

Surface Water Drainage Design Note

Proposed Commercial Development at

**Chalcroft Nursery, Chalcroft Lane
Bersted, West Sussex**

On behalf of

Chalcroft Associates LLP

June 2026

Document History and Status

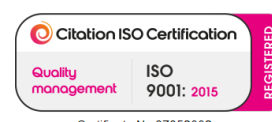
Project Number 24123

Date	Version	Prepared By	Reviewed By	Approved By
27 May 2026	1.0	Steve Doughty Director	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE
9 June 2026	1.1	Steve Doughty Director	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE

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Certificate No.87852002

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1 Non Technical Summary

- 1.1 This Drainage Note has been undertaken on behalf of Chalcroft Associates LLP to discharge planning conditions 22 and 23 of Planning Permission BE/13/24/S73 (as amended by BE/77/25/NMA) for the construction of 3 commercial properties buildings with associated access roads, car parking, loading bays, storage areas and landscaping at Chalcroft Nursery, Chalcroft Lane, Bersted, West Sussex.
- 1.2 The proposed development will incorporate a sustainable drainage system which will discharge surface water by gravity at a suitably restricted rate to the watercourse adjacent to the northern site boundary and provide storage for all storm return periods up to and including the 1:100 year rainfall event with an allowance for climate change.
- 1.3 This report concludes that a suitable surface water drainage system has been designed to accommodate the anticipated flows from the proposed development.

2 Planning Policy Context

2.1 Planning Permission BE/81/20/OUT

2.1.1 Planning Permission BE/81/20/OUT for the development proposals was granted by Arun District Council on 23 March 2021

2.1.2 Two planning conditions were applied with regard to drainage.

2.1.3 **Planning Condition 22** states: *'Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA.*

Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No part of the development hereby approved shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan. This is required to be a pre- commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.'

2.1.4 **Planning Condition 22** states: *'Development shall not commence until full details of the maintenance and management of the surface water drainage system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual*

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W DM1, W DM2 and W DM3 of the Arun Local Plan. It is

considered necessary for this to be a pre-commencement condition to ensure that the future maintenance and funding arrangements for the surface water disposal scheme are agreed before construction commences.'

2.2 Subsequent Minor Material Amendment (BE/13/24/S73) with wording amended by BE/77/25/NMA

2.2.1 **Planning Condition 22 of BE/13/24/S73** (as amended) states '*Development of each phase shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme for that phase have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No part of the development hereby approved shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.'*

2.2.2 **Condition 23 of the BE/13/24/S73** as amended states '*Development of each phase shall not commence until full details of the maintenance and management of the surface water drainage system for that phase is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual.'*

3 Existing Site

3.1 Site Location

- 3.1.1 The development site is located on land at Chalcroft Nursery, Chalcroft Lane Bersted, West Sussex, PO21 5TS and centred on Ordnance Survey reference SU 917 005.



Image 1: Site Location

- 3.1.2 The site is bounded to the north by an ordinary watercourse, the south by Chalcroft Lane, the east by commercial development and the west by a potential Residential development site.

- 3.1.3 A copy of the site location plan is located in Appendix 1 at the rear of this report.

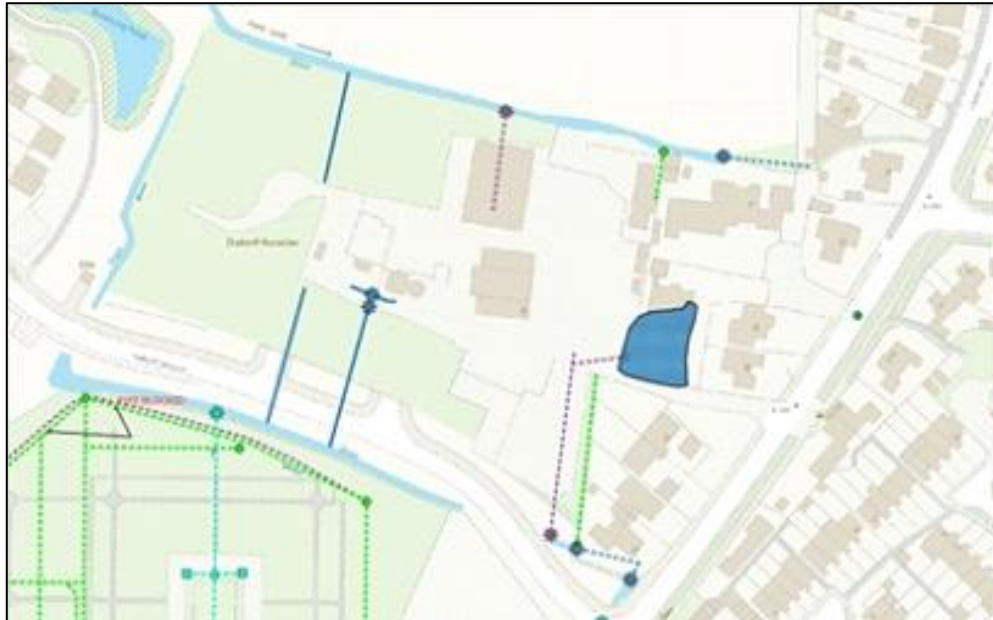
3.2 Site Description

- 3.2.1 The site is approximately 4,597m² in area and forms a part of the wider Chalcroft Nursery site.
- 3.2.2 Existing ground levels are highest at the northeast corner of the site at approximately 7m AOD. The site falls towards its southern boundary to a level of approximately 6.7m AOD.
- 3.2.3 A copy of the existing site layout plan is located in Appendix 2 at the rear of this report.

3.3 Existing Surface Water Drainage

3.3.1 Surface water is currently collected and discharged to the watercourse at the southern site boundary.

3.3.2 Arun Drainage Team provided the following plan indicating potential on site drainage in green and purple dashed lines to be investigated.



3.3.3 Chalcroft Associates investigated the routes on 29 April 2026 and confirmed the following:

- Purple dashed line to north of the site:
No outflow to ditch evident, building has been constructed over the line noted, no evidence of this route on site.
- Green dashed line to north of the site:
No outflow to ditch evident, no evidence of this route on site.
- Purple dashed line to south of site:
There is a 100m diameter pipe, Pond has been removed no evidence of connection to the north, 100mm connection to the southern ditch. Never observed any discharge from the ditch outfall.
- Green dashed line to the south of the site:
No evidence of a connection to the ditch. Pipe is indicated in no man's land between property boundaries and could not gain access.

3.3.4 None of the routes present a reasonable prospect of providing a surface water connection.

3.4 Geology and Groundwater

3.4.1 Infiltration testing was undertaken in November 2025 with four tests being attempted. Tests were ultimately abandoned after 25 hours with only a 28% drop in water levels across that period.

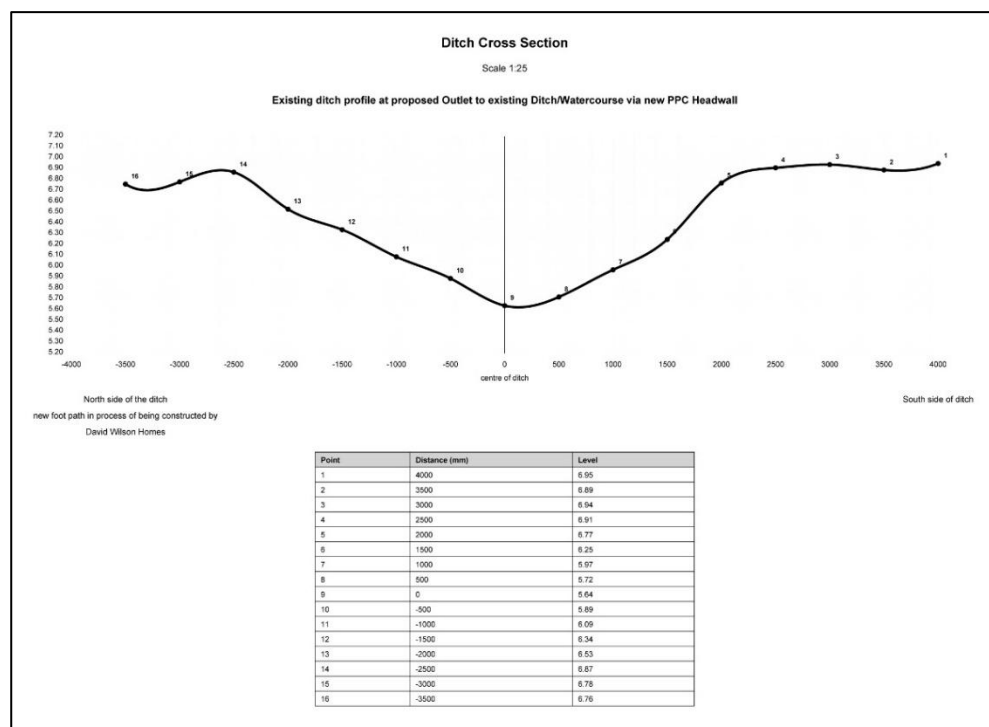
3.4.2 Winter groundwater monitoring has confirmed groundwater rising to a peak of 6.298m AOD, approximately 700mm below ground level.

3.4.3 Extracts from the groundwater monitoring and infiltration testing reports are located in Appendix 3 at the rear of this report.

3.5 Existing Watercourse

3.5.1 The ditch at the proposed outfall location has a bed level of 5.64m. Top of bank is at 6.87m AOD.

3.5.2 A profile of the ditch has been provided at the location of the proposed surface water outfall.



3.5.3 Water level monitoring observations on site have confirmed a typical water depth of 170mm during recent rainfall events, a top water level of 5.81m AOD.

