

**Proposed Rockingham Development, Birdwell
Phase II Geo-Environmental Assessment Summary**

Site Investigation	The investigation has involved: • Review of an existing desk study report. • 20 trial pits to a maximum depth of 4.0m • 9 mini percussion boreholes to a maximum depth of 4.0m. • Installation of ground gas monitoring wells. • Geotechnical and contamination related testing (to follow once received). • Preliminary ground gas and groundwater monitoring.
Current Use	The site is open and unoccupied land overgrown with scrub vegetation, long grass. Numerous semi mature and mature trees are present, the majority of which are along site boundaries. The site is uneven with lower lying parts of the site marked by waterlogged surface conditions with bog grass present identifying that it is a regular condition on the site.
Site History	In house data identifies the site to have been on the fringes of an opencast coal mine, which was backfilled in the 1990s. Historical reports suggest that engineered made ground comprising colliery spoil present to depths of between 0.8m and >4.0m. A former mineral railway in a potential shallow cutting is also present running northeast/southwest along the northern boundary.
Ground Conditions	The site is covered by made ground materials between 0.3m and >4.0m in thickness. The deeper areas of made ground were proven in the eastern part of the site, however, it does appear to be very variable in terms of depth rather than a consistent increase in depth. The made ground generally comprised mudstone gravels in a clayey matrix (Colliery Spoil), reworked gravelly clay or clay bound gravel and sandstone and brick. The made ground is generally underlain by firm to stiff residual clay or directly by weathered bedrock.
Groundwater	Groundwater was encountered sporadically within the made ground at depths between 1.3m and 2.7m and prevented excavation progress in one location (TP09). During the preliminary monitoring visits, three wells were found to be dry or damp at base to a maximum depth of 2.50m bgl. However, a single well (BH07) sited in a low lying area in the northern part of the site was fully waterlogged.
Gas Monitoring	Ground gas monitoring has been carried out on 1 occasion to date, with five further visits are planned. The results of the preliminary gas monitoring results indicate that no combustible ground gas (methane) is present and high concentrations of carbon dioxide (18.8% v/v). The results suggest a CIRIA C665 Characteristic Situation 2, but this will be confirmed on completion of the monitoring programme.
Contamination	Information obtained during the desk study by Enzygo indicated a low to moderate risk of contamination. No physical evidence of contamination was encountered during the intrusive works and the results of the laboratory chemical analysis is likely to indicate low determinand concentrations which do not exceed the generic assessment criteria for human health for the proposed commercial end use. This will be confirmed upon receipt and review of the laboratory test results.

