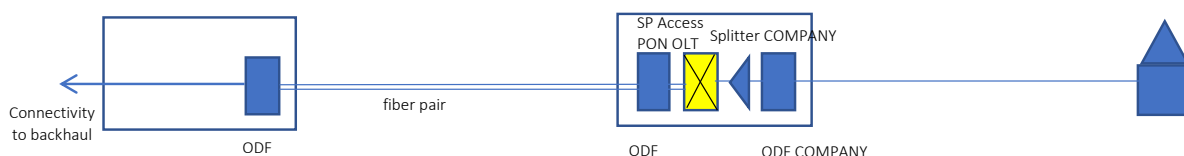


Figure 4: PON Solution with equipment in Area POP

4.3. Service Orders

The full FTTx connectivity can be made up of different components, based on Operator's preference and active service offerings.

The following 6 Service Orders are defined:

- 1) **Wholesale ODF Access order**, includes (applicable when the Access Point is not yet connected to the Company's network and an FTU has to be installed)
 - a. Access Network from Company ODF at the Area POP to the Access Point including FTU at premises.
 - b. Patch connecting Company's ODF to Operator's rack space (Ethernet) or splitter in Company's rack (PON)
- 2) **Wholesale ODF Patch order** (applicable when the Access Point is already connected to the Company network and an FTU is installed)
 - a. Patch connecting Company's ODF to Operator's rack space (Ethernet) or splitter in Company's rack (PON)
- 3) **POP Ring Connectivity order**: connectivity between the Area POP and the Central POP. Four options exist:
 - a. Fiber pair including patches
 - b. Feeder capacity + desired splitter capacity, standard ratio of 1:32, 1:16 and 1:8 available upon request
 - c. Single splitter, standard ratio of 1:32 is offered, 1:16 and 1:8 available upon request. These splitters can be used when Operator is installing equipment in POP.
 - d. Single fiber on POP ring + patch between Company ODF (Area POP) and Company ODF (Area POP) connecting the FTU
- 4) **Area or Central POP service order**:
 - a. Rackspace per 20HE
 - b. DC power supply at rack (230V on request)
- 5) **Termination order**
- 6) **Cancellation order**

These orders are explained in more detail in paragraph 9 of this document.

5. Network Specifications

5.1. Network Assumptions

The FTTx Network will consist of new infrastructure, on the event partially making use of existing assets (tubes/ducts, fiber, buildings e.g. for POPs, grounds) when possible.

The network design is made up of a Point-to-Point structure in which a fiber runs directly from the Area POP to each specific Access Point at a unique address. Each unique address receives a fiber pair which is terminated at an FTU.

Only 1 fiber is installed all the way through. For SWAPS, we foresee slots early mornings when a Company's technician is available in the POP to limit as much as possible service interruptions between the swap execution (by the Company) in the morning and the in-home installation (by Operator) later. The second fiber is spliced only up the Access Distribution Point.

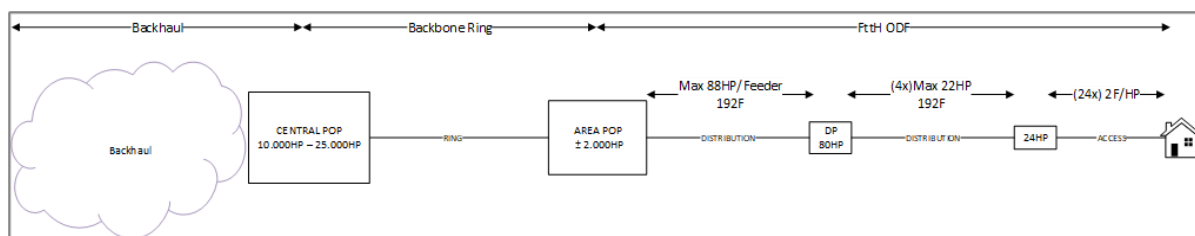


Figure 5: Network concept and dimensioning

High-level network specifications:

- Central POP per 10.000 – 20.000 Homes Passed
- Area POP per 2.000 – 2.500 Homes Passed
 - Access network consists of a 24 fiber pairs optic Emtelle cable which offers a fiber pair per unique address
 - Each Access Point is connected with a tube with one fiber pair. The first single fiber is assembled, the second is available as a spare.
 - POP-Ring capacity between the Central and Area POP will be connected redundantly in cascade order. The dimensioning of this capacity will be based on
 - a. the number of Area POPs on the ring
 - b. the volume commitment/forecast Homes Connected and
 - c. the forecasted capacity of fiber usage of the POP-ring (alignment on splitter capacity and forecast of expected Point-to-Point B2B services).
 - Multi-dwelling locations will be connected through a handhole in front of the premises, allowing for a dedicated fiber optic cable per multi-dwelling unit. Company has different network concept scenario's* on how the Homes Passed network is terminated for MDUs (via façade or in the building). Company will aim at minimizing complexity/shortening time at customer activation moment.
 - Demarcation of ODF Access product: the Company is responsible for the network between Company equipment in the POPs to the FTU at the Access Point. In case Operator additionally orders POP services, delivery of

rack space for Operator Equipment in Central POP and Area POP is also Company responsibility.

*MDU's are divided into quadrants that are linked to HP/HC demarcation points. It means that a quadrant will always have the same demarcation point. If the quadrant is known, the point of connections is known.

Quadrant	Description
A	Means that the fiber is waiting connection in a floor dropbox on each level of the building.
C	Means that the fiber is waiting connection in the budi dropbox located at the basement or groundfloor inside the building.
D	Means that the fiber is waiting connection on the façade in a Façade Dropbox.
M	Quadrant Multifu, means that the fiber is waiting connection in a Multifu tube located underground.
P	Quadrant Pole, mean that the fiber is waiting connection on the Pole Dropbox.
Ax	Same as quadrant A, but plastic cable tray needs to be installed vertically during HP phase, or Ax means it's a complex building.
Cx	Same as quadrant C, but plastic cable tray needs to be installed vertically during HP phase. Also know as Cn quadrant.
Dx	Same as quadrant D, but fiber need to go on the façade(s) who is/are not accessible via the street and thus agreement of owner is needed in HP fase.
Mx	Same as quadrant M, but the fibre is waiting wrapped in "HP plastic, HPR" box at the limit of the private area.

5.2. Network Specifications

The network is designed in such a way that quality standards are guaranteed. Company aims to build and deliver a network that is (next generation) PON ready. Design rules will lead to the most efficient/short network lengths and dimensioning.

As such, Company will aim at providing the (technical) flexibility for operators to install their PON active equipment either in the Central POP or in the Area POP. Ultimately the density of the area and granted locations of the Central POP and Area POP will determine the full possibility of meeting these criteria. In the event the density of the area does not allow for this, the operator might be forced to place active PON equipment in the Area POP.

	1330 nm	1550nm	1625nm
Splice Loss	0,10 dB	0,10 dB	0,10 dB
Insertion Loss	0,5 dB	0,5 dB	0,5 dB
Optical Return Loss	≤ -60 dB	≤ -60 dB	≤ -60 dB

Table 7: Fiber Charateristics

The Company will issue a technical description how an Operator can connect its equipment to the ODF. The fibers of the outside plant cables are according to ITU G.657.A1. The number of intermediate connectors per link will be kept to a minimum. Splices will be preferred.

The Company shall deploy a network that has optical transmission characteristics compliant with ITU G.984.2 and G.9807.1 and will allow a 1/64 splitting ratio if the operator uses optical equipment with 32 dB power budget and a 1/32 splitting ratio if the operator uses 28 dB optical equipment.

The deployed network shall comply with the transparent transport of any wavelength(s) in the range from 1260 nm to 1625 nm for the (NG)PON services and the wavelength band 1625 to 1675 nm (U-band, maintenance band) for in service fiber line testing at 1650 nm (OTDR), as defined in following recommendations ITU-T G.984.5 *Gigabit-capable passive optical networks (GPON) Enhancement band* and ITU-T L.66 *Optical fibre cable maintenance criteria for in-service fibre testing in Access networks*.

5.3. Network Ownership and Protection

The Network is built, operated and owned by the Company. Except for conditions mentioned in the SLA, the Company will not make any alterations to the Network. Operator and the Company will treat each other's Equipment and facilities at the Central POP, Area POP and Access Points with utmost care.

In the table below definition of who is "responsible" and who is owner" for each network component:

Network element	Responsible	Owner	Remarks
POP	Company	Company	
OLT	Operator	Operator	
Splitter	Company	Company	The splitter belongs to the Company and its responsibility.
Rack	Company	Company	
ODF	Company	Company	The patch between the splitter and the ODF is the responsibility and property of the Company. The ODF is the responsibility and property of the Company.
Patch	Company	Company	
Manhole interconnection	Company	Company	
Cable interconnection	Operator	Operator	
Distribution Point	Company	Company	
Distribution Access Point	Company	Company	
FTU	Company	Company	
ONT	Operator	Operator	

OLT link between Splitter Patch ODF	Operator (OLT)	Company	The OLT is the responsibility of the Operator (installation and cabling). The splitter between the OLT and the splitter is the responsibility of the Company and belongs to the company.
-------------------------------------	----------------	---------	--

6. Homes Passed Network Deployment

6.1. Network Planning

Company’s network roll-out schedule is based on a combination of:

- a. the absence of fiber/competitive network
- b. population density
- c. customer’s attractiveness
- d. network build cost
- e. commune approval
 - f. operational reasons (e.g. subco capacity)
 - g. operators desired commercial roll-out planning

A first selection of roll-out potential per city/urban area is defined, based on Company’s roll-out Deployment Areas. Based on this selection, council orientation will give insight in potential deviant operational conditions, mandatory combination of other construction works, potential presence of contaminated soil and a first alignment on POP Locations. Both studies will lead to a High-Level Design (HLD) and High-Level Budget.

The HLDs will result in an overall roll-out scheme which is made up of timelines per Fiberzone. A full city or urban area is split up in smaller batches of approximately 2.000 – 2.500 Homes Passed.

