



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



Drainage Statement and Management Strategy

Proposed Residential Development at

23018 Bonham's Field, Yapton

On behalf of

Seaward Properties Limited

June 2020

Document History and Status

Project Number 23018

Date	Version	Prepared By	Reviewed By	Approved By
30 May 2019	Draft 1.0	Steve Doughty Director	Stuart Magowan IE ng MIC E	Stuart Magowan IE ng MIC E
31 May 2019	1.1	Steve Doughty Director	Stuart Magowan IE ng MIC E	Stuart Magowan IE ng MIC E
6 J une 2019	1.2	Steve Doughty Director	Stuart Magowan IE ng MIC E	Stuart Magowan IE ng MIC E
17 J une 2019	1.3	Steve Doughty Director	Stuart Magowan IE ng MIC E	Stuart Magowan IE ng MIC E
20 April 2020	1.4	Martin Kempshall C Eng MIC E	Stuart Magowan IE ng MIC E	Stuart Magowan IE ng MIC E
26 J une 2020	1.5	Martin Kempshall C Eng MIC E	Steve Doughty Director	Stuart Magowan IE ng MIC E

This document has been prepared in accordance with the scope of services for The Civil Engineering Practice's appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of The Civil Engineering Practice's client. The Civil Engineering Practice accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of The Civil Engineering Practice.

Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. In preparing this document, information and advice may have been sought from third parties. The Civil Engineering Practice cannot be held liable for the accuracy of third party information.

The information contained within this report takes precedence over that contained within any previous version.



CONTENTS

1	Non Technical Summary	1
2	Planning Policy Context.....	2
2.1	National Planning Policy Framework.....	2
3	Existing Site.....	3
3.1	Site Location.....	3
3.2	Site Description.....	3
3.3	Existing Drainage.....	4
3.4	Geology and Groundwater.....	5
4	Development Proposals	6
4.1	Description.....	6
4.2	Detailed Surface Water Drainage Design.....	6
4.3	Water Quality	8
4.4	Foul Water	9
5	Maintenance During Construction	10
6	Conclusions	11
7	List of Appendices, Images and Tables	12

1 Non Technical Summary

- 1.1 This Drainage Statement has been undertaken in accordance with the National Planning Policy Framework on behalf of Seaward Properties Limited in support of a Reserved Matters Submission to discharge conditions 11, 12, 14 and 16 of Outline Planning Permission Y/1/17/OUT for the construction of 56 residential dwellings with associated access roads, car parking and landscaping on the northeast side of the B2233 Yapton Road, Yapton, West Sussex.
- 1.2 The proposed development will incorporate a sustainable drainage system which will discharge surface water by infiltration to ground via an infiltration blanket and provide sufficient onsite storage for all storm return periods up to and including the 1:100 year rainfall event with a 40% allowance for climate change.
- 1.3 Foul drainage will be discharged by gravity to the existing public foul sewer located beneath the B2233 Yapton Road to the southwest of the site.
- 1.4 A suitable maintenance plan will be implemented by the developer to ensure that maintenance of the foul and surface water drainage systems in shared ownership is passed on to a suitably qualified Management Company appointed by the developer on behalf of the residents.

2 Planning Policy Context

2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework was updated in February 2019.

2.1.2 With regard to major developments the NPPF states that :major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

- a) take account of advice from the lead local flood authority;
- b) have appropriate proposed minimum operational standards;
- c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- d) where possible, provide multifunctional benefits ~

2.1.3 Major development is defined as follows:

:For housing, development where 10 or more homes will be provided, or the site has an area of 0.5 hectares or more. For non-residential development it means additional floorspace of 1,000m² or more, or a site of 1 hectare or more, or as otherwise provided in the Town and Country Planning (Development Management Procedure) (England) Order 2015. ~

3 Existing Site

3.1 Site Location

- 3.1.1 The development site is located on the northeast side of the B2233 Yapton Road, Yapton, West Sussex at Ordnance Survey reference SU 975 034. The nearest postcode is BN18 0DX.



Image 1: Site Location

- 3.1.2 The site is bounded to the north by agricultural farm land, the east and west by existing residential dwellings and the southeast by the B2233 Yapton Road.

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

3.2 Site Description

- 3.2.1 The site is approximately 3.2ha in area and currently comprises undeveloped agricultural land.

- 3.2.2 The site is relatively level with existing ground levels generally ranging between 6.5m and 6 m AOD falling at the southwest site boundary to approximately 4.5m AOD at its boundary with the B2233 Yapton Road.

- 3.2.3 There are no public sewers crossing the site and Southern Water's sewer records do not identify any surface water sewers in the immediate vicinity.

- 3.2.4 A copy of the existing site layout plan is located in Appendix 2 at the rear of this report.

3.3 Existing Drainage

- 3.3.1 The site currently has no positive surface water or foul water drainage infrastructure.
- 3.3.2 Rainfall on the site currently discharges in part to ground and in part overland as a greenfield runoff.
- 3.3.3 There are no watercourses adjoining the site boundaries.
- 3.3.4 The existing greenfield runoff rate has been established using the HR Wallingford tool for Greenfield runoff estimation.
- 3.3.5 Q_{bar} has been established at 6.2l/s and the 1:100 year peak runoff 19.9l/s.
- 3.3.6 The equivalent greenfield runoff rates are 2l/s/ha and 6.2l/s/ha respectively.



HR Wallingford
Working with water

Greenfield runoff estimation for sites

www.uniscalls.com | Greenfield runoff tool

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are needed to meet normal best practice criteria in line with Environment Agency guidance. 'Preliminary' rainfall runoff management for developments' (EN-598007 R111 rev. 2, 2011) and the 'Safe' Manual, C183 (ENR, 2015). This information is for greenfield runoff rates only and is not to be used for setting consent for the drainage of surface water runoff from roads.

Site coordinates

Latitude:

Longitude:

Reference:

Date:

Methodology	R1124
Site characteristics	
Total site area (ha)	3.2
Methodology	
Over estimation method	Calculate from SPR and SAAR
SPR estimation method	Calculate from SCL type
	Default Edited
SCL type	2 2
HOIST class	---
SPR/SPR-HOIST	11.3 6.9
Hydrological characteristics	
	Default Edited
SAAR (mm)	741 741
Hydrological region	7 7
Growth curve factor: 1 year	0.85 0.85
Growth curve factor: 30 year	2.3 2.3
Growth curve factor: 100 year	3.19 3.19

Notes:

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

Normally limiting discharge rates which are less than 2.0 l/s/ha are set at 2.0 l/s/ha.

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

(3) Is $SPR/SPR-HOIST < 0.39$?

Where ground-water levels are low enough the use of soakaways to avoid discharge offsite may be a requirement for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{bar} (l/s)	6.23	6.23
1 in 1 year (l/s)	5.5	5.5
1 in 30 years (l/s)	14.34	14.34
1 in 100 years (l/s)	19.89	19.89

Image 2: Greenfield Runoff Calculation

3.3.7 There are public foul water sewers located beneath the B2233 Yapton Road to the southwest of the site.

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

3.4 Geology and Groundwater

3.4.1 British Geological Survey maps and borehole information identify the site being located within an area underlain by Superficial River Terrace Deposits (a clayey Sand layer) overlying Lewes Nodular Chalk.

3.4.2 A site specific Site Investigation was undertaken by Tweedie Evans Consulting in September 2016 with additional investigations in April 2018 and October 2019.

3.4.3 Soakage testing in September 2016 was undertaken to BRE365 and generally recorded favourable soakage rates in the order of $3 \times 10^{-5} \text{m/s}$.

3.4.4 The worst case infiltration rate recorded in September 2016 was $9.16 \times 10^{-6} \text{m/s}$ and suggested within the Site Investigation an indicative localised infiltration rate equivalent to $3.65 \times 10^{-6} \text{m/s}$.

3.4.5 Further site wide testing was completed in October 2019 which confirmed infiltration test results of between $1.95 \times 10^{-6} \text{m/s}$ and $9.16 \times 10^{-6} \text{m/s}$.

3.4.6 Groundwater was encountered at a depth of 3m below ground level during the October 2019 testing. Subsequent monitoring undertaken between October 2019 and March 2020 confirmed groundwater at a highest level of 0.95m below ground level in the southeast corner of the site.

3.4.7 The online 'Magic Map' available from Defra confirms that the site is located above a major aquifer classified as having an intermediate vulnerability.

3.4.8 Extracts from the Site Investigation reports are located in Appendix 4 at the rear of this report.

4 Development Proposals

4.1 Description

4.1.1 The construction of 56 residential dwellings with associated access roads, car parking and landscaping.

4.2 Detailed Surface Water Drainage Design.

4.2.1 Based on the site investigation and infiltration testing undertaken in accordance with the principles of BRE365 a system for discharge of surface water by infiltration to ground has been designed.

4.2.2 The impermeable areas for the site are as follows:

- ¿ 5,000m² roof area

- ¿ 7,385m² parking, private drives and highways

4.2.3 The total impermeable area of the site is 12,385m²

4.2.4 All surface water runoff from the roofs, private access roads, driveways and parking areas will be discharged via rainwater diffusers units into voided subbase infiltration blankets located beneath the onsite roads and driveways.

4.2.5 Sufficient storage is provided to accommodate a 1:100 year storm event with an additional 40% to account for the predicted effects of future climate change.

4.2.6 All rainwater diffuser units will have upstream catch pits to reduce the potential for siltation of the units.

4.2.7 The drainage has been separated into eight catchments. The infiltration rates used in the design are based on the nearest infiltration test from the soakage tests, which are as follows:

Catchment	Test Location Used	Infiltration Rate
A	TP01	3.6×10^{-6} m/s
B	TP01	3.6×10^{-6} m/s
C	TP01	3.6×10^{-6} m/s
D	TP03	2.0×10^{-6} m/s
E	TP05	4.1×10^{-6} m/s
F	TP06	6.7×10^{-6} m/s
G	TP09	9.3×10^{-6} m/s
H	TP07	2.5×10^{-6} m/s

Table 1: Infiltration Test Results

4.2.8 Given the consistency of infiltration test results across the site the test result from TP04 is anticipated to be an anomaly and the test result from TP05 has been used in catchment C.

4.2.9 Surface water storage requirements for each catchment is as follows:

- ¿ Catchment A comprises 105m² of impermeable area discharging to 105m³ of voided subbase. A minimum subbase thickness of 191mm is required equating to 5.5m³ of storage, a minimum 14.2m³ is to be provided.
- ¿ Catchment B comprises 294m² of impermeable area discharging to 157m³ of voided subbase. A minimum subbase thickness of 351mm is required equating to 16.8m³ of storage, a minimum 21.2m³ is to be provided.
- ¿ Catchment C comprises 426m² of impermeable area discharging to 241m³ of voided subbase. A minimum subbase thickness of 332mm is required equating to 23.9m³ of storage, a minimum 32.5m³ is to be provided.
- ¿ Catchment D comprises 4,041m² of impermeable area discharging to 1,585m³ of voided subbase. A minimum subbase thickness of 570mm is required with 273.2m³ of storage being provided.
- ¿ Catchment E comprises 2,310m² of impermeable area discharging to 1,690m³ of voided subbase. A minimum subbase thickness of 230mm is required equating to 117.1m³ of storage, a minimum 228m³ is to be provided.

- ¿ Catchment F comprises 1,899m² of impermeable area discharging to 972m³ of voided subbase. A minimum subbase thickness of 315mm is required equating to 90.7m³ of storage, a minimum 131m³ is to be provided.
- ¿ Catchment G comprises 1,400m² of impermeable area discharging to 784m³ of voided subbase. A minimum subbase thickness of 250mm is required equating to 58.4m³ of storage, a minimum 105m³ is to be provided.
- ¿ Catchment H comprises 1,909m² of impermeable area discharging to 981m³ of voided subbase. A minimum subbase thickness of 395mm is required equating to 117.2m³ of storage, a minimum 132m³ is to be provided.

4.2.10 Assumed CBR values of 2%-5% require a minimum voided subbase thickness of 450mm which will be provided beneath all parking areas, access roads and driveways. Catchment D will have a deeper voided subbase to ensure sufficient surface water attenuation.

4.2.11 The maximum construction depth of the subbase formation level is 900mm below ground level. The winter groundwater monitoring confirms this will ensure that an unsaturated zone is maintained between the infiltration surface and the maximum recorded groundwater level.

4.2.12 Proposed Site Drainage Layout, Maintenance Plans and microdrainage calculations are located in Appendix 5 at the rear of this report.

4.3 Water Quality

4.3.1 The proposed development is for residential use. In accordance with CIRIA SuDS Manual 2015 (Report C753), the pollution hazard level for this type of development is between very low and low.

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

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

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car park, low-traffic roads	Low	0.5	0.4	0.4

Table 2: Pollution Hazard Indices

4.3.4 Where multiple drainage components are used in series the individual mitigation index of secondary and tertiary components is lowered by 50% due to reduced performance associated with primary treatment.

SuDS Type	Total suspended solids (TSS)	Metals	Hydro-carbons
Permeable pavement	0.7	0.6	0.7
Soakaway with 300mm minimum depth underlying soil drainage media	0.4	0.4	0.4

Table 3: Pollution Mitigation Indices

4.3.5 The proposed use of permeable paving will meet the target treatment level required for runoff with very low to low risk of pollution hazard thus demonstrating that the surface water drainage system for the site can be designed to adequately mitigate against the risk of pollution.

4.4 Foul Water

4.4.1 The anticipated peak foul water discharge from the site is 3l/s in accordance with Sewers for Adoption requirements.

4.4.2 Foul drainage will be discharged by gravity to the existing public foul sewer located beneath the B2233 Yapton Road to the southwest of the site.

5 Maintenance During Construction

- 5.1 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.
- 5.2 Should hardstanding areas be constructed prior to the completion of the proposed surface water scheme any overland flow will be temporarily channelled into localised soakaways wherever viable. Appropriate water quality mitigation in accordance with CIRIA Report C532 will be provided. This approach allows for surface water to be attenuated and sediments captured during the construction phase.
- 5.3 The permeable subbase layer will be constructed and then covered with a sacrificial layer of geotextile overlaid by 100mm thick compacted voided stone or similarly approved hardcore for use as a temporary road surface. The sacrificial stone and geotextile will be removed and discarded at the end of the main construction period prior to the laying course and paver surface being laid.
- 5.4 The Contractor will maintain the proposed drainage system during construction and until the site is handed over to the private Management Company.

