



15 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 8RT
UK

Planning ref: A/144/15/PL, Decision Notice dated 02/06/2016

Our Ref: 27621L06(01)/arj

9th May 2017

CALA Homes (South Home Counties) Limited
Tilford House
Farnham Business Park
Weydon Lane
Farnham
Surrey, GU9 8QT



For attention of: Mr Gary Biggs

Dear Sirs

RE: FORMER WEST END NURSERY, ANGMERING - GROUNDWATER LEVEL SUMMARY

1. BACKGROUND

RSK Environment Limited (RSK) was commissioned by CALA Homes (South Home Counties) Limited to carry out a review of groundwater conditions at the site based on existing ground investigation and groundwater monitoring data.

The site was previously occupied by a garden nursery growing herbs and agricultural fields. The garden nursery has since been demolished and previous infrastructure has been removed.

Several phases of investigation and risk assessment have previously been carried out by RSK. These are outlined in the following reports:

- RSK, 27621- R01(02) 'Geo-environmental Site Investigation', West End Nursery, Angmering, September 2015;
- RSK, 27621- R02 (00) 'Additional Geo-environmental Site Investigation and Remediation', West End Nursery, Angmering, June 2015;
- RSK, 27621- R03 (01) 'Remedial Strategy', West End Nursery, Angmering, January 2016;
- RSK, 27621- R04 (01) 'Supplementary Geo-environmental Site Assessment', West End Nursery, Angmering, June 2016;
- RSK, 27621L03(00)/jr, Soakage and CBR testing at Former West End Nursery, Angmering, 20 October 2016.

The site is planned for residential redevelopment comprising low rise residential properties with associated infrastructure and soft landscaping. It is understood that information in relation to groundwater levels is required to inform the drainage strategy at the proposed development.



INVESTORS
IN PEOPLE

RSK Environment Ltd

Registered office

34 Albyn Place • Aberdeen • Aberdeenshire • AB10 1FW • UK

Registered in Scotland No. 118530

www.rsk.co.uk

2. GROUND CONDITIONS

A summary of ground conditions encountered during previous phases of intrusive works is outlined in the following sections. Generally the site was underlain by made ground over River Terrace Deposits, with the Lewes Nodular Chalk Formation at depth. Exploratory hole logs are presented in **Appendix B**.

Table 1: General succession of strata

Strata	Exploratory holes encountered	Depth to top of stratum m bgl	Thickness (m)
Top soil	TP6, TP7, TP8	Ground level	0.0 m to 0.4 m bgl
Made Ground	38 of 49 locations	Ground level	0.0m to 3.0m*
River Terrace Deposits	29 of 49 locations	Ground level to 3.0m	>0.2 (TP4) to >3.3 m bgl (BH12)
Lewes Nodular Chalk Formation	BH8, BHA-BHE	2.6-8.2	>8.6
Notes: *Location terminated in made ground ie depth not proven at HA4, HA6, HA7, HA10, HA12, HA13, HA17, HA18, HA18A, TP3 and TP5 to TP9			

2.1 Made ground

Made ground was encountered across much of the site with varied composition locally. The materials encountered predominantly comprised sandy gravels and sandy gravelly clays, with variable proportions of brick fragments, ash, concrete, ceramic tile, plastics, metal wire, mortar, polystyrene, rare glass and clinker.

Within the soil bunds (predominantly around the site boundaries) the materials encountered generally comprised of friable brown to dark brown blackish greyish sandy silty gravelly clay with frequent suspected cement bonded asbestos containing materials (ACM), plastic sacking, metal, bricks, glass, plastic, charcoal, wood, and concrete.

2.2 River Terrace Deposits

Beneath the made ground, generally the River Terrace Deposits comprised silty clays, sand and gravel, and fine to medium sands. Typically clay soils were encountered in the upper 2-3 m of the strata, with sand and gravel at greater depths. The thickness of the River Terrace Deposits ranged between 2.5 m and 6.4 m.

2.3 Chalk

Chalk was encountered underlying the River Terrace Deposits in BHA-E and BH8, from depths ranging 2.6 m to 8.2 m bgl, identified to the full depth of investigation of 16.1 m. The stratum was typically recovered as a structureless melange as a result of the percussive drilling technique adopted.

Based on the in-situ and laboratory testing carried out, it is considered likely that this stratum comprises a Grade D_c and D_m Chalk in accordance with CIRIA C574.

3. GROUNDWATER

Groundwater strikes were observed in BHB (7.8 m bgl) and BHE (7.8 m bgl) during intrusive works, no other groundwater strikes were recorded throughout any phase of intrusive works. It should be noted that during the drilling of BHA-E, clean drilling techniques were incorporated, as well as provision of in-situ borehole soakaway testing and this may have affected identification of groundwater strikes.

Monitoring wells were installed at 11 borehole positions across the site. Six drive-in sampler borehole positions were installed with shallow monitoring wells in the River Terrace Deposits between 1.9 and 3.7 m depth (BH1, BH5, BH7, BH9, BH11, BH14A). Five cable percussive borehole positions were installed with deep monitoring wells into the River Terrace Deposits and/or Lewes Nodular Chalk (BHA-E). Three groundwater monitoring visits were conducted on the shallow wells on 30th January, 13th February and 24th February. Two groundwater monitoring visits were conducted on the deep wells on 29th October and 5th November 2015. A further groundwater visit was undertaken on 20th December 2016. During this visit it was established that only BHA, BHB and BHC remained serviceable following demolition and remedial works undertaken during 2016. The monitoring results and details of response zones are presented in **Appendix C**.

3.1 Groundwater levels

Groundwater levels were observed at depths ranging between 1.79 m and 7.13 m below top of casing (TOC, approximately at ground level).

Typically the shallow monitoring wells were dry or contained water between 1.79 m and 3.40 m. The groundwater levels within these positions were variable across the monitoring visits and it is considered that the water was perched, particularly given the predominantly cohesive nature of the soils encountered across the site in the upper 2-3 m of the River Terrace Deposits.

Groundwater within the deep monitoring wells was identified between 5.28 m and 7.1 m during 2015, rising above response zones in some positions. Monitoring wells were found to be dry during the December 2016 visit.

It is considered that the groundwater between the lower River Terrace Deposits and Lewes Nodular Chalk is in hydraulic continuity, although groundwater influx from within the River Terrace Deposits may fluctuate due to the variable nature of the strata (clay, sand and gravel).

A consistent confining cohesive layer was not identified to be present between the River Terrace Deposits and Chalk strata at any position and groundwater levels were generally found to rise above the chalk into the River Terrace Deposits, regardless of response zone.

3.2 Winter groundwater levels

Groundwater monitoring was carried out at the site during January, February, October and November 2015 and December 2016.

Significant variation of water levels was identified within the shallow monitoring wells and it is considered that these represent perched water in the upper cohesive strata of the River Terrace Deposits.

Water levels identified within the deep monitoring wells BHA-E (circa 5.28 m bgl to >7.45 m bgl) during October and November 2015 and December 2016 are considered to be representative of groundwater levels within the underlying aquifer.

Ongoing monitoring of BHA and BHB has been carried out on four occasions between January 2017 and April 2017 and on three occasions in BHC with groundwater levels ranging between 5.59 m bgl and 6.68 m bgl. This concurs with the previous data collected and is considered to be representative of groundwater levels within the underlying aquifer.

3.3 Groundwater flow direction

Based on a review of the groundwater levels at depths recorded within BHA-E in November 2015 compared with elevation data obtained via GPS, a piezometric surface plan has been generated and is presented as **Figure 3**. No definitive groundwater flow direction could be inferred based upon the available information. Regionally, groundwater is anticipated to flow in a southerly direction.

We trust that the information provided above meets your requirements. Should you have any queries or require additional information, please do not hesitate to contact the undersigned.

3.4 Conclusions

Based on the results of the winter groundwater monitoring data collected, groundwater levels are considered suitable in relation to the drainage design prepared for the Angmering site.



