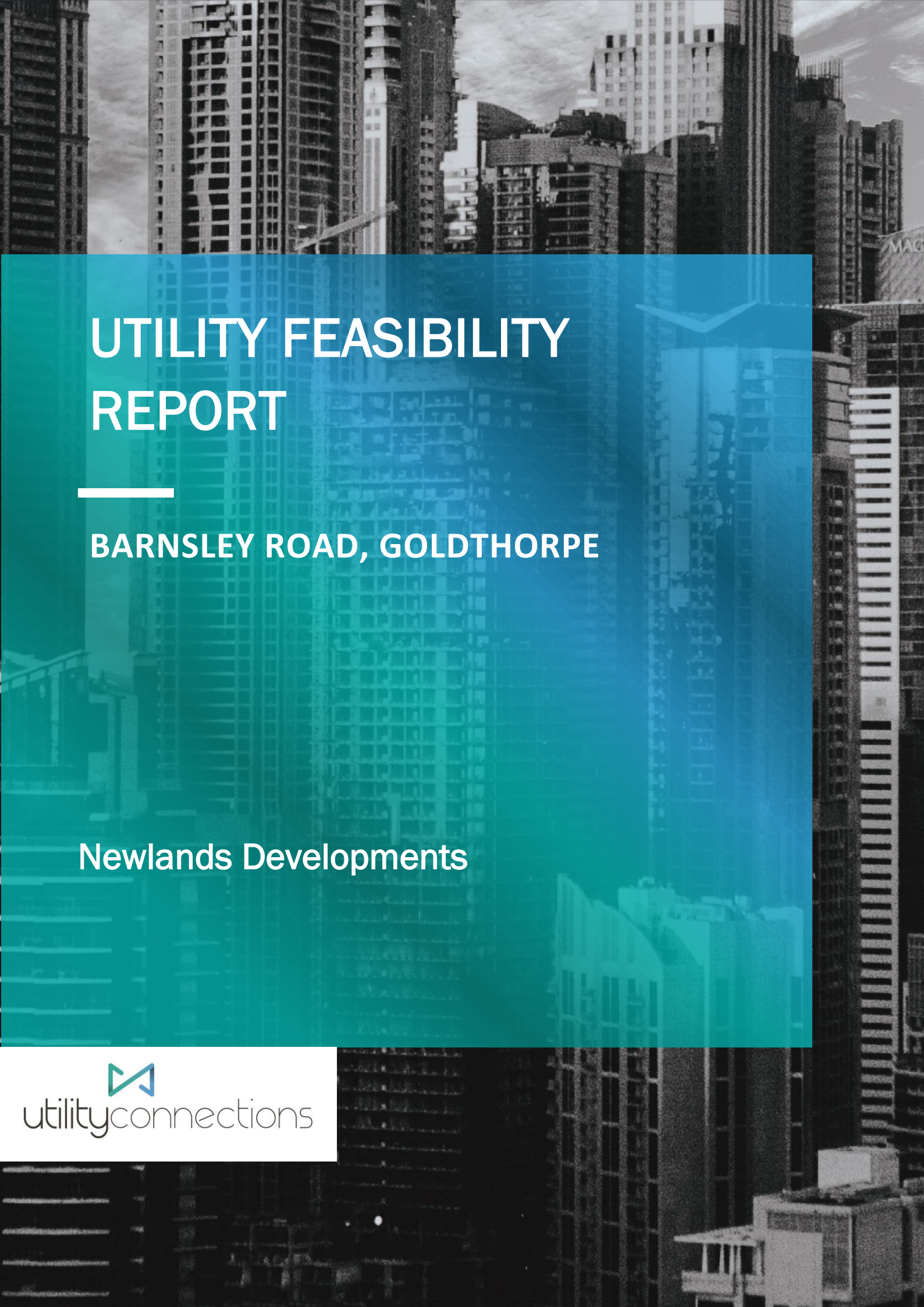

UTILITY FEASIBILITY REPORT

BARNSLEY ROAD, GOLDTHORPE

Newlands Developments

utilityconnections

DOCUMENT VERIFICATION

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CONTENTS

1. INTRODUCTION

GENERAL

This report assesses the utility diversion and new connection works required prior to construction of the proposed development site at Barnsley Road, Goldthorpe.

The report considers the requirement for disconnection of services to any existing plots where demolition will take place, diversion of assets affected by construction of the proposed development and any constraints associated with the procurement of new supplies to serve the proposed development.

Budget costs for the above have been included for the disconnection, diversion and new supply element of the works.

The scope of this report is as follows:-

1. Identify existing utility assets (using utility operator company records) on site and around the site boundary;

2. Outline any potential diversionary requirements of existing utility assets;

3. Profile the electricity, water and gas capacity requirements to service proposed units;

4. Outline potential points of connection to extend new utility infrastructure into the development site;

5. Make comment on potential off site reinforcement requirements to deliver the profiled site load requirements;

6. Assessment of existing Wayleaves and easements across the site;

Formal applications have been made for the points of connection to the following asset owners for the area:-

1) Electricity – Northern Powergrid

2) Water – Yorkshire Water

3) Gas – Cadent Gas Networks

1.1. CONNECTION CONSTRAINTS

ELECTRICITY

- Diversion of multiple existing overhead 11kV cables and poles within the development boundary.
- Diversion of the existing underground LV mains within the highways modification areas.
- Delivery timescales for NPG 132kV, 66kV & 11kV reinforcement and point of connection.
- Modification application to National Grid Electricity System Operator (NGESO).

WATER

- Diversion of the existing potable water main within the development boundary and highways modification areas.

TELECOM

- Diversion of the existing underground Openreach chambers and ducts within the highways modification areas.
- Diversion of the existing underground Virgin Media chambers and ducts within the highways modification areas.

2. SITE LOCATION

The site is located to the south of the A635 as per figure 2.1 below, the existing site consists of Greenfield/Agricultural land.

Site boundary

Figure 2.1 – Site location Plan

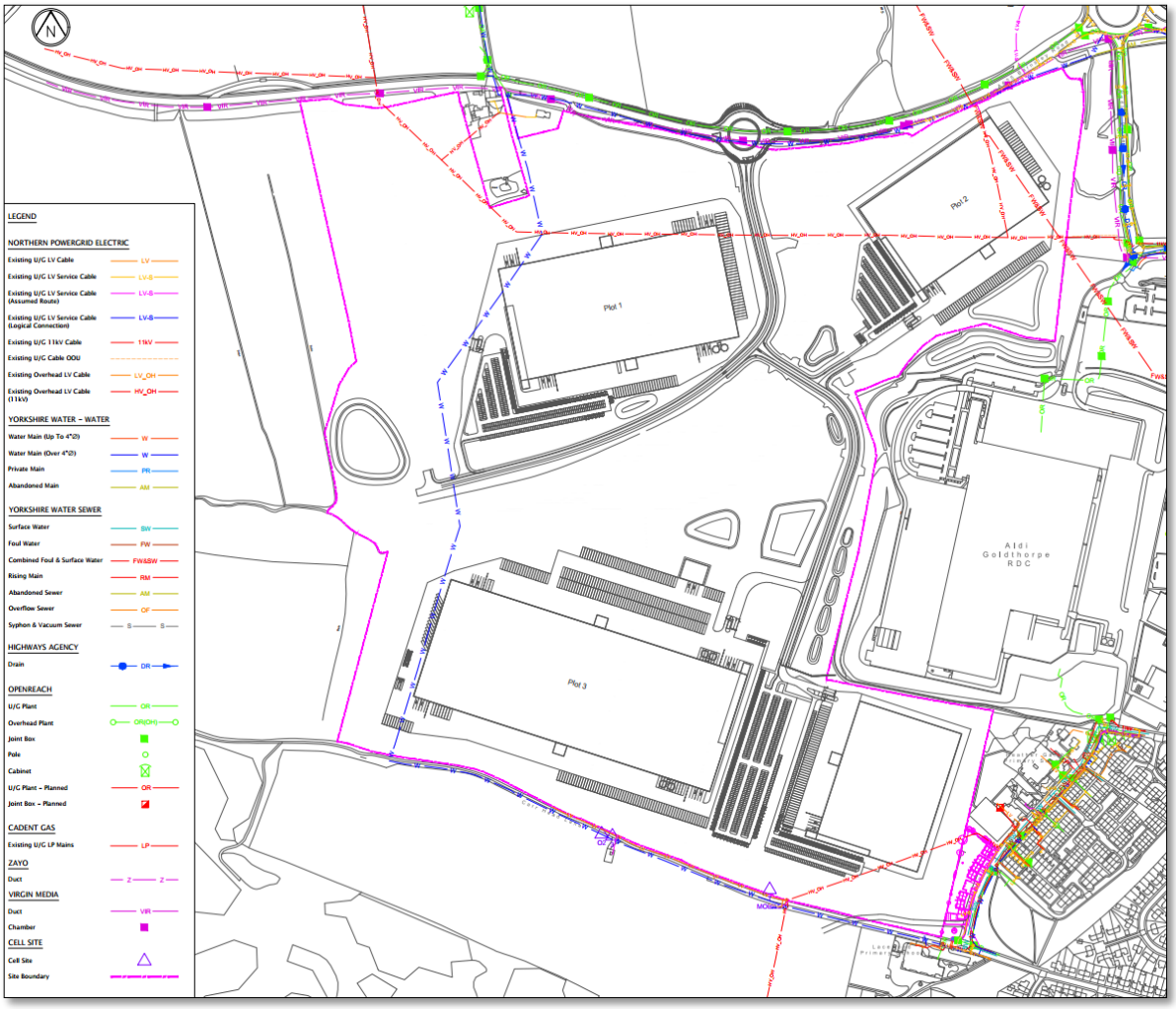
3. PROPOSED DEVELOPMENT

Figure 3.1 – Proposed Development Layout

Item	Description
Drawing	Indicative Masterplan
Development Area	2,123,400 sqft
Proposed number of Units	4no. Industrial and commercial warehouses and office space
Development Type/use	B8 Industrial and Commercial

4. UTILITY NETWORK COMPOSITE OVERLAY

Figure 4.1 – Existing Network Composite Overlay



5. UTILITY NETWORK ASSET RECORDS SEARCH

A utility asset search has been undertaken to determine what assets exist near to or on the proposed development site.

The results of this search and affected assets can be seen in table 5.1 below.

The utility asset records can be found in Appendix 1 to this report.

Table 5.1 – Search Results

Company Name	Type	Plant in Area
Northern Powergrid	Electricity	Yes
Yorkshire Water	Water	Yes
Cadent Gas Networks	Gas	Yes
GTC	Gas	Yes
Last Mile	Gas	Yes
Openreach	Telecoms	Yes
Virgin Media	Telecoms	Yes
Zayo	Telecoms	Yes
Mast Data	Telecoms	Yes

6. EXISTING UTILITY INFRASTRUCTURE

Diversion of exsiting mains and service infrastrucutre wihtin the A635 Barnsley Road have been assesed on the access roundabout and s278 re-alignment works detailed on the development masterplan. We have been advised that the local highway authroity have planned works in this area to construct the access to the development ahead of development construction works commencing.

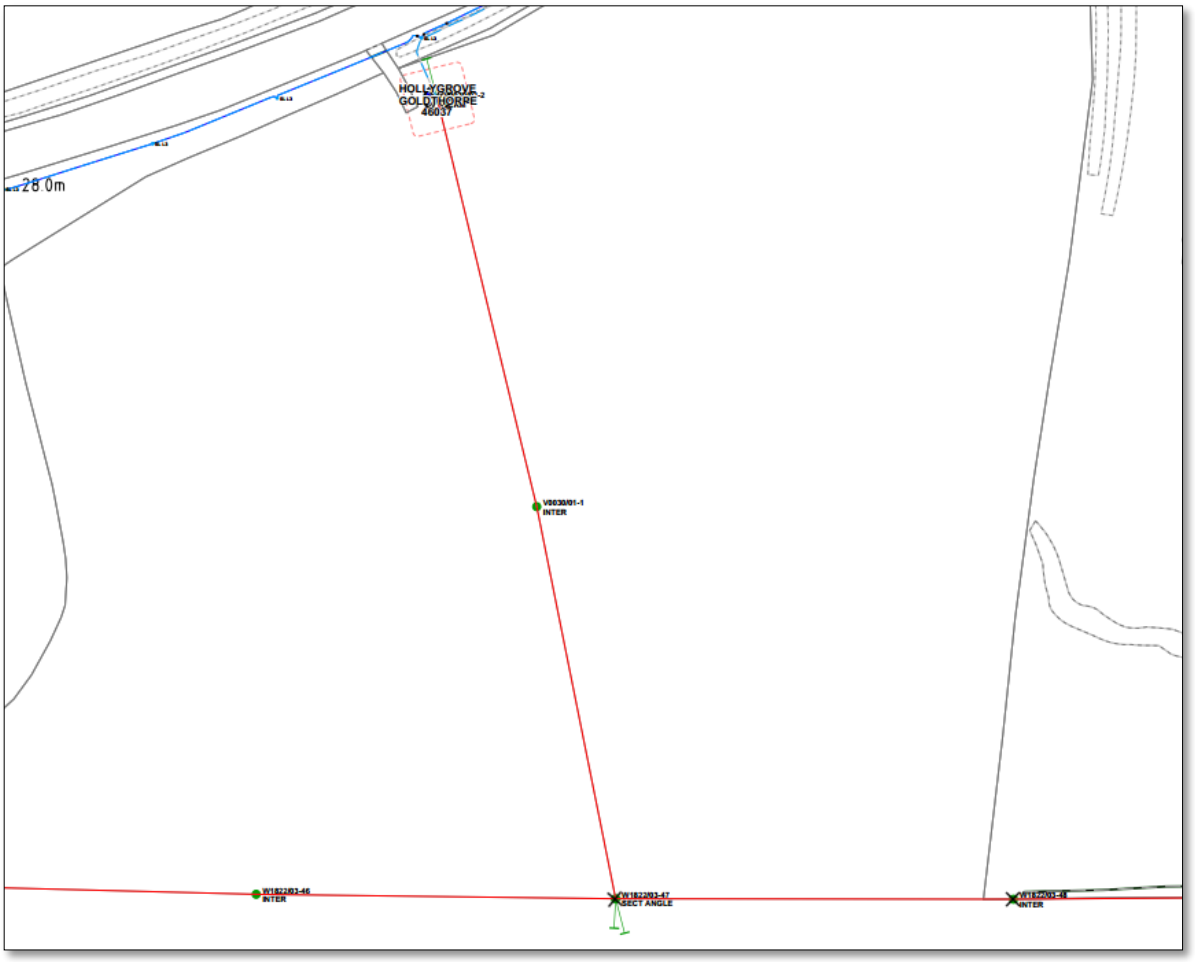
In this instance some or all of the diversion works will be carried out by the LHA, however further consideration will be reauired to determine future excavation works in this area and any s.58 restrictions affecting both new utility and diversion installations.

6.1 NORTHERN POWERGRID

11KV NETWORKS – A635

The Northern Powergrid asset record indicates that there are existing overhead 11kV (HV) cables and poles which enter the site boundary from the A635 and run southbound as per figure 6.1.1 below, its anticipated the overhead 11kV (HV) cables and poles will need to be diverted to faciltate the proposed development.

Figure 6.1.1 – Existing NPG overhead 11kV (HV) cables and poles



11KV NETWORKS – A635

The Northern Powergrid asset record indicates that separate overhead 11kV (HV) cables and poles run east to west across the site as per figures 6.1.2 and 6.1.3 below, it's anticipated that these cables and poles will also need to be diverted to faciltate the proposed development.

