

# Connected Street Infrastructure

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### Leading the way in connecting Small Cell assets to dark fibre

### London Borough of Hammersmith and Fulham

With around 180,000 people living in 6.3 square miles, the London Borough of Hammersmith and Fulham has a highly concentrated demand for telecoms connectivity.

Cellnex holds the concession to use the borough's street assets for telecommunications purposes. We worked closely with Hammersmith and Fulham to select street light column locations that would deliver the greatest benefit in the area. The columns are connected by a brand-new 15km high density dark fibre network, which is multi-operator capable and provides the bandwidth for Mobile Network Operators (MNOs) to deploy advanced technology, including centralised C-RAN architecture and 5G. The network consists of a fibre ring with 90 cabinets and associated assets. It also enables network operators to benefit from infrastructure sharing.

The result is the **UK's first** plug and play, 5G-enabled network for small cells.

#### Key features of the project

**Shared infrastructure** – enables lower costs and faster deployment. Cabinets for up to four MNO small cells with power provided.

**Built-in architectural resilience** – in the unlikely event of a fibre break, half the sites would remain operational

**Dark fibre backhaul network** – to 2 Points of Interconnect (PoI) at BT exchanges

**Shared infrastructure** – omni or directional antenna with feeder system serving lamp columns. Cabinet space for MNO Network Termination Equipment

**Cellnex Service Desk** – incident management, ticket raising and resolution tracking

**Easy ground level access** – for equipment installation and maintenance

**Flexibility** – to support backhaul connection of other site solutions

This diagram shows the main components of the solution. Cellnex provides everything from the small cell site up to and including the Pol. MNO's connect to the Pol via dark fibre of their own choice. A connection via a BT Meet-Me chamber is also shown. Other configurations are possible.



### Cellnex

Cellnex provides and manages the infrastructure, including coordination of all activities of contractors involved in build and operations of the Cellnex provided equipment:

- Street works contractors carrying out ground-level or at-height telecommunications works on the columns
- Surveyors performing structural surveys and structural analysis of street columns, ensuring installations are safe and do not damage the column or present a health and safety risk to the public
- Electricity supplier that connects and maintains supply to the cabinets

## The MNOs are responsible for...

- Connecting their network to the Pol. This may be subcontracted to BT or another supplier
- Operating the small cell equipment they own using the infrastructure provided on site
- Providing and installing the equipment, commissioning and maintenance of the small cell

These activities may be sub-contracted to a Managed Service Provider (MSP) such as Ericsson or Nokia.

### The London Borough of Hammersmith and Fulham

The Borough owns the column assets and any existing apparatus inside street lighting columns, including wiring, electrical isolators and Christmas lights timers.



### **Deploying the solution**

The Cellnex solution is highly flexible and is designed to accommodate differing MNO needs on the same network and in the same cabinets. We work collaboratively with MNO's to find the right solution.



Cellnex provides a list of available locations - including antenna type, bearing and system gains and losses at each location, and considering the spaces and operating frequencies in use by other MNOs.

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The MNO identifies and validates all or a selection of the locations which suit their needs – including where small cells and/or fibre connections may be required, together with the frequency bands they wish to operate. Together we agree the design

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### **Getting connected**

This diagram shows the dark fibre route and locations of small cell sites. The 90 standard sites consist of an antenna equipped street column and a shared cabinet.

Connection to the network proceeds as follows:



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Cellnex provides dark fibre to a joint box (or BT 'meet-me' chamber) close to the Pol. The MNO sources and provisions a single pair of dark fibres from its core network to the point of demarcation at the joint box.

#### If sourced from BT, this would consist of an External Cablelink product from the joint box to a cable chamber within the BT exchange and an Internal Cablelink from the cable chamber to the MNO's equipment rack inside the exchange. BT would splice the External Cablelink to the Cellnex fibre in the BT joint box.

The Pol contains an Optical Distribution Frame (ODF). Cellnex will make the point to point fibre jump in the ODF to complete the connection to the MNO's network and provide the customer with a mapping matrix.

