



Flood Risk Assessment and Drainage Strategy

Land South of Sunningdale, Horsham Road, BN4 3AA

Client

SJD Projects

Ref: 14007

Date: June 2026

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Index

1	Introduction	2
2	Existing Site & Current Flood Risk	3
3	Proposed Surface Water Strategy	6
4	Foul Drainage Strategy	9
5	Conclusions	10

Schedule of Appendices

A	Location Plan
B	Topographic Survey
C	Flood Maps
D	Soil Soakage Test Report
E	Sewer Records
F	Scheme Drawings
G	Calculations
H	Draft Drainage Maintenance Plan

Issue	Issue date	Compiled	Checked
First Issue – for review	05/06/2026	DT	FVV
Second Issue – for submission	11/06/2026	DT	FVV

1 Introduction

- 1.1 This report has been prepared for the Client in relation to the proposed development at Land South of Sunningdale, Horsham Road, BN44 3AA. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.2 GTA Civils & Transport Limited was appointed by SJD Projects to prepare a Flood Risk Assessment (FRA) report to support a planning application for the construction of a new dwelling, with associated access and landscaping, at the above site.
- 1.3 The FRA has been prepared in accordance with the 2025 National Planning Policy Framework (NPPF) and the current Planning Practice Guidance (PPG).

2 Existing Site & Current Flood Risk

- 2.1 The application site is located on the eastern side of Horsham Road (B2135) in Steyning, within the administrative area of Horsham District Council (HDC). The site, currently a field with established trees and hedgerows along the boundaries, covers an area of approximately 1.08 ha. The proposed development comprises the construction of a new dwelling with an associated access driveway and private garden areas. A site location map and aerial view are provided in Appendix A.
- 2.2 Topography: the site survey, included in Appendix B, indicates that the site slopes from south to north, with a secondary slight gradient falling from west to east, away from Horsham Road. Site levels range from approximately 25.6m Above Ordnance Datum (AOD) to 23.7m AOD.
- 2.3 Hydrology: An unnamed ditch (Ordinary Watercourse) is located parallel to the north-western boundary of the site. It flows in a west to east direction within the application site, before crossing into Sunningdale. A couple existing inlet pipes and culverts are identified on the topographic survey.
- 2.4 The ditch then continues eastwards before joining the River Adur's wider ditch network. The River Adur is located approximately 2km to the east.
- 2.5 Geology: British Geological Survey (BGS) online mapping and on-site exploratory works confirm the site is underlain by superficial Head Deposits (clay, silt, sand, and gravel), which overlie the Folkestone Formation (sandstone) bedrock.
- 2.6 Site-specific soil infiltration testing was carried out on May 2026 in general accordance with BRE Digest 365. Relevant extracts from the Soil Investigation (SI) Report are included in Appendix D. A summary of the findings is as follows:
- Ground Conditions: A trial pit (TP01) revealed topsoil to 0.40m below ground level (bgl), followed by firm light brown sandy clay (Head Deposits) to the base of the pit at 1.60m bgl.
 - Groundwater: No groundwater was encountered during the investigation.
 - Test Results: During three consecutive tests, the water level failed to achieve a fall from 75% to 25% of the effective depth.
 - Infiltration Rate: As the 25% effective depth was not achieved, a soil infiltration rate could not be calculated, and drainage characteristics are classified as 'Poor'.
- 2.7 The EA's Groundwater Vulnerability Zones (GWVZ) shows the site to be overlying a 'Medium - High' zone. It is not within a Source Protection Zone (SPZ) – see Appendix C.

- 2.8 Fluvial/tidal flooding: The Environment Agency's (EA) Flood Map for Planning (Appendix C) confirms the site is situated in **Flood Zone 1 (Low Probability)**. This zone comprises land assessed as having a less than 1 in 1,000 (<0.1%) Annual Exceedance Probability (AEP) of river or sea flooding.
- 2.9 Surface water flooding: this *can* occur when excess rainwater does not infiltrate into the ground, or is not intercepted by urban drainage systems, and instead flows across the surface. The EA's Surface Water Depth Flood Map in Appendix C shows a localised flood pattern limited to the northern boundary of the site (in line with the existing ditch). The proposed dwelling and its primary access are located to the south of this pattern; therefore, the risk to the proposed development is considered **low**.
- 2.10 Climate Change: The site lies within the Adur and Ouse Management Catchment. The peak river flow allowance applicable to the Proposed Development is +37% (2080s epoch, Central allowance). The peak rainfall allowances applicable to the development are +40% for the 1 in 30 AEP event (2070s epoch, upper end allowance) and +45% for the 1 in 100 AEP event (2070s epoch, upper end allowance).
- 2.11 A climate change (2070 to 2125) layer was added to the Flood Map for Planning available online. The mapping shows no impact to the site when climate change is taken into account.
- 2.12 Artificial sources: flooding from reservoirs, canals and docks. The EA's Reservoirs Flood Map in Appendix C shows this site is not liable to flood from a nearby reservoir failing. There are no docks or canals nearby.
- 2.13 Groundwater Flooding: Groundwater flooding can occur when groundwater rises up from the underlying aquifer to flood subsurface infrastructure or to emerge at the ground surface. While the site overlies sandstone bedrock, the presence of the cohesive Head Deposits (sandy clay) found during the recent on-site testing suggests a **low risk** of groundwater emergence at the surface.
- 2.14 Historical Flooding: the EA's historical flood map in Appendix C shows this site has not been affected by flooding in the past. The nearest recorded events are contained to the existing natural ponds in the area.
- 2.15 In conclusion, the flood risk profile from all sources for the post-development area of the site is **Low**.
- 2.16 Public sewers: Southern Water has confirmed that there are no public foul or surface

water sewers in this area. Appendix E shows the blank results 'map' provided by Southern Water.

- 2.17 Greenfield runoff rates per hectare have been calculated using FEH 2025 Statistical method – see Appendix G. The rates for the 4 main storm return periods have been tabulated below:

Table 2-1: Greenfield Runoff Rates

Event	Flow Rate (l/s/ha)
Qbar	6.8
1 in 2 yr	6.0
1 in 30 yrs	15.6
1 in 100 yrs	25.4

3 Proposed Surface Water Strategy

- 3.1 Defra published the National standards for SuDS ("NSS") in June 2025 (Updated July 2025). The key principles underpinning the NSS include a natural approach to managing water and an early and integrated design. The proposed SuDS strategy is illustrated in Appendix F and has been prepared in accordance with these key principles. There are 7 core standards set out in the NSS and these are discussed in turn as follows:

Standard 1: runoff destinations.

- 3.2 The NSS hierarchy sets the priority as collecting runoff for non-potable use. Rainwater harvesting solutions need to be considered within the architectural and building services design and hence will be considered at detailed stage. Water butts will be provided at a minimum. Unless supersized storage tanks are provided in excess of the demand sizing, it must be assumed that any RWH systems are full and quickly overflowing at the time of an extreme storm event. Onward discharge must therefore be considered.
- 3.3 The 2nd priority is to infiltrate runoff to ground. The published ground conditions indicate that the use of infiltration SuDS at the site is unlikely to be effective due to the impermeable soils. Site-specific soil infiltration testing was carried out in general accordance with BRE Digest 365 confirming this.
- 3.4 The 3rd priority is to discharge runoff to an above ground surface water body. The strategy for the development is therefore to discharge runoff to the existing ditch. Due to the site levels falling from west to east, it is proposed to discharge to the ditch at its lowest point within the adjacent Sunningdale property (same ownership). The outfall location is illustrated on the Strategy plan in Appendix F.

Standard 2: management of everyday rainfall (interception)

- 3.5 An integrated SuDS approach has been developed to serve the proposed dwelling. Roof drainage will be directed to a combination of swales and raingardens, which overall will provide sufficient interception areas in accordance with Standard 2. As the attenuation pond is designed to permanently hold water, it has been excluded from the interception calculations.
- 3.6 The proposed driveway is to be permeably surfaced and shall remain unlined. This will provide interception benefits for the driveway and adjacent impermeable areas draining to it.

- 3.7 A summary of the interception calculations is shown on the strategy plan in Appendix F.

Standard 3: management of extreme rainfall and flooding

- 3.8 The total impermeable area for the proposed development have been calculated as 0.103 hectares. This includes a 10% urban creep factor applied to the dwelling's roof areas.
- 3.9 The NSS guidance sets out that the peak allowable discharge rate from the development to the watercourses should be limited to the 1 in 2 (50%) AEP greenfield runoff rate, or 3 l/s/ha, whichever is the greater. As shown in Section 2 above, the 1 in 2 AEP greenfield runoff rate for the site is 6.0 l/s/ha (see Appendix G). The target runoff rate for the development is therefore **0.6 l/s**.
- 3.10 Discharges will be limited to the applicable rate by means of flow controls with attenuation storage provided within the permeable paving subbase and an attenuation pond. The location, levels and capacity of each component are shown on the strategy plan in Appendix F.
- 3.11 Flow calculations are included in Appendix G to demonstrate that sufficient storage volume has been provided to cater for the 1 in 100-year plus 45% climate change events. The calculations use FEH 22 rainfall data and CV values of 1.
- 3.12 Exceedance: Overland flow in the event of extreme storm events or failure of the drainage system will flow towards the existing ditch, as shown on the strategy plan.

