

Growing Baldock

Environmental Statement Volume 1: Text
Chapter 16: Utilities



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Urban&Civic

Hertfordshire

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16.1 INTRODUCTION

- 16.1.1 This chapter identifies and evaluates the utility demand requirements for the proposed development, as well as identifying and reviewing any site constraints and network reconfiguration works required on the existing utility networks to accommodate the proposed development.
- 16.1.2 This chapter has been prepared by Joanne Blackburn, an Associate Director at Utilities Connections Management Ltd (UCML) and UCML is an independent Utility Consultancy providing services relating to the review and provision of utility disconnections, diversions, capacity assessments, and connections for all types of developments, including the delivery of utility infrastructure projects as part of major developments. UCML has been appointed to review this development site by Urban&Civic (U&C) and the author of this chapter is a competent expert with over 10 years' experience in reviewing and developing utility infrastructure projects for major developments.
- 16.1.3 UCML's review of utility services includes assessment of the clean water, gas, electricity, and telecommunications networks.
- 16.1.4 The draft description of development comprises:

Outline planning application with all matters reserved except for means of highway access into the development from the A505/Royston Road, North Road and Clothall Road: for up to 3,200 homes, up to 16ha of employment, waste and leisure infrastructure, a mixed use local centre, up to 1 secondary school, up to 2 x primary schools, up to 1 SEND school, health hub, green infrastructure (including parks, formal sports provision, play, habitat areas, informal open space and structural planting), internal street network, access junctions and railway crossing, public transport infrastructure, pedestrian/cycle network (including PRow diversions, active travel routes, mobility hubs and crossing of the railway), utilities and drainage infrastructure (including diversions of existing and provision of new infrastructure, pumping stations, sustainable drainage, primary substations, rising main/strategic sewer and renewable energy infrastructure), ground remodelling/earthworks and any necessary demolitions.

16.2 RELEVANT POLICY

16.2.1 Relevant policies and legislation relevant to infrastructure issues are contained within the following documents,

National Policy

National Planning Policy Framework

16.2.2 The National Planning Policy Framework (NPPF) (December 2024) Section 10 (Supporting high quality communications) outlines that advanced, high quality and reliable communications infrastructure is essential for economic growth and social well-being. Planning policies and decisions should support the expansion of electronic communications networks.

16.2.3 Section 14 (Meeting the challenge of climate change, flooding and coastal change) supports renewable and low carbon energy and associated infrastructure. New development should avoid increased vulnerability to the range of impacts arising from climate change.

16.2.4 Section 15 (Conserving and enhancing the natural environment) includes that development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.

Local Policy

North Hertfordshire Local Plan

16.2.5 The North Hertfordshire Local Plan (NHLP 2011-2031) sets out the long-term vision and objectives for the whole of North Hertfordshire for the period up to 2031.

- Policy SP11 (Natural resources and sustainability) – The plan seeks to meet the challenges of climate change and flooding. Including supporting the principles of the water framework directive (WFD) Regulations 2017 and seeking to protect, enhance and manage the water environment; and work with utilities providers other authorities and relevant agencies to ensure additional wastewater treatment capacity is delivered.
- Polic D1 (Sustainable design) – Development proposals should take all reasonable opportunities to create or enhance public realm; optimise potential of the site by incorporating Sustainable Drainage Systems; reduce energy consumption and waste; maximise accessibility, legibility and social connectivity both internally and with neighbouring areas; future proof for changes in technology and lifestyle.; minimise the impacts of street furniture and parking.
- Policy NE10 (Water conservation and wastewater infrastructure) – Policy requires that in order for planning permission to be granted, new development must not

result in the deterioration of any watercourse; and must contribute to words the WFD objectives. Development must deliver necessary new or improved water and/or wastewater infrastructure and adequate foul water treatment and disposal already exists or can be provided in time to serve the development.

