Infrastructure Horizons: Broadband
A practical guide for contractors seeking to enter the broadband civil engineering sector.
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01
There are opportunities for contractors looking to become involved in the broadband market across the UK. The Westminster Government is working to ensure that in the next few years everyone in the UK is able to access broadband speeds of at least 2 megabits per second (Mbps) and 90 per cent of the UK receiving far greater speeds (at least 24Mbps).

In December 2013, a £10 million competitive fund in 2014 was announced by the government to market test innovative solutions that will deliver superfast broadband services to the most difficult to reach areas of the UK. The government has said that it will continue to support local bodies to develop appropriate strategies to procure additional coverage in areas not covered by current plans, using the £250 million allocated at the 2013 Spending Round.

Furthermore, faster mobile broadband will be rolled out to most areas following the auction of the 4G Spectrum.

Much has been done to clear the path to enable the roll out of broadband across the UK. Notably competing network providers can now purchase the use of BT infrastructure to channel broadband to customers. Within the sector the opportunities for contractors lie in upgrading and maintaining existing networks and in laying new fibre-optic broadband across the UK as a stepping stone to fully-fibred services (either to the home or premises). There will continue to be numerous opportunities in local and regional projects, within the mobile and satellite sectors, in public service networks and in utilities.

It was with this in mind that the Civil Engineering Contractors Association have undertaken the creation of a guide to the broadband sector for contractors who are looking to enter the market. While the toolkit is aimed at smaller firms, we hope that it will have a wider audience who may find its contents useful, whatever their position in the supply chain and experience level. The toolkit is intended to provide an overview of the sector, identifying the key players and the opportunities.

Given the number of organisations operating within the market, the information provided in this toolkit is not exhaustive, but is an attempt to provide a flavour of where opportunities lie within the sector. While contracts offered by larger companies will be evident, there will also be many small local projects. These are unlikely to be widely known so building up a network of key contacts, good relationships and monitoring local activity is essential.

We are indebted to the CITB for their sponsorship of the toolkit, and to all of those who have been involved in its preparation.
Civil engineering contractors looking to enter the broadband market will find that there are few new training requirements. Essentially the bulk of the work involves digging and filling in trenches, enabling ducts and laying fibre either to the premises or to the cabinet. Fibre cables are often ‘blown’ or ‘jetted’ through ducts and there is a range of additional skills associated with terminations and fibre-splicing. There will also be some construction opportunities within the roll-out of wireless networks.

Just as with other sectors, the procurement process in order to become part of a client supply chain for larger projects is demanding. Notably clients of all sizes will be keen to minimise cost and disruption and this is reflected in their supply chain requirements. Some contractors deploy advanced ground-cutting/micro-duct-laying systems to speed up deployment with minimal restatement works. Projects in rural areas often (in collaboration with local landowners) utilise the softer soil of tracks and field edges to reduce wayleave costs and rating levies.

### Fixed-Line Broadband

Research has found that the average fixed-line broadband download speed provided by UK residential connections has continued to increase. Compared to November 2012, average actual download speeds increased by 22 per cent. This represents a 64 per cent increase compared to the May 2012.

However, not all fibre-optic broadband is created equally. A fibre-optic customer may receive their service on a mixture of fibre-optic and copper wires in three different configurations: Fibre to the Cabinet (FTTC), Fibre to the Premises (FTTP) and Fibre to the Home (FTTH).

Fibre-optic broadband to the home or to the premises is essential for future proofed Internet. Previously ADSL technology was considered a substantial step forward compared to the first 56 Kilobit (K) dial-up connections. ADSL (and now Very High Speed Digital Subscriber Line – VDSL) is still used in combination with copper connections from a local cabinet.

Standard ADSL broadband is limited to 24 Mbps but VDSL with fibre-enhanced connections in the UK can provide users with download speeds reaching 100Mbps but with limited upload speeds and a performance that is dependent on the length and quality of the final copper line. These speeds are likely to increase and in the future, fibre-like speeds could be delivered to rural areas via fixed-wireless connection although some rural FTTH schemes are now proven to be viable.

