APPENDIX 10.1: FLOOD RISK ASSESSMENT 2021

stomor
CIVIL ENGINEERING CONSULTANTS

FLOOD RISK ASSESSMENT

GRID REF: 528027E, 193454N

ROYAL BRUNSWICK PARK

NEW SOUTHGATE, BARNET, LONDON

prepared for

COMER HOMES GROUP

July 2021

REFERENCE: ST3013/FRA-2107
REVISION 0

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Revision	*Author*	*Checked by*	*Issue Date*
0	*JD*	*SJB*	*05.07.21*

CONTENTS

APPENDICES

1 Introduction

1.1 Stomor Ltd have been commissioned by Comer Homes Group to prepare a Flood Risk Assessment (FRA) associated with the proposed redevelopment of North London Business Park in Barnet, London. A Site Location Plan is provided in **Appendix A**.

1.2 The overall area of the site is approximately 16.37 hectares (ha) and currently comprises office buildings, car parking facilities, a Secondary School and numerous other small structures.

1.3 Development proposals comprise a mixed-use development of up to 2,500 residential dwellings, 1,162m^2 retail space, 1,010m^2 community space and a 1,050-pupil capacity school. A copy of the Proposed Site Plan is provided in **Appendix B.**

1.4 The site was subject to an Outline Planning Application (REF: 15/07932/OUT) for a mixed-use development of up to 1,350 residential dwellings, 1,162m^2 retail space, 1,010m^2 community space and a 1,050-pupil capacity school. The application was submitted in 2015 and was granted planning permission at appeal in February 2020.

1.5 An FRA was previously prepared by Awcock Ward Partnership (AWP) to support the 2015 planning application. No objections to the FRA or the accompanying drainage strategy were received from the statutory consultees.

1.6 Policy Context

1.6.1 The FRA has been prepared in accordance with the relevant national, regional and local planning policy as follows:

- The National Planning Policy Framework (NPPF) by the Ministry of Housing, Communities and Local Government, and accompanying National Planning Practice Guidance (NPPG).
- Department for Environment, Food and Rural Affairs (DEFRA) and The Environment Agency (EA) published Guidance for Planning Applications: Assessing Flood Risk.
- The EA Flood Risk Standing Advice (FRSA) version 3.1 (April 2012).
- The EA's Approach to Groundwater Protection (March 2017).
- The London Plan (March 2021).

- London Borough of Barnet (LBB) Strategic Flood Risk Assessment (SFRA) (2018).
- LBB Local Flood Risk Management Strategy (October 2017).

1.6.2 Furthermore, the FRA follows the methodology prescribed in Construction Industry Research and Information Association (CIRIA) document C624: Development and Flood Risk (2004), Guidance for the Construction Industry.

1.7 Vulnerability and the NPPF Sequential Test

1.7.1 The NPPF follows a sequential risk based approach in determining the suitability of land for development in flood risk areas, with the intention of steering all new development to the lowest flood risk areas.

1.7.2 The indicative floodplain map obtained from the EA website is provided in **Figure 1.1**. This shows the site to be located within Flood Zone 1.

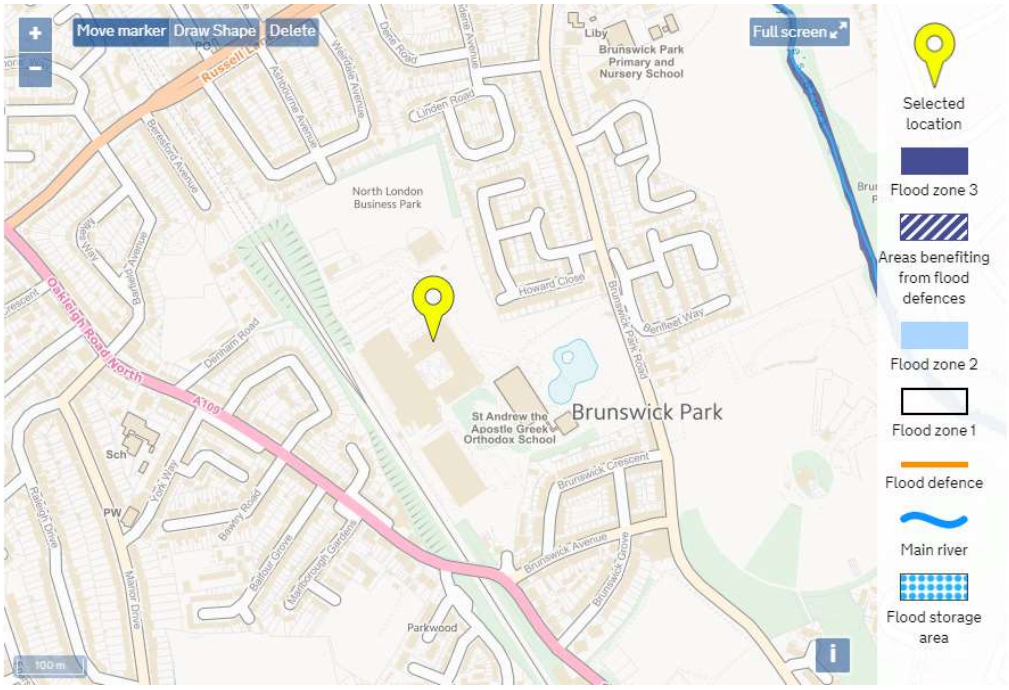


Figure 1.1 - Environment Agency Indicative Floodplain Map

1.7.3 The difference between Flood Zones 1, 2 and 3 are described in the table below:

Zone 1 Low Probability	Land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)
Zone 2 Medium Probability	Land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.55% – 0.1%) in any year.

Zone 3a High Probability	Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Zone 3b The Functional Floodplain	Land where water has to flow or be stored in times of flood. (Land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood or at another probability to be agreed between the LPA and the EA including water conveyance routes).

1.7.4 The Flood Risk and Coastal Change Category (ID 7) of the PPG and associated documents identifies that a Flood Risk Assessment is required for areas at risk of flooding, or for developments of more than 1ha within Flood Zone 1.

1.7.5 The Flood Risk and Coastal Change Category of the NPPG and associated documents identifies that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

1.7.6 The current use of the site for commercial purposes would have an NPPF flood risk vulnerability classification of ‘Less Vulnerable’. Where redevelopment comprises residential units and a new school, the flood risk vulnerability would increase from ‘Less Vulnerable’ to ‘More Vulnerable’.

1.7.7 EA Technical Guidance identifies that ‘Less Vulnerable’ uses of land are appropriate within Flood Zones 1, 2 and 3a, whilst ‘More Vulnerable’ land uses are only appropriate within Flood Zones 1 and 2. Therefore, it is considered that the proposed development would be appropriate in this area.

1.7.8 The DEFRA and EA Guidance for Planning Applications identifies that an FRA will be required for developments more than 1 ha and in Flood Zone 1.

1.7.9 The Flood Risk and Coastal Change Category of the NPPG and associated documents identify that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

2 Site Location

2.1 The application site comprises approximately 16.37ha of previously developed land, to the west of New Southgate.

2.2 Access to the site is currently taken from the A109 Oakleigh Road South, to the south, and from Brunswick Park Road, to the east.

2.3 The development boundary is defined by an existing railway line to the west, Brunswick Park Road to the east and residential development to the north and south.

2.4 The site levels vary significantly, with steep slopes down to the south east and eastern boundaries. The highest point of the site is about 72.53m Above Ordnance Datum (AOD), at the north western corner, adjacent to the residential dwellings to the north.

2.5 The nearest watercourse to the site is Pymmes Brook, located approximately 450m to the east and is identified as an EA designated statutory Main River. A copy of the EA Main River Map is presented in **Figure 2.1.**

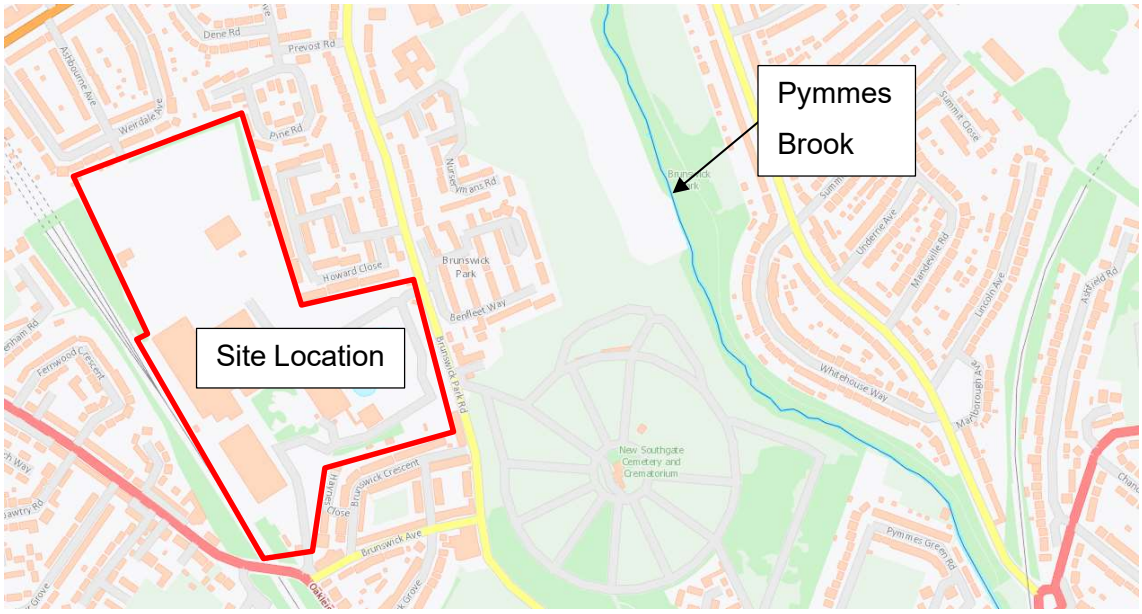


Figure 2.1 - Environment Agency Main River Map

2.6 The site is not located within any Groundwater Source Protection Zones. Therefore, there should be no restrictions on the area discharging via infiltration methods, subject to suitable infiltration rates and levels of water treatment.