Baldock, Bygrave and Clothall Neighbourhood Plan

16.2.6 The Baldock, Bygrave and Clothall Neighbourhood Plan was 'made' in June 2021. Policies of relevance include:

- Policy E1 – Transport and air quality - Applications for sites BA1, BA2, BA3, BA4 and BA10 should provide for or contribute towards reducing impacts of congestion/ air quality including providing the necessary infrastructure to allow convenient charging of electric vehicles.
- Policy E3 – Managing Construction Impacts – Applications to develop sites BA1, BA2, BA3, BA4 and BA10 proposed in the new North Hertfordshire Local Plan should ensure that the impact of construction activity on Baldock, Lower and Upper Bygrave and local roads is minimised

16.3 ASSESSMENT METHODOLOGY

Scope

- 16.3.1 The purpose of the assessment undertaken by UCML seeks to;
- Identify site constraints and potential network reconfiguration works (including diversionary and disconnection works) required to accommodate the proposed development;
 - Identify the requirement for network reinforcement and upgrade works required to supply the proposed development;
 - Evaluate the potential impacts of the above in terms of both beneficial and detrimental consequences and review potential mitigation of these impacts where appropriate.

Data Sources

- 16.3.2 Existing utility asset records have been obtained from the relevant utility network operators to review the indicative location of the clean water, gas, electricity, and telecommunications networks in the vicinity of the development site. The incumbent utility network owners operating in the geographical area of the development site are identified in **Table 16.1** below:

Table 16.1 – Utility Network Operators

Utility	Network Owner/Operator
Clean Water	Affinity Water
Gas	Cadent Gas
Electricity	UK Power Networks
Telecommunications	Openreach
	Virgin Media

- 16.3.3 Capacity information for the clean water and electricity networks have been sourced from the relevant utility network owners to establish the availability of capacity within the existing utility networks, and establish the requirement for any network reinforcement or upgrade works to accommodate the proposed development.

Assessment Approach

- 16.3.4 The development proposals have been derived from review of the Parameter Plan (drawing no. UAC092-002 rev. Q) and Outline Planning Application Boundary (drawing no. UAC092-001 rev. E), provided to UCML by U&C.
- 16.3.5 Demand estimates for the proposed development were calculated and provided to the relevant statutory utility network owners to complete their review and capacity assessment.

- 16.3.6 Review of the constraints posed by existing utility apparatus and the identification of any associated network reconfiguration works (including diversionary and disconnection works) required to accommodate the development proposals was undertaken through desktop review of the utility asset records provided to UCML by the relevant utility network owners.

Demand Schedule

- 16.3.7 A demand schedule for the development has been developed to illustrate the additional supply required to be provided within the relevant utility networks, and for the utility network owners to undertake an assessment both of the available network capacity and the network reinforcement and upgrade works that may be required to provide the required demand.
- 16.3.8 The demand estimate for the clean water requirements for the commercial and educational elements of the development were produced using both data from 'Rules of Thumb – Guidelines for Building Services' (5th Edition) and using UCML's industry experience on other similar developments of a comparable type and size.
- 16.3.9 The calculation of a demand estimate in litres per second (l/s) for the residential development is not typically required. As residential connections are standardised by the relevant clean water network operator, this allows them to assess capacity requirements and availability through review of the total number of residential dwellings proposed.
- 16.3.10 For residential dwellings, the standard daily water consumption is managed through current Building Regulation standards (Building Regulations Part G). At the time of writing, the standard daily consumption allowance is set at 125 litres of water consumption per person per day (l/pppd). Based on an average household size of 2.36 persons per property in the UK¹, for information, this equates to an average allowance of 0.003 l/s per dwelling.
- 16.3.11 Affinity Water as the clean water network operator has a responsibility under their license condition as set by the industry regulator, OfWat, to provide a minimum of 7 meters head (0.7 bar pressure) to the boundary stop tap of each dwelling connected to their distribution network.
- 16.3.12 The demand estimate for the electricity requirement for the commercial and educational elements of the development were produced using both data from 'Rules of Thumb – Guidelines for Building Services' (5th Edition) and using UCML's industry experience on other similar developments of a comparable type and size.
- 16.3.13 The demand estimate for the electricity requirements for the residential element of the development were produced using industry After Diversity Maximum Demand (ADMD)

¹ Taken from ONS statistics, Families and Households in the UK: 2022

allowances per dwelling. The ADMD figures used are based on the use of an electrical heating strategy for each dwelling, through the installation of Air Source Heat Pumps (ASHPs), and include for current industry standard allowances for the installation of 1 no. 7.2 kW Electric Vehicle (EV) charging unit for each dwelling. The ADMD figures used are currently published Independent Distribution Network Operator (IDNO) figures, as it is likely that the network installed as part of the development construction will be adopted by an IDNO.