“Just as with other sectors, the procurement process in order to become part of a client supply chain for larger projects is demanding.”
Who provides fixed-line broadband in the UK?
Currently the main suppliers are BT and Virgin Media; however there are many firms who provide the service based on BT’s network infrastructure. These companies often rely on Openreach for their civil engineering requirements.

Further detail about the companies which provide their own networks can be found below.

BT and Openreach
BT is the UK’s oldest communications company. BT is bringing fibre broadband to cities, towns and rural areas across the UK and aims to pass around two-thirds of UK premises by the end of 2015.

BT is the UK’s largest broadband provider with a 37 per cent share of the retail broadband market and, with a very large share of the wholesale broadband market, controls around 80 per cent of the total market.

In Great Britain Openreach provides services over the ‘local loop’ network (also referred to as the ‘local access network’ and the ‘first’ or ‘last’ mile). This is a critical national asset that comprises the copper and fibre connections between telephone exchanges and consumer and business premises. Openreach is also responsible for delivering the roll-out of BT’s mixed fibre/copper broadband network. In addition to delivering local loop services, Openreach provides backhaul services that connect exchanges to communication providers’ networks.

BT is regulated and must sell services to all communication providers on an open and equal basis.
Openreach provides access products to around 490 communications providers, including fixed and mobile operators and Internet Service Providers. Openreach’s largest customers include BT Retail, Sky and TalkTalk.

For those communications providers who wish to invest in building their own networks Openreach rents the copper access lines to the communications providers who put their own equipment in the exchanges. This is called Local Loop Unbundling (LLU). The competitive market place for broadband has stimulated growth in LLU.

Opportunities
Details about how to access the BT and Openreach supply chain can be found here: http://www.selling2bt.bt.com/index.htm
Carillion telent (Ct) are delivering a number of services for BT and Openreach associated with the maintenance and development of the telephone infrastructure, including civil engineering, cabling, heavy cable recovery and constructing the ‘Next Generation Access’ (NGA) infrastructure, as well as asset management and maintenance. Openreach’s NGA programme is of key strategic and revenue importance to BT plc providing millions of UK homes access to fibre-based superfast broadband.

Ct has consolidated Openreach’s previous regional supply chain into a national single delivery contract. Ct has around 600 staff that manages 2,500 strong field operatives across a supply chain that services the UK, excluding Northern Ireland.

Ct’s SOLO management system controls work flow through to the supply chain, following the processing and validation of job orders and creation of job packs. When works are completed on site, the job packs are updated and returned via SOLO, providing an efficient end-to-end process flow.

**Opportunities**

Details about how to access Carillion’s supply chain can be found here: [http://www.carillionplc.com/suppliers/prospective-suppliers.aspx](http://www.carillionplc.com/suppliers/prospective-suppliers.aspx)
Virgin Media delivers high-speed broadband Internet services to customers on its cable network to over 4 million residential subscribers. The company owns and operates its own fibre-optic and coaxial copper cable network, which is the only national cable network in the UK and is available to around 50 per cent of households.

The company was formed in March 2006 by the merger of NTL and Telewest. A later merger with Virgin Mobile UK in July 2006 created the first “quadruple-play” media company in the UK.

In early 2013 Virgin Media was taken over by Liberty Global creating Europe’s largest broadband business.

Opportunities

Details about how to access the Virgin Media supply chain can be found here: http://www.virginmedia.com/suppliers/
Fujitsu’s extensive technologies and expertise are easily applied to address a host of network requirements, across proven, ready-to-deploy applications and the development of bespoke solutions.

Covering Next Generation Network exchange deployments, as well as mobile and broadband backhaul requirements, and access network aggregation, the company delivers services over copper and fibre.

Opportunities

Details of the company’s supply chain policy can be found here: http://www.fujitsu.com/uk/about/local/corporate-responsibility/csr-report/supply-chain/
CityFibre Holding

CityFibre is the largest provider of fibre-optic infrastructure to the UK’s second tier cities.

