ADDENDUM TO DRAINAGE STRATEGY			
Job Title	Sports Hall Seaside Primary School Lancing	**Job No**	WG1275
		Date	March 2023
Prepared	LG	***Checked***	GW

Client	Seaside Primary School
Architect	Burns Guthrie

ADDENDUM TO DRAINAGE DESIGN AND INFORMATION - REV.C 23.08.2022 (Ref: WG1275)

Responses to ADUR District SUD's comments

Following submission of the Drainage Design Information prepared by ourselves in August 2022 (attached within the Appendices for reference) to Adur as part of the Planning Condition discharge for the site (REF: AWDM/1732/21), additional information was requested by the Adur SUD's Team in order to discharge the conditions relating to surface water drainage.

The Adur SUD's Engineer requested that a Winter Infiltration Test and Winter Ground Water monitoring should be conducted before the Planning Condition for surface water drainage are approved for discharge.

When the original submission of information was made to discharge the surface water drainage conditions it was August 2022. Therefore, in order to undertake the additional testing we had to wait until Winter 2022/23 period.

The additional testing has now been conducted and the report from the Soil Investigation company has been attached within the Appendices. A BRE365 infiltration test was carried out in January 2023 with ground water monitoring conducted between December 2022 and February 2023.

Infiltration testing carried out was to BRE365 guidance and was in the location of the proposed soakaway. Three consecutive tests were carried out with the results ranging between $1.850x10^{-5}$m/s and $3.846x10^{-6}$m/s.

Groundwater monitoring was carried out in boreholes up to 4.8m BGL in close proximity to the proposed soakaway. On all monitoring visits all boreholes were recorded as dry.

The original surface water soakaway design for the site carried out in August of last year utilised an infiltration rate $4.65x10^{-6}$m/s. This was based on infiltration testing carried out May 2022.

Following the latest infiltration testing results the drainage calculations have been updated to contain the lowest rate recorded of $3.846x10^{-6}$m/s. The soakaway on the proposed drainage layout has been updated to accommodate the revised infiltration rate.

With the groundwater monitoring results recorded as dry up to 4.8m BGL the depth at which the soakaway was originally positioned would not need to be altered. The base level of the soakaway is approximately 1.8mBGL. As groundwater monitoring was conducted up to 4.8m BGL this gives an unsaturated zone of at least 3m below the base of the soakaway.

Drained areas drawing has been updated to reflect updates to layout of levels and building shape, since the original submission of the drainage calculations. Updated drawing attached within the Appendices.

APPENDIX A – Revised Drainage Layout

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

RESIDUAL HAZARDS

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following:

1. Unknown services/depths within work zone. Contractor to undertake necessary precautions and investigation prior to excavating.
2. Existing Overhead Power and Telecoms Cables. Contractor is to prepare a method statement to ensure operatives are familiar and competent with the dangers of working near overhead cable.
3. The works will involve the movement of plant and machinery within a school playground. There is a risk of potential conflict between plant/machinery and the school personnel / children. Contractor to undertake necessary precautions and ensure suitable traffic management is in place prior to commencement.
4. Working in live sewers. Contractor to ensure operatives are familiar and competent with the dangers of working in live sewers.
5. Excavations within existing tree root zones. Contractor is to seek advice from an Arboriculturalist and work to the methodology and requirements set out in the Arboriculturalist's report.
6. Deep excavations associated with the drainage installation of soakaways & manholes. Contractor is to ensure suitable temporary works are in place to ensure the safety of operatives and the public (where necessary). Contractor to ensure operatives are familiar and competent with the dangers of working in deep excavations.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement

DRAWING LEGEND

SURFACE WATER DRAINAGE		FOUL WATER DRAINAGE	
	EXISTING SURFACE WATER DRAINAGE		EXISTING FOUL WATER SEWER
	PROPOSED SURFACE WATER DRAINAGE		PROPOSED FOUL WATER DRAINAGE
SW# CL ##.## IL ##.## (450/600Ø/CP)	TYPE 3 INSPECTION CHAMBER (Max 3m depth to invert, CP denotes Catchpit) Chambers deeper than 1.2m to be non-entry.		PROPOSED FOUL WATER PUMPED MAIN (Size to be confirmed by Manufacturer)
RE IL ##.##	RODDING EYE	Pump Station CL ##.## IL ##.## (####Ø)	PUMPING CHAMBER (See specialist details for size and other information)
	CELLULAR SOAKAWAY (Vented)	MISC	
Vent	CELLULAR STORAGE TANK VENT (To be positioned in non-trafficed location)	FFL ##.###	PROPOSED BUILDING FINISHED FLOOR LEVEL
Channel	CHANNEL DRAIN (100mm wide, Heelguard grating, trapped gully outlet) TD - Threshold Drain	##.##	PROPOSED SPOT LEVEL
		##.##	EXISTING SPOT LEVEL
		1:80	GRADIENT OF FALL

CONSTRUCTION

SUBJECT TO PLANNING APPROVAL

Ex.FWMH
CL 5.37
IL 4.94
(Measured onsite)

From the site visit this manhole was measured at only 0.4m deep.

FW
Packaged Pump Station
TT Pumps 'Venus' Dual Pump (or similar)
Encased in a minimum of 300mm thick concrete.
CL 5.300
Incoming IL 4.950
Base Level 3.000 (Based on 2.3m Dp unit)
Volume of storage below incoming IL would equate to 1.53m³ (1530 litres).
Therefore, at 10litres per toilet flush this would equate to 153 flushes for the 24hr storage period.
Estimated usage for this single toilet would only be in the region of 30-50 flushes per day. Therefore way below the avaliable storage.
(1000Ø)

Final position of Pumped Main to be adjusted onsite by Contractor as to co-ordinate with existing drainage / services.

Level difference of approx. 800mm between proposed / existing levels.
If existing seating area is removed, area is to be graded (1 in 3 max).
If existing seating area is to remain a retaining wall would be required.
Client / Architect to confirm final arrangement.

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

Tie in with existing levels

Existing Wall shortened to allow for proposed layout.

Level difference between existing Concrete Hardstanding / Proposed path levels to be reviewed onsite. If nesscary a HB2 kerb to be installed along hardstanding edge.

Existing Concrete Hardstanding to remain

PUMPED MAIN

100Ø @ 6.97m 1:40

FW
CL 6.300
IL 5.200
(450Ø)

100Ø 8.58m 1:24

FW
CL 6.300
IL 5.300
(450Ø)

1:40 (Min.)

RB
IL 5.350

TD

RE
CL 5.700
IL 5.200

SW
CL 6.250
IL 5.100
(450Ø/CP)

2.000 - 150Ø 9.37m 1:94

2.001 150Ø 7.96m 1:80

IL 5.000

FFL 6.300

Soakaway to be postioned a minimum of 10m away from existing / proposed buildings. Proposed Soakaway to be positioned a minimum of 10m away from existing soakaway

CELLULAR SOAKAWAY
Wavin Aquacell 'CORE-R' or similar
3.0m (w) x 16.5m (l) x 1.2m (dp)
Base Level - 4.40
(Min. cover 0.6m)
(Vehicle Loading - Pedestrian / Grass Cutting Only)

IL 5.200

1.001 - 150Ø 10.61m 1:35

RE
IL 5.700

1.000 - 150Ø 12.08m 1:81
ACO Hexdrain
(B125)

SW
CL 6.350
IL 5.500
(450Ø/CP)

EXISTING SOAKAWAY FOR PREVIOUS SCHOOL EXTENSION.
Soakaway Size - 5m (w)x 20m(l) x 2m(dp)
Top Level - 4.50
Base Level - 2.50

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

Tie in with existing levels

1:125 @ A1
1:250 @ A3
0 2 4 6 8 10 12 m

Notes:	A1

1. This drawing is to be read in conjunction with all other WGC drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
2. WGC accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
3. Do not scale, work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care whilst undertaking the works.
5. 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.
6. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. WGC logos and company information must be removed from copies if information is re-used.
7. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

DRAINAGE NOTES:

1. All drainage works to be constructed in strict accordance with specification of the Local Authority, Building Regulations, Sewers for Adoption, BS8301 & BSEN.752-1.
2. For location and setting out of building drainage points refer to architects drawings.
3. All pipe runs near buildings to comply with the Building Regulations 2002 part h1. Where a pipe is within 1m of a foundation the trench shall be filled with class gen3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class gen3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
4. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
5. Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid in a concrete bed and surround.
6. 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.
7. All private building drainage shall be constructed in strict accordance with BS EN.752-1. unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of (<1l/s = 1 in 40/>1l/s = 1 in 80) for foul drains and 1 in 80 for surface water drains. all building drains shall be laid in conjunction with 'non adoptive bedding details' (class d, n or b) unless otherwise specified.
8. All pipes, bends and junction for private building drainage shall be UPVC conforming to BS4660 and BS5481 as appropriate and shall be laid in accordance with the manufacturer's specification. All pipes, bends and junction materials for adoptable drainage shall be vitrified clay, extra strength or super strength to BSEN295, with flexible joints and kitemark certified
9. All back inlet gullies to be roddable or connected to inspection chambers.
10. All gully connections other than at manholes to be 'y' junctions.
11. All road gully connections to be 150mm diameter.
12. All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
13. All connections to be soffit to soffit unless otherwise noted.
14. All concrete and concrete products to be in accordance with BRE 363 for sulphates.
15. The locations of all svps and rwps shall be cross referenced against the architects drawings during setting out.
16. Before connections are made to existing public sewers an application under 106 must be made to relevant sewerage undertaker.
17. The precise depth and location and size of existing pipes or manholes where connections or diversion are proposed must be confirmed and reported to the engineer at the earliest opportunity.
18. Where inspection covers are located in areas of block paving or paving slabs they shall be fitted with recessed covers and infilled with the adjacent material.
19. Existing drains - any existing drains to be abandoned to be decommissioned in view of building regulations by either building out, infilled or sealed.

Rev	Date	Revisons	Drwn	Chk
C2	01.03.23	Updated soakway from infiltration testing.	LG	GW
C1	21.10.22	Updated for revised foul drainage	LG	GW
P3	23.08.22	Service Routes indicatively shown	LG	GW
P2	17.06.22	Updated to latest Soil Investigation Report. Threshold drains removed as per Architects comments.	LG	GW
P1	06.06.22	Preliminary Issue	LG	GW

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Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drainage and Levels Layout

Scale:	Date:	Drawn:	Checked:
1:125	MAY 22	LG	GW

Drawing No: WG1275/201
Rev: C2

APPENDIX B – Revised Drainage Calculations / Drained Area Layout

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.026	4-8	0.009

Total Area Contributing (ha) = 0.035

Total Pipe Volume (m^3) = 0.743

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.080	0.150	80.5	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	10.610	1.150	9.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	9.370	0.100	93.7	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	7.960	0.700	11.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	150.94	5.18	5.700	0.018	0.0	0.0	0.0	1.12	19.8	7.4
1.001	150.40	5.23	5.550	0.018	0.0	0.0	0.0	3.34	59.0	7.4
2.000	151.24	5.15	5.200	0.017	0.0	0.0	0.0	1.04	18.4	7.0
2.001	150.79	5.19	5.100	0.017	0.0	0.0	0.0	3.00	53.1	7.0
1.002	150.07	5.27	4.400	0.035	0.0	0.0	0.0	1.00	17.8	14.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.300	0.600	Open Manhole	250	1.000	5.700	150				
2	6.350	0.800	Open Manhole	450	1.001	5.550	150	1.000	5.550	150	
3	5.700	0.500	Open Manhole	250	2.000	5.200	150				
4	6.250	1.150	Open Manhole	450	2.001	5.100	150	2.000	5.100	150	
5	6.300	1.900	Open Manhole	450	1.002	4.400	150	1.001	4.400	150	
								2.001	4.400	150	
	6.300	1.920	Open Manhole	0		OUTFALL		1.002	4.380	150	

No coordinates have been specified, layout information cannot be produced.

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002		6.300	4.380	0.000	0	0

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Online Controls for Storm

Pump Manhole: 5, DS/PN: 1.002, Volume (m³): 0.6

Invert Level (m) 4.400

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.0000	0.700	0.0000	1.300	0.0000	1.900	0.0000	2.500	0.0000
0.200	0.0000	0.800	0.0000	1.400	0.0000	2.000	0.0000	2.600	0.0000
0.300	0.0000	0.900	0.0000	1.500	0.0000	2.100	0.0000	2.700	0.0000
0.400	0.0000	1.000	0.0000	1.600	0.0000	2.200	0.0000	2.800	0.0000
0.500	0.0000	1.100	0.0000	1.700	0.0000	2.300	0.0000	2.900	0.0000
0.600	0.0000	1.200	0.0000	1.800	0.0000	2.400	0.0000	3.000	0.0000

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Storage Structures for Storm

Cellular Storage Manhole: 5, DS/PN: 1.002

Invert Level (m) 4.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01385 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01385

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	49.5	49.5	1.200	49.5	96.3	1.300	0.0	96.3

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 518927 104262 TQ 18927 04262	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	2	+0%					5.747	-0.103	0.000
1.001	2	15 Summer	2	+0%					5.577	-0.123	0.000
2.000	3	15 Summer	2	+0%					5.248	-0.102	0.000
2.001	4	15 Summer	2	+0%					5.128	-0.122	0.000
1.002	5	600 Winter	2	+0%	2/180 Summer				4.603	0.053	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.21			3.8	OK	
1.001	2	0.07			3.8	OK	
2.000	3	0.22			3.6	OK	
2.001	4	0.08			3.6	OK	
1.002	5	0.00		769	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 518927 104262 TQ 18927 04262	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	10
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	10	+40%					5.777	-0.073	0.000
1.001	2	15 Summer	10	+40%					5.593	-0.107	0.000
2.000	3	15 Summer	10	+40%					5.280	-0.070	0.000
2.001	4	15 Summer	10	+40%					5.145	-0.105	0.000
1.002	5	960 Winter	10	+40%	10/15 Summer				4.869	0.319	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.52			9.4	OK	
1.001	2	0.18			9.3	OK	
2.000	3	0.55			8.9	OK	
2.001	4	0.19			8.8	OK	
1.002	5	0.00		1435	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
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Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	30	+0%					5.775	-0.075	0.000
1.001	2	15 Summer	30	+0%					5.591	-0.109	0.000
2.000	3	15 Summer	30	+0%					5.277	-0.073	0.000
2.001	4	15 Summer	30	+0%					5.143	-0.107	0.000
1.002	5	720 Winter	30	+0%	30/15 Summer				4.811	0.261	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.49			8.8	OK	
1.001	2	0.17			8.8	OK	
2.000	3	0.51			8.3	OK	
2.001	4	0.18			8.3	OK	
1.002	5	0.00		1388	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
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Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	100	+0%					5.787	-0.063
1.001	2	15 Summer	100	+0%					5.597	-0.103
2.000	3	15 Summer	100	+0%					5.289	-0.061
2.001	4	15 Summer	100	+0%					5.149	-0.101
1.002	5	960 Winter	100	+0%	100/15 Summer				4.930	0.380

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.63			11.2	OK	
1.001	2	0.000	0.21			11.2	OK	
2.000	3	0.000	0.65			10.6	OK	
2.001	4	0.000	0.23			10.5	OK	
1.002	5	0.000	0.00		1695	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
Site Location	GB 518927 104262 TQ 18927 04262		Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	100	+40%					5.810	-0.040
1.001	2	15 Summer	100	+40%					5.606	-0.094
2.000	3	15 Summer	100	+40%					5.313	-0.037
2.001	4	960 Winter	100	+40%					5.174	-0.076
1.002	5	960 Winter	100	+40%	100/15 Summer				5.174	0.624

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.88			15.7	OK	
1.001	2	0.000	0.30			15.6	OK	
2.000	3	0.000	0.92			14.9	OK	
2.001	4	0.000	0.02			0.9	OK	
1.002	5	0.000	0.00		2232	0.0	SURCHARGED	

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Notes: A3

1. This drawing is to be read in conjunction with all other WGC drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
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3. Do not scale, work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
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10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

INFORMATION

Rev	Date	Revisons	Drwn	Chk
I2	02.03.23	Updated for revised building	LG	GW
I1	23.08.22	For Information	LG	GW

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Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drained Areas

Scale:	Date:	Drawn:	Checked:
1:200	AUG 22	LG	GW

Drawing No: WG1275/102
Rev: I2

APPENDIX C – Geotechnical Information / Reports

40 soils LIMITED
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Infiltration Investigation Report

at
Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL

for
New Horizons Seaside Primary School

Reference: 20588/IR
February 2023

Control Document

Project
Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL

Document Type
Main Investigation Report

Document Reference
20588/IR

Document Status
Final

Date
February 2023

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person 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.

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BGA CORPORATE MEMBER 2022 www.britishgeotech.org.uk
Quality Systems Certifications Ltd ISO 45001:2018
Quality Systems Certifications Ltd ISO 9001:2015

Commission

New Horizons Seaside Primary School commissioned Soils Limited to undertake an intrusive ground investigation and prepare a Infiltration Report on land at Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL. The scope of the investigation was outlined in the Soils Limited quotation reference Q26948, dated 5th October 2023.

This document comprises the Infiltration Report (IR) and incorporates the results, discussion, and conclusions to this intrusive works.

Limitations and Disclaimers

This Infiltration Report relates to the site located at Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL and was prepared for the sole benefit of New Horizons Seaside Primary School The "Client"). The report was prepared solely for the brief described in Section 1.1 of this report.

The contents, recommendations and advice given in the report are subject to the Terms and Conditions given in Soils Limited's Quotation and accepted by the Client in their signed notice of appointment order form dated 16th November 2022.

Soils Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

The report is personal and confidential to the Client and Soils Limited accept no responsibility of whatever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly at its own risk.

The Client may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited.

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 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.

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.

If the term “competent person” is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Unless the site investigation works have been designed and specified in accordance with EC7, this report is a Geotechnical Investigation Report and is not necessarily a Ground Investigation Report as defined by EC7 (Eurocode 7 Part 1, §3.4, Part 2, §6.1) or a Geotechnical Design Report (Eurocode 7 Part 1, §2.8) as defined by Eurocode 7 and as such may not characterise the ground conditions and additional works may be required to comply with the requirements of EC7.

Within the report reference to ground level relates to the site level at the time of the investigation, unless otherwise stated.

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

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. Supplied site surveys may not include substantial shrubs or bushes and is also unlikely to have data or any trees, bushes or shrubs removed prior to or following the site survey.

Where trees are mentioned in the text this means existing trees, substantial bushes or shrubs, recently removed trees (approximately 20 years to full recovery on cohesive soils) and those planned as part of the site landscaping).

Ownership of land brings with it onerous legal liabilities in respect of harm to the environment. “Contaminated Land” is defined in Section 57 of the Environment Act 1995 (as updated 2021) as:

“Land which is in such a condition by reason of substances in, on or under the land that significant harm is being caused or that there is a significant possibility of such harm being caused or that pollution of controlled waters is being, or is likely to be caused”.

It must be noted that a detailed survey of the possible presence or absence of invasive species, such as Japanese Knotweed, is outside of the scope of investigation.

Deleterious materials may be present in any Made Ground that pose a potential risk to site workers, end users and adjacent vulnerable receptors. These could include a range of contaminants, including asbestos, especially if the material includes large fractions of demolition derived materials.

The investigation, analysis or recommendations in respect of contamination are made solely in respect of the prevention of harm to vulnerable receptors, using where possible best practice at the date of preparation of the report. The investigation and report do not address, define or make recommendations in respect of environmental liabilities. A separate environmental audit and liaison with statutory authorities is required to address these issues.

All environmental works are undertaken in the context of, and in compliance with, BS10175+A2 2017 and LCRM (EA 2021) and all other pertinent planning, standards, documentation and guidance appropriate to the site at the time of production which may include, but are not necessarily limited to, documents provided by BS/CEN/ISO, NHBC, AGS, CIEH, CIRIA, SoBRA and CLAIRE.

Ownership of copyright of all printed material including reports, survey data, drawings, laboratory test results, trial pit and borehole log sheets, including drillers log sheets remains with Soils Limited. License is for the sole use of the client and may not be assigned, transferred or given to a third party. This license is only valid once we have been paid in full for this engagement. In the event of non-payment for our services, we reserve the right to retract the license for all project data, preventing their use and any reliance upon such data by the client or any other third party. We may also contact parties other than the client to notify them of this retraction.

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Section 1 Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare an Infiltration Investigation Report to supply the Client and their designers with information regarding ground and groundwater conditions present onsite in order to inform drainage design.

1.2 Location

The site was located at Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL and had an approximate O.S Land Ranger Grid Reference of TQ 18949 04231.

The site location plan is given in Figure 1.

1.3 Site Description

The site is currently located within the boundaries of Seaside Primary School.

The surrounding area was occupied by residential properties.

The site was mainly a grassed playing field, hedgerows and mature trees are present sporadically across the school plot and within the domestic gardens of the adjacent residential properties.

The overall topography of the site and wider area was sloping down towards the south at approximately 2°.

An aerial photograph of the site and its close environs has been included in Figure 2.

1.4 Proposed Development

The proposed development comprised of the construction of a new single storey sports hall. The proposed development is located to the south of the pre-existing school buildings. The proposal includes minor associated hard landscaping works.

In compiling this report reliance was placed on drawing number 3018/1002, Dated April 2022 and was prepared by Burns Guthrie and Partners. The recommendations provided within this report are made exclusively in relation to the scheme outlined above, and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Development plans provided by the Client are presented in Appendix C.

1.5 Anticipated Geology

The 1:50,000 BGS map showed the site to be located directly on the Raised Marine Deposits superficial deposits with a bedrock of Newhaven Chalk Formation.

1.5.1 Raised Marine Deposits

Raised Beach Deposits consist of shingle, sand, silt and clay. Beach deposits may be in the form of dunes, sheets or banks, now above the level of the present shoreline as a result of earth movement or a general fall in sea level.

1.5.2 Newhaven Chalk Formation

The Newhaven Chalk Formation is a soft white friable microporous limestone composed of coccolith biomicrites with a varying proportion of larger shell fragments.

At various levels clay sized material occurs as marl seams and partings. Close to the surface the upper few metres are invariably discoloured brown, due to leaching from the overlying strata. The interface with any overlying stratum is invariably extremely irregular as a result of localised weathering and general solution. Weathering by frost action may extend to a depth of several metres.

Chalk is a weak rock and as such it should be noted that the drilling, excavating and sampling process is detrimental to its fabric and structure. Chalk samples that have been machine sampled will therefore appear to be of a lower descriptive grade, as given in CIRIA C574, than the in-situ chalk. Soil sampling and visual observations from open excavations i.e. trial pits would allow chalk description and classification in accordance with CIRIA 574 including commenting for any aperture and discontinuities in the chalk structure.

Occasional erosional features, such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits, are found in the chalk. The features sometimes manifest themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions and satisfy planning conditions for the proposed commercial development. The intended investigation, as outlined within the Soils Limited quotation (Q26948, dated 5th October 2022), was to comprise the following items:

- Service clearance with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation
- 4No up to 5m deep windowless sampler boreholes
- 4No. monitoring well installations
- 1No. infiltration test in general accordance with BRE DG365:2016 (in January)
- 4No. groundwater monitoring visits (November-February)

2.1.1 Actual Project Works

The actual project works were undertaken on 28th November 2022 with subsequent infiltration testing being conducted on the 20th January 2023. Following site works the samples were logged, monitoring, and reporting. The actual works comprised:

- Service clearance with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation
- 4No up to 5m deep windowless sampler boreholes
- 4No. monitoring well installations
- 1No. infiltration test in general accordance with BRE DG365:2016 undertaken in a trial pit excavated at a location and depth chosen by the client.
- 4No. groundwater monitoring visits (November-February)

The trial pit in which the infiltration test was conducted was pre dug by the Client. All windowless sampler boreholes were backfilled with gravel and bentonite following the installation of monitoring wells.

All exploratory hole locations have been presented in Figure 3.

2.2 Ground Conditions

On 13th November 2022 four windowless sampler boreholes (WS1 – WS4) were drilled, using a Premier Tracked Rig, to depths ranging between 4.00 and 5.00m below ground level (bgl) at locations selected by Soils Limited using a drainage plan provided by the Client.

- Standpipes were installed within all window sample borehole locations to allow for continued monitoring of both groundwater levels. The trial pit was excavated at a location and depth chosen by the client.

The maximum depths of the exploratory holes have been included in Table 2.1.

All exploratory holes were scanned with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation to ensure the health and safety of the operatives.

Table 2.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	5.00[w]	WS3	4.00[w]
WS2	5.00[w]	WS4	4.00[w]
TP1	1.75[I]		

Note(s): [w] - well installation. The depths given in this table are taken from the ground level on-site at the time of investigation. [I] Pit pre dug by client.

The approximate exploratory hole locations are shown on Figure 3.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Topsoil (TS)
Raised Marine Deposits (RMD)
Newhaven Chalk Formation (NCK) – not encountered

The ground conditions encountered in the exploratory holes are summarised in Table 2.2.

Table 2.2 Ground Conditions

Strata	Epoch	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
		Top	Bottom		
TS	Holocene	0.00	0.40-0.60	0.50	Soft dark brownish grey slightly gravelly sandy CLAY.
RMD[2]	Holocene	0.40-0.60	4.00[1]-5.00[1]	Unknown	Orangish brown mottled light brown sandy GRAVEL or Yellowish brown mottled light brown gravelly SAND.

Note(s): [1] Final depth of exploratory hole. [2] Base of strata not encountered. The depths given in this table are taken from the ground level on-site at the time of investigation.

2.3 Ground Conditions Encountered in Exploratory Holes

The ground conditions encountered in exploratory holes have been described below in descending order. The engineering logs are presented in Appendix B.1.

2.3.1 Topsoil

Soils described as Topsoil were encountered within all exploratory holes to a maximum depth of 0.90m bgl (WS4).

The Topsoil comprised soft dark brownish grey slightly gravelly sandy CLAY. Gravel is angular to sub rounded, fine to coarse flint. Frequent rootlets were observed.

The established depth of Topsoil found at each exploratory hole location have been included in Table 2.3.

Table 2.3 Established Depth of Topsoil

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	0.50	WS3	0.50
WS2	0.40	WS4	0.60
TP1	0.90		

2.3.2 Raised Marine Deposits

Raised Marine Deposits were encountered to the base of each exploratory hole underling the Topsoil and was commonly described as yellowish brown mottled orangish brown and light greyish brown slightly clayey gravelly SAND or orangish brown mottled yellowish brown slightly clayey sandy GRAVEL.

The established depth of Raised Marine Deposits found at each exploratory hole location have been included in Table 2.4.

Table 2.4 Established Depth of Raised Marine Deposits

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	5.00[1]	WS3	4.00[1]
WS2	5.00[1]	WS4	4.00[1]
TP1	1.75[1]		

Note(s): [1] Final depth of exploratory hole.

2.4 Roots

Roots were encountered in four out of the five exploratory holes at depths ranging between 0.40 and 0.60m bgl. The established depth of root penetration found at the exploratory hole locations has been included in Table 2.5.

Table 2.5 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	0.50	WS3	0.50
WS2	0.40	WS4	0.60
TP1	Not encountered		

Roots may be found to greater depth at other locations on the site particularly close to trees and/or trees that have been removed both within the site and its close environs.

It must be emphasised that the probability of determining the maximum depth of roots from a narrow diameter borehole is low. A direct observation such as from within a trial pit is necessary to gain a better indication of the maximum root depth.

2.5 Groundwater

Groundwater was not encountered during the intrusive site investigation, nor has it been encountered in any of the monitoring visits undertaken to date (Feb 2023).

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation was conducted in November (2022) and January (2023) when groundwater levels should be rising from their annual minimum (lowest) elevation, which typically occurs around September to the annual maximum (highest) which typically occurs around March.

Further groundwater monitoring was conducted within the standpipe installed on site following completion of site works and has been presented in Table 2.6.

