

**Land south and east
of Adastral Park**
Suffolk

*Service Supply
Statement*

March 2017



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10391-SU-01

Executive Summary

The proposed development Site boundary measures an area of approximately 113.3ha and comprises of land to the south and east of Adastral Park (which is to be retained) to the north and north-west. The Site is bound to the west by the A12 and to the north-west by Barracks Square, Gloster Road and Belts Avenue, which form boundaries to Adastral Park. The south of the Site is bound by Newbourne Road and Ipswich Road, with the east of the Site bound a by a footpath which separates the current agricultural land.

Anglian Water (AW) operate potable water distribution mains, **UK Power Networks (UKPN)** operate High Voltage (HV) cables and **BT Openreach** operate cables along and/or off the A12 to the south-west of the proposed development. AW also operate Foul Water, Surface Water and potable water mains, **National Grid (NG)** operate Low Pressure (LP) gas mains, UKPN operate HV and LV cables and BT Openreach own apparatus north-west of the proposed development within Adastral Park.

HV, LV and 33kV overhead cables operated by UKPN, BT Openreach apparatus are shown cross the proposed development. A 15" potable water main operated by AW is shown off the A12 which may cross the proposed development along with a Virgin Media cable BT Openreach cable and HV mains. Once at the detailed design stage, the companies which may be affected by the proposed development can be contacted to determine whether any diversions and/or protection works of their existing apparatus are required.

Each incumbent company, along with the multi-utility companies GTC and TriConnex, have been consulted in regards to supplying the proposed development. A summary of their indicative costings is provided in Table 1a.

Utility Company	Service	Budget Estimate
Anglian Water	Potable Water	<p>Confirm proposed development can be supplied from the existing 15" AC water main (TM2483345115) located at land at Adastral Park, Martlesham off Barracks Square.</p> <p>Discounted Aggregate Deficit (DADs) contribution of £498,737.00.</p>
Anglian Water	Foul Sewerage	<p>Confirm that a direct connection to the public foul sewerage system is likely to have a detrimental effect on the existing network. AW has undertaken modelling for the proposed development and outline a proposed solution of:</p> <ol style="list-style-type: none"> 1) Providing storage of 352m³ at Martlesham - BT. Research SP, west of the proposed development. 2) Upsizing Martlesham - B.T. Research SP from 25l/s to 50l/s and increasing the existing emergency storage by 237m³, west of the proposed development. 3) Providing offline storage of 781m³ off Felixstowe Road at Martlesham - Hilton RD SP, north of the proposed development. 4) Providing offline storage of 174.5m³ in green area adjacent to Main Road, north of the proposed development. <p>An estimated cost for the proposed off-site reinforcement solution is £1,898,398, with an indicative developer contribution of £347,802.</p> <p>Confirm that the foul drainage from the proposed development is within the catchment of Woodbridge Creek FM Water Recycling Centre. And has current capacity to treat the flows from the proposed development.</p>

UK Power Networks	Electricity	£6,429,150.00 to supply the proposed development, which includes reinforcing Martlesham Primary with 20/30MVA 33/11kV transformers, installing 11kV switchgear, plus ancillary equipment, installing 11kV cable from Martlesham Primary to and around the Site and installing 2,5000 house services (230V) and 4x11kV supplies for the commercial.
National Grid	Gas	Insufficient capacity to the 125mm PE Medium Pressure main approximately 736m north of the proposed development. As part of their capacity assessment, NG are unable to provide further details with regards to potential budget estimate costs for reinforcements. However, further details may be offered as part of TriConnex's multi utility budget estimate.
GTC (Multi Utility)	Electricity, Gas	£3,626,049.65 Offsite Total = £2,864,441.55 Onsite Total = £761,608.10 The electricity Point of Connection is to the high voltage network, and it has been confirmed that there is a requirement for upstream offsite reinforcement to the Martlesham Primary Substation to facilitate the Point of Connection. The gas Point of Connection is to the 125mm PE MP gas main situated adjacent to the junction of Barrack Square and Gloster Road, north west of the proposed development.
GTC	Fibre Optics	£412,500.00
GTC	Fibre Optics with FIRS	£275,000.00
TriConnex (Multi Utility)	Electricity, Gas and Potable Water	£9,331,915.24 Offsite Total = £4,195,915.48* Onsite Total = £5,135,999.76 The electricity Point of Connection is to the 11kKV UK Power Networks cable close to the Martlesham Primary Substation within the footway of Betts Avenue. The gas Point of Connection is to the 125mm PE Medium Pressure Gas located within the footway of Gloster Road, near the bell mouth of Barrack Square. An assumed Point of Connection has been made to the existing Anglian Water distribution main in Barrack Square, onsite.

Table 1a: Summary of Supply Budget Estimates (Based on a maximum development quantum of Up to 2,500 dwellings)

*Excluding Potable Water

This statement demonstrates that the Proposed Development has the potential to be supplied with normal network service supplies. However, some localised, non-prohibitive reinforcements may be necessary along with protection or diversions where existing plant apparatus is affected. This will be confirmed once all enquiries have been completed by each respective utility company and once at the detailed design stage.

1 Introduction

- 1.1 Brookbanks Consulting Limited is appointed by Carlyle Land Ltd and Commercial Estates Group to complete a Service Supply Statement for a proposed mixed use development at land south and east of Adastral Park, Martlesham.
- 1.2 The objective of the study is to demonstrate that the development proposals may adequately be provided with service supplies and to identify the outline requirement for any necessary reinforcements to existing networks.
- 1.3 This report presents the findings of the study and specifically addresses the following issues:
 - Existing network apparatus
 - Supply requirements for the Proposed Development
 - Consultations with the incumbent supply network operators
 - Development of outline proposals to supply the Proposed Development.

