geotechnical and environmental consultants

ground&water

Phase 1 Desk Study

22 Tanza Road, Hampstead, London NW3 2UB
On behalf of Dan Wong & Robin Koshyk

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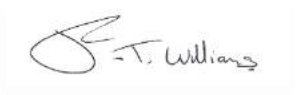
v.1.01			
	Rob Terrell BSc (Hons) MSc Senior Engineer	Miltiadis Mellios MSc(Eng) GMICE Principal Engineer	Francis Williams MGeol (Hons) FGS CEnv AGS CGeol Director

Site Investigations | Environmental Consultants | Geotechnical Engineers

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

Registered Office: Kineton House, 31 Horse Fair, Banbury, Oxfordshire OX16 0AE Registered in England No. 07032001

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EXECUTIVE SUMMARY	
Proposed Development	At the time of reporting, May 2021, the proposed development comprised the underpinning of the existing undercroft to create a basement level. Other parts of the redevelopment include the side (north-western) extension of the property, where and additional level is added on the first floor, and an extension to the rear (south-western) side of the property. The basement did not extend below these areas.
Geology	The British Geological Survey Solid and Drift Geology Map for the Hampstead area (North London Sheet No. 256) revealed that the site was located on the London Clay Formation. No superficial deposits were noted on-site; however, there was a propensity for superficial Head Deposits. The Claygate Member of the London Clay Formation was noted ~125m north of the site. No other superficial deposits, outcrops of bedrock deposits or areas of Made/Worked Ground were noted within a 250m radius of the site.
Hydrogeology	The DEFRA online maps indicated that the site was located on Unproductive Strata associated with the London Clay Formation. The nearby Claygate Member of the London Clay Formation was also classified as an Unproductive Strata. There was no classification for superficial deposits, given their likely absence; however, the site was in an area with propensity for Head Deposits. Head Deposits, if encountered, were likely to be classified as a Secondary (Undifferentiated) Aquifer. Classifications of these aquifers has been provided below. The Number 1 Hampstead Heath Pond was noted ~210m west of the site, with two additional ponds noted to the north. No other surface water features or watercourses were present within a 250m radius of the site. Examination of Environment Agency records demonstrate that the site was not located within a Groundwater Source Protection Zone (SPZ). From analysis of hydrogeological and topographical maps, the actual groundwater table was anticipated to be encountered at depth; however, groundwater could be encountered at shallow depth within superficial Head Deposits capping the underlying, relatively impermeable London Clay Formation, if they are located on-site. It was considered that the groundwater was flowing southwards, in alignment with local topography. Perched water was also likely to be found within the Made Ground and underlying strata where silty/sandy/gravelly bands are noted, especially after periods of intense or prolonged rainfall.
Radon	BRE 211 (2015) Map 5 of the London, Sussex and west Kent area indicated that the site was not located within an area where mandatory protection measures against the ingress of radon were likely to be required. A review of the freely available Public Health England radon database, UK Radon, indicated that the site was located within a 1km grid square, where the maximum radon potential of <1% was recorded. Basic radon protection measures are required in areas where more than 3% of houses are at or above the Action Level. The site was therefore assessed as being within an area where a risk assessment was not required.
Potential Sources Of Contamination	Full details can be seen in sections 6.3 and 6.4 of this report. Onsite - The Desk study has revealed the following potential sources of contamination onsite: • Made Ground from construction/ demolition activities • Aggressive ground conditions with Made Ground and natural ground, including groundwater; • Asbestos Containing Materials within the building's fabric; • Ground gases generated by Made Ground Offsite - The Desk study has revealed the following potential sources of contamination within the site's environs: • Made Ground within the site environs, contemporary and historical industrial uses (railway, garage): • Ground gases generated by nearby railway cuttings and backfilled brickfield • Electricity sub-station

Recommendations and Phase 2 Objectives	It is recommended that an intrusive ground investigation is undertaken at the site to evaluate the risk that contaminants of concern within the soils and groundwater may affect end-users. This should determine the underlying ground and groundwater conditions and include an assessment of the level of contamination to enable the quantification of the ground-related risks associated with the proposed redevelopment. It is possible that asbestos and asbestos containing materials will be incorporated within any Made Ground. An asbestos management strategy should be implemented to ensure that any asbestos uncovered during the investigation does not pose a risk to members of the public that use the site. If analytical results show elevated concentrations of contaminants of concern in the soil samples then there might be a requirement to assess the potential risks of leachability of contaminants migrating into the groundwater/perched water underlying the site. This might mean leachate testing on soils samples is required or groundwater sampling and testing. This risk of groundwater or controlled waters being affected however is considered low, due to the ground conditions expected. The CSM has identified a low risk from ground gases at the site as a result of limited Made Ground on-site or within the site's environs. Other potential off-site sources were identified but dismissed for further risk assessment, as analysed in Section 6.3.

1. INTRODUCTION

1.1. General

Ground and Water Limited were instructed by Dan Wong & Robin Koshyk on the 13th April 2021 to conduct a Phase 1 Desk Study on the site at 20 Tanza Road, Hampstead, London NW3 2UB. The scope of the investigation was detailed within the fee proposal GWQ6351.

1.2. Aims of the Investigation

This Phase 1 Desk Study was undertaken to advise the client on risk factors pertaining to the site with special reference to former and present day potential contaminative uses and their impact on sensitive receptors, these being human health, controlled waters, buildings, building materials and services. In addition, comments on general geotechnical considerations regarding the site are made at the end of the report, based on the desk study review. A separate document is produced for the site addressing specific screening, scoping and actions regarding geotechnical risks and hydrogeological considerations for the proposed development and the surroundings.

1.3. Conditions and Limitations

This report has been prepared based on the terms, conditions and limitations outlined within Appendix A of this report.

2. SITE SETTING

2.1. Site Location

The site comprised a ~390m^2 triangular-shaped plot of land, with a north-east to south-west orientation, along the south-western side of Tanza Road, ~35m south-east of the Junction with Parliament Hill. The site was located in the Hampstead, a primarily residential town within the north London Borough of Camden. The national grid reference for the centre of the site was approximately TQ 27541 85932. A site location plan is given within Figure 1. A plan showing the site area is given within Figure 2.

2.2. Site Description

A Site Walkover was undertaken on the 27th April 2021 by a Ground and Water Limited representative. A description of the site, as noted during the Site Walkover, is tabulated below. An aerial view of the site, showing an approximate site boundary, is given within Figure 3. An existing plan view of the undercroft level and ground floor level have been provided within Figure 4 and 5 respectively, with an existing section view provided within Figure 6.

Site Description Sheet	
Variable	**Description**
Use of site	At the time of the site walkover (29/04/2021), the existing development comprised a two-storey, detached residential dwelling, with a undercroft level beneath the majority of the property and an additional storey of habitable space within a roof conversion. Attached to the north of the property was a single storey garage. The front (east) of the site comprised hardstanding. The rear of the site was not available to view during the site walkover and was anticipated to be predominantly soft landscaping.
Site Topography and Floor Levels	The site was situated on a south-facing slope. It was however noted to be less than 7° steep. The undercroft floor level was 75.96m AOD, with the ground floor level 77.60m AOD. The front garden level was 78.20m AOD at the northern extreme, lowering to 76.26m AOD at the eastern extreme. The rear garden level was roughly between 76.00 – 76.60m AOD.
Area topography	The topography of the surrounding area was noted to be on a south-facing slope. It was however noted to be less than 7° steep.
Structures on-site	A detached, two-storey residential dwelling was noted in the north-eastern section of the site, with living space within the roof conversion. Attached to the north of the property was a single storey garage. A undercroft was noted below the ground floor of the property.
Use of surrounding ground	The use of the surrounding area was predominantly residential. Hampstead Heath was noted >50m to the north and west of the site, beyond nearby residential buildings. The residential buildings along Tanza Road varied between 2 and 3 storey buildings, some of which having living space within roof conversions. The residential buildings along Parliament Hill varied between 3 and 4 storey buildings, some of which having living space within roof conversions. No evidence of a basement or subterranean development was noted within the developments; however it was possible that they may have been built into the slope.
Site covering	The eastern half of the site comprised the footprint of the property, with hardstanding noted to the front/east of the property. The western half of the site to the rear of the property was unable to be viewed and was anticipated to comprise a private, soft landscaped garden.
Contamination sources on-site	No obvious sources of contamination were identified on site during the site walkover.

Site Description Sheet	
Variable	**Description**
Contamination sources off-site	No obvious sources of contamination were identified in close proximity to the site during the site walkover.
Vegetation on-site	Small areas of soft landscaping were noted around the site boundaries, with soft landscaped areas, hedges and scattered trees anticipated within the rear garden.
Vegetation off-site	Off-site vegetation was localised to the soft landscaped gardens of surrounding properties as well as systematic trees noted along the pathway of Tanza Road.
Services	Water, gas and electricity services were assumed to be connected to the existing office block

2.3. Proposed Development

At the time of reporting, May 2021, the proposed development comprised the underpinning of the existing undercroft to create a basement level. Other parts of the redevelopment include the side (north-western) extension of the property, where and additional level is added on the first floor, and an extension to the rear (south-western) side of the property. The basement did not extend below these areas.

At this stage the proposals are to construct the retaining walls with mass concrete and to then construct a reinforced concrete basement box within this. The retaining walls were noted to have a 2.70m long stem, with a 1.40m wide, 500mm thick base; therefore the overall depth from ground floor level was to be 3.20m, and the foundations relating to the basement were to be formed at 74.40m AOD. However, given there is already an undercroft below the existing ground floor level to 75.96m AOD, the actual underpin/excavation was noted to be ~1.60m. The maximum length and width of the basement were ~11.70m and 11.30m respectively. The retaining walls were noted to have a load of 51kN/m2 based on the structural calculations provided within Appendix B.

The amount of hardstanding across the entire site was anticipated to increase, given extensions were noted as part of the development. The levels on-site were considered to remain the same. No trees were anticipated to be removed/felled or planted as part of the proposed development.

The proposed development fell within Geotechnical Design Category 2 in accordance with Eurocode 7. A plan view of the basement level and ground floor level of the proposed development can be viewed within Figure 7 and 8, with a section view provided within Figure 9.

2.4. Geology

The British Geological Survey Solid and Drift Geology Map for the Hampstead area (North London Sheet No. 256) revealed that the site was located on the London Clay Formation. No superficial deposits were noted on-site; however, there was a propensity for superficial Head Deposits. The Claygate Member of the London Clay Formation was noted ~125m north of the site. No other superficial deposits, outcrops of bedrock deposits or areas of Made/Worked Ground were noted within a 250m radius of the site.

Superficial deposits (Drift) are the youngest geological deposits formed during the most recent period of geological time. They rest on older deposits or rocks referred to as bedrock (Solid), which are the

main mass forming the Earth. Bedrock is present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

2.4.1. Anticipated On-site Deposits

Head Deposits

The majority of Head Deposits are clay-dominated, derived from the London Clay. Generally, less than 2m thick, they probably accumulated in shallow mudslides of softened brecciated bedrock in the active layer. They consist of soft, ochreous brown silty clay with blue-grey mottling in places and angular, frost-shattered fragments of flint occur sporadically throughout. At the base of these deposits and interbedded in places, there is a bed of pebbly clay, generally less than 0.2m thick, with well-rounded flint pebbles derived from nearby outcrops of 'high level' gravel such as Stanmore Gravel.

London Clay Formation

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of Gypsum (Selenite) are often found within the weathered part of the London Clay Formation, and precautions against sulphate attack to concrete are sometimes required. The lowest part of the formation is a sandy bed with black rounded gravel and occasional layers of sandstone and is known as the Basement Bed.

2.4.2. Anticipated Off-site Deposits

Claygate Member of the London Clay Formation

The Claygate Member of the London Clay Formation comprises alternating layers of clayey sand and sandy clays. The sands usually overlie the clays. The clays are typically brown to mauve mottled and are overconsolidated. The bed is transitional and overlays the undivided London Clay Formation. It has been used extensively for brick making.

2.4.3. BGS Borehole Records

A BGS Borehole (reference TQ28NE5) record noted within similar geology was noted ~400m west of the site within similar geology. This borehole recorded the London Clay Formation to ~88m bgl, underlain by Reading and Thanet Beds for ~116m bgl, before chalk for the remaining depth of the borehole (138m bgl). As the borehole was undertaken for water purposes, yield recordings were noted, which indicated the levels of groundwater. No water yield was noted within the London Clay Formation; however 60 gallons a minute of water yield were noted from the Thanet Sand, whereas the chalk had 10 gallons a minute. This indicated that the groundwater was noted at depth below the London Clay Formation.

2.5. Slope Stability, Railways and Subterranean Developments

The site was situated on a south-facing slope. It was however noted to be less than 7° steep. The existing basement floor level was 75.96m AOD, with the ground floor level 77.60m AOD. The front garden level was 78.20m AOD at the northern extreme, lowering to 76.26m AOD at the eastern extreme. The rear garden level was roughly between 76.00 – 76.60m AOD.

The topography of the surrounding area was noted to be on a south-facing slope. It was however noted to be less than 7° steep.

The site is not in close proximity to any National Rail lines; however the North London Line and Hampstead Health Railway Station was noted ~150 – 250m south of the site, noted to be within railway cuttings No London Underground tunnels were noted within a 250m radius of the site. The site was considered to be not sufficiently close to underground transport services, in order for these to affect the property and there are no approved proposals for any TfL services in the vicinity that would affect the development.

During the site walkover, no evidence was noted to suggest basements/lower ground floors were present within surrounding properties; however there may be floor levels which are built into the slope profile of the surrounding area.

2.6. Hydrogeology and Hydrology

The DEFRA online maps indicated that the site was located on Unproductive Strata associated with the London Clay Formation. The nearby Claygate Member of the London Clay Formation was also classified as an Unproductive Strata. There was no classification for superficial deposits, given their likely absence; however, the site was in an area with propensity for Head Deposits. Head Deposits, if encountered, were likely to be classified as a Secondary (Undifferentiated) Aquifer. Classifications of these aquifers has been provided below.

- Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.
- Secondary Aquifers include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. There are three different types of Secondary Aquifers:
    - Secondary A Aquifers typically comprise permeable layers, capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. They are generally aquifers formerly classified as Minor Aquifers by the Environment Agency.
    - Secondary B Aquifers typically comprise predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
    - Secondary (undifferentiated) Aquifers are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

The Number 1 Hampstead Heath Pond was noted ~210m west of the site, with two additional ponds noted to the north. No other surface water features or watercourses were present within a 250m radius of the site.

Examination of Environment Agency records demonstrate that the site was not located within a Groundwater Source Protection Zone (SPZ).

From analysis of hydrogeological and topographical maps, the actual groundwater table was anticipated to be encountered at depth; however, groundwater could be encountered at shallow

depth within superficial Head Deposits capping the underlying, relatively impermeable London Clay Formation, if they are located on-site. It was considered that the groundwater was flowing southwards, in alignment with local topography. Perched water was also likely to be found within the Made Ground and underlying strata where silty/sandy/gravelly bands are noted, especially after periods of intense or prolonged rainfall.

2.7. Flooding

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of fluvial or coastal flooding). The site was not protected by flood defences or benefiting from flood storage. The flood map for planning can be viewed within Figure 12, with the risk of flooding from rivers and seas map provided within Figure 13.

The site and adjacent properties were at very low risk of surface water flooding. Tanza Road was also noted to be at very low risk of surface water flooding; however, some nearby areas, especially rear gardens, were noted to have a low risk of surface water flooding. The risk of flooding from surface water map has been provided within Figure 14. The details of each classification can be viewed below.

- Very low risk means that each year this area has a chance of flooding of less than 0.1%
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.
- High risk means that each year this area has a chance of flooding of greater than 3.3%.

The site and immediate site environs were also not at risk from reservoir flooding. The risk of flooding from reservoirs map has been provided within Figure 15.

Camden also has a small risk of groundwater flooding, which takes two principal forms. The most common form of groundwater flooding in Camden is from ‘perched’ groundwater, water that becomes lodged between the top layer and the impermeable London Clay layer. The risk of this type of flooding is difficult to model but has been recorded in parts of the borough, notably Kilburn, Fortune Green and West Hampstead, and will need to be considered and mitigated against in any new development. Aquifer based groundwater flooding is relatively rare in Camden, but it is possible in areas around Hampstead Heath and in the very south of the borough. This occurs when the water table rises due to prolonged heavy rain.

From analysis of hydrogeological and topographical maps, groundwater was anticipated to be encountered at depth; however, perched groundwater could be encountered within the Made Ground and Head Deposits (should they be encountered), capping the underlying London Clay Formation. It was considered that the groundwater was flowing southwards, in alignment with local topography. Perched water was also likely to be found within the Made Ground and underlying strata where silty/sandy/gravelly bands are noted, especially after periods of intense or prolonged rainfall.

The site was not classified as being within an area where increased susceptibility to elevated groundwater was noted. There are no actual records of groundwater flooding affecting a property within a 250m radius of the site; however, the groundwater flood incident records from the Environment Agency shows groundwater flooding incident occurred ~150m west of the site, close to

South Hill Park. No other groundwater flooding incidents were recorded within a 250m radius of the site. A map of information regarding groundwater flooding can be viewed within Figure 16.

The site was not located within a post code area where either internal or external sewer flood events were recorded. Maps regarding internal sewer flood events and external sewer flood events can be viewed within Figure 17 and 18.

The site was noted to be within the Counter's Creek Catchment CDA, as shown by Figure 19. The site was however not located within any other Critical Drainage Areas or Local Flood Risk Zones, as shown by Figure 20. A Critical Drainage Area (CDA) is described as "a discrete geographic area and usually a hydrological catchment, where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones (LFRZ)." A Local Flood Risk Zone (LFRZ) is described as "a discrete area of flooding that does not exceed the national criteria for a Flood Risk Area but affects houses, businesses and/or local infrastructure. The boundary is defined as the actual spatial extent of predicted flooding in a single location."