16.3.14 No estimate for gas demand has been produced based on the approach that the development will utilise low-carbon heating strategies where required across the whole of the development.

16.3.15 The demand schedule includes an estimate for demand based on the anticipated 'worst-case' scenario for the development (Option 1), the scenario that would result in the largest demand requirement, which includes the potential requirement for an up to 12FE secondary school on BA3.

16.3.16 The demand schedule estimated for the development is outlined in **Table 16.2**.

Table 16.2 – Utility Demand Schedule

Utility	Residential	Commercial/Educational	Total
Clean Water	9.6 l/s ²	26.40 l/s	36 l/s
Electricity	9,920 kVA ³	8,080 kVA	18,000 kVA

Significance Criteria

16.3.17 An assessment of the significance of an effect has been made by firstly considering sensitivity of the receptor (i.e. its importance and ability to tolerate and recover from change and, secondly, by considering the likely magnitude of the effect (i.e. its spatial extent and duration). By combining sensitivity and magnitude, the significance of the effect can be established. If significant negative effects are identified, mitigation measures can be proposed to reduce the significance.

16.3.18 Determination of the magnitude of change to the receptors as a result of the proposed development is based on the criteria set out in **Table 16.3**.

Table 16.3 – Magnitude of Impacts

Magnitude	Description
Large	Results in loss of and/or quality and integrity of the receptor. Following development, the baseline situation is fundamentally changed.

² Based on 0.03l/s for average consumption, based on average household size of 2.35 residents and the daily water consumption allowance of 125 l/pppd set in current Building Regulations.

³ Based on current IDNO ADMD allowances per dwelling for residential developments where dwellings utilise ASHPs and 1 no. 7.2 kW EV charging unit per dwelling.

Moderate	Results in impact on integrity of or loss of part of the receptor. Following development, the baseline situation is noticeably changed.
Small	Results in some measurable change in receptor's quality or vulnerability. Following development, the baseline situation is largely unchanged with barely discernible differences.
Negligible	The impacts are unlikely to be detectable or outside the norms of natural variation.

- 16.3.19 The sensitivity of a receptor is characterised by its ability to tolerate and recover from changes in the environment as well as its importance to society (i.e. protection under a statutory designation or economic value). **Table 16.4** shows the criteria used to determine receptor sensitivity.

Table 16.4 – Sensitivity of Receptor

	Description
High	High quality and rarity, local scale, and limited potential for substitution. Medium quality and rarity, regional or national scale, and limited potential for substitution. Highly sensitive to change.
Medium	Medium quality and rarity, local scale, and limited potential for substitution. Reasonably tolerant of change.
Low	Low quality and rarity, local scale, and limited potential for substitution. Tolerant of modest change.
Negligible	Very limited quality and tolerant of the substantial change.

- 16.3.20 The significance of a potential effect is derived based upon the sensitivity of the receptor and the magnitude of the change. The significance of the effect is then determined using the matrix shown in **Table 16.5**. The significance of an effect can be beneficial, neutral, or adverse. The significance of an effect should also be qualified based on the likelihood of an impact occurring (using a scale of certain, likely, or unlikely) and the confidence in the accuracy of the assessment.

Table 16.3 - Significance of Effects

Magnitude	Sensitivity			
	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Negligible
Small	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

- 16.3.21 The significance of residual effects (i.e. the environmental effects that remain after the incorporation of mitigation measures) has been assessed through consideration of their

magnitude, duration, and nature (i.e. reversible or irreversible) and also the geographic context (e.g. highly localised or widespread). The significance criteria are set out in **Table 16.6**. In the absence of 'industry standard' significance criteria, a qualitative approach, based upon available knowledge, experience and professional judgement, is employed.

Table 16.6 - Significance of Effects

Significance Level	Significance Level Criteria
Major Beneficial	Major improvements at catchment scale.
Moderate Beneficial	Improvements at local scale.
Minor Beneficial	Limited improvements at local scale.
Not Significant	No appreciable impact.
Minor Adverse	Limited detrimental effects at local scale.
Moderate Adverse	Detrimental effects at local scale.
Major Adverse	Important detrimental effects at catchment scale which may become key factors in the decision making process.
Severe	Important detrimental effects at sites of national or regional importance which will become key factors in the decision making process.

