

Mary Feilding Guild Care Home

Highgate Care Ltd

**Mary Feilding Guild Care Home, 103-107 North Hill,
Highgate, N6 4DP**

Surface Water and Foul Drainage Statement

**REPORT REF.
2100310-01A**

December 2022

HEAD OFFICE: 3rd Floor, The Hallmark Building, 52-56 Leadenhall Street, London, EC3M 5JE **T** | 020 7680 4088

ESSEX: 1 - 2 Crescent Court, Billericay, Essex, CM12 9AQ **T** | 01277 657 677

KENT: Suite 10, Building 40, Churchill Business Centre, Kings Hill, Kent, ME19 4YU **T** | 01732 752 155

MIDLANDS: Office 3, The Garage Studios, 41-43 St Mary's Gate, Nottingham, NG1 1PU **T** | 0115 697 0940

SOUTH WEST: City Point, Temple Gate, Bristol, BS1 6PL **T** | 0117 456 4994

SUFFOLK: Suite 110, Suffolk Enterprise Centre, 44 Felaw Street, Ipswich, IP2 8SJ **T** | 01473 407 321

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REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	Draft	FH	CC	DRAFT	22.10.2021
-	FINAL	FH	CC	BC	16.11.2021
-	Updated Planning Application	LB	CC 	BC 	08.12.2022

Distribution

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1. Introduction

Overview

- 1.1. Ardent Consulting Engineers (hereafter referred to as Ardent) has been appointed by Highgate Care Ltd to provide planning support on the implementation of surface water management features, including SuDS, at the new care home (Class C2 - Residential Institution) and well-being and physiotherapy centre at 103-107 North Hill, Highgate, N6 4DP (hereafter referred to as 'the site').
- 1.2. This report has been prepared with specific reference to the requirements of National Planning Policy Framework (NPPF) updated in July 2021, the Planning Practice Guidance (PPG), which superseded the Technical Guidance to the NPPF, in March 2014, and the London Plan 2021. This report also takes into consideration the requirements within the Non-statutory technical standards for sustainable drainage systems (March 2015) and its Practice Guidance (July 2015) produced by LASOO.

Site Location

- 1.3. The site is located in Highgate in the London Borough of Haringey. The site currently comprises a residential care home and is situated in a predominantly residential area. The site is bound by residential properties with North Hill to the east, View Road to the south and Yeatman Road to the north. The approximate National Grid Reference of the site is TQ 28028 88215 (528028 mE, 528028, 188215 mN). The site location is shown in **Figure 1-1**.

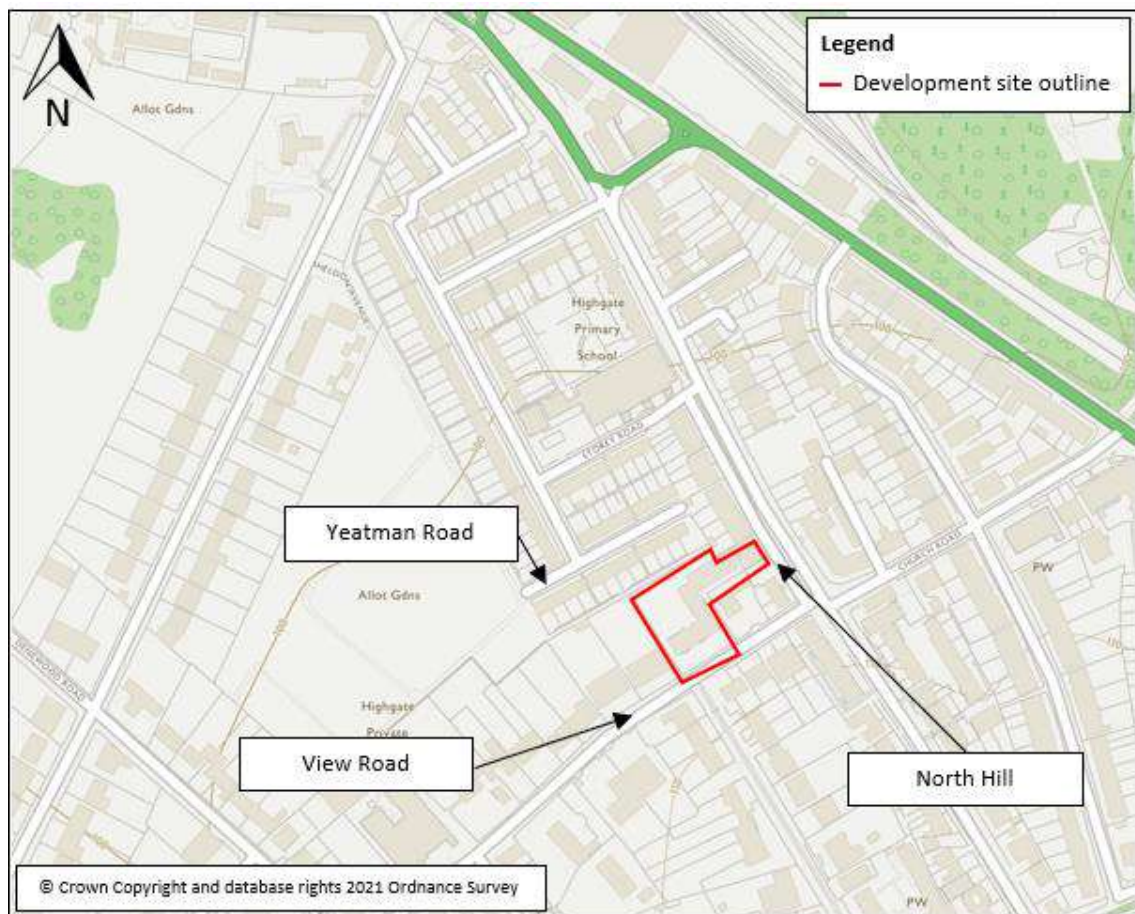


Figure 1-1: Site Location Plan

Development Proposals

- 1.4. The development proposals consist of the demolition of the existing buildings and redevelopment to provide a new care home (Class C2 - Residential Institution), together with a well-being and physiotherapy centre. The proposed care home includes up to 70 bedrooms, a hydrotherapy pool, steam room, sauna, gym, treatment/medical rooms, hairdressing and beauty salon, restaurant, cafe, lounge, bar, well-being shop, general shop, car and cycle parking, refuse/recycling storage, mechanical and electrical plant, landscaping and associated works
- 1.5. The development plan layouts can be found in **Appendix A**.

2. Policy Context

National Planning Policy Framework

- 2.1. The National Planning Policy Framework (NPPF) was updated in July 2021; paragraph 159 to 169 inclusive, establishes the Planning Policy relating to flood risk management. The Technical Guide to the NPPF has been superseded by the Planning Practice Guidance (PPG), also updated in July 2021.
- 2.2. The main focus of the policy is to direct development towards areas of the lowest practicable flood risk and to ensure that all development is safe, without increasing flood risk elsewhere. The main considerations are:
- Applying the Sequential Test, and if necessary, apply the Exception Test;
 - Safeguarding land from development that is required for current and future flood management;
 - Using opportunities offered by new development to reduce the causes and impacts of flooding; and,
 - Where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.

Sustainable Drainage Systems - Non-statutory Technical Standards for Sustainable Drainage Systems (March 2015)

- 2.3. The Non-statutory technical standards for sustainable drainage systems were published in March systems. They should be used in conjunction with the Planning Practice Guidance. In addition, the Best Practice Guidance for the Non-statutory technical standards was published in July 2015 by LASOO.
- 2.4. The Local Planning Authority (LPA) may set local requirements for planning permission that have the effect of more stringent requirements than these non-statutory technical standards.
- 2.5. In addition, SuDS should be designed in accordance with CIRIA 753 SuDS Manual, which represents current best practice.

The London Plan (2021)

- 2.6. The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London.
- 2.7. In March 2021, the Mayor published the updated London Plan superseding the previous versions. Within the London Plan the following policy relates specifically to sustainable drainage:

Policy SI 13 Sustainable Drainage

Development should utilise sustainable drainage systems (SuDS) unless there are practical reasons for not doing so, and 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 line with the following 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. discharge rainwater direct to a watercourse;*
- 5. discharge rainwater to a surface water sewer/drain; and*
- 6. discharge rainwater to the combined sewer.*

Drainage should be designed and implemented in ways that deliver other policy objectives of this Plan, including water use efficiency and quality, biodiversity, amenity and recreation.

London Borough of Haringey Local Plan (2013)

- 2.8. The Haringey Local Plan sets out the vision, objectives, strategy, and policies that will guide public and private sector investment to manage development and regeneration in the Borough between 2013 and 2026. The Local Plan is about shaping the future of the borough as a better place to live, work and visit and sets out planning policies for the future development of the borough.

- 2.9. Within the Local Plan, Policy SP5 *Water Management and Flooding* sets out the local policy on flood risk. This, policy SP5 covers local policy in relation to Sustainable Drainage Systems and Water Management and confirms that the national standards must be applied within Haringey.

London Borough of Haringey Surface Water Management Plan (August 2011)

- 2.10. The London Borough of Haringey Surface Water Management Plan, prepared by Capita in 2011, was produced to outline the preferred surface water management strategy at a local level. The report also establishes a long-term action plan to manage surface water and will influence future capital investment, maintenance, public engagement and understanding, land use planning, emergency planning and future developments.
- 2.11. Direct rainfall modelling was undertaken as part of the Surface Water Management Plan (SWMP). The results of the modelling indicate Local Flood Risk Zones (LRFZs) where flooding affects houses, businesses and/or infrastructure. Those areas at more significant risk have been delineated into Critical Drainage Areas.
- 2.12. A Critical Drainage Area (CDA) is defined as a discrete geographic area and usually a hydrological catchment, where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones. Local Flood Risk Zones (LFRZs) are discrete areas/extents of predicted surface water flooding. The Site is not located within a Critical Drainage Area as defined by the SWMP.

