

FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 1 – Haringey SuDS Proforma & LLFA Meeting Minutes

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	30-36 Clarendon Road
	Address & post code	N8 0DJ
	OS Grid ref. (Easting, Northing)	E 530933 N 189520
	LPA reference (if applicable)	
	Brief description of proposed work	Demolition of the existing building and construction of building up to eleven storeys, with basement, with access, landscaping and car and cycle parking
	Total site Area	785 m ²
	Total existing impervious area	765 m ²
	Total proposed impervious area	785 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Assumed pipes to local Thames Water sewers. No CCTV currently to confirm
Designer Name	Archie Shirley-Beavan	
Designer Position	Senior Civil Engineer	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	None	
	Bedrock geology classification	London Clay	
	Site infiltration rate	m/s	
	Depth to groundwater level	TBC m below ground level	
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	Y	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.	Y	N
2c. Proposed Discharge Details			
Proposed discharge location	TBC. Preferred via existing outfall		
Has the owner/regulator of the discharge location been	Yes		

	Designer Company	Graphic Structures
--	------------------	--------------------

	consulted?	
--	------------	--

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Q _{bar}	0.35			
	1 in 1	0.3	12.9	70	5
	1 in 30	0.8	31.8	60	5
	1 in 100	1.11	41.3	55	5
	1 in 100 + CC				5
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Pump		
	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		390	390	39
	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		395		25
	Total		785	390	64

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	p19/S7.2.4
	Drainage hierarchy (2b)	p17/S7.1
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Appendix 2 & 5
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	p22/S7.5 & Appendix 6
	Proposed SuDS measures & specifications (3b)	P18/S7.2 & Appendix 7
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix 4
	Detailed drainage design drawings, including exceedance flow routes	Appendix 5
	Detailed landscaping plans	Appendix 4
	Maintenance strategy	Appendix 7
	Demonstration of how the proposed SuDS measures improve:	p18/S7.2
	a) water quality of the runoff?	p18/S7.2
	b) biodiversity?	p18/S7.2
	c) amenity?	p18/S7.2

AFRICAN CARIBBEAN CULTURAL CENTRE, CLARENDON ROAD – REF: PRE/2020/0004
LLFA PRE-PLANNING MEETING

Date of Meeting: 11th November 2020, 14.00-15.00

Location: Microsoft Teams

Attendees:

- | | | |
|-------------------------------|-------------------------|----------------------------|
| • Tobias Finlayson (TF) | Haringey Council (HC) | Principle Planning Officer |
| • Ray Matthews (RM) | Haringey Council (HC) | SuDS Officer |
| • Archie Shirley-Beavan (ASB) | Graphic Structures (GS) | Civil Engineer |
| • Mark Mawby (MM) | Graphic Structures (GS) | Structural Engineer |
| • Jeff Iles (JI) | Stockwool (SW) | Architect |

Apologies:

- | | | |
|---------------------------|-----------------------|---------------------|
| • John McCrory (JM) | Haringey Council (HC) | |
| • Deborah Wartenberg (DW) | Stockwool (SW) | Architect |
| • Frances Young (FY) | DLP Consultants (DLP) | Planning Consultant |

No.	Item	Action
1.0	Introduction	
1.1	Purpose of meeting is to discuss the proposed drainage scheme for inclusion within the Flood Risk Assessment (FRA) for the planning submission.	Note
1.2	The development proposals involve demolition of existing site buildings and construction of new mixed use building up to 13-storeys involving a basement carpark.	Note
1.3	GS previously sent initial SuDS sketches for LLFA review demonstrating the site constraints and outlining high-level drainage scheme options.	Note
2.0	Discussion	
2.1	ASB gave overview of the site constraints which impact the feasibility of below ground SuDS including the available external space for providing underground attenuation. The current scheme proposals involve blue roofs working in conjunction with an underground attenuation tank.	Note
2.2	ASB discussed two scheme options; one involving an underground attenuation tank provided externally; and one with a pumped tank in the basement. Both schemes options proposed a peak surface water discharge rate of 25 l/s, set in line with guidance on minimum 50% reduction of flows.	Note
2.3	ASB advised that the LLFA's comments on the peak outflow rate are sought. RM had previously advised a rate of no greater than 3x the greenfield rate (around 15 l/s).	Note
2.4	RM acknowledged constrained site and reduced opportunities for SuDS. RM stated that upon further consideration of the site, the proposed rate of 25 l/s is appropriate.	Note
2.5	RM confirmed site located in Flood Zone 1 and not within a Critical Drainage Area (CDA). Although small pockets of surface water flooding risk (from overland flows) occur within the site.	Note
2.6	RM stated that the existing trees around the site provide bioretention benefits.	Note
2.7	RM advised the scheme should aim to achieve a high percentage of blue roofs	Note
2.8	ASB advised that the blue roof area has not been confirmed at this stage. Coordination is ongoing with the M&E engineer on roof plant requirements. Hence the current underground attenuation estimates for a range of blue roof areas. To be confirmed by	GS/SW

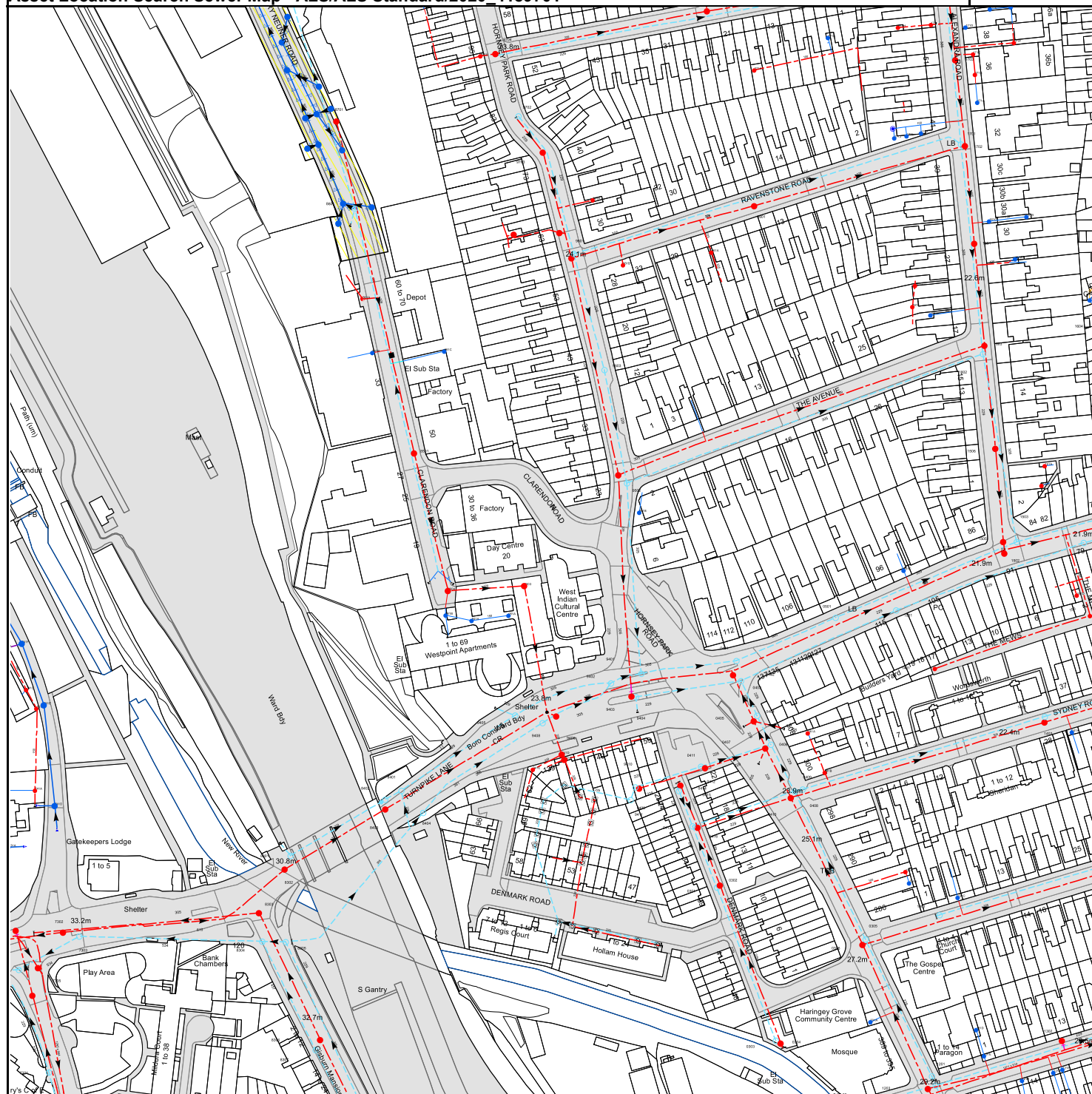
	planning submission.	
2.9	ASB advised the non-pumped scheme option is the preferred scheme at this stage, although is reliant on high level offsets of rainwater pipes.	Note
2.10	ASB discussed the basement scheme and the solution involving a below slab tank or one above the slab. Pilecaps would reduce the available underground space which would lead to a challenging design and deeper excavations. The alternative would be to dedicate space within the basement to an above slab tank solution. JI advised this may be possible although awaiting information on M&E plant requirements	Note
2.11	MM discussed previous experience with a basement tank above the slab, with access and maintenance a key LLFA consideration	Note
2.12	RM recalled a previous scheme in Alexandra Palace involved a similar tank design	Note
2.13	RM advised if a pumped option is chosen, information on maintenance and back up pumps would need to be included within the FRA.	Note
2.14	ASB stated the FFL's have been set by SW to be above the surrounding road/footway levels to mitigate the surface water flood risk. GS to provide an overland flows plan within the FRA	GS
2.15	JI queried if a CCTV survey of existing drainage is a requirement for planning. HC to confirm.	TF/RM
2.16	ASB queried if FSR or FEH rainfall data should be used for surface water calculations. RM advised FEH should be used. GS to ensure FEH point data is used	ASB
2.17	RM confirmed that a climate change allowance of 40% must be applied to rainfall for surface water calculations.	Note
2.18	RM confirmed no urban creep factor to rainfall applies to the scheme	Note
2.19	RM advised GS should contact Thames Water to receive comments on sewer capacity for proposed flows. GS to submit predevelopment enquiry	ASB
2.20	TF stated a draft drainage layout and information for planning may be sent for comments in advance of submission.	Note

FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 2 – Thames Water Correspondence

Thames Water Record Map

2020 scheme Thames Water Sewer Capacity Letter



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 530951,189532

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

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
171J	n/a	n/a
171H	n/a	n/a
171L	n/a	n/a
171K	n/a	n/a
171I	n/a	n/a
1703	22.88	21.08
1701	22.91	21.69
1702	22.9	20.92
171D	n/a	n/a
171C	n/a	n/a
171B	n/a	n/a
171A	n/a	n/a
171E	n/a	n/a
171G	n/a	n/a
171F	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
8701	24.33	21.75
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
8601	25.34	22.28
n/a	n/a	n/a
961A	n/a	n/a
0701	23.46	21.94
0601	23.51	21.5
071A	n/a	n/a
071B	n/a	n/a
8501	25.33	21.24
861B	n/a	n/a
961C	n/a	n/a
861A	n/a	n/a
9602	24.44	22.25
9604	n/a	n/a
9605	n/a	n/a
9703	24.32	22.63
9702	24.16	23.37
n/a	n/a	n/a
971U	n/a	n/a
9704	23.9	22.25
n/a	n/a	n/a
n/a	n/a	n/a
151C	n/a	n/a
1502	21.97	n/a
1504	21.75	20.81
1503	21.83	20.69
1505	22.19	20.37
951B	n/a	n/a
151B	n/a	n/a
9502	24.01	22.29
9501	23.94	21.55
151A	n/a	n/a
1506	22.16	20.47
9603	24.25	22.65
1602	22.37	21.06
1603	22.38	20.72
161H	n/a	n/a
1604	n/a	n/a
161F	n/a	n/a
161E	n/a	n/a
161D	n/a	n/a
161G	n/a	n/a
961B	n/a	n/a
161A	n/a	n/a
9601	24.43	22.87
061A	n/a	n/a
1601	22.64	20.78
161C	n/a	n/a
161B	n/a	n/a
131C	n/a	n/a
1402	22.26	21.11
1403	22.3	20.64
141A	n/a	n/a
151D	n/a	n/a
1507	21.74	21.03
1203	29.11	26.66
1202	29.02	27.53
1201	28.87	26.64
0304	29.77	27.78
0303	29.66	27.73
031A	n/a	n/a
0306	26.51	24.3
0305	26.52	25.36
1301	25.41	24.13
0301	25.93	24.41
0302	25.92	24.17
131B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
131A	n/a	n/a
0416	25.02	23.32
0413	24.97	23.73
9411	25.04	23.46
0410	24.02	21.92
0408	23.94	22.82
0415	24.64	23.8
0409	24.13	22.95
9409	24.63	22.97
9410	24.61	23.46
0414	24.61	23.57
041B	n/a	n/a
121B	n/a	n/a
121F	n/a	n/a
121E	n/a	n/a
121C	n/a	n/a
131E	n/a	n/a
1302	26.55	n/a
131D	n/a	n/a
941B	n/a	n/a
9504	24.45	21
941A	n/a	n/a
951A	n/a	n/a
9405	23.72	22.71
9503	23.8	20.84
941E	n/a	n/a
9408	23.57	22.94
9406	23.65	n/a
941D	n/a	n/a
941C	n/a	n/a
9402	23.26	22.12
9403	23.19	n/a
9404	23.18	22.03
9401	23.03	21.9
0411	24.22	22.82
0412	24.24	22.46
0402	22.76	20.45
0401	22.72	21.65
0403	22.71	21.65
0405	23.26	21.28
0404	23.11	21.95
0407	23.55	21.62
0406	23.49	22.35
041A	n/a	n/a
0501	22.34	21.21
1501	22.12	21.15
1401	22.35	21.74
731A	n/a	n/a
7301	34.19	n/a
7304	34.28	27.32
741F	n/a	n/a
741C	30.93	29.34
7306	34.54	31.13
741A	31.11	29.99
741B	30.93	29.48
7305	34.1	n/a
741E	n/a	n/a
7201	35.46	33.63
741D	n/a	n/a
7302	33.55	27.2
7303	33.29	27.47
8303	31.6	28.07
8304	31.79	27.88
8302	30.64	23.37
8305	31.84	30.22
8301	30.4	29.73
8307	32.73	29.1
8306	32.77	29.33
8402	27.49	26.02
8403	27.51	23.32
8401	26.83	24.62
8404	27.39	25.33

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



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Vent Pipe
	Proposed Thames Surface Water Sewer
	Proposed Thames Foul Sewer
	Gallery
	Surface Water Rising Main
	Sludge Rising Main
	Vacuum
	Foul Rising Main
	Combined Rising Main
	Proposed Thames Water Rising Main

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.

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

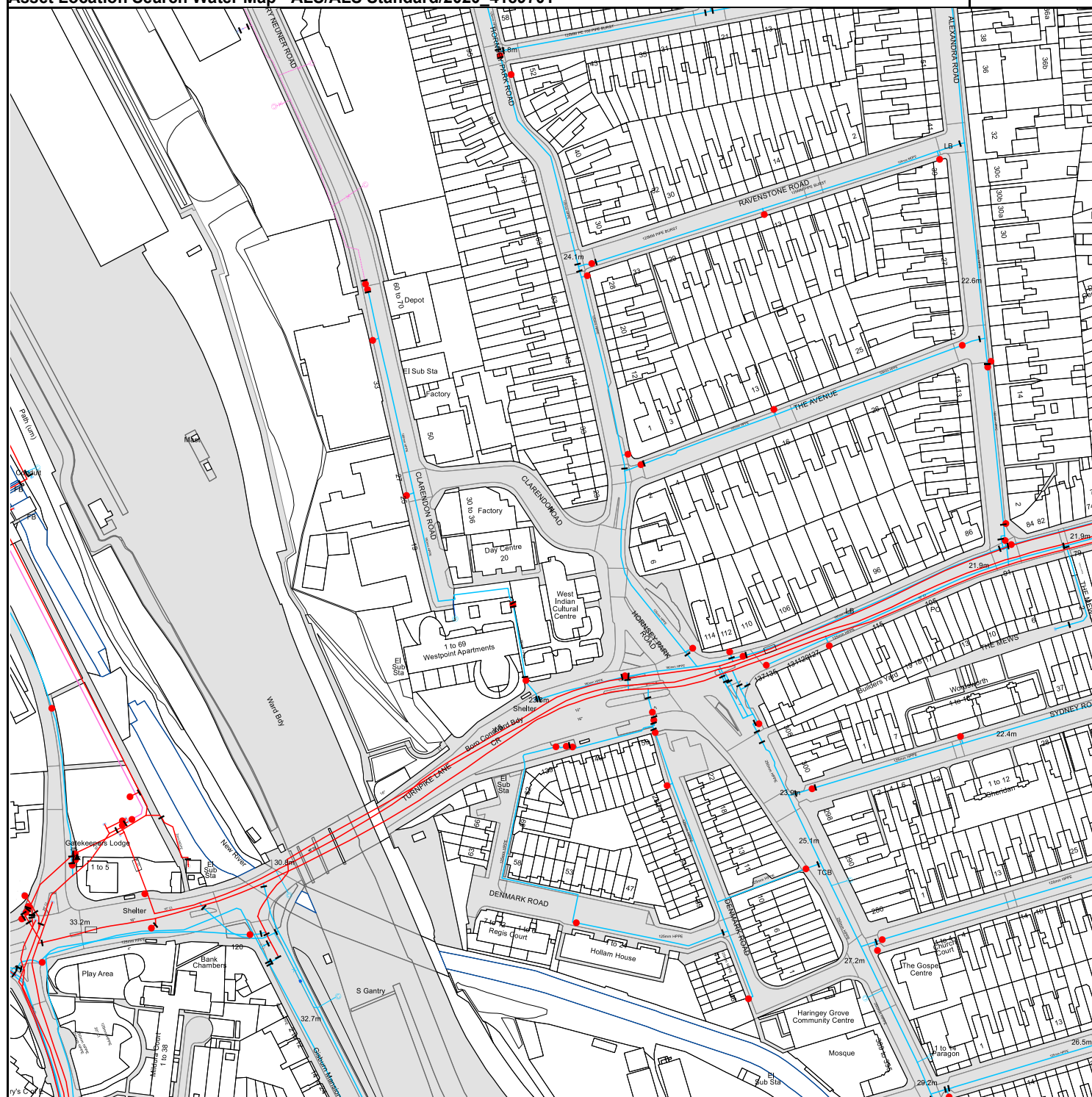
Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

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

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

Asset Location Search Water Map - ALS/ALS Standard/2020 4189701



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 530951, 189532.

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.



ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

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

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

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

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

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

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

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

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

Operational Sites

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

Other Symbols

	Data Logger
---	-------------

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

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

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



Mr Archie Shirley-Beavan
Graphic Structures
2nd Floor, 60A Weston St
London
SE1 3QJ



07 December 2020

Pre-planning enquiry: Confirmation of sufficient capacity

Dear Mr Shirley-Beavan,

Thank you for providing information on your development:

African Caribbean Cultural Centre, Clarendon Road, London, N8 0DJ.