The initial phase from kick-off, with High-Level Design, followed by Street Surveys and Detailed Design, is called the Initiation Phase (see Figure 6, yellow). The Initiation Phase is followed by the effective Network Build Phase (see Figure 6, green). Depending on the size of the Fiberzone, the network build will last between 6 to 10 months. The overall lead time of a Fiberzone from kick-off till Initial Delivery is around 18 months.

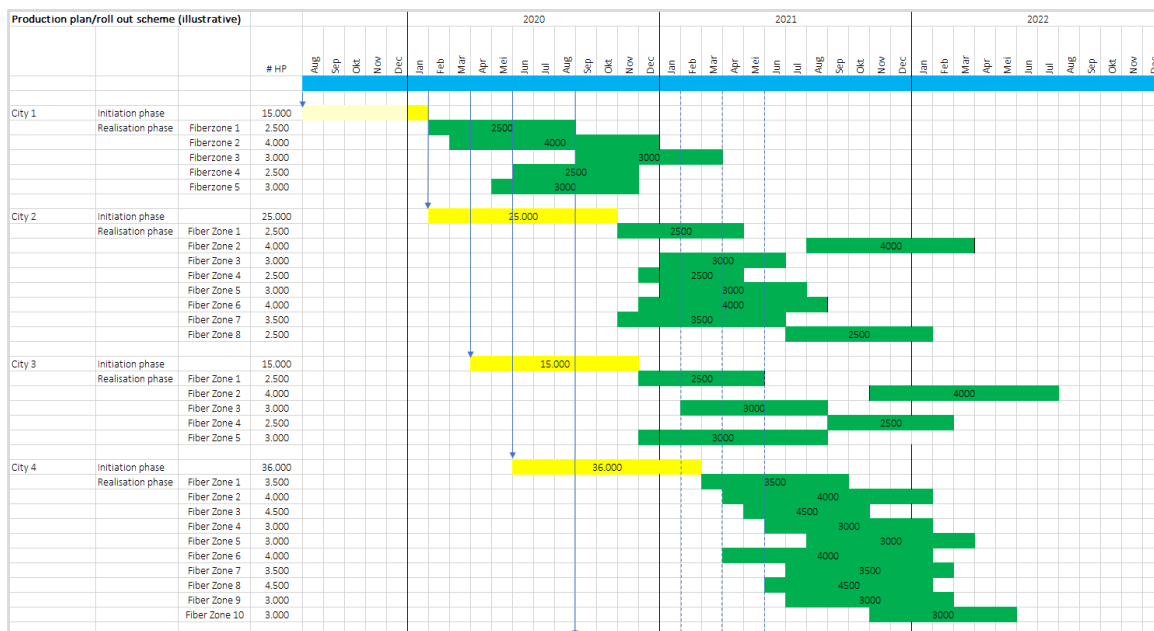


Figure 6: Illustrative network roll-out scheme

Unifiber has developed procedures to ensure that information about the roll-out of its FTTH network (both location and timing) is made available in a non-discriminatory way and is provided in time to the Operators.

After signing the Master Service Agreement, Unifiber will communicate to each beneficiary Operator which communes will be launched in the next 2 years, with more details on the current year.

Three (3) files are made available to the (partner) Operators:

1. During the Scope validation sessions, the shape files are shared with the Operators. The Final Scope List file is made available via a portal (unifiber.be/portal). An estimate of the number of homes passed will be communicated to the Operators during the validation of the polygon, a correction will be made after the street surveys and as built. Experience shows that the variation in the number of Homes Passed will remain below 2%, generally it is slight increase in terms of number of Homes Passed.
2. The eligible addresses of the final scope list are communicated to the Operators via an interface between Unifiber and the Operator at the time of the Initial Delivery. During the construction, the Deployment File gives progression on the number of Homes Passed. The addresses are shared to the Operators via DMP.
3. The POP addresses, including those of the Central POP, will be communicated as soon as they are known. A POP planning file will be made available to Operators via a portal (unifiber.be/portal). The POP addresses will allow operators to plan their backhauls well in advance of the roll-out process.

During the roll-out, monthly steering committees are organised with the Operators to share progression on the civil works.

Every quarter the shape files are also communicated to BIPT.

Once a DA has reached the 80% threshold, the addresses are made available in the Service update file.

6.2. Network Engineering

As soon as a city/urban area reaches a positive business case based on HLD and the municipality/city council orientation comes back favorable, the engineering phase starts. For the most efficient design, an advanced alignment with the municipality council on POP locations is supposed to take place.

In the Engineering period, a street- and infrastructure survey result in the complete address database with all premises to be covered in the Homes Passed network. A Detailed Design (DD) is made for each Fiberzone and the different types of permits and approvals are requested (public domain, façade approval, syndic alignment). Regarding alignment with syndics, this is initiated as early as possible to ensure Homes Passed network is available in the entire MDU. It is the responsibility of Company to ensure agreement is reached regarding HP network. However, Operator can always help with existing syndic relationships (e.g. syndic names & contact details).

See Figure 7 for a schematic overview of the roll-out process. In order to minimize lead-time, several activities are planned in parallel.

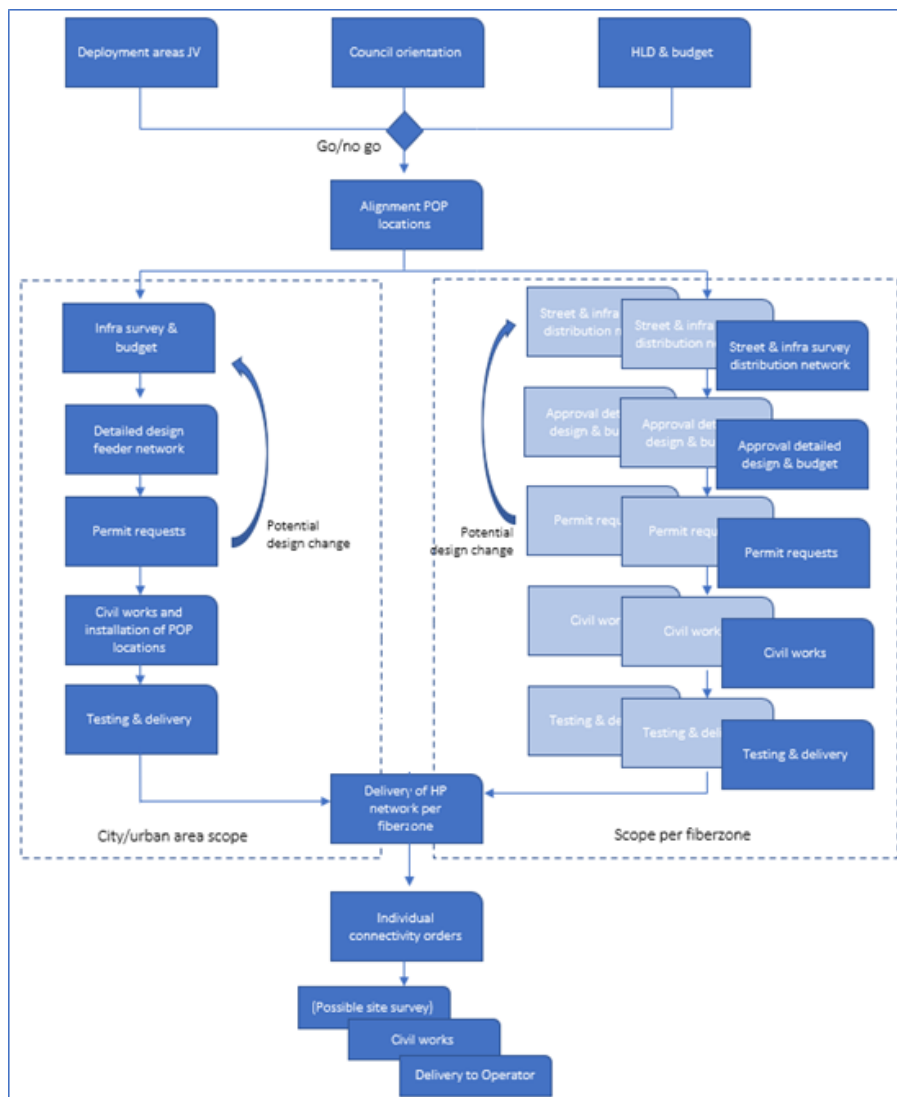


Figure 7: Schematic overview of the roll-out process

6.3. Network Delivery

Once the build phase has reached a certain level, Operator can start its marketing activities to allow for Wholesale ODF Access orders in a seamless flow for the contractor to continue its civil works in a steady pace. The timing of these marketing activities is decided by the Operator.

When both the Feeder and Distribution network are delivered and when the fiber cable passes in front of 80% of the Access Points in a Deployment Area, the Homes Passed network is delivered and ready for Wholesale ODF Access sales. The network is then also registered as 'available' in the availability checker – this is the IT system that Company offers for Operator to find available network on an address basis, and be able to place and follow orders.

In case of an MDU, the Company has to negotiate first with the landlords the method of building connection and install the internal cabling including floor boxes when relevant. This negotiation should ideally lead to the signing of a technical document containing the agreement concluded between the landlord and the Company, avoiding potential discussions later on.

6.4. Operator Equipment Installation

While Company builds the Homes Passed network, Operator will be able to install the necessary equipment at the available POP location(s). Both the POP Locations and equipment of Operator need to meet the technical standards which are described in Appendix 1 of this document. Should an incident occur regarding the technical standards of either the POP facilities or Operator equipment, parties will discuss what preventive and corrective actions are necessary.

Operator is responsible to make sure that employees and its employable suppliers are fully equipped, trained and able to perform their activities which adhere to the work instructions and safety guidelines.

Additionally, Operator is responsible to make sure that employees and employable suppliers to perform activities in POP Locations have successfully participated in the Company POP Certification training.