3. Baseline Conditions

Flood Risk

- 3.1. As the site is located in Flood Zone 1, is less than 1 ha and is not located within any critical drainage areas, a site-specific Flood Risk Assessment is not required. However, flood risk from a number of sources has been assessed below.
- 3.2. According to the Environment Agency's indicative *Flood Map for Planning*, the site is located within Flood Zone 1 defined as having a 'very low' (less than 0.1%) chance of flooding and being suitable for any type of development. Therefore, the risk of flooding from fluvial or tidal sources is considered to be very low.
- 3.3. The Environment Agency's *Surface Water Flood Map* also shows the site is predominantly at 'very low' risk of surface water flooding with the proposed development surface water drainage strategy designed to manage any higher risk areas located at the site.
- 3.4. The site is not anticipated to be at risk of flooding from groundwater, sewers or reservoirs and artificial sources.

Hydrology

- 3.5. There are no Main Rivers or Ordinary Watercourses (OWC) in close proximity to the site. The closest Main River is Mutton Brook, approximately 1.2km to the northwest of the site.

Topography

- 3.6. A topographic survey of the site was undertaken by Malcolm Hughes in March 2021 (Ref. 56927/1, 56927/2 and 56927/3). The survey notes that the site currently predominantly comprises existing buildings and hardstanding areas, with the remainder of the site being gardens and grassed areas.
- 3.7. The site slopes from the northeast to southwest, with levels ranging from 105.7 mAOD to 108.4 mAOD.
- 3.8. A copy of the topographic survey is provided in **Appendix B**.

Ground Conditions / Geology

- 3.9. According to the British Geological Survey (BGS) online datasets, the Bedrock geology of the site consists of Claygate Member – Clay, Silt and Sand with no Superficial geology.
- 3.10. The site does not lie within any Source Protection Zones (SPZs) for local groundwater abstraction therefore groundwater is unlikely to be a significant receptor to any contaminants (although this should still be avoided).

Existing Sewer Infrastructure

- 3.11. The *Thames Water Asset Plans* show the publicly operated sewer network in the vicinity of the site of which a summary is provided below.
- 3.12. A surface water sewer runs through the site from southeast to northwest before continuing along Yeatman Road to the north of the site. Thames Water manhole levels and depths are limited in this area however information from surrounding manholes indicate that the sewer runs at an approximate depth of circa 1.9m below ground level (b.g.l.)
- 3.13. A number of foul and surface water sewers exist in the surrounding roads such as along, View Road, Yeatman Road and North Hill.
- 3.14. The Thames Water Asset Plans are provided in full in **Appendix C** and an extract is shown in **Figure 1-2** below.

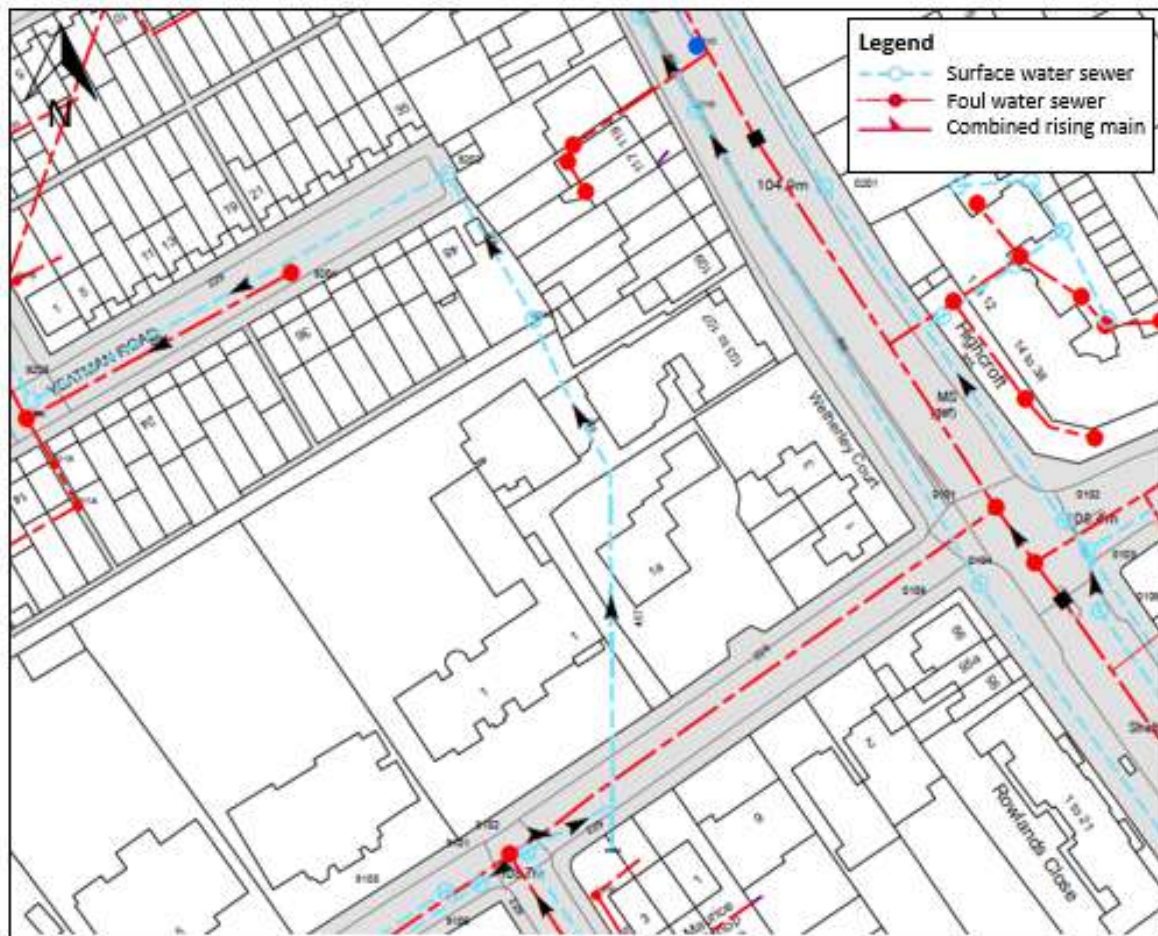


Figure 1-2: Extract from Thames Water Asset Map

3.15. In addition to the public assets, the topographic survey picks up a number of manholes across the site which appear to be associated with private drainage. It is understood that these drainage runs will be abandoned to accommodate the new development.

4. Surface Water Management Strategy

Existing Surface Water Discharge

- 4.1. The London Borough of Haringey Sustainable Drainage Proforma has been included in **Appendix D**.
- 4.2. The planning redline boundary equates to 0.36 ha. A large proportion of this area is hardstanding and buildings, with the remainder of the site being grassed areas. Approximately 0.257ha (69%) of the existing site is impermeable. In order to assess the current discharge from the site, the *Modified Rational Method* has been used to predict the current surface water discharge rate from the impermeable areas, as shown below.

$$Q = 2.78 * C * i * A$$

Where:

Q = Peak Discharge (l/s)

i = Rainfall Intensity (mm/hr)

(50.8 mm/hr for 1yr, 5 min storm TRRL Report 595)

A = Impermeable Area (ha)

C = Runoff Coefficient

- 4.3. Therefore, based on the Modified Rational Method, peak runoff rates generated from the existing site for a 1 in 1 year, 1 in 30 and 1 in 100-year, 5 minutes storm are provided in **Appendix E**.
- 4.4. The Greenfield runoff rates from the site have been determined using the *ICP SuDS Mean Annual Flow Method* which provide the runoff from the permeable areas. Peak Greenfield Runoff rates calculations can be found in **Appendix F**.
- 4.5. A summary of both the existing Brownfield and Greenfield runoff rates are shown in **Table 4-1** below.

Table 4-1: Existing Brownfield and Equivalent Greenfield Runoff Rates

Scenario	Area	$Q_{Bar.}$	$Q_{1yr.}$	$Q_{30yr.}$	$Q_{100yr.}$
Brownfield	0.257 ha	-	36.29 l/s	80.75 l/s	102.81 l/s
Greenfield	0.103 ha	0.4	0.4 l/s	1.0 l/s	1.3 l/s
Total	0.36 ha	-	36.69 l/s	81.75 l/s	104.11 l/s

Drainage Hierarchy

4.6. Based on Policy SI 13 (B) of the London Plan, surface water runoff should be disposed of according to the following hierarchy:

1. Store rainwater for later use (for example rainwater harvesting, blue roofs for irrigation);
2. Use infiltration techniques, such as porous surfaces in non-clay areas;
3. Rainwater attenuation in green infrastructure features for gradual release;
4. Discharge rainwater to a watercourse;
5. Controlled discharge to a surface water sewer/drain; and
6. Controlled discharge to the combined sewer.

4.7. The benefits of rainwater harvesting and attenuation on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure therefore this has not been considered as part of the surface water management strategy but will be included in the final designs.

4.8. As discussed in **Section 3**, the site is located on an impermeable bedrock (Claygate Member) which is known to not promote sufficient infiltration to be considered feasible as a means of discharge.

4.9. There are no surface water bodies in the vicinity of the site into which to discharge. However, a surface water sewer runs through the centre of the site, as well as along North Hill.

4.10. Considering the above, the most practicable means of discharge is to the existing public surface water sewer at a restricted rate.

Proposed Sustainable Drainage Systems (SuDS)

4.11. The constraints and opportunities for the use of SuDS techniques within the Site is appraised in **Table 4-2** overleaf, adopting the management train approach outlined in CIRIA C753 'The SuDS Manual'.

Table 4-2: C753 SuDS Management Train

Type	<i>Infiltration Devices (Source Control)</i>
Constraints	Impermeable underlying bedrock and risk of mobilising contaminants.
Opportunities	None.
Type	<i>Permeable Paving (Source Control)</i>
Constraints	Provision for services needs to be considered within the design.
Opportunities	Private roads and parking could be utilised as lined permeable paving.
Type	<i>Rainwater Harvesting (Source Control)</i>
Constraints	The benefits of rainwater harvesting on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure.
Opportunities	Features will be utilised within the site for irrigation purposes but are not considered as part of the surface water management plan.
Type	<i>Swales etc. (Permeable Conveyance)</i>
Constraints	Significant land requirement to accommodate 1:3 side slopes.
Opportunities	Limited space for provision of such features.
Type	<i>Bio Retention Systems</i>
Constraints	Limited benefits to attenuation requirements in larger developments.