3 Site Background

3.1 A level 1 Strategic Flood Risk Assessment (SFRA) for the area was prepared by Metis Consultants Ltd. in April 2018. The SFRA is used as a desk-based study to map all forms of flood risk to provide an evidence basis to locate new development primarily within low risk areas. The information allows the planning authority to identify the level of detail required for site-specific Flood Risk Assessments.

3.2 Inspection of the British Geological Survey (BGS) website identifies that the underlying ground conditions of the site comprise London Clay Formation. Local borehole data from the BGS website confirms the area to be underlain by London Clay.

3.3 Inspection of Cranfield University's Soilscapes Map, obtained from the Land Information System (LandIS) website, identifies that the soil at the application site is base-rich, loamy and clayey with impeded drainage. A copy of the Soilscapes map is provided in **Appendix C.**

3.4 For the purposes of this assessment, it is assumed that infiltration methods at the site will not be feasible. However, it is recommended that infiltration tests to BRE Digest 365 will need to be undertaken during the detailed design stages.

4 Existing Drainage

4.1 Investigations into the existing drainage of the site have been carried out using the above information in conjunction with the topographical survey and site inspection. In addition, existing Thames Water Utilities (TWU) drainage records have been obtained in order to identify the available public sewer networks in the vicinity of the site. A copy of the TWU records is provided in **Appendix D**.

4.2 Surface Water Drainage

4.2.1 Topographical survey information for the site identifies several existing gullies and inspection chambers located across the site. It is presumed that this infrastructure discharges to the public sewer network in the vicinity of the site.

4.2.2 TWU sewer records identify a 525mm diameter public surface water sewer which runs parallel to the western site boundary, before passing through the middle of the site from west to east. TWU records suggest this public sewer serves a culverted watercourse which crosses beneath the existing railway located to the west of the site.

4.2.3 An additional 375mm diameter public surface water sewer runs from west to east through the site. The head of this run appears to be located west of the existing school located on site. The two public sewers passing through the site converge at the eastern site boundary, before joining the public surface water sewer located on Brunswick Park Road

4.2.4 Inspection of the British Geological Survey (BGS) website identifies that the underlying geology of the site comprises London Clay Formation. This information indicates that the underlying soil conditions are unlikely to provide a suitable infiltration rate, although this would need to be confirmed by soil infiltration testing, in accordance with BRE Digest 365.

4.2.5 Considering an existing impermeable area of approximately 6.62ha, brownfield runoff rates for the site during various storm events have been calculated, based upon the Modified Rational Method, as follows:

Storm Event	Rainfall Intensity	Peak Runoff Rate
1 in 1 year	50mm/h	920l/s
1 in 30 years	126mm/h	2,319l/s
1 in 100 years	152mm/h	2,797l/s

4.2.6 Greenfield runoff rates have been calculated based upon IH124 Method, using a total site area of 16.37ha to be positively drained. Geotechnical information indicates that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 4. A copy of the calculation sheet is provided in **Appendix E**, which gives flow rates as follows:

Greenfield Runoff (l/s)		
Qbar	-	75.1
1 in 1 year	Q1	63.8
1 in 30 years	Q30	172.7
1 in 100 years	Q100	239.5

4.2.7 As previously stated, an FRA and associated drainage strategy were approved as part of the 2015 planning application, with permission received in February 2020. As part of this FRA, the following Greenfield Runoff Rates were identified and approved as discharge rates for the proposed development:

Greenfield Runoff (l/s)		
1 in 2 year	Q2	63.3
1 in 30 years	Q30	152.9
1 in 100 years	Q100	222.7

4.2.8 With the introduction of additional SuDS features, it is proposed to provide betterment on these previously approved rates via a complex flow control for all return periods up to 1 in 100 years plus climate change allowance.

4.3 Foul Drainage

4.3.1 TWU sewer records identify a 225mm public foul water sewer running from north to south along Brunswick Park Road, to the east of the site. The public foul sewer then appears to head east along Benfleet Way, although the sewer records identify the sewers on Benfleet Way as being subject to an adoption agreement.

4.3.2 TWU sewer records do not identify any public foul water manholes located within the application site.

5 Proposed Development

5.1.1 Development proposals comprise a mixed-use development of up to 2,500 residential dwellings, 1,162m^2 retail space, 1,010m^2 community space and a 1,050 pupil capacity school.

5.1.2 Vehicular access to the site will be taken from Brunswick Park Road to the east and Oakleigh Road South to the south of the application site.

5.1.3 The proposed development would have a NPPF flood risk vulnerability classification of 'More Vulnerable', which NPPG guidance deems appropriate within Flood Zones 1, 2 and 3a.

6 Proposed Site Drainage

6.1 General

6.1.1 Environment Agency (EA) Flood Risk Assessment (FRA) Guidance Note 1 - Development within a Critical Drainage area or greater than 1 hectare (ha) in Flood Zone 1 (Dated April 2012) states that the applicant should submit, "*Proposals for surface water management that aims to not increase, and where practicable reduce the rate of runoff from the site as a result of the development"*.

6.2 Surface Water Drainage

6.2.1 It is considered that surface water runoff from the site currently discharges into the public surface water sewers which pass through the site.

6.2.2 For the purposes of this assessment, it has been assumed that the proposed development of the site will result in the generation of approximately 6.62ha of impermeable area.

6.2.3 In accordance with EA Guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows; infiltration methods, watercourses then public sewer network.

6.2.4 Inspection of the British Geological Survey (BGS) website identifies that the underlying geology of the site comprise London Clay Formation, which indicates it is unlikely there will be a suitable infiltration rate on site for the use of SuDS. Therefore, for the purpose of this assessment, it is assumed that infiltration methods will not be suitable for the discharge of surface water from the development.

6.2.5 The approved FRA previously prepared for the site identified the surrounding area as being subject to impeded drainage, and subsequently disregarded infiltration as a means of surface water discharge. Therefore, for the purposes of this assessment infiltration has not been deemed feasible.

6.2.6 It is therefore proposed that runoff will connect to the existing public sewer network passing through the site.

6.2.7 A drainage strategy for the site is provided in **Appendix F.** The strategy demonstrates a proposed layout of SuDS to provide sufficient source control and storage to avoid flooding within the site during all storms up to and including the 1 in 100 year storm event plus 40% allowance for climate change.

6.2.8 The proposed drainage strategy incorporates SuDS features which will need to have clear, enforceable maintenance regimes in place so that they provide effective flood protection and water treatment for the long term.

6.2.9 The CIRIA SuDS Manual C753 promotes the use of the Simple Index Approach as a methods of determining water quality risk management and is generally regarded as the accepted method within the industry.

6.2.10 Table 26.2 of The SuDS Manual C753 gives pollution hazard indices for different land use classifications:

Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydro-carbons**
Residential Roofs	Very Low	0.2	0.2	0.05
Other Roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (unless there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g schools, offices) i.e <300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g hospitals, retail) all roads except low traffic roads and truck roads/ motorways	Medium	0.7	0.6	0.7

6.2.11 Table 26.3 of The SuDS Manual provides typical treatments levels for discharge to surface waters. The proposed drainage strategy for the site incorporates permeable pavement, and a detention basin. An extract of the relevant sections of the table is reproduced below:

	Mitigation indices		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Bioretention System (Rain Gardens)	0.8	0.8	0.8
Detention Basin	0.5	0.5	0.6

6.2.12 To deliver adequate treatment, the selected SuDS components should have a total mitigation indices that equals or is greater than the pollution hazard index. Where a single

SuDS component is insufficient, additional components in a series would be required where:

Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_n$)

6.2.13 Surface water runoff from residential roofs and low traffic roads will, as a minimum, pass through the detention basin. Therefore, as a minimum, the total SuDS mitigation would be as follows:

	Mitigation indices		
SuDS components	**TSS**	**Metals**	**Hydrocarbons**
1) Detention Basin	0.5	0.5	0.6
Total	**0.5**	**0.5**	**0.6**

6.2.14 Surface water runoff from all other roads (greater than 300 traffic movements a day) will, as a minimum, pass through the proposed rain gardens and the detention basin. Therefore, as a minimum, the total SuDS mitigation would be as follows:

	Mitigation indices		
SuDS components	**TSS**	**Metals**	**Hydrocarbons**
1) Bioretention System (Rain Gardens)	0.8	0.8	0.8
2) Detention Basin	0.25	0.25	0.3
Total	**1.05**	**1.05**	**1.1**

6.2.15 From the above tables the SuDS proposed on the development would provide an adequate level of water treatment for the potential pollution hazards generated by the land uses.

6.2.16 In order to provide a robust assessment, drainage proposals will retain the 1 in 100 year storm event within the site, without generating flood risk to proposed buildings within or adjacent to the development, while also making provision for climate change, relating to a 40% increase in rainfall intensity.

