



**RODGERS LEASK
ENVIRONMENTAL**

Consulting Geotechnical &
Environmental Engineers



Kirkby Road, Desford
Infiltration Test Factual Report

1.0 Introduction

1.1 Terms of Reference

In October 2014 Rodgers Leask Environmental (RLE) were commissioned by Davidsons Developments Ltd. to conduct initial infiltration testing for a proposed residential development on land at Kirkby Road, Desford. This land will henceforth be referred to as the “site”.

RLE previously undertook permeability testing for the site as documented in RLE Permeability Test Factual Report, dated 29th August 2014.

1.2 Objectives

The objectives of the investigation were to:

- Assess the suitability of the ground with regard to using soakaways to drain surface water from the proposed development.

1.3 Scope

In order to achieve the outlined objectives the scope of the study encompassed:

- On-site excavation of trial pits to undertake infiltration tests.
- Calculation and reporting of the results.

1.4 Site Location

The site is situated to the southwest of the village of Desford, Leicestershire. The site centre grid reference is approximately: 447180E, 302882N. A site location plan is included in Appendix A.

2.0 Trial Pits

Ten trial pits (TP) were excavated on 31st October 2014 by means of a JCB 3CX excavator in order to conduct the infiltration testing.

RLL, undertaking civil drainage assessment for the site provided the preferred locations for the TP's. The locations of the TP's are indicated on RLE Drawing No. P14-310-003 contained in Appendix B of this report.

TP's were logged in accordance with BS 5930 'Code of Practice for Site Investigations' 1999. However, it should be noted that the density of granular material was based upon a visual assessment only. A copy of the TP logs is contained in Appendix C.

TP's across the site generally comprised the following:

- Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains to depths of between 0.3m and 0.35m, overlying
- Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite to depths between 0.55m and 1.1m, overlying
- Medium dense orange/brown medium grained slightly clayey slightly gravelly SAND containing occasional pockets of clay to depths between 1.5m and 1.7m.

Firm red/brown/grey mottled slightly gravelly very sandy CLAY was encountered within SA3(B) at between 1.0m and 1.8m and within SA5(B) at between 1.0m and 1.9m.

The sides of the TP's were generally stable during excavation. Slight instability was noted during the testing within sand strata. A significant collapse was noted within SA4(B) during the testing.

3.0 Infiltration Test Methodology and Results

Infiltration testing was undertaken on the ten excavated TP's.

The infiltration tests were generally carried out in accordance with the methodology set out in BRE 365. However, trial pits were only filled once.

All dimensions of the pits were recorded for use in calculation of the soil infiltration rate.

The soakaway tests were commenced and completed on 31st November 2014. Water was added to the pit and the water level from a known marker positioned at the surface was recorded at the start of the test and at regular intervals throughout.

Soakaway pits SA1(B) and SA2(B) failed to empty to 75% of the water volume by the end of testing. SA3(B), SA4(B) and SA5(B) failed to empty 25% of the water volume. The data was extrapolated in order to determine soil infiltration rates for these tests. The remaining pits successfully emptied beyond 75% volume. A copy of the calculations and graphs is included as Appendix D.

Ref.	Depth of Infiltration Test (m)	Soil Infiltration Rate (f m/s)
SA1(A)	0.60	2.26×10^{-5}
SA1(B)	1.50	1.76×10^{-6}
SA2(A)	0.65	1.35×10^{-5}
SA2(B)	1.50	1.14×10^{-6}
SA3(A)	0.55	7.03×10^{-6}
SA3(B)	2.00	1.24×10^{-6}
SA4(A)	0.55	2.01×10^{-5}
SA4(B)	1.60	1.02×10^{-6}
SA5(A)	0.60	6.94×10^{-6}
SA5(B)	1.90	1.32×10^{-6}

*Red indicates extrapolated result.

SITE



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Client: Davidsons
Developments Ltd.

