

Flood Risk Assessment and Surface and Foul Water Drainage Strategy

75 Marlborough Road, Lancing, BN15 8UG



Project	FRA SFWDS – Scout Stores, 75 Marlborough Road, Lancing
Project No.	1804 Rev A
Client	Scout Stores
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Prepared by	BH/DMC

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Updates following WSCC comments

☒ Interception has not been calculated and/or provided.	Objection: This has not been provided as no above ground SuDS have been considered.	Interceptions storage now incorporated in permeable paving and a bioretention area. See Strategy plan in Appendix II and Section 12 P14.
☒ Surface water sewer – no in principle agreement from owner of the asset.	Objection: This has not been provided.	Connection to be made to existing private on-site storm sewer. CCTV shows existing storm runoff drains to the sewer. Peak runoff is reduced following development offering betterment over existing.
☒ The application must provide water quantity benefits in open, at the surface or above ground SuDS.	Objection: This has not been provided as no above ground SuDS have been considered.	Bioretention area and further permeable paving added the parking area of the scheme. Strategy plan in Appendix II
☒ The application must provide biodiversity benefits or demonstrate why this is not achievable (lack of space will not be accepted).	Informative: This should be considered. A lack of space is not acceptable justification	Bioretention area incorporated into scheme. See Strategy plan in Appendix II
☒ The application must provide amenity benefits or demonstrate why this is not achievable (lack of space will not be accepted).	Informative: This should be considered. A lack of space is not acceptable justification.	Bioretention area incorporated into scheme. See Strategy plan in Appendix II
☒ Flood resistance and resilience must be shown to be included in the design. A minimum of 300mm must be provided between the design flood event and the finished floor level.	Objection: This has not been demonstrated.	Development is located in Flood Zone 1 therefore not at immediate risk of flooding therefore flood resistance and resilience measures not required. Section 7 p9 added to report to clarify.
☒ A minimum of 150mm above external ground levels and show that they are sloping away from vulnerable areas such as doorways.	Objection: This has not been demonstrated.	Updated strategy plans now show more levels and FFL 150mm above external ground levels. Strategy plan in Appendix II
☒ Exceedance of the design 1% AEP rainfall event plus climate change (or failure of the drainage network) must be shown on a drawing, minimizing impacts to people and property. This drawing will include proposed external ground levels, finished floor levels and any designed slopes on impermeable surfaces such as highways or car parks	Objection: Although arrows for exceedance flow are shown on the drainage layout, levels should also be provided to demonstrate the exceedance flow routes are appropriate.	Updated strategy plans now show more levels and updated exceedance flow paths. Strategy plan in Appendix II

1 Introduction

Haworth McCall have been instructed to prepare a site-specific Flood Risk Assessment (FRA), Surface Water Drainage Strategy (SWDS) and Foul Water Drainage Strategy (FWDS) for the development at 75 Marlborough Road, Lancing, BN15 8UG.

It is understood that the proposals are for the demolition of the existing buildings on site and construction of a replacement warehouse.

The British Geological Survey (BGS) Geology Viewer indicates that the bedrock underlying the site is part of the Lambeth Group Formation, comprising of clay, silt and sand. The BGS Geology Viewer also indicates that there are superficial deposits of sand and gravel, and sand, silt and clay recorded on the site. CCTV drain survey information has confirmed the presence of separate foul and storm drainage on site. As a result, it is unlikely that infiltration will be suitable for use of large scale infiltration SuDS for roof runoff.

The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). The risk from fluvial and tidal sources is deemed low.

The EA surface water models show the site to be at very low risk from surface water flooding. Very low risk means that each year this area has a chance of flooding of less than 0.1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

Following the drainage hierarchy, it is proposed to discharge surface water runoff to a nearby surface water sewer, using the existing offsite connection as full infiltration of roof runoff is considered unlikely due to ground conditions.

Runoff from the car park and roof is proposed to be routed and attenuated by a geocellular tank underneath the car parking area. The tank will have a plan area of 260m² with a depth of 0.8m and a porosity of 0.95 giving a volume of 197.6m³. The geocellular tank would provide storage volume sufficient to reduce runoff to a maximum of 1.6l/s (as close to pre development greenfield runoff rates as possible) for all events up to and including 100yr+25%CC storm event.

Southern Water have provided sewer record plans for the local area, which shows a 150mm diameter foul water sewer running underneath Marlborough Road. A CCTV survey has also been conducted showing there to be existing foul water drainage onsite which connects into the foul water sewer. New foul water pipes are proposed onsite, which will reuse the existing offsite connection into the foul water sewer. The CCTV show existing storm drainage on site and proposals are to outfall to the existing offsite storm connection.

This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and based on the findings of this report, it is deemed that the development could be constructed without worsening the flood risk on site or offsite.

2 Policy Compliance

The purpose of this assessment is to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the:

- National Planning Policy Framework
- Adur District Council SFRA 2020
- CIRIA SuDS Manual
- DEFRA Non-statutory technical standards for sustainable drainage systems

3 Site Location and Description

The development location is at 75 Marlborough Road, Lancing, BN15 8UG. It is shown in red outline in Figure 1. The existing site is comprised of a warehouse with some associated hard surfacing.

It is understood that the proposals are for the demolition of the existing buildings on site and construction of a replacement warehouse. (see Appendix 1 showing the architect proposals for the site).



FIGURE 1: SITE LOCATION. PLANNED DEVELOPMENT OUTLINED IN RED

4 Geology and Infiltration Potential

The British Geological Survey (BGS) Geology Viewer indicates that the bedrock underlying the site is part of the Lambeth Group Formation, comprising of clay, silt and sand (Source: BGS). The BGS Geology Viewer also indicates that there are superficial deposits of sand and gravel, and sand, silt and clay recorded on the site. CCTV drain survey information has confirmed the presence of separate foul and storm drainage on site.

Site investigation, carried out by AVZ GeoEng Ltd, indicates infiltration rates at the site to be within the range $4.32 \times 10^{-5} \text{m/s}$ to $2.19 \times 10^{-4} \text{m/s}$. These are above the minimum rate set out in the CIRIA SuDS manual to be viable for infiltration, which is $1 \times 10^{-6} \text{m/s}$. However, due to the sites proximity to the coast, winter groundwater levels are likely to be high. As they are currently unknown for the site, and that currently the site drains to sewers and not via soakaway, it is assumed at this stage that infiltration is not viable as a 'worst case' scenario. Local paving can infiltrate and is shown permeable in the strategy where feasible.

Based on the information above, it is likely that infiltration rates on site won't be appropriate for infiltration SuDS.

