



making the right connections



Cross Road, Kent

Utility Study

Level 2

Document Status				
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3				

UCML Utility Study – Level 2

Cross Road,
Walmer,
Kent

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Contents

1.0	Introduction	4
2.0	Scope and Objectives	8
3.0	Assumptions and Exclusions	10
4.0	Terms and Definitions	11
5.0	Executive Summary	12
6.0	Electricity	14
7.0	Gas	22
8.0	Water	28
9.0	Communications	34
10.0	Other	42
11.0	Conclusion	46
12.0	Risk Matrix	49
13.0	Street Works UK	50
14.0	Further UCML Services	53
	Appendices	55

1.0 Introduction

UCML has been instructed by Gladman Developments Ltd (hereafter referred to as 'the Client') to provide a desktop utility study to identify the outline constraints derived from the statutory utility infrastructure on a proposed residential development of up to 135 no. dwellings. The site is located off Cross Road, Walmer, Kent. This study includes the land within the red line boundary as indicated within Figure 1.1 below.



Figure 1.1 – Development Framework Plan

UCML has been commissioned to provide a desktop utility study defining potential cost and timescale risks that could impact on the overall delivery of the project. The principal aim of this utility study is to identify the key constraints derived from statutory utility infrastructure on the proposed development. The information provided within this desktop study is based on review of the current sketch site layout plan (drawing no. 2944GD-SK01 rev. A) provided to UCML by the Client, as indicated in Figure 1.2 below.



Figure 1.2 – Site Layout Plan

The information provided within this desktop study is based on the development consisting of up to 135 no. residential dwellings. The Client has provided UCML with the electricity load requirements, which 2 no. load assessments provided based on the use of either a mixed gas and electrical or a full electrical heating strategy. The mixed heating strategy is based on 50 no. dwellings using gas heating and the remaining 85 no. being electrically heated. Table 1.1 below summarises the estimated loads used for the study provided to UCML by the Client.

Utility	Gas Heated	Electric Heated
Electric Load	420 kVA	480 kVA
Gas Load	60 kW	N/A

Table 1.1 – Load summary

Please note, these estimated loads are intended for use as a guide only to produce this study, and it is recommended that a Mechanical and Electrical Consultant is employed to calculate the actual load required based on the final layout design and proposed heating method. Please note, the load estimations for the residential development does not include a figure for individual clean water load requirements as residential clean water connections are standardised; therefore, no individual load assessment is required.

This desktop study has been produced using the statutory records received from each relevant body. The host statutory network operators which operate in the vicinity of the development site and covered within this study are listed in Table 1.2 below.

Utility	Statutory Operator
Electricity	UK Power Networks
Gas	Southern Gas Networks
Water	Southern Water
Telecoms	Openreach

Table 1.2 – Host Statutory Network Operators

UCML is not responsible for the accuracy or quality of the information provided on statutory utility infrastructure records, and has attempted to use reasonable skill and care in investigating the existing site services. Unless stated otherwise, UCML has not made any provision for out-of-area water mains, private networks, unrecorded networks, Liquid Petroleum Gas (LPG) networks, street lighting, CCTV, traffic signals/illuminated signage, data centre networks, electricity generation installations, interconnectors, or drainage/sewerage networks.

Please note, all information on the drawings contained within this utility study and elsewhere is indicative only. The verification of the details and plant location given on the relevant infrastructure records should be undertaken using the following methods;

- The use of plant location equipment to trace all underground plant.
- The use of hand dug trial holes to confirm the precise location of plant.
- The use of suitable paint or markers on the surface to clearly indicate the position of buried apparatus.

All works undertaken are to be in accordance and compliance with the Construction Design and Management 2015 Regulations, published Health & Safety Guidelines, and the agreed working practices of the relevant utility companies. The following assumptions must be made in regards to any existing utility apparatus;

- All mains, services cables, and pipes should be assumed live until proven dead prior to any excavation, demolition or groundworks commencing.
- Any existing building is assumed to have live services until proven otherwise.
- Any site is assumed to have existing utility apparatus located within the boundary until proven otherwise.
- Service connections are not indicated on all utility infrastructure records. Where no service connections are indicated, their presence should be anticipated until proven otherwise.

2.0 Scope and Objectives

Utilities Connections Management Limited (UCML) is an independent Utility Consultancy providing services relating to the provision of utility connections to all types of developments.

This desktop utility study aims to provide a 'snapshot' in time of the current statutory utility networks and review the potential connection, diversion, and disconnection works that may be required to accommodate the development proposals. The objective of the commission is to provide a level of information relating to budgetary costs and risks, without incurring significant costs relating to distribution network studies. It should be noted that as this study is desktop in nature, no site visits or surveys have been undertaken during its completion.

The scope of works undertaken by UCML may be summarised as follows;

- Obtain the statutory Network Operators' infrastructure records.
- Review the existing utility distribution networks within the local area of the site.
- Application for firm points of connection for electricity, gas, and water supplies to the site to determine the location of proposed connection.
- Consider the impact existing utility apparatus will have on proposed development works and provide a technical review and analysis of all statutory authority infrastructure affected by proposed on and off-site works, including the provision of the following;
 - Budget estimates for anticipated disconnection and diversion works.
 - Budget estimates for connection works, derived from firm non-contestable charges including an estimate of required reinforcement works where applicable.
 - Cost risk and analysis.
 - Timescales for provision and execution of quotations for the required works, highlighting risks to project programme.
 - Highlight of abnormal legal requirements including wayleaves and easements, and explanation of requirements to mitigate risk.

UCML's desktop utility studies provide a detailed overview of the statutory electricity, gas, clean water, and telecommunications infrastructure in the vicinity of a proposed site, ideal for:

- Due diligence prior to land purchase to allow negotiation.
- Risk assessment prior to tender.
- Assistance with site layout design to minimise impact on existing utilities, taking statutory utility infrastructure legal requirements into account.
- Detailed planning statements.
- Investment analysis.

3.0 Assumptions and Exclusions

In view of the limitations of the available information, the following assumptions have been made to produce this utility study;

- All estimated loads have been based on information provided in the Network Operators Distribution Code and other documented standards.
- The information provided within the desktop study is based on the development site area as identified on the proposed site layout plan shown in Figure 1.2 within the introduction. Any land falling outside of the provided boundary is outside of the scope of this desktop study and, should it be incorporated within the proposed development boundary, this may affect the information and recommendations provided within this desktop study.
- The desktop study has been produced based on the specification provided by the Client/Developer at the time of instruction. Any changes to the size, type, number of specification of the development (for instance the extent of EV charging provision and/or use of Low Carbon heating solutions) may affect the information and recommendations provided within this desktop study.
- In the timescales and budget costs quoted, no allowances have been made in respect to the following unless stated otherwise;
 - Wayleaves, easements, or access rights.
 - Reinforcement charges.
 - Land transfers or lease arrangements for substation requirements if applicable.
 - Abnormal off-site civils.
 - Specialist traffic management (non-standard).
 - On-site civils and builders work.
 - Seasonal Embargoes.

It should be noted that all budgetary figures quoted are exclusive of any Value Added Tax (VAT) that may be applicable unless stated otherwise.

4.0 Terms and Definitions

ADMD	After Diversity Maximum Demand. The development demand considering diversity of usage.
ASHP	Air Source Heat Pump.
CHP	Combined Heat and Power generator.
CSEP	Controlled System Exit Point. Gas mains connection point.
DNO	Distribution Network Operator. This is the licensed electricity distributor for the geographic region.
EV	Electric Vehicle. Charging points for electric vehicles can significantly increase electricity demand of a development.
FTTP	Fibre to the Premise telecommunications connection.
GT	Gas Transporter. The GT is the licensed gas network operator for a specific geographical area.
GSHP	Ground Source Heat Pump.
ICP	Independent Connection Providers. Undertake new electrical connections, however they do take ownership of the asset.
IDNO	Independent Distribution Network Operator. Network owners and operators that are not constrained to a geographic area.
IGT	Independent Gas Transporter. A GT that is not governed by its geographic location.
NAV	New Appointment and Variation. Agreements signed by independent water network operators, not governed by geographical area, with Ofwat to adopt water infrastructure within a given boundary.
POC	Point of Connection. This is a formal document submitted by the DNO identifying the location for a new electrical connection.
PV	Photovoltaic generation.

5.0 Executive Summary

This study comprises the results of the investigation and appraisal undertaken by UCML of the existing utility infrastructure located in the vicinity of the development site, and provides an overview of the likely demand requirements to support the proposed development works along with a review of any network reconfiguration works that are currently anticipated.