Standard 4: water quality

- 3.13 The proposed SuDS strategy includes treatment to protect water quality in the receiving water environment.
- 3.14 Based on the Simple Index Approach described in CIRIA C753 (The SuDS Manual) the development's pollution hazard indices are outlined in Table 3-1 below along with the relevant SuDS mitigation indices for the proposed SuDS components.

Pollutant type	TSS	Metals	Hydrocarbons
Pollution hazard indices			
Residential roofs – Very low	0.2	0.2	0.05
Vehicular areas – Low	0.5	0.4	0.4
SuDS mitigation indices			
Bioretention system	0.8	0.8	0.8

Permeable pavement	0.7	0.6	0.7
Swale	0.5	0.6	0.6
Attenuation Pond	0.7	0.7	0.5
Swale -> Pond	0.85	0.95	0.85
Bioretention -> Swale -> Pond	1.4	1.45	1.35
Pavement -> Swale -> Pond	1.475	1.425	1.375

Table 3-1: Runoff Treatment - Simple Index Approach

- 3.15 Table 3-1 demonstrates that the proposed SuDS treatment train will sufficiently protect the water environment.

Standard 5: amenity

- 3.16 The proposed SuDS features have been integrated into the landscape proposals to ensure amenity potential is realised, within the constraints of the site.
- 3.17 The raingarden, conveyance swales and attenuation pond will represent positive features within the landscaped garden.

Standard 6: biodiversity

- 3.18 The proposed SuDS strategy offers potential for biodiversity gains by means of vegetated features including within the raingarden area as well as the swales. For more information, refer to ecology consultant's documents.

Standard 7: design of drainage for construction, operation, maintenance, decommissioning and structural integrity

- 3.19 Construction and Phasing: It is expected that the development will be constructed in one phase. Construction of the surface water drainage scheme will be carried out in line with best practice methods and controls.
- 3.20 Ownership and maintenance: A draft Drainage Maintenance Plan (DMP) outlining ownership and maintenance responsibilities is included in Appendix H. This is a draft version based on the information currently available at this stage; the DMP will be updated as the design of each phase is developed and will remain a live document over the duration of the project.

4 Foul Drainage Strategy

- 4.1 All proposed foul water flows from the development will be directed to a proposed packaged treatment plant, before releasing treated flows to the proposed new outfall to the existing ditch (downstream of any flow controls).
- 4.2 The packaged treatment plant shall be sized to suit the expected foul loads from the development. The treated effluent discharge shall be compliant with the EA binding rules for new residential discharges.
- 4.3 The proposed outfall to the existing ditch shall be subject to an Ordinary Watercourse Consent (OWC), to be applied for in due course.

5 Conclusions

- 5.1 The site lies entirely within Flood Zone 1, and flood risks from all sources have been assessed as low. The development is appropriate in terms of flood risk.
- 5.2 The proposed surface water drainage strategy proposes to discharge to the existing watercourse north of the site. Runoff will be restricted to the 1 in 2 AEP greenfield rate of 0.6 l/s. Attenuation is provided through permeable paving and an attenuation pond, sized to accommodate the 1 in 100-year plus 45% climate change rainfall event.
- 5.3 A robust SuDS train, including a raingarden and conveyance swales, will ensure interception of everyday rainfall events, as well as amenity and biodiversity benefits in line with the recommendations of the National Standards for SuDS.
- 5.4 The proposed foul runoff will be directed to a new packaged treatment plan, sized to accommodate the expected foul loads from the development. The treated effluent discharge shall comply with the EA binding rules.

Appendix A

Location Plan



Aerial Photo



Appendix B

Topographic Survey



Tree Schedule			
1	Oak	d=0.6	h=15
2	Hawthorn	d=0.25	h=7
3	Hawthorn	d=0.25	h=7
4	Ash	d=0.6	h=12
5	Ash	d=0.4	h=12
6	Ash	multibole	h=10
7	Ash	d=0.25	h=12
8	Hazel	multibole	h=5
9	Hazel	multibole	h=3
10	Ash	d=0.3	h=12
11	Hazel	multibole	h=6
12	Hazel	multibole	h=6
13	Beech	d=0.1	h=4
14	Beech	d=0.1	h=4
15	Ash (pollarded)	d=1.0	h=6
16	Ash (pollarded)	d=2x0.5	h=5
17	Ash	d=0.15	h=12
18	Hawthorn	d=1.0	h=7
19	Hazel	d=0.1	h=6
20	Unknown	d=0.3	h=10
21	Unknown	d=0.3	h=10
22	Beech	d=0.1	h=4
23	Magnolia	d=0.1	h=4
24	Ash	d=0.15	h=6
25	Ash	d=0.15	h=6
26	Ash	d=0.15	h=6
27	Ash	d=0.4	h=16
28	Ash	d=0.8	h=16
29	Fruit	d=0.3	h=4
30	Hazel	multibole	h=6
31	Oak	d=0.4	h=12
32	Unknown	d=0.4	h=12
33	Oak	d=0.6	h=12
34	Hazel	multibole	h=6
35	Elder	d=0.3	h=6
36	Oak	d=1.0	h=16
37	Elder	d=0.3	h=6
38	Oak	d=0.4	h=12
39	Oak	d=1.0	h=16
40	Oak	d=1.0	h=16

Survey control		
Sn	Easting	Northing
H1	517465.806	113240.839
H2	517525.104	113162.549
H3	517456.747	113187.362
H4	517524.935	113251.269
H4A	517531.587	113206.543
H5	517446.121	113261.849
H5A	517424.404	113244.512
H5B	517430.137	113248.144
H6	517429.365	113241.998
H7	517410.138	113246.060
H8	517399.482	113126.894
H10	517436.646	113247.467
H20	517535.546	113151.263
H21	517418.138	113156.401
H22	517407.900	113158.243

Any setting-out should be undertaken using these control stations and any setting-out using GPS should be transformed to this control.

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Topographical Survey Legend

Hedge Undergrowth Tree Bush Building Glass Building Open Building

Telephone line Power line Banking Contour line Survey Station Gate Level

Ordnance Survey Benchmark Foul Drainage Storm Drainage

Abbreviations

Animal Settle Air Valve Borehole Bus Stop Cover Level Earth Rod Electricity Pole Fire Hydrant Inspection Cover Invert Level Lamp Post Manhole Marker Name Plate Power Pole Rain water Pipe Road Sign Rodding Eye Reinforced Steel Joint Soil Vent Pipe Stop Valve Survey Station Telegraph Pole Tree Stump Trial Hole Unable To Lift Vent Pipe Water Valve

Sett AV BH BS CL ER EP FH IC IL LP MH MK RNP PP RWP RS RSI SVP SV STN TP STump TH UTL VP WV

Metres Scale

Notes

All trees are identified where possible. Species, spread, height and girths are indicative only.

Drainage has been surveyed where found, and traced where possible.

Eaves and ridge heights of surrounding buildings have been surveyed where possible.

HOOK SURVEY

Land & Building Surveyors

www.hooksurvey.com

Project: Land at Sunningdale, Horsham Road, Steyning, West Sussex BN44 3AA

Client: SJD Projects Limited

Drawing title: Topographical Survey

Job No.: 525/10595 Dwg No.: 525/10595/01 Revision: 1.200 Date: August 2025 Drawn by: W.M.

Grid & Levels related to: Ordnance survey coordinate system using GPS related to the Leica SmartNet RTK network. Based around 4 survey stations with a scale factor of 1.000, only the fixed survey stations H1, H2, H7 & H8 are true Ordnance Survey positions.