5 Sequential Test/Exception Test

Under the NPPF, all new planning applications should undergo a Sequential Test. This test should be implemented by local planning authorities with a view to locating particularly vulnerable new developments (e.g. residential, hospitals, mobile homes etc.) outside of the floodplain. As the development proposes a replacement of an existing warehouse a full sequential test is considered outside the scope of this report.

The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Areas within Flood Zone 1 have been shown to be at a less than 0.1% annual probability of flooding from rivers and/or a less than 0.1% annual probability of flooding from the sea.

Following the published Flood Risk and Coastal Change Planning Policy Guidance (PPG) Table 2 and NPPF guidelines, the proposed development is classed as 'Less vulnerable', as it will be used for storage and distribution.

The NPPF Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table is reproduced below;

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	✗	Exception Test Required	✓
	Zone 3b Functional Floodplain	Exception Test Required	✓	✗	✗	✗

TABLE 1 THE SEQUENTIAL TEST: FLOOD RISK VULNERABILITY AND FLOOD ZONE 'COMPATIBILITY' TABLE AS SPECIFIED BY NPPF.

PLEASE NOTE: ✓ MEANS AN EXCEPTION TEST IS NOT REQUIRED; ✗ MEANS THE DEVELOPMENT SHOULD NOT BE PERMITTED.

Using the principles of the Sequential Test outlined above, the proposed development is classed as 'More Vulnerable' under the NPPF. The development areas are shown to be located within Flood Zone 1 (as defined by the EA flood map for planning in Figure 2) and therefore, in accordance with Table 1 above the proposed development would be acceptable without the need for an Exception Test.

6 Sources of Flooding

6.1 Tidal and Fluvial

The Environment Agency (EA) mapping for Flood Risk (Figure 2), shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Areas within Flood Zone 1 have been shown to be at a less than 0.1% chance of flooding from rivers and/or the sea in any given year.

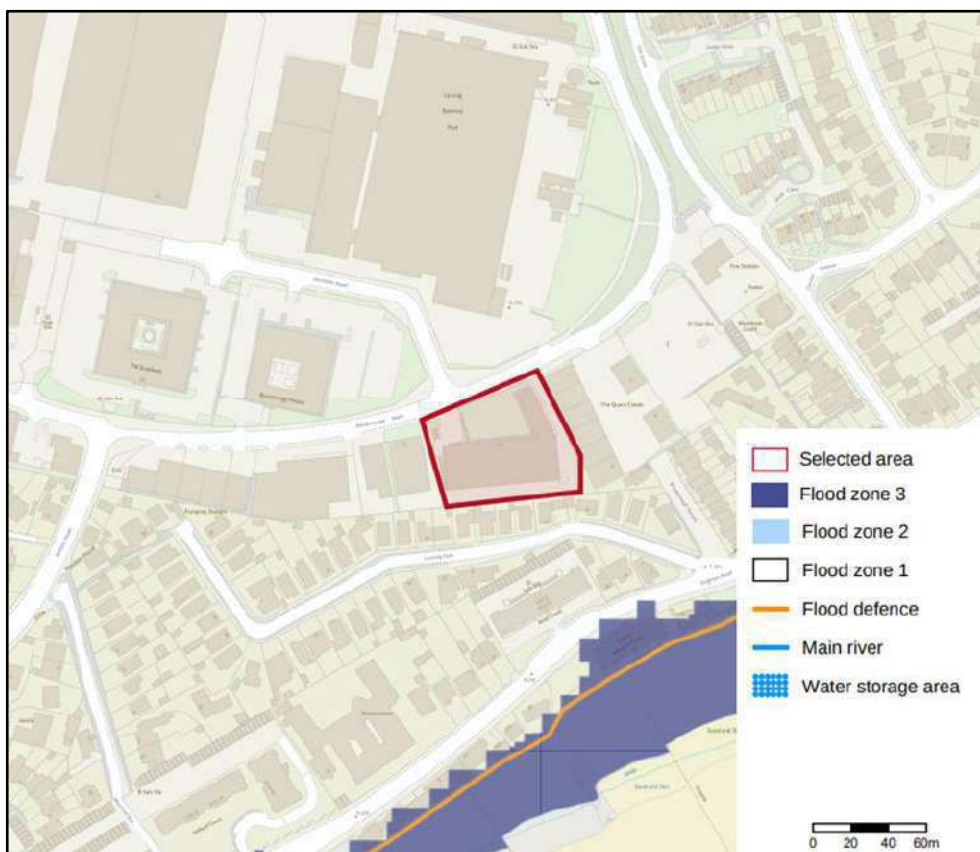


FIGURE 2: EA FLOOD MAP FOR PLANNING EXTRACT. RED LINE SHOWS THE EXTENT OF PROPOSED DEVELOPMENT SITE

6.2 Surface Water

The EA Long Term Risk of Flooding from Surface Water (RoFSW) map data (figure 3) below shows the site to be at very low risk from surface water flooding. Very low risk means that each year this area has a chance of flooding of less than 0.1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.



FIGURE 3: LONG TERM ROFSW MAP EXTRACT - EXTENT OF FLOODING(SOURCE: EA)

6.3 Groundwater

According to the Adur District Council Strategic Flood Risk Assessment groundwater mapping, groundwater levels are within 0.5m and 0.025m of the ground surface. Based off of this information, groundwater flood risk to the site can be considered low as the proposed building is located within the site at a higher ground level than the road to the front.

