

Our ref: R2744-L20190617
Your ref: Soil Infiltration (Soakaway) Calculations

Ruth Roberts
The Towers Day Nursery
Llangollen Road
Acrefair
Wrexham
LL14 3SG

17th June 2019

By e-mail: ruth831@btinternet.com

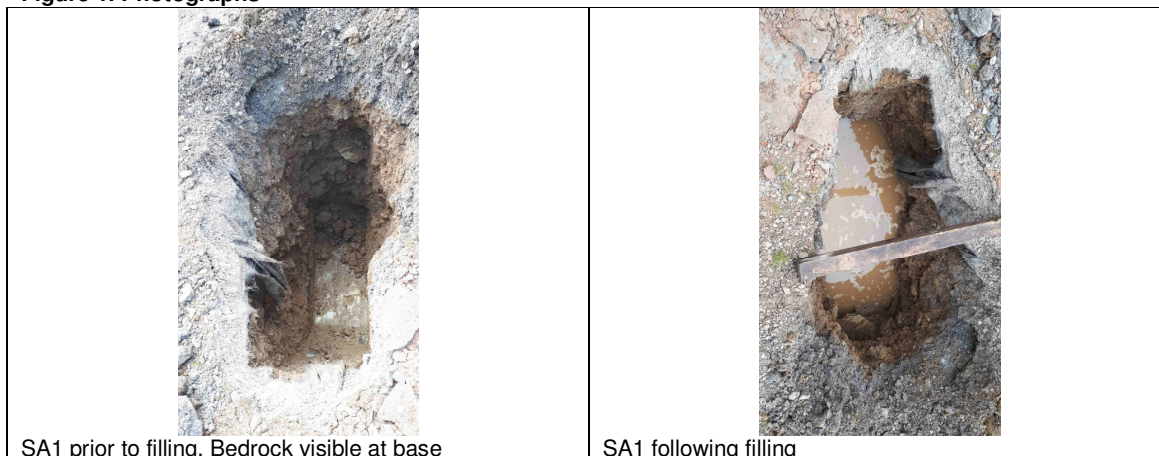
Dear Ruth,

Soil Infiltration Testing at Towers Day Nursery, Acrefair

SGP were instructed to carry out a soakaway trial-pit at the above site to determine a soil infiltration rate and assist in the determination of the feasibility of soakaways.

SGP attended site on 17.04.19 and 1 soakaway pit (SA1) was excavated within the predetermined area to a depth of 1.59m bgl. The location of the test-pit is as per the attached plan provided by the client (ref. 813/L(52)01) with works carried out in accordance with BRE 365¹.

Figure 1. Photographs



Three runs of soakaway tests were carried out within SA1 due to good drainage (fully drained on all tests), however due to some spalling of the side walls during the third run was ended before being fully drained. Soil infiltration rates were calculated by the methodology detailed in BRE 365; a copy of the worksheet is provided with soil infiltration rates summarised in the table below:

¹ Building Research Establishment; Soakaway Design. Digest 365

Table 1.1 Soil infiltration rates

Test-Pit	Soil Infiltration Rate (m/s)		
	Run 1	Run 2	Run 3
SA1	5.22×10^{-5}	3.80×10^{-5}	6.03×10^{-5}

Soil infiltration rates for SA1 were within the range of 10^{-5} m/s. The results of soakaway testing correspond to good drainage conditions², typical of mixtures of sand, silt and gravel.

The results should be provided to a specialist drainage engineer who can determine the suitability of soakaways on the site and advise on the design.

Yours sincerely
for: Smith Grant LLP

A handwritten signature in black ink, appearing to read "D. Wayland", is written over a horizontal line.

