



Proximus Reference Offer for Duct Access in GPON Underground Deployments

Main Body

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Table of contents

Table of contents.....	2
1. Introduction.....	4
1.1 Scope of the Reference Offer.....	4
1.2 General Principles and Limits of the Reference Offer.....	5
1.3 Definitions.....	6
1.4 Terminology, Structure and Concepts.....	7
1.4.1 GPON infrastructure.....	7
1.4.2 SRV ducts in GPON underground deployments.....	7
1.4.3 DTP-X handholes in GPON underground deployments.....	8
1.4.4 Presence of underground subduct GPON infrastructure.....	9
1.5 Practical information.....	10
2. Technical Implementation of the Service.....	11
2.1 Access to a Proximus SRV subduct.....	11
2.2 Lead-in to Proximus SRV subduct.....	11
2.3 Connection of Proximus SRV subduct in Proximus street infrastructure.....	12
3. Technical specifications.....	13
4. General principles for ordering and provisioning.....	14
4.1 Introduction.....	14
4.2 Pre-provisioning.....	14
4.2.1 NDA.....	14
4.2.2 Obligatory testing of fibre cables used in Proximus ducts.....	14
4.2.3 Availability Check.....	15
4.3 Request For Design.....	15
4.4 Ordering.....	15
4.5 Provisioning.....	16
4.6 Roles and responsibilities of the Parties.....	16
4.6.1 Proximus' roles and responsibilities.....	16
4.6.2 Beneficiary's roles and responsibilities.....	16
5. Network Adjustments.....	17

5.1 Roadworks.....	17
6. Repair.....	18
7. Removal of lead-in & repair to original state of subduct.....	19
8. SLA.....	20
9. Pricing.....	21
10. Evolution of the reference offer.....	22

1. Introduction

1.1 Scope of the Reference Offer

- 1) The present Reference Offer for Duct Access deals with the duct access services that Proximus offers to a Telecommunications Operator, hereafter called “Beneficiary”, under the conditions of this offer.
- 2) The present version contains a functional and quantitative reference offer setting out both
 - the technical characteristics necessary to allow the Beneficiary to obtain an accurate picture of the product that he will be able to order, and
 - the general pricing principles and pricing structure as can be determined at this stage.
- 3) The duct access services included in this reference offer encompass the following services, as defined and described below:
 - Access to a Proximus SRV Subduct
 - Lead-in to a Proximus SRV Subduct
 - Interconnection of Proximus SRV subduct in Proximus street infrastructure
- 4) The Proximus Reference Offer for Duct Access in GPON Underground Deployments implements the obligation under paragraph 1081.1 of the CRC decision of June 29th 2018, setting out an obligation to provide access to reasonable requests for (parts of) fiber ducts in the event that the End-User is connected from end to end via such ducts within the relevant product market of market 3 (a).
- 5) In this regard, the reference offer thus contains the access to available subducts within the SRV deployed in Proximus fiber GPON zones where Proximus has placed end to end underground infrastructure.
- 6) The subducts made available by Proximus are the distribution infrastructure of the Proximus GPON deployment, i.e. they are situated between the Proximus OFP and the Proximus DTP-X’s. Figure 1 depicts an underground GPON deployment and shows which SRV’s are made available through the present Reference Offer.

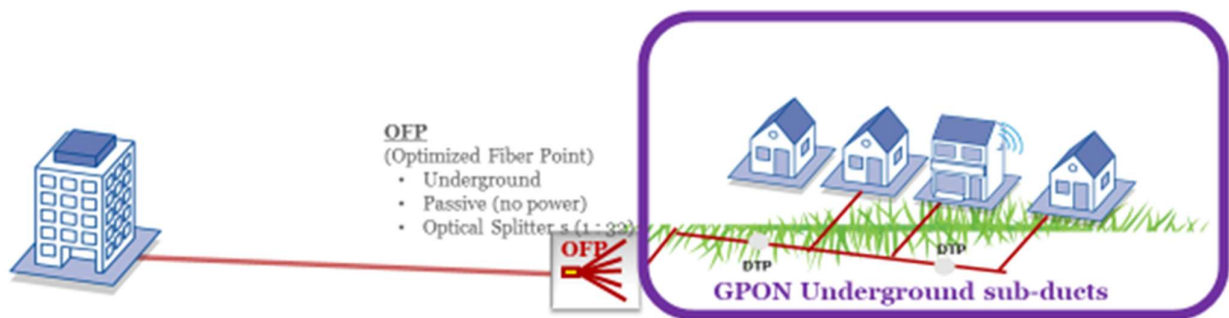


Figure 1: schematic of a GPON underground zoning.
 The purple square indicates the distribution SRV's which are made available through the Proximus Reference Offer for Duct Access in Underground GPON deployments.
 The drop subduct connecting the End-Users are not part of the offer.

- 7) Under the conditions of this reference offer, the Reference Offer for Duct Access allows the Beneficiary to use, in a planned construction project by the Beneficiary, pre-existing available Proximus GPON underground ducts. As such, ordering is done as part of the existing steps by a Beneficiary in preparing for a construction project of the Beneficiary.
- 8) The current presence of Proximus underground GPON duct infrastructure is limited, and extremely dispersed over the Belgium territory, with scattered geographical coverage.
- 9) Proximus notes that the number of existing and free Proximus underground GPON duct infrastructure in the local access network is limited and there are often, both foreseeable or emerging needs for Proximus' own use. Proximus will investigate, at the time of the request, the availability of the relevant sub ducts, taking into account inter alia effective use and identified future needs for such ducts by Proximus, inter alia in view of use by Proximus for repair, capacity extensions, and/or dedicated fiber connections.

