The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

Drainage Statement

Proposed Change of Use at

Lingworth, 17 Oathall Road, Haywards Heath

On behalf of

Adelaide Healthcare Limited

November 2024

Document History and Status

Project Number 23990

Date	Version	Prepared By	Reviewed By	Approved By
26 Nov 2024	1.0	Sonya Macandrew BEng GMICE	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE
28 Nov 2024	1.1	Sonya Macandrew BEng GMICE	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE

CONTENTS

1 Non Technical Summary 1

2 Planning Policy Context 2

2.1 National Planning Policy Framework 2

2.2 Local Planning Policy 2

3 Legislation 4

3.1 Water Industries Act 1991 4

3.2 Section 115 Water Industries Act 4

4 Existing Site 5

4.1 Site Location 5

4.2 Site Description 5

4.3 Existing Drainage 6

4.4 Geology and Groundwater 7

5 Development Proposals 8

5.1 Description 8

5.2 Surface Water Drainage 8

5.3 Contingent Surface Water Drainage 9

5.4 Foul Drainage 11

5.5 Water Quality 11

5.6 Risk to Others 12

5.7 Surface Water Exceedance Routes 12

6 Conclusions 13

7 List of Appendices, Images and Tables 14

1 Non Technical Summary

1.1 This Drainage Statement has been undertaken on behalf of Adelaide Healthcare Limited in support of a Planning Application for a Change of Use from a dwelling to a care home including construction of approximately 150m^2 of side and rear extensions at Lingworth, 17 Oathall Road, Haywards Heath, West Sussex, RH16 3EG.

1.2 This Statement is to be read in conjunction with all planning, architectural and other reports that accompany the Planning Application for the proposed development.

1.3 The proposed development will incorporate a sustainable drainage system (SuDS) for the proposed new impermeable areas with attenuation and storage provided for all storm return periods up to and including the 1:100 year rainfall event with an allowance for climate change.

1.4 The SuDS will additionally provide betterment for the existing building compared with the unrestricted discharge for all storm return periods up to and including the 1:100 year rainfall event with an allowance for climate change.

1.5 A suitable surface water and foul water drainage system can be designed for this development.

2 Planning Policy Context

2.1 National Planning Policy Framework

2.1.1 With regard to planning and flood risk the National Planning Policy Framework, section 167, states that *'All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:*

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

2.2 Local Planning Policy

2.2.1 The Mid Sussex District Plan 2021-2039 was adopted on 28 March 2018.

2.2.2 The following policies are of specific relevance to this Drainage Statement:

Policy DP41: Flood Risk and Drainage states:

'Strategic Objectives:

1) To promote development that makes the best use of resources and increases the sustainability of communities within Mid Sussex, and its ability to adapt to climate change; and

2) To support sustainable communities which are safe, healthy and inclusive. Evidence Base: Gatwick Sub Region Water Cycle Study; Strategic Flood Risk Assessment; Water. People. Places SuDS guidance.

Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The District Council's Strategic Flood Risk Assessment (SFRA) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs.

Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates.

Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. Arrangements for the long term maintenance and management of SuDS should also be identified.

For the redevelopment of brownfield sites, any surface water draining to the foul sewer must be disconnected and managed through SuDS following the remediation of any previously contaminated land.

SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.

The preferred hierarchy of managing surface water drainage from any development is:

1. Infiltration Measures

2. Attenuation and discharge to watercourses; and if these cannot be met,

3. Discharge to surface water only sewers.

Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies for existing run-off rates.'

3 Legislation

3.1 Water Industries Act 1991

3.1.1 The Water Industries Act 1991 provides the legislative framework that sets out the powers and duties of water and sewerage companies together with the rights of communication for the disposal of foul and surface water from premises.

3.1.2 Legislation is above all subsidiary guidance, whether that guidance is written in the SuDS Manual, in the Lead Local Authority's guidance or District Council guidance.

3.2 Section 115 Water Industries Act

3.2.1 Section 115 (Use of highway drains as sewers and vice versa) of the Water Industries Act 1991 states:

'(1) Subject to the provisions of this section, a relevant authority and a sewerage undertaker may agree that—

(a) any drain or sewer which is vested in the authority in their capacity as a highway authority may, upon such terms as may be agreed, be used by the undertaker for the purpose of conveying surface water from premises or streets;

(b) any public sewer vested in the undertaker may, upon such terms as may be agreed, be used by the authority for conveying surface water from roads repairable by the authority.

(2) Where a sewer or drain with respect to which a relevant authority and a sewerage undertaker propose to make an agreement under this section discharges, whether directly or indirectly, into the sewers or sewage disposal works of another sewerage undertaker, the agreement shall not be made without the consent of that other undertaker.

(3) Subject to subsection (4) below, a consent given by a sewerage undertaker for the purposes of subsection (2) above may be given on such terms as that undertaker thinks fit.

(4) Neither a relevant authority nor a sewerage undertaker shall—

(a) unreasonably refuse to enter into an agreement for the purposes of this section; or

(b) insist unreasonably upon terms unacceptable to the other party;

and a sewerage undertaker shall not unreasonably refuse to consent to the making of such an agreement or insist unreasonably upon terms unacceptable to either party.'

4 Existing Site

4.1 Site Location

4.1.1 The development site is located on land west of B2112 Oathall Road, Haywards Heath at Ordnance Survey reference TQ333 242. The nearest postcode is RH16 3EG.

Image 1: Site Location

4.1.2 The site is bounded to the north and south by residential dwellings, the east by B2112 Oathall Road and the west by an area of woodland within Clair Park.

4.1.3 The closest watercourse is a tributary of Scrase Stream that is located approximately 570m from the eastern site boundary.

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

4.2 Site Description

4.2.1 The site is approximately 0.3ha in area and currently comprises a single residential dwelling including a main building and coach house.

4.2.2 Existing ground levels are highest along the southern boundary at approximately 71m AOD. The site falls towards its northeast corner to a level of approximately 67.1m AOD.

