elliottwood

Kingsway House
Sustainable Drainage Strategy

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Planning
P1
19.07.24

Engineering a Better Society

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Document Control

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Date: **19.07.24**	Signature:		Signature:		Signature:	

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1. Executive Summary

Elliott Wood Partnership Ltd has been commissioned by GMS Estates to provide a Drainage Strategy Report to support the full planning application for the proposed redevelopment of Kingsway House, 99-103 Kingsway, London, WC2B 6QX.

The proposal is to develop the existing building to an apart hotel (Hotel Class C1). The objective is to retain the external envelope and the major structural elements utilizing the plan form to deliver a more environmentally and economically responsible proposal. This will consist of removing the internal floor plates and supporting the internal structure to allow for the installation of a RC frame with open floor plates and a new servicing core. The existing masonry façade and party wall would be retained with the introduction of a further storey at roof level as part of a newly constructed mansard.

The proposed surface water strategy will be to incorporate a blue roof on a section of the new roof which will be restricted to a maximum rate of approximately 1 l/s (for all storm returns up to and including the 1 in 100 year + 40% climate change event), which will provide a betterment to the existing surface water runoff rate. A blue roof system cannot be incorporated on the mansard roofs and was deemed unsuitable for locating under the proposed mechanical plant space on the roof due to potential future access/maintenance restrictions. As a result, the other roofs and small terraces will drain unrestricted as per the existing arrangement. Some of the blue roof areas are proposed to be overlain with green roofs. Green roofs increase the time of entry for surface water runoff entering the drainage network, reduce the volume of rainfall discharged off site and provide biodiversity and amenity benefits.

All foul drainage below ground floor level will be pumped by a submersible packaged pumping station which will protect the basement level from the risk of flooding from sewer surcharge.

2. Introduction

Elliott Wood Partnership Ltd has been commissioned by GMS Estates to provide a Drainage Strategy Report to support the full planning application for the proposed development of Kingsway House, 99-103 Kingsway, London, WC2B 6QX.

The purpose of this report is to explain the approach taken with regards to the below ground drainage strategy for the proposed development. It evaluates the selection of SuDS and highlights how the drainage disposal hierarchy has been followed.

The following documents have been reviewed during preparations for this SuDS Report:

- National Planning Policy Framework (NPPF) (2023)
- Planning Practice Guidance (PPG)
- The London Plan 2021
- Camden Local plan
- London Borough of Camden Strategic Flood Risk Assessment (SFRA), January 2024
- London Borough of Camden Local Flood Risk Management Strategy (LFRMS) 2022-2027
- CIRIA SuDS Manual

3. Site Context

3.1 Site Location

Kingsway House is located within the London Borough of Camden and sits centrally within the Kingsway Conservation Area. The site is located approximately 120m south of Holborn London Underground Station, along Kingsway. The site is bound by Parker Street to the north, Kingsway to the east and Great Queen Street to the south. Refer to Figure 1 for the site location plan.

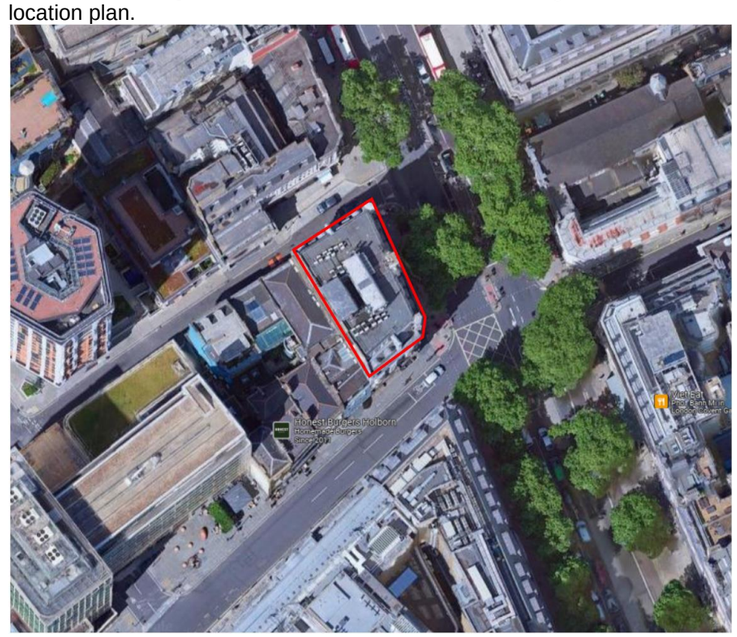


Figure 1: Site Location

3.2 Existing Development

Kingsway House is an existing 9 storey (including lower ground floor) building located on the west side of the Kingsway between High Holborn and the Strand. It was constructed in approximately 1906-07. The ground and lower ground floors were previously occupied by retail and storage whilst the uppers were office usage. The whole building is currently let to charities on a meanwhile basis whilst the building is being marketed for an office let. The building is not listed.

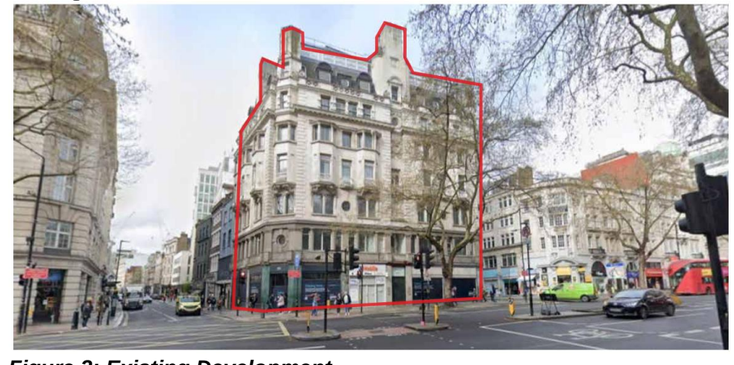


Figure 2: Existing Development

3.3 Existing Site Topography

A topographic survey was undertaken by Greenhatch in August 2014 and a copy of this is included in **Appendix A**. The survey confirms that the external footway levels fall away from the site and towards Great Queen Street to the south of the site, Parker Street to the north of the site and Kingsway to the east of the site.

3.4 Underlying Site Geology and Hydrology

3.4.1 Geology

An intrusive site-specific ground investigation is yet to be completed on site. According to British Geological Survey (BGS) mapping, the sites bedrock geology is made up of clay, silt and sand which forms part of the London Clay Formation shown in Figure 3. BGS maps also suggest that most of the site is underlain by superficial deposits of sand and gravel referred to as Lynch Hill Gravel Member shown in Figure 4.

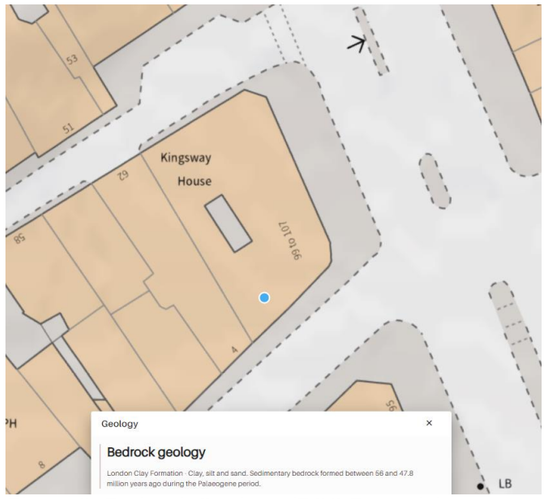


Figure 3: Bedrock Geology (BGS Records)

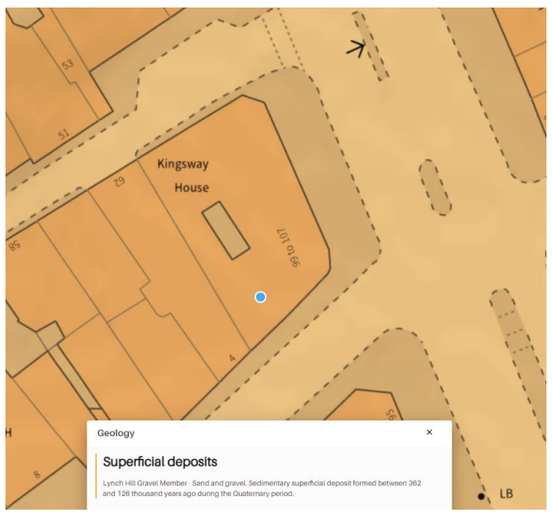


Figure 4: Superficial Geology (BGS Records)

3.4.2 Hydrology

The closest watercourse to the site is The River Thames, which runs approximately 750m south of the site. The site is not located near any Source Protection Zones or above any aquifers.

3.5 Flood Risk

Flood Zone 1 (low risk) is defined as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any given year. Flood Zone 2 (medium risk) is land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or between 1 in 200 and 1 in 1,000 annual probability of sea flooding in any given year. Flood Zone 3 (high risk) is land assessed as having 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability of sea flooding in any given year.

In accordance with the GOV.uk flood maps for planning, the site is located in Flood Zone 1, which is defined as land and property assessed as having less than a 0.1% (1 in 1,000) annual probability of flooding in any given year. The Environment Agency (EA) Flood Map for Planning can be found in Figure 5**.** After review of the relevant information, this development is considered to be at a **low risk** of flooding from rivers and the sea.

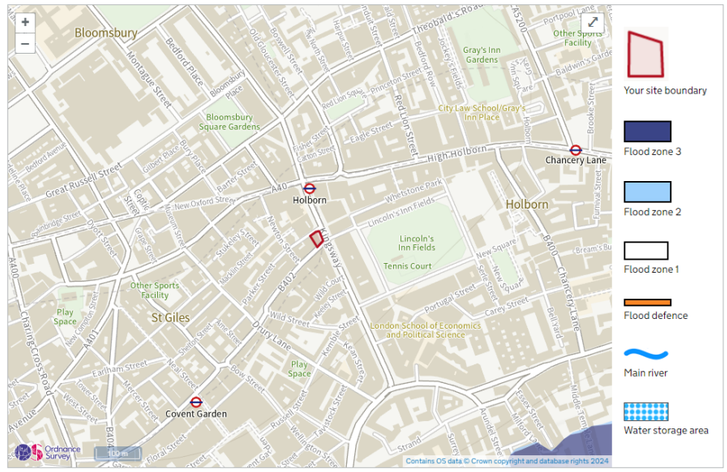


Figure 5: EA Flood Map

Surface water flooding may occur during intense or prolonged rainfall events where there is insufficient capacity within the ground or the existing drainage infrastructure which leads to overland flows.

Figure 6 is an extract from the Environment Agency Flood Risk from Surface Water and shows that there is a low risk of flooding within Kingsway and Parker Street and a medium risk of flooding in Great Queen Street to the south of the development. As noted in section 3.3 the external footway levels fall away from the site and towards to the surrounding roads.

