Gilston Park Estate

North of Harlow

9 - Utilities Strategy

places for people

May 2014

AECOM Water Places for People December 2013

GILSTON PARK ESTATE

Utilities Strategy

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Approved by:

Foul Drainage and Sewage Treatment Strategy

Rev No	Comments	Checked by	Approved by	Date
Rev1	Comments incorporated	BDF	BU	14/05/2014
Rev2	Comments incorporated	BDF	BU	21/05/2014

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Table of Contents

Capabilities on project:
Water

Introduction

This note has been prepared to collate, update and inform the status of discussions with the various utilities organisations for the Gilston Park Estate development.

Previous Reports
A utilities capacity report was prepared in early 2002 by AECOM legacy company FaberMaunsell based on an earlier masterplan. The number of dwellings considered in this earlier report varied between 7,000 and 10,000. Discussions with utility companies during 2005 were on the basis of a 25,000 dwelling development, with phase 1 up to 2021 comprising around 12,500 dwellings.

At this stage it has been assumed that around 8630 units may be delivered at the Gilston Park Estate by 2031 with first occupation by 2014. It has also been assumed that residential build-out will be no more than 650 units per year.

The development will also comprise commercial, retail and employment space appropriate for a sustainable mixed use community.

Other Developments
Besides the Gilston Park Estate proposal, additional growth is anticipated in the East Herts/Harlow area to satisfy intended needs. The timing of such schemes is relevant as they may utilise whatever spare capacity there is in the local utilities infrastructure. Therefore, whilst there may be a certain level of spare capacity in the infrastructure today, this may be used up to a greater or lesser extent by other developments before it can be claimed for Gilston Park Estate. Therefore the assessments made by utility providers have been based on the present day scenario and assuming that no other developments come forward.

Range of Utilities
Sketch SK004 in Appendix B illustrates the range of services that will be installed in the highway strip around the Gilston Park Estate. These represent the local distributor network of services and so will effectively be the minimum number of services in the ground (with the exception of NTL (Virgin Media). There will also be main trunk systems feeding these local systems (e.g. larger diameter potable water pipes).

Capabilities on project:
Water

Current Project Details

Scope –
Principally residential, Gilston Park Estate will also include some local retail development and land dedicated to educational, recreational and amenity use. Within the development area there are a few small isolated parcels of existing residential property in other ownerships which will remain as at present and not be redeveloped. The development will consist of approximately 8630 dwellings, commercial, local retail and industrial sites, delivered as a series of connected villages.

Capabilities on project:
Water

Water Supply

Work carried out to date at this stage confirms that it will be possible to provide a Water supply solution.

EXISTING APPARATUS

Affinity Water confirmed that the results of the previous study carried out in 2005 by Violia for 25,000 houses were no longer current and the report was updated. Affinity Water carried out a revised study during 2013 to assess the off-site upgrade to their infrastructure required to support the Gilston Park Estate proposal based on a version of the illustrative masterplan that included circa 8630 dwellings. The following table highlights the indicative build out schedule that has been assumed for the purposes of the modelling assessment carried out:

Year	Number of Units	Completions per year	Items
2014 / 2015	0	0	Preparation works, road, utilities & drainage
2016	523	523	Village, place of worship, primary & secondary schools
2017	1,046	523	Village, nursery school, community centre & crèche
2018	1.569	523	Village, primary care centre, primary school
2019	2.092	523	Village
2020	2.616	524	Village, eastern crossing, primary school
2021	3,221	605	Village, secondary school, leisure centre
2022	3,826	605	Village, secondary school, nursery centre, crèche
2023	4,431	605	Village
2024	5,036	605	Primary & secondary schools, village, Stort crossing
2025	5.641	605	Primary school, nursery, community centre, village
2026	6,163	522	Village, primary school, nursery, community centre, crèche
2027	6,684	521	Village
2028	7,332	648	Primary school, health centre, police station, fire station
2029	7.980	648	Village, Primary & secondary schools, library
2030	8,628	648	Village, primary school, nursery, community centre, crèche

The total consumption for the proposed Gilston Park Estate proposal based on an assumed 8630 dwellings and associated local retail and employment, has been estimated at 6.47Ml/day.

