11 to 12 Hampstead High Street
London
NW3 1PY

Basement Impact Assessment Report

Farlane Investments Ltd

September 2022

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Rev 0

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Executive (Non technical) summary

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

Brief

This report describes the findings of a Basement Impact Assessment (BIA) carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of CSM Architects, on behalf of Farlane Investments Ltd, with respect to the remodelling of the existing building, including the construction of a new two storey extension within the existing lower ground floor area on the rear part of the site, which will need to be enlarged and extended into the embankment and stairwell to the rear of the site.

The purpose of the report has been to provide an assessment of any impact of the proposed extension of the existing lower ground floor on the local hydrology, hydrogeology or surrounding structures. This has been carried out through a review of a previous desk study by 3E Consulting Engineers (report ref: P21 270/P1, dated December 2021) and site investigation by Hydrock 3E (report ref: P21 270 3E XX XX RP G 9001, dated August 2022).

Desk Study Findings

The previous desk study indicates that at the time of the first map studied, dated 1871, the southern part of the site was occupied by an unnamed building, with a large garden extending across the central and northern parts of the site. A small building was present on the western part of the site, which was demolished some time between 1920 and 1936. Small buildings were then constructed on the eastern and western parts of the site between 1966 and 1970, with the eastern building then being demolished some time between 1973 and 1991. The building on the southern part of the site is first referred to as a bank between 1973 and 1991 and has remained essentially unaltered from that time.

The historical maps indicate that surrounding land use has included a mixture of commercial and residential properties, along with a brewery (Old Hampstead Brewery), garages and various works buildings.

On the basis of the findings of the desk study research it was concluded that there was a VERY LOW risk to potential receptors.

A preliminary UXO risk assessment has indicated that the site did not suffer any damage during World War II and that is not at an elevated risk with respect to the potential presence of unexploded ordnance.

Ground Conditions

The British Geological Survey (BGS) map of the area indicates that the site is underlain by the Claygate Member over the London Clay Formation.

This was generally confirmed by the previous investigation of the site, in that, beneath a variable thickness of made ground, firm sandy clay of the Claygate Member was encountered to a depth of 5.6 m, below which the London Clay extended to the maximum depth investigated, of 24.8 m.

Groundwater inflows were not recorded within the borehole and trial pits but has been measured towards the base of the Claygate Member at a depth of about 4.5 m during subsequent monitoring.

Basement Impact Assessment

It has been concluded that the majority of the impacts identified can be mitigated by appropriate design and standard construction practice

Excavations for the proposed lower ground floor extension will require temporary support to maintain stability and to prevent any excessive ground movements. However, as the proposed extension is set back some distance from the public highway and will not lead to any significant increase in foundation depth with respect to neighbouring buildings, it is not considered to pose any significant risk to any nearby assets and structures.

Groundwater is unlikely to be encountered during the proposed excavations and the proposed development should not, therefore, have any noticeable effect on groundwater flow.

1.0 Introduction

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by CSM Architects, on behalf of Farlane Investments Ltd, to carry out a basement impact assessment (BIA) for the proposed development of this site at 11 to 12 Hampstead High Street, London, NW3 1PY, within the London Borough of Camden.

This report also forms part of a Basement Impact Assessment (BIA), which has been carried out in accordance with guidelines from the London Borough of Camden in support of a planning application.

The site has been the subject of a previous desk study by 3E Consulting Engineers (report ref: P21 270/P1, dated December 2021) and site investigation by Hydrock 3E (report ref: P21 270 3E XX XX RP G 9001, dated August 2022). Records of this work have been provided to GEA and the information from these reports has been used to assist with the completion of this assessment.

1.1 Proposed Development

It is understood that the proposed redevelopment of the site will include a 'two storey extension and alterations to the lower ground floor and ground floor of the existing building to allow for the construction of two residential flats and the existing HSBC bank'.

The new extension will be located within the existing lower ground floor courtyard on the rear part of the site and will need to be cut into the existing paved embankment and stairwell that separates this part of the site from an adjoining car park area to the north.

This report is specific to the proposed development and the advice herein should be reviewed if the development proposals are amended.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to check records of data on the ground conditions, groundwater, surface water and other publicly available data; and
- to provide an assessment of the impact of the proposed development on groundwater, surface water and land stability in support of a planning application.

1.3 Scope of Work

In order to meet the above objectives, an assessment was carried out, comprising, in summary, the following activities:

- a review of readily available geology maps; and
- a review of the previous desk study and site investigation carried out by 3E Consulting Engineers and Hydrock 3E, respectively; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

1.3.1 Basement Impact Assessment (BIA)

The work carried out includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment). These assessments form part of the BIA procedure specified in the London Borough of Camden Planning Guidance CPG[1] and their Guidance for Subterranean Development[2] prepared by Arup (the "Arup report") in accordance with Policy A5 of the Camden Local Plan 2017.

The aim of the work is to provide information on surface water, groundwater and land stability and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1 London Borough of Camden Planning Guidance CPG (January 2021) *Basements*

2 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society (FGS) who has over 20 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by Matthew Penfold, MSc in Engineering Geology, Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS), with over 15 years' experience of geological and hydrogeological assessments. The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a Chartered Geologist (CGeol) and Fellow of the Geological Society (FGS) with some 30 years' experience in geotechnical engineering and engineering geology.

All assessors meet the qualification requirements of the Council guidance.

1.4 Limitations

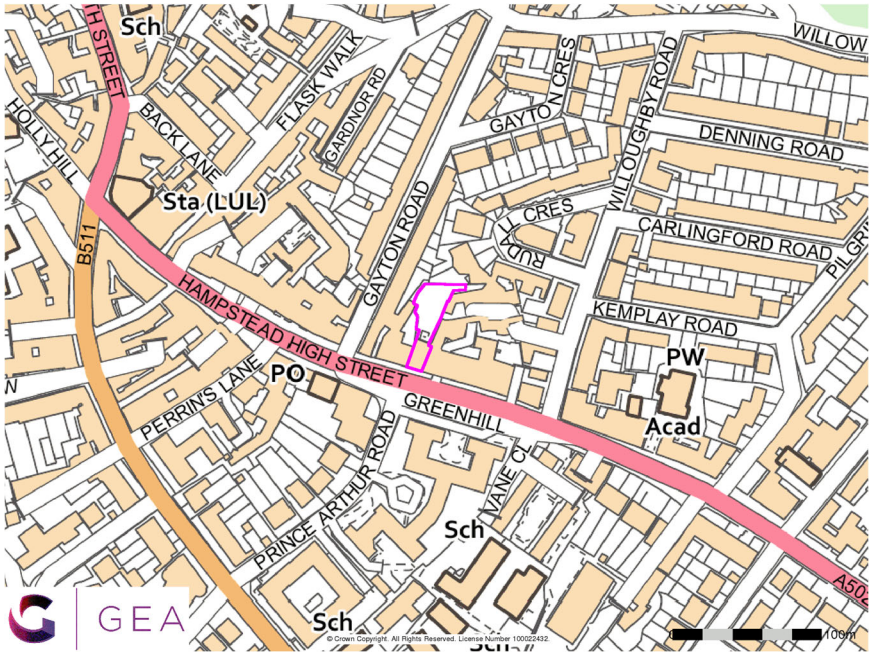
The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or ground water samples tested. No liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

2.0 The Site

2.1 Site Description

The site is located in London Borough of Camden, approximately 225 m to the east southeast of Hampstead London Underground station. It fronts onto Hampstead High Street to the south and is bounded by an adjoining commercial property, residential properties and the rear gardens of properties fronting onto Gayton Road, to the west; the rear gardens of properties fronting onto Gayton Road and Rudall Crescent, to the north; and an adjoining commercial property and residential properties along Old Brewery Mews, to the east.

