



KEYTECH DEVELOPMENT DESIGN LTD

Residential Development
Lilac Grove
Leek
ST13 7DA



June 26th 2024

SURFACE WATER INFILTRATION TEST RESULTS TO BRE DIGEST 365

Date of tests: 27.06.24

Three tests were undertaken on site, in accordance with BRE Digest 365.

TRIAL PIT – OBSERVATIONS

The trial pit was excavated to 3.20m long x 0.8m wide x 2.76m deep filled with water 1.81m below ground level for all tests.

Trail Pit							
3.2m X 0.8m X 1.81mDeep							
Mins	Depth Below Ground		Mins	Depth Below Ground		Mins	Depth Below Ground
Test 1			Test 2			Test 3	
26.06.24			26.06.24			26.06.24	
0	1.81		0	1.81		0	1.80
5	1.99		5	1.96		5	1.91
10	2.14		10	2.02		10	1.98
15	2.28		15	2.07		15	2.03
30	2.43		30	2.23		30	2.14
45	2.52		45	2.34		45	2.23
60	2.60		60	2.44		60	2.32
75	2.68		75	2.55		75	2.41
90	EMPTY		90	2.64		90	2.51
			105	2.70		105	2.58
			120	Empty		120	2.64
						135	2.70
						150	Empty

TRIAL PIT 1- CALCULATIONS

Trial Pit was 3.2m long x 0.8m wide x 2m deep



TEST 1

DEPTH OF WATER = 2.76-1.81=0.95m

75% Effective Depth=2.522

25% Effective Depth= 2.047

75% - 25% Effective Depth = 0.4755m

Volume of outflow based on 75% to 25% effective depth (0.4755m)

$$V = 3.2 \times 0.8 \times (2.522 - 2.047) \quad \mathbf{V = 1.217m^3}$$

Maximum surface through which outflow occurs = pit sides x 50% effective depth + base of pit
 $= (3.2 \times 0.4755)2 + (0.8 \times 0.4755)2 + (3.2 \times 0.8) \quad \mathbf{= 6.364m^2}$

From graph time = 39mins (2340 Secs)

$$J = \frac{1.217}{6.364 \times 2340} \quad \mathbf{= 8.172 \times 10^{-5} m/sec}$$

TEST 2

DEPTH OF WATER = 2.76-1.81=0.95m

75% Effective Depth=2.522

25% Effective Depth= 2.047

75% - 25% Effective Depth = 0.4755m

Volume of outflow based on 75% to 25% effective depth (0.4755m)

$$V = 3.2 \times 0.8 \times (2.522 - 2.047) \quad \underline{V = 1.217\text{m}^3}$$

Maximum surface through which outflow occurs = pit sides x 50% effective depth + base of pit
 $= (3.2 \times 0.4755)2 + (3.2 \times 0.4755)2 + (3.2 \times 0.8) \quad \underline{= 6.364\text{m}^2}$

From graph time = 59mins (3540 Secs) 22528.56

$$J = \frac{1.217}{6.364 \times 3540} \quad \underline{= 5.402 \times 10^{-5} \text{ m/sec}}$$

TEST 3

DEPTH OF WATER = 2.76-1.80=0.96m

75% Effective Depth=2.520

25% Effective Depth= 2.04

75% - 25% Effective Depth = 0.480m

Volume of outflow based on 75% to 25% effective depth (0.480m)

$$V = 3.2 \times 0.8 \times (2.520 - 2.04) \quad \underline{V = 1.228\text{m}^3}$$

