Camden Goods Yard - Main Site

Surface Water Drainage Strategy

St George West London Ltd

CGY00-ACM-XXX-XX-RP-ST-000004

22nd May 2020

Quality information

Prepared by	Checked by	Verified by	Approved by
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Revision History

Revision	Revision date	Details	Name	Position
1	22/05/2020	First Issue	Yu Wu	Senior Engineer
2	07/07/2020	Second Issue	Yu Wu	Senior Engineer

Distribution List

# Hard Copies	PDF Required	Association / Company Name

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Introduction

This report is prepared as an addendum of consented Flood Risk Assessment (FRA) and Drainage Strategy dated June 2017, which to be included into Ramboll's Phase 2A S73 Environmental Implication Letter (EIL) It should be read in conjunction with the following documents:

- CGY00-ACM-XXXX-ZZ-DR-CV-002101_P01 Main Site Proposed Drainage Strategy (Appendix A)
- 1573/011 Rev D – Urban Greening Factor (Refer to Appendix B)

  1573/014 – Levels Strategy (refer to Appendix B)

The consented FRA and Drainage Strategy dated October 2017 proposed a restriction to the peak surface water discharge rate of 3 times Greenfield Rate for Phase 2A of the proposed development, however a subsequent Thames Water planning consultation email rejected 3 times Greenfield runoff (refer to Appendix E) due to the potential increased risk of flooding on-site. This report addresses the historical comments on the peak surface water discharge rate raised by Thames Water. Following further modelling, Greenfield runoff rates have been calculated and submitted to Thames Water for approval. Thames Water have responded with confirmation that the receiving sewer has available capacity to accept the proposed rates, refer to Appendix C for correspondence.

Existing Site

The application site is located adjacent to Juniper Crescent in the London Borough of Camden (LBC) and has an approximate total area of 2.86Ha. The existing site is currently occupied by a large Morrisons supermarket, service yard and surface car park .The application site Eastings and Northings are, 528412E, 184106N and postcode is NW1 8AA. There is only one highway access point to the north and three pedestrian access points.

The existing site has been raised compared to historic levels. This has allowed the existing site to be at the same ordinance datum as the surrounding railway lines and Gilbeys Yard. Access to the site is via Juniper Crescent, off the A502 Chalk Farm Road. This road passes beneath the railway line to the north of the site, under Southampton Bridge. The road then rises by approximately 6 metres (m) to reach the current Morrisons Store.

The application site is bound to the north-east and south-west by railway lines servicing London Euston to the south east. Juniper Crescent, the access road serving the site, runs along the northwest boundary. The rear gardens of the houses on Gilbeys Yard and the Interchange building are located along the south-east boundary.

In addition, the eastern corner of the site abuts the Horse Tunnel Market. This section of the market is below ground level in this area and the Morrisons Store car park extends over the roof of the market in this area.

Existing Site Topography

The application site is relatively flat with no significant changes in levels. Levels across the application site ranges from approximately 32.82m to 34.21m Above Ordnance Datum (AOD) with a slope trending from the high point in the north-west to the low point in the south-east. The Juniper Crescent access road has an approximate elevation of 32.89m near the roundabout on the western end of the site which falls steeply to approximately 27.15m near the railway bridge.

Proposed Site topography

The proposed site levels have been provided by Murdoch Wickham in March 2020, shown on drawing 1573/014. These levels have been used to determine surface water catchment areas for the Morrisons Store land parcel. The key changes that the level strategy proposes include;

- levels have been lowered by 5m at the north and north-east sections of the site adjacent to the access road;
- A new step in site levels occurs midway through the site towards the south of Block B;

- The southern area of the site south of Block B is levelled ranging from 34.000m and 34.500m;
- The western boundary levels range from 34.000m to 34.500m.

Design guidance requirements

The drainage strategy has been developed to comply with relevant policy documents including Draft New London Plan 2019 (Intend to Publish Version) and Camden Local Plan 2017, and sets out the minimum operating requirements as required in the National Planning Policy Framework (NPPF) and its relevant guidance document i.e National Planning Policy Guidance (NPPG)

From the above guidance documents, the following design criteria and design objectives have been set out:

- The development shall not increase flood risk and will reduce the risk of flooding where possible;
- No flooding during the 1 in 30 year rainfall events;
- Surface water arising from return periods above the 30 year event and up to 1 in 100 year, including a 40% climate change an allowance for climate change, shall be safely contained on site. No flood risk to the development users or vital infrastructure up to this event;
- Mimic the natural drainage regime;
- Utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve greenfield runoff rates where feasible and achieve all SuDS objectives; **Quantity** (attenuation) , improved water **Quality**, **Biodiversity** and **Amenity**.

Discharge options

The Camden Local Plan 2017 outlines a discharge hierarchy as below illustrating where rainwater collected on the development can be drained.

Drainage hierarchy
1. store rainwater for later use
2. use infiltration techniques, such as porous surfaces in non-clay areas
3. attenuate rainwater in ponds or open water features for gradual release
4. attenuate rainwater by storing in tanks or sealed water features for gradual release
5. discharge rainwater direct to a watercourse
6. discharge rainwater to a surface water sewer/drain
7. discharge rainwater to the combined sewer

Option 1: To provide a conservative estimate of the surface water volumes required to be held within SuDS features throughout the site, it is currently assumed that rainwater reuse will not be reduce the volume of attenuation within the proposed development.

Option 2: Due the underlying London Clay, which is confirmed in Ramboll Environmental study from 2016, and the proposed basement, disposal of runoff via infiltration techniques is not viable for the proposed development.

Option 3: The proposed development is in a high density urbanised area with basement underneath, therefore ponds/open water features are not feasible.

Option 4: This is the primary drainage discharge option. AECOM has proposed geocelluar attenuation tanks at podium and below the ground, to help to gradual release the surface water runoff. Vortex flow controls and orifice plates are also proposed to limit the runoff flow rate to greenfield rates.

Option 5: The proposed development is in a high density urbanised area with basement underneath, therefore discharge to a watercourse is not feasible. In addition, there are no watercourses within the footprint of the site.

Option 6 : Once the rainwater runoff is released from geocelluar attenuation tanks, it will discharge into a combined sewer.

Drainage Strategy

Existing Drainage

The application site is served by a combined TWUL sewer network (refer to Appendix C for TWUL Asset Plan).

The TWUL Asset Plans show that a combined sewer with nominal internal dimensions of 1524 x 914mm runs from south-west to north-east across the application site. This existing sewer has an approximate crown level of 27.40mAOD assuming a 500mm brick construction thickness. This sewer poses a significant constraint to proposed drainage infrastructure and attenuation passing over. A second TWUL combined sewer is located to the east of the application site which runs under the Gilgamesh restaurant and the railway track and has a diameter of 450mm. This sewer then continues to the west with nominal internal dimensions of 1372 x 914mm and merges with the 1524 x 914mm sewer. This sewer also receives flow from a 610 x 457mm combined sewer which is believed to have formerly served the adjacent plot at Gilbeys Yard.

Once the two combined sewers have merged, the resultant sewer then continues beneath the access road that crosses the railway line north of the site and then runs north to discharge to a 1855 x 1804mm combined sewer within Chalk Farm Road.

Proposed Surface Water Discharge Rates

The emerging drainage strategy aims to mimic the natural flow routes and discharge regimes during a rainfall event. This is driven by specific site characteristics, including site topography and ground conditions.