The site may be additionally located by National Grid Reference 526600, 185690 and is shown on the map extract below.



The site is irregular in shape, measuring approximately 20 m east west by 60 m north south, in maximum extent, and comprises a number of essentially level areas.

The southern part of the site is occupied by a four storey building, with a lower ground floor level, which comprises a HSBC bank, with residential apartments above. A small courtyard area is present at lower ground floor level to the rear of the bank, which is presently occupied by a series of air conditioning units and is separated from the central and northern parts of the site by a retained slope (approx. 15°), with a stairwell and ground level walkway providing access between these two areas, as shown in the photograph below.

The central and northern part of the site, referred to as Marty's Yard, is presently used as a car park accessed from the east from Old Brewery Mews.

The site is almost entirely covered by the existing building and areas of external hardstanding.

2.1.1 Proposed Lower Ground Floor Extension

It is understood from the information provided, that the new extension will be constructed at lower ground floor level to the rear of the existing building and will be partly cut into the retained slope shown in the photograph opposite.

The information provided indicates that new lower ground floor extension is unlikely to result in a significant increase in foundation depth with respect to the adjoining properties, which are already set at a similar level. Similarly, where the new retaining wall will be set into the existing slope, little impact is expected, as this structure will only need to be designed to support an adjoining area of car parking, which forms the northern part of the site, rather than an adjoining building.

The proposed lower ground floor extension is also set back from the frontage of the site with Hampstead High Street by in excess of 20.0 m, such that it is not within the immediate vicinity of any services or other third party assets present beneath this roadway.

2.2 Previous Desk Study Findings

2.2.1 Site History

The previous desk study indicates that at the time of the first map studied, dated 1871, the southern part of the site was occupied by an unnamed building, with a large garden extending across the central and northern parts of the site.

A small building was present on the western part of the site, which was demolished some time between 1920 and 1936. Small buildings were then constructed on the eastern and western parts of the site between 1966 and 1970, with the eastern building then being demolished some time between 1973 and 1991.

The building on the southern part of the site is first referred to as a Bank between 1973 and 1991 and has since remained unaltered.

The historical maps indicate that surrounding land use has included a mixture of commercial and residential properties, along with a brewery (Old Hampstead Brewery), garages and various works buildings.

2.2.2 Other Information

The previous report indicates that there are no landfill sites, waste management, transfer, treatment or disposal sites located within 500 m of the site.

There are no pollution incidents to controlled waters recorded within 1000 m of the site, and no contaminated land entries, controls or consents 250 m, or are otherwise likely to have any impact on the site. There are no fuel stations within 500 m.

There are 35 Contemporary Trade Directory entries within 250 m of the site, the closest of which comprises a former cleaners, 8 m to the southwest. However, the majority of these are listed as inactive and are unlikely to have had any adverse impact on the site, given their scale, distance, limited nature of any potentially contaminative activities and the intervening ground conditions.

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1% of homes are affected by radon emissions and therefore radon protective measures will not be necessary.

A preliminary UXO assessment, undertaken by 1st Line Defence (report ref: PA1671 00A, dated November 2021), found that the site was not an elevated risk, and that further assessment or on site action was not required.

It is understood that the running tunnels of the London Underground Northern Line are present at depth beneath Hampstead High Street. However, from correspondence with London Underground included as part of the previous desk study, it is understood that the closest tunnel is at a distance of at least 35 m from the proposed lower ground floor extension and associated retaining walls; it has therefore been confirmed by London Underground that they do not have any concerns with respect to the proposed development and that no further action is necessary.

Copies of the service search information provided by Hydrock 3E are included within the appendix.

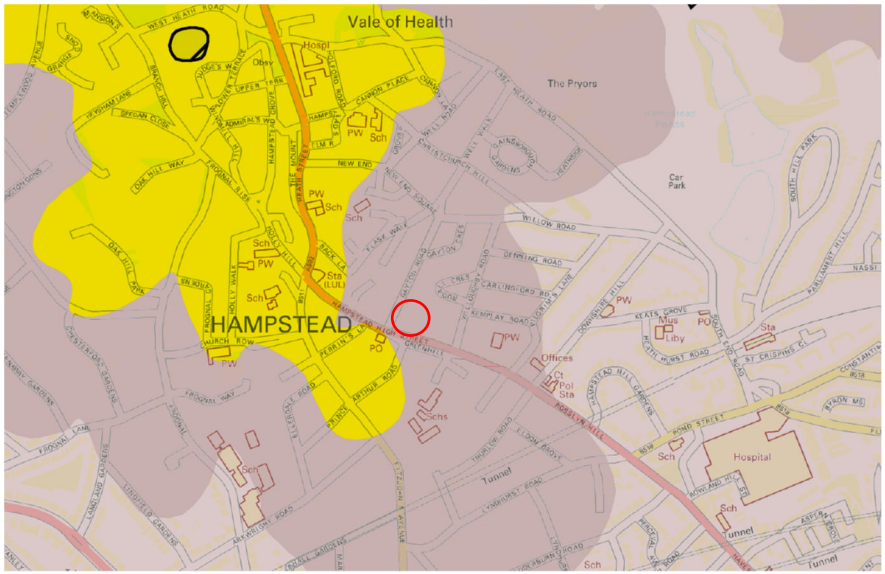
2.2.3 Preliminary Risk Assessment

On the basis of the desk study research there was considered to be a VERY LOW risk to potential end receptors.

3.0 Ground Conditions

3.1 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates that the site is underlain by the Claygate Member over the London Clay, with the Bagshot Formation shown to be present approximately 50 m to the west southwest, as shown on the map extract below. Areas of "Head propensity" are also shown approximately 100 m to the east.



According to the British Geological Society (BGS) Memoir, the Claygate Member comprises alternating beds of clayey silt, very silty clay, sandy silt and glauconitic silty fine sand. The lower part of the Claygate Member is generally more bioturbated and a bed of calcareous concretions is present near the base in many places.

The London Clay Formation is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine grained sand.

The boundary between the Claygate Member and London Clay is often difficult to distinguish, as the boundaries are transitional between the strata.

The geology in this area is generally horizontally bedded such that the boundary between the geological formations roughly follows the ground surface contour lines.

"Head propensity" is based on the geotechnical properties of the London Clay and head may occur close to the Claygate Member / London Clay boundary. Head propensity is shown on the BGS map as areas denoted as most likely to be covered by Quaternary Head Deposits as interpreted from digital slope analysis and confirmed by borehole data. These are not mapped and have not been verified by fieldwork.

A search of the BGS database has revealed records of a historical borehole drilled approximately 25 m to the east, on the site of former Old Hampstead Brewery, which, beneath a moderate thickness of made ground, encountered London Clay to a depth of approximately 110 m, and below which a downward sequence of the Lambeth Group, Thanet Sand and White Chalk is expected to be present, with the top of the Chalk likely to be encountered at a depth of about 135 m.

