Basement Impact Assessment: The Pears Building

(Surface Water and Groundwater)

Basement Impact Assessment: The Pears Building

Prepared for

RFC Development Limited,
Royal Free Charity
Pond Street
London NW3 2QG

Report reference: 62361R1, October 2014
Report status: Final Report

Confidential
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Basement Impact Assessment: The Pears Building

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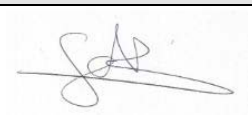
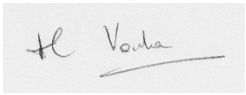
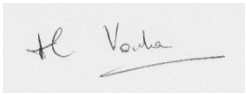
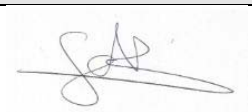
62361R1. Final Report

Surface Water

	Name	Signature
Author	Samson Collier	
Checked by	Helen Vonka (CIWEM)	
Reviewed by	Helen Vonka (CIWEM)	

Groundwater

	Name	Signature
Author	Samson Collier	
Checked by	Joe Gomme (CGeol)	
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Revision record:

Issue	Report ref	Comment	Author	Checker	Reviewer	Issue date	Issued to
1	62361R1	SW & GW	SCC	HCV & JWG	HCV & JWG	21/10/2014	Nick Tibbitts, Burofour
2							

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REPORT SUMMARY

The assessment findings are summarised as follows:

1. Impacts to surface water flows and related flooding	High	
	Med	
	Low	
2. Impacts to groundwater flows and related flooding	High	
	Med	
	Low	
3. Overall risk posed by the Site	High	
	Med	
	Low	

Key:

High		*There is a high potential risk*
Med		*There is medium potential risk*
Low		*There is a low potential risk*

RECOMMENDATIONS (FOR NEXT STEPS)

The development described in this report will change the proportion of impermeable surface area. However peak runoff and related flooding risk from the proposed development will not change as the entirety of the runoff from the Site is directed into the adjacent sewer pre- and post-development. It is expected that mitigation measures will be put in place to ensure that the discharge to the sewer post-development is less than the discharge to the sewer pre-development.

Two streets within 250 m of the site were subject to surface water flooding in 1975 and 2002. These are believed to be related to sewer flooding following extreme rainfall summer events; however there have been no reported incidents of sewer flooding at the site, according to Thames water.

Groundwater is present below the site within the London Clay, based on two boreholes to the south west and north east of the Site. However it is believed that the water within these boreholes is not a reflection of a water table but merely a presence of localised pockets of water within the London Clay.

Precautions should be taken against sewer flooding at this location; however it is expected that the discharge to the sewer post-development will be less than pre-development, reducing the impact on the sewer system.

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FIGURES

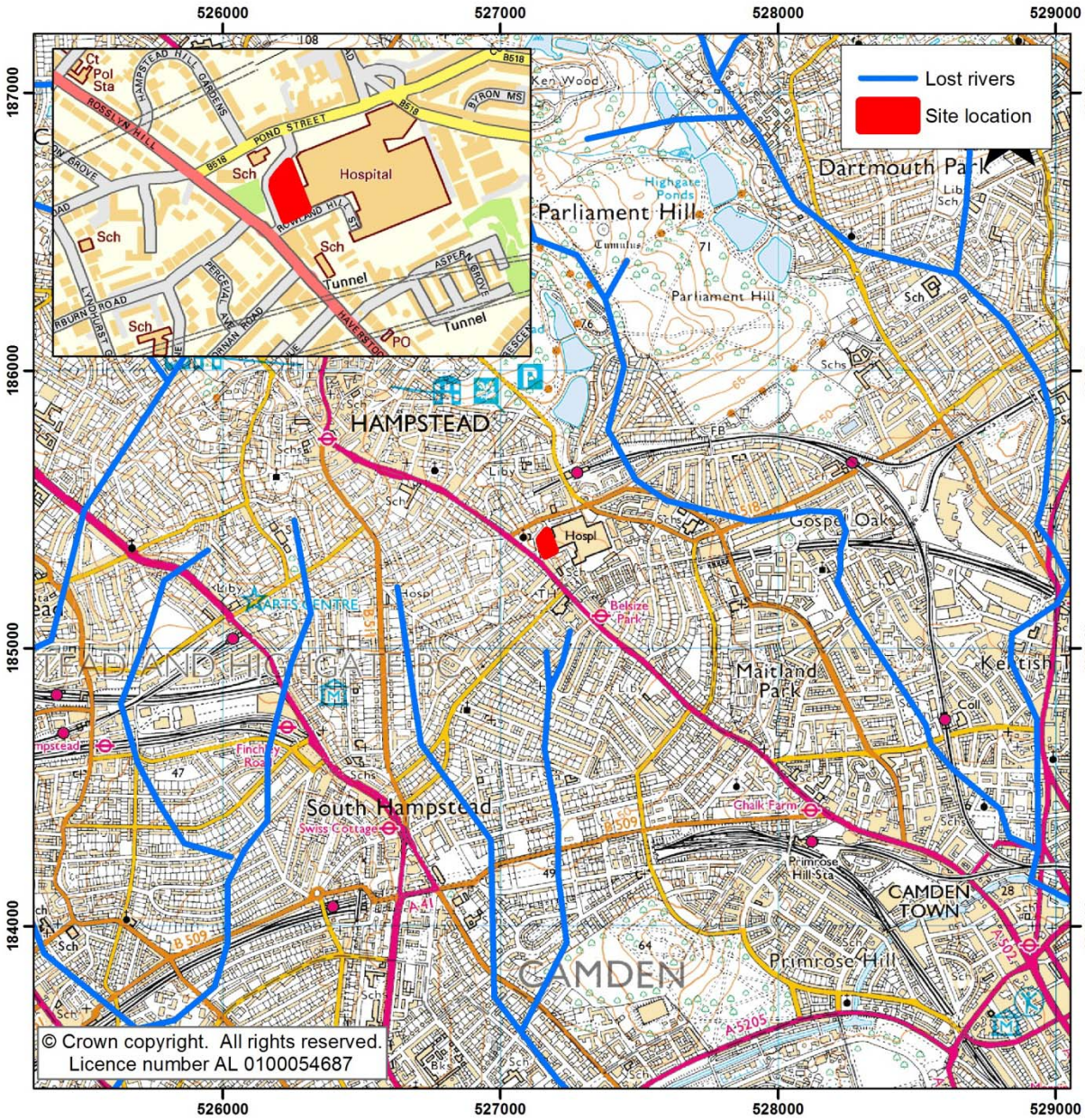
APPENDICES

1 INTRODUCTION

1.1 Background

ESI Ltd (ESI) was commissioned by RFC Development Limited in April 2014 to undertake a Basement Impact Assessment (BIA) for the proposed development of the Pears Buildings, NW3 2QG. The site is at an elevation of between 68.5 mAOD and 77 mAOD (Site plans, Appendix A) and lies in a generally flat area with topography sloping gently up from south west to north east. It is located at the approximate national grid reference of TQ 27173 85374 in the London Borough of Camden (Figure 1.1).

Figure 1.1 Site location



This document is a desk study which considers the potential impact relating to the proposed basement development in terms of surface water and groundwater flow and flooding and complies with guidance issued by the London Borough of Camden. The other key component of the BIA (Ground Stability) is covered by the complementary report (Soil Consultants 2014). These reports will be used for submission to the Planning Authority in support of the planning application for the proposed development.

1.2 Scope of Works

The scope of works requested was an assessment of the impacts of the proposed development on surface and ground water flow, levels and drainage. This report outlines the hydrogeological conditions with relevance to construction of the basement at the property. The assessment conforms to the requirements set out by the London Borough of Camden which provides comprehensive guidance on planning applications for basement extensions. These guidelines for basement impact assessments (ARUP (2010), Camden Borough Council, (2011)) have been consulted in order to complete a screening analysis of key hydrological and hydrogeological issues that will satisfy the relevant planning requirements.

The works undertaken follow the procedure outlined below:

1) Screening, which aims to identify sites that are a priority for investigation;
2) Scoping, which uses simple calculations to demonstrate whether the potential hazards identified in the screening stage pose a risk as a result of the development, and whether the actual risk is significant;
3) Groundwater modelling;
4) Impact assessment; and
5) Recommendations based on the outcome of the assessment.