6 Conclusions

- 6.1 The geology of the area is suitable to provide an infiltration drainage system.
- 6.2 Calculations confirm that surface water runoff generated by the proposed development can be discharged to ground via a voided subbase infiltration blanket located beneath the roads and driveways sized with sufficient depth to accommodate a 1:100 year storm event with an additional 40% to account for the predicted effects of future climate change.
- 6.3 Water quality improvement will be provided to mitigate against any risk to any receiving waterbody.
- 6.4 Foul drainage will be discharged by gravity to the existing public foul sewer located beneath the B2233 Yapton Road to the southwest of the site.
- 6.5 Upon completion the maintenance of the shared drainage systems incorporating the below highway infiltration drainage blanket and shared foul drainage infrastructure will be passed on to a suitably qualified Management Company appointed by the developer on behalf of the residents.
- 6.6 In the event that the Management Company becomes unable to discharge its duties within two years of first occupation the developer will endeavour to appoint an alternative on behalf of the residents.
- 6.7 The development proposals are suitable at this location.

7 List of Appendices, Images and Tables

Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout Plan
Appendix 3	Sewer Records
Appendix 4	Site Investigation and Winter groundwater Monitoring Extracts
Appendix 5	Proposed Site Drainage Layout, Maintenance Plans and Calculations

Image 1 Site Location

Image 2 Greenfield Runoff Calculation

Table 1 Infiltration Test Results

Table 2 Pollution Hazard Indices

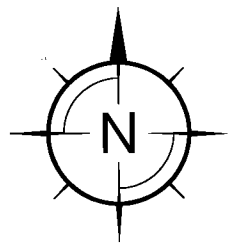
Table 3 Pollution Mitigation Indices

Appendix 1

Site Location Plan

Appendix 2

Existing Site Layout Plan



TITLE Existing Site Layout Plan			
SCALE 1:1000 @ A3		PROJECT No. 23018	
REPORT TYPE FRA		DRG. No. 2	

Appendix 3

Sewer Records



Node	Cover	Invert	Size	Material	Shape		Node	Cover	Invert	Size	Material	Shape
0001X	8.32	6.31	150	VC	CIRC	*	9101X	6.61	3.01	350	PF	CIRC
0001X	5.9	4.02	175	VC	CIRC	*	9102X	3.22	-0.06	350	PF	CIRC
0001X	6.06	3.61	225	VC	CIRC	*	9301X	5.53	4.18	175	VC	CIRC
0002X	5.83	3.49	225	VC	CIRC	*	9302X	5.56	4.18	175	VC	CIRC
0002X	6.96	4.79	150	VC	CIRC	*	9303X	5.54	4.08	175	VC	CIRC
0002X	5.93	3.76	175	VC	CIRC	*	9402X	6.999	5.79	150	VC	CIRC
0003X			150	VC	CIRC		9502X	6.938	5.057	150	VC	CIRC
0004X			150	VC	CIRC		9505X	7.037		150	VC	CIRC
0101X	6.13	2.98	350	PF	CIRC		9601X	6.25	3.98	175	VC	CIRC
0301X	5.67	4.49	175	VC	CIRC		9603X	6.298		175	VC	CIRC
0401X	5.92	4.58	150	VC	CIRC		9801X	6.27	4.77	175	VC	CIRC
0402X	5.8	5.03	150	VC	CIRC		9901X	6.27	4.85	175	VC	CIRC
0403X	6.32	5.24	150	VC	CIRC		9902X	6.13	4.56	175	VC	CIRC
0404X	6.46	5.42	150	VC	CIRC							
0405X	6.55	5.38	150	VC	CIRC							
0406X	6.72	5.55	150	VC	CIRC							
0407X	7.03	5.69	150	VC	CIRC							
0408X	6.82	5.6	150	VC	CIRC							
0501X	5.89	4.78	175	VC	CIRC							
0502X	5.86	4.41	175	VC	CIRC							
0503X	5.99		175	VC	CIRC							
0504X	6.05	4.53	175	VC	CIRC							
0801X	5.38	3.93	175	VC	CIRC	*						
0801X	6.25	4.12	225	VC	CIRC	*						
0802X	7.44	4.75	175	VC	CIRC	*						
0802X	4.67	3.24	175	VC	CIRC	*						
0803X	7.4	4.64	175	VC	CIRC							
0804X	7.47	4.43	175	VC	CIRC							
0901X	6.53	3.91	225	VC	CIRC	*						
0901X	5.39	3.49	150	VC	CIRC	*						
0902X	6.5	3.9	225	VC	CIRC							
0903X	6.23	3.79	225	VC	CIRC							
1001X	5.78	4.38	150	VC	CIRC	*						
1001X	5.73	3.46	350	PF	CIRC	*						
1002X	6.88	3.85	150	VC	CIRC							
1003X	6.53	3.87	175	VC	CIRC							
1004X	7.13	6.1	150	VC	CIRC							
1005X	6.414	3.974	150	VC	CIRC							
1008X	6.06	4.145	150	VC	CIRC							
1007X	6.96	4.445	150	VC	CIRC							
1101X	6.908	4.753	150	VC	CIRC	*						
1101X	5.91	3.61	175	VC	CIRC	*						
1102X			150	VC	CIRC							
1103X	6.887	4.987	150	VC	CIRC							
1104X			150	VC	CIRC							
1105X			150	VC	CIRC							
1201X			150	VC	CIRC							
1401X	6.39	5.24	175	VC	CIRC							
1501X	6.45	4.65	175	VC	CIRC							
1502X	6.39	4.58	175	VC	CIRC							
1701X	5.34	2.61	175	VC	CIRC							
1801X	4.84	3	175	VC	CIRC							
1802X	7.14	5	175	VC	CIRC							
180DX			175	VC	CIRC							
1901X	7.23	6.16	150	VC	CIRC							
1902X	7.12	5.95	150	VC	CIRC							
1903X	7.31	5.78	150	VC	CIRC							
1904X	7.11	5.92	150	VC	CIRC							
2001X	6.59	4.81	175	VC	CIRC							
2002X	6.82	4.02	175	VC	CIRC							
2003X	6.78		175	VC	CIRC							
2101X	6.5	5.36	175	VC	CIRC							
2102X	6.092	4.332	150	VC	CIRC							
2103X		4.551	150	VC	CIRC							
2104X	6.684	4.669	150	VC	CIRC							
2105X			150	VC	CIRC							
2106X			150	VC	CIRC							
2402X			150	VC	CIRC							
2405X	6.453	5.647	UNK	UNK	CIRC							
2601X	4.42	2.1	175	VC	CIRC							
2701X	4.91	2.31	175	VC	CIRC							
2801X	7.02	5.74	150	VC	CIRC							
2802X	6.67	5.54	175	VC	CIRC							
2803X	7.06	5.33	175	VC	CIRC							
2901X	6.91	6.02	150	VC	CIRC							
2902X	6.99	5.66	150	VC	CIRC							
3001X	7.06	4.28	175	VC	CIRC							
3002X	6.98	4.99	150	VC	CIRC							
3003X	6.92	5.15	150	VC	CIRC							
3005X	7.02		150	VC	CIRC							
3006X			UNK	UNK	CIRC							
3007X			UNK	UNK	CIRC							
3008X			UNK	UNK	CIRC							
3401X	3.95	1.25	350	PF	CIRC							
3501X	3.02	1.08	350	PF	CIRC							
3502X	2.58	0.9	350	PF	CIRC							
3601X	3.96	2.11	175	VC	CIRC							
3602X	3.14	0.74	350	PF	CIRC							
3604X	3.19	0.86	150	VC	CIRC							
3605Y	3.15		225	VC	CIRC	*						
3605X	3.15		225	VC	CIRC	*						
3606X	3.42		150	VC	CIRC							
360PX	3.42	3.41	300	BAC	CIRC							
3701X	5	3.44	150	VC	CIRC							
3901X	7.06	4.38	175	VC	CIRC							
4301X	4.78	1.72	350	PF	CIRC							
4401X	4.49	1.27	350	PF	CIRC							
4601X	4.46	2.99	150	VC	CIRC							
4901X	6.58	4.6	175	VC	CIRC							
5101X	6.35	2.81	150	VC	CIRC							
5102X	6.42	3.06	150	VC	CIRC							
5301X	4.63	2.12	350	PF	CIRC							
5302X	4.86	2.04	350	PF	CIRC							
5303X	5.39	1.81	350	PF	CIRC							
5304X	5.33	1.81	350	PF	CIRC							
5305X	5.32	1.96	350	PF	CIRC							

Appendix 4

Site Investigation Extracts

materials, CBR values of <2.5% would be recommended for preliminary design purposes where road formation is proven to be within made ground.

- 10.5.5 It should be noted that all road formations should be proof rolled and soft spots removed and replaced with selected granular fill and, where adoptable, a pavement of sufficient thickness to prevent the penetration of frost should be employed.

10.6 Excavations

- 10.6.1 Excavation of the materials immediately beneath the site should be achievable using conventional excavation plant.
- 10.6.2 Based on observations made during intrusive site investigations, groundwater ingress unlikely to pose an issue within excavations on site. Therefore, dewatering works are considered unlikely during the excavation works.
- 10.6.3 Where excavations extend beyond 1.2m depth and are within soils, it is recommended that appropriate shoring/temporary works is used i.e. in accordance with current Health and Safety requirements where access for personnel is required.

10.7 Protection of Buried Concrete

- 10.7.1 The results of the water soluble sulphate and pH testing carried out for the made ground and natural ground materials indicate that in accordance with BRE Special Digest 1 (2005), the natural ground materials encountered on site generally yield an Aggressive Chemical Environment for Concrete (ACEC) of AC-1 requiring a Design Sulphate Class of DS-1.

10.8 Drainage

- 10.8.1 Soakage testing was undertaken in two locations on site (TP1/SA1 and TP2/SA2), in general accordance with BRE 365, within the natural ground materials comprising gravelly sandy clay and sandy gravelly clay respectively. The full data sheet is provided in Appendix I.
- 10.8.2 TP1 (SA1) failed to drain during the test period (i.e. to 75% effective water depth). Notwithstanding this, extrapolation of the data suggests indicative infiltration rate of 3.65×10^{-6} within this location.
- 10.8.3 TP2 (SA2) drained fully (i.e. to >75% effective water depth) during the 3No. tests undertaken within this location. As a result, an infiltration rate has been calculated based on the methodology described in BRE365, with indicative infiltration rates of between 3.02×10^{-5} and 6.75×10^{-5} m/s calculated for this location.
- 10.8.4 A summary of the calculated infiltration rates for all soakage tests carried out at the site is presented in Table 10.3.

Table 10.3: Summary of Soakage Test Data

Location	Test 1	Test 2	Test 3
TP01/SA1	9.16×10^{-6}	-	-
TP02/SA2	3.08×10^{-5}	2.92×10^{-5}	2.97×10^{-5}

- 10.8.5 Based on the soakage test data collated to date, it is considered that the more granular underlying ground materials encountered may provide a suitable drainage medium, should suitable and sufficient attenuation be available. It is recommended that an

Trial Pit Soakage Test Summary Sheet

BRE Digest 365 (2007) Soakaway Design

Site	Bonhams Field, Yapton
Test Pit Reference	TP2/SA2
Site Reference	1008913/001
Client	Seaward Properties Ltd
Operator	TEC
Test Date	8th September 2016

Test 1

Time (min)	Depth (mm bgl)
0	1500
10	1450
20	1400
30	1350
40	1300
50	1250
60	1200
70	1150
80	1100
90	1050
100	1000
110	950
120	900
130	850
140	800
150	750
160	700
170	650
180	600
190	550
200	500
210	450
220	400
230	350
240	300
250	250
260	200
270	150
280	100
290	50
300	0

Test 2

Time (min)	Depth (mm bgl)
0	1500
10	1450
20	1400
30	1350
40	1300
50	1250
60	1200
70	1150
80	1100
90	1050
100	1000
110	950
120	900
130	850
140	800
150	750
160	700
170	650
180	600
190	550
200	500
210	450
220	400
230	350
240	300
250	250
260	200
270	150
280	100
290	50
300	0

Test 3

Time (min)	Depth (mm bgl)
0	1500
10	1450
20	1400
30	1350
40	1300
50	1250
60	1200
70	1150
80	1100
90	1050
100	1000
110	950
120	900
130	850
140	800
150	750
160	700
170	650
180	600
190	550
200	500
210	450
220	400
230	350
240	300
250	250
260	200
270	150
280	100
290	50
300	0