3.5.4 Given that it was raining on 2 March the 170mm depth is considered representative of as the 1:1 year storm level.

3.5.5 A model of the existing watercourse has been created in Causeway Flow software which includes the section of watercourse from the site boundary and a section of the downstream 750mm diameter pipe.

- 3.5.6 Sufficient drainage area has been added to this model to recreate the observed 170mm depth of flow on a 1:1 year rainfall event.
- 3.5.7 Simulation has been undertaken for the 1:100 year plus 45% climate change event to predict the corresponding peak water level during that rainfall event.
- 3.5.8 The depth of water calculated for the 1:100 year +45% climate change event is 336mm, a top water level of 5.986m AOD.
- 3.5.9 Water Level monitoring details and calculations are located in Appendix 4 at the rear of this report.

4 Development Proposals

4.1 Description

4.1.1 The development proposals are for the construction of 3 commercial properties buildings with associated access roads, car parking, loading bays, storage areas and landscaping.

4.1.2 The areas of the various positively drained elements of the development are summarised as follows:

- Roof Areas 516m²
- Access Road, Parking Areas and Loading Bays 1,727m²
- Storage Areas 197m²
- Footpaths 629m²

4.1.3 A copy of the proposed site layout plan showing the positively drained areas is located in Appendix 5 at the rear of this report.

4.2 Surface Water Drainage

4.2.1 CIRIA report C753 The SuDS Manual-v6 provides guidance on surface water drainage. The aim for surface water runoff is to match greenfield runoff rates and volumes where reasonably achievable.

4.2.2 The National Standards for Sustainable Drainage Systems set out the drainage hierarchy for surface water drainage and notes the following list of drainage options in order of preference:

- Priority 1: collected for non-potable use
- Priority 2: infiltrated to ground
- Priority 3: discharged to an above ground surface water body
- Priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- Priority 5: discharged to a combined sewer

4.2.3 The preferred surface water drainage strategy should where possible be based on infiltration to ground, however infiltration has been proven to be unviable and groundwater has been recorded approximately 700mm below ground level.

4.2.4 The proposed surface water drainage strategy will therefore be based on a restricted discharge to the watercourse at the northern site boundary.

4.2.5 Pre-developed greenfield runoff rates have been established using the HR Wallingford tool for Greenfield Runoff Estimation based on the FEH Statistical Method for rainfall estimation.



Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (<https://www.uksuds.com/>)

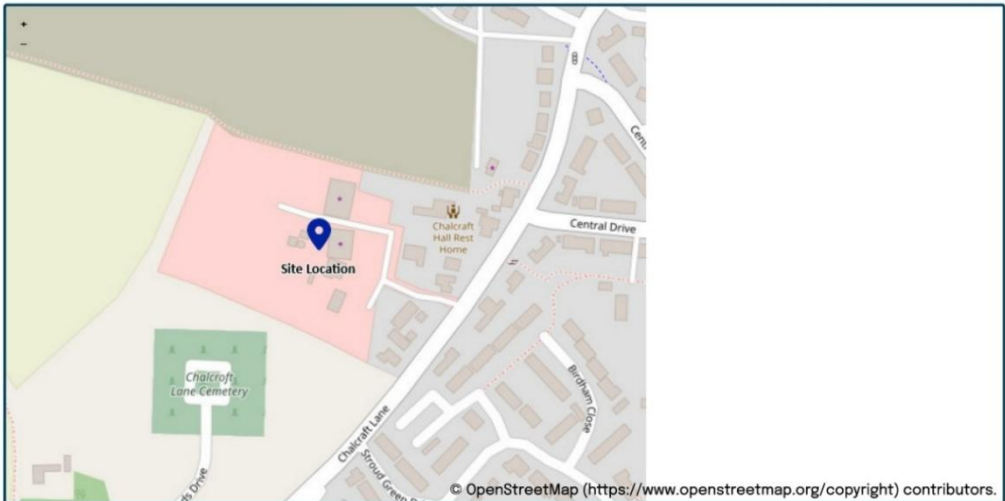
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	10/02/2026
Calculated by	Steve Doughty
Reference	24123
Model version	2.2.2

Location

Site name	Charlcroft Nursery
Site location	Bersted



Site easting (British National Grid)	491784
Site northing (British National Grid)	100513

Site details

Total site area (ha)	1	ha
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Greenfield runoff

Method

Method

FEH statistical (2025)

FEH statistical (2025)

	My value	Map value
SAAR9120 (mm)	768	mm
BFIHOST19scaled	0.668	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	1.7	l/s
QBar (FEH statistical 2025) (l/s)	2	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
Method	FEH statistical (2025)
Flow rate 1 year (l/s)	1.7
Flow rate 2 year (l/s)	1.7
Flow rate 10 years (l/s)	3.2
Flow rate 30 years (l/s)	4.5
Flow rate 100 years (l/s)	6.3
Flow rate 200 years (l/s)	7.3

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/) (<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 these data in the design or operational characteristics of any drainage scheme.

Image 2: Greenfield Runoff Calculation

4.2.6 The total positively drained area of the site will be approximately 3,070m² and the equivalent greenfield runoffs are as follows:

- Q_{bar} (approximate 1:2 year) at 1.7 l/s/ha 0.5 l/s
- 1:30 year at 4.5 l/s/ha 1.4 l/s
- 1:100 year at 6.3 l/s/ha 1.9 l/s

4.2.7 The National Standards for Sustainable Drainage Systems notes that *'the peak allowable discharge rate from the development to surface waters or sewers for the 50% AEP event shall be limited to the equivalent 50% AEP greenfield runoff rate, or 3 l/s/ha, whichever is the greater.*

Where the volume of runoff discharged from the development to surface waters or sewers for the 1% AEP, 6-hour rainfall event is greater than the volume of greenfield runoff for the same rainfall event, the peak allowable discharge rate from the development for the 1% AEP event shall be limited to the 50% AEP greenfield runoff rate or 3l/s/ha, whichever is the greater.'

4.2.8 This equates to a peak discharge rate at 3l/s/ha of 0.9l/s during a 1:100 year +45% climate change event.

4.2.9 Preliminary calculations have been prepared in order to demonstrate that surface water drainage can be adequately accommodated within the site without increasing flood risk elsewhere.

4.2.10 The proposed development is comprised almost exclusively of areas where surface water will be collected and as such no additional area has been included within the calculations to account for potential future urban creep as there is no realistic possibility of increasing the positively drained areas beyond the current proposals.

4.2.11 A permeable paving system is proposed with a 30% voided subbase sized with sufficient storage to accommodate a 1:100 year storm event including an additional 45% to account for the predicted effects of future climate change.

4.2.12 The permeable stone will need to extend beneath the roads parking bays and loading bays and be laid with a level base at 6.20m AOD, (620mm deep beneath the main carriage way and increasing beneath the parking bays and loading areas as proposed levels dictate).

4.2.13 The system will be lined in order to avoid groundwater ingress.

4.2.14 As previously noted the depth of water calculated for the 1:100 year +45% climate change event within the existing ditch at the proposed outfall location is 336mm, a top water level of 5.986m AOD.

4.2.15 The system has been modelled with a surcharged outfall to the existing drainage ditch.

4.2.16 The surcharge applied to outfall pipe in the modelling (invert level 5.75m AOD) is 236mm equating to the top water level of 5.986m AOD.

4.2.17 A copy of the drainage strategy plan together with calculations is located in Appendix 6 at the rear of this report.

4.1 Water Quality

4.1.1 The proposed development is for commercial use. In accordance with CIRIA SuDS Manual 2015 (Report C753), the pollution hazard level for this type of development is classified as between low and medium depending on depending on the various elements of the site.

4.1.2 The surface water drainage scheme will include mitigation to ensure that surface water is suitably treated and any pollution risk adequately managed prior to discharge.

4.1.3 Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types. Those of relevance to the development proposals are as follows:

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Commercial / Industrial roofs	Low	0.3	0.2	0.05
Commercial yards and delivery areas	Medium	0.7	0.6	0.7

Table 1: Pollution Hazard Indices

4.1.4 The surface water drainage design will incorporate the use of permeable paving which is sufficient to meet the required treatment level.

SuDS Type	Total suspended solids (TSS)	Metals	Hydrocarbons
Permeable pavement	0.7	0.6	0.7

Table 2: Pollution Mitigation Indices

4.1.5 An interim drainage management and maintenance plan is located in Appendix 7 at the rear of this report.

4.2 Risk to Others

- 4.2.1 The proposed surface water drainage system has been designed to current SuDS standards and incorporate attenuation and storage which will minimise runoff leaving the site during times of heavy rainfall.
- 4.2.2 Allowance has been made for a 45% increase in rainfall intensity which accords with the latest figures published by the Environment Agency and with the requirements under the National Planning Policy Framework.
- 4.2.3 The surface water drainage design will ensure that runoff from the proposed development does not exceed the relevant pre-developed greenfield runoff rates and the resultant risk is negligible.
- 4.2.4 The proposed drainage system will incorporate sufficient treatment prior to final discharge thus mitigating the risk of pollution from the site.
- 4.2.5 Sewerage undertakers have an obligation to upgrade the existing networks if a connection to an equivalent or larger sized public sewer is technically achievable.
- 4.2.6 The residual risk of sewer flooding from this development for the foreseeable future is therefore negligible.

4.3 Surface Water Exceedance

- 4.3.1 In the event that part of the onsite surface water drainage network was to become blocked, suffer a failure due to lack of maintenance or be inundated with a storm beyond the 1:100 year +45% design storm surface water would pond on the site and ultimately overtop the onsite storage and flow into the watercourses at the north and south of the site.