The Draft New London Plan 2019 (Intent to Publish Version) states the following Policy in discharge rates:

"Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible".

In addition, the Council also *"require developments to utiltise Sustainable Drainage Systems (SuDS), to achieve greenfield runoff rates, unless demonstrated that this is not feasible"*. On top of that, the site is located in an Critical Drainage Area Group3_003 as shown in London Borough of Camden Strategic Flood Risk Assessment and Thames water required surface water to be attenuated to Greenfield runoff rates in their pre-planning response backing 21st July 2017, as the development *"is in the Counters Creek Catchment where significantly property flooding already occurs".*

Therefore, surface water flows from the development should be limited to greenfield 1 year, 30 year and 100 year (+ 40% climate change) rates for the corresponding return period. Thames Water has confirmed via a pre-planning response letter (See Appendix D) that they have no objections to the proposal if the peak surface water runoff discharge is restricted to greenfield runoff rates.

The total development area shown in Figure 1 is 2.86ha, including the green hatched access road and the brown hatched main site. However, no change is proposed to the existing catchment area for the road at the north-west of the site (green hatch - approx. 0.22ha) as it will drain as per existing via a separate highway drainage network. Therefore, the remaining catchment area to be considered within this drainage strategy is for the main site and is calculated as 2.64ha

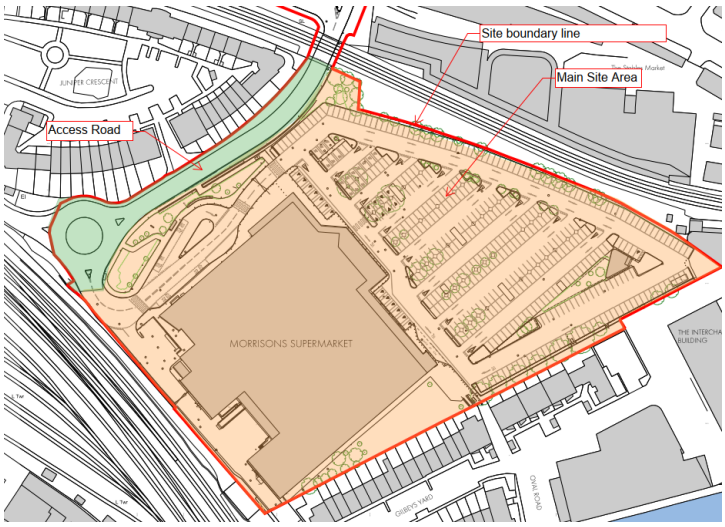
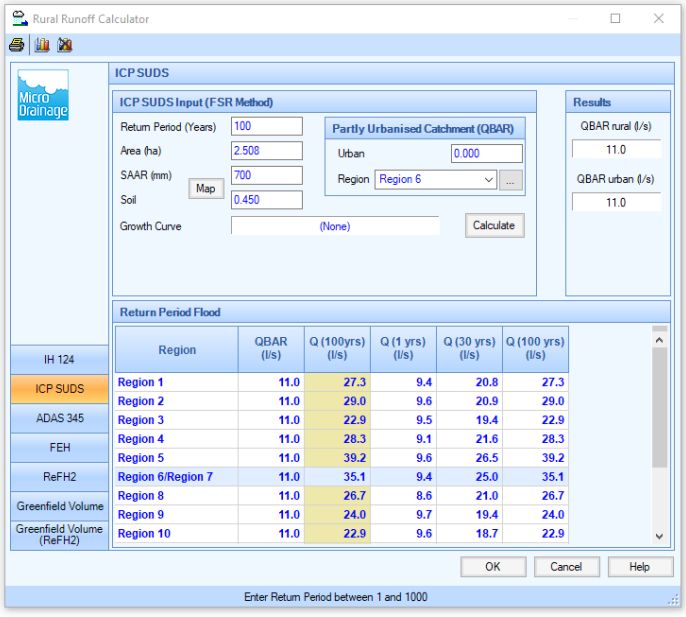


Figure 1 –Development Area

The greenfield runoff rates have been calculated using the MicroDrainage Rural Runoff Calculator, as shown in Figure 2. The results of the Rural Runoff Calculator show the following allowable rates:

- 1 year allowable peak discharge rate = 9.4 l/s
- 30 year allowable peak discharge rate = 25.0 l/s
- 100 year + 40% allowable peak discharge rate = 35.1 l/s

To determine the allowable greenfield runoff rates, it has been assumed that the development will have 95% impermeable area, with 5% soft landscaping. Therefore, the allowable greenfield runoff rates for the site have been based on 2.508ha.



Region	QBAR (l/s)	Q (100yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	11.0	27.3	9.4	20.8	27.3
Region 2	11.0	29.0	9.6	20.9	29.0
Region 3	11.0	22.9	9.5	19.4	22.9
Region 4	11.0	28.3	9.1	21.6	28.3
Region 5	11.0	39.2	9.6	26.5	39.2
Region 6/Region 7	11.0	35.1	9.4	25.0	35.1
Region 8	11.0	26.7	8.6	21.0	26.7
Region 9	11.0	24.0	9.7	19.4	24.0
Region 10	11.0	22.9	9.6	18.7	22.9

Figure 2 – Rural Runoff Calculator Results

Attenuation volumes

The attenuation volumes have been calculated using the Quick Storage Estimate calculator within MicroDrainage Source Control module. The input variables are shown in Figure 3. The attenuation volume storage calculation is based on using the previously consented FSR rainfall data.

To provide a conservative attenuation estimate that accounts for the low permeability of the soil, it has been assumed that both hard and soft landscaped areas will contribute to the proposed drainage system. Therefore, an attenuation volume has been based on 2.64ha.

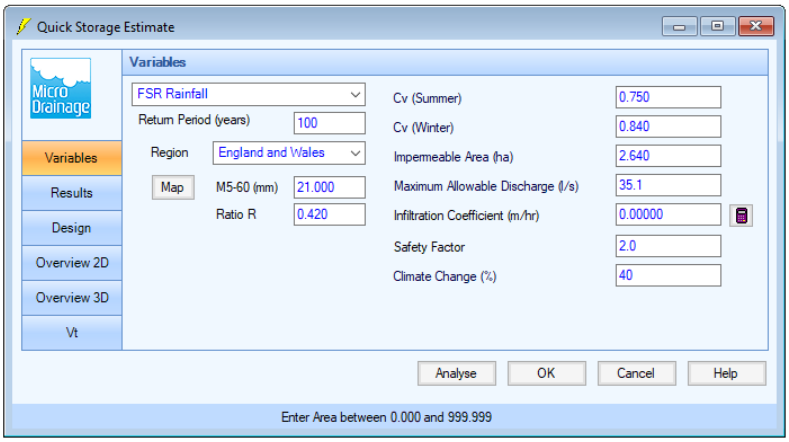


Figure 3 – FSR Quick Storage Estimate Input Variables

The Quick Storage Estimate (QSE) results for the 100 year return period with 40% for climate change is shown in Figure 4 and yields a range of volumes from 1265m³ to 1712m³. It should be noted that these are estimates and further modelling through the future stages of design should be carried out to optimise the volumes.