D Wayland BSc MSc AssocCIWM MCIWEM C.WEM
Partner

Enc: Soakaway test results (SA1 Infiltration calculations)
Drawing D01 Soakaway test locations (813/L(52)01)
SA1 Log

² BS 8004:2015 Code of practice for foundations

Site: Towers Day Nursery, Acrefair

Trial Pit	SA1
------------------	------------

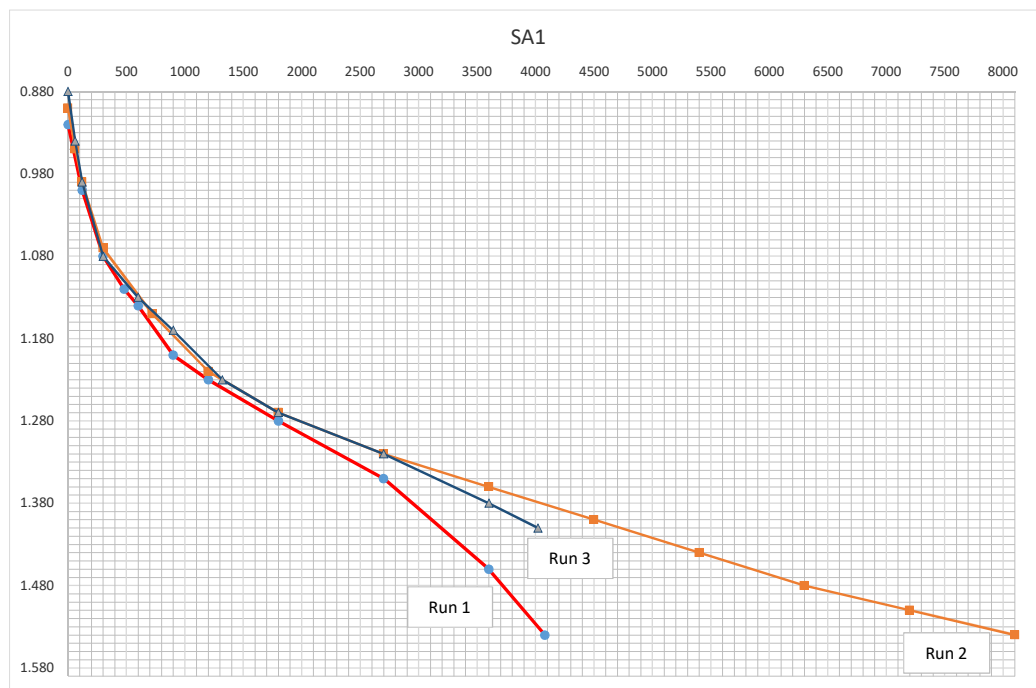
Trial Pit dimensions (m)				effective depth (ed)	Run 1 0.590 m	Run 2 0.590	Run 3 0.590
	Run 1	Run 2	Run 3				
Length	1.500	1.500	1.500				
Width	1.000	1.000	1.000				
Depth	1.590	1.590	1.590				
Trial pit fill	None	None	None				
Initial water volume (m ³)	1.005	1.035	1.065				

Drainage times	
Run 1	
elapsed time (s)	depth to water (m)
0	0.920
120	1.000
300	1.080
480	1.120
600	1.140
900	1.200
1200	1.230
1800	1.280
2700	1.350
3600	1.460
4080	1.540

Run 2	
elapsed time (s)	depth to water (m)
0	0.900
60	0.950
120	0.990
300	1.070
720	1.150
1200	1.220
1800	1.270
2700	1.320
3600	1.360
4500	1.400
5400	1.440
6300	1.480
7200	1.510
8100	1.540

Run 3	
elapsed time (s)	depth to water (m)
0	0.880
60	0.940
120	0.990
300	1.080
600	1.130
900	1.170
1320	1.230
1800	1.270
2700	1.320
3600	1.380
4020	1.410

Calculations			
	Run 1	Run 2	Run 3
(m) level at start (0%)	0.920	0.900	0.880
(m) level at end (100%)	1.540	1.540	1.410
(m) 25% level	1.075	1.06	1.0125
(m) 75% level	1.385	1.38	1.2775
(m) level change (75-25%)	0.31	0.32	0.265
(m ³) volume drained (75-25%)	0.465	0.48	0.3975
(m ²) surface area drained (75-25%)	3.3	3.35	3.725
(s) time at 25% level	288.75	277.5	165
(s) time at 75% level	2986.36	4050	1935
soil infiltration rate (75-25% actual), $f =$	5.22E-05	3.80E-05	6.03E-05

ms⁻¹

This drawing is the property of CB ARCHITECTURAL DESIGN. Copyright is reserved by them and the drawing issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person either wholly or in part without the written consent of CB ARCHITECTURAL DESIGN.

