

Mr Bernard Brown
10 Western Parade
Emsworth
Hampshire
PO10 7HS

21st July 2020

Dear Bernard

Re: 10 Western Parade – Infiltration Test Results

Many thanks for the records from the infiltration tests you undertook at your property between 17th and 21st July 2020 and as discussed I am pleased to detail below the information and results of the infiltrate rate calculations.

Summary of Site Works

As shown on the attached annotated James Potter Associates site plan two soakaway tests were undertaken with one in the rear garden (SA1) and the other to the front of the existing property (SA2). Unfortunately, due to access restrictions the pit in the rear garden (SA1) had to be excavated by hand although SA2 in the front garden was dug using a 3tonne tracked excavator.

As can be seen from the attached photographs both pits revealed beneath a layer of topsoil natural soils comprising a light brown clayey slightly gravelly sand to their full depth. Neither of the pits encountered groundwater at the time of digging although as can be seen from the table below due to the slow infiltration of the added water the repeat tests in both pits were undertaken with standing water from the first tests still in them.

Test ref	Pit length	Pit width	Pit depth	Depth to standing water
SA1 - rear	1.5m	0.65m	1.2m	Dry for first test 0.83m for repeat test
SA2 - front	Av. 1.79m	0.80m	1.5m	Dry for first test 0.79m for repeat test

Infiltration Results

The pits were filled with water and allowed to drain for a period of 24 hours with the water level being measured at regular intervals after which they were refilled and the test repeated. Unfortunately, as can be seen from the attached calculation sheets and the summary table, overleaf, the infiltration rates, which where possible were calculated in accordance BRE Digest 365 Soakaway design 1991, were slow.

Test Pit	First test			Repeat test			Comments
	Total Level drop (m)	Time (hrs)	Infiltration rate (m/s)	Total Level drop (m)	Time (hrs)	Infiltration rate(m/s)	
SA1 - rear	0.700	24	1.37×10^{-6}	0.655	24	2.63×10^{-6}	During the first test the level did not drop by 75% but it was >50% therefore the infiltration was calculated by extrapolating the time. For the repeat test the water level at the start was 0.83m hence the calculation of the infiltration rate used a smaller effective storage area
SA2 - front	0.528	24	n/a	0.439	24	2.74×10^{-6}	Repeat test started with the water level at 0.79m hence the calculation of the infiltration rate used a smaller effective storage area

Attached are the graphs used for the calculation of the above results based upon the actual or estimated times, where applicable, for the water level to drop between 75% and 25% of the available storage depth.

Conclusion

Generally, an infiltration rate of 1×10^{-6} m/s is the minimum to permit the use of soakaways, although for very small catchments lower rates could be used. Therefore, based upon the infiltration rates for SA1 in the rear garden of 1.37×10^{-6} and 2.63×10^{-6} , although the latter was for only draining the upper half of the pit due to the level of standing water, the soils have the potential to permit soakaway drainage.

With regard to SA2 in the front garden although an infiltration rate was calculated for the repeat test, as with the repeat in SA1 this was because the pit was half full with water at the start, which effectively enabled the required 75% level drop to be recorded. Although, based upon the actual volume of water that drained into the surrounding soils during the second test this was less than was achieved during the first round.

Also, the pit was left open over the weekend and after 63½ hours the water level had only dropped by a total of 0.657m, which equates to just over 50% of the original volume of water added. Therefore, it is considered these soils would not be suitable for siting a soakaway in.

An additional consideration, which could be influencing the infiltration rates, is that due to the proximity of the site to the shoreline the groundwater level could be in hydraulic conductivity with the tides, which have a range of around 3.5m based upon the tide tables for Emsworth Yacht Club.