Table 2.6 Groundwater Monitoring

Exploratory Hole	Well Depth (m bgl)	Depth to Water (m bgl)		
		22/12/2023	11/01/2023	15/02/2023
WS1	4.80	Dry	Dry	Dry
WS2	4.00	Dry	Dry	Dry
WS3	4.00	Dry	Dry	Dry
WS4	4.00	Dry	Dry	Dry

Section 3 Infiltration Testing

3.1 Infiltration Tests

Infiltration testing was undertaken in a trial pit which had been excavated at a location and depth chosen by the client. The test was undertaken within the within the Raised Marine Deposits following the principles of BRE Digest 365 Soakaway design: 1991. BRE 365 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test can only be ended once 75% of the water present has drained away.

Three full tests were conducted within the trial pit with the third test draining overnight.

The results outlined in Table 3.1.

Table 3.1 Infiltration Rates

Exploratory Hole	Test No.	Infiltration Rate (m/s)	Comment
TP1	1	1.850E-05	
	2	1.918E-05	
	3	3.846E-06	Test left to run overnight.

The results of in-situ soakage tests gave soil infiltration rates in the Raised Beach Deposits of between 1.850E-05 m/s and 3.846E-06m/s.

It is recommended that the results of the in-situ permeability testing are passed to a drainage engineer for commentary and design.

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Figure 1 – Site Location Map

Job Number 20588	**Project** Seaside Primary School, Freshbrook Road, Lancing West Sussex BN15 8DL
Client New Horizons Seaside School	**Date** February 2023



Figure 2 – Aerial Photograph

Project
Seaside Primary School,
Freshbrook Road, Lancing, West Sussex,BN15 8DL

Client
New Horizons Seaside School

Date
February 2023

Job Number
20588





Figure 3 – Exploratory Hole Plan

Project
Seaside Primary School, Freshbrook Road, Lancing, West Sussex, BN15 8DL

Client
New Horizons Seaside School

Date
February 2023

Job Number
20588



Appendix A Standards and Resources

The site works, soil descriptions and geotechnical testing was undertaken in accordance with the following standards were applicable:

- BS 5930:2015 and BS EN ISO 22476-2 2005+A1:2011
- BS 5930:2015 and BS EN ISO 22476-2&3:2005+A1:2011
- BS 5930:2015 and BS EN ISO 22476-3:2005+A1:2011
- BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design
- BS EN ISO 14688-1:2018 - Geotechnical investigation and testing - Identification and description
- LCRM 2021 Environment Agency
- Google Earth
- British Geological Survey Website & iGeology App

Appendix B Field Work

Appendix B.1 Engineers Logs

soils LIMITED

Contract Name:	Client:	Hole ID:
Seaside School	Waller Grey	**WS1**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
20588	28/11/22	AN	KF	FINAL	**WS**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			PREM1	28/02/2023	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.50)		Soft dark grey slightly gravelly sandy CLAY. Gravel is angular to sub rounded, fine to coarse flint and rare ceramics. Frequent Rootlets. TOPSOIL.		
				0.50 (0.30)		Orangish brown slightly clayey sandy GRAVEL. Gravel is angular to subrounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				0.80 (1.50)		Yellowish brown mottled light brown very gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				2.30 (0.30)		Yellowish brown mottled orangish brown slightly SAND. Sand is fine to medium. RAISED BEACH DEPOSITS.		
				2.60 (2.40)		Yellowish brown mottled orangish brown and light greyish brown slightly clayey gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Borehole Diameter

Depth (m)	Dia (mm)

Casing Diameter

Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.

Chiselling

From (m)	To (m)	Duration	Remarks

Installation

Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN	50
1.00	4.80	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

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Contract Name:	Client:	Hole ID:
Seaside School	Waller Grey	**WS2**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
20588	28/11/22	AN	KF	FINAL	**WS**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			PREM1	28/02/2023	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.40)		Soft dark brownish grey slightly gravelly sandy CLAY. Gravel is angular to sub rounded, fine to coarse flint. Frequent Rootlets. TOPSOIL.		
				0.40				
				(0.30)		Orangish brown slightly clayey sandy GRAVEL. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				0.70				
				(0.30)		Orangish brown slightly silty gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded fine to coarse flint. RAISED BEACH DEPOSITS.		
				1.00		Yellowish brown mottled orangish brown very gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(2.70)				
				3.70		Yellowish brown mottled orangish brown very gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. Occasional clayey lenses. RAISED BEACH DEPOSITS.		
				(1.30)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN	50
1.00	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Seaside School	Waller Grey	**WS3**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
20588	28/11/22	AN	KF	FINAL	**WS**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			PREM1	28/02/2023	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.50) 0.50		Soft to firm dark brownish grey slightly gravelly sandy CLAY. Gravel is angular to sub rounded, fine to coarse flint. Frequent Rootlets. Rare medium sized flint gravel. TOPSOIL.		
				0.75		Orangish brown slightly clayey sandy GRAVEL. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				1.00		Orangish brown sandy GRAVEL .Gravel is sub angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(1.00) 2.00		Yellowish brown mottled light brown gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(0.70) 2.70		Light orangish brown gravelly SAND. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(0.70) 3.40		Yellowish brown mottled reddish brown gravelly SAND. Gravel is sub angular to sub rounded , fine to coarse flint. Rare clayey lenses. RAISED BEACH DEPOSITS.		
				(0.60) 4.00		Light orangish brown mottled reddish brown gravelly SAND. Sand is fine. Gravel is sub angular to sub rounded, fine to coarse flint. Rare clayey lenses. RAISED BEACH DEPOSITS.		
						End of Borehole at 4.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Borehole Diameter

Depth (m)	Dia (mm)

Casing Diameter

Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.

Chiselling

From (m)	To (m)	Duration	Remarks

Installation

Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN	50
1.00	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

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Contract Name:		Client:			Hole ID:
Seaside School		Waller Grey			**WS4**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
20588	28/11/22	AN	KF	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			PREM1	28/02/2023	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.60) 0.60		Soft to firm dark brownish grey slightly gravelly sandy CLAY. Gravel is angular to sub rounded, fine to coarse flint. Frequent Rootlets. Rare medium sized flint gravel. TOPSOIL.		
				(0.80) 1.40		Yellowish brown mottled orangish brown gravelly SAND. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(0.60) 2.00		Orangish brown mottled light brown sandy GRAVEL. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
				(0.45) 2.45		Light yellowish brown SAND. Sand is fine to medium. RAISED BEACH DEPOSITS.		
				(1.55) 4.00		Orangish brown mottled yellowish brown slightly silty ,sandy GRAVEL. Sand is fine to medium. Gravel is angular to sub rounded, fine to coarse flint. RAISED BEACH DEPOSITS.		
						End of Borehole at 4.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
				0.00	1.00	PLAIN	50
				1.00	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR
Tel: 01737 814221 Email: admin@soilslimited.co.uk

Trial Pit Log

Trial Pit No. **TP1** Sheet 1 of 1

Project Name: Seaside School	Project No.: 20588	Method: Machine excavated	Hole Type: TP
Location: Freshbrook Road, Lancing, West Sussex, BN15 8DL		Plant: PIT PRE DUG	Scale: 1:25
Client: Waller Grey	Trial Pit Length: 1.70m	Trial Pit Width: 0.60m	Support: NONE
Dates: 20/01/2023	Level:	Co-ords:	Logged By: JO

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
							Soft brown slightly sandy gravelly CLAY. Gravel is rounded to subrounded fine to coarse flint. TOPSOIL.
				0.90			Yellowish brown fine to medium sub rounded to rounded flint gravels SAND AND GRAVEL. RAISED BEACH DEPOSITS.
				1.75			End of Pit at 1.750m

General Remarks:
Pit pre dug by and backfilled by client. No groundwater encountered.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

Soakaway Calculations

Soakaway Test No.	SA1 Test 1
Contract:	Seaside School
Contract No.	20588

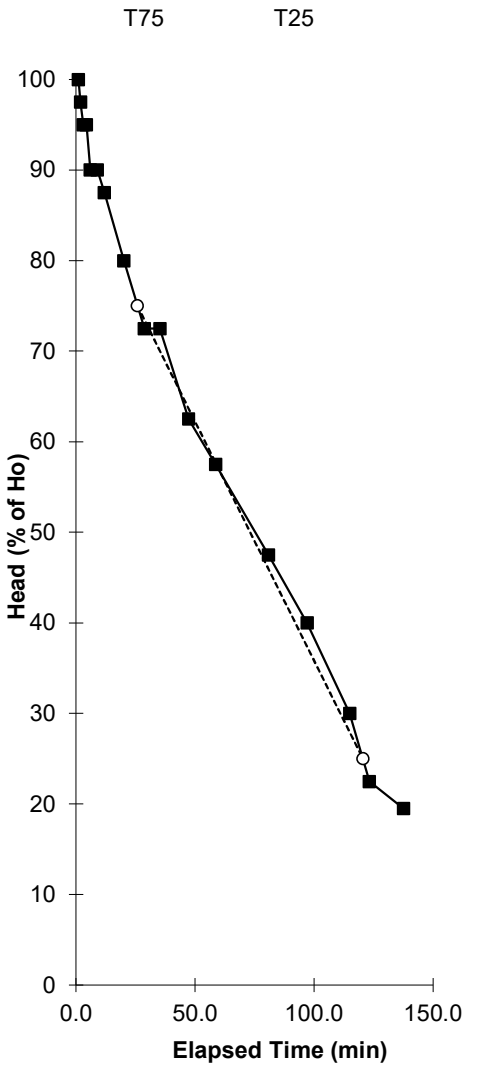
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.70	m
Width of Pit	0.60	m
Length of Pit	1.70	m
Depth of Pit Soaked	0.40	m
ap50	1.94	m2
Vp75-25	0.204	m3
t75-25	94.8	min
water used	0.4080	m3
f	1.850E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
1.3	0	100	0.4
1.30	1.0	100	0.40
1.31	1.8	98	0.39
1.32	3.1	95	0.38
1.32	4.3	95	0.38
1.34	6.0	90	0.36
1.34	8.9	90	0.36
1.35	11.9	88	0.35
1.38	20.1	80	0.32
1.41	28.7	73	0.29
1.41	35.2	73	0.29
1.45	47.3	63	0.25
1.47	58.7	58	0.23
1.51	80.9	48	0.19
1.54	97.1	40	0.16
1.58	115.0	30	0.12
1.61	123.3	23	0.09
1.62	137.7	20	0.08



T75	25.783	75
T25	120.533	25
T75-25	94.750	Derived from Best Fit

Comments

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Surrey, KT20 5SR
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Soakaway Calculations

Soakaway Test No.	SA1 Test 2
Contract:	Seaside School
Contract No.	20588

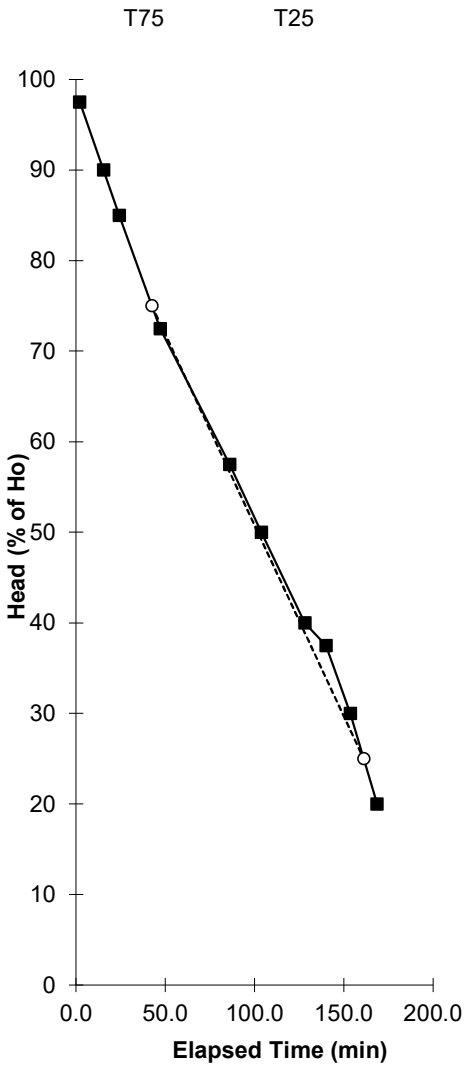
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.70	m
Width of Pit	0.60	m
Length of Pit	1.70	m
Depth of Pit Soaked	0.71	m
ap50	2.653	m2
Vp75-25	0.3621	m3
t75-25	118.6	min
water used	0.7242	m3
f	1.918E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
1.3	0	100	0.4
1.31	2.0	98	0.39
1.34	15.3	90	0.36
1.36	24.2	85	0.34
1.41	47.1	73	0.29
1.47	86.1	58	0.23
1.5	103.7	50	0.20
1.54	128.2	40	0.16
1.55	140.1	38	0.15
1.58	153.6	30	0.12
1.62	168.7	20	0.08



T75	42.510	75
T25	161.142	25
T75-25	118.632	Derived from Best Fit

Comments

SOILS LIMITED
Newton House, Cross Road, Tadworth
Surrey, KT20 5SR
Telephone: 01737 814 221
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Soakaway Calculations

Soakaway Test No.	SA1 Test 3
Contract:	Seaside School
Contract No.	20588

Field Test

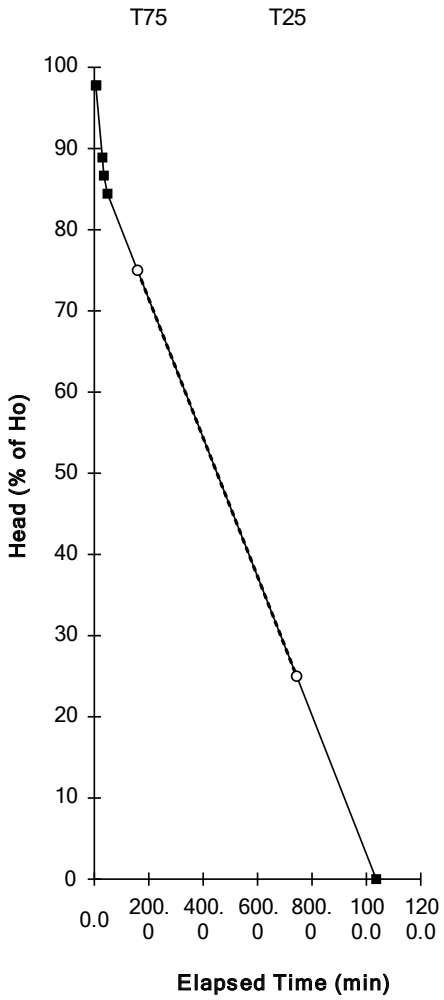
'rial Pit Log (include details of groundwater)
See trial Pit record

Depth of Pit	1.73	m
Width of Pit	0.60	m
Length of Pit	1.70	m
Depth of Pit Soaked	0.69	m
ap50	2.607	m2
Vp75-25	0.3519	m3
t75-25	584.9	min
water used	0.7038	m3
f	3.846E-06	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
1.28	0	100	0.45
1.29	5.0	98	0.44
1.29	7.2	98	0.44
1.33	29.6	89	0.40
1.34	34.9	87	0.39
1.35	48.1	84	0.38
1.73	1036.0	0	0.00

T75	158.618	75
T25	743.539	25
T75-25	584.921	Derived from Best Fit



Comments

Final reading taken following morning.

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Appendix C Information Provided by the Client



01 Site Plan Existing - Topo Survey 1:250

revisions

rev.	date	description
C01	1/9/22	First issue

notes

drawing status:

CONSTRUCTION

3a hawkwell barn
hawkwell business centre
maidstone road,
pembury, kent
tn2 4ag

tel: 01892 824193

e-mail:
enquiries@burns-guthrie.co.uk

burnsguthrie and partners

job title:
New Horizons Academy Trust
Lancing
Seaside Primary - New Sports Hall

drawing title:
Site Plan Existing - Topo Survey

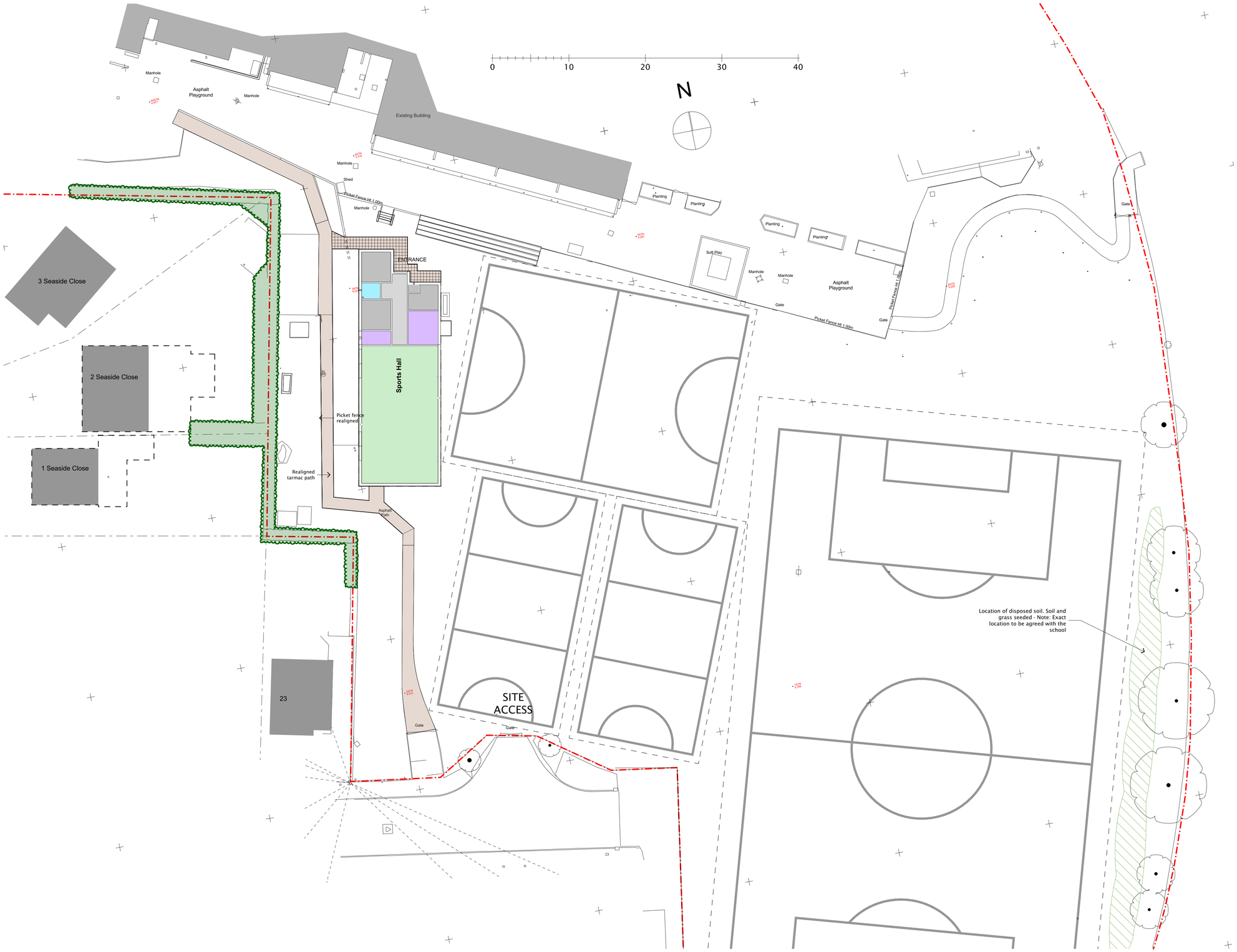
scale:
1:250 @ A1

drawn by:
MH

date:
4/4/2022

drawing number:
3018/1001

rev.:
C01



01 Site Plan Proposed 1:250

revisions

rev.	date	description
C01	1/9/22	First issue

notes

drawing status:

CONSTRUCTION

3a hawkwell barn
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job title:
New Horizons Academy Trust
Lancing
Seaside Primary - New Sports Hall

drawing title:
Site Plan Proposed

scale:
1:250 @ A1

drawn by:
MH

date:
4/4/2022

drawing number:
3018/1002

rev.:
C01

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

RESIDUAL HAZARDS

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following:

1. Unknown services/depths within work zone. Contractor to undertake necessary precautions and investigation prior to excavating.
2. Existing Overhead Power and Telecoms Cables. Contractor is to prepare a method statement to ensure operatives are familiar and competent with the dangers of working near overhead cable.
3. The works will involve the movement of plant and machinery within a school playground. There is a risk of potential conflict between plant/machinery and the school personnel / children. Contractor to undertake necessary precautions and ensure suitable traffic management is in place prior to commencement.
4. Working in live sewers. Contractor to ensure operatives are familiar and competent with the dangers of working in live sewers.
5. Excavations within existing tree root zones. Contractor is to seek advice from an Arboriculturalist and work to the methodology and requirements set out in the Arboriculturalist's report.
6. Deep excavations associated with the drainage installation of soakaways & manholes. Contractor is to ensure suitable temporary works are in place to ensure the safety of operatives and the public (where necessary). Contractor to ensure operatives are familiar and competent with the dangers of working in deep excavations.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement

DRAWING LEGEND

SURFACE WATER DRAINAGE		FOUL WATER DRAINAGE	
	EXISTING SURFACE WATER DRAINAGE		EXISTING FOUL WATER SEWER
	PROPOSED SURFACE WATER DRAINAGE		PROPOSED FOUL WATER DRAINAGE
SW# CL ##.## IL ##.## (450/600Ø/CP)	TYPE 3 INSPECTION CHAMBER (Max 3m depth to invert, CP denotes Catchpit) Chambers deeper than 1.2m to be non-entry.		PROPOSED FOUL WATER PUMPED MAIN (Size to be confirmed by Manufacturer)
RE IL ##.##	RODDING EYE	Pump Station CL ##.## IL ##.## (####Ø)	PUMPING CHAMBER (See specialist details for size and other information)
	CELLULAR SOAKAWAY (Vented)	MISC	
Vent	CELLULAR STORAGE TANK VENT (To be positioned in non-trafficed location)	FFL ##.###	PROPOSED BUILDING FINISHED FLOOR LEVEL
Channel	CHANNEL DRAIN (100mm wide, Heelguard grating, trapped gully outlet) TD - Threshold Drain	##.##	PROPOSED SPOT LEVEL
		##.##	EXISTING SPOT LEVEL
		1:80	GRADIENT OF FALL

PRELIMINARY

From the site visit this manhole was measured at only 0.4m deep.

FW
Packaged Pump Station
TT Pumps 'Venus' Dual Pump (or similar)
Encased in a minimum of 300mm thick concrete.
CL 5.300
Incoming IL 4.950
Base Level 3.000 (Based on 2.3m Dp unit)
Volume of storage below incoming IL would equate to 1.53m³ (1530 litres).
Therefore, at 10litres per toilet flush this would equate to 153 flushes for the 24hr storage period.
Estimated usage for this single toilet would only be in the region of 30-50 flushes per day. Therefore way below the available storage.
(1000Ø)

Level difference of approx. 800mm between proposed / existing levels.
If existing seating area is removed, area is to be graded (1 in 3 max).
If existing seating area is to remain a retaining wall would be required.
Client / Architect to confirm final arrangement.

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

Tie in with existing levels

Existing Wall shortened to allow for proposed layout.

Level difference between existing Concrete Hardstanding / Proposed path levels to be reviewed onsite. If nesscary a HB2 kerb to be installed along hardstanding edge.

Existing Concrete Hardstanding to remain

Tie in with existing levels

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

EXISTING SOAKAWAY FOR PREVIOUS SCHOOL EXTENSION.
Soakaway Size - 5m (w)x 20m(l) x 2m(dp)
Top Level - 4.50
Base Level - 2.50

Soakaway to be postioned a minimum of 10m away from existing / proposed buildings. Proposed Soakaway to be positioned a minimum of 10m away from existing soakaway

CELLULAR SOAKAWAY
Wavin Aquacell 'CORE-R' or similar
3.0m (w) x 14.0m (l) x 1.2m (dp)
Base Level - 4.40
(Min. cover 0.6m)
(Vehicle Loading - Pedestrian / Grass Cutting Only)

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

1:125 @ A1
1:250 @ A3
0 2 4 6 8 10 12 m

Notes: A1

1. This drawing is to be read in conjunction with all other WGC drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
2. WGC accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
3. Do not scale, work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care whilst undertaking the works.
5. 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.
6. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. WGC logos and company information must be removed from copies if information is re-used.
7. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

DRAINAGE NOTES:

1. All drainage works to be constructed in strict accordance with specification of the Local Authority, Building Regulations, Sewers for Adoption, BS8301 & BSEN.752-1.
2. For location and setting out of building drainage points refer to architects drawings.
3. All pipe runs near buildings to comply with the Building Regulations 2002 part h1. Where a pipe is within 1m of a foundation the trench shall be filled with class gen3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class gen3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
4. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
5. Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid in a concrete bed and surround.
6. 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.
7. All private building drainage shall be constructed in strict accordance with BS EN.752-1. unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of (<1l/s = 1 in 40/>1l/s = 1 in 80) for foul drains and 1 in 80 for surface water drains. all building drains shall be laid in conjunction with 'non adoptive bedding details' (class d, n or b) unless otherwise specified.
8. All pipes, bends and junction for private building drainage shall be UPVC conforming to BS4660 and BS5481 as appropriate and shall be laid in accordance with the manufacturer's specification. All pipes, bends and junction materials for adoptable drainage shall be vitrified clay, extra strength or super strength to BSEN295, with flexible joints and kitemark certified
9. All back inlet gullies to be roddable or connected to inspection chambers.
10. All gully connections other than at manholes to be 'y' junctions.
11. All road gully connections to be 150mm diameter.
12. All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
13. All connections to be soffit to soffit unless otherwise noted.
14. All concrete and concrete products to be in accordance with BRE 363 for sulphates.
15. The locations of all svps and rwps shall be cross referenced against the architects drawings during setting out.
16. Before connections are made to existing public sewers an application under 106 must be made to relevant sewerage undertaker.
17. The precise depth and location and size of existing pipes or manholes where connections or diversion are proposed must be confirmed and reported to the engineer at the earliest opportunity.
18. Where inspection covers are located in areas of block paving or paving slabs they shall be fitted with recessed covers and infilled with the adjacent material.
19. Existing drains - any existing drains to be abandoned to be decommissioned in view of building regulations by either building out, infilled or sealed.

Rev	Date	Revisons	Drwn	Chk
P3	23.08.22	Service Routes indicatively shown	LG	GW
P2	17.06.22	Updated to latest Soil Investigation Report. Threshold drains removed as per Architects comments.	LG	GW
P1	06.06.22	Preliminary Issue	LG	GW

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Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drainage and Levels Layout

Scale:	Date:	Drawn:	Checked:
1:125	MAY 22	LG	GW

Drawing No: WG1275/201 Rev: P3

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APPENDIX D – Previous Drainage Design Information Pack (Calculations and Infiltration rates are Superseded)

WALLER GRAY CONSULTING

SEASIDE PRIMARY SCHOOL
SPORTS HALL

DRAINAGE DESIGN INFORMATION

(REV.C)

PROPOSED SPORTS HALL

JOB REF: WG1275

JUNE 2022

DRAINAGE STRATEGY

Project: Seaside Primary School Sports Hall

Client: Seaside Primary School

Ref: WG1275

Author: ..... Initials: LG Date: 06.06.2022

Checked By: ..... Initials: GW Date: 06.06.2022

Approved By: ..... Initials: GW Date: 06.06.2022

REVISION	DATE	STATUS	ISSUED BY
A	06.06.2022	First Draft	LG
B	17.06.2022	Updated to latest SI report	LG
C	23.08.2022	Updated to Planning Comments	LG
D			
E			

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APPENDICES

Appendix A Architects Layout GA
Appendix B Southern Water Sewer Records
Appendix C Drained Areas
Appendix D Greenfield Predevelopment Surface Water Calculations
Appendix E Proposed Surface Water Calculations
Appendix F Geotechnical Report for Sports Hall Works
Appendix G Site Photographs
Appendix H Schools Previous Adjacent Extension Information (Drainage Layout / SI)
Appendix I Drainage Maintenance Schedule

1.0 INTRODUCTION

1.1 Planning Background

1.1.1 The site has previously been schemed for Planning in terms of its drainage. This was submitted for the original application AWDM/1732/21 with Adur and Worthing Council.