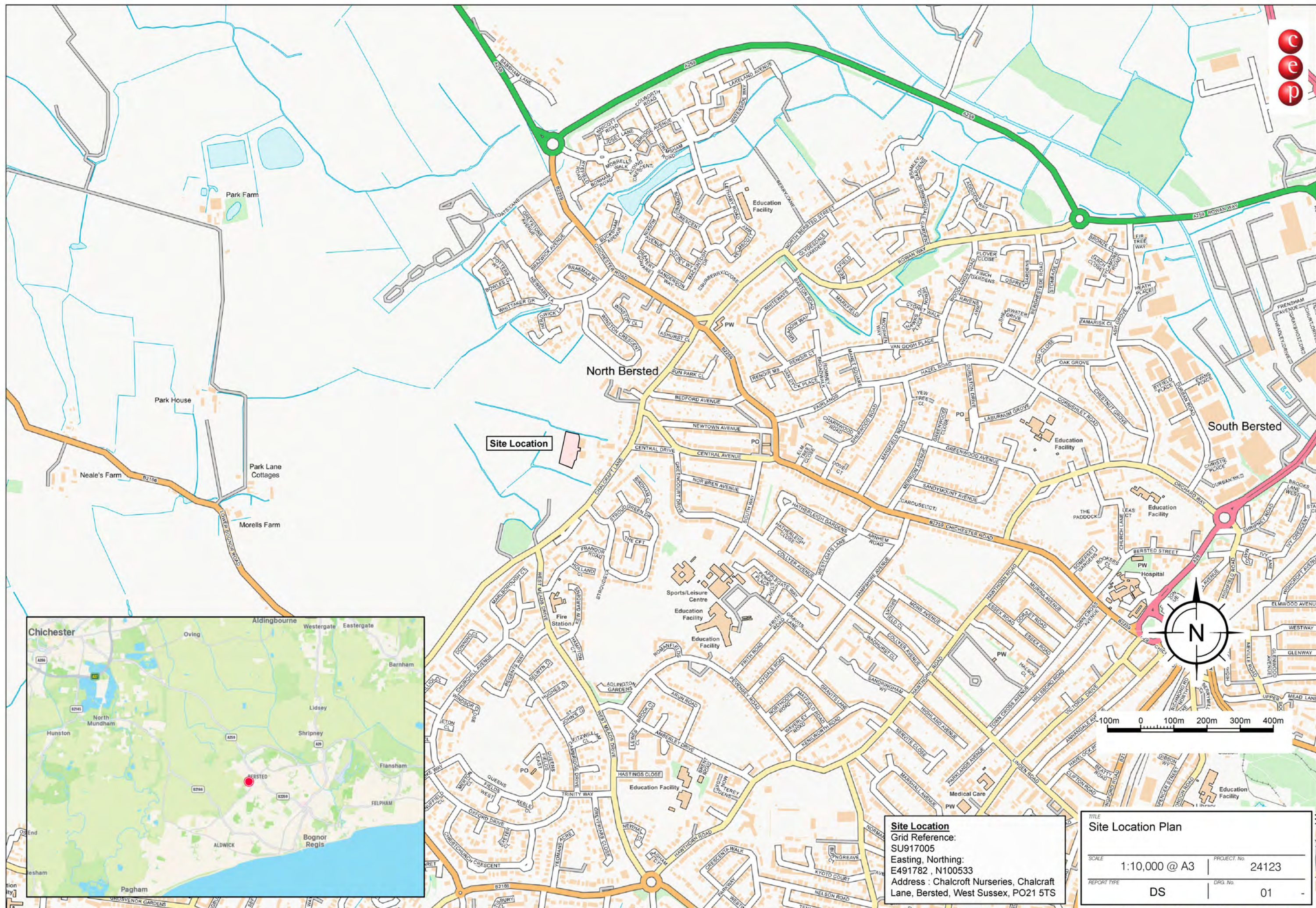
5 Conclusions

- 5.1 Winter groundwater monitoring has been undertaken to establish highest annual ground water levels and winter percolation testing has been undertaken in accordance with BRE 365.
- 5.2 Infiltration has been proven to be unviable and groundwater has been recorded approximately 700mm below ground level and an infiltration drainage system is not viable.
- 5.3 A suitable SuDS drainage system is proposed which accords with the requirements of national and local policy.
- 5.4 Surface water will be discharged at a restricted rate to the existing watercourse to the north of the site.
- 5.5 Preliminary calculations confirm that surface water runoff generated by the proposed development can be attenuated on site for all rainfall events up to the 1:100 year event including an allowance for climate change.
- 5.6 Water quality improvement will be provided to mitigate against any risk to any receiving waterbody.
- 5.7 A site-specific maintenance manual has been prepared which includes details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life.
- 5.8 A suitable surface water drainage system has been designed to accommodate the anticipated flows from the proposed development.

6 List of Appendices, Images and Tables

Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout Plan
Appendix 3	Extracts from Ground Water Monitoring and Infiltration Testing Reports
Appendix 4	Water Level Monitoring and Watercourse Calculations
Appendix 5	Proposed Site Layout and Positively Drained Areas Plan
Appendix 6	Drainage Strategy Plan and Calculations
Appendix 7	Interim Drainage Management and Maintenance Plan
Image 1	Site Location
Image 2	Greenfield Runoff Calculation
Table 1	Pollution Hazard Indices
Table 2	Pollution Mitigation Indices

