



Blenheim Estates

**37 – 41 BRIGHTON ROAD,
SHOREHAM-BY-SEA**

Surface Water Drainage Strategy





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Surface Water Drainage Strategy

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Blenheim Estates

37 - 41 BRIGHTON ROAD, SHOREHAM-BY-SEA

Surface Water Drainage Strategy

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Drainage Strategy	Updated based on LLFA comments		
Date	26/05/2025	23/10/2025		
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Signature				
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1. INTRODUCTION

1.1. SCOPE OF REPORT

- 1.1.1. WSP UK Limited (WSP) have been commissioned by Blenheim Estates to prepare a surface water drainage strategy in support of an outline planning application for the redevelopment of the Kwik-Fit site at 37-41 Brighton Road, Shoreham-by-Sea (herein referred to as 'the development' in this report).
- 1.1.2. The development will include up to 49 apartments and approximately 90 m² of retail space. The proposed development is situated south of Brighton Road and to the north of the Free Wharf Development.
- 1.1.3. The proposed development site covers an area of approximately 0.215 hectares (ha).
- 1.1.4. This strategy has been developed in accordance with National standards for sustainable drainage systems (SuDS), 2025 and SuDS manual (C753, 2015).

The following documents have been reviewed in the preparation this surface water drainage strategy.

- Adur Local Plan 2017¹
- Shoreham Harbour Flood Risk Management Guide, 2015²
- Shoreham Harbour Joint Area Action Plan, 2019³
- West Sussex Local Flood Risk Management Strategy (LFRMS), 2014⁴
- Shoreham Harbour Joint Area Action Plan, 2019⁵
- National planning policy framework, 2024⁶
- National standards for sustainable drainage systems (SuDS), 2025⁷

¹ [Adur Local Plan 2017 \(adopted\) - Complete document \(adur-worthing.gov.uk\)](https://www.adur-worthing.gov.uk/Adur-Local-Plan-2017)

² [FRMG SPD Consultation Statement Final Sep 15.pdf \(brighton-hove.gov.uk\)](https://www.brighton-hove.gov.uk/FRMG-SPD-Consultation-Statement-Final-Sep-15.pdf)

³ [Shoreham Harbour Joint Area Action Plan \(JAAP\) - adopted October 2019 \(adur-worthing.gov.uk\)](https://www.adur-worthing.gov.uk/Shoreham-Harbour-Joint-Area-Action-Plan-JAAP)

⁴ https://www.westsussex.gov.uk/media/1595/local_flood_risk_management_strategy.pdf

⁵ <https://www.adur-worthing.gov.uk/media/Media,156282.smx.pdf>

⁶ <https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf>

⁷ [standards-for-sustainable-drainage-systems](https://www.gov.uk/government/standards-for-sustainable-drainage-systems)

2. EXISTING SCENARIO

2.1. SITE LOCATION

2.1.1. The proposed development site is currently occupied by a single storey industrial unit with Kwik Fit as a tenant. The postcode for the site is BN43 6RE. The site fronts Brighton Road and is surrounded by a mix of residential and commercial properties. To the east and south, it is adjacent to the Free Wharf Development that is currently under construction. To the west, there is a car wash facility that has right of way access at both the front and rear of the site.

A general site location plan is presented in Figure 1 below:



Figure 1 Site location

2.2. TOPOGRAPHY

2.2.1. Existing ground levels surrounding the site generally lies in the range of 4.0 mAOD to 4.6 mAOD as per the topographical survey. The River Adur is located 65 m away (at closest point) which flows from west to east at the southern side of the site.

The site generally slopes from south-west to north towards Brighton Road, with a high point of 4.6mAOD at the south-west corner and a low point of 4.0mAOD on the north edge of the site.

2.3. EXISTING SURFACE WATER DRAINAGE

- 2.3.1. The total catchment area of the site is 0.215ha which is fully impermeable with hardstanding surfaces and building roofs. According to the topographical survey, the site slopes towards the north edge along Brighton Road.
- 2.3.2. The topographical survey identifies several surface water gullies and chambers placed across the site. The initial proposal was developed based on the topographical survey. Given the existing ground slope and the presence of several gullies on the northern side of the road, it was logically assumed that runoff from the site discharged into the Brighton Road drainage network. However, the exact point of discharge to the road drainage network was not identified. Hence, an objection was raised by the Lead Local Flood Authority, with a requirement to establish a proof of connection (refer to Appendix A for correspondence from the LLFA).
- 2.3.3. To determine the site drainage and how and where it discharges outside the property, a connectivity survey was commissioned. Based on the inspection report, which is enclosed in Appendix E, it has been determined that the drainage flows south and, via a petrol interceptor - discharges to a surface water drainage network in an adjacent, recently developed Free Wharf site. The ultimate outfall for this drainage network is the River Adur.
- 2.3.4. Refer to Appendix F for the drainage plan developed for the adjacent Free Wharf site which indicates the presence of the receiving storm water network and the spur provided at the point-of-connection for the Kwik-Fit site runoff.
- 2.3.5. It is assumed that infiltration to ground is very unlikely in this area due to assumed high ground water levels being in close vicinity to the sea. Further investigation of groundwater levels and infiltration rates will be undertaken prior to detailed design stage.
- 2.3.6. The Proposed development is at very low probability of surface water flooding as identified The EA's flood map for planning from surface water (shown in Figure 2).

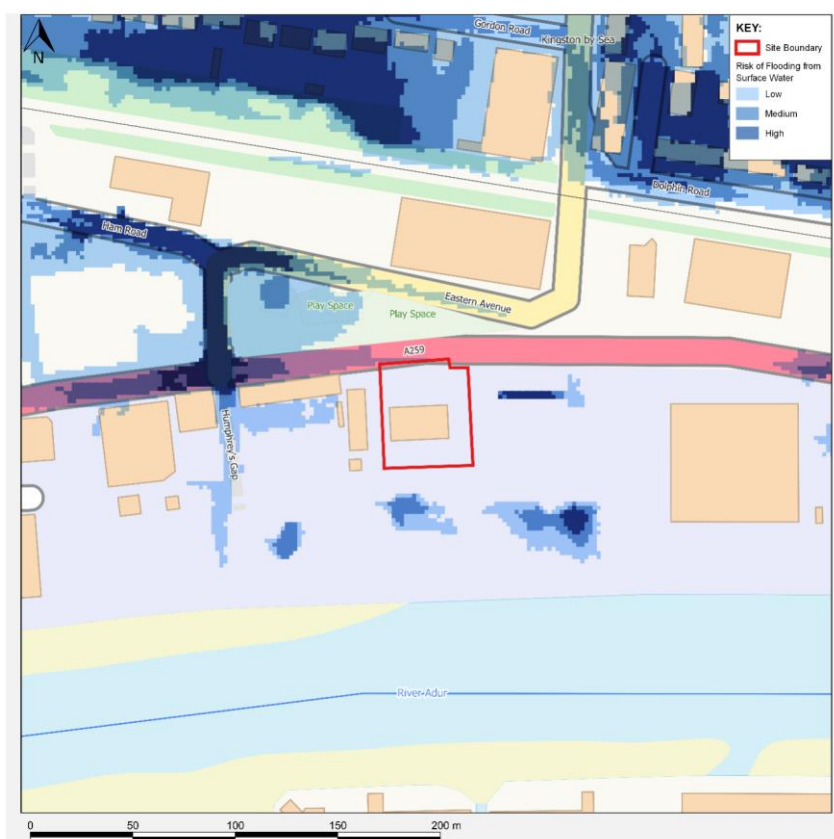


Figure 2 EA surface water flood extents

2.4. EXISTING PEAK DISCHARGE RATES

2.4.1. Peak surface water discharge rates for pre-development site have been calculated in MicroDrainage software using FEH rainfall data (2 yr, 30 yr and 100 yr) and FSR data (1 yr) for the site by creating a model based on the topographical survey and assumed outfall. The calculated peak discharge rates are presented in the Table 1 below. MicroDrainage calculations are attached in Appendix B

Table 1 Pre-development surface water run-off rates

Storm return period (years)	Pre-development surface water peak rate of runoff (l/s)
1	32.30
2	36.80
30	74.60
100	85.00

3. PROPOSED DEVELOPMENT SCHEME

3.1.1. The proposed development is mixed-use and will include up to 49 apartments and approximately 90m² of retail space. The scheme includes 18 parking spaces in the undercroft. The residential lobby and a commercial unit are proposed on the ground floor with prominent corners facing Brighton Road, while the undercroft car park is located at the rear of the site. The established frontage along Brighton Road is enhanced by a double-height colonnade and a landscaped green strip. The building is designed with residential units located on the upper floors, with a minimum finished floor level (FFL) of 8.0 mAOD. The finished floor level for the ground floor, which is designated for commercial use, is set at 4.4 mAOD. Figure 3 shows the FFLs and northern elevation of the proposed development.