The relevant sections of the study will discuss the development requirements and constraints in further detail, however UCML would highlight the following main site constraints, along with the recommended next steps to be taken;

- UK Power Solutions has confirmed there is sufficient capacity available within the 11 kV HV distribution network to provide supply for the development. The HV POC will be required for both load options investigated as part of this study. Please note, an estimated 500 metres of off-site mains lay will be required to bring capacity from the PCO to the site entrance.
- SGN has provided confirmation that there is sufficient capacity available within the LP mains network to provide supply for up to 50 no. residential dwellings, if required.
- Southern Water has provided confirmation that there is sufficient capacity available within the clean water distribution network to provide supply for the proposed development.
- Based on review of the current site layout plan, no diversionary works are currently anticipated as confirmed by consultation with the relevant statutory network operators.
- No disconnection works are currently anticipated to accommodate the development proposals as the development site is currently greenfield.

Cost Summary

Table 5.1 below summarises the total anticipated budget costs for the required utility works. Please refer to the relevant section of the study for further detail.

Electricity	Budget Cost
Non-Contestable Works	£10,744.36
Contestable Connection Works	£298,000.00
Diversiory Works	None currently anticipated
Disconnection Works	None currently anticipated
Total Electricity Costs	£308,744.36
Gas	Budget Cost
Connection Works	£Nil
Diversiory Works	None currently anticipated
Disconnection Works	None currently anticipated
Total Gas Costs	£Nil
Water	Budget Cost
Connection Works	£220,000.00
Diversiory Works	None currently anticipated
Disconnection Works	None currently anticipated
Total Water Costs	£220,000.00
Openreach	Budget Cost
Connection Works	£Nil
Diversiory Works	None currently anticipated
Disconnection Works	None currently anticipated
Total Openreach Costs	£Nil
Budgetary sums exclude Value Added Tax, on-site civils, and principal contractor preliminaries.	

Table 5.1 – Cost Summary Table

6.0 Electricity

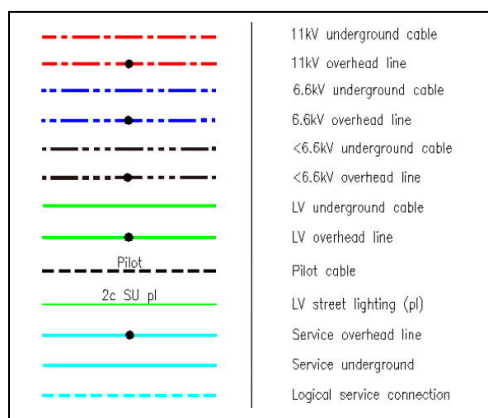
6.1 Existing Electricity Network

The electricity distribution network in the vicinity of the development site is under the ownership of UK Power Networks and is operated within the terms of its Electricity Distribution License issued by Ofgem. The local electricity distribution network in the immediate vicinity of the site comprises of underground cables and associated substations operating at High Voltage (HV) and Low Voltage (LV).

The figure overleaf illustrates the location of existing UK Power Networks infrastructure which has been extracted from its network records. The cables shown in dashed red are operated at 11,000 Volts (HV), those shown in dashed dark blue are operated at 6,600 Volts (HV), and those shown in green and light blue are operated at 415 Volts (LV). Please refer to the infrastructure record appended to this study for further detail.



Figure 6.1 – Existing Electricity Infrastructure Plan



6.2 Connection Works

6.2.1 Non-Contestable Works

The non-contestable element of the connection works are works required to accommodate the provision of capacity for the development, which can only be undertaken by the relevant Distribution Network Operator (DNO). The non-contestable costs are covered within a Point of Connection (POC) quotation.

Based on the development information as outlined within the introduction, the Client provided UCML with 2 no. electrical load requirement for the proposed residential development of 135 no. dwellings, with one option based on the use of either a mixed gas and electrical and the other based on the use of a full electrical heating strategy. The mixed heating strategy is based on 50 no. dwellings using gas heating and the remaining 85 no. being electrically heated. Based on these estimated loads of 420 kVA for the mixed strategy and 480 kVA for the full electric strategy, UCML requested Point of Connection quotations for the non-contestable works from UKPN.

UKPN has confirmed that the POC solution would be the same for both load options, and has confirmed the development can be connected to the 11 kV HV distribution network. The POC will be located from an existing 11 kV HV cable routed within the southern side footpath of St Richards Road, to the north of the development site. Please see Figure 6.2 overleaf for further detail on the location of the POC.

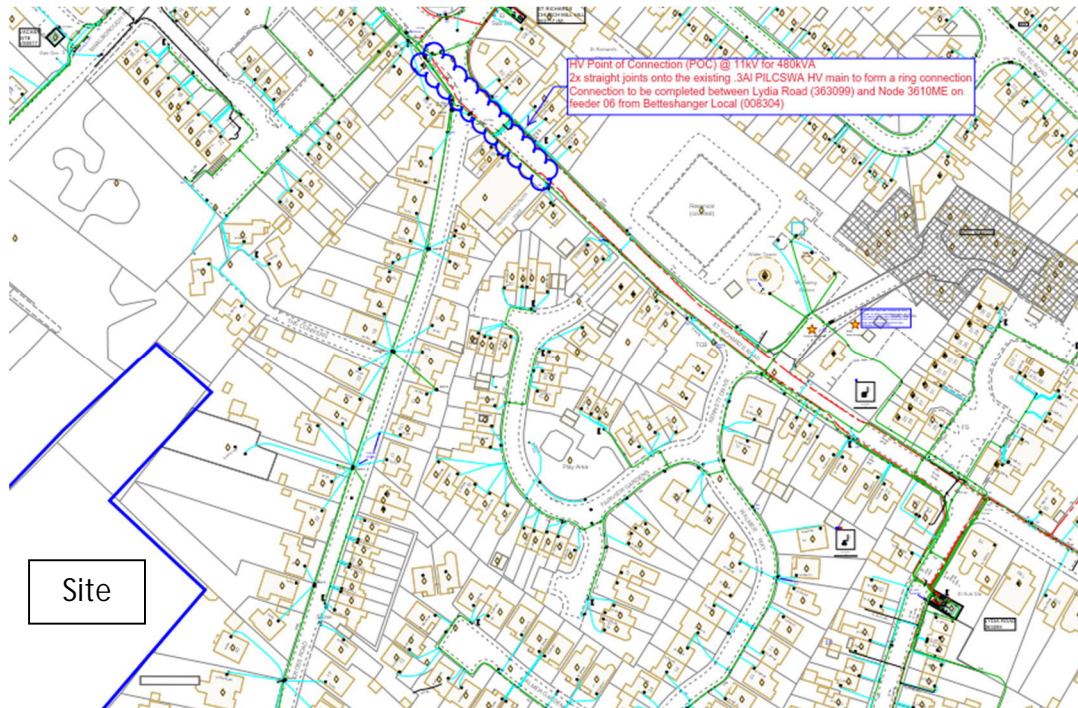


Figure 6.2 – Plan showing electricity HV Point of Connection

UKPN has advised that, based on current network availability, there is sufficient electric capacity available within the existing electricity infrastructure to serve the proposed development; therefore, no reinforcement works are currently required. However, no capacity can be reserved until payment is made for a valid UKPN non-contestable POC offer.

As part of the non-contestable works, UKPN will undertake ICP design approval and inspections. Cable jointing works for the POC will typically be undertaken by a UKPN Engineer. Please refer to Section 6.2.2 for further detail on the associated contestable connection works required to utilise the provided HV POC.

The total cost and breakdown of the UKPN non-contestable POC is detailed below;

Description	Cost
Assessment Charges	£430.00
Operational Work	£2,888.91
HV Plant & Switchgear	£7,425.45
Total Non-Contestable Charges	£10,744.36

Table 6.1 – Point of Connection cost breakdown

6.2.2 Contestable Works

Based on the confirmed non-contestable POC provided by UKPN, the following contestable connection works will need to be undertaken to provide connections to the proposed dwellings;

- Lay HV cabling from Point of Connection to proposed substation position.
- Excavate, backfill, and permanently reinstate public highway/footpath to Local Authority standards.
- Supply, install and commission the following within the substation housing;
 - High Voltage Ring Main Units
 - 1 no. 11kV/433v distribution transformer
 - Low Voltage distribution board
- Lay LV mains infrastructure on-site.
- Install LV service connections to each dwelling, and connect to LV mains infrastructure.

Allow a budget cost of £298,000.00 for the contestable works.

This is based on the confirmed Point of Connection being located within approximately 500 metres of the proposed site entrance.

The cost provided is based on the developer undertaking all on-site excavation, reinstatement and civils works; including the construction of the substation concrete plinth and housing to the UKPN, or appointed Independent Network Operator (IDNO), standard.

As discussed above, the use of a HV POC will trigger the requirement for a secondary substation to be constructed on-site. To accommodate the construction of a secondary substation, a parcel of land of approximately 5m x 5m, along with suitable access and egress, will need to be allowed within the development boundary to accommodate the substation compound.

As the above works are contestable, they can be undertaken by the DNO, or an Independent Connection Provider (ICP) can be appointed to complete the works. The use of an ICP to undertake the contestable connection works provides the opportunity to open the contestable element of the works to competitive tender, which may provide significant cost savings in comparison to the DNO undertaking the works.