3.2 Hydrology and Hydrogeology

The Claygate Member is classified by the Environment Agency as a Secondary 'A' Aquifer, defined as 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.

The underlying London Clay is classified as 'Unproductive Strata', as defined by the Environment Agency as rock or drift deposits with low permeability that have negligible significance for water supply or river base flow.

As the lower part of the Claygate Member and underlying London Clay are likely to comprise predominantly clay soils, they cannot support groundwater flow over any significant distance, nor can they be considered to support a "water table" such as would be found within a porous and permeable saturated stratum. However, perched water may be present within any more permeable horizons within the Claygate Member and where these horizons are more continuous, perched water is likely to flow beneath the site in a generally southerly direction with the local topography of the area.

The previous desk study indicates that the nearest natural water feature comprises Hampstead Pond No 1, which is located approximately 600 m to the east northeast.

The site is not located within a Groundwater Source Protection Zone and there are no licenced groundwater abstractions within the vicinity of the site.

Figure 11 of the Arup report does not show the site to be located within 250 m of any previous springs or watercourses. However, historical records[3] indicate that a tributary of the River Fleet rose on the edge of Hampstead Heath to the northwest of the site and flowed in a south easterly direction in the area between Christchurch Hill and East Heath Road, before joining with the main branch of the river, just to the south of Hampstead Ponds, approximately 600 m to the east northeast of the site. This tributary, like many of London's lost rivers, was culverted or covered and incorporated into the existing sewer network in the late 19th Century.

The course of the former tributary is also coincident with the spring line shown on the late 19th Century maps, approximately 300 m to the north of the site on Well Walk, which subsequently become known as Chalybeate Spring or Well. However, anecdotal evidence indicates that water has never flown freely from the well, due to development of the area and redirection of groundwater flows into the sewer network.

The previous desk study identified a former well within the Old Hampstead Brewery to the east of the site, information for which is included on the BGS borehole record mentioned in the previous section. The well abstracted water from the underlying Chalk aquifer and is therefore unlikely to have had any influence on the near surface groundwater regime. The well is understood to have been decommissioned prior to the 1930s when the old brewery closed.

The site is not within an area shown by the Environment Agency to be at risk from flooding from rivers or the sea, nor is it identified on Figure 15 of the Arup report, or the EA surface water flood maps, as being at risk from surface water flooding. BGS mapping indicates that the site is within an area with a limited potential for groundwater flooding to occur.

The site is almost entirely covered by the existing building and hardstanding and therefore infiltration of rainwater into the ground beneath the site is limited such that the majority of surface runoff is likely to drain into combined sewers in the road.

3.3 Previous Investigation

The previous ground investigation by Hydrock 3E comprised a single 24.8 m deep rotary borehole, completed within the southern part of the existing parking area, immediately adjacent to the proposed lower ground floor extension. This was supplemented with a single hand held percussive borehole and two trial pits, which were completed within the existing lower ground floor level courtyard area.:

A selection of the samples recovered from the boreholes and trial pits were submitted to a soil mechanics laboratory for a programme of geotechnical testing and an analytical laboratory for a programme of contamination testing; the Hydrock 3E report should be referred to for full details of the techniques and methods and standards adopted for the investigation and laboratory analysis, and for a full assessment of the results.

3.3.1 Summary of Ground Conditions

The investigation generally encountered the expected ground conditions, in that beneath a variable thickness of made ground, the Claygate Member was encountered and found to be underlain by the London Clay to the maximum depth investigated, of 24.8 m.

The made ground was encountered to the base of the hand held percussive borehole and trial pits to depths of between 0.45 m to 1.40 m but was proved in the rotary borehole to a depth of 0.55 m, and typically comprised dark brown sand, clay and occasional gravel, with variable amounts of extraneous material.

The underlying Claygate Member comprised firm brown and orange mottled sandy clay and was encountered in the rotary borehole to a depth of 5.60 m. Below this, stiff becoming very stiff dark grey slightly silty clay of the London Clay was encountered and proved to the maximum depth of the investigation, of 24.8 m.

3.3.2 Summary of Groundwater Conditions

Groundwater was not encountered within any of the shallow trial pits or boreholes during drilling. However, during monitoring of the standpipe installed into the rotary borehole, water was recorded at depths of 4.45 m to 4.54 m, which has been attributed to localised perched water inflows, rather than representing a continuous groundwater table.

3 Nicholas Barton & Stephen Myers (2016) The *Lost Rivers of London.* Historical Publications Ltd

4.0 Basement Screening Assessment

The Camden guidance suggests that any development proposal that includes a basement should be screened to determine whether or not a full BIA is required.

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendices E1, E2 and E3 which include a series of questions within screening flowcharts for surface flow and flooding, subterranean (groundwater) flow and land stability. The flowchart questions and responses to these questions are tabulated below.

4.1 Subterranean (Groundwater) Flow Screening Assessment

Question	Response for 11 to 12 Hampstead High Street
1a. Is the site located directly above an aquifer?	*Yes. The site is located above a Secondary 'A' Aquifer as designated by the EA. However, as the Claygate Member comprises predominantly clay beneath this and adjacent sites, it is likely it will have the characteristics of Non-Productive Strata, similar to that of the London Clay.*
1b. Will the proposed basement extend beneath the water table surface?	No. As the proposed development does not extend below existing lower ground floor level, it will not intercept groundwater, which has been recorded at a depth of about 4.5 m below existing ground level; equivalent to more than 2.0 m below proposed formation level for the lower ground floor extension.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	*Yes. The site is located approximately 25 m from a former well, used to provide water to the Old Hampstead Brewery. However, this well abstracted water from the deep aquifer of the underlying Chalk and was decommissioned prior to the early 1930s.*
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. The proposed development will not result in any change in the proportion of hard surfaced / paved areas.
5. As part of the site drainage, will more surface water (e.g., rainfall and run off) than at present be discharged to the ground (e.g., via soakaways and/or SUDS)?	No. It is unlikely that there will be any increase in discharge of surface water run off to the ground.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No. Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report confirm that there are no local ponds or spring lines in the vicinity of the site.

The above assessment has identified the following potential issues that need to be assessed.

Q1a The site is underlain by a Secondary A Aquifer.
Q2 The site is located within 100 m of a former well.