Project: Kirkby Road, Desford

Title: Site Location Plan

Scale: NTS

Project ref: P14-310

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GENERAL NOTES

NO DIMENSIONS TO BE SCALED OFF THIS DRAWING.
THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL
RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS.
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED
OTHERWISE.
ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
ANY DISCREPANCIES NOTED ON SITE ARE TO BE
REPORTED TO THE ENGINEER IMMEDIATELY.



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Client

DAVIDSONS DEVELOPMENTS

Project

KIRKBY ROAD, DESFORD

Drawing Title

**INTRUSIVE LOCATION PLAN -
SOAKAWAY TESTING**

Status

FINAL

Scale Drawn Checked Date

A3 @ NTS AG SJF 03.11.14

Project No. Drawing No. Rev.

P14-310 002 Original

File Path:

P:\2014\ P14-310\ Drawings

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Trial Pit Log

Trial Pit
SA1(A)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.35		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded quartzite.
							0.60		End of Trial Pit at 0.60 m
							1.0		
							1.5		
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA1(B)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.35		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded quartzite.
							0.90		Medium dense red/orange/brown medium grained SAND containing occasional slightly clayey pockets.
							1.50		End of Trial Pit at 1.50 m
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA2(A)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded quartzite.
							0.65		End of Trial Pit at 0.65 m
							1.0		
							1.5		
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA2(B)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite and welded gravels. Gravels of fine to coarse, sub-rounded quartzite.
							1.0		Occasional pocket of fine to medium yellow/brown gravelly sand below 1.0m.
							1.10		Medium dense orange/brown/red occasionally grey mottled slightly clayey slightly gravelly SAND containing occasional pocket of very sandy clay. Gravels of fine to coarse, sub-rounded to angular quartzite and fine grained sandstone.
							1.50		End of Trial Pit at 1.50 m
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA3(A)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.55		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded to angular quartzite and occasional sandstone.
									End of Trial Pit at 0.55 m
							1.0		
							1.5		
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA3(B)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD)	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.35		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown/grey slightly clayey SAND.
							0.60		Firm orange/brown/grey slightly gravelly sandy CLAY. Gravels of fine to coarse, sub-rounded to angular quartzite and rare flint.
							1.00		Firm red/brown occasionally grey mottled slightly gravelly very sandy CLAY. Gravels of fine to coarse, sub-rounded quartzite.
							1.80		Medium dense red/brown occasionally grey slightly clayey gravelly SAND. Gravels of fine to coarse, sub-rounded to angular quartzite and occasional sandstone.
							2.00		End of Trial Pit at 2.00 m
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA4(A)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded quartzite.
							0.55		End of Trial Pit at 0.55 m
							1.0		
							1.5		
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA4(B)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD)	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown gravelly medium grained SAND containing occasional cobble of quartzite. Gravels of fine to coarse, sub-rounded quartzite.
							1.10		Medium dense orange/brown/red slightly gravelly medium grained SAND containing occasional pocket of sandy clay and occasional quartzite cobble. Gravels of fine to coarse, sub-rounded quartzite.
							1.5		Frequent cobbles below 1.5m.
							1.70		End of Trial Pit at 1.70 m
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL	Shear Vane Test: S.VANE	Stability: Sides stable during excavation. Some instability following addition of water
Bulk disturbed Sample: B	Ground Water Strike: GW Strike	Remarks:
Small Disturbed Sample: D		
Large Bulk Disturbed Sample: LB	Ground Water Rise:	
Undisturbed Sample: U		
Water Sample: W		
Volatile Organic Compound: VOC		



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Trial Pit Log

Trial Pit
SA5(A)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD) -	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown slightly clayey gravelly medium grained SAND containing occasional quartzite cobble. Gravels of fine to coarse, sub-rounded quartzite.
							0.60		End of Trial Pit at 0.60 m
							1.0		
							1.5		
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:



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Trial Pit Log

Trial Pit
SA5(B)

