

Land North of Tuttles Lane East

Utilities Assessment

Welbeck Strategic Land III Ltd.

Project reference: 60562750

21 March 2018

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	February 2018	Draft for review	АМ	A Marshall	Principal Engineer
2	March 2018	First Issue	AM	A Marshall	Principal Engineer
3	March 2018	Updated Masterplan	AM	A Marshall	Principal Engineer

Distribution List

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1. Introduction

1.1 Background

AECOM have been appointed by Welbeck Strategic Land III Limited to undertake a desktop Utilities Assessment for a site known as the Land North of Tuttles Lane East (reference GNLP006).

The site was previously submitted to the call for sites consultation for the Greater Norwich Local Plan (GNLP) in July 2016. Following submission, the site was reviewed as part of the Housing and Economic Land Availability Assessment (HELAA) and considered to be 'suitable'.

As part of the consultation process which follows the HELAA, further evidence regarding the site is being provided to demonstrate the site's suitability to accommodate residential development which would form part of the GNLP housing supply.

1.2 Scope

The aim of this report is to establish if the proposed development quantum is likely to be limited by the capacity available in nearby utility networks and how any new capacity might be provided if necessary. This includes:

- A review of utility record drawings (electricity, gas, potable water, public foul and surface water sewers and telecommunications) and identify any existing constraints there may be on the proposed masterplan in respect of the location of existing plant and apparatus within the development boundary;
- Production of a utility services constraints plan, based on information obtained from utility record drawings, indicating the presence of existing services within and adjacent to the site;
- Identify the existing utilities potentially affected by the proposed development, including guidance on likely diversions, any relevant easement widths, and no build zone requirements.
- A desktop review of information from recent applications and available information from service providers to establish whether any offsite reinforcement and/or upgrades are likely to be required to support the proposed development;
- Advise the client of the need for any specialist surveys or studies (e.g. network modelling requirements).

A high level desk top study and review of existing utility services information has been completed, to identify constraints to the proposed development and to establish the need for any diversions or protection measures. This has been supplemented with limited visual inspection across small section of the site adjacent to the public highway.

Capacity enquiries have not been submitted to the various utility providers at this stage.

2. Existing Site and Proposed Development

2.1 Site Location and Description

The site is located on the northern edge of Wymondham, approximately 1.75km north-east of the town-centre at Grid Reference TG 11773 03117.

The site is bounded by Tuttles Lane East to the south and by Melton Road to the west, with a small parcel of land further west beyond Melton Road. To the east the site is bounded by Wymondham Rugby Club, various commercial and residential premises at Downham Grove, and further agricultural land.

Wymondham Garden Centre and Grove Farm Cottages are located within the site at the south-east corner, with frontage and access to Tuttles Lane East. Mayes Farm and associated buildings are located adjacent the site to the north.

The site extends to circa 55 hectares, predominantly comprising open farmland in agricultural use. There is a small area of Woodland to the north of Homestead Nursery at the south-east corner of the site, and an existing public footpath which crosses the western corner of the site between Tuttles Lane East and Melton Road on a north-south alignment.

OS contour mapping shows the site to be generally falling from south to north, from a high point of around 45m AOD adjacent to Tuttles Lane East to a low point around 35m AOD at the northern boundary adjacent to Mayes Farm.

A small drainage channel crosses the north-east corner of the site and is understood to convey flows to the north and west towards the River Tiffey.

A site location plan is provided at Appendix A and is illustrated on Figure 1 below.