6.2.17 The proposed drainage strategy has been modelled using Micro Drainage. Copies of Micro Drainage output files for the development are provided in **Appendix G**, demonstrating that the proposed SuDS features provide sufficient storage to avoid flooding during the 1 in 100 year storm event plus 40% allowance for climate change.

6.3 Foul Drainage

6.3.1 As previously stated, TWU sewer records do not identify any public foul water manholes located within the application site.

6.3.2 A proposed development of up to 2,500 residential units would be expected to generate a peak foul flow rate of approximately 115.7l/s, based upon 4000 litres/unit dwelling/day, in accordance with Water UK's Design and Construction Guidance.

6.3.3 A school with capacity for 1,050 students would be expected to generate a peak foul flow rate of approximately 3.39l/s, based upon 90 litres per head per day and an 8 hour school day. However, it is considered that the peak foul flow periods for the school and residential units would not occur at the same time due to the schools operational period being within the general working weekday periods of 09:00hrs to 17:00hrs.

6.3.4 A Pre-Planning Enquiry has been submitted to TWU to establish points of connection and to determine any requirement for associated upgrade works.

6.3.5 A drainage strategy for the discharge of foul water flows from the development has been prepared and is provided in **Appendix F**. These drawings show an illustrative drainage layout to demonstrate that the site can be drained based upon the proposed development. These drawings are a strategy only and must not be used for construction purposes.

6.4 Detailed Design and Approvals

6.4.1 The drainage strategy is subject to approval by the Lead Local Flood Authority, BBC and TWU.

6.4.2 During detailed design stage, surface and foul water discharge rates and connections will need to be approved by TWU.

6.4.3 Proposed drainage systems will need to be modelled in MicroDrainage to confirm required pipe sizes and storage volumes.

6.4.4 Overland flow routes have been shown on the drainage strategy through the development towards several wet ponds. Final external levels will be designed to prevent overland flow routes from entering buildings during extreme rainfall events.

6.5 Maintenance of Drainage Features

6.5.1 The design process should consider the maintenance of the components including any corrective maintenance to repair defects or improve performance of SuDS. Inlets, outlets, control structures or other below ground features should be as shallow as reasonably possible to allow easy access for maintenance and to reduce safety risks, while ensuring that sufficient depth is maintained for structural stability.

6.5.2 A SuDS Management Plan will be provided at detailed design stage which will identify the following:

- The function of SuDS;
- How and why it works on the site;
- Impacts on amenity and wildlife, indicating how they can be enhanced;
- Health and safety issues;

6.5.3 Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. Typical inspection and maintenance requirements for surface SuDS features are identified below:

Activity	**Indicative frequency**	**Typical tasks**
Routine/regular maintenance	Monthly (for normal care of SuDS)	• litter picking • grass cutting (cuttings to compost, wildlife piles or removed from site) Height and frequency dependent upon amenity of grass area. • inspection of inlets, outlets and control structures.
Occasional maintenance	Annually (dependent on the design)	• silt control around components • vegetation management around components • suction sweeping of permeable paving in autumn after leaf fall • silt and debris removal from inlets, outlets, gratings, catchpits, control chambers, soakaways and cellular storage. • strim wet swale or pond edges in September to October or 3-year rotation for wildlife value • wetland vegetation to be cut to 30% height annually and to 100mm on a 3 year rotation • remove overhanging trees or growth within SuDS features
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	• inlet/outlet repair • erosion repairs • reinstatement of edgings • reinstatement following pollution • removal of silt build up.

6.5.4 For below-ground SuDS, such as permeable paving, the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into the SuDS Management Plan.

6.5.5 Funding for the maintenance of SuDS features on the site should be resolved at the start of the development process to ensure that there is sufficient resources to maintain the systems in the long-term.

6.5.6 If the development is to be constructed in phases, the proposed surface water drainage system is established as soon as reasonably practicable. It will be necessary to ensure sufficient storage is provided for earlier phases of development to avoid flooding during the 1 in 100 year storm event plus 40% allowance for climate change.

7 Potential Sources of Flooding

7.1 Flooding from Rivers or Sea

7.1.1 The EA Indicative Floodplain Map, shown in **Figure 1.1**, identifies that the site lies wholly within Flood Zone 1; land considered to have a Very Low probability of flooding and defined as land having less than 1 in 1,000 annual probability of river or sea flooding.

7.1.2 The primary source of fluvial flooding from the site would be from Pymmes Brook, located approximately 450m east of the site.

7.1.3 The EA Indicative Floodplain Map identifies that fluvial flooding associated with Pymmes Brook would not affect any areas in the immediate vicinity of the site.

7.2 Flooding from Land (Surface Water)

7.2.1 Flooding from land occurs when intense rainfall is unable to soak into the ground or enter drainage systems. Local topography and built form can have a strong influence on the direction and depth of flow.

7.2.2 The EA indicative surface water flood map identifies land to the east of the existing school building on site, and the railway line abutting the western site boundary, are considered to be at a high risk of surface water flooding. A small corridor of land which passes through the middle of the site from north to south, before heading east towards Brunswick Park Road, is considered to be at a low risk of surface water flooding. An extract from the EA website is provided in **Figure 7.1** below.

Figure 7.1 – Environment Agency Indicative Surface Water Flood Map

7.2.3 Overland flow paths will be taken into account in design of levels for the proposed development to direct overland flows away from buildings. Overland flow routes are shown on the Indicative Drainage Strategy which is provided in **Appendix F.**

7.2.4 On-site drainage systems will be designed to accommodate runoff volume from a 1 in 100 year plus 40% climate change rainfall event, so as to minimise overland flow routes during such storm events.

7.3 Flooding from Groundwater

7.3.1 Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding events are most likely to occur in low lying areas underlain by permeable rocks (aquifers).

7.3.2 The SFRA identifies land within the eastern half of the site as being <25% susceptible to groundwater flooding. According to the SFRA maps, land to the north west of the site is considered to have no susceptibility to groundwater flooding. A copy of the Susceptibility

to Groundwater Flood Risk Map from the London Borough of Barnet SFRA is provided in **Appendix H**.

7.3.3 It is anticipated that groundwater flooding should not be an issue to the proposed development. However, overland flow routes will be taken into account in the design of levels for the proposed development and, should groundwater flooding occur on the site, flows will tend to run overland towards ponds situated at the low areas of the site.

7.4 Flooding from Sewers

7.4.1 The SFRA identifies between 61-80No. sewer flooding incidents within the N11 1 postcode area. However, the exact location of these incidents has not been specified. A sewer flooding history enquiry was submitted to Thames Water who confirmed that they have no historic recorded flooding incidents for the area in the vicinity of the site. A copy of the TWU sewer flooding history enquiry response in provided in **Appendix I.**

7.4.2 The development layout will be designed with consideration of flood routing, to ensure that new buildings and occupants of the site will not be subject to detrimental impacts in the event of flooding from infrastructure failure within or upstream of the site.

7.5 Flooding from Reservoirs, Canals and Other Artificial Sources

7.5.1 Inspection of the EA flood maps confirms that there are no records of flooding due to reservoirs, canals or other artificial sources in the vicinity of the site.

7.5.2 No other non-natural or artificial sources of flooding where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction, would appear to be located in the vicinity of the site which may cause increase floodwater depths or velocities.

8.0 Summary and Recommendations

8.1 Stomor Ltd have been commissioned by Comer Homes Group to prepare a Flood Risk Assessment (FRA) associated with proposed redevelopment North London Business Park in Barnet, London.

8.2 The overall area of the site is approximately 16.37 hectares (ha) and comprises office buildings, car parking facilities, a Secondary School and numerous other small structures.

