Appendix 3

Geotechnical Test Results (PSL20/1337)

Infiltration Test Results (TP4 and TP5)

LABORATORY REPORT

4043

Contract Number: PSL20/1337

Report Date: 06 March 2020

Client's Reference: 44856

Client Name: Eastwood & Partners
St Andrews House
23 Kingfield Road
Sheffield
S11 9AS

For the attention of: Josephine Hicks

Contract Title: Lower Eastfield Farm, Thurgoland, Sheffield

Date Received: 3/3/2020
Date Commenced: 3/3/2020
Date Completed: 6/3/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
S Royle (Laboratory Manager)	S Eyre (Senior Technician)	L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP02		D	2.60	3.00	Brown highly weathered MUDSTONE.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP02		D	2.60	3.00	14			41	24	17	60	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Lower Eastfield Farm, Thurgoland, Sheffield

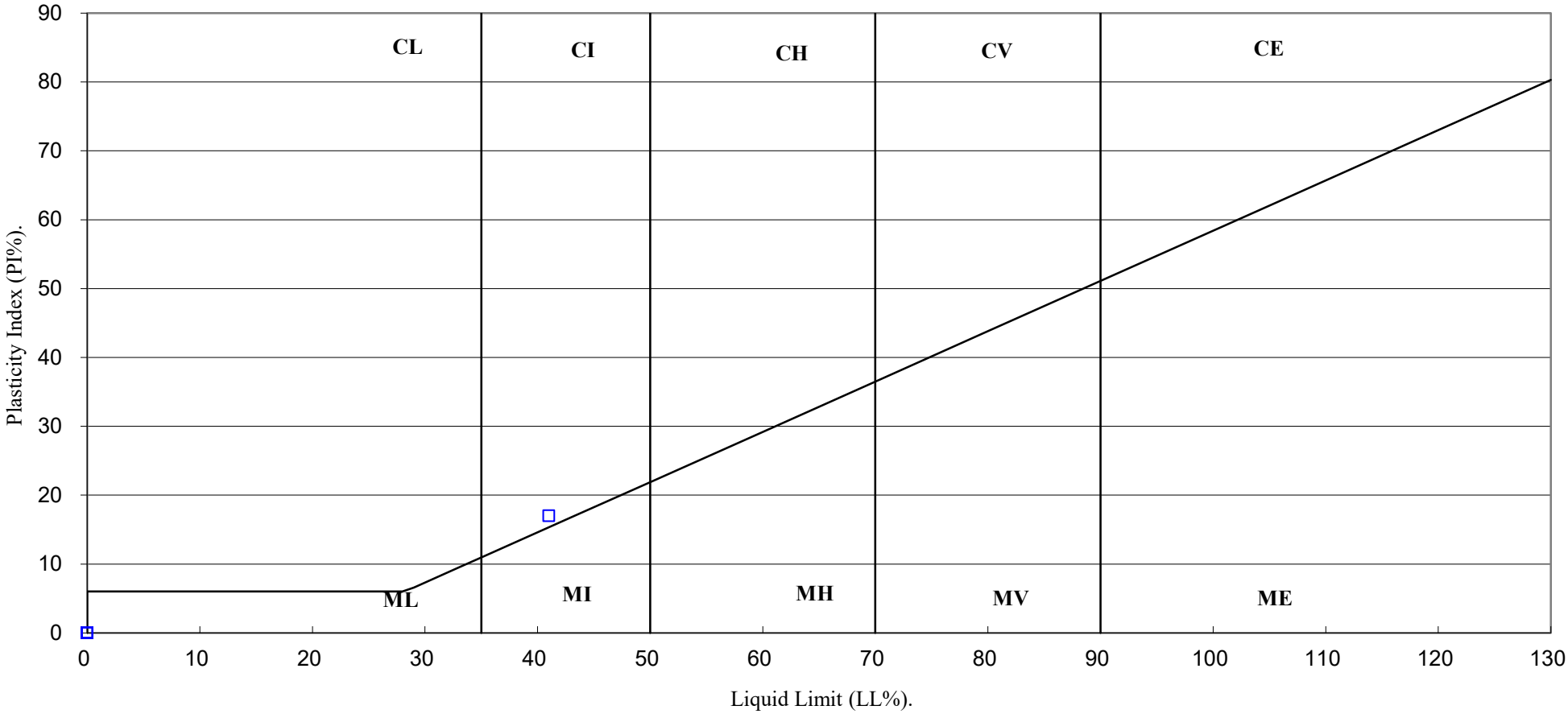
Contract No:

PSL20/1337

Client Ref:

44856

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Lower Eastfield Farm, Thurgoland, Sheffield	**Contract No:** PSL20/1337 **Client Ref:** 44856

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

Test No. **TP4 - Test 1**

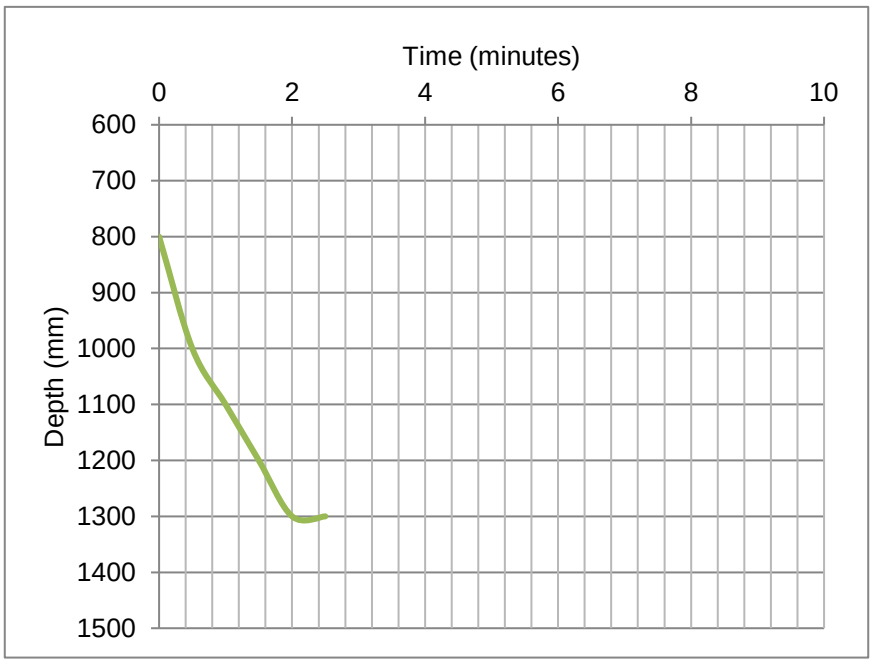
Test Pit Dimensions

Length = **2200** mm
Width = **650** mm
Depth = **1300** mm (Total depth)

Plan area = **1.43** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **800** mm

Time (min)	Depth (mm)
0	**800**
0.5	**1000**
1	**1100**
1.5	**1200**
2	**1300**
2.5	**1300**



Test Pit Log

Depth (m)	Description
0-0.2	TOPSOIL
0.2-1.5	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP4 - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **800** mm
Start time = **0** min

Average water depth: **250** mm

Change in water depth: **500** mm

Final parameters

Depth to water = **1300** mm
End time = **3** min

Time interval: **2.5** min

Effective Storage Volume of Water in the Trial Pit	=	**0.715**	m³
75% Effective Depth	=	**925**	mm from ground level
25% Effective Depth	=	**1175**	mm from ground level
Time at 75% Effective Depth	=	**0**	minutes
Time at 25% Effective Depth	=	**1.4**	minutes

V_{p75-25} = **0.36** m³

a_{p50} = **2.86** m²

t_{p75-25} = **66** sec

f = **1.9E-03 m/sec**

Average Soakaway Rate = **4.8E-03** m³/sec
Average soakaway area = **2.86** m² (sides + base)

