11. Infrastructure/ Utilities

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1 Introduction

1.1.1 This report describes the existing utility infrastructure in the vicinity of Surrey Canal and the likely impact the Proposed Development may have on those services. The potential requirement for diversions due to new building locations and new road layouts is discussed. The impact of higher demand loads on the services and therefore the potential for network reinforcement is also reviewed.

1.1.2 The existing services in relation to The Site are shown on drawing number 8450-Study-4000 and the existing services in relation to the Proposed Development are shown on drawing number 8450-Study-4020.

1.1.3 The following drawings diagrammatically illustrate the potential utilities infrastructure for the Proposed Development,

- 8450-Study-4100 – Proposed Gas Distribution
- 8450-Study-4101 – Proposed Telecomms Distribution
- 8450-Study-4102 – Proposed Water Distribution
- 8450-Study-4103 – Proposed Sewer Distribution
- 8450-Study-4104 – Proposed Electrical Distribution (UKPN)
- 8450-Sudy-4105 – Proposed Electrical Distribution (Private Wire Network)
- 8450-Study-4106 – Proposed Indicative Community Heat Network

1.1.4 All the drawings are included at Appendix A of this report.

1.2 Electricity

Existing Services

1.2.1 The local distribution network operator (DNO) is UK Power Networks (UKPN), formerly EDF.

1.2.2 The record drawings obtained from UKPN show that there are four existing distribution substations located within the vicinity of The Site providing medium voltage (MV) and low voltage (LV) supplies to buildings located on and adjacent to The Site.

1.2.3 The existing MV and LV cable distribution routes follow the existing road layout except to the west of Millwall FC Stadium where they traverse the large car park north of Stockholm Road on a north/south axis.

1.2.4 An extra high voltage (EHV) circuit is routed along the south side of Surrey Canal Road. This is labelled EHV Route 389 on the UK Power Networks record drawings.

Diversions

1.2.5 Three of the existing substations are located within The Site boundary and clash with new building locations as shown on the Proposed Parameter Plans. These will need to be re-provided as either new standalone buildings or be incorporated into the proposed new buildings. Each substation will need to be protected during the relevant construction phases to ensure existing non-redundant supplies are maintained until the replacement substation and services are installed.

1.2.6 The following MV/LV sections of cables may require re-routing:

- The cables routed across the Millwall FC Stadium large car park north of Stockholm Road to suit the Proposed Development layout for Stockholm 1 and Stadium Avenue plots.
- The cables currently routed around the north end of the Lions Centre from Bolina Road to a substation located to the north east of the Millwall FC Stadium to suit the Proposed Development layout for the Bolina East plot.
- The cables routed under the overhang of the Stadium 1 plot may be affected if this corner of the Millwall FC stadium is filled in at ground level with development.
- The cables routed from the existing substation within the middle of the Excelsior plot to the south side of Surrey Canal Road.
- The cables routed from an existing substation located on the eastern edge of Stockholm 2 plot to the Surrey Canal Road.

1.2.7 The actual requirement for diversions would require detailed site investigations to establish precise locations as the utility company record drawings are not always accurate. UK Power Networks will also need to carry out their own study to confirm which cables are live and which are redundant.

1.2.8 It should be noted the EHV Cable Route 389 routed along Surrey Canal Road is an important part of the network and therefore works to this cable need to be avoided to minimise disruption and costs. Based on the proposed levels of the new road junctions works to this cable route would be avoided.

1.2.9 The existing individual supplies that serve buildings which become redundant due to the Proposed Development would need to be removed to suit the construction phasing.

Loads and Capacity for Proposed Development.

1.2.10 The electrical demand for the Proposed Development has been estimated as a worst case scenario. This scenario encompasses the land uses that could be incorporated as shown on the Parameter Plans and the maximum floor space detailed in the Development Specification. For certain land uses the Development Specification allows for a range of floor areas and therefore the worst case scenario utilises the maximum floor space for the highest demand usages.

