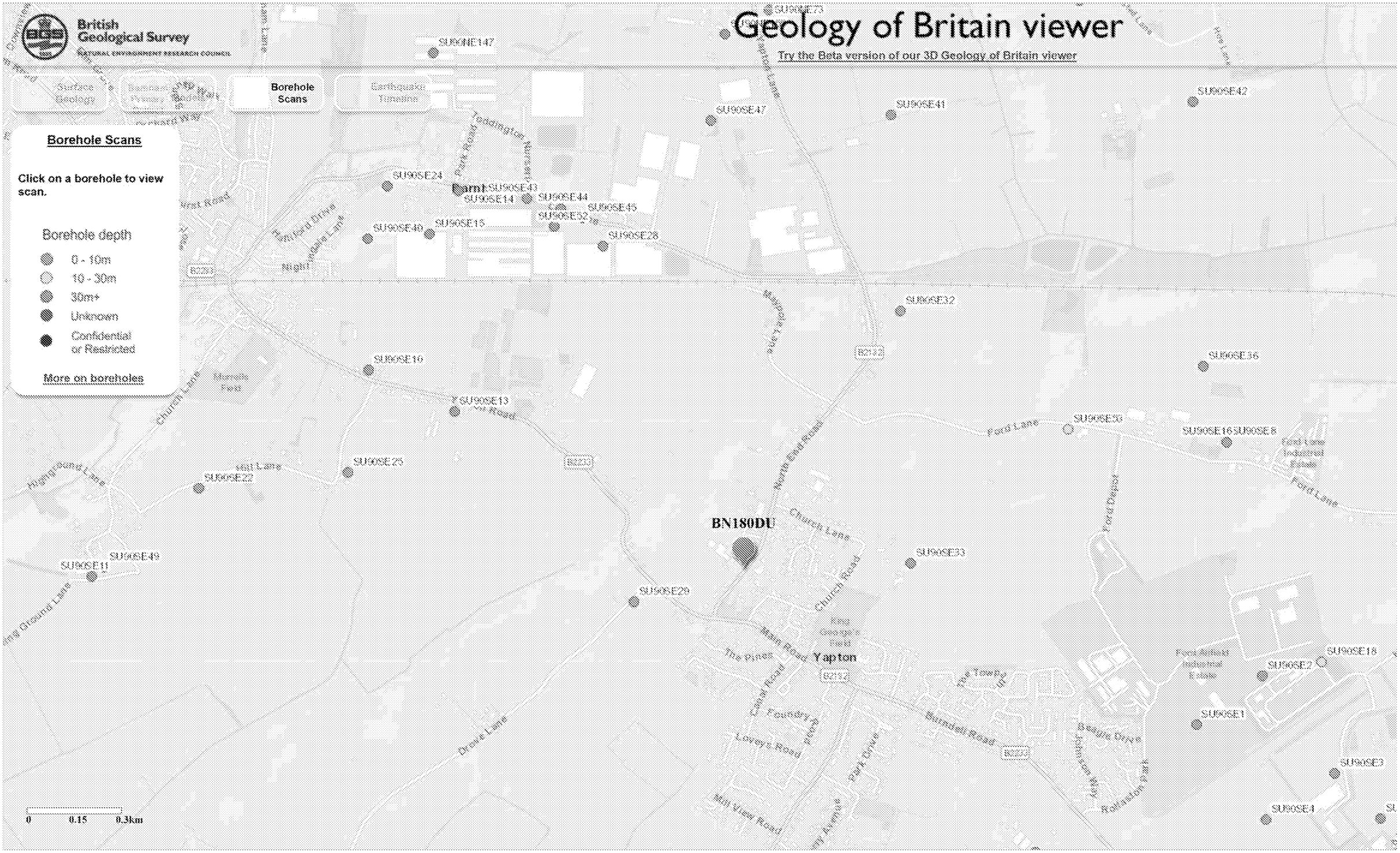
Appendix 6

Borehole Records, Site Investigation Information and Site Investigation Correspondence



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 434407 : BGS Reference: SU90SE29
British National Grid (27700) : 497380,103350
Report an issue with this borehole

SU 90 SE 39 9738 0335 **North-east end of Drove Lane, Yapton** **Block H**

Surface level +6.6 m
Water struck at +1.9 m
October 1981

Overburden 2.9 m
Mineral 1.0 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, brown, silty	1.4	1.9
Raised Beach Deposits (younger)	Silt, chalky, with chalk pebbles	1.0	2.9
	'Very clayey' sandy gravel Gravel: coarse with flint dominant, and fine with chalk dominant; some cobbles Sand: fine with some medium and coarse; coarse mostly chalk Fines: silt and clay, chalky	1.0	3.9
Upper Chalk	Chalk, rubbly, soft, silty and sandy to 6.0 m	2.3+	6.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines	Sand			Gravel			
				-¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm		
35	38	27	2.9-3.9	35	28	4	6	18	14	3	

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British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 434410 : BGS Reference: SU90SE32
British National Grid (27700) : 498220,104300
Report an issue with this borehole

SU 90 SE 32 **9822 9430** **North End, Yapton** **Block H**

Surface level +6.0 m
Water not stuck
August 1981

Waste 3.3 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, brown, silty, with a few subangular flint pebbles. Very sandy near base	2.7	3.0
Raised Beach Deposits (younger)	Sand, mid to dark brown: fine to coarse; quartz with flint; silty and with angular to well rounded flint pebbles	0.3	3.3
Upper Chalk	Chalk, soft, rubbly	1.2+	4.5

ARUN DISTRICT COUNCIL Y/15/25/PL

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 434411 : BGS Reference: SU90SE33
British National Grid (27700) : 498270,103490
Report an issue with this borehole

SU 90 SE 33 **9827 0349** **Yapton Church** **Block H**

Surface level +6.4 m
Water not struck
September 1981

Waste 1.4 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.3	0.3
Brickearth	Clay, very sandy, mottled brown and grey-brown; some small flint pebbles	1.1	1.4
Upper Chalk	Chalk, soft, weathered, pale yellowish brown; nodular flints	1.6+	3.0

Stakers Farm
North End Road
Yapton
West Sussex

In Situ Infiltration Test Report

Report Beneficiary:
Granite Gate Ltd
Stakers Farm
North End Road
Yapton
West Sussex
BN18 0DU

Project Reference: P14458

Report Reference: R14124

Document Control				
Issue No.	**Status**	**Issue Date**	**Notes**	
1	Final	17th March 2020		
Report Section			**Prepared By**	**Approved By**
In Situ Infiltration Testing			Rebecca Webb BSc FGS	Steven McSwiney BA mod Geol MSc FGS

Head Office
Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG

Northern Office
Suite C2
Dunham House
85-89 Cross Street
Sale
Cheshire
M33 7HH

[redacted]

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FIGURES

1. INTRODUCTION

Ashdown Site Investigation Ltd was requested to undertake in situ infiltration testing at Stakers Farm Barn, North End Road, Yapton, West Sussex to assist others with the drainage strategy.

The specific objectives of the works were to:
a) Establish the expected geology and hydrogeology at the site;
b) Investigate the shallow ground and groundwater conditions at locations specified by others; and
c) Provide calculated soil infiltration rates to assist others in undertaking design of soakaways.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q9351, dated 28th January 2020. The instruction to proceed was received from the client, Granite Gate Ltd.

Subsequent to the instruction, a further request was made to extend the groundwater monitoring period to the end of March 2020 and as such the groundwater monitoring results will be issued under separate cover.

2. SITE CONTEXT

2.1 Site Details

The site comprises a plot of land located at Staker Farm Barn, North End Road, Yapton, West Sussex, and is centred on the approximate Ordnance Survey national grid reference SU 9771 0350. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

2.2 Geological and Hydrogeological Information

2.2.1 Expected Geology and Aquifer Designation

The stratigraphic succession that may be expected to underlie the site is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Superficial	River Terrace Deposits	Secondary A Aquifer
Bedrock	White chalk Subgroup	Principal Aquifer

The River Terrace Deposits in this area were formerly denoted as the Brickearth and comprise brown sandy (fine) silt or clay largely originating from the solution weathering of the previously existing chalk. The material will have been reworked by water flow to produce some lateral variability in the grain size of the soil (sand and gravel) and can be expected to contain a variable content of flint.

The White Chalk Subgroup comprises a weak, white chalk locally with flint bands together with scattered nodular flints. It may be expected to have a deeply convoluted upper surface as a result of solution weathering. The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary deposits such as the River Terrace Deposits. The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures.

2.2.2 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply.

3. GROUND INVESTIGATION

The ground investigation comprised the excavation of a series of hand dug trial pits (designated TP01 to TP05) to depths of between 0.55m and 0.60m below ground level. In addition, two dynamic sampler boreholes (denoted WS01 and WS02) were drilled to a depth of 4.00m to enable installation of groundwater monitoring standpipes. The fieldwork was carried out on 13th and 14th February 2020. The exploratory hole locations are shown on Figure 2.

Falling head soakage tests were undertaken in each of the trial pits in general accordance with BRE guidance[1], other than the number of fills per pit were limited to the time allowed on site of two days.

Whilst not part of the scope of works, non standard soakage testing was carried out within borehole WS01 at a depth of 4.00m. In addition, falling head soakage testing was also undertaken in borehole WS02 at a depth of 2.00m in general accordance with the Kent County Council guidance[2].

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in the appendices, together with notes to assist in their interpretation and the in situ test results.

The results of the groundwater monitoring will be issued under separate cover.

[1] Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.
[2] The Soakaway Design Guide published by Kent County Council, 2000.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

Each of the exploratory holes was excavated through a surface cover of asphalt or topsoil some 50mm to 150mm in thickness.

4.1.2 Made Ground

Made ground, generally comprising gravelly sandy clay and/or clayey gravel, was recorded to depths of between 0.25m and 0.60m below ground level. The gravel fraction comprised variable quantities of chalk, flint, brick, tile, concrete, breeze block, crystalline rock and clinker-like material.

No made ground soils were recorded with trial pit TP04.

4.1.3 River Terrace Deposits

Underlying the surfacing/made ground, the investigation progressed into undisturbed slightly gravelly slightly sandy clay deposits. These soils were recorded to the full depth of the trial pits and borehole WS01, and to a depth of 2.30m within borehole WS02.

These soils are considered to represent the River Terrace Deposits indicated on the published geological map.

4.1.4 White Chalk Subgroup

Beneath the River Terrace Deposits, where penetrated, the dynamic sampler borehole WS02 encountered structureless chalk to the full depth of the borehole of 4.00m. These deposits are considered to be representative of the White chalk Subgroup indicated on the published geology map.

4.2 Stability

Each of the exploratory holes was recorded to remain stable during the course of drilling / excavation.

4.3 Groundwater Conditions

The trial pits remind dry during excavation. Groundwater was recorded within the boreholes WS01 and WS02 at depths of 1.67m and 1.73m below ground level, respectively, on completion of drilling, although some instability was recorded during the soakage tests.

It should be noted that water levels within the boreholes may not have equilibrated with the groundwater table at the time the readings were recorded and that groundwater levels should be expected to fluctuate seasonally.

Further groundwater data is to be provided under separate cover on completion of the monitoring programme.

5. STORMWATER INFILTRATION SYSTEMS

In-situ infiltration testing[3] was carried out in each of the trial pits. For the first test carried out in trial pit TP03, TP04 and TP05, the tests were continued overnight and were recorded to be dry in the morning. Therefore these tests the soil infiltration rate (f) was calculated by dividing the volume of water lost between 75% and 25% of the initial test depth by the sum of the average surface area of the sides of the trial pit in contact with the water during the test monitoring period, and its base area. This figure was then divided by the test duration (time taken for the water level to fall between 75% and 25% of the initial test depth based on the overnight reading) to give the soil infiltration rate in metres per second.

For the remaining tests, the water level within the test pits did not fall below 25% of the initial test depth and calculation of the soil infiltration rates in accordance with the BRE digest was not possible. For these tests, the soil infiltration rate has been calculated by dividing the volume of water lost during the test by the product of the average surface area of the trial pit in contact with water during the test period and the test duration in seconds.

In-situ infiltration testing[4] was also undertaken in borehole WS02. From the test results, calculations were made to estimate the infiltration rate that could be expected for soakaways constructed to discharge into the underlying soils within the test zone.

Non-standard falling head infiltration testing was carried out in the uncased dynamic sampler borehole WS01. The soil infiltration rate has been calculated by dividing the volume of water lost during the test by the product of the average surface area of the sides in contact with water during the test period and the test duration in seconds.

The infiltration rates derived from the tests are summarised in the following table.

Table 2. Calculated Infiltration Rates

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Driving Head of Water (m)
	Top	Bottom			
TP01 Test 1	0.30	0.55	Made Ground	1.3×10^{-5}	-
TP01 Test 2	0.24	0.55	Made Ground	2.1×10^{-5}	-
TP01 Test 3	0.23	0.55	Made Ground	3.2×10^{-5}	-
TP02 Test 1	0.33	0.60	River Terrace Deposits	6.2×10^{-7}	-
TP02 Test 2	0.30	0.60	River Terrace Deposits	5.0×10^{-7}	-
TP03 Test 1	0.33	0.55	River Terrace Deposits	1.6×10^{-6}	-
TP03 Test 2	0.30	0.55	River Terrace Deposits	Negligible – no fall in water level recorded in 210 minutes	
TP04 Test 1	0.30	0.55	River Terrace Deposits	1.4×10^{-6}	-
TP04 Test 2	0.24	0.55	River Terrace Deposits	1.5×10^{-6}	-

[3] Conducted in general accordance with the requirements of BRE 365, Soakaway Design.
[4] Conducted in accordance with The Soakaway Design Guide, published by Kent County Council, July 2000.

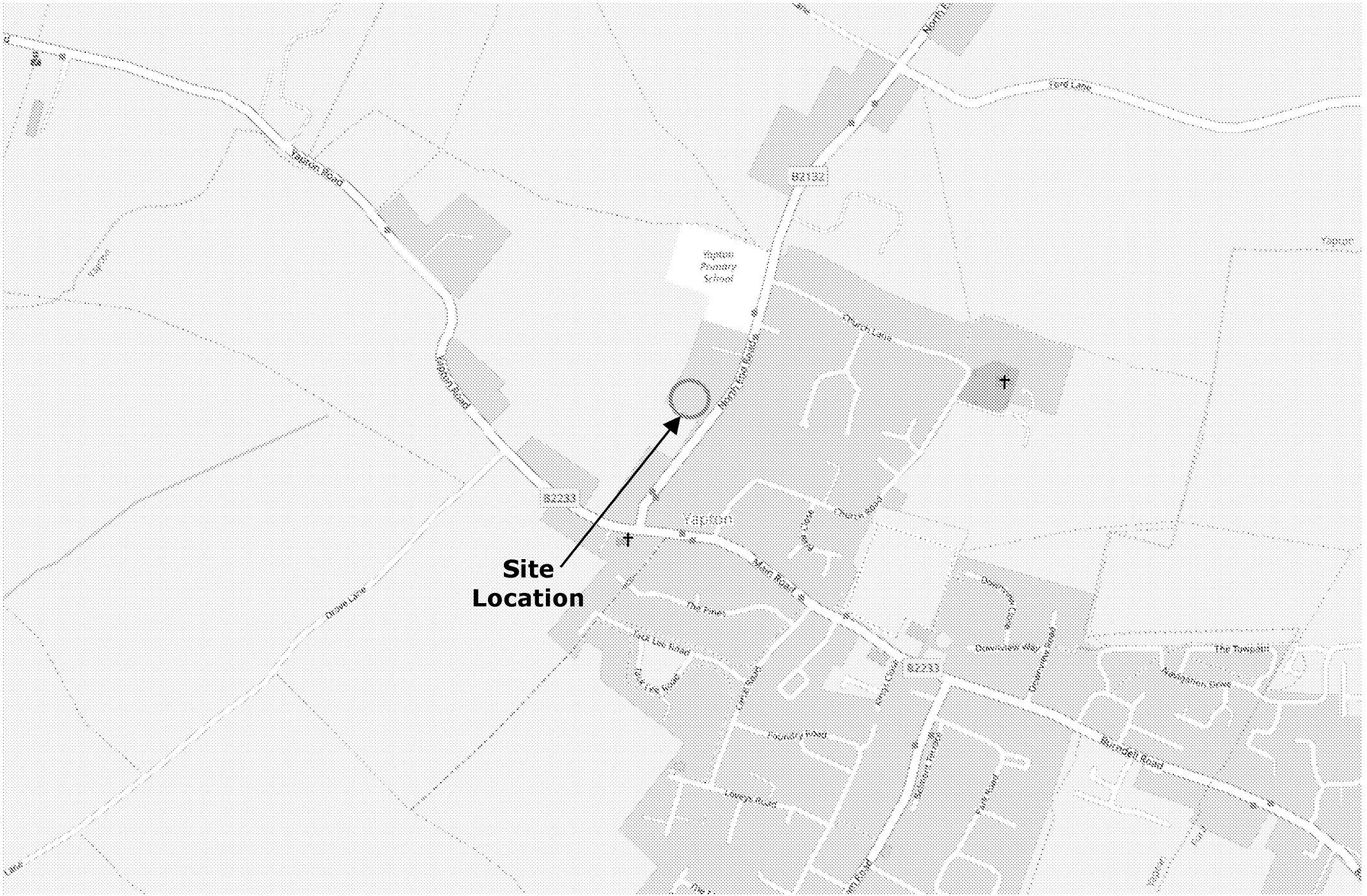
TP05 Test 1	0.35	0.55	River Terrace Deposits	1.7×10^{-6}	-
TP05 Test 2	0.29	0.55	River Terrace Deposits	6.5×10^{-7}	-
WS01	0.30	4.00	River Terrace Deposits	7.7×10^{-7}	-
WS02 Test 1	1.00	2.00	River Terrace Deposits	1.5×10^{-5}	1.0
WS02 Test 2	1.00	2.00	River Terrace Deposits	4.6×10^{-6}	1.0

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The results from the infiltration tests indicate that the made ground and River Terrace Deposits soils possess negligible to poor infiltration characteristics. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

Ashdown Site Investigation Ltd.