4.2 Land Stability Screening Assessment

Question	Response for 11 to 12 Hampstead High Street
1. Does the existing site include slopes, natural or manmade, greater than 7°?	*Yes. The existing lower ground floor courtyard is separated from the adjoining car park by a retained slope with an angle of about 15°.However, this slope fully paved and supported by an existing retaining wall at its base. This feature will also be removed as part of the proposed development.*
2. Will the proposed re profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. The proposed development is not understood to introduce any new slopes with angles greater than 7°.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No. Topographical maps and Figures 16 and 17 of the Arup report confirm this.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	
5. Is the London Clay the shallowest strata at the site?	No. The site is underlain by soils of the Claygate Member

Question	Response for 11 to 12 Hampstead High Street
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No. There are no trees within the vicinity of the proposed rear extension.
7. Is there a history of seasonal shrink swell subsidence in the local area and / or evidence of such effects at the site?	*Yes. The area is prone to these effects as a result of the presence of shrinkable clay soils. However, there no trees within the vicinity of the proposed lower ground floor extension and no evidence of any potential movement on the existing and / or surrounding structures.*
8. Is the site within 100 m of a watercourse or potential spring line?	No. Not according to Figure 12 of the Arup report, the previous desk study and Ordnance Survey maps.
9. Is the site within an area of previously worked ground?	No. Not according to the BGS map and Figure 3 of the Arup report.
10a. Is the site within an aquifer?	*Yes. The site is located above a Secondary 'A' Aquifer as designated by the EA. However, as the Claygate Member comprises predominantly clay beneath this and adjacent sites, it is likely it will have the characteristics of Non-Productive Strata, similar to that of the London Clay.*
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No. As the proposed development does not extend below existing lower ground floor level, it will not intercept groundwater, which has been recorded at a depth of about 4.5 m below existing ground level; equivalent to more than 2.0 m below proposed formation level for the lower ground floor extension.
11. Is the site within 50 m of Hampstead Heath ponds?	No. The previous desk study indicates that the site is 600 m to the west southwest of these features.
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes. The site is bounded by Hampstead High Street to the south However, the proposed lower ground floor extension is set back approximately 20 m from this boundary.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No. The proposed development does not include any deepening of the existing lower ground floor level and as such, will not result in any significant increase in foundation depth with respect to any neighbouring properties .
14. Is the site over (or within the exclusion zone of) any tunnels, e.g., railway lines?	No. Information contained within the desk study indicates that the proposed lower ground floor extension and any associated retaining walls are at sufficient distance from the existing London Underground tunnels beneath Hampstead High Street, that no further action is required.

The above assessment has identified the following potential issues that need to be assessed:

Q1 The site incudes a man made slope with an angle in excess of 7°.
Q7. There is a history in the area is of shrink swell subsidence due to the presence of shrinkable clays.
Q10a The site is underlain by a Secondary A Aquifer.
Q12 The southern part of the site fronts onto Hampstead High Street.

4.3 Surface Flow and Flooding Screening Assessment

Question	Response for 11 to 12 Hampstead High Street
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
2. As part of the proposed site drainage, will surface water flows (e.g., volume of rainfall and peak run off) be materially changed from the existing route?	No. There will not be an increase in impermeable area as a result of the proposed development, so the surface water flow regime will be unchanged.
2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. There will not be an increase in impermeable area as a result of the proposed development.
3. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. There will not be an increase in impermeable area as a result of the proposed development, so the surface water flow regime will be unchanged.
4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The proposed development is very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as the surface water

Question	Response for 11 to 12 Hampstead High Street
	drainage regime will be unchanged and the land uses will remain the same.
5. Is the site in an area identified to have surface water flood risk, or is otherwise at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	No. The findings of this BIA together with the Camden Flood Risk Management Strategy dated 2013 and Figures 3iii, 4e, 5a and 5b of the SFRA dated 2014, in addition to the Environment Agency online flood maps show that the site has a very low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses. It is possible that the proposed retaining walls may be constructed within pockets of perched water, *although statutory requirements with regards to waterproofing and tanking will reduce any associated risk to acceptable levels.* In accordance with paragraph 6.16 of the CPG, a positive pumped device and non return valve should be installed to further protect the site from sewer flooding.

The above assessment has not identified any following potential issues that need further assessment:

5.0 Basement Scoping Assessment

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

5.1 Potential Impacts

The following potential impacts have been identified by the screening process.

Screening Issue	Potential Impact
The site is located above a Secondary 'A' Aquifer as designated by the EA.	There is the potential for the hydrogeological setting to be affected by the proposed lower ground floor extension.
The site is within 100 m of a well (used/ disused) or potential spring line.	The flow from a potential spring or well may increase or decrease if the groundwater flow regime which supports that feature is affected by the proposed development.
The site includes a man made slope with an angle in excess of 7°.	The presence of a slope may cause local instability within the site.
The site is within an area likely to be affected by seasonal shrink swell	If a new basement is not dug to below the depth likely to be affected by tree roots this could lead to damaging differential movement between the subject site and adjoining properties.
The site located within 5 m of a public highway or pedestrian right of way?	The public walkway of Hampstead High Street borders the site to the south and the excavation of a basement can cause instability of such structures.

6.0 Basement Impact Assessment

Knowledge of the site conditions and proposed development has been used below to review the potential impacts identified by the screening, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

The site is underlain by the Claygate Member, which is classified as a Secondary (A) Aquifer.

Whilst the site is underlain by the Claygate Member, which is classified as a Secondary A Aquifer, the ground investigation has found the soils present beneath the site to be predominantly clayey in nature and are therefore unable to support significant groundwater flows. This has been confirmed by the absence of any inflows during completion of the field work and whilst groundwater has been recorded during subsequent monitoring this is at significant depth beneath formation level for the proposed lower ground floor extension.

Given these factors, it is considered that the proposed development will not have any significant influence on the local hydrogeology and will not therefore have any potential impact on any adjoining sites.

The site is within 100 m of a former well.

A well is understood to have been present approximately 25 m to the east of the site, which provided water for the Old Hampstead Brewery.

BGS records confirm that this well extended into and drew its water from the underlying chalk aquifer, such that it bypassed the near surface aquifer of the Claygate Member. The well is also understood to have been decommissioned prior to the 1930s, with the area having been subsequent redeveloped with the existing commercial and residential properties.

It is not therefore considered likely that the site could have any potential impact on or be adversely affected by this historical feature.

The site includes a man-made slope, with an angle in excess of 7°.

As previously noted, an existing slope is present between the external courtyard are to the rear of the existing building and the car parking area, which extends across the central and northern parts of the site. However, as per the previous comments and photograph included in Section 2.1, this slope is fully paved and is supported at its base by an existing retaining structure and is not therefore considered to pose any significant risk of potential instability.

This feature will also be removed and replaced with a new retaining wall as part of the proposed development, thus removing any potential long term risk.

The site is within an area likely to be affected by shrink swell.

The investigation confirmed the expected ground conditions, in that, beneath a variable thickness of made ground, firm sandy clay of the Claygate Member has been encountered over the London Clay. However, the proposed lower ground floor extension is not understood to be within the zone of influence of any tress and will be formed at a depth, such that any new foundations would be expected to bypass any potentially desiccated soils.

Subject to inspection of foundation excavations in the normal way to ensure that there is not significant unexpectedly deep root growth, it is not considered that the occurrence of shrink swell issues in the local area has any bearing on the proposed development.

Location of public highway.

Whilst the site fronts onto Hampstead High Street, the proposed lower ground floor extension is positioned to the rear of the existing building and is understood to be at a distance of no less than 20 m from this potentially sensitive asset at its closest point.

As the proposed lower ground floor extension and associated retaining walls are therefore at a distance in excess of 5 m from the public highway, it is unlikely to result in any adverse impact and further assessment is not considered to be necessary.

7.0 CONCLUSIONS

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. A number of potential impacts were identified as a result of the screening exercise. However, it has been concluded that all potential impacts can be mitigated by appropriate design and standard construction practice.

Standard safe working practices and measures that will be adopted to construct the basement mean that the proposed development is unlikely to result in any specific groundwater or land or slope stability issues.

