Eastwood & Partners CONSULTING ENGINEERS

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Mr M Platts
Premier Group
51 Rimington Road
Wombwell
Barnsley
S73 8DQ

PR/AJK/SAE/43497-001

27 December 2018

Dear Martyn,

Wombwell High School

We are writing to report the findings of the infiltration testing undertaken on the above site on 17 and 18 December 2018.

The site comprises a former school, now demolished, and associated playing fields. The site is split into three terraces, with the upper terrace and former school present in the west of the site, and the lowest terrace present in the east of the site. A difference in level of approximately 5 m bgl is present between each terrace.

Site Works

Nine soakaway pits were excavated across the site, to depths of between 1.2 m and 2.3 m below ground level (bgl).

Water was then pumped in to each pit to a depth of at least 500 mm, and the change in water level was monitored at regular intervals over at least a three hour period, or until the water had drained from each pit, whichever came first. Between one and three infiltration tests were undertaken in each pit.

Two trial pits were additionally excavated to 2.4 m and 3.4 m bgl, in order to assess the depth of fill in the east of the uppermost terrace.

The locations of the soakaway and trial pits are shown on the Exploratory Hole Location Plan, drawing number 43497/001/A, which is appended to this report.

Ground Conditions

Historically, a cut and fill earthworks exercise has occurred on the site in order to create three flat terraces for the former school playing fields. Generally the surrounding land slopes from the west down to the east.

Topsoil comprising clayey sand, and occasionally sandy clay, was encountered in the excavations across the site to depths of between 0.3 m and 0.5 m bgl. This was underlain by clayey sand and gravel in SA3, SA6 and SA7, encountered to the base of the pit in SA3 and underlain by weak to medium strong sandstone at 1.1 m and 0.9 m bgl respectively in SA6 and SA7.

In the remainder of exploratory holes, made ground comprising sandy gravelly reworked clay, with occasional to frequent cobbles of sandstone with depth was encountered, with the depth of made ground increasing towards the east. This was underlain by natural sand and gravel from 0.6 m bgl in SA1 and SA4, and from 1.4 m bgl in SA7, and by weak to medium strong sandstone from depths of between 1.1 m and 2.25 m bgl in SA2, SA8, SA9, TP1 and TP2. Pits excavated in the west of each terrace generally recorded sandstone bedrock at shallower depth than those in the east of each terrace.

The trial pit and soakaway logs are appended to this report.

Infiltration Results

The results and calculation of Infiltration Results are appended to this report, and are summarised in the table below:

Soakaway	Test Material	BRE365 Soil Infiltration Rate (x10-6) m/s	Average Infiltration Rate
SA1 Test 1	Reworked clay over sand and gravel	34	31
SA1 Test 2		69	56
SA1 Test 3		47	57
SA2	Reworked clay over sandstone at base	0	0
SA3 Test 1	Sand and gravel	360	580
SA3 Test 2		240	360
SA3 Test 3		310	430
SA4 Test 1	Reworked clay over sand and gravel	21	34
SA4 Test 2		25	40
SA5 Test 1	Reworked clay over sand and gravel	45	66
SA5 Test 2		18	33
SA6 Test 1	Sand and gravel over sandstone	220	310
SA6 Test 2		120	180
SA6 Test 3		120	160

SA7 Test 1	Gravel over sandstone	33	39
SA7 Test 2		17	25
SA8	Reworked clay over sandstone	-	2.5
SA9 Test 1	Reworked clay over sandstone	98	98
SA9 Test 2		64	76
SA9 Test 3		61	79

Conclusion

Soakaways excavated within sand and gravel generally performed the best, with those soakaways whose pit walls generally comprised reworked clay performing the worst overall.

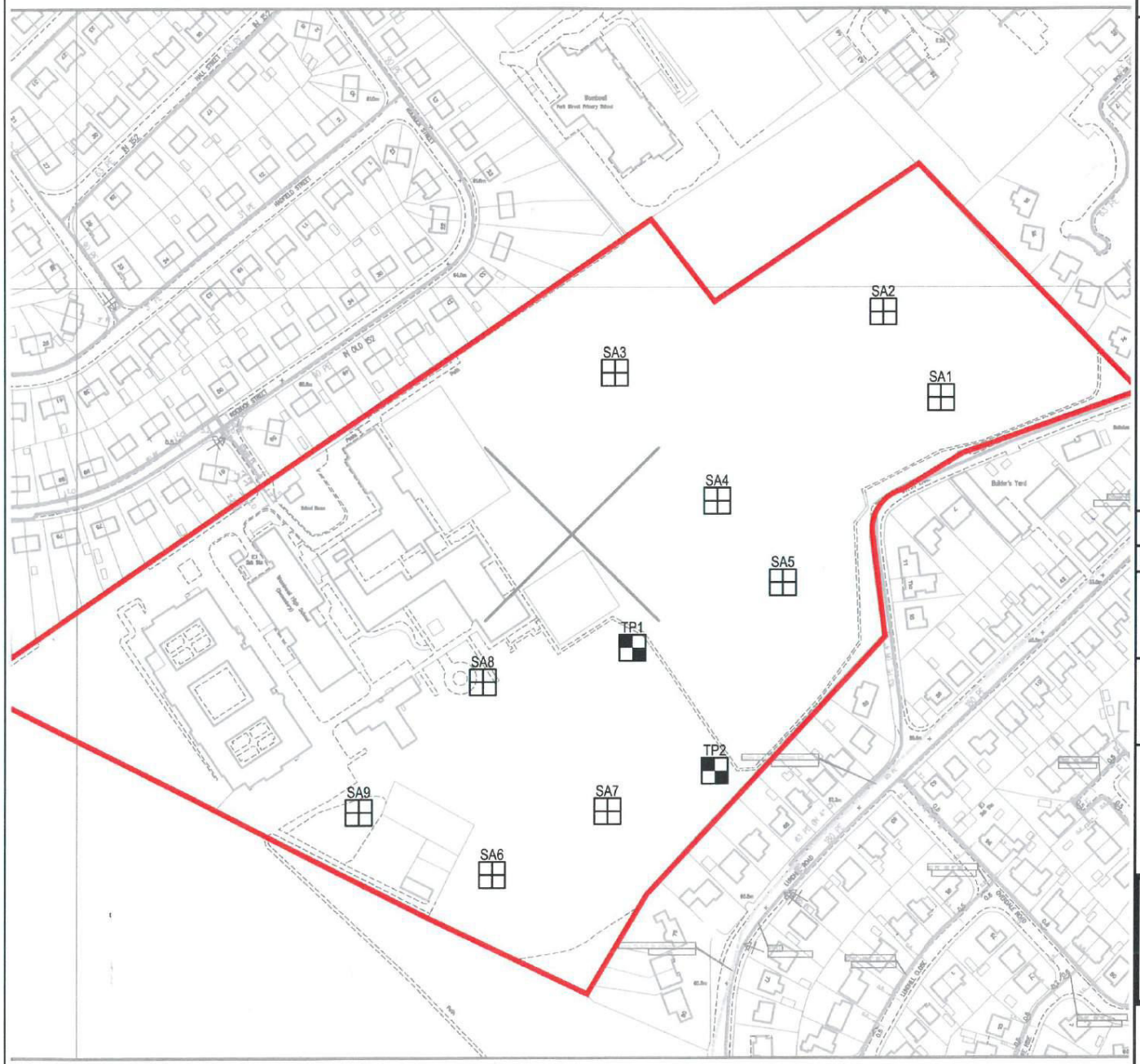
Therefore it is recommended soakaways be constructed within the sand and gravel generally found to the west of each terrace, and avoid the made ground, found to extend to significant depth towards the east of each terrace.

We trust that this meets with your approval, however if you have any comments or queries please do not hesitate to contact us.

Yours sincerely

Andrew Kerslake
Associate

Enc. Exploratory Hole Plan
Infiltration Results - SA1 to SA9
Trial Pit and Soakaway Logs



This plan shows those pipes owned by Cadent Gas Ltd in their role as a

INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

KEY:

- Approximate location of trial pits excavated by Eastwood and Partners on 18.12.18.
- Approximate location of soakaway excavated by Eastwood and Partners between 17.12.18 and 18.12.18.
- Site Boundary

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

PREMIER CONSTRUCTION NORTHERN LTD

WOMBWELL HIGH SCHOOL, GYPSY LANE, WOMBWELL

EXPLORATORY HOLE LOCATION PLAN

Eastwood & Partners
CONSULTING ENGINEERS
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SCALE WHEN PLOTTED AT A3	DRAWING STATUS
1:2000	INFORMATION

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
TC	?	19.12.18	43497/001	A

		TrialPit No **SA1** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 2.50m, 0.60m, Depth: 1.60m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown sandy CLAY.
			0.35			MADE GROUND: Light brown /orange brown sandy reworked CLAY.
			0.60			Brown Clayey SAND and GRAVEL with occasional to frequent cobbles. Gravel is fine to coarse angular to sub-angular of sandstone.
			1.60			Trialpit Complete at 1.600m

Remarks:

Stability:

		TrialPit No **SA2** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 2.90m, 0.60m, Depth: 2.25m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Gras sover dark brown clayey SAND.
			0.40			MADE GROUND: Firm brown sandy reworked CLAY.
			1.20			MADE GROUND: Stiff to friable brown mottled grey sandy gravelly reworked CLAY with occasional cobbles. Gravel is medium to coarse angular to sub-angular of sandstone.
			1.80			MADE GROUND: Grey brown friable sandyreworked CLAY.
			2.20			Strong brown SANDSTONE.
			2.25			Trialpit Complete at 2.250m

Remarks:

Stability:

		TrialPit No **SA3** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: Depth: 1.60m (2.90m × 0.60m)	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.40			Orange brown clayey SAND and GRAVEL. Gravel is medium to coarse angular to sub-angular of sandstone. Occasional becomng frequent cobbles with depth.
			1.60			Trialpit Complete at 1.600m

Remarks:

Stability:

		TrialPit No **SA4** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 3.10m, 0.65m, Depth: 1.50m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.30			MADE GROUND: Brown very sandy reworked CLAY.
			0.60			Orange brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular of sandstone. Occasional becoming frequent cobbles from 0.9 m bgl.
			1.50			Trialpit Complete at 1.500m

1
2
3
4

Remarks:

Stability:

		TrialPit No **SA5** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 2.80m, 0.65m, Depth: 1.80m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.30			MADE GROUND: Brown sandy gravelly reworked CLAY with occasional cobbles. Gravel is fine to coarse sub-angular of sandstone.
			1.40			Brown slightly clayey SAND and GRAVEL.Gravel is fine to coarse sub-angular of sandstone, with occasional cobbles.
			1.80			Trialpit Complete at 1.800m

Remarks:

Stability:

		TrialPit No **SA6** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 3.00m, Depth: 1.30m, 0.70m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.30			Yellow/orange brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular to subangular of sandstone. Frequent cobbles with depth.
			1.10			Weak to medium strong yellow brown SANDSTONE recovered as cobbles and gravel.
			1.30			Trialpit Complete at 1.300m

Remarks:

Stability:

		TrialPit No **SA7** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: 3.10m, 0.80m, Depth: 1.20m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.50			Orange brown slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular of sandstone, with frequent cobbles with depth.
			0.90			Medium strong SANDSTONE recoverd as sand gravel, with frequent cobbles.
			1.20			Trialpit Complete at 1.200m