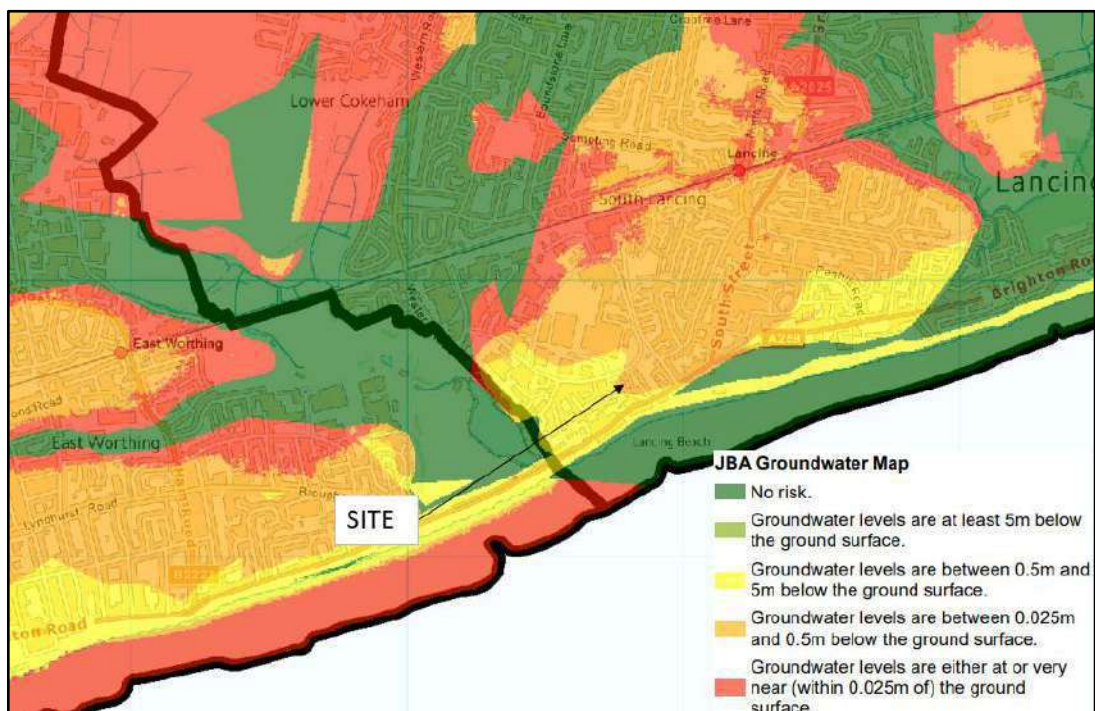


FIGURE 4: ADC SFRA GROUNDWATER MAPPING

6.4 Sewer

The Adur District Council SFRA includes information from the Southern Water Sewer Incident Report Form(SIRF). This data shows there to be 6 recorded sewer flood incidents between August 2014 and March 2019 for the postcode in which the site is located(BN15 8). This is above average for the district, but still objectively low. Based on this information, sewer flood risk to the site could be considered medium.

Post code	Recorded flood incidents	Post code	Recorded flood incidents
BN11 1	1	BN14 8	1
BN11 3	3	BN14 9	3
BN11 5	1	BN15 0	4
BN12 4	2	BN15 8	6
BN13 1	1	BN15 9	4
BN13 2	7	BN42 4	4
BN13 3	1	BN43 5	1
BN14 0	1	BN43 6	2
BN14 7	3	Total: 45	

FIGURE 5: ADC SFRA SIRF

In order to minimise the risk of sewer waters backing up into the site in the event of public sewer surcharge, it is proposed that non-return valves are fitted to the offsite connections from the site. This is deemed to be a suitable mitigation measure for the level of risk to the site. Any new offsite sewer connections are subject to the approval of the local sewer authority and any approvals should be sought prior to commencement onsite.

6.5 Reservoir

The proposed development site is not shown to be within the extent of reservoir flooding, according to the EA long term flood risk mapping.

7 Flood Resilience And Resistance

Given the site is not shown to be located within an area that places the building at immediate flood risk (site is located within Flood Zone 1 and at Very low risk of surface flooding) specific flood resistance and resilience measures are not specifically required.

Given the relatively low level of flood risk on site finished floor levels of the unit should ideally be raised 150mm above surrounding ground levels, where feasible, to mitigate potential residual risks from exceedance events causing overland flow around the building.

8 Climate Change Allowances

Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO₂) emissions to the atmosphere.

Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances and River Catchment peak river flow allowances.

The data published on the DEFRA database shows the site located within the Adur and Ouse Management Catchment and for this development (lifespan 100 years) an upper end allowance of 25% should be applied to rainfall events.

As the site is located within Flood Zone 1 a climate change allowance for peak river flow does not need to be applied to this development.

9 Residual Risks

Residual risks will be limited to exceedance rainfall events causing overtopping of the designed drainage or blockage in underground drainage. The following section of flood risk management measures details mitigation strategies.

The proposed building is shown sited within redline boundary in an area that is raised in relation to the levels in Marlborough Road. This would offer protection from residual risks such as sewer surcharge and overland flow on Marlborough Road.

Given the relatively low level of flood risk on site finished floor levels of the unit should ideally be raised 150mm above surrounding ground levels, where feasible, to mitigate potential residual risks from exceedance events causing overland flow around the building.

10 Flood Risk Management Measures

Given the relatively low level of flood risk on site the following flood mitigation measures are deemed to be suitable:

- Finished floor levels of the unit should ideally be raised 150mm above surrounding ground levels, where feasible, to mitigate potential residual risks from exceedance events causing overland flow around the building
- Surface water runoff should be managed and reduced in line with current SuDS guidance outlined within the Ciria SuDS manual C753 and local guidance. The surface water management and SuDS strategy are discussed within the following sections of this report.

11 Sustainable Urban Drainage Assessment

In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
	1.	Store rainwater for later use	✓	Rainwater harvesting is being considered by the developer and could be used around the wider site where feasible
	2.	Use infiltration techniques, such as porous surfaces in non-clay areas	x	According to BGS records, infiltration rates are likely unsuitable for large scale infiltration SuDS
	3.	Attenuate rainwater in ponds or open water features for gradual release	x	Insufficient space on site to accommodate open water SuDS features
	4.	Attenuate rainwater by storing in tanks or sealed water features for gradual release	✓	Attenuation will be provided by a geocellular crate in order to reduce runoff rates from the site
	5.	Discharge rainwater direct to a watercourse	x	No watercourse available for direct connection
	6.	Discharge rainwater to a surface water sewer/drain	✓	The existing offsite Surface water connection is proposed to be reused.
	7.	Discharge rainwater to Combined Sewer	x	Not necessary due to management higher up hierarchy

Table 1: SuDS Drainage Hierarchy

Following the SuDS drainage hierarchy infiltration rates are not likely to be suitable for managing surface water runoff according to information in section 4.

The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 2, below.

SUITABILITY OF SUDS COMPONENTS		
SuDS Component	Comment	Suitability
Infiltrating SuDS	According to BGS records, infiltration rates are likely unsuitable for large scale infiltration SuDS but infiltration of access paths may be feasible	✓
Permeable Pavement	Paved pathways to the rear and side of the building to be of permeable construction. Lined paving is shown to the car park where ground water may be close to the surface.	✓
Green / Blue Roofs	Unsuitable due to slope of roofs	x
Rainwater Harvesting	Rainwater harvesting for re-use in amenity/landscaped areas has been shown	✓
Swales	Unsuitable due to insufficient space on site to implement	x
Rills and Channels	Not deemed necessary for this site	x
Bioretention Systems	Bioretention systems would overall provide little benefit to storage volumes but offer interception and retention benefits as well as biodiversity and amenity benefits and are incorporated where feasible.	✓
Retention Ponds and Wetlands	Unsuitable due to insufficient space on site to implement	x
Detention Basins	Unsuitable due to insufficient space on site to implement	x
Geocellular Systems	Geocellular systems can be configured to suit almost every site/development. They can be used in this development to provide necessary attenuation storage.	✓
Proprietary Treatment Systems	An oil interceptor is proposed to treat runoff from the lorry loading area	✓
Filter Drains and Filter Strips	Not deemed necessary for this site	x

Table 3: Suitability of SuDS Components

11.1 Permeable Pavement

Permeable pavements are efficient in treating oils and metals but also in intercepting debris and silt. The permeable paving to external paved surfaces (i.e. external paved areas) would be Type A in order to treat storm water and allow it to infiltrate. The permeable paving to parking bays would be Type C (due the potential for high groundwater) in order to treat storm water and provide interception storage.