Existing: Commercial premises (595sqm), Cultural and recovery centre (1485sqm).

Proposed: Demolition of the existing buildings and the construction of a mixed use building up to 13 storeys. 85 flats, 1500sqm commercial premises and 1050sqm community centre. Foul water discharging by gravity to the foul water manhole 9503 via an existing connection. Surface water discharging by gravity to the surface water sewer in Clarendon Road via an existing connection attenuated to 25l/s with blue roofs.

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

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

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

If the peak surface water run-off discharge is then restricted to Greenfield run-off rates/a maximum of 25l/s as your drainage strategy indicates, then we would have no objections to the proposals.

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

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

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

What happens next?

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

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

Yours sincerely

Siva Rajaratnam - Adoptions Engineer

Thames Water

FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 3 – Topographic Survey

BENCH MARK USED IS LOCATED AT :-
SURVEY CONTROL STATION 2, AS SHOWN ON DRAWING.

VALUE GIVEN AS 23.955m (GPS DATUM)

SURVEY CONTROL STATIONS SHOWN 

ABBREVIATIONS (where applicable)

AV	Air Valve	MH	Manhole Cover
BK	Brick	MK	Marker
CB	Cold Lead	MS	Missile
S3	Bus Stop	MT	Meter
BT	Baseball Television	MY	Mercury
CB	Control Box	DH	Overhead
D/B	Close Boarded	PAY	Paving
CL	Close Level	PA	Post
CL	Chain Link	PE	Pipe
CU	Curb	PM	Parking Meter
CC	Concrete	P	Post and Rail
CC	Conc. Pipe	PT	Pipe
CPS	Concrete Paving Slabs	P/W	Post and Wire
CC	Curb	R	Roadside Eye
DC	Drainage Channel	RET	Retaining
EC	Electric Pipe	RS	Road Sign
EC	Electricity Cover	RSJ	Rail Steel Joint
ED	Earthed Road	SC	Stack
FL	Fence	SK	Sidewalk
FM	Fence	SG	Signpost
FL	Flower Level	SL	Slit Trap
FL	Flower Level	SV	Stop Valve
GA	Gate	SVC	Security Video Cam
GA	Gate Post	TCB	Telephone Call Box
GY	Gully	TK	Threshold
MY	My Night	TN	Tank
MY	My Night	TL	Traffic Light
MY	My Night	TL	Telephone Pole
IL	Invert Level	UG	Underground
UT	Unable to Trace	UT	Unable to Trace
L/R	Left Hand Railings	UTL	Unable to Lift
VL	Van	V	Vent Pipe
LB	Little Bin	WL	Water Level
LP	Lamp Post	WH	Water Meter
LP	Lamp Post	WH	Wash Out

CW	Combined Water
FW	Foulwater
SW	Stormwater
D	Depth
UTT	Unable to trace
UTF	Unable To Lift
UTL	Unable To Lift
d	Diameter

NOTE

- Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only.
 - Tree species (where shown) should be treated with caution and expert identification is advised.
- Although this is a digital survey the accuracy and amount of detail shown is not commensurate with the topographical scale of mapping as specified. Care should be exercised when working to larger scales.
- Visible features in the vicinity of the boundaries as shown above, may not represent the exact location of legally conveyed boundaries.
- Whilst every effort has been made to ensure accuracy on this plan, CRU clearance dimensions, levels and invert levels should be checked prior to design and construction.
- Kerb levels have been taken in the bottom of the channel.
 - Areas of dense undergrowth cannot be surveyed in detail, these areas will be shown in outline only and marked as 'dense undergrowth' on the plan.

SITE PLAN
1/2" = 1' - 0"

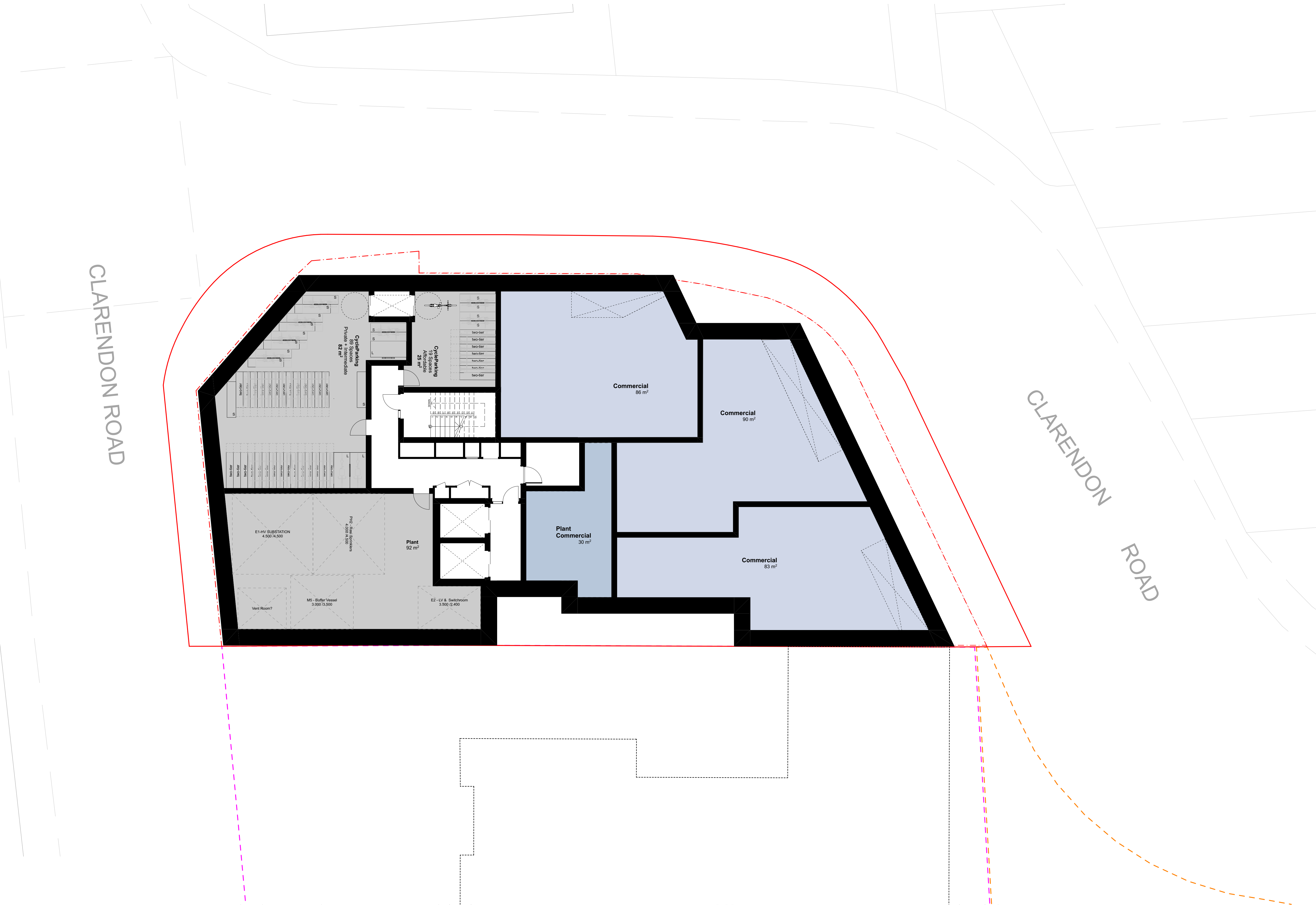
9-30
CLARENDON ROAD
HARINGEY
LONDON
N8 0DJ

TOPOGRAPHICAL SURVEY

SURVEYED FOR		PAUL SHOWN MAGG GROUP MAGG HOUSE 5-11 GREEN LANES PALMER'S GREEN LONDON N12 4TN		SURVEYOR DATE		D/C/S MAY 2020	
NO	DATE	REVISION					
DRAWING NO				L 9761/1			
SCALE				1 : 200			
SEE ALSO DWG NOS				L 9761/1 -			
SHEET				1 of 3			
REF NO				L 9761			

FLOOD RISK ASSESSMENT & SUDS REPORT

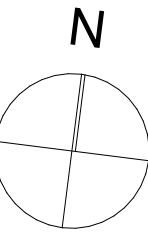
Appendix 4 - Architect Site Plans



BASEMENT LEVEL PLAN

Any errors and omissions to be reported to the Architect prior to commencement. Dimensions and areas are based on survey information provided by the client. This drawing is copyright © STOCKWOOL. All dimensions to be checked on site. Do not scale.