Yours faithfully

For RSK Environment Limited



Cathy Latimer

Principal Geo-Environmental Engineer

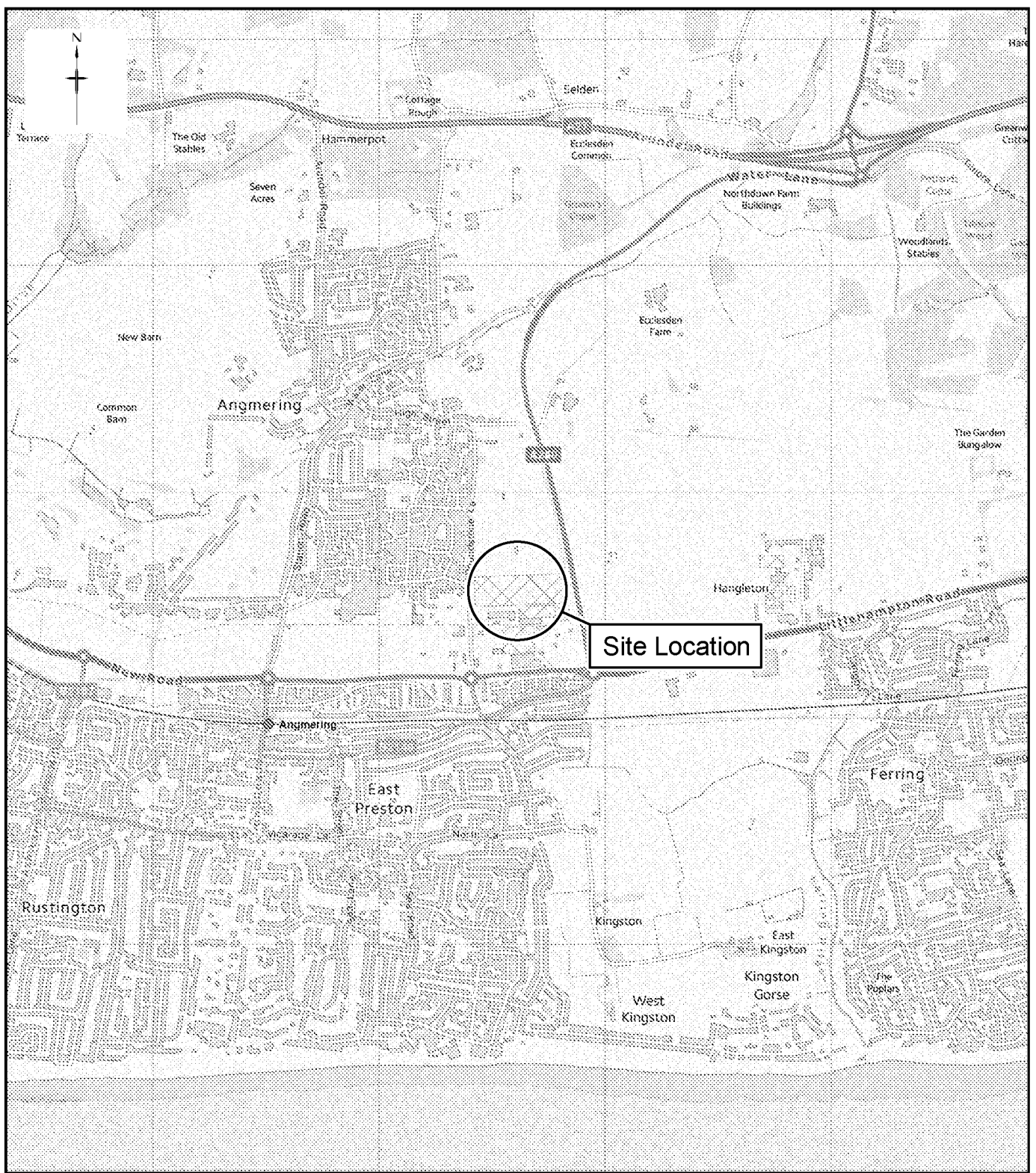
Nigel Austin

Director – Geosciences

Enc.

Figure 1	Site Location Map
Figure 2	Exploratory Hole Location Plan
Figure 3	Piezometric Surface Plan
Appendix A	Service Constraints
Appendix B	Exploratory Hole Logs
Appendix C	Groundwater monitoring data

FIGURES



Contains Ordnance Survey data © Crown copyright and database right 2013



15 Prognostic Road
Hemel Hempstead
Hertfordshire
HP3 9RT
United Kingdom
Tel: +44 (0) 1462 437500
Fax: +44 (0) 1462 437550
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client

CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title

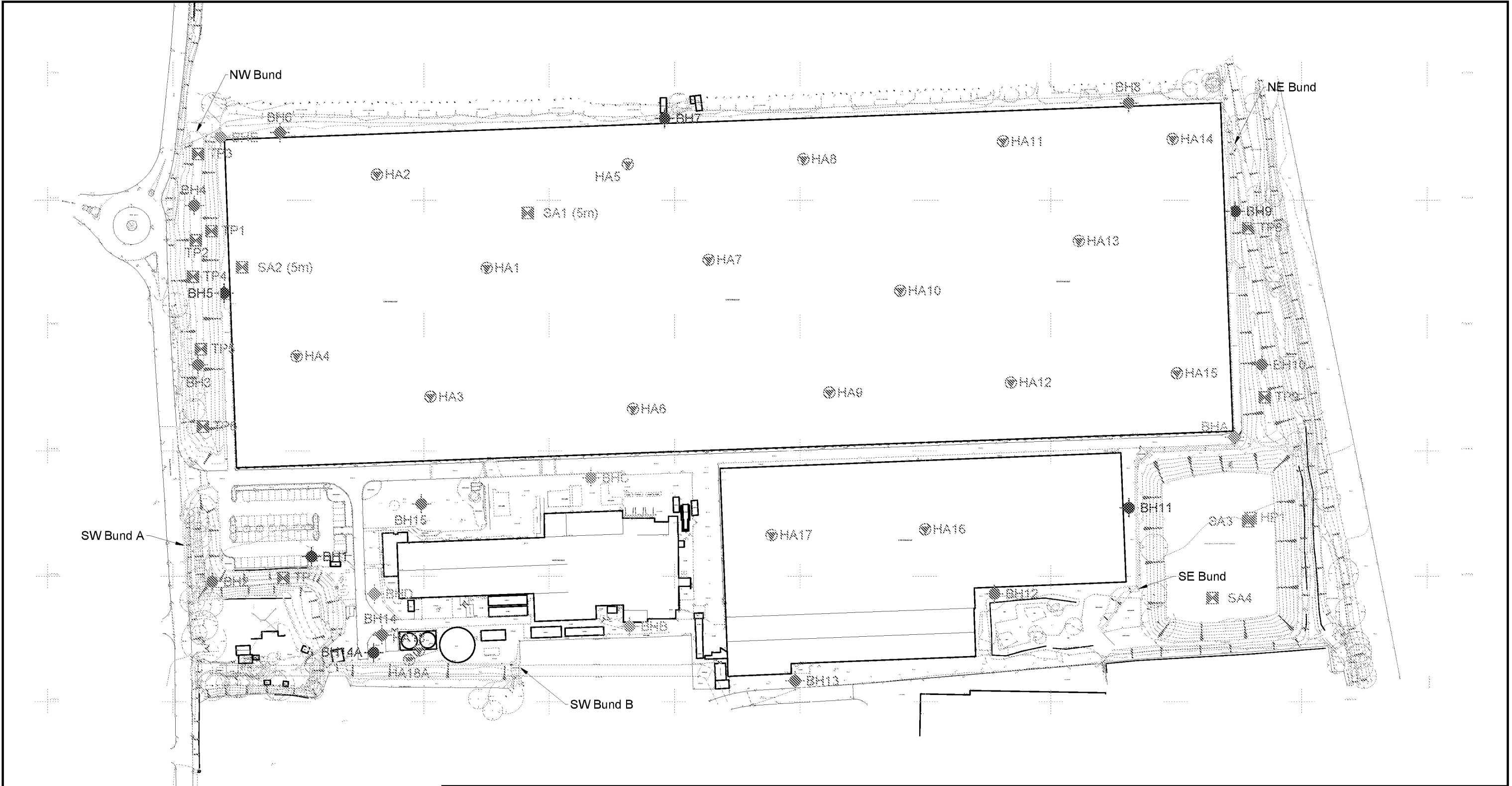
**WEST END NURSERY,
ANGMERING**

Drawing Title

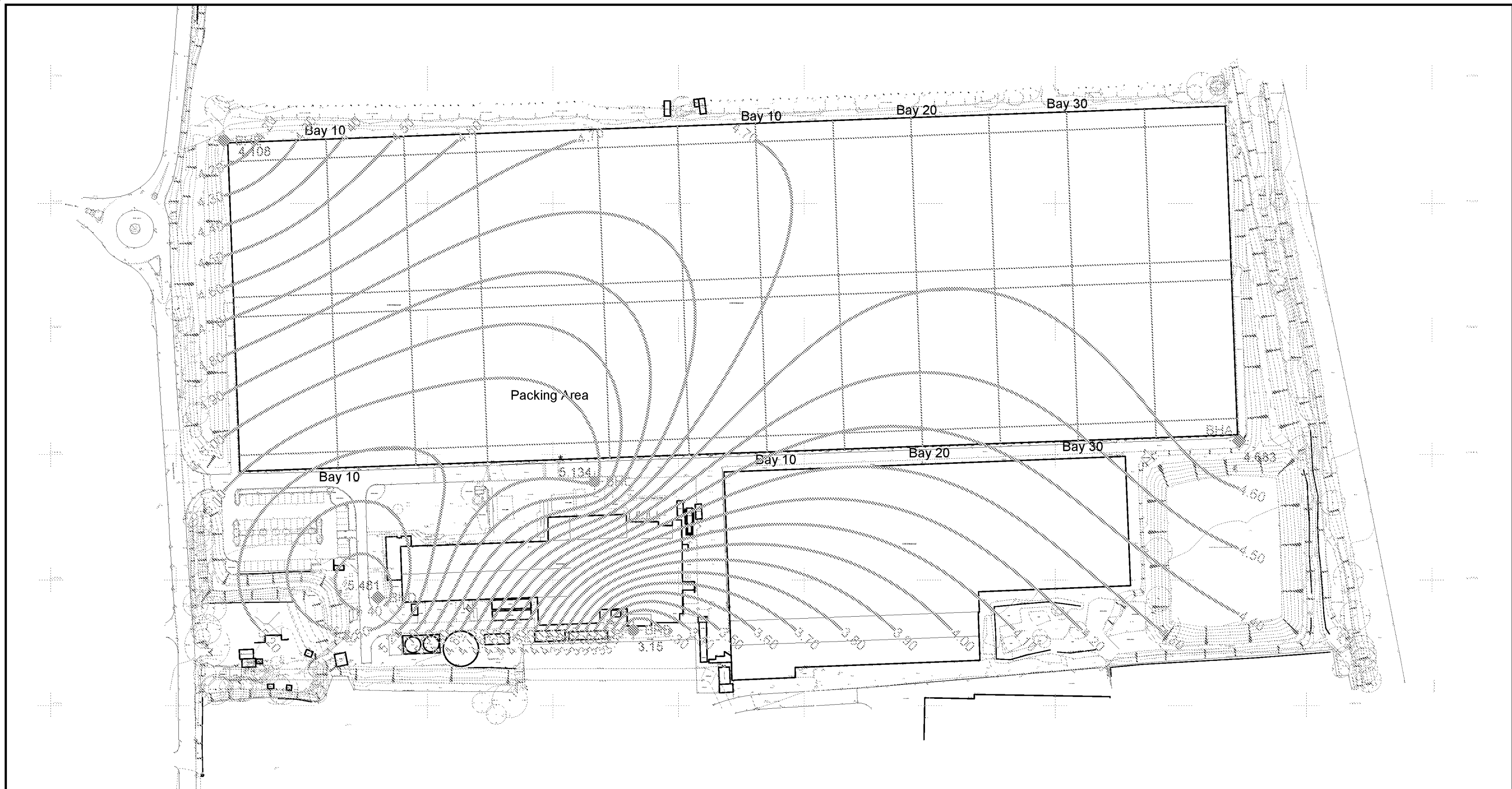
SITE LOCATION MAP

Rev	Drawn	Date	Checked	Date	Approved	Date
00	AP	07.12.16	ARJ	07.12.16	ARJ	07.12.16
Dimensions		m	Scale		Original Size	
			1:25,000		A4	

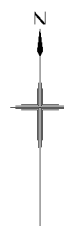
Project Number	Drawing File	Drawing Number
27621 - L06	27621 - SLP.dwg	FIGURE 1



<div>LEGEND</div> <div><div><div></div><div>Borehole Location - Jan 2015</div></div><div><div></div><div>Hand Auger Location - Jan 2015</div></div><div><div></div><div>Borehole Location with installation - Jan 2015</div></div><div><div></div><div>Trial Pit Location - May 2015</div></div><div><div></div><div>Borehole Location - Oct 2015</div></div><div><div></div><div>Hand Pit Location - Oct 2015</div></div><div><div></div><div>Soakaway Location</div></div></div>	<div><div></div><div></div><div></div></div>						<div><div><div>RSK</div><div>18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9PT United Kingdom</div><div>Tel: +44 (0) 1442 437500 Fax: +44 (0) 1442 437550 Email: info@rsk.co.uk Web: www.rsk.co.uk</div></div></div>						Client CALA HOMES (SOUTH HOME COUNTIES) LTD																			
							Project Title WEST END NURSERY, ANGMERING																									
							Drawing Title EXPLORATORY HOLE LOCATION PLAN																									
							Drawn AP						Date 07.12.16		Checked ARJ		Date 07.12.16		Approved ARJ		Date 07.12.16		Project No. 27621- L06 (00)						Drawing File 27621 (L06-00) Fig 2.dwg			
	Rev.		Date		Amendment				Drawn		Chkd.		Appd.		Scale 1:1500				Orig Size A3		Dimensions m		Drawing No. FIGURE 2								Rev. P1	



- LEGEND**
-  Borehole Location - Oct 2015
 -  1.23 Groundwater elevation (m AOD) - Nov 2015

						 18 Frogmore Road Hemeley Hempstead Hertsfordshire HPG 9PT United Kingdom Tel: +44 (0) 1442 437500 Fax: +44 (0) 1442 437550 Email: info@rsk.co.uk Web: www.rsk.co.uk						Client CALA HOMES (SOUTH HOME COUNTIES) LTD			
												Project Title WEST END NURSERY, ANGMERING			
						Drawing Title PIEZOMETRIC SURFACE PLAN (NOVEMBER 2015)									
P1		07.12.16		First Issue		AP		ARJ		ARJ		Project No. 27621- L06 (00)		Drawing File 27621 (L06-00) fig 3.dwg	
Rev.		Date		Amendment		Drawn		Chkd.		Appd.		Drawing No. FIGURE 3		Rev. P2	

Drawn AP	Date 07.12.16	Checked ARJ	Date 07.12.16	Approved ARJ	Date 07.12.16
Scale 1:1500		Orig Size A3		Dimensions m	

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for CALA Homes (south home counties) (the "client") in accordance with the terms of a contract between RSK and the "client", dated 9/5/17. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information], and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.