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Appendix C

Flood Maps



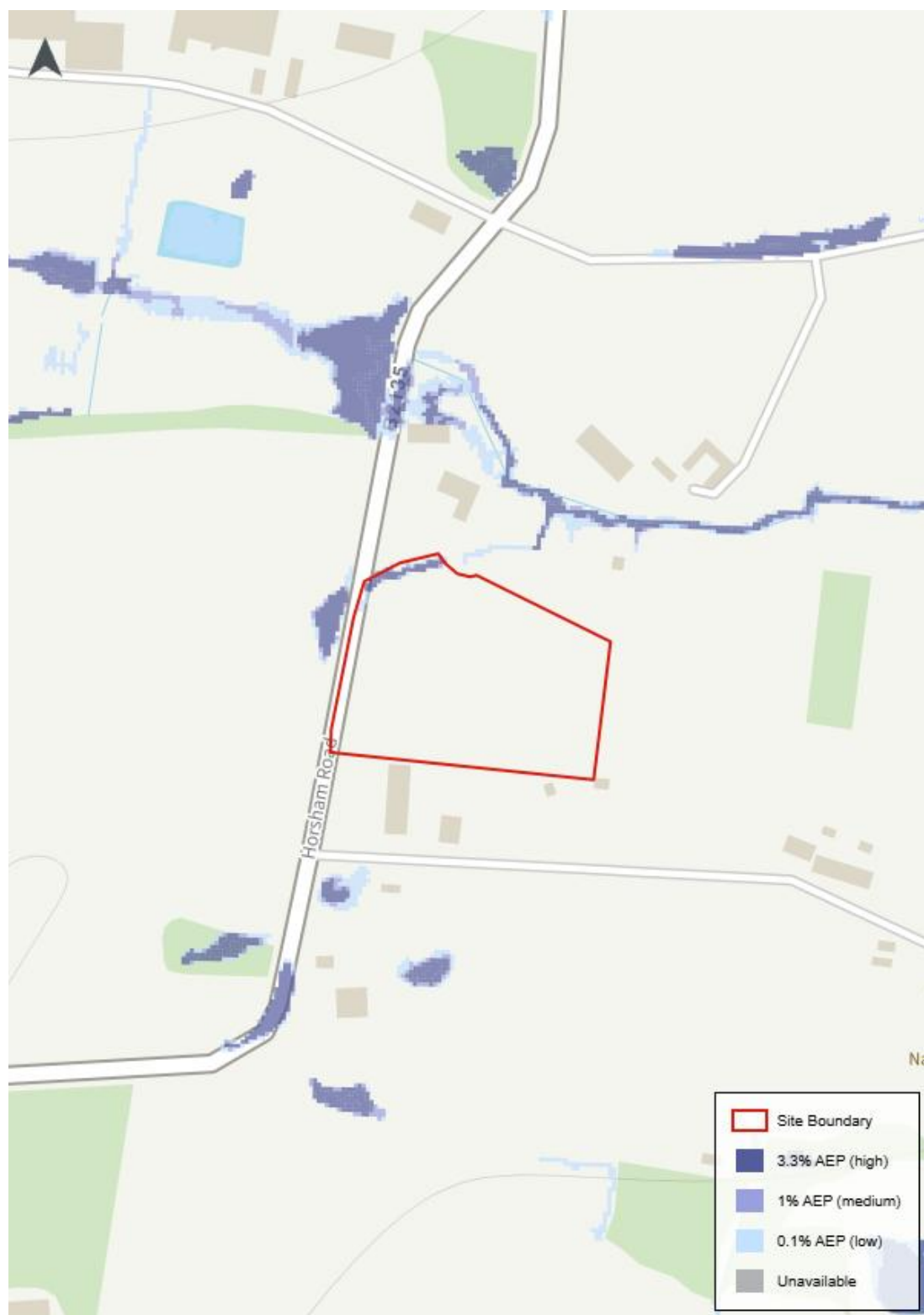
© Environment Agency copyright and/or database right 2025. All rights reserved
Environment Agency Main Rivers Map



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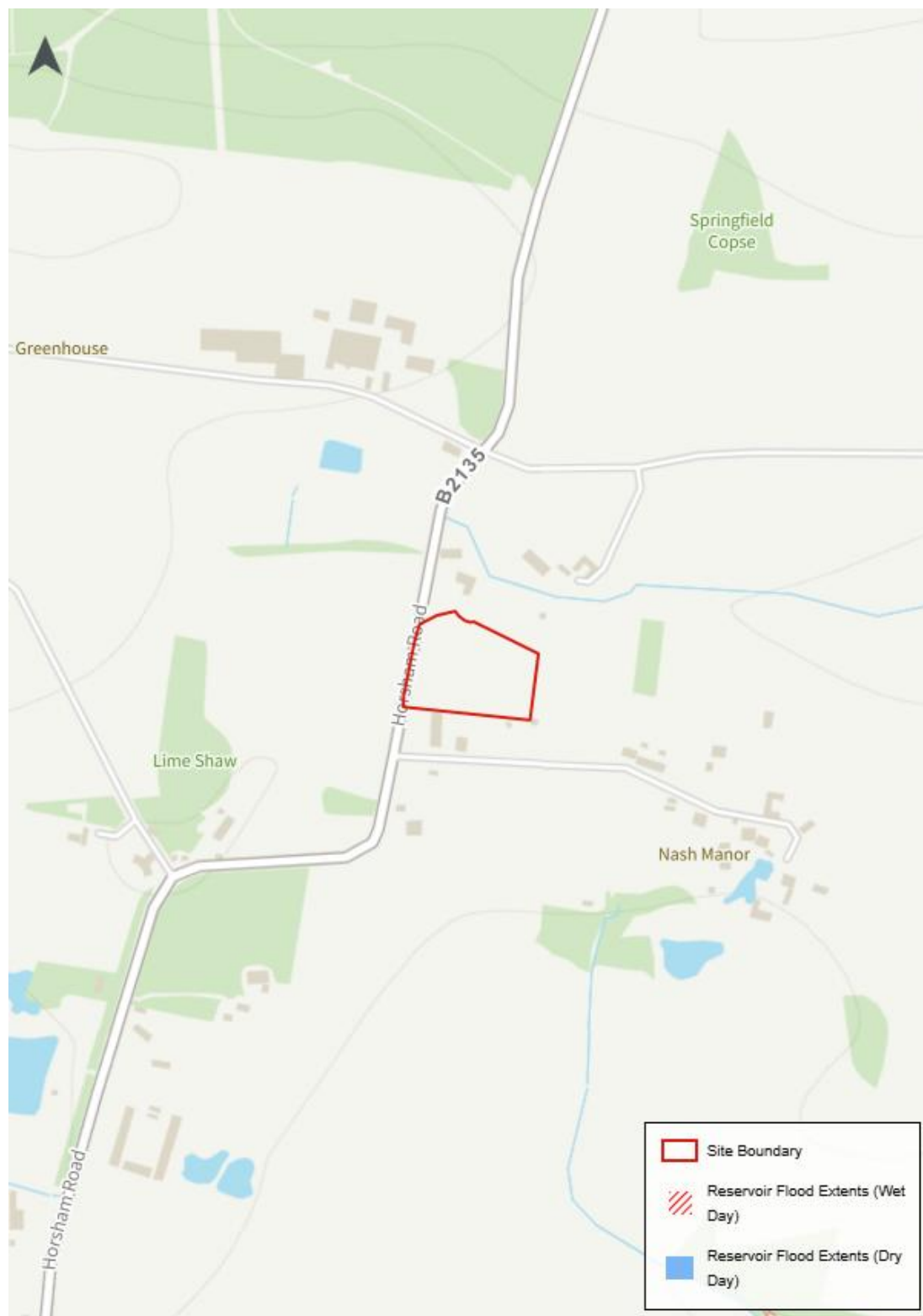
Environment Agency Flood Map for Planning

The site is located in Flood Zone 1



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Environment Agency Surface Water Flood Extents Map



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Environment Agency Flood Risk from Reservoirs