Opportunities	Potential for rain gardens around the proposed development building.
Type	<i>Living Roofs</i>
Constraints	The benefits of rainwater harvesting on a specific design storm event cannot be quantified. Limited potential of sloped roofs.
Opportunities	Potential for provision of living roof on flat roofs associated with the development. Not included within the surface water management strategy as a conservative measure.
Type	<i>Attenuation Tanks (End of Line Treatment)</i>
Constraints	None.
Opportunities	Should attenuation be required this could be achieved through oversized pipework or geocellular attenuation tanks.

4.12. After consideration of the CIRIA C753 approach the most viable SuDS options are a combination of lined permeable paving and geo-cellular attenuation tanks. This will provide the necessary storage and treatment for up to the 1 in 100 year including an allowance of 40% for climate change whilst also offering water quality improvements.

Pre and Post Development Impermeable Area

4.13. The planning redline boundary equates to approximately 0.36 hectares of which 69% is existing hardstanding areas. The redevelopment proposals will reduce the impermeable area across the site through the introduction of communal landscaped features, trees and private gardens.

4.14. Green roofs have also been proposed as part of the development. Surface water runoff from the roof would be reduced by a maximum of 20% as a result of the green roofs. This is in accord with the GRO Green Roof Code (GRO, 2011) and the Guidance for the Planning, Execution and Upkeep of Green Roof Site (FFL, 2002). This has not however been included in the preliminary calculations. Comparisons between the existing and proposed hardstanding areas excluding green roofs are shown in **Table 4-3** below.

Table 4-3: Summary of Pre- and Post-Development Impermeable Areas

Site Ref.	Area (ha)	Impermeable Area (ha)	Permeable Area (ha)	% Impermeable
Pre-Development	0.360	0.257	0.103	71%
Post-Development (excluding green roofs)	0.360	0.166	0.194	46%

Proposed Discharge Rates

4.15. The London Plan, of which local Haringey policy generally mirrors, states that “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.”

4.16. As such, consideration was given to the **Table 4-4** where the Greenfield rates are reported. It is considered that the Greenfield rates are impracticably low and would cause issues with self-cleansing velocities. As such, the lowest reasonably practicable rate of 2.0 l/s is proposed as the discharge rate for all storm events up to the 1 in 100-year plus a 40% allowance for climate change.

Table 4-4: Surface Water Runoff Reduction

Discharge Rate	Return Period			
	Q_{1yr.}	Q_{30yr.}	Q_{100yr.}	Q_{100yr. + 40%}
Pre-Development Brownfield	36.29 l/s	80.75 l/s	102.81 l/s	-
Pre-Development Greenfield	0.4 l/s	1.0 l/s	1.3 l/s	-
Pre-Development Total	36.69 l/s	81.75 l/s	104.11 l/s	-
Post-Development	2.0 l/s	2.0 l/s	2.0 l/s	2.0 l/s
Percentage Reduction	95%	97 %	98 %	-

4.17. A Pre-Development enquiry has been submitted to Thames Water and they have confirmed that the proposed discharge rate is acceptable and that the network has sufficient capacity to take the flows from the development. This is included in **Appendix G**.

Proposed Surface Water Attenuation

4.18. In order to achieve the proposed discharge rate of 2.0 l/s per outfall, it is proposed that a total storage volume of approximately 162.3m³ will be provided within the proposed geocellular storage and lined permeable paving. **Table 4-4** demonstrates the significant reduction in surface water discharge rates from the proposed development.

4.19. Additional benefits and storage volumes will be provided within the proposed green roofs, although this has conservatively not been accounted for in the preliminary calculations. It may also be possible to incorporate capillary irrigation within the basement slab to further reduce surface water flood risk however again, this has not been accounted for within the preliminary calculations.

4.20. Please refer to *Drawing No. 2100310-001A* within **Appendix H** for the proposed surface water drainage layout.

4.21. It is therefore proposed that a combination of landscaping and amenities, lined permeable paving (49.3m³) and a geo-cellular attenuation tank (113m³) will provide sufficient storage volume for the 1 in 100-year storm event including a 40% allowance for climate change. Refer to **Appendix I** for proposed Surface Water calculations.

4.22. Invert and cover levels should be confirmed on-site and the location and outfall of the existing system should be explored with a CCTV drainage survey at the detailed design stage. If possible, this system could be re-used.

Urbanisation

4.23. In accordance with the LASOO guidance an urbanisation factor of 10% should be applied. However, as the proposals consist of care home facilities it is not considered necessary to apply an urbanisation factor to the proposed development.

Long Term Storage

4.24. As the development is decreasing the impermeable area across the site, there is no requirement to consider Long Term Storage.

Water Quality

4.25. The pollution hazard associated with a residential development would be '*very low*' and the utilisation of catchpit manholes within the drainage network, in conjunction with the lined permeable paving and landscaping will provide sufficient mitigation.

4.26. The recommended stage of treatment in terms of water quality would be provided through the aforementioned geocellular storage and permeable paving. In line with the SuDS Manual C753, Tables 26.2 and 26.3, the pollution hazard and mitigation indices associated with residential roofs are mitigated by the provision of SuDS features.

4.27. Please refer to **Appendix J** for copies of Tables 26.2 and 26.3, the pollution hazard and mitigation indices.

Maintenance and Management of System

4.28. The maintenance of all SuDS components will be in accord with the best practices and the CIRIA Manual C753. A private management company will be set up to maintain the surface water drainage network. The name of the Management Company to be advised.

4.29. Please refer to **Appendix K** for the proposed Management and Maintenance Plan.

5. Foul Water Management

Existing Foul Water Drainage

- 5.1. Foul water flows from the site are understood to be connected to the existing Thames Water foul sewer by private drainage network joining the foul sewers on North Hill and View Road.
- 5.2. The existing site is currently occupied by an existing care home, with capacity for 43 beds. Based on the Thames Water Foul Flow Rates Criteria, it is estimated that the existing peak Foul Flow discharged from the site equates to 1.23 l/s. Refer to the Existing Foul Loading Calculations provided in **Appendix L**.

Proposed Foul Water Drainage

- 5.3. The proposed foul flow has been calculated to be 2.005 l/s based on the proposed 70 unit care home. Refer to the Proposed Foul Loading Calculations provided in **Appendix I**. It is proposed that foul flows from the development will discharge into Thames Water foul sewers along View Road. Refer to the preliminary drainage strategy *Drawing No. 2100310-001A* provided in **Appendix H**.
- 5.4. A Pre-Development enquiry has been submitted to Thames Water and they have confirmed that that the proposed discharge rate is acceptable and that the network has sufficient capacity to take the flows from the development. This is included in **Appendix G**.
- 5.5. The cumulative peak flow rate for the overall post-developed site (combined foul and surface water flows) is therefore 4.005 l/s (2.005/s + 2.00 l/s). Considering the existing site peak combined runoff rate is 104.60 l/s the proposals will result in a reduction of combined flows of 98% from the pre-development scenario for the 1 in 100-year event.
- 5.6. Whilst at the planning stage it is not required to have an agreed consent for a proposed discharge connection point, based on the Thames Water asset data in **Appendix C**, the site is assumed to have a pre-existing connection to the Thames Water sewer.

6. Conclusions

- 6.1. Ardent Consulting Engineers has been appointed by Precious Homes to provide planning support on the implementation of surface water management features, including SuDS, at the proposed care home development at 103-107 North Hill, Highgate, N6 4DP.
- 6.2. The development proposals consist of the demolition of the existing buildings and redevelopment to provide a new care home (Class C2 - Residential Institution), together with a well-being and physiotherapy centre. The proposed care home includes up to 70 bedrooms, a hydrotherapy pool, steam room, sauna, gym, treatment/medical rooms, hairdressing and beauty salon, restaurant, cafe, lounge, bar, well-being shop, general shop, car and cycle parking, refuse/recycling storage, mechanical and electrical plant, landscaping and associated works.
- 6.3. The site is not anticipated to be at risk of flooding from rivers / seas, surface water, groundwater, sewers or reservoirs and artificial sources.
- 6.4. The planning redline boundary equates to approximately 0.36 hectares of which 71% is existing hardstanding areas. The redevelopment proposals will reduce the impermeable area across the site through the introduction of communal landscaped features, trees and private gardens.
- 6.5. Consideration of the drainage hierarchy indicates that the most practicable means of discharge is to the existing public surface water sewer at a restricted rate.
- 6.6. The London Plan, of which local Haringey policy generally mirrors, indicates that 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. However, these were determined to be impracticably low and would cause issues with self-cleansing velocities. As such, the lowest reasonably practicable rate of 2.0 l/s is proposed as the discharge rate for all storm events up to the 1 in 100-year plus a 40% allowance for climate change.
- 6.7. The surface water drainage strategy will reduce flood risk by restricting flows in accordance with restricting surface water flows in accordance with the London Plan and the London Borough of Haringey requirements. It is proposed that a combination of lined permeable paving (49.3m³), a geo-cellular attenuation tank (113 m³), green

roofs and amenities will provide sufficient storage volume for the 1 in 100-year storm event including a 40% allowance for climate change. Storm water attenuation is provided for all storms up to and including the 1 in 100-year critical event (including a 40% allowance for climate change). The proposed development results in significant betterment over the predevelopment scenario in terms of a reduction of surface water runoff.

- 6.8. The maintenance of all SuDS components will be in accord with the best practices and the CIRIA Manual C753. A private management company will be set up to maintain the surface water drainage network. The name of the Management Company to be advised.
- 6.9. The above report demonstrates that the proposed development is deliverable whilst provided significant betterment from the existing scenario and not increasing flood risk elsewhere. The report also demonstrates that the proposals are in accordance with both national and local policy and should therefore be considered appropriate.