1.1.2 The Drainage Strategy indicated surface water being discharged via a new soakaway within the playing field of the school.

1.2 Site Location and Description

1.2.1 Seaside Primary school is located on Freshbrook Road, Lancing. The sea is approximately 500m South of the site, with the Brighton to Portsmouth railway line cited approximately 400mm North. Brighton City Airport is located 1.7km North West of the School.

1.2.2 The proposed location of the new sports hall, is bounded by the existing school buildings to the North, and the schools playing fields to the East. Residential dwellings and their gardens on Seaside Close bound the site to the West. South of the building is an area of school playing field, with Seaside Avenue beyond.

1.2.3 The site is currently school playing field, with some existing paths crossing the proposed building location.

1.2.4 Looking back through historic satellite imagery it is hard to distinguish when the buildings roofs were removed. Even though the roofs have been removed, the site still keeps its concrete hardstanding to the all the old building footprints and the courtyard areas.

1.2.5 The site has a fall of approximately 1m from South to North, over the development area.

1.2.6 The site area is approximately 500m^2 (0.05Ha). This is an estimate of the new sports hall and relative external areas associated with the new building.

1.3 Ground Conditions

1.3.1 An intrusive Geotechnical study was carried out by Ground and Water back in April / May 2022 (Report Ref: GWPR4784). Extracts of these reports are included within the Appendices.

1.3.2 The testing included both infiltration testing and groundwater monitoring as part of the investigatory works onsite.

1.3.3 The underlying geology is identified as Raised Beach Deposits.

1.3.4 Infiltration testing was carried out at a depth of approximately 1.8m below ground level, inline with the anticipated base level of the proposed soakaway. Infiltration rates of between 4.65x10^{-6}m/s and 1.49x10^{-5}m/s were recorded.

1.3.5 Groundwater was not recorded during the testing, with excavations taken up to 3.45m deep below existing ground levels.

1.3.6 The Geotechnical report suggest soakaways to be positioned a minimum of 10m from the proposed / existing buildings due to the underlying Chalk and risk to creation of solution features.

1.4 Existing Drainage

Surface Water

1.4.1 The main school building discharges its surface water to a soakaway within the school playing fields. This soakaway for the main school building was reconstructed under the construction of the previous extension to the main building in 2015.

1.4.2 A copy of the previous drainage layout design has been located from the Planning Portal for the extension to the main building. The Planning application reference for these works was AWDM/1017/13. A copy of this drainage layout is included within the Appendices for reference.

1.4.3 The schools previous soakaway was installed with a base depth of 2.50mAOD, and from previous site investigatory work for this extension groundwater was encountered at a depth of approximately 1.10mAOD. Extracts of this previous investigation are included within the Appendices.

1.4.4 Southern Water sewerage plans do not indicate any surface water sewers within close proximity to the site. A copy of these records are included within the Appendices of this report.

1.4.5 The area where the proposed building is to be located is mainly playing fields with the exception of some minor impermeable paths. Therefore the area would be considered as greenfield in terms of its surface water runoff. Greenfield runoff calculated for the site would be as follow (calculated in accordance with ICP SUDS):

1 in 1yr	0.1 l/s
1 in 2yr (Qbar)	0.1 l/s
1 in 30yr	0.2 l/s
1 in 100yr	0.3 l/s

1.4.6 The greenfield runoff volume is calculated to be 9.519m3 (based on FEH, SPR of 29.28%).

Foul Water

1.4.7 The existing school buildings discharge their foul water to the Southern Water sewerage network.

1.4.8 Southern Water sewerage plans indicate a foul sewer crossing the school playing fields approximately 75m to the East of the proposed sports hall location. The foul sewer at this location is 300mm in diameter and in the region of 3m deep.

1.4.9 From a walkover survey and review of previous drainage layouts we were able to locate a foul manhole approximately 20m North of the proposed building location. This drains in a Northerly direction under the building and out to the Southern Water foul sewer via the schools main sewer connection. This manhole is 0.43m deep with the outgoing pipe 100mm in diameter. It appears to be fed by a sink within a classroom and a water drinking fountain.

1.4.10 Southern Water records are attached within the Appendices of this report.

2.0 PROPOSED DRAINAGE / SUD's STRATEGY

2.1 Surface Water Drainage

2.1.1 The SUD's Manual and Building Regulations set out a hierarchy of drainage methods to ensure that developments maximise the use of sustainable drainage techniques. The hierarchy favours infiltration methods of disposal over other methods such as watercourses and sewers.

SUDS Technique	Suitable	Comments
Green Roofs	No	Not suitable due to the proposed roof type and size.
Basins and Ponds - Constructed Wetlands - Balancing Ponds - Detention Basins - Retention Ponds	 No No No No	Due to the size and type of building that is proposed, we would consider these inappropriate in this instance, due to proximity to a school with young pupils.
Filter strips Swales	No No	Due to the size and type of building that is proposed, these types of features would not be required.
Infiltration Devices - Soakaways - Infiltration trenches and basins	 Yes No	Infiltration features such as soakaways are proposed for the new building, based on the infiltration results recorded during the intrusive testing.
Porous paviours	Yes	Potentially these could be utilised. However, with limited external surfacing included in the project scope is limited for this technique.
Tanked systems - Oversized pipes - Cellular tanks	 Yes Yes	These techniques could be used. But as infiltration techniques are proposed these are least likely to require implementing.

2.1.2 Under the SUD's hierarchy as set out in CIRIA C753 Suds Manual and Building Regulations, surface water drainage should be designed in certain manner to maximise its benefits. The hierarchy favours infiltration techniques over that of discharging water to a watercourse or the local sewerage network.

2.1.3 The geotechnical testing undertaken onsite of BRE365 infiltration tests indicate the soils are viable for infiltration techniques.

2.1.4 Its is proposed to discharge the surface water runoff via a cellular soakaway located in the playing fields are adjacent the new building. The soakaway is to be positioned as minimum of 10m away from proposed / existing buildings in accordance with the geotechnical report recommendations.

2.1.5 The soakaway has been designed to cater for all storm events up to and including the 1 in 100yr + 40% climate change event. The soakaway has a half drain time of less than 24hrs for the 1 in 30 year event, and the inlets into the soakaway are all above the highest water level for the 1 in 10 year + 40%cc event.

2.1.6 As the building is a sports hall for an educational building no additional allowance would need to be made for urban creep.

2.1.7 The proposed soakaway will be installed with a base level of 4.40mAOD. Groundwater was not recorded during the investigatory works for the Sports Hall with investigatory works taken to a depth of 3.45mBGL (i.e. 2.75mAOD).

2.1.8 The soakaway for the previous extension was installed with a base level of 2.50mAOD, with soil investigation for this work indicating groundwater at a level of 1.10mAOD. Therefore, the proposed soakaway for the new extension is located at a level above that of the existing soakaway and previously encountered groundwater.

2.1.9 Therefore, inline with the drainage strategy it is proposed to proceed with this method of discharge for the surface water from the site.

2.1.10 All surface water drainage design is designed to cater for 1 in 100 year return period plus a 40% allowance for climate change.

2.2 Surface Water Treatment

2.2.1 The CIRIA SUDS Manual C753 outlines three categories of pollution hazard identification for the various types of land use as follows:

- Total Suspended Solids (TSS)
- Metals (M)
- Hydrocarbons (H)

2.2.2 In accordance with C753 Table 26.2 the proposed land uses at the site are categorised as follows:

- Other Roofs – Low / TSS-0.3 / M-0.2 / H-0.05

2.2.3 In accordance with C753 Table 26.3 to establish whether a proposed surface water management technique can provide sufficient treatment for runoff, the values are compared. If the treatment score for each pollutant category is higher than the pollution score, then the chosen technique is sufficient. If a single technique is not judged to provide enough treatment, then other techniques can be added to the system.

2.2.4 The proposed soakaway would drain roof area only.

2.2.5 The unsaturated zone provided between the base of the proposed soakaway and the maximum groundwater level is greater than 1m and will provide a suitable medium in order to treat / protect the groundwater.

2.3 Foul Water Drainage

2.3.1 The existing site is currently only a playing field, and thus has not foul drainage requirement.

2.3.2 The main school's foul manhole is located less than 20m to the North of the proposed Sports Hall Building.

2.3.3 It is proposed to connect the Sports Halls foul into noted above outside the main school building.

2.3.4 The existing manhole has a 100mm diameter outgoing pipe and would appear to service only one sink and one drinking water fountain to the main school building. Therefore, should have adequate capacity for the proposed Sports Hall.

2.3.5 However, due to the depth of the existing manhole being only 0.43m deep it will require the foul to be pumped to this location. This is the nearest viable point of foul connection on the main school.

2.3.6 The foul from the Sports hall will discharge to a packaged pumping station before being pumped to the schools main foul system.

2.3.7 The Sports Hall has one toilet (including basin) and also a caretakers cupboard sink, in terms of its foul output. It would be anticipated the maximum amount of flushes to the toilet in a day would be approximately 50, which would equate to 4.5 flushes per hour. A typical new cistern would use approximately 8litres per flush, therefore this would equate to 400litres per day. Therefore, including the sinks would equate to a maximum of 500 litres per day.

2.3.8 Therefore, in accordance with Part H of Building Regulations the pumping system would need to cater for a 24hr storage based on the buildings anticipated output. The pumping station specified on the design drawings has a storage below the incoming invert levels of over 1500litres. This would therefore be sufficient to cater for the buildings anticipated foul discharge.

2.4 Maintenance and Management

2.4.1 A Maintenance Schedule is attached within the Appendices of this document.

3.0 PLANNING CONDITIONS

3.1.1 Adur and Worthing District Council (Ref: AWDM/1732/21)

The planning conditions have been extracted from the Decision Notice and shown below in *italics* how they are set out within the document. A response has been set out below each listed condition.

3.1.2 Condition 8 – '' Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and winter infiltration testing to BRE DG365, or similar approved, will be required to support the design of any Infiltration drainage. No building / No part of the extended building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.''

A detailed drainage layout is included within the package of information drawing reference WG1275/201 and WG1275/250. The information in the previous sections sets out the philosophy behind the drainage design along with the relevant design information included within the Appendices.

3.1.3 Condition 9 – '' Development shall not commence until full details of the maintenance and management of the surface water drainage system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual. ''

A design and maintenance schedule for the site is included within the Appendices of this document.

WALLER GRAY DESIGN DRAWINGS

WG1275/201 Drainage and Levels Layout
WG1275/250 Drainage Details

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

RESIDUAL HAZARDS

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following:

1. Unknown services/depths within work zone. Contractor to undertake necessary precautions and investigation prior to excavating.
2. Existing Overhead Power and Telecoms Cables. Contractor is to prepare a method statement to ensure operatives are familiar and competent with the dangers of working near overhead cable.
3. The works will involve the movement of plant and machinery within a school playground. There is a risk of potential conflict between plant/machinery and the school personnel / children. Contractor to undertake necessary precautions and ensure suitable traffic management is in place prior to commencement.
4. Working in live sewers. Contractor to ensure operatives are familiar and competent with the dangers of working in live sewers.
5. Excavations within existing tree root zones. Contractor is to seek advice from an Arboriculturalist and work to the methodology and requirements set out in the Arboriculturalist's report.
6. Deep excavations associated with the drainage installation of soakaways & manholes. Contractor is to ensure suitable temporary works are in place to ensure the safety of operatives and the public (where necessary). Contractor to ensure operatives are familiar and competent with the dangers of working in deep excavations.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement

DRAWING LEGEND

SURFACE WATER DRAINAGE		FOUL WATER DRAINAGE	
	EXISTING SURFACE WATER DRAINAGE		EXISTING FOUL WATER SEWER
	PROPOSED SURFACE WATER DRAINAGE		PROPOSED FOUL WATER DRAINAGE
SW# CL ##.## IL ##.## (450/600Ø/CP)	TYPE 3 INSPECTION CHAMBER (Max 3m depth to invert, CP denotes Catchpit) Chambers deeper than 1.2m to be non-entry.		PROPOSED FOUL WATER PUMPED MAIN (Size to be confirmed by Manufacturer)
RE IL ##.##	RODDING EYE	Pump Station CL ##.## IL ##.## (####Ø)	PUMPING CHAMBER (See specialist details for size and other information)
	CELLULAR SOAKAWAY (Vented)	MISC	
Vent	CELLULAR STORAGE TANK VENT (To be positioned in non-trafficed location)	FFL ##.###	PROPOSED BUILDING FINISHED FLOOR LEVEL
Channel	CHANNEL DRAIN (100mm wide, Heelguard grating, trapped gully outlet) TD - Threshold Drain	##.##	PROPOSED SPOT LEVEL
		##.##	EXISTING SPOT LEVEL
		1:80	GRADIENT OF FALL

PRELIMINARY

From the site visit this manhole was measured at only 0.4m deep.

FW
Packaged Pump Station
TT Pumps 'Venus' Dual Pump (or similar)
Encased in a minimum of 300mm thick concrete.
CL 5.300
Incoming IL 4.950
Base Level 3.000 (Based on 2.3m Dp unit)
Volume of storage below incoming IL would equate to 1.53m³ (1530 litres).
Therefore, at 10litres per toilet flush this would equate to 153 flushes for the 24hr storage period.
Estimated usage for this single toilet would only be in the region of 30-50 flushes per day. Therefore way below the avaliable storage.
(1000Ø)

Level difference of approx. 800mm between proposed / existing levels.
If existing seating area is removed, area is to be graded (1 in 3 max).
If existing seating area is to remain a retaining wall would be required.
Client / Architect to confirm final arrangement.

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

Tie in with existing levels

Existing Wall shortened to allow for proposed layout.

Level difference between existing Concrete Hardstanding / Proposed path levels to be reviewed onsite. If nesscary a HB2 kerb to be installed along hardstanding edge.

Existing Concrete Hardstanding to remain

EXISTING SOAKAWAY FOR PREVIOUS SCHOOL EXTENSION.
Soakaway Size - 5m (w)x 20m(l) x 2m(dp)
Top Level - 4.50
Base Level - 2.50

Soakaway to be postioned a minimum of 10m away from existing / proposed buildings. Proposed Soakaway to be positioned a minimum of 10m away from existing soakaway

CELLULAR SOAKAWAY
Wavin Aquacell 'CORE-R' or similar
3.0m (w) x 14.0m (l) x 1.2m (dp)
Base Level - 4.40
(Min. cover 0.6m)
(Vehicle Loading - Pedestrian / Grass Cutting Only)

Ex.FWMH
CL 5.37
IL 4.94
(Measured onsite)

PUMPED MAIN >>
<< Existing SW Drain 100Ø
Existing SW Drain 100Ø >>
Existing SW Drain 150Ø >>
Existing SW Drain 150Ø >>

RE
CL 5.700
IL 5.200

SW
CL 6.250
IL 5.100
(450Ø/CP)

2.001 - 150Ø 9.36m 1:80

IL 5.000

1.001 - 150Ø 10.61m 1:35

IL 5.200

SW
CL 6.350
IL 5.500
(450Ø/CP)

RE
IL 5.700

1.000 - 150Ø 12.08m 1:81
ACO Hexdrain
(B125)

TD

FFL 6.300

FFL 6.300

1:125 @ A1
1:250 @ A3
0 2 4 6 8 10 12 m

Notes: A1

1. This drawing is to be read in conjunction with all other WGC drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
2. WGC accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
3. Do not scale, work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care whilst undertaking the works.
5. 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.
6. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. WGC logos and company information must be removed from copies if information is re-used.
7. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

DRAINAGE NOTES:

1. All drainage works to be constructed in strict accordance with specification of the Local Authority, Building Regulations, Sewers for Adoption, BS8301 & BSEN.752-1.
2. For location and setting out of building drainage points refer to architects drawings.
3. All pipe runs near buildings to comply with the Building Regulations 2002 part h1. Where a pipe is within 1m of a foundation the trench shall be filled with class gen3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class gen3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
4. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
5. Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid in a concrete bed and surround.
6. 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.
7. All private building drainage shall be constructed in strict accordance with BS EN.752-1. unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of (<1l/s = 1 in 40/>1l/s = 1 in 80) for foul drains and 1 in 80 for surface water drains. all building drains shall be laid in conjunction with 'non adoptive bedding details' (class d, n or b) unless otherwise specified.
8. All pipes, bends and junction for private building drainage shall be UPVC conforming to BS4660 and BS5481 as appropriate and shall be laid in accordance with the manufacturer's specification. All pipes, bends and junction materials for adoptable drainage shall be vitrified clay, extra strength or super strength to BSEN295, with flexible joints and kitemark certified
9. All back inlet gullies to be roddable or connected to inspection chambers.
10. All gully connections other than at manholes to be 'y' junctions.
11. All road gully connections to be 150mm diameter.
12. All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
13. All connections to be soffit to soffit unless otherwise noted.
14. All concrete and concrete products to be in accordance with BRE 363 for sulphates.
15. The locations of all svps and rwps shall be cross referenced against the architects drawings during setting out.
16. Before connections are made to existing public sewers an application under 106 must be made to relevant sewerage undertaker.
17. The precise depth and location and size of existing pipes or manholes where connections or diversion are proposed must be confirmed and reported to the engineer at the earliest opportunity.
18. Where inspection covers are located in areas of block paving or paving slabs they shall be fitted with recessed covers and infilled with the adjacent material.
19. Existing drains - any existing drains to be abandoned to be decommissioned in view of building regulations by either building out, infilled or sealed.

Rev	Date	Revisons	Drwn	Chk
P3	23.08.22	Service Routes indicatively shown	LG	GW
P2	17.06.22	Updated to latest Soil Investigation Report. Threshold drains removed as per Architects comments.	LG	GW
P1	06.06.22	Preliminary Issue	LG	GW

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Client:
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Drawing Title:
Drainage and Levels Layout

Scale:	Date:	Drawn:	Checked:
1:125	MAY 22	LG	GW

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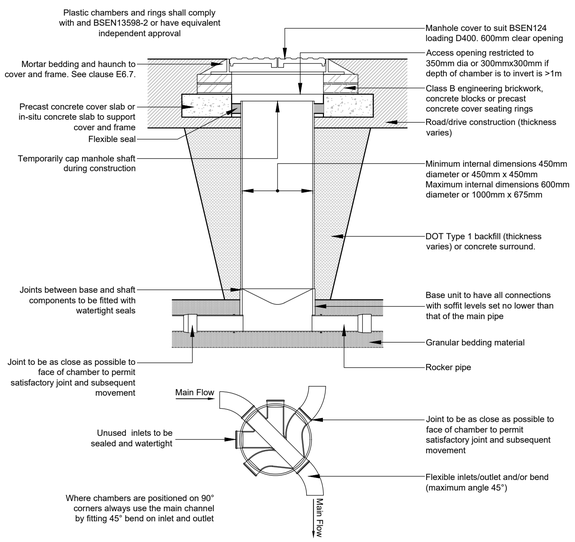
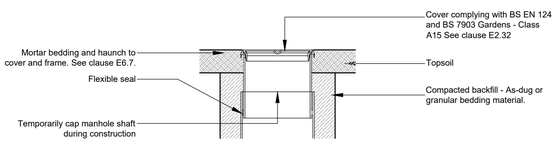
Rev: P3



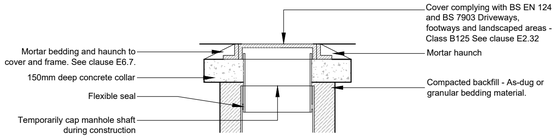
TYPICAL ACCESS CHAMBER DETAIL - TYPE 3

3m maximum depth to from cover to pipe soffit. (non entry) vehicle loading
(Scale 1:20)



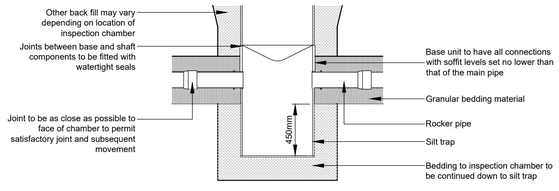
ALTERNATIVE TOP DETAIL - TYPE 3

Sited in domestic gardens subject to pedestrian loading only
(Scale 1:20)



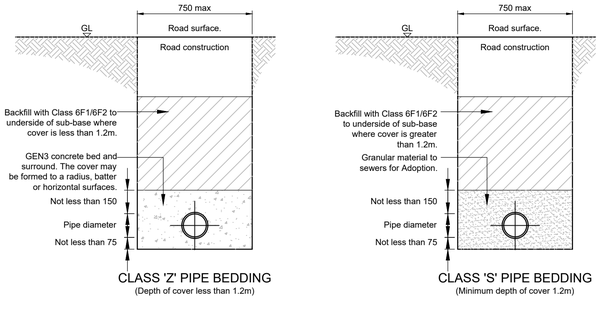
ALTERNATIVE TOP DETAIL - TYPE 3

Sited in driveways/paved areas subject to light vehicle loading only
(Scale 1:20)



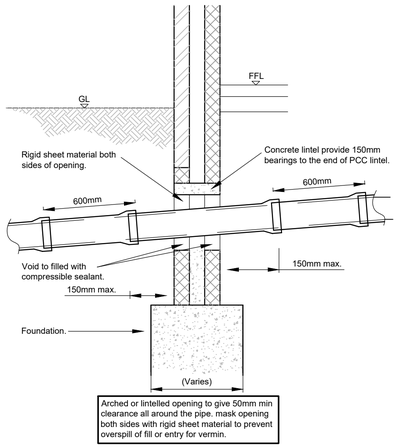
TYPICAL SILT TRAP DETAIL - TYPE 3

(Scale 1:20)



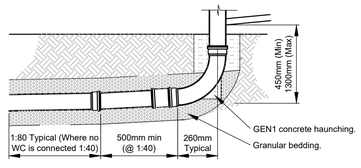
PIPE BEDDING DETAILS (UNDER HIGHWAYS)

(Scale 1:20)



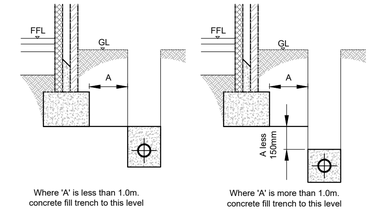
TYPICAL SECTION PIPE PASSING THROUGH WALL PIPE THROUGH LINTELLED OPENING

(Scale 1:20)



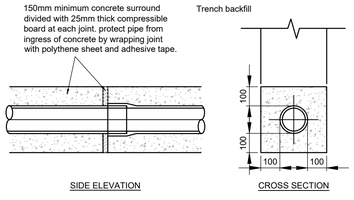
DETAIL OF FOUL REST BEND DETAIL

(Scale 1:20)



DETAIL OF PIPE RUNS NEAR BUILDINGS

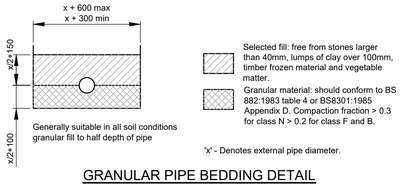
(Scale 1:10)



CONCRETE BED AND SURROUND TO PIPES

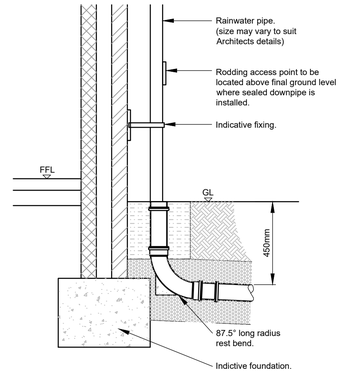
(Scale 1:20)

LIMITS OF COVER FOR THERMOPLASTIC PIPES IN ANY WIDTH OF TRENCH					
Nominal Size	Fields and gardens		Light traffic roads		Heavy traffic roads	
	MIN	MAX	MIN	MAX	MIN	MAX
100-300mm	0.6	7.0	0.9	7.0	0.9	7.0



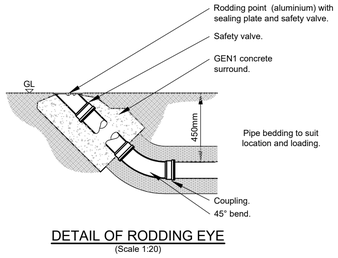
GRANULAR PIPE BEDDING DETAIL

(Scale 1:20)
Refer to Limits of Cover Table below for minimum covers.



TYPICAL RWP REST BEND DETAIL

(Scale 1:20)



DETAIL OF RODDING EYE

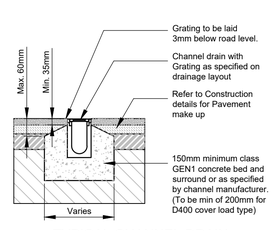
(Scale 1:20)

Minimum Dimensions for Access Fittings and Chambers						
Type	Internal Sizes				Cover Sizes	
	Depth to invert (m)	Size of largest pipe (DN)	Length x Width (mm)	Circular (mm)	Length x Width (mm)	Circular (mm)
Rodding Eye	As Drain but Minimum 100mm					
Shallow Access						
Small	0.6 or less	150	150x100	150	150x100	150
Large			225x100		225x100	
Inspection Chamber	0.6 or less			190		190
	1.2 or less	150	450x450	450	450x450	450
	1.2 - 3.0		450x450	450	300x300	350
Manhole	1.5 or less	150	675x750	1200	675x750	n/a
		225	675x1200	1200	1200x675	n/a
		300	675x1200	1200	1200x675	n/a
		>300	DN+450 x1800	The larger of 1800 or (DN+450)	1200x675	n/a
	Over 1.5	225	1200x1000	1200	600x600	600
		300	1200x1075	1200	600x600	600
		375-450	1350x1225	1200	600x600	600
		>450	DN+775 x1800	The larger of 1800 or (DN+775)	1200x675	600
Manhole Shaft	Over 2.7		900x840	900	600x600	600

BUILDING REGULATIONS MINIMUM DIMENSIONS FOR MANHOLES

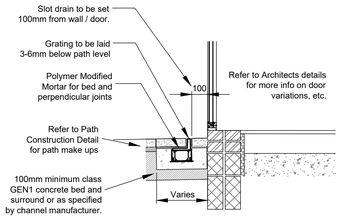
(Not to Scale)

This plan complies with the Building Regulations 2002
Section 'H' - Drainage & Waste Disposal.



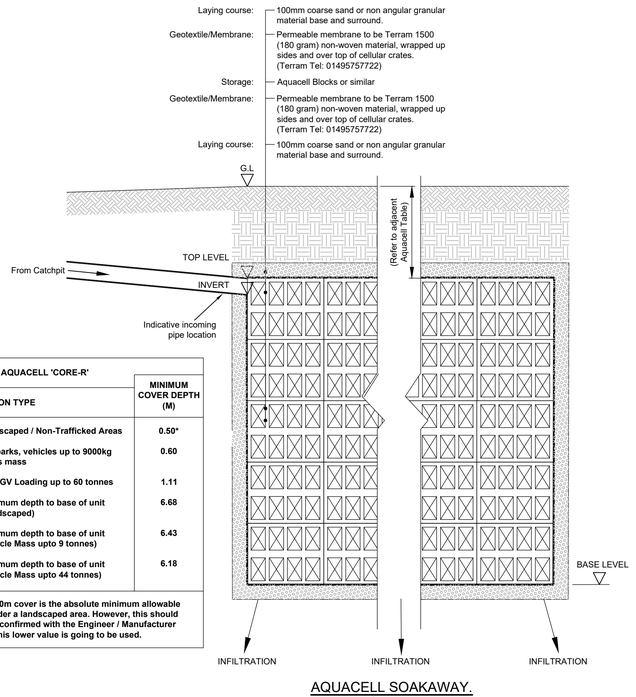
TYPICAL CHANNEL DRAIN

(Scale 1:20)
(ACO Mulitdrain MD - Asphalt Pavement)



TYPICAL THRESHOLD SLOT DRAIN

(Scale 1:20)
(ACO HexDrain Brickslot Channel - Pedestrian Loading Only)



AQUACELL 'CORE-R'	
LOCATION TYPE	**MINIMUM COVER DEPTH (M)**
Landscaped / Non-Trafficked Areas	**0.50***
Car parks, vehicles up to 9000kg gross mass	**0.60**
HA/HGV Loading up to 60 tonnes	**1.11**
Maximum depth to base of unit (Landscaped)	**6.68**
Maximum depth to base of unit (Vehicle Mass upto 9 tonnes)	**6.43**
Maximum depth to base of unit (Vehicle Mass upto 44 tonnes)	**6.18**

(*) - 0.30m cover is the absolute minimum allowable under a landscaped area. However, this should be confirmed with the Engineer / Manufacturer if this lower value is going to be used.

