MATE GEO-TECHNIC SERVICES
Shirley Herne Lane
Rustington
[redacted]

Site Address : Land at “Long Acre” the Street, Walberton, BN18 0PY

Planning Reference : t.b.c.

Dear sirs

<u>SCOPE</u>

The original Groundwater Monitoring details were broadly as per the Arun DC requirements to be at the location and depth of any expected infiltration structures, to record the peak groundwater levels in the ‘winter periods’ of 2023 - 2024 and to use this data to inform as to the depths for subsequent Soil Infiltration Testing to calculate the ‘Soil Infiltration Rate’.

The soil details recorded are purely from a visual aspect during the 3 Trial Pit excavations for Soil Infiltration Testing. No Particle Size Analysis has been carried out.

Soil Infiltration Testing, otherwise known as Percolation or Porosity Testing was carried out to BRE DG365 principles, with 3 tests being performed ‘in quick succession’, to best simulate saturated soils. The testing was carried out over a period of 5 days in mid / late July 2024, for Surface Water Drainage Disposal, and although being outside of the Arun DC ‘wet winter period’, it was considered to be valid for an initial Planning Application since 2024 so far has been a particularly wet year.

Data from the previous Groundwater Monitoring exercise was used to inform as to the depth of Infiltration Testing, this being shallow. From discussions with the project drainage consultant, it seemed appropriate to have the all of the impermeable main roof areas draining into the entrance roadway, turning and parking areas, for storage and infiltration. These areas are to be of a permeable construction. All the testing was carried out at typical depths of 372mm – 475mm so as to provide some Freeboard.

This set of data to be used in a proposed Planning Application.

<u>WORKS DETAILS – Supplementary Groundwater Monitoring</u>

The Groundwater Monitoring was initially installed in February 2023, and is subject to a separate report. In addition, monitoring was also recorded during the period of Soil Infiltration Testing. During this period, groundwater levels were recorded in each of the 3 monitoring points at a depth of over 2 metres deep.

The full supplementary recorded Groundwater Monitoring Data, both tabular and graphical, is appended.

WORKS DETAILS – Soil Infiltration Testing

Testing for surface water disposal was carried out within 3 Trial Pits, at the locations and expected depths for any proposed permeable paving infiltration structures, consistent with the principles contained within document BRE DG365. Typical dimensions of the trial pits were 1200mm – 1600mm long by 450mm wide and with varying depths of 372mm - 475mm. The increase in depths for Trial Pits TP#1 and TP#3 were as a result of the removal of soil wash-in during the water filling phase. This will provide some Freeboard.

For Trial Pit TP#1 (north)

0	Ground Level
	Topsoil
~300	
	Compact Dry Clay
372	
	Base of Trial Pit

It's size was 1200mm long x 450mm wide with a variable depth over the 3 tests. These were carried out in quick succession, as per BRE DG365, on Tuesday 16th July, Wednesday 17th July and Thursday 18th July 2024.

The results are summarised in the table below with the minimum rate of 4.561 E-05 metres second^{-1}, from test #3 to be used in any calculations for soakaway sizing.

Soil Infiltration Testing for Surface Water Drainage Disposal			
Trial Pit TP#1 (north) 1200mm long x 450mm wide			
	Test #1	Test #2	Test #3
Date of Testing	Tues 16th July	Wed 17th July	Thurs 18th July
Full Depth of Trial Pit (mm)	372	395	395
Calculated Result (m sec^{-1})	5.746 E-05	4.795 E-05	4.561 E-05
Minimum Rate to be used in any Calculations is 4.561 E-05 metres second^{-1}			

The full data, tabular and graphical for Trial Pit TP#1 is appended.

For Trial Pit TP#2 (centre)

0	Ground Level
	Topsoil
260	
	Clayey Topsoil
440	
	Compact Dry Clay (Just Exposed)
445	
	Base of Trial Pit

It's size was 1370mm long x 450mm wide x 445mm deep. The 3 tests were carried out in quick succession, as per BRE DG365, on Tuesday 16th July, Wednesday 17th July and Thursday 18th July. The results are summarised in the table below with the minimum rate of 3.296 E-06 metres second^{-1}, to be used in any calculations for soakaway sizing. Surprisingly the slowest rate was from test #1, which is not normally the case. It was attributed to the fact that the very compact clay encountered at the base of the Trial Pit was 'softened' to be more permeable, from the first test. As can be seen from the graphical plots, all 3 tests were very similar in profile above this clay layer.

Soil Infiltration Testing for Surface Water Drainage Disposal			
Trial Pit TP#2 (centre) 1370mm long x 450mm wide			
	Test #1	Test #2	Test #3
Date of Testing	Tues 16th July	Wed 17th July	Thurs 18th July
Full Depth of Trial Pit (mm)	445	445	445
Calculated Result (m sec^{-1})	3.296 E-06	5.481 E-06	4.892 E-06
Minimum Rate to be used in any Calculations is 3.296 E-06 metres $second^{-1}$			

The full data, tabular and graphical for Trial Pit TP#2 is appended.

For Trial Pit TP#3 (south)

0	Ground Level
250	Topsoil
350	Compact Clayey Topsoil
460	Small to Medium Angular Gravel in Silty Matrix
	Base of Trial Pit

Its size was 1600mm long x 450mm wide with a variable depth over the 3 tests. These were carried out in quick succession, as per BRE DG365, on Wednesday 17th July, Thursday 18th July and Sunday 21st July.

The results are summarised in the table below with the minimum rate of 2.362 E-06 metres $second^{-1}$, from test #1 to be used in any calculations for soakaway sizing. It is considered that the significant increase in infiltration rate obtained from test #3 was due to the fact that it was carried out with a 2 day break from test #2.

Soil Infiltration Testing for Surface Water Drainage Disposal			
Trial Pit TP#3 (south) 1600mm long x 450mm wide			
	Test #1	Test #2	Test #3
Date of Testing	Wed 17th July	Thurs 18th July	Sun 21st July
Full Depth of Trial Pit (mm)	460	475	475
Calculated Result (m sec^{-1})	2.362 E-06	2.711 E-06	7.145 E-06
Minimum Rate to be used in any Calculations is 2.362 E-06 metres $second^{-1}$			

The full data, tabular and graphical for Trial Pit TP#3 is appended.

WORKS DETAILS – Site Plan Testing Locations

The topographical mapping provisional site plan, overlaid with the locations of the 3 Groundwater Monitoring Points and the 3 shallow Surface Water Trial Pits is appended.

GEOLOGY

The British Geological Survey classifies the area with superficial of "River Terrace Deposits" consisting of Sand, silt and clay, overlying bedrock of the London Clay Formation. During the excavation of the 3 Trial Pits, the London Clay was not encountered, with only the superficial encountered.

CONCLUSION

The rates, at the time of testing, within Trial Pits TP#1 and TP#2 indicate that drainage disposal is viable and within TP#3 is just viable (but it may only need to drain itself with no attributable storage) whilst maintaining some Freeboard.
The soil encountered in Trial Pit TP#3 was vastly different to that encountered within the other 2 Trial Pits, being topsoil overlying compact small to medium angular gravel in a silty matrix.