Figure 6.1.2 – Existing NPG overhead 11kV (HV) cables and poles

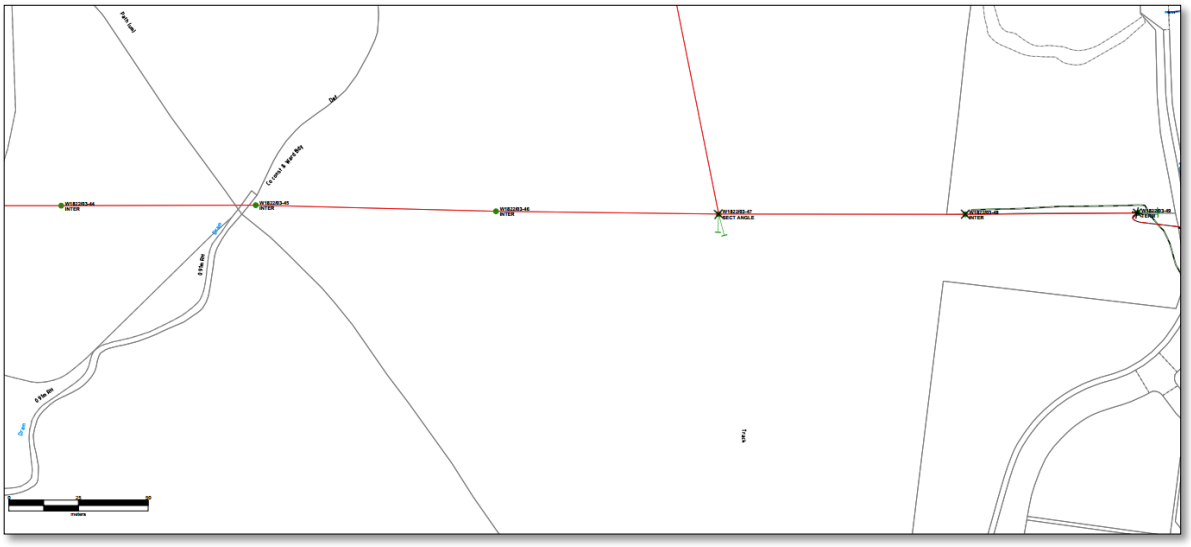
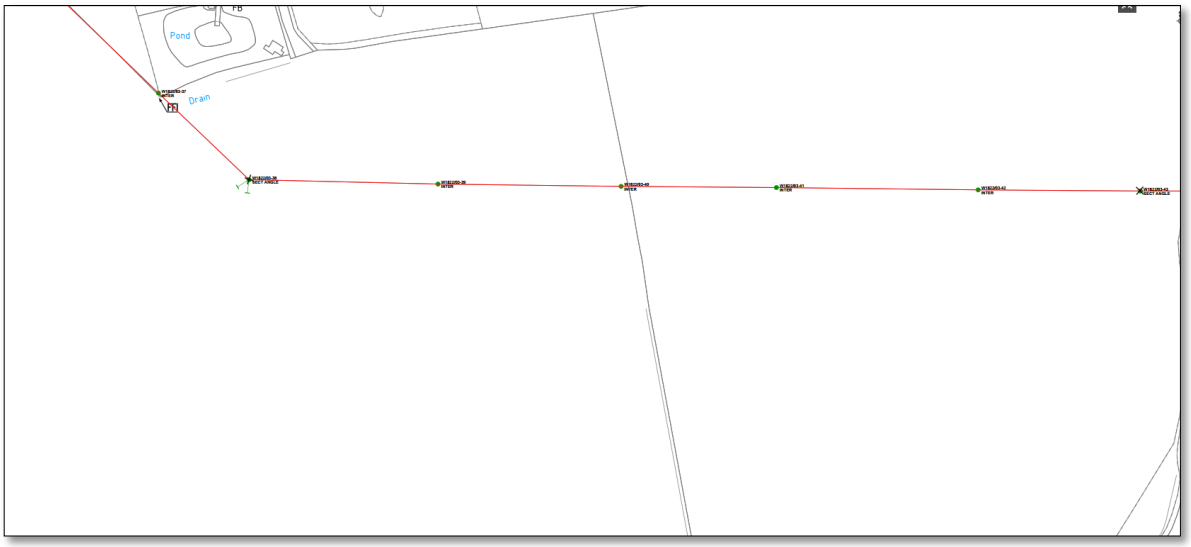


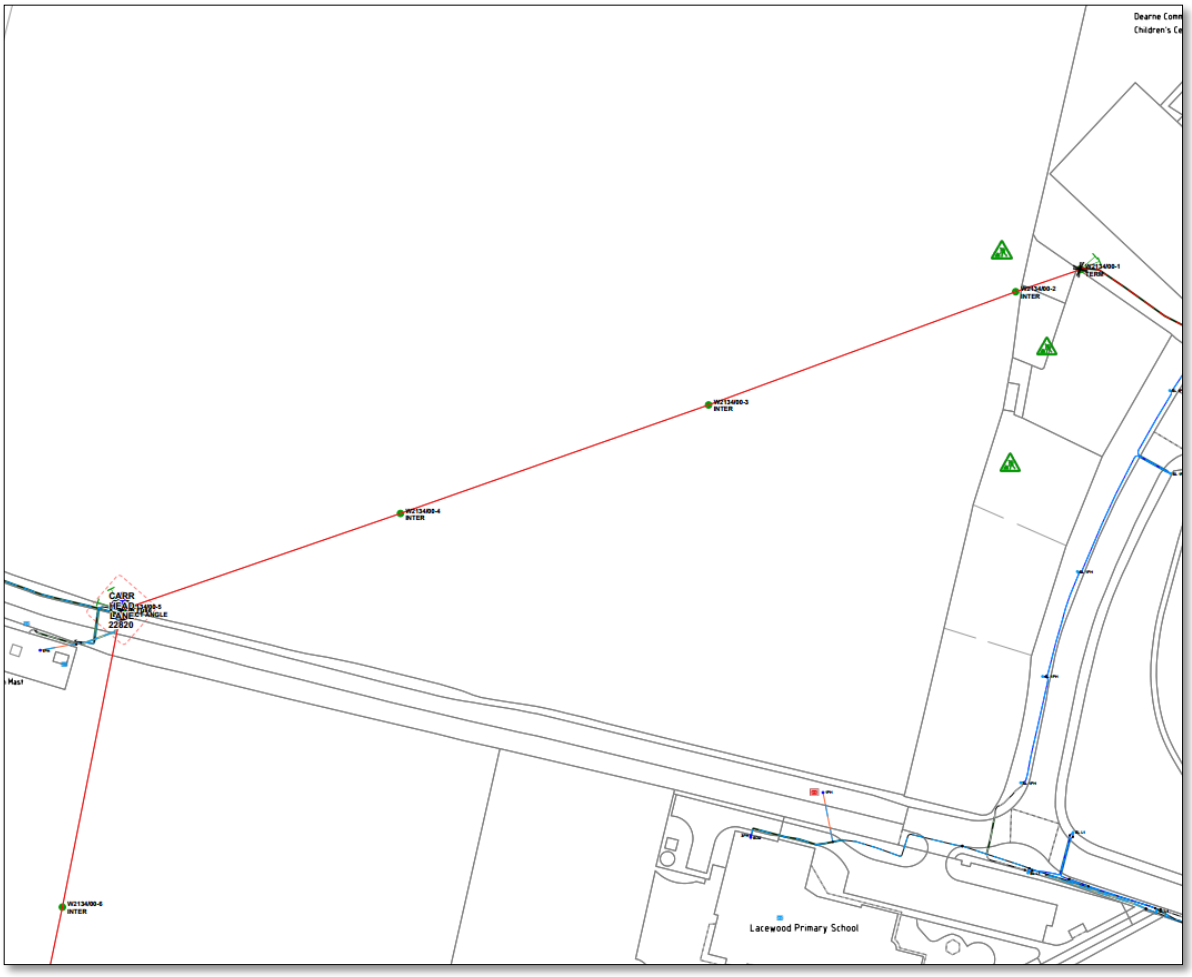
Figure 6.1.3 – Existing NPG overhead 11kV (HV) cables and poles



11KV NETWORKS – A635

The Northern Powergrid asset record indicates that there are existing overhead 11kV (HV) cables and poles which enter the site boundary from Carr Head Lane and run across the south east corner of the site as per figure 6.1.4 below, its anticipated that these cables will need to be diverted to faciltate the proposed development.

Figure 6.1.4 – Existing NPG overhead 11kV (HV) cables and poles



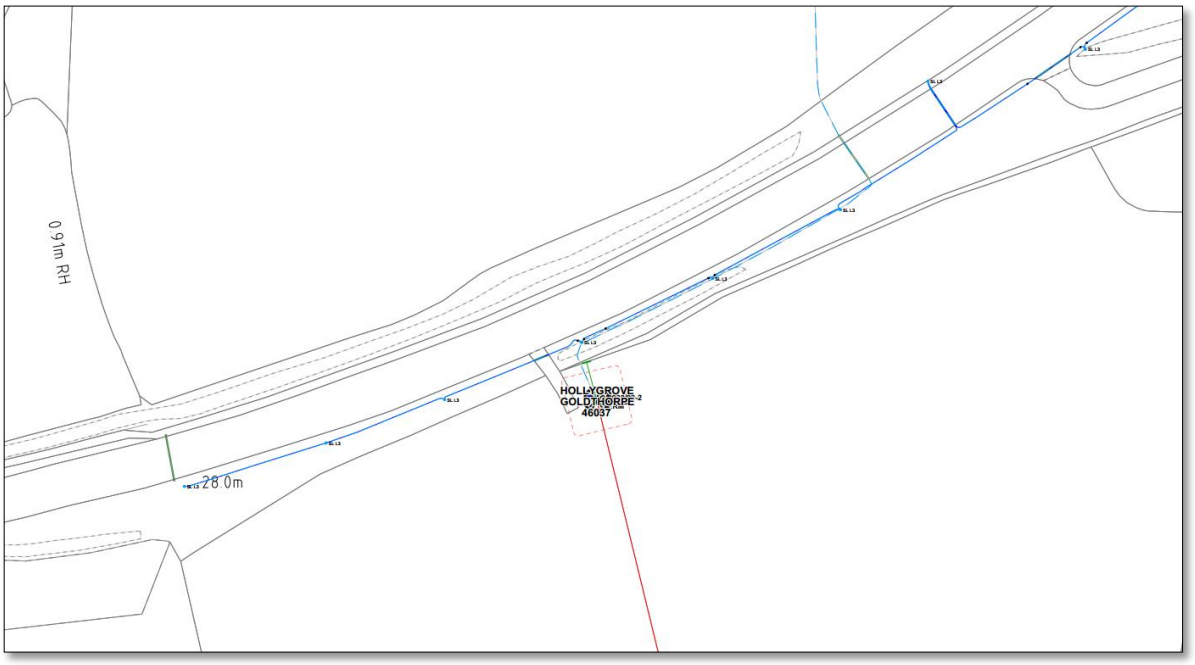
LV NETWORKS – A635

The Northern Powergrid asset record indicates that there are existing underground low voltage mains and service cables positioned in the verge of the A635 to the north of the site as per figure 6.1.5 below, it's anticipated that these cables will be affected by the proposed highway modifications on this area.

It's highly recommended that a GPR survey and trial holes areundertaken in this area to establish the depth and position of the existing underground low voltage mains and service cables, followed if necessary by trial pit investigations.

We are not currently in receipt of S278 modification designs, once this information becomes available a secondary review of any affected utility asset records will need to be undertaken.

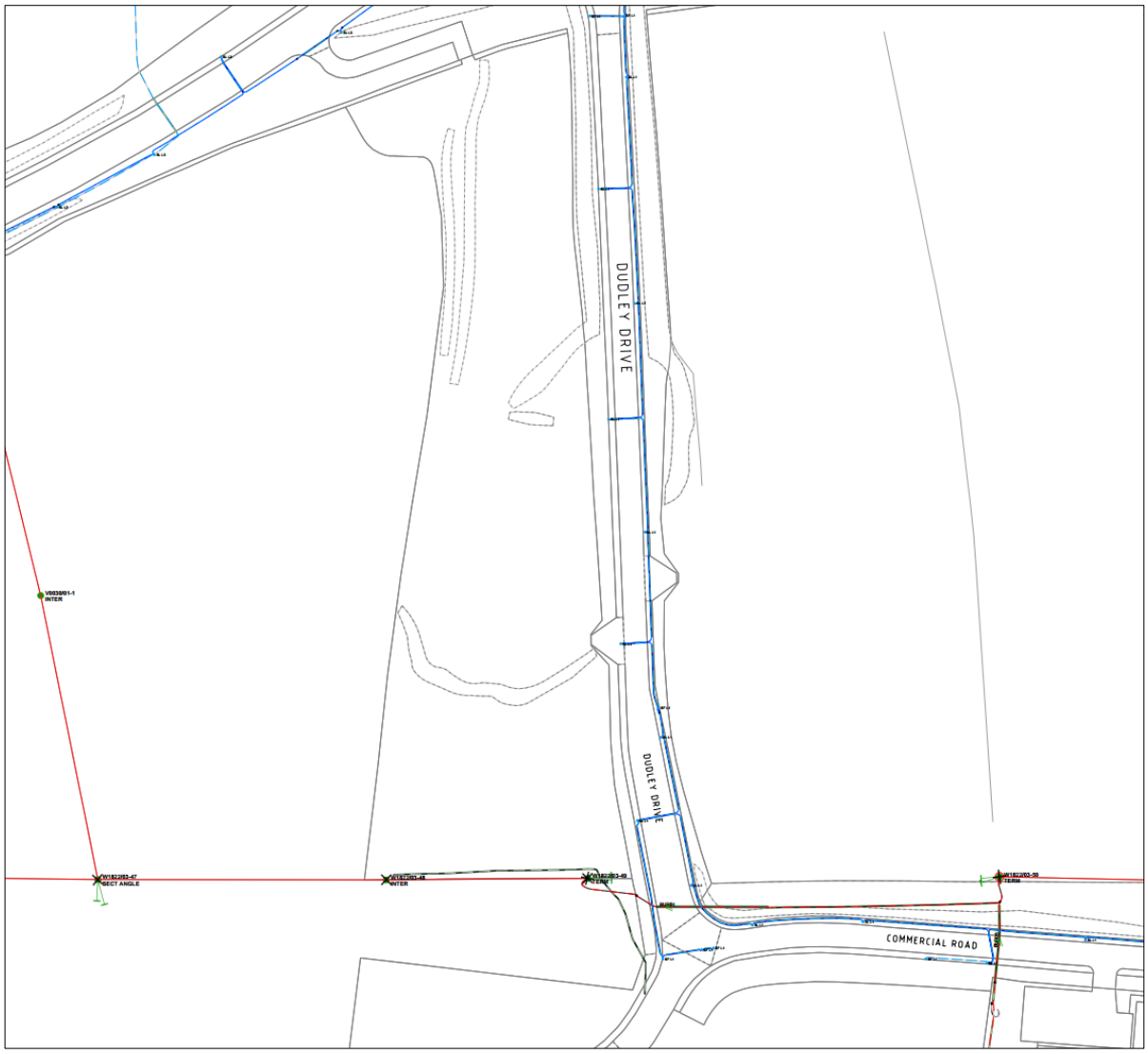
Figure 6.1.5 – Existing NPG underground LV mains and service cables adjacent to the A635



LV NETWORKS – DUDLEY DRIVE AND COMMERCIAL ROAD

The Northern Powergrid asset record indicates that there are underground low voltage service cables positioned in the footways of Dudley Drive and Commercial Road which feed the existing lighting columns as per figure 6.1.6 below, however its anticipated that in their current positions the cables will ultimately remain unaffected by the proposed development.

