

Sustainable Drainage Options Appraisal & Strategy

10 May 2026

Eco 360

48 Wickham Way, Haywards Heath, West Sussex, RH16 1UQ

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1. Introduction

The following document is a Sustainable Drainage Options Appraisal & Strategy carried out by Oakshire Environmental, and includes details of the site, previous investigations, an evaluation of drainage options and an assessment of further investigations.

1.1 Project Overview

The client's proposed project involves the construction of a dwelling and associated work at 48 Wickham Way, Haywards Heath, West Sussex, RH16 1UQ. Oakshire Environmental have carried out a Sustainable Drainage Options Appraisal & Strategy, as described below.

1.2 Purpose of Investigation

The objectives of the Sustainable Drainage Options Appraisal & Strategy were to:

- Establish the context and setting of development at the site.
- Assess the nature of existing surface water management at the site.
- Calculate surface water storage volumes and runoff rates.
- Identify suitable sustainable drainage option(s).
- Outline a strategy for the implementation of suitable sustainable drainage option(s).

1.3 Scope of Work

- Brief introductory information will be noted to provide context to the report and will include an Introduction, Project Overview, Scope of Work and Limitations.
- Desk studies will be carried out to establish the context and setting of development and the nature of existing surface water management at the site, through analysis of information obtained from sources including the Environment Agency, Local & National Authorities, Strategic Flood Risk Assessments and Digital Terrain Model (DTM) LiDAR topographical surveys.
- Quantitative surface water analysis will be conducted, to calculate runoff rates and storage volume requirements needed to meet Environment Agency, DEFRA and CIRIA guidance.
- Identify initial feasible options for sustainable drainage at the site, including assessment of potential constraints and generic objectives, based on the estimated cost, practicality and regulatory implications of their application.
- Conduct a detailed evaluation of sustainable drainage options, including development of site-specific objectives, in order to determine which option(s) are most appropriate for the site.
- Outline a strategy for the implementation of suitable sustainable drainage option(s).
- Recommended sustainable drainage option(s) will be assessed to determine the requirement or scope of further investigations at the site.
- Supporting appendix to include photographs, maps and plans of the site.

1.4 Limitations

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This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

2. Site

The following section provides a description of the site, location and previous investigations, utilising information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located at 48 Wickham Way, Haywards Heath, West Sussex, RH16 1UQ and covers an area of approximately 630m² or 0.063ha. The site is located off the west of Wickham Way in the north of Haywards Heath.

The site is comprised of the northern half of the residential garden of the existing house, no. 48 Wickham Way. The site is predominantly grassed with a gravel entranceway off Wickham Way in the east. Site boundaries comprise residential fencing and the carriageway of Wickham Way to the east.

The site is bordered by residential land use in all directions apart from a rail line to the west behind a wooded boundary.

The site is understood to have no drainage currently.

The site has a fall from west to east with levels from 9.25mAOD in the west and 6.30mAOD in the carriageway of Wickham Way.

There are no watercourses in the vicinity of the site.

National Grid Reference: 533164E, 125225N

2.2 Proposed Development

The proposed development involves the construction of a dwelling and associated work.

The proposed dwelling and patio will have a total impermeable area of 368m² comprising the below, and the remainder of the site (~262m²) will be covered by grass and soft landscaping.

- Dwelling = 138m²
- Patio = 120m²
- Reinforced gravel = 110m²

2.3 Existing Drainage

Currently there is no surface water drainage system installed in the site.

The existing site features small impermeable areas such as a shed, walls and a gravel entrance but for the purposes of this report will be classed as entirely permeable.

Surface water and foul water from the existing off-site dwelling, 48 Wickham Way, discharge to private surface water and foul sewers in Wickham Way to the east which discharge to the public sewer.

2.4 Previous Investigations

No previous investigations regarding surface water management have been carried out at the site.

3. Sustainable Drainage Options

A Sustainable Drainage Options Appraisal requires the initial identification of feasible options for sustainable drainage at a site, based on the costs involved and the practicality of their application. Some methods may not be appropriate to a particular site and some may not be cost effective. Other site-specific constraints such as the available space can also determine the feasibility of a particular drainage option. The following section outlines objectives for the site, taking into account potential constraints, and includes a selection of feasible drainage options.

3.1 Runoff Destination

Surface water runoff from the proposed development has been assessed in accordance with the National Planning Policy Framework (NPPF), the Planning Practice Guidance (PPG) for Flood Risk and Coastal Change, the Non-Statutory Technical Standards for Sustainable Drainage Systems (SuDS), and relevant local SuDS guidance. These documents establish a sustainable hierarchy for the management of surface water, prioritising options that reduce runoff volumes and mimic natural drainage processes wherever practicable.

In line with current guidance, the preferred hierarchy for managing runoff is:

- Priority 1 - Collection and re-use of roof water for non-potable purposes
- Priority 2 - Infiltration to ground
- Priority 3 - Discharge to a surface water body
- Priority 4 - Discharge to a surface water sewer or highway drain
- Priority 5 - Discharge to a combined sewer

The purpose of this hierarchy is to minimise runoff volumes, reduce peak flows, protect the capacity of existing sewer networks, and deliver water quality, biodiversity and water-efficiency benefits. The feasibility of each option has been reviewed for the site and is summarised in the table below, with the preferred discharge route identified in the subsequent sections.

Table 1: Runoff Feasibility Summary

Runoff Destination	Feasibility Summary
Re-use for non-potable demand	Roof water from the dwelling is to be collected into a piped underground system via downpipes and directed to an underground rainwater harvesting tank which has an overflow system to a soakaway. This enables a reduction in surface water discharge from the site and the reduction in potable water use. The rainwater harvesting tank will be specified by the architect and whether this is to be used simply for irrigation or for non-potable domestic purposes.
Infiltration to ground	Nearby boreholes indicate the presence of sand, sandstone and clay with groundwater being very deep. The site is not within a Source Protection Zone. The site is within a Drinking Water Safeguard Zone, it is not in a Drinking Water Protected Area. Groundwater is noted to be of high vulnerability, and the bedrock is classified as a Secondary A Aquifer. Soils are described by the National Soil Resources Institute as 'slightly acid loamy and clayey soils with impeded drainage.' Infiltration testing has been carried out at the site, in accordance with BRE365 guidance, and shows that infiltration will be feasible to the rear of the dwelling at the west while for infiltration will not be feasible at the east of the site due to the low infiltration rate identified.
Discharge to surface water body	There are no watercourses in the vicinity of the site. Due to the third-party land between the site and any watercourse, a direct connection to a watercourse is currently not being considered.
Discharge to surface water sewer	There is a private surface water sewer in Wickham Way to the east, therefore, surface water will be discharged to this sewer where infiltration is not feasible.
Discharge to combined sewer	There are no combined sewers in the vicinity of the site.

Summary of Runoff Destination

In accordance with the Drainage Hierarchy and as explained in the table above, surface water should be discharged to the ground via infiltration where feasible and to the surface water sewer in Wickham Way where infiltration is not feasible.

Management of Water Quantity

The proposed development will increase the impermeable surface cover across the site, therefore, sustainable drainage measures will be designed to ensure that the volume of runoff from the site is attenuated and discharged within the site as does not produce a flood risk to the site or adjacent land.

3.2 Feasible Drainage Options

The proposed development will increase the impermeable surface cover across the site, therefore, sustainable drainage measures will be designed to ensure that the rate and volume of runoff from the site is not increased and is reduced to as close to the greenfield rate as is reasonably practicable.

The following sustainable drainage options are, therefore, considered appropriate for the site and will be subject to a more detailed evaluation in the following section.

1. *Infiltrating Pervious Paving*
2. *Soakaway*
3. *Rainwater Harvesting*
4. *Green Roof*

3.3 Detailed Evaluation of Drainage Options

Following the identification of feasible sustainable drainage options, a detailed evaluation of options, including development of site-specific objectives, is required to determine which option(s) are most appropriate for the site.

