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CWM AFAN
AFAN VALLEY

Condition 27
Proposed Drainage
Strategy

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NATURE'S ADVENTURE

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1.0 INTRODUCTION

- 1.1 This drainage strategy has been prepared in accordance with the Flood Consequence Assessment and Drainage Strategy (reference 16255/FCA&DS/revA dated 20/2/2018) forming Appendix 15.1 of the Environmental Statement approved under the outline planning consent (Ref: P2018/0493).
- 1.2 The report forms the scheme for the design of the site wide drainage to be submitted for the discharge of Condition 27 of the planning consent.

Condition 27

As part of the first reserved matters for each phase (or sub-phase) of development identified within condition 7 a scheme shall be submitted to and approved in writing by the Local Planning Authority for the design of the site drainage, watercourse diversion and attenuation ponds to reinstate, create and enhance, where possible, the biodiversity interest of such features.

Reason: *To maintain, re-create and improve water habitats in accordance with Policy EN7 of the Neath Port Talbot Local Development Plan.*

- 1.3 The drainage strategy has been developed in accordance with the requirements of the Planning Policy Wales Technical Advice Note 15: Development and Flood Risk.
- 1.4 All proposed drainage systems are designed to accommodate the 1 in 100 year storm event, plus a 30% climate change allowance, without flooding, in accordance with the Flood Consequence Assessment.
- 1.5 SuDS drainage techniques have been proposed where practicable to manage water at source in accordance with the guidance in the SuDS Manual CIRIA 753.

EXISTING DRAINAGE ARRANGEMENTS

- 1.6 A desktop review shows that there are no recorded streams or watercourses on the eastern part of the site and there are no highway ditches along the A4063 Maesteg Road which borders the south-eastern part of the site.
- 1.7 In the centre of the site there are small defined flow routes / streams which flow north and discharge off the site next to the Cymmer Welfare Bowling Club where, based on the previously approved Flood Consequence Assessment, there is a 375mm diameter culvert beneath the A4107. On one of these streams there is evidence of a flow control structure to 'train' the flow at a crossing point of an existing track.
- 1.8 On the north-western and western parts of the site there are also two further streams discharging to the west and across the A4107 into the River Afan.
- 1.9 From a walkover of the site there is very little discernible visible evidence of any ditches or streams in the northeast part of the site along what would appear to be the flow path routes based on the topography.
- 1.10 It is readily apparent that there is generally a limited depth of topsoil across the site with highly fractured sandstone outcropping regularly. Loose blocks are also strewn throughout the site. Evidence of the historic mine workings are visible in the form of fissures and adits. In these areas the ground is understandably loose and the fractured limestone readily visible.

- 1.11 These ground conditions result in a permeable site with little run-off likely to occur, particularly on the eastern side of site. Consequently, there are limited discharge opportunities to watercourses / streams, or open water bodies, and there are no existing surface water sewers present.
- 1.12 Infiltration testing has been undertaken across the development areas of the site and the results are depicted on drawing AV-STN-DG-XX-DR-D-0002 and within the soakaway testing logs contained within **Appendix A**.

PROPOSED SURFACE WATER STRATEGY

- 1.13 The proposed surface water drainage strategy will seek to mimic the existing flow regime and discharge the majority of the site to ground, using infiltration basins, soakaways, swales and permeable surfaces, to manage water at source and avoid large, concentrated point discharges.
- 1.14 For design purposes the lowest two measured infiltration rates have been used within the east and western areas, respectively. The infiltration rates are depicted on drawing AV-STN-DG-XX-DR-D-0002 contained within **Appendix A**.
- 1.15 The Central Plaza comprises the hotel, the main activity buildings and external entertainment areas, consequently there will be a greater level of density and impermeability. In this area an infiltration led solution is not considered appropriate due to geology, mine workings and spatial constraints. However, the opportunity exists to utilise more traditional attenuation features with discharge at the mean annual flood rate (Q_{bar}) into the existing flow route / streams.
- 1.16 The site wide surface water drainage strategy is illustrated on drawing AV-STN-DG-XX-DR-D-0005 contained within **Appendix B**.
- 1.17 A pre-application submission has been made to the SuDS Approval Body (SAB) and the proposed strategy has been discussed submitted for comment. The consultations will be ongoing as the design detail develops and ownership and maintenance information becomes available.

WATER HABITATS

- 1.18 As required by Condition 27 of the Outline Consent, the surface water drainage design includes retained exiting watercourses, proposed attenuation basins and swale features which have been designed to increase the biodiversity value where possible, through planting with native aquatic and marginal species. Further details on the proposed biodiversity measures and the proposals for their long-term management are included within the Strategic Ecology Landscape Management Plan (SELMP) and associated landscape drawings (Report ref: Stantec 2022 Wildfox- Afan Valley- SELMP 332310683/02) which should be read in conjunction with this Drainage Strategy Report and are included with this submission.
- 1.19 Implementation of the proposed drainage strategy will create the following new water habitats across the site:
- Shallow swales along the upslope side of the lodge roads. These will take excess surface run-off from the areas between the lodges, but will be nominally dry.
 - Two adjacent permanent water bodies (Retention Basins) in the central plaza area, which will be separated by a walkway. These will have marginally different permanent water levels, which will have a limited range of fluctuation during storm events.

- A connected series of nominally dry detention basins below the Rock & Wild building. These will provide the final attenuation of run-off from the central plaza area prior to the discharge into the existing stream. The water level fluctuations in these basins could be up to 1.2m in extreme events.
- Small detention basins will also be provided adjacent to the Mountain building, the Summit hub, and the Arrival building. The water level fluctuations in these basins will be approx. 800mm in extreme events.

2.0 HYDRAULIC DESIGN ELEMENTS

GUEST LODGE AREAS

- 2.1 Across the majority of the site the topography makes the provision of primary infiltration basins challenging and multiple smaller basins would reduce the developable area within the lodge zones. Therefore, to reduce the volume of run-off collected within the lodge areas, the access roads are proposed to be permeable.
- 2.2 To further manage surface water as efficiently as practicable it is proposed to oversize the granular sub-base of the permeable paving to also accept the roof run-off from the lodges. Thereby creating a series of linear infiltration systems throughout the lodge areas. Each permeable lodge road will drain the road surface itself and the upslope lodges, however, to be effective the pavement sub-base cannot be continuous and needs to be sectionalised, using 'dams' to hold back water prior to infiltration. Consequently, a standard cross-section for the road has been developed, which includes a shallow swale and underdrain incorporated within the pavement base. Refer to drawing AV-STN-DG-XX-DR-D-0003 contained within **Appendix C**. This will be applied in sections of varying length depending upon the road gradient. Should the capacity of any section be exceeded in an extreme event, flows would cascade into the adjacent section of road through the permeable surface.
- 2.3 The impermeability of the lodge areas is dependent on the layout configuration and lodge types applied. There are small pockets with a higher density particularly where terrace lodges are proposed, however, the majority of lodge areas have a lower impermeable area where there are detached lodges. In determining the contributing impermeable area per metre length of road we have assessed the high and average density areas for a standard length of road. Refer to drawing AV-STN-DG-XX-DR-D-0004 contained within **Appendix D**. This plan shows that in the higher density locations the contributing area per 50m length of road is an average of 600m², whereas for the majority of the site, the impermeable area is 450m² or less. Therefore, an average contributing impermeable area from the lodge roof areas of 500m² per 50m length of road has conservatively been used in the permeable road design, in addition to the road surface itself.
- 2.4 The length of each section of permeable pavement, and hence the spacing of the sub-base dams to hold back water, is dependent upon the gradient of the carriageway. The steeper the gradient the shorter the section needs to be to ensure effective use of the granular sub-base storage. The length of the pavement sections has been calculated based on providing a constant depth of granular sub-base with a maximum longitudinal formation gradient of 1 in 50. Where the longitudinal carriageway gradient is less than 1 in 50 the formation gradient can also be relaxed to match the carriageway.
- 2.5 The depth of the granular sub-base storage varies between the eastern and western site areas based on the different infiltration rates applied in these areas.

Site Area	Depth of Sub-Base	Sub-Base Dam Spacing		
		Road Gradient 1 in 12	Road Gradient 1 in 20	Road Gradient 1 in 50
Eastern	1.00m	10m	15m	20m
Western	0.80m	10m	15m	22m

Table 1 - Permeable Paving section length

- 2.6 The modular sections of lodge roads have been modelled in MicroDrainage as permeable pavements using source control. Each section of road is taken as having a carriageway level of 100m AOD at the low end, the porous bituminous pavement layers are 220mm deep and so the overflow weir between sections is set at 99.780m AOD. The sub-base storage is capped at either 1m or 800mm depth for the eastern and western areas, respectively. The associated calculation outputs are contained with Appendix E.

MAIN SITE SPINE ROAD

- 2.7 The main spine road through the centre of the site will also primarily be a permeable surface similar to the lodge access roads, but it will not accommodate additional run-off from roofs or other surfaces. Consequently, the depth of the sub-base storage required will be reduced down to 500mm.
- 2.8 To manage the effects of the longitudinal road gradient the pavement will also be sectionalised with sub-base dams in the same frequency as the lodge roads.
- 2.9 The spine road from the western access off the A4107 to the Arrivals Lodge will be drained in a traditional manor with run-off draining into a series of ditches and / or infiltration trenches on either side of the road. This is due to the longitudinal road gradient on this section of road being continually too steep to effectively manage with a permeable pavement.
- 2.10 The two existing streams on the western side of the site are crossed by the spine road alignment with new pre-cast concrete pipe culvert crossings. The proposed ditches discharge into the streams via connections into the new culverts.
- 2.11 The sub-catchment plan (Drg ref:AV-STN-HDG-SR-DR-CD-0511) and the drainage infrastructure layout (Drg ref: AV-STN-HDG-SR-DR-CD-0512) for the western spine road are contained within **Appendix F**.
- 2.12 The western site access junction itself is drained by a series of new gullies and a highway drain network which connects into the existing stream outfall to the River Afan (Drg ref: AV-STN-HDG-WA-DR-CD-0501).

CENTRAL PLAZA

- 2.13 The Central Plaza area is the densest part of the site with the main activity buildings and largest external public realm area, consequently this part of the site will generate the largest rain-fall runoff. To manage the run-off in this area two water features and a nominally dry detention basin will provide water storage.
- 2.14 The central plaza is situated upstream of an existing stream that flows to the north and into to the River Afan. Therefore, to remove the risk of large infiltration point discharges destabilising the ground, it is proposed the basins discharge into the stream at the restricted rate of the mean annual flood rate (QBar), rather than act as infiltration systems.

- 2.15 The QBar rate for the site is 10.14 litres / second / hectare. The total drainage area of the central plaza area is 3.797 ha, therefore the allowable discharge into the stream is 38.50 l/s.
- 2.16 The water features and basin will be linked together in a cascading format, with flow controls to provide the storage required. Each basin will drain the run-off from its respective building roof area plus the associated external hard paved areas. For details, refer to Drawing AV-STN-DG-XX-DR-D-0006 contained in **Appendix G** and **Figure 1** below.

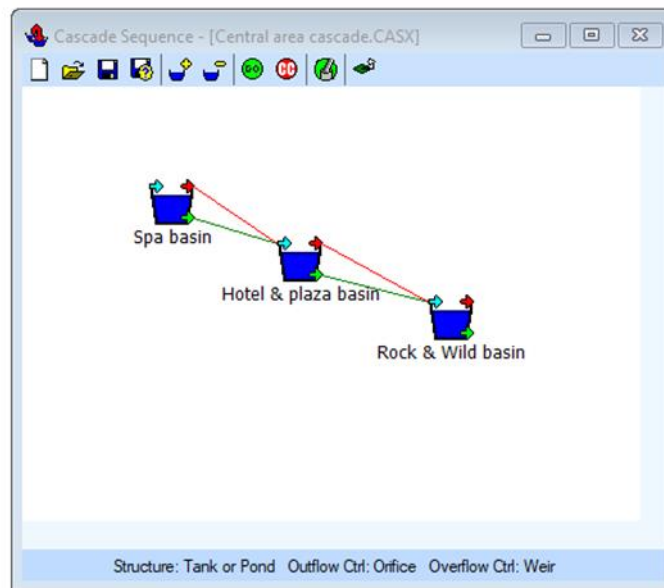


Figure 1 – Water features cascade

- 2.17 The Spa water feature is the upstream basin and is designed to have an almost constant water level with very little fluctuation (approx. 100mm) even in a 100 year design event. The Spa Basin is separated from the Hotel & Plaza basin by a walkway which will contain a flow control feature allowing the Spa basin to discharge into the lower Hotel & Plaza basin.
- 2.18 The Hotel & Plaza basin is the largest waterbody and is designed to allow water level fluctuations of less than 450mm, with its controlled outflow discharging down into the retention basin to the north of the Rock & Wild centre.
- 2.19 The basin to the north of the Rock & Wild centre is split into two sections and will only retain water during a rainfall event. This is the final attenuation feature in the cascade where the largest depth of retained water will occur in a design event (up to 1.2m) prior to discharge at the QBar rate. The run-off from the Rock & Wild roof and external area will also pass through a small decorative water feature on the western perimeter of the building but this will not provide attenuation within the system.
- 2.20 The central plaza basins with their contributing areas have been modelled in MicroDrainage using source control and the cascade feature to link them. The basins have been conservatively modelled with vertical side slopes as the depth of attenuation is relatively shallow, but in reality, there will be a greater surface area of water at the maximum water level. The associated calculation output is contained within **Appendix H**.