Appendix 1
Site Location Plan



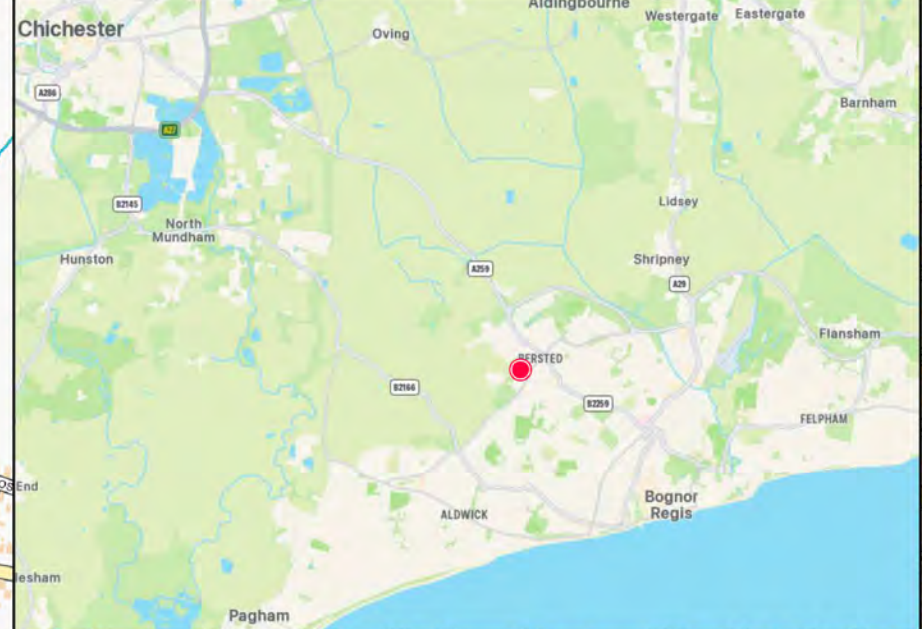
Site Location

North Bersted

South Bersted



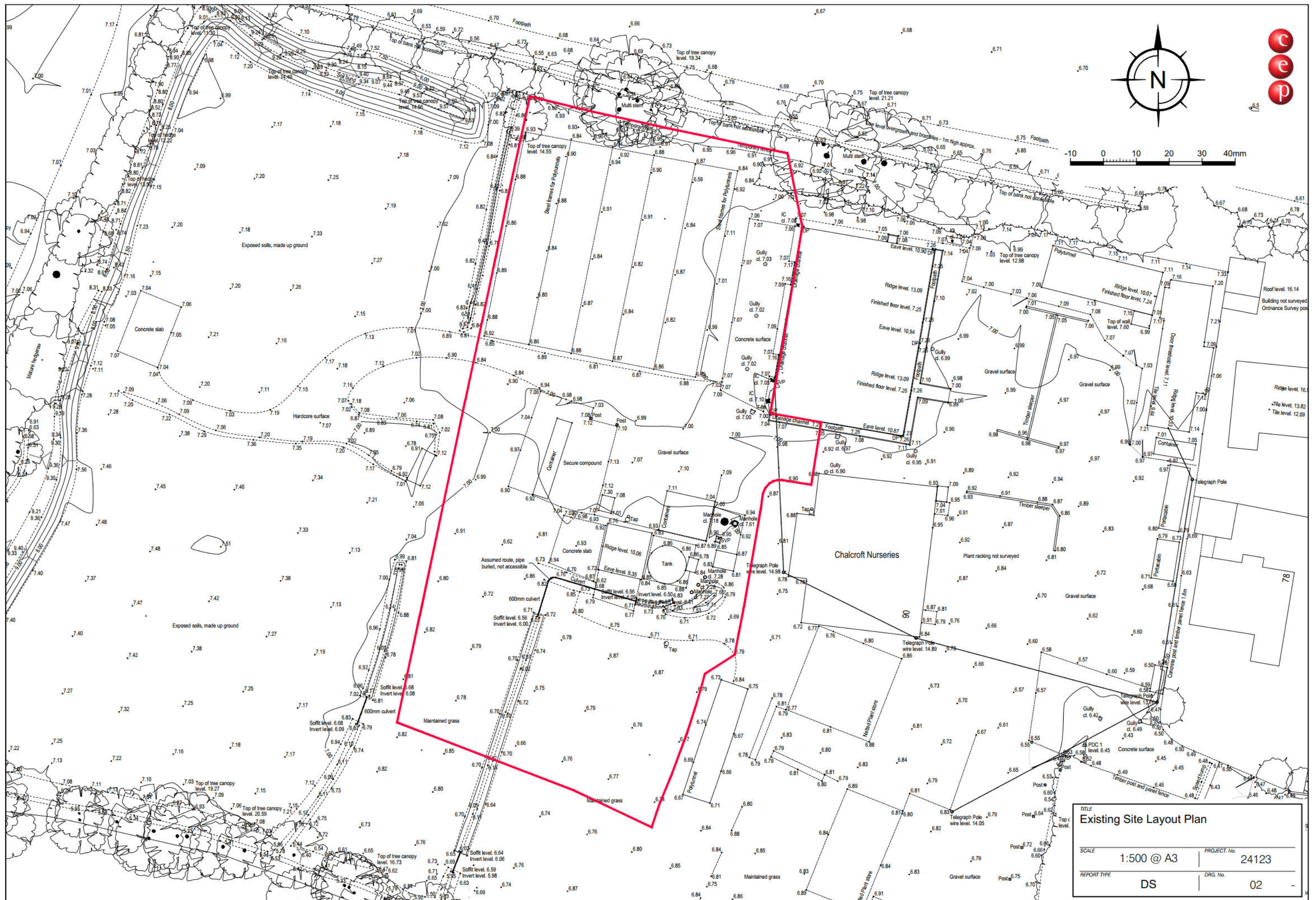
100m 0 100m 200m 300m 400m



Site Location
Grid Reference:
SU917005
Easting, Northing:
E491782, N100533
Address : Chalcraft Nurseries, Chalcraft
Lane, Bersted, West Sussex, PO21 5TS

Site Location Plan			
SCALE		PROJECT No.	
1:10,000 @ A3		24123	
REPORT TYPE		DRG. No.	
DS		01	

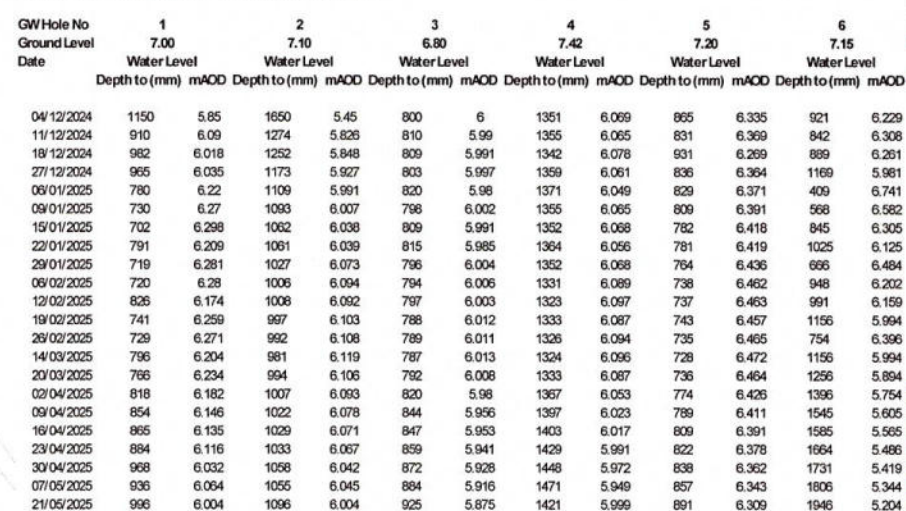
Appendix 2
Existing Site Layout Plan



Appendix 3

Extracts from Ground Water Monitoring and Infiltration Testing Reports

1. This drawing is to be read in conjunction with drawings FC2921/01-25



Scale in Meters (1:500)

Year	Number of cases	Rate
1990	10	1.0
1991	15	1.5
1992	20	2.0
1993	25	2.5
1994	30	3.0
1995	35	3.5
1996	40	4.0
1997	45	4.5
1998	50	5.0
1999	55	5.5
2000	60	6.0
2001	65	6.5
2002	70	7.0
2003	75	7.5
2004	80	8.0
2005	85	8.5
2006	90	9.0
2007	95	9.5
2008	100	10.0
2009	105	10.5
2010	110	11.0
2011	115	11.5
2012	120	12.0
2013	125	12.5
2014	130	13.0
2015	135	13.5
2016	140	14.0
2017	145	14.5
2018	150	15.0
2019	155	15.5
2020	160	16.0
2021	165	16.5
2022	170	17.0
2023	175	17.5
2024	180	18.0
2025	185	18.5
2026	190	19.0
2027	195	19.5
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2029	205	20.5
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2090	510	51.0
2091	515	51.5
2092	520	52.0
2093	525	52.5
2094	530	53.0
2095	535	53.5
2096	540	54.0
2097	545	54.5
2098	550	55.0
2099	555	55.5
2100	560	56.0



DRAWING

SITE OVERVIEW
WINTER GROUND WATER
MONITORING LOCATIONS

SCALE	1:500	DATE	NOV 24	INITIAL	MH	CHKD	
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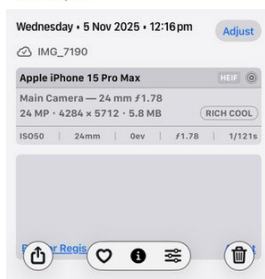
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Winter Infiltration Testing

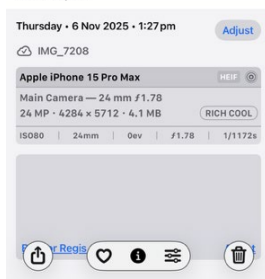
Site;	Chalcroft Nurseries, Chalcroft Lane, Bersted. PO21 5TS
Planning Authority;	Arun District Council
Planning Application Reference;	BE/89/25/DOC Conditions 22 and 23
Date of Test;	6 th November 2025
Location of Trial Pit;	491769.497E 100577.996N
Trial Pit Size;	330mm Wide x 2000mm Length x 1500mm deep (hit water table)
Topo Ground Level	6.87
Topo Designed Invert Level	6.13
25% Target	5.94
75% Target	5.56
100% Target	5.37
Commencement	12.15pm filled with 501.6litre to 6.13 invert level
1 st check 5 th November 2025	2.33pm reading 6.03 = 10.659% drop in 2 hours 18 mins
2 nd check 5 th November 2025	5.06pm reading 5.98 = 15.504% drop in 4 hours 51 mins
3 rd check 6 th November 2025	8.34am reading 5.88 = 25.194% drop in 20 hours 19 mins
4 th check 6 th November 2025	1.27pm reading 5.85 = 28.101% drop in 25 hours 17 mins
Test Finished as non-compliant result.	



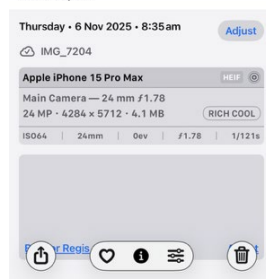
Add a Caption



Add a Caption



Add a Caption



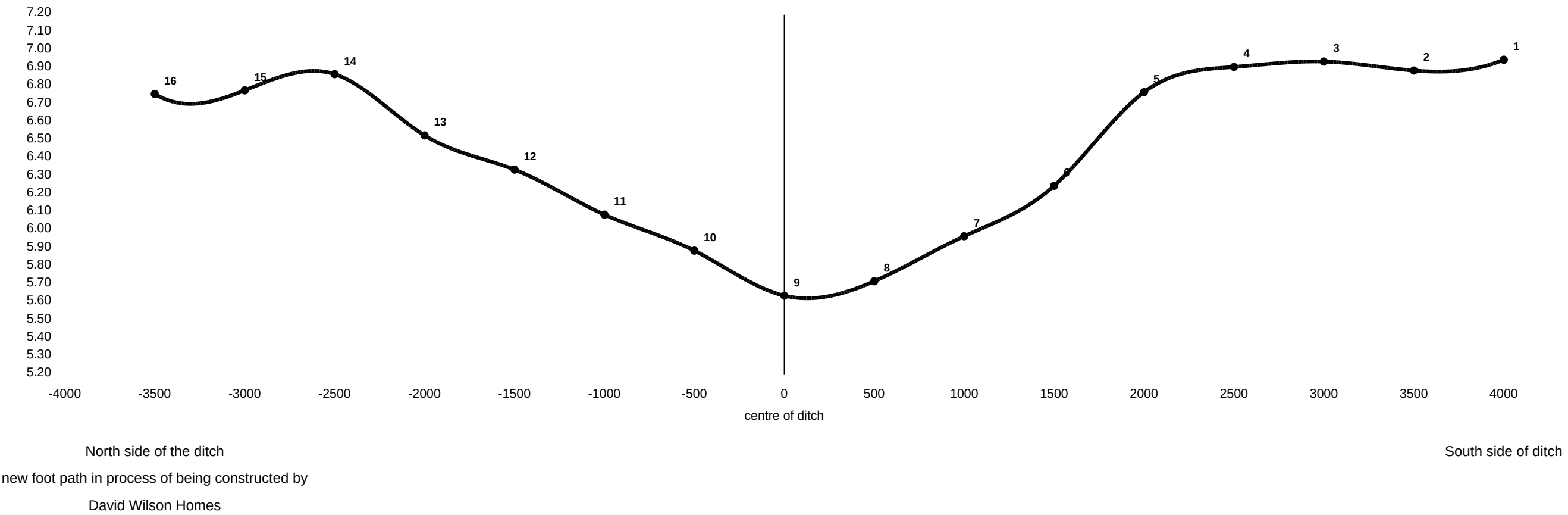
Appendix 4

Water Level Monitoring and Watercourse Calculations

Ditch Cross Section

Scale 1:25

Existing ditch profile at proposed Outlet to existing Ditch/Watercourse via new PPC Headwall



Point	Distance (mm)	Level
1	4000	6.95
2	3500	6.89
3	3000	6.94
4	2500	6.91
5	2000	6.77
6	1500	6.25
7	1000	5.97
8	500	5.72
9	0	5.64
10	-500	5.89
11	-1000	6.09
12	-1500	6.34
13	-2000	6.53
14	-2500	6.87
15	-3000	6.78
16	-3500	6.76

Steve Doughty

From: [REDACTED]
Sent: 10 March 2026 16:35
Subject: FW: 24123 RE: Chalcroft Nursery

From: patrick cullen
Sent: 10 March 2026 15:42
To: Steve Doughty
Cc: Stuart Magowan ; Alastair Smyth ; CEP | Reception
Subject: Re: 24123 RE: Chalcroft Nursery

Hello Steve and Stuart,

We have today taken the water level in the ditch. The water is sat at 5.805

To confirm the highest we have seen the water in the ditch would tie in most recent storms on the 19th February 2026 the level would have been circa 5.89.