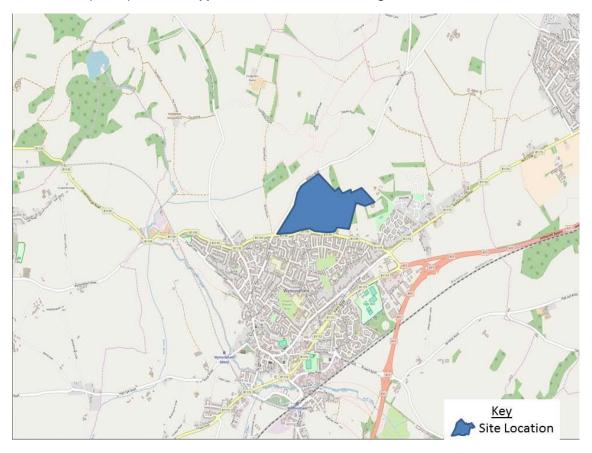


Figure 1 Site Location Plan

2.2 Development Proposals

Initial strategic masterplans for the site has been developed by Bidwells Urban Design Studio, refer to drawing UDS417666-A3-0102 attached at **Appendix B**.

It is proposed that the development would provide a sustainable urban extension at the northern edge of Wymondham, comprising residential development, a primary school, community uses, infrastructure and public open space.

2.3 Demand loads

An initial assessment of anticipated utility loads has been undertaken based upon the following assumed scale of development:

- 1,000 dwellings
- 1 form of entry primary school (approx. 1,350m²)
- local centre (400m² retail use).

Refer to demand estimation summary attached at Appendix C.

It is likely that the development quantum will fluctuate as the masterplan is developed, but this is unlikely to have any significant overall impact on the strategic delivery of new utility apparatus.

Table 1. Calculated utility demands

Utility	Anticipated peak load	Other load criteria
Gas	30,260 KWh	24,570 MWh (annual)
Electric	-	1,670 kW (diversified demand)
Water	6 l/s (Average)	363,790 l/d
Foul	37.6 l/s	26.4 l/s (based on potable water demand)

3. Utilities Assessment

This section provides a summary of existing utilities apparatus within the site and the immediate surrounds, as well as a summary of potential opportunities and constraints for servicing the proposed development.

Reference should be made to the Utilities Constraints Plan, attached at **Appendix D**, which illustrates the existing position of apparatus identified by this study (AECOM drawing number 60562750-SKE-C-0001).

3.1 Gas

Asset records provided by Cadent Gas indicate that there is no existing gas apparatus within the bounds of the site.

There is a network of low pressure (LP) gas mains serving the existing residential development to the south of Tuttles Lane, which includes a 180mm polyethylene LP main which runs across the site frontage to Tuttles Lane between Finderne Drive and Melton Road.

This network is served from a medium pressure main located on the B1172 Norwich Road, approximately 900m from the site.

3.1.1 Network Modifications

There is no gas apparatus within the bounds of the site that would require diversion to accommodate the development proposals. Minor lowering or protection measures to the LP main at the site frontage may be required to enable site access to Tuttles Lane East.

3.1.2 Network Capacity

It is estimated that the proposed development will generate an approximate peak demand load of 30,260 KWh.

The Norfolk Infrastructure Delivery Plan 2017 - 2027 identifies significant infrastructure projects required to deliver growth in the region. The report does not identify any power supply reinforcement or upgrade works in the Wymondham area, which is identified as a key housing growth site for 2,501 - 6,000 dwellings.

Following a desktop review, we have not identified any reference to capacity issues in the gas network in Wymondham that would impact on viability for the proposed development. A formal enquiry to Cadent Gas will be required at the appropriate stage to confirm a point of connection to their existing network.

3.1.3 New Infrastructure

A new LP distribution network within the development will be required. This will likely be served by a new MP connection within Tuttles Lane East of approximately 900m in length to connect with existing MP apparatus in B1172 Norwich Road.

3.1.4 Financial Considerations

The Gas industry is fully deregulated and alternative Public Gas Transporters offer competition to the incumbent supplier. The following options are available:

- Alternative quotations from various Public Gas Transporters to service the site can be sought offering financial benefits to the Developer.
- There is a financial benefit opportunity for the Developer to self-lay and obtain adoption by a Public Gas Transporter.