Access to the POP locations

- **Remote Access Control**

Remote access will be possible in two ways:

- iLOQ : NMC (24/7) has admin rights on the iLOQ platform and can add/delete users the our iLOQ-locks at all times. In case someone needs to enter site he/she can be created in the system within 5 minutes.
- iBOX : remote accessible security platform via which we can open the door remotely

- **Access Logging**

Each access is logged in the iLOQ-platform and can be reported on.

Whenever remote access has been provided (see previous topic) a ticket is raised and tracked in the NMC.

- **Trouble Shooting**

If there is no access possible to the POP, the NMC can check for the root cause in the iLOQ platform (24/7). If a lock fails functioning, Unifiber can open the door remotely or will follow the principle of a 'normal' doorlock malfunction via a lock-smith.

Technical/Operational Issues with respect to shared presence of multiple operators in one co-location room (in the event of installation): all racks are separated and individually powered. Security wise, the risk is the same as in all datacentres and we trust on the common sense & respect of the individual operator engineers to respect the competition.

- **Use of Security Cameras**

The idea exists, but with low priority. Goal is to have 1 camera indoor and 1 camera outdoor. within the data privacy & data retention law boundaries. RFP was sent to Amadys/Amado.

7. Homes Connect Network Deployment

The technical scope of a Wholesale ODF Access order can vary much: i.e. depending on soil, length of front garden to cross, technical possibility to realize the drop cable (making use of existing available duct or need to trench for dedicated new duct) – ultimately resulting in varying timelines and cost levels. Some orders may request customization as set in annex 2 §2.4; Each Service Order for Access that does not meet the specifications and assumptions (for instance an Access order with a Drop Cable) beyond 8m if introduction duct or equivalent is not available or usable) will be considered non-standard and Company shall charge Operator incremental costs above 8m incurred by Operator for such additional works.

As soon as the Company receives a signed Wholesale ODF Access order, the order is passed to the contractor. Ideally the scheduling of the realization date (Company) and activation date (Operator) is organized in such an (automated) way that the resident is able to select one or more selected timeframes which combines the two activities in 1 day. This process is fully automated and is using a commercially available software called 'ServiceCruiser' that allows to book all available slots. Unifiber shall determine the time slots (through its contractors/installers). For the moment (trial), they can be chosen as slots of 3 hours.

Only in 'non-standard' situations (no available duct and drop cable length > 8 meters) the contractor will inspect the premises and determine the solution for the drop cable, after which either the resident agrees on the spot and the drop cable and FTU mounting can be realized directly, or a second date is scheduled for the construction works which can then be combined with the activation by the Operator.

The Company strives to perform as many FTTx connections in just 1 day – this allows for the lowest possible cost and the fastest lead- & delivery time. Both parties (Company and Operator) need to cover the necessary details and information during the engineering process of the Distribution Network and sales process for individual orders to make this possible. Meaning that Operator will strive to retrieve as much data as possible on the

technical situation of the premise to connect upfront, to maximize the number of 1-day operations by both parties.

8. Overall Accountability

During the entire Homes Passed Network deployment phase, Company is responsible for available capacity, alignment with municipalities, managing all public relations, commercial material, quality assurance, project management etc. to realize its roll-out. During the Homes Connect phase it is a joint responsibility in terms of appointment handling at the customer, and an Operator responsibility to provide in accurate customer data and manage expectations on the realization process to come – allowing a most efficient process and resulting in shortest lead times – to the highest percentage of first time right and a process that is as much customer oriented as possible. Company and Operator will constantly seek to improve the process.

There are some external factors (such as customer absence) that might negatively impact KPI's and for which Company cannot be held accountable. The different type of situations in relation to KPI measurement are described in the SLA (see Annex 4). For those cases, the Company will have to provide evidence that the root cause of the missed appointment / installation / repair is indeed the responsibility/fault of the Operator or Customer.

9. Wholesale ODF Access Ordering and Provisioning

9.1. Service Order Types

As the Homes Passed network is built, Operator is free to start its marketing activities leading to the creation of Wholesale ODF Access orders. These orders will come in on an individual base per unique address. Company distinguishes 6 types of orders:

a. Initial Wholesale ODF Access order

The unique address is not yet connected to the Company FTTx Network. The order will result in

- provisioning of an ultimate physical fiber optic network connection from the customer premises to the Homes Passed network (also known as the Drop Cable);
 - installing an FTU at customer's premises, thus connecting the premises to the Company FTTx Network
 - provisioning of a patch at the Area POP location to be able to allow Operator to provide services to the customer.

It is also the Company's responsibility to connect MDU's to Company's Homes Passed network by using a network concept that accommodates the building. The Company commits itself to be able to realize the Homes Connect installation (Wholesale ODF Access order) within the agreed lead times in the SLA.

OTDR tests come with a cost, which would require Unifiber to charge the Operator. Tests have proven that in more than 99% of the cases, the fiber is end-to-end available without any problem. So OTDRs are kept for trouble shooting.

b. Patch order

In the event the unique address is already connected to the Company FTTx Network and Operator places an order to establish a connection to its equipment, only patching activities are needed to deliver the service. Either Company or the Operator will provide in the patching activities as stated in alinea 2.3 of Appendix 1.

c. POP Ring Connectivity order

Connectivity between Area POP and Central POP in four options:

- a. Fiber pair including patches
- b. Feeder capacity + desired splitter capacity, standard ratio of 1:32, 1:16 and 1:8 available upon request
- c. Single splitter, standard ratio of 1:32 is offered, 1:16 and 1:8 available upon request. These splitters can be used when Operator is installing equipment in POP.
- d. Single fiber on POP ring + patch between Company ODF (Area POP) and Company ODF (Area POP) connecting the FTU

d. POP service order

(additional) rack space and/or power supply at either the Area or Central POP

e. Cancellation order during delivery process

In the unlikely event the Wholesale ODF Access order is cancelled during the delivery process (assuming it is not the fault of Company), the delivery will be put on hold immediately and all incurred costs will be charged to Operator.

f. Termination order

In the event Operator ends a contractual agreement for a specific address, Company will possibly de-activate the ODF service by removing the patches at the Area POP Location. The termination box (FTU) will remain at the premises for potential future activation. Wholesale ODF Access Ordering and Provisioning (figure 8). Section **(De-) Patching** of Appendix 1 describes the patching and de-patching process.

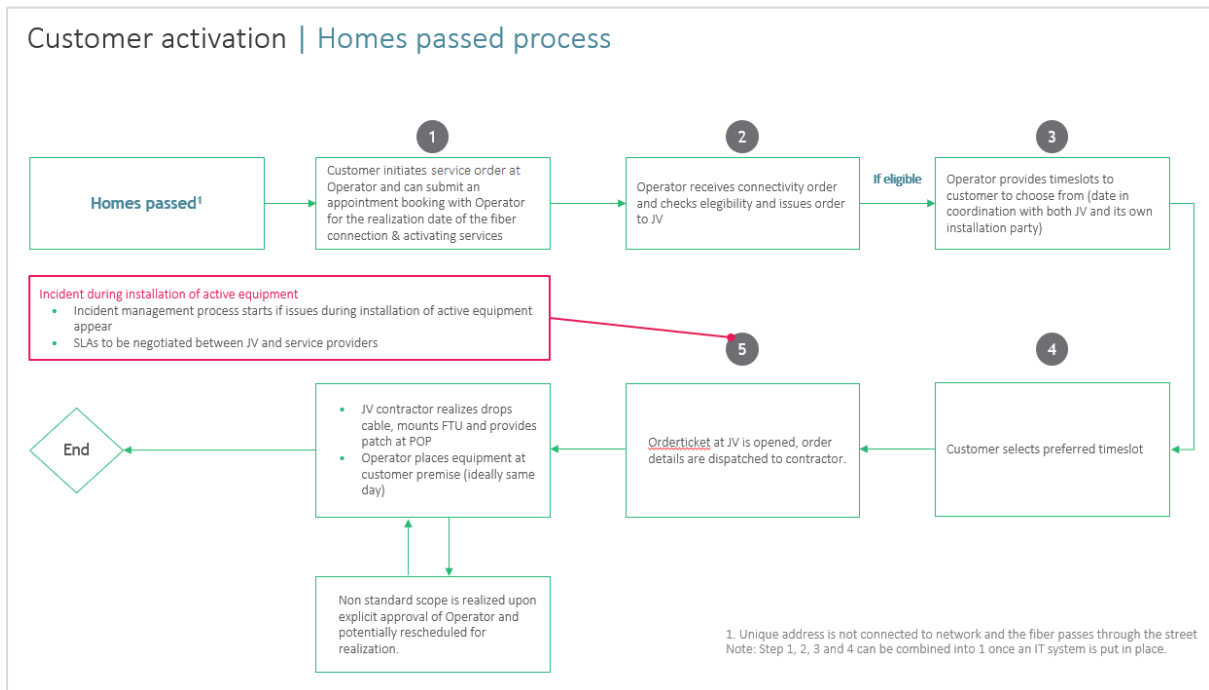


Figure 8: Homes Passed Customer Activation

NB figure 8: Operator will have access to a real-time API "access register" to be able to see which customers are eligible (passed or connected)

