

Land at Netley Firs, Kanes Hill Southampton

Hi-Acre Construction Ltd

Response to LLFA Consultation

TSH/TN/0040/7230
16th January 2026

Introduction

MJA Consulting have been appointed by Hi-Acre Construction to progress the Reserved Matters & Detailed Design for the development of land at Netley Firs, Kanes Hill, Southampton specifically the foul and surface water drainage strategies. The site currently benefits from outline planning permission for 23 employment units with associated car parking and access from Kanes Hill. Granted by Eastleigh Borough Council in March 2021. Application Reference: 0/18/82750.

MJA Consulting submitted a Foul and Surface Water Drainage Technical Note (report reference TSH/TN/0529) to Eastleigh Borough Council (EBC) as part of the Reserved Matters Application (RMA) (Application Reference DC/25/99595) for the development with the intention of discharging Conditions 23 and 24 of the planning consent.

Hampshire County Council (HCC), as the Lead Local Flood Authority (LLFA), provided a Consultation Response (referenced SWM/2025/0400) to the RMA requesting further information relating to groundwater monitoring, infiltration testing and remodelling of the surface water strategy. HCC's response has been included in **Appendix A**.

Further ground investigation has been undertaken to establish groundwater levels and infiltration rates in the locations of and at the depths of the proposed infiltration features. The results of the investigation show that an infiltrating surface water drainage strategy will not be possible due to high groundwater levels and reduced infiltration rates.

This Technical Note has been prepared to provide the additional information requested by the LLFA and to demonstrate that an alternative surface water strategy is deliverable for the development in accordance with National, Regional and Local planning policy.

The provision of this technical note should allow the LLFA to recommend Conditions 23 and 24 are discharged.



Further Ground Investigation

Forge Environmental Management Ltd provided a letter, dated 15th December 2025, detailing the method and results of their ground investigation undertaken on the 9th and 10th December 2025. This letter has been included in **Appendix B**.

Trial pits were excavated to the equivalent depth of the proposed infiltration features. At the base of the trial pits groundwater was encountered that rose slowly. The trial pits were left over night to allow the standing groundwater level to be achieved. The results are shown in **Figure 1** below:

Figure 1 – Extract from Forge Environmental Management’s Letter

Table 1 –Infiltration Test Pit Dimensions

Test Pit Ref	Pit length	Pit width	Pit depth	Standing water depth	Comments
Structure 1	2.200m	0.700m	0.750m	0.540m	
Structure 2	2.100m	0.700m	1.300m	1.020m	Moved due to trees
Structure 3	1.500m	0.700m	1.800m	1.580m	Deepened from 1.3m due to clay at base
Structure 4	1.900m	0.700m	1.300m	0.710m	
Structure 5	2.200m	0.700m	1.700m	0.870m	Moved due to trees
Structure 6	2.100m	0.700m	1.800m	0.550m	
Structure 7	2.100m	0.700m	1.600m	1.190m	

Forge Environmental Management did attempt infiltration testing in accordance with BRE 365 however it was not possible to complete the required number of tests due to the slow infiltration and high groundwater. A summary of the calculated infiltration rate is included in **Figure 2** below:

Figure 2 – Extract from Forge Environmental Management’s Letter Table 3

Table 3 - Summary of the Calculated Infiltration Rates

Test Pit Ref	Test Number	Depth to Standing Water (m)	Depth of Water Added (m)	Total Water Level Drop (m)	Total Time Taken (min)	Infiltration Rate (m/s)
Structure 1	Test 1	0.540	0.100	0.030	319	n/a
Structure 2	Test 1	1.020	0.100	0.030	310	n/a
Structure 3	Test 1	1.580	0.150	0.050	248	n/a
Structure 4	Test 1	0.710	0.100	0.000	265	n/a
Structure 5	Test 1	0.870	0.070	0.030	274	n/a
Structure 6	Test 1	0.550	0.100	0.025	235	n/a
Structure 7	Test 1	1.190	0.110	0.010	214	n/a

Due to the higher than anticipated groundwater levels in the locations of all the proposed infiltration features and the subsequent slower infiltration rates an infiltrating surface water drainage strategy is no longer deemed feasible.

Alternative Surface Water Strategy

Considering the results of the ground investigation an alternative surface water drainage strategy has been developed. This strategy has been developed in accordance with the surface water drainage hierarchy – infiltration, watercourse, surface water sewer.

There are no existing watercourses on or near the site that can be used as an outfall for surface water. There is an existing public surface water sewer, owned by Southern Water, in Kinsbourne Way. It is proposed to discharge surface water runoff from the development into this sewer (chamber reference 5551) at a maximum restricted rate of 2.5l/s. Southern Water records have been included in **Appendix C**.

A pre-planning application has been made to Southern Water to confirm capacity in the existing public surface water network. At the time of preparing this Technical Note Southern Water were still preparing a response. This will be forwarded to the planning authority and LLFA upon receipt.

Existing greenfield rates have been calculated using the online UK SuDS Greenfield Runoff Rate Estimation tool. The results are included in **Appendix D** and summarised in **Table 1** below. As can be seen the proposed discharge rate (2.5 l/s) is significantly less than the 1-year greenfield rate and therefore complies with LLFA requirements.

Table 1 – Summary of Greenfield Runoff Rates

Return Period	Flow Rate (l/s)
1 Year	6.0
2 Year	6.2
10 Year	11.4
30 Year	16.1
100 Year	22.4
200 Year	26.2

The proposed surface water drainage strategy has been included in **Appendix E**. The strategy proposes permeable pavement for all roads and the majority of parking areas. Surface water falling onto the roads, parking areas and roofs of buildings will be directed towards the sub-base of the roads.

The sub-base of the roads will provide treatment and attenuation to all surface water runoff from the development before being directed to 2 attenuation tanks located beneath the the access road. Flows will be attenuated further

in these tanks before discharging into a new surface water sewer at a restricted rate of 2.5 l/s (for all storm events up to and including the 100 year climate change adjusted event).

The new sewer will flow via gravity north, along Kanes Hill, before heading west and connecting into the existing 525mm diameter Southern Water surface sewer in Kinsbourne Way.

The proposed surface water strategy has been modelled using Causeway's Flow software. Simulations have been undertaken for a variety of storm events with and without climate change adjustments. The full set of calculations have been included in **Appendix F**. A summary of results has been provided in **Table 2** below.

Table 2 – Summary of Proposed Discharge Rates

Return Period	Discharge Rate (l/s)
1 Year	1.4
30 Year	1.7
30 year + 40%cc	2.1
100 Year	1.9
100 Year + 45%cc	2.4

Appendix E of this report includes the following:

- proposed levels design, showing road contours and finished floor levels of units.
- proposed surface water drainage strategy, showing details of the permeable paving and outfall features.
- a catchment plan, showing where runoff will flow towards based on the proposed levels design.
- an exceedance flow plan, showing where runoff will flow to in the event of a blockage, a storm event exceeding the design parameter or any failure of the system.
- Proposed foul water drainage strategy

Referring to Table 26.2 of the SuDS Manual – 'Pollution hazard indices for different land use classifications' the proposed development and land use results in a medium pollution hazard (commercial yard and delivery areas, therefore a 'Simple Index' method can be used to make a qualitative assessment of the proposed SuDS management.

Pollution hazard indices (Table 26.2 of SuDS Manual):

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Commercial yard and delivery areas	Medium	0.7	0.6	0.7

To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

SUDs Mitigation Indices (Table 26.4 of SuDS Manual):

Type of SUDs component (Within development)	Mitigation indices		
	TSS	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

As is demonstrated above the proposals provide suitable treatment to surface water runoff from the development prior to discharge.

Appendix G of this technical note includes the updated SuDS Management and Maintenance Plan for this development.

Summary and Conclusions:

This Foul and Surface Water Drainage Technical Note has been prepared on behalf of Hi-Acre Construction Ltd in respect of the approved planning application for 23 commercial units off of Kanes Hill, Southampton. Planning Approval Ref: 0/18/82750.

This note has been prepared to provide the provide the additional information requested by the LLFA and to demonstrate that an alternative surface water strategy is deliverable. It should now allow the discharge of Planning Conditions 23 (foul water drainage) and 24 (surface water drainage).

This note along with its appendices provide all the requested information within Condition 23 and 24 and should now allow EBC to recommend discharge of Condition 23 and 24 of the Outline Application 0/18/82750.

Appendices:

Appendix A: HCC's Consultation Response

Appendix B: Site Investigation Data

Appendix C: Southern Water Sewer Records

Appendix D: Greenfield Runoff Calculations

Appendix E: Proposed Design Drawings

Appendix F: Proposed Simulation Calculations

Appendix G: Suds Management and Maintenance Plan

Appendix A:
HCC's Consultation Response



Hampshire County Council

Universal Services
The Castle
Winchester, Hampshire SO23 8UD

Tel: 0300 555 1375
Fax 01962 847055
www.hants.gov.uk

Enquiries to	Scott Glover	My reference	SWM/2025/0400
Direct Line	TBC	Your reference	DC/25/99595
Date	8 August 2025	Email	swm.consultee@hants.gov.uk

Dear Sir/Madam,

Discharge of Conditions 15 (Levels), Condition 16 (Pedestrian Link Construction Detail), Condition 19 (Lighting) and Condition 23 and 24 (Foul and Surface Water Drainage) of Outline Planning Permission O/18/82750 (Outline application for the demolition of existing buildings and erection of 23 employment units (up to 5,905 sq.m.) with units 12-20 for Use Class B1 (b) and (c) and units 1-11 and 21-23 for Use Class B2, with associated car parking and access. Detailed matters considered: Access and layout) approved March 2021. at Land at Netley Firs, Kanes Hill, SOUTHAMPTON, SO19 6AJ(Application No. DC/25/99595)

Hampshire County Council as Lead Local Flood Authority has provided comments in relation to the above application in our role as statutory consultee on surface water drainage for major developments.

This response does not reflect the position of Hampshire County Council as the Highway Authority. If there is a potential for the drainage features to be offered for adoption, this will need to be discussed separately with Highways development planning as they might not be considered acceptable by the Highway Authority.

In order to assist applicants in providing the correct information to their Local Planning Authority for planning permission, Hampshire County Council has set out the information it requires to provide a substantive response at <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning>

The County Council has reviewed the following documents relating to the above application:

Director of Universal Services
Patrick Blogg

- Foul and Surface Water Drainage Technical Note, TSH/TN/0529/7230, 19th June 2025
- Ground Appraisal Report, GE18367-GAR-OCT19, 15/10/2019

In order for us to provide a substantive response, the following information is required:

Winter groundwater monitoring is required to evidence the viability of infiltration features and to demonstrate any risk from groundwater flooding is suitably managed.

Infiltration rates are required at the locations of the underground geocellular storage tanks. Re-modelling is required for each outfall using these results, rather than the average, to evidence sufficient capacity in the network.

The runoff from the impermeable footpath must be managed in the drainage strategy and included in the calculations where necessary.

More information is required to demonstrate the correct factor of safety has been used for the infiltration tanks. Safety Factors should align with the principles outlined in the SuDS Manual. Justification should be given for any Safety Factors used.

The maintenance regime should include all drainage features within the design.

We require this further information before we can make a decision on whether to recommend to the Local Planning Authority that Condition .

As a statutory consultee, the County Council has a duty to respond to consultations within **21 days**. The 21 day period will not begin until we have received sufficient information to enable us to provide a meaningful response.

Please ensure all data is sent to us via the relevant Local Planning Authority.

If you require additional guidance on providing the correct information, we recommend you use our **Surface Water Management Pre-application service** which will enable discussions with the reviewing engineer and scope out works that would address the points raised. For full details, please visit: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning> and click on [pre-application advice request form](#).

This response has been provided using the best knowledge and information submitted by the applicant as part of the planning application at the time of responding and is reliant on the accuracy of that information.