2 Background Information

Location & Details

- 2.1 The proposed development Site boundary measures an area of approximately 113.3ha and comprises of land to the south and east of Adastral Park (which is to be retained) to the north and north-west. The Site is bound to the west by the A12 and to the north-west by Barracks Square, Gloster Road and Belts Avenue, which form boundaries to Adastral Park. The south of the Site is bound by Newbourne Road and Ipswich Road, with the east of the Site bound a by a footpath which separates the current agricultural land. The Site boundary, outlined in red, is shown below in Figure 2a:
- 2.2 The proposed development area is outlined in red, as shown on Figure 2a, below:

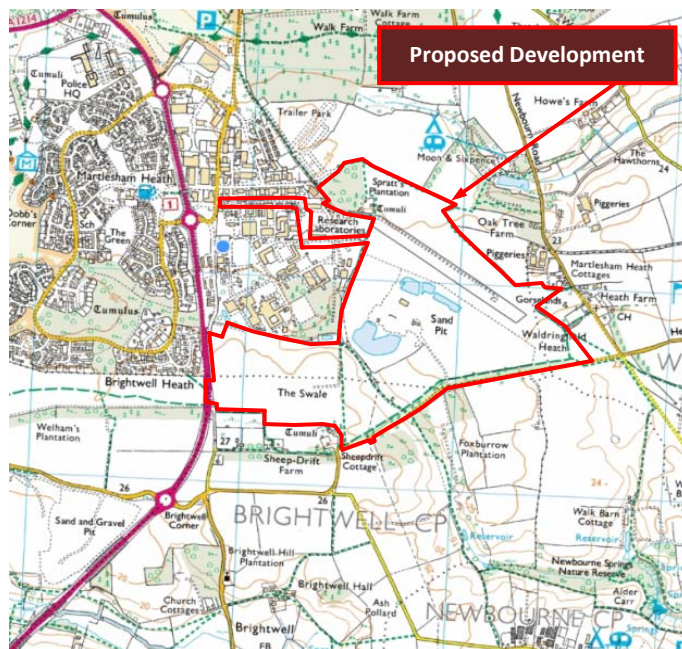


Figure 2a: Site Location

Development Criteria

- 2.3 Outline application for up to 2,000 dwellings, an employment area of c0.6ha (use Class B1), primary local centre (comprising use classes A1, A2, A3, A4, A5, B1, C3, D1 and D2), secondary centre (comprising possible use Classes A1, A3, A5 and D2), a school, green infrastructure (including Suitable Accessible Natural Green Space (SANGS), outdoor play

areas, sports ground and allotments/community orchards), public footpaths and cycleways, vehicle accesses and associated infrastructure.

Supply Loading

- 2.4 The following loading assumptions (Table 2b), have been made to determine the Supply loadings to provide to the incumbent potable water, electricity and gas suppliers, based on a *maximum* development quantum (which comprises potentially up to 2500 dwellings and employment). The assessment has been carried out for a higher number of homes proposed in order to ensure a robust conclusion.

Development Type	Potable Water Assumptions	Foul Water Assumptions	Electricity Assumptions	Peak Gas Assumptions	Annual Gas Assumptions
Up to 2,500 Residential Dwellings	Daily Water Demand of 125l/person/day over an 18 hour day. Peaking Factor of 3	Assuming 95% of the Potable Water Demand	2KW/Dwelling	23kW/Dwelling	17,000kW/Dwelling
B1 Employment	Daily Water Demand of 45l/person/day over an 8 hour day. Peaking Factor of 3	Assuming 95% of the Potable Water Demand	80W/m ²	80W/m ²	180kW/m ²
A 7-Form Entry all through School	Daily Water Demand of 15l/person/day over an 8 hour day. Peaking Factor of 3	Assuming 95% of the Potable Water Demand	50W/m ²	87W/m ²	150kW/m ²

Table 2b: Supply Loading Assumptions

- 2.5 Following the assumptions made above, Table 2c below outlines the supply loadings which have been provided to each incumbent utility company (Anglian Water, UK Power Networks and National Grid) in order for them to confirm whether they have capacity in their existing network to supply the proposed development.

Development Type (Area)	Peak Potable Water Demand (l/s)	Peak Foul Water Demand (l/s)	Electricity Demand (kVA)	Peak Gas Demand (kWh)	Annual Gas Demand (kWh)
Up to 2,500 Residential Dwellings	33.28	31.61	5,000	57,500	42,500,000
B1 Employment	1.95	1.86	1,200	1,200	2,700,000
7 Form Entry all through School	0.87	0.82	138	239	412,500
Total	36.1	34.29	6,338	58,939	45,612,500

Table 2c: Supply Loadings

Sources of Information

2.6 The following bodies have been consulted whilst completing this study:

- Anglian Water - Potable Water
- Anglian Water - Foul Water Sewerage
- UK Power Networks - Electricity
- National Grid - Gas
- BT Openreach - Telecommunications
- Sam Knows Website - Broadband Availability
- Multi Utility Company – GTC - Electricity and Gas
- Multi Utility Company – TriConnex - Potable Water, Gas and Electricity

3 Water Supply

Existing Conditions

- 3.1 **Anglian Water (AW)** has been consulted regarding the location and capacity of their existing network within the vicinity of the Site. Existing details of their water supply network has been provided and transferred to a composite existing services plan, which is contained in the Appendix.
- 3.2 AW operates a 15" AC potable water mains to the west of the proposed development off the A12, where the main may cross the proposed development in the south-west. Further assets (200mm AC potable water mains) are shown to the north-west of the proposed development along Barracks Square and Betts Avenue within Adastral Park.
- 3.3 Additionally, AW operates 15" AC potable water mains south of the proposed development along Newbourne Road and Ipswich Road, along with a 3" AC off an access road.
- 3.4 Further assets are shown to the west of the proposed development supplying the residential dwellings.

