



231 Watford Road

Drainage Management Plan

September 2021

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

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Comments Planning Issue

Comments



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Executive Summary

Waterman has instructed by by Fruition Properties to undertake a Drainage Strategy in relation to the proposed development located at 231 Watford Road, Harrow HA1 3TU.

Environment Agency mapping indicates that the Site is located within Flood Zone 1, denoting a low probability of flooding from tidal sources.

The risk of flooding from fluvial, pluvial, groundwater and artificial sources has also been assessed separately by Ardent.

Surface water runoff from the proposed development would discharge into the public surface water sewer.

The existing runoff rate for the Site has been calculated to be 32.25 l/s. It is proposed to discharge the site to greenfield runoff rates with a peak outflow rate of 3.2 l/s. The London Borough of Brent would require a restriction of the surface water runoff and the use of SuDS, sustainable drainage systems, would be expected.

This report sets out the principles of the Sustainable Drainage System on site, however, the final strategy would be confirmed at detailed design stage.

The on-site drainage network and Sustainable Drainage System encompassing green roof, bio-retention/raingarden and permeable paving would be managed and maintained for the lifetime of the development by an appropriate managing body, ensuring that it remains fit for purpose and functions appropriately.

Foul flows from the Site would discharge by gravity into Thames Water foul water sewer network. The existing foul discharge rates have been calculated using the water consumption method to be 0.4 l/s and proposed rates would be 0.9 l/s.

It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework and Local Policy.

The proposed development is located within proximity of a Thames Water surface water sewer and application have been made for a build over/adjacent application to Thames Water.

Thames Water have confirmed that the proposed foul discharge is acceptable. Surface water is acceptable subject to infiltration being carried out to confirm whether soakaways can be used.

1. Introduction

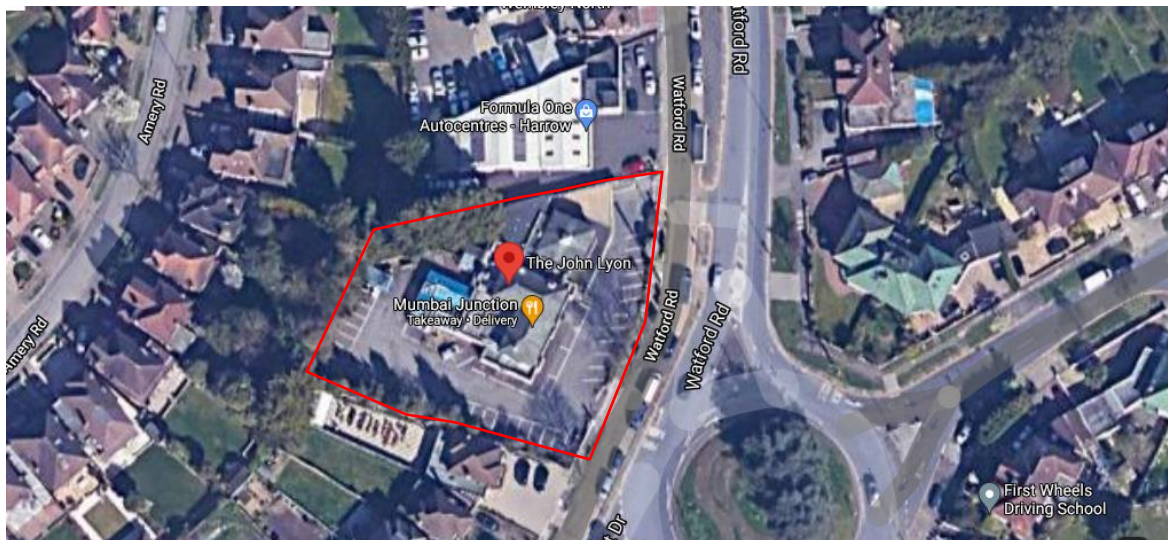
- 1.1. Waterman are instructed by Fruition Properties Limited ('the Applicant') to prepare a Drainage Management Plan (DMP) in support of a planning application for residential development at 231 Watford Road, Harrow, HA1 3TU ('the Site').
- 1.2. The planning application is made for:

'Demolition of the existing building and the erection of a part three, part four and part five storey building to provide residential dwellings (Use Class C3); car and cycle parking; landscaping, amenity space and play area; and refuse storage and other associated works.'
- 1.3. The proposals follow extensive pre-application engagement with the London Borough of Brent ('LBB') planning officers throughout 2020 and 2021; presentation of the proposals at a LBB Design Review workshop in June 2021; and public consultation in June-July 2021.
- 1.4. The proposals will optimise the Site for new residential development on underutilised land within a predominately residential area, responding well to the character of the local area.
- 1.5. This report assesses the management of surface water runoff and provides details of an overall drainage strategy and SUDs to be provided.

Site Description

- 1.6. The Site is located at 231 Watford Road, Harrow, HA1 3TU and extends to 0.24 hectares.
- 1.7. The Site is occupied by the Mumbai Junction restaurant, a part one and part two storey building. The existing building is set back from Watford Road by a large area of car parking, which wraps around the building from the east to the south.
- 1.8. The Site is located to the west of the John Lyon roundabout. Vehicular and pedestrian access is made from the east of the Site, from the service road which runs alongside Sudbury Court Drive and Watford Road.
- 1.9. The Site is bound to the north by Formula One Autocentres; to the east by Watford Road and the John Lyon roundabout; to the south by residential properties along Sudbury Court Drive; and to the west by residential properties along Amery Road.
- 1.10. The surrounding area is predominately residential in nature, although there is an autocentre directly to the north and commercial uses along Watford Road to the south of the John Lyon roundabout. Other nearby uses include Harrow School, Northwick Park, Northwick Park Golf Course and Northwick Park Hospital to the north and Sudbury Court Park/Pasture Park Pass and Sudbury Hill Park to the south. Harrow Town Centre is located approximately 2.5km north of the Site.
- 1.11. The Site is not located within a Conservation Area and there are no listed buildings within the immediate vicinity. The Sudbury Court Conservation Area is located to the east of the Site on the opposite side of the John Lyon roundabout. The nearest listed building is the Grade II listed 96 and 98 Sudbury Court Road located approximately 0.4km south of the Site.

Figure 1: Site Location Plan



 Site Boundary

Source: Google Maps

- 1.12. The topographic survey (Appendix A) indicates that ground levels within the existing site between 53.3 to 52.5m AOD across the site. The site is lower at the north eastern boundary with Watford Road. The existing building levels are set at a level of 53.260m.

Development Proposals

- 1.13. The development proposals (Appendix B) are as follows: -

Demolition of the existing building and the erection of a part three, part four and part five storey building to provide residential dwellings (Use Class C3); car and cycle parking; landscaping, amenity space and play area; and refuse storage and other associated works.

Scope of Report

- 1.14. This report assesses the management of surface water runoff and provides details of an overall drainage strategy. This includes to effectively managing runoff whilst working within the site-specific constraints, so that flood risk is not increased elsewhere.

2. Planning Policy and Guidance

National Planning Policy Framework and Planning Practice Guidance

- 2.1. The National Planning Policy Framework¹ (NPPF) last revised in February 2019 and its supporting Planning Practice Guidance² (PPG) states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary, it must be made safe without increasing flood risk elsewhere.
- 2.2. In relation to drainage it states that when determining planning applications, Local Planning Authorities (LPA) should only consider development in areas where priority is given to the use of Sustainable Drainage Systems (SuDS).
- 2.3. The PPG states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of SuDS.

Non-statutory Technical Standards for Sustainable Drainage Systems

- 2.4. The Non-statutory Technical Standards for SuDS³ was published in March 2015 and is the current guidance for the design, maintenance and operation of SuDS.
- 2.5. The standards set out that the peak runoff rates should be as close as is reasonably practicable to the greenfield rate, but should never exceed the pre-development runoff rate.
- 2.6. The standards also set out that the drainage system should be designed so that flooding does not occur on any part of the site for a 1 in 30 year rainfall event, and that no flood of a building (including basement) would occur during a 1 in 100 year rainfall event.
- 2.7. It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.

London Plan and the London Plan Supplementary Planning Guidance

- 2.8. The London Plan published in March 2021⁴ provides a good indication of industry best-practice and what developments should aim to achieve.
- 2.9. The policy SI 13 on Sustainable drainage states that development proposals should aim to achieve greenfield runoff rates and ensure that surface water runoff is managed in line with the following: -

A Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.

B 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. There should also be a preference for green over grey features, in line with the following drainage hierarchy:

1) Rainwater use as a resource (for example rainwater harvesting or blue roofs for irrigation);

1 Ministry of Housing, Communities and Local Government, February 2019. National Planning Policy Framework.

2 Ministry of Housing, Communities and Local Government, March 2014. Planning Practice Guidance.

3 Department for Environment, Food, and Rural Affairs, March 2015. Non-statutory technical standards for sustainable drainage systems.

4 Greater London Authority, March 2021 Published as The London Plan.

- 2) *Rainwater infiltration to ground at or close to source;*
- 3) *Rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens);*
- 4) *Rainwater discharge direct to a watercourse (unless not appropriate);*
- 5) *Controlled rainwater discharge to a surface water sewer or drain; and*
- 6) *Controlled rainwater discharge to a combined sewer.*

2.10. In addition, the policy states that: -

C Development proposals for impermeable paving should be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

D Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

2.11. The document notes that, there should be a preference for green over grey features, and drainage by gravity over pumped systems.

2.12. The London Plan Supplementary Planning Guidance⁵ (SPG) entitled ‘Sustainable Design and Construction’, published in April 2014, provides further information on how to achieve the objectives of the London Plan. Regarding the control of surface water runoff, the SPG states:

- Developers should aim to achieve 100% attenuation of the site’s undeveloped surface water runoff, i.e. achieve greenfield runoff rates; and
- Where greenfield rates cannot be achieved, a minimum of 50% attenuation of the undeveloped site’s surface water runoff is expected.

Water Industry Act

2.13. Thames Water is the local Sewerage Undertaker and provides sewerage services under the regulation of the Water Industry Act 1991.

2.14. Under Section 106 of the Water Industry Act, the developer currently maintains the automatic right to ‘communicate’ with the public foul water sewer system.

London Borough of Brent Council Core Strategy CP18 – Protection and Enhancement of Open Space, Sports and Diversity

2.15. The CP18 Strategy⁶ forms part of the London Borough of Brent Council (LBB) Local Plan, setting out the vision, objectives and spatial planning strategy for the Borough adopted in 2010 and presents policies to future core planning strategy.

2.16. This policy is to improve flood risk management and promote sustainable drainage systems. This is to ensure individual development proposals will have no adverse impact and that essential community infrastructure will be at less risk of damage.

London Borough of Brent Sites and Policies Plan DMP 9B – On Site Management and Surface Water Attenuation

2.17. In Line with the London Plan, London Borough of Brent’s Sites and Policies Plan DMP 9B dated from

⁵ Mayor of London, April 2014. Supplementary Planning Guidance: Sustainable Design and Construction.

⁶ London Borough of Brent | Core Strategy: July 2010.