General guidance for the application

It is important to ensure that the long-term maintenance and responsibility for Sustainable Drainage Systems is agreed between the Local Planning Authority and the applicant before planning permission is granted. This should involve discussions with those adopting and/or maintaining the proposed systems, which could include the Highway Authority, Planning Authority, Parish Councils, Water Companies and private management companies.

For SuDS systems to be adopted by Hampshire Highways it is recommended that you visit the website at:

<https://www.hants.gov.uk/transport/developers/constructionstandards> for guidance on which drainage features would be suitable for adoption.

Where the proposals are connecting to an existing drainage system it is likely that the authorities responsible for maintaining those systems will have their own design requirements. These requirements will need to be reviewed and agreed as part of any surface water drainage scheme.

Works in relation to ordinary watercourses

*PLEASE NOTE: If the proposals include works to an ordinary watercourse, under the Land Drainage Act 1991, as amended by the Flood and Water Management Act 2010, prior consent from the Lead Local Flood Authority is required. **This consent is required as a separate permission to planning.***

Information on ordinary watercourse consenting can be found at the following link

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/cangewatercourse>

It is strongly recommended that this information is reviewed before Land Drainage consent application is made.

*For guidance on providing the correct information, we recommend you use our **Ordinary Watercourse Consents Pre-application service** and help avoid delays occurring at the formal application stage. A Pre-application service for Ordinary Watercourse Consents is available, allowing consents to go through in a smoother, often more timely manner. For full information please visit:*

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/cangewatercourse>

Yours faithfully,

PP 

Scott Glover
Senior FWM Project Officer



Appendix B:
Site Investigation Data

Mr James Dennis
Netleys Firs,
Kanes Hill,
Southampton,
SO19 6AJ

15th December 2025

Dear Jim

Re: Land at Netleys Firs, Kanes Hill – In-situ Infiltration and Percolation Testing

Further to the in-situ infiltration testing undertaken between the 9th and 10th December 2025 on your proposed development site on Kanes Hill please see below details and assessment of the results.

Summary of Site Works

The attached drawing shows the locations of the trial pits that were generally in the marked out locations although as noted on the drawing some had to be relocated slightly due to obstructions or trees.

Table 1 –Infiltration Test Pit Dimensions

Test Pit Ref	Pit length	Pit width	Pit depth	Standing water depth	Comments
Structure 1	2.200m	0.700m	0.750m	0.540m	
Structure 2	2.100m	0.700m	1.300m	1.020m	Moved due to trees
Structure 3	1.500m	0.700m	1.800m	1.580m	Deepened from 1.3m due to clay at base
Structure 4	1.900m	0.700m	1.300m	0.710m	
Structure 5	2.200m	0.700m	1.700m	0.870m	Moved due to trees
Structure 6	2.100m	0.700m	1.800m	0.550m	
Structure 7	2.100m	0.700m	1.600m	1.190m	

The infiltration test pits were excavated using a mini EC18E tracked excavator, which as can be seen from the attached photographs revealed a layer of topsoil/asphalt surfacing over a sandy gravelly made ground with evidence of burning that rested upon the natural clayey gravelly sand.

Groundwater was encountered in the base of all the test pits that slowly rose therefore the pits were left overnight to allow the standing level to achieved, which are shown in table 1.

In addition to the seven infiltration test pits two percolation tests were undertaken in the area of the proposed drainage field. The locations of these had to be relocated to the south as they were within a large stockpile of topsoil. Initially the upper c.0.9m of the percolation test pits were dug using the excavator to expose the underlying natural clayey gravelly sand. However, these filled with water. Therefore, further shallow sumps were hand dug but terminated in the layer of brown clayey slightly gravelly sand below the topsoil, as summarised in Table 2 overleaf.

Table 2 –Percolation Test Pit Dimensions

Test Pit Ref	Pit length	Pit width	Pit depth	Water depth at start of test	Comments
P1	0.300m	0.300m	0.450m	dry	Moved due to stockpile
P2	0.300m	0.300m	0.500m	0.405m	Moved due to stockpile

The trial pits (Structure 1 to 7) were used to undertake infiltration tests in accordance with the procedures outlined in BRE Digest 365 Soakaway Design 1991, which requires the time for the water level to drop from 25% to 75% to be recorded for the calculation of the infiltration rate.

The two percolation tests pits (P1-P2) were used to undertake the BS 6297 waste water test to determine the Vp value, which requires the time for the 0.027m³ of water placed in the 0.3m cube in the base of the test pit to drain from 25% and 75%. In accordance with the BS methodology prior to commencing the tests following excavation the pits were filled with 0.3m of water, which was allowed to drain overnight, however P2 did not fully drain, and therefore contained standing water as shown in Table 2 above

Copies of the record sheets for the tests are attached but the findings and conclusions are discussed overleaf

BRE365 - Infiltration Results

The results from the attached soakaway infiltration rate calculation sheets are summarised in the table below that confirms in the time available for the tests the water levels did not drop sufficiently to allow for the infiltration rate to be calculated in accordance with the procedures in BRE365. Therefore, it was not possible to undertake the specified three repeats of the test.

Table 3 - Summary of the Calculated Infiltration Rates

Test Pit Ref	Test Number	Depth to Standing Water (m)	Depth of Water Added (m)	Total Water Level Drop (m)	Total Time Taken (min)	Infiltration Rate (m/s)
Structure 1	Test 1	0.540	0.100	0.030	319	n/a
Structure 2	Test 1	1.020	0.100	0.030	310	n/a
Structure 3	Test 1	1.580	0.150	0.050	248	n/a
Structure 4	Test 1	0.710	0.100	0.000	265	n/a
Structure 5	Test 1	0.870	0.070	0.030	274	n/a
Structure 6	Test 1	0.550	0.100	0.025	235	n/a
Structure 7	Test 1	1.190	0.110	0.010	214	n/a

Although the tests were not completed in some of the trial pits the water levels did drop sufficiently that in 24hours it is possible they would drain to the standing water level. Therefore, as a guide to indicate the likely infiltration rates achieved the time for 25% to 75% reductions for each test have been used for the calculation the results of which are shown below.

Table 4 – 25%-75% reduction infiltration rates

Test Pit Ref	Infiltration Rate (m/s)
Structure 1	1.17×10^{-6}
Structure 2	2.78×10^{-6}
Structure 3	3.69×10^{-6}
Structure 4	n/a
Structure 5	1.47×10^{-6}
Structure 6	1.36×10^{-6}
Structure 7	4.71×10^{-7}

The infiltration tests could not be completed in accordance with the BRE365 procedures due to the high groundwater table levels and slow infiltration rates. However, the unsaturated soils have been shown to have a limited capacity to allow the passage of water with the results, where there was a reduction, ranging from 4.71×10^{-7} to 3.69×10^{-6} m/s. Typically, the minimum infiltration rate for a soakaway design is $>1 \times 10^{-6}$ m/s therefore the non-standard calculated rates for the soils at Netleys Firs indicate they may support a soakaway drainage solution.

However, due to the groundwater level being higher than the proposed invert levels, as these corresponded with the proposed test pit bases, the local Authority and the Environment Agency will need to be consulted as direct discharge into the groundwater is not normally permitted.

BS6297 - Percolation Results

As noted above due to the high water table level the percolation test pits were terminated within the upper 0.5m of the soils in the proposed drainage field area. However, neither pit was able to drain the full 300mm of water within 6 hours as required by BS6297. Therefore, the test failed, however test pit P1 did allow the passage of water and although slow the water level drop was sufficient to calculate the Vp (percolation value). Attached are copies of the record sheets for each test, which were not repeated, and Table 5 below summarises the results.

Table 5 - Summary of the Percolation Test Results

Trial Pit	Test Number	Time for water level to drop from 25-75% (mins)	Vp (s/mm)
P1	Test 1	350	136
P2	Test 1	n/a	n/a

Although it was possible to calculate a Vp value from the test in P1 as the value was >100 s/mm the soils are considered unlikely to be suitable and the local authority should be consulted about any proposals to use a drainage field to discharge wastewater.

Conclusion

Based upon the results of the infiltration tests undertaken at Netleys Firs it has been concluded that although the soils have been shown to have a limited potential to permit the passage of water due to the slow rates in conjunction with the highwater tables the regulators will to be need consulted prior to undertaking any designs for soakaways or drainage fields.

I hope the above and attached are sufficiently detailed but if you have any queries or would like to discuss the results further then please do not hesitate to contact me.

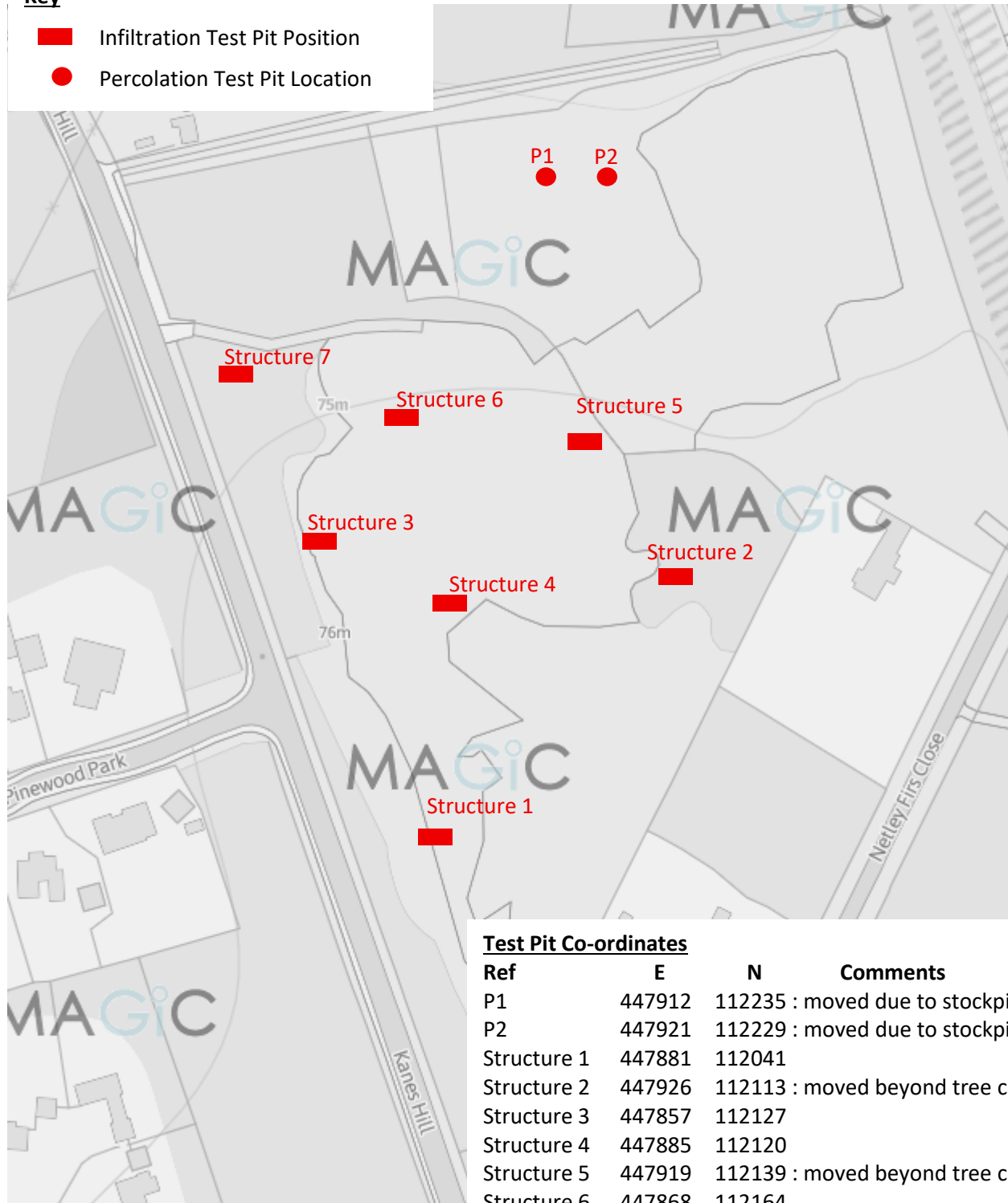
Yours sincerely



Richard Blaney
for Forge Environmental Management Ltd

Key

-  Infiltration Test Pit Position
-  Percolation Test Pit Location



Test Pit Co-ordinates

Ref	E	N	Comments
P1	447912	112235	: moved due to stockpile
P2	447921	112229	: moved due to stockpile
Structure 1	447881	112041	
Structure 2	447926	112113	: moved beyond tree canopy
Structure 3	447857	112127	
Structure 4	447885	112120	
Structure 5	447919	112139	: moved beyond tree canopy
Structure 6	447868	112164	
Structure 7	447821	112172	

PROJECT

**Kanes Hill,
Southampton**

CLIENT

HI-ACRE CONSTRUCTION

Date : 12th December 2025

Scale : Not To Scale

DRAWING TITLE

**Infiltration and percolation test pit
approximate locations**

DRAWING No.