AQUACELL SOAKAWAY.

(Scale 1:20)

Notes:

A1

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7. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

Rev	Date	Revisons	Drwn	Chk
P1	06.06.22	Preliminary Issue	LG	GW

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T: 01323 405700 E: info@wallergray.co.uk

Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drainage Details

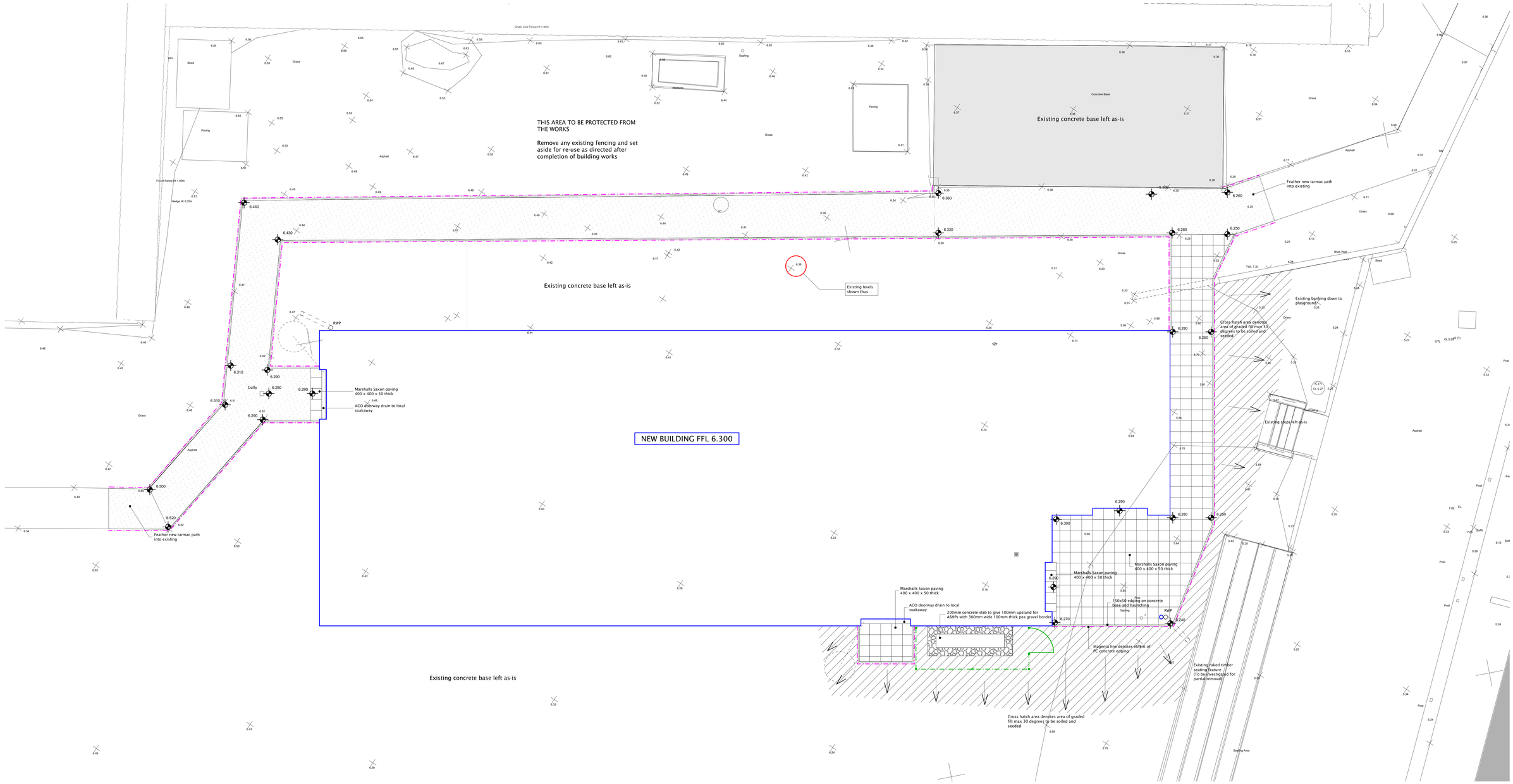
Scale:	Date:	Drawn:	Checked:
AS	JUN 22	LG	GW

Drawing No: WG1275/250
Rev: P1

APPENDICES

Appendix A	Architects Layout GA
Appendix B	Southern Water Sewer Records
Appendix C	Drained Areas
Appendix D	Greenfield Predevelopment Surface Water Calculations
Appendix E	Proposed Surface Water Calculations
Appendix F	Geotechnical Report for Sports Hall Works
Appendix G	Site Photographs
Appendix H	Schools Previous Adjacent Extension Information (Drainage Layout / SI)
Appendix I	Drainage Maintenance Schedule

Appendix A Architects Layout GA


THIS AREA TO BE PROTECTED FROM THE WORKS
Remove any existing fencing and set aside for re-use as directed after completion of building works
Existing concrete base left as-is
Existing concrete base left as-is
Existing concrete base left as-is
Existing levels shown thus
NEW BUILDING FFL 6.300
RWP
Marshalls Saxon paving 400 x 400 x 50 thick
ACO doorway drain to local soakaway
Feather new tarmac path into existing
Feather new tarmac path into existing
Existing banking down to playground
Cross hatch area denotes area of graded fill max 30 degrees to be soiled and seeded
Existing steps left as-is
Existing raked timber seating feature (To be investigated for partial removal)
Magenta line denotes extent of PC concrete edging
Cross hatch area denotes area of graded fill max 30 degrees to be soiled and seeded
150x50 edging on concrete base and haunching
200mm concrete slab to give 100mm upstand for ASNPs with 300mm wide 100mm thick pea gravel border
Chain Link Fence Ht 1.40m
Hedge Ht 3.00m
Paving
Shed
Grass
Asphalt
Sapling
Bedrock
Concrete Base
Brick Wall
TWL 7.30
Swaying Area
Gully
Post
Soft
Pal
Path
Tree
Bollard
Lamp
Bench
Manhole
Inspection Chamber
Rodding Eye
Gas Valve
Water Valve
Stop Valve
Electric Box
Telecom Box
Traffic Light
Sign
Pole
Fence
Wall
Kerb
Edge
Top
Bottom
Invert
Soffit
Ridge
Eaves
Window
Door
Step
Ramp
Handrail
Parapet
Roof
Floor
Ceiling
Beam
Column
Foundation
Retaining Wall
Drainage
Pipe
Duct
Cable
Overhead Line
Underground Line
Boundary
Property Line
Site Boundary
Building Line
Setback
Offset
Dimension
Level
Spot Level
Contour
Index Contour
Intermediate Contour
Hatching
Shading
Tone
Texture
Pattern
Material
Finish
Colour
Scale
Grid
Reference
Key
Legend
Note
Title
Number
Revision
Date
Author
Checked
Approved
Status
Issue
Drawing
Sheet
Project
Client
Address
Telephone
Email
Website
Company
Practice
Architect
Engineer
Surveyor
Contractor
Subcontractor
Supplier
Manufacturer
Product
Specification
Schedule
Quantity
Unit
Rate
Cost
Budget
Estimate
Tender
Contract
Agreement
Programme
Phase
Stage
Milestone
Deliverable
Task
Activity
Resource
Risk
Issue
Action
Decision
Meeting
Minute
Agenda
Report
Survey
Investigation
Test
Result
Conclusion
Recommendation
Proposal
Option
Alternative
Variation
Change
Request
Approval
Rejection
Comment
Query
Response
Clarification
Confirmation
Instruction
Direction
Order
Invoice
Payment
Receipt
Credit
Debit
Account
Ledger
Journal
Transaction
Balance
Statement
Audit
Review
Inspection
Certificate
Warranty
Guarantee
Insurance
Policy
Claim
Settlement
Dispute
Arbitration
Litigation
Court
Judge
Jury
Witness
Evidence
Testimony
Verdict
Judgment
Sentence
Appeal
Precedent
Statute
Regulation
Code
Standard
Guideline
Best Practice
Benchmark
Metric
KPI
Target
Goal
Objective
Strategy
Plan
Vision
Mission
Value
Culture
Ethics
Compliance
Governance
Risk Management
Quality Assurance
Quality Control
Health and Safety
Environment
Sustainability
Social Responsibility
Diversity
Inclusion
Equality
Human Rights
Data Protection
Privacy
Security
Confidentiality
Intellectual Property
Copyright
Trademark
Patent
Design Right
Database Right
Moral Right
Licence
Permission
Consent
Authorisation
Delegation
Power of Attorney
Trust
Fiduciary
Beneficiary
Settlor
Trustee
Executor
Administrator
Probate
Will
Testament
Codicil
Intestacy
Inheritance
Succession
Estate
Asset
Liability
Equity
Capital
Income
Expenditure
Profit
Loss
Tax
VAT
Corporation Tax
Income Tax
Capital Gains Tax
Inheritance Tax
Stamp Duty
Council Tax
Business Rates
Rent
Lease
Freehold
Leasehold
Tenancy
Landlord
Tenant
Mortgage
Loan
Interest
Principal
Repayment
Default
Foreclosure
Bankruptcy
Insolvency
Liquidation
Administration
Receivership
Company
Partnership
Sole Trader
Limited Liability
Shareholder
Director
Secretary
Auditor
Accountant
Solicitor
Barrister
Notary
Conveyancer
Surveyor
Valuer
Estate Agent
Auctioneer
Broker
Dealer
Trader
Customer
Supplier
Vendor
Purchaser
Buyer
Seller
Agent
Principal
Intermediary
Middleman
Wholesaler
Retailer
Manufacturer
Producer
Consumer
Market
Economy
Recession
Depression
Boom
Bust
Inflation
Deflation
Stagflation
Hyperinflation
Interest Rate
Exchange Rate
Foreign Exchange
Currency
Bank
Central Bank
Commercial Bank
Investment Bank
Building Society
Credit Union
Pension
Annuity
Insurance
Assurance
Reinsurance
Underwriting
Actuary
Broker
Agent
Claim
Premium
Excess
Deductible
Coverage
Exclusion
Limitation
Condition
Warranty
Guarantee
Indemnity
Liability
Negligence
Duty of Care
Breach
Damages
Compensation
Restitution
Rescission
Specific Performance
Injunction
Declaration
Order
Judgment

Appendix B Southern Water Sewer Records

SOUTHERN WATER



The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530

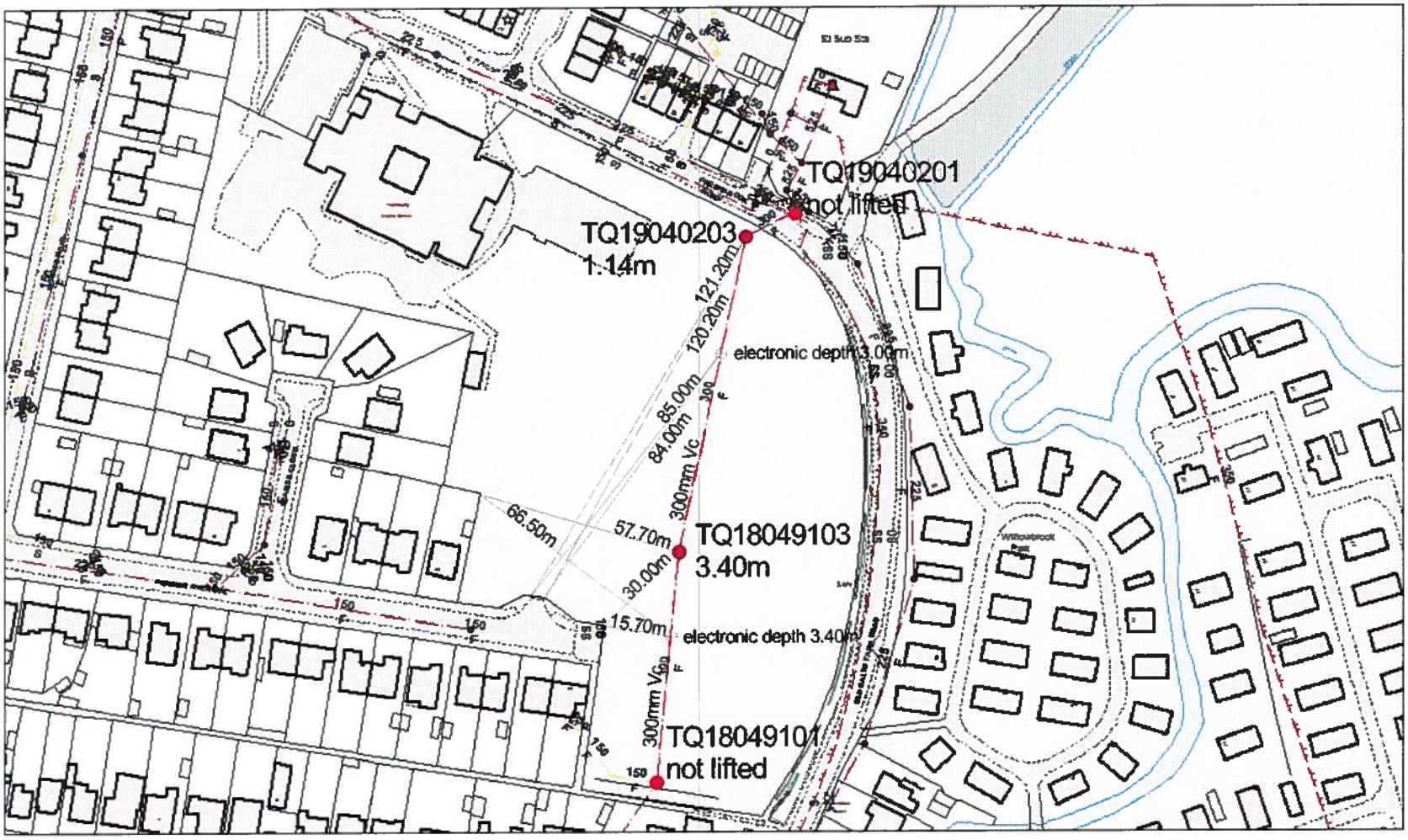
Southern Water

O.S. REF: TQ1804SE | Scale: 1:2500 | N | Printed By: chandro | Date: 27-9-2013

Sewer Plot | Southern Water MapGuide Browser

WARNING: BAC pipes are constructed of Bonded Asbestos Cement | Requested By:

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



General Notes

- foul water manhole with flow direction
- soil pipe
- foul gully
- surface water mh with flow direction
- rwp
- rainwater gully
- svp soil & vent pipe
- sp soil pipe
- wc toilet
- fg foul gully
- rg rainwater gully
- rwp rainwater pipe
- re rodding eye
- Points traced electronically

InSewer Surveys
16a Revenge Road
Chatham
Kent ME5 8UD

Tel: 01634 861 768
Fax: 01634 201 376
email: mail@insewer.co.uk

Project Name and Address

Seaside Primary Sch.
Freshbrook Road
Lancing
West Sussex
BN15 8DL
Drainage Survey

Disclaimer

Detail shown on this plan is for reference only.
The positions of the pipes have been traced electronically and their route and location are believed to be correct.
InSewer Surveys accept no responsibilty in the event of inaccuracy.
Before mechanical plant is used the actual position and route of the drainage system should be verified on site.

Project 001314
Date 10/10/2013
Scale Not to scale

Appendix C Drained Areas

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

N

Path to runoff to soft landscaped area

Path to runoff to soft landscaped area

Path to runoff to soft landscaped area

177m²

FFL 6.300

191m²

FFL 6.300

SOAKAWAY
TOTAL DRAINED AREA = 368m²
(Individual Areas shown adj.)

1:200 @ A3
0 2 4 6 8 m

Notes:

A3

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INFORMATION

Rev	Date	Revisons	Drwn	Chk
I1	23.08.22	For Information	LG	GW

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STRUCTURAL AND CIVIL ENGINEERS
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Eastbourne, East Sussex. BN23 6QW
T: 01323 405700 E: info@wallergray.co.uk

Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drained Areas

Scale:	Date:	Drawn:	Checked:
1:200	AUG 22	LG	GW

Drawing No: WG1275/102
Rev: I1

Appendix D Greenfield Predevelopment Surface Water Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 700 Urban 0.000
Area (ha) 0.050 Soil 0.300 Region Number Region 7

Results l/s

QBAR Rural 0.1
QBAR Urban 0.1

Q100 years 0.3

Q1 year 0.1
Q30 years 0.2
Q100 years 0.3

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Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.700
Ratio R	0.350
Areal Reduction Factor	1.00
Area (ha)	0.050
SAAR (mm)	700
CWI	105.000
Urban	0.000
SPR	30.000

Results

Percentage Runoff (%)	29.28
Greenfield Runoff Volume (m^3)	9.519

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Appendix E Proposed Surface Water Calculations

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.028	4-8	0.009

Total Area Contributing (ha) = 0.037

Total Pipe Volume (m³) = 0.743

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.080	0.150	80.5	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	10.610	1.150	9.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	9.370	0.100	93.7	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	7.960	0.700	11.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	150.94	5.18	5.700	0.019	0.0	0.0	0.0	1.12	19.8	7.8
1.001	150.40	5.23	5.550	0.019	0.0	0.0	0.0	3.34	59.0	7.8
2.000	151.24	5.15	5.200	0.018	0.0	0.0	0.0	1.04	18.4	7.4
2.001	150.79	5.19	5.100	0.018	0.0	0.0	0.0	3.00	53.1	7.4
1.002	150.07	5.27	4.400	0.037	0.0	0.0	0.0	1.00	17.8	15.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.300	0.600	Open Manhole	250	1.000	5.700	150				
2	6.350	0.800	Open Manhole	450	1.001	5.550	150	1.000	5.550	150	
3	5.700	0.500	Open Manhole	250	2.000	5.200	150				
4	6.250	1.150	Open Manhole	450	2.001	5.100	150	2.000	5.100	150	
5	6.300	1.900	Open Manhole	450	1.002	4.400	150	1.001	4.400	150	
								2.001	4.400	150	
	6.300	1.920	Open Manhole	0		OUTFALL		1.002	4.380	150	

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	1	6.300	5.700	0.450	Open Manhole	250
1.001	o	150	2	6.350	5.550	0.650	Open Manhole	450
2.000	o	150	3	5.700	5.200	0.350	Open Manhole	250
2.001	o	150	4	6.250	5.100	1.000	Open Manhole	450
1.002	o	150	5	6.300	4.400	1.750	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	12.080	80.5	2	6.350	5.550	0.650	Open Manhole	450
1.001	10.610	9.2	5	6.300	4.400	1.750	Open Manhole	450
2.000	9.370	93.7	4	6.250	5.100	1.000	Open Manhole	450
2.001	7.960	11.4	5	6.300	4.400	1.750	Open Manhole	450
1.002	2.000	100.0		6.300	4.380	1.770	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002		6.300	4.380	0.000	0	0

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Online Controls for Storm

Pump Manhole: 5, DS/PN: 1.002, Volume (m³): 0.6

Invert Level (m) 4.400

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.0000	0.700	0.0000	1.300	0.0000	1.900	0.0000	2.500	0.0000
0.200	0.0000	0.800	0.0000	1.400	0.0000	2.000	0.0000	2.600	0.0000
0.300	0.0000	0.900	0.0000	1.500	0.0000	2.100	0.0000	2.700	0.0000
0.400	0.0000	1.000	0.0000	1.600	0.0000	2.200	0.0000	2.800	0.0000
0.500	0.0000	1.100	0.0000	1.700	0.0000	2.300	0.0000	2.900	0.0000
0.600	0.0000	1.200	0.0000	1.800	0.0000	2.400	0.0000	3.000	0.0000

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Storage Structures for Storm

Cellular Storage Manhole: 5, DS/PN: 1.002

Invert Level (m) 4.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01674 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01674

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	42.0	42.0	1.200	42.0	82.8	1.300	0.0	82.8

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
Site Location	GB 518927 104262 TQ 18927 04262		Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	2	+0%					5.748	-0.102	0.000
1.001	2	15 Summer	2	+0%					5.577	-0.123	0.000
2.000	3	15 Summer	2	+0%					5.249	-0.101	0.000
2.001	4	15 Summer	2	+0%					5.129	-0.121	0.000
1.002	5	600 Winter	2	+0%	2/120 Summer				4.651	0.101	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.22			4.0	OK	
1.001	2	0.08			4.0	OK	
2.000	3	0.23			3.8	OK	
2.001	4	0.08			3.8	OK	
1.002	5	0.00		765	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
Site Location	GB 518927 104262 TQ 18927 04262		Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	10
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	10	+40%					5.780	-0.070	0.000
1.001	2	15 Summer	10	+40%					5.594	-0.106	0.000
2.000	3	15 Summer	10	+40%					5.282	-0.068	0.000
2.001	4	15 Summer	10	+40%					5.146	-0.104	0.000
1.002	5	720 Winter	10	+40%	10/15 Summer				4.978	0.428	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.55			9.9	OK	
1.001	2	0.19			9.8	OK	
2.000	3	0.58			9.4	OK	
2.001	4	0.20			9.3	OK	
1.002	5	0.00		1430	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
Site Location	GB 518927 104262 TQ 18927 04262		Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	30	+0%					5.777	-0.073	0.000
1.001	2	15 Summer	30	+0%					5.588	-0.112	0.000
2.000	3	15 Summer	30	+0%					5.179	-0.071	0.000
2.001	4	15 Summer	30	+0%					5.043	-0.107	0.000
1.002	5	720 Winter	30	+0%	30/15 Summer				4.909	0.359	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.52			9.3	OK	
1.001	2	0.14			9.3	OK	
2.000	3	0.54			8.8	OK	
2.001	4	0.18			8.8	OK	
1.002	5	0.00		1349	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 1.000
Site Location	GB 518927 104262 TQ 18927 04262		Cv (Winter) 1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	15 Summer	100	+0%					5.790	-0.060	0.000
1.001	2	15 Summer	100	+0%					5.593	-0.107	0.000
2.000	3	15 Summer	100	+0%					5.193	-0.057	0.000
2.001	4	720 Winter	100	+0%					5.055	-0.095	0.000
1.002	5	720 Winter	100	+0%	100/15 Summer				5.055	0.505	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.66			11.9	OK	
1.001	2	0.18			11.8	OK	
2.000	3	0.69			11.2	OK	
2.001	4	0.02			0.9	OK	
1.002	5	0.00		1626	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 518927 104262 TQ 18927 04262	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	15 Summer	100	+40%					5.814	-0.036
1.001	2	15 Summer	100	+40%					5.601	-0.099
2.000	3	960 Winter	100	+40%	100/360 Summer				5.350	0.100
2.001	4	960 Winter	100	+40%	100/180 Summer				5.350	0.200
1.002	5	960 Winter	100	+40%	100/15 Summer				5.350	0.800

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.92			16.6	OK	
1.001	2	0.000	0.25			16.5	OK	
2.000	3	0.000	0.06			1.0	SURCHARGED	
2.001	4	0.000	0.02			1.0	SURCHARGED	
1.002	5	0.000	0.00		2136	0.0	SURCHARGED	

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Appendix F Geotechnical Report for Sports Hall Works

geotechnical and environmental consultants

ground&water

Ground Investigation Report

Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL

On behalf of the New Horizons Academy Trust c/o Burns Guthrie

Report Reference: GWPR4784/GIR/June 2022 V1.01			Status: Final
Issue	Prepared By	Checked By	Verified By
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Geotechnical Report	
REPORT REFERENCE	GWPR4784/GIR/June 2022. The conditions and limitations of this geotechnical report can be viewed within Appendix A, with the aims of the investigation provided within Appendix B. A technical glossary has also been provided within Appendix C.
SITE DETAILS	The site comprised a ~500m^2 roughly rectangular shaped plot of land, with a north to south orientation, situated within the playing fields of the Seaside Primary School. The site was located in eastern Lancing in West Sussex. A site location plan has been provided within Figure 1. At the time of the investigation, May 2022, the site comprised a grass covered portion of the playing fields. A view of the site development area has been provided within Figure 2, with an aerial view of the site provided in Figure 3.
PROPOSED DEVELOPMENT	At the time of reporting, June 2022, the proposed development comprises the construction of a single storey sports hall. A proposed development plan is displayed within Figure 4.
HISTORICAL MAPPING	The site formed part of a larger undeveloped area of open land/farmland from the earliest available map (1873). A southerly flowing stream was noted ~120m to the east. The 1898 map showed a nursery had been developed to within 50m to the west of the site. By 1932,the site was shown to be part of an orchard. By 1943 residential development of the nursery to the west along Seaside Road and open land to the south along Seaside Avenue had taken place. By 1951, no trees were shown on the site which remained open and undeveloped and by 1952 residential properties were shown to the immediate west along Seaside Close. No significant changes occurred until the early 1990s when the site was shown within the grounds of the Thornberry Middle School. There were significant changes on the subsequent maps. Historical maps, obtained from GroundSure, can be viewed within Appendix D.
ANTICIPATED GEOLOGY AND HYDROGEOLOGY	The British Geological Survey (BGS) maps and DEFRA online maps for the area suggest that the site was located on the Raised Beach Deposits, classified as a Secondary A Aquifer, overlying the Newhaven Chalk Formation, classified as a Principal Aquifer. Based on this, it was anticipated that the actual groundwater table was anticipated to be encountered at depth within the Newhaven Chalk Formation. Some amounts of groundwater however may be present at shallower depths within Made Ground or parts of the Raised Beach Deposits. It was considered that groundwater was flowing in a south-easterly direction toward the River AdurShoreham Harbour in line with local topography. A BGS borehole record in similar geology ~65m north-east of the site (ref.: TQ 19000 04300) noted silt and stones to 10.00m bgl, overlying chalk rubble to 30.00m bgl, underlain by chalk with flints for the remaining depth of the trial hole (65.00m bgl). A claystone was noted at 3.80m bgl. Groundwater was encountered at depth of 10.00m bgl. A second BGS borehole record in similar geology ~209m west of the site (ref.: TQ 18740 04150) noted Drift deposits to ~6.00m bgl, overlying Upper Chalk for the remaining depth of the borehole (6.45m bgl). No groundwater was noted.
SITE WORKS	Site works were undertaken 16th and 17th May 2022. 3No. Windowless Sampler Boreholes (WS1 – WS3) were drilled to depths of between 0.70 – 3.45m bgl with Standard Penetration Tests at 1.00m intervals. Super Heavy dynamic probes were undertaken through the base of WS1, WS2 and WS3 to a depth of

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0.90m, 5.00m and 1.20m bgl respectively. In each case the boreholes and probes were terminated due to the density of the soils.
In addition, two trial pits (TP1 – TP2) were machine excavated to a depth of 1.80m bgl and infiltration tests in accordance with the principles of BRE365 were undertaken in each of the trial pits.

GROUND CONDITIONS ENCOUNTERED

A summary of the ground conditions encountered has been summarised in the following table. The trial hole logs can be seen within Appendix E.