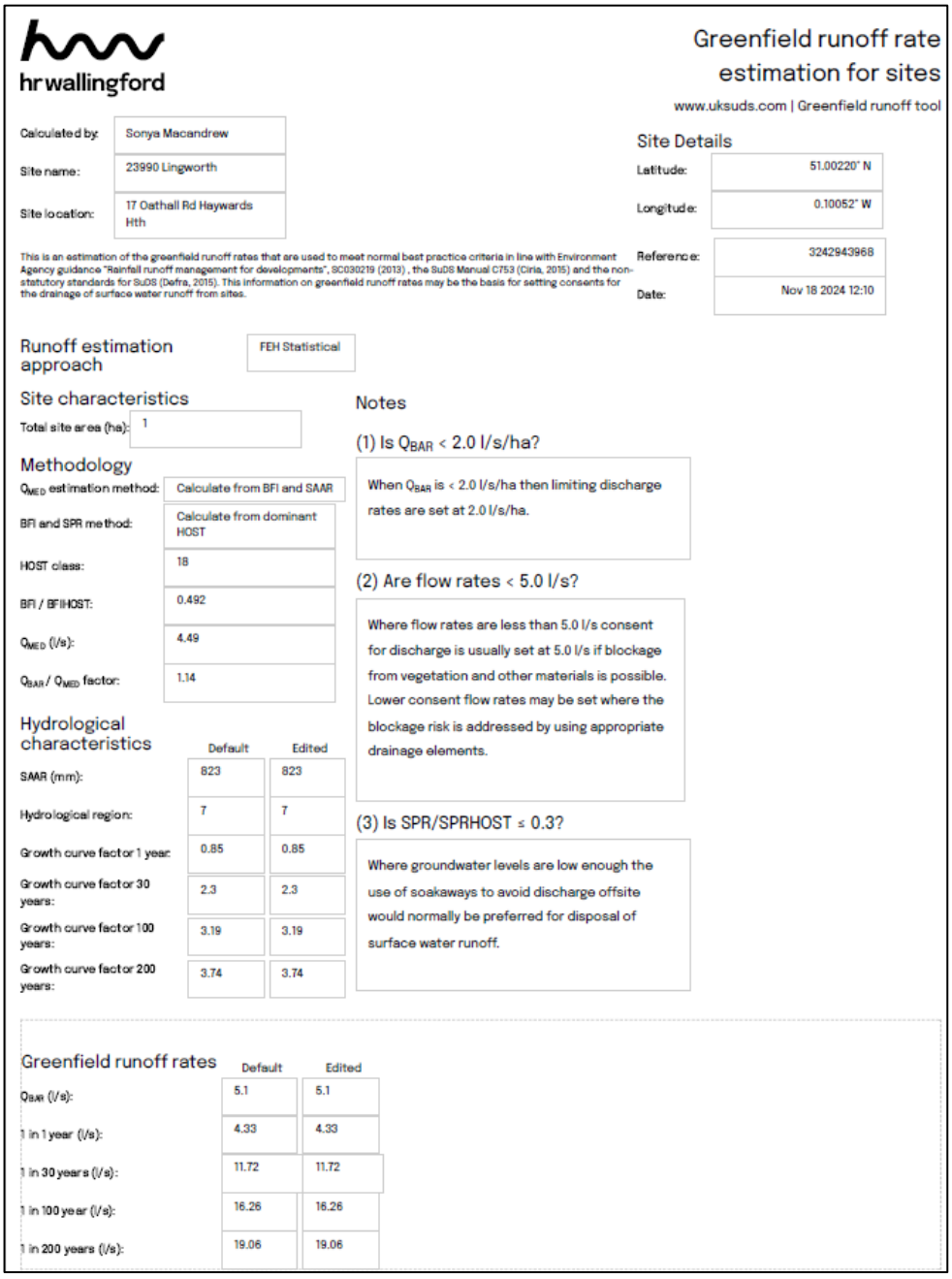
4.2.3 A copy of the existing site layout and drained areas plan is located in Appendix 2 at the rear of this report.

4.3 Existing Drainage

4.3.1 The surface water from the impermeable areas and foul water currently discharges in an unrestricted manner via the existing on-site drainage infrastructure to the public foul sewer beneath Oathall Road.

4.3.2 Rainfall on the permeable areas currently discharges in part to ground and in part overland as a greenfield runoff to the northeast of the site.

4.3.3 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.



hr wallingford

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Sonya Macandrew
Site name:	23990 Lingworth
Site location:	17 Oathall Rd Haywards Hth

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.

Site Details

Latitude:	51.00220° N
Longitude:	0.10052° W
Reference:	3242943968
Date:	Nov 18 2024 12:10

Runoff estimation approach: FEH Statistical

Site characteristics

Total site area (ha): 1

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Calculate from dominant HOST
HOST class:	18
BFI / BFIHOST:	0.492
Q_{MED} (l/s):	4.49
Q_{BAR} / Q_{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	823	823
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	5.1	5.1
1 in 1 year (l/s):	4.33	4.33
1 in 30 years (l/s):	11.72	11.72
1 in 100 year (l/s):	16.26	16.26
1 in 200 years (l/s):	19.06	19.06

Image 2: Greenfield Runoff Calculation

4.3.4 The Hydrology of Soil Type (HOST) has been confirmed by the National Soil Resources Institute at Cranfield University as soil type 18 which is classified as *'Slowly permeable soils with slight seasonal waterlogging and moderate storage capacity over slowly permeable substrates with negligible storage'.*

4.3.5 The pre-developed greenfield runoff rates are as follows:

- Q_{bar} 5.1 l/s/ha
- 1:30 year 11.72 l/s/ha
- 1:100 year 16.26 l/s/ha

4.3.6 There is a public foul sewer located beneath the B2112 Oathall Road to the east of the site.

4.3.7 There is evidence of a highway drain a located beneath the B2112 Oathall Road to the east of the site.

4.3.8 There is no evidence of a public surface or combined sewer within 100m of the site.

4.3.9 A copy of the sewer records is located in Appendix 3 at the rear of this report.

4.4 Geology and Groundwater

4.4.1 British Geological Survey maps and borehole information confirm that the site is within an area underlain by silty clay and siltstone to a depth of at least 9m below ground level.

4.4.2 Groundwater was encountered at depths of between 2 to 5m below ground level in the clay and siltstone layers within 1km of the site.

4.4.3 Site investigation for a site 1.4km to the north on similar geology indicate an infiltration rate in the vicinity of $1.91x10^{-7}$m/s from one test.

4.4.4 The online "Magic Map" available from DEFRA confirms that the site is located above a Secondary A aquifer in the bedrock classified as having a high vulnerability.

4.4.5 Copies of the BGS borehole records and extracts from site investigation for a similar site are located in Appendix 4 at the rear of this report.

5 Development Proposals

5.1 Description

5.1.1 The development proposals are for the change of use of the existing single dwelling to a care home including construction of a rear and side extension to the main building and roof and side extension to the coach house.

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

- Roof Areas +171m^2
- Driveway and Parking Areas +166m^2
- Paved Areas -399m^2

5.1.3 A copy of the proposed site layout and additional drained areas plan is located in Appendix 5 at the rear of this report.

5.2 Surface Water Drainage

5.2.1 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.

5.2.2 For surface water discharge, the drainage hierarchy notes the following list of drainage options in order of preference:

1 Infiltration to ground

2 Discharge to a watercourse

3 Discharge to a surface water sewer

4 Discharge to a combined water sewer

5.2.3 The proposed surface water drainage strategy will be based on infiltration to ground with sufficient storage provided to accommodate a 1:100 year storm event including an additional 45% to account for the predicted effects of future climate change.

5.2.4 Preliminary calculations have been prepared based on an assumed infiltration rate of 2x10^{-7} m/s as indicated by a site on similar geological strata approximately 1.4km from this site.

5.2.5 Site specific infiltration testing to BRE Digest 365 will be required to inform the detailed design.

5.2.6 The total proposed impermeable areas of the site will be less than existing however calculations have been prepared based on the additional roof, driveway and parking areas of up to 340m^2.

5.2.7 A total storage volume of 73m^3 will be sufficient to accommodate a 1:100 year storm event including an additional 45% to account for the predicted effects of future climate change. This will be provided in 95% voided storage crates beneath the parking areas and gardens.

5.2.8 Rainwater harvesting is proposed in the form of water butts for use in the gardens.

5.2.9 It is proposed to connect the existing on-site surface water, which currently connects to the on-site combined private sewer, to a proposed on-site private surface water sewer.

5.2.10 The drainage proposals will be confirmed at detailed design stage subject to further site investigations and infiltration testing.

5.3 Contingent Surface Water Drainage

5.3.1 If site investigation demonstrates that infiltration is not a viable option, then the following options have been assessed in accordance with the drainage hierarchy.