Ground Conditions / Comments

1. Topsoil (0-100mm) dark brown, silty and grey at 100mm.

2. Subsoil (100-150mm) dark brown, silty and grey at 150mm.

3. Subsoil (150-200mm) dark brown, silty and grey at 200mm.

4. Subsoil (200-250mm) dark brown, silty and grey at 250mm.

5. Subsoil (250-300mm) dark brown, silty and grey at 300mm.

6. Subsoil (300-350mm) dark brown, silty and grey at 350mm.

7. Subsoil (350-400mm) dark brown, silty and grey at 400mm.

8. Subsoil (400-450mm) dark brown, silty and grey at 450mm.

9. Subsoil (450-500mm) dark brown, silty and grey at 500mm.

10. Subsoil (500-550mm) dark brown, silty and grey at 550mm.

11. Subsoil (550-600mm) dark brown, silty and grey at 600mm.

12. Subsoil (600-650mm) dark brown, silty and grey at 650mm.

13. Subsoil (650-700mm) dark brown, silty and grey at 700mm.

14. Subsoil (700-750mm) dark brown, silty and grey at 750mm.

15. Subsoil (750-800mm) dark brown, silty and grey at 800mm.

16. Subsoil (800-850mm) dark brown, silty and grey at 850mm.

17. Subsoil (850-900mm) dark brown, silty and grey at 900mm.

18. Subsoil (900-950mm) dark brown, silty and grey at 950mm.

19. Subsoil (950-1000mm) dark brown, silty and grey at 1000mm.

20. Subsoil (1000-1050mm) dark brown, silty and grey at 1050mm.

21. Subsoil (1050-1100mm) dark brown, silty and grey at 1100mm.

22. Subsoil (1100-1150mm) dark brown, silty and grey at 1150mm.

23. Subsoil (1150-1200mm) dark brown, silty and grey at 1200mm.

24. Subsoil (1200-1250mm) dark brown, silty and grey at 1250mm.

25. Subsoil (1250-1300mm) dark brown, silty and grey at 1300mm.

26. Subsoil (1300-1350mm) dark brown, silty and grey at 1350mm.

27. Subsoil (1350-1400mm) dark brown, silty and grey at 1400mm.

28. Subsoil (1400-1450mm) dark brown, silty and grey at 1450mm.

29. Subsoil (1450-1500mm) dark brown, silty and grey at 1500mm.

30. Subsoil (1500-1550mm) dark brown, silty and grey at 1550mm.

31. Subsoil (1550-1600mm) dark brown, silty and grey at 1600mm.

32. Subsoil (1600-1650mm) dark brown, silty and grey at 1650mm.

33. Subsoil (1650-1700mm) dark brown, silty and grey at 1700mm.

34. Subsoil (1700-1750mm) dark brown, silty and grey at 1750mm.

35. Subsoil (1750-1800mm) dark brown, silty and grey at 1800mm.

36. Subsoil (1800-1850mm) dark brown, silty and grey at 1850mm.

37. Subsoil (1850-1900mm) dark brown, silty and grey at 1900mm.

38. Subsoil (1900-1950mm) dark brown, silty and grey at 1950mm.

39. Subsoil (1950-2000mm) dark brown, silty and grey at 2000mm.

40. Subsoil (2000-2050mm) dark brown, silty and grey at 2050mm.

41. Subsoil (2050-2100mm) dark brown, silty and grey at 2100mm.

42. Subsoil (2100-2150mm) dark brown, silty and grey at 2150mm.

43. Subsoil (2150-2200mm) dark brown, silty and grey at 2200mm.

44. Subsoil (2200-2250mm) dark brown, silty and grey at 2250mm.

45. Subsoil (2250-2300mm) dark brown, silty and grey at 2300mm.

46. Subsoil (2300-2350mm) dark brown, silty and grey at 2350mm.

47. Subsoil (2350-2400mm) dark brown, silty and grey at 2400mm.

48. Subsoil (2400-2450mm) dark brown, silty and grey at 2450mm.

49. Subsoil (2450-2500mm) dark brown, silty and grey at 2500mm.

50. Subsoil (2500-2550mm) dark brown, silty and grey at 2550mm.

51. Subsoil (2550-2600mm) dark brown, silty and grey at 2600mm.

52. Subsoil (2600-2650mm) dark brown, silty and grey at 2650mm.

53. Subsoil (2650-2700mm) dark brown, silty and grey at 2700mm.

54. Subsoil (2700-2750mm) dark brown, silty and grey at 2750mm.

55. Subsoil (2750-2800mm) dark brown, silty and grey at 2800mm.

56. Subsoil (2800-2850mm) dark brown, silty and grey at 2850mm.

57. Subsoil (2850-2900mm) dark brown, silty and grey at 2900mm.

58. Subsoil (2900-2950mm) dark brown, silty and grey at 2950mm.

59. Subsoil (2950-3000mm) dark brown, silty and grey at 3000mm.

60. Subsoil (3000-3050mm) dark brown, silty and grey at 3050mm.

61. Subsoil (3050-3100mm) dark brown, silty and grey at 3100mm.

62. Subsoil (3100-3150mm) dark brown, silty and grey at 3150mm.

63. Subsoil (3150-3200mm) dark brown, silty and grey at 3200mm.

64. Subsoil (3200-3250mm) dark brown, silty and grey at 3250mm.

65. Subsoil (3250-3300mm) dark brown, silty and grey at 3300mm.

66. Subsoil (3300-3350mm) dark brown, silty and grey at 3350mm.

67. Subsoil (3350-3400mm) dark brown, silty and grey at 3400mm.

68. Subsoil (3400-3450mm) dark brown, silty and grey at 3450mm.

69. Subsoil (3450-3500mm) dark brown, silty and grey at 3500mm.

70. Subsoil (3500-3550mm) dark brown, silty and grey at 3550mm.

71. Subsoil (3550-3600mm) dark brown, silty and grey at 3600mm.

72. Subsoil (3600-3650mm) dark brown, silty and grey at 3650mm.

73. Subsoil (3650-3700mm) dark brown, silty and grey at 3700mm.

74. Subsoil (3700-3750mm) dark brown, silty and grey at 3750mm.

75. Subsoil (3750-3800mm) dark brown, silty and grey at 3800mm.

76. Subsoil (3800-3850mm) dark brown, silty and grey at 3850mm.

77. Subsoil (3850-3900mm) dark brown, silty and grey at 3900mm.

78. Subsoil (3900-3950mm) dark brown, silty and grey at 3950mm.

79. Subsoil (3950-4000mm) dark brown, silty and grey at 4000mm.

80. Subsoil (4000-4050mm) dark brown, silty and grey at 4050mm.

81. Subsoil (4050-4100mm) dark brown, silty and grey at 4100mm.

82. Subsoil (4100-4150mm) dark brown, silty and grey at 4150mm.

83. Subsoil (4150-4200mm) dark brown, silty and grey at 4200mm.

84. Subsoil (4200-4250mm) dark brown, silty and grey at 4250mm.

85. Subsoil (4250-4300mm) dark brown, silty and grey at 4300mm.

86. Subsoil (4300-4350mm) dark brown, silty and grey at 4350mm.

87. Subsoil (4350-4400mm) dark brown, silty and grey at 4400mm.

88. Subsoil (4400-4450mm) dark brown, silty and grey at 4450mm.

89. Subsoil (4450-4500mm) dark brown, silty and grey at 4500mm.

90. Subsoil (4500-4550mm) dark brown, silty and grey at 4550mm.

91. Subsoil (4550-4600mm) dark brown, silty and grey at 4600mm.

92. Subsoil (4600-4650mm) dark brown, silty and grey at 4650mm.

93. Subsoil (4650-4700mm) dark brown, silty and grey at 4700mm.

94. Subsoil (4700-4750mm) dark brown, silty and grey at 4750mm.

95. Subsoil (4750-4800mm) dark brown, silty and grey at 4800mm.

96. Subsoil (4800-4850mm) dark brown, silty and grey at 4850mm.

97. Subsoil (4850-4900mm) dark brown, silty and grey at 4900mm.

98. Subsoil (4900-4950mm) dark brown, silty and grey at 4950mm.

99. Subsoil (4950-5000mm) dark brown, silty and grey at 5000mm.

100. Subsoil (5000-5050mm) dark brown, silty and grey at 5050mm.

101. Subsoil (5050-5100mm) dark brown, silty and grey at 5100mm.

102. Subsoil (5100-5150mm) dark brown, silty and grey at 5150mm.

103. Subsoil (5150-5200mm) dark brown, silty and grey at 5200mm.

104. Subsoil (5200-5250mm) dark brown, silty and grey at 5250mm.

105. Subsoil (5250-5300mm) dark brown, silty and grey at 5300mm.

106. Subsoil (5300-5350mm) dark brown, silty and grey at 5350mm.