Summary of Strata Encountered

Strata	Top Depth (m bgl)	Base Depth (m bgl)	Thickness (m)
TOPSOIL (WS, WS3, TP1 and TP2 only): Brown silty gravelly SAND. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint.	GL	0.20 – 0.80	0.20 – 0.80
MADE GROUND (WS2, TP1 and TP2 only): Brown silty sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (95%) and brick (5%).	GL – 0.20	0.60 – 0.90	0.40 – 0.90
RAISED BEACH DEPOSITS (WS2 only): Brown gravelly sandy CLAY. The sand was fine to medium grained and the gravel was fine to medium sub-angular to sub-rounded flint.	0.90	1.60	0.70
RAISED BEACH DEPOSITS (WS2 only): Brown gravelly clayey SAND. The sand was fine to medium grained and the gravel was fine to coarse sub-angular to sub-rounded flint.	1.60	2.10	0.50
RAISED BEACH DEPOSITS: Orange brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse sub-angular to sub-rounded flint.	0.30 – 2.10	0.70 – 3.45	>0.45 – >1.35

GROUNDWATER

Groundwater was not encountered in the trial holes.

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation was undertaken in May 2022 when groundwater levels are likely to be approaching their annual minimum (lowest elevation). Exact groundwater levels may only be determined through long term measurements from monitoring wells installed on-site.

ROOTS

Roots were noted to a depth of 0.20m bgl in TP1 and TP2 and to a depth of between 0.60 – 1.00m bgl in the boreholes.

Roots may be found to greater depths at other locations on the site, particularly close to trees and/or trees that have been removed both within the site and its close environs.

IN-SITU STRENGTH TESTING

A summary of the in-situ strength testing conducted has been summarised in the following table overpage.

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Interpretation of In-situ Geotechnical Testing Results

Strata	SPT "N" Blow Counts or Equivalent SPT "N Value from DP	Equivalent Undrained Shear Strength (Cu) (kPa)	Soil Type		Trial Hole/s
			Granular (Density)	Cohesive (Cu)	
Raised Beach Deposits (Cohesive)	19	95	-	High	WS2/0.90 – 1.60m bgl
Raised Beach Deposits (Granular)	23 - >50	-	Dense – Very Dense	-	WS2/1.60 – 3.45m bgl
	>50	-	Very Dense	-	WS3/0.80 – 1.25m bgl
Assumed Raised Beach Deposits (Granular)	>52	-	Very Dense	-	WS/DP1/0.70 – 0.90m bgl
	21 – 32	-	Medium Dense – Dense	-	WS/DP2/3.45 – 5.00m bgl
	46 – 65	-	Very Dense – Extremely Dense	-	WS/DP3/0.80 – 1.20m bgl

VOLUME CHANGE POTENTIAL AND MOISTURE DEFICITS

Atterberg Testing

A précis of Atterberg limit testing undertaken can be seen in the following table. The test results are presented within Appendix F.

Atterberg Limit Tests Results Summary

Stratum	Moisture Content (%)	Passing 425 µm sieve (%)	Modified PI (%)	Soil Class	Consistency Index (Ic)	Volume Change Potential	
						BRE	NHBC
Raised Beach Deposits (*Undif.*)	**12**	**70**	**7.70**	**CL**	**Stiff**	**Low**	**No**

- **NP – Non-plastic**
- **BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)**
- **Soil Classification based on British Soil Classification System.**
- **Consistency Index (Ic) based on BS EN IS0 14688-2:2018.**

Moisture Deficits

The results of the Atterberg Limit tests were analysed to determine the Liquidity Index of the sample, to give an indication as to whether the sample recovered showed a moisture deficit as well assessing its degree of consolidation. Liquid Limit analyses was undertaken to assess whether there was a potentially significant moisture deficit within the sample tested.

A potential moisture deficit caused by lithology was noted within WS2 at 1.00m bgl.

Particle Size Distribution Testing

The results of particle size distribution (PSD) testing undertaken show that none of the four samples tested have a volume change potential in accordance with BRE240 and NHBC Standards Chapter 4.2. The results of the PSD testing can be viewed within Appendix F.

Atterberg Limit Tests Results Summary

Stratum	Range Passing 63µm Sieve (%)	Volume Change Potential	
		BRE	NHBC
Raised Beach Deposits	1 – 13	No	No

- **Volume Change Potential refers to BRE Digest 240 (based on Grading test results).**

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	• **Shrinkability refers to NHBC Standards Chapter 4.2 (based on Grading test results).** • **BRE 240 states that a soil has a volume change potential when the clay fraction exceeds 15%. Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve.** • **NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.**
CHALK DISSOLUTION AND MINING RISK ASSESSMENT	The presence of dissolution features on-site can prove problematic, as they often provide inconsistency within the underlying geology. Often formed during glacial and periglacial conditions, the depth and width of these features can vary substantially, often providing inconsistency in geological strength data. If a dissolution feature is suspected, a geotechnical engineer and structural engineer should be contacted for suitable engineering designs, based on further works identifying and classifying the area the feature occupies. The Groundsure Datasheets (Appendix H) revealed the following information which may be pertinent to this risk assessment. • The site was classified as a negligible risk of ground dissolution of soluble rocks. Approximately 100m south-east of the site was an area of low risk of ground dissolution of soluble rocks. • An on-site Class A Historical Mining area was identified 106m to the south-west; however, this is generally a precautionary statement attributed to all areas associated with chalk within the ground profile. Therefore, this does not identify any underground chalk features at the site location. • No natural cavities were noted within a 500m radius of the site. • No Britpits were noted within 250m radius of the site. • 10 records of surface ground workings were noted between 78 – 243m from the site. 10 of these were referenced as lake/pond or water body to the north-west or south of the site. The remainder was a sewage works 78m to the north-east. No unspecified ground workings, brick works or clay pits were noted. • No records of underground workings, mining cavities or JPB mining areas were noted within a 500m radius of the site. • The historical mapping review undertaken in section 3.1 of this report confirmed the findings of the Groundsure datasheets discussed above. • A review of the data available on www.lidarfinder.com showed no features of concern (e.g. potential infilled ground or potential indication for dissolution related features) on or in a close proximity to the site. • The Edmonds Procedure (Edmonds, C.N., 2001. Predicting natural cavities in chalk. Geological Society, London, Engineering Geology Special Publications, 18(1), pp.29-38.); highlighted a moderately high subsidence hazard classification for the site. Given the geomorphological and geological setting of the site, it was considered that the Edmonds Procedure was unduly conservative and overestimated the risk. The site investigation encountered a 0.20 – 0.90m capping of Topsoil/Made Ground overlying predominantly granular soils of the Raised Beach Deposits for the remaining depth of all boreholes (maximum depth of 3.45m bgl). No chalk was encountered. Based on nearby BGS boreholes, chalk was

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	likely to be encountered between ~6.00 – 10.00m bgl. In-situ testing revealed the granular soils were generally medium dense to extremely dense. A band of cohesive soils of high undrained shear strength (95kPa) were encountered between 0.90 – 1.60m bgl in WS2. No loose or soft spots were encountered. As a result of the desk-based review of the site, although the geology could potentially show a moderately high risk in theory, based on collective information to date and the competent ground encountered to a moderate depth, in combination with the size of the site, it is unlikely that dissolution features that would technically affect the buildings, would be present.
FOUNDATION RECOMMENDATIONS	A summary of the findings from the site investigation, relevant to foundation recommendations, can be seen below: • Foundations should be taken through any Made Ground/Topsoil and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics. • Foundations should be designed in accordance with soils of low volume change potential. • Given the presence of cohesive soils at shallow depth, special foundation precautions may be required to prevent possible future shrinkage/swelling of the soils affecting the integrity of the faces of foundations (underfloor void diameter/compressible material/void formers etc). A compressible layer must be provided to accommodate potential seasonal movement, based on NHBC guidance. • Due to the shallow soils having volume change potential and Made Ground thickness is more than 600mm, a suspended slab is required. • The loads of proposed foundations should not exceed the allowable bearing capacity of the soils they are founding upon. • If soft or loose spots are encountered, they should be bypassed. • Care should be taken not to overdig foundations as this may stress underlying soft spots, should they be present. • Foundations must not be placed within fresh root penetrated and/or desiccated soils with volume change potential. It is recommended that foundations are taken at least 300mm into non-fresh root penetrated strata if the soils have volume change potential, or into soils of no volume change potential. • The influence of trees on or surrounding the site will need to be taken into account in final design (NHBC Standards Chapter 4. 2) (tree rings). • Any water ingress must be prevented from entering foundation trenches and excavations must be kept dry and either concreted or blinded as soon after excavation as possible. If water were allowed to accumulate within the excavation for even a short period of time, an increase in heave occur. The shear strength will also be reduced, resulting in lower bearing capacities, resulting in increased settlements. Instability issues may arise within the foundation trenches, in case of perched water being present.
SHALLOW FOUNDATIONS	Based on the above, foundations should bypass any Made Ground/Topsoil and soft spots/loose granular soils, before extending 300mm below the proved depth of root penetration. Foundations would therefore be constructed on competent, moisture stable soils of the Raised Beach Deposits. Foundations should be taken through any Topsoil or Made Ground, extend 300mm below the proven depth of root penetration and found on moisture stable, competent soils of the Raised Beach Deposits.

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Geotechnical Report	
	Across the majority of the site, a minimum foundation depth of 0.75 – 1.00m bgl is applicable, subject to reference to NHBC tables; however cohesive soils were encountered in WS between 0.90 – 1.60m bgl and may result in locally deepened foundation depths to ~1.70m bgl to potential reduce the effects of differential settlement between foundations passing from granular to cohesive soils and vice versa. Foundations constructed on the granular soils of the Raised Beach Deposits at a depth of 0.75 – 1.00m bgl can be designed based on a presumed allowable bearing capacity of 125kN/m^2 over the majority of the site. This is based on trial hole records, the results of in-situ testing, inspection of samples recovered, and based on a 5m long by 1m wide foundation and a maximum settlement of 25mm. Settlements on loading are likely to be moderate. Differential settlement between foundations cast into the cohesive and granular soils of the Raised Beach Deposits is anticipated and foundations must be reinforced to allow for such potential differential movement. Note should be made that differential settlement may also occur between strip and isolated pad foundations.
RAFT FOUNDATION	Alternatively, a raft foundation could be adopted. Cohesive deposits were encountered in WS2 to a depth of 1.90m bgl and roots were noted to depths of 0.50 – 1.20m bgl therefore a minimum depth of 1.50m bgl is recommended due to the possibility of root exacerbated moisture variations. Consequently, in order to reduce the effects, the potential for differential settlements between cohesive and granular soils and the potential for seasonal movements caused by the water demand from roots, the cohesive soils should be removed from the footprint of the proposed structure to expose the underlying granular soils of the Raised Beach Deposits. The formation level should then be proof rolled and any soft spots removed and infilled with a suitably compacted granular material. Site levels should be brought up to underside of proposed slab level using with suitable granular soil (Type I or Type II) rolled in thin layers. Given the presence of cohesive soils at shallow depth, special foundation precautions will be required to prevent possible future shrinkage/swelling within clay strata affecting the integrity of the outside faces of ground beams. A void, void former or compressible layer must be provided to accommodate potential movement. Based on a literature review Bowles (1996) indicated an appropriate Modulus of Subgrade Reaction at ~1.0m bgl of ~12,000kN/m^2/m.
PILED FOUNDATIONS	Based on the results of the intrusive investigation, a piled foundation scheme was unlikely to be required.
EXCAVATIONS AND INSTABILITY	Shallow excavations in the Made Ground are likely to be marginally stable at best. Long, deep excavations, through these strata and into the underlying Raised Beach Deposits are likely to become unstable.

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Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions should therefore be taken to ensure that such earth faces are adequately supported before excavations are entered by personnel.

SUB-SURFACE CONCRETE DESIGN

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground' considering the pH of the soils. For the classification given below, the "mobile" and "natural" case was adopted given the geology encountered and the residential use of the site. This assessment was based on the results of laboratory testing summarised within Section 5, specifically relating to sulphates, pH and other water soluble chemicals.

Topsoil/Made Ground
No samples of the Topsoil/Made Ground were analysed for sulphates and pH.

Raised Beach Deposits
The water-soluble sulphates in the Raised Beach Deposits were noted to be <4mg/l, with a pH of 7.4 – 8.3, from the geotechnical and chemical laboratory testing. The total potential sulphate (3x total sulphur) was <0.06%, from chemical laboratory testing.

Therefore, sulphate concentrations measured in 2:1 water/soil extracts taken from the Raised Beach Deposits and total potential sulphate concentrations, fell into Class **DS-1** of the BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground'. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of **AC-1**.

SURFACE WATER DISPOSAL

Soakaway tests, in accordance with the principles of BRE365 were undertaken in the base of the trial pits at a depth of 1.80m bgl. TP1 and TP2 were bottomed out within the soils of the Raised Beach Deposits comprising brown sandy gravel. The sand was fine to coarse grained and the gravel was fine to coarse sub-angular to sub-rounded gravel. The infiltration rates recorded within the trial pits can be seen tabulated below.

Soakage Testing Results

Trial Hole	Test Number	Depth (m bgl)	Start Depth (m bgl)	Finish Depth (m bgl)	Time Taken (mins)	Infiltration Rate (m/sec)
TP1	1	1.80	0.63	1.59	209	1.38 x 10^-5
	2	1.80	0.55	1.57	209	1.14 x 10^-5
	3	1.80	0.61	1.52	5.00	4.65 x 10^-6
TP2	1	1.80	0.64	1.56	130	1.49 x 10^-5
	2	1.80	0.77	1.56	160	1.23 x 10^-5
	3	1.80	0.68	1.59	170	1.24 x 10^-5

The principles of sustainable urban drainage system (SUDS) should be applied to reduce the risk of flooding from surface water ponding and collection associated with the construction of the foundations.

Consultation with the Environment Agency must be sought regarding any use that may have an impact on groundwater resources, abstractions and surface water features/watercourses.

It should be noted that water discharge into the chalk may worsen/create dissolution features. Therefore, soakaways should be remote from structures and undertaken in accordance with available

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	guidance. A number of published information sources make reference to an appropriate distance at which a soakaway should be sited in relation to any building foundations in the vicinity: • The British Standard BS8301 :1985 "Code of practice for building drainage" (1985), suggests that: "A soakaway is not desirable nearer to a building than about 5 metres nor in such a position that the ground below foundations is likely to be adversely affected." • The Building Research Establishment Digest 365 "Soakaway design" (1991), suggests that "Soakaways should not normally be constructed closer than 5m to building foundations. In chalk or other soil and fill material subject to modification or instability, the advice of a specialist geotechnologist should be sought as to the advisability and siting of a soakaway". In addition, the distance a soakaway is located from any foundations can be informed by both the soakaway type and chalk density present at the site. • The Kent County Council Soakaway Design Guide (July 2000) states that "Highway soakaways shall be situated the following minimum distances from dwellings (measured from the outside edge of the soakaway): (1) 5 metres for conventional perforated soakaway; (2) 10 metres for deep bored soakaway. In addition, adjacent soakaways of a similar type shall also be spaced a minimum of 10 metres apart. • CIRIA 574 states that soakaways should be sited at least 5-10m away from any structure, depending on the chalk density. Where the chalk present is of low or unknown density, soakaways should be sited at least 10m from any foundations, and where the chalk is of medium density or higher, any foundations should be sited at least 5m from any foundations.
ROADS AND HARDSTANDING	This section provides information relating to the construction of roads and hardstanding, for each strata encountered. **Anticipated CBR Values and Frost Susceptibility** **Topsoil** Roads and hardstanding should bypass Topsoil given the likely low strength, high compressibility and general variability. **Made Ground** Roads and hardstanding should not be constructed on Made Ground given its variability in composition and likely low strength/density. Where these cannot be bypassed a CBR value of 1% should be adopted for Made Ground. Given that Made Ground encountered beneath the site comprised a mixture of poorly drained gravelly sand based soils, these deposits are likely to be **frost susceptible**. **Raised Beach Deposits (cohesive)** Roads and hardstanding constructed on the cohesive Raised Beach Deposits should be designed based on a CBR value of 4.0%. This is based on reference to Table C1 of TRL1132 and average construction conditions. Based on wet conditions a CBR of 2.5% should be adopted, with dry conditions a CBR of 4.5% being applicable. These clay-based soils (poorly drained) with plasticity indexes below 20% are likely to be frost susceptible.

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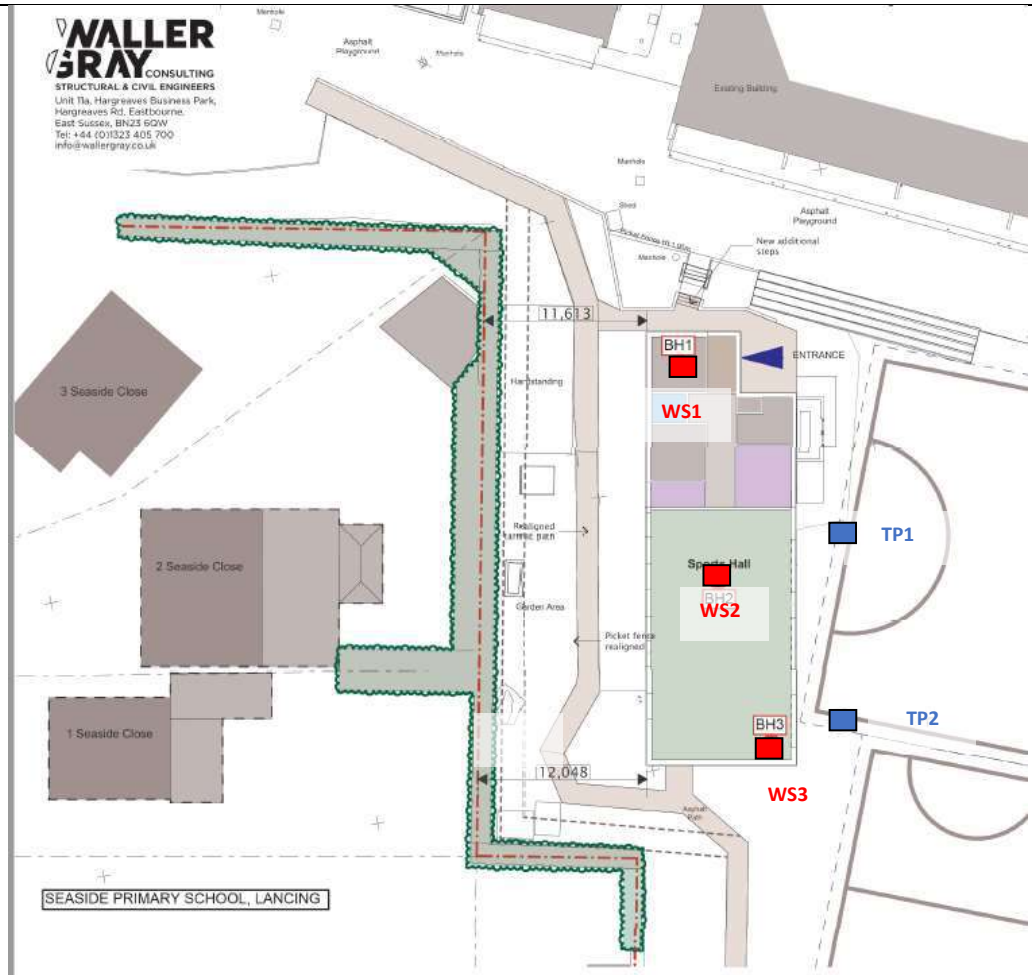
	Raised Beach Deposits (granular) Where shallow Topsoil, Subsoil and Made Ground is noted, roads and hardstanding constructed on the granular Raised Beach Deposits should be designed based on a CBR value of 40%. This is based on reference to Table C1 of TRL1132 and average construction conditions. Based on wet conditions a CBR of 20% should be adopted, with dry conditions a CBR of 60% being applicable. Given that the granular soils encountered beneath the site generally had a clay content of <10% **these deposits are likely to be non-frost susceptible.** All formation levels for roads and hardstanding should be proof rolled to highlight any soft areas which should then be dug out and replaced with selected granular material compacted in thin layers to a suitable specification.
WASTE CLASSIFICATION	The excavation of foundations and other soils is likely to produce waste which will require classification and then recycling or removal from site. Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal all waste must be classified as; • Inert; • Non-hazardous, or; • Hazardous. The Environment Agency's Hazardous Waste Technical Guidance (WM3) document outlines the methodology for classifying wastes. Once classified the waste can be removed to the appropriately licensed facilities, with some waste requiring pre-treatments prior to disposal. Hazardous waste requires pre-treatment prior to removal. The site may need to be registered as a Hazardous waste producer should such waste be removed from the site.
DUTY OF CARE	Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather. To prevent exposure to airborne dust by both the general public and construction personnel the site should be kept damp during dry weather and at other times when dust is generated as a result of construction activities. The site should be securely fenced at all times to prevent unauthorised access. Washing facilities should be provided and eating restricted to mess huts.

FIGURES **2**
APPENDIX A: Conditions and Limitations **2**
APPENDIX B: Scope of the Investigation **2**
APPENDIX C: Technical Glossary **2**
APPENDIX D: GroundSure Historical Mapping **2**
APPENDIX E: Trial Hole Logs **2**



Seaside Primary School, Freshbrook Road, Lancing, West Sussex BN15 8DL	Figure 5
Client: New Horizons Academy Trust c/o Burns Guthrie	Date: June 2022
Trial Hole Location Plan	Ref: GWPR4784

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APPENDIX B: Trial Hole Logs

Percussion Drilling Log

Project Name: Seaside Primary School,	Client: New Horizons Academy Trust c/o Burns Guthrie	Date: 12/05/2022
Location: Freshbrook Rd, Lancing BN15 8DL	Contractor: MCD	
Project No. : GWPR4784	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS1	WLS		NV	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				
		0.20	D		0.30			Brown gravelly silty SAND. Gravel was fine to coarse sub-angular to sub-rounded flint. (TOPSOIL).
		0.50	D					Brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. (RAISED BEACH DEPOSITS).
		0.70	D		0.70			End of Borehole at 0.700m

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
								0.00	0.70	90	0

Remarks

Groundwater not encountered. Roots noted to 0.60m bgl. Due to the density of the soils, the borehole refused at 0.70m bgl.

Percussion Drilling Log

Project Name: Seaside Primary School,	Client: New Horizons Academy Trust c/o Burns Guthrie	Date: 12/05/2022
Location: Freshbrook Rd, Lancing BN15 8DL	Contractor: MCD	
Project No. : GWPR4784	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS2	WLS		NV	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				
		0.20	D					Brown silty sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (95%) and brick (5%). (MADE GROUND).
		0.50	D					
		0.80	D					
		1.00	D		0.90			
		1.00	SPT	N=19 (12,6/5,4,6,4)				Brown gravelly sandy CLAY. The sand was fine to medium grained and the gravel was fine to medium, sub-angular to sub-rounded flint. (RAISED BEACH DEPOSITS).
		1.50	D		1.60			
		2.00	D					Brown gravelly clayey SAND, The sand was fine to medium grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. (RAISED BEACH DEPOSITS).
		2.00	SPT	N=23 (5,6/7,7,6,3)	2.10			Pale brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded GRAVEL. (RAISED BEACH DEPOSITS).
		2.50	D					
		3.00	D					
		3.00	SPT	N=50 (8,12/50 for 275mm)				
					3.45			End of Borehole at 3.450m

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 not encountered. Roots noted to 0.80m bgl. Due to the density of the soils, the borehole refused at 3.45m bgl.

Percussion Drilling Log

Project Name: Seaside Primary School,	Client: New Horizons Academy Trust c/o Burns Guthrie	Date: 12/05/2022
Location: Freshbrook Rd, Lancing BN15 8DL	Contractor: MCD	
Project No. : GWPR4784	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS3	WLS		NV	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				
		0.20	D					Brown silty gravelly SAND. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (TOPSOIL).
		0.50	D					
		0.80	D		0.80			Brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (RAISED BEACH DEPOSITS).
		1.00	D					
		1.00	SPT	50 (14,25/50,,,)	1.25			End of Borehole at 1.250m

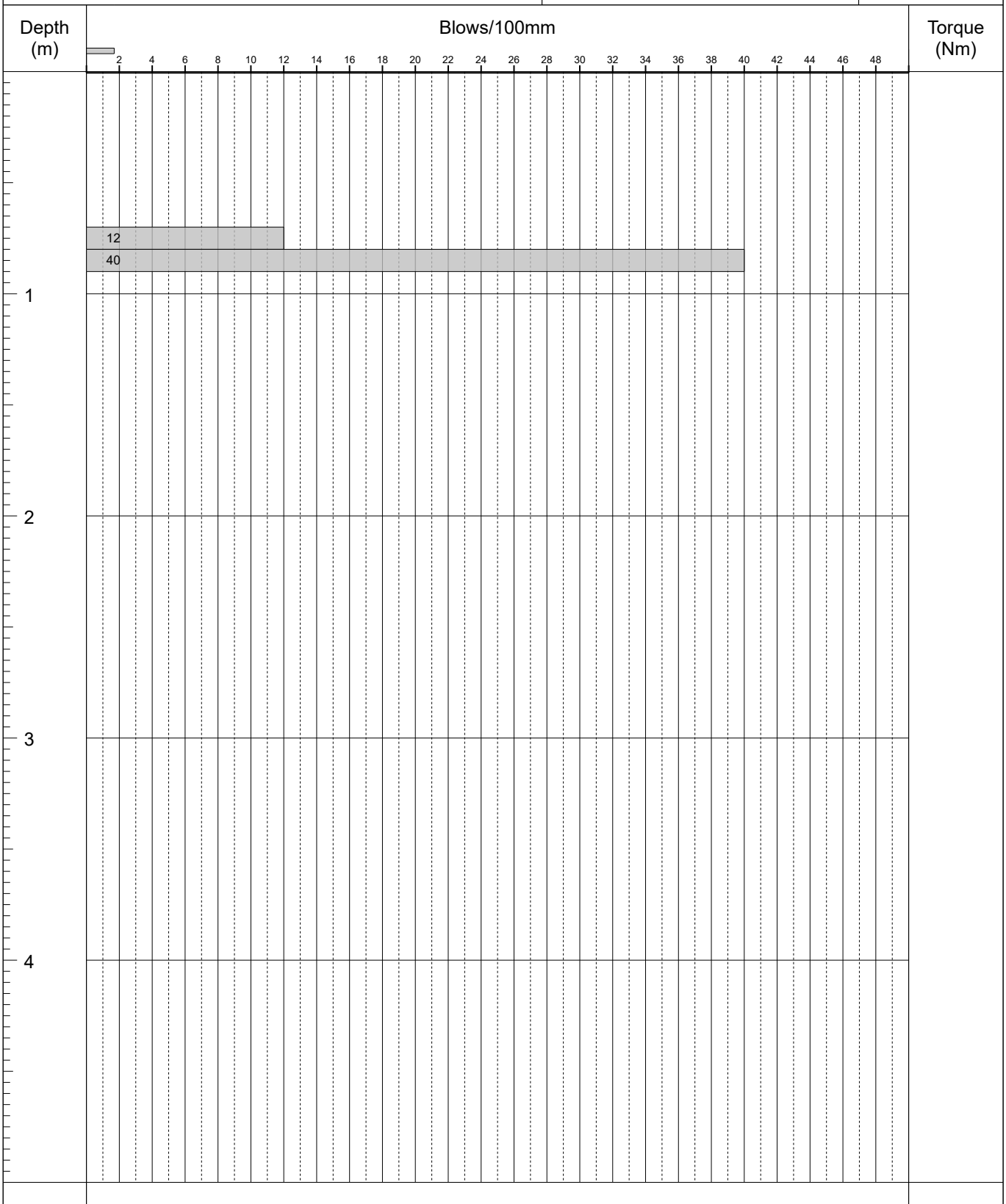
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
								0.00	1.25	90	0

Remarks

Groundwater not encountered. Roots noted to 1.00m bgl. Due to the density of the soils, the borehole refused at 1.25m bgl.