Supply Loading

- 3.5 To assist Anglian Water in their capacity assessment of their existing network, a total Peak Clean Water Demand of 37.35l/s was provided. Further details of the supply loadings and assumptions are outlined in Tables 2b and 2c.

Network Requirements

- 3.6 AW confirm that the proposed development can be supplied from the existing 15" AC water main (TM2483345115) located at land at Adastral Park, Martlesham off Barracks Square. A 280mm main has been modelled with 2,500 standard 25mm connections assumed for the domestic dwellings, a 63mm connection with a 40mm meter for the Employment and a 50mm connection with a 25mm meter for the proposed school.
- 3.7 In order for AW to supply the proposed development whilst maintaining the performance of the existing network, it will be necessary to install approximately 781mm of 355mm HPPE main to reinforce the existing 15" GI main from grid reference: TM2099744653 to grid reference: TM2108944604 and from grid reference: TM2125144534 to grid reference: TM2186044269 at an approximate cost of £258,612.00
- 3.8 In addition to the £258,612.00 for reinforcement works, the estimate onsite water mains is estimated at £1,500,000.00 with a total cost for providing the water infrastructure of £1,758.612.00.
- 3.9 AW outline a Discounted Aggregate Deficit (DADs) contribution of £498,737.00.

Diversions – onsite

- 3.10 AW operates a potable water mains which may cross the proposed development. AW outline easements of a 363mm potable water main is 3m either side of the main and for the 75mm potable water main of 2.25m either side of the main. Once confirmed at the detailed design stage, AW could be contacted to confirm whether any necessary diversions will be required.

Diversions – offsite

- 3.11 AW operate potable water mains within Adastral Park and off the A12. Once confirmed at the detailed design stage, AW could be contacted to confirm whether any necessary diversions will be required.

Regulatory Background

- 3.12 The introduction of the Water Act 2003 has:
- Formalised the procedures for developers wishing to complete self-lay schemes through multi-utility businesses.
 - Implemented revised financial procedures, being more developer focused by offsetting capital costs of infrastructure against supply revenue.
- 3.13 The result is that the provision of water and drainage infrastructure for new developments is now cheaper.
- 3.14 Under current regulations, the new off-site and on-site infrastructure can be implemented by multi-utility contractors, with the exception of a small element of non-contestable works where the new supply is connected to the existing network. Alternative asset owning businesses are able to implement and supply a strategic area through an Inset Appointment. Alternative asset owners normally procure the water supply through a bulk supply contract with the incumbent business or by an alternative means of supply such as a borehole.
- 3.15 The Water Act 2003 allows two principal options in terms of financial arrangement between the developer and water infrastructure business. Both take into account the revenue earned by the business as a result of the new supplies.

- The Discounted Aggregate Deficit (DAD) / Commuted Sum method calculates the cost of implementing and funding the required infrastructure over a ten year period. The year on year income from new supplies is then offset against the funding, which when brought forward to an equivalent present day cost, identifies the contribution attributed to the developer. The mains are then installed by the water infrastructure company.
- The Asset Value method, whereby the mains may be laid by a multi-utility contractor, calculates the year on year income generated from the water supply, which is then paid back to the developer on the adoption of the mains. As a multi-utility contractor generally completes the work at a lower cost than the water supplying company, the Asset Payment method can often be the most cost effective.

3.16 The procedures outlined in the Water Act 2003 should result in all water businesses (including the incumbent operator) giving similar rebates through either the Asset Value or Commuted Sum procedures. The Asset Value method generally offers a cheaper scheme for site developers wishing to procure services through a multi-utility contract.

4 Foul Water Sewerage and Storm Water Drainage

Existing Conditions

- 4.1 **Anglian Water (AW)** has been consulted regarding the location and capacity of their existing sewerage network within the vicinity of the Site. Existing details of their Foul Water supply network has been provided and transferred to a composite existing services plan, which is contained in the Appendix.
- 4.2 AW operate Foul Water, Surface Water and Foul Rising mains within the vicinity of the proposed development. A 200mm Foul Rising Main is shown to the north-east of the proposed development and may potentially cross the Site. Additionally to the east of the proposed development, 100/125/200mm Foul Rising Mains are shown. In addition a 225mm Foul Water main is shown to the east of the proposed development along Newbourne Road.
- 4.3 A 200mm Foul Water and 200mm Foul Rising main are shown off the A12 to the north-west of the proposed development. In addition Foul Water and Surface Water mains are shown to the north-west of the proposed development within Adastral Park.
- 4.4 AW also operate apparatus to the west and north-west of the proposed development supplying the residential development off the A12.

Supply Loading

- 4.5 To assist Anglian Water in their capacity assessment of their existing foul network, a total Foul Water demand for the site of 35.45 l/s was provided. Further details of the supply loading and assumptions are outlined in Tables 2b and 2c.

Network Requirements

- 4.6 AW has assessed the proposed development and have outlined that a direct connection to the public foul sewerage system is likely to have a detrimental effect on the existing network. AW confirm that the foul drainage from the proposed development is within the catchment of Woodbridge Creek FM Water Recycling Centre. It has been confirmed that this currently has capacity to treat the flows from the proposed development. However it is highlighted that they cannot reserve the capacity at the Water Recycling Centre.