Typical construction of permeable pavement could consist of the following:

- Permeable Concrete blocks (or similar such as permeable resin bound gravel).
- Laying Course Material.
- Geotextile filter.
- Sub-Base: 6-20mm Clean Crushed Stone (depth varies for attenuation storage).
- Geotextile filter or impermeable membrane as required.

Guidance about proper use, installation and maintenance of any proprietary system should be provided by the supplier and incorporated into the site proposals at detailed design stage.

11.2 Geocellular storage

Geocellular systems can be used to control and manage rainwater surface water runoff either as a soakaway or as a storage tank. In this instance as a storage tank underneath the car parking.

The modular/honeycomb nature of geocellular systems means that they can be tailored to suit the specific requirements of any site. The maintenance of Geocellular crates consists of regular inspection of silt traps, manholes, pipework and pre-treatment devices, with removal of sediment and debris as required.

Guidance about proper use, installation and maintenance of any proprietary system should be provided by the supplier and incorporated into the site proposals at detailed design stage.

11.3 Bioretention areas

Bioretention areas are shallow landscaped depressions which are typically under drained and rely on engineered soils, enhanced vegetation and filtration to remove pollution and reduce runoff downstream. They are aimed at managing and treating runoff from frequent rainfall events.

Guidance about proper use, installation and maintenance of any proprietary system should be provided by the supplier and incorporated into the site proposals at detailed design stage.

12 Surface Water Drainage Strategy

In accordance with local guidance, developments are required to use SuDS to reduce runoff rates to the public drainage system.

Greenfield runoff rates for the site are low, so designing a strategy to reduce runoff rates to greenfield rates would be impractical. As a result, it is proposed runoff rates will be limited to 1.6l/s, to provide a large degree of betterment over brownfield rates. This runoff rate was chosen in order to reduce the half drain time of the storage to below 24 hours. A hydrobrake is proposed as part of the strategy, in order to provide this flow reduction.

The runoff from the roofs and parking areas is proposed to be routed to and attenuated by a geocellular tank below the car park. The tank will have a plan area of 260m² with a depth of 0.8m and a porosity of 0.95 giving a volume of 197.6m³. The geocellular tank would provide storage volume sufficient to reduce runoff to a maximum of 1.6l/s for all events up to and including 100yr+25%CC storm event.

The catchment area that is going to be attenuated by the geocellular tank is the car parking and lorry parking areas, as well as the building roof. This totals to approximately 2600m². The paved pathways at the side and rear of the building are proposed to be of permeable construction and as such will be self-draining.

SURFACE WATER DISCHARGE RATES SUMMARY					
	Area (ha)	Discharge Rates (l/s)			
		2 year/Q _{BAR}	30 year	100 year	100 year +25%CC
Greenfield Rates (site area)	0.41	0.07	0.16	0.22	-
Existing Brownfield Rates (existing hardstanding)	0.32	63.2	165.4	208.4	260.3
Proposed Runoff Rates (proposed hardstanding)	0.26	1.6	1.6	1.6	1.6
Betterment		97%	99%	99%	99%

Table 4: Surface water discharge rates summary

It is proposed that the existing surface water offsite connection be reused. This drain appears to discharge to an existing storm sewer underneath Marlborough Road. This sewer is not shown on Southern Water asset plans and is understood to be a Highways maintained drain.

Interception storage can be provided at the front of the property through the use of permeable paving to the front car parking. This paving is to be lined as the site is shown in an area where ground water could be up to 0.5m below ground level (See section 4). Interception storage can be provided at the rear through introduction of a bioretention area in the rear garden area.

A proposed storm drainage strategy plan layout is included in Appendix II with relevant calculations within Appendix III.

13 Foul Water Drainage Strategy

Southern Water have provided sewer record plans for the local area, which shows a 150mm diameter foul water sewer running underneath Marlborough Road. A CCTV survey has also been conducted showing there to be existing foul water drainage onsite which connects into the foul water sewer.

New foul water pipes are proposed onsite, which will reuse the existing offsite connection into the foul water sewer. A proposed foul drainage strategy layout is included on the site layout drainage plans in Appendix II.

14 Water Quality

The primary risk to water quality is from the lorry loading area. Runoff from the loading bay is proposed to be treated via a separate proprietary treatment oil interceptor to offer appropriate level of treatment prior to discharge to the surface water network for attenuation.

Runoff from the carpark is shown to be treated via the introduction of an area of permeable paving. This also offers interception and retention potential into the scheme in the paved frontage area.

Runoff from the roofs is considered to be largely uncontaminated and so does not require treatment.

15 Schedule of Maintenance

All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be confirmed and agreed with the site owners before handover and ongoing operation.

In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.

The property owner will be responsible for the management and maintenance of SuDS devices.

The maintenance of the geocellular system should be in accordance with the manufacturer's recommendations.

The maintenance of the oil interceptor for the lorry loading bay should also be in accordance with the manufacturer's recommendations.

General maintenance of key SuDS components are provided below.

PROPOSED SCHEDULE OF MAINTENANCE FOR BELOW GROUND DRAINAGE				
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Surface Water Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Foul Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried as necessary
Soakaways and catchpits	1 year		N/A	Cleansing to be carried as necessary
Petrol interceptor: Chamber and Alarm	1 year	1 year	N/A	Maintenance in accordance with manufacturer's instructions
Permeable Block Paving	1 year	'Swept' clean of debris every 2 years	N/A	Lift block and remove sand bedding and replace and re-bed paving – refer manufacturers recommendations.

Table 5: Schedule of Maintenance for below ground drainage

16 Conclusion

Haworth McCall have been instructed to prepare a site-specific Flood Risk Assessment (FRA), Surface Water Drainage Strategy (SWDS) and Foul Water Drainage Strategy (FWDS) for the development at 75 Marlborough Road, Lancing, BN15 8UG.

It is understood that the proposals are for the demolition of the existing buildings on site and construction of a replacement warehouse.

Bedrock on site is shown to comprise of clay, silt and sand with superficial deposits of sand and gravel. Site investigation returned reasonable infiltration rates, however given that no winter groundwater testing has been undertaken, and the sites proximity to the coast, it is assumed that site geology will not be suitable for large scale SuDS

The site is considered to be at low risk of fluvial and tidal flooding and very low risk from surface water flooding. Groundwater flood risk is considered low risk, sewer flooding is considered medium risk and reservoir flooding is considered low risk.