Probe Log

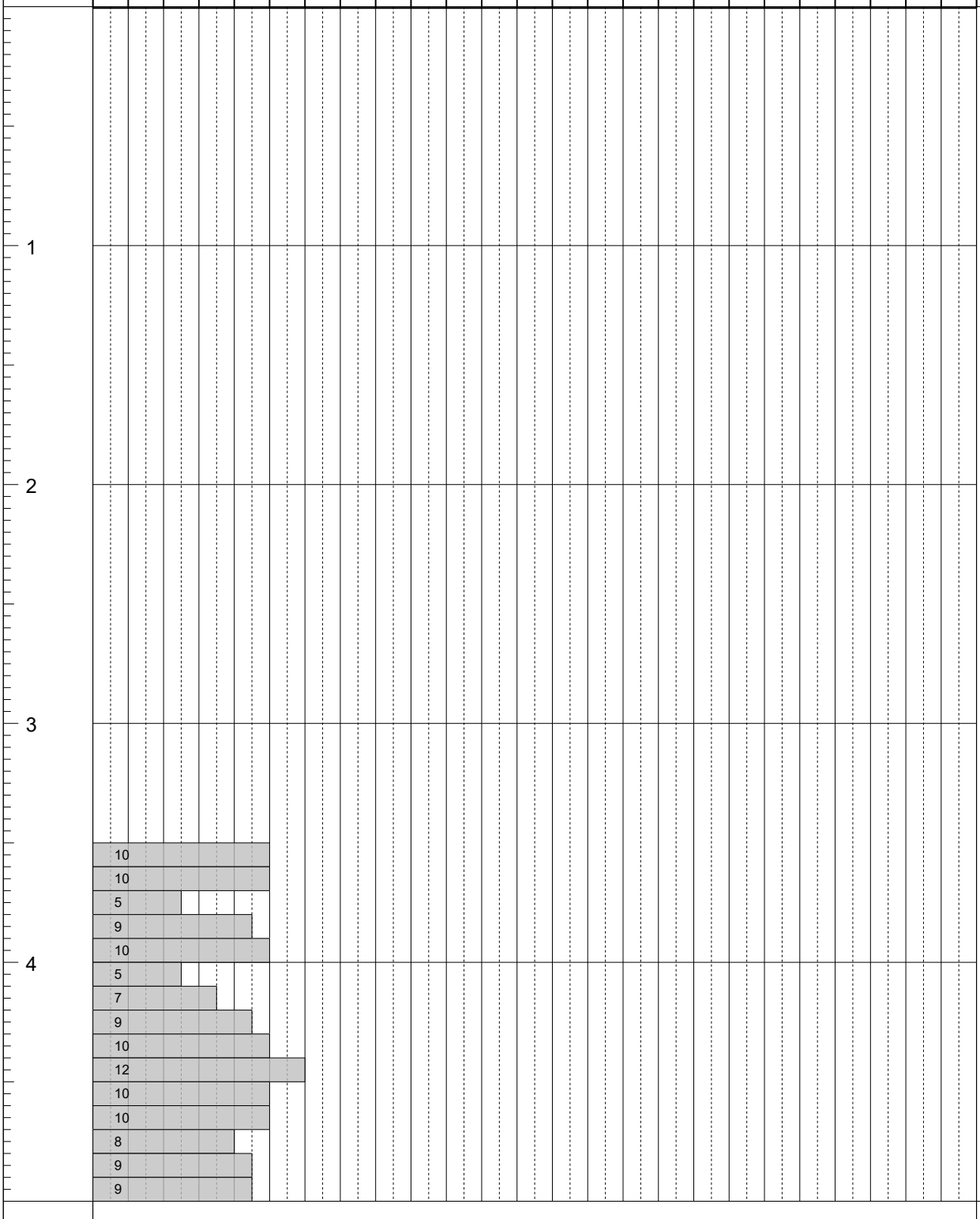
			Probe No DP1 Sheet 1 of 1
Project Name: Seaside Primary School,	Project No. GWPR4784	Co-ords:	Hole Type DP
Location: Freshbrook Rd, Lancing BN15 8DL		Level:	Scale 1:25
Client: New Horizons Academy Trust c/o Burns Guthrie		Dates: 12/05/2022	Logged By



Remarks:	Fall Height	750	Cone Base Diameter	
	Hammer Wt	64	Final Depth	0.90
	Probe Type	DPSH-B		

Probe Log

ground&water			Probe No DP2 Sheet 1 of 1
Project Name: Seaside Primary School,	Project No. GWPR4784	Co-ords:	Hole Type DP
Location: Freshbrook Rd, Lancing BN15 8DL		Level:	Scale 1:25
Client: New Horizons Academy Trust c/o Burns Guthrie		Dates: 12/05/2022	Logged By

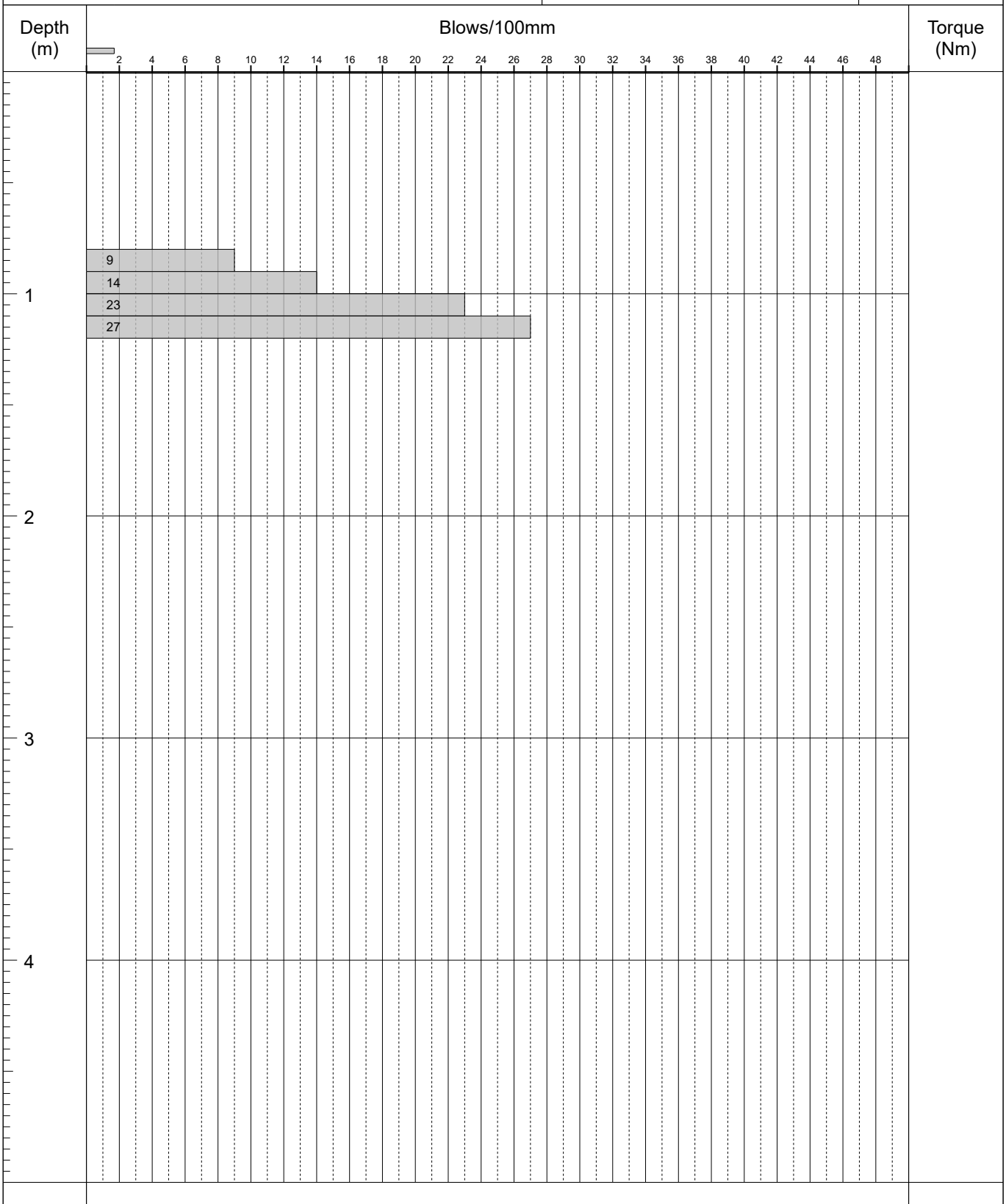


Remarks:	Fall Height	750	Cone Base Diameter	
	Hammer Wt	64	Final Depth	5.00
	Probe Type	DPSH-B		

AGS

Probe Log

ground&water			Probe No DP3 Sheet 1 of 1
Project Name: Seaside Primary School,	Project No. GWPR4784	Co-ords:	Hole Type DP
Location: Freshbrook Rd, Lancing BN15 8DL		Level:	Scale 1:25
Client: New Horizons Academy Trust c/o Burns Guthrie		Dates: 12/05/2022	Logged By



Remarks:	Fall Height	450	Cone Base Diameter	
	Hammer Wt	64	Final Depth	1.20
	Probe Type	DPSH-B		

AGS

Trial Pit Log

Project Name: Seaside Primary School,	Client: New Horizons Academy Trust c/o Burns Guthrie	Date: 11/05/2022 - 12/05/2022	
Location: Freshbrook Rd, Lancing BN15 8DL	Contractor: MCD		
Project No. : GWPR4784	Crew Name:	Equipment:	

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP1	TP			1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.20			Brown gravelly SAND. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. (TOPSOIL).
		0.50	D		0.60			Brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (95%) and brick (5%). (MADE GROUND).
		0.80	D					Orange brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. (MADE GROUND).
		1.00	D					
		1.50	D		1.80			End of Borehole at 1.800m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Groundwater not encountered. Roots noted to 0.20m bgl.

Trial Pit Log

Project Name: Seaside Primary School,	Client: New Horizons Academy Trust c/o Burns Guthrie	Date: 11/05/2022 - 12/05/2022
Location: Freshbrook Rd, Lancing BN15 8DL	Contractor: MCD	
Project No. : GWPR4784	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP2	TP			1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.20			Brown gravelly silty SAND. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. (TOPSOIL).
		0.50	D		0.60			Brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint (95%) and brick (5%).
		0.80	D					Orange brown sandy GRAVEL. The sand was fine to coarse grained and the gravel was fine to coarse, sub-angular to sub-rounded flint. RAIED BEACH DEPOSITS).
		1.00	D					
		1.50	D		1.80			End of Borehole at 1.800m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Groundwater not encountered. Roots noted to 0.20m bgl.

Appendix G Site Photographs



Existing Foul Manhole where it is proposed to connect Sports Hall drainage to.



Existing Foul Manhole for proposed connection point. Photograph looking towards outfall of existing manhole going under main school building



Existing Foul Manhole for proposed connection point. Looking towards location of proposed building.

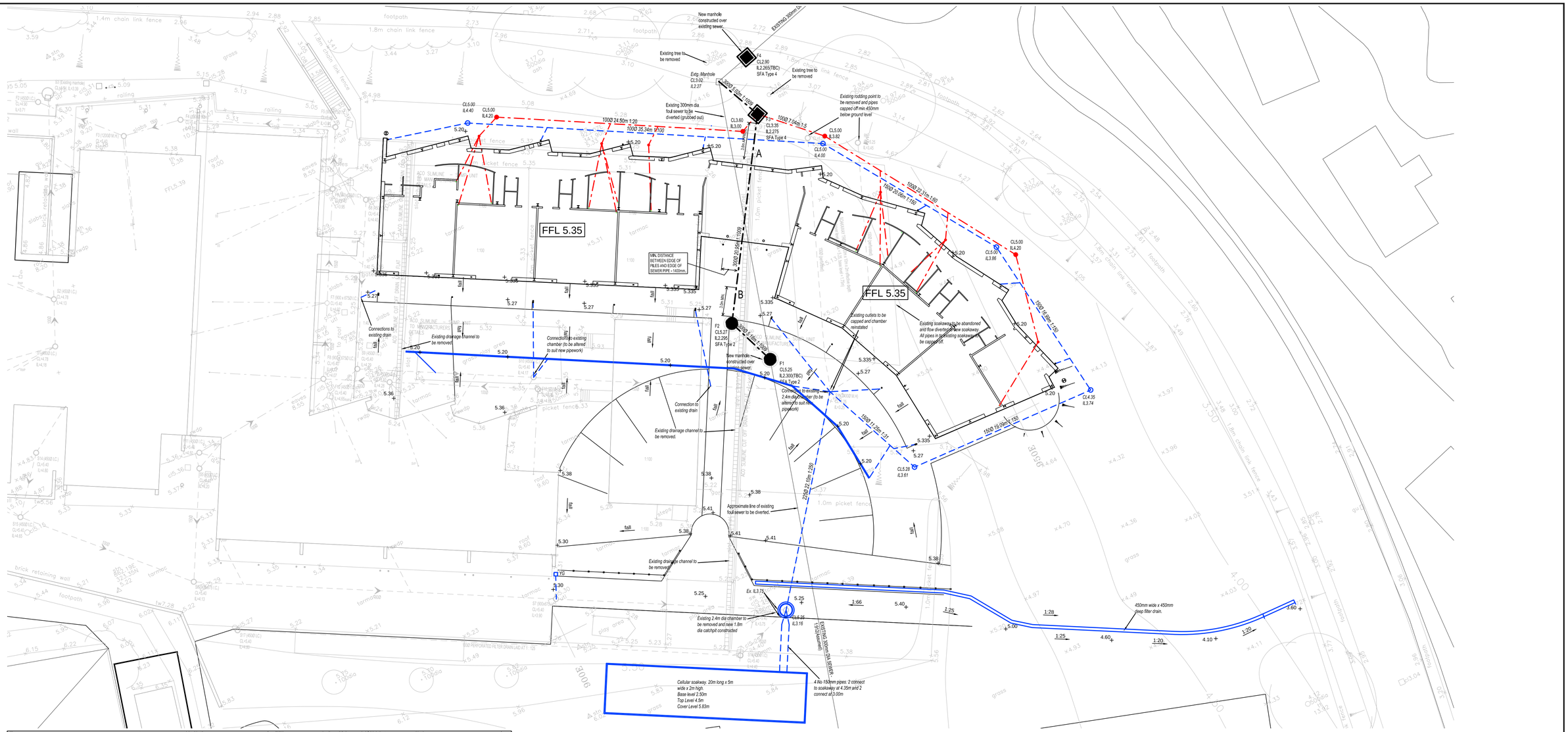


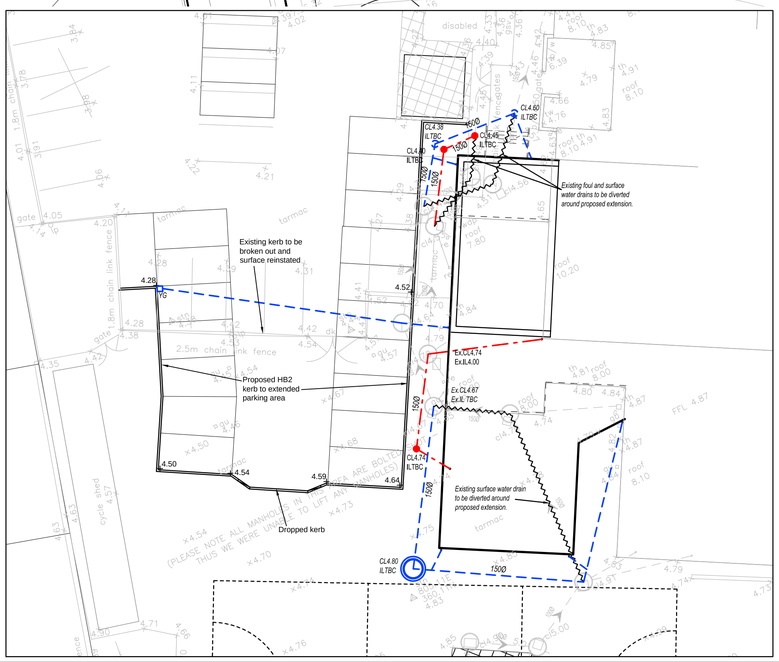
Looking North at location of proposed building towards existing school building.



Looking South at location of proposed building.

Appendix H Schools Previous Adjacent Extension Information (Drainage Layout / SI)





DRAINAGE NOTES:

ALL DRAINAGE WORKS TO BE CONSTRUCTED IN STRICT ACCORDANCE WITH SPECIFICATION OF THE LOCAL AUTHORITY, BUILDING REGULATIONS, SEWERS FOR ADOPTION, BS8301 & BSEN.752-1.

2.
FOR LOCATION AND SETTING OUT OF BUILDING DRAINAGE POINTS REFER TO ARCHITECTS DRAWINGS.

3.
ALL PIPE RUNS NEAR BUILDINGS TO COMPLY WITH THE BUILDING REGULATIONS 2002 PART H1. WHERE A PIPE IS WITHIN 1m OF A FOUNDATION THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATION. WHERE THE TRENCH IS FURTHER THAN 1m FROM THE FOUNDATION, THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE TO A LEVEL BELOW THE LOWEST LEVEL FOR THE FOUNDATION EQUAL TO THE DISTANCE FROM THE FOUNDATION LESS 150mm. IN BOTH CASES THE PIPE SHALL BE BEDDED AND SURROUNDED IN 150mm THICK CLASS GEN3 CONCRETE.

4.
WHERE PIPES, EXTERNAL TO THE STRUCTURES, HAVE A DEPTH TO SOFFIT FROM GROUND LEVEL OF LESS THAN 450mm THEY SHALL HAVE A CLASS GEN3 CONCRETE ENCASEMENT (150mm THICK).

5.
WHERE A PIPE, UNDER A VEHICULAR AREA, HAS A DEPTH OF COVER OF LESS THAN 0.9m THE PIPE SHALL BE LAID IN A CONCRETE BEDDING.

6.
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.

7.
ALL BUILDING DRAINAGE SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH BSEN.752-1. UNLESS OTHERWISE SPECIFIED BUILDING DRAINAGE SHALL BE 100mm DIAMETER AND SHALL BE LAID AT A MINIMUM GRADIENT OF (<1LIS = 1 IN 40>1LIS = 1 IN 80) FOR FOUL DRAINS AND 1 IN 100 FOR SURFACE WATER DRAINS.

8.
ALL PIPES, BENDS AND JUNCTION FOR BUILDING DRAINAGE SHALL BE UPVC CONFORMING TO BS4660 AND BS5481 AS APPROPRIATE AND SHALL BE LAID IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION.

9.
ALL BACK INLET GULLIES TO BE RODDABLE OR CONNECTED TO INSPECTION CHAMBERS.

10.
ALL GULLY CONNECTIONS OTHER THAN AT MANHOLES TO BE 'Y' JUNCTIONS.

11.
ALL ROAD GULLY CONNECTIONS TO BE 150mm DIAMETER.

12.
ALL STUB STACKS TO BE FITTED WITH AIR ADMITTANCE VALVES WHERE BRANCH DRAIN EXCEEDS 12m EXCEPT AT THE HEAD OF THE RUN. SOIL VENT PIPES LOCATED AT THE HEAD OF A RUN TO TERMINATE TO FRESH AIR.

13.
ALL CONNECTIONS TO BE SOFFIT TO SOFFIT UNLESS OTHERWISE NOTED.

14.
ALL CONCRETE AND CONCRETE PRODUCTS USED IN THE DRAINAGE SYSTEM TO BE IN ACCORDANCE WITH BRE 363 FOR SULPHATES.

15.
BEFORE CONNECTIONS ARE MADE TO EXISTING PUBLIC SEWERS AN APPLICATION UNDER 106 MUST BE MADE TO THE DRAINAGE AUTHORITY.

16.
THE PRECISE DEPTH AND LOCATION AND SIZE OF EXISTING PIPES OR MANHOLES WHERE CONNECTIONS OR DIVERSION ARE PROPOSED MUST BE CONFIRMED AND REPORTED TO THE ENGINEER AT THE EARLIEST OPPORTUNITY.

17.
ANY EXISTING LIVE DRAINS FOUND AND SEVERED DURING CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER AND CONNECTED TO THE PROPOSED OR EXISTING DRAINAGE SYSTEM.

18.
THE LOCATION OF THE EXISTING DRAINAGE SYSTEM IS BASED ON AS CONSTRUCTED INFORMATION PROVIDED TO SWP BY THE CLIENT. ITS ACCURACY MUST BE CHECKED ON SITE BEFORE WORKS COMMENCE AND ANY DISCREPANCIES MUST BE REPORTED TO SWP.

DRAWING LEGEND

SURFACE WATER DRAINAGE	
CL##.## IL ##.##	PRECAST CONCRETE RING MANHOLE
CL##.## IL ##.##	INSPECTION CHAMBER
	DRAINAGE CHANNEL (ACO SLIMLINE)
	EXISTING SURFACE WATER DRAINAGE
	EXISTING SURFACE WATER DRAINAGE TO BE ABANDONED/DIVERTED
FOUL WATER DRAINAGE	
CL##.## IL##.##	PRECAST CONCRETE RING MANHOLE
CL##.## IL##.##	INSPECTION CHAMBER
	EXISTING FOUL DRAINAGE
FFL 69.78	PROPOSED BUILDING FINISHED FLOOR LEVEL
	REINFORCED CAVITY RETAINING WALL
	PROPOSED BANKING MAX 1:2.5
53.800 x	PROPOSED SPOT LEVEL
53.800 x	EXISTING SPOT LEVEL

AS-BUILT ISSUE

REV.	DATE	DESCRIPTION
K	04/03/14	FOODTECH DRAINAGE REVISED.
J	28/02/14	FOODTECH DRAINAGE REVISED.
H	27/02/14	DRAINAGE LOCATIONS ADJUSTED TO SUIT DELTA GREEN DRAWING ISSUE.
G	06/02/14	ADDITIONAL SVP AND RWP ADDED AT EXTENSION BY CAR PARK
F	23/12/13	ADDITIONAL SVP AND RWP ADDED.
E	14/11/13	NEW BUILDING LOCATION ADDED.
D	13/11/13	SOAKAWAY LEVELS REVISED AND CHANNEL DRAIN RELOCATED
C	07/11/13	NEW BUILDING LAYOUT AND LANDSCAPING ADDED. FITLER DRAIN AND FOOTPATH LEVELS REVISED
B	25/09/13	SEWER DIVERSION REVISED TO BUILD OVER.
A	18/09/13	SEWER DIVERSION ADDED.

CLIENT

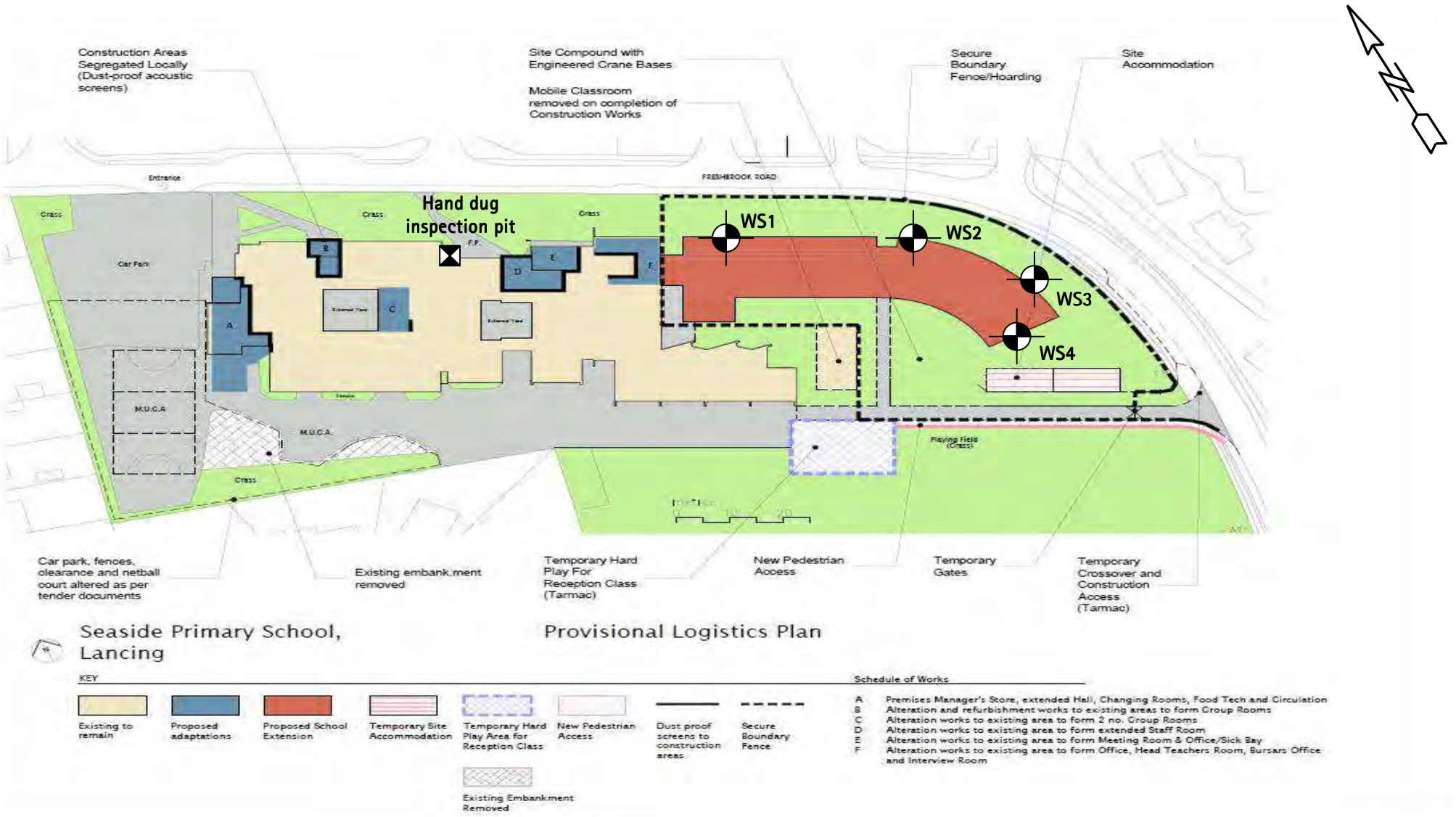
ARCHITECT

JOB TITLE
SEASIDE SCHOOL
LANCING

DRAWING TITLE
SITE LAYOUT
DRAINAGE AND LEVELS

SCALE AT A1	DATE	DRAWN
1:200	JUL 13	LF
	ENG. LF	CHECKED -

JOB No.	DRAWING No.	REV.
E5802	201	K



NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned

Site: Seaside Primary School, Freshbrook Road, Lancing	STL: J11421	Fig No: 1
Date on Site: 6th June 2013	Trial hole location plan	

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Southern Testing
Environmental & Geotechnical

Job No: **J11421** Hole No: **WS1**

National Grid Reference		TQ 189 043	
Start date	06/06/2013	End date	06/06/2013
Ground level		Backfill date	06/06/2013
Logged by	TRL	Engineer	RCS
Final depth	4.60	Page	1 of 1