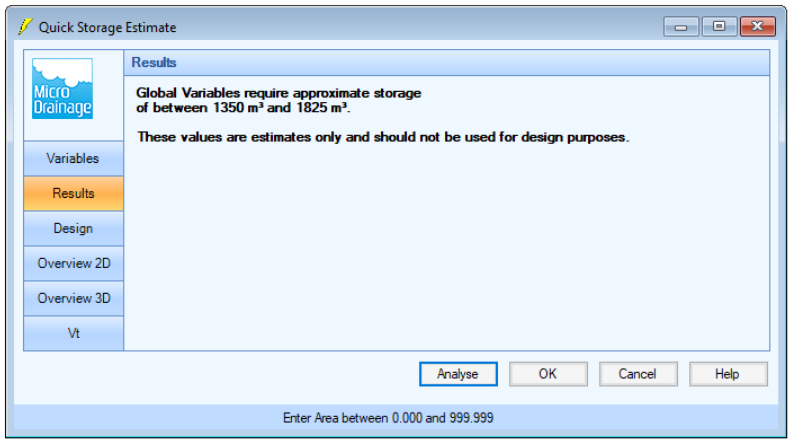


Figure 4 – FSR Quick Storage Estimate Results

Due to the size of the site and its location within a critical drainage area, the attenuation volumes have been assessed against the FEH rainfall data. The result of a QSE shown in Figure 5 below indicates that an attenuation volume of up to 2273m³ could be required. The strategy therefore aims to achieve as close as possible to this volume.

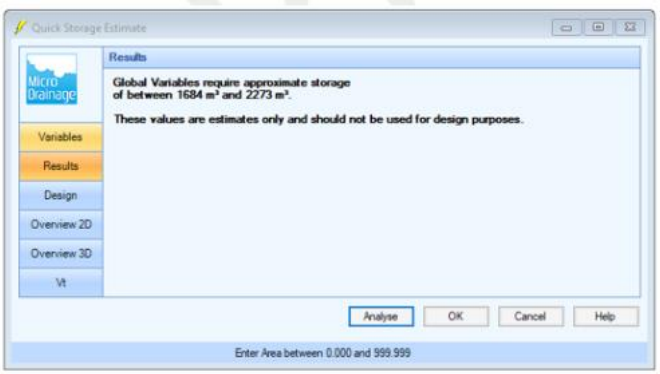


Figure 5 – FEH Quick Storage Estimate Results

Surface water catchments and attenuation distribution

The distribution of attenuation throughout the site has been investigated to determine the likely location of attenuation. This investigation has considered both the building drainage points provided by the project Mechanical Engineers (MEP) and proposed site levels provided by Murdoch Wickham in 05/05/2020, shown on drawing 1573/014. This data has produced two main catchment areas: a northern catchment and a southern catchment, as shown is Figure 6.

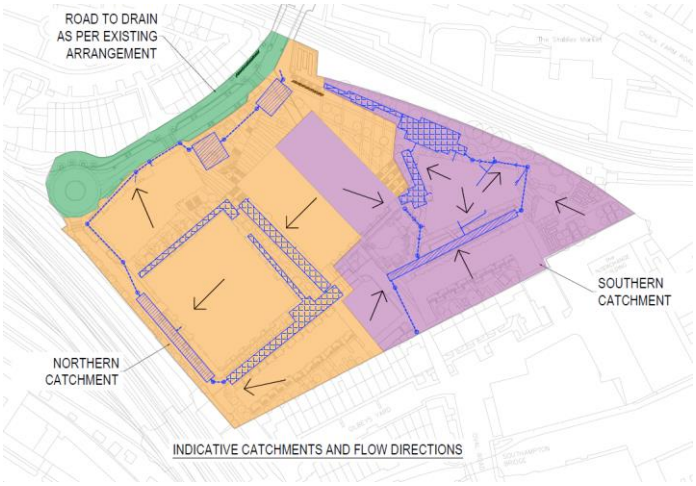


Figure 6 – Proposed Surface Water Catchment Areas

The northern catchment area accepts roof water runoff from Blocks A, E2, F and 50% of Block B via rain water pipes (RWP) routed internally to a centralised location coordinated with MEP. In addition to this roof area, the proposed external paved areas adjacent to these blocks also contribute runoff. The anticipated collection method from external pavements will be a combination of permeable paving and linear channel drains. All collection features will discharge into the underground attenuation tanks shown on drawing CGY00-ACM-XXXX-ZZ-DR-CV-002101_P01 located in Appendix A. The arrows on Figure 6 illustrate the direction for surface water runoff to be conveyed and stored within the proposed drainage network. The discharge location for the entire northern catchment area is a proposed connection into the existing combined sewer south of the existing underpass within the access road, at the northern corner of the site.

The southern catchment collects surface water runoff from the area shaded in purple on Figure 6. The specific areas include Block C, D, E1 and 50% of B. The external pavements adjacent to these blocks will also be accepted into the southern catchment area. The collection feature will include permeable paving and linear channel drains and will discharge into the underground

attention tanks shown on drawing CGY00-ACM-XXXX-ZZ-DR-CV-002101_P01. The discharge location for the entire southern catchment area is a proposed connection into the proposed combined sewer diversion northeast of Block C.

For all surface water drainage networks, the attenuation will comprise of two types of tanks, shallow tanks (permavoid or similar systems) and deeper geocellular attenuation crate systems. The shallower permavoid units have been selected to be situated in external areas with basement or podium deck structures below. This system can be used in areas where limited cover is a particular constraint. Where the depth to the top of the attenuation crates is not a constraint, standard geocellular attenuation systems can be used.

Due to limited space available for attenuation tanks, the drainage networks have been designed to incorporate a cascading attenuation system, mobilising all external areas to be utilised for storage therefore allowing the site to achieve sufficient storage to meet the proposed discharge rates (greenfield runoff rates).

As a result of using attenuation at multiple levels throughout the site, several flow control devices will be required to restrict flow from each tank, fully utilising the storage within. This can be in the form of orifice plates or vortex flow controls. Consideration for access to both the attenuation tanks and flow control devices has been given to allow appropriate maintenance activities to take place safely.

Various urban greening features shall be linked to the attenuation systems to ensure the site provides not only the quantum of SuDS required but also quality, biodiversity and amenity. Drawing 1573/011 Rev D – Urban Greening Factor indicated location of these feature including rain gardens, permeable paving and tree pits that all can act as collection or attenuation features to unlock all SuDS benefits.

Roof gardens, extensive green roofs and, brown roofs are being incorporated into the masterplan as illustrated in both the consented Design and Access Statement dated June 2017 and S73 Design and Access Addendum dated June 2020. Further stages of design and hydraulic modelling is required to investigate the impact that these roof types will have on the underground attenuation system. It is anticipated that the investigation will yield a reduction in underground attenuation volumes by providing capacity at source within the roof systems.

To support the structural design assumptions, subsurface drainage will be proposed to reduce pour water pressure of the basement floor slab. A drainage blanket beneath the floor slab is proposed to remove perched water and discharge to the proposed on-site drainage network. Approvals from Thames Water will be required. Further consideration to the quality of the water will be investigated to understand if surface water treatment will be required prior to entering the Thames Water sewer.

Maintenance and ownership

The onsite drainage systems serve several buildings all within one curtilage, therefore shall be privately owned. The exceptions to this are the two Thames Water diversions. Thames Water sewers shall be adopted and maintained by Thames Water in accordance with the requirements of Sewers for Adoption.