Uncertainties and Limitations

- 16.3.22 The utility demand schedule was produced using 'Rules of Thumb – Guidelines for Building Services' (5th Edition), current electricity IDNO ADMD allowances for residential dwellings, and UCML's experience of demand requirements from comparable developments of a similar type and size to the proposed development.
- 16.3.23 The assumption was made to base the demand estimates on the use of a low-carbon electrical heating strategies for all types of development, assuming that the use of mains gas connections will not be considered for the development in order to comply with developing de-carbonisation of heating methodologies for new build dwellings and compliance with potential future Building Regulations.
- 16.3.24 The demand estimates for electricity also include a diversified allowance for EV charging units in residential dwellings, and assumes EV units will likely be installed as part of the commercial elements of the development. Assumptions as to the size and number of EV charging units have been made in advance of the final requirements being known.
- 16.3.25 The capacity information and location of likely Points of Connection (POCs) on the clean water and electricity networks have been provided by the relevant utility network owners and were correct at the time of issue.
- 16.3.26 The utility asset records used to review site constraints and potential network reconfiguration works (including diversionary and disconnection works) have been provided by the relevant utility network owners. The information provided on the asset

records is intended as indicative, and verification of the detail and location of assets shown on the relevant records should be undertaken by the use of asset location equipment to trace underground plant and the use of hand dug trial excavations to confirm the location of underground plant.

- 16.3.27 Any reference to 'on-site' assets or apparatus relates to utility assets indicated as located within the development red line boundary as shown on the Parameter Plan.
- 16.3.28 Any reference to 'off-site' assets or apparatus relates to utility assets located outside of the application red line boundary as shown on the parameter plan.

16.4 BASELINE CONDITIONS

The Current Baseline

Clean Water

- 16.4.1 The statutory clean water network in the vicinity of the development site is owned and operated by Affinity Water, with the distribution network consisting of trunk and distribution water mains of various diameters and materials. The existing clean water network located in the immediate vicinity of the development site consists of distribution mains and associated apparatus. The location of existing assets are illustrated on the asset plans provided by Affinity Water and included within **Appendix 16.1**.
- 16.4.2 Existing on-site clean water assets present include:
- 400 mm ductile iron and 200 mm ductile iron mains routed across the land located to the north and south of Clothall Road;
 - 200 mm ductile iron mains routed across the land located to the north of Clothall Road; and
 - 3" cast iron distribution main routed along Bygrave Road, which changes material and diameter to 90 mm high density polyethylene.
- 16.4.3 Network reconfiguration works will be required to undertake diversionary and disconnection works where required to accommodate the on-site construction works.
- 16.4.4 It should be noted that Affinity Water do not typically indicate individual service pipes on their asset records. Where existing units are located within the development site boundary within proximity of a mains asset, the assumption can be made a service is present until proven otherwise. The disconnection of service pipes will be required to accommodate any demolition works required to clear existing dwellings and/or units located within the development site boundary.
- 16.4.5 Existing off-site clean water assets present include:
- 125 mm polyethylene distribution main routed along North Road;
 - 4" cast iron distribution main routed along Royston Road;
 - 180 mm polyethylene distribution main routed along Wallington Road; and
 - 125 mm polyethylene distribution main routed along Clothall Road.
- 16.4.6 Network reconfiguration works will be required to undertake diversionary works where required to accommodate the construction of site entrances and any associated off-site highway improvement works where these works will directly affect the location and depth of the mains apparatus within the public highway and footpaths.
- 16.4.7 Affinity Water has advised that a connection point for the development will need to be provided for the trunk main water network, and has advised a likely connection point