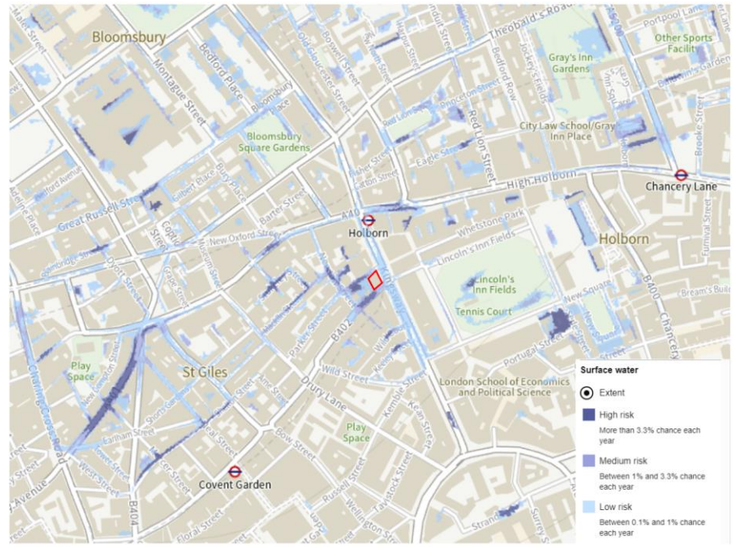


Figure 6: Surface Water Flood Map

Reservoirs are artificially created lakes that are usually formed by building a dam across a river. If one of the dams failed then water could escape from the reservoir, resulting in land or property being flooded.

Figure 7 from the Environment Agency's online mapping indicates that the development site is located outside the maximum extent of flooding from reservoirs.

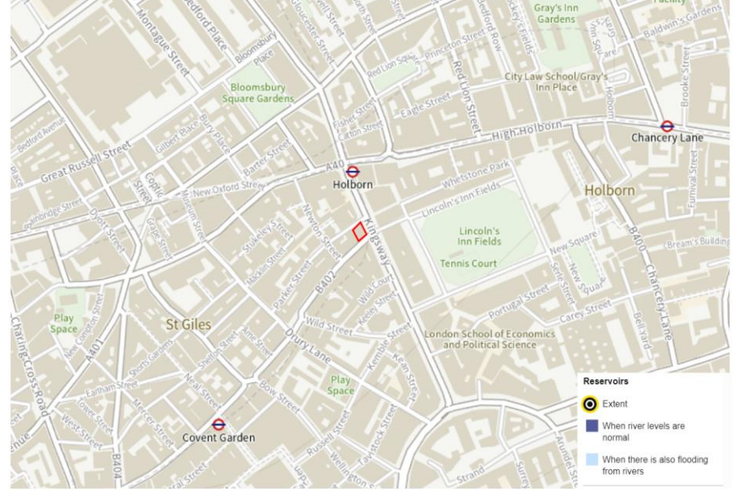


Figure 7: Reservoir Flood Map

4. Existing Drainage

4.1 Public Sewers

Thames Water asset maps show that there are several public sewers in the vicinity of the site as follows:

- A 1676x914mm combined sewer running from west to east beneath Parker Street north of the site.
- Two 1397x813mm combined sewers running from north to south beneath Kingsway east of the site.
- Two combined sewers sized1219x813mm and 1219x762 running from west to east beneath Great Queen Street south of the site.

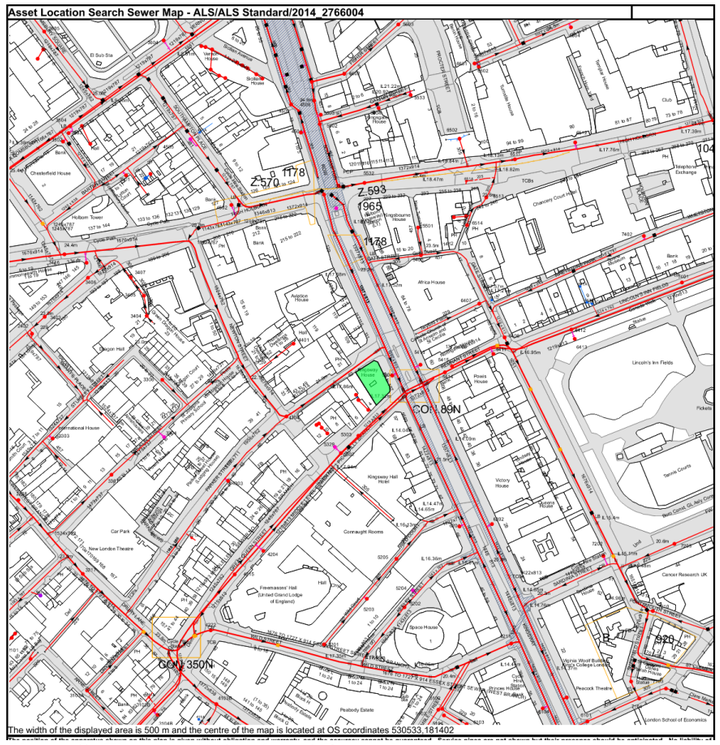


Figure 8: Thames Water Asset Records

Refer to **Appendix B** for a copy of the Thames Water asset location search.

4.2 Existing Drainage

A CCTV drainage survey of the existing below ground drainage was undertaken by Clearview Surveys Ltd in May 2024. The survey identified that the existing site drainage is combined and drains by gravity into the combined Thames Water sewers via three outfalls on the northern, eastern and southeastern areas of the site. All three outfalls are 150mm diameter vitrified clay pipes. Refer to **Appendix C** for a copy of the CCTV drainage plan.

5. Existing Surface Water Run-off Rate

The existing area breakdown for the development is shown in **Table 1.**

Table 1: Existing Area Breakdown

	Area (m^2)	Hectares (ha)	% of site
Existing Hardstanding	413	0.0413	100
Existing Soft Landscaping	0	0	0
Total	413	0.0413	100

The existing surface water run-off rates have been calculated based on the existing impermeable areas and using the Modified Rational Method as set out below.

Q = 2.78 x I x A x Cv x Cr

Where: I – Rainfall intensity (mm/h)

A – Drained areas (ha)

Cv – Volumetric Run-off Coef = 0.75

Cr – Routing Coefficient = 1.3

The full calculations are attached as **Appendix D**

Table 2: Existing Surface Water Discharge Rates

	Rate (l/s)
1 in 1-year event	3.6
1 in 30-year event	9.0
1 in 100-year event	11.4

5.1 Greenfield Run-off Rates

The Greenfield run-off rates have been calculated in line with the SuDS Manual C753 and the non-statutory standards for SuDS using the IH124 approach. The results are shown in **Table 3** below and are based on a site area of 0.0413ha. The calculations can be found in **Appendix E**

Table 3: Existing Greenfield Run-off Rate

Return Period	Rate (l/s)
Qbar	0.16
1 in 1-year event	0.13
1 in 30-year event	0.36
1 in 100-year event	0.50

6. Proposed Development

6.1 Development Proposals

The proposal is to develop the existing building to an apart hotel (Hotel Class C1). The objective is to retain the external envelope and the major structural elements utilizing the plan form to deliver a more environmentally and economically responsible proposal. This will consist of removing the internal floor plates and supporting the internal structure to allow for the installation of a RC frame with open floor plates and a new servicing core. The existing masonry façade and party wall would be retained with the introduction of a further storey at roof level as part of a newly constructed mansard. Improvements to the building will consist of:

- New fire escape stairs
- Redesigned floor layout to provide spacious apart hotel rooms, FOH and lobby areas.
- BOH provided on each floor.
- Improved accessibility and circulation

7. Proposed Drainage and SuDS

7.1 SuDS / Surface Water Drainage

The surface water drainage system has been designed in accordance with the GOV.UK *Sustainable Drainage Systems: Non-statutory Technical Standards* and the London Plan.

The following drainage hierarchy has therefore been considered:

- Store rainwater for later use
- Use infiltration techniques, such as porous surfaces in non-clay areas
- Attenuate rainwater in ponds or open water features for gradual release
- Attenuate rainwater by storing in tanks or sealed water features for gradual release
- Discharge rainwater direct to a watercourse
- Discharge rainwater to a surface water sewer/drain
- Discharge rainwater to a combined sewer

7.1.1 Appraising the use of Rainwater Re-Use

Incorporating a rainwater harvesting system in this development has been discounted as there is insufficient space to locate the required tanks and associated equipment within the plant rooms.

7.1.2 Appraising the use of Infiltration Techniques

Infiltration is not possible as the building occupies the whole site.

7.1.3 Appraising the use of Open Water Features

Attenuating rainwater in open water features is not possible as the building occupies the whole site.

7.1.4 Appraising the use of Green/Blue Roofing

A green roof is proposed on a section of the main roof. Green roofs are not included as part of the storage strategy for surface water run-off, however green roofs provide interception benefits such as absorbing the first flush event and reduce water discharging from the site in low level storms, particularly intense short duration events in the summer months.

Green roofs can provide water quality, water quantity, amenity, and biodiversity improvements, along with reducing the urban heat island effect and can lead to CO2 removal associated with the natural processes of the vegetation.

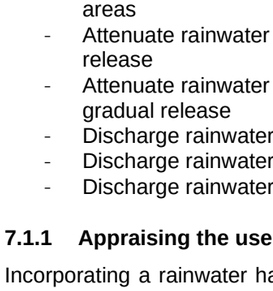


Figure 9: Green Roof SuDS Pillars

A Blue roof is proposed on a section of the main roof. Flow control outlets within the blue roof system will release rainwater at a restricted rate.

7.1.5 Appraising the use of Permeable Surfacing

The proposed building footprint (including basement) occupies the full site area which precludes the use of permeable surfacing.

7.2 Evaluation of SuDS Techniques

Table 4: Evaluation of SuDS Techniques

SuDS technique	Included?	Comment
Rainwater reuse	N	Rainwater harvesting has been omitted from the scheme due to the lack of available plant space for such a system
Infiltration devices	N	The proposed building footprint (including basement) occupies the full site area which precludes the use of infiltration devices.
Attenuation in green infrastructure (i.e. green roofs, rain gardens etc.)	Y	Green roof overlays are proposed over the blue roof
Blue Roofs	Y	A Blue roof system is proposed on a section of the main roof. Flow control outlets within the blue roof system will release rainwater at a restricted rate.
Rainwater discharge direct to a watercourse	N	There are no watercourses located within the vicinity of the development.
Controlled rainwater discharge to a surface water sewer or drain	N	There are no surface water sewers located in the vicinity of the development.
Controlled rainwater discharge to a combined sewer	Y	It is proposed to discharge surface water to the combined sewer network via the existing outfalls.