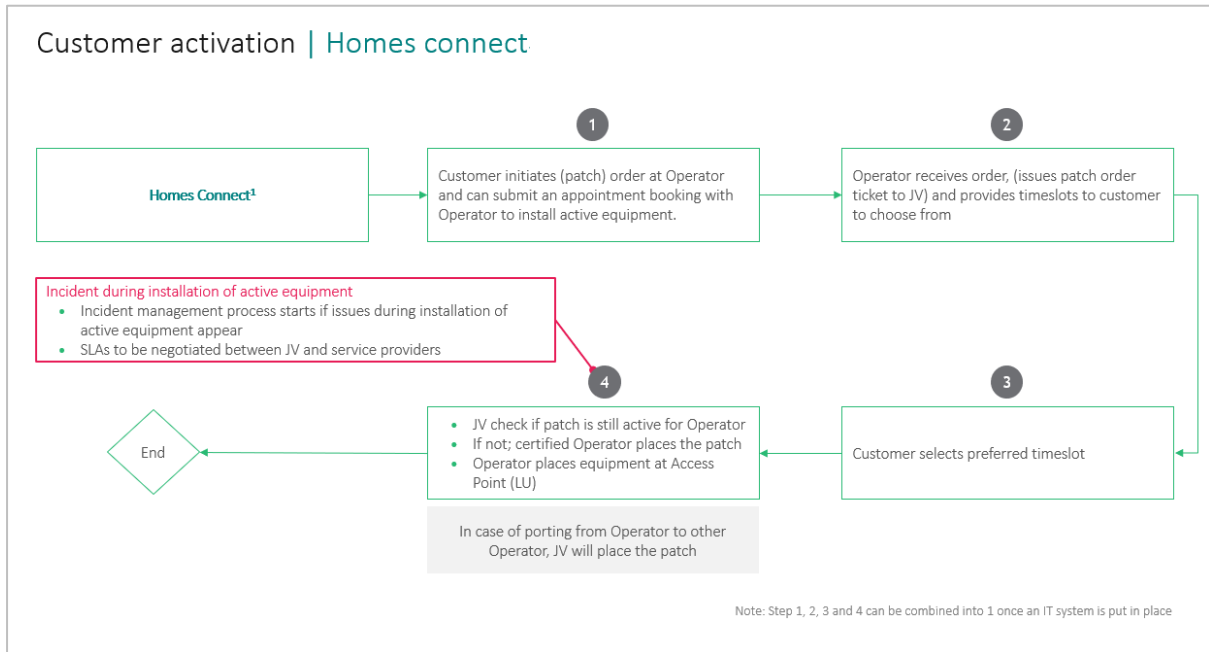


Figure 9: Homes Connect Customer Activation

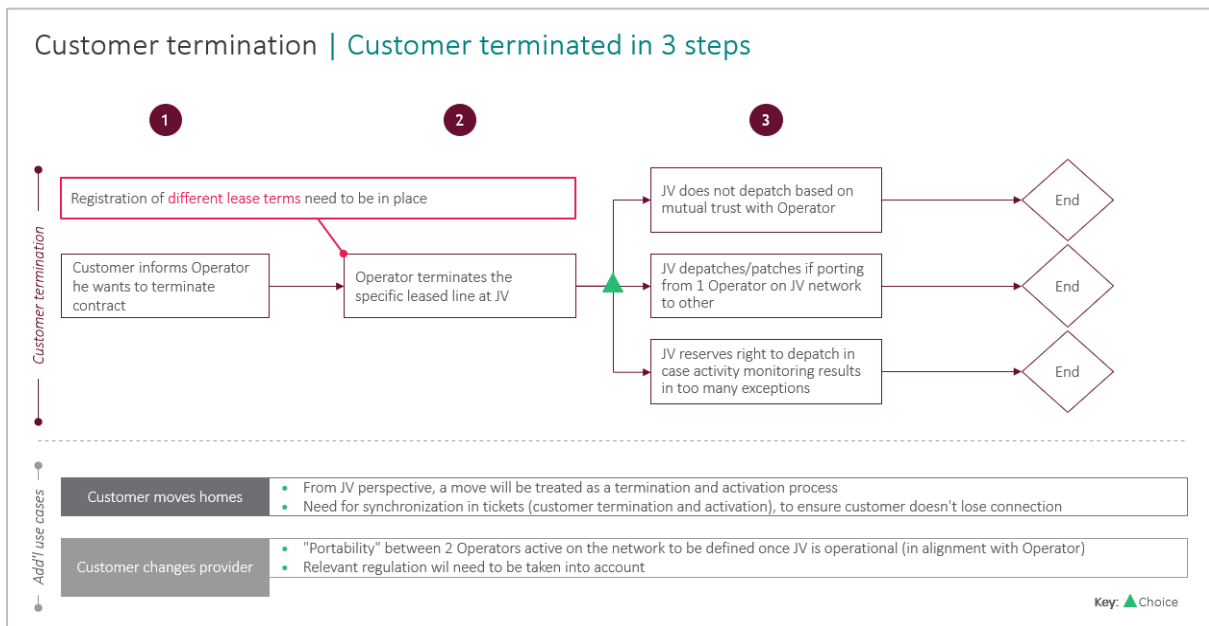


Figure 10: Customer Termination Process

9.2. General Principles

- 1) Company shall grant Access to the FTTx Network after Operator has submitted a Service Order and that Service Order has been accepted by Company.
- 2) Each Service Order shall be governed by the terms and conditions of this Agreement and its appendices. The Service Order will specify the type of Services purchased by Operator and the start date for the provision of the Services and shall be executed in accordance with the terms of the SLA.
- 3) The Parties shall comply with the provisions and processes for ordering, delivery and acceptance of Access and Services. This includes the installation, testing and supply of the Access and Services on a per Access Point basis in accordance to the terms and conditions of this Agreement.
- 4) Upon receipt of the Service Order submitted by Operator, Company will process Operator's Service Order in accordance with the terms of the SLA.
- 5) Operator may order Company to activate an Access Point through the submission of a Service Order if the code "Home Passed" has been issued for the relevant Access Point.
- 6) Operator warrants that it has and will at the time of any Service Order have full authority to submit such Service Order for Access in relation to a specific Access Point and shall hold harmless and indemnify Company against claims by third parties, including claims by other operators and Subscribers, in relation to that Service Order. Company may charge to Operator all reasonable costs actually incurred as a result of Service Orders placed by Operator without authorization.
- 7) Upon approval of the Service Order for POP Services, Company shall adopt the necessary facilities for the connection of Operator Equipment with the FTTx Network in accordance with the provisions of this Agreement. As soon as Company shall notify Operator that such facilities are in place, Operator can start connecting its Operator Equipment to the FTTx Network.

9.3. Access Portability

In the event that a Subscriber changes Operator, the following procedure will be applied:

- The New Operator will capture the LOA (Letter of Agreement) and issue a request for "Change of Operator"
- Company analyzes the request for "Change of Operator"
- Once the request for "Change of Operator" is technically confirmed to the New Operator, the Initial Operator will be informed of this request through an "Auto-Cease Notification". This notification will contain the date on which the service will be officially transferred to the New Operator.
- If there is a cancellation of the request to Change Operators, Company will cancel the "Change of the Operator" request, indicating the reason of such cancellation 'LOA received by Subscriber' to the requestor, and related auto-cess notification.
- Once the patch swap order has been successfully executed by Company, both Operators will receive confirmation that the patch order has been executed and closed.

Process Description

- New Contract concluded with a New Operator

The request for “Change of Operator” occurs when a Subscriber sign a new contract with a New Operator, implying termination of his contract with his Initial Operator.

- Start of the “Change of Operator” process
The New Operator starts the “Change of Operator” request while submitting this specific order request to Company. Once the New Operator successfully books a time slot into Company’s calendar and the order is technically confirmed, the Initial Operator is, in real-time, informed of the Access Point take-over by another operator through an “Auto-Cease Notification”.
- The service interruption will be minimal if the New Operator can perform activation of its service on the same date of the patch swap order request.
- Deactivation of the Service by the Initial Operator
The Initial Operator terminates the contract by deactivating the active line through software from the agreed date.
- Patching in POP
On the agreed date, the Company will remove the patch connecting Company ODF to Initial Operator’s rack space or splitter in Company’s rack and perform the patch connection between Company ODF to New Operator’s rack space (Ethernet) or splitter in Company rack (PON).
- Activation of the service at Customer’s premises
The activation of the service by the New Operator at Customer’s premises can be performed and tested according to the rules in place.

9.4. Planning & Timelines

The build of the Homes Passed network is an activity that takes place on Company’s behalf and before Operator’s orders are coming in. Parties will have frequent project meetings which initially provide updates on the progress of the Homes Passed network, meant to determine the timing of the expected delivery of Fiberzones. Operator and Company both strive to gain the highest potential uptake and benefit by a most reliable planning to also create a solid, smooth and efficient shift to the Wholesale ODF Access realization process by the contractor.

It is the Company’s responsibility to maintain enough capacity on the feeder ring, while it is Operators’ responsibility to prepare and provide capacity forecast on the feeder ring for its services and inform the Company in advance upcoming capacity orders.

9.5. Forecasting

Lead times and number of Wholesale ODF Access orders to be delivered per day/week are depending on the available capacity at contractor. Operators’ forecasting is a key element in aligning expected necessary capacity and being able to meet the expected delivery times which are agreed upon in this document.

Operator shall make commercially reasonable efforts to provide Company with a monthly rolling forecast of quantity requirements of Wholesale ODF Access orders and fiber capacity on POP ring.

Operator and Company acknowledge and agree that:

- a) each such forecast is a good faith estimate of its anticipated Wholesale ODF Access orders and fiber capacity on POP ring based on information then available to Operator; and
- b) forecasts do not constitute a binding order or commitment of any kind by Operator to purchase Wholesale ODF Access orders or fiber capacity on POP ring; and
- c) that in case of significant deviations in the monthly rolling forecast, Operator understands that this deviation might impact delivery lead times and the number of orders to be delivered.

It is understood that there can be no impact from a forecast deviation from another Operator on the Operator itself. Orders will be carried out by the Company as soon as possible, according to the remaining capacity available and Company will inform Operator accordingly on which earliest slot can be granted. Operator has the opportunity to request a rush order of which Company will do its utmost to realize.

Operator will manage expectations of its Customers of lead times applicable at that time by adjusting its marketing messages and delivery information accordingly.

For managing capacity to guarantee delivery all order types, capacity/forecast management shall be a fixed subject in the monthly Service Delivery meetings (see section 12).

9.6. Forecasting Procedure

The forecasted volumes are established by a dedicated person within Operator and communicated, when possible, per type of intervention for Wholesale ODF Access products (Wholesale ODF Access or Patch Orders).