Site : Seaside Sch, Freshbrook Rd, Lancing

Client : **Sunninghill Construction Co Ltd**

Drilling Method : Windowless Sampler

Piezometer or Monitoring well	Testing: Depth	Testing: Penetration Test (N value) U(blows)	Samples: Depth	Samples: Type	Strata: Thickness	Strata: Level	Strata: Legend	Strata: Depth	Strata Descriptions	
			0.10	D	0.30			0.30	TOPSOIL	Light grey clay TOPSOIL with frequent rootlets and occasional fine to coarse sub angular to sub rounded flint gravel and glass fragments
			0.40	D	0.20			0.50	MADE GROUND	MADE GROUND: light brown clayey sandy fine to coarse sub angular to sub rounded GRAVEL comprising flint, chalk and brick fragments.
	0.70	HP (200)			0.50				MADE GROUND	MADE GROUND: firm to stiff, light brown CLAY with frequent fine to coarse, sub angular to sub rounded GRAVEL comprising flint and chalk fragments.
	1.00	SPT (15)						1.00		NO RECOVERY
					0.30			1.30		
			1.40	D					MADE GROUND	MADE GROUND: firm to stiff, dark grey CLAY with frequent fine to coarse sub angular to sub rounded gravel comprising flint, chalk and brick fragments.
	1.55	HP (210)			0.50					At 1.3 m: Concrete fragments.
			1.80	D				1.80	MADE GROUND	MADE GROUND: reworked firm to stiff yellow to light brown mottled brick red, CLAY with occasional glass fragments and frequent fine to coarse sub angular to sub rounded flint gravel.
	1.90	HP (230)			0.20					
	2.00	SPT (16)						2.00	MADE GROUND	MADE GROUND comprising of fine to course sub anular to sub rounded flint gravels and concrete fragments.
					0.30					
								2.30	GRAVEL	Light brown to grey sandy clayey, fine to coarse, sub angular to sub rounded, flint and chalk GRAVEL.
					0.20			2.50	CLAY	Firm to stiff orange brown sandy, CLAY with frequent fine to coarse, sub angular to sub rounded flint gravel.
			2.60	D	0.30					
								2.80	SAND	Orange brown medium to coarse SAND with frequent fine to course sub angular to sub rounded flint gravels.
			2.90	D	0.20					
	3.00	SPT (16)						3.00		NO RECOVERY
					1.00					
	4.00	SPT (4)						4.00	SAND	Orange brown medium to coarse SAND with frequent fine to coarse sub angular to sub rounded flint gravel.
					0.50					
					0.10			4.50	CLAY	Firm to stiff grey brown CLAY with fine to medium chalk fragments.
								4.60		End of Borehole

PRELIMINARY

Hole Diameters			Water Strikes						Chiselling Time			General Remarks
Depth (m)	Hole (mm)	Casing (mm)	Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	From (m)	To (m)	Time (hrs)	Hole collapsed to 2.4 m

Southern Testing
Environmental & Geotechnical

Job No: **J11421** Hole No: **WS2**

National Grid Reference		TQ 189 043	
Start date	06/06/2013	End date	06/06/2013
Ground level		Backfill date	06/06/2013
Logged by	TRL	Engineer	RCS
Final depth	5.00	Page	1 of 1

Site : Seaside Sch, Freshbrook Rd, Lancing

Client : **Sunninghill Construction Co Ltd**

Drilling Method : Windowless Sampler

Piezometer or Monitoring well	Testing Depth	Testing Penetration Test (N value) U(blows)	Samples Depth	Samples Type	Strata Thickness	Strata Level	Strata Legend	Strata Depth	Strata Descriptions	
			0.10	D	0.20			0.20	TOPSOIL	Brown slightly silty clay TOPSOIL with frequent fine rootlets and rare to occasional fine to coarse sub-rounded flint gravel
			0.30	D					MADE GROUND	MADE GROUND: Reworked orange brown slightly clayey gravelly fine to medium SAND. Gravel comprises fien to coarse sub-angular to sub-rounded flint
					0.80					
	1.00	SPT (4)						1.00	MADE GROUND	MADE GROUND: Reworked firm to stiff brown sandy CLAY with frequent fine to coarse gravel comprising flint and occasional brick fragments, with occasional patches of orange brown sandy clay
	1.10	HP (220)	1.20	D						
					1.10					
			1.70	D						
	2.00	SPT (15)						2.10	CLAY	Firm grey brown mottled orange brown sandy CLAY with frequent fine to coarse sub-rounded flint gravel
	2.10	HP (120)	2.20	D						
					1.00					
			2.70	D						
	2.90	HP (200)						3.10	CLAY	Stiff orange brown slightly sandy CLAY with rare sub-angular to sub-sounded fine to medium flint gravel
	3.00	SPT (16)								
	3.20	HP (340)								
					0.60					
			3.50	D						
								3.70	SAND /GRAVEL	Orange brown slightly clayey SAND/GRAVEL. Gravel comprised fine to coarse sub-angular to sub-rounded flint.
					0.30					
	4.00	SPT (15)	4.00	D				4.00		NO RECOVERY
								4.70	SAND /GRAVEL	Orange brown slightly clayey SAND/GRAVEL. Gravel comprised fine to coarse sub-angular to sub-rounded flint.
					0.30					
	5.00	SPT (5)						5.00		End of Borehole

PRELIMINARY

Hole Diameters			Water Strikes						Chiselling Time			General Remarks
Depth (m)	Hole (mm)	Casing (mm)	Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	From (m)	To (m)	Time (hrs)	
			06/06/13	4.45			4.45					

Southern Testing
Environmental & Geotechnical

Job No: **J11421** Hole No: **WS3**

National Grid Reference		TQ 189 043	
Start date	06/06/2013	End date	06/06/2013
Ground level		Backfill date	06/06/2013
Logged by	TRL	Engineer	RCS
Final depth	4.50	Page	1 of 1

Site : Seaside Sch, Freshbrook Rd, Lancing

Client : **Sunninghill Construction Co Ltd**

Drilling Method : Windowless Sampler

Piezometer or Monitoring well	Testing		Samples		Strata				
	Depth	Penetration Test (N value) Ub/bws)	Depth	Type	Thickness	Level	Legend	Depth	Strata Descriptions
			0.10	D	0.30			0.30	**TOPSOIL** Light grey clay TOPSOIL with frequent rootlets and occasional fine to coarse sub angular to sub rounded flint gravel and glass fragments
			0.50	D	0.50			0.80	**MADE GROUND** MADE GROUND: orange brown to light grey sandy clayey fine to coarse, sub angular to sub rounded, flint GRAVEL with occassional brick fragments At 0.3 m: Geotextile
	0.90	HP (150)			0.20				**CLAY** Stiff dark grey CLAY with frequent fine to medium, sub angular to sub rounded, flint gravel and with a slight organic odur.
	1.00	SPT (12)						1.00	**CLAY** Firm orange brown to dark grey CLAY with abundant fine to coarse sub angular to sub rounded flint gravels and occasional coarse gravel to cobble sized flint fragments.
	1.20	HP (100)			0.40			1.40	**GRAVEL** Light brown to light grey sandy, fine to coarse sub angular to sub rounded flint GRAVEL
					0.40			1.80	**SAND** Yellow brown to orange brown fine to coarse SAND with frequent fine to coarse sub angular to sub rounded flint gravel.
	2.00	SPT (25)			0.80				
	2.70	HP (125)						2.60	**CLAY** Firm brownish grey to orange brown sandy CLAY
	3.00	SPT (7)	3.00	D	1.50				
	4.00	SPT (5)							
			4.30	D	0.40			4.10	**SILT** Recovered as: Firm, light brownish white to light buff brown SILT comprising destructed putty chalk with occasional fine to coarse sub angular chalk gravels.
								4.50	End of Borehole
	5.00	SPT (1)							

PRELIMINARY

Hole Diameters			Water Strikes						Chiselling Time			General Remarks
Depth (m)	Hole (mm)	Casing (mm)	Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	From (m)	To (m)	Time (hrs)	Hole collapsed to 1.51 m
			06/06/13	3.37			3.37					

Southern Testing
Environmental & Geotechnical

Job No: **J11421** Hole No: **WS4**

National Grid Reference		TQ 189 043	
Start date	06/06/2013	End date	06/06/2013
Ground level		Backfill date	06/06/2013
Logged by	TRL	Engineer	RCS
Final depth	5.00	Page	1 of 1

Site : Seaside Sch, Freshbrook Rd, Lancing

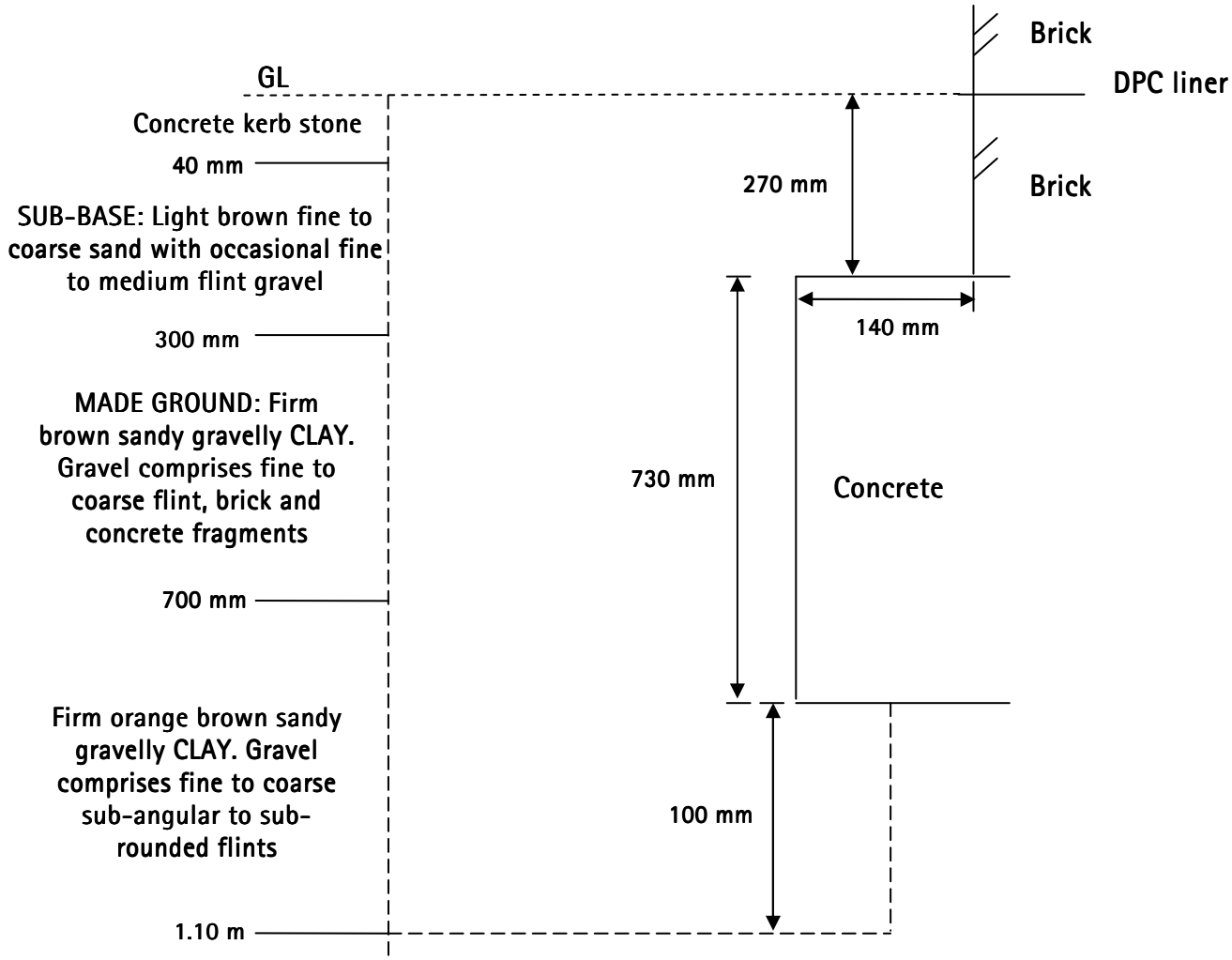
Client : **Sunninghill Construction Co Ltd**

Drilling Method : Windowless Sampler

Piezometer or Monitoring well	Testing: Depth	Testing: Penetration Test (N value) (Blows)	Samples: Depth	Samples: Type	Strata: Thickness	Strata: Level	Strata: Legend	Strata: Depth	Strata Descriptions	
			0.10	D	0.30			0.30	TOPSOIL	Light grey clay TOPSOIL with frequent rootlets and occasional fine to coarse sub angular to sub rounded flint gravel and glass fragments
	0.45	HP (300)			0.30			0.60	MADE GROUND	Stiff dark brown to dark grey CLAY with frequent medium to coarse, sub angular to sub rounded flint gravels.
			0.70	D	0.20			0.80	MADE GROUND	At 0.3 m: Geotextile
	0.85	HP (250)	0.80	D	0.10			0.90	MADE GROUND	MADE GROUND: Yellow brown to light grey medium to coarse SAND with frequent fine to coarse sub angular to sub rounded gravel comprising flint and brick fragments.
	1.00	SPT (5)							CLAY	
			1.10	D	0.50					At 0.6 m: Concrete and brick fragments
	1.20	HP (270)						1.40	SAND	MADE GROUND: Stiff dark grey CLAY with frequent fine to coarse sub angular to sub rounded flint gravel and organic odur.
			1.50	D	0.40					At 0.8 m: wood, rubber and plastic fragments
	1.90	HP (150)			0.20			1.80	CLAY	Stiff light yellow brown CLAY
	2.00	SPT (17)						2.00	SAND	Yellow brown to orange brown fine to coarse SAND with occasional fine to coarse, sub angular to sub rounded flint gravel.
					0.70					Stiff brown grey CLAY with frequent fine to coarse, sub angular to sub rounded flint gravel.
			2.50	D						Fine to coarse yellow brown to orange brown SAND.
	3.00	SPT (36)						2.70	SAND	Orange brown, fine to coarse SAND with frequent fine to coarse sub angular to sub rounded chalk gravel.
					1.30					
	4.00	SPT (13)						4.00		NO RECOVERY
					1.00			5.00		End of Borehole

PRELIMINARY

Hole Diameters			Water Strikes						Chiselling Time			General Remarks
Depth (m)	Hole (mm)	Casing (mm)	Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	From (m)	To (m)	Time (hrs)	



NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned

Site: Seaside School, Freshbrook Road, Lancing	STL: J11421	Fig No: 1
Date on Site: 6th June 2013	Foundation inspection pit	

Summary Sheet

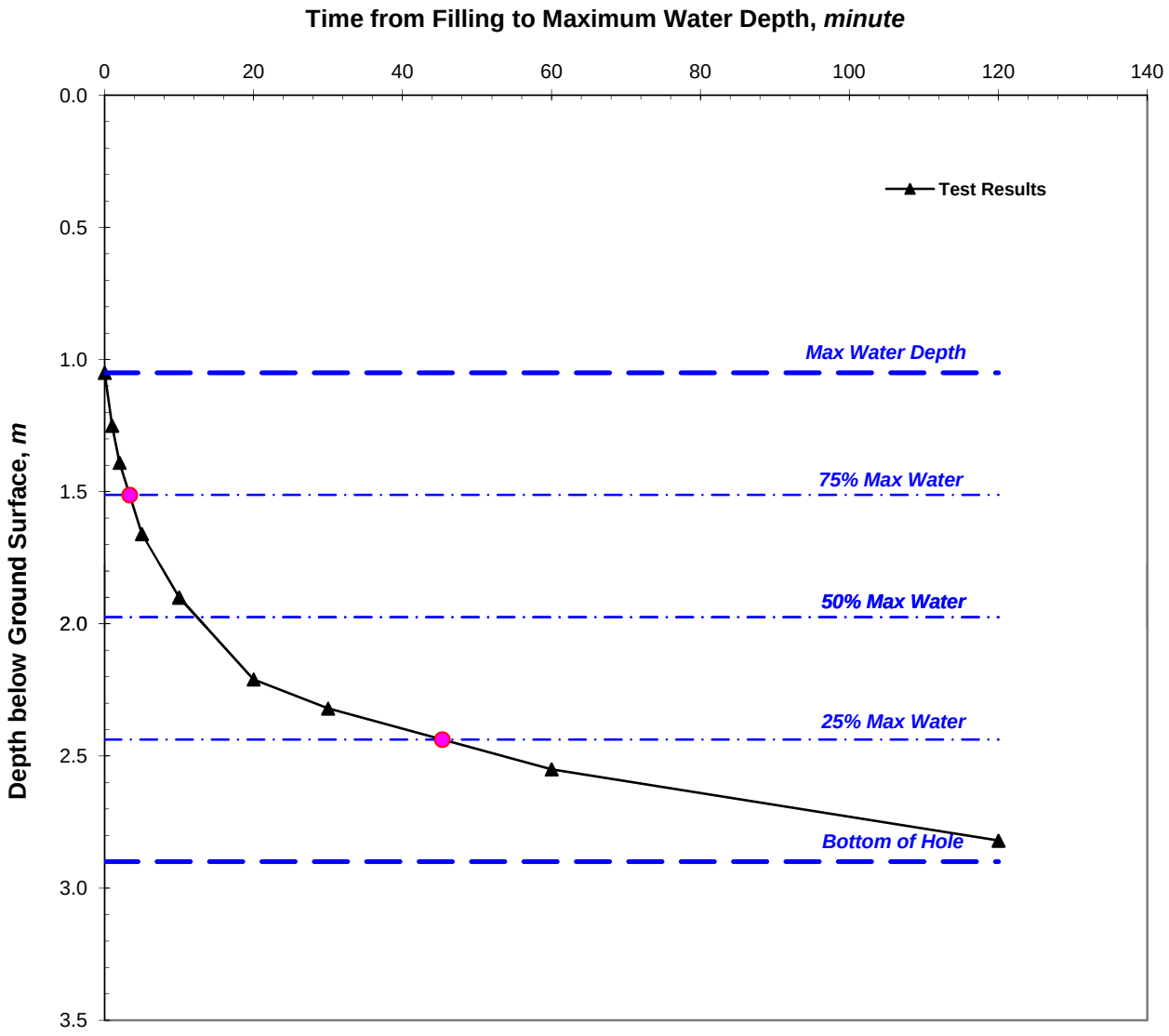
Results of BRE Digest 365 Soakage Tests

Site :	Seaside School, Freshbrook Road, Lancing	**Job No :**	J11421
Client :	Sunninghill Construction Co Ltd	**O S Reference :**	TQ 189 043
Tested By :	AD	**Engineer:** RCS	**Test Date :** 06/Jun/2013

Hole No	Test No	Hole Depth *m*	Soakage Rate for Each Test *litre/m² /min*	Soakage Rate for Each Hole *litre/m² /min*	Soakage Rate for Each Hole *m/sec*	Water Level at Finish of Test	Remarks
WS1	No 1	2.90	0.409	0.165	2.76E-6	Nearly empty pit.	
WS1	No 2	2.90	0.165			Pit was not emptied; Non compliant value was calculated.	
WS3	No 1	1.67	1.56	1.34	2.24E-5	Empty pit.	
WS3	No 2	1.67	1.34			Nearly empty pit.	
Mean Value of All Calculated Soakage Rates :				**0.754** *litre/m² /min*	**1.26E-5** *m/sec*		

BRE Digest 365 Soakage Test

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



Diameter of Borehole, m	0.070	Depth to Water at Start of Test, ***m***	1.050
Depth to End of Borehole Casing, m		Max Water Dropdown during Test, ***m***	1.770
Depth to Borehole Base, m	2.900	Total Soakage Test Time, ***min***	120.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.207
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.085
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m^2/min***	**0.409**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**6.82E-06**

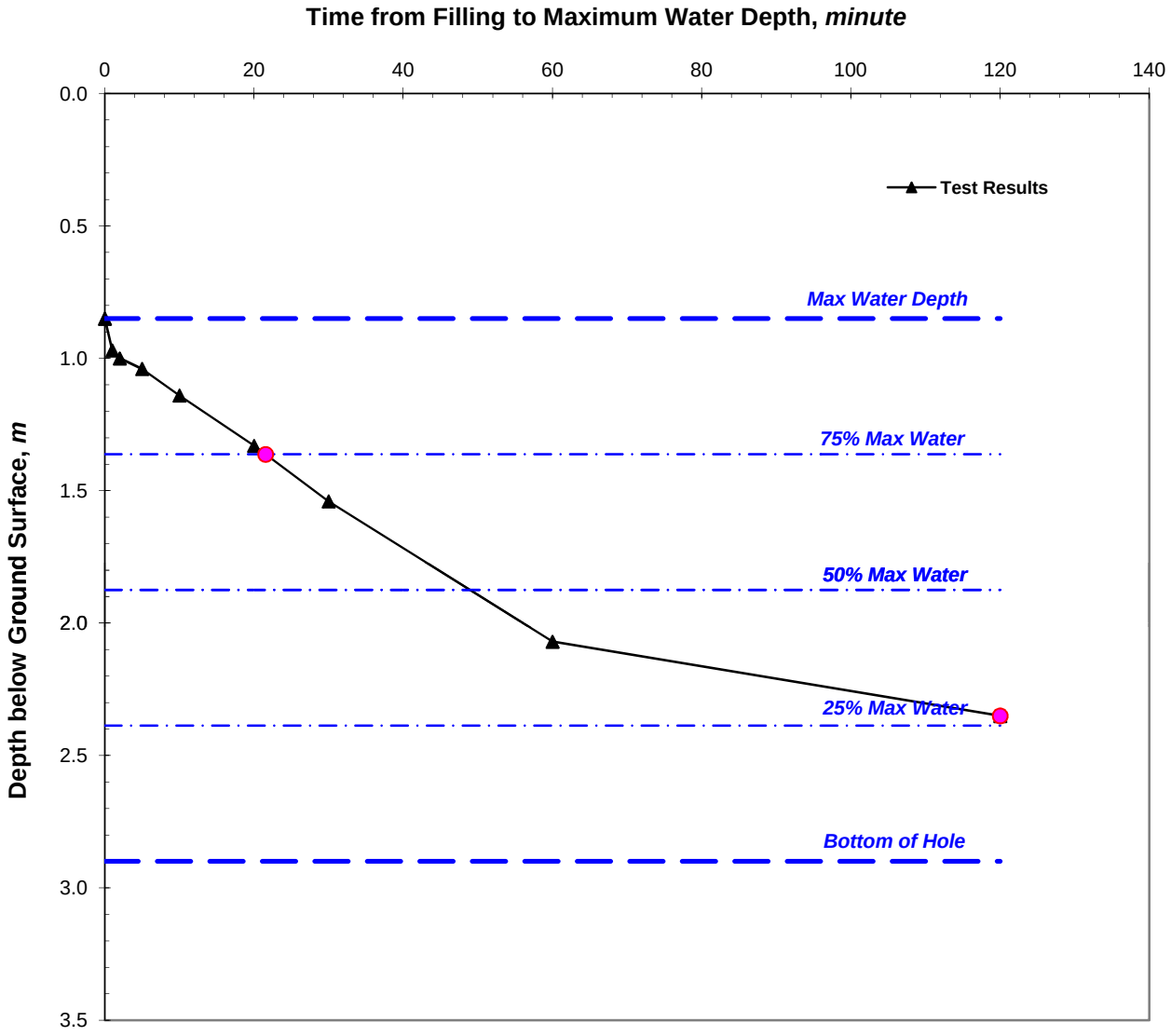
Comments:

Pit was nearly emptied at finish of test.

Client:	Sunninghill Construction Co Ltd	**Job No:**	J11421	**Test Date:**	06/Jun/2013		
Site:	Seaside School, Freshbrook Road, Lancing	**Tested By:**	AD	**Engineer:**	RCS	**Fig.**	**S1**

BRE Digest 365 Soakage Test

Test Hole No: WS1
Test No: Test No 2 (Repeated)



Diameter of Borehole, m	0.070	Depth to Water at Start of Test, ***m***	0.850
Depth to End of Borehole Casing, m		Max Water Dropdown during Test, ***m***	1.500
Depth to Borehole Base, m	2.900	Total Soakage Test Time, ***min***	120.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.233
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.039
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m^2/min***	**0.165**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**2.76E-06**

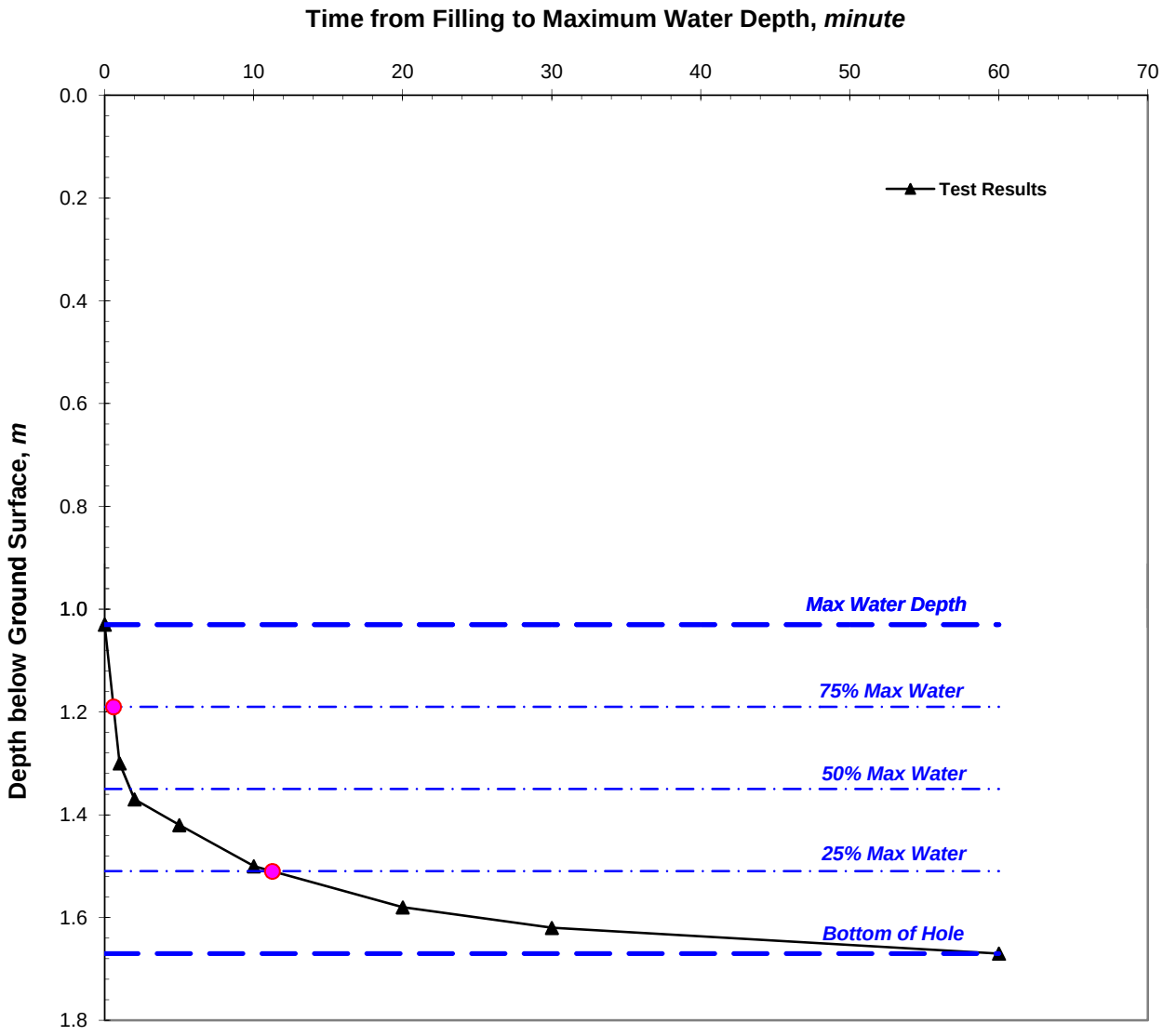
Comments:

Water level fell to 50% -- 25% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Sunninghill Construction Co Ltd	**Job No:**	J11421	**Test Date:**	06/Jun/2013		
Site:	Seaside School, Freshbrook Road, Lancing	**Tested By:**	AD	**Engineer:**	RCS	**Fig.**	**S2**

BRE Digest 365 Soakage Test

Test Hole No: WS3
Test No: Test No 1 (Initial)



Diameter of Borehole, m	0.070	Depth to Water at Start of Test, ***m***	1.030
Depth to End of Borehole Casing, m		Max Water Dropdown during Test, ***m***	0.640
Depth to Borehole Base, m	1.670	Total Soakage Test Time, ***min***	60.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.074
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.116
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m²/min***	**1.56**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**2.59E-05**

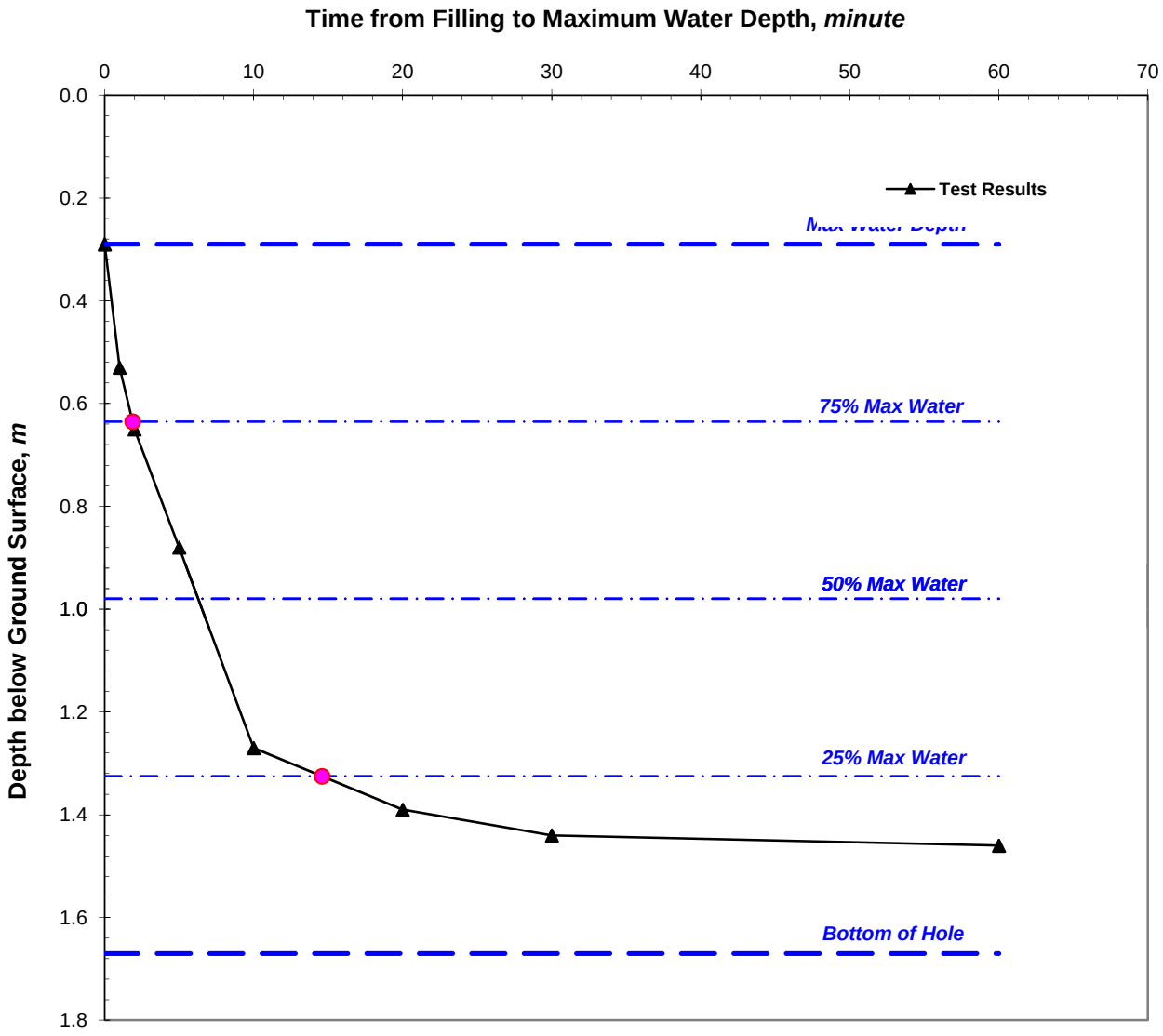
Comments:

Pit was emptied at finish of test.