Appendix A

Development Layouts



Room Key

- Circulation
- Lightwell
- Resident Facilities
- Staff
- Storage

Basement Floor GA Plan
1:200 @ A1

Building

Total Residential Units: 70
64 Beds & 6 Suites

Gross External Area:

Basement Floor

Overall = 2090.3m²
Overall = (Excluding Car Park) = 1359.8m²

Building

Nursing / Care Home = 4672.1m²
Wellness = 1466.3m²

Overall (Including Car Park) = 6830.2m²
Overall (Excluding Car Park) = 6099.7m²

DRAWING REVISIONS

REV	DESCRIPTION	DATE	BY	CHK
-	-	-	-	-

NOTES

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DWA Architects (London) Ltd
Cyclops House
Link Business Park
York
United Kingdom
YO10 3JB
01904 544 400
dwa@dwa-architects.co.uk
www.dwa-architects.co.uk

CLIENT
Highgate Care Ltd

PROJECT
New Build 70 Bed Nursing and Convalescent
Care Home With Well Being and
Physiotherapy Centre at: 1 View Road /
103-107 North Hill, Highgate

DRAWING TITLE
Proposed Basement GA Plan

DRAWING STATUS
PLANNING

SCALE 1 : 200 @ A1	DATE 22.07.21	
DRAWN BY JRA	CHECKED BY NMJ	
JOB NO. P2719	DWG NO. 101	REV -



- Room Key
- Bedroom
 - Circulation
 - Resident Facilities
 - Staff
 - Storage

Ground Floor GA Plan
1:200 @ A1

Total Residential Units: 18
18 Beds

Building

Total Residential Units: 70
64 Beds & 6 Suites

Gross External Area:

Ground Floor

Overall =1591.3m²

Building

Overall (Including Car Park) = 6830.2m²
Overall (Excluding Car Park) = 6099.7m²

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DWA Architects (London) Ltd
Cyclops House
Link Business Park
York
United Kingdom
YO10 3JB

01904 544 400
dwa@dwa-architects.co.uk
www.dwa-architects.co.uk

CLIENT

Highgate Care Ltd

PROJECT

New Build 70 Bed Nursing and Convalescent
Care Home With Well Being and
Physiotherapy Centre at: 1 View Road /
103-107 North Hill, Highgate

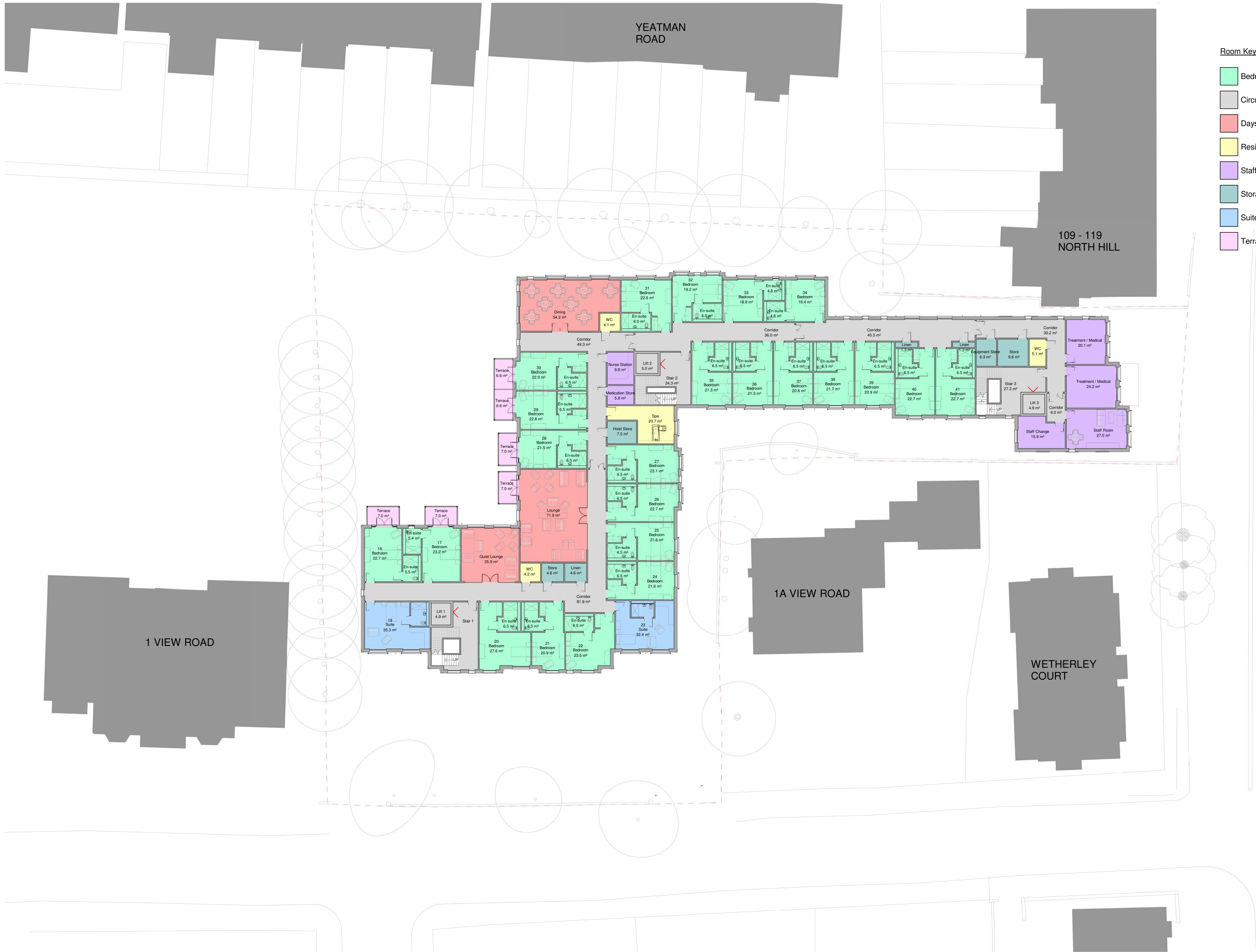
DRAWING TITLE

Proposed Ground Floor GA Plan

DRAWING STATUS

PLANNING

SCALE	DATE	
1 : 200 @ A1	22.07.21	
DRAWN BY	CHECKED BY	
JRA	NMJ	
JOB NO.	DWG NO.	REV
P2719	102	-



Room Key

- Bedroom
- Circulation
- Dayspace
- Resident Facilities
- Staff
- Storage
- Suites
- Terraces

First Floor GA Plan
1:200 @ A1

Total Residential Units: 29
27 Beds & 2 Suites

Building

Total Residential Units: 70
64 Beds & 6 Suites

Gross External Area:

First Floor

Overall =1591.3m²

Building

Overall (Including Car Park) = 6830.2m²

Overall (Excluding Car Park) = 6099.7m²

DRAWING REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK

NOTES

DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.

ALL DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK OR THE PRODUCTION OF ANY SHOP DRAWING. ALL DISCREPANCIES TO BE REPORTED TO THE ARCHITECT.

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DWA
ARCHITECTS

DWA Architects (London) Ltd
Cyclops House
Link Business Park
York
United Kingdom
YO10 3JB
01904 544 400
dwa@dwa-architects.co.uk
www.dwa-architects.co.uk

CLIENT
Highgate Care Ltd

PROJECT
New Build 70 Bed Nursing and Convalescent
Care Home With Well Being and
Physiotherapy Centre at: 1 View Road /
103-107 North Hill, Highgate

DRAWING TITLE
Proposed First Floor GA Plan

DRAWING STATUS
PLANNING

SCALE 1 : 200 @ A1	DATE 22.07.21
DRAWN BY JRA	CHECKED BY NMJ
JOB NO. P2719	DWG NO. 103
	REV -



- Room Key
- Bedroom
 - Circulation
 - Dayspace
 - Resident Facilities
 - Staff
 - Storage
 - Suites
 - Terraces

Second Floor GA Plan
1:200 @ A1

Total Residential Units: 23
19 Beds & 4 Suites

Building

Total Residential Units: 70
64 Beds & 6 Suites

Gross External Area:

Second Floor

Overall =1387.1m²

Building

Overall (Including Car Park) = 6830.2m²

Overall (Excluding Car Park) = 6099.7m²

DRAWING REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1				

NOTES

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ARCHITECTS

DWA Architects (London) Ltd
Cyclops House
Link Business Park
York
United Kingdom
YO10 3JB