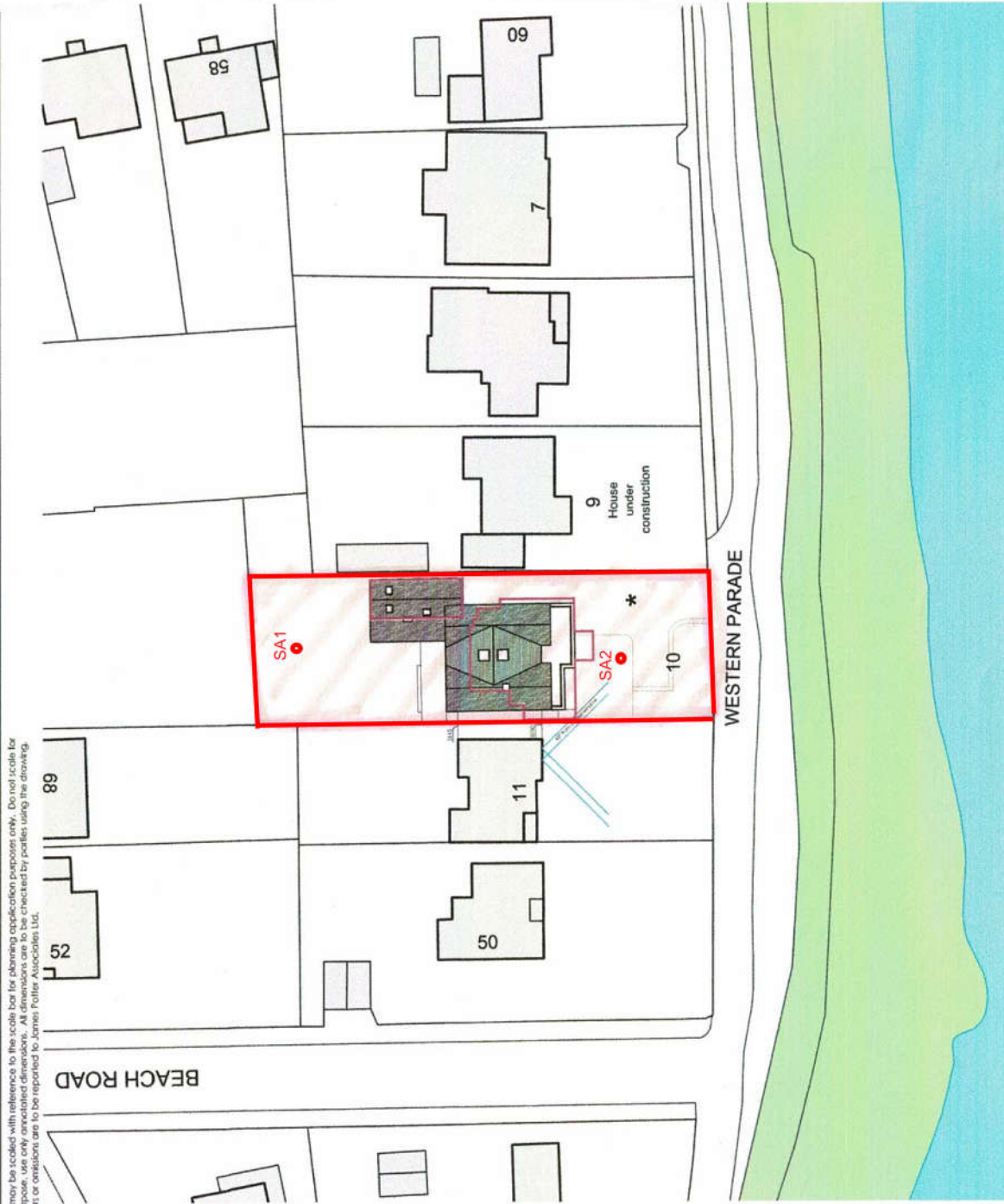
I hope the above and attached are sufficiently detailed but if you have any comments or would like to discuss the findings further then please do not hesitate to contact me

Yours sincerely

A handwritten signature in blue ink, appearing to read "Richard Blaney", written over a horizontal line.

Richard Blaney
for Forge Environmental Management Ltd

This drawing may be scaled with reference to the scale bar for planning application purposes only. Do not scale for any other purpose. Use only annotated dimensions. All dimensions are to be checked by parties using the drawing, and any errors or omissions are to be reported to James Potter Associates Ltd.



KEY

Existing house and garage

* Indicative landscaping

BLOCK PLAN
SCALE 1:500



Project	REPLACEMENT DWELLING AT 10 WESTERN PARADE EMS WORTH PO10 7HS	Drawing Job-Dwg Number	BLOCK AND LOCATION PLAN	
			18065-PL-301	Rev -
Client	MR & MRS BROWN	 JAMES POTTER ASSOCIATES www.jpa.design JPA - PORTSMOUTH 117 Highland Road, Portsmouth, PO4 10D T: +44(0)2394 002 897		
Station	PLANNING			
Scale	1:500/1:1250			
Author	RH	Checked	JP	Date
				11/02/20



PLATE 1 – Soakaway SA1 – 1.5m long x 0.65m wide by 1.2m deep – hand dug in the rear garden



