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Kenley Campus, Victor Beamish Way

SuDS Strategy

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		Remarks:	For Information				
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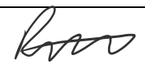
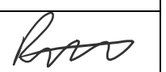
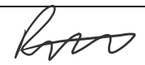
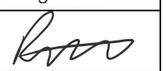
Date:	16/06/2023	Signature:		Signature:		Signature:	
Revision:	P2	Prepared by:	*Anthony Horswell MEng*	Checked by:	Paul Chance *CEng MICE*	Approved by:	Paul Chance *CEng MICE*
Date:	27/06/2023	Signature:		Signature:		Signature:	

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Appendices

One

Terms of Reference

1.1 Introduction

Elliott Wood Partnership Ltd has been commissioned to produce a SuDS statement report for the proposed development for an 87 home development at Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX.

The scope of works for this SuDS statement is to review data in relation to the existing drainage regime, review ground conditions for the suitability of SuDS and consider the use of SuDS for the disposal of surface water run-off.

This report has been carried out in accordance with the National Planning Policy Framework (NPPF), Tandridge Strategic Flood Risk Assessment, Surrey Preliminary Flood Risk Assessment (PFRA), and Surrey Local Flood Risk Management Strategy.

Two

Existing Site

2.1 Site Location

The site is located to the north of Caterham in Surrey. Directly adjacent to the north of the site is Kenley Aerodrome and to the east lies undeveloped land forest land. The site is bounded by residential buildings to the south and west. Located within the middle of the site boundary is a school, which is not included as part of this planning application.

The approximate site area of the site is 4.4ha with an OS Grid Reference (approximately at the centre of the site) of 533166, 157341. Refer to Figure 1 for a site location plan.

Figure 1: Site Location (Development site boundary shown in red)

2.2 Existing Development

Historically the site was used by the Royal Air Force (RAF) with various buildings and hard standing. Most of the buildings have since been demolished, althought much of the northern part of the site is still underlain by concrete surfacing.

Historical imagery from 2003 (found in figure 2) shows the extents of hard surfacing prior to overgrowth which is seen in more recent imagery. The southern part of the site is currently used as a sports field.

Figure 2: Historical mapping of the site.

2.3 Existing Site Topography

A Topographical Survey has been undertaken by 360Geomatics in July 2021. The survey indicates ground levels fall to the northeast of the site, with levels varying from approximately 174mAOD falling to 171.5mAOD. **Figure 3** below contains an extract of the existing topographical survey with a copy located in Appendix A.

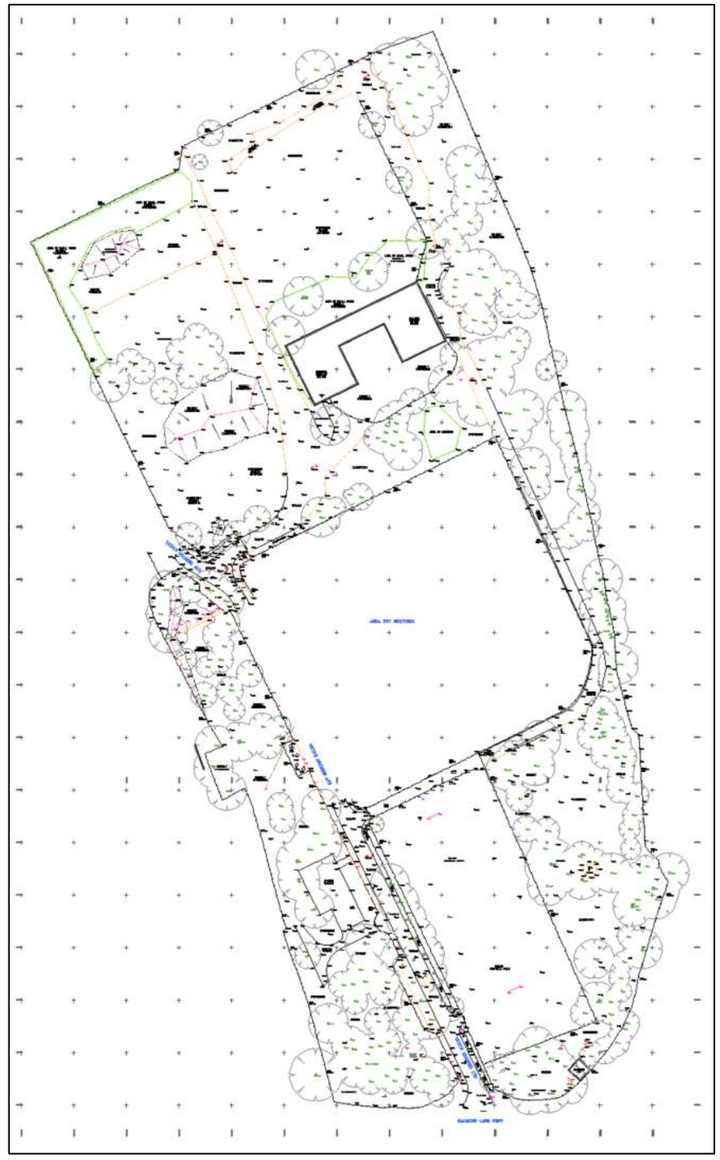

Figure 3: Topographical Survey

2.4 Underlying Geology

British Geological Society (BGS) records have been reviewed to understand the likely ground conditions and soil profile on site. The BGS map data indicates that the underlying bedrock is made up of Lewes Nodular Chalk Formation. Superficial deposits of Clay-with-flints Formation, which consist primarily of clay, silt, sand and gravel, are also expected.

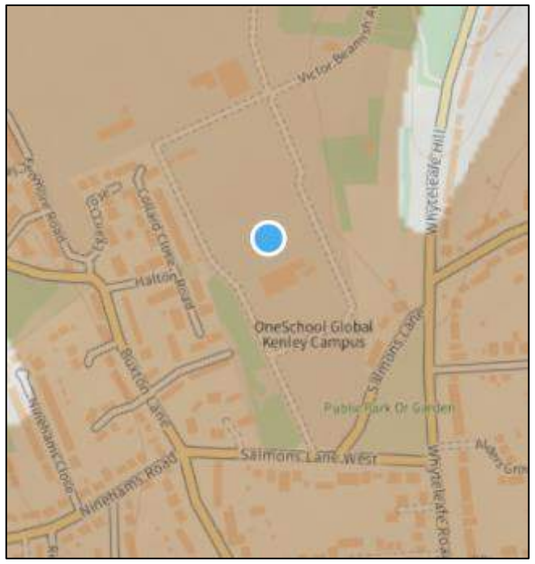

Figure 4: BGS Geology Data (Superficial)

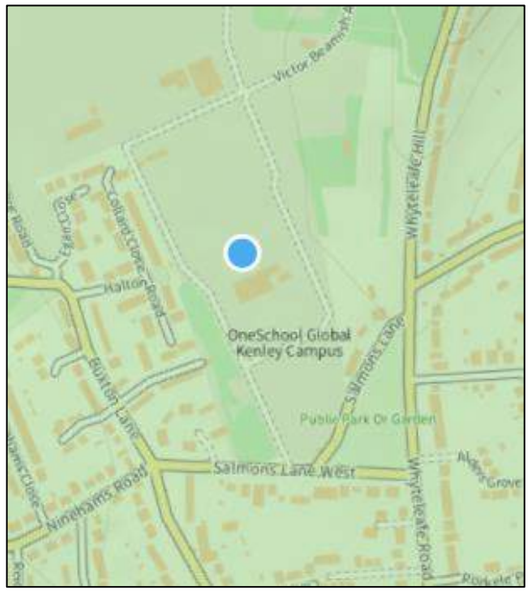

Figure 5: BGS Geology Data (Bedrock)

A site survey was conducted by CGL Ltd. The survey confirms the expected ground conditions and are recorded as clay-with-flints formation over White Chalk Subgroup.

Borehole soakage testing was undertaken by Ground & Water at two locations on the site. Chalk was identified at a depth between 8.2m to 10.2m. The infiltration testing results are shown below in Table 1.

Trial Hole	Test Number	Depth (m bgl)	Infiltration Rate (m/sec)
BH1	1	10.60	$4.83x10^{-3}$
	2		$1.29 x10^{-3}$
	3		$1.22 x10^{-3}$
BH2	1	11.50	$2.57 x10^{-3}$
	2		$1.35 x10^{-3}$
	3		$9.46 x10^{-4}$

It is advised that soakaways are located at least 10m away from foundations due to the risk of chalk dissolution. The results from this site investigation are attached as Appendix B.

Three

Proposed Development

The proposed development will consist of the construction of 87 homes, with associated gardens, roads and driveways and landscaping areas.

An extract of the proposed development can be seen below as **Figure 6** with more detailed plans in **Appendix C**.

Figure 6: Proposed Site Layout

Four

Existing Drainage

4.1 Thames Water Sewers

According to Thames Water sewer mapping, there is no infrastructure located within the site boundary. Additionally, there are no Thames Water surface water sewers indicated to exist in the local area.

Beyond the site boundary there are foul sewers within the highways to the south. A 225mm diameter sewer flows along Salmons Lane West to the east and then flows along Salmons Lane. A further sewer, of unknown diameter, is located within Salmons Lane West but flows to the west.

There are 150mm diameter sewers within the development to the west of the site, which serve the properties in this area. This development drains south down Buxton Lane and connects to the sewer in Salmons Lane West, and continues flowing along Ninehams Road.

An extract of the Thames Water records is presented in **Figure 8** and in full in **Appendix D**.