SUMMIT HUB

- 2.21 The Summit Hub building has a roof area, terrace area and viewing areas totalling 640m², which will be drained to a small infiltration basin, with a surface area of 180m². The external paved areas associated with access are to be permeable surfaces.
- 2.22 The basin is proposed to be nominally dry and will only hold water in rainfall events prior to infiltration. The infiltration rate taken for the eastern lodge area has been conservatively used for the summit hub basin design and the resulting maximum depth of stored water for the 100 year design storm event plus climate change is less than 850mm. The MicroDrainage calculation output is contained within **Appendix I**.

MOUNTAIN HUB

- 2.23 The Mountain Hub building has a roof area, activity arrival deck area and external surface area totalling 2,612m², which will be drained to an infiltration basin with a surface area of 807m².
- 2.24 The basin is proposed to be nominally dry and will only hold water in rainfall events prior to infiltration. The infiltration rate taken for the eastern lodge area has also been used for the Mountain Hub basin design and the resulting maximum depth of stored water for the 100 year design storm event plus climate change is less than 800mm. The MicroDrainage calculation output is contained within **Appendix J**.

FOREST HUB

- 2.25 The Forest Hub is the downhill focus of the various trails, runs and zip wires, and comprises a small building containing a waiting area, toilet, staff area and a pickup point. There will be no positively drained external surfaces in this location and so the roof area of the forest hub will be drained into two linked traditional ring (1.2m diameter) soakaways. The MicroDrainage calculation output is contained within **Appendix K**.

ARRIVAL BUILDING

- 2.26 The Arrival building has a roof area of 387m², which will be drained to a small infiltration basin with a surface area of 112m².
- 2.27 The basin is proposed to be nominally dry and will only hold water in rainfall events prior to infiltration. The infiltration rate taken for the western lodge area has also been used for the Terrain Hub basin design and the resulting maximum depth of stored water for the 100 year design storm event plus climate change is less than 700mm. The MicroDrainage calculation output is contained within Appendix L.

STAFF BUILDING AND CAR PARK

- 2.28 The staff building and car park are located on the south eastern side of the site and are situated within the sub-catchment of an area identified as containing deposits of peat which is protected, and consequently the existing hydrological regime needs to be maintained. As such the car parking and circulation routes will be constructed as permeable surfaces which will allow direct infiltration to ground, maintaining the groundwater recharge.
- 2.29 The run-off from the staff building roof area will be collected in a local drainage network and

connected across the main access road into the adjacent section of the car park storage sub-base, with diffuser units, to similarly infiltrate into the ground. Consequently, the existing regime of rainfall within the sub-catchment directly discharging into the sub-catchment will be maintained and the recharge of the ground water and peat layers will be unchanged.

2.30

The use of a permeable pavement for the car park will protect against any potential contamination of the run-off through filtration, biodegradation of organic pollutants (inc. petrol and diesel), absorption of pollutants, and settlement and retention of solids (refer to the CIRIA SuDS Manual section 20.6).

2.31

The car park and access routes have an area of 5,566m² and the roof area of the staff building is 875m², giving a total drained surface area of 6,441m². This contributing area has been modelled into a receiving permeable pavement of 5,495m² with a 1m depth of granular sub-base.

2.32

The resulting maximum depth of stored water for the 100 year design storm event plus climate change is less than 900mm. Although, the car park has been modelled as a single permeable pavement with a sub-base gradient of 1 in 150, the finished surface level will have a gradient of approximately 1 in 50, therefore, the pavement will need to be sectionalised into at least three sections with sub-base dams to hold back the water prior to infiltration in a similar fashion to the access roads. The single permeable pavement MicroDrainage design calculation output is contained within **Appendix M**.

3.0 CONCLUSION

3.1

This strategy has been developed in accordance with relevant policy guidance and should be read in conjunction with the Flood Consequence Assessment and Drainage Strategy (reference 16255/FCA&DS/revA dated 20/2/2018) forming Appendix 15.1 of the Environmental Statement approved under the outline planning consent.

3.2

The proposed surface water drainage strategy mimics the existing site drainage regime by principally discharging rainfall runoff to ground via infiltration and maintains the flow in the central stream, through discharge of the central plaza runoff from the cascading basins.

3.3

In accordance with the Flood Consequence Assessment an allowance of 30% climate change has been added to the peak rainfall intensities in the 1 in 100 year design storm event for the lifetime of the development.

3.4

All proposed drainage system elements are designed to accommodate the 1 in 100 year storm event, plus a 30% climate change allowance, without flooding.

3.5

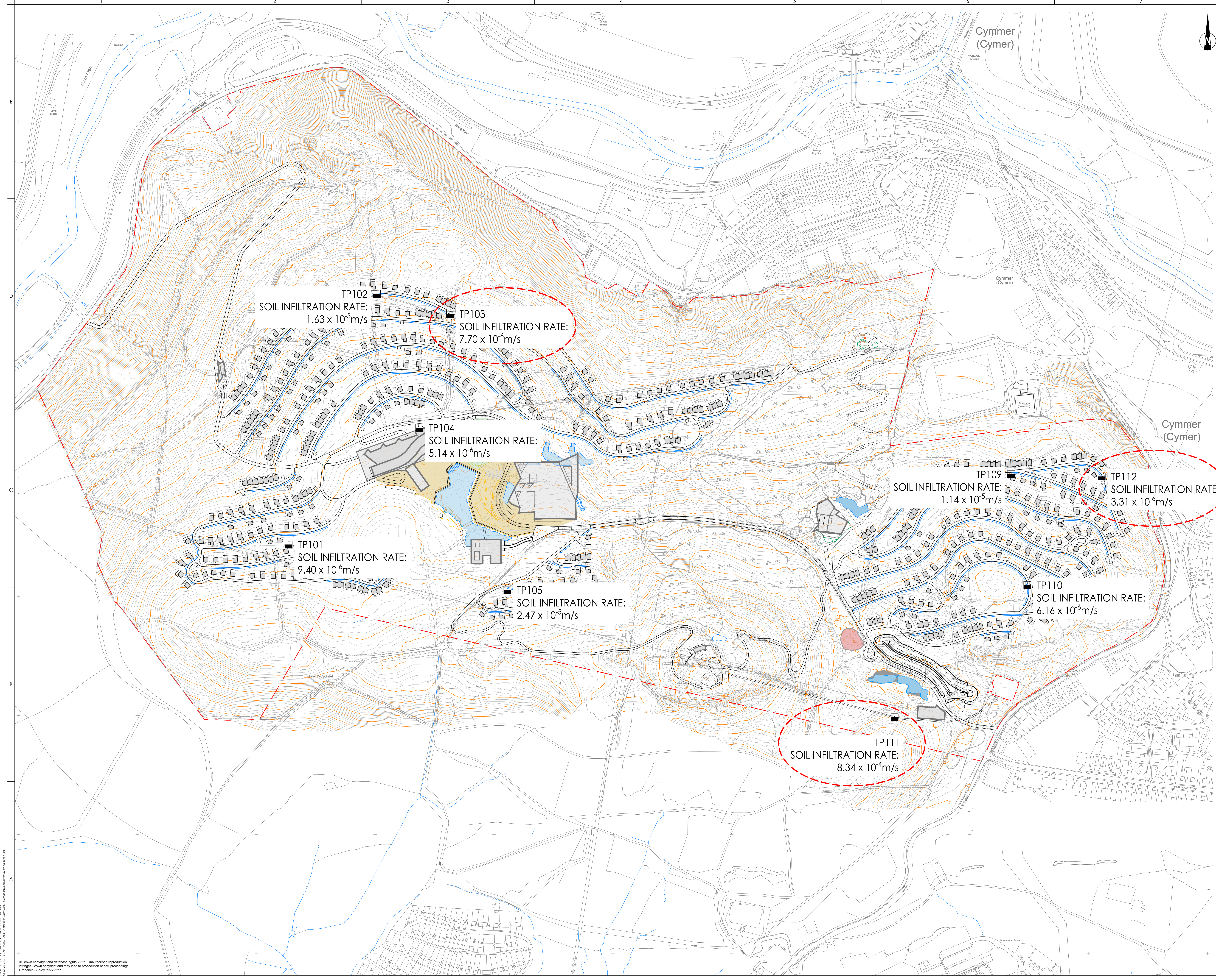
The proposed surface water drainage networks utilises near surface SuDS in form of detention basins and permeable pavements which provide water quality benefits through the biodegradation of hydrocarbons, the capture of nitrates and the removal of suspended debris.

3.6

As a result, the principles advocated by relevant planning policy guidance have been satisfactorily addressed.

APPENDIX A SITE WIDE INFILTRATION RATES

- Stantec Drawing AV-STN-DG-XX-DR-D-0002



- NOTES
- 1) DO NOT SCALE FROM THIS DRAWING
 - 2) MASTERPLAN LAYOUT BASED ON POWELL DOBSON
DRAWING 21055 (05) 104 - PROPOSED MASTERPLAN,
RECEIVED 24.08.2022
 - 3) INFILTRATION RATES TAKEN FROM RESULTS OF SOAKAWAY
TESTS CARRIED OUT JUNE/JULY 2022

- KEY
- SITE BOUNDARY (INDICATIVE ONLY)
 - SOAKAWAY TEST LOCATION
 - INFILTRATION RATES USED FOR DESIGN

ISSUE	AB	DTM	2022.08.25
Issued/Revision	By	Appd	YYYYMMDD
	AB	DTM	2022.08.25
	Dwn	Sign	CHG

Issue Status

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AFAN VALLEY

Title
SITE WIDE SOAKAWAY TEST
LOCATIONS AND INFILTRATION RATES

Project No.
332310683

Scale
NTS

Revision
P01

Drawing No.
AV-STN-DG-XX-DR-D-0002



SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID		Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP101		1	285063.50	195494.81		1.20	2.90	0.90
Test Data			Soakaway Construction		Vertical sides trimmed square. No fill material.			
Time Elapsed (mins)	Water Depth (m bgl)		Date of Test		05/07/2022	Weather		Overcast
0.5	0.43		Fill Porosity			Test Duration (mins)		390
1	0.44		Operative		SC	Checked by		
1.5	0.45							
2	0.46							
2.5	0.47							
3.5	0.49							
4	0.50							
5	0.51							
6	0.53							
7	0.55							
8	0.56							
9	0.57							
10	0.58							
20	0.69							
30	0.79							
40	0.83							
50	0.87							
60	0.88							
90	0.90							
120	0.91							
270	0.98							
345	0.99							
390	1.00							



SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP101	2	285063.50	195494.81		1.20	2.90	0.90	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.40							
1	0.41							
1.5	0.42							
2	0.43							
2.5	0.44							
3	0.44							
3.5	0.45							
4	0.46							
4.5	0.47							
5	0.48							
6	0.49							
7	0.49							
8	0.50							
9	0.51							
10	0.52							
20	0.60							
30	0.68							
150	0.89							
300	0.93							
435	0.95							
480	0.96							

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	06/07/2022	Weather	Overcast
Fill Porosity		Test Duration (mins)	480
Operative	SC	Checked by	

Water Depth Test Start (m)	0.37	Base base area (m²)	2.61
Water Depth Test End (m)	0.96	Pit sides area (m²)	3.48
75% effective depth (m)	0.58	Vp75-25 (m³)	1.08
50% effective depth (m)	0.79	ap50 (m²)	4.85
25% effective depth (m)	0.99		

Time water level reaches 75% effective depth (Tp75) (mins)	19
Time water level reaches 25% effective depth (Tp25) (mins)	

Soil Infiltration Rate (f) (m/s)	Unable to determine
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Remarks
 Undertaken in accordance with BRE digest 365 (2016)
 Test terminated as site closed.