1.2 General Principles and Limits of the Reference Offer

- 10) The provision of Duct Access Services is subject to the conclusion of a Duct Access agreement between Beneficiary and Proximus according to the General Terms and Conditions of the Bitstream Fiber GPON reference offer when deemed relevant for the said provision. As specified in the Main Body of the Bitstream Fiber GPON reference offer, the General Terms and Conditions of the Reference Offer for Duct Access in GPON Underground Deployments will be set out by Proximus by means of an engineering study covering the technical and IT feasibility as well as the reasonability of the request.
- 11) Proximus will keep the full ownership of the network elements that belong to it and that have been installed by Proximus or on behalf of Proximus and that are used to provide Duct Access Services to the Beneficiary.
- 12) The Beneficiary will keep the full ownership of the network elements that belong to the Beneficiary and that have been installed by the Beneficiary or on behalf of the Beneficiary, using the Proximus GPON underground duct infrastructure.
- 13) Proximus is not responsible for the content of the communications conveyed using the infrastructure placed by the Beneficiary inside the Proximus ducts.

1.3 Definitions

14) The capitalized terms in the present Reference Offer for Duct Access have the meaning as defined below.

GPON	Gigabit Passive Optical Network.
SRV	Cable type used in the Proximus underground GPON deployments, consisting of 7 + 2 subducts. The name comes from the maker of these cables: Speedpipe Rohr Verband.
DTP-X	Proximus handhole used in underground GPON deployments. It is used to connect the distribution subducts to the drop-ducts, connecting the End-User.
End-User	User of electronic services provided by the Beneficiary, Third Party Beneficiary, or a reseller of that service, and/or Proximus.
OFP	Optimized Fiber Point. Is the end point of the feeding and the beginning of the distribution.
ONTP	Optical Network Termination Point. Box that terminates one fibre in the Living Unit or in the technical room (for some MDUs).
FTTB	Fiber To The Business: business zones where there is a mix of GPON and copper technologies.
FTTH	Fiber To The Home.

1.4 Terminology, Structure and Concepts

1.4.1 GPON infrastructure

15) The description below sets out the current Proximus GPON underground infrastructure network architecture, which is based on a topology and deployment rules as carried out presently.

This is without prejudice to modifications to such topology and deployment rules which might have an impact on the availability of duct access as described under the current offer.

16) The Fiber GPON infrastructure is a shared network solution, i.e. a distribution network that is shared amongst several End-Users. The fiber GPON underground distribution infrastructure consists of several components:

- The OFP (Optimized Fiber Point), which is equipped with splitters and splits the signal from the feeding cable over the different distribution fibers
- The distribution cable, running from the OFP to several DTP-X's
- The DTP-X, a small handhole used for splicing the distribution fibers onto the introduction fiber cable
- The ONTP, the network termination point within the End-User's home

A full description of the GPON Infrastructure is available in the Proximus Reference Offer for Bitstream Fiber GPON Access.

17) At Proximus, Fiber GPON infrastructure is deployed in different areas ("*polygons*"), which are split into two types:

- Greenfield areas (where no copper had been deployed before, and only fiber is available)
- Brownfield areas (where copper pre-existed, and in certain circumstances is meant to be outphased).

18) The GPON areas are further split into two categories:

- FTTH areas (mostly residential and also businesses)
- FTTB areas (exclusively business areas (e.g. industrial zonings, office multi-dwelling units)).

19) Combining 17) and 18), Proximus considers 4 types of deployments:

- FTTH Greenfield
- FTTH Brownfield
- FTTB Greenfield
- FTTB Brownfield

1.4.2 SRV ducts in GPON underground deployments

20) The SRV assemblies used in GPON underground deployments consist – within an outer orange sheath – of

- 7 subducts in a black inner sheath, and
- 2 outer subducts outside the black sheath.

These subducts are sufficiently sturdy to be put in the ground without outer protection. The inner black sheath is to keep the subducts straight so as to allow blowing of fiber cable, the orange sheath serves to keep the whole assembly together and, by its colour, to identify the SRV as a Proximus asset. Figure 2 and Figure 3 show the SRV cables.

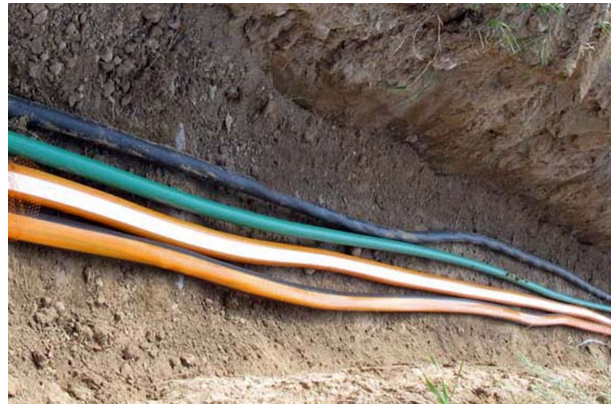


Figure 2: Proximus SRV in an open trench, next to other cables

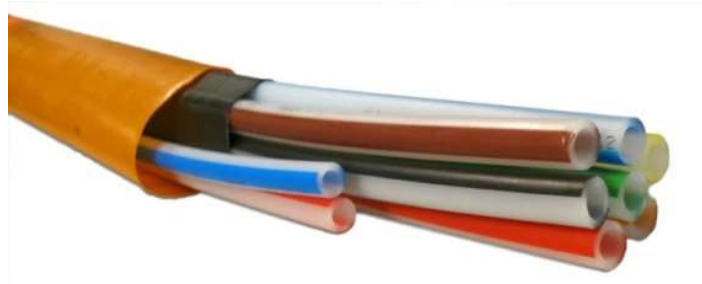


Figure 3: Inside of a Proximus SRV cable: 2 outer subducts are visible + 7 inner subducts within a separate black sheet

