SERVICE DESCRIPTION 2-15.1: UNBUNDLED METALLIC PATH SERVICE

1. THE SERVICE

The UMP Service is an access service which provides the OLO the full useable spectrum of a dedicated metallic path to an end user. Whilst Batelco does not deploy pair gain systems on its Network the removal of pair gain Equipment does not form part of the UMP Service.

A technical description of the metallic path is available in Annex 4 of this Service Description, for illustrative purposes only. Where there are discrepancies, the text in this Service Description will prevail.

Available To: Holders of an Individual National Fixed Services License (NFL) or an Internet Service Provider Class License (ISP) granted by the Telecommunications Regulatory Authority**.**

Traffic: Traffic permitted by the licenses held by the OLO.

2. DEFINITIONS

Capitalised terms not defined in this Service Description are defined in the Dictionary of the Supply Terms. Terms defined in this Service Description are specific to it.

ANFP means Batelco's Access Network Frequency Plan which is a spectrum management plan for controlling interference, caused by cross talk, within a metallic access network as reviewed and amended from time to time.

Batelco Service Node (BSN) means a Batelco exchange building specified in the list issued by Batelco pursuant to paragraph 3.2 Annex A ("Implementation") of Access Order No.1 of 2009.

Blocks means those blocks in 100 pair units installed either on the MDF or HDF forming part of the UMP Service.

Blocks and Tie Cables Delivery Rebate Cap means 200% of the monthly HDF Block Rental Charge or monthly Tie Cable Rental Charge where applicable.

Blocks and Tie Cables Validation Rebate Cap means 200% of the monthly HDF Block Rental Charge or monthly Tie Cable Rental Charge where applicable.

CLTQS means Batelco's centralized line testing and pre-qualification solution

Covered Failure means an actual or suspected failure in the UMPL.

DP means a Distribution Point.

End User Consent means the written consent of an End User duly completed and signed to receive a service by means of amongst other components a UMP Service supplied to the OLO in accordance with a **UMP Request**, which consent is provided to Batelco by or on behalf of the End User. For the avoidance of doubt the End User Consent can be in the form of the terms and conditions signed by the customer when requesting a service from the OLO.

End User Management means all aspects of interface with the customer product support and billing of the End User by the OLO in relation to each End User contracting with the OLO for using the UMP Service and all customer support by the OLO in relation to maintenance issues related to the End User.

Fault means faults related to the provision of the Local Loop Unbundling Service.

Fault Management means Faults described in Schedule 6 of Batelco's Reference Offer.

Gaining Operator means an OLO who presents Batelco a UMP Request.

HDF means Batelco provided handover distribution frame for the connection of a Tie Cable.

HDF Block Service Credit means, in relation to a single Service Credit, that amount represented by five per cent (5%) of the monthly rental charges for the HDF Block.

Infrastructure Availability means in accordance with paragraph 4.1 (b) for non-active UMPLs Batelco carries out a physical survey of the availability of the UMPL between the DP and the MDF.

Implementation Date means the target date by which Batelco shall complete an UMP Request.

Line Continuity means a tone test carried out by Batelco from time to time in relation to the UMPL:

- For active lines: between the HDF and the line side of the MDF; and
- For non-active lines: between the HDF and the relevant Network Boundary (passing though the relevant street cabinet) except in case of Distant collocation where the test is completed from the MDF.

Losing Operator means an OLO whose End User is subject to a UMP Request given to Batelco by a Gaining Operator.

LPQM means Batelco's line plant query manager giving the theoretical distance and broadband performance on the basis of the address of the End-user.

Response Time means Batelco's Response Times in respect of each Covered Failure.

Restoration Time means Batelco's Restoration Times in respect of each Covered Failure.

MDF means the Batelco owned main distribution frame in a BSN enabling provision of a UMP.

MP means metallic path.

Network Boundary means the Batelco distribution point at customer premises contemplated by Batelco's fixed services license.

NTP means Network Termination Point.

Order means a written request by the OLO for Blocks and Tie Cables in a form issued or approved by Batelco from time to time.

Response Rebate Cap means 40% of the monthly rental Charges for the UMPL (8 UMP Service Credits).

Restoration Rebate Cap means 800% of the monthly rental Charges for the UMPL (160 UMP Service Credits).

SNFM Service means the Service Node Facilities Management Service used in conjunction with this service description as specified in service description 2-15.2 of the Reference Offer.

Service Qualification means the analysis carried out by Batelco to confirm whether a UMP service can be provided on the Batelco network by checking:

(a) Line Continuity; and/or

(b) Infrastructure Availability; and/or

(c) CLTQS (active UMPLs) or LPQM (non-active UMPL) on an information only basis.

Threshold Response Time means, in relation to a Covered Failure, the threshold response times set out in paragraph 7.2.

Threshold Restoration Time means, in relation to a Covered Failure, the threshold restoration times set out in paragraph 7.2.

Tie Cable means a cable connecting the UMP from the MDF to the HDF provided by Batelco.

UMP means an existing two wire metallic path connection between the HDF and the Network Boundary comprising a UMPL, jumper cable connecting the UMPL and the Tie Cable, and Tie Cable connecting the MDF with the HDF together with Blocks for the HDF and MDF.