If an ICP is appointed, the network can then be adopted by an Independent Distribution Network Operator (IDNO). The license of an IDNO allows for an asset value to be offered to the appointed ICP for the adoption of the constructed network. The asset value offered by the IDNO reflects the anticipated value in adopting the newly constructed network, based on the expected revenue that may be generated from the acquisition of new customers. The cost incurred by the ICP in constructing the network may be offset by any asset value offered by the IDNO, which could provide further cost savings.

6.3 Diversions & Disconnections

UK Power Networks infrastructure records indicate LV apparatus routed within the wider vicinity of the development site, with sections of overhead LV cable routed along Cross Road to the north west of the development site and along Ellens Road to the south east of the development site. UK Power Networks has reviewed the proposed development layout plan and has confirmed that their apparatus will not be affected by the development proposals; therefore, no diversionary works are currently anticipated.

Desktop review of the development site does not indicate any existing units located within the boundary and it appears that the site is currently greenfield. No disconnection works are currently anticipated.

6.4 Conclusion – Cost & Risk Analysis

Costs relating to the reconfiguration of the existing UK Power Networks distribution system are identified in the following table;

Detail	Cost
Non-Contestable Works	£10,744.36
Contestable Connection Works	£298,000.00
Diversions	None currently anticipated
Disconnections	None currently anticipated
Total	£308,744.36

Table 6.2 – Electricity costs

The main risks associated with the procurement of proposals and required works are as follows;

- Some figures have been applied based on previous projects of similar size and UCML’s experience, others have been provided for budgetary purposes by UK Power Networks.
- A Point of Connection, once issued, is valid for only 3 months from submission. The network capacity can only be reserved upon submission of signed acceptance and a suitable design from either an Independent Connection Provider or Independent Distribution Network Operator.

7.0 Gas

7.1 Existing Gas Network

The local Gas Distribution Network in the vicinity of the development site is owned and operated by Southern Gas Networks (SGN) under its Gas Transportation License issued by Ofgem. The gas network in the immediate vicinity of the site comprises of gas mains and apparatus operating at Medium Pressure (MP) and Low Pressure (LP).

The figure overleaf is an extract from SGN statutory records and details the currently indicated position of existing infrastructure, however it may be prudent to undertake a below ground survey to ensure there are no services present which are not recorded on statutory records. Please refer to the infrastructure record appended to this study for further detail.

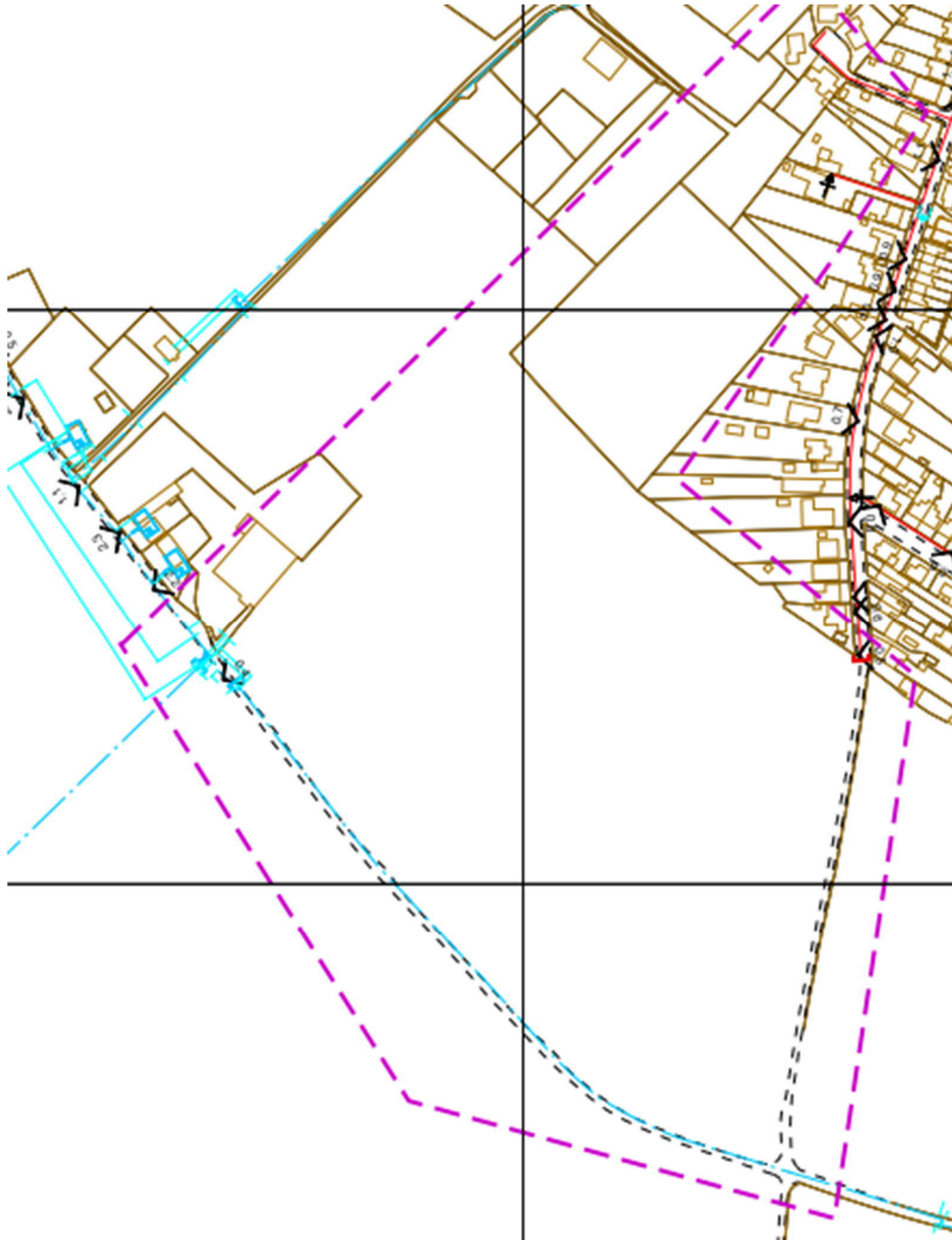
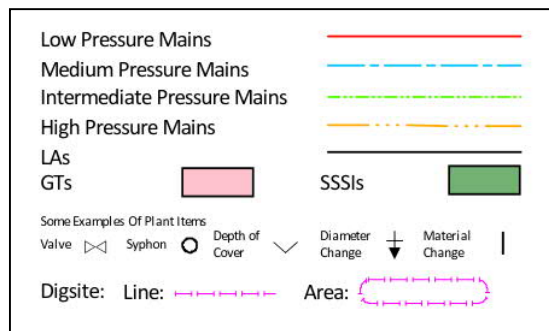


Figure 7.1 – Existing gas infrastructure plan



7.2 Proposed Gas Service

As outlined within the introduction, UCML has been asked by the Client to investigate capacity for the development site based on 2 no. scenarios – the use of a mixed gas and electric heating strategy and the use of a full electrical heating strategy. For the mixed heating strategy, up to 50 no. dwellings would require a mains gas connection. Based on 50 no dwellings, UCML has estimated the gas load requirement for the proposed residential to be 60 kW hourly (723,400 kWh annually), based on the use of gas heating.

SGN has undertaken a capacity check on behalf of UCML to confirm the availability of capacity within the existing distribution network. SGN has advised that the development could be connected to the existing LP mains network from the 90mm polyethylene LP main routed within Cross Road, to the north of the development site boundary. Please see Figure 7.2 below for further detail.