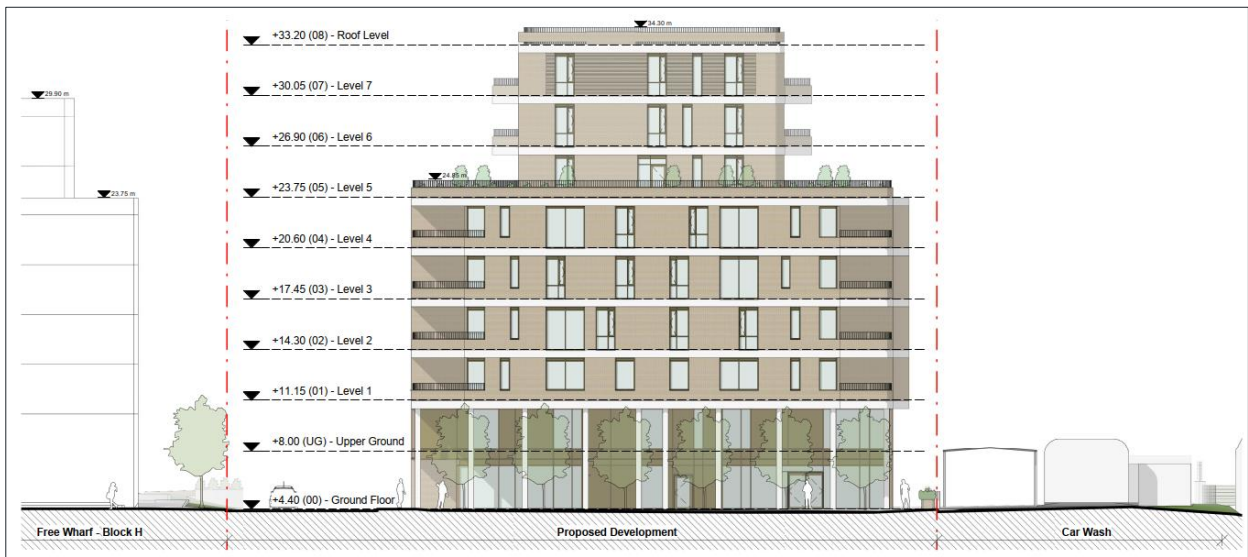


Figure 3 Floor levels and northern elevation

The proposed development masterplan is shown in Figure 4 below.



Figure 4 Proposed development

3.2. PROPOSED SURFACE WATER DRAINAGE

- 3.2.1. The impermeable area of the site post-development is considered for design purposes to be equal to that of the pre-development site i.e. 0.215ha. The existing outfall shall be retained in the post-development site.
- 3.2.2. According to 'National standards for sustainable drainage systems (SuDS)'⁷ The peak allowable discharge rate from the development to surface waters or sewers for the 50% and 1% AEP events shall be limited to the equivalent 50% AEP greenfield runoff rate, or 3 l/s/ha, whichever is the greater (paragraph 3.18). Where the volume of runoff discharged from the development to surface waters or sewers for the 1% AEP, 6-hour rainfall event is greater than the volume of greenfield runoff for the same rainfall event, the peak allowable discharge rate from the development for the 1% AEP event shall be limited to the 50% AEP greenfield runoff rate or 3l/s/ha, whichever is the greater (paragraph

3.19). The greenfield runoff rate for the Kwik-fit site is calculated using web-based greenfield runoff rate estimation tool⁸ and FEH data which is 0.1 l/s (refer Appendix D for calculations).

- 3.2.3. According to paragraph 3.21.1 from the "National standards for sustainable drainage systems" For previously developed sites a 'relaxation factor' shall be applied to the target 50% and 1% AEP greenfield runoff rates. The relaxation factor shall be no greater than 5 times the greenfield runoff rate. As per this consideration, the calculated allowable discharge rates are 0.5 l/s (applying 5 times the greenfield rate) and 0.645 l/s (for an area of 0.215 ha) – the latter value being the greater of the two values and thus used as the design permitted discharge value - for all rainfall events up to and including 100-year rainfall event with 45% climate change. The existing drainage outfall will be retained in the post-development site. As per the analysis conducted using MicroDrainage software in the Source Control module with this flow control setting estimates the required attenuation volume as 270m³. The storage estimate calculations are given in Appendix D. This can be accommodated below the right of access for the car wash on the driveway on the east of the apartment building. The detailed design of surface water drainage will include the exact location and dimensions of the attenuation feature. A tentative layout for the same is shown in the Figure 5.
- 3.2.4. As the existing outfall connection is to be retained, the receiving drainage network should be able to accommodate the reduced discharge rate in in the post-development site. Whilst the actual flow rate assumed by the designers of the adjacent Free Wharf development as an input from the Kwik Fit site has not been determined, it can reasonably be assumed that the 0.645l/s design discharge assumed from this proposed development is conservative and will not cause surcharge or flooding in the downstream network.
- 3.2.5. The guidance stipulates that the surface water drainage system must be designed to prevent flooding on any part of the site during a 1 in 30-year rainfall event. Additionally, it should ensure that no flooding occurs in any part of a building, including basements, or in any utility plants susceptible to water during a 1 in 100-year event. The detailed design of the surface water drainage system will consider these parameters, with pipe networks appropriately arranged to meet these requirements.
- 3.2.6. According to the drainage inspection report, the existing drainage system directs water toward the southern boundary where it ultimately discharges to an existing surface water conveyance pipe in the service road at the back of the site. (Refer Appendix E and F for details). During extreme rainfall events, exceedance flow will eventually get directed towards Brighton Road, based on the existing slope of the site, where it will be captured by the Brighton Road drainage system.
- 3.2.7. The use of planting, landscaping area with bioretention features and permeable paving at the ground level or a green roof will offer improvement in post-development peak run-off both qualitatively and quantitatively. The amount of potential improvement to the surface water run-off post development is dependent upon the landscaping design and shall be addressed at detailed design stage.

⁸<https://www.uksuds.com/tools/members/greenfield-runoff-rate-estimation-members>

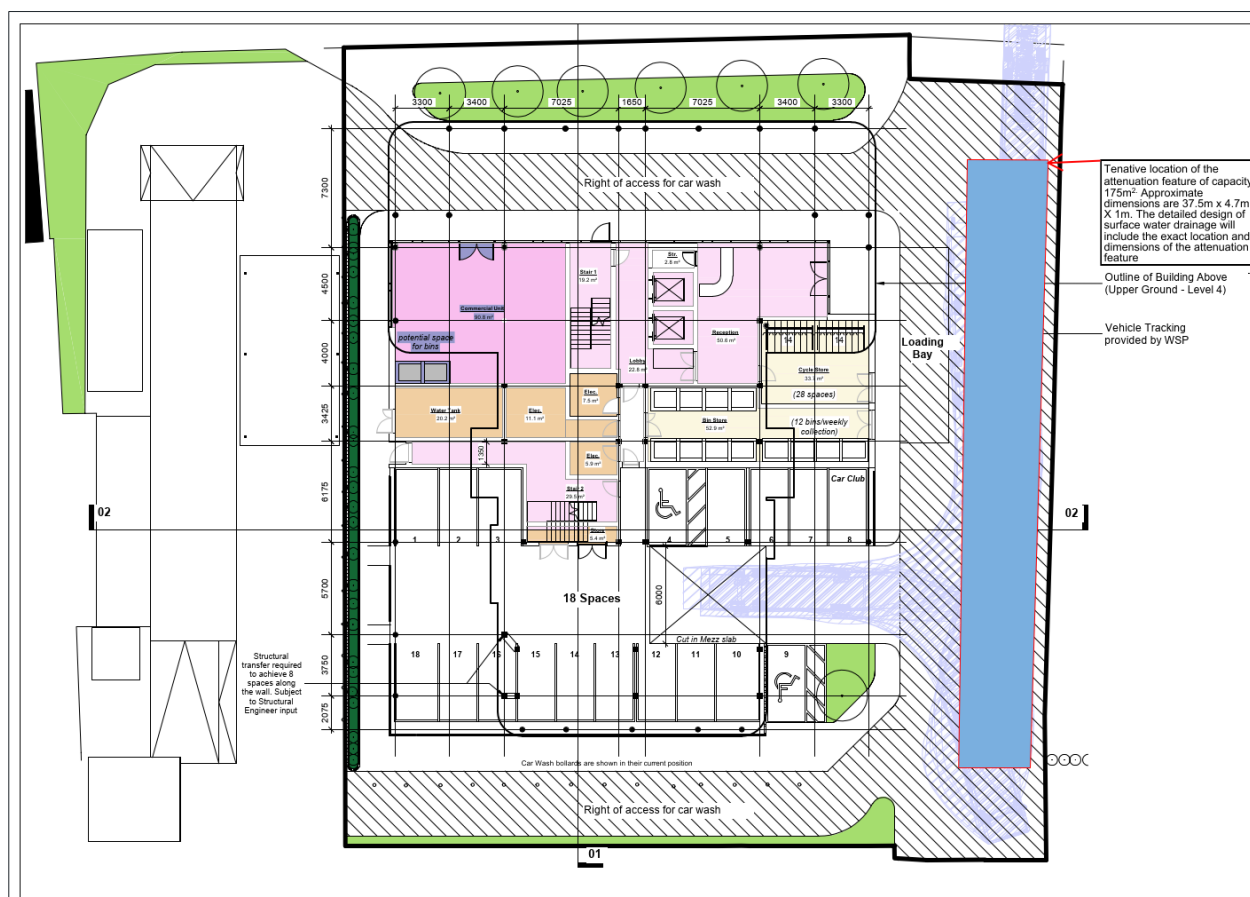


Figure 5 Tentative location of attenuation feature

3.3. WATER QUALITY

- 3.3.1. According to SuDS manual (CIRIA 7539 - Table 4.3), the runoff from residential roofs is considered of very low risk of pollution hazard and does not require and pollution control measures except removal of gross solids and sediments only. This can be achieved by use of trapped gullies, silt traps and catchpits etc. in the surface water drainage system. The detailed design of the drainage will consider these provisions.
- 3.3.2. The post-development site will have car parks and internal roads which are considered as low risk areas for containing contaminants. SuDS manual (CIRIA 753 – Table 4.3) suggests using the simple index method to assess the pollution control measures.