7.3 Proposed Surface Water Drainage Strategy

The proposed surface water strategy is to incorporate a blue roof on a section of the new roof. This section of roof will be restricted to a maximum rate of approximately 1 l/s (for all storm returns up to and including the 1 in 100 year + 40% climate change event). The other roofs and terraces will drain unrestricted as per the existing arrangement. The introduction of the blue roof on the main roof will provide betterment to the existing surface water run-off rate, shown in Table 5.

Table 5: Existing and Proposed Surface Water Run-off Rates

	Existing Runoff (l/s	Proposed Runoff Unrestricted (l/s)	Proposed Blue Roof Discharge Rate (l/s)	Total Proposed Runoff (l/s)
1 in 1	3.6	2.1	1.0	3.1
1 in 30	9.0	5.3	1.0	6.3
1 in 100	11.4	6.7	1.0	7.7
1 in 100 + 40%CC	N/A	9.4	1.0	10.4

A blue roof system on this scheme will allow rainwater to be captured and stored at high level in a shallow crate system, providing temporary attenuation at roof level, which can then be released at a controlled rate via the rainwater outlets to the below ground drainage network. Flow rates from the blue roofs are calculated by a blue roof manufacturer based on FEH22 rainfall data. These calculations and a preliminary drainage strategy layout can be found in **Appendix F.** A typical blue roof system is shown in Figure 10.

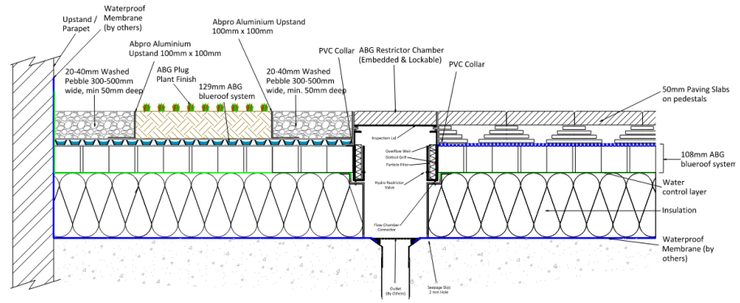


Figure 10: Typical Blue Roof Build up & Outlet

Some of the blue roof areas are proposed to be overlain with green roofs. Green roofs increase the time of entry for surface water runoff entering the drainage network and can subsequently reduce the volume of rainfall discharged off site. During dry periods green roofs can capture the first few millimetres of rainfall and attenuate it on site, however this cannot be quantified as it is assumed that the planted medium is saturated. Where green roofs are accessible or will be overlooked, they can provide an amenity benefit as they provide an aesthetically pleasing environment amongst an urban landscape. Green roofs also provide an area of biodiversity and aid with the urban greening effect. Inclusion of a variety of planting and vegetation on a green roof provides a natural environment for birds, bees, butterflies and invertebrates.

Figure 11: Example Green Roof

Refer to **Appendix G** for a copy of the completed London Borough of Camden Drainage proforma.

7.4 Proposed Foul Water Drainage Strategy

The existing below ground foul drainage network will be removed and replaced as part of the new development proposals.

All foul water drainage from ground floor and above will offset at high-level within the building, as designed by the M&E engineer, and drop to the existing sewer outfalls.

All foul water drainage serving the basement level will be pumped by a submersible packaged pumping station. The pumping station will include non-return valves to protect the basement level against sewer surcharge. The pumping station will include dual pumps in a duty/standby arrangement, alarms and control panel telemetry / links to a BMS system if available.

7.5 Pre – Planning Enquiry

A pre-planning enquiry has been submitted to Thames Water to check that the offsite sewers have sufficient capacity to accommodate the proposed development. Thames Water have confirmed that there is sufficient capacity. A copy of their response is contained within **Appendix H.**

8. Pollution Prevention and Surface Water Treatment

As part of the CIRIA SuDS Manual C753, Section 26 provides guidance regarding methods for managing pollution risks from surface water run-off. The development has been assessed in line with Table 26.2 of the SuDS Manual for the pollution hazard indices for different land use classifications. Refer to Figure 12.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones 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 (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg 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[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 12: Table 26.2 Showing Pollution Hazard Indices

Table 26.3 of C753 reproduced below sets out the mitigation indices provided by SuDS features for discharge to surface water.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	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.		

Figure 13: SuDS Mitigation Methods

Table 6: SuDS Mitigation Indices for Green Roofs (taken from the SuDS Manual Annex 5

SuDS component	Total suspended solids (TSS)	Metals	Hydrocarbons
Green roofs	0.8-0.9	0.7-0.9	0.9

8.1 Roof Areas

The roof is considered to have a “very low” pollution hazard, generating 0.2 total suspended solids, 0.2 metals and 0.05 hydrocarbons.

The above tables show that green roofs are sufficient on its own to adequately treat runoff from commercial roofs. Mitigation indices for green roofs are shown to be higher than the pollution indices for commercial roofs.

9. Operation and Maintenance Requirements

Regularly inspecting of the surface water drainage network for blockages and clearing unwanted debris/silt from the system should improve the performance of the surface water network and decrease the need for future repairs.
The level and frequency of maintenance required on site to maintain the system is dependant on the type of facility. The type of maintenance will fall into one of three categories “regular maintenance”, “occasional” and “remedial maintenance”.
The drainage and SuDS elements used should after an initial inspection following completion be inspected monthly for the first 12 months and after significant storms, thereafter the following maintenance regime should be implemented and adjusted if the 12-month monitoring process has identified any issues.
Following completion of the development a management company will be set up/appointed to maintain all drainage services on site. It will be their responsibility to maintain the drainage network and SuDS elements.
The following sections tabulates the requirements for each SuDS element.

9.1 Blue Roofs

Maintenance of a blue roof system is critical to the viability of its function.

Table 7: Blue Roof Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular inspections	Visually inspect the outlets to ensure no blockage has occurred	Quarterly and after severe storms
	Visually inspect the waterproofing system at all upstands, to ensure that it is firmly adhered to the detail that it is waterproofing	Annually and after severe storms
	Visually inspect underside of roof for evidence of leakage	Annually and after severe storms
	Remove debris and litter to prevent clogging of inlet drains	Six monthly and annually or as required
Regular maintenance	Cut back tree limbs that overhang the roof to give at least 1m clearance.	Annually
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

The specific blue roof maintenance requirements shall be confirmed with the specialist manufacturer.

9.2 Green Roofs

Table 8: Green Roof Maintenance Schedule

Maintenance Schedule	Required Action	Recommended Frequency
Regular inspections	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
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of 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 actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

10. Conclusion

This Drainage Strategy report has been prepared by Elliott Wood Partnership on behalf of GMS Estates in support of a planning application submitted to the London Borough of Camden (“LBC”) application for the proposed redevelopment of Kingsway House, 99-103 Kingsway, London, WC2B 6QX.

The SuDS Hierarchy has been followed in order to employ the most suitable and practicable SuDS techniques to improve surface water run off rates from the site. The development will provide benefits to surface water runoff, water quality, amenity space and biodiversity through the incorporation of blue and green roofs.

Through the use of blue roof systems, the total peak surface water discharge rate from the site will be restricted to 10.4 l/s for all events up to and including the 1 in 100 year + 40% climate change allowance event, without flooding.

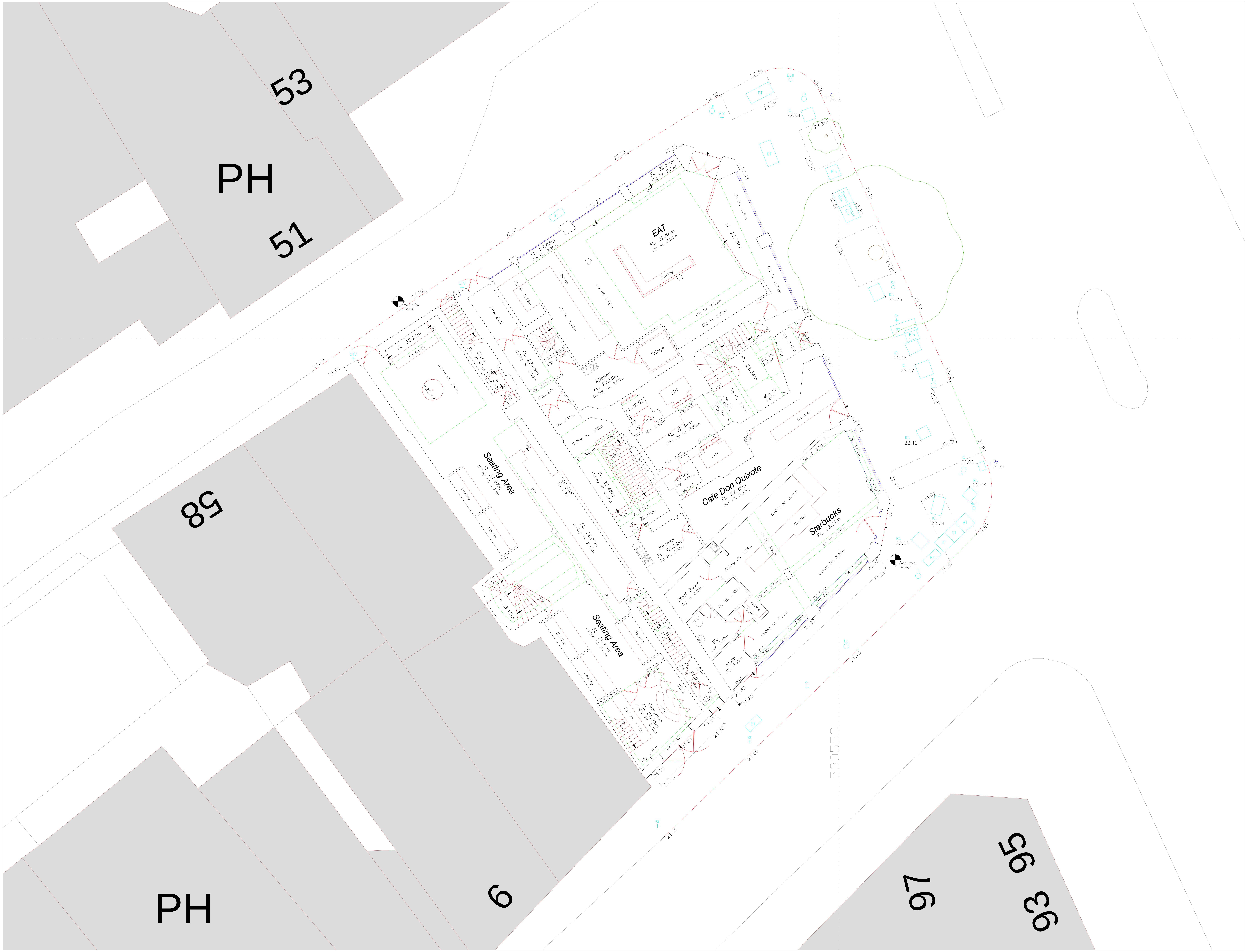
All foul drainage below ground floor level will be pumped by a submersible packaged pumping station which will protect the basement level from the risk of flooding from sewer surcharge.

