

**Proposed Residential Development
At
Springfield, Hook Lane, Aldingbourne, PO20 3TE
FOUL SEWERAGE AND SURFACE WATER STATEMENT**

1. Background:

1.1 This statement has been drafted to specifically address the issues around both foul and surface water run-off from the proposed site.

2. Foul Water Drainage

2.1 There is a public foul water sewer located within Hook Lane, to which the proposed site can be connected. It is considered that Southern Water would have no objection to this connection and it would have no impact to the local foul water drainage network.

3. Surface Water Drainage

3.1 Where possible shallow soakaways, and permeable surfaces will be utilised.

3.2 As the site is generally somewhat impermeable overflows will be directed to an attenuation tank and drained at a managed rate into a watercourse on the northern boundary.

3.3 Final design will be confirmed once the layout of the site has been agreed through planning. Documents provided in support:

Appendix 1	Site Survey
Appendix 2	Attenuation Calculations
Appendix 3	Existing Site Discharge
Appendix 4	Run off Rates
Appendix 5	Winter Ground Water Monitoring
Appendix 6	BRE 365 Tests

Escher Silverman		Page 1
Lone Barn Studios Stanbridge Lane Romsey SO51 0HE	Hook Lane Aldingbourne Pumped Attenuation	
Date September 2019 File Attenuation Tank.SRC	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Summary of Results for 100 year Return Period (+40%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	2.0	2.0	10.7613	0.7613	48.7	O K
30 Summer	2.0	2.0	11.0083	1.0083	64.5	O K
60 Summer	2.0	2.0	11.2558	1.2558	80.4	O K
120 Summer	2.0	2.0	11.4767	1.4767	94.5	O K
180 Summer	2.0	2.0	11.5677	1.5677	100.3	O K
240 Summer	2.0	2.0	11.6012	1.6012	102.5	O K
360 Summer	2.0	2.0	11.6082	1.6082	102.9	O K
480 Summer	2.0	2.0	11.5772	1.5772	100.9	O K
600 Summer	2.0	2.0	11.5427	1.5427	98.7	O K
720 Summer	2.0	2.0	11.5082	1.5082	96.5	O K
960 Summer	2.0	2.0	11.4412	1.4412	92.2	O K
1440 Summer	2.0	2.0	11.3088	1.3087	83.7	O K
15 Winter	2.0	2.0	10.8558	0.8558	54.8	O K
30 Winter	2.0	2.0	11.1358	1.1358	72.7	O K
60 Winter	2.0	2.0	11.4207	1.4207	90.9	O K
120 Winter	2.0	2.0	11.6812	1.6812	107.6	O K
180 Winter	2.0	2.0	11.7972	1.7972	115.0	O K
240 Winter	2.0	2.0	11.8487	1.8487	118.3	O K
360 Winter	2.0	2.0	11.8837	1.8837	120.6	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	128.24	23
30 Summer	86.18	37
60 Summer	55.25	66
120 Summer	34.18	126
180 Summer	25.41	186
240 Summer	20.44	246
360 Summer	15.04	364
480 Summer	12.08	432
600 Summer	10.18	490
720 Summer	8.85	552
960 Summer	7.09	680
1440 Summer	5.18	956
15 Winter	128.24	22
30 Winter	86.18	37
60 Winter	55.25	66
120 Winter	34.18	124
180 Winter	25.41	182
240 Winter	20.44	240
360 Winter	15.04	354

Section: Civils		 KAZYS NARBUTAS CONSULTING <i>Civil Engineering Consultant</i> Roughton, A2 Omega Park, Electron Way, Chandlers Ford. SO53 4SE Telephone: 023 8027 8643 Email: kazys.n@knc.email			
Project: Hook Lane, Aldingbourne					
Client : DOMUSEA					
Date: September 2019	Job No. KNC1932	Page No. 1	Chk:	By: KHN	Rev: A
Reference	Calculation Existing Site Discharge				Result
<u>Existing Green Field Run off from IH124</u> Existing site area 0.465Ha Q_{bar} discharge from 50Ha site = 192.8lits/sec (see MicroDrainage IH124 results) Applying ratio of existing site to this discharge: $0.465/50 \times 192.8 = 1.8 \text{ lit/sec}$; assume practical discharge 2.0lit/sec Take 2.0 lits/sec limiting discharge through new surface water drainage network. Proposed impermeable area draining through attenuated discharge = 0.21Ha Volume of storage required for 1 in 100yr storm event + 40% addition for climate change = 120.6 cu.m. Attenuation tank 10.0 x 6.5 x 2.0m deep					