- from an 18" cast iron trunk main located near the Weston Hills Pumping Station, off London Road and near Hatch Lane, located to the south of the development site.
- 16.4.8 A suitable route for the new water main to be installed from the connection point on the 18" cast iron trunk main will be agreed with Affinity Water. Indicative options for the off-site mains route and the route of mains within the Development Site boundary have been discussed with Affinity Water, and the selection of the most appropriate route for water mains will be confirmed at detailed design stage.
- 16.4.9 Affinity Water has advised that modelling works undertaken to date confirms the requirement for network reinforcement works to provide the required additional capacity within their distribution network to supply the required development demand. Affinity Water has confirmed that the completion of the required network reinforcement works will be phased to suit the proposed development phasing plan, to ensure capacity is made available in a phased approach as the development construction works progress.
- 16.4.10 The strategy for the network reinforcement works required will be developed by Affinity Water based on a formal application for the water supply to the development site, and they will design the reinforcement works to deliver the required capacity for the development and, as part of these works, they will consider the impact of any additional demand in the area.
- 16.4.11 Affinity Water has advised that the modelling works completed to date have been based on the use of a single source of water to the connection point provided, which is the Weston Hills Reservoir. Affinity Water has advised that the use of this single source of water for the development will affect the reservoir levels; therefore, the network reinforcement works required will include the provision of a second source of water for the development from an alternative reservoir source. Affinity Water has advised the second source of water will be confirmed as they develop their detailed reinforcement design and programme.
- 16.4.12 The capacity that can be provided by use of the POC provided will offer some flexibility in capacity, able to support alternative options for the development such as the provision of a secondary school. Sufficient capacity can be made available to support either of the current options available for the provisional of a secondary school on the flexible land use parcel.
- 16.4.13 Affinity Water has advised that to provide water capacity and supply to the development, they do not undertake extraction from rivers and watercourses, with water supply for their network being sourced from man-made reservoirs and chalk bores located within their supply area.
- 16.4.14 Affinity Water has advised that the source of water for specific sites will fluctuate, dependant on the availability of capacity from various sources as well as works being

undertaken on their network. They monitor the availability of supply within their network continuously and adjust the flow within their network accordingly.

Gas

- 16.4.15 The statutory gas network in the vicinity of the development site is owned and operated by Cadent Gas, with the gas distribution network consisting of main operating at Local High Pressure (LHP), Intermediate Pressure (IP), Medium Pressure (MP), and Low Pressure (LP). The existing gas network located in the immediate vicinity of the development site consists of MP and LP mains and associated apparatus. The location of existing assets are illustrated on the asset plans provided by Cadent Gas and included within **Appendix 16.2**.
- 16.4.16 Review of the Cadent Gas asset records indicates no mains apparatus are located on-site.
- 16.4.17 It should be noted that Cadent Gas do not typically indicate individual service pipes on their asset records. Where existing units are located within the development site boundary within proximity of a mains asset, the assumption can be made a service is present until proven otherwise. The disconnection of service pipes will be required to accommodate any demolition works required to clear existing dwellings and/or units located within the development site boundary.
- 16.4.18 Existing off-site mains gas assets present include:
- 3" cast iron LP main routed along North Road.
- 16.4.19 Network reconfiguration works will be required to undertake diversionary works where required to accommodate the construction of site entrances and any associated off-site highway improvement works where these works will directly affect the location and depth of the mains apparatus within the public highway and footpaths.
- 16.4.20 As previously noted, it is assumed that no mains gas connections will be required on-site due to the likely use of low-carbon electric heating strategies for the development.

Electricity

- 16.4.21 The statutory electricity network in the vicinity of the development site is owned and operated by UK Power Networks, with the electricity distribution network consisting of cables and assets operating a various voltages, including; 132 kV Extra High Voltage (EHV), 33 kV EHV, 11 kV High Voltage (HV), and Low Voltage (LV). The existing electricity distribution network located in the immediate vicinity of the development site consists of cables and associated apparatus operating at 33 kV EHV, 11 kV HV, and LV. The location of existing assets is illustrated on the asset plans provided by UK Power Networks and included within **Appendix 16.3**.
- 16.4.22 Existing on-site electricity assets present include:

- Underground 33 kV EHV cabling and associated pilot cable routed across the northern parcel of the development site.
- Underground 11 kV HV cabling routed within the development site to the north of Bygrave Road.
- Underground 11 kV HV cabling routed within the area of the development site located immediately to the south of the rail line and north of Royston Road.
- Overhead 11 kV HV cabling and associated apparatus within the development site parcel located to the south west of Clothall Road.