UMP Cease Request means a request by an End User to Batelco or the OLO on the request of the End User to reverse a UMP Request as described in the UMP Request process set out in Annexure 1 to this Service Schedule.

UMP Invalid Transfer means a UMP Transfer:

(a) where the End User (or its/her/his agent) did not request the services that the OLO has made a UMP Service Request in order to supply to the End User;

(b) where a written End User Consent cannot be produced by the Gaining Operator on request by Batelco to support the UMP Request; or

(c) which resulted from a processing error.

UMP Request means a UMP Service Request, a UMP Swap Request or UMP Cease Request, as the case may be.

UMP Service Credit means, in relation to a single Service Credit, that amount represented by five per cent (5%) of the monthly rental charges for the UMPL.

UMP Service Request means the request by the OLO for a UMP Service relating to a proposed UMPL under paragraph 4.1(b) (non-active lines).

UMP Swap means on the request of the End User to Batelco or a Gaining Operator to Batelco or End User to the Gaining Operator for a change of an active UMP from Batelco to the OLO or from the OLO to Batelco or from a OLO to another OLO for the provision of services to an End User.

UMP Swap Request means a request from an OLO to make a UMP Swap.

UMP Transfer means a UMP Request by an OLO.

UMPL means an existing two wire metallic path connection between a Batelco MDF and the Network Boundary.

UMPL Delivery Rebate Cap means 200% of the monthly rental Charges for the UMPL.

UMPL Validation Rebate Cap means 200% of the monthly rental Charges for the UMPL.

Useable Pair means the copper wire connection to the End User as specified in paragraph 4.1.

Wrongful Repair Charge means charges for repairs as a result of a fault report lodged to Batelco by an OLO and such faults do not relate to the UMP Service.

3. SERVICE TERMS

3.1 Each party acknowledges this Service is conditional upon necessary space being prepared, accepted by the OLO and made ready in accordance with the SNFM Service.

3.2 Ownership of the UMP shall remain with Batelco. Without prejudicing the ability to resell licensed telecommunications services using the UMP, the OLO shall not assign, transfer or share their interest in or rights to the UMP.

3.3 Batelco will implement UMP Requests from the OLO and requests for configuration and provision of connections from other OLOs and from itself with respect to any UMPL in accordance with Batelco's non-discriminatory provisioning schedule by area.

3.4 Each UMP Service or UMP Swap Request shall be for a minimum period of 1 month from the activation date of the UMP Service. If Batelco receives a UMP Cease Request for that UMP on or before the end of the first month from the activation date then the OLO shall pay Batelco the UMP pro rata aggregate rental cancellation charges for the unexpired 1 month period.

3.5 If Batelco terminates this service in whole or in part subject to the termination condition included in this SD, then each relevant UMP Service and SNFM Service will terminate.

3.6 If a regulatory obligation to support or supply any specific UMP Service no longer applies, Batelco may cease to supply the UMP Service to an OLO on 12 months prior written notice. The OLO will not request the UMP Service for any further End Users 6 months prior to end of the notice period unless commercially agreed between the parties. The OLO will also inform each existing End User that the UMP Service will terminate at the end of the 12 month period.

3.7 Where Batelco has reasonable objective grounds to consider that the OLO is in breach of an obligation consequent to the UMP Service, Batelco may, after notifying the Authority and obtaining the Authority's written approval:

(a) suspend implementation by the OLO of the UMP Service and/or

(b) take any other step contemplated by the Supply Terms to protect Batelco's network or other interests.

4. END USER ACCESS

Useable Pairs

4.1 The OLO acknowledges that Batelco only supplies the UMP Service, subject to successful Service Qualification, where:

(a) Batelco supplies operational telephone PSTN and ISDN or broadband services to the same End User over the same Useable Pair as may be used with the UMP Service by the OLO to provide services to the End User; or

(b) spare copper pairs exist between the MDF and Batelco's distribution point; and where there are no objective and justifiable technical, legal or operational grounds to prevent delivery by jumpering at the MDF, jumpering at the street cabinet and/or provision of a drop wire. Batelco will provide objective reasons justified in writing to OLOs at the time of Batelco's refusal. To the extent it applies similar treatment and processes to its retail End Users, Batelco shall provision an alternative UMPL if existing suitable spare pairs are available

4.2 For each UMP Request the OLO warrants that it has informed the End User that the installation and operation of the UMP Service may require changes to the placement of existing telecommunications devices or changes of equipment.

4.3 The OLO acknowledges that the UMP Service will allow the provisioning of services to End Users but the quality of such services will be subject to the variable conditions and characteristics of the Useable Pairs. Where the quality of service degradation or interruption of service arises in connection with the operational life span of the UMPL, Batelco is under no obligation to replace that UMPL except in cases where failure to do so would result in undue discrimination by Batelco between its retail business and the OLO.

Maintenance and Non Discrimination

4.5 Batelco will provide network maintenance and support services to ensure that the UMP Service is provided to the OLO at the same level of quality of service and availability as Batelco provides to itself.

5. EQUIPMENT

5.1 The provision of a UMP Service or the implementation or transfer of the Service does not include the provision of any internal cabling or any customer premises equipment and only comprises the elements specified in this service description.