Escher Silverman		Page 1
Lone Barn Studios Stanbridge Lane Romsey SO51 0HE	Hook Lane Aldingbourne Pumped Attenuation	
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IH 124 Mean Annual Flood

Input

Return Period (years)	100	SAAR (mm)	779.000	Urban	0.000
Area (Ha)	50.000	Soil	0.400	Region Number	7

Results l/s

QBAR Rural	192.8
QBAR Urban	192.8
Q 100 years	615.0
Q 1 year	163.9
Q 2 years	169.8
Q 5 years	246.8
Q 10 years	312.3
Q 20 years	386.2
Q 25 years	414.1
Q 30 years	436.9
Q 50 years	505.1
Q 100 years	615.0
Q 200 years	722.9
Q 250 years	757.7
Q 1000 years	994.8

Escher Silverman		Page 2
Lone Barn Studios Stanbridge Lane Romsey SO51 0HE	Hook Lane Aldingbourne Pumped Attenuation	
Date September 2019 File Attenuation Tank.SRC	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Summary of Results for 100 year Return Period (+40%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
480 Winter	2.0	2.0	11.8662	1.8662	119.4	O K
600 Winter	2.0	2.0	11.8222	1.8222	116.6	O K
720 Winter	2.0	2.0	11.7707	1.7707	113.3	O K
960 Winter	2.0	2.0	11.6807	1.6807	107.6	O K
1440 Winter	2.0	2.0	11.4832	1.4832	94.9	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
480 Winter	12.08	462
600 Winter	10.18	564
720 Winter	8.85	592
960 Winter	7.09	736
1440 Winter	5.18	1042

Escher Silverman		Page 3
Lone Barn Studios Stanbridge Lane Romsey SO51 0HE	Hook Lane Aldingbourne Pumped Attenuation	
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Micro Drainage	Source Control W.11.2	

Rainfall Details

Region	ENG+WAL	Cv (Summer)	0.750	Summer Storms	Yes
Return Period (years)	100	Cv (Winter)	0.840	Winter Storms	Yes
M5-60 (mm)	19.500	Shortest Storm (mins)	15	Climate Change %	+40
Ratio-R	0.350	Longest Storm (mins)	1440		

Time / Area Diagram

Total Area (ha) = 0.210

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.210

Escher Silverman		Page 4
Lone Barn Studios Stanbridge Lane Romsey SO51 0HE	Hook Lane Aldingbourne Pumped Attenuation	
Date September 2019 File Attenuation Tank.SRC	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Tank/Pond Details

Invert Level (m) 10.000 Ground Level (m) 12.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.00	64.0	1.00	64.0	2.00	64.0	3.00	64.0	4.00	64.0	5.00	64.0
0.20	64.0	1.20	64.0	2.20	64.0	3.20	64.0	4.20	64.0		
0.40	64.0	1.40	64.0	2.40	64.0	3.40	64.0	4.40	64.0		
0.60	64.0	1.60	64.0	2.60	64.0	3.60	64.0	4.60	64.0		
0.80	64.0	1.80	64.0	2.80	64.0	3.80	64.0	4.80	64.0		

Pump Outflow Control

Invert Level of Control 10.000

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)	Depth (m)	Flow (l/s)
0.10	2.0	0.60	2.0	1.60	2.0	2.60	2.0	5.00	2.0	7.50	2.0
0.20	2.0	0.80	2.0	1.80	2.0	3.00	2.0	5.50	2.0	8.00	2.0
0.30	2.0	1.00	2.0	2.00	2.0	3.50	2.0	6.00	2.0	8.50	2.0
0.40	2.0	1.20	2.0	2.20	2.0	4.00	2.0	6.50	2.0	9.00	2.0
0.50	2.0	1.40	2.0	2.40	2.0	4.50	2.0	7.00	2.0	9.50	2.0



Edward Rees (Domusea Developments)

By Email only: ed@edwardrees.com

Our Ref: 17894/LR

1st November 2019

Dear Edward,

Thomas Telford House
Sun Valley Business Park
Winnall Close
Winchester SO23 6LB

RE: Hook Lane, Aldingbourne, PO20 3TE

We are writing regarding the intrusive investigation undertaken at the above-named site.

