

SUDS REPORT

Site Address

202 Long Drive,
Ruislip,
HA4 0HY

On behalf of

Studio Infinitii

Project Ref: 202-LD

Version: 1.0

Date: 1st February 2021

Introduction

The SuDs Report is prepared to support discharge of condition 6 (scheme for provision of sustainable water management) application for original planning application ref: 66827/APP/2020/1706 which was for a single storey side extension and single storey side/rear extension at 202 Long Drive, Ruislip, HA4 0HY.

The purpose of this report is to establish the flood risk to the site from all protentional sources and consideration of surface water management as a result of the development.

Site Description

The proposal site is the existing residential dwelling located at **202 Long Drive, Ruislip, HA4 0HY.**

Grid Reference: TQ 11820 85954 (Figure 1)

The site is located within the administrative boundary of London Borough of Hillingdon, which is the Local Planning Authority.

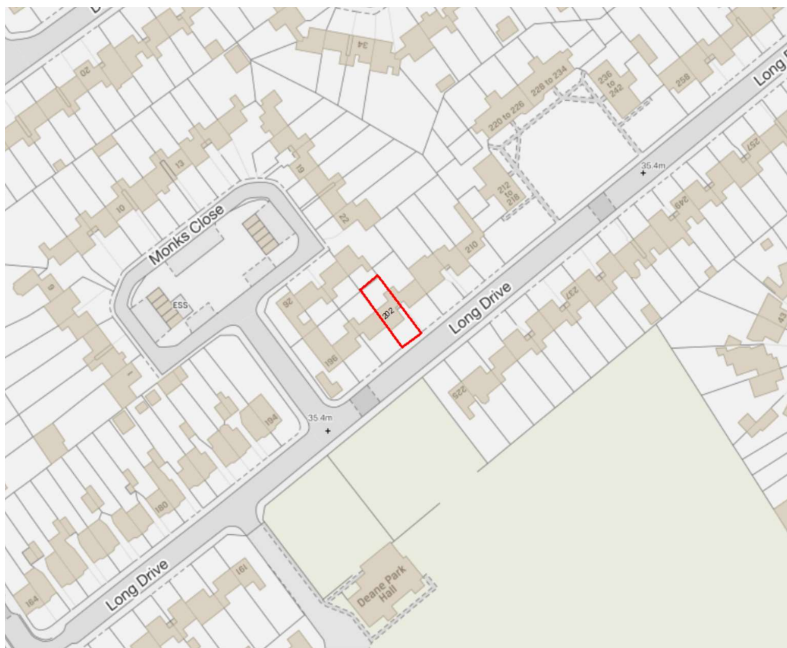


Figure:1 Location of the development site, highlighted



Figure:2 Aerial photograph of the development site, highlighted

Proposed Development

Figure 3 shows the existing floor layouts and Figure 4 shows the proposed floor layouts.