6. BLOCKS AND TIE CABLES

6.1 The OLO shall submit a correctly completed Order to Batelco to request supply of Blocks and Tie Cables in accordance with this Service Description. The Order shall be submitted in the form specified by Batelco from time to time.

6.2 To be valid, the Order shall be accompanied by reference information identifying the BSN to enable Batelco to implement the Blocks and Tie Cables Order.

6.3 Subject to Batelco obtaining all necessary consents and the OLO fulfilling all of its obligations under the Supply Terms in particular provisioning and installation of the relevant SNFM Service, Batelco will provide the OLO with the Blocks and Tie Cables as specified in the Order accepted by Batelco.

6.4 The OLO shall pay the relevant Charges for the Blocks and Tie Cables as specified in Schedule 3 of Batelco's Reference Offer.

6.5 At any time and subject to any obligations arising as a result of paragraph 3.4 above, following the successful completion of a Blocks and Tie Cables Request, the OLO may make a request to Batelco to cease the Blocks and Tie Cables service. In this case, the OLO shall pay the Tie Cable cease charge as specified in Schedule 3 of Batelco's Reference Offer.

7 CONNECTION

7.1 Batelco will use its reasonable endeavours to connect the UMP Service on or before the relevant Implementation Date which shall be dependent on the following timescales:

(a) The maximum validation time and delivery lead time for the installation for an Order or a UMP Request placed by the OLO and accepted by Batelco shall be as follows:

UMP Service component	**Validation time between receipt of Order or UMP Service Request and (for UMP Service Requests) verification or (for Orders) acceptance or rejection**	**Delivery time from acceptance of UMP Request or Blocks and Tie Cables Order to implementation**
UMPL	5 Working Days	10 Working Days
Blocks and Tie Cables	5 Working Days	20 Working Days

(b) The Service Rebates for a failure to meet the maximum validation time and delivery lead time in the preceding paragraph are as follows:

Target	**Rebate for each Working Day or part of a Working Day late**
UMPL validation time	10 UMP Service Credits subject to the UMPL Validation Rebate Cap (Equivalent to 50% of the UMPL Rental charge)
UMPL delivery time	10 UMP Service Credits subject to the UMPL Delivery Rebate Cap (Equivalent to 50% of the UMPL Rental charge)
Blocks and Tie Cables validation time	10 HDF Block Service Credits subject to the Blocks and Tie Cables Validation Rebate Cap (Equivalent to 50% of the HDF Block Rental charge)
Blocks and Tie Cables delivery time	10 HDF Block Service Credits subject to the Blocks and Tie Cables Delivery Rebate Cap (Equivalent to 50% of the HDF Block Rental charge)

Batelco will notify the OLO when the connection has been effected in accordance with the UMP Request procedures set out in Annex 1 to this Service Description.

7.2 Fault response and repair

(a) Subject to (b) below, the OLO will, as soon as practicable and after becoming aware of a Fault with the UMP (between the HDF and the network boundary) or any other Covered Failure, notify Batelco of that Fault in accordance with the procedures for the reporting of faults set out in Schedule 6 (Fault Management) for the reporting of faults, Fault investigation and identification of the Fault Owner and Other Affected Party. In particular, the Fault should be raised at the level of Fault Control Centre which operates 24-hours a day, 7 days a week and all days in each year in

accordance with article 3.1 of Schedule 6 (Fault Management) of Batelco's Reference Offer.

(b) The OLO shall in particular use the UMPL Fault Management form.

(c) Batelco shall adhere to the following Response Times and Restoration Times:

Fault type	**Response Time between receipt of the Fault Management form and acceptance or rejection**	**Restoration Time from acceptance of the Fault Management form to notification of restoration**	**Threshold Response Time between receipt of the Fault Management form and acceptance or rejection**	**Threshold Restoration Time from acceptance of the Fault Management form to notification of restoration**
Covered Failure standard	60 minutes	3 Working Days	90 minutes	5 Working Days
Covered Failure premium	60 minutes	NA	90 minutes	8 hours

(d) Where Batelco's Response Time or Restoration Time exceeds the Threshold Response Time or Threshold Restoration Time respectively for Covered Failures then the following Service Rebates, assessed on a quarterly basis per event, will apply:

Fault type (as defined in Schedule 6)	**Time by which Response Time exceeds Threshold Response Time**	**Response Service Rebate**	**Time by which Restoration Time exceeds Threshold Restoration Time**	**Restoration Service Rebate**
Covered Failure	15 minutes 1 hour More than 1 hour	1 UMP Service Credit 2 UMP Service Credits 1 UMP Service Credits per every additional hour subject to the Response Rebate Cap	One Working Day or part of a Working Day	40 UMP Service Credits subject to the Restoration Rebate Cap

8. FORECASTING

8.1 At the beginning of each calendar month, the OLO shall supply a non-binding forecast of the expected requests for the UMP Service in each month of the twelve month period following the date of the forecast, in the form required by Batelco from time to time. The OLO shall use all reasonable endeavours to forecast accurately given Batelco is placing reliance on those forecasts.

9 UMP TRANSFER

UMP Transfer Process

9.1 Batelco and the OLO shall comply with clause 9 and Annex 1 of this Service Description when carrying out any UMP Request.