KEY:



0 1000 2000 3000 4000 5000mm

APPLICATION BOUNDARY - PSMG OWNERSHIP

OWNERSHIP BOUNDARY - PSMG OWNERSHIP

STUDIO

1B2P

2B3P

2B4P

3B5P

COMMERCIAL

SERVICES

Mixed tenures

Affordable Rent

Private + Intermediate

Rent + Intermediate

Private

WIP 06/10/2022

rev	date	description
-----	------	-------------

stock wool

The Pump House 19 Hooper Street
London E1 8BU 020 7264 8600
info@stockwool.co.uk

Client
Magic Living Ltd
Paul Simon Homes

Project
3572_30-36 Clarendon Road
(Jessica Buttons Factory)

Drawing
PLAN - Basement Level

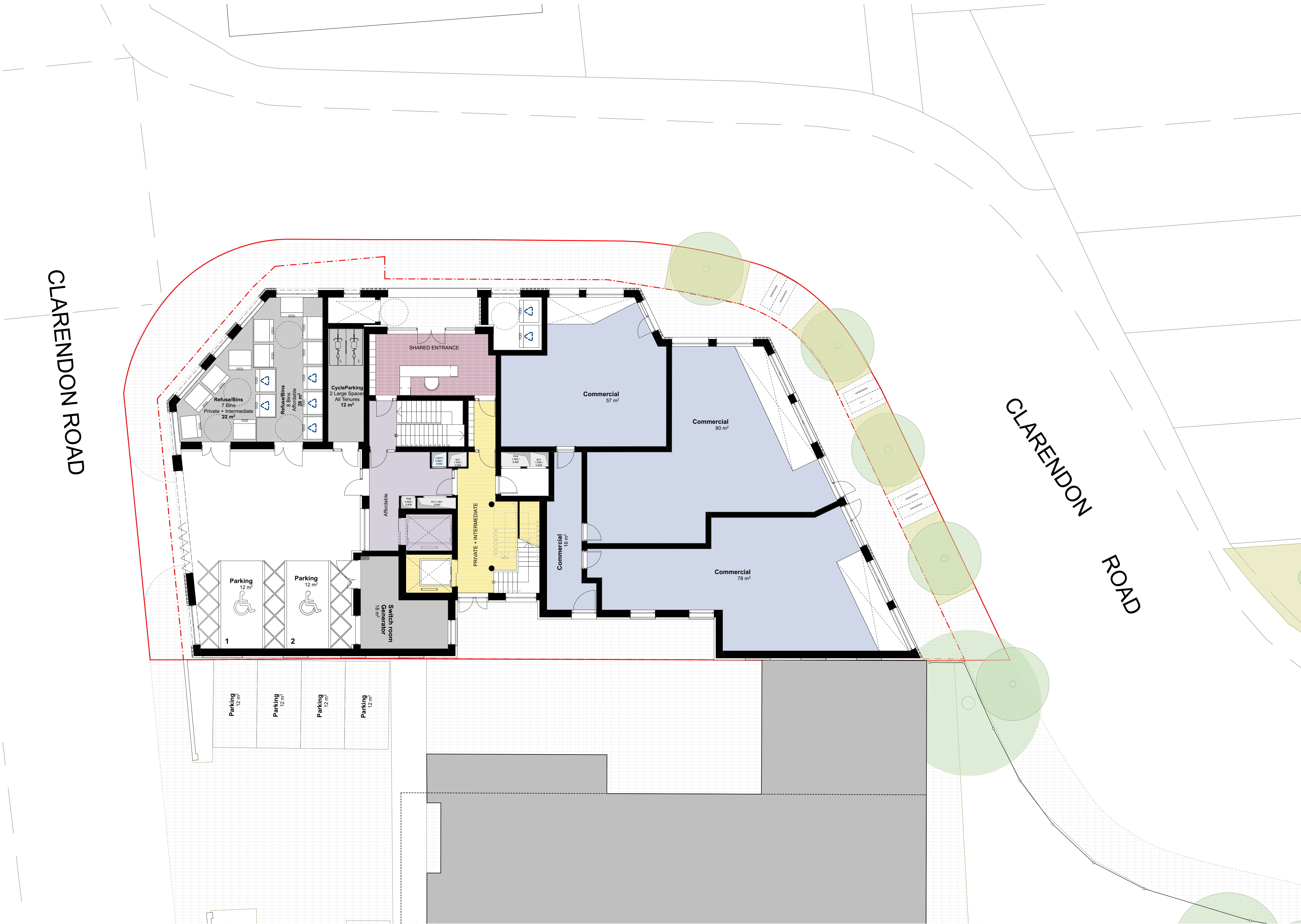
Project status
PLANNING

Scale 1:100@A1
CAD File 3572 - Buttons Factory_MainFile_221005.pln
Date created 21.09.22
Drawn AS
Checked JW

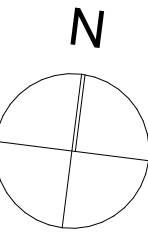
Project no_Drawing no_Revision
3572_PL(20)1B1_

GROUND FLOOR PLAN

Any errors and omissions to be reported to the Architect prior to commencement. Dimensions and areas are based on survey information provided by the client. This drawing is copyright © STOCKWOOL. All dimensions to be checked on site. Do not scale.



KEY:



APPLICATION BOUNDARY - PSMG OWNERSHIP

OWNERSHIP BOUNDARY - PSMG OWNERSHIP

STUDIO

1B2P

2B3P

2B4P

3B5P

COMMERCIAL

SERVICES

Mixed tenures

Affordable Rent

Private + Intermediate

Rent + Intermediate

Private

WIP 06/10/2022

rev date description

stock wool

The Pump House 19 Hooper Street
London E1 8BU 020 7264 8600
info@stockwool.co.uk

Client

Magic Living Ltd
Paul Simon Homes

Project

3572_30-36 Clarendon Road
(Jessica Buttons Factory)

Drawing

PLAN - Ground floor

Project status

PLANNING

Scale 1:100@A1

CAD File 3572 - Buttons Factory_MainFile_221005.pln

Date created 21.09.22

Drawn AS

Checked JW

Project no_Drawing no_Revision

3572_PL(20)100_



ROOF PLAN

KEY:

N

010002000300040005000mm

APPLICATION BOUNDARY - PSMG OWNERSHIP

OWNERSHIP BOUNDARY - PSMG OWNERSHIP

STUDIO

1B2P

2B3P

2B4P

3B5P

COMMERCIAL

SERVICES

Mixed tenures

Affordable Rent

Private + Intermediate

Rent + Intermediate

Private

WIP 06/10/2022

rev

date

description

stockwool

The Pump House 19 Hooper Street
London E1 8BU 020 7264 8600
info@stockwool.co.uk

Client

Magic Living Ltd
Paul Simon Homes

Project

3572_30-36 Clarendon Road
(Jessica Buttons Factory)

Drawing

PLAN - Roof Level

Project status

PLANNING

Scale

1:100@A1

CAD File

3572 - Buttons Factory_MainFile_221005.pln

Date created

21.09.22

Drawn

AB

Checked

JW

Project no_Drawing no_Revision

3572_PL(20)120_

Any errors and omissions to be reported to the Architect prior to commencement. Dimensions and areas are based on survey information provided by the client. This drawing is copyright © STOCKWOOL. All dimensions to be checked on site. Do not scale.



FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 5 – Graphic Structures Drawings

Preliminary Drainage Layout

Exceedance Flows Plan

Blue Roof Plan

GRAPHIC STRUCTURES

2nd FLOOR, 60A WESTON STREET,
LONDON, SE1 3QJ
T: 0203 151 5821 E: info@graphicstructues.com

www.graphicstructures.com

- General Notes:
1. This drawing is to be read in conjunction with all the relevant Architect's, Engineer's and specialists' drawings and specifications.
 2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. Setting out of grid by others.
 3. Health & Safety: All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
 4. Drainage subject to results of CCTV survey on existing site drainage system. It may be feasible to reuse an existing outfall to reduce highway excavations.
 5. Drainage subject to coordination with underground services and foundations.
 6. Drainage subject to high level offset strategy of rainwater pipes and foul down building.
 7. Peak surface water outflow rate subject to approval by the LLFA
 8. External manholes subject to coordination with existing and proposed underground services. Additionally S50 agreement required with Highways for placement of private apparatus in Highway land.