All new gas infrastructure from the PRS (if applicable) or connection point to the metered supply will generally fall under the "contestable" heading allowing self-lay as an optional procurement route. All modifications and diversions of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider.

3.2 Electricity

3.2.1 Exiting Infrastructure

Asset records provided by UK Power Networks (UKPN) indicate the following electricity distribution apparatus within the site and in the immediate vicinity:

- 11kV overhead line crossing the site on a north-south alignment from Grove Farm Cottages;
- 11kV overhead line crossing the site at the north-west corner on an east-west alignment;
- An underground LV cable is present in the farm track adjacent to Tuttles Lane East; and,
- A network of HV and LV services to the existing residential development to the south of Tuttles Lane.

3.2.2 Network Modifications

Diversion of the existing 11kV overhead lines crossing the site is likely to be required to accommodate development of the site. The affected routes are approximately 475m and 225m in length.

Further works may be required to divert or lower the existing LV cable in the farm track adjacent to Tuttles Lane East if affected by site access works.

3.2.3 Network Capacity

It is estimated that the proposed development will generate an approximate diversified demand of 1,670 KW.

The primary 33kV substation for Wymondham is located off Lady's Lane approximately 2km south-west of the site. The UKPN Norwich Regional Development Plan (2014) identifies a scheme to replace the under-rated sections of the 33kV circuit at Wymondham. The report states that this work was either in progress or due to be completed prior to 2015.

It is also understood that a new primary intake substation has been constructed off Silfield Road to the south of Wymondham to serve permitted development at South Wymondham.

The Norfolk Infrastructure Delivery Plan 2017 - 2027 identifies significant infrastructure projects required to deliver growth in the region. The report does not identify any power supply reinforcement or upgrade works in the Wymondham area, which is identified as a key housing growth site for 2,501 - 6,000 dwellings.

Following a desktop review, we have not identified any reference to electrical network capacity issues in Wymondham that would impact on viability for the proposed development.

3.2.4 New Infrastructure

It is anticipated that the following infrastructure would be required:

- Two new 11kV supplies to the site;
- Four new 11kV substations within the site.

Capacity assessment by UKPN would be required to confirm any capacity within the existing 11kV overhead lines crossing the site to serve the proposed development.

3.2.5 Legal Tenure

Where electricity lines are to be installed in private land UK Power Networks will require an easement in perpetuity for its electric lines, and in the case of electrical plant the freehold interest in the substation site, on UK Power Network terms, without charge and before any work commences.

3.2.6 Financial Considerations

The estimated electricity demand proposed for this development may be of sufficient scale to encourage an "out of area" licensed Distribution Network Operator (DNO) to establish an embedded system within the incumbent's licensed area and alternative quotations could be procured.

All new electricity infrastructure from the point of connection to the existing network to the point of metered supply will generally fall under the "contestable" heading allowing "self-lay" as an optional procurement route.

All modifications and diversions of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider.

Generally, building and civils work associated with the provision of new supplies is considered to be a contestable element in terms of both new and diversionary work. A detailed review of the electricity scope of work offered by UKPN should be undertaken once a formal connection offer and quotation has been received.

3.3 Water Supply

3.3.1 Exiting Infrastructure

Anglian Water records indicate the presence of an existing 10 inch (250mm) asbestos cement water main at the site frontage to Tuttles Lane East. Records indicate that this main is located in the southern verge to the east of Hewitts Lane, before crossing the carriageway to run in the northern verge.

Records indicate that the 10 inch main runs beneath the carriageway in the vicinity of the junction with Lime Tree Avenue

A 3 inch (75mm) cast iron main is present adjacent Melton Road which appears to provide supply to Mayes Farm to the north of the site.

3.3.2 Network Modifications

Confirmation of position and depth of the existing water mains in Tuttles Lane East and Melton Road will be required to confirm is these assets would be affected by site access works.