9.2 The OLO shall establish robust procedures to ensure an appropriate End User Consent duly completed and signed is received and properly recorded by the OLO before any UMP Service Request is notified to Batelco.

9.3 The OLO shall provide Batelco, upon request, a copy of the End User Consent (OLO's document signed by the End User explaining rights and obligations of the End User and the consequences of Unbundling).

Charges

9.4 The OLO shall pay to Batelco the relevant Charges as set out in Schedule 3 of Batelco's Reference Offer.

Responsibilities

9.5 From the time of the completion of the UMP Request, the relevant End User will no longer be a customer of Batelco for those services supplied by the OLO using the UMP Service, but instead the customer of the OLO for those services.

9.6 From the time of completion of the UMP Request, the OLO shall provide End User Management to support the UMP Services.

9.7 When a fault is reported by an End User, it is the responsibility of the OLO to perform initial tests, prior to raising a fault to Batelco, in order to validate that the fault is not within the OLO's network and equipment. In order to assist in the resolution and for efficient use of resources, the OLO shall promptly provide reasonable and complete details of the test performed when reporting the fault to Batelco. If after further investigation Batelco demonstrates the fault does not relate to the UMP Service, then the OLO shall pay the Wrongful Repair Charge (on a time basis as set in Schedule 3 of Batelco's Reference Offer).

9.8 In relation to any Batelco service:

(a) Batelco will continue to bill the End User for any outstanding Batelco charges and other Batelco services; and

(b) The OLO acknowledges that the End User remains liable to pay any outstanding charges to Batelco and remains subject to standard Batelco debt enforcement policies notwithstanding that the End User is at the same time an OLO Customer.

9.9 In respect of each UMP Request submitted by the OLO to Batelco, the OLO shall ensure that:

(a) it has an End User Consent for the transfer or implementation (which consent is not more than 30 days old from the date the UMP Request submission is made to Batelco);

(b) it retains records of the End User Consent and the retention is in accordance with the reasonable requirements notified to the OLO by Batelco from time to time;

(c) it has used its reasonable endeavours to ensure that the information in the UMP Request is complete and correct;

(d) the processing of each UMP Request, at the time it is lodged, does not breach any party's contractual or other rights (but, for the avoidance of doubt, a signed End User Consent shall be deemed to be a valid notice to Batelco to terminate the relevant Batelco services);

9.10 Where there is any allegation of a failure to comply with this Service Description then the parties will apply the dispute resolution process outlined in clause 24 of the Supply Terms.

Indemnity

9.11 Each party indemnifies the other, subject to using all reasonable endeavours to mitigate against the effect of the occurrence of any loss, liability or cost incurred by a party (including third party claims or claims by any End User) caused by a breach of this Service Description.

10 Billing Period

10.1 The Billing Period in respect of the Service shall be 30 days. The Billing Period shall commence on the date of the first billing date of the Batelco billing cycle after installation and may include billing on a pro rata time basis for the period between the UMP Request to the next billing cycle to ensure compatibility with the Batelco billing cycle.

ANNEX 1 – UMP REQUEST PROCESS

1. UMP Service Request and UMP Swap Request

1.1 The OLO shall make a UMP Service Request for the provision of a UMP Service by Batelco to allow the OLO to supply a new or existing service to an End User.

1.2 A UMP Service Request shall be in the format notified by Batelco from time to time and be submitted by the means notified by Batelco from time to time.

1.3 Batelco will, within 5 Working Days of receipt of any UMP Service Request or UMP Swap Request, notify the OLO whether the UMP Service Request is:

(a) accepted; or

(b) rejected.

1.4 Batelco may reject a UMP Service Request or UMP Swap Request if it:

(a) is incomplete or incorrect or illegible or cannot reasonably be understood;

(b) does not properly identify the End User, or provide information which does not enable Batelco to identify the Useable Pair;

(c) is not submitted in accordance with paragraph 2 of this Annex 1;

(d) in the case of a UMP Swap Request, is an UMP Invalid Transfer;

(e) has any other material defect which will hinder the completion of the request, notified by Batelco to the OLO at the time of rejection; or

(f) was made at a BSN where the OLO has no SNFM service.

In such a case, the OLO will be charged the Rejection, reversal and withdrawal charge per UMP order charge (as set out in Schedule 3 of the Reference Offer).

1.5 Batelco may in its sole discretion elect to accept any UMP Service Request notwithstanding that there is any defect in that UMP Service Request if Batelco considers that such defect does not have a material effect on Batelco's ability to process the UMP Service Request and provide the UMP Service.

2. Batches

2.1 The OLO shall submit UMP Requests to Batelco in batches of no more than ten requests. Batches shall be:

(a) submitted by the means notified by Batelco from time to time;

(b) submitted by authorised personnel of the OLO;

(c) made up of only UMP Requests that comply with the requirements of this Service Description and the Supply Terms; and

(d) identified by a unique batch number generated by the OLO.

2.2 Batelco will only accept batches of UMP Requests that:

(a) are delivered to Batelco during business hours (for the avoidance of doubt submission received after business hours will be deemed to have been received on the next working day);

(b) comply with the requirements set out in paragraph 1 of this Annex;

(c) do not exceed the maximum number of two batches per day.