APPENDIX B

EXPLORATORY HOLE LOGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH1
Contract Ref: 27621	Start: 08.08.16 End: 08.08.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill & Instru- mentation	Water	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results					
0.30-0.40	1	ES				Tarmac	0.09	
0.50-0.80	2	B				MADE GROUND: Light brown slightly clayey very sandy GRAVEL. Gravel is fine to coarse of flint with occasional tarmac and fine to coarse brick fragments with rare half bricks.	0.25	
						MADE GROUND: Grey brown sandy gravelly CLAY with occasional concrete and brick cobbles, occasional string, wood and charcoal.	(0.85)	
1.00-1.45	1	SPT(c)	N=9			0.50-0.80m : Between 0.50m and 0.80m bgl; Possible ACM.	1.10	
1.20-1.40	3	D				0.90-1.10m : Between 0.90m and 1.10m bgl; Very gravelly.		
1.50		V	c _r =50			Soft brown slightly silty CLAY.		
1.70-2.00	4	D				1.40m : Below 1.40m bgl; Soft becoming firm.		
2.00-2.45	2	SPT(c)	N=9			2.00m : Below 2.00m bgl; Becoming light brown.		
2.50	5	D					(2.90)	
2.50		V	c _r =37			2.70m : Below 2.70m bgl; Slight mottling. Rare fine to coarse flint gravel.		
3.00-3.45	3	SPT(c)	N=11			3.20-3.25m : Between 3.20m and 3.25m bgl; Gravel band.		
3.50		V	c _r =53			3.30m : Below 3.30m bgl; Becoming light brown orange.		
4.00-4.45	4	SPT(c)	N=34			Borehole terminated at 4.00m depth.	4.00	

Boring Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			
						1. No groundwater was encountered 2. Inspection pit hand dug to 1.00m 3. Gas and groundwater monitoring well installed to 4.00m depth		
Method Used: Trial Pit/trench + Window sampling						All dimensions in metres		
Plant Used: Hand tools + Dando Terrier						Scale: 1:50		
Drilled By: KDS						Logged By: AJames		
Checked By: AGS						Checked By: AGS		



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH2
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
1.20-1.60	1	ES				MADE GROUND: Grass over light brown silty CLAY.	0.40	
						MADE GROUND: Light grey sandy GRAVEL comprised of flint and concrete.	0.60	
						MADE GROUND: Dark brown to black very sandy CLAY with plastic sacking, plastic fragments, metal wire, mortar, ash, glass and charcoal.	(2.00)	
2.60-2.80	2	ES				MADE GROUND: Dark grey brown silty slightly gravelly CLAY with occasional fine glass and charcoal fragments.	2.60	
3.50	3	D				Firm light brown silty CLAY.	(1.00)	
3.50		V	$c_r=40$				4.00	
Borehole terminated at 4.00m depth.								

Boring Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. No groundwater encountered 2. Borehole backfilled with arisings upon completion.
						</



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH3
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

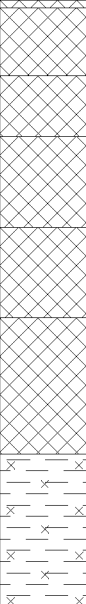
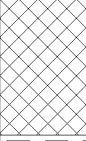
Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.60-1.00	1	ES				MADE GROUND: Grass over light brown slightly gravelly CLAY with occasional fine brick and charcoal fragments. 0.40m : At 0.40m bgl; Brick cobble.	(1.30)	
1.50-2.00	2	ES				MADE GROUND: Brick. MADE GROUND: Dark brown to black sandy gravelly CLAY with plastic sacking, plastic, wood, brick, charcoal and ash fragments.	1.30 1.40 (0.70)	
2.20-2.50	3	ES				MADE GROUND: Grey to dark grey slightly sandy CLAY with occasional plastic sacking and charcoal.	2.10 (0.70)	
3.50	4	D				Firm light brown silty CLAY.	2.80 (1.20)	
3.50		V	$c_r=50$			Borehole terminated at 4.00m depth.	4.00	

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Borehole backfilled with arisings upon completion	
All dimensions in metres						Scale:	1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: AGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH4
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thick ness)	Material Graphic Legend	
	No	Type	Results						
0.60-0.90 0.60-0.90	1	ES B	c _r =40			MADE GROUND: Grass over brown silty CLAY. (Topsoil)	0.05		
						MADE GROUND: Light brown slightly gravelly CLAY with occasional charcoal.	0.50		
	MADE GROUND: Brown slightly sandy gravelly CLAY. Gravel is occasional flint, brick, charcoal, plastic fragments with black plastic sacking.	0.90							
	MADE GROUND: Pinkish brown flint and limestone GRAVEL.	(0.60)							
		1.50							
1.50	2	D				MADE GROUND: Brown grey CLAY with black plastic sacking.	(0.60)		
							2.10		
2.50-3.00 2.60-3.00	3	ES B				MADE GROUND: Black to dark grey brown peaty CLAY with much organic matter and an organic odour. Occasional brick, ash and charcoal.	(0.90)		
	4					2.60m : At 2.60m bgl; Possible ACM.	3.00		
						Firm light brown silty CLAY.			
3.50	5	D				3.00m : At 3.00m bgl; Possible ACM.	(1.00)		
3.50		V					4.00		
Borehole terminated at 4.00m depth.									

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Borehole backfilled with arisings upon completion	



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH5
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill & Instru- mentation	Water	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results					
0.30-0.40	2	ES				MADE GROUND: Brown silty slightly gravelly CLAY (Topsoil). MADE GROUND: Brown silty gravelly CLAY with occasional black plastic sacking. Stiff becoming soft to firm light brown silty CLAY with ancient fine roots. 0.80m : Appears desiccated up to 0.80m bgl.	0.05 0.45	
0.80 0.90-1.00	1	V D	$c_r=63$					
1.40-1.60	3	D						
1.50		V	$c_r=32$				(2.85)	
2.40-2.60	4	D						
2.50		V	$c_r=37$					
						Borehole terminated at 3.30m depth.	3.30	

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Gas and groundwater monitoring well was installed to 3.00m depth 3. Ancient roots to 1.10m depth	
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: AGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH6
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.00-0.10	1	ES				MADE GROUND: Brown silty CLAY with occasional fine charcoal (Topsoil). Firm to stiff brown silty CLAY.	0.10	
0.50		V	$c_r=65$				(1.60)	
0.90-1.00	2	D						
1.30-1.50	3	D				1.50-1.70m : Between 1.50m and 1.70m bgl; Becoming gravelly.	1.70	
1.30		V	$c_r=73$			Firm to stiff light brown yellow very gravelly sandy CLAY. Slightly desiccated.	(0.70)	
2.00-2.30	4	D					2.40	
						Firm to stiff light brown silty CLAY. 2.40-2.50m : Between 2.40m and 2.50m bgl; Slightly desiccated.	(0.60)	
2.70		V	$c_r=72$				3.00	
2.80-3.00	5	D				Borehole terminated at 3.00m depth.		

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Fine to coarse roots seen to 3.00m 3. Borehole backfilled with arisings upon completion	
						All dimensions in metres	Scale: 1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: AGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH7
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill & Instru- mentation	Water	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results					
0.40-0.60	1	ES	$c_r=68$			MADE GROUND: Grass over brown silty CLAY with occasional fine brick and charcoal (Topsoil). Firm brown silty CLAY.	0.15	
0.70 0.90-1.00	2	V D				1.00-1.20m : Between 1.00m and 1.20m bgl; Desiccated and slightly sandy.	(1.95)	
1.40-1.60	3	D				Medium dense to dense light grey angular to subangular fine to medium flint GRAVEL. Borehole terminated at 2.40m depth.	2.10 2.40	

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						<div>1. No groundwater was encountered</div> <div>2. Occasional fine roots present to 2.00m</div> <div>3. Gas and groundwater monitoring well installed to 2.00m</div> <div>4. Borehole refused at 2.40m upon hard strata.</div>	
						All dimensions in metres	Scale: 1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By:



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH8
Contract Ref: 27621	Start: 26.01.15 End: 26.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.30-0.40	1	ES	c _r =52			MADE GROUND: Grass over brown silty CLAY with isolated glass fragments. Firm to stiff light brown silty CLAY.	0.10 (1.10)	
0.80 0.90-1.00	2	V D				Firm to stiff brown very gravelly CLAY.	1.20 (0.80)	
1.50-1.60	3	D				Medium dense to dense brown clayey sandy angular to subrounded fine to coarse flint GRAVEL.	2.00 (0.60)	
2.80-3.00	4	D				Weathered CHALK. Off white to cream very gravelly clayey comminuted chalk. Borehole terminated at 3.00m depth.	2.60 3.00	

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Fine to coarse roots seen to 1.20m 3. Borehole backfilled with arisings upon completion.	