With network in over 50 towns and cities and over 30,000 km of fibre in the ground, CityFibre provides Gigabit capable infrastructure for service providers, mobile operators, the public sector and businesses throughout the country.

CityFibre also operate a FTTH network in Bournemouth.

Opportunities

Further details can be found here: http://www.cityfibre.com/
Geo Networks

Geo has over 3,000 kms of fibre network in UK, connecting all major cities and commercial regions. The company specialises in bespoke networks for business and government users and has a presence at most major data processing centres.

For further details, visit:
http://www.geo-uk.net/projects/fibre-to-the-premises

Hyperoptic

Hyperoptic is building a new full fibre-optic network to premises. Currently, the company’s top speed today is one Gigabit per second. The company hopes to offer speeds of up to ten Gigabits per second in future.

For further details, visit:
https://hyperoptic.com/web/guest/home
Velocity 1

Velocity 1 provides next-generation broadband and entertainment services to consumers and businesses through high-speed optical fibre. Magnet Networks has a 90 per cent stake in the company. London urban regeneration specialist Quintain Estates retains a 10 per cent stake in Velocity 1.

For further details, visit:
http://www.velocity1.co.uk/

UK Broadband

UK Broadband is the UK’s largest commercial holder of national radio spectrum suitable for 4G mobile services and fixed wireless solutions. They switched on the first 4G LTE system for commercial services in the UK in February 2012 in London and now provide 4G LTE services in London, Reading, Swindon and Scunthorpe.

For further details, visit:
http://www.ukbroadband.com
Local Projects

Local projects are likely to include a variety of broadband solutions dependent on an area’s geography, location and population density. The information below is an attempt to provide an overview of where to find opportunities within the sector.

Broadband Delivery UK

Broadband Delivery UK (BDUK) is the lead team operating within the Department for Culture, Media and Sport (DCMS) to improve the UK’s broadband network. It has particular emphasis on making high-speed broadband available in rural communities.

BDUK is responsible for managing the rural programme, whereas local authorities and the devolved administrations are responsible for individual projects, as set out in BDUK’s delivery model.

The rural broadband programme will be delivered through numerous separate local projects with complex procurements. The lead local authorities will have responsibility for managing the procurement process (the devolved administrations will be responsible for the process in Scotland, Wales and Northern Ireland).

To help speed up the procurement process, BDUK has put in place a framework agreement, with input from a number of the pilot local authorities. Local authorities and other local bodies can run a mini-competition from the framework to select a specific supplier to deliver broadband services for a local project. The framework agreement will be between BDUK, as part of DCMS, and BT and Fujitsu, while each call-off contract will be between the relevant local bodies and a specific contractor. The framework will be suitable for the majority of local broadband projects – i.e., those looking for an investment gap-funded model.

For further details, visit:
https://www.gov.uk/broadband-delivery-uk
Connection Voucher Scheme

Small businesses in Belfast, Salford, Portsmouth, Cardiff, Derby, Bristol, Edinburgh, Newport, London and Manchester can now benefit from a £100m pot of money to connect them to better quality, high speed broadband. The broadband connection voucher scheme will be extended to 12 other cities around the UK in early 2014.

The scheme will allow businesses to apply for grants of up to £3,000 each to cover the costs of installing faster and better broadband, allowing them to offer customers faster service and increased reliability.

For further details, visit:
https://www.connectionvouchers.co.uk/
Local Enterprise Partnerships (LEPs) are partnerships between local authorities and businesses in England only. They decide what the priorities should be for investment in roads, buildings, facilities etc in the area. Most LEPs have a strong interest in broadband and it is advisable that civil engineering contractor companies build a relationship with key LEPs to keep abreast of local and regional opportunities.

LEPs can apply to become Enterprise Zones with superfast broadband. These zones can take advantage of tax incentives and simplified local planning regulations.