2.3 When a batch of UMP Requests contains one or more Requests that contain one or more defects, Batelco will:

(a) reject the defective UMP Requests by returning them to the OLO; and

(b) continue to process the valid UMP Requests within the same batch.

3. Completion of Request

3.1 When Batelco notifies the OLO that the UMP Request is accepted, then Batelco shall use its reasonable efforts to complete the UMP Request on or before the Implementation Date.

3.2 Batelco shall put on hold a UMP Request if:

(a) The relevant UMP Service cannot meet Service Qualification;

(b) An authorised person from the End User or the OLO is not available to provide further information when requested and has been contacted at least twice.

3.3 For the avoidance of doubt, Batelco shall notify the OLO in writing once a UMP Request is on hold and shall resume the process as soon as the reason for putting on hold the request as per 3.2 above is satisfied accordingly and brought to Batelco's notice in writing by the OLO.

3.4 Any Service Levels and Service Credits shall not be considered during the period which the UMP Request is put on hold as a result of paragraph 3.2 above.

3.5 Once a request is successfully completed, the OLO will be charged the connection charge (as set out in Schedule 3 of Batelco's Reference Offer).

4. Notification of Completion of Request

4.1 Batelco shall, within 2 Working Days of completion of a UMP Service Request, notify the OLO of completion.

4.2 Batelco is entitled to rely on a UMP Request as evidence that the relevant End User has given an End User Consent in relation to the requested UMP Request and understands and is aware of the End User's continuing liability to pay any charges to Batelco when due.

5. UMP Cease Request

5.1 At any time following the successful completion of a UMP Request, either:

(a) the relevant End User; or

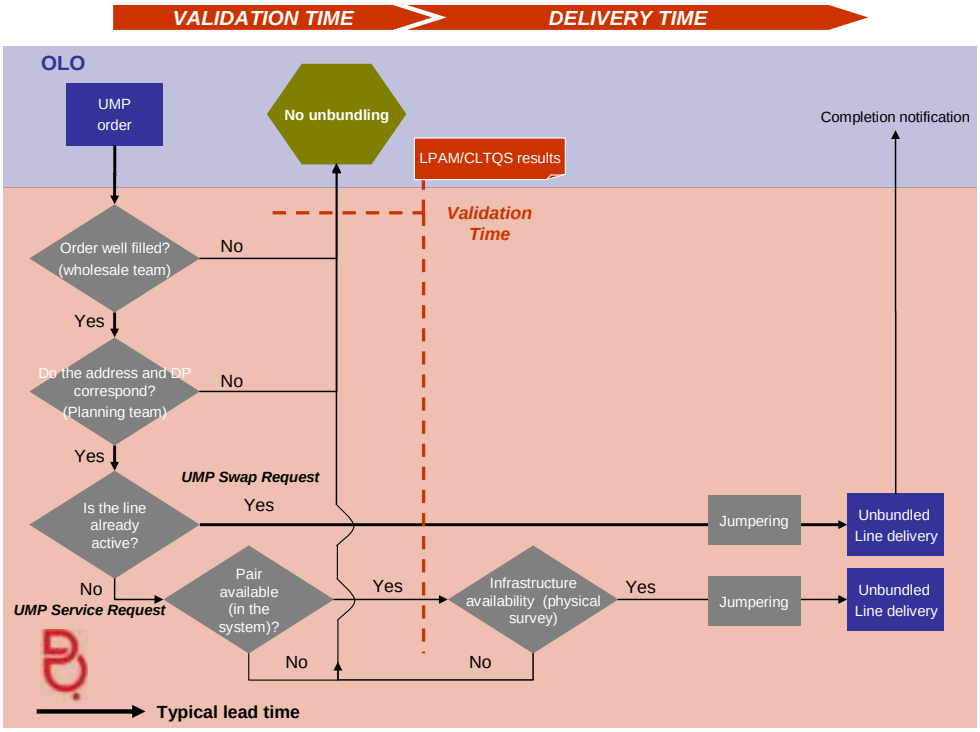
(b) the OLO;

may make a request to Batelco to cease the UMP Request.

5.2 Batelco will, within 2 Working Days of completion of a UMP Cease Request notify the Gaining and Losing OLOs that the UMP Cease Request has been processed.