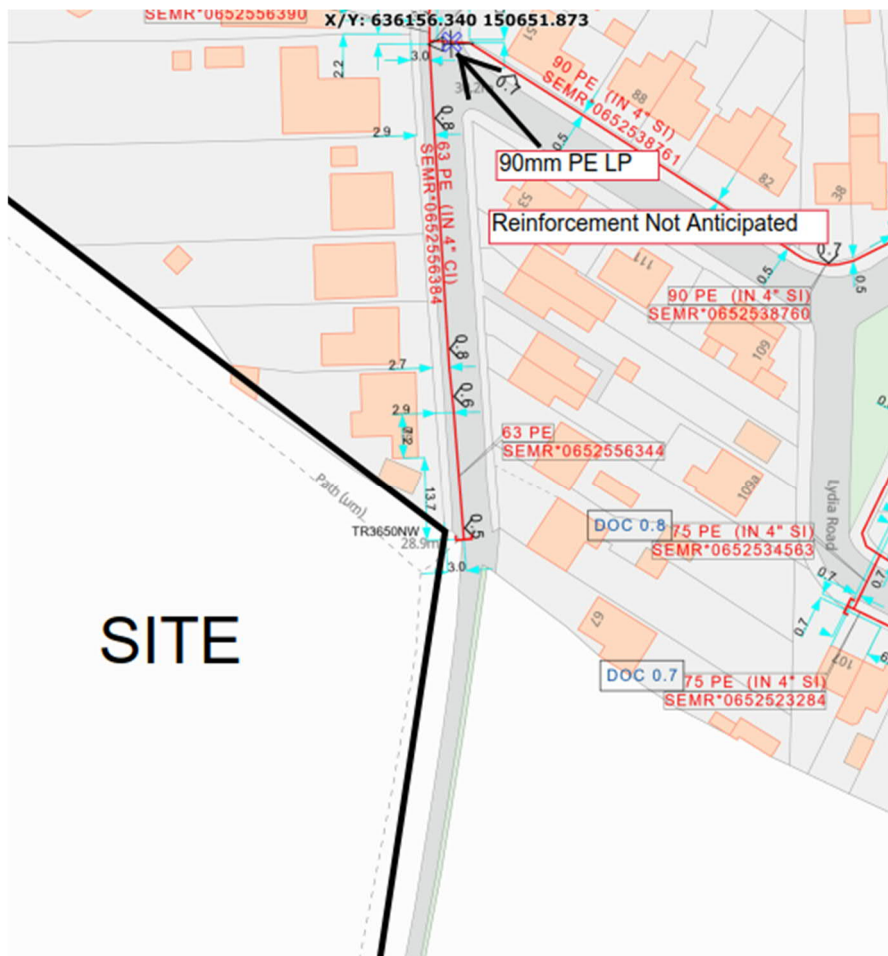


Figure 7.2 – Gas connection point

SGN has advised that, based on desktop review of the current network, there is sufficient capacity within the existing LP network to provide supply to the proposed residential development without the requirement for network reinforcement works.

For similar sized developments, UCML has recently been in receipt of nil cost offers for gas connections from connection providers. Their works would typically include the completion of all off-site civils works, all on and off-site mains installation works, installation of 50 no. service connections, and the supply and installation of smart meters. The site contractor would be responsible for all on-site excavation, backfill, and reinstatement works. Note, if an electrical heating strategy is utilised, any gas connection works will be no longer applicable.

7.3 Diversions & Disconnections

SGN infrastructure record indicates an 8" ductile iron MP main routed within the site side carriageway of Ellens Road to the development site. Given the location of the asset, and provided no alterations will be made to the carriageway as part of the development works, it is assumed that it will be unaffected by the site works. SGN has provided confirmation that no diversionary works are currently required.

SGN do not typically indicate individual service pipes and associated apparatus on their infrastructure records; however, their presence should be anticipated until proven otherwise. Based on desktop review of the development site indicating it is greenfield with no existing units present, it can be assumed none are present. No disconnection works are currently anticipated.

7.4 Conclusion – Cost & Risk Analysis

Costs relating to the reconfiguration of the existing SGN network are identified in the following table;

Detail	Cost
Connections	£Nil (TBC)
Diversions	None currently anticipated
Disconnections	None currently anticipated
Total	£Nil

Table 7.1 – Gas costs

The main risks associated with the procurement of proposals and required works are as follows;

- If the development reverts to requiring mains gas connections for the entire development, consultation will be required with SGN to confirm the availability of capacity within the local network and confirm a connection point for the development.
- SGN may provide a revised CSEP position due to changes in capacity on the existing network. It should be noted that the availability of capacity can only be confirmed following completion of formal design approval for a connection design.
- Formal offers are yet to be received, therefore there is a possibility that costs may fluctuate substantially due to material costs, contractor rates, asset value etc. It is anticipated that significant savings may be made through competitive tender.
- The utility contractor is required to include for all off-site excavation, backfill and permanent reinstatement within the tender documentation.
- Excavation within the immediate vicinity of Medium Pressure gas mains should not be undertaken prior to consultation with the gas transporter.

8.0 Water

8.1 Existing Water Network

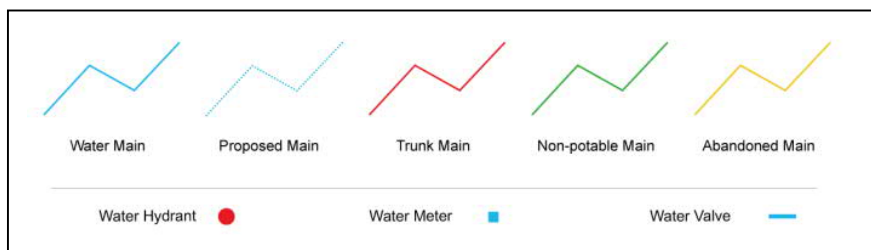
The local clean water distribution network in the vicinity of the development site is owned and operated by Southern Water within the terms of its statutory license issued by Ofwat. The clean water network in the immediate vicinity of the site comprises of trunk and distribution water mains and associated apparatus. Please refer to the infrastructure record appended to this study for further detail.

The figure overleaf is an extract from Southern Water statutory records and details the current indicated position of existing infrastructure, however it may be prudent to undertake a below ground survey to ensure there are no unknown services which are not recorded.

Please note on rare occasions 'out of area' water supply authorities have water mains crossing other water supply authority areas. This is typically trunk or raw water mains transporting water extracted from reservoirs or water courses between areas. Unless stated otherwise, UCML's utility study covers the statutory water network operator for this region as identified within the introduction only.



Figure 8.1 – Existing water infrastructure plan



8.2 Proposed Water Service

UCML has sourced a pre-development response from Southern Water to establish the availability of capacity within the local distribution network, and confirm the likely connection point for the development. Southern Water has advised that a connection point for the development can be provided from the 4" cast iron distribution main routed within Cross Road. Southern Water has also confirmed that this main has sufficient capacity to supply the development without the requirement for associated off-site reinforcement works.

From April 2018, off-site network reinforcement costs have been funded through infrastructure charges which are applied to each new connection. The principle of infrastructure charges recognises that every new connection imposes an additional demand on the overall capacity of the water supply and sewerage systems, and eventually those systems will need to be enlarged. The collection of infrastructure charges is intended to cover the extra demand on the existing network away from the development site

Infrastructure charges are calculated based on the estimated costs of all off-site reinforcement works required to facilitate connections to new developments within Southern Water's area over a rolling 5 year period, based on the total anticipated number of new connections within that supply area. Please note, the infrastructure charge costs can vary year on year and therefore long term developments may be affected by the possible variance in infrastructure charges. Each water company has a differing infrastructure charge based on their individual network and anticipated levels of reinforcement works, and the cost of the infrastructure charges for clean and waste water are likely to differ.

The infrastructure charges applicable to developments within Southern Water's region for the current scheme of charges (2023-2024) are £434.00 per plot for clean water and £Nil per plot for sewerage, both of which are applied to the clean water connection costs.

An income offset is paid by Southern Water against infrastructure charges paid by the developer and is applicable to all connections (including any made to existing water mains) where infrastructure charges are payable. As with infrastructure charges, the income offset

payment is set by each water company at a set charge per plot. The infrastructure charges provided overleaf include the current income offset rates. If no infrastructure charges are payable for a connection, no income offset payment will be available. Note, the income offset scheme is planned to end in March 2025 and therefore will not be available to any connections made after this date.

Based on the aforementioned infrastructure charges and income offset allowance, allow a budget cost of £220,000.00 for mains and connections.

A Phase 2 ground investigation and risk assessment will be required to precisely identify contaminated and uncontaminated ground within the site. The level of contamination on-site will determine the material used for the water mains and service pipes on-site. If the level of contamination is low, standard polyethylene pipe could be used. However, if the level of contamination on-site is determined to be high, the site will require the use of barrier pipe laid in a sterile trench. Should the use of barrier pipe be required, this will increase the cost of connections significantly. As this is generally a greenfield site, it has been anticipated that the levels of contamination may be low and so standard polyethylene pipe could be used.

Southern Water has introduced environmental incentives to incentivise sustainable development within their region and encourage developers to construct properties which promote the efficient use of water. In compliance with Part G of the Building Regulations 2010, all new homes built in the UK must be built to a rating of 125 litres of water usage per person, per day (PPPD). Southern Water offer a credit of £250.00 for properties that properties have been built to a usage rating of 100 litres of water PPPD or less.

Further to the above, Southern Water offer incentives where developments utilise water recycling technologies such as rainwater harvesting, grey water recycling, or other water reuse technologies. If a developer can provide evidence that their reuse technology will capture at least 50 litres of water per property per day for reuse, a further £800.00 credit could be made available.

8.3 Diversions & Disconnections

Southern Water infrastructure records indicate a 450mm distribution main routed within the site side verge of Cross Road to the development site which will be affected by the construction of the proposed site entrance. Southern Water has reviewed the proposed site layout plan and has advised that, provided their set criteria can be met, they would not seek to divert their asset.