Brief

The Soils Limited quotation (reference Q21895, dated 25th September 2019) set the scope of the investigation. The investigation was to comprise infiltration test to BRE DG365:2016 to inform for a surface water soakaway system.

General

The site had an approximate area of 0.48ha and was located at Hook Lane, Aldingbourne, PO20 3TE at O.S Land Ranger Grid Reference of SU 935 045.

A site location plan has been included as Figure 1.

Site Works

Site works were undertaken on the 16th October 2019 and comprised the excavation of four machine excavated trial pits (TPSK1, TPSK1B, TPSK2 and TPSK2B). The trial hole locations were chosen by Soils Limited and confirm by the client Edward Rees prior to the investigation. The depths of the trial holes were to be up to 3.00m bgl as quoted, however due to the discovery of the water table at 1.90m bgl in both TPSK1 and TPSK2 these trial holes were backfilled, and fresh pits were dug 2.00m away from the original holes to 1.39m and 1.40m bgl (TPSK1B and TPSK2B). Following the construction of the trial holes, infiltration tests in accordance of the principles of BRE DG365:2016 were carried out within TPSK1B and TPSK2B.

A trial hole location plan is included as Figure 2.

Upon completion the trial holes were backfilled with arisings and mounded over for future settlement.

Ground Conditions

The ground conditions encountered during the site investigation have been summarised in Table 1.

Topsoil (TS) River Terrace Deposits (RTD)

Table 1 – Summary of Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Description
	Top	Base	
TS	0.00	0.30	Grass topped soft brown sandy SILT. Occasional angular fine flint. Fine rootlets present.
RTD	0.30	1.90 ¹	Soft orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub rounded to sub angular fine flint and chalk. Occasional fine rootlets up to 1.4m.

Notes: ¹ encountered to base of trial hole

Infiltration Testing

Infiltration tests were performed within trial pits TPSK1B and TPSK2B, in order to provide guidance on the suitability of the ground for the adoption of a surface water drainage system. The tests were undertaken within the River Terrace Deposits to depths of 1.39m bgl in TPSK1B and 1.40m bgl in TPSK2B. The tests comprised piping water via a water source supplied by the client into the open trial hole, the drop in water level over time was then recorded to give an indication of soakage potential.

BRE DG365:2016 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test is completed once 75% of the water present has drained away, in order to determine whether or not the underlying ground conditions may be suitable for surface water drainage.

Table 2 presents the infiltration test results performed within TPSK1 and TPSK2.

Table 2 - Infiltration Test Results

Trial Hole (Test No.)	Test Stratum	Test Depth (m bgl)	Infiltration Rate (m/sec)	Test duration (minutes)
TPSK1B(1)	RTD	1.39	N/A	312
TPSK2B(1)	RTD	1.40	N/A	327

One infiltration test was conducted within each of the trial pits TPSK1B and TPSK2B. However, due to the high clay content of the tested strata there was negligible infiltration over the test period meaning that an infiltration rate was unable to be calculated for either trial pit. The maximum head loss observed over the test period was 8% and

therefore it was not possible to calculate an infiltration rate, nor was it possible to extrapolate the data to calculate an infiltration rate.

Full results are included within Appendix A.

Conclusions

Given the observed infiltration over the test period, it is considered that alternative methods of surface water disposal should be sought due to the poor infiltration discovered from the investigation. It should also be noted that the water table was located at 1.90m bgl at the base of the clay, therefore it would not be possible for a soakaway to be located at a greater depth.

The following attachments make up the remainder of this letter report.