All private drainage infrastructure will be maintained by the site owner(s) in perpetuity. A maintenance company will be set up to ensure the drainage system is kept in a suitable state of repair. All SuDS features and conventional drainage infrastructure will be maintained in line with recommendations of the SuDS manual.

Conclusion

The existing drainage arrangement consists of traditional piped networks which discharge at an unknown rate into the existing Thames Water combined sewer. The existing site is predominately impermeable with a limited soft landscaping along the perimeter of the site.

The proposed site is a high-density development that has maximised the external space to support the surface water drainage strategy. Through coordination with the landscape architect, MEP and structural engineers the development has allocated not only the appropriate volume of attenuation but also the correct distribution of attenuation across the site to overcome the challenging levels constraints and spatial requirements.

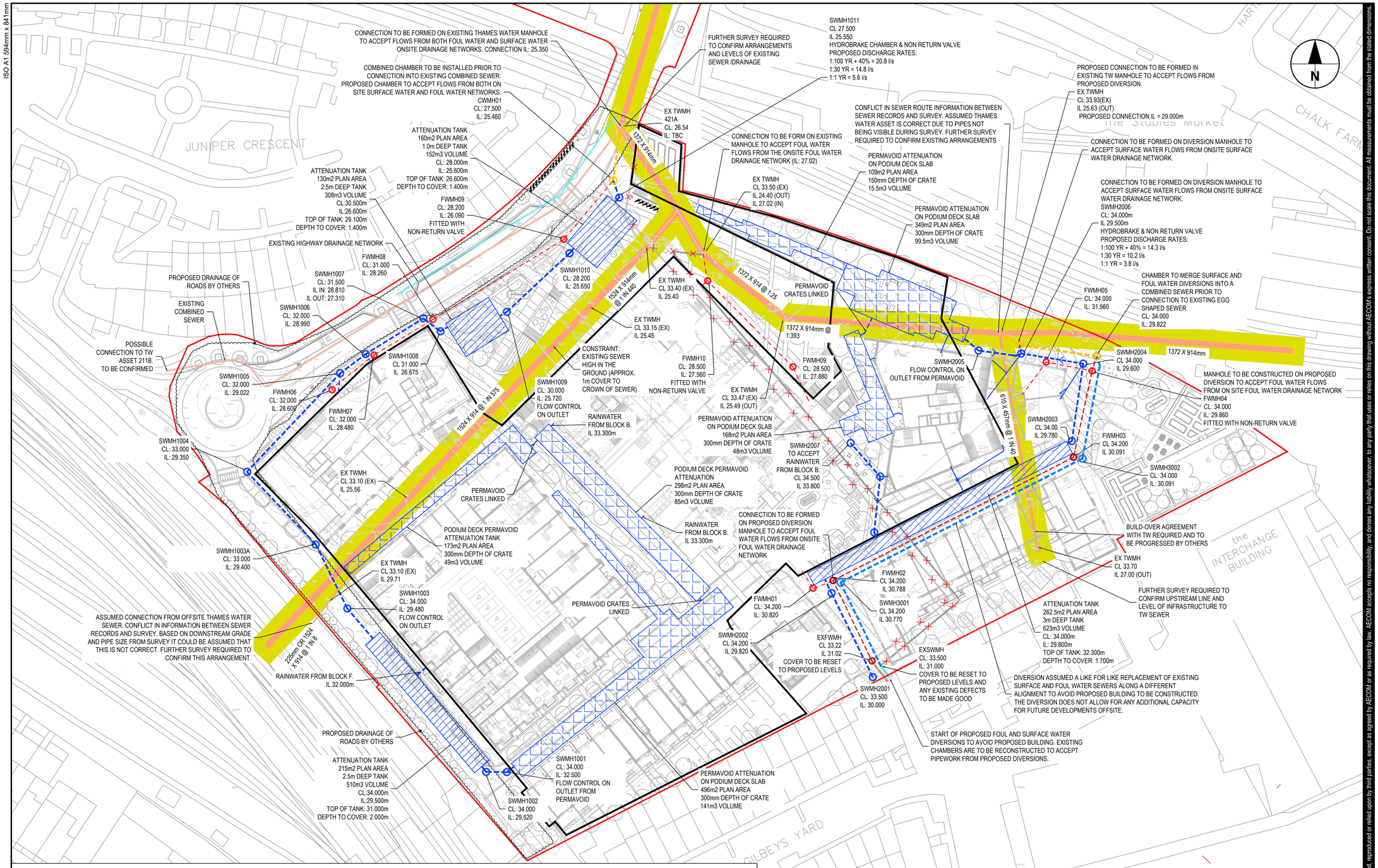
The surface water strategy achieves a restricted peak discharge rate of greenfield runoff rates for the equivalent return periods by utilising a cascading attenuation system allowing the site to maximise all external areas and promoting at source storage. This will allow urban greening features such as tree pits, rain gardens and green roofs to be linked to the attenuation features helping to provide a drainage strategy that achieves all the SuDS objectives including quantity, quality, biodiversity and amenity.

Appendix A – Drawing: CGY00-ACM-XXXX-ZZ-DR-CV-002101_P01 – Main Site Proposed Drainage Strategy

ISO A1 594mm x 841mm

Project Management Initials: Designer: OH | Drawn: OH | Checked: NP/RP | Approved: SG

Last saved by: YU,WU (2020-06-16) Last Plotted: 2020-07-07
Filename: K:\INFRASTRUCTURE LONDON\60620758 - CAMDEN GOOD YARD\06_CAD_DATA\01-WIP\[DISCIPLINE]\01_01-DRAWINGS\CGY00-ACM-XXX-ZZ-DR-CV-002101.DWG