2016, states:

- A. *Proposals for new development will be required to make provision for the installation and management of measures for the efficient use of mains water and for the control and reduction of surface water run-off. Substantial weight will be afforded to the target for mains water consumption of 105 litres or less per person per day and to the achievement of greenfield runoff rates. Where greenfield run-off rates cannot be achieved this should be clearly justified by the applicant.*
- B. *The design and layout of major development proposals will be required to:*
 - a. *use appropriate sustainable drainage*
 - a. *use appropriate sustainable drainage measures to control the rate and volume of surface water run-off*
 - b. *ensure where feasible separation of surface and foul water systems;*
 - c. *make reasonable provision for the safe storage and passage of flood water in excessive events; and*
 - d. *demonstrate adequate arrangements for the management and maintenance of the measures used*

London Borough of Brent Sustainable Drainage (SUDS) Design

2.18. The document states that the: -

Post-development surface water discharge rate should be limited to greenfield runoff rates. Proposals for higher discharge rates should be agreed with the LLFA ahead of submission of the Planning Application. Clear evidence should be provided with the Planning Application to show why greenfield rates cannot be achieved.

2.19. A detailed planning application should include a detailed SuDS design to allow planning approval and commencement. The London Sustainable Drainage Proforma is completed and included as Appendix C.

3. Surface Water Drainage

Existing Drainage

3.1. Thames Water records (Appendix D) indicate foul water sewers within the vicinity of the Site, as shown in Table 1 below. The surface and foul water drainage for the site will connect into the Thames Water sewers, which have been outlined below.

Figure 2: Existing Drainage connections from the Site

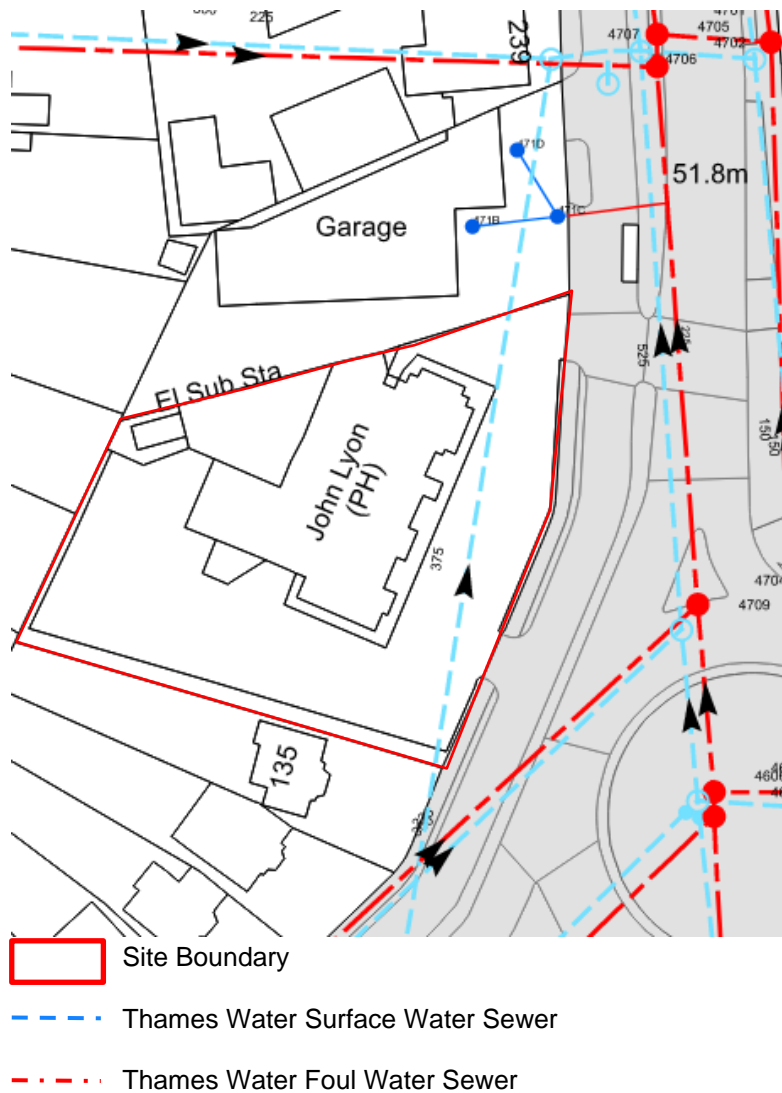


Table 1: Existing Sewer Network Summary

Location	Sewer
Thames Water	
Watford Road	225mm diameter foul water sewer
	525mm diameter surface water sewer
Through the site	375mm diameter surface water sewer

Proposed Drainage

- 3.2. The proposed drainage system would be designed to convey surface and foul water separately. The design would be in accordance with BS EN 752 – Drain and Sewer Systems Outside Building, BS EN 12056 – Gravity Drainage Systems Inside Buildings and Approved Document H of Building Regulations.⁷
- 3.3. In line with Building Regulations and the PPG, the following hierarchy of surface water disposal should be adhered to, in decreasing order of preference.
- I. Discharge to ground;
 - II. Discharge to surface water body;
 - III. Discharge to a surface water sewer; and
 - IV. Discharge to a combined sewer.

Discharge to Ground

- 3.4. Due to the limited space available for soakaways and the required 5m offset from buildings and the boundary, discharging to ground is not considered feasible at this time. From BGS maps, it appears that the ground will be London Clay which will have a very low infiltration rate but this will need to be checked and confirmed through a site investigation.

Discharge to a Surface Water Body

- 3.5. The nearest water course is a tributary of the River Brent located over 2 km from the site and therefore connection is not possible.

Discharge to a Surface Water sewer

- 3.6. As indicated in Table 1, there are existing Thames Water surface water sewers that runs in the adjacent road and within the site boundary.

Sustainable Drainage Systems

- 3.7. The most sustainable way to manage surface water drainage is through the use of Sustainable Drainage Systems (SuDS), which need to be considered in relation to site-specific conditions.
- 3.8. SuDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, thereby reducing the risk of flooding. In addition to reducing flood risk, SuDS devices can improve water quality, and provide biodiversity and amenity

⁷ British Standards Institution, April 2008. *BS EN 752:2008 – Drain and Sewer Systems Outside Buildings.*

benefits.

- 3.9. A variety of SuDS are available to reduce or temporarily attenuate the discharge of surface water runoff. The potential for SuDS was considered throughout the development of the scheme proposals. Table 2 outlines the potential SuDS devices and their constraints and opportunities at the Site.

Table 2: SuDS Features Constraints

Device	Description	Constraints/Comments	✓/✗
Blue Roof (source control)	Provide soft landscaping over attenuation units at roof level to reduce surface water run-off and control water at source	Combined loading for both green and blue roofs will increase build-up zones and internal structural zones for the transfer deck of the modular construction and therefore increasing the building height.	✗
Green/brown roofs (source control)	Provide soft landscaping at roof level which reduces surface water runoff.	Useable space would be located at the rooftops, therefore green/brown roofs could be proposed within the development. This would be dependent on the strength of the building.	✓
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration.	The lack of available space to provide the required minimum offset to soakaways precludes the use of infiltration devices.	✗
Pervious surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer, from which it can infiltrate and/or slowly discharge into sewers.	This will be possible as a lined storage device within the limited car parking space on site.	✓
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from the site by reusing water for non-potable uses e.g. toilet flushing or water butts.	This would need to be confirmed with the development potentials for the use of rainwater harvesting but is not proposed at present.	✗
Swales (permeable conveyance)	Broad, shallow channels that convey/store runoff, and allow infiltration (ground conditions permitting)	The lack of available space on-site precludes the use of swales.	✗

Device	Description	Constraints/Comments	✓/✗
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration (ground conditions permitting).	The lack of available space on-site precludes the use of filter drains.	✗
Filter strips (permeable conveyance)	Wide, gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas.	There is insufficient space for filter strips to be incorporated, therefore they have not been incorporated into the development.	✗
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base.	The limited available space on-site means that that infiltration basins are unfeasible.	✗
Bio-retention systems/ rain garden (end of pipe treatment)	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils.	The available space on-site is very limited and means that these devices may not be feasible though we have proposed these in parts of the green space to store and drain parts of the site.	✓
Dry ponds (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base.	Due to the limited space available on-site, dry ponds are considered to be unfeasible.	✗
Underground attenuation (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level.	These have been proposed to store excess runoff within the development. This will be located below the car parking and landscaping areas.	✓

Green/Brown Roof

- 3.10. Green and brown living roofs comprise a vegetative cover over a drainage layer which mimics the natural drainage regime of a Greenfield site, through absorption by the plants and retention of precipitation within the growing medium. This reduces the volume of runoff and peak flows. Living roofs can also provide benefits through providing replacement and additional habitat within developments. Furthermore, they can facilitate in reducing a building's carbon footprint by removing CO₂ and reducing energy demand owing to the thermal benefits. This is being provided and areas will be confirmed by the Architect drawing in Appendix B.

Pervious Surfaces

- 3.11. Pervious surfaces allow for the infiltration of runoff through otherwise impermeable surfaces such as roads and pavements and allows treatment of the surface water. Pervious paving would be proposed in the car parking area of the proposed building.

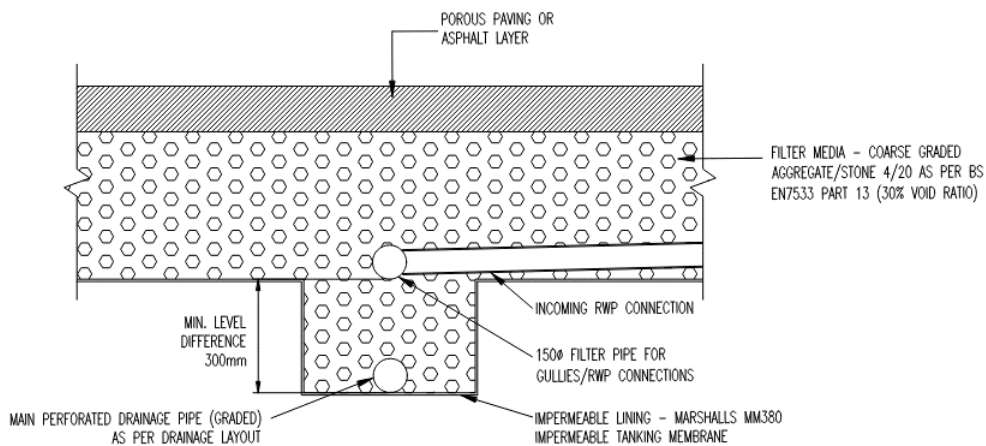


Figure 3: Permeable Paving

Bio-retention Systems

- 3.12. A filter (bio-retention) strip is proposed above the filter drain/trench to be in the soft landscaping areas. This comprises a layer of planted soil, which provides an additional level of treatment of the runoff before it is conveyed into the filter drain with gravel surround.