1.3 Proposed Basement Works

The proposed redevelopment will comprise the installation of a renewed, two-storey basement (level 00 and level 01) beneath the footprint of a new four-storey building (the Pears Building). The minimum base elevation of the proposed basement is planned to be 68.5 mAOD which is identical to the maximum depth of the current basement. Levels 00 and 01 will be extended by approximately 620 m^2 to the south west (current and proposed Site plans are shown in Appendix A).

2 SCREENING

The screening stage for Impact Assessment has been considered as set out in CPG4 (Camden Council, 2011) as follows.

2.1 SURFACE WATER (Surface flow and flooding screening flowchart (Figure 3, CPG4 (Camden Council, 2011))			
Impact question	**Answer**	**Justification**	**Reference**
1) Is the Site within the catchment of the pond chains on Hampstead Heath?	**No**	The Site is not located within the catchment for any of the Hampstead Heath ponds.	Arup, 2010.
2) As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	**No**	The drain on site discharges to the adjacent sewer. There will be no additional surface water runoff caused by the proposed development so the total runoff will remain unchanged. Post-development, this runoff is likely to be diverted to the adjacent sewer although plans for on-site storage are yet to be finalised.	Site Plans (Appendix A) BDP, 2014
3) Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	**Yes**	The site is currently covered by a combination of permeable and impermeable surfaces. There will be an increase in impermeable surface area resulting from the development.	Site Plans (Appendix A).
4) Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	**No**	There will be an increase in impermeable surfaces after development of the Site, however all the permeable surfaces are shallow and underlain by impermeable surfaces which direct infiltrated water to join runoff from impermeable surfaces and eventually discharge into the nearby sewer. Therefore there is not expected to be any change in surface water quantity being received by adjacent properties or downstream watercourses. A tributary of the “lost” River Tyburn runs approximately 250 m to the south of the proposed development and the River Fleet runs 160 m east of the proposed development. Given that the entirety of the Site runoff is directed into the sewer pre- and post-development and that the nearby lost rivers are most likely culverted, there will be no changes to the watercourse inflows. No other surface water bodies are known to exist within 500 m of the Site.	Ordnance Survey Mapping. Barton, 1992. Site plans (Appendix A) BDP, 2014
5) Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	**No**	The entirety of the Site run-off is directed into the sewer pre- and post-development, therefore there will be no changes in the quality of surface water being received by adjacent properties of downstream watercourses.	BDP, 2014

6) Is the Site in an area known to be at risk from surface water flooding or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	**No**	The Site itself is considered to be at low risk of surface water flooding according to Groundsure (2014). According to Bakewell (2008), two streets within 250 m of the site were flooded in 1975 and 2002. The flood event in August 2002 was caused by excessive rainfall causing the main sewer system to become completed inundated. According to Hopkins Architects (2014), the peak discharge to the sewer post-development will be less than pre-development, reducing the impact on the sewer system. This will be mitigated by water storage beneath the Site. According to Thames Water, there is no history of sewer flooding at the site (Appendix C). The area is not in a zone at risk of flooding from rivers, the sea or failing reservoirs as defined by the Environment Agency (2014). The east side of the Site is at a moderate risk of surface water flooding according to the Environment Agency.	ARUP, 2010. Environment Agency, 2014. Thames Water, 2014 Bakewell, 2008 Groundsure Flood report, 2014

2.2 GROUND WATER (Subterranean (ground water) flow screening chart (Figure 1, CPG4 (Camden Council, 2011))

Impact question	Answer	Justification	Reference
1a) Is the Site located directly above an aquifer?	**No**	The Site is located upon the London Clay Formation, described by the BGS as "a sedimentary bedrock comprising bioturbated or poorly laminated, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay". This may contain high porosity, low permeability horizons within generally low permeability and low porosity material that is classified as Unproductive Strata by the Environment Agency. According to the Site investigation borehole logs (Appendix B), BH3, BH3a, BH4 and BH5 indicate a depth of Made Ground between 1 and 4 m below ground level underlain by London Clay which is present to the bottom of each borehole. The maximum depth London Clay was recorded in was BH5 (the deepest borehole) at 40 mbgl.	British Geological Survey, 2014. Environment Agency, 2014. Site investigation (Appendix B)
1b) Will the proposed basement extend beneath the water table surface?	**Yes**	Given the nature of the London Clay in the vicinity of the Site significant groundwater movement in the London Clay beneath the Site is unlikely. However during a site visit in October 2014 (see Appendix C), water levels in BH3 and BH5 were recorded respectively at 67.03 mAOD and 73.86 mAOD which in the latter case is higher than the base of Level 00 of the existing and proposed basements.	Site investigation (Appendix B)
2) Is the Site within 100m of a watercourse, well (used/disused) or potential spring line?	**No**	There are no existing or "lost" rivers within 100 m of the Site Given the local geology and topography it is unlikely that there are any springs within the vicinity of the site.	Ordnance Survey Mapping. 2014. Barton, 1992.

		There are no wells within 100 m of the Site.	Arup, 2010
3) Is the Site within the catchment of the pond chains on Hampstead Heath?	**No**	The Site is not located within the catchment for any of the Hampstead Heath ponds.	Arup, 2010.
4) Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	**Yes**	The site is currently covered by a combination of permeable and impermeable surfaces. There will be an increase in impermeable surface area resulting from the development.	Site Plans (Appendix A)
5) As part of the Site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	**No**	The entirety of the run-off from the proposed development will be discharged to the adjacent sewer.	Site details provided by the BDP (2014)
6) Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond or spring line.	**No**	The water level in Hampstead no 1 Pond located 450 m north of the Site is at a similar level to the lowest point of the basement. There are no spring lines within the vicinity of the Site	Ordnance Survey Mapping.

3 SCOPING

3.1 SURFACE WATER (Surface flow and flooding screening flowchart (Figure 3, CPG4 (Camden Council, 2011))			
Impact question	**Answer**	**Justification**	**Reference**
3) Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	**Yes**	The site is currently covered by a combination of permeable and impermeable surfaces. There will be an increase in impermeable surface area resulting from the development. Despite the change of proportion in hard surfaced/paved external areas, the entirety of the rainfall falling on the site will be collected and discharged into the adjacent sewer. Even the rainfall that infiltrates through permeable surfaces will infiltrate through shallow permeable strata before being directed into the adjacent sewer.	Site Plans (Appendix A)

3.2 GROUND WATER (Subterranean (ground water) flow screening chart (Figure 1, CPG4 (Camden Council, 2011))			
Impact question	**Answer**	**Justification**	**Reference**
1b) Will the proposed basement extend beneath the water table surface?	**Yes**	Given the nature of the London Clay in the vicinity of the Site significant groundwater movement in the London Clay beneath the Site is unlikely. However during a site visit in October 2014 (see Appendix C), water levels in BH3 and BH5 were recorded respectively at 67.03 mAOD and 73.86 mAOD which in the latter case is higher than the Level 00 of the basement which is 68.5 mAOD. However it is likely that the water encountered in these boreholes is localised in pockets and not a reflection of a true water table beneath the Site.	Site investigation (Appendix B)
4) Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	**Yes**	The site is currently covered by a combination of permeable and impermeable surfaces. There will be an increase in impermeable surface area resulting from the development. Despite the change of proportion in hard surfaced/paved external areas, the entirety of the rainfall falling on the site will be collected and discharged into the adjacent sewer. Even the rainfall that infiltrates through permeable surfaces will infiltrate through shallow permeable strata before being directed into the adjacent sewer.	Site Plans (Appendix A) BDP (2014)

4 GROUNDWATER MODELLING

A two-dimensional scoping model has been developed of the area around the Site, to estimate the magnitude of groundwater level change in the vicinity of the proposed basements at the Site. The details of the model are as follows.

The existing and proposed basements are represented in the model as a block of impermeable cells (it is reasonable to assume that it is sealed as it penetrates the whole aquifer and therefore must be constructed to limit groundwater ingress).

Model results are compared between two scenarios, with and without the proposed basement.

The conceptual model is of Made Ground overlying an essentially impermeable base (London Clay). The model has not been calibrated to groundwater level except to match approximately the observed hydraulic gradient and saturated thickness at the Site.