KAN566.D/sk01



The Forge
Lower Vagg
Chilthorne Domer
Yeovil
Somerset
BA21 3PY
Tel : 01935 840 346



PLATE 1 – Initial test pit for percolation test P1



PLATE 2 – Water at base of trial pit at c.0.9m where the 300x300mm sumps would have been dug



PLATE 5 – Water level in PO1 rose to top of the yellow slightly clayey very gravelly SAND.



PLATE 4 – Shallow sump dug near original pit



PLATE 5 – Shallow test sump for PO1



PLATE 6 – Location of percolation test pit PO2



PLATE 7 – Water entered the trial pit during excavation



PLATE 8 – Standing water level rose in PO2 trial pit



PLATE 9 – New shallow sump dug near original PO2 trial pit



PLATE 10 – New test sump for PO2



PLATE 11 – PO2 test sump did not drain the pre-commencement 300mm overnight



PLATE 12 – Structure 1 trial pit



PLATE 13 – Standing water level in Structure 1 trial pit at start of the infiltration test



PLATE 14 – Structure 2 trial pit



PLATE 15 – Standing water level in Structure 2 trial pit at start of the infiltration test



PLATE 16 – Structure 3 trial pit



PLATE 17 – Standing water level in Structure 3 trial pit



PLATE 18 – Structure 4 trial pit



PLATE 19 – Standing water level in Structure 4 trial pit



PLATE 20 – Structure 5 trial pit an hour after being dug



PLATE 21 – Standing water level in Structure 5 trial pit the following morning



PLATE 22 – Structure 6 trial pit



PLATE 23 – Standing water level in Structure 6 trial pit at start of the infiltration test



PLATE 24 – Structure 7 trial pit



PLATE 25 – Standing water level in Structure 7 trial pit at start of the infiltration test

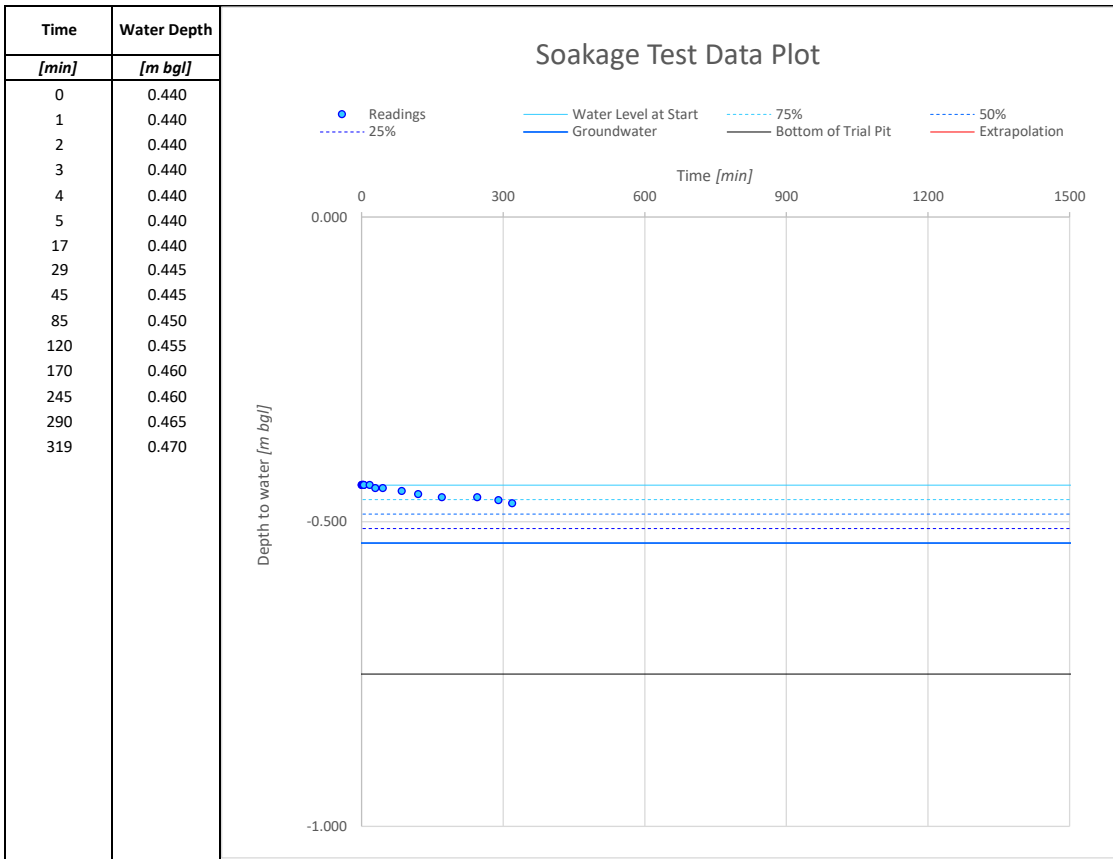


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 1	Length [m]: 2.20
Test No: 1	Depth [m]: 0.75
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 0.54

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.250	Topsoil - Brown slightly gravelly sandy silty clay
		0.250	0.600	Made ground - Grey slightly silty very gravelly sand with bands of black charcoal
		0.600	0.750	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.07**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.82**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.

FORGE

Environmental Engineering Ltd

SOIL INFILTRATION RATE

Client:

Hi-Acre

Project Title:

Kanes Hill, Southampton

Project No:

KAN566.S

Trial Pit No:

Structure 2

Test No:

1

Date:

10th December 2025

Logged by:

RB

Length [m]:

2.10

Depth [m]:

1.30

Width [m]:

0.70

Groundwater [m bgl]:

1.02

Ground

Conditions

from - to [m bgl]

Description

0.0000.200

Topsoil - Brown slightly gravelly sandy silty clay

0.2000.600

Made ground - Grey slightly silty very gravelly sand with bands of black charcoal

0.6001.300

Dark yellow clayey gravelly sand

Time

Water Depth

[min]

[m bgl]

00.920

10.920

20.920

30.920

40.920

50.920

150.920

200.920

300.920

740.925

1030.925

1550.930

2260.945

2740.945

3100.950

Soakage Test Data Plot

Readings

Water Level at Start

Groundwater

25%

75%

Bottom of Trial Pit

50%

Extrapolation

Time [min]

Depth to water [m bgl]

030060090012001500

0.000-0.500-1.000-1.500-2.000

Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75 - 25}}{a_{s50} \times t_{p75 - 25}}$$

with:

$V_{p75 - 25}$

as Effective Storage Volume of water between 75% and 25% effective storage depth [m³]

0.07

a_{s50}

as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²]

1.75

$t_{p75 - 25}$

as Time for the water level to fall from 75% to 25% effective storage depth [s]

n/a

Soil Infiltration Rate [m/s]:

n/a

Remarks: Result could not be calculated. Soakage test failed.

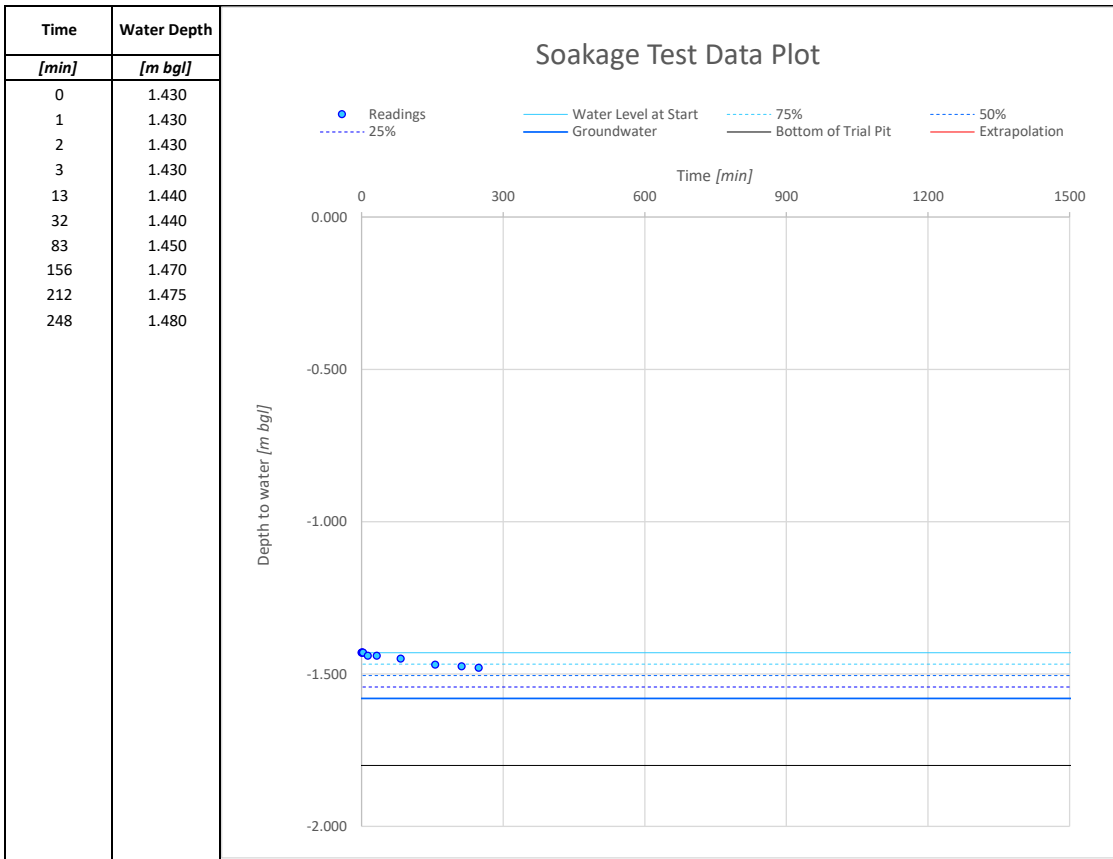


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 3	Length [m]: 1.50
Test No: 1	Depth [m]: 1.80
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 1.58

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.300	Made ground - asphalt surfacing & road plannings with occasional brick fragments
		0.300	0.800	Made ground - Grey slightly silty very gravelly sand with bands of black charcoal
		0.800	1.700	Made ground brown/grey gravelly clay
		1.700	1.800	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.08**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.38**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.