Figure 6.1.6 – Existing NPG underground LV service cables in Dudley Drive and Commercial Road



11KV NETWORKS – DIVERSION SUMMARY (NORTH OF SITE OVERHEAD LINE)

Removal of the 11kV overhead line (OHL) and retention of supplies on A635 and retained residential units will require installation of a new buried 11kV circuit from the existing underground cable network within Dudley Drive.

POD 1 (Dudley Drive)

- Excavate joint bay over existing 11kV buried circuit in Dudley Drive.
- Excavate cable trench along east boundary, northbound towards the A635.
- Continue along northern boundary A635 heading west bound.
- At west boundary continue south to POD 2 adjacent to the existing residential property.
- Install suitably rated 11kV cable circuit between POD 1 & POD 2.

POD 2 (Onsite west boundary)

- Erect new HV terminal pole with Stays (6-8m stay span from base of pole)
- Install HV pole termination from new buried cable circuit
- Re-span 11kV conductors from terminal pole to POD 3

POD 3 (Onsite north boundary)

- From new buried 11kV circuit install short section of 11kV cable branch to existing pole on A625 Barnsley Road.
- Complete pole termination to retain 11kV Pole Mounted Transformer (PMT) and LV network on Barnsley Road

Jointing & Site clearance.

- During planned outage complete;
    - 1 x HV straight joint to circuit in Dudley Drive
    - 1 x HV Breech Joint
    - 2 X HV Pole terminations
    - HV conductor re-span and termination
    - Removal of redundant HV conductors and poles

11KV NETWORKS – DIVERSION SUMMARY (SOUTHEAST OF SITE OVERHEAD LINE)

Diversion of the 11kV overhead line at the southeast corner of the development (Plot 04) will require the diversion to retain supplies within Carr Head Lane.

Two options can be considered for removal of the lines from site;

1) Full removal from site utilising buried cable circuit in Billingley View.
2) Erect 2no. HV terminal poles within the development boundary with the diversion kept onsite.

For the purpose of the report we have reviewed full removal of plant.

POD 1 (Billingley View)

- Excavate approximately 355 metres of mixed carriageway/footway/verge to install the new 11kV cable circuit between POD 1 and POD 2

POD 2 (Carr Head Lane)

- Erect terminal pole at POD 2
- Install HV pole termination

Jointing & Site clearance.

- During planned outage complete;
    - 1 x HV straight joint to circuit in Billingley View
    - 1 X HV Pole terminations
    - HV conductor re-span and termination
    - Removal of redundant HV conductors and poles

LOW VOLTAGE NETWORKS – DIVERSION SUMMARY (A635)

Relay of low voltage underground cable circuits and reconnection of street furniture supplies fed via existing pole mounted transformer on the A635, subject to confirm of the proposed highway modifications.

Figure 6.1.7 – Proposed HV diversion route for Northern Section

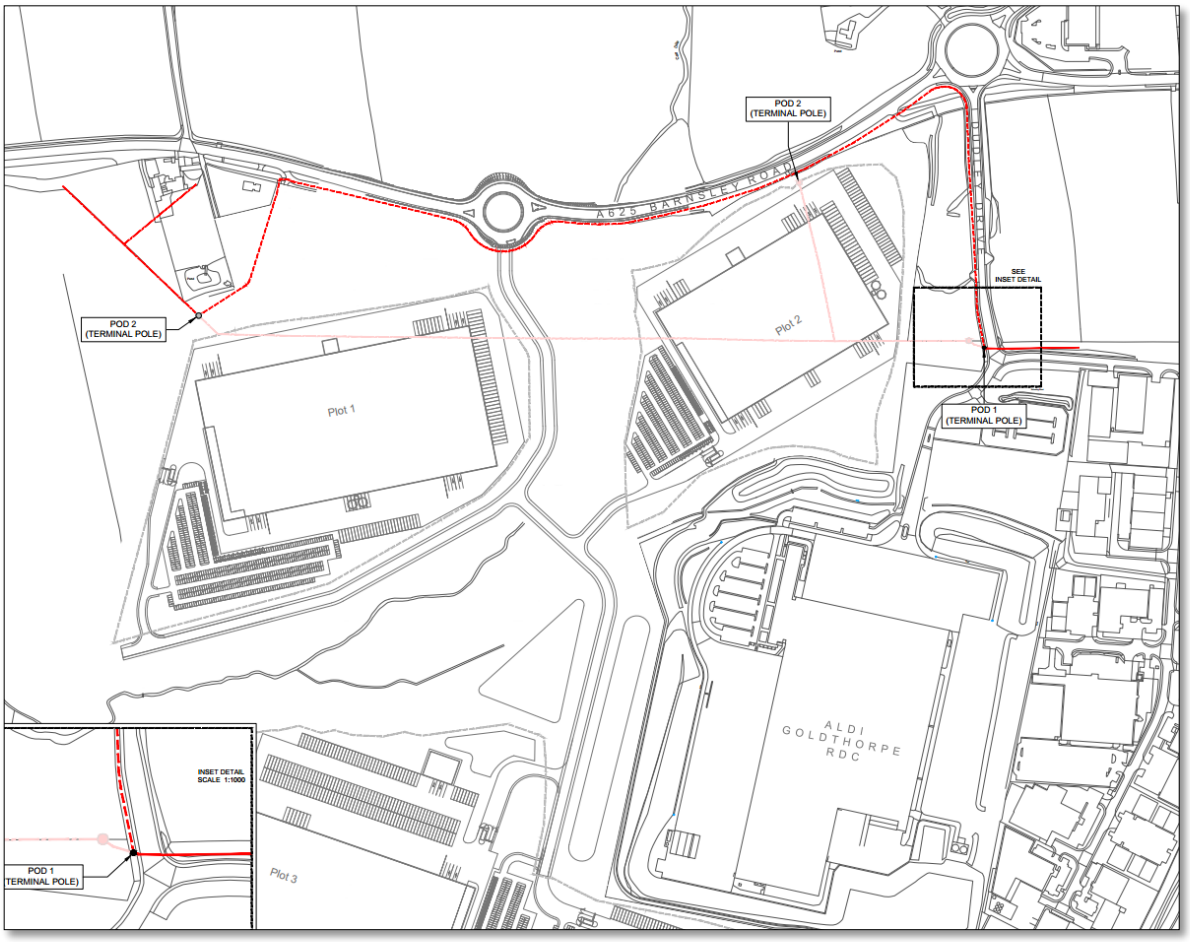
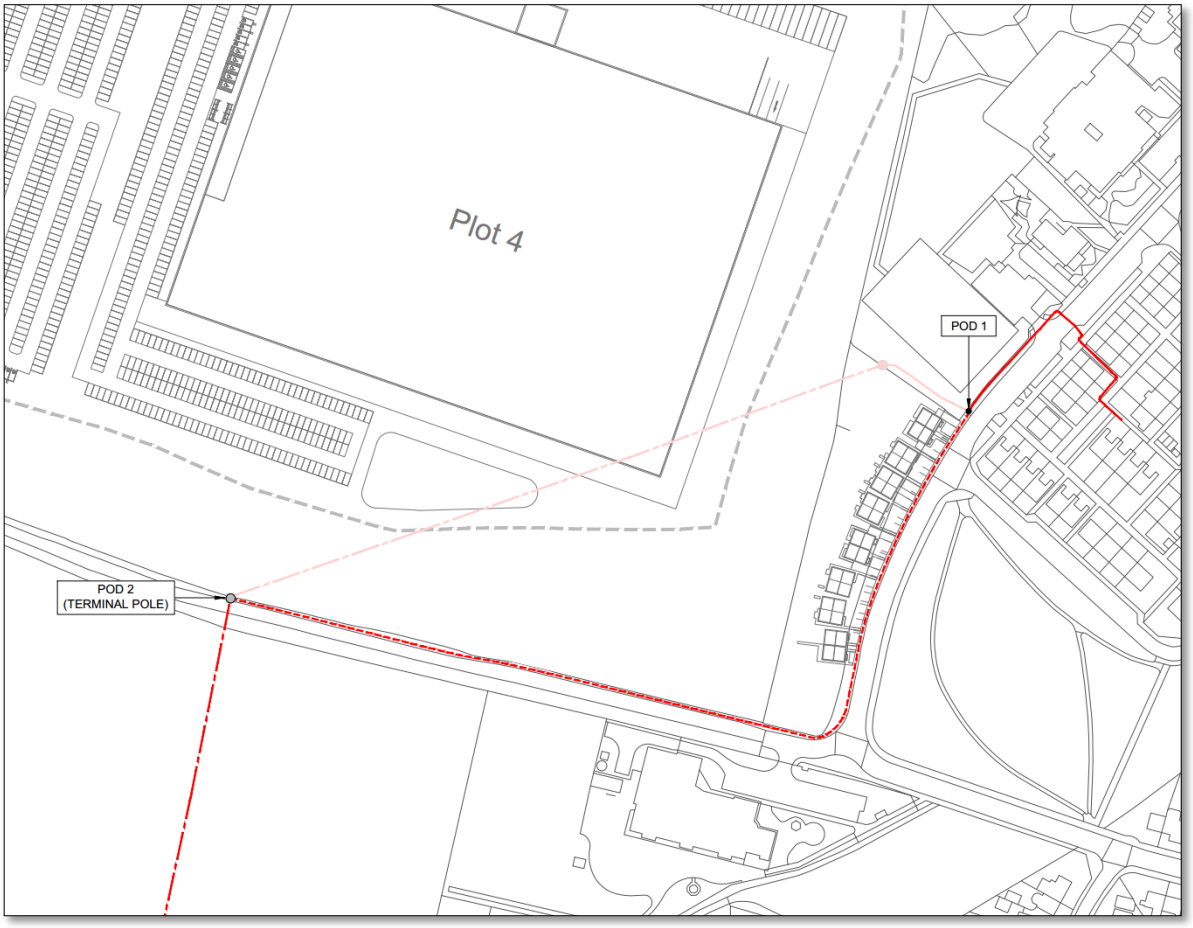


Figure 6.1.8 – Proposed HV diversion route for Southern Section



6.2 YORKSHIRE WATER

POTABLE WATER NETWORKS

The Yorkshire Water asset record indicates that there is an existing water main (4inch and above) which enters the site from the A635 and runs southbound through the proposed development before exiting onto Carr Head Lane as per figures 6.2.1 and 6.2.3 below, its anticipated that this main will need to be diverted to faciltate the proposed development.

Figure 6.2.1 – Existing Yorkshire Water underground water main (4inch and above)

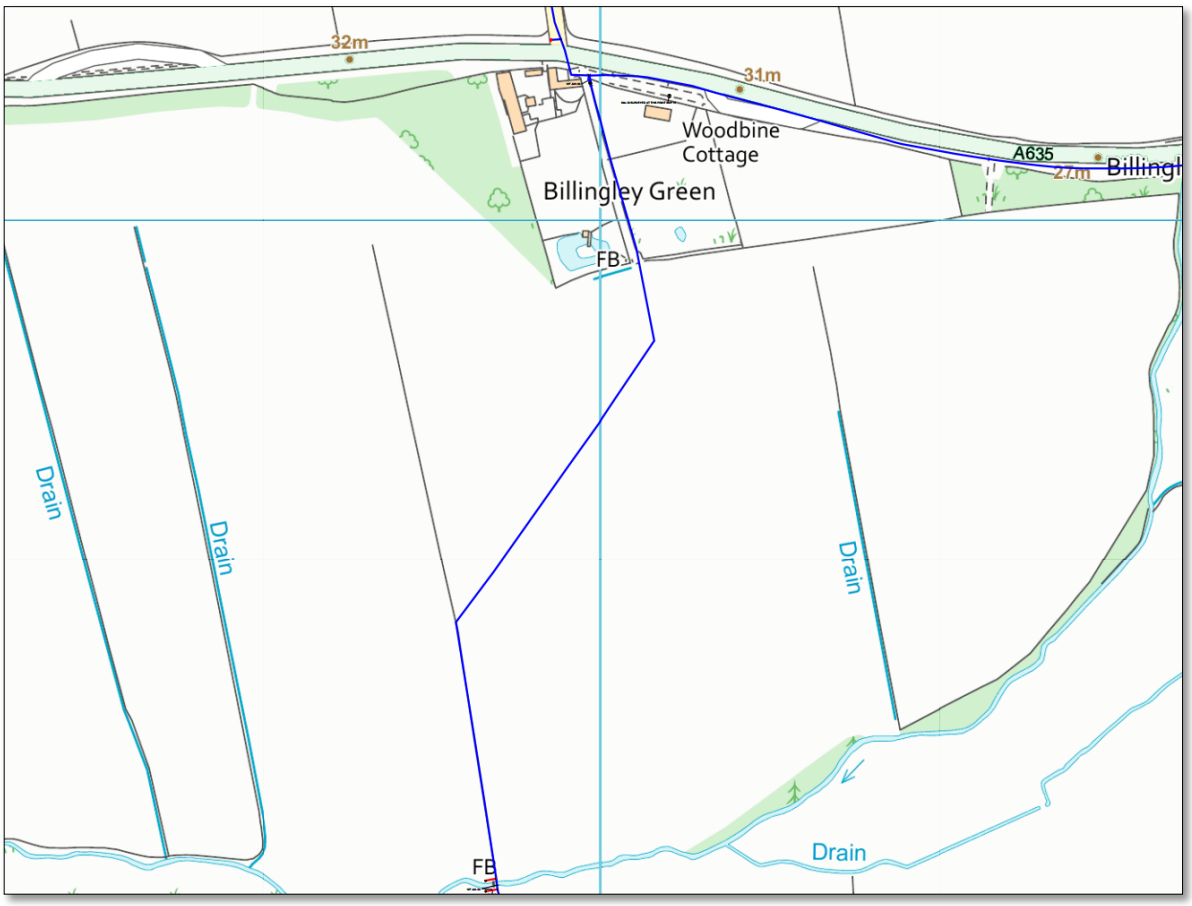


Figure 6.2.2 – Existing Yorkshire Water underground water main (4inch and above)