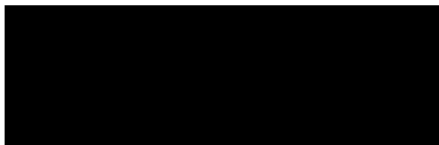
Figure 1. Site Location Plan

Figure 2. Trial Hole Location Plan

Appendix A. Field Data

Should you have any further questions please do not hesitate to contact the undersigned.

Yours Sincerely



Michael Foulkes

Placement Geo-Technical Engineer



Figure 1 – Site location Plan

Figure number
1

Title
Site Location Map

Project
Springfield, Hook Lane, Aldingbourne, PO20 3TE

Date
October 2019

Client
Edward Rees (Domusea Developments)

Reference
17894

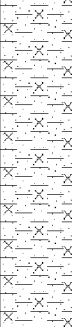
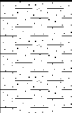
Figure 2. Trial Hole Location Plan

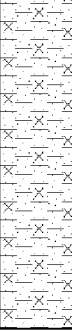
Figure number**2****Title****Trail hole location plan**

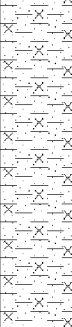
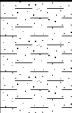
Project**Springfield, Hook Lane, Aldingbourne, PO20 3TE****Date****October 2019**

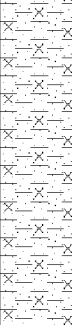
Client**Edward Rees (Domusea Developments)****Reference****17894**

Appendix A. Field Data

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR 			Trial Pit Log		Trial Pit No. TPSK1 Sheet 1 of 1	
Project Name: Springfield, Hook Lane				Project No.: 17894		Method:		Hole Type TP
Location: Springfield, Hook Lane, Aldingbourne, PO20 3TE				Support:		Scale 1:25		
Client: Edward Rees (Domusea Developments)				Trial Pit Length: 1.60m		Trial Pit Width: 0.60m		Logged By MF
Dates: 16/10/2019		Level:		Co-ords:				
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D		0.30			TOPSOIL. Grass topped soft brown sandy SILT. Occasional fine angular flint. Fine rootless present	
	0.50	D					Soft orangish brown slightly sandy silty CLAY. Sand is fine to coarse. Rare sub angular to sub rounded fine to medium flint and chalk fragments. Occasional fine rootless. RIVER TERRACE DEPOSITS.	
	0.90	D						
	1.30	D B		1.40				
	1.50	D B					Soft to firm orangish brown gravelly slightly sandy CLAY/SILT. Gravel is sub rounded to sub angular fine to medium flint and chalk. RIVER TERRACE DEPOSITS.	
	1.90	D B		1.80 1.90			Orangish brown slightly silty SAND. Sand is fine to medium. Occasional sub rounded fine flint and chalk fragments. RIVER TERRACE DEPOSITS.	
							End of Pit at 1.900m	
General Remarks: Groundwater encountered at base of hole. Maximum rootlet depth of 1.40m.								Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks:								

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SP			Trial Pit Log		Trial Pit No. TPSK1B Sheet 1 of 1	
Project Name: Springfield, Hook Lane				Project No.: 17894		Method:		Hole Type TP
Location: Springfield, Hook Lane, Aldingbourne, PO20 3TE				Support:		Scale 1:25		
Client: Edward Rees (Domusea Developments)				Trial Pit Length: 1.60m		Trial Pit Width: 0.60m		Logged By MF
Dates: 16/10/2019			Level:		Co-ords:			
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			TOPSOIL. Grass topped soft brown sandy SILT. Occasional fine angular flint. Fine rootless present	
				1.40			Soft orangish brown slightly sandy silty CLAY. Sand is fine to coarse. Rare sub angular to sub rounded fine to medium flint and chalk fragments. Occasional fine rootless. RIVER TERRACE DEPOSITS.	
							End of Pit at 1.390m	
General Remarks: Infiltration test conducted within TPSK1B. Maximum rootlet depth of 1.40m.							Sample Type D: Disturbed B: Bulk J: Jar W: Water	
Groundwater Remarks:								