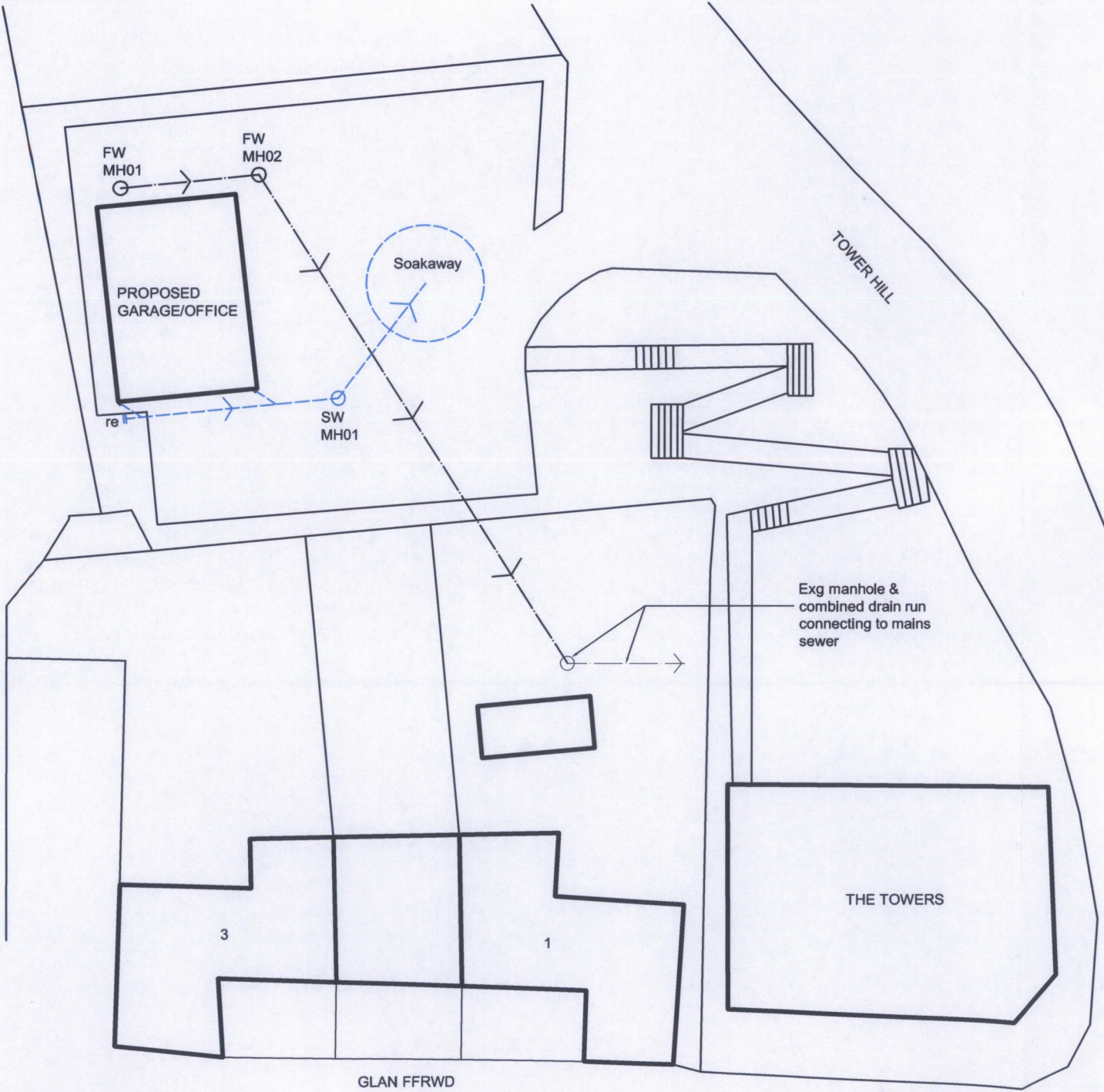
- 1. All dimensions to be verified on site prior to any shop works being commenced.
- 2. Any discrepancies to be reported to the Designer before any work is put in hand.
- 3. Do not scale from this drawing.
- 4. This drawing is to be read in conjunction with relevant consultants and specialists drawings.
- 5. This is a metric drawing.
- 6. Dimensions indicated thus "****" are site dimensions and are to be adjusted onsite by the Contractor accordingly.