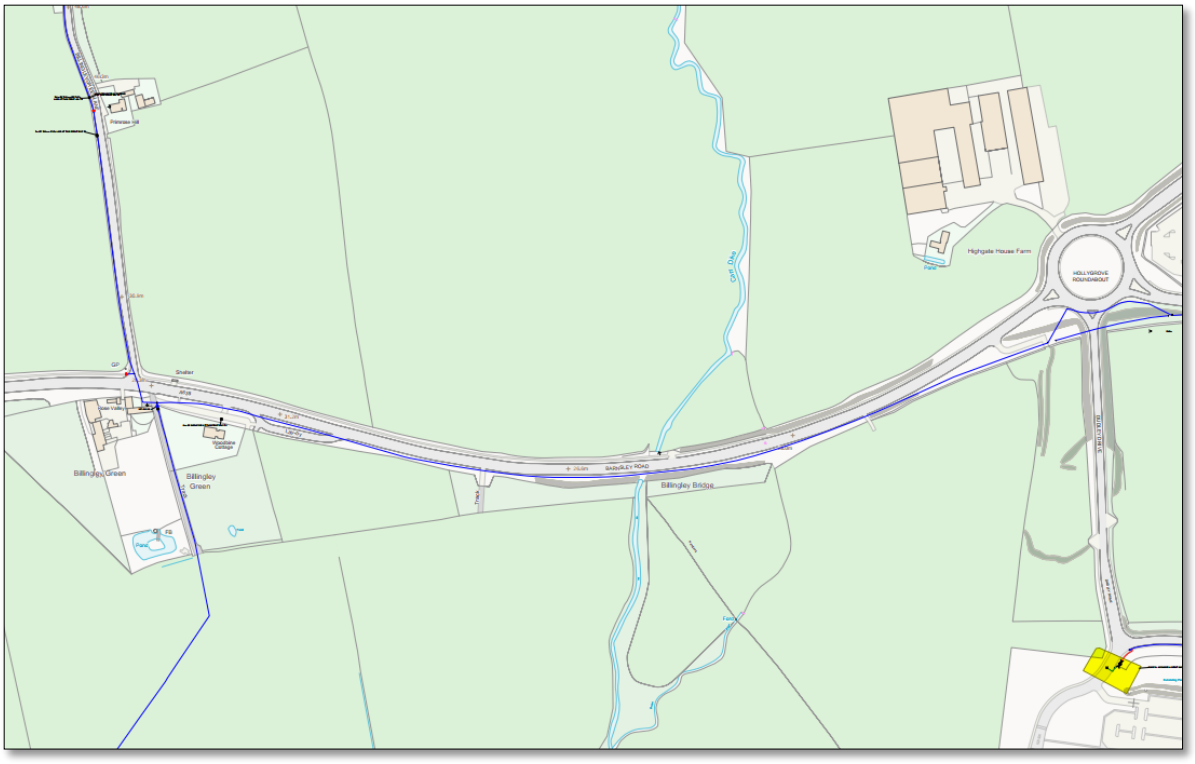
POTABLE NETWORKS – A635

The Yorkshire Water asset record indicates that there is an existing water main (4inch and above) positioned in the grass verge of the A635 to the north of the proposed development as per figure 6.2.3 below, its anticipated that the main will be affected by the proposed S278 highway alteration works to the existing carriageway.

It's highly recommended that a GPR survey is undertaken in this area to establish the depth and position of the existing water main, followed if necessary by trial pit investigations.

We are not currently in receipt of S278 modification designs, once this information becomes available a secondary review of any affected utility asset records will need to be undertaken.

Figure 6.2.3 – Existing Yorkshire Water main (4inch and above) positioned in the verge of the A635



POTABLE WATER NETWORKS – DIVERSION SUMMARY (POTABLE WATER MAIN)

Diversion of the underground potable water main (4inch and above) which enters the site boundary from the A635 and runs southbound, across Carr Dike, before exiting the site boundary onto Carr Head Lane.

POD 1 (Onsite adjacent to the A635)

- Excavate joint bay over existing potable water main adjacent to the residential property.
- Excavate trench along the eastern and southern boundaries of plot 1 towards the Carr Dike crossing.
- Install suitably sized main (barrier pipe) between POD 1 & POD 2 to replace the existing section of main.
- Pressure test and chlorination of the new main with samples sent off for testing.
- Connect the newly installed main onto the existing main at POD 1.

POD 2 (Onsite to the north of Carr Dike crossing)

- Excavate joint bay over existing potable water main to the north of the Carr Dike crossing.
- Connect the newly installed main into the existing main at POD 2.

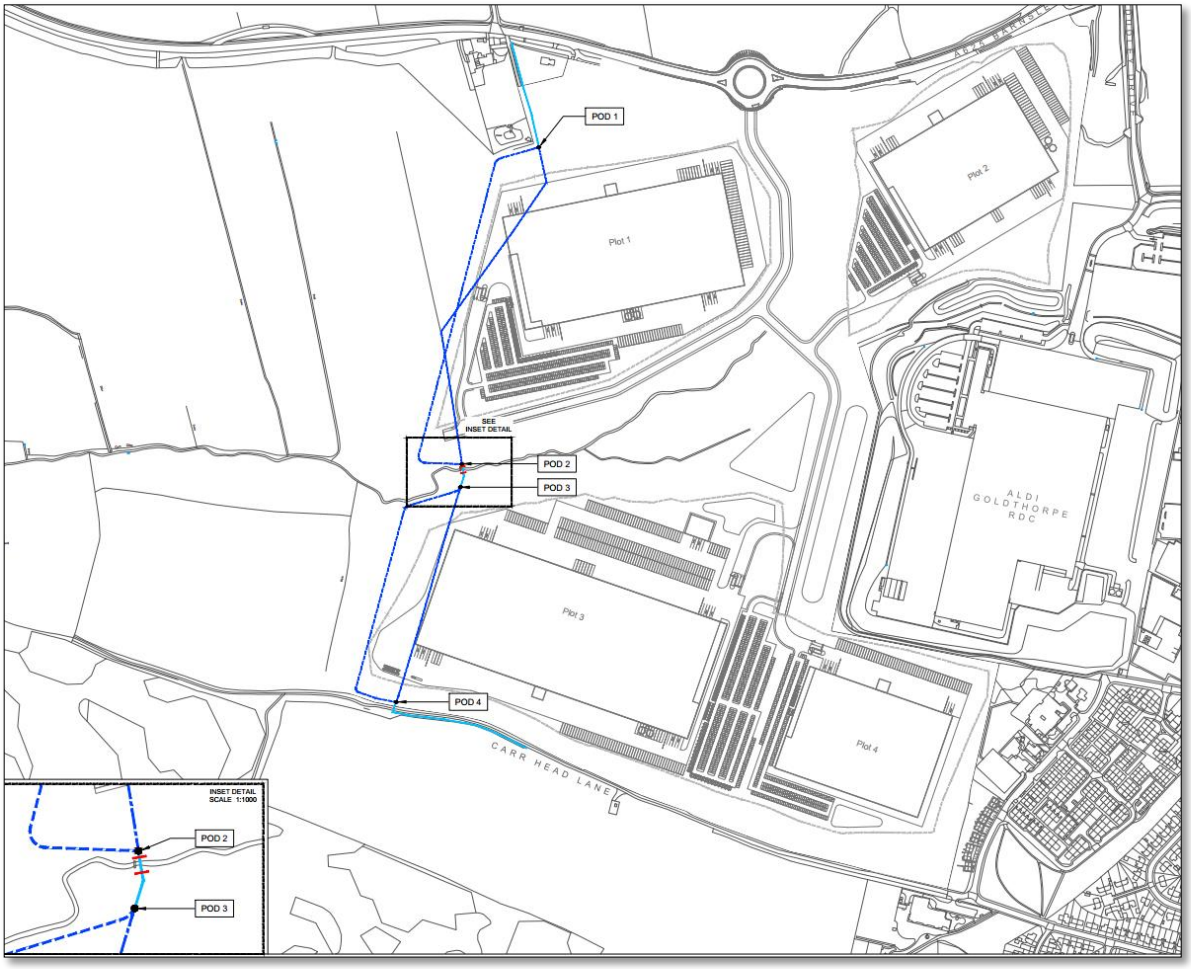
POD 3 (Onsite to the south of Carr Dike crossing)

- Excavate joint bay over existing potable water main to the south of the Carr Dike crossing.
- Excavate trench along the eastern and southern boundaries of plot 3 towards Carr Head Lane.
- Install suitably sized main (barrier pipe) between POD 3 and POD 4 to replace the existing section of main.
- Pressure test and chlorination of the new main with samples sent off for testing.
- Connect the newly installed main onto the existing main at POD 3.

POD 4 (Onsite adjacent to Carr Head Lane)

- Excavate the joint bay over existing potable water main to the north of Carr Head Lane.
- Connect the newly installed main into the existing main at POD 4.

Figure 6.2.4 – Proposed diversion route for the potable water main

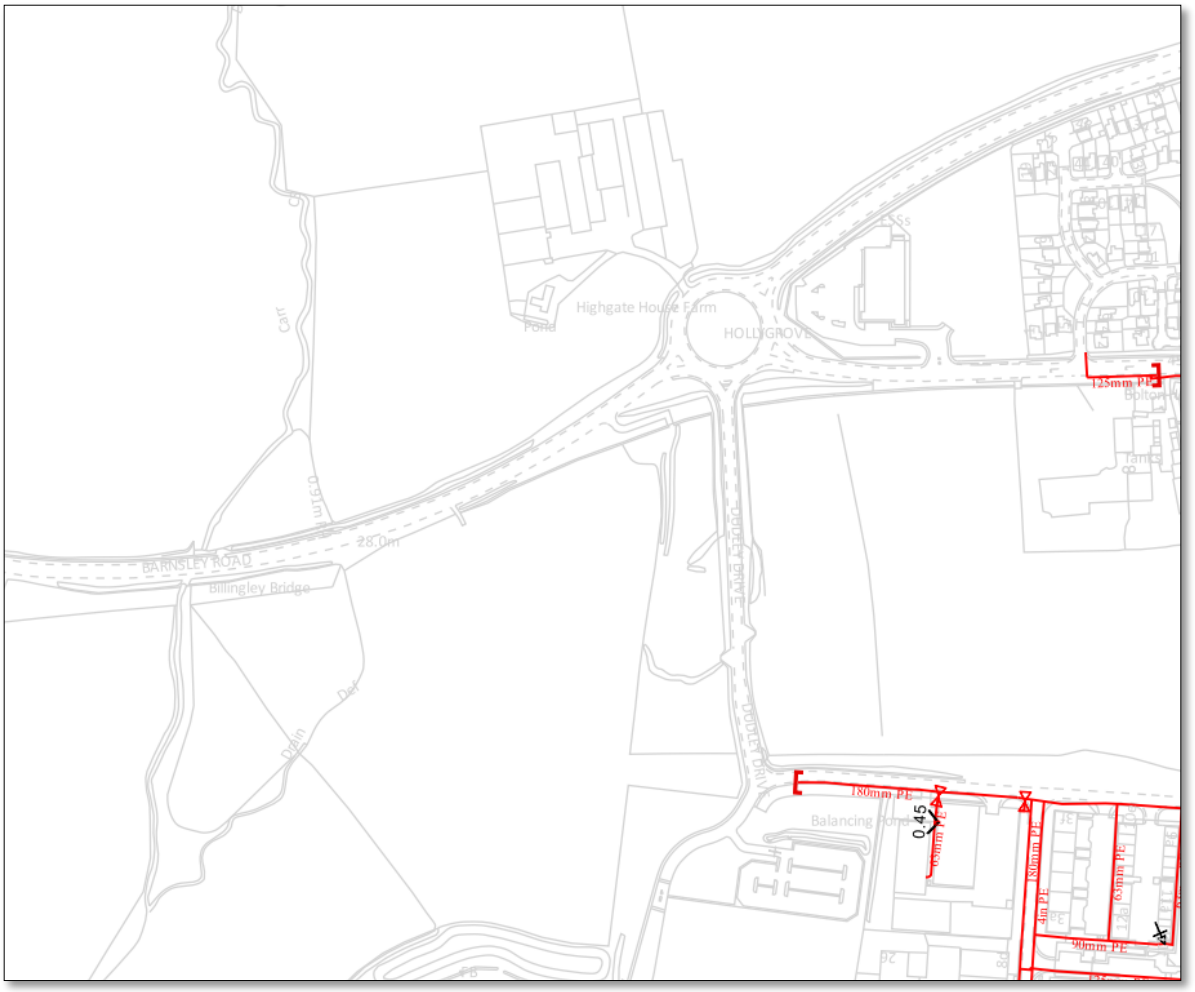


6.3 CADENT GAS NETWORKS

LOW PRESSURE NETWORK – COMMERICAL ROAD

The Cadent Gas Networks asset record indicates that there is an existing 180mm PE Low Pressure main positioned in Commercial Road to the east of the site as per figure 6.3.1 below, however as the main sits outside of the site boundary its anticipated that it will remain unaffected by the proposed development.

Figure 6.3.1 – Existing Cadent Gas Networks 180mm PE Low Pressure main in Commercial Road



6.4 GTC

LOW PRESSURE NETWORK – RESIDENTIAL DEVELOPMENT

The GTC Gas asset record indicates that there are existing underground low pressure gas mains and services which supply an existing residential development to the north east of the site as per figure 6.4.1 below, however as the main and services sit outside of the site boundary its anticipated that they will ultimately remain unaffected by the proposed development.

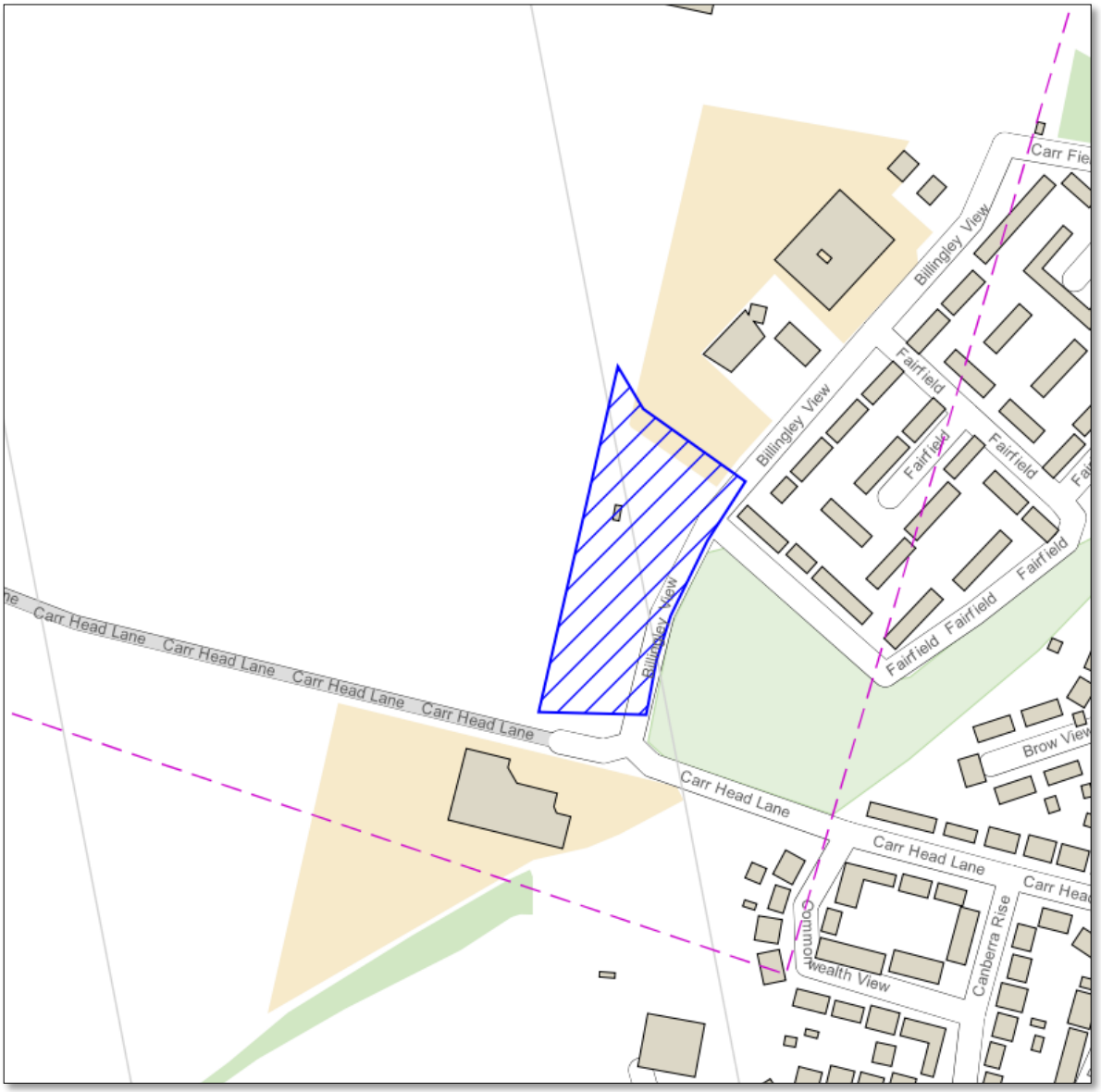
Figure 6.4.1 – Existing GTC Gas low pressure gas mains and services within the residential development

6.5 LAST MILE

GAS INFRASTRUCTURE – RESIDENTIAL DEVELOPMENT

The Last Mile asset record indicates that there is existing gas infrastructure which will suppl a proposed residential development off Billingley View to the south west of the site as per figure 6.51 below, further investigation is required to determine the routes of the services but its anticipated that they will remain unaffected by the proposed development.