Table 2: Summary of Site-Specific Objectives

Mitigation Objective	Objective Type	Evaluation Criteria
Ensure that the volume of runoff from the site is not increased	General/Technical	Runoff volume for the 100 year, 6 hour event to be constrained to as close as reasonably practicable to the greenfield runoff volume
Ensure that the implemented option can be maintained for the lifetime of the development	General/Technical	Allow maintenance of selected option for a minimum of 100 years
Enable development of a drainage strategy that meets regulatory requirements	Management	Drainage strategy to be agreed with Local Authority and carried out in accordance with relevant regulations
Enable development of a drainage strategy that meets the owner's requirements	Management	Drainage strategy to be agreed with site owner

3.4 Pervious Paving

Infiltrating pervious paving could be implemented in the proposed patio while lined pervious paving could be implemented in the proposed driveway to provide a means of allowing the storage and treatment of surface water close to the surface.

Pervious paving provides treatment of surface water to improve water quality through processes including the filtration of silt and the attached pollutants, biodegradation of organic pollutants (such as petrol and diesel within the pavement construction), adsorption of pollutants and the settlement and retention of solids.

Downpipes from the proposed dwelling roof should be connected to filter chambers/catchpits and then connected directly into the sub base using diffusers, comprised of geocellular boxes wrapped in a geotextile, that extend into the sub base. Roof runoff should only be discharged to the sub base of the driveway paving and not the infiltrating patio paving to minimise the risk of potential ground stability issues.

3.5 Soakaway

Surface water runoff from the proposed dwelling roof and patio could be managed through the installation of a soakaway. A soakaway would need to be at least 5m from the foundations of the dwelling, at least 2.5m from the site boundary, at least 5m from an adopted road and, where possible, should also be built on land lower than, or sloping away from, the dwelling.

There will not be sufficient space within the development to allow a suitably sized soakaway, given the offset requirements for this concentrated surface water discharge from buildings, roads and site boundaries. A soakaway cannot be located in the rear garden without being particularly deep due to the ground levels here being higher than at the proposed dwelling.

It is considered that infiltration and off-site discharge through pervious paving represents a better solution for this site.

3.6 Rainwater Harvesting

The proposed development incorporates a rainwater harvesting tank serving the roof drainage system. Under typical weather conditions, captured runoff is stored within the tank and reused for non-potable demands within the dwelling and for external irrigation. This reuse ensures a proportion of the tank's storage volume is regularly available ahead of subsequent rainfall events.

By retaining and re-using roof runoff, the RWH system delivers a reduction in the volume of water discharged during storm events, as a proportion of rainfall is prevented from entering the drainage system entirely. The tank therefore contributes to long-term volume management, reduction in peak runoff, and alignment with the SuDS hierarchy.

It is noted that the storage provided by the rainwater harvesting tank is not relied upon in the design of any other SuDS components such as sub-base storage volume. This ensures that the drainage strategy remains true under conditions where the tank may be partially full during extreme rainfall.

3.7 Green Roof

A green roof could be implemented on the proposed rear flat roof section of the dwelling to provide storage of surface water and reductions in peak runoff rates. These can be extensive, involving shallow substrates usually covered by grass or hardy plants, or intensive, involving deeper substrates allowing growth of shrubs and trees. Water that falls on the roof will be taken up by the plants/vegetation and soil pores, with some water then lost back to the atmosphere by evapotranspiration, while remaining water will slowly percolate through the green roof and into the drainage system.

Due to the size of the flat roof area and the excessive weight that an intensive green roof would apply, an extensive green roof would be the preferred option and surface water storage could be provided through the use of shallow geo-cellular boards which can provide high porosity.

Extensive green roofs require little to no maintenance allowing it to be easily maintained for the lifetime of the development, in addition, the development of a green roof will also provide biodiversity benefits and improve the thermal performance of the building.

It is important to note that the addition of a green roof on a development of this scale will drastically change the scope and cost of the project. It has not been suggested by the Client and therefore is only being suggested as a potential solution, not a proposed option.

4. Recommendations

4.1 Sustainable Drainage Strategy

Following a detailed evaluation of feasible sustainable drainage options, the final option is selected, taking into account site-specific factors and the constraints outlined previously.

The most appropriate sustainable drainage option at the site is considered to be through the implementation of infiltrating pervious paving in the proposed patio and lined pervious paving in the proposed driveway. The construction details regarding this are outlined below.

Pervious paving should be implemented in all areas of the proposed driveway and patio.

4.2 Construction Details

Pervious paving should comprise modular permeable paving (e.g. brick paving/concrete block or slab permeable paving) in the patio areas and reinforced or resin-bound gravel for the driveway, above a sub-base of coarse graded aggregate (or Type 3 MOT), a typical buildup is detailed in the table below.

A minimum infiltration rate of 2,500mm/h (7 x 10⁻⁴m/s) is considered reasonable for a pavement surface to be considered pervious in respect to surface water management and most permeable paving designs can achieve infiltration rates of far more than this.

Table 4: Pervious paving construction

Infiltrating Pervious Paving Buildup	
Paving blocks & reinforced/resin-bound gravel by manufacturer	60mm thick paving blocks should be laid on the bedding layer, however, advice should also be sought from the manufacturer on their recommendations. Manufacturer's advice should also be sought to determine the joint spacing and joint filling requirements of the block paving.
Bedding course	A 50mm bedding layer should be placed on top of the geotextile layer. The bedding layer should comprise aggregate material of type 2/6.3 Gc 80/20 in accordance with BS EN 13242:2007.
Geotextile	A non-woven geotextile layer should be laid on top of the sub base to ensure that aggregate from the sand bedding layer is not washed down into the sub base. This layer should be laid in accordance with manufacturers' instructions and with overlaps between adjacent strips of 300mm without any folds or creases.
Sub Base	Calculations show that the proposed patio area will require a minimum sub base depth of 180mm while the proposed driveway will require a sub base depth of 450mm. These both exceed the structural requirements of 100mm and 150mm, respectively. Sub base material should have a porosity of at least 30% in accordance with BS7533-13:2009 or DfT (1998) and should also have a minimum infiltration rate of 1 x 10⁻²m/s. Sub base should be laid in 100-150mm layers and compacted to ensure the maximum density is achieved without crushing the individual particles or reducing the porosity below the design value.

To support uniform infiltration through the permeable sub-base in the patio area, the subgrade should be profiled to be as level as practicable across the full basal area. A flat formation layer promotes even distribution of stored water and avoids concentration of flows toward the downslope edge under peak conditions. This approach helps maintain consistent infiltration performance across the entire base.

Check dams formed of vertically placed impermeable membrane should be formed between any stepped areas of subbase. An impermeable flexible membrane should be laid along the site boundary on the eastern downslope edge as well as along the northern and southern boundaries of the subbase.

Across the proposed driveway area, an impermeable flexible membrane should be laid across all areas of paving and lapped at the edges. This should be manufactured from high density polyethylene (HDPE), polypropylene or ethylene propylene diene monomer rubber (EPDM) and should be durable, resistant to puncture and unaffected by potential pollutants.

The subgrade soil should be profiled to have a fall towards an outlet at the south east of the site with a gradient no flatter than 1:150 to aid the conveyance of water through the sub-base. A collector box, comprised of a geocellular box wrapped in a geotextile, should be situated at the south east of the paving which will connect to an inspection chamber fitted with a vortex flow control device that will limit the discharge rate to 1l/s. This will then discharge to the existing surface water sewer in Wickham Way to the east of the site.

Roof drainage from the proposed dwelling should be incorporated into the new drainage system, via downpipes fed into diffuser boxes before discharging into the sub base of the driveway.

Treatment design should ensure that the surface layer has sufficiently small voids to trap silt within 30mm of the surface but still be permeable enough to allow water to flow into the sub base. Modular permeable paving with type 2/6.3 jointing material and reinforced or resin-bound gravel should meet this requirement.