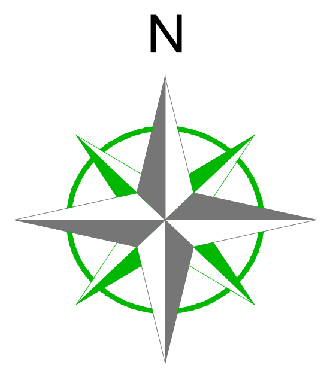
There are three existing combined water connections to the Thames Water combined sewer network. It is proposed that foul and surface water from the development will discharge via these existing sewer outfalls. Thames Water have confirmed that there is sufficient capacity within their local sewer network to accommodate the estimated discharge from the development.

Appendices

Appendix A: Greenhatch Topographical Survey

Site Plan





OS Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings ▨ *Surveyed Buildings* ☐

This survey has been orientated to the Ordnance Survey (O.S) National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN02 & OSGM02 transformation models.
The survey has been correlated to this point and a further one or more OSGB36 points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid.

Building Survey Legend:

SHt 1.00 HHt 2.12	Sill Height from FFL. Head Height from FFL.
SL 51.03m HL 52.82m	Sill Level from defined datum. Head Level from defined datum.
Susp CHt: 2.00 Struct CHt: 3.00	Suspended Ceiling Height from FFL. Structural Ceiling Height from FFL.
Susp Ceil: 30.00m Struct Ceil: 31.00m	Suspended Ceiling Level from datum. Structural Ceiling Level from datum.
IFL: 100.00m +100.00m	Internal Floor Level (General). Internal Floor Level (Specific).
Insertion Point	Insertion Point for overlay drawings of other floors or details.

Legend:

- Buildings
- Wall
- Kerb line
- Line marking
- Drop kerb
- Centre line
- Overhead Cable
- Concrete edge
- Tarmac edge
- Grass verge
- Canopy/Overhang
- Verge

1	Station and Name
100.000	Station Level
Bush Sap	Tree / Bush / Sapling
	Area of Undergrowth
	Woodland
R:	Ridge Level
E:	Eaves Level
F:	Flat Roof Level
	Gate

Fence types:

I\W	Interwoven
I\R	Iron Railings
W\M	Wire Mesh
P\R	Post & Rail
P\W	Post & Wire
C\L	Chain Link
W\P	Wooden Panels
C\P	Concrete Panels
S\P	Steel Palisade

IC	Inspection chamber	Boll	Bollard
PInv	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Bg	Back gully	Vp	Vent pipe
Dp	Down pipe	Grl	Ground light
Pipe	Pipe above ground	Lbox	Letter box
MH	Manhole	Ldr	Ladder
WL	Water level	Sty	Stile
Fl	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trialhole
Tl	Traffic light	BH	Borehole
Bus	Bus stop	ELC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	C'box	Control box
Er	Earth rod	TT	Tactile
Wm	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Av	Air valve	CVR	Cover
ICU	Undentified inspection	IC	Inspection chamber
Wo	Wash out	R/wall	Retaining wall
Re	Rodding eye	UTL	Unable to lift
BB	Belisha beacon	TCL	Tree canopy level
CTV	Cable tv	G:	Girth
Mkr	Marker post	MG	Multi girth
Gmkr	Gas marker post	Stmp	Tree Stump
So	Soffit	CL:	Cover level
		IL:	Invert level

Rev	Date	Description	Drawn	Q. Ref.

greenhatch
group

☐ Topographical Surveys
☐ Site Engineering
☐ Utility / CCTV Surveys
☐ Measured Building Surveys
☐ 3D Laser Scanning
☐ Revit & BIM Models

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CLIENT
EMRYS
Architects

PROJECT
Kingsway House
London

TITLE
Existing
Site Plan

SCALE	DATE
A1@ 1: 100	05.08.14
DRAWN	QUALITY REF
PG	

Level datum: GPS
Grid orientation: GPS
Job number: 20370
Drawing No.: 20370_01_P
Rev.: 0

Comments
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

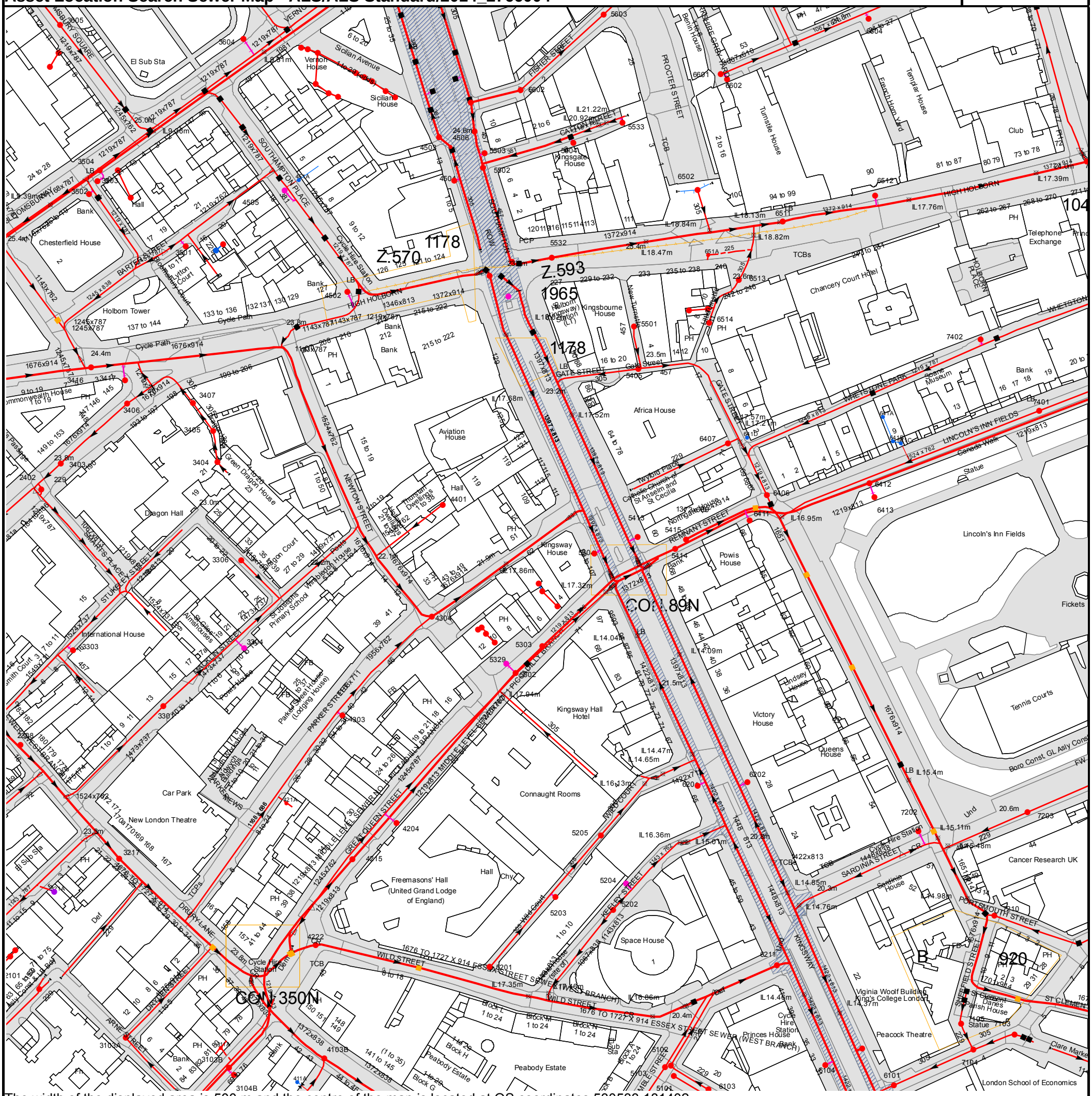
All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

Appendix B: Thames Water Asset Records

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2766004



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 530533,181402

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6103	20.46	15.8
6101	19.39	n/a
5101	20.68	16.78
5103	20.68	16.2
5102	20.65	15.7
6104	n/a	n/a
7104	19.18	14.84
6105	n/a	n/a
7103	18.98	n/a
7105	19.33	15.2
6211	n/a	n/a
7210	19.65	14.97
5202	20.92	17.51
5204	n/a	n/a
7202	n/a	n/a
7203	20.56	16.36
6201	n/a	14.6
6202	n/a	14.59
5501	23.29	19.58
5413	n/a	n/a
5405	23.48	19.04
5414	n/a	n/a
5415	n/a	17.56
5594	n/a	n/a
6515	n/a	n/a
651A	n/a	n/a
6514	23.7	21.1
6407	23.03	18.16
6513	23.45	20.17
641D	n/a	n/a
6411	n/a	n/a
6406	22.58	17.06
6511	23.71	n/a
6412	n/a	n/a
6413	n/a	n/a
641A	n/a	n/a
641B	n/a	n/a
641C	n/a	n/a
7402	n/a	n/a
7401	22.85	17.99
6512	24.12	n/a
6502	23.93	19.35
7510	24.18	n/a
5533	25.19	n/a
6602	n/a	n/a
6601	25.09	20.83
6604	24.71	n/a
46DH	n/a	n/a
46EC	n/a	n/a
46EB	n/a	n/a
4502	n/a	n/a
46DG	n/a	n/a
46DF	n/a	n/a
46DE	n/a	n/a
46DD	n/a	n/a
46DC	n/a	n/a
4501	n/a	n/a
4503	n/a	n/a
4504	n/a	n/a
4604	n/a	n/a
4506	n/a	n/a
5502	n/a	n/a
5503	n/a	n/a
5505	n/a	n/a
5506	n/a	n/a
5531	n/a	n/a
5602	25.05	n/a
5532	23.55	18.77
5504	n/a	n/a
5603	24.89	20.42
36BC	n/a	n/a
36BD	n/a	n/a
3605	24.74	20.67
3403	23.9	20.21
3502	n/a	n/a
3416	24.38	19.26
3503	n/a	n/a
3504	25.02	9.36
35DE	n/a	n/a
3417	n/a	n/a
3406	23.87	20.31
35DD	n/a	n/a
3501	n/a	n/a
3407	n/a	n/a
3405	n/a	n/a
35DG	n/a	n/a
3404	22.89	20.95
35DH	n/a	n/a
3604	n/a	n/a
4505	n/a	n/a
451A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
46DJ	n/a	n/a
46DI	n/a	n/a
46ED	n/a	n/a
5203	22.28	n/a
321A	n/a	n/a
4215	n/a	9.65
3217	23.43	19.23
5205	21.26	16.61
4204	n/a	n/a
421A	n/a	n/a
2308	n/a	19.3
4303	n/a	n/a
3301	23.05	19.03
5302	n/a	n/a
5329	n/a	n/a
3303	n/a	n/a
3304	22.68	n/a
5303	21.4	n/a
53EG	n/a	n/a
53EF	n/a	n/a
43BD	n/a	n/a
53EE	n/a	n/a
4304	22.1	18.09
53DG	n/a	n/a
53DF	n/a	n/a
53DE	n/a	n/a
3306	22.7	18.79
5304	n/a	n/a
4401	n/a	18.95
2402	n/a	n/a
411A	n/a	n/a
3104B	24.26	n/a
3103B	n/a	9.75
4103B	23.59	19.65
311A	n/a	n/a
3103A	24	19.51
2101	22.93	18.43
5201	22.1	17.6
22BJ	n/a	n/a
22CA	n/a	n/a
4222	23.46	18.18

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

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

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

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

2) All measurements on the plans are metric.

