

2 EXISTING SITE DRAINAGE

The drainage survey enclosed in Appendix D delineates all observed surface water and foul networks within the site. The surface water runoff from the existing site discharges off site via 4 different connections into the public surface water sewer located in New Lane. Similarly, the existing foul water network is shown to discharge into the public foul water sewer in New Lane.

The existing surface water runoff is collected using an assortment of various devices including road gullies, rainwater downpipes and channels. Moreover, two surface water attenuation tanks can be observed within the existing drainage networks. One of the existing surface water networks utilises a pump chamber to convey the surface water runoff from the site. It is noted that no existing Sustainable Drainage Systems (SUDS) have been identified within the site, indicating the site discharges freely to the public sewer network.

3 PROPOSED SITE DRAINAGE

3.1 Surface Water Discharge Location

Traditional approaches to urban drainage have comprised of underground tanks and pipe networks. More recently, the benefits and opportunities to use Sustainable Drainage Systems (SuDS) have been realised and encouragement to use such systems is promoted throughout Flood Risk Management policy at all levels. SuDS is a term which encompasses a variety of approaches to managing surface water in a way which is more sympathetic to the natural and human environment than conventional piped drainage systems. Management of surface water is an essential element for reducing flood risk and SuDS techniques are often designed to achieve this in a way that mimics the natural environment.

The Building Regulations (H3) states the priority for discharging surface water runoff from a development is as follows:

1. Infiltration into the ground;
2. Discharge into a watercourse;
3. Discharge into a sewer.

In conjunction with Building Regulations H3, the primary approach to the drainage of surface water runoff must be subject to the results of an infiltration test (conducted in accordance with BRE365 guidance) commissioned on the development site, winter ground water level monitoring and the availability of good infiltration media at the proposed soakaway locations. A site-specific infiltration test (conducted in accordance with BRE365 guidance) will be commissioned on the development site to establish the suitability of the infiltration approach. However, the site is located within 'Zone 1-Subsurface Activity' Ground Water Source Protection Zone (refer to section 2.4 of the FRA report produced by Pinnacle Consulting Engineers), which is designated as most at risk from contamination and development activities. Moreover, based on the geological profile in Table 1.1 and the existing drainage network on site, infiltration is not proposed to be a suitable solution for this site, and therefore alternative discharge methods will be required.

The next method of discharge in conjunction to Building Regulation H3 would be to discharge into the nearest watercourse. No opportunity exists to discharge into watercourse as the nearest watercourse is located at approximately 60m away from the north west site boundary; beyond New Lane road and residential properties.

This report therefore proposes to discharge the surface water runoff from a development into the existing public surface water network. Discharge into the existing network is deemed more practical, in this case, as the existing site has existing connections to the nearby public sewer under New Lane road.

3.2 Local Policy

The Local Plan (Core Strategy) was adopted by the Havant Borough Council in March 2011. An extract of the flood risk management policy is included below.

Policy CS15 Flood and Coastal Erosion Risk

Development in areas at risk of flooding now and in the future as identified on the latest Environment Agency flood risk maps and Strategic Flood Risk Assessment climate change maps will only be permitted where:

1. *It meets the sequential and exception test (where required) in relation to PPS25.*
2. *The site is located in a low hazard area as defined in the Strategic Flood Risk Assessment.*

3. *A site-specific flood risk assessment demonstrates that the development will be safe, including the access, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*
4. *The scheme incorporates flood protection, flood resilience and resistance measures appropriate to the character and biodiversity of the area and the specific requirements of the site.*
5. *Appropriate flood warning and evacuation plans are in place.*
6. *New site drainage systems are designed taking account of events which exceed the normal design standard.*

All development will be required to ensure that there is no net increase in surface water run off. Priority should be given to incorporating Sustainable Drainage Systems (SuDS) to manage surface water drainage, unless it is proven that SuDS are not appropriate. Where SuDS are provided arrangements must be put in place for their whole life management and maintenance.

The council will work with partners to implement the Coastal Policy Zones in the North Solent Shoreline Management Plan to ensure that development avoids areas at risk from coastal erosion and coastal flooding and that areas required to offset coastal squeeze and prevent habitat fragmentation, to allow species to adapt to climate change, are identified and protected from development.

A pre- submission version of the Havant Borough Local Plan with changes was published in September 2020 and is expected to be submitted to the Secretary of State after consultation. Extracts of all relevant drainage and flood risk management policies are included below.

Policy E19 Managing flood risk in new development

Planning permission will only be granted where:

- a. *The proposal meets the sequential and exception tests as set out in the NPPF and relevant local guidance;*
- b. *The development will be safe over its lifetime without increasing flood risk elsewhere;*
- c. *Any proposed flood protection, resilience and resistance measures address the specific requirements of the site, and are appropriate to the character and biodiversity of the area;*
- d. *Opportunities have been explored to reduce flood risk;*
- e. *Where necessary, appropriate flood warning and evacuation plans are in place; and*
- f. *Where necessary, a contribution has been made towards any identified flood alleviation scheme(s).*

Policy E20 Drainage infrastructure in new development

Planning permission will only be granted where:

- a. *Run-off rates have been reduced to below the pre-development rate, or, if this is not possible, there is no net increase in surface water run-off compared with the pre-development rate;*
- b. *Drainage systems meet the drainage needs of the development in full over the lifetime of the development and do not increase flood risk elsewhere;*
- c. *The drainage strategy incorporates SuDS, unless there is clear evidence that this would be inappropriate;*
- d. *Arrangements have been made between the applicant and the service provider for the timely delivery of sewerage network reinforcement; and*

- e. Any existing sewerage infrastructure is taken into account in site layout, to safeguard future access for maintenance and upsizing purposes.