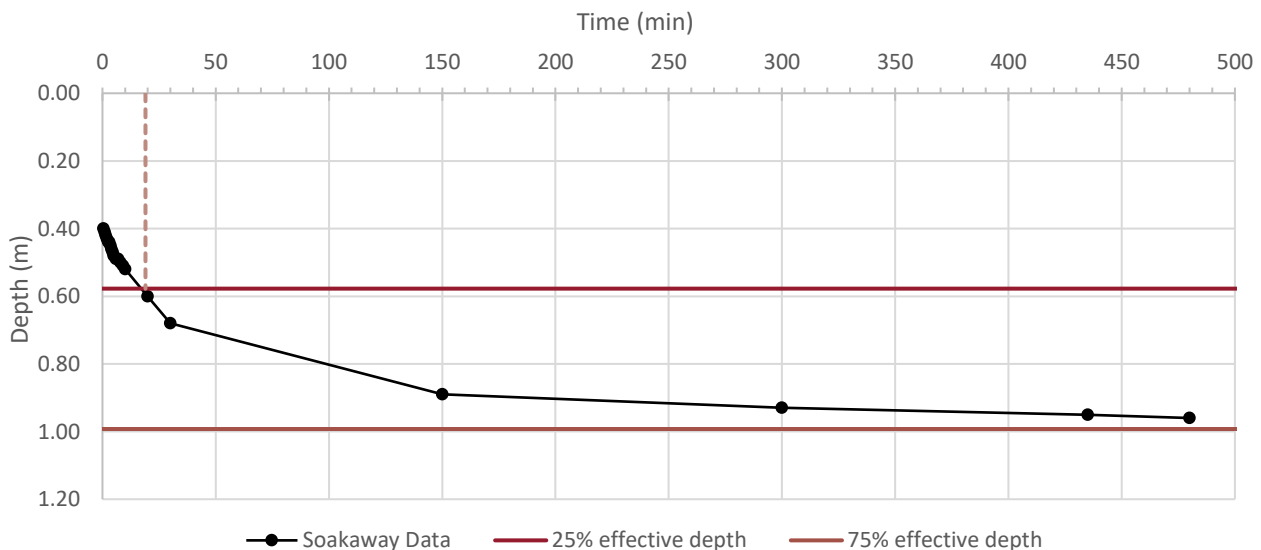




Figure 10 is a line graph showing the relationship between Depth (m) and Time (min) for the soakaway. The y-axis represents Depth (m) from 0.00 to 1.20, and the x-axis represents Time (min) from 0 to 450. The graph includes three data series: Soakaway Data (black line with dots), 25% effective depth (red line), and 75% effective depth (brown line). The Soakaway Data shows a rapid initial drop in depth, leveling off around 0.80 m after 200 minutes. The 25% effective depth is a constant red line at approximately 0.57 m, and the 75% effective depth is a constant brown line at approximately 1.00 m.

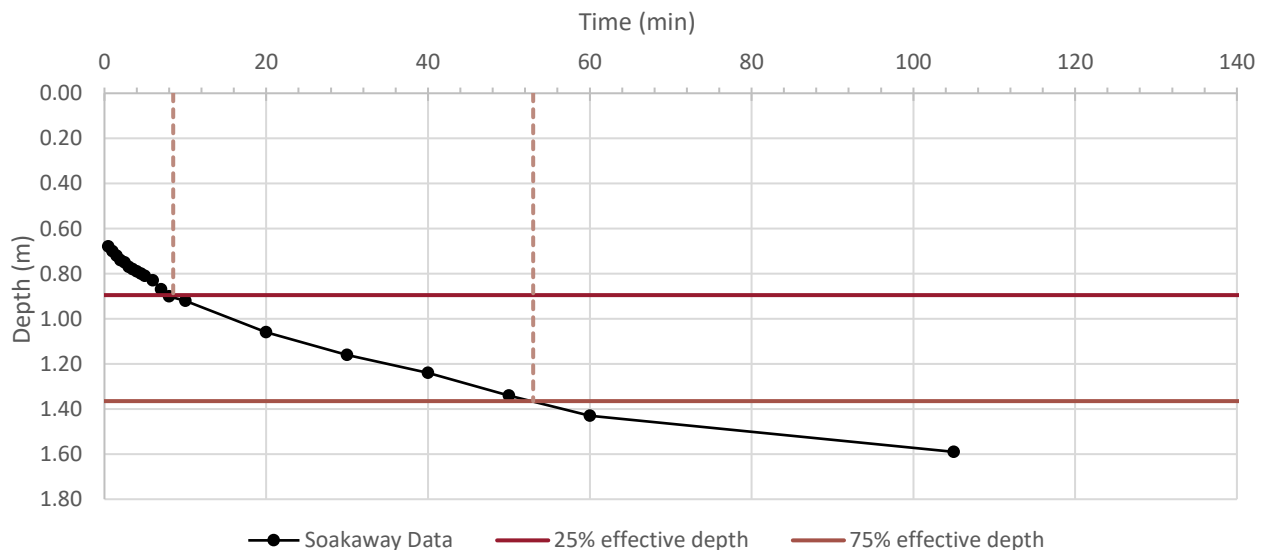
Time (min)	Soakaway Data (m)	25% effective depth (m)	75% effective depth (m)
0	0.35	0.57	1.00
10	0.38	0.57	1.00
20	0.40	0.57	1.00
30	0.42	0.57	1.00
40	0.45	0.57	1.00
50	0.48	0.57	1.00
60	0.50	0.57	1.00
70	0.52	0.57	1.00
80	0.55	0.57	1.00
90	0.58	0.57	1.00
100	0.60	0.57	1.00
150	0.75	0.57	1.00
200	0.78	0.57	1.00
250	0.79	0.57	1.00
300	0.80	0.57	1.00
350	0.80	0.57	1.00
400	0.80	0.57	1.00



SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP102	1	285206.53	195909.57		1.60	2.80	0.70
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.68	Date of Test		04/07/2022	Weather		Overcast
1	0.70	Fill Porosity			Test Duration (mins)		105
1.5	0.72	Operative		SC	Checked by		
2	0.74						
2.5	0.75	Water Depth Test Start (m)		0.66	Base base area (m ²)		1.96
3	0.77	Water Depth Test End (m)		1.59	Pit sides area (m ²)		4.48
3.5	0.78	75% effective depth (m)		0.90	Vp75-25 (m ³)		0.92
4	0.79	50% effective depth (m)		1.13	ap50 (m ²)		5.22
4.5	0.80	25% effective depth (m)		1.37			
5	0.81						
6	0.83	Time water level reaches 75% effective depth (Tp75) (mins)		8.5			
7	0.87	Time water level reaches 25% effective depth (Tp25) (mins)		53			
8	0.90						
10	0.92	Soil Infiltration Rate (f) (m/s)		6.62E-05			
20	1.06						
30	1.16						
40	1.24						
50	1.34						
60	1.43						
105	1.59						

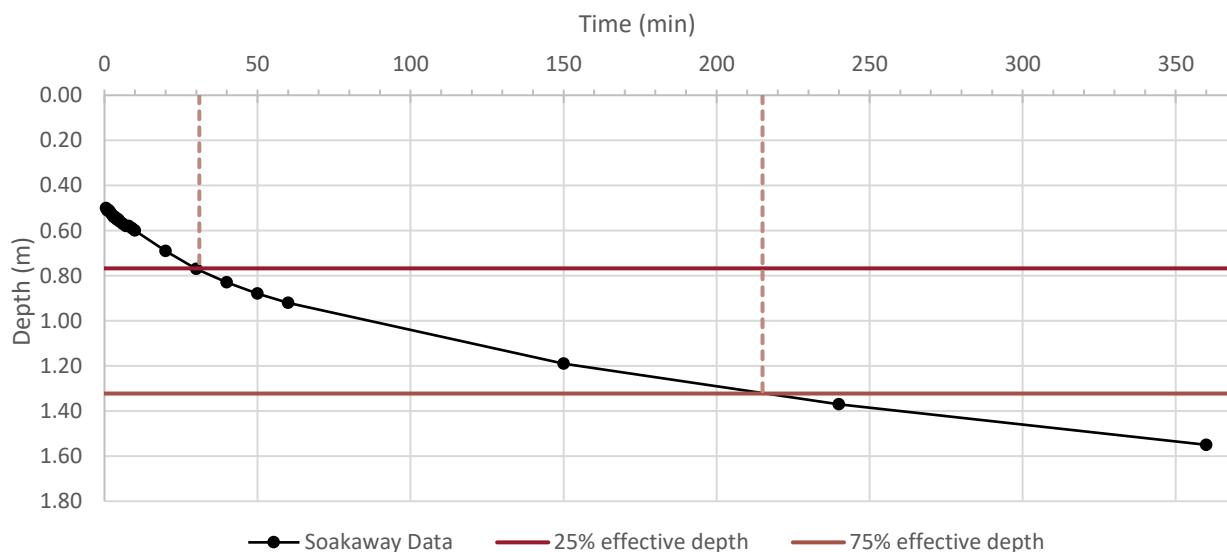
Remarks
Undertaken in accordance with BRE digest 365 (2016)





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP102	2	285206.53	195909.57		1.60	2.80	0.70	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.50							
1	0.51							
1.5	0.51							
2	0.52							
2.5	0.53							
3	0.54							
3.5	0.54							
4	0.55							
4.5	0.55							
5	0.56							
6	0.57							
7	0.58							
8	0.58							
9	0.59							
10	0.60							
20	0.69							
30	0.77							
40	0.83							
50	0.88							
60	0.92							
150	1.19							
240	1.37							
360	1.55							
		Soakaway Construction		Vertical sides trimmed square. No fill material.				
		Date of Test		05/07/2022	Weather		Overcast with sunny spells	
		Fill Porosity			Test Duration (mins)		360	
		Operative		SC	Checked by			
		Water Depth Test Start (m)		0.49	Base base area (m²)		1.96	
		Water Depth Test End (m)		1.55	Pit sides area (m²)		4.48	
		75% effective depth (m)		0.77	Vp75-25 (m³)		1.09	
		50% effective depth (m)		1.05	ap50 (m²)		5.67	
		25% effective depth (m)		1.32				
		Time water level reaches 75% effective depth (Tp75) (mins)		31				
		Time water level reaches 25% effective depth (Tp25) (mins)		215				
		Soil Infiltration Rate (f) (m/s)		1.74E-05				
Remarks								
Undertaken in accordance with BRE digest 365 (2016)								



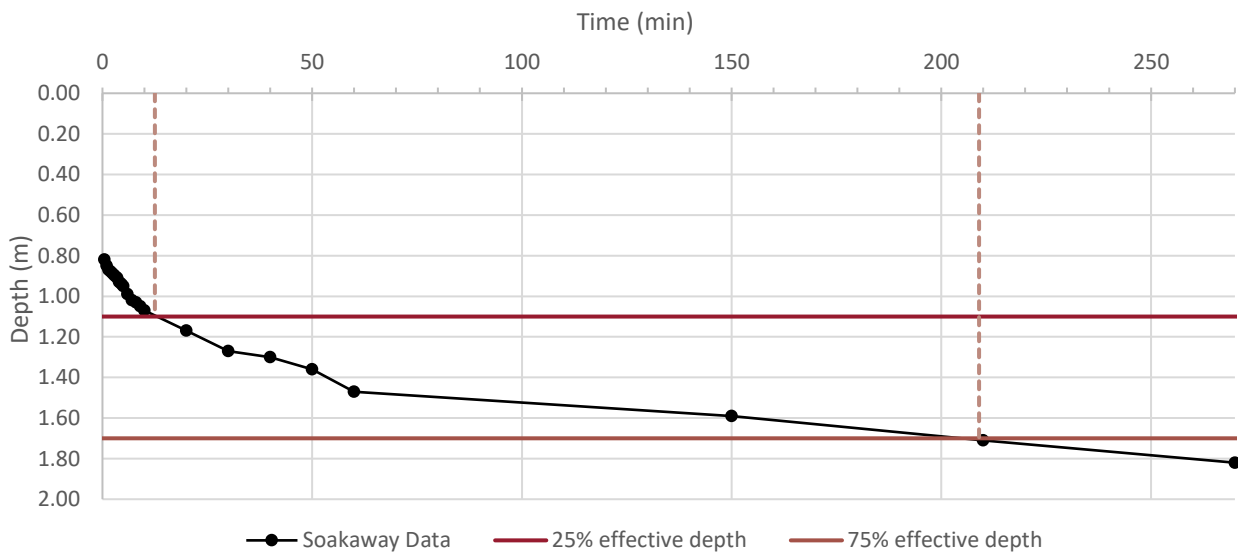


Time (min)	Soakaway Depth (m)
0	0.45
10	0.50
20	0.55
30	0.60
45	0.75
75	0.88
130	1.05
190	1.20
230	1.25
300	1.35