Given the relatively low flood risk it is recommended that finished floor levels of the unit should ideally be raised 150mm above surrounding ground levels, where feasible, to mitigate potential residual risks from exceedance events causing overland flow around the building.

This drainage strategy proposes to discharge via the existing offsite connection into the nearby surface water sewer. A geocellular tank will be used to provide attenuation with a storage volume of 197.6m³. Runoff will be reduced to a maximum of 1.6l/s for all events up to and including 100yr+25%CC storm event. Paved pathways are to be of permeable construction

This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and based on the findings of this report, it is deemed that the development could be constructed without worsening the flood risk on site or offsite.

Appendix I

Appendix II

Appendix III

Calculated by: Brendan Haworth

Site name: MC0338

Site location: Scouts Stores

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

Site Details

Latitude: 50.82018° N

Longitude: 0.3295° W

Reference: 1363308623

Date: Sep 27 2023 09:41

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.41

Methodology

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

SPR estimation method: Calculate from SOIL type

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.

Soil characteristics

	Default	Edited
SOIL type:	1	1
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.1

(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.

Hydrological characteristics

	Default	Edited
SAAR (mm):	700	700
Hydrological region:	7	7
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

(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):	0.07	0.07
1 in 1 year (l/s):	0.06	0.06
1 in 30 years (l/s):	0.16	0.16
1 in 100 year (l/s):	0.22	0.22
1 in 200 years (l/s):	0.26	0.26

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.

CAUSEWAY 		File: livedesign calcs detail.pfd Network: Storm Network 1 MN 05/01/24		Page 1 Scouts stores Proposed network																																																																																																							
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Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
✓	Attenuation tank			7.400	1200	1.600
✓	19	0.008	4.00	8.450	150	1.300
✓	HBMH	0.016	4.00	7.120	1200	1.620
✓	Outflow			7.200	1200	2.280
✓	22			7.650	600	1.300
✓	23			7.200	600	1.400
✓	14			8.300	600	1.200
✓	17			8.300	600	0.600
✓	18			8.300	600	0.700
✓	20			8.300	600	0.800
✓	21			8.300	600	0.900
✓	24			8.300	600	1.000
✓	25			8.300	600	1.100
✓	26	0.059	4.00	7.100	600	1.500
✓	27	0.014	4.00	8.450	150	1.300

Links

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)	Rain (mm/hr)
? 7.000	1	14	1.846	0.600	7.150	7.100	0.050	36.9	100	4.02	50.0
? 1.008	2	15	11.843	0.600	6.800	6.700	0.100	118.4	225	5.42	50.0
? 1.009	15	16	10.003	0.600	6.700	6.600	0.100	100.0	225	5.54	50.0
✓ 1.010	16	CPMH	9.991	0.600	6.600	6.500	0.100	99.9	225	5.67	50.0
? 1.011	CPMH	Attenuation tank	7.287	0.600	6.500	6.400	0.100	72.9	225	5.75	50.0
? 10.000	6	16	2.783	0.600	6.700	6.600	0.100	27.8	100	4.03	50.0
? 9.000	4	15	2.769	0.600	6.750	6.700	0.050	55.4	100	4.04	50.0
? 12.000	8	CPMH	2.827	0.600	6.600	6.500	0.100	28.3	100	4.03	50.0
? 8.000	19	2	3.295	0.600	7.150	6.800	0.350	9.4	100	4.02	50.0
? 11.000	10	CPMH	10.394	0.600	6.650	6.500	0.150	69.3	100	4.19	50.0
✓ 1.012	Attenuation tank	HBMH	9.982	0.600	5.800	5.500	0.300	33.3	225	5.82	50.0
? 1.013	HBMH	Outflow	3.707	0.600	5.500	4.920	0.580	6.4	300	5.83	50.0
? 13.001	22	23	10.448	0.600	6.350	5.800	0.550	19.0	100	4.10	50.0

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
7.000	1	14	1.273	10.0	2.2	1.059	1.100	0.008	0.0	32	1.017
1.008	2	15	1.200	47.7	26.4	1.045	1.145	0.102	0.0	119	1.228
1.009	15	16	1.307	52.0	30.3	1.145	1.245	0.118	0.0	123	1.355
1.010	16	CPMH	1.308	52.0	34.3	1.245	1.345	0.133	0.0	134	1.396
1.011	CPMH	Attenuation tank	1.533	61.0	41.8	1.345	0.775	0.162	0.0	137	1.647
10.000	6	16	1.468	11.5	4.0	1.650	1.370	0.015	0.0	40	1.329
9.000	4	15	1.037	8.1	4.0	1.600	1.270	0.015	0.0	49	1.027
12.000	8	CPMH	1.457	11.4	4.0	1.750	1.470	0.015	0.0	40	1.319
8.000	19	2	2.534	19.9	2.2	1.200	1.170	0.008	0.0	22	1.659
11.000	10	CPMH	0.926	7.3	3.5	1.700	1.470	0.014	0.0	49	0.917
1.012	Attenuation tank	HBMH	2.275	90.5	41.8	1.375	1.395	0.162	0.0	108	2.234
1.013	HBMH	Outflow	6.256	442.2	66.6	1.320	1.980	0.259	0.0	78	4.552
13.001	22	23	1.780	14.0	2.2	1.200	1.300	0.008	0.0	26	1.279

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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)	Rain (mm/hr)
? 13.002	23	HBMH	9.889	0.600	5.800	5.620	0.180	54.9	100	4.26	50.0
? 13.000	12	22	1.171	0.600	7.150	6.350	0.800	1.5	100	4.00	50.0
? 1.007	14	2	33.745	0.600	7.100	6.800	0.300	112.5	225	5.25	50.0
? 1.001	17	18	10.715	0.600	7.700	7.600	0.100	107.2	225	4.16	50.0
? 1.002	18	20	10.570	0.600	7.600	7.500	0.100	105.7	225	4.30	50.0
? 1.003	20	21	9.964	0.600	7.500	7.400	0.100	99.6	225	4.42	50.0
? 1.004	21	24	9.685	0.600	7.400	7.300	0.100	96.8	225	4.55	50.0
? 1.005	24	25	10.090	0.600	7.300	7.200	0.100	100.9	225	4.67	50.0
? 1.006	25	14	9.593	0.600	7.200	7.100	0.100	95.9	225	4.79	50.0
? 1.000	11	17	1.470	0.600	7.750	7.700	0.050	29.4	100	4.02	50.0
? 2.000	13	18	1.958	0.600	7.650	7.600	0.050	39.2	100	4.03	50.0
Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
13.002	23	HBMH	1.041	8.2	5.7	1.300	1.400	0.022	0.0	61	1.124
13.000	12	22	6.447	50.6	2.2	1.200	1.200	0.008	0.0	14	3.240
1.007	14	2	1.232	49.0	24.2	0.975	1.045	0.094	0.0	112	1.230
1.001	17	18	1.262	50.2	2.2	0.375	0.475	0.008	0.0	32	0.638
1.002	18	20	1.271	50.5	6.1	0.475	0.575	0.024	0.0	52	0.861
1.003	20	21	1.310	52.1	10.1	0.575	0.675	0.039	0.0	67	1.021
1.004	21	24	1.328	52.8	14.1	0.675	0.775	0.055	0.0	80	1.131
1.005	24	25	1.301	51.7	18.1	0.775	0.875	0.070	0.0	92	1.189
1.006	25	14	1.335	53.1	22.1	0.875	0.975	0.086	0.0	101	1.272
1.000	11	17	1.428	11.2	2.2	0.600	0.500	0.008	0.0	30	1.110
2.000	13	18	1.236	9.7	4.0	0.700	0.600	0.015	0.0	45	1.179