Remarks:

Stability:

		TrialPit No **SA8** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: Depth: 1.30m (3.20m × 0.70m)	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.40			MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
			0.60			POSSIBLE MADE GROUND: Yellow/orange brown sandy very gravelly CLAY. Gravel is fine to medium sub-angular of sandstone.
			1.10			Extremely weak to weak grey brown SANDSTONE, recovered as tabular gravel.
			1.30			Trialpit Complete at 1.300m

Remarks:

Stability:

		TrialPit No **SA9** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: Depth: 1.25m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over dark brown clayey SAND.
			0.40			MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
			0.60			POSSIBLE MADE GROUND: Yellowish brown sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone.
			1.10			Weak to medium strong yellow brown SANDSTONE, recovered as tabular gravel and cobbles.
			1.25			Trialpit Complete at 1.250m

Remarks:

Stability:

		TrialPit No **TP1** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: m	Scale 1:25
Client: Premier Construction Northern Ltd.		Depth: 3.40m m	Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Dark Brown clayey SAND.
			0.40			MADE GROUND: Brown Sandy gravelly reworked CLAY with occasional cobbles. Gravel is fine to coarse sub-angular of SANDSTONE.
			1.00			MADE GROUND: Brown sclayey gravelly SAND. Gravel is fine to coarse sub-angular of SANDSTONE with occasional cobbles.
			1.30			MADE GROUND: Brown sandy gravelly reworked CLAY with occasional cobbles. Gravel is fine to coarse sub-angular of SANDSTONE.
			2.00			Extremely weak to weak grey brown SANDSTONE recovered as sand, gravel and occasional cobbles. Cobble content increases with depth.
			3.40			Trialpit Complete at 3.400m

1 2 3 4

Remarks:

Stability:

		TrialPit No **TP2** Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Wombwell High School	43497	Level:	19/12/2018
Location:		Dimensions: m Depth: 2.40m m	Scale 1:25
Client: Premier Construction Northern Ltd.			Logged

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Dark brown clayey SAND.
			0.30			MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to coarse sub-angular of SANDSTONE.
			0.80			MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to coarse sub-angular of SANDSTONE.
			1.20			MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is sub-angular of SANDSTONE.
			2.10			Medium strong brown SANDSTONE recovered as sand, gravel and cobbles.
			2.40			Trialpit Complete at 2.400m

Remarks:

Stability:

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. **SA1 - Test 1**

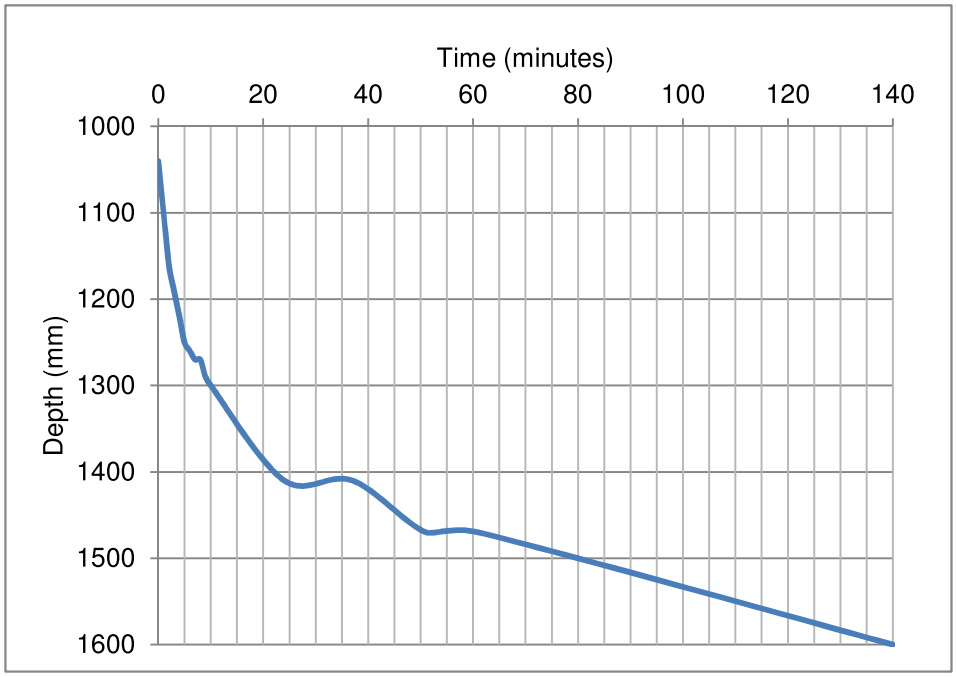
Test Pit Dimensions

Length = **2500** mm
Width = **600** mm
Depth = **1600** mm (Total depth)

Plan area = **1.5** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **1040** mm

Time (min)	Depth (mm)
0	**1040**
1	**1100**
2	**1160**
3	**1190**
4	**1220**
5	**1250**
6	**1260**
7	**1270**
8	**1270**
9	**1290**
10	**1300**
24	**1410**
37	**1410**
51	**1470**
61	**1470**
140	**1600**



Depth (m)	Description
0.00 - 0.35	TOPSOIL: Grass over dark brown sandy CLAY.
0.35 - 0.60	MADE GROUND: Light brown / orange brown sandy reworked CLAY.
0.60 - 1.60	Brown clayey SAND and GRAVEL with occasional to frequent cobbles. Gravel is fine to coarse angular to sub-angular of sandstone.

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. SA1 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **1040** mm
Start time = **0** min

Final parameters
Depth to water = **600** mm
End time = **140** min

Average water depth: **280** mm

Change in water depth: **560** mm

Time interval: **140** min

Effective Storage Volume of Water in the Trial Pit = **0.75** m³
75% Effective Depth = **1225** mm from ground level
25% Effective Depth = **1475** mm from ground level
Time at 75% Effective Depth = **4** minutes
Time at 25% Effective Depth = **64** minutes

= **0.38** m³

= **3.05** m²

= **3600** sec

= **3.4E-05 m/sec**

Average Soakaway Rate = **1.0E-04** m³/sec
Average soakaway area = **3.24** m² (sides + base)

V_{p75-25}
BR365 Soil Infiltration Rate = 3.4E-05 m/sec
a_{p50} **Average Infiltration Rate = 3.1E-05 m/sec**

t_{p75-25}

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. **SA1 - Test 2**

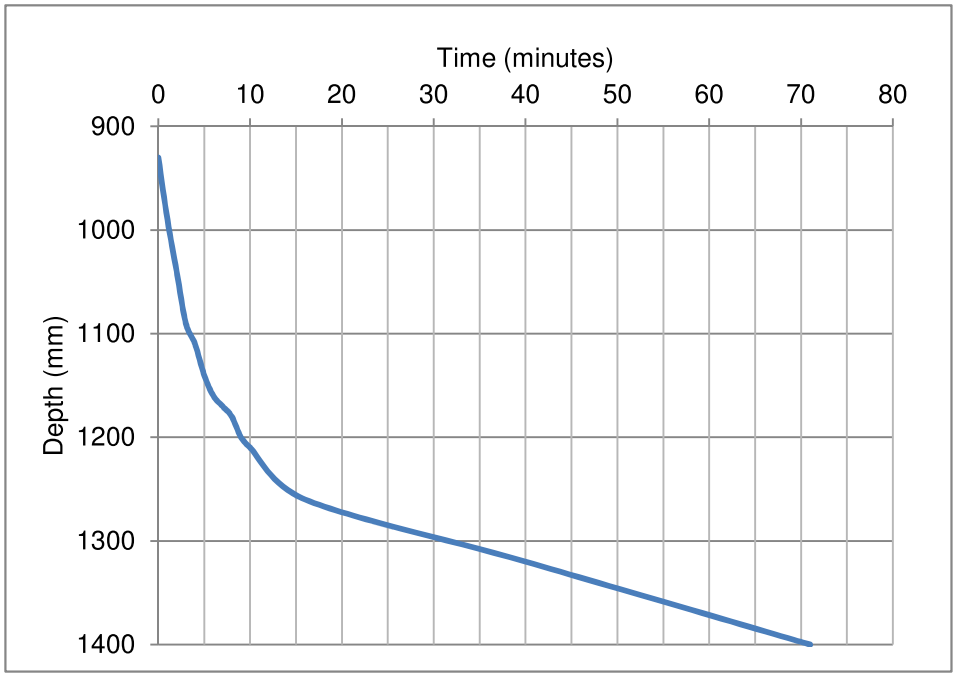
Test Pit Dimensions

Length = **2500** mm
Width = **600** mm
Depth = **1400** mm (Total depth)

Plan area = **1.5** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **930** mm

Time (min)	Depth (mm)
0	**930**
1	**990**
2	**1040**
3	**1090**
4	**1110**
5	**1140**
6	**1160**
7	**1170**
8	**1180**
9	**1200**
10	**1210**
16	**1260**
40	**1320**
71	**1400**



Depth (m)	Description
0.00 - 0.35	TOPSOIL: Grass over dark brown sandy CLAY.
0.35 - 0.60	MADE GROUND: Light brown / orange brown sandy reworked CLAY.
0.60 - 1.60	Brown clayey SAND and GRAVEL with occasional to frequent cobbles. Gravel is fine to coarse angular to sub-angular of sandstone.

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. SA1 - 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 = **930** mm
Start time = **0** min

Final parameters
Depth to water = **400** mm
End time = **71** min

Average water depth: **235** mm

Change in water depth: **470** mm

Time interval: **71** min

Effective Storage Volume of Water in the Trial Pit = **0.615** m³
75% Effective Depth = **1093** mm from ground level
25% Effective Depth = **1298** mm from ground level
Time at 75% Effective Depth = **3** minutes
Time at 25% Effective Depth = **30** minutes

V_{p75-25} = **0.31** m³

a_{p50} = **2.77** m²

t_{p75-25} = **1620** sec

= 6.9E-05 m/sec

Average Soakaway Rate = **1.7E-04** m³/sec
Average soakaway area = **2.96** m² (sides + base)

BR365 Soil Infiltration Rate = 6.9E-05 m/sec
Average Infiltration Rate = 5.6E-05 m/sec