FIGURES



ASHDOWN SITE INVESTIGATION LIMITED	Site Location Plan	Site Name	Figure No.	Project Reference
		Stakers Farm Barn, North End Road, Yapton, West Sussex	1	P14458

ASHDOWN SITE INVESTIGATION LIMITED	Site Plan	Site Name	Figure No.	Project Reference
		Stakers Farm Barn, North End Road, Yapton, West Sussex	2	P14458

NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

1 Symbols and abbreviations

Samples

U	'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
U_o	Sample not obtained
U*	Full penetration of sample not obtained
Pi	Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D	Disturbed Sample
R	Root Sample
B	Bulk Disturbed Sample
W	Water Sample
J	Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T	Tub Sample
Vi	Vial Sample

In situ Testing

S Standard penetration test (SPT): Using the split spoon sampler.

C Standard Penetration Test (SPT): using a solid cone instead of the sampler - conducted usually in coarse grained soils or weak rocks.

V Shear Vane Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

H Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

P Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP	Cable Percussion Borehole
WLS	Dynamic Sampler Borehole using windowless sampler tubes
WS	Dynamic Sampler Borehole using window sampler tubes
TP	Trial Pit excavated using mechanic excavator
HDP	Trial Pit excavated using hand tools

2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

4 Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

ASHDOWN SITE INVESTIGATION LIMITED

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

[redacted]

Start Date: 14/02/2020

End Date: 14/02/2020

Borehole Number: **WS01**

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
							0.00	Asphalt.
							0.10	MADE GROUND: Brown grey sandy clayey angular to subrounded fine to coarse gravel of flint. Sand is fine to coarse.
	D	0.30					0.20	MADE GROUND: Off white compacted chalk.
	D	0.80					0.60	Brown and orange brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. (River Terrace Deposits)
	D	1.50						
	D	2.50					3.70	Green brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (River Terrace Deposits)
							4.00	End of borehole at 4.00m

Remarks

Groundwater: Groundwater at 1.67m depth on completion.

Stability: Borehole cased to 1.00m depth.
Borehole stable on completion.

Notes: Standpipe installed to 4.00m depth; 4.00m to 2.00m slotted pipe with gravel surround; 2.00m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: RJ

ASHDOWN SITE INVESTIGATION L·I·M·I·T·E·D

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

Start Date: 14/02/2020
End Date: 14/02/2020

Borehole Number: **WS02** Sheet 1 of 1

Standpipe	Samples and In Situ Testing: Sample/ Test Type	Samples and In Situ Testing: Depth From (m)	Samples and In Situ Testing: Depth To (m)	Samples and In Situ Testing: Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
							0.00	Topsoil.
							0.10	MADE GROUND: Brown and dark brown gravelly sandy clay. Gravel is angular to subrounded fine to coarse flint and rare brick. Sand is fine to coarse.
							0.25	Orange brown and brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded flint. (River Terrace Deposits)
	D	0.50						
	D	1.20						
	D	1.80					1.70	Orange brown and off white very gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse chalk and occasional flint. (River Terrace Deposits)
	D	2.50					2.30	Structureless off white CHALK recovered as gravelly silt. Clasts are very weak low to medium density off white. Matrix is off white. (White Chalk Subgroup)
	D	3.50						
	D	3.80					4.00	End of borehole at 4.00m

Remarks

Groundwater: Groundwater at 1.73m on completion.

Stability: Borehole cased to 1.00m depth.
Borehole stable on completion.

Notes: Standpipe installed to 4.00m depth; 4.00m to 2.00m slotted pipe with gravel surround; 2.00m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: RJ

ASHDOWN SITE INVESTIGATION

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

Start Date: 13/02/2020

End Date: 13/02/2020

Trial Pit Number: **TP01** Sheet 1 of 1

Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Asphalt.
					0.05	MADE GROUND: Brown and dark brown very gravelly sandy clay. Gravel is angular to subrounded fine to coarse gravel of flint, chalk, brick, tile and occasional concrete.
D	0.40					becoming orange brown and clayey below 0.40m depth.
					0.55	End of trial pit at 0.55m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.40m

Made By: RJ

ASHDOWN SITE INVESTIGATION LIMITED

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

Start Date: 13/02/2020

End Date: 13/02/2020

Trial Pit Number: **TP02**

Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Asphalt.
					0.08	MADE GROUND: Cream/ off white sandy silty angular to subrounded fine to coarse gravel of flint and chalk.
D	0.25				0.20	
					0.35	MADE GROUND: Brown and dark brown gravelly very sandy clay. Gravel is angular to subrounded fine to coarse brick, flint, clinker-like material, concrete and occasional breeze block. Sand is fine to coarse.
D	0.60				0.60	Orange brown and brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (River Terrace Deposits)
						End of trial pit at 0.60m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method:	TP
Pit Length:	1.00m
Pit Width:	0.35m
Made By:	RJ

ASHDOWN SITE INVESTIGATION LIMITED

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

Start Date: 13/02/2020

End Date: 13/02/2020

Trial Pit Number: **TP03**

Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Asphalt.
					0.10	MADE GROUND: Off white and grey compacted chalk.
D	0.25				0.20	MADE GROUND: Orange brown and brown gravelly sandy clay. Gravel is angular to subrounded fine to coarse flint, brick, concrete, crystalline rock and occasional chalk.
					0.30	Stiff brown and orange brown slightly gravelly slightly CLAY. Gravel is angular to subrounded fine to coarse flint and rare brick. (Possibly Reworked/ River Terrace Deposits)
D	0.55				0.55	End of trial pit at 0.55m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.30m

Made By: RJ

ASHDOWN SITE INVESTIGATION LIMITED

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

Start Date: 13/02/2020

End Date: 13/02/2020

Trial Pit Number: **TP04** Sheet 1 of 1

Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Topsoil.
					0.15	Orange brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (River Terrace Deposits)
D	0.30					becoming gravelly below 0.40m depth.
D	0.55				0.55	End of trial pit at 0.55m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.30m

Made By: RJ

ASHDOWN SITE INVESTIGATION LIMITED

Site Name: Stakers Farm Barn, North End Road, Yapton, West Sussex

Job Number: P14458

E [redacted]

Start Date: 13/02/2020

End Date: 13/02/2020

Trial Pit Number: **TP05**

Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Topsoil.
D	0.20				0.10	MADE GROUND/ Reworked: Brown and dark brown slightly gravelly slightly sandy clay. Gravel is angular to subrounded fine to coarse flint and rare brick.
					0.25	Brown and orange brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to medium. (River Terrace Deposits)
D	0.50				0.55	End of trial pit at 0.55m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.30m

Made By: RJ

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Barn Farm, North End Road, Yapton, West Sussex	Project No: P14458 Sheet No.: 1 of 5

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP01 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.30
1	0.30
2	0.30
3	0.30
6	0.30
10	0.30
15	0.30
19	0.31
25	0.33
32	0.33
40	0.35
65	0.36
80	0.38
92	0.42
110	0.48
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.55m bgl	

TP01 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.24
1	0.24
2	0.24
3	0.24
5	0.26
7	0.26
8	0.26
10	0.27
12	0.27
15	0.27
22	0.28
30	0.28
35	0.29
38	0.30
40	0.30
46	0.32
60	0.43
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.55m* bgl	

TP01 (Test 3)	
Time (mins)	Depth to water (m bgl)
0	0.23
1	0.23
2	0.24
4	0.26
5	0.27
6	0.27
8	0.29
10	0.30
12	0.31
15	0.32
20	0.33
26	0.34
28	0.36
32	0.38
38	0.42
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.55m* bgl	

Remarks: bgl - below ground level.
*Within trial pit TP01 the pit collapsed to 0.45m during test 2 and test 3.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Barn Farm, North End Road, Yapton, West Sussex	Project No: P14458 Sheet No.: 2 of 5

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP02 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.33
3	0.33
5	0.33
10	0.33
12	0.33
15	0.34
29	0.34
37	0.34
54	0.33#
75	0.33#
88	0.32#
109	0.33#
118	0.33#
137	0.32#
163	0.32#
183	0.33#
193	0.34#
213	0.34#
1323	0.45
Pit Length - 1.00m Pit Width - 0.35m Pit Depth - 0.60m bgl	

TP02 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.30
1	0.30
3	0.30
6	0.30
8	0.30
12	0.30
16	0.30
18	0.30
25	0.30
28	0.31
32	0.31
45	0.31
60	0.31
80	0.32
125	0.32
140	0.32
170	0.32
205	0.32
Pit Length - 1.00m Pit Width - 0.35m Pit Depth - 0.60m bgl	

Remarks: bgl - below ground level.
#During test 1 within TP02 water ingress/ surface run off during heavy precipitation started to fill pit. Last reading on test 1 taken overnight prior to refilling pit for test 2.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Barn Farm, North End Road, Yapton, West Sussex	Project No: P14458 Sheet No.: 3 of 5

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP03 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.33
1	0.33
5	0.33
9	0.33
15	0.33
21	0.33
34	0.33
40	0.33
55	0.33
67	0.33
92	0.30#
112	0.32#
122	0.32#
132	0.32#
142	0.33#
167	0.33#
182	0.33#
197	0.33#
222	0.34#
1328	Dry
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

TP03 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.30
1	0.30
3	0.30
9	0.30
12	0.30
23	0.30
38	0.30
55	0.30
83	0.30
95	0.30
118	0.30
128	0.30
158	0.30
171	0.30
198	0.30
210	0.30
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

Remarks: bgl - below ground level.
#During test 1 within TP03 water ingress and surface runoff during heavy precipitation started to fill pit. Last reading for test 1 taken overnight prior to refilling pit for test 2.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Barn Farm, North End Road, Yapton, West Sussex	Project No: P14458 Sheet No.: 4 of 5

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP04 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.30
4	0.30
7	0.30
10	0.30
16	0.30
21	0.30
29	0.30
34	0.30
46	0.30
67	0.30
77	0.30
97	0.31
101	0.31
118	0.33
131	0.33
146	0.34
156	0.34
183	0.35
1333	Dry
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

TP04 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.24
1	0.24
2	0.24
4	0.24
6	0.24
8	0.24
10	0.24
12	0.24
18	0.25
26	0.25
30	0.25
45	0.25
60	0.25
82	0.26
100	0.26
120	0.27
145	0.28
162	0.28
205	0.30
220	0.31
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

Remarks: bgl - below ground level.
Last reading for test 1 taken overnight prior to refilling pit for test 2.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Barn Farm, North End Road, Yapton, West Sussex	Project No: P14458 Sheet No.: 5 of 5

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP05 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.35
5	0.35
12	0.35
17	0.35
29	0.35
31	0.32#
37	0.31#
43	0.30#
57	0.30#
72	0.30#
80	0.30#
92	0.30#
112	0.30#
137	0.32#
152	0.32#
172	0.33#
185	0.33#
1339	Dry
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

TP05 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.29
1	0.29
2	0.29
4	0.29
8	0.29
10	0.30
15	0.30
20	0.30
24	0.30
30	0.30
40	0.30
55	0.30
74	0.30
105	0.30
125	0.31
160	0.31
185	0.31
195	0.31
210	0.32
245	0.32
Pit Length - 1.00m Pit Width - 0.30m Pit Depth - 0.55m bgl	

Remarks: bgl - below ground level.
#During test 1 within TP05 water ingress/ surface runoff during heavy precipitation started to fill pit. Last reading for test 1 taken overnight prior to refilling pit for test 2.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Stakers Farm Barn, North End Road, Yapton, West Sussex	Report No.: P14458 Sheet No.: 1 of 1

SUMMARY OF BOREHOLE FALLING HEAD SOAKAGE TEST RESULTS

WS01	
Time (mins)	Depth to water (m bgl)
0	0.30
1	0.41
2	0.43
3	0.45
4	0.60
5	0.64
6	0.68
8	0.71
10	0.77
15	0.92
22	1.00
28	1.05
35	1.10
42	1.13
60	1.14
65	1.14
80	1.15
105	1.15
120	1.15
Borehole Depth (m bgl)	4.00
Casing Depth (m bgl)	N/A
Borehole Diameter (mm)	85.50
Casing Diameter (mm)	N/A

WS02 (Test 1)	
Time (mins)	Depth to water (m bgl)
0	0.30
1	0.33
2	0.39
4	0.42
5	0.46
7	0.55
8	0.64
10	0.70
13	0.78
15	0.82
22	0.91
30	0.96
35	1.12
Borehole Depth (m bgl)	2.00
Casing Depth (m bgl)	1.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

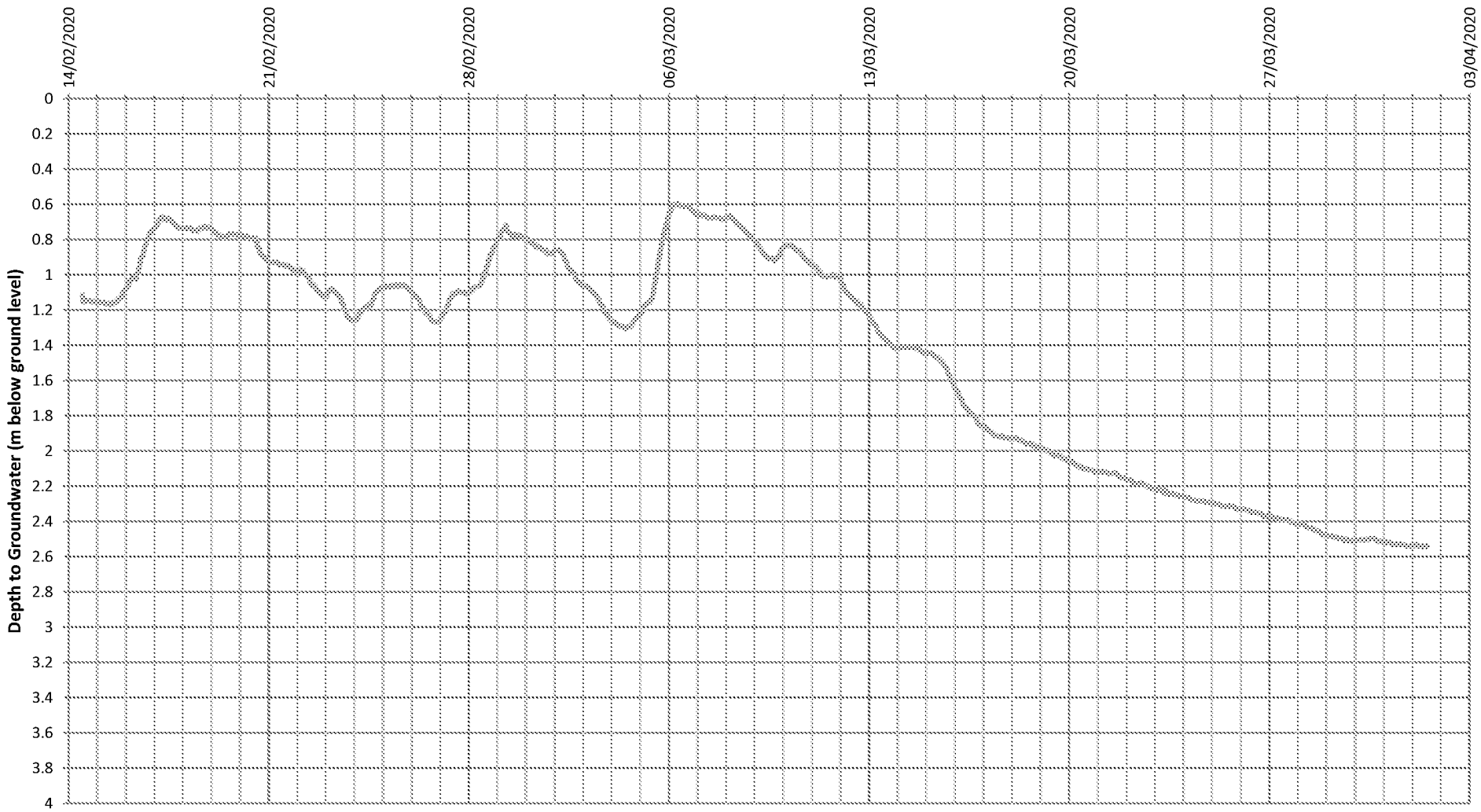
WS02 (Test 2)	
Time (mins)	Depth to water (m bgl)
0	0.35
1	0.38
3	0.41
4	0.43
6	0.48
12	0.55
16	0.59
22	0.63
24	0.67
30	0.70
34	0.75
42	0.79
45	0.86
50	0.94
Borehole Depth (m bgl)	2.00
Casing Depth (m bgl)	1.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Notes: bgl – below ground level.

