



## Customer Interface Publication: CIP043

### **KCOM Group Limited** **EXTERIOR CABLE CONNECT DESCRIPTION AND** **TECHNICAL CHARACTERISTICS**

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## 2 Introduction

This customer interface publication (CIP) has been created to describe and detail the technology to provide the KCOM Exterior Cable Connect service. This service is available as part of the Reference Offer for the provision of Ancillary Services.

KCOM wholesale, the wholesale division of KCOM Group Limited provides this service to Communications Providers (CPs), enabling the fibre connectivity between Co-location Services and the CP's existing external fibre network.

Terms and abbreviations used in this document are included in section 7 of this document and in the Reference Offer for the provision of Ancillary Services.

Changes to the technical architecture and network interface detail that affect the correct working of the service will be published by KCOM Group Limited within documents published on the KCOM website.

This service may be subject to change due to changes in the UK industry standards and specification forums. It may also be impacted by a change in regulatory requirements applicable to these specifications.

Enquiries relating to the technical content of this document and the availability of other publications should be directed to:

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### 3 Service Description

The Exterior Cable Connect service provides a physical cable connection between the CP's Compliant Equipment in their Co-Location Hostel within an Exchange Site and the CP's Network located within the curtilage of the same Exchange Site or at a specified location within 100 metres of the curtilage of the same Exchange Site.

#### 3.1 Service Availability

External Cable Connect Services demarcate at the Point of Handover:

Point of Handover means, in relation to Exterior Cable Connect, a physical point where the CP's duct is joined to the wall of the Hand-Over Box and the Exterior Cable Connect Service terminates.

The CP if necessary, will extend its duct network to the Point of Handover; and provide a length of cable at the Point of Handover sufficient to be pulled through to, and spliced within, the KCOM cable chamber by KCOM.

The CP's cable will be pulled in from the Hand-Over Box and spliced by KCOM to the KCOM provided internal fibre cable which forms part of the Exterior Cable Connect.

The Hand-Over Box and connecting ductwork, where required for provision of Exterior Cable Connect, will be paid for by the CP and ownership passed to KCOM. The CP agrees that ownership of that part of the cable on KCOM's side of the Hand-Over Box also passes to KCOM. For the avoidance of doubt, KCOM will be responsible for the connectivity between the Point of Handover and the Compliant Equipment within the Exchange Site.

Internal fibre cable may be left coiled in the Co-Location Hostel or, for an additional charge, may be terminated by KCOM on an optical patch panel.