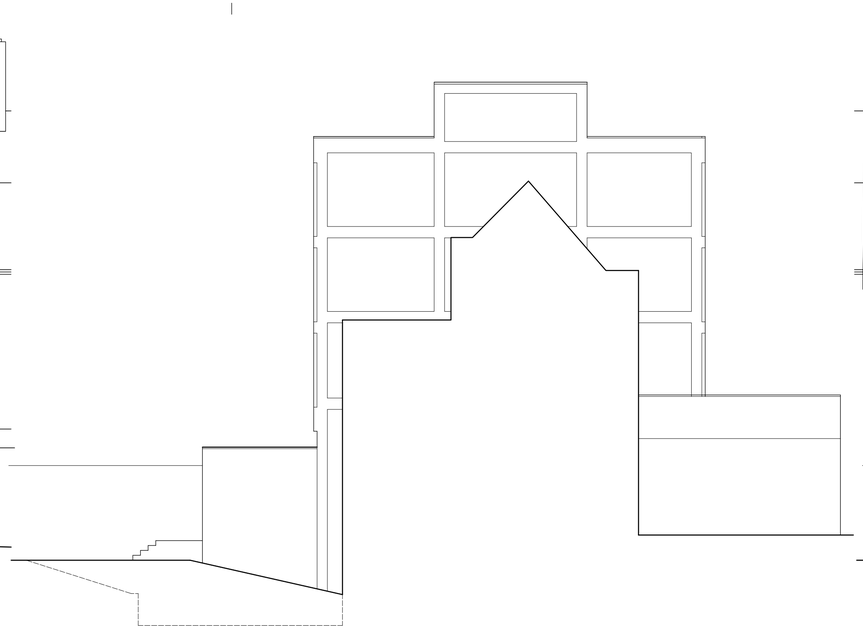
Appendix

Existing Plans & Development Proposals

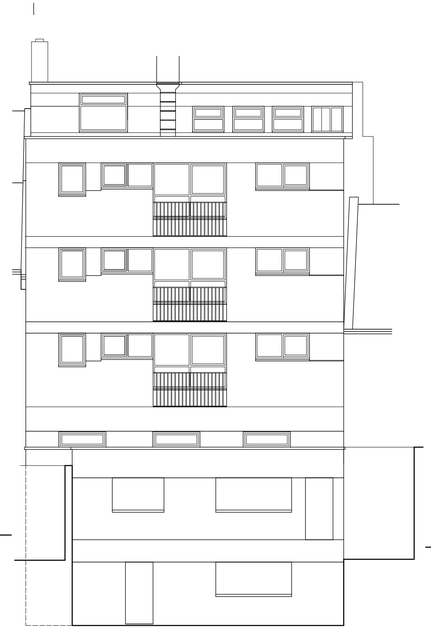
Service Search Information

appendix

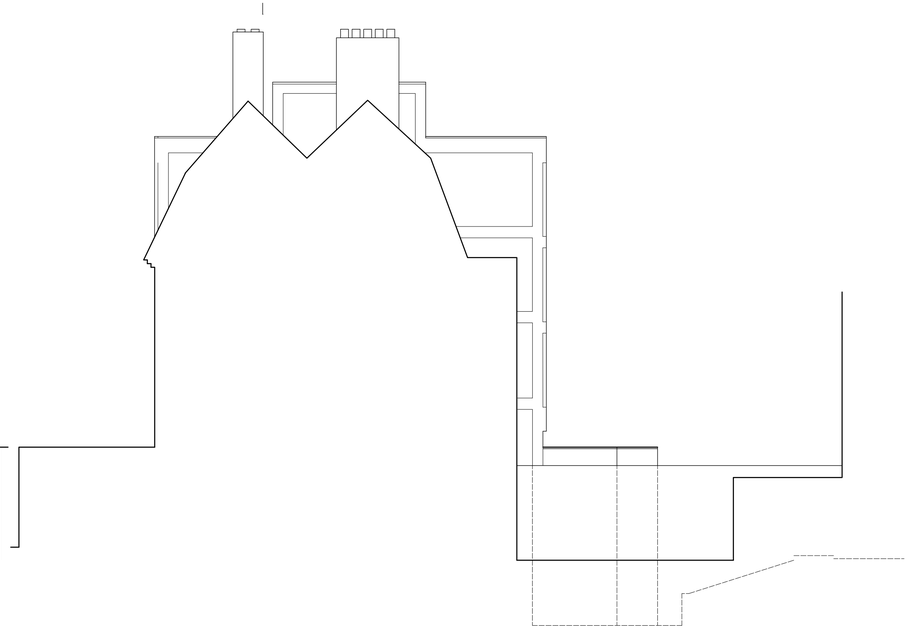
South (Front) Elevation



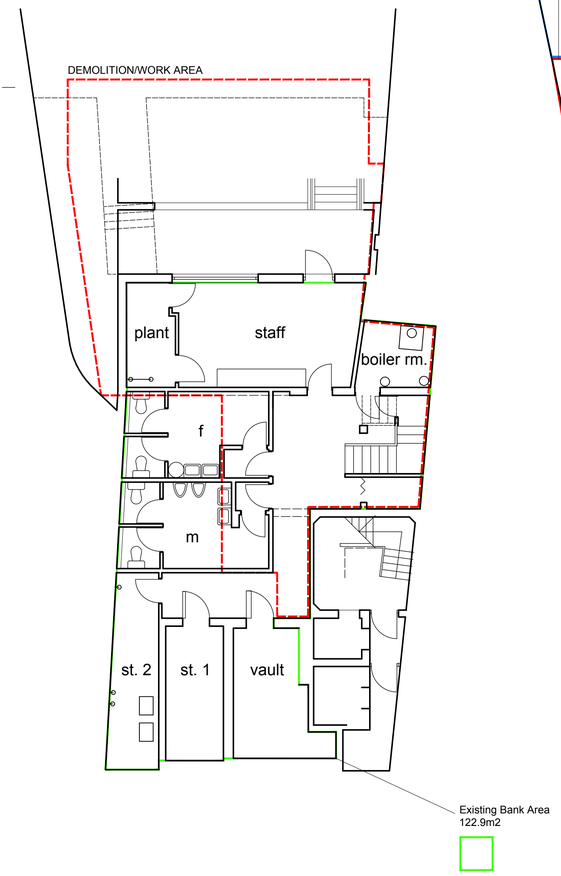
West (Side) Elevation



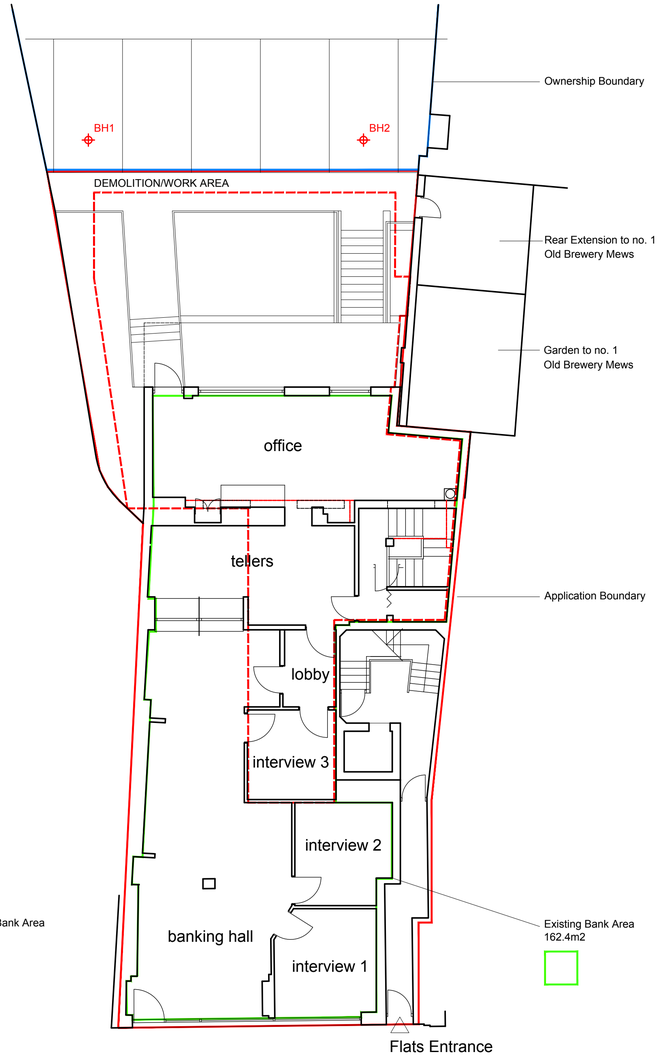
North (Rear) Elevation