5.3.2 Discharge to Watercourse

5.3.2.1 The nearest watercourse or suitable water body is located approximately 570m to the east of the site.

5.3.2.2 There are no other suitable water bodies near the site.

5.3.2.3 This option is therefore discounted as a means of discharging surface water from the site.

5.3.3 Discharge to a Surface Water Sewer

5.3.3.1 The nearest public surface water sewers are approximately 100m south of the site beneath Oathall Road with an invert level of 69.35m AOD and approximately 160m to the north with an invert level of 59.57m AOD.

5.3.3.2 The sewer to the south would require the pumping of surface water, which is undesirable in terms of sustainability, and both sewers are too far from the site to make connection to them a viable option.

5.3.3.3 This option is therefore discounted as a means of discharging surface water from the site.

5.3.4 Discharge to a Combined Sewer

5.3.4.1 There are no combined sewers in the local area.

5.3.4.2 This option is therefore discounted as a means of discharging surface water from the site.

5.3.5 Discharge to a Highway Drain

5.3.5.1 There is visual evidence of a highway drain beneath Oathall Road adjacent to the site.

5.3.5.2 West Sussex County Council Highway Authority guidance states that *'Private surface water will not be allowed to discharge into a highway drainage system*'.

5.3.5.3 Section 115 of the Water Industry Act 1991 (Use of highway drains as sewers and vice) makes provision for a highway drain to be used, upon such terms as may be agreed, by the sewerage undertaker for the purpose of conveying surface water from premises or streets. Neither the relevant authority nor the sewerage undertaker should unreasonably refuse to enter into such an agreement.

5.3.5.4 If infiltration is unviable then subject to the agreement of the Highway Authority and sewerage undertaker surface water flow from the development can be discharged at a restricted rate to the highway drain.

5.3.5.5 Further detail for this option is available if site investigation shows infiltration to ground to be unviable.

5.3.5.6 This is a viable option for the discharge of surface water from the site.

5.3.6 Discharge to a Foul Sewer

5.3.6.1 There is a public foul sewer beneath Oathall Road adjacent to the site and surface and foul water from the site both currently discharge to this sewer in an unrestricted manner.

5.3.6.2 If infiltration is unviable and a connection to the highway drain is not agreed then the reduced surface water flow from the development can be discharged at a restricted rate to the public foul sewer.

5.3.6.3 The preliminary calculations show that the proposed development will provide betterment on the existing rate of surface water discharge to the foul sewer both through the reduction in impermeable areas and by the provision of storage together with a restricted discharge of up to 2l/s from the proposed additional impermeable areas to the foul sewer.

5.3.6.4 Further detail for this option is available if site investigation shows that both infiltration to ground and connection to the highway drain are unviable.

5.3.6.5 This is a viable option for the discharge of surface water from the site.

5.4 Foul Drainage

5.4.1 Foul water will be discharged to the existing public foul sewer located beneath Oathall Road using the existing onsite connection.

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

5.5 Water Quality

5.5.1 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 very low and low depending on the use / area of the site.

5.5.2 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.

5.5.3 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
Residential roofs	Very Low	0.2	0.2	0.05
Non-residential car parking with infrequent change (e.g. school)	Low	0.5	0.4	0.4

Table 1: Pollution Hazard Indices

5.5.4 The surface water drainage design will use filter drains for the proposed roof areas and permeable paving in the proposed parking area.

SuDS Type	Total suspended solids (TSS)	Metals	Hydrocarbons
Filter drain	0.4	0.4	0.4
Permeable pavement	0.7	0.6	0.7

Table 2: Pollution Mitigation Indices

5.5.5 An outline drainage management and maintenance schedule is located in Appendix 7 at the rear of this report.

5.6 Risk to Others

5.6.1 The proposed surface water drainage system will be designed to current standards incorporating SuDS elements providing attenuation and storage which will minimise runoff leaving the site during times of heavy rain.

5.6.2 Allowance has been made for a 45% increase in rainfall intensities which accords with the latest figures published by the Environment Agency with the requirements under the National Planning Policy Framework.

5.6.3 The proposed drainage system will incorporate sufficient treatment prior to final discharge thus mitigating the risk of pollution from the site.

5.6.4 Sewerage undertakers have an obligation to upgrade the existing networks if a connection to an equivalent or larger sized public sewer is technically achievable.

5.6.5 The proposed surface water drainage strategy will provide betterment on existing either through infiltration to ground or through a reduced rate of discharge of surface water to the highway drain or foul sewer compared with existing.

5.6.6 The residual risk of sewer flooding from this development for the foreseeable future is therefore negligible.

5.7 Surface Water Exceedance Routes

5.7.1 In the event that part of the onsite surface water drainage network was to become blocked or suffer a failure due to lack of maintenance surface water would migrate overland towards the northeast corner of the site.

5.7.2 In the event of a storm return period in excess of the 100 year +45% design standard surface water would overflow to the existing on-site sewer network mimicking the existing drainage route.

5.7.3 There is no associated increase in flood risk to the downstream catchment.

6 Conclusions

6.1 The geology of the area is predominantly clay and limited infiltration is assumed.

6.2 A suitable SuDS drainage system is proposed which accords with the requirements of national and local policy.

6.3 Three options for discharging additional surface water from the site have been provided. The first outlines the design for infiltration to ground with exceedance discharging to the existing public surface water sewer beneath Oathall Road.

6.4 The second and third options, should infiltration to ground be shown to be unviable, outline the design for storage and attenuation with a restricted discharge to the existing highway drain or to the public foul sewer.

6.5 All three options will provide betterment on the existing discharge of surface water to the foul sewer.

6.6 Preliminary calculations for all three options 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.

6.7 Water butts will be provided to harvest rainwater for use in the gardens.

6.8 Water quality improvement will be provided to mitigate against any risk to any receiving waterbody.

6.9 Foul water will be discharged to the existing public foul sewer located beneath Oathall Road using the existing onsite connection.

6.10 This report concludes that a suitable surface water and foul water drainage system can be designed to accommodate the anticipated flows from the proposed development and in terms of drainage the development proposals are suitable at this location.