Figure 6.5.1 – Existing Last Mile gas infrastructure to the southwest of the proposed development



6.6 OPENREACH

DUCTED NETWORK – A635

The Openreach asset record indicates that there are existing underground ducts and chambers positioned in the verge of the A635 to the north of the proposed development as per figures 6.6.1 to 6.6.3 below, it's anticipated that they will be affected by the proposed S278 highway alteration works to the existing carriageway.

It's highly recommended that a GPR survey is undertaken in this area to establish the depth and position of the existing water main, followed if necessary by trial pit investigations.

We are not currently in receipt of S278 modification designs, once this information becomes available a secondary review of any affected utility asset records will need to be undertaken.

Figure 6.6.1 – Existing Openreach underground ducts and chambers in the A635

Figure 6.6.2 – Existing Openreach underground ducts and chambers in the A635

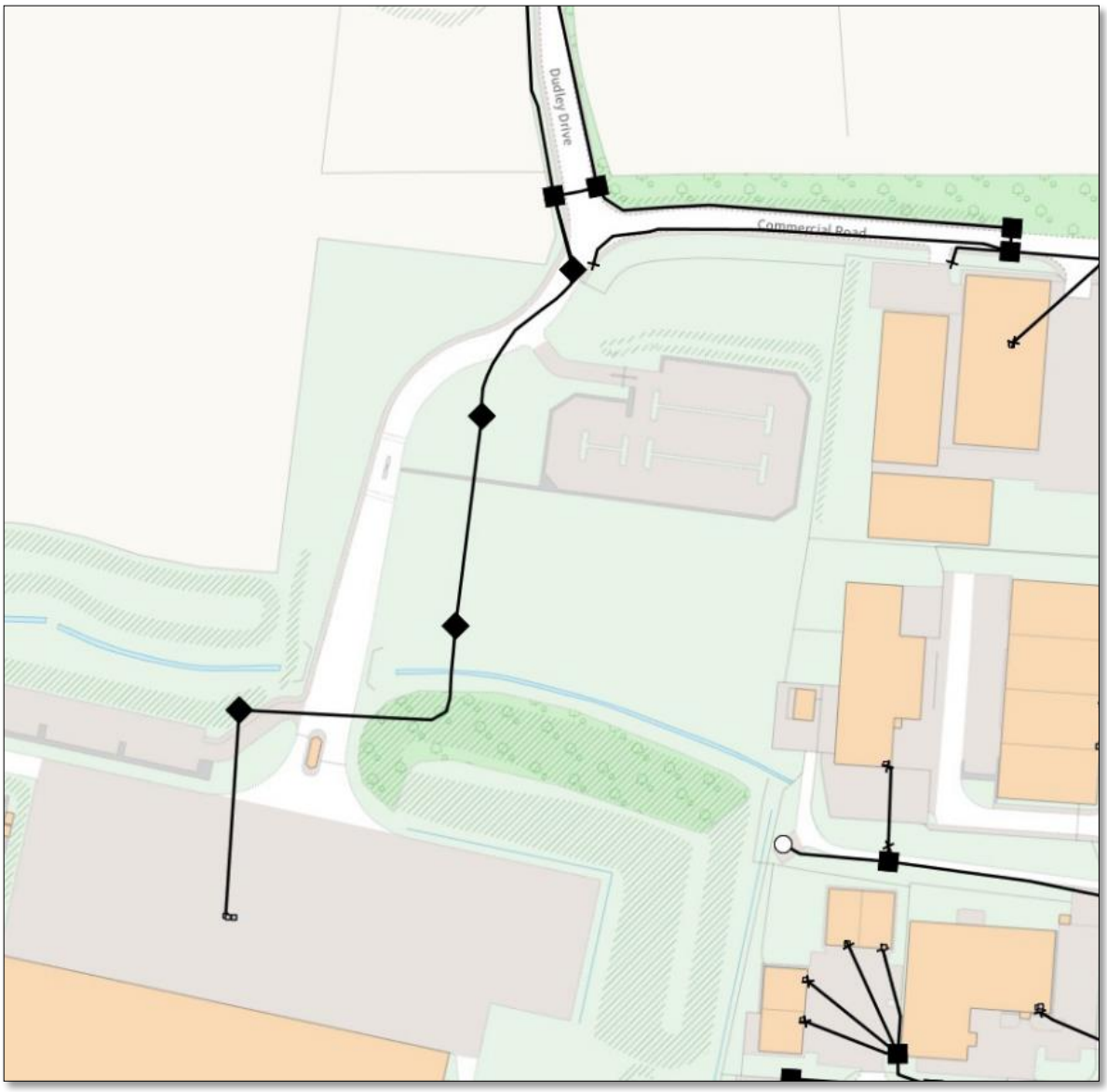
Figure 6.6.3 – Existing Openreach underground ducts and chambers in the A635

DUCTED NETWORK – DUDLEY DRIVE AND COMMERCIAL ROAD

The Openreach asset record also indiciates that there are existing underground ducts and chambers within both Dudley Drive and Commercial Road to the east of the proposed development as per firgures 6.6.4 and 6.6.5 below, however as the infrastructure sits outside of the site boundary its anticipated that it will remain unaffected by the proposed development.

Figure 6.6.4 – Existing Openreach underground ducts and chambers in Dudley Drive and Commercial Road

6.6.5 – Existing Openreach underground ducts and chambers in Dudley Drive and Commercial Road



6.7 VIRGIN MEDIA

DUCTED NETWORK – A635

The Virgin Media asset record indicates that there are existing underground ducts and chambers positioned in the verge of the A635 to the north of the site as shown in figures 6.7.1 and 6.7.2 below, it's anticipated that they will be affected by the proposed highway modifications in this area.

It's highly recommended that a GPR survey is undertaken in this area to establish the depth and position of the existing water main, followed if necessary by trial pit investigations.

We are not currently in receipt of S278 modification designs, once this information becomes available a secondary review of any affected utility asset records will need to be undertaken.

Figure 6.7.1 – Existing Virgin Media underground ducts and chambers in the A635

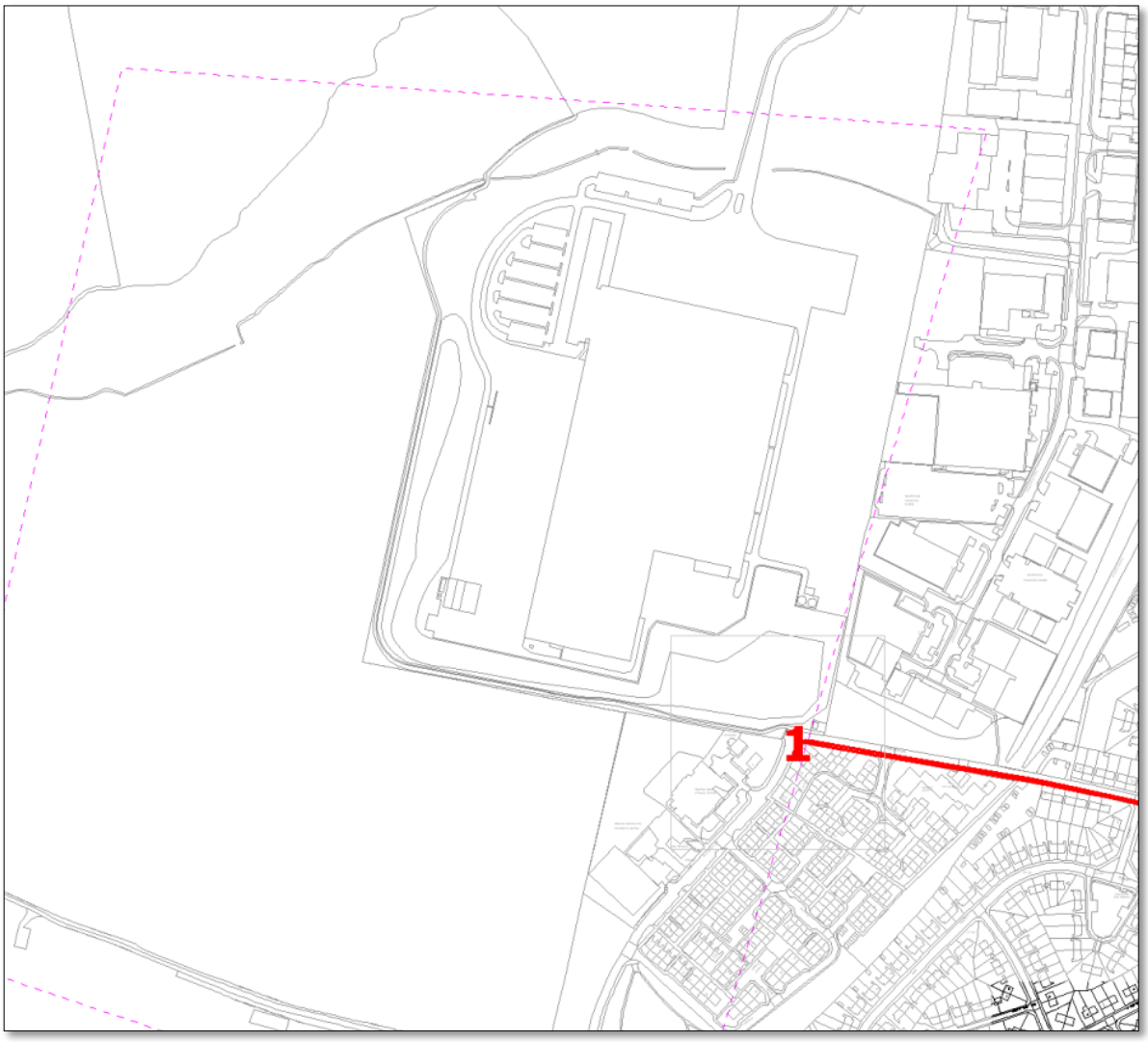
Figure 6.7.2 – Existing Virgin Media underground ducts and chambers in the A635

6.8 ZAYO

DUCTED NETWORK – CARR FIELD LANE

The Zayo asset record indicates that there are existing underground ducts positioned in Carr Field Lane to the south east of the site as per figure 6.8.1 below, however its anticipated that they will remain unaffected by the proposed development.

Figure 6.8.1 – Existing Zayo ducts in Carr Field Lane

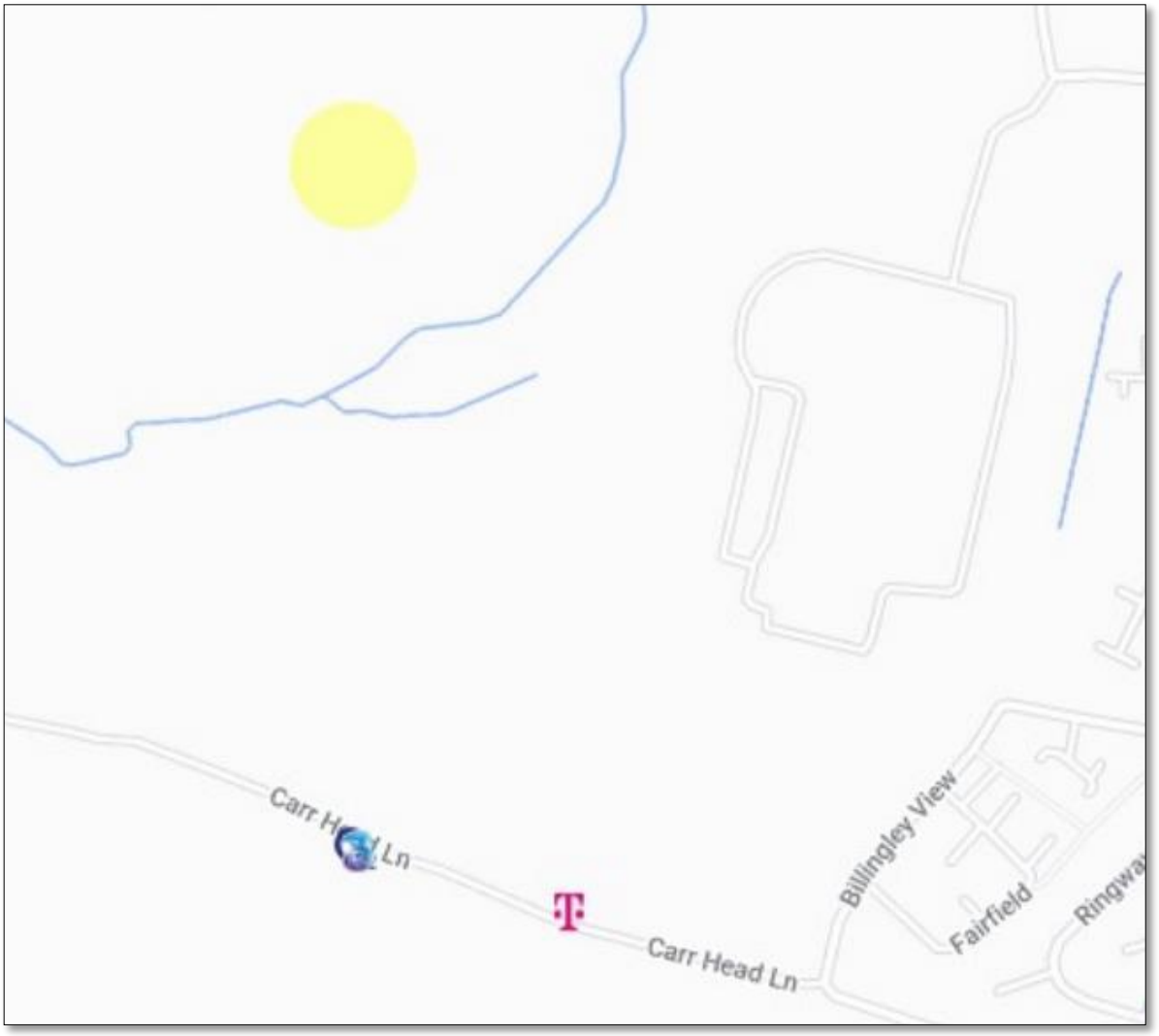


6.9 MAST DATA

TELCOM MASTS – KNUSTON LODGE FARM

The Mast Data asset record indicates that there are existing Three, O2 and T-Mobile telecoms masts positioned on Carr Head Lane to the south of the development as shown in figure 6.9.1 below, however its anticipated that they will remain unaffected by the proposed development as they are positioned outside of the development boundary.