We cannot remember ever seeing the water higher in the ditch during the time we have owned the site.



You can see that downstream the ditch appears to have no holding water in today's photographs.

We will continue to measure the levels weekly.

Kind regards

Pat Cullen
[REDACTED]

From: patrick cullen <[REDACTED]>
Sent: Friday, March 06, 2026 08:52
To: Steve Doughty <[REDACTED]>
Cc: Stuart Magowan <[REDACTED]>, Alastair Smyth <[REDACTED]>; Reception CEP
[REDACTED]
Subject: Re: 24123 RE: Chalcroft Nursery

Hello Steve,

The grass clump by Alastair's foot that I have circled is about level with the highest point we have seen the water. I am in Poland until Monday and will take a measurement of the height then. It looks



about 80mm higher than our last measurement.

I hope that helps

Regards

Pat



Sent from my iPhone

On 5 Mar 2026, at 12:32, Steve Doughty <[REDACTED]> wrote:

Hi Pat.

Thanks for that.

The cross section is extremely helpful.

One question.

Are you able to estimate the water level as it was on 18/19th Feb 2026?

Steve Doughty



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From: patrick cullen <[REDACTED]>

Sent: 04 March 2026 19:30

To: Stuart Magowan <[REDACTED]>; Alastair Smyth <[REDACTED]>

Subject: Re: Chalcroft Nursery

Hello Stuart and Steve,

Thank you for sparing us the time yesterday.

Please find attached a cross section of the ditch at the location of the suggested discharge point. I have also attached a couple of Mark Hobbs drawings showing the Topography stretching into BDW's land to the North . It appears that this area is being lifted by the looks of the construction.

The water level in the ditch on 2nd March 2026 was sitting at 5.81. The highest we have seen it was following the storm on 18/19th Feb 2026 when most of Bognor Regis was underwater as shown in the photo dated 20th February 2026

I will send over some other photos with the ground water monitoring measurements.

Kind regards

Pat Cullen



Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.000
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Watercourse Link Type

Template	Freeform Carrier	Preferred Cover (m)	0.001
Shape	Open User Defined	Follow Ground	✓
Barrels	1	Velocity	Manning
Auto Increment (mm)	1	ks (mm) / n	0.035

Available Diameters (mm)

1230

Width / Total	Depth / Total	Width / Total	Depth / Total	Width / Total	Depth / Total
0.000	1.000	2.000	0.203	4.000	0.496
0.500	0.724	2.500	0.000	4.500	0.919
1.000	0.569	3.000	0.065	5.000	1.000
1.500	0.366	3.500	0.268		

Surface Link Type

Template	Freeform Carrier	Auto Increment (mm)	75
Shape	Circular	Follow Ground	x
Barrels	1		

Available Diameters (mm)

150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
1	0.147	5.00	6.870	491777.403	100597.620	1.220	5.650
2			6.660	491840.074	100583.750	1.070	5.590
3			6.800	491896.234	100572.073	1.292	5.508

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)
Watercourse	1	2	64.187	0.035	5.650	5.590	0.060	1069.8	1230	6.71	51.2
1.000	2	3	57.361	0.600	5.590	5.508	0.082	699.5	700	7.66	48.0

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)
Watercourse	0.627	2555.4	27.2	-0.010	-0.160	0.147	0.0	183	0.192
1.000	1.006	387.1	25.5	0.370	0.592	0.147	0.0	120	0.579

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	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

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
10	0	0	0
20	0	0	0
30	0	0	0
50	0	0	0
100	45	0	0

Results for 1 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
15 minute summer	1	12	5.820	0.170	18.4	0.0000	0.0000	OK
30 minute summer	2	22	5.679	0.089	15.0	0.0000	0.0000	OK
30 minute summer	3	22	5.576	0.068	13.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	15.9	
30 minute summer	2	1.000	13.0	10.4

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	5.899	0.249	53.0	0.0000	0.0000	OK
15 minute summer	2	13	5.748	0.158	51.1	0.0000	0.0000	OK
15 minute summer	3	13	5.637	0.129	45.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	51.1	
15 minute summer	2	1.000	45.7	23.0

Results for 20 year Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	5.914	0.264	62.9	0.0000	0.0000	OK
15 minute summer	2	13	5.763	0.173	60.9	0.0000	0.0000	OK
15 minute summer	3	13	5.650	0.142	55.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	60.9	
15 minute summer	2	1.000	55.6	27.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	5.922	0.272	68.5	0.0000	0.0000	OK
15 minute summer	2	13	5.770	0.180	66.7	0.0000	0.0000	OK
15 minute summer	3	13	5.658	0.150	61.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	66.7	
15 minute summer	2	1.000	61.0	29.8

Results for 50 year Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	5.932	0.282	75.8	0.0000	0.0000	OK
15 minute summer	2	13	5.779	0.189	74.1	0.0000	0.0000	OK
15 minute summer	3	13	5.666	0.158	68.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	74.1	
15 minute summer	2	1.000	68.1	32.9

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	5.986	0.336	124.7	0.0000	0.0000	OK
15 minute summer	2	12	5.835	0.245	122.5	0.0000	0.0000	OK
15 minute summer	3	13	5.714	0.206	113.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	1	Watercourse	122.5	
15 minute summer	2	1.000	113.5	54.2

Appendix 5

**Proposed Site Layout
and Positively Drained Areas Plan**

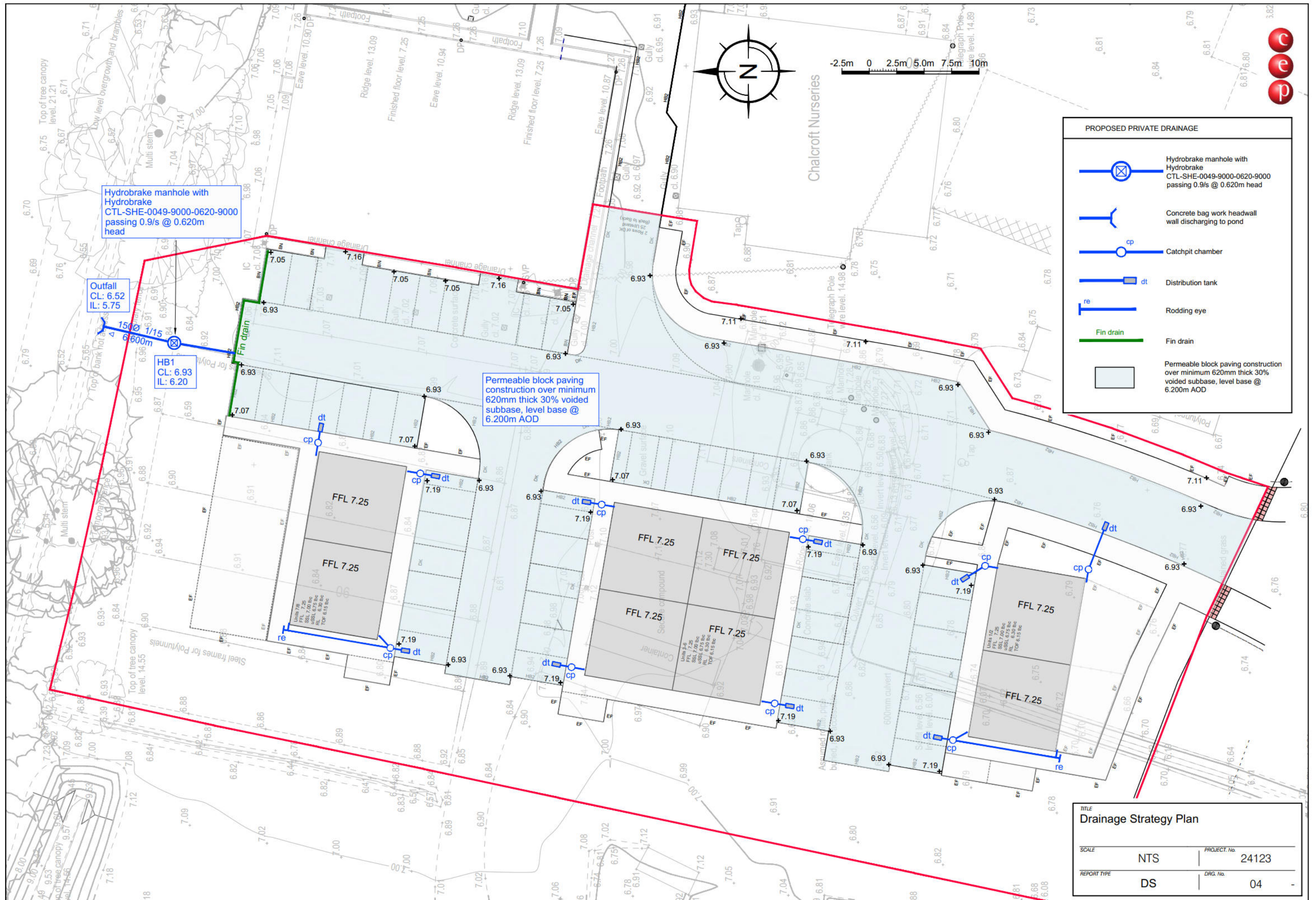
PROPOSED AREAS KEY		
	Site boundary	4,597m sq
	Roofs	516m sq
	Access Road	1,083m sq
	Parking Bays	477m sq
	Loading Bays	167m sq
	Storage Areas	197m sq
	Footpaths	629m sq
TOTAL		3,069m sq