The site was located within the hydraulic catchment of Counter's Creek, a larger sewer drainage system that spans the London boroughs of Brent, Ealing, Hounslow, Camden, Hammersmith and Fulham, Kensington and Chelsea and the City of Westminster. A Policy Area (Group3_008) (multiple CDAs linked together to provide a planning policy tool for the end users) has been drawn to match this catchment as almost all flooding issues spanning this area are interlinked due to the sewer network. Over the last 20 years, changes in land use, planning and population have meant an increase in the volume of water entering the system and the speed at which it gets there have increased. The extent of the CDA and the LFRZ have been validated against sewer flooding data from TWUL as well as historical flood data and other information gained from meetings with the boroughs within the catchment.

2.8. Radon

BRE 211 (2015) Map 5 of the London, Sussex and west Kent area indicated that the site **was not** located within an area where mandatory protection measures against the ingress of radon were likely to be required.

A review of the freely available Public Health England radon database, UK Radon, indicated that the site was located within a 1km grid square, where the maximum radon potential of <1% was recorded. Basic radon protection measures are required in areas where more than 3% of houses are at or above the Action Level.

The site was therefore assessed as being within an area where a risk assessment was not required.

2.9. Unexploded Ordinance Risk

A review of the data available on www.zeticauxo.com/ revealed the site was located within the London low to moderate risk area associated with unexploded ordnance (UXO). The London area is further separated into 25No. categories based on bombing densities, where green is indicated for areas having <10 bombs dropped per km^2 and red is indicated for areas having >150 bombs dropped per km^2. The site is situated within the light orange to yellow area. One record of a UXO finding was noted within a 250m radius of the site, ~150m south-west of the site.

2.10. Historical Landfill Tool Review

A review of the data available on www.groundsure.io/ revealed no areas of historical or authorised landfill within a 250m radius of the site.

3. HISTORICAL REVIEW

3.1. Historical Map Review

The object of this search was to report on the history of the site and its environs from available County Series and Ordnance Survey Maps dating from the mid to late 19th Century to the present day and downloaded from Groundsure. In the following sections dealing with individual maps, only features considered to have a potential contaminative impact on the site and usually within a notional 250 metre radius of the site boundaries are discussed. Any distances quoted for features remote from the site have been scaled from the maps and are only approximate. The north point and approximate extent of the site are indicated on each figure. The historical maps referred to are given within Appendix C. The implications of the map search are discussed later within this report.

It should be noted that the maps are for the adjacent parcel of land for 20 Tanza Road. The site (22 Tanza Road is noted immediately to the north-west of the boundaries within the maps.

Environmental Significance of Data from Historical Maps		
Date	**Site**	**Environs**
1870	At the time of the earliest historical map (1870), the site was noted to be undeveloped.	At the time of the earliest historical map (1870), the immediate site environs were noted to comprise undeveloped land. A railway line was noted ~175m south of the site, noted to be within extensive cuttings. Hampstead station was noted along this railway line ~300m south-west of the site. Hampstead Ponds (New River Companys Waterworks Reservoirs) were noted ~250m west of the site. Brickfields were noted ~250m north-west of the site, with associated embanked land also noted.
1894 – 1896	No significant changes were noted from the previous map(s).	By the mid 1890s, large scale development occurred around the site, mainly residential. Tanza Road was noted immediately north-east of the site. Other nearby roads, including Parliament Hill Road and Nassington Road were also noted. All three of these roads were noted to have structures resembling residential development along them. The cuttings associated with the railway line ~175m south of the site slightly reduced in extent. Whilst the brickfields were no longer noted, embanked land associated with them remained ~250m north-west of the site. No other significant changes were noted from the previous map(s).
1915	By the mid 1910s, a structure was noted on-site. No other significant changes were noted from the previous map(s).	Further development occurred along Tanza Road, resembling residential housing, including 20 Tanza Road noted immediately to the south-east of the site. No other significant changes were noted from the previous map(s).
1952	By the early 1950s, a minor extension was noted to the north-west of the structure, which no had a similar layout to that noted within the site walkover. No other significant changes were noted from the previous map(s).	An embanked area of land was noted ~250m south-east of the site. A garage was noted ~250m south-west of the site. No other significant changes were noted from the previous map(s).
1972 – 1974	No significant changes were noted from the previous map(s).	The embanked area of land noted ~250m south-east of the site was no longer noted. No other significant changes were noted from the previous map(s).

Environmental Significance of Data from Historical Maps		
Date	**Site**	**Environs**
1978	No significant changes were noted from the previous map(s).	An electricity sub-station was noted ~100m north-west of the site. No other significant changes were noted from the previous map(s).
1985	No significant changes were noted from the previous map(s).	Large areas of the cuttings to the north of the railway line ~175m south of the site were reprofiled and converted into allotment gardens. No other significant changes were noted from the previous map(s).
1987 – 1991	No significant changes were noted from the previous map(s).	A number of relatively small properties were constructed in undeveloped parcels of land between the houses/gardens of Tanza Road, Parliament Hill Road and Nassington Road. No other significant changes were noted from the previous map(s).

3.2. Historical Aerial Photography Review

The object of this search was to report on the history of the site and its environs from available Aerial Photography dating from the mid-20th Century to the present day and downloaded from Google Earth and Groundsure. In the following sections, only features considered to have a potential contaminative impact on the site and usually within a notional 250 metre radius of the site boundaries are discussed. Any distances quoted for features remote from the site have been scaled from the photography and are only approximate.

At the time of the earliest aerial photography, 1945, the site appears to be occupied by a structure, similar to that noted during the site walkover. The surrounding land-uses comprised structures anticipated to be residential dwellings, which had similar layouts to that noted during the site walkover.

4. GROUNDSURE DATASHEETS REVIEW

4.1. Groundsure Datasheets

GroundSure Environmental and Geological Datasheets were obtained for the site. Unless the data indicates a significant risk, only information within a 250m buffer zone has been included. The GroundSure Datasheets are also presented in Appendix C and a summary is given below and overleaf(s).

Environmental Insight	
Source	**Nearest Distance from Site/Dated/Type**
Past Land Use	
Historical industrial land uses	• 23 offsite records of cuttings, railway sidings and railway buildings noted 144 – 242m S/SE/SW (1869 – 1974)
Historical Energy Features Database	• 1 offsite record of electricity substation noted 120m NW (1978 – 1991)
Historical Garages Database	• 2 offsite records of garages 245 – 246m SW (1952 – 1953)
Current Industrial Land Use	
Recent Industrial Land Uses	• 1 offsite record of electricity substation noted 123m NW
Hydrogeology	
Bedrock Aquifer	• 1 onsite record of Unproductive Strata • 1 offsite record of Secondary A Aquifer 145m N
Groundwater Vulnerability	• 1 onsite record with low leaching class within soil and surface, and no vulnerability to underlying aquifers
Hydrology	
Surface Water Features	• 2 offsite records noted >200 west of the site, associated with the Hampstead Heath ponds
WFD Surface Water Body Catchments	• 1 onsite coastal catchment (water body ID 128)
River and Coastal Flooding	
Surface Water Flooding	• Negligible risk on-site and within 50m of the site.
Groundwater Flooding	• Negligible risk on-site and within 50m of the site.
Environmental Designations	
SSSI Impact Risk Zones	• 1 onsite and surrounding area record relating to infrastructure; minerals, oil and gas; air pollution; combustion; waste; and water supply
Visual and Cultural Designations	
Listed Buildings	• 1 offsite record relating to 31 South Hill Park, 194m W • 1 offsite record relating to 78 South Hill Park, 205m W • 1 offsite record relating to 80 – 90 South Hill Park (evens), 211m NW
Conservation Areas	• 1 onsite record relating to South Hill Park • 1 offsite record relating to Mansfield, 176m S
Agricultural Designations	
Agricultural Land Classification	• 1 onsite record relating to Urban Classification • 1 offsite record relating to Non Agricultural Classification 73m NW
Open Access Land	• 1 offsite record relating to Hampstead Health 204m W
Habitat Designation	
Priority Habitat Inventory	• 26 offsite records relating to deciduous woodland, lowlands heathland and good quality semi-improved grassland 46 – 246m in all directions.
Habitat Networks	• 1 onsite record relating to Network Enhancement Zone 2 • 1 offsite record relating to Primary Habitat 54m E • 1 offsite record relating to Network Enhancement Zone 2 168m NE • 1 offsite record relating to Associated Habitats 193m SE • 1 offsite record relating to Associated Habitats 214m W
Geology	
Bedrock Geology	• 1 onsite record relating to London Clay Formation – Clay, Silt and Sand • 1 offsite record relating to Claygate Member – Clay, Silt and Sand 145m N
Bedrock Permeability	• 1 onsite record relating to mixed flow of very low to moderate permeability

Environmental Insight	
Source	**Nearest Distance from Site/Dated/Type**
Natural Ground Subsidence	
Shrink Swell Clays	• Moderate onsite risk
Running Sands	• Very Low onsite risk
Compressible Deposits	• Negligible onsite risk
Collapsible Deposits	• Very Low onsite risk
Landslides	• Very Low onsite risk
Ground Dissolution of Soluble Rocks	• Negligible onsite risk
Mining, Ground Workings and Natural Cavities	
Surface Ground Workings	• 16 offsite records of Cuttings >100m S (1869 – 1974) • 15 offsite records of Ponds/Reservoirs >200m W/NW (1873 – 1996)
Radon	
Radon	• 1 onsite record estimated less than 1% of properties affected and no radon protection measures required
Soil Chemistry	
BGS Estimated Background Soil Chemistry	• 1 onsite record with no available data • 1 offsite record with no available data 38m SW
BGS Estimated Urban Soil Chemistry	• 2 onsite records and 4 offsite records within 50m: arsenic 17 – 22mg/kg, lead 193 – 308mg/kg, cadium 0.4 – 0.5mg/kg, chromium 75 – 102mg/kg, copper 52 – 69mg/kg, nickel 22 – 28mg/kg, tin 12 – 29mg/kg
Railway Infrastructure and Projects	
Historical Railways and Tunnel Features	• 30 offsite records of Cuttings 136 – 221m S/SW
Railways	• 5 records of the North London Line/not given 180 – 243m S/SW

5. ONLINE REVIEW AND PREVIOUS SITE INVESTIGATIONS

5.1. Online Planning Database

A review of the Camden Council Planning Database revealed that eight planning applications had been filed for the site. Those pertinent to the site development area are tabulated below.

Summary of Planning Applications		
Application No./Date	**Proposed**	**Decision**
TP/82400/NW/12374 16/09/1958	Erection of a private garage at No.22 Tanza Road, Hampstead, and the formation of a means of access to the highway.	Conditional 20-10-1958
P9603250 28/10/1996	Erection of single storey extension at rear ground floor level, as shown on drawing numbers, A0202/100, /111.	Grant Full Planning Permission 11-12-1996
C9603251 28/10/1996	Demolition of existing single storey rear extension at ground floor level, as shown on drawing numbers, A0202/100, /111.	Grant Conservation Area Consent 11-12-1996
2006/0237/T 13/01/2006	REAR GARDEN: 1 x Acacia Delbata - Crown reduction of 75%. 1 x Prunus - Crown thin 30-40%.	No Objection to Works to Tree(s) in CA 13-02-2006
2013/1146/T 01/03/2013	DD - REAR GARDEN: 1 x Cherry - Fell - DD.	No Objection to Emergency Works (CA) 08-04-2013
2016/5955/T 31/10/2016	REAR GARDEN: 1 x Bay (T2) - reduce height by one third and prune sides up to 1m to shape 1 x Fig (T3) - reduce crown by up to 3m 1 x Maple (T6) - O.5 metre crown reduction, remove branch over lawn and dead branches 1 x Olive (T7) - reduce vertices branches by 0.5 metres.	No Objection to Works to Tree(s) in CA 09-12-2016
2019/5979/T 29/11/2019	REAR GARDEN: 1 x Bay (T1) - Fell to ground level.	No Objection to Works to Tree(s) in CA 10-01-2020
2019/5753/P 11/12/2019	Erection of a single storey rear extension to dwelling house (Class C3).	Granted 31-01-2020

5.2. Previous Investigations

No other reports of previous Desk Studies and Ground Investigations were available for the site at the time of the preparation of this Desk Study.

5.3. Internet Search

No further information considered pertinent to this Desk Study was obtained via an internet search for the site.

6. PHASE I RISK ASSESSMENT

6.1. Contaminant Source-Pathway-Receptor Model

In the UK, the assessment of risk from contamination follows the source-pathway-receptor (SPR) approach. For a risk to be present there must be a source of contamination, a receptor or receptors, and a pathway for contaminants to migrate or be absorbed. If one of these three elements are absent, it is considered that there is no risk of harm. If, however, there is a linkage between any given source and any given receptor, then a risk-based approach is used to assess the significance or impact of the pollutant linkage.

The Phase 1 Desk Study has been used to identify potential on-site and off-site sources of contamination, which are summarised in this section of the report. Additional potential sources of contamination identified within the Desk Study have been discounted based on the absence of a realistic SPR linkage (i.e. the distance from the site or the nature or age of any potential contamination sources).

In line with the requirements of BS 21365:2020, *Soil Quality – Conceptual site models for potentially contaminated sites*, the Conceptual Site Model (CSM) can be described in text, tabulated or presented as a figure. A tabulated CSM is provided in Section 6.6 of this report, where each component is discussed in the following sections. A diagrammatic CSM is provided within Figure 6.

6.2. Potential On-site Sources of Contaminants

This Desk Study revealed that at the time of the earliest historical mapping (1870) the site comprised undeveloped fields until the mid 1910s, where a structure was noted on-site. By the early 1950s, a minor extension was noted to the north-west of the structure, which no had a similar layout to that noted within the site walkover.

The Phase 1 Desk Study revealed the following on-site sources of contamination:

- The site has undergone various phases of construction/demolition and as a result various thicknesses of Made Ground resulting from these activities are likely to be encountered.

  Contaminants of concern associated with Made Ground deposits include; metals, Petroleum Hydrocarbons (TPHs), Polycyclic aromatic hydrocarbons (PAHs), asbestos, sulphates, volatile organic compounds (VOCs) and ground gases.

- The risk posed to building materials and services in contact with the Made Ground and underlying natural soils must be assessed.

  Concerns include acidic pH and elevated sulphates corroding concrete, as well as PAHs leaching into water pipes.

- Due to the age of the buildings, asbestos containing materials (ACMs) are likely to be present within structures on site. There is also the possibility that any demolition materials within the Made Ground from previous phases of demolition, refurbishment and construction may be present.

An asbestos survey and associated removal works must be carried out within all of the structures to be demolished. This is standard good practice and all materials will need to be removed in line with current legislation prior to clearance. The potential for the presence of ACMs is considered to be moderate due to the age of the structures on site.

6.3. Potential Off-site Sources of Contaminants

The Phase 1 Desk Study revealed the following potential off-site sources of contamination:

- At the time of the earliest historical map (1870), railway land within extensive cuttings were noted ~175m south of the site. The cuttings slightly reduced in extend by the mid-1890s. By the mid-1980s, large areas of the cuttings were reprofiled and converted into allotment gardens.

  Putrescible material may have been used to during the development of the railway cuttings, which in turn could decay to produce ground-gas; however, given the time since development, the risk of large scale ground-gas production still ongoing is limited. In addition, any fill would likely be at surface, uncapped, with preferential pathways for migration to surface.

  A railway line may be a potential source of contaminants such as heavy metals, semi-metals, Polycyclic Aromatic Hydrocarbons (PAH's), petroleum hydrocarbons and ethylene glycol (anti-freeze). Given the limited development noted onsite it was considered unlikely that any fill from the railway would have been imported onto site. Given the railway is located in a deep cutting the risk of contaminants migrating from the source onto the site, via surface water etc, was considered to be low.

- At the time of the earliest historical map (1870), the immediate site environs comprised undeveloped land; however, over time, large scale development occurred around the site, mainly for residential land use. By the early 1950s, a garage was noted ~250m south-west of the site.

  The potential contaminants of concern include heavy metals and semi-metals, poly-cyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), BTEX compounds, asbestos/asbestos containing materials (ACMs), volatile and semi-volatile organic carbons (VOCs and SVOCs), cyanide and phenol, as well as harmful pH.

- At the time of the earliest historical map (1870), brickfields were noted to extend >250m north-west of the site, with associated embanked land also noted. The brickfield was no longer noted by the mid-1890s; however, the embanked land remained.

  Putrescible material may have been used to backfill the brick field which in turn could decay to produce ground-gas; however, given the time since backfilling, the risk of large scale ground-gas production still ongoing is limited. In addition, any fill would likely be at surface, uncapped, with preferential pathways for migration to surface.

- By the late 1970s, an electricity sub-station was noted ~100m north-west of the site.

High-voltage electricity sub-stations may be a potential source for Polychlorinated Biphenyls (PCBs), especially in pre-1970's sub-stations. PCB oils and other cable/transformer oils, together with a series of waxes are commonly used in mainly high voltage applications. PCBs are generally toxic; however, newer (post-1970's) forms of non-toxic oils and waxes have replaced the use of PCBs. All cable oils are extremely viscous and adhere strongly to soil particles and do not tend to migrate far from the point of leakage or spillage. Therefore, given the distance and age of the electricity sub-station, it was concluded that the potential risk of encountering PCBs on the site was negligible, and therefore discounted from further assessment.

6.4. Potential Receptors

At the time of reporting, May 2021, the proposed development comprised the underpinning of the existing semi-basement from its original level (75.96m AOD) to 74.47m AOD. Assuming the slab thickness is ~500mm, this equates to an overall underpin depth of ~2.00m and the basement being founded at ~73.96m AOD.

Based on the proposed development, the potential receptors are presented below and comprise:

Human Health

- End users of the site (Residents/Future site visitors);
- Construction workers during redevelopment;
- Site operatives during maintenance works; and
- Neighbours and members of the public.