Southern Water has advised that the construction works immediately above their asset must be completed with caution and in line with HSG47 (Avoiding Danger from Underground Services). They have also advised that the typical depth for their clean water assets is typically 900mm below the ground level; therefore, if the construction depth will reduce cover over their apparatus to 500mm, then at that depth and position a protective slab of reinforced concrete should be installed. If the depth of cover will be reduced below 500mm, then diversionary works would be triggered.

Further investigation works are recommended to undertake trial excavations at the location of the proposed site entrance to determine the current location and depth of the clean water asset. These trial excavation results can then be reviewed in conjunction with the detailed site entrance drawings, once available, to confirm the depth of cover will not be reduced below 500mm.

Southern Water do not typically indicate individual service pipes and associated apparatus on their infrastructure records; however, their presence should be anticipated until proven otherwise. Based on desktop review of the development site indicating it is greenfield with no existing units present, it can be assumed none are present. No disconnection works are currently anticipated.

8.4 Conclusion – Cost & Risk Analysis

Costs relating to the reconfiguration of the existing Southern Water network distribution system are identified in the following table;

Detail	Cost
Mains and Connections	£220,000.00
Diversions	None currently anticipated
Disconnections	None currently anticipated
Total	£220,000.00

Table 8.1 – Water costs

The main risks associated with the procurement of proposals and required works are as follows;

- Some figures have been applied based on previous projects of similar size and UCML’s experience, others have been provided for budgetary purposes by Southern Water.
- The pre-development response, once received, is valid for only 6 months from submission. The available network capacity can vary continually, due to proposed developments taking capacity from the water distribution network within the vicinity of this specific scheme.
- The developer cannot reserve any water capacity and pressure until a formal order has been placed with the relevant water Network Operator.
- Please be aware that the position of any required fire hydrants will be determined and implemented upon the advice and requirements of the Local Fire Authority.

9.0 Communications

9.1 Openreach

Openreach own and operate telecommunications apparatus in the vicinity of the development site within the terms of its statutory license issued by Ofcom. The Openreach network in the immediate vicinity of the site comprises of underground cables, overhead lines, and associated apparatus. Please refer to the infrastructure record appended to this study for further detail.

The figure overleaf is an extract from Openreach records and details the current indicated position of existing infrastructure, however it may be prudent to undertake a below ground survey to ensure there are no unknown services which are not recorded.

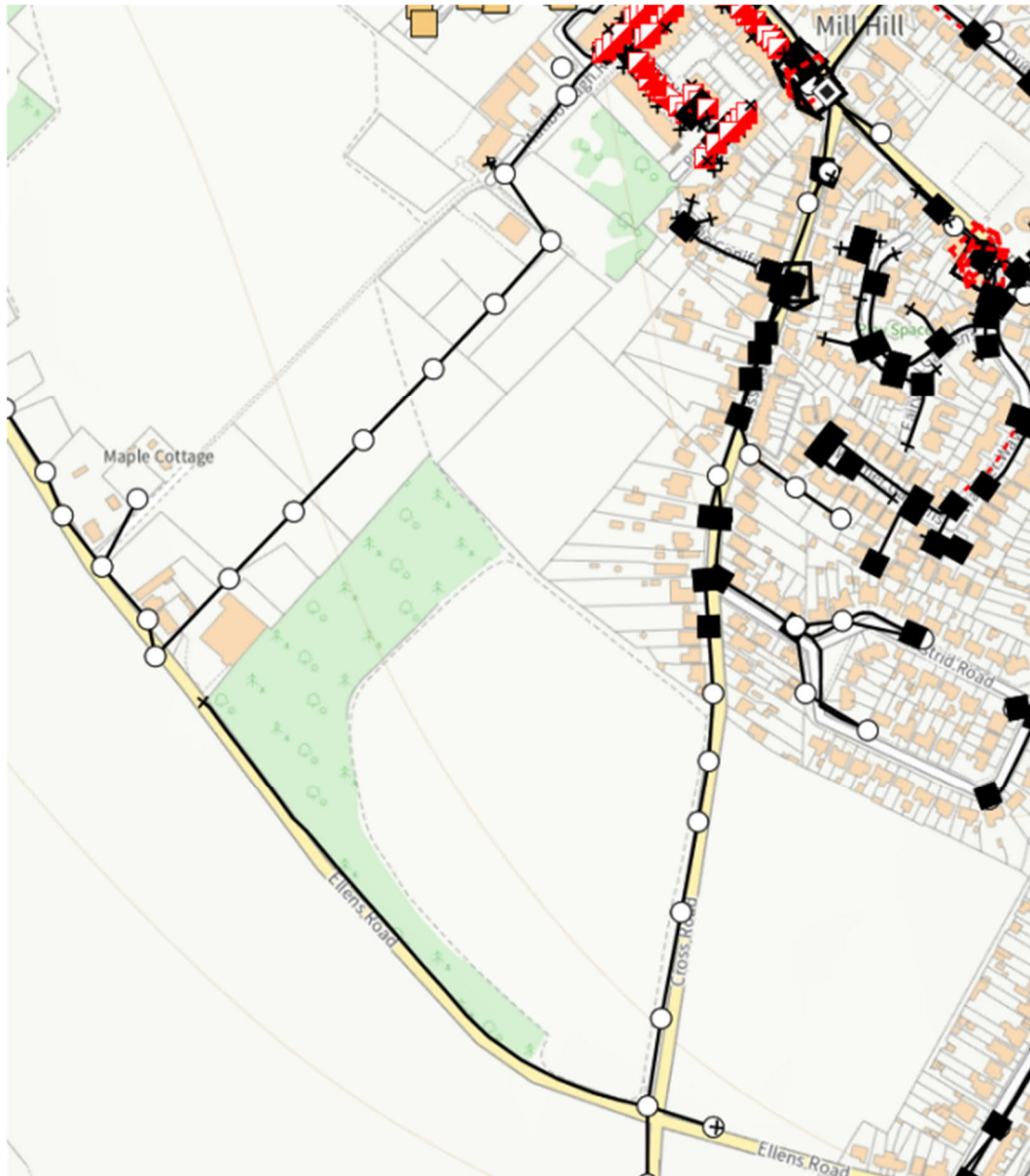


Figure 9.1 – Existing Openreach infrastructure

KEY TO BT SYMBOLS			
DP		Pole	
Planned DP		Planned Pole	
PCP		Joint Box	
Planned PCP		Change Of State	
Built		Split Coupling	
Planned		Duct Tee	
Inferred		Planned Box	
Building		Manhole	
Kiosk		Planned Manhole	
Hatchings		Cabinet	
		Planned Cabinet	

9.1.1 Openreach Connections

Openreach provide a Fibre to the Premise (FTTP) connection design as standard for new developments. FTTP connections will provide ultrafast broadband speeds to each dwelling and deliver a level of future proofing for broadband as the demand for speed increases. Openreach will provide an allowance of up to £3,400.00 per plot to undertake all off-site works required, however any costs incurred above this allowance will be chargeable to the developer. As the development consists of over 20 no. residential dwellings, Openreach will likely provide FTTP connections free of charge.

Openreach FTTP network is constructed as an Open Access Network, allowing multiple Internet Service Providers (ISPs) to provide services to future residents and customers utilising the same infrastructure. The installation of Open Access Networks mitigate the requirement for multiple service providers installing duplicate infrastructure within the development site.

Typically, the work undertaken by the developer as part of an Openreach FTTP network installation will consist of laying on-site duct and tubing, building all joint boxes, and providing a cable from a designated joint box to each dwelling (with cappings and covers over external entry points). Openreach will carry out all excess construction works outside of the site boundary and in the public highway.

For a FTTP installation, the developer will need to sign a contract and Wayleave agreement with Openreach. This is a legal requirement for Openreach to install and access its infrastructure. However, if the installation of an independent fibre network is being considered for the development site, exclusivity may be required and therefore the Openreach wayleave should not be signed until it is confirmed an independent third party fibre provider will not be used.

As part of the contract for the installation of Openreach connections, the developer may receive a rebate of up to £140.00 per house for carrying out on-site works as detailed within the contract provided with their connection proposal. The rebate is in line with the Home Builders Federation (HBF) rates and are payable by BT Plc through its Openreach division.

For the installation of FTTP within an individual dwelling, an Optical Network Termination (ONT) will be installed. The ONT is the Openreach demarcation point and replaces the traditional copper master socket. The Openreach ONT will sit in a wall mounted enclosure along with a Battery Backup Unit (BBU) and the associated wiring. The ONT will include an optical port which connects to the external Customer Splice Point (CSP), an Ethernet port which connects to the communications provider's router, and a telephony port to connect to the voice call network.