- 4.7 AW has undertaken further hydraulic modelling to provide a solution to drain foul flows from the proposed development. It has been confirmed that the foul flows from the Site drain to the Woodbridge-Creek Water Recycling Centre located to the north of the proposed development.
- 4.8 The proposed connection Point is the Martlesham- B.T. Research SP pumping station, manhole MAPOSP (TM2483444782) located off Barrack Square, immediately west of the proposed development. A review of the topography indicates that a gravity connection is not feasible, and will therefore require a pumping regime.
- 4.9 The detrimental effect to the sewerage system therefore requires a mitigation solution. AW has provided mitigation solutions to prevent detriment to the existing sewerage network performance during a 1 in 30 year critical duration storm event. The proposed solution comprises of:
- 1) Providing storage of 352m³ off Barrack Square at Martlesham - B.T. Research SP west of the proposed development.
 - 2) Upsizing Martlesham - B.T. Research SP from 25l/s to 50l/s and increasing the existing emergency storage by 237m³, west of the proposed development.
 - 3) Providing offline storage of 781m³ off Felixstowe Road at Martlesham - Hilton RD SP, north of the proposed development.
 - 4) Providing offline storage of 174.5m³ in the green area adjacent to Main Road north of the proposed development.
- 4.10 AW consider the above mitigation to be a feasible solution for planning application purposes. A detailed design would be required to investigate the solution further.
- 4.11 The estimated cost for the offsite reinforcement works is £1,898,398. The indicative cost chargeable to the developer for the required mitigation option outlined within the modelling, following the offsetting of expected future revenue is predicted to be £347,802.
- 4.12 Once at the detailed design stage, alternative solutions to the outlined mitigation could also be considered such as, pumping the development flows directly to the WRC could be another feasible option, however this was significantly more costly, so was not taken any further.

Diversions – onsite

- 4.13 AW operates a Foul Water Main and potentially a Foul Water Rising Main are shown to potentially cross the north-east of the proposed development. AW confirm that the 200mm public Foul Sewer has an easement of 3m either side of the main. Once at the detailed design stage AW could be contacted to confirm whether any necessary diversions will be required.

Diversions – offsite

- 4.14 AW operates a Foul Rising Main to the north-east of the proposed development and further assets are shown within Adastral Park. Once at the detailed design stage AW could be contacted to confirm whether any necessary diversions will be required.

Storm Drainage

- 4.15 The means to discharge storm water drainage on site will be dealt with via Sustainable Drainage Systems (SuDS) and therefore no connection to Anglian Water storm water drainage is proposed. Further information can be provided within a Flood Risk Assessment report.

5 Electricity Supply

Existing Conditions

- 5.1 **UK Power Networks (UKPN)** has been consulted regarding their existing network locations. Existing details of the electricity supply network have been provided and transferred to a composite existing services plan, which is contained in the Appendix.
- 5.2 UKPN operate existing High Voltage (HV), Low Voltage (LV) and 33kV Overhead networks which are crossing the centre of the proposed development. Additionally, HV apparatus operated by UKPN are shown to the south-west of the proposed development which could potentially cross the A12.
- 5.3 Additionally UKPN operate HV and LV networks to the north-west of the proposed development within Adastral Park and within the residential dwellings to the west of the proposed development. HV networks are shown to the north-east of the proposed development.

Supply Loading

- 5.4 To assist UKPN in their capacity assessment of their existing network, a total Electricity Demand for the Site of 6,553kVA was provided. Further details of the supply loading and assumptions are outlined in Tables 2b and 2c.

Network Requirements

- 5.5 UKPN has provided a budget estimate of 6,429,150.00 to supply the proposed development with a Point of Connection to the Martlesham Primary substation (TM24934537).
- 5.6 The budget estimate provided by UKPN includes the reinforcement of Martlesham Primary with 20/30MVA 33/11kV transformers. UKPN will also install 11kV switchgear, plus ancillary equipment along with 11kV cable from Martlesham Primary to and from the Site.
- 5.7 UKPN will also install 2,500 house services (230V) and four 11kV supplies for the commercial.

Diversions – onsite

- 5.8 UKPN operate HV, LV and 33kV Overhead networks which are shown to cross the proposed development. A diversionary request was submitted to UKPN for the diversion of the overheads, which cross the proposed development. UKPN has provided a diversionary budget estimate of £1,220,00 (plus VAT), for the diversion of the 33kV overhead lines which cross the proposed development.
- 5.9 UKPN's estimate includes for the undergrounding of the dual circuit 33kV overhead line across Adastral Park into Martlesham Primary Substation. UKPN also outline that a shorter option may be possible once the Site routes are known.
- 5.10 It is also outlined that there may be a need to overlay the existing 33kV cables to provide reinforcement for new load on the Site, and therefore UKPN included for larger cables and a longer route.

Diversions – offsite

- 5.11 UKPN operate HV networks along the A12 which are shown to potentially cross the proposed development. Further HV and LV assets are shown within Adastral Park to the north-west of the proposed development. Once at the detailed design stage UKPN could be contacted to confirm whether any necessary diversions will be required.

Regulatory Background

- 5.12 Competition in the electrical market is now reasonably mature and a developer is free to procure third party DNOs to provide an embedded network, or indeed multi-utility / third party installations. The likes of Metropolitan and GTC take a holistic view in putting together infrastructure reinforcements, site distribution and supply packages and off-set the costs with anticipated future revenue through the transmission and supply of service to give a better financial arrangement and single point of responsibility for the developer.