NOTES

1. DESIGN SUBJECT TO BUILDING CONTROL, LOCAL AUTHORITY, WATER AUTHORITY APPROVALS AND COMMENTS.
2. DRAWING USES BACKGROUND INFORMATION RECEIVED FROM:
   - LANDSCAPE ARCHITECT PROPOSED EXTERNAL LEVELS " 1573 / 014 SITE WIDE LEVELS STRATEGY" DATED MARCH 2020
   - LANDSCAPE ARCHITECT LAYOUT "1573 GF BASE_202000511" (RECEIVED 11/05/2020)
   - ARCHITECT PROPOSED GROUND FLOOR LAYOUT (RECEIVED ARIL 2020)
   - MEP DRAIN POINTS LOCATION (RECEIVED 15/05/2020)
3. DESIGN IS SCHEMATIC TO INFORM PLANNING APPLICATION AND SHALL BE DEVELOPED DURING FURTHER STAGES OF DESIGN
4. THE DRAINAGE SYSTEM HAS BEEN DESIGNED TO DISCHARGE GREENFIELD RATES FOR EQUIVALENT RETURN PERIODS OF ALL STORMS UP TO AND INCLUDING THE 1 IN 100 YEAR RETURN PERIOD PLUS A 40% ALLOWANCE FOR CLIMATE CHANGE WITH NO SURFACE FLOODING.
5. ALL BUILDING DRAINAGE TO BE INSTALLED AND TESTED IN COMPLIANCE WITH PART H OF THE BUILDING REGULATION 2015 AND BS EN 752:2017.
6. ALL DRAINAGE RUNS TO BE LAID SOFFIT TO SOFFIT UNLESS SPECIFIED OTHERWISE.
7. MEP, ELECTRICAL SUPPLY, TRADE EFFLUENT, GREASE CONTROL, PUMPING STATION, VENTING AND BUILDING MANAGEMENT SYSTEM COMMUNICATION BY OTHERS.
8. RAINWATER PIPES THAT DO NOT CONNECT TO AN ACCESS POINT SHALL BE FITTED WITH A RODDING ACCESS ABOVE GROUND. WHERE APPROPRIATE, DIFFUSER UNITS WILL BE INCLUDED TO PROTECT DOWNSTREAM ATTENUATION TANKS FROM INGRESS OF DEBRIS.
9. PRIOR TO THE COMMENCEMENT OF WORKS THE CONTRACTOR SHALL LIAISE WITH THE RELEVANT AUTHORITIES TO LOCATE, PROTECT AND, WHERE NECESSARY, DIVERT ANY AFFECTED SERVICES
10. CONTRACTOR IS RESPONSIBLE FOR ALL AGREEMENTS, NEGOTIATIONS AND PAYMENTS REQUIRED BY THE UNDERTAKER.
11. EXACT LEVELS OF NEW COVERS AND FRAMES TO BE DETERMINED ON SITE TO MATCH LEVEL AND PROFILE OF FINISHED SURFACE.
12. WHERE ROOT BARRIER MEMBRANE IS REQUIRED TO PROTECT DRAINAGE INFRASTRUCTURE FROM TREE ROOTS, DETAILS SHALL BE SPECIFIED BY LANDSCAPE ARCHITECT.
13. WHERE DOWNPIPES ARE CONNECTED TO TANKS, ACCESS AND DIFFUSER UNITS SHALL BE PROVIDED FOR EASE OF MAINTENANCE.
14. DRAINAGE CONSTRUCTION WORKS ARE TO BE IN ACCORDANCE WITH BUILDING REGULATIONS PART H, EXCEPT WHERE INFRASTRUCTURE SHALL BE ADOPTABLE, IN WHICH CASE THE DRAINAGE CONSTRUCTION WORKS SHALL BE COMPLETED IN ACCORDANCE WITH SEWERS FOR ADOPTION AND CESWI.
15. STRATEGIC DRAINAGE IS SHOWN ONLY. ADDITIONAL INFRASTRUCTURE WILL BE REQUIRED TO DRAIN SITE SUCH AS GULLIES, CHANNELS, BUILDING DRAINAGE ETC.

AECOM

PROJECT
CAMDEN GOODS YARD

CLIENT
ST GEORGE
WEST LONDON LTD

CONSULTANT

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GENERAL NOTES

THIS DRAWING IS TO BE USED FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR ONLY AND IS SUBJECT TO AMENDMENT DURING DESIGN DEVELOPMENT.

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION, ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN THESE DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ARCHITECT AND/OR THE ENGINEER FOR CLARIFICATION.
2. DO NOT SCALE FROM DRAWING FOR CONSTRUCTION PURPOSES, USE ONLY PRINTED DIMENSIONS, ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN THESE DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ARCHITECT AND/OR THE ENGINEER FOR CLARIFICATION.
3. ALL DIMENSIONS, CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS NOTED OTHERWISE.
4. DESIGN IS SCHEMATIC TO INFORM PLANNING APPLICATION AND SHALL BE DEVELOPED DURING FURTHER STAGES OF DESIGN

KEY

- PROPOSED ATTENUATION TANK
- PROPOSED SURFACE WATER DRAIN AND MANHOLE
- PROPOSED SURFACE WATER DIVERSION
- PROPOSED FOUL WATER DRAIN AND MANHOLE
- PROPOSED FOUL WATER DIVERSION
- PROPOSED COMBINED SEWER
- EXISTING COMBINED SEWER
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- INDICATIVE EXISTING EASEMENT
- EXISTING SEWER PROPOSED TO BE REMOVED
- PROPOSED BASEMENT EXTENTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P02	21.05.2020	ISSUE FOR STAGE 2+ DESIGN
P01	01.05.2020	ISSUE FOR COORDINATION

PURPOSE OF ISSUE
FOR INFORMATION

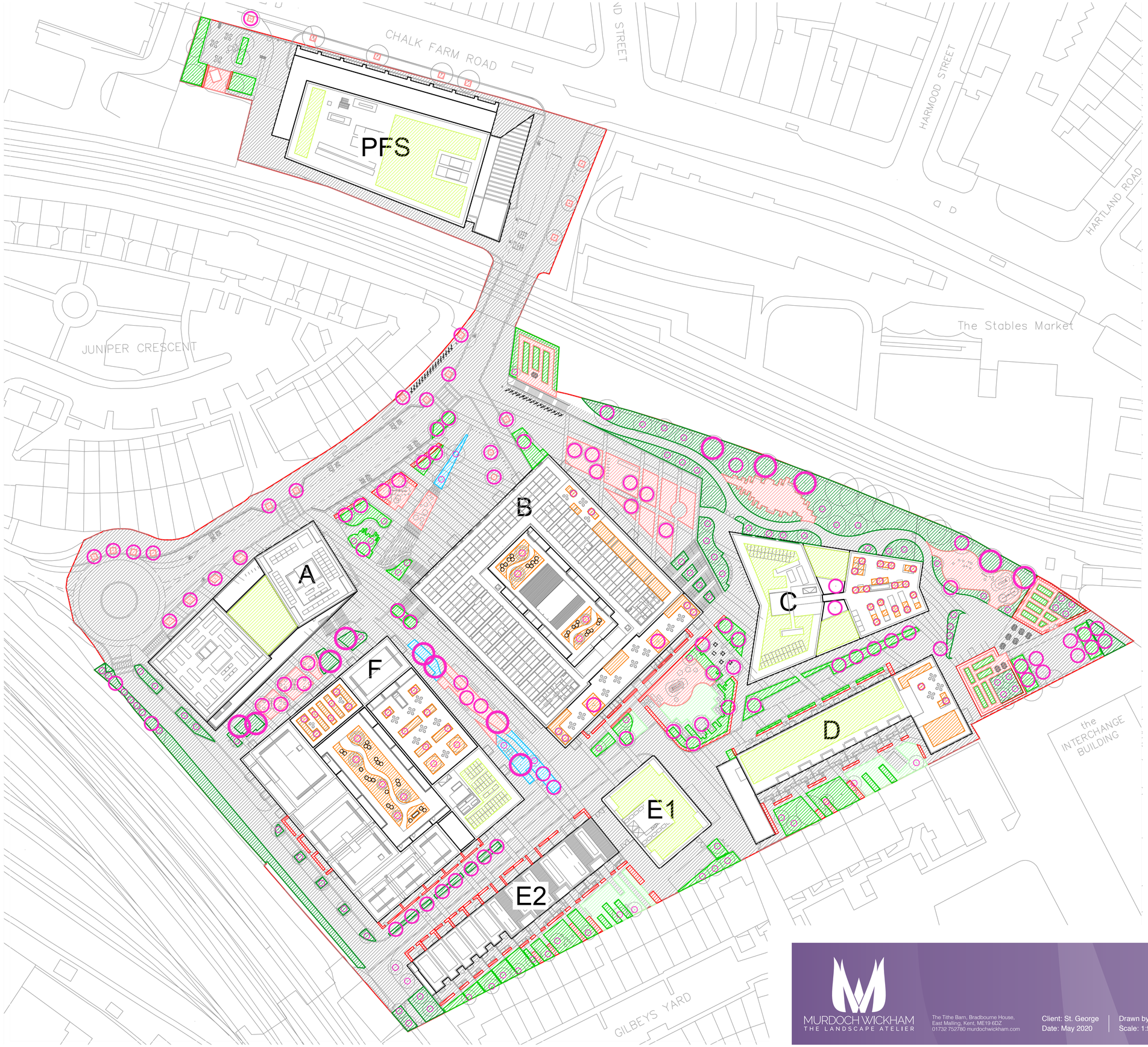
SCALE 1:500
SUITABILITY S2

PROJECT NUMBER
60620758

SHEET TITLE
MAIN SITE
PROPOSED DRAINAGE STRATEGY

SHEET NUMBER CGY00-ACM-XXX-ZZ-DR-CV-002101
REV P02

Appendix B – Drawing: 1573/011 Rev D – Urban Greening Factor and 1573/014 – Levels Strategy