Figure 6.9.1 – Existing Three, O2 and T-Mobile telecoms masts



7. NEW INFRASTRUCTURE

DEVELOPMENT LOAD SCHEDULE

The table below provides details of the capacities that should be provided for the new mains infrastructure.

Unit	sqft	Electricity kVA	Gas kwh	Water L/s
Unit 01	568,500	4224	2906	2.240
Unit 02	370,000	2696	1901	1.498
Unit 03	840,000	5657	3736	2.757
Unit 04	345,000	2703	1908	1.504
Total	**2,123,500**	**15,530**	**10,451**	**7.99**

7.1. ELECTRICITY POINT OF CONNECTION (NON-CONTESTABLE)

Northern Powergrid have provided an IDNO Point of Connection offer under reference **ENQ23122208.**

Non-Contestable contribution	£4,614,139.01 ex VAT
Valid until	14th June 2023

SITE LOAD

An electrical supply capacity of 15,530 kVA has been requested from Northern Powergrid as detailed within Table 7.1.

POINT OF CONNECTION

Northern Powergrid have provided a Point of Connection from the existing 11,000 Volt network at Houghton Main 66/11kV Primary Substation.

POC 1 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

POC 2 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

POC 3 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

POC 4 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

NON-CONTESTABLE WORKS

- All excavation and reinstatement within the Houghton Main 66/11kV Primary Substation only
- Install IDNO provided 4 x NPG spec cables through Houghton Main 66/11kV Primary Substation
- 4 x 11kV Terminations on to new NPG 11kV breakers at the Houghton Main 66/11kV Primary Substation

REINFORCEMENT WORKS

Northern Powergrid have confirmed that network reinforcement at West Melton Grid Supply Point Substation and Houghton Main 66/11kV Primary Substation will have to be completed before the final connection can take place, the anticipated duration for the completion of these works from receipt of the acceptance and full payment is **34 months**.

The non-contestable reinforcement contributions are detailed as;

- Undertake the detailed design to provide the Point of Connection and the Exit Point and, where applicable, the Entry Point to/from the Distribution System;
- Undertake the necessary protection, inter-tripping and control modifications at our Houghton Main 66/11kV PSS and at our West Melton grid Supply Point Substation to facilitate the connection of the Contestable Connection Assets;
- Carry out the ground works required at our Houghton Main 66/11kV PSS in order to install the new modular 11kV switchroom, and modular 66/11kV control room;
- Install nine 11kV feeder circuit breakers, two 11kV transformers LV circuit breakers and one 11kV bus section circuit breaker in the new modular 11kV switchroom at our Houghton Main 66/11kV PSS;
- Install new protection equipment to correspond to the newly installed 11kV switchgear in the new modular control room at our Houghton Main 66/11kV PSS;
- Install and joint short lengths of 11kV (300mm2 Al Triplex 3x1c) onto the existing 11kV feeder circuits and terminate them at the newly installed 11kV switchgear at our Houghton Main 66/11kV PSS;
- Carry out the civils works required at our Houghton Main 66/11kV PSS in order to extend the outdoor compound and facilitate the installation of the new T1 and T2 66/11kV transformers;
- Install two 66/11kV, 15/30MVA transformers at our Houghton Main 66/11kV PSS;
- Install new 11kV and 66kV protection panels in the new modular 66/11kV control room at our Houghton Main 66/11kV PSS in order to provide protection for the new T1 and T2 66/11kV transformers;
- Install short lengths of 66kV (300mm2 Cu XLPE 3x1c_ cable from the new T1 and T2 transformers to the existing 66kV busbar section at our Houghton Main 66/11kV PSS;
- Install short lengths of 11kV (500mm2 Cu XLPE 3x3x1c) cable from the new T1 and T2 transformers to the new 11kV transformer circuit breakers and terminate at both ends at our Houghton main 66/11kV PSS;
- Carry out the civils works required at our West Melton GSP substation in order to replace the existing GT1 132/66kV transformer;
- Install one 132/66kV, 45/90MVA transformer at our West Melton GSP substation;
- Install 66kV cable (400mm2 Cu XLPE 2x3x1c) from the new 132/66kV GT1 transformer to the 66kB busbar section at West Melton GSP substation;

There are both civils and excavations works required at West Melton Grid Supply Point Substation and Houghton Main 66/11kV Primary Substation to facilitate the works detailed above, further information on these works can be found under sections 3.2.1 and 3.2.2 of the quote letter which can be found within the appendices of this report.

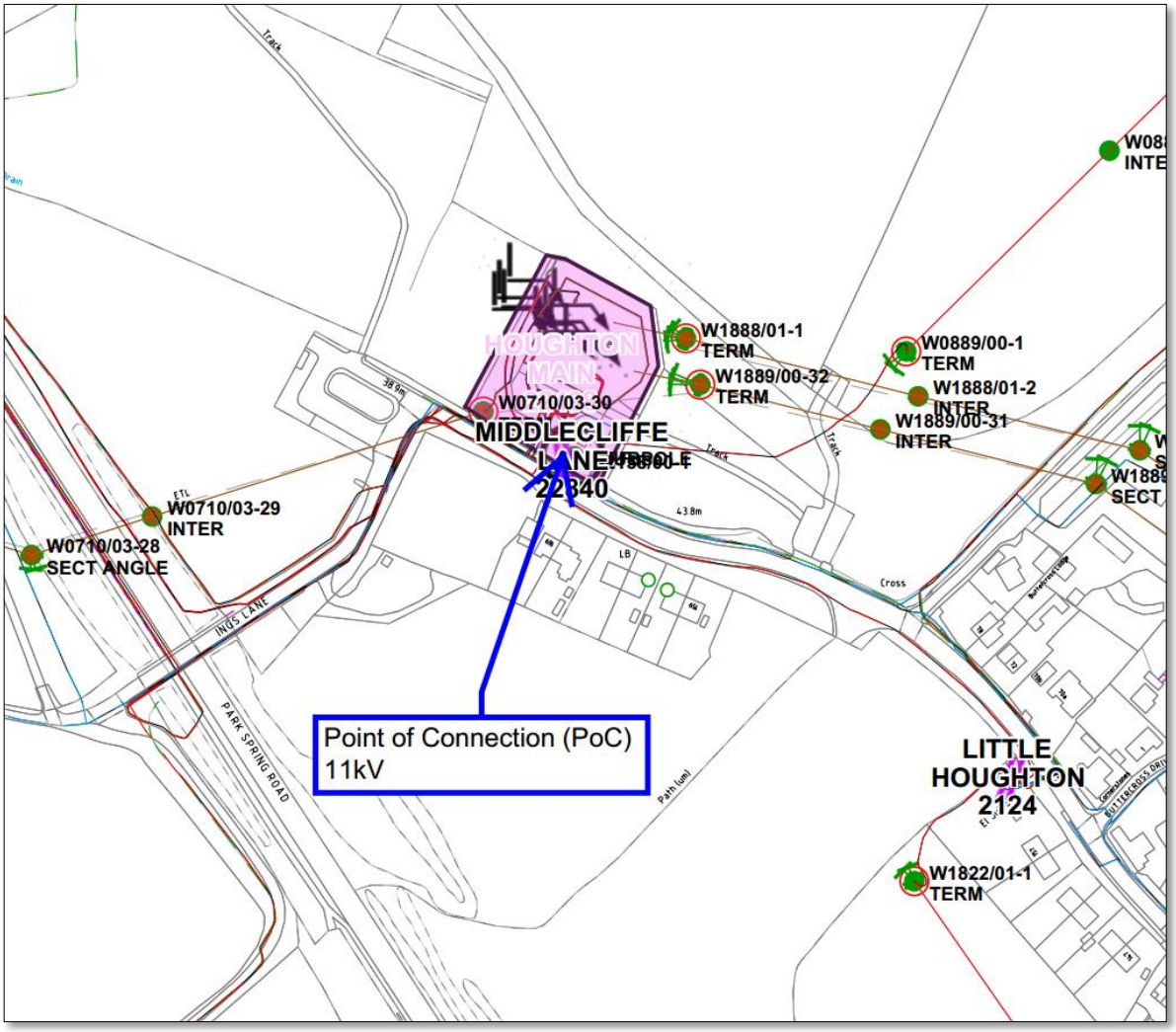
POC CONSTRAINTS

The Point of connection will be subject to completion of the reinforcement works at West Melton Grid Supply Point Substation and Houghton Main 66/11kV Primary Substation, the anticipated duration for the completion of these works from receipt of the acceptance and full payment is **34 months**.

The Point of Connection is conditional on the submission of a modification application to National Grid Electricity System Operator (NGESO) to determine if the additional capacity can be provided from West Melton Grid Supply Point Substation.

If following the completion of the modification application, NGESO identify the requirement for reinforcement on the transmission network, the customer will be responsible for paying a contribution towards the cost of these works and could delay the final connection – a typical timeframe for reinforcement works of this nature is five years from commencement.

Figure 7.1.1 – Electricity Point of Connection



7.2. ELECTRICITY POINT OF CONNECTION (CONTESTABLE)

OFFSITE ROUTE (11,000 VOLT NETWORK)

4no. 11,000volt High Voltage circuits will be installed onsite via a looped connection from 4 x 11kV 630a circuit Breakers at Houghton Main 66/11kV Primary Substation.

POC 1 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

POC 2 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

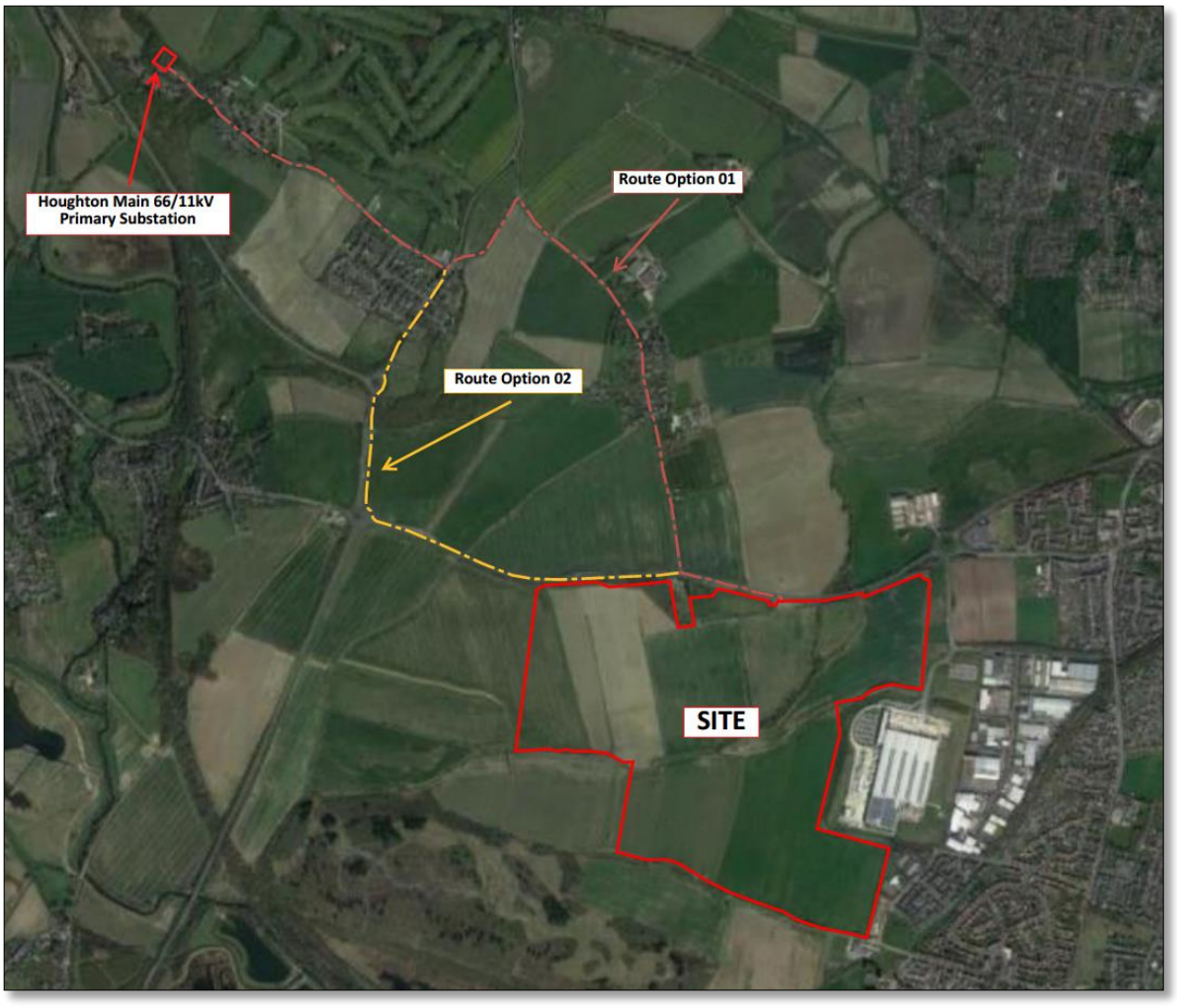
POC 3 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

POC 4 – 1 x 11kV 630A circuit breaker at Houghton Main 66/11kV Primary Substation.

The excavation and installation of 4no. suitably rated 11kV circuits will be required from Houghton Main 66/11kV Primary Substation through to the development boundary, from our initial assessment we have identifed two potential cables routes.

The routes are highlighted in figure 7.2.1, with constraints summarised within the following section.

Figure 7.2.1 – Potential cable route overview



ROUTE 1 (RED ROUTE CIRCA 3350M)

Consultation will be required with the Local Highway Authority along with trial hole excavations at strategic locations to determine the viability of the highlighted route, this will also include the procurement of the existing utility asset records to identify pinch point areas outside of the constraints which have already been identifed.

Route Option 01 – Constraints Summary

- Route distance approximately 3350m

- **Constraint 1** – The proposed route will involve installing both circuits through the village of Little Houghton which the local highway authority will treat as a traffic sensitive area, subsequently its recommended that contact is made to the local highway authority early to establish any restrictions and/or limitations in respect of working hours.

- **Constriant 2** – The proposed route will involve installing both circuits through the small hamlet of Middlecliff which the local highway authority will treat as a traffic sensitive area, subsequently its recommended that contact is made to the local highway authority early to establish any restrictions and/or limitations in respect of working hours.

- **Constraint 3** – The proposed route will involve installing both circuits through the village of Billingley which the local highway authority will treat as a traffic sensitive area, subsequently its recommended that contact is made to the local highway authority early to establish any restrictions and/or limitations in respect of working hours.

- **Constraint 4** – There is evidence to suggest that carriagway of West Kirk Lane and the High Street through the village of Billingley have recently been resurfaced, subsequently its recommended that the local highway authority are contacted to establish if there is a section 58 restriction is in place.

- **Constraint 5** – Its understood that the proposed highway modifications on the A635, specifically the formation of the roundabout opposite the entrance into the development, will be undertaken by a third party contractor on behalf of the local highway authority. It's highly recommended that contact is made with the local highway authority to understand the timescales and parameters associated with the highway modifications, and to understand if, following their completion, a section 58 restriction will be imposed on the existing highway.