4.3 Maintenance

The responsibility for the maintenance of the pervious surfaces will be with the homeowners. The pavement should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

It is likely that the surface layer will become clogged to some degree over the lifetime of the development due to the build-up of silt and dirt from vehicles and off-site runoff. Despite reduction in surface infiltration due to clogging, available evidence indicates that the long-term reduced rate is more than sufficient in most cases to deal with any rainfall intensities likely to occur in the UK.

The following table provides guidance on the type of operational and maintenance requirements that are recommended and the frequency at which they should be carried out.

Maintenance Schedule

Table 5: Operation and maintenance requirements at the site

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect for and remove sediment and debris in pre-treatment components and floor of inspection tube or chamber	Annually or as required
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers' recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber	As required, based on inspections
	Removal of weeds	As required
Remedial actions	Replacement of clogged geotextile (will require reconstruction of paving buildup)	As required
	Remedial work to any depressions, rutting and cracked or broken areas of paving considered detrimental to the structural performance or a hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation and establish appropriate brushing frequencies	Annually

5. Calculations

5.1 Greenfield Runoff Rate

The greenfield runoff rate for the site has been calculated using the UKSuDS tool from HR Wallingford.

Outputs are provided in the appendix.

5.2 Pervious Paving Sub Base Depth

A 45% allowance for climate change has been applied which is the appropriate peak rainfall intensity climate change allowance for the 'Adur and Ouse' Management Catchment. Considering the site's anticipated design life the upper end allowance has been used which is in accordance with NPPF and Environment Agency guidance.

BRE365 testing has been carried out at the site including trial pits at the west and east of the site to determine the feasibility of infiltration through pervious paving in the proposed patio and driveway. An infiltration rate of 4.6×10^{-6} m/s was identified at the west of the site while an infiltration rate of 1.7×10^{-6} m/s was identified at the east.

Patio

Calculations using UKSuDS infiltration volume design tool has been used to determine the minimum subbase thickness to contain a 1% AEP storm plus climate change event with no flooding to the surface:

- Patio
 - Total infiltrating area: 120m²
 - Total contributing area: 120m²
 - Infiltration rate: 4.6×10^{-6} m/s
 - Subbase porosity: 30%
 - Factor of safety: 1.5
 - Subbase thickness required = **180mm**

Calculations show that this would half empty in 2 hours and 24 minutes.

Driveway

The infiltration volume design tool was also used to determine the sub base requirements for the driveway area and this showed that the driveway sub base would not half empty within 24 hours, therefore, infiltrating pervious paving is not feasible in the driveway area.

The UKSuDS surface water storage volume design tool was, therefore, used to determine the sub base thickness required to limit the 1% AEP plus climate change event to a value as close as reasonably practicable to the greenfield rate. The 50% AEP greenfield rate for the proposed driveway contributing area (i.e. dwelling footprint and driveway area) is 0.1l/s.

It is not considered feasible to limit the runoff rate from the proposed development area to the 50% AEP greenfield rate, due to the risk of blockages, therefore, it is proposed to limit the runoff rate for the 1% AEP rainfall event, including an allowance for climate change, to 1l/s:

- Driveway
 - Total base area: 110m^2
 - Total contributing areas 138m^2 of roof + 110m^2 of driveway = 238m^2
 - Discharge rate: 1l/s
 - Subbase porosity: 30%
 - Subbase thickness required = **450mm**

Outputs are shown in the appendix.

6. References

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UK Centre for Ecology & Hydrology. *Flood Estimation Handbook Web Service*. [online] Available at: <fehweb.ceh.ac.uk>.

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Appendix - Site Maps & Plans	
Description	
Site location plan	
Sources	
Contains OS data © Crown copyright and database rights	
Key	
	Site boundary
	North