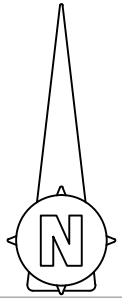
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Appraisal	Remediation – Subject to receipt of the laboratory test results the proposed areas of building and hardstanding is likely to be sufficient to break the latent pollutant pathway between the made ground and end users. Where landscaping areas are present, a capping of 300mm of imported topsoil materials will be required. Imported fill and capping will need to be validated to ensure it is not pose a risk to the environment. Where more sensitive end uses such as a crèche are proposed the capping depth may need to be increased in areas of private soft landscaping. Disposal of Materials - Waste classification testing has not been carried out, however, an initial assessment and suggest that generally, the made ground are considered to be suitable for disposal as stable non-reactive hazardous waste. Mining – Based on the findings of the desk study the site is considered to be stable with respect to mining. Foundations and Floor Slabs – At this stage, in the western and extreme southern parts of the site the natural residual clays appear suitable for pad and strip foundations at a minimum depth of 900mm based on an allowable bearing capacity of 100kN/m². Foundations will need to be deepened for heave where effected by trees which are present, particularly around boundaries. Elsewhere where deep variable made ground is present an alternative foundation solution will be required. This could be ground improvement by vibro stone columns, although allowance for pre boring of the columns may be required, or the adoption of raft foundations on fully re-engineered fill materials where building size and sensitivity allows. Alternatively, large scale settlement testing could be carried out to determine the settlement characteristics, which may allow the use of current made ground as a bearing stratum without significant full depth re-engineering. Based on the depth of fill present use of a suspended floor slab should be allowed for at this stage, unless ground improvement is carried out. External Works – A CBR value of 2% should be adopted at this stage for design. Gas precautions – The results of the preliminary gas monitoring results indicate that no combustible ground gas (methane) is present, however, carbon dioxide was recorded to a maximum concentration of 18.8%. The results suggest a CIRIA C665 Characteristic Situation 2 i.e. gas protection measures required. This recommendation is subject to revision following completion of the gas monitoring and issue of the gas monitoring addendum report. Water Supply Pipes – UKWIR analysis has not been undertaken as part of this assessment. It is recommended that the results of the assessment are provided to the water supply company so that the correct pipe material can be selected. Subject to the receipt of the laboratory testing results, our preliminary assessment indicates that basic precautions are required with respect to water supply pipes. Drainage – Based on the presence of deep made ground and cohesive soils, the use of soakaways are not considered feasible. Excavations and Dewatering – If man entry is proposed into excavations, the use of support to excavation sides is recommended, in line with health and safety guidelines. Significant groundwater ingress into shallow excavations is anticipated sporadically across the site and dewatering of excavation should be allowed for and carefully monitoring. Sulphate attack on buried concrete – Allowance should be made for sulphate
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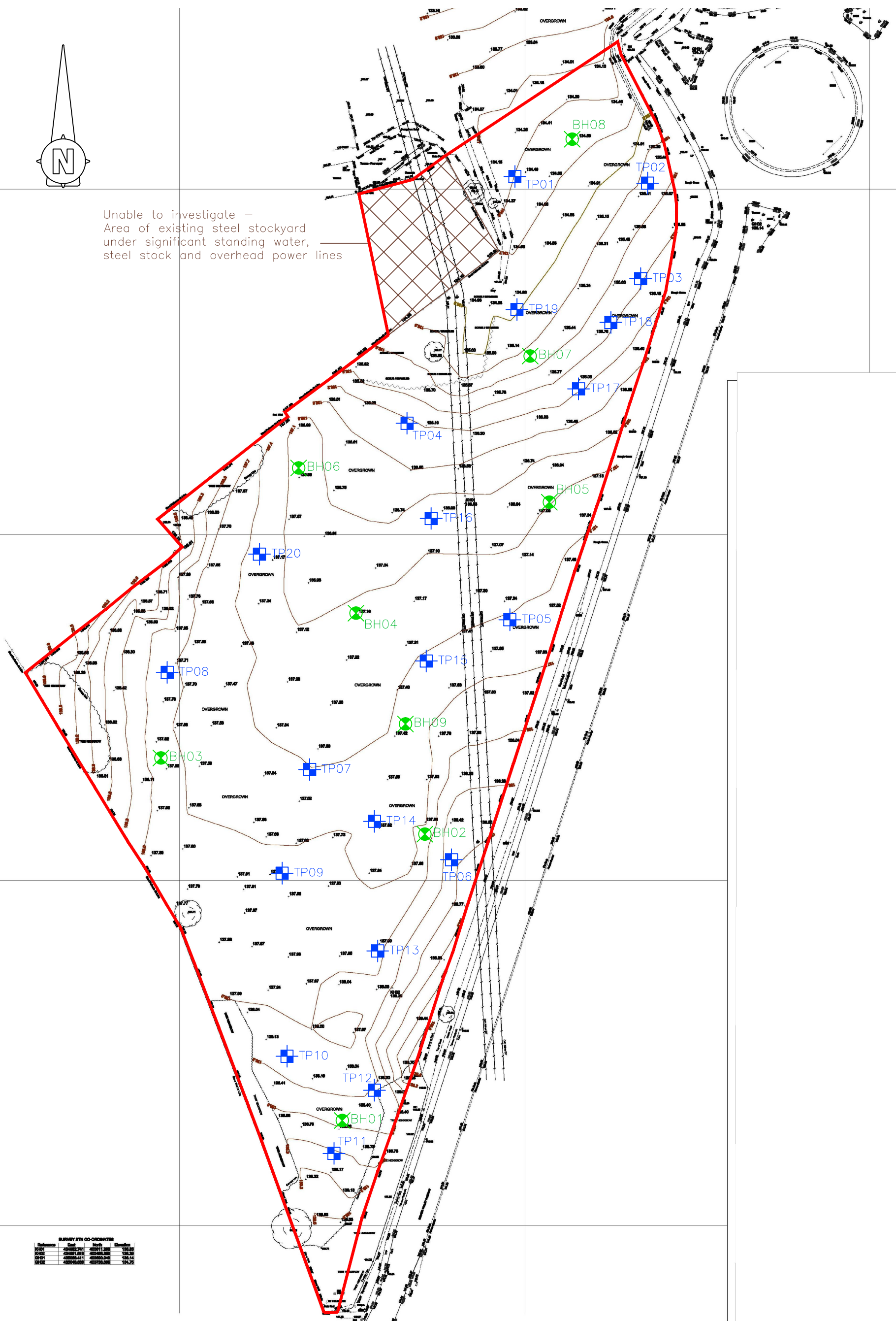