Regards

For Mate Geo-Technic Services

Ray Cooper
Proprietor

July 28th 2024

Appended

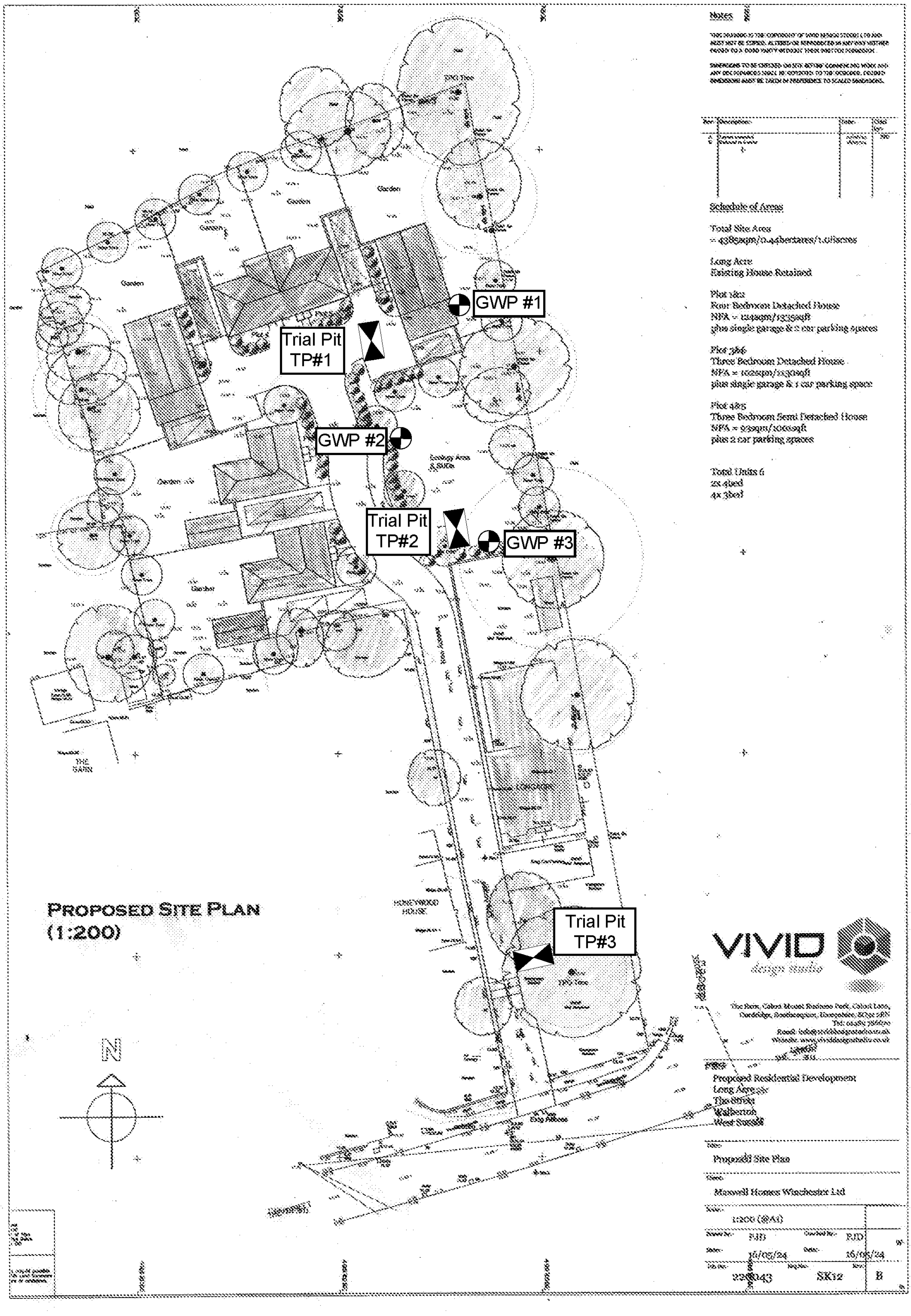
Provisional Site Plan overlaid with Groundwater Monitoring Points (x3) & Trial Pit Locations (x3).

Supplementary Groundwater Monitoring, for groundwater points GWP#1, GWP#2 & GWP#3 full data – tabular and graphical.

Soil Infiltration Testing, for Surface Water Disposal, full data for Trial Pit TP#1 – tabular and graphical.

Soil Infiltration Testing, for Surface Water Disposal, full data for Trial Pit TP#2 – tabular and graphical.

Soil Infiltration Testing, for Surface Water Disposal, full data for Trial Pit TP#3 – tabular and graphical.


Notes
Trial Pit
TP#1
GWP #1
GWP #2
Trial Pit
TP#2
GWP #3
Trial Pit
TP#3
Garden
Schedule of Areas
Total Site Area
Long Acre
Existing House Retained
Four Bedroom Detached House
plus single garage & 2 car parking spaces
Three Bedroom Detached House
plus single garage & 1 car parking space
Three Bedroom Semi Detached House
plus 2 car parking spaces
Total Units 6
2x 4bed
4x 3bed
PROPOSED SITE PLAN
(1:200)
N
VIVID
design studio
Proposed Residential Development
Long Acre
Walberton
West Sussex
Proposed Site Plan
Maxwell Homes Winchester Ltd
1:200 (@A1)
RJD
16/05/24
SK12
B

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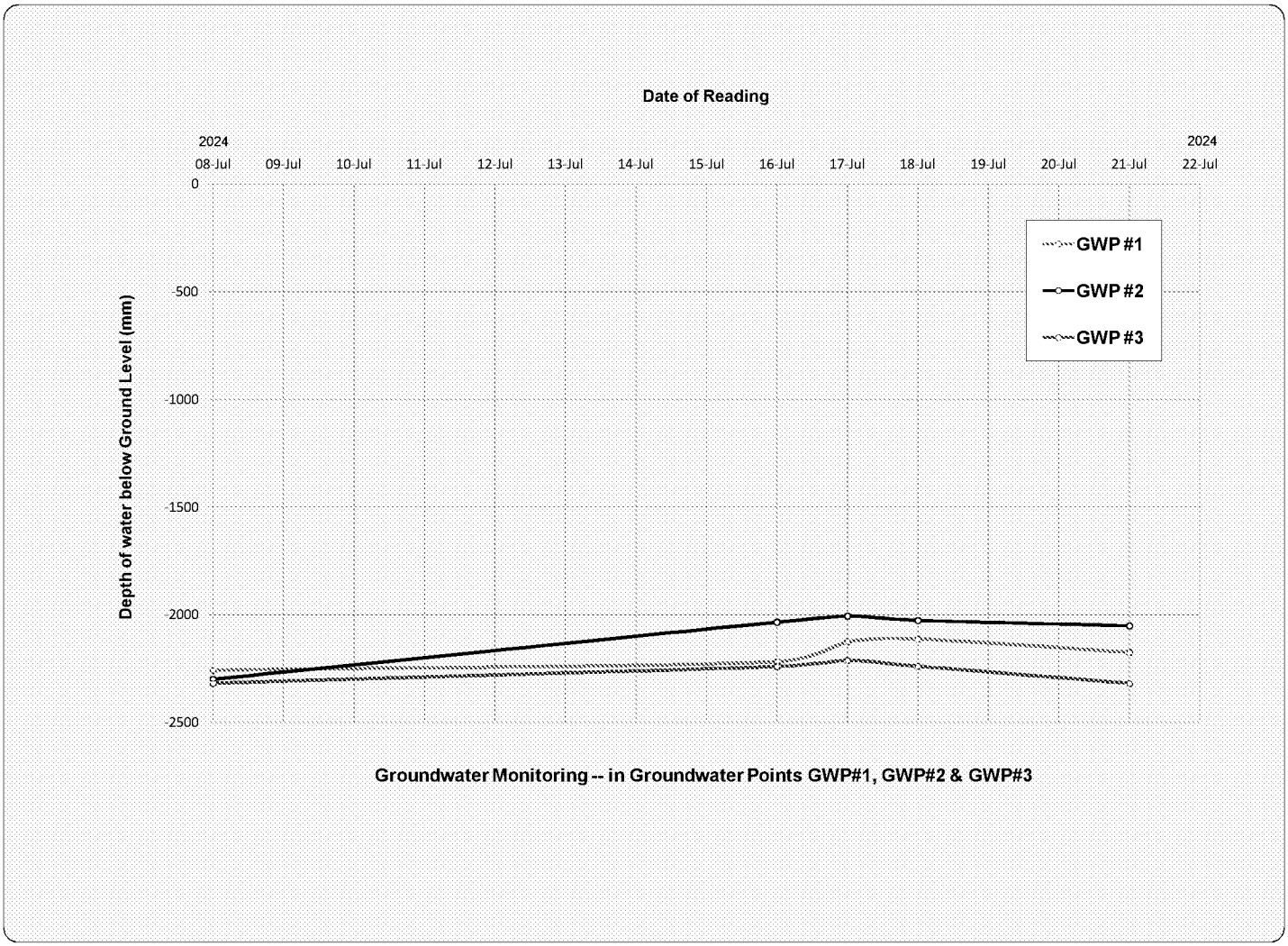
Groundwater Monitoring at "Longacre" Walberton during Soil Infiltration Testing July 2024

LOCATION	Pipe I.D.	Pipe Depth	Pipe Height	A.O.D. Ground Level	DATE	DATE Heavy Rain Overnight	DATE Some Rain in the Day	DATE Dry	DATE Dry
"Longacre" the Street WALBERTON									
Installed on Wednesday 15th February 2023				ToP BGL	Monday 8-Jul	Tuesday 16-Jul	Wednesday 17-Jul	Thursday 18-Jul	Sunday 21-Jul
Maximum Depth	GWP #1	2950			2975	2936	2841	2829	2891
Below Ground Level	(north)	-2232	718	14.958	-2257	-2218	-2123	-2111	-2173
Level Above O.D.		12.008		14.240	11.983	12.022	12.117	12.129	12.067
Change from Previous						39	95	12	-62
Water Strike Below Ground Level		-2250							
Maximum Depth	GWP #2	2950			2822	2557	2529	2549	2574
Below Ground Level	(centre)	-2426	524	14.432	-2298	-2033	-2005	-2025	-2050
Level Above O.D.		11.482		13.908	11.610	11.875	11.903	11.883	11.858
Change from Previous						265	28	-20	-25
Water Strike Below Ground Level		-2470							
Maximum Depth	GWP #3	2950			2890	2811	2782	2810	2890
Below Ground Level	(south)	-2378	572	14.357	-2318	-2239	-2210	-2238	-2318
Level Above O.D.		11.407		13.785	11.467	11.546	11.575	11.547	11.467
Change from Previous						79	29	-28	-80
Water Strike Below Ground Level					Into Wet Mud				

