



GRM Development Solutions Ltd
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Our Ref: P10086/SA Let.

Date: 14th September 2022

Catesby Strategic Land Ltd
Orchard House,
Papple Close,
Houlton,
Rugby,
CV23 1EW

For the attention of Mr. J. Findlay

Dear James,

RE: Soakaway Testing – Land South of Burford Road, Minster Lovell, Oxfordshire

This letter report should be read in conjunction with GRM Phase I Desk Study Assessment (ref. GRM/P9940/DS.1/Rev. A, dated July 2022), prepared on behalf of the Catesby Strategic Land Ltd.

Further to your instruction GRM have attended the above site to carry out soakaway testing at four locations to confirm the infiltration characteristics of the underlying soils. The proposed development has been assumed to comprise private residential housing and associated infrastructure.

Information reviewed as part of the Phase I Desk Study assessment indicated the site was likely to be largely underlain by a combination of the White Limestone Formation in the east and the Forest Marble Formation (both limestone and mudstone facies) across the remainder of the site.

Four mechanically excavated trial pits (SA01-SA04) were advanced on the 1st September 2022 at locations targeting the recorded locations of both the White Limestone Formation and the Forest Marble Formation (limestone facies only) to provide a representative assessment of the geologies present. A Location Plan showing the position of the tests is attached to this letter report along with the exploratory hole logs.

The strata encountered were visually similar in all four locations. The strata in SA03 have been classified as White Limestone Formation based on the geological mapping. Further investigation is recommended to confirm the recorded geology and its distribution across the site.

The Forest Marble Formation was encountered in SA01, SA02 and SA04 and the White Limestone in SA03.



Land Appraisal | Environmental | Geotechnical | Design | Mining | Inspections

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Proven Ground Conditions

Soakaway Pit	Depth From and To (m)	Stratum Description
SA01	0.0 - 0.25	Topsoil: brown, slightly clayey, gravelly, SAND with gravel comprising limestone.
	0.25 – 1.0	Forest Marble Formation: dense, yellowish-brown, sandy, cobbly GRAVEL. Gravel and cobbles comprise limestone.
	1.0 – 1.5	Forest Marble Formation: very dense, yellowish-brown, slightly sandy, very gravelly COBBLES. Gravel and cobbles comprise limestone.
SA02	0.0 – 0.3	Topsoil: brown, slightly clayey, gravelly, SAND with gravel comprising limestone.
	0.3 – 0.6	Forest Marble Formation: dense yellowish-brown, sandy, cobbly, GRAVEL. Gravel and cobbles comprise limestone.
	0.6 – 1.6	Forest Marble Formation: very dense, yellowish-brown, sandy, gravelly, COBBLES. Gravel and cobbles comprise limestone.
	1.6 – 1.95	Forest Marble Formation: weak to moderately strong, yellowish-brown LIMESTONE.
SA03	0.0 – 0.3	Topsoil: brown, slightly clayey, gravelly SAND with gravel comprising limestone.
	0.3 – 1.0	White Limestone Formation: dense yellowish-brown, sandy, cobbly GRAVEL. Gravel and cobbles comprise limestone.
	1.0 – 1.5	White Limestone Formation: very dense, pale, yellowish-brown, sandy, gravelly COBBLES. Gravel and cobbles comprise limestone.
SA04	0.0 – 0.3	Topsoil: brown, slightly clayey, gravelly SAND with gravel comprising limestone.
	0.3 – 1.0	Forest Marble Formation: dense, yellowish-brown, sandy, cobbly, GRAVEL. Gravel and cobbles comprise limestone.
	1.0 – 1.3	Forest Marble Formation: very dense, yellowish-brown, sandy, gravelly, COBBLES. Gravel and cobbles comprise limestone.

Groundwater seepage / inflow was not observed during the excavation of the pits.

Soakaway Testing

The soakaway pits were installed with a series of plastic storm crates in order to maintain pit stability during testing. Each of the tested locations was filled with water to levels of between 0.69m and 1.44m below ground level (begl) and the level of water present was monitored over time.

Infiltration rates have been calculated from the data obtained. Three tests were completed in SA01-03 and two in SA04, due to time constraints.

Soakaway Pit	Infiltration Rates (m/s)		
	Test 1	Test 2	Test 3
SA01	>9 x 10 ⁻⁴ empty after 90 seconds	>9 x 10 ⁻⁴ empty after 180 seconds	8 x 10 ⁻⁴
SA02	1.23 x 10 ⁻⁴	1.17 x 10 ⁻⁴	1.10 x 10 ⁻⁴
SA03	>9 x 10 ⁻⁴ empty after 45 seconds	>9 x 10 ⁻⁴ empty after 60 seconds	8 x 10 ⁻⁴
SA04	1.96 x 10 ⁻⁵	1.59 x 10 ⁻⁵	Not completed

Infiltration rates >9 x 10⁻⁴ m/s were achieved in tests 1 and 2 in pits SA01 and SA03, before slowing to 8 x 10⁻⁴. The infiltration rates were such that it was not possible to establish a head of water greater than 320mm. In SA04 the infiltration rates were generally at least a magnitude slower, although still

reasonable, which is likely to be due to increased fines content or a change in geology or a combination of the two; however, no visual change was noted.

The results of the testing should be provided to the project's drainage engineer for inclusion within the site's surface water drainage design after taking into account suitable factors of safety. It may be prudent to consider targeted testing to delineate the areas of slower drainage dependant upon the sensitivity of the drainage design.

We trust that the above is sufficient for your current purposes, however if you have any queries, please do not hesitate to contact us.