Ashdown Site Investigation Limted

Site: Stakers Farm, North End Road, Yapton, West Sussex	Project Ref.: P14458

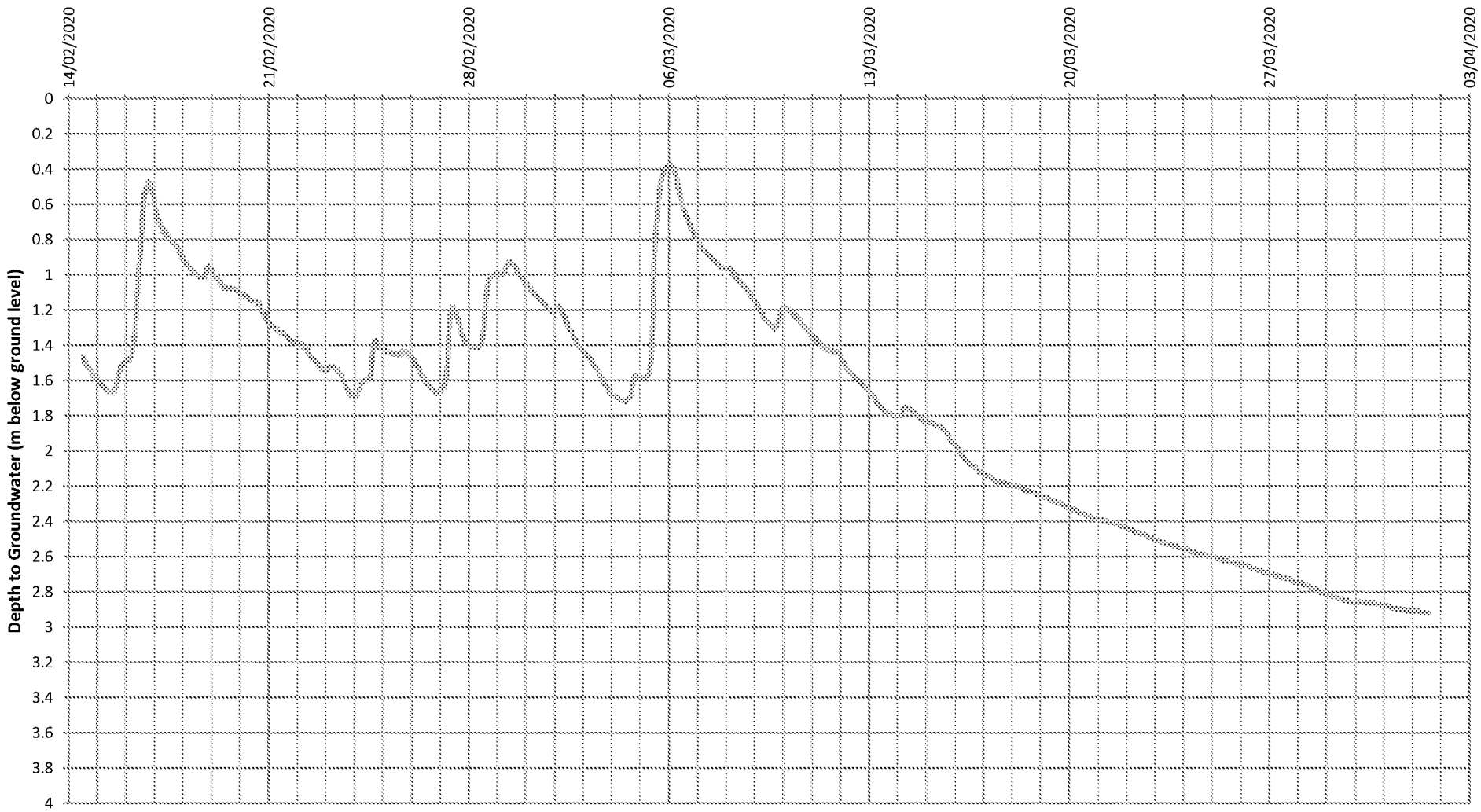
Groundwater Monitoring Results - WS01



Ashdown Site Investigation Limted

Site: Stakers Farm, North End Road, Yapton, West Sussex	Project Ref.: P14458

Groundwater Monitoring Results - WS02



From: Projects
Sent: 31 July 2023 15:26
To: Kyanna Hodge
Cc: CEP | Reception; Stuart Magowan; Zac Denton; Projects
Subject: RE: 23452 Stakers Farm, Yapton - Consultation Response

Good afternoon Kyanna

We cannot comment on data for the adjoining sites as we have no understanding of the elevations / locations of the monitoring points, the intervals between readings taken on those sites or the construction details of those monitoring installations.

With regard to our works, we do note that groundwater was present on completion of drilling of both boreholes WS01 and WS02 at respective depths of 1.67m and 1.70m. These depths were recorded prior to installation of the monitoring standpipes. The construction details of the standpipes are clearly shown on the borehole records, both graphically and in the notes at the base of each record. Both installations included an upper portion of plain pipe surrounded with a bentonite clay seal that extended some 2m below ground level. The clay seal was constructed to that depth specifically to guard against surface water infiltrating down the borehole. It is not possible to photograph the bentonite seal in the ground, so I am bemused photographs are needed to support our monitoring data.

Our monitoring was undertaken using dataloggers programmed to collect readings at 15-minute intervals to ensure that the data captured ephemeral short term rises in groundwater, which will naturally occur during periods of heavy rainfall at the very time soakaways are required to capture surface water prior to discharging their contents to ground. The depths at which groundwater were first captured by the dataloggers in each hole at the commencement of monitoring (approx. 1.1m and 1.5m in boreholes WS01 and WS02, respectively) are slightly higher than recorded at the end of drilling. This is due to upward displacement of water within the borehole as the standpipe construction ,materials were introduced into the holes. However, the water levels within the standpipes would have quickly re-equilibrated with the surrounding groundwater table over a short length of time.

The groundwater records for the two separate boreholes located in different parts of the site are very consistent. We have no reason to believe that they are not reflective of the groundwater table over the duration of the monitoring period.

Kind regards

Steven McSwiney
Technical Director

Ashdown Site Investigation Ltd

[redacted]

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Head Office: Unit 3, The Old Grain Store, Ditchling Common Business Park, Ditchling, East Sussex, BN6 8SG

From: Kyanna Hodge
Sent: Monday, July 31, 2023 9:45 AM
To: Admin
Cc: CEP | Reception; Stuart Magowan; Zac Denton
Subject: 23452 Stakers Farm, Yapton - Consultation Response
Importance: High

Good morning

Your project reference: P14458
Report reference: R14124

In regard to the site investigation report produced by Ashdown Site Investigation Limited on behalf of Granite Gate Ltd, copy attached - please also see the attached the email chain between CEP and Arun District Council.

We are proposing to discharge surface water to the public main sewer as there are no other alternatives following the drainage hierarchy.
Moderate to poor infiltration with rates varying from $3.2x10^{-5}$ m/s to $6.5x10^{-7}$ m/s, high groundwater encountered between 0.38-0.58m below ground level.
No existing watercourses and no public surface water mains within the vicinity of the site.

Arun District Council are requesting that we revisit the results provided in the site investigation report as there is disparity between the peak groundwater levels on this site and the adjacent site (which infiltrates to ground).

Based on our involvement with a few sites in Yapton, the geology and infiltration vary vastly in this location. However, they are requesting further explanations to justify the difference given that groundwater levels are the primary reason for ruling out infiltration.
They are concerned that rainwater ingress may have influenced the groundwater monitoring data for this site and no photos have been provided to show the groundwater monitoring installation as evidence.

If you can get back to me at your earliest convenience, that will be much appreciated.

Any further information needed, please do not hesitate to contact.

Kind Regards,
Kyanna

Kyanna Hodge

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA
[redacted]

All communications to the Civil Engineering Practice must be via telephone, email or letter. We do not monitor or respond to messages received by any other means.

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Groundwater Monitoring Report	
SITE ADDRESS	Stakers Farm, North End Road, Yapton
CLIENT	Piers Bucknall
REPORT REFERENCE	GWPR5703/SR/March 2024. The conditions and limitations of this groundwater monitoring report can be viewed within Appendix A. A technical glossary has also been provided within Appendix B.
SCOPE OF WORKS	The investigation was to be undertaken to provide the installation of groundwater monitoring wells in order to complete winter groundwater monitoring at the site. This was to formalise the drainage design. The techniques adopted for the investigation were chosen considering the requirements of the client, anticipated ground conditions, and bearing in mind the nature of the site, limitations to site access and other logistical limitations.
SITE DETAILS	The site was located within Yapton, within West Sussex. The site comprised a farm occupied with existing structures and associated areas of hardstanding and soft-landscaping. A Site Location Plan is provided within Figure 1.
SITE WORKS AND ENCOUNTERED GROUND CONDITIONS	Site works were undertaken on 23/11/2023 and comprised the drilling of 2No. windowless sampler boreholes (WS1 and WS2) in close proximity to previously drilled boreholes on-site (WS01 and WS02). The trial hole logs can be seen within Appendix C. The trial hole location plan can be seen in Figure 1.
GROUNDWATER CONDITIONS	During the site investigation works, groundwater was encountered within WS1 at 1.10m bgl and within WS2 at 1.20m bgl.
GROUNDWATER MONITORING	Winter groundwater monitoring was undertaken within each of wells (WS101-WS102 and WS-WS2) on 10No. visits throughout the wet winter months, to provide an insight on worse case levels of groundwater. The results from the monitoring have been tabulated below:

Summary of Groundwater Observations

Date	Trial Hole	Water Level	Final Well Depth
30/11/2023	WS1	Dry	2.30
	WS01	2.60	3.60
	WS2	3.00	3.90
	WS02	3.70	3.70
8/12/2023	WS1	Dry	2.30
	WS01	2.40	3.60
	WS2	2.90	3.90
	WS02	2.70	3.70
22/12/2023	WS1	0.90	2.40
	WS01	0.80	3.60
	WS2	1.10	3.80
	WS02	1.10	3.70
5/01/2024	WS1	0.20	2.40
	WS01	0.30	3.60
	WS2	0.80	3.00
	WS02	0.20	3.70
22/01/2024	WS1	Dry	2.30

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Groundwater Monitoring Report

	WS01	2.60	3.60
	WS2	3.10	3.90
	WS02	2.30	3.70
2/02/2024	WS1	2.30	2.40
	WS01	2.60	3.60
	WS2	3.30	3.90
	WS02	2.50	3.70
14/02/2024	WS1	2.12	2.43
	WS01	2.57	3.61
	WS2	3.16	4.04
	WS02	2.28	3.71
22/02/2024	WS1	1.54	2.43
	WS01	2.40	3.61
	WS2	2.60	4.04
	WS02	2.23	3.71
07/03/2024	WS1	1.32	2.43
	WS01	2.03	3.61
	WS2	2.67	4.04
	WS02	1.98	3.71
13/03/2024	WS1	1.43	2.43
	WS01	2.37	3.61
	WS2	2.72	4.04
	WS02	2.03	3.71

Please feel free to contact us should you have any queries regarding the information enclosed within this report.

Summary of Authors		
Prepared By	**Checked By**	**Approved By**
[redacted]		
Libby Bennett BSc (Hons) Geotechnical and Geoenvironmental Engineer	Miltiadis Mellios MSc(Eng) GMICE FGS MIEnvSc Principal Engineer	Francis Williams MGeol (Hons) FGS CEnv CGeol Director

For and on behalf of Ground and Water Limited

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[redacted]
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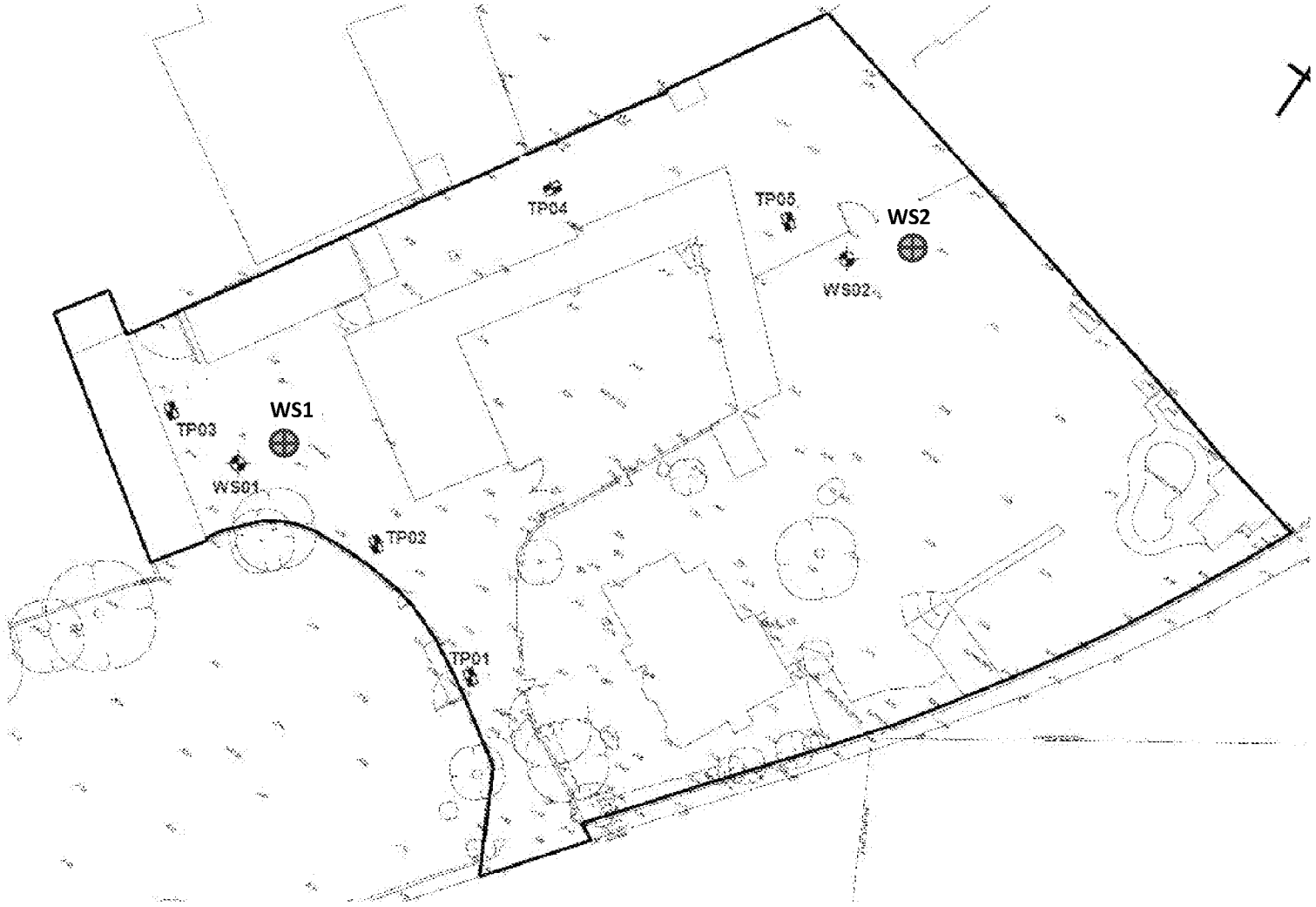
FIGURES



Site boundary

Windowless Sampler Borehole

Stakers Farm, North End Road, Yapton

November 2023

Figure 1 – Trial Hole Location Plan

GWPR5703

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APPENDIX A: Conditions and Limitations

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The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to The Becton Centre The Fairway New Milton Hampshire BH25 7AE.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

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The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

The aim of the investigation was understood to be to supply the client and their designers with information regarding the ground conditions underlying the site to assist them in preparing an appropriate scheme for development.