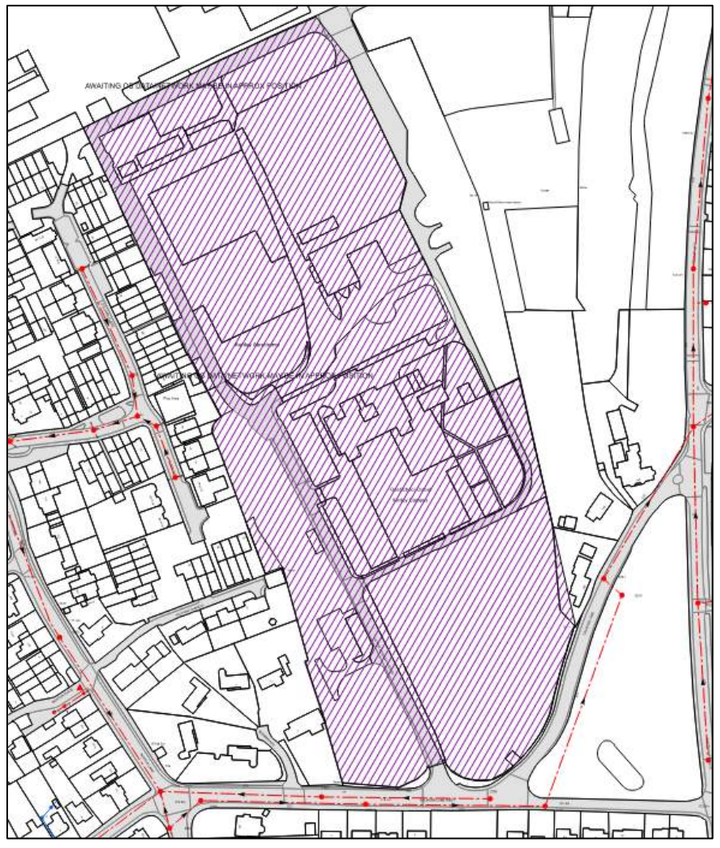

Figure 7: Thames Water Sewer Record Extract (Note: purple hatch shows area requiring further OS mapping)

4.2 Existing Surface Water Discharge Rate

Table 2 indicates, the existing drained area summary for the development.

Table 2: Existing Area Breakdown

	m^2	Hectares (ha)	% of site
Existing Hardstanding	19820	1.98	45
Existing Soft Landscaping	24180	2.42	55
Total	44000	4.4	100

As no formal surface water drain appears to exist on the site, we have not calculated an existing brownfield runoff rate.

The greenfield run-off rates have been calculated in line with the SuDS Manual C753 and the non-statutory standards for SuDS using the IH124 approach. The results are shown in table 4 below and are based on a site area of 4.4ha.

The existing greenfield calculations can be found below in **Table 3** and in **Appendix E**.

Table 3: Greenfield runoff calculations

Return Period	Rate (l/s)
Qbar	0.84
1 in 1-year event	0.71
1 in 30-year event	1.93
1 in 100-year event	2.68

Five

Proposed Drainage Strategy

5.1 Pre-Application Advice

Pre-application advice was sought from Thames Water for foul disposal, discharge of surface water to the Thames Water network was not requested since discharge is proposed to be to ground. Thames Water have confirmed that they have sufficient capacity and their response is attached as Appendix F.

5.2 Proposed Discharge Rates and Drained Areas

The approximate drained area breakdown of the proposed development is summarised as follows:

Table 4: Approximate Proposed Area Breakdown

	m^2	Hectares (ha)	% of site
Proposed Hardstanding	11270	1.13	26
Proposed Buildings	8930	0.89	20
Proposed Soft Landscaping	23800	2.38	54
Total	44000	4.4	100

It can be seen from Table 4 that proposed development only sees a slight decrease in soft landscaping, i.e., a reduction of 380m^2 from 24180m^2 to 23800m^2.

Appendix G includes the existing and proposed impermeable areas for the development.

5.3 Sustainable Drainage Hierarchy

Sustainable Drainage (SuDS) has been considered for the management of surface water for this development in line with the following:

1. Rainwater harvesting (including a combination of green and blue roofs)
2. Infiltration techniques and green roofs
3. Rainwater attenuation in open water features for gradual release
4. Rainwater discharge direct to a watercourse (unless not appropriate)
5. Rainwater attenuation above ground (including blue roofs)
6. Rainwater attenuation below ground
7. Rainwater discharge to a surface water sewer or drain.
8. Rainwater discharge to a combined sewer.

In line with this hierarchy, **Table 5** details SuDS that have been considered.

SUDS Technique	Y/N	Comment
Green/Blue Roofs	N	Refer to section 5.3.1
Rainwater reuse	Y	Refer to section 5.3.2
Permeable surfaces	Y	Refer to section 5.3.3
Infiltration Devices	Y	Refer to section 5.3.4
Basin and ponds	N	Refer to section 5.3.5
Filter strips and swales	Y	Refer to section 5.3.6
Tanked systems	Y	Refer to section 5.3.7

Table 5: SuDS Evaluation

5.3.1 Green / Blue Roofs

Green roofs are not currently proposed for the development since the houses will have pitched roofs. However, other SuDS features are being proposed to manage surface water and pollution control.

5.3.2 Rainwater Harvesting

Rainwater harvesting will be provided in the form of rainwater butts for use as irrigation for all the houses.

More substantial rainwater harvesting systems will not be provided as it makes more sense to use less water (by using water efficient appliances) than it does to install a rainwater harvesting system which have complex filters which can have high embodied energy and perform poorly in terms of their Life Cycle Analysis.

5.3.3 Permeable Surfaces

Permeable surfaces will be used for the proposed residential roads and parking bays throughout the site. The surfaces will be designed to infiltrate to ground where possible with overflow connection into the deeper sitewide drainage system.

Permeable surfaces provide high mitigation indices and provide water quantity, water quality and amenity benefits.

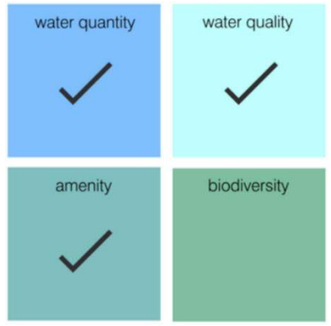

Figure 8: Permeable Paving Performance

5.3.4 Infiltration Devices

As discussed in Section 2.4 the ground is suitable for infiltration and chalk was identified at a depth between 8.2m to 10.2m. It is therefore proposed to discharge to ground via deep bore soakaways. The conservative rates for the site were $9.46x10^{-4}$m/s.

Surface water run-off collected from the proposed hardstanding and buildings and will be attenuated via the use of both above and below ground attenuation features. The surface water will be directed to a borehole soakaway located to the northeast of the site.

Hydraulic modelling was undertaken on Simulation (MicroDrainage) for the design and has been designed for all events up to the 1 in 100 + 40% climate change storm event using an infiltration rate of $9.46x10^{-4}$. These calculations are attached as Appendix G.

Infiltration devices provide water quality and water quantity improvements.

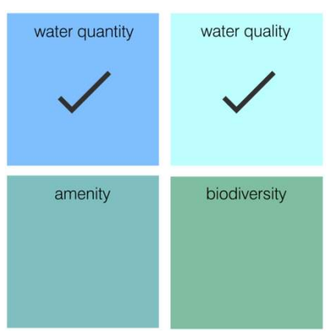

Figure 9: Infiltration Devices Performance

5.3.5 Basins and Ponds

Due to the spatial configuration on site the use of retention/detention basins and/or ponds is not possible and therefore has been discounted from the strategy.

5.3.6 Filter Strips and Swales

The use of filter strips and swales will be used through the development. Filter Strips will be proposed along Victor Beamish Avenue to manage the surface water run-off from the road.

A swale is proposed along the south side of the existing school. This area was identified as an existing surface water flow path so to ensure that there is no flooding in this area a swale will be used to manage the surface water in this area.

Filter strips and swales provide water quality, water quantity, amenity and biodiversity improvements.

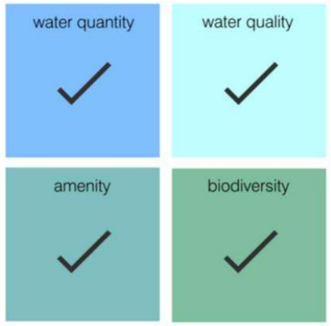

Figure 10: Filter Strips and Swales Performance

5.3.7 Tanked Systems

Even with the SuDS proposed, below ground attenuation tanks are required to ensure sufficient attenuation volume is achieved.

The tanks have been sized to manage surface water for all storm events up to and including the 1 in 100 + 40% climate change. All surface water will be routed towards these below ground attenuation tanks before discharge to ground via the deep bore soakways.

Tank systems provide water quantity improvements.

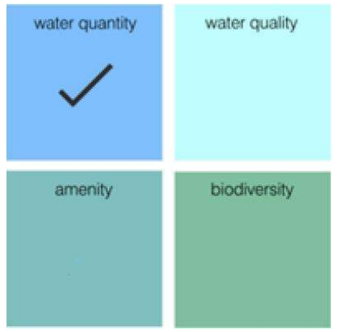

Figure 11: Tank Systems Performance

Refer to Appendix H for drainage calculations and Appendix I for the proposed drainage drawings, and Appendix J for a copy of the Surrey Surface Water Drainage Summary Pro-forma.

5.4 Foul Water Drainage

The proposed foul water strategy will consist of a series of pipes and manholes, before discharging to the existing Thames Water foul sewer located beneath Salmons Lane West to the south. A pre-planning capacity check was submitted to Thames Water and they have confirmed sufficient capacity.

A S106 application will need to be made by the developer post planning approval.

Six

Pollution Management

6.1 Pollution Hazard Indices

As part of the CIRIA SuDS Manual C753, Section 26 provides guidance regarding methods for managing pollution risks from surface water run-off.

The development has been assessed in line with Table 26.2 of the SuDS Manual for the pollution hazard indices for different land use classifications. Refer to Figure 13.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 12: Table 26.2 showing Pollution hazard indices

Table 26.3 of C753 reproduced below sets out the mitigation indices provided by SuDS features for discharge to surface water.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Figure 13: SuDS Mitigation Methods

The roof is considered to have a “very low” pollution hazard, generating 0.2 total suspended solids, 0.2 metals and 0.05 hydrocarbons.