WARRINGTON COUNTY COUNCIL
26 FEB 2019
PLANNING DEPARTMENT

P2019/0151

SANITARY/DRAINAGE NOTES:

Above slab level sanitary drainage designed and installed to meet the requirements of BS5572: 1978 using upvc pipework.
Wastes to discharge into new vertical stack through boss pipes and branches, basin waste 32mm diameter fitted with 75mm bottle trap and WC connecting with 100mm multi-kwik adapters. Soil pipes to be fitted with access saddle for rodding purposes. All wastes and pipes to be adequately supported at maximum vertical centres of 2.0m and 1.0m horizontally.
Wastes from w.h.b.'s to be fitted with anti-vac traps.
Positions shown on plans are indicative only and all depths locations etc are to be determined on site and any discrepancy to be reported to the designer immediately.
Any drainage running under the building, where the crown of the pipe is within 300mm of the underside of the slab, concrete encasement should be integral with the slab.
Any drainage running under the building to be encased in min. 150mm concrete surround.
All drainage to accord with BSEN 295.
Drainage running through the footings are to be protected by a re-inforced pre-cast conc. lintel over, providing 50mm space all around the pipe.
Mask opening both sides of the opening with a rigid sheet material to prevent entry of fill or vermin.
IMPORTANT: Fill any voids with compressible sealant to prevent entry of gas.
All external drainage to be proprietary pipework as detailed on drawings.
All pipe runs, inspection chambers and manholes to be bedded and surrounded in strict accordance with the manufacturer's recommendations.
Generally, 150mm dia PVC pipework to BS 4660:1989 with flexible joints laid to minimum 1:40 fall for foul and 1:80 for surface and bedded on 50mm layer of 10mm granular material. PPIC's (100's and 150's) to BS 7158:1989 up to max 930mm deep and encased in 150mm concrete to manufacturers recommendations.
Any drainage trench within 1m of the foundation shall be filled with concrete at least to the level of the underside of the foundation.
All lengths to be tested as works proceed and with the approval of the Building Control Officer.
All surface water drainage from new rwg's to connect to soakaway min. 5m from the building.
Soakaway to be in accordance with BRE Digest 365 and sized appropriately.
Contractor to allow for permeability test.
NOTE: FW drainage to run under SW system in all cases.



T: 07833 029535
E: info@cbarchitecturaldesign.co.uk
W: www.cbarchitecturaldesign.co.uk

Architectural Design

Rev.	Date	Description	Initialed	Checked
Client	MRS RUTH ROBERTS			
Drawn	Drainage AS PROPOSED			
Scale	1:250	Drawn CB	Chkd, CB	Date 24/02/19
Project	The Towers Nursery, Trevor Wrexham LL14 3SG			
Drawn No.	813/L(52)01			
Revision				

SHEET: 1 of 1	LOCATION: Acrefair	PROJECT: Towers Day Nursery	ENGINEER: SM	JOB NO. R2744	TRIAL PIT NO. SA1
		EXCAVATED BY: JCB 180 Sitemaster	CLIENT: Ruth Roberts	DATE: 17/06/2019	
DEPTH (m)	SAMPLES/ TESTING	FIELD RECORDS	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Geotextile present between interface of natural soils and placed gravel at 0.15m bgl	0.00	MADE GROUND: Fine to coarse gravel of limestone fill	
			0.15	Soft to firm light brown sandy gravelly CLAY with frequent cobbles and boulders of sandstone.	
			1.00		
			1.59	Terminated on encountering sandstone bedrock at 1.59m bgl	
			2.00		
			3.00		
			4.00		
			5.00		
 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk		GROUND WATER: Not encountered			
		REMARKS:			
		SCALE: 1:250	LOGGED BY: SM	FIGURE NO. 1	