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Alton, Hampshire GU34 3NB
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APPENDIX B: Technical Glossary

TECHNICAL GLOSSARY

The list of possible definitions within the report may be seen below. Please note that some definitions may not be relevant to this report.

HYDROGEOLOGY:

A **Principal Aquifer** is a layer of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary (A) Aquifers consist of deposits with permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers.

Secondary (B) Aquifers consist of deposits with predominantly lower permeability layers with may stoke and yield limited amounts of groundwater due to localised features such as fissures, think permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Aquifers (Undifferentiated) are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both a minor aquifer and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

FLOOD ZONES:

Environment Agency Flood Zone 2, defined as; land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

Environment Agency Flood Zone 3 shows the extent of a river flood with a 1 in 100 (1%0 or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year.

Environment Agency Flood Zone 3 area that benefits from flood defences, defined as; land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

GROUNDWATER SOURCE PROTECTION ZONES (SPZS):

Inner Zone (SPZ1): This zone is 50 day travel time of pollutant to source with a 50 metres default minimum radius.

Outer Zone (SPZ2): This zone is 400 day travel time of pollutant to source. This has a 250 or 500 metres minimum radius around the source depending on the amount of water taken.

Total Catchment (SPZ3): This is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

Zone of Special Interest (SPZ4): This zone is where local conditions require additional protection.

IN-SITU STRENGTH GEOTECHNICAL TESTING:

Windowless Sample and/or Cable Percussion and/or Rotary Boreholes provide samples of the ground for assessment but they do not give any engineering data. The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test uses a thick-walled sample tube, with an outside diameter of 50mm and an inside diameter of 35mm, and a length of around 650mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5kg falling through a distance of 760mm. The sample tube is driven 150mm into the ground and then the number of blows needed for the tube to penetrate each 75mm up to a depth of 450mm is recorded. The sum of the number of blows is termed the "standard penetration resistance" or the "N-value".

Dynamic Probing involves the driving of a metal cone into the ground via a series of steel rods. These rods are driven from the surface by a hammer system that lifts and drops a 63.5kg (SHDP) hammer onto the top of the rods through a set height, thus ensuring a consistent energy input. The number of hammer blows that are required to drive the cone down by each 100mm increment are recorded. These blow counts then provide a comparative assessment from which correlations have been published, based on dynamic energy, which permits engineering parameters to be generated. (The Dynamic Probe 'Super Heavy' (SHDP) Tests were conducted in accordance with BS 1377; 1990; Part 9, Clause 3.2).

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APPENDIX C: Trial Hole Logs

Registered Office: [illegible] House, 31 Horse Fair, Banbury, Oxfordshire [illegible]. Registered in England No. [illegible]

Percussion Drilling Log

Project Name: Stakers Farm, North End Road, Yapton	Client: Piers Bucknell	Date: 23/11/2023
Location: Stakers Farm, North End Road, Yapton	Contractor:	
Project No. : GWPR5703	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS1	WS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with abundant roots. Sand is fine to medium and gravel comprises fine to medium sub-angular to sub-rounded flint
								Orangish brown slightly sandy CLAY (RIVER TERRACE DEPOSITS)
					2.00			Off white structureless CHALK composed of slightly gravelly SILT. Gravel is fine to medium sub-angular to sub-rounded medium density chalk and flint. Grade Dm in accordance with CIRIA 574. (CHALK)
					5.00			End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Groundwater was encountered at 1.10m bgl.

ARUN DISTRICT COUNCIL Y/15/25/PL

Percussion Drilling Log

Project Name: Stakers Farm, North End Road, Yapton	Client: Piers Bucknell	Date: 23/11/2023
Location: Stakers Farm, North End Road, Yapton	Contractor:	
Project No. : GWPR5703	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS2	WS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with abundant roots. Sand is fine to medium and gravel comprises fine to medium sub-angular to sub-rounded flint Orangish brown slightly sandy CLAY (RIVER TERRACE DEPOSITS)
					1.95			Off white structureless CHALK composed of slightly gravelly SILT. Gravel is fine to medium sub-angular to sub-rounded medium density chalk and flint. Grade Dm in accordance with CIRIA 574. (CHALK)
					5.00			End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

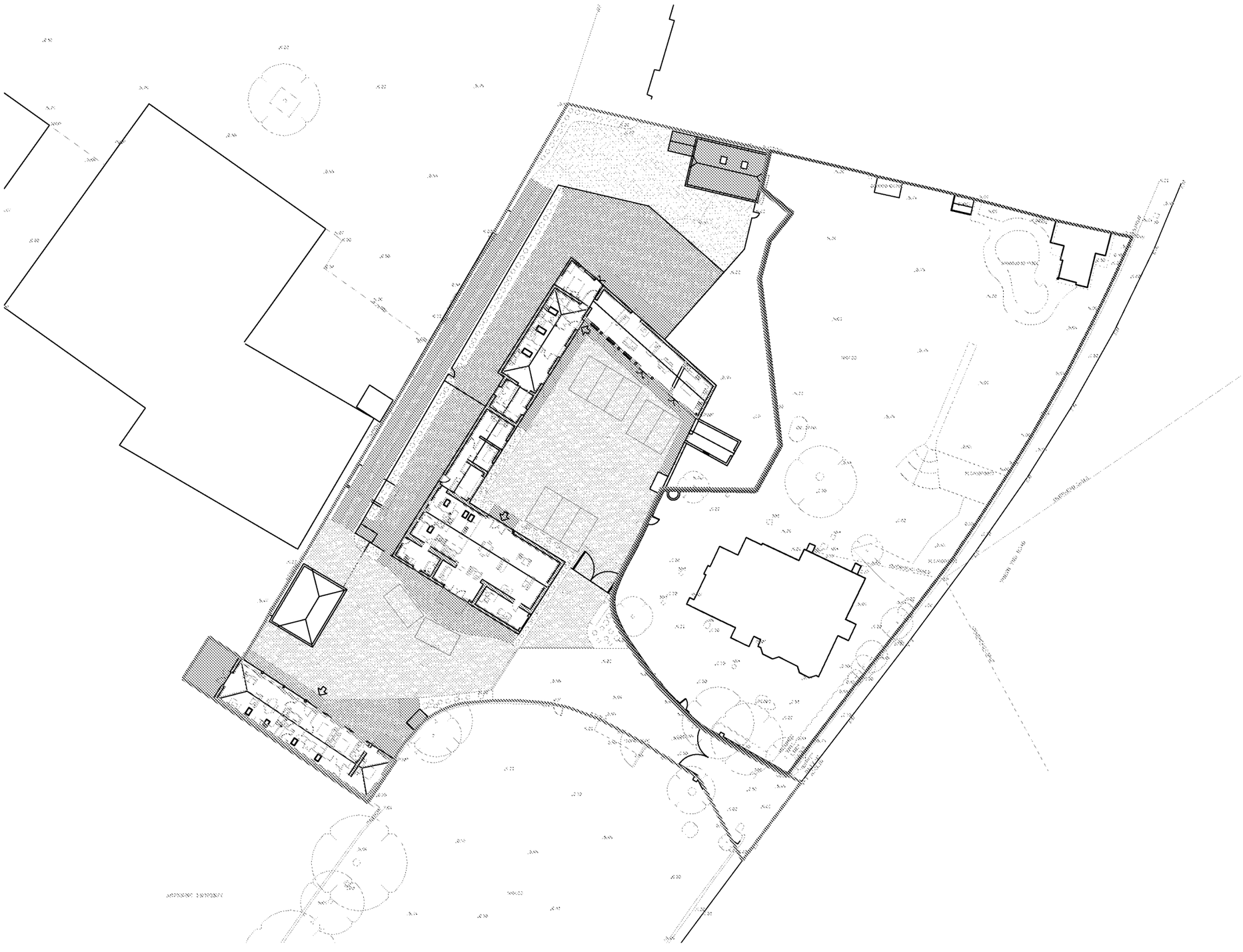
Groundwater was encountered at 1.20m bgl.

Appendix 7

Proposed Site Layout Plan

and

Proposed Drained Areas Plan



-5m 0 5 10 15 20m

TITLE
Proposed Site Layout Plan

SCALE	PROJECT. No.
1:500 @ A3	23452
REPORT TYPE	DRG. No.
DS	05 -

ARUN DISTRICT COUNCIL Y/15/25/PL

PROPOSED SITE PLAN

(Scale 1:500)

Key

Proposed Roofs		719m²
Urban Creep (10%)		72m²
	Total	790m²
Proposed Impermeable Surfaces		87m²
Proposed Permeable Surface with voided subbase below		1,000m²

TITLE
Proposed Drainage Areas Plan

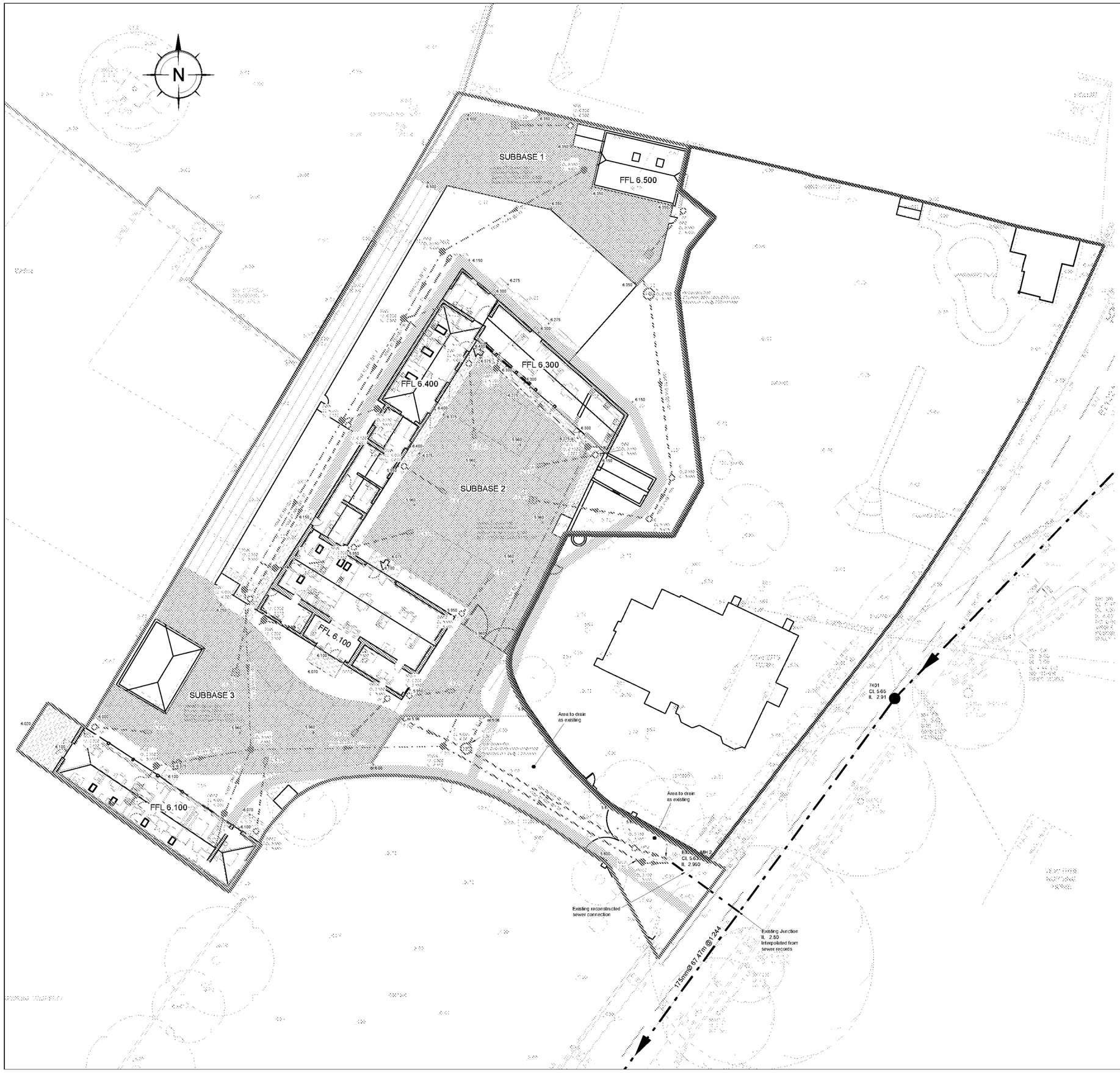
SCALE	PROJECT. No.
1:500 @ A3	23452
REPORT TYPE	DRG. No.
DS	06 -

Appendix 8

Drainage Strategy Plan, Construction Details

and

Calculations



Drainage Legend:

- Existing Foul Sewer
- Storm Water Drainage
- Storm Water Rodding Eye
- Storm Water Inspection Chamber
- Storm Water Catchpit
- Storm Water Diffuser tanks
- Voided subbase for attenuation and filtration
- Fin Drain from voided subbase
- Hydrobrake with Reference:
- Non return Valve
- Foul Water Drainage
- Foul Water Inspection Chamber

Surface Finishes Legend:

- Block paving. Impermeable with falls to landscaping areas
- Permeable paving with voided subbase beneath.

Note:
Surface finishes are shown for illustrative purposes only.
See architect's design and details

Other Legend:

- Site Boundary
- Adjacent Site in client ownership
- Service Trench

NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.

2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.

3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.

4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

5. All pipes, bends and junctions shall be vitrified clay to BS EN 295-1, with flexible joints and kitemark certified. Alternatively all pipes and fittings can be UPVC conforming to BS EN 1401-1 and shall be laid in accordance with the manufacturers specification. If UPVC pipes are to be used then the manufacturer shall be approved by the Engineer prior to construction.

6. All Adoptable sewers shall be in strict accordance with the current edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.

7. All private building drainage shall be constructed in strict accordance with BS EN 752:1996. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.

8. Where the service trench is near to the foundation of any building, refer to the guidance in Approved Document H, Building Regulations Part H1.

9. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.

10. In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreboard or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.

11. All svps shall have rodding access plates fitted at their bases (ground floor level).

12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

REV	DATE	INT	DESCRIPTION	CHK
C	01.11.24	MJP	Updated with enlarged viewport	SRM
B	01.06.23	PR	Hydrobrake references updated.	KH
A	03.11.22	PR	New site layout added. Drainage updated to suit.	KH

Issue Status FOR APPROVAL

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

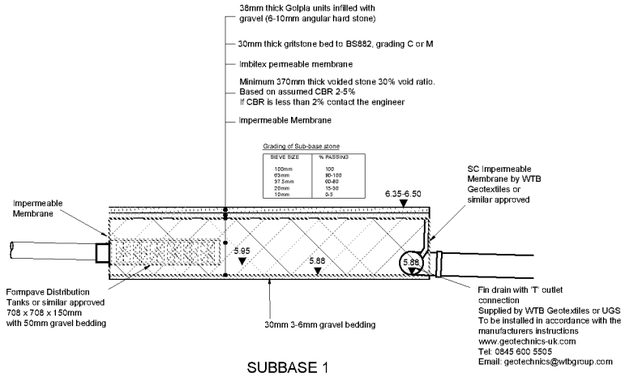
CLIENT: Granite Gate Ltd

PROJECT: Stakers Farm, North End Road, Yapton

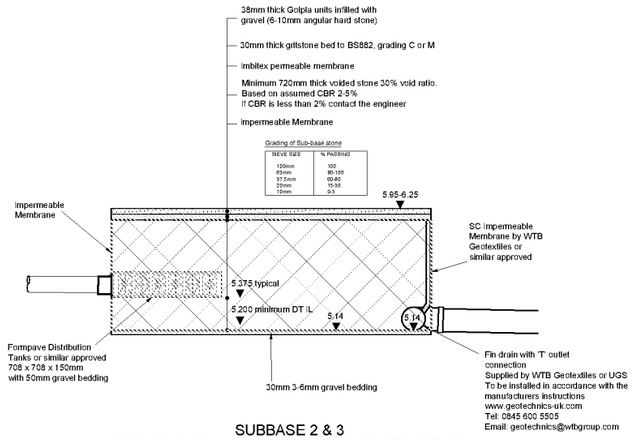
TITLE: Proposed Drainage and Levels Layout Plan

DRAWN	DATE	PROJECT NO.
M Pacifico	Feb 2021	2345
ENGINEER	CHECKED	DRG. No. / REV.
S Magowan		201 C
SCALE		
1:200 @ A1		

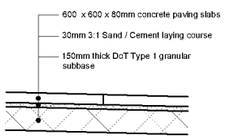
ARUN DISTRICT COUNCIL Y/125/PL



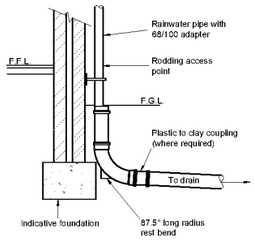
SUBBASE 1
PERMEABLE GOLPA DRIVEWAY CONSTRUCTION
(Scale 1:20)



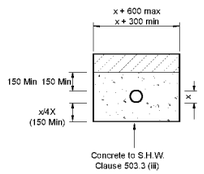
SUBBASE 2 & 3
PERMEABLE GOLPA DRIVEWAY CONSTRUCTION
(Scale 1:20)



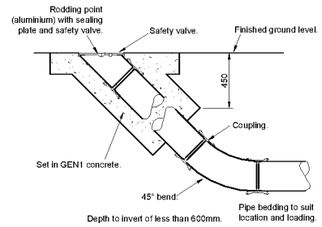
PAVING SLAB FOOTPATH
CONSTRUCTION DETAIL
(Scale 1:20)



TYPICAL RAINWATER PIPE DETAIL
(Scale 1:25)



CLASS Z PIPE BEDDING
PIPE BEDDING DETAILS
(Not To Scale)



DETAIL OF RODDING EYE
(Scale 1:25)

NOTES:

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5. All pipes, bends and junctions shall be vitrified clay to BS EN 295-1, with flexible joints and kitemark certified. Alternatively all pipes and fittings can be UPVC conforming to BS EN 1401-1 and shall be laid in accordance with the manufacturers specification. If UPVC pipes are to be used then the manufacturer shall be approved by the Engineer prior to construction.