END of MONITORING CYCLE



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Tuesday 16th July 2024

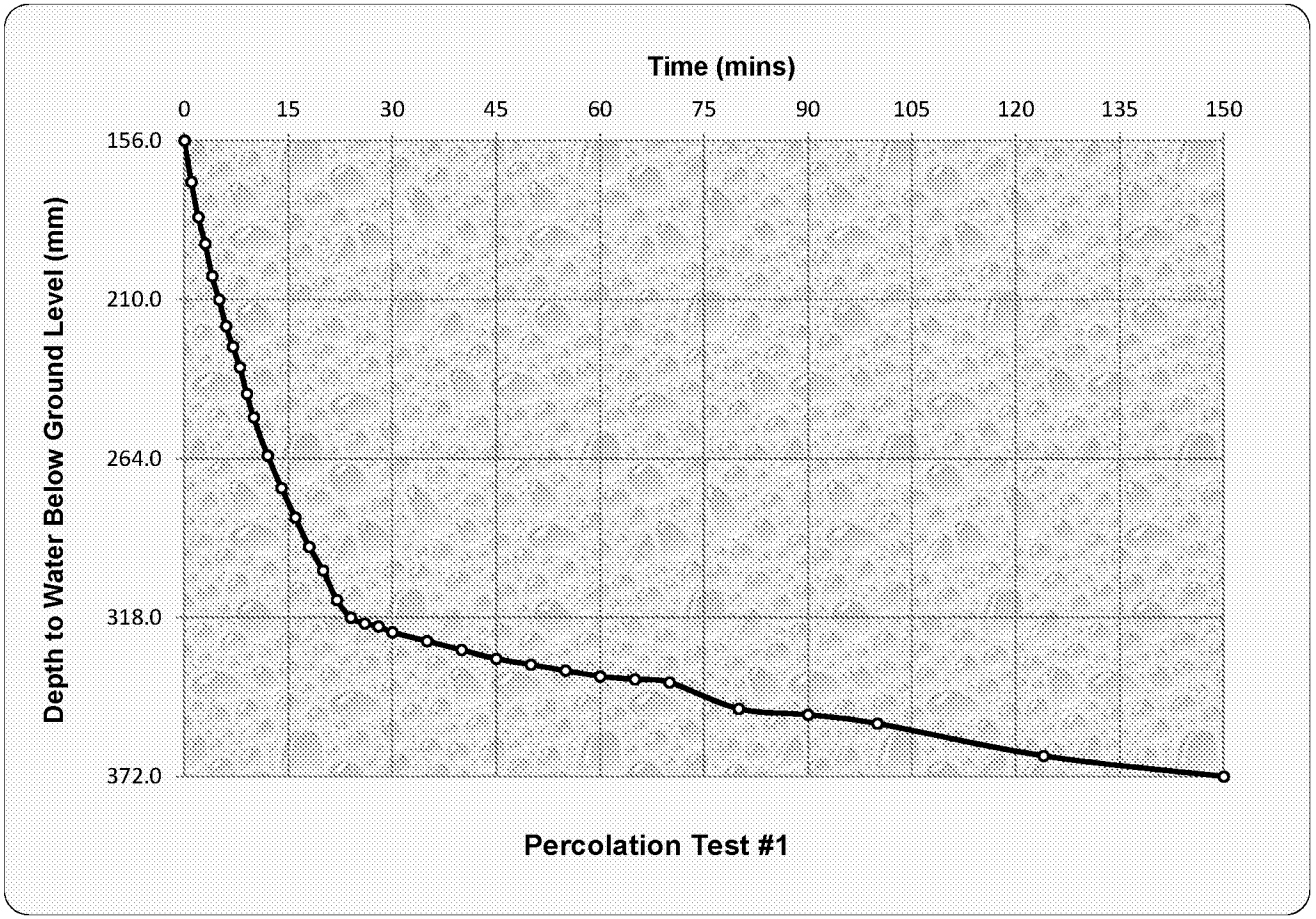
"LongAcre" the Street Walberton

Percolation Trial Pit TP#1 (north)

Percolation Test Number 1

1280mm Length x 450mm Width x 372mm Depth

	Time (mins)	Depth to Water Surface
12:25:00	0	156
	1	170
	2	182
	3	191
	4	202
	5	210
	6	219
	7	226
	8	233
	9	242
	10	250
	12	263
	14	274
	16	284
	18	294
	20	302
	22	312
	24	318
	26	320
	28	321
	30	323
	35	326
	40	329
	45	332
	50	334
	55	336
	60	338
	65	339
	70	340
	80	349
	90	351
	100	354
	124	365
	150	372



Soil infiltration rate: $f = \frac{0.062}{0.950 \times 19.0 \times 60} = 5.746E\text{-}05$ m/s

SOIL INFILTRATION RATE IS

5.746E-05 metres/second

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Wednesday 17th July 2024

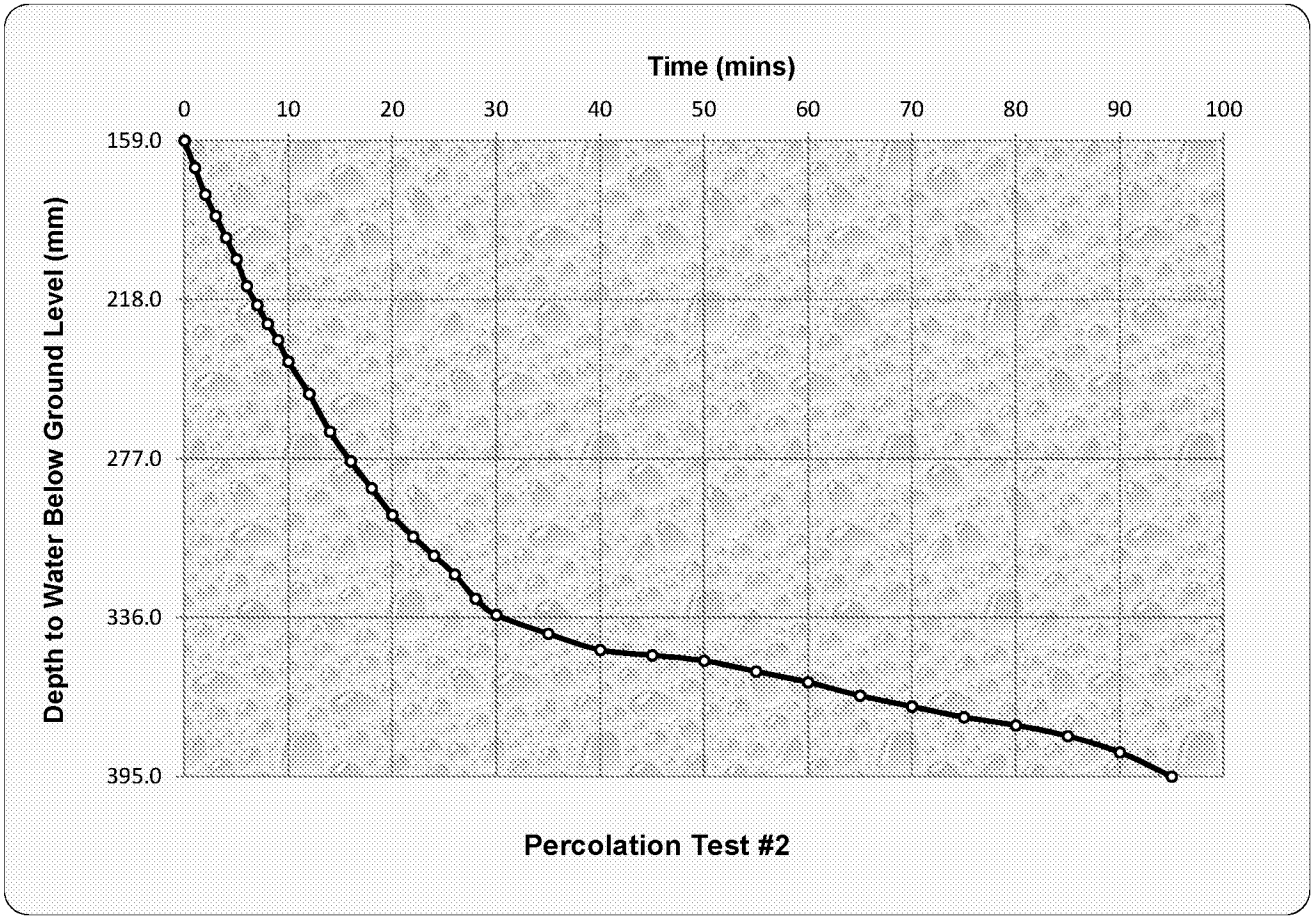
"LongAcre" the Street Walberton

Percolation Trial Pit TP#1 (north)