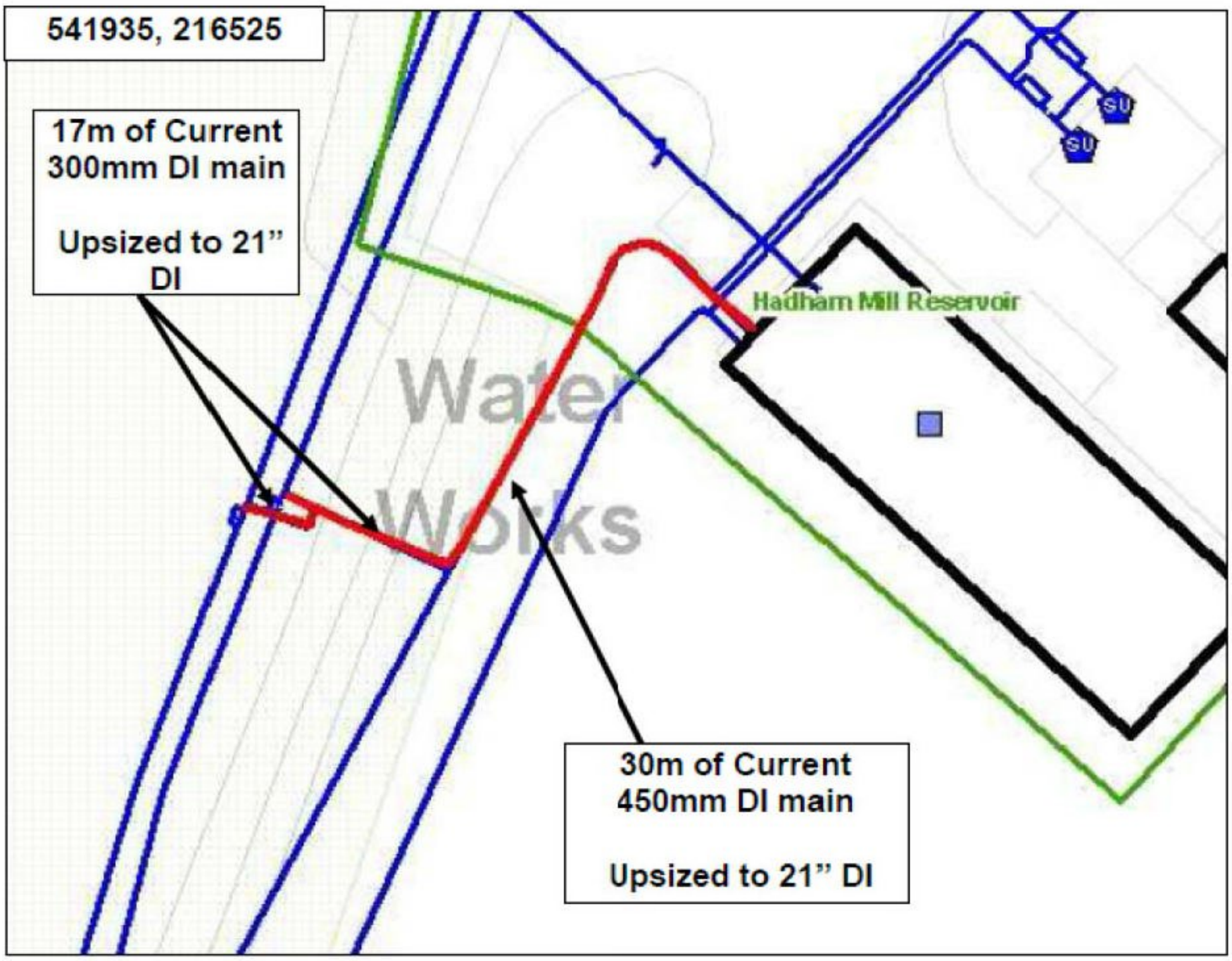
Capabilities on project:
Water

The analysis in the Affinity Water report has concluded that there is little resource available within the Rye Hill zone due to abstraction licences and constraints with abstractions. Historically, this was an option for providing supply to the proposed development area, but this resource is no longer available. Therefore the required supply to the development should be supported by importing additional water from the Bulls Green gravity feed. However it was found that the existing network between Bulls Green and Sacombe is already operating at maximum transfer capacity. Therefore improvements to the network are required in order to meet the additional demand required for the development. It's recommended that the transfer capacity is increased via the installation of a new 6km main, parallel to the existing 27" main between Bulls Green and Sacombe. This will need to be constructed within 12 months of construction of the development commencing.