PLATE 2 – Soakaway SA2 – av. 1.85m long x 0.8m wide by 1.5m deep located in the front garden. As the length sloped from 2.2m at the top to 1.5m at the base although the average is 1.85m the average length at the water level is 1.79m



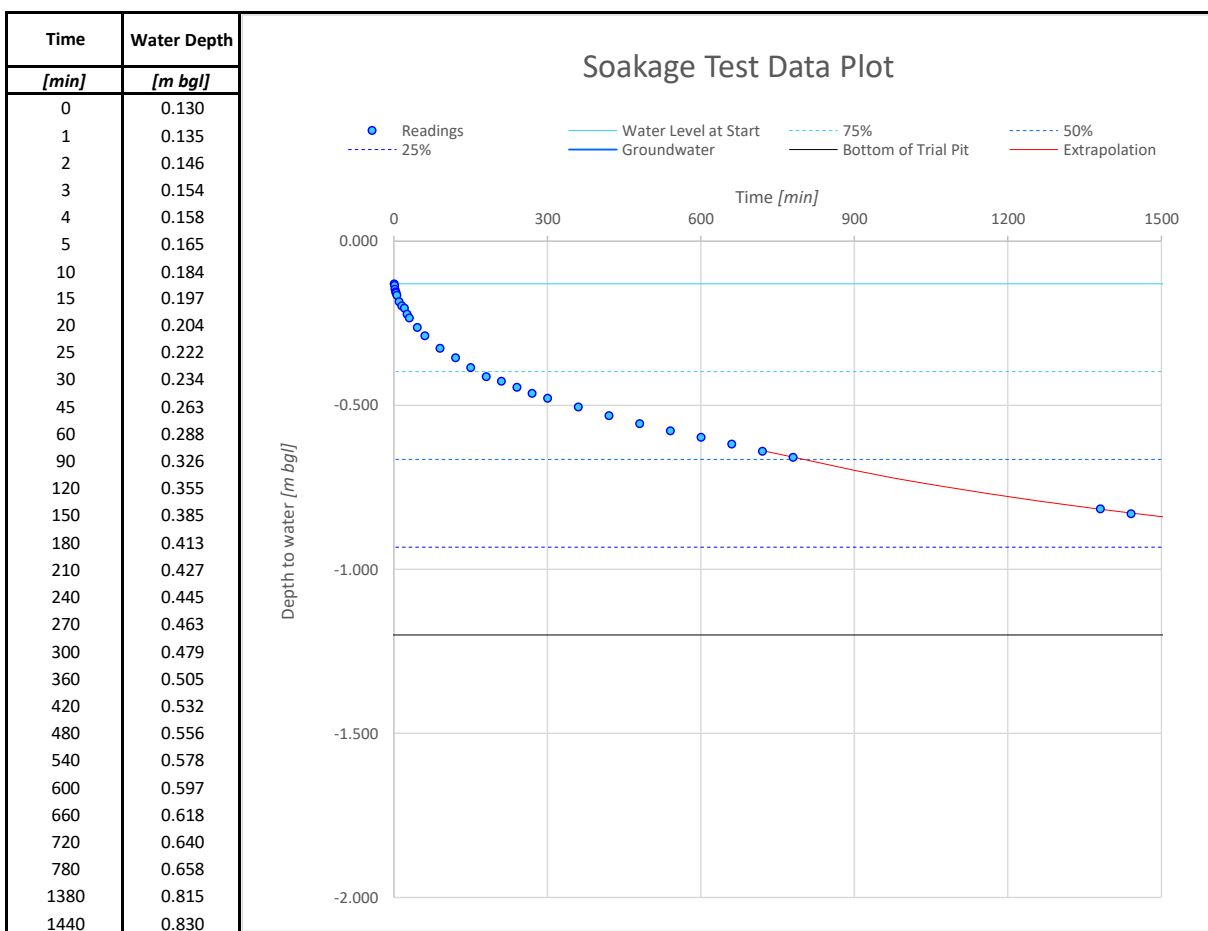
SOIL INFILTRATION RATE

Client: Mr Bernard Brown
Project Title: 10 Western Parade
Project No: WES207.D

Borehole No: SA1 - rear garden
Test No: 1
Date: 19th July 2020
Logged by: BB

Length [m]: 1.50
Depth [m]: 1.20
Width [m]: 0.65
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]	Description
			topsoil
			clay slightly gravelly sand



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.52**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **3.28**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **1.2.E+05**

Soil Infiltration Rate [m/s]: 1.37E-06

Remarks: Calculation of soil infiltration rate based on extrapolated results.