Appendix - Site Maps & Plans

Description

Proposed site plan

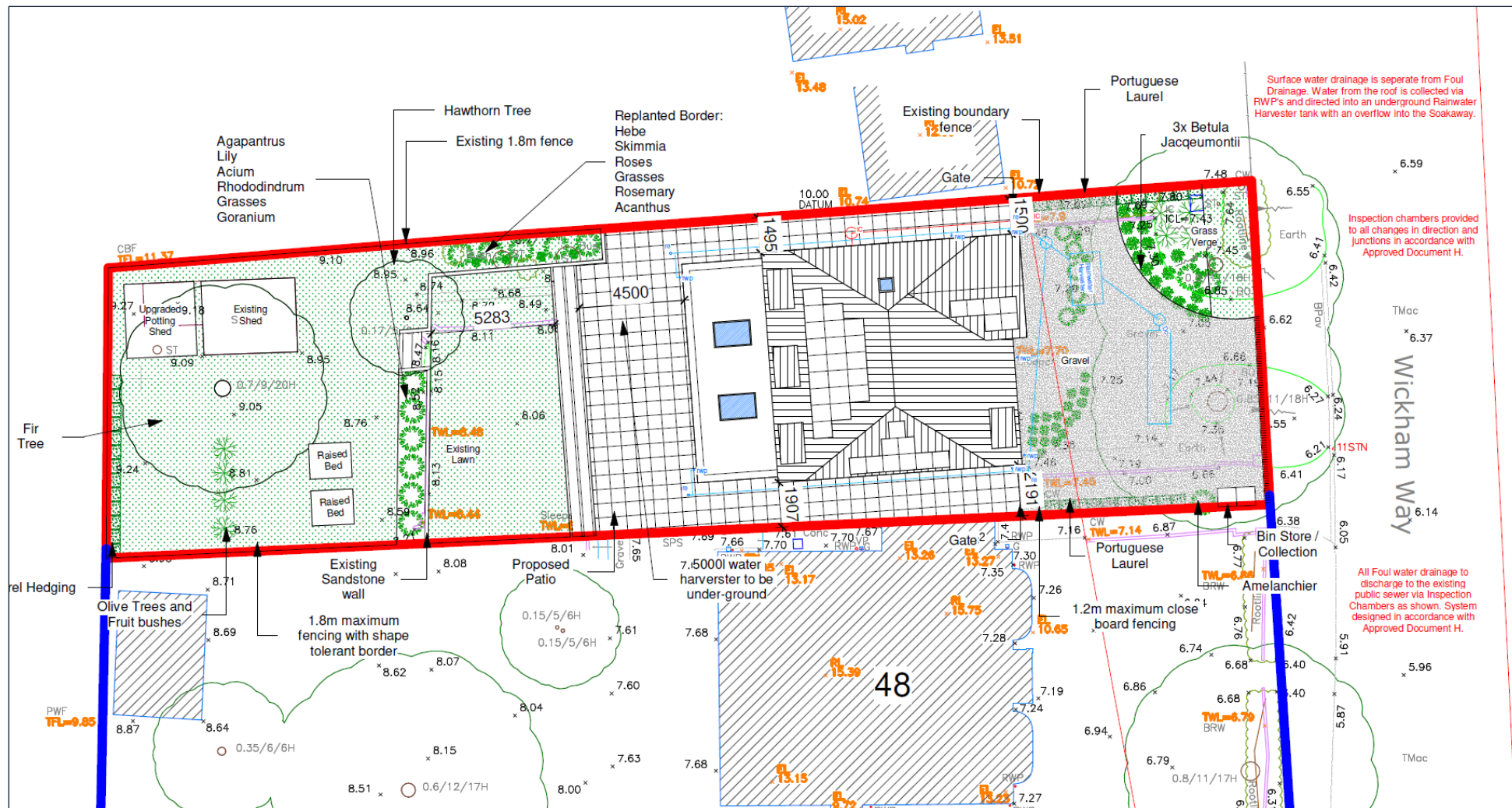
Sources

Fleming Homes

Key

Site boundary

▲ North



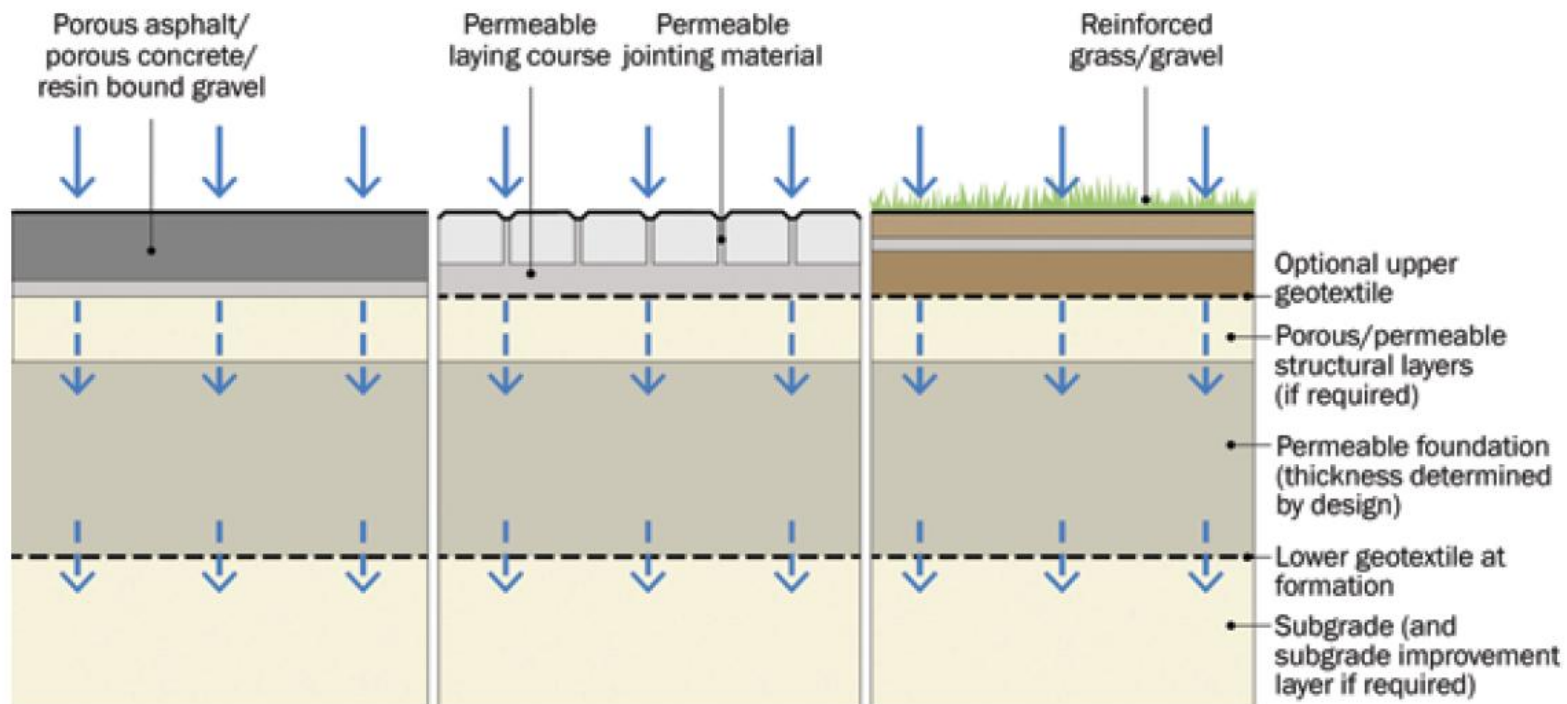
Appendix - Example Construction Drawings

Description

Infiltrating pervious paving cross section

Sources

The SuDS Manual



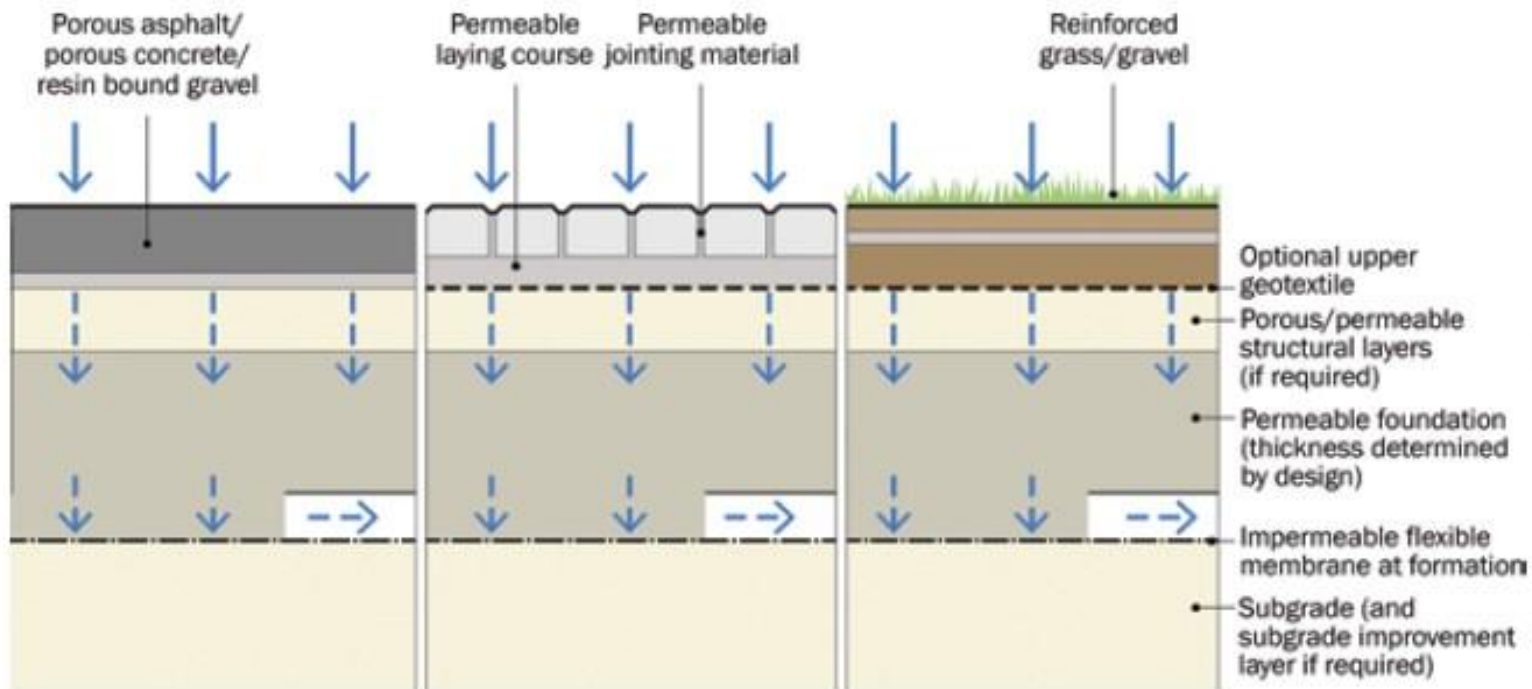
Appendix - Example Construction Drawings