3.3.3 Network Capacity

Based on standard water consumption rates, it is estimated that the proposed development will generate an average daily demand of 363,790 l/d, equating to an average demand of 6 l/s.

Objective 1 of the JCS states that 'Water efficiency will be a priority in both new and existing development', while Policy 3 requires new housing development of over 500 dwellings to reach Code for Sustainable Homes level 6. This would require measures to be implemented to achieve average water consumption of 80 litres per person per day (It should be noted that the Code for Sustainable Homes has now been withdrawn, aside from the management of legacy cases, and has been replaced by new national technical standards).

Applying a reduced demand of 80 litres per person per day, it is estimated that the proposed development will generate an average daily demand of 195,790l/d, equating to an average demand of 3 l/s.

Anglian Water published its Water Resources Management Plan (WRMP) in 2015 which covers the period to 2040. Wymondham is located in the AW Norfolk rural resource zone, which is supplied from groundwater abstractions from the underlying chalk aquifer. The WRMP states that no supply deficits are forecast on the Norfolk rural resource zone.

The Norfolk Infrastructure Delivery Plan 2017 – 2027 identifies a requirement for network improvements in order to accommodate the 4,400 dwellings planned for Wymondham. Funding for such improvements is yet to be confirmed and as such contributions to any associated improvements may be required through a zonal charge as set out in the AW Developer Charging Arrangements.

It is anticipated that the development could be supplied from the existing 10 inch (250mm) water main at the site frontage to Tuttles Lane East, subject to confirmation by Anglian Water.

3.3.4 New Infrastructure

In addition to the mains contribution costs, connection charges would be payable as follows (AW, 2016-2017 Customer Charges Scheme):

- Connection Charge £433 per plot
- Water Infrastructure £354 per plot
- Sewerage Infrastructure £354 per plot

3.3.5 Financial Considerations

The client (developer) will be required to submit a formal requisition to Anglian Water for potable water supply, under the terms of Section 41 of the Water Industry Act.

All modifications and diversion of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider. Generally, builder's work in association is considered to be a contestable element of both new and diversionary work.

Provision of the offsite works is contestable as a self-lay option.

3.4 Telecoms

3.4.1 Exiting Infrastructure

Records obtained from BT Openreach confirm the presence of existing overhead and below ground telecoms apparatus servicing existing residential and commercial premises to the south, east and north of the site. There is also a ducted route present adjacent to the existing farm track adjacent to Tuttles Lane East.

In addition to the above, Mast Data have confirmed the presence of an operational mobile phone mast located to the north of Wymondham Garden Centre.

3.4.2 Network Modifications

Minor works to divert or lower the existing duct in the farm track adjacent to Tuttles Lane East may be required if affected by site access works.

The requirement to relocate the existing mobile phone mast has not been confirmed at this stage. The existing location of the mast within the site is subject to a lease with the landowners. The mast could be retained in its current position or relocated to an area of open space within the site.

3.5 Foul Drainage

3.5.1 Existing Infrastructure

Anglian Water (AW) records confirm the presence of an existing gravity foul sewer within the site at the frontage to Tuttles Lane East. The sewer conveys flows to the west, and comprises 300mm concrete pipework, increasing to 600mm at AW manhole (MH) 5803. The sewer receives flows from 2 no. foul rising mains located in Tuttles Lane to the east of Grove Farm.

There is also a 225mm gravity foul sewer in Tuttles Lane that collects flows from the existing residential development to the south. The sewer is located in the southern verge, crossing to the north at the junction with Hewitts Lane.

There are 2 connections shown between this sewer and the larger 600mm sewer, one within the south-west corner of the site and a second to the west of the junction with Melton Road.

3.5.2 Network Modifications

Cover and invert levels for the existing 300 / 600mm sewer within the site are not provided on Anglian Water asset records and would need to be confirmed by survey.