KEY

THAMES WATER STORM SEWER

THAMES WATER FOUL SEWER

PROPOSED STORM DRAINAGE

INDICATIVE FOUL DRAINAGE

INDICATIVE HIGH LEVEL DRAINAGE OFFSETS

PROPOSED SURFACE WATER PUMP

PROPOSED ATTENUATION TANK

INDICATIVE FOUL STORAGE AND PUMP

PROPOSED RAIN GARDENS IN HIGHWAY LAND

01	11/10/22	ASB	ASB	First Issue
Ver	Date	By	Chk	Amendment

30-36 CLARENDON ROAD
PAUL SIMON MAGIC GROUP

Project & Client

FOR INFORMATION
NOT FOR CONSTRUCTION

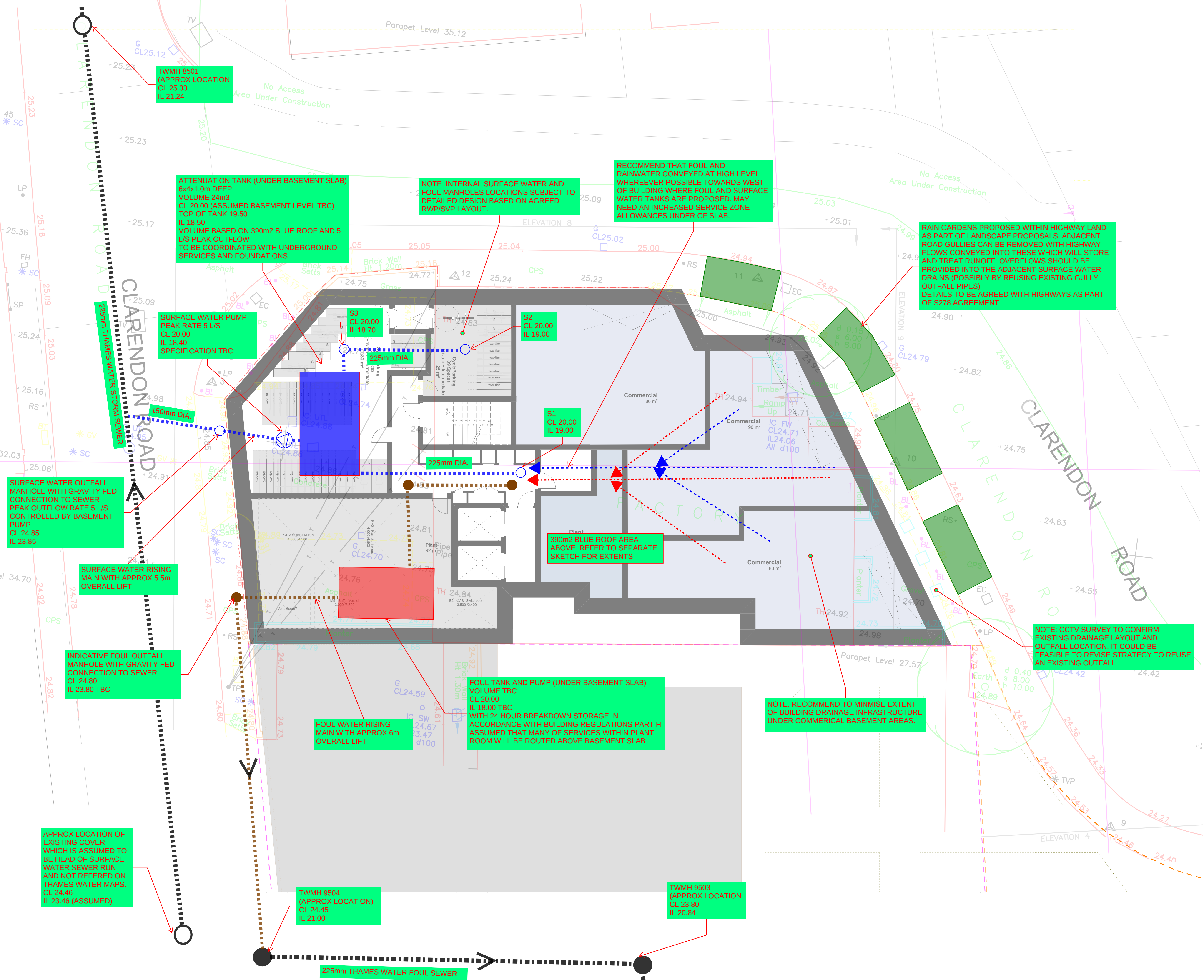
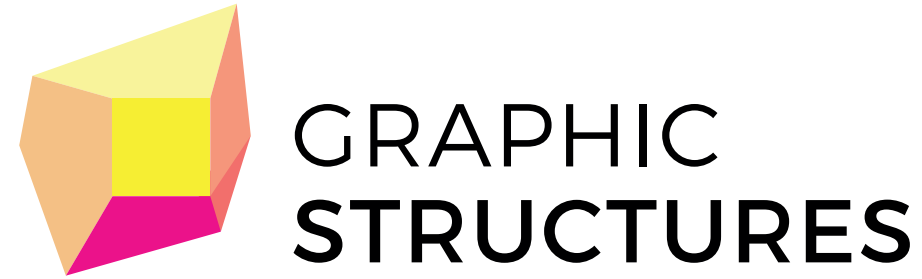
Status

PRELIMINARY DRAINAGE LAYOUT

Scale: 1:100 @A1

221070-GSL-ZZ-XX-SK-C-0001
Sketch No.

Status Code --- Version 01



GRAPHIC STRUCTURES

2nd FLOOR, 60A WESTON STREET,
LONDON, SE1 3QJ
T: 0203 151 5821 E: info@graphicstructures.com

www.graphicstructures.com

- General Notes:
1. This drawing is to be read in conjunction with all the relevant Architect's, Engineer's and specialists' drawings and specifications.
 2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. Setting out of grid by others.
 3. Health & Safety: All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

KEY

- EXISTING LEVEL (24.87)
- PROPOSED LEVEL (24.99)
- EXCEEDANCE FLOW DIRECTION

01 11/10/22 ASB ASB First Issue

Ver Date By Chk Amendment

30-36 CLARENDON ROAD
PAUL SIMON MAGIC GROUP

Project & Client

FOR INFORMATION
NOT FOR CONSTRUCTION

Status

EXCEEDANCE FLOWS PLAN

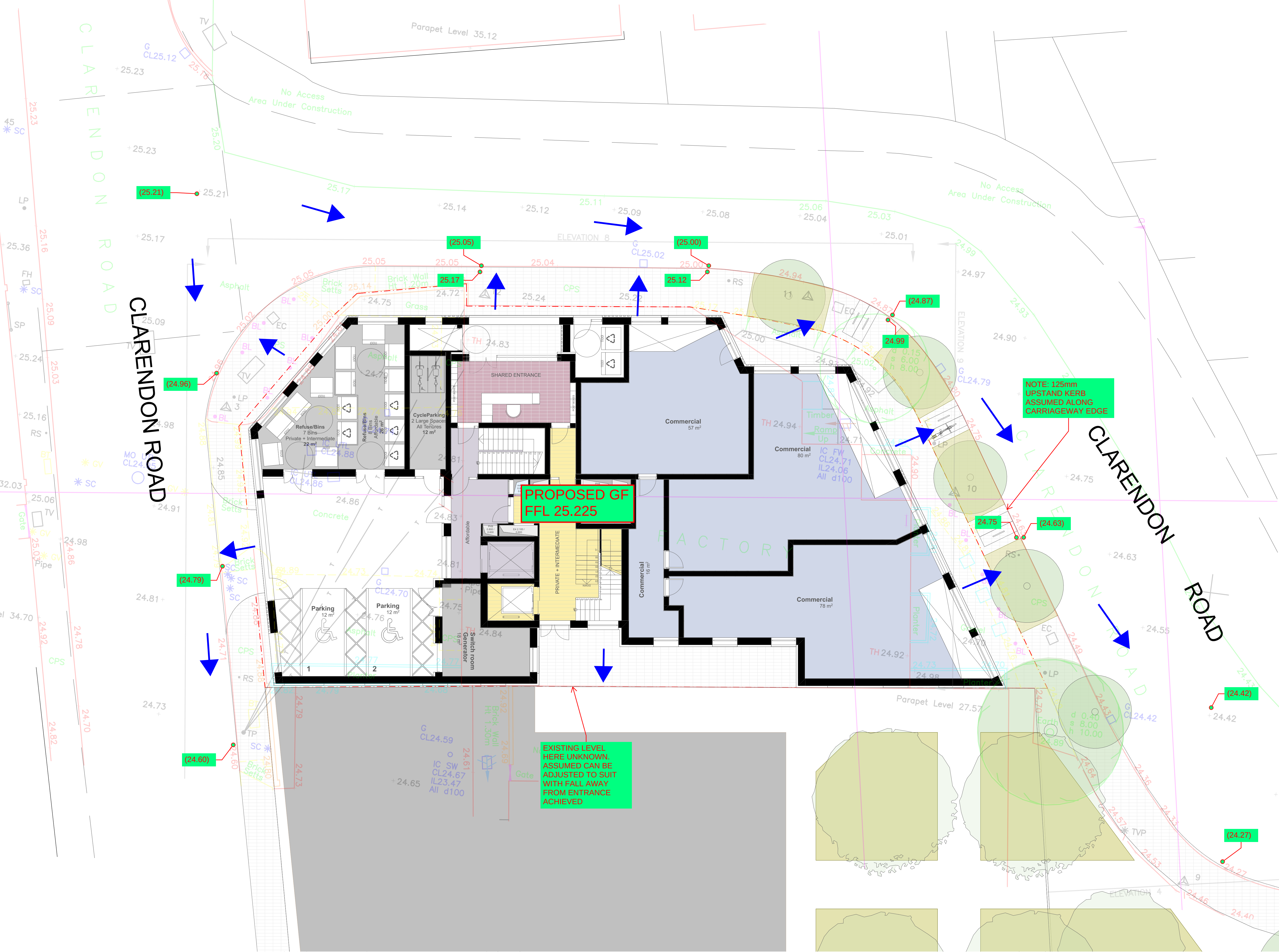
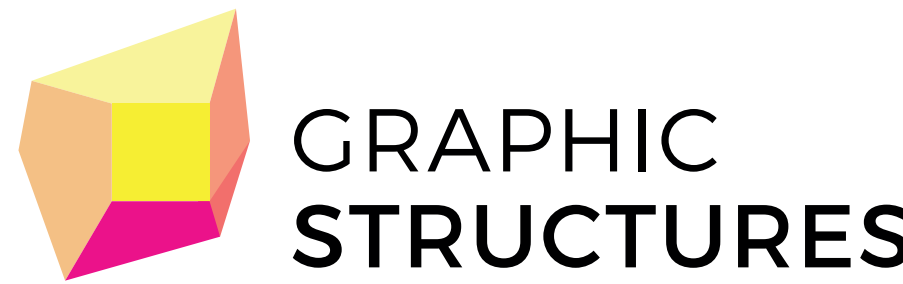
Scale: 1:100 @A1