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH9
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill & Instru- mentation	Water	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results					
0.10-0.20	1	ES				MADE GROUND: Light brown silty CLAY with a little glass. Firm light brown slightly silty CLAY.	0.10	
0.70-1.00	2	D					(1.30)	
0.80 1.00-1.45	1	V SPT(c)	c _r =55 N=11				1.40	
1.30 1.60-1.80	3	V D	c _r =47			Firm light brown very gravelly CLAY.	(0.60) 2.00	
2.00-2.45	2	SPT(c)	N=5			Interbedded light brown gravelly CLAY and clayey flint GRAVEL. 2.00m : Below 2.00m bgl; Soils locally damp.	(1.30) 3.30	
						Borehole terminated at 3.30m depth.		

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Gas and groundwater monitoring well installed to 3.00m	
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By:



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH10
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.30-0.40	1	ES				MADE GROUND: Grass over dark brown silty slightly gravelly CLAY with occasional plastic sacking.	0.40	
						MADE GROUND: Brown silty slightly gravelly CLAY with occasional glass fragments.	(0.50)	
							0.90	
1.10-1.40	2	ES				MADE GROUND: Dark brown to black slightly silty CLAY with black plastic sacking, wood, glass, string and mortar. Slight organic odour.	(0.80)	
1.50	5	B				1.50m : At 1.50m bgl; Possible ACM.	1.70	
						MADE GROUND: Dark grey silty slightly gravelly CLAY with a little charcoal. Moderate organic odour.	2.10	
						Firm light brown silty CLAY.		
2.50-2.80	3	D						
2.80		V	c _r =53				(1.90)	
						3.30m : Below 3.30m bgl; Slightly sandy and light yellowish brown.		
3.50-3.70	4	D						
3.50		V	c _r =55				4.00	
						Borehole terminated at 4.00m depth.		

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Borehole backfilled with arisings upon completion	
						All dimensions in metres	Scale: 1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: AGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH11
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill & Instru- mentation	Water	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results					
0.30-0.40	1	ES				MADE GROUND: Flint and limestone GRAVEL. MADE GROUND: Grey sandy flint and limestone GRAVEL with tarmac/ charcoal. MADE GROUND: Light brown yellowish gravelly SAND. Dark grey silty CLAY (Possibly made ground) Soft to firm light brown silty CLAY.	0.05 0.25 0.45 0.65	
1.00-1.45 1.00-1.20	1 2	SPT(c) D	N=6					
1.20 1.60-1.80	3	V D	c _r =52					
2.00-2.45	2	SPT(c)	N=10			2.00-2.30m : Between 2.00m and 2.30m bgl; Gravelly.	(2.65)	
2.40-2.60 2.50	4 3	D V	c _r =47					
3.00-3.45	3	SPT(c)	N=0			3.00-3.15m : Between 3.00m and 3.15m bgl; Becoming very soft.	3.30	
Borehole terminated at 3.30m depth.								

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Gas and groundwater monitoring well installed to 3.00m depth	
						All dimensions in metres	Scale: 1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By:



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH12
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.20-0.40	1	ES				MADE GROUND: Grass over dark brown silty slightly gravelly CLAY (Topsoil). Gravel is fine flint, slate, brick and charcoal. MADE GROUND: Brown silty gravelly CLAY with occasional brick, charcoal and string. 0.20m : At 0.20m bgl; Possible ACM. Firm light brown slightly silty CLAY.	0.15	
0.20	2	B					(0.55)	
0.70-1.00	3	D					0.70	
0.80		V	$c_r=40$			2.40m : Below 2.40m bgl; Becoming very gravelly.	(3.30)	
1.00-1.45	1	SPT(c)	N=7					
1.40-1.60	4	D						
1.50		V	$c_r=38$					
2.00-2.45	2	SPT(c)	N=11					
2.30		V	$c_r=35$					
2.40-2.70	5	D						
3.00-3.45	3	SPT(c)	N=8					
4.00-4.45	4	SPT(c)	N=15					
							4.00	
						Borehole terminated at 4.00m depth.		

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. No groundwater was encountered 2. Roots seen to 1.50m 3. Borehole backfilled with arisings upon completion	
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: AGS



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH13
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.10-0.30	1	ES				MADE GROUND: Grass over brown silty slightly gravelly CLAY with isolated fine charcoal fragments (Topsoil). MADE GROUND: Brown silty slightly gravelly CLAY with a little polystyrene, slate, pottery and brick fragments. Firm becoming soft light brown silty CLAY	0.10 0.30	
1.00-1.45	1	SPT(c)	N=6			2.00-3.00m : Between 2.00m and 3.00m bgl; Locally gravelly.	(2.70)	
1.00-1.20	2	D						
1.50	3	V	c _r =52					
1.70-2.00		D						
2.00-2.45	2	SPT(c)	N=5					
2.50	3	V	c _r =35			Borehole terminated at 3.00m depth.	3.00	
3.00-3.45		SPT(c)	N=10					

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. Inspection pit hand dug to 1.20m 2. No groundwater was encountered 3. Borehole backfilled with arisings upon completion	
				All dimensions in metres		Scale:	1:50
Method Used: Window sampling			Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By: 



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH14A
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.20-0.60	1	ES				MADE GROUND: Grass over brown silty CLAY with occasional fine flint and charcoal (Topsoil).	0.10	
						MADE GROUND: Brown sandy gravelly CLAY with occasional concrete and brick cobbles, charcoal and clinker.	(0.70)	
0.80-0.90	5	ES				MADE GROUND: Dark grey silty CLAY with occasional charcoal and clinker.	0.80	
1.00-1.45	1	SPT(c)	N=10				1.05	
1.10-1.30	2	D				Firm light brown slightly silty CLAY with isolated flint GRAVEL.		
1.50		V	c _r =48					
1.60-1.80	3	D						
2.00-2.45	2	SPT(c)	N=6				(2.25)	
2.40-2.60	4	D						
2.50		V	c _r =43			2.60m : Below 2.60m bgl; Becoming light orange brown mottled.		
3.00-3.45	3	SPT(c)	N=7				3.30	
						Borehole terminated at 3.30m depth.		

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				
						1. Inspection pit hand excavated to 1.20m 2. No groundwater was encountered 3. Gas and groundwater monitoring well installed to 3.00m			
						All dimensions in metres			
						Scale:	1:50		
Method Used: Window sampling				Plant Used: Dando Terrier		Drilled By: KDS	Logged By: AJames	Checked By:	



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BH15
Contract Ref: 27621	Start: 27.01.15 End: 27.01.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Depth (m)	Samples & Testing			Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results					
0.10-0.30	1	ES				Grass over brown silty CLAY with occasional fine to medium flint gravel (Topsoil).	0.35	
0.50-0.50	2	B				MADE GROUND: Brown sandy gravelly CLAY. Gravel is fine to medium of flint, concrete, charcoal, glass and brick fragments. 0.50m : At 0.50m bgl; Possible ACM.	(0.55)	
0.60-0.80	3	ES					0.90	
1.10-1.30	4	D				Firm light brown silty CLAY with rare fine to coarse angular to subangular flint gravel.		
1.50	5	V	$c_r=55$				(2.10)	
1.70-2.00		D						
2.50		V	$c_r=45$			Borehole terminated at 3.00m depth.	3.00	

Boring Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. No groundwater was encountered 2. Borehole was backfilled with arisings upon completion
						</