5.3 The OLO will be charged the Cessation charge (as set out in Schedule 3 of Batelco's Reference Offer).

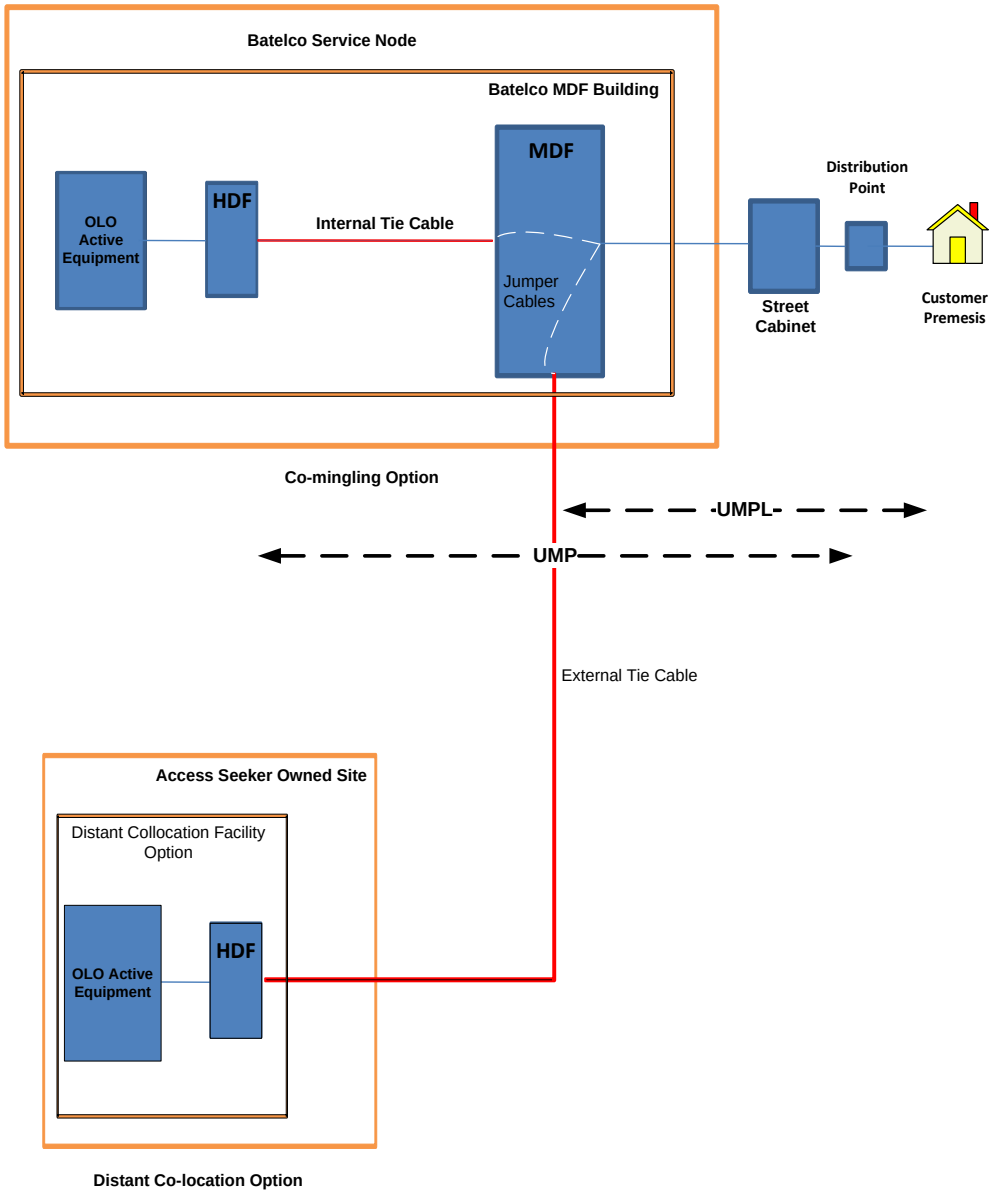
The following diagram(s) are for illustrative purposes only. Where there are discrepancies, the text in this Service Description will prevail.


VALIDATION TIME
DELIVERY TIME
OLO
UMP order
No unbundling
LPAM/CLTQS results
Completion notification
Validation Time
Order well filled? (wholesale team)
No
Yes
Do the address and DP correspond? (Planning team)
No
Yes
UMP Swap Request
Is the line already active?
Yes
Jumpering
Unbundled Line delivery
No
UMP Service Request
Pair available (in the system)?
Yes
Infrastructure availability (physical survey)
Yes
Jumpering
Unbundled Line delivery
No
No
Typical lead time

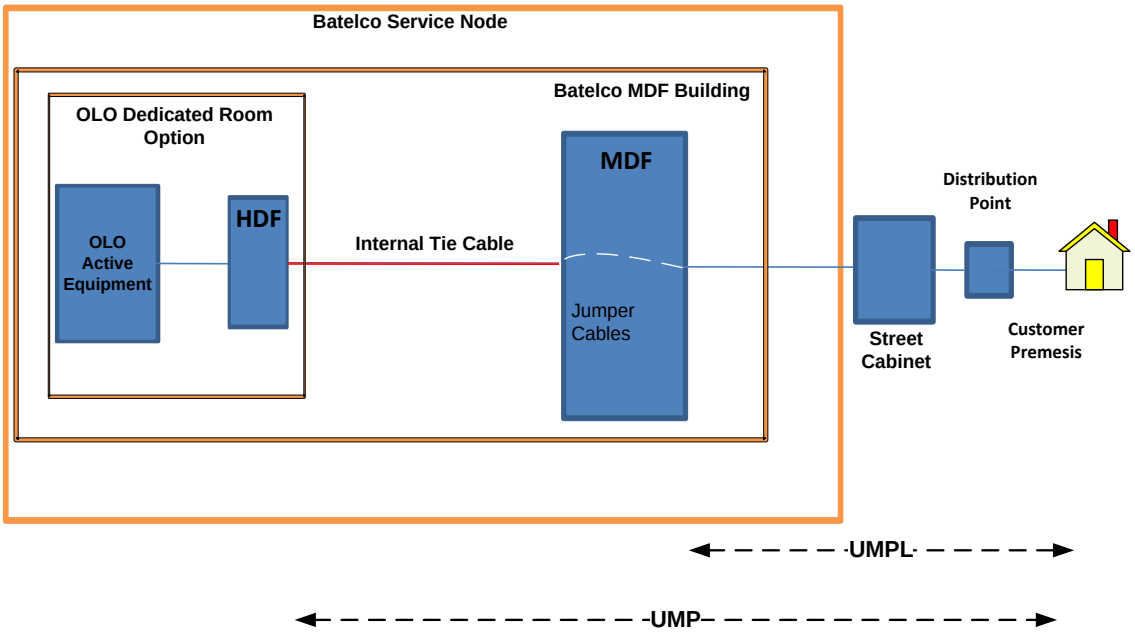
ANNEX 2 Technical UMP diagram (to be read with the SNFM service description)