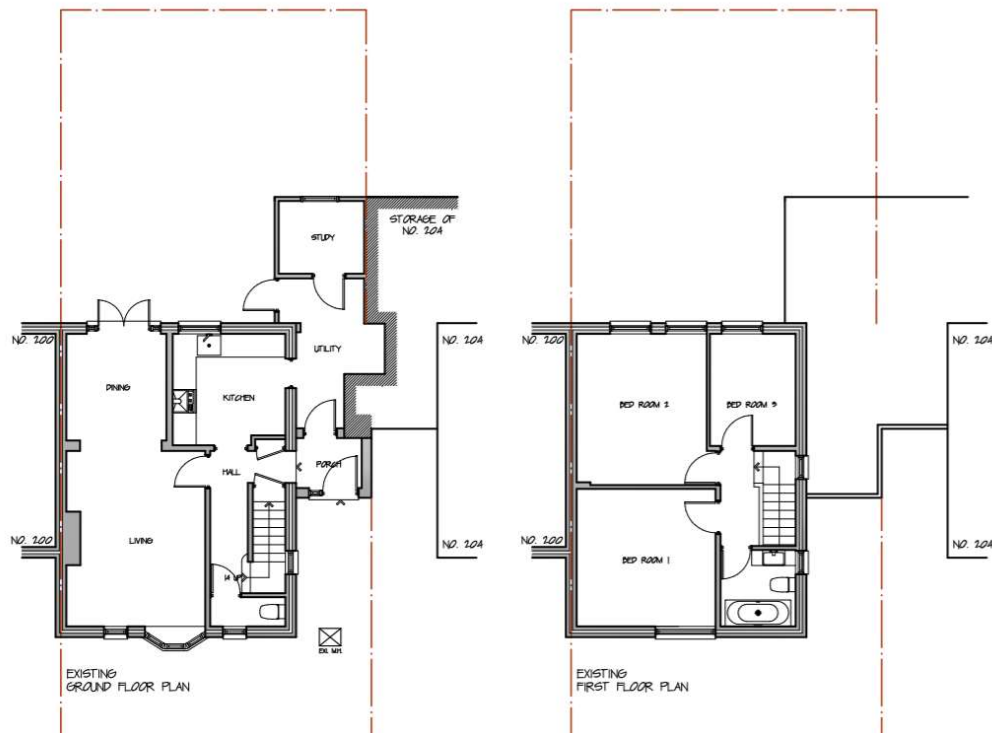


Figure:3 Existing Floor Layout

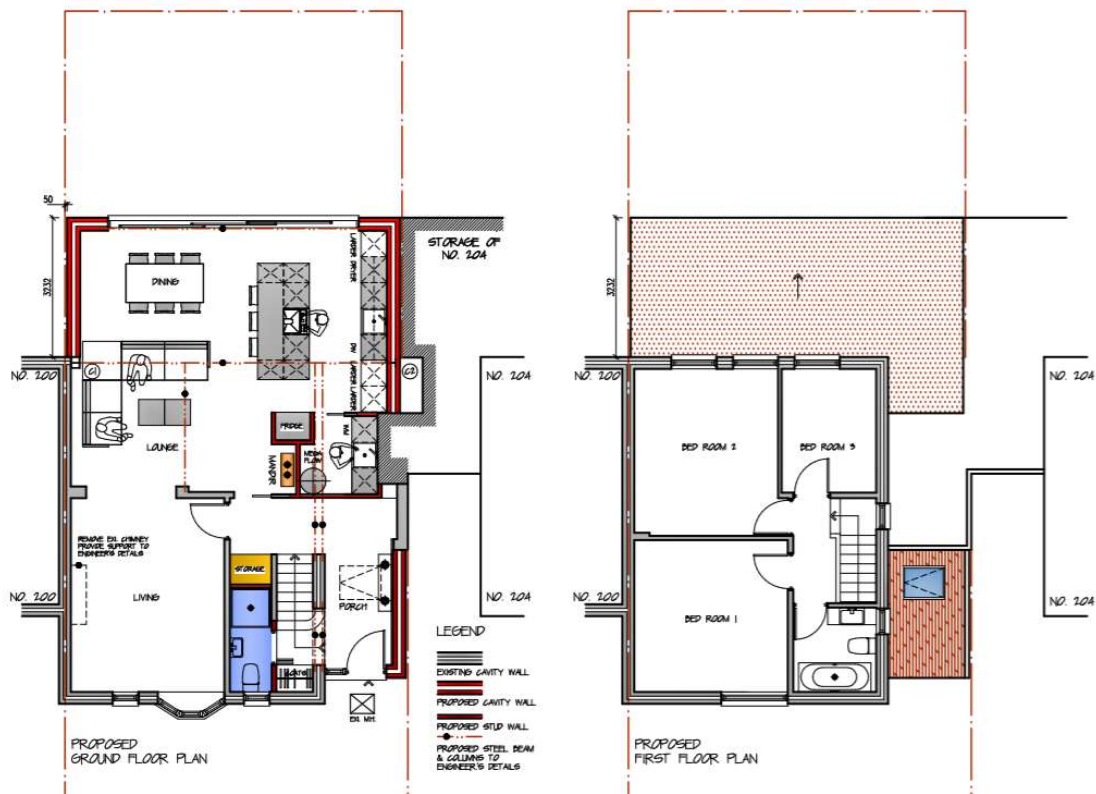


Figure:4 Proposed Floor Layout

Flood Zones

Fluvial Flood Map:

The Environment Agency's Flood Map for Planning (Rivers and Sea) identifies fluvial and tidal flood zones. Figure 5, below, presents the Flood Map for the development site and the surrounding area.