The analysis has also concluded that if the complete demand required for the development is supported off the parallel 18" & 21" mains from Hadham Mill to Rye Hill Reservoir, then the required transfer in the network would increase by 20%. Therefore although the development can be supported off this supply there would be no additional capacity available within the network during a reduction in output at Roydon or Redricks Lane sources during a period of sustained hot weather. As a result there is a need for a new 500mm diameter primary connection to the development directly from Hadham Mill (approximately 3.3km), so that the transfer capacity is not reduced. While construction is commenced to ensure there is adequate resilience in the network, the Gilston Park Estate development can be supplied directly off the 21" main that comes from the existing Rye Hill reservoir.

EARLY PHASE CONNECTION

Prior to the first Gilston Park Estate occupancy, it is recommended that approximately 47m of main is upsized between the Hadham Mill boosters and the 18" & 21" trunk main.



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TIMESCALE

Capabilities on project:
Water

The Gilston Park Estate development has been divided into 7 indicative phases. The analysis has considered the water supply and distribution system requirements as the development increases in size by approximately 600 properties per year.

COSTS

The rules on developer funding change from time to time and are likely to change again soon, but at present the developer's contribution is as follows:

Infrastructure	Developer contribution
Off-site wider water supply system (water treatment works/reservoirs)	0%
Off-site improvements required to the Affinity Water transmission system	100%
On-site trunk main system	100%
On-site local distribution system	Around 60%

FURTHER WORK

- Easement details for onsite mains to be confirmed at detailed design stage;
- Affinity Water will need to carry out further work on a detailed pressure network model to confirm the details and demand projections of the final design and to tie up with the latest road layout on site.

The Affinity Water proposal is for the sole purpose of the Gilston Park Estate and therefore imposes no restriction to being able to supply the site with water and consequently there will be no implications to other growth locations that may come forward in the wider area.

Capabilities on project:
Water

Gas Supply

Work carried out to date at this stage confirms that it will be possible to provide a Gas supply solution.

National Grid is responsible for the existing plant and supplies local to the site.

EXISTING PLANT

National Grid is responsible for maintaining the gas distribution system in the Harlow area. An intermediate pressure (IP) main occurs to the east of the site that transports gas from Sawbridgeworth to the northeast part of Harlow. A high pressure main (HP) has a junction with the IP main at Redricks Lane, and is located across the north of the proposed development.

PROPOSED DEMAND

National Grid has not confirmed the exact proposed demand at this stage and proposals are based upon the likely estimated demand. Detailed demand calculations will be carried out at the Detailed Planning stage.

PROPOSED SITE NETWORK

To support the anticipated load and plot distribution, a number of gas governor houses may need to be established across the site as construction phasing occurs. The proposed gas supply arrangements are as follows:

1. A gas governor station on the Intermediate pressure (IP) main at Redricks Lane to reduce the gas pressure to medium pressure (MP). MP mains will be laid around the development in order to supply the villages. Local gas governors will be required for each village to reduce pressure from MP to low pressure (LP) for feed to houses. Local gas governors will either be in the form of GRP enclosures or if planning/hard landscaping requires, brick built.

The primary site distribution main will follow the strategic road system. A ring main around the development may be beneficial but is not a requirement.

DIVERSIONS AND EASEMENTS

The IP main from Sawbridgeworth down into northeast Harlow is approximately 1.5 km east of the proposed development boundary but linked to the proposed development by Redricks Lane. It is likely that extension of this IP main will be under Redricks Lane to link with the strategic road system near Pole Hole Farm

The easement widths are to be confirmed at the Detailed Planning stage.

Previous discussions with Transco's high pressure pipeline representative, Ian Bates took place in 2005. These discussions established the base parameters for development adjacent to high-pressure gas mains. Subsequent discussions had been held with the Health and Safety Executive HSE in February 2013, to confirm the parameters.