6 Gas Supply

Existing Conditions

- 6.1 **National Grid (NG)** has been consulted regarding the location of their existing network in the vicinity of the Site. Existing details of the gas supply network have been provided and transferred to composite existing services plan, which is contained in the Appendix.
- 6.2 NG operate a Medium Pressure (MP) gas main to the north-west of the proposed development along the A12, with Low Pressure (LP) gas mains to the north-west within Adastral Park.
- 6.3 Further LP assets are shown to the west of the proposed development supplying the residential development.
- 6.4 NG also operates a High Pressure (HP) gas main approximately 480m east of the proposed development within Waldringford golf course. Consultation with the HSE confirms an Inner, Middle and Outer Consultation Zone distance of 14m, and will therefore not affect the proposed development.
- 6.5 **GTC** also operate LP gas mains to the north of the proposed development along Roma Avenue, Turino Avenue and Milano Avenue.

Supply Loading

- 6.6 To assist NG in their capacity assessment of their existing network, a Total Peak Gas Demand for the Site of 57,100kWh and an annual gas demand of 46,498,880kWh was provided. Further details of the supply loading and assumptions are outlined in Tables 2b and 2c.
- 6.7 **Network Requirements** NG has confirm that there is insufficient capacity to the nearest main (125mm PE MP) approximately 736m north-west of the proposed development off Gloster Road.
- 6.8 As part of their capacity assessment, NG are unable to provide further details with regards to potential budget estimate costs for reinforcements. However, further details may be offered as part of TriConnex's multi utility budget estimate.

Diversions – onsite

- 6.9 No NG apparatus are shown to cross the proposed development.

Diversions – offsite

- 6.10 NG operates LP gas mains within Adastral Park north-west of the proposed development. Once at the detailed design stage NG could be contacted to confirm whether any necessary diversions will be required.

Regulatory Background

- 6.11 Early deregulation in the gas infrastructure market has led to a competitive environment. Third party shippers are permitted to offset the capital cost of infrastructure against the income generated from conveying the gas which may reduce future development costs.

7 Telecommunications

Existing Conditions

- 7.1 The main incumbent telecommunications provider is **BT Openreach**. An extract from their asset plans is shown within the Appendix, which shows an existing network which crosses the proposed development in the west and centre of the proposed development. Additional BT assets are shown to the north-west of the proposed development within Adastral Park and to the east along Newbourne Road.
- 7.2 Further BT Openreach assets are shown to the west of the proposed development supplying the residential development. BT Openreach has also advised that they own additional apparatus within Adastral Park and they will need to be contacted prior to any works commencing to obtain their assets in this area.
- 7.3 **Virgin Media** also operate assets within the vicinity of the proposed development. Virgin Media assets are shown to the west of the proposed development along the A12, where this may cross the proposed development to the south-west.

Supply Requirements

- 7.4 A development of this nature will require a suite of communication services, typically being:

FTTP: Fibre to the Premises (FTTP) technology, where the fibre runs all the way to the home or business, from the local exchange is being deployed in certain areas. FTTP will offer the top current download speed of 330Mbps for residential properties and 1Gbps for commercial properties. This is labelled 'Ultrafast Broadband' by BT Openreach.

ADSL: Asymmetric Digital Subscriber Line (ADSL) is the basic broadband service delivered over the traditional copper network and predominately in use in rural areas offering up to 24Mbps downloads, and up to 2.5Mbps upstream. This is adversely affected by distance from the exchange.

Cable Television: Cable television services provide an option for the proposed domestic dwellings to replace the need for satellite dishes. Cable Television is provided by Virgin Media, BT (BT Vision) and GTC.

FTTC: Fibre to the Cabinet (FTTC) relies on the existing copper network between the telephone cabinets but is then fed by fibre optic cables to the local exchange. This reduces the loss experienced over the copper network. Download speeds offered can be up to 80Mbps.

LLU: Local Loop Unbundling (LLU) is the process of opening up a telephone exchange so that it can be used by a number of different broadband providers. These broadband providers are then able to use connections from the telephone exchange through to the customer's homes to deliver home broadband.

ISP: Internet Service Providers (ISP) supplies the end user with internet access services over the telecom network. The speeds offered by the ISP are restricted by the physical network. The available ISPs delivering services over FTTP are currently limited but will increase as it is rolled out to more customers to increase the market.

Network Requirements

7.5 A Connectivity Assessment can be applied for through BT Openreach to confirm supply requirements for the proposed development. BT Openreach advise the ideal time for this request is at land purchase stage. The majority of the proposed development is covered by the Waldringfield exchange. In addition to BT Openreach, ADSL, an initial review has identified no LLU operators are present in the Waldringfield exchange. The south-west of the proposed development is covered by the Kesgrave exchange. In addition to BT Openreach, ADSL, and Virgin Media an initial review has identified the following LLU operators are present in the Kesgrave exchange: Sky, Talk (CPW) and Vodafone.

7.6 The Waldringfield exchange (approximately 2.1km east of the proposed development) can offer FTTC in some areas. The Kesgrave exchange (approximately 3.5 km west of the proposed development) can offer FTTC and FTTP in some areas.

7.7 The Multi-Utility company GTC has provided an offer to supply the residential dwellings with ultra-fast fibre optic network.

GTC (Ultra-Fast Fibre Optic Network)

7.8 GTC has provided an installation offer for the Fibre Optic Distribution Network to the proposed dwellings at £412,500.00. The cost is payable to GTC.

7.9 GTC has undertaken a detailed network assessment and report that the current speeds available for the future homeowners will be 300Mbps.

GTC (Ultra-Fast Fibre Optic Network with Fibre Integrated Receiver System)

7.10 GTC has provided an installation offer for the Fibre Optic Distribution Network, with the provision of a single Fibre Integrated Receiver System (FIRS) to the proposed residential dwellings at £275,000.00. The cost is payable to GTC.

7.11 GTC has undertaken a detailed network assessment and outline that current speeds available for the future homeowners will be 300Mbps.

7.12 The offer includes the provision of FIRS. GTC outline that the FIRS system provides Freeview™, DAB and FM radio and Sky TV from a central dish and aerial array into every property on the development over GTC's fibre optic network.