The site is clear from the risk of flooding from this source

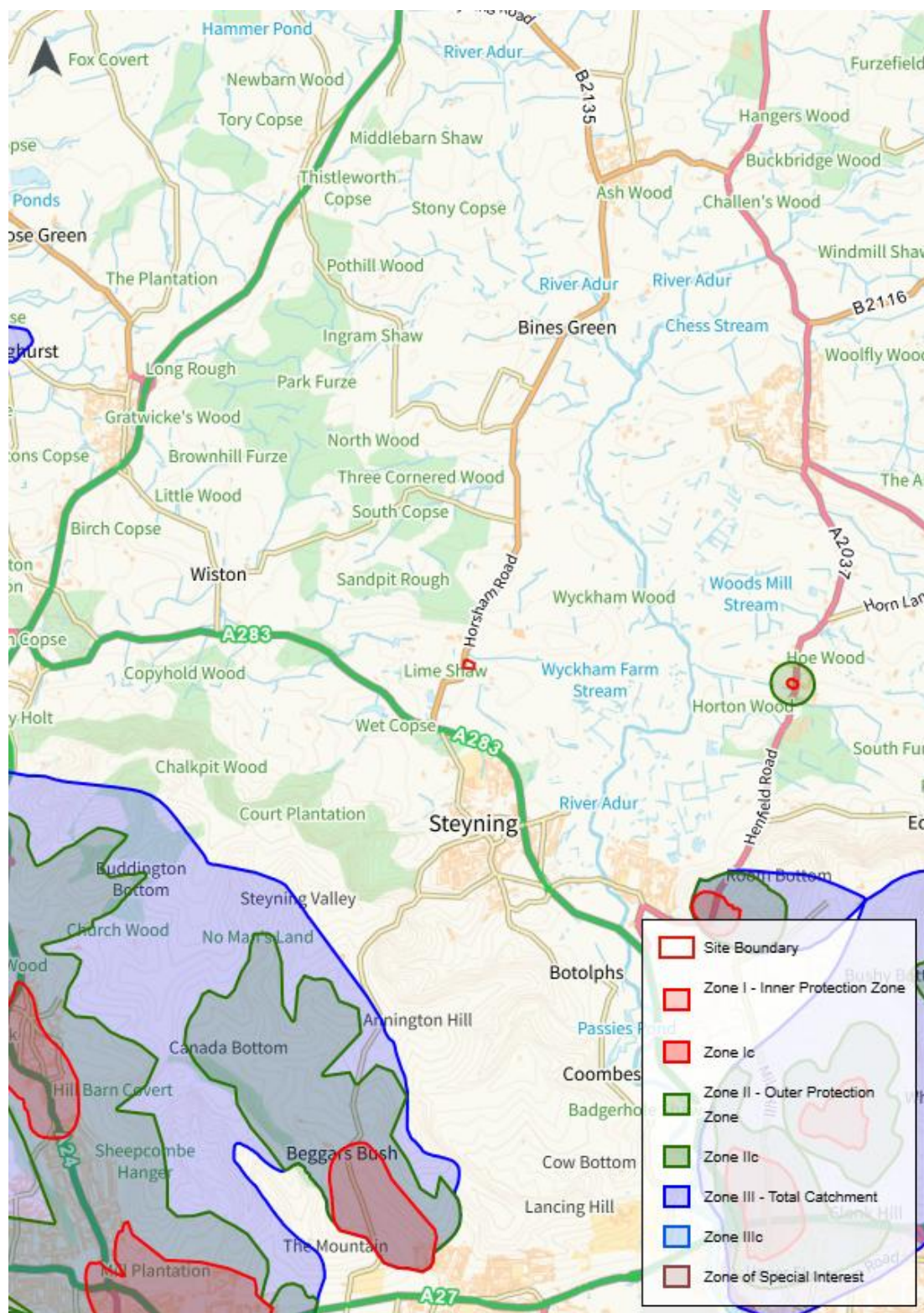


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DEFRA Historical Flooding Map

Neither this site nor anywhere in the vicinity has been affected by flooding in the past

Flood Risk Assessment: Land South of Sunningdale

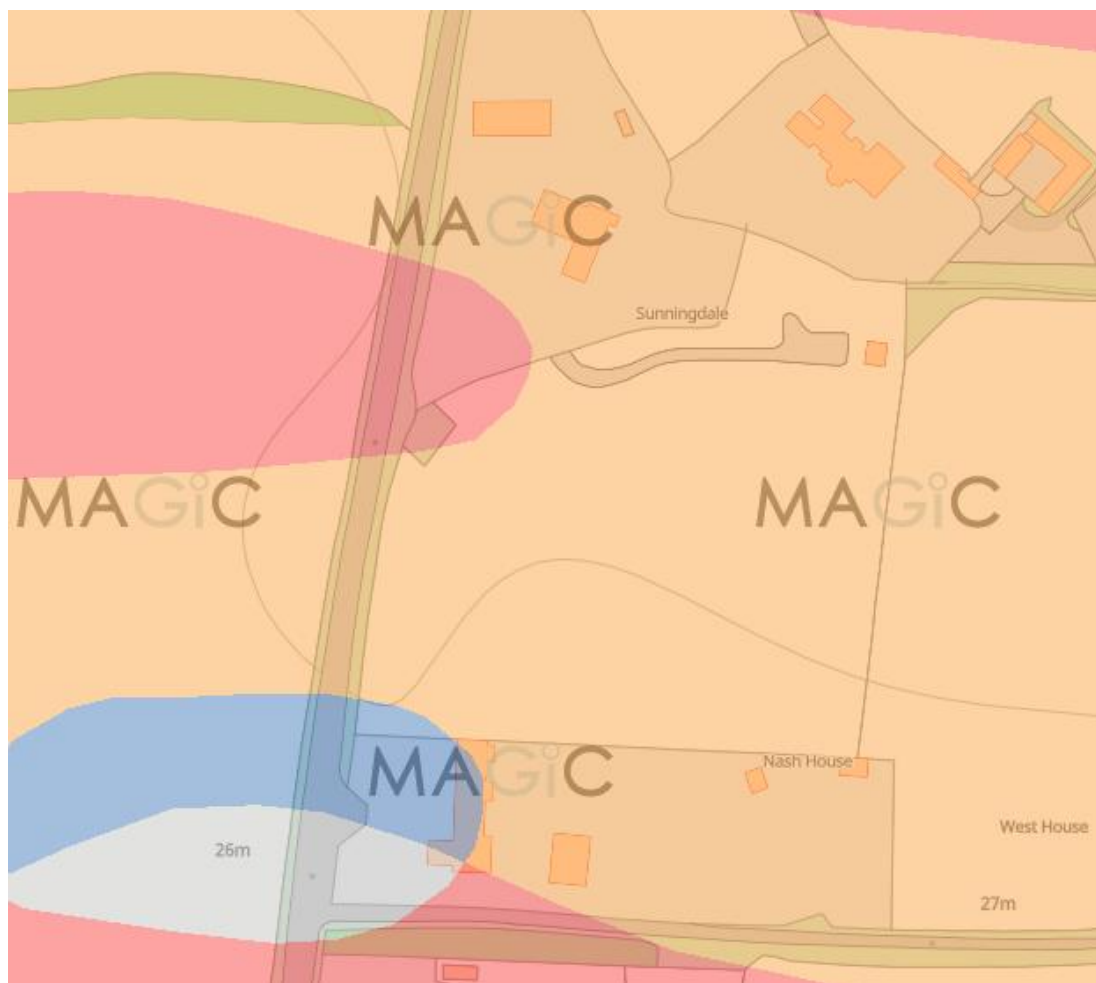


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Environment Agency Groundwater Source Protection Zones Map

The site is not within a SPZ

Flood Risk Assessment: Land South of Sunningdale



Landscape

Geology and Soils

Groundwater Vulnerability Map (England)

- Local Information
- Soluble Rock Risk
- High
- Medium - High
- Medium
- Medium - Low
- Low
- Unproductive

Environment Agency Online Groundwater Vulnerability Zones Map

The site overlies at a 'Medium - High' Groundwater Vulnerability Zone.

Appendix D

Soil Soakage Test Report

IPX1374
Soil Infiltration Testing Report
Land South of Sunningdale, Horsham Road,
Steyning, BN44 3AA
May 26

	Name	Position	Signature	Date
Prepared	Jacob Roby	Geologist/Geotechnical Engineer	J Roby	1 May 2026
Reviewed	Graham Dowlen	Principal Engineering Geologist	Graham Dowlen	1 May 2026
Authorised	Richard Addison	Managing Director	R Addison	1 May 2026

Issue	Date	Description	Prepared	Reviewed	Authorised
01	1 May 2026	Final Report	JR	GD	RA

Contents

Introduction	3
Physical Setting	4
Geology	4
Radon.....	4
Mining	4
Unexploded Ordnance (UXO)	4
Site Investigation.....	5
Geology and Groundwater Conditions	6
Ground Conditions	6
Groundwater	6
Infiltration Testing.....	7
Conclusion.....	7
Notes and Limitations.....	8
Limitations and Uncertainties	8
 Appendix A	Industry References
Appendix B	Trial Pit Plan
Appendix C	Trial Pit Log
Appendix D	Trial Pit Photographs
Appendix E	Soil Infiltration Test Results

Introduction

iPlant have been instructed by GTA Civils to undertake soil infiltration testing at a site at land south of Sunningdale in Steyning. This report has been prepared in accordance with BS 5930:2015+A1:2020 Code of Practice for Site Investigations.

Grid Reference	517451, 113219
Size of Study Site	1.23 Ha
Topography	26m AOD

The scope of works included one (1no.) trial pit. The infiltration test location was selected by the client and undertaken in accordance with Building Research Establishment (BRE) Digest 365, Soakaway Design, September 1991.

The current proposed development plans comprise:

- Construction of a new dwelling with access driveway and private garden areas.

Physical Setting

The site is located to the south of the Sunningdale property to the north of the town of Steyning, approximately 1.29 miles from the town centre. The site is currently occupied by a field with trees and hedgerows along the eastern, southern and western site boundaries and a gravel path in the north. The site is surrounded by Sunningdale and fields to the north, fields to the east, residential properties and fields to the south, and Horsham Road and fields to the west.

Geology

The relevant British Geological Survey (BGS) GeoIndex Onshore online mapping information indicates the site is underlain by the superficial Head deposits (clay, silt, sand and gravel).

With respect to the underlying bedrock geology, the site is identified to be underlain by the Folkestone Formation (sandstone).

There are no British Geological Survey (BGS) borehole records within 250m of the site.

Radon

The radon potential at the site is indicated to be <1%.

Mining

The site is outside the coal mining reporting area as outlined by the Mining Remediation Authority.

Unexploded Ordnance (UXO)

The UXO risk at the site is low.