BR365 Soil Infiltration Rate = 1.9E-03 m/sec
Average Infiltration Rate = 1.7E-03 m/sec

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

Test No. **TP4 - Test 2**

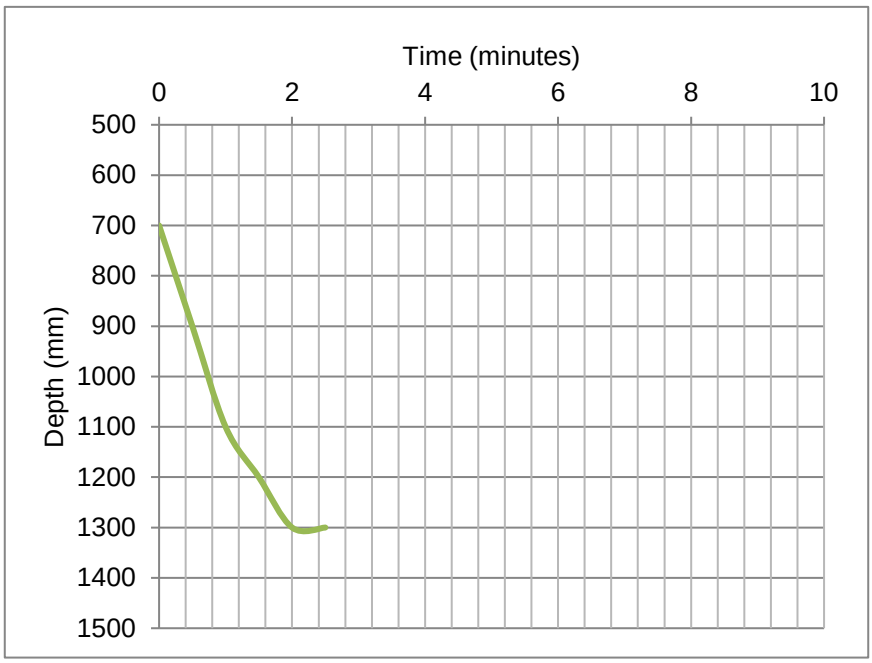
Test Pit Dimensions

Length = **2200** mm
Width = **650** mm
Depth = **1300** mm (Total depth)

Plan area = **1.43** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **700** mm

Time (min)	Depth (mm)
0	**700**
0.5	**900**
1	**1100**
1.5	**1200**
2	**1300**
2.5	**1300**



Test Pit Log

Depth (m)	Description
0-0.2	TOPSOIL
0.2-1.5	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP4 - Test 2

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **700** mm
Start time = **0** min

Average water depth: **300** mm

Change in water depth: **600** mm

Final parameters

Depth to water = **1300** mm
End time = **3** min

Time interval: **2.5** min

Effective Storage Volume of Water in the Trial Pit = **0.858** m³
75% Effective Depth = **850** mm from ground level
25% Effective Depth = **1150** mm from ground level
Time at 75% Effective Depth = **0** minutes
Time at 25% Effective Depth = **1.15** minutes

V_{p75-25} = **0.43** m³

a_{p50} = **3.14** m²

t_{p75-25} = **45** sec

f = **3.0E-03 m/sec**

Average Soakaway Rate = **5.7E-03** m³/sec
Average soakaway area = **3.14** m² (sides + base)

BR365 Soil Infiltration Rate = 3.0E-03 m/sec
Average Infiltration Rate = 1.8E-03 m/sec