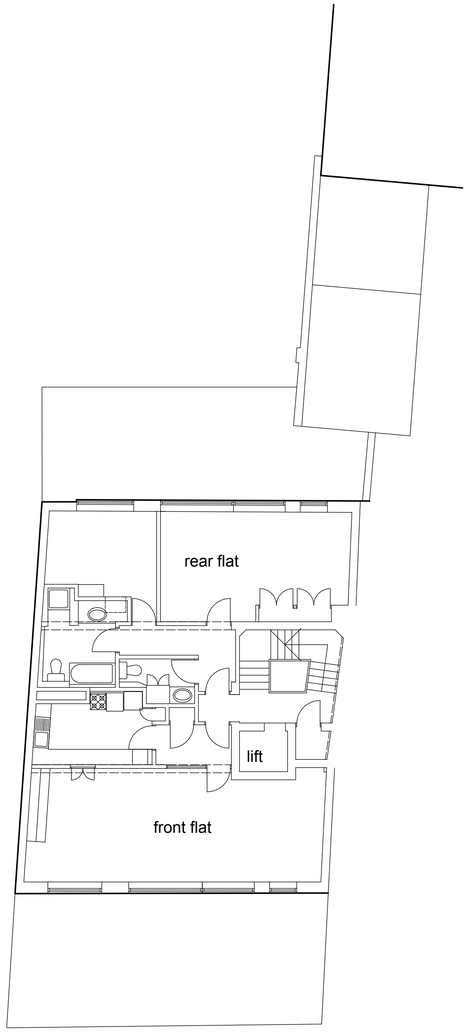
East (Side) Elevation



Lower Ground Floor



Ground Floor



First Floor & Above

A1 Original Sheet Size

Scale Bar @ 1:50 0 2.5m

Scale Bar @ 1:100 0 5.0m

Revision

Job

11 Hampstead High Street
London NW3 1PX

Client

Farlane Investments Ltd

Drawing

Existing Plans

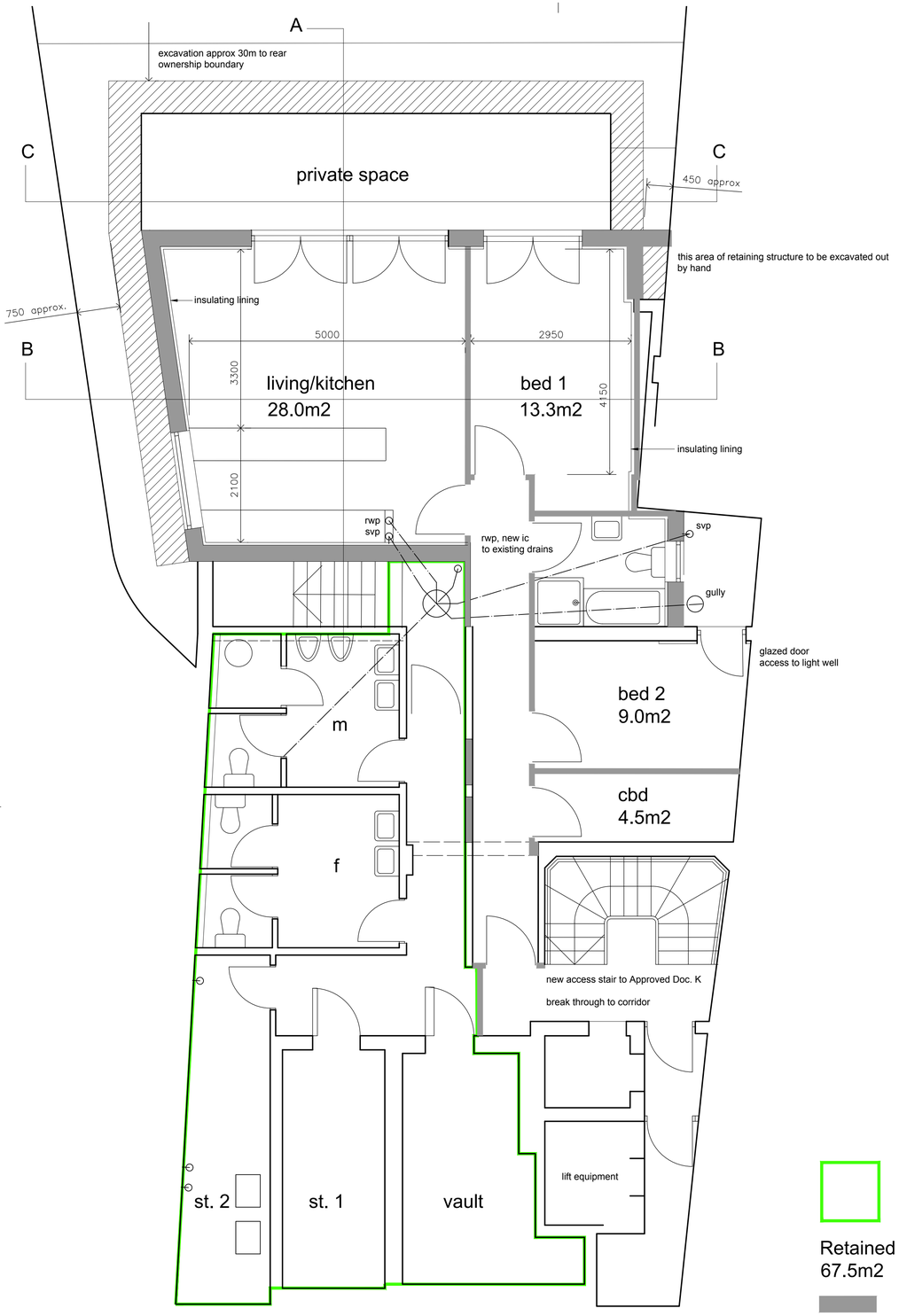
Scale/Date/Drawn/Chk.

