Dark Fibre Access (DFA) Final Reference Offer - Physical and Electrical Requirements for Street Furniture Incorporating the Dark Fibre Access Service

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12. Document History
1. Introduction

This document specifies the minimum requirements for Street Furniture such that the Street Furniture is suitable to have the dark fibre service installed within it.

Physical characteristics of the duct network, fibre connectivity options and electrical safety are all covered within this document.

2. Physical Street Furniture Requirements

Street furniture must have the following characteristics:

1. It must be robust and physically stable.
2. The Openreach engineer must be able to install the dark fibre service in a safe environment or the service request will be declined.
3. It may have thermal stability however this is not mandated for the dark fibre service as long as it meets the environment specification listed in the Technical Specification (and forthcoming SIN)
4. It must keep the dark fibre components correctly sheltered for the external environment.
5. There must be contact information available on the street furniture such that an Openreach engineer or their agents can report faults or other information back to the street furniture owner or Communication Provider (CP).
6. For the avoidance of doubt, suitable Street Furniture will not be an underground chamber or an overhead wall mounted box where the use of ladders to access the equipment is required.

3. Cable Entries

The CP shall provide suitable access in the base of the street furniture to permit the entry of underground communications cables. If blown fibre is used, then the access port or ports shall accommodate 2-tube Blown Fibre cable of dimensions 14mm x 9mm. If cable is used, then the access port or ports shall accommodate cable of 13mm diameter.

The number of cable entries shall be sufficient for initial provision of service, plus the agreed expansion of services during the service life of the street furniture.

Openreach will connect up to a service duct on the basis of Excess Construction Charges (ECCs) only. This will require a breakout from the Openreach network into the duct entry owned by the CP or 3rd party Street Furniture owner as follows:
Under the duct ‘poke out’ concept the CP should be able to order a DFA product from planned drawings by red-lining the proposed enclosure location on a map of the area, at the point where the DFA patch panel is to be deployed (i.e. street cabinet location). This can be physically confirmed at survey stage.

The following is free-issued from Openreach in advance of the CP commencing work on the base of their street furniture:

1. A 90 degree bend made from Duct 56. Either a 350mm radius for soft verge/pavement or a 622mm radius for road crossing.

2. A 1 metre straight length of Duct 56.

The CP will be required to build the base for the street furniture first, usually a concrete plinth. The 1m length of duct 56 leads from the 90 degree bend in the direction of the Openreach equipment.

Openreach will build up to the poke out and marry up the Openreach ducting as they would normally. See Appendix A for more information.

In exceptional cases, where CP (or Third Party) Street Furniture already exists, agreement may be reached where Openreach will utilise a small section of the CP-provided duct as a poke out. Openreach expects this ductwork to be fully roped. Such agreement would need to be in writing from both Openreach and the CP.

4. Optical fibre cables will not be installed within the duct until the street furniture is built. Cable Route within Street Furniture

The street furniture owner or CP shall provide a suitable route from the cable entry point to the fibre termination. This should include support or tieback as appropriate.

4.1 Blown Fibre Tubing

The minimum bend radius of the blown fibre tubing shall be 60mm at any point.

4.2 Cable

The minimum bend radius of the cable shall be 200mm at any point.

5. Fibre Termination

The street furniture shall accommodate one of the following products as agreed with the Openreach planner:
5.1 12 – 24 Way Dark Fibre Optical Connector Patch panel.

Details as per the dark fibre Technical Specification and SIN (when issued). The Patch Panel is designed to fit in either a 19 inch rack or an ETSI 600mm rack (535mm between mounting rails).

5.2 24 – 48 Way Dark Fibre Optical Connector Patch panel.

Details as per the dark fibre Technical Specification and SIN (when issued). The Patch Panel is designed to fit in either a 19 inch rack or an ETSI 600mm rack (535mm between mounting rails).

5.3 4 or 8 way Dark Fibre Optical Connector Assembly.

Details as per the dark fibre Technical Specification and SIN (when issued). To be fixed using screws into suitable timber mount.