7 List of Appendices, Images and Tables

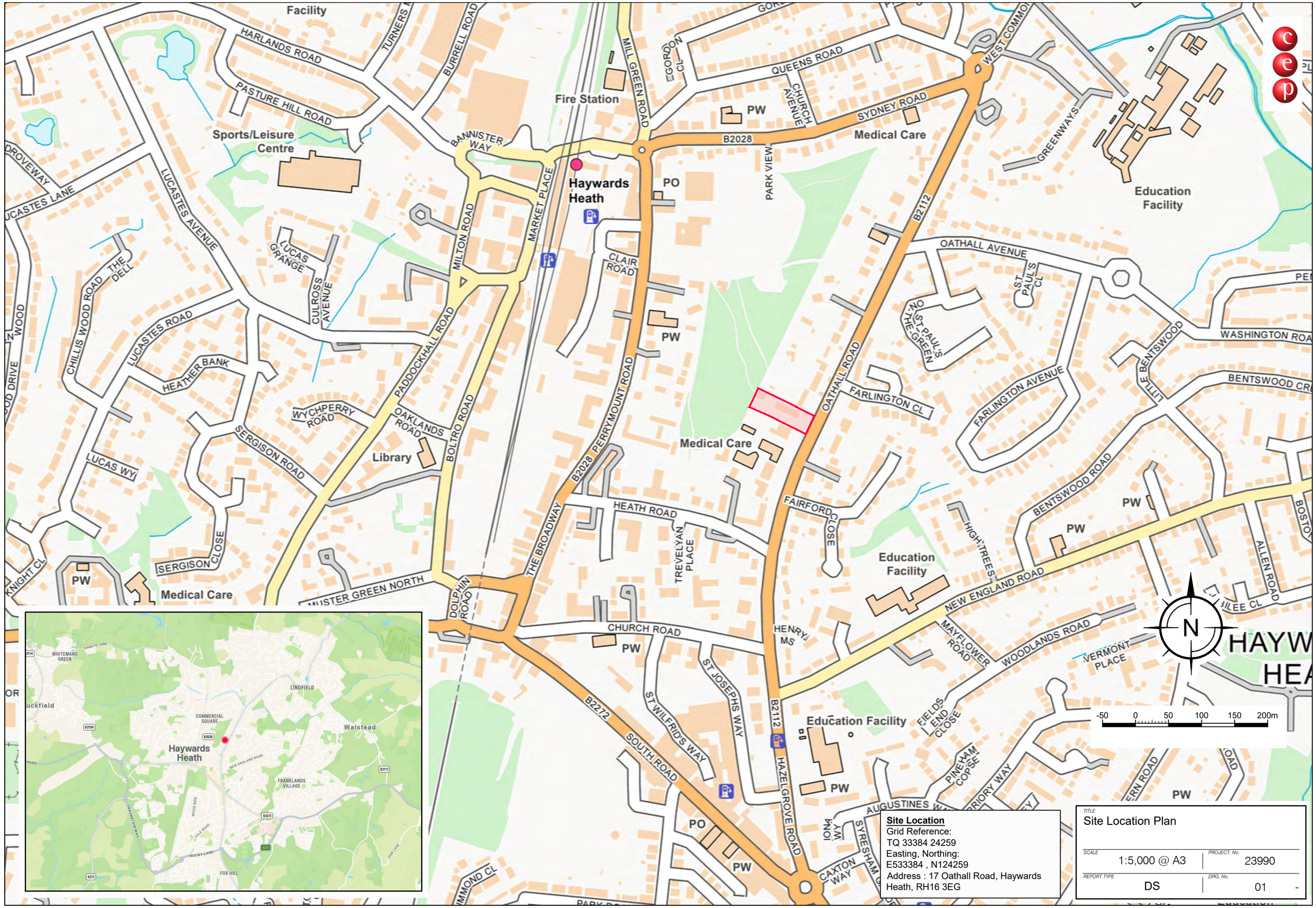
Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout and Drained Areas Plan
Appendix 3	Sewer Records
Appendix 4	BGS Borehole Records and Extracts from Site Investigation for a Similar Site
Appendix 5	Proposed Site Layout and Additional Drained Areas Plan
Appendix 6	Preliminary Drainage Strategy Plan with Calculations
Appendix 7	Outline Drainage Maintenance Schedule

Image 1	Site Location
Image 2	Greenfield Runoff Calculation

Table 1	Pollution Hazard Indices
Table 2	Pollution Mitigation Indices

Appendix 1

Site Location Plan



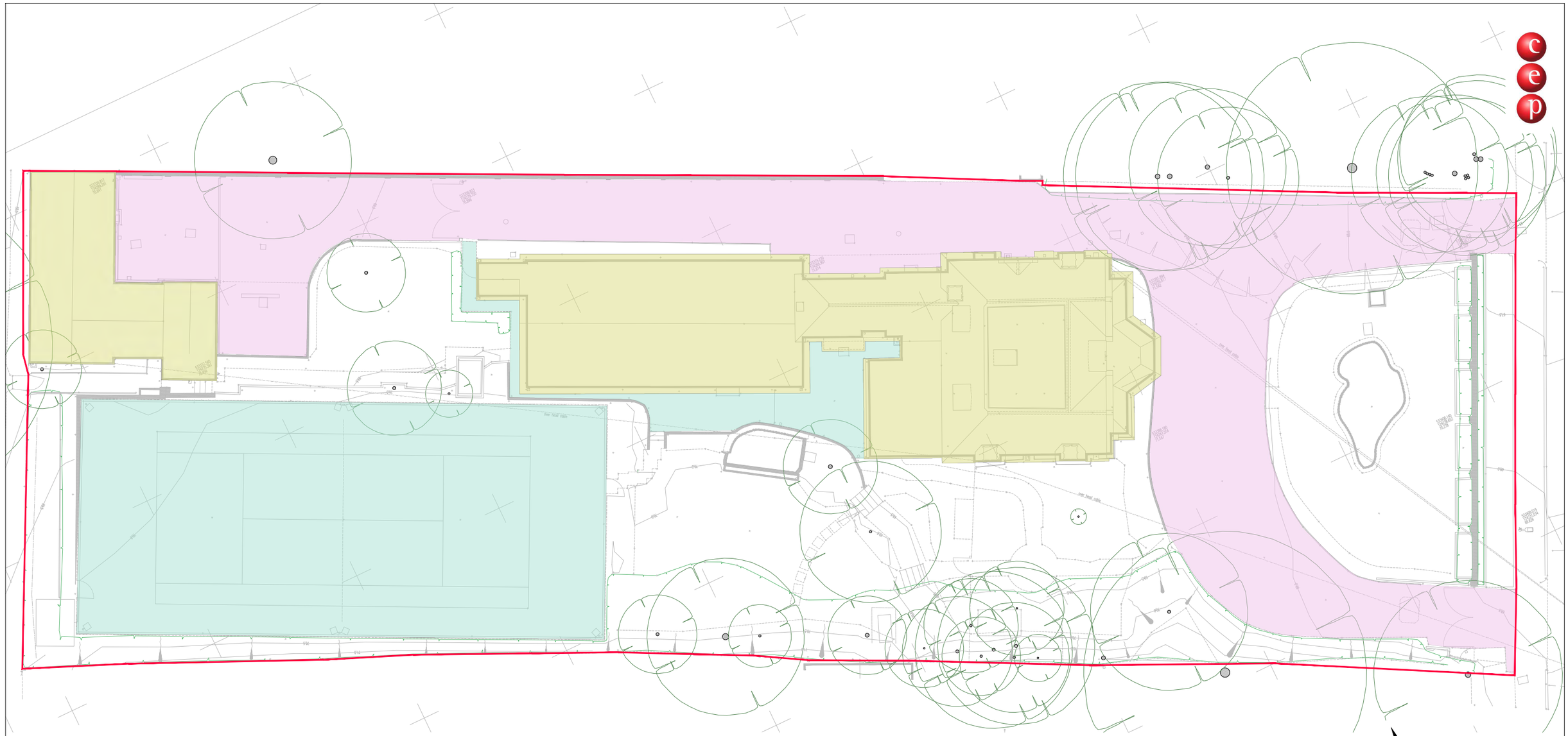
Site Location
Grid Reference:
TQ 33384 24259
Easting, Northing:
E533384 , N124259
Address : 17 Oathall Road, Haywards Heath, RH16 3EG

TITLE
Site Location Plan

SCALE	PROJECT. No.
1:5,000 @ A3	23990
REPORT TYPE	DRG. No.
DS	01 -

Appendix 2

Existing Site Layout and Drained Areas Plan



EXISTING AREAS KEY:

	Total site area	2,898m²
	Roofs	512m²
	Paved areas	555m²
	Driveway and parking areas	669m²
	Total area	1736m²