6. All Adoptable sewers shall be in strict accordance with the current edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.

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8. Where the service trench is near to the foundation of any building, refer to the guidance in Approved Document H, Building Regulations Part H1.

9. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.

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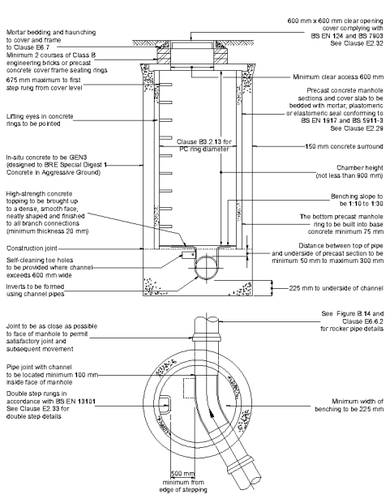
11. All svps shall have rodding access plates fitted at their bases (ground floor level).

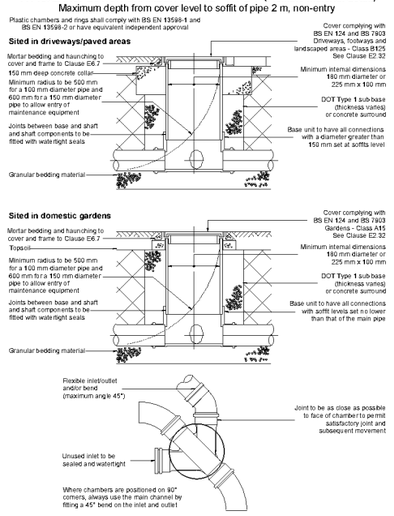
12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

FIGURE B.12
TYPICAL MANHOLE DETAIL - TYPE 2
Maximum depth from cover level to soffit of pipe 3.0 m



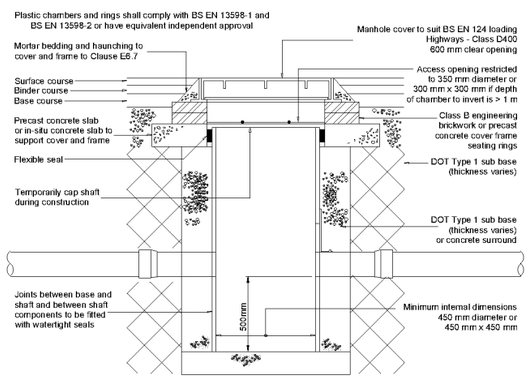
Not to scale

FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry



Note: Where the access chamber is in the highway the Highway Authority can have specific requirements
Not to scale

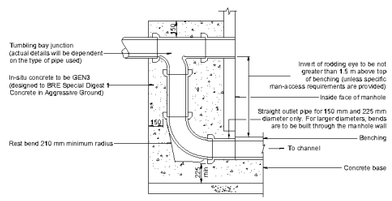
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry

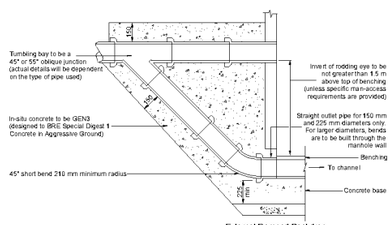


Not to scale

CATCHPIT CHAMBER
500mm SUMP
(Scale 1:20)

FIGURE B.15
TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL
Note: Steeper gradients are preferred to the use of backdrops.
Type of backdrop to be used to be agreed with Undertaker.





Not to scale, dimensions in millimetres

REV	DATE	INT	DESCRIPTION	CHK
C	01.11.24	MJP	Updated subbase depth and stone	SRM
B	09.11.22	PR	Hydrobrake Schedule added.	KH
A	03.11.22	PR	Permeable detail updated. Block paving detail added.	KH

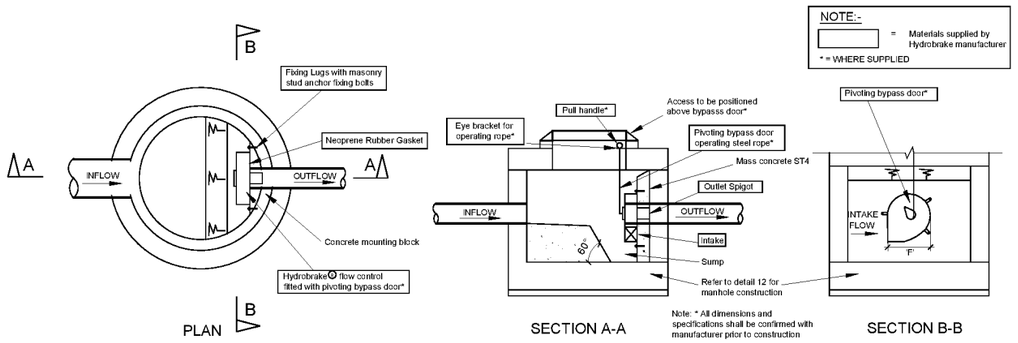
Issue Status: FOR APPROVAL

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA

CLIENT: Granite Gate Ltd
PROJECT: Stakers Farm, North End Road, Yapton
TITLE: Proposed Construction Details

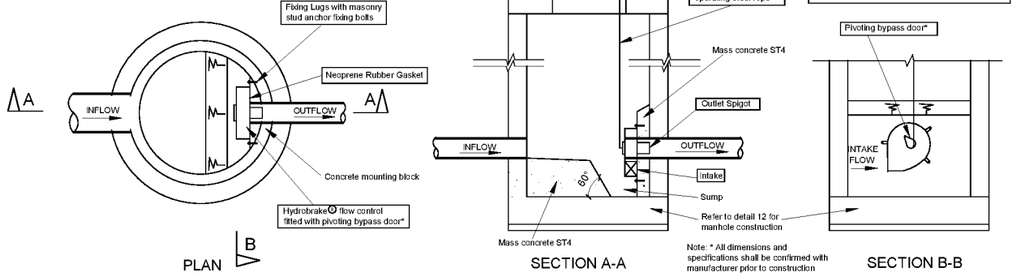
DRAWN	DATE	PROJECT NO
M Pacifico	Feb 2021	2345
ENGINEER	CHECKED	
S Magowan		
SCALE	DRG. No	REV
As Shown@A1	501	C

ARUN DISTRICT COUNCIL Y/15/25/PL



Hydrobrake Schedule							
MH Ref	CL	IL	Base	Dia	Cover Grade	Cover Opening	Ref	Discharge l/s
4	6.500	5.750	5.250	1.000	B125	1.22 x 0.685 Multiple Ductile Iron	CTL-SHE-0050-1000-0750-1000	1 l/s

MANHOLE 4
WITH HYDROBRAKE
(Scale 1:25)



Hydrobrake Schedule								
MH Ref	CL	IL	Base	Dia	Cover Grade	Cover Opening	Ref	Discharge l/s
7	5.890	4.540	4.040	1.000	B125	1.22 x 0.685 Multiple Ductile Iron	CTL-SHE-0045-1000-1200-1000	1 l/s

MANHOLE 7
WITH HYDROBRAKE
(Scale 1:25)

NOTES:

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12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

REV	DATE	INT	DESCRIPTION	CHK

Issue Status: FOR APPROVAL

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA

CLIENT: Granite Gate Ltd

PROJECT: Stakers Farm, North End Road, Yapton

TITLE: Proposed Construction Details

DRAWN	DATE	PROJECT NO.
M Pacifico	Nov 2024	23452
ENGINEER	CHECKED	DRG No. / REV.
S Magowan		502
SCALE		
As Shown@A1		

APUN DISTRICT COUNCIL Y/15/25/PL

Appendix 9

Correspondence with Southern Water

From: Sewerconnections
To: Stuart Magowan
Subject: RE: 23452 Stakers Farm, Yapton
Date: 07 January 2025 12:48:39
Attachments: image002.png
image007.jpg
image008.png
image009.png
image010.png
image011.gif

Good Afternoon Stuart,

S106 Sewer Connections Application Reference – 18493
Site: Stakers Farm, North End Road, Yapton, West Sussex, BN18 0DU

I am emailing in regards to an update for one of your sites, whereby a S106 application has been submitted, for Stakers Farm.

I have had an in depth meeting and conversations with planning on your behalf and I am pleased to confirm that planning are to allow the connection of surface water to the public foul sewer asset as per your submitted plans. Therefore, Southern Water will now accept a surface water flow rate of the 1L/S which is a betterment of the existing 17.9L/S. The reason for this, it that you have clearly explored every other option available. You have submitted all the evidence detailing every conversation with relevant third parties.

As you are aware, Southern Water are no longer accepting any surface water into foul drainage networks. However, in this isolated instance every other avenue has been explored via the agreed Part H3 process of the building regulations.

As discussed on the phone, I have conducted a fully comprehensive technical review of your application and kindly require the below to be confirmed / clarified before approval can be given:

1. **The approved copy of the planning consent for this development, including details of any conditions that have been imposed by the Planning Authority.**

Once the above has been received, your S106 application will be approved and I will complete and upload the approval letter as a prioirty.

Kindest regards,

Dale

Dale Hughes
Technical Coordinator
Waste Water
Developer Services
[redacted] sw-email-logo

From: Sewerconnections <[redacted]
Sent: Tuesday, January 7, 2025 9:34 AM
To: Stuart Magowan <[redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Good Morning Stuart,

Thank you, I had a very well deserved break!

Your swift and in depth exploration and submitted analysis and evidence has been a pleasure to review and has been extremely helpful in order to try and progress this for you.

I have reviewed your email and have uploaded all the relevant information to the portal. I have just compiled a detailed summary email back to my colleague at planning who I am liaising with which covers every option explored by yourself, with detailed documentation supporting such.

Once I receive a response I will contact you as a prioirty.

Kindest regards,

Dale

Dale Hughes
Technical Coordinator
Waste Water
Developer Services

[redacted]
southernwater.co.uk

sw-email-logo

From: Stuart Magowan <[redacted]>
Sent: Monday, January 6, 2025 4:59 PM
To: Sewerconnections <[redacted]>
Cc: CEP | Receptio[redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Hi Dale

Happy New Year.! I had a great Christmas and trust you had a good break.

Thanks for your email below:

I have attached emails today from James Snelgar at Dandara confirming my verbal discussion with them prior to Christmas confirming that they would not accept a third party connection to their private system.

I also attach my exchange today with Kevin Macknay at West Sussex Highways regarding the highway network. Kein has sent what they know of the network and condition and I have responded to Kevin with my thoughts on the potential upgrades that would be required to simply repair the system to full functionality which are essentially as follows:

1. Clear roots / reline / replace the North End Lane 150mm (if replace probably increase to 225mm diameter). Approx 185m length
2. Additional jetting to the Main Road element. Approx 450m length
3. Clear roots / reline / replace the system below the old ditch line or potentially remove and reinstate the ditch and culverts (as the abattoir is no more). Approximately 315m length.

West Sussex do not appear to have undertaken any costing or have improvements planned and the works noted above would not confirm capacity for this site nor necessarily reduce the flood issues. Whilst root intrusion and the silt issue may be affecting the efficiency of the system it is also likely the 150mm and 225mm diameter pipework is not suitable for the catchment and current design storms.

As a minimum it would appear that replacing the North End Lane route with a 225mm diameter pipe and then potentially 315m of 225mm diameter pipe replacement to the line of the old ditch would be required.

As a cost it is likely to be £450,000.00- £500,000.00 of works to replace both sections and not something that this development could fund.

Is there a potentially for a S115 Agreement between Southern Water and WSCC highways to take the Highways drain into Southern Water's Network? How would the repair / upgrade works be funded and how would this affect a planning application on this site with anticipated timescales for S115 Agreement and upgrade works. It still appears that in terms of viability that the restriction to the foul sewer is still the most appropriate option for this site.

The comments on the 30 year event calculations are noted.

Regards

Stuart

Stuart Magowan
[redacted]
stuart@civil.co.uk

From: Sewerconnections
Sent: 06 January 2025 09:49
To: Stuart Magowan
Cc: CEP | Reception
Subject: RE: 23452 Stakers Farm, Yapton

Good Morning Stuart,

I hope you have had a great Christmas and new year with your family.

As agreed before Christmas, I have had a meeting with planning to identify a way we can move forward in regards to surface water discharge at this location.

We discussed in depth the site in question, the makeup of the drainage as a whole, and every avenue you have clearly explored prior to proposing to connect to the nearby southern water foul network. I have walked through planning the main attractive proposal of the betterment, which is to be a new restricted rate of 1L/S from the existing 17L/S.

Planning wanted to see if the below options could be explored first:

1. **You received a reply from kevin.mackenzie@westsussex.gov.uk on 09/12/22 in relation to highways drainage near to the entrance of the site. It seems they will only entertain a conversation regarding a connection to that drain if there are any improvements completed. Are you able to identify what works are required and potential costing of works which may allow a future connection into it? If I have a confirmed list of works and costings this could be an avenue to pursue our end.**

2. **Could you please confirm if approaching the Dandara site next door, and to seek permission to connect to the identified soakaway on their site via a pumped connection from yours? Please kindly submit any correspondence to evidence this.**

I have also reviewed the calculation figures for the existing and proposed flow rates and planning are to focus on the 1 in 30 figures for this site:

I have uploaded the calculation for the 1 in 30 storm event to the application so don't be alarmed if you see 2 screenshots of such uploaded. This will be a betterment of 1L/S from the 11.68L/S.

I have agreed with planning to discuss with them your responses to the above 2 points. Once received, I will discuss and hopefully obtain a way forward for you.

Like I said to you before Christmas, your evidence for each exploration has been vital and really useful to proceed as you clearly are trying everything available.

I look forward to hearing from you soon.

Kindest regards,

Dale

Dale Hughes
Technical Coordinator
Waste Water
Developer Services

[redacted]
southernwater.co.uk

From: Stuart Magowan <[redacted]>
Sent: Friday, December 20, 2024 8:48 AM
To: Sewerconnections[redacted]>
Cc: CEP | Reception <[redacted]>

Subject: RE: 23452 Stakers Farm, Yapton

Hi Dale

I have received confirmation from the Client Piers Bucknell which owns this site that he does not own the adjacent site, that is owned by Dandara. Email attached.

Have a very Merry Christmas and Happy New Year

Stuart

Stuart Magowan
[redacted]

From: Stuart Magowan <[redacted]
Sent: 19 December 2024 15:56
To: Sewerconnections [redacted]
Cc: CEP | Reception [redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Hi Dale

Thank you for the prompt response, I have asked the Client regarding ownership but my understanding is the site to the west is now owned by Dandara / private owners and land registry has not caught up.

Dandara site

Within the Dandara scheme the area of site immediately west of this site was developed for a 9 house development for which CEP undertook the detailed design. That area is at a slightly higher ground level and a very shallow infiltration blanket was used to drain the small 9 house development and was consented and built when the recorded winter groundwater levels were lower than have been recorded on this site.

The main Dandara site does have a surface water sewer and drains to infiltration unfortunate the closest surface water drain in the Dandara site has an invert level of 6.629m AOD which is 229mm and 529mm higher that our main FFL at 6.1 and 6.4m AOD and as conversations we can really lift the site without levelling and rebuilding, which is not a viable proposal, and therefore a surface water

connection to the Dandara site by gravity connection is not feasible.

Watercourse / pond on site

The issue with a watercourse or pond as a discharge option on this site remains an outfall. If a watercourse / pond was dug onsite the only option would be a discharge to ground or connection to the public foul sewer. There are no other local watercourses, and connection to Highway Drain has already been discounted due to flood risk grounds, and ack of a right of connection and highway essentially ruling out any improvements to their system.