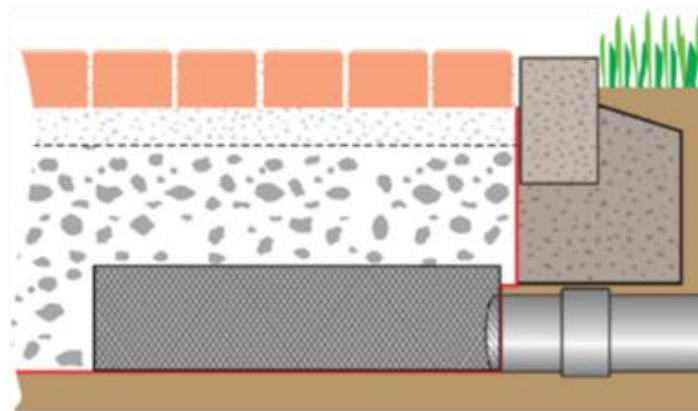
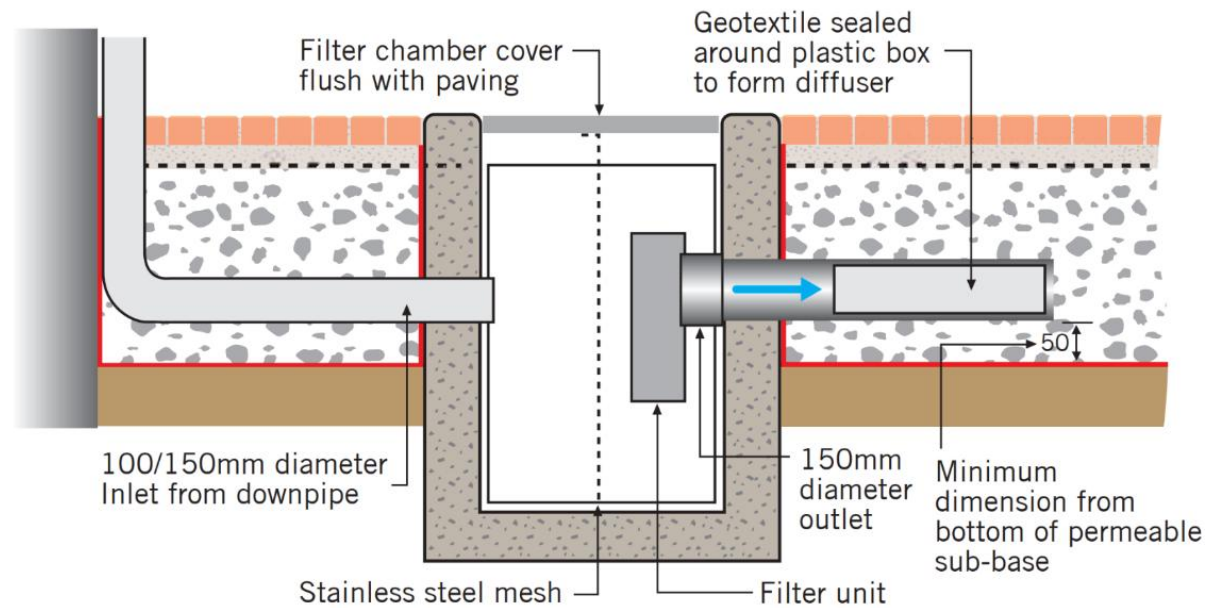
Description

Pervious paving cross section

Sources

The SuDS Manual





Appendix - Example Construction Drawings

Description

Example of diffuser inlet arrangement (above) and collector box arrangement at outlets (below)

Sources

Interpave, 2018

28th-30th April 2025

48 Wickham Way
Haywards Heath
RH161UQ

DRIVEWAY TEST PIT

PIT SIZE	VALUE/FORMULA	RESULT
Length	1.2	1.2M
Depth	1	1.0M
Width	0.5	0.5M
75% Depth	1×0.75	0.75m
25% Depth	1×0.25	0.25m
Storage Volume	$1.2 \times 0.5 (0.75 - 0.25)$	0.3m ³
Surface Area at 50% Depth	2.3	2.3m ³

TIME	TEST1	TEST2	TEST3	TIME
	D mm	D mm	D mm	
0min	750	750	750	0min
10min	700	x	x	10min
20min	670	x	x	20min
30min	600	x	x	30min
1hr	550	640	640	1hr
2	490	x	580	2
3	450	550	535	3
4	410	520	x	4
5	380	495	475	5
6	350	470	440	6
7	x	445	420	7
8	x	420	405	8
9	x	405	380	9
10	x	390	370	10
11	x	380	350	11
12	x	x	x	12
13	x	355	320	13
14	250	x	x	14hr17min
15		x	x	15
16		x	x	16
17		x	x	17
18		x	x	18
19		x	x	19
20		x	240	20hr50min
21		250		21hr6min

PATIO AREA TEST PIT

PIT SIZE	VALUE/FORMULA	RESULT
Length	1.2	1.2M
Depth	1.2	1.2M
Width	0.5	0.5M
75% Depth	1*0.75	0.90m
25% Depth	1*0.25	0.30m
Storage Volume	1.2*0.5(0.90-0.30)	0.36m3
Surface Area at 50% Depth	2.64	2.64m3

TIME	TEST1	TEST2	TEST3	TIME
	D mm	D mm	D mm	
0min	900	900	900	0min
10min	830	840	x	10min
20min	770	790	x	20min
30min	720	x	750	30min
1hr	635	680	650	1hr
2	515	565	570	2
3	430	485	510	3
4	385	420	450	4
5	345	380	400	5
6	315	350	360	6
7	300	320	330	6hr30min
8		295	305	8
			300	8hr12min

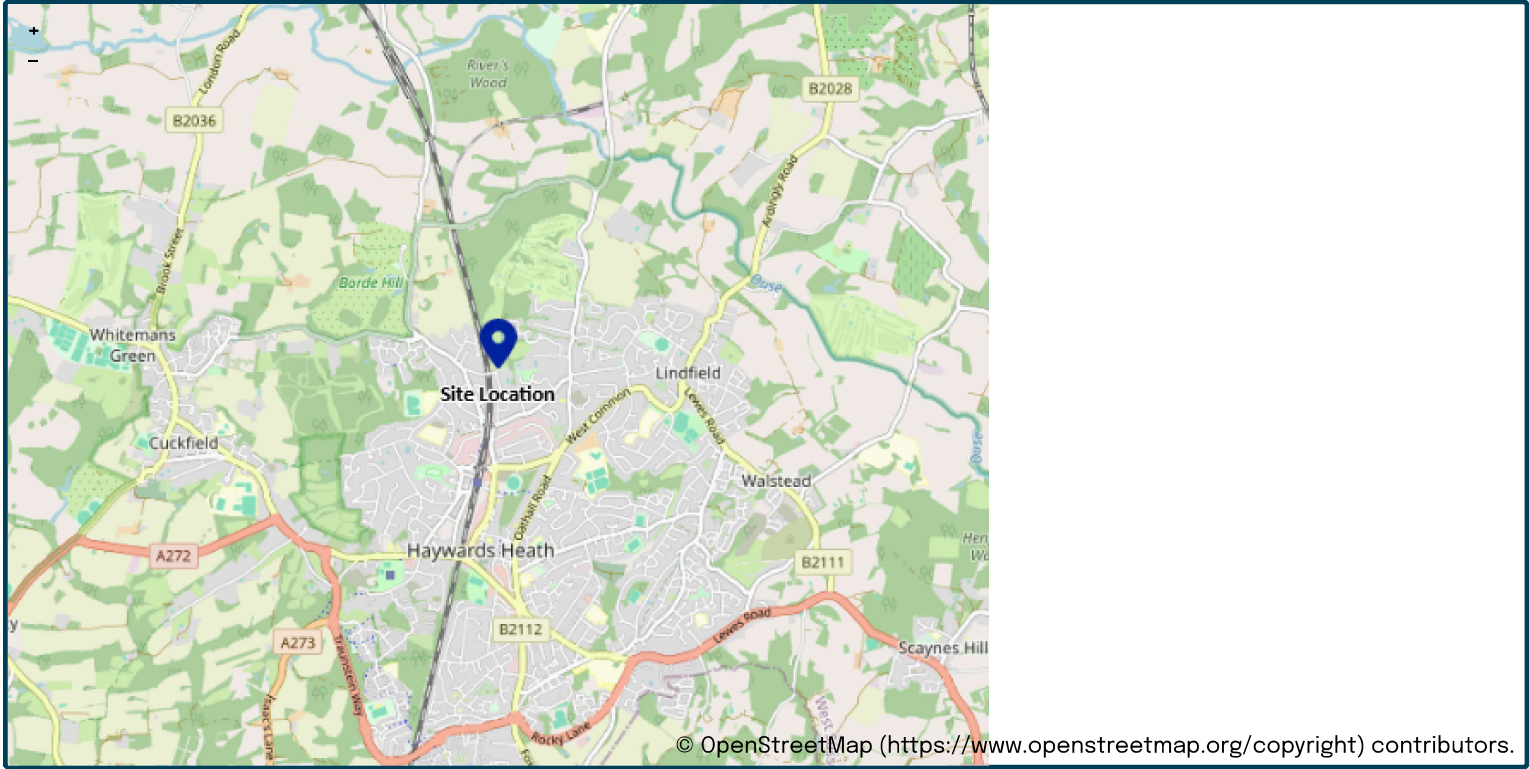
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	15/04/2026
Calculated by	WD
Reference	Eco 360 - Wickham Way
Model version	2.2.3