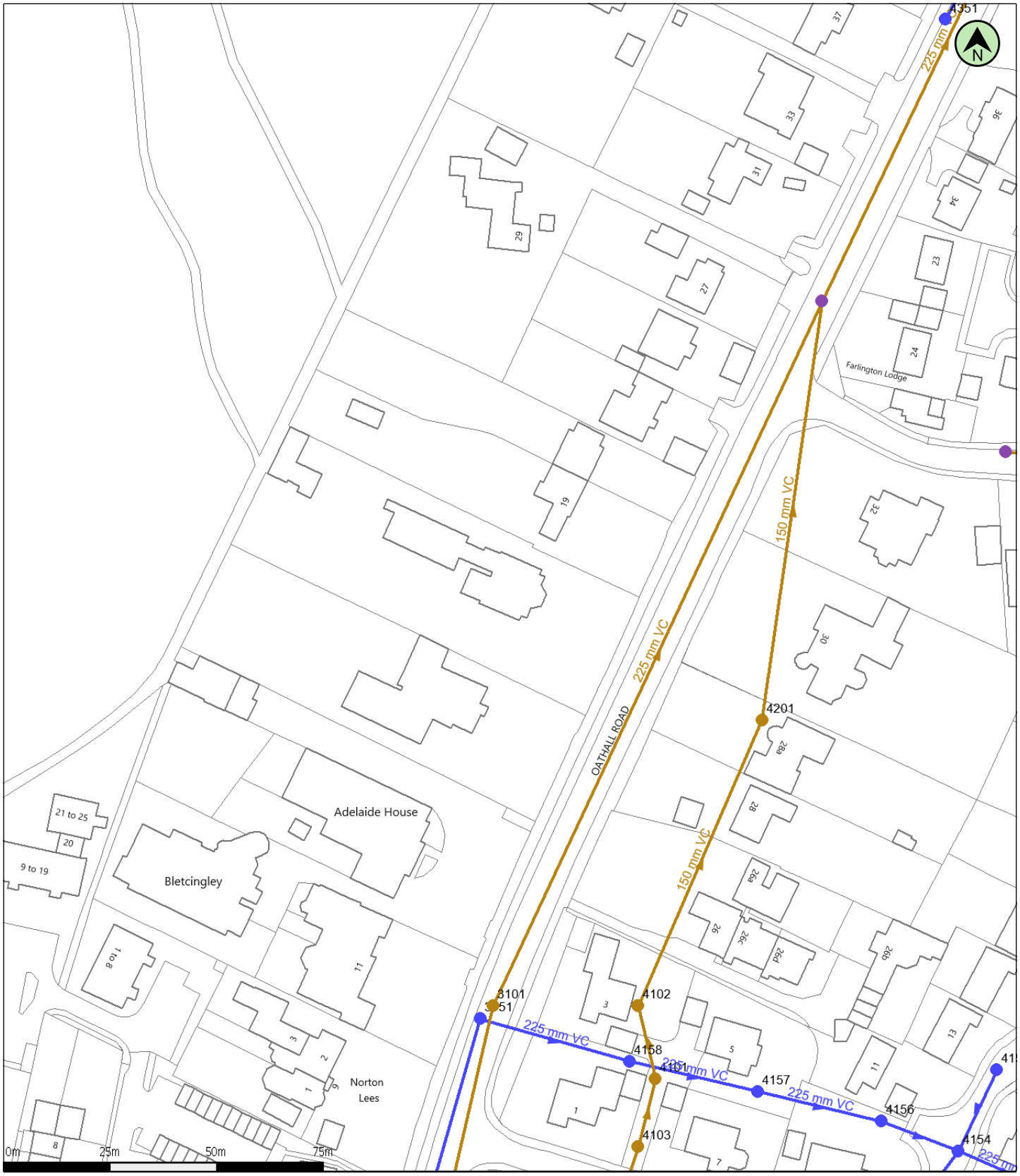
-2.5m 0 2.5m 5.0m 7.5m 10m

TITLE
Existing Site Layout And Drained Areas Plan

SCALE	PROJECT. No.
1:250 @ A3	23990
REPORT TYPE	DRG. No.
DS	02 -

Appendix 3

Sewer Records



(c) Crown copyright and database rights 2024 Ordnance Survey AC0000808122	Scale: 1:1250	Date: 13/11/24	Wastewater Plan A4
Data updated: 28/10/24	Map Centre: 533384,124254	Our Ref: 1618907 - 1	Powered by digdat

mat@civil.co.uk

23990 Lingworth

17 Oathall Road, Haywards Heath

WATER for LIFE from Southern Water.

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 2024 Ordnance Survey AC0000808122 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3101	F	70.74	69.60	
4101	F	67.28	64.76	
4102	F	67.67	64.46	
4103	F	67.94	65.20	
4201	F	0.00	63.03	
3151	S	70.78	69.35	
4154	S	60.06	57.74	
4155	S	59.47	57.96	
4156	S	61.45	60.19	
4157	S	64.61	63.16	
4158	S	67.82	66.36	
4351	S	0.00	59.57	

Appendix 4

BGS Borehole Records and Extracts from Site Investigation for a Similar Site

Southern Testing | ST Consult

Tel: 01342 333100

Project No.	Hole Type	Borehole No
J11709	**WS**	**WS1** Sheet 1 of 1

Project Name: Haywards Heath

Dates: 13/02/2014

Location: 20 Balcombe Road, RH16 1PF

NGR: -

Client: Nigel Cairns

Level: -

Logged By: TRL

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.20		0.20	TOPSOIL: Firm light brown silty CLAY with frequent fine rootlets.
		0.30 0.30	D	UCS = 110		0.50		0.70	Firm medium strength light grey brown slightly mottled orange brown silty slightly sandy CLAY with rare to occasional fine to coarse sub-angular to sub-rounded weak fine grained iron stained sandstone fragments. 0.40m - 0.70m: Sandstone fragments becoming occasional to frequent.
		0.60 0.60	D	UCS = 100					
		0.90 0.90	D	UCS = 120		0.40		1.10	Firm medium strength buff brown mottled orange brown silty sandy CLAY with occasional sub-angular to sub-rounded gravel and occasional cobbles comprising fine grained weak iron stained sandstone fragments.
		1.40	D			0.60		1.70	Medium dense yellow orange to buff brown clayey silty fine SAND with frequent fine to coarse weak fine grained sandstone fragments.
		1.80 1.80	D	UCS = 600		0.30		2.00	Very stiff to hard very high to extremely high strength blue grey mottled light yellow brown slightly silty CLAY.
		2.00 2.00	D	UCS = 600					End of Borehole at 2.00 m