8.3 The nearest watercourse to the site is Pymmes Brook, located approximately 450m east of the site.

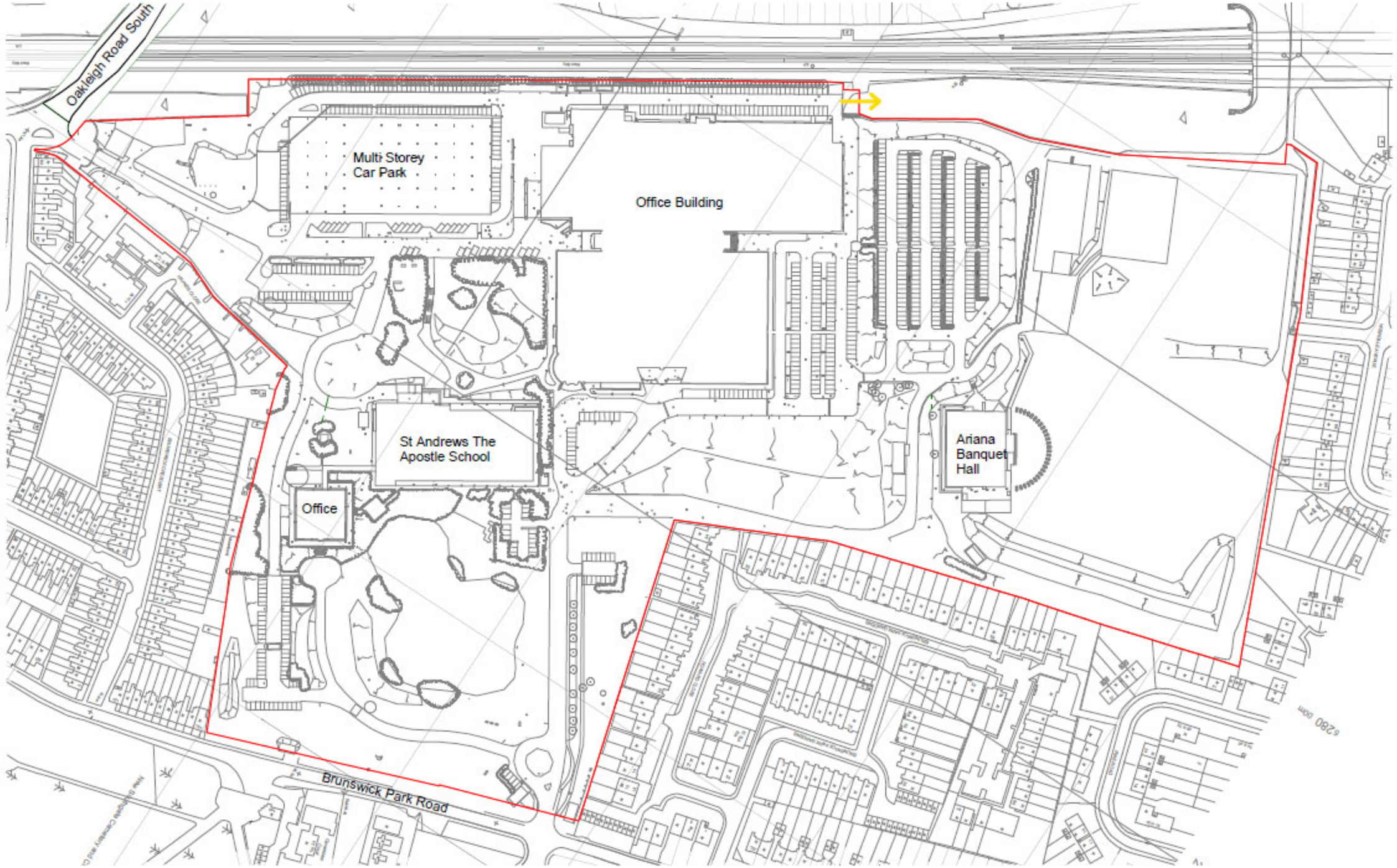
8.4 The proposed development would have an NPPF flood risk vulnerability classification of 'More Vulnerable'. The proposed development area of the site will be situated mostly within Flood Zone 1. NPPG identifies that 'More Vulnerable' uses of land are appropriate within this flood zone.

8.5 It is considered that the site would not be at risk of flooding from surface water, sewer, groundwater or artificial sources.

8.6 A potential surface water outfall from the development would appear to be feasible into the existing public surface water sewer passing through the site.

8.7 The proposed surface water drainage strategy demonstrates a system of SuDS and attenuation features to provide sufficient storage to avoid flooding within the site during the 1 in 100 year storm event + 40% allowance for climate change.

8.8 Overland flow paths will be taken into account in design of levels for the proposed development to direct overland flows away from buildings.



General Notes

1. Developmentment Zones (within which development can occur) and public open spaces are identified on drawing number 211_WS_02_01
2. Access and circulation routes are identified on Drawing number 211_WS_02_02.
3. Landscape treatments are identified on drawing number 211_WS_02_03
4. Allowable uses at ground floor frontages are identified on Drawing number 211_WS_02_04
4. Allowable uses at ground floor frontages are identified on Drawing number 211_WS_02_04
5. Allowable horizontal limits of deviations are identified on Drawing number 211_WS_02_05
6. Proposed site ground levels and allowable vertical deviations are identified on Drawing number 211_WS_02_06
7. Heights and allowable vertical deviations are identified on Drawing number 211_WS_02_07
8. Basement extents and allowable horizontal and vertical deviation are identified on drawing number 211_WS_02_08

NOT TO SCALE IN REPORT APPENDICES

NOTES:

REV:	DATE:	DETAILS:	INITIALS:

Legend

Planning Application Boundary

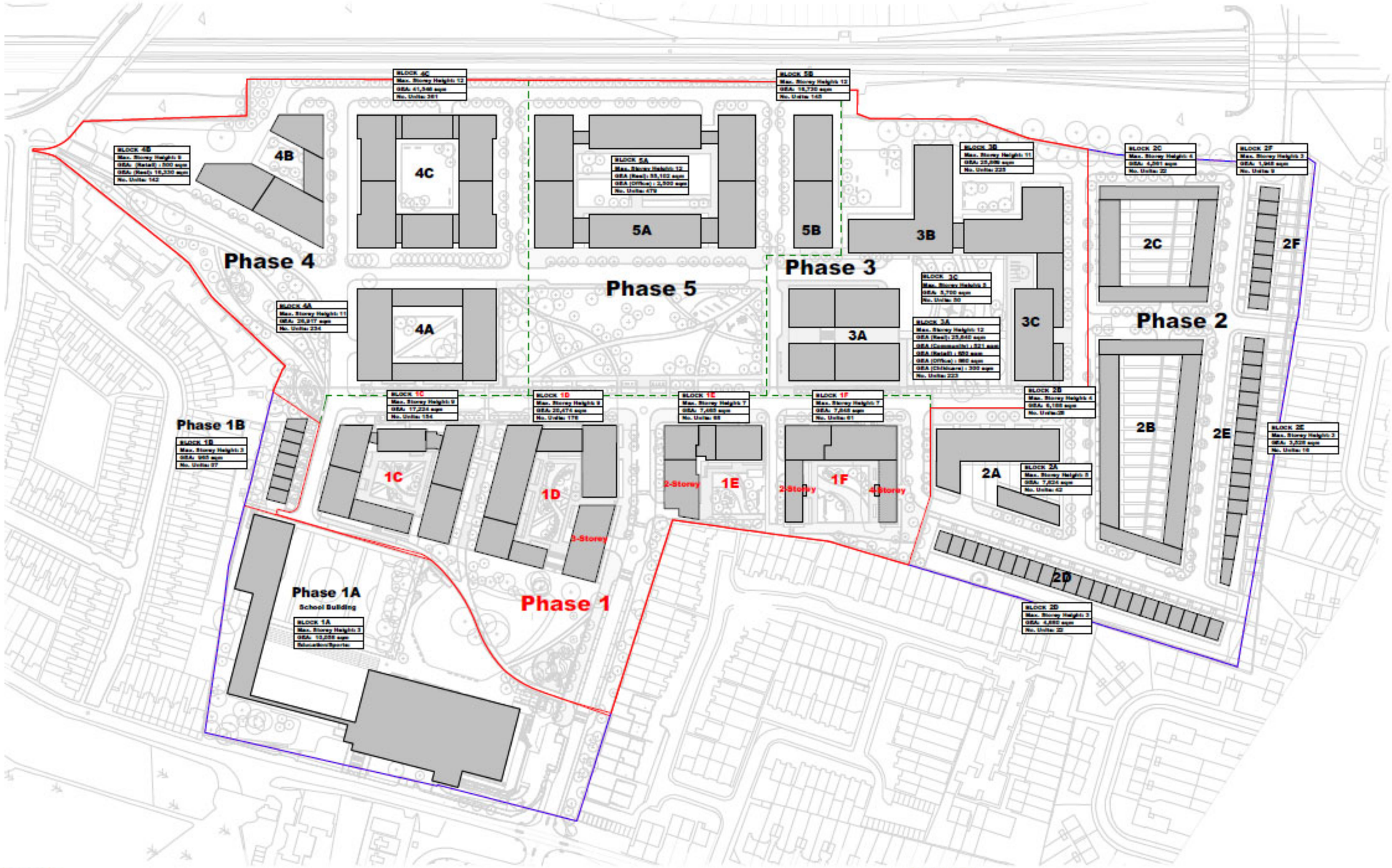
Land Owned by Applicant

NORTH POINT:

KEY PLAN:

PLUS ARCHITECTURE Bonhoeper Chambers, Bonhoeper Street, Dublin 2, Ireland. W: www.plusarchitecture.ie T: 353 (0) 1 531 3878

PROJECT: North London Business Park	PROJECT: 211	DATE: 31/05/2021
CLIENT: The Corner Group	DRAWING NO.: 211_WS_02_00	REVISION NO.:
TITLE: RedLine Boundary Plan	DRAWN BY: JG	SCALE @ A1: 1 : 1000
ISSUE TYPE: Planning	CHECKED BY: DT	SCALE @ A3: 1 : 2000



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8. Basement extents and allowable horizontal and vertical deviation are identified on drawing number 211_WS_02_06

Additional Notes

1. Refer to Section 5 of the Design Principles Document for further guidance on the Development Zone.
2. Refer to section 4 of the Design Principles Document for further guidance on the Public Open Space Zones, access routes typologies , and landscaping treatments of streets and spaces.
3. Refer to section 3 of the Design Principles Document for further guidance on the streets and circulation routes.