4.1 Model run

The model was developed using Groundwater Vistas, running MODFLOW in steady state mode. The model is made up from 22,500 cells arranged in a 150 x 150 cell grid; cell size is 1 m x 1 m. The model was run according to three scenarios: Scenario 1, Scenario 2 and Scenario 3.

4.1.1 Scenario 1 – fixed thickness

Layer	Elev mAOD	Comment
1	74.5 – 73.1	Made Ground – taken as average of site
2	73.1 – 72.55	London Clay to base of Level 01
3	72.55 – 68.5	London Clay to base of Level 00
4	68.5 – 48.1	London Clay of fixed thickness below Made Ground

Constant heads applied as a gradient calculated from the highest (worst case) levels recorded in BH3a and BH5.
Hydraulic conductivity (K) of Made Ground = 500 m/d (British Geological Survey, 2006)
K of London Clay = 0.001 m/d (Environment Agency, 2000)
K of current basement = 0.0000001 m/d

4.1.2 Scenario 2 – varied thickness

Layer	Elev mAOD	Comment
1	Varied - Digitised OS contours	Made Ground – taken as average of site (constant 1.4 m thickness)
2	Varied	London Clay to base of Level 01 (constant 0.55 thickness)
3	Varied	London Clay to base of Level 00 (constant 4.05 m thickness)
4	Varied	London Clay of fixed thickness below Made Ground (constant 20.4 m thickness)

Constant heads applied as a gradient calculated from the highest (worst case)levels recorded in BH3a and BH5.
K of Made Ground = 500 m/d
K of London Clay = 0.001 m/d NOTE: another run was completed on the model with K increased to 0.1 m/d
K of current basement = 0.0000001 m/d

4.1.3 Scenario 3 – varied thickness no made ground

Layer	Elev mAOD	Comment
1	90 mAOD to top of LC	Made ground replaced with London clay
2	Varied	London Clay to base of Level 01 (constant 0.55 thickness)
3	Varied	London Clay to base of Level 00 (constant 4.05 m thickness)
4	Varied	London Clay of fixed thickness below Made Ground (constant 20.4 m thickness)

Constant heads applied as a gradient calculated from the highest (worst case) levels recorded in BH3a and BH5.
K of London Clay = 0.001 m/d NOTE: another run completed on model with K increased to 0.1 m/d
K of current basement = 0.0000001 m/d

Numerical instability was experienced in all model runs. Convergence criteria were relaxed in an effort to stabilise the model. Despite this, none of the three approaches taken resulted in a model which converged.[1] The model instability is due to the very low permeability of the London Clay, and as a result, a simulated water table could not be established on the basis of the measured water levels.

The three scenarios selected were based on the results of the site investigation and best represented the conditions at the site. That none of the model scenarios were able to establish a water table supports the conclusion that there is not a consistent water table at the site and that the recorded water levels reflect localised pockets of water associated with fractures and sandy lenses in the Clay matrix.

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[1] Model convergence indicates that the repeated calculations required in the model approach a common value, which is the modelled solution.

5 IMPACT ASSESSMENT

5.1 CONCEPTUAL UNDERSTANDING		
Geology	Superficials	No superficial deposits are known to exist at the Site (although artificial Made Ground is present).
	Bedrock	The Site is located upon the London Clay Formation, described by the BGS as "a sedimentary bedrock comprising bioturbated or poorly laminated, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay". According to the Site investigation borehole logs (Appendix B), BH3, BH3a, BH4 and BH5 indicate a depth of made ground between 1 and 4 m below ground level underlain by London Clay which is present to the bottom of each borehole. The maximum depth London Clay was recorded in was BH5 (the deepest borehole) at 40 mbgl.
Aquifers	The London Clay is classified as unproductive strata by the Environment Agency. The definition of this is as follows: "geological strata with low permeability that have negligible significance for water supply or river base flow" The borehole logs indicate that the London Clay beneath the Site contains localised lenses of fine sand and selenite crystals During the installation of BH3, BH3a and BH5 in June 2014, water was struck at depths of 58.2 mAOD, 58.2 mAOD[2] and 66.6 mAOD respectively. These rose to 67.03m AOD in BH3a and 73.86 mAOD in BH5 in October 2014 (see Appendix B). If these October levels were used to determine a groundwater level, the building would extend beneath the water table surface. However, given the nature of the London Clay beneath the Site and the conclusions of the modelling, it is believed that the water encountered in these boreholes was localised in pockets of more permeable strata. This statement is supported by the fact that no water was encountered in BH4 (see Appendix B).	

Given the above conditions at the Site, it can be confirmed that the development will not have an impact on groundwater flows or groundwater levels.

[2] No datum was provided for BH3a, it was therefore assumed that is was the same as BH3

6 CONCLUSIONS

Potential impacts of the proposed basement development at the Pears Building have been considered as set out in the scope of works. The following summary conclusions are made.

6.1 Surface water

There is a low overall risk of surface water flooding at the Site

- The proposed development will alter the area of hard standing at the site however this will not have an impact on the volume of run-off generated by the site as the permeable areas are underlain by impermeable surfaces that direct the run-off into the local sewer. It is therefore unlikely there will be any impact to surface water flows in the surrounding area.
- There is unlikely to be any impact to flood risk in the local area.
- Two “lost” rivers run respectively 160 and 250 m to the east and south of the proposed development. Given that the entirety of the Site run-off will be directed into the adjacent sewer, there will therefore be no changes to the watercourse inflows.
- There have been reported incidents of surface water flooding within the vicinity of the site and in nearby streets, believed to be due to past sewer flooding events. However no sewer flooding incidents have been recorded at the site itself.

6.2 Groundwater

There is a low overall risk of groundwater flooding at the Site

- The proposed basement will be constructed to a depth of approximately 3.0 m below ground level (68.5 mAOD) into the underlying London Clay which is considered as unproductive strata.
- Groundwater was recorded during the site investigation in BH3 and BH5 respectively to the north east and south west of the Site. The water level in BH5 rose above Level 00 of the proposed basement in October 2014 (73.86 mAOD); however it is believed that this was localised and associated with fractures and sandy lenses within the Clay matrix.
- No water was recorded in BH4, which supports the statement that a consistent water table is not present beneath the Site.
- The overall risk from the proposed development is considered to be low, based on the absence of a groundwater table beneath the Site.

6.3 Recommendations

Precautions should be taken against sewer flooding at this location; however it is expected that mitigation measures implemented during the development will mean that the discharge to the sewer post development will be less than pre-development, reducing the impact on the sewer system.

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Ordnance survey mapping, 1:10,000. © Crown copyright. All rights reserved. Licence number AL 100015683

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APPENDICES

APPENDIX A.1

Site plans before development

Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN02 & OSGM02 transformation models.
The survey has been correlated to this point and a further one or more OSGB36 points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid.

Building Survey Legend:

SHt 1.00 *HHt 2.12*	Sill Height from FFL, Head Height from FFL,
SL 51.03m *HL 52.82m*	Sill Level from defined datum, Head Level from defined datum,
Susp CHt: 2.00 *Struct CHt: 3.00*	Suspended Ceiling Height from FFL, Structural Ceiling Height from FFL,
Susp Ceil: 30.00m *Struct Ceil: 31.00m*	Suspended Ceiling Level from datum, Structural Ceiling Level from datum,
IFL: 100.00m ***+100.00m***	Internal Floor Level (General), Internal Floor Level (Specific),
Insertion Point	Insertion Point for overlay drawings of other floors or details.