Percolation Test Number 2

1280mm Length x 450mm Width x 395mm Depth

	Time (mins)	Depth to Water Surface
12:43:00	0	159
	1	169
	2	179
	3	187
	4	195
	5	203
	6	213
	7	220
	8	227
	9	233
	10	241
	12	253
	14	267
	16	278
	18	288
	20	298
	22	306
	24	313
	26	320
	28	329
	30	335
	35	342
	40	348
	45	350
	50	352
	55	356
	60	360
	65	365
	70	369
	75	373
	80	376
	85	380
	90	386
	95	395



Soil infiltration rate: $f = \frac{0.068}{0.984 \times 24.0 \times 60} = 4.795E\text{-}05$ m/s

SOIL INFILTRATION RATE IS

4.795E-05 metres/second

Mate GeoTechnic Services

Thursday 18th July 2024

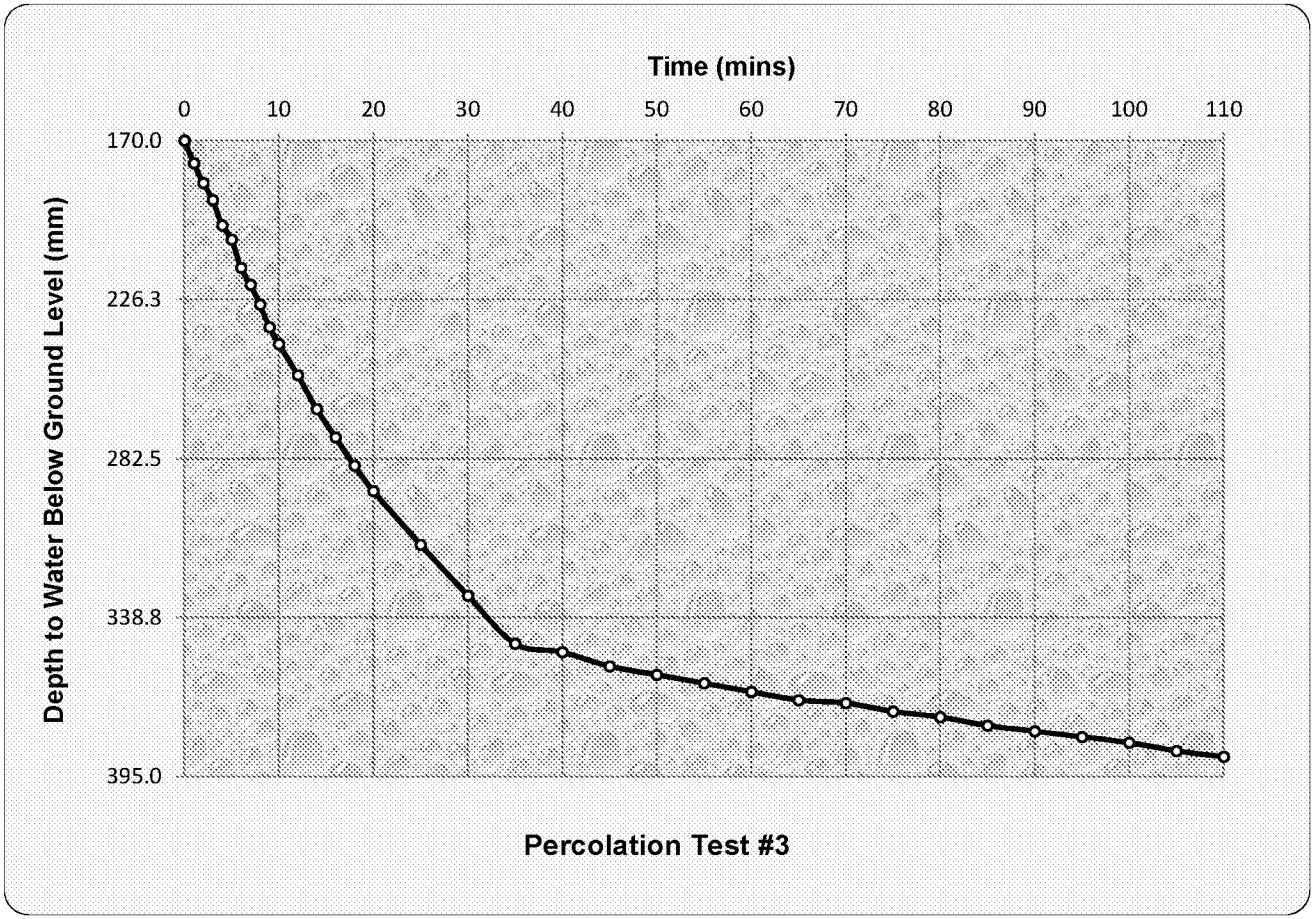
"LongAcre" the Street Walberton

Percolation Trial Pit TP#1 (north)

Percolation Test Number 3

1280mm Length x 450mm Width x 395mm Depth

	Time (mins)	Depth to Water Surface
12:05:00	0	170
	1	178
	2	185
	3	191
	4	200
	5	205
	6	215
	7	221
	8	228
	9	236
	10	242
	12	253
	14	265
	16	275
	18	285
	20	294
	25	313
	30	331
	35	348
	40	351
	45	356
	50	359
	55	362
	60	365
	65	368
	70	369
	75	372
	80	374
	85	377
	90	379
	95	381
	100	383
	105	386
13:55:00	110	388



Soil infiltration rate: $f = \frac{0.065}{0.965 \times 24.5 \times 60} = 4.561E\text{-}05$ m/s

SOIL INFILTRATION RATE IS

4.561E-05 metres/second

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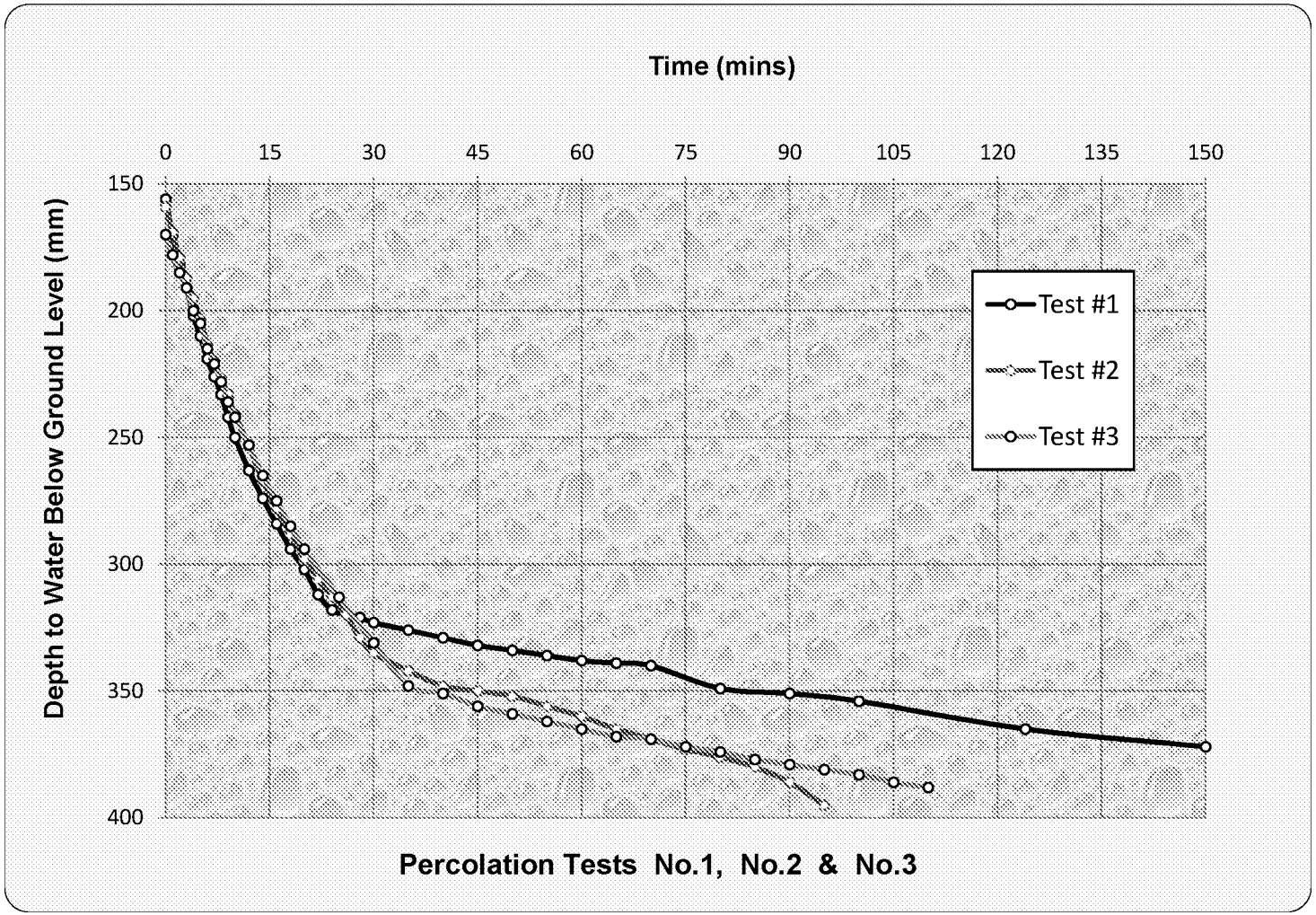
Tuesday 16th, Wednesday 17th & Thursday 18th July 2024