An easement will need to be maintained and taken into consideration in developing the site layout in the vicinity of the sewer. Exact details of the easement will be subject to agreement with AW following confirmation of the depth of the sewer. A minimum clearance of 3m either side of the centre line to any buildings/structures is likely to apply.

The sewer is likely to be at sufficient depth so as not to be impacted by site access works. This would need to be confirmed by survey and the site access locations coordination with existing MH positions.

3.5.3 Network Capacity

The site falls within the catchment of the Wymondham Water Recycling Centre, located off Chapel Lane approximately 1.75Km to the west of the site. This treatment works discharges to the River Tiffey.

The Greater Norwich Development Board Stage 2b Water Cycle Study (2010) identified that the Wymondham Water Recycling Centre was operating with an approximate capacity for 4600 dwellings, based on 2008 measured and 2009 estimated dry weather flows (DWF).

Including anticipated growth to 2026, comprising 2750 dwellings and 4605 jobs, the study identifies residual headroom to accommodate additional dwellings within the catchment for the treatment works.

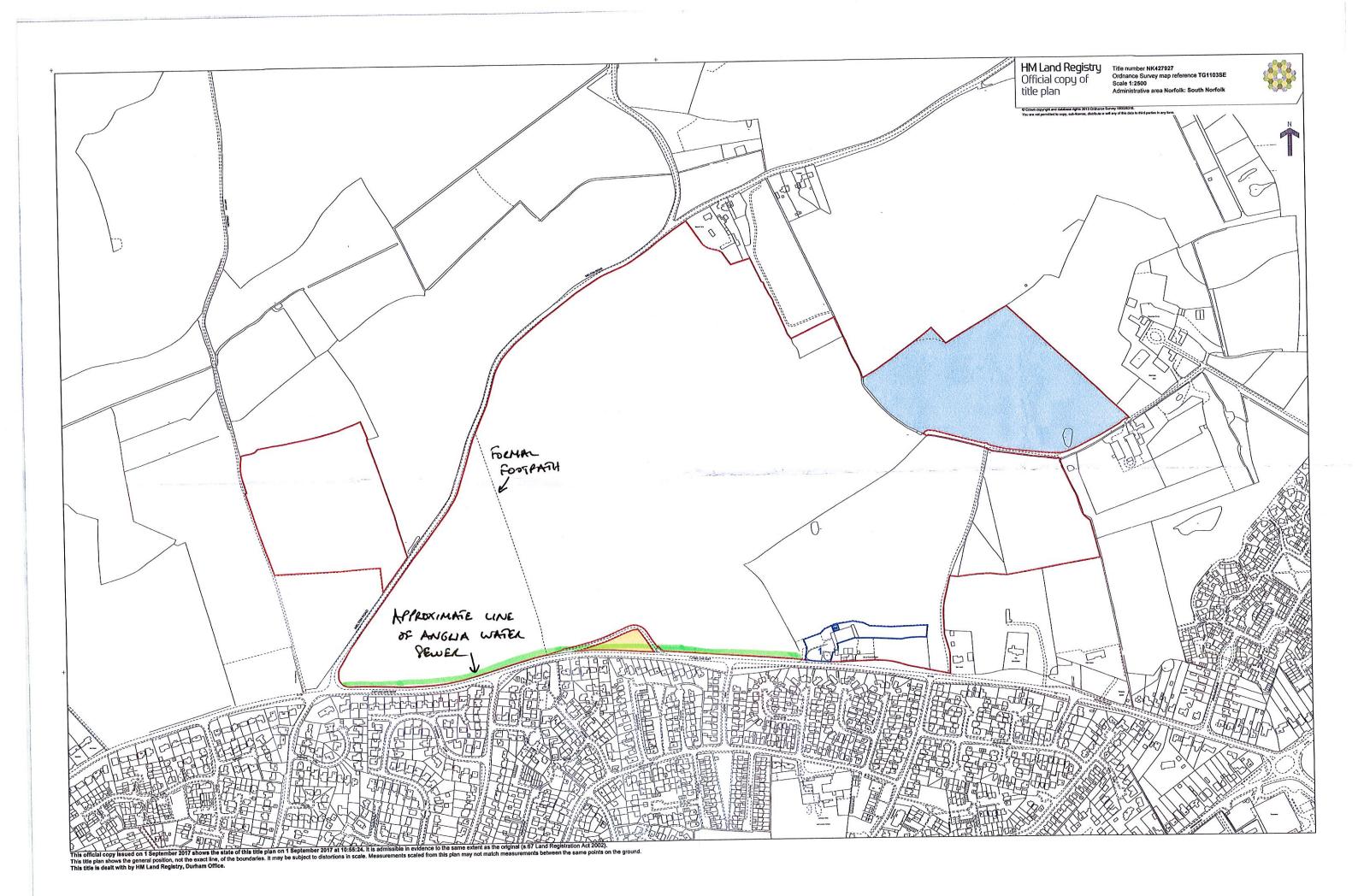
It is anticipated that the existing 600mm foul sewer located within the site at the frontage to Tuttles Lane could accommodate foul flows from the development.