 Soils Limited Newton House, Cross Road, Tadworth KT20 5SR				Trial Pit Log			Trial Pit No. TPSK2 Sheet 1 of 1	
Project Name: Springfield, Hook Lane				Project No.: 17894		Method:		Hole Type TP
Location: Springfield, Hook Lane, Aldingbourne, PO20 3TE						Plant:		
Client: Edward Rees (Domusea Developments)				Trial Pit Length: 1.80m		Trial Pit Width: 0.60m		Scale 1:25 Logged By MF
Dates: 16/10/2019				Level:		Co-ords:		
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D		0.30			TOPSOIL. Grass topped soft brown sandy SILT. Occasional angular fine flint. Fine rootless present	
	0.50	D						
	0.90	D B			Soft to firm orangish brown gravelly slightly sandy CLAY/SILT. Gravel is sub rounded to sub angular fine to medium flint and chalk. RIVER TERRACE DEPOSITS.			
	1.50	D B				Orangish brown slightly silty SAND. Sand is fine to medium. Occasional sub rounded fine flint and chalk fragments. RIVER TERRACE DEPOSITS.		
	1.90	D B		1.80 1.90		End of Pit at 1.900m		
General Remarks: Groundwater encountered at base of hole. Maximum rootlet depth of 1.30m.								Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks:								

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR 			Trial Pit Log		Trial Pit No. TPSK2B Sheet 1 of 1	
Project Name: Springfield, Hook Lane				Project No.: 17894		Method:		Hole Type TP
Location: Springfield, Hook Lane, Aldingbourne, PO20 3TE				Support:		Scale 1:25		
Client: Edward Rees (Domusea Developments)				Trial Pit Length: 1.80m		Trial Pit Width: 0.60m		Logged By MF
Dates: 16/10/2019			Level:		Co-ords:			
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			TOPSOIL. Grass topped soft brown sandy SILT. Occasional angular fine flint. Fine rootless present	
				1.40			Soft orangish brown slightly sandy silty CLAY. Sand is fine to coarse. Rare sub angular to sub rounded fine to medium flint and chalk fragments. Occasional fine rootless. RIVER TERRACE DEPOSITS.	
							End of Pit at 1.400m	
General Remarks: Infiltration test conducted within TPSK2B. Maximum rootlet depth of 1.30m.								Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks:								

Soakaway Calculations

Seakaway Test No.	TPSK1B (test 1)
Contract:	Hook Lane
Contract No.	17894

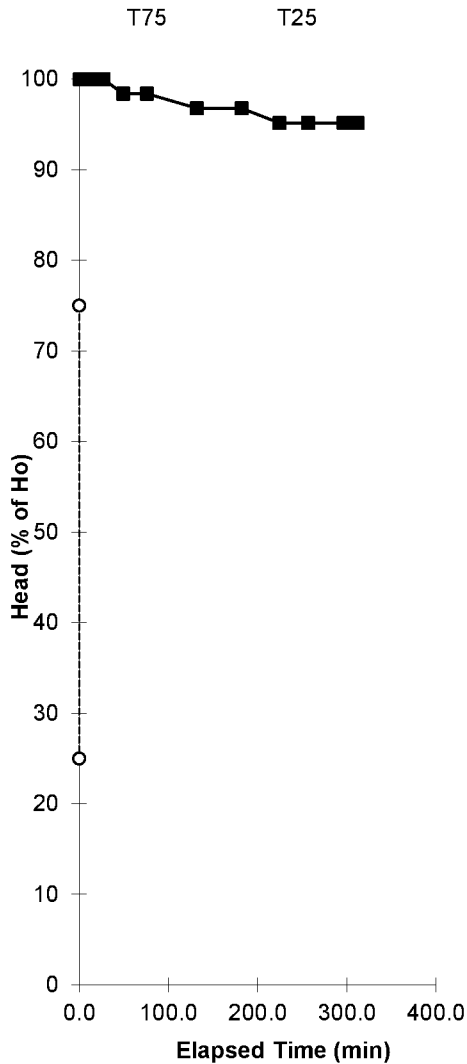
Field Test

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

Depth of Pit	1.39 m
Width of Pit	0.60 m
Length of Pit	0.90 m
Depth of Pit Sealed	0.62 m
ap50	1.47 m ²
Vp75-25	0.1674 m ³
t75-25	0.0 min
water used	0.3348 m ³
i	N/A m/sec.