1:100/06'21/WDM

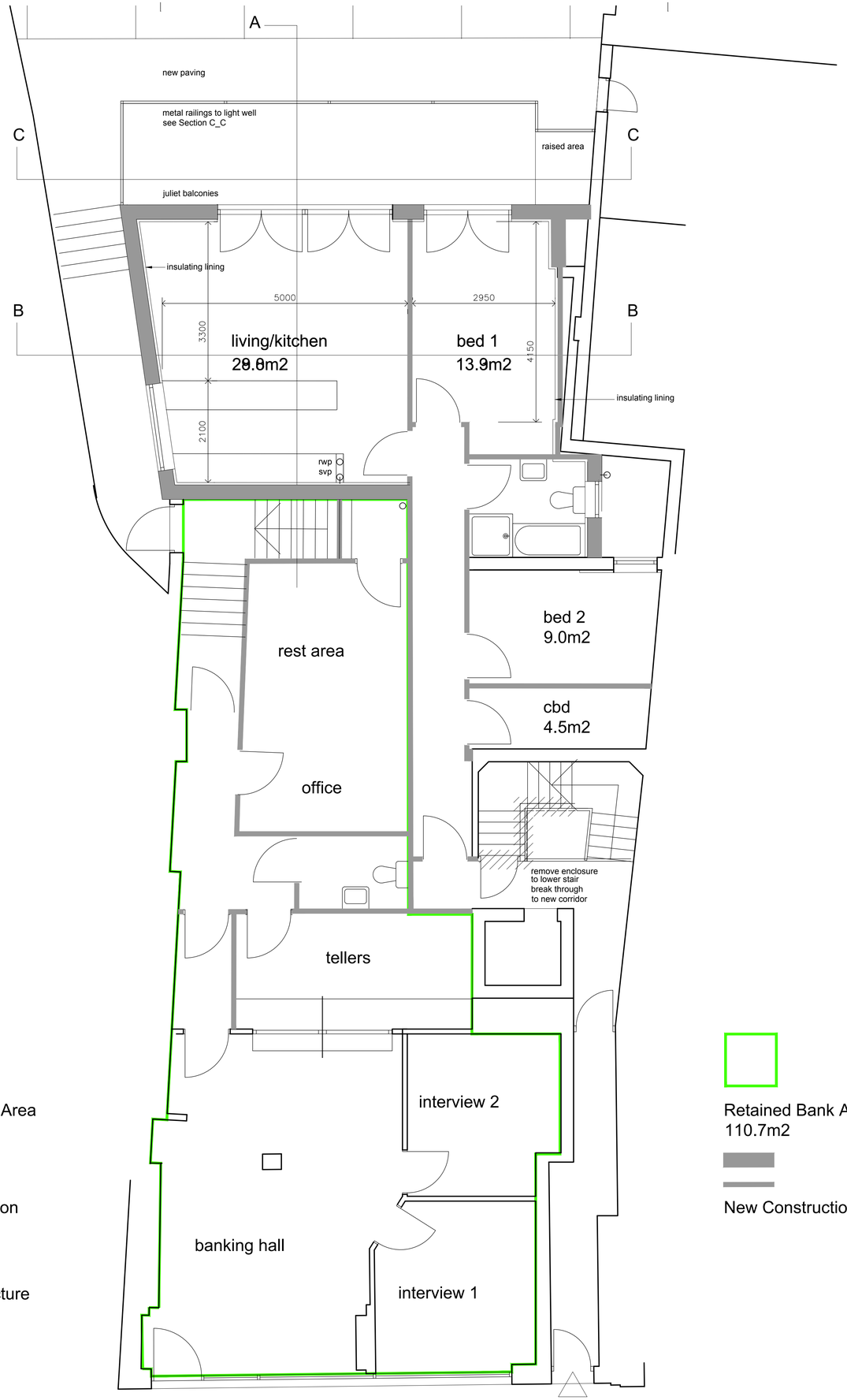
CSM + ARCHITECTS
1 Boyd Street
Shieldfield
Newcastle upon Tyne
NE2 1AP
Tel + 44 (0) 191 260-2450
Fax + 44 (0) 191 261-7301
E-mail admin@csmarchitects.co.uk
Web Site www.csmarchitects.co.uk

4408

-21



Lower Ground Floor



Ground Floor

Flats Entrance

Retained Bank Area
67.5m2

New Construction

Retaining Structure

Retained Bank Area
110.7m2

New Construction

A1 Original Sheet Size

Scale Bar @ 1:50 0 2.5m

Scale Bar @ 1:100 0 5.0m

Revision

Job

11 Hampstead High Street
London NW3 1PX

Client

Farlane Investments Ltd

Drawing

Proposed Plans Enlarged

Scale/Date/Drawn/Chk.

1:500/12'21/WDM

CSM + ARCHITECTS
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Tel + 44 (0) 191 260-2450
Fax + 44 (0) 191 261-7301
E-mail admin@csmarchitects.co.uk
Web Site www.csmarchitects.co.uk

4408

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Enquiry Confirmation

LSBUD Ref: 26004791

Date of enquiry: 20/06/2022
Time of enquiry: 16:08

Enquirer

Name	Mrs Nicola Watson	Phone	01912302993
Company	3e Consulting Engineers Limited	Mobile	Not Supplied
Address	2 Esh Plaza, Sir Bobby Robson Way, Great Park Sir Bobby Robson Way Newcastle upon Tyne Tyne & Wear NE13 9BA		
Email	nicola.watson@3econsult.com		

Enquiry Details

Scheme/Reference	P21-270		
Enquiry type	Planned Works	Work category	Excavations Non Utility
Start date	27/06/2022	Work type	Multiple excavations site (deeper tl
End date	29/06/2022	Site size	50 metres diameter
Searched location	XY= 526600, 185690	Work type buffer*	50 metres
Confirmed location	526600 185690		
Site Contact Name	Nicola Watson	Site Phone No	01912302993
Description of Works			

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map

Enquiry Confirmation

LSBUD Ref: 26004791

Date of enquiry: 20/06/2022
Time of enquiry: 16:08

Asset Owners

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.linesearchbeforeudig.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

Notes. Please ensure your contact details are correct and up to date on the system in case the LSBUD Members need to contact you.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Asset Owners & Responses. Please note the enquiry results include the following:

1. "LSBUD Members" who are asset owners who have registered their assets on the LSBUD service.
2. "Non LSBUD Members" are asset owners who have not registered their assets on the LSBUD service but LSBUD is aware of their existence. Please note that there could be other asset owners within your search area.

Below are three lists of asset owners:

1. LSBUD Members who have assets registered within your search area. ("Affected")
   a. These LSBUD Members will either:
      i. Ask for further information ("Email Additional Info" noted in status). The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.

      ii. Respond directly to you ("Await Response"). In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.

2. LSBUD Members who do not have assets registered within your search area. ("Not Affected")

3. Non LSBUD Members who may have assets within your search area. Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

Enquiry Confirmation

LSBUD Ref: 26004791

Date of enquiry: 20/06/2022
Time of enquiry: 16:08

LSBUD Members who have assets registered on the LSBUD service within the vicinity of your search area.

List of affected LSBUD members			
Asset Owner	**Phone/Email**	**Emergency Only**	**Status**
Cadent Gas	0800688588	0800111999	Await response
National Grid Electricity Transmission	08000014282	0800404090	Await response
UK Power Networks	08000565866	08000565866	Await response

LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area. Please be aware that LSBUD Members make regular changes to their assets and this list may vary for new enquiries in the same area.