Legend:

Buildings; Wall; Kerb line; Line marking; Drop kerb; Centre line; Overhead Cable; Concrete edge; Tarmac edge; Grass verge; Canopy/Overhang; Verge

Station and Name; Station Level 100.000

Tree / Bush / Sapling; Area of Undergrowth; Woodland

Ridge Level; Eaves Level; Flat Roof Level; Gate

Fence types: Interwoven; Iron Railings; Wire Mesh; Post & Rail; Post & Wire; Chain Link; Wooden Panels; Concrete Panels; Steel Palisade

IC	Inspection chamber	Bol/I	Bollard
PInv	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Bg	Back gully	Vp	Vent pipe
Dp	Down pipe	Gl	Ground light
Pipe	Pipe above ground	Lbox	Letter box
MH	Manhole	Ldr	Ladder
WL	Water level	Sty	Stile
Fl	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trathole
Tl	Traffic light	BH	Borehole
Bus	Bus stop	ELC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	Ctbox	Control box
Er	Earth rod	TT	Tactile
Wm	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Av	Air valve	CVR	Cover
ICU	Unidentified inspection	IC	Inspection chamber
Wo	Wash out	Rwall	Retaining wall
Re	Rodding eye	UTL	Unable to lift
BB	Bellsha beacon	TCL	Tree canopy level
CTV	Cable tv	G	Girth
Mkr	Marker post	MG	Multi girth
Gmkr	Gas marker post	Stmp	Tree Stump
So	Soffit	CL	Cover level
		IL	Invert level

Rev	Date	Description	Drawn	Q. Ref

greenhatch group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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Newcastle: 24 Riverside Studios, Amethyst Road, Newcastle Bus. Park, Newcastle-U-Tyne NE4 7YL, t. (01912) 736391
Poland: ul. Panewnicka 91, 40-761 Katowice, Poland, t. 0048 32 202 2292, www.greenhatch.pl

CLIENT
Buro Four Project Services Ltd

PROJECT
Royal Free Hospital
Pond Street
London

TITLE
Car Park
Level 00

SCALE	DATE
A2@ 1: 200	**30.04.14**
DRAWN: **LR**	QUALITY REF: **C749**

Level datum	*OS GPS*
Grid orientation	*OS GPS*
Job number	*19734*

Drawing No.: ***19734_01_P*** Rev.: ***0***

Comments
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.
All dimensions should be checked on site prior to design and construction.
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN02 & OSGM02 transformation models.
The survey has been correlated to this point and a further one or more OSGB36 points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid.

Building Survey Legend:

SHt 1.00 *HHt 2.12*	Sill Height from FFL, Head Height from FFL,
SL 51.03m *HL 52.82m*	Sill Level from defined datum, Head Level from defined datum,
Susp CHt: 2.00 *Struct CHt: 3.00*	Suspended Ceiling Height from FFL, Structural Ceiling Height from FFL,
Susp Ceil: 30.00m *Struct Ceil: 31.00m*	Suspended Ceiling Level from datum, Structural Ceiling Level from datum,
IFL: 100.00m ***+100.00m***	Internal Floor Level (General), Internal Floor Level (Specific),
Insertion Point	Insertion Point for overlay drawings of other floors or details.

Legend:

Buildings; Wall; Kerb line; Line marking; Drop kerb; Centre line; Overhead Cable; Concrete edge; Tarmac edge; Grass verge; Canopy/Overhang; Verge

Station and Station Level; Tree / Bush / Sapling; Area of Undergrowth; Woodland; Ridge Level; Eaves Level; Flat Roof Level; Gate

Fence types: Interwoven; Iron Railings; Wire Mesh; Post & Rail; Post & Wire; Chain Link; Wooden Panels; Concrete Panels; Steel Palisade

IC	Inspection chamber	Bol	Bollard
PInv	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Bg	Back gully	Vp	Vent pipe
Dp	Down pipe	Gl	Ground light
Pipe	Pipe above ground	Lbox	Letter box
MH	Manhole	Ld	Ladder
WL	Water level	Sty	Stile
Fl	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trathole
Tl	Traffic light	BH	Borehole
Bus	Bus stop	ELC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	Ctbox	Control box
Er	Earth rod	TT	Tactile
Wm	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Av	Air valve	CVR	Cover
ICU	Unidentified inspection	IC	Inspection chamber
Ro	Walsh out	RWall	Retaining wall
Re	Rodding eye	UTL	Unable to lift
BB	Belisha beacon	TCL	Tree canopy level
CTV	Cable tv	G.	Girth
Mkr	Marker post	MG	Multi girth
Gmkr	Gas marker post	Stmp	Tree Stump
So	Soffit	CL	Cover level
		IL	Invert level

Rev	Date	Description	Drawn	Q. Ref.

greenhatch group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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CLIENT
Buro Four Project Services Ltd

PROJECT
Royal Free Hospital
Pond Street
London

TITLE
Car Park
Level 01

SCALE	DATE
A2@ 1: 200	30.04.14
DRAWN	QUALITY REF
LR	C749

Level datum	*OS GPS*
Grid orientation	*OS GPS*
Job number	*19734*

Drawing No. *19734_02_P* *Rev.* *0*

Comments
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Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

Building Survey Legend:

SHt 1.00 HHt 2.12	Sill Height from FFL. Head Height from FFL.
SL 51.03m HL 52.82m	Sill Level from defined datum. Head Level from defined datum.
Susp CHt: 2.00 Struct CHt: 3.00	Suspended Ceiling Height from FFL. Structural Ceiling Height from FFL.
Susp Ceil: 30.00m Struct Ceil: 31.00m	Suspended Ceiling Level from datum. Structural Ceiling Level from datum.
IFL: 100.00m +100.00m	Internal Floor Level (General). Internal Floor Level (Specific).
Insertion Point	Insertion Point for overlay drawings of other floors or details.

Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings *Surveyed Buildings*

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No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid.

Legend:

Buildings, Wall, Kerb line, Line marking, Drop kerb, Centre line, Overhead Cable, Concrete edge, Tarmac edge, Grass verge, Canopy/Overhang, Verge

1 100.000 Station and Name, Station Level

Tree / Bush / Sapling

Area of Undergrowth

Woodland

R: Ridge Level

E: Eaves Level

F: Flat Roof Level

Gate

Fence types:

I\W	Interwoven
I\R	Iron Railings
W\M	Wire Mesh
P\R	Post & Rail
P\W	Post & Wire
C\L	Chain Link
W\P	Wooden Panels
C\P	Concrete Panels
S\P	Steel Palisade

IC	Inspection chamber	Boll	Bollard
PInv	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Bg	Back gully	Vp	Vent pipe
Dp	Down pipe	Grl	Ground light
Pipe	Pipe above ground	Lbox	Letter box
MH	Manhole	Ldr	Ladder
WL	Water level	Sty	Stile
Fl	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trialhole
Tl	Traffic light	BH	Borehole
Bus	Bus stop	ELC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	C'box	Control box
Er	Earth rod	TT	Tactile
Wm	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Av	Air valve	CVR	Cover
ICU	Undentified inspection	IC	Inspection chamber
Wo	Wash out	R/wall	Retaining wall
Re	Rodding eye	UTL	Unable to lift
BB	Belisha beacon	TCL	Tree canopy level
CTV	Cable tv	G:	Girth
Mkr	Marker post	MG	Multi girth
Gmkr	Gas marker post	Stmp	Tree Stump
So	Soffit	CL:	Cover level
		IL:	Invert level

Rev	Date	Description	Drawn	Q. Ref.

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CLIENT

Buro Four Project Services Ltd

PROJECT

Royal Free Hospital Pond Street London

TITLE

Garden Level Plan

SCALE	DATE
A1@ 1: 200	30.04.14
DRAWN	QUALITY REF
SP	C749

Level datum: OS GPS

Grid orientation: OS GPS

Job number: 19734

Drawing No.: 19734_03_P

Rev.:

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

APPENDIX A.2

Proposed site plans

Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
09.04.2014	A	First issue - for information and review	EF
17.04.2014	B	Second Issue - for information and review	EF
22.04.2014	C	Third issue - for information and review	EF
23.04.2014	D	Car parking and stair access added	EF
08.05.2014	E	Subconsultant comments incorporated	EF