16.4.23 Network reconfiguration works will be required to undertake diversionary and disconnection works where required to accommodate the on-site construction works.

16.4.24 Existing off-site electricity assets present include:

- 33 kV EHV cabling routed along Royston Road;
- Overhead 11 kV HV cabling and associated apparatus routed along North Road;
- Underground 11 kV HV cabling routed along Wallington Road; and
- Underground LV cabling routed within the residential areas surrounding the development site, from which existing dwellings/units will be connected via LV service cables.

16.4.25 Network reconfiguration works will be required to undertake diversionary works where required to accommodate the construction of site entrances and any associated off-site highway improvement works where these works will directly affect the location and depth of the mains apparatus within the public highway and footpaths.

16.4.26 UK Power Networks has advised that a connection point for the development to provide the total demand required will need to be provided from the 33 kV EHV network, and has advised a likely connection point from 2 no. new 33 kV EHV circuit breakers to be installed at the existing Letchworth Grid Primary Substation.

16.4.27 UK Power Networks has advised that provision of the total demand capacity required for the development will be subject to the completion of currently ongoing network reinforcement works being completed on the upstream 132 kV EHV network. These are current already ongoing network reinforcement works which UK Power Networks are completing to provide significant additional capacity on their local distribution network in the area.

16.4.28 The use of a connection point at 33 kV EHV will require the construction and installation of an on-site 33 kV/11 kV Primary Substation, from which the on-site 11 kV secondary distribution network will be connected. The on-site 11 kV distribution network will then in turn supply the on-site LV distribution network, from which the majority of dwellings and units will take LV service connections.

- 16.4.29 The capacity that can be provided by use of a 33 kV EHV POC and installation of an on-site Primary Substation will offer some flexibility in capacity, able to support alternative options for the development such as the provision of a secondary school. Sufficient capacity can be made available to support all of the land use options on the flexible land use parcel from the proposed Primary Substation to be constructed on-site.
- 16.4.30 UK Power Networks has advised that during the completion of the upstream network reinforcement works and the construction of the on-site Primary Substation, interim supplies can likely be offered from the existing 11 kV HV distribution network at strategic locations surrounding the development site.

Telecommunications - Openreach

- 16.4.31 A telecommunications network in the vicinity of the development site is owned and operated by Openreach. The existing Openreach network located in the immediate vicinity of the development site consists of underground and overhead fibre and copper cables and associated apparatus. The location of existing assets are illustrated on the asset plans provided by Openreach and included within **Appendix 16.4**.
- 16.4.32 Existing on-site Openreach assets present include:
- Underground and overhead assets routed along Bygrave Road; and
 - Underground assets routed within the development site to the south of Clothall Road.
- 16.4.33 Network reconfiguration works will be required to undertake diversionary and disconnection works where required to accommodate the on-site construction works.
- 16.4.34 Existing off-site Openreach assets present include:
- Underground and overhead assets routed along Royston Road;
 - Underground and overhead assets routed along North Road;
 - Underground and overhead assets routed along Wallington Road; and
 - Underground and overhead assets routed along Clothall Road.
- 16.4.35 Network reconfiguration works will be required to undertake diversionary works where required to accommodate the construction of site entrances and any associated off-site highway improvement works where these works will directly affect the location and depth of the apparatus within the public highway and footpaths.
- 16.4.36 Openreach will provide Fibre to the Premise (FTTP) connections as standard for new developments. FTTP connections provide ultrafast broadband speeds to each new dwelling, and deliver a level of future proofing for broadband as demand increases. Openreach advises that their full fibre FTTP network is fully compliant with current building regulations and meets the definition of 'Gigabit' ready.

Telecommunications – Virgin Media

- 16.4.37 A telecommunications network in the vicinity of the development site is owned and operated by Virgin Media. The existing Virgin Media network located in the immediate vicinity of the development site consists of underground hybrid fibre and coaxial cables and associated apparatus. The location of existing assets are illustrated on the asset plans provided by Virgin Media and included within **Appendix 16.5**.
- 16.4.38 Review of the Virgin Media asset records indicates no apparatus is located on-site.
- 16.4.39 Existing off-site Virgin Media assets present include:
- Underground assets routed along Salisbury Road;
 - Underground assets routed along Yeomanry Drive;
 - Underground assets routed along Wallington Road; and
 - Underground assets routed along Clothall Road.
- 16.4.40 Network reconfiguration works will be required to undertake diversionary works where required to accommodate the construction of site entrances and any associated off-site highway improvement works where these works will directly affect the location and depth of the apparatus within the public highway and footpaths.
- 16.4.41 Virgin Media are currently undertaking a multi-year programme to upgrade their network from hybrid fibre-coaxial to a full fibre network, and will likely be able to provide fibre connections to the development. Virgin Media can be installed alongside Openreach FTTP connections to offer end users additional options for fibre connections.