The forecasts are prerequisites for the respect by Company of the SLA on slot availability for orders submitted. Forecasts are needed to help Company plan a reasonable capacity to fulfil Operators' demands. Slot availability will be offered in such a timeframe that it offers on one hand a long enough period for the customer to have several options and on the other hand in such a timeframe that the filling up of slots results in a tight as possible scheduling to allow for optimal use of contractor capacity.

Operator is guaranteed that the Company will set-up the necessary resources for the period concerned to meet its market needs, based on the hereafter mentioned forecasting procedure.

For each Deployment Area launched the Company will request Operators to forecast the number of customers expected to be connected in the year following launch (whether this is a conversion of existing technology, a new customer acquisition or a new market).

The Company expects activations to be spread according to the Rayleigh model, where more than 50% of connection requests (per Deployment Area) will occur between 3 and 15 months after launch. The remainder of activations will occur more moderately over the following months and years.

A global forecasting mechanism will be put in place by the Company for those Deployment Areas that will attain at least one of the following thresholds:

- Coverage reaches of 70% Homes Connect
- 2 years after the first connection

The overrun and underrun mechanisms will be globalised over the total volume of the Deployment Areas (DA's) that will be made available each calendar year as ready for "commercial launch".

For the three first series of forecasts, both Parties will enter into good faith discussions about the submitted forecasts and the feasibility to implement the forecasts concerned. A forecast is made up out of 2 components:

- Expected number of orders in the first wave period*, necessary for capacity alignment with the homes connect deployment contractor
- Expected number of orders in the 'catch up' or exploitation phase, necessary for capacity alignment on a regional level. When Parties agree the first wave period comes to an end, the forecasted number of orders of that Deployment Area will be added to the regional overview.

** The so called first wave is the first period of Homes Connect installations which is expected to follow closely after the Initial Delivery of each Fiberzone. This is the period in which there is an expected high uptake percentage as a result of Operators' marketing & sales activities. After a certain period in time, the first peak of interest and orders will come in more gradually, resulting in smaller numbers of orders. The duration of the first wave period will be determined together with the subcontractor and Operator(s) active in the relevant Deployment Area, based on type of area (dense or more rural), forecast of Homes Connect numbers (potentially based on demographic figures that Operator has, known base of customers for migration, etc.) and other relevant factors.*

The Operator is responsible for the accuracy of the forecast. Therefore, Operator is requested to submit monthly its forecast for the next 6 months, at the latest by the first day of each month. Forecast modifications or confirmation shall be done through the use of the templates provided by the Company (see Appendix 2). These templates will only be considered as valid when they are properly completed. In case data is missing or is not correct, the forecast will be rejected (within 2 working days following its reception). In the latter case, the reasons of rejection will be indicated on the template by Company. After rejection, Operator has 2 working days to rework its forecast accordingly. If no modification is received by that time, the Company will consider as forecast the mathematical average of the actual ordered volumes of the Operator over the last 6 months.

For each forecasted month common to 2 successive forecasts, the maximum deviation between the successive forecasts of this month at month M and at month M-1 will be - 30% to + 30%.

Deviations between forecasted volumes and actual volumes

- Underrun: Underrun occurs when actual ordered volumes are below forecasted volumes. A reasonable underrun of the forecasted volumes can be absorbed by Company and has no direct consequences for the Operator. A reasonable underrun is considered to be no more than a 15% deviation of the forecasted volume, considered on a monthly basis. In case of multiple repetitive and severe underruns (e.g. 3 consecutive months), Company reserves its right to define on behalf of Operator to a level deemed necessary by Company a reasonable forecast for the months to come (based on the mathematical average of the actual ordered volumes of the Operator over the last 6 months).

o

- Overrun: Monthly Overrun occurs when actual ordered volumes have a deviation superior to 15% above forecasted volumes.
 - As from the first order exceeding this deviation, all orders of the Operator for the remainder of the month will be considered in “overrun”, meaning that conditions of the slot availability within the SLA will be fulfilled on a best effort basis.

The following milestones are shared between both parties:

- Start civil works
- Initial Delivery by the company of # Homes Passed network per Area POP (Fiberzone)*

** When the availability check provides a positive outcome on available network it means that agreements with relevant syndics are in place and distribution network (Homes Passed network) is available to provide Homes Connect realization in the building.*

For forecasting & capacity purposes, the following numbers are measured and exchanged between parties:

- # Wholesale ODF Access order intake
- # Wholesale ODF Access orders connected
- # Patch orders
- # Patch orders delivered
- # Termination orders
- Lead times per order type

10. Area and/or Central POP Services

Company shall provide rack space per 20HE (= half rack, allowing installation of ETS 300119-2 ETSI sub racks) and 1000 W DC / 20HE power to Operator to enable the latter to install equipment and connect it to the Optical Distribution Frame (ODF) of Company.

Operator Equipment installed in the Area and/or Central POP remains the property of Operator and can be maintained and removed by Operator in accordance with the access regulations that will be defined by the Company. Operator shall ensure that the equipment installed meets the requirements set out in Appendix 1, Technical Description, and complies with the interfaces specifications.

Unless Company and Operator have agreed otherwise in writing in advance, Operator shall:

- a) remove its equipment at the Area and/or Central POP and
- b) hand over its access means to the POP (e.g. key or access pass) to Company within 30 days of the expiration or termination of the POP service.

Operator will not cause any nuisance or inconvenience to other users in the Area and/or Central POP in which the Operator Equipment is installed.

Company is responsible for the application for and possession of any compulsory government permits, consents and/or exemptions for the use and operation of the POP's. The associated costs will be borne entirely by Company. At the request of Company,

Operator will provide all cooperation necessary to apply for and keep the permits, consents and/or exemptions.

The following ETSI standards are applicable to Operator Equipment and Company environment:

- Mechanical : ETS 300119-4
- DC Powering : ETS300132-2
- Environmental : ETS 300019 class 3.1
- Emitted sound power : ETSI EN 300 753

11. Communication

In this chapter the communication, project organization, responsibilities regarding information exchange and escalation path between Operator and Company is described.

11.1. Monthly Service Delivery Meeting

Parties agree to organize a monthly meeting to support a smooth and successful cooperation between parties and be informed about the operational progress on the network roll out. Both parties appoint a contact person who is the Central point of contact regarding the full initiation and realisation phase of the FTTx Network

The frequency of this meeting might be changed at a later stage during the term of the Agreement, upon agreement between both parties and the results of the project that allows for it.

11.2. Escalations

Escalations within the day-to-day business are solved on an operational level. If any issues arise or escalations needed, a conference call will be organized according to the escalation chart below.

Level 1	Order Manager
Level 2	Service Manager
Level 3	COO

Table 2: Incident Escalation Levels

12. Information Exchange & IT landscape

Company and Operator will exchange the following information per Fiberzone:

- Expected delivery date full Homes Passed scope
- # of Homes Passed delivered
- # Homes Connected orders dispatched/received
- # Homes Connected orders delivered

Operators will receive the eligible homes via an agreed format – CSV file on a weekly basis (called Service Update) pushed to the Operator via SFTP. This information can also be requested per address via rest API. Rest API is an interface between computer systems.

Both parties strive to maximize an automated process and have data processed through a Portal and/or API's. Below a schematic overview of the proposed systems and interfaces is presented.

The APIs that will be made available between Company and Operator are:

- Availability API
- Order API
- Incident API

Potentially, an API or other kind of tooling will also be put in place for the end Customers to be able to schedule both Operator and Company deployment activities by himself.



Figure 11: Potentially Available APIs

While API connectivity is being built, Company will probably also offer a so called Operator Portal. This portal allows for availability checks based on individual address, placing orders and being able to follow the order status and delivery. Additionally, an access register will be available in this portal.

Company has defined unique IDs to be used by Operators and will put in place data quality processes for

- the address / location data
- the demarcation point at customer side (FTU) data

The unique ID is called JVID. Each JVID represents a specific connection point (address with street name, city name, etc). All address information communicated to the Operator contains the JVID. Orders from Operators will be introduced with the JVID and address details.

Below an example of the JVID including address detailed information which will be exchanged with the Operator.

juAddressID	CityName	streetName	postalCode	houseNumber	houseNumberExtension	apptNo	busNo
10207932	Waterloo	Chemin des Noces	1410	73		73	
10208116	Waterloo	Avenue du Clairpré	1410	15		15	27
10208117	Waterloo	Avenue du Clairpré	1410	15		15	28
10208129	Waterloo	Avenue du Clairpré	1410	15		15	8
10208135	Waterloo	Avenue du Clairpré	1410	17		17	13