	Surface Cover Type	Area (sqm)	Factor	Area x Factor
	Site Boundary	32640	-	-
	Semi-natural vegetation (e.g. woodland, flower rich grassland) created on site	1930	1	1930
	Wetland or open water (semi-natural; not chlorinated) created on site	0	1	0
	Intensive green roof or vegetation over structure. Vegetatiod sections only. Substrate minimum settled depth of 150mm	841	0.8	672.8
	Standard trees planted in natural soils or in connected tree pits with a minimum soil volume equivalent to at least two thirds of the projected canopy area of the mature tree	1596	0.8	1276.8
	Extensive green roof with substrate of minimum settled depth of 80mm (or 60mm beneath vegetation blanket)	1813	0.7	1269.1
	Flower-rich perennial planting	1273	0.7	891.1
	Rain gardens and other sustainable drainage elements	139	0.7	97.3
	Hedges (line of mature shrubs one or two shrubs wide)	391	0.6	234.6
	Standard trees planted in pits with soil volumes less than two thirds of the projected canopy area of the mature tree	0	0.6	0
	Amenity grassland (species poor, regularly mown)	355	0.4	142
	Permeable paving	1349	0.1	134.9
	Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone)	13883	0.0	0.0
			Total	6648.6
			UGF	0.20

Scale

1:500

0 5 15 30m

N

MURDOCH WICKHAM
THE LANDSCAPE ATELIER

The Tithe Barn, Bradbourne House,
East Malling, Kent, ME19 6DZ
01732 752780 murdochwickham.com

Client: St. George
Date: May 2020

Drawn by: JM
Scale: 1:500 @ A1

Camden Goods Yard

Urban Greening Factor

1573/011 Rev D

Legend

+0.00 Building finished floor levels

+0.00 Proposed landscape levels

PFS

CHALK FARM ROAD

HARMOOD STREET

HARTLAND ROAD

The Stables Market

JUNIPER CRESCENT

the INTERCHANGE BUILDING

GILBEYS YARD

A
+31.50
+34.50
+34.50
+34.50
+34.50

B
+34.50
+28.75
29.87+
+28.30
30.57+
+28.00
+31.50
31.00+
+34.50
+34.50

C
+28.50
+34.30
+34.00
+34.50
34.18+
+34.50
+34.00

D
34.00+
+34.50

E1
+34.50
33.70+
+34.50

E2
+34.50
+34.00
+34.00

F
+34.50
+34.50

Scale

1:500

0 5 15 30m

N

MURDOCH WICKHAM
THE LANDSCAPE ATELIER
The Tithe Barn, Bradbourne House,
East Malling, Kent, ME19 6DZ
01732 752780 murdochwickham.com

Client: St. George
Date: March 2020

Drawn by: JM
Scale: 1:500 @ A1

Camden Goods Yard

Site Wide Levels Strategy

1573/014

Appendix C – TWUL Asset Plan

Asset location search

Thames Water Property Searches

Subsight Surveys Ltd
Braunston Business Park
Unit 5London Road
DAVENTRY
NN11 7HB

Search address supplied

Morrisons PFS
Chalk Farm Road
London
NW1 8AN

Your reference 53260

Our reference ALS/ALS Standard/2019_4109922

Search date 13 November 2019

Keeping you up-to-date

Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: www.thameswater-propertysearches.co.uk
Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.

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

0845 070 9148

searchcode

Asset location search

Property Searches

Search address supplied: Morrisons PFS, Chalk Farm Road, London, NW1 8AN

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 0845 070 9148, 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.

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.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