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

Test No. **TP4 - Test 3**

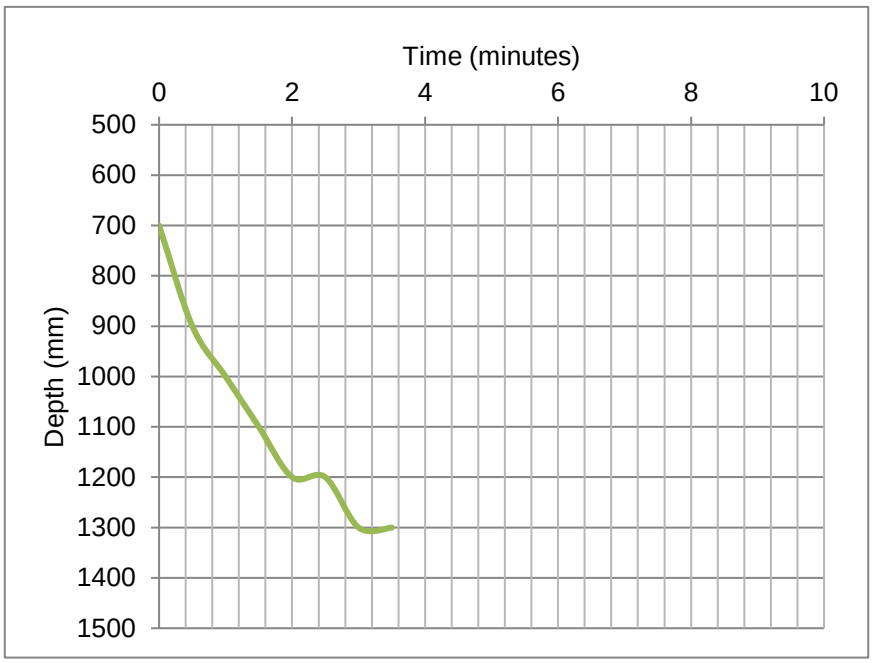
Test Pit Dimensions

Length = **2200** mm
Width = **650** mm
Depth = **1300** mm (Total depth)

Plan area = **1.43** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **700** mm

Time (min)	Depth (mm)
0	**700**
0.5	**900**
1	**1000**
1.5	**1100**
2	**1200**
2.5	**1200**
3	**1300**
3.5	**1300**



Test Pit Log

Depth (m)	Description
0-0.2	TOPSOIL
0.2-1.5	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP4 - Test 3

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where: V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **700** mm
Start time = **0** min

Average water depth: **300** mm

Change in water depth: **600** mm

Final parameters

Depth to water = **1300** mm
End time = **4** min

Time interval: **3.5** min

Effective Storage Volume of Water in the Trial Pit = **0.858** m³
75% Effective Depth = **850** mm from ground level
25% Effective Depth = **1150** mm from ground level
Time at 75% Effective Depth = **0** minutes
Time at 25% Effective Depth = **1.65** minutes

V_{p75-25} = **0.43** m³

a_{p50} = **3.14** m²

t_{p75-25} = **74** sec

f = **1.9E-03 m/sec**

Average Soakaway Rate = **4.1E-03** m³/sec
Average soakaway area = **3.14** m² (sides + base)

BR365 Soil Infiltration Rate = 1.9E-03 m/sec
Average Infiltration Rate = 1.3E-03 m/sec