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Phase II Geo-Environmental Assessment Summary**

	resistant concrete. The BRE Special Digest 1:2005 Design Sulphate Class will be determined upon receipt of the laboratory testing results.
Further Works	Further investigation to confirm the depth of made ground in areas of potential uncertainty/variability. If it is proposed to construct raft foundations on the made ground without re-engineering of the foundation soils, settlement testing should be carried out to confirm that potential settlements are within acceptable limits. This testing could be carried out by the construction of an appropriately loaded dummy foundation or the construction of a surcharge embankment designed to simulate the loads imposed by the proposed development, accurately monitored by precise levelling.



Unable to investigate –
Area of existing steel stockyard
under significant standing water,
steel stock and overhead power lines



SURVEY BTH CO-ORDINATES			
Reference	East	North	Direction
TP01	430852.341	420111.306	135.00
TP02	430852.341	420111.306	135.00
TP03	430852.341	420111.306	135.00
TP04	430852.341	420111.306	135.00

Legend:



Trial Pit Position



Mini Percussive
Borehole Location



1st Floor, Block C
Holland Park
Holland Drive
Newcastle upon Tyne
NE2 4LD

tel: 0191 230 2993
fax: 0191 230 3677
www.3econsult.com

Project		Rockingham Development, Birdwell, Barnsley for Hartwood Estates Ltd.		
Title		Exploratory Hole Location Plan		
Scale	NTS	Drawn	NW	Checked AHC
Job No.	15677	Drawing No.	Figure 2	Date Aug '15
				Rev 0



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Mini-Percussive Log

BH01

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

Key:

↓ = Water Strike Depth & No.
↓ = Resting Water Depth & No.
D = Small Disturbed Sample
B = Large Disturbed Sample

ES = Environmental Sample
W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.20	ES	N22 (3/3/4/4/6/8)	(0.30) 0.30	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone. (Colliery Spoil)					
0.90 1.00	D C		(1.20) 1.50	Stiff brown mottled yellow CLAY.	1.0				
1.90 2.00	D C		(0.50) 2.00	Brown/grey completely weathered MUDSTONE.	2.0				
		N46/225mm (7/9/12/15/19/-)		End of Exploratory Hole at 2m					

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	
		No Groundwater Encountered					1. Borehole terminated on refusal



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Mini-Percussive Log

BH02

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

Key:

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↓ = Resting Water Depth & No.
D = Small Disturbed Sample
B = Large Disturbed Sample

ES = Environmental Sample
W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.30	ES	N19 (3/3/4/5/5/5)	0.10	MADE GROUND: Clayey TOPSOIL.					
			(0.30)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone. (Colliery Spoil)					
			0.40	MADE GROUND: Brown friable gravelly CLAY. Gravel is fine to coarse angular mudstone and sandstone.					
0.80	D	N12 (2/2/3/2/3/4)	(1.50)	POSSIBLE MADE GROUND: Firm to stiff friable brown mottled grey slightly gravelly CLAY.	1.0				
1.00	C								
1.80	D								
2.00	C	N20 (4/3/4/4/6/6)	(1.80)	Stiff grey mottled brown CLAY.	2.0				
2.80	D								
3.00	C								
4.00	C	N51 (5/6/6/8/13/24)	3.70	End of Exploratory Hole at 4m	4.0				
			(0.30)						
			4.00						

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	
1	3.0	Groundwater strike.					1. Borehole terminated on refusal



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Mini-Percussive Log

BH03

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

Key:

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ES = Environmental Sample
W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.50	ES	N18 (2/2/3/4/5/6)	(1.10)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone. (Colliery Spoil)					
1.00	C		1.10		1.0				
1.50	D		(0.85)	Firm to stiff brown mottled grey slightly gravelly CLAY.					
2.00	D	N50/50mm (8/12/50/-/-)	1.95						
2.00	C		2.00	Completely weathered SANDSTONE/SILTSTONE recovered as tabular angular gravel. <i>End of Exploratory Hole at 2m</i>	2.0				

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Mini-Percussive Log

BH04

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

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W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.50	ES	N18 (2/2/3/4/5/6)	(1.50)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone and occasional ironstone. (Colliery Spoil)					
1.00	C				1.0				
1.60	D		1.50						
			(0.40)	Brown gravelly CLAY. Gravel is fine to coarse angular sandstone and mudstone.					
2.00	D	N50/15mm (25/-/50/-/-/-)	1.90						
2.00	C		(0.15) 2.05	Firm brown mottled grey gravelly CLAY.	2.0				
				End of Exploratory Hole at 2.05m					

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Mini-Percussive Log

BH05

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

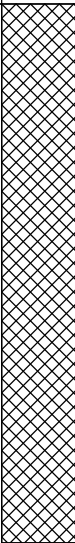
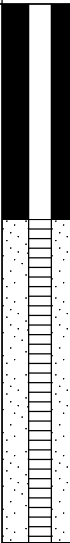
Contractor: White Rose

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HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.50	ES		(2.50)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone. (Colliery Spoil)					
1.00	C	N23 (4/7/6/6/5/6)			1.0				
1.50	D								
2.00	C	N15 (3/3/2/2/5/6)			2.0				
2.50	C	N50/0mm (25/-/50/-/-/-)			2.50				
				End of Exploratory Hole at 2.5m					

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Mini-Percussive Log

BH06

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

Key:

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↓ = Resting Water Depth & No.
D = Small Disturbed Sample
B = Large Disturbed Sample

ES = Environmental Sample
W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.40	ES	N17 (2/3/4/4/5/4)	(1.70)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone and occasional sandstone. (Colliery Spoil)	1.0				
1.00	C								
1.40	D								
1.75	D	N50/0mm (18/12/50/-/-/-)	1.70	MADE GROUND: Grey/brown gravelly CLAY. Gravel is fine to coarse angular mudstone and occasional brick SUSPECTED BEDROCK: Recovered as gravel of SANDSTONE. <i>End of Exploratory Hole at 1.85m</i>					
1.85	D		1.80						
1.85	C		1.85						

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Mini-Percussive Log

BH07

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

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HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
1.00	C	N19 (2/2/4/5/5/5)	(2.90)	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone. (Colliery Spoil)	1.0				
2.00	C	N19 (3/4/4/5/5/5)			2.0				
2.90	C	N50/10mm (25/-/50/-/-/-)	2.90	2.50 - 2.90 occasional sandstone gravel					
				End of Exploratory Hole at 2.9m					

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	
		No Groundwater Encountered					1. Borehole terminated on refusal



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Mini-Percussive Log

BH08

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

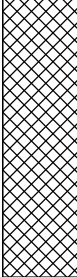
Contractor: White Rose

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HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.50	ES	N29 (2/3/3/5/7/14) N60/0mm (25/-/50/-/-/10)	(1.30) 1.30	MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone with pockets of brown gravelly clay. (Colliery Spoil) <i>End of Exploratory Hole at 1.3m</i>	1.0				
1.00	C								
1.30	C								

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Mini-Percussive Log

BH09

Site Name: Rockingham, Birdwell
Client: Hartwood Estates Ltd
Project No: 15677

Ground Level:
Easting:
Northing:

Contractor: White Rose

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D = Small Disturbed Sample
B = Large Disturbed Sample

ES = Environmental Sample
W = Water Sample
HSV = Hand Shear Vane (kPa)
S / C = Split Spoon / Cone
N = SPT N Value

Plant: Mini Percussive Rig
Date: 19/08/2015
Logged By: AHC

Samples/Tests			Strata Details					Well	
Depth (m)	Type	Results	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	Strike	Log
0.50	ES			MADE GROUND: Grey clayey, sandy angular GRAVEL of mudstone with pockets of brown gravelly clay. (Colliery Spoil)					
1.00	C	N11 (1/2/2/2/3/4)			1.0				
1.50	D								
2.00	C	N21 (1/2/3/6/7/5)			2.0				
2.50	D								
3.00	C	N26 (2/3/3/4/5/14)			3.0				
3.45	C	N50/10mm (25/-/50/-/-/-)	3.40	End of Exploratory Hole at 3.45m					