To date 39 LEPs have been created. A full list and map of LEPs and enterprise zones can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/11033/Map_of_enterprise_zones.pdf

The LEP Network has been created to enable LEPs to discuss issues of shared importance, engage with Government, and share knowledge and good practice.

For further details, visit:
http://www.lepnetwork.org.uk/
Independent Networks Cooperative Association

The genesis for the Independent Networks Cooperative Association (INCA) lies in the debate around Next Generation Broadband that began with the publication of the Broadband Stakeholder Group’s Pipedreams report in April 2007. This report demonstrated that a homogenous, national roll-out of NGA was unlikely given the costs and commercial risks involved for BT and other major operators. It was around this time that the idea of a ‘patchwork quilt’ of local initiatives to fill the gap was articulated.

INCA brings together many private sector suppliers, local authorities and community schemes encouraging information sharing, collaboration and partnership development.

The trade association runs a project called Marketplace that aims to link those offering consultancy, network development, equipment and other services, with those who need them.

For further details, visit:
http://www.inca.coop/
Rural Broadband Partnership

The Rural Broadband Partnership (RBP) was designed to support and enable the creation of community broadband projects across the UK and to act as a signposting agency to those already completed or under way.

For further details, visit:
http://www.ruralbroadband.com/

Community Broadband Network

Community Broadband Network (CBN) works with communities, local authorities and NGOs, both in the UK and internationally, to help develop community-focused, sustainable broadband networks.

For further details, visit:
http://www.broadband.coop/
KC

KC, formerly known as Kingston Communications provides a range of communications services to consumers and businesses in Hull and East Yorkshire.

For further details, visit:
http://www.kc.co.uk/

Digital Region

Digital Region provides South Yorkshire with superfast broadband coverage. It has built a 350 mile fibre-optic network across the entire region.

For further details, visit:
http://www.digitalregion.co.uk/
Scotland

Many areas of Scotland will be covered by Government funding and investment from those companies mentioned earlier in this booklet. However, as with England, there remain connectivity gaps. Scotland’s requirements are more challenging than in other parts of the UK, in part because of the country’s geography.

In July 2013 the Scottish Government signed an agreement with BT to help rollout fibre broadband to more remote areas. The Scottish Government is working with BDUK and local authorities to deliver this.

Community Broadband Scotland

Community Broadband Scotland aims to help kick-start community-led broadband projects in rural communities.

Local action is required because it is not usually commercially viable for mainstream broadband service providers to deliver superfast broadband to remote areas.

Details of projects can be found here: http://www.communitybroadbandscotland.org/index.php/home
The Welsh Government and BT are working in partnership on the Superfast Cymru programme to develop a superfast broadband infrastructure in Wales.

This is the largest partnership of its kind currently in the UK and a major infrastructure investment that will take around three years to complete. To introduce a high speed broadband infrastructure to rural areas on this scale is an immense engineering task - the programme will deploy around 3,000 new fibre broadband cabinets to bring superfast broadband to Wales.

For further details, visit:

The Enterprise Zone areas are a priority for the project as these are areas of economic importance for Wales. Superfast Cymru is working with each of the seven Enterprise Zones to identify their specific requirements. Following this, it will look to ensure Local Growth Zones (LGZs) are prioritised for roll-out.

For further details, visit:
http://ms.fs4b.wales.gov.uk/sub_sites/enterprise_zone_wales.aspx
A Competitive Fixed-Line Communications Market

The UK Competitive Telecommunication Association represents companies competing in the fixed-line communications market. These companies are likely to build and own their own networks. To become a member of UKCTA a company must own a fixed electronic network, be engaged in the provision of fixed electronic networks and services and other business activities.

The trade association has a small but significant membership list which can be found here: http://www.ukcta.org.uk/ukcta_members.htm. These companies have invested billions of pounds in developing advanced network infrastructures. They provide a full range of voice, data and Internet services that benefit millions of UK customers, both consumers and businesses.