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. **SA1 - Test 3**

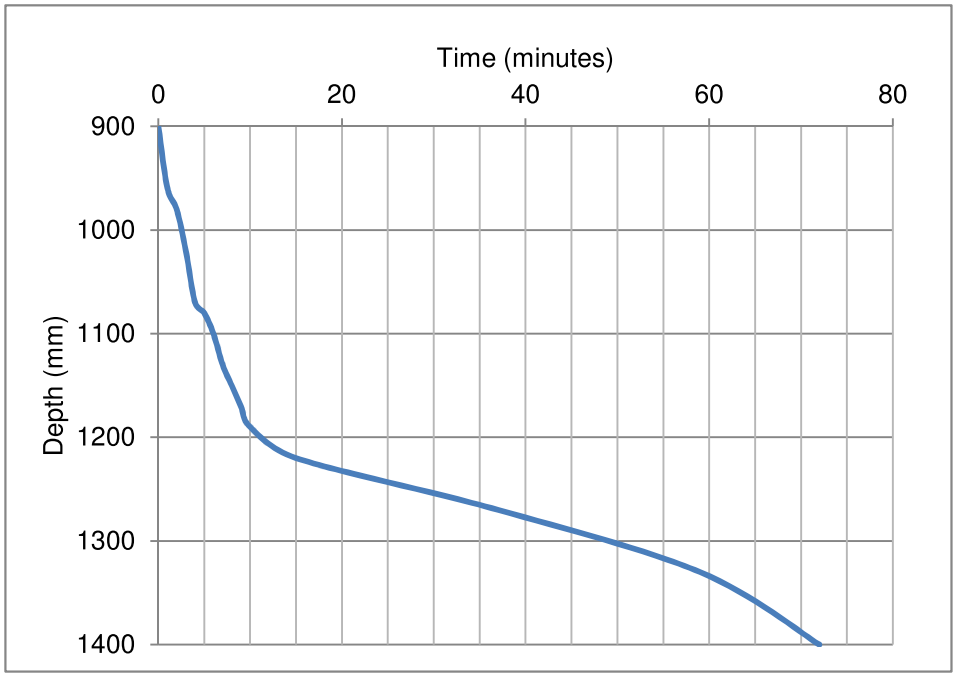
Test Pit Dimensions

Length = **2500** mm
Width = **600** mm
Depth = **1400** mm (Total depth)

Plan area = **1.5** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **900** mm

Time (min)	Depth (mm)
0	**900**
1	**960**
2	**980**
3	**1020**
4	**1070**
5	**1080**
6	**1100**
7	**1130**
8	**1150**
9	**1170**
10	**1190**
15	**1220**
37	**1270**
59	**1330**
72	**1400**



Depth (m)	Description
0.00 - 0.35	TOPSOIL: Grass over dark brown sandy CLAY.
0.35 - 0.60	MADE GROUND: Light brown / orange brown sandy reworked CLAY.
0.60 - 1.60	Brown clayey SAND and GRAVEL with occasional to frequent cobbles. Gravel is fine to coarse angular to sub-angular of sandstone.

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. SA1 - 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 = **900** mm
Start time = **0** min

Final parameters

Depth to water = **400** mm
End time = **72** min

Average water depth: **250** mm

Change in water depth: **500** mm

Time interval: **72** min

Effective Storage Volume of Water in the Trial Pit = **0.66** m³
75% Effective Depth = **1070** mm from ground level
25% Effective Depth = **1290** mm from ground level
Time at 75% Effective Depth = **4** minutes
Time at 25% Effective Depth = **45** minutes

V_{p75-25} = **0.33** m³

a_{p50} = **2.86** m²

t_{p75-25} = **2460** sec

f = 4.7E-05 m/sec

Average Soakaway Rate = **1.7E-04** m³/sec
Average soakaway area = **3.05** m² (sides + base)

BR365 Soil Infiltration Rate = 4.7E-05 m/sec
Average Infiltration Rate = 5.7E-05 m/sec

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared JA/SAE	Checked DN

Test No. **SA2 - Test 1**

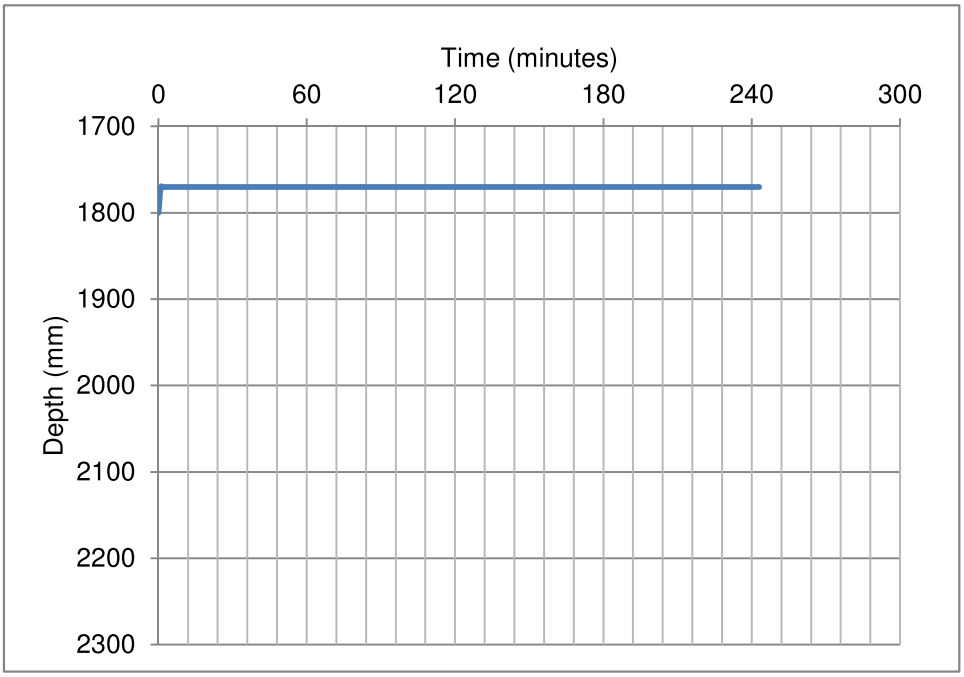
Test Pit Dimensions

Length = **2900** mm
Width = **600** mm
Depth = **2250** mm (Total depth)

Plan area = **1.74** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **1800** mm

Time (min)	Depth (mm)
0	**1800**
1	**1770**
2	**1770**
3	**1770**
4	**1770**
5	**1770**
6	**1770**
7	**1770**
8	**1770**
9	**1770**
10	**1770**
20	**1770**
39	**1770**
112	**1770**
203	**1770**
243	**1770**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.40 - 1.20	MADE GROUND: Firm brown sandy reworked CLAY.
1.20 - 1.80	MADE GROUND: Stiff to friable brown mottled grey sandy gravelly reworked CLAY with occasional cobbles. Gravel is medium to coarse angular to sub-angular of sandstone.
1.8-2.2	MADE GROUND: Grey brown friable sandyreworked CLAY.
2.2 - 2.25	Strong brown SANDSTONE.

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Test No. SA2 - 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 = **1770** mm
Start time = **0** min

Final parameters

Depth to water = **770** mm
End time = **243** min

Average water depth: **480** mm

Change in water depth: **0** mm

Time interval: **243** min

Effective Storage Volume of Water in the Trial Pit = **0.8352** m³
75% Effective Depth = **1890** mm from ground level
25% Effective Depth = **2130** mm from ground level
Time at 75% Effective Depth = **N/A** minutes
Time at 25% Effective Depth = **N/A** minutes

V_{p75-25} = **0.42** m³

a_{p50} = **3.42** m²

t_{p75-25} = **0** sec

= **N/A m/sec**

Average Soakaway Rate = **0.0E+00** m³/sec
Average soakaway area = **5.10** m² (sides + base)

BR365 Soil Infiltration Rate = 0.0E+00 m/sec
Average Infiltration Rate = 0.0E+00 m/sec

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Test No. **SA3 - Test 1**

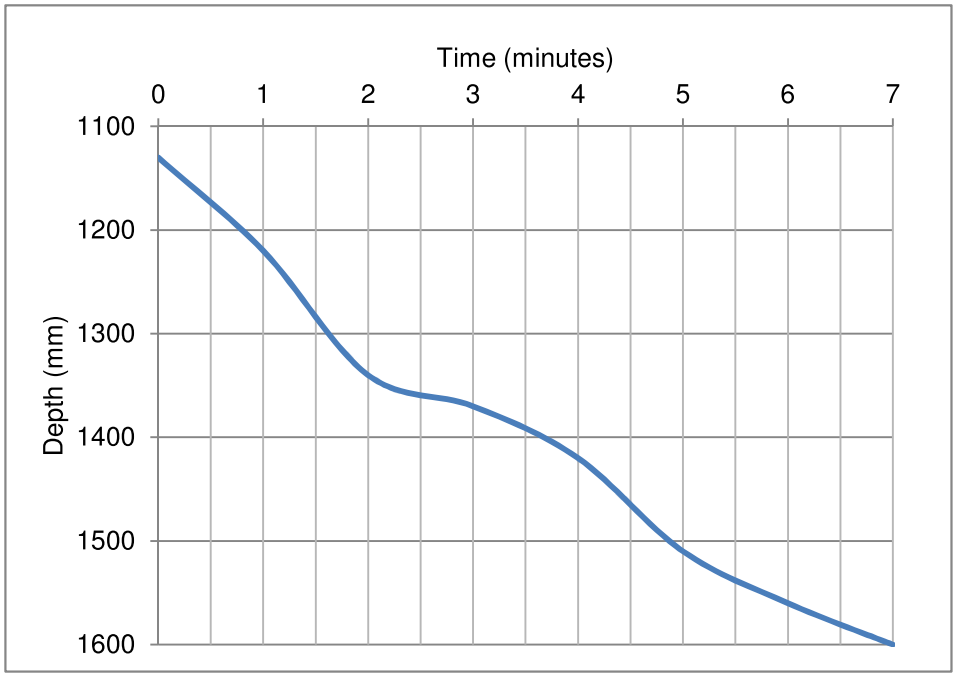
Test Pit Dimensions

Length = **2900** mm
Width = **600** mm
Depth = **1600** mm (Total depth)

Plan area = **1.74** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **1130** mm

Time (min)	Depth (mm)
0	**1130**
1	**1220**
2	**1340**
3	**1370**
4	**1420**
5	**1510**
6	**1560**
7	**1600**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.40 - 1.6	Orange brown clayey SAND and GRAVEL. Gravel is medium to coarse angular to sub-angular of sandstone. Occasional becomng frequent cobbles with depth.