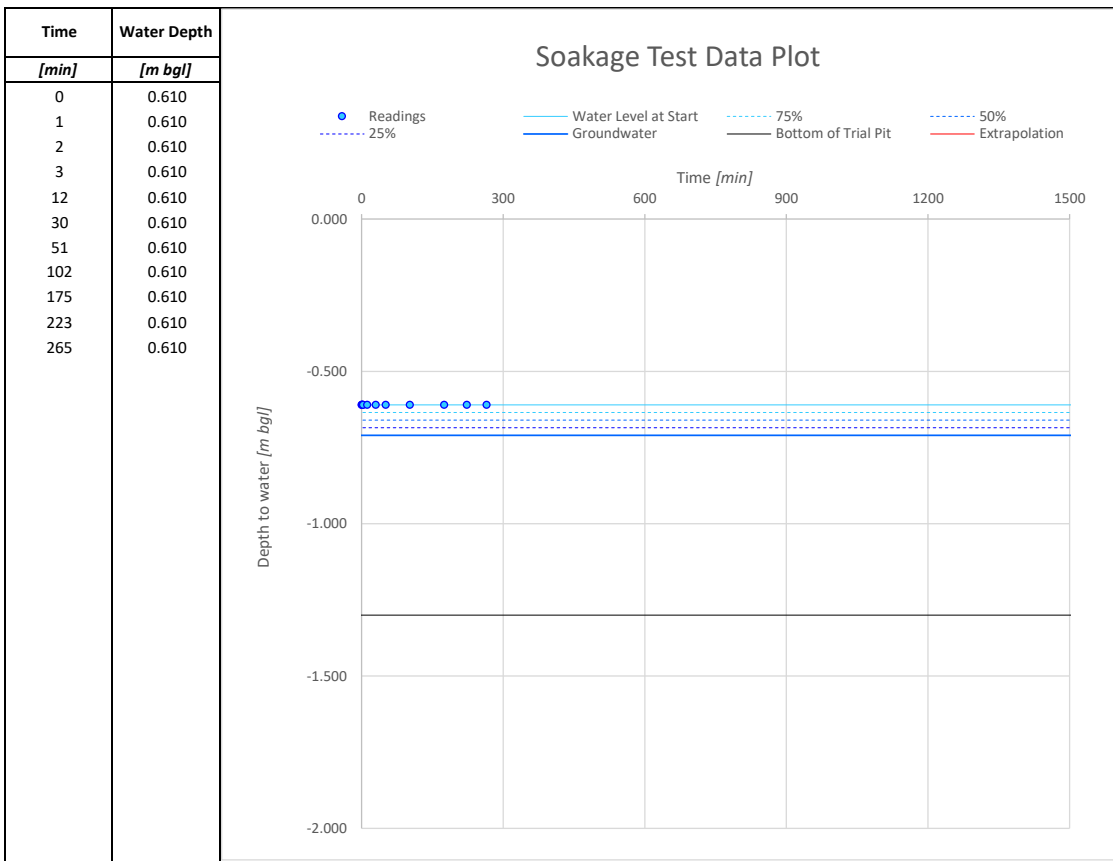


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 4	Length [m]: 1.90
Test No: 1	Depth [m]: 1.30
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 0.71

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.200	Topsoil - Brown slightly gravelly sandy silty clay
		0.200	0.700	Made ground - Grey slightly silty very gravelly sand with bands of black charcoal
		0.700	1.300	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.07**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.59**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.

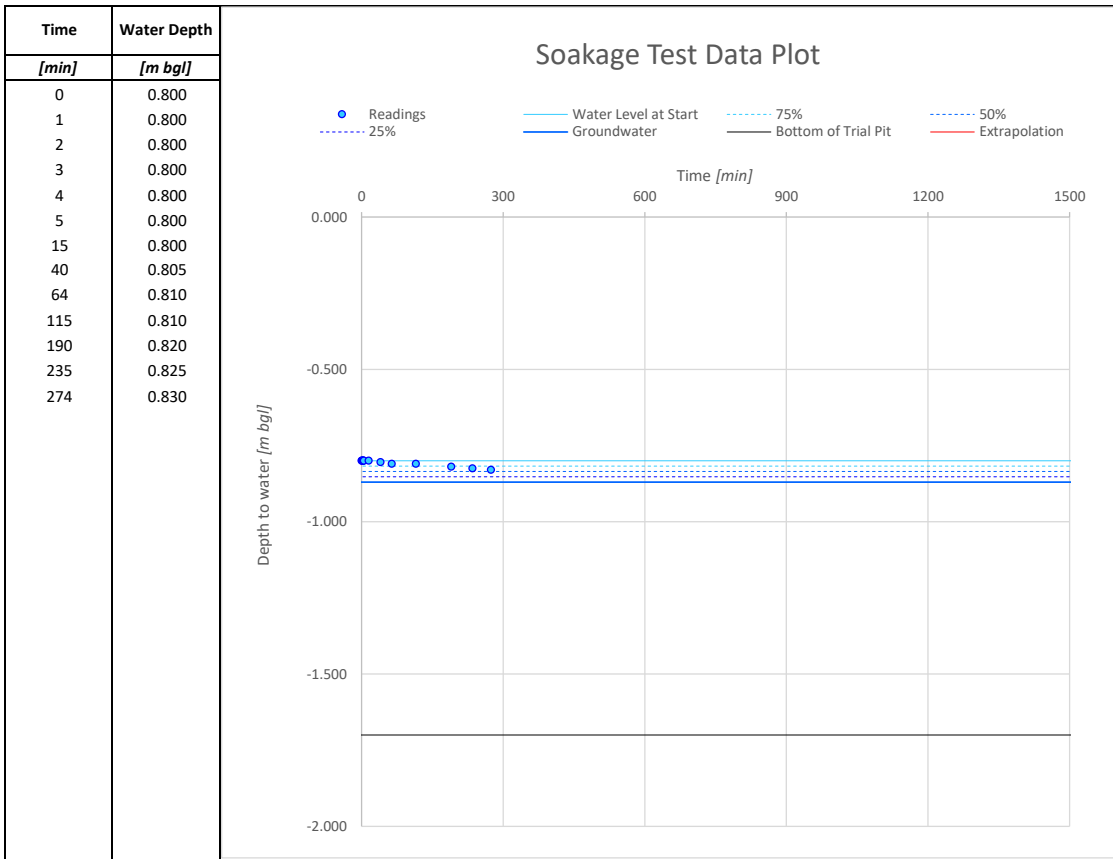


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 5	Length [m]: 2.20
Test No: 1	Depth [m]: 1.70
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 0.87

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.200	Topsoil - Brown slightly gravelly sandy silty clay
		0.200	0.700	Made ground - Grey slightly silty very gravelly sand with bands of black charcoal
		0.700	1.700	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.05**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.74**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.

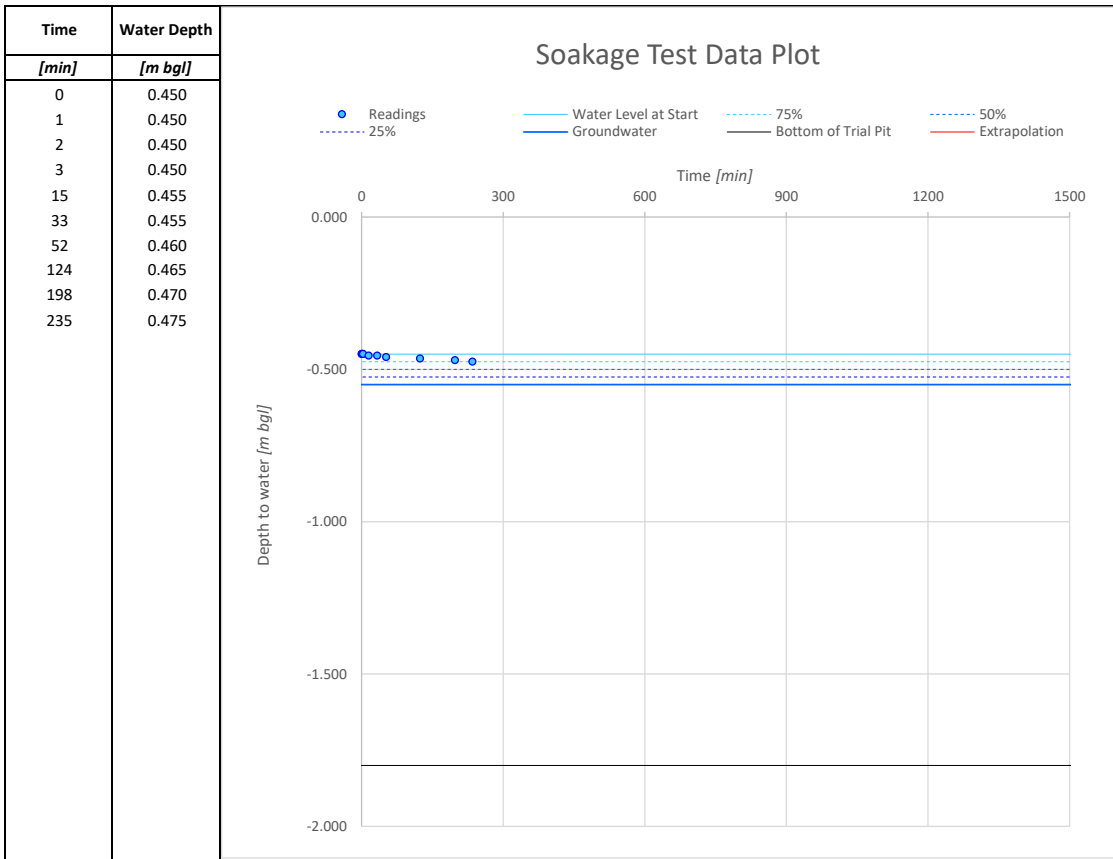


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 6	Length [m]: 2.10
Test No: 1	Depth [m]: 1.80
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 0.55

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.100	Topsoil - Brown slightly gravelly sandy silty clay
		0.100	0.600	Made ground - brown slightly gravelly sandy clay
		0.600	1.400	brown grey silty/clayey gravelly sand
		1.400	1.800	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.07**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.75**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.

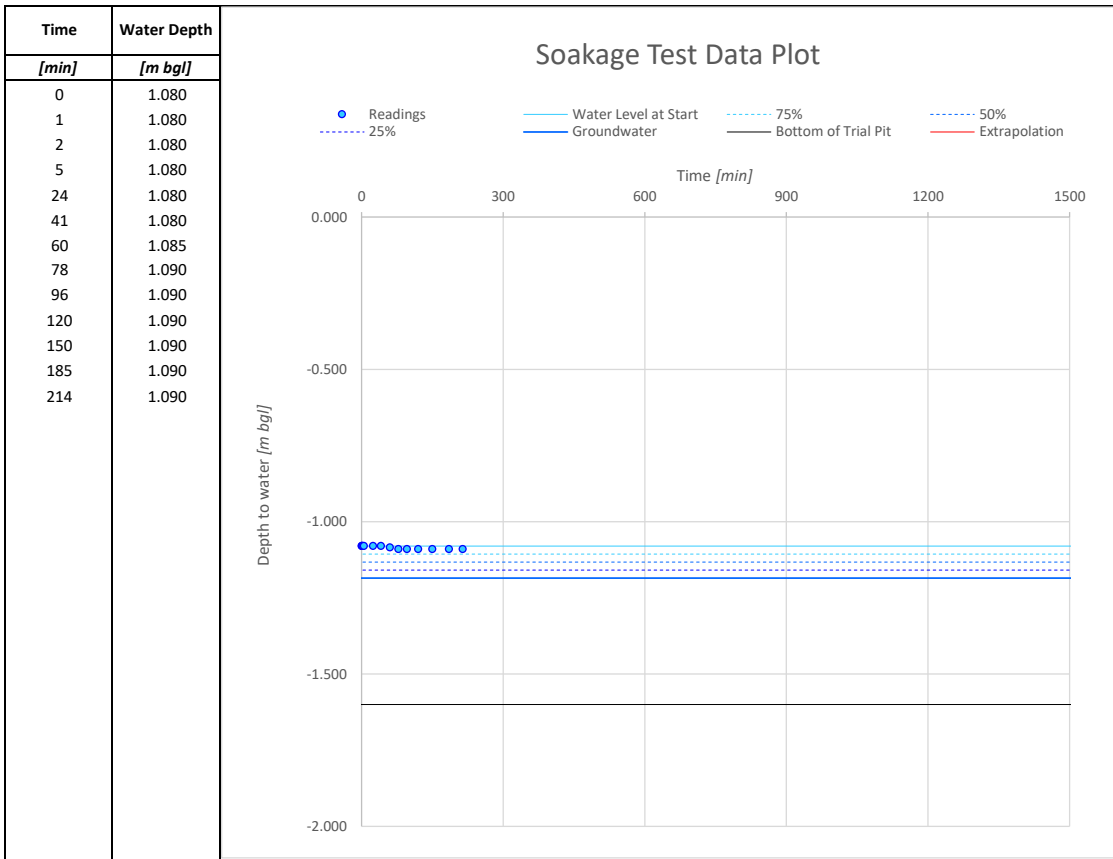


SOIL INFILTRATION RATE

Client: Hi-Acre
Project Title: Kanes Hill, Southampton
Project No: KAN566.S

Trial Pit No: Structure 7	Length [m]: 2.10
Test No: 1	Depth [m]: 1.60
Date: 10th December 2025	Width [m]: 0.70
Logged by: RB	Groundwater [m bgl]: 1.19

Ground	Conditions	from - to [m bgl]		Description
		0.000	0.300	Topsoil - Brown slightly gravelly sandy silty clay
		0.300	0.900	Made ground - Grey slightly silty very gravelly sand with bands of black charcoal
		0.900	1.600	Dark yellow clayey gravelly sand



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.08**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **1.76**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Result could not be calculated. Soakage test failed.