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

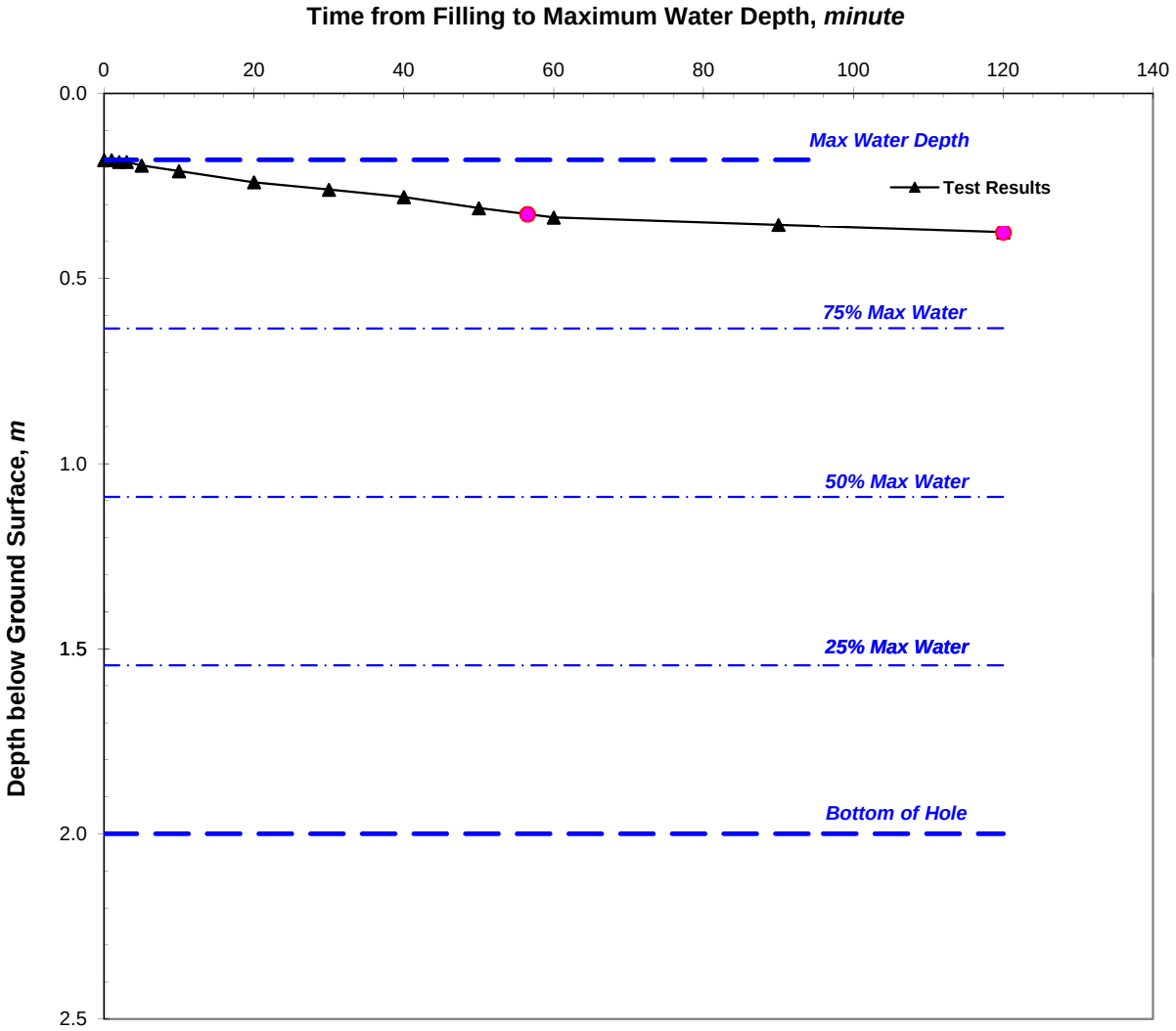
General Remarks:

Sampler refused at 2.0 m

PT = Equivilant Standard Penetration Test UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

BRE Digest 365 Soakage Test

Test Hole No: WS1
Test No: Test No 1 (Initial)



Diameter of Borehole, m	0.100	Depth to Water at Start of Test, ***m***	0.180
Depth to End of Borehole Casing, m	0.000	Max Water Dropdown during Test, ***m***	0.195
Depth to Borehole Base, m	2.000	Total Soakage Test Time, ***min***	120.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.526
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.006
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m²/min***	**0.011**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**1.91E-07**

Comments:

Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Mr Nigel Cairns	**Job No:**	J11709	**Test Date:**	13/Feb/2014		
Site:	20 Balcombe Road, Haywards Heath	**Tested By:**	TL/TRL	**Engineer:**	TRL	**Fig. 2**	


GeoIndex Onshore
Enter location
Data
Borehole records
Add Data
Show Legend
Haywards Heath
The Heath
Commercial Square
Muster Green
Victoria Park
Beech Hurst Recreation Ground
Scrase Stream
Lindfield Common
Franklands Village
Reading Wood
Bolnore Wood
Catt's Wood
Ashenground Park
Butler's Green
B2272
B2028
B2112
TQ32NW13
TQ32NW12
TQ32SW28
TQ32SW60
TQ32SW59
TQ32SW63
TQ32SW65
TQ32SW62
TQ32SW66
TQ32SW64
TQ32SW61
TQ32SW43
TQ32SW44
TQ32SW42
TQ32SW38
TQ32SW40
TQ32SW37
TQ32SW46
TQ32SW21
TQ32SW78
TQ32SW76
TQ32SW77
TQ32SW7
TQ32SW5
TQ32SW6
TQ32SW35
TQ32SW70
TQ32SW69
TQ32SW68
TQ32SW75
TQ32SW67
TQ32SW49
TQ32SW51
TQ32SW48
TQ32SW47
TQ32SW50
TQ32SW32
TQ32SW34
TQ32SW58
TQ32SW57
TQ32SW33
TQ32SW29
TQ32SW31
TQ32SW55
TQ32SW71
Location: 535467, 125146
Contains OS data © Crown Copyright and c

TQ32/42

W/S

302

TQ32 SW/46

71

Haywards Heath

for Mr Bannister 1893.

Communicated by Mr E. Lanton.

OD + 153. Kept throughout.

R.W.L. 11ft down.

Mr J. Clarke says that the water is very ferruginous and unfit.

	Thickness	Depth
Soil	1	1
Sandy loam and clay with a little roakage	11	12
Running sandy marl and clay	6	18
Sand, mixed with blue marl	3	21
White sand. Strong spring	1½	22½
Hard blue marl	17½	40
White sand and marl	1	41
Hard blue sandy marl	9	50
Blue marl, sandy on hard on stone	18	68
Sand	1	69
Hard blue marl, with occasional small sandy veins	26	95
White sand. Strong spring	5	100.

Published in W.S.Sx. I. p. 44.

Could not be traced. 19.7.47 [illegible].

Can't find site on 1" Looks like all UTW.

TQ 32 SW/38
NGR 3271 2461

RECORD OF BOREHOLE No: 5

Location : CUCKFIELD SPORTS CENTRE
Contract No. : 540
Type of Boring : Shell & Auger
Date (started) : 5·11·69

Borehole Dia : 6"
Casing : 6" to 25'-0"
Ground Level : [illegible]

Depth of Casing	Water Level	SAMPLES Depth	Type	No.	STRATA Legend	Depth	Thickness	DESCRIPTION OF STRATA
						0'-0"		
							2'-0"	Sandy TOPSOIL
		2'-6"—3'-3"	U	1		2'-0"		
							3'-6"	Hard brown-grey mottled silty sandy CLAY.
		5'-0"—5'-3"	U	2		5'-6"		
							4'-6"	Very dense brown grey silty SAND with bands of siltstone.
		9'-6"—10'-10"	U	3		10'-0"		
		14'-6"—15'6"	U	4			10'-6"	Very hard silty CLAY
		20'-0"—21'-0"	U	5		20'-6"		
12.30 13**	21'-0" 21'-0"	16'-0" 15'-0"					4'-6"	Hard grey SILTSTONE.
11 11 69 12.30	Nil	7'-3"						
		25'-0" (N = 75/3¼")	D W	6		25'-0" (Thin)		Borehole completed

REMARKS:
Water seepage encountered at 14'-6" and 21'-0"

WR38: Borehole record form

Borehole record

Nicholls Boreholes

British Geological Survey

Environment Agency

Water Resources Act 1991 (as amended by the Water Act 2003)

A Site details

Borehole drilled for Traditional Homes.

Location The Horsbury Bostonit Club, Haywards Heath, RH16 3PT.