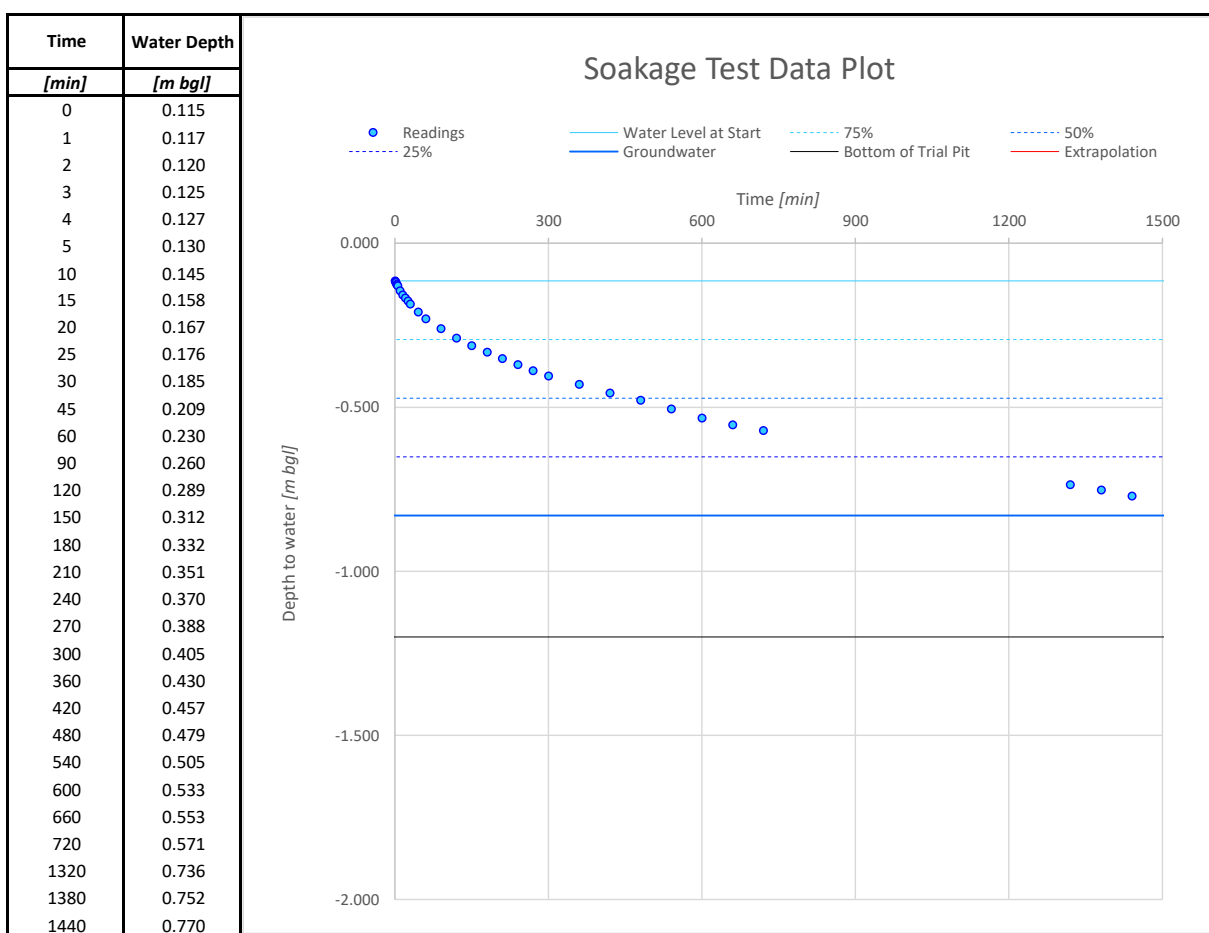
SOIL INFILTRATION RATE

Client: Mr Bernard Brown
Project Title: 10 Western Parade
Project No: WES207.D

Borehole No: SA1 - rear garden
Test No: 2
Date: 20th July 2020
Logged by: BB

Length [m]: 1.50
Depth [m]: 1.20
Width [m]: 0.65
Groundwater [m bgl]: 0.83

Ground	Conditions	from - to [m bgl]	Description
			topsoil
			clay slightly gravelly sand



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.35**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.51**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **5.3.E+04**

Soil Infiltration Rate [m/s]: 2.63E-06

Remarks: Infiltration rate manually calculated based upon the the reduced effective storage area due to the pit still being just under half full from test 1.