SOIL PERCOLATION RESULT

Client : Hi-Acre
Date of Tests : 10th December 2025
Project Title : Kanes Hill, Southampton, SO19 6AJ
Project No : KAN566.S

Test Pit No : P1

Depth of pit (m) : 0.450
Depth to water level (m) :

Ground Conditions	From to (m bgl)		Description
	0.000	0.150	Brown slightly gravelly sandy silty clay (topsoil)
	0.150	0.450	Brown clayey slightly gravelly sand

Test No	Times				Time Lapse 25-75% drop			Vp (s/mm)
	Start	25% drop	75% drop	Dry	hours	minutes	second	
1	08:00	08:20	11:15	14:00	5.67	340	20400	136
2								
3								
Average Vp =								n/a

Comments

1. The test was started in a dry pit after 300mm had soaked away overnight
2. As the calculated Vp is >100 the Regulators should be consulted
3. The test pit failed to drain within 6 hours therefore soils are unsuitable.



SOIL PERCOLATION RESULT

Client : Hi-Acre
Date of Tests : 10th December 2025
Project Title : Kanes Hill, Southampton, SO19 6AJ
Project No : KAN566.S

Test Pit No : P2

Depth of pit (m) : 0.500
Depth to water level (m) : 0.405

Ground Conditions	From to (m bgl)		Description
	0.000	0.150	Brown slightly gravelly sandy silty clay (topsoil)
	0.150	0.450	Brown clayey slightly gravelly sand
	0.450	0.500	Dark yellow clayey gravelly sand

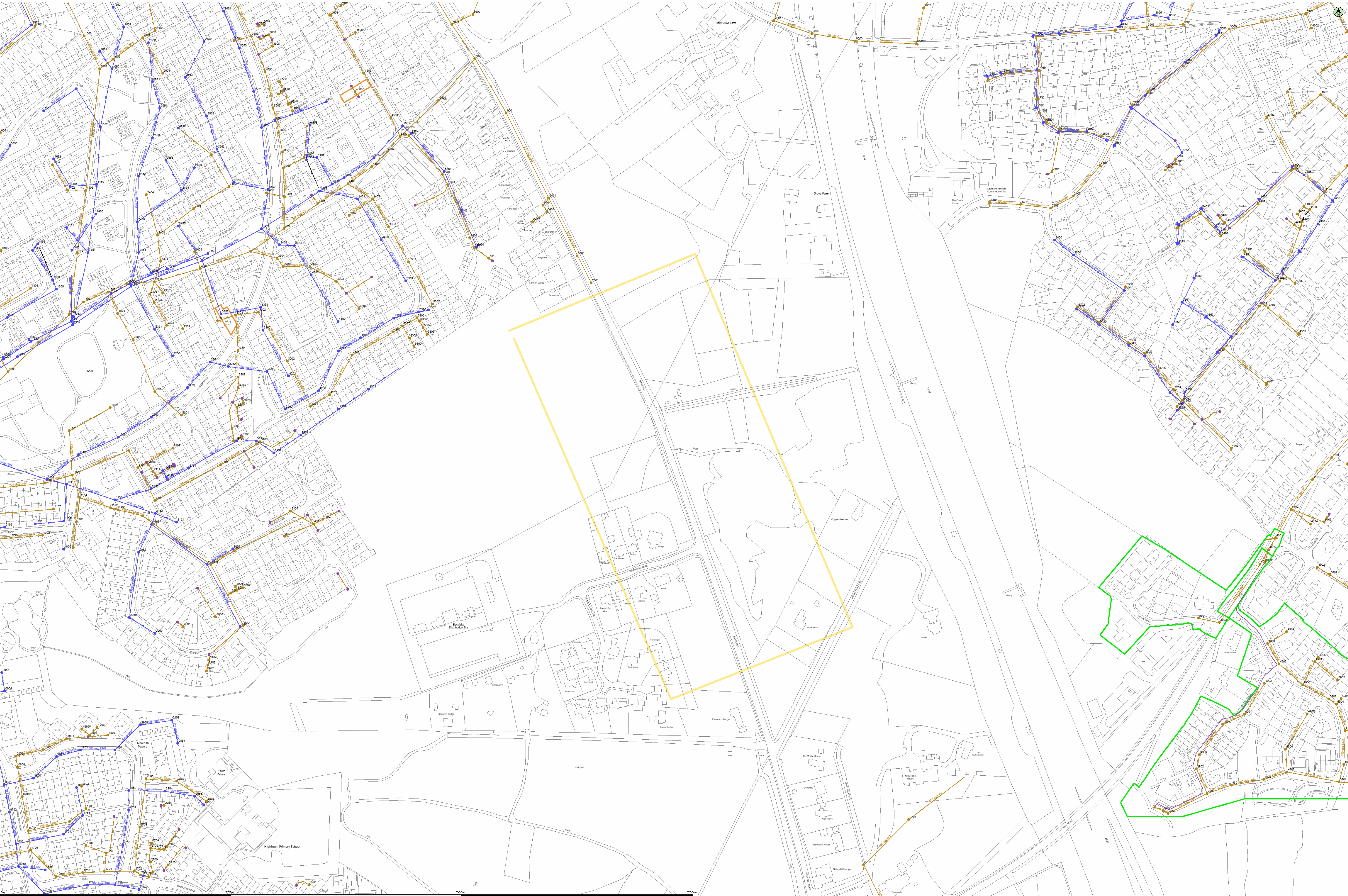
Test No	Times				Time Lapse 25-75% drop			Vp (s/mm)
	Start	25% drop	75% drop	Dry	hours	minutes	second	
1	08:10	11:40	-	-	-	-	-	n/a
2								
3								
Average Vp =								n/a

Comments

1. 300mm was placed in the pit but overnight it had only drained to 95mm
2. After 6 hours the pit had only drained 110mm therefore the test was abandoned



Appendix C:
Southern Water Sewer Records

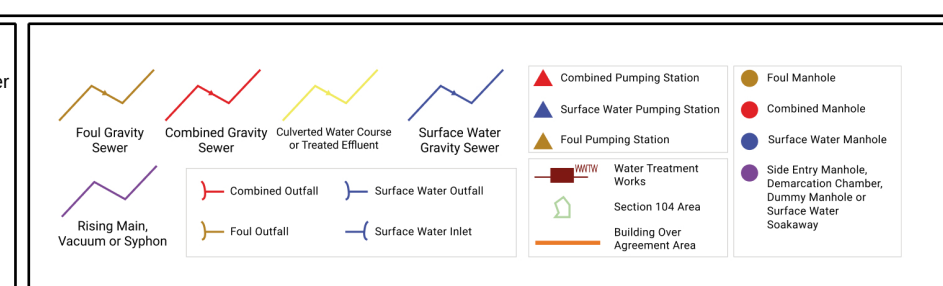


© Crown copyright and database rights 2025 Ordnance Survey AC0000808122 Date: 23/06/25 Scale: 1:1250 Map Centre: 447796,112189 Data updated: 20/05/25 Our Ref: 1805267-3

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 2025 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water pipes 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.



lucy.burt@meurveys.co.uk
36255



Waterwise Plan 40
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Appendix D:
Greenfield Runoff Calculations

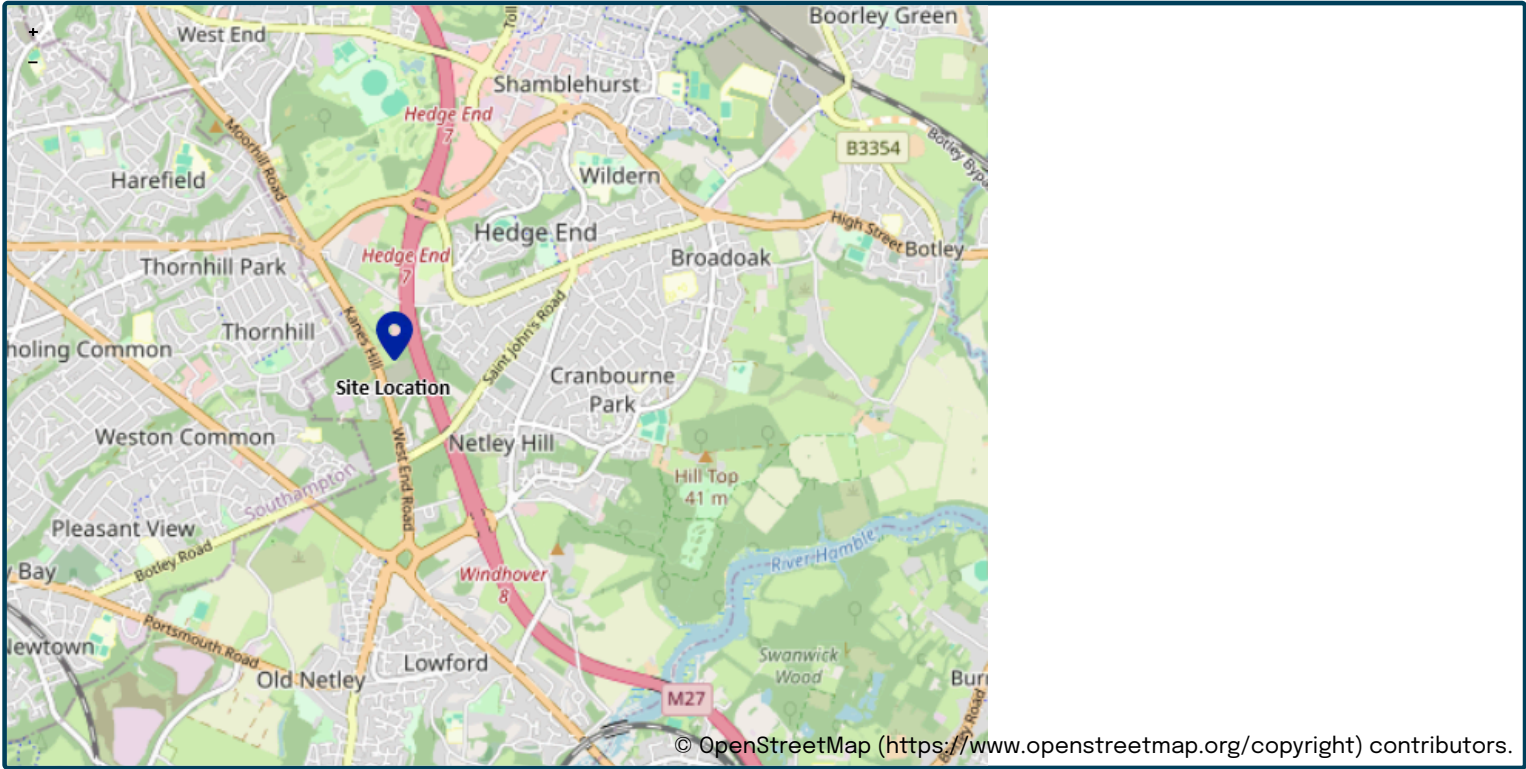
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	16/01/2026
Calculated by	Theo Sims-Harris
Reference	7230 Netley Firs
Model version	2.2.2

Location

Site name	Netley Firs
Site location	Kanes Hill, Southampton



Site easting (British National Grid)	447889
Site northing (British National Grid)	112132

Site details

Total site area (ha)	1.164	ha
----------------------	-------	----

Greenfield runoff

Method

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

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	870	mm
BFIHOST19scaled	0.443	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	6.2	l/s
QBar (FEH statistical 2025) (l/s)	7	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)	6.0
Flow rate 2 year (l/s)	6.2
Flow rate 10 years (l/s)	11.4
Flow rate 30 years (l/s)	16.1
Flow rate 100 years (l/s)	22.4
Flow rate 200 years (l/s)	26.2

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 (2.2.2) 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>). 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 these data in the design or operational characteristics of any drainage scheme.