Figure 7.2.2 – Route Option 01 Overview

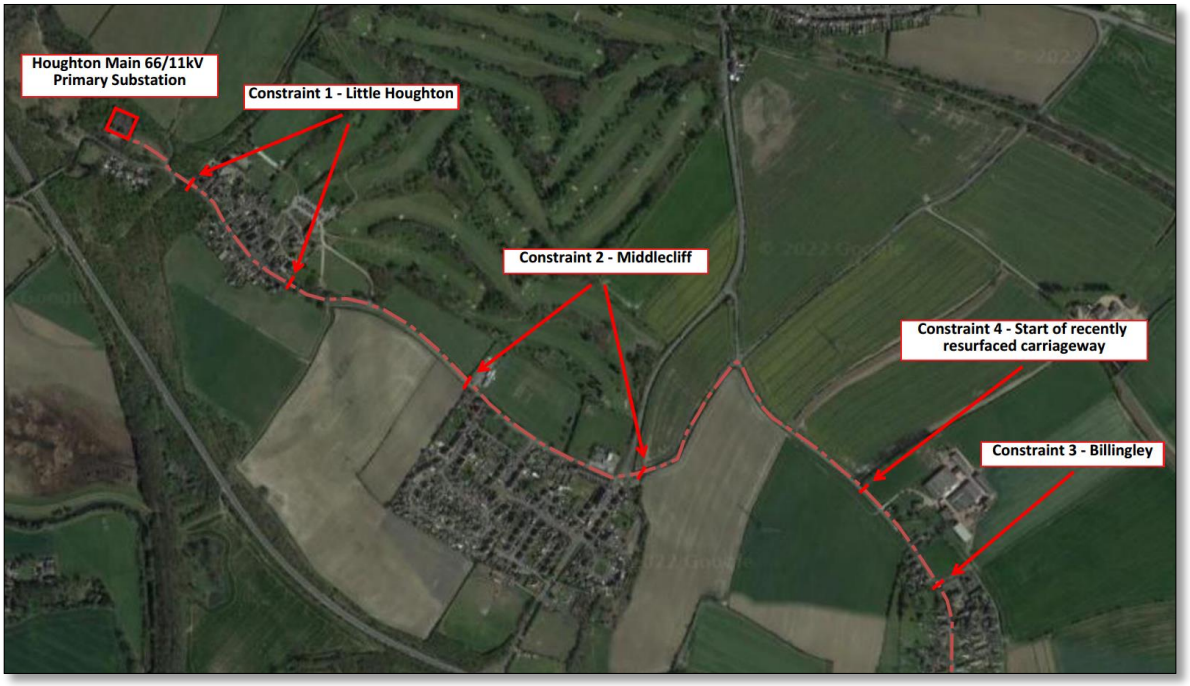


Figure 7.2.3 – Route Option 01 Overview

Figure 7.2.4 – Constraint 1: Little Houghton Village

Figure 7.2.5 – Constraint 2: Middlecliff Village

Figure 7.2.6 – Constraint 3: Billingley Village

Figure 7.2.7 – Recently resurfaced carriageway on West Kirk Lane

ROUTE 2 (ORANGE ROUTE CIRCA 3500M)

Consultation will be required with the Local Highway Authority along with trial hole excavations at strategic locations to determine the viability of the highlighted route, this will also include the procurement of the existing utility asset records to identify pinch point areas outside of the constraints which have already been identifed.

Route Option 02 – Constraints Summary

- Route distance approximately 3500m

- **Constraint 1** – The proposed route will involve installing both circuits through the village of Little Houghton which the local highway authority will treat as a traffic sensitive area, subsequently its recommended that contact is made to the local highway authority early to establish any restrictions and/or limitations in respect of working hours.

- **Constriant 2** – The proposed route will involve installing both circuits through the small hamlet of Middlecliff which the local highway authority will treat as a traffic sensitive area, subsequently its recommended that contact is made to the local highway authority early to establish any restrictions and/or limitations in respect of working hours.

- **Constraint 3** – The proposed route will involve installing both circuits across Rotherham Road Roundabout, the carriageway of the roundabout appears to have been recently resurfaced therefore its recommended that the local highway authroity are contacted to establish if there is a section 58 restriction in place.

- **Constraint 4** – The proposed route will involve installing both circuits across Cathill Roundabout, the carriageaway and footways in and around the roundabout appears to have been recently resurfaced therefore its recommend that the local highway authority are contacted to establish if there is a section 58 restriction in place.

- **Constraint 5** – Its understood that the proposed highway modifications on the A635, specifically the formation of the roundabout opposite the entrance into the development, will be undertaken by a third party contractor on behalf of the local highway authority. It's highly recommended that contact is made with the local highway authority to understand the timescales and parameters associated with the highway modifications, and to understand if, following their completion, a section 58 restriction will be imposed on the existing highway.

Figure 7.2.8 – Route Option 02 Overview

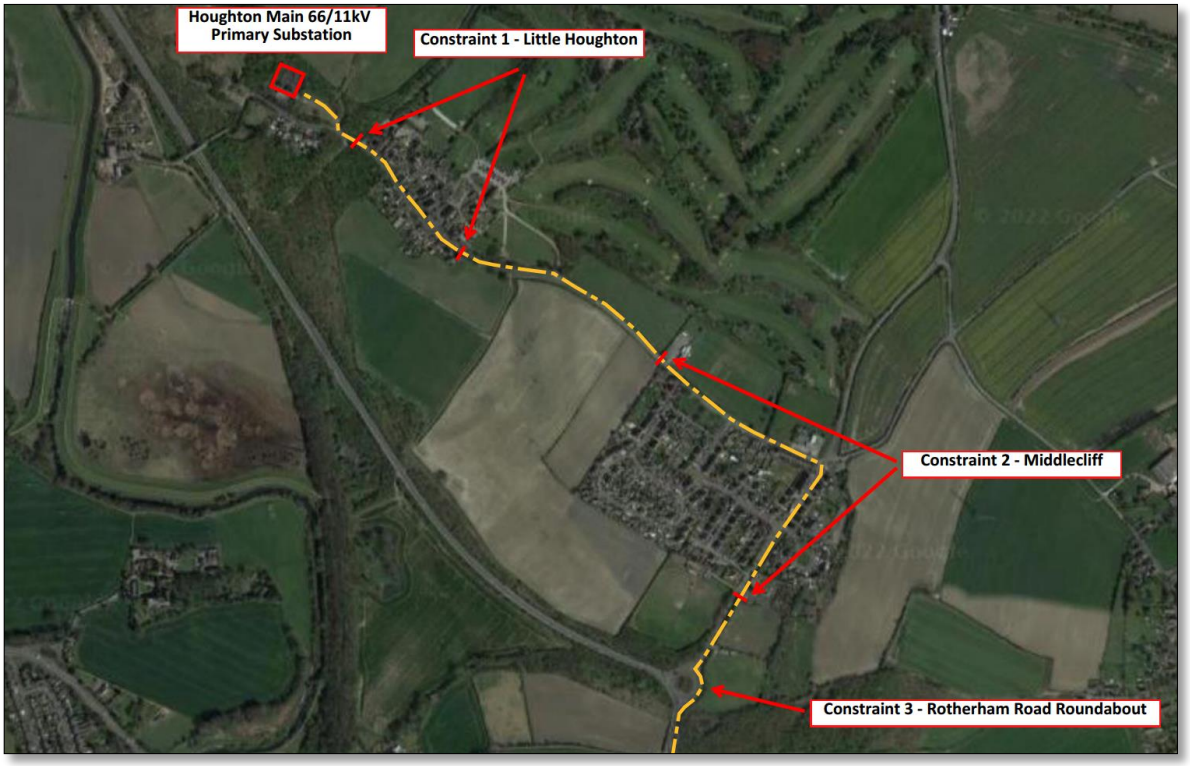


Figure 7.2.9 – Route Option 02 Overview

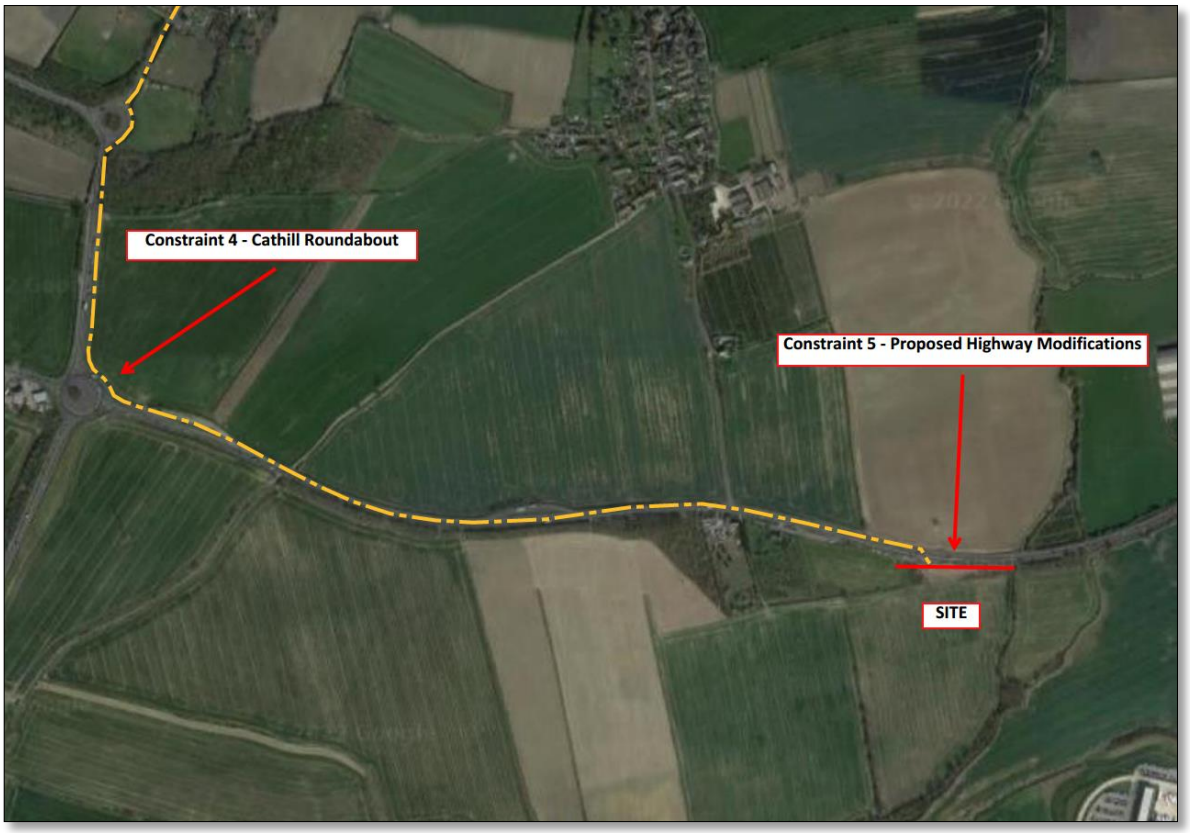


Figure 7.2.9 – Constraint 1: Little Houghton Village

Figure 7.2.10 – Constraint 2: Middlecliff Village

Figure 7.2.11 – Constraint 3: Rotherham Road Roundabout

Figure 7.2.12 – Constraint 4: Cathill Roundabout

ONSITE SECONDARY NETWORK (11,000/400 VOLT)

A suitably sized 11,000 Volt network will be installed within the new estate road and footpaths to provide connections to plots and associated landlords' supplies (*street lighting, pumping stations etc*), distributed via a minimum of 4no. 11kV cable circuits (two loops).

We estimate that 4no. 11kV HV Metered Supplies & 1no 11kV Landlords Package substation will be required.

Further design works are required to determine a suitable arrangement for the distribution of load between plots via the 11kV network arrangement. Northern Power Grid are yet to confirm if the network back to the 4 x 11kV Circuit Breakers at the POC can be fully IDNO adopted. If the network is required to be adopted by Northern Power Grid, we will be constrained by the applied NPG cable & circuit breaker ratings and may require installation of a suitable 11kV panel board, upsizing of conductors or change in material (aluminium to copper) to facilitate suitable load distribution within the site.

Figure 7.2.13 – Onsite Secondary Network

SUMMARY OF WORKS – NEW CONNECTION

Summary the ICP will undertake/provide/deliver: -

- All necessary design works for the 11kV network extension, obtain full design approval and ensure the network is adoptable;
- Design and construct DNO/IDNO adopted 11kV substations;
- Cast concrete plinths for 11kV substations and metering enclosures to DNO/IDNO specification;
- Supply, install and commission DNO/IDNO adoptable 11kV switchgear and transformers;
- Complete all offsite cable excavation, lay and reinstatement;
- Completion of directional drill works;
- Liaison with Highways England, Canal and Rivers Trust and Local Authorities and any other 3rd parties to gain permission to excavate;
- Supply, install and commission the 11kV mains cables;
- Supply, install and commission the Low Voltage mains cables;
- Supply, install and commission all DNO/IDNO adopted 11kV switchgear;
- Complete 11kV jointing works and liaison with DNO/IDNO;
- Complete Low Voltage jointing works and liaison with DNO/IDNO;
- Supply, install and commission remote CT metering panels;
- Termination of customer supplied 11kV cables within Ring Main Units;
- Provision of suitable GRP enclosures to house the RMU and metering panels;
- Supply, install and commission earth mats;
- Commission Low Voltage substation house supplies;
- Request outages from DNO/IDNO to energise primary and secondary substations;
- The necessary works to ensure the appropriate legal titles are instructed for cable rights;
- A set of as built records to be included in the necessary H&S files;
- Conform with current CDM regulations and obligations as Principal designer and contractor (offsite works only).

In summary the developer will need to undertake/provide/deliver:-

- The appointment of a suitably accredited utility infrastructure installer;
- Acceptance of non-contestable charges with host DNO*;
- Consideration payments for 3rd party land where applicable;
- All onsite excavations, reinstatements, ducts and service entries to DNO/IDNO specification;
- Provide clear and level site along with setting out of substation compound and finished levels;
- Cast concrete plinth for substation and metering enclosures to DNO/IDNO specification;
- Ensure the necessary planning permission is in place for secondary substation compound/housings;
- Provision of all ducts, marker tape and suitable sand/dust surround;
- Supply, install and commission all customer Low Voltage distribution equipment and cabling;
- Appropriate metering to the service position and to liaise with the end users to ensure energy supply contracts are entered;

7.3. WATER

Yorkshire Water have provided a Pre-planning report under reference **U718756**

Non-Contestable contribution	Pre-planning report
Valid until	N/A

SITE LOAD

A peak flow rate of 7.99 litres per second has been requested from Yorkshire Water **as** detailed within Table 7.1.

POINT OF CONNECTION

The point of connection identified by Yorkshire Water is from the existing 6inch cast iron main positioned in the verge of the A635 to the north of the site as per figure 7.3.1 below.

Yorkshire Water have confirmed that network reinforcement isn't required to facilitate the connection.