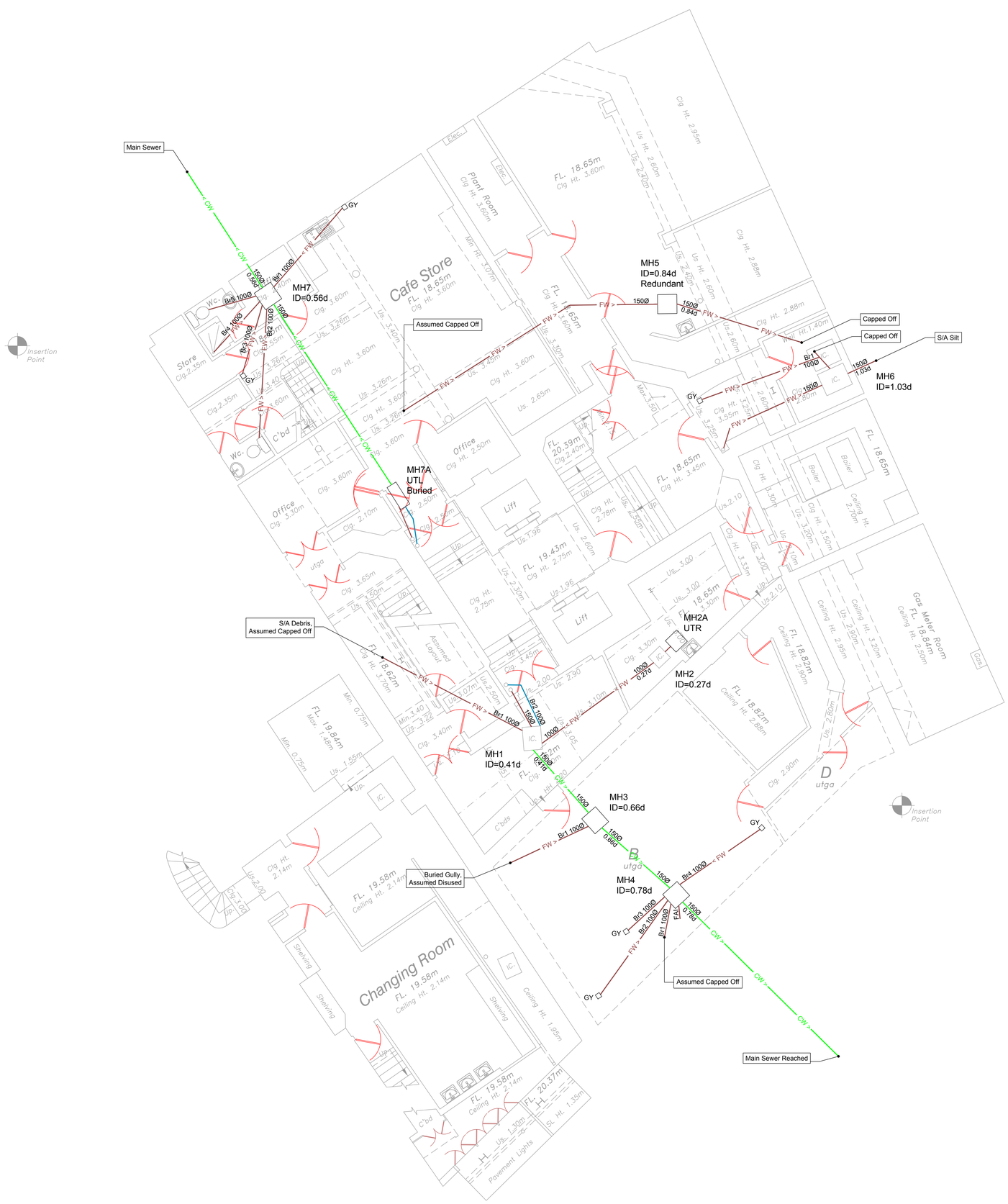
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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

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

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Appendix C: Clearview CCTV Report



N
INDICATIVE

Notes

Utilities may continue outside of the survey area. Any paint marks outside of the area are for investigative purposes only and may not represent the full extent of the sub-surface utilities.

Only sub-surface utility information is provided. Above ground utility information may be shown where it assists with positional referencing.

Where logic indicates a utility exists but which cannot be positively confirmed with the technology, an assumed route (AR) is recorded.

ClearView Surveys does not procure statutory or private source utility information (Unless requested at time of order) as part of its detection service nor does it record any such information in a utility survey unless otherwise requested. Statutory plans should be consulted to supplement this survey.

Vertical & Horizontal Position - Vertical position (depth) is indicative to the top of the utility/feature and is recorded as DTS (depth to top of service) and should not be taken as exact. Where depth information from the technology is unclear, depth is not shown. Drains may have been detected using threading and the depth indicated could be between the top and the bottom of the drain. Horizontal position is indicative to the centre of the utility/feature and should not be taken as exact.

Warranty - Biodegradable paints are used to mark-out the position of the utilities. Before long paint markings may become illegible depending on ground, weather and traffic conditions. No warranty is given in respect of the durability of the paint markings and that they are a complete representation of the sub-surface utilities therefore this drawing should be used as the primary reference for the survey results.

This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive technologies only and the performance can be adversely affected by ground, weather and site conditions outside of ClearView Surveys control therefore some utilities may be undetectable. While ClearView Surveys uses reasonable endeavours to detect all utilities, it does not warrant that 100% detection will be achieved and that approximate depth penetration of the technologies will be greater than two metres.

Sewer and manhole details shown on this drawing have been obtained by observation and measurement from the surface and as such cannot be guaranteed. Where precise sewer details will be critical to the project design ClearView Surveys would recommend that entry into the chamber be undertaken using a specialist team, appropriately qualified for confined space entry. These teams can be supplied on request.

Irrespective of the information provided by a utility survey and statutory plans, excavation work should be undertaken with extreme caution and in accordance with HSE Guidelines - HSG47 Avoiding Danger from Underground Services

Additional Notes:

1. The correct identification of the utility types can not be 100% guaranteed, therefore these should be independently verified prior to use in any design or building works.
2. All pipe diameters and levels are assumed to be correct, but due to non entry of the inspection chambers, these should be verified before any works commence.
3. All utility depths are in metres.
4. All pipe/duct sizes are in millimeters.
5. Information provided should not be altered. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of ClearView Surveys.
6. All dimensions should be checked on site before any fabrication,construction or excavation.
7. CCTV Drainage Pipe positions are indicative only and are in an approximate position.
8. Base Topo Supplied By Client. Accuracy of this cannot be guaranteed as it was not undertaken by ClearView Surveys.

Key:

STREET FURNITURE

BB	Belisha Beacon
BL	Basement Light
Bin	Litter Bin
BO	Bollard
BS	Bus Stop
CPO	Concrete Post
EC	Electric Cupboard
EFP	Electric Feeder Pillar
EP	Electric Pole
FB	Flower Bed
FHM	Fire Hydrant Marker
FL	Flood Light
FP	Flag Pole
FPO	Fence Post
JB	Junction Box
GB	Grit Box
GMK	Gas Marker Post
GPO	Gate Post
IBO	Illuminated Bollard
LH	Lamp Hole
LP	Lamp Post
LPO	Lockable Post
MK	Marker
MPO	Metal Post
NP	Name Plate
PB	Post Box
PM	Parking Meter
RPO	Reflector Post
RS	Road Sign
SI	Sign
STN	Survey Station
Tap	Attached to Wall/Building etc
TCB	Telephone Call Box
TL	Traffic Light
TLCB	Traffic Light Control Box
TP	Telegraph Pole
TPO	Timber Post

PIPES & CABLES

AR	Assumed Route
CIG	Cable In Ground
DBC	Directly Buried Cable
DP	Down Pipe
eot	End Of Trace
FWP	Foul Water Pipe
GP	Gas Pipe
ONV	Outlet Not Visible
PIG	Pipe In Ground
RWP	Rain Water Pipe
SP	Stand Pipe
SVP	Soil Vent Pipe
UTS	Unable To Survey
UTT	Unable To Trace
VP	Vent Pipe
WP	Waste Pipe

LEVELS & DEPTHS

A	Approximate
BD	Back Drop Depth
BDL	Back Drop Level
CD	Chamber Depth
CL	Cover Level
DPC	Damp Proof Course
EL	Eaves Level
FFL	Finished Floor Level
FRL	Flat Roof Level
IBDL	Internal Back Drop
ID	Invert Depth
IL	Invert Level
OD	Outlet Depth
OL	Outlet Level
PWL	Parapet Wall Level
RL	Ridge Level
SD	Sump Depth
SFD	Soffit Depth
SFL	Soffit Level
SiltL	Silt Level
SL	Sump Level
SSL	Structural Slab Level
TFL	Top Of Fence Level
THL	Threshold Level
TWL	Top Of Wall Level
WL	Water Level

FENCES & WALLS

BW	Block Wall
BRP	Brick Pier
BRTW	Brick Retaining Wall
BRW	Brick Wall
BWF	Barbed Wire Fence
CBF	Close Board Fence
CIF	Corrugated Iron Fence
CLF	Chain Link Fence
CPF	Chestnut Paling Fence
CRW	Concrete Retaining Wall
CW	Concrete Wall
CWF	Chicken Wire Fence
DIL	Dilapidated
HR	Hand Rail
IWF	Interwoven Fence
LF	Lattice Fence
MF	Miscellaneous Fence
MRF	Metal Railing Fence
OBF	Open Board Fence
PCF	Post & Chain Fence
PNF	Panel Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
RTW	Retaining Wall
STW	Stone Wall
SRTW	Stone Retaining Wall
WMF	Wire Mesh Fence