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Test No. SA3 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **1130** mm
Start time = **0** min

Final parameters
Depth to water = **600** mm
End time = **7** min

Average water depth: **235** mm

Change in water depth: **470** mm

Time interval: **7** min

Effective Storage Volume of Water in the Trial Pit = **0.6612** m³
75% Effective Depth = **1315** mm from ground level
25% Effective Depth = **1505** mm from ground level
Time at 75% Effective Depth = **2** minutes
Time at 25% Effective Depth = **5** minutes

= **0.33** m³

= **3.07** m²

= **300** sec

= **3.6E-04** **m/sec**

Average Soakaway Rate = **1.9E-03** m³/sec
Average soakaway area = **3.39** m² (sides + base)

V_{p75-25}
BR365 Soil Infiltration Rate = **3.6E-04** **m/sec**
a_{p50} **Average Infiltration Rate =** **5.8E-04** **m/sec**

t_{p75-25}

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Test No. **SA3 - Test 2**

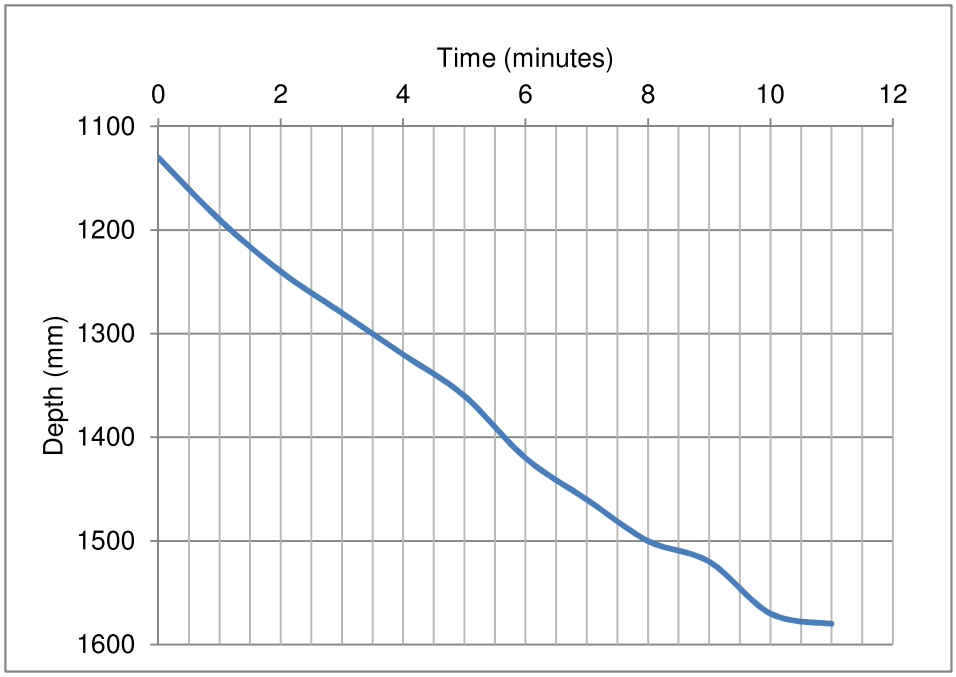
Test Pit Dimensions

Length = **2900** mm
Width = **600** mm
Depth = **1580** mm (Total depth)

Plan area = **1.74** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **1130** mm

Time (min)	Depth (mm)
0	**1130**
1	**1190**
2	**1240**
3	**1280**
4	**1320**
5	**1360**
6	**1420**
7	**1460**
8	**1500**
9	**1520**
10	**1570**
11	**1580**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.40 - 1.6	Orange brown clayey SAND and GRAVEL. Gravel is medium to coarse angular to sub-angular of sandstone. Occasional becomng frequent cobbles with depth.

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Test No. SA3 - Test 2

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters

Depth to water = **1130** mm
Start time = **0** min

Final parameters

Depth to water = **580** mm
End time = **11** min

Average water depth: **225** mm

Change in water depth: **450** mm

Time interval: **11** min

Effective Storage Volume of Water in the Trial Pit = **0.6786** m³
75% Effective Depth = **1288** mm from ground level
25% Effective Depth = **1483** mm from ground level
Time at 75% Effective Depth = **3.5** minutes
Time at 25% Effective Depth = **7.5** minutes

V_{p75-25} = **0.34** m³

a_{p50} = **3.11** m²

t_{p75-25} = **450** sec

BR365 Soil Infiltration Rate = 2.4E-04 m/sec

Average Soakaway Rate = **1.2E-03** m³/sec
Average soakaway area = **3.32** m² (sides + base)

Average Infiltration Rate = 3.6E-04 m/sec

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Test No. **SA3 - Test 3**

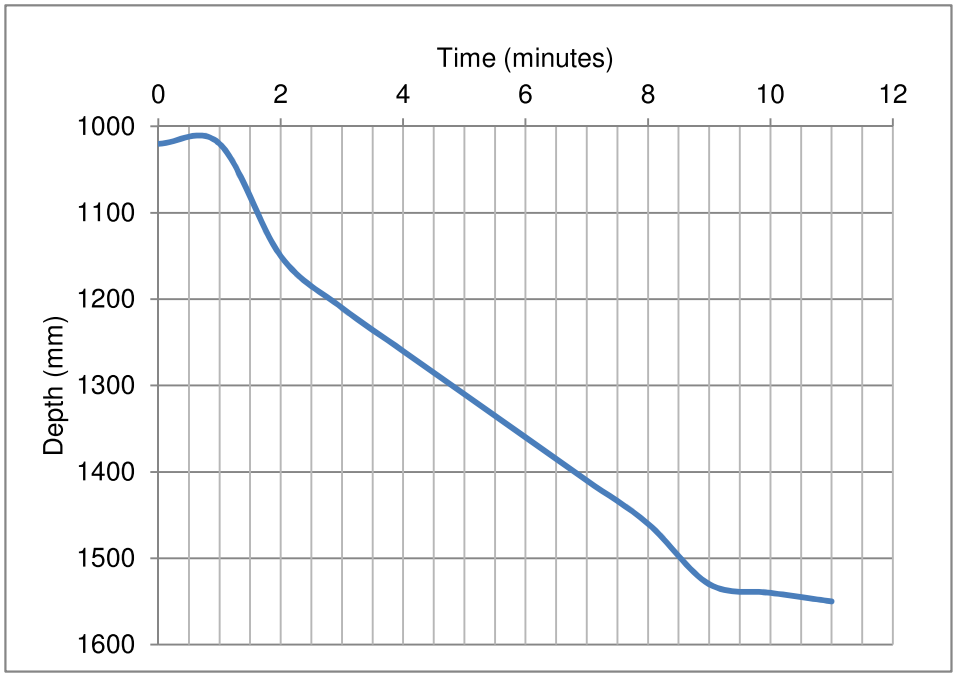
Test Pit Dimensions

Length = **2900** mm
Width = **600** mm
Depth = **1550** mm (Total depth)

Plan area = **1.74** m²

Approximate time to discharge water into the hole: **50** Seconds
Depth to water after completion of pumping: **1020** mm

Time (min)	Depth (mm)
0	**1020**
1	**1020**
2	**1150**
3	**1210**
4	**1260**
5	**1310**
6	**1360**
7	**1410**
8	**1460**
9	**1530**
10	**1540**
11	**1550**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.40 - 1.6	Orange brown clayey SAND and GRAVEL. Gravel is medium to coarse angular to sub-angular of sandstone. Occasional becomng frequent cobbles with depth.

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Test No. **SA3 - Test 3**

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **1020** mm
Start time = **1** min

Final parameters
Depth to water = **550** mm
End time = **11** min

Average water depth: **265** mm

Change in water depth: **530** mm

Time interval: **10** min

Effective Storage Volume of Water in the Trial Pit = **0.9222** m³
75% Effective Depth = **1153** mm from ground level
25% Effective Depth = **1418** mm from ground level
Time at 75% Effective Depth = **2** minutes
Time at 25% Effective Depth = **7** minutes

V_{p75-25} = **0.46** m³

a_{p50} = **3.60** m²

t_{p75-25} = **420** sec

BR365 Soil Infiltration Rate = **3.1E-04 m/sec**

Average Soakaway Rate = **1.5E-03** m³/sec
Average soakaway area = **3.60** m² (sides + base)

Average Infiltration Rate = **4.3E-04 m/sec**

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Test No. **SA4 - Test 1**

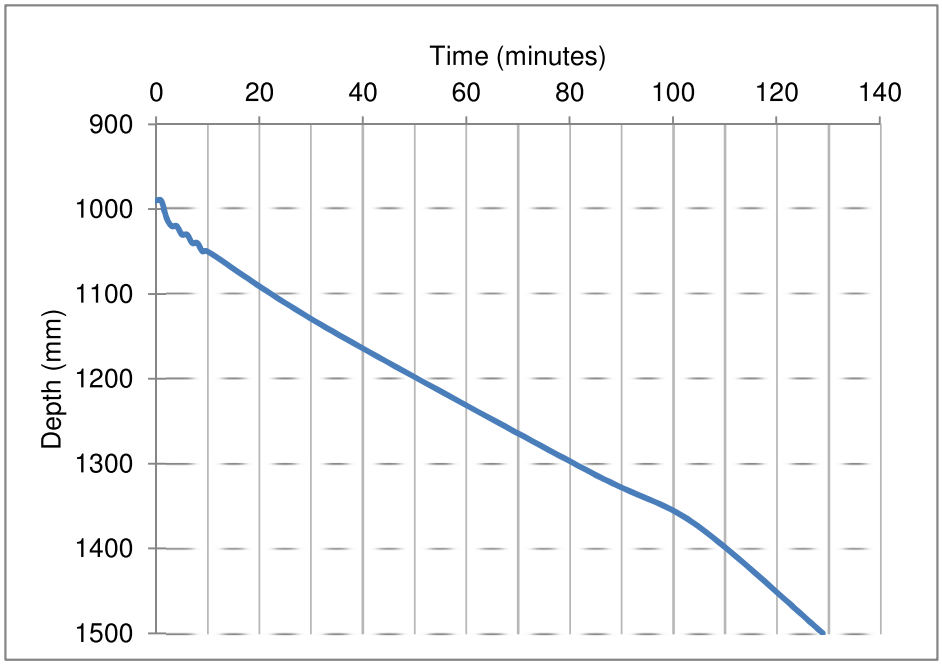
Test Pit Dimensions

Length = **3100** mm
Width = **650** mm
Depth = **1500** mm (Total depth)

Plan area = **2.015** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **990** mm

Time (min)	Depth (mm)
0	**990**
1	**990**
2	**1010**
3	**1020**
4	**1020**
5	**1030**
6	**1030**
7	**1040**
8	**1040**
9	**1050**
10	**1050**
33	**1140**
84	**1310**
104	**1370**
129	**1500**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 - 0.60	MADE GROUND: Brown very sandy reworked CLAY.
0.60 - 1.5	Orange brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular of sandstone. Occasional becoming frequent cobbles from 0.9 m bgl.

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Test No. SA4 - 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 = **990** mm
Start time = **0** min

Final parameters

Depth to water = **500** mm
End time = **129** min

Average water depth: **255** mm

Change in water depth: **510** mm

Time interval: **129** min

Effective Storage Volume of Water in the Trial Pit = **1.02765** m³
75% Effective Depth = **1118** mm from ground level
25% Effective Depth = **1373** mm from ground level
Time at 75% Effective Depth = **27** minutes
Time at 25% Effective Depth = **105** minutes

V_{p75-25} = **0.51** m³

a_{p50} = **3.93** m²

t_{p75-25} = **6300** sec

f = 2.1E-05 m/sec

Average Soakaway Rate = **1.3E-04** m³/sec
Average soakaway area = **3.93** m² (sides + base)

V_{p75-25} / a_{p50} Soil Infiltration Rate = 2.1E-05 m/sec
Average Infiltration Rate = 3.4E-05 m/sec