⁹https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C753

3.3.3. The simple index method is specified in the SuDS Manual (CIRIA 753 – Table 26.2) and provides pollution hazard indices for different land use classifications. An extract applicable to the development site is provided in Table 2.

Table 2 Extract of table 26.3 from SuDS manual

Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	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

3.3.4. These indices are to be compared against the mitigation indices specified in SuDS manual (CIRIA-753 – Table 26.3), an extract of which showing the mitigation indices for SuDS options is provided in Table 3.

Table 3 Indicative SuDS mitigation indices - Extract of Table 26.3 from the SuDS Manual

Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS component	Mitigation indices ¹		
	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.		

3.3.5. The SuDS manual also specifies that proprietary systems also can be used as pollution control measures. These products must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area.

3.3.6. The specification of the SuDS components shall be determined in the detailed design phase.

Provision of pollution control elements and treatment prior to discharging in the receiving drainage network shall ensure a significant improvement to the quality of the surface water run-off from the site.

3.4. SuDS MAINTENANCE

- 3.4.1. Details for the SuDS operation and maintenance activities are provided within chapter 32 of the SuDS manual. A summary of typical key SuDS components is given in Table 4 (an extract of Table 32.1 from SuDS manual) All the proposed SuDS components shall undergo regular inspection and maintenance activities in accordance with the SuDS manual.
- 3.4.2. SuDS components at the site are not to be adopted and will be maintained for their lifetime by the managing company of the development for the site-wide SuDS features.
- 3.4.3. Further operational activities for the SuDS components described for the site include regular litter and debris removal; and weed and invasive plant control to ensure the drainage systems function without their design characteristics being compromised.
- 3.4.4. Contractors should protect SuDS components from adverse sediment runoff during the construction phase, and an initial pre-handover inspection is required (CCTV survey, etc.) to ensure that the drainage system has been constructed as designed.

Table 4 Extract of Table 32.1 of the SuDS Manual

Typical key SuDS components operation and maintenance activities (for full specifications, see Chapters 11–23)													
Operation and maintenance activity	SuDS component												
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip	Green roofs	Proprietary treatment systems
Regular maintenance													
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■		□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■		
Weed and invasive plant control	□	□	□	□		□	□		□		□	■	
Shrub management (including pruning)	□	□	□	□					□	□	□		
Shoreline vegetation management	■	■	□										
Aquatic vegetation management	■	■	□										
Occasional maintenance													
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■		■
Vegetation replacement	□	□	□	□						□	□	■	
Vacuum sweeping and brushing									■				
Remedial maintenance													
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□	
Infiltration surface reconditioning				□	□	□	□		□	□	□		

Key

- will be required
- may be required

Notes

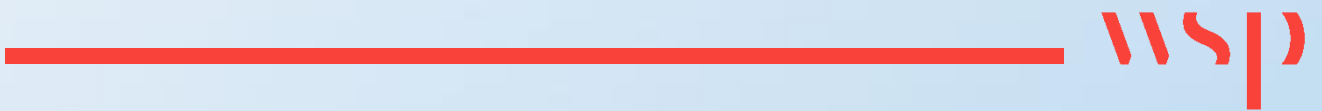
1 Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

4. CONCLUSION

- 4.1.1. The total catchment area or the pre-development site is 0.215ha which is fully impermeable with hardstanding surfaces and building roofs. The outfall for the existing surface water drainage network is assumed to be to the existing drainage network in the service road to the south of the site.
- 4.1.2. The impermeable area of the site post-development is considered for design purposes to be equal to that of the pre-development site, i.e. 0.215ha. The existing outfall shall be retained in post-development site.
- 4.1.3. To provide a robust drainage solution to reduce flood risk downstream, discharge rate of 3 l/s/ha i.e. 0.645 l/s, during all rainfall event up to and including 100-year rainfall event with 45% climate change, which requires approximately 270m³ of attenuation volume which can be provided within the site. The detailed design of surface water drainage will include the exact location and dimensions of the attenuation feature.
- 4.1.4. The use of proprietary systems is considered compliant in accordance with SuDS manual for pollution control measures. These products must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area. The specification of the proprietary system shall be determined in the detailed design phase.
- 4.1.5. West Sussex surface water statement proforma has been enclosed in Appendix C of this report.

Appendix A

LEAD LOCAL FLOOD AUTHORITY RESPONSE



Ground Floor
Northleigh
County Hall
Chichester
West Sussex
PO19 1RH



Lead Local Flood Authority

Date 11th July 2025

Stephen Cantwell
Local Planning Authority
Planning and Development
Adur & Worthing Councils
Portland House
Richmond Road
Worthing
BN11 1HS

Dear Stephen,

RE: AWDM/0738/25 – 39-41 Brighton Road, Shoreham-by-Sea, West Sussex, BN43 6RE

Thank you for your consultation on the above site, received on 20th June 2025. We have reviewed the application as submitted and wish to make the following comments.

This is an outline application for the demolition of the existing building and the erection of a one to nine-storey block of residential apartments, a commercial unit (Class E), with associated cycle parking and car parking.

We **object** to this planning application in the absence of an acceptable Drainage Strategy relating to:

- The application is not in accordance with the updated [National standards for sustainable drainage systems \(SuDS\)](#). It is unclear why the previous WSCC Policy for the Management of Surface Water is being referred to as this hasn't been used since 2023.
- As there is no other viable method of draining the site, the location of the outfall must be determined at outline stage, to ensure the receiving system has capacity. Given the location of the site, this is likely to be from a third-party.

We support the use of bioretention features and permeable paving. While this is more within the EA remit as the site is not currently at surface water flood risk, it is noted that there isn't much on flood resilience and resistance.

Yours sincerely,

Eleanor Read
Flood Risk Management Team
FRM@westsussex.gov.uk

Annex

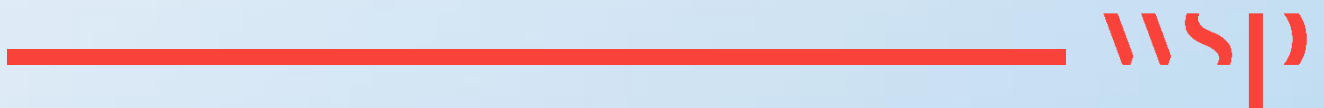
The following documents have been reviewed, which have been submitted to support the application;