107. Subsoil (5350-5400mm) dark brown, silty and grey at 5400mm.

108. Subsoil (5400-5450mm) dark brown, silty and grey at 5450mm.

109. Subsoil (5450-5500mm) dark brown, silty and grey at 5500mm.

110. Subsoil (5500-5550mm) dark brown, silty and grey at 5550mm.

111. Subsoil (5550-5600mm) dark brown, silty and grey at 5600mm.

112. Subsoil (5600-5650mm) dark brown, silty and grey at 5650mm.

113. Subsoil (5650-5700mm) dark brown, silty and grey at 5700mm.

114. Subsoil (5700-5750mm) dark brown, silty and grey at 5750mm.

115. Subsoil (5750-5800mm) dark brown, silty and grey at 5800mm.

116. Subsoil (5800-5850mm) dark brown, silty and grey at 5850mm.

117. Subsoil (5850-5900mm) dark brown, silty and grey at 5900mm.

118. Subsoil (5900-5950mm) dark brown, silty and grey at 5950mm.

119. Subsoil (5950-6000mm) dark brown, silty and grey at 6000mm.

120. Subsoil (6000-6050mm) dark brown, silty and grey at 6050mm.

121. Subsoil (6050-6100mm) dark brown, silty and grey at 6100mm.

122. Subsoil (6100-6150mm) dark brown, silty and grey at 6150mm.

123. Subsoil (6150-6200mm) dark brown, silty and grey at 6200mm.

124. Subsoil (6200-6250mm) dark brown, silty and grey at 6250mm.

125. Subsoil (6250-6300mm) dark brown, silty and grey at 6300mm.

126. Subsoil (6300-6350mm) dark brown, silty and grey at 6350mm.

127. Subsoil (6350-6400mm) dark brown, silty and grey at 6400mm.

128. Subsoil (6400-6450mm) dark brown, silty and grey at 6450mm.

129. Subsoil (6450-6500mm) dark brown, silty and grey at 6500mm.

130. Subsoil (6500-6550mm) dark brown, silty and grey at 6550mm.

131. Subsoil (6550-6600mm) dark brown, silty and grey at 6600mm.

132. Subsoil (6600-6650mm) dark brown, silty and grey at 6650mm.

133. Subsoil (6650-6700mm) dark brown, silty and grey at 6700mm.

134. Subsoil (6700-6750mm) dark brown, silty and grey at 6750mm.

135. Subsoil (6750-6800mm) dark brown, silty and grey at 6800mm.

136. Subsoil (6800-6850mm) dark brown, silty and grey at 6850mm.

137. Subsoil (6850-6900mm) dark brown, silty and grey at 6900mm.

138. Subsoil (6900-6950mm) dark brown, silty and grey at 6950mm.

139. Subsoil (6950-7000mm) dark brown, silty and grey at 7000mm.

140. Subsoil (7000-7050mm) dark brown, silty and grey at 7050mm.

141. Subsoil (7050-7100mm) dark brown, silty and grey at 7100mm.

142. Subsoil (7100-7150mm) dark brown, silty and grey at 7150mm.

143. Subsoil (7150-7200mm) dark brown, silty and grey at 7200mm.

144. Subsoil (7200-7250mm) dark brown, silty and grey at 7250mm.

145. Subsoil (7250-7300mm) dark brown, silty and grey at 7300mm.

146. Subsoil (7300-7350mm) dark brown, silty and grey at 7350mm.

147. Subsoil (7350-7400mm) dark brown, silty and grey at 7400mm.

148. Subsoil (7400-7450mm) dark brown, silty and grey at 7450mm.

149. Subsoil (7450-7500mm) dark brown, silty and grey at 7500mm.

150. Subsoil (7500-7550mm) dark brown, silty and grey at 7550mm.

151. Subsoil (7550-7600mm) dark brown, silty and grey at 7600mm.

152. Subsoil (7600-7650mm) dark brown, silty and grey at 7650mm.

153. Subsoil (7650-7700mm) dark brown, silty and grey at 7700mm.

154. Subsoil (7700-7750mm) dark brown, silty and grey at 7750mm.

155. Subsoil (7750-7800mm) dark brown, silty and grey at 7800mm.

156. Subsoil (7800-7850mm) dark brown, silty and grey at 7850mm.

157. Subsoil (7850-7900mm) dark brown, silty and grey at 7900mm.

158. Subsoil (7900-7950mm) dark brown, silty and grey at 7950mm.

159. Subsoil (7950-8000mm) dark brown, silty and grey at 8000mm.

160. Subsoil (8000-8050mm) dark brown, silty and grey at 8050mm.

161. Subsoil (8050-8100mm) dark brown, silty and grey at 8100mm.

162. Subsoil (8100-8150mm) dark brown, silty and grey at 8150mm.

163. Subsoil (8150-8200mm) dark brown, silty and grey at 8200mm.

164. Subsoil (8200-8250mm) dark brown, silty and grey at 8250mm.

165. Subsoil (8250-8300mm) dark brown, silty and grey at 8300mm.

166. Subsoil (8300-8350mm) dark brown, silty and grey at 8350mm.

167. Subsoil (8350-8400mm) dark brown, silty and grey at 8400mm.

168. Subsoil (8400-8450mm) dark brown, silty and grey at 8450mm.

169. Subsoil (8450-8500mm) dark brown, silty and grey at 8500mm.

170. Subsoil (8500-8550mm) dark brown, silty and grey at 8550mm.

171. Subsoil (8550-8600mm) dark brown, silty and grey at 8600mm.

172. Subsoil (8600-8650mm) dark brown, silty and grey at 8650mm.

173. Subsoil (8650-8700mm) dark brown, silty and grey at 8700mm.

174. Subsoil (8700-8750mm) dark brown, silty and grey at 8750mm.

175. Subsoil (8750-8800mm) dark brown, silty and grey at 8800mm.

176. Subsoil (8800-8850mm) dark brown, silty and grey at 8850mm.

177. Subsoil (8850-8900mm) dark brown, silty and grey at 8900mm.

178. Subsoil (8900-8950mm) dark brown, silty and grey at 8950mm.

179. Subsoil (8950-9000mm) dark brown, silty and grey at 9000mm.

180. Subsoil (9000-9050mm) dark brown, silty and grey at 9050mm.

181. Subsoil (9050-9100mm) dark brown, silty and grey at 9100mm.

182. Subsoil (9100-9150mm) dark brown, silty and grey at 9150mm.

183. Subsoil (9150-9200mm) dark brown, silty and grey at 9200mm.

184. Subsoil (9200-9250mm) dark brown, silty and grey at 9250mm.

185. Subsoil (9250-9300mm) dark brown, silty and grey at 9300mm.

186. Subsoil (9300-9350mm) dark brown, silty and grey at 9350mm.

187. Subsoil (9350-9400mm) dark brown, silty and grey at 9400mm.

188. Subsoil (9400-9450mm) dark brown, silty and grey at 9450mm.

189. Subsoil (9450-9500mm) dark brown, silty and grey at 9500mm.

190. Subsoil (9500-9550mm) dark brown, silty and grey at 9550mm.

191. Subsoil (9550-9600mm) dark brown, silty and grey at 9600mm.

192. Subsoil (9600-9650mm) dark brown, silty and grey at 9650mm.

193. Subsoil (9650-9700mm) dark brown, silty and grey at 9700mm.

194. Subsoil (9700-9750mm) dark brown, silty and grey at 9750mm.

195. Subsoil (9750-9800mm) dark brown, silty and grey at 9800mm.

196. Subsoil (9800-9850mm) dark brown, silty and grey at 9850mm.

197. Subsoil (9850-9900mm) dark brown, silty and grey at 9900mm.

198. Subsoil (9900-9950mm) dark brown, silty and grey at 9950mm.

199. Subsoil (9950-10000mm) dark brown, silty and grey at 10000mm.

Soil Infiltration Test Results

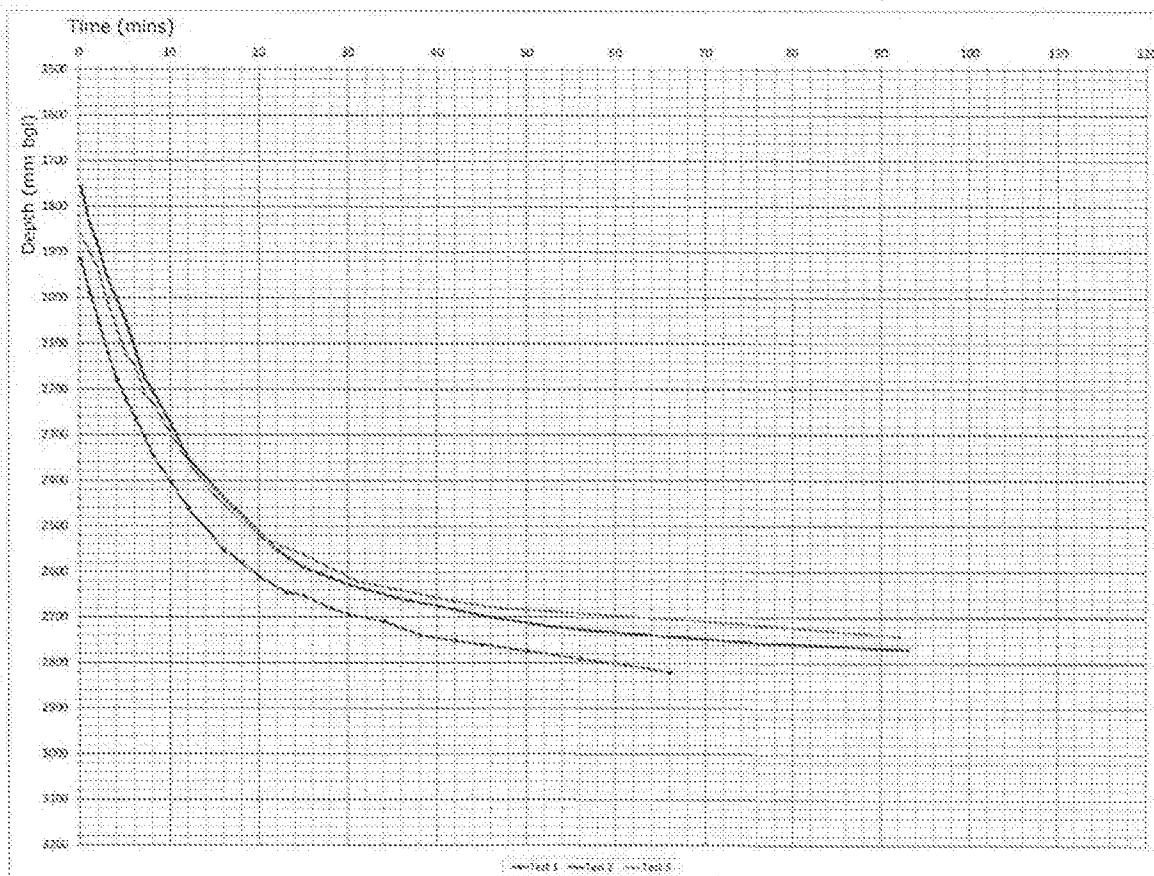
Test	Soil Infiltration Rate (m/sec)	Soil Infiltration Rate (mm/hr)
Test 1	6.75E-05	2.43E+02
Test 2	6.17E-05	2.22E+02
Test 3	3.02E-05	1.09E+02

Soil Infiltration Test Results

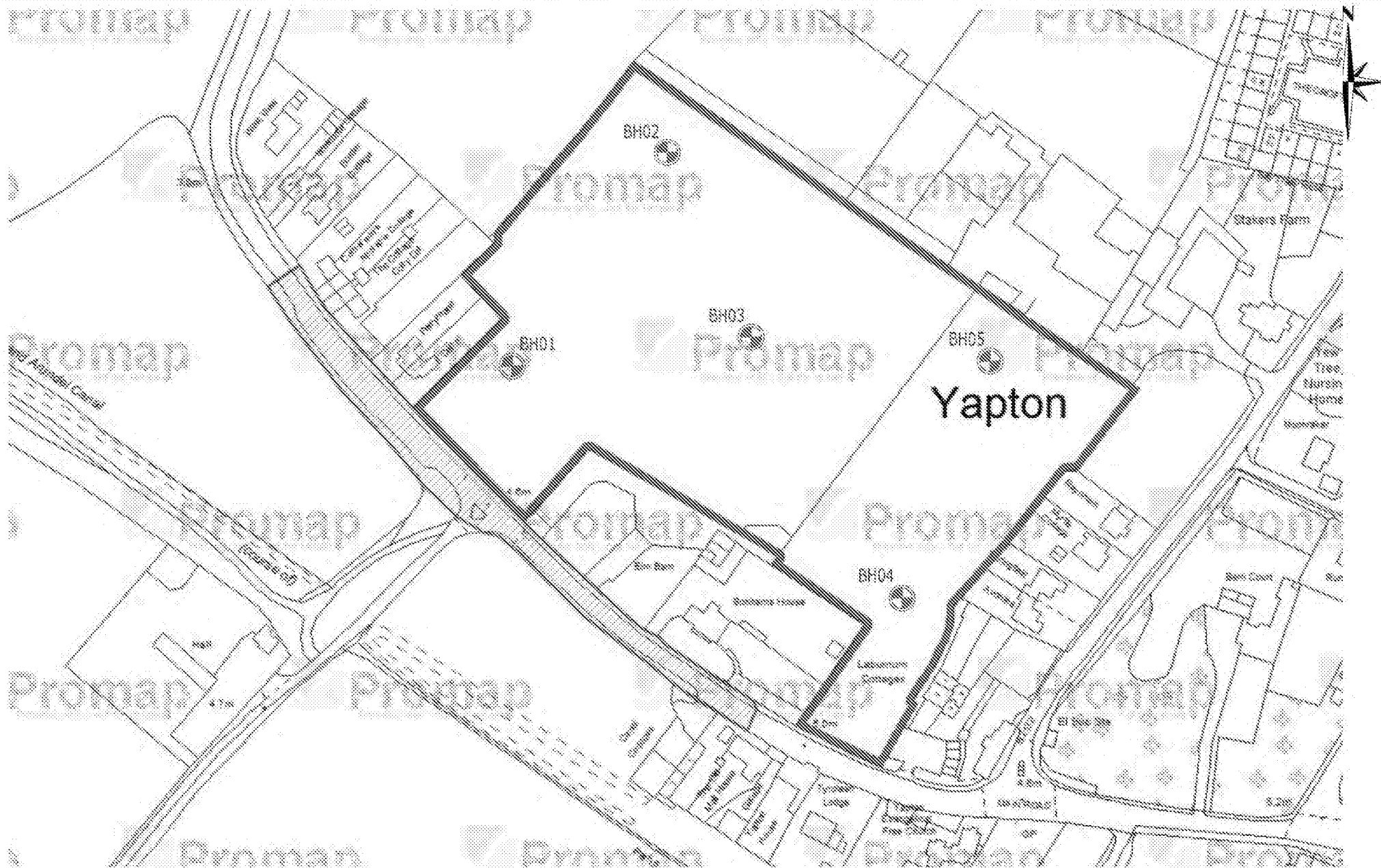
Test	Soil Infiltration Rate (m/sec)	Soil Infiltration Rate (mm/hr)
Test 1	6.75E-05	2.43E+02
Test 2	6.17E-05	2.22E+02
Test 3	3.02E-05	1.09E+02

Soil Infiltration Rate (m/sec) 6.75E-05 6.17E-05 3.02E-05

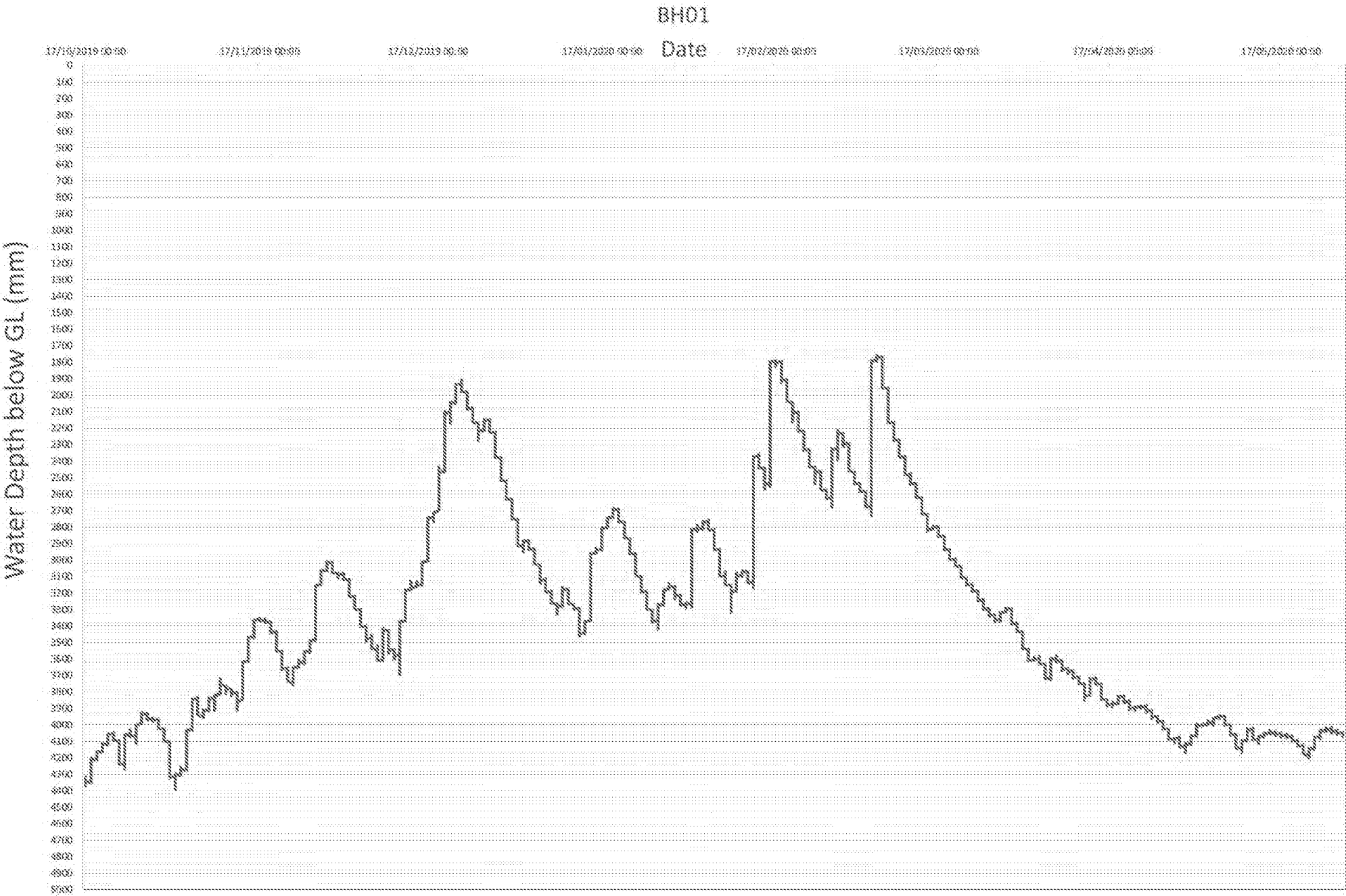
Soil Infiltration Rate (mm/hr) 2.43E+02 2.22E+02 1.09E+02



Infiltration calculated to method in BRE Digest 365 (2007) Soakaway Design

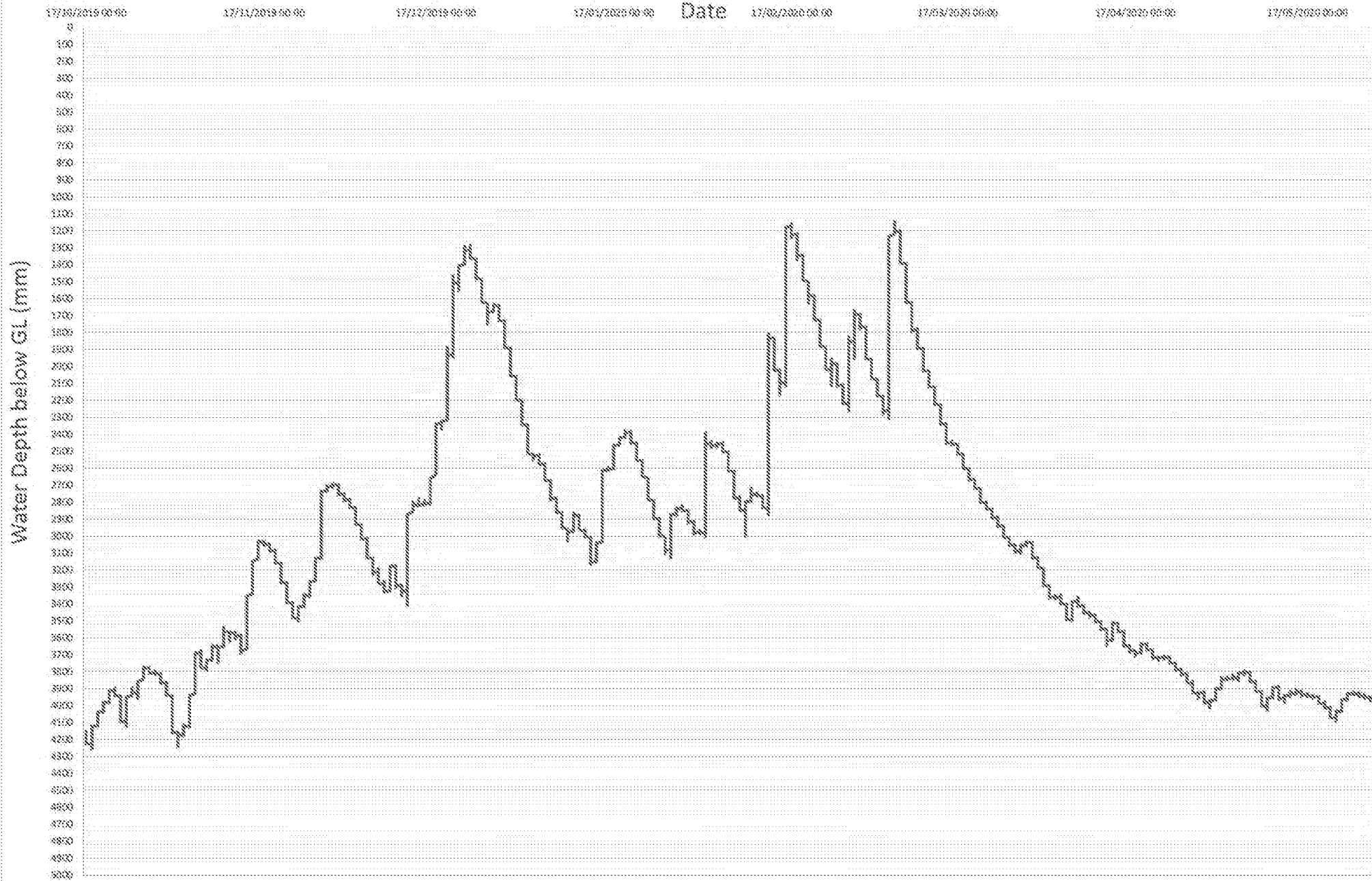


TEC Exploratory Hole with Installation Location: 