- 21) The 2 outer subducts within the SRV are used for home termination by Proximus. They are cut at each DTP and the 4 ends (2 to the right and 2 to the left) are brought into the DTP-X.
- 22) The 7 inner subducts are primarily used for the actual distribution network of the GPON infrastructure. The relevant inner subduct that is being used for the distribution is cut at each DTP-X handhole and brought in and out of that DTP-X handhole.

1.4.3 DTP-X handholes in GPON underground deployments

- 23) Following Proximus' current engineering rules, typically DTP-X handholes are placed every 2 buildings.
- 24) At each DTP-X, one of the inner subducts is brought in and out of the DTP-X handhole and will contain the fiber distribution cable for the Proximus PON network. Both of the outer subducts are also cut and the 4 ends (2 to the right and 2 to the left) are brought into the DTP-X.
- 25) The DTP-X has a maximum capacity of 6 terminating subducts. It follows from 24) that the full capacity of the DTP-X is occupied and in use by Proximus. There is thus no access to DTP-X handholes for Beneficiaries. If necessary, Beneficiaries will deploy their own handholes in case of termination in the vicinity.
- 26) A schematic view of the deployment of the DTP-X and the SRV is shown in Figure 4.

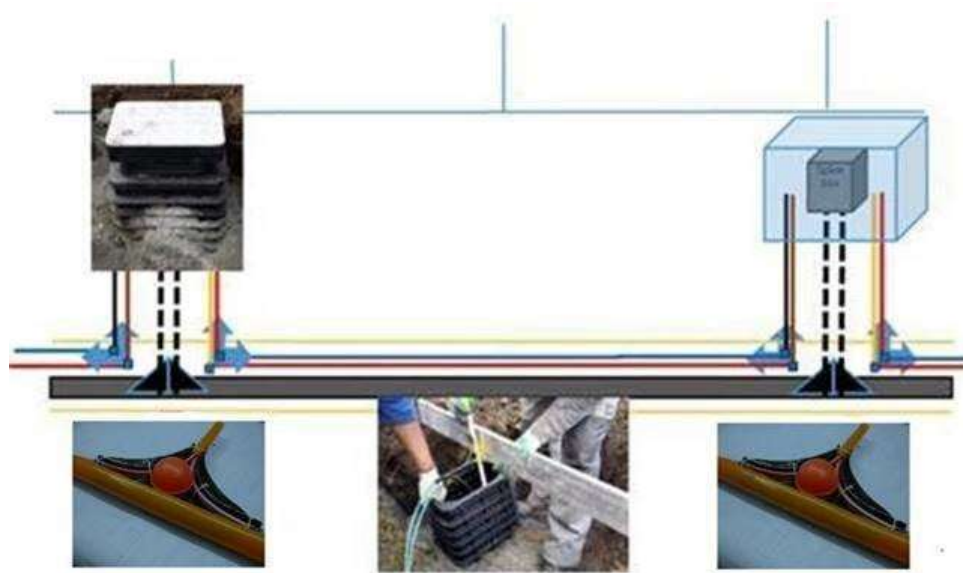


Figure 4: Schematic of DTP-X handholes and the SRV with subducts connected to the handholes

1.4.4 Presence of underground subduct GPON infrastructure

1.4.4.1 FTTH

- 27) In FTTH greenfield zones where Proximus has installed GPON infrastructure since 2015 (start of FTTH in Greenfields as standard solution) it may be assumed that an SRV is present at both sides of the street.
- 28) A number of Proximus FTTH Greenfield deployments consist of a single multi dwelling building that is connected, in which the OFP is situated inside the building and distribution is achieved through indoor vertical cabling works. In these deployments no SRV is used, and thus no GPON underground SRV subduct access is available.
- 29) In FTTH brownfield zones, in the initial stages of deployment priority is given to façade deployment in centers of cities and communes throughout Belgium. In fact, Proximus today maximally selects projects for construction where underground deployment is minimal given the trenching costs, thus with maximal façade deployment. As a result, in such FTTH brownfield polygons underground segments of SRV's are likely to be small stretches, and not continuous.
- 30) Therefore, the current presence of Proximus underground GPON duct infrastructure is limited, and extremely disperse over the Belgium territory, with scattered geographical coverage.

1.4.4.2 FTTB

- 31) The sites in FTTB zonings are typically connected through SRV underground, both for greenfield and brownfield cases.
- 32) A number of Proximus FTTB Greenfield deployments consist of a single multi office building that is connected, in which the OFP is situated inside the building and distribution is achieved through indoor vertical cabling works. In these deployments no SRV is used, and thus no GPON underground SRV subduct access is available.