Appendix E:
Proposed Design Drawings





NOTES

1. Do not scale from this drawing.

2. All dimensions are in metres unless stated otherwise.

3. Impermeable area used for the calculations is 100% of the catchment thus removing the requirement to add 10% for urban creep.

KEY

Proposed Catchment Flow Arrow

Pipe Catchments

PN1.000 – 2003m² – 0.200 Ha

PN1.001 – 944m² – 0.094 Ha

PN1.002 – 330m² – 0.033 Ha

PN1.003 – 2014m² – 0.201 Ha

PN1.004 – 1498m² – 0.150 Ha

PN2.000 – 740m² – 0.074 Ha

PN2.001 – 0m² – 0.000 Ha

PN2.002 – 887m² – 0.089 Ha

PN3.000 – 791m² – 0.079 Ha

PN2.004 – 971m² – 0.097 Ha

PN1.005 – 305m² – 0.031 Ha

PN1.006 – 289m² – 0.029 Ha

PN1.007 – 0m² – 0.000 Ha

PN1.008 – 0m² – 0.000 Ha

PN1.009 – 340m² – 0.034 Ha

PN1.010 – 0m² – 0.000 Ha

PN1.011 – 525m² – 0.053Ha

PN1.012 – 0m² – 0.000 Ha

Total Impermeable Catchment – 1,164 Ha

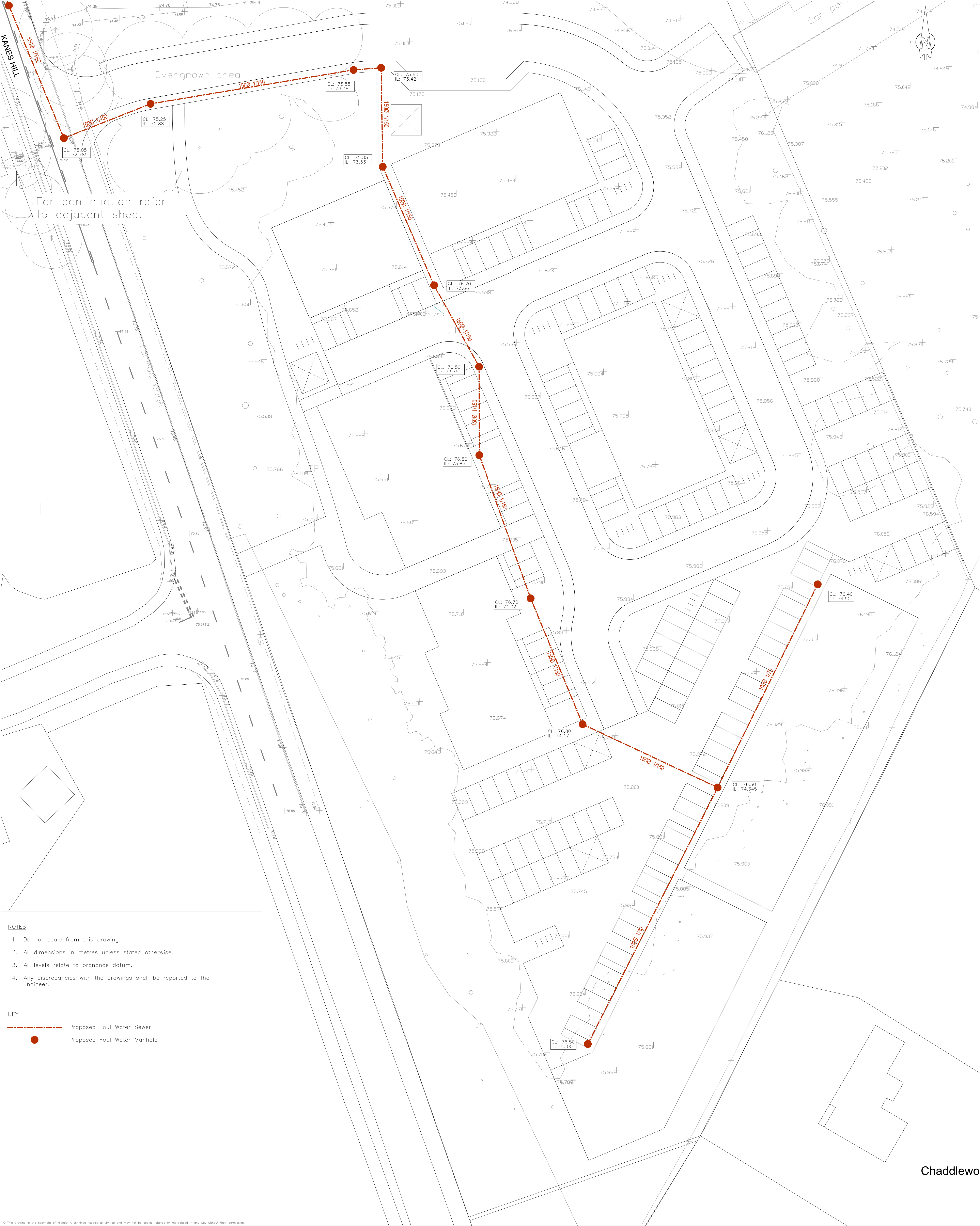


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REV. No.	DATE	DESCRIPTION	DRAWN	CHECKED
Client: HI-Acre Construction Ltd				
Project: Kanes Hill, Southampton				
Title: Surface Water Exceedance Plan				
Scale: 1:250 @ A0		Status: PLANNING		
Drawn: TSH	Project Engineer: TSH	MJA Project No: 7230	Date: March 2025	
Drawing Number: 7230-MJA-SW-XX-DR-C-005	Rev: PL1			

MJA CONSULTING
CIVIL & STRUCTURAL ENGINEERS
Ipsum Court, 24 The Quadrant,
Abingdon Science Park, Abingdon
Oxon, OX14 3YU
Tel: 01235 555173
Email: mail@mjaconsulting.co.uk





NOTES

1. Do not scale from this drawing.
2. All dimensions in metres unless stated otherwise.
3. All levels relate to ordnance datum.
4. Any discrepancies with the drawings shall be reported to the Engineer.

KEY

--- Proposed Foul Water Sewer

● Proposed Foul Water Manhole

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Chaddlewo

PLZ	09.01.2026	Amended to suit revised surface water drainage strategy	TSH	KG
REV. No.	DATE	DESCRIPTION	DRAWN	CHECKED
Client	HI-Acre Construction Ltd		MJA CONSULTING CIVIL & STRUCTURAL ENGINEERS Ipsum Court, 24 The Quadrant, Abingdon Science Park, Abingdon Oxon, OX14 3YF Tel: 01235 555173 Email: mail@mjaconsulting.co.uk	
Project	Kanes Hill, Southampton		Status: PLANNING	
Title	Foul Water Drainage Strategy		Scale: 1:250 @ A0	
Drawn: TSH		Project Engineer: TSH	MJA Project No: 7230	Date: March 2025
Drawing Number: 7230-MJA-SW-XX-DR-C-006		Rev: PL2		

Appendix F

Proposed Simulation Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
1	0.200	5.00	76.700		447896.101	112058.450	1.690	75.010
2	0.094	5.00	76.800		447896.802	112064.946	1.817	74.983
3	0.033	5.00	76.620	1200	447888.837	112083.295	1.720	74.900
4	0.201	5.00	76.250	1200	447921.346	112099.280	1.500	74.750
5	0.150	5.00	76.080	1350	447921.102	112115.288	1.575	74.505
6	0.031	5.00	75.850	1350	447905.361	112147.953	1.575	74.275
7	0.029	5.00	75.620	1350	447897.003	112168.788	1.500	74.120
8	0.000		75.500	1350	447883.301	112176.768	1.500	74.000
Tank 1			75.300		447868.007	112176.668	4.250	71.050
10	0.034	5.00	75.330	1350	447856.439	112176.488	4.330	71.000
Tank 2	0.053	5.00	74.950		447835.783	112173.188	4.000	70.950
Flow Control	0.000		75.000	1500	447812.195	112167.889	4.080	70.920
13			74.820	1500	447797.111	112169.080	4.155	70.665
9	0.074	5.00	76.430	1200	447885.792	112098.732	1.500	74.930
11	0.000		76.290	1200	447877.015	112120.621	1.500	74.790
14	0.089	5.00	76.240	1200	447874.694	112126.548	1.500	74.740
15	0.000		76.090	1200	447878.412	112136.420	1.500	74.590
16	0.097	5.00	76.050	1200	447883.047	112138.403	1.500	74.550
18	0.079	5.00	76.190		447864.543	112130.531	1.500	74.690

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	6.534	0.600	75.010	74.983	0.027	240.0	300	5.11	50.0
1.001	2	3	20.003	0.600	74.983	74.900	0.083	240.0	300	5.44	50.0
1.002	3	4	36.226	0.600	74.900	74.750	0.150	241.5	300	6.04	50.0
1.003	4	5	16.010	0.600	74.750	74.580	0.170	94.0	300	6.20	50.0
1.004	5	6	36.260	0.600	74.505	74.275	0.230	157.7	375	6.62	50.0
1.005	6	7	22.449	0.600	74.275	74.120	0.155	144.8	375	6.87	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.010	71.4	27.1	1.390	1.517	0.200	0.0	128	0.943
1.001	1.010	71.4	39.8	1.517	1.420	0.294	0.0	160	1.037
1.002	1.007	71.2	44.3	1.420	1.200	0.327	0.0	171	1.059
1.003	1.622	114.6	71.6	1.200	1.200	0.528	0.0	172	1.708
1.004	1.440	159.1	91.9	1.200	1.200	0.678	0.0	205	1.490
1.005	1.503	166.0	142.0	1.200	1.125	1.048	0.0	268	1.681