CIRIA SuDS Manual 2015

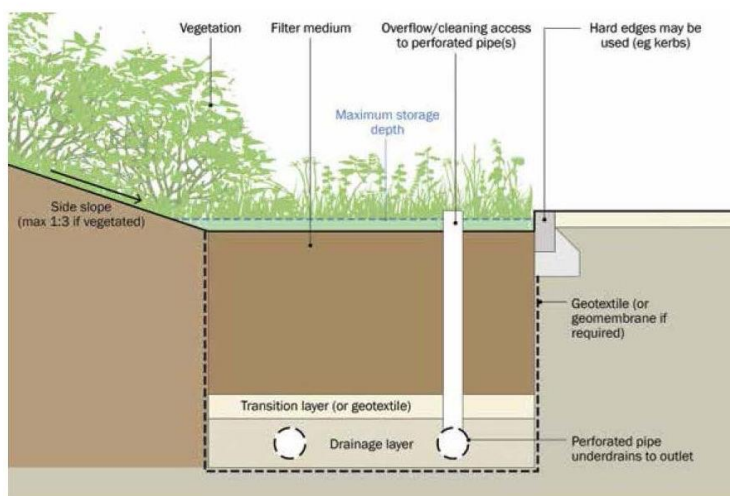
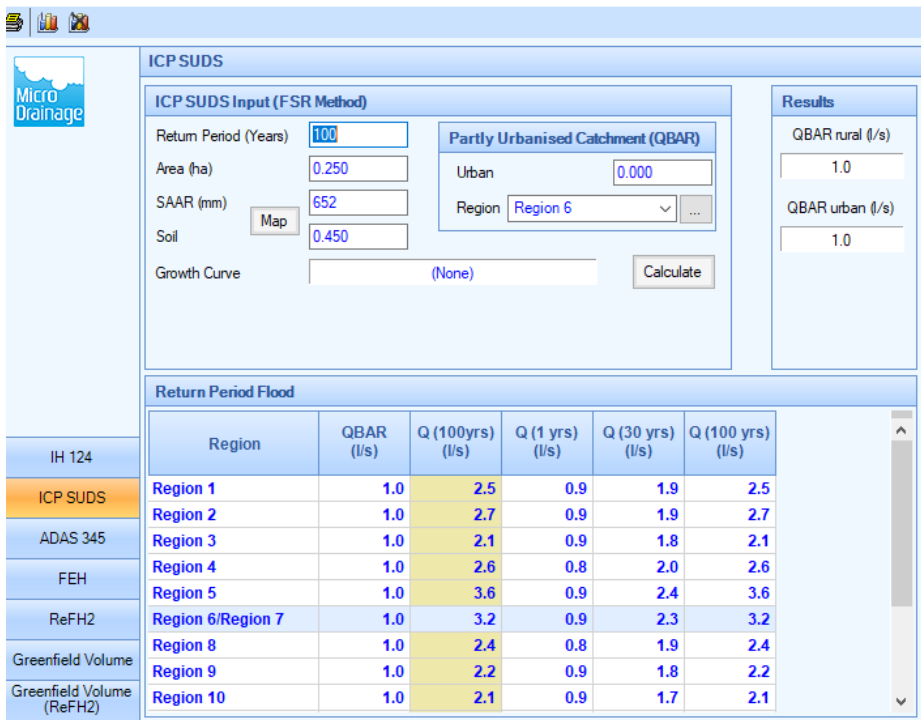


Figure 4: Bio-Retention System

Proposed Surface Water Drainage Strategy

- 3.13. The total Site area within the red line boundary is 0.2500 ha. The existing discharge rate for the Site has been calculated for the 100-year 60-minute event using the Modified Rationale Method (Appendix E). This gives an existing runoff rate from the site of 32.25 l/s.
- 3.14. The proposed greenfield run-off is calculated using WINDES IOH124 giving flow rate indicated below.



The screenshot shows the ICP SUDS software interface. The 'ICP SUDS Input (FSR Method)' section contains the following fields:

- Return Period (Years): 100
- Area (ha): 0.250
- SAAR (mm): 652
- Soil: 0.450
- Growth Curve: (None)
- Partly Urbanised Catchment (QBAR): Urban: 0.000, Region: Region 6

The 'Results' section shows:

- QBAR rural (l/s): 1.0
- QBAR urban (l/s): 1.0

The 'Return Period Flood' table is as follows:

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	1.0	2.5	0.9	1.9	2.5
Region 2	1.0	2.7	0.9	1.9	2.7
Region 3	1.0	2.1	0.9	1.8	2.1
Region 4	1.0	2.6	0.8	2.0	2.6
Region 5	1.0	3.6	0.9	2.4	3.6
Region 6/Region 7	1.0	3.2	0.9	2.3	3.2
Region 8	1.0	2.4	0.8	1.9	2.4
Region 9	1.0	2.2	0.9	1.8	2.2
Region 10	1.0	2.1	0.9	1.7	2.1

- 3.15. Based on a flow rate of 3.2 l/s for the 1 in 100 year return period plus 40% climate change using Quick Storage Estimate, the required surface water attenuation is a maximum of 172 cubic metres for an impermeable area of 2000 square metres. The extent of this volume will be taken by permeable paving and below ground attenuation tank.
- 3.16. A flow control device, i.e. Hydrobrake or similar, would restrict runoff to 3.2 l/s before discharging into the Thames Water sewer. Please see Appendix F for the Proposed Indicative Drainage Strategy.

Treatment Train Design

- 3.17. The runoff draining from the residential roofs will have a very low pollution hazard level and the development proposals should mitigate for these runoff indices. Runoff will flow into either the proposed green roof or through roof level landscaping. Runoff from these roofs will discharge into the below ground system being attenuated before discharge into the receiving environment.
- 3.18. Runoff from the access road and carparking spaces are stated as a medium pollution hazard level, as included earlier. Runoff from this area will be directed into that areas where the permeable paving is proposed to then connect into the drainage system. The treatment train from this runoff routes, will move through permeable paving and then into attenuation tanks below. This treatment train will mitigate the medium pollution hazard level as detailed below.

Table 3: Pollution hazard/mitigation indices for medium and very low hazard

Pollutant	Pollution Hazard Indices (Very low – Roof /Podium)	Mitigation Indices Component Green roof / Bioretention	Pollution Hazard Indices (Medium – Access Road)	Mitigation Indices Component Permeable Paving
Total Suspended Solids	0.2	0.8	0.7	0.7
Metals	0.2	0.8	0.6	0.6
Hydrocarbons	0.05	0.8	0.7	0.7

[Total SuDS Mitigation Indices \geq Pollution Hazard Indices] (for each contaminant type)

- 3.19. Any exceedance flow would flow through the car park towards the drainage in the adjacent road. This is shown on the Drainage layout attached in Appendix F.

Sustainable Drainage Systems Management Plan

- 3.20. The Policy Plans set out the requirement for developers to consider the operation, management and maintenance of all SuDS proposed. The on-site drainage network and SuDS would be privately managed and maintained over the lifetime of the development, ensuring that they remain fit for purpose and function appropriately.
- 3.21. Post construction, an on-site management company would be responsible for the SuDS included within the scheme. Table 4 below presents an indicative schedule of the anticipated maintenance and repairs, in line with the guidance from the CIRIA SuDS Manual.

Table 4: SuDS Maintenance Schedule

SuDS Feature	Frequency
Green Roof	
Inspect all components for operation, waterproofing and structural stability	Annually and after severe storms
Post establishment, replace dead plants as required (>5% coverage)	Annually (in autumn)
Pervious Surfacing	
Inspection of main structure, pipework and filtration devices and remove any sediments	Quarterly or as required
Jetting of main structure to remove any sediment build-up	Annually or as required

Filter (Bio-retention) Strip	
Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain to determine if maintenance is necessary	Quarterly
Check operation of underdrains by inspection of flows after rain	Annually
Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
Inspect inlets and outlets for blockages	Quarterly
Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
Replace any plants, to maintain planting density	As required
Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remove and replace filter medium and vegetation above	As required
Underground Attenuation	
Inspection of silt traps, manholes and pipework, and remove any sediment/debris and control flow structure	Quarterly or as required
Jetting of main structure to remove any sediment build up	Annually or as required

Flood Risk Assessment

- 3.22. A Flood Risk Assessment (FRA) report has been prepared by Ardent Consulting and has been issued as a separate report.
- 3.23. Parts of the Site has been identified as a low 'Risk' of surface water flooding. As such, the report has recommended that the ground floor be raised by 150mm above the existing ground levels.
- 3.24. The FRA report has indicated that historical sewer flooding has taken place 40 to 60m to the east of the proposed development and does not affect the site. To mitigate the low possibility of flooding, we would provide a non-return valve at the outfall.

Build Over Agreement

- 3.25. Owing to the proximity of the existing surface water sewer to the new building envelope (please refer

to sketch WIE18371-SK100), an application has been submitted to Thames Water for 'build over' agreement for the 375mm sewers that run through the proposed development. (see Appendix H) Thames Water will need the sewer to be surveyed to confirm its condition, exact invert level and location and to ensure that any proposed piling / foundation works do not affect the structural stability or integrity of the sewer.

- 3.26. Thames Water have started the dialogue with the design team to confirm the method of piling and to confirm that the foundation could be located a minimum of 1.5m from the outside edge of the sewer.

4. Foul Drainage

- 4.1. The proposed foul drainage would be designed in accordance with BS EN 752 – Drain and Sewer Systems Outside Buildings, BS EN 12056 – Gravity Discharge Systems Inside Buildings⁸, and Approved Document H of Building Regulations⁹.
- 4.2. The existing foul discharge rates have been calculated using the water consumption method at 0.4 l/s (Appendix G) and the proposed foul discharge rates based on the total number of 43 residential units for the proposed site and 143 persons have been calculated at 0.9 l/s.
- 4.3. A Pre-Planning Application has been submitted to Thames Water to confirm that the proposed foul water discharge is acceptable in comparison of the existing discharge. Thames Water have responded to confirm that the proposed foul water discharge is acceptable. (Appendix G)
- 4.4. The proposed development will connect to the foul water sewer in the road through a new connection through a S106 direct connection agreement with Thames Water, under the Water Industry Act 1991. Subject to CCTV survey, the existing foul water connection could be re-used and a S106 indirect connection could be made.

⁸ British Standards Institution, September 2000. *BS EN 12056-2:2000 – Gravity Drainage Systems Inside Buildings*.

⁹ HM Government, October 2015. *Building Regulations 2010, Drainage and Waste disposal, Approved Document H*.