1.2.11 The estimated worst case demands for each land use are tabulated below:

Table 1.1: Electrical Demand Loads

Land Use	Electrical Load (kVA)
A1/A2 - Retail	430
A3/A4 – Cafes/Restaurants	490
A5 – Hot Food Takeaways	40
B1 -Business	1800
C1 - Hotels	2400
C3 - Residential	6725
D1 - Community	360
D2 – Leisure and Entertainment	950
TOTAL	**13195**

1.2.12 The estimated total worst case demand for the Proposed Development, excluding the Millwall FC Stadium, is approximately 13.2MVA. The existing demand for The Site is estimated at between 5MVA and 8MVA. Therefore the electrical infrastructure would need to support an additional 5.2MVA to 8.2MVA load.

1.2.13 The Energy Strategy document discusses the potential for providing a Private Wire Network (PWN) for The Site served from SELCHP. A new MV distribution system would need to be provided to connect to a new or existing primary substation located at the north side of the SELCHP building. A new MV network would be provided around The Site to serve new distribution substations (MV/LV).

1.2.14 Should this strategy be adopted then the existing UK Power Network's system would not require reinforcement. If however, it is not adopted then the existing UK Power Network would need to be extended to serve new distribution substations (MV/LV) around The Site. UK Power Networks would need to carry out a detailed network study to establish if the Proposed Development can be supported by the existing infrastructure or if the network needs to be reinforced from local primary substations with additional MV circuits installed primarily along Surrey Canal Road.

1.3 Gas

Existing Services

1.3.1 From record drawings obtained from Scotia Gas Networks The Site is currently served by:

- An intermediate pressure (IP) gas main (600mm dia.) routed through The Site along Surrey Canal Road;

- Low pressure (LP) mains in Bolina Road (250mm dia. reducing to 180mm dia.);
- Low pressure (LP) mains in Stockholm Road (125mm dia.), and
- Low pressure (LP) mains in Rollins Street (150mm dia.).

1.3.2 All the LP mains appear to be served from a 250mm diameter LP mains located in Ilderton Road. From these mains the existing buildings are served by small diameter individual supply pipes.

Diversions

1.3.3 The routes of the existing mains follow the existing roads and it appears, from the Proposed Parameter Plans, no diversions would be required due to the proposed buildings. It should be noted that the intermediate pressure main routed along Surrey Canal Road is an important part of the gas main network and therefore works to this pipe need to be avoided to minimise disruption and costs. Based on the proposed levels of the new road junctions works to this gas main route would be avoided.

1.3.4 The existing small diameter individual supply pipes that serve buildings which become redundant due to the Proposed Development would need to be removed to suit the construction phasing. This particularly applies to all the plots in the following plot areas:

- Bolina North
- Orion
- Excelsior

1.3.5 The existing gas supply to Millwall FC Stadium connects into the LP gas network via a gas meter located adjacent to Zampa Road. The exact route of the pipe from the gas meter to Millwall FC stadium needs to be determined as it does not appear on the utility record drawings. This supply would be maintained if it does not require diversion due to the Proposed Development. If diversion is required then a new supply would be installed prior to disconnection of the existing supply in order to minimise disruption.

Loads and Capacity for Proposed Development.

1.3.6 The gas demand for the Proposed Development has been estimated as a worst case scenario. This scenario encompasses the land uses that could be incorporated as shown on the Parameter Plans and the maximum floor space detailed in the Development Specification. For certain land uses the Development Specification allows for a range of floor areas and therefore the worst case scenario utilises the maximum floor space for the highest demand usages.

1.3.7 The estimated worst case demands for each land use are tabulated below:

Table 1.2: Gas Demand Loads

Land Use	Gas Load m^3/hr
A1/A2 - Retail	47
A3/A4 – Cafes/Restaurants	112
A5 – Hot Food Takeaways	24
B1 -Business	198
C1 - Hotels	237

C3 - Residential	2060
D1 - Community	165
D2 – Leisure and Entertainment	251
TOTAL	**3008**

1.3.8 Gas demand for The Site is significantly higher than the existing demand.

1.3.9 The Energy Strategy proposes a district heating network to serve the site fed from SELCHP. However, in order to guarantee supplies standby/backup plant using gas fired boilers is also proposed. It is envisaged that a central energy centre would be located in the Orion plot. A gas supply, probably an intermediate pressure supply, from the existing pipe routed along Surrey Canal Road would be required to serve this facility. New supplies to individual plots would be required to serve, for example restaurant units. These will be served from extensions of the existing low pressure pipe network. The low pressure mains in Zampa Road, Bolina Road and Stockholm Road are likely to require reinforcement. The intermediate pressure main along Surrey Canal Road is also likely to require reinforcement in order to support the back-up energy centre.