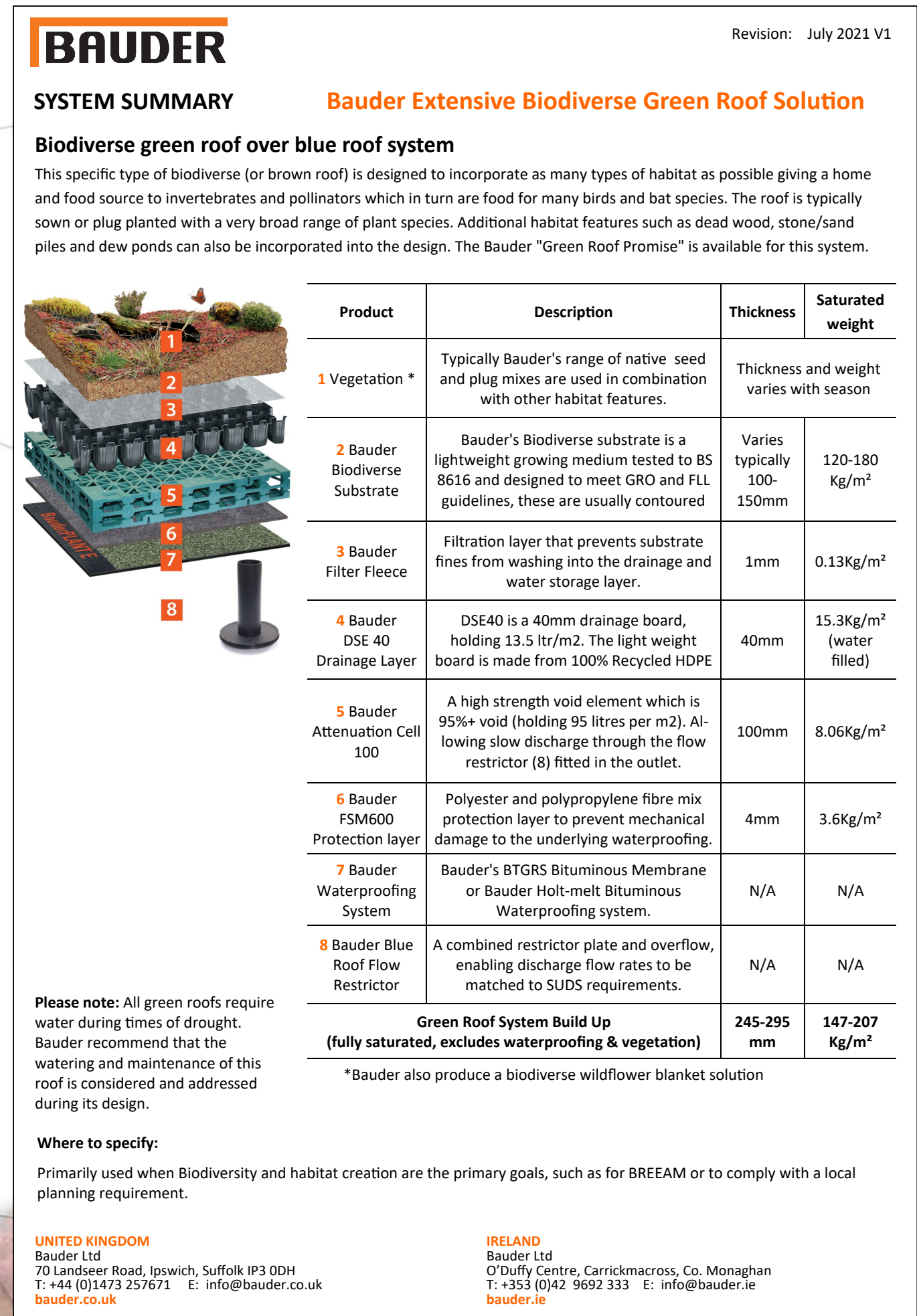
221070-GSL-ZZ-XX-SK-C-0002

Sketch No.

Status Code ---

Version 01





General Notes:

1. This drawing is to be read in conjunction with all the relevant Architect's, Engineer's and specialists' drawings and specifications.
2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. Setting out of grid by others.
3. **Health & Safety:** All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

Product	Description	Thickness	Saturated weight
1 Vegetation *	Typically Bauder's range of native seed and plug mixes are used in combination with other habitat features.	Thickness and weight varies with season	
2 Bauder Biodiverse Substrate	Bauder's Biodiverse substrate is a lightweight growing medium tested to BS 8616 and designed to meet GRO and FLL guidelines, these are usually contoured	Varies typically 100-150mm	120-180 Kg/m ²
3 Bauder Filter Fleece	Filtration layer that prevents substrate fines from washing into the drainage and water storage layer.	1mm	0.13kg/m ²
4 Bauder DSE 40 Drainage Layer	DSE40 is a 40mm drainage board, holding 13.5 ltr/m ² . The light weight board is made from 100% Recycled HDPE	40mm	15.3Kg/m ² (water filled)
5 Bauder Attenuation Cell 100	A high strength void element which is 95%+ void (holding 95 litres per m ²). Allowing slow discharge through the flow restrictor (R) fitted in the outlet.	100mm	8.06kg/m ²
6 Bauder FSM600 Protection layer	Polyester and polypropylene fibre mix protection layer to prevent mechanical damage to the underlying waterproofing.	4mm	3.6kg/m ²
7 Bauder Waterproofing System	Bauder's BTGRS Bituminous Membrane or Bauder Holf-melt Bituminous Waterproofing system.	N/A	N/A
8 Bauder Blue Roof Flow Restrictor	A combined restrictor plate and overflow, enabling discharge flow rates to be matched to SUDS requirements.	N/A	N/A
Green Roof System Build Up (fully saturated, excludes Waterlogging & Vegetation)		245-295 mm	147-207 Kg/m²

Please note: All green roofs require water during times of drought. Bauder recommend that the watering and maintenance of this roof is considered and addressed during its design.

Where to specify:

Primarily used when Biodiversity and habitat creation are the primary goals, such as for BREEAM or to comply with a local planning requirement.

UNITED KINGDOM
Bauder Ltd
70 Landseer Road, Ipswich, Suffolk IP3 0DH
T: +44 (0)1473 257671 E: info@bauder.co.uk
bauder.co.uk

IRELAND
Bauder Ltd
O'Duffy Centre, Carrickmacross, Co. Monaghan
T: +353 (0)42 9692 333 E: info@bauder.ie
bauder.ie

Assumed blue roof and biodiverse roof build-up

02	11/10/22	ASB	ASB	Updated for planning submission
01	27/9/22	ASB	ASB	First Issue

Ver	Date	By	Chk	Amendment
-----	------	----	-----	-----------

30-36 CLARENDON ROAD
PAUL SIMON MAGIC GROUP

Project & Client

**FOR INFORMATION
NOT FOR CONSTRUCTION**

Status

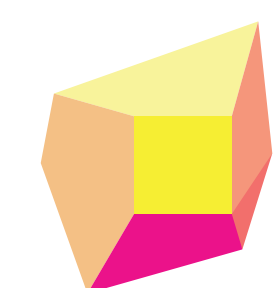
BLUE ROOF AREAS FOR SUDS STRATEGY

Scale: 1:100 @A1

221070-GSL-ZZ-XX-SK-C-0003

Sketch No.

Status Code ---

Version **02**

GRAPHIC STRUCTURES

FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 6 – Graphic Structures Hydraulic Calculations

Pre & Post-Development Run-off Calculations

Greenfield runoff rates

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	3.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
IMP AREA	0.076	3.00	2.000	1200	0.000	0.000	1.000
OUTFALL			2.000	1200	10.000	0.000	1.200

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)
1.000	IMP AREA	OUTFALL	10.000	0.600	1.000	0.800	0.200	50.0	225	3.09

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IMP AREA	0.000	0.000	2.000	1.000	1200				
							0	1.000	1.000 225
OUTFALL	10.000	0.000	2.000	1.200	1200				
							1	1.000	0.800 225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991	30 year 480 minute summer	24.324	6.428
1 year 15 minute winter	76.857	30.991	30 year 480 minute winter	16.160	6.428
1 year 30 minute summer	71.439	20.215	30 year 600 minute summer	19.756	5.404
1 year 30 minute winter	50.133	20.215	30 year 600 minute winter	13.498	5.404
1 year 60 minute summer	48.435	12.800	30 year 720 minute summer	17.490	4.687
1 year 60 minute winter	32.179	12.800	30 year 720 minute winter	11.754	4.687
1 year 120 minute summer	30.053	7.942	30 year 960 minute summer	14.215	3.743
1 year 120 minute winter	19.966	7.942	30 year 960 minute winter	9.416	3.743
1 year 180 minute summer	23.233	5.979	30 year 1440 minute summer	10.161	2.723
1 year 180 minute winter	15.102	5.979	30 year 1440 minute winter	6.829	2.723
1 year 240 minute summer	18.475	4.882	30 year 2160 minute summer	7.160	1.979
1 year 240 minute winter	12.274	4.882	30 year 2160 minute winter	4.933	1.979
1 year 360 minute summer	14.169	3.646	30 year 2880 minute summer	5.883	1.577
1 year 360 minute winter	9.210	3.646	30 year 2880 minute winter	3.953	1.577
1 year 480 minute summer	11.185	2.956	30 year 4320 minute summer	4.374	1.143
1 year 480 minute winter	7.431	2.956	30 year 4320 minute winter	2.880	1.143
1 year 600 minute summer	9.182	2.511	30 year 5760 minute summer	3.554	0.910
1 year 600 minute winter	6.274	2.511	30 year 5760 minute winter	2.301	0.910
1 year 720 minute summer	8.203	2.199	30 year 7200 minute summer	2.987	0.762
1 year 720 minute winter	5.513	2.199	30 year 7200 minute winter	1.928	0.762
1 year 960 minute summer	6.768	1.782	30 year 8640 minute summer	2.583	0.659
1 year 960 minute winter	4.483	1.782	30 year 8640 minute winter	1.667	0.659
1 year 1440 minute summer	4.949	1.326	30 year 10080 minute summer	2.284	0.583
1 year 1440 minute winter	3.326	1.326	30 year 10080 minute winter	1.474	0.583
1 year 2160 minute summer	3.574	0.988	100 year 15 minute summer	348.738	98.681
1 year 2160 minute winter	2.462	0.988	100 year 15 minute winter	244.728	98.681
1 year 2880 minute summer	2.986	0.800	100 year 30 minute summer	228.965	64.789
1 year 2880 minute winter	2.007	0.800	100 year 30 minute winter	160.677	64.789
1 year 4320 minute summer	2.276	0.595	100 year 60 minute summer	153.288	40.510
1 year 4320 minute winter	1.499	0.595	100 year 60 minute winter	101.841	40.510
1 year 5760 minute summer	1.885	0.483	100 year 120 minute summer	92.562	24.461
1 year 5760 minute winter	1.220	0.483	100 year 120 minute winter	61.496	24.461
1 year 7200 minute summer	1.609	0.410	100 year 180 minute summer	69.806	17.964
1 year 7200 minute winter	1.038	0.410	100 year 180 minute winter	45.376	17.964
1 year 8640 minute summer	1.409	0.359	100 year 240 minute summer	54.269	14.342
1 year 8640 minute winter	0.910	0.359	100 year 240 minute winter	36.055	14.342
1 year 10080 minute summer	1.260	0.322	100 year 360 minute summer	40.484	10.418
1 year 10080 minute winter	0.813	0.322	100 year 360 minute winter	26.315	10.418
30 year 15 minute summer	268.706	76.035	100 year 480 minute summer	31.414	8.302
30 year 15 minute winter	188.566	76.035	100 year 480 minute winter	20.871	8.302
30 year 30 minute summer	174.929	49.499	100 year 600 minute summer	25.431	6.956
30 year 30 minute winter	122.757	49.499	100 year 600 minute winter	17.376	6.956
30 year 60 minute summer	116.589	30.811	100 year 720 minute summer	22.452	6.017
30 year 60 minute winter	77.459	30.811	100 year 720 minute winter	15.089	6.017
30 year 120 minute summer	70.438	18.615	100 year 960 minute summer	18.166	4.784
30 year 120 minute winter	46.797	18.615	100 year 960 minute winter	12.033	4.784
30 year 180 minute summer	53.298	13.715	100 year 1440 minute summer	12.896	3.456
30 year 180 minute winter	34.645	13.715	100 year 1440 minute winter	8.667	3.456
30 year 240 minute summer	41.604	10.995	100 year 2160 minute summer	9.021	2.493
30 year 240 minute winter	27.641	10.995	100 year 2160 minute winter	6.216	2.493
30 year 360 minute summer	31.221	8.034	100 year 2880 minute summer	7.371	1.975
30 year 360 minute winter	20.295	8.034	100 year 2880 minute winter	4.954	1.975