INSPECTION CHAMBERS

AC	Access Cover
BH	Borehole
CDC	Concrete Drainage Channel
EIC	Electric Inspection Cover
ER	Earth Rod
FWIC	Foul Water Inspection Cover
FWPS	Foul Water Pumping Station
FH	Fire Hydrant
GIC	Gas Inspection Cover
GM	Gas Meter
GV	Gas Valve
G	Gully
IC	Inspection Cover
KI	Kerb Inlet
LHP	London Hydraulic Power
MDC	Metal Drainage Channel
MW	Monitoring Well
NFI	No Further Information
RE	Rodding Eye
SDIC	Service Duct Inspection Cover
SV	Stop Valve
SWCP	Surface Water Catch Pit
SWIC	Surface Water Inspection Cover
SWSA	Surface Water Soakaway
TCIC	Traffic Control Inspection Cover
TIC	Telecom Inspection Cover
UIC	Unidentified Inspection Cover
UTR	Unable To Raise
WIC	Water Inspection Cover
WM	Water Meter
WWO	Water Wash Out
WSV	Water Stop Valve

SURFACES

BPav	Brick Paving
Conc	Concrete
CPav	Crazy Paving
CPS	Concrete Paving Slabs
FB	Flower / Shrub Border
KFC	Kidney Flint Cobbles
T	Tiles
Tmac	Tarmac
TPav	Tactile Paving
TS	Trench Scar

MEASUREMENTS

d	Depth (m)
Ø	Diameter (mm)
Ext.Ø	External Diameter (mm)
H	Object Height (m)

Linetype Key:

UTILITY KEY

< FW	Foul Drainage
< FW AR	Foul Drainage (Assumed)
< FW (R)	Foul Drainage (Records)
< SW	Storm Drainage
< SW AR	Storm Drainage (Assumed)
< SW (R)	Storm Drainage (Records)
< CW	Combined Drainage
< CW AR	Combine Drainage (Assumed)
< CW (R)	Combine Drainage (Records)

Rev	Date	Notes	By

THIS AREA IS ALLOCATED TO SHOW SHEET LOCATION OF THE WHOLE SITE IF BROKEN DOWN INTO MULTIPLE SHEETS

CLIENT
Elliottwood

SITE
99-103 Kingsway
London
WC2B 6QX

DRAWING TITLE
CCTV Drainage Survey

PROJECT NUMBER 14600	DRAWING NUMBER 14600_F	DATE MAY 2024
SURVEYED BY MR	DRAWN BY DG	CHECKED BY AG
SCALE 1:50	SHEET SIZE A0	SHEET 1 OF 1

CLEAR VIEW SURVEYS

UNIT 301, OLD BARN FARM ROAD
WOOLSBRIDGE INDUSTRIAL PARK
THREE LEGGED CROSS, WIMBORNE, BH21 6SP
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F 01202 824777
E info@clearviewsurveys.co.uk
W www.clearviewsurveys.co.uk

Appendix D: Modified Rational Method Calcs

Modified Ration Method for Brownfield Runoff

Project Number:	2220217
Project Name:	Kingsway House
Date:	13/05/2024

Area (Ha) 0.0413

Storm Return Period	Existing Discharge (L/S)
1yr	3.6
30yr	9.0
100yr	11.4
100yr+40%	16.0

Q= 2.78 * Cv * Cr * I * A

Q = flow rate (l/s)
Cv = Volumetric Runoff Coefficient
Cr = Routing Coefficient
I - Rainfall intensity
A = Area (Ha)

Under summer rainfall conditions Cv ranges from 0.6 - 0.9, for fully impermeable areas value of 0.75 should be used.

The routing coeffcieint varies between 1 and 2 and accounts for the effect of rainfall characterisitcs and catchment shape on the peak runoff magnitude.
The SuDS manual recommends a fixed value for Cr of 1.3 for design.

Rainfall intensity is calculated following Walling Procedure Volume 4 and is as follows:

1.0 Determination of M5-60 min and r

60 minute, 5 year storm (M5-60) has a rainfall depth

M5-60 20.000
Ratio r 0.4

2.0 Determination of M5-D

M5-D = Z1 (M5-60min)
Z1 is taken from A3.a or A.3b for values between 0.12 and 0.45 and for durations between 5 minutes and 48 hours read to 0.01.

Assuming 1yr 15min, 30yr 15 min, 100yr 15min

Z1 0.64
M5-15 12.8 mm

3.0 Determination of MT-D

MT-D is obtained from the relationship:
MT-D = Z2(M5-D)

Taken from Table A1 for 1yr return period 15min storm
Z2 = 0.62
M1-15= 7.9

Taken from Table A1 for 30yr return period 15min storm
Z2= 1.57
M30-15= 20.1

Taken from Table A1 for 100yr return period 15min storm
Z2= 1.99
M100-15= 25.5

4 **Determination of point rainfall intensities**

i= 31.744 mm/hr

i= 80.384 mm/hr

i= 101.888 mm/hr

5 Application of areal reduction factor

From chart A4 where area is less than 1km2
ARF= 1

Average 1yr intensity
31.7

Average 30yr intensity
80.4

Average 100yr intensity
101.9

Average 100yr+40% intensity
142.6

Appendix E: Greenfield Run-off Calc

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	folarin Awogbemila
Site name:	Kingsway House
Site location:	London

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

Site Details

Latitude:	51.51641° N
Longitude:	0.11998° W
Reference:	75643826
Date:	May 21 2024 15:16

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.1

Methodology

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

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	611	611
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	0.16	0.16
1 in 1 year (l/s):	0.13	0.13
1 in 30 years (l/s):	0.36	0.36
1 in 100 year (l/s):	0.5	0.5
1 in 200 years (l/s):	0.58	0.58

Appendix F: Blue Roof Calcs, Detail and Extents

BLUE ROOF ATTENUATION AND OUTFLOW SUMMARY

PRIVATE & CONFIDENTIAL - NOT FOR DISTRIBUTION

Project Name:	99-103 Kingsway, Holborn, WC1B 6QY - Main Roof (<1 l/s) - Rev2
Prepared for:	Elliott Wood
Date:	17/06/2024
ABG Project ID:	99-103KW Calculator version: 1.35
Prepared by:	Matt Gledhill, matthew.gledhill@abgltd.com
Notes/description:	Mix of green roof, soft and hard landscaping - TBC. Maintenance or pedestrian/amenity access only - TBC. Warm/inverted roof construction, with zero falls - TBC.
Document/Drawing references:	

Input Parameters - Rainfall Information (FEH22)

Return period:	100 years	*As supplied by Client*
Allowance for Climate Change:	40 %	*As supplied by Client*
OS grid reference selected for FEH data:	TQ 30250 81436	

Input Parameters - Roof Information

Total catchment area:	116 m^2	*As supplied by Client*
Attenuation area:	63 m^2	*As supplied by Client*
Maximum allowable runoff:	0.9 l/s	*As supplied by Client*

Output - Rainfall Calculation

Duration	Time to Empty	Restricted Outflow (l/s)
15 mins	2 hours and 30 minutes	0.8
30 mins	2 hours and 50 minutes	0.8
1 hour	2 hours and 50 minutes	0.9
2 hours	2 hours and 50 minutes	0.9
4 hours	2 hours and 20 minutes	0.7
6 hours	1 hour and 30 minutes	0.5
10 hours	0 hours and 20 minutes	0.2
24 hours	0 hours and 0 minutes	0.0
48 hours	0 hours and 0 minutes	0.0

Total attenuation required: 6 m^3
Half empty time: 1 hours and 10 minutes.

Output - Recommended Blue Roof System

System Name:	ABG blueroof VF HD 108mm
Description:	Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-referenced with the structural engineer's long-term deflection analysis. Additional 'tell-tale' parapet overflow outlets, may also be added by the architect.
Total attenuation capacity:	6.1 m^3
Number of Blue Roof outlets:	2

Notes:

1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
2. Further details on the theories used in this estimate are available upon request from ABG. The values given for the performance of the system relate to testing, modelling and analysis of our systems obtained from laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes to our systems without notice at any time.
3. The estimate given in this report is based on the stated parameters as per the brief. If these parameters are not correct or have changed, ABG should be contacted to provide a revised estimate.
4. This estimate is specific to the characteristics of ABG products/systems and is not applicable to other competitor products. The substitution of the whole or any component of this design for a material supplied from another source renders this estimate invalid.
5. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

Blue Roof Estimate

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1. DEFINITIONS

'Consultant' means ABG Geosynthetics Ltd and its legal successors. 'Client' means the person, firm, company or organisation for whom the Consultant is performing the Services. 'Agreement' means the contract referred to in Clause 2. 'Services' means the services to be performed by the Consultant in accordance with the proposal from the Consultant. 'Project' means the project or works for which the Client has commissioned the Services.

2. GENERAL

Unless and until a formal agreement is entered into, the Client's acceptance of the proposal for Services from the Consultant or a request for some or all the Services to be performed by the Consultant, shall constitute a binding
contract between the Client and the Consultant which contract will be subject to any terms and conditions contained or referred to in the aforementioned proposal and these terms and conditions. In the event of any conflict, the terms and conditions in the proposal shall prevail over these terms and conditions. The Agreement so formed shall supersede all previous understandings, commitments or agreements whether written or oral between the Client and the Consultant relating to the subject matter hereof. No person or entity shall have any rights in relation to this Agreement, whether as third parties or otherwise, save the parties to this Agreement. Should any term or condition of this Agreement be held to be unenforceable or invalid by the courts of any jurisdiction to which it is subject then such term or condition shall be disregarded and the remaining terms and conditions shall remain in full force and effect.

3. PERFORMANCE OF SERVICES AND SCOPE

The Consultant shall perform the Services using the degree of skill care and diligence to be expected from a consultant experienced in the provision of services of similar scope size and complexity. The Consultant shall use reasonable endeavours to complete the Services within the time or programme agreed but shall not be responsible for any delay beyond the reasonable control of the Consultant. The fee contained in the proposal is for the scope of services as defined therein. If not already contained in the proposal the Consultant and the Client shall agree as an initial activity an integrated project services programme to
include the activities of all the parties to the Project relevant to the Services to be supplied by the Consultant. The
aforesaid programme shall show the key dates for final information and the delivery of such to the Consultant so as to enable the Consultant to carry out the services in an efficient once through manner to achieve the programme delivery dates for the Services.
The Consultant provides various services including Design and Product use advice which is distinct from a Design Service. The Design Service may or may not attract a fee.
Where the Consultant's services are of an advisory nature and dependent upon the degree of information and release thereof by the Client then the Client agrees that any reliance placed on the services by the Client shall take due account of such constraints.

4. CONFIDENTIALITY AND INTELLECTUAL PROPERTY RIGHTS

i. The Consultant and the Client shall keep confidential all information pertaining to the Services.
ii. Copyright for all reports, documents and the like produced by the Consultant in the performance of the Services
shall remain vested with the Consultant but the Consultant shall grant an irrevocable royalty free license to the Client to use such reports, documents and the like for any purpose in connection with the Project.