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Test No. **SA4 - Test 2**

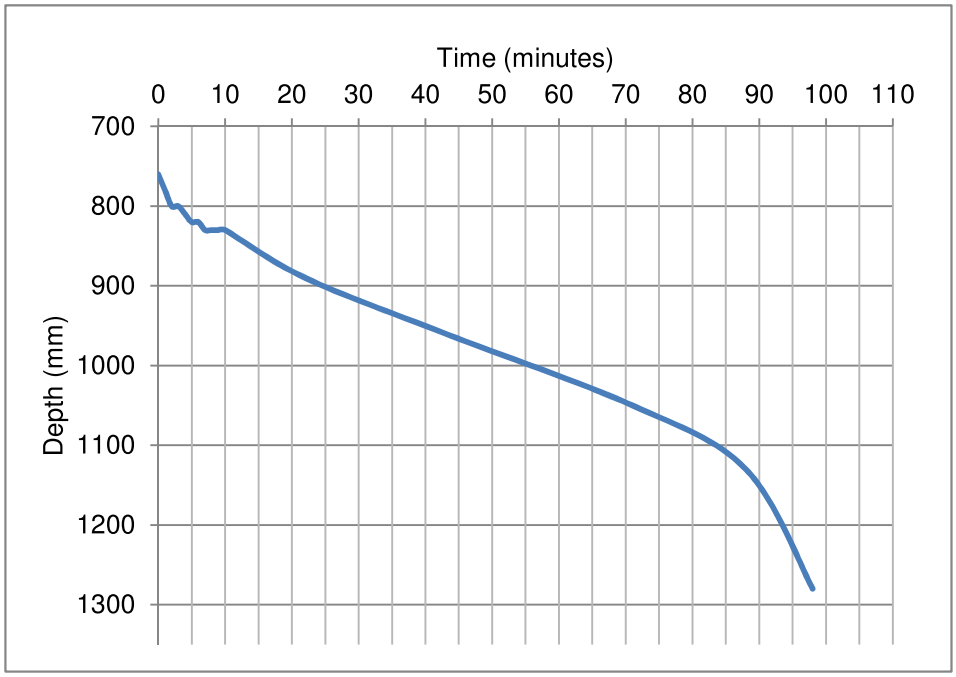
Test Pit Dimensions

Length = **3100** mm
Width = **650** mm
Depth = **1350** mm (Total depth)

Plan area = **2.015** m²

Approximate time to discharge water into the hole: **50** Seconds
Depth to water after completion of pumping: **760** mm

Time (min)	Depth (mm)
0	**760**
1	**780**
2	**800**
3	**800**
4	**810**
5	**820**
6	**820**
7	**830**
8	**830**
9	**830**
10	**830**
22	**890**
43	**960**
71	**1050**
88	**1130**
98	**1280**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 - 0.60	MADE GROUND: Brown very sandy reworked CLAY.
0.60 - 1.5	Orange brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular of sandstone. Occasional becoming frequent cobbles from 0.9 m bgl.

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Test No. SA4 - 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 = **760** mm
Start time = **0** min

Final parameters
Depth to water = **280** mm
End time = **98** min

Average water depth: **330** mm

Change in water depth: **520** mm

Time interval: **98** min

Effective Storage Volume of Water in the Trial Pit = **1.14855** m³
75% Effective Depth = **923** mm from ground level
25% Effective Depth = **1208** mm from ground level
Time at 75% Effective Depth = **32** minutes
Time at 25% Effective Depth = **93** minutes

V_{p75-25} = **0.57** m³

a_{p50} = **4.15** m²

t_{p75-25} = **5580** sec

2.5E-05 Soil Infiltration Rate = **2.5E-05 m/sec**
verage Infiltration Rate = **4.0E-05 m/sec**

= **2.5E-05 m/sec**

Average Soakaway Rate = **1.8E-04** m³/sec
Average soakaway area = **4.49** m² (sides + base)

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Test No. **SA5 - Test 1**

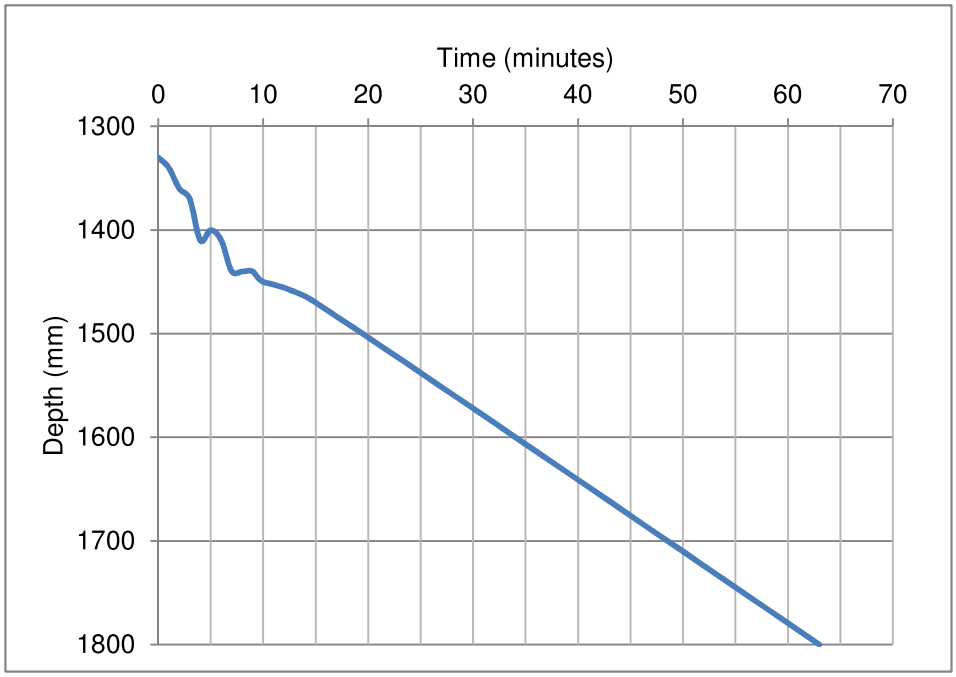
Test Pit Dimensions

Length = **2800** mm
Width = **650** mm
Depth = **1800** mm (Total depth)

Plan area = **1.82** m²

Approximate time to discharge water into the hole: **50** Seconds
Depth to water after completion of pumping: **1330** mm

Time (min)	Depth (mm)
0	**1330**
1	**1340**
2	**1360**
3	**1370**
4	**1410**
5	**1400**
6	**1410**
7	**1440**
8	**1440**
9	**1440**
10	**1450**
15	**1470**
63	**1800**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 -1.40	MADE GROUND: Brown sandy gravelly reworked CLAY with occasional cobbles. Gravel is fine to coarse sub-angular of sandstone.
1.40 - 1.80	Brown slightly clayey SAND and GRAVEL.Gravel is fine to coarse sub-angular of sandstone, with occasional cobbles.

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Test No. SA5 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **1330** mm
Start time = **0** min

Final parameters
Depth to water = **800** mm
End time = **63** min

Average water depth: **235** mm

Change in water depth: **470** mm

Time interval: **63** min

Effective Storage Volume of Water in the Trial Pit = **0.8372** m³
75% Effective Depth = **1455** mm from ground level
25% Effective Depth = **1685** mm from ground level
Time at 75% Effective Depth = **11** minutes
Time at 25% Effective Depth = **46** minutes

V_{p75-25} = **0.42** m³

a_{p50} = **3.41** m²

t_{p75-25} = **2760** sec

= 4.5E-05 m/sec

Average Soakaway Rate = **2.3E-04** m³/sec
Average soakaway area = **3.44** m² (sides + base)

BR365 Soil Infiltration Rate = 4.5E-05 m/sec
Average Infiltration Rate = 6.6E-05 m/sec

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Test No. **SA5 - Test 2**

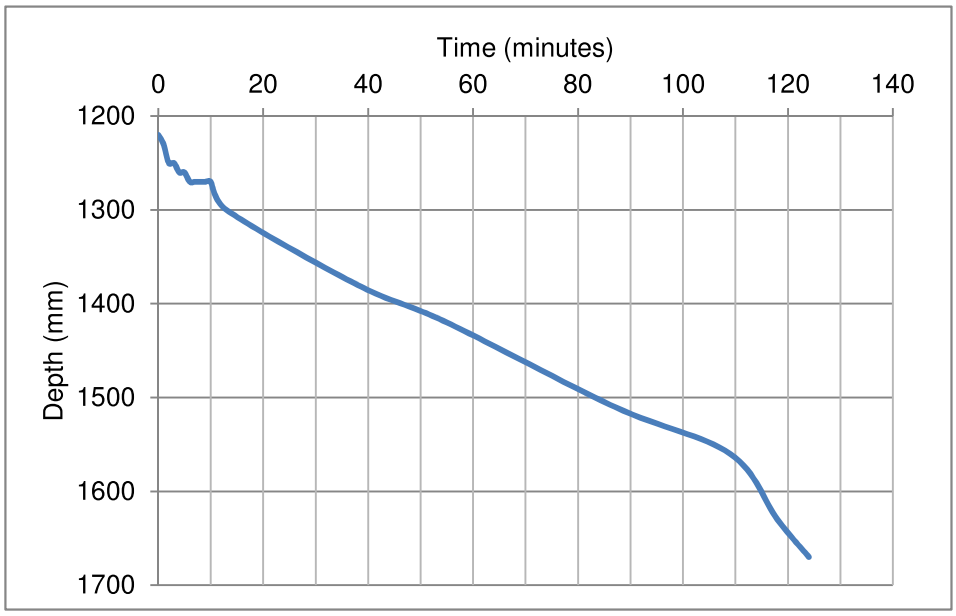
Test Pit Dimensions

Length = **2800** mm
Width = **650** mm
Depth = **1670** mm (Total depth)

Plan area = **1.82** m²

Approximate time to discharge water into the hole: **50** Seconds
Depth to water after completion of pumping: **1220** mm

Time (min)	Depth (mm)
0	**1220**
1	**1230**
2	**1250**
3	**1250**
4	**1260**
5	**1260**
6	**1270**
7	**1270**
8	**1270**
9	**1270**
10	**1270**
13	**1300**
38	**1380**
55	**1420**
87	**1510**
109	**1560**
118	**1630**
124	**1670**



Note: Repeated minor side collapse between 2 minutes and 10 minutes

Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 -1.40	MADE GROUND: Brown sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse sub-angular of sandstone.
1.40 - 1.80	Brown slightly clayey SAND and GRAVEL.Gravel is fine to coarse sub-angular of sandstone, with occasional cobbles.