SOIL SOAKAWAY INFILTRATION TEST

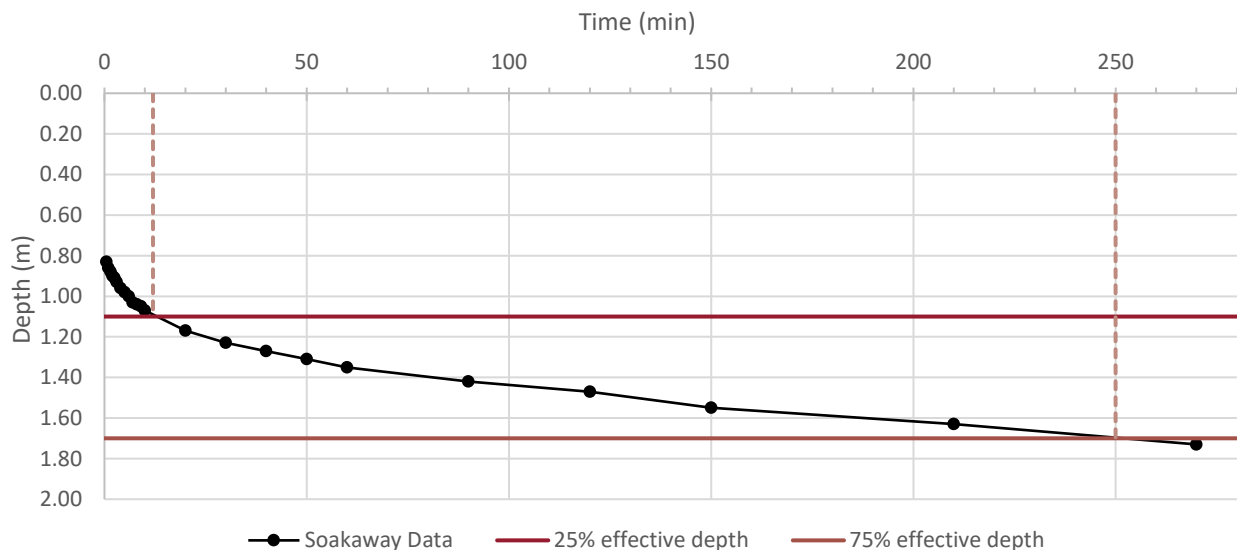
Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP103	1	285319.89	195858.66		2.00	2.40	0.60
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.82	Date of Test		01/07/2022	Weather		Overcast
1	0.85	Fill Porosity			Test Duration (mins)		270
1.5	0.87	Operative		SC	Checked by		
2	0.88	Water Depth Test Start (m)					
2.5	0.89	0.8					
3	0.90	Base base area (m ²)					
3.5	0.91	1.44					
4	0.93	Water Depth Test End (m)					
4.5	0.94	1.82					
5	0.95	75% effective depth (m)					
6	0.99	1.10					
7	1.02	Vp75-25 (m ³)					
8	1.03	0.86					
9	1.05	50% effective depth (m)					
10	1.07	1.40					
20	1.17	ap50 (m ²)					
30	1.27	4.50					
40	1.30	25% effective depth (m)					
50	1.36	1.70					
60	1.47	Time water level reaches 75% effective depth (Tp75) (mins)					
150	1.59	12.5					
210	1.71	Time water level reaches 25% effective depth (Tp25) (mins)					
270	1.82	209					
Soil Infiltration Rate (f) (m/s)				1.63E-05			
Remarks							
Undertaken in accordance with BRE digest 365 (2016)							





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP103	2	285319.89	195858.66		2.00	2.40	0.60	
Test Data		Soakaway Construction						
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.83	Vertical sides trimmed square. No fill material.						
1	0.86							
1.5	0.88	Date of Test						
2	0.90	04/07/2022						
2.5	0.91	Weather						
3	0.93	Overcast						
4	0.96	Fill Porosity						
5	0.98	Test Duration (mins)						
6	1.00	210						
7	1.03	Operative						
8	1.04	SC						
9	1.05	Checked by						
10	1.07							
20	1.17	Water Depth Test Start (m)						
30	1.23	0.8						
40	1.27	Base base area (m ²)						
50	1.31	1.44						
60	1.35	Water Depth Test End (m)						
90	1.42	1.63						
120	1.47	Pit sides area (m ²)						
150	1.55	4.8						
210	1.63	75% effective depth (m)						
270	1.73	1.10						
		Vp75-25 (m ³)						
		0.864						
		50% effective depth (m)						
		1.40						
		ap50 (m ²)						
		3.93						
		25% effective depth (m)						
		1.70						
		Time water level reaches 75% effective depth (Tp75) (mins)						
		12						
		Time water level reaches 25% effective depth (Tp25) (mins)						
		250						
		Soil Infiltration Rate (f) (m/s)						
		1.54E-05						
		Remarks						
		Undertaken in accordance with BRE digest 365 (2016)						

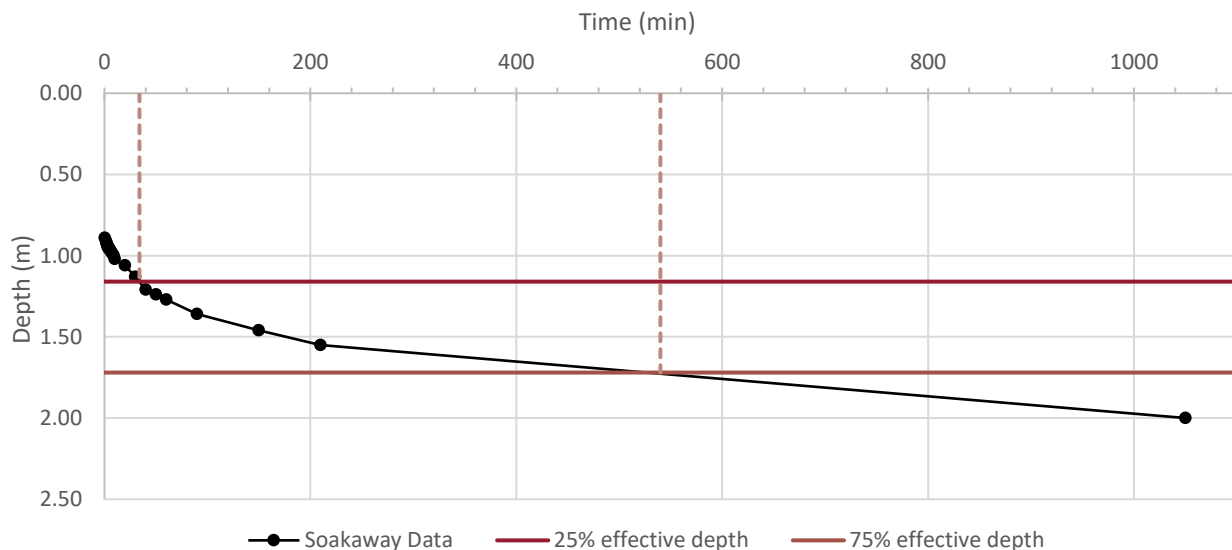




SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP103	3	285319.89	195858.66		2.00	2.40	0.60	
Test Data		Soakaway Construction						
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.						
0.5	0.89	Date of Test		04/07/2022	Weather		Overcast	
1.5	0.91	Fill Porosity			Test Duration (mins)		210	
2	0.92	Operative		SC	Checked by			
2.5	0.93							
3	0.94	Water Depth Test Start (m)		0.88	Base base area (m ²)		1.44	
3.5	0.95	Water Depth Test End (m)		1.55	Pit sides area (m ²)		4.80	
4	0.95	75% effective depth (m)		1.16	Vp75-25 (m ³)		0.81	
4.5	0.96	50% effective depth (m)		1.44	ap50 (m ²)		3.45	
5	0.96	25% effective depth (m)		1.72				
6	0.97							
7	0.98	Time water level reaches 75% effective depth (Tp75) (mins)		34				
8	0.99	Time water level reaches 25% effective depth (Tp25) (mins)		540				
9	1.00							
10	1.02	Soil Infiltration Rate (f) (m/s)		7.70E-06				
20	1.06							
30	1.13							
40	1.21							
50	1.24							
60	1.27							
90	1.36							
150	1.46							
210	1.55							
1050	2.00							

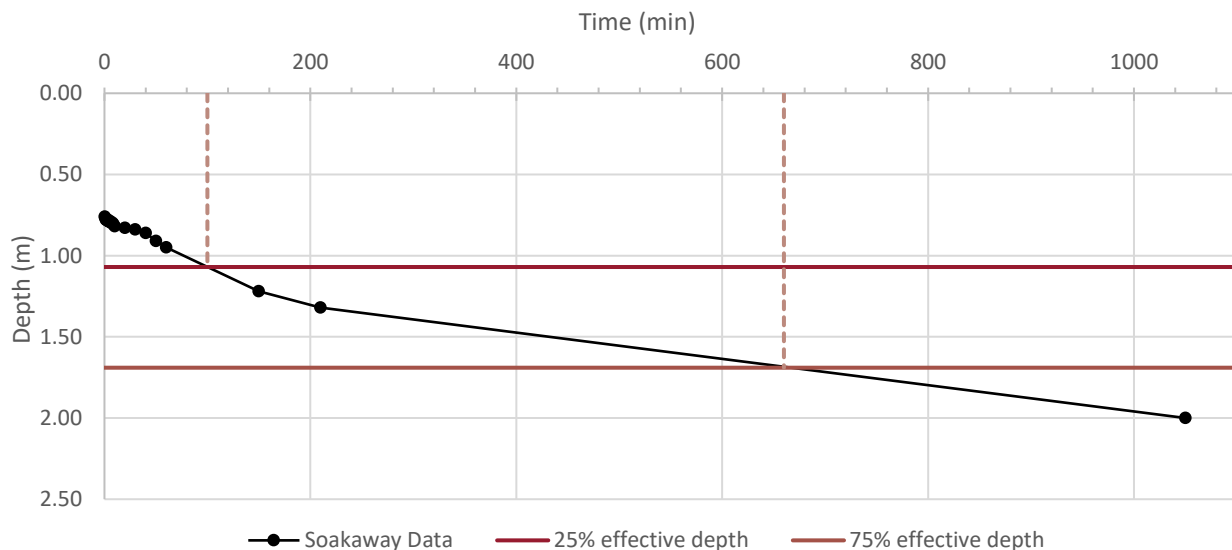
Remarks
Undertaken in accordance with BRE digest 365 (2016)
Engineer stayed 1hr after site closed to monitor. Test left to run overnight and dry in morning. 75% depth is estimated.





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP104	1	285277.76	195683.27		2.00	2.80	0.80
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.76	Date of Test					
1	0.77	05/07/2022					
1.5	0.78	Weather					
2	0.78	Overcast					
2.5	0.78	Fill Porosity					
3	0.78	Test Duration (mins)					
3.5	0.78	210					
4	0.79	Operative					
4.5	0.79	SC					
5	0.79	Checked by					
6	0.79						
7	0.80	Water Depth Test Start (m)					
8	0.80	0.76					
9	0.81	Base base area (m ²)					
10	0.82	2.24					
20	0.83	Water Depth Test End (m)					
30	0.84	1.32					
40	0.86	Pit sides area (m ²)					
50	0.91	5.6					
60	0.95	75% effective depth (m)					
150	1.22	1.07					
210	1.32	Vp75-25 (m ³)					
1050	2.00	1.39					
		50% effective depth (m)					
		1.38					
		ap50 (m ²)					
		4.26					
		25% effective depth (m)					
		1.69					
		Time water level reaches 75% effective depth (Tp75) (mins)					
		100					
		Time water level reaches 25% effective depth (Tp25) (mins)					
		660					
		Soil Infiltration Rate (f) (m/s)					
		9.71E-06					
		Remarks					
		Undertaken in accordance with BRE digest 365 (2016)					
		Test terminated as site closed. Engineer stayed 45 mins after site closed. Test left to run overnight and dry in morning. 75% depth is estimated.					