BH02

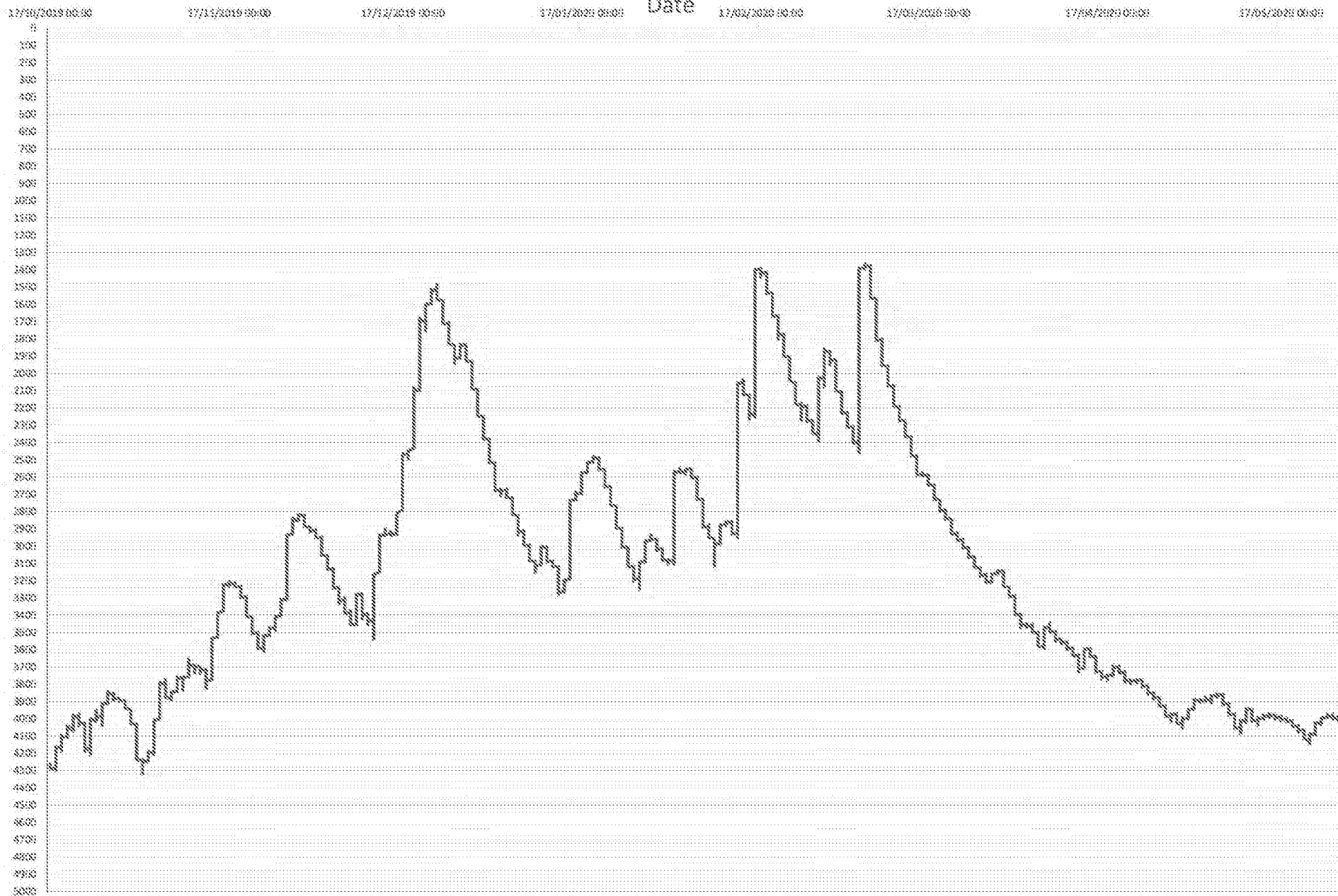
Date



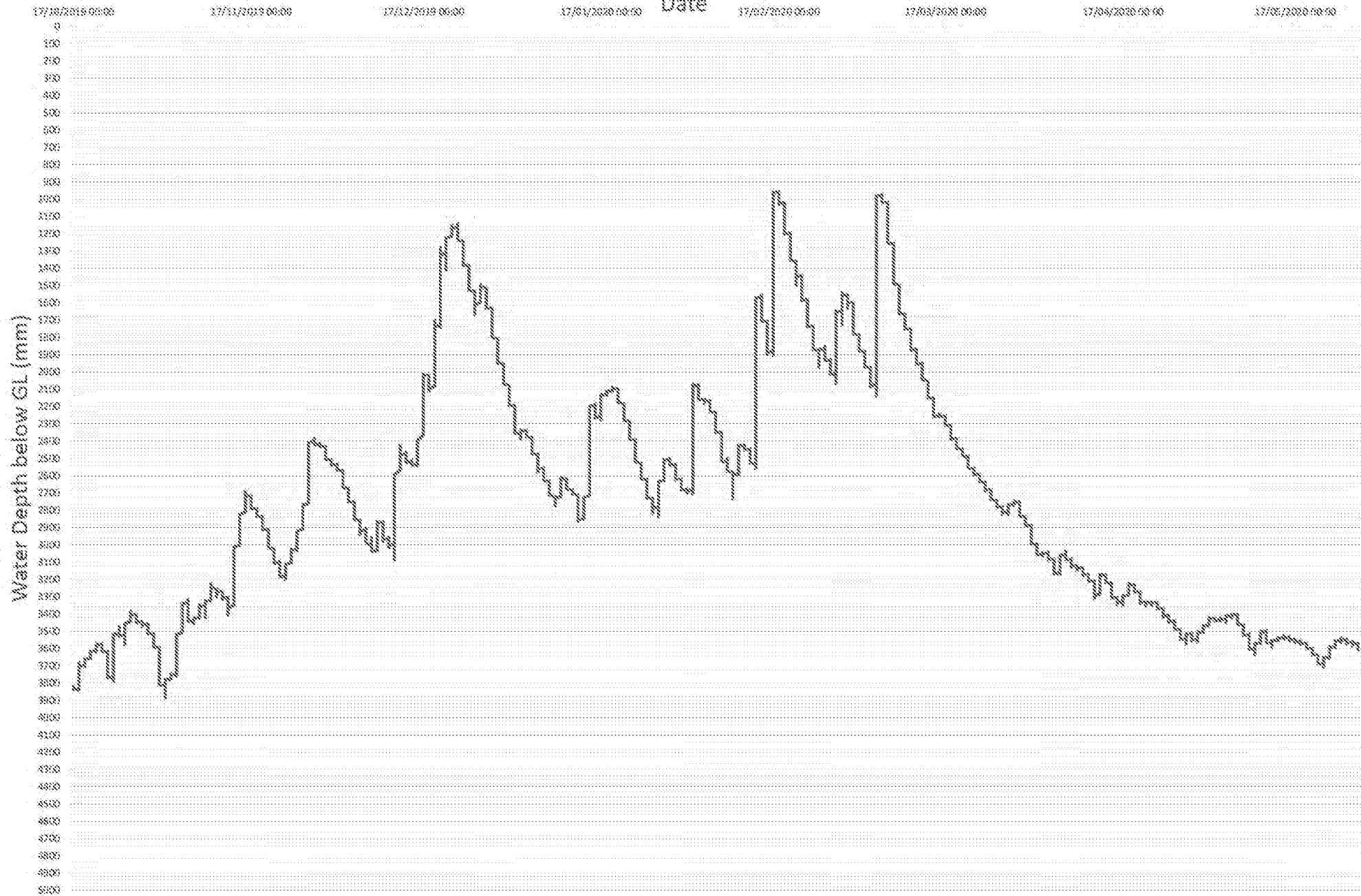
BH03

Date

Water Depth below GL (mm)

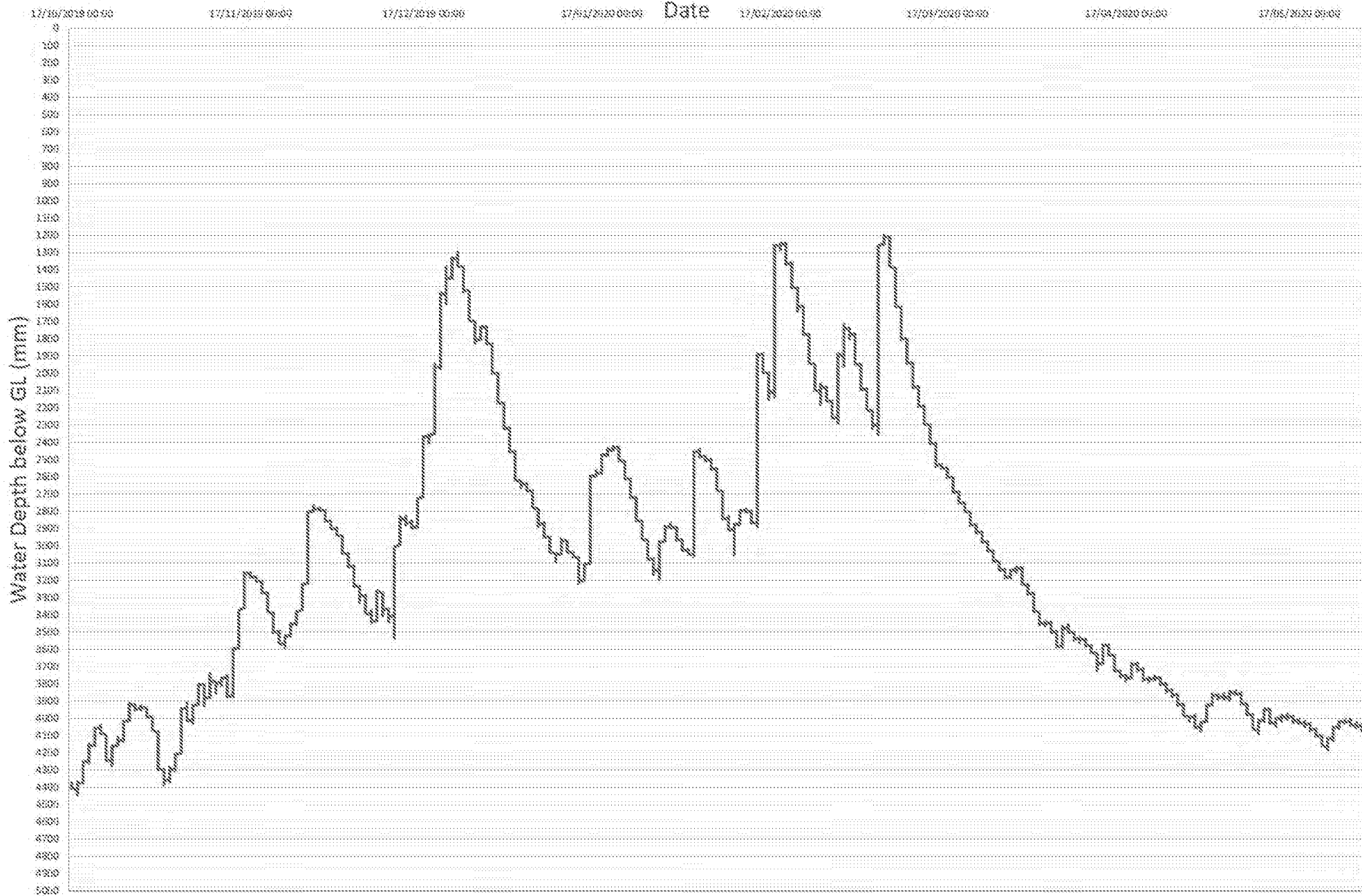


BH04
Date



BH05

Date



Intrusive investigation.

Soakage Test Results

The results of the soakage tests generally indicate a very slight drop in water level at all locations and all test locations failed to drain during the test (i.e. to 75% effective water depth) and, therefore, insufficient time was available to complete the testing in accordance with BRE365 and determination of infiltration rates at the site in strict accordance with BRE365 has not been possible.

Soakage Test Results

Soakage Test	Depth (mbgl)	Comments
TP01	2.6	Drop in water level: 7.5m in 5hr
TP02	2.9	Drop in water level: 6.5cm in 4hr 22min
TP03	3.5	Drop in water level: 3.0cm in 4hr
TP04	2.9	No drop in water level in 5hr and 32min
TP05	3.0	Drop in water level: 9cm in 5hr 6min
TP06	1.8	Drop in water level: 16cm in 4hr 49min
TP07	3.1	Drop in water level: 5.0cm in 5hr 1min
TP08	3.2	Drop in water level: 2.0cm in 5hr 4min
TP09	1.7	Drop in water level: 21cm in 4hr 12min

The results indicate that the ground materials tend to be of very limited permeability.