Flood Risk Assessment by WSP, May 2025, First issue

Surface Water Drainage Strategy by WSP, 31/01/2025, First issue

Appendix B

**EXISTING DISCHARGE RATES AND PROPOSED
ATTENUATION REQUIREMENT CALCULATIONS**



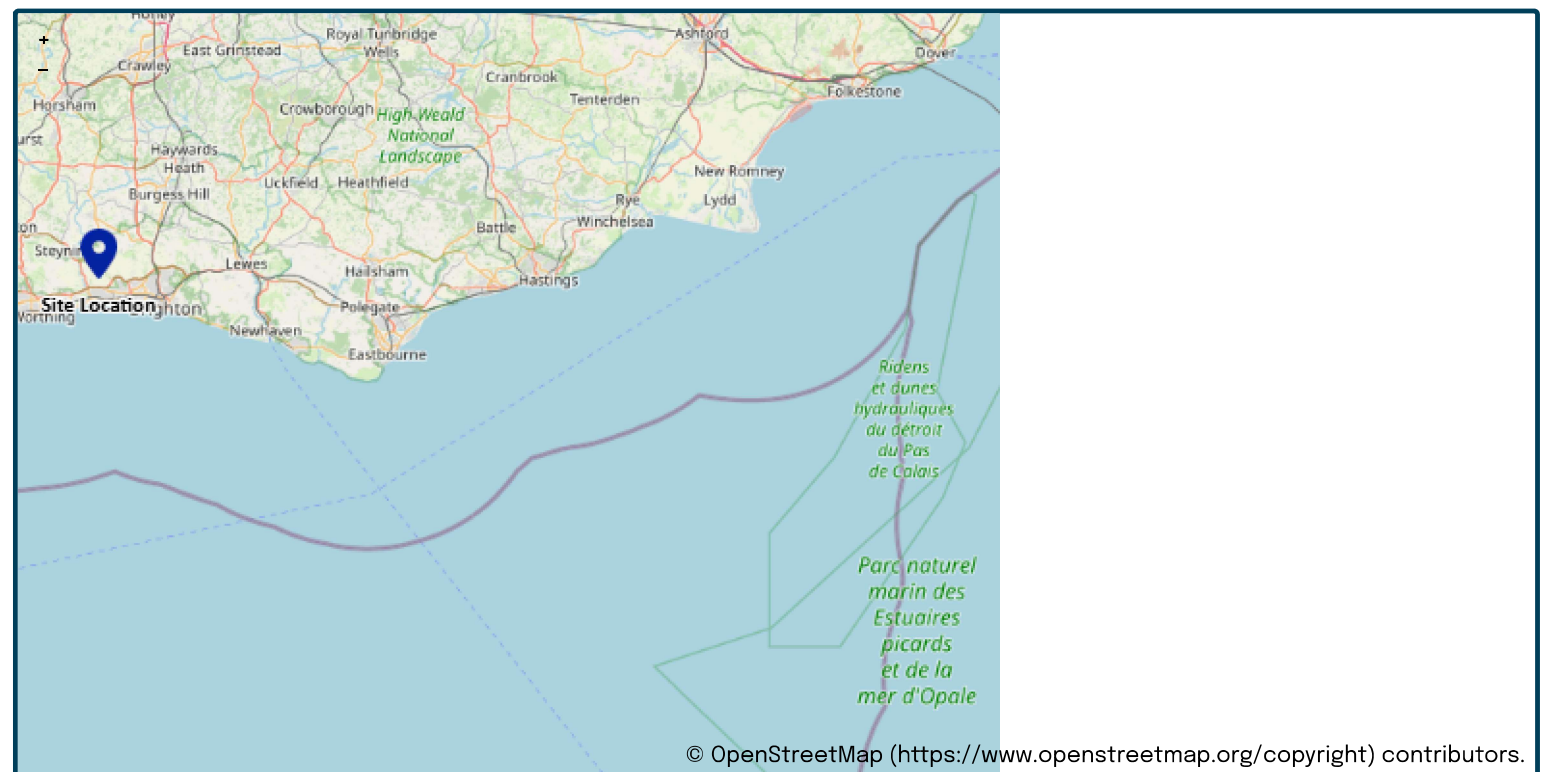
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	<input type="text" value="17/10/2025"/>
Calculated by	<input type="text" value="Arjun K R"/>
Reference	<input type="text"/>
Model version	<input type="text" value="2.2.1"/>

Location

Site name	<input type="text" value="Kwik-Fit"/>
Site location	<input type="text" value="Shoreham by Sea"/>



Site easting (British National Grid)	<input type="text" value="522221"/>
Site northing (British National Grid)	<input type="text" value="105119"/>

Site details

Total site area (ha)	<input type="text" value="0.215"/>	ha
----------------------	------------------------------------	----

Greenfield runoff

Method

Method

FEH statistical (2025)

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BFIHOST19scaled	<input type="text" value="0.873"/>	
QMed-QBar conversion	<input type="text" value="1.136"/>	<input type="text" value="1.136"/>
QMed (l/s)	<input type="text" value="0.1"/>	<input type="text" value="l/s"/>
QBar (FEH statistical 2025) (l/s)	<input type="text" value="0.1"/>	<input type="text" value="l/s"/>

Growth curve factors

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10 year growth factor	<input type="text" value="1.62"/>	
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100 year growth factor	<input type="text" value="3.19"/>	
200 year growth factor	<input type="text" value="3.74"/>	

Results

Method	<input type="text" value="FEH statistical (2025)"/>	
Flow rate 1 year (l/s)	<input type="text" value="0.1"/>	<input type="text" value="l/s"/>
Flow rate 2 year (l/s)	<input type="text" value="0.1"/>	<input type="text" value="l/s"/>
Flow rate 10 years (l/s)	<input type="text" value="0.2"/>	<input type="text" value="l/s"/>
Flow rate 30 years (l/s)	<input type="text" value="0.3"/>	<input type="text" value="l/s"/>
Flow rate 100 years (l/s)	<input type="text" value="0.4"/>	<input type="text" value="l/s"/>
Flow rate 200 years (l/s)	<input type="text" value="0.5"/>	<input type="text" value="l/s"/>

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.1) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://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 [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

2nd Floor FC-24 Sec-16A
 Noida Uttar Pradesh
 201301 India

Kwik-Fit Site
Brownfield Discharge Rates



Date 09-01-2025
 File KWIKFIT_EXISTING RATES.MDX

Designed by Vishvesh D
 Checked by Steven Burke

Micro Drainage

Network 2020.1.3

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	8.146	0.081	100.6	0.037	5.00	0.0	0.600	o	150	Pipe/Conduit
1.001	10.061	0.101	99.6	0.030	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	5.479	0.037	148.1	0.032	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	20.034	0.134	149.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.004	13.499	0.090	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	8.668	0.058	149.4	0.022	5.00	0.0	0.600	o	150	Pipe/Conduit
3.000	6.103	0.050	122.1	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit
2.001	15.004	0.100	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
4.000	4.842	0.032	150.0	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit
2.002	11.406	0.100	114.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	8.928	0.060	150.0	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit
6.000	5.811	0.040	145.3	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit
1.005	6.981	0.055	126.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	3.120	0.037	0.0	1.00	17.7
1.001	3.039	0.067	0.0	1.01	17.8
1.002	2.938	0.099	0.0	0.82	14.6
1.003	2.901	0.099	0.0	0.82	14.5
1.004	2.767	0.099	0.0	0.82	14.5
2.000	3.040	0.022	0.0	0.82	14.5
3.000	2.950	0.031	0.0	0.91	16.1
2.001	2.900	0.053	0.0	0.82	14.5
4.000	2.870	0.032	0.0	0.82	14.5
2.002	2.800	0.085	0.0	0.94	16.6
5.000	2.930	0.021	0.0	0.82	14.5
6.000	3.010	0.019	0.0	0.83	14.7
1.005	2.677	0.224	0.0	1.16	46.1

2nd Floor FC-24 Sec-16A
Noida Uttar Pradesh
201301 India

Kwik Fit Site



Date 09-01-2025

Designed by Vishvesh D

File KWIKFIT_EXISTING RATES.MDX

Checked by Steven Burke

Micro Drainage

Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Default	100	0.037	0.037	0.037
1.001	Classification	Default	100	0.030	0.030	0.030
1.002	Classification	Default	100	0.032	0.032	0.032
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
2.000	Classification	Default	100	0.022	0.022	0.022
3.000	Classification	Default	100	0.031	0.031	0.031
2.001	-	-	100	0.000	0.000	0.000
4.000	Classification	Default	100	0.032	0.032	0.032
2.002	-	-	100	0.000	0.000	0.000
5.000	Classification	Default	100	0.021	0.021	0.021
6.000	Classification	Default	100	0.019	0.019	0.019
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.224	0.224	0.224

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.600 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.350 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 50.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1
 Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.
									Level (m)	Depth (m)	Volume (m ³)	
1.000	G1	15 Summer	1	+0%					3.186	-0.084	0.000	0.40
1.001	G2	15 Summer	1	+0%					3.154	-0.035	0.000	0.64
1.002	G3	15 Summer	1	+0%	1/15 Summer				3.116	0.028	0.000	1.19
1.003	IC4	15 Summer	1	+0%	1/15 Summer				3.069	0.018	0.000	0.98
1.004	IC5	15 Summer	1	+0%	1/15 Summer				2.943	0.026	0.000	1.03
2.000	G6	15 Summer	1	+0%					3.095	-0.095	0.000	0.29
3.000	G7	15 Summer	1	+0%					3.014	-0.086	0.000	0.38
2.001	IC8	15 Summer	1	+0%					2.989	-0.061	0.000	0.65
4.000	G9	15 Summer	1	+0%					2.943	-0.077	0.000	0.48
2.002	J10	15 Summer	1	+0%					2.921	-0.029	0.000	0.81
5.000	G11	15 Summer	1	+0%					2.984	-0.096	0.000	0.28
6.000	G12	15 Summer	1	+0%					3.061	-0.099	0.000	0.25
1.005	IC13	15 Summer	1	+0%					2.855	-0.047	0.000	0.98

PN	US/MH Name	Overflow (l/s)	Half Drain	Pipe	Level Exceeded
			Time (mins)	Flow (l/s)	
1.000	G1			6.2	OK
1.001	G2			10.1	OK
1.002	G3			14.2	SURCHARGED
1.003	IC4			13.4	SURCHARGED
1.004	IC5			13.7	SURCHARGED
2.000	G6			3.7	OK
3.000	G7			5.1	OK
2.001	IC8			8.7	OK
4.000	G9			5.4	OK
2.002	J10			13.5	OK*
5.000	G11			3.5	OK
6.000	G12			3.1	OK
1.005	IC13			32.3	OK