Location

Site name	Wickham Way
Site location	Haywards Heath



Site easting (British National Grid)	533172
Site northing (British National Grid)	125303

Site details

Total site area (ha)	.063	ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	My value	Map value
SAAR9120 (mm)	895	mm
BFIHOST19scaled	.467	
QMed-QBar conversion	1.136	☒ 1.136
QMed (l/s)	0.3	l/s
QBar (FEH statistical 2025) (l/s)	0.4	l/s

Growth curve factors

	My value	Map value
Hydrological region	7	☒ 7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	0.3	l/s
Flow rate 2 year (l/s)	0.3	l/s
Flow rate 10 years (l/s)	0.6	l/s
Flow rate 30 years (l/s)	0.9	l/s
Flow rate 100 years (l/s)	1.2	l/s
Flow rate 200 years (l/s)	1.4	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.

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This is an estimation of the infiltration volumes and drain-down time to half empty the infiltration system in line with the on CIRIA infiltration drainage R156 guidance (1996) and CIRIA SuDS manual (C753, 2015). This information may be used as the basis for designing an infiltration system for the drainage of surface water runoff from sites.

Project details

Date	09/05/2026
Calculated by	Oakshire Environmental
Reference	Eco 360
Model version	2.2.3

Site details

Site name	Wickham Way - Patio
Site location	Haywards Heath

Infiltration system

Infiltration system	Planar infiltration
Type	Infiltration from base only

Geometry, porosity and infiltration

Infiltration coefficient (m/s)	0.0000046	m/s
Porosity of fill material	30% - e.g. High-porosity sand/gravel	
Soakaway height (m)	0.18	m

Area to be drained

Total area (m ²)	120	m ²
Factor of safety	1.5	

Rainfall

Rainfall input type	FEH22 CSV file	
	FEH_Point_Rainfall_FEH22_AM_533171_125300.csv	
Return period (years)	100	
Climate change allowance factor	145%	

Results

Minimum base area (m²)	120	m²
Time for half-emptying (hours)	2.4	hours
Critical duration (hours)	2.0	hours

Please note storage volume estimation are subject to uncertainty. Infiltration system height and base area are reported to the nearest 1m or 1m² value when the height or base area are greater than 10m or 10m²; and reported to the nearest to 0.1m or 0.1m² value when the height or base area are less than 10m or 10m².

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Appendix A – Rainfall Depths

Rainfall depths (mm) with climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	20 years	30 years	50 years	75 years	100 years	150 years	200 years	500 years	1000 years	10000 years
15	0.25	8.64	11.48	18.04	22.56	26.97	29.48	32.63	35.21	37.08	39.73	41.66	48.13	53.62	77.52
30	0.5	11.19	14.96	23.66	29.83	35.81	39.30	43.67	47.30	49.97	53.72	56.48	65.80	73.60	108.53
60	1	14.32	19.07	30.03	37.80	45.60	50.16	56.07	60.86	64.32	69.31	72.96	85.39	95.87	142.97
120	2	21.20	26.54	38.85	47.37	55.75	60.74	67.13	72.37	76.20	81.75	85.85	100.06	112.52	168.24
180	3	25.72	31.33	44.30	53.27	62.12	67.38	74.20	79.79	83.88	89.91	94.39	110.26	124.40	185.67
240	4	29.02	34.84	48.28	57.61	66.80	72.31	79.47	85.38	89.74	96.22	101.06	118.47	134.08	199.27
360	6	33.60	39.77	54.03	63.89	73.65	79.55	87.25	93.74	98.63	106.02	111.65	131.89	150.00	220.07
540	9	38.29	44.80	59.84	70.30	80.79	87.20	95.82	103.14	108.71	117.33	123.97	148.20	168.97	242.77
720	12	41.73	48.50	64.13	75.04	86.19	93.06	102.50	110.62	116.83	126.50	134.01	161.24	183.64	259.72
900	15	44.48	51.48	67.63	78.89	90.61	97.96	108.13	117.06	123.93	134.56	142.75	171.81	195.05	273.14
1080	18	46.85	54.04	70.63	82.24	94.44	102.21	113.03	122.67	130.14	141.59	150.37	180.74	204.58	284.26
1440	24	51.14	58.59	75.79	88.04	101.09	109.52	121.39	132.07	140.36	153.11	162.76	195.07	219.95	301.96
1800	30	54.83	62.52	80.29	93.05	106.75	115.70	128.46	139.97	148.91	162.56	172.77	206.35	231.94	315.61
2160	36	58.21	66.12	84.38	97.54	111.81	121.18	134.65	146.86	156.31	170.61	181.22	215.76	241.86	326.83
2880	48	64.37	72.66	91.80	105.60	120.74	130.76	145.30	158.54	168.75	183.93	195.10	230.99	257.85	344.78

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	20 years	30 years	50 years	75 years	100 years	150 years	200 years	500 years	1000 years	10000 years
15	0.25	5.96	7.92	12.44	15.56	18.60	20.33	22.50	24.28	25.57	27.40	28.73	33.19	36.98	53.46
30	0.5	7.72	10.32	16.32	20.57	24.70	27.10	30.12	32.62	34.46	37.05	38.95	45.38	50.76	74.85
60	1	9.87	13.15	20.71	26.07	31.45	34.59	38.67	41.97	44.36	47.80	50.32	58.89	66.12	98.60
120	2	14.62	18.30	26.79	32.67	38.45	41.89	46.30	49.91	52.55	56.38	59.21	69.01	77.60	116.03
180	3	17.74	21.61	30.55	36.74	42.84	46.47	51.17	55.03	57.85	62.01	65.10	76.04	85.79	128.05
240	4	20.01	24.03	33.30	39.73	46.07	49.87	54.81	58.88	61.89	66.36	69.70	81.70	92.47	137.43
360	6	23.17	27.43	37.26	44.06	50.79	54.86	60.17	64.65	68.02	73.12	77.00	90.96	103.45	151.77
540	9	26.41	30.90	41.27	48.48	55.72	60.14	66.08	71.13	74.97	80.92	85.50	102.21	116.53	167.43
720	12	28.78	33.45	44.23	51.75	59.44	64.18	70.69	76.29	80.57	87.24	92.42	111.20	126.65	179.12
900	15	30.67	35.50	46.64	54.41	62.49	67.56	74.57	80.73	85.47	92.80	98.45	118.49	134.52	188.37
1080	18	32.31	37.27	48.71	56.72	65.13	70.49	77.95	84.60	89.75	97.65	103.70	124.65	141.09	196.04
1440	24	35.27	40.41	52.27	60.72	69.72	75.53	83.72	91.08	96.80	105.59	112.25	134.53	151.69	208.25
1800	30	37.81	43.12	55.37	64.17	73.62	79.79	88.59	96.53	102.70	112.11	119.15	142.31	159.96	217.66
2160	36	40.14	45.60	58.19	67.27	77.11	83.57	92.86	101.28	107.80	117.66	124.98	148.80	166.80	225.40
2880	48	44.39	50.11	63.31	72.83	83.27	90.18	100.21	109.34	116.38	126.85	134.55	159.30	177.83	237.78