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BHA
Contract Ref: 27621	Start: 21.10.15 End: 22.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.40	1	ES				MADE GROUND: Brownish grey sandy fine to coarse grained GRAVEL. Gravel is angular to rounded flint. (SUB-BASE).		
0.10-0.40	B1	B					0.40	
0.40-0.70	2	ES				MADE GROUND: Dark brown mottled black sandy CLAY. With rare fine to medium angular flints, rare glass, brick and ash.		
0.40-0.70	B2	B					0.70	
0.70-1.00	B3	B				Firm orangish brown slightly sandy silty CLAY. Sand is fine (sand: 0.063 - 0.2mm). With rare fine lignite fragments and angular white flints.		
1.00	3	ES						
1.20-1.65	U1	U ₍₁₀₀₎	50 blows				(1.70)	
1.65	D1	D						
2.00-2.45	1	SPT	N=8			Medium dense orangish brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is very angular to subangular fine to coarse grained flints.	2.40	
3.00-3.45	2	SPT(c)	N=19				(2.30)	
4.00-4.45	3	SPT(c)	N=25			Medium dense orangish brown fine to medium grained SAND.	4.70	
5.00-5.45	4	SPT	N=10				(1.10)	
6.50-6.95	5	SPT(c)	N=40			Medium dense brown and white SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse grained flints and subangular to subrounded chalk gravel.	5.80	
8.00-8.45	6	SPT(c)	N=50				(0.60)	
						CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc)	6.40	
							(3.60)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									1. No groundwater was encountered 2. Inspection pit to 1.20m 3. Groundwater monitoring well installed to 9.50m
Method Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000			Drilled By: MBD			Logged By: RSpeight		Checked By:	



Contract:		Client:		Borehole:
Land at West End Nursery, Angmering		Cala Homes (South Home Counties) Ltd		BHA
Contract Ref:	Start: 21.10.15	Ground Level:	Co-ordinates:	Sheet:
27621	End: 22.10.15	---	---	2 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.50-9.95	7	SPT(c)	N=50			<p>CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc) <i>(stratum copied from 6.40m from previous sheet)</i></p>	10.00	
						Borehole terminated at 10.00m depth.		

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
									All dimensions in metres	Scale: 1:50		
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2000		Drilled By:	MBD	Logged By:	RSpeight	Checked By:	



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BHB
Contract Ref: 27621	Start: 16.10.15 End: 20.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20-0.50	B1	B				MADE GROUND: Concrete. Reinforced concrete slab.	0.25	
0.25-0.40	1	ES	TJV			FILL: Light brown and grey very sandy fine to coarse grained GRAVEL. Gravel is angular to rounded flint with frequent brick and concrete and rare clinker.	0.50	
0.50-0.70	B2	B					0.80	
0.60-0.80	2	ES	TJV			Full bricks required breaking out	(0.70)	
0.70-1.00	B3	B				MADE GROUND: Brown to dark brown gravelly sandy CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints with numerous brick and concrete fragments, rare clinker.	1.50	
1.00-1.20	3	ES	TJV				(0.50)	
1.20-1.65	1	SPT	N=6			MADE GROUND: Dark orangish brown sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is angular to rounded fine to medium grained flints with rare brick and clinker.	2.00	
1.50-2.00	4	ES	TJV			Soft becoming firm with depth orangish brown sandy silty CLAY. Sand is fine (sand: 0.063 - 0.2mm). with occasional fine lignite fragments and angular white flints.	2.40	
2.00	U1	U ₍₁₀₀₎	50 blows			Firm light brown slightly sandy gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints, with frequent fine gravel sized fragments of lignite or burnt wood fragments.	(2.00)	
2.45	D2	D				Firm light brown slightly sandy gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flint.	4.40	
3.00-3.45	2	SPT(c)	N=8			Medium dense grey and orange sandy fine to coarse grained GRAVEL with a low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse grained flint. Cobbles are angular to subangular up to 70.0mm in diameter flint.	(1.20)	
4.00-4.45	3	SPT(c)	N=11				5.60	
5.00-5.45	4	SPT(c)	N=26			CHALK (Grade Dc). Recovered as off white GRAVEL with a medium cobble content. Gravel is subrounded to subangular coarse of chalk. Cobbles are subrounded to subangular. Gravel and cobbles are medium to high density, weak.	(2.20)	
5.40-6.00	B7	B					7.80	
6.50-6.95	5	SPT	N=50			Structureless off white CHALK. Recovered as slightly sandy gravelly SILT. Gravel is subrounded to subangular fine to coarse of chalk and occasional flint, medium density, weak. (Grade Dm).	8.00	
8.00-8.45	6	SPT(c)	N=50			Structureless off white CHALK. Recovered as slightly silty slightly sandy GRAVEL. Gravel is subangular to subrounded fine to coarse of chalk and rare flint, medium density, weak. (Grade Dm).		

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
13/10/15	07:39	15.00	-		Dry				1. No groundwater was encountered 2. Inspection pit to 1.20m 3. Groundwater monitoring well installed to 8.50m
Method Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000			Drilled By: MBD		Logged By: CJBall	Checked By: AGS			



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BHB
Contract Ref: 27621	Start: 16.10.15 End: 20.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.50-10.00	B10	B	N=50			Structureless off white CHALK. Recovered as slightly silty slightly sandy GRAVEL. Gravel is subangular to subrounded fine to coarse of chalk and rare flint, medium density, weak. (Grade Dm). <i>(stratum copied from 8.00m from previous sheet)</i>	(3.00)	
10.00-10.45	7	SPT(c)						
11.00-11.50	B11	B	N=50			Structureless off white CHALK. Recovered as off white slightly sandy gravelly SILT with occasional brown discolouration. Gravel is subangular to subrounded fine to coarse of chalk, low density, weak in a discontinued matrix. (Grade Dm).	11.00	
12.00-12.45	8	SPT(c)						
12.50-13.00	B12	B				(3.50)		
14.00-14.45	9	SPT(c)	N=50					
15.00-15.50	B13	B					Borehole terminated at 14.50m depth.	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Borehole: BHC
Contract Ref: 27621	Start: 20.10.15 End: 21.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results					
0.20-0.60	1	ES				MADE GROUND: Dark brown slightly clayey slightly gravelly SAND. Gravel is angular to rounded fine to coarse grained flint and occasional concrete fragments and rare glass.	0.20	
0.20-0.60	B1	B						
0.60-1.00	2	ES				MADE GROUND: Dark orangish brown clayey slightly gravelly SAND. Gravel is angular to rounded fine to coarse grained flints with rare clinker and concrete fragments and rare fine to medium angular flints, rare glass, brick and ash.	0.60	
0.60-1.00	B2	B						
1.20-1.65	1	SPT	N=8			Firm becoming stiff with depth orangish brown slightly sandy silty CLAY. Sand is fine (sand: 0.063 - 0.2mm). With rare fine lignite fragments and rare fine to medium angular white chalk fragments and flints.	(1.60)	
2.00	U1	U ₍₁₀₀₎	50 blows				2.20	
2.35	D2	D				Medium dense orangish brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is very angular to subangular fine to coarse grained flints.		
							(1.70)	
3.00-3.45	2	SPT(c)	N=11				3.90	
4.00-4.45	3	SPT	N=20			Medium dense orangish brown fine to medium grained SAND.		
							(3.00)	
5.00-5.45	4	SPT(c)	N=27				6.90	
6.50-6.95	5	SPT	N=50			Dense to very dense brown and white SAND and GRAVEL with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse grained flints and subangular to subrounded chalk gravel. Cobbles are subangular up to 100.0mm in diameter.	(1.10)	
							8.00	
8.00-8.45	6	SPT(c)	N=50			CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc)		

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									1. No groundwater was encountered 2. Inspection pit to 1.20m 3. Groundwater monitoring well installed to 9.50m	
									All dimensions in metres	
									Scale: 1:50	
Method Used: Inspection pit + cable percussion				Plant Used: Dando 2000		Drilled By: MBD		Logged By: CJBall		Checked By: 