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Test No. SA5 - 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 = **1270** mm
Start time = **10** min

Final parameters

Depth to water = **1670** mm
End time = **124** min

Average water depth: **200** mm

Change in water depth: **400** mm

Time interval: **114** min

Effective Storage Volume of Water in the Trial Pit = **0.8008** m³
75% Effective Depth = **1340** mm from ground level
25% Effective Depth = **1560** mm from ground level
Time at 75% Effective Depth = **26** minutes
Time at 25% Effective Depth = **109** minutes

V_{p75-25} = **0.40** m³

a_{p50} = **3.34** m²

t_{p75-25} = **6540** sec

f = **1.8E-05 m/sec**

Average Soakaway Rate = **1.1E-04** m³/sec
Average soakaway area = **3.20** m² (sides + base)

BR365 Soil Infiltration Rate = 1.8E-05 m/sec
Average Infiltration Rate = 3.3E-05 m/sec

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PROJECT:	**Wombwell High School**	**Job No. 43497**	**Date 19.12.18**
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Test No. **SA6 - Test 1**

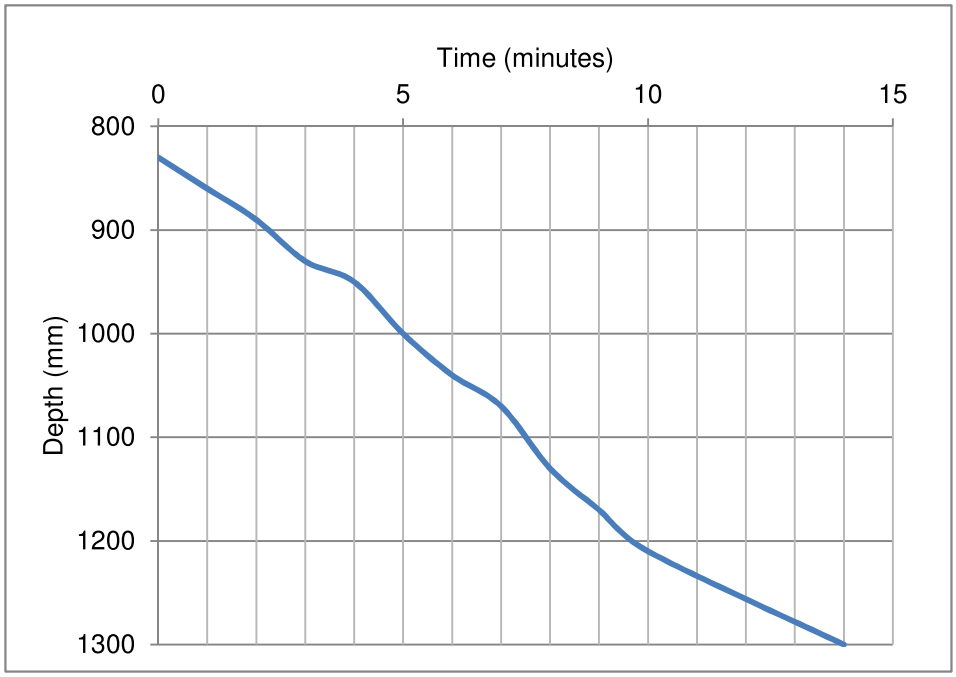
Test Pit Dimensions

Length = **3000** mm
Width = **700** mm
Depth = **1300** mm (Total depth)

Plan area = **2.1** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **830** mm

Time (min)	Depth (mm)
0	**830**
1	**860**
2	**890**
3	**930**
4	**950**
5	**1000**
6	**1040**
7	**1070**
8	**1130**
9	**1170**
10	**1210**
14	**1300**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 - 1.10	Yellow/orange brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular to subangular of sandstone. Frequent cobbles with depth.
1.10 - 1.30	Weak to medium strong yellow brown SANDSTONE recovered as cobbles and gravel.

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Test No. SA6 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **830** mm
Start time = **0** min

Final parameters
Depth to water = **300** mm
End time = **14** min

Average water depth: **235** mm

Change in water depth: **470** mm

Time interval: **14** min

Effective Storage Volume of Water in the Trial Pit = **0.924** m³
75% Effective Depth = **970** mm from ground level
25% Effective Depth = **1190** mm from ground level
Time at 75% Effective Depth = **4.5** minutes
Time at 25% Effective Depth = **9.5** minutes

V_{p75-25} = **0.46** m³

a_{p50} = **3.73** m²

t_{p75-25} = **570** sec

f = **2.2E-04 m/sec**

Average Soakaway Rate = **1.2E-03** m³/sec
Average soakaway area = **3.84** m² (sides + base)

BR365 Soil Infiltration Rate = 2.2E-04 m/sec
Average Infiltration Rate = 3.1E-04 m/sec

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Test No. **SA6 - Test 2**

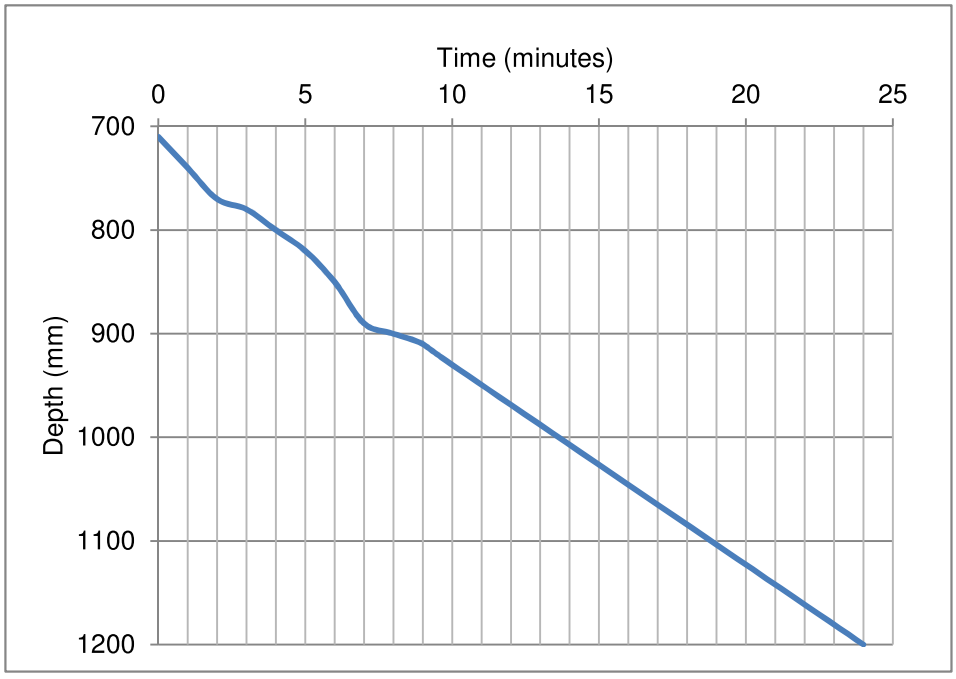
Test Pit Dimensions

Length = **3000** mm
Width = **700** mm
Depth = **1200** mm (Total depth)

Plan area = **2.1** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **710** mm

Time (min)	Depth (mm)
0	**710**
1	**740**
2	**770**
3	**780**
4	**800**
5	**820**
6	**850**
7	**890**
8	**900**
9	**910**
10	**930**
24	**1200**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 - 1.10	Yellow/orange brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular to subangular of sandstone. Frequent cobbles with depth.
1.10 - 1.30	Weak to medium strong yellow brown SANDSTONE recovered as cobbles and gravel.

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Test No. SA6 - Test 2

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **710** mm
Start time = **0** min

Final parameters
Depth to water = **200** mm
End time = **24** min

Average water depth: **245** mm

Change in water depth: **490** mm

Time interval: **24** min

Effective Storage Volume of Water in the Trial Pit = **0.966** m³
75% Effective Depth = **855** mm from ground level
25% Effective Depth = **1085** mm from ground level
Time at 75% Effective Depth = **6.5** minutes
Time at 25% Effective Depth = **18** minutes

V_{p75-25} = **0.48** m³

a_{p50} = **3.80** m²

t_{p75-25} = **1080** sec

f = 1.2E-04 m/sec

Average Soakaway Rate = **7.1E-04** m³/sec
Average soakaway area = **3.91** m² (sides + base)

BR365 Soil Infiltration Rate = 1.2E-04 m/sec
Average Infiltration Rate = 1.8E-04 m/sec

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
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Test No. **SA6 - Test 3**

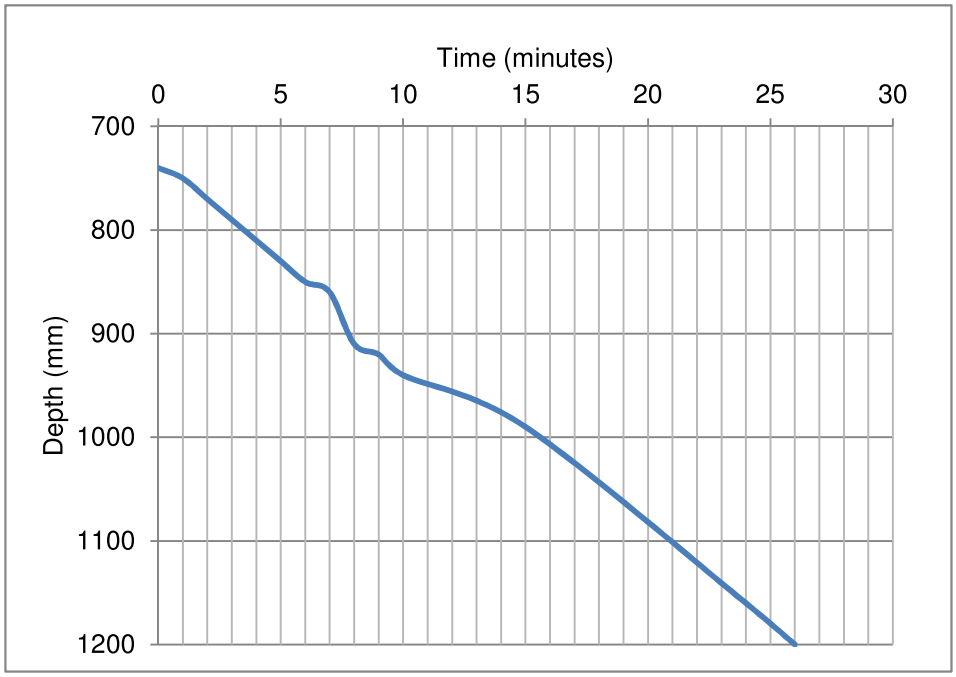
Test Pit Dimensions

Length = **3000** mm
Width = **700** mm
Depth = **1200** mm (Total depth)

Plan area = **2.1** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **740** mm

Time (min)	Depth (mm)
0	**740**
1	**750**
2	**770**
3	**790**
4	**810**
5	**830**
6	**850**
7	**860**
8	**910**
9	**920**
10	**940**
15	**990**
24	**1160**
26	**1200**



Depth (m)	Description
0.00 - 0.30	TOPSOIL: Grass over dark brown clayey SAND.
0.30 - 1.10	Yellow/orange brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular to subangular of sandstone. Frequent cobbles with depth.
1.10 - 1.30	Weak to medium strong yellow brown SANDSTONE recovered as cobbles and gravel.