01904 544 400
dwa@dwa-architects.co.uk
www.dwa-architects.co.uk

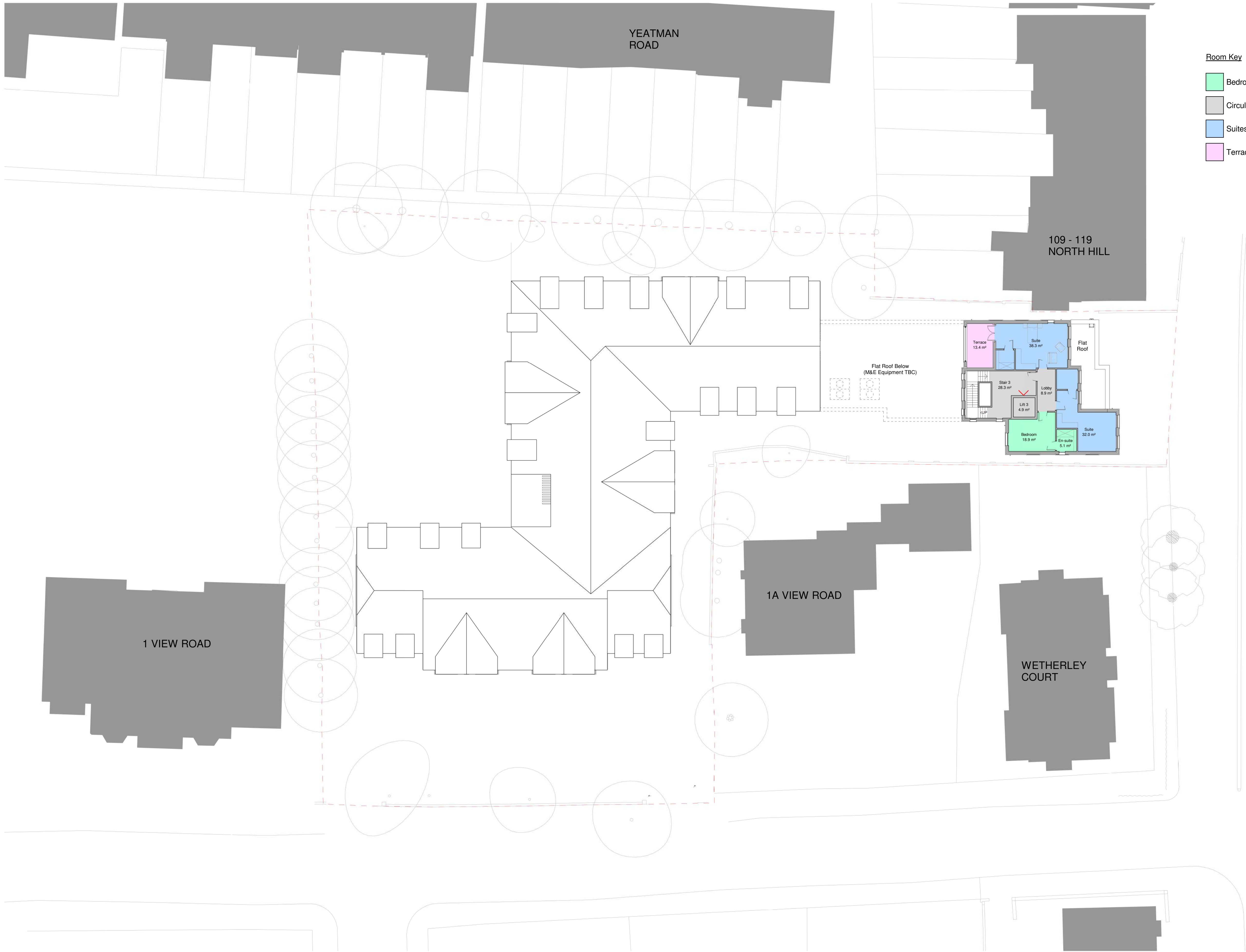
CLIENT
Highgate Care Ltd

PROJECT
New Build 70 Bed Nursing and Convalescent
Care Home With Well Being and
Physiotherapy Centre at: 1 View Road /
103-107 North Hill, Highgate

DRAWING TITLE
Proposed Second Floor GA Plan

DRAWING STATUS
PLANNING

SCALE 1 : 200 @ A1	DATE 22.07.21		
DRAWN BY JRA	CHECKED BY NMJ		
JOB NO. P2719	DWG NO. 104	REV -	



- Room Key
- Bedroom
 - Circulation
 - Suites
 - Terraces

Third Floor GA Plan
1:200 @ A1

Building

Total Residential Units: 70
64 Beds & 6 Suites

Gross External Area:

Third Floor

Overall =170.2m²

Building

Overall (Including Car Park) = 6830.2m²
Overall (Excluding Car Park) = 6099.7m²

DRAWING REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK

NOTES

DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.

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DWA Architects (London) Ltd
Cyclops House
Link Business Park
York
United Kingdom
YO10 3JB

01904 544 400
dwa@dwa-architects.co.uk
www.dwa-architects.co.uk

CLIENT

Highgate Care Ltd

PROJECT

New Build 70 Bed Nursing and Convalescent
Care Home With Well Being and
Physiotherapy Centre at: 1 View Road /
103-107 North Hill, Highgate

DRAWING TITLE

Proposed Third Floor GA Plan

DRAWING STATUS

PLANNING

SCALE	DATE		
1 : 200 @ A1	11.08.21		
DRAWN BY	CHECKED BY		
JRA	NMJ		
JOB NO.	DWG NO.	REV	
P2719	105		

Appendix B

Topographic Survey

[illegible]

Sheet Index

[illegible]



**MALCOLM
HUGHES**

**CHARTERED
LAND SURVEYORS**

65 Cross Street, Sale, Manchester
M33 7HF. Tel: 0161 955 1265
www.malcolmhughes.co.uk
survey@mhsl.co.uk

Accreditations








Client

ND PLANNING LTD
32 ST. JAMES'S AVENUE
BECKENHAM BR3 4HG

Project

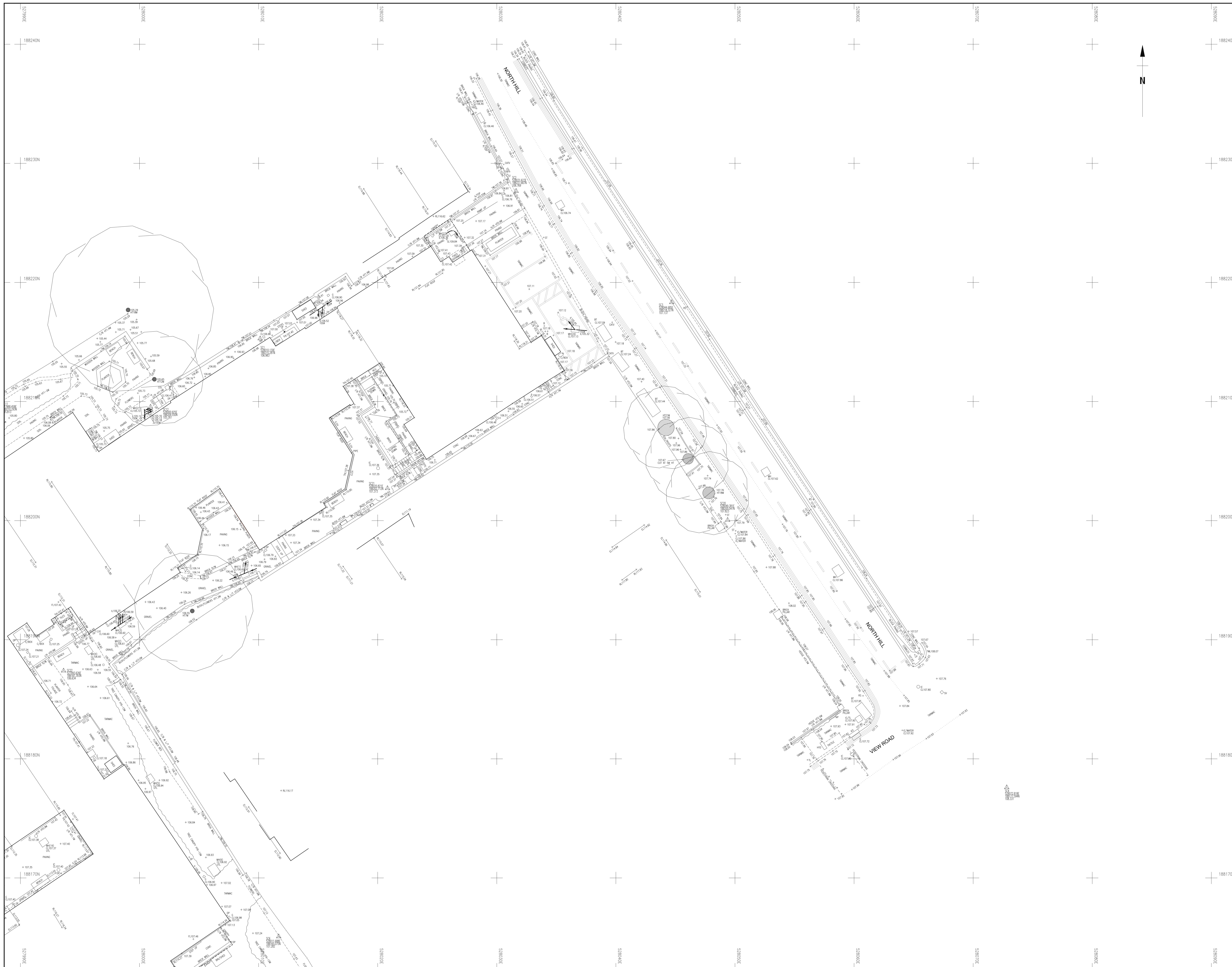
MARY FIELDING GUILD CARE HOME

LONDON N6 4DP

Drawing Title

TOPOGRAPHICAL SURVEY

Drawn By AL	12/03/21	Survey Date March 2021
Checked by ED	12/03/21	Scale A0@1:100
Drawing No 56927/1		Revision



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC5

Levels: Related to OS datum from GNSS positioning,
converted using the National Geoid Model OSGM15.