Flora and Fauna

- Vegetation within soft landscaped areas;
- Habitat networks

Building Materials and Services

- Buildings;
- Buried concrete;
- Confined spaces; and
- Underground services (Water Pipes).

Controlled Waters

- Potential Secondary (Undifferentiated) Aquifer underlying the site, if Head Deposits are encountered; and
- Hampstead Heath ponds ~210m west of the site.

Ground-Gas

- Buildings/End Users (especially with confined spaces)

6.5. Contaminant Absorption Pathways

The potential pathways for contaminant absorption between the identified sources and the identified receptors are as follows:

Human Health:

- Direct ingestion of soil and soil derived dust;
- Dermal contact of soil and soil derived dust;
- Inhalation of dust (indoors and outdoors) with elevated concentration of determinands;
- Ingestion of home-grown produce, and soil attached;
- Direct ingestion of groundwater;
- Inhalation of volatile vapour (indoors and outdoors);
- Inhalation of ground gases.; and
- Explosion.

Flora and Fauna

- Direct uptake of groundwater; and
- Direct uptake of contaminants in the soil.

Building Materials and Services

- Direct contact;
- Explosion.

Controlled Waters

- Vertical and lateral migration in permeable strata horizons;
- Via anthropogenic pathways (infilled ground and service runs);
- Surface water Runoff.

6.6. Tabulated Conceptual Site Model

The tabulated Conceptual Site Model developed as part of this Desk Study is outlined overleaf. For ease of reference and understanding, the risks have been classified within this risk assessment against four possible levels / categories, summarised in the table below.

Risk Categories used in the Tabulated CSM	
Risk	**Risk Description**
Negligible	Regarding this potential SPR linkage, the site is considered suitable for the proposed end-use and there is no plausible risk. Therefore, there is no need to further assess this potential source of contamination.
Low Risk	Regarding this potential SPR linkage, the site is considered suitable for the proposed end-use and there is not considered to be an unacceptable risk to receptors. However, it is considered that further investigation to confirm this is recommended.
Moderate Risk	Regarding this potential SPR linkage, the site may not be suitable for the proposed end-use in its current condition and there may be an unacceptable risk to receptors. Further investigation is required to confirm this.
High Risk	Regarding this potential SPR linkage, the site is probably or certainly not suitable for proposed end-use and there is likely to be an unacceptable risk to receptors. Contaminants probably or certainly present and urgent action required in the short term.

Tabulated Conceptual Site Model – Pollutant Linkage Summary			(On-Site Sources)
Potential Sources	**Potential Absorption Pathways**	**Potential Receptors**	**Risk Classification**
Made Ground from construction/ demolition activities: • Asbestos, • PAHs, • TPHs, • VOCs, • Sulphates, and • Metals.	• Direct ingestion of soil and soil derived dust • Dermal contact of soil and soil derived dust • Inhalation of dust (indoors and outdoors) with elevated concentration of determinands • Ingestion of home-grown produce, and soils attached • Direct ingestion of groundwater • Inhalation of volatile vapour (indoors and outdoors)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development • Site operatives during maintenance works • Neighbours and public	**Moderate**
	• Direct uptake of groundwater • Direct uptake of determinands in the soil	**Flora and Fauna** • Vegetation within soft landscaped areas • Habitat networks	**Moderate**
	• Anthropogenic (man-made) pathways • Vertical and lateral migration in permeable strata • Surface water runoff	**Controlled Waters** • Potential Secondary (Undifferentiated) Aquifer underlying the site, if Head Deposits are encountered; and • Hampstead Heath ponds ~210m west of the site.	**Low**
Aggressive ground conditions with Made Ground and natural ground, including groundwater: • Sulphates, • PAH/TPH.	• Direct contact with aggressive ground conditions	**Building Materials and Services** • Buildings; • Buried concrete; • Confined spaces; and • Underground services (Water Pipes).	**Moderate**
Asbestos Containing Materials within the building's fabric	• Direct ingestion of soil and soil derived dust • Dermal contact of soil and soil derived dust • Inhalation of dust (indoors and outdoors) with elevated concentration of determinands • Ingestion of home-grown produce, and soils attached • Direct ingestion of groundwater • Inhalation of volatile vapour (indoors and outdoors)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development • Site operatives during maintenance works • Neighbours and public	**Moderate**
Ground gases generated by Made Ground: • Methane, • Carbon Dioxide, • Hydrogen Sulphide, and • Carbon Monoxide.	• Migration through anthropogenic & natural pathways • Inhalation of Asphyxiating gases • Explosion (methane only)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development (especially in confined spaces) • Site operatives during maintenance works in confined spaces • Neighbours and public	**Low**
	• Migration through anthropogenic & natural pathways • Explosion (methane only)	**Building Materials and Services** • Buildings • Confined spaces • Underground services	**Low**

Tabulated Conceptual Site Model – Pollutant Linkage Summary			(Off-Site Sources)
Potential Sources	**Potential Absorption Pathways**	**Potential Receptors**	**Risk Classification**
Made Ground within the site environs, contemporary and historical industrial uses (railway, garage): • Asbestos, • PAHs, • TPHs, • VOCs, • Sulphates, and • Metals.	• Direct ingestion of soil and soil derived dust • Dermal contact of soil and soil derived dust • Inhalation of dust (indoors and outdoors) with elevated concentration of determinands • Direct ingestion of groundwater • Inhalation of volatile vapour (indoors and outdoors)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development • Site operatives during maintenance works • Neighbours and public	**Low**
	• Direct uptake of groundwater	**Flora and Fauna** • Vegetation within soft landscaped areas • Habitat networks	**Low**
	• Anthropogenic (man-made) pathways • Vertical and lateral migration in permeable strata • Surface water runoff	**Controlled Waters** • Potential Secondary (Undifferentiated) Aquifer underlying the site, if Head Deposits are encountered; and • Hampstead Heath ponds ~210m west of the site.	**Low**
Ground gases generated by nearby railway cuttings and backfilled brickfield: • Methane, • Carbon Dioxide, • Hydrogen Sulphide, and • Carbon Monoxide.	• Migration through anthropogenic & natural pathways • Inhalation of Asphyxiating gases • Explosion (methane only)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development (especially in confined spaces) • Site operatives during maintenance works in confined spaces • Neighbours and public	**Low**
	• Migration through anthropogenic & natural pathways • Explosion (methane only)	**Building Materials and Services** • Buildings • Confined spaces • Underground services	**Low**
Electricity sub-station • PCBs	• Direct ingestion of soil and soil derived dust • Dermal contact of soil and soil derived dust • Inhalation of dust (indoors and outdoors) with elevated concentration of determinands • Direct ingestion of groundwater • Inhalation of volatile vapour (indoors and outdoors)	**Human Health** • End Users (Residents/Future site visitors) • Construction workers during development • Site operatives during maintenance works Neighbours and public	**Negligible**
	• Direct uptake of groundwater	**Flora and Fauna** • Vegetation within soft landscaped areas Habitat networks	**Negligible**
	• Anthropogenic (man-made) pathways • Vertical and lateral migration in permeable strata • Surface water runoff	**Controlled Waters** • Potential Secondary (Undifferentiated) Aquifer underlying the site, if Head Deposits are encountered; and • Hampstead Heath ponds ~210m west of the site.	**Negligible**

6.7. Recommendations and Phase II Objectives

This section of the report will present recommendations for the further investigation of each plausible pollutant linkage identified by the Conceptual Site Model.

It is recommended that an intrusive ground investigation is undertaken at the site to evaluate the risk that contaminants of concern within the soils and groundwater may affect end-users. This should determine the underlying ground and groundwater conditions and include an assessment of the level of contamination to enable the quantification of the ground-related risks associated with the proposed redevelopment.

Consideration should be given to the testing of soil samples recovered from exploratory holes for chemical laboratory testing. The testing should be for a broad range of contaminants in accordance with DEFRA / CLEA methodologies and include the contaminants of concern identified within the Conceptual Site Model.

6.7.1. Soils

It is possible that asbestos and asbestos containing materials will be incorporated within any Made Ground. An asbestos management strategy should be implemented to ensure that any asbestos uncovered during the investigation does not pose a risk to members of the public that use the site.

On the basis of the Phase 1 Site Assessment the following contaminants of concern have been identified and should be included in the chemical analysis suite for the ground investigation:

- Asbestos.
- Semi-metals and heavy metals;
- Poly-cyclic aromatic hydrocarbons (PAHs);
- Speciated TPH including full aliphatic/aromatic split;
- Volatile/semi-volatile organic compounds – BTEX Used as marker compounds;
- Sulphates;
- pH
- Cyanide;

The list above does not imply that these determinands are present on-site or that they are likely to cause contamination issues at the site. The ground investigation will be used to prove the presence or absence of these contaminants. The sampling and testing strategy must be in line with current standards. Given the site has undergone various phases of building and demolition, random sampling should be adopted across the site. Targeted sampling of proposed soft landscaped areas may be deemed appropriate. Results should be assessed against suitable assessment criteria to be protective of human health as well as vegetation.

Sub-surface concrete may be damaged due to being in contact with aggressive ground conditions. Sampling should be undertaken where the proposed foundations will be in contact with Made Ground and/or natural ground and tested for aggressive ground conditions (sulphates/pH). Classification should then be undertaken of the ground conditions in accordance with Building Research Establishment Special Digest 1, 2005, ‘Concrete in Aggressive Ground’.

6.7.2. Services

The CSM has identified a moderate risk for aggressive ground conditions that may affect water supply pipes as part of the development. Consideration should be given to the targeted sampling (0.75 – 1.50m bfgl) and scheduling for contaminants of concern.

6.7.3. Groundwater/Controlled waters

If analytical results show elevated concentrations of contaminants of concern in the soil samples then there might be a requirement to assess the potential risks of leachability of contaminants migrating into the groundwater/perched water underlying the site. This might mean leachate testing on soils samples is required or groundwater sampling and testing. This risk of groundwater or controlled waters being affected however is considered low, due to the ground conditions expected.

6.7.4. Ground-gas

The CSM has identified a low risk from ground gases at the site as a result of limited Made Ground on-site or within the site's environs. Other potential off-site sources were identified but dismissed for further risk assessment, as analysed in Section 6.3.

Regarding the on-site Made Ground, analysis of soil samples should include Total Organic Carbon (TOC) testing in order to enable a pragmatic ground gas risk assessment to be undertaken at the site. This approach will only quantify the risk associated with on-site sources.

6.8. Geotechnical Review

The BGS have identified the following natural hazards on-site and within a 50m buffer.

Natural Hazards	
Hazard	**On-site Risk Classification**
Shrink-Swell Clay	Moderate risk on-site.
Running Sands	Very Low risk on-site.
Compressible Deposits	Negligible risk on-site.
Collapsible Deposits	Very Low risk on-site.
Landslides	Very Low risk on-site.
Ground Dissolution of Soluble Rocks	Negligible risk on-site.

When designing foundations, the potential presence of aggressive ground conditions should be taken into consideration. Further investigation may be required in accordance with the guidance established in BRE Special Digest 1 (SD1) (2005) 'Concrete in aggressive ground'. The BGS do not record any details regarding the potential for aggressive ground conditions within shallow units identified at the site.

It is recommended that as part of the site-specific ground investigation on-site, geotechnical testing is undertaken to determine the underlying ground conditions and to evaluate any geotechnical related risks associated with the proposed redevelopment of the site. The soils onsite are likely to have low permeability and may not be suitable for surface water disposal.

Since the proposed development comprises a basement, specific screening and scoping should be carried out in a Basement Impact Assessment, addressing the specific geotechnical risks and hydrogeological considerations regarding the site and the surroundings.

FIGURES

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

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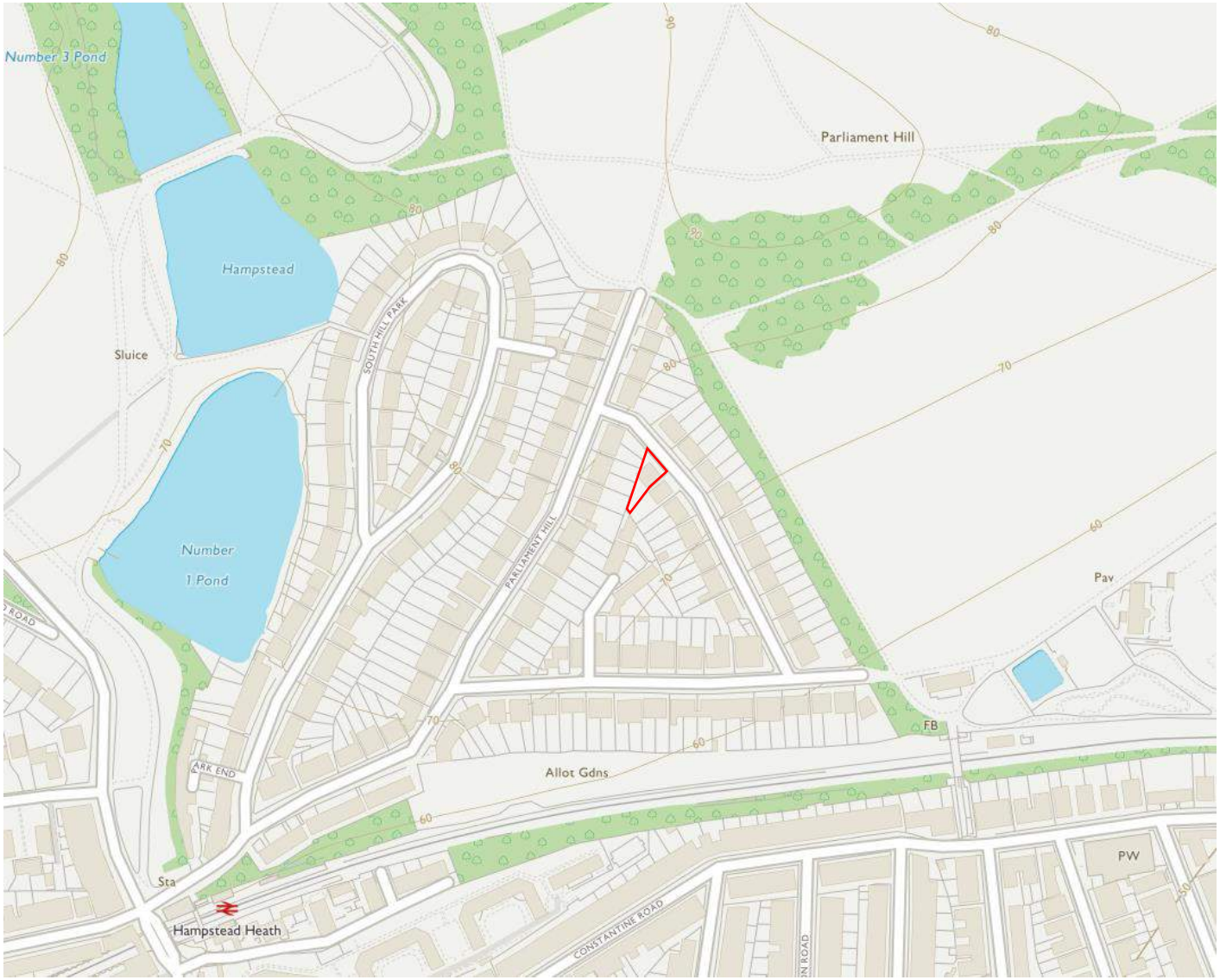

Approximate Site Development Area

Not to Scale

22 Tanza Road, Hampstead, London NW3 2UB	
Dan Wong & Robin Koshyk	**May 2021**
Figure 1: Site Location Plan	**GWPR4200**

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Approximate Site Development Area

Not to Scale

22 Tanza Road, Hampstead, London NW3 2UB

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Figure 2: Site Development Area	**GWPR4200**

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Approximate Site Development Area

Not to Scale

22 Tanza Road, Hampstead, London NW3 2UB	
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Figure 3: Aerial View of the Site	**GWPR4200**

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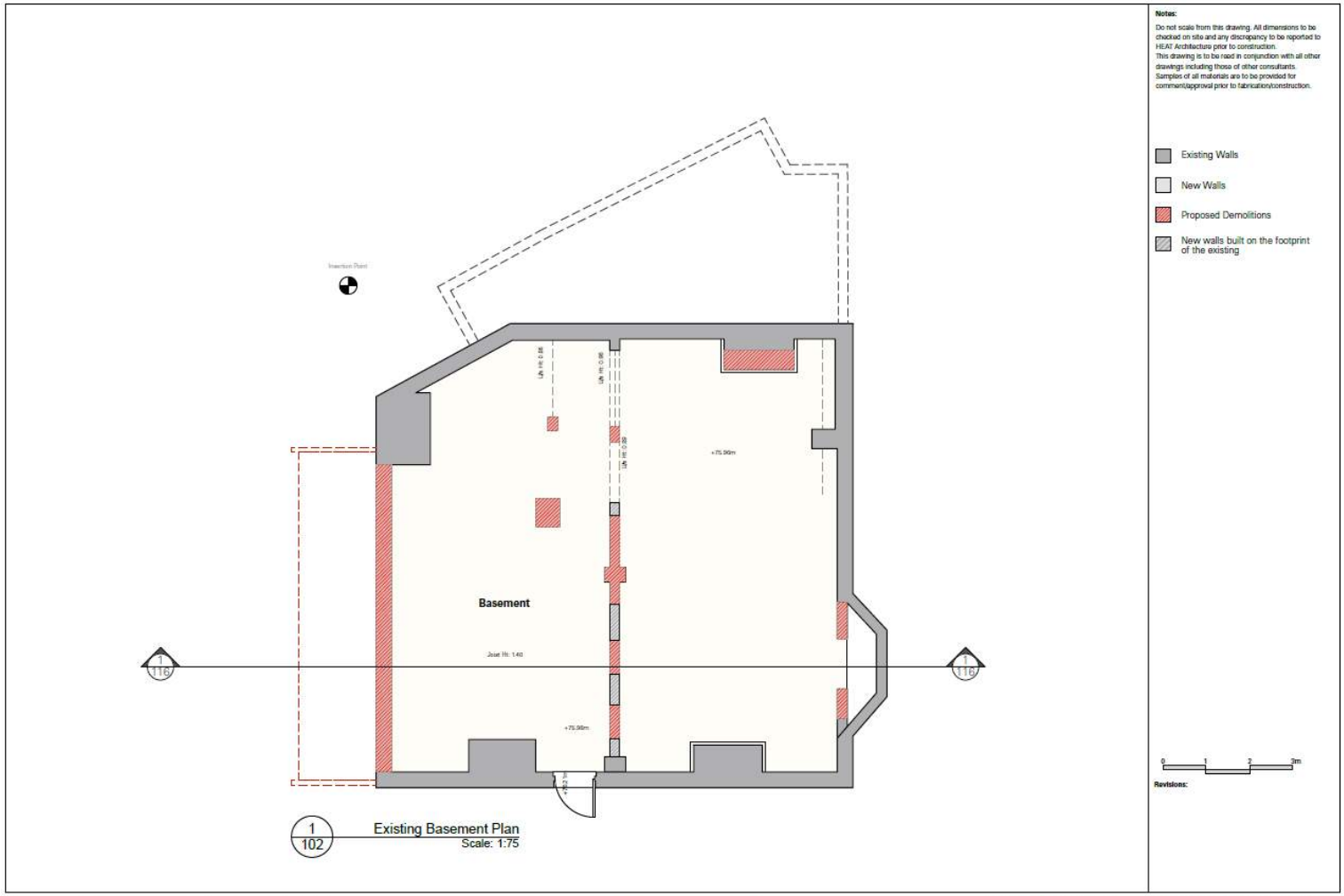