Following a desktop review, we have not identified any reference to network capacity issues in Wymondham that would impact on viability for the proposed development. This would be subject to a network modelling exercise undertaken as part of a pre-development enquiry by Anglian Water.

3.5.4 New Infrastructure

Due to site topography it is anticipated that on-site foul pumping station(s) will be required, located at the northern and western corners of the site. Flows would be conveyed via rising mains within the site to the existing 600mm sewer at Tuttles Lane.

Appendix A Site Location



Appendix B Strategic Masterplan





Appendix C Initial Loading Estimates

UTILITY SERVICES DEMAND ESTIMATIONS

PROJECT: JOB NO: SHEET NO: 60562750 MADE BY: 1 of 1 CHECKED BY: DATE: Tuttles Lane, Wymondham 22-Feb-18 A. Marshall T. Hydes

TOTAL SITE AREA =

GROSS EMPLOYMENT AREA @

Land Use Tipe on Occupancy

Land Ose <u>inps on Occupancy</u>						
	Use Class	Number	% Area	Area, ft ²	Area, m ²	Occupancy m ² /Person
Residentia		1000		2.4		
B1 Office						
B2 Genera	l industrial					
B8 Wareho	ouse					
Other,	Primary School	210		18,000	1,345	
Other,	Commercial			4,000	400	25
Other,						
	TOTAL	1000		22,000	1,745	

ELECTRICITY Tins on Electricity Loadings

LLLCTRIC	11 1	TIPS UIT	LICCHICITY L	uauiiiys	
		hourly	Demand*	Diversity	Diversified
Type	Dei	mand	kW	(No Diversity =	Demand*
				1.0)	kW
B1		W/m²			
ы		VV/111			
B2**		W/m ²			
D2		**////			
B8		W/m ²			
-					
Other	0.5	kW/pupil	105.0	1.00	105
Other	160	W/m ²	64.0	1.00	64
		_			
Other		W/m ²			
Residential	1.5	kW	1500.0	1.00	1500
	Total				1,669
	IUlai				1,009

Peak Hourly Demand	** Non-process.

GAS Tins on Gas Loadings

GAG	TIPS OIL G	is Luaulings			
	Peak	hourly	Peak	Diversity	Annual**
Type	Loa	ding	Demand	(No Diversity	Demand
		•	KWh	= 1.0)	MWh
B1		Whr/m ²			
B2		Whr/m ²			
		-			
B8		Whr/m ²			
Other	150	Whr/m ²	202	0.5	247
Other	150	Whr/m ²	60	0.5	74
Otrici	150	***************************************	00	0.5	, -
Other		Whr/m ²			
Other		VVIII/111			
Residential					
(Diversified)	30	kWhr	30000	0.33	24255
(=:::::::::::)				5.55	
		Total	30,262	ī I	24,576
		IUlai	30,202	<u>l</u>	24,37