NOT TO SCALE IN REPORT APPENDICES

Legend

- Planning Application Boundary
- Public Open Space
- Detailed Application Zone Blocks
- Phase 1 — Detailed Application Zone Reference
- 1A — Detailed Application Zone Block Reference
- + 57.00 — Proposed Site Basement Level (.ACD) Limit of Deviation +/- 2.0m
- Phasing of Outline Component of Application

NOTES:

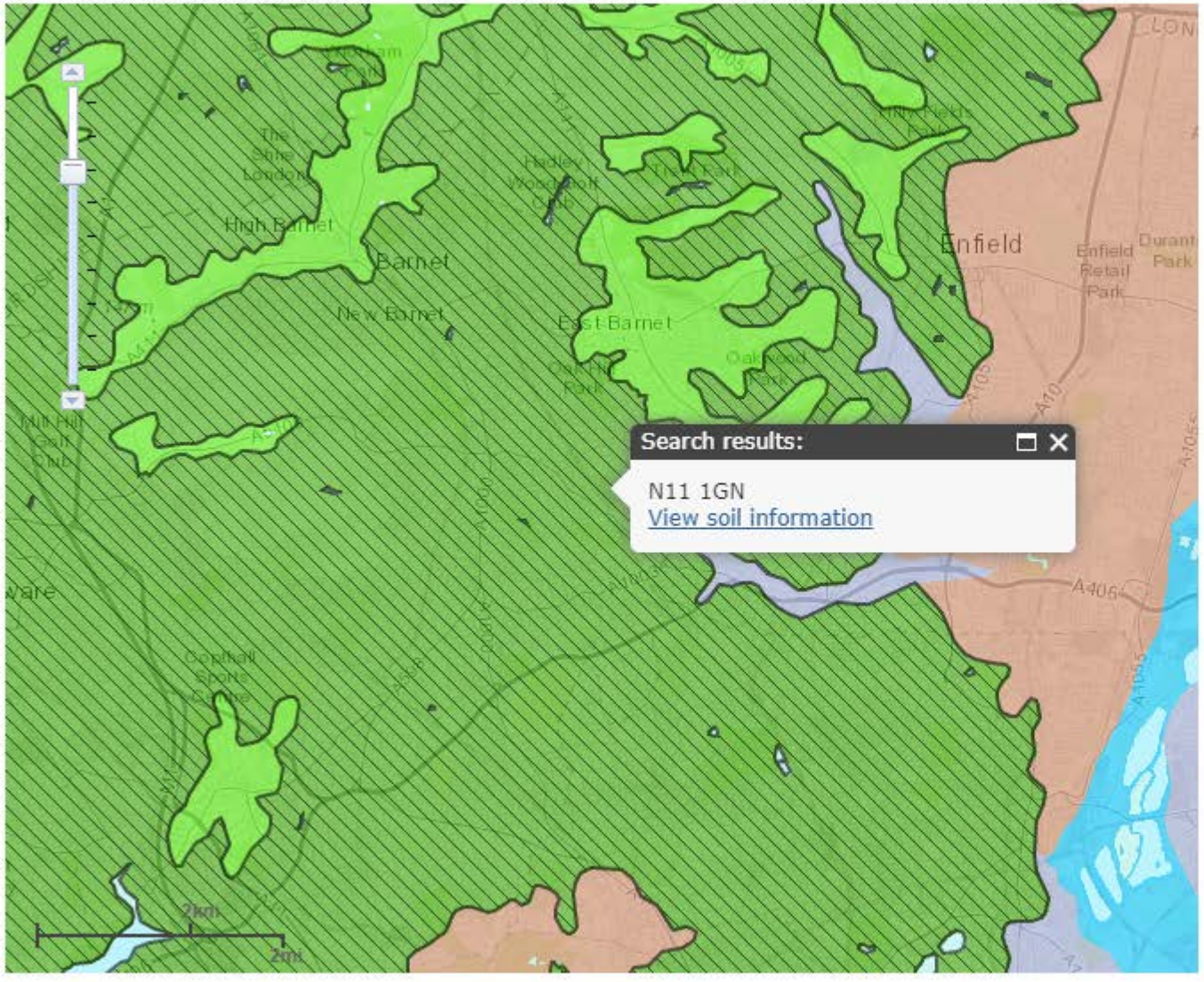
REV.	DATE:	DETAILS:	INITIALS:

NORTH POINT:

KEY PLAN:

PLUS ARCHITECTURE — Exchequer Chambers, Exchequer Street, Dublin 2, Ireland. W: www.plusarchitecture.ie T: 353 (0) 1 531 3078

PROJECT: North London Business Park	PROJECT: 211	DATE: 21/05/2021
CLIENT: The Corner Group	DRAWING NO.: 211_WS_02_01	REVISION NO.:
TITLE: Proposed Development Zone Plan	DRAWN BY: JB	SCALE AT A1: 1 : 1000
ISSUE TYPE: Planning	CHECKED BY: PP	SCALE AT A3: 1 : 2000



Adjust transparency

Legend

Search

Soil information

Soilscape 18:
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils

Texture:
Loamy and clayey

Coverage:
England: 19.9% Wales: 2.4%
England & Wales: 17.5%

Selected area:
483km^2

Drainage:
Impeded drainage

Fertility:
Moderate

Habitats:
Seasonally wet pastures and woodlands

Landcover:
Grassland and arable some woodland

Carbon:
Low

Drains to:

Asset location search

Property Searches

Stomor Ltd
19

HITCHIN
SG4 9SP

Search address supplied

Building 1
Oakleigh Road South
North London Business Park
London
N11 1GN

Your reference ST-3013

Our reference ALS/ALS Standard/2021_4405603

Search date 19 April 2021

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Building 1, Oakleigh Road South, North London Business Park, London, N11 1GN

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ2893SW
TQ2893NW
TQ2793SE
TQ2793NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Following examination of our statutory maps, Thames Water has been unable to find

any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TQ2893SW	Affinity Water
TQ2893NW	Affinity Water
TQ2793SE	Affinity Water
TQ2793NE	Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

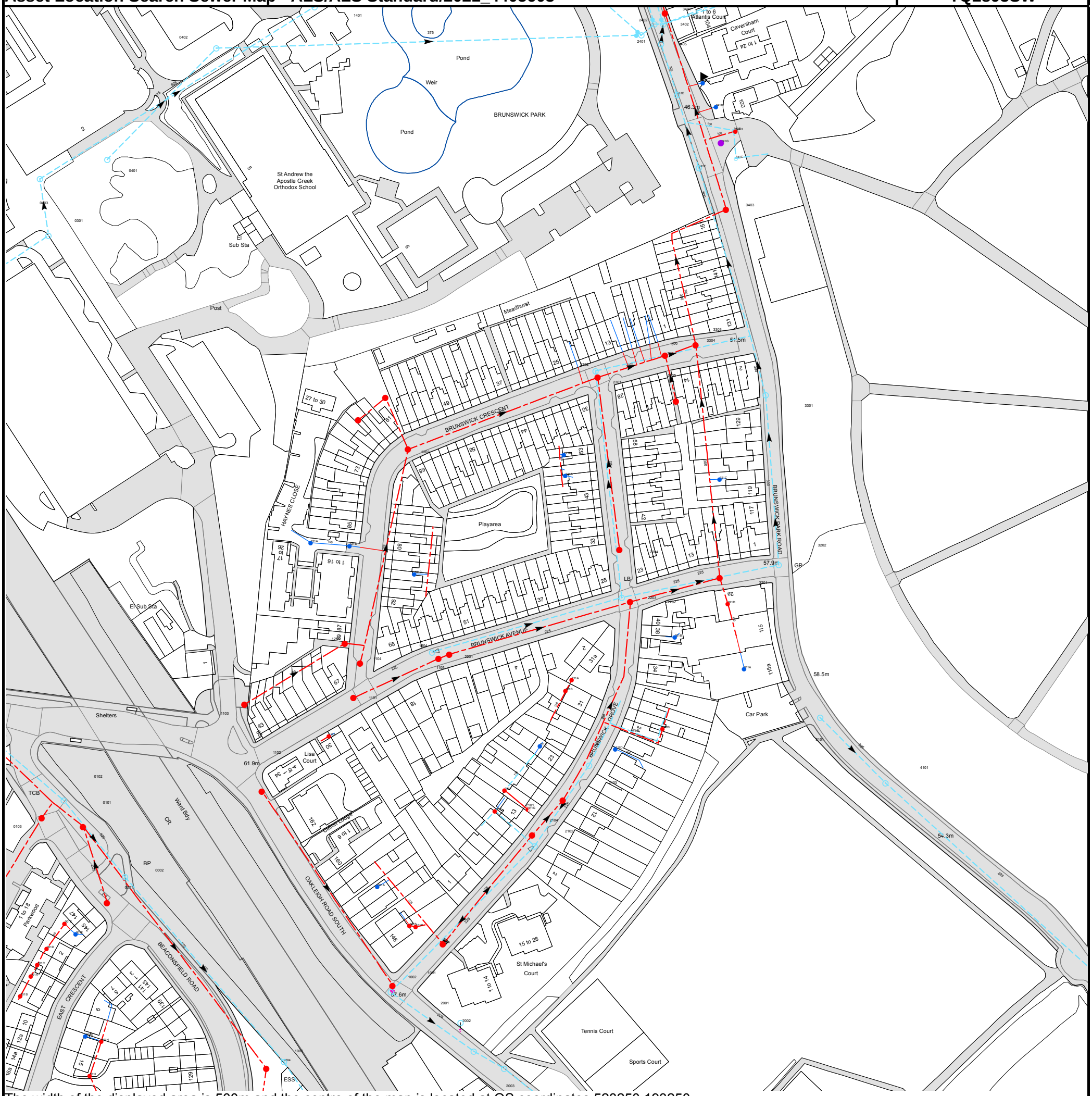
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4405603