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BHC
Contract Ref: 27621	Start: 20.10.15 End: 21.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.50-9.95	7	SPT(c)	N=50			CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc) (stratum copied from 8.00m from previous sheet)		
11.00-11.45	8	SPT(c)	N=50				(8.10)	
12.50-12.95	9	SPT(c)	N=50					
14.00-14.45	10	SPT(c)	N=50					
15.50-15.95	11	SPT(c)	N=50					
16.00-16.45	12	SPT(c)	N=50			Borehole terminated at 16.10m depth.	16.10	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Borehole: BHD
Contract Ref: 27621	Start: 15.10.15 End: 16.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.20	1	ES				MADE GROUND: Brown slightly sandy gravelly CLAY with a low cobble content. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints. Cobbles are subrounded up to 90.0mm in diameter brick, concrete and chalk with frequent brick and concrete fragments, rare glass, ceramic tile and rare rootets. Grass covering.	(1.00)	
0.50	2	ES					1.00	
1.00-1.20	3	ES				MADE GROUND: Dark brown and black sandy silty CLAY. Sand is fine to medium. With abundant burnt wood fragments, ash, clinker and occasional brick, concrete and ceramic tile and with rare glass. Moderate chemical odour. Moderate ash smell.	1.30	
1.20-1.65	1	SPT	N=12				(0.50)	
1.50	4	ES				MADE GROUND: Firm light brown mottled black slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints with rare brick fragments. Firm brown slightly sandy gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints.	1.80	
2.00-2.45	2	SPT(c)	N=14				(1.65)	
3.00	U1	U ₍₁₀₀₎	60 blows			Firm orangish brown slightly sandy silty CLAY. Sand is fine.	3.45	
3.45	D2	D					(0.65)	
4.00-4.45	3	SPT	N=18			Firm orangish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse grained flints.	4.10	
5.00-5.45	4	SPT(c)	N=9				(2.20)	
6.00-6.50	B6	B				Dense brown silty fine to medium grained SAND with occasional bands of soft to firm sandy silty clay.	6.30	
6.50-6.95	5	SPT	N=37				(1.90)	
8.00-8.45	6	SPT(c)	N=42			CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc)	8.20	
							(1.00)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									1. No groundwater was encountered 2. Inspection pit to 1.20m 3. Groundwater monitoring well installed to 7.50m				
									All dimensions in metres Scale: 1:50				
Method Used:	Inspection pit + cable percussion			Plant Used:	Dando 2000		Drilled By:	MBD		Logged By:	CJBall	Checked By:	<div></div> AGS



Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.00-9.20	B9	B				Borehole terminated at 9.50m depth.	9.20	

ARUN DISTRICT COURT used 794/17/00



FINAL BOREHOLE LOG

Contract: Land at West End Nursery, Angmering			Client: Cala Homes (South Home Counties) Ltd		Borehole: BHE
Contract Ref: 27621	Start: 12.10.15 End: 13.10.15	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.50 0.10-0.50	1 B1	ES B	TJV			MADE GROUND: Brown slightly gravelly silty sandy CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints. With occasional brick and concrete fragments, rare glass, ceramic tile and rare rootets. Grass covering.	(1.00)	
1.00-1.20 1.00-1.20 1.30	2 B2 D1	ES B D	TJV			MADE GROUND: Dark brown and black silty sandy CLAY. Sand is fine to medium. With abundant burnt wood fragments, ash, clinker and occasional brick, concrete and ceramic tile and with rare glass. Moderate chemical odour. Moderate ash smell.	1.00 (0.55) 1.55	
1.50-1.95	1	SPT(c)	N=7			Firm orangish brown silty sandy CLAY. Sand is fine. With occasional fine lignite fragments and angular white flints.	2.00	
2.00	3	ES	TJV			Firm light brown silty slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints. With frequent fine gravel sized fragments of lignite or burnt wood fragments.	2.40	
2.80 3.00-3.45	D3 2	D SPT(c)	N=8			Firm light brown silty slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse grained flints. Becoming very gravelly clay. 2.70m : Becoming very gravelly with depth.	(1.40)	
3.50 3.60-3.80	4 B4	ES B	TJV				3.80	
3.90 4.00-4.45	D4 3	D SPT(c)	N=48			Dense grey and orange sandy fine to coarse grained GRAVEL with a low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse grained flint. Cobbles are angular to subangular up to 70.0mm in diameter flint.	(1.90)	
5.20-5.65	4	SPT(c)	N=2				5.70	
6.00-6.45	5	SPT(c)	N=23			Brown slightly clayey silty fine SAND. With occasional bands of soft to firm sandy silty clay.	(2.10)	
7.50-7.95	6	SPT(c)	N=3				7.80	
8.00-8.50 8.00	B8 D7	B D				CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc)		

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
13/10/15	07:39	15.00	-		Dry								
									1. No groundwater was encountered 2. Inspection pit to 1.20m 3. Groundwater monitoring well installed to 15.00m				
									All dimensions in metres		Scale: 1:50		
Method Used:	Inspection pit + cable percussion			Plant Used:	Dando 2000		Drilled By:	MBD		Logged By:	CJBall	Checked By:	<div>AGS</div>



Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.00-9.45	7	SPT(c)	N=33			CHALK: Recovered as light brownish grey to white silty gravel. Gravel is subangular to subrounded fine to coarse very weak to weak medium density chalk with occasional subangular to subrounded chalk cobbles. (Grade Dc) <i>(stratum copied from 7.80m from previous sheet)</i>	(7.20)	
10.00-10.45	8	SPT(c)	N=20					
11.50	D9	D						
12.00-12.45	9	SPT(c)	N=50					
13.00-13.45	10	SPT(c)	N=33					
14.00	B12	B						
14.50-14.95	11	SPT(c)	N=50					
15.00-15.45	12	SPT(c)	N=50					
						Borehole terminated at 15.00m depth.	15.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		

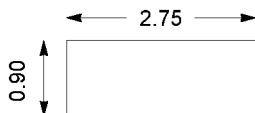


FINAL TRIAL PIT LOG

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: SA1
Contract Ref: 27621	Start: 30.06.16 End: 30.06.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
4.50-4.60	1	B				MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to rounded fine to medium flint, with few chalk, brick fragments, glass, and charcoal. No odour. 0.10m : Rare irrigation hose; single piece of suspected ACM cement fragment 90x40x5mm in size.	(0.90)	
						MADE GROUND: Band of angular to rounded fine to coarse flint GRAVEL. Very stiff dark brown slightly sandy gravelly CLAY. Sand is fine. Gravel is angular to rounded fine to coarse flint and chalk, with a little charcoal.	0.90 0.95 (0.75)	
						Orangish brown very clayey GRAVEL with a low cobble content. Gravel is very angular to well rounded fine to coarse flint. Cobbles are subangular to subrounded flint upto 145mm.	1.70 (2.70)	
						Light yellowish brown fine SAND.	4.40 (0.60)	
						Trial pit terminated at 5.00m depth.	5.00	

Plan (Not to Scale)



General Remarks

1. Trial pit remained dry and stable during excavation.
2. Trench boxes installed to 4.40m depth.
3. Outside of trench boxes filled with spoil.
4. Soakaway test carried out.
5. Trial pit backfilled by ground worker.