Diversions – onsite

7.13 BT Openreach operate apparatus which cross the proposed development. Once at the detailed design stage, BT Openreach may be contacted to confirm whether any necessary diversions of their existing assets are required.

Diversions –offsite

- 7.14 BT Openreach own apparatus within Adastral Park and Virgin Media own apparatus along the A12 which may cross the proposed development. Once at the detailed design stage, BT Openreach and Virgin Media may be contacted to confirm whether any necessary diversions of their existing assets are required

Regulatory Background

- 7.15 BT Openreach is the incumbent national communications business throughout most of the country, with the exception of K-Com in the Hull area. They own and operate the majority of fibre and copper telecoms networks in the country.
- 7.16 With BT Openreach controlling the existing cables feeding residential development, and the exchange (known as the 'local loop' or 'last mile'), they have maintained a dominant position in controlling the communications sector.
- 7.17 The industry regulator, Ofcom has completed much work in unbundling the local loop and bringing competition into the residential market. Following this deregulation, Virgin Media, TalkTalk and Vodafone are undertaking major investment to place switch equipment into BT's existing exchanges and hence allow direct access to their network. This system, known as Carrier Pre-Selection is becoming increasingly popular, although wholesale line provision down at local loop level, within the residential market, has yet to develop. Accordingly, BT or local cable franchise cable operators are the prime source of network connections on residential sites.
- 7.18 Virgin Media and GTC offer rival options to supply telecoms to residential developments, although the choice of alternative ISPs is more restricted than via the BT Openreach network.

8 Multi Utility Companies

- 8.1 The Multi Utility Companies **GTC and TriConnex** have been consulted to provide a budget estimate for supplying the proposed development with gas and electricity (and potable water where possible).

Supply Loading

- 8.2 The same gas loading assumptions that were provided to NG and electrical loading assumptions that were provided to UKPN have been provided to GTC and TriConnex in order for them to provide their connection budget estimate costs.

Network Requirements

GTC

Electricity and Gas

- 8.3 GTC has provided a budget estimate to supply the proposed development with electricity and gas at **£3,626,049.65**, with offsite costs of £2,864,411.55 and onsite costs of £761,608.10.

Electricity

- 8.4 A High Voltage Point of Connection has been provided by GTC to feed the proposed development and have allowed for 8 substations due to the size of the development and these costs have been included within the quotation. GTC has assumed that the developer will carry out all civil works associated with the substations.

- 8.5 GTC confirm the requirement for upstream offsite reinforcement to the Martlesham Primary Substation to facilitate the Point of Connection. The cost of the works is estimate at £2,531,299.26, which is included within the budget estimate.
- 8.6 The quotation includes the excavation and reinstatement costs in the public highway, which includes 380m in the road and 380m in the footpath.
- 8.7 The developer will be responsible for all on-site excavation and reinstatement.
- 8.8 The quotation excludes meter boxes and hockey sticks; these can be supplied at an additional charge of £20.60 each for a standard box.
- 8.9 Diversionary and abandonment works are also excluded from the GTC budget estimate.

Gas

- 8.10 GTC has been offered a firm Point of Connection from the 125mm PE MP gas main situated north-west of the proposed development. The Point of Connection is situated adjacent to the junction of Barrack Square and Gloster Road and GTC have allowed for 920m of offsite work (460m road, 460m footpath). GTC will be responsible for the excavation and reinstatement of this work; all other excavation will be the responsibility of the Developer.
- 8.11 The supply of the governor and the installation costs for this have been included within the budget estimate.
- 8.12 The developer will be responsible for all on-site excavation and reinstatement.
- 8.13 The costings have been based on smart meters in cavity meter boxes.

Ultra-Fast Fibre Optic Network

- 8.14 As further detailed in Section 7.

TriConnex

- 8.15 TriConnex has provided a budget estimate to supply the proposed development with potable water, electricity and gas at **£9,331,915.24**, with offsite costs of £4,195,915.48 and onsite costs of £5,135,999.76.

Electricity

- 8.16 A Point of Connection has been provided to the UK Power Network HV cable close to the Martlesham Primary Substation within the footway of Betts Avenue. From the Point of Connection, TriConnex will dual lay HV mains within the carriageway of Betts Avenue onto the Site. Approximately 720m of offsite works will be required to bring supply into the Site comprising excavation, reinstatement and localised traffic management within the carriageway and footways of Betts Avenue.
- 8.17 Onsite, TriConnex will dual lay HV cables up to an intake substation, within the Site boundary, continuing to a 1000kVA transformer housed within a purpose-built substation enclosure, which TriConnex has assumed to be located close to the main Site entrance. The HV network will continue to service further six 10000kVA transformers in purpose-brick built substation enclosures required around the Site. From these substations, a LV network will be installed across Site, with individual services.

- 8.18 Capacity for the non-residential units has been allowed for and these units will each be serviced by single services from the plant rooms terminating at a heavy-duty cut-out only, onward distribution of supply and metering to be the responsibility of the ground worker.
- 8.19 Excluded from the TriConnex quotation is the supply and fit of electricity meters. Electricity ducting or racking, the supply of electric meter boxes or hockey sticks and the installation of enclosures, plinths and meter boxes have all also been excluded from the budget estimate. TriConnex outline that they have not included for any diversionary work for the existing LV and HV overhead cables which are crossing the proposed development.
- 8.20 TriConnex has provided a cost estimate of £6,163,338.31. The offsite Electricity cost of £3,790,478.94, with the onsite HV network costing £673,313.28 and onsite LV mains and connections at £1,699,546.09.