TITLE			
Proposed Site Layout And Positively Drained Areas Plan			
SCALE	NTS	PROJECT No.	24123
REPORT TYPE	DS	DRG. No.	03

Appendix 6

Drainage Strategy Plan and Calculations



Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Surface Link Type

Template	Freeform Carrier	Auto Increment (mm)	75
Shape	Circular	Follow Ground	x
Barrels	1		

Available Diameters (mm)

150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
HB1	0.307	5.00	6.930	1200	491779.193	100589.349	0.730	6.200
Outfall	0.000		6.520		491780.693	100595.776	0.770	5.750

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	HB1	Outfall	6.600	0.600	6.200	5.750	0.450	14.7	150	5.04	58.0

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	2.644	46.7	64.4	0.580	0.620	0.307	0.0	150	2.693

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	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

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
10	0	0	0
30	0	0	0
30	45	0	0
100	0	0	0

Return Period (years)		Climate Change (CC %)		Additional Area (A %)		Additional Flow (Q %)			
100		45		0		0			
<u>Node Outfall Surcharged Outfall</u>									
Overrides Design Area		x	Depression Storage Area (m²)		0	Evapo-transpiration (mm/day)		0	
Overrides Design Additional Inflow		x	Depression Storage Depth (mm)		0				
Applies to All storms									
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.236	440	0.236	880	0.236	1320	0.236	1760	0.236
10	0.236	450	0.236	890	0.236	1330	0.236	1770	0.236
20	0.236	460	0.236	900	0.236	1340	0.236	1780	0.236
30	0.236	470	0.236	910	0.236	1350	0.236	1790	0.236
40	0.236	480	0.236	920	0.236	1360	0.236	1800	0.236
50	0.236	490	0.236	930	0.236	1370	0.236	1810	0.236
60	0.236	500	0.236	940	0.236	1380	0.236	1820	0.236
70	0.236	510	0.236	950	0.236	1390	0.236	1830	0.236
80	0.236	520	0.236	960	0.236	1400	0.236	1840	0.236
90	0.236	530	0.236	970	0.236	1410	0.236	1850	0.236
100	0.236	540	0.236	980	0.236	1420	0.236	1860	0.236
110	0.236	550	0.236	990	0.236	1430	0.236	1870	0.236
120	0.236	560	0.236	1000	0.236	1440	0.236	1880	0.236
130	0.236	570	0.236	1010	0.236	1450	0.236	1890	0.236
140	0.236	580	0.236	1020	0.236	1460	0.236	1900	0.236
150	0.236	590	0.236	1030	0.236	1470	0.236	1910	0.236
160	0.236	600	0.236	1040	0.236	1480	0.236	1920	0.236
170	0.236	610	0.236	1050	0.236	1490	0.236	1930	0.236
180	0.236	620	0.236	1060	0.236	1500	0.236	1940	0.236
190	0.236	630	0.236	1070	0.236	1510	0.236	1950	0.236
200	0.236	640	0.236	1080	0.236	1520	0.236	1960	0.236
210	0.236	650	0.236	1090	0.236	1530	0.236	1970	0.236
220	0.236	660	0.236	1100	0.236	1540	0.236	1980	0.236
230	0.236	670	0.236	1110	0.236	1550	0.236	1990	0.236
240	0.236	680	0.236	1120	0.236	1560	0.236	2000	0.236
250	0.236	690	0.236	1130	0.236	1570	0.236	2010	0.236
260	0.236	700	0.236	1140	0.236	1580	0.236	2020	0.236
270	0.236	710	0.236	1150	0.236	1590	0.236	2030	0.236
280	0.236	720	0.236	1160	0.236	1600	0.236	2040	0.236
290	0.236	730	0.236	1170	0.236	1610	0.236	2050	0.236
300	0.236	740	0.236	1180	0.236	1620	0.236	2060	0.236
310	0.236	750	0.236	1190	0.236	1630	0.236	2070	0.236
320	0.236	760	0.236	1200	0.236	1640	0.236	2080	0.236
330	0.236	770	0.236	1210	0.236	1650	0.236	2090	0.236
340	0.236	780	0.236	1220	0.236	1660	0.236	2100	0.236
350	0.236	790	0.236	1230	0.236	1670	0.236	2110	0.236
360	0.236	800	0.236	1240	0.236	1680	0.236	2120	0.236
370	0.236	810	0.236	1250	0.236	1690	0.236	2130	0.236
380	0.236	820	0.236	1260	0.236	1700	0.236	2140	0.236
390	0.236	830	0.236	1270	0.236	1710	0.236	2150	0.236
400	0.236	840	0.236	1280	0.236	1720	0.236	2160	0.236
410	0.236	850	0.236	1290	0.236	1730	0.236	2170	0.236
420	0.236	860	0.236	1300	0.236	1740	0.236	2180	0.236
430	0.236	870	0.236	1310	0.236	1750	0.236	2190	0.236



Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
2640	0.236	3180	0.236	3720	0.236	4260	0.236	4800	0.236	5340	0.236
2650	0.236	3190	0.236	3730	0.236	4270	0.236	4810	0.236	5350	0.236
2660	0.236	3200	0.236	3740	0.236	4280	0.236	4820	0.236	5360	0.236
2670	0.236	3210	0.236	3750	0.236	4290	0.236	4830	0.236	5370	0.236
2680	0.236	3220	0.236	3760	0.236	4300	0.236	4840	0.236	5380	0.236
2690	0.236	3230	0.236	3770	0.236	4310	0.236	4850	0.236	5390	0.236
2700	0.236	3240	0.236	3780	0.236	4320	0.236	4860	0.236	5400	0.236
2710	0.236	3250	0.236	3790	0.236	4330	0.236	4870	0.236	5410	0.236
2720	0.236	3260	0.236	3800	0.236	4340	0.236	4880	0.236	5420	0.236
2730	0.236	3270	0.236	3810	0.236	4350	0.236	4890	0.236	5430	0.236
2740	0.236	3280	0.236	3820	0.236	4360	0.236	4900	0.236	5440	0.236
2750	0.236	3290	0.236	3830	0.236	4370	0.236	4910	0.236	5450	0.236
2760	0.236	3300	0.236	3840	0.236	4380	0.236	4920	0.236	5460	0.236
2770	0.236	3310	0.236	3850	0.236	4390	0.236	4930	0.236	5470	0.236
2780	0.236	3320	0.236	3860	0.236	4400	0.236	4940	0.236	5480	0.236
2790	0.236	3330	0.236	3870	0.236	4410	0.236	4950	0.236	5490	0.236
2800	0.236	3340	0.236	3880	0.236	4420	0.236	4960	0.236	5500	0.236
2810	0.236	3350	0.236	3890	0.236	4430	0.236	4970	0.236	5510	0.236
2820	0.236	3360	0.236	3900	0.236	4440	0.236	4980	0.236	5520	0.236
2830	0.236	3370	0.236	3910	0.236	4450	0.236	4990	0.236	5530	0.236
2840	0.236	3380	0.236	3920	0.236	4460	0.236	5000	0.236	5540	0.236
2850	0.236	3390	0.236	3930	0.236	4470	0.236	5010	0.236	5550	0.236
2860	0.236	3400	0.236	3940	0.236	4480	0.236	5020	0.236	5560	0.236
2870	0.236	3410	0.236	3950	0.236	4490	0.236	5030	0.236	5570	0.236
2880	0.236	3420	0.236	3960	0.236	4500	0.236	5040	0.236	5580	0.236
2890	0.236	3430	0.236	3970	0.236	4510	0.236	5050	0.236	5590	0.236
2900	0.236	3440	0.236	3980	0.236	4520	0.236	5060	0.236	5600	0.236
2910	0.236	3450	0.236	3990	0.236	4530	0.236	5070	0.236	5610	0.236
2920	0.236	3460	0.236	4000	0.236	4540	0.236	5080	0.236	5620	0.236
2930	0.236	3470	0.236	4010	0.236	4550	0.236	5090	0.236	5630	0.236
2940	0.236	3480	0.236	4020	0.236	4560	0.236	5100	0.236	5640	0.236
2950	0.236	3490	0.236	4030	0.236	4570	0.236	5110	0.236	5650	0.236
2960	0.236	3500	0.236	4040	0.236	4580	0.236	5120	0.236	5660	0.236
2970	0.236	3510	0.236	4050	0.236	4590	0.236	5130	0.236	5670	0.236
2980	0.236	3520	0.236	4060	0.236	4600	0.236	5140	0.236	5680	0.236
2990	0.236	3530	0.236	4070	0.236	4610	0.236	5150	0.236	5690	0.236
3000	0.236	3540	0.236	4080	0.236	4620	0.236	5160	0.236	5700	0.236
3010	0.236	3550	0.236	4090	0.236	4630	0.236	5170	0.236	5710	0.236
3020	0.236	3560	0.236	4100	0.236	4640	0.236	5180	0.236	5720	0.236
3030	0.236	3570	0.236	4110	0.236	4650	0.236	5190	0.236	5730	0.236
3040	0.236	3580	0.236	4120	0.236	4660	0.236	5200	0.236	5740	0.236
3050	0.236	3590	0.236	4130	0.236	4670	0.236	5210	0.236	5750	0.236
3060	0.236	3600	0.236	4140	0.236	4680	0.236	5220	0.236	5760	0.236
3070	0.236	3610	0.236	4150	0.236	4690	0.236	5230	0.236	5770	0.236
3080	0.236	3620	0.236	4160	0.236	4700	0.236	5240	0.236	5780	0.236
3090	0.236	3630	0.236	4170	0.236	4710	0.236	5250	0.236	5790	0.236
3100	0.236	3640	0.236	4180	0.236	4720	0.236	5260	0.236	5800	0.236
3110	0.236	3650	0.236	4190	0.236	4730	0.236	5270	0.236	5810	0.236
3120	0.236	3660	0.236	4200	0.236	4740	0.236	5280	0.236	5820	0.236
3130	0.236	3670	0.236	4210	0.236	4750	0.236	5290	0.236	5830	0.236
3140	0.236	3680	0.236	4220	0.236	4760	0.236	5300	0.236	5840	0.236
3150	0.236	3690	0.236	4230	0.236	4770	0.236	5310	0.236	5850	0.236
3160	0.236	3700	0.236	4240	0.236	4780	0.236	5320	0.236	5860	0.236
3170	0.236	3710	0.236	4250	0.236	4790	0.236	5330	0.236	5870	0.236

