



Plot SGR 1, Bicester

Preliminary Utilities Appraisal

Section 1 of 2

On behalf of **SGR (Bicester 1) Limited**

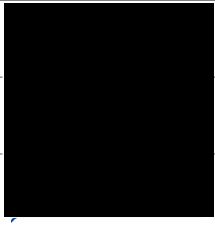
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Glossary

Undertaker	Various companies that have the legal right to carry out certain utility connection and diversion activities for development and highway works.
Incumbent	Commonly referred to as the 'host', this undertaker is the local distribution network operator for the region.
Budget Estimate	Documentation produced by an undertaker providing a desk top cost summary, stating a point of connection to their infrastructure network.
Pre-development enquiry	The equivalent of a budget estimate for waste water operators.
Land Enquiry	Report provided by an undertaker identifying a suitable point of connection for a set load onto their network.
Asset Record	A plan for a set region identifying the location of an undertaker's infrastructure.
Substation	Electricity plant room that transforms high voltage electricity to low voltage for residential and commercial supply.
Asset Value	Infrastructure paid for by the client, then adopted by the incumbent undertaker will produce transportation income for the undertaker. A proportion of this can be paid to the developer in the form of a one off net present value (NPV) payment.
Low Voltage (LV)	Electricity supply to residential and commercial properties typically with a voltage of 230V-400V.
High Voltage (HV)	Electricity supply for transportation purposes, with a voltage of over 1000V.

1 Introduction

1.1 Report Scope

This report has been prepared by Peter Brett Associates LLP (PBA) on behalf of SGR (Bicester 1) Limited to support the proposed outline planning submission for the residential development known as Land to the West of Home Farm. It will assess utility constraints to the development (excluding privately owned infrastructure) as well as risks associated with procuring new potable water, foul water, gas, electricity and telecommunications services. Our client intends to submit an outline planning application to Cherwell District Council for up to 75 residential units along with areas of open space, pedestrian & cycle links, allotments and orchard.

1.2 Site Information

Existing Land Use and Site Location

The proposed site is currently a greenfield site covering an area extending to approximately 5.03 hectares. The development forms part of the wider NW Bicester Ecotown and is located to the West of Home Farm (Postcode OX27 8TG) currently being used by commercial tenants. Figure 1.1 below identifies the location of the site, outlined by a red boundary.



Figure 1.1 - Proposed Site Location Plan

Proposed Development

The development proposals comprise up to 75 residential units that are predicted to be accessed from Charlotte Avenue which has been constructed as part of an earlier phase of the Ecotown. As part of this development a junction has been constructed to serve this phase. The proposed masterplan layout for the site is shown in Figure 1.2 below.



Figure 1.2 - Proposed Masterplan

Planning Policy

National Policy

The National Planning Policy Framework (NPPF) (March 2012) confirms that there should be a presumption in favour of development where it can be demonstrated that the proposals are sustainable. When making plans for development NPPF states:

[para 163] *'Local planning authorities should work with other authorities and providers to: Assess the quality and capacity of infrastructure for transport, water supply, wastewater and its treatment, energy (including heat), telecommunications, utilities, waste, health, social care, education, flood risk and coastal change management, and its ability to meet forecast demands; and*

Take account of the need for strategic infrastructure including nationally significant infrastructure within their areas.'

Local Policy

The site lies within the Cherwell District Council. As such in the context of utilities the development should consider policies outlined by Cherwell District Council. In their Local Plan 2011-2031. Part 1, 2015 page 81 states *'The use of shared utility enclosures or grouper*

service strips should be used to reduce the service corridor width and limit impact on street design including the location of street trees. Protective and preventative measures should be adopted to avoid tree root intrusions into service corridors’.

Cherwell District Council’s North West Bicester Supplementary Planning Document dated February 2016, includes detail relating to both energy and utility requirements for new developments in North West Bicester;

Page 14 states *‘Infrastructure requirements will be futureproofed so that the development can adapt to change. Renewable energy generation from on-site sources will be the key to delivering zero carbon emissions from energy used in buildings on the site. The provision of utilities’ infrastructure should be coordinated and support the overarching objective for zero carbon development.’*

Page 43 states *‘Other options may exist and should also be explored. In terms of on-site sewerage network capacity, it is suggested in the WCS that gravity sewers are employed to collect the majority of the waste water to avoid the need for a multitude of onsite sewage pumping stations. The design standard shall also require that water recycling technologies are used locally to supplement domestic supplies. It sets out options for the proposed development. It explores the proposed new potable demand from the development and the alternative methods to reduce the demand on the existing Thames Water Utilities network. In this way it seeks to move the development towards water neutrality to avoid the above mentioned supply demand deficits.’*

Information regarding renewable energy can be found within the PBA Energy Statement (41436_3001_Outline Energy Statement).