Sheet 1 of 1

Method: JCB 3CX	Date: 31/10/2014	Groundwater: None	Site: Kirkby Road, Desford	Scale: 1:25
Grid Ref: -	Logged by: AG	Ground Level: (m AOD)	Client: Davidsons Developments	Job No: P14-310

Soil Samples/Tests					GW Strike	Level	Depth	Legend	Description of Strata
Reference:	Depth: (m)	Type:	VOC: (ppm)	S.VANE: (KPa)	(m)	(m AOD)	(m)		
							0.30		Dark brown sandy gravelly reworked agricultural TOPSOIL containing organic remains. Gravels of fine to coarse, sub-rounded quartzite.
							0.5		Medium dense orange/brown/grey mottled gravelly SAND containing cobbles of tabular grey fine grained sandstone. Gravels of fine to coarse, sub-rounded quartzite.
							0.60		Medium dense orange/brown/grey clayey gravelly SAND containing occasional cobble of quartzite containing occasional pockets of sandy gravelly clay. Gravels of fine to coarse, sub-rounded quartzite.
							1.00		Firm orange/brown/grey/red gravelly very sandy CLAY containing pockets of clayey sand. Gravels of fine to coarse, sub-rounded to angular quartzite and occasional weak sandstone.
							1.5		Very gravelly with abundant cobbles below 1.5m.
							1.90		End of Trial Pit at 1.90 m
							2.0		
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		

Key: Amalgamated Sample: AMAL
Bulk disturbed Sample: B
Small Disturbed Sample: D
Large Bulk Disturbed Sample: LB
Undisturbed Sample: U
Water Sample: W
Volatile Organic Compound: VOC

Shear Vane Test: S.VANE
Ground Water Strike: GW Strike
Ground Water Rise:

Stability: Sides stable during excavation.

Remarks:

BRE Digest 365 Soakaway Tests - Desford

Red indicates extrapolated data

Insert field data into yellow shaded areas

Trial Pits

	Enter trial pit designation below e.g. TP1									
	SA1(A)	SA1(B)	SA2(A)	SA2(B)	SA3(A)	SA3(B)	SA4(A)	SA4(B)	SA5(A)	SA5(B)
Depth	0.6	1.5	0.65	1.5	0.55	2	0.55	1.6	0.6	1.9
Length	1.4	1.6	1.8	1.6	1.6	1.5	1.6	1.6	1.6	1.8
Width	0.6	0.6	0.6	0.65	0.6	0.65	0.6	0.6	0.6	0.6
water level from surface at start	0.4	0.68	0.39	0.56	0.36	0.88	0.36	0.8	0.43	1
Time to 25 % empty mins	20	150	18	225	38	325	12	300	33	600
Time to 75 % empty mins	70	1500	120	2500	195	2500	67	2600	180	2500
Time for outflow between 75% and 25 % effective depth mins	50	1350	102	2275	157	2175	55	2300	147	1900
Height of water in TP	0.2	0.82	0.26	0.94	0.19	1.12	0.19	0.8	0.17	0.9
Effective depth m	0.2	0.82	0.26	0.94	0.19	1.12	0.19	0.8	0.17	0.9
75% effective depth	0.55	1.295	0.585	1.265	0.5025	1.72	0.5025	1.4	0.5575	1.675
25% effective depth	0.45	0.885	0.455	0.795	0.4075	1.16	0.4075	1	0.4725	1.225
vol between 75% and 25% m3	0.084	0.3936	0.1404	0.4888	0.0912	0.546	0.0912	0.384	0.0816	0.486
Mean Surface Area m50 m2	1.24	2.764	1.704	3.155	1.378	3.383	1.378	2.72	1.334	3.24
Soil Infiltration Rate f m/s	2.26E-05	1.76E-06	1.35E-05	1.14E-06	7.03E-06	1.24E-06	2.01E-05	1.02E-06	6.94E-06	1.32E-06