The driveways and access roads is likely to have a “low” pollution hazard, generating 0.5 total suspended solids, 0.4 metals and 0.4 hydrocarbons. These will be routed towards swales, filter strips and/or permeable paving to ensure suitable mitigation before discharge via the deep bore soakaway.

The drainage design provides mitigation indices which exceed the pollution hazard indices therefore are therefore consider appropriate.

Seven

Protection of drainage during construction

7.1 General

Appropriate measures will be taken to protect the surface water drainage system during construction and the surface water runoff. These measures will be developed by the contractor, but we would expect to include:

- All foul water and surface water drains downstream of the site works as well as the relevant water authority will be identified;
- Underground services will be investigated and identified to avoid damage to them;
- All containers and tanks will have clear notices of their contents and how to handle them;
- Stockpiled material will be protected to reduce rainwater infiltration.
- In the event of a spillage causing pollution to water (i.e., discharged into drains) or land, the source will be contained, and the Environment Agency will be notified.
- All works should be in constructed in accordance with Best Practice, British Standards and CIRIA documents C753 and C768.

Eight

Maintenance Requirements

8.1 General

Regularly inspecting the surface water drainage network for blockages and clearing unwanted debris/silt from the system should improve the performance of the surface water network and decrease the need for future repairs.

The level and frequency of maintenance required on site to maintain the system is dependant on the type of facility. The type of maintenance will fall into one of three categories “regular maintenance”, “occasional” and “remedial maintenance”.

The drainage and SuDS elements used should after an initial inspection following completion be inspected monthly for the first 12 months and after significant storms, thereafter the following maintenance regime should be implemented and adjusted if the 12-month monitoring process has identified any issues.

Following completion of the development a management company will be set up/appointed to maintain all drainage services on site. It will be their responsibility to maintain the drainage network and SuDS elements.

The following sections tabulates the requirements for each SuDS element.

8.2 Soakaway Maintenance

Table 7: Soakway Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for sediment debris in pre-treatment components and floor of inspection tube / chamber and inside soakaway	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference	As required, based on inspections
Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually

8.3 Permeable Paving

Table 8: Permeable Paving Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove debris and leaves etc.	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds	As required- once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting etc	As required
	Rehabilitation of surface and upper substructure	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three-monthly, 48 hours after large storms in the first six months
	Inspect silt accumulation rates and establish appropriate frequencies for rehabilitation	Annually
	Monitor inspection chambers	Annually

8.4 Filter Strips

Table 9: Filter Strip Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect filter strip surface to identify evidence of evosion, poor vegetation growth, compaction, ponding, sedimentation and contamination	Monthly (at start, then as required)
	Check flow spreader and filter strip surface for even gradients	Monthly (at start, then as required)
	Inspect gravel flow spreader and filter strip surface for even gradients	Monthly (at start, then as required)
	Inspect silt accumulation rates and establish appropriate removal frequencies	Monthly (at start, then as required)
Occasional maintenance	Reseed areas of poor vegetation growth; alter plant types to better suit conditions, if required	
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow separator or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

8.5 Swales

Table 10: Swales Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal	Monthly (or as required)
	Grass cutting	Monthly (during growing season) or as required
	Manage other vegetation and remove nuisance plants	Month (at start) then as required
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets and outlets	Annually (or as required)
Remedial actions	Repair erosion or other damage by re-seeding or re-turfing	As required
	Repair / rehabilitation of inlets and outlets	As required
	Re-level uneven surfaces and reinstate design levels.	As required

	Replacement of dead or damaged plants	As required
Monitoring	Inspect inlets, outlets for blockages and inspected banksides for damage	Monthly or after large storms

8.6 Tanked Systems

Table 11: Tanked Systems Maintenance

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

8.7 Gullies/Linear Channels

Inspection and removal of debris from silt trap every three months, preferably after leaf fall in the autumn. (Timeframe can be adjusted to suit actual site conditions).

Table 12: Gullies/Linear Channel Maintenance

	Required Action	Typical Frequency
Regular maintenance	Litter and debris removal	Monthly or as required
	Check and remove large vegetation growth near channel runs	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving	3-monthly, 48 hours after large storms
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required
Monitoring	Inspect/check all inlets, outlets, to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of gullies for sediment build-up and remove if necessary	Every year or as required

8.8 Drainage pipes, manholes & silt traps

Inspect manholes & silt traps for build-up of silt and general debris (minimum of 6 monthly or to suit site requirements). If silt/debris is building up then clean with jetting lorry / gully sucker and inspect pipe – repeat cleaning if required.

Table 13: Drainage pipes, manholes & silt traps maintenance

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
	Remove sediment from structures.	Annually or as required
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required
Monitoring	Inspect/check all inlets, outlets, to ensure that they are in good condition and operating as designed.	Annually.
	Survey inside of pipe manholes for sediment build-up and remove if necessary	Every 5 years or as required.

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Appendices

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A Topographical Survey

Coordinate Table

Station	Eastings	Northings	Level	Description
STN A1	533102.364	157363.261	172.83	Nail
STN A2	533116.367	157448.836	172.12	Nail
STN A3	533171.994	157512.032	171.90	Nail
STN A4	533197.017	157447.111	171.73	Nail
STN A1A	533213.103	157394.859	172.04	Nail
STN A10	533121.109	157323.651	173.35	Nail
STN A11	533173.817	157215.213	172.96	Nail

Note

This survey data has been prepared for the client detailed below to an agreed specification. Unless otherwise agreed in writing the liability of 360 Geomatics Ltd is limited to the client or his appointed agent and does not extend to use beyond the limitations of the specification.

Physical boundary detail may not represent the extent of legally conveyed ownership.

Grid: Survey is based on a local plane grid, site centred at Station A1 to Ordnance Survey National Grid coordinates (OSGB36).

Level datum: Ordnance Datum Newlyn (ODN).

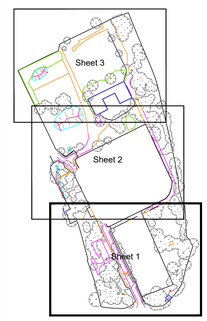
All levels on kerb lines are channel levels unless noted otherwise.

Abbreviations (Where Applicable)

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHL	Overhead Pipe
BW	Brickwork Wire Fence	OSBM	Ordnance Survey Bench Mark
CAT	Cable TV Cover	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
DPJB	Down Pipe Junction Box	SCR	Screwed
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
FIG	Feed Into Ground	TB	Telephone Box
FW	Foul Water	TBM	Temporary Bench Mark
GU	Gully	TFR	Taken From Records
GV	Gas Valve	THL	Threshold Level
H	Height	TJB	Telephone Junction Box
IC	Inspection Cover	TKS	Trellis Paving Slab
IL	Invert Level	TL	Top Level
IR	Iron Railing Fence	TP	Telephone Pole
KO	Kerb Outlet	UTL	Unable To Lift
LB	Letter Box	UTT	Unable To Trace
LC	Lamp Column	VP	Vent Pipe
LP	Lamp Post	WKH	Water Key Hole
MH	Manhole	WM	Water Meter
		WV	Water Valve
		---	Approximate

Tree
Girth/Spread/Height
Girth -Trunk Diameter
Spread -Canopy Radius

Sheet Layout



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Job Title:
Program Ltd
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Drawing Title:
TOPOGRAPHICAL SURVEY

Drawing No:	Rev Suffix:
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Drawn:	Checked:	Scale:	Date:
SR	PB	1:200	JULY 2021

Job No:	Sheet:	Sheet Size:
21067T	1 of 3	A0

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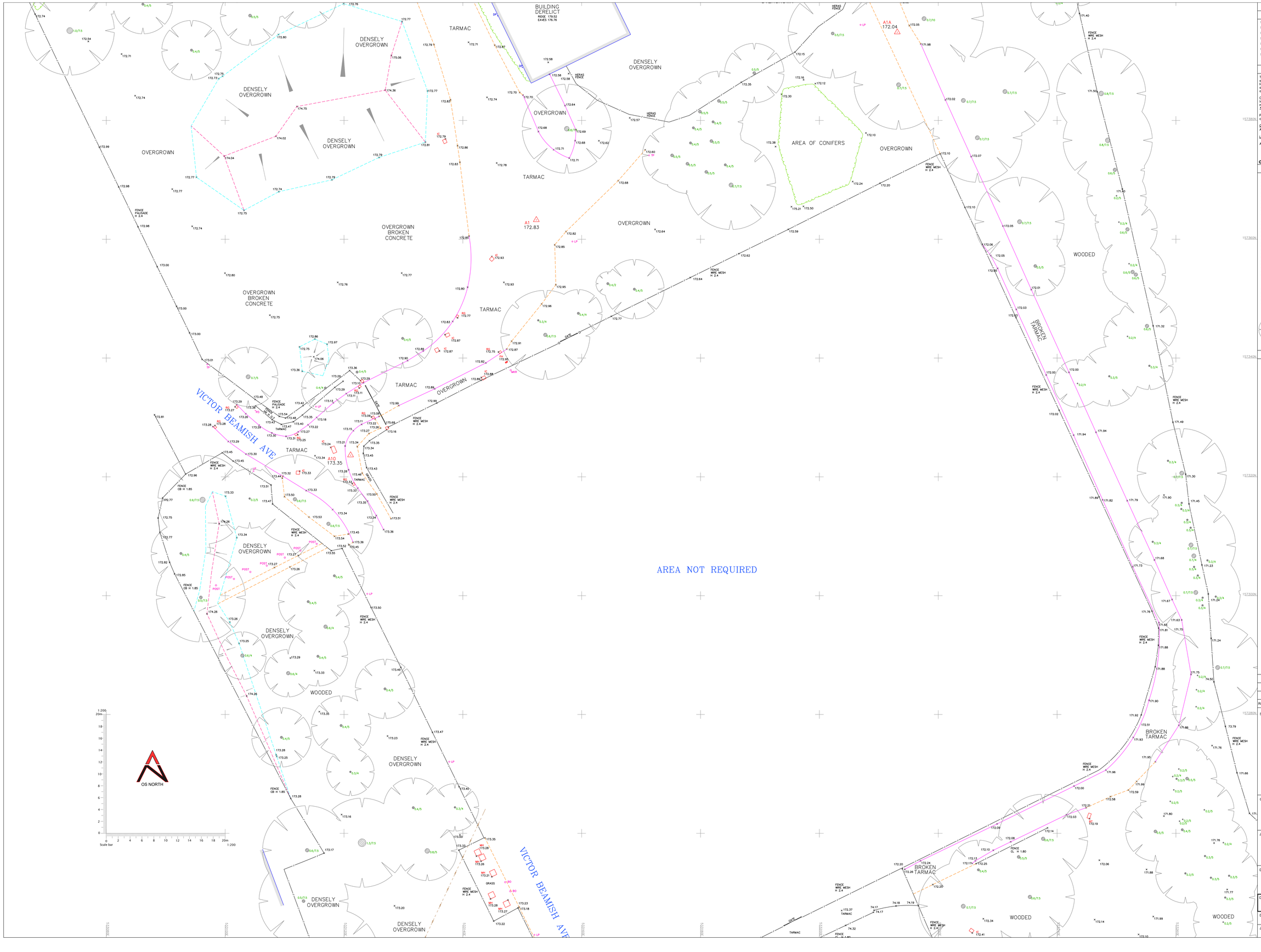