1.3 Methodology

Assessment Procedure

This report is divided into the following primary service disciplines; electricity, gas, telecommunications, water and wastewater. Each of these disciplines will be described in terms of existing infrastructure, new connections and diversion/alterations activities. In each of these sections the existing utility network constraints are described and where relevant one or more solutions are proposed to enable the delivery of the masterplan.

1.4 Utility Undertaker Communications

For the purposes of this report, PBA have made initial capacity enquiries to the incumbent undertakers to ascertain points of connection and to determine if there is a need to reinforce any of the existing offsite utility networks.

The potable water supply undertaker for this site is Thames Water; the incumbent foul water undertaker is also Thames Water. The public gas transporter is Southern Gas Networks (SGN) whilst Southern and Scottish Electricity (SSE) is the host electricity Distribution Network Operator (DNO). BT Openreach is the licensed open access telecommunications network provider. GTC are also present on the Ecotown, who act as an independent distribution network operator (iDNO).

This report makes reference to copies of the contemporary utility asset plans obtained from each utility undertaker, which identify only adopted utility assets, not privately operated networks and generally do not include individual service connections. Based on these record plans a composite layout of the incumbent's assets are shown on drawing no '41436_2001_001' contained in Appendix A.

Table 1.2: Undertaker Enquiries

Undertaker	Utility	Enquiry	Response Received?
Thames Water	Waste Water	Asset Records Budget Estimate Capacity Check	Yes N/A N/A
Thames Water	Potable Water	Asset Records Budget Estimate Capacity Check	Yes N/A N/A
Southern Gas Networks	Gas	Asset Records Budget Estimate Capacity Check	Yes N/A Yes
GTC	Gas and Electricity	Asset Records Budget Estimate Capacity Check	Yes Yes Yes
Scottish and Southern Electricity	Electricity	Asset Records Budget Estimate Capacity Check	Yes Yes No

Asset records or responses have also been received from each of the following undertakers confirming that their apparatus will not be affected by the proposed development at Bicester:

Anglian Water, Cityfibre, Colt, Energetics Electricity, ENGIE, GTT, Interoute, KPN, Level 3 Communications, Mobile Broadband Network Limited, Tata, Telettelia, Utility assets Ltd, Verizon Business, Virgin Media, Vodafone and Vtesse Networks.

A search of numerous nationwide asset owners' data was undertaken using the Line-search online database (refer to Appendix B). The line-search enquiry is a mechanism for confirming whether a number of strategic infrastructure companies have infrastructure within a specified site boundary, in this instance no assets of a strategic nature were identified. A NRSWA list was also obtained from Oxfordshire County Council, and the undertakers contacted, as above.

It should be noted that all asset records and capacity investigations were completed at a specific point in time, therefore the results of these enquires may be subject to future refinement or change by the network operators.

2 Utility Demand Schedule

2.1 Assumptions

The number of proposed residential units is currently identified as up to 75. It has been assumed that the energy strategy for the purposes of this report will utilise a gas heating method, and that there will be no abnormal loading units (i.e. swimming pools and lifts). Electric vehicle charging has not been included in the electricity loading result. The existing exemplar site is heated through a district heating network. At the detailed design stage a full assessment will be made on the feasibility of this development connecting into the existing network. A worst-case connection into a gas network has been allowed for at this stage to show the scheme is deliverable.

2.2 Schedule

An indicative utility loading schedule has been prepared by PBA based on the above information (75no. units), and current industry standards. The output figures below have been issued to each statutory utility provider as the basis for their capacity assessment and to identify the scope of any offsite activities necessary to bring utilities to the boundary of the site.