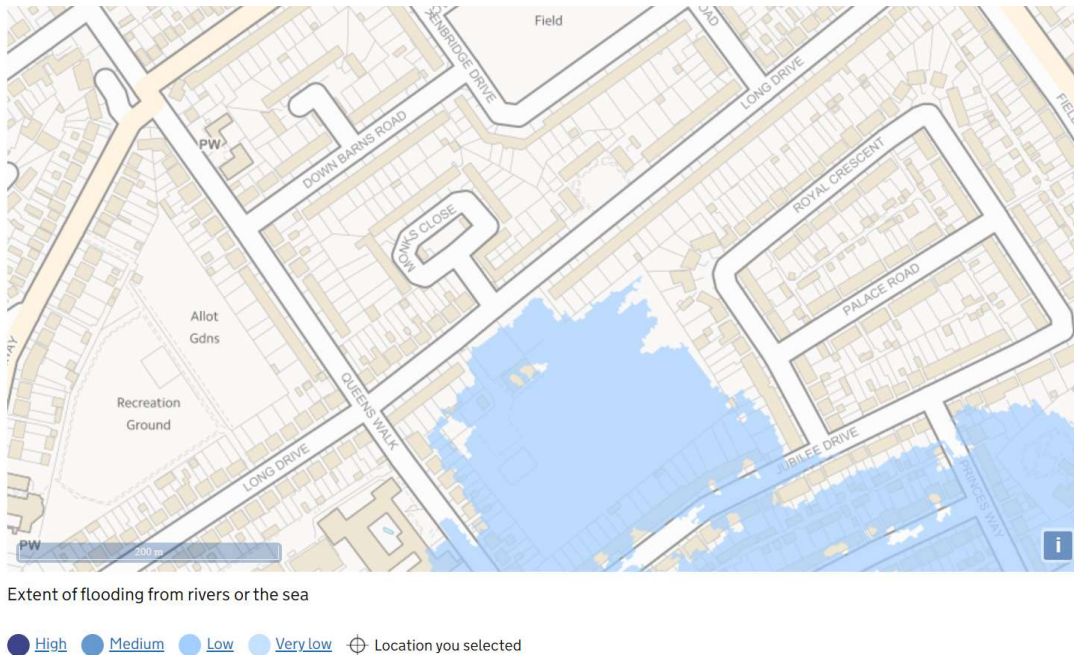


Figure:5 EA Fluvial Flood Extent Map

The EA Fluvial Flood Extent Map identifies the development site to lie within Flood Zone 1, where the chance of flooding is less than 1 in 1000 (0.1%) annual probability of flooding.

Information from Joint West London SFRA website has also been acquired – see Figure 6 below. This confirms that the property is outside the fluvial flood zone 2 & 3 flood extent.