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

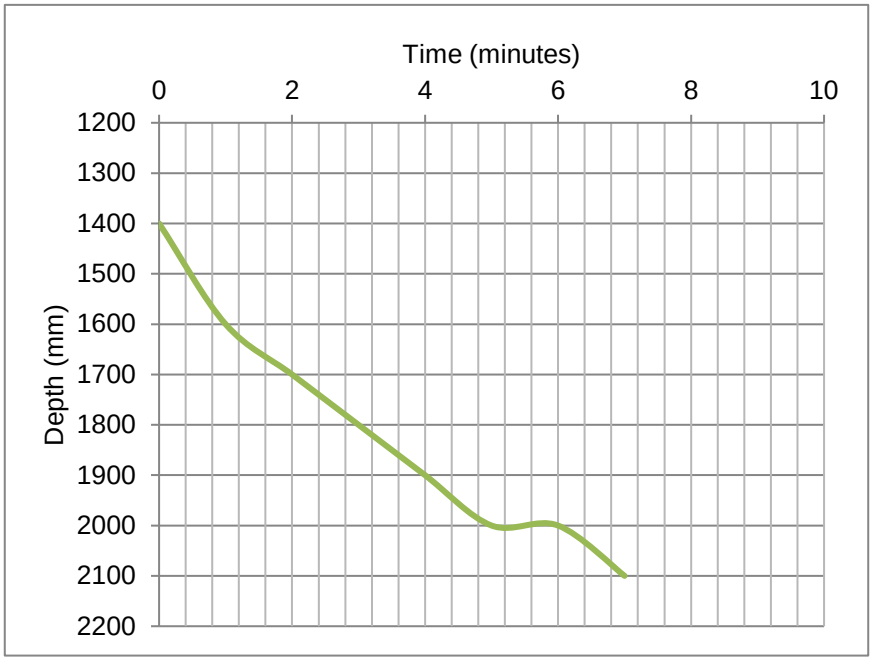
Test No. **TP5 - Test 1**

Test Pit Dimensions

Length = **3400** mm Plan area = **2.38** m²
Width = **700** mm
Depth = **2200** mm (Total depth)

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **1400** mm

Time (min)	Depth (mm)
0	**1400**
1	**1600**
2	**1700**
3	**1800**
4	**1900**
5	**2000**
6	**2000**
7	**2100**



Test Pit Log

Depth (m)	Description
0-0.1	Reworked TOPSOIL
0.1-0.5	MADE GROUND - Granular
0.5-1.1	MADE GROUND - Cohesive
1.1-1.7	Clayey GRAVEL with low cobble content
1.7-2.2	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP5 - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **1400** mm
Start time = **0** min

Average water depth: **450** mm

Change in water depth: **700** mm

Final parameters

Depth to water = **2100** mm
End time = **7** min

Time interval: **7** min

Effective Storage Volume of Water in the Trial Pit = **1.904** m³
75% Effective Depth = **1600** mm from ground level
25% Effective Depth = **2000** mm from ground level
Time at 75% Effective Depth = **1** minutes
Time at 25% Effective Depth = **5** minutes

V_{p75-25} = **0.95** m³

a_{p50} = **5.66** m²

t_{p75-25} = **240** sec

f = **7.0E-04 m/sec**

Average Soakaway Rate = **4.0E-03** m³/sec
Average soakaway area = **6.07** m² (sides + base)

BR365 Soil Infiltration Rate = 7.0E-04 m/sec
Average Infiltration Rate = 6.5E-04 m/sec

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

Test No. **TP5 - Test 2**

Test Pit Dimensions

Length = **3400** mm
Width = **700** mm
Depth = **1900** mm (Total depth)

Plan area = **2.38** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **1300** mm

Time (min)	Depth (mm)
0	**1300**
1	**1400**
2	**1500**
3	**1600**
4	**1700**
5	**1700**
6	**1700**
7	**1800**
9	**1900**

Test Pit Log

Depth (m)	Description
0-0.1	Reworked TOPSOIL
0.1-0.5	MADE GROUND - Granular
0.5-1.1	MADE GROUND - Cohesive
1.1-1.7	Clayey GRAVEL with low cobble content
1.7-2.2	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP5 - Test 2

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where: V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **1400** mm
Start time = **0** min

Average water depth: **250** mm

Change in water depth: **500** mm

Final parameters

Depth to water = **1900** mm
End time = **9** min

Time interval: **9** min

Effective Storage Volume of Water in the Trial Pit = **1.428** m³
75% Effective Depth = **1450** mm from ground level
25% Effective Depth = **1750** mm from ground level
Time at 75% Effective Depth = **2** minutes
Time at 25% Effective Depth = **6.5** minutes

V_{p75-25} = **0.71** m³

a_{p50} = **4.84** m²

t_{p75-25} = **300** sec

f = **4.9E-04 m/sec**

Average Soakaway Rate = **2.2E-03** m³/sec
Average soakaway area = **4.43** m² (sides + base)

BR365 Soil Infiltration Rate = 4.9E-04 m/sec
Average Infiltration Rate = 5.0E-04 m/sec