The Planning Authority (PA) has a statutory duty to consult with HSE on the GPE development if the location of the proposed dwellings, schools, nurseries etc. on the GPE site are each located within the following distances from the centre line of the gas pipe:

- 250mm dia pipeline is 36m
- 100mm dia is 15m.

As the proposed development is indicated as being set outside the gas existing easements, as shown in Appendix A, there is unlikely to be a need to consult with the HSE.

SITE SPECIFIC

Capabilities on project:
Water

The Intermediate pressure main forms a junction with the HP main at Redricks Lane and heads south to cross the river Stort to feed into North Harlow. The IP main is 12" steel and has a proximity distance of 3m each side of the pipe.

OFF SITE REINFORCEMENT

National Grid do not anticipate off-site reinforcement.

LOCATION OF SUPPLY

From the east via the Intermediate pressure main.

TIMESCALE

The time scale to provide the various items is subject to ongoing assessment.

Previous information given in 2005 indicated the following:

A design study for diversions would be in the order 2 weeks.
A budget cost provided thereafter in 6 weeks and
A lead–in time of 26 weeks to start the works. The work would only be carried out between the months of May and September, when the demand is lower.

6 months would be the indicative period to implement the additional supply mains.

COSTS AND PROCUREMENT

Places for People will have to pay for the main and local pipe feeder systems on the site and governor stations that are required.

The current understanding of Developer contributions to cost is as follows:

Infrastructure	Developer contribution
Off-site wider system upgrades	0%
Off-site improvements required to the Transco transmission system	100%
On-site main feeder system (governor stations)	100%
On-site local gas distribution system	100%

MISCELLANEOUS

- Gas supply from the Intermediate Pressure main at Redricks Lane will be reduced to Medium Pressure by a gas governor before it is supplied to the Gilston Park Development.
- The governor station to reduce the IP gas supply to medium or low pressure will occupy an area of land approximately 10m by 10m.
- Gas supply to the site will be via a medium pressure supply main.
- Gas governors will be required for each village to reduce the pressure from the expected medium pressure to low pressure. The current land take for a gas governor is 5x5m.

FURTHER WORK

- Easement details for detailed layouts will be confirmed at the detailed planning stage..
- National Grid will need to carry out work on a detailed pressure network model to confirm the details of the final design and to tie up with the proposed development road layouts. This will be done at the detailed planning stage.
- Diversion details of any existing gas network assets within the development boundary will be required at the detailed planning stage if relevant.

Capabilities on project:
Water

Telecommunications

Work carried out to date at this stage confirms that it will be possible to provide a telecoms solution.

Telecoms – BT
Point of contact – Paul Amass (01394 693212)
Meetings to date: None

The following text is unchanged from the 2010 reports. From experience on other recent projects it is felt the statements below are likely to hold true for the current situation.

From January 2005:

We have made contact with BT and advised them of the nature of the development and of the timescale. They have indicated that whilst the proposed Gilston Park Estate is a large development and will have a major impact on their system, they do not commence formal liaison until a planning application has been submitted. They will then carry out the necessary reinforcement to their network to support the development.

BT pays for most of the infrastructure requirements for new developments. They deliver plastic ducts to site free of charge and the developer installs them, and the necessary pits, in the ground himself to a BT design. Once the pits and ducts are installed, BT will then pull cables. The costs are as follows:

Infrastructure	Developer contribution
Off-site wider system upgrades	0%
Off-site improvements required to the network	0%
On-site main feeder system	Ducts free, dev. pays for installing them and for pits. Cables pulled and provided free by BT
On-site local distribution system	Ducts free, dev. pays for installing them and for pits. Cables pulled and provided free by BT

Furthermore BT offer a subsidy to the developer around £80 per flat and £135 per house when the house is connected to the BT system.

Telecoms – Previously NTL now Virgin Media
Point of Contact – Phil Clapperton, Development Manager for SE England
Meetings to date: 14 January 2005 and 3 February 2005. Further telephone conversation February 2013.

AECOM have currently been unable to confirm a more recent point of contact to discuss technical matters concerning the proposed development. The following assumes the principles previously discussed with NTL hold true for Virgin Media also.