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
5880	0.236	6420	0.236	6960	0.236	7500	0.236	8040	0.236	8580	0.236
5890	0.236	6430	0.236	6970	0.236	7510	0.236	8050	0.236	8590	0.236
5900	0.236	6440	0.236	6980	0.236	7520	0.236	8060	0.236	8600	0.236
5910	0.236	6450	0.236	6990	0.236	7530	0.236	8070	0.236	8610	0.236
5920	0.236	6460	0.236	7000	0.236	7540	0.236	8080	0.236	8620	0.236
5930	0.236	6470	0.236	7010	0.236	7550	0.236	8090	0.236	8630	0.236
5940	0.236	6480	0.236	7020	0.236	7560	0.236	8100	0.236	8640	0.236
5950	0.236	6490	0.236	7030	0.236	7570	0.236	8110	0.236	8650	0.236
5960	0.236	6500	0.236	7040	0.236	7580	0.236	8120	0.236	8660	0.236
5970	0.236	6510	0.236	7050	0.236	7590	0.236	8130	0.236	8670	0.236
5980	0.236	6520	0.236	7060	0.236	7600	0.236	8140	0.236	8680	0.236
5990	0.236	6530	0.236	7070	0.236	7610	0.236	8150	0.236	8690	0.236
6000	0.236	6540	0.236	7080	0.236	7620	0.236	8160	0.236	8700	0.236
6010	0.236	6550	0.236	7090	0.236	7630	0.236	8170	0.236	8710	0.236
6020	0.236	6560	0.236	7100	0.236	7640	0.236	8180	0.236	8720	0.236
6030	0.236	6570	0.236	7110	0.236	7650	0.236	8190	0.236	8730	0.236
6040	0.236	6580	0.236	7120	0.236	7660	0.236	8200	0.236	8740	0.236
6050	0.236	6590	0.236	7130	0.236	7670	0.236	8210	0.236	8750	0.236
6060	0.236	6600	0.236	7140	0.236	7680	0.236	8220	0.236	8760	0.236
6070	0.236	6610	0.236	7150	0.236	7690	0.236	8230	0.236	8770	0.236
6080	0.236	6620	0.236	7160	0.236	7700	0.236	8240	0.236	8780	0.236
6090	0.236	6630	0.236	7170	0.236	7710	0.236	8250	0.236	8790	0.236
6100	0.236	6640	0.236	7180	0.236	7720	0.236	8260	0.236	8800	0.236
6110	0.236	6650	0.236	7190	0.236	7730	0.236	8270	0.236	8810	0.236
6120	0.236	6660	0.236	7200	0.236	7740	0.236	8280	0.236	8820	0.236
6130	0.236	6670	0.236	7210	0.236	7750	0.236	8290	0.236	8830	0.236
6140	0.236	6680	0.236	7220	0.236	7760	0.236	8300	0.236	8840	0.236
6150	0.236	6690	0.236	7230	0.236	7770	0.236	8310	0.236	8850	0.236
6160	0.236	6700	0.236	7240	0.236	7780	0.236	8320	0.236	8860	0.236
6170	0.236	6710	0.236	7250	0.236	7790	0.236	8330	0.236	8870	0.236
6180	0.236	6720	0.236	7260	0.236	7800	0.236	8340	0.236	8880	0.236
6190	0.236	6730	0.236	7270	0.236	7810	0.236	8350	0.236	8890	0.236
6200	0.236	6740	0.236	7280	0.236	7820	0.236	8360	0.236	8900	0.236
6210	0.236	6750	0.236	7290	0.236	7830	0.236	8370	0.236	8910	0.236
6220	0.236	6760	0.236	7300	0.236	7840	0.236	8380	0.236	8920	0.236
6230	0.236	6770	0.236	7310	0.236	7850	0.236	8390	0.236	8930	0.236
6240	0.236	6780	0.236	7320	0.236	7860	0.236	8400	0.236	8940	0.236
6250	0.236	6790	0.236	7330	0.236	7870	0.236	8410	0.236	8950	0.236
6260	0.236	6800	0.236	7340	0.236	7880	0.236	8420	0.236	8960	0.236
6270	0.236	6810	0.236	7350	0.236	7890	0.236	8430	0.236	8970	0.236
6280	0.236	6820	0.236	7360	0.236	7900	0.236	8440	0.236	8980	0.236
6290	0.236	6830	0.236	7370	0.236	7910	0.236	8450	0.236	8990	0.236
6300	0.236	6840	0.236	7380	0.236	7920	0.236	8460	0.236	9000	0.236
6310	0.236	6850	0.236	7390	0.236	7930	0.236	8470	0.236	9010	0.236
6320	0.236	6860	0.236	7400	0.236	7940	0.236	8480	0.236	9020	0.236
6330	0.236	6870	0.236	7410	0.236	7950	0.236	8490	0.236	9030	0.236
6340	0.236	6880	0.236	7420	0.236	7960	0.236	8500	0.236	9040	0.236
6350	0.236	6890	0.236	7430	0.236	7970	0.236	8510	0.236	9050	0.236
6360	0.236	6900	0.236	7440	0.236	7980	0.236	8520	0.236	9060	0.236
6370	0.236	6910	0.236	7450	0.236	7990	0.236	8530	0.236	9070	0.236
6380	0.236	6920	0.236	7460	0.236	8000	0.236	8540	0.236	9080	0.236
6390	0.236	6930	0.236	7470	0.236	8010	0.236	8550	0.236	9090	0.236
6400	0.236	6940	0.236	7480	0.236	8020	0.236	8560	0.236	9100	0.236
6410	0.236	6950	0.236	7490	0.236	8030	0.236	8570	0.236	9110	0.236

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
9120	0.236	9410	0.236	9700	0.236	9990	0.236	10280	0.236	10570	0.236
9130	0.236	9420	0.236	9710	0.236	10000	0.236	10290	0.236	10580	0.236
9140	0.236	9430	0.236	9720	0.236	10010	0.236	10300	0.236	10590	0.236
9150	0.236	9440	0.236	9730	0.236	10020	0.236	10310	0.236	10600	0.236
9160	0.236	9450	0.236	9740	0.236	10030	0.236	10320	0.236	10610	0.236
9170	0.236	9460	0.236	9750	0.236	10040	0.236	10330	0.236	10620	0.236
9180	0.236	9470	0.236	9760	0.236	10050	0.236	10340	0.236	10630	0.236
9190	0.236	9480	0.236	9770	0.236	10060	0.236	10350	0.236	10640	0.236
9200	0.236	9490	0.236	9780	0.236	10070	0.236	10360	0.236	10650	0.236
9210	0.236	9500	0.236	9790	0.236	10080	0.236	10370	0.236	10660	0.236
9220	0.236	9510	0.236	9800	0.236	10090	0.236	10380	0.236	10670	0.236
9230	0.236	9520	0.236	9810	0.236	10100	0.236	10390	0.236	10680	0.236
9240	0.236	9530	0.236	9820	0.236	10110	0.236	10400	0.236	10690	0.236
9250	0.236	9540	0.236	9830	0.236	10120	0.236	10410	0.236	10700	0.236
9260	0.236	9550	0.236	9840	0.236	10130	0.236	10420	0.236	10710	0.236
9270	0.236	9560	0.236	9850	0.236	10140	0.236	10430	0.236	10720	0.236
9280	0.236	9570	0.236	9860	0.236	10150	0.236	10440	0.236	10730	0.236
9290	0.236	9580	0.236	9870	0.236	10160	0.236	10450	0.236	10740	0.236
9300	0.236	9590	0.236	9880	0.236	10170	0.236	10460	0.236	10750	0.236
9310	0.236	9600	0.236	9890	0.236	10180	0.236	10470	0.236	10760	0.236
9320	0.236	9610	0.236	9900	0.236	10190	0.236	10480	0.236	10770	0.236
9330	0.236	9620	0.236	9910	0.236	10200	0.236	10490	0.236	10780	0.236
9340	0.236	9630	0.236	9920	0.236	10210	0.236	10500	0.236	10790	0.236
9350	0.236	9640	0.236	9930	0.236	10220	0.236	10510	0.236	10800	0.236
9360	0.236	9650	0.236	9940	0.236	10230	0.236	10520	0.236		
9370	0.236	9660	0.236	9950	0.236	10240	0.236	10530	0.236		
9380	0.236	9670	0.236	9960	0.236	10250	0.236	10540	0.236		
9390	0.236	9680	0.236	9970	0.236	10260	0.236	10550	0.236		
9400	0.236	9690	0.236	9980	0.236	10270	0.236	10560	0.236		