1.5 Practical information

- 33) Further requests for information concerning the present Reference Offer can be made in writing by interested Parties at the following Proximus contact point. In particular, in the event of doubt as to the interpretation of the provisions of this Reference Offer, Proximus should be contacted. In the event of doubt and as stated by the BIPT, contacting Proximus is without prejudice to any clarification of the reference offer given by the BIPT.
- 34) In case of disagreement about the interpretation, one of the Parties can request the BIPT for a decision on the specific case. This decision will be taken within a reasonable term and will take into account the legal framework and the valid advices. The possibility for the Parties to present the BIPT a problem in interpretation will not influence the legal means that remain at the Parties' disposal in case of a conflict.

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- 35) The sharing by Proximus of some types of information (e.g. the addresses of Proximus buildings) is subject to the prior signing of a Non-Disclosure Agreement by the requesting Party.
- 36) It is also a right for everyone who has signed a Non-Disclosure Agreement to obtain information via the Proximus website through a secured access. Information on how to access the mentioned website can be obtained at the Proximus contact point mentioned above.
- 37) This offer is made by Proximus PLC under Belgian Public Law, a Belgian autonomous public enterprise organized under the Law of March 21, 1991, with registered office at B-1030 Brussels, 27 Boulevard du Roi Albert II, VAT BE 0202 239 951 Brussels Register of Legal Entities, exercising its activities under the commercial name Proximus, and referred to as "Proximus" in all the documents that are part of this Reference Offer.

2. Technical Implementation of the Service

38) The below section describes the technical characteristics of the Proximus subduct GPON underground infrastructure and the technical possibilities to access these in order for the Beneficiary to install its own network infrastructure.

39) In order to build a network using the Proximus subduct GPON underground infrastructure, the Beneficiary must combine two service components: access to the SRV subduct itself, and lead-in in order to connect the SRV subduct to its own subduct infrastructure.

Figure 5 shows an example implementation: the beneficiary connects onto the Proximus SRV subduct using an L branch. Further down the cable the Beneficiary again leaves the Proximus SRV subduct infrastructure using another L branch. In between the two points the Beneficiary can place a T branch to connect to an intermediate point.



Figure 5: example implementation of a network infrastructure using components of the Proximus Reference Offer for Duct Access.

2.1 Access to a Proximus SRV subduct

40) The Beneficiary is allowed access for rents to subduct between two points, both located on the same SRV, from an “Entry point” A to an “Exit point” B.

41) The Beneficiary can combine duct access between two points (e.g. Entry point A to an exit point B) with access between two other points (Entry point C to an exit point D).

42) The Beneficiary is responsible to install its own passive physical infrastructure such as ducts and manholes to and from the entry and exit points, in order to connect the relevant Proximus subduct GPON underground infrastructure with its own network infrastructure.

43) All construction work and authorizations for the Beneficiary’s own subducts, handholes and any street-furniture needed are the responsibility of the Beneficiary.

2.2 Lead-in to Proximus SRV subduct

44) The lead-in to Proximus SRV is the demarcation point of the Proximus Reference Offer for Duct Access in GPON Underground Deployments.

45) Two different types of lead-ins are available:

- L branch: a subduct in the SRV is cut and one side of the subduct is connected to the Beneficiary's subduct. This lead-in can be used for single entry or exit points. Figure 6 depicts an L branch.
- T branch: a subduct in the SRV is cut and both sides of the subduct are connected to the Beneficiary's subduct. Two subducts need to be foreseen by the Beneficiary. This lead-in can be used for combined entry and exit points. Figure 7 depicts a T branch.

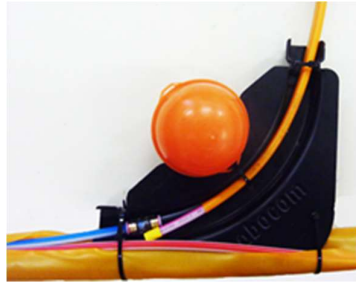


Figure 6: L branch serving as entry or exit point

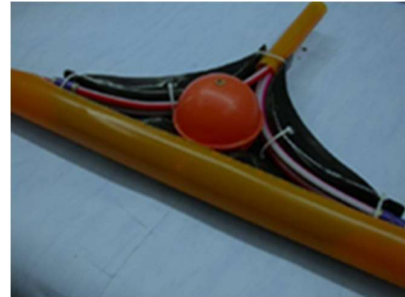


Figure 7: T branch serving as both entry and exit point

- 46) The Beneficiary is to foresee a subduct of the right specifications for Proximus to connect to the lead-in.
- 47) The Proximus lead-ins are buried and not accessible without civil works. A beacon can be included in the branch for easy localization.
- 48) Lead-ins cannot be located in passive physical infrastructure (hand- or manhole) owned or operated by Proximus. The Beneficiary is responsible to install its own hand- or manhole near the Proximus manhole for connection to the Proximus man- or handhole or T or L branch.