Client:	Sunninghill Construction Co Ltd	**Job No:**	J11421	**Test Date:**	06/Jun/2013		
Site:	Seaside School, Freshbrook Road, Lancing	**Tested By:**	AD	**Engineer:**	RCS	**Fig.**	**S3**

BRE Digest 365 Soakage Test

Test Hole No: WS3
Test No: Test No 2 (Repeated)



Diameter of Borehole, m	0.070	Depth to Water at Start of Test, ***m***	0.290
Depth to End of Borehole Casing, m		Max Water Dropdown during Test, ***m***	1.170
Depth to Borehole Base, m	1.670	Total Soakage Test Time, ***min***	60.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.156
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.209
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m^2/min***	**1.34**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**2.24E-05**

Comments:

Pit was nearly emptied at finish of test.

Client:	Sunninghill Construction Co Ltd	**Job No:**	J11421	**Test Date:**	06/Jun/2013		
Site:	Seaside School, Freshbrook Road, Lancing	**Tested By:**	AD	**Engineer:**	RCS	**Fig.**	**S4**

Appendix I Drainage Maintenance Schedule

DRAINAGE MAINTENANCE SCHEDULE			
Job Title	**Seaside Primary School SPORTS HALL**	**Job No**	**WG1275**
		Date	June 2022
Prepared	LG	***Checked***	GW

Introduction

This statement details the drainage maintenance requirements for the proposed surface and foul water systems at the development above. A copy of this statement should be provided to the party responsible for maintaining the drainage system and should also be included within the Maintenance Manuals for the development.

The maintenance detailed in this document must be undertaken throughout the lifetime of the development. Failure to undertake this maintenance may result in the drainage system not operating as designed, increasing the risk of flooding.

Drawings detailing the design of the drainage system are referenced WG1275/201 (attached within Appendices of this document).

Brief Description of the Surface Water Drainage System

The below ground surface water drainage system for the new sports hall comprises a traditional piped system, draining by gravity to a cellular soakaway located in the schools playing fields to the East of the new building.

The system operates entirely by gravity and this system does not rely on moving parts to remain operational.

The surface water drainage for the building will not be offered for adoption to the statutory sewerage undertaker.

Brief Description of the Foul Water Drainage System

The below ground foul water drainage system comprises of a traditional piped system, draining by gravity to a packaged pumping station to the North of the new sports hall.

The packaged pumping station is private and the responsibility of the school.

The foul water drainage for the development will not be offered for adoption to the statutory undertaker.

Responsibility for Maintenance

Seaside Primary School –

All drainage associated with the new sports hall building is private and will remain the responsibility of Seaside Primary School.

If drainage either foul or surface water for the new building experiences issues, the school's maintenance team should be contacted to carry out the necessary maintenance or repairs, in the first instance.

Maintenance Requirements

Whilst the drainage system has been designed to operate with as little maintenance as possible, there are key operations that must regularly be undertaken to ensure that it remains in optimal condition, most of which are general housekeeping tasks that should be undertaken for any drainage system, but with additional attention to the catchpits upstream of the soakaway. These operations are summarised below together with recommended frequencies:

- Periodic desilting of catchpits, gully sumps and channel drains. These should be emptied at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years.
- Periodic jetting or rodding of pipework as required to clear blockages.
- Gratings on any gullies and channel drains to be kept clear of debris.
- Any manufacturer specific requirements for maintenance should be added to the periodic maintenance.

Cellular Soakaway

As set out in the CIRIA SuDs Manual there are additional maintenance procedures and measures which can be implemented for certain items. The list below is not an exhaustive list and any manufacturer specific maintenance requirements should be added to the list below to the list below. In the case of this site it would be related to the Cellular Soakaway. Please see below an extract from the SuD's Manual listing these additional measures:

TABLE 13.1 Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Foul Water Pump Station

The foul pump station will require additional maintenance measures to ensure it operates as designed. Failure it carrying out this maintenance, could increase the risk of flooding. The list below is not an exhaustive list and any manufacturer specific maintenance requirements should be added to the list below to the list below. The additional measures are as follow:

- The pump station should be service as a minimum annually with all electrical equipment inspected and tested, in accordance with manufacturers recommendations.
- The manufacturers recommendations for additional maintenance measures should also be added to any periodic maintenance.
- The sludge retained should be monitored at least every 3 months and desludged as necessary, with the maximum time between desludging of 12 months, or more frequently if manufacturers recommendations require.
- The desludging should be carried out by a licenced operator, who can dispose of the waste in a correct manner.

Remedial/Repair Actions

Significant storm events may cause significant damage to the drainage system. As such it may be necessary to inspect and carry out essential recovery works to return the feature to full working order.

Accidental Spillages

It is not envisaged that any materials are to be stored onsite once the development is completed, which could cause major spills and potential pollution issues within the drainage system. If this situation alters in the future a specialist will be required to be contacted to confirm if any upgrades to the existing system are required.

Future Alterations to the Development

Any future alterations to the drainage system should be confirmed by a specialist, as it could adversely affect the operation of the system.

APPENDICES

Appendix A – Drainage Design Drawings

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

RESIDUAL HAZARDS

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following:

1. Unknown services/depths within work zone. Contractor to undertake necessary precautions and investigation prior to excavating.
2. Existing Overhead Power and Telecoms Cables. Contractor is to prepare a method statement to ensure operatives are familiar and competent with the dangers of working near overhead cable.
3. The works will involve the movement of plant and machinery within a school playground. There is a risk of potential conflict between plant/machinery and the school personnel / children. Contractor to undertake necessary precautions and ensure suitable traffic management is in place prior to commencement.
4. Working in live sewers. Contractor to ensure operatives are familiar and competent with the dangers of working in live sewers.
5. Excavations within existing tree root zones. Contractor is to seek advice from an Arboriculturalist and work to the methodology and requirements set out in the Arboriculturalist's report.
6. Deep excavations associated with the drainage installation of soakaways & manholes. Contractor is to ensure suitable temporary works are in place to ensure the safety of operatives and the public (where necessary). Contractor to ensure operatives are familiar and competent with the dangers of working in deep excavations.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement

DRAWING LEGEND

SURFACE WATER DRAINAGE		FOUL WATER DRAINAGE	
	EXISTING SURFACE WATER DRAINAGE		EXISTING FOUL WATER SEWER
	PROPOSED SURFACE WATER DRAINAGE		PROPOSED FOUL WATER DRAINAGE
SW# CL ##.## IL ##.## (450/600Ø/CP)	TYPE 3 INSPECTION CHAMBER (Max 3m depth to invert, CP denotes Catchpit) Chambers deeper than 1.2m to be non-entry.		PROPOSED FOUL WATER PUMPED MAIN (Size to be confirmed by Manufacturer)
RE IL ##.##	RODDING EYE	Pump Station CL ##.## IL ##.## (####Ø)	PUMPING CHAMBER (See specialist details for size and other information)
	CELLULAR SOAKAWAY (Vented)	MISC	
Vent	CELLULAR STORAGE TANK VENT (To be positioned in non-trafficed location)	FFL ##.###	PROPOSED BUILDING FINISHED FLOOR LEVEL
Channel	CHANNEL DRAIN (100mm wide, Heelguard grating, trapped gully outlet) TD - Threshold Drain	##.##	PROPOSED SPOT LEVEL
		##.##	EXISTING SPOT LEVEL
		1:80	GRADIENT OF FALL

PRELIMINARY

From the site visit this manhole was measured at only 0.4m deep.

FW
Packaged Pump Station
TT Pumps 'Venus' Dual Pump (or similar)
Encased in a minimum of 300mm thick concrete.
CL 5.300
Incoming IL 4.950
Base Level 3.000 (Based on 2.3m Dp unit)
Volume of storage below incoming IL would equate to 1.53m³ (1530 litres).
Therefore, at 10litres per toilet flush this would equate to 153 flushes for the 24hr storage period.
Estimated usage for this single toilet would only be in the region of 30-50 flushes per day. Therefore way below the avaliable storage.
(1000Ø)

Level difference of approx. 800mm between proposed / existing levels.
If existing seating area is removed, area is to be graded (1 in 3 max).
If existing seating area is to remain a retaining wall would be required.
Client / Architect to confirm final arrangement.

RWP indiacted as 150mm diameter on Architectural Layout.
Below ground pipework to be a minimum of 150mm to connect RWP's.

NOTE:
SERVICE ROUTES INDICATIVELY SHOWN.
FOR FINAL LAYOUT AND DESIGN INFORMATION PLEASE REFER TO DELTA GREENS DRAWINGS AND INFORMATION

Tie in with existing levels

Existing Wall shortened to allow for proposed layout.

Level difference between existing Concrete Hardstanding / Proposed path levels to be reviewed onsite. If nesscary a HB2 kerb to be installed along hardstanding edge.

Existing Concrete Hardstanding to remain

EXISTING SOAKAWAY FOR PREVIOUS SCHOOL EXTENSION.
Soakaway Size - 5m (w)x 20m(l) x 2m(dp)
Top Level - 4.50
Base Level - 2.50

Soakaway to be postioned a minimum of 10m away from existing / proposed buildings. Proposed Soakaway to be positioned a minimum of 10m away from existing soakaway

CELLULAR SOAKAWAY
Wavin Aquacell 'CORE-R' or similar
3.0m (w) x 14.0m (l) x 1.2m (dp)
Base Level - 4.40
(Min. cover 0.6m)
(Vehicle Loading - Pedestrian / Grass Cutting Only)

Ex.FWMH
CL 5.37
IL 4.94
(Measured onsite)

PUMPED MAIN >>
<< Existing SW Drain 100Ø
Existing SW Drain 100Ø >>
Existing SW Drain 150Ø >>
Existing SW Drain 150Ø >>

RE
CL 5.700
IL 5.200

SW
CL 6.250
IL 5.100
(450Ø/CP)

2.001 - 150Ø 9.36m 1:80

IL 5.000

1.001 - 150Ø 10.61m 1:35

IL 5.200

SW
CL 6.350
IL 5.500
(450Ø/CP)

RE
IL 5.700

1.000 - 150Ø 12.08m 1:81
ACO Hexdrain
(B125)

TD

FFL 6.300

FFL 6.300

1:125 @ A1
1:250 @ A3
0 2 4 6 8 10 12 m

Notes: A1

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7. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
10. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any WGC drawings, the manufacturers instructions must be used.
11. All Earthworks in accordance with the Specification for Highway Works.

DRAINAGE NOTES:

1. All drainage works to be constructed in strict accordance with specification of the Local Authority, Building Regulations, Sewers for Adoption, BS8301 & BSEN.752-1.
2. For location and setting out of building drainage points refer to architects drawings.
3. All pipe runs near buildings to comply with the Building Regulations 2002 part h1. Where a pipe is within 1m of a foundation the trench shall be filled with class gen3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class gen3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
4. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
5. Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid in a concrete bed and surround.
6. 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.
7. All private building drainage shall be constructed in strict accordance with BS EN.752-1. unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of (<1l/s = 1 in 40/>1l/s = 1 in 80) for foul drains and 1 in 80 for surface water drains. all building drains shall be laid in conjunction with 'non adoptive bedding details' (class d, n or b) unless otherwise specified.
8. All pipes, bends and junction for private building drainage shall be UPVC conforming to BS4660 and BS5481 as appropriate and shall be laid in accordance with the manufacturer's specification. All pipes, bends and junction materials for adoptable drainage shall be vitrified clay, extra strength or super strength to BSEN295, with flexible joints and kitemark certified
9. All back inlet gullies to be roddable or connected to inspection chambers.
10. All gully connections other than at manholes to be 'y' junctions.
11. All road gully connections to be 150mm diameter.
12. All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
13. All connections to be soffit to soffit unless otherwise noted.
14. All concrete and concrete products to be in accordance with BRE 363 for sulphates.
15. The locations of all svps and rwps shall be cross referenced against the architects drawings during setting out.
16. Before connections are made to existing public sewers an application under 106 must be made to relevant sewerage undertaker.
17. The precise depth and location and size of existing pipes or manholes where connections or diversion are proposed must be confirmed and reported to the engineer at the earliest opportunity.
18. Where inspection covers are located in areas of block paving or paving slabs they shall be fitted with recessed covers and infilled with the adjacent material.
19. Existing drains - any existing drains to be abandoned to be decommissioned in view of building regulations by either building out, infilled or sealed.

Rev	Date	Revisons	Drwn	Chk
P3	23.08.22	Service Routes indicatively shown	LG	GW
P2	17.06.22	Updated to latest Soil Investigation Report. Threshold drains removed as per Architects comments.	LG	GW
P1	06.06.22	Preliminary Issue	LG	GW

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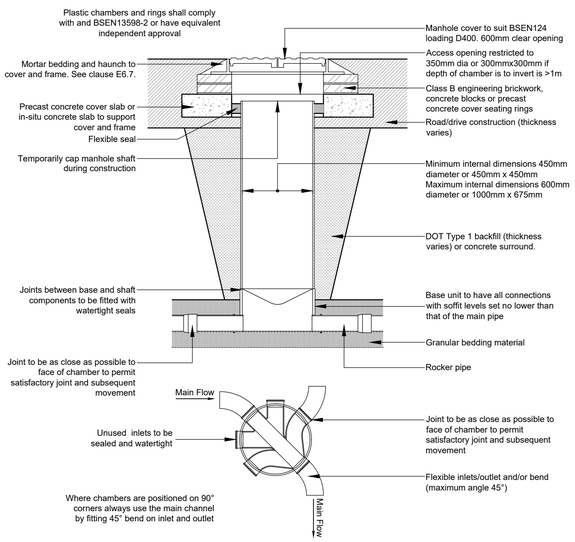
Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drainage and Levels Layout

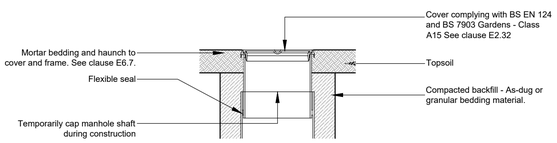
Scale:	Date:	Drawn:	Checked:
1:125	MAY 22	LG	GW

Drawing No: WG1275/201
Rev: P3



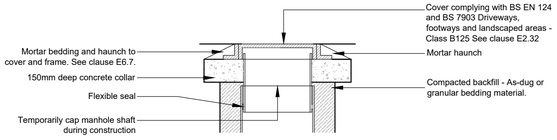
TYPICAL ACCESS CHAMBER DETAIL - TYPE 3

3m maximum depth to from cover to pipe soffit. (non entry) vehicle loading
(Scale 1:20)



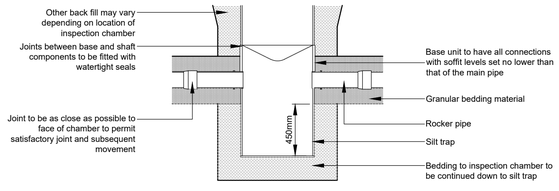
ALTERNATIVE TOP DETAIL - TYPE 3

Sited in domestic gardens subject to pedestrian loading only
(Scale 1:20)



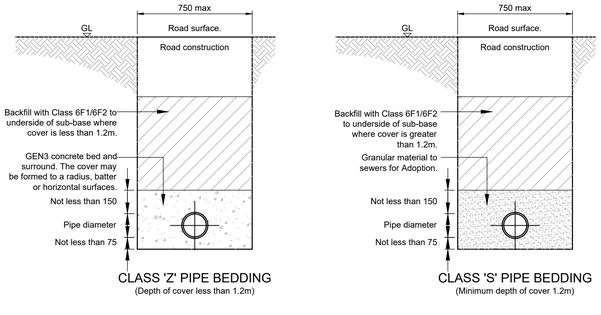
ALTERNATIVE TOP DETAIL - TYPE 3

Sited in driveways/paved areas subject to light vehicle loading only
(Scale 1:20)



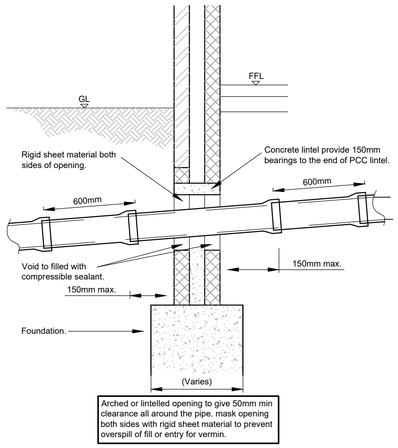
TYPICAL SILT TRAP DETAIL - TYPE 3

(Scale 1:20)



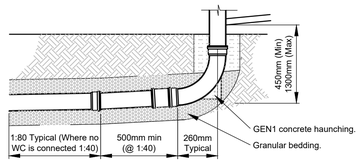
PIPE BEDDING DETAILS (UNDER HIGHWAYS)

(Scale 1:20)



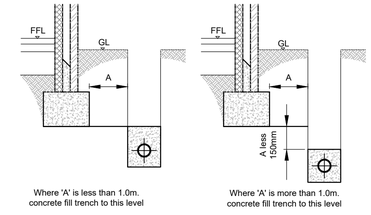
TYPICAL SECTION PIPE PASSING THROUGH WALL PIPE THROUGH LINTELLED OPENING

(Scale 1:20)



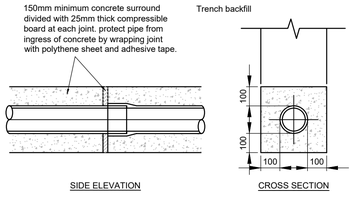
DETAIL OF FOUL REST BEND DETAIL

(Scale 1:20)



DETAIL OF PIPE RUNS NEAR BUILDINGS

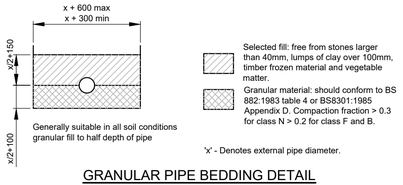
(Scale 1:10)



CONCRETE BED AND SURROUND TO PIPES

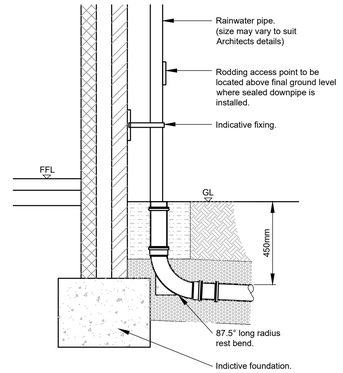
(Scale 1:20)

LIMITS OF COVER FOR THERMOPLASTIC PIPES IN ANY WIDTH OF TRENCH					
Nominal Size	Fields and gardens		Light traffic roads		Heavy traffic roads	
	MIN	MAX	MIN	MAX	MIN	MAX
100-300mm	0.6	7.0	0.9	7.0	0.9	7.0



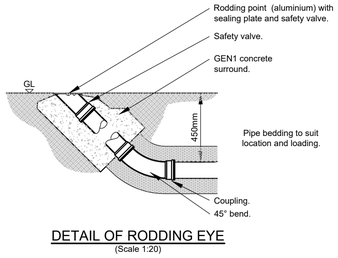
GRANULAR PIPE BEDDING DETAIL

(Scale 1:20)
Refer to Limits of Cover Table below for minimum covers.



TYPICAL RWP REST BEND DETAIL

(Scale 1:20)



DETAIL OF RODDING EYE

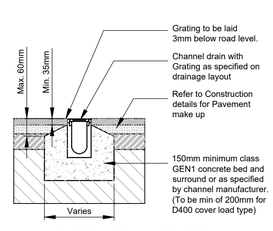
(Scale 1:20)

Minimum Dimensions for Access Fittings and Chambers						
Type	Internal Sizes				Cover Sizes	
	Depth to invert (m)	Size of largest pipe (DN)	Length x Width (mm)	Circular (mm)	Length x Width (mm)	Circular (mm)
Rodding Eye	As Drain but Minimum 100mm					
Shallow Access						
Small	0.6 or less	150	150x100	150	150x100	150
Large			225x100		225x100	
Inspection Chamber	0.6 or less			190		190
	1.2 or less	150	450x450	450	450x450	450
	1.2 - 3.0		450x450	450	300x300	350
Manhole	1.5 or less	150	675x750	1200	675x750	n/a
		225	675x1200	1200	1200x675	n/a
		300	675x1200	1200	1200x675	n/a
		>300	DN+450 x1800	The larger of 1800 or (DN+450)	1200x675	n/a
	Over 1.5	225	1200x1000	1200	600x600	600
		300	1200x1075	1200	600x600	600
		375-450	1350x1225	1200	600x600	600
		>450	DN+775 x1800	The larger of 1800 or (DN+775)	1200x675	600
Manhole Shaft	Over 2.7		900x840	900	600x600	600

BUILDING REGULATIONS MINIMUM DIMENSIONS FOR MANHOLES

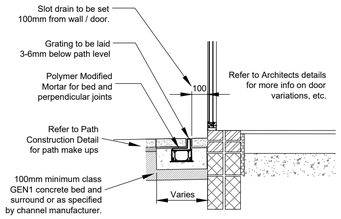
(Not to Scale)

This plan complies with the Building Regulations 2002
Section 'H' - Drainage & Waste Disposal.



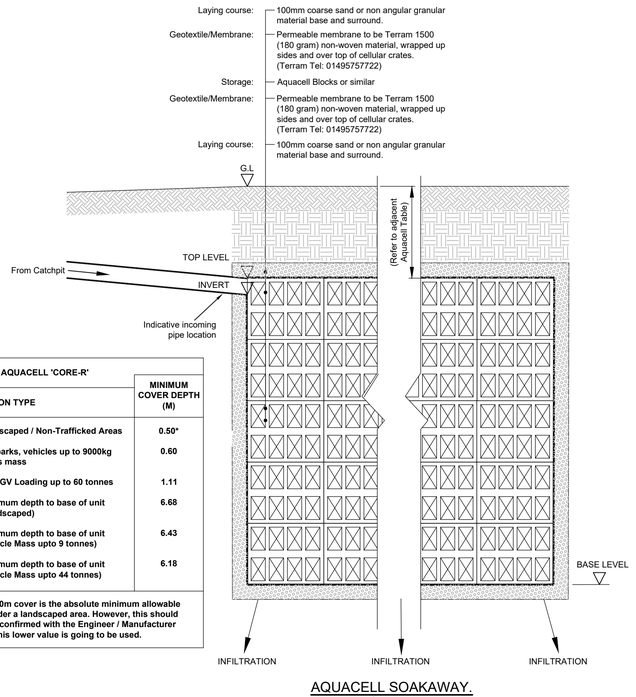
TYPICAL CHANNEL DRAIN

(Scale 1:20)
(ACO Mulitdrain MD - Asphalt Pavement)



TYPICAL THRESHOLD SLOT DRAIN

(Scale 1:20)
(ACO HexDrain Brickslot Channel - Pedestrian Loading Only)



AQUACELL 'CORE-R'	
LOCATION TYPE	**MINIMUM COVER DEPTH (M)**
Landscaped / Non-Trafficked Areas	**0.50***
Car parks, vehicles up to 9000kg gross mass	**0.60**
HA/HGV Loading up to 60 tonnes	**1.11**
Maximum depth to base of unit (Landscaped)	**6.68**
Maximum depth to base of unit (Vehicle Mass upto 9 tonnes)	**6.43**
Maximum depth to base of unit (Vehicle Mass upto 44 tonnes)	**6.18**

(*) - 0.30m cover is the absolute minimum allowable under a landscaped area. However, this should be confirmed with the Engineer / Manufacturer if this lower value is going to be used.

AQUACELL SOAKAWAY.

(Scale 1:20)

Notes:

A1

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11. All Earthworks in accordance with the Specification for Highway Works.

Rev	Date	Revisons	Drwn	Chk
P1	06.06.22	Preliminary Issue	LG	GW

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Client:
Seaside Primary School

Project:
New Sports Hall
Seaside Primary School, Lancing

Drawing Title:
Drainage Details

Scale:	Date:	Drawn:	Checked:
AS	JUN 22	LG	GW

Drawing No: WG1275/250
Rev: P1