Gas

- 8.21 A Point of Connection has been provided to the existing National Grid 125mm PE Medium Pressure gas main located within the footway of Gloster Road, near the bell mouth of Barrack Square.
- 8.22 TriConnex confirm that the existing main is within the table of permissible offtake loads for the proposed development up to Year 10 and no chargeable reinforcement will be required. However, it should be noted that the existing main is not within the table of permissible offtake loads from given pipe sizes and the required total calculated load which gives capacity for all future developments including after Year 10. National Grid can confirm that reinforcement works of £9,441.81 will need to be completed after the proposed Year 10 development; however this cost will be waived by National Grid. Approximately 880m of offsite works should be required to bring the gas to the Site.
- 8.23 As the gas connection point is to a medium pressure main, a pressure reduction installation (PRI) will be needed to convert the medium pressure into a low pressure main for distribution across the Site. The PRI needs to be housed in accordance asset adopters design standards and regulations.
- 8.24 On Site, TriConnex have allowed for individual connections to each residential plot terminating at a smart meter within an approved external multi box and for non-residential units we have allowed for single services up to the plant rooms of the non-residential units terminating at an above ground entry with an Emergency Cut-off Valve directly inside the external wall, onward distribution of supply and metering is deemed to be by others.
- 8.25 Excluded from the TriConnex quotation is the supply and installation of any commercial meters and housing, along with service entries to garages. TriConnex's network is not designed to work in conjunction with boosted boilers however if these are required they can be contacted to amend the quotation accordingly. TriConnex outline that they have not included for any diversionary work, disconnection or lowering for any National Grid apparatus which is shown to cross the proposed development.
- 8.26 TriConnex has provided a cost estimate of £1,085,420.36. The offsite cost are £405,436.54 and the onsite Low Pressure gas main and connections estimated at £679,983.82.

Potable Water

- 8.27 TriConnex has assumed a connection to a suitable existing Anglian Water distribution main in Barrack Square. On Site, TriConnex have allowed for new mains with individual plot connections terminating at a meter within a ground boundary box only for flats and houses.

- 8.28 For the non-residential units, TriConnex have allowed for a single large service in a ground boundary chamber only, onward distribution of supply is deemed to be by others. TriConnex have also allowed for individual meters from Anglian Water (to be fitted by others).
- 8.29 The TriConnex quotation is based on installing water a part of a Self-Lay Agreement with Anglian Water.
- 8.30 Excluded from the quotation is Infrastructure Charges or any network reinforcement required by the adopting network.
- 8.31 TriConnex has provided an estimate of £2,083,156.57 for their onsite water mains and connection. As outlined above any offsite network reinforcement has not been included within the TriConnex quotation.

9 Service Supply Competition

- 9.1 The traditional procurement route, up until recently, had been to provide service supplies to a new development through a local network operator. With the incumbent companies having somewhat of a monopoly, competition in the market was poor.
- 9.2 However, following deregulation of the service supply networks, through the likes of Ofgem, Ofcom and Ofwat, independent network operators have been able to enter the market and provide new service supplies to developments.
- 9.3 Companies such as GTC and Connect take a holistic view in putting together infrastructure reinforcements, site distribution and supply packages and off-set the costs with anticipated future revenue through the transmission and supply of service to give a better financial arrangement and single point of responsibility for the developer.
- 9.4 These businesses use a multi-utility approach to implement the infrastructure. The independent companies are still regulated by the relevant office of regulation and subsequently asset owners must:
- Ensure that the installed network meets regulated standards
 - Design to an operating lifetime of 40+ years
 - Manage a return on their investment
 - Ensure that the existing network performance is not compromised
- 9.5 Throughout this document a review has been completed for the provision of service supply infrastructure at the site through the local network operators. This approach provides a good indication as to the likely upgrading requirements for the local infrastructure, but at this stage, does not demonstrate a competitive cost for services procurement.
- 9.6 Multi-utility companies provide significant investment to the provision of services at a development based on a whole life financial model, considering revenue from supply conveyance. Due to these investments, large reductions can be achieved to the capital cost for the provision of services at a site.
- 9.7 A development of this size has the potential to benefit a great deal from the financial investment of companies such as Connect and GTC. As such independent companies may be utilised to provide final network supplies for the Site.
- 9.8 This report summarises the details relating to the current network conditions outlining the requirements for reinforcements and provision of supply through the existing network.

10 Summary

- 10.1 This Services Statement has indicated that the proposed development on the Site has the potential to be supplied with normal network service supplies, potentially without prohibitive reinforcements to the existing networks.
- 10.2 However, some localised, non-prohibitive reinforcements may be necessary together with protections or diversions where existing plant is affected by the proposals. This will be confirmed once all enquiries have been completed by each respective utility company.
- 10.3 Table 10a outlines the supply requirements for each incumbent company, along with the multi-utility company:

Utility Company	Service	Budget Estimate
Anglian Water	Potable Water	<p>Confirm proposed development can be supplied from the existing 15" AC water main (TM2483345115) located at land at Adastral Park, Martlesham off Barracks Square.</p> <p>Discounted Aggregate Deficit (DADs) contribution of £498,737.00</p>
Anglian Water	Foul Sewerage	<p>Confirm that a direct connection to the public foul sewerage system is likely to have a detrimental effect on the existing network. AW has undertaken modelling for the proposed development and recommend the following solution:</p> <ul style="list-style-type: none"> • Providing storage of 352m³ at Martlesham - B.T. Research SP, west of the proposed development. • Upsizing Martlesham - B.T. Research SP from 25l/s to 50l/s and increasing the existing emergency storage by 237m³, west of the proposed development. • Providing offline storage of 781m³ off Felixstowe Road at Martlesham - Hilton RD SP, north of the proposed development. • Providing offline storage of 174.5m³ in green area adjacent to Main Road, north of the proposed development. <p>An estimated cost for the proposed off-site reinforcement solution is £1,898,398, with an indicative developer contribution of £347,802.</p> <p>AW Confirm that the foul drainage from the proposed development is within the catchment of Woodbridge Creek FM Water Recycling Centre which currently has capacity to treat the flows from the proposed development.</p>
UK Power Networks	Electricity	<p>£6,429,150.00 to supply the proposed development, which includes:</p> <ul style="list-style-type: none"> - reinforcing Martlesham Primary with 20/30MVA 33/11kV transformers - 11kV switchgear, plus ancillary equipment - 11kV cable from Martlesham Primary to and around the Site - 2,5000 house services (230V) - 4x11kV supplies for the commercial.