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.006	7	8	15.856	0.600	74.120	74.000	0.120	132.1	375	7.04	50.0
1.007	8	Tank 1	15.294	0.600	74.000	73.350	0.650	23.5	375	7.11	50.0
1.008	Tank 1	10	11.569	0.600	71.050	71.000	0.050	231.4	450	7.25	50.0
1.009	10	Tank 2	20.918	0.600	71.000	70.950	0.050	418.4	450	7.60	50.0
1.010	Tank 2	Flow Control	24.176	0.600	70.950	70.920	0.030	805.9	525	8.12	50.0
1.011	Flow Control	13	15.131	0.600	70.920	70.665	0.255	59.3	525	8.21	50.0
2.000	9	11	23.583	0.600	74.930	74.790	0.140	168.5	300	5.33	50.0
2.001	11	14	6.365	0.600	74.790	74.740	0.050	127.3	300	5.40	50.0
2.002	14	15	10.549	0.600	74.740	74.590	0.150	70.3	300	5.50	50.0
2.003	15	16	5.041	0.600	74.590	74.550	0.040	126.0	300	5.56	50.0
2.004	16	6	24.272	0.600	74.550	74.350	0.200	121.4	300	5.84	50.0
3.000	18	15	15.067	0.600	74.690	74.590	0.100	150.7	300	5.20	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.006	1.574	173.9	146.0	1.125	1.125	1.077	0.0	264	1.755
1.007	3.748	414.0	146.0	1.125	1.575	1.077	0.0	153	3.436
1.008	1.332	211.8	146.0	3.800	3.880	1.077	0.0	276	1.432
1.009	0.987	157.0	150.6	3.880	3.550	1.111	0.0	356	1.117
1.010	0.781	169.1	157.8	3.475	3.555	1.164	0.0	404	0.882
1.011	2.911	630.2	157.8	3.555	3.630	1.164	0.0	178	2.440
2.000	1.208	85.4	10.0	1.200	1.200	0.074	0.0	69	0.816
2.001	1.392	98.4	10.0	1.200	1.200	0.074	0.0	64	0.903
2.002	1.877	132.7	22.1	1.200	1.200	0.163	0.0	82	1.402
2.003	1.399	98.9	32.8	1.200	1.200	0.242	0.0	119	1.260
2.004	1.426	100.8	45.9	1.200	1.200	0.339	0.0	142	1.394
3.000	1.278	90.4	10.7	1.200	1.200	0.079	0.0	69	0.867

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node Flow Control Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.011	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0059-2500-2800-2500
Invert Level (m)	70.920	Min Outlet Diameter (m)	0.075
Design Depth (m)	2.800	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.5		

Node Tank 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.050
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)
0.000	240.0	0.0	2.800	240.0	0.0	2.801	0.0	0.0

Node Tank 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	70.950
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)
0.000	200.0	0.0	2.800	200.0	0.0	2.801	0.0	0.0

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	75.900	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	29.000	Inf Depth (m)	
Porosity	0.33	Length (m)	29.000		

Node 18 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	75.350	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	5	Depth (m)	
Safety Factor	2.0	Width (m)	6.150	Inf Depth (m)	
Porosity	0.33	Length (m)	20.000		

Node 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	75.820	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	1	Depth (m)	
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.33	Length (m)	19.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	75.134	0.124	21.1	0.2931	0.0000	OK
15 minute winter	2	10	75.125	0.142	30.7	0.1467	0.0000	OK
15 minute winter	3	11	75.050	0.150	33.8	0.2278	0.0000	OK
15 minute winter	4	11	74.909	0.159	54.0	0.6043	0.0000	OK
15 minute winter	5	11	74.682	0.177	69.1	0.5920	0.0000	OK
15 minute winter	6	11	74.516	0.241	107.5	0.4397	0.0000	OK
15 minute winter	7	11	74.349	0.229	109.2	0.4166	0.0000	OK
15 minute winter	8	12	74.137	0.137	108.2	0.1961	0.0000	OK
7200 minute winter	Tank 1	4980	71.507	0.457	3.3	109.7542	0.0000	SURCHARGED
7200 minute winter	10	4980	71.507	0.507	2.4	0.8056	0.0000	SURCHARGED
7200 minute winter	Tank 2	4980	71.507	0.557	2.4	111.6086	0.0000	SURCHARGED
7200 minute winter	Flow Control	4980	71.507	0.587	1.5	1.0378	0.0000	SURCHARGED
60 minute winter	13	85	70.684	0.019	1.4	0.0000	0.0000	OK
15 minute winter	9	10	74.992	0.062	7.8	0.1312	0.0000	OK
15 minute winter	11	11	74.852	0.062	7.7	0.0702	0.0000	OK
15 minute winter	14	10	74.815	0.075	16.8	0.1744	0.0000	OK
15 minute winter	15	11	74.715	0.125	24.8	0.1414	0.0000	OK
15 minute winter	16	11	74.677	0.127	34.5	0.3087	0.0000	OK
15 minute winter	18	10	74.751	0.061	8.3	0.0637	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	20.8	0.692	0.292	0.1966	
15 minute winter	2	1.001	3	30.3	0.896	0.424	0.6755	
15 minute winter	3	1.002	4	33.9	0.928	0.476	1.3241	
15 minute winter	4	1.003	5	54.2	1.525	0.473	0.5690	
15 minute winter	5	1.004	6	69.4	1.099	0.436	2.2865	
15 minute winter	6	1.005	7	106.3	1.463	0.640	1.6314	
15 minute winter	7	1.006	8	108.2	2.039	0.622	0.8468	
15 minute winter	8	1.007	Tank 1	108.9	3.104	0.263	0.5368	
30 minute winter	Tank 1	1.008	10	46.4	0.996	0.219	0.5402	
30 minute winter	10	1.009	Tank 2	47.1	1.605	0.300	1.2805	
30 minute winter	Tank 2	1.010	Flow Control	5.0	0.302	0.030	2.1762	
60 minute winter	Flow Control	1.011	13	1.4	0.616	0.002	0.0356	23.1
15 minute winter	9	2.000	11	7.7	0.738	0.090	0.2452	
15 minute winter	11	2.001	14	7.7	0.636	0.078	0.0768	
15 minute winter	14	2.002	15	16.6	0.815	0.125	0.2183	
15 minute winter	15	2.003	16	24.9	0.884	0.251	0.1418	
15 minute winter	16	2.004	6	35.0	1.089	0.347	0.8305	
15 minute winter	18	3.000	15	8.2	0.454	0.091	0.2835	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	13	75.996	0.986	70.3	6.7929	0.0000	SURCHARGED
15 minute winter	2	13	75.986	1.003	83.5	3.7630	0.0000	SURCHARGED
15 minute winter	3	12	75.929	1.029	89.3	1.5584	0.0000	SURCHARGED
15 minute winter	4	11	75.808	1.058	139.4	4.0302	0.0000	SURCHARGED
15 minute winter	5	11	75.544	1.039	177.5	3.4647	0.0000	SURCHARGED
15 minute winter	6	12	75.238	0.963	255.0	1.7567	0.0000	SURCHARGED
15 minute winter	7	12	74.727	0.607	263.6	1.1030	0.0000	SURCHARGED
15 minute winter	8	12	74.237	0.237	264.4	0.3393	0.0000	OK
7200 minute winter	Tank 1	5280	72.192	1.142	5.9	274.0999	0.0000	SURCHARGED
7200 minute winter	10	5280	72.192	1.192	3.4	1.8930	0.0000	SURCHARGED
7200 minute winter	Tank 2	5280	72.192	1.242	3.7	248.7439	0.0000	SURCHARGED
7200 minute winter	Flow Control	5280	72.192	1.272	1.7	2.2477	0.0000	SURCHARGED
7200 minute winter	13	5280	70.685	0.020	1.7	0.0000	0.0000	OK
15 minute winter	9	12	75.492	0.562	29.5	1.1905	0.0000	SURCHARGED
15 minute winter	11	12	75.485	0.695	34.9	0.7865	0.0000	SURCHARGED
15 minute winter	14	12	75.481	0.741	46.5	1.7186	0.0000	SURCHARGED
15 minute winter	15	12	75.456	0.866	69.1	0.9789	0.0000	SURCHARGED
15 minute winter	16	12	75.422	0.872	87.0	2.1144	0.0000	SURCHARGED
15 minute winter	18	12	75.466	0.776	27.7	2.1977	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	64.4	0.914	0.901	0.4601	
15 minute winter	2	1.001	3	86.1	1.223	1.206	1.4086	
15 minute winter	3	1.002	4	98.7	1.401	1.386	2.5510	
15 minute winter	4	1.003	5	124.8	1.772	1.088	1.1274	
15 minute winter	5	1.004	6	165.4	1.500	1.040	3.9994	
15 minute winter	6	1.005	7	255.5	2.317	1.539	2.4761	
15 minute winter	7	1.006	8	264.4	2.605	1.521	1.4565	
15 minute winter	8	1.007	Tank 1	265.0	3.822	0.640	1.0599	
15 minute winter	Tank 1	1.008	10	180.8	1.469	0.853	1.6529	
15 minute winter	10	1.009	Tank 2	174.8	2.017	1.113	3.2245	
15 minute summer	Tank 2	1.010	Flow Control	19.1	0.370	0.113	4.5895	
7200 minute winter	Flow Control	1.011	13	1.7	0.649	0.003	0.0404	599.4
15 minute winter	9	2.000	11	24.3	0.901	0.285	1.6607	
15 minute summer	11	2.001	14	28.6	0.697	0.291	0.4482	
15 minute summer	14	2.002	15	45.1	0.931	0.340	0.7429	
15 minute winter	15	2.003	16	71.4	1.013	0.722	0.3550	
15 minute winter	16	2.004	6	89.8	1.275	0.891	1.7092	
15 minute winter	18	3.000	15	35.7	0.566	0.395	1.0610	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	14	76.119	1.109	110.7	25.6577	0.0000	SURCHARGED
15 minute winter	2	14	76.109	1.126	89.2	8.4540	0.0000	SURCHARGED
15 minute winter	3	12	76.075	1.175	116.0	1.7809	0.0000	SURCHARGED
15 minute winter	4	10	76.035	1.285	146.2	4.8958	0.0000	FLOOD RISK
15 minute winter	5	11	75.804	1.299	195.2	4.3321	0.0000	FLOOD RISK
15 minute winter	6	12	75.440	1.165	278.8	2.1266	0.0000	SURCHARGED
15 minute winter	7	11	74.832	0.712	291.4	1.2936	0.0000	SURCHARGED
15 minute winter	8	12	74.254	0.254	291.0	0.3635	0.0000	OK
10080 minute winter	Tank 1	7440	72.946	1.896	6.6	454.9509	0.0000	SURCHARGED
10080 minute winter	10	7440	72.946	1.946	3.9	3.0897	0.0000	SURCHARGED
10080 minute winter	Tank 2	7440	72.946	1.996	4.2	399.6516	0.0000	SURCHARGED
10080 minute winter	Flow Control	7440	72.946	2.026	2.1	3.5792	0.0000	SURCHARGED
10080 minute winter	13	7440	70.687	0.022	2.1	0.0000	0.0000	OK
15 minute winter	9	12	75.773	0.843	36.4	1.7846	0.0000	SURCHARGED
15 minute winter	11	12	75.756	0.966	53.1	1.0923	0.0000	SURCHARGED
15 minute winter	14	13	75.749	1.009	74.1	2.3399	0.0000	SURCHARGED
15 minute winter	15	13	75.718	1.128	90.7	1.2753	0.0000	SURCHARGED
15 minute winter	16	13	75.667	1.117	102.8	2.7083	0.0000	SURCHARGED
15 minute winter	18	13	75.734	1.044	73.7	12.6210	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	89.2	1.266	1.249	0.4601	
15 minute winter	2	1.001	3	116.0	1.648	1.625	1.4086	
15 minute winter	3	1.002	4	117.9	1.675	1.656	2.5510	
15 minute summer	4	1.003	5	128.3	1.822	1.119	1.1274	
15 minute winter	5	1.004	6	185.4	1.681	1.166	3.9994	
15 minute winter	6	1.005	7	279.2	2.532	1.682	2.4761	
15 minute winter	7	1.006	8	291.0	2.809	1.673	1.5043	
15 minute winter	8	1.007	Tank 1	291.2	3.891	0.703	1.1440	
15 minute winter	Tank 1	1.008	10	191.5	1.435	0.904	1.8330	
15 minute winter	10	1.009	Tank 2	197.5	2.084	1.257	3.3143	
15 minute summer	Tank 2	1.010	Flow Control	25.0	0.397	0.148	5.2228	
10080 minute winter	Flow Control	1.011	13	2.1	0.689	0.003	0.0472	988.1
15 minute winter	9	2.000	11	34.3	0.906	0.401	1.6607	
15 minute winter	11	2.001	14	38.0	0.693	0.386	0.4482	
15 minute summer	14	2.002	15	71.3	1.012	0.537	0.7429	
15 minute winter	15	2.003	16	92.6	1.315	0.937	0.3550	
15 minute winter	16	2.004	6	106.6	1.515	1.058	1.7092	
15 minute winter	18	3.000	15	69.4	0.986	0.768	1.0610	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	14	76.075	1.065	87.5	17.2198	0.0000	SURCHARGED
15 minute winter	2	13	76.066	1.083	94.0	6.7984	0.0000	SURCHARGED
15 minute winter	3	12	76.026	1.126	107.3	1.7057	0.0000	SURCHARGED
15 minute winter	4	11	75.974	1.224	150.0	4.6664	0.0000	FLOOD RISK
15 minute winter	5	11	75.725	1.220	189.3	4.0707	0.0000	SURCHARGED
15 minute winter	6	11	75.369	1.094	270.9	1.9968	0.0000	SURCHARGED
15 minute winter	7	11	74.796	0.676	282.3	1.2294	0.0000	SURCHARGED
15 minute winter	8	11	74.248	0.248	282.1	0.3552	0.0000	OK
2880 minute winter	Tank 1	2760	72.474	1.424	12.2	341.7189	0.0000	SURCHARGED
2880 minute winter	10	2760	72.474	1.474	6.3	2.3404	0.0000	SURCHARGED
2880 minute winter	Tank 2	2760	72.474	1.524	6.8	305.1675	0.0000	SURCHARGED
2880 minute winter	Flow Control	2760	72.474	1.554	1.9	2.7456	0.0000	SURCHARGED
2880 minute winter	13	2760	70.686	0.021	1.9	0.0000	0.0000	OK
15 minute winter	9	12	75.664	0.734	41.2	1.5547	0.0000	SURCHARGED
15 minute winter	11	12	75.652	0.862	28.9	0.9747	0.0000	SURCHARGED
15 minute winter	14	12	75.646	0.906	64.4	2.1005	0.0000	SURCHARGED
15 minute winter	15	13	75.614	1.024	84.1	1.1580	0.0000	SURCHARGED
15 minute winter	16	12	75.575	1.025	97.4	2.4844	0.0000	SURCHARGED
15 minute winter	18	13	75.631	0.941	58.7	8.3366	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	78.6	1.116	1.100	0.4601	
15 minute winter	2	1.001	3	106.3	1.509	1.488	1.4086	
15 minute winter	3	1.002	4	112.6	1.599	1.581	2.5510	
15 minute winter	4	1.003	5	127.8	1.815	1.115	1.1274	
15 minute winter	5	1.004	6	177.6	1.611	1.117	3.9994	
15 minute winter	6	1.005	7	270.9	2.456	1.631	2.4761	
15 minute winter	7	1.006	8	282.1	2.741	1.622	1.4881	
15 minute winter	8	1.007	Tank 1	281.8	3.868	0.681	1.1148	
15 minute winter	Tank 1	1.008	10	190.8	1.497	0.901	1.8330	
15 minute winter	10	1.009	Tank 2	189.8	2.144	1.209	3.3143	
15 minute winter	Tank 2	1.010	Flow Control	23.6	0.381	0.140	5.2228	
2880 minute winter	Flow Control	1.011	13	1.9	0.666	0.003	0.0432	279.2
15 minute winter	9	2.000	11	28.9	0.933	0.338	1.6607	
15 minute winter	11	2.001	14	32.5	0.681	0.331	0.4482	
15 minute winter	14	2.002	15	62.0	0.931	0.467	0.7429	
15 minute winter	15	2.003	16	86.5	1.228	0.875	0.3550	
15 minute winter	16	2.004	6	101.0	1.435	1.003	1.7092	
15 minute winter	18	3.000	15	60.3	0.856	0.667	1.0610	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	15	76.221	1.211	185.0	51.6752	0.0000	SURCHARGED
15 minute winter	2	14	76.214	1.231	101.3	12.5501	0.0000	SURCHARGED
15 minute winter	3	11	76.190	1.290	124.6	1.9536	0.0000	SURCHARGED
15 minute winter	4	11	76.200	1.450	156.5	5.5243	0.0000	FLOOD RISK
15 minute winter	5	11	76.018	1.513	203.3	5.0487	0.0000	FLOOD RISK
15 minute winter	6	12	75.625	1.350	299.0	2.4637	0.0000	FLOOD RISK
15 minute winter	7	11	74.927	0.807	315.1	1.4676	0.0000	SURCHARGED
15 minute winter	8	12	74.270	0.270	314.3	0.3860	0.0000	OK
10080 minute winter	Tank 1	7560	73.421	2.371	7.6	568.9623	0.0000	SURCHARGED
10080 minute winter	10	7560	73.421	2.421	4.4	3.8440	0.0000	SURCHARGED
10080 minute winter	Tank 2	7560	73.421	2.471	4.8	494.7857	0.0000	SURCHARGED
10080 minute winter	Flow Control	7560	73.421	2.501	2.4	4.4186	0.0000	SURCHARGED
10080 minute winter	13	7560	70.688	0.023	2.4	0.0000	0.0000	OK
15 minute winter	9	12	76.076	1.146	47.0	2.4269	0.0000	SURCHARGED
15 minute winter	11	13	76.047	1.257	41.1	1.4213	0.0000	FLOOD RISK
15 minute winter	14	13	76.039	1.299	94.4	3.0119	0.0000	FLOOD RISK
15 minute winter	15	13	75.990	1.400	103.0	1.5833	0.0000	FLOOD RISK
15 minute winter	16	13	75.929	1.379	116.8	3.3433	0.0000	FLOOD RISK
15 minute winter	18	13	76.006	1.316	109.1	23.9581	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	101.3	1.439	1.419	0.4601	
15 minute winter	2	1.001	3	124.6	1.770	1.745	1.4086	
15 minute winter	3	1.002	4	125.5	1.783	1.763	2.5510	
30 minute summer	4	1.003	5	130.0	1.846	1.134	1.1274	
15 minute winter	5	1.004	6	193.9	1.758	1.219	3.9994	
15 minute winter	6	1.005	7	299.0	2.711	1.801	2.4761	
15 minute winter	7	1.006	8	314.3	2.984	1.808	1.5472	
15 minute winter	8	1.007	Tank 1	314.7	3.944	0.760	1.2194	
15 minute summer	Tank 1	1.008	10	200.9	1.453	0.948	1.8330	
15 minute winter	10	1.009	Tank 2	207.4	2.101	1.320	3.3143	
15 minute summer	Tank 2	1.010	Flow Control	23.4	0.416	0.138	5.2228	
10080 minute winter	Flow Control	1.011	13	2.4	0.707	0.004	0.0507	1080.8
15 minute winter	9	2.000	11	41.1	0.942	0.481	1.6607	
15 minute winter	11	2.001	14	39.2	0.682	0.398	0.4482	
15 minute winter	14	2.002	15	88.8	1.261	0.669	0.7429	
15 minute winter	15	2.003	16	105.1	1.493	1.063	0.3550	
15 minute winter	16	2.004	6	121.1	1.720	1.202	1.7092	
15 minute winter	18	3.000	15	83.9	1.191	0.928	1.0610	