Coordinate Table

Station	Eastings	Northings	Level	Description
STN A1	533102.364	157363.261	172.83	Nail
STN A2	533116.367	157448.836	172.12	Nail
STN A3	533171.994	157512.032	171.90	Nail
STN A4	533197.017	157447.111	171.73	Nail
STN A1A	533213.103	157394.859	172.04	Nail
STN A10	533121.109	157323.651	173.35	Nail
STN A11	533173.817	157215.213	172.96	Nail

Note

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Physical boundary detail may not represent the extent of legally conveyed ownership.

Grid: Survey is based on a local plane grid, site centred at Station A1 to Ordnance Survey National Grid coordinates (OSGB36).

Level datum: Ordnance Datum Newlyn (ODN).

All levels on kerb lines are channel levels unless noted otherwise.

Abbreviations (Where Applicable)

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHP	Overhead Pipe
BW	Barbed Wire Fence	OSBM	Ordnance Survey Bench Mark
BWK	Brickwork	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
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CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
DJB	Electricity Junction Box	SGR	Sluice
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
FIG	Feed Into Ground	TB	Telephone Box
FW	Foul Water	TBM	Temporary Bench Mark
GU	Gully	TFR	Taken From Records
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H	Height	TJB	Telephone Junction Box
IC	Inspection Cover	TPS	Traffic Paving Slab
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LO	Lamp Column	VP	Vent Pipe
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		- - -	Approximate

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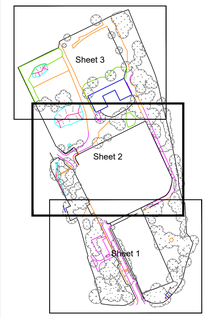
Girth/Spread/Height
Girth - Trunk Diameter
Spread - Canopy Radius

Sheet Layout



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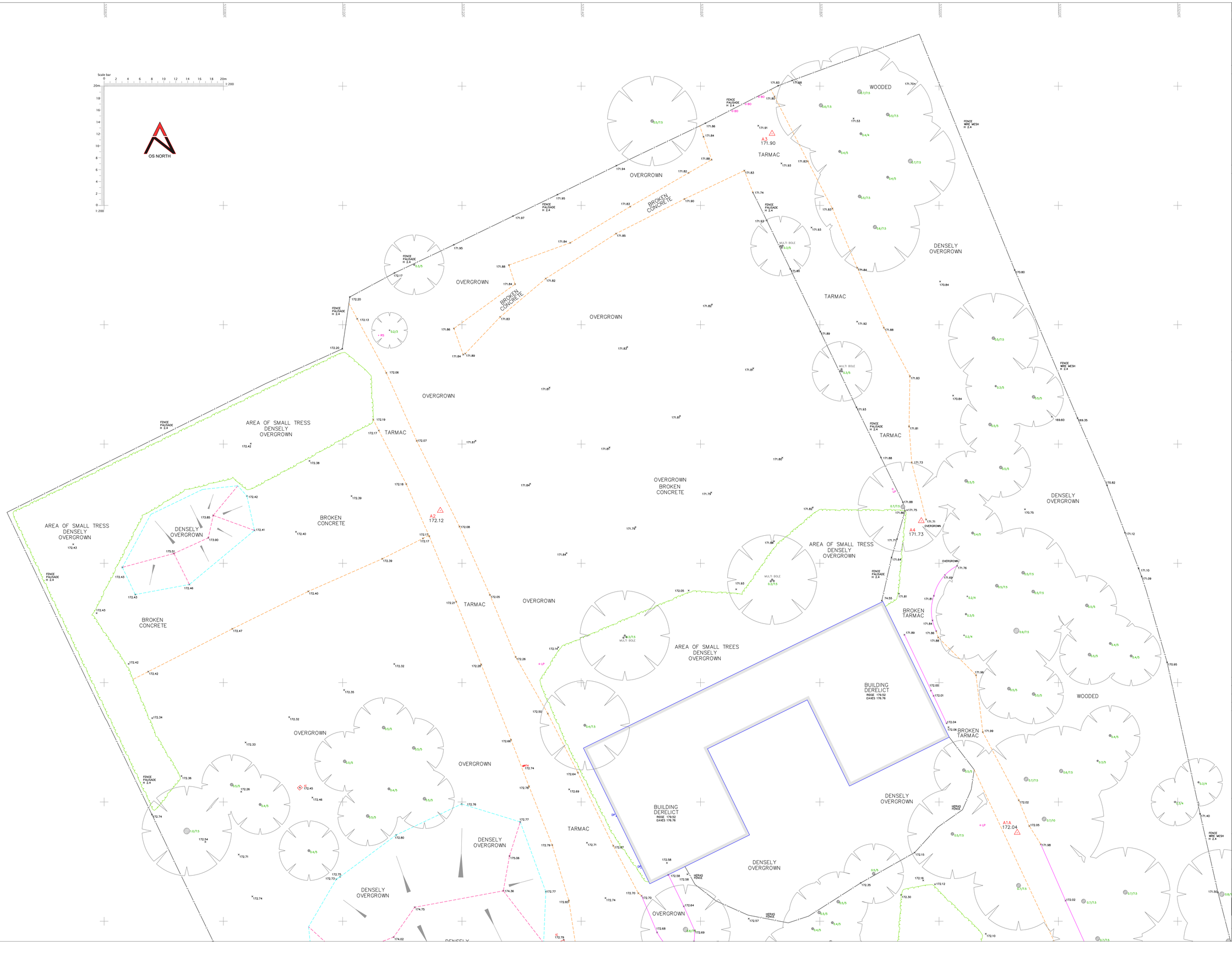
Drawing Title:
TOPOGRAPHICAL SURVEY

Drawing No:		Rev Suffix:
360G/21067T/100		
Drawn: SR	Checked: PB	Scale: 1:200	Date: JULY 2021
Job No: 21067T	Sheet: 2 of 3	Sheet Size: A0	



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Note

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DP	Down Pipe	SC	Stop Cock
DPJB	Down Pipe Junction Box	SCR	Scrub
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EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
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B Ground & Water Site investigation

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SOAKAGE LETTER REPORT

CLIENT	Daniel Watney LLP
SITE ADDRESS	Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX
REPORT REFERENCE	GWPR5384 The conditions and limitations of this soakage letter report can be viewed within Appendix A.
ENGINEER	Adam Young, Ground and Water Limited
GENERAL	Ground and Water Limited were instructed on 05/05/2023 to infiltration testing and a chalk dissolution risk assessment on Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX. The scope of the investigation was outlined within the Ground and Water Limited fee proposal ref: GW-1926 dated 04/05/2023.
INVESTIGATION LOCATIONS AND SCOPE OF WORKS	Site works were undertaken on Friday between 23/05/2023 – 24/05/2023 and comprised the drilling of 2No. Cable Percussion Boreholes (BH01 – BH02) to a depth of between 10.00m – 11.00m bgl. These then underwent soakaway testing following the principles of BRE365. A Borehole location plan can be seen within Figure 1.
GROUND CONDITIONS ENCOUNTERED	A summary of the ground conditions encountered can be viewed below. The trial hole logs can be seen within Appendix B.

Summary of Strata Encountered

Strata	Top Depth (m bgl)	Base Depth (m bgl)	Thickness (m)
Concrete	GL	0.05	0.05
Made Ground: MADE GROUND: Reddish brown gravelly CLAY. Gravel is fine to coarse, angular to sub-rounded of flint (75%), brick (10%), chalk (10%) and bituminous material (5%).	0.05	0.80	0.75
Clay-with-flints: Reddish brown gravelly CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of flint and chalk. (Clay-with-flints Formation).	0.80	8.20 – 10.20	7.40 – 9.40
Lewes Nodular Chalk Formation: Cream Chalk recovered as gravelly SILT. Gravel is fine to coarse. Clasts are upper end of weak, medium density, with occasional black specs. Class Dm in accordance with CIRIA C574.	8.20 – 10.20	10.00 – 11.00	0.80 – 1.80

GROUNDWATER	No groundwater strikes were encountered within the boreholes during the investigation. Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. Exact groundwater levels may only be determined through long term measurements from monitoring wells installed on-site. The investigation was undertaken in May 2023 when groundwater levels are likely to be between their annual maximum and minimum. The long-term groundwater elevation might increase at some time in the future due to seasonal fluctuation in weather conditions.
ROOTS	Roots were proven to 1.50m bgl during the investigation. Roots may be found to greater depths at other locations on the site, particularly close to trees and/or trees that have been removed both within the site and its close environs.
Saturated Moisture content & density of Chalk	Below shows the SMC and density test of chalk, from fragments recovered from the boreholes.