As groundwater was recorded at 200mm-300mm below ground level in Winter 2023/24 any watercourse / pond would likely be inundated with groundwater through the winter period and the water quality improvement and surface water storage required to mitigate any risk of pollution to the receiving waterbody (groundwater) from the yard and access areas would be impossible to achieve.

Proposed Works

The barns are to be converted to residential property. The total current roof and paving area is the proposed is 2023m^2. Indicated on drawing 04 in Appendix 3 of the Drainge Strategy. We have also, on drawing 04, noted the area of surface water we have proved flows to the exiting foul sewer at 1,465m^2 and used that area in our initial calculations. The total proposed impermeable area is 1,790m^2 (which includes a 10% urban creep allowance for the roofs but is not actually to be constructed currently).

For foul the barns all have internal gullies that connect to the foul sewer, two had sinks and one a toilet, these are not currently in use and we did not allow for those in the existing flows. The three proposed dwellings will produce a peak foul flow of 0.14l/s in accordance with DCG guidance.

We have therefore proposed a maximum of 1l/s of surface water during a 100 year plus 45% rainfall event and peak foul flow of 0.14 so a worst case 1.14l/s to the foul sewer during a 100 year plus 45% rainfall event.

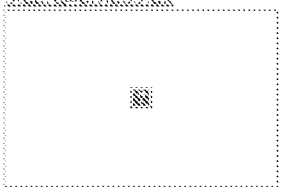
I understand the issue of improvement and the current foul water issue in the area but the development is really the only opportunity for this site to reduce the existing unrestricted surface water flows to the foul sewer and we are hopeful we can agree a practical way forward.

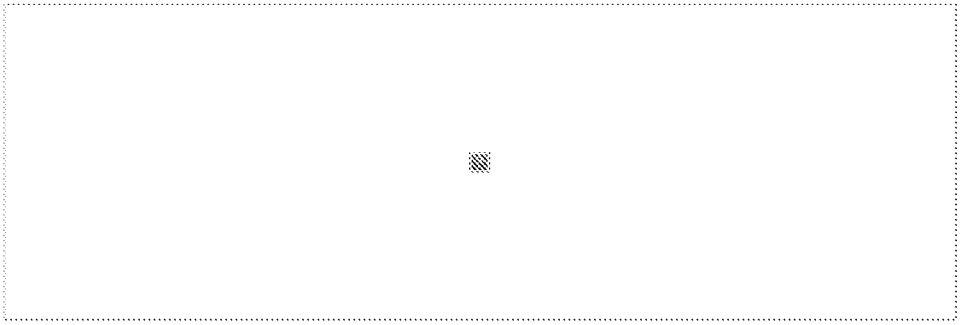
If you have any queries on the above or if I an be of any assistance please do not hesitate to contact me.

Regards and Merry Christmas

Stuart

Stuart Megowan
[redacted]





From: Sewerconnections [redacted]
Sent: 19 December 2024 12:51
To: Stuart Magowan [redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Good Afternoon Stuart,

First of all I hope you are well and looking forward to Christmas.

I am emailing you in relation to our conversation over the past few weeks regarding the below email chain.

I can confirm my team behind who receive the initial S106 sewer connection applications have made me aware of your submitted application reference 18493, for Stakers Farm, North End Road, Yapton, West Sussex, BN18 0DU. I have since spoken to the application advisor and have agreed that I will take ownership of the application from start to finish for you. This is to prevent any needless clarification that may be asked of you as I am aware of issues on site already. I have started to conduct a fully comprehensive review of the application and is very close to approval. However, as you mentioned, the proposed surface water discharge from site, that is proposed to connect to the public foul sewer, is going to be stumbling block at current.

I appreciate you have been in contact with Southern Water future planning, albeit with no positive progression emphasised by yourself, and that they have declined any surface water to enter the foul sewer in situ.

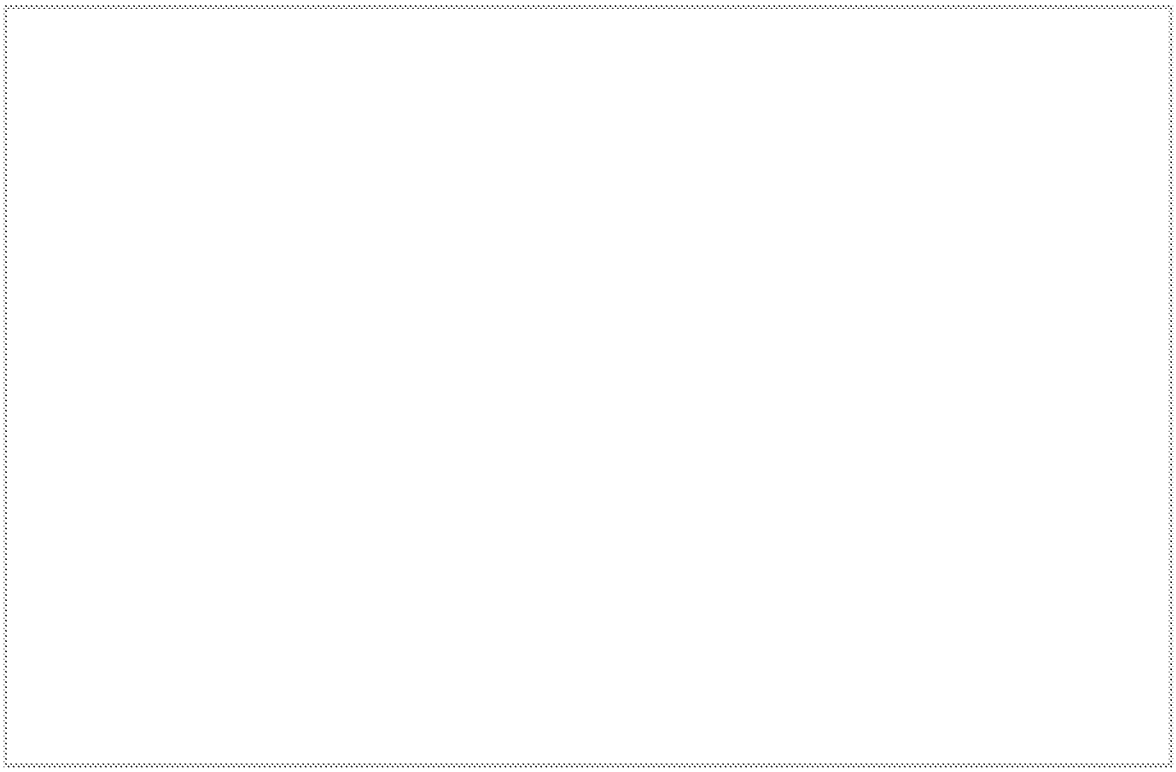
Therefore, I had booked a meeting with my manager this morning and walked him through the whole site, our past conversations, and your in depth exploration of each point of the part H3 of the building regulations. I have since completed a summary of your explorations in surface water discharge and have spoken about this in depth during the meeting.

First of all, thank you for submitting all the documentation requested with your S106 application as this has been really useful to use to explore alternatives. My manager is very familiar with the area of Yapton and the vast issues with drainage in and around sites in that area. For context, due to the sheer impact of rainfall in the area yearly, a vast amount of expenditure is sourced to cover the costs of multiple tankers who help decrease the demand in the area every winter time year on year. In addition, Southern Water have to fund the expenditure of layering new roads due to issues in the area. I completely appreciate that this isn't 'your' responsibility or possible 'concern' but wanted to highlight the impact in that area at current for the local community.

I have reviewed all submitted tests for the site kindly uploaded by yourself and can agree that high levels of groundwater in the area is present and it that prevents the use of alternative methods of infiltration. For context, when my manager and I explored the groundwater summary he knew exactly the issues present without looking at the figures.

My planning colleague stated that we would not accept any surface water into the foul sewer on 09/12/24. However we want to try and work with you to try and overcome this barrier.

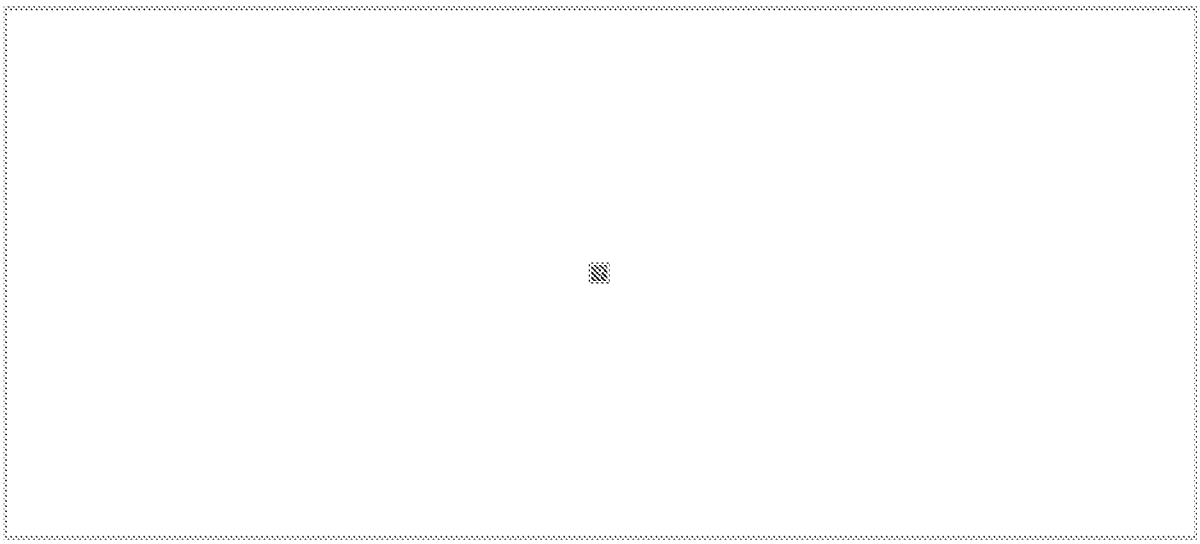
On exploring alternatives, we note that there is a relatively new development that has been constructed behind the site, named 'Paddock View'. The site seems to of been constructed by 'Dandara Homes' and has an entry to the site near 1 Pear Tree Close. On reviewing land registry, it seems to confirm that the land of that site, and the site that the barns are situated, are owned by the same person? Please see below snippet of the site described which I have highlighted in red border:



Can you explore if:

a) If the owner of the land for Stakers Farm and the site behind is owned by the same person,
and
b) if they have constructed a private surface water sewer throughout the site

This may be option to explore to see if it may be feasible to connect the farm's site surface water discharge to the site behind. I have listed below the contact details for the offices for the site, and also note a sales office may even be present on the site itself. Once explored, this will be further evidence to demonstrate every alternative method of discharge has been explored.



Contact Us | Dandara

Dandara South East
Courier House
80-84 Calverley Road
Tunbridge Wells
Kent
TN1 2UN
[redacted]

Southern
Dandara Southern
Roman House
South Hampshire Industrial Park
Southampton
SO40 3SA
[redacted]

Could you also advise me on the exact works taking place to the barns itself, is there any increase in roof surface area to the existing and is there any extra flows to be prosed to enter the foul sewer than the existing? With this information I can explain more clearly in meetings exactly what is taking place there.

In addition, have you also considered an option to craft and construct a new watercourse on the same land as the barns to act as a discharge option (pond / ditch etc)? This may entice the owner of the site as multiple sites around the land maybe interested in connecting their own surface water into it for a monetary cost.

To confirm, everything else is in order and have been technically checked and reviewed by myself. We are just at the hurdle of surface water discharge. To confirm, although the site is now a betterment of what was there before, due to the local issues within the foul sewers for thw area as a whole, connecting surface water to this is going to be incredibly difficult to approve.

I look forward to hearing from you via email or via the portal in due course to update me on how you have progressed with the above. IF exploration of the above has progressed matters, I will look to book a further meeting with my planning team and my management to formulate a plan moving forward.

Kindest regards,

Dale

Dale Hughes
Technical Coordinator
Waste Water
Developer Services

T. 0330 303 0119
southernwater.co.uk

From: Sewerconnections <[redacted]
Sent: Tuesday, December 10, 2024 11:30 AM
To: Stuart Magowan <[redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Good Morning Stuart,

I hope you are well and sorry that issues on site have caused frustration recently.

I attempted to call your office today but unfortunately you were not in the office at the time so I gave a brief summary to one of your colleagues. She agreed she would pass on information explained on the call but I confirmed I would send you an email also.

Thank you for taking the time to engage with our planning team regarding the Stakers Farm, Yapton site.

Like I stated before, I am part of the S106 sewer connections team and my role is to technically review sites with the aim to approve, S106 applications. I also work closely with our planning colleagues as we have an agreed approach to limit and minimize any surface water that is proposed to enter public foul sewer networks.

I note in the below email chain that planning have stated they are to refuse any surface water entering the local foul sewer near to the site.

I also note that you are offering a reduction on a 1 year return period rainfall event from 17ls (existing site) to 1.15l/s redeveloped site and significantly better therefore on greater return periods.

My advice is when submitting the S106 application onto the Get Connected Portal, please upload all documentation and evidence which details your obvious exploration of the Part H3 of the building regulations. I can then assess the efforts on your part to explore, in depth, each part of the Part H3 before proposals to connect to the public foul sewer network. I can only speak on behalf of my team and our

current policies, and with that, we do sometimes look at sites in isolation when it comes to surface water discharge. Once all documentation is received, I can look to liaise with both the planning team and my manager to explore any alternatives. If no alternatives present, then there may be scope to explore connections to the public sewers. However, this would need to be heavily based on evidence provided by yourselves that details efforts in exploring alternative solutions. To start this exploration, I would advise to reduce the flow to 1.0L/S or under as a starting point.

When submitting the application for the above site, please attach this email chain as part of the documentation, and also state my name, being aware of thew current site. This will then allow my colleagues who would initially receive the S106 application to communicate with me at an early stage and will prevent repeated responses to you that you have already had.

In summary, i am not saying that connection to the foul regarding your discharge of surface water is acceptable or not, I am merely stating that exploration our side can be done if you have clearly explored the part H3 of the building regulations.

I intend to assist you wherever I can and want to support you in progressing the S106 application in due course with as little disruption as possible.

If you need anything else, or any further questions please do not hesitate in connecting me or the team.

Kindest regards,

Dale

Dale Hughes
Technical Coordinator
Waste Water
Developer Services

[redacted]

southernwater.co.uk

From: Stuart Magowan <[redacted]
Sent: Monday, December 9, 2024 1:26 PM
To: Sewerconnections[redacted]
Cc: CEP | Reception <[redacted]
Subject: FW: 23452 Stakers Farm, Yapton

Attn Dale Hughes

Hi Dale

I am hitting brick wall with your Planning Team, please see email chain and report attached.

This site has an existing surface water connection to the foul sewer, high groundwater precludes soakage, no watercourses, there is a highway drain but Highways note it floods and the site has no right of connection (highways also refused a surface connection to their highway drain for the site next door). We are proposing a reduction on a 1 year return period rainfall event from 17ls (existing site) to 1.15l/s redeveloped site and significantly better therefore on greater return periods.

I have tried to engage with the Southern Water Planning Team to gauge if the betterment is acceptable, which I thought would be welcomed as it improves the system over the do nothing scenario, but appear to have hit a wall.

Could you give me a call this afternoon on 01273 424424, as I would like a brief run through.

Regards

Stuart

Stuart Magowan

[redacted]

Our office will be closing at 5pm on Friday 20 December and will re-open at 8.30am on Monday 6 January 2025.
As an ISO 9001 : 2015 certified company, we invite you to reply to this email with any feedback (positive or negative) that you would like to share. Any response will be reviewed by the directors and quality assurance department.

From: Southern Water Planning <[redacted]
Sent: 09 December 2024 12:01
To: Stuart Magowan <[redacted]
Cc: CEP | Reception <[redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Good Afternoon Stuart,

We will not accept a surface waste connection to the foul sewer.

Water companies are under immense pressure to eliminate storm overflows; hence our surface water management policy.

'The Environment Act 2021 also places a legally binding duty on water companies to progressively reduce the adverse impacts of discharges from storm overflows. Work is underway to reduce reliance on these systems, and by 2025, water companies will have reduced storm overflow discharges from 2020 levels by around 25%. (DEFRA, Storm Overflows Discharge Reduction Plan 2023). We need to work differently to achieve these targets. Our focus is on getting rainwater and groundwater out of our sewers so more wastewater can stay in.'

Also, it would appear based on the drainage statement that an element of your surface water discharge relates to non-domestic, i.e., road, this is something that highways need to cater to. I note you say that contact has already been made with them; however, maintenance issues are not a valid excuse to us; it is something you need to take up with them and request they need to upgrade their network.