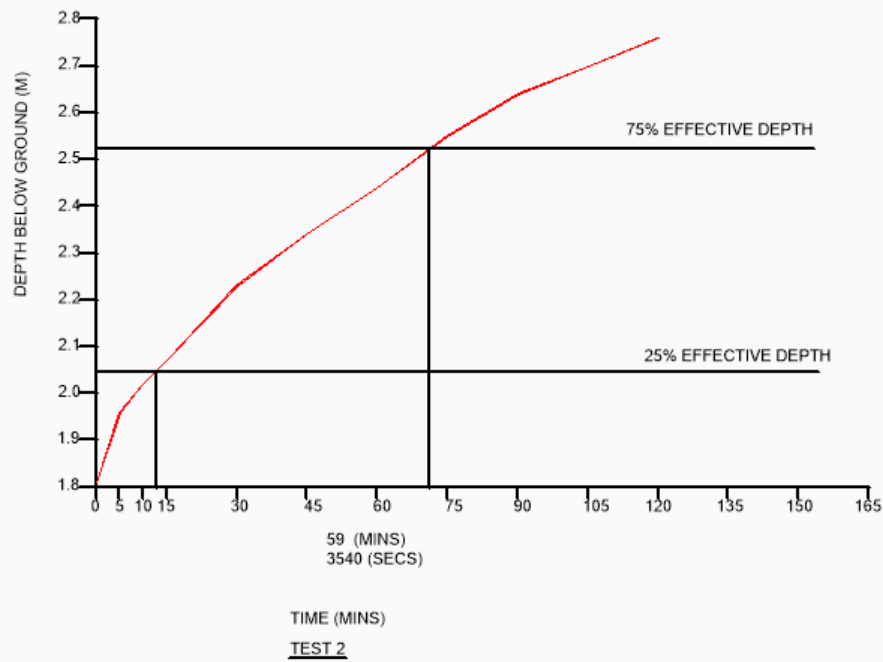
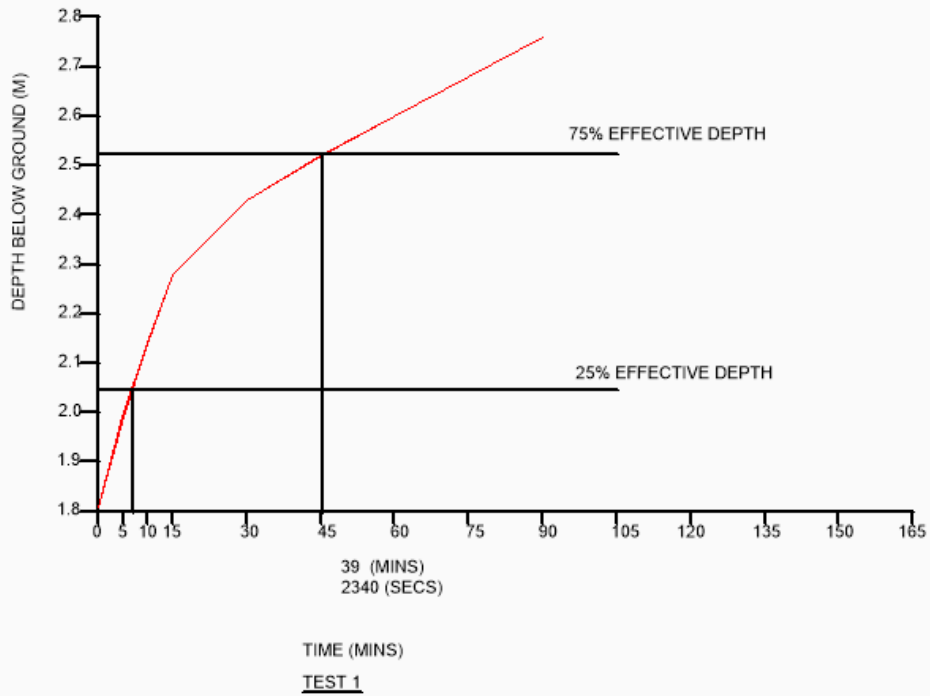
Maximum surface through which outflow occurs = pit sides x 50% effective depth + base of pit
 $= (3.2 \times 0.480)2 + (0.8 \times 0.480)2 + (3.2 \times 0.8) \quad \underline{= 6.4\text{m}^2}$

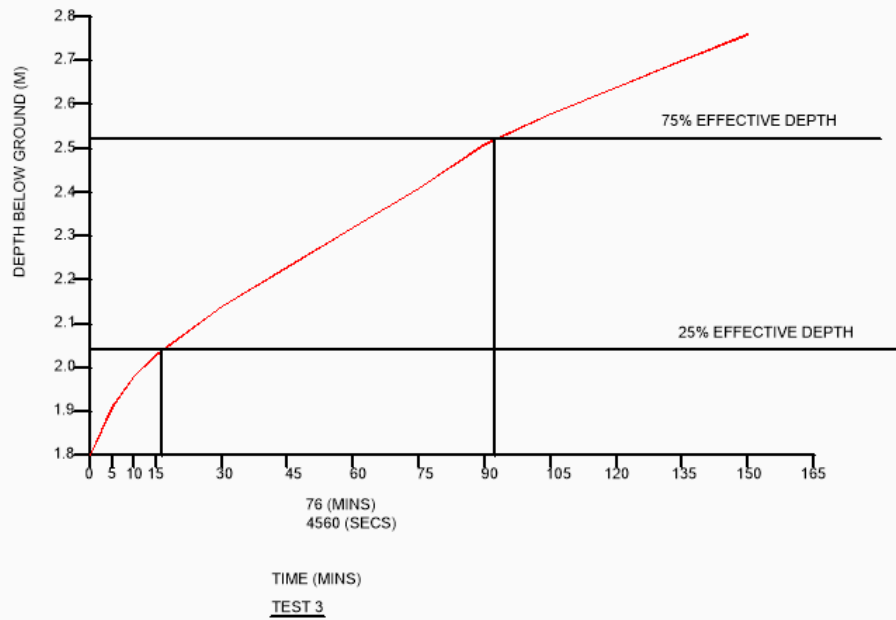
From graph time = 76mins (4560 Secs) 29184

$$J = \frac{1.228}{6.4 \times 4560} \quad \underline{= 4.208 \times 10^{-5} \text{ m/sec}}$$



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Foul Infiltration Test

An excavation was made to the dimensions of 1mx1mx1m, within the center of this a further excavation was made to the dimensions of 0.3mx0.3mx0.3m. The smaller excavation was filled with water twice and allowed to drain out each time. It was then filled with water a third time and was timed between 75%-25% depth. The results are shown below.

Test

Foul pit – sump = $0.3 \times 0.3 \times 0.3 = 27\text{LTS}$

Time taken to infiltrate from 75%-25% depth = 1mins45secs

105 seconds / 150 = VP rate of 0.7seconds



1.00 Summary

- 1.01 Infiltration testing was undertaken at the above development to determine whether ground conditions are suitable for surface water disposal via infiltration techniques.
- 1.02 A trial pit was excavated to the dimensions indicated.
- 1.03 Testing was undertaken on 26.06.24
- 1.04 Three tests were undertaken in the Trial Pit. The third test infiltrated fully, with an infiltration rate of 4.208 x 10⁻⁵ m/sec. This infiltration rate will be used for the purposes of sizing appropriate infiltration infrastructure for the proposed development.

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