2.3 Connection of Proximus SRV subduct in Proximus street infrastructure

- 49) Proximus can interconnect subducts of two SRV's if both SRV's arrive in the same Proximus handhole, if technically feasible, i.e. in principle if two SRVs enter the handhole from opposite sides and sufficient space is available within the handhole to interconnect the two subducts

3. Technical specifications

- 51) The Beneficiary is obliged to adhere to the technical specifications, described in Annex B “Technical Specifications”

4. General principles for ordering and provisioning

4.1 Introduction

- 52) Proximus shall deliver access to reasonable requests to Proximus GPON underground subducts according to the Beneficiary's orders submitted to Proximus in accordance with the rules set out in this Reference Offer, and will be worked out in detail, following a first concrete reasonable access request in Annex A: Planning & Operations.
- 53) The documentation of the Proximus network elements is spread over two different documentation systems. To create a technical design for a new Proximus installation, Proximus must bring together information from these two systems to form a complete picture of the available network elements. Moreover, a visit to the site is often needed to investigate the situation in reality. As such no large-scale studies for access to Proximus ducts are possible.
- 54) Ordering of access to a Proximus SRV subduct and corresponding lead-ins to a Proximus SRV subduct is to be done in 1 ordering cycle.
- 55) Any extra lead-ins to be added afterwards in a subduct already used by the Beneficiary is to be done in a separate ordering cycle, to allow verification as to feasibility of such lead-ins.
- 56) A Beneficiary can enquire in advance the locations and roll-out plans of substantial upcoming underground infrastructure at the occasion of the Proximus communication of its planned construction works for substantial new network infrastructure through the existing regional coordination platforms (GIPOD, OSIRIS, or Powalco).
- 57) In practice, through these platforms and/or the GPON availability check tool, Beneficiary can obtain transparent information on substantial planned infrastructure deployment typically between two to four months prior to actual deployment, possibly up to 6 months for greenfield deployment.

4.2 Pre-provisioning

4.2.1 NDA

- 58) The sharing by Proximus of some types of information (e.g. the addresses of Proximus buildings) is subject to the prior signing of a Non-Disclosure Agreement by the requesting Party.
- 59) Information obtained in the provisioning process can only be used for specific related underground GPON duct access.

4.2.2 Obligatory testing of fibre cables used in Proximus ducts

- 60) Before the Beneficiary can start ordering access to Proximus duct infrastructure, he is obliged to have the cable types he wishes to blow into the Proximus subducts tested by Proximus. The procedure and pricing for testing a new cable type are described in Annex E "Testing protocol and pricing for new fibre cable types".
- 61) The Beneficiary is obliged to have every new cable type he wishes to use inside the Proximus subducts tested.

62) Without proof of having performed the necessary tests, the Beneficiary will not receive access to the Proximus Duct Infrastructure.

4.2.3 Availability Check

63) An overview of the location of underground Proximus infrastructure can be obtained electronically as part of the preparation of roadworks by the Beneficiary.

64) As such, Proximus expects the Beneficiary to have followed all steps necessary to perform a construction project in Belgium. As part of the preparation, the Beneficiary will perform a plan request, using the existing online platform of KLIP/KLIM.

65) Proximus will respond to the plan request of the Beneficiary with a plan detailing the underground infrastructure Proximus has in place at the specific location.

66) On this plan, the Beneficiary can verify whether any infrastructure is located in a place, suitable for its construction project.

67) Subsequently, Beneficiary can enquire the nature of the infrastructure present and availability of relevant GPON underground sub ducts if present.

68) Proximus will respond indicating the availability, as evaluated at the time of the request, taking into account inter alia effective use and identified future needs for such ducts by Proximus, in view of use by Proximus for inter alia repair, capacity extensions, and/or dedicated fiber connections.

69) If no subducts are available for use by a Beneficiary in the particular SRV ordered by the Beneficiary, the SRV subducts access requests issued by the Beneficiary with respect to the Proximus GPON zone concerned will be discarded, since the provisioning of access to these SRV subducts cannot be performed. Proximus will inform the Beneficiary of the reasons for non-availability in case of negative result of the availability check.

4.3 Request For Design

70) If the Beneficiary is interested to rent part of Proximus underground GPON subduct infrastructure, he will send a request for design to Proximus, providing at least the following information:

- Geographical position of the relevant subduct infrastructure of interest
- For each lead-in,
 - side of the street to which it should connect
 - geographical position with accuracy within 2m
 - Type of lead-in requested (L branch or T branch)
- Topographical plan of own construction works for connection to be made near the network

71) Upon receiving the request for design, Proximus will investigate and respond whether for the requested specific construction work, at the specific locations, lead-ins are feasible.

4.4 Ordering

72) Following the availability check and request for design, if the requested sub ducts at the specific locations are available, and the Beneficiary agrees with the response to the request for design, Beneficiary can order in accordance with order process under Annex A: Planning & Operations.

4.5 Provisioning

- 73) The Beneficiary is to act as lead synergy operator following the normal coordination processes between utility and telco companies.
- 74) The Beneficiary is in charge of obtaining all authorizations including those for the punctual openings to be made by Proximus to create the entry- and exit points.
- 75) The Beneficiary can blow its own fiber cable through subduct routes created by combining its own segments and rented segments. In doing so, the Beneficiary must respect technical guidelines to avoid damage to the Proximus subduct.

4.6 Roles and responsibilities of the Parties

4.6.1 Proximus' roles and responsibilities

- 76) Proximus will couple the Beneficiary subduct to the Proximus subduct through the L or T branches, referenced in chapter 2.2
- 77) The installation of all entry and exit points (in the form of L or T branches) is to be done under Proximus supervision by a Proximus certified subcontractor.