WGR (ten digits) TQ34299 23988 Please attach site plan

Ground level (if known) ____ metres Above Ordnance Datum

Drilling company Nicholls Boreholes.

Date drilling commenced ____ (DD/MM/YYYY) Completed ____ (DD/MM/YYYY)

B Construction details

Borehole datum (if not ground level) ____ metres (m). Please tick if this is above ☐ or below ☐ ground level.
(point from which all measurements of depth are taken, for example, flange, edge of chamber)

Borehole drilled diameter
- 200 mm from 0 to 18 m/depth
- ____ mm from ____ to ____ m/depth
- ____ mm from ____ to ____ m/depth
- ____ mm from ____ to ____ m/depth

Casing material Solid uPVC 113mm diameter 113 mm from 0 to 5 m/depth
and type (for example, if plain steel, plastic slotted). Please record permanent casing details, not temporary casing.

Casing material Slotted uPVC diameter 113 mm from 5 to 17 m/depth
Casing material 4mm Screen on end cap diameter ____ mm from ____ to ____ m/depth
Casing material ____ diameter ____ mm from ____ to ____ m/depth
Grouting details ____

Water struck at 1. 2 m (depth below datum - mbd) 2. ____ m (mbd)
3. ____ m (mbd) 4. ____ m (mbd)

C Test pumping summary (Please supply full details on form WR39)

Test pumping datum (if different from borehole datum) ____ m. Please tick if this is above ☐ or below ☐ ground level.

Pump suction depth ____ mbd

Water level (start of test) 2 mbd

Water level (end of test) ____ mbd

Type of test (for example, bailer, step, constant rate) ____

Pumping rate ____ m³/hour ☐ or litres/second ☐. Please tick as appropriate.

Recovery to ____ mbd in ____ for ____ days, ____ hours, ____ mins
(from end of pumping) ____ days, ____ hours, ____ mins

Date(s) of measurements Pump started ____ (DD/MM/YYYY)
Pump stopped ____ (DD/MM/YYYY)

Please supply chemical analysis if available. If you have included this please tick this box ☐

Contract: SCRASE BRIDGE II
Client: Southern Water Services

Borehole No. 6
Sheet No. 1 Of 1.
Depth 0 to 10 metres.

Equipment and Methods
Lightweight Augering
75mm Diameter

Orientation Vertical

Ground Level : m.O.D.

Coordinates :

Job Number : S91/093

Location : 3402 2483

Dates : 8/5/91

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					0.00			
				J 1754	(0.40)		MADE GROUND. (Brown and grey silty CLAY with some gravel and bricks.)	
				J 1755	0.40			
				U 1756			Firm brown silty CLAY with occasional fine gravel	
				J 1757				
					(1.70)			
				J 1758				
				U 1759				
				J 1760	2.10			
	8/5	Water rose to 2.30m		W 1768			Soft to firm brownish grey silty CLAY	
	8/5	after 20 min.		W 1769	(0.80)			
				J 1761				
				U 1762				
				J 1763	2.90			
				J 1764	(0.90)		Soft to firm greyish brown silty CLAY with traces of gravel	
				U 1765	3.80			
				J 1766			Firm brown sandy silty CLAY with fine to medium gravel	
					(1.20)			
8/5				J 1767	5.00			
							End of Borehole	

Operator MS

Scale 10m/sheet

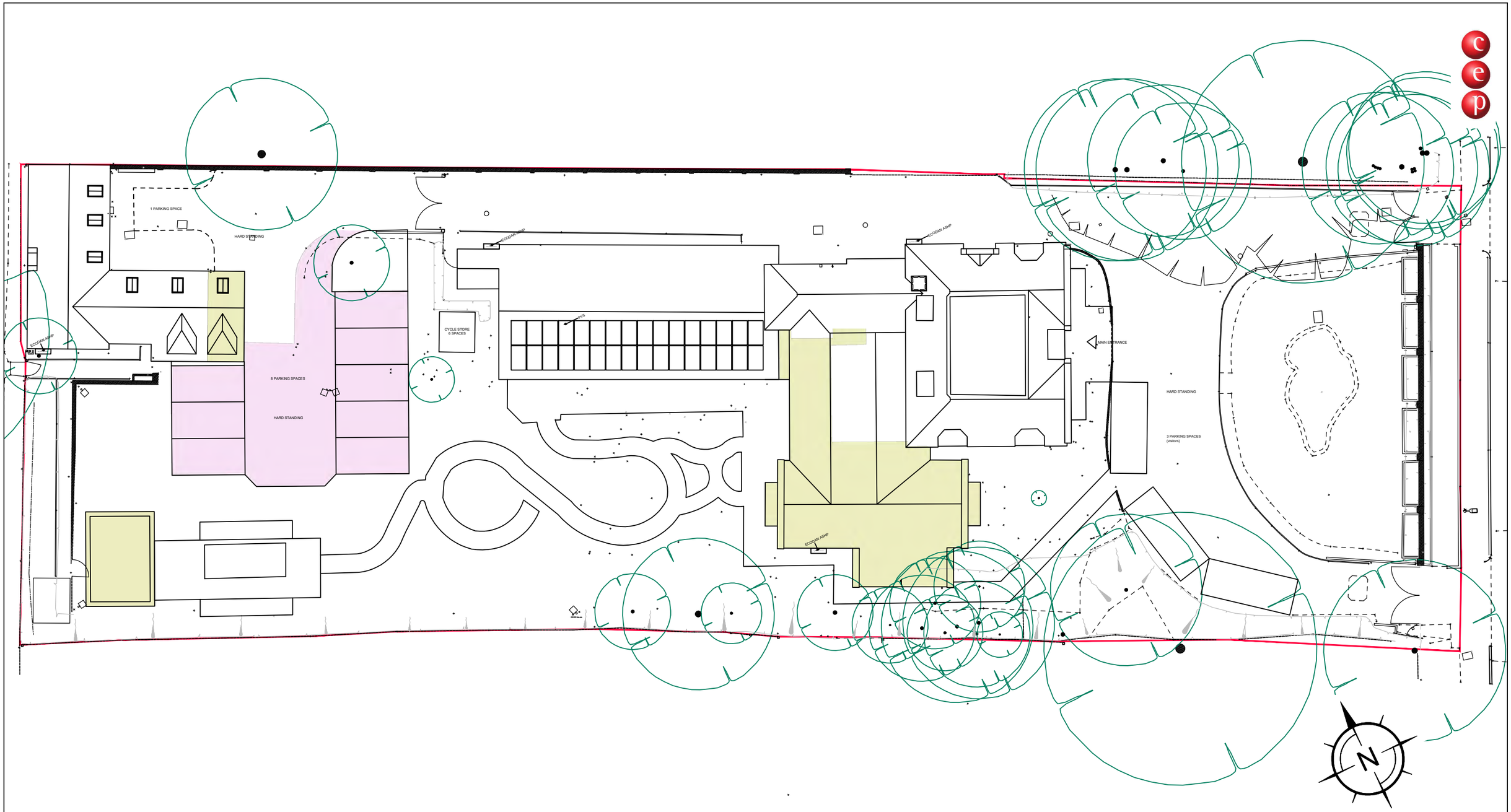
General Remarks:

Appendix 1

Sheet No. 11

Appendix 5

Proposed Site Layout and Additional Drained Areas Plan



-2.5m 0 2.5m 5.0m 7.5m 10m

PROPOSED AREAS KEY:

	Total site area	2,898m²
	Roofs	171m²
	Driveway and parking areas	166m²
	Total area	337m²