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 522076 105104 TQ 22076 05104 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 50.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.000	G1	15 Summer	2	+0%	2/15 Summer	30/15 Summer			3.306	0.036	0.000
1.001	G2	15 Summer	2	+0%	2/15 Summer	30/15 Summer			3.285	0.096	0.000
1.002	G3	15 Summer	2	+0%	2/15 Summer	30/15 Summer			3.241	0.153	0.000
1.003	IC4	15 Summer	2	+0%	2/15 Summer				3.183	0.132	0.000
1.004	IC5	15 Summer	2	+0%	2/15 Summer				3.019	0.102	0.000
2.000	G6	15 Summer	2	+0%	30/15 Summer				3.103	-0.087	0.000
3.000	G7	15 Summer	2	+0%	30/15 Summer	100/15 Summer			3.055	-0.045	0.000
2.001	IC8	15 Summer	2	+0%	30/15 Summer				3.041	-0.009	0.000
4.000	G9	15 Summer	2	+0%	30/15 Summer				3.001	-0.019	0.000
2.002	J10	15 Summer	2	+0%	2/15 Summer				2.988	0.038	0.000
5.000	G11	15 Summer	2	+0%	30/15 Summer				2.991	-0.089	0.000
6.000	G12	15 Summer	2	+0%	100/15 Summer				3.069	-0.091	0.000
1.005	IC13	15 Summer	2	+0%	2/15 Summer				2.904	0.002	0.000

Half Drain Pipe

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	G1	0.46			7.1	SURCHARGED	8
1.001	G2	0.71			11.2	SURCHARGED	10
1.002	G3	1.32			15.8	SURCHARGED	9
1.003	IC4	1.10			15.0	SURCHARGED	
1.004	IC5	1.17			15.5	SURCHARGED	
2.000	G6	0.36			4.6	OK	
3.000	G7	0.47			6.3	OK	3
2.001	IC8	0.77			10.3	OK	
4.000	G9	0.58			6.5	OK	
2.002	J10	0.92			15.3	SURCHARGED*	
5.000	G11	0.35			4.4	OK	
6.000	G12	0.32			3.9	OK	
1.005	IC13	1.11			36.8	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 522076 105104 TQ 22076 05104 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 50.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.000	G1	15 Summer	30	+0%	2/15 Summer	30/15 Summer			4.321	1.051	0.576
1.001	G2	30 Summer	30	+0%	2/15 Summer	30/15 Summer			4.261	1.072	1.466
1.002	G3	15 Summer	30	+0%	2/15 Summer	30/15 Summer			4.141	1.053	0.516
1.003	IC4	15 Summer	30	+0%	2/15 Summer				3.964	0.913	0.000
1.004	IC5	15 Summer	30	+0%	2/15 Summer				3.470	0.553	0.000
2.000	G6	15 Summer	30	+0%	30/15 Summer				3.758	0.568	0.000
3.000	G7	15 Summer	30	+0%	30/15 Summer	100/15 Summer			3.769	0.669	0.000
2.001	IC8	15 Summer	30	+0%	30/15 Summer				3.730	0.680	0.000
4.000	G9	15 Summer	30	+0%	30/15 Summer				3.545	0.525	0.000
2.002	J10	15 Summer	30	+0%	2/15 Summer				2.988	0.038	0.000
5.000	G11	15 Summer	30	+0%	30/15 Summer				3.148	0.068	0.000
6.000	G12	15 Summer	30	+0%	100/15 Summer				3.136	-0.024	0.000
1.005	IC13	15 Summer	30	+0%	2/15 Summer				3.117	0.215	0.000

Half Drain Pipe							
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	G1	0.86			13.2	FLOOD	8
1.001	G2	1.35			21.5	FLOOD	10
1.002	G3	2.66			31.9	FLOOD	9
1.003	IC4	1.99			27.2	SURCHARGED	
1.004	IC5	2.08			27.5	SURCHARGED	
2.000	G6	0.71			9.0	SURCHARGED	
3.000	G7	0.92			12.4	SURCHARGED	3
2.001	IC8	1.49			19.8	SURCHARGED	
4.000	G9	1.23			13.9	SURCHARGED	
2.002	J10	1.95			32.4	SURCHARGED*	
5.000	G11	0.72			9.2	SURCHARGED	
6.000	G12	0.74			9.1	OK	
1.005	IC13	2.26			74.6	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 522076 105104 TQ 22076 05104 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 50.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.000	G1	15 Summer	100	+0%	2/15 Summer	30/15 Summer			4.322	1.052	1.814
1.001	G2	30 Summer	100	+0%	2/15 Summer	30/15 Summer			4.263	1.074	3.293
1.002	G3	30 Summer	100	+0%	2/15 Summer	30/15 Summer			4.142	1.054	1.894
1.003	IC4	15 Summer	100	+0%	2/15 Summer				3.979	0.928	0.000
1.004	IC5	15 Summer	100	+0%	2/15 Summer				3.525	0.608	0.000
2.000	G6	15 Summer	100	+0%	30/15 Summer				4.048	0.858	0.000
3.000	G7	15 Summer	100	+0%	30/15 Summer	100/15 Summer			4.001	0.901	0.799
2.001	IC8	15 Summer	100	+0%	30/15 Summer				3.985	0.935	0.000
4.000	G9	15 Summer	100	+0%	30/15 Summer				3.837	0.817	0.000
2.002	J10	15 Summer	100	+0%	2/15 Summer				2.988	0.038	0.000
5.000	G11	15 Summer	100	+0%	30/15 Summer				3.256	0.176	0.000
6.000	G12	15 Summer	100	+0%	100/15 Summer				3.234	0.074	0.000
1.005	IC13	15 Summer	100	+0%	2/15 Summer				3.204	0.302	0.000

Half Drain Pipe

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	G1	0.86			13.2	FLOOD	8
1.001	G2	1.49			23.6	FLOOD	10
1.002	G3	2.69			32.2	FLOOD	9
1.003	IC4	2.05			28.0	SURCHARGED	
1.004	IC5	2.14			28.4	SURCHARGED	
2.000	G6	0.94			11.9	SURCHARGED	
3.000	G7	1.30			17.4	FLOOD	3
2.001	IC8	1.83			24.5	SURCHARGED	
4.000	G9	1.56			17.5	SURCHARGED	
2.002	J10	2.31			38.5	SURCHARGED*	
5.000	G11	0.91			11.6	SURCHARGED	
6.000	G12	0.86			10.5	SURCHARGED	
1.005	IC13	2.57			85.0	SURCHARGED	

Appendix C

**WEST SUSSEX SURFACE WATER STATEMENT
PROFORMA**



Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed development this pro-forma must be completed in full and be submitted with any planning application which seeks permission for 'major' development. This information contained in this form will be used by West Sussex County Council in its role as Lead Local Flood Authority and 'statutory consultee' on SuDs for all 'major' planning applications. The pro-forma is supported by the [Defra/EA Guidance on Rainfall Runoff Management](#) and can be completed using freely available tools including [SuDS Tools](#). The pro-forma should be considered alongside other supporting SuDS Guidance but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

1. Site Details

Site	Kwik Fit
Address & post code or LPA reference	37-41 Brighton Road, Shoreham-by-Sea, BN43 6RN
Grid reference	TQ 22212 05113 (E: 522212 m, N:105113 m)
Is the existing site developed or Greenfield?	Developed site
Total Site Area served by drainage system (excluding open space) (Ha)*	0.215 ha
Topographical survey plan showing existing site layout, site levels and drainage system	Yes.

* The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers & Local Authorities
Impermeable area (ha) (areas to be shown on a plan)	0.215	0.215	-	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed permeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)	Surface water drainage sewer	Surface water drainage sewer	N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
Existing and proposed micro-drainage calculations	Yes		Peak surface water discharge rates for pre-development site are calculated in MicroDrainage software using FEH rainfall data (2 yr, 30 yr and 100 yr) and FSR data (1 yr) for the site by creating a model based on the topographical survey and assumed outfall to drainage system for Brighton Road.	Please provide micro-drainage calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration		No	Investigation of groundwater levels and infiltration rates will be undertaken prior to detailed design stage.	e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse		No		e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA)
To surface water sewer	Yes		Discharge rate 3 l/s/ha i.e. 0.645 l/s, during all rainfall event up to and including 100-year rainfall event with 45% climate change. Existing drainage outfall will be retained in the post-development site.	Confirmation from sewer provider that sufficient capacity exists for this connection.

Combination of above		No		e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.
Has the drainage proposal had regard to the SuDS hierarchy?	Yes			Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Layout plan showing where the sustainable drainage infrastructure will be located on site.	Yes		The tentative layout for the SuDS components included in the Strategy. The detailed design of surface water drainage will include the exact location and dimensions of the attenuation feature.	Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan, and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of development.