Site Investigation

The works were completed on the 29th April 2026 under the supervision of a Geo-Environmental Engineer from iPlant and was carried out in general accordance with BS5930:2015+A1:2020 and BRE Digest 365.

In summary, the investigation undertaken included:

- Excavation of 1no. trial pit (TP01).
- Subsequent infiltration testing.

The location of the exploratory position was selected relative to the proposed development and being free of buried services.

The trial pit was logged in accordance with BS EN ISO 14688 with any groundwater conditions noted.

Upon completion, the trial pit was backfilled, compacted and made good to existing levels and finishes, with any surplus spoil bagged up and removed from site.

The position of the trial pit can be reviewed within Appendix B, and the trial pit log is available in Appendix C.

Geology and Groundwater Conditions

Reference to the British Geological Survey databases indicates that the site and surrounding areas are underlain by the superficial Head Deposits (clay, silt, sand and gravel) and Folkestone Formation bedrock (sandstone).

Ground Conditions

The following ground conditions were encountered during the works:

Topsoil

Topsoil was encountered in TP01 from ground level to a depth of 0.40m bgl and comprised dark brown clayey sandy TOPSOIL.

Head Deposits

Superficial deposits were encountered in TP01 from a depth of 0.40m bgl to a depth of 1.60m bgl and comprised firm light brown sandy CLAY.

Folkestone Formation

Bedrock deposits were not encountered during the investigation.

Groundwater

Groundwater was not encountered during the investigation.

It should be noted that groundwater levels are dependent upon seasonal variations and can change after periods of prolonged rainfall or drought.

Photographs can be reviewed in Appendix D.

Infiltration Testing

During the soakaway tests the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume in the pit, and as such an infiltration rate could not be calculated. The results obtained from the soakaway tests are summarised below:

TP and Test Number	Dimensions (m)	Depth (m bgl)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 Test 1	1.20 x 0.30	1.60	N/A	Poor
TP01 Test 2	1.20 x 0.30	1.60	N/A	Poor
TP01 Test 3	1.20 x 0.30	1.60	N/A	Poor

Conclusion

The soils encountered beneath the site were found to be sandy Clay. The soakage rates obtained during the investigation were found to be poor. Given the data from the test, it is considered that the use of shallow soakaways within the Head Deposits is not suitable for this site.

The detailed soil infiltration test results can be reviewed within Appendix E.

Notes and Limitations

iPlant take no responsibility for conditions which have not been revealed by the trial pits, or which occur between trial pits. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative, and liability cannot be accepted for its accuracy.

The information contained in this report is intended for the use of the named client (or their approved contractors). Should a third party rely on any part of this report, that party does so wholly at its own risk and iPlant disclaim any liability to such parties. Should the purposes for which the report is used, or the proposed use of the site change, this report may no longer be valid and further use of reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. iPlant should in all such altered circumstances be commissioned to review and update this report accordingly.

iPlant take no responsibility for any construction design, foundation design, final design and structural plans that the customer chooses to carry out or implement. iPlant provide a factual report based on the information we find and our opinions/interpretation of the data.

iPlant have not been instructed to carry out a Euro Code (7) design or global slope stability assessment.

The site works carried out are a snapshot in time and environmental/other factors can alter ground conditions in which iPlant take no responsibility for. It is down to the customer to ascertain if further investigations are required if a long period of time passes between report and implementation.

Limitations and Uncertainties

iPlant have prepared this report with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, iPlant reserves the right to review such information and, if warranted, to alter the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such are not a guarantee that the study site is free of hazardous conditions.

IPX1374

Land South of Sunningdale, Horsham Road, Steyning, BN44 3AA

May 26



This report has been prepared solely for the use of the named client and may not be relied upon by other parties without written consent from iPlant. iPlant disclaim any responsibility to the client and others in respect of any matters outside the agreed scope of the work.



Appendix A – Industry References

British Standards Institution 'Investigation of Potentially Contaminated sites - Code of Practice' BS 10175:2017.

British Standards Institution 'Code of Practice for Site Investigations' BS 5930:2015.

British Standards Institution "Geotechnical investigation and testing - Identification and classification of soil" BS EN ISO 14688:2002.

BRE Report BR211 'Radon - Guidance on protective measures for new buildings' 2015 Edition.

Water Framework Directive.

Environmental Quality Standards.

BRE Digest 365 "Soakaway Design" 2015.

IPX1374

Land South of Sunningdale, Horsham Road, Steyning, BN44 3AA

May 26



Appendix B – Trial Pit Plan





Site Investigation Plan



Land South of Sunningdale, Steyning
IPX1374
28/04/2026

IPX1374

Land South of Sunningdale, Horsham Road, Steyning, BN44 3AA

May 26



Appendix C – Trial Pit Log





Trial Pit Log

TrialPit No
TP01
Sheet 1 of 1

Project Name: Land South of Sunningdale

Project No.
IPX1374

Co-ords: -
Level:

Date
29/04/2026

Location: Steyning

Dimensions (m): 1.20

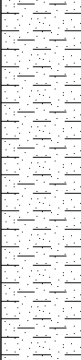
Depth
1.60

0.30

Scale
1:25

Logged
JR

Client: GTA Civils

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.40			Dark brown clayey sandy TOPSOIL. Sand is fine to coarse.	
				1.60			Firm light brown sandy CLAY. Sand is fine to coarse.	1
							End of Pit at 1.60m	2
								3
								4
								5

Remarks: Location cleared of services using handheld CAT scanner. Trial pit excavated to 1.60m bgl. No groundwater encountered. Soil infiltration testing carried out. Trial pit backfilled with arisings.

Stability: Stable



IPX1374

Land South of Sunningdale, Horsham Road, Steyning, BN44 3AA

May 26



Appendix D – Trial Pit Photographs



IPX1374

Walkover Photos

Location of TP01



Depth of TP01



TP01



Arisings from TP01



IPX1374

Walkover Photos

TP01 During the Tests



TP01 Backfilled



IPX1374

Land South of Sunningdale, Horsham Road, Steyning, BN44 3AA

May 26



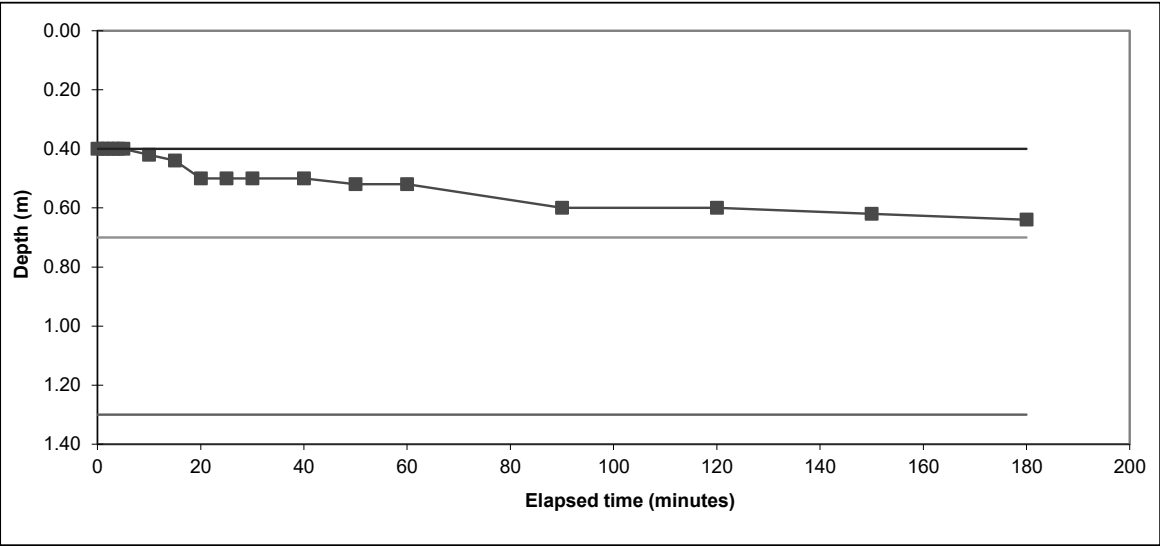
Appendix E – Soil Infiltration Test Results



iPlant Geotechnical

Soakaway Test

Trial Pit No:	TP01	Test No:	1	Date:	29/04/2026
Length (m):	1.200	Datum Height:	0.00 m agl		
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	
Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)		
0	0.400	90	0.600		
1	0.400	120	0.600		
2	0.400	150	0.620		
3	0.400	180	0.640		
4	0.400				
5	0.400				
10	0.420				
15	0.440				
20	0.500				
25	0.500				
30	0.500				
40	0.500				
50	0.520				
60	0.520				



Start water depth for analysis (mbgl)	0.40		
75% effective depth (mbgl):	0.70	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.00		
25% effective depth (mbgl):	1.30	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.60		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			2.16
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks	Results processed following BRE 365 (2007).