5.4 4 or 8 or 12 way Dark Fibre Optical Connectorised Block.

Details as per the dark fibre Technical Specification and SIN (when issued). Block to be Corning IP68 rated connector block. To be fixed using screws into suitable timber mount.

5.5 Dark Fibre patch panel for Restricted Spaces E.g. Lampposts


6. Wayleaves

Refer to product description section 9.11 for full details.

7. Dark Fibre Optical Connector Component Dimensions

<table>
<thead>
<tr>
<th>Component</th>
<th>Height (mm)</th>
<th>Width (mm)</th>
<th>Depth (mm)</th>
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<tbody>
<tr>
<td>12 – 24 Connector Rack</td>
<td>44 (1U)</td>
<td>19 inch practise</td>
<td>19 inch practise</td>
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<tr>
<td>24 – 48 Connector Rack</td>
<td>44 (1U)</td>
<td>19 inch practise</td>
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<td>4 way connector Assembly</td>
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<td>155</td>
<td>60</td>
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<td>8 way connector Assembly</td>
<td>260</td>
<td>155</td>
<td>60</td>
</tr>
<tr>
<td>4 way IP68 Assembly</td>
<td>274</td>
<td>73</td>
<td>66</td>
</tr>
</tbody>
</table>
8. Street Furniture: Electrical Safety

Street furniture must conform to the relevant Electrical Safety Standards for external equipment before Openreach engineers or their agents will be permitted to install the dark fibre product(s) within. The relevant standards are BS761:2008+A3:2015 and ENA Requirements for the Application of Multiple Earthing to Low Voltage Networks (G12 Issue 4 2013).

The Openreach engineer will only be permitted to work in external equipment where such equipment has sufficient secondary covers such that the engineer cannot come into contact with electrical potentials.

On arrival at the street furniture the Openreach engineer must undertake a Risk Assessment on its suitability to be worked on.

The Openreach engineer will check that the street furniture shell is not electrically live; by using a proven voltage indicator stick before touching the cabinet. If the cabinet shell proves to be live then the engineer will report it to their controls and cancel the planned action.

9. Street Furniture: Duct Sealing

Openreach provides Duct Sealing of incoming duct network, cables and fibre where appropriate as shown below but only with the agreement of the CP:

Vented unsealed street furniture. Protection minimised. Duct work usually expected to finish proud of the internal surface by 50mm to prevent blockage by detritus. No Openreach sealant applied. No Openreach attempt to seal the ductwork or cables.

Mostly sealed street furniture but with some minor gaps. Openreach would normally seal ducts, cables and blown fibre tubes against gas ingress. It is the responsibility of the CP to agree for sealant to be used on the incoming infrastructure used for the dark fibre service. By default Openreach will seal blown fibre tubes and/or cable sheaths. Usually Openreach uses Compound 16 (non-curing Mastic) under these conditions.

Sealed street furniture such as Kiosks. Openreach would normally seal ducts, cables and blown fibre tubes against gas ingress. It is the responsibility of the CP to agree for sealant to be used on the incoming infrastructure used for the dark fibre service. By default Openreach will seal blown fibre tubes and/or cable sheaths. Usually Openreach uses Resin which is a setting compound under these conditions.
10. **Access to Street Furniture**

It shall be the responsibility of the CP to provide timely and safe access to the Street Furniture for the Openreach engineer or agents in order that the dark fibre service may be installed and, where necessary, maintained.

11. **CP Street Furniture Documentation**

The CP shall provide documentation for the Street Furniture that clearly describes the installation of the cable and the fibre connectivity components. The documentation shall be provided in a format which can be stored in an electronic document system.

The preferred electronic format shall be PDF, such that the file size is minimised for ease of download via the intranet or internet.

The documentation must specify how access is to be made available for the Openreach engineer, including keys, tools, timing, or special instructions for access as appropriate.
A.1 An example U/G entry for Street Furniture.

A.1 Section view showing Duct 56 bend

A.2 Top view showing CP and Openreach duct marry-up.
12. Document History

<table>
<thead>
<tr>
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