TQ2893SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 528250,193250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2402	45.92	41.04
3405	45.98	44.57
3402	45.99	40.98
3401	45.99	45.08
221B	n/a	n/a
1202	57.7	55.03
3305	54.22	51.9
1301	n/a	n/a
3301	53.24	52.04
2301	55.02	52.99
2302	54.63	53.1
3304	53.15	50.45
3303	52.4	49.68
3403	47.75	46.1
341F	n/a	n/a
341C	n/a	n/a
341G	n/a	n/a
341H	n/a	n/a
341D	n/a	n/a
341B	n/a	n/a
341E	n/a	n/a
341A	n/a	n/a
1401	50.63	47.33
2401	49.38	41.38
4101	55.94	54.16
211D	n/a	n/a
311C	n/a	n/a
311B	n/a	n/a
3101	57.56	55.88
1104	.01	n/a
121C	n/a	n/a
1204	.01	n/a
1105	61.05	58.6
2201	60.94	n/a
221A	n/a	n/a
211A	n/a	n/a
2204	59	n/a
2203	59.86	n/a
2202	59.91	54.67
321B	n/a	n/a
321C	n/a	n/a
3201	58.88	54.08
321D	n/a	n/a
311A	n/a	n/a
3202	58.01	56.76
001I	n/a	n/a
1005	.01	n/a
1004	.01	n/a
2003	54.88	54.11
2002	55.66	54.31
001H	n/a	n/a
001G	n/a	n/a
2001	.01	n/a
1002	57.63	n/a
1001	.01	n/a
2004	58.16	56.18
001F	n/a	n/a
101C	n/a	n/a
101B	n/a	n/a
001E	n/a	n/a
0001	.01	n/a
101A	n/a	n/a
0002	61.18	59.43
2102	59.07	57.86
2101	59.26	55.9
0101	61.88	57.31
211E	n/a	n/a
211G	n/a	n/a
2104	59.59	55.86
1102	61.37	n/a
211F	n/a	n/a
2103	.01	n/a
211C	n/a	n/a
1103	.01	n/a
1101	61.29	59.05
211B	n/a	n/a
001B	n/a	n/a
001A	n/a	n/a
001C	n/a	n/a
0103	62.56	58.07
001D	n/a	n/a
0102	62.34	61.07
111A	n/a	n/a
121A	n/a	n/a
1201	61	59.71
121B	n/a	n/a
1302	n/a	n/a
0402	.01	n/a
0301	57.72	51.12
0403	57.44	51.02
0401	.01	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4405603

TQ2893NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 528250,193750

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 528250,193750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

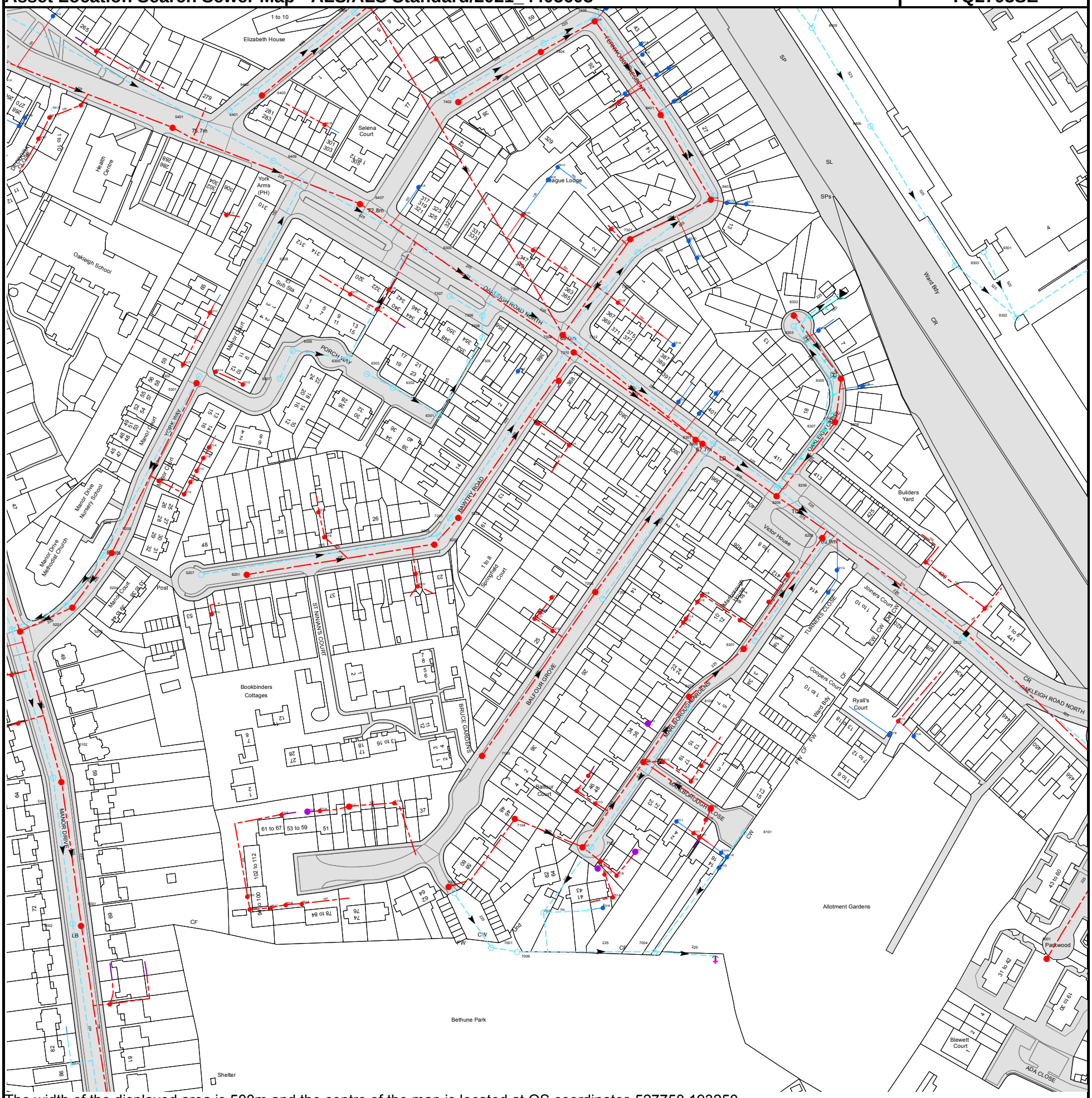
Manhole Reference	Manhole Cover Level	Manhole Invert Level
4706	46.14	43.29
4509	41.3	39.55
451A	n/a	n/a
4501	.01	n/a
4614	n/a	n/a
4508	40.95	39.32
4615	n/a	n/a
4602	45.26	43.07
4616	n/a	n/a
4510	42.89	38.9
4503	42.76	38.51
4502	.01	n/a
4701	43.1	41.5
3723	n/a	n/a
3639	n/a	n/a
3719	n/a	n/a
3724	n/a	n/a
3506	.01	n/a
3640	n/a	n/a
3514	44.75	43
3713	n/a	n/a
4603	n/a	n/a
4702	n/a	n/a
461A	n/a	n/a
4610	n/a	n/a
4506	44.37	42.42
4612	n/a	n/a
451C	n/a	n/a
4708	n/a	n/a
451B	n/a	n/a
4621	43.94	41.39
4611	n/a	n/a
4505	43.57	41.62
4703	n/a	n/a
4704	46.04	43.69
4507	43.72	41.97
4712	n/a	n/a
4711	n/a	n/a
4613	n/a	n/a
4705	45.97	42.12
4801	.01	n/a
4802	.01	n/a
3901	.01	n/a
4901	.01	n/a
2513	46.17	44.87
2507	46.27	45.47
2514	46.96	45.2
3622	n/a	n/a
2505	46.74	44.22
3510	46.76	44.83
3517	46.6	44.84
3509	46.54	44.06
3621	n/a	n/a
3508	46.39	44
3518	46.37	44.6
3603	n/a	n/a
3620	n/a	n/a
3619	n/a	n/a
3513	46.32	43.23
3504	45.6	43.03
3602	45.54	43.09
3507	45.66	43.68
3519	45.58	43.95
3601	44.79	43.09
3516	45.59	43.73
3515	45.66	43.73
3505	.01	n/a
2602	49.49	46.91
2703	49.55	47.32
2615	48.85	47.11
2603	48.79	46.98
2604	48.8	46.6
2605	48.47	n/a
261B	n/a	n/a
261C	n/a	n/a
261A	n/a	n/a
2704	48.79	47.94
371A	n/a	n/a
371B	n/a	n/a
3715	n/a	n/a
371C	n/a	n/a
3721	n/a	n/a
3717	n/a	n/a
3722	n/a	n/a
3607	n/a	n/a
3633	n/a	n/a
3714	n/a	n/a
3802	47.99	46.4
3720	n/a	n/a
3606	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3632	n/a	n/a
3638	n/a	n/a
3718	n/a	n/a
3612	n/a	n/a
161E	n/a	n/a
151D	n/a	n/a
151B	n/a	n/a
1604	52.66	50.37
1602	52.04	51.03
151C	n/a	n/a
161D	n/a	n/a
1603	51.04	49.47
151A	n/a	n/a
2611	50.18	49.16
2614	50.3	48.37
2511	.01	n/a
2610	49.56	48.3
2613	49.55	48.21
2609	49.55	48.1
2608	49.23	47.7
2612	49.26	47.98
2607	48.43	46.6
2606	48.44	46.27
2504	47.75	45.63
2503	46.63	43.88
2502	46.6	n/a
2501	46.58	45.28
261D	n/a	n/a
261E	n/a	n/a
2620	n/a	n/a
251A	n/a	n/a
1914	50.2	47.42
2905	48.53	45.56
1908	n/a	n/a
1916	49.85	47.4
1902	49.8	47.05
1917	50	47.39
1918	49.67	46.98
2902	49.75	46.84
2903	49.8	47
191C	n/a	n/a
1805	59.66	57.74
1806	59.34	n/a
181C	n/a	n/a
2803	n/a	n/a
181B	n/a	n/a
181E	n/a	n/a
181A	n/a	n/a
3803	n/a	n/a
1803	53.53	53.22
1802	53.4	52.11
2804	n/a	n/a
1801	56.57	n/a
1907	52.62	n/a
1906	51.53	n/a
1903	51.2	48.04
1913	50.83	n/a
191A	n/a	n/a
161G	n/a	n/a
161F	n/a	n/a
161I	n/a	n/a
171C	n/a	n/a
171D	n/a	n/a
171F	n/a	n/a
161C	n/a	n/a
1609	54.33	53.5
161B	n/a	n/a
1610	54.28	53.18
161A	n/a	n/a
1608	53.56	52.64
1607	53.43	52.14
1605	52.89	49.52
181D	n/a	n/a
1606	53.39	50.49
171A	n/a	n/a
1807	52.48	50.74
1804	52.35	50.04
2619	50.9	49.49
2618	48.85	47.11
2702	51.3	n/a
2701	51.29	n/a
2601	49.53	47.45
161H	n/a	n/a
0601	59.59	57.76
0602	59.58	58.06
061A	n/a	n/a
071C	n/a	n/a
0701	59.6	n/a
071B	n/a	n/a
071A	n/a	n/a
071H	n/a	n/a
071G	n/a	n/a
171E	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
071D	n/a	n/a
171G	n/a	n/a
0803	62.32	60.23
081B	n/a	n/a
081E	n/a	n/a
081C	n/a	n/a
081D	n/a	n/a
0806	57.86	56.05
0807	57.51	n/a
0808	57.45	n/a
0910	57.9	56.28
0903	55.78	n/a
0911	56.9	53.89
091G	56.13	55.09
0912	55.51	53.62
091H	56.13	54.77
0904	55.51	n/a
0913	55.09	53.47
0902	54.67	51.32
0905	55.05	n/a
0901	53.69	51.26
091D	n/a	n/a
0908	55.12	52.88
0906	54.46	52.89
0907	54.49	53.24
0909	57.94	56.84
091I	58.03	56.81
091F	57.65	56.28
091A	n/a	n/a
091B	n/a	n/a
091C	n/a	n/a
0802	62.47	n/a
081A	n/a	n/a
0804	59.59	n/a
0801	63.16	n/a
3902	46.87	44.48
191B	n/a	n/a
2901	49.06	48.24
1901	48.44	45.49
1912	48.84	46.98