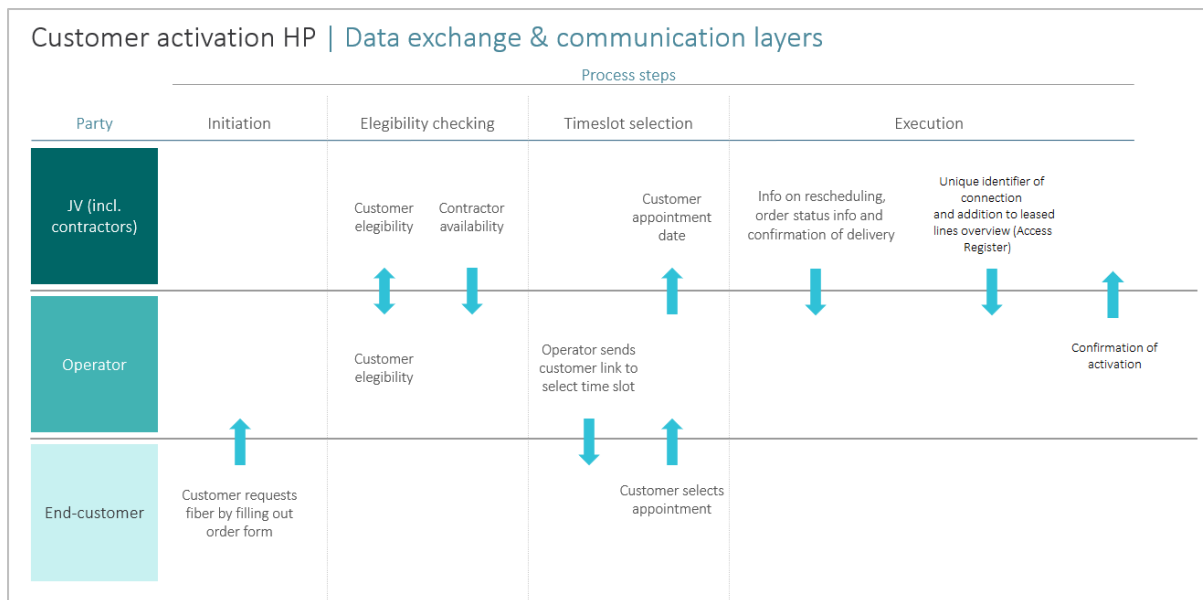


Figure 12: Planned data exchange for Homes Passed Customer Activation

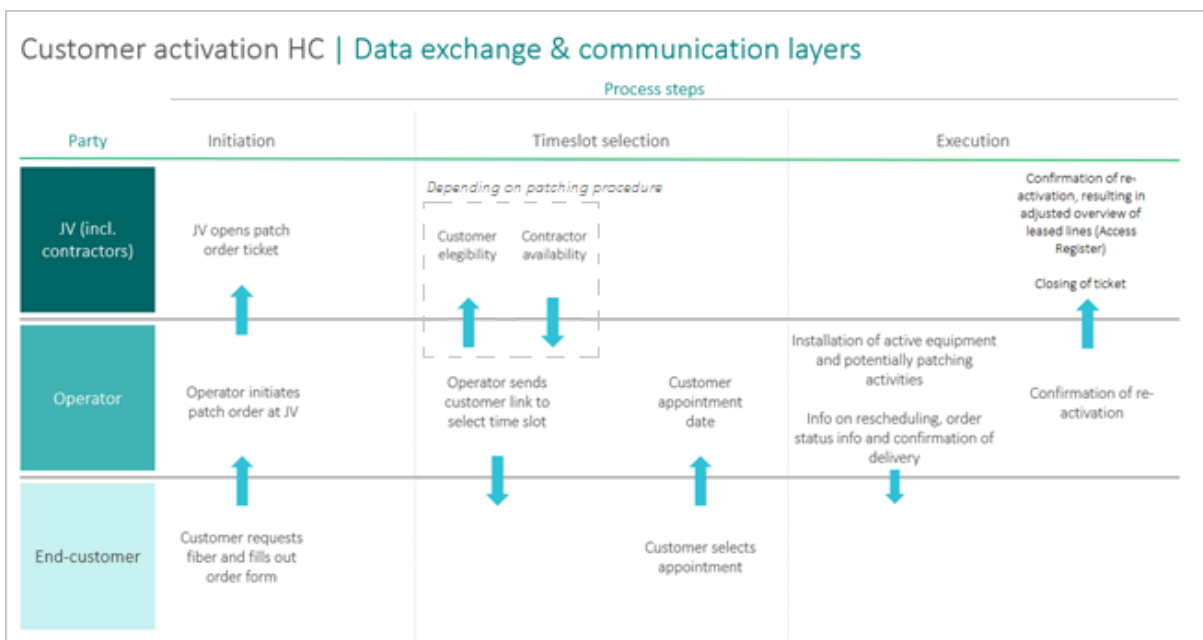


Figure 13: Planned data exchange for Homes Connect Customer Activation

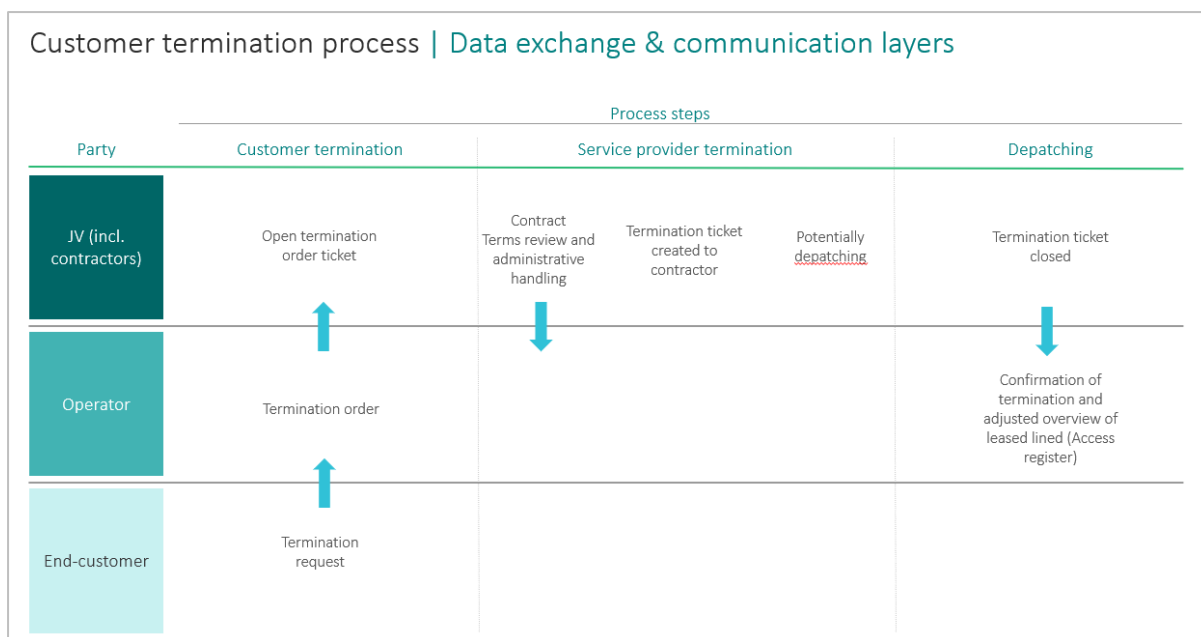


Figure 14: Planned data exchange for Customer Termination

13. Financial process

The detailed financial process will be defined by Company. For Homes Connect invoicing, Operator will provide Company with an order per individual address.

The following mandatory invoicing requirements are applicable for all transactions:

- Date of issue of the invoice;
- VAT identification number Vendor;
- VAT identification number customer/purchaser;
- Full name and address of the Vendor;
- Full name and address of customer;
- PO number that is provided by Operator
- Description:
 -
- The unit price exclusive of tax;
- Taxable amount per VAT rate. Each invoice will present a total amount excluding VAT, total amount of VAT and the total amount including VAT;
- The total VAT amount payable (must be expressed in the currency of the country where the transaction takes place, expressed in an exchange rate if you want to mention another currency; all COMPANY invoicing takes place in Euro);
- Reference on the invoice in specific cases;
 - Details tax representative, the following details should be mentioned on the invoice in case the person liable to pay the VAST is the tax representative:
 - VAT identification number
 - Full name and address

Company will invoice recurring charges monthly in advance (in the beginning of each running month). Company will invoice one-off charges as an addition to the monthly invoice.

In the unlikely event Operator notices that the invoice is made up with incorrect data, Operator should contact Company within 30 days after receipt of the invoice. Company will, when incorrect data is confirmed, adjust the invoice. Operator commits to pay the non-disputed part of the invoice within the agreed payment terms as defined in the Master Services Agreement.

In the event the incorrect data is discovered after payment of the invoice, Parties shall enter into mutual consultation. The correction of the payable amount is possible up to 12 months after the final payment date of the amendable invoice.

14. Incident Management Process

14.1. General

The monitoring & incident management process is in place to provide 24x7 monitoring and support on the Company dark fiber network. From this function, all incidents are handled and coordinated towards potential supplier(s) for physical activities needed to resolve the incident. Typical incidents that could occur, but not limited, are:

- Individual incident (FTU or Drop Cable): full connectivity loss or degraded quality
- Multiple customers report connectivity issues (connectivity loss or degraded quality) - likely partially distribution network related
 - Large number of customers report connectivity issues – POP equipment failure or distribution network related
- Scheduled maintenance that was missed or unforeseen by (end) Customer
- Scheduled maintenance that runs out of service window
- Research question as a result of incident in Company or Operator domain
- Other

As a basic principle, it is agreed that the Company has a relationship with the Operator, the Operator communicates and reports to its Customers. Access to Company network (fiber, spliceboxes, POP Locations) is arranged by Company, access to Customer's premises is arranged by the Operator. Customer appointments are always Operator's responsibility. The Company is not allowed to keep customer data (GDPR) and does not initiate direct contact with the Subscriber. Incident management will be based on a unique ID.

14.2. Incident Management Process

On detecting an incident, to the extent possible, Operator first excludes the possibility that it has an internal cause affecting power, equipment, cables or configuration, etc. If no internal cause is found for the incident and there is no planned work in the area concerned, Operator contacts Company NMC by phone to create an Incident Ticket or creates an incident ticket via the available API. It is crucial to ensure adequate handling of the incident that the following information is available and part of the reporting to the Company:

- When reporting an incident, Operator will be asked for the nature of the problem, for how long the problem occurs and whether there has been any work carried out nearby;

- It is also important to pass on the line ID as well as the installation address as received in the Access Register as part of the notification.

An incident ticket will be created and the NMC will commence troubleshooting. The incident ticket number will be used as reference for the incident. There may be one or more contact moments while the incident is being dealt with. Once an incident has been resolved, Company NMC will contact Operator for confirmation of incident recovery. The incident will be closed once Operator has confirmed recovery from the incident. A Reason for Outage (RFO) report can be generated at Operators' request and forwarded within three (3) business days. During this time, the incident manager may request an additional investigation in Operators' area of responsibility.

Company NMC can suspend the turnaround time of the incident while the investigation in Operator's area of responsibility is taking place. An incident is therefore closed with a gross and a net turnaround time. The gross turnaround time is inclusive and the net turnaround time exclusive of the periods during which the incident was temporarily suspended while the investigation in Customer's area of responsibility was taking place.