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Saturation Moisture Content of Chalk

Borehole reference/depth (m)	Moisture Content	Bulk Density	Dry Density	Saturated Moisture Content	Dry Density Classification (Based on CIRIA574)
BH01/9.00	25	1.99	1.60	26	Medium
BH02/11.00	27	2.00	1.58	26	Medium

The geotechnical laboratory testing can be seen within Appendix D within this report.

Chalk Dissolution Risk Assessment

The presence of dissolution features on-site can prove problematic, as they often provide inconsistency within the underlying geology. Often formed during glacial and periglacial conditions, the depth and width of these features can vary substantially, often providing inconsistency in geological strength data.

If a dissolution feature is suspected, a geotechnical engineer and structural engineer should be contacted for suitable engineering designs, based on further works identifying and classifying the area the feature occupies.

The Groundsure Geoinsight datasheets, presented Appendix C of this report, revealed the following information which may be pertinent to this risk assessment. The Groundsure Datasheets are displayed within Appendix C.

- Ground Dissolution of Soluble Rocks – The site was classified as a Moderate risk of ground dissolution of soluble rocks.
  - Moderate risk was described as *"Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence is at a level where it may need to be considered".*
- An on-site Class A Historical Mining area was identified on-site. A Class A area was described as *"Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level, where they need not be considered"*. However, this is generally a precautionary statement attributed to all areas associated with chalk within the ground profile. Therefore, this does not identify any underground chalk features at the site location.
- No natural cavities were identified within a 250m radius of the site.
- No Britpits were noted within 250m radius of the site.
- No records of surface ground workings were noted within a 250m radius of the site.
- No records of Underground workings, Mining Cavities or JPB Mining Areas were noted within a 500m radius of the site.
- The historical mapping review confirmed the findings of the groundsure datasheets discussed above.
- A Lidar review of the site showed two bulges in the northern section of the site, however no depressions were noted.
- The Edmonds Procedure (Edmonds, C.N., 2001. Predicting natural cavities in chalk. Geological Society, London, Engineering Geology Special Publications, 18(1), pp.29-38.); highlighted a moderately low subsidence hazard classification.

The intrusive investigation comprised two boreholes. These encountered a 0.80m capping of Made Ground overlying cohesive clay-with-flints formation to ~8.20 – 10.20m bgl, underlain by the Lewes

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nodular Chalk Formation for the remaining depth of the boreholes (maximum base depth of 10.00m – 11.00m bgl).

In-situ strength testing identified the cohesive clay-with-flints formation to have equivalent SPT "N" values of between ~8 - ~21 from probing. In-situ strength testing identified the bedrock chalk deposits to have an SPT "N" value of 5 near the head of the chalk (clay/chalk boundary) in BH1. Both boreholes showed a similar chalk head.

Based on the results of the two boreholes, although a lower N SPT value was noted at the boundary of the clay/chalk interface, no particular concerning results were noted. However, it should be noted that the site is within a geological sequence, which should be investigated further, from a geotechnical point of view, if buildings are proposed to be constructed. More site needs to be covered and probes/boreholes are proposed at building locations, for foundation risk assessment. This was not in the scope of this report however and will not be taken further.

INFILTRATION TESTING

Soakage testing, following the principles of BRE365 was undertaken within the Lewes Nodular Chalk Formation within BH01 and BH02. The infiltration test results can be seen tabulated below.

Soakage Testing Results

Trial Hole	Test Number	Depth (m bgl)	Start Depth (m bgl)	Finish Depth (m bgl)	Time Taken (mins)	Infiltration Rate (m/sec)
BH01	1	10.60	9.10	10.60	2	4.03x10-4
	2	10.60	9.03	10.60	3	2.69x10-4
	3	10.60	8.77	10.60	4	2.03x10-4
BH02	1	11.50	10.21	11.50	2	4.01x10-4
	2	11.50	10.10	11.50	3	2.68x10-4
	3	11.50	9.56	11.50	5	1.62x10-4

Soakaways constructed within the Lewes Nodular Chalk Formation are likely to prove satisfactory for the disposal of stormwater.

The principles of sustainable urban drainage system (SUDS) should be applied to reduce the risk of flooding from surface water ponding and collection associated with the construction of the foundations.

Any soakaways should be located sufficiently away from buildings and infrastructure, in order to prevent undermining of foundations.

It should be noted that water discharge into the chalk may worsen / create dissolution features. Therefore, soakaways should be remote from structures and undertaken in accordance with available guidance.

A number of published information sources make reference to an appropriate distance at which a soakaway should be sited in relation to any building foundations in the vicinity:

- The British Standard BS8301 :1985 "Code of practice for building drainage" (1985), suggests that: "A soakaway is not desirable nearer to a building than about 5 metres nor in such a position that the ground below foundations is likely to be adversely affected."
- The Building Research Establishment Digest 365 "Soakaway design" (1991), suggests that "Soakaways should not normally be constructed closer than 5m to building foundations. In chalk or other soil and fill material subject to modification or instability, the advice of a

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specialist geotechnologist should be sought as to the advisability and siting of a soakaway".

In addition, the distance a soakaway is located from any foundations can be informed by both the soakaway type and chalk density present at the site.

- The Kent County Council Soakaway Design Guide (July 2000) states that "Highway soakaways shall be situated the following minimum distances from dwellings (measured from the outside edge of the soakaway): (1) 5 metres for conventional perforated soakaway; (2) 10 metres for deep bored soakaway. In addition, adjacent soakaways of a similar type shall also be spaced a minimum of 10 metres apart.
- CIRIA 574 states that soakaways should be sited at least 5-10m away from any structure, depending on the chalk density. Where the chalk present is of low or unknown density, soakaways should be sited at least 10m from any foundations, and where the chalk is of medium density or higher, soakaways should be sited at least 5m from any foundations.

It is considered, taking into account all data to date, combined guidance and the considerations of the geotechnical investigation for the site with respect to the dissolution risk, that the deep soakaways should be sited ~10m away from buildings and between themselves.

Please feel free to contact us should you have any queries regarding the information enclosed within this letter report.

Kind Regards,

Adam Young

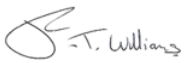
Prepared By	Checked By	Verified By
		
Adam Young BSc (Hons) Engineer	Miltiadis Mellios MSc(Eng) GMICE FGS MIEnvSc Principal Engineer	Francis Williams MGeol (Hons) FGS CEnv AGS CGeol Director

Figure 1 **Trial Hole Location Plan**

Appendix A **Conditions and Limitations**
Appendix B **Trial Hole Logs**
Appendix C **Groundsure datasheets**
Appendix D **Geotechnical Testing**

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FIGURES

Site boundary

Windowless Sampler Borehole

Approximately 45m

Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX

May 2023

Figure 1 – Trial Hole Location Plan

GWPR5384

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APPENDIX A: Conditions and Limitations

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The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX.

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Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

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APPENDIX B: Trial Hole Logs

Percussion Drilling Log

Project Name: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Client: Daniel Watney LLP	Date:	
Location: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Contractor:		
Project No. : GWPR5384	Crew Name:	Drilling Equipment:	

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	CP			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			Concrete
		0.20						MADE GROUND: Reddish brown gravelly CLAY. Gravel is fine to coarse, angular to sub-rounded of flint (75%), brick (10%), chalk (10%) and bituminous material (5%).
		0.50						
		0.80			0.80			
		1.00						Reddish brown gravelly CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of flint and chalk. (Clay-with-flints Formation).
		1.20	SPT	N=12 (2,2/2,3,3,4)				
		1.50						
		2.00						
		2.00	SPT	N=15 (1,2/2,4,5,4)				
		2.50						
		3.00						
		3.00	SPT	N=17 (1,2/3,6,4,4)				
		3.50						
		4.00						
		4.00	SPT	N=21 (2,2/4,5,6,6)				
		4.50						
		5.00						
		5.00	SPT	N=19 (2,2/4,4,6,5)				
		6.50	SPT	N=21 (2,3/4,5,6,6)				
		8.00	SPT	N=5 (2,1/1,1,1,2)				
					8.20			Cream CHALK composed of gravel and SILT. Gravel is fine to coarse. Clasts are upper end of weak, medium density, with occasional black specs. Class Dm in accordance with CIRIA C574. (Lewes Nodular Chalk Formation).
		9.50	SPT	N=10 (1,2/2,2,3,3)				
					10.00			End of Borehole at 10.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Roots to 1.50m bgl
No groundwater strikes.

Percussion Drilling Log

Project Name: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Client: Daniel Watney LLP	Date:
Location: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Contractor:	
Project No. : GWPR5384	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH02	CP			1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.05			Concrete
		0.50	D					MADE GROUND: Reddish brown gravelly CLAY. Gravel is fine to coarse, angular to sub-rounded of flint (75%), brick (10%), chalk (10%) and bituminous material (5%).
		0.80	D		0.80			
		1.00	D					Reddish brown gravelly CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of flint and chalk. (Clay-with-flints Formation).
		1.50	D					
		1.65	SPT	N=9 (1,1/2,2,3,2)				
		2.00	D					
		2.45	SPT	N=11 (1,2/2,2,3,4)				
		2.50	D					
		3.00	D					
		3.45	SPT	N=16 (1,2/3,3,5,5)				
		3.50	D					
		4.00	D					
		4.45	SPT	N=17 (1,2/4,5,4,4)				
		4.50	D					
		5.00	D					
		5.45	SPT	N=21 (3,5/6,6,4,5)				
		5.50	D					
		6.00	D					
		6.50	D					
		6.95	SPT	N=14 (4,4/2,4,4,4)				
		7.00	D					
		7.50	D					
		8.00	D					
		8.45	SPT	N=8 (4,2/2,2,2,2)				
		8.50	D					
		9.00	D					
		9.50	D					
		9.95	SPT	N=9 (1,2/2,2,2,3)				
		10.00	D					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Roots to 1.50m bgl
No groundwater strikes.

