

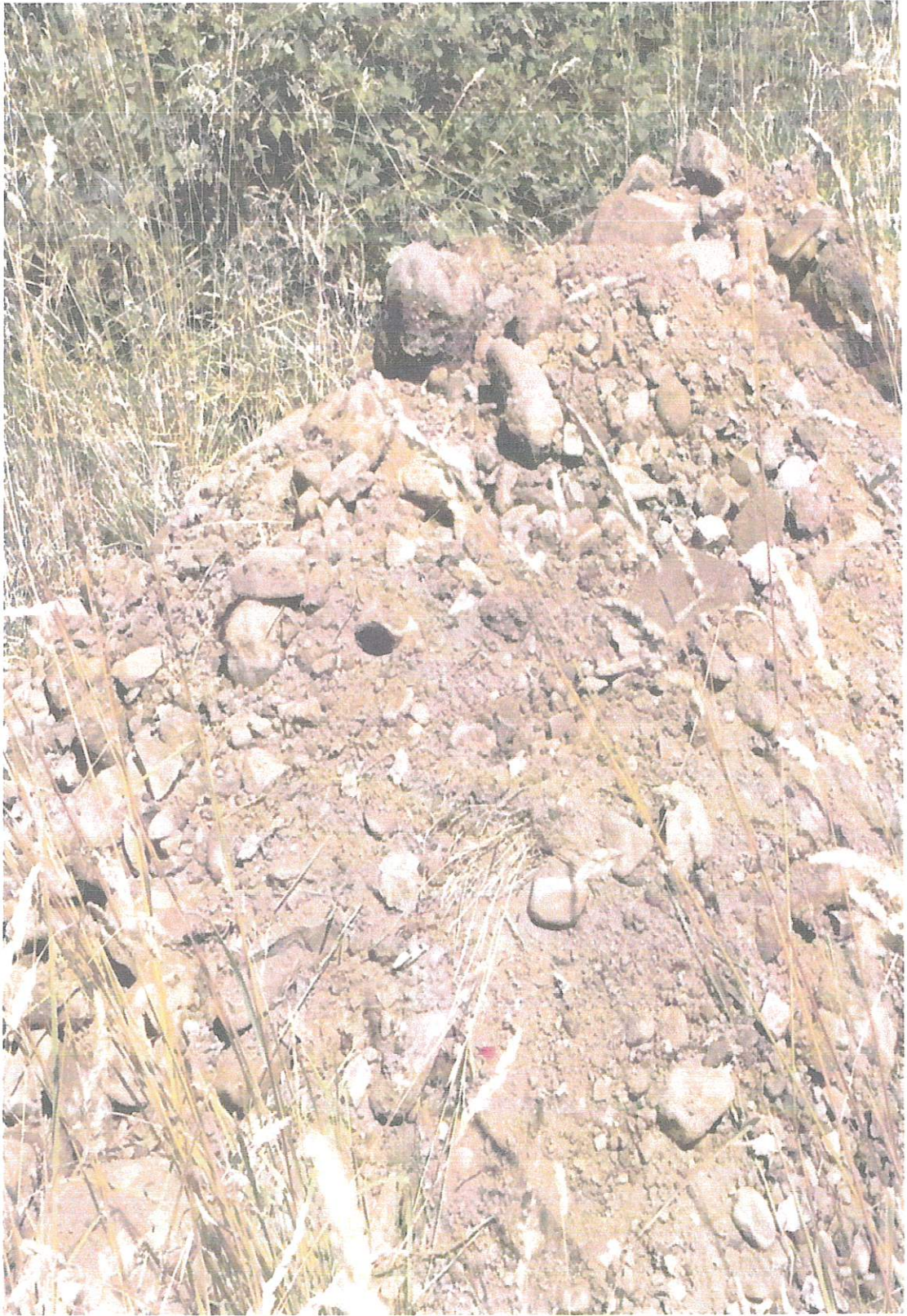
CONDITION 16

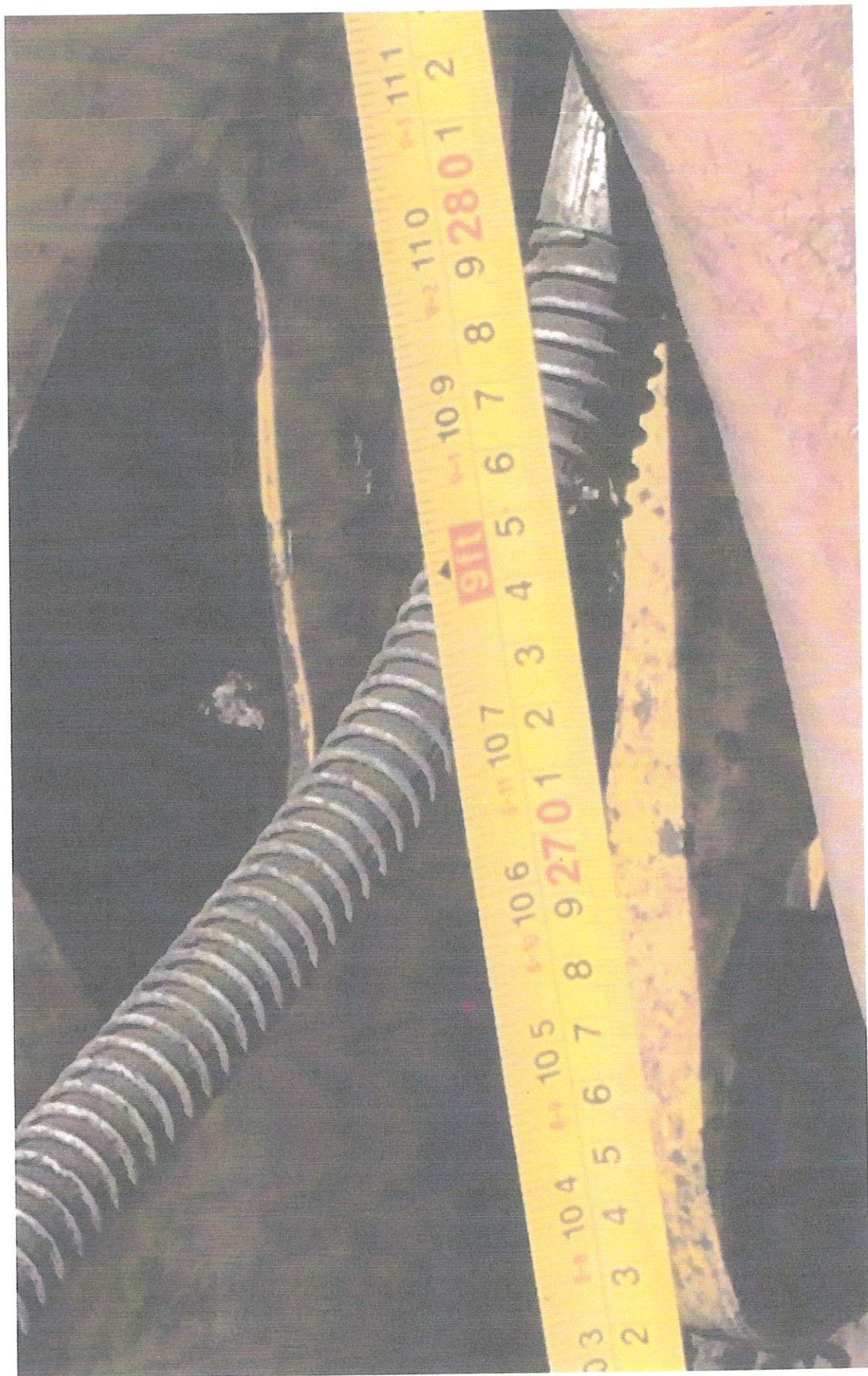
SPR HOOPER

CONSULTING CIVIL AND STRUCTURAL ENGINEERS

**TRIAL PIT EXCAVATION
INDICATING DRY SOIL
AND NO WATERTABLE AT A DEPTH
OF 2.70 METRES**







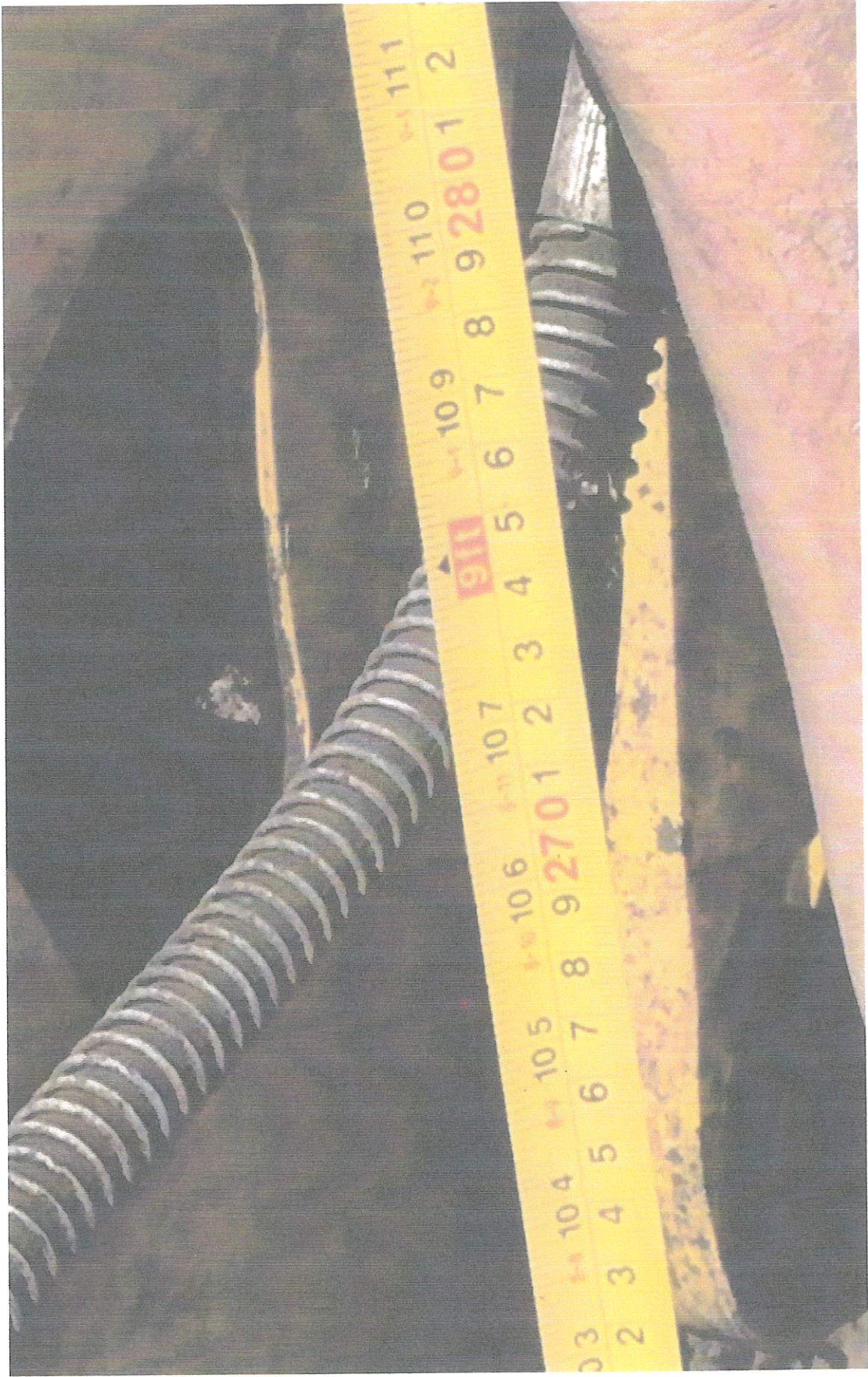
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**HYDRAULIC CALCULATIONS FOR
PROPOSED HIGHWAY SOAKAWAY