"LongAcre" the Street Walberton

Percolation Trial Pit TP#1 (north)

Percolation Testing Numbers #1, #2 & #3

1280mm Length x 450mm Width



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Tuesday 16th July 2024

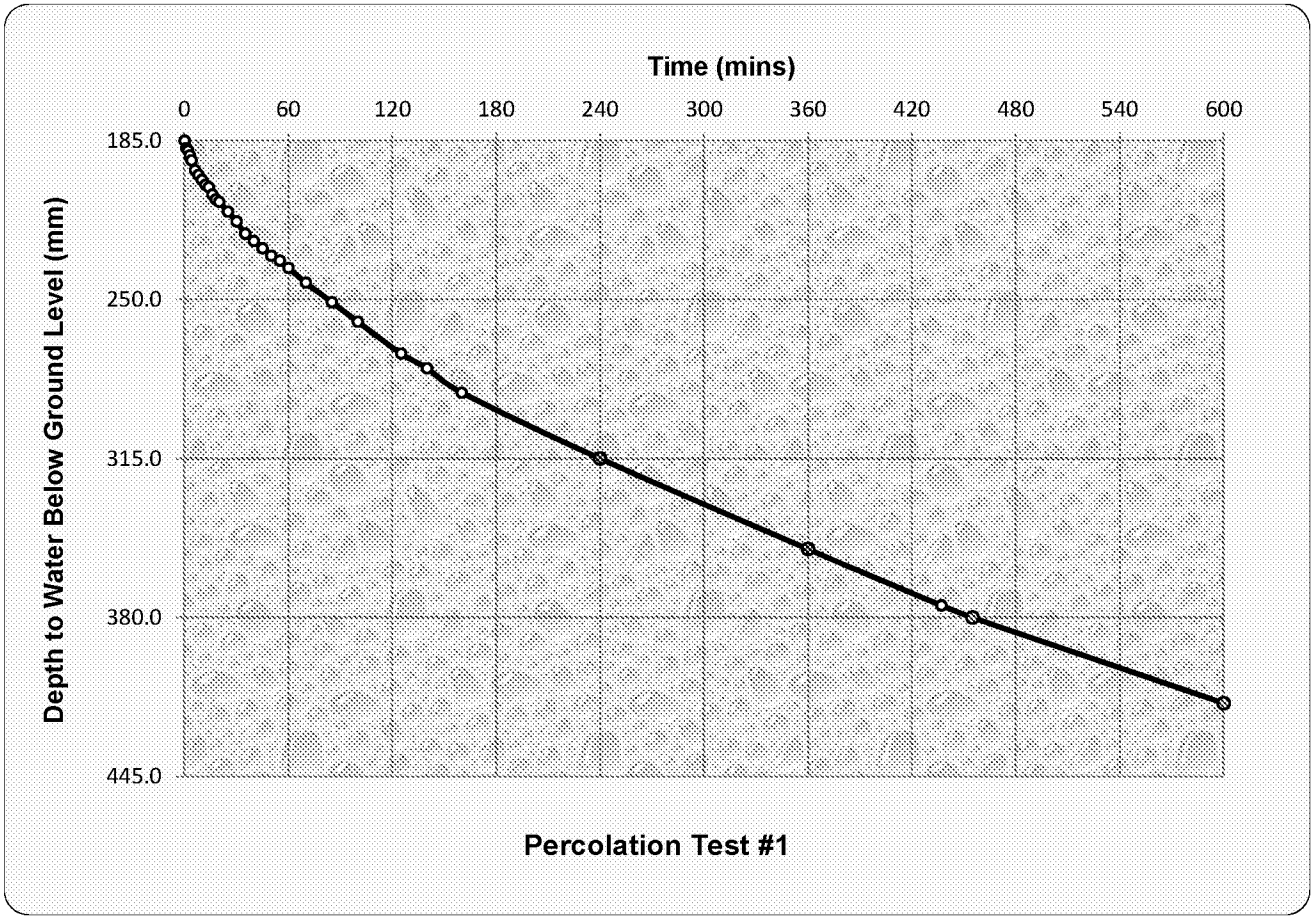
"LongAcre" the Street Walberton

Percolation Trial Pit TP#2 (centre)

Percolation Test Number 1

1370mm Length x 450mm Width x 445mm Depth

	Time (mins)	Depth to Water Surface
13:53:00	0	185
	1	188
	2	189
	3	191
	4	193
	6	197
	8	199
	10	201
	12	203
	14	204
	16	207
	18	209
	20	210
	25	214
	30	218
	35	223
	40	226
	45	229
	50	232
	55	234
	60	237
	70	243
	85	251
15:33:00	100	259
	125	272
	140	278
16:33:00	160	288
	240	315
	360	352
21:10:00	437	375
	455	380
	600	415



Soil infiltration rate: $f = \frac{0.080}{1.090 \times 371.9 \times 60} = 3.296E\text{-}06$ m/s