I am also concerned about the operational issues this could cause the local community, i.e., flooding, and it would be Southern Water that would be ultimately responsible for this.
Please look to discharge your surface water elsewhere.

We are supported by Ofwat, our regulator, to deny these types of queries.

Kind Regards

Rachael Powys-Keck
Future Growth Planner, South East Region
[redacted]

From: Stuart Magowan <[redacted]
Sent: Tuesday, December 3, 2024 11:48 AM
To: Southern Water Planning <[redacted]

Cc: CEP | Reception <[redacted]>; Dunn, Graham <[redacted]>
Subject: RE: 23452 Stakers Farm, Yapton

Hi Rachel

Thank you for your email, I have been through the Surface Water Management policy v03and whilst I note your comments on the privately owned drainage systems, West Sussex Highways who own the highway drainage have no plans to upgrade their system to remove flooding and the developer has no right of connection to that sewer or realistic chance West Sussex Highways will allow a connection given the correspondence on the issue to date.

I also note that the Southern Water Policy Document v03 does not appear to align with current legislation. The site is in a sewered area and Southern Water are the Statutory Undertaker and Under S106 of Water Industries Act 1991 the site has a right of communication with the public sewer.

106 Right to communicate with public sewers.

(1)(1)Subject to the provisions of this section—

(a)the owner or occupier of any premises, or

(b)the owner of any private sewer which drains premises,

shall be entitled to have his drains or sewer communicate with the public sewer of any sewerage undertaker and thereby to discharge foul water and surface water from those premises or that private sewer.]

I understand that there is further caveat that permission is required for surface water to discharge to a foul sewer but this provision is only where there are already separate foul and surface water sewers.

In Yapton, where the site is located there are only foul water sewers and the site does already have an unrestricted surface water connection to the public foul sewer, the proposals seek to significantly reduce the flow of surface water from the site to the Public Foul Sewer as set out in the Drainage Statement, this is only possible if planning for the site is achieved. With a scheme the site will continue to discharge unrestricted surface water to the public foul sewer.

My understanding is that as the site had exhausted the other options and are proposing significant betterment then Southern Water would consider the scheme and were likely to be supportive given the reduction in peak flow to the foul networks and betterment proposed.

Is the position that Southern Water would rather continue to receive the unrestricted surface water flow than accept the betterment proposed?

Regards

Stuart

Stuart Magowan
[redacted]

From: Southern Water Planning <[redacted]
Sent: 03 December 2024 11:13
To: Stuart Magowan [redacted]
Cc: CEP | Reception [redacted]
Subject: RE: 23452 Stakers Farm, Yapton

Good Morning Stuart,

Thank you for your email and for reaching out to us to discuss your surface water proposal.

You would need to go through the H3 hierarchy for surface water which can be found here : Microsoft Word - Surface Water Management Policy v0.3

As you will see under section 5 of the policy, council or privately owned drainage systems comes as a priority before we would consider a connection, and their issues of flooding is something they would be required to address themselves.

I am sorry this is not the news you were wanting to hear, but due to reasons set out in the policy, Southern Water needs to reduce and remove surface water connections to the public foul sewers to relieve the system from being overwhelmed.

Kind Regards

Rachael Powys-Keck
Future Growth Planner, South East Region
[redacted]

From: Stuart Magowan [redacted]
Sent: Tuesday, November 26, 2024 12:03 PM
To: Southern Water Planning [redacted]
Cc: CEP | Reception [redacted]
Subject: 23452 Stakers Farm, Yapton

You don't often get email from [redacted]. Learn why this is important

Hi Southern Water Planning team

We are working on a project at Stakers Farm Yapton. The project had planning permission which has lapsed and is to be resubmitted.

The proposed development is to convert the existing barns to three residential dwellings.

We are seeking your comment on the proposal for surface water and foul water disposal to reuse the existing connection to the public foul water sewer but to restrict the discharge to provide betterment for all storm events up to and including the 100 year plus 45% Climate Change event.

The attached Drainge Statement details the investigation into the options following the Drainage Hierarchy site as follows:

- Winter groundwater levels are 200mm below ground precluding infiltration to ground
- The nearest watercourse is 550m to the southwest and there is no viable connection for a development of 3 dwellings.
- There are no surface or combined sewers in the vicinity of the site (Yapton).
- We have confirmed with the Highway Authority that their highway drainage is subject to regular flooding and any connection would increase local flooding.

The report includes CCTV of the existing on site surface water system which has proven a connection to the existing public foul sewer and includes calculations confirming a rate of discharge for a 1-year rainfall event of 17.9l/s from the drained areas.

It is proposed a peak discharge to the public foul sewer of 1.14l/s made up of a peak discharge of 1l/s surface water and 0.14l/s of foul water during a 100 year plus 45% Climate Change event.

We are therefore proposing a betterment in peak discharge for a 1 year rainfall event and significant betterment for all storm events up to and including the 100 year plus 45% Climate Change Event from the scheme proposals when compared to the existing and do nothing scenario.

We would be grateful if you would confirm that Southern Water would be supportive of this proposed reduction in discharge to the public foul sewer from the proposed scheme and would support the proposed Planning Application to achieve this betterment to the public foul sewer system.

If you have any queries or if I can be of any assistance please do not hesitate to contact me.

Regards

Stuart

Stuart Magowan

[redacted]

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Appendix 10

Draft Drainage Maintenance and Management Schedule

Draft Drainage Maintenance and Management Schedule

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA
[redacted]

Project	**Stakers Farm, 3 Dwelling Barn Conversions**
Project Number	**23452**
By	Stuart Magowan
Date	30 October 2024

1 Introduction

1.1 This draft Drainge Management and Maintenance Schedule has been prepared as the initial draft of the Document that will become the Drainage Maintenance and Management Manual.

1.2 The Drainage Maintenance and Management 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 This is a live document and will be added to through the final design, construction and handed over to the Management company on completion where it will be used to guide and record the maintenance and management of the site surface water SuDS system.

2 The Site Sustainable Urban Drainage System (SuDS)

2.1 Overview

2.1.1 The SuDS system for this development collects surface water from the roofs, access, hardstanding and parking areas and provides storage within a voided stone layer below the hardstanding and parking areas.

2.1.2 The discharge from the site is restricted to a maximum of 1litre per second for all storm events up to a 100 year return period event with a 45% increase to allow for the future affects of climate change.

2.2 How the system functions

2.2.1 The hardstanding and parking areas are proposed as permeable gravel restraint system with voided stone beneath, this is typically referred to as a permeable paving system. The voided stone is lined to prevent any groundwater ingress to the voided stone layer and ensure the storage volume is available for rainfall events.

2.2.2 The surface water falling on the permeable area is filtered through the gravel and permeable membrane into the voided stone layer beneath.

2.2.3 Surface water falling on the roofs is collected in the gutters and channelled to rainwater pipes which convey the water to ground level and into catchpits. The catchpits trap silt and debris and provide a point of access for maintenance. The catchpits are connected to distribution tanks located within the voided stone beneath the hardstanding and parking areas.

2.2.4 The distribution tanks provide a large surface area for water to be filtered into the voided stone storage area beneath the hardstanding and parking areas.

2.2.5 Fin drains, a permeable pipe system located within the voided stone, collect the surface water at the east of the hardstanding and parking area and a 150mm diameter drain conveys the collected surface water to a hydrobrake manhole which restricts the discharge from the system to a maximum of 1l/s. From the hydrobrake manhole the surface water is conveyed through a section of further private drainage pipework and manhole to a connection with the lateral public sewer connection manhole in the entrance to the site.

2.2.6 The permeable paving system provides filtration and water quality improvement to the surface water ensuring that at the point of discharge the surface water has received suitable mitigation against the low risk of pollution from the site use.

2.2.7 A plan detailing the proposed drainage system is attached to the rear of this schedule.

3 Schedule of Maintenance

3.1 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.

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

3.3 Upon completion the Principal Contractor will collate the data sheets, operation and maintenance details of all materials and components used in the construction of the site drainage system and they will be incorporated into this document.

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

3.5 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 Residents.

3.6 Maintenance of individual property drainage connections is the responsibility of the individual property owners.

3.7 There are three categories of maintenance activities:

- **Regular maintenance** consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
- **Occasional maintenance** comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example). The table below summarises the likely maintenance activities required for each SUDS component and specific maintenance activities is given in the following sections.
- **Remedial maintenance** comprises 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. Remedial maintenance items can comprise items such as:
    - inlet/outlet repairs
    - reinstatement or realignment of edgings, or other erosion control
    - infiltration surface rehabilitation
    - construction stage sediment removal (although this activity should have been undertaken before the maintenance contract)

3.8 The following maintenance schedule details the 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 and after leaf fall in autumn
	Remove sediment and debris from silt trap chambers and manholes	6 monthly
	Rake gravel surface	6 monthly
	Inspect hydrobrake flow control manholes and clear any debris	6 monthly
	Visual inspection of permeable paving / gravel restraint system for defects and settlement	Annually
	Surface and foul water pipework – jetting / rodding	Every 2 years or as required
Corrective Maintenance	Remove debris / nuisance plant growth	As required
	Repairs to access chambers / manhole covers	As required

Maintenance Schedule	Required Action	Frequency
	Replace any broken section of the gravel restraint system, remedial works to any depressions or rutting	As required
Monitoring	Inspect catchpits and note the rate sediment has accumulated	Monthly in the first year and then annually

Indicative Schedule of Maintenance for the Proposed Drainage System

Component	Inspection Frequency					
	1 Month	3 Months	6 Months	1 Year	After leaf fall in Autumn	2 Years
Gutters		✓			✓	
Catchpits	✓				✓	
Surface and Foul Water Pipework						✓
Permeable Paving				✓		
Flow Controls			✓			

Inspection Frequency Summary

4 Regular Maintenance Procedures

4.1 It is recommended the Management Company employ a suitably qualified company to undertake the maintenance works on site for all shared drainage. The following procedures provide a guide to the two most common maintenance items, jetting and silt removal, to be undertaken on site.

4.2 Jetting

4.2.1 Equipment Required:

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

4.2.2 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 length is cleaned
- Monitor the process to avoid any damage to the pipe structure.
- Collect dislodged silt and debris at the downstream end using a vacuum or manual removal

4.3 Silt Removal and Disposal

4.3.1 Equipment Required:

- Vacuum truck or manual removal tools

- Containers for temporary storage of silt and debris

4.3.2 Typical Procedure:

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

5 Financing

5.1 The regular maintenance of all private drainage, channels, gutters, rainwater pipes and connections will be the responsibility of the individual property owners.

5.2 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 Residents.

6 Health and Safety

6.1 Designers Residual Risks

6.1.1 There are no significant residual risks associated with the construction of the propose 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.

6.2 Construction Phase

6.2.1 The Principal Contractor will undertake a construction Phase Health and Safety Plan for the site.

6.2.2 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.

7 Design Life

7.1 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.

7.2 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.

8 Emergency Plan

8.1 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

8.2 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

8.3 Emergency Contact Information

8.3.1	Management Company	TBC
8.3.2	Maintenance Team	TBC

9 Appended Documents

Drainage Management Plan

Approved Drainage Drawings and Construction Details (to be added once approved)

Pre Handover Inspection Checklist (to provided by Principal Contractor)

Maintenance Checklist (to provided by Principal Contractor at handover)

Maintenance Record Pro Forma (to provided by Principal Contractor at handover)

Drainage Legend:

- Existing Foul Sewer

Private Drainage

- Storm Water Drainage
- Storm Water Rodding Eye
- Foul Water Drainage
- Foul Water Inspection Chamber

Private Drainage to be maintained by the estates company

- Storm Water Drainage
- Storm Water Inspection Chamber
- Storm Water Catchpit
- Storm Water Diffuser tanks
- Voided subbase for attenuation and filtration 955m³
- Fin Drain from voided subbase
- Hydrobrake Reference: CTL-SHE-0064-2000-1250-2000
- Non return Valve
- Foul Water Drainage
- Foul Water Inspection Chamber
- Site boundary
- Adjacent Site in client ownership

Surface Finishes Legend:

- Block paving. Impermeable with falls to landscaping areas
- Permeable paving with voided subbase beneath.

Note:
Surface finishes are shown for illustrative purposes only.
See architect's design and details

NOTES:

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5. All pipes, bends and junctions shall be vitrified clay to BS EN 295-1, with flexible joints and kitemark certified. Alternatively all pipes and fittings can be UPVC conforming to BS EN 1401-1 and shall be laid in accordance with the manufacturers specification. If UPVC pipes are to be used then the manufacturer shall be approved by the Engineer prior to construction.

6. All Adoptable sewers shall be in strict accordance with the current edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.

7. All private building drainage shall be constructed in strict accordance with BS EN 752:1996. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.

8. Where the service trench is near to the foundation of any building, refer to the guidance in Approved Document H, Building Regulations Part H1.

9. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.

10. In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreboard or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.

11. All svps shall have rodding access plates fitted at their bases (ground floor level).

12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

REV	DATE	INT	DESCRIPTION	CHK

Issue Status: FOR APPROVAL

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA
01273 424404
reception@cep.co.uk
www.cep.co.uk

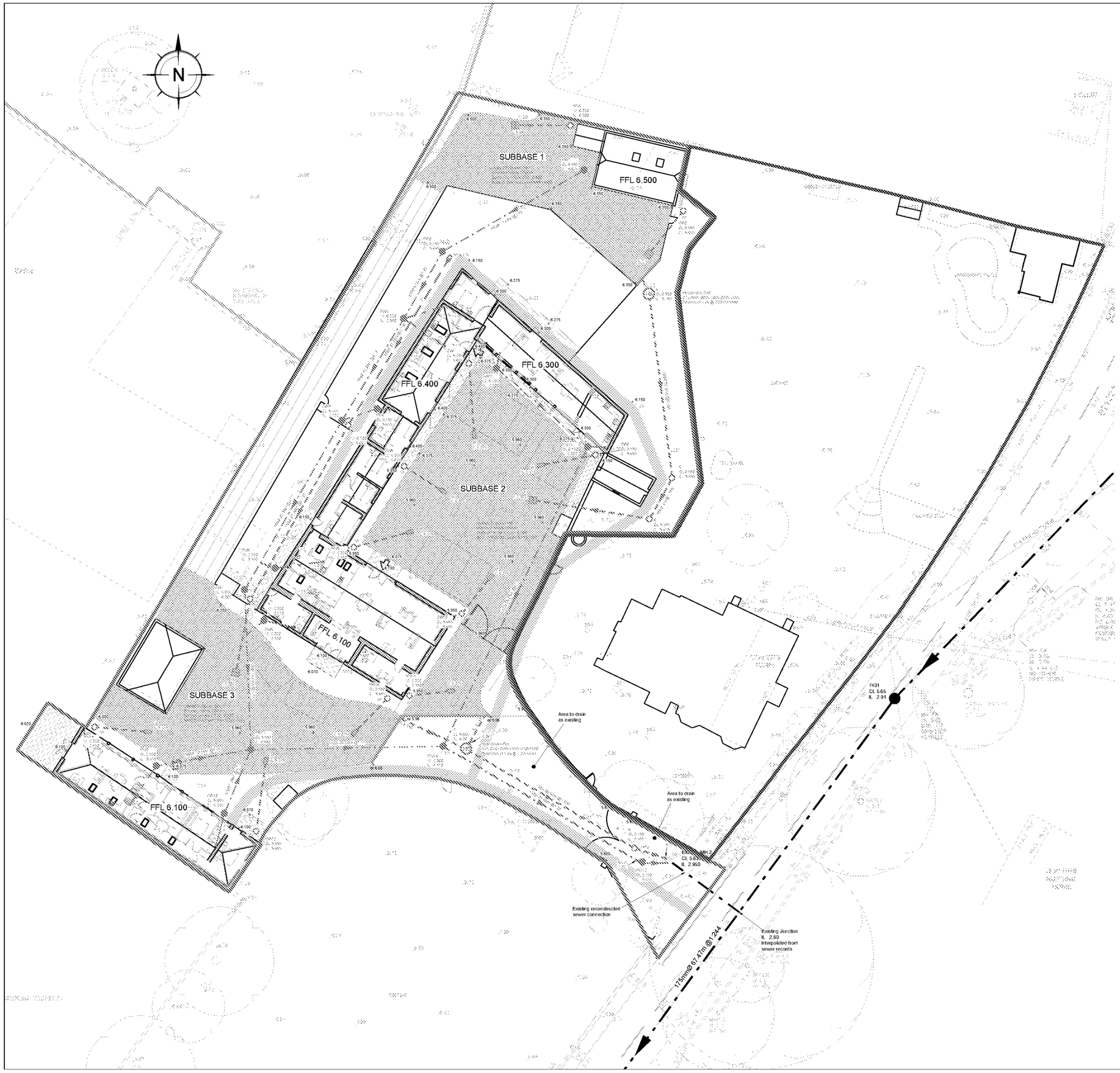
CLIENT: Granite Gate Ltd

PROJECT: Stakers Farm, North End Road, Yapton

TITLE: Proposed Drainage Management Plan

DRAWN	DATE	PROJECT NO
M Pacifico	Feb 2021	2345
ENGINEER	CHECKED	
S Magowan		
SCALE	DRG No	REV
1:200 @ A1	202	-

ARUN DISTRICT COUNCIL Y/15/25/PL



Drainage Legend:

- Existing Foul Sewer
- Storm Water Drainage
- Storm Water Rodding Eye
- Storm Water Inspection Chamber
- Storm Water Catchpit
- Storm Water Diffuser tanks
- Voided subbase for attenuation and filtration
- Fin Drain from voided subbase
- Hydrobrake with Reference:
- Non return Valve
- Foul Water Drainage
- Foul Water Inspection Chamber

Surface Finishes Legend:

- Block paving. Impermeable with falls to landscaping areas
- Permeable paving with voided subbase beneath.