Commingling and Distant OLO Space

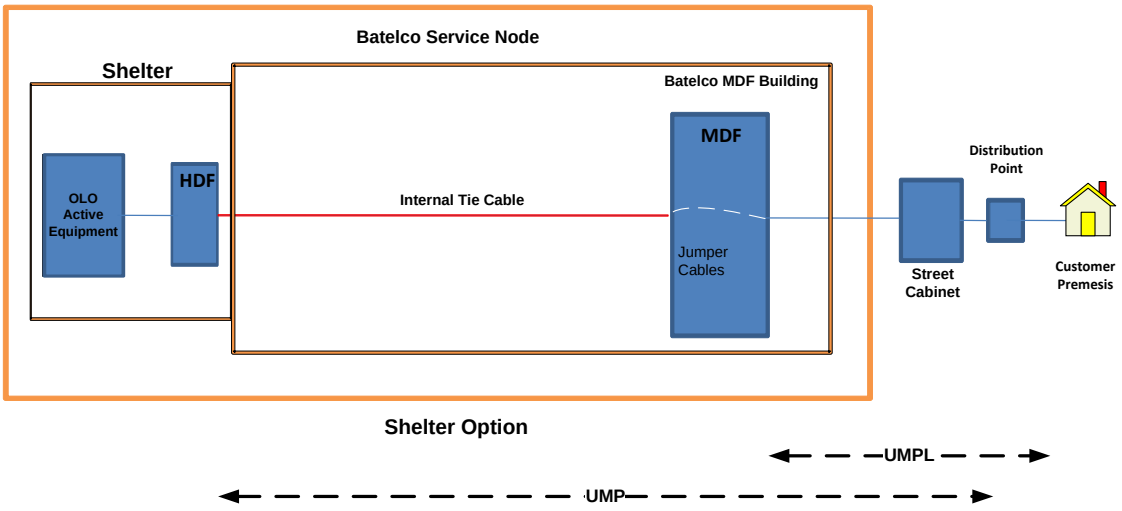
The following diagram(s) are for illustrative purposes only. Where there are discrepancies, the text in this Service Description will prevail.



Dedicated OLO Space



Licensed Shelter Space



ANNEX 3 UMP CHARGES

The OLO shall pay to Batelco the relevant Charges determined in accordance with Schedule 3 of Batelco's Reference Offer.

ANNEX 4 METALLIC PATH SPECIFICATION

This specification has been produced by Batelco Networks in order to provide OLOs with the parameters of the Batelco MP. This document is provided for technical guidance only and highlights the general characteristics of the Batelco MP for information only rather than detailing specific characteristics of the particular UMP as supplied by Batelco as part of the UMP Service. The document does not form part of the legally binding service description and Batelco Reference Offer, but is produced for information only.

The specification contained in this Annex 4 may be varied by Batelco in accordance with clause 8 of the Supply Terms.

1. Scope

This specification defines the electrical parameters of Batelco MP from the Service Node to the Customer premises. It applies to the MP when the internal wiring and equipment are in isolation.

2. Metallic Path Parameters

The parameters of Batelco MP are defined for the copper pair from the MDF in the Service Node to the NTP in the Customer premises. The Batelco MP must be tested in isolation of the internal wiring and CPEs. The parameters are listed in table 1 below.

Parameter	Value	Notes
Electrical Continuity	The MP is a continuous connection between the MDF in Batelco Service Node to the NTP in the Customer premises.	
Insertion Loss	Max is 10 dB at 1600 Hz	
Loop Resistance	Less than 1200 Ohms	
Insulation Resistance A-B or B-A	Greater than 50 KOhm	Measured using voltage of 100 V DC.
Insulation Resistance Wire - Erath	Greater than 50 KOhm	Measured using voltage of 100 V DC.
Insulation Resistance Wire	Greater than 50 KOhm	Measured using voltage

- Battery		of 100 V DC.