5. Conclusions

- 5.1. Surface water runoff from the proposed development would discharge into the existing surface water sewer, as per the existing situation. The existing runoff rate for the Site has been calculated to be 32.25 l/s. It is proposed to reduce runoff from the development in line with London Borough of Brent Policy requirements to 3.2 l/s, providing a betterment of 90% over the existing situation. Based on this restriction, approximately 172m³ of storage would be required.
- 5.2. Surface water attenuation will be provided in the porous paving subbase storage, below ground attenuation and bioretention systems. These will be located over the extent of the site to attenuate sub-catchments effectively.
- 5.3. The pollution hazard level of surface water runoff from the development is classified as 'very low' for the residential roofs and 'medium' for the car park. Appropriate treatment would be incorporated through the use of permeable paving, bioretention and green roof, to ensure that the quality of water discharged to the existing sewer is acceptable.
- 5.4. This report sets out the principles of the Sustainable Drainage System, however, the final strategy would be confirmed at detailed design stage.
- 5.5. The on-site drainage network and Sustainable Drainage System would be managed and maintained for the lifetime of the development by an appropriate managing body, ensuring that it remains fit for purpose and functions appropriately.
- 5.6. Foul flows from the Site would discharge by gravity into the Thames Water foul water sewer network in Watford Road. The existing foul discharge rates have been calculated using the water consumption method at 0.4 l/s (Appendix G). and the proposed foul discharge rates have been calculated at 0.9 l/s.



APPENDICES

A. Topographic Survey



Legend :

AP	Anchor Point	LB	Letter Box
B/W	Barbed Wire	MH	Manhole
BB	Bellisha Beacon	Mkr	Marker
B	Bollard	MS	Mile Stone
CATV	Cable TV Cover	Pat	Paving
C/B	Close Boarded Fence	PM	Parking Meter
CE	Cleaning Eye	P	Post
C/I	Corrugated Iron	P/C	Post and Chain
Col.	Column	P/R	Post and Rail
Cul	Culvert	P/W	Post and Wire
DP	Drain Pipe	RWP	Rain Water Pipe
DL	Detector Loop	RP	Reflector Post
EJB	Electricity Junction Box	R/W	Retaining Wall
EP	Electricity Pole	RS	Road Sign
ELIC	Electricity Service Cover	SB	Sign Board
FIG	Feeds Into Ground	SP	Sign Post
FS	Flag Staff	SC	Stop Cock
G	Gully	TS	Tactile Paving
GM	Gas Meter	Tac.	Tactile Paving
GV	Gas Valve	Tel.	Telecoms Cover
GP	Gate Post	TJB	Telecoms Junction Box
H	Hydrant	TP	Telephone Pole
I/R	Iron Rolling	TS	Traffic Signal
IC	Inspection Cover	VP	Vent Pipe
I/W	Interoven	WM	Water Meter
KO	Kerb Outlet	W/M	Wire Mesh Fence
LP	Lamp Post	WV	Water Valve

Permanent Ground Marker ⊙
O.S. Bench Mark ↑

Notes :
1. Do not scale from this drawing. Please refer to source CAD file for dimensions.

Rev	Description	Date	Initial
1	Original Issue	12/11/20	KDL

VOP GROUP
GEMINI HOUSE
180-182 BERMONDSET ST
LONDON
SE1 3TQ

MALCOLM HUGHES
CHARTERED LAND SURVEYORS

MALCOLM HUGHES
CHERRY TREE HOUSE
CARMARTHEN ROAD
SWANSEA
SA1 1HE
Tel 01792 644181
Fax 01792 203333

Project
**MUMBAI JUNCTION RESTAURANT
HARROW**

Title
Topographical Survey

Scale @A1:	Date:	Drawn:	Checked:
1:200	Nov 2020	KDL	AT

Cad File Name:
56433-MH-VTO-MumbaiJn-M2-G-0001



B. Development Proposals

Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2

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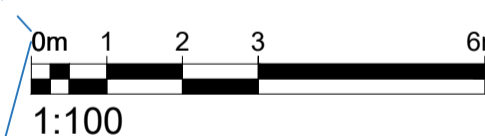
Note:

1. -
2. Brick perimeter wall.
3. -
4. -
5. Sliding metal gate with laser cut pattern. Finish to match roofing material.
6. Hedge. Refer to Landscape Architect information.
7. Landscaping. Refer to Landscape Architect information.
8. -
9. -
10. Passive charging points (isolator box only) (18no total)
11. Proposed trees. Refer to Landscape Architect information.
12. Wall mounted electrical charging point (4no in total).
13. Pergola
14. Existing UKPN Substation. Access via neighbouring Formula One site.

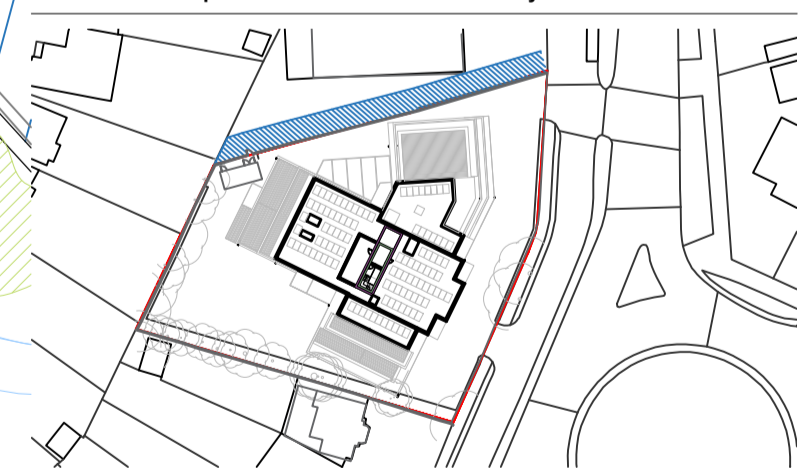
Aluminium RWP. PPC colour to match zinc.

Trees / hedge / greenery - refer to Landscape Architect information

Access boundary to substation from Formula One



Rev.	Description	By	Date
P2	Issued for planning	SL	17.09.21



Client
Fruition Properties

Project
231 Watford Road

Title
Proposed Ground Floor Plan

Status	Purpose of Issue	RIBA stage
S2	For Planning	03

Project No.	Drawn	Checked	Scale	Rev.
2111	SS	GV	1:100 @ A1 1:200 @ A3	P2

Drawing No.

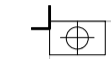



2111-BG-00-00-DR-A-20.201

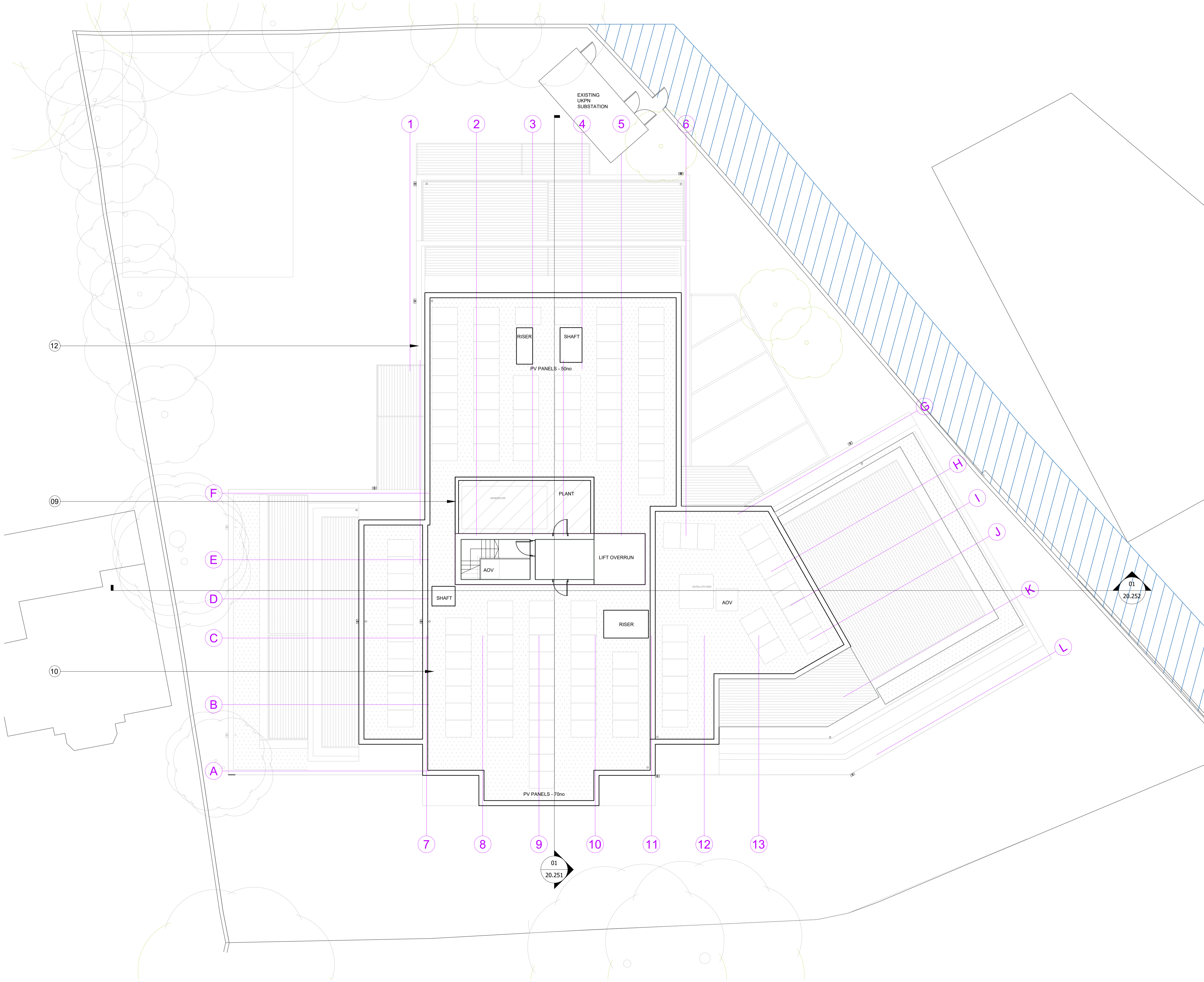
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Note:

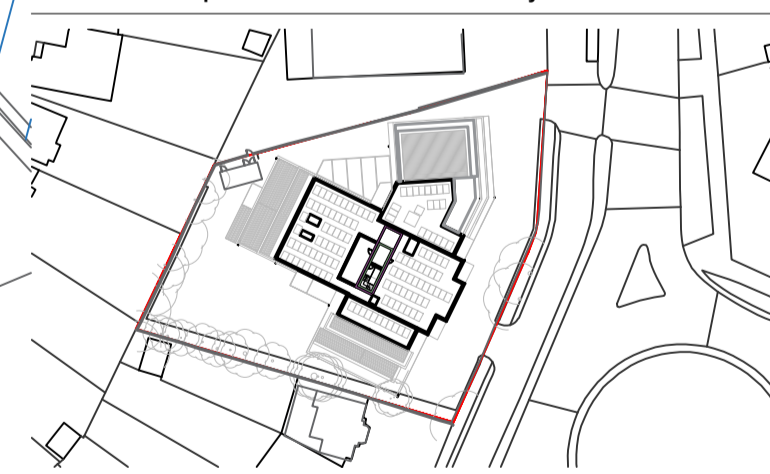
1. -
2. -
3. -
4. -
5. -
6. -
7. -
8. -
9. Metal louvred plant screen. PPC colour to match zinc.
10. Green/ brown roof.
11. -
12. Parapet / perimeter coping