4.6.2 Beneficiary's roles and responsibilities

- 78) The Beneficiary must
 - follow the Proximus technical specifications,
 - ensure that all work carried out on Proximus network infrastructure is in accordance with Proximus engineering principles, good industry practice and laws and federal or regional regulations (i.a. in relation to safety, permits and public road interventions),
 - avoid any interference with existing communications services whether belonging to Proximus or other customers.
- 79) Beneficiary or Beneficiary's subcontractors cannot carry out civil engineering interventions on Proximus infrastructure.
- 80) If the cable gets stuck in the Proximus segment during blowing, the Beneficiary must request an unblocking by Proximus. In no circumstance is the Beneficiary allowed to open the Proximus SRV itself to try and unblock the cable.

5. Network Adjustments

5.1 Roadworks

- 81) If Proximus is ordered to remove the SRV due to a roadwork the Beneficiary's access to the subduct ends automatically.
- 82) The Beneficiary will need to redesign its network and can order new spare ducts from Proximus if available
- 83) Proximus has no obligation to design its modification to the roadwork to restore the Beneficiary's subduct. As is the case for Proximus, all costs caused by roadworks are to be taken by the Beneficiary.

6. Repair

- 84) When the Proximus SRV is damaged, the Beneficiary needs to remove its fiber cable, at Proximus request, and afterwards re-blow it after Proximus has repaired the subduct.
- 85) In the absence of concrete response from the Beneficiary, Proximus can remove the fiber cable to make sure repair is not blocked.
- 86) All costs to remove, reinstall and restore service over the Beneficiary cable are at the Beneficiary's expense.
- 87) The Beneficiary can try to recoup this cost from the party at fault for the damage. Proximus takes no responsibility.

7. Removal of lead-in & repair to original state of subduct

88) When the access to the Proximus SRV subduct is stopped, either by the Beneficiary or by Proximus (in the case of non-compliance to the Terms and Conditions) Proximus will remove the lead-ins and restore the Proximus subducts to their original conditions.

89) In order to restore the subduct to its original state, the Beneficiary will need to remove its own infrastructure from the Proximus subduct. Proximus will communicate a timing by which this action should be taken. If the infrastructure is not removed by this time, Proximus reserves the right to remove the infrastructure itself, and, if necessary, cut it.

90) Where a duct cannot be restored in original state and becomes unavailable for re-use the goodwill related to the asset will be borne by the Beneficiary.

8. SLA

91) Details on SLA will be worked out, following a first concrete reasonable access request.

9. Pricing

92) General pricing principles and pricing structure for the Proximus Reference Offer for Duct Access in GPON Underground Deployments is found in Annex C "Pricing".

10. Evolution of the reference offer

- 93) As the technology, infrastructure design and operational choices are in constant evolution, Proximus is continuously in the process of adapting and upgrading its telecommunication infrastructure, as well as its engineering and operational rules.
- 94) Proximus reserves the right to change its engineering and operational rules and deployment architecture in particular to stay relevant in the market, which means that e.g. future evolutions may lead to different materials being used in underground deployments.
- 95) In such case, Proximus will adapt the Reference Offer if needed and inform the BIPT.
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Proximus Reference Offer for Duct Access in GPON Underground Deployments

Annex B Technical Specifications

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Table of contents

Table of contents.....	2
1. Introduction.....	3
2. Specifications of Proximus network elements	3
3. Cable capacity specification.....	3
4. Cable blowing performance	4
5. Sub-annexes to Annex B.....	5

1. Introduction

1. This annex describes the technical specifications related to the Proximus Reference Offer for Duct Access, as are known at this stage of the learning process at Proximus in this regard.
2. In order to safeguard the integrity of the subducts of Proximus, Beneficiaries must notify their acceptance of and willingness to comply with the Proximus technical requirements before they can be supplied with a subduct.
3. Conformity with the Proximus technical requirements is essential for an efficient and safe installation of fibre cables in Proximus subducts minimizing the risk for problems or damages.
4. This document contains a general description of the requirements that cables must meet to be suitable for use in Proximus subducts and it gives the technical specifications of the concerned Proximus network elements.
5. More additional details might further be provided to the Beneficiary at the time that a specific concrete project will occur. These details will be worked out in the elaboration of the detailed processes in the context of a concrete project whereby a concrete access is provided in response to a reasonable request for access from a concrete wholesale customer.

2. Specifications of Proximus network elements

6. The Beneficiary undertakes it will be using only cables that are compatible with the concerned Proximus network elements, e.g. subducts, L-branches, T-branches. For example, the diameter of the cables that the Beneficiary will blow into the subducts of Proximus must be sufficiently smaller than and suitable for the inner diameter of the subduct.
7. Therefore Proximus puts at the disposal of the Beneficiary the following technical documentation:
 - Annexe 5.1 gives, as an example, the technical specifications of the SRV's currently used in the Proximus network. They consist of 7 inner subducts of 12 mm outer diameter and 8 mm inner diameter and 2 outer subducts of 10 mm outer diameter and 6 mm inner diameter:
 - Annexe 5.2 gives, as an example, the technical specifications of the L- and T-branches currently used in the Proximus network.
 - Annexe 5.3 gives, as an example, the technical specifications of the connectors, connecting two identical subducts, currently used in the Proximus network.

3. Cable capacity specification

8. Before starting the cable blowing performance test, the Beneficiary supplies Proximus with the vendor datasheet of the cable that the Beneficiary would like to install.
9. Annexe 5.4 gives, as an example, the vendor datasheet of a cable containing 24 fibres that is currently used in the Proximus GPON distribution network.