Technical Standards S2 and S3

4. Peak Discharge Rates – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
Greenfield QBAR	0.14	N/A	N/A	Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1	32.30	0.645	-31.665	Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
1 in 30	74.60	0.645	-73.955	
1 in 100	85.00	0.645	-84.355	
1 in 100 plus climate change	N/A	0.645		To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change should be added to the peak rainfall intensity. EA Guidance - Flood Risk Assessments: Climate Change Allowances (Published Feb 2016) https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Technical Standards S4 to S9

5. Calculate discharge volumes –The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Volume (m ³)	Proposed Volume (m ³)	Difference (m ³) (Proposed-Existing)	Notes for developers & Local Authorities
1 in 1				Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30				
1 in 100				
1 in 100 plus climate change				To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

To provide a robust drainage solution to reduce flood risk downstream, the brownfield discharge rate for 1-year event will be used with 50% betterment i.e. 16.15 l/s, during all rainfall event up to and including 100-year rainfall event with 40% climate change. Existing drainage outfall will be retained in the post-development site. Hence volumetric assessment is not necessary.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

		Notes for developers & Local Authorities
Storage volume required to retain discharge rates as existing (m ³)	270m ³	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing
Where will the storage be provided on site?	Tentative plan is included in the strategy.	

7. How is Storm Water stored on site?

Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long-term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

			Notes for developers & Local Authorities
Infiltration	State the Site's Geology/drift material overlaying)	Investigation of groundwater levels and infiltration rates will be undertaken prior to detailed design stage.	Avoid infiltrating in made ground.
	Does the site have a high ground water table? Yes/No?		If yes, please provide details of the site's hydrology.
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?		Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ)
	Are infiltration rates suitable?		Infiltration rates should be no lower than 1x10 ⁻⁶ m/s.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.		Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
	State the distance between a proposed infiltration device base and the ground water (GW) level		Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
	Were infiltration rates obtained by desk study or infiltration test?		Infiltration rates can be estimated from desk studies at most stages of the planning system if a back-up attenuation scheme is provided.
Is infiltration feasible?	Yes/No?		If infiltration is not feasible how will the additional volume be stored? The applicant should then consider the following options in the next section.

7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

		Notes for developers & Local Authorities
Please confirm what option has been chosen and how much storage is required on site.	Discharge rate 3 l/s/ha will be used i.e. 0.645 l/s, during all rainfall event up to and including 100-year rainfall event with 45% climate change. Existing drainage outfall will be retained in the post-development site. As per the analysis conducted using MicroDrainage software in the Source Control module with this flow control setting estimates the required attenuation volume as 270m ³ .	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Additional Consideration to comply with the Technical Standards and PPG

		Notes for developers & Local Authorities
Which Drainage Systems measures have been used?	Trapped gullies, silt traps and catchpits, bioretention system, soft landscaping etc.	SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	The existing drainage system directs water toward the southern boundary where it ultimately discharges to an existing surface water conveyance pipe in the service road at the back of the site. During extreme rainfall events, exceedance flow will be directed toward Brighton Road, following the existing slope of the site, where it will be captured	Safely: not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths

	by the Brighton Road drainage system	
How are rates being restricted?	Flow control device shall be specified in detailed design.	Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices cannot be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
Drainage during construction period		Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control.
Key Drainage components / Features		Which component if blocked (even partial) will lead to flooding?

Technical Standards S10 to S12

9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

<p>How is the entire drainage system to be maintained in perpetuity?</p>	<p>SuDS components at the site are not to be adopted and will be maintained for their lifetime by the managing company of the development for the site-wide SuDS features.</p>	<p>Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust.</p> <p>Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed.</p> <ul style="list-style-type: none"> — Specification notes that describe how work is to be undertaken and the materials to be used. — A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate. — A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the Management Plan. <p>Where open water is involved please provide a health and safety plan within the management plan.</p>
<p>Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.</p>	<p>Shall be specified in detailed design.</p>	<p>If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.</p>
<p>Please provide details demonstrating that any third-party agreements required using land outside the application site have been secured.</p>		

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By: *Arjun Ramanunni*

Qualification of person responsible for signing off this pro-forma: Edward Clarke, BSc MSc MCIWEM C.WEM CEng CEnv

Company: *WSP UK Limited*

On behalf of (Client's details): *Blenheim Estates Ltd*

Date: *17/10/2025*

Appendix D

STORAGE CALCULATION



2nd Floor FC-24 Sec-16A
Noida Uttar Pradesh
201301 India

Shoreham By Sea



Date 16-10-2025

Designed by Arjun K R

File Shoreham by Sea - Source contro...

Checked by Vaidyanathan C

Micro Drainage

Source Control 2020.1

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	2.650	0.360	0.3	62.9	O K
30 min Summer	2.772	0.482	0.4	84.4	O K
60 min Summer	2.906	0.616	0.4	107.8	O K
120 min Summer	3.031	0.741	0.4	129.6	O K
180 min Summer	3.106	0.816	0.5	142.9	O K
240 min Summer	3.160	0.870	0.5	152.2	O K
360 min Summer	3.232	0.942	0.5	164.8	O K
480 min Summer	3.279	0.989	0.5	173.1	O K
600 min Summer	3.312	1.022	0.5	178.9	O K
720 min Summer	3.337	1.047	0.5	183.1	O K
960 min Summer	3.368	1.078	0.5	188.6	O K
1440 min Summer	3.391	1.101	0.5	192.7	O K
2160 min Summer	3.391	1.101	0.5	192.7	O K
2880 min Summer	3.375	1.085	0.5	189.8	O K
4320 min Summer	3.346	1.056	0.5	184.8	O K
5760 min Summer	3.324	1.034	0.5	181.0	O K
7200 min Summer	3.310	1.020	0.5	178.5	O K
8640 min Summer	3.300	1.010	0.5	176.7	O K
10080 min Summer	3.293	1.003	0.5	175.5	O K
15 min Winter	2.770	0.480	0.4	84.0	O K
30 min Winter	2.934	0.644	0.4	112.6	O K
60 min Winter	3.113	0.823	0.5	144.0	O K
120 min Winter	3.281	0.991	0.5	173.4	O K
180 min Winter	3.384	1.094	0.5	191.5	O K
240 min Winter	3.457	1.167	0.5	204.2	O K
360 min Winter	3.557	1.267	0.5	221.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	157.018	0.0	26.8	27
30 min Summer	105.429	0.0	28.6	42
60 min Summer	67.598	0.0	59.5	72
120 min Summer	40.971	0.0	65.4	132
180 min Summer	30.325	0.0	68.6	190
240 min Summer	24.401	0.0	70.7	250
360 min Summer	17.849	0.0	73.3	370
480 min Summer	14.245	0.0	74.9	490
600 min Summer	11.931	0.0	75.7	608
720 min Summer	10.308	0.0	76.2	728
960 min Summer	8.161	0.0	76.5	966
1440 min Summer	5.841	0.0	75.3	1444
2160 min Summer	4.184	0.0	147.0	2160
2880 min Summer	3.314	0.0	146.0	2744
4320 min Summer	2.404	0.0	140.2	3420
5760 min Summer	1.929	0.0	262.3	4200
7200 min Summer	1.638	0.0	261.3	5040
8640 min Summer	1.441	0.0	258.7	5872
10080 min Summer	1.298	0.0	253.0	6664
15 min Winter	157.018	0.0	28.6	27
30 min Winter	105.429	0.0	32.7	41
60 min Winter	67.598	0.0	68.9	72
120 min Winter	40.971	0.0	75.5	130
180 min Winter	30.325	0.0	79.1	188
240 min Winter	24.401	0.0	81.5	248
360 min Winter	17.849	0.0	84.3	364

2nd Floor FC-24 Sec-16A
Noida Uttar Pradesh
201301 India

Shoreham By Sea



Date 16-10-2025

Designed by Arjun K R

File Shoreham by Sea - Source contro...

Checked by Vaidyanathan C

Micro Drainage

Source Control 2020.1

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
480 min Winter	3.624	1.334	0.6	233.4	O K
600 min Winter	3.672	1.382	0.6	241.9	O K
720 min Winter	3.709	1.419	0.6	248.2	O K
960 min Winter	3.758	1.468	0.6	256.9	O K
1440 min Winter	3.805	1.515	0.6	265.2	O K
2160 min Winter	3.829	1.539	0.6	269.3	O K
2880 min Winter	3.829	1.539	0.6	269.4	O K
4320 min Winter	3.801	1.511	0.6	264.5	O K
5760 min Winter	3.776	1.486	0.6	260.1	O K
7200 min Winter	3.760	1.470	0.6	257.2	O K
8640 min Winter	3.744	1.454	0.6	254.5	O K
10080 min Winter	3.731	1.441	0.6	252.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
480 min Winter	14.245	0.0	85.9	482
600 min Winter	11.931	0.0	86.8	600
720 min Winter	10.308	0.0	87.3	718
960 min Winter	8.161	0.0	87.3	952
1440 min Winter	5.841	0.0	85.5	1416
2160 min Winter	4.184	0.0	170.3	2100
2880 min Winter	3.314	0.0	168.4	2768
4320 min Winter	2.404	0.0	160.4	4016
5760 min Winter	1.929	0.0	311.9	4512
7200 min Winter	1.638	0.0	310.9	5472
8640 min Winter	1.441	0.0	306.5	6400
10080 min Winter	1.298	0.0	299.0	7360

2nd Floor FC-24 Sec-16A
 Noida Uttar Pradesh
 201301 India

Shoreham By Sea



Date 16-10-2025
 File Shoreham by Sea - Source contro...