EXISTING PLANT

It is believed Virgin Media (VM) has an existing main cable trunk route in the A1184 road to the East of the development site that is part of a sub-loop fed directly by a Head End (satellite receiver) in the Bishop Stortford area. This is presently awaiting confirmation from VM.

DIVERSIONS

There is no other VM plant that will be affected by the site development.

OFF SITE REINFORCEMENT

Previous discussions with NTL confirmed that subject to final internal discussions, NTL would likely bear the cost of any off-site reinforcement required to their network including bringing fibre-optic cables from their Head Works in Bishops Stortford to the site.

Capabilities on project:
Water

SYSTEM INSTALLATION

The developer would need to install a strategic network of ducts around the site in the road system. These will be laid in line with the National Joint Utilities Group (NJUG) layouts. VM will then negotiate with individual plot owners to provide the necessary cabling etc for their needs.

COSTS

The costs for cabinets and cables to serve each plot will be borne by the developer for that plot. Site Developer provision of a ducting system through which VM will pull their cables at a later stage is likely to be the favoured situation.

Costs borne by the Developer are estimated to be:

Infrastructure	Ropemaker contribution
Off-site wider system upgrades	0% (In accordance with current NTL proposals)
Off-site improvements required to the network	0% (In accordance with current NTL proposals)
On-site main feeder system	Limited to installing a pit and duct system.
On-site local distribution system	Cost borne by plot developer

Telecoms – Other

Redstone Communications previously confirmed they have no apparatus affected by the development.

FURTHER WORK

- VM to advise commercial deal available to the Developer, i.e. free issue of ducts.
- Strategic road layout to be provided so VM are able to scope the required duct system and chamber/cabinet positions.

Work carried out to date at this stage confirms that it will be possible to provide a cable telecoms solution. However, the Detailed Planning stage will create better opportunity to engage with VM again in order to provide more robust cost and design details.

Capabilities on project:
Water

Electricity Supply

Work carried out to date at this stage confirms that it will be possible to provide an Electricity supply solution.

Electricity – EDF
Point of Contact – Derek Levy, EDF
Meetings to date: 15 October 2004, 21 January 2005, 24 November 2008. Telephone conversations have also been held in February 2013 and July 2013.

EDF Energy is responsible for the network in the Harlow area. It should be noted that EDF Energy does not supply electricity, but only the infrastructure. Other network providers are able to design and provide a new network, but links to the EDF system would need to be negotiated and reinforcement works to the existing system would be undertaken by EDF. Therefore, EDF have only been approached at this stage.

Individual householders will negotiate electricity supplies at the time of property connection.

EXISTING PLANT

There are existing EDF 33kv high voltage services located off-site, to the south of the proposed development area and west of Harlow town centre. These are served through a 132 kV supply from the west, via Hoddesdon that is stepped down to 33kv at the Harlow West Primary substation (PSS).

EDF have confirmed that there is little spare capacity within the local supply system. A new primary sub-station is planned for East Harlow that may free up some spare capacity for the south east of the development. However, it is understood this reinforcement is primarily to enable further expansion of employment area to the east of Harlow town centre and facilitate the release of other sites for residential development within Harlow.

PROPOSED DEMAND

To serve circa 8,630 dwellings and associated commercial, retail and industrial use, the anticipated electrical load for the development is estimated at approximately 13 MVA. Gas or electrical heating will have a substantial affect on the level of domestic demand.

PROPOSED SITE NETWORK

To support the anticipated load up to 8,630 dwellings, a primary sub-station (33kV to 11kV) would need to be established on the site. One unit could supply 30-40MVA. The PSS would comprise a 40m x 40m enclosure and would feed a local 11kV high voltage network. A proximity distance would sterilise a 60 x 60m area. Sanitary provisions and connection to mains drainage will be required. A number of further local sub-stations would be required to facilitate phasing and local demand. These sub-stations would be of an area 8 x 8m. Approximate locations are indicated on the plan in the appendices of this report. All compounds would require vehicle access and further detail of exact position will be determined at the Detailed Planning stage.

One 30-40 MVA primary substation would be comfortably adequate for phase 1 up to 2021.