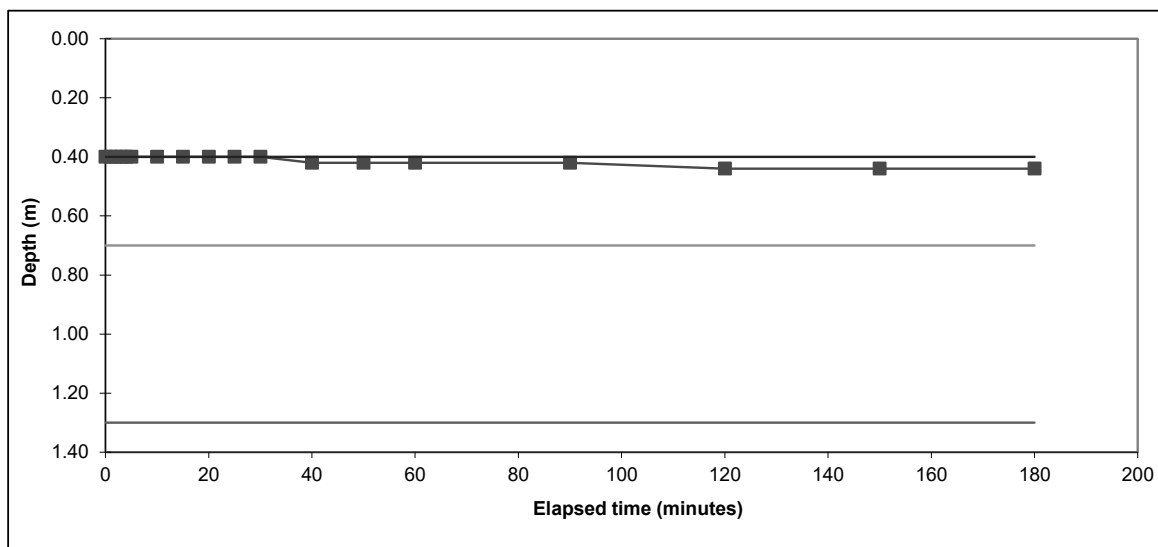
Client:	GTA Civils	
Site:	Land South of Sunningdale, Steyning	TP01

iPlant Geotechnical

Soakaway Test

Trial Pit No:	TP01	Test No:	2	Date:	29/04/2026
Length (m):	1.200	Datum Height:	0.00 m agl		
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.400	90	0.420
1	0.400	120	0.440
2	0.400	150	0.440
3	0.400	180	0.440
4	0.400		
5	0.400		
10	0.400		
15	0.400		
20	0.400		
25	0.400		
30	0.400		
40	0.420		
50	0.420		
60	0.420		



Start water depth for analysis (mbgl)	0.40		
75% effective depth (mbgl):	0.70	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.00		
25% effective depth (mbgl):	1.30	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.60		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			2.16
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks	Results processed following BRE 365 (2007).

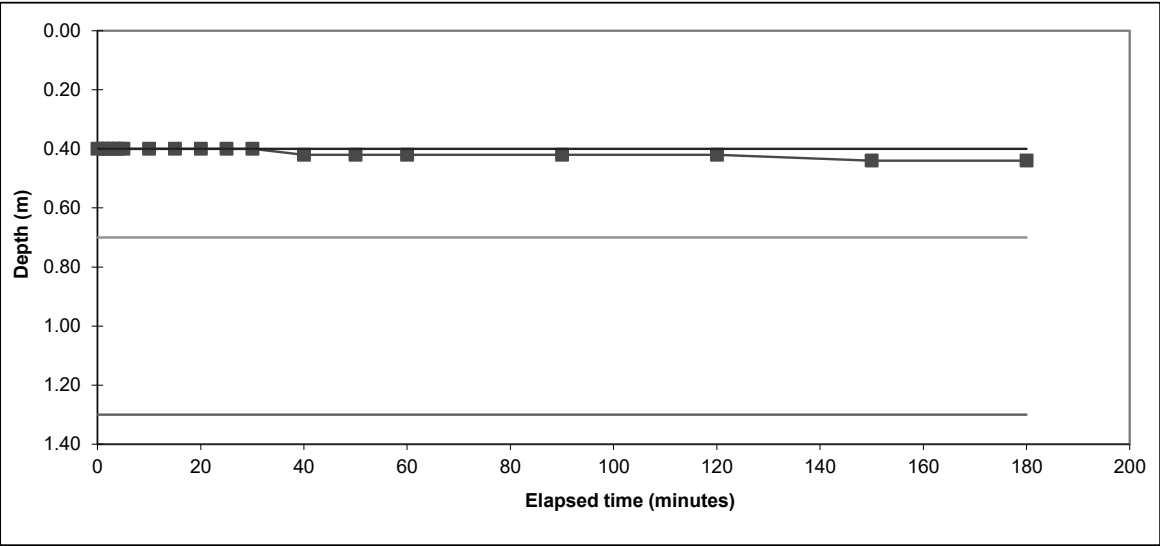
Client:	GTA Civils	
Site:	Land South of Sunningdale, Steyning	TP01

iPlant Geotechnical

Soakaway Test

Trial Pit No:	TP01	Test No:	3	Date:	29/04/2026
Length (m):	1.200	Datum Height:	0.00 m agl		
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.400	90	0.420
1	0.400	120	0.420
2	0.400	150	0.440
3	0.400	180	0.440
4	0.400		
5	0.400		
10	0.400		
15	0.400		
20	0.400		
25	0.400		
30	0.400		
40	0.420		
50	0.420		
60	0.420		



Start water depth for analysis (mbgl)	0.40		
75% effective depth (mbgl):	0.70	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.00		
25% effective depth (mbgl):	1.30	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.60		

Volume outflow between 75% and 25% effective depth (m³):

Mean surface area of outflow (m²): 2.16
(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks	Results processed following BRE 365 (2007).

Client:	GTA Civils	
Site:	Land South of Sunningdale, Steyning	TP01



www.iplantcontracting.com

Appendix E

Sewer Records



(c) Crown copyright and database rights 2026 Ordnance Survey AC0000806827
Data updated: 20/03/26

Scale: 1:1250
Map Centre: 517611.113220

Date: 14/04/26
Our Ref: 2088462 - 1

Wastewater Plan A2
Powered by digdat

	cfagan@gtacivils.co.uk 14007 Sunningdale	 
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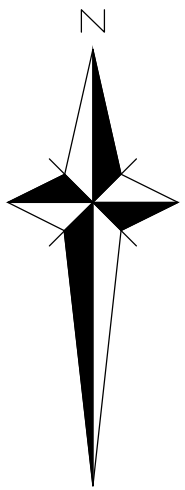
The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Appendix F

Scheme Drawings



INTERCEPTION CALCULATIONS

UNLINED DRIVEWAY AREAS: 390m²
PROVIDED INTERCEPTION AREA: 390 x 2 = 780m²
AREAS DRAINING TO DRIVEWAY (INC. DRIVEWAY): 441m²
COMPLIANT

RAINGARDEN AREA: 65m²
SWALE BASE AREAS - TOTAL: 55m²
• SWALE 1: 12m²
• SWALE 2: 16m²
• SWALE 3: 11m²
• SWALE 4: 16m²
PROVIDED INTERCEPTION AREA: 120 x 5 = 600m²
AREAS DRAINING TO SWALE/RAINGARDEN: 590m²
COMPLIANT

Sunningdale

GENERAL NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-contractors or suppliers work must be checked and agreed between the sub-contractor or supplier and the main contractor.
2. This drawing is to be read in conjunction with all relevant architects, services and engineers drawings and specifications.
3. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations, record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gta prior to works commencing.
4. Tender or billing drawings shall not be used for construction or the ordering of materials.
5. Do not scale. All dimensions and levels to be site confirmed.
6. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

DESIGN NOTES

1. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 45 %.
2. DRAIN POINTS AND LOCATIONS TO BE CONFIRMED BY ARCHITECT. ALL LEVELS SHOWN BASED ON ARCHITECT'S DESIGN.
3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.
4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE. ANY DRAIN ROUTE THROUGH ROOT PROTECTION AREAS TO BE INSTALLED IN ACCORDANCE WITH ARBORICULTURAL SPECIALIST REQUIREMENTS.
5. APPROVAL TO BE GAINED FROM LLFA/JDB FOR DISCHARGE TO EXISTING WATERCOURSE AND DISCHARGE RATES

KEY

- Planning Application Boundary
- Existing ditch
- Private surface water drain
- Private foul drain
- Private treated effluent
- Drainage channel
- FIC
- CP
- SMH
- 27
- Raingarden area (unlined)
- Permeable driveway (unlined)
- Overland flow route
- Root Protection Areas

SURFACE WATER FLOOD RISK

- Surface Water Flood Risk - 1 in 30yr
- Surface Water Flood Risk - 1 in 100yr
- Surface Water Flood Risk - 1 in 1000yr

Rev	Amendments	Date	Dsn	Chk
P3	Coordinated with arb	11.06.2026	FV	MR
P2	Updated surface water run	29.05.2026	FV	MR
P1	INITIAL ISSUE	26.05.2026	FV	MR