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 4320 minute summer	5.435	1.421	100 year 7200 minute winter	2.368	0.936
100 year 4320 minute winter	3.579	1.421	100 year 8640 minute summer	3.160	0.806
100 year 5760 minute summer	4.390	1.124	100 year 8640 minute winter	2.039	0.806
100 year 5760 minute winter	2.841	1.124	100 year 10080 minute summer	2.784	0.710
100 year 7200 minute summer	3.670	0.936	100 year 10080 minute winter	1.797	0.710

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	IMP AREA	9	1.068	0.068	13.2	0.1808	0.0000	OK
15 minute summer	OUTFALL	9	0.863	0.063	12.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	IMP AREA	1.000	OUTFALL	12.9	1.337	0.175	0.0964	4.4

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	IMP AREA	9	1.116	0.116	32.4	0.3068	0.0000	OK
15 minute summer	OUTFALL	9	0.903	0.103	31.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	IMP AREA	1.000	OUTFALL	31.8	1.668	0.432	0.1909	10.8

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	IMP AREA	9	1.137	0.137	42.0	0.3639	0.0000	OK
15 minute summer	OUTFALL	9	0.920	0.120	41.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	IMP AREA	1.000	OUTFALL	41.3	1.765	0.560	0.2338	14.0

[Print](#)[Close Report](#)

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Archie Shirley-Beavan

Site name: Jessica Button Factory

Site location: Hornsey

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.

Runoff estimation approach: IH124

Site characteristics

Total site area (ha): 0.0785

Methodology

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

SPR estimation method: Calculate from SOIL type

Soil characteristics

	Default	Edited
--	---------	--------

SOIL type:	4	4
------------	---	---

HOST class:	N/A	N/A
-------------	-----	-----

SPR/SPRHOST:	0.47	0.47
--------------	------	------

Hydrological characteristics

	Default	Edited
--	---------	--------

SAAR (mm):	650	650
------------	-----	-----

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
--------------------------------	------	------

Site Details

Latitude: 51.58956° N

Longitude: 0.11168° W

Reference: 3761788827

Date: Oct 04 2022 14:04

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 $SPR/SPRHOST \leq 0.3$?

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):	0.35	0.35
1 in 1 year (l/s):	0.3	0.3
1 in 30 years (l/s):	0.8	0.8
1 in 100 year (l/s):	1.11	1.11
1 in 200 years (l/s):	1.3	1.3

We use cookies on this site to enhance your user experience

[Ok, I agree](#)[More info](#)

By clicking the Accept button, you agree to us doing so.

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

We use cookies on this site to enhance your user experience

Ok, I agree

More in

By clicking the Accept button, you agree to us doing so.

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	3.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

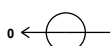
Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
BLUE ROOF	0.039	3.00	30.000		25.000	0.000	10.100
S1	0.020	3.00	20.000	600	15.000	0.000	1.000
S2	0.020	3.00	20.000	600	15.000	6.000	1.000
S3			20.000	600	7.000	6.000	1.300
TANK			20.000		7.000	0.000	1.500
PUMP			20.000	1200	4.000	0.000	1.600
OUTFALL			24.850		0.000	0.000	1.000

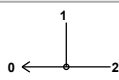
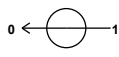
Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)
1.000	BLUE ROOF	S1	10.000	0.600	19.900	19.000	0.900	11.1	100	3.07
1.001	S1	TANK	8.000	0.600	19.000	18.500	0.500	16.0	225	3.11
2.000	S2	S3	8.000	0.600	19.000	18.700	0.300	26.7	225	3.05
2.001	S3	TANK	6.000	0.600	18.700	18.500	0.200	30.0	225	3.09
1.002	TANK	PUMP	3.000	0.600	18.500	18.400	0.100	30.0	225	3.13
1.003	PUMP	OUTFALL	4.000	0.600	18.400	23.850	-5.450	-0.7	150	3.20

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
BLUE ROOF	25.000	0.000	30.000	10.100					
						0	1.000	19.900	100
S1	15.000	0.000	20.000	1.000	600		1	1.000	19.000
						0	1.001	19.000	225
S2	15.000	6.000	20.000	1.000	600				
						0	2.000	19.000	225
S3	7.000	6.000	20.000	1.300	600		1	2.000	18.700
						0	2.001	18.700	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
TANK	7.000	0.000	20.000	1.500			1	2.001	18.500	225
							2	1.001	18.500	225
							0	1.002	18.500	225
PUMP	4.000	0.000	20.000	1.600	1200		1	1.002	18.400	225
							0	1.003	18.400	150
OUTFALL	0.000	0.000	24.850	1.000			1	1.003	23.850	150

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	40	0	0

Node PUMP Online Pump Control

Flap Valve	x	Design Depth (m)	1.000	Switch off depth (m)	0.001
Replaces Downstream Link	✓	Design Flow (l/s)	5.0		
Invert Level (m)	18.400	Switch on depth (m)	0.002		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	5.000	6.000	5.000

Node BLUE ROOF Online Orifice Control

Flap Valve	x	Invert Level (m)	19.900	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.020		

Node BLUE ROOF Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.900
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	390.0	0.0	0.100	390.0	0.0	0.101	0.0	0.0

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	24.0	0.0	1.000	24.0	0.0	1.001	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	105.313	29.800
2 year 15 minute winter	73.904	29.800
2 year 30 minute summer	66.793	18.900
2 year 30 minute winter	46.872	18.900
2 year 60 minute summer	43.327	11.450
2 year 60 minute winter	28.785	11.450
2 year 120 minute summer	32.684	8.638
2 year 120 minute winter	21.715	8.637
2 year 180 minute summer	27.007	6.950
2 year 180 minute winter	17.555	6.950
2 year 240 minute summer	22.089	5.838
2 year 240 minute winter	14.675	5.838
2 year 360 minute summer	17.260	4.442
2 year 360 minute winter	11.220	4.442
2 year 480 minute summer	13.644	3.606
2 year 480 minute winter	9.065	3.606
2 year 600 minute summer	11.143	3.048
2 year 600 minute winter	7.614	3.048
2 year 720 minute summer	9.880	2.648
2 year 720 minute winter	6.640	2.648
2 year 960 minute summer	8.010	2.109
2 year 960 minute winter	5.306	2.109
2 year 1440 minute summer	5.686	1.524
2 year 1440 minute winter	3.821	1.524
2 year 2160 minute summer	3.997	1.105
2 year 2160 minute winter	2.754	1.105
2 year 2880 minute summer	3.302	0.885
2 year 2880 minute winter	2.219	0.885
2 year 4320 minute summer	2.524	0.660
2 year 4320 minute winter	1.662	0.660
2 year 5760 minute summer	2.123	0.543
2 year 5760 minute winter	1.374	0.543
2 year 7200 minute summer	1.852	0.472
2 year 7200 minute winter	1.195	0.472
2 year 8640 minute summer	1.663	0.424
2 year 8640 minute winter	1.073	0.424
2 year 10080 minute summer	1.528	0.390
2 year 10080 minute winter	0.986	0.390
30 year 15 minute summer	330.587	93.545
30 year 15 minute winter	231.991	93.545
30 year 30 minute summer	210.444	59.548
30 year 30 minute winter	147.680	59.548
30 year 60 minute summer	137.118	36.236