^{**} Assume 245 days/year and 10 h days for employment Assume 245 days/year and 10 h days for residential

DOTABLE WATER Tipe on Water Supply

POTABLE WATER		on water St		
Type	Supply	Occupancy	Demand	Peak Demand
		m ² /Person	litres/day	litres/s**
	litres/person/day			
B1			-	
B2**			-	
B8			-	
Other	15		3,150	0.09
Other	40	25	640	0.02
Other			_	
Other				
Residential	150	2.4	360,000	5.56
residential	130	persons per	555,000	5.50
	1	dwelling		

** Non-process. ** Assume 10 h days for employment Assume 18 h days for residential

363,790

Total

OUL WATER DISCHARGE	Tips on Foul Water	r Drainage

TOOL WATER DIOONAR			i oui watci				
Type	Discharge	Discharge	Occupancy	Discharge	Peak	Foul Flows Bas	
	l/person/day	l/s/ha (DWF)	m ² /Person	(DWF) litres/day	Discharge	Water Deman	
	(DWF)				litres/s**	over 24	I h day
						i	
						95% Potable	Peak
						Water	Discharge
						Demand	litres/s**
						litres/s	
						(DWF)	
B1				_		ł	
ы		-		-		ì	
						i	
B2**	-		-	-		l	
						!	
B8	_		_	_		!	
						:	
Other	50			10,500	0.9	0.1	0.2
Other	50			10,500	0.9	0.1	0.2
						İ	
Other	50			800	0.1	0.0	0.1
						ļ.	
Other						!	
						!	
Residential	200		2.4	400 000	36.7	4.0	26.1
Residential	200		2.4 persons per	480,000	30.7	4.0	20.1
			dwelling			i	
			amount				