Notes

[illegible]

Sheet Index

[illegible]



**MALCOLM
HUGHES**
CHARTERED
LAND SURVEYORS

65 Cross Street, Sale, Manchester
M33 7HF. Tel: 0161 905 1265
www.malcolm-hughes.co.uk
survey@mh.co.uk

Accreditations







Client

ND PLANNING LTD
32 ST. JAMES'S AVENUE
BECKENHAM BR3 4HG

Project

MARY FIELDING GUILD CARE HOME
LONDON N6 4DP

Drawing Title

TOPOGRAPHICAL SURVEY

Drawn By	AL	12/03/21	Survey Date	March 2021
Checked by	ED	12/03/21	Scale	A0@1:100
Drawing No	56927/2			Revision

Appendix C

Thames Water Asset Plans

Ardent Consulting Engineers
Hallmark Building
Leadenhall Street
LONDON
EC3M 5JE

Search address supplied Mary Feilding Guild
Truscott House 103-107
North Hill
London
N6 4DP

Your reference Mary Fielding Guild Home

Our reference ALS/ALS Standard/2021_4468677

Search date 15 July 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

Search address supplied: Mary Feilding Guild, Truscott House 103-107, North Hill,
London, N6 4DP

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 search provides 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

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

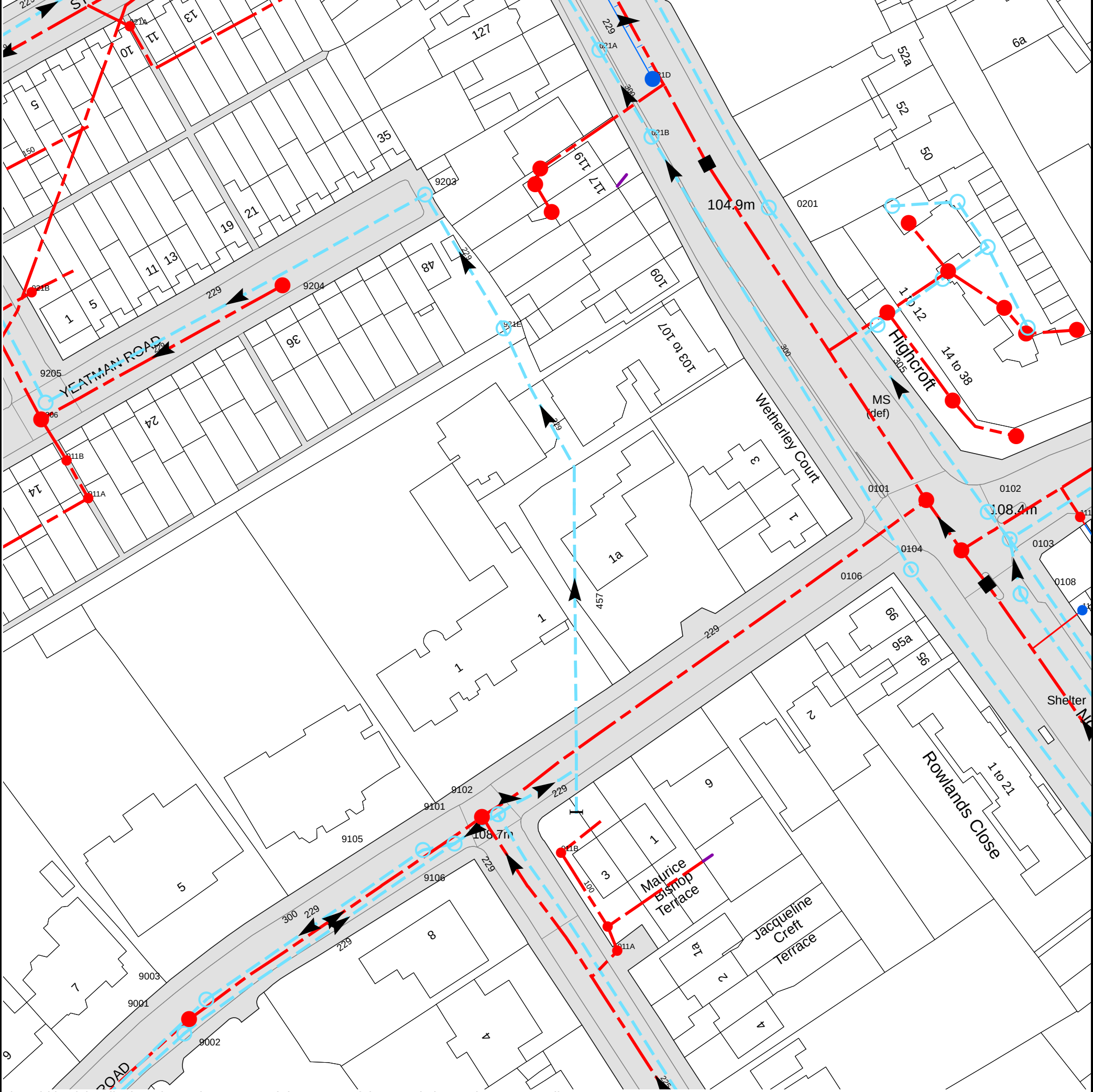
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

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



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528004,188180
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
111H	n/a	n/a
0108	108.47	106.57
0106	108.27	106.7
0104	108.39	104.51
0103	108.27	106.39
111A	n/a	n/a
0102	108.15	n/a
0101	107.94	104.16
01YQ	n/a	n/a
02XS	n/a	n/a
02YS	n/a	n/a
12YV	n/a	n/a
02XV	n/a	n/a
02XX	n/a	n/a
02YV	n/a	n/a
02YR	n/a	n/a
02XY	n/a	n/a
02YW	n/a	n/a
02XZ	n/a	n/a
02YX	n/a	n/a
0201	105.18	103.05
02YQ	n/a	n/a
02YP	n/a	n/a
021B	n/a	n/a
921A	n/a	n/a
021A	n/a	n/a
021D	n/a	n/a
9106	108.37	105.84
9101	108.68	104.8
9102	108.64	106.24
911A	n/a	n/a
911B	n/a	n/a
9206	104.3	100.49
9205	104.37	100.97
921E	n/a	n/a
921B	n/a	n/a
9204	104.37	100.79
0203	n/a	n/a
9203	103.31	101.38
0204	n/a	n/a
0205	n/a	n/a
9002	108.33	106.92
9001	108.42	105.62
9003	108.43	104.58
011A	n/a	n/a
01YS	n/a	n/a
011B	n/a	n/a
9105	108.63	105.71
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.		



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

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 'D' on a manhole level indicates that data is unavailable.

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

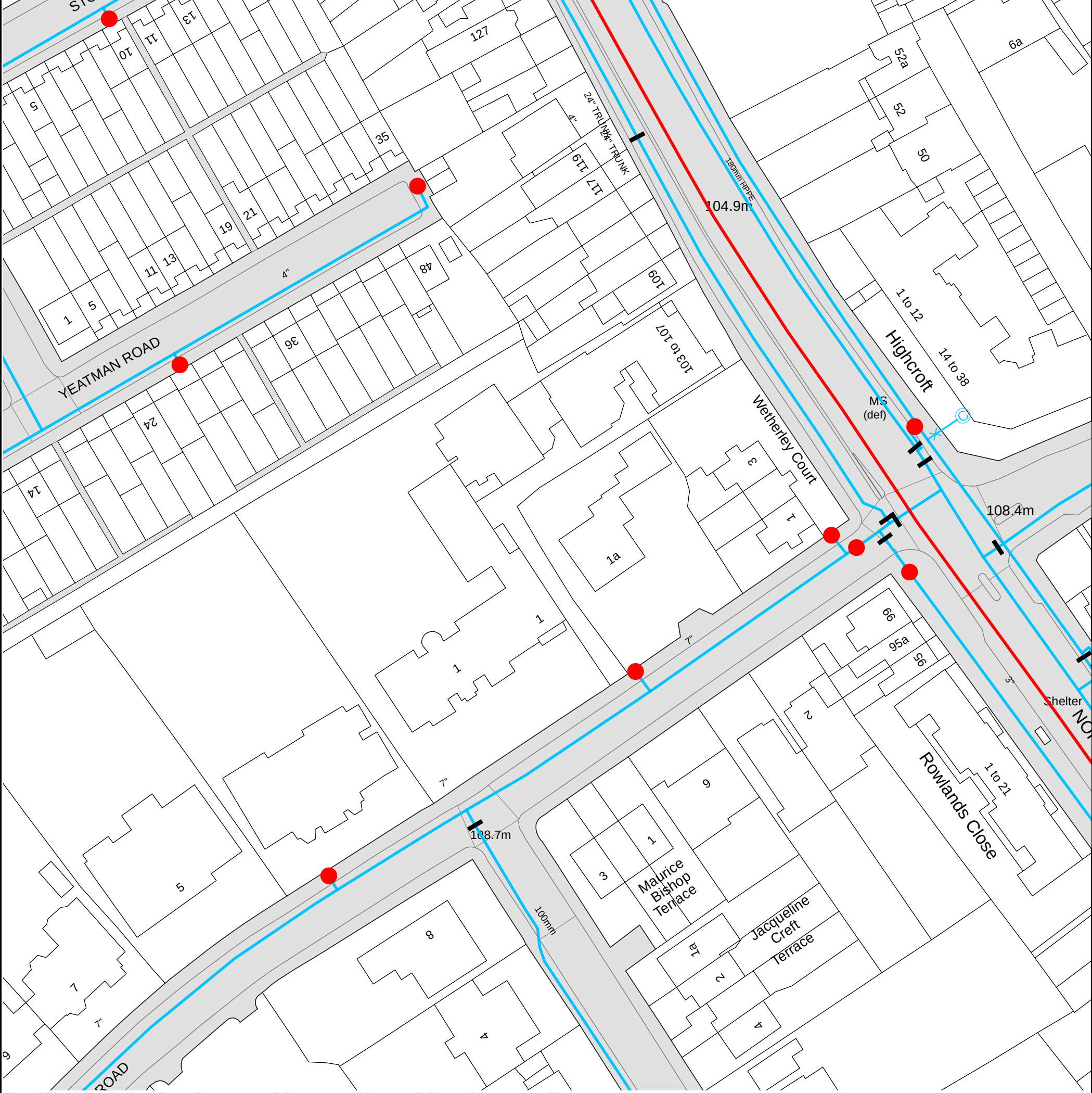
Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

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

	Foul Sewer
	Surface Water Sewer
	Combined Sewer
	Gully
	Culverted Watercourse
	Proposed
	Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. 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.



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528004, 188180.
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.
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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: Indicates 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 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.