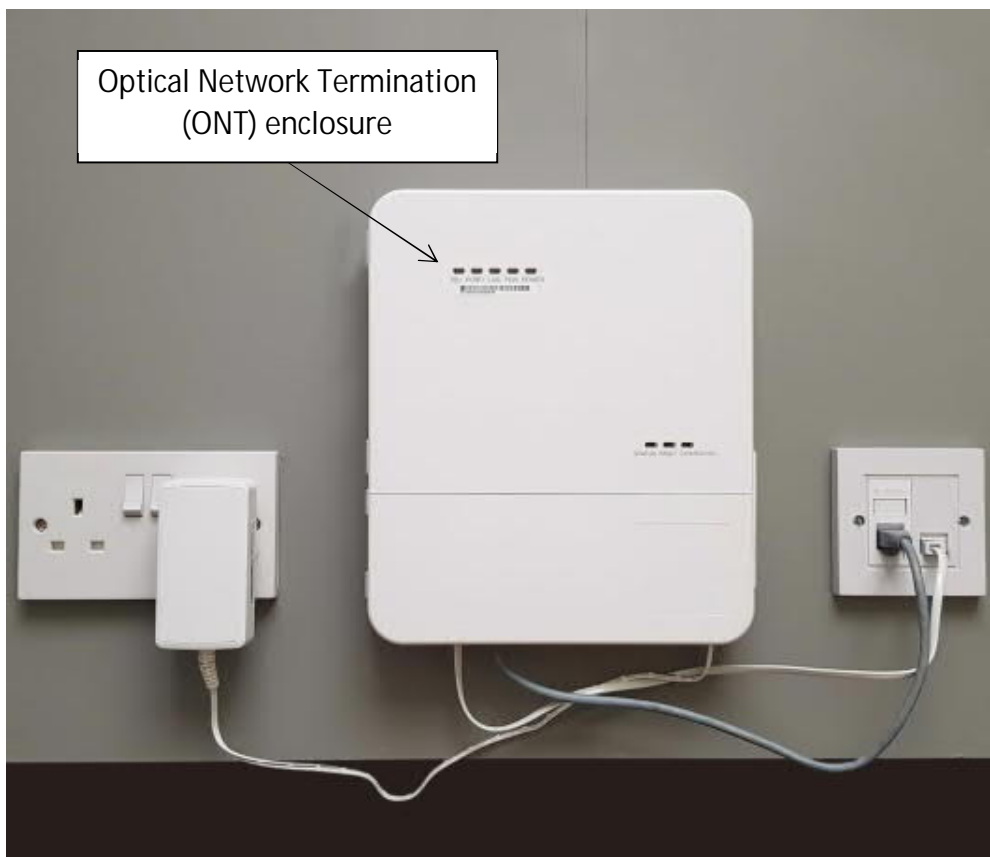


Figure 9.2 – Openreach FTTP Internal Equipment

For all sites installing Openreach Full Fibre Infrastructure, the ONT will be installed by an Openreach engineer. The ONT will be installed at the position of the incoming fibre cable. Figure 9.3 overleaf illustrates the typical installation for the FTTP equipment in a domestic dwelling, where the ONT and associated equipment is located adjacent to the outside wall where the incoming fibre cable is located.

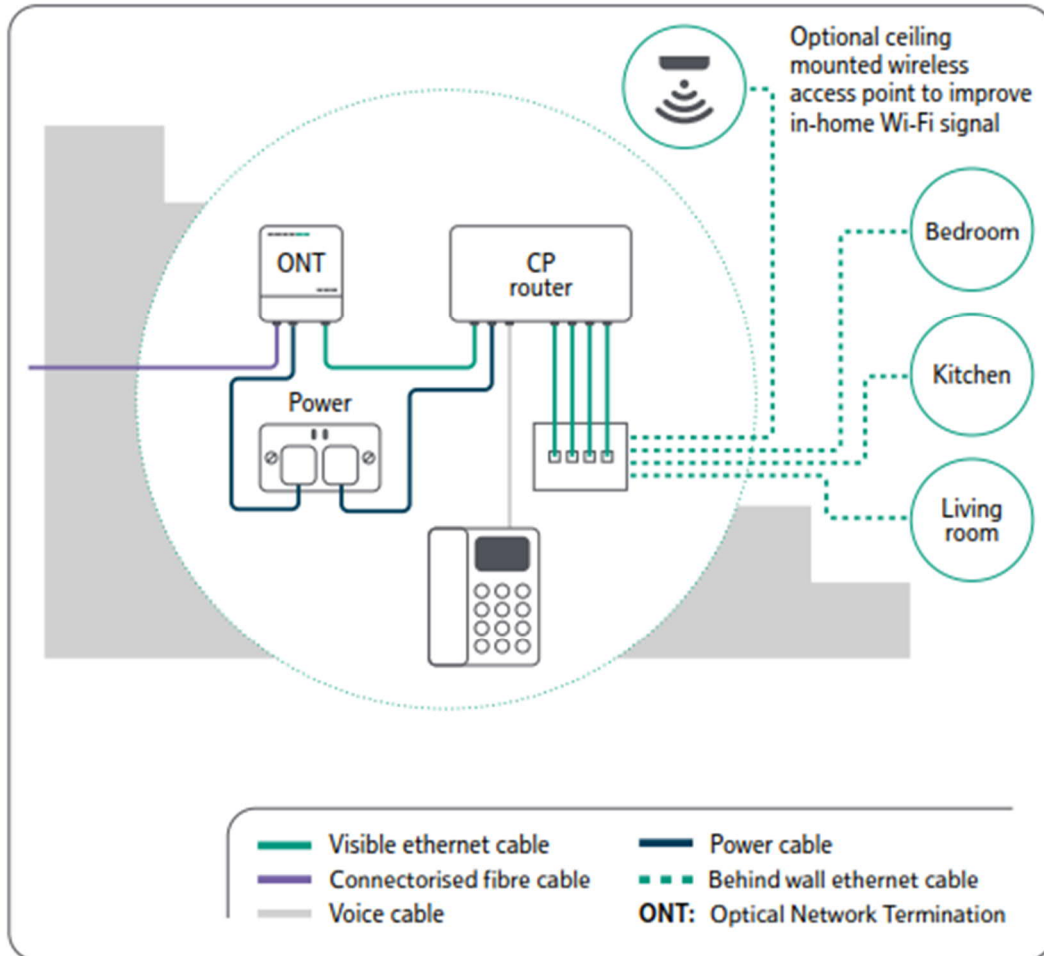


Figure 9.3 – Typical FTTP installation

9.1.2 Diversions & Disconnections

Openreach infrastructure record indicates overhead apparatus routed along the site side verge of Cross Road to the development site boundary. Openreach has reviewed the proposed site layout plan, and based on the current information available for review they do not believe their apparatus will be affected to the extent diversionary works will be required.

It may be prudent to undertake an overhead line survey to confirm the height of the overhead line once the maximum height of construction traffic has been established to ensure sufficient clearance is present.

Openreach infrastructure record indicates apparatus routed along the site side verge of Ellens Road to the development site boundary. Based on review of the proposed site layout plan, it appears this apparatus is currently unaffected by the development works.

Openreach do not typically indicate individual service connections on their infrastructure records; however, their presence should be anticipated until proven otherwise. Based on desktop review of the development site indicating it is greenfield with no existing units present, it can be assumed none are present. No disconnection works are currently anticipated.

9.1.3 Conclusion – Cost & Risk Analysis

Costs relating to the reconfiguration of the existing Openreach distribution network are identified in the following table;

Detail	Cost
Connections	£TBC
Diversions	None currently anticipated
Disconnections	None currently anticipated
Survey Fees	N/A
Total	£Nil

Table 9.1 – Openreach Costs

The main risks associated with the procurement of proposals and the required works are as follows;

- Provisional sums have been applied based on previous projects of similar size and UCML’s experience.
- Openreach infrastructure records currently do not differentiate between copper and fibre optic cables, and as such the type of infrastructure within the ground cannot be determined through desktop review of their statutory infrastructure records. Please note, the presence of fibre optic cables could multiply anticipated diversion costs significantly.

9.2 Alternative Fibre Providers

Several alternative fibre providers operate nationally, who can provide Fibre to the Premise (FTTP) connections as an alternative to the standard option of the installation of an Openreach telecommunications network.

Some alternative fibre providers can also offer installation of a Fibre Integrated Reception System (FIRS) which can deliver digital, terrestrial, and satellite TV, and digital radio direct to individual dwellings through a centrally located satellite dish and aerial array.

It should be noted that some alternative fibre providers will require exclusivity on a development site as part of the contract for installation, meaning only their infrastructure can be installed within the site boundary. This restricts the option for installing alternative fibre apparatus alongside Openreach infrastructure. These alternative fibre networks are constructed as Open Access Networks, providing a choice of ISP to the end user. However, there can be restrictions as to which ISP's can operate on certain networks which would need to be considered prior to proceeding with an alternative fibre network installation.

Alternatively, there are several alternative fibre providers who do not require exclusivity for installation and so can be installed on a development site in addition to Openreach networks to provide a greater selection of choice to end users. These providers can also utilise Openreach proposed duct layout routes for installing their equipment which negates the duplication of physical infrastructure on a development site.