Groundwater Observations			Window Sample Run				General Remarks
No.	Struck (m)	Remarks	From (m)	To (m)	Dia. (mm)	Recovery (%)	1. Borehole terminated on refusal
		No Groundwater Encountered					



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Trial Pit Log

TP01

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	ES				0.10	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil)			
					(1.00)	MADE GROUND: Grey clayey sandy fine to coarse angular GRAVEL of mudstone. occasional cobbles of subrounded sandstone. (Colliery spoil).			
1.00	D				1.10		1.0		
1.30	D				(0.30)	MADE GROUND: Firm brown very silty slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mixed aggregates.			
					1.40				
2.00	D				(1.10)	MADE GROUND: Grey claybound fine to coarse angular GRAVEL of mudstone. (Colliery spoil).	2.0		
					2.50				
					2.60	SUSPECTED BEDROCK: Recovered as fine to coarse gravel of SANDSTONE.			
						End of Exploratory Hole at 2.6m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP02

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

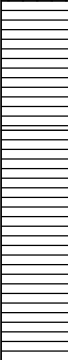
Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecon
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.40	ES				0.10	MADE GROUND: Grass over soft grey silty very gravelly CLAY. Gravel is fine to coarse angular mudstone and sandstone. Many rootlets. (Colliery spoil)	1.0		
					(1.20)	MADE GROUND: Grey sandy fine to coarse angular GRAVEL of siltstone and mudstone. (Colliery spoil)			
					1.30				
					(0.50)	Grey clayey fine to coarse gravel of highly weathered MUDSTONE.			
2.50	D				1.80		2.0		
					(0.90)	BEDROCK: Recovered as fine to coarse angular gravel of MUDSTONE.			
					2.70				
						End of Exploratory Hole at 2.7m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP03

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecon
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.60	ES				(0.20) 0.20	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil)			
					(0.40) 0.60	MADE GROUND: Grey sandy fine to coarse angular GRAVEL and COBBLES of mudstone. (Colliery spoil).			
					(1.80) 2.40	MADE GROUND: Grey claybound fine to coarse angular GRAVEL of mudstone. occasional pockets of clay.	1.0 2.0		
2.70	D				(0.40) 2.80	SUSPECTED BEDROCK: Grey/brown clayey fine to coarse angular gravel of MUDSTONE becoming less clayey with depth.			
						End of Exploratory Hole at 2.8m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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4 Calder Close
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Trial Pit Log

TP04

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	ES				0.10	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
						MADE GROUND: Grey clayey fine to coarse angular GRAVEL and COBBLES of mudstone with occasional clay pockets. (Colliery spoil).			
1.10	ES				(2.80)		1.0		
1.90	D						2.0		
					2.90				
3.00	ES				(0.20)	MADE GROUND: Grey/brown clayey sandy fine to coarse angular GRAVEL of mudstone, sandstone, brick fragments and ironstone.	3.0		
					3.10				
					3.20				
					(0.35)	MADE GROUND: Yellow sandy fine to coarse angular to rounded GRAVEL of dolomite.			
					3.55				
					3.60	MADE GROUND: Grey clayey sandy fine to coarse GRAVEL mudstone, coal, sandstone.			
						SUSPECTED BEDROCK: Brown fine to coarse gravel of SANDSTONE.			
						End of Exploratory Hole at 3.6m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP05

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	D				(0.20) 0.20	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone and coal. Many rootlets. (Colliery spoil).			
					(0.40) 0.60	MADE GROUND: Brown sandy fine to coarse angular GRAVEL and COBBLES of sandstone and mudstone.			
					(0.50) 1.10	MADE GROUND: grey clayey sandy fine to coarse angular GRAVEL of mudstone.			
1.20	ES				1.20	BEDROCK: Recovered as grey fine to coarse angular gravel of SANDSTONE.	1.0		
						End of Exploratory Hole at 1.2m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:	
			Width:	
			Orientation:	