Yours sincerely,
for GRM Development Solutions Ltd



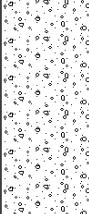

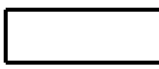
A handwritten signature in black ink, appearing to read 'P Wardle', written over a light grey rectangular background.


Paul Wardle BSc, MA
Acting Principal Geologist.



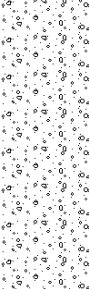

Attached: Soakaway Pit Location Plan.
 Exploratory Hole Logs.



NOTES: NOTES	CLIENT: CLIENT	PROJECT No: E/P ref	DATE: DATE	DESIGN/DRAWN: INITIALS	<div> GRM Development Solutions Ltd Tel: 01283 551 249 mail@grm-uk.com www.grm-uk.com</div>
	PROJECT: PROJECT NAME	DRAWING NUMBER: Drawing Number	ISSUE: ISSUE		
	© GRM Development Solutions Ltd © Crown Copyright. AL 100014100				
TITLE: DRAWING TITLE					


		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		<h1 style="text-align: center;">Trial Pit Log</h1>			Trial Pit No SA01 Sheet 1 of 1	
Site Name: Minster Lovell, West Oxfordshire							Ground Level (mAOD) 121.20	
Client: Catesby Strategic Land Ltd					GRM Project Ref: P10086		Coordinates 430687 E 210635 N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.25	120.95	  	Brown, slightly clayey, gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Contains frequent rootlets. TOPSOIL	
				1.00	120.20		Dense, yellowish brown, sandy cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	
				1.50	119.70		Very dense, yellowish brown, slightly sandy, very gravelly COBBLES. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	
							End of Pit at 1.500m	
Date Excavated: 01/09/2022 Date Backfilled: 01/09/2022 Shoring: None. Stability: Stable during excavation. Plant Used: JCB 3CX Logged by: RP				Groundwater Observations: No groundwater encountered.				
				Trial Pit Dimensions (m): 0.60  2.50		Reason for termination of Trial Pit: Achieved required depth.		
General Remarks:								
Relative density is approximate and determined by observation only.				Version: FINAL			Scale: 1:25	



		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		<h1 style="text-align: center;">Trial Pit Log</h1>			Trial Pit No SA02 Sheet 1 of 1	
Site Name: Minster Lovell, West Oxfordshire							Ground Level (mAOD) 119.90	
Client: Catesby Strategic Land Ltd					GRM Project Ref: P10086		Coordinates 430718 E 210428 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	119.60		Brown, slightly clayey, gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Contains frequent rootlets. TOPSOIL	
				0.60	119.30		Dense, yellowish brown, sandy cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	
				1.60	118.30		Very dense, yellowish brown, sandy gravelly COBBLES. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	1
				1.95	117.95		Weak to moderately strong, yellowish brown LIMESTONE. Recovered as gravel and cobbles. Very low ripability. FOREST MARBLE FORMATION - LIMESTONE	
							End of Pit at 1.950m	2
								3
								4

Date Excavated: 01/09/2022		Groundwater Observations:	
Date Backfilled: 02/09/2022		No groundwater encountered.	
Shoring: None.			
Stability: Stable during excavation.			
Plant Used: JCB 3CX		Reason for termination of Trial Pit:	
Logged by: RP		Achieved required depth.	
General Remarks:			


Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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
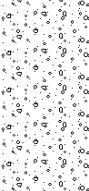

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		<h1>Trial Pit Log</h1>			Trial Pit No SA03 Sheet 1 of 1	
Site Name: Minster Lovell, West Oxfordshire							Ground Level (mAOD) 120.10	
Client: Catesby Strategic Land Ltd					GRM Project Ref: P10086		Coordinates 430716 E 210530 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	119.80		Brown, slightly clayey, gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Contains frequent rootlets.	
							TOPSOIL Dense, yellowish brown, sandy cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. WHITE LIMESTONE FORMATION	
				1.00	119.10		Very dense, pale yellowish brown, sandy gravelly COBBLES. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. WHITE LIMESTONE FORMATION	1
				1.50	118.60		End of Pit at 1.500m	
								2
								3
								4

Date Excavated: 01/09/2022		Groundwater Observations:	
Date Backfilled: 01/09/2022		No groundwater encountered.	
Shoring: None.			
Stability: Stable during excavation.			
Plant Used: JCB 3CX		Reason for termination of Trial Pit:	
Logged by: RP		Achieved required depth.	
General Remarks:			

Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		<h1 style="text-align: center;">Trial Pit Log</h1>			Trial Pit No SA04 Sheet 1 of 1	
Site Name: Minster Lovell, West Oxfordshire							Ground Level (mAOD) 118.00	
Client: Catesby Strategic Land Ltd					GRM Project Ref: P10086		Coordinates 430908 E 210494 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	117.70		Brown, slightly clayey, gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Contains frequent rootlets. TOPSOIL	
				1.00	117.00		Dense, yellowish brown, sandy cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	1
				1.30	116.70		Very dense, yellowish brown, sandy gravelly COBBLES. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are of limestone. FOREST MARBLE FORMATION - LIMESTONE	2
							End of Pit at 1.300m	3
								4

Date Excavated: 01/09/2022		Groundwater Observations:	
Date Backfilled: 02/09/2022		No groundwater encountered.	
Shoring: None.			
Stability: Stable during excavation.			
Plant Used: JCB 3CX		Reason for termination of Trial Pit:	
Logged by: RP		Achieved required depth.	

General Remarks:

Trial Pit Dimensions (m):

0.60

2.50

Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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