Table 1: Batelco Metallic Path Parameters

2.1 Cables Types

Batelco mainly use two types of cables as follows:

2.1.1. Primary Cable

Designed primarily for installation in ducts in the Primary Side of Batelco Access Network (from MDF at the Service Node to the Cabinets). The conductors in the cable consist of a solid wire of standard annealed copper, smoothly drawn, circular in section, uniform in quality. Each conductor covered with a solid polyethylene compound Type 03 complying with BS 6234. Two appropriately coloured insulated conductors twisted together to form a pair (Each unit contains 25 pairs). The cable is sheathed with black polyethylene and sheath thickness includes the moisture barrier. The cable sheath is pneumatically tested to a pressure of 800 millibars, and sustains a constant pressure of 630±50 millibars.

2.1.2. Secondary Cable

Designed primarily for installation in ducts in the Secondary Side of Batelco Access Networks (from Cabinets to Distribution Points). Each conductor in the cable consist of a solid wire of standard annealed copper, smoothly drawn, circular in section, uniform in quality. Each conductor covered with a solid polyethylene compound Type 03 complying with BS 6234. Two appropriately coloured insulated conductors twisted together to form a pair. The cable is sheathed with black polyethylene and sheath thickness includes the moisture barrier. The interstices of the cable core are completely filled with a compound. The compound is capable, in conjunction with the insulation, of giving a cable lifetime in excess of 25 years, in the environment of Bahrain.

2.2. Cables Gauges

Batelco uses different gauges of cables such as 0.4, 0.5 and 0.63 mm. The cable gauge chosen should be of the smallest which meets the Loop Resistance limit. Cables of lower gauge should be used close to the Service Node and the gauge increased with distance from the Service Node. Figure 1 below shows the typical application of the different gauges in Batelco Access Network and Table 2 below shows the different Cable gauges parameters.

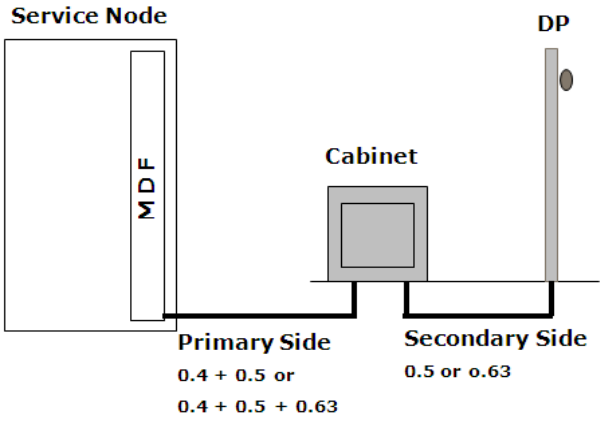


Figure 1: Typical Application of Different Gauges

Cable Gauge (mm)	Loop Resistance (Ω / Km) @ 20 °C	Mutual Capacitance (nF / Km)	Attenuation (dB / Km) @ 1600 Hz
0.4	150	60	2.37
0.5	96	64	1.84
0.63	60	64	1.47

Table 2: Different Cable Gauges Parameters

3. Metallic Path Electrical Termination

The MP consists of two copper wires designated as “A” and “B” wires.

3.1. Network Termination Point Termination

The connection to the MP at the Customer premises is a Batelco Master Socket representing the NTP.

3.1.1. Batelco Master Socket Connections

The connection to the MP is provided by Batelco Master Socket on the face plate. The connections for the socket with Voice and Broadband service are shown in Table 2 below.

Contact No	Connectivity
1	Not Used
2	“A” or “B” Wire
3	Shunt Connection
4	Not Used
5	“B” or “A” Wire
6	Not Used

Table 3: Batelco Master Socket Connections

The Shunt Connection is derived from the centre point between a 470 KOhm resistor and a 1.8 µF capacitor connected is series across the “A” and “B” wires. Additionally there is an overvoltage protection device connected across “A” and “B” wires. Figure 2 below shows the circuit diagram.

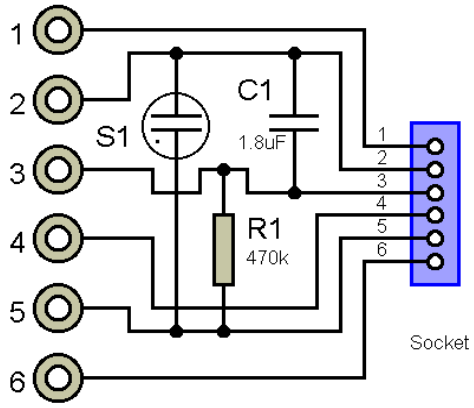


Figure 2: Batelco Master Socket Circuit Diagram

3.2. Main Distribution Frame Termination

In UMP service, no direct access to the MP end is provided at the MDF. Indirect connection is only provided via an Internal or External Tie Cable. The interface to the network end of the MP will be the HDF within the LLU OLO space.

4. Metallic Path Operation

In order to ensure network integrity, eliminate interference and for safety reasons, the equipment connected to Batelco MP must conform to the ANFP and meet the following technical requirements:

4.1. Power Feeding

The voltage applied to Batelco MP must not at any time exceed 120V of either polarity with respect to earth to either leg of the MP. Voltage measurement should be made using a high internal impedance (10 MOhm) voltmeter.

The current caused to flow should not exceed 60mA between either legs of the MP.

The voltages and currents limits above are absolute including AC signals at any frequency together with any DC power supplied to the CPEs.

4.2. Input Signals

Any signals applied to Batelco MP must conform to Batelco ANFP.