Table 2.1: Existing Utility Loading Results

Utility	Total
Electricity	125 kVA
Gas	552 kW
Potable Water	1.90 l/s
Foul Water	1.81 l/s

3 Electricity

3.1 Existing Infrastructure

Both Scottish and Southern Electricity (SSE) and GTC (acting as an iDNO) have electricity infrastructure in the local area. Asset records received from SSE show underground high voltage cables (11kV) running along the B4100 to North of the site boundary. From this cable an overhead 11kV cable supplies a pole mounted transformer close to the site boundary. From the pole, mounted transformer an overhead LV cable then continues to supply the commercial units at Home Farm. Overhead low voltage electricity cables (LV) can also be found running along the B4100 to the North.

Asset records received from GTC show underground 11kV and LV cables supplying the development to the West (Exemplar Site). A GTC secondary substation is located near the Western boundary of the site.

3.2 Proposed New Connection Activities

A budget estimate has been provided by SSE to carry out on site and off site connection works for 75 residential units. Currently awaiting confirmation from SSE for the point of connection.

A budget estimate has also been provided by GTC to carry out on site and off site connection works for 75 residential units. GTC has confirmed a low voltage connection from the existing GTC substation to the west of the site can supply the proposed scheme. No reinforcement of the network will be required.

3.3 Proposed Diversion/Disconnection Works

The asset records show no infrastructure within the site boundary and therefore no diversions are anticipated.

4 Gas

4.1 Existing Infrastructure

SGN is the gas transporter (GT) for this region. However, GTC (as an iDNO) own and operate the gas network in the Ecotown to the West of the site.

SGN own and operate infrastructure on Fringford Road 500m East of the site.

4.2 Proposed New Connection Activities

Although SGN do not own infrastructure in the local area they have provided a point of connection to their existing 63mm PE low pressure (LP) gas main approximately 500m to the East of the site on Fringford Road. SGN have also confirmed their existing network has sufficient capacity to supply the proposed development. Therefore, a low-pressure supply will be delivered to site and a gas governor is not required.

GTC has also confirmed that a LP point of connection can be made to the GDN/iGT 6" Metallic low pressure main located along Fringford Road and have allowed for 795 metres off-site work from the connection point to the site entrance (entering site from the east off the B4100).

The gas infrastructure, if required, can be delivered by either SGN or GTC.

4.3 Proposed Diversion/Disconnection Works

Asset records received from both SGN and GTC do not indicate any gas mains within the site boundary, therefore it is not anticipated that any diversions will be required.

5 Telecommunications

5.1 Existing Infrastructure

Underground BT Openreach plant is located to the North of the site running along the B4100.

Overhead BT Openreach plant can also be located to the North of the site running along the B4100. Asset records received from Openreach show no infrastructure within the boundary of the development.

At this stage in the scheme development, PBA has not yet received sufficient information to identify whether the cables described above are fibre-optic or copper. However, it can be assumed that the overhead cables are copper.

5.2 Proposed New Connection Activities

It is expected that a connection will be made into the earlier phases of the Ecotown via Charlotte Avenue. In line with current practices, Openreach will issue all new connection ducts with jointing-box frames and covers for installation by the developer's groundwork contractor free of charge. Typically, network reinforcement is funded and undertaken by Openreach (up to the value of £3,400 per unit).

5.3 Proposed Diversion/Disconnection Works

The asset records received from Openreach identify assets near the Northern boundary of the site. Trial holes should be undertaken to confirm the exact location of the cables. It has been assumed for the purpose of this report that the cables are located outside of the site boundary.

6 Water

6.1 Existing Infrastructure

Thames Water is the incumbent water transporter who own and operate the potable water mains in the area. Thames Water mains supply the existing development to the immediate West of the site boundary, known as the Exemplar land.

Asset records show a main, of unknown size, in the spine road of the Exemplar land.

6.2 Proposed New Connection Activities

As of 1st April 2018, it is Thames Water's responsibility to cover reinforcement/capacity upgrades to their network. Infrastructure charges are expected to change and timeframes for modelling are currently not known. Thames Water asset records show they supply to Exemplar site to the West of the site boundary, PBA propose to connect to this network located in the access road on Charlotte Avenue.

6.3 Proposed Diversion/Disconnection Works

PBA have been in correspondence with Thames Water over the supply of this development. Thames Water have advised that flow and pressure testing on site will be required to determine whether the existing main within the Exemplar site has capacity to supply the development or whether reinforcement will be required to the Thames Water network.