National Grid	Gas	<p>Insufficient capacity to the 125mm PE Medium Pressure main approximately 736m north of the proposed development.</p> <p>As part of their capacity assessment, NG are unable to provide further details with regards to potential budget estimate costs for reinforcements. However, further details may be offered as part of TriConnex's multi utility budget estimate.</p>
GTC (Multi Utility)	Electricity, Gas	<p>£3,626,049.65 Offsite Total = £2,864,441.55 Onsite Total = £761,608.10</p> <p>The electricity Point of Connection is to the high voltage network, and it has been confirmed that there is a requirement for upstream offsite reinforcement to the Martlesham Primary Substation to facilitate the Point of Connection.</p> <p>The gas Point of Connection is to the 125mm PE MP gas main situated adjacent to the junction of Barrack Square and Gloster Road, north west of the proposed development.</p>
GTC (Multi Utility)	Fibre Optics	-£412,500.00
GTC (Multi Utility)	Fibre Optics with FIRS	-£275,000.00
TriConnex (Multi Utility)	Electricity, Gas and Potable Water	<p>£9,331,915.24 Offsite Total = £4,195,915.48* Onsite Total = £5,135,999.76</p> <p>The electricity Point of Connection is to the 11kKV UK Power Networks cable close to the Martlesham Primary Substation within the footway of Betts Avenue.</p> <p>The gas Point of Connection is to the 125mm PE Medium Pressure Gas located within the footway of Gloster Road, near the bell mouth of Barrack Square.</p> <p>An assumed Point of Connection has been made to the existing Anglian Water distribution main in Barrack Square, onsite.</p>

Table 10a: Summary of Supply Budget Estimates (Based on a maximum development quantum of Up to 2,500 dwellings)

*Excluding Potable Water

11 Limitations

- 11.1 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the Site.
- 11.2 Third Party information has been used in the preparation this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for the same.
- 11.3 Existing network appraisals and proposed reinforcements are based on current infrastructure. Ongoing load growth will occur that may feasibly affect network availability. It is therefore necessary to monitor and review the existing networks capacity regularly.
- 11.4 The benefits of this report are provided solely to Carlyle Land Ltd and Commercial Estates Group for the proposed development on the Site only.
- 11.5 Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

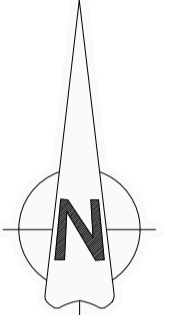
Appendix

Construction Design and Management (CDM)
Key Residual Risks
 Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

- 1) Overhead and underground services
- 2) Street Lighting Cables
- 3) Working adjacent to water courses and flood plain
- 4) Soft ground conditions
- 5) Working adjacent to live highways and railway line
- 6) Unchartered services
- 7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
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KEY:

- Red Line Boundary
- Potable Water (Anglian Water)
- Foul Water Sewer (Anglian Water)
- Surface Water Sewer (Anglian Water)
- Rising Main (Anglian Water)
- Decommissioned Foul Water Sewer (Anglian Water)
- High Pressure Gas Main (National Grid)
- Medium Pressure Gas Main (National Grid)
- Low Pressure Gas Main (National Grid)
- GTC Low Pressure Gas Main
- High Voltage Electricity (UK Power Networks)
- Low Voltage Electricity (UK Power Networks)
- Abandoned High Voltage (UK Power Networks)
- 33kV Overhead (UK Power Networks)
- BT Openreach
- BT Openreach to be contacted prior to work commencing for additional assets in this area
- Virgin Media

- C Site Description Change AM LW PAB 22.03.17
- B Red Line Boundary Changed AM LW PAB 10.03.17
- A Additional Assets Added AM LW PAB 18.11.16
- First Issue AM LW PAB 19.10.16

Brookbanks
 6150 Knights Court, Solihull Parkway, Birmingham B37 7WY
 Tel (0121) 329 4330 Fax (0121) 329 4331
 www.brookbanks.com

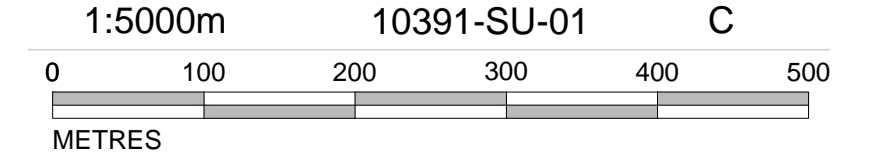
**Carlyle Land Ltd and
 Commercial Estates Group**

**Land South and East of
 Aداstral Park**

Existing Services

Location Plan

Status	DRAFT		Status Date	October 2016
Drawn	AM	Checked	LW	Date 14.10.2016
Scale	1:5000m	Number	10391-SU-01	Rev C



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CARLYLE LAND
LIMITED



Andrew McCloy
Recreation Consultant

bakerconsultants

BroadwayMalyan^{BM}

Brookbanks



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RSK



TG Tyler Grange