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP104	2	285277.76	195683.27		2.00	2.80	0.80	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.58							
1	0.59							
1.5	0.60							
2	0.60							
2.5	0.60							
3	0.60							
3.5	0.61							
4	0.61							
4.5	0.61							
5	0.61							
6	0.62							
7	0.62							
8	0.62							
9	0.63							
10	0.63							
20	0.66							
30	0.69							
90	0.86							
240	1.19							
360	1.37							
1260	2.00							

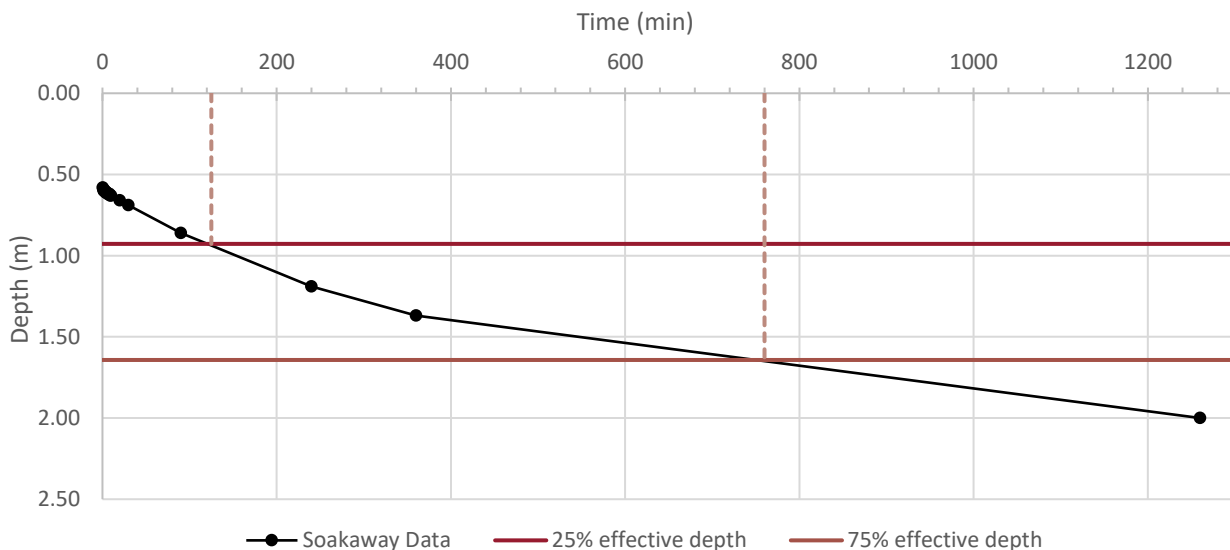
Soakaway Construction		Vertical sides trimmed square. No fill material.	
Date of Test	06/07/2022	Weather	Overcast
Fill Porosity		Test Duration (mins)	360
Operative	SC	Checked by	

Water Depth Test Start (m)	0.57	Base base area (m²)	2.24
Water Depth Test End (m)	1.37	Pit sides area (m²)	5.6
75% effective depth (m)	0.93	Vp75-25 (m³)	1.60
50% effective depth (m)	1.29	ap50 (m²)	5.12
25% effective depth (m)	1.64		

Time water level reaches 75% effective depth (Tp75) (mins)	125
Time water level reaches 25% effective depth (Tp25) (mins)	760

Soil Infiltration Rate (f) (m/s)	8.21E-06
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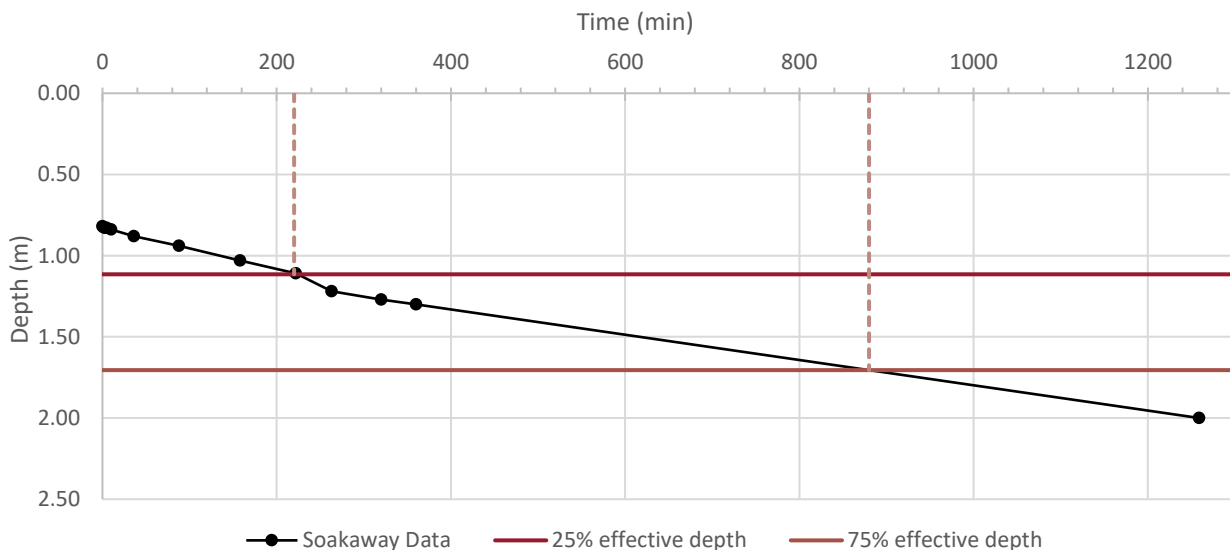
Remarks
 Undertaken in accordance with BRE digest 365 (2016)
 Test left to run overnight and dry in morning. 75% depth is estimated.





SOIL SOAKAWAY INFILTRATION TEST

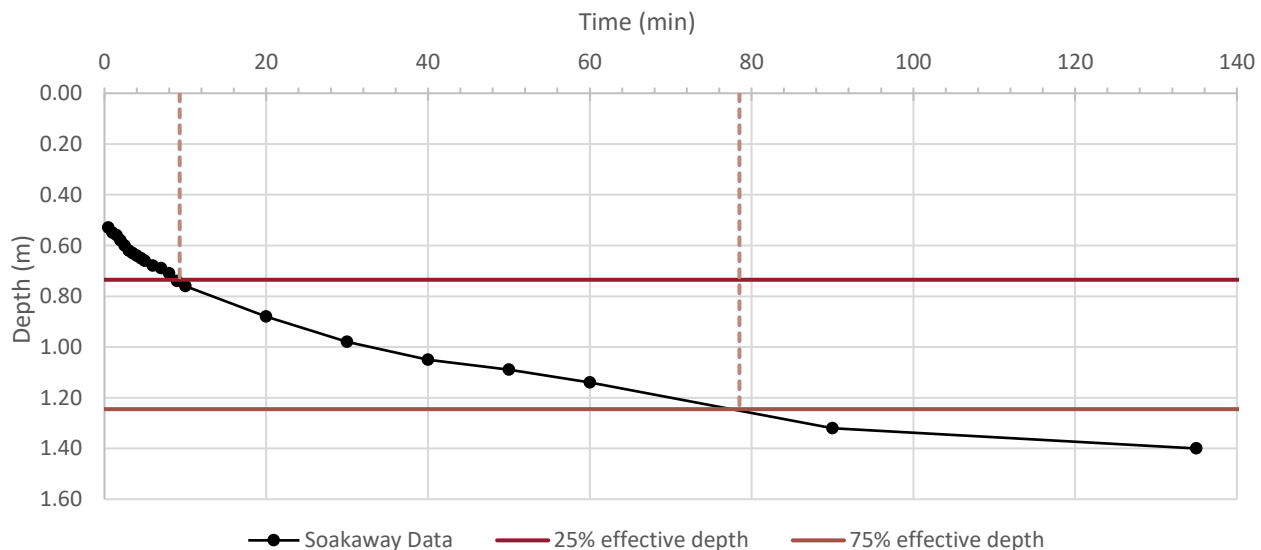
Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP104	3	285277.76	195683.27		2.00	2.80	0.80
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0	0.82	Date of Test		07/06/2022	Weather		Sunny
1	0.825	Fill Porosity			Test Duration (mins)		1319
3	0.83	Operative		AF	Checked by		
5	0.83						
10	0.84	Water Depth Test Start (m)		0.82	Base base area (m ²)		2.24
36	0.88	Water Depth Test End (m)		2	Pit sides area (m ²)		5.6
88	0.94	75% effective depth (m)		1.12	Vp75-25 (m ³)		1.32
158	1.03	50% effective depth (m)		1.41	ap50 (m ²)		6.49
222	1.11	25% effective depth (m)		1.71			
263	1.22						
320	1.27	Time water level reaches 75% effective depth (Tp75) (mins)		220			
360	1.30	Time water level reaches 25% effective depth (Tp25) (mins)		880			
1259	2.00						
		Soil Infiltration Rate (f) (m/s)		5.14E-06			
		Remarks					
		Undertaken in accordance with BRE digest 365 (2016)					





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP105	1	285407.11	195426.35		1.50	2.70	0.80
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.53	Date of Test		01/07/2022	Weather		Sunny spells
1	0.55	Fill Porosity			Test Duration (mins)		135
1.5	0.56	Operative		SC	Checked by		
2	0.58						
2.5	0.60	Water Depth Test Start (m)		0.48	Base base area (m ²)		2.16
3	0.62	Water Depth Test End (m)		1.4	Pit sides area (m ²)		4.05
3.5	0.63	75% effective depth (m)		0.74	Vp75-25 (m ³)		1.10
4	0.64	50% effective depth (m)		0.99	ap50 (m ²)		5.38
4.5	0.65	25% effective depth (m)		1.25			
5	0.66						
6	0.68	Time water level reaches 75% effective depth (Tp75) (mins)		9.3			
7	0.69	Time water level reaches 25% effective depth (Tp25) (mins)		78.5			
8	0.71						
9	0.74	Soil Infiltration Rate (f) (m/s)		4.93E-05			
10	0.76						
20	0.88						
30	0.98						
40	1.05						
50	1.09						
60	1.14						
90	1.32						
135	1.40						
Remarks							
Undertaken in accordance with BRE digest 365 (2016)							

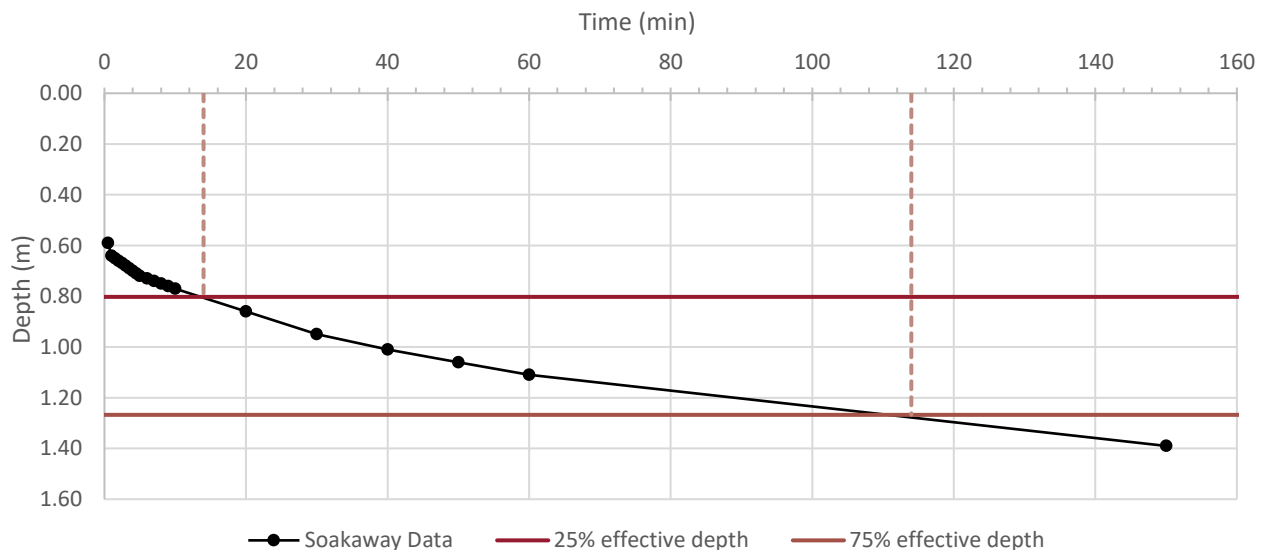




SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP105	2	285407.11	195426.35		1.50	2.70	0.80
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.59	Date of Test		04/07/2022	Weather		Overcast
1	0.64	Fill Porosity			Test Duration (mins)		150
1.5	0.65	Operative		SC	Checked by		
2	0.66						
2.5	0.67	Water Depth Test Start (m)		0.57	Base base area (m ²)		2.16
3	0.68	Water Depth Test End (m)		1.39	Pit sides area (m ²)		4.05
3.5	0.69	75% effective depth (m)		0.80	Vp75-25 (m ³)		1.00
4	0.70	50% effective depth (m)		1.04	ap50 (m ²)		5.03
4.5	0.71	25% effective depth (m)		1.27			
5	0.72						
6	0.73	Time water level reaches 75% effective depth (Tp75) (mins)		14			
7	0.74	Time water level reaches 25% effective depth (Tp25) (mins)		114			
8	0.75						
9	0.76	Soil Infiltration Rate (f) (m/s)		3.33E-05			
10	0.77						
20	0.86						
30	0.95						
40	1.01						
50	1.06						
60	1.11						
150	1.39						