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4405603

TQ2793SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 527750,193250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
811H	n/a	n/a
811E	n/a	n/a
8101	64.74	63.58
911B	n/a	n/a
911C	n/a	n/a
911A	n/a	n/a
9001	.01	-1.49
831H	n/a	n/a
821D	n/a	n/a
821A	n/a	n/a
8301	67.66	64.92
821E	n/a	n/a
831F	n/a	n/a
821B	n/a	n/a
8208	67.63	60.12
8207	67.52	66.35
831G	n/a	n/a
821C	n/a	n/a
8201	.01	n/a
8202	68.27	66.75
8206	67.18	65.93
8205	66.72	n/a
8203	66.93	59.75
8307	.01	n/a
821F	n/a	n/a
8308	64.32	60.16
821G	n/a	n/a
831B	n/a	n/a
921A	n/a	n/a
9202	65.8	64.27
921B	n/a	n/a
711I	n/a	n/a
7101	65.91	61.93
711H	n/a	n/a
7004	.01	n/a
811C	n/a	n/a
811J	n/a	n/a
8104	.01	n/a
8103	.01	n/a
811B	n/a	n/a
811I	n/a	n/a
811F	n/a	n/a
811A	n/a	n/a
811G	n/a	n/a
8102	.01	n/a
811D	n/a	n/a
7006	.01	n/a
7001	.01	n/a
7003	.01	n/a
701B	n/a	n/a
701A	n/a	n/a
7002	.01	n/a
701D	n/a	n/a
711B	n/a	n/a
711D	n/a	n/a
711A	n/a	n/a
711C	n/a	n/a
7103	64.28	62.36
7102	68.35	66.78
7104	.01	n/a
711G	n/a	n/a
711F	n/a	n/a
711E	n/a	n/a
7105	.01	n/a
721E	n/a	n/a
721D	n/a	n/a
721C	n/a	n/a
7204	70.93	68.01
721F	n/a	n/a
7203	.01	n/a
6202	73.11	70.82
6203	72.84	71.12
7201	72.84	70.91
7202	.01	n/a
531D	n/a	n/a
521E	n/a	n/a
521D	n/a	n/a
521C	n/a	n/a
5301	.01	n/a
5302	.01	n/a
521B	n/a	n/a
521A	n/a	n/a
531C	n/a	n/a
531A	n/a	n/a
631D	n/a	n/a
6307	.01	n/a
6306	75.41	73.96
6305	74.97	73.14
6303	.01	n/a
631A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6302	.01	n/a
6301	73.65	72.18
7309	.01	n/a
7306	70.57	69.41
7308	.01	n/a
731E	n/a	n/a
731D	n/a	n/a
7311	.01	n/a
7304	69.08	60.88
721A	n/a	n/a
7310	88.93	n/a
7312	68.93	n/a
5002	.01	n/a
501B	n/a	n/a
601E	n/a	n/a
601D	n/a	n/a
601C	n/a	n/a
611E	n/a	n/a
601B	n/a	n/a
601A	n/a	n/a
611D	n/a	n/a
611A	n/a	n/a
611C	n/a	n/a
5101	.01	n/a
5102	.01	n/a
501A	n/a	n/a
5001	.01	n/a
511A	n/a	n/a
511B	n/a	n/a
511C	n/a	n/a
5202	76.31	73.98
5201	76.36	74.68
5204	.01	n/a
5203	.01	n/a
621D	n/a	n/a
5207	75.41	73.96
6201	.01	n/a
621C	n/a	n/a
5205	.01	n/a
5206	.01	n/a
621B	n/a	n/a
621A	n/a	n/a
741A	n/a	n/a
741B	n/a	n/a
8405	57.31	53.5
8305	62.89	61.66
8306	.01	n/a
831A	n/a	n/a
831E	n/a	n/a
8303	62.57	61.27
9302	57.3	51.67
8302	62.41	60.49
9303	56.94	51.99
831C	n/a	n/a
9301	57.61	52.03
7302	.01	n/a
831D	n/a	n/a
7301	.01	n/a
841C	n/a	n/a
841D	n/a	n/a
8404	62.58	61.39
8403	.01	n/a
8406	57.03	52.93
8401	.01	n/a
8402	.01	n/a
841F	n/a	n/a
841E	n/a	n/a
741G	n/a	n/a
841G	n/a	n/a
7307	.01	n/a
7401	.01	n/a
7402	.01	n/a
7305	70.22	n/a
741D	n/a	n/a
731C	n/a	n/a
7404	.01	n/a
7403	.01	n/a
741E	n/a	n/a
741C	n/a	n/a
7406	.01	n/a
7405	63.59	60.85
7303	.01	n/a
741H	n/a	n/a
731A	n/a	n/a
731B	n/a	n/a
741F	n/a	n/a
5401	.01	n/a
641C	n/a	n/a
6401	75.37	73.84
6402	74.02	72.37
6308	75.77	74.8
6403	.01	n/a
6406	75.18	73.02

Manhole Reference	Manhole Cover Level	Manhole Invert Level
641B	n/a	n/a
631C	n/a	n/a
6404	68.48	66.91
6407	.01	n/a
6405	68.19	61.24
631B	n/a	n/a
641A	n/a	n/a
6309	.01	n/a
641D	n/a	n/a
541F	n/a	n/a
541H	n/a	n/a
541G	n/a	n/a
521F	n/a	n/a
541D	n/a	n/a
541C	n/a	n/a
541B	n/a	n/a
541A	n/a	n/a
521G	n/a	n/a
821I	n/a	n/a
821H	n/a	n/a
611B	n/a	n/a
541E	n/a	n/a
741I	n/a	n/a