Non Reading Smoothing Points in BLUE

Non Reading Extrapolated Points in RED

SOIL INFILTRATION RATE IS

3.296E-06 metres/second

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Wednesday 17th July 2024

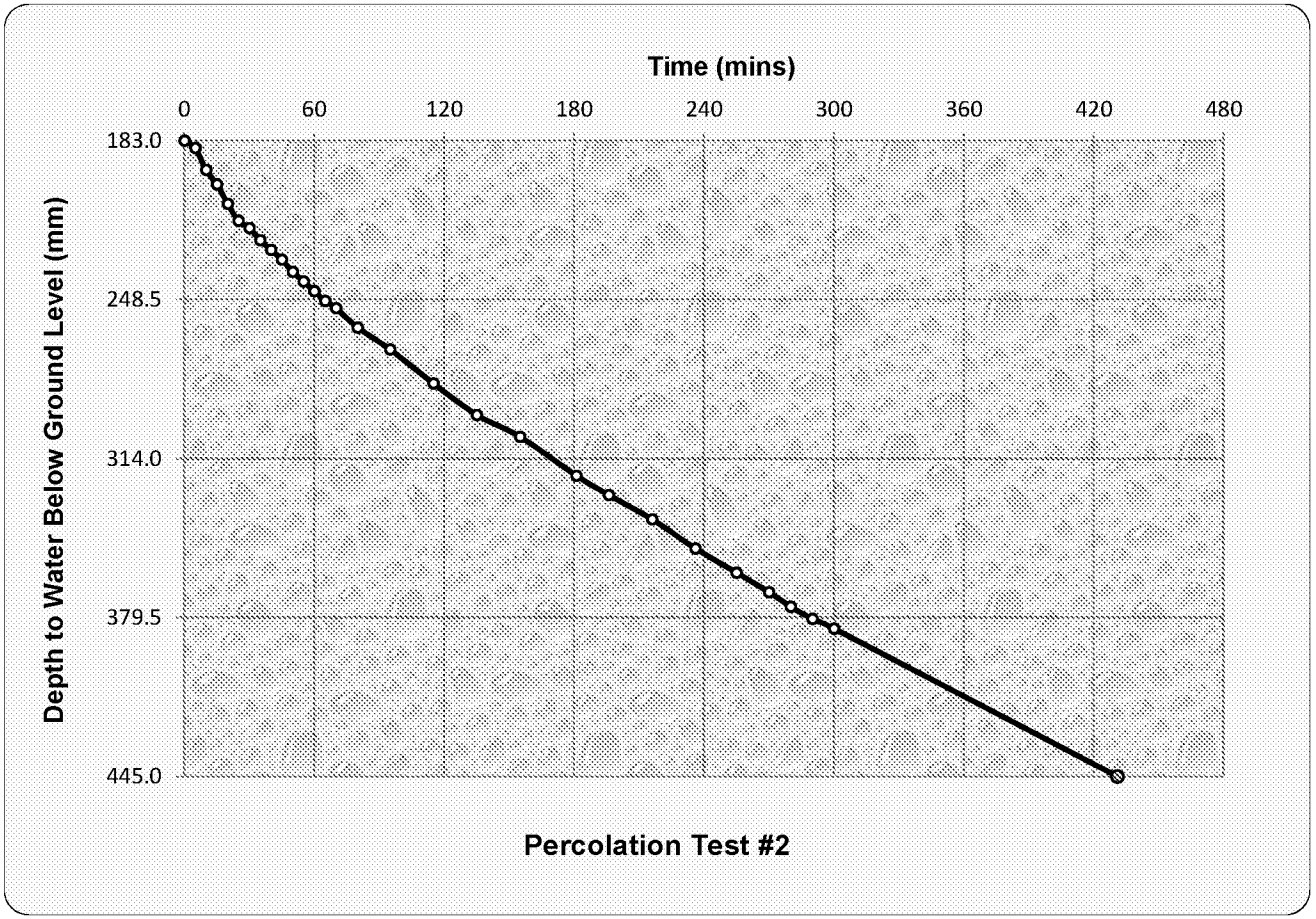
"LongAcre" the Street Walberton

Percolation Trial Pit TP#2 (centre)

Percolation Test Number 2

1370mm Length x 450mm Width x 445mm Depth

	Time (mins)	Depth to Water Surface
11:19:00	0	183
	5	186
	10	195
	15	201
	20	209
	25	216
	30	219
	35	224
	40	228
	45	232
	50	237
	55	241
	60	245
	65	249
	70	252
	80	260
	95	269
	115	283
	135	296
	155	305
14:20:00	181	321
	196	329
	216	339
	236	351
	255	361
	270	369
	280	375
	290	380
16:19:00	300	384
18:30:00	431	446
	Client Observation	



Soil infiltration rate: $f = \frac{0.081}{1.093 \times 224.6 \times 60} = 5.481E\text{-}06$ m/s

Non Reading Extrapolated Point in RED

SOIL INFILTRATION RATE IS

5.481E-06 metres/second

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Thursday 18th July 2024

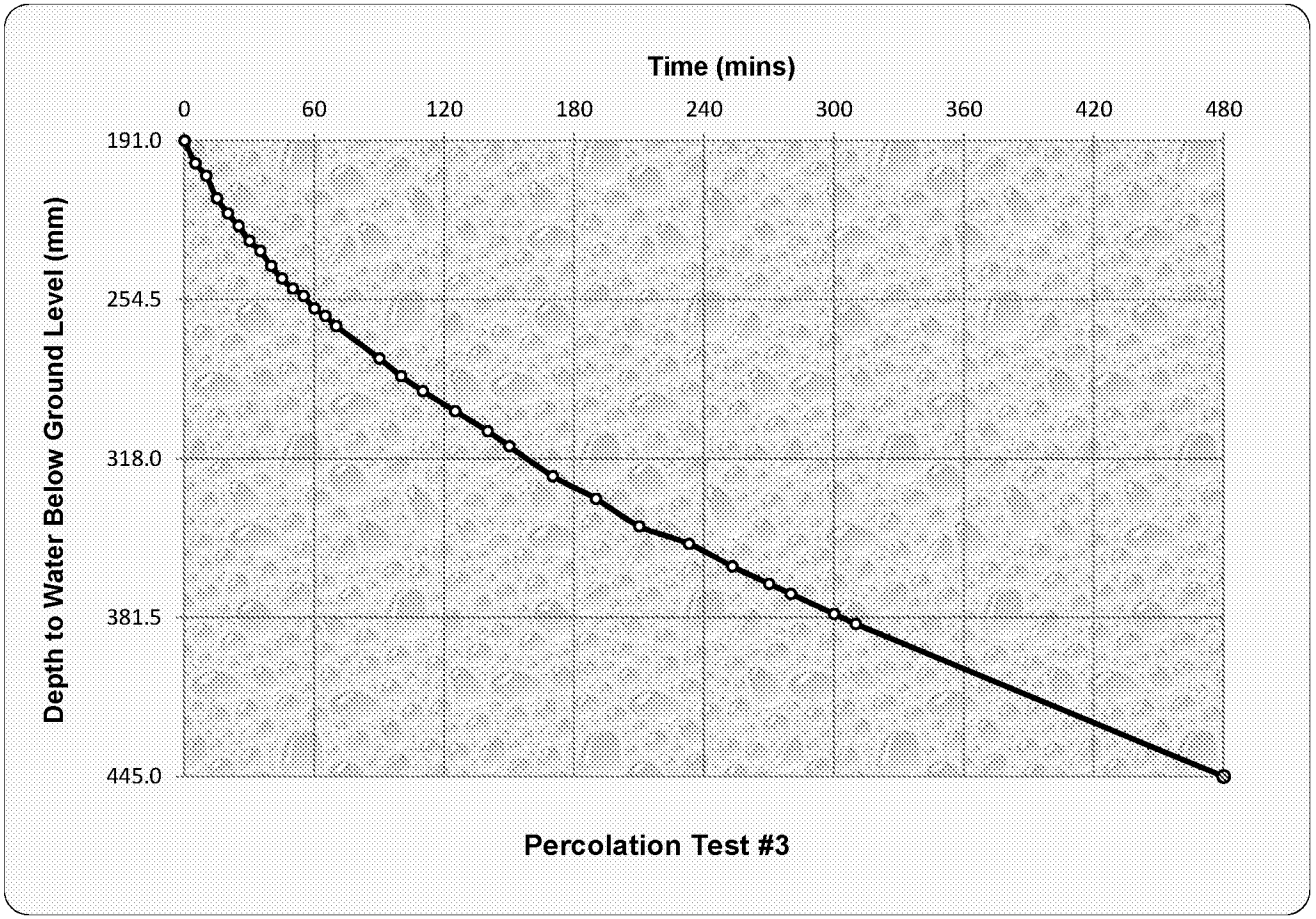
"LongAcre" the Street Walberton

Percolation Trial Pit TP#2 (centre)

Percolation Test Number 3

1370mm Length x 450mm Width x 445mm Depth

	Time (mins)	Depth to Water Surface
10:47:00	0	191
	5	200
	10	205
	15	214
	20	220
	25	225
	30	231
	35	235
	40	241
	45	246
	50	250
	55	253
	60	258
	65	261
11:57:00	70	265
	90	278
	100	285
	110	291
	125	299
	140	307
	150	313
	170	325
	190	334
	210	345
	233	352
	253	361
	270	368
	280	372
15:47:00	300	380
	310	384
	480	445



Soil infiltration rate: $f = \frac{0.078}{1.079 \times 247.3 \times 60} = 4.892E\text{-}06$ m/s