5. LIABILITY

i. The Consultant shall be liable to pay compensation to the Client arising out of or in connection with this
Agreement only if a breach of the duty of care in Clause 3 is established against the Consultant.
ii. Notwithstanding any other term to the contrary in this Agreement or any related document and whether the cause of action for any claim arises under or in connection with the Agreement in contract or in tort, in negligence or for breach of statutory duty or otherwise the Consultant shall have no liability to the Client in respect of any claim for loss or damage arising from acts of war or terrorism or arising from flooding, burst water mains or failed drainage or arising from any incidence of toxic mould or asbestos but otherwise in relation to any cause of action as aforesaid the total liability of the Consultant in the aggregate for all claims shall be limited to a sum equivalent to ten (10) times the fee payable under this Agreement or £50,000, whichever is the lesser, or such other sum as may be expressly stated in the Consultant's proposal, and further but without prejudice to the aforesaid limit of liability any such liability of the Consultant shall be limited to such sum or sums as it would be just and equitable for the Consultant to pay having regard to the Consultant's responsibility for the same and on the basis that all other parties appointed or to be appointed by the Client to perform related services in connection with the Project shall be deemed to have provided undertakings on terms no less onerous than this Agreement and shall be deemed to have paid to the Client such contribution as it would be just and equitable for them to pay having regard to their responsibility for any loss or damage and providing that it shall be deemed that such other parties have not limited or excluded their liability to the Client for such loss or damage in any way which may be prejudicial to the Consultant's liability under this clause. Nothing in this clause shall operate to exclude or limit the Consultant's liability for death or personal injury.
iii. The Client shall indemnify and keep indemnified the Consultant from and against all claims, demands,
proceedings, damages, costs and expenses arising out of or in connection with this Agreement or the Project
arising from acts of terrorism or arising otherwise in excess of the liability of the Consultant under this
Agreement or which may be made in respect of events occurring after the expiry of the period of liability stated
in this Agreement.
iv. No action or proceedings under or in connection with this Agreement shall be commenced against the Consultant after the expiry of one year from completion of the Services.
v. ABG Geosynthetics Ltd is not responsible for consequential, indirect or incidental losses.

6. INSURANCE

The Consultant shall arrange Professional Indemnity Insurance cover for the amount stated in Clause 5(ii). The Consultant will use all reasonable endeavours to maintain Professional Indemnity Insurance cover for the period stated in 5(iv) above, providing such insurance remains available to the Consultant at commercially reasonable rates.

7. CLIENT'S OBLIGATIONS

The Client shall supply, without charge and in such time so as not to delay or disrupt the performance of the Consultant in carrying out the Services, all necessary and relevant information, in his possession or available to him from his other agents or consultants and all necessary approvals or consents. Any deviation on any information from the proposal shall be confirmed in writing and any attendant consequential fees will be forwarded for approval by the Client before any changes are made. The Consultant shall not be liable for any consequential delays on site. Every reasonable effort will be made to mitigate against delays, however no liability for losses and costs will be accepted. The approval or consent by the Client to the Services shall not relieve the Consultant from any liability under this Agreement. All work undertaken by the Consultant must be ratified and signed off by the Client.

8. PAYMENT

i. The Client shall pay the Consultant for the Services in accordance with the proposal and this Agreement. If the Consultant performs any additional services or if the Services are delayed or disrupted for reasons beyond the
reasonable control of the Consultant then the Consultant shall be entitled to such additional fees as are fair and
reasonable in the circumstances. The Consultant may render an invoice at monthly intervals for services properly
performed. The agreed invoice, or in the event of a dispute the undisputed element, shall be paid within 28 days of receipt of the invoice by the Client. Any invoice paid after this period will attract interest at 3% above the base
rate of the central bank of the country of the currency of payment along with any collection costs which may occur.
ii. The Client shall not withhold any payment of any sum or part of a sum due to the Consultant under this
Agreement by reason of claims or alleged claims against the Consultant unless the amount to be withheld has
been agreed between the Client and the Consultant as due to the Client or such sum arises from an award in
adjudication, arbitration or litigation in favour of the Client and arises under or in connection with the Agreement.
Save as aforesaid all rights of set off at common law, in equity or otherwise which the Client may otherwise be
entitled to exercise are hereby expressly excluded.

9. TERMINATION

If a party is in breach of a material term of this Agreement and despite written notice from the other party fails to
remedy such breach within 30 days or such other period as may be agreed between the parties, then the other party shall be entitled to terminate this Agreement forthwith. The Consultant may seek to recoup costs incurred for works completed prior to termination.

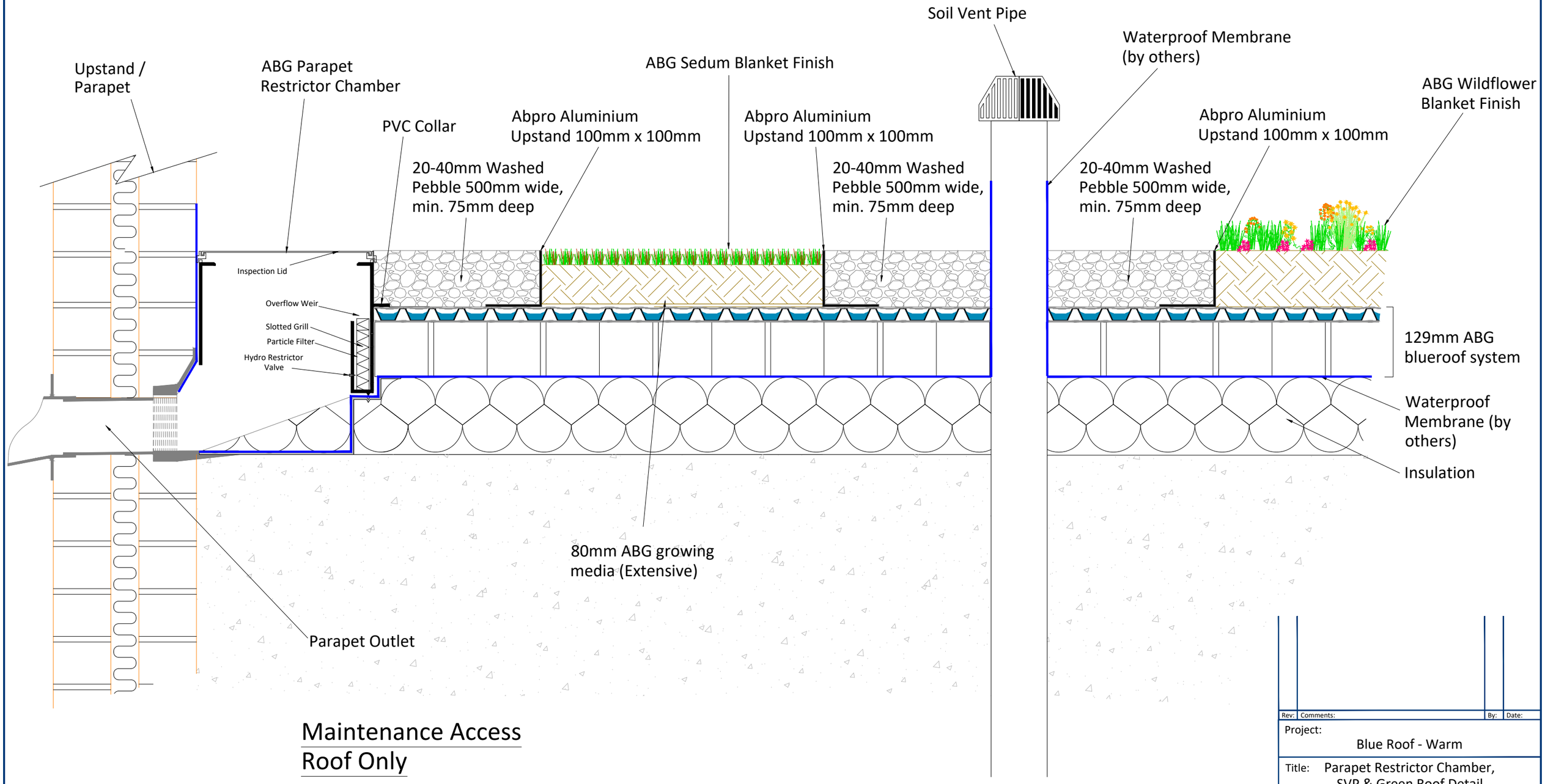
10. DISPUTE RESOLUTION

Any dispute between the parties that cannot be settled by mutual agreement shall be referred for final settlement to the arbitration of a person agreed between the parties or failing such agreement appointed upon the application of either party by the President of the Chartered Institute of Arbitrators and the said arbitration shall be carried out in accordance with the Construction Industry Model Arbitration Rules 1998 or such other version current at the time of the referral under this clause. Where the Agreement is subject to a governing law other than that of England and Wales then any dispute between the parties that cannot be settled by mutual agreement shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules by one arbitrator appointed in compliance with the said Rules. In either case such rules as appropriate are deemed to be incorporated into this Agreement by reference.

11. COMPLIANCE WITH LAWS

This Agreement shall be governed by and construed in accordance with the law of England and Wales unless stated
otherwise in the proposal for services from the Consultant.

Changes to the above terms and conditions will only be considered if agreed in writing as
part of the appointment process prior to ABG Geosynthetics commencing work.