Percussion Drilling Log

Project Name: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Client: Daniel Watney LLP	Date:
Location: Kenley Campus, Victor Beamish Way, Caterham, CR3 5FX	Contractor:	
Project No. : GWPR5384	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH02	CP			1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.20			Reddish brown gravelly CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of flint and chalk. (Clay-with-flints Formation).
		10.50	D					Cream CHALK composed of gravel and SILT. Gravel is fine to coarse. Clasts are upper end of weak, medium density, with occasional black specs. Class Dm in accordance with CIRIA C574. (Lewes Nodular Chalk Formation).
		11.00	D		11.00			End of Borehole at 11.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

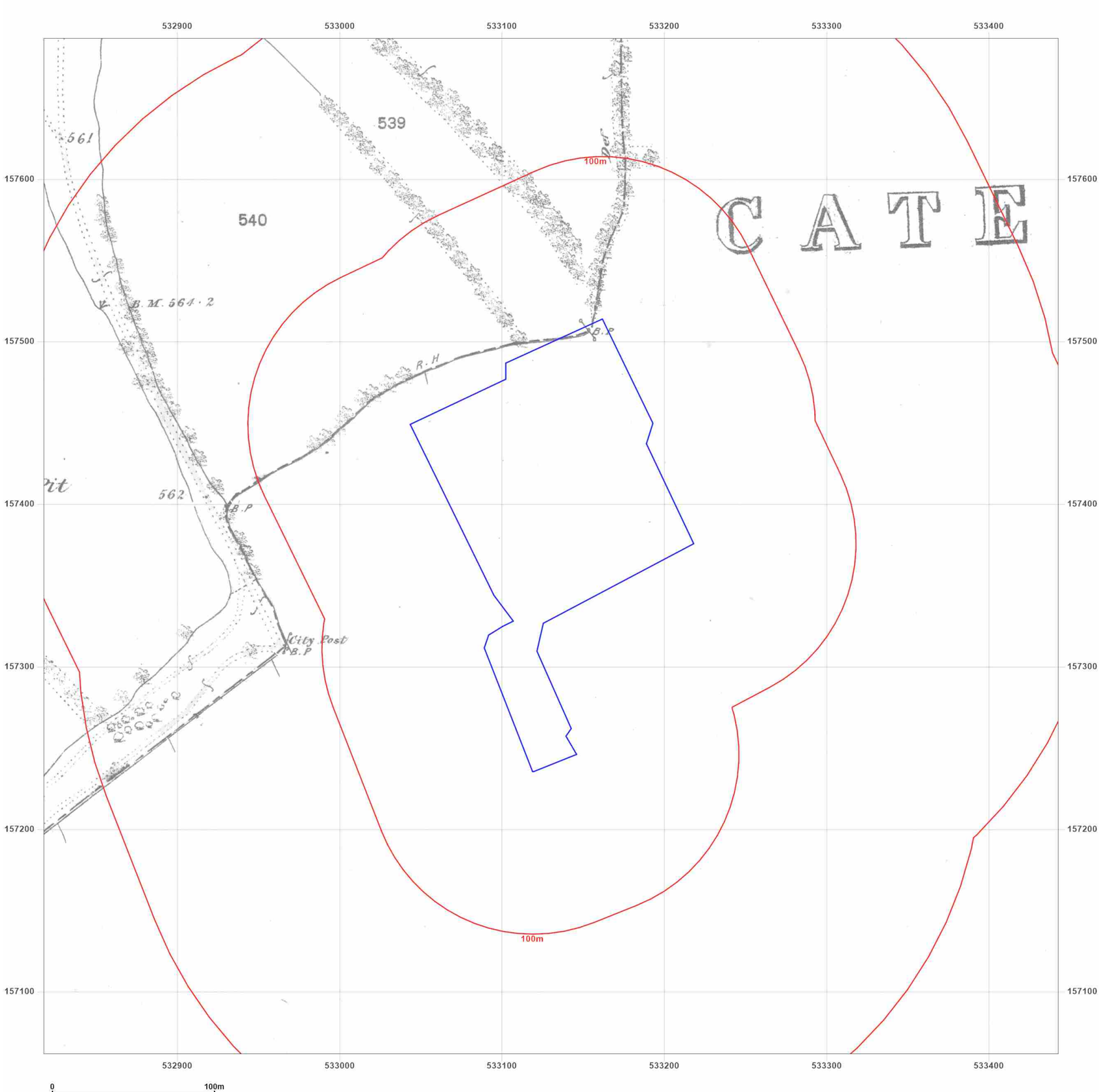
Roots to 1.50m bgl
No groundwater strikes.

2 The Long Barn,
Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

0333 600 1221
enquiries@groundandwater.co.uk

groundandwater.co.uk

APPENDIX C: Groundsure Datasheets



Groundsure INSIGHTS

Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series
Map date: **1868**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1868
Revised 1868
Edition N/A
Copyright N/A
Levelled N/A

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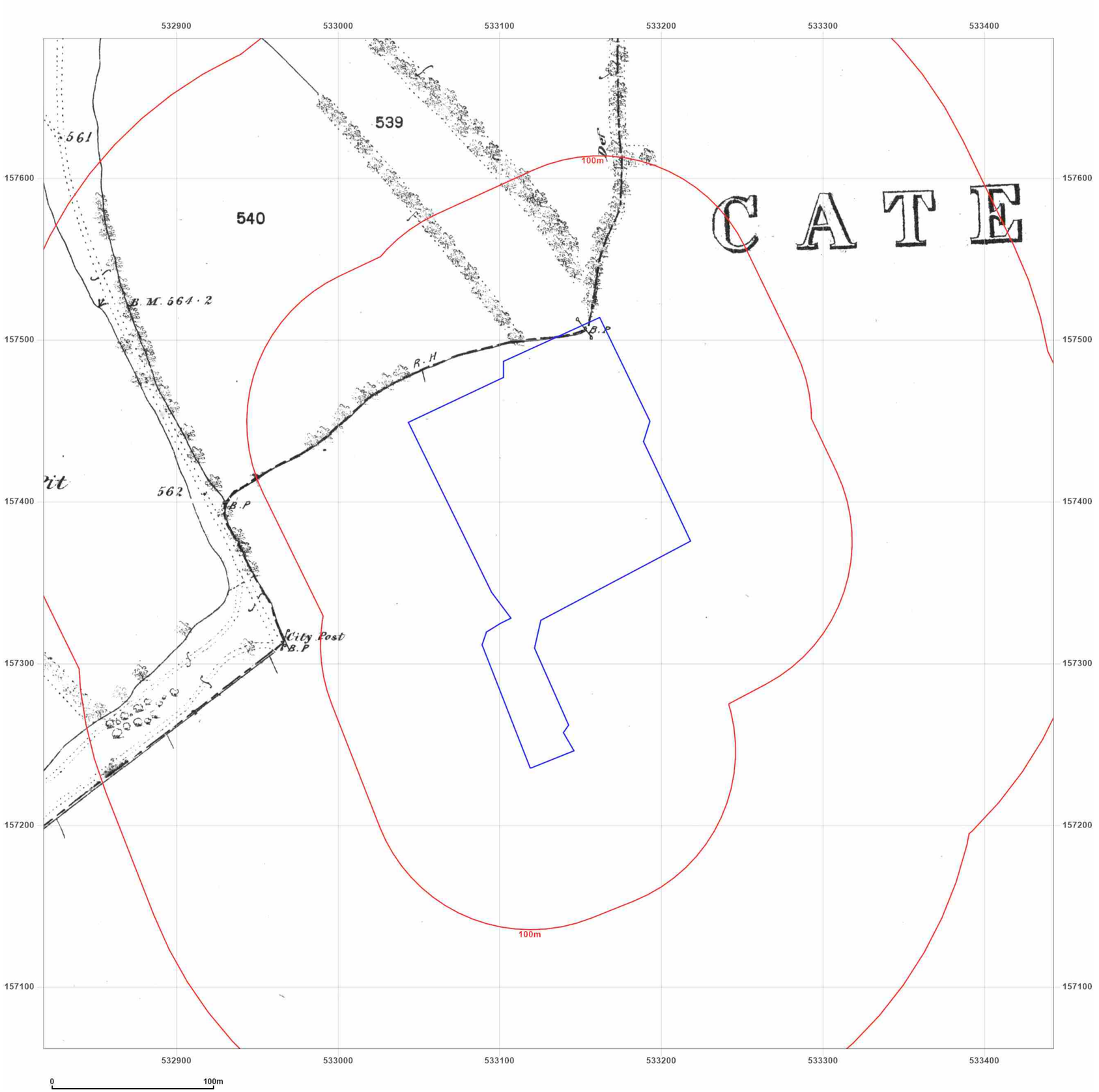

Groundsure INSIGHTS

Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series
Map date: **1868**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1868
Revised 1868
Edition N/A
Copyright N/A
Levelled N/A