It should also be noted that CIRIA Report 156 – Infiltration Drainage – Manual of Good Practice, recommends that any infiltration systems constructed should normally be built at least 5m away from the nearest foundation. In addition, it is noted that where draining to the underlying chalk, CIRIA Report C574 recommends that soakaways should be located at least 5m from foundations for the medium density chalk recorded at the site.

In addition, the requirements of the Environment Agency would need to be incorporated into any design which drains into an aquifer, such as on this site.

Recommendations

Based on the results, it is considered unlikely that the encountered ground materials would provide a suitable drainage medium for the site.

Closure

We hope you find the above to your satisfaction, but should you have queries please do not hesitate to contact us.

Yours sincerely



Matt Langreiter
For and on behalf of

TWEEDIE EVANS CONSULTING LIMITED

Enclosed:

Figure 1 – Exploratory Hole Location Plan
Exploratory Hole Logs
Soakage Test Results



Richard Evans



Twoedde Evans Consulting
The Old Chapel
35a Southover
Wells, Somerset
BA5 2LN

Tel: 01749 677260
Fax: 01749 679345
Email: info@iec.co.uk
www.iec.co.uk

Site Name:
Bonham's Field, Yapton

Drawing Name:
Exploratory Hole Location Plan

Client Name:
The Civil Engineering Practice

Project No:
1909008.001

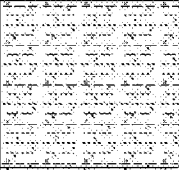
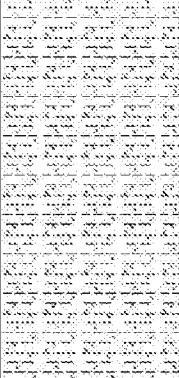
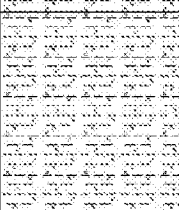
Figure No:
1

Date:
Nov 2019

Scale:
NTS

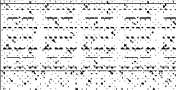
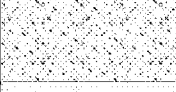
Engineering Logs

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP01	
Project No: 1909008.002	Dates: 22nd October 2019	
Client: The Civil Engineering Practice		

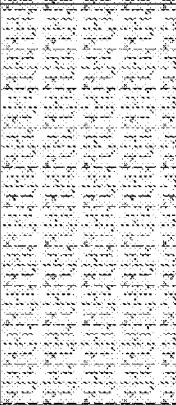
Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.30	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets throughout.				
0.80	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
2.00	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.		1.00		HSV at 1.0mbgl - 60-70 kPa
2.60	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange sandy gravelly silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.		2.00		HSV at 1.5mbgl - 60 kPa
	Trial Pit Terminated		2.60		HSV at 2.0mbgl - 35-40kPa
			3.00		HSV at 2.5mbgl - 35kPa

Excavation Details:	Dimensions:	Notes and Remarks:	
Date excavated: 22nd October 2019	B: 0.5m	Water observations: No groundwater encountered.	
Date backfilled: 22nd October 2019	A: 3.2m		
Plant: JCB 3CX		Logged by: DH	Checked by: RE
Shoring: None		Approved by: ET	
Stability: Good			

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP02	
Project No: 1909008.002	Dates: 22nd October 2019	
Client: The Civil Engineering Practice		

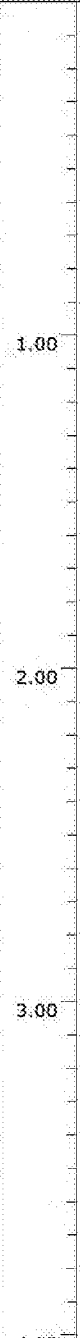
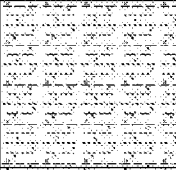
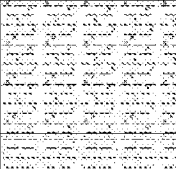
Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks																									
0.25	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets throughout.																													
0.60	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.																													
	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.		1.00		HSV at 1.0mbgl - 65-70 kPa																									
			2.00		HSV at 1.5mbgl - 55-60 kPa																									
2.40																														
2.60	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange sandy gravelly silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.				HSV at 2.0mbgl - 50-55kPa																									
2.90	RIVER TERRACE DEPOSITS [Loose] yellow-brown clayey/silty gravelly SAND with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.				HSV at 2.5mbgl - 40 kPa																									
	Trial Pit Terminated		3.00																											
<table border="1"> <tr> <td>Excavation Details:</td> <td>Dimensions:</td> <td colspan="2">Notes and Remarks:</td> </tr> <tr> <td>Date excavated: 22nd October 2019</td> <td>B: 0.5m</td> <td colspan="2" rowspan="2">Water observations: No groundwater encountered.</td> </tr> <tr> <td>Date backfilled: 22nd October 2019</td> <td>A: 3.2m</td> </tr> <tr> <td>Plant: JCB 3CX</td> <td></td> <td>Logged by: DH</td> <td>Checked by: RE</td> <td>Approved by: ET</td> </tr> <tr> <td>Shoring: None</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Stability: Good</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						Excavation Details:	Dimensions:	Notes and Remarks:		Date excavated: 22nd October 2019	B: 0.5m	Water observations: No groundwater encountered.		Date backfilled: 22nd October 2019	A: 3.2m	Plant: JCB 3CX		Logged by: DH	Checked by: RE	Approved by: ET	Shoring: None					Stability: Good				
Excavation Details:	Dimensions:	Notes and Remarks:																												
Date excavated: 22nd October 2019	B: 0.5m	Water observations: No groundwater encountered.																												
Date backfilled: 22nd October 2019	A: 3.2m																													
Plant: JCB 3CX		Logged by: DH	Checked by: RE	Approved by: ET																										
Shoring: None																														
Stability: Good																														

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP03	
Project No: 1909008.002	Dates: 22nd October 2019	
Client: The Civil Engineering Practice		

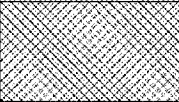
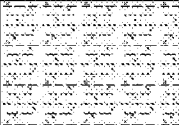
Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.25	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets throughout.				
0.65	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.		1.00		HSV at 1.0mbgl - 65-70 kPa
					HSV at 1.5mbgl - 60-65 kPa
			2.00		HSV at 2.0mbgl - 45-50 kPa
2.30					
	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange sandy gravelly silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.		3.00		HSV at 2.5mbgl - 35 kPa
					HSV at 3.0mbgl - 35-40 kPa
3.50					
	Trial Pit Terminated				

Excavation Details:	Dimensions:	Notes and Remarks:	
Date excavated: 22nd October 2019	B: 0.5m	Water observations: No groundwater encountered.	
Date backfilled: 22nd October 2019	A: 3.1m		
Plant: JCB 3CX		Logged by: DH	Checked by: RE
Shoring: None		Approved by: ET	
Stability: Good			

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP05	
Project No: 1909008.002	Dates: 23rd October 2019	
Client: The Civil Engineering Practice		

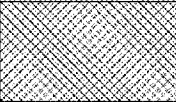
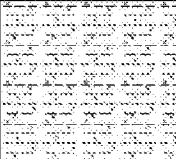
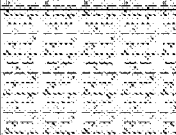
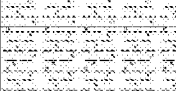
Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.30	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets throughout.				
0.80	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
2.30	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.			1.00	HSV at 1.0mbgl - 65-70 kPa
				2.00	HSV at 1.5mbgl - 55-60 kPa
				2.50	HSV at 2.0mbgl - 45-50 kPa
2.70	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange sandy gravelly silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.				HSV at 2.5mbgl - 35-40 kPa
3.00	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange gravelly very sandy silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.		3.00		HSV at 3.0mbgl - 30-35 kPa
Trial Pit Terminated					
Excavation Details:		Dimensions:	Notes and Remarks:		
Date excavated: 23rd October 2019 Date backfilled: 23rd October 2019 Plant: JCB 3CX Shoring: None Stability: Good		B: 0.5m  A: 3.2m	Water observations: No groundwater encountered.		
			Logged by: DH	Checked by: RE	Approved by: ET

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP06	
Project No: 1909008.002	Dates: 23rd October 2019	
Client: The Civil Engineering Practice		

Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.30	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets throughout.		1.00		HSV at 1.0mbgl - 65-70 kPa HSV at 1.5mbgl - 60 kPa
0.70	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
1.80	RIVER TERRACE DEPOSITS Firm medium strength dark orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
	Trial Pit Terminated		2.00		
			3.00		

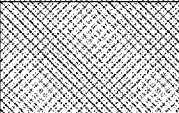
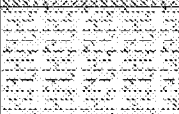
Excavation Details:	Dimensions:	Notes and Remarks:	
Date excavated: 23rd October 2019 Date backfilled: 23rd October 2019 Plant: JCB 3CX Shoring: None Stability: Good	B: 0.5m  A: 2.9m	Water observations:	
		Logged by: DH	Checked by: RE Approved by: ET

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP07	
Project No: 1909008.002	Dates: 24th October 2019	
Client: The Civil Engineering Practice		

Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.30	MADE GROUND Grass over brown slightly gravelly sandy organic silt/clay. Gravel is flint. Fine fibrous rootlets and roots up to 10mm diameter throughout.				
0.80	RIVER TERRACE DEPOSITS Firm to stiff orange-brown slightly gravelly slightly sandy SILT/CLAY with low cobble content. Gravel and cobbles are strong angular to subrounded flint.				
1.20	RIVER TERRACE DEPOSITS Stiff high strength orange-brown slightly gravelly slightly sandy silty CLAY. Gravel is strong fine to medium angular to subrounded flint.		1.00		HSV at 1.0mbgl - 75-80 kPa
	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY. Gravel is strong fine to medium angular to subrounded flint.				HSV at 1.5mbgl - 65-70 kPa
			2.00		HSV at 2.0mbgl - 45-50 kPa
2.60					HSV at 2.5mbgl - 40-45 kPa
2.80	RIVER TERRACE DEPOSITS Soft low strength grey, buff and orange slightly sandy gravelly silty CLAY with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.				
3.10	RIVER TERRACE DEPOSITS [Loose] yellow-brown slightly clayey/silty gravelly to very gravelly SAND with low cobble content. Gravel is strong angular to subrounded flint and very weak subrounded to rounded fine to medium chalk. Cobbles are strong angular to subangular flint.		3.00		
	Trial Pit Terminated				

Excavation Details:	Dimensions:	Notes and Remarks:	
Date excavated: 24th October 2019 Date backfilled: 24th October 2019 Plant: JCB 3CX Shoring: None Stability: Good	B: 0.5m  A: 3.0m	Water observations: No groundwater encountered.	
		Logged by: DH	Checked by: RE
		Approved by: ET	

TRIAL PIT RECORD:		 TEC TWEEDIE EVANS CONSULTING www.tecon.co.uk info@tecon.co.uk
Project Title: Bonhams Field, Yapton	Trial Pit: TP09	
Project No: 1909008.002	Dates: 25th October 2019	
Client: The Civil Engineering Practice		

Depth (m)	Description	Legend	Depth (m)	Sample Details	Remarks
0.35	MADE GROUND Grass over brown sandy organic silt/clay. Fine fibrous rootlets throughout.		1.00		HSV at 1.0mbgl - 70-75 kPa
0.70	RIVER TERRACE DEPOSITS Stiff orange-brown slightly gravelly slightly sandy SILT/CLAY. Gravel is strong angular to subrounded flint.				
1.50	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel is strong fine to medium angular to subrounded flint. Cobbles are strong angular to subangular flint.				
1.70	RIVER TERRACE DEPOSITS Firm medium strength orange-brown slightly sandy gravelly silty CLAY with moderate cobble content. Gravel and cobbles are strong angular to subrounded flint.				
	Trial Pit Terminated		2.00		HSV at 1.5mbgl - 60-70 kPa
			3.00		

Excavation Details:	Dimensions:	Notes and Remarks:	
Date excavated: 25th October 2019	B: 0.5m	Water observations: No groundwater encountered.	
Date backfilled: 25th October 2019	A: 2.9m		
Plant: JCB 3CX		Logged by: DH	Checked by: RE
Shoring: None		Approved by: ET	
Stability: Good			

BRE365 Soakage Test Data

TEC
THERMOCALORIMETRIC

Project:	Bonhams Fields, Yapton
Project Number:	1909008.001
Est. No. References:	TP01
Client:	Seaward Homes
Manager:	DH
Issue Date:	22/10/2019

Time (min)	Depth (mm)	Temp (°C)
0.0	1.20G	
5	2.21G	
15	3.22G	
25	4.23G	
35	5.11G	
45	5.62G	
55	5.79G	
1.15	4.42G	
1.45	2.54G	
1.75	1.55G	
2.05	1.55G	
2.35	1.68G	
3.00	2.61G	

[illegible][illegible][illegible]