From time to time these member companies will require civil engineering contractors. The membership of this trade association is not exhaustive to companies operating within this particular field and other companies who build their own networks include:

Geo http://www.geo-uk.net/

Vodafone http://www.vodafone.co.uk/

Hibernia Networks http://www.hiberniaatlantic.com/construction.html
Mobile Broadband

Mobile infrastructure is crucial for the delivery of broadband. Mobile use in the UK is at 92 per cent, with four in ten people already accessing the Internet using a mobile device, a proportion that is constantly rising as smartphones become the norm, and as more and more people have tablet computers.

Around two thirds of all mobile phone base stations in use in the UK are located on existing buildings and structures, including buildings, TV and radio transmission towers and existing mobile phone masts. By sharing existing structures, the mobile network operators reduce the need to build new masts on which to locate their equipment. A major trend in the mobile networks is towards the use of much smaller cell coverage areas (with Femto-cells) and these can often be integrated with street lighting upgrade schemes.

The way in which the UK’s mobile networks are deployed has changed dramatically in recent years. There are now two, rather than five, organisations planning and building mobile networks in the UK. This has resulted in a far greater amount of sharing, and an increase in the types of sharing, that occur across the mobile phone networks.

The two companies involved in the mobile broadband market are Mobile Broadband Network Limited (MBNL) and Cornerstone. MBNL is the joint venture management company created by 3UK and T-Mobile (now EE). Cornerstone combines O2 and Vodafone.

Despite the establishment of these two organisations, procurement opportunities remain with individual companies.

4G

The communications regulator Ofcom has completed the award process for the 4G spectrum auction. Licences have been issued to five operators allowing them to deploy 4G services.

This was the largest mobile spectrum auction ever to take place in the UK with the space on offer equivalent to three quarters of the current mobile spectrum.

An update on the deployment of 4G services can be found here: http://www.pcadvisor.co.uk/features/broadband/3424488/4g-lte-network-rollout-in-uk/
Satellite Broadband

Internet access can be provided through satellites. Today, satellite Internet service is typically provided through geostationary satellites with the latest satellites achieving speeds up to 18 Mbps. For many organisations and consumers in areas of poor connectivity, satellite broadband can be a viable solution.

The main advantage of satellite broadband is that it can be provided virtually anywhere in the world.

There are various providers who offer satellite broadband services, but many resell the services of existing satellite operators. There are currently four main providers of satellite broadband in the UK: Tariam, Eutelsat, Avanti and Astra.

These companies have retail channel partners who may outsource installation work. They have a heavy duty market in the business sector where they provide ‘resilience’ (network back-up in case of land-based network failures) and they are also very active in very remote places – e.g. parts of Africa and offshore.
The Public Services Network (PSN) is rationalising government communication services, based on industry standards, and is setting up a more open and competitive ICT marketplace to save money in the public sector. This will enable citizens to benefit from more joined-up public services.

Details can be found here: https://www.gov.uk/public-services-network

Opportunities will arise via members of the PSN governing body. Details here: http://psngb.org/

A similar body is in operation in Wales. The Public Service Broadband Aggregation (PSBA) project has been a major collaboration activity across the Welsh Public Sector starting in 2004. This has resulted in the creation of the PSBA Partnership which is the name that is applied to all of the Public Sector bodies who are financing and using the PSBA Network. Details here: http://www.psba.org.uk/index.aspx

The Scottish Wide Area Network (SWAN) Programme is designed to deliver a single, holistic public services network available for the use of any, and potentially all, public service organisations within Scotland.

The aim of the SWAN initiative is to enable infrastructure and service sharing. SWAN will, over time, replace the existing model where individual organisations procure, implement and maintain their own network infrastructure.

The SWAN initiative is strategically aligned with the McClelland Review of Scottish Public Sector ICT Infrastructure, taking forward its recommendations on public sector collaborative procurement, aggregation of network demand and use of common standards.