Status FOR PLANNING

Client SJD PROJECTS

Architect ATELIER DE LINDE LTD

Project LAND SOUTH OF SUNNINGDALE
HORSHAM ROAD BN44 3AA

Title DRAINAGE STRATEGY PLAN

Date MAY 2026 Scale @ A1 1:200
Clients Ref. Project Ref. 14007

gta Civils & Transport

Maple House, 192-198 London Road,
Burgess Hill, West Sussex, RH15 9RD
Tel:01444 871444 Web: www.gtacivils.co.uk

Drawing Number 14007/1100 Rev. P3

Appendix G

Calculations

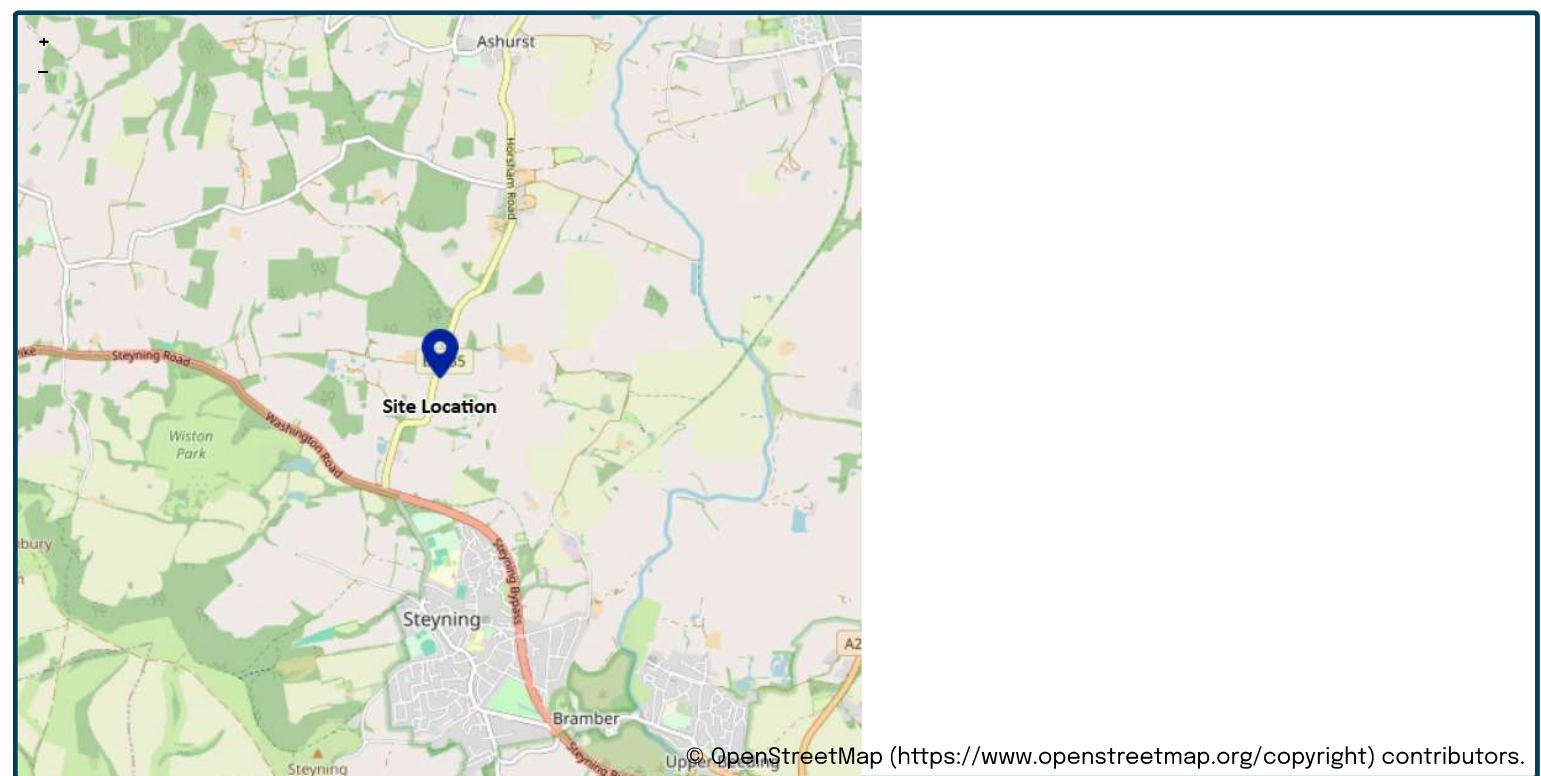
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	21/05/2026
Calculated by	FVV
Reference	14007
Model version	2.2.3

Location

Site name	Land South of Sunningdale
Site location	Horsham Road



Site easting (British National Grid)	517481
Site northing (British National Grid)	113192

Site details

Total site area (ha)	1	ha
----------------------	--------------------------------	----

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MORE INFO

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	-----------------------------------

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	886	mm	
BFIHOST19scaled	0.415		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	6	l/s	
QBar (FEH statistical 2025) (l/s)	6.8	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)	5.8	l/s
Flow rate 2 year (l/s)	6.0	l/s
Flow rate 10 years (l/s)	11.0	l/s
Flow rate 30 years (l/s)	15.6	l/s
Flow rate 100 years (l/s)	21.6	l/s
Flow rate 200 years (l/s)	25.4	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.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of the results in the design or operational characteristics of any drainage scheme.

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Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Depth (m)	Invert Level (m)
PP1	0.044	5.00	24.500	Junction	0.550	23.950
Pond 1	0.059	5.00	24.000	Junction	1.000	23.000
Flow Control			24.000	Manhole	1.165	22.835
PS16			23.574	Manhole	1.125	22.449
PS17			23.083	Manhole	1.088	21.995
Outfall			22.230	Junction	0.305	21.925

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	PP1	Pond 1	3.051	0.600	23.950	23.800	0.150	20.3	100
1.001	Pond 1	Flow Control	3.687	0.600	23.000	22.835	0.165	22.3	150
1.002	Flow Control	PS16	8.905	0.600	22.835	22.524	0.311	28.6	150
1.003	PS16	PS17	44.080	0.600	22.449	21.995	0.454	97.1	225
1.004	PS17	Outfall	8.867	0.600	21.995	21.925	0.070	126.7	225

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	Σ Area (ha)
1.000	1.719	13.5	11.5	0.044
1.001	2.139	37.8	27.0	0.103
1.002	1.888	33.4	27.0	0.103
1.003	1.327	52.8	27.0	0.103
1.004	1.160	46.1	27.0	0.103

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	1440	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations														
	15	30	60	120	180	240	360	480	600	720	960	1440	2160	2880
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	45		0		0		
30	40		0		0									

Node Flow Control Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.002	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0037-6000-0850-6000
Invert Level (m)	22.835	Min Outlet Diameter (m)	0.075
Design Depth (m)	0.850	Min Node Diameter (mm)	1200
Design Flow (l/s)	0.6		

Node PP1 Online Orifice Control

Flap Valve	x	Replaces Downstream Link	x	Diameter (m)	0.050
Downstream Link	1.000	Invert Level (m)	23.950	Discharge Coefficient	0.600

Node Pond 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	70.1	0.0	0.200	89.7	0.0	0.400	111.9	0.0	0.600	136.3	0.0	0.800	163.0	0.0	1.000	192.0	0.0
0.100	79.5	0.0	0.300	100.5	0.0	0.500	123.8	0.0	0.700	149.4	0.0	0.900	177.2	0.0			

Node PP1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	39.000	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.950	Length (m)	10.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	148	Slope (1:X)	1000.0		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	PP1	156	24.011	0.061	3.0	6.5524	0.0000	OK
600 minute summer	Pond 1	600	23.237	0.237	3.4	19.3227	0.0000	SURCHARGED
600 minute summer	Flow Control	600	23.237	0.402	2.6	0.4544	0.0000	SURCHARGED
15 minute summer	PS16	11	22.465	0.016	0.5	0.0025	0.0000	OK
15 minute summer	PS17	233	22.011	0.016	0.5	0.0026	0.0000	OK
15 minute summer	Outfall	234	21.941	0.016	0.5	0.0000	0.0000	OK

US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)
PP1	1.000	Pond 1	1.0	1.003
Pond 1	1.001	Flow Control	2.6	0.195
Flow Control	1.002	PS16	0.5	0.671
PS16	1.003	PS17	0.5	0.480
PS17	1.004	Outfall	0.5	0.376

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	PP1	128	24.130	0.180	10.5	20.4265	0.0000	SURCHARGED
720 minute winter	Pond 1	735	23.689	0.689	4.7	73.4805	0.0000	SURCHARGED
720 minute winter	Flow Control	735	23.689	0.854	2.3	0.9656	0.0000	SURCHARGED
720 minute winter	PS16	735	22.466	0.017	0.6	0.0027	0.0000	OK
720 minute winter	PS17	735	22.013	0.018	0.6	0.0029	0.0000	OK
720 minute winter	Outfall	735	21.943	0.018	0.6	0.0000	0.0000	OK