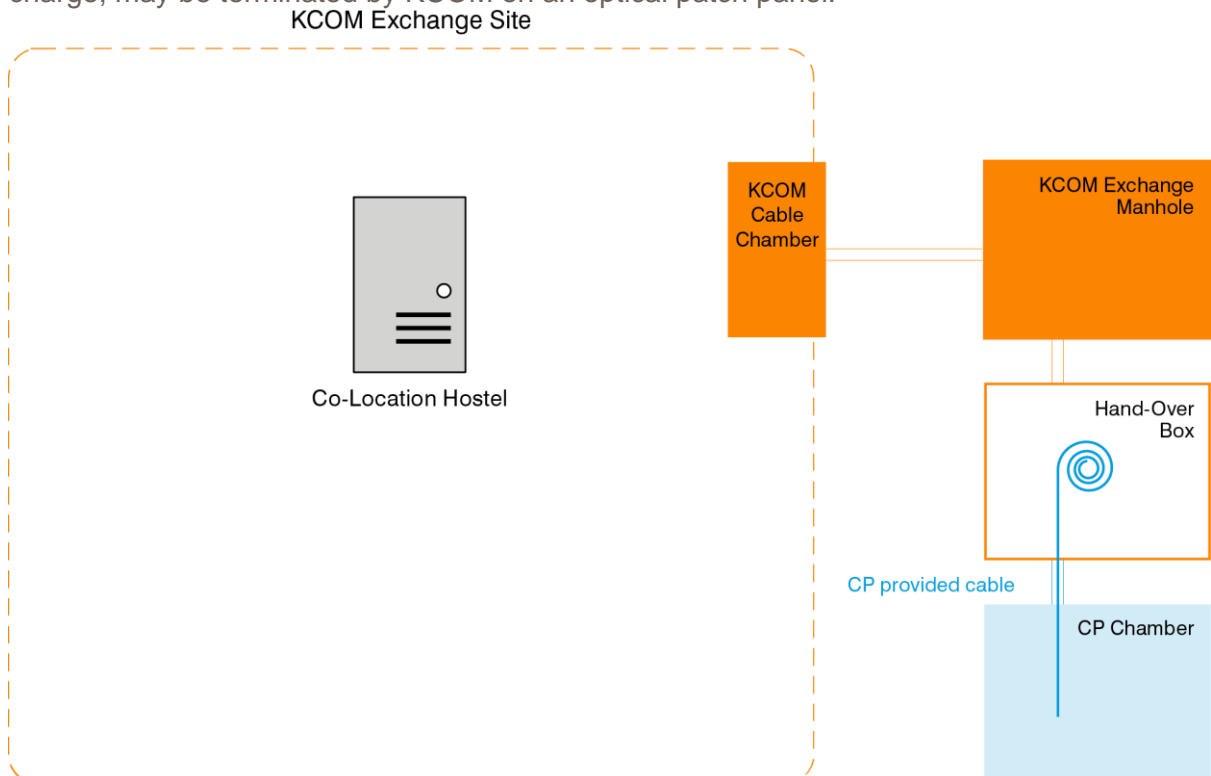


Figure 1 – Exterior Cable stage 1

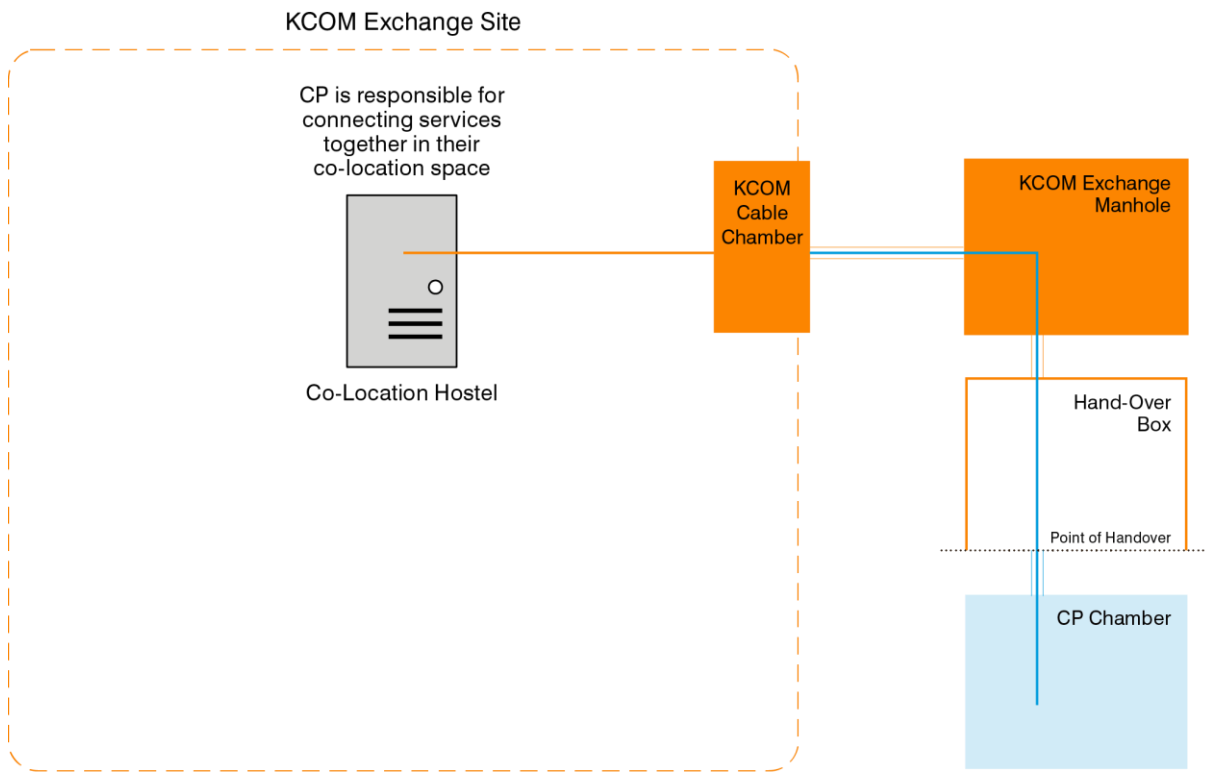


Figure 2 – Exterior Cable stage 2

## 4 Service Features

### 4.1 Structured Optical Fibre Cable Characteristics

This section gives an overview of the external structured optical fibre cable to be used in the Exterior Cable Connect Product:

- The number of fibres in cables range between 12 and 48 and the fibre consists of units of 12 fibres per tube (element).
- The fibre is primary coated single mode fibre in line with ITU-T recommendation G.657.A [1]
- The fibre contains a central strength member of GRP or Steel and is coated with black polyethylene.
- The stranded layers around the central strength member should be identified by colour or a marker and reference. (Red to Green)
- The layer binder is threads or tapes of a polyester water swellable material.
- The fibre contains 2 x rip cords over the binding layer.
- The cable sheath construction is black polyethylene of a suitable grade with a smooth finish. It is also labeled with the manufacturer name, number of fibres and that it is an optical fibre telecoms cable.
- The outside diameter of the cable's ranges from 7-13.5mm.
- The fibres are jointed by fusion splicing.
- The cables are installed into the joint closure mechanically or using heat shrink methods.

### 4.2 ULW (Ultra Light Weight) Optical Fibre Cable Characteristics

- The number of fibres in the ULW range between 12-48 these are contained in 12 fibre Gel filled microbundles, the bundle colour code is 1-Blue 2-Orange 3-Green 4-Brown.
- The fibres are primary coated single mode in line with ITU-T recommendation G.657A [1] and are coloured 1-Blue 2-Orange 3-Green 4-Brown 5-Slate 6-Red 7-Yellow 8-Purple 9-Pink 10-White 11-Black 12-Turquoise.
- The construction of the cable is gel filled microbundles containing 12 G.657A[1] fibres.
- The water layer is of swellable yarns over which there are 2 x ripcords.