N.B.: If Company has carried out works and it is later established that the cause of an incident lies within Operators' area of responsibility, Company reserves the right to charge the costs incurred. If Operator has carried out works and it is later established that the cause of an incident lies within Company's area of responsibility, Operator reserves the right to charge the costs incurred.

Operational management of the Company Network is conducted from the NMC. The NMC incident managers can be contacted and can be reached 24 hours a day, 7 days a week.

14.3. Escalations

Operator can initiate an escalation procedure if an incident is not handled satisfactorily, or if SLA parameters are exceeded. Escalations must always be reported to the NMC and are handled by Company according to the following table:

Level 1	Incident manager
Level 2	Manager NMC
Level 3	COO

Table 3: Incident Escalation Levels

15. Planned Work Process

The Planned Work (also known as scheduled maintenance) process entails the coordination of all deployment and maintenance activities that take place on the Company network with (potential) impact on customer connectivity.

Planned work may derive, for instance, from below mentioned activities in the network:

- o Upgrades
- o Cable moves due to external requests (for instance road works)
- o Repairs that are not urgent and can be scheduled
- o Scheduled site & facility management activities (POP maintenance)

Planned work on the network is organized by the Planned Work team. All planned work that might potentially have an impact on a service or services is performed within Company's Service Window.

This Service Window runs from: **Monday to Sunday, between 00:00 hours and 06:00 hours (CET)**. In cases, very specific interventions would require an extension of the service window outside of the standard window, prior communication and alignment thereof will be done with the impacted Operator(s).

Company distinguishes two different types of activity:

- Service Affecting (SA)
- Customer Specific Activity (CSA)

Scheduled works (CSA) are announced at least 5 Business Days prior to the commencement of the work. CSA activities only relate to a single connection and are always carried out in mutual consultation.

SA-type activities are notified at least 10 Business Days prior to commencement of the planned work relates to multiple connections. Emergency repairs are excluded from this rule and will be notified as soon as possible. Emergency repairs are excluded from this rule and will be notified as soon as possible.

Company will provide Operator with the following details in the event of an SA notification:

- Type of activity;
- Reason for maintenance/servicing (SA);
 - Line ID's of the service affected;

16. Appendices

Appendix 1. Technical Specifications

Appendix 2. Forecasting Template

Appendix 3. Acoustic Simulation Cooling Unit

Appendix 1: Technical Specifications

Description of the technical specifications of the network so that Operator knows which technical requirements the equipment must meet in order to connect to the network.

Network specifications

Access to the Company FTTx Network

The Company FTTx Network is made up of fiber optic cables which create an optical path in a Point-to-Point manner between an optical connector in the FTU and the patch position at the ODF in a POP Location. At the POP Location, rack space is offered where Operator can install equipment to allow patching with the beforementioned ODF. To be able to offer Wholesale Services, Operator creates an active network service by either connecting the equipment at the Central or Area POP Location via a (Point-to-Point) fiber path to the equipment which is connected to the FTU at an Access Point. Via the (passive) equipment at the Area POP, Operator connects its services to the Central POP via the POP-ring, or chooses to directly connect the Area POP to a backhaul connection of a third party. Which architecture is used for this connectivity service, is determined by the Operator. At the Central POP, a physical area is available where Operator Equipment is connected to the network.

The network concept consists of the construction of a Point-to-Point network between the Area POP and the Access Point. The Point-to-Point network consists of 2 fibers per connection (200% network).

A Feeder network (POP ring) is created between the Central POP (CP) and Area POP (AP). The ring consists of 192 fibers. 24 fibers are spliced per Area POP (counterclockwise - clockwise). These fibers are used for the use of GPON splitters with a ratio of 1-32 (adaptable at operator's demand). 2 x 768 GPON ports are available per Area POP. When the GPON capacity is expanded, spare fibers from the feeder ring are spliced in the Area POP.

The splitter ratio may be adjusted upon agreement between the Operator and Company.

The fiber path of the POP ring that connects multiple Area POP Locations with the Central POP is fully redundant and enters each POP Location via two (2) entry points. Both connections terminate at the Central Company ODF.

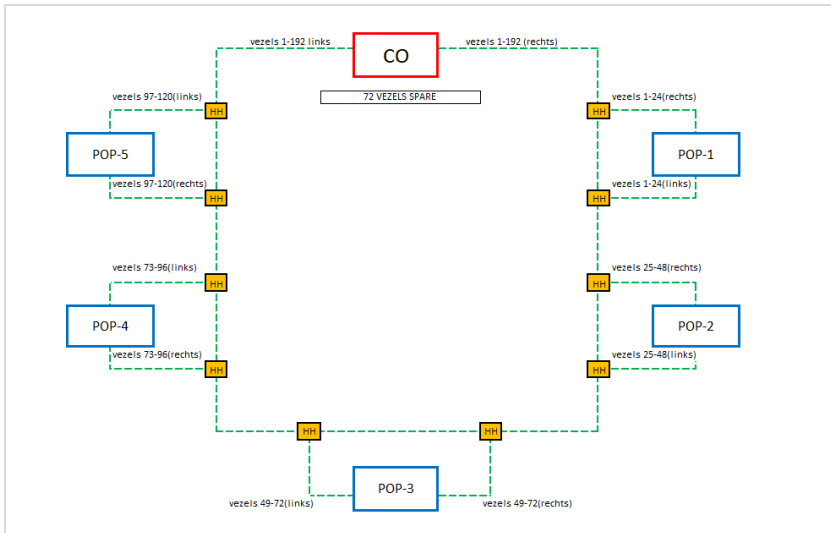


Figure 15: Schematic overview of POP-ring

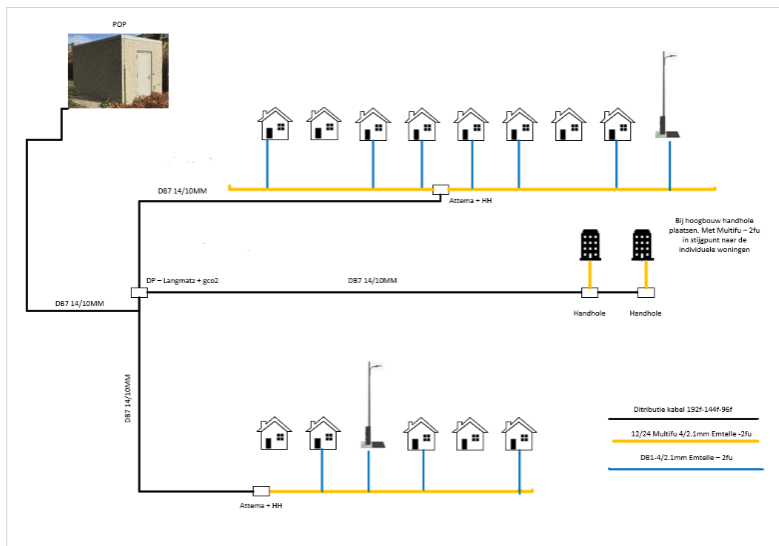


Figure 16: Schematic overview of Distribution Network

Conditions for controlling Dark Fiber

The FTx network may only be used for transmitting optical transmission signals. The lasers used by the Operator must comply with the laser safety standards in IEC 60825-2 for Class 1 lasers. Class 1M lasers may also be used if increased laser power is needed in connection with the distance(s) to be covered, provided that the lasers have an active facility that shuts down the laser or dims it in the event the light circuit is broken. This facility is known as ALS, APR or IPR procedure: Automatic Laser Shutdown, Automatic Power Reduction or Intelligent Power Reduction. Class 3B lasers may only be used upon mutual agreement. Transmission systems utilizing Class 4 lasers may never be used on Dark Fiber in connection with the safety of employees engaged in maintaining the connections. Transmission systems that utilize automatic restart procedures may not exceed Class 1M during the restart signals of short duration in the interest of eye and fire safety.

Central & Area POP

In the event Company cannot make use of existing technical units or POP Locations in its related network, Company will build new POP Location(s) in the roll-out area. Company has selected one (1) standard POP type for both Central and Area POP. The outline of the POP Location is displayed below:

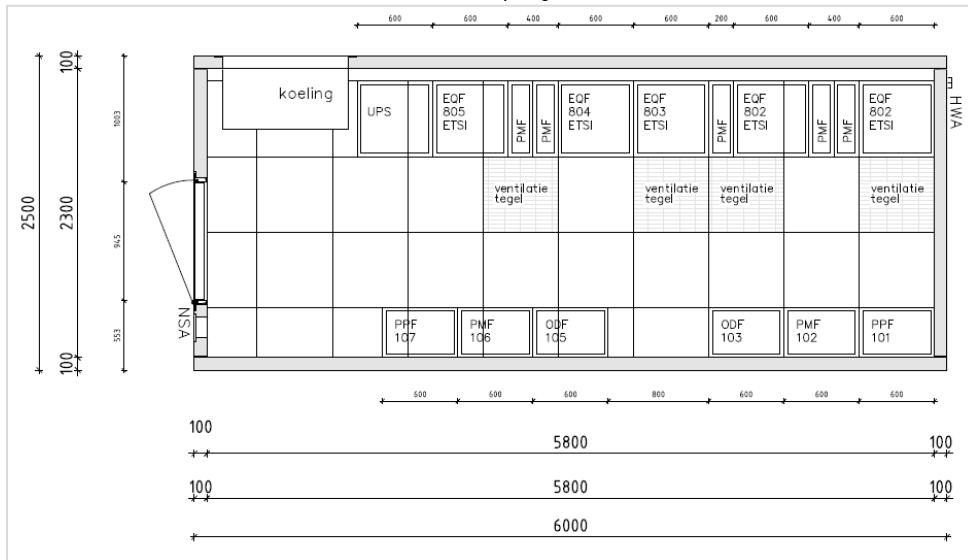


Figure 17: Outline of Area & Central POP

Definitions:

- Cooling: Space reserved for the cooling unit for climate control
- UPS: Uninterruptible Power Supply (also DC system) for autonomy in case of power failure
- ETSI: Standardized dimensions of depth and height units
- EQF: Equipment Frame in which active equipment is installed
- PMF: Patch Management Frame for controlled routing of patch cords
- NSA: “Nood Stroom Aansluiting” meaning Emergency Power Connection for the external connection of an emergency power generator in the event of a long power outage
- ODF: Optical Distribution Frame where passive components such as patch / splicing units are installed

The Central & Area POP Location(s) allow housing of Operator Equipment which can be placed in requested rack space. Key features include:

Feature	Required	Additional remark
Controller in combination with CPE	X	
Electronic Access provision	x	
Access via key	X	
Burgleralarm	X	Forced entry
Net watcher sensor (power supplier)	X	
Temperature sensors	X	
Smoke detectors	X	

Leak detection	X	
UPS/batteries/rectifier (DC)	X	Autonomy >45 min
UPS failure sensor	X	1x power supply eg down
NSA connection	x	
Camera surveillance	x	
Climate control (free cooling)	x	
Emergency lighting	x	

Table 4: Available facilities and alarms for the POPs

All systems comply with all legal requirements and industry standards and are regularly inspected and maintained according to the applicable standards.