### Add Small Cells

Once the Pol is in place Small Cells can be added to cabinets as per the agreed design. Our 'Connected Street Infrastructure – Cabinet' installation guide describes the generic process, covering:

- How the MNO space is used
- Power consumption
- Connection to the combiner and antenna system

Each MNO has its own equipment and process for installation and commissioning (potentially including and MSP contractor), so each MNO is responsible for creating their own installation guidelines, based on the generic Cellnex guidelines provided.

### The process for developing MNO specific installation guidelines is as follows:

 The MNO's engineering team visits an existing cabinet location – including one at Hammersmith if preferred
to determine installation and commissioning processes that will suit their current operations.

### Go live

The MNO will make cells live and check for correct operation using the Installation and Commissioning (I&C) process defined in its guidelines.

### Live operations

Cellnex monitors the cabinet environment for each live site, including:

- Door Open Alarm
- Fan Faults Alarm
- Cabinet Temperature Alarm
- Blocked Filters Alarm
- Mains Power Alarm

### The Cellnex Service Desk provides ongoing support, including:

- Acceptance of sites into Service Management
- Active monitoring and management of Cellnex owned elements of the infrastructure
- Fast response in the event of an incident
- Management of contractors for planned or unplanned works
- Ensuring requests and/or incidents are fulfilled within agreed Service Levels
- Provision of resilience reports to the MNO
- Coordination of site visits

### Operations are brought together by Cellnex

#### Customer Incident Management:

The Cellnex Service Desk is the single point of contact for all incidents. It manages all raised tickets through to a successful resolution.

### Cabinet Monitoring:

Cellnex monitor the status of power, cooling and cabinet entry. Alerts are raised in the Cellnex Network Management Centre, and appropriate action is initiated. Operational Reporting:

Delivery of incident reporting information to the project team and the MNO to demonstrate the effectiveness of the service being provided. • The team tailors the generic Cellnex installation guidelines, developing a MNO-specific document that outlines what their field force will and will not do when on site.

• Cellnex reviews the document. Any changes required are made through joint dialogue. Once the guidelines are approved, equipment can be installed.



### **Specifications**

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Points of Interconnection	BT Exchanges: Fulham, Parsons Green	
Antenna height	10m column: 6m to 8m	
	8m column: 6m to 7m	
	бm column: 5m	
Omni Antenna	Alpha Wireless Aw3388	
Directional Antenna	Amphenol 6173010 panel type	
Frequency bands	Covered: 1800, 2100 and 2600 MHz bands	
	Optional: 3.5GHz bands	
Combiner	Quad hybrid combiner with 8 connectors facing 4 x 2 port small cells	
Cabinet space	Each bay contains two spaces for use by one or two MNOs	
	4 spaces per cabinet	
	Each space provides for a 1RU NTE (or equipment) and Small Cell	
	Each cabinet is approx. 1400 mm(h) (including plinth) x 400mm (d) x1800 mm (w)	
	The typical internal depth available for equipment is 350mm	
Cabinet environment	Maximum ambient temperature within the cabinet remains below 45°C at a maximum external ambient temperature of 35°C	
Equipment connectivity	1 pair of dark fibres per space (i.e. 2 per bay)	
Equipment power level	Maximum 5W per port, measured at the small cell antenna port	
Equipment mountings	2 sets of 19inch equipment mounting rails (front and rear)	
NTE	1RU maximum, if required.	
Power	Maximum aggregate power consumption per Space (Small Cell + NTE) 350W	
	One double 13A socket per space	
Standards	ICNIRP compliant	

To find out more about connected street infrastructure contact the sales team: sales@cellnextelecom.co.uk

### Why Cellnex?

Cellnex plays a key role within the telecoms sector enabling connectivity throughout Europe. In the UK, as the country's leading independent telecoms site partner, Cellnex provides critical national infrastructure & services to telecoms operators, emergency services organisations and many other enterprises.

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