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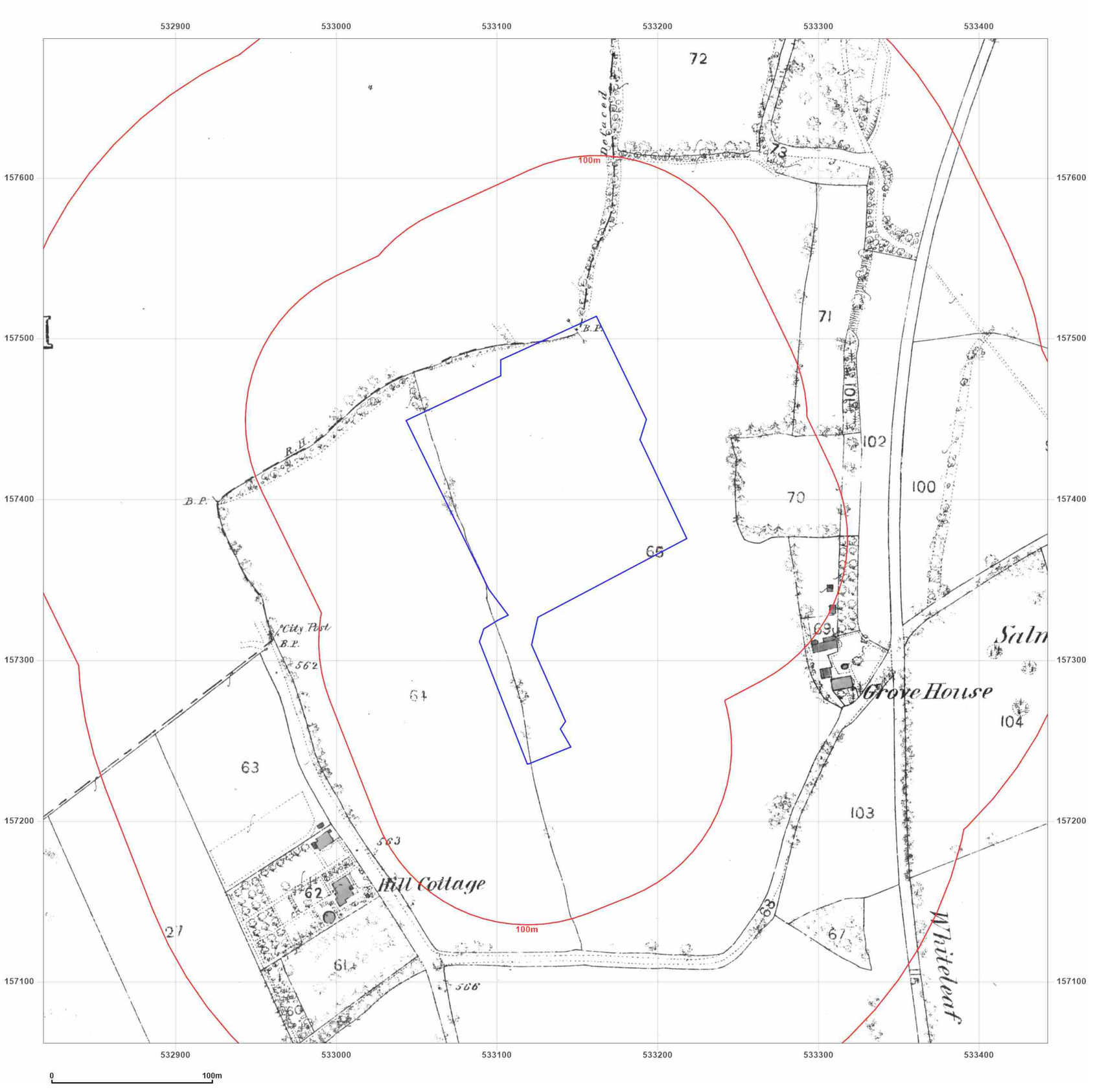

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Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series

Map date: **1870**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1870
Revised 1870
Edition N/A
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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series

Map date: **1870**

Scale: 1:2,500

Printed at: 1:2,500

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Edition N/A
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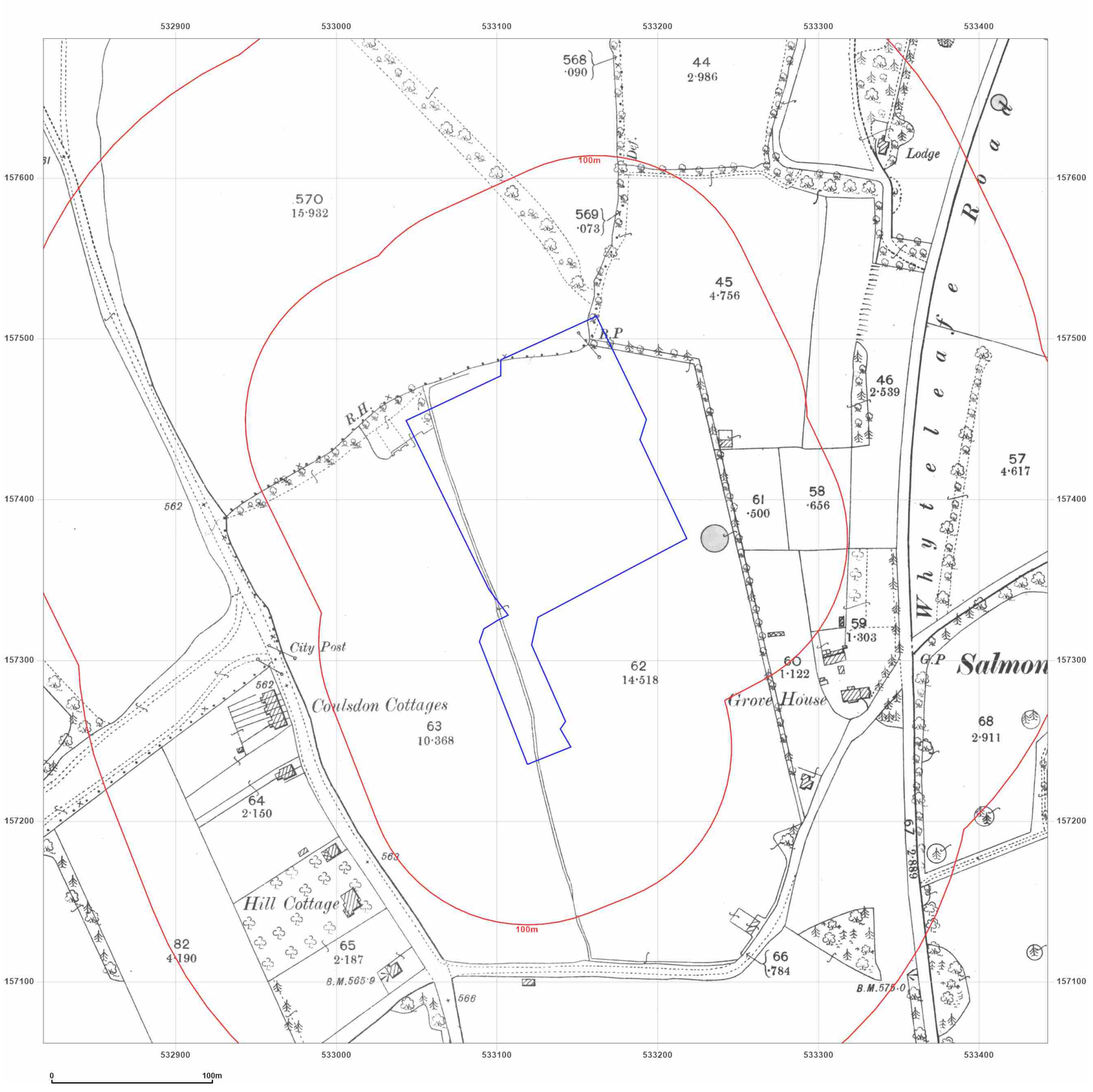

Groundsure INSIGHTS

Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series
Map date: **1897**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1897
Revised 1897
Edition N/A
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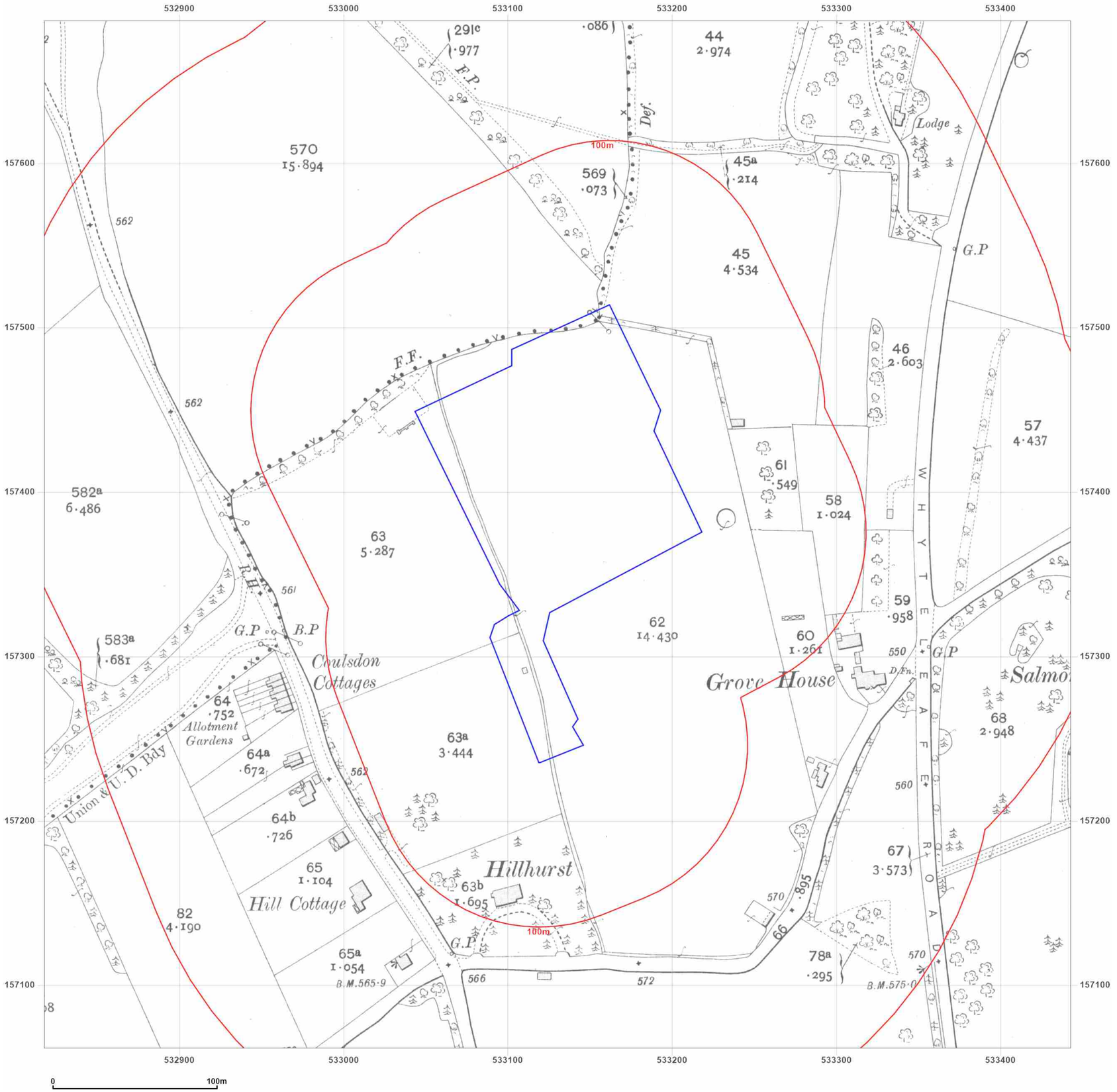