1.3.10 Scotia Gas Networks would need to carry out a detailed network study to establish if the Proposed Development can be supported by the existing infrastructure or if the worst case reinforcement scenario described in 1.3.9 is necessary.

1.4 Water

Existing Services

1.4.1 From asset location maps obtained from Thames Water The Site is currently served by a combination of the following water mains:

- 4” distribution main routed along Bolina Road;
- 125mm branch main in Stockholm Road served from a distribution main in Ilderton Road;
- Two branch connections served from a trunk main in Surrey Canal Road, and
- 180mm distribution main in Rollins Street.

1.4.2 From these mains the existing buildings are being served via private mains and individual supply pipes.

Diversions

1.4.3 The routes of the existing mains follow existing roads and it appears, from the Proposed Parameter Plans, no diversions would be required due to the proposed buildings. It should be noted that the 300mm main routed along Surrey Canal Road is designated as a trunk main on the water company plans and as such will be a strategic section of their network. Works to this pipe therefore need to be avoided to minimise disruption and costs. Based on the proposed levels of the new road junctions works to this water main would be avoided.

1.4.4 The existing individual supply pipes that serve buildings which become redundant due to the Proposed Development would need to be removed to suit the construction phasing.

1.4.5 The existing water supply to Millwall FC Stadium is routed through Gate 3. The exact route of this pipe needs to be determined as it does not appear on the utility record drawings. This supply would be maintained if it does not require diversion due to the Proposed Development. If diversion is required then a new supply would be installed prior to disconnection of the existing supply in order to minimise disruption.

Loads and Capacity for Proposed Development.

1.4.6 The water demand for the Proposed Development has been estimated as a worst case scenario. This scenario encompasses the land uses that could be incorporated as shown on the Parameter Plans and the maximum floor space detailed in the Development Specification. For certain land uses the Development Specification allows for a range of floor areas and therefore the worst case scenario utilises the maximum floor space for the highest demand usages.

1.4.7 The estimated worst case demands for each land use are tabulated below:

Table 1.3: Water Demand Loads

Land Use	Daily Consumption (m^3)
A1/A2 - Retail	2.0
A3/A4 – Cafes/Restaurants	8.2
A5 – Hot Food Takeaways	1.2
1 -Business	42.0
C1 - Hotels	30.0
C3 - Residential	732.0
D1 - Community	12.0
D2 – Leisure and Entertainment	8.8
TOTAL	**836.2**

1.4.8 The 180mm distribution main in Rollins Road may be adequate to serve the Excelsior and Timber Wharf plots of the Proposed Development. However the 4” distribution main in Zampa Road and Bolina Road and the 125mm distribution main in Stockholm Road are likely to require reinforcement.

1.4.9 To assess the overall impact of the Proposed Development on the local water mains network the water company would require a study to be carried out to determine the implications and whether the worst case reinforcement scenario as described in 1.4.8 is necessary.

1.4.10 It would be necessary to extend new sections of branch mains and supply pipes from the water company’s network to supply all new buildings on the Proposed Development.

1.5 Drainage

Existing Services

1.5.1 From asset location maps obtained from Thames Water the extent of the existing sewers serving The Site include:

- Small local combined sewer commencing at the south end of Bolina Road and running north;
- Small local combined sewer routed in Ilderton Road commencing at the junction with Stockholm Road and running north, and
- Large combined sewer which runs east to west along the south side of Surrey Canal Road before turning south to run parallel to the new East London Line and then east to west along Rollins Street before connecting into the trunk sewer in Ilderton Road. The trunk sewer commences at the junction with Stockholm Road and runs south.

1.5.2 There are also likely to be private branch sewers running from The Site, draining from individual buildings connecting into the Thames Water sewers.

Diversions

1.5.3 The routes of the existing utility sewers follow existing roads and it appears from the Proposed Parameter Plans no diversions would be required.

1.5.4 The existing individual drains from buildings which become redundant due to the Proposed Development would need to be removed to suit the construction phasing.