4. Cable blowing performance

10. Before installing any cable type in any Proximus subduct the Beneficiary needs to have the cable's blowing performance validated by Proximus at Proximus's own test site in Liedekerke.
11. The cable's blowing performance differs strongly between vendors and between cable types of the same vendor. The cable's blowing performance needs to be validated to prevent the usage of cables with inferior blowing performance.
12. The cable's blowing performance is validated by the same testing protocol as Proximus uses for its own fibre distribution cables, for example for deciding on the supplier in RFQ's and for regular quality check tests to control the quality and conformity of the cables supplied. It will be set out in more detail in Annex E Testing protocol and pricing for new fibre cable types.
13. The test is executed by Proximus. The cost of this test will be at the Beneficiary's expense.
14. The test site of Proximus is located in Liedekerke. It consists of an underground loop of 295 m distance with the following infrastructures regarding to SRV infrastructure:
 - 1 SRV with 7 subducts of outer diameter of 12 mm and inner diameter of 8 mm and 2 subducts of outer diameter of 10 mm and inner diameter of 6 mm.
 - 1 SRV with 7 subducts of outer diameter of 12 mm and inner diameter of 8 mm and 2 subducts of outer diameter of 10 mm and inner diameter of 6 mm and 7 DTP-X's in order to test the cable blowing in an SRV that connects customers.

Figure 1 schematically depicts the Proximus test site regarding SRV's at Liedekerke.

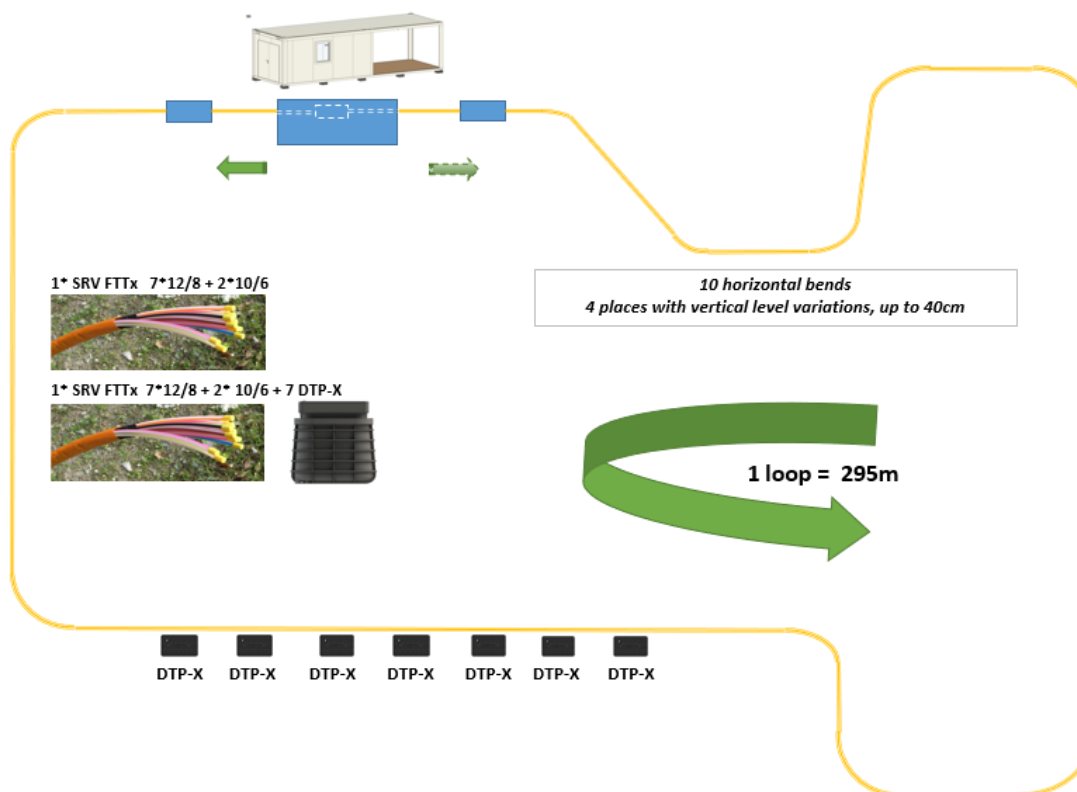


Figure 1: Test site for cable's blowing performance in SRV's of Proximus

15. The following acceptance criterium is applied: when blown inside an 8 mm inner diameter subduct, the cable has to reach the minimum distance of 1.000 meters within a maximum time of 50 minutes with a minimum blowing speed of 10 meters/minute and a maximum air pressure of 14 bar.

5. Sub-annexes to Annex B

- 5.1. Technical vendor datasheet of SRV with 7 inner subducts of 12 mm diameter and 2 outer subducts of 10 mm diameter.
B.5.1. Technical vendor datasheet – SRV-G 50 7x12+2x10 tc.pdf
- 5.2. Technical vendor datasheet of L-and T-branches.
B.5.2. Technical vendor datasheet - TBS and LBS.pdf
- 5.3. Technical vendor datasheet of connectors.
B.5.3. Technical vendodr datasheet - DSM 7, 10, 12, 14 permanent.pdf
- 5.4. Technical vendor datasheet of multi micro-tubes cable (SP 1822) containing 24 fibers.
B.5.4. Technical vendor datasheet – Multi Micro-Tubes Cable SP1822 – 24 fibres.pdf



Proximus Reference Offer for Duct Access in GPON Underground Deployments

Annex C Pricing

Communicated to the Belgian Institute for Postal services and Telecommunications on 04/07/2019