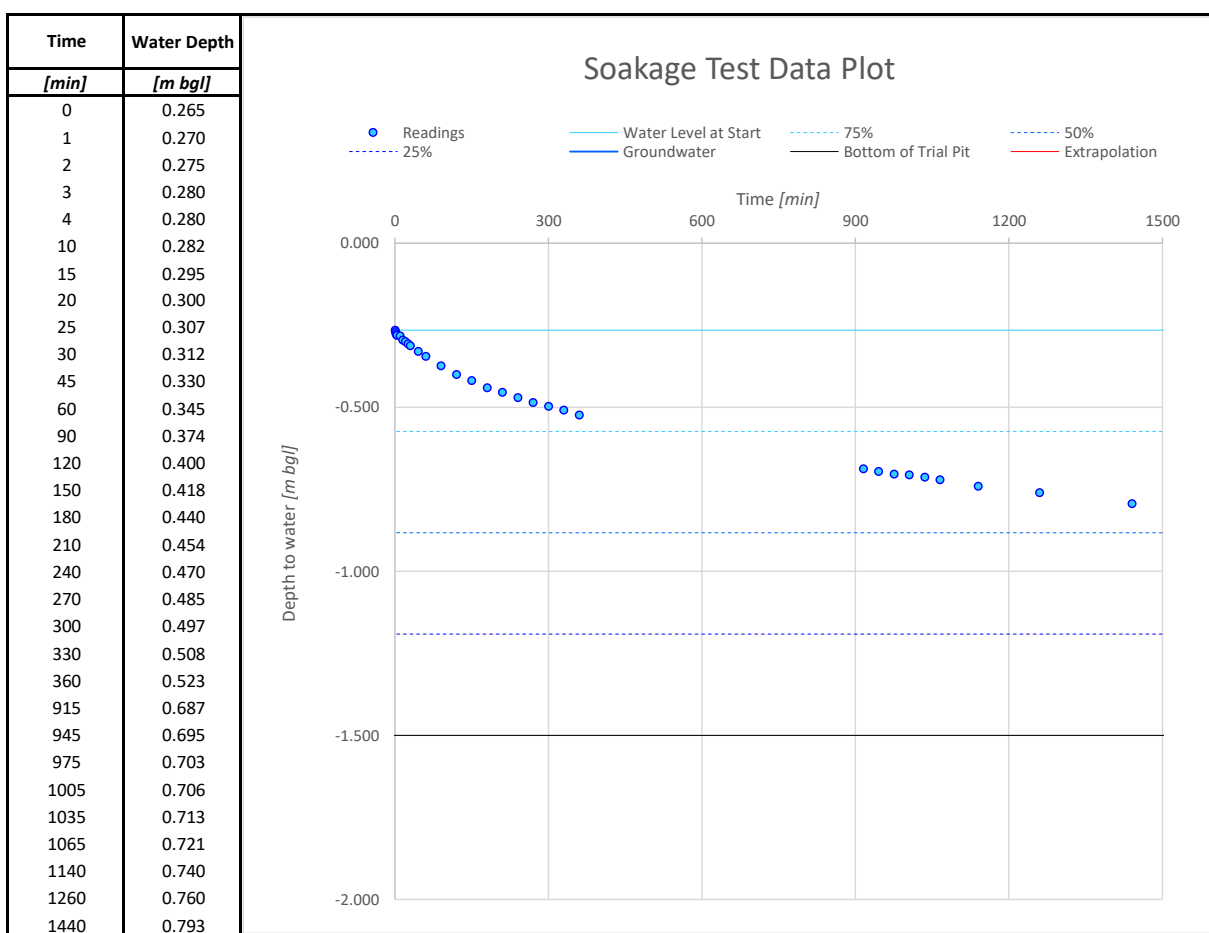
SOIL INFILTRATION RATE

Client: Mr Bernard Brown
Project Title: 10 Western Parade
Project No: WES207.D

Borehole No: SA2 - front garden
Test No: 1
Date: 17th July 2020
Logged by: RB

Average Length [m]: 1.79
Depth [m]: 1.50
Width [m]: 0.80
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]	Description
			topsoil
			clay slightly gravelly sand



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.88**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **4.63**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **n/a**

Soil Infiltration Rate [m/s]: **n/a**

Remarks: Results could not be calculated in accordance with BRE365 as the water level didn't reach 50% within 24 hours.
Soakage test failed