EASTWOOD & PARTNERS **Sheet 1 of 2**
(Consulting Engineers) Ltd

PROJECT:	**Lower Eastfield Farm, Thurgoland**	**Job No. 44856**	**Date 18/02/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared JH**	**Checked GCB**

Test No. **TP5 - Test 3**

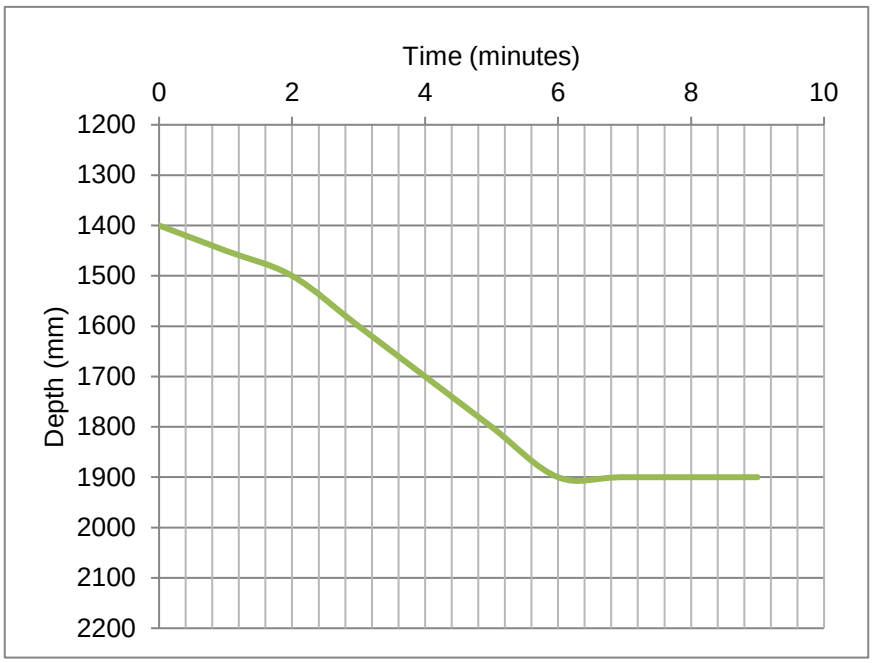
Test Pit Dimensions

Length = **3400** mm
Width = **700** mm
Depth = **1900** mm (Total depth)

Plan area = **2.38** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **1400** mm

Time (min)	Depth (mm)
0	**1400**
1	**1450**
2	**1500**
3	**1600**
4	**1700**
5	**1800**
6	**1900**
7	**1900**
9	**1900**



Test Pit Log

Depth (m)	Description
0-0.1	Reworked TOPSOIL
0.1-0.5	MADE GROUND - Granular
0.5-1.1	MADE GROUND - Cohesive
1.1-1.7	Clayey GRAVEL with low cobble content
1.7-2.2	COBBLES with some sandy clayey gravel

PROJECT:	Lower Eastfield Farm, Thurgoland	Job No. 44856	Date 18/02/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JH	Checked GCB

Test No. TP5 - Test 3

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where: V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water = **1400** mm
Start time = **0** min

Average water depth: **250** mm

Change in water depth: **500** mm

Final parameters

Depth to water = **1900** mm
End time = **9** min

Time interval: **9** min

Effective Storage Volume of Water in the Trial Pit = **1.19** m³
75% Effective Depth = **1525** mm from ground level
25% Effective Depth = **1775** mm from ground level
Time at 75% Effective Depth = **2** minutes
Time at 25% Effective Depth = **4.6** minutes

V_{p75-25} = **0.60** m³

a_{p50} = **4.43** m²

t_{p75-25} = **138** sec

f = **9.7E-04 m/sec**

Average Soakaway Rate = **2.2E-03** m³/sec
Average soakaway area = **4.43** m² (sides + base)

BR365 Soil Infiltration Rate = 9.7E-04 m/sec
Average Infiltration Rate = 5.0E-04 m/sec