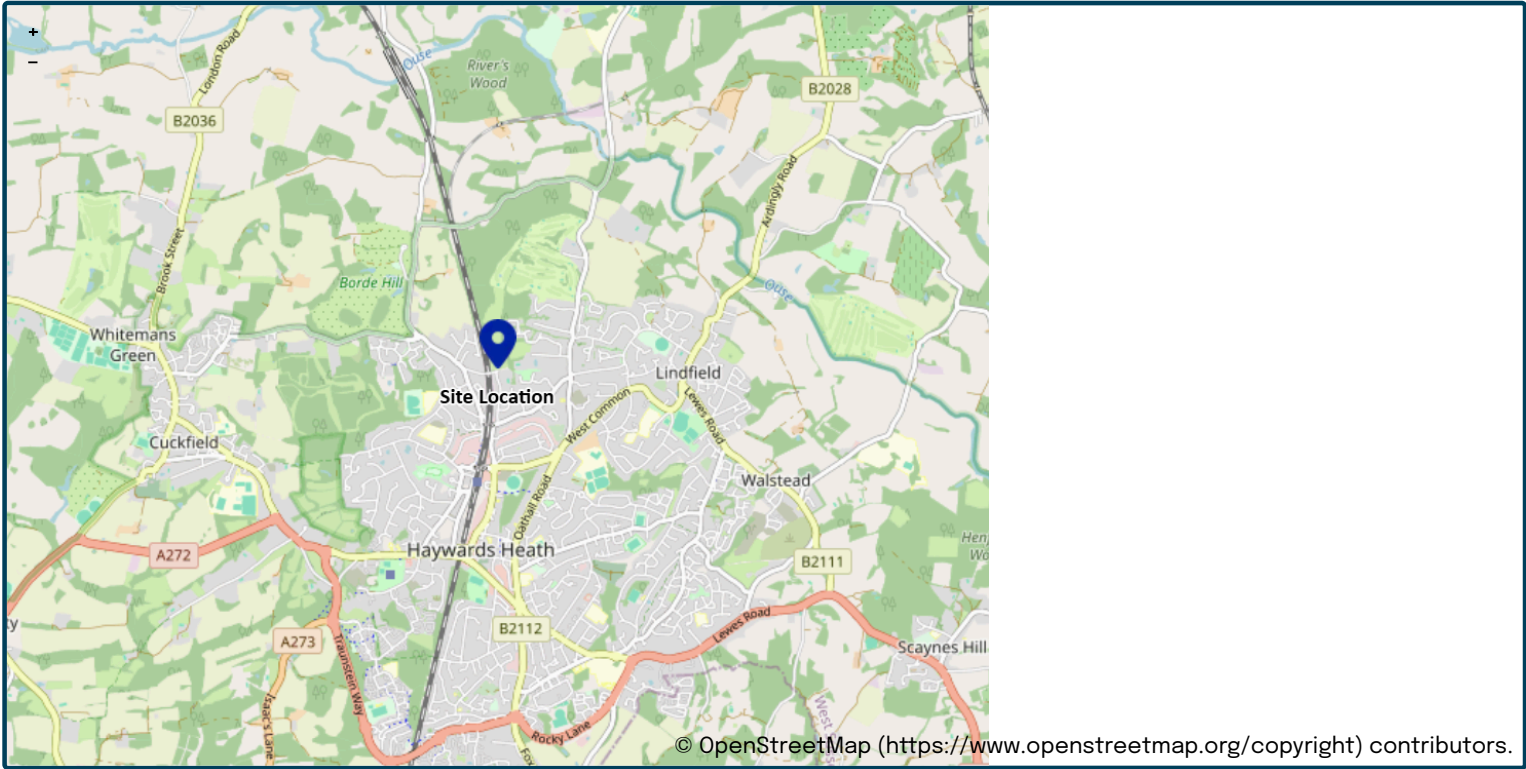
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	09/05/2026
Calculated by	Oakshire Environmental
Reference	Eco 360
Model version	2.2.3

Location

Site name	Wickham Way - Driveway
Site location	Haywards Heath



Site easting (British National Grid)	533174
Site northing (British National Grid)	125299

Site details

Total site area (ha)	0.0248	ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	895	mm
BFIHOST19scaled	0.467	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	0.1	l/s
QBar (FEH statistical 2025) (l/s)	0.1	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	0.1
Flow rate 2 year (l/s)	0.1
Flow rate 10 years (l/s)	0.2
Flow rate 30 years (l/s)	0.3
Flow rate 100 years (l/s)	0.5
Flow rate 200 years (l/s)	0.5

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

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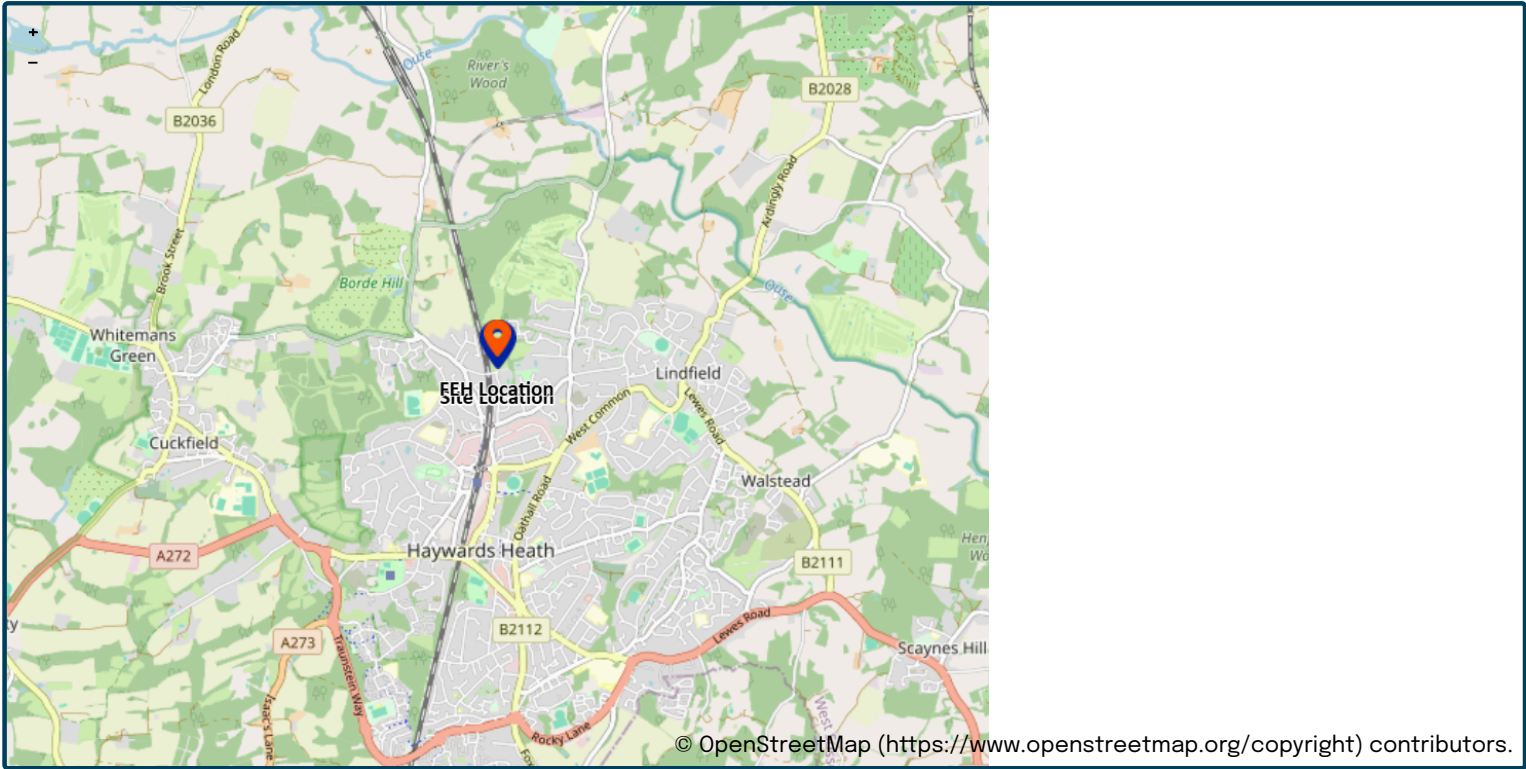
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