1.5.5 The existing drainage outflow from Millwall FC Stadium exits via a pumping station located in the south east corner of the facility to a sewer located on the south side of Surrey Canal Road. The exact route of this pipe needs to be determined as it does not appear on the utility record drawings. This service would be maintained if it does not require diversion due to the Proposed Development. If diversion is required then a new service will be installed prior to the disconnection of the existing supply in order to minimise disruption.

Loads and Capacity for Proposed Development.

1.5.6 The foul drainage demand for the Proposed Development has been estimated as a worst case scenario. This scenario encompasses the land uses that could be incorporated as shown on the Parameter Plans and the maximum floor space detailed in the Development Specification. For certain land uses the Development Specification allows for a range of floor areas and therefore the worst case scenario utilises the maximum floor space for the highest demand usages.

1.5.7 The estimated worst case demands for each land use are tabulated below:

Table 1.4: Foul Drainage Demand Loads

Land Use	Daily Load (m^3)
A1/A2 - Retail	2.3
A3/A4 – Cafes/Restaurants	9.4
A5 – Hot Food Takeaways	1.4
B1 -Business	48.3
C1 - Hotels	34.5
C3 - Residential	841.6
D1 - Community	13.8
D2 – Leisure and Entertainment	12.8

TOTAL	**964.1**

1.5.8 The sewer routed east to west (Surrey Canal Road/Rolling Street) and Ilderton Road (south) may be adequate to serve the Orion, Excelsior and Timber Wharf plots of the Proposed Development but the sewers routed along Bolina Road and Ilderton Road (north) are likely to require reinforcement in order to serve the Bolina, Stadium, Stadium Avenue, Stockholm, and Senegal Way plots.

1.5.9 To assess the overall impact of the Proposed Development on the local sewer network the water company would require a study to be carried out to determine the implications and whether the worst case reinforcement scenario described in 1.5.8 is necessary.

1.5.10 A network of new sewers to serve the Proposed Development would be provided from the individual buildings.

1.5.11 With regard to surface water drainage the Strategic Flood Risk Assessment identifies a requirement to reduce the peak rainfall rate of runoff arising from the Proposed Development by 50% when compared to that arising from the Site in its existing condition. Sustainable drainage (SUDS) techniques will be incorporated into the design of the development by use of green and brown roofs, permeable paving and open water features. Details are included in the Flood Risk Assessment and Water Resources report.

1.6 Communications/Media

General

1.6.1 New pit and duct networks would be installed throughout the Proposed Development to allow for at least three communication providers (BT, Virgin Media and “others”) to support The Site. The BT and Virgin networks will connect into existing local networks.

BT

1.6.2 The vicinity of The Site is well served by existing BT infrastructure with services distributed along Bolina Road, Stockholm Road, Surrey Canal Road and Rollins Street.

1.6.3 Due to the creation of new road junctions along Surrey Canal Road some existing manholes will need to be modified as the cover level near to the junctions will be raised.

1.6.4 Detailed site investigations to establish precise locations as the utility company record drawings are not always accurate would be required and BT will also need to carry out their own study. BT would need to reinforce their network with the installation of additional cables within the existing cable duct network serving The Site.

During each construction phase the individual supplies to existing buildings that become redundant due to the Proposed Development would have to be removed.

Virgin Media

1.6.5 A Virgin Media trunk route passes through The Site along Surrey Canal Road and therefore works to this cable need to be avoided to minimise disruption and costs. Based on the proposed levels of the new road junctions works to this cable route would be avoided.

1.6.6 Although there are distribution services serving residential buildings to the south of Rollins Street there are no distribution services within The Site boundary.

1.6.7 Detailed site investigations to establish precise locations as the utility company record drawings are not always accurate would be required and Virgin Media will also need to carry out their own study. However no diversion works are envisaged.

Fibernet (Global Crossing)

1.6.8 A Fibernet fibre optic service, which forms part of Global Crossings London Metro Network, is routed through The Site along Surrey Canal Road and therefore works to this cable need to be avoided to minimise disruption and costs. Based on the proposed levels of the new road junctions works to this cable route would be avoided.

1.6.9 Detailed site investigations to establish precise locations as the utility company record drawings are not always accurate would be required and Fibernet will also need to carry out their own study. However as stated in 1.6.9 no diversion works are envisaged.