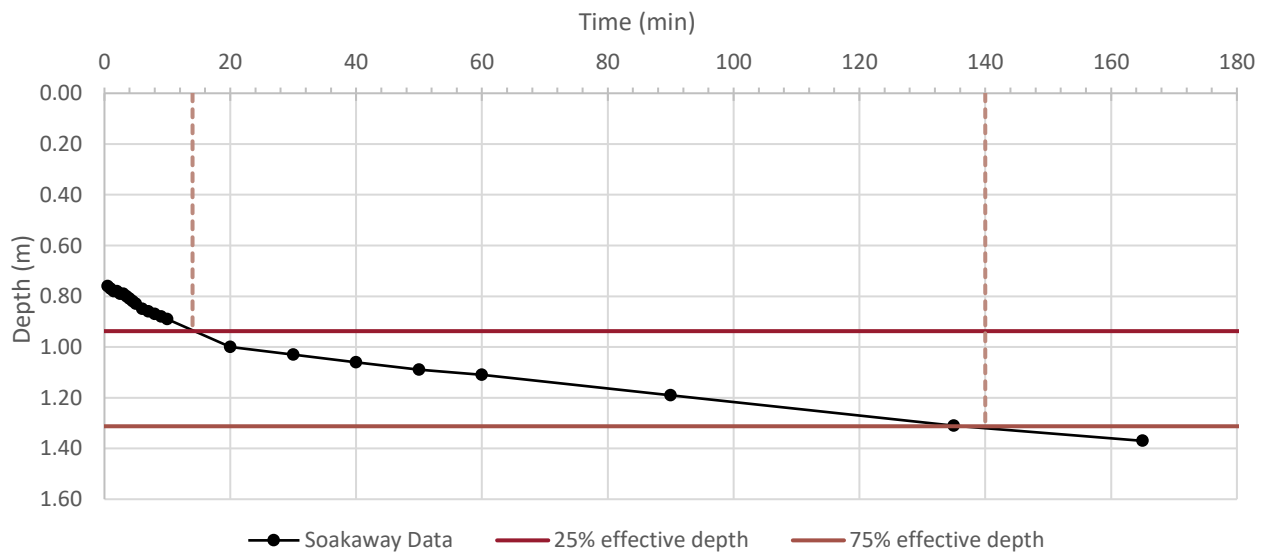
Remarks
Undertaken in accordance with BRE digest 365 (2016)





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP105	3	285407.11	195426.35		1.50	2.70	0.80	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.76							
1	0.77							
1.5	0.78							
2	0.78							
2.5	0.79							
3	0.79							
3.5	0.80							
4	0.81							
4.5	0.82							
5	0.83							
6	0.85							
7	0.86							
8	0.87							
9	0.88							
10	0.89							
20	1.00							
30	1.03							
40	1.06							
50	1.09							
60	1.11							
90	1.19							
135	1.31							
165	1.37							
Soakaway Construction		Vertical sides trimmed square. No fill material.						
Date of Test	04/07/2022	Weather	Overcast					
Fill Porosity		Test Duration (mins)	165					
Operative	SC	Checked by						
Water Depth Test Start (m)	0.75	Base base area (m²)	2.16					
Water Depth Test End (m)	1.37	Pit sides area (m²)	4.05					
75% effective depth (m)	0.94	Vp75-25 (m³)	0.81					
50% effective depth (m)	1.13	ap50 (m²)	4.33					
25% effective depth (m)	1.31							
Time water level reaches 75% effective depth (Tp75) (mins)		14						
Time water level reaches 25% effective depth (Tp25) (mins)		140						
Soil Infiltration Rate (f) (m/s)		2.47E-05						
Remarks								
Undertaken in accordance with BRE digest 365 (2016)								





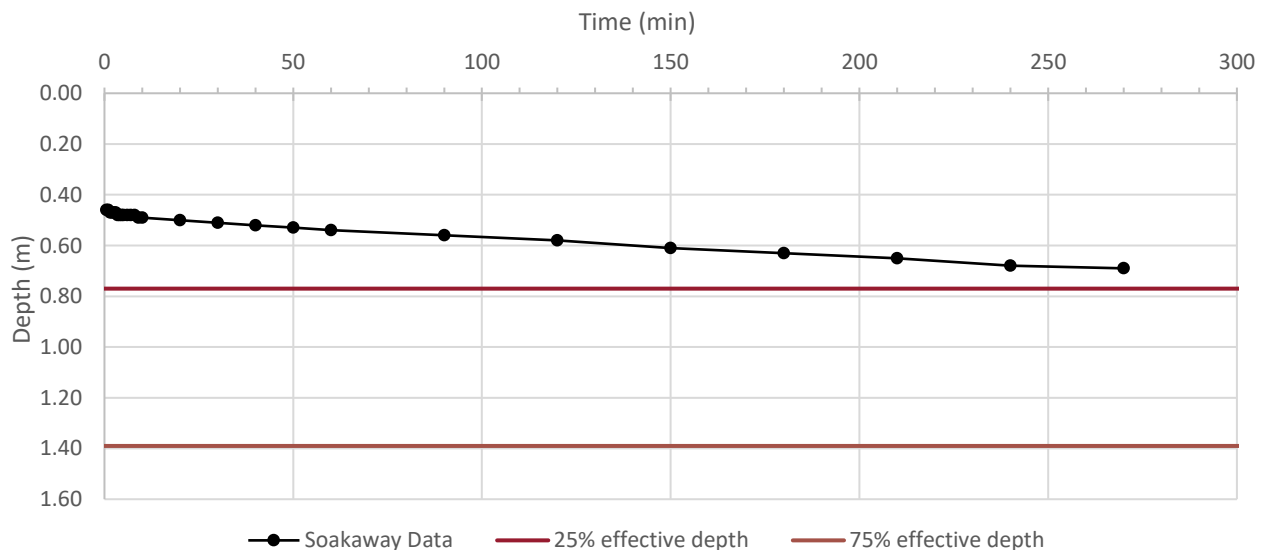
The graph displays the relationship between depth and time for a soakaway system. The y-axis represents Depth in meters (m), ranging from 0.00 at the top to 1.40 at the bottom. The x-axis represents Time in minutes (min), ranging from 0 to 2500. Three data series are plotted: Soakaway Data (black line with circular markers), 25% effective depth (red horizontal line), and 75% effective depth (brown horizontal line). The Soakaway Data starts at approximately 0.43 m depth at 0 minutes and gradually increases to about 0.62 m depth at 1300 minutes. The 25% effective depth is constant at approximately 0.70 m, and the 75% effective depth is constant at approximately 1.23 m.

Time (min)	Soakaway Data (m)	25% effective depth (m)	75% effective depth (m)
0	0.43	0.70	1.23
100	0.43	0.70	1.23
200	0.43	0.70	1.23
300	0.43	0.70	1.23
950	0.59	0.70	1.23
1150	0.61	0.70	1.23
1300	0.62	0.70	1.23



SOIL SOAKAWAY INFILTRATION TEST

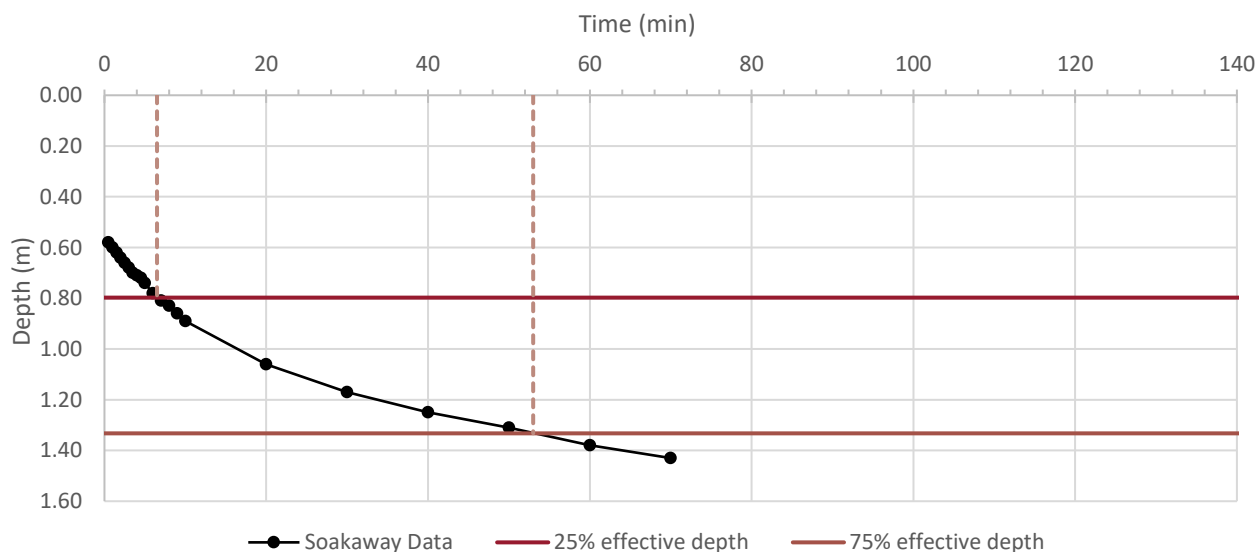
Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP108	1	286058.35	195518.23		1.70	2.20	0.60	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)	Soakaway Construction		Vertical sides trimmed square. No fill material.				
0.5	0.46	Date of Test		27/06/2022	Weather		Dry	
1	0.46	Fill Porosity			Test Duration (mins)		270	
1.5	0.47	Operative		SC	Checked by			
2	0.47							
2.5	0.47	Water Depth Test Start (m)		0.46	Base base area (m²)		1.32	
3	0.47	Water Depth Test End (m)		0.69	Pit sides area (m²)		3.74	
3.5	0.48	75% effective depth (m)		0.77	Vp75-25 (m³)		0.82	
4	0.48	50% effective depth (m)		1.08	ap50 (m²)		1.96	
4.5	0.48	25% effective depth (m)		1.39				
5	0.48							
10	0.49	Time water level reaches 75% effective depth (Tp75) (mins)						
20	0.5	Time water level reaches 25% effective depth (Tp25) (mins)						
30	0.51							
40	0.52	Soil Infiltration Rate (f) (m/s)		Unable to determine				
50	0.53							
60	0.54							
90	0.56							
120	0.58							
150	0.61							
180	0.63							
210	0.65							
240	0.68							
270	0.69							
		Remarks						
		Undertaken in accordance with BRE digest 365 (2016)						
		Soakaway terminated due to lack of infiltration as per client request						