Field Data

<i>Depth to Water</i>	<i>Elapsed Time</i>	<i>Head of Water</i>	<i>Head of Water</i>
(m)	(min)	(% of Ho)	(m)
0.77	0	100	0.62
0.77	1.1	100	0.62
0.77	2.6	100	0.62
0.77	9.9	100	0.62
0.77	21.3	100	0.62
0.77	27.1	100	0.62
0.78	49.3	98	0.61
0.78	76.0	98	0.61
0.79	132.2	97	0.60
0.79	181.8	97	0.60
0.8	224.6	95	0.59
0.80	256.7	95	0.59
0.8	296.7	95	0.59
0.80	311.9	95	0.59
T75	0.000	75	
T25	0.000	25	
T75-25	0.000	Derived from Best Fit	



Comments

Negligible infiltration over the test period of 312 minutes.

SOILS LIMITED

**Newton House, Cross Road, Tadworth
Surrey, KT20 5SR**

Telephone: 01737 814 221
Facsimile: 01737 812 557

Soakaway Calculations

Seakaway Test No.	TPSK2B (test 1)
Contract:	Hook Lane
Contract No.	17894

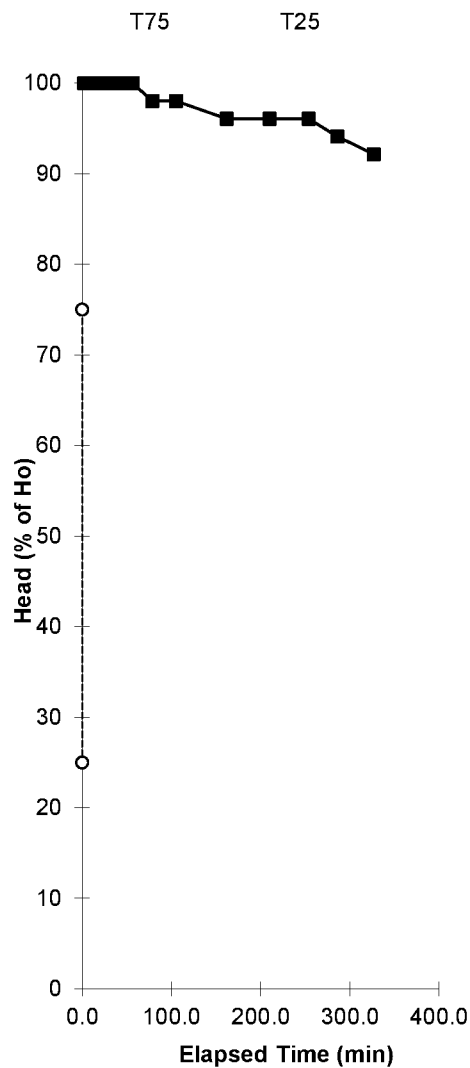
Field Test

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

Depth of Pit	1.40 m
Width of Pit	0.60 m
Length of Pit	1.20 m
Depth of Pit Soaked	0.51 m
ap50	1.638 m ²
V _p 75-25	0.1836 m ³
t75-25	0.0 min
water used	0.3672 m ³
i	N/A m/sec.

Field Data

Depth to Water	Elevated Time	Head of Water	Head of Water
(m)	(min)	(% of Ho)	(m)
0.89	0	100	0.51
0.89	2.4	100	0.51
0.89	6.3	100	0.51
0.89	13.5	100	0.51
0.89	25.4	100	0.51
0.89	30.9	100	0.51
0.89	39.4	100	0.51
0.89	50.8	100	0.51
0.89	56.7	100	0.51
0.90	78.8	98	0.50
0.9	105.2	98	0.50
0.91	162.0	96	0.49
0.91	210.4	96	0.49
0.91	253.9	96	0.49
0.92	286.2	94	0.48
0.93	326.9	92	0.47
T75	0.000	75	
T25	0.000	25	
T75-25	0.000	Derived from Best Fit	



Comments

Negligible infiltration over the test period of 327 minutes.

SOILS LIMITED

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