TITLE
Proposed Site Layout And Drained Areas Plan

SCALE	PROJECT. No.
1:250 @ A3	23990
REPORT TYPE	DRG. No.
DS	03 -

Appendix 6

Preliminary Drainage Strategy Plan with Calculations

Approxinate line of private sewer

Proposed foul connections to existing

Proposed foul connections to existing

Existing public foul sewer

1 PARKING SPACE

HARD STANDING

ECODAN ASHP

8 PARKING SPACES

HARD STANDING

CYCLE STORE 6 SPACES

ECODAN ASHP

ECODAN ASHP

MAIN ENTRANCE

HARD STANDING

3 PARKING SPACES (visitors)

ECODAN ASHP

N

-2.5m 0 2.5m 5.0m 7.5m 10m

DRAINAGE KEY:

- Existing public foul sewer
- Existing private sewer
- Proposed surface water sewer
- 3No. Crate soakaways. Total 58m² x 0.5m deep, minimum 5m from buildings
- Proposed parking area. Permeable construction with 300mm depth of 95% voided Permavoid storage crates. Total area = 160m²
- Permeable paving footpaths draining to ground

TITLE
Preliminary Drainage Strategy Plan

SCALE	PROJECT. No.
1:250 @ A3	23990
REPORT TYPE	DRG. No.
DS	04 -

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	0.850	Preferred Cover Depth (m)	0.400
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)	150.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.005	5.00	69.300	450	533344.720	124262.890	0.550
2	0.006	5.00	69.300	450	533355.655	124262.441	0.550
3	0.006	5.00	69.300	450	533357.569	124269.463	0.550
4	0.017	5.00	68.900	450	533342.223	124271.112	0.200
5			68.900	450	533349.615	124278.225	0.766
5_OUT			67.500	450	533438.900	124280.952	0.252

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)
2.000	1	5	16.097	0.600	68.750	68.134	0.616	26.1	150	5.14	53.4
1.000	2	5	16.900	0.600	68.750	68.134	0.616	27.4	150	5.15	53.4
3.000	3	5	11.834	0.600	68.750	68.134	0.616	19.2	150	5.09	53.6
4.000	4	5	10.258	0.600	68.700	68.134	0.566	18.1	150	5.07	53.7
1.001	5	5_OUT	89.327	0.600	68.134	67.248	0.886	100.8	150	6.63	47.6

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)
2.000	1.977	34.9	0.8	0.400	0.616	0.005	0.0	16	0.827
1.000	1.929	34.1	1.0	0.400	0.616	0.006	0.0	17	0.845
3.000	2.308	40.8	1.0	0.400	0.616	0.006	0.0	16	0.967
4.000	2.377	42.0	2.8	0.050	0.616	0.017	0.0	26	1.350
1.001	1.000	17.7	5.0	0.616	0.102	0.034	0.0	54	0.859

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.000	16.097	26.1	150	Circular	69.300	68.750	0.400	68.900	68.134	0.616
1.000	16.900	27.4	150	Circular	69.300	68.750	0.400	68.900	68.134	0.616
3.000	11.834	19.2	150	Circular	69.300	68.750	0.400	68.900	68.134	0.616
4.000	10.258	18.1	150	Circular	68.900	68.700	0.050	68.900	68.134	0.616

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	1	450	Manhole	Private	5	450	Manhole	Private
1.000	2	450	Manhole	Private	5	450	Manhole	Private
3.000	3	450	Manhole	Private	5	450	Manhole	Private
4.000	4	450	Manhole	Private	5	450	Manhole	Private

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	89.327	100.8	150	Circular	68.900	68.134	0.616	67.500	67.248	0.102

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	5	450	Manhole	Private	5_OUT	450	Manhole	Private

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	0.850	Drain Down Time (mins)	10000	Check Discharge Volume	x
Winter CV	0.900	Additional Storage (m³/ha)	0.0		

Storm Durations

15	2160	2880	4320	5760	7200	8640	10080

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

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00072	Safety Factor	2.0	Invert Level (m)	68.480
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	160.0	160.0	0.300	160.0	160.0	0.301	0.0	160.0

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00072	Safety Factor	2.0	Invert Level (m)	68.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	16.0	16.0	0.500	16.0	16.0	0.501	0.0	16.0

Node 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00072	Safety Factor	2.0	Invert Level (m)	68.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	22.0	22.0	0.500	22.0	22.0	0.501	0.0	22.0

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00072	Safety Factor	2.0	Invert Level (m)	68.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	20.0	20.0	0.500	20.0	20.0	0.501	0.0	20.0

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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute winter	1	2820	68.714	-0.036	0.1	7.0598	0.0000	OK
5760 minute winter	2	3720	68.733	-0.017	0.1	9.1785	0.0000	OK
5760 minute winter	3	3720	68.689	-0.061	0.1	9.1795	0.0000	OK
4320 minute winter	4	4020	68.679	-0.021	0.3	30.2681	0.0000	OK
15 minute summer	5	1	68.134	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5_OUT	1	67.248	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
4320 minute winter	1	2.000	5	0.0	0.000	0.000	0.0000	
4320 minute winter	1	Infiltration		0.0				
5760 minute winter	2	1.000	5	0.0	0.000	0.000	0.0000	
5760 minute winter	2	Infiltration		0.0				
5760 minute winter	3	3.000	5	0.0	0.000	0.000	0.0000	
5760 minute winter	3	Infiltration		0.0				
4320 minute winter	4	4.000	5	0.0	0.000	0.000	0.0000	
4320 minute winter	4	Infiltration		0.0				
15 minute summer	5	1.001	5_OUT	0.0	0.000	0.000	0.0000	0.0

Appendix 7

Outline Drainage Management and Maintenance Plan

Drainage Maintenance Schedule

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

Project	**Lingworth, 17 Oathall Road, Haywards Heath**
Project Number	**23990**
By	Sonya Macandrew
Date	28 November 2024

1 Schedule of Maintenance

1.1 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.

1.2 The Contractor will maintain the proposed drainage system during construction and until the handing over of the site.

1.3 Upon completion the Principal Contractor will collate the data sheets, operation and maintenance details of all materials used in the construction of the site drainage system.

1.4 These details will issued to the Management Company for their records.

1.5 Upon completion management of shared drainage facilities will be passed on to a Management Company appointed by the Developer on behalf of the Residents.

1.6 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 Residents.

1.7 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	Monthly or as required
	Cleaning of gutters and any filters on downpipes	3 Monthly
	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 / vacuuming of permeable paving	Every 2 years

Maintenance Schedule	Required Action	Frequency
	Surface and foul water pipework – jetting / rodding	Every 2 years or as required
Corrective Maintenance	Remove debris / blockages to silt traps / channel drains	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 and gullies for blockages, standing water and clear	As required
	Reconstruct storage structures if performance deteriorates or failure occurs	As required
	Where there is a build-up of silt at inlets of 50mm or more above the design level remove silt and spread on site. Undertake when ground is damp in autumn or early spring and transplant turf / overseed to original design levels	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	3 Months	1 Year	After leaf fall in Autumn	2 Years
Gullies, Channels and Gutters		✓		✓	
Catchpits	✓			✓	
Surface and Foul Water Pipework					✓
Permeable Paving			✓		
Storage Facilities			✓		

Inspection Frequency Summary

2 Design Life

2.1 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.

2.2 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 replace the faulty component.

3 Emergency Plan

3.1 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

3.2 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
    - For adopted onsite drainage the relevant statutory undertaker should be alerted
    - 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