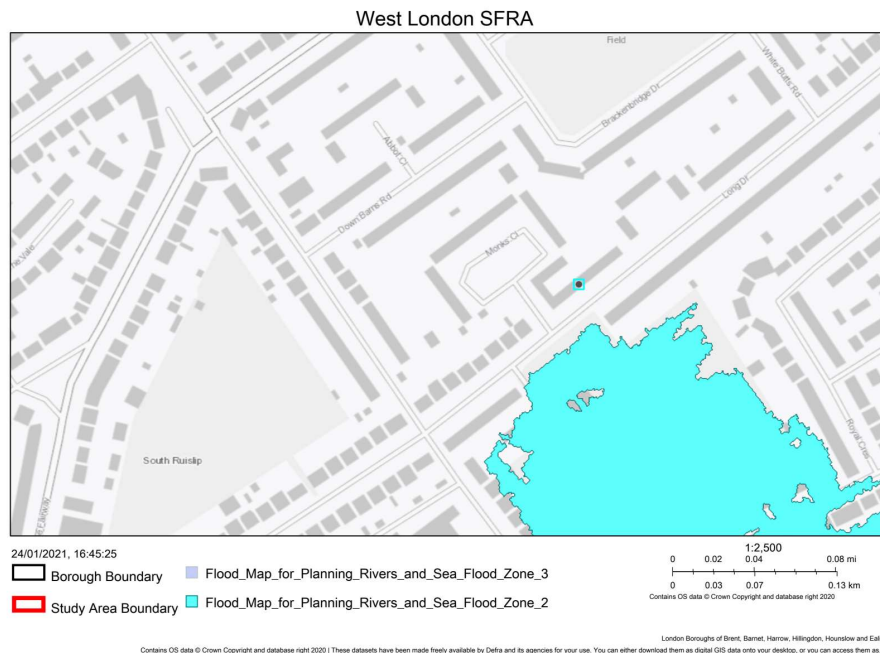


Figure:6 SFRA Fluvial Flood Extent Map

Surface Water Flood Maps:

The Environment Agency's updated Flood Map for Surface Water (uFMfSW) identifies pluvial flood risk. Figure 7, below, presents the uFMfSW for the development site and the surrounding area

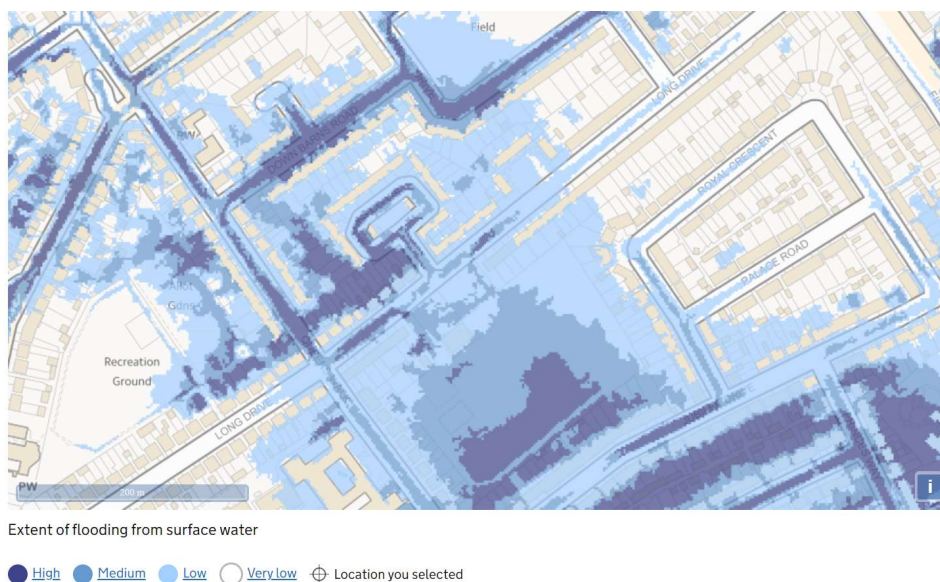


Figure:7 EA Surface Water Flood Extent Map

The uFMfSW shows that area in the vicinity of the development site is at low risk of surface water flooding. Low risk means that the probability of flooding in any given year is between 1 in 1000 (0.1%) and 1 in 100 (1%).

Information from Joint West London SFRA website has also been acquired – see Figure 8 below. This confirms that the property is outside the 1 in 30-year and 1 in 100-year surface water flood extent.