Groundsure INSIGHTS

Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series
Map date: **1913**
Scale: 1:2,500
Printed at: 1:2,500

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Revised 1913
Edition N/A
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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series
Map date: **1934**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1934
Revised 1934
Edition N/A
Copyright N/A
Levelled N/A

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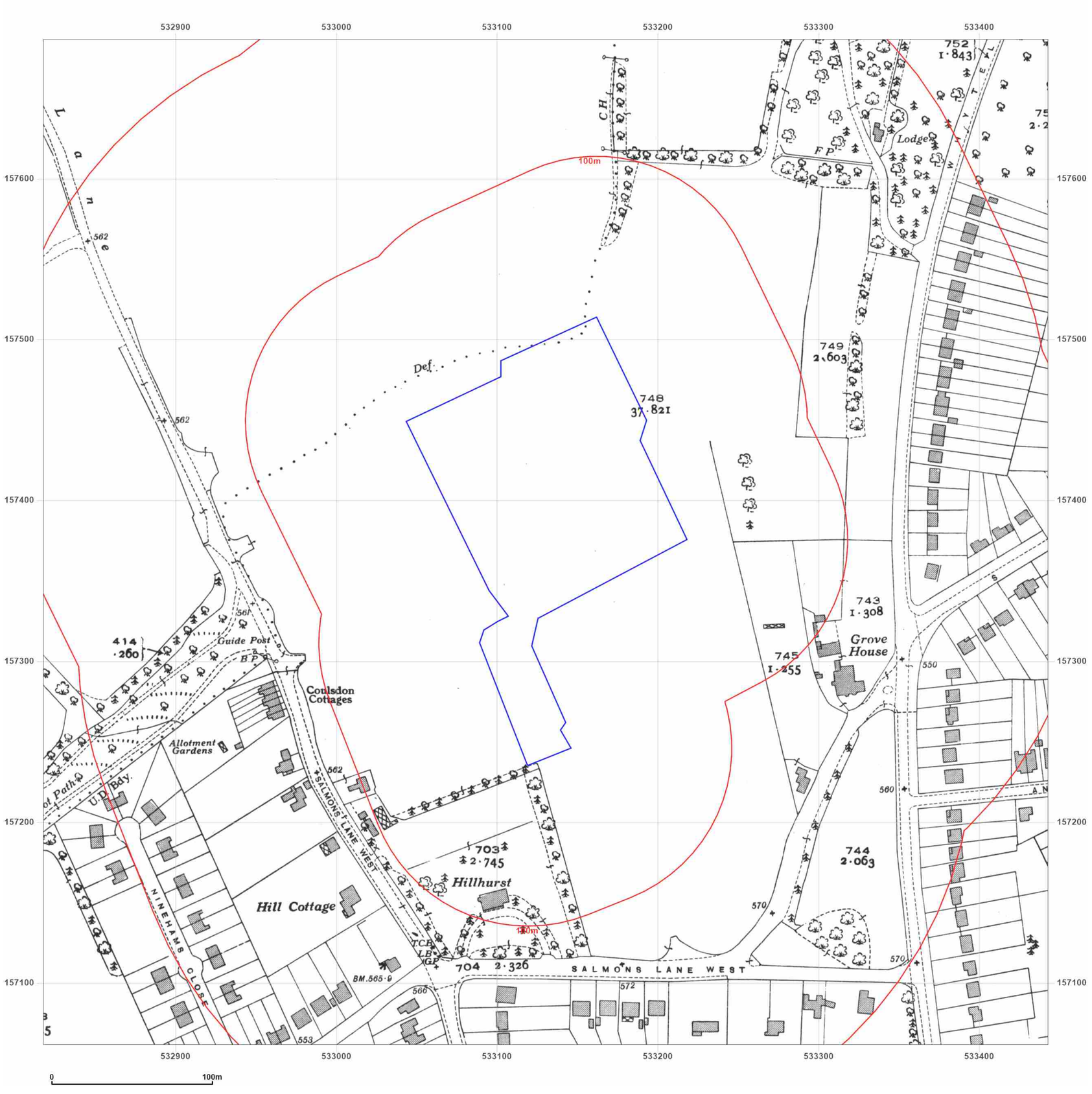

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Site Details:

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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: County Series

Map date: **1943**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1943
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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: National Grid
Map date: **1956-1957**
Scale: 1:1,250
Printed at: 1:2,000

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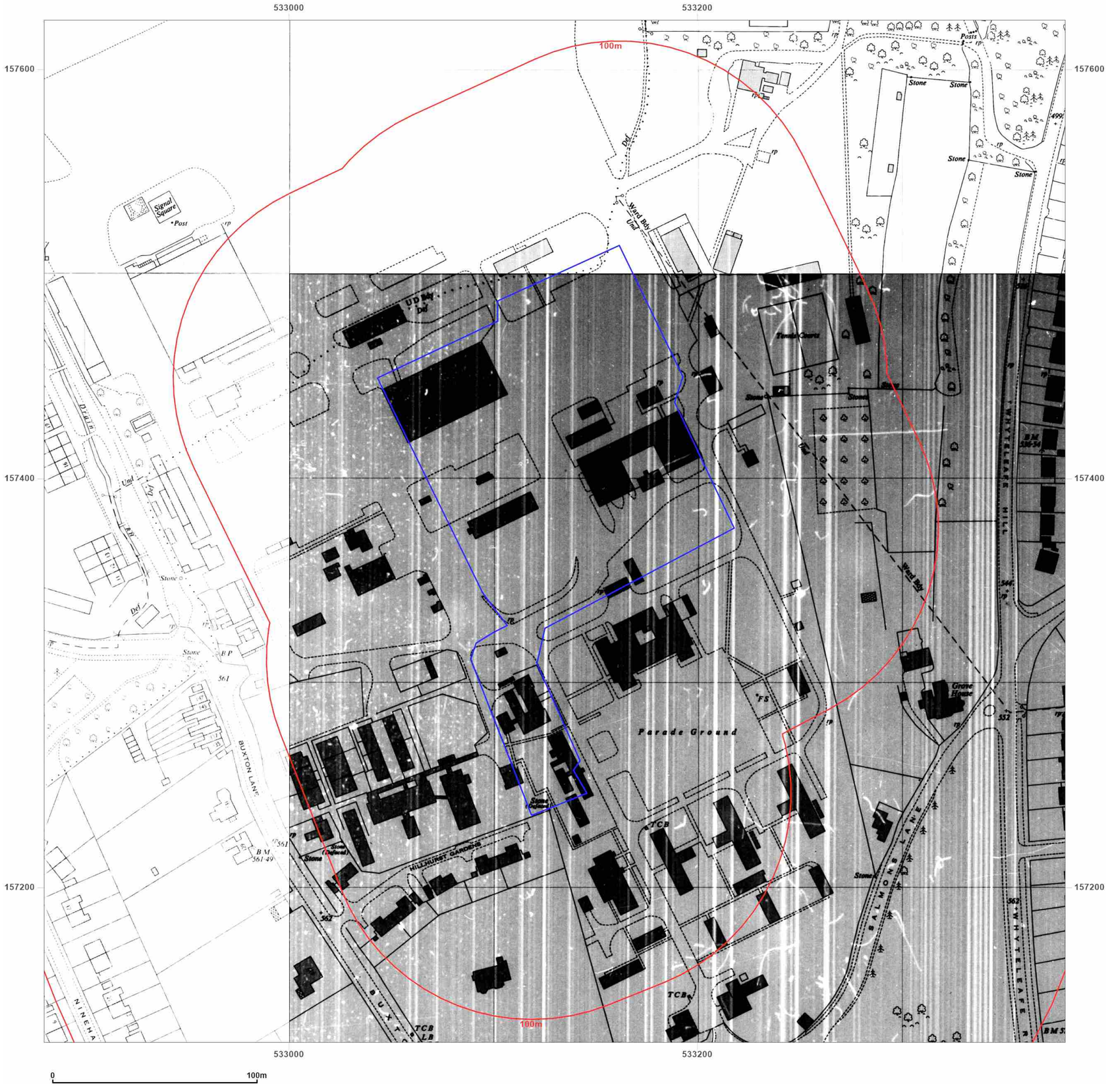

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Site Details:

FOCUS SCHOOL, KENLEY CAMPUS, VICTOR BEAMISH AVENUE, CATERHAM, CR3 5FX

Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: National Grid
Map date: **1957**
Scale: 1:1,250
Printed at: 1:2,000

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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: National Grid

Map date: **1958**

Scale: 1:2,500

Printed at: 1:2,500

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Client Ref: GWPR5384
Report Ref: GS-CE1-VX7-4QQ-ZS6
Grid Ref: 533130, 157374

Map Name: National Grid

Map date: **1958**

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Printed at: 1:2,500

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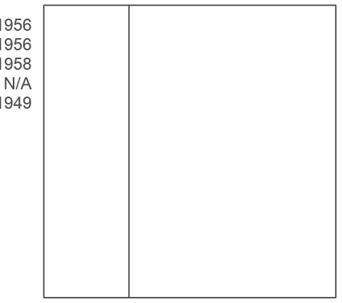

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