10.0 Other

In addition to the statutory network operators operating within the vicinity of the development site, UCML has contacted several Independent Distribution Networks Operators (IDNOs), Independent Gas Transporters (IGTs), telecommunications providers, pipeline operators, and other third parties who own and operate apparatus nationwide to determine whether any apparatus is located within the vicinity of the development site.

The companies contacted, and their associated response, are summarised within Table 10.2 overleaf. Please refer to the key provided below for further detail on the definitions used.

Table Key	Definition
Affected	Utility apparatus is indicated as being located within the vicinity of the development site.
Not Affected	Utility apparatus is not indicated as being located within the vicinity of the development site.
No Response	No response has been received from the utility provider to date.
Desk Research	Any response determined from desktop research is indicated in this column. This indicates utility infrastructure records have been obtained in house using mapping software provided by the relevant utility provider.

Table 10.1 – Plant Enquiry Response Key

Utility	Company	Desk Research	Affected (date issued)	Not Affected (date issued)	No Response
IDNO	Leep Utilities			02/11/2023	
IDNO	Utility Assets				20/12/2023
IDNO	Eclipse Power Networks Ltd			02/11/2023	
IGT	BBL Company				20/12/2023
IGT	GTC*	✓		03/11/2023	
IGT	Interconnector UK LTD				20/12/2023
Comms	Arqiva				20/12/2023
Comms	Arelion (formerly Telia Carrier)	✓		30/10/2023	
Comms	Cityfibre	✓		30/10/2023	
Comms	CA Telecom			02/11/2023	
Comms	Instalcom				20/12/2023
Comms	McNicholas (TATA)				20/12/2023
Comms	Mobile Broadband Network LTD			02/11/2023	
Comms	O'Connor Utilities**			03/11/2023	
Comms	Sky UK LTD			30/11/2023	
Comms	SOTA			01/11/2023	
Comms	Spectrum Communications				20/12/2023
Comms	Telent				20/12/2023
Comms	Verizon			06/11/2023	
Comms	Virgin Media			30/10/2023	
Comms	Vodafone			08/11/2023	
Transport	National Highways			06/11/2023	
Transport	Network Rail			30/10/2023	
Other	Mastdata.COM (Mobile Phone Masts)	✓		30/10/2023	

Table 10.2 – Plant Enquiry Responses

*Note GTC includes: GTC Pipelines Ltd, Independent Pipelines Ltd, Quadrant Pipelines Ltd, Electricity Network Company Ltd, Independent Power Networks Ltd, Independent Water Networks Ltd, Independent Fibre Networks Ltd, and Independent Community Heating Ltd.

** O'Connor Utilities includes: Lumen Technologies (formerly CenturyLink Communications UK Limited, Level 3, Global Crossing (UK) Ltd, Global Crossing PEC, Fibernet UK Ltd and Fibrespan Ltd.

Optional Searches

Some utility providers are rarely confirmed to be in the vicinity of infrastructure record searches and are therefore only included within the search upon request, as the charge per enquiry is disproportionate to the number of affected responses received. Please advise UCML if you would like to include these additional searches at an additional cost. These optional searches are as follows;

Optional Searches		
IDNO	Harlaxton	Approximate cost £35 (plus VAT)
IDNO	UK Power Distribution	Cost ranges from £9 - £95 (plus VAT) subject to site size

Table 10.3 – Optional Searches

LinesearchbeforeUDig

Several asset owners are registered with LinesearchbeforeUDig (LSBUD), an online service used to review the location of utility assets in relation to a development site location. UCML has undertaken an LSBUD search for this development site, and the response is shown in Figure 10.1 below.

Affected LSBUD members (LSBUD Members who have assets registered on LSBUD within the vicinity of your search area.)			
Asset Owner	Phone/Email	Emergency Only	Status
SGN	08009121722	0800111999	Await response
UK Power Networks	08000565866	08000565866	Await response

List of not affected LSBUD members (LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area.)		
Angus Energy	AWE Pipeline	B & D Energy Limited
Balfour Beatty Investments Limited	BOC Limited (A Member of the Linde Group)	Box Broadband
BP Exploration Operating Company Limited	BPA	Cadent Gas
Cambridgeshire County Council Climate Change and Energy Services	CATS Pipeline c/o Wood Group PSN	Cemex
Centrica Storage Ltd	CNG Services Ltd	Concept Solutions People Ltd
ConocoPhillips (UK) Teesside Operator Ltd	D.S.Smith	Diamond Transmission Corporation
DIO (MOD Abandoned Pipelines)	DIO (MOD Live Pipelines)	E.ON UK CHP Limited
EDF Energy Renewables Ltd	EirGrid	Eleclink Limited
Electricity North West Limited	Energy Assets Networks	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESB CCGT Power station (Carrington Gas Pipeline)
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Fulcrum Pipelines Limited	Gamma
Gas Networks Ireland (UK)	Gateshead Energy Company	Gigaclear Ltd
Harbour Energy	Heathrow Airport LTD	Humbly Grove Energy
IGas Energy	INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)
INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)
Jurassic Fibre Ltd	Kensa Utilities	Last Mile
Mainline Pipelines Limited	Manchester Jetline Limited	Manx Cable Company
Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited	Moray East Offshore Windfarm
MUA Group Limited	National Gas Transmission	National Grid Electricity Distribution
National Grid Electricity Transmission	Neos Networks	Northern Gas Networks Limited
Northumbrian Water Group	NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd
NYnet Ltd	Ogi	Oikos Storage Limited
Ørsted	Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)
Petroineos	Phillips 66	Portsmouth Water
Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)
RWEpower (Little Barford and South Haven)	SABIC UK Petrochemicals	SAS Utility Services Ltd
Scottish and Southern Electricity Networks	Scottish Power Generation	Seabank Power Ltd
SES Water	Shell	Shell NOP
SP Energy Networks	Spring Fibre Limited	Squire Energy Networks
SSE Generation Ltd	SSE Transmission	SSE Utility Solutions Limited
Storengy	Tata Communications (c/o JSM Construction Ltd)	Total Colnbrook Pipelines
Total Finaline Pipelines	Transmission Capital	Uniper UK Ltd
University of Cambridge Granta Backbone Network	Vattenfall	Veolia ES SELCHP Limited
Veolia ES Sheffield Ltd	Voneus Limited	VPI Power Limited
Wales and West Utilities	West of Duddon Sands Transmission Ltd	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

Figure 10.1 – LSBUD search result

11.0 Conclusion

Based on the information currently available for review, the existing utility infrastructure within the vicinity of the development site appears to be capable of supporting the additional demand required to provide connections for the proposed development of 135 no. residential dwellings. As discussed within the study, UCML has undertaken capacity checks with the relevant statutory network operators who have provided confirmation that the existing electricity, gas, clean water, and telecoms services in the vicinity of the development site currently have sufficient capacity to serve the development.

Figure 11.1 below indicates the locations of the points of connection provided by the statutory utility operators in relation to this development.



Figure 11.1 – Location Plan indicating position of points of connection

The figure overleaf includes indicative routes from the points of connection to the development site, which have been included for information and guidance only, and are subject to change. The final routes of utility apparatus to the development site will be provided by the relevant appointed utility provider and are subject to design approval from the adopting network owner, highway authority or landowner and the completion of relevant legal searches.

Based on the information provided by the relevant network operators, no abnormal legal requirements are currently anticipated to utilise the proposed electricity, gas, or clean water connection points as they are located within publicly adopted land. Figure 11.2 below and Figure 12.3 overleaf are extracts from the FindMyStreet adopted road mapping service confirming the above.