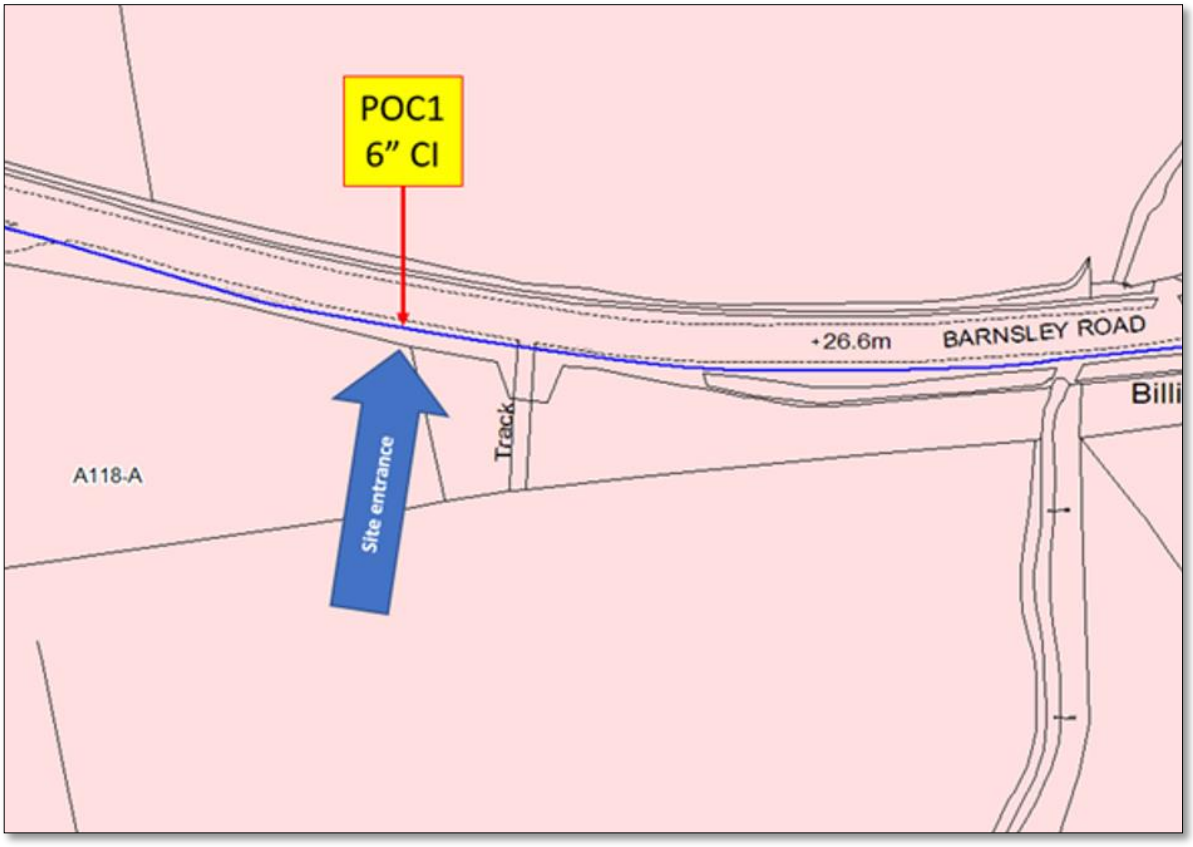
NON-CONTESTABLE WORKS

- Final connection to mains

CONSTRAINTS

- Co-ordination with the proposed highway modification works by the third-party contractor.

Figure 7.3.1 – Water Point of Connection



7.4. WATER – NEW CONNECTION (CONTESTABLE)

OFFSITE ROUTE

The POC has been determined from the existing 6inch cast iron main positioned in the verge of the A635 to the north of the site approx. 10 metres from the boundary of the site.

ONSITE POTABLE WATER NETWORK

Extension of the network will be required onsite to provide connection to each plot for potable and fire connections utilising a minimum of 180mm PE pipework.

The site is assumed to be uncontaminated and non-barrier pipework has been assumed. A full SI report will need to be issued to Yorkshire Water to review ahead of provision of the formal Point of Connection offer.

ONSITE CONSTRAINTS

- Consideration will need to be given to the construction of the estate road where it crosses Carr Dike to ensure that there is sufficient cover for the new medium pressure gas main.

Figure 7.4.1 – Indicative onsite water distribution

SUMMARY OF WORKS – NEW CONNECTION

In summary Yorkshire Water/Approved installation contractor will provide/deliver: -

- All design works associated with the new water mains and services to accommodate the site load requirements;
- All offsite excavation and reinstatement works (from POC to site boundary);
- Liaison with Highways England, Local Authorities and any other 3rd parties to gain permission to excavate;
- Liaison with Yorkshire Water during design approval and implementation of upstream reinforcement works to facilitate the new connection.
- Application to Yorkshire Water for connection onto the parent main;
- Connection of the service pipes onto the water main with an appropriate boundary meter;
- Installation of water meters;
- Testing and chlorination of mains pipework;
- Management of any identified offsite reinforcement works by host network operator;
- The necessary works to ensure the appropriate legal titles are instructed;
- A set of as built records to be included in the necessary H&S files;
- Conform with current CDM regulations and obligations as Principal designer and contractor (offsite only).

In summary the main contractor will need to undertake/provide/deliver:-

- All on-site excavations and reinstatement;
- Connected metered potable service pipes from the unit up to the point of connection, including service entry ducts and internal fittings to isolate the pipework;
- Testing and chlorination of the service pipes prior to connection where required;

7.5. GAS – POINT OF CONNECTION

Cadent Gas Networks have provided a land enquiry response under reference **180014265**

Non-Contestable contribution	*£10,000.00 ex VAT*
Valid until	N/A

SITE LOAD

A peak flow rate of **10,451kW** has been requested from Cadent Gas Networks detailed within Table 7.1.

Elevated pressure has not been accounted for in the application.

POINT OF CONNECTION

The point of connection provided by Cadent Gas Networks is from the existing 225mm PE Medium Pressure gas main positioned in the carriageway of Highgate Lane close the junction with Barnsley Road.

NON-CONTESTABLE WORKS

- Design Approval and inspection

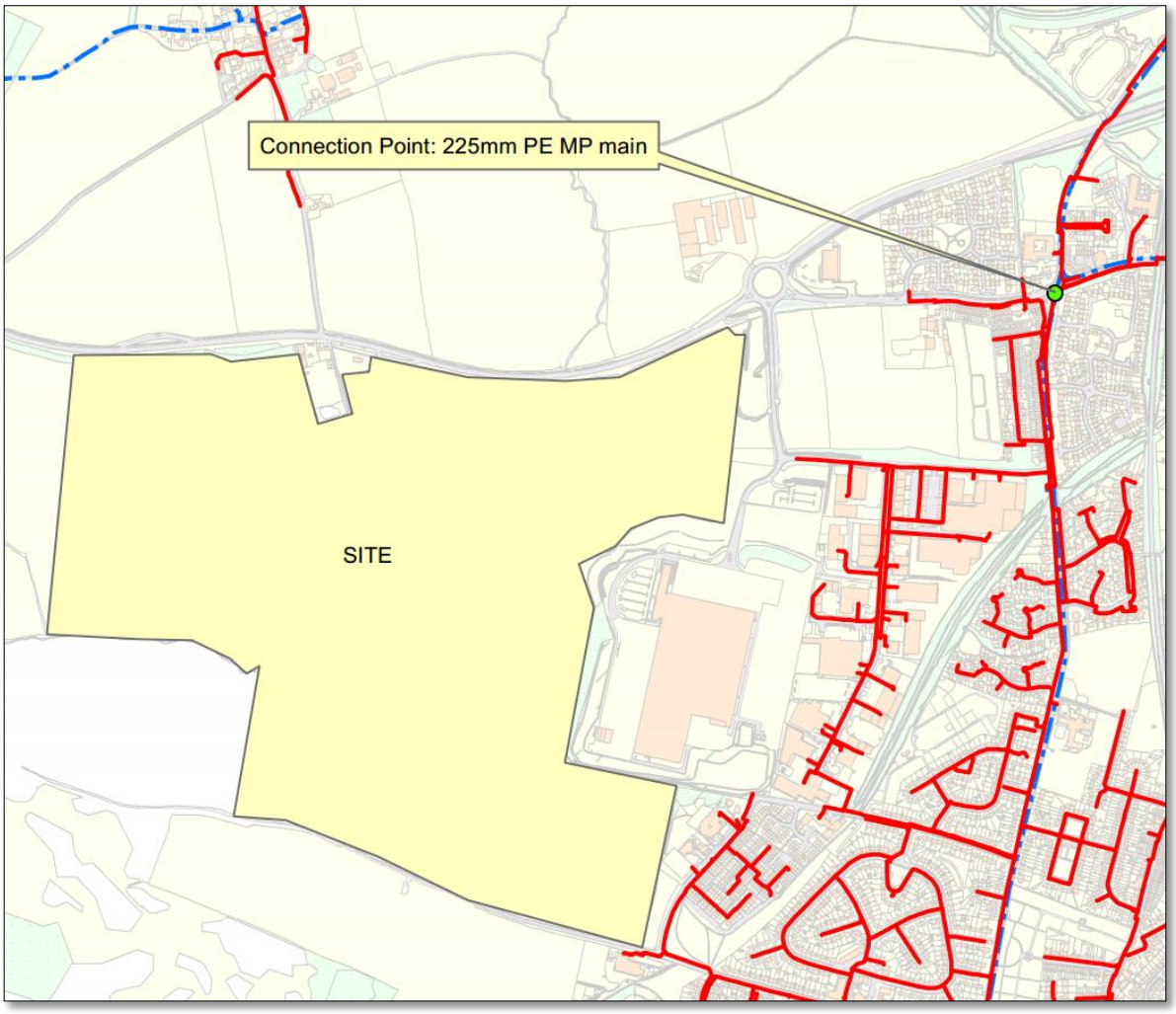
REINFORCEMENT WORKS

- Cadent Gas have confirmed that network reinforcement isn't required to facilitate the connection.

CONNECTION CONSTRAINTS

- Connection within a traffic sensitive area at the junction of Highgate Lane and Barnsley Road.
- Co-ordination with the proposed highway modification works by the third-party contractor.

Figure 7.5.1 - Gas Point of Connection



7.6. GAS – NEW INFRASTRUCTURE

OFFSITE ROUTE

A new Medium Pressure (MP) main will be extended from the point of connection within Highgate Lane to be distributed within the development boundary.

The drawing below provides an indicative route for the new gas mains on site.

Figure 7.6.1 – Indicative Gas onsite route

ONSITE GAS NETWORK

A new Medium Pressure (MP) mains network will be installed within the estate road by a GIRS approved contractor.

Plot connections will be at Medium Pressure housed externally within GRP cubicles.

Elevated pressure has not been accounted for in our calculations.

The appointed connection provider will be responsible for the design, installation and adoption of the new networks, in line with the requirements of the adopting asset owner.

ONSITE CONSTRAINTS

- Consideration will need to be given to the construction of the estate road where it crosses Carr Dike to ensure that there is sufficient cover for the new medium pressure gas main.

SUMMARY OF WORKS – NEW CONNECTION

In summary the appointed ICP (GIRS accredited) will need to undertake/provide/deliver:-

- All design works associated with the new gas mains and services to accommodate load requirements;
- All offsite excavation and reinstatement work and application for permits (from POC to site boundary);
- Liaison with Highways England, Local Authorities and any other 3rd parties to gain permission to excavate;
- Liaison with Cadent Gas Networks during design approval and implementation of upstream reinforcement works to facilitate the new connection.
- Extension of Medium Pressure mains pipework within the site boundary;
- Design, test and commission up to ECV Medium Pressure Gas service inlet pipes;
- Installation of Concrete plinths and provision of suitable gas GRP housing;
- The necessary works to ensure the appropriate legal titles are instructed for mains rights;
- A set of as built records to be included in the necessary H&S files;
- Conform with current CDM regulations and obligations as Principal designer and contractor (offsite works only).

In summary the main contractor will need to undertake/provide/deliver:-

- All on-site excavations and reinstatement;

7.7. TELECOMS

Based on the BT Openreach asset records there are existing underground ducts and chambers positioned in the verge of the A635 to the north of the site as shown in figure 7.7.1 below, its anticpated that a road crossing and a new chamber will be installed in this area which will serve as the connection point to the proposed development.

Openreach now charge for installation of Fibre & Copper networks and will only provide an FTTP installation (Fibre to The Premises) as part of the new site application. This will need to be considered with and requirement for leased lines (Ethernet) or copper (FTTC) being an extra over to the standard Newsites application.

Figure 7.7.1 – Telecoms Point of Connection

SUMMARY OF WORKS – NEW CONNECTION

In summary the main contractor will need to undertake/provide/deliver:-

- Procurement of a suitable design from Openreach to extend the existing telecommunications network into site;
- All on site excavation and reinstatement works;
- All excavation and reinstatement works within the new access road and footpath;
- Installation of BT ducts, boxes and chambers as designed by BT.
- As laid records of installed ducts/chamber etc.

Where appropriate, installations will need to conform to BT Openreach specifications.

8. FINANCIAL SUMMARY

FINANCIAL SUMS TO BE CONSIDERED

Diversions		Budget Cost (ex VAT)
Northern Powergrid	Diversion of HV assets	£900,000.00
Yorkshire Water	Diversion of potable mains network	£250,000.00
Openreach	Diversion of Openreach ducted network within the A635	£250,000.00
Virgin Media	Diversion of Virgin Media ducted network within the A635	£250,000.00
	Total	**£1,650,000.00**

New Services		Budget Cost (ex VAT)
Electric - Infrastructure	Based on 3.35km 11kV infrastructure only scheme inc. landlords substation and street lighting provision	£4,800,000.00
Electric - Infrastructure	*Extra over cost for copper Cable upgrade*	*£1,350,000.00*
Electric - Infrastructure	*Extra over cost for onsite 11kV panel board*	*£750,000.00*
Electric POC	NPG non-contestable costs and reinforcement contribution	£4,614,139.01
Water	Extension of Potable network	£380,000.00
Gas	Extension of MP gas mains network onsite	£1,300,000.00
Telecoms	Duct infrastructure only	£100,000.00
Route Proving Study		£60,000.00
Trial Pit Investigations		£60,000.00
	Total	**£13,414,139.01**
The total budget figure includes for the assumed extra over costs. If these items are not required, the budgets will reduce to reflect the item(s) removal.		

Note

- Budget costs have been calculated based on information available at the time of feasibility
- A desktop assessment has been undertaken to understand constraints associated with the works and are subject to review during detailed design and scheme progression
- We not in receipt of full highways modification/s278 drawings to determine the full extent of diversion works required at the development
- All POC information is valid for 90 days from issue of quotation. As utility networks are of a dynamic nature the connection points are subject to change following expiration of the offers, interactivity or subsequent design works undertaken which prove the proposed connection points as unfeasible

9. NEXT STEPS

We recommend moving forward that the client reviews the below information against the schemes planning, details design and construction program to assess the impact of works and progression and implementation of the utility strategy to the development.

Status	Item	Description
HIGH	Route Proving	Route proving assessment to determine feasibility of the identified offsite route from POC to site.
HIGH	Secure electrical POC	Limited available capacity within the area.
HIGH	Onsite HV diversion	Consult Northern Powergrid for diversion costs to understand onsite constraints ahead of detailed design.
HIGH	Onsite water diversion	Consult Yorkshire Water for diversion costs to understand onsite constraints ahead of detailed design.
MEDIUM	Highway Modifications	Consult the third-party s278 contractor to understand the status of the diversions within the A635.

10. APPENDICES

- Utility Asset Records
- Utility Composite Overlay
- HV Diversion Drawing (Northern Section)
- HV Diversion (Southern Section)
- Water Diversions Drawing
- Electricity Point of Connection
- Water Point of Connection
- Gas Point of Connection