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 60 minute winter	91.098	36.236
30 year 120 minute summer	88.010	23.258
30 year 120 minute winter	58.471	23.258
30 year 180 minute summer	68.234	17.559
30 year 180 minute winter	44.354	17.559
30 year 240 minute summer	53.856	14.233
30 year 240 minute winter	35.781	14.233
30 year 360 minute summer	40.469	10.414
30 year 360 minute winter	26.306	10.414
30 year 480 minute summer	31.243	8.257
30 year 480 minute winter	20.757	8.257
30 year 600 minute summer	25.098	6.865
30 year 600 minute winter	17.148	6.865
30 year 720 minute summer	21.973	5.889
30 year 720 minute winter	14.767	5.889
30 year 960 minute summer	17.493	4.606
30 year 960 minute winter	11.588	4.606
30 year 1440 minute summer	12.077	3.237
30 year 1440 minute winter	8.117	3.237
30 year 2160 minute summer	8.239	2.277
30 year 2160 minute winter	5.677	2.277
30 year 2880 minute summer	6.645	1.781
30 year 2880 minute winter	4.466	1.781
30 year 4320 minute summer	4.865	1.272
30 year 4320 minute winter	3.204	1.272
30 year 5760 minute summer	3.949	1.011
30 year 5760 minute winter	2.556	1.011
30 year 7200 minute summer	3.345	0.853
30 year 7200 minute winter	2.159	0.853
30 year 8640 minute summer	2.929	0.747
30 year 8640 minute winter	1.890	0.747
30 year 10080 minute summer	2.630	0.671
30 year 10080 minute winter	1.697	0.671
100 year +40% CC 15 minute summer	614.492	173.880
100 year +40% CC 15 minute winter	431.222	173.880
100 year +40% CC 30 minute summer	393.829	111.440
100 year +40% CC 30 minute winter	276.371	111.440
100 year +40% CC 60 minute summer	256.934	67.900
100 year +40% CC 60 minute winter	170.701	67.900
100 year +40% CC 120 minute summer	165.219	43.662
100 year +40% CC 120 minute winter	109.768	43.662
100 year +40% CC 180 minute summer	129.232	33.256
100 year +40% CC 180 minute winter	84.004	33.256
100 year +40% CC 240 minute summer	102.773	27.160
100 year +40% CC 240 minute winter	68.280	27.160
100 year +40% CC 360 minute summer	78.002	20.072
100 year +40% CC 360 minute winter	50.703	20.073
100 year +40% CC 480 minute summer	60.582	16.010
100 year +40% CC 480 minute winter	40.249	16.010
100 year +40% CC 600 minute summer	48.801	13.348
100 year +40% CC 600 minute winter	33.344	13.348
100 year +40% CC 720 minute summer	42.769	11.462

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 720 minute winter	28.743	11.462
100 year +40% CC 960 minute summer	34.002	8.954
100 year +40% CC 960 minute winter	22.524	8.954
100 year +40% CC 1440 minute summer	23.338	6.255
100 year +40% CC 1440 minute winter	15.685	6.255
100 year +40% CC 2160 minute summer	15.703	4.340
100 year +40% CC 2160 minute winter	10.820	4.340
100 year +40% CC 2880 minute summer	12.491	3.348
100 year +40% CC 2880 minute winter	8.394	3.348
100 year +40% CC 4320 minute summer	8.903	2.328
100 year +40% CC 4320 minute winter	5.863	2.328
100 year +40% CC 5760 minute summer	7.060	1.807
100 year +40% CC 5760 minute winter	4.569	1.807
100 year +40% CC 7200 minute summer	5.864	1.496
100 year +40% CC 7200 minute winter	3.785	1.496
100 year +40% CC 8640 minute summer	5.050	1.288
100 year +40% CC 8640 minute winter	3.260	1.288
100 year +40% CC 10080 minute summer	4.470	1.140
100 year +40% CC 10080 minute winter	2.885	1.140

Results for 2 year Critical Storm Duration. Lowest mass balance: 85.29%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	BLUE ROOF	1350	19.923	0.023	0.3	8.6133	0.0000	OK
15 minute summer	S1	9	19.025	0.025	3.3	0.0168	0.0000	OK
15 minute summer	S2	9	19.028	0.028	3.3	0.0195	0.0000	OK
15 minute summer	S3	9	18.728	0.028	3.3	0.0080	0.0000	OK
15 minute winter	TANK	10	18.544	0.044	6.1	0.9947	0.0000	OK
15 minute winter	PUMP	12	18.527	0.127	6.5	0.1437	0.0000	OK
15 minute summer	OUTFALL	1	23.850	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	BLUE ROOF	Orifice	S1	0.1				
15 minute summer	S1	1.001	TANK	3.3	1.400	0.025	0.0295	
15 minute summer	S2	2.000	S3	3.3	1.126	0.032	0.0231	
15 minute summer	S3	2.001	TANK	3.2	1.070	0.034	0.0238	
15 minute winter	TANK	1.002	PUMP	6.5	2.355	0.069	0.0405	
15 minute winter	PUMP	Pump	OUTFALL	5.0				2.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 85.29%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	BLUE ROOF	585	19.952	0.052	1.6	19.4417	0.0000	OK
15 minute summer	S1	9	19.043	0.043	10.5	0.0293	0.0000	OK
15 minute summer	S2	9	19.052	0.052	10.5	0.0353	0.0000	OK
15 minute summer	S3	9	18.750	0.050	10.4	0.0141	0.0000	OK
15 minute winter	TANK	14	18.683	0.183	25.2	4.1645	0.0000	OK
30 minute winter	PUMP	19	18.694	0.294	17.1	0.3330	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	23.850	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	BLUE ROOF	Orifice	S1	0.2				
15 minute summer	S1	1.001	TANK	10.4	1.688	0.080	0.1280	
15 minute summer	S2	2.000	S3	10.4	1.554	0.103	0.0535	
15 minute summer	S3	2.001	TANK	10.2	1.319	0.107	0.0983	
15 minute winter	TANK	1.002	PUMP	19.2	1.823	0.201	0.1115	
30 minute winter	PUMP	Pump	OUTFALL	5.0				12.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 85.29%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	BLUE ROOF	660	20.263	0.363	2.6	37.2632	0.0000	SURCHARGED
15 minute summer	S1	9	19.058	0.058	19.5	0.0399	0.0000	OK
15 minute summer	S2	9	19.073	0.073	19.5	0.0497	0.0000	OK
30 minute winter	S3	26	18.939	0.239	12.5	0.0678	0.0000	SURCHARGED
30 minute winter	TANK	27	18.939	0.439	25.1	10.0159	0.0000	SURCHARGED
30 minute winter	PUMP	27	18.939	0.539	23.6	0.6094	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	23.850	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	BLUE ROOF	Orifice	S1	0.5				
15 minute summer	S1	1.001	TANK	19.4	1.959	0.149	0.1887	
15 minute summer	S2	2.000	S3	19.3	1.820	0.191	0.1360	
30 minute winter	S3	2.001	TANK	12.5	1.366	0.131	0.2386	
30 minute winter	TANK	1.002	PUMP	23.6	1.454	0.248	0.1193	
30 minute winter	PUMP	Pump	OUTFALL	5.0				21.0

FLOOD RISK ASSESSMENT & SUDS REPORT

Appendix 7 – Graphic Structures SuDS Maintenance Plan

30-36 CLARENDON ROAD



SUDS MAINTENANCE PLAN

220170-GSL-XX-XX-RP-C-0001

OCTOBER 2022

PREPARED BY:	A SHIRLEY-BEAVAN	MEng	ENGINEER
CHECKED BY:	A SHIRLEY-BEAVAN	MEng	ENGINEER

CONTENTS

- 1. INTRODUCTION**
- 2. MAINTENANCE REQUIREMENTS**
 - 2.1. ATTENUATION TANK/ UNDERGROUND STORAGE
 - 2.2. LIVING ROOFS
 - 2.3. MANHOLES, PIPEWORK & GULLIES

11.10.22	1	FOR INFORMATION	ASB	ASB
DATE	VERSION	PURPOSE	ISSUED BY	CHECKED BY

1. INTRODUCTION

This document has been prepared to provide a maintenance methodology to the surface water drainage elements for London Borough of Newham residential development at Morse Close, East London. For additional information refer to CIRIA report C753 The SuDS Manual from which the maintenance requirements within this report are derived. This report is to be read in conjunction with Graphic Structures tender drainage drawings and documentation. If during construction the drainage scheme fundamentals are revised (e.g. involving the use of different types of SuDS), this report should be superseded and an updated maintenance plan produced.

Refer to drawing 211400-GSL-ZZ-XX-DR-C-7001 for the site plan. Access points are via manholes, rodding eyes and gullies which are all situated in clear areas.

2. MAINTENANCE REQUIREMENTS

The proposed buildings are to be owned by London Borough of Newham who will be responsible for the maintenance of the proposed foul and surface water networks, including SuDS. A drainage maintenance regime has been outlined in the remaining sections of this report:

2.1. ATTENUATION TANK/ UNDERGROUND STORAGE

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action. Debris removal from catchment surface (where may cause risks to performance) Remove sediment from pre-treatment structures including catch pits	Monthly for 3 months, then six monthly Monthly 6 monthly, or as required
Remedial actions	Repair/rehabilitation of inlets, outlets, overflows, and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms. Include CCTV survey for perforated pipe if excessive silts found in chambers.

2.2 LIVING ROOFS

Maintenance schedule	Required action	Typical 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 ant	Annually and after severe storms
	Inspect drain inlets to ensure 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 (i.e. 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 like 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

2.3 MANHOLES, PIPEWORK AND GULLIES

Drainage pipes, manholes & Silt traps:

Inspect manholes & silt traps for build-up of silt and general debris (minimum of 6 monthly or to suit site requirements). If silt/debris is building up, then clean with jetting lorry / gully sucker and inspect pipe – repeat cleaning if required.

NOTE: Manhole covers can be heavy and suitable lifting equipment / procedures should be used. Where possible, personnel should not enter manholes to carry out maintenance.

Gullies / Linear Channels:

Inspection and removal of debris from silt trap every 3 months; preferably after leaf fall in the autumn. (Timeframe can be adjusted to suit actual site conditions).