Non Reading Extrapolated Point in RED

SOIL INFILTRATION RATE IS

4.892E-06 metres/second

Mate GeoTechnic Services

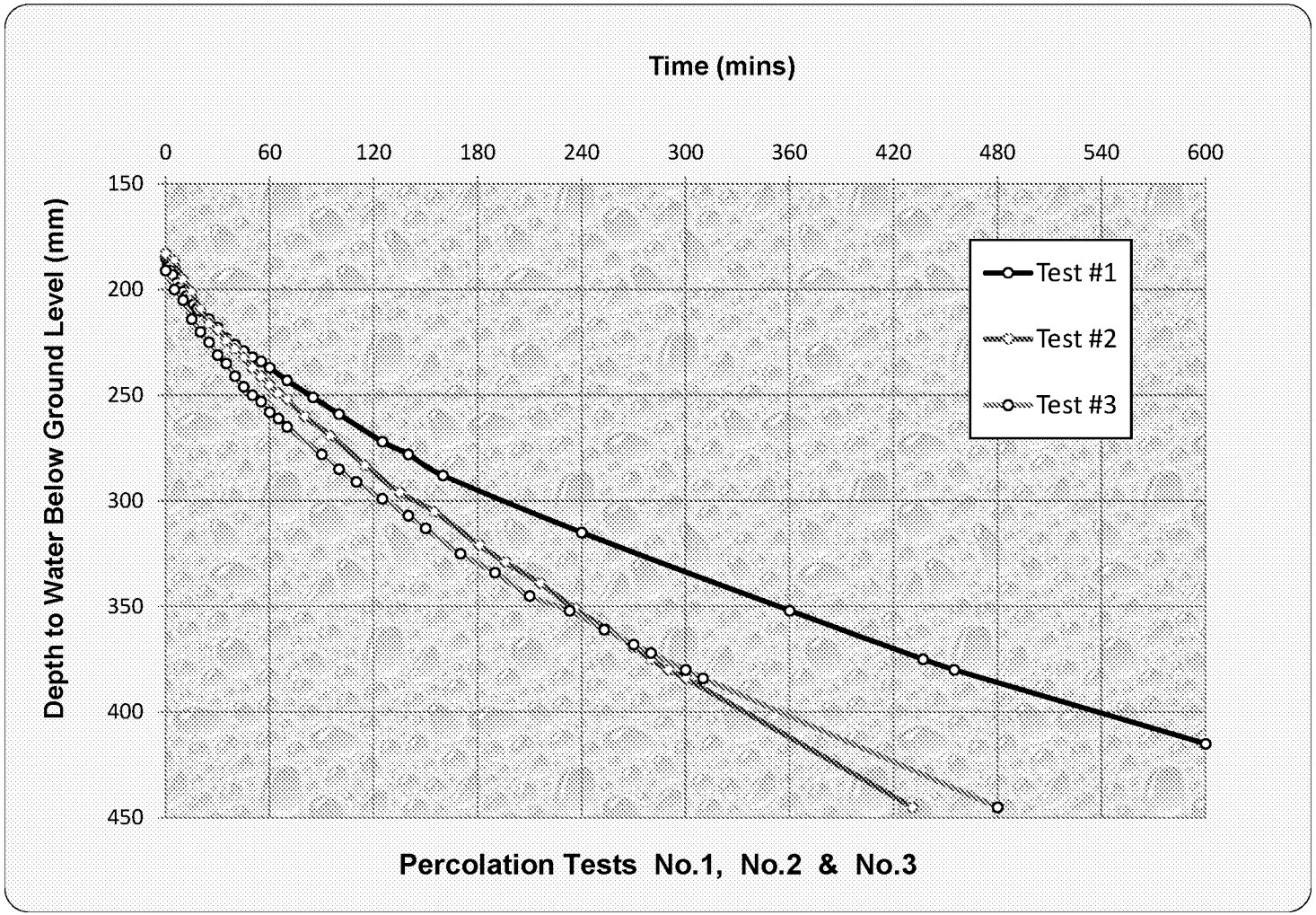
Tuesday 16th, Wednesday 17th & Thursday 18th July 2024

"LongAcre" the Street Walberton

Percolation Trial Pit TP#2 (centre)

Percolation Testing Numbers #1, #2 & #3

1370mm Length x 450mm Width



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Wednesday 17th July 2024

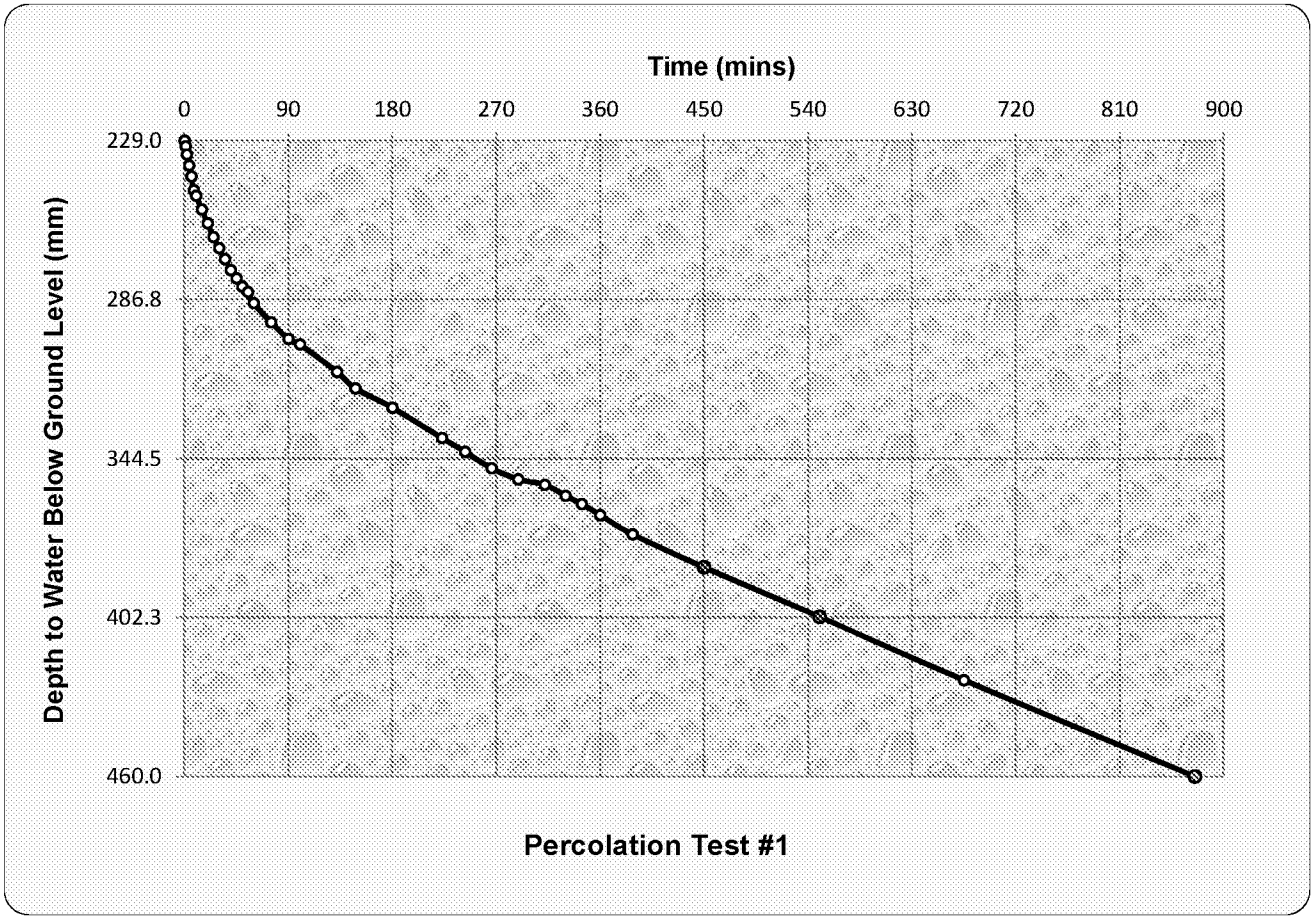
"LongAcre" the Street Walberton

Percolation Trial Pit TP#3 (south)

Percolation Test Number 1

1600mm Length x 450mm Width x 460mm Depth

	Time (mins)	Depth to Water Surface
09:34:00	0	229
	1	231
	2	234
	4	238
	6	242
	8	247
	10	249
	15	254
	20	259
	25	264
	30	268
	35	272
	40	276
	45	279
	50	282
	55	284
	60	288
	75	295
	90	301
11:34:00	100	303
	132	313
	148	319
12:34:00	180	326
	223	337
13:37:00	243	342
	266	348
	289	352
	312	354
	330	358
	344	361
15:34:00	360	365
	388	372
	450	384
	550	402
20:49:00	675	425
	875	460



Soil infiltration rate: $f = \frac{0.083}{1.194 \times 491.6 \times 60} = 2.362E\text{-}06$ m/s