Maintenance Access Roof Only

Rev:	Comments:	By:	Date:

Project: Blue Roof - Warm

Title: Parapet Restrictor Chamber, SVP & Green Roof Detail

Drawn by:	Date:	
RH	13/01/20	
Scale: NTS	Drawing Ref: BRST08	Rev: 1.03

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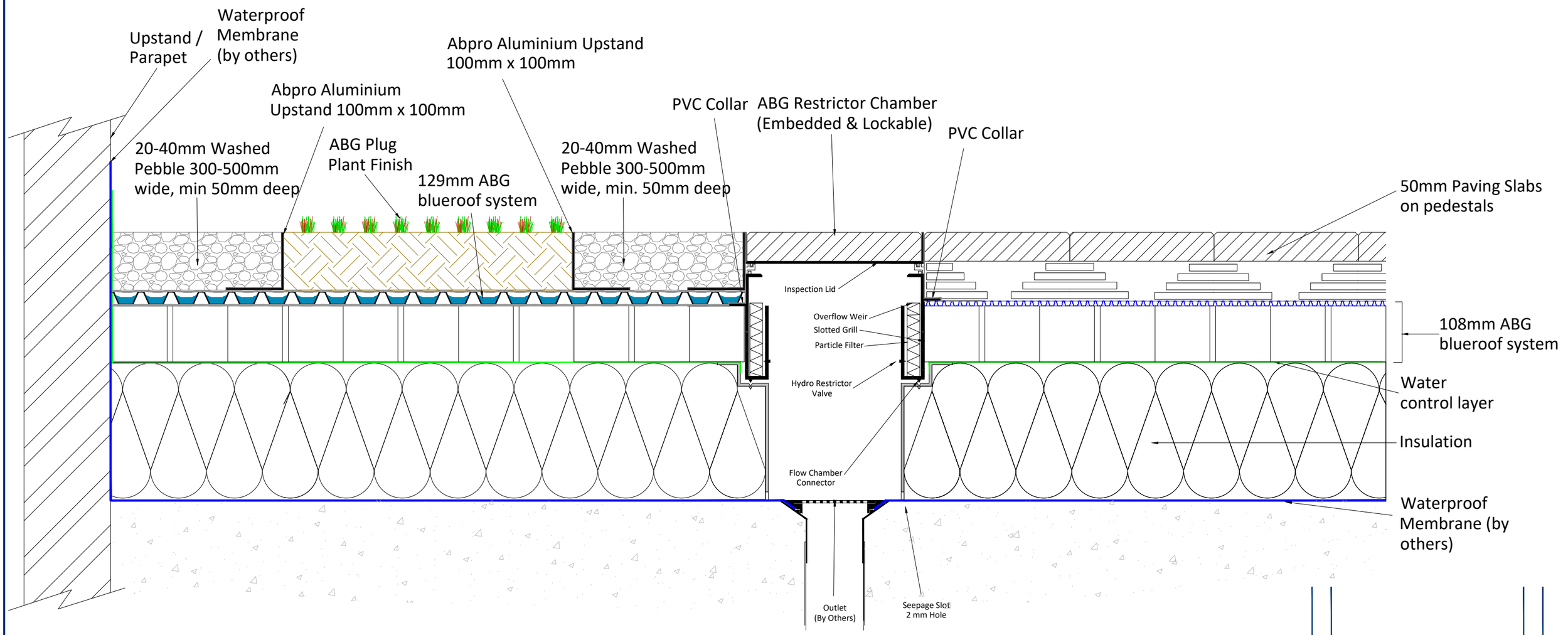

Rev:	Comments:	By:	Date:

Project:
Blue Roof - Inverted

Title:
Restrictor Chamber & Green Roof / Paved Details

Drawn by:	Date:	
RH	07/07/23	
Scale:	Drawing Ref:	Rev:
NTS	BRST02	1.04

abg creative geosynthetic engineering

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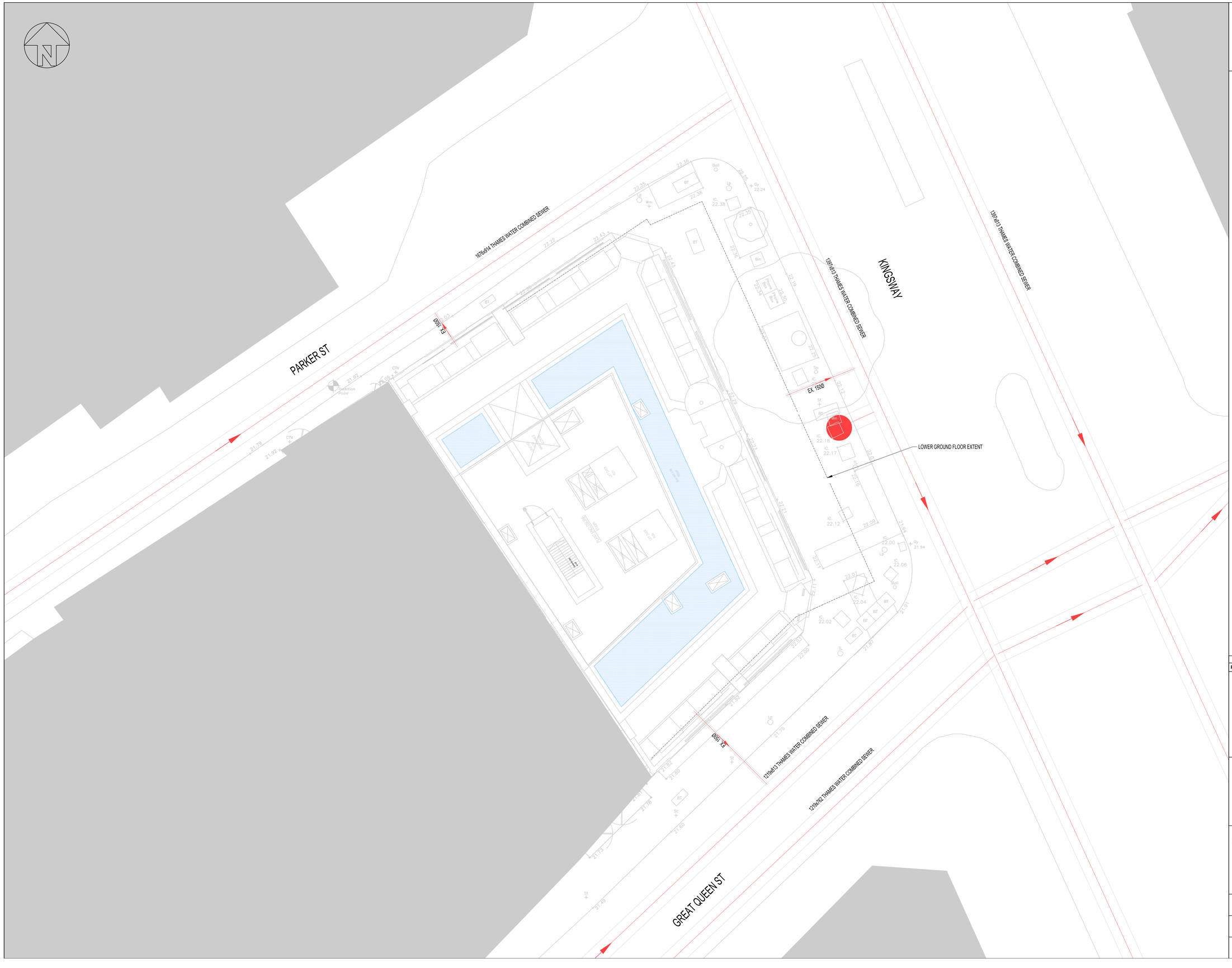

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.

DO NOT SCALE FROM THIS DRAWING.

ALL DRAWINGS TO BE PRINTED IN COLOUR

LEGEND

- EXISTING COMBINED WATER MANHOLE
- EXISTING COMBINED WATER
- PROPOSED BLUE ROOF EXTENT
- EXISTING BUILDINGS
- LOWER GROUND FLOOR EXTENT

NOT FOR CONSTRUCTION

Rev	Date	By	Chk	Description
P01	25.06.24	FAw	TKe	Issued for Information

ElliottWood

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• +44(0)20-7499-5888

Project

Kingsway House
London

Drawing Title

Proposed SuDS Strategy

Scale	EWP Project	Date	Drawn
1:100 @ A1	2230217	June 2024	FAw

Design Phase	Status	Revision
For Information	S2	P01

[Project]-[Origin]-[Function]-[Spatial]-[Form]-[Discipline]-[No.]

2230217-EWP-ZZ-ZZ-DR-C-15000

Appendix G: Camden Drainage Proforma

Camden

GREATER**LONDON**AUTHORITY

LoDEG

1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	Kingsway House
Address & post code	Kingsway House, 103 Kingsway, London, WC2B 6QX
OS Grid ref. (Easting, Northing)	E 530545
	N 181395
LPA reference (if applicable)	
Brief description of proposed work	Refurb of existing builidng to an Extended Stage Hotel use (Hotel Class C1)
Total site Area	413 m^2
Total existing impervious area	413 m^2
Total proposed impervious area	413 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	Drains via gravity to a combined sewer
Designer Name	Folarin Awogbemila
Designer Position	Civil Engineer
Designer Company	Elliott Wood Partnership

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	N/A
Bedrock geology classification	London Clay Formation
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	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	N	N
7 discharge rainwater to the combined sewer.	Y	Y

2c. Proposed Discharge Details

Proposed discharge location	TW combined water sewer
Has the owner/regulator of the discharge location been consulted?	Yes

Camden

GREATERLONDONAUTHORITY

LoDEG

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)*
Qbar	0.16			
1 in 1	0.13	3.6		3.1
1 in 30	0.36	9		6.3
1 in 100	0.5	11.4		7.7
1 in 100 + CC				10.4
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Orifice		

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	116	63	6.8
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	0	0	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	0		0
Total	**116**	**63**	**6.8**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 7
Drainage hierarchy (2b)	Section 7
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Appendix F & H
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Appendix F
Proposed SuDS measures & specifications (3b)	Section 7
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix F
Detailed drainage design drawings, including exceedance flow routes	Appendix F
Detailed landscaping plans	Appendix F
Maintenance strategy	Section 9
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 7
b) biodiversity?	Section 7
c) amenity?	Section 7

Appendix H: Thames Water Pre-Dev Response

Mr Folarin Awogbemila
Elliott Wood Ltd
241 The Broadway
Wimbledon
Greater London
SW19 1SD

Wastewater pre-planning
Our ref **DS6118817**

16 July 2024

Pre-planning enquiry: Confirmation of sufficient capacity

Site: Kingsway House, 103 Kingsway, Holborn, Greater London, WC2B 6QX

Dear Mr Awogbemila,

Thank you for Pre-planning application for the conversion of **2446sqm office & 364sqm commercial premises** for the use of **58 bed hotel & 126sqm commercial premises**.

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.

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.

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

Combined (foul & surface) Water discharge

Foul Units	Surface water flow	Sewer
Outfall 1: 19 beds	3.1 litres/sec	1219x813mm combined sewer in Great Queen Street
Outfall 2: 19 beds	4.1 litres/sec	1676x914mm combined sewer in Parker Street
Outfall 3: 20 beds & 126sqm commercial premises	3.1 litres/sec	1397x813mm combined sewer in Kingsway

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 LLFA (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. 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.

More detailed surface water hierarchies can be found within Local Planning Policies.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of **10.3 litres/sec** for all storm events up to and including 1:100yr+40%CC, then Thames Water would not have any objections to the proposal.

Diversion

From our records we don't anticipate that any wastewater assets need to be diverted to accommodate your proposals.

Please see our FAQ's leaflet for additional information.

What happens next?

If not already done so, please submit your **S106 Connection Application**, giving us at least 21 days' notice of the date you wish to make your new connection(s).

If you've any further questions, please do not hesitate to contact me.

Yours sincerely,

Colins Akemche
Clean & Waste Pre-Planning Engineer
Adoption Team - Service Delivery

elliottwood

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Engineering a Better Society

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