Power and climate

Details of the electrical installation:

- Power to be requested from the supplier is 15Kw
- The total power of the POP is set at a minimum of 12kW
- Voltage type per EQF DC voltage (DC)
- 2 kW is available per EQF
- With shared use of the EQF, it is issued per 20 HE (half EQF) with a maximum power of 1000 watts
- The 2 kW UPS with 1 battery string is intended for 120 minutes of autonomy support of the facility systems
- DC autonomy for Operator Equipment is set up to cover 120 minutes. Longer autonomy in case of power outage to be realised by bringing a mobile generator unit on site. The maximum power available shall be 800 W DC/20HE.
 - A+B feed on -48V DC and 230V AC coming from UPS, meaning “no break” and still powered from batteries when electricity drops in the site.

POP facility details:

- The Company will make available to the operators ETSI racks allowing installation of ETS 300119-4 sub racks. The Company will provide rack space per 20HE (half rack) to Operator to enable the latter to install equipment and connect it to the Company ODF.
- The racks are installed in a room that guarantees environmental conditions according to ETSI ETS 300019 class 3.1
- The racks shall be flexible regarding the airflow through the equipment (bottom to top; left <-> right; back <-> front).
- Customer racks are not closed (access can be via front or the back). Only Power rack is closed by a door with a key. Can be delivered but will be reflected in price of the POP obviously.
- The operators have the option to install equipment with 48V DC ETS300132-2 power supply.
- The POP shall be designed to respect local environmental guidelines. The facility equipment (telecom equipment excluded) including cooling unit will comply with ETSI EN 300 753. Regional regulations specifying the maximum sound pressure at limit of the local and Central POP property will be respected. The Company will ensure that total noise at a site is compliant with regulation and will align with operators accordingly. Please find acoustic simulation cool unit at Appendix 2.
- Between the racks and the ODF, a fibre guidance system (gutters and cable racks) shall be installed compatible with bending radius of fibres G.657.A1 and

G657.A2. In the rack, equipment with cabling leaving the card horizontally to the side or vertically to the top of the equipment will be supported. A suitable cable guidance system from the equipment to the top or the bottom of the rack (depending if the cable routing is designed through overhead cable gutters or by using a false floor) will be present (PMF, Patch Management Frame).

- Airflow regulation within the rack space is Operator responsibility.

Additional remarks regarding the shared use of the EQF:

- The PDU (Power Distribution Unit): sub-rack into telecom rack that can house modular automatic fuses is provided by the Company, as well as the cabling between it and the rectifiers. It provides DC A and DC B powering. The modular automatic fuses can either be provided by the Operator or Company, as well as the cabling PDU-telecom equipment. However, a fuse panel in a rack (or ¼ a rack) will cost rack space. It is preferred that Operator (or Company which is not determined at this moment) will install a fuse panel into their rack in order to avoid customer coming into the distribution board. If Company provides the fuse panel in Operator rack there will be uniformity and risks of human failure will be minimalized. The automatic fuses are clipped on a 35 mm DIN rail and 18 mm width. The Company will align with Operator on this installation specification.
- In order to hold the 48V voltage at end of battery discharge to power feed the telecom equipment within the ETSI ETS 300132-2 limit, the section of the powering cables (as well DC as return) will be dimensioned taking into account the maximum cable loss PDU-operator Equipment of 1V (DC and return).

The battery autonomy will cover the time to bring and connect an external power generator. The contract to rent and connect the power generator is under the responsibility of the Company.

- The RGIE/AREI is applicable to the installation.

Cooling

A Free Cooling Unit, type 4000 has been chosen. This means that the cooling is regulated with “outside temperature”. The temperature in the POP is therefore dependent on the outside temperature and is in line with the operating specifications of common telecommunications equipment used in Fiber to the Home networks. Below table shows the expected temperatures in relation to the outside temperature. This cooling method is very low in energy consumption and is therefore switched behind the UPS. It is maintenance-free and has a very long service life of > 15 years.

Temp.Binnen	Temp.Buiten	Ventilator	Verwarming	Stuurklep
Verwarmen		0-1000m3/h		
<7 °C	<40 °C	30%=1000m3	AAN	Dicht 0%
>=7 °C - <10 °C	<40 °C	30%=1000m3	UIT	Dicht 0%
Recirculeren LAAG				
>=10 °C - <15°C	<40 °C	30%=1000m3	UIT	Dicht 0%
Recirculeren HOOG				
>=15 °C - <25°C	<40 °C	30%=1000m3	UIT	Open 8%
<20°C (na koelen)	<40 °C	30%=1000m3	UIT	Dicht 8%
Koelen				
1) >=25 °C - <27°C	<40 °C	30-100%	UIT	Open 100%
2) >=27 °C - <29°C	<40 °C	30-100%	UIT	Open 100%
3) >=29 °C - <31°C	<40 °C	30-100%	UIT	Open 100%
4) >=31 °C - <33°C	<40 °C	30-100%	UIT	Open 100%
5) >=33 °C - <35°C	<40 °C	30-100%	UIT	Open 100%
MAX =35 °C - <37°C	<40 °C	m3 unit afhankelijk	UIT	Open 100%
BOOST >=37 °C	<40 °C	ca. 10% boven max	UIT	Open 100%

Table 5: Temperature Settings for POP

Access request third parties

Access request by the Operator for third parties will only be processed if the requestor is authorized to submit the request. Authorization levels by person according to “contact and authorization list”. This request must be submitted 24 hours in advance and must contain the following information.

- Visitor name
- Visitor Phone number
- Date of visit
- Time of arrival
- Estimated duration
- Reason for visit

The procedure foresees in calling the NMC (Network Monitoring Center) in case access authorisation is needed or not working as it should.

(De-) Patching

The networks specifications (cf. Chapter 3) are to be respected in order to place equipment in the allocated racks at the Central POP.

In case of termination orders, in the initial phase, the Company will act based on mutual trust and will therefore initially not de-patch to allow for a speedy delivery process of patch orders (scenario 1). However, the patching process will change from scenario 1 (no de-patching) to scenario 2 (de-patching after termination) in case of:

- There are multiple Operators on the network, and at least one of the operators use an ethernet topology.
- There are multiple Operators on the network, and a high level of swap orders.
- Quality and risks issues (e.g. lot of activity in POP Locations, numerous (de)-patching faults)
- Significant disbalance in port occupancy vs. number of reactivations for Operator

Also, in case of traffic rebalancing (moving customer from PON A to PON B by re-patching in the POP), the Company will perform de-patching and re-patching.

Graphs below depicts the main principles of termination and patching responsibilities.

Patching scenarios	Current operator	Next operator	Patching
Scenario 1: New customer New customer without FTU (ODF access order)	----	Any operator	<ul style="list-style-type: none"> JV does <u>patching</u> JV installs drop cable and FTU
Scenario 2: New customer New customer on available connection that is not active (patch order)	----	Any operator	<ul style="list-style-type: none"> Patch already in place (as no <u>depatching</u> in this scenario) JV needs to record that customer is going active, but no physical patching needs to take place
Scenario 3: Termination The customer is leaving current operator and no new subscriber expected on this address	Current operator	----	<ul style="list-style-type: none"> Default scenario: no <u>depatch</u>
Scenario 4: Operator change The customer changes operator on the same address	Old operator	New operator	<ul style="list-style-type: none"> JV does <u>depatching</u> / patching

Table 6: Scenario 1: No de-patching

Scenario 2

Patching scenarios	Current operator	Next operator	Patching
Scenario 1: New customer New customer without FTU (ODF access order)	----	Any operator	<ul style="list-style-type: none"> JV does <u>patching</u> JV installs drop cable and FTU
Scenario 2: New customer New customer on available connection that is not active (patch order)	----	Any operator	<ul style="list-style-type: none"> JV does <u>patching</u> - physical patching needs to take place (Patch removed on termination of previous subscriber)
Scenario 3: Termination The customer is leaving current operator and no new subscriber expected on this address	Current operator	----	<ul style="list-style-type: none"> JV <u>depatches</u> (in batches)
Scenario 4: Operator change The customer changes operator on the same address	Old operator	New operator	<ul style="list-style-type: none"> JV does <u>depatching</u> / patching

Table 7 Scenario2: De-patching

Appendix 2: Forecasting Template for Wholesale ODF Access

FORECASTING TEMPLATE FOR WHOLESALE ODF ACCESS & PATCH ORDERS

Operator Reference:
Edition:
Split: Select Type of Orders (Wholesale ODF Access or Patch Orders)
Issue Date:

Zone	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆				
Deployment Area 1										
Deployment Area 2										
...										
....										

Appendix 3: Acoustic Simulation Cooling Unit