-  Aluminium RWP. PPC colour to match zinc.
-  Terrace decking
-  Brown/ green roof
-  Access boundary to substation from Formula One



0m 1 2 3 6m
1:100

P2	Issued for planning	SL	17.09.21
Rev.	Description.	By	Date



Client Fruition Properties				
Project 231 Watford Road				
Title Proposed Roof Plan				
Status	Purpose of issue	RIBA stage		
S2	For Planning	03		
Project No.	Drawn	Checked	Scale	Rev.
2111	SS	GV	1:100 @ A1 1:200 @ A3	P2

Drawing No.
2111-BG-00-05-DR-A-20.206

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C. Sustainable Drainage Proforma

Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2

The London Sustainable Drainage Proforma

Introduction

This proforma is intended to accompany a drainage strategy prepared for a planning application where required by national or local planning policy. It should be used to summarise the key outputs from the strategy to allow assessing officers at the Lead Local Flood Authority (LLFA) to quickly assess compliance with sustainable drainage (SuDS) planning

The proforma is divided into 4 sections, which are intended to be used as follows:

1. Site and project information - Provide summary details of the development, site and drainage
2. Proposed discharge arrangement – Summarise site ground conditions to determine potential for infiltration. Select a surface water discharge method (or mix of methods) following the hierarchical approach set out in the London Plan.
3. Drainage strategy – Prioritise SuDS measures that manage runoff as close to source as possible and contribute to the four main pillars of SuDS; amenity, biodiversity, water quality and water quantity.
4. Supporting information – Provide cross references to the page or section of the drainage strategy report where the detailed information to support each element can be found. This may be more than one reference for each

Policy

SuDS:

1. [London Borough of Brent Local Plan policy DMP 9b.](#)
2. [London Plan policy 5.13](#) and draft [New London Plan policy S113](#)
3. [The National Planning Policy Framework \(NPPF\)](#)

Technical Guidance

- Post-development surface water discharge rate should be limited to greenfield runoff rates. Proposals for higher discharge rates should be agreed with the LLFA ahead of submission of the Planning Application. Clear evidence should be provided with the Planning Application to show why greenfield rates cannot be achieved.
- Greenfield runoff rate is the runoff rate from a site in its natural state, prior to any development. This should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- Attenuation storage volumes required to reduce post-development discharge rates to greenfield rates should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- 'CC' refers to climate change allowance from the current Environment Agency guidance.
- An operation and maintenance strategy for proposed SuDS measures should be submitted with the Planning Application and include the details set out in section 32.2 of CIRIA C753 The SuDS Manual. The manual should be site-specific and not directly reproduce parts of The SuDS Manual.
- Other useful sources of guidance are:
 - [o West London Strategic Flood Risk Assessment](#)
 - [o The London Plan Sustainable Design and Construction SPG](#)
 - [o DEFRA non-statutory technical standards for sustainable drainage](#)
 - [o Environment Agency climate change guidance](#)
 - [o CIRIA C753 The SuDS Manual](#)

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	231 Watford Road		
	Address & post code	231 Watford Road Harrow London HA1 3TU		
	OS Grid ref. (Easting, Northing)	E	516396	
		N	186718	
	LPA reference (if applicable)			
	Brief description of proposed work	Demolition of existing building and erection of a part there, part four and part 5 storey building to provide c. 43 residential dwellings (Use Class C3); car and cycle parking; landscaping, amenity space and play areas; and refuse storage and other associated works.		
	Total site Area	2500	m ²	
	Total existing impervious area	2500	m ²	
	Total proposed impervious area	1534	m ²	
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	YES		
	Existing drainage connection type and location	Connected to 375mm Thames Water Surface Water Sewer		
	Designer Name	Haridass Chetty		
	Designer Position	Senior Associate Director		
Designer Company	Waterman Infrastructure & Environment			

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	London Clay	
	Bedrock geology classification	London Clay Formations	
	Site infiltration rate	tbc	m/s
	Depth to groundwater level	tbc	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		<i>Feasible (Y/N)</i>	<i>Proposed (Y/N)</i>
	1 store rainwater for later use	N	N
	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.	N	N
2c. Proposed Discharge Details			
Proposed discharge location	Thames Water 375mm diameter surface water sewer		
Has the owner/regulator of the discharge location been consulted?	Pre-Development Enquiry has been issued		

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)
Qbar	1.0			
1 in 1	0.9	9.75	32.0	3.2
1 in 30	2.3	21.1	60.0	3.2
1 in 100	3.2	32.25	83.0	3.2
1 in 100 + CC			125.0	3.2
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake		
3c. Proposed SuDS Measures				
	Catchment area (m ²)	Plan area (m ³)	Storage vol. (m ³)	
Rainwater harvesting	0		0	
Infiltration systems	0		0	
Green roofs	372.5	372.5	0	
Blue roofs	0	0	0	
Filter strips	0	0	0	
Filter drains	0	0	0	
Bioretention / tree pits	150.0	75.0	10.0	
Pervious pavements	821.0	200.0	23.0	
Swales	0	0	0	
Basins/ponds	0	0	0	
Attenuation tanks	712.0		92.0	
Total	1534.0		125.0	

3. Drainage Strategy

4a. Discharge & Drainage Strategy	Page/section of drainage report
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Clause 3.4
Drainage hierarchy (2b)	Clause 3.3
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Clause 3.15 & Appendix G
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Clause 3.15 & Appendix E
Proposed SuDS measures & specifications (3b)	Clause 3.9, 3.10, 3.11 and 3.12
4b. Other Supporting Details	Page/section of drainage report
Detailed Development Layout	Appendix B
Detailed drainage design drawings, including exceedance flow routes	Appendix F
Detailed landscaping plans	Appendix B
Maintenance strategy	Clause 3.21
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Clause 3.17
b) biodiversity?	Clause 3.10
c) amenity?	

4. Supporting Information



D. Thames Water Sewer Records

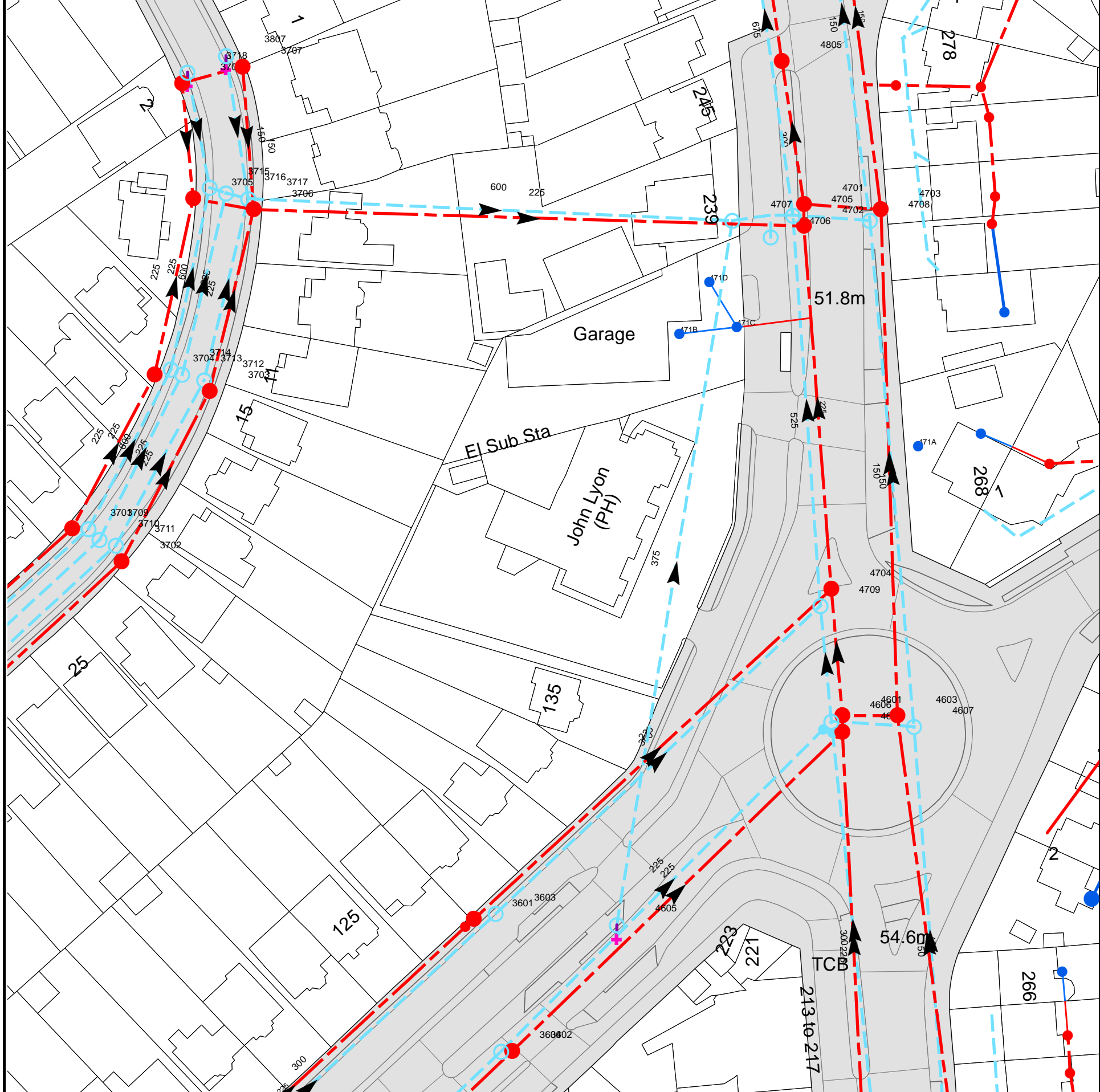
Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2

CommercialDW Drainage and Water Enquiry Sewer Map- CDWS/CDWS Standard/2019_ 4016736



The width of the displayed area is 200m

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 no survey information is available.

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4606	54.32	49.54
4704	53.12	49.94
4601	54.27	50.18
4602	54.29	51.17
4708	51.68	49.83
4703	51.64	49.63
47DA	n/a	n/a
4603	54.4	51.89
4607	54.4	51.68
471A	n/a	n/a
47BE	n/a	n/a
47CJ	n/a	n/a
47CI	n/a	n/a
47CG	n/a	n/a
47CH	n/a	n/a
47CF	n/a	n/a
47BF	n/a	n/a
46BE	n/a	n/a
46CF	n/a	n/a
46BG	n/a	n/a
46BF	n/a	n/a
3718	51.95	50.6
3707	51.97	50.27
4805	50.95	48.9
3807	51.97	50.62
3709	52.9	50.79
3710	52.8	50.34
3711	52.92	50.76
3702	52.91	50.42
3704	52.19	49.98
3714	52.17	50.39
3713	52	50.07
3708	51.95	50.25
3705	51.89	49.63
3712	52.1	50.32
3715	51.87	50.09
3703	52.1	49.74
3716	51.7	49.9
3717	51.83	49.85
3706	51.83	49.54
3601	54.51	51.08
3603	54.5	50.74
4605	54.24	51.24
471B	n/a	n/a
471D	n/a	n/a
4707	51.96	49.1
471C	n/a	n/a
4706	51.7	49.51
4705	n/a	n/a
4702	51.77	49.15
4701	51.69	49.07
4709	53.16	49.3
3701	52.88	50.47
3604	54.28	52.25
3602	54.26	51.95

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.