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Figure 4: Existing Development Undercroft Plan View	**GWPR4200**

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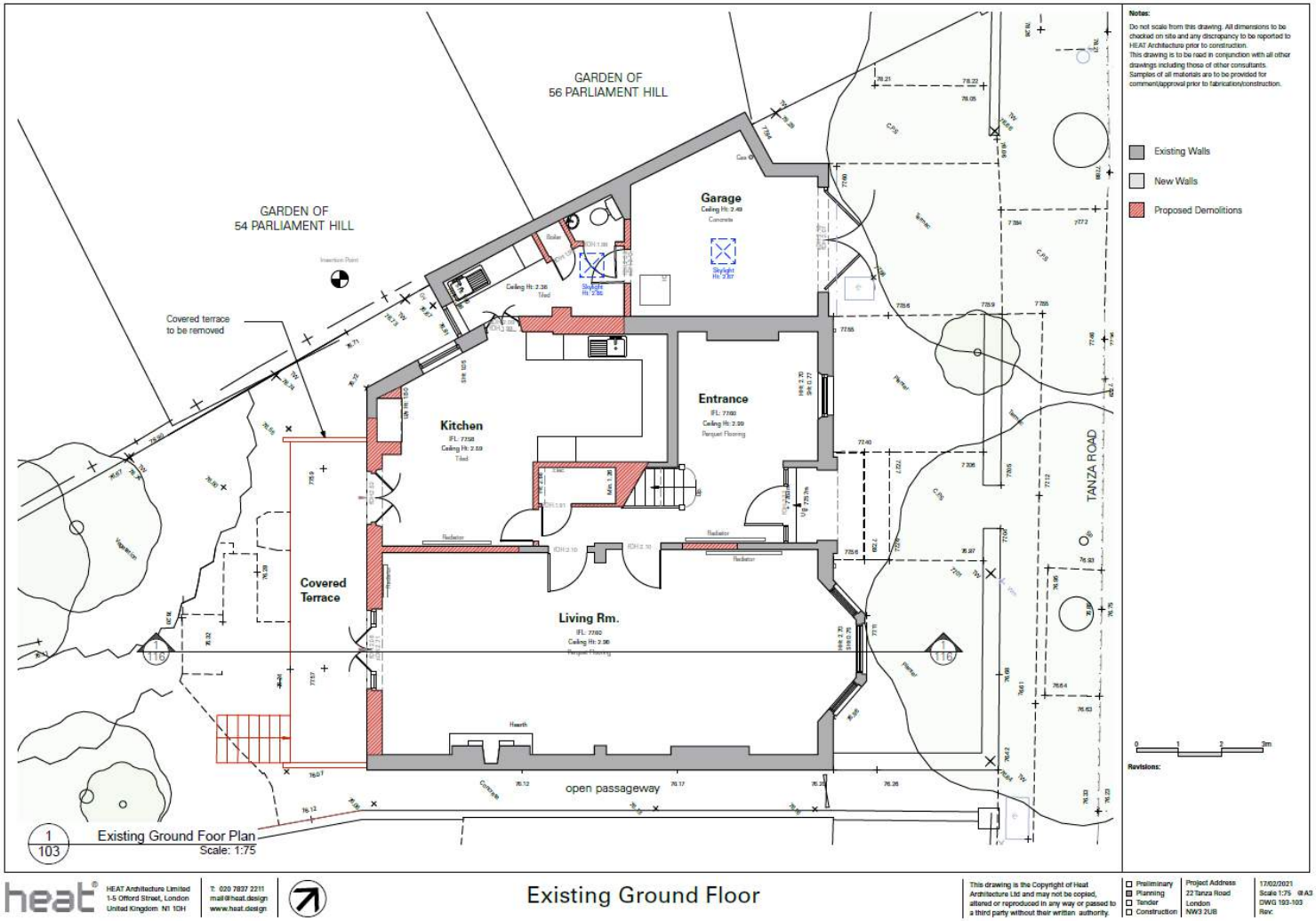

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22 Tanza Road, Hampstead, London NW3 2UB

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Figure 5: Existing Development Ground Floor Plan View	**GWPR4200**

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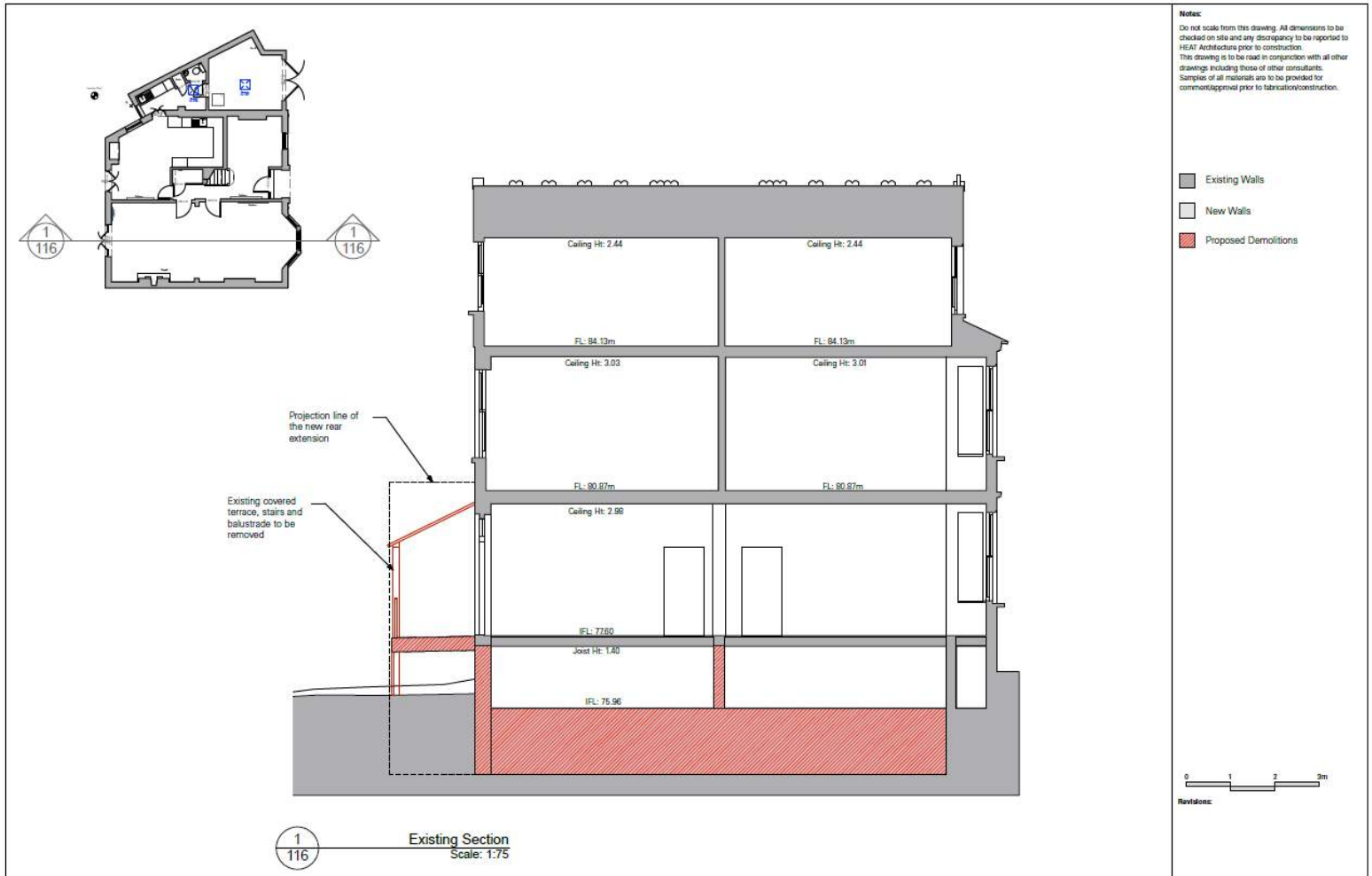

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22 Tanza Road, Hampstead, London NW3 2UB

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Figure 6: Existing Development Section View	**GWPR4200**

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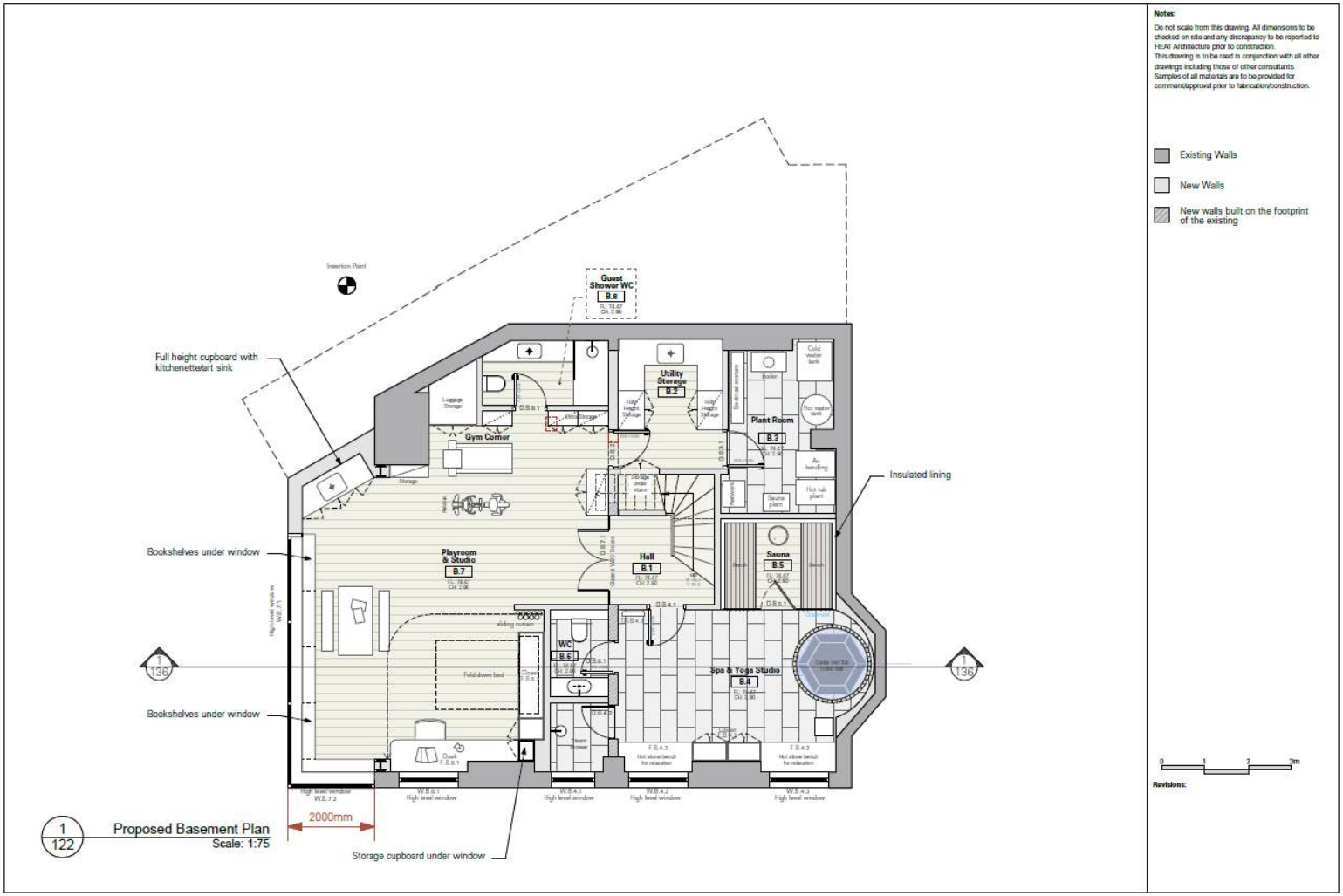

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22 Tanza Road, Hampstead, London NW3 2UB

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Figure 7: Proposed Development Basement Plan View	**GWPR4200**

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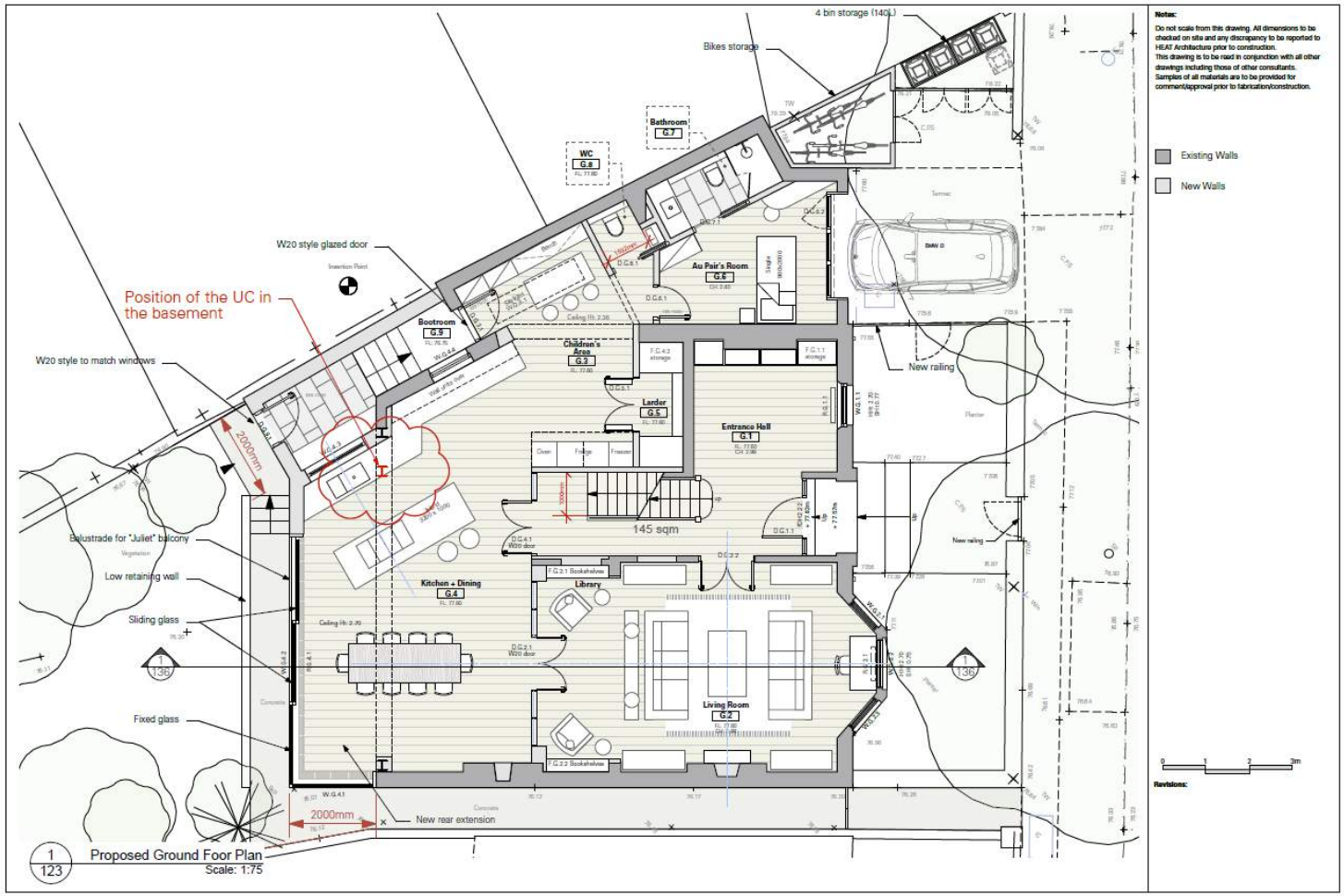

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Proposed Ground Floor

☐ Preliminary ☒ Planning ☐ Tender ☐ Construction

Project Address: 22 Tanza Road, London NW3 2UB

17/02/2021 | Scale 1:75 @A3 | DWG 193-123 | Rev:

Not to Scale

22 Tanza Road, Hampstead, London NW3 2UB

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May 2021

Figure 8: Proposed Development Ground Floor Plan View

GWPR4200

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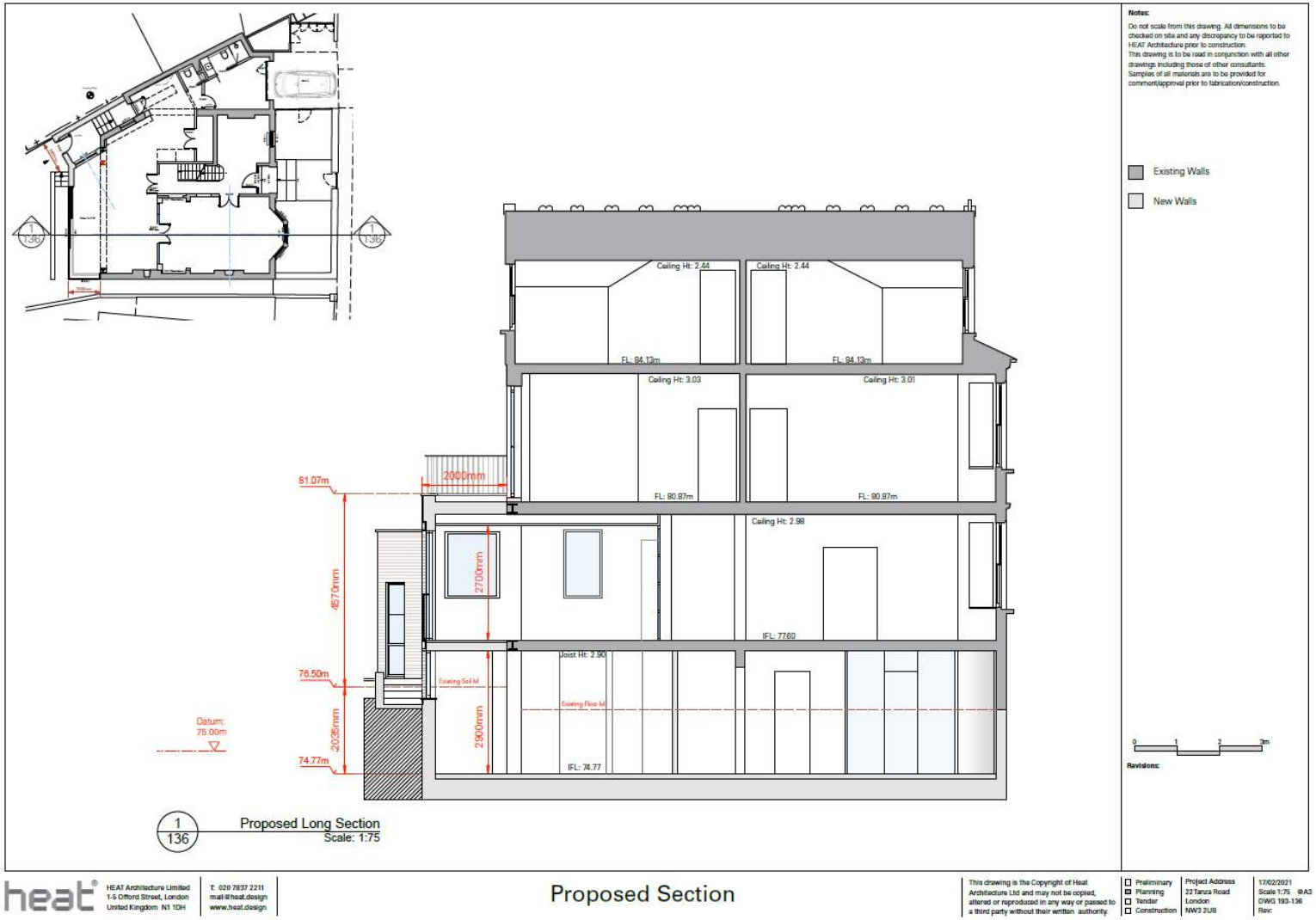

Not to Scale

22 Tanza Road, Hampstead, London NW3 2UB

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Figure 9: Proposed Development Section View	**GWPR4200**

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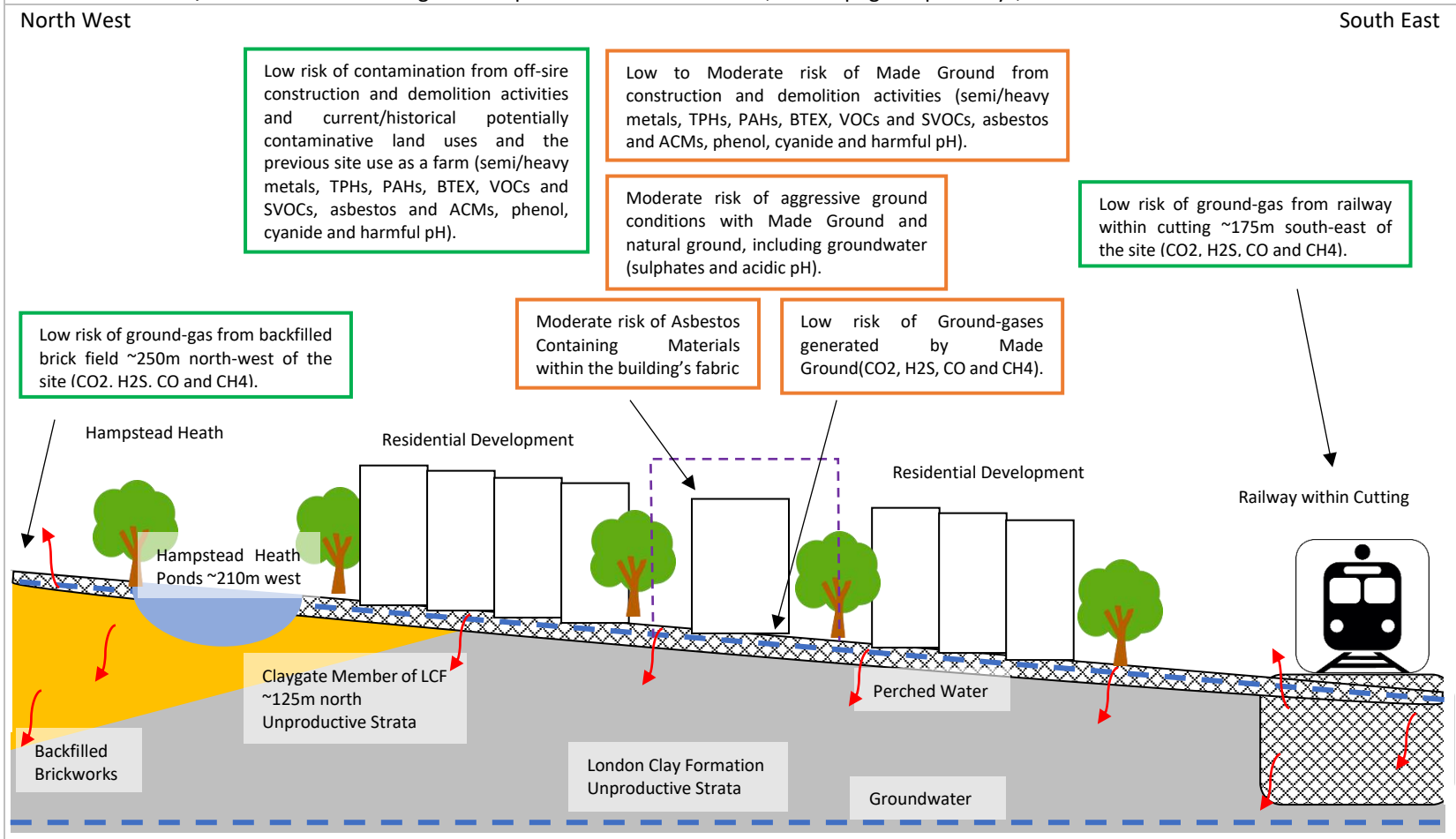
Potential Contaminant Pathways (including but not limited to):

Human Health; Direct ingestion of soil and soil derived dust, Dermal contact of soil and soil derived dust, Inhalation of dust, Ingestion of home-grown produce and soil attached, Inhalation of volatile vapour, Inhalation of ground gases, and Explosion.

Flora and Fauna; Direct uptake of groundwater, and Direct uptake of contaminants in the soil.

Building Materials and Services; Direct contact, and Explosion.

Controlled Waters; Vertical and lateral migration in permeable strata horizons, Anthropogenic pathways, and Surface water runoff



Site Boundary

Made Ground

London Clay Fm.

Claygate Member of LCF

Groundwater

On-site Sources

Off-site Sources

Potential Contaminant Pathways

At the time of reporting, May 2021, the proposed development comprised the underpinning of the existing semi-basement. Other parts of the redevelopment include the side (north-western) extension, where and additional level is added on the first floor, and an extension to the rear (south-western) side of the property. The basement did not extend below these areas.

Not to Scale (with vertical exaggeration)

Should be read in conjunction with Table in Section 6.6 of GWPR4200/DS/May 2021 V1.01

22 Tanza Road, Hampstead, London NW3 2UB

Dan Wong & Robin Koshyk	**May 2021**
Figure 10: Diagrammatic Conceptual Site Model	**GWPR4200**

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APPENDIX A: Conditions and Limitations

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

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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 22 Tanza Road, Hampstead, London NW3 2UB.

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.

APPENDIX B: Site Photographs

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

Registered Office: Kineton House, 31 Horse Fair, Banbury, Oxfordshire OX16 0AE Registered in England No. 07032001

Photo 1: Front of the existing building

Photo 2: Front of existing garage

Photo 3: Tanza Road to the Front of the Site

Photo 4: 20 Tanza Road

22 Tanza Road, Hampstead, London NW3 2UB

Dan Wong & Robin Koshyk	**May 2021**
Appendix B: Site Photographs	**GWPR4200**

ground&water

Photo 5: Properties Opposite the Site

Photo 6: Rear of the Site

Photo 7: Rear Garden of the Site

Photo 8: Existing Subterranean Level on-site

22 Tanza Road, Hampstead, London NW3 2UB

Dan Wong & Robin Koshyk	**May 2021**
Appendix B: Site Photographs	**GWPR4200**

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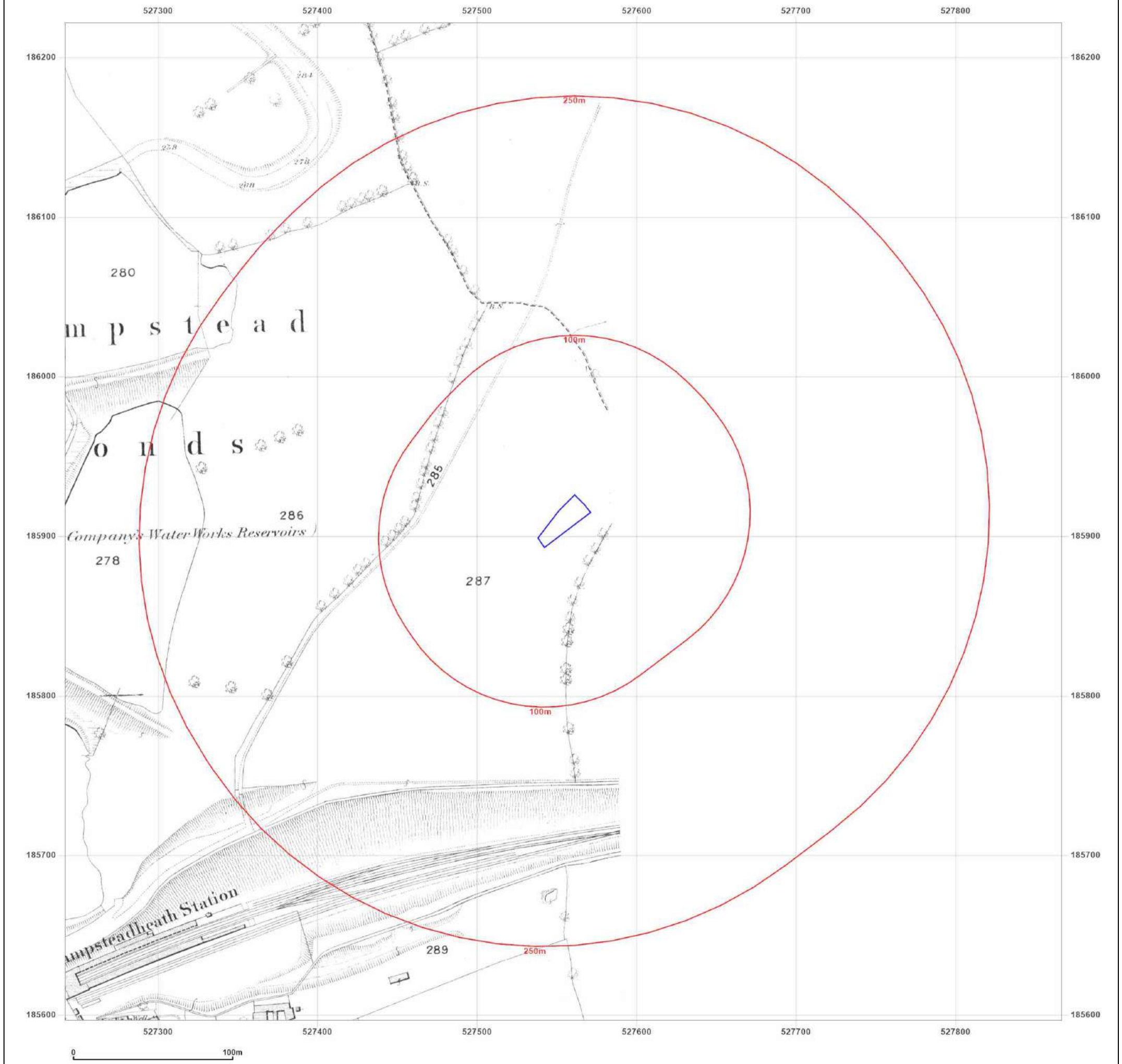
APPENDIX C: Historical Mapping

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

Registered Office: Kineton House, 31 Horse Fair, Banbury, Oxfordshire OX16 0AE Registered in England No. 07032001



Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: County Series

Map date: **1870**

Scale: 1:2,500

Printed at: 1:2,500

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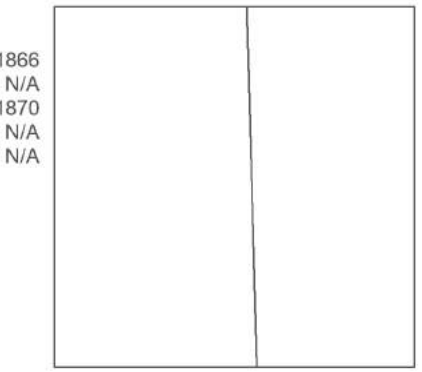
Surveyed 1866
Revised N/A
Edition 1870
Copyright N/A
Levelled N/A



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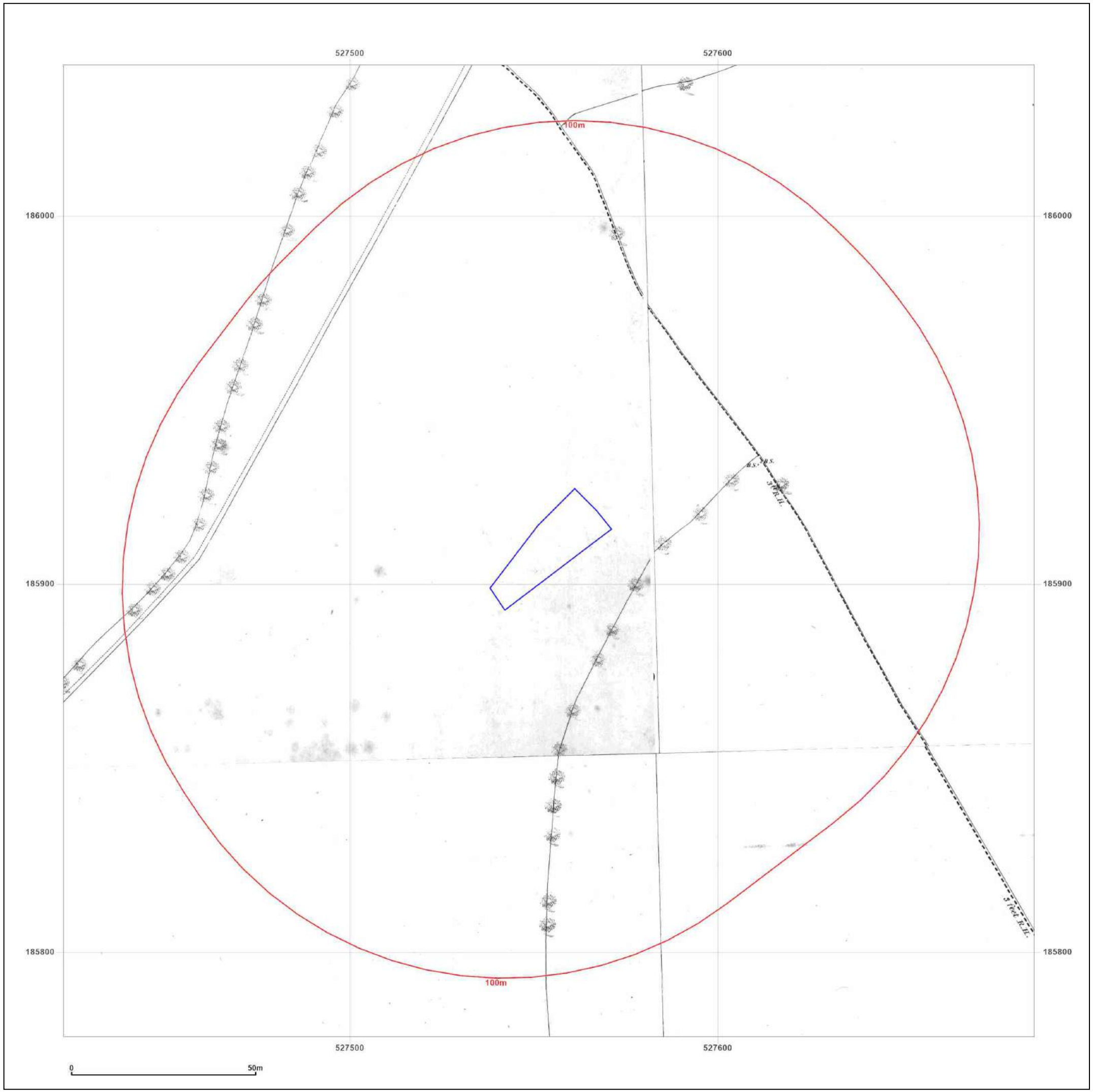