Appendix D

London Borough of Haringey SuDS Proforma

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Mary Feilding Guild Care Home
	Address & post code	103-107 North Hill, Highgate, N6 4DP
	OS Grid ref. (Easting, Northing)	E 527997 N 188202
	LPA reference (if applicable)	
	Brief description of proposed work	Demolition of existing building and construction of proposed nursing and convalescence home and well-being and physiotherapy centre
	Total site Area	3600 m ²
	Total existing impervious area	0.257 m ²
	Total proposed impervious area	0.166 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Assumed private drainage connection to TW sewer
	Designer Name	Faye Hammer
	Designer Position	Engineer
Designer Company	Ardent Consulting Engineer	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	None	
	Bedrock geology classification	Claygate Member – Clay, Silt and Sand	
	Site infiltration rate	m/s	
	Depth to groundwater level	m below ground level	
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	Y	Y
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	Y	N
2c. Proposed Discharge Details			
Proposed discharge location	bes Water surface water sewer along View		
Has the owner/regulator of the discharge location been consulted?	Yes		

3. Drainage Strategy

3a. Discharge Rates & Required Storage				
	Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
Q _{bar}	0.4			
1 in 1	0.4	36.69		2
1 in 30	1	81.75		2
1 in 100	1.3	104.11		2
1 in 100 + CC				2
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake		
3c. Proposed SuDS Measures				
	Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)	
Rainwater harvesting	0		0	
Infiltration systems	0		0	
Green roofs	0	0	0	
Blue roofs	0	0	0	
Filter strips	0	0	0	
Filter drains	0	0	0	
Bioretention / tree pits	0	0	0	
Pervious pavements	0	547	49.3	
Swales	0	0	0	
Basins/ponds	0	0	0	
Attenuation tanks	1160		91.2	
Total	1160	547	140.5	

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 3.8 and 4.6-4.10
	Drainage hierarchy (2b)	Section 4.6-4.10
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 4.15-14.17 and Appendix G
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 4.15-4.23 and Appendix H
	Proposed SuDS measures & specifications (3b)	Section 4.8-4.23 and Appendix F
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix A
	Detailed drainage design drawings, including exceedance flow routes	Appendix F
	Detailed landscaping plans	-
	Maintenance strategy	Appendix H
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Appendix H
	b) biodiversity?	
	c) amenity?	

Appendix E

Modified Rational Method - Existing Brownfield Runoff Rates

EXISTING SURFACE WATER

Existing site information:

Site Boundary Area	3734	m ²
Developable Area	0.3734	ha
Impermeable Area	0.2570	ha

Modified Rational Method Equation:

$$Q_n = 2.78 CiA$$

where:

C	Runoff Coeffic =	1 (in this case 1 as using impermeable area)
i_n	Rainfall Intensity for n return period (mm/hr)	
A	Impermeable Area (Ha)	
Q_n	Runoff for n return period (l/s)	

Rainfall Intensity:

The rainfall intensities for various return periods were extracted from Table 1(a) of the Transport and Road Research Laboratory Report - Estimated rainfall for drainage calculations in the United Kingdom (TRRL Report LR 595) by C. P. Young. For the 5 min duration.

i_1	50.8 mm/hr
i_{30}	113.02 mm/hr
i_{100}	143.9 mm/hr

Existing Surface Water Runoff:

Therefore:

			C		i_n		A		Q_n	
Q_1	2.78	x	1	x	50.8	x	0.257	=	36.29	l/s
Q_{30}	2.78	x	1	x	113.0	x	0.257	=	80.75	l/s
Q_{100}	2.78	x	1	x	143.9	x	0.257	=	102.81	l/s

Appendix F

ICP SuDS Mean Annual Flow Method – Equivalent Greenfield Runoff Rates

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Innovyze	Source Control 2020.1	
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.450 Area (ha) 0.103 Urban 0.000 SAAR (mm) 657 Region Number Region 6 Results 1/s QBAR Rural 0.4 QBAR Urban 0.4 Q100 years 1.3 Q1 year 0.4 Q30 years 1.0 Q100 years 1.3		
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Appendix G

Thames Water Pre-development Enquiry



Planning your wastewater

We've put together some information on sewerage to help you plan your new development.

How long does it take to get consent to connect to a sewer?

If you're applying for consent to connect to a sewer under Section 106 of the Water Industry Act 1991, you'll need to give us 21 days' notice.

I think I'll need to connect to a trunk sewer – is that possible?

Connecting directly to trunk sewers can be complex and dangerous, and we won't permit this at all in London. If you're considering a trunk sewer as a point of connection, please contact us as soon as possible to discuss.

How do I handle trade effluent and groundwater discharges?

You mustn't discharge non-domestic waste to our sewers without a valid trade effluent consent - doing this is an offence under Section 109(1) of the Water Industry Act 1991. You can call our trade effluent team on 0203 577 9200 to get help with trade effluent consents and ground water discharge permits.

Where can I discharge surface water?

The Lead Local Flood Authority, or if you are in a London Borough, 'The London Plan', advises that your development should utilise sustainable drainage systems (SuDS) unless there are practical reasons for not doing so. You should aim to achieve greenfield run-off rates and ensure you manage surface water run-off as close to its source as possible in line with the following 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 or drain.
- 7 Discharge rainwater to a combined sewer.

Please note that if you're discharging surface water anywhere other than to a public sewer – such as to a watercourse – you'll need approval from the relevant authority, for example the Environment Agency, the local authority or the Canals and Rivers Trust.

If you don't follow the surface water hierarchy you may not be granted planning permission, and Thames Water may seek to put conditions on the planning application.

There's no right of discharge of highway drainage into the public sewerage system, and we'd need to agree this with the relevant highway authority under Section 115 of the Water Industry Act 1991. You can contact us to discuss this further.

What can I do about redundant sewers and rising mains on my site?

On brownfield sites where existing sewers or rising mains need to be made redundant or diverted, the developer will need to fund the work, as set out in Section 185 of the Water Industry Act. If there's no practical way of making a diversion, we'll apply the standoff distances in Sewers for Adoption 7th edition to assess the width of easement required.



Faye Hammer
Ardent Consulting Engineers
The Hallmark Building
52.56 Leaderhall Street
London
EC3M 5JE



02 November 2021

Pre-planning enquiry: Confirmation of sufficient capacity

Site: Mary Fielding Guild Care Home, 107 North Hill, London, N6 4DP

Dear Ms Hammer,

Thank you for providing information on your development.

Existing site: Nursing/Care Home (43 beds)

Proposed site: Nursing/Care Home (82 beds)

Proposed foul water discharge by gravity into 229mm foul water sewer on View Road downstream of manhole TQ27889101

Proposed surface water discharge by gravity at 2l/s for all storm events up to and including 1:100+40%CC into 300mm surface water sewer on View Road via manhole TQ27889105

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 foul water 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

When developing a site, policy 5.13 of the London Plan and Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design And Construction) states that every attempt should be made to use flow attenuation and SuDS/Storage to reduce the surface water discharge from the site as much as possible.

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water 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. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.



The disposal hierarchy being:

1. store rainwater for later use.
2. use infiltration techniques where possible.
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.
8. discharge rainwater to the foul sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of 2l/s for all storm events up to and including 1:100+40%CC, then Thames Water would not have any objections to the proposal.

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

Diversion

There are existing public sewers crossing the site. New buildings will need to be kept between 3 and 6.5m away from existing sewer depending on the size and depth of the sewer. Alternatively, it may be possible for sewers to be diverted around the new development. If you wish us to review a diversion proposal, please submit this via a Section 185 Diversion application. On some occasions it may be possible to abandon existing public sewers. Please contact us for further information on this process.

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 have any further questions, please contact me on 0800 009 3921.

Kind Regards,

A handwritten signature in black ink, appearing to read "Kojo Howard", with a long horizontal line extending from the start of the signature.

Kojo Howard

Developer Services – Adoptions Engineer, Sewer Adoptions Team

Tel: 0800 009 3921

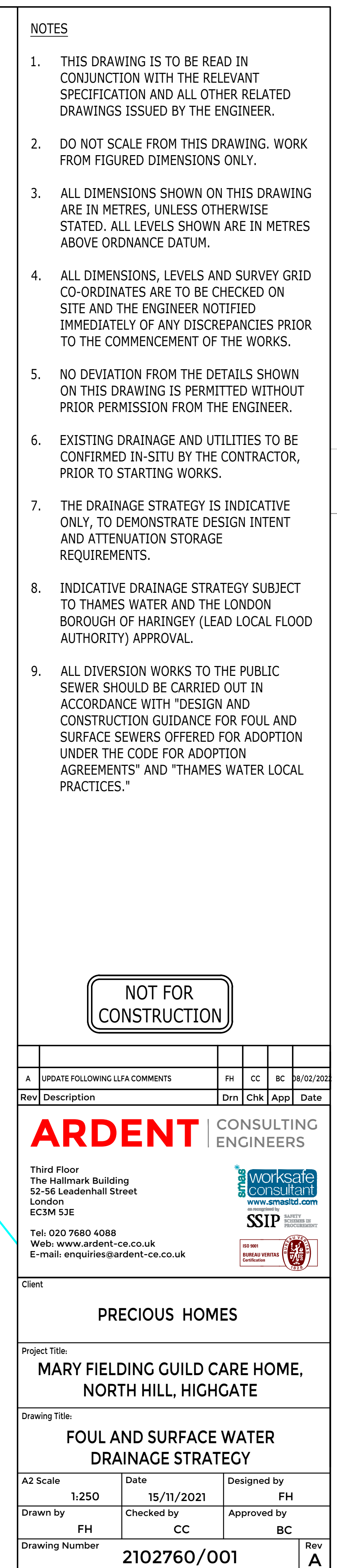
Get advice on making your sewer connection correctly at connectright.org.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk

Appendix H

2100310-001 Proposed Surface Water Drainage Strategy



Appendix I

Proposed Surface Water Drainage Strategy Calculations

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Page 1



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)

FEH Rainfall Version

Site Location GB 528010 188216 TQ 28010 88216

Data Type

Maximum Rainfall (mm/hr)

Maximum Time of Concentration (mins)

Foul Sewage (l/s/ha)

Volumetric Runoff Coeff.