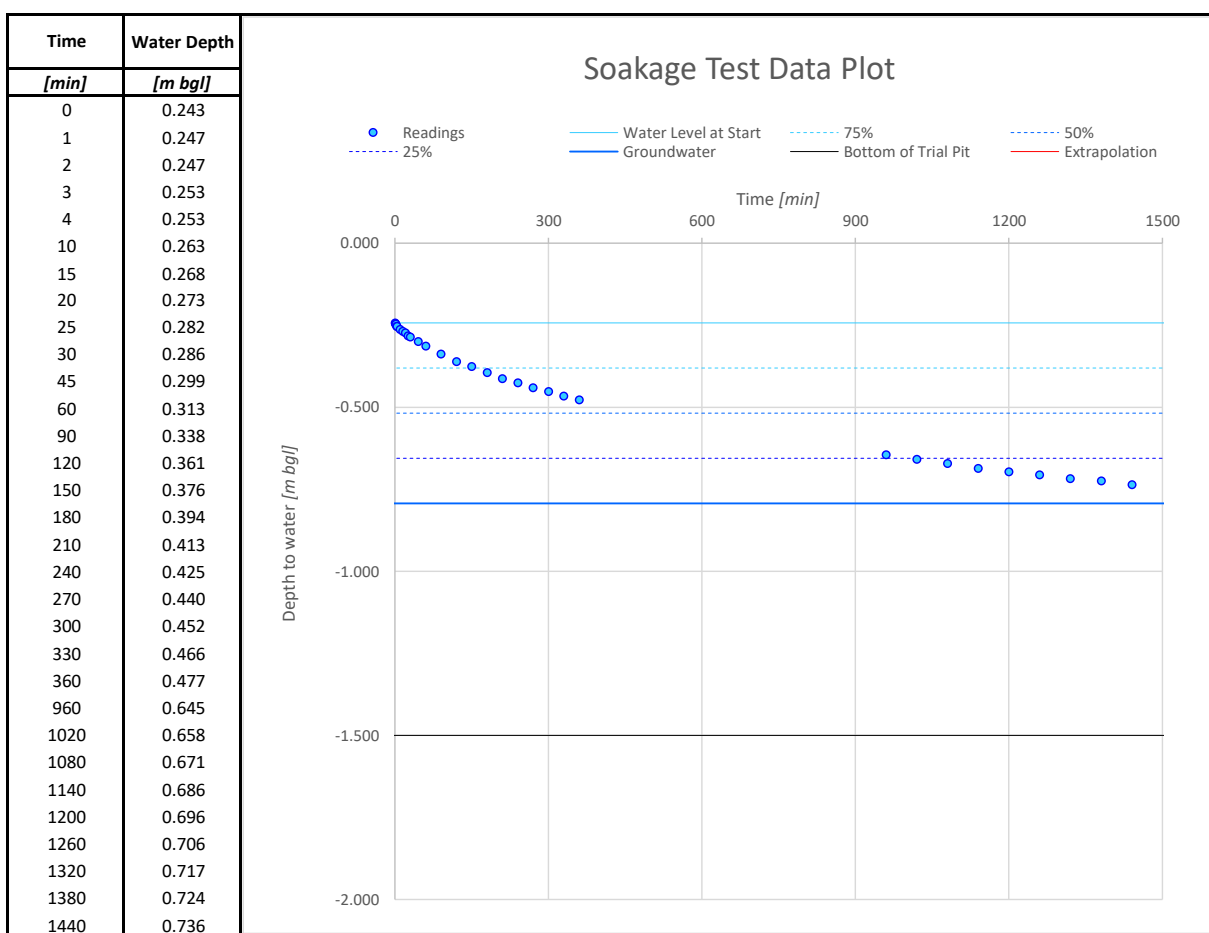
SOIL INFILTRATION RATE

Client: Mr Bernard Brown
Project Title: 10 Western Parade
Project No: WES207.D

Borehole No: SA2 - front garden
Test No: 2
Date: 18th July 2020
Logged by: BB

Average Length [m]: 1.79
Depth [m]: 1.50
Width [m]: 0.80
Groundwater [m bgl]: 0.79

Ground	Conditions	from - to [m bgl]	Description
			topsoil
			clay slightly gravelly sand



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.39**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.86**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **5.0.E+04**

Soil Infiltration Rate [m/s]: 2.74E-06

Remarks: Infiltration rate manually calculated based upon the the reduced effective storage area due to the pit still being half full from test 1.