3.3 Proposed Development Runoff Rate

As the proposed development site is a fully developed Brownfield site and currently discharging surface water into the Southern Water sewer at unrestricted rate via 3 numbers of discharge locations in New Lane Road. Using the modified rational method, the existing surface water runoff rate from the site has been estimated. The below table outlines the existing run off rates for a number of events. The average intensities are based on FSR rainfall data and a winter rainfall profile for a duration of 15 minutes, please refer to the Micro Drainage results (provided below) for determining the average intensity values in Table 1.

$$Q = 2.78 \times C \times i \times A$$

where,

Q = design event peak rate of runoff (l/s)

C = non – dimensional runoff coefficient, taken as 1.00

i = rainfall intensity of the design return period (in mm/hr)

A = total catchment area in ha, (paved area = 6.20ha)

Event	Average intensity (i) 15min Winter Event	Calculation	Brownfield Discharge Rate (l/s)
QBar	50mm/hr	$Q = 2.78 \times 1.00 \times 50 \times 6.20$	861.80
1 in 1 year	20.181mm/hr	$Q = 2.78 \times 1.00 \times 20.181 \times 6.20$	347.84
1 in 30 year	66.019mm/hr	$Q = 2.78 \times 1.00 \times 66.019 \times 6.20$	1137.90
1 in 100 year	101.063mm/hr	$Q = 2.78 \times 1.00 \times 101.063 \times 6.20$	1741.92

Table 3.1- Existing Surface Water Runoff Rates

The brownfield runoff rate calculated using the Modified Rational Method was 861.80l/s. As part of our proposal, the following discharge rates (≥50% betterment to the existing brownfield runoff rates) for the development are proposed.

- 1 in 1 year return period storm event = 174 l/s (50% betterment)
- 1 in 30 year return period storm event = 395 l/s (65% betterment)
- 1 in 100 year return period storm event plus 20% climate change = 395 l/s (77% betterment)

The proposed impermeable area of 56,960m² from six catchments: (A) 14,355m² (B) 11,486m² (C) 6,171m² (D) 11,950m² (E) 11,715m² (F) 1,081m² will be divided into three separate networks. Refer to Appendix E for the proposed Catchment Plan. Table 3.2 outlines the proposed discharge rates from each of the three surface water networks at various storm return periods.

Return Period (year) 1 in (X)	Discharge rate (l/s)		
	Network 1 (Catchment A, B and F)	Network 2 (Catchment C and D)	Network 3 (Catchment E)
1	60	62	52
30	135	140	120
100 (plus 20% climate change)	135	140	120

Table 3.2 – Summary of discharge rates

A pre-development enquiry to Southern Water was submitted on the 14th of December 2020 and they have confirmed that their surface water sewers have sufficient capacity to accommodate the runoff from the proposed development (see Appendix K).

3.4 Proposed Development Surface Water Drainage Strategy

The proposed development plan necessitates demolition of existing structures and construction of new development. The surface water runoff from the proposed impermeable areas in catchment A, B, C, D, E and F (total impermeable area of 56,960m²) will be collected into three separate networks (see Appendix E). The surface water runoff from the existing footpath along the western site boundary will flow into the surrounding landscaping. It is also noteworthy to mention there is a significant increase in permeable areas from 4,897m² to 10,105m² (over 106%) (see Appendix F).

Due to the nature of the development, most of the site is impermeably surfaced and opportunities for SuDS features are limited. Car parking bays are to be permeable block paving. The surface water runoff from van parking areas, loading docks and the access road will pass through high-capacity slot drainage channels, gullies and filtered through the petrol interceptor before they enter the designated cellular storage tanks. Petrol interceptor will prevent potential contaminants that are present in the form of hydrocarbons from oil spillages from reaching into the underground storage tanks. Flows will then be restricted to prescribed discharge rates by using flow control devices (hydrobrakes) before discharging into the two outfall points within New Lane. A Pump chamber will be required for the proposed surface water network collecting runoff from catchment A, whereas rest of the surface water runoff will be conveyed through a gravity piped network. See Appendix G for the proposed drainage plan.

The attenuation volume required for the proposed development has been modelled in MicroDrainage (see Appendix H). Based on calculations designed to meet the storage demand for all events up to and including a 1 in 100 years + climate change event (20%), a total cellular attenuation storage capacity of 1046.15m³ (excluding storage capacity from high-capacity slot drainage channels and permeable paving) will be required for the total site. Following CCTV surveys of the existing attenuation tanks on site in April 2021, the conditions of both tanks were deemed acceptable for reuse. However, due to the size and position of the existing tanks, it will not be possible to incorporate these into the proposed design so both tanks will be abandoned.

3.5 Exceedance Flow Routes

In the event that the capacity of the attenuation is exceeded, flood water will be directed away from the buildings, and towards the service yard and car parking areas. The exceedance flow path plan is enclosed in Appendix L.

3.6 Proposed Development Foul Water Drainage Strategy