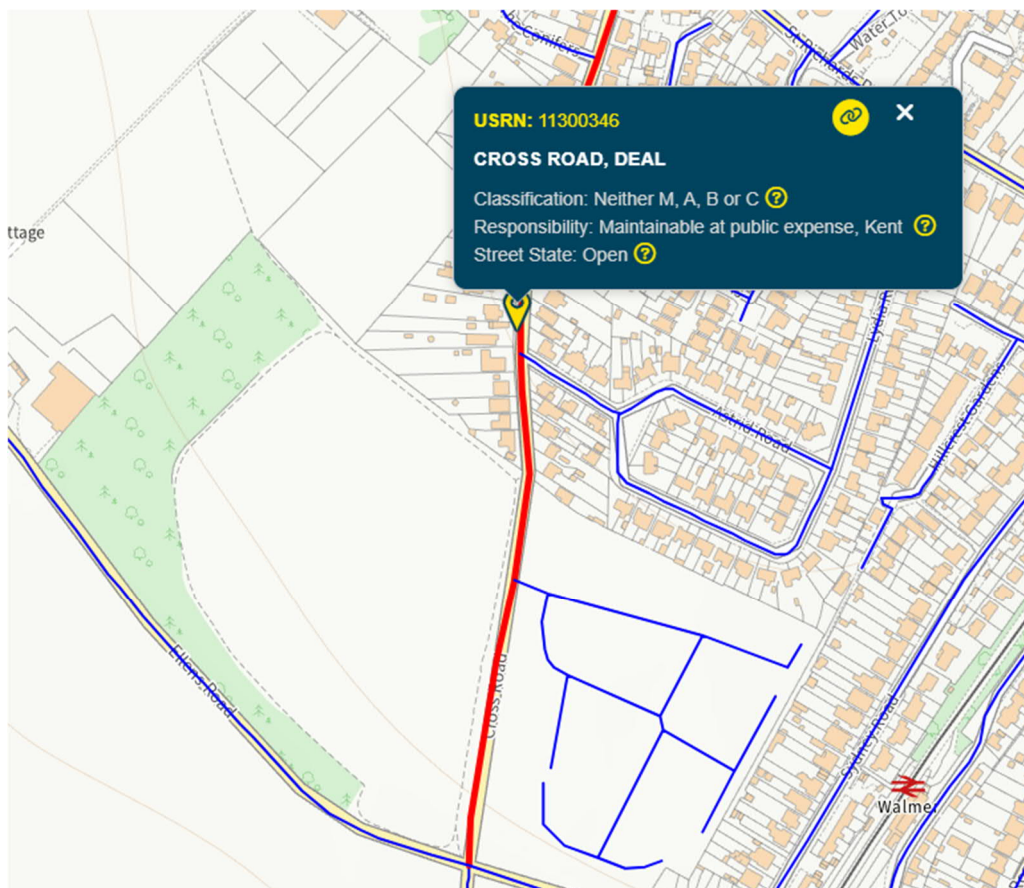


Figure 11.2 – Adopted Road Enquiry (Cross Road)

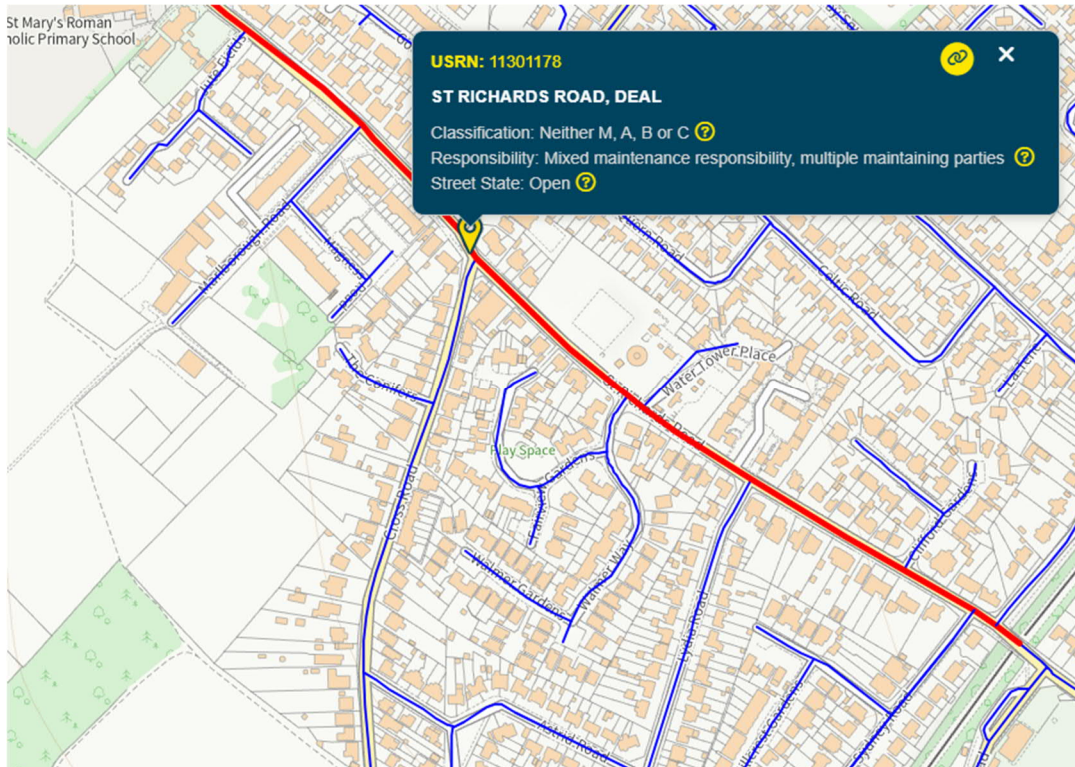


Figure 11.3 – Adopted Road Enquiry (Cross Road)

The connection costs provided in the main body of the report are based on individual utility connection proposals being accepted. It may be possible to undertake the connections works as part of a multi utility offering which can combine the installation of electricity, gas, water, and telecoms under a single works contract. For some sites, the appointment of a multi utility provider may be more cost-effective option for the connections.

12.0 Risk Matrix

Based upon the anticipated utility works required for this development discussed within this study, UCML has drawn up an indicative risk matrix for the development. For the risk matrix, each item is allocated a 'traffic light' score based on the anticipated risk to the development and associated timescales based on the key shown below.









Matrix Key	
	Do not envisage any major issues.
	Could cause delay that can be measured in weeks, and can also be prevented.
	Could cause delay that can be measured in months, and may be prevented.
	Could cause major delay, that may not be mitigated.
Utility	Risk
Electricity	
Connection Works – HV POC, off-site HV mains lay, installation of on-site secondary substation, on-site HV mains lay, on-site LV mains lay, and installation of LV service to each dwelling. Diversionsary Works – None currently anticipated Disconnection Works – None currently anticipated	
Gas	
Connection Works – Off-site LP mains lay, on-site LP mains lay, and installation of LP service connection to each dwelling requiring a mains gas connection. If no gas connections are utilised, no works will be required. Diversionsary Works – None currently anticipated Disconnection Works – None currently anticipated	
Water	
Connection Works – Off-site mains lay, on-site mains lay, and installation of service connection to each dwelling. Diversionsary Works – None currently anticipated Disconnection Works – None currently anticipated	
Telecoms – Openreach	
Connection Works – FTTP network installation Diversionsary Works – None currently anticipated Disconnection Works – None currently anticipated	

Table 12.1 – UCML Risk Matrix

13.0 Street Works UK

Existing and new utilities are assumed to be located in accordance with the Street Works UK (formerly the National Joint Utility Group) guidelines. However, in reality, existing utilities are often not laid to these guidelines. Where new road entrances are being formed it is recommended that trial hole investigations are carried out to verify the precise position and depth of infrastructure. In some cases, if the utility infrastructures are sufficiently deep, this may enable the extent and cost of diversions to be reduced.

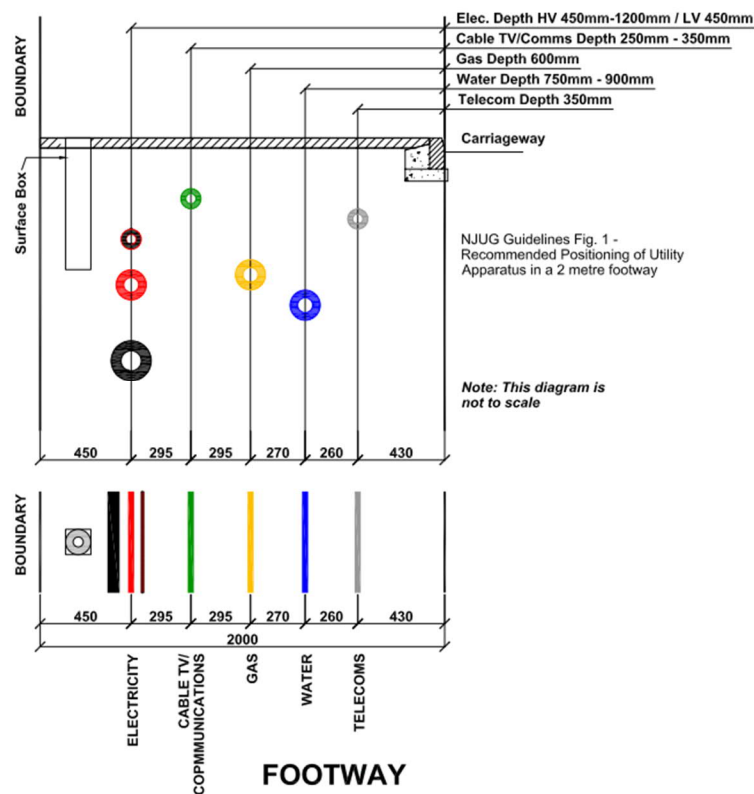


Figure 13.1 – Recommended positioning of utility apparatus in a footpath

The position and depths of underground and overhead apparatus as indicated on infrastructure records included within the utility study are approximate and may deviate from the marked route. The plan information shown is given without warranty and is derived from statutory network information provided by others. The accuracy thereof must not be relied upon in the event of any development or works without further below ground investigations taking place.