A secure supply would be provided to the primary systems. This is where a load is supported via two separate circuits such that if one fails, the other can take the full lcad with no or limited interruption in supply. A non-secure supply is where the load has no back up.

As this work is 'contestable' another provider could be approached to provide a cost.

DIVERSIONS & EASEMENTS

Diversions of major EDF equipment are not anticipated. Minor local overhead supplies would be subsumed as the development progresses.

Easement conditions on the existing plant are to be defined. Easements on the new systems will occur. The minor easement requirements would be 3m overall for the new cables which can be accommodated within the highway network of the proposed development.

OFF-SITE REINFORCEMENT

Capabilities on project:
Water

For EDF to provide the network supply route, they will require to undertake off-site reinforcement. EDF have confirmed that Harlow West primary station would still be the supply point for the new development. EDF are undertaking a study to establish the extent of reinforcement works and plan to upgrade the PSS within the next five years. Financial contributions for the upgrade would be apportioned between all developers requiring power. The percentage split and method of charging will be reviewed and advised in due course.

LOCATION OF SUPPLY

The provision of new underground cabling from Harlow West, across the river valley to the new primary substations is required. This would be laid long the existing and new road network.

EARLY PHASE WITHOUT REINFORCEMENT

EDF have indicated that there is very little spare capacity in the existing system in the area and that beyond a nominal increase, reinforcement would be required. EDF will respond with more details once the road layout has been forwarded to them.

TIMESCALES

Reinforcement and main cable works is to be advised. The new PSS completion will depend on cable routes. Crossings under railway lines and rivers tend to extend delivery time.

COSTS

The cost advised in the 2005 report for the off-site cable link and on-site substations was £8-10M. No additional cost updates have been sought or advised for this and the following, therefore inflationary increases may be assumed to apply. EDF have confirmed that costs for the installation of the PSS would be an agreed schedule of charges.

The site network with new 11kV to 415V transformer sub-stations could attract costs of £600 to £1000 per house, although this cost is likely to be borne by the developer for each plot.

Capital costs would be payable in advance and Developer contributions are as follows:

Infrastructure	Developer contribution
Off-site wider system upgrades (e.g. National Grid system or power stations)	0%
Off-site improvements required to the EDF transmission system (primary sub-station)	100%
On-site main feeder system	100%
On-site local electricity distribution system	100%

MISCELLANEOUS

- Planning approval for the on-site sub-stations will be by the developer, with details, compound layout etc provided by EDF.
- The environmental issues and assessment will be undertaken by EDF.

FURTHER WORK

- Easement details need to be confirmed.
- EDF will progress more detailed layouts and cost estimates at the Detailed Planning stage.

Electricity – National Grid
Point of contact – Jeremy Lea of National Grid
Meetings to date: 06 March 2006, 10 May 2006 and discussions in February 2010.

Capabilities on project:
Water

The National Grid Transmission (NGT) overhead 400kV system runs to the west of the proposed development. This is the major electricity supply towards London and utilises type L6 towers which are the largest towers used by National Grid to support conductors.

The power lines are to be retained on site, however, their position and location in relation to the development has been taken into consideration as part of the masterplanning process. A minimum offset to existing buildings of 118m from overhead power lines to dwellings has been accommodated.

Capabilities on project:
Water

Oil Pipelines

A complete search of the Harlow North development site was carried out using Linesearch in order to determine risk to existing pipeline plant.

National Grid Gas (National Transmission System) and National Grid Electricity Transmission (Overhead Line) are both noted within the zone of interest as previously known. No oil pipelines are in the zone of interest (encompassing boundary extent of North Harlow).