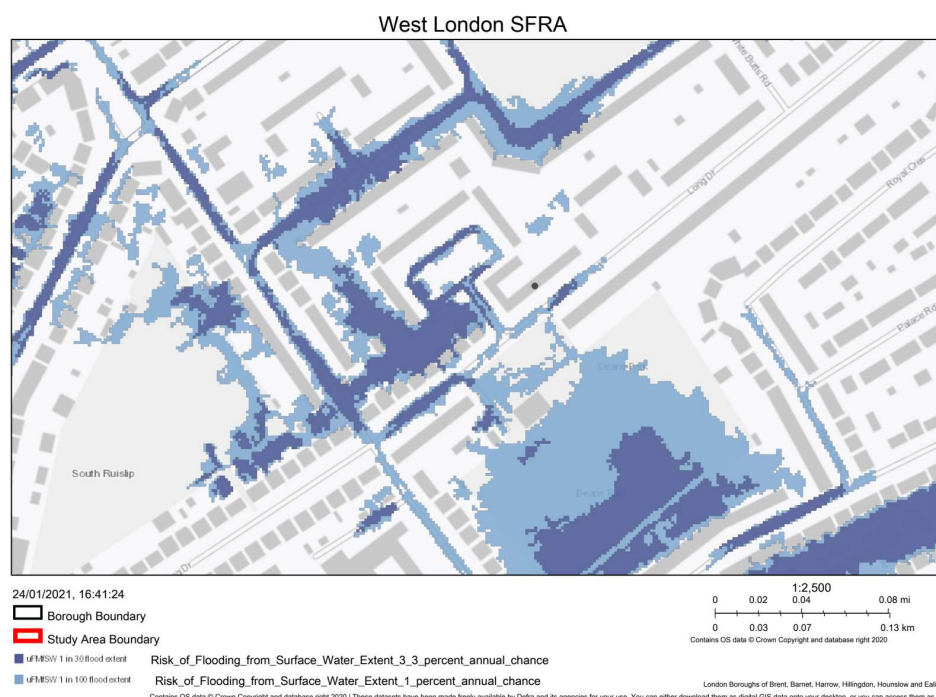


Figure:8 Joint West London SFRA Surface Water Flood Extent Map

Surface water management

Surface water is the rainwater that falls on the city's surfaces; on the ground, streets, pavements, roofs, parks, and gardens.

Flooding

When this water does not soak into the ground or drain through normal drainage systems, but lies on or flows over the ground instead, it can cause surface water flooding.

SUDS

Planning practice guidance (PPG) which is prepared by the Ministry of Housing, Communities and Local Government (DCLG) states that developers and Local Authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

As such, the developer must implement a SuDS strategy in line with the drainage hierarchy set out in Policy 5.13 of the London Plan as outlined below to reduce surface water discharges from the site.

SuDs Options

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

The requirements for SuDS will ensure that any redevelopment or new development does not negatively contribute to the surface water flood risk of other properties and instead provides a positive benefit to the level of risk in the area. It will also ensure that appropriate measures are taken to increase the

flood resilience of new properties and developments in surface water flood risk areas, such as those identified as being locally important flood risk areas.



Figure 9: Surface water storage facilities and potential SuDS features - rainwater harvesting, on-site tank storage, rain garden soak-away and green roofs. (Source: UK SuDS Manual)

Most Sustainable ↑ ↓ Least Sustainable	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
	Living roofs	✓	✓	✓
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviers	✓	✓	
	Tanked systems - over-sized pipes/tanks - storms cells	✓		

Figure 10: Suds techniques & their Benefits

The NPPF, Planning Practice Guide and the Ministerial Statement all look at the use of SuDS as a priority to aid the disposal of surface water from new developments.

Due to the minor nature of the development proposal and the size of the site there are limited opportunities for implementing SuDS. Measures such as rain-water harvesting, infiltration (soakaways, permeable paving, rain gardens) or attenuation storage tanks should be considered and the use of water butts may also be implemented for use, where appropriate, to minimise surface water runoff from the site.