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: 1056 Scale Town Plan

Map date: **1871-1872**

Scale: 1:1,056

Printed at: 1:1,056

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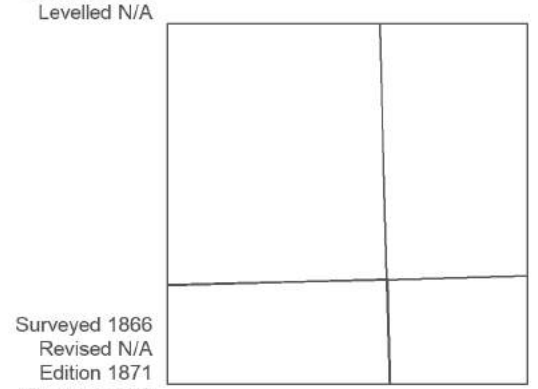
Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1869
Revised N/A
Edition 1871
Copyright N/A
Levelled N/A



Surveyed 1866
Revised N/A
Edition 1871
Copyright N/A
Levelled N/A

Surveyed 1869
Revised N/A
Edition 1872
Copyright N/A
Levelled N/A

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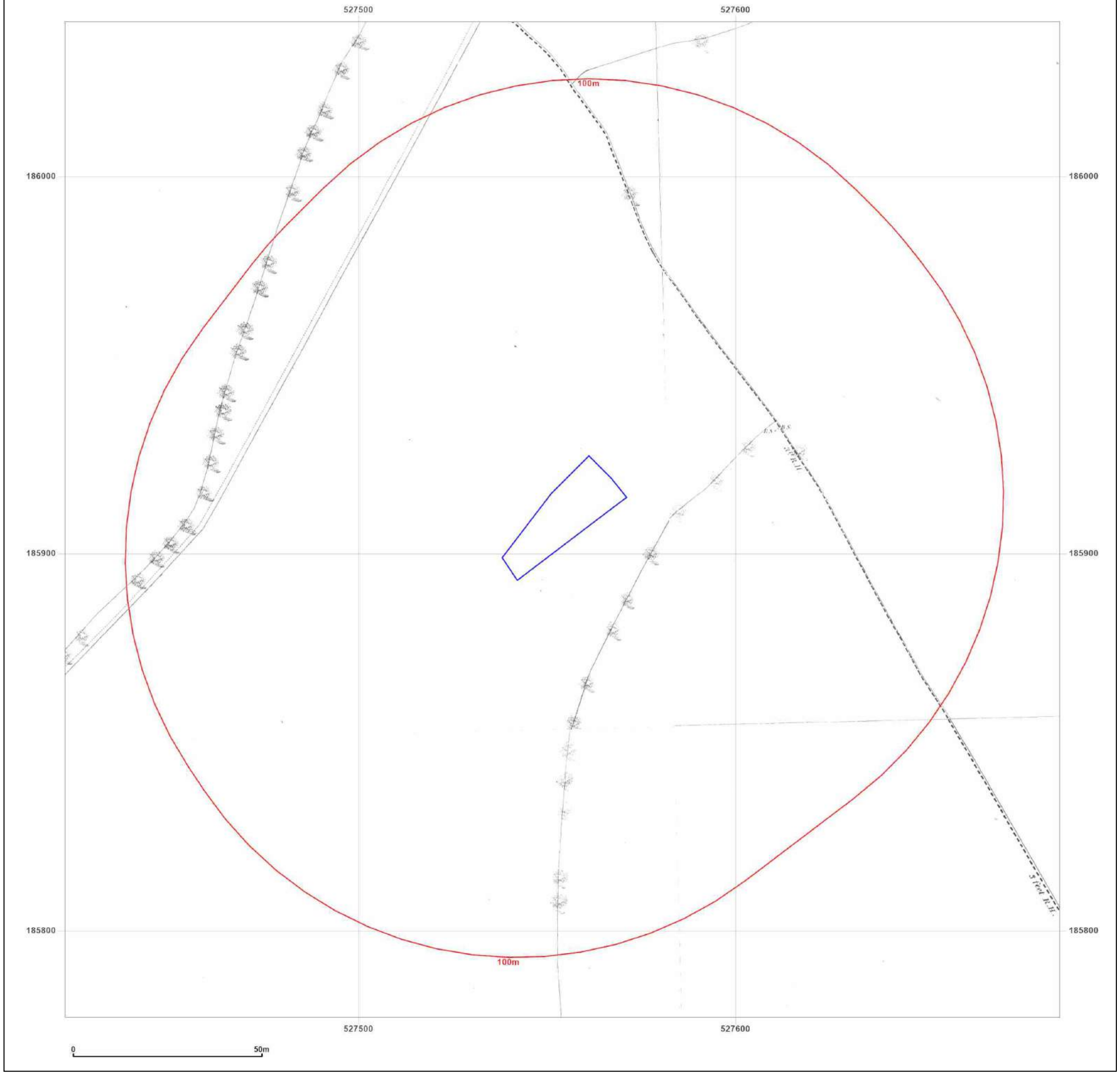

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: 1056 Scale Town Plan

Map date: **1871-1872**

Scale: 1:1,056

Printed at: 1:1,056

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

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

Surveyed 1866
Revised N/A
Edition 1871
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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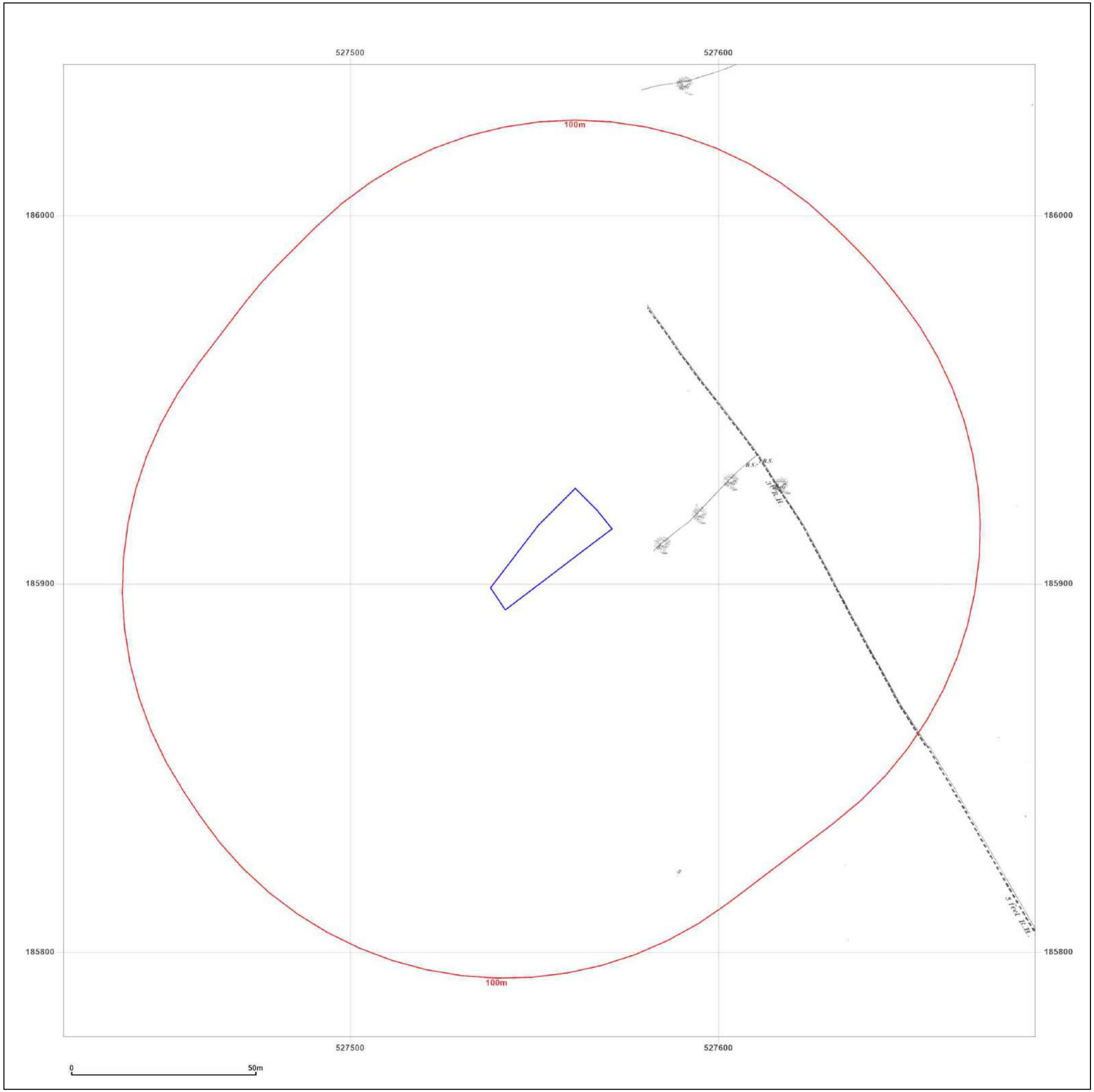

Groundsure INSIGHTS

Site Details:

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NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: 1056 Scale Town Plan

Map date: **1871-1872**

Scale: 1:1,056

Printed at: 1:1,056

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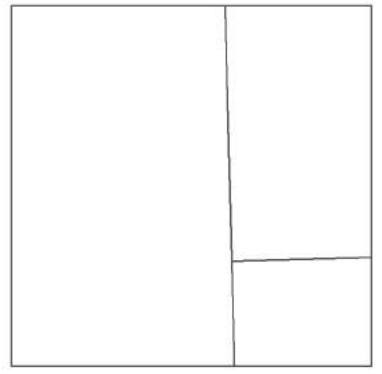
Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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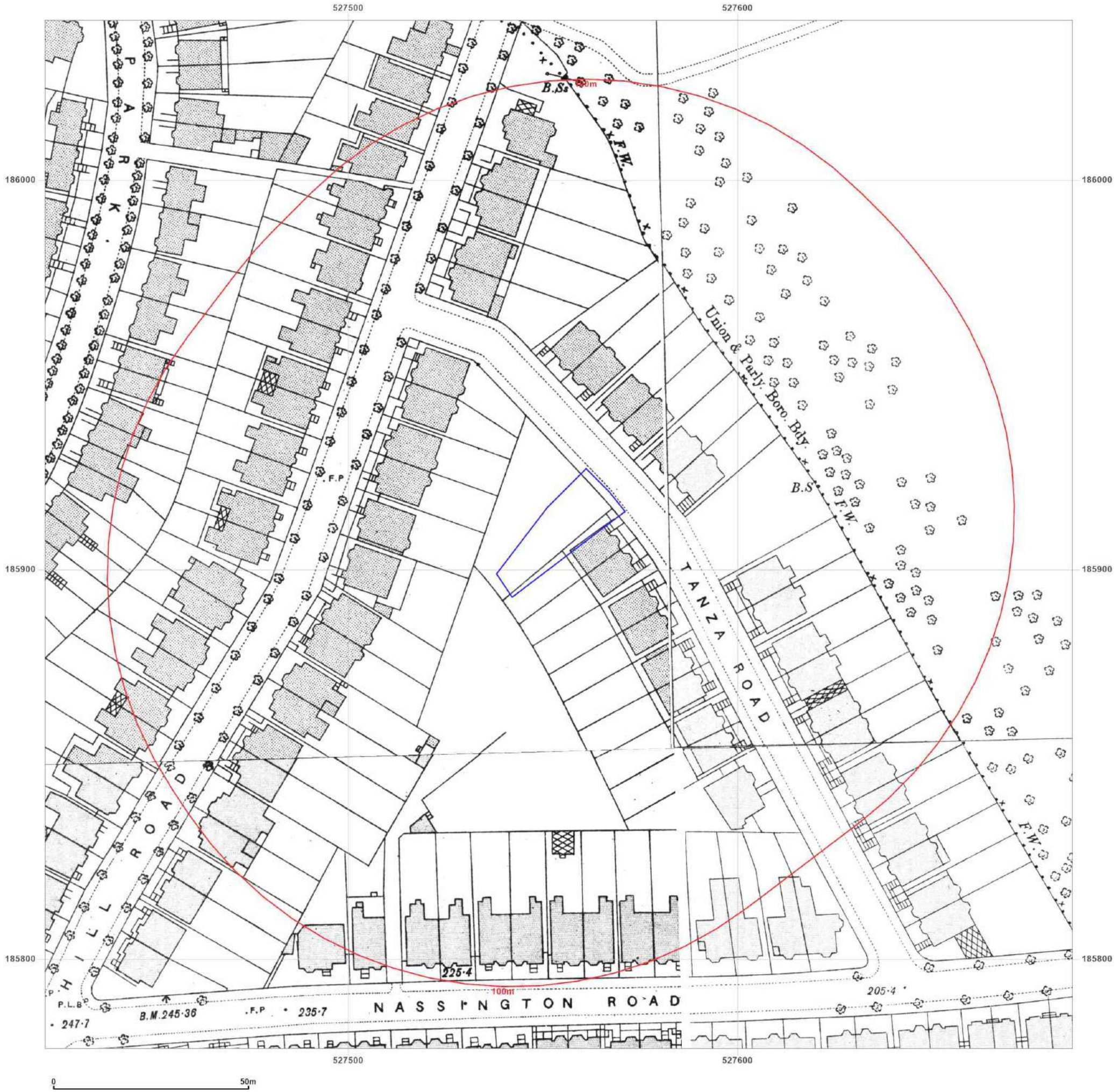

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: 1056 Scale Town Plan

Map date: **1896**

Scale: 1:1,056

Printed at: 1:1,056

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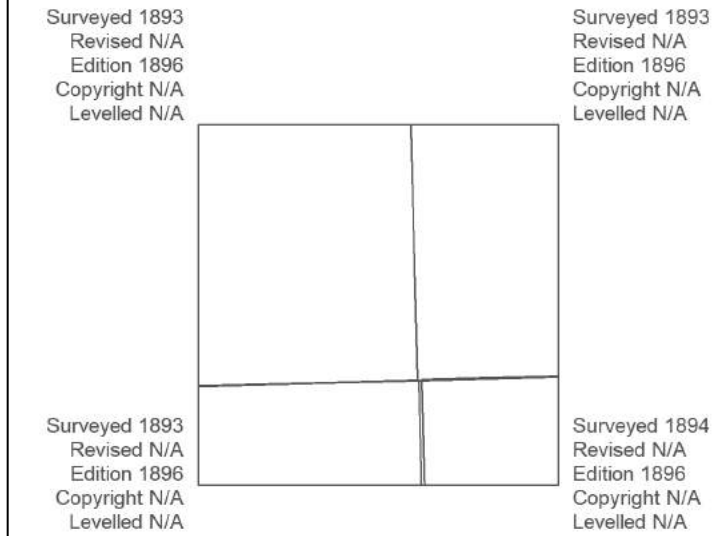

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Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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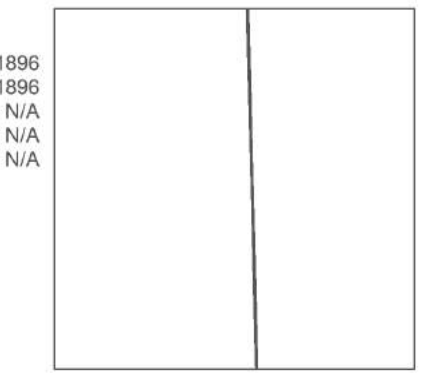
Surveyed 1896
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1896
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

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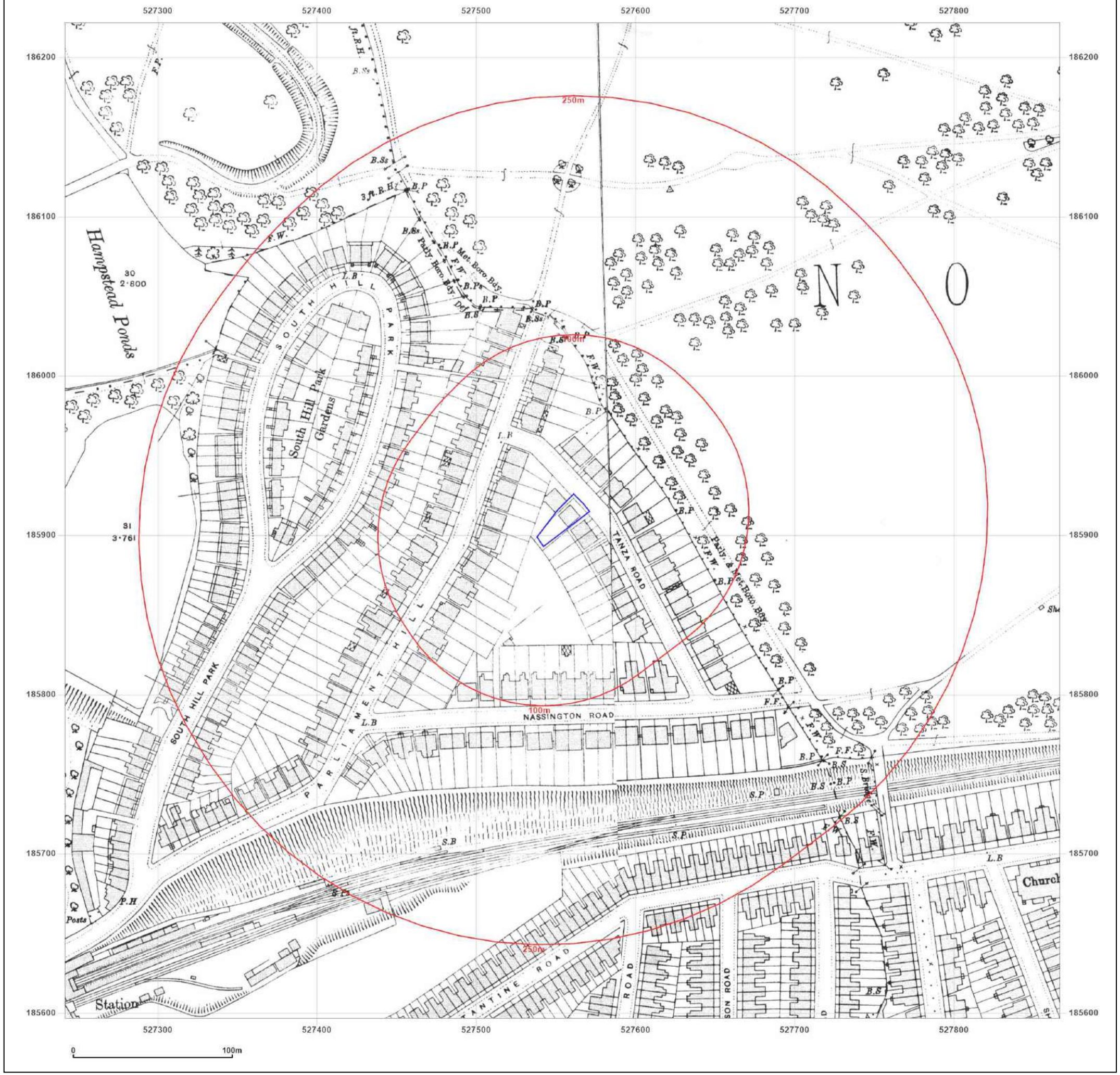