Appendix G

SuDS Maintenance and Management Plan

**NETLEY FIRS
KANES HILL
SOUTHAMPTON
SO19 6AJ**

SUDS MANAGEMENT AND MAINTENANCE PLAN

HI-ACRE CONSTRUCTION Ltd

JANUARY 2026
REF: TSH/RP/0530/7230 REV A



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Appendices

Appendix A – Surface Water Drainage Strategy

References

The SuDS Manual – CIRIA C753 (2015) ISBN 9780-86017-760-9



1 Introduction

1.1 Scope

This document sets out the principles for the long-term management and maintenance of the proposed surface water Sustainable Drainage Systems (SuDS) installed as part of the development of land at Netley Firs, Kanes Hill, Southampton, Hampshire.

1.2 The purpose of this document is to ensure that the management company that will be maintaining the SuDS is entrusted with an inspection and maintenance programme to ensure the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and off site in accordance with the NPPF.

1.3 The principal storm water drainage strategy for the development is to attenuate flows in SuDS features including permeable pavements. This report should be read in conjunction with MJA drawings 7230-MJA-SW-XX-DR-C-003 Surface Water Drainage Strategy which is included in **Appendix A**.

1.4 Private drainage relating to individual properties such as gutters, rainwater downpipes, private inspection chambers, rodding eyes, channel drains, yard gullies etc are to be maintained by the property owner.

1.5 This document details the SuDS structures within the treatment train and their required maintenance processes to ensure that no polluted discharge to the watercourse will take place. This report will be made available to the adopting body and/or maintenance organisation that will ultimately control the SuDS assets.

1.6 This report does not include maintenance regimes for traditional pipes, chambers and gullies, these items will be offered for adoption to the Water/Sewerage Undertaker, NAV (new appointees or variation) or Highway Authority who will be responsible for maintaining these features in perpetuity.



1.7 Overview

This document is laid out in specific sections applicable to the relevant SuDS type detailing:

- A description of the SuDS component and its use.
- Maintenance requirements and frequencies.
- Inspection requirements and frequencies.

1.8 The activities listed are generic to SuDS types and represent the minimum maintenance and inspection requirements. However additional tasks, or varied maintenance frequency may be introduced as required. This may include:

- Measurement and recording of sediment levels.
- Photographic recording of problem areas
- Increased frequency of litter removal in areas identified as litter hotspots.
- Adjusted timescales of maintenance activities to minimise impact on wildlife (e.g. great crested newts, birds, voles, etc)
- The use of manual methods of maintenance to limit impact on wildlife habitat (e.g. management of emergent vegetation in ponds)

1.9 This plan has been directly referenced from the latest technical SuDS guidance within the CIRIA Report C753 The SuDS Manual (2015) and other applicable guidance.

2 SuDS Layout & Design

- 2.1 The installed SuDS system for the development will be the responsibility of the appointed Management Company.
- 2.2 Following installation and after transfer, all SuDS are to be maintained in perpetuity by the Management Company and shall ensure that it or any contractor employed by it carries out periodic maintenance of all such SuDS in accordance with the schedules listed in this report.
- 2.3 Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.
- 2.4 In terms of water quality, the proposed surface water system offers a suitable level of mitigation in accordance with the Environment Agency pollution prevention guidance GP3, NPPF, CIRIA C753 and DEFRA guidance.
- 2.5 There are three categories of maintenance activities referred to in this report:
 - **Regular maintenance** (including inspections and monitoring).
Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, inspections and sampling.
 - **Occasional maintenance**
Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).
 - **Remedial maintenance**
Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

3 Permeable Paving

Description

- 3.1 Permeable paving provides a pavement suitable for pedestrian and vehicular traffic, while allowing rainwater to permeate through the surface and into the underlying sub-base. The water is temporarily stored in the sub-base before discharging to the underlying ground (infiltrating) or discharging to a piped network (tanked).
- 3.2 Permeable paving, together with associated substructures, are an efficient means of managing surface water runoff close to source – intercepting runoff, reducing the volume and frequency of runoff and providing a treatment medium. Treatment processes that occur within the surface structure, the subsurface matrix (including soil layers where infiltration can occur) and the geotextile layers include:
- Filtration
 - Adsorption
 - Biodegradation
 - Sedimentation

Inspection, Maintenance Activities and Frequency

- 3.3 Refer to **Table 1** below for maintenance activities and frequency for attenuation basins.

Table 1: Permeable Paving Maintenance Requirements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	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 manufacturer's 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	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	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)
Monitoring	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, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually



APPENDIX A

SURFACE WATER DRAINAGE STRATEGY