Date	Rev.	Description	Approved By

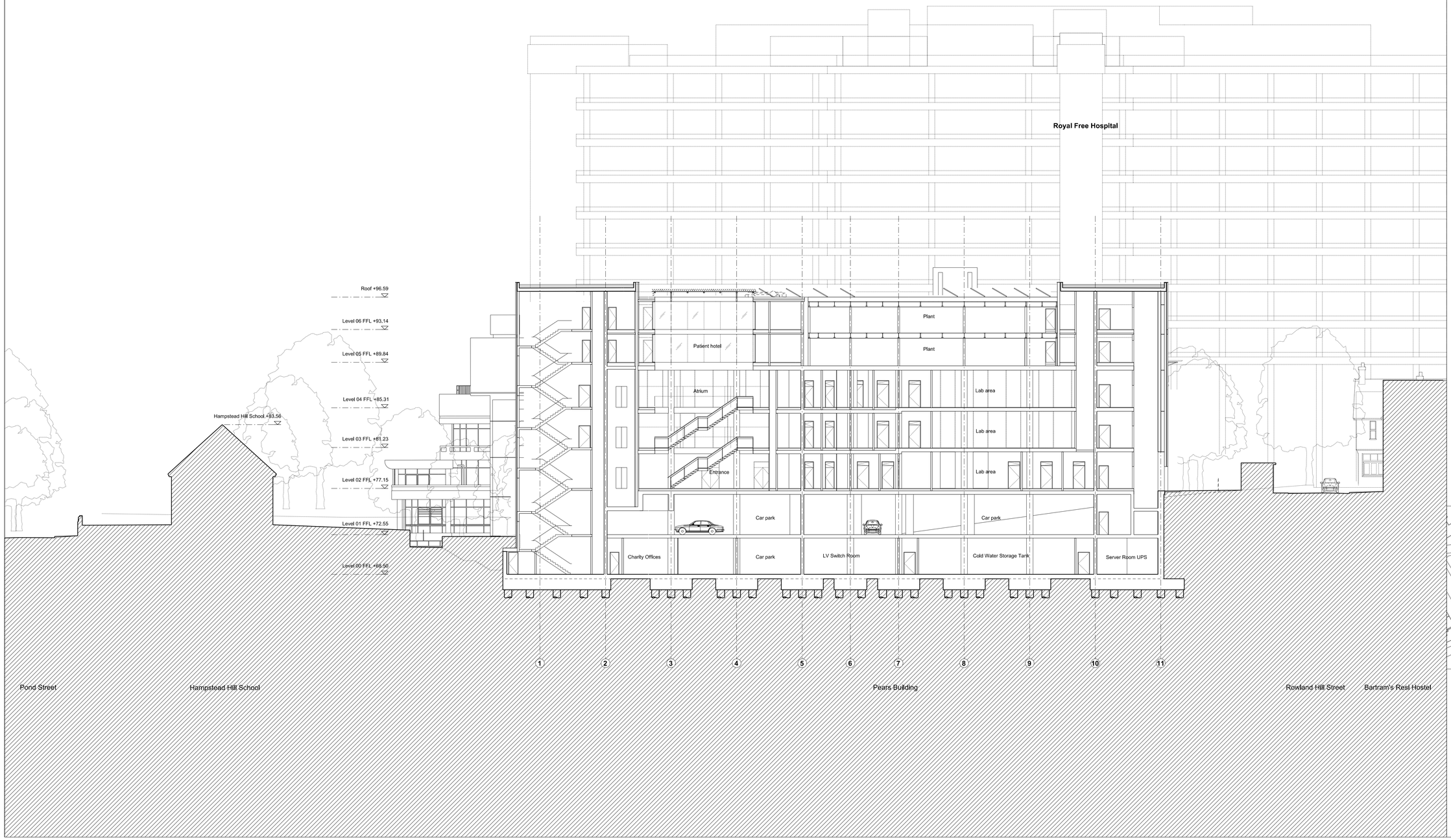
Project: The Pears Foundation Building

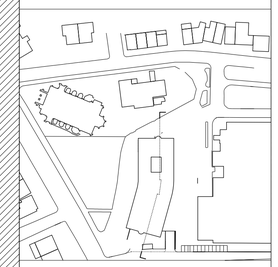
Subject: Level 01 Plan

Architects: Hopkins Architects Partnership LLP
27 Broadley Terrace, London, NW1 6LG
T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/RFMR	SK_068	E

Date 09.04.2014 Scale 1:200 at A1





Section Key Plan

STAGE D

Scale at 1:200

0 1 2 5 10m

Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
16.09.2014	A	First Issue for Stage D design coordination	EF
03.10.2014	B	Stage D Submission	EF

Date	Rev.	Description	Approved By

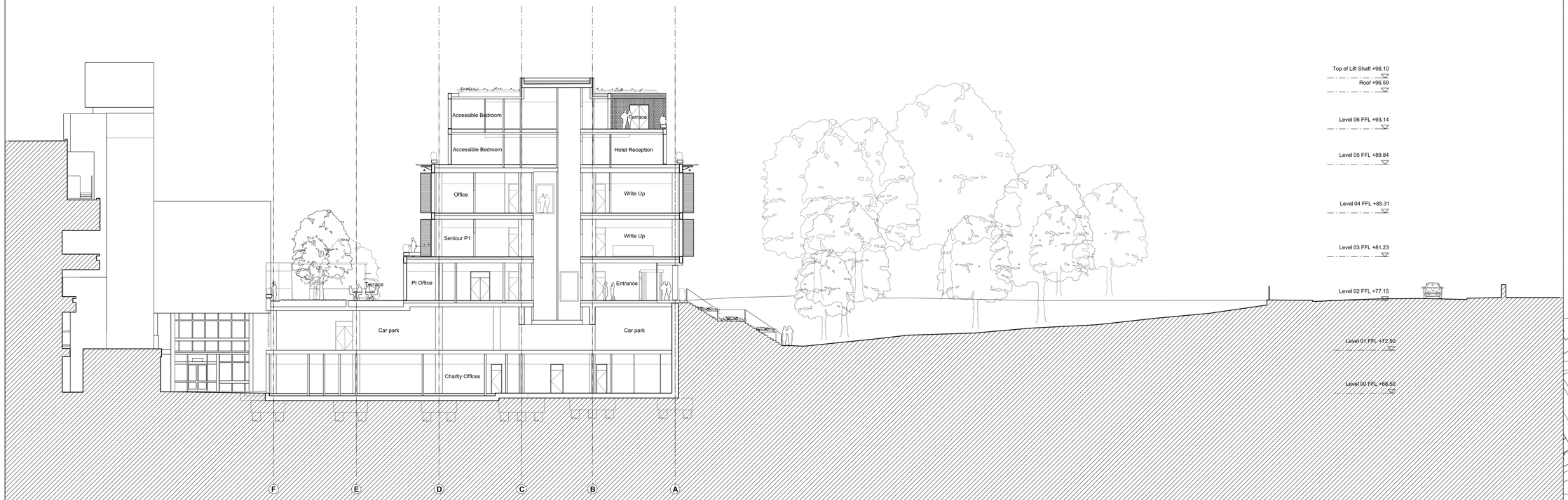
Project Pears Building

Subject Long Section
Section A-A

Architects Hopkins Architects Partnership LLP
27 Broadley Terrace, London, NW1 6LG
T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/RFMR	4100	B

Date 16.09.2014 Scale 1:200 at A1



Section Key Plan

STAGE D

Scale at 1:200

0 1 2 5 10m

Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
16.09.2014	A	First issue for Stage D coordination	EF
03.10.2014	B	Stage D Submission	EF