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Test No. SA6 - 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 = **740** mm
Start time = **0** min

Final parameters
Depth to water = **200** mm
End time = **26** min

Average water depth: **230** mm

Change in water depth: **460** mm

Time interval: **26** min

Effective Storage Volume of Water in the Trial Pit = **0.945** m³
75% Effective Depth = **863** mm from ground level
25% Effective Depth = **1088** mm from ground level
Time at 75% Effective Depth = **7** minutes
Time at 25% Effective Depth = **18** minutes

V_{p75-25} = **0.47** m³

a_{p50} = **3.77** m²

t_{p75-25} = **1080** sec

f = 1.2E-04 m/sec

Average Soakaway Rate = **6.2E-04** m³/sec
Average soakaway area = **3.80** m² (sides + base)

BR365 Soil Infiltration Rate = 1.2E-04 m/sec
Average Infiltration Rate = 1.6E-04 m/sec

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PROJECT:	**Wombwell High School**	**Job No. 43497**	**Date 19.12.18**
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Test No. **SA7 - Test 1**

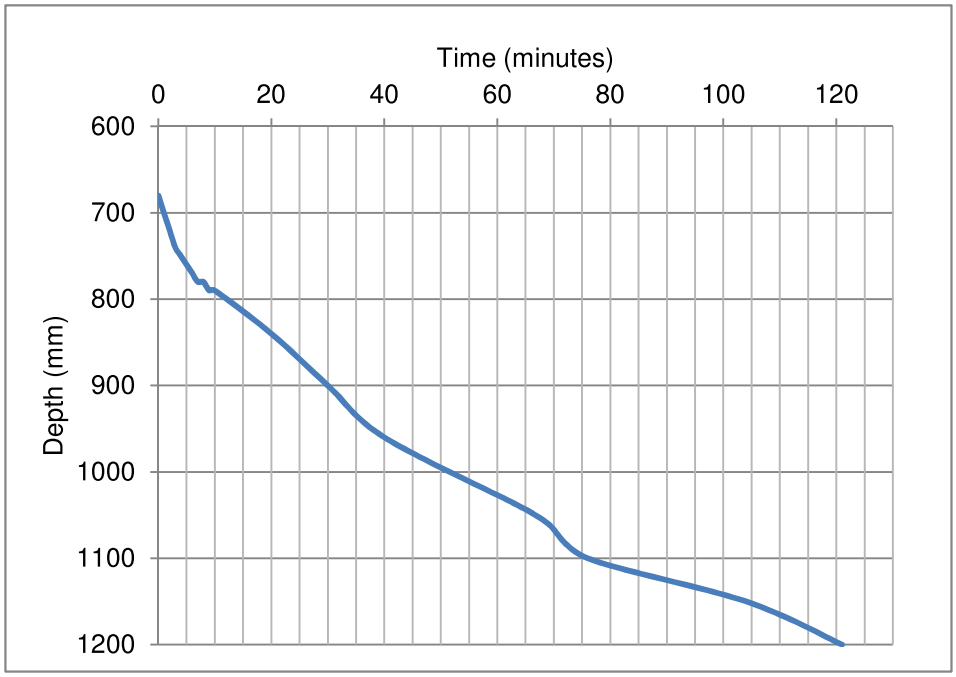
Test Pit Dimensions

Length = **3100** mm
Width = **800** mm
Depth = **1200** mm (Total depth)

Plan area = **2.48** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **680** mm

Time (min)	Depth (mm)
0	**680**
1	**700**
2	**720**
3	**740**
4	**750**
5	**760**
6	**770**
7	**780**
8	**780**
9	**790**
10	**790**
20	**840**
30	**900**
40	**960**
64	**1040**
69	**1060**
76	**1100**
104	**1150**
121	**1200**



Depth (m)	Description
0.00 - 0.50	TOPSOIL: Grass over dark brown clayey SAND.
0.50 - 0.90	Orange brown slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular of sandstone, with frequent cobbles with depth.
0.90 - 1.20	Medium strong SANDSTONE recoverd as sand gravel, with frequent cobbles.

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Test No. SA7 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **680** mm
Start time = **0** min

Final parameters
Depth to water = **200** mm
End time = **121** min

Average water depth: **260** mm

Change in water depth: **520** mm

Time interval: **121** min

Effective Storage Volume of Water in the Trial Pit = **1.24** m³
75% Effective Depth = **825** mm from ground level
25% Effective Depth = **1075** mm from ground level
Time at 75% Effective Depth = **18** minutes
Time at 25% Effective Depth = **70** minutes

V_{p75-25} = **0.62** m³

a_{p50} = **4.43** m²

t_{p75-25} = **4200** sec

BR365 Soil Infiltration Rate = 3.3E-05 m/sec

= **3.3E-05 m/sec**

Average Soakaway Rate = **1.8E-04** m³/sec
Average soakaway area = **4.51** m² (sides + base)

Average Infiltration Rate = 3.9E-05 m/sec

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Test No. **SA7 - Test 2**

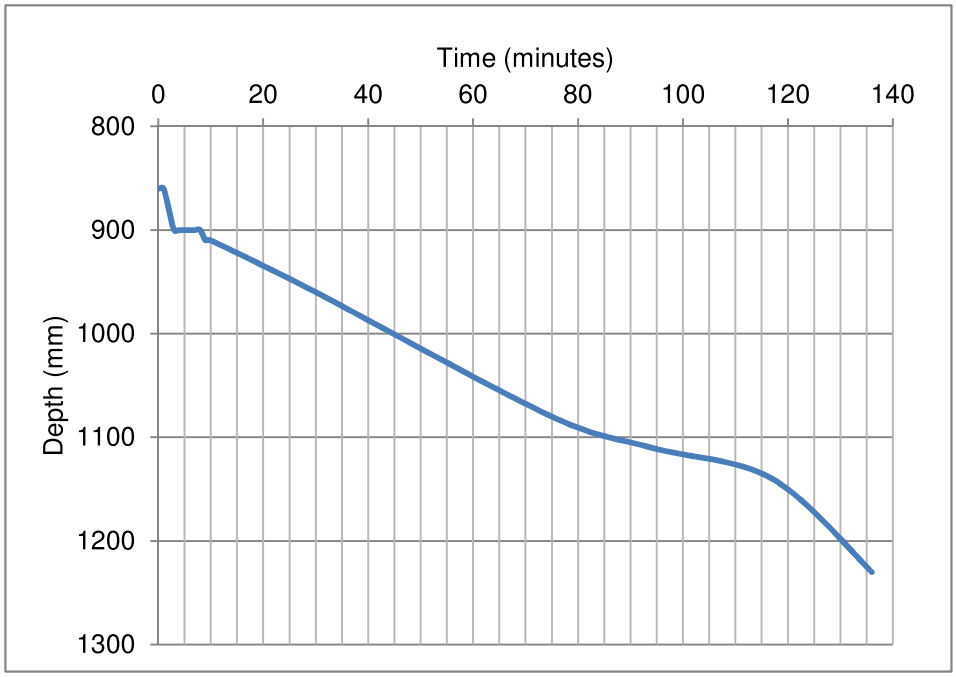
Test Pit Dimensions

Length = **3100** mm
Width = **800** mm
Depth = **1300** mm (Total depth)

Plan area = **2.48** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **860** mm

Time (min)	Depth (mm)
0	**860**
1	**860**
2	**880**
3	**900**
4	**900**
5	**900**
6	**900**
7	**900**
8	**900**
9	**910**
10	**910**
30	**960**
75	**1080**
94	**1110**
117	**1140**
136	**1230**



Depth (m)	Description
0.00 - 0.50	TOPSOIL: Grass over dark brown clayey SAND.
0.50 - 0.90	Orange brown slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular of sandstone, with frequent cobbles with depth.
0.90 - 1.20	Medium strong SANDSTONE recovered as sand gravel, with frequent cobbles.

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Test No. SA7 - 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 = **910** mm
Start time = **10** min

Final parameters
Depth to water = **230** mm
End time = **136** min

Average water depth: **230** mm

Change in water depth: **320** mm

Time interval: **126** min

Effective Storage Volume of Water in the Trial Pit = **1.0912** m³
75% Effective Depth = **970** mm from ground level
25% Effective Depth = **1190** mm from ground level
Time at 75% Effective Depth = **34** minutes
Time at 25% Effective Depth = **128** minutes

V_{p75-25} = **0.55** m³

a_{p50} = **4.20** m²

t_{p75-25} = **7680** sec

f = 1.7E-05 m/sec

Average Soakaway Rate = **1.0E-04** m³/sec
Average soakaway area = **4.27** m² (sides + base)

BR365 Soil Infiltration Rate = 1.7E-05 m/sec
Average Infiltration Rate = 2.5E-05 m/sec

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Test No. **SA8 - Test 1**

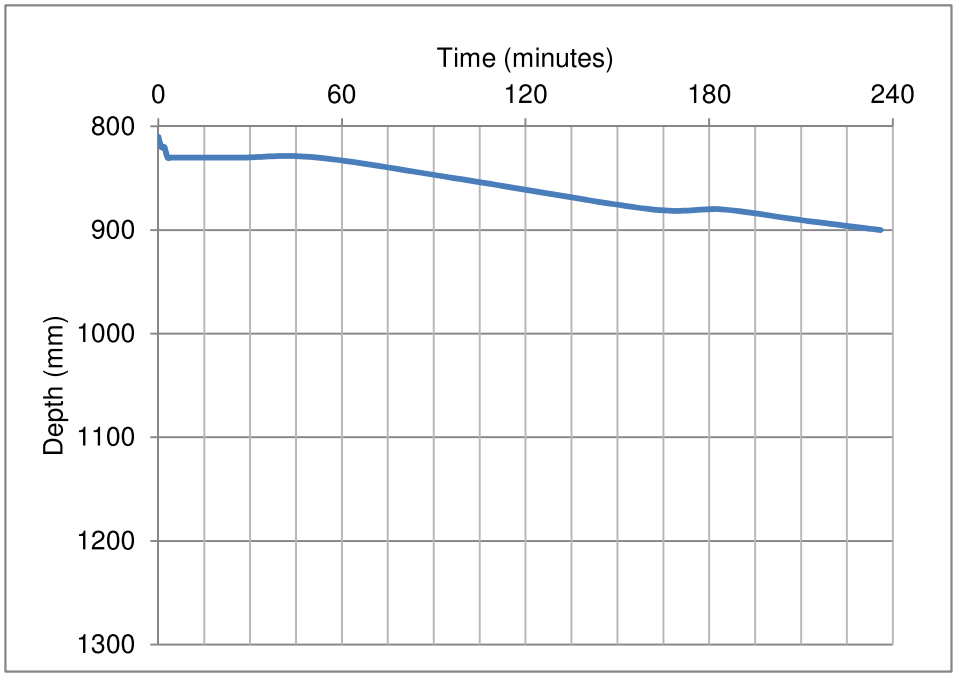
Test Pit Dimensions

Length = **3200** mm
Width = **700** mm
Depth = **1300** mm (Total depth)

Plan area = **2.24** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **810** mm

Time (min)	Depth (mm)
0	**810**
1	**820**
2	**820**
3	**830**
4	**830**
5	**830**
6	**830**
7	**830**
8	**830**
9	**830**
10	**830**
20	**830**
28	**830**
52	**830**
97	**850**
161	**880**
184	**880**
209	**890**
236	**900**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.40 - 0.60	MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
0.6 - 1.1	POSSIBLE MADE GROUND: Yellow/orange brown sandy very gravelly CLAY. Gravel is fine to medium sub-angular of sandstone.
1.1 - 1.3	Extremely weak to weak grey brown SANDSTONE, recovered as tabular gravel.