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: County Series

Map date: **1915**

Scale: 1:2,500

Printed at: 1:2,500

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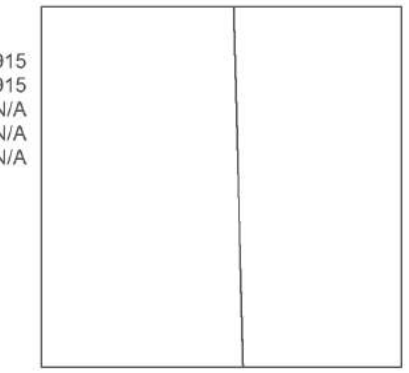
Surveyed 1915
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1915
Revised 1915
Edition N/A
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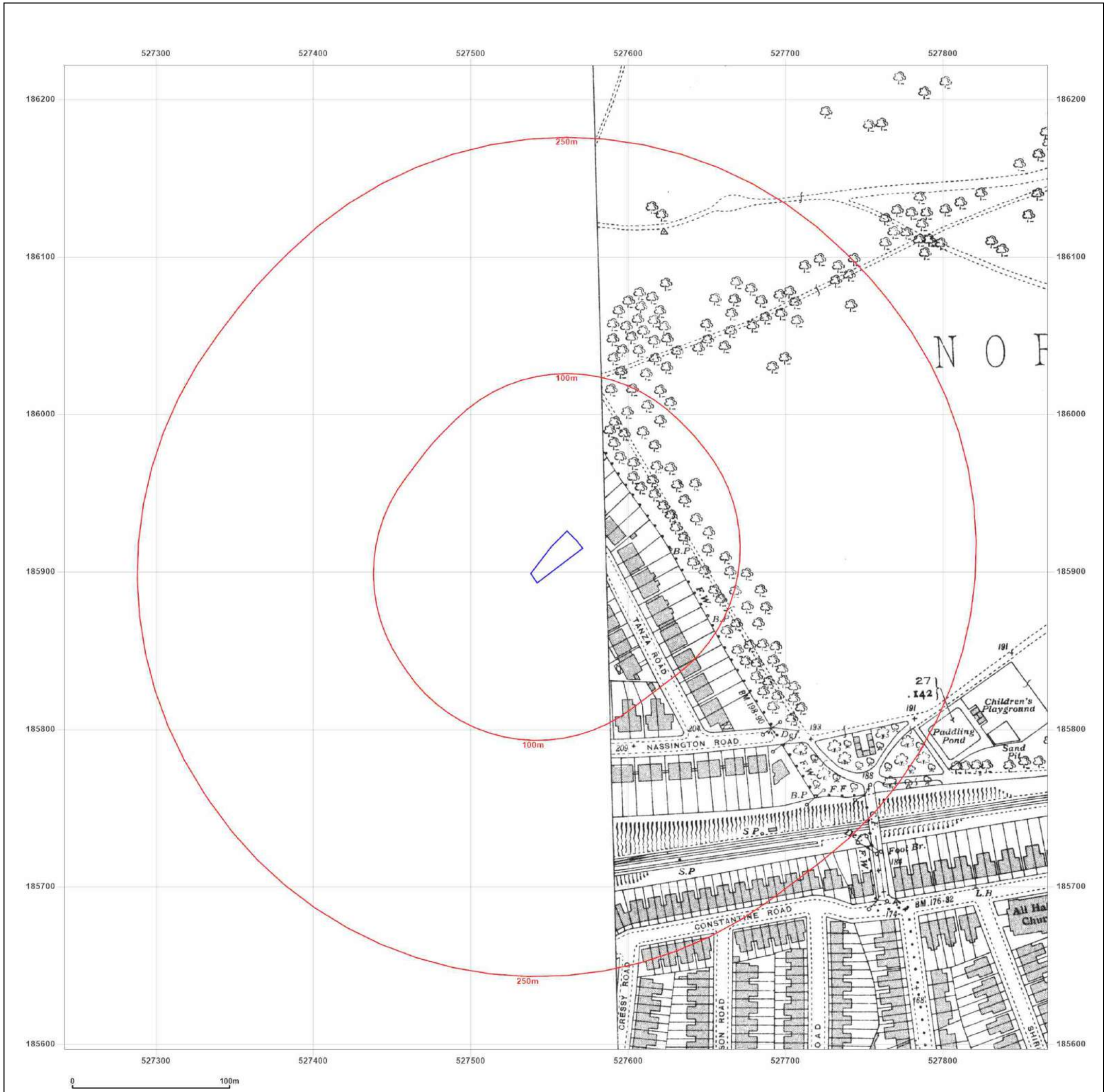

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: County Series

Map date: **1936**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1936
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

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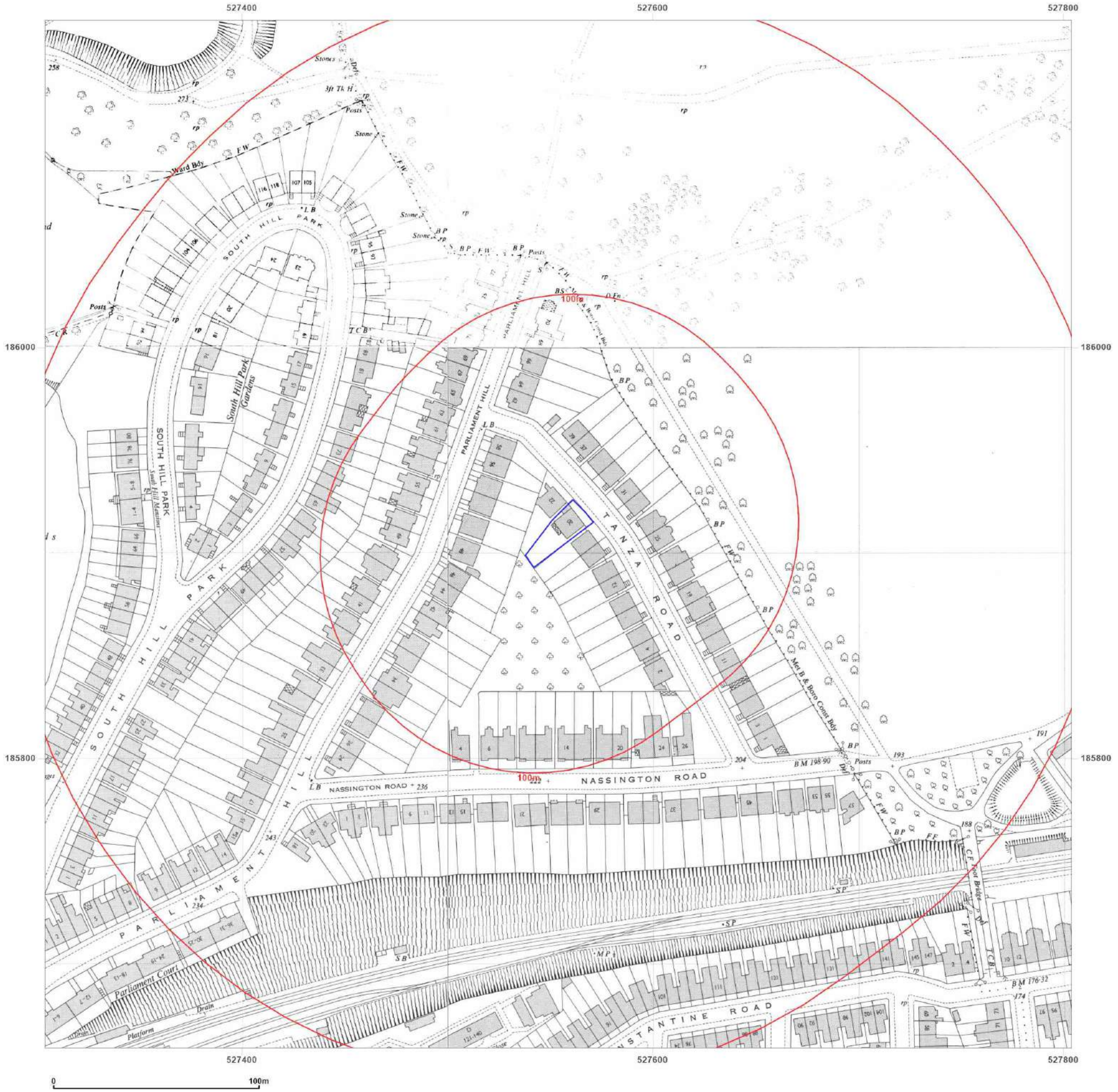

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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

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

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1933

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled N/A

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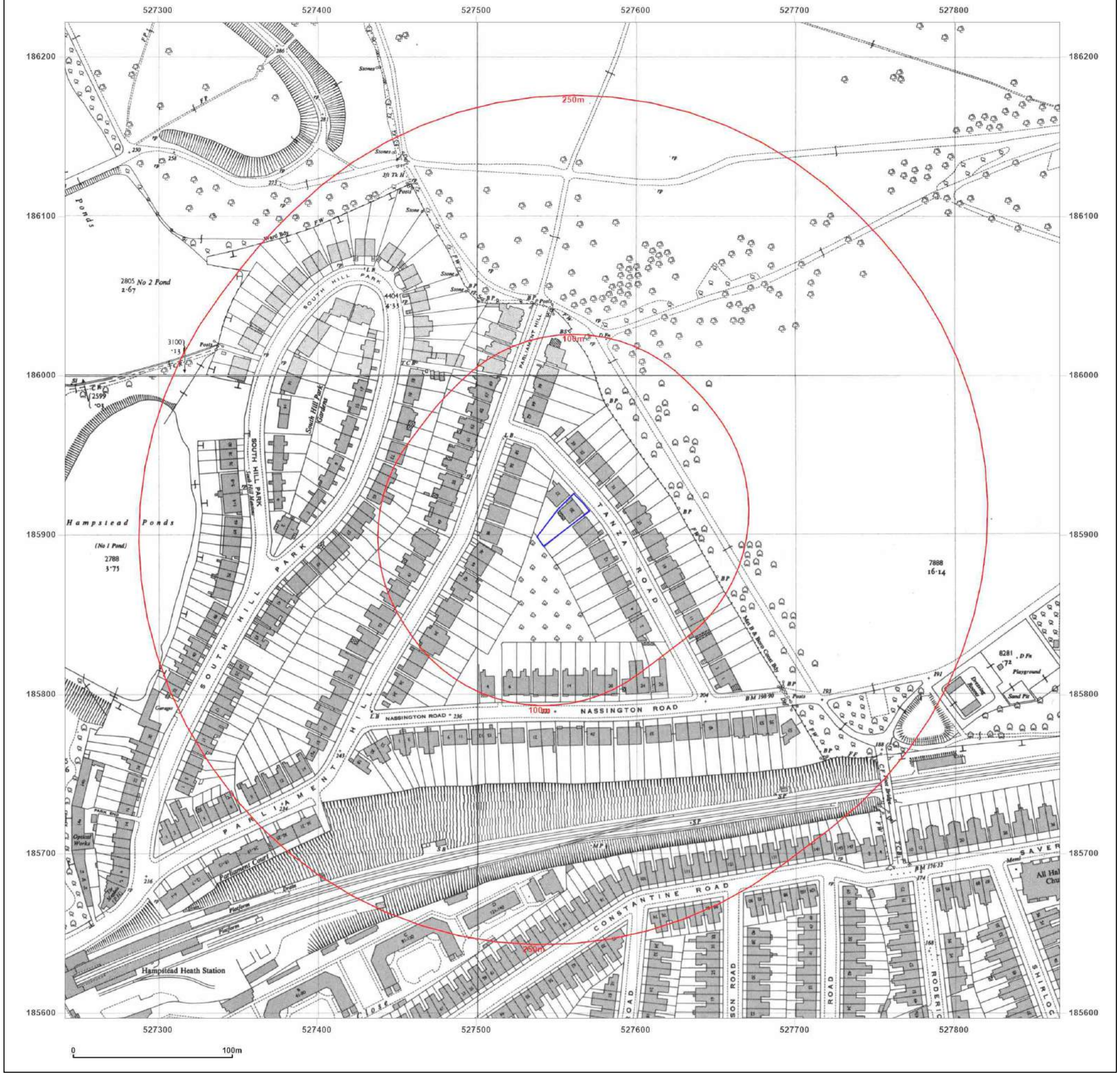

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON, NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1952-1953**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1953
Revised 1953
Edition 1954
Copyright N/A
Levelled 1934

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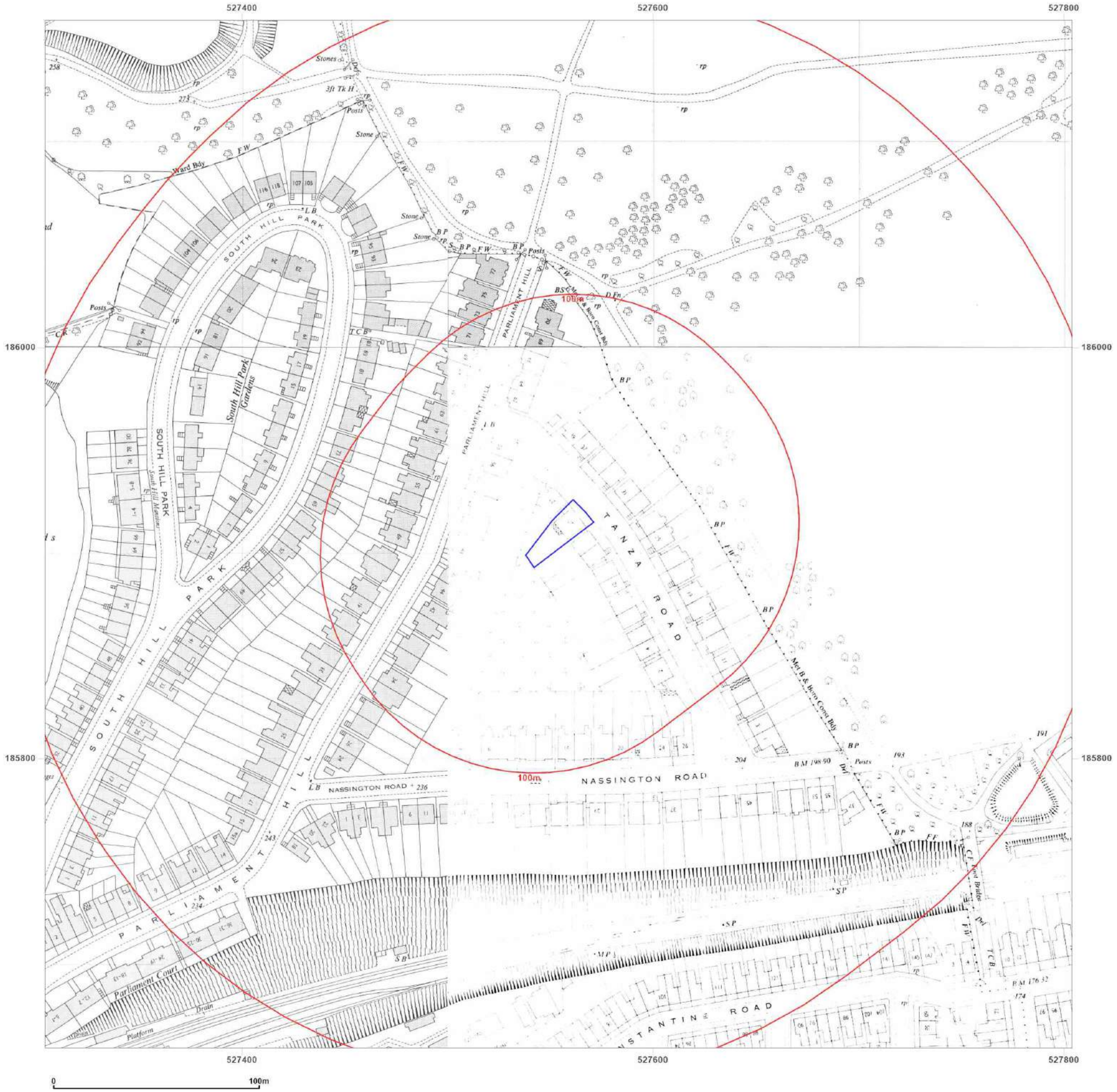