All dimensions in metres

Scale: **1:33**

Method

Used: **Machine dug**

Plant

Used: **Tracked excavator**

Logged

By: **EHughes**

Checked

By:



Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: SA2
Contract Ref: 27621	Start: 30.06.16 End: 30.06.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.20	1	ES	1xT, 1xJ, 1xV			MADE GROUND: Very soft brown and greyish brown slightly sandy CLAY. Sand is fine.	0.30	
0.30-0.50	2	ES	1xT, 1xJ, 1xV			MADE GROUND: Firm to stiff dark brownish grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick fragments and concrete fragments, with few glass fragments. Cobbles are subangular concrete and brick up to 400mm. Occasional plastic, wood and metal fragments. Rare suspected ACM cement fragments up to 25x45x5mm. Frequent black staining. Weak hydrocarbon odour. Soft to firm brown mottled dark brown slightly sandy CLAY. Sand is fine.	(0.35)	
0.70-0.90	3	ES	1xT, 1xJ, 1xV				0.65	
							(1.25)	
2.00-2.50	4	ES	1xT, 1xJ, 1xV			Orangish brown very clayey GRAVEL with a medium cobble content. Gravel is very angular to well rounded fine to coarse flint. Cobbles are subangular flint up to 140mm.	1.90	
							(1.80)	
							3.70	
4.50-4.70	5	B				Cream and light brown silty sandy GRAVEL. Sand is fine to coarse. Gravel is very angular to well rounded fine to coarse flint with a little chalk.	(1.00)	
							4.70	
						Trail pit terminated at 4.70m depth.		

Plan (Not to Scale)		General Remarks		
		<ol style="list-style-type: none"> 1. Trial pit remained dry and stable during excavation. 2. Trench boxes installed to 3.70m depth. 3. Soakaway test carried out. 4. Trial pit backfilled by ground worker. 		
All dimensions in metres		Scale: 1:28		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: EHughes	Checked By:	



FINAL TRIAL PIT LOG

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: SA3
Contract Ref: 27621	Start: 26.09.16 End: 26.09.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Dark brown slightly sandy TOPSOIL with frequent rootlets and much organic matter.	0.10	
						Firm yellowish brown slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of flint.	0.30	
						Multicoloured slightly sandy clayey GRAVEL. Gravel is angular to subrounded fine to coarse of flint.	(1.50)	
							1.80	
						Yellow slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded medium to coarse of flint.	(1.00)	
							2.80	
						With abundant flint cobbles at 2.8m. Trial pit terminated at 2.8m depth.		

Plan (Not to Scale)		General Remarks		
		<ol style="list-style-type: none">Pit length for first soakage test was 1.6 m and extended to 2.0m long for the second soakage test.Trial pit advanced to 1.2 m bgl prior to first soakage test being completed.On completion of the first soakage test, remaining water was bailed out and the pit extended to 2.8 m bgl in order for second and third soakage tests to be completed.		
		All dimensions in metres	Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: CLatimer	Checked By:	

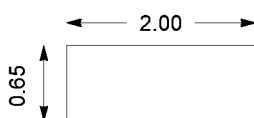


FINAL TRIAL PIT LOG

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: SA4
Contract Ref: 27621	Start: 26.09.16 End: 26.09.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Dark brown slightly sandy TOPSOIL with frequent rootlets and much organic matter. Firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of flint.	0.10	
							(1.70)	
						Brownish cream slightly gravelly SILT. Gravel is angular to subrounded fine to coarse of flint.	1.80	
							(0.40)	
							2.20	
						Brownish cream very gravelly SILT. Gravel is angular to subrounded fine to very coarse of flint.	(0.70)	
							2.90	
						Trial pit terminated at 2.9m depth.		

Plan (Not to Scale)



General Remarks

1. Pit length for first soakage test was 1.6 m and extended to 2.0m for the second soakage test.
2. Trial pit advanced to 1.0 m bgl prior to first soakage test being completed.
3. On completion of the first soakage test, remaining water was bailed out and the pit extended to 2.9m bgl in order for second soakage test to be completed.

All dimensions in metres

Scale: **1:25**

Method

Used: **Machine dug**

Plant

Used:

JCB-3CX

Logged

By:

CLatimer

Checked

By:





APPENDIX C

GROUNDWATER MONITORING DATA

Exploratory hole location	Response zone	Visit No.	Depth to groundwater (m TOC)	Geology at water level	TOC Elevation (m AOD)	Water Table Elevation (m AOD)	Depth to base (m TOC)	Depth to base (m AOD)
BH1	RTD	30-Jan-15	Dry	-	ND	ND	3.74	ND
		13-Feb-15	2	RTD			3.74	
		24-Feb-15	3.4	RTD			3.73	
BH5	RTD	30-Jan-15	2.8	RTD	ND	ND	2.93	ND
		13-Feb-15	2.91	RTD			2.93	
		24-Feb-15	1.79	RTD			2.93	
BH7	RTD	30-Jan-15	Dry	-	ND	ND	1.9	ND
		13-Feb-15	Dry	-			1.9	
		24-Feb-15	Dry	-			1.9	
BH9	RTD	30-Jan-15	Dry	-	ND	ND	2.93	ND
		13-Feb-15	Dry	-			2.93	
		24-Feb-15	Dry	-			2.93	
BH11	RTD	30-Jan-15	Dry	-	ND	ND	2.93	ND
		13-Feb-15	2.8	RTD			2.93	
		24-Feb-15	Dry	-			2.93	
BH14A	RTD	30-Jan-15	Dry	-	ND	ND	2.92	ND
		13-Feb-15	2.92	RTD			2.93	
		24-Feb-15	2.12	RTD			2.92	
BHA	RTD + CK	29-Oct-15	6.4645	CK	11.173	4.7085	8.4	2.773
		05-Nov-15	6.49	CK		4.683	7.5	3.673
		20-Dec-16	Dry	CK		ND	7.45	3.723
		06-Feb-17	6.5	CK		4.673	7.06	4.113
		28-Feb-17	6.45	CK		4.723	NR	ND
		28-Mar-17	6.48	CK		4.693	NR	ND
		25-Apr-17	6.68	CK		4.493	NR	ND
BHB	CK	29-Oct-15	5.367	RTD	10.51	5.143	7.8	2.71
		05-Nov-15	7.36	CK		3.15	7.5	3.01
		20-Dec-16	Dry	CK		ND	6.42	4.09
		06-Feb-17	5.703	CK		4.807	6.26	4.25
		28-Feb-17	5.59	CK		4.92	NR	ND
		28-Mar-17	5.82	CK		4.69	NR	ND
		25-Apr-17	6.03	CK		4.48	NR	ND
BHC	RTD + CK	29-Oct-15	*	*	11.054**	*	*	*
		05-Nov-15	5.92	RTD		5.134	6.22	4.834
		20-Dec-16	Dry	RTD		ND	5.98	5.074
		06-Feb-17	6.005	RTD		5.049	NR	ND
		28-Feb-17	6.09	RTD		4.964	NR	ND
		28-Mar-17	6.1	RTD		4.954	NR	ND
BHD	RTD	29-Oct-15	5.286	RTD	11.011	5.725	7.38	3.631
		05-Nov-15	5.53	RTD		5.481	6.57	4.441
BHE	CK	29-Oct-15	6.841	RTD***	11.238	4.397	14.08	-2.842
		05-Nov-15	7.13	RTD***		4.108	14.23	-2.992

Notes:

TOC - Measurement taken from top of casing (approximately existing ground level)

NR - Not recorded, ND - No data, RTD - River Terrace Deposits, CK - Chalk

* Monitoring well inaccessible during monitoring round one

** Ground level at TOC could not be taken due to restricted access. Measurement at ground level (closest accessible area). Likely adjustment factor circa -0.2m

***Water level rose up above response zone

Groundwater strikes

Exploratory hole location	Depth to groundwater strike (m bgl)	Depth to base of borehole (m bgl)
BH1	Dry	4.00
BH2	Dry	4.00
BH3	Dry	4.00
BH4	Dry	4.00
BH5	Dry	3.30
BH6	Dry	3.00
BH7	Dry	2.40
BH8	Dry	3.00
BH9	Dry	3.30
BH10	Dry	4.00
BH11	Dry	3.30
BH12	Dry	4.00
BH13	Dry	3.00
BH14A	Dry	3.30
BH15	Dry	3.00
BHA	Dry	10.00
BHB	7.80	14.50
BHC	Dry	16.10
BHD	Dry	9.50
BHE	7.80	15.00
SA1	Dry	5.00
SA2	Dry	4.70
SA3	Dry	2.80
SA4	Dry	2.90