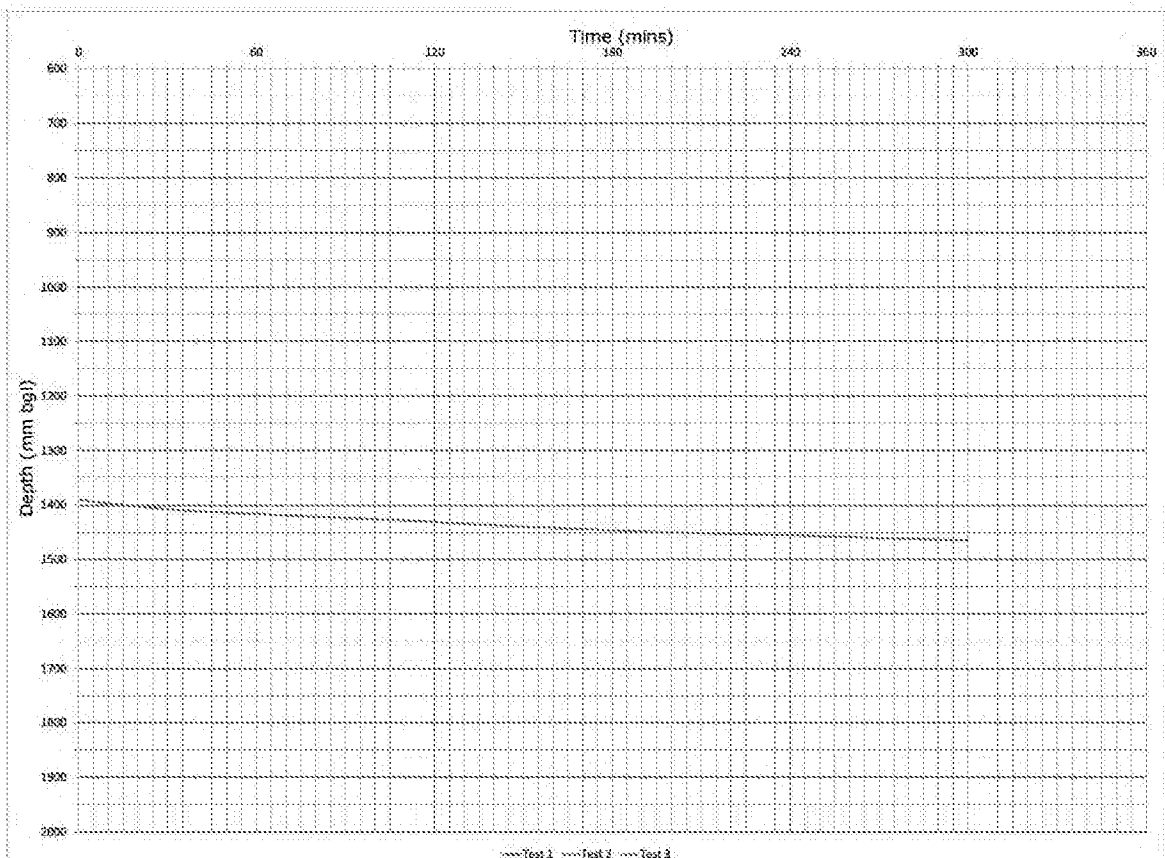
Pit depth (m)	2.66
Pit width (m)	1.59
Pit length (m)	3.26
Depth to standing water (m)	
Gravelly Pit used to stabilize the pit?	N

	Test 1	Test 2	Test 3
1. The average of 10 numbers is 120.	120		
2. The average of 10 numbers is 120.	120		
3. The average of 10 numbers is 120.	120		
4. The average of 10 numbers is 120.	120		
5. The average of 10 numbers is 120.	120		
6. The average of 10 numbers is 120.	120		
7. The average of 10 numbers is 120.	120		
8. The average of 10 numbers is 120.	120		
9. The average of 10 numbers is 120.	120		
10. The average of 10 numbers is 120.	120		

2000	5.97		
2001	5.08		
2002	0		

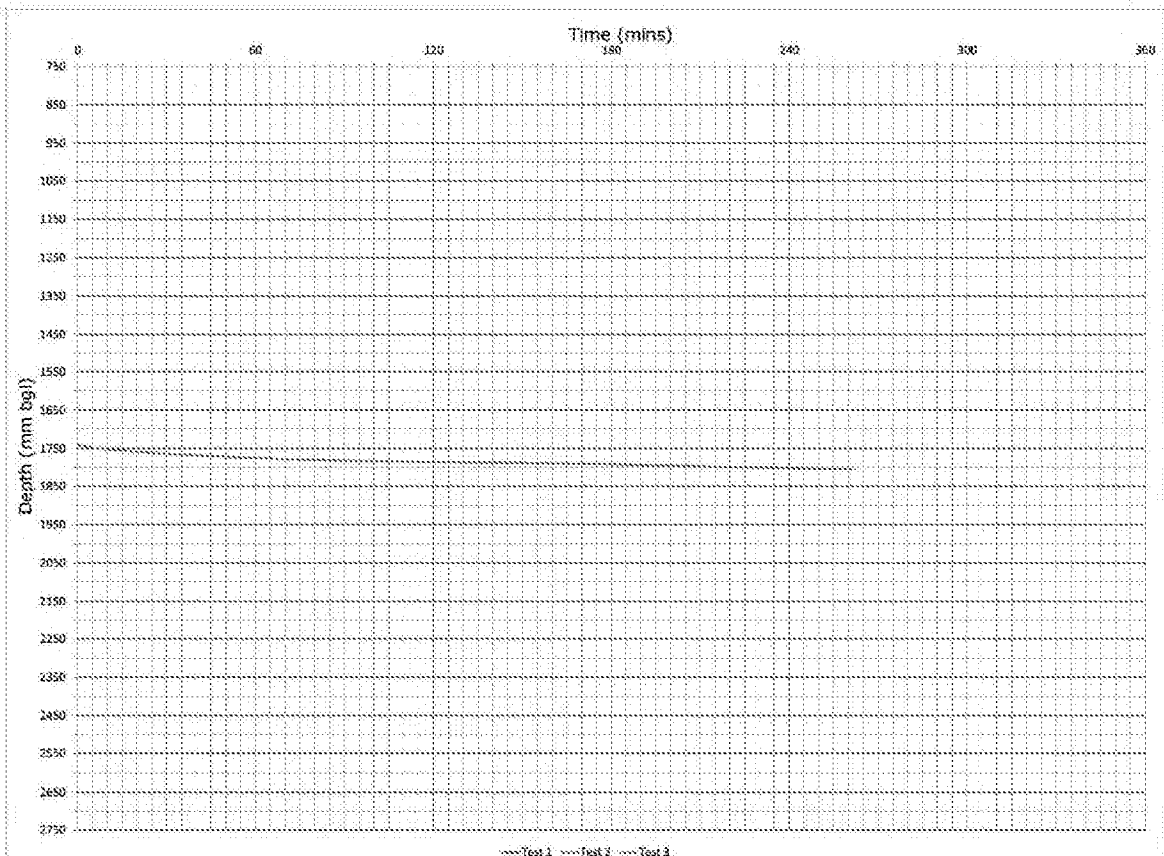
Note: When granular fill used to stabilize the base pit, content shall be 30% free volume.

Soil Infiltration Rate (m/sec)			
Soil Infiltration Rate (mm/hr)			
Extrapolated Data?			



TEC
THERMOCALORIMETRIC

Test 1		Test 2		Test 3	
Time (m)	Depth (mmHg)	Time (m)	Depth (mmHg)	Time (m)	Depth (mmHg)
0.0	1745				
5	1745				
10	1745				
15	1745				
20	1745				
25	1745				
30	1745				
35	1745				
40	1745				
45	1745				
50	1745				
55	1745				
60	1745				
65	1745				
70	1745				
75	1745				
80	1745				
85	1745				
90	1745				
95	1745				
100	1745				
105	1745				
110	1745				
115	1745				
120	1745				
125	1745				
130	1745				
135	1745				
140	1745				
145	1745				
150	1745				
155	1745				
160	1745				
165	1745				
170	1745				
175	1745				
180	1745				
185	1745				
190	1745				
195	1745				
200	1745				
205	1745				
210	1745				
215	1745				
220	1745				
225	1745				
230	1745				
235	1745				
240	1745				
245	1745				
250	1745				
255	1745				
260	1745				
265	1745				
270	1745				
275	1745				
280	1745				
285	1745				
290	1745				
295	1745				
300	1745				
305	1745				
310	1745				
315	1745				
320	1745				
325	1745				
330	1745				
335	1745				
340	1745				
345	1745				
350	1745				
355	1745				
360	1745				
365	1745				
370	1745				
375	1745				
380	1745				
385	1745				
390	1745				
395	1745				
400	1745				
405	1745				
410	1745				
415	1745				
420	1745				
425	1745				
430	1745				
435	1745				
440	1745				
445	1745				
450	1745				
455	1745				
460	1745				
465	1745				
470	1745				
475	1745				
480	1745				
485	1745				
490	1745				
495	1745				
500	1745				
505	1745				
510	1745				
515	1745				
520	17				



TEC
THERMOCALORIMETRIC

TEC
THERMOCALORIMETRIC

TEC
THERMOCALORIMETRIC

Project:	Bonhams Fields, Yapton
Project Number:	1909008.001
Est. No. References:	TPO3
Client:	Seaward Homes
Operator:	BH
Start Date:	22/10/2019

Test 1			
Time (hr)	Depth	Temp (°C)	Salinity
0.0	1.00	1.00	1.00
1.0	1.00	1.00	1.00
2.0	1.00	1.00	1.00
3.0	1.00	1.00	1.00
4.0	1.00	1.00	1.00
5.0	1.00	1.00	1.00
6.0	1.00	1.00	1.00
7.0	1.00	1.00	1.00
8.0	1.00	1.00	1.00
9.0	1.00	1.00	1.00
10.0	1.00	1.00	1.00
11.0	1.00	1.00	1.00
12.0	1.00	1.00	1.00
13.0	1.00	1.00	1.00
14.0	1.00	1.00	1.00
15.0	1.00	1.00	1.00
16.0	1.00	1.00	1.00
17.0	1.00	1.00	1.00
18.0	1.00	1.00	1.00
19.0	1.00	1.00	1.00
20.0	1.00	1.00	1.00
21.0	1.00	1.00	1.00
22.0	1.00	1.00	1.00
23.0	1.00	1.00	1.00
24.0	1.00	1.00	1.00
25.0	1.00	1.00	1.00
26.0	1.00	1.00	1.00
27.0	1.00	1.00	1.00
28.0	1.00	1.00	1.00
29.0	1.00	1.00	1.00
30.0	1.00	1.00	1.00
31.0	1.00	1.00	1.00
32.0	1.00	1.00	1.00
33.0	1.00	1.00	1.00
34.0	1.00	1.00	1.00
35.0	1.00	1.00	1.00
36.0	1.00	1.00	1.00
37.0	1.00	1.00	1.00
38.0	1.00	1.00	1.00
39.0	1.00	1.00	1.00
40.0	1.00	1.00	1.00
41.0	1.00	1.00	1.00
42.0	1.00	1.00	1.00
43.0	1.00	1.00	1.00
44.0	1.00	1.00	1.00
45.0	1.00	1.00	1.00
46.0	1.00	1.00	1.00
47.0	1.00	1.00	1.00
48.0	1.00	1.00	1.00
49.0	1.00	1.00	1.00
50.0	1.00	1.00	1.00
51.0	1.00	1.00	1.00
52.0	1.00	1.00	1.00
53.0	1.00	1.00	1.00
54.0	1.00	1.00	1.00
55.0	1.00	1.00	1.00
56.0	1.00	1.00	1.00
57.0	1.00	1.00	1.00
58.0	1.00	1.00	1.00
59.0	1.00	1.00	1.00
60.0	1.00	1.00	1.00
61.0	1.00	1.00	1.00
62.0	1.00	1.00	1.00
63.0	1.00	1.00	1.00
64.0	1.00	1.00	1.00
65.0	1.00	1.00	1.00
66.0	1.00	1.00	1.00
67.0	1.00	1.00	1.00
68.0	1.00	1.00	1.00
69.0	1.00	1.00	1.00
70.0	1.00	1.00	1.00
71.0	1.00	1.00	1.00
72.0	1.00	1.00	1.00
73.0	1.00	1.00	1.00
74.0	1.00	1.00	1.00
75.0	1.00	1.00	1.00
76.0	1.00	1.00	1.00
77.0	1.00	1.00	1.00
78.0	1.00	1.00	1.00
79.0	1.00	1.00	1.00
80.0	1.00	1.00	1.00
81.0	1.00	1.00	1.00
82.0	1.00	1.00	1.00
83.0	1.00	1.00	1.00
84.0	1.00	1.00	1.00
85.0	1.00	1.00	

[illegible][illegible][illegible]

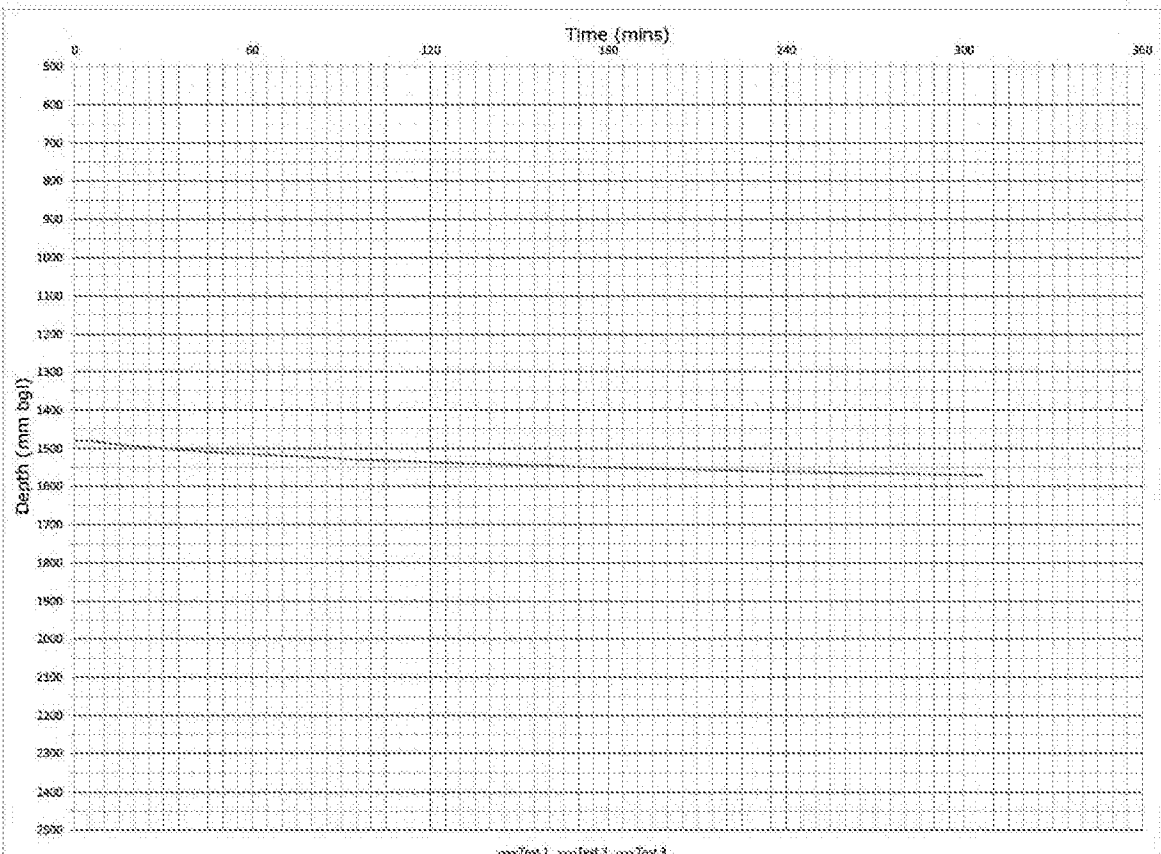
Parameter	Value
Pit depth (m)	3.00
Pit width (m)	1.59
Pit length (m)	3.26
Depth to grouting water (m)	
Gravel Pit used to surround the pit	N

	Test 1	Test 2	Test 3
NAEP 2001 NAEP Math	1000		
NAEP 2001 NAEP Science (2001-2002)	1406		
NAEP 2001 NAEP Reading	1529		
NAEP 2001 NAEP Writing (2001-2002)	1969		
NAEP 2001 NAEP Social Studies (2001-2002)	2240		
NAEP 2001 NAEP History (2001-2002)	2524		
NAEP 2001 NAEP Math			
NAEP 2001 NAEP Science (2001-2002)			
NAEP 2001 NAEP Reading			
NAEP 2001 NAEP Writing (2001-2002)			
NAEP 2001 NAEP Social Studies (2001-2002)			
NAEP 2001 NAEP History (2001-2002)			

1997	1.22		
1998	7.22		
1999	0		

Note: Where granular fill used to stabilize the base pit, concrete should be 30% free volume.