- The outer sheath is 7mm HDPE with x2 brass coated steel strength members and coloured black with x2 yellow stripes at 180 degrees to each other.
- It will be marked as an optical fibre telecommunications cable with the number of fibres, meter marks and name.

### 4.3 Interior Optical Fibre Cable Characteristics

- The interior cable comes in 12 and 24 fibre variants which are of tight buffer construction.
- The fibres are G657A1 secondary coated. The colour code is to be agreed before splicing commences.
- The sheathing is flame retardant LSOH (Low Smoke Zero Halogen) which has x2 GRP rods encased. Flame non-propagation is to BS EN 60332-1.
- There is no water block in this cable.
- It is marked with the following manufacturer, cable type, number and type of fibres and meter markings.

#### 4.4 CP's Cable Specification

In order to be connected to the KCOM Network the CPs external cable will be required at a minimum to meet the following.

- Be suitable for installation in ducts and be of a robust construction.
- A cable that meets the specification in 4.1 or 4.2
- The fibre will be primary coated single mode fibre ITU-T Recommendation of G.657.A [1] or G.652 [2]
- The fibres will be identifiable by a colour code provided by the CPs. The cable will be 12 fibres per tube (element) and the tubes will be coloured for identification, if the cable is "marker and reference" the start tube would be the red working around to green.
- The cable will be of a diameter from 7mm-25mm, and the sheath should have the CPs name, number of fibres and that it is an optical fibre telecoms cable clearly marked.
- All materials within the cable should adhere to the latest COSHH Regulations.

Other cable specifications may be used subject to written acceptance by KCOM prior to the Order being accepted.

#### 4.5 Cable Labelling

The CP is required to label the end of the cable coiled in the Hand-Over Box and also at the point of entry into the Hand-Over box. The label should have the cable reference number and job pack number.