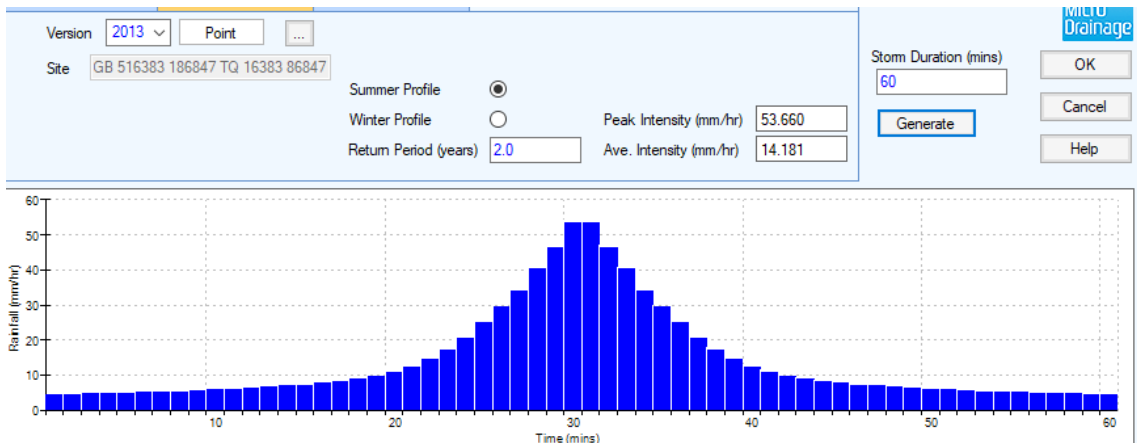
E. Surface Water Calculations & Catchment Area

Appendices

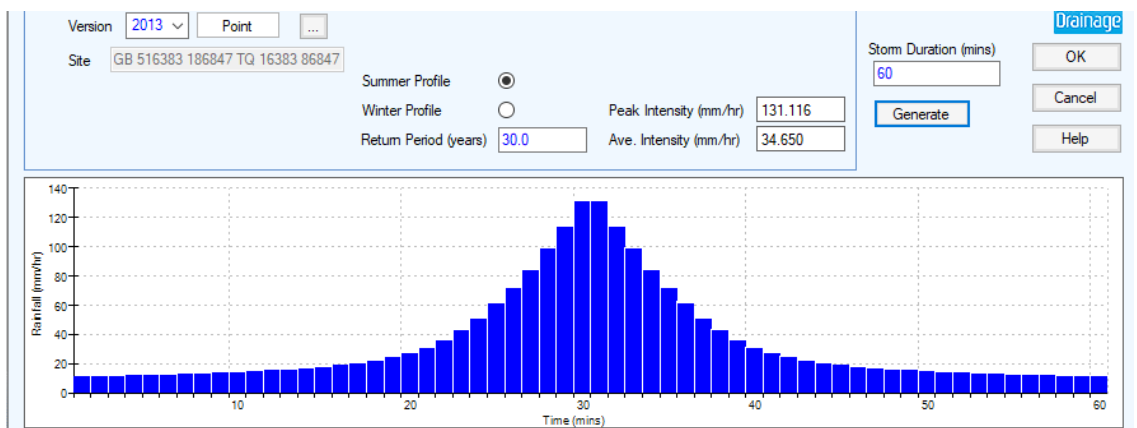
231 Watford Road

Project Number: WIE18371

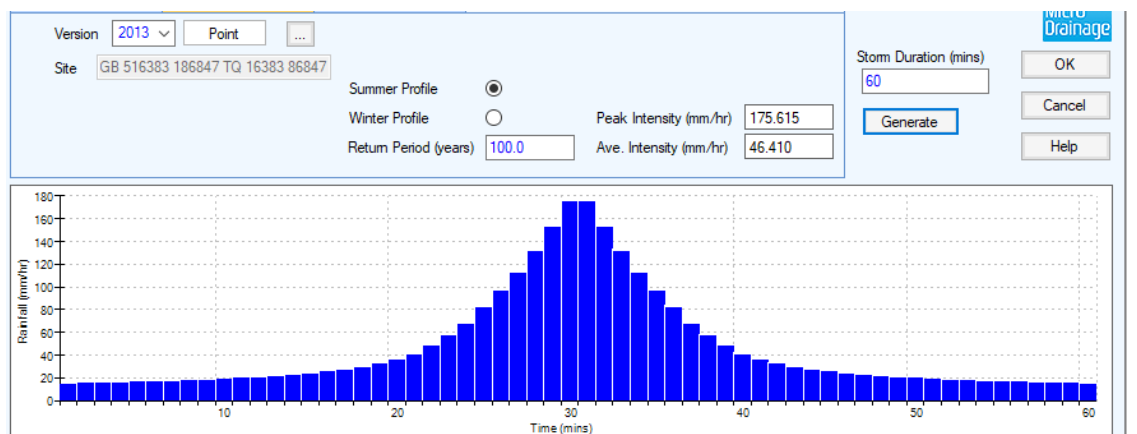
Document Reference: WIE18371-100-DMP-2-2-2



$$Q = 2.78 \times 14.181 \times 0.25 = 9.75 \text{ l/s}$$




$$Q = 2.78 \times 34.65 \times 0.25 = 24.08 \text{ l/s}$$



$$Q = 2.78 \times 46.41 \times 0.25 = 32.25 \text{ l/s}$$

Greenfield Run-off



ICP SUDS

ICP SUDS Input (FSR Method)

Return Period (Years)

Area (ha)

SAAR (mm) Map

Soil

Growth Curve Calculate

Partly Urbanised Catchment (QBAR)

Urban

Region ...

Results

QBAR rural (l/s)

1.0

QBAR urban (l/s)

1.0

Return Period Flood

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	1.0	2.5	0.9	1.9	2.5
Region 2	1.0	2.7	0.9	1.9	2.7
Region 3	1.0	2.1	0.9	1.8	2.1
Region 4	1.0	2.6	0.8	2.0	2.6
Region 5	1.0	3.6	0.9	2.4	3.6
Region 6/Region 7	1.0	3.2	0.9	2.3	3.2
Region 8	1.0	2.4	0.8	1.9	2.4
Region 9	1.0	2.2	0.9	1.8	2.2
Region 10	1.0	2.1	0.9	1.7	2.1

IH 124

ICP SUDS

ADAS 345

FEH

ReFH2

Greenfield Volume

Greenfield Volume (ReFH2)

Quick Storage Estimate

Micro Drainage		Variables		
<ul style="list-style-type: none"> Variables Results Design Overview 2D Overview 3D Vt 	FEH Rainfall	Cv (Summer)	0.750	
	Return Period (years)	100	Cv (Winter)	0.840
	Version	2013	Point	...
	Impemeable Area (ha)		0.153	
	Site	GB 516383 186847 TQ 16383 86847	Maximum Allowable Discharge (l/s)	3.2
			Infiltration Coefficient (m/hr)	0.00000
			Safety Factor	2.0
		Climate Change (%)	40	

Micro Drainage		Results
<ul style="list-style-type: none"> Variables Results Design Overview 2D Overview 3D Vt 	<p>Global Variables require approximate storage of between 88 m³ and 125 m³.</p> <p>These values are estimates only and should not be used for design purposes.</p>	

Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2

BARR GAZETAS

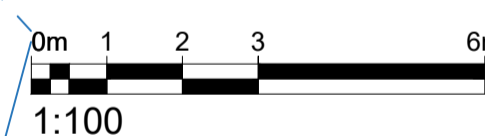
Note:

1. -
2. Brick perimeter wall.
3. -
4. -
5. Sliding metal gate with laser cut pattern. Finish to match roofing material.
6. Hedge. Refer to Landscape Architect information.
7. Landscaping. Refer to Landscape Architect information.
8. -
9. -
10. Passive charging points (isolator box only) (18no total)
11. Proposed trees. Refer to Landscape Architect information.
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14. Existing UKPN Substation. Access via neighbouring Formula One site.

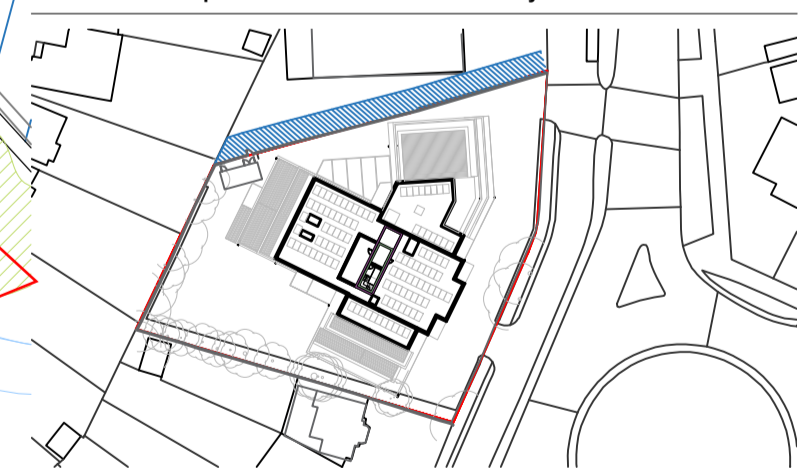
Aluminium RWP. PPC colour to match zinc.

Trees / hedge / greenery - refer to Landscape Architect information

Access boundary to substation from Formula One



Rev.	Description	By	Date
P2	Issued for planning	SL	17.09.21



Client
Fruition Properties

Project
231 Watford Road

Title
Proposed Ground Floor Plan

Status	Purpose of Issue	RIBA stage
S2	For Planning	03

Project No.	Drawn	Checked	Scale	Rev.
2111	SS	GV	1:100 @ A1 1:200 @ A3	P2

Drawing No.