491,300 37.6 4.1 26.4 Total NB. INDIVIDUAL JUDGEMENT IS STILL REQUIRED TO REVIEW/ASSESS APPROPRIATE DESIGN FLOWS



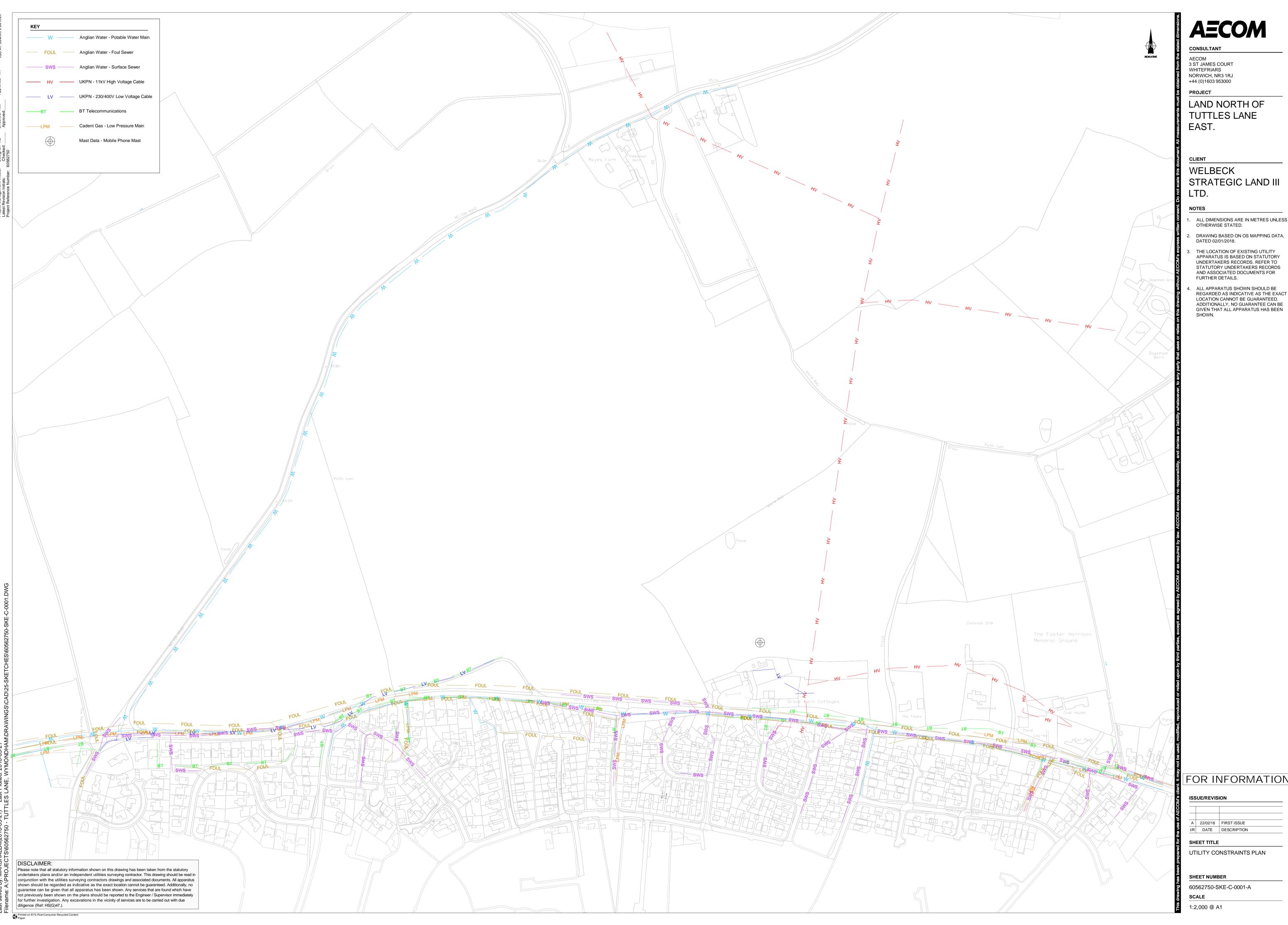
SUMMARY OF CALCULATIONS GAS, PEAK HOURLY GAS, ANNUAL 30,262 kWh 24,576 MWh ELECTRICITY 1,669 kW POTABLE WATER, DAILY POTABLE WATER, PEAK 363,790 litres/day (363. m3/day) 6 litres/sec FOUL WATER, 491,300 litres/day (491.:m3/day) FOUL WATER, PEAK 37.6 litres/sec

To Loadings for primary school based on assumed 1FE = 30 pupils x 7 years = 210 pupils total (including pre-school). 1345m2 gross floor area for Primary School based on DfE Area guidelines for mainstream schools. Gross area = 400 + 4.5*N.

Note: Peak discharges set out above relate to gravity sewer design and may require adjustment to reflect the use of a pumping station or treatment works

^{**} Assumes 10 h days and 3 x DWF for employment Assume 24 h days and 6 x DWF + 10% for residential

Appendix D Utility Constraints Plan



LAND NORTH OF TUTTLES LANE

WELBECK STRATEGIC LAND III

- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
- 3. THE LOCATION OF EXISTING UTILITY APPARATUS IS BASED ON STATUTORY UNDERTAKERS RECORDS. REFER TO STATUTORY UNDERTAKERS RECORDS AND ASSOCIATED DOCUMENTS FOR FURTHER DETAILS.
- ALL APPARATUS SHOWN SHOULD BE REGARDED AS INDICATIVE AS THE EXACT

LOCATION CANNOT BE GUARANTEED.
ADDITIONALLY, NO GUARANTEE CAN BE
GIVEN THAT ALL APPARATUS HAS BEEN

FOR INFORMATION

A 22/02/18 FIRST ISSUE

UTILITY CONSTRAINTS PLAN

60562750-SKE-C-0001-A