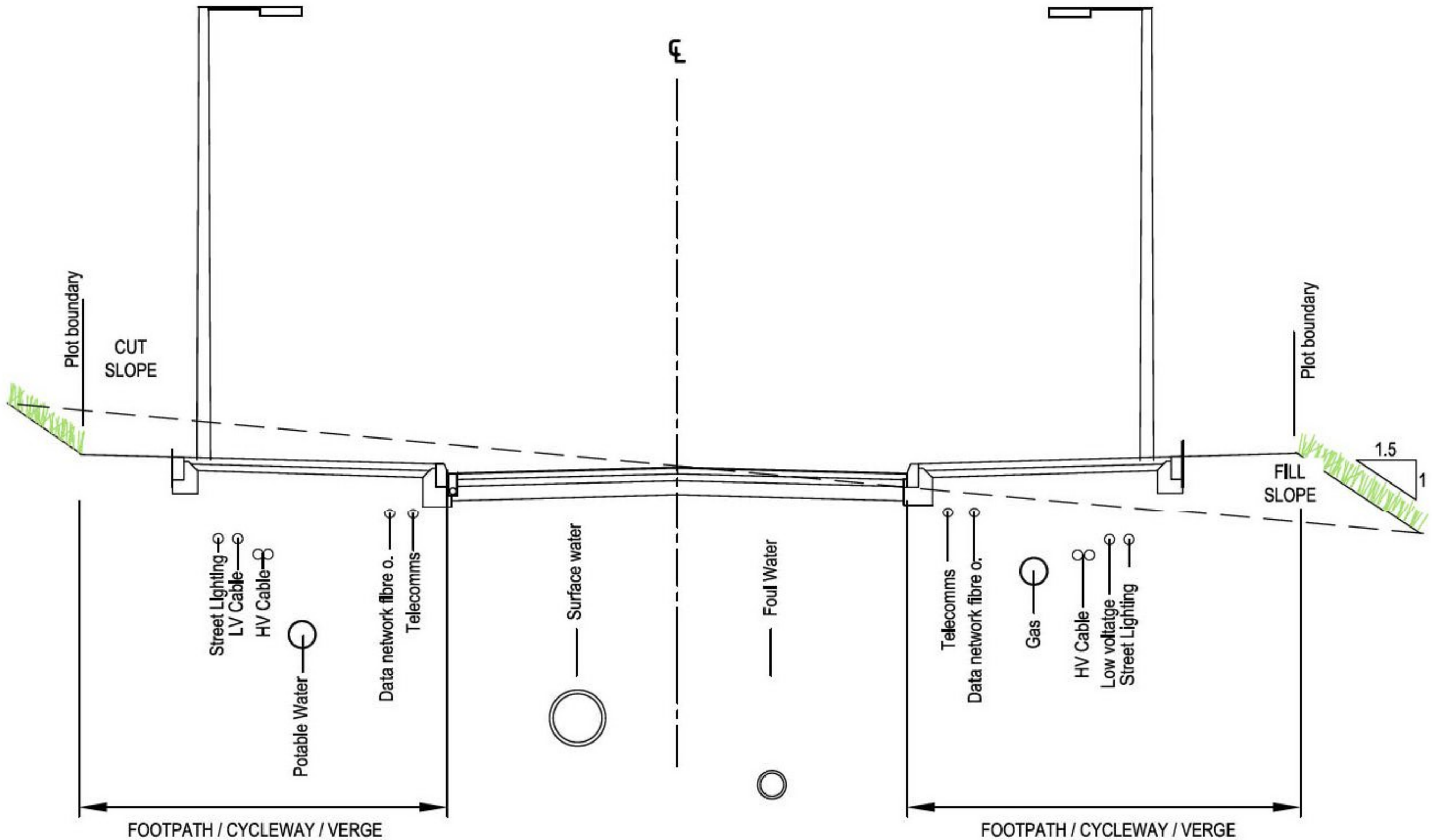
Summary

This report concludes that through discussions with the relevant Utility service providers at this stage the proposed Gilston Park Estate development can be serviced. Further discussions will be required at the detailed planning stage in order to progress both cost and network designs for each of the Utility providers.

Appendix A: Plans

60286648/SK204 – STRATEGIC UTILITY ROUTE, TYPICAL ROAD CROSS SECTION

60286648/SK205 – MAJOR UTILITIES CONSTRAINTS



Client: Places for People	Title: STRATEGIC UTILITY ROUTE	AECOM	Design: KS / CAD: KS
Project: GILSTON PARK ESTATE	TYPICAL ROAD CROSS SECTION	AECOM House, 63-77 Victoria Street, St Albans, Hertfordshire. AL1 3ER Tel: +44 (0)1727 535000 www.AECOM.com	Chk'd: BF / App'd: Date: Feb 2013 / Scale: 1/50 @ A3 No. 60286648 / SK204 / Rev:

cm | A3

Last saved by: FYFEB(2014-05-14) Last Plotted: 2014-05-14
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Project Management Initials: Designer: _ACM-DESIGNER _ACM-CHECKER: _ACM-APPROVER: 297mm x 420mm