SOIL SOAKAWAY INFILTRATION TEST

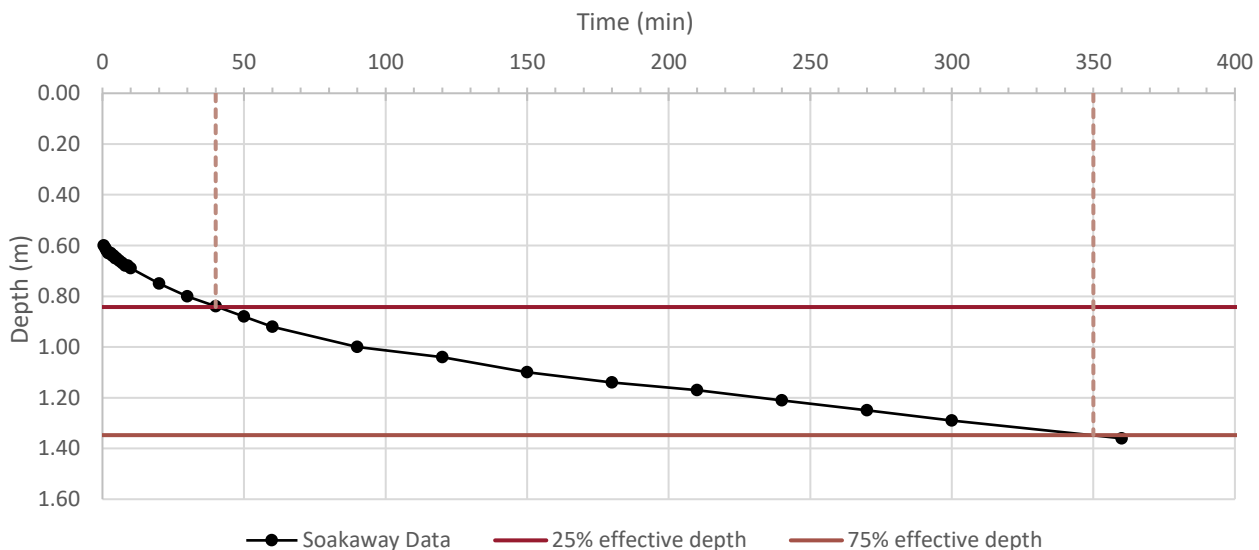
Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP109	1	286058.00	195518.00		1.60	2.20	0.75
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.58	Date of Test		27/06/2022	Weather		Dry
1	0.60	Fill Porosity			Test Duration (mins)		70
1.5	0.62	Operative		SC	Checked by		
2	0.64	Water Depth Test Start (m)					
2.5	0.66	0.53					
3	0.68	Base base area (m ²)					
3.5	0.70	1.65					
4	0.71	Water Depth Test End (m)					
4.5	0.72	1.43					
5	0.74	75% effective depth (m)					
6	0.78	0.80					
7	0.81	Vp75-25 (m ³)					
8	0.83	0.88					
9	0.86	50% effective depth (m)					
10	0.89	1.07					
20	1.06	ap50 (m ²)					
30	1.17	4.31					
40	1.25	25% effective depth (m)					
50	1.31	1.33					
60	1.38	Time water level reaches 75% effective depth (Tp75) (mins)					
70	1.43	6.5					
		Time water level reaches 25% effective depth (Tp25) (mins)					
		53					
		Soil Infiltration Rate (f) (m/s)					
		7.35E-05					
Remarks							
Undertaken in accordance with BRE digest 365 (2016)							





SOIL SOAKAWAY INFILTRATION TEST

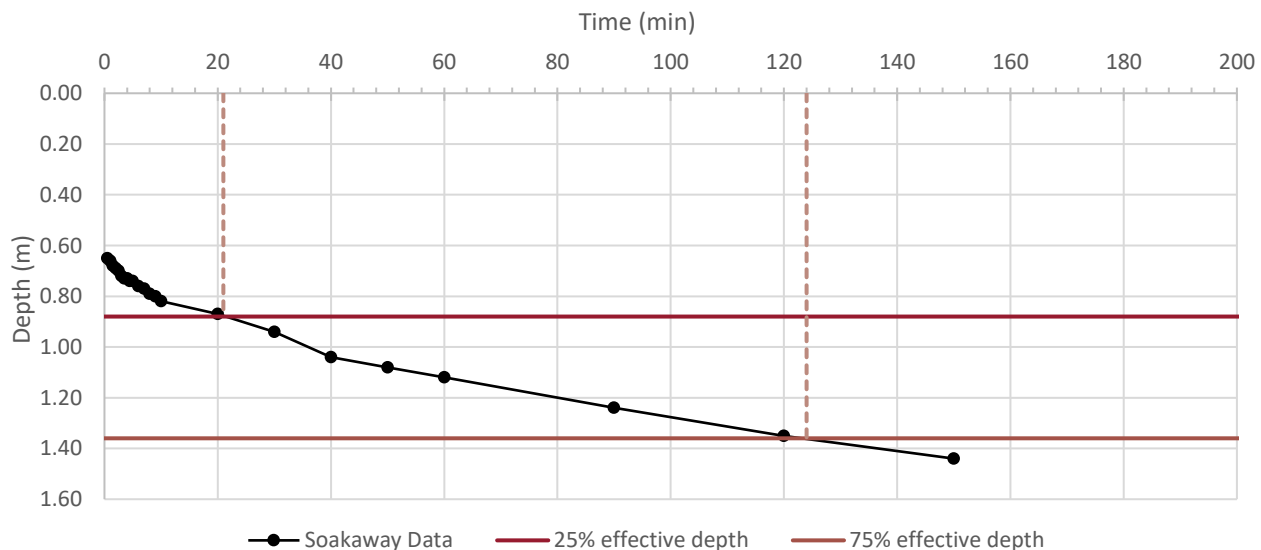
Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP109	2	286058.00	195518.00		1.60	2.20	0.75
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.60	Date of Test		28/06/2022	Weather		Drizzly rain
1	0.61	Fill Porosity			Test Duration (mins)		360
1.5	0.62	Operative		SC	Checked by		
2	0.63						
2.5	0.63	Water Depth Test Start (m)		0.59	Base base area (m ²)		1.65
3	0.63	Water Depth Test End (m)		1.36	Pit sides area (m ²)		3.52
3.5	0.64	75% effective depth (m)		0.84	Vp75-25 (m ³)		0.83
4	0.64	50% effective depth (m)		1.10	ap50 (m ²)		3.92
4.5	0.65	25% effective depth (m)		1.35			
5	0.65						
10	0.69	Time water level reaches 75% effective depth (Tp75) (mins)				40	
20	0.75	Time water level reaches 25% effective depth (Tp25) (mins)				350	
30	0.80						
40	0.84	Soil Infiltration Rate (f) (m/s)				1.14E-05	
60	0.92						
90	1.00						
120	1.04						
150	1.10						
180	1.14						
210	1.17						
240	1.21						
270	1.25						
360	1.36						
Remarks							
Undertaken in accordance with BRE digest 365 (2016)							





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP109	3	286058.00	195518.00		1.60	2.20	0.75	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.65							
1	0.66							
1.5	0.68							
2	0.69							
2.5	0.70							
3	0.72							
3.5	0.73							
4	0.73							
4.5	0.74							
5	0.74							
6	0.76							
7	0.77							
8	0.79							
9	0.8							
10	0.82							
20	0.87							
30	0.94							
40	1.04							
50	1.08							
60	1.12							
90	1.24							
120	1.35							
150	1.44							
Soakaway Construction		Vertical sides trimmed square. No fill material.						
Date of Test		29/06/2022		Weather		Overcast		
Fill Porosity				Test Duration (mins)		150		
Operative		SC		Checked by				
Water Depth Test Start (m)		0.64		Base base area (m ²)		1.65		
Water Depth Test End (m)		1.44		Pit sides area (m ²)		3.52		
75% effective depth (m)		0.88		Vp75-25 (m ³)		0.79		
50% effective depth (m)		1.12		ap50 (m ²)		4.01		
25% effective depth (m)		1.36						
Time water level reaches 75% effective depth (Tp75) (mins)				21				
Time water level reaches 25% effective depth (Tp25) (mins)				124				
Soil Infiltration Rate (f) (m/s)				3.20E-05				
Remarks								
Undertaken in accordance with BRE digest 365 (2016)								





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP110	1	286295.04	195412.76		1.50	2.30	0.70	
Test Data								
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.64							
1	0.65							
1.5	0.66							
2.5	0.66							
3	0.67							
3.5	0.67							
4	0.67							
4.5	0.67							
5	0.67							
10	0.68							
20	0.70							
30	0.73							
40	0.75							
50	0.77							
60	0.79							
90	0.82							
120	0.84							
180	0.99							
270	1.09							
1260	1.50							

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	29/06/2022	Weather	Overcast
Fill Porosity		Test Duration (mins)	270
Operative	SC	Checked by	

Water Depth Test Start (m)	0.62	Base base area (m²)	1.61
Water Depth Test End (m)	1.09	Pit sides area (m²)	3.45
75% effective depth (m)	0.84	Vp75-25 (m³)	0.71
50% effective depth (m)	1.06	ap50 (m²)	3.02
25% effective depth (m)	1.28		

Time water level reaches 75% effective depth (Tp75) (mins)	120
Time water level reaches 25% effective depth (Tp25) (mins)	755

Soil Infiltration Rate (f) (m/s)	6.16E-06
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Remarks
 Undertaken in accordance with BRE digest 365 (2016)
 Trial pit left open overnight, dry when dipped 21 hrs after start of test. Unknown what time trial pit became dry. Soakage rate calculated based on this datapoint and therefore conservative.

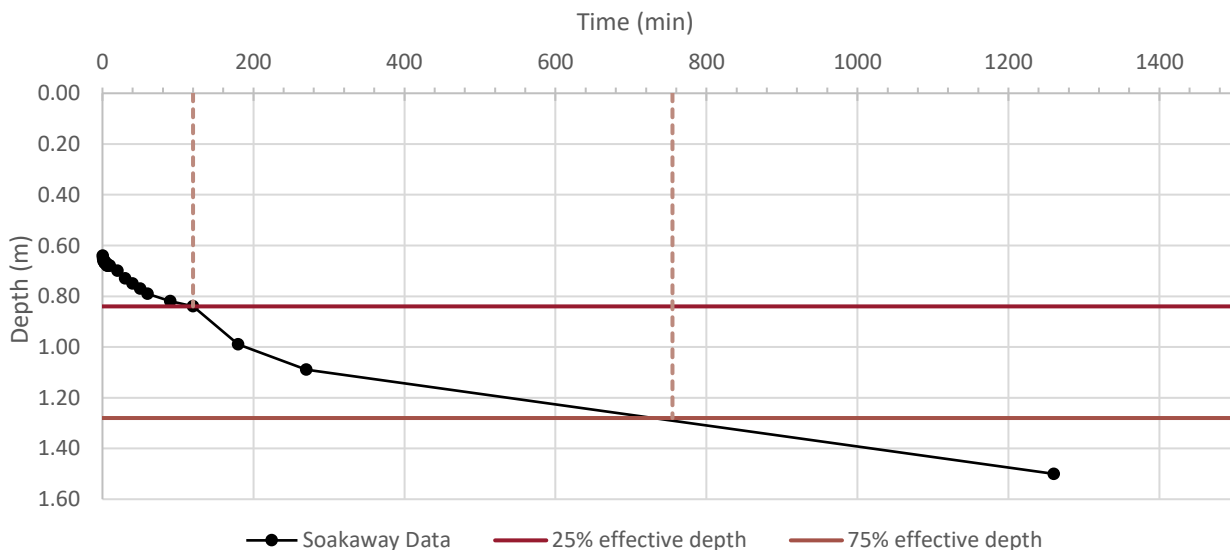




Figure 10 is a line graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 1.60 meters. Three data series are plotted:

- Soakaway Data:** Represented by a black line with circular markers. It starts at approximately 1.35m depth at 0 minutes, drops sharply to about 1.50m within the first 5 minutes, and then remains constant at 1.50m for the rest of the 140-minute period.
- 25% effective depth:** Represented by a solid dark red horizontal line at approximately 1.35m depth.
- 75% effective depth:** Represented by a dashed brown vertical line at 0 minutes, extending from 0.00m to 1.60m depth.



SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP111	2	286017.06	195183.39		1.60	3.00	0.80	
Test Data		Soakaway Construction						
Time Elapsed (mins)	Water Depth (m bgl)							
0.5	0.70	Vertical sides trimmed square. No fill material.						
1	0.85							
1.5	0.93	Date of Test						
2	1.00	30/06/2022						
2.5	1.11	Weather						
3	1.17	Sunny						
3.5	1.27	Fill Porosity						
4	1.36	Test Duration (mins)						
4.5	1.50	5						
		Operative						
		SC						
		Checked by						
		Water Depth Test Start (m)						
		0.6						
		Base base area (m ²)						
		2.40						
		Water Depth Test End (m)						
		1.5						
		Pit sides area (m ²)						
		4.80						
		75% effective depth (m)						
		0.85						
		Vp75-25 (m ³)						
		1.20						
		50% effective depth (m)						
		1.10						
		ap50 (m ²)						
		5.82						
		25% effective depth (m)						
		1.35						
		Time water level reaches 75% effective depth (Tp75) (mins)						
		1						
		Time water level reaches 25% effective depth (Tp25) (mins)						
		3.9						
		Soil Infiltration Rate (f) (m/s)						
		1.18E-03						
		Remarks						
		Undertaken in accordance with BRE digest 365 (2016)						

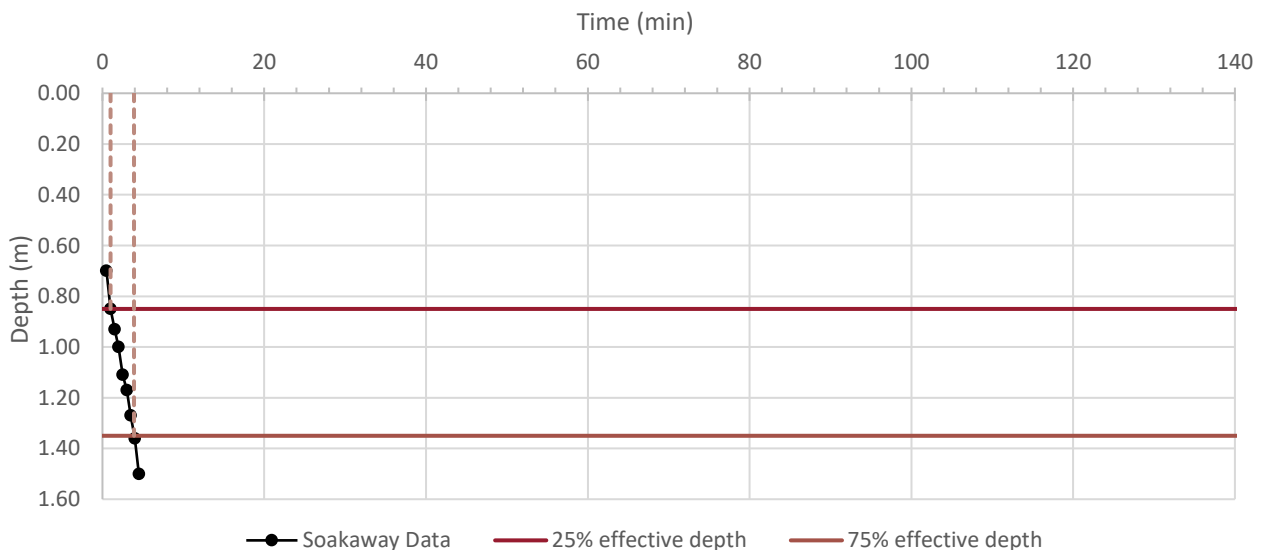




Figure 10 is a line graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 1.60 meters. The graph displays 'Soakaway Data' as black dots connected by a line, showing a rapid decrease in depth over time. Two horizontal red lines represent '25% effective depth' at approximately 1.00 m and '75% effective depth' at approximately 1.40 m. A vertical dashed brown line indicates the '75% effective depth' time at approximately 5 minutes.

Time (min)	Depth (m)	Series
0	0.88	Soakaway Data
1	1.00	Soakaway Data
2	1.10	Soakaway Data
3	1.15	Soakaway Data
4	1.20	Soakaway Data
5	1.25	Soakaway Data
6	1.30	Soakaway Data
7	1.35	Soakaway Data
8	1.40	Soakaway Data
9	1.45	Soakaway Data
10	1.50	Soakaway Data
11	1.52	Soakaway Data
0	1.00	25% effective depth
140	1.00	25% effective depth
0	1.40	75% effective depth
140	1.40	75% effective depth

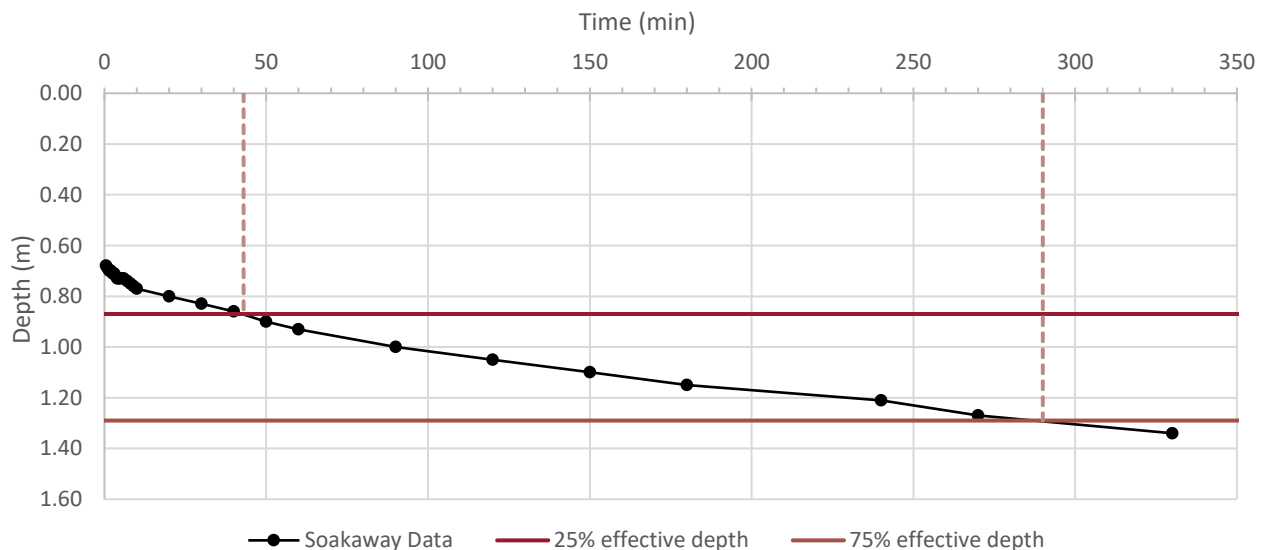


Figure 10 is a graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 1.60 meters. The graph displays 'Soakaway Data' as black dots connected by a line, showing a rapid decrease in depth over time. Two horizontal lines represent '25% effective depth' (at approximately 0.90 m) and '75% effective depth' (at approximately 1.35 m). Vertical dashed lines indicate the time taken for the soakaway to reach these depths, which is approximately 5 minutes for the 25% depth and 10 minutes for the 75% depth.



SOIL SOAKAWAY INFILTRATION TEST

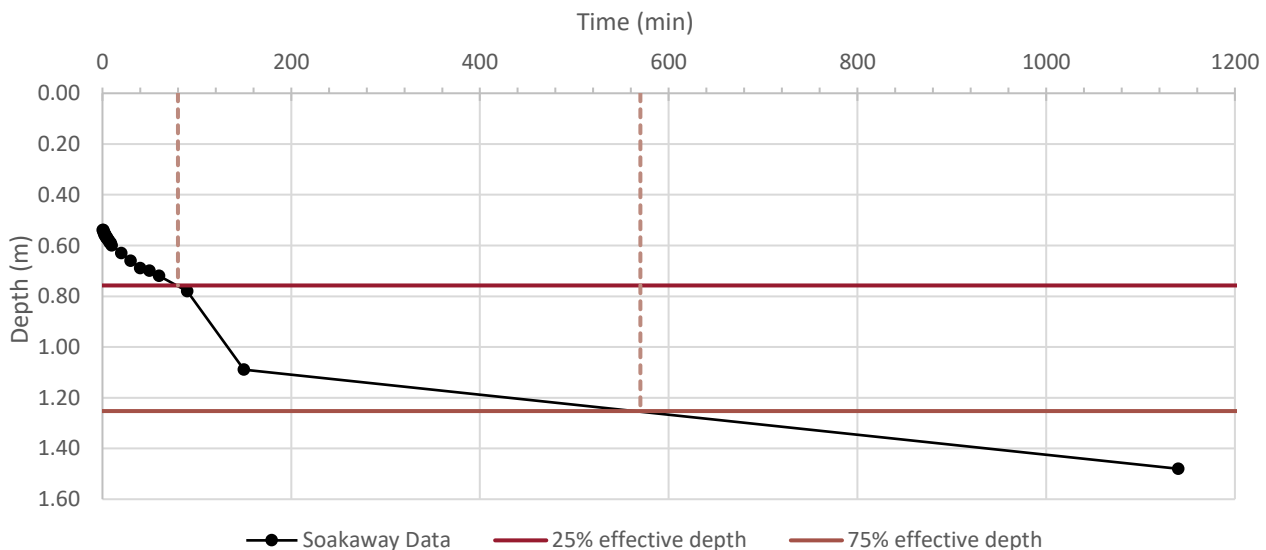
Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP112	1	286427.23	195597.62		1.50	2.90	0.60
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.68	Date of Test		28/06/2022	Weather		Overcast
1	0.69	Fill Porosity			Test Duration (mins)		330
1.5	0.70	Operative		SC	Checked by		
2	0.70						
2.5	0.71	Water Depth Test Start (m)		0.66	Base base area (m ²)		1.74
3	0.71	Water Depth Test End (m)		1.34	Pit sides area (m ²)		4.35
3.5	0.72	75% effective depth (m)		0.87	Vp75-25 (m ³)		0.73
4	0.73	50% effective depth (m)		1.08	ap50 (m ²)		4.12
4.5	0.73	25% effective depth (m)		1.29			
5	0.73						
10	0.77	Time water level reaches 75% effective depth (Tp75) (mins)		43			
20	0.8	Time water level reaches 25% effective depth (Tp25) (mins)		290			
30	0.83						
40	0.86	Soil Infiltration Rate (f) (m/s)		1.20E-05			
50	0.90						
60	0.93						
90	1.00						
120	1.05						
150	1.10						
180	1.15						
240	1.21						
270	1.27						
330	1.34						
Remarks							
Undertaken in accordance with BRE digest 365 (2016)							





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park		Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)	
TP112	2	286427.23	195597.62		1.50	2.90	0.60	
Test Data		Soakaway Construction						
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.						
0.5	0.54	Date of Test		29/06/2022	Weather		Overcast	
1	0.54	Fill Porosity			Test Duration (mins)		1140	
1.5	0.55	Operative		SC	Checked by			
2	0.55							
2.5	0.56	Water Depth Test Start (m)		0.51	Base base area (m ²)		1.74	
3	0.56	Water Depth Test End (m)		1.48	Pit sides area (m ²)		4.35	
3.5	0.56	75% effective depth (m)		0.76	Vp75-25 (m ³)		0.86	
4	0.57	50% effective depth (m)		1.01	ap50 (m ²)		5.14	
4.5	0.57	25% effective depth (m)		1.25				
5	0.57							
6	0.58	Time water level reaches 75% effective depth (Tp75) (mins)		80				
7	0.58	Time water level reaches 25% effective depth (Tp25) (mins)		570				
8	0.59							
9	0.59	Soil Infiltration Rate (f) (m/s)		5.71E-06				
10	0.60							
20	0.63							
30	0.66							
40	0.69							
50	0.70							
60	0.72							
90	0.78							
150	1.09							
1140	1.48							
Remarks								
Undertaken in accordance with BRE digest 365 (2016)								
Trial pit left open overnight, level recorded when dipped 19 hrs after start of test. Rate overnight not measured. Soakage rate calculated based on these limited datapoints and therefore conservative.								





SOIL SOAKAWAY INFILTRATION TEST

Project	Afan Adventure Park	Project No	G22033	Client	Stantec		
Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
TP112	3	286427.23	195597.62		1.50	2.90	0.60
Test Data		Soakaway Construction					
Time Elapsed (mins)	Water Depth (m bgl)	Vertical sides trimmed square. No fill material.					
0.5	0.58	Date of Test		30/06/2022	Weather		overcast with light drizzle
1	0.58	Fill Porosity			Test Duration (mins)		1350
1.5	0.58	Operative		SC	Checked by		
2	0.59						
2.5	0.59	Water Depth Test Start (m)		0.58	Base base area (m ²)		1.74
3	0.59	Water Depth Test End (m)		1.37	Pit sides area (m ²)		4.35
3.5	0.59	75% effective depth (m)		0.81	Vp75-25 (m ³)		0.80
4	0.60	50% effective depth (m)		1.04	ap50 (m ²)		4.51
4.5	0.60	25% effective depth (m)		1.27			
5	0.60						
6	0.60	Time water level reaches 75% effective depth (Tp75) (mins)		255			
7	0.60	Time water level reaches 25% effective depth (Tp25) (mins)		1150			
8	0.60						
9	0.60	Soil Infiltration Rate (f) (m/s)		3.31E-06			
10	0.60						
20	0.61						
30	0.63						
150	0.71						
285	0.84						
390	0.93						
1350	1.37						

Remarks
Undertaken in accordance with BRE digest 365 (2016)