Surface Water Drainage

The existing runoff rate from the site can be calculated using the Modified Rational Rainfall Method. Where $Q = 2.78 * C_v * C_r * R_i * A$

$C_v = 0.75$ – Fully impermeable areas i.e. existing roads and hardstanding

$C_r = 1.3$ – Routing Coefficient (CIRIA C697 recommends a value of 1.3)

$R_i = 120$ mm Rainfall intensity

$A = 0.013$ ha current impermeable area

$Q_{100} = 2.78 * 0.75 * 1.3 * 120 * 0.013$

$Q_{100} = 4.2$ l/s

It is assumed that the existing arrangement for the discharge of surface water from the development is into the surface water system. The overall impermeable area of the site will not be increased drastically as major part of the development is being built over impermeable ground, however we are looking at improving the current situation and hence are proposing the below options.

- We will be considering discharging the surface water from the proposed development into a soakaway.
- We will be installing a water butt at rear to capture excess rainwater and reuse it to water the planters and the garden.
- We are also proposing to replace the existing hardstanding at the front to permeable paving.

On this basis, the proposed discharge of surface water from the development will not see any surface water flooding on site in the 1 in 30 year and 1 in 100 year plus climate change events. Therefore, it will not increase the risk of surface water / sewer flooding elsewhere.



Figure 11: Proposed Surface Water Improvement Measures

Soakaway

Soakaway Design

We have considered the general design criteria for a soakaway as 1m³ of empty storage volume for every 16m² of impermeable area draining into it, and that a minimum empty volume of 3m³ should be considered.

Total impermeable area = 38m² (i.e. area of proposed extension)

Therefore, Storage volume of soakaway (m³) = $38/16 = 2.375\text{m}^3$ which is less than the minimum volume of 3m³.

Therefore, it is proposed that a circular soakaway of minimum storage volume of 3m³ (Diameter = 1.50m, Depth = 1.70m, total storage = 3m³) will be implemented at the site in order to improve the surface runoff from the site.

The location and its dimensions (length, width and depth) can be changed in order to suit the local condition ensuring that minimum of 3m³ of storage is provided. The landowners will be responsible for the repair and management of the soakaway throughout the lifetime of the proposed development.