1.7 Communications/Media

1.7.1 The Energy Strategy for Surrey Canal Site is based on the connection of the Proposed Development to the nearby SELCHP, by utilising the waste heat as a source for a community heat network. It is also proposed as discussed (in Item 1.2) to provide a private wire electrical system. The project team is currently working with SELCHP to determine the best way forward. Details of this proposal are contained in the Energy Strategy Report produced by Mott MacDonald Fulcrum.

1.7.2 The community heating network and the electrical private wire network would require new distribution systems to serve all the buildings of the Proposed Development. An indicative community heating network is illustrated on drawing 4850-Study-4106. This drawing is based on the drawing included in the Energy Strategy report. The proposed private wire network is illustrated on drawing 4850-Study-4105.

1.7.3 Both the community and the private wire network will originate from the north end of SELCHP adjacent to the East London Line Extension. Both networks would be routed across the railway line, using an Under Track Crossing. They will then be routed adjacent to the railway line southwards towards Surrey Canal Road via a Network Rail bridge archway. Both services need to cross the Surrey Canal Road to serve the Excelsior and Timber Wharf plots.

1.7.4 As illustrated by the drawings the vast majority of the new networks will be distributed within The Site and therefore co-ordination with the existing utility services and their associated extensions to serve new buildings of the Proposed Development will be relatively straight forward.

1.7.5 The Under Track Crossing, the Network Rail bridge crossing and the Surrey Canal Road crossing are the three key areas which will require detailed investigation and liaison with various parties including Network Rail, landowners, local authorities, traffic authorities and utility companies to ensure minimal disruption. The proposed network routes are discussed in more detail in the Energy Strategy report.

1.8 Impact on Existing Users

1.8.1 During each phase of construction supplies to non-redundant existing buildings located on and off The Site will need to be maintained and a detailed strategy will be put in place to ensure disruption to Millwall FC Stadium, local businesses and local residents is minimised. Where existing services need to be diverted new supplies would be installed prior to the removal of the existing services to minimise disruption to the disconnection and reconnection element of the works only.

1.8.2 Detailed investigations would be carried out in conjunction with the utility companies and in consultation with local businesses and residents to ensure a robust and detailed strategy is developed, and put in place, prior to works commencing for each construction phase.

1.9 Summary

1.9.1 The existing utility services in the vicinity of the Site have been researched and record information obtained from the utility companies. This information has been added to the geographical survey to produce a co-ordinated drawing illustrating how the existing services relate to the existing site and to the Proposed Development. It should be noted, however, that utility record drawings are not always accurate.

1.9.2 This report has identified that the vast majority of the existing utility distribution services are routed along existing roads which would be retained within the Proposed Development. The only utility distribution services not routed along existing roads are electrical cables routed through the Bolina East, Stadium Avenue, Stadium 1, Excelsior (1-5) and Stockholm 1 and 2 plots which would need to be diverted if not made redundant by the Proposed Development.

1.9.3 Diversions to the trunk services routed along Surrey Canal Road would be avoided based on the proposed levels of the new road junctions.

1.9.4 Detailed investigations and strategies would be put in place prior to each construction phase to ensure supplies are maintained and disruption minimised to Millwall FC Stadium, local businesses and local residents.

1.9.5 Utility demand loads for the Proposed Development have been estimated based on the worst case development scenario. The loads for all utilities are significantly higher than the existing condition as low demand facilities, such as warehouses, are being replaced by higher demand uses such as residential, commercial and retail.

1.9.6 Detailed network analysis would be carried out in conjunction with the utility companies to establish system capacities and to establish the optimum solutions for each service with regard to onsite and offsite network reinforcement to minimise impact to the local community. This report however identifies the envisaged worst case reinforcement scenario. The existing networks would be extended into each plot to serve the Proposed Development as the plots are developed.

1.9.7 The Energy Strategy for the Proposed Development proposes the use of a community heat network and an electrical private wire network served from SELCHP. These would require new distribution systems around The Site. There are three key co-ordination areas, the Under Track Crossing, the Network Rail bridge crossing and the Surrey Canal Road crossing which would require detailed investigation and liaison with various parties to minimise disruption.