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Links

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)	Rain (mm/hr)
? 3.000	9	20	2.272	0.600	7.550	7.500	0.050	45.4	100	4.03	50.0
? 4.000	7	21	2.271	0.600	7.450	7.400	0.050	45.4	100	4.03	50.0
? 5.000	5	24	1.976	0.600	7.350	7.300	0.050	39.5	100	4.03	50.0
? 6.000	3	25	2.203	0.600	7.250	7.200	0.050	44.1	100	4.03	50.0
? 15.000	26	HBMH	5.290	0.600	5.600	5.500	0.100	52.9	300	4.04	50.0
? 14.000	27	23	1.265	0.600	7.150	5.800	1.350	0.9	100	4.00	50.0

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.000	9	20	1.146	9.0	4.0	0.800	0.700	0.015	0.0	46	1.110
4.000	7	21	1.146	9.0	4.0	0.900	0.800	0.015	0.0	46	1.111
5.000	5	24	1.230	9.7	4.0	1.000	0.900	0.015	0.0	45	1.173
6.000	3	25	1.164	9.1	4.0	1.100	1.000	0.015	0.0	46	1.128
15.000	26	HBMH	2.166	153.1	15.1	1.200	1.320	0.059	0.0	63	1.392
14.000	27	23	8.059	63.3	3.5	1.200	1.300	0.014	0.0	16	4.323

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
7.000	1.846	36.9	100	Circular	8.309	7.150	1.059	8.300	7.100	1.100
1.008	11.843	118.4	225	Circular	8.070	6.800	1.045	8.070	6.700	1.145
1.009	10.003	100.0	225	Circular	8.070	6.700	1.145	8.070	6.600	1.245

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
7.000	1	150	Manhole	Adoptable	14	600	Manhole	Adoptable
1.008	2	600	Manhole	Adoptable	15	600	Manhole	Adoptable
1.009	15	600	Manhole	Adoptable	16	600	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.010	9.991	99.9	225	Circular	8.070	6.600	1.245	8.070	6.500	1.345
1.011	7.287	72.9	225	Circular	8.070	6.500	1.345	7.400	6.400	0.775
10.000	2.783	27.8	100	Circular	8.450	6.700	1.650	8.070	6.600	1.370
9.000	2.769	55.4	100	Circular	8.450	6.750	1.600	8.070	6.700	1.270
12.000	2.827	28.3	100	Circular	8.450	6.600	1.750	8.070	6.500	1.470
8.000	3.295	9.4	100	Circular	8.450	7.150	1.200	8.070	6.800	1.170
11.000	10.394	69.3	100	Circular	8.450	6.650	1.700	8.070	6.500	1.470
1.012	9.982	33.3	225	Circular	7.400	5.800	1.375	7.120	5.500	1.395
1.013	3.707	6.4	300	Circular	7.120	5.500	1.320	7.200	4.920	1.980
13.001	10.448	19.0	100	Circular	7.650	6.350	1.200	7.200	5.800	1.300
13.002	9.889	54.9	100	Circular	7.200	5.800	1.300	7.120	5.620	1.400
13.000	1.171	1.5	100	Circular	8.450	7.150	1.200	7.650	6.350	1.200
1.007	33.745	112.5	225	Circular	8.300	7.100	0.975	8.070	6.800	1.045
1.001	10.715	107.2	225	Circular	8.300	7.700	0.375	8.300	7.600	0.475

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.010	16	600	Manhole	Adoptable	CPMH	600	Manhole	Adoptable
1.011	CPMH	600	Manhole	Adoptable	Attenuation tank	1200	Manhole	Adoptable
10.000	6	150	Manhole	Adoptable	16	600	Manhole	Adoptable
9.000	4	150	Manhole	Adoptable	15	600	Manhole	Adoptable
12.000	8	150	Manhole	Adoptable	CPMH	600	Manhole	Adoptable
8.000	19	150	Manhole	Adoptable	2	600	Manhole	Adoptable
11.000	10	150	Manhole	Adoptable	CPMH	600	Manhole	Adoptable
1.012	Attenuation tank	1200	Manhole	Adoptable	HBMH	1200	Manhole	Adoptable
1.013	HBMH	1200	Manhole	Adoptable	Outflow	1200	Manhole	Adoptable
13.001	22	600	Manhole	Adoptable	23	600	Manhole	Adoptable
13.002	23	600	Manhole	Adoptable	HBMH	1200	Manhole	Adoptable
13.000	12	150	Manhole	Adoptable	22	600	Manhole	Adoptable
1.007	14	600	Manhole	Adoptable	2	600	Manhole	Adoptable
1.001	17	600	Manhole	Adoptable	18	600	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	10.570	105.7	225	Circular	8.300	7.600	0.475	8.300	7.500	0.575
1.003	9.964	99.6	225	Circular	8.300	7.500	0.575	8.300	7.400	0.675
1.004	9.685	96.8	225	Circular	8.300	7.400	0.675	8.300	7.300	0.775
1.005	10.090	100.9	225	Circular	8.300	7.300	0.775	8.300	7.200	0.875
1.006	9.593	95.9	225	Circular	8.300	7.200	0.875	8.300	7.100	0.975
1.000	1.470	29.4	100	Circular	8.450	7.750	0.600	8.300	7.700	0.500
2.000	1.958	39.2	100	Circular	8.450	7.650	0.700	8.300	7.600	0.600
3.000	2.272	45.4	100	Circular	8.450	7.550	0.800	8.300	7.500	0.700
4.000	2.271	45.4	100	Circular	8.450	7.450	0.900	8.300	7.400	0.800
5.000	1.976	39.5	100	Circular	8.450	7.350	1.000	8.300	7.300	0.900
6.000	2.203	44.1	100	Circular	8.450	7.250	1.100	8.300	7.200	1.000
15.000	5.290	52.9	300	Circular	7.100	5.600	1.200	7.120	5.500	1.320
14.000	1.265	0.9	100	Circular	8.450	7.150	1.200	7.200	5.800	1.300
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type		
1.002	18	600	Manhole	Adoptable	20	600	Manhole	Adoptable		
1.003	20	600	Manhole	Adoptable	21	600	Manhole	Adoptable		
1.004	21	600	Manhole	Adoptable	24	600	Manhole	Adoptable		
1.005	24	600	Manhole	Adoptable	25	600	Manhole	Adoptable		
1.006	25	600	Manhole	Adoptable	14	600	Manhole	Adoptable		
1.000	11	150	Manhole	Adoptable	17	600	Manhole	Adoptable		
2.000	13	150	Manhole	Adoptable	18	600	Manhole	Adoptable		
3.000	9	150	Manhole	Adoptable	20	600	Manhole	Adoptable		
4.000	7	150	Manhole	Adoptable	21	600	Manhole	Adoptable		
5.000	5	150	Manhole	Adoptable	24	600	Manhole	Adoptable		
6.000	3	150	Manhole	Adoptable	25	600	Manhole	Adoptable		
15.000	26	600	Manhole	Adoptable	HBMH	1200	Manhole	Adoptable		
14.000	27	150	Manhole	Adoptable	23	600	Manhole	Adoptable		