Soil Infiltration Rate (m/sec)			
Soil Infiltration Rate (mm/hr)			
Extrapolated Data?			



TEC
THERMOCALORIMETRIC

TEC
THERMOCALORIMETRIC

TEC

SEE Digest 369 / 2018 / Sogakwey Design

Project:	Bonhams Fields, Yapton
Project Number:	1909008.001
Test Pit Reference:	TP08
Client:	Seaward Homes
Operator:	CH
Test Date:	24/10/2019

Feet 1	
Force (N)	Depth (mm) kg
0.0	2.765
3	2.675
14	2.576
23	2.475
37	2.368
51	2.260
83	2.079
117	1.928
158	1.777
204	1.626

[illegible][illegible][illegible]

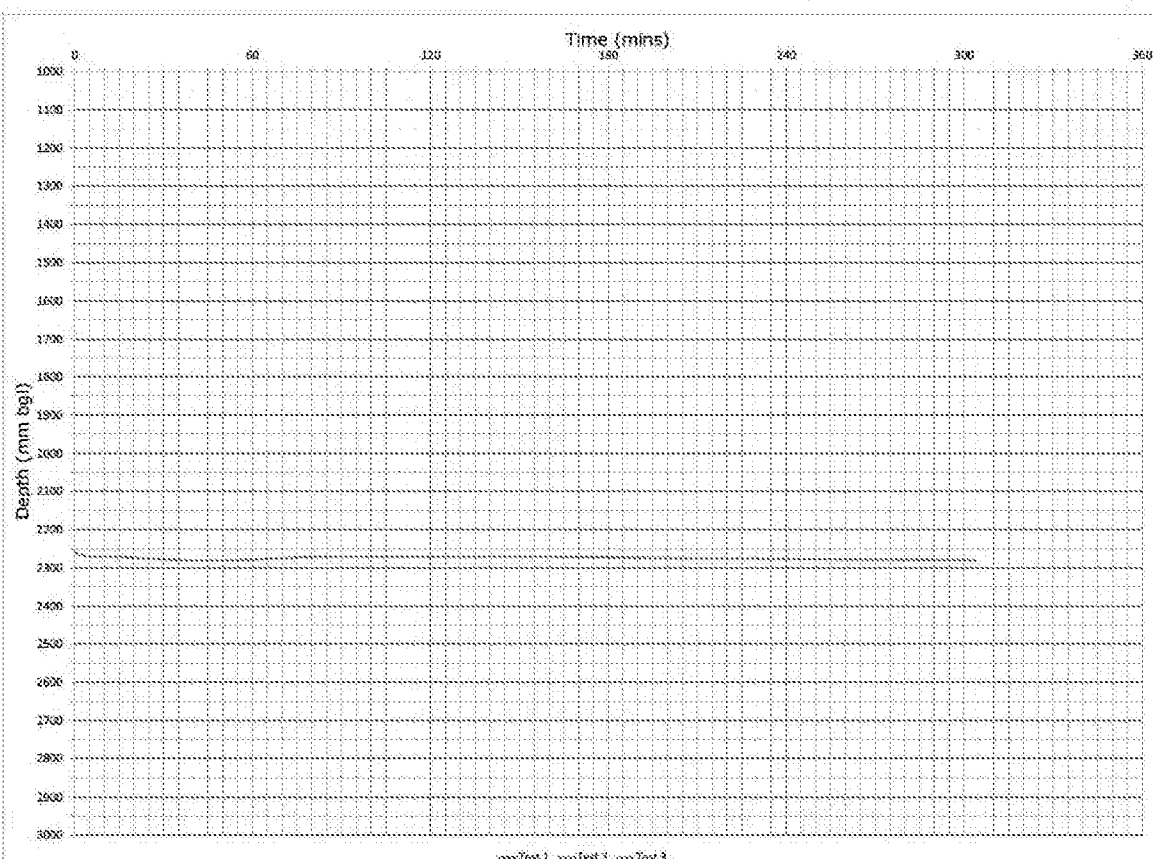
Pit depth (m)	3.20
Pit width (m)	1.50
Pit length (m)	2.00
Depth to graining water (m)	
Grain pit used in composite fine pit?	0

	Test 1	Test 2	Test 3
Test 1: 100% correct	3700		
Test 2: 100% correct	2250		
Test 3: 100% correct	3400		
Test 4: 100% correct	2350		
Test 5: 100% correct	3730		
Test 6: 100% correct	2960		
Test 7: 100% correct			
Test 8: 100% correct			
Test 9: 100% correct			
Test 10: 100% correct			

	3.66		
	4.50		
	0		

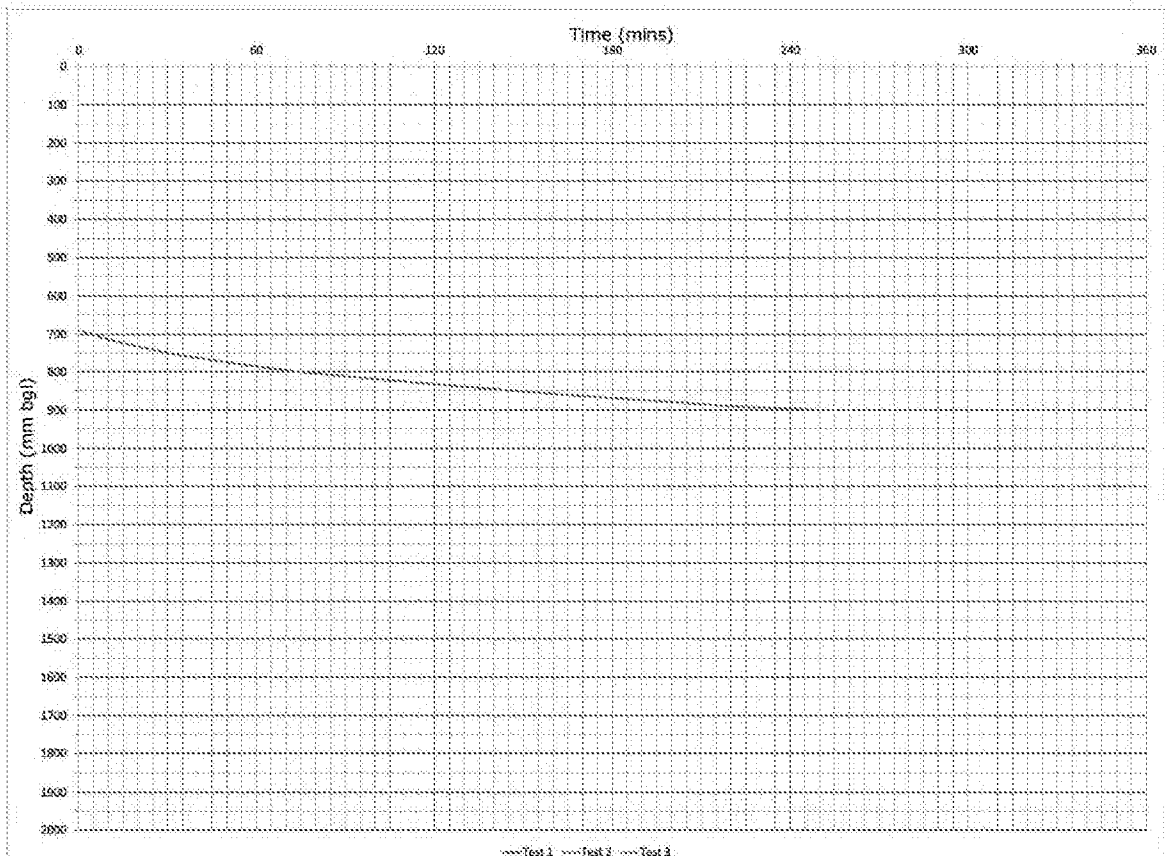
Note: Where onocular fill is used to stabilize the test pit, ensure them to be 30% free volume.

Soil Infiltration Rate (in/sec)			
Soil Infiltration Rate (mm/hr)			
Extrapolated Rate*			



TEC
TWOOL SWAN CONTRACTS

Test 1		Test 2		Test 3	
Time (m)	Depth (mm/ft)	Time (m)	Depth (mm/ft)	Time (m)	Depth (mm/ft)
0.0	0.0				
2	0.25				
4	0.5				
6	0.75				
8	1.0				
10	1.25				
12	1.5				
14	1.75				
16	2.0				
18	2.25				
20	2.5				
22	2.75				
24	3.0				
26	3.25				
28	3.5				
30	3.75				
32	4.0				
34	4.25				
36	4.5				
38	4.75				
40	5.0				
42	5.25				
44	5.5				
46	5.75				
48	6.0				
50	6.25				
52	6.5				
54	6.75				
56	7.0				
58	7.25				
60	7.5				
62	7.75				
64	8.0				
66	8.25				
68	8.5				
70	8.75				
72	9.0				
74	9.25				
76	9.5				
78	9.75				
80	10.0				
82	10.25				
84	10.5				
86	10.75				
88	11.0				
90	11.25				
92	11.5				
94	11.75				
96	12.0				
98	12.25				
100	12.5				
102	12.75				
104	13.0				
106	13.25				
108	13.5				
110	13.75				
112	14.0				
114	14.25				
116	14.5				
118	14.75				
120	15.0				
122	15.25				
124	15.5				
126	15.75				
128	16.0				
130	16.25				
132	16.5				
134	16.75				
136	17.0				
138	17.25				
140	17.5				
142	17.75				
144	18.0				
146	18.25				
148	18.5				
150	18.75				
152	19.0				
154	19.25				
156	19.5				
158	19.75				
160	20.0				
162	20.25				
164	20.5				
166	20.75				
168	21.0				
170	21.25				
172	21.5				
174	21.75				
176	22.0				
178	22.25				
180	22.5				
182	22.75				
184	23.0				
186	23.25				
188	23.5				
190	23.75				
192	24.0				
194	24.25				
196	24.5				
198	24.75				
200	25.0				
202	25.25				
204	25.5				
206	25.75				
208	26.0				



WASH DC 57002 INQUIRY

TP1 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	3.2 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.6 m ²	
Start Depth	1.21 m	
End Depth	1.135 m	
Volume of water lost from pit		0.12 m ³
Average effective drainage area including base		1.8775 m ²
Test Duration	18000 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	3.55E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	3.55E-06 m/s

TP2 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	3.2 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.6 m ²	
Start Depth	1.16 m	
End Depth	1.095 m	
Volume of water lost from pit		0.104 m ³
Average effective drainage area including base		1.8405 m ²
Test Duration	15720 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	3.59E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	3.59E-06 m/s

TP3 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	3.1 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.55 m ²	
Start Depth	1.47 m	
End Depth	1.44 m	
Volume of water lost from pit		0.0465 m ³
Average effective drainage area including base		1.658 m ²
Test Duration	14400 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	1.95E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	1.95E-06 m/s

TP5 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	3.2 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.6 m ²	
Start Depth	1.52 m	
End Depth	1.43 m	
Volume of water lost from pit		0.144 m ³
Average effective drainage area including base		1.933 m ²
Test Duration	18360 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	4.06E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	4.06E-06 m/s

Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	2.9 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.45 m ²	
Start Depth	1.23 m	
End Depth	1.07 m	
Volume of water lost from pit		0.232 m ³
Average effective drainage area including base		1.994 m ²
Test Duration	17340 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	6.71E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	6.71E-06 m/s

TP7 Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	3 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.5 m ²	
Start Depth	0.97 m	
End Depth	0.92 m	
Volume of water lost from pit		0.075 m ³
Average effective drainage area including base		1.675 m ²
Test Duration	18060 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	2.48E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	2.48E-06 m/s

TP8 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	2.8 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.4 m ²	
Start Depth	0.94 m	
End Depth	0.92 m	
Volume of water lost from pit		0.028 m ³
Average effective drainage area including base		1.466 m ²
Test Duration	18240 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	1.05E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	1.05E-06 m/s

TP9 - Alternate Method based on actual volume discharged over observed time period

Width of Trial Pit	0.5 m	
Length of Trial Pit	2.9 m	
or		
Diameter of Borehole	0 m	
Surface area of pit	1.45 m ²	
Start Depth	1.01 m	
End Depth	0.8 m	
Volume of water lost from pit		0.3045 m ³
Average effective drainage area including base		2.164 m ²
Test Duration	15120 s	

Infiltration rate = Volume discharged / (effective drainage area x test duration)

Infiltration rate =	9.31E-06 m/s
Factor of Safety	1
Design Infiltration Rate =	9.31E-06 m/s