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Trial Pit Log

TP06

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecone

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.70	ES				0.10 (1.60)	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil). MADE GROUND: Grey clayey sandy fine to coarse angular GRAVEL and COBBLES of mudstone. occasional boulders of subrounded sandstone. (Colliery spoil).	1.0		
1.30	D				1.70 (1.40)	MADE GROUND: Brown/grey fine to coarse angular GRAVEL of mudstone and sandstone. (Colliery spoil).	2.0		
3.20	D				3.10 (0.30) 3.40	Firm brown silty CLAY.	3.0		
						End of Exploratory Hole at 3.4m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in natural soils
		No Groundwater Encountered	Length:	
			Width:	
			Orientation:	



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Trial Pit Log

TP07

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecone
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.50	ES				0.10	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
					(0.30)				
					0.40				
0.90	D				(0.40)	MADE GROUND: Grey clayey sandy fine to coarse angular GRAVEL of mudstone.			
					0.80	MADE GROUND: Brown sandy fine to coarse angular GRAVEL of sandstone.			
					(0.80)	MADE GROUND: Firm to stiff brown silty slightly gravelly CLAY. Gravel is fine to coarse angular mudstone and occasional brick fragments.			
1.30	ES				1.60	POSSIBLE MADE GROUND: Brown and grey firm silty slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mixed lithology.			
2.00	D				(0.90)				
					2.50				
					2.55	SUSPECTED BEDROCK: Recovered as a brown gravel of SANDSTONE.			
						End of Exploratory Hole at 1.8m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP08

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	ES				(0.25) 0.25	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
0.60	D				(1.25) 1.50	Stiff brown and grey silty CLAY	1.0		
					(0.30) 1.80	BEDROCK: Recovered as brown angular gravel of MUDSTONE.			
						End of Exploratory Hole at 1.8m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:	
			Width:	
			Orientation:	



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Trial Pit Log

TP09

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecone

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.90	ES				0.10	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
					(2.10)	MADE GROUND: Grey sandy fine to coarse angular GRAVEL and COBBLES sandstone and mudstone. Becomes clayey below 1.3m.			
2.30	D				2.20	Stiff silty slightly gravelly CLAY. Gravel is fine to coarse of mudstone.			
					(0.20) 2.40				
						End of Exploratory Hole at 2.4m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Poor below water strike	1. Excavation terminated in bedrock
1	1.3	Moderate groundwater seepage.	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP10

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 19/08/2015

Logged By: CB

Samples		Tests			Strata Details					
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend	
1.60 1.70	D				0.10	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).	1.0			
					(1.40)	MADE GROUND: Brown sandy fine to coarse angular GRAVEL and COBBLES of sandstone with occasional brick.				
	1.50									
	(0.15) 1.65				MADE GROUND: Very soft brown and grey silty CLAY with occasional fibrous organic matter.					
2.70	D				(1.25)	Firm brown and grey silty CLAY.	2.0			
					2.90					
					3.00	SUSPECTED BEDROCK: Recovered as brown fine to coarse angular gravel of MUDSTONE.				
					End of Exploratory Hole at 2.8m					

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP11

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecon
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.20	ES				(1.00)	MADE GROUND: Grass over grey clayey sandy fine to coarse angular GRAVEL mudstone and sandstone. occasional rootlets and brick fragments. (Colliery spoil).			
1.10	D				1.00		1.0		
1.80	D				(1.30)	Firm to stiff brown and grey silty slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mixed lithology.			
					2.30		2.0		
					(0.50)	SUSPECTED BEDROCK: Recovered as brown and grey fine to coarse angular gravel of MUDSTONE.			
					2.80				
						End of Exploratory Hole at 2.8m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP12

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecone
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	ES				(0.15)	MADE GROUND: Grass over soft grey silty gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
0.30	ES				(0.45)	MADE GROUND: Brown very friable sandy gravelly CLAY. Gravel is fine to coarse angular mudstone, sandstone and old pipe fragment.			
					0.60				
					0.70				
					(0.40)	MADE GROUND: Dark brown friable silty sandy slightly gravelly CLAY. Gravel is fine to coarse angular sandstone. (Possible relict topsoil).			
					1.10		1.0		
						POSSIBLE MADE GROUND: Firm to stiff brown silty sandy slightly gravelly CLAY. occasional concrete.			
1.50	D				(1.10)	Firm to stiff brown silty sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mixed lithology.			
					2.20		2.0		
					(0.60)	SUSPECTED BEDROCK: Brown fine to coarse angular gravel of MUDSTONE.			
					2.80				
						End of Exploratory Hole at 2.8m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP13