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Drain Down Time (mins)	1440	Check Discharge Rate(s)	x
Summer CV	0.950	Skip Steady State	x	Additional Storage (m ³ /ha)	0.0	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0

Node HBMH Online Hydro-Brake® Control

Replaces Downstream Link	Flap Valve	x	Objective	(HE) Minimise upstream storage
Invert Level (m)		5.500	Sump Available	✓
Design Depth (m)		1.100	Product Number	CTL-SHE-0066-2000-1100-2000
Design Flow (l/s)		2.0	Min Outlet Diameter (m)	0.100
			Min Node Diameter (mm)	1200

Node Attenuation tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	5.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	300.0	0.0	0.800	300.0	0.0
			0.801	0.0	0.0

Appendix IV

Appendix V

Project

Project Name: Scout Stores - Lancing

Project Description: CCTV Survey

Project Status: Complete

Project Date: 28/09/2023

Inspection Standard: MSCC5 Sewers & Drainage GB (SRM5 Scoring)



EYES ON DRAINAGE

CCTV-Trace-Plot-Map-Repair



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Scout Stores - Lancing

Project Number

Project Date
28/09/2023

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Project Information**Project Name**
Scout Stores - Lancing**Project Number****Project Date**
28/09/2023**Client**

Company: Haworth McCall Consulting
Street: 28 Edward St
Town or City: Brighton
County: E.Sussex
Post Code: BN2 0JL
Phone: 01273 617 117
Email: solutions@haworthmccall.co.uk

**Site**

Department: Scout Stores
Street: Marlborough Rd
Town or City: Lancing
County: West Sussex
Post Code: BN15 8UG

Contractor

Company: Eyes On Drainage Services Ltd
Contact: Jay Young
Department: Merrion House
Street: Bines Green
Town or City: Horsham
County: West Sussex
Post Code: RH13 8EH
Phone: 01403 710971
Mobile: 077111 84951
Email: info@eyesondrainage.co.uk



Project Information

Project Name
Scout Stores - Lancing

Project Number

Project Date
28/09/2023

Project Drawing, Page 'Scout Stores - Lancing'



Scoring Summary

Project Name
Scout Stores - Lancing**Project Number****Project Date**
28/09/2023

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
1	SWMH3X	4	Fractures, multiple at joint from 12 o'clock to 12 o'clock

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	SWMH3X	3	Multiple defects
2	FWMH7X	3	Joint displaced, medium

Abandoned Surveys

Section	PLR	Description
All inspections complete, none are abandoned.		

Information

These scoring summaries are based on the SRM grading from the WRc.



Project Pictures

Project Name
Scout Stores - Lancing

Project Number

Project Date
28/09/2023



SWMH3



FWMH7

Section Profile

Project Name
Scout Stores - Lancing

Project Number

Project Date
28/09/2023

Circular, 150 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
1	SWMH3	Sewer	27/09/2023	Marlborough Rd	Vitrified clay	7.40 m	7.40 m
2	FWMH7	7601	27/09/2023	Marlborough Rd	Vitrified clay	3.30 m	3.30 m

Total: 2 Inspections x Circular 150 mm, 0 mm = 10.70 m Total Length and 10.70 m Inspected Length

Total: 2 Inspections = 10.70 m Total Length and 10.70 m Inspected Length

Section Summary

Project Name Scout Stores - Lancing	Project Number	Project Date 28/09/2023
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Number of sections	2
Total length of sections	10.70 m
Total length of inspected sections	10.70 m
Total length of not inspected sections	0.00 m
Number of abandoned inspections	0
Number of section inspection photos	21
Number of section inspection videos	2
Number of section inspection scans	0
Number of section inclination measurements	0

PLR:	SWMH3X	Upstream Node:	SWMH3
Inspection Direction:	Downstream	Downstream Node:	Sewer
Inspected Length:	7.40 m	Dia/Height:	150 mm
Total Length:	7.40 m	Material:	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: SWMH3
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.70	FMJ	Fractures, multiple at joint from 12 o'clock to 12 o'clock
4	0.90	CM	Cracks, multiple from 8 o'clock to 4 o'clock, start
5	1.50	GP	General photograph taken at this point
6	2.30	JDM	Joint displaced, medium
7	2.60	CM	Cracks, multiple from 12 o'clock to 12 o'clock, change
8	3.60	CM	Cracks, multiple from 8 o'clock to 4 o'clock, change
9	4.10	JDM	Joint displaced, medium
10	5.00	JDM	Joint displaced, medium
11	5.40	FC	Fracture, circumferential from 12 o'clock to 12 o'clock
12	5.50	CM	Cracks, multiple from 8 o'clock to 4 o'clock, finish
13	5.90	JDM	Joint displaced, medium
14	6.80	FCJ	Fracture, circumferential at joint from 8 o'clock to 4 o'clock
15	6.80	JDM	Joint displaced, medium
16	7.30	FCJ	Fracture, circumferential at joint from 3 o'clock to 9 o'clock
17	7.40	MHF	Finish node, manhole, reference: Sewer

PLR:	FWMH7X	Upstream Node:	FWMH7
Inspection Direction:	Downstream	Downstream Node:	7601
Inspected Length:	3.30 m	Dia/Height:	150 mm
Total Length:	3.30 m	Material:	Vitrified clay