2111-BG-00-00-DR-A-20.201

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F. Proposed Indicative Drainage Strategy

Appendices

231 Watford Road



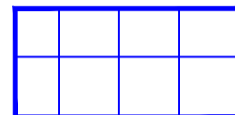
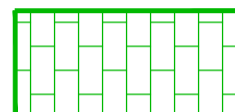




Project Number: WIE18371

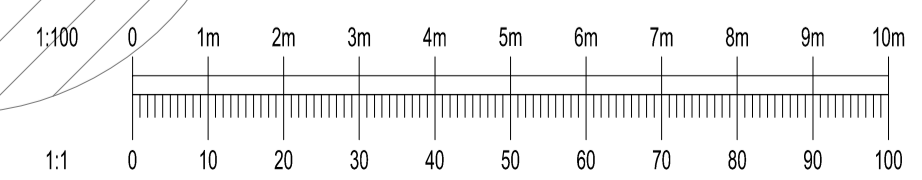
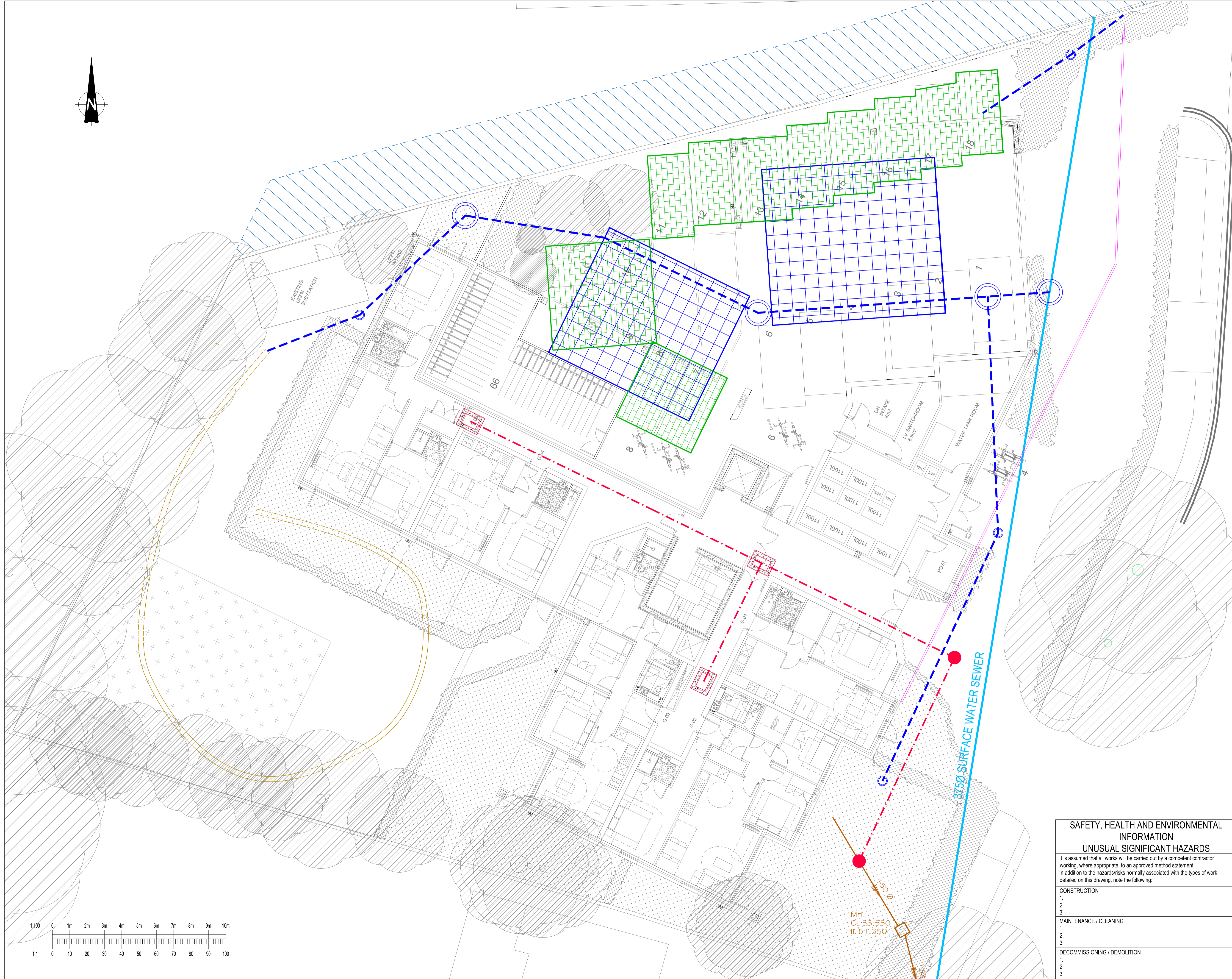
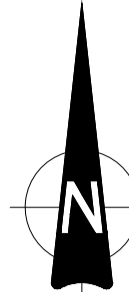
Document Reference: WIE18371-100-DMP-2-2-2

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GENERAL NOTES

LEGEND

-  EXISTING 375mm SURFACE WATER SEWER
-  EXISTING 150mm FOUL WATER SEWER
-  ATTENUATION TANK
-  PERMEABLE PAVE
-  LINEAR CHANNEL
-  BIO-RETENTION TRENCH
-  PROPOSED SURFACE WATER
-  PROPOSED FOUL WATER



SAFETY, HEALTH AND ENVIRONMENTAL UNUSUAL SIGNIFICANT HAZARDS

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement. In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

- CONSTRUCTION**
 - 1.
 - 2.
 - 3.
- MAINTENANCE / CLEANING**
 - 1.
 - 2.
 - 3.
- DECOMMISSIONING / DEMOLITION**
 - 1.
 - 2.
 - 3.

A02	S2	16.09.21	LAYOUT UPDATED TO SUIT ARCHITECT.	AKL	HC
A01	S2	12.07.21	FIRST ISSUE	AKL	HC
Status	Date	Description	By	CHK	

Project
231 WATFORD ROAD
 Title
PROPOSED DRAINAGE LAYOUT
 Client
 Fruition Properties



Pickfords Wharf Clink Street London SE1 9DG 1 020 7928 7888 mail@watermangroup.com www.watermangroup.com			
INFORMATION			S2
Designed By	AKL	Director	HC
Waterman Ref	WIE 18371-100		
Drawn By	AKL	Date	June 2021
Scale	@ A1		
Project	Originator	Volume	Level
Type	Role	Number	Revision
18371-WIE-SA-GF-92-C-0002			A02

N:\Projects\WIE\18371\0017_CAD\92_Drainage



G. Foul Water Calculations & Pre-development Enquiry

Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2



Project Title: 231 Watford Road
Calculations Title: Existing Foul Flow Estimate

Sheet No: 1 of 2
By: K. Stokes
Checked: H. Chetty

Project No: WIE18371
Date: 7.5.21

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential						
Existing property =	160 litres/person/day	Thames Water Guidelines (2016)	0 existing units	2.12	24	0.0
New property =	125 litres/person/day	Thames Water Guidelines (2016)	0 proposed units			0.0
Occupancy =	2.3 persons					
Hotel						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.0
Student Accommodation						
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.0
Offices						
Offices	750.0 litres per 100m ²	Jones (1992)	0 m ²	3	24	0.0
Retail						
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	24	0.0
Cinema						
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	24	0.0
Health Club/Sports Centre						
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	24	0.0
Day School						
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.0
Boarding School						
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.0
Hospital						
Hospital	625.0 litres per bed	Jones (1992)	0 beds	3	24	0.0
Nursing Home						
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.0
Restaurant						
Restaurant	30.0 litres per cover	British Water (2013)	340 covers	3	24	0.4
Pub/Club						
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	24	0.0
Warehouse						
Warehouse	150.0 litres per 100m ²	Jones (1992)	0 m ²	3	24	0.0
Manufacturing						
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	24	0.0
Commercial						
Commercial	300.0 litres per 100m ²	Jones (1992)	0 m ²	3	24	0.0
SUB TOTAL						0.4
Infiltration percentage	10%					0.0
TOTAL						0.4

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



Project Title: 231 Watford Road
Calculations Title: Proposed Foul Flow Estimate

Sheet No: 2 of 2
Project No: WIE18371
By: K. Stokes
Date: 7.5.21
Checked: H. Chetty
Date:

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential						
Existing property =	160 litres/person/day	Thames Water Guidelines (2016)	0 existing units		24	0.0
New property =	125 litres/person/day	Thames Water Guidelines (2016)	42 proposed units			0.8
Occupancy =	2.3 persons					
Hotel						
Hotel	500.0 litres per room	British Water (2013)	0 rooms		24	0.0
Student Accommodation						
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds		24	0.0
Offices						
Offices	750.0 litres per 100m ²	Jones (1992)	0 m ²		24	0.0
Retail						
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²		24	0.0
Cinema						
Cinema	10.0 litres per seat	Jones (1992)	0 seats*		24	0.0
Health Club/Sports Centre						
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**		24	0.0
Day School						
Day School	90.0 litres per pupil	British Water (2013)	0 pupils		24	0.0
Boarding School						
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils		24	0.0
Hospital						
Hospital	625.0 litres per bed	Jones (1992)	0 beds		24	0.0
Nursing Home						
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds		24	0.0
Restaurant						
Restaurant	30.0 litres per cover	British Water (2013)	0 covers		24	0.0
Pub/Club						
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***		24	0.0
Warehouse						
Warehouse	150.0 litres per 100m ²	Jones (1992)	0 m ²		24	0.0
Manufacturing						
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²		24	0.0
Commercial						
Commercial	300.0 litres per 100m ²	Jones (1992)	0 m ²		24	0.0
SUB TOTAL						0.8
Infiltration percentage	10%					0.08
TOTAL						0.9

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

Pre- planning enquiry

Application form

Please complete this form and return it to us at
developer.services@thameswater.co.uk or
Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, RG1 8DB.



Application for a pre-planning enquiry

Please complete ALL relevant sections of this form in BLOCK CAPITALS

Use this form to find out if there's existing capacity in our network for your proposed development. Please ensure you complete the form in full and we'll respond within 21 calendar days from receipt of your completed application form. We'll let you know if sufficient capacity already exists in the network or if further modelling will be needed to determine if network adjustments or reinforcement will be required.

Is your application for: Water and sewerage Water Sewerage (Please tick one.)

Section A - About you

(i) Details of applicant

Company name

Developer Consultant Land promoter SLP NAV Other

Title Mr Mrs Ms Miss Dr Other

First name(s)

Last name

Preferred phone no.

Alternative phone no.

Email address

Full postal address Address line 1

Address line 2

Town

County

Postcode

(ii) Who should we contact to discuss the application?

Applicant Nominated contact (Please tick one.)

If nominated contact:

Company name

Developer Consultant Land promoter SLP NAV Other

Title Mr Mrs Ms Miss Dr Other

First name(s)

Last name

Preferred phone no.

Alternative phone no.

Email address

Full postal address Address line 1

Address line 2

Town

County

Postcode

Section B - About the site

(i) Your site address

Same as applicant

Same as nominated contact

At another location

(Please tick one.)

If another location:

Site name

Full postal address Address line 1

Address line 2

Town

County

Postcode

Does the developer own the site? Yes No Don't know

What is the local authority?

Ordnance Survey grid ref

Type of site Greenfield Brownfield Mixed

How big is the site? hectares

(ii) Your planning status (If you've already started the planning process).

Is the development identified in the local plan? Yes No Don't know If Yes, reference number

Does it have outline planning permission? Yes No Don't know If Yes, reference number

Does it have full planning permission? Yes No Don't know If Yes, reference number

Does the development have building regulations permission? Yes No Don't know

(iii) Your development

To enable us to determine whether the capacity is sufficient or whether further modelling and reinforcement of our network will be required please provide details of the properties currently existing on the site (where applicable) and how you will phase your development. The information you provide at this stage will help improve the accuracy of our assessment. If you have more than 6 phases for your development please add details on a separate sheet.