OLD WELFARE HALL SITE
GLYNNEATH
NEATH PORT TALBOT**

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Proj: 4913.016

Ref : Trial Pit 1

Date: 17/10/19

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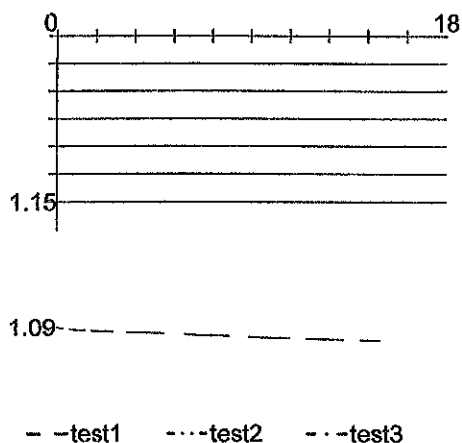
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365*Test pit details*

Reference = TP01; Length = 0.83m; Breadth = 0.85m ; Dept h = 1.15m
Depth of water at start = 1.09 m

Test data

Time Vs Water depth plot



Step	Test 1	
	Time (minutes)	Water depth (m)
1	0	1.09
2	1	1.1
3	2	1.11
4	4	1.11
5	7	1.12
6	10	1.13
7	15	1.14

Maximum effective storage depth	= 0.06 m
Volume outflow, V_{p75-25}	= 0.021 m ³
Mean outflow surface area, a_{p50}	= 0.81 m ²
Time taken for mean outflow, t_{p75-25}	= 10.5 ; min.
Soil infiltration rate	= 0.000042 ; m/s