Section Summary

Project Name
Scout Stores - Lancing

Project Number

Project Date
28/09/2023

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: FWMH7
2	0.00	WL	Water level, 5% of the vertical dimension
3	2.40	LR	Line deviates right
4	2.70	JDM	Joint displaced, medium
5	3.30	MHF	Finish node, manhole, reference: 7601

Section Inspection - 27/09/2023 - SWMH3X

Item No. 1	Insp. No. 1	Date 27/09/23	Time 11:20	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SWMH3X
Operator JY		Vehicle BV21 CDX		Camera Pearpoint P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Lancing	Inspection Direction:	Downstream	Upstream Node:	SWMH3
Road:	Marlborough Rd	Inspected Length:	7.40 m	Upstream Pipe Depth:	2.300 m
Location:	Road	Total Length:	7.40 m	Downstream Node:	SEWER
Surface Type:	Concrete	Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	150 mm		
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:62	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 2.30 m SWMH3							
		0.00	MH	Start node, manhole, reference: SWMH3	00:00:00		
		0.00	WL	Water level, 0% of the vertical dimension	00:00:01	1	
		0.70	FMJ	Fractures, multiple at joint from 12 o'clock to 12 o'clock	00:00:08	2	4 / 2
		0.90	S02	Cracks, multiple from 8 o'clock to 4 o'clock, start	00:00:11	3, 4	
		1.50	GP	General photograph taken at this point	00:00:24	5	
		2.30	JDM	Joint displaced, medium	00:00:31	6	1 / 3
		2.60	C02	Cracks, multiple from 12 o'clock to 12 o'clock, change	00:00:43	7	
		3.60	C02	Cracks, multiple from 8 o'clock to 4 o'clock, change	00:00:57	8	
		4.10	JDM	Joint displaced, medium	00:01:12	9	1 / 3
		5.00	JDM	Joint displaced, medium	00:01:21	10	1 / 3
		5.40	FC	Fracture, circumferential from 12 o'clock to 12 o'clock	00:01:25	11	3 / 2
		5.50	F02	Cracks, multiple from 8 o'clock to 4 o'clock, finish	00:01:27		3 / 2
		5.90	JDM	Joint displaced, medium	00:01:28	12	1 / 3
		6.80	FCJ	Fracture, circumferential at joint from 8 o'clock to 4 o'clock	00:01:35	13	3 / 2
		6.80	JDM	Joint displaced, medium	00:01:37	14	1 / 3

Section Inspection - 27/09/2023 - SWMH3X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	27/09/23	11:20	Not Specified	No Rain Or Snow	No	SWMH3X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
JY		BV21 CDX		Pearpoint P540	Not Specified	Private Drain	Not Specified

Scale: 1:62

Position [m]

7.30

7.40

Sewer

Depth: m

Code

Observation

MPEG

Photo

Grade

FCJ

Fracture, circumferential at joint from 3 o'clock to 9 o'clock

00:01:43

15

3 / 2

MHF

Finish node, manhole, reference: Sewer

00:00:00

16

Construction Features					Miscellaneous Features						
Structural Defects					Service & Operational Observations						
STR No.	Def	STR Peak	STR Mean	STR Total	STR Grade	SER No.	Def	SER Peak	SER Mean	SER Total	SER Grade
10		120.0	54.7	405.0	4.0	10		3.0	2.6	19.0	4.0

Section Pictures - 27/09/2023 - SWMH3X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	SWMH3X		



1, 00:00:01, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:08, 0.70 m
Fractures, multiple at joint from 12 o'clock to 12 o'clock



3, 00:00:11, 0.90 m
Cracks, multiple from 8 o'clock to 4 o'clock, start



4, 00:00:11, 0.90 m
Cracks, multiple from 8 o'clock to 4 o'clock, start



5, 00:00:24, 1.50 m
General photograph taken at this point



6, 00:00:31, 2.30 m
Joint displaced, medium

Section Pictures - 27/09/2023 - SWMH3X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	SWMH3X		



7, 00:00:43, 2.60 m
Cracks, multiple from 12 o'clock to 12 o'clock, change



8, 00:00:57, 3.60 m
Cracks, multiple from 8 o'clock to 4 o'clock, change



9, 00:01:12, 4.10 m
Joint displaced, medium



10, 00:01:21, 5.00 m
Joint displaced, medium



11, 00:01:25, 5.40 m
Fracture, circumferential from 12 o'clock to 12 o'clock



12, 00:01:28, 5.90 m
Joint displaced, medium

Section Pictures - 27/09/2023 - SWMH3X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	SWMH3X		



13, 00:01:35, 6.80 m
Fracture, circumferential at joint from 8 o'clock to 4 o'clock



14, 00:01:37, 6.80 m
Joint displaced, medium



15, 00:01:43, 7.30 m
Fracture, circumferential at joint from 3 o'clock to 9 o'clock



16, 00:00:00, 7.40 m
Finish node, manhole, reference: Sewer



Item No. 2	Insp. No. 1	Date 27/09/23	Time 11:59	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR FWMH7X
Operator JY		Vehicle BV21 CDX		Camera Pearpoint P540	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Lancing	Inspection Direction:	Downstream	Upstream Node:	FWMH7
Road:	Marlborough Rd	Inspected Length:	3.30 m	Upstream Pipe Depth:	2.370 m
Location:	Road	Total Length:	3.30 m	Downstream Node:	7601
Surface Type:	Concrete	Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	150 mm		
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection	Lining Material:	No Lining		

Recommendations:

Scale: 1:50 Position [m]

Depth: 2.37 m
FWMH7

Code	Observation	MPEG	Photo	Grade
MH	Start node, manhole, reference: FWMH7	00:00:00	1	
WL	Water level, 5% of the vertical dimension: Live	00:00:01	2	
LR	Line deviates right	00:00:28	3	
JDM	Joint displaced, medium	00:00:31	4	1 / 3
MHF	Finish node, manhole, reference: 7601	00:00:41	5	

7601
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	1.0	0.3	1.0	1.0	1	2.0	0.6	2.0	3.0

Section Pictures - 27/09/2023 - FWMH7X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	FWMH7X		



1, 00:00:00, 0.00 m
Start node, manhole, reference: FWMH7



2, 00:00:01, 0.00 m
Water level, 5% of the vertical dimension, Live



3, 00:00:28, 2.40 m
Line deviates right



4, 00:00:31, 2.70 m
Joint displaced, medium



5, 00:00:41, 3.30 m
Finish node, manhole, reference: 7601

Disclaimer

Although every effort has been made to produce a thorough and precise report, Eyes On Drainage Services Ltd cannot be held liable for any discrepancies or omissions.

Furthermore Eyes On Drainage Services Ltd cannot be held responsible for any actions taken based on the information supplied within this report.