Date	Rev.	Description	Approved By

Project Pears Building

Subject Cross Section
Section B-B

Architects Hopkins Architects Partnership LLP
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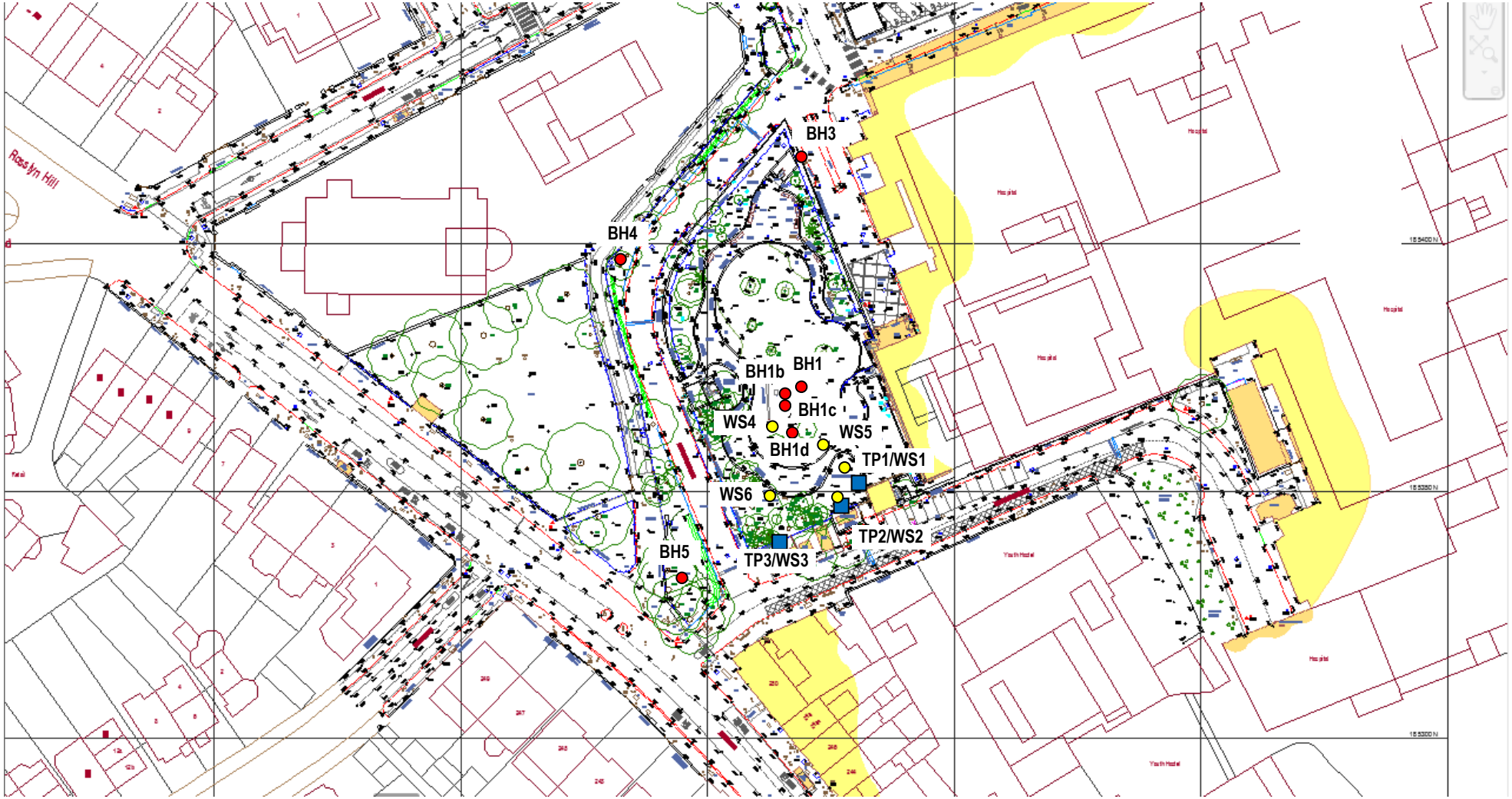
T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/RFMR	4101	B

Date 16.09.2014 Scale 1:200 at A1

APPENDIX B

Site Investigation BH logs



RSK	**Site Layout and Investigation Locations Plan**	**Client:**	Royal Free Charity	**Figure No:**	2
		Site:	RFC – Institute of Immunology and Transplantation Phase 2	**Job No:**	27119
		Scale:	NTS	**Source:**	BDP

BH	Installation type	Strike (mbgl)	Rise (20min) (mbgl)	Monitoring Results (mbgl)			
				16/7/14	25/7/14	3/10/14	14/10/14
BH3 (original investigation)	Not Installed	10.50	10.40	-	-	-	-
BH3A (additional borehole)	38mm standpipe (12.5mbgl)	4.20	-	NA	NA	1.89	1.42
		10.50	10.40				
BH4 (original investigation)	50mm standpipe (3.0mbgl)	Dry	Dry	Dry	Dry	Dry	Dry
BH5 (original investigation)	Vibrating wire piezometer (14mbgl)	11.20	11.10	5.31*	4.83*	No record	No record
	50mm monitoring standpipe (2.0mbgl)			Dry	Dry	Dry	Dry
	19mm monitoring pipe (11.0mbgl)			4.23	4.28	3.89	3.74

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH1

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 25.06.14	75.00	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						MADE GROUND: Low rise vegetation over brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick and concrete.	74.50	(0.50) 0.50	
0.50	D1	D				MADE GROUND: Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete.	74.00	(0.50) 1.00	
1.00	D2	D				MADE GROUND: Brown locally dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional cobbles of brick and concrete			
1.50-1.95	1	SPT	N=4					(1.50)	
2.00	D3	D					72.50	2.50	
2.50-2.95	2	SPT	N=12			MADE GROUND: Brown very clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick and concrete			
3.00	D4	D						(1.00)	
3.50-3.95	3	SPT	N=6				71.50	3.50	
4.00	D5	D				MADE GROUND: Brown locally dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional cobbles of brick and concrete			
4.50-4.95	U1	$U_{(100)}$	17 blows						
5.00	D6	D						(3.50)	
5.50	D7	D							
6.00-6.45	4	SPT	N=7						
6.50	D8	D		1 1					
7.00	D9	D					68.00	7.00	
						MADE GROUND: Concrete			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Borehole cased to 6.80m
2. Groundwater encountered at 7.00m
3. Backfilled upon completion

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH1C

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	27.06.14 End: 30.06.14	---	---	1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						Clay and brick fill		(8.30)	
								8.30	
						Concrete			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH1C

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	27.06.14 End: 30.06.14	---	---	2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						Concrete *(stratum copied from 8.30m from previous sheet)*		(1.70) 10.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH1D

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	30.06.14	---	---	1 of 2
	End: 30.06.14			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
1.20	1	B				Topsoil		(3.00)	
								3.00	
						Clay and brick fill		(7.00)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Borehole cased to 2.60m
2. Groundwater not encountered during drilling

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH1D

Contract Ref:	Start: 30.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 30.06.14	---	---	2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						Clay and brick fill *(stratum copied from 3.00m from previous sheet)*		10.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH3

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	21.06.14	68.45	---	1 of 2
	End: 21.06.14			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						MADE GROUND: Compacted black sand and gravel bound layer	68.40	0.05	
						MADE GROUND: Light grey concrete composed of approximately 30% flint aggregate	68.15	0.30	
0.50	D1	D				MADE GROUND: Clay, gravel and brick fill	67.55	(0.60) 0.90	
1.00	D2	D				Firm brown grey silty CLAY with occasional fine gravel			
1.50-1.95	U1	$U_{(100)}$	20 blows						
2.00	D3	D							
2.50-2.95	1	SPT	N=9					(3.30)	
3.00	D4	D							
3.50-3.95	U2	$U_{(100)}$	21 blows						
4.00	D5	D					64.25	4.20	
4.50-4.95	2	SPT	N=17			Firm to stiff dark grey brown silty CLAY (LONDON CLAY FORMATION)			
5.25	D6	D							
6.00-6.45	U3	$U_{(100)}$	25 blows						
6.50	D7	D						(5.80)	
7.25	D8	D							
7.50-7.95	3	SPT	N=15						
8.25	D9	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Borehole cased to 1.50m
2. Groundwater strike at 10.50m
3. Backfilled upon completion

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH3

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	21.06.14	68.45	---	2 of 2
	End: 21.06.14			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45	U4	$U_{(100)}$	29 blows			Firm to stiff dark grey brown silty CLAY (LONDON CLAY FORMATION) *(stratum copied from 4.20m from previous sheet)*	58.45	10.00	
9.50	D10	D							
10.25	D11	D		1		Stiff dark grey silty CLAY (LONDON CLAY FORMATION)		(1.00)	
10.50-10.95	4	SPT	N=24				57.45	11.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH4

Contract Ref:	Start: 17.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 19.06.14	72.20	---	1 of 3

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
						MADE GROUND: Dark brown clayey sandy GRAVEL. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional cobbles of concrete		(0.70)	
0.50	B1	B					71.50	0.70	
						MADE GROUND: Brown slightly clayey slightly sandy GRAVEL. Gravel is fine to coarse angular to subrounded flint brick and concrete with common cobbles of concrete and whole bricks		(1.20)	
1.00	D1	D							
1.50	B2	B					70.30	1.90	
						Firm to stiff light brown silty CLAY with localised lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION)			
2.00	D2	D							
2.50-3.00	U1	$U_{(100)}$	21 blows						
3.50-3.95	1	SPT	N=14					(3.60)	
4.00	D3	D							
4.50-4.95	U2	$U_{(100)}$	30 blows						
5.00	D4	D							
5.40	D5	D					66.70	5.50	
						. . . claystone band between 5.40m and 5.50m			
5.50-5.95	2	SPT	N=14			Firm to stiff dark grey brown silty CLAY with localised lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION)			
6.25	D6	D							
7.00-7.45	U3	$U_{(100)}$	35 blows						
7.50	D7	D							
								(5.30)	
8.25	D8	D							
8.50-8.95	3	SPT	N=18						