Other

- 16.4.42 Other utility network operators have been contacted to confirm if they have assets located in the vicinity of the development site that would be affected by the development proposals. The utility companies contacted, and who have provided confirmation that they currently have no assets located in the immediate vicinity of the development site, include:
- Leep Utilities;
 - Eclipse Power Networks;
 - GTC;
 - Arelion;
 - CityFibre;
 - CA Telecom;
 - Mobile Network Broadband Ltd;
 - Lumen Technologies;
 - Sky UK Ltd;
 - SOTA;
 - Telent;

- Verizon;
- Vodafone; and
- LinesearchBeforeUDig members (the full list of which is provided on the LSBUD website).

The Projected Future Baseline

- 16.4.40 Should the Proposed Development works not take place, the current conditions of the utility networks will largely be influenced by regional and national trends, network reinforcement and upgrade works resulting from general network maintenance requirements, any requirement for improvement and reinforcement works results from other proposed development works in the area, and any reconfiguration works resulting from highway improvement works in the area.
- 16.4.41 Examples of national and regional trends that will influence the evolution of utility networks outside of the direct impact of new development works include:
- The impact of general population changes on utility demand; for instance, regional water supply operators plan network improvement and investment works within their long-term management plans that consider population growth and demand management.
 - The impact of climate change and extreme weather events on the availability of water supply, particularly the risk of drought on reservoir supplies in the summer months.
 - The impact of decarbonisation of the electricity transmission grid network and distribution networks, where the national targets for decarbonisation will continue to evolve based on national Government set targets and the increased use of renewable sources of power, such as solar and wind power.
 - The increase in investment on the national electricity network to support the increased demand resulting from decarbonisation, with network upgrade works on both the transmission and distribution networks ongoing generally to support the increased use of electrical heating strategies for both new developments and retrofitting of existing dwellings (for instance, the increased use of heat pumps). the increased use of Electric Vehicles, and the increased construction of large high power demand users such as data centres.

16.5 POTENTIAL EFFECTS

Construction Stage

- 16.5.1 On-site construction activities will include the clearance of vegetation, topsoil stripping and stockpiling, demolition of existing buildings, establishment of compound areas, excavation and ground levelling to create development platforms, preparations and construction of an on-site road network, and the construction of foundations and buildings. The completion of these works in the vicinity of on-site assets will impact upon any existing utility assets located on-site. Network reconfiguration works, including diversionary and disconnection works where appropriate, will need to be undertaken in accordance with the relevant utility network operator's guidelines to accommodate the on-site works.
- 16.5.2 The construction of site access from the existing off-site road network and completion of any associated off-site highway improvement works may impact existing utility assets located off-site within the existing public highway. Network reconfiguration works, including diversionary and disconnection works where appropriate, will need to be undertaken in accordance with the relevant utility network operator's guidelines to accommodate any off-site works and site entrance construction works.
- 16.5.3 The movement of plant and machinery into site may impact services located off-site within the existing public highway. Network reconfiguration works, including diversionary works where appropriate, or network protection measures will need to be undertaken in accordance with the relevant utility network operator's guidelines to minimise any impact and risk of damage to utility assets that could be caused by the movement of plant into site.
- 16.5.4 The potential risks of damage to existing utility assets during construction can be categorised as having a **Minor Adverse** effect.