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecon
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.10	ES				(0.20) 0.20	MADE GROUND: Grass over brown and grey clayey sandy fine to coarse angular GRAVEL of sandstone and mudstone. Many rootlets. (Colliery spoil).			
0.40	ES				(0.65) 0.85	MADE GROUND: Brown clayey sandy fine to coarse angular GRAVEL of mudstone and sandstone.			
					(0.55) 1.40	MADE GROUND: Firm to stiff friable sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded mixed lithology.	1.0		
2.20	D				(1.30) 2.70	MADE GROUND: Firm friable brown and grey silty sandy gravelly CLAY.	2.0		
2.80	D				(0.30) 3.00	Stiff brown and grey silty CLAY.	3.0		
						End of Exploratory Hole at 3m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in natural soils
		No Groundwater Encountered	Length:	
			Width:	
			Orientation:	



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Trial Pit Log

TP14

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.10	ES				(0.25) 0.25	MADE GROUND: Grass over very soft grey sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone. Many rootlets. (Colliery spoil).			
					(0.75) 1.00	MADE GROUND: Grey sandy fine to coarse angular GRAVEL mudstone and sandstone with occasional clay pockets. (colliery spoil).			
					(0.40) 1.40	MADE GROUND: Brown clayey sandy fine to coarse angular GRAVEL sandstone with occasional clay pockets.	1.0		
1.80	D				(1.50) 2.90	MADE GROUND: Firm brown and grey friable sandy gravelly reworked CLAY. Gravel is fine to coarse angular mudstone and sandstone.	2.0		
3.00	D				(0.50) 3.40	Stiff brown and grey silty CLAY.	3.0		
						End of Exploratory Hole at 3.4m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in natural soils
		No Groundwater Encountered	Length:	
			Width:	
			Orientation:	



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Trial Pit Log

TP15

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.30	ES				(2.70)	MADE GROUND: Grass over grey sandy fine to coarse angular GRAVEL of sandstone and mudstone.. Many rootlets. (Colliery spoil).	1.0		
					2.70		2.0		
					(0.80)	MADE GROUND: Brown slightly clayey very sandy fine to coarse angular GRAVEL of sandstone with occasional clay pockets.	3.0		
3.70	D				3.50				
					(0.40)	MADE GROUND: Very soft grey and brown sandy gravelly CLAY. Gravel is fine to coarse angular sandstone, mudstone, ironstone, bricks and occasional fibrous organic matter.			
3.95	D				3.90				
					4.00	Firm to stiff brown and grey very sandy silty CLAY.	4.0		
						End of Exploratory Hole at 4m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in natural soils
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP16

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
0.15	ES				(0.20) 0.20	MADE GROUND: Grass over slightly clayey silty gravelly fine to medium SAND. Gravel is fine to coarse angular mudstone. Many rootlets.			
0.50	D				(0.60) 0.80	MADE GROUND: Grey sandy fine to coarse angular GRAVEL and COBBLE of sandstone and siltstone.			
					(0.80) 1.60 1.65	MADE GROUND: Grey clayey sandy fine to coarse angular GRAVEL of sandstone and mudstone.	1.0		
						BEDROCK: Recovered as grey fine to coarse angular gravel of SANDSTONE. <i>End of Exploratory Hole at 1.65m</i>			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		



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Trial Pit Log

TP17

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
					0.10	MADE GROUND: Grass over dark brown clayey sandy fine to coarse angular GRAVEL of mudstone. occasional rootlets.			
						MADE GROUND: Grey sandy fine to coarse GRAVEL and COBBLES of mudstone and sandstone. Many boulders.			
					(3.60)		1.0		
							2.0		
							3.0		
					3.70				
					3.80	Grey and brown silty CLAY.			
						End of Exploratory Hole at 3.8m			

Groundwater Observations			Stability / Dimensions		General Remarks	
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in natural soils	
1	2.7	Slight water ingress.	Length:			
			Width:			
			Orientation:			