Property type	Existing site to be demolished	Proposed site						Total
		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
Start on site date								
Date of Occupation								
General housing (total units)								
Flat (total units)								
Primary school (max. pupil capacity)								
Secondary school (max. pupil capacity)								
Boarding school (max. pupil capacity)								
Assembly hall (max. capacity)								
Cinema (max. capacity)								
Theatre (max. capacity)								
Sports hall (max. capacity)								
Hotel (total bedrooms)								
Guest house (total bedrooms)								
Motel (total bedrooms)								
Holiday apartment (total capacity)								
Leisure park (max. capacity)								
Caravan park standard (total spaces)								
Caravan site standard (total spaces)								
Camping site standard (total spaces)								
Camping site serviced (total spaces)								
Student accommodation (max. capacity)								
Public house (max. capacity)								
Restaurant / Day care centre (max. capacity)								
Drive in restaurant (max. capacity)								
Hospital (total beds)								
Nursing / Care home (total beds)								
Offices (gross internal area in m ²)								
Shopping centre (gross internal area in m ²)								
Warehouse (gross internal area in m ²)								
Commercial premises (gross internal area in m ²)								
Manufacturing unit (gross internal area in m ²)								
Other (please state units and description)								

Section C - About the water supply

(Not required if only applying for sewerage connection).

(i) Phasing water supply for your development

If you already have a plan for the phasing of your development please give details below.

Property type	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Date water connection required						
Estimated peak clean water flow rate (litre/sec)						
Break tank capacity, if any (m ³)						

If you're using a break tank please advise what measures you plan to take to avoid high peak flow over a short period of time.

Section D - About your sewerage connections

(Not required if only applying for water connection).

(i) Your existing sewerage connections (brownfield site only).

Please give us details of your existing connections.

	Foul water	Surface water
Does the site have the following sewerage connections?		
What is the type of discharge method?	Gravity	Gravity
	Pumped	Pumped
If sewage is pumped, what is the pump rate?	litres/sec	litres/sec
What is the existing impermeable area per connection?		m ²
What are the existing connection points? (For example, 'X' properties to TW manhole ref 'Y')		

(ii) Your proposed sewerage connections

Please give us details of your proposed connections.

	Foul water	Surface water
Does the site have the following sewerage connections?		
What is the type of discharge method?	Gravity	Gravity
	Pumped	Pumped
If sewage is pumped, what is the pump rate?	litres/sec	litres/sec
What is your proposed approach to surface water drainage?		Sustainable drainage system (SuDS)
		Traditional piped system
Do you propose using separate highway surface water drainage systems?		Yes No
If the surface water rate is attenuated, to what rate is it attenuated?		litres/sec
What is the proposed impermeable area per connection?		m ²
What are the proposed connection points? (For example, 'X' properties to TW manhole ref 'Y')		

Please note: The developer is expected to follow the local authority's drainage strategy and be able to demonstrate how the proposed (attenuated) discharge rate of any surface water flows have been calculated. For developments in Greater London, please refer to the London Plan Drainage Hierarchy (Policy 5.13). We will challenge the rates provided if they are not in line with those based on the local drainage strategies.

Section E - What next?

(i) What we need to process your application:

Completed application (ensure all relevant sections of this form are completed in full)

Site location plan (showing the site with nearby buildings, road and any sewers)

Scaled site layout (showing existing and proposed layouts including Point of Connection to our water network)

Site drainage strategy plan (if available at this stage showing all proposed sewers, pipe sizes and gradients)

CCTV and topographical surveys (if available for existing brownfield sites)

Please make sure any attachments are in PDF format and don't exceed a total of 20MB in size per email. All drawings must be of suitable detail and have a drawing reference number on them.

Please note: without this information we may need to make assumptions about your requirements when calculating your budget estimate (if requested).

(ii) How we'll use this information

We'll use the information you give on this application form, and potentially share it with our delivery partners, to provide the service you've requested.

This could include contacting you to discuss your application and/or provide more details, visiting the site where work needs to be carried out and invoicing you when appropriate. Your feedback is important to us, so we may also use the information to ask for your feedback on how we can improve our performance.

We won't use this information for marketing purposes without contacting you to seek your consent.

You can find Thames Water's privacy policy at thameswater.co.uk/Legal/Privacy.

(iii) Declaration

Print name

Job title

Company

Date

Signature

(iv) Submitting your application

Please send your completed form to receive your capacity check in 21 calendar days:

Via email:

developer.services@thameswater.co.uk

Or send to:

Thames Water Developer Services, Clearwater Court, Vastern Road, Reading RG1 8DB



Harry Chetty

Waterman Infrastructure & Environment Ltd
Pickford Wharf
Clink Street
London
SE1 9DG



21 July 2021

Pre-planning enquiry: Confirmation of sufficient capacity

Site: 231 Watford Road, Harrow HA1 3TU

Dear Harry,

Thank you for providing information on your development.

Proposed site: General housing (29 units), Flats (14 units)

Proposed foul water discharge by gravity into 225mm foul water sewer downstream of manhole TQ16863601.

Proposed surface water discharge at 3.2 l/s for all storm events up to and including 1:100yr+40%CC into 375mm surface water sewer crossing the site.

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

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.



When developing a site, policy SI 13 of the London Plan states “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. There should also be a preference for green over grey features, in line with the following drainage hierarchy:”

The disposal hierarchy being:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)
5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined 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 3.2 l/s, 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,

Hemlata Gurung

Developer Services – Technical Coordinator, Sewer Adoptions Team

Tel: 0800 009 3921

hemlata.gurung@thameswater.co.uk

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



H. Build Over Application

Appendices

231 Watford Road

Project Number: WIE18371

Document Reference: WIE18371-100-DMP-2-2-2

Building over or near a public sewer

Application form

Please complete this form and return it to us at
developer.services@thameswater.co.uk or
Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, RG1 8DB.



Application to build over or near a public sewer

Please complete all sections of this form in BLOCK CAPITALS

A - About the person applying

This is the person we'll contact about the application and who will receive all correspondence. This can be the property owner or someone acting on their behalf.

Are you applying as? An individual or A company
An 'individual' is a homeowner and 'A company' is an agent/architect/builder, etc, acting on behalf of the homeowner

Company name

Title Mr Mrs Ms Miss Dr Other

First name(s)

Last name

B - Applicant contact details

We'll use these details to get in touch with you about your application.

Preferred contact number

Alternative number

Full postal address Address line 1

Address line 2

Town

County Postcode

Email address

C - Where the work is taking place

What is the site address?

Same as applicant details?

Yes No

If No:

Site name

231 Watford Road

Full postal address

Address line 1 231 Watford Road

Address line 2 Harrow

Town

County Middlesex

Postcode HA1 3TU

Who's the best person to contact on site?

The person applying

Yes No

If No:

Full name

Contact Number

D - The property owner

Who owns the property?

Details of the owner(s) of the freehold must be provided, as they will need to be a party to any agreement.

The person applying

Yes No

If No:

Title

Mr Mrs Ms Miss Dr Other

First name(s)

Rishin

Last name

Kotecha

Full postal address

Address line 1 Fruition Properties

Address line 2 23 Kensington Gardens Square

Town Fruition Properties

County London

Postcode

Email address

rishin@fruitionproperties.co.uk

Is there another owner?

Yes No Other owners to be confirmed

(If yes please complete the 'Other owners' section at the end of the form.)

E - Invoices

Who should we send invoices to?

Applicant Nominated contact Someone else

(Please tick one. This person will also receive the quote.)

If someone else

Mr Mrs Ms Miss Dr Other

If owner, which one?

1 2 3

(Please tick one)

First name(s)

Last name

Full postal address

Address line 1

Address line 2

Town:

County

Postcode

Email address

F - Development details

Has excavation work started?

Yes No

What are you building?

New building Side extension Rear extension Basement
Underpinning Front extension

Which local authority does the property fall under?

London Borough of Brent

When was the existing property built?

DD MM YYYY

Not Known

This may help determine whether you need a build over agreement.

How did you know you needed to apply?

Building control Approved inspector Thames Water website
Letter from Thames Water

(Please tick one)

Other: Experience

G - Working out the costs

Is the work taking place for someone entitled to Disability Benefit? Yes No

Is the property: (Please tick one)
Domestic Designed for people to live in
Commercial Used solely for business purposes

What is the diameter of the sewer? (Please tick one)
160mm or less **161 to 375mm** **over 375mm**

Domestic	up to 160mm	£343 £299 when applying and paying online	161 to 375mm	£687
Commercial, industrial or new build property	up to 160mm	£687	161 to 375mm	
Any sewer	over 375mm	£1,300		

Costs relating to disabled applicant:

Domestic	up to 160mm	Free	161 to 375mm	£344
Commercial, industrial or new build property	up to 160mm	£344	161 to 375mm	£344
Any sewer	over 375mm	£957		

** Actual costs will be charged for sewers over 375mm, however a minimum deposit of £1,300 or £957 will be required with this application, depending on whether this is a disabled application or not. Any additional costs we incur will be invoiced accordingly. Cheques should be made payable to Thames Water Utilities Limited with the site address written on the back. If you wish to pay by Credit Card, please indicate your contact name and number here and we will contact you to take payment.

Card holder name

Telephone no.

H - Enclose your documents

Please make sure the sewer is clearly marked on the drawing. All drawings must be of suitable detail and have a drawing reference number on them.

What we need from you to process your application:

- Site location plan
- Cross-sectional foundation plan
- Existing and proposed ground floor plans
- Proof of entitlement to disability benefit (e.g. Letter from the Department of Works and Pensions, Blue badge)

Two copies of the following information should accompany your application form:

- 1 Site location plan @ 1:1250
- 2 Site plan @ 1:100 or larger, showing location of sewer and manholes
- 3 Sectional plan of buildings
- 4 Section through building indicating position of sewer relative to structure in relation to the new structure. This should also show foundation arrangement and manhole details.
- 5 Copies of drawings submitted for Building Regulations approval
- 6 Please ensure the sewer is clearly marked on the drawing showing its position.

I. How we'll use this information

We'll use the information you give on this application form, and potentially share it with our delivery partners, to provide the service you've requested.

This could include contacting you to discuss your application and/or provide more details, visiting the site where work needs to be carried out, and invoicing you when appropriate. Your feedback is important to us, so we may also use the information to ask for your feedback on how we can improve our performance.

We won't use this information for marketing purposes without contacting you to seek your consent.

You can find Thames Water's privacy policy at thameswater.co.uk/Legal/Privacy.

J. Checklist and Declaration


Please ensure that you have included the following items with this application form:

- 1 Drawings 2 Appropriate fees

Failure to include any of the above will be deemed as an incomplete application and result in the application being delayed or returned. No works should commence until approval has been granted. Any applications cancelled by the applicant will result in a charge to cover abortive costs, however once consent has been granted no refund will be given. Please note, by signing this application, you are not automatically granted approval.

I confirm to the best of my knowledge the above information to be complete and correct.

Signature



Name in BLOCK CAPS

Harry Chetty

Date

22.06.21

UK and Ireland Office Locations