Table of contents

1. Introduction.....	3
2. Pricing.....	4
2.1 Pre-provisioning.....	4
2.1.1 Obligatory testing of fibre cables used in Proximus ducts.....	4
2.1.2 Availability Check	4
2.2 Ordering & Provisioning.....	4
2.2.1 One-off Project fee.....	4
2.2.2 Entry/Exit points feasibility study and design.....	4
2.2.3 Path-through connections study and design	5
2.2.4 Site survey.....	5
2.2.5 Installation of Entry/Exit points.....	5
2.2.6 Installation of path-through connections	5
2.3 (Monthly) Rentals	6
2.4 One off costs for specific interventions.....	7
2.4.1 Intervention Proximus to deblock Beneficiary blowing fiber cables.....	7
2.4.2 Repair following damage by third party to sub duct used by Beneficiary..	7
2.5 Service cancellation.....	8
2.5.1 Repair into original state at contractual end, annulation or non-payment of pricing elements.....	8

1. Introduction

- 1 The present annex illustrates the general pricing principles and pricing structure that may be used in setting pricing for use of Proximus underground GPON sub-ducts infrastructure in regard of the Proximus Reference Offer for Duct Access, and as can be determined at this stage.
- 2 Any prices in this Price List are in Euro and are VAT exclusive.
- 3 The structure and prices of the below Price List are subject to further adaptations.

2. Pricing

2.1 Pre-provisioning

2.1.1 Obligatory testing of fibre cables used in Proximus ducts

ITEM	EUR	UNIT
Testing of fibre cables used in Proximus ducts	TBD	Per testing exercise for one type of fiber cable

2.1.2 Availability Check

ITEM	EUR	UNIT
Availability Check	TBD	Per SRV segment

2.2 Ordering & Provisioning

2.2.1 One-off Project fee

ITEM	EUR	UNIT
Coordination and delivery management	TBD	Per order

[Note: In order to realise a project for duct access some general costs to coordinate the project end-to-end will need to be compensated]

2.2.2 Entry/Exit points feasibility study and design

ITEM	EUR	UNIT
Feasibility study and design of Entry/Exit points	TBD	Per Entry or Exit point

2.2.3 Path-through connections study and design

ITEM	EUR	UNIT
Feasibility study and design of Entry/Exit points	TBD	Per Entry or Exit point

2.2.4 Site survey

ITEM	EUR	UNIT
Survey at location of entry/exit points	TBD	Per location

2.2.5 Installation of Entry/Exit points

ITEM	EUR	UNIT
Installation Lead-In of L type and connection to OLO infrastructure	TBD	Per item
Installation Lead-In of T type and connection to OLO infrastructure	TBD	Per item

2.2.6 Installation of path-through connections

ITEM	EUR	UNIT
Installation of connection between two subducts in Proximus manhole	TBD	Per item

2.3 (Monthly) Rentals

Below table sets out the currently proposed recurrent (monthly) rental cluster prices for the use of a subduct in case of duct access of 1 alternative operator in a particular bundle:

With 1 alternative operator in the bundle	For the initial period of 5 years (EUR/meter/5 years)	For the subsequent period (EUR/meter/month)
Cluster1	15,35	0,30
Cluster2	27,87	0,54
Cluster3	45,38	0,88
Cluster4	72,96	1,42
Cluster5	139,58	2,72

Notes:

1. Above prices are **indicative** for the order of magnitude of the recurrent monthly rental prices.

Taking into account the still untested field of wholesale GPON duct access activities at Proximus, and the related unexplored wholesale price setting at Proximus for wholesale GPON duct access, final recurrent rental prices will be fixed at a later stage based on new evaluations, taking into account in particular following aspects:

- o **Geographically**, each cluster price applies to a series of statistical sectors (NIS), which are based on currently available FTTH network simulations. These geographically differentiated pricing reflects the costs of a particular meter, which are determined by the number of homes passed in given statistical sector (NIS). This is translated in a different cost/price per meter.

When final prices will be fixed, FTTH network simulations available at that time will be used.

- o Rental prices in the initial 5 year time period are **to evolve in time** to take account for the sharing by access seekers of the infrastructure investment risk for newly built duct infrastructure.
2. Subducts in SRVs are not accessible during a **first two year moratorium period** after SRV construction.
 3. Finally, a monthly fee for **unemployed SRV segment** portion of rented subduct is still to be added: when the cuts in a subduct of a SRV segment for the entry/exit points leave parts of a subduct between the manholes of Proximus and entry/exit points unemployed

2.4 One off costs for specific interventions

2.4.1 Intervention Proximus to deblock Beneficiary blowing fiber cables

ITEM	EUR	UNIT
Intervention Proximus to deblock	TBD	Per intervention

2.4.2 Repair following damage by third party to sub duct used by Beneficiary

ITEM	EUR	UNIT
Repair following damage by third party	TBD	Per intervention

2.5 Service cancellation

2.5.1 Repair into original state at contractual end, annulation or non-payment of pricing elements

ITEM	EUR	UNIT
Removal of Lead-In and restoration of subduct integrity	TBD	Per entry/exit point
Removal of subduct connection in Proximus manhole	TBD	Per connection
Removal of Beneficiary cable from Proximus subduct	TBD	Per subduct segment
Additional work for restoration of Proximus infrastructure	TBD	Per intervention

[Note: Where a duct can not be restored in original state and becomes unavailable for re-use, the goodwill related to the asset will be borne by the Beneficiary.]