Construction details of the proposed Soakaway

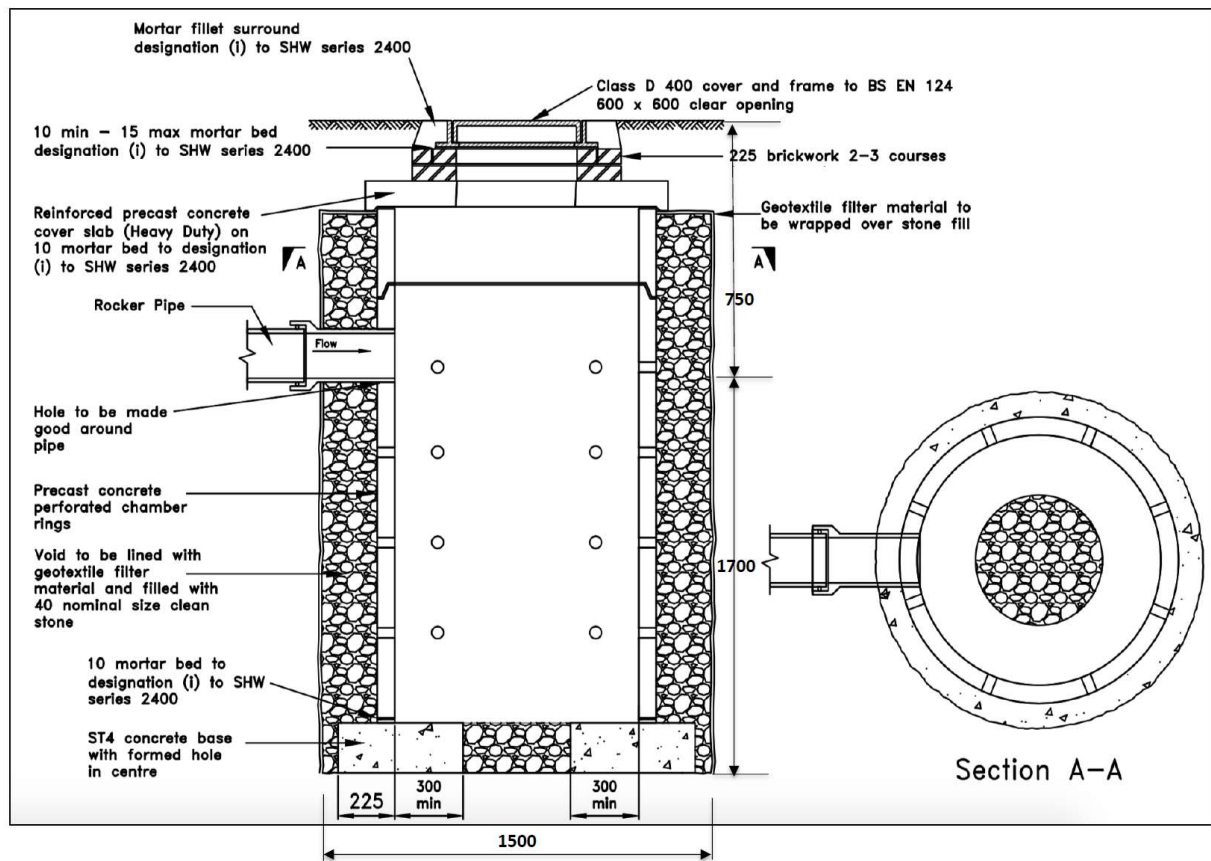


Figure 12: Construction details of Soakaway

Water Butt

Water resources in the UK are under pressure from climate change and population growth. Rainwater can be collected from the roofs of homes, garages, greenhouses and other garden structures as long as they have gutters and a down pipe that enters the drain at ground level.

A water butt is a large container used to capture and store rainwater. Water butts with rainwater diverters are designed to collect water from the down pipe and still let the overflow enter the drain.

A water butt provides a ready supply of water for all gardening needs, even when the occasional hose pipe ban is in place due to summer drought.

Harvesting rainwater reduces runoff, and therefore play a part in reducing the pressure on prevent overtaxed storm sewers.

Reduced runoff reduces the amount of fertilizer, chemicals, and other substances being washed into the waterways.

A rainwater butt or barrel will also allow to make savings on water bills.

Rainwater contains nitrates and organic matter, so it feeds and nourishes the plants.

Water Butts are ideal source of water for the flower beds, greenhouse and hanging baskets.



Figure 13: Example of Proposed Water Butt

Permeable Paving

Permeable paving systems allow stormwater to percolate and infiltrate through the pavement and into the aggregate layers and/or soil below. In addition to reducing surface runoff, permeable paving systems can trap suspended solids, thereby filtering pollutants from stormwater. The goal is to control stormwater at the source, reduce runoff and improve water quality by filtering pollutants in the subsurface layers.



Figure 14: Permeable Paving

Permeable pavement surfaces are made of either a porous material that enables stormwater to flow through it or nonporous blocks spaced so that water can flow between the gaps, trickling through to a specially prepared sub-base below the paving stones. The sub-base forms an attenuation tank where the water is stored until it soaks into the ground below the permeable paving.