Due to the changes to the Water Industry Act (WIA 1991), Thames Water are required, from 1st April 2018, to fund and deliver all required reinforcement to enable development. As such even if there is found to be inadequate capacity in the network Thames Water will reinforce the network in line with the development programme.

7 Wastewater

7.1 Existing Infrastructure

Thames Water are the incumbent wastewater undertaker for the area. Thames Water have confirmed in writing there are no Thames Water assets within the site boundary. It is believed Thames Water own and operate the wastewater network in the Exemplar site to the West of the site boundary. However, Thames Water's asset records have not been updated to show this information.

The asset records that have been received show a surface water sewer running along Fringford Road 500m East of the site boundary.

7.2 Proposed New Connection Activities

The changes to the WIA 1991 (referred to in section 6) also apply to wastewater operators. As such it is the responsibility of Thames Water to ensure that adequate capacity is made available for the proposed scheme.

Thames Water own and operate the wastewater network at the Exemplar site to the West of the site boundary. It is expected that a connection to this network can be made via Charlotte Avenue. However, a connection to the foul sewer in Charlotte Avenue is likely to be required.

If necessary, an allowance should be made for an 8 by 12 m pumping station enclosure with a 15 m offset from the wet well to residential units, as well as providing access for a tanker.

However, there is the possibility that a connection can be made into an (assumed) smaller foul sewer to the south west of the scheme, within the Exemplar land. At this stage Thames Water do not have the size, cover or invert level of the potential connection manhole. Should, at the detailed design stage, this connection point be found to have adequate capacity, it should be utilised as the site may be able to drain to this location by gravity, and therefore not require a pumping station.

7.3 Proposed Diversion/Disconnection Works

Asset records received from Thames Water do not indicate any sewers within the site boundary, therefore it is not anticipated that any diversions will be required.

8 Summary of Connections

8.1 New Connection Activities

The capacity information below has been obtained by PBA for 75 residential units.

SSE and GTC have offered a low voltage electricity connection from the existing substation to supply the site.

SGN and GTC have confirmed that they can both provide a gas low pressure point of connection capable of supplying the scheme.

For the purposes of this report it has been assumed that connection can be made to the BT Openreach network located on the B4100. Should this not be the case, Openreach will contribute up to £3,400 per unit (connected to their network) for any offsite reinforcement, if required.

As of 1st April 2018, it is Thames Water's responsibility to cover reinforcement/capacity upgrades to their network. Infrastructure charges are expected to change and timeframes for modelling are currently not known. For both wastewater and potable water PBA propose, at this stage, to connect to the Thames Water infrastructure within the Exemplar site to the West located in Charlotte Avenue.

8.2 Diversionsary Works

It has been assumed for the purposes of this report no alteration will be required to the existing road that is to be used to access the development.

No diversions to existing electricity infrastructure are anticipated.

No diversions to existing gas infrastructure are anticipated.

No diversions are anticipated for the existing BT Openreach telecommunications network.

No diversions to existing potable water infrastructure are anticipated.

No diversions to existing wastewater infrastructure are anticipated.

8.3 Planning Policy Compliance

This report complies with NPPF by providing evidence of working with providers to assess the quantity and capacity of infrastructure capable of supplying the proposed development.

The scheme will utilise, where programme allows for it, a shared trenching mechanism for the lay of new utilities, complying with Cherwell District Councils local plan.

In relation to the North West Bicester Supplementary Planning Document the report shows compliance with:

Page 14: Where possible, electricity cables will look to be appropriately sized to withstand the generation of electricity from renewable sources at a residential level.

Page 43: A gravity foul drainage network will be employed within the scheme where practicable. This will ultimately be dependent on the point of connection identified by Thames Water.

9 Recommendations and Next Steps

9.1 Recommendations and Next Steps

PBA recommend that trial holes are dug to confirm the exact location of the BT cable that is shown to be within the site boundary by the asset records. If the cables are in fact within the site, they can be diverted outside of the site boundary where possible to minimise constraints on the development.

It is also recommended that a GPR survey is undertaken to identify any infrastructure within the development boundary that has been identified from asset records.

Asset records and capacity response can normally be assumed as accurate for a period of 90 days. Outside of this timeframe the undertakers may require new enquiries to be submitted.

PBA recommend the detailed new connection quotations are requested at the earliest opportunity following planning permission to avoid delays further into the construction programme.