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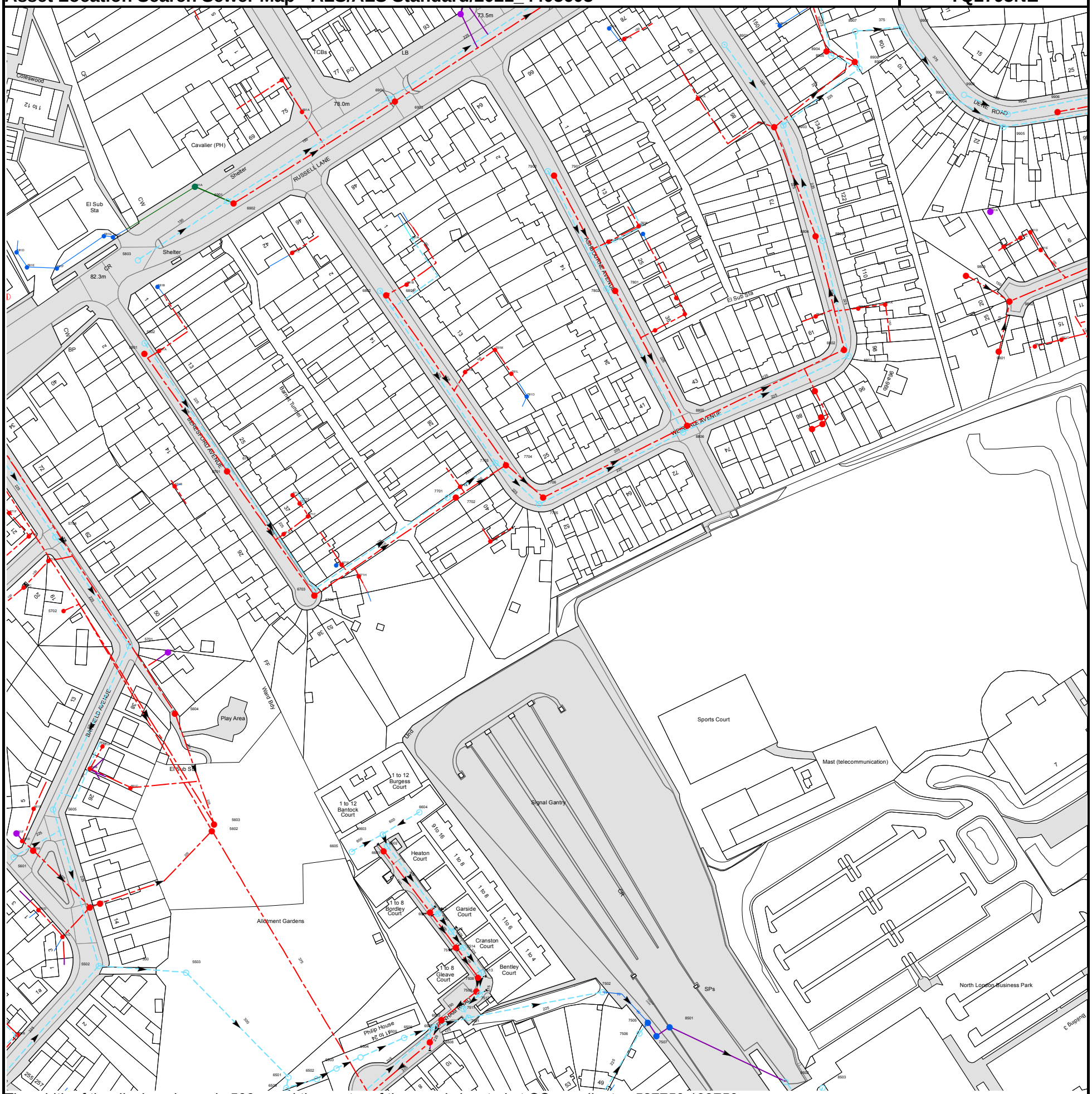
Asset Location Search Sewer Map - ALS/ALS Standard/2021_4405603

TQ2793NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 527750,193750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9905	59.5	57.12
9904	59.36	58.21
9906	58.91	57.42
9902	60.51	58.28
9903	60.26	58.48
8908	64.86	63.91
9901	61.81	59.64
9801	.01	n/a
981F	n/a	n/a
981G	n/a	n/a
881A	n/a	n/a
981A	n/a	n/a
9802	62.64	61.17
9803	.01	n/a
981E	n/a	n/a
981B	n/a	n/a
981C	n/a	n/a
981D	n/a	n/a
991A	n/a	n/a
7506	.01	n/a
7505	n/a	n/a
7507	n/a	n/a
8501	n/a	n/a
8806	72.66	n/a
8805	72.58	69.68
8502	n/a	n/a
8807	n/a	n/a
8809	n/a	n/a
8810	n/a	n/a
8503	57.72	53.87
8808	n/a	n/a
8801	68.04	66.11
8802	68	65.75
7804	n/a	n/a
881B	n/a	n/a
8811	n/a	n/a
8812	n/a	n/a
8803	66.32	64.45
8804	66.26	n/a
7803	n/a	n/a
781J	n/a	n/a
781K	n/a	n/a
8902	66.34	63.96
8903	66.31	64.18
891A	n/a	n/a
8906	64.9	63.71
8905	65.13	63.82
8904	65.15	63.63
8901	68.09	66.8
8907	.01	n/a
891B	n/a	n/a
7515	66.2	64.432
7510	66.267	64.72
7514	65.82	64.22
7511	65.5	62.6
7501	65.8	62.22
7509	65.7	64.33
7508	65.82	64.38
7512	65.55	63.623
7513	65.648	63.87
7502	n/a	n/a
6704	76.33	74.83
6703	76.32	74.85
671H	n/a	n/a
671G	n/a	n/a
671F	n/a	n/a
771B	n/a	n/a
671C	n/a	n/a
7705	75.17	72.93
671B	n/a	n/a
671E	n/a	n/a
7706	75.12	72.59
7701	76.44	n/a
7702	76.46	n/a
771A	n/a	n/a
7704	75.65	n/a
7703	75.67	n/a
781O	n/a	n/a
781L	n/a	n/a
781N	n/a	n/a
781M	n/a	n/a
6801	77.5	75.63
7801	72.38	n/a
6802	77.56	75.97
7802	72.36	n/a
681B	n/a	n/a
781H	n/a	n/a
781A	n/a	n/a
681A	n/a	n/a
5503	.01	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6509	.01	n/a
6501	69.93	68.9
6502	67.94	67.04
6503	.01	n/a
6504	.01	n/a
6505	65.9	63.73
6506	65.71	64.11
6508	65.84	63.85
6507	65.43	n/a
6510	65.28	64
5702	.01	n/a
571C	n/a	n/a
571D	n/a	n/a
5704	81.76	n/a
571A	n/a	n/a
671D	n/a	n/a
671A	n/a	n/a
571B	n/a	n/a
6701	79.84	77.86
6702	79.89	78.2
5801	81.78	79.91
581A	n/a	n/a
5802	81.81	80.31
5804	n/a	n/a
581B	n/a	n/a
581F	n/a	n/a
581E	n/a	n/a
5803	81.87	80.72
681C	n/a	n/a
581D	n/a	n/a
581H	n/a	n/a
581G	n/a	n/a
591A	n/a	n/a
6512	66.634	64.685
6511	66.756	65.34
551D	n/a	n/a
5501	76.19	73.49
551E	n/a	n/a
5601	78.18	76.33
6605	n/a	65.34
6601	67.58	66.25
5606	77.63	75.45
6602	67.675	65.187
561D	n/a	n/a
6603	n/a	65.3
561F	n/a	n/a
5602	72.66	62.8
5603	72.83	n/a
6604	n/a	65.348
5605	77.22	75.85
561E	n/a	n/a
561C	n/a	n/a
561B	n/a	n/a
561A	n/a	n/a
5604	76.72	n/a
571E	n/a	n/a
5701	78.82	n/a
551A	n/a	n/a
551B	n/a	n/a
5502	76.28	74.53
551C	n/a	n/a
571F	n/a	n/a
561G	n/a	n/a
6902	80.43	n/a
7901	72.89	n/a
7902	77.84	n/a
691A	n/a	n/a
6903	76.6	n/a
6904	76.51	n/a
691B	n/a	n/a
791A	n/a	n/a
791B	n/a	n/a
7904	n/a	n/a
7903	n/a	n/a
6901	80.48	n/a

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ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0800 009 4540.

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2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
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Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Jack Dudmish

Site name: NLBP

Site location: Barnet

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude: 51.62536° N

Longitude: 0.15124° W

Reference: 1884100542

Date: Jul 05 2021 17:14

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 16.37

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	670	670
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	75.08	75.08
1 in 1 year (l/s):	63.82	63.82
1 in 30 years (l/s):	172.69	172.69
1 in 100 year (l/s):	239.52	239.52
1 in 200 years (l/s):	280.81	280.81

Rev	Description	Date	Drawn	Checked	Apvd.

Project

ROYAL BRUNSWICK PARK - NEW SOUTHGATE

Drawing Description

DRAINAGE STRATEGY - WHOLE SITE - SHEET 1 OF 3

Project Number	Drawing Number
ST-3013	501

Scale	Date	Drawn	Checked	Approved
1:500@A1	04.05.21	TJW	SB	NJM

Client

Architect

stomor
CIVIL ENGINEERING CONSULTANTS
Suite 2, First Floor, Portmill House,
Portmill Lane, Hitchin, Herts, SG5 1DJ
www.stomor.com | 01462 615433 | info@stomor.com

ATTENUATION TANK 3
10.0x15.0x2.0 MODULAR TANK
INVERT LEVEL - 55.950m AOD
STORAGE VOLUME - 285m³

COMPLEX FLOW CONTROL CHAMBER
LIMITING FLOWS FROM PHASE 5 INTO
THE PHASE 1 INFRASTRUCTURE

ATTENUATION TANK 5
20.0x30.0x2.0 MODULAR TANK
INVERT LEVEL - 54.500m AOD
STORAGE VOLUME - 1140m³

COMPLEX FLOW CONTROL CHAMBER
LIMITING FLOWS FROM PHASE 4 INTO
THE PHASE 1 INFRASTRUCTURE

ATTENUATION TANK 4
15.0x25.0x2.0 MODULAR TANK
INVERT LEVEL - 50.600m AOD
STORAGE VOLUME - 712.5m³

KEY

- SITE BOUNDARY
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- PROPOSED DETENTION BASIN WITH PERMANENT WATER LEVEL
- PROPOSED POROUS PAVING
- PROPOSED SURFACE WATER PIPE RUN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER PIPE RUN
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED SURFACE WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED MODULAR STORAGE TANK
- PROPOSED GREEN ROOF
- PROPOSED GRANULAR STORAGE AREA TO COURTYARDS
- PROPOSED PERFORATED PIPE WITHIN COURTYARD STORAGE
- PROPOSED RAIN GARDEN - PRIMARY TREATMENT FOR HIGHWAY RUNOFF

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.

0 5 10 15 20 25m
SCALE BAR 1:500