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Borehole cased to 1.50m
2. Water not encountered during drilling
3. 50mm diameter installation to 2.80m

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH4

Contract Ref:	Start: 17.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 19.06.14	72.20	---	2 of 3

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
9.25	D9	D				Firm to stiff dark grey brown silty CLAY with localised lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION) *(stratum copied from 5.50m from previous sheet)*			
10.00-10.45	U4	$U_{(100)}$	39 blows						
10.50	D10	D					61.40	10.80	
11.25	D11	D				Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION)			
11.50-11.95	4	SPT	N=26						
12.25	D12	D							
13.00-13.45	U5	$U_{(100)}$	46 blows						
13.50	D13	D							
14.25	D14	D							
14.50-14.95	5	SPT	N=28						
15.25	D15	D							
16.00-16.45	U6	$U_{(100)}$	46 blows						
16.50	D16	D							
17.25	D17	D							
17.50-17.95	6	SPT	N=30					(14.20)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH4

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 19.06.14	72.20	---	3 of 3

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
						Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION) *(stratum copied from 10.80m from previous sheet)*			
19.00-19.45	U7	$U_{(100)}$	49 blows						
19.50	D18	D							
20.25	D19	D							
20.50-20.95	7	SPT	N=32						
21.25	D20	D							
22.00-22.45	U8	$U_{(100)}$	51 blows						
22.50	D21	D							
23.50-23.95	8	SPT	N=36						
24.25	D22	D							
24.50-24.95	U9	$U_{(100)}$	54 blows						
							47.20	25.00	
25.00	D23	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	**Royal Free Charity**	**BH5**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: **04.07.14**	**77.60**	**---**	**1** of **5**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
						MADE GROUND: Low rise vegetation over brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick and concrete.	77.40	0.20	
						MADE GROUND: Dark brown slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional cobbles of brick and concrete		(1.00)	
1.20	B1	B					76.40	1.20	
1.50-1.95	1	SPT	N=16			Firm to stiff light brown silty CLAY with localised lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION)			
2.50-3.00	U1	U							
3.20	D1	D							
3.50-3.95	2	SPT	N=12						
4.30	D2	D							
4.50-5.00	U2	U						(7.80)	
5.20	D3	D							
5.50-5.95	3	SPT	N=10						
6.50	D4	D							
7.50-8.00	U3	U					68.60	9.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Borehole cased to 12.05m
2. Groundwater strike at 11.20m
3. Vibrating Wire Piezometer installed at 14.00m depth
4. 19mm diameter standpipe installed to 11.00m
5. 50mm diameter standpipe installed to 2.00m

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	**Dando 1000 (cut down)**	**GEH**	**JPearson**	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH5

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 04.07.14	77.60	---	2 of 5

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45	4	SPT	N=28			Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION)			
9.80	D5	D							
10.50-11.00	U4	U		1					
11.50	D6	D							
12.00-12.45	5	SPT	N=31						
14.00-14.45	U5	$U_{(100)}$	31 blows						
14.50	D8	D							
15.25	D9	D							
15.50-15.95	6	SPT	N=28						
16.25	D10	D							
17.00-17.45	U6	$U_{(100)}$	34 blows						
17.50	D11	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH5

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 04.07.14	77.60	---	3 of 5

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
18.25	D12	D				Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION) *(stratum copied from 9.00m from previous sheet)*			
18.50-18.95	7	SPT	N=29						
19.25	D13	D							
20.00-20.45	U7	$U_{(100)}$	37 blows						
20.50	D14	D							
21.25	D15	D							
21.50-21.95	8	SPT	N=34						
22.25	D16	D							
23.00-23.45	U8	$U_{(100)}$	41 blows						
23.50	D17	D							
24.00	D18	D							
24.25	D19	D						(31.00)	
24.50-24.95	9	SPT	N=37						
25.25	D20	D							
26.00-26.45	U9	$U_{(100)}$	46 blows						
26.50	D21	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH5

Contract Ref:	Start: 01.07.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 04.07.14	77.60	---	4 of 5

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
27.25	D22	D				Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION) *(stratum copied from 9.00m from previous sheet)*			
27.50-27.95	10	SPT	N=39						
28.25	D23	D							
29.00-29.45	U10	$U_{(100)}$	50 blows						
29.50	D24	D							
30.25	D25	D							
30.50-30.95	11	SPT	N=40						
31.25	D26	D							
32.00-32.45	U11	$U_{(100)}$	50 blows						
32.50	D27	D							
33.25	D28	D							
33.50-33.95	12	SPT	N=41						
34.25	D29	D							
35.00-35.45	U12	$U_{(100)}$	54 blows						
35.50	D30	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH5

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 04.07.14	77.60	---	5 of 5

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
36.25	D31	D				Stiff to very stiff dark grey brown silty CLAY with rare lenses of fine sand and selenite crystals throughout. (LONDON CLAY FORMATION) *(stratum copied from 9.00m from previous sheet)*			
36.50-36.95	13	SPT	N=47						
37.25	D32	D							
38.00-38.45	U13	$U_{(100)}$	62 blows						
38.50	D33	D							
39.25	D34	D							
39.50-39.80	14	SPT	N=90*						
						. . . claystone band between 39.80m and 40.00m	37.60	40.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Dando 1000 (cut down)	GEH	JPearson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH3A

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	12.09.14 End: 13.09.14	---	---	1 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						MADE GROUND: Weak black tar bound MACADAM.		0.12	
						MADE GROUND: Weak light brownish grey (unreinforced) CONCRETE. 30-40% aggregate of angular to well rounded fine to medium flint.		0.45	
0.50	B1	B				MADE GROUND: Grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of concrete and flint.		0.90	
1.00-1.45	U1	U	19 blows			Firm to stiff brown locally fissured silty CLAY. Frequent relict rootlets with local blue grey gleying. Occasional clusters of fine to coarse sand sized selenite crystals. Fissures are extremely closely to closely spaced. (WEATHERED LONDON CLAY FORMATION)			
2.00-2.45	1	SPT	N=6						
2.50	D1	D							
3.00-3.45	U2	U	23 blows						
4.00-4.45	2	SPT	N=11	≈				(6.10)	
4.50	D2	D							
5.00-5.45	U3	U	25 blows						
6.00	D3	D							
6.50-6.95	3	SPT	N=12			. . . at 6.80m becoming brownish grey		7.00	
						Firm to stiff indistinctly fissured dark greyish brown silty CLAY. Fissures are randomly orientated. (LONDON CLAY FORMATION)			
7.50	D4	D							
8.00-8.45	U4	U	34 blows					(4.00)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
			- -		4.20 10.50

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Cable tool rig	GEH	TJohnson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH3A

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	12.09.14	---	---	2 of 3
	End: 13.09.14			

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
9.25	D5	D				Firm to stiff indistinctly fissured dark greyish brown silty CLAY. Fissures are randomly orientated. (LONDON CLAY FORMATION) *(stratum copied from 7.00m from previous sheet)*			
9.50-9.95	4	SPT	N=19						
						. . . at 9.80 to 9.90m locally sandy			
10.25	D6	D				. . . at 10.50m CLAYSTONE		11.00	
11.00-11.45	U5	U	43 blows			Stiff to very stiff dark grey silty CLAY. Occasional lenses of fine slightly micaceous silty sand.			
12.25	D7	D							
12.50-12.95	5	SPT	N=23						
15.50-15.95	6	SPT	N=25					(14.00)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Cable tool rig	GEH	TJohnson	

BOREHOLE LOG

Contract:	Client:	Borehole:
RFT Institute of Immunology and Transplantation	Royal Free Charity	BH3A