Designed by Arjun K R
 Checked by Vaidyanathan C

Micro Drainage Source Control 2020.1

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 522076 105104 TQ 22076 05104	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.215

Time (mins)		Area	Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.072	4	8	0.072	8	12	0.072

2nd Floor FC-24 Sec-16A
 Noida Uttar Pradesh
 201301 India

Shoreham By Sea
 Designed by Arjun K R
 Checked by Vaidyanathan C



Date 16-10-2025

File Shoreham by Sea - Source contro...

Source Control 2020.1

Model Details

Storage is Online Cover Level (m) 4.340

Tank or Pond Structure

Invert Level (m) 2.290

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	175.0	1.550	175.0	1.551	0.0	2.050	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0032-6000-1550-6000
 Design Head (m) 1.550
 Design Flow (l/s) 0.6
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 32
 Invert Level (m) 2.290
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200

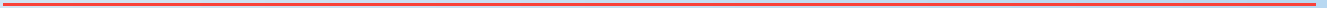
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.550	0.6	Kick-Flo®	0.287	0.3
Flush-Flo™	0.144	0.3	Mean Flow over Head Range	-	0.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.3	0.800	0.4	2.000	0.7	4.000	0.9	7.000	1.2
0.200	0.3	1.000	0.5	2.200	0.7	4.500	1.0	7.500	1.2
0.300	0.3	1.200	0.5	2.400	0.7	5.000	1.0	8.000	1.3
0.400	0.3	1.400	0.6	2.600	0.8	5.500	1.1	8.500	1.3
0.500	0.4	1.600	0.6	3.000	0.8	6.000	1.1	9.000	1.3
0.600	0.4	1.800	0.6	3.500	0.9	6.500	1.1	9.500	1.4

Appendix E

DRAINAGE INSPECTION REPORT



METRO ROD

CCTV Inspection Report

View via iTouch Live 

Your full report, including the video is only a click away download or view online now.



**Kwik-Fit
Brighton Road
Shoreham-by-Sea
BN43 6RE**

**09/10/2025
Approved By: Richard Kempson
Job Number: 1341695
Client Job Number: P117455UK001**

Metro Rod (Sussex and Tunbridge)

270A Old Shoreham Road, Hove, East Sussex, BN3 7EG
Tel: 01273 023 728

Job Number
1341695

Surveyed by (Operator)
NEIL CORNEY

Base Unit
96UM3JK9TI

Date
09/10/2025

Client Details:

WSP UK Ltd
WSP House
70 Chancery Lane
London
WC2A 1AF

Client Contact Name: Adam Coleman
Client Contact Tel: 07884731127

Site Details:

Kwik-Fit
Brighton Road
Shoreham-by-Sea
BN43 6RE

Site Contact Name: Adam Coleman
Site Contact Tel: 07884731127

Contractor Details:

Metro Rod (Sussex and Tunbridge)
270A Old Shoreham Road
Hove
East Sussex
BN3 7EG

Office Contact Name: Richard Kempson
Office Contact Number: 01273 023 728

Purpose of Survey:

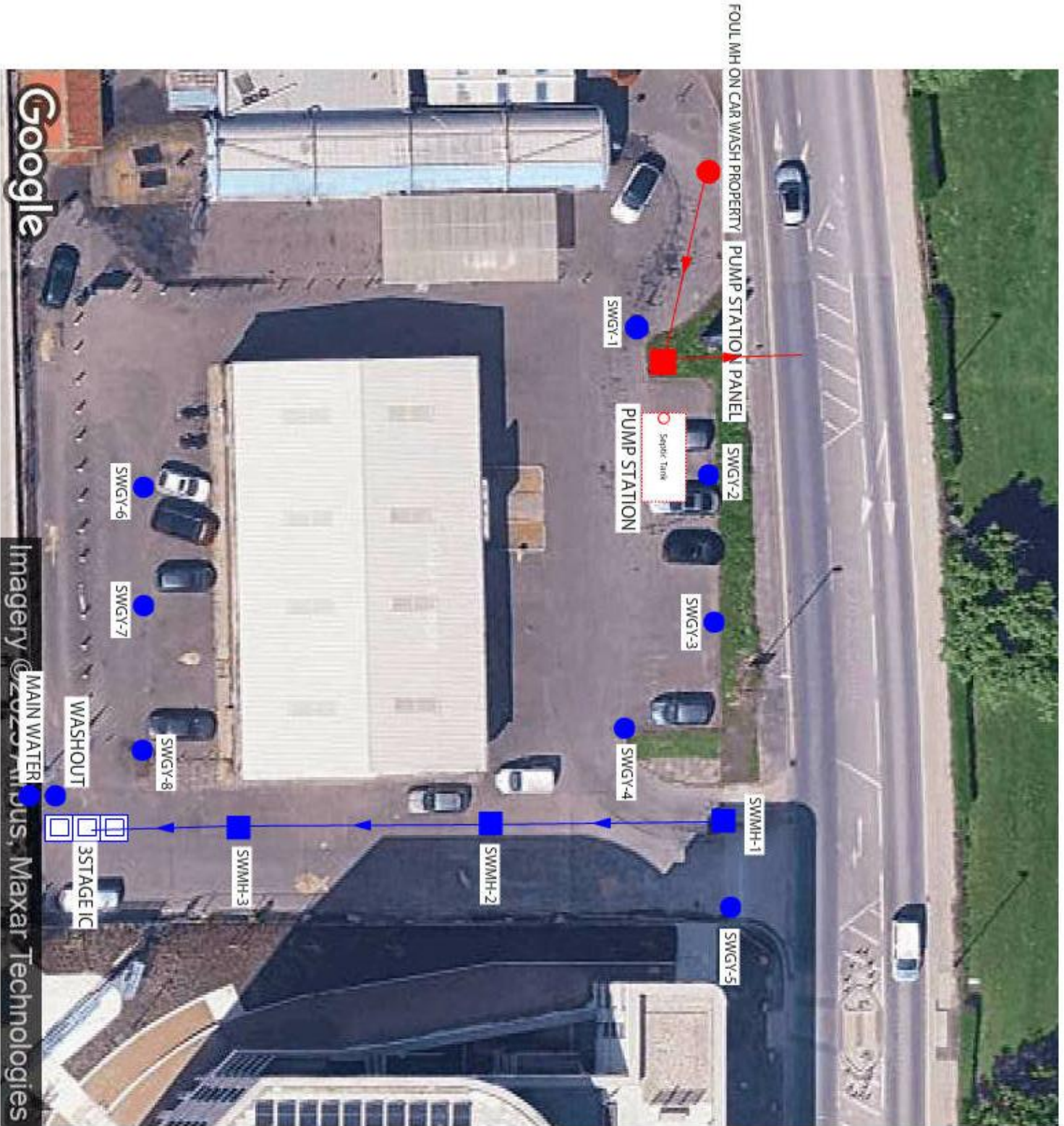
Job Number 1341695	Surveyed by (Operator) NEIL CORNEY	Base Unit 96UM3JK9TI	Date 09/10/2025
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Report Contents

Page 1	Cover Page
Page 2	Job Overview
Page 3	Contents Page
Page 4	Site Drawings
Page 5	Grade Defect Descriptions
Page 6	Site Photos
Page 9	Job Summary

Job Number 1341695	Surveyed by (Operator) NEIL CORNEY	Base Unit 96UM3JK9TI	Date 09/10/2025
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This sketch is not to scale and does not represent the exact routing of the drainage system



Job Number 1341695	Surveyed by (Operator) NEIL CORNEY	Base Unit 96UM3JK9TI	Date 09/10/2025
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1: Occurences without damage. For example, laterals, joints,etc.

NO DEFECTS WERE DETECTED.

2: Constructional deficiencies or occurences with insignificant influence to tightness, hydraulic or static pressure or pipe: Eg. wide joints, badly torched intakes, minor deformation of plastic pipes, minor erosions etc.

REHABILITATION CAN BE SCHEDULED LONG-TERM.

3: Constructional deficiencies diminishing static, hydraulic and tightness: Eg. untorched intakes, cracks, minor drainage obstructions such as calcite build ups, protruding laterals, minor damages to pipe wall, individual root penetrations, corroded pipe walls etc.

REHABILITATION IS NECESSARY MEDIUM-TERM WITHIN 3 TO 5 YEARS.