Project details

Date	09/05/2026
Calculated by	Oakshire Environmental
Reference	Eco 360
Model version	2.2.3

Location

Site name	Wickham Way - Driveway
Site location	Haywards Heath



Site easting (British National Grid)	533173
Site northing (British National Grid)	125297

Site areas

Total site area (ha)	0.063	ha
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Roof area

Total roof area (ha)	0.0138	ha
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Contributing roof area (ha)	0.0138	ha
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Non-contributing roof area (ha)	0	ha
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Paved area

Total paved area (ha)	0.023	ha
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Contributing paved area (ha)	0.011	ha
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Non-contributing paved area (ha)	0.012	ha
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Grass / vegetated area

Total grass / vegetated area (ha)	0.0262	ha
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Contributing grass / vegetated area (ha)	0	ha
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Non-contributing grass / vegetated area (ha)	0.0262	ha
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Total area

Total contributing area (ha)	0.0248	ha
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Contributing areas with urban creep allowance

Urban creep allowance factor	+10%
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Contributing roof area (adjusted for urban creep) (ha)	0.0138	ha
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Contributing paved area (adjusted for urban creep) (ha)	0.011	ha
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Contributing grass / vegetated area (adjusted for urban creep) (ha)	0	ha
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Storage design parameters

Storage base shape	Rectangular / square
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Storage base length to width ratio	2:1
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Storage design depth (m)	0.45	m
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Storage side slope (1 in x)	Vertical sided
-----------------------------	---------------------------

Storage voids ratio (%)	30% (e.g. aggregate filled structure)
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Storage volume design return period (years)	1:100 years
---	------------------------

Discharge flow rate from the site

Method

Type of site

Previously developed

Specify the method

FEH statistical (2025) + relaxation

FEH statistical (2025)

My value

Map/default value

SAAR9120 (mm)

895

mm

BFIHOST19scaled

0.467

QMed (l/s)

0.3

l/s

QMed-QBar conversion

1.136

1.136

Total area for greenfield runoff calculation (ha)

0.063

ha

0.063

QBar (l/s)

0.4

l/s

Hydrological region

7

7

Return period (years)

1:2 year

Growth curve factor

0.88

Relaxation factor

1x

Final discharge rate

Runoff calculation method

FEH statistical (2025) + relaxation

Design flow rate (l/s)

0.3

l/s

Blockage risk

Specify the method

Flow rate

Minimum discharge flow rate to prevent blockage

1l/s

My value

Calculated value

Design orifice diameter (mm)

27

mm

26

Flow rate of orifice (l/s)

1.01

l/s

Rainfall and runoff

Rainfall input type

FEH22 CSV file

FEH_Point_Rainfall_FEH22_AM_533171_125300.csv

Distance from FEH location to site (km)

0

km

Climate change allowance factor

145%

Specify the runoff method from grass / vegetated areas

Fixed percentage - based on rainfall event depth and SPR

My value

Map value

How should SPR be derived?

Estimate using BFI

BFIHOST19scaled

0.467

Model results

- **Maximum discharge flow rate:** 1.0 (l/s)
- **Outflow orifice diameter:** 27 (mm)
- **Storage base length:** 15 (m)
- **Storage base width:** 7.3 (m)
- **Storage base area:** 108 (m²)
- **Storage total volume:** 50 (m³)
- **Storage total water volume:** 15 (m³)
- **Storm return periods run:** 1, 2, 10, 30, 100, 200 (years)
- **Storm durations run:** 15, 30, 60, 120, 180, 240, 360, 540, 720, 900, 1080, 1440, 1800, 2160, 2880, 3600, 4320, 5040, 5760 (minutes)

Return Period (years)	Critical Duration (minutes)	Peak Flow Rate (l/s)	Max Depth (m)	Max water volume (m ³)	Max storage volume (m ³)
1	240	0.5	0.12	3.9	13
2	240	0.6	0.15	4.8	16
10	180	0.8	0.27	8.7	29
30	180	0.9	0.35	11	37
<u>100</u>	<u>180</u>	<u>1.0</u>	<u>0.45</u>	<u>15</u>	<u>50</u>
200	180	1.0	0.47	17	57

Please note runoff estimation and storage volume estimation are subject to uncertainty. Storage volume results are therefore reported to the nearest 1 m³ value, unless storage volumes are less than 10 m³, in which case, storage volumes are provided to 1 decimal place.

Disclaimer

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Appendix A - Rainfall Depths

Rainfall depths (mm) with climate change

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	8.64	11.48	22.56	29.48	37.08	41.66
30	0.5	11.19	14.96	29.83	39.30	49.97	56.48
60	1	14.32	19.07	37.80	50.16	64.32	72.96
120	2	21.20	26.54	47.37	60.74	76.20	85.85
180	3	25.72	31.33	53.27	67.38	83.88	94.39
240	4	29.02	34.84	57.61	72.31	89.74	101.06
360	6	33.60	39.77	63.89	79.55	98.63	111.65
540	9	38.29	44.80	70.30	87.20	108.71	123.97
720	12	41.73	48.50	75.04	93.06	116.83	134.01
900	15	44.48	51.48	78.89	97.96	123.93	142.75
1080	18	46.85	54.04	82.24	102.21	130.14	150.37
1440	24	51.14	58.59	88.04	109.52	140.36	162.76
1800	30	54.83	62.52	93.05	115.70	148.91	172.77
2160	36	58.21	66.12	97.54	121.18	156.31	181.22
2880	48	64.37	72.66	105.60	130.76	168.75	195.10
3600	60	70.25	78.85	113.03	139.17	178.86	206.12
4320	72	75.88	84.74	119.93	146.81	187.69	215.60
5040	84	81.27	90.38	126.47	153.92	195.62	224.01
5760	96	86.56	95.87	132.76	160.62	202.90	231.65

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	5.96	7.92	15.56	20.33	25.57	28.73
30	0.5	7.72	10.32	20.57	27.10	34.46	38.95
60	1	9.87	13.15	26.07	34.59	44.36	50.32
120	2	14.62	18.30	32.67	41.89	52.55	59.21
180	3	17.74	21.61	36.74	46.47	57.85	65.10
240	4	20.01	24.03	39.73	49.87	61.89	69.70
360	6	23.17	27.43	44.06	54.86	68.02	77.00
540	9	26.41	30.90	48.48	60.14	74.97	85.50
720	12	28.78	33.45	51.75	64.18	80.57	92.42
900	15	30.67	35.50	54.41	67.56	85.47	98.45
1080	18	32.31	37.27	56.72	70.49	89.75	103.70
1440	24	35.27	40.41	60.72	75.53	96.80	112.25
1800	30	37.81	43.12	64.17	79.79	102.70	119.15

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
2160	36	40.14	45.60	67.27	83.57	107.80	124.98
2880	48	44.39	50.11	72.83	90.18	116.38	134.55
3600	60	48.45	54.38	77.95	95.98	123.35	142.15
4320	72	52.33	58.44	82.71	101.25	129.44	148.69
5040	84	56.05	62.33	87.22	106.15	134.91	154.49
5760	96	59.70	66.12	91.56	110.77	139.93	159.76