Note:
Surface finishes are shown for illustrative purposes only.
See architect's design and details

Other Legend:

- Site Boundary
- Adjacent Site in client ownership
- Service Trench

NOTES:

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11. All svps shall have rodding access plates fitted at their bases (ground floor level).

12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

REV	DATE	INT	DESCRIPTION	CHK
C	01.11.24	MJP	Updated with enlarged viewport	SRM
B	01.06.23	PR	Hydrobrake references updated.	KH
A	03.11.22	PR	New site layout added. Drainage updated to suit.	KH

Issue Status FOR APPROVAL

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

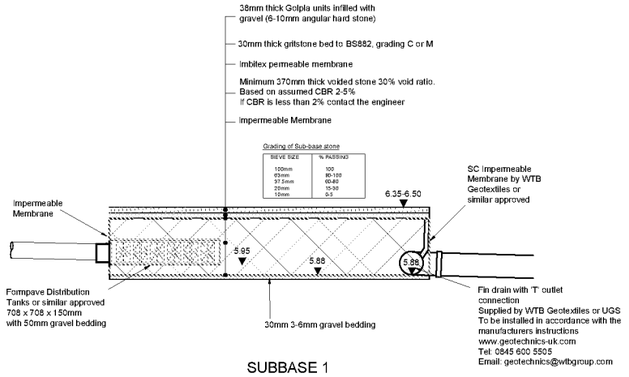
CLIENT: Granite Gate Ltd

PROJECT: Stakers Farm, North End Road, Yapton

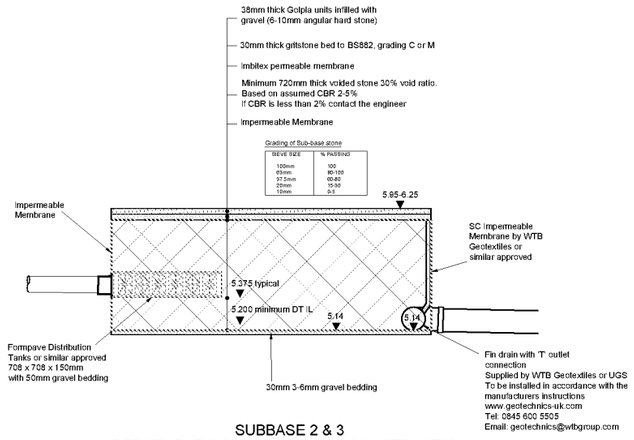
TITLE: Proposed Drainage and Levels Layout Plan

DRAWN	DATE	PROJECT NO.
M Pacifico	Feb 2021	2345
ENGINEER	CHECKED	DRG. No. / REV.
S Magowan		201 C
SCALE		
1:200 @ A1		

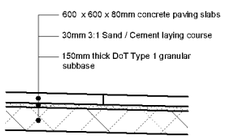
ARUN DISTRICT COUNCIL Y/125/PL



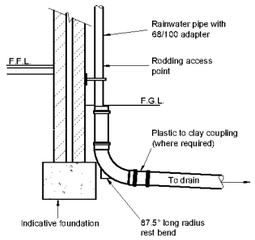
SUBBASE 1
PERMEABLE GOLPA DRIVEWAY CONSTRUCTION
(Scale 1:20)



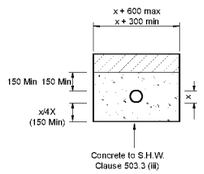
SUBBASE 2 & 3
PERMEABLE GOLPA DRIVEWAY CONSTRUCTION
(Scale 1:20)



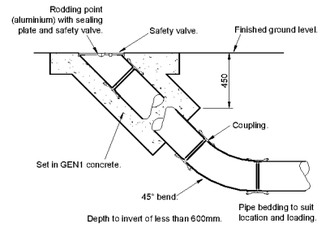
PAVING SLAB FOOTPATH
CONSTRUCTION DETAIL
(Scale 1:20)



TYPICAL RAINWATER PIPE DETAIL
(Scale 1:25)



CLASS Z PIPE BEDDING
PIPE BEDDING DETAILS
(Not To Scale)



DETAIL OF RODDING EYE
(Scale 1:25)

NOTES:

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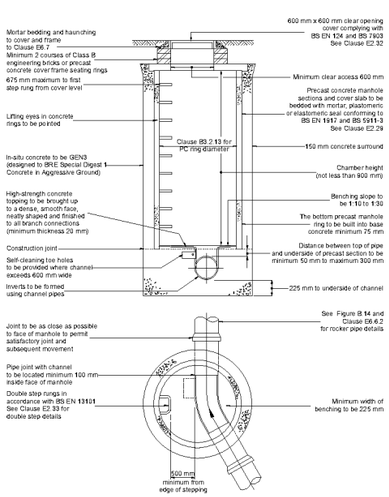
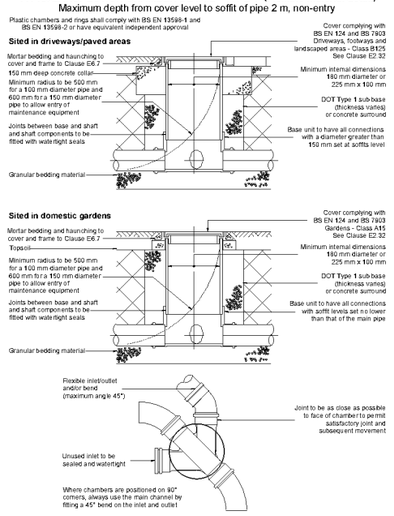
FIGURE B.12
TYPICAL MANHOLE DETAIL - TYPE 2
Maximum depth from cover level to soffit of pipe 3.0 m



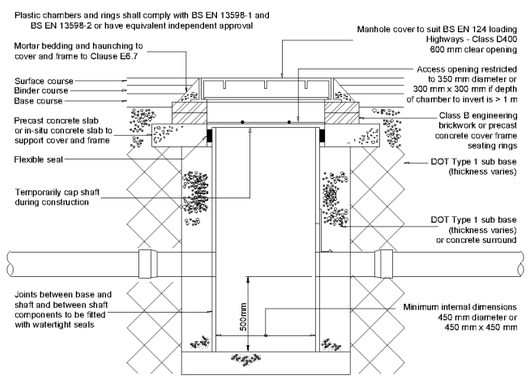
Not to scale

FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry



Note: Where the access chamber is in the highway the Highway Authority can have specific requirements
Not to scale

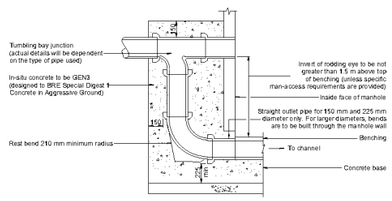
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry

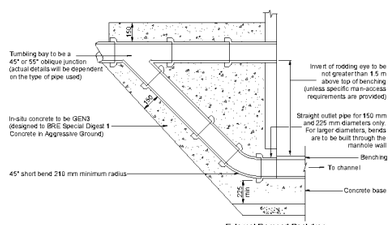


Not to scale

CATCHPIT CHAMBER
500mm SUMP
(Scale 1:20)

FIGURE B.15
TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL
Note: Steeper gradients are preferred to the use of backdrops.
Type of backdrop to be used to be agreed with Undertaker.





Not to scale, dimensions in millimetres

REV	DATE	INT	DESCRIPTION	CHK
C	01.11.24	MJP	Updated subbase depth and stone	SRM
B	09.11.22	PR	Hydrobrake Schedule added.	KH
A	03.11.22	PR	Permeable detail updated. Block paving detail added.	KH

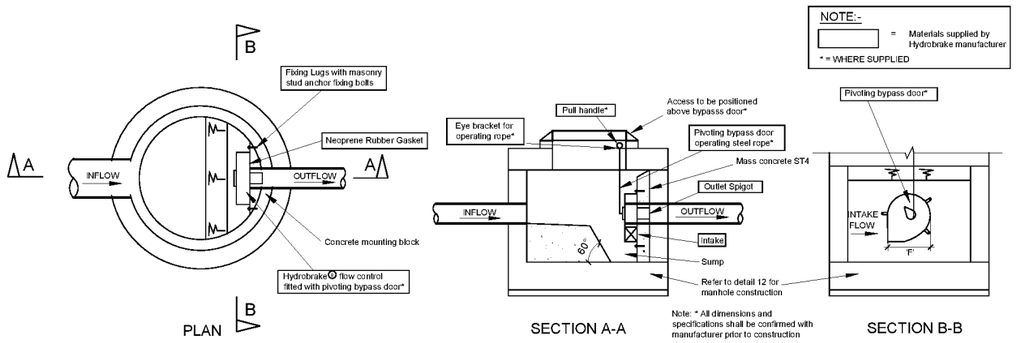
Issue Status: FOR APPROVAL

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA

CLIENT: Granite Gate Ltd
PROJECT: Stakers Farm, North End Road, Yapton
TITLE: Proposed Construction Details

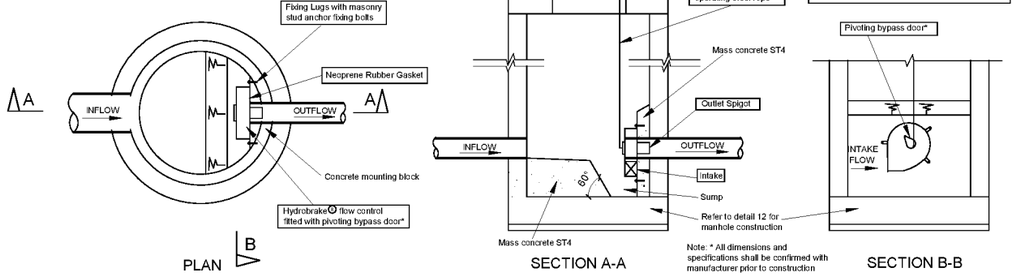
DRAWN	DATE	PROJECT NO
M Pacifico	Feb 2021	2345
ENGINEER	CHECKED	
S Magowan		
SCALE	DRG. No	REV
As Shown@A1	501	C

ARUN DISTRICT COUNCIL Y/15/25/PL



Hydrobrake Schedule							
MH Ref	CL	IL	Base	Dia	Cover Grade	Cover Opening	Ref	Discharge l/s
4	6.500	5.750	5.250	1.000	B125	1.22 x 0.685 Multiple Ductile Iron	CTL-SHE-0050-1000-0750-1000	1 l/s

MANHOLE 4
WITH HYDROBRAKE
(Scale 1:25)



Hydrobrake Schedule								
MH Ref	CL	IL	Base	Dia	Cover Grade	Cover Opening	Ref	Discharge l/s
7	5.890	4.540	4.040	1.000	B125	1.22 x 0.685 Multiple Ductile Iron	CTL-SHE-0045-1000-1200-1000	1 l/s

MANHOLE 7
WITH HYDROBRAKE
(Scale 1:25)

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REV	DATE	INT	DESCRIPTION	CHK

Issue Status: FOR APPROVAL

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA

CLIENT: Granite Gate Ltd

PROJECT: Stakers Farm, North End Road, Yapton

TITLE: Proposed Construction Details

DRAWN	DATE	PROJECT NO.
M Pacifico	Nov 2024	23452
ENGINEER	CHECKED	DRG No. / REV.
S Magowan		502
SCALE		
As Shown@A1		

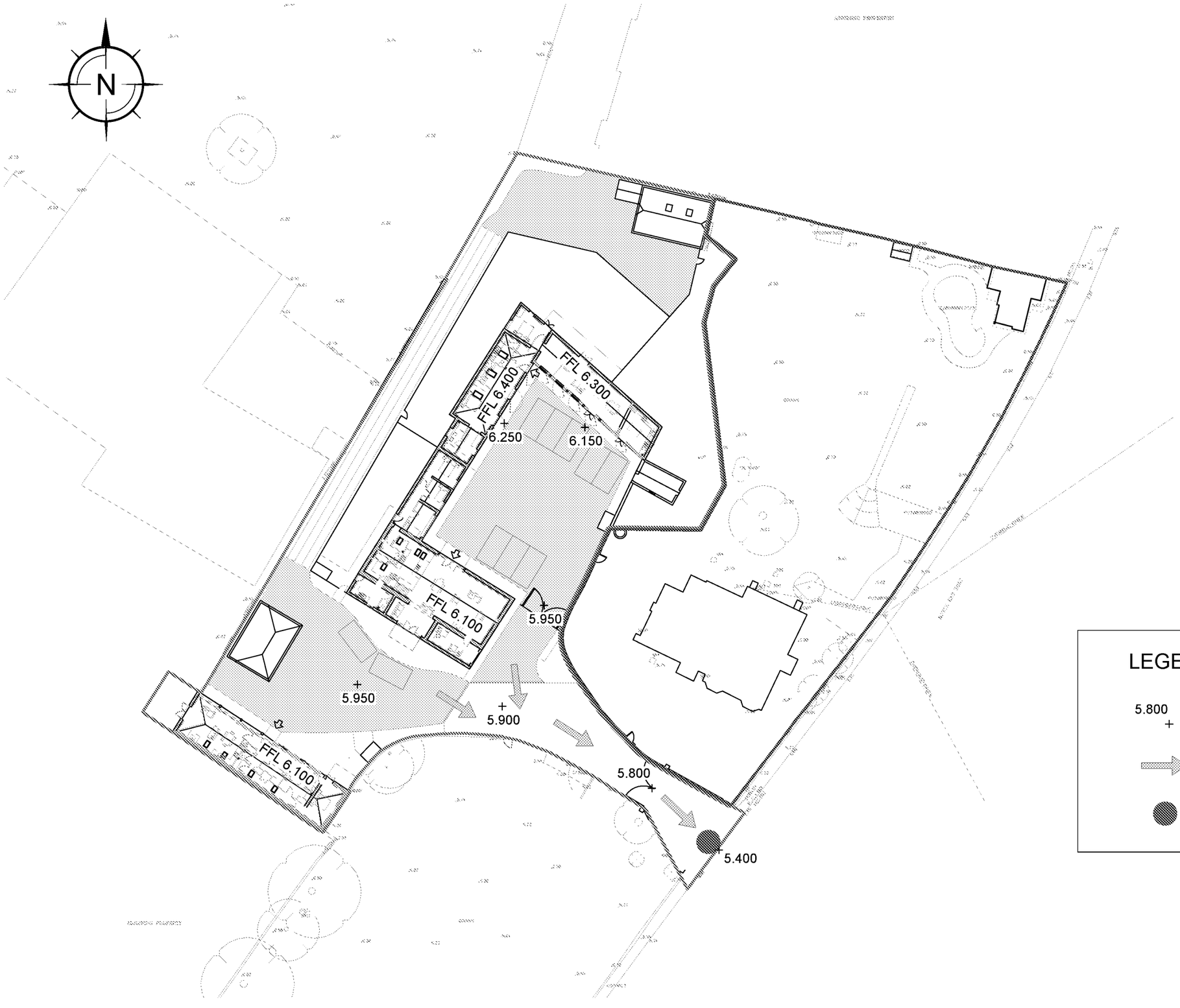
APUN DISTRICT COUNCIL Y/15/25/PL

Appendix 11

Existing and Proposed Exceedance Route Plans

TITLE
Existing Exceedance Flow Route Plan

SCALE	PROJECT. No.
1:500 @ A3	23452
REPORT TYPE	DRG. No.
DS	07 -



LEGEND

5.800 + Proposed Spot Levels

Exceedance Flow Route

Site Low Points

-5m 0 5 10 15 20m

Scale 1:500

TITLE
Proposed Exceedance Flow Route Plan

SCALE	PROJECT. No.
1:500 @ A3	23452
REPORT TYPE	DRG. No.
DS	08 -

ARUN DISTRICT COUNCIL Y/15/25/PL