4: Constructional damages with insufficient static safety, hydraulic or tightness: Eg. axial/radial pipe bursts, pipe deformations, visually noticeable infiltration/exfiltration, cavities, in pipe-wall, severe protruding, laterals severe root penetrations, severe corrosion of pipe wall etc.

REHABILITATION PROCEDURE IS URGENT AND HAS TO BE COMPLETED WITHIN 1 TO 2 YEARS. NECESSITY FOR EMERGENCY OPERATIONS HAS TO BE EXAMINED.

5: Pipe is already or will shortly be impermeable: Eg. collapsed pipe, deeply rooted pipe or other drainage obstructions. Pipe loses water or danger of backwater in basements etc.

REHABILITATION IS URGENT AND SHORT-TERM. IN ORDER TO PREVENT FURTHER DAMAGE, NECESSARY TEMPORARY SPOT REPAIR HAS TO BE CONDUCTED ON EMERGENCY LEVEL.

Job Number 1341695	Surveyed by (Operator) NEIL CORNEY	Base Unit 96UM3JK9TI	Date 01/01/1970
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Other Site Photos: WASHOUT



Other Site Photos: SWMH-1



Other Site Photos: 3 STAGE IC



Other Site Photos: MAINS WATER LINE



Other Site Photos: PUMP STATION PANEL



Other Site Photos: FOUL MH ON CAR WASH PROPERTY

Job Number
1341695

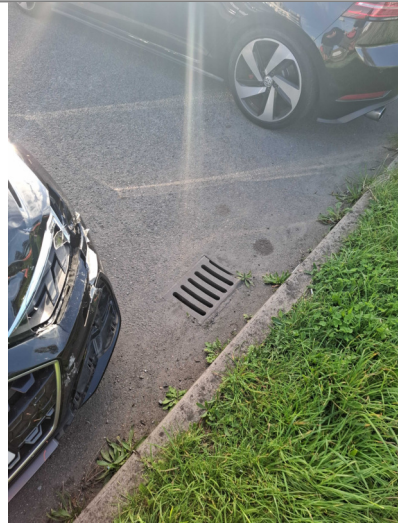
Surveyed by (Operator)
NEIL CORNEY

Base Unit
96UM3JK9TI

Date
01/01/1970



Other Site Photos: SWGY-1



Other Site Photos: SWGY-2



Other Site Photos: SWGY-3



Other Site Photos: SWGY-4



Other Site Photos: SWGY-5



Other Site Photos: SWGY-8

Job Number
1341695

Surveyed by (Operator)
NEIL CORNEY

Base Unit
96UM3JK9TI

Date
01/01/1970



Other Site Photos: SWGY-7



Other Site Photos: SWGY-6

Job Number 1341695	Surveyed by (Operator) NEIL CORNEY	Base Unit 96UM3JK9TI	Date 09/10/2025
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Job Information

Total Distance Surveyed: **0 meters**
Engineer: **NEIL CORNEY**
Number of Surveys: **0**
Number of Surveys grade 4 or above: **0**

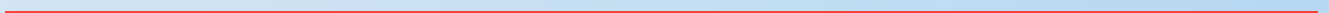
Job Comments

There is no access to the foul water manholes on the Kwik Fit site, as they are located in the car wash area. The surface water lines are full of silt and will need a HPWJ clean before a survey can be carried out.

Spoke to Steve on the phone. He requested a drainage map showing the layout and flow directions and confirmed that a camera survey was not required.

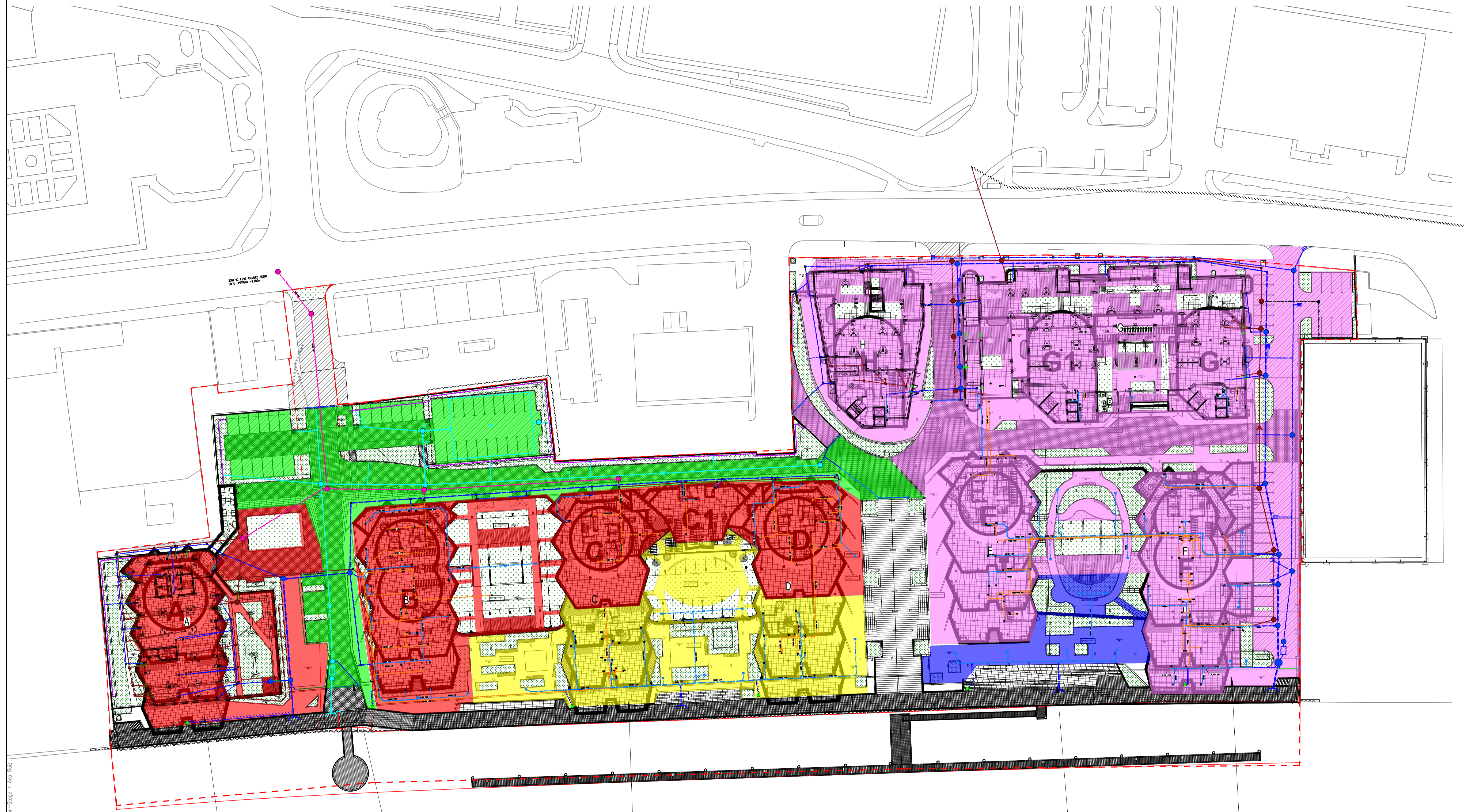
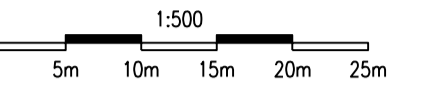
Appendix F

SURROUNDING SITE PLAN



1. GENERAL

- (i) This drawing is not to be scaled, work to figured dimensions only, confirmed on site.
- (ii) This drawing is to be read in conjunction with all relevant architectural drawings, detailed specifications where applicable and all associated drawings in this series.
- (iii) Any discrepancy on this drawing is to be reported immediately to the partnership for clarification.
- (iv) The contractor is responsible for all temporary works and for the stability of the works in progress.



CATCHMENT 1
AREA=4880m²

CATCHMENT 2
AREA=2805m²

CATCHMENT 3
AREA=2139m²

CATCHMENT 4
AREA=611m²

CATCHMENT 5
AREA=9144m²

C:\PROJETS\14576 - Free Wharf - Brighton Road, Shoreham\Drawings\DWG\14576-01-DR-C-0550.dwg - Stage 4 - Rev 02



ISSUED FOR INFORMATION	AR, JAK, 08.04.19	P1
Description	By	Appt. Date

PRELIMINARY DRAWING
NOT FOR CONSTRUCTION

Title
CATCHMENT AREAS

Project
**FREE WHARF - STAGE 3
SHOREHAM-BY-SEA**

Client
SOUTHERN HOUSING GROUP

HOP CONSULTING CIVIL AND STRUCTURAL ENGINEERS
HOP House, 41 Church Road Hove, East Sussex BN3 2BE
www.hop.uk.com
ask@hop.uk.com
+44 (0)1273 223900

Drawing No.	14576-HOP-00-XX-DR-C-0550	Status	S0
Rev.			P1





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70 Chancery Lane
London
WC2A 1AF

wsp.com