PIMP (%)

Add Flow / Climate Change (%)

Minimum Backdrop Height (m)

Maximum Backdrop Height (m)

Min Design Depth for Optimisation (m)

Min Vel for Auto Design only (m/s)

Min Slope for Optimisation (1:X)

100

2013

Point

50

30

0.000

0.750

100

0

0.200

1.500

0.600

1.00

500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	19.600	0.335	58.5	0.166	4.98	0.0	0.600	o	225	Pipe/Conduit	
1.001	12.400	0.074	168.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	23.140	0.271	85.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	15.500	0.092	168.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.17	106.180	0.166	0.0	0.0	0.0	1.71	68.1	22.5
1.001	50.00	5.38	105.845	0.166	0.0	0.0	0.0	1.01	40.0	22.5
1.002	50.00	5.65	105.771	0.166	0.0	0.0	0.0	1.42	56.3	22.5
1.003	50.00	5.91	105.500	0.166	0.0	0.0	0.0	1.01	40.0	22.5

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.003	106.790	105.408	105.127	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 528010 188216 TQ 28010 88216
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 2, DS/PN: 1.001, Volume (m³): 2.5

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	105.845
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0	Kick-Flo®	0.564	1.4
Flush-Flo™	0.280	1.7	Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		

Hydro-Brake® Optimum Manhole: 4, DS/PN: 1.003, Volume (m³): 2.2

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	105.500
Minimum Outlet Pipe Diameter (mm)	100

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Hydro-Brake® Optimum Manhole: 4, DS/PN: 1.003, Volume (m³): 2.2

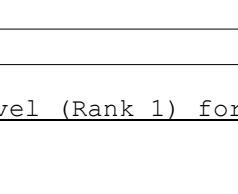
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0	Kick-Flo®	0.564	1.4
Flush-Flo™	0.280	1.7	Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	2	Number of Storage Structures	3	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 528010 188216 TQ 28010 88216
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	480 Winter	100	+40%	100/120 Summer				107.282
1.001	2	480 Winter	100	+40%	30/120 Winter				107.278
1.002	3	960 Winter	100	+40%	100/240 Winter				106.394
1.003	4	960 Winter	100	+40%	100/240 Winter				106.390

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.877	0.000	0.13			8.1	FLOOD RISK	
1.001	2	1.208	0.000	0.06		136	2.0	FLOOD RISK	
1.002	3	0.398	0.000	0.04		1008	1.9	SURCHARGED	
1.003	4	0.665	0.000	0.05			1.7	FLOOD RISK	

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Appendix J

CIRIA C753 Simple Index Method

C753 SIMPLE INDEX TREATMENT METHOD
November 2021

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, home zones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 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 trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 1: Pollution hazard indices for different land use classifications

(land use in bold applicable for the development).

Type of SuDS component	Mitigation indices		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bio retention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 2: Indicative SuDS mitigation indices for discharges to surface waters

(bold text is applicable to this development).

For surface water discharge from Residential Parking Areas and Low Traffic Roads <300 traffic movements/day			
	Required mitigation indices		
Source	TSS	Metals	Hydrocarbons
Low	0.5	0.4	0.4
Type of SuDS component provided			
Permeable pavement	0.7	0.6	0.7
Total	0.7	0.6	0.7
Check	+0.20	+0.20	+0.3

Table 3: SuDS mitigation indices provided

Appendix K

Surface Water Management and Maintenance Plan

1.0 INTRODUCTION

- 1.1 The development at Mary Fielding guild Care Home includes a number of Sustainable Drainage Systems (SuDS) as part of the surface water drainage system including green roofs, permeable paving and geocellular tanks. This Technical Note sets out an outline management plan for the aforementioned SuDS components.
- 1.2 The proposed SuDS components in addition to addressing climate change will bring a number of benefits in terms of water quality, environmental, and social amenity.
- 1.3 The maintenance of all SuDS components will be in accord with the best practices and CIRIA document C753 "The SuDS Manual". Typical maintenance activities for the proposed SuDS components have been reproduced from Table 32.1 of "The SuDS Manual" in **Table 1** below. A private management company will be set up to maintain the surface water drainage network, including on-site SuDS. .

Table 1: Typical SuDS Maintenance Activities

Operation and maintenance activity	SuDS component		
	Geo-cellular Tank	Permeable paving	Green roof
Regular maintenance			
Inspection	■	■	■
Litter and debris removal	□	■	■
Grass cutting			■
Weed and invasive plant control		□	■
Shrub management		□	
Shoreline vegetation			
Aquatic vegetation management			
Occasional maintenance			
Sediment management	■	■	
Vegetation replacement			■
Vacuum sweeping and brushing		■	
Remedial maintenance			
Structure rehabilitation / repair	□	□	□
■ will be required □ may be required			

2.0 SuDS MANAGEMENT PLAN

- 2.1 This plan is intended to cover all on-site drainage structures. The Site Management Team should oversee and implement the SuDS Management Plan and designate a qualified person who will be responsible for the proper operation and maintenance of the surface water drainage structures.

Water Quality Management

- 2.2 In line with Tables 26.2 and 26.3 of the CIRIA C753 The SuDS Manual, it can be seen that the proposed greenroofs and permeable paving would provide sufficient treatment for the surface water runoff from the Site.
- 2.3 The surface drainage network would also be designed to protect and enhance the quality of surface water runoff through the removal of sediment and pollutants. Catchpit manholes and silt trapped gullies will reduce the amount of pollutants entering the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular sweeping and litter removal, prohibitions on the use of pesticides, and maintenance of bin areas.

Maintenance Program

- 2.4 The Site Management Team will conduct the SuDS Management Plan set forth in this document. The Site Management will ensure that inspections and record keeping are timely and accurate. Inspection & Maintenance Log Forms should include the date and physical conditions of the structures, depth of sediment in structures, evidence of overtopping or debris blockage and maintenance required of each structure. Records of maintenance will be kept on file on-site and copies of Inspection & Maintenance Log sheets indicating all work and inspections will be available to the Council upon request. A model Maintenance log is appended for reference.
- 2.5 Regular maintenance should include:
- Inspect channel and gully inlet grates and remove any debris every 6 months or as determined to be reasonable based on experience with the installed

systems to ensure that the gullies are working in their intended fashion and that they are free of debris;

- Inspect gully sumps and bottom of drain manholes quarterly; if depth of sediment in sumps exceeds 50% capacity, sediment must be removed. Excessive sediment shall be removed and properly disposed by a licensed drainage cleaning company.
- All litter shall be picked up and removed from the parking areas, external bin store, wetland areas, green roofs, and soft landscaping.
- Inspect all green roofs. Replant bare areas or areas with sparse growth.
- Inspect external bin stores for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the surface water drainage network.
- Green roofs will require regular inspection and maintenance on a weekly or fortnightly basis, especially during the establishment stage (first 12 – 15 months). Maintenance during the establishment stage should be made the responsibility of the green roof provider, to ensure healthy growth and satisfactory establishment. Regular inspections of the green roof area should also include the soil substrate for the presence of erosion and drainage inlets to ensure run-off can discharge unrestricted.
- The inlets, outlet and vents and overflows of SuDS components should be checked annually and after large storms to ensure that they are in good condition and operating as designed. Regular maintenance includes inspection and identification of any areas that are not operating correctly monthly for the first 3 months and then every 6 months after.

Winter Maintenance Program

- 2.6 Ensure that drainage structures are not blocked by ice, snow, debris or rubbish during winter months.

Operation and Maintenance requirements

2.7 Recommendations for the operation and maintenance including typical frequencies are included in **Tables 2, 3** and **4** below.

Table 2: SuDS Operation and Maintenance Requirements- Green Roofs

SUDS Element	Green Roofs	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	6 monthly and annually, or as required
	During establishment (i.e. year one) replace dead plants	Monthly
	Post establishment, replace dead plants as required (where >5% coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial Work	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required.
	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources or erosion damage should be identified and controlled	As required.

Monitoring	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms.
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources.	Annually and after severe storms.
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system.	Annually and after severe storms.
	Inspect underside of roof for evidence of leakage.	Annually and after severe storms.

Table 3: SuDS Operation and Maintenance Requirements- Permeable paving

SUDS Element	Permeable Paving	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Brushing and vacuuming	Once a year or as required
Occasional Maintenance	Stabilise and mow contributing adjacent area	As required
	Removal of weed or management using glyphosate applied directly into weeds by an applicator rather than spraying	As required
Remedial Work	Remediate any landscaping which has been raised to within 50mm of the level of the paving	As required.
	Remedial work to any depressions, rutting and cracked or broken	As required.

	blocks considered detrimental to structural performance or a hazard to users.	
Monitoring	Rehabilitation of surface or upper structure by remedial sweeping	Every 10 to 15 years, or as required
	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48hrs after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 4: SuDS Operation and Maintenance Requirements- Attenuation tank

SUDS Element	Attenuation Tank	
Maintenance Period	Maintenance Task	Frequency
Maintenance Work	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risk to performance)	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial Work	Repair/rehabilitate inlets, outlets, overflows and vents	As required.

Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually.
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required.

Suds Management Plan- Appendix A
Drainage Operation and Maintenance Log

Site Maintenance Supervisor: _____ Date: _____

☐ Routine ☐ Response to rainfall event _ in ☐ Other: _____

BMP	Frequency	Date Performed	Comments
Gullies and Manholes	Monthly Inspections		
	Maintenance Quarterly and as necessary		
Pavement Areas (parking, driveways, service areas)	Quarterly Sweeping		
	Rubbish & Litter Removal as Necessary		
Green Roofs	Annual inspection		
Green Roofs Geocellular attenuation (permavoid)	Bi-annual maintenance as necessary		
	Inspect and identify areas not operating properly every 3 months (for the first 3 months) and every 6 months after		
Geocellular attenuation (permavoid)	Full bi-annual inspection		

Appendix L

Existing and Proposed Peak Foul Water Runoff Rates

EXISTING FOUL WATER



Unit Type	Existing Area/Units	Hours (hrs)	Foul Water Flow Rate l/day	Peak Factor	Peaked Loading l/s	Loading (l/s)
Nursing/Care Home	43 units	24	375 per property	6.6	0.0286458 per property	1.232

TOTAL EXISTING FOUL LOADING = 1.232

PROPOSED FOUL WATER

Unit Type	Proposed Area/Units	Hours (hrs)	Foul Water Flow Rate l/day	Peak Factor	Peaked Loading l/s	Loading (l/s)
Nursing/Care Home	70 units	24	375 per property	6.6	0.0286458 per property	2.005

TOTAL PROPOSED FOUL LOADING = 2.005