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1952-1954**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1933	Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1933
Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1933	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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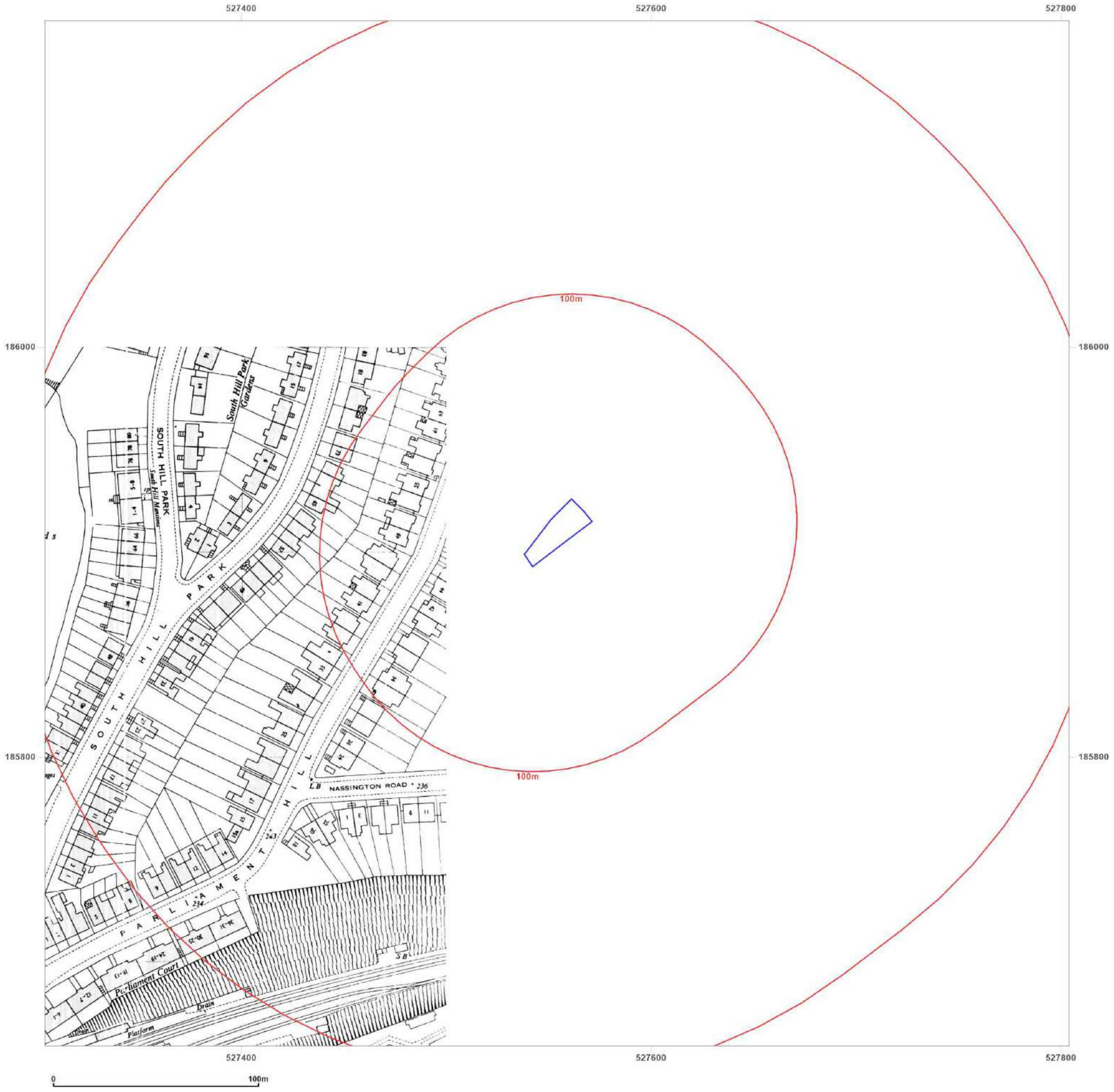

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid
Map date: **1954**
Scale: 1:1,250
Printed at: 1:2,000

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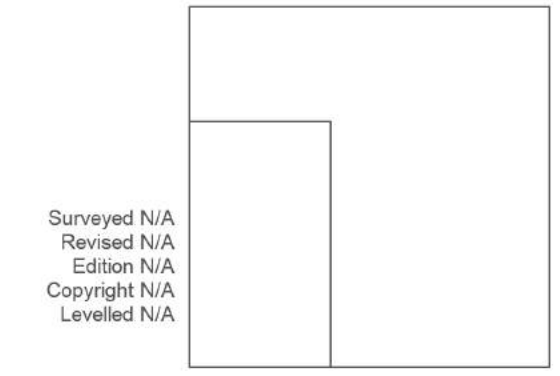

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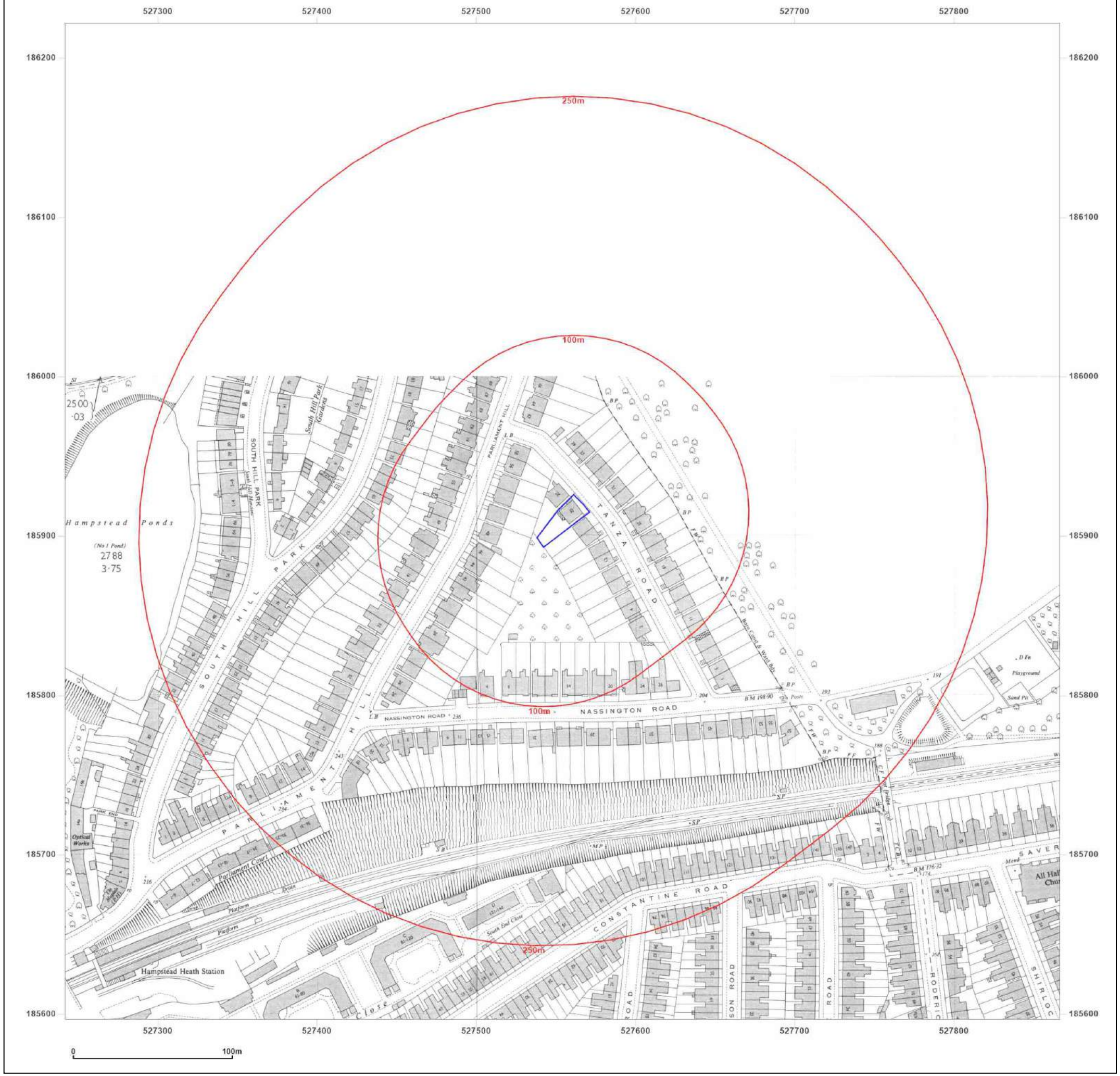

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1965
Revised 1965
Edition N/A
Copyright 1970
Levelled 1954

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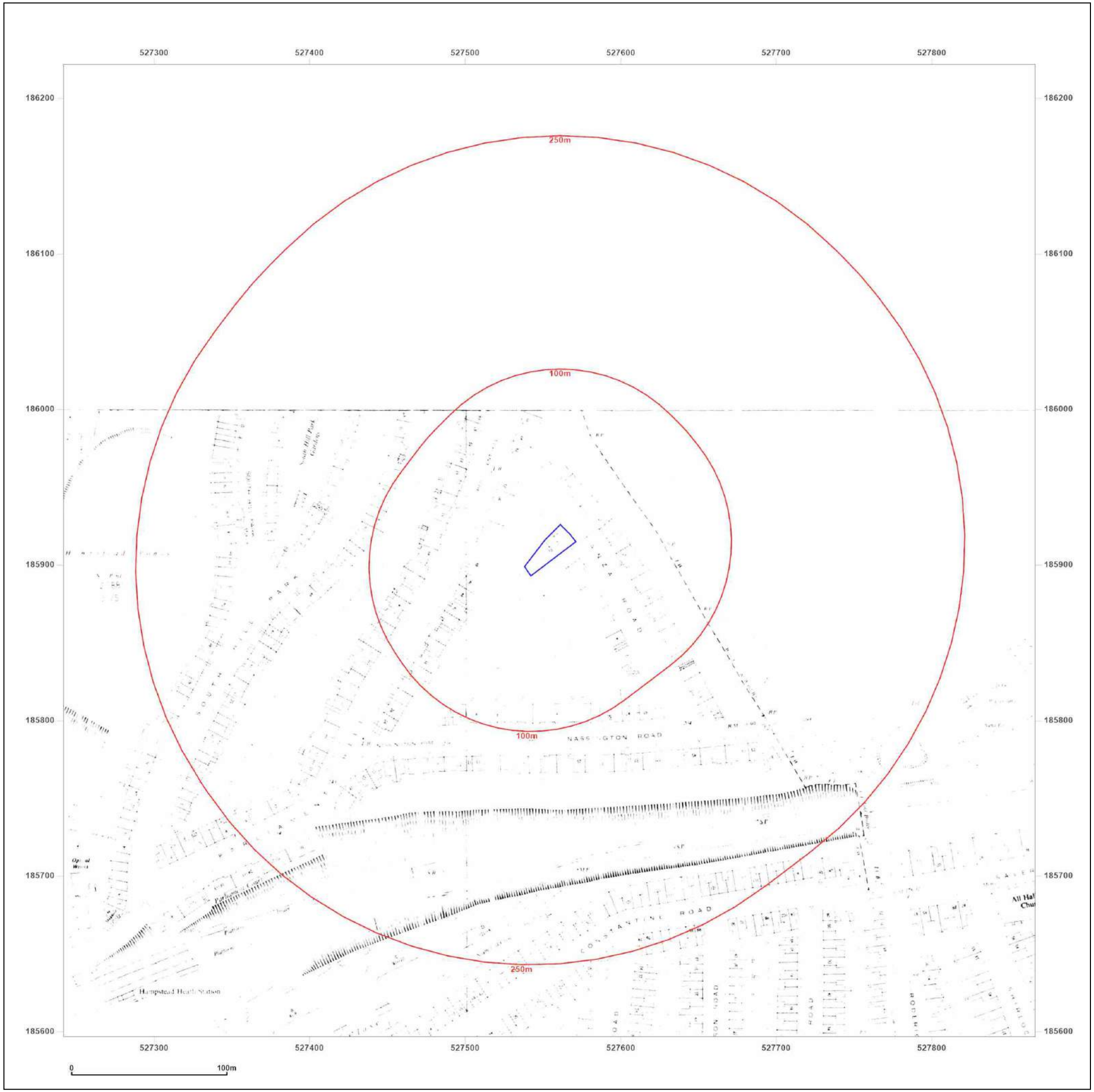

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1970**

Scale: 1:2,500

Printed at: 1:2,500

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

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Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1972-1974**

Scale: 1:1,250

Printed at: 1:2,000

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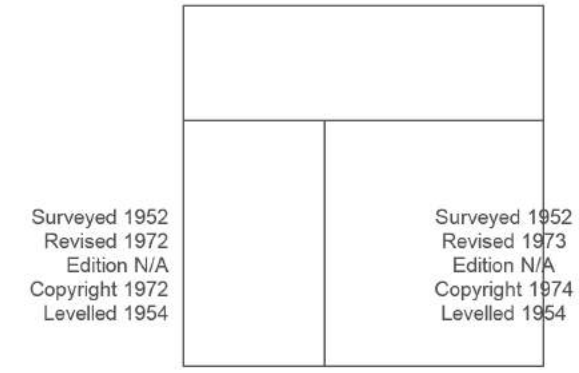

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Production date: 15 April 2021

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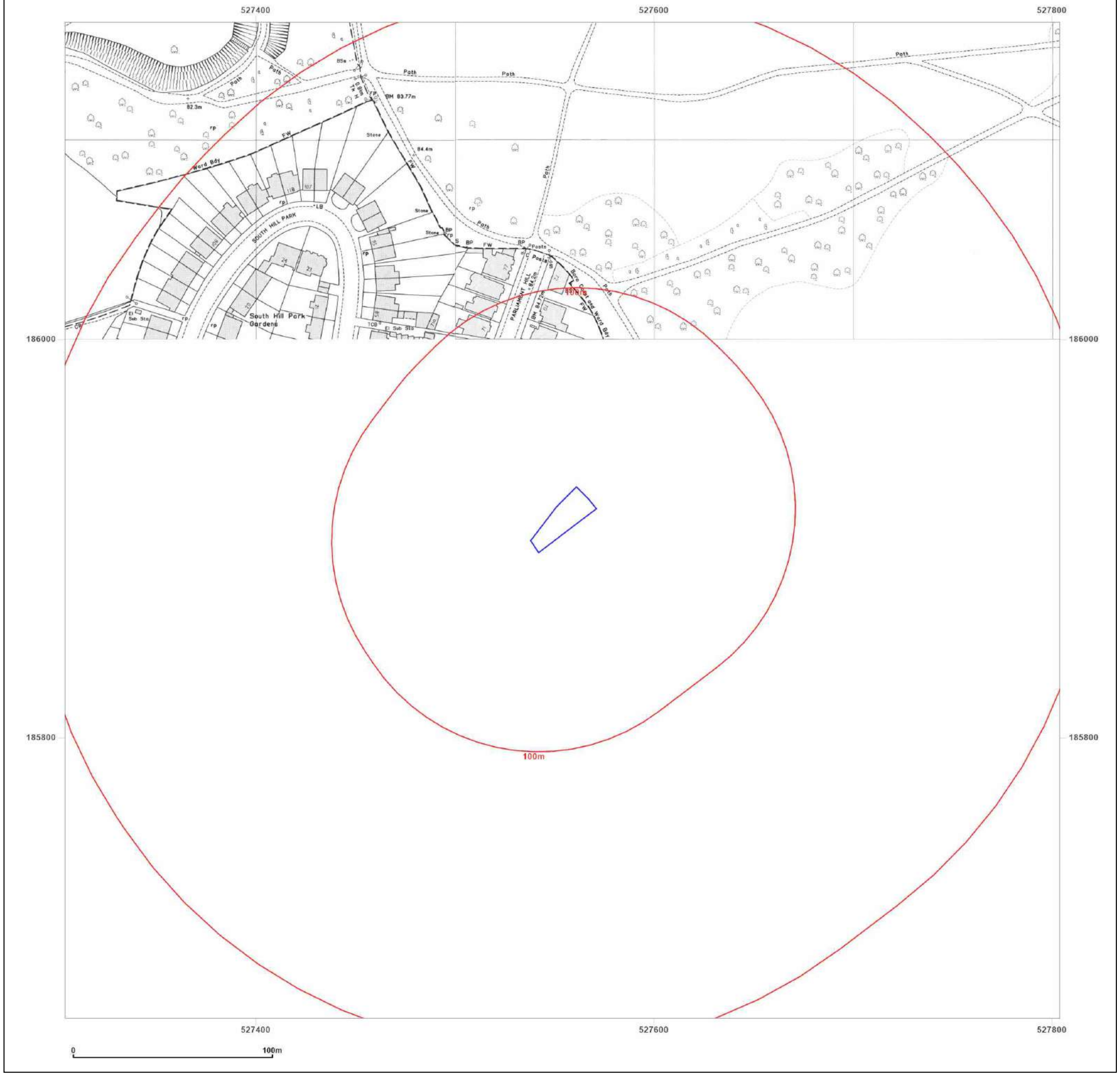

Groundsure INSIGHTS

Site Details:

20, TANZA ROAD, LONDON,
NW3 2UB

Client Ref: GWPR4200
Report Ref: HMD-445-7751011
Grid Ref: 527554, 185909

Map Name: National Grid

Map date: **1978**

Scale: 1:1,250

Printed at: 1:2,000

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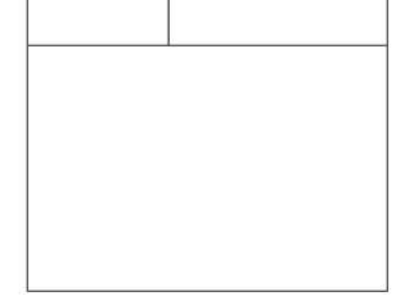
Surveyed 1978
Revised 1978
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1952
Revised 1978
Edition N/A
Copyright 1979
Levelled 1975



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