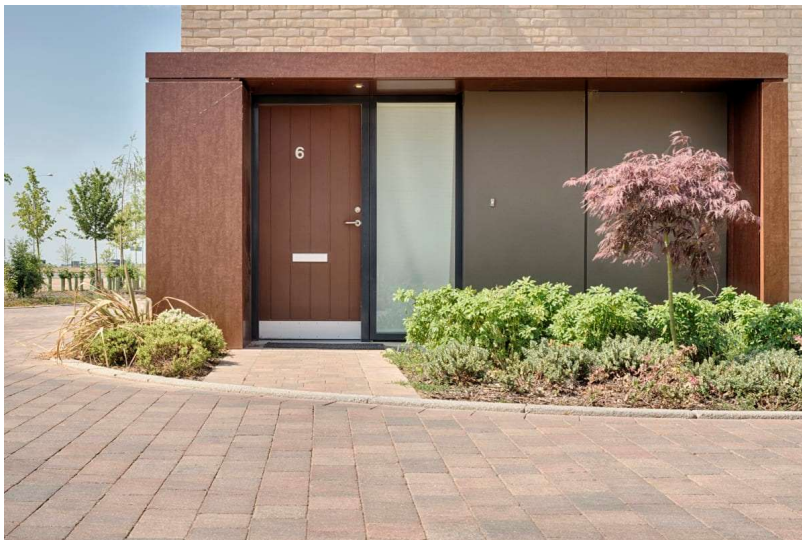
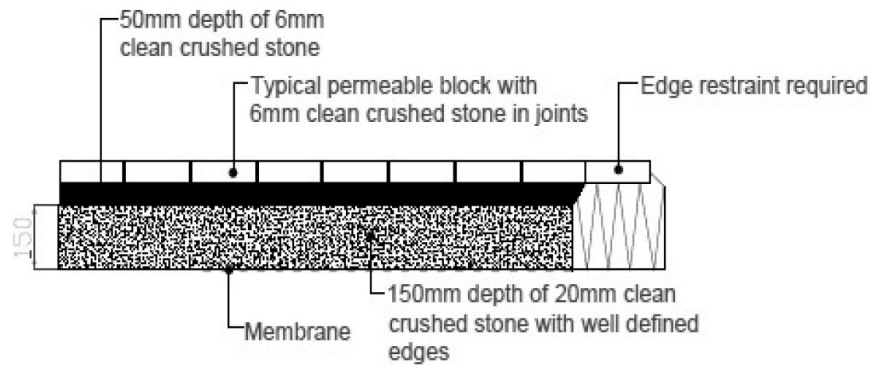


Figure 15: Example of Proposed Marshalls Tegula Priora (Traditional) Permeable Block Paving for Driveway



Typical section through a driveway constructed in accordance with Marshalls Register Installation Procedures

Scale 1:20 @ A3

Figure 16: Permeable Paving Cross Section (Source: Marshalls Manual)

Suds Maintenance Plan

This section provides guidance on the maintenance of the key features of the sustainable drainage system proposed, so that it may remain effective and functional throughout its design life. In addition to the guidance provided in this section, the operation and maintenance requirements provided by the manufactures of any proprietary systems or components should also be considered. The responsibility to maintain the drainage system lies with the property owner and the maintenance plan should be made available to them and any respective company appointed to manage the sites maintenance.

Item	Suds Feature	Maintenance Schedule	Requirement	Frequency	Responsibility
1	Soakaway	Regular Maintenance	Inspect for sediments and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually	Landowner
			Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)	Landowner
			Trimming any roots that may be causing blockage	Annually (or as required)	Landowner
		Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspection	Landowner
		Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required	Landowner
			Replacement of clogged geotextile (will require reconstruction of soakaway)	As required	Landowner
		Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually	Landowner
			Check soakaway to ensure emptying is occurring	Annually	Landowner
2	Waterbutts	Regular maintenance	Clearing of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters and other debris	Annual (or following poor performance)	Landowner
		Occasional maintenance	Replacement of any filters	As required	Landowner
		Remedial actions	Repair any erosion damage, or damage to tank	As required	Landowner
		Monitoring	inspection of tank for debris and sediment build up	Annual (or following poor performance)	Landowner

			Inspection of inlets, outlets and withdrawal devices	Annual (or following poor performance)	Landowner
			Inspection of areas receiving overflow, for evidence of erosion	After extreme storms	Landowner
			Inspection of roof drain filters	Annual (or following poor performance)	Landowner
3	Permeable paving	Regular maintenance	Brushing and vacuuming	Three times/year at end of winter, midsummer, after autumn leaf fall - or as required	Landowner
		Occasional maintenance	Removal of weeds	As required	Landowner
		Remedial actions	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users	As required	Landowner
			Rehabilitation of surface and upper surface sub-structure	As required	Landowner
		Monitoring	Initial inspection	Monthly for three months after installation	Landowner
			Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	3-monthly, 48 hours after large storms	Landowner
			Inspect silt accumulation rates and establish brushing frequencies	Annually	Landowner
			Monitor inspection chambers	Annually	Landowner