Post-Completion Stage

- 16.5.5 The increased demand on the clean water and electricity networks resulting from the construction of the proposed development will trigger the requirement for network reinforcement works to be completed on the clean water and electricity networks. The reinforcement works will account for the increased demand placed on the networks by the development proposals, and the completion of these works will consider the development construction programme and phased requirement for increased demand. Note, as previously discussed, Affinity Water has confirmed that water will not be sourced through extraction from rivers or watercourse; therefore, the aquifer will not be impacted.
- 16.5.6 The adoption of the new network assets to be installed to serve the development will be arranged with the relevant statutory network operator and/or a suitable accredited Independent Distribution Network Operator (IDNO – in relation to electricity networks)

or New Appointment and Variation (NAV – in relation to clean water) company. The relevant adopting network operator will be responsible for operation and maintenance of the new utility networks in compliance with the regulations issued by the relevant industry regulatory body.

- 16.5.7 The significance of effects associated with utility infrastructure after the completion of the development can be considered to be **Negligible**.

16.6 MITIGATION MEASURES**Construction Stage**

- 16.6.1 Potential damage to existing utility assets can be mitigated through the use of industry standard safe digging practices and safe working procedures; including the verification of asset location through radar scans and hand dug trial excavations in compliance with Health and Safety Executive Guideline 47 (HSG47) 'Avoiding Danger from Underground Utility Services', and the use of Health and Safety Executive Guideline 6 (GS6) 'Avoiding Danger from Overhead Power Lines'. Specific site safety guidelines and working procedures will also be provided by the relevant utility asset owner where works are to be undertaken the vicinity of utility assets.
- 16.6.2 The Outline Construction Environmental Management Plan (OCEMP) is submitted with the OPA. Further individual CEMPs for each phase of the Proposed Development will be prepared and submitted for each phase, with detailed CEMPs provided for the relevant reserved matters parcels.
- 16.6.3 The requirement for asset protection measures and/or network reconfiguration can be agreed with the relevant asset owner to mitigate the impact of off and on-site construction works on existing utility assets. These works can be included within the relevant construction programming and progressed as the Development progresses to detailed design stage.
- 16.6.4 Design and programming of the new utility assets required to be installed on-site to serve the Proposed Development can be progressed as the Development progresses to detailed design stage to ensure risks associated with new utility installation works can be mitigated.

Post-Completion Stage

- 16.6.5 Network reinforcement works and the construction of new networks assets will be undertaken either in advance of or during the construction phase of the Proposed Development; therefore, no effects associated with utility infrastructure after the completion of the Development are likely and no mitigation measures are considered to be required post-completion.

16.7 RESIDUAL EFFECTS

Construction Stage

- 16.7.1 The design and installation of the new utility infrastructure required to support the Proposed Development will consider the requirement for suitable and sustainable resources to be made available for the ongoing use of the dwellings and all development uses, including commercial units and schools, to be constructed on-site.
- 16.7.2 The completion of all required network reconfiguration works during construction for any utility assets affected by the proposed on and off-site construction works will ensure no residual effects associated with the construction stage.
- 16.7.3 With the implementation of the mitigation measures detailed in the previous section, it can be concluded that the residual effects associated with the construction stage will be **Negligible**.

Post-Completion Stage

- 16.7.4 The completion of required network reinforcement works during construction stage will ensure there are no residual effects once the construction works are complete.

Summary of Effects

- 16.7.5 The effects identified are summarised in **Table 16.7** below:

Table 16.7 - Summary of Effects

Potential Effect	Significance (pre-mitigation)	Mitigation Measure	Significance of residual effect
Construction Stage			
Construction impact on utility assets	Minor adverse	Mitigation measures as set out in previous section	Negligible
Post-Completion Stage			
Impact of additional demand on utility networks	Negligible	None required based on completion of required network reinforcement works during construction stage	Negligible

16.8 CUMULATIVE EFFECTS

16.8.1 No cumulative effects have been identified.

16.8.2 Should any utility demands required to facilitate the development of any adjacent sites (which may include future residential or commercial end users), it is assumed that the utility demand requirements will be included in the network reinforcement and new supply strategies as assessed by the utility companies, in accordance with industry standard good practice and statutory controls as those schemes progress.

16.9 REFERENCE LIST

Ministry of Housing, Communities and Local Government, The Building Regulations Part G: Sanitation, hot water safety and water efficiency (2010)

Office for National Statistics, Families and Households in the UK (2022)

Glenn Hawkins, Rules of Thumb: Guidelines for Building Services' (5th Edition) (2011)