Node HB1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	6.200	Product Number	CTL-SHE-0049-9000-0620-9000
Design Depth (m)	0.620	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.9	Min Node Diameter (mm)	1200

Node HB1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	6.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	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	1727.0	1727.0	0.620	1727.0	1818.3	0.621	0.0	1818.3

Results for 1 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
2160 minute summer	HB1	1440	6.312	0.112	2.8	58.0144	0.0000	OK
15 minute summer	Outfall	1	5.986	0.236	0.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
2160 minute summer	HB1	1.000	0.8	88.9

Results for 10 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
720 minute summer	HB1	720	6.437	0.237	12.9	123.2903	0.0000	SURCHARGED
15 minute summer	Outfall	1	5.986	0.236	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
720 minute summer	HB1	1.000	0.9	100.5

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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	HB1	720	6.505	0.305	16.0	158.3481	0.0000	SURCHARGED
15 minute summer	Outfall	1	5.986	0.236	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m ³)
720 minute summer	HB1	1.000	0.9	103.1

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	HB1	1410	6.676	0.476	8.7	247.1409	0.0000	FLOOD RISK
15 minute summer	Outfall	1	5.986	0.236	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	HB1	1.000	0.9	122.3

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	HB1	945	6.599	0.399	10.6	207.3201	0.0000	SURCHARGED
15 minute summer	Outfall	1	5.986	0.236	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
960 minute winter	HB1	1.000	0.9	109.8

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	HB1	1410	6.811	0.611	10.9	317.2932	0.0000	FLOOD RISK
15 minute summer	Outfall	1	5.986	0.236	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	HB1	1.000	0.9	131.0

Appendix 7

Interim Drainage Management and Maintenance Plan

Interim Drainage Management and Maintenance Plan

Project	Chalcroft Nursery, Bersted, West Sussex
Project Number	24123
By	Steve Doughty
Date	26 May 2026

1 Introduction

- 1.1 This Interim Drainage Management and Maintenance Plan has been prepared as the initial draft of the document that will become the Drainage Maintenance and Management Manual.
- 1.2 The Drainage Management and Maintenance Manual will be completed as part of the Operation and Maintenance Manual to be provided by the Principal Contractor on completion of construction.
- 1.3 The Drainage Management and Maintenance Manual will be handed over to a Management Company appointed by the Developer the Site Operators on project completion.
- 1.4 The Drainage Management and Maintenance Manual will remain a live document and will be used to guide and record the management and maintenance of the surface water and foul drainage systems.
- 1.5 In the event that the Management Company becomes unable to discharge its duties within two years of first appointment the Developer will endeavour to appoint an alternative on behalf of the Site Operators.

2 During Construction

- 2.1 Once appointed the Contractor will prepare a site specific method statement for the control of silt and other pollutants during construction. CIRIA Report C532, Control of water pollution from construction sites, provides further guidance on this.
- 2.2 The Contractor will maintain the proposed drainage system during construction and until the handing over of the site.

3 Surface Water Drainage System

- 3.1 The surface water drainage system has been designed as a Sustainable Urban Drainage System (SuDS).
- 3.2 The system has been designed to collect surface water from the roofs and discharge it at a restricted rate to the watercourse at the north of the site.
- 3.3 Onsite Highways and parking areas have been designed as permeable which will also discharge surface water at a restricted rate to the watercourse at the north of the site and will provide storage for high intensity rainfall events within a voided subbase.
- 3.4 The system will provide water quality improvement to ensure that at the point of discharge the surface water has received suitable pollution mitigation.

4 Schedule of Maintenance

- 4.1 Management of shared drainage facilities will be passed on to a Management Company.
- 4.2 Maintenance of individual property drainage connections is the responsibility of the individual property owners (the Site Operators).
- 4.3 There are three categories of maintenance activities:

- **Regular maintenance**

Basic tasks undertaken on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.

- **Occasional maintenance**

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**

Intermittent tasks that may be required to rectify faults associated with the system. 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.

- 4.4 The following maintenance schedule details the typical tasks to be undertaken at different intervals.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Manage vegetation and remove nuisance plants - aesthetics	As required
	Litter and debris removal - catchpits and manholes	Monthly or as required
	Cleaning of gutters and any filters on downpipes	3 Monthly
Occasional Maintenance	Remove sediment and debris from silt trap chambers, channel drains and inlet chambers	6 monthly
	Visual inspection of permeable paving for defects and settlement	Annually
	Sweeping / brushing of permeable paving	Every 2 years
	Surface and foul water pipework - jetting / rodding	Every 2 years or as required
Remedial Maintenance	Remove debris / blockages to silt traps / channel drains / headwalls	As required
	Repairs to access chambers / manhole covers	As required
	Replace any broken permeable blocks / surface, remedial works to any depressions or rutting	As required
	Inspect inlet, outlet from downpipes, channel drains, headwalls and gullies for blockages, standing water and clear	As required
	Reconstruct storage structures if performance deteriorates or failure occurs	As required
Monitoring	Inspect silt traps and note the rate sediment has accumulated	Monthly in the first year and then annually
	Inspect storage structures to ensure they are fully emptying	Annually

Indicative Schedule of Maintenance for the Proposed Drainage System

Component	Inspection Frequency				
	1 Month	6 Months	1 Year	After leaf fall in Autumn	2 Years
Gullies, Channel Drains and Gutters		✓		✓	
Catchpits	✓			✓	
Surface and Foul Water Pipework					✓
Permeable Paving			✓		
Flow Controls		✓			
Storage Facilities			✓		
Existing Watercourse	✓				

Inspection Frequency Summary

5 Maintenance Procedures

5.1 It is recommended that the Management Company employ a suitably qualified company to undertake the maintenance works for all shared drainage.

5.2 The following procedures provide a guide to the two most common maintenance items, jetting and silt removal, to be undertaken on site:

5.3 Jetting

5.3.1 Equipment Required:

- High-pressure water jetting equipment.
- Personal protective equipment (PPE) for operators.

5.3.2 Typical Procedure:

- Perform a pre-jetting inspection to assess the level of sedimentation.
- Insert the jetting hose into the pipe, starting from the upstream end.
- Gradually move the jetting hose downstream, ensuring the entire pipe or structure length is cleaned.
- Monitor the process to avoid any damage to the drainage infrastructure.
- Collect dislodged silt and debris at the downstream end using a vacuum or manual removal.

5.4 Silt Removal and Disposal

5.4.1 Equipment Required:

- Vacuum truck or manual removal tools.
- Containers for temporary storage of silt and debris.

5.4.2 Typical Procedure:

- Collect the dislodged silt and debris from the downstream end of pipe or structure.
- Transfer the collected material to the containers.
- Dispose of the collected silt and debris following local regulations and environmental guidelines.

6 Financing

6.1 The regular and corrective maintenance of all shared elements of the drainage system will be managed and funded through the Management Company on behalf of the Site Operators.

- 6.2 Maintenance of individual property drainage infrastructure will be funded by the individual property owners (the Site Operators).

7 Health and Safety

7.1 Designers Residual Risks

- 7.1.1 There are no significant residual risks associated with the construction of the proposed surface or foul water drainage network or permeable paving system beyond common site risks that would reasonably be anticipated by a competent Civil Engineering Contractor.

7.2 Construction Phase

- 7.2.1 The Principal Contractor will undertake a construction phase Health and Safety Plan for the site.
- 7.2.2 Prior to handover the Principal Contractor will undertake a review of maintenance activities required and prepare suitable Health and Safety documentation as part of the site hand over documents.

8 Design Life

- 8.1 The design life of the development is likely to exceed the design life of the components within the SuDS network. During the routine drainage inspections it may be determined that some components have reached the end of their functional life cycle.
- 8.2 Where possible repairs should be the first option considered however if repairs are unviable it will be necessary for the property owner / Management Company to arrange for the replacement of the faulty component.

9 Emergency Plan

9.1 Potential flood and maintenance indicators:

- Manholes or inspections chambers overflowing
- Gullies overflowing or ponding
- Channel drains overflowing or ponding
- Other visual indicators of the drainage system not performing as it should

9.2 Should any of the items above occur then immediate action as outlined below should be undertaken:

- Inspect for blockages in the problem area
- Should the problem not be identified via an initial inspection:

- For unadopted onsite drainage the Management Company should appoint a suitable drainage engineer to inspect and survey the system and jet any blockages
- Where it is suspected that there is a problem with the downstream drainage network the Owner or relevant statutory undertaker of that system should be alerted

9.3 Spillages

9.3.1 If a serious spillage in volume or toxicity occurs on site then the spillage should be isolated with soil, turf or specialist fabric and all downstream outlets should be bunged / blocked.

9.3.2 Once the spillage is contained the Environment Agency should be contacted immediately on 0370 850 6506.

9.4 Emergency Contact Details

Management Company	TBC
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