US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)
PP1	1.000	Pond 1	2.0	1.240
Pond 1	1.001	Flow Control	-2.7	-0.215
Flow Control	1.002	PS16	0.6	0.718
PS16	1.003	PS17	0.6	0.423
PS17	1.004	Outfall	0.6	0.404

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	PP1	132	24.184	0.234	13.5	26.8128	0.0000	SURCHARGED
960 minute winter	Pond 1	960	23.858	0.858	5.0	100.4402	0.0000	FLOOD RISK
960 minute winter	Flow Control	960	23.858	1.023	2.3	1.1568	0.0000	FLOOD RISK
960 minute winter	PS16	960	22.467	0.018	0.6	0.0028	0.0000	OK
960 minute winter	PS17	960	22.014	0.019	0.6	0.0030	0.0000	OK
960 minute winter	Outfall	960	21.944	0.019	0.6	0.0000	0.0000	OK

US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)
PP1	1.000	Pond 1	2.4	1.293
Pond 1	1.001	Flow Control	-2.4	-0.194
Flow Control	1.002	PS16	0.6	0.735
PS16	1.003	PS17	0.6	0.433
PS17	1.004	Outfall	0.6	0.415

Appendix H

Draft Drainage Maintenance Plan

South of Sunningdale, Horsham Road
BN44 3AA
Drainage Maintenance Plan

Contents

1	Introduction	2
2	Ownership & Maintenance Responsibilities	3
3	Health and Safety	4
4	Schedule A – Sewers, Manholes & Gullies	5
5	Schedule B – Permeable Pavement	7
6	Schedule C – Swales	8
7	Schedule D – Detention Ponds and Control Chambers	10
8	Schedule E – Rain Gardens, Bioretention Features	12
9	Schedule F – Riparian Watercourse	14
10	Contamination or Dilution of Spillage	16

Issue	Issue date	Compiled	Checked
First Draft Issue	05.06.2026	DT	FVV

1 Introduction

- 1.1 This report has been prepared by GTA Civils & Transport Ltd for the client in relation to the proposed development at South of Sunningdale, Horsham Road, BN44 3AA. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.2 This Drainage Maintenance Plan (DMP) has been prepared for inclusion as an Appendix to the Flood Risk Assessment (FRA) submitted to Horsham District Council (HDC) in order to support the planning application.
- 1.3 The DMP sets out the framework for the management of the proposed sustainable drainage systems (SuDS) within the development. The DMP remains a draft version during the design stage; it will be updated with final construction information prior to Handover and will remain a live document over the duration of the project. At this stage, what is set out herein is intended to be sufficient to demonstrate the viability of the proposed SuDS maintenance regime for planning purposes.

2 Ownership & Maintenance Responsibilities

- 2.1 A summary of the ownership and maintenance responsibilities for the development is as follows:
- The private drainage will remain the responsibility of the site owner in perpetuity.
 - The contractor will be responsible for maintaining completed SuDS components in advance of transfer to the relevant party.
- 2.2 The DMP is intended to comprise a useful handbook to assist with arranging regular and appropriate maintenance activities for the assets.
- 2.3 Additional reference should be made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).
- 2.4 This DMP should be considered a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance of the drainage systems over time.
- 2.5 Important safety information is set out in the next section.

3 Health and Safety

- 3.1 All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:
- The Health and Safety at Work etc Act 1974
 - The Management of Health and Safety at Work Regulations 1999
 - The Workplace (Health, Safety and Welfare) Regulations 1992
- 3.2 The property owner is responsible for suitable risk assessment and management to ensure safe working conditions and practices.
- 3.3 Specialist contractors used should work to industry guidelines and be able to demonstrate safe working practices.
- 3.4 Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and policies implemented based on risk assessment.
- 3.5 Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.
- 3.6 Entry of pipes, chambers, tanks and culverts should be avoided. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.
- 3.7 For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

4 Schedule A – Sewers, Manholes & Gullies

- 4.1 Regular inspection and maintenance is required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.
- 4.2 Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems.
- 4.3 The report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client for future reference.
- 4.4 Operation and maintenance requirements for all sewers, manholes and gullies are described in the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly intervals.
	Common yard & car park & other hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems.	Monthly.
	Debris removal from gullies (where may cause risks to performance).	6 Monthly intervals, after autumn leaf fall, or as required based on specific observations.
	Lift and inspect receiving manholes to check for any blockages.	Monthly.
Remedial Actions	Repair any damaged gully gratings.	As required.
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits during the survey.	10-yearly intervals.

- 4.5 Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements.
- 4.6 In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in 'Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services. Further information on safety is set out in Section 3.

5 Schedule B – Permeable Pavement

5.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Machine sweeper (push- or scarab-type).	Annually after autumn leaf fall
Occasional Maintenance	Weed removal	Annually
Remedial Actions	Remediate adjacent landscaping to original levels	As required
	Paving repairs including replenishment of lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required if infiltration is reduced by clogging
Monitoring	Initial inspection	Monthly for first three months
	Inspection for evidence of poor operation and/or weed growth	Quarterly, 48 hrs after large storms in first six months
	Inspection for silt accumulation to establish sweeping frequencies	Annually
	Monitor inspection chambers	Annually

5.2 Further information on safety is set out in Section 3.

6 Schedule C – Swales

6.7 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or reseedling	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance,	As required

	break up silt deposits and prevent compaction of the soil surface Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip Remove and dispose of oils or petrol residues using safe standard practices	As required As required
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7 Schedule D – Detention Ponds and Control Chambers

7.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Inspect marginal and bankside vegetation, and remove nuisance plants (for first 3 years)	Monthly at start, then as required.
	Inspect inlets, outlets, banksides, etc. for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Hand cut submerged and emergent aquatic plants	Annually
	Remove sediment and planting from one quadrant of the main body of pond	Every 5 years – or as required
Remedial Actions	Repair erosion or other damage	As required.
	Replant, where necessary	As required.
	Aerate pond when signs of eutrophication are detected	As required.
	Repair / rehabilitate inlets, outlets, overflows	As required.
Control Chambers and Hydrobrakes	Check hydrobrake orifices are clear and retention tank door is closed. Check function of retention tank door and oil if necessary. Similarly, check outfalls and inlets of	First 2 years of occupation – Monthly Then annually

	attenuation ponds to ensure pipes are clear and free-flowing.	
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7.2 Safety information is set out in Section 3.

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8 Schedule E – Rain Gardens, Bioretention Features

8.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time and assess standing water levels in underdrain	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly; monthly for tree pits
Regular Maintenance	Remove litter, debris and weeds	At least quarterly; monthly for tree pits
	Replace any plants, to maintain planting density	As required
	Manage other vegetation and remove nuisance plants from tree pits	Monthly (at start, then as required)
	Remove sediment, build-up from around inlets and forebays	Quarterly to biannually
Occasional Maintenance	Infill any holes or scour, improve erosion protection	As required
	Repair minor accumulations of silt by raking away surface mulch,	As required

	scarifying surface of filter medium and replacing mulch Tree pits: check tree health and manage tree appropriately Tree pits: remove silt build-up from inlets and surface and replace mulch as necessary Tree pits: watering	Annually Annually, or as required As required in periods of drought
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly
Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

8.1 Safety information is set out in Section 3.

9 Schedule F – Riparian Watercourse

9.7 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Litter and debris removal	Monthly
	Cut back vegetation, remove cuttings	Annually between September and March, trim alternate banks each year
Occasional Maintenance	Silt removal from ditch bed including culverts	Rolling programme over 3 years
Remedial Actions	Repair erosion damage, re-seed bare patches on banks	As required
	Clear blockages	As required
	Repair culverts and headwall structures	As required
Monitoring	Inspect culverts for blockages and any damage	Monthly
	CCTV survey of long or multi-directional culverts	5 years

9.8 Safety: The dynamic nature of open and culverted watercourses means that risk should be assessed on a case-by-case basis. Appropriate clothing and protective wear should be worn by all involved in the maintenance. High visibility jackets are recommended when carrying out maintenance near a road. The increased risk of working near a road will need to be considered.

9.9 Culvert entry should be avoided. Works should be carried out from the surface using appropriate equipment.

- 9.10 Further safety information is set out in Section 3.
- 9.11 There are legal duties regarding Ordinary Watercourses which should be reviewed and understood prior to undertaking significant maintenance. Environmental laws may also apply depending on the habitat at each location.
- 9.12 The riparian ownership of each ditch should also be understood so that work does not take place on 3rd party land without prior agreement.

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10 Contamination or Dilution of Spillage

10.1 In the event of a spillage it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

10.2 Environment Agency – Emergency Contact Number

In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is **0800 80 70 60** (Freephone 24hrs).



Civil Engineering - Transport Planning - Flood Risk

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