The SWAN procurement process has already begun and an OJEU Notice was issued on 19 October 2012. The process is being led by the NHS and a number of other authorities who have formed a ‘Vanguard’ of organisations who are committed to enter into a contract with the supplier immediately following conclusion of the Framework Agreement.

The target date for a contract to be in place is September of 2013 and the service is expected to ‘go live’ in April 2014. For more information contact Andrew Williamson at: andrew.williamson@scotland.gsi.gov.uk
The Government is requiring energy companies to install smart meters for their customers. Smart meters for gas, electricity and water will record consumption and will frequently relay that information to utility companies.

Most households will have smart meters installed by their energy company between 2014 and 2019, although some energy companies are starting to install smart meters now.

Most of the smart meters that are currently being installed use mobile phone-type signals to send meter readings to energy companies, and other wireless technologies to send information to the in-home display. However, there are a number of other technologies available.

Further information can be found here: https://www.gov.uk/smart-meters-how-they-work
Channels to Market

A substantial section of this toolkit has been dedicated to projects where public funds are involved, and in these cases the procurement processes can be onerous. However, as we have also indicated, the opportunities are much wider than this and those keen to enter the broadband market need to gain visibility in places where project managers and investors gather.

Below are links to the key conferences within the field. All of these attract a number of exhibitors who engage in civil works related to fibre deployments or who project manage many of the local schemes.

Digital Scotland conference: http://www.nextgenevents.co.uk/events/digital-scotland-2013

Intelligent Cities conference: http://www.nextgenevents.co.uk/events/intelligent-cities-conference

NextGen13: http://www.nextgenevents.co.uk/events/nextgen-13

For those who develop strong expertise (and are export minded), there will be opportunities through the FTTH Council Europe: http://www.ftthcouncil.eu/

The property development industry also has a burgeoning interest in fibre deployment. Developers keen to differentiate their offerings are quite often inclined to provide independent local digital infrastructures.
Skills and Quality

As suggested above, requirements for civil engineering contractors entering this field are not as stringent as in other sectors. The table below outlines the expertise levels that may be required for fibre broadband.

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<th>FTTP</th>
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<td>Cable recovery</td>
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<td><strong>Jointing</strong></td>
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<td>Fibre lay out and jointing</td>
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Infrastructure Horizons

Infrastructure Horizons online

CECA’s *Infrastructure Horizons: Broadband* guide represents an overview of the sector and its relationship with its civil engineering supply chain at a given point in time.

Given the fast pace of change in the sector, it is essential that this guide is updated regularly to detail the latest developments that occur, whether it be in terms of new opportunities coming to the market, changes in the existing client base, or new thinking in relation to any of the issues covered by the guide.

For this reason, CECA will be reproducing all of the CECA Infrastructure Horizons series online at:

www.ceca.co.uk/infrastructurehorizons.

This will allow appropriate updates and amendments to be made as and when they occur. Access to the website will be free to the public.

For further information, please contact CECA director of external affairs Alasdair Reisner on 0207 340 0454, or e-mail alasdairreisner@ceca.co.uk.

*Infrastructure Horizons* is a series of guides prepared by CECA to provide contractors with a snapshot of emerging markets in the UK. The series has been undertaken with the generous support of the Construction Sector Skills Council the CITB.

About CECA

The Civil Engineering Contractors Association is the representative body for companies who work day-to-day to deliver, upgrade, and maintain the country’s infrastructure. With more than 300 members split across eight regions, CECA represents firms who together carry out an estimated 70-80 per cent of all civil engineering activity in the UK, in the key sectors of transport, energy, communications, waste and water.

www.ceca.co.uk

About the CITB

The CITB is the Sector Skills Council and Industry Training Board for the UK’s construction industry, working with industry, for industry, to deliver a safe, professional and fully qualified UK construction workforce. The CITB works with construction companies to help them improve skills, increase their competitive edge, and respond to the many challenges employers face - from the low-carbon agenda, through to reducing costs on-site and recruiting the best and brightest talent for their sector.

www.cskills.org