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Trial Pit Log

TP18

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample HSV = Hand Shear Vane
D = Small Disturbed Sample CBR = Mexecon
W = Water Sample ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.40	ES				(3.20)	MADE GROUND: Grass over grey slightly clayey sandy fine to coarse angular GRAVEL and COBBLES of mudstone and sandstone. Colliery spoil). Many boulders of mudstone and sandstone and becomes clayey below 1.8m.	1.0		
2.10	D						2.0		
3.50	D				3.20		3.0		
					(0.40)	Very stiff brown and grey CLAY			
					3.60	End of Exploratory Hole at 3.6m			

Groundwater Observations			Stability / Dimensions	General Remarks
No.	Struck (m)	Remarks	Stability: Good	1. Excavation terminated in natural soils
1	1.8	Slight water ingress.	Length:	
			Width:	
			Orientation:	



consulting engineers
4 Calder Close
Calder Park
Wakefield
WF4 3BA
Tel. 01924 240420

Trial Pit Log

TP19

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.80	ES				(1.20)	MADE GROUND: Grass over sandy fine to coarse angular GRAVEL and COBBLES sandstone and mudstone. occasional boulders of angular sandstone.			
					1.20		1.0		
					(0.50)	MADE GROUND: Brown slightly clayey sandy angular fine to coarse GRAVEL, with sandstone and occasional brick (colliery spoil).			
					1.70				
2.20	D				(0.40)	MADE GROUND: Friable brown and grey slightly gravelly silty CLAY. Gravel is angular fine to coarse sandstone, with occasional brick and dolomite.			
					2.10		2.0		
					(1.90)	MADE GROUND: Firm grey sandy gravelly CLAY, with occasional soft clay pockets. Gravel is angular to subangular fine to coarse dolomite, mudstone and occasional brick (reworked clay).			
					4.00		3.0		
							4.0		
						End of Exploratory Hole at 4m			

Groundwater Observations			Stability / Dimensions		General Remarks	
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated on maximum depth of excavator	
		No Groundwater Encountered	Length:			
			Width:			
			Orientation:			



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Trial Pit Log

TP20

Site Name: Rockingham, Birdwell

Client: Hartwood Estates Ltd

Project No: 15677

Ground Level:

Easting:

Northing:

Key:

B = Large Disturbed Sample

HSV = Hand Shear Vane

D = Small Disturbed Sample

CBR = Mexecon

W = Water Sample

ES = Environmental Sample

Plant: Backhoe Excavator

Date: 20/08/2015

Logged By: CB

Samples		Tests			Strata Details				
Depth (m)	Type	Depth (m)	HSV (kPa)	CBR (%)	Depth (m) (Thickness)	Strata Description	Depth (m)	Level (AOD)	Legend
1.10	ES				(0.70) 0.70	MADE GROUND: Grass over clayey sandy fine to coarse angular GRAVEL and COBBLES, with occasional boulders. Gravel and cobbles consist of sandstone. Boulders are subangular sandstone (colliery spoil).			
					(0.90) 1.60	MADE GROUND: Brown slightly clayey sandy angular GRAVEL and COBBLES, with occasional boulders. Gravel and cobbles consist of sandstone and mudstone. Boulders are subrounded sandstone (colliery spoil).	1.0		
					(0.80) 2.40	BEDROCK: Recovered as very weak fine to coarse sandstone GRAVEL.	2.0		
						End of Exploratory Hole at 2.4m			

Groundwater Observations			Stability / Dimensions		General Remarks
No.	Struck (m)	Remarks	Stability:	Good	1. Excavation terminated in bedrock
		No Groundwater Encountered	Length:		
			Width:		
			Orientation:		

Gas monitoring record

3e Consulting Engineers Ltd

4 Calder Close

Calder Park

Wakefield

WF4 3BA

Job no: 15677
Site: Rockingham, Birdwell
Date: 26/08/2015
Weather: Sunny with clouds
Pressure Trend: Rising

BH No	Methane (%v/v)	Carbon dioxide (%v/v)	Oxygen (%v/v)	Barometric Pressure (mb)	Flow (l/hr)	Water level (m bgl)	Remarks
BH1	0.0	2.8	15.2	985	0.0	Dry	
BH4	0.0	11.6	3.2		0.0	DAB	
BH5	0.0	18.8	2.6		0.0	Dry	
BH7	*	*	*	*	*	*	Waterlogged to surface

DAB = Damp at Base