Non Reading Smoothing Points in BLUE

Non Reading Extrapolated Points in RED

SOIL INFILTRATION RATE IS

2.362E-06 metres/second

Mate GeoTechnic Services

Thursday 18th July 2024

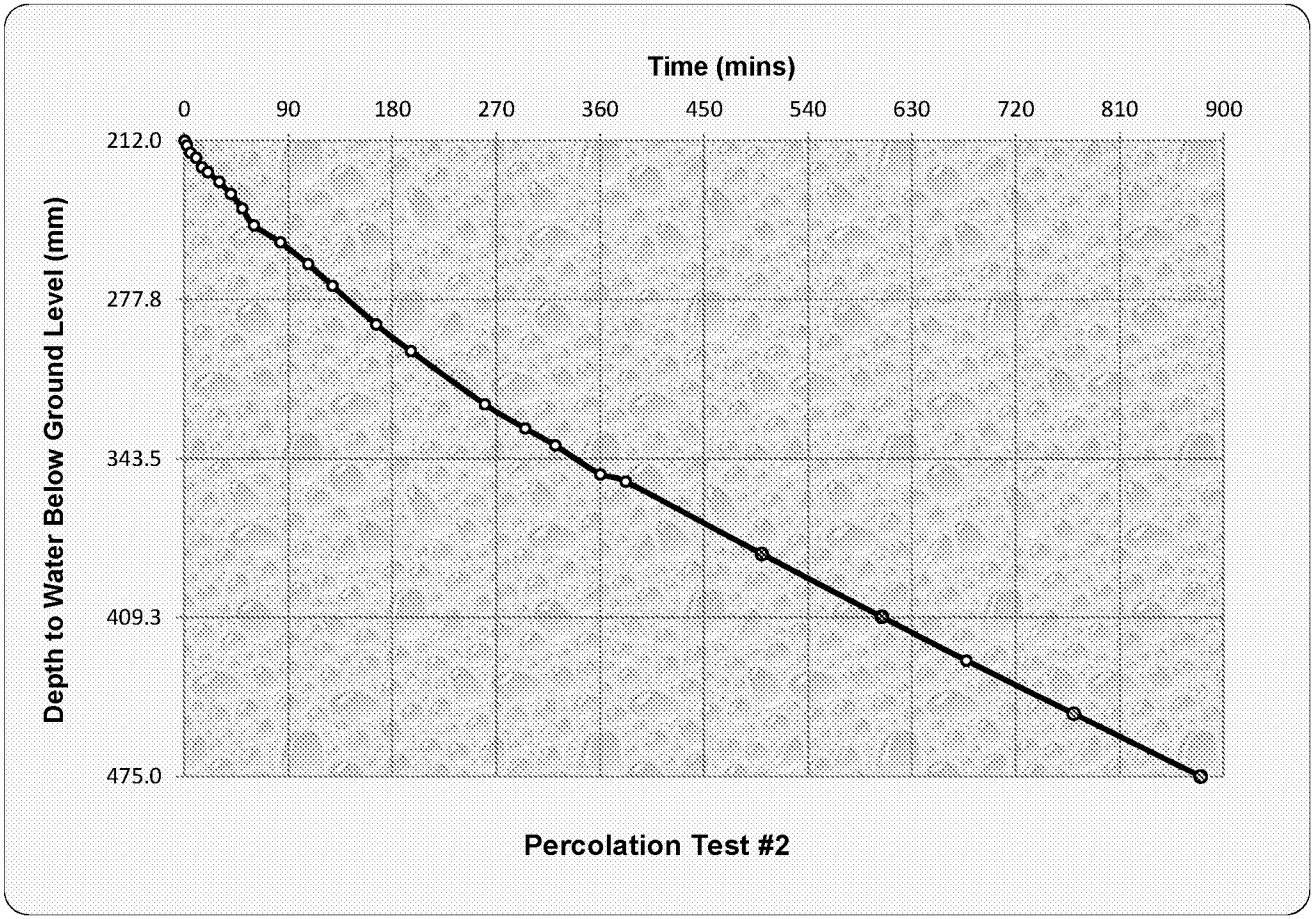
"LongAcre" the Street Walberton

Percolation Trial Pit TP#3 (south)

Percolation Test Number 2

1600mm Length x 450mm Width x 475mm Depth

	Time (mins)	Depth to Water Surface
09:42:00	0	212
	2	214
	5	217
	10	219
	15	223
	20	225
	30	229
	40	234
	50	240
	60	247
	83	254
	107	263
11:50:00	128	272
	166	288
	196	299
14:02:00	260	321
	295	331
	321	338
15:42:00	360	350
16:04:00	382	353
	500	383
	604	409
20:59:00	677	427
	778	448
	880	475



Soil infiltration rate: $f = \frac{0.095}{1.259 \times 462.3 \times 60} = 2.711E\text{-}06$ m/s

SOIL INFILTRATION RATE IS

2.711E-06 metres/second

Mate GeoTechnic Services

Sunday 21st July 2024

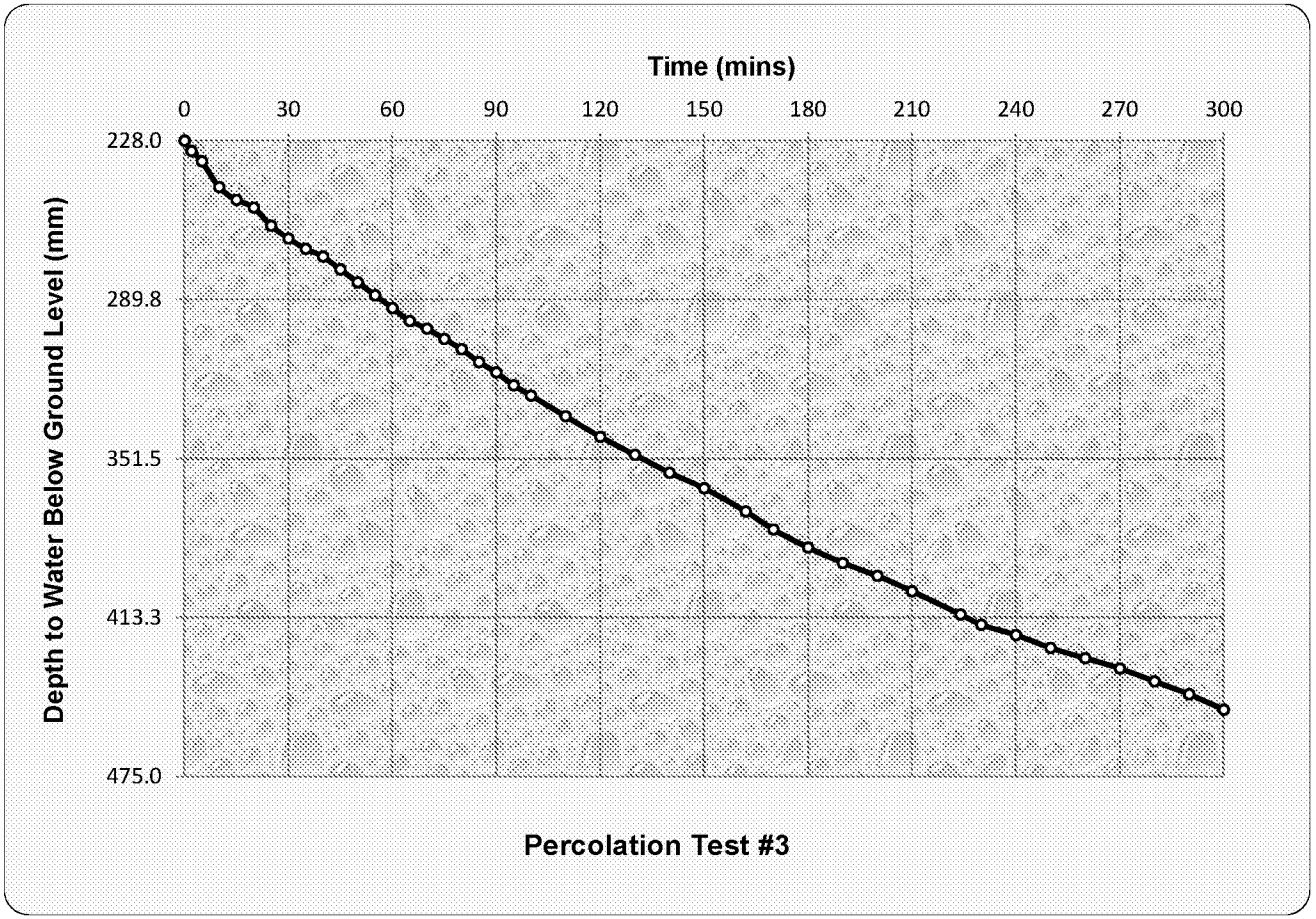
"LongAcre" the Street Walberton

Percolation Trial Pit TP#3 (south)

Percolation Test Number 3

1600mm Length x 450mm Width x 475mm Depth

	Time (mins)	Depth to Water Surface
09:30:00	0	228
	2	232
	5	236
	10	246
	15	251
	20	254
	25	261
	30	266
	35	270
	40	273
	45	278
	50	283
	55	288
10:30:00	60	293
	65	298
	70	301
	75	305
	80	309
	85	314
	90	318
	95	323
	100	327
	110	335
	120	343
	130	350
	140	357
	150	363
	162	372
	170	379
	180	386
	190	392
	200	397
	210	403
13:14:00	224	412
	230	416
	240	420
	250	425
	260	429
	270	433
	280	438
	290	443
14:30:00	300	449



Soil infiltration rate: $f = \frac{0.089}{1.226 \times 169.1 \times 60} = 7.145E\text{-}06$ m/s

SOIL INFILTRATION RATE IS

7.145E-06 metres/second

Mate GeoTechnic Services

Wednesday 17th, Thursday 18th & Sunday 21st July 2024

"LongAcre" the Street Walberton

Percolation Trial Pit TP#3 (south)

Percolation Testing Numbers #1, #2 & #3

1600mm Length x 450mm Width