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 13.09.14	---	---	3 of 3

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
18.50-18.95	7	SPT	N=29			Stiff to very stiff dark grey silty CLAY. Occasional lenses of fine slightly micaceous silty sand. *(stratum copied from 11.00m from previous sheet)*			
21.50-21.95	8	SPT	N=34						
24.50-24.95	9	SPT	N=43						
								25.00	
						Terminated at 25.00m.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable percussion	Cable tool rig	GEH	TJohnson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS1

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	Tub+J+VL			MADE GROUND: Soft brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and whole bricks	(0.85) 0.85	
	0.50	2	ES	Tub+J+VL					
	0.90	3	ES	Tub+J+VL			MADE GROUND: Dark brown grey slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with common cobble clast of concrete and brick	(0.45) 1.30	
							MADE GROUND: Light orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and brick	(0.70) 2.00	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS2

Contract Ref:	Start: 18.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	Tub+J+VL			MADE GROUND: Dark brown grey slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with common cobble clast of concrete and brick		
	0.50	2	ES	Tub+J+VL				(1.20)	
								1.20	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS3

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	Tub+J+VL			MADE GROUND: Compacted black sand and gravel bound layer	0.05	
	0.50	2	ES	Tub+J+VL			MADE GROUND: Light brown slightly silty gravelly SAND with common rootlets at the top of the unit. Gravel is fine to coarse angular to subrounded brick concrete and flint with occasional whole brick and cobble clasts of concrete.	(0.95)	
	1.10	3	ES	Tub+J+VL				1.00	
							MADE GROUND: Firm light brown mottled grey silty CLAY with occasional pocket of gravelly sand. Gravel is fine to coarse angular to subrounded brick concrete and flint	(0.60)	
								1.60	
							Firm to stiff light brown mottled grey silty CLAY with occasional pocket of slightly gravelly sand.	(2.40)	
								4.00	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS4

Contract Ref:	Start: 18.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	Tub+J+VL			MADE GROUND: Low rise vegetation over brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick and concrete.	(0.60)	
	0.40	2	ES	Tub+J+VL				0.60	
	0.80	3	ES	Tub+J+VL			MADE GROUND: Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional fragments of rubber and metal	(1.10)	
	1.60	4	ES	Tub+J+VL				1.70	
							MADE GROUND: Brown locally clayey sandy GRAVEL. Gravel is fine to coarse angular to subrounded flint brick and concrete.	1.80	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS5

Contract Ref:	Start: 18.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	Tub+J+VL			MADE GROUND: Low rise vegetation over brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick and concrete.	(0.80)	
	0.50	2	ES	Tub+J+VL				0.80	
	0.90	3	ES	Tub+J+VL			MADE GROUND: Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick and concrete.	(0.90)	
	1.70	4	ES	Tub+J+VL				1.70	
							MADE GROUND: Brown locally clayey sandy GRAVEL. Gravel is fine to coarse angular to subrounded flint brick and concrete with occasional fragment of metal.	1.80	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
RFT Institute of Immunology and Transplantation	Royal Free Charity	WS6

Contract Ref:	Start: 18.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 18.06.14	---	---	1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10	1	ES	Tub+J+VL			MADE GROUND: Brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and brick	(0.70)	
	0.40	2	ES	Tub+J+VL				0.70	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Groundwater was not encountered
2. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	Archway Competitor	???	JPearson	

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
RFT Institute of Immunology and Transplantation	Royal Free Charity	TP1

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	19.06.14	---	---	1 of 1
	End: 19.06.14			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	Tub+J+VL			MADE GROUND: Soft dark brown sandy slightly gravelly CLAY with fragments of wood and rootlets throughout. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and brick	(0.30) 0.30	
0.40	2	ES	Tub+J+VL			MADE GROUND: Soft brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and whole bricks	(0.30) 0.60	
1.00	3	ES	Tub+J+VL			MADE GROUND: Dark brown clayey gravelly SAND with occasional fragment of metal plastic and wire. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with common cobble clast of concrete and whole bricks	(0.80) 1.40	
1.50	4	ES	Tub+J+VL			MADE GROUND: Light orange brown silty slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and brick	(0.75) 2.15	

General Remarks

1. Pit remained generally stable although some minor pit instability was encountered
2. Groundwater was not encountered
3. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Hand and machine dug	Mini tracked excavator	JPearson	

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
RFT Institute of Immunology and Transplantation	Royal Free Charity	TP2

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
27119	16.06.14	---	---	1 of 1
	End: 16.06.14			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	Tub+J+VL			MADE GROUND: Soft dark brown sandy slightly gravelly CLAY with fragments of wood and rootlets throughout. Gravel is fine to coarse angular to subrounded flint brick concrete and bituminous material with occasional cobble clast of concrete and brick	(0.60)	
0.40	2	ES	Tub+J+VL				0.60	

General Remarks

1. Pit remained stable throughout
2. Groundwater was not encountered
3. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	Hand tools	JPearson	

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
RFT Institute of Immunology and Transplantation	Royal Free Charity	TP3

Contract Ref:	Start: 19.06.14	Ground Level:	Co-ordinates:	Sheet:
27119	End: 19.06.14	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Compacted black sand and gravel bound layer	0.05	
0.20	1	ES	Tub+J+VL			MADE GROUND: Light brown slightly silty gravelly SAND with common rootlets. Gravel is fine to coarse angular to subrounded brick concrete and flint with occasional whole brick and cobble clasts of concrete.	(1.20)	
0.50	2	ES	Tub+J+VL					
1.00	3	ES	Tub+J+VL				1.25	

General Remarks

1. Pit remained stable throughout
2. Groundwater was not encountered
3. Backfilled and compacted using arisings

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	Hand tools	JPearson	

APPENDIX C

Thames Water Sewer Flooding Enquiry

Sewer Flooding

History Enquiry

Thames Water Property Searches

Vastern Road

Search address supplied

Royal Free Hampstead Nhs Trust
Royal Free Hospital
Pond Street
London
NW3 2QG

Your reference 62361R1

Our reference SFH/SFH Standard/2014_2783523

Received date **5 June 2014**

Search date **5 June 2014**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

Search address supplied: Royal Free Hampstead Nhs Trust,Royal Free Hospital,Pond Street,London,NW3 2QG

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

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E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0845 9200 800 or website www.thameswater.co.uk

Thames Water Utilities Ltd

Property Searches
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I www.thameswater-propertysearches.co.uk

APPENDIX D

Permeability plans - existing and proposed

Area Sq. m	Type of space
1013	Green - Permeable
183	Hard surface Impermeable
1796	Existing Building
1667	Road

Hopkins Architects Partnership LLP
Title: Existing Site Plan

RFC_IIT2_RFMR_SK_096_Existing Site Plan

14/06/10 Scale 1:200@A1

Rev C

NOTES

KEY PLAN

Site Boundary

1. Existing footpath resurfaced in natural yorkstone setts
2. Existing trees retained with new understorey planting
3. Public Woodland Garden
4. Lift access to upper floor level
5. Terrace Colonade, natural yorkstone flags
6. Planted Terraces with 500mm high seating wall
7. Feature steps
8. Planting onto the Colonade level
9. Public footpath resurfaced in natural yorkstone setts
10. Hampstead Green meadow
11. Green Wall to service yard
12. Existing London Plane trees retained with understorey of proposed planting, embraced by new retaining wall.
13. Timber deck
14. Grass lawn
15. Steps and bleachers linking both gardens and providing informal seating.
16. Grass lawn
17. Bench seating against a planted wall edge
18. Raised planters with copses of Silver Birch and meadowgrass
19. Threshold of Rowland Hill Street and Rosslyn Hill resurfaced with reclaimed granite setts

Area of permeable landscape to natural ground

Area of impermeable Landscape via outlets to sewer

REVISION/DESCRIPTION	DRWN	CHKD	DATE
	KM	MS	22.05.14

N

0 2 5 10

BDP.

16 Brewhouse Yard
Clerkenwell
London, EC1V 4LJ
United Kingdom

T +44 (0)20 7812 8000
F +44 (0)20 7812 8399

www.bdp.com

PROJECT TITLE
The Pears Foundation Building

PROJECT NUMBER
P2005878

DRAWING TITLE
Landscape Masterplan
Permeable & Impermeable Zones

SCALE
1:200@A1

DATE
22.05.2014

DRAWING NO
(90)LP002

REVISION
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