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

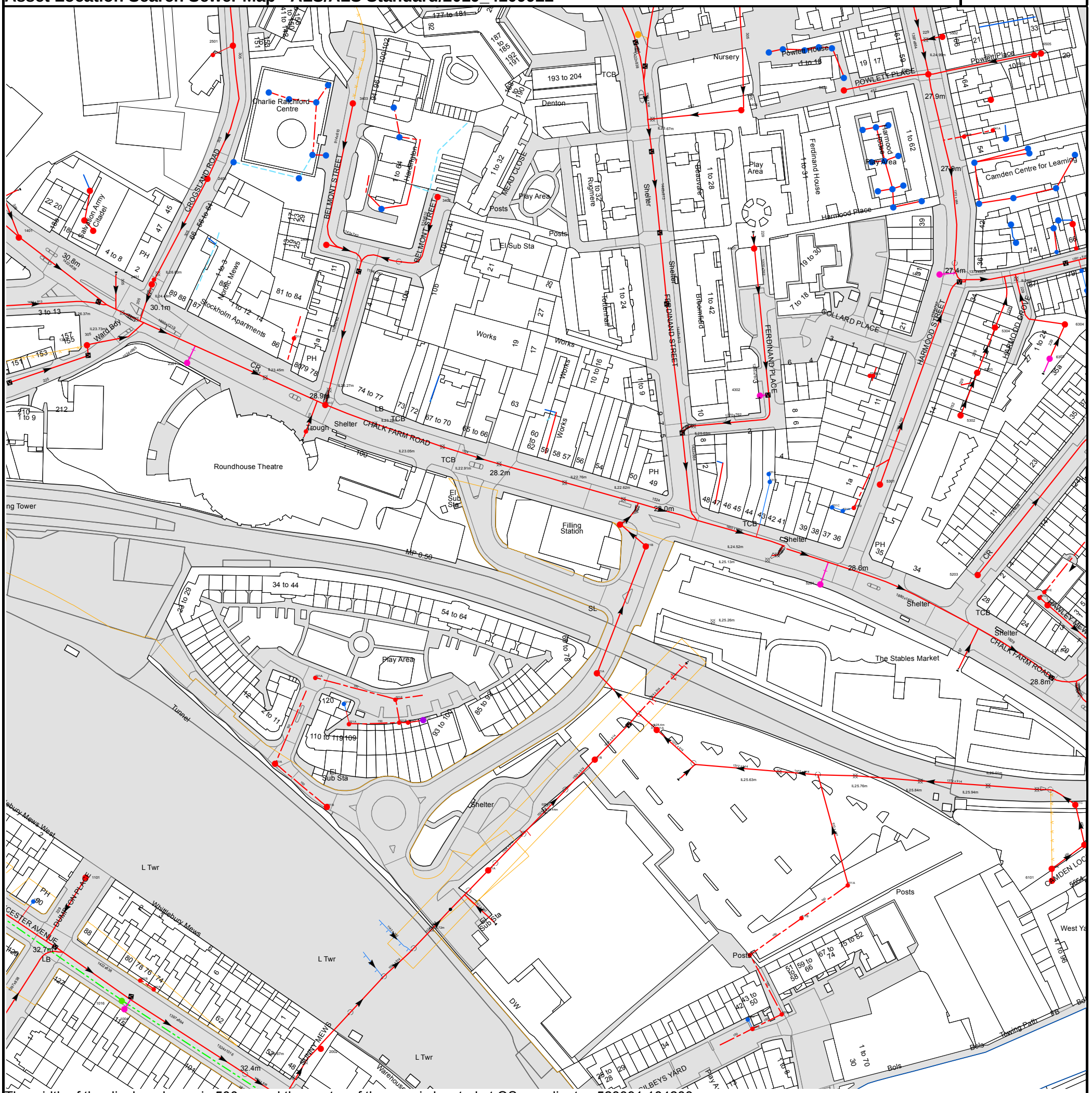
Clean Water queries

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/2019_4109922



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 528391,184283

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.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

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
45BJ	n/a	n/a
45CA	n/a	n/a
55DD	n/a	n/a
55DE	n/a	n/a
55DF	n/a	n/a
5502	n/a	n/a
6504	n/a	n/a
6505	n/a	n/a
64AF	n/a	n/a
401C	n/a	n/a
401F	n/a	n/a
401B	n/a	n/a
401A	n/a	n/a
511B	n/a	n/a
511A	n/a	n/a
6101	30.18	27.3
611A	n/a	n/a
611B	n/a	n/a
611C	n/a	n/a
621A	29.69	25.88
621D	n/a	25.95
621E	n/a	n/a
5201	n/a	n/a
64BH	n/a	n/a
54CA	n/a	n/a
54AJ	n/a	n/a
54CB	n/a	n/a
64EA	n/a	n/a
54BH	n/a	n/a
54BI	n/a	n/a
64EB	n/a	n/a
54BJ	n/a	n/a
54AE	n/a	n/a
54BE	n/a	n/a
54BG	n/a	n/a
54BF	n/a	n/a
64EC	n/a	n/a
64ED	n/a	n/a
64DJ	n/a	n/a
64EH	n/a	n/a
541B	n/a	n/a
541A	n/a	n/a
54BC	n/a	n/a
54BD	n/a	n/a
54BB	n/a	n/a
4404	28.34	25.26
54DE	n/a	n/a
5403	28.07	25.52
54DI	n/a	n/a
5501	28.05	24.45
5203	28.17	24.3
421B	n/a	n/a
421C	n/a	n/a
521A	n/a	n/a
531D	n/a	n/a
531C	n/a	n/a
5301	27.93	24.41
431B	n/a	n/a
431A	n/a	n/a
5302	n/a	n/a
4302	n/a	n/a
531A	n/a	n/a
531B	n/a	n/a
5303	n/a	n/a
6303	n/a	n/a
5304	n/a	n/a
6304	n/a	n/a
641A	n/a	n/a
5402	n/a	n/a
641B	n/a	n/a
64CH	n/a	n/a
64CA	n/a	n/a
4401	27.66	25.32
64EG	n/a	n/a
64CG	n/a	n/a
64EE	n/a	n/a
64BJ	n/a	n/a
2002	32.37	25.9
1004	32.19	n/a
1016	32.19	22.3
201A	n/a	n/a
201B	n/a	n/a
1101	n/a	n/a
311A	33.13	25.37
211B	n/a	n/a
211A	n/a	n/a
411B	33.14	25.1
411A	33.52	25.39
321A	n/a	n/a
321B	n/a	n/a
321D	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
321C	n/a	n/a
221B	n/a	n/a
321E	n/a	n/a
221A	n/a	n/a
421A	n/a	n/a
24CA	n/a	n/a
24CE	n/a	n/a
34BC	n/a	n/a
34BB	n/a	n/a
3403	30.31	27.29
24CD	n/a	n/a
24CC	n/a	n/a
24CB	n/a	n/a
24CH	n/a	n/a
251A	n/a	n/a
2501	31.9	29.5
231B	n/a	n/a
231C	n/a	n/a
2301	n/a	n/a
1302	30.77	26.84
231A	n/a	n/a
2401	30.19	n/a
2402	29.91	26.52
1401	31.06	27.24
14BC	n/a	n/a
14BB	n/a	n/a
34BF	n/a	n/a
3402	29.85	26.86
14BA	n/a	n/a
2403	30.82	28.25
24BJ	n/a	n/a
24BI	n/a	n/a
111A	n/a	n/a

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

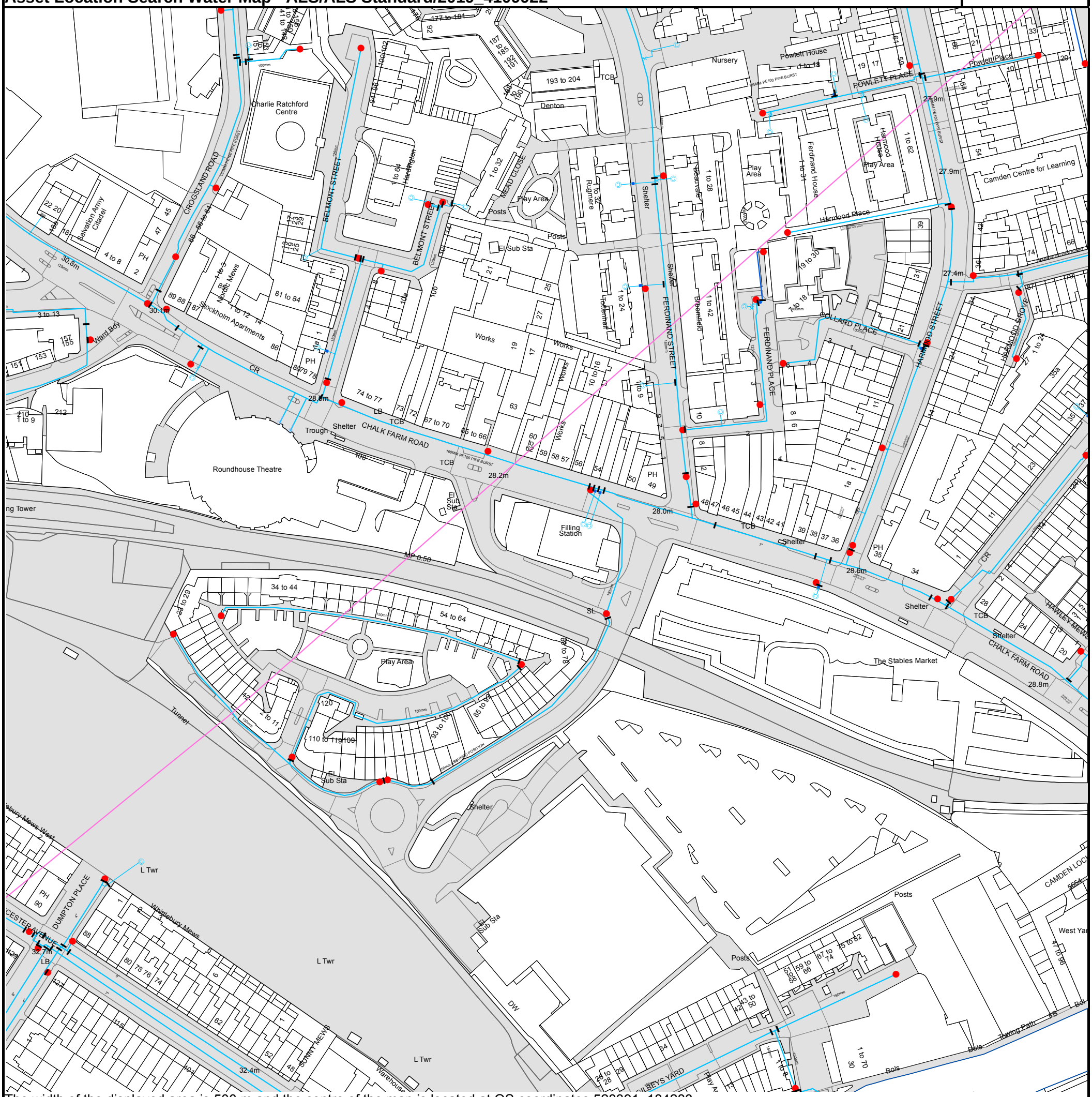
Other Sewer Types (Not Operated or Maintained by Thames Water)