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Ref : Trial Pit 2

Date: 17/10/19

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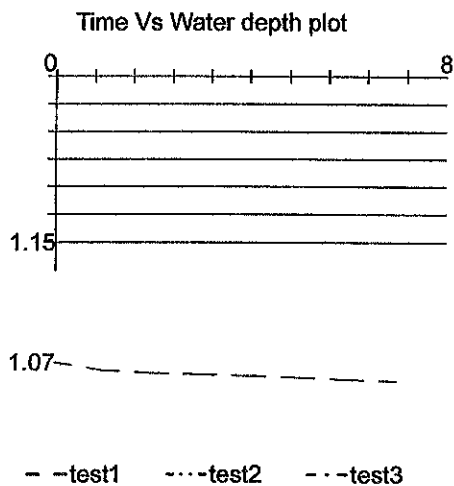
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365

Test pit details

Reference = TP02; Length = 0.76m; Breadth = 0.82m ; Dept h = 1.15m
Depth of water at start = 1.07 m

Test data



Step	Test 1	
	Time (minutes)	Water depth (m)
1	0	1.07
2	1	1.1
3	2	1.11
4	4	1.12
5	7	1.14

Maximum effective storage depth	= 0.08 m
Volume outflow, V_{p75-25}	= 0.025 m ³
Mean outflow surface area, a_{p50}	= 0.75 m ²
Time taken for mean outflow, t_{p75-25}	= 4.83 ; min.
Soil infiltration rate	= 0.00011 ; m/s

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Ref : Trial Pit 3

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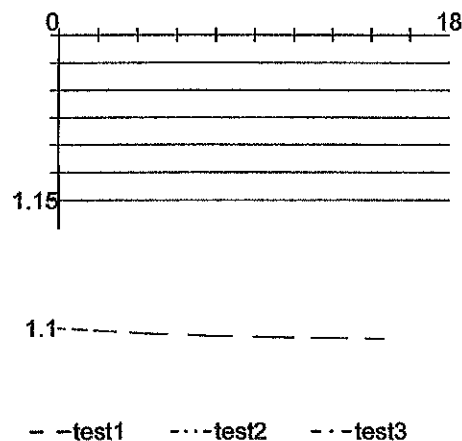
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365*Test pit details*

Reference = TP013; Length = 0.82m ; Breadth = 0.83 m; Depth = 1.15m
Depth of water at start = 1.1 m

Test data

Time Vs Water depth plot



Test 1		
Step	Time (minutes)	Water depth (m)
1	0	1.1
2	1	1.11
3	2	1.11
4	4	1.12
5	7	1.13
6	10	1.14
7	15	1.14

Maximum effective storage depth = 0.05 m
Volume outflow, V_{p75-25} = 0.017 m³
Mean outflow surface area, a_{p50} = 0.76 m²
Time taken for mean outflow, t_{p75-25} = 10 ; min.
Soil infiltration rate = 0.000037 ; m/s

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Ref : Highway Soakaway

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Residential Development Glynneath
General components

SOIL INFILTRATION RATES

TRIAL PIT 1 - 0.000042 m/sec

TRIAL PIT 2 - 0.000110 m/sec

TRIAL PIT 3 - 0.000037 m/sec

AVERAGE INFILTRATION RATE = 0.000063 m/sec

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Ref : Highway Soakaway

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Residential Development Glynneath
General components

Soakaway design

Soakaway location - England/Wales
Area draining to soakaway A = 727 m²
Invert to soakaway = 1.15 m
Soakaway type - Trench
Breadth of soakaway = 4 m
Effective storage depth D_e = 0.8 m
Soil infiltration rate f = 0.000063 m/s
Rainfall ratio r = 0.25
Permeability of fill P_{er} = 95 %
Length increment = 0.1 m (computed length will be rounded to this value)

Design calculations to BRE Digest 365

Length of soakaway L = 7.2 m
Effective outflow area a_{s50} = 0.5*((2*B*D_e)+(2*L*D_e))
= 0.5*((2*4*0.8)+(2*7.2*0.8))
= 8.96 m²
Storage volume V_s = L*B*D_e*P_{er}/100
= 7.2*4*0.8*95/100
= 21.89 m³
Time of emptying half storage volume t_{s50} = V_s*0.5/(a_{s50}*f*60*60)
= 21.89*0.5/(8.96*0.000063*60*60)
= 5.4 hrs.

D min.	R m	I m ³	O m ³	S m ³	A _{max} m ²
10	0.011	8.34	0.34	8	1938
20	0.015	11.27	0.68	10.59	1456
30	0.019	13.52	1.02	12.51	1231
40	0.021	15.14	1.35	13.79	1116
60	0.025	18.03	2.03	16	965
120	0.032	23.26	4.06	19.19	811
240	0.041	29.73	8.13	21.6	734
360	0.047	33.91	12.19	21.72	731
600	0.055	40.32	20.32	20	761
1440	0.075	54.68	48.77	5.91	939