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Test No. **SA8 - 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 = **810** mm
Start time = **0** min

Final parameters

Depth to water = **900** mm
End time = **236** min

Average water depth: **445** mm

Change in water depth: **90** mm

Time interval: **236** min

Effective Storage Volume of Water in the Trial Pit = **1.0752** m³
75% Effective Depth = **940** mm from ground level
25% Effective Depth = **1180** mm from ground level
Time at 75% Effective Depth = **N/A** minutes
Time at 25% Effective Depth = **N/A** minutes

V_{p75-25} = **0.54** m³

a_{p50} = **4.11** m²

t_{p75-25} = **0** sec

f = **#DIV/0! m/sec**

Average Soakaway Rate = **1.4E-05** m³/sec
Average soakaway area = **5.71** m² (sides + base)

BR365 Soil Infiltration Rate = UTC m/sec
Average Infiltration Rate = 2.5E-06 m/sec

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Test No. **SA9 - Test 1**

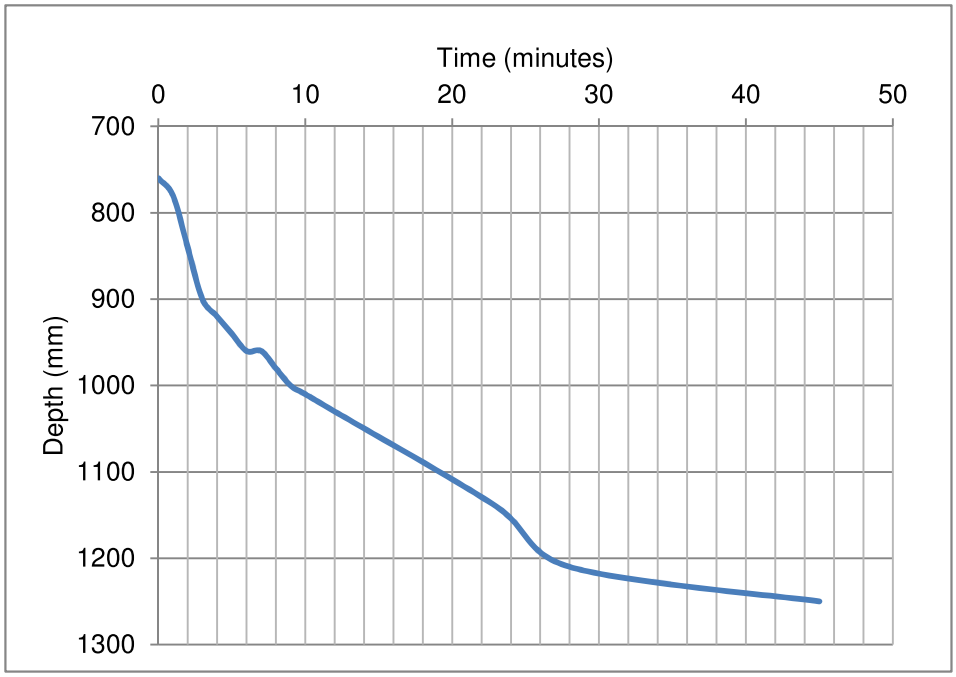
Test Pit Dimensions

Length = **3200** mm
Width = **700** mm
Depth = **1250** mm (Total depth)

Plan area = **2.24** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **760** mm

Time (min)	Depth (mm)
0	**760**
1	**780**
2	**840**
3	**900**
4	**920**
5	**940**
6	**960**
7	**960**
8	**980**
9	**1000**
10	**1010**
12	**1030**
23	**1140**
28	**1210**
45	**1250**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.4 - 0.6	MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
0.6 -1.1	POSSIBLE MADE GROUND: Yellowish brown sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone.
1.1 - 1.25	Weak to medium strongyellow brown SANDSTONE, recovered as tabular gravel and cobbles.

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Test No. SA9 - Test 1

Soil Infiltration Rate in Accordance with BR365

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

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

Initial parameters
Depth to water = **760** mm
Start time = **0** min

Final parameters
Depth to water = **250** mm
End time = **45** min

Average water depth: **245** mm

Change in water depth: **490** mm

Time interval: **45** min

Effective Storage Volume of Water in the Trial Pit = **1.0528** m³
75% Effective Depth = **898** mm from ground level
25% Effective Depth = **1133** mm from ground level
Time at 75% Effective Depth = **3** minutes
Time at 25% Effective Depth = **22** minutes

V_{p75-25} = **0.53** m³

a_{p50} = **4.07** m²

t_{p75-25} = **1320** sec

BR365 Soil Infiltration Rate = 9.8E-05 m/sec

= **9.8E-05 m/sec**

Average Soakaway Rate = **4.1E-04** m³/sec
Average soakaway area = **4.15** m² (sides + base)

Average Infiltration Rate = 9.8E-05 m/sec

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Test No. **SA9 - Test 2**

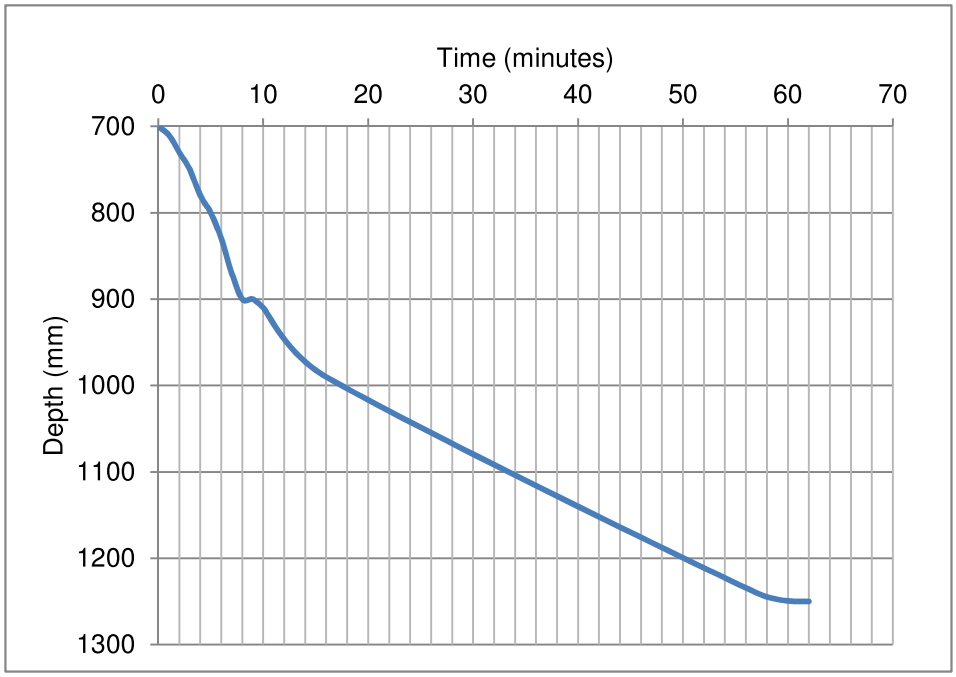
Test Pit Dimensions

Length = **3200** mm
Width = **700** mm
Depth = **1250** mm (Total depth)

Plan area = **2.24** 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**
1	**710**
2	**730**
3	**750**
4	**780**
5	**800**
6	**830**
7	**870**
8	**900**
9	**900**
10	**910**
16	**990**
57	**1240**
62	**1250**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.4 - 0.6	MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
0.6 -1.1	POSSIBLE MADE GROUND: Yellowish brown sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone.
1.1 - 1.25	Weak to medium strongyellow brown SANDSTONE, recovered as tabular gravel and cobbles.

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Test No. SA9 - Test 2

Soil Infiltration Rate in Accordance with BR365

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

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

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

Final parameters
Depth to water = **250** mm
End time = **62** min

Average water depth: **275** mm

Change in water depth: **550** mm

Time interval: **62** min

Effective Storage Volume of Water in the Trial Pit = **1.2096** m³
75% Effective Depth = **845** mm from ground level
25% Effective Depth = **1115** mm from ground level
Time at 75% Effective Depth = **6** minutes
Time at 25% Effective Depth = **36** minutes

V_{p75-25} = **0.60** m³

a_{p50} = **4.35** m²

t_{p75-25} = **2160** sec

f = **6.4E-05 m/sec**

Average Soakaway Rate = **3.3E-04** m³/sec
Average soakaway area = **4.39** m² (sides + base)

BR365 Soil Infiltration Rate = 6.4E-05 m/sec
Average Infiltration Rate = 7.6E-05 m/sec

PROJECT:	Wombwell High School	Job No. 43497	Date 19.12.18
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Test No. **SA9 - Test 3**

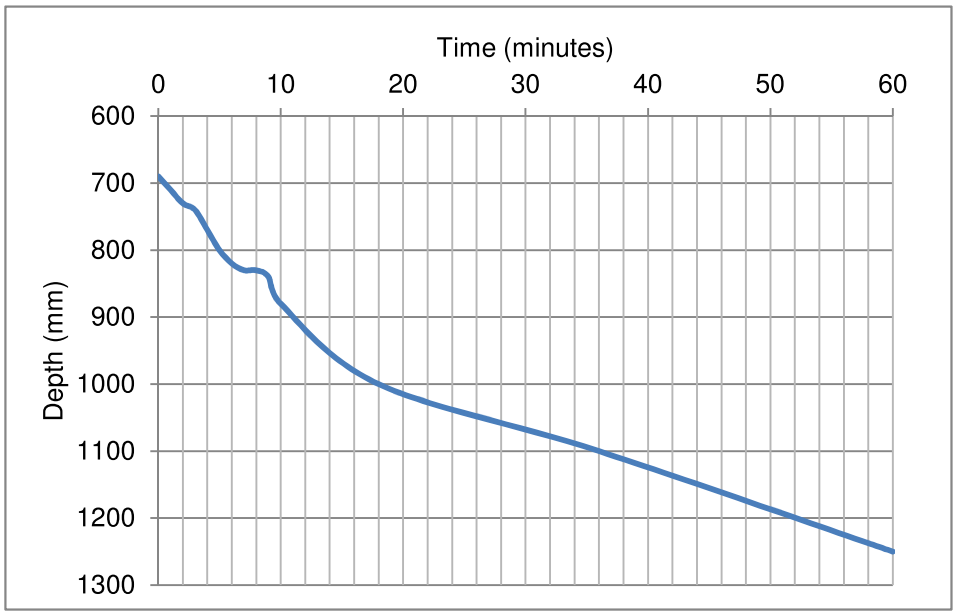
Test Pit Dimensions

Length = **3200** mm
Width = **700** mm
Depth = **1250** mm (Total depth)

Plan area = **2.24** m²

Approximate time to discharge water into the hole: **40** Seconds
Depth to water after completion of pumping: **690** mm

Time (min)	Depth (mm)
0	**690**
1	**710**
2	**730**
3	**740**
4	**770**
5	**800**
6	**820**
7	**830**
8	**830**
9	**840**
10	**880**
18	**1000**
36	**1100**
60	**1250**



Depth (m)	Description
0.00 - 0.40	TOPSOIL: Grass over dark brown clayey SAND.
0.4 - 0.6	MADE GROUND: Brown sandy gravelly reworked CLAY. Gravel is fine to medium sub-angular of sandstone.
0.6 -1.1	POSSIBLE MADE GROUND: Yellowish brown sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone.
1.1 - 1.25	Weak to medium strongyellow brown SANDSTONE, recovered as tabular gravel and cobbles.

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Test No. SA9 - 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 = **690** mm
Start time = **0** min

Final parameters

Depth to water = **1250** mm
End time = **60** min

Average water depth: **280** mm

Change in water depth: **560** mm

Time interval: **60** min

Effective Storage Volume of Water in the Trial Pit = **1.2096** m³
75% Effective Depth = **845** mm from ground level
25% Effective Depth = **1115** mm from ground level
Time at 75% Effective Depth = **9** minutes
Time at 25% Effective Depth = **38** minutes

V_{p75-25} = **0.60** m³

a_{p50} = **4.35** m²

t_{p75-25} = **2280** sec

f = **6.1E-05 m/sec**

Average Soakaway Rate = **3.5E-04** m³/sec
Average soakaway area = **4.42** m² (sides + base)

BR365 Soil Infiltration Rate = 6.1E-05 m/sec
Average Infiltration Rate = 7.9E-05 m/sec