- 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 Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2019_4109922



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 528391, 184283.

ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4" — **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16" — **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY — **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE — **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED — **Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
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.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0845 070 9148** 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.

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if the Ombudsman finds that you have suffered actual loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Web site: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Appendix D – TWUL Pre-planning Response Letter

Mr Yu Wu
Aecom
Aldgate Tower
2 Leman Street
London
E1 8FA

Wastewater pre-planning
Our ref DS6072206

04 May 2020

Pre-planning enquiry: Confirmation of sufficient capacity

Dear Mr Wu,

Thank you for providing information on your development:

Camden goods yard (Morrisons Supermarket), Chalk Farm Road, London, NW1 8AA.

Existing: Morrisons Supermarket (7240sqm) and car parking space (11351sqm).

Proposed: 700 residential units, Morrisons supermarket (3800sqm), and undercroft car parking (4562sqm and 4943sqm). Foul water discharging by gravity. 350 units to discharge to the combined water manhole 511A and 350 units and supermarket discharging to combined water manhole 421A. Surface water to discharge by gravity at greenfield rates (1Y=9.4l/s, 30Y=25l/s, 100Y=35.1l/s) 50:50 split tp manholes 511A and 421A.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent combined sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

Only when it can be proven that soakage into the ground or a connection into an adjacent watercourse is not possible would we consider a restricted discharge into the public combined sewer network.

If the peak surface water run-off discharge is then restricted to Greenfield run-off rates as your drainage strategy indicates, then we would have no objections to the proposals.

Thames Water Planning team would ask to see why it is not practicable on the site to restrict to Greenfield run-off rates if they are consulted as part of any planning application.

In considering your surface water needs, we support the use of sustainable drainage on development sites. You'll need to show the local authority and/or lead local flood authority how you've taken into account the surface water hierarchy that we've included.

Please see the attached 'Planning your wastewater' leaflet for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 0203 577 9811

Yours sincerely

Siva Rajaratnam – Adoptions Engineer

Thames Water

Appendix E – TWUL Historic comments

Gentet, Matthias

From: BCTAdmin@thameswater.co.uk
Sent: 07 November 2017 12:47
To: Planning
Subject: 3rd Party Planning Application - 2017/3847/P - Oct17

London Borough of Camden Our DTS Ref: 2160
Camden Town Hall Your Ref: 2017/3847/P - Oct17
Argyle Street
Euston Road
London
WC1H 8EQ

7 November 2017

Dear Sir/Madam

Re: MORRISONS SUPERMARKET AND PETROL FILLING STATION, CAMDEN GOODS YARD, CHALK FARM ROAD, NW1 8AA

Waste Comments
Following initial investigation, Thames Water has identified an inability of the existing waste water infrastructure to accommodate the needs of this application. Should the Local Planning Authority look to approve the application, Thames Water would like the following 'Grampian Style' condition imposed. "Development shall not commence until a drainage strategy detailing any on and/or off site drainage works, has been submitted to and approved by, the local planning authority in consultation with the sewerage undertaker. No discharge of foul or surface water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed". Reason - The development may lead to sewage flooding; to ensure that sufficient capacity is made available to cope with the new development; and in order to avoid adverse environmental impact upon the community. Should the Local Planning Authority consider the above recommendation is inappropriate or are unable to include it in the decision notice, it is important that the Local Planning Authority liaises with Thames Water Development Control Department (telephone 0203 577 9998) prior to the Planning Application approval.

'We would expect the developer to demonstrate what measures he will undertake to minimise groundwater discharges into the public sewer. Groundwater discharges typically result from construction site dewatering, deep excavations, basement infiltration, borehole installation, testing and site remediation. Any discharge made without a permit is deemed illegal and may result in prosecution under the provisions of the Water Industry Act 1991. Should the Local Planning Authority be minded to approve the planning application, Thames Water would like the following informative attached to the planning permission:"A Groundwater Risk Management Permit from Thames Water will be required for discharging groundwater into a public sewer. Any discharge made without a permit is deemed illegal and may result in prosecution under the provisions of the Water Industry Act 1991. We would expect the developer to demonstrate what measures he will undertake to minimise groundwater discharges into the public sewer. Permit enquiries should be directed to Thames Water's Risk Management Team by telephoning 02035779483 or by emailing wwqriskmanagement@thameswater.co.uk. Application forms should be completed on line via www.thameswater.co.uk/wastewaterquality."

Water Comments
The existing water supply infrastructure has insufficient capacity to meet the additional demands for the

proposed development. Thames Water therefore recommend the following condition be imposed: Development should not be commenced until: Impact studies of the existing water supply infrastructure have been submitted to, and approved in writing by, the local planning authority (in consultation with Thames Water). The studies should determine the magnitude of any new additional capacity required in the system and a suitable connection point. Reason: To ensure that the water supply infrastructure has sufficient capacity to cope with the/this additional demand.

No piling shall take place until a piling method statement (detailing the depth and type of piling to be undertaken and the methodology by which such piling will be carried out, including measures to prevent and minimise the potential for damage to subsurface water infrastructure, and the programme for the works) has been submitted to and approved in writing by the local planning authority in consultation with Thames Water. Any piling must be undertaken in accordance with the terms of the approved piling method statement. Reason: The proposed works will be in close proximity to underground water utility infrastructure. Piling has the potential to impact on local underground water utility infrastructure. The applicant is advised to contact Thames Water Developer Services on 0800 009 3921 to discuss the details of the piling method statement.

Thames Water recommend the following informative be attached to any planning permission: There is a Thames Water main crossing the development site which may/will need to be diverted at the Developer's cost, or necessitate amendments to the proposed development design so that the aforementioned main can be retained. Unrestricted access must be available at all times for maintenance and repair. Please contact Thames Water Developer Services, Contact Centre on Telephone No: 0800 009 3921 for further information.

Supplementary Comments

We do not support the surface water proposals for a peak discharge rate three times that of Greenfield rates for this redevelopment. We require surface water attenuation the Greenfield run-off rates as this site falls within he highly flood sensitive Counters Creek Catchment.

Yours faithfully
Development Planning Department

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