NOTES:

1. DRAWING BASED ON MASTERPLAN RECEIVED ON THE 07/08/13.
2. LOCATION OF PLANT AND EQUIPMENT IS DIAGRAMMATIC ONLY. THE ACCURACY CAN NOT BE GUARANTEED. UP TO DATE INFORMATION IS REQUIRED BEFORE ANY WORK IN THE VICINITY OF THE UTILITY PLANTS.
3. TRANSCO EASEMENT AND PROXIMITY DISTANCES.
HP MAIN IS A THICK WALL PIPE.
PROXIMITY DISTANCE IS 3m EACH SIDE FROM EDGE OF PIPE.
EASEMENT IS 6m EACH SIDE FROM EDGE OF PIPE.
INNER AND MEDIUM ZONES ARE 3m EACH SIDE FROM EDGE OF THE PIPE. CAR PARKS AND ROADS MAY BE BUILT BUT NO HOUSING. GAS MAIN TO BE IN THE VERGE OR UNDER THE FOOTPATH. COVER DEPTH TO BE 1m MINIMUM.
OUTER ZONE IS 135m EACH SIDE. ANY BUILDING FOR VULNERABLE POPULATION CAN NOT BE BUILT IN THIS ZONE (E.G SCHOOL, HOSPITAL, STADIUM, MARKET, NURSING AND CARE HOUSE, CRECHE).
IP MAIN EASEMENT = 6m EACH SIDE.
IP MAIN PROXIMITY DISTANCE = 3m EACH SIDE.
4. AFFINITY WATER TWIN MAINS EASEMENT IS 16m FROM EACH PIPE CENTER LINE (CL). ROADS AND CAR PARKS CAN BE BUILT ABOVE IF THE PIPES ARE APPROPRIATELY PROTECTED (CONCRETE SLAB).
5. NATIONAL GRID EASEMENT AND PROXIMITY DISTANCES. FROM REPORT *ELECTROMAGNETIC SURVEY RELATED TO OVERHEAD HIGH VOLTAGE LINES* ISSUED BY DAVID BUICK.
TYPICAL EASEMENT IS 20m EACH SIDE.
59m TO CL OF PYLON. DOMESTIC AND COMMERCIAL ELECTRONIC EQUIPMENT UNAFFECTED AT DISTANCE GREATER THAN 59m. TELECOMS CABLING MY BE RUN PARALLEL TO LINES AT THIS DISTANCE.
93m TO CL OF PYLON. NATIONAL RADIOLOGICAL PROTECTION BOARD STATE THAT LEUKAEMIA RISK IS ESTIMATED TO DOUBLE WITHIN THAT DISTANCE.
116m TO CL OF PYLON. RECOMMENDED MINIMUM DISTANCE FROM LINES FOR SCHOOLS & PLACES WITH CHILDREN AS BASED ON SWEDISH RESEARCH.
6. EDF HV CABLE EASEMENT AND PROXIMITY DISTANCES. VALUES TO BE CONFIRMED BY EDF.
7. ALL OF THE ABOVE INFORMATION IS SUBJECT TO FINAL CONFIRMATION FROM THE UTILITY COMPANIES.

LEGEND:

EXISTING TRANSCO KEYS:
HP MAIN
IP MAIN
AFFINITY WATER KEYS:
EXISTING NETWORK
EDF KEYS:
EXISTING OVERHEAD 275 KV GRID
EXISTING HV (BURIED/OVERHEAD)
THAMES WATER KEYS:
EXISTING TRUNK SEWER
AREA OF UTILITY CONSTRAINTS
REFER TO NOTES 3, 4, 5 &6
FOR DETAIL INFORMATION
REDLINE BOUNDARY

Issue Status: DRAFT

GILSTON PARKE ESTATE

PLACES FOR PEOPLE
Project No.: 60286648 DECEMBER_2013

MAJOR_UTILITY CONSTRAINTS

AECOM

60286648_SK005_REVA