#### 4.6 Cable Jointing

The method used to joint the fibres is fusion splicing and the cables enter the Inter-Connect Joint by either a heat shrink or mechanical sealing method and so it must be possible to perform these operations without damaging the components of the cable.

A splicing schedule should be agreed between both parties before jointing work commences.

#### 4.7 Building Entry

The only authorised route into the Exchange Site is via the KCOM underground infrastructure, duct and exchange duct seal terminating in the cable chamber.

In the event of a blown fibre entry a gas block will be fitted on the tubing in the exchange cable chamber. The CP should supply a suitable gas block to comply with the manufacturer of the cable supplied.

#### 4.8 Handover Box

No subduct is to be present in the Hand-Over Box. The length of cable coiled in the Hand-Over Box is to be a measured length agreed at survey (distance to exchange chamber plus a jointing length). Coil needs to be labelled as stated in 4.5.

#### 4.9 Splicing and Optical Losses

KCOM will make every effort to ensure splice losses are less than 0.3dB @ 1310nm in line with ITU-T L.12[3] recommendations. Losses greater than 0.3dB may be found if uni-directional measurements are used with an Optical Time Domain Reflectometer (OTDR) but

this will be caused by Back scatter and not the splice.  
All measurements are to be completed at 1310nm and 1550nm.  
These higher losses are acceptable providing the overall performance does not exceed the overall power loss budget.  
As KCOM does not have the overall Power loss budget of the Exterior Cable Connect, service will be considered faulty if:

The CP bidirectional average of the OTDR readings for a splice are greater than 0.3dB @ 1310nm. Bidirectional test results are to be provided by the CP to KCOM in accordance with ITU-T L.12[3]. This average is calculated using ITU-T L.12[3] G650.3[4] as a reference. CPs measurements are to be made using referenced OPM and OLS at 1310dB and 1550dB. All results are to be in dB and the 2patch reference method should be employed. (IEC and BS EN 61280-4-2[5])

#### **4.10 Testing Connectivity**

All test equipment connections to the fibres in the cable will be by a Pigtail and temp fusion splice or a Patch cord via or the terminated 1U 19" 24 way patch panel, all connections are to be cleaned and inspected before connection.

### **5 Customer Base**

KCOM's target customer base is those CP's wishing to connect other KCOM wholesale services through Co-Location and into their own fibre network.

### **6 Availability**

The service will only be available within the Hull Area or as otherwise specifically agreed with the CP.



## 7 Glossary and Definitions

CIP	Customer Information Publication
COSHH	Health and Safety Executive - Control of Substances Hazardous to Health
CP	Communications Provider
Exchange Site	Means the site of an operational building of KCOM as advised by KCOM
Hull Area	the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc
Hand-Over Box	the chamber, external to an Exchange Site, where fibre will be left coiled for KCOM to draw through to its cable chamber within the Exchange Site
Inter-Connect Joint	Joint between the CP provided external cable and the KCOM provided internal fibre cable in the Exchange Cable Chamber
ITU-T	International Telecommunications Union – Telecom Standardisation Sector
OTDR	Optical Time Domain Reflectometer
Point of Handover	the position in the network where responsibility passes between KCOM and the CP at the Hand-Over Box.
RFC	Request For Comment – IETF Publications

## 8 References

[1]	ITU-T G.657.A	Characteristics of a bending-loss insensitive single-mode optical fibre and cable	2016
[2]	ITU-T G.652	Characteristics of a single-mode optical fibre and cable	2016
[3]	ITUT L.12	Optical fibre splices	2008
[4]	ITUT G.650.3	Test methods for installed single-mode optical fibre cable links	2017
[5]	IEC 61280-4-2	Fibre-optic communication subsystem test procedures	2020

References [1], [2], [3] and [4] may be obtained from <https://www.itu.int/en/Pages/default.aspx>

Reference [5] may be found at <https://www.bsigroup.com/>

## 9 History

Date	Issue	Comments	Author
01/03/2022	1.0	Version 1.0 new document created for launch of Ancillary Services	KCOM External Planning and Product Architecture