List of not affected LSBUD members		
Angus Energy	AWE Pipeline	Balfour Beatty Investments Limited
BOC Limited (A Member of the Linde Group)	Box Broadband	BP Exploration Operating Company Limited
BPA	Carrington Gas Pipeline	CATS Pipeline c/o Wood Group PSN
Cemex	Centrica Storage Ltd	CNG Services Ltd
Concept Solutions People Ltd	ConocoPhillips (UK) Teesside Operator Ltd	D.S.Smith
Diamond Transmission Corporation	DIO (MOD Abandoned Pipelines)	DIO (MOD Live Pipelines)
E.ON UK CHP Limited	EirGrid	Eleclink Limited
Electricity North West Limited	Energy Assets Pipelines	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESP Utilities Group
ESSAR	Esso Petroleum Company Limited	euNetworks Fiber UK Ltd
EXA Infrastructure	Exolum Pipeline System	Fulcrum Electricity Assets Limited
Fulcrum Pipelines Limited	Gamma	Gas Networks Ireland (UK)
Gateshead Energy Company	Gigaclear Ltd	Harbour Energy
Heathrow Airport LTD	Humbly Grove Energy	IGas Energy
INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)	INOVYN ChlorVinyls Limited
INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)	Jurassic Fibre Ltd
Last Mile	Mainline Pipelines Limited	Manchester Jetline Limited
Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited
Moray East Offshore Windfarm	Murphy Utility Assets	National Grid Gas Transmission
Neos Networks	Northumbrian Water Group	NPower CHP Pipelines
NTT Global Data Centers EMEA UK Ltd	NYnet Ltd	Oikos Storage Limited
Ørsted	Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)
Petroineos	Phillips 66	Portsmouth Water
Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)
RWEnpower (Little Barford and South Haven)	SABIC UK Petrochemicals	SAS Utility Services Ltd
Scottish and Southern Electricity Networks	Scottish Power Generation	Seabank Power Ltd
SES Water	SGN	Shell
Shell NOP	SP Energy Networks	Squire Energy Networks

SSE Generation Ltd	SSE Transmission	SSE Utility Solutions Limited
Tata Communications (c/o JSM Construction Ltd)	Total Colnbrook Pipelines	Total Finaline Pipelines
Transmission Capital	Uniper UK Ltd	University of Cambridge Granta Backbone Network
Vattenfall	Veolia ES SELCHP Limited	Veolia ES Sheffield Ltd
Voneus Limited	VPI Power Limited	Wales and West Utilities
West of Duddon Sands Transmission Ltd	Western Power Distribution	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

Enquiry Confirmation

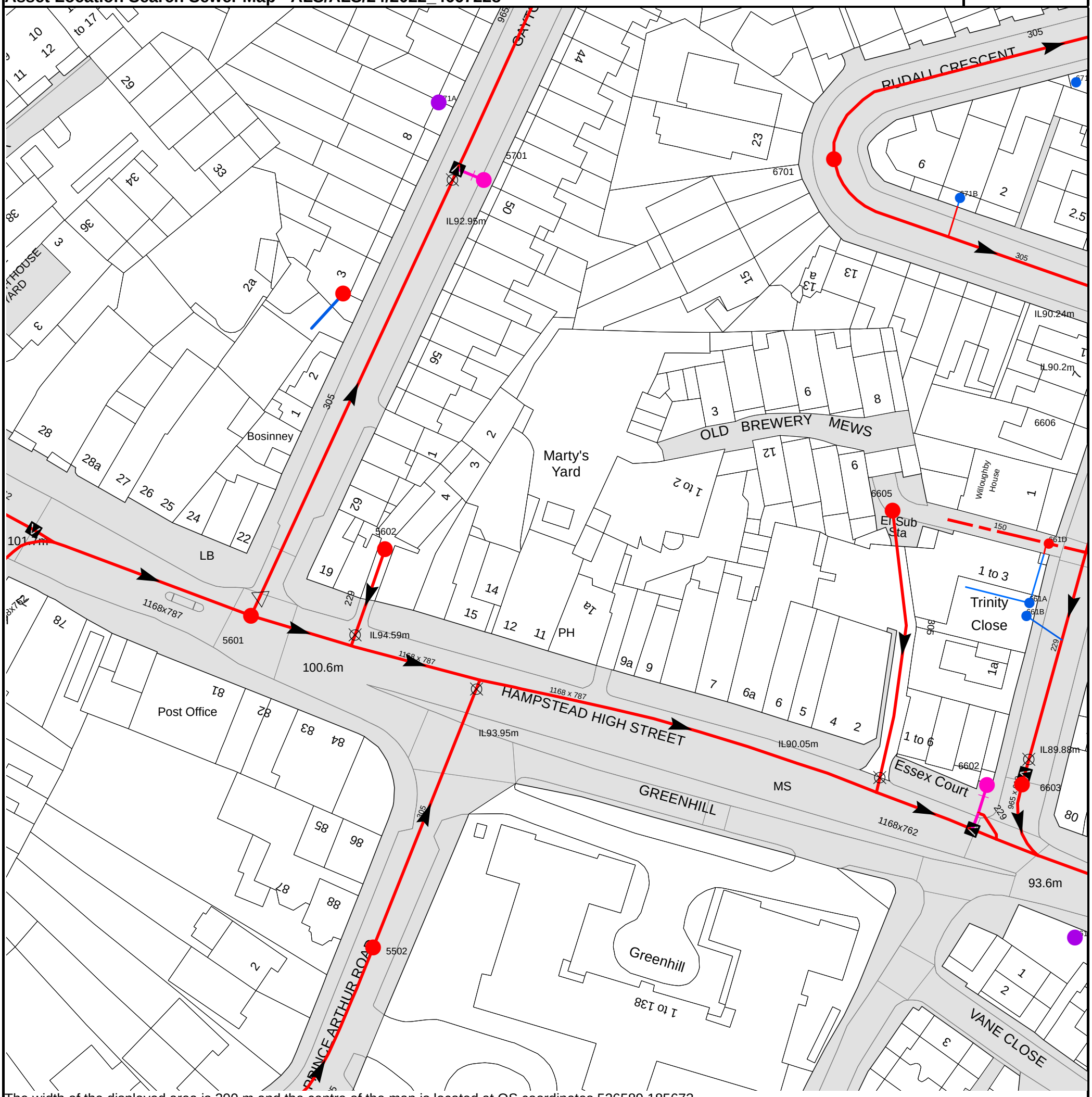
LSBUD Ref: 26004791

Date of enquiry: 20/06/2022
Time of enquiry: 16:08

The following Non-LSBUD Members may have assets in your search area. It is YOUR RESPONSIBILITY to contact them before proceeding. Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.

Non-LSBUD members (Asset owners not registered on LSBUD)			
Asset Owner	**Preferred contact method**	**Phone**	**Status**
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
ENGIE	nrswa.uk@equans.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@instalcom.co.uk	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Sky UK Limited	nrswa@sky.uk	02070323234	Not Notified
Sota	SOTA.plantenquiries@instalcom.co.uk		Not Notified
Teliasonera	check-network@arelion.com	0800526015	Not Notified
Thames Water	http://www.digdat.co.uk	08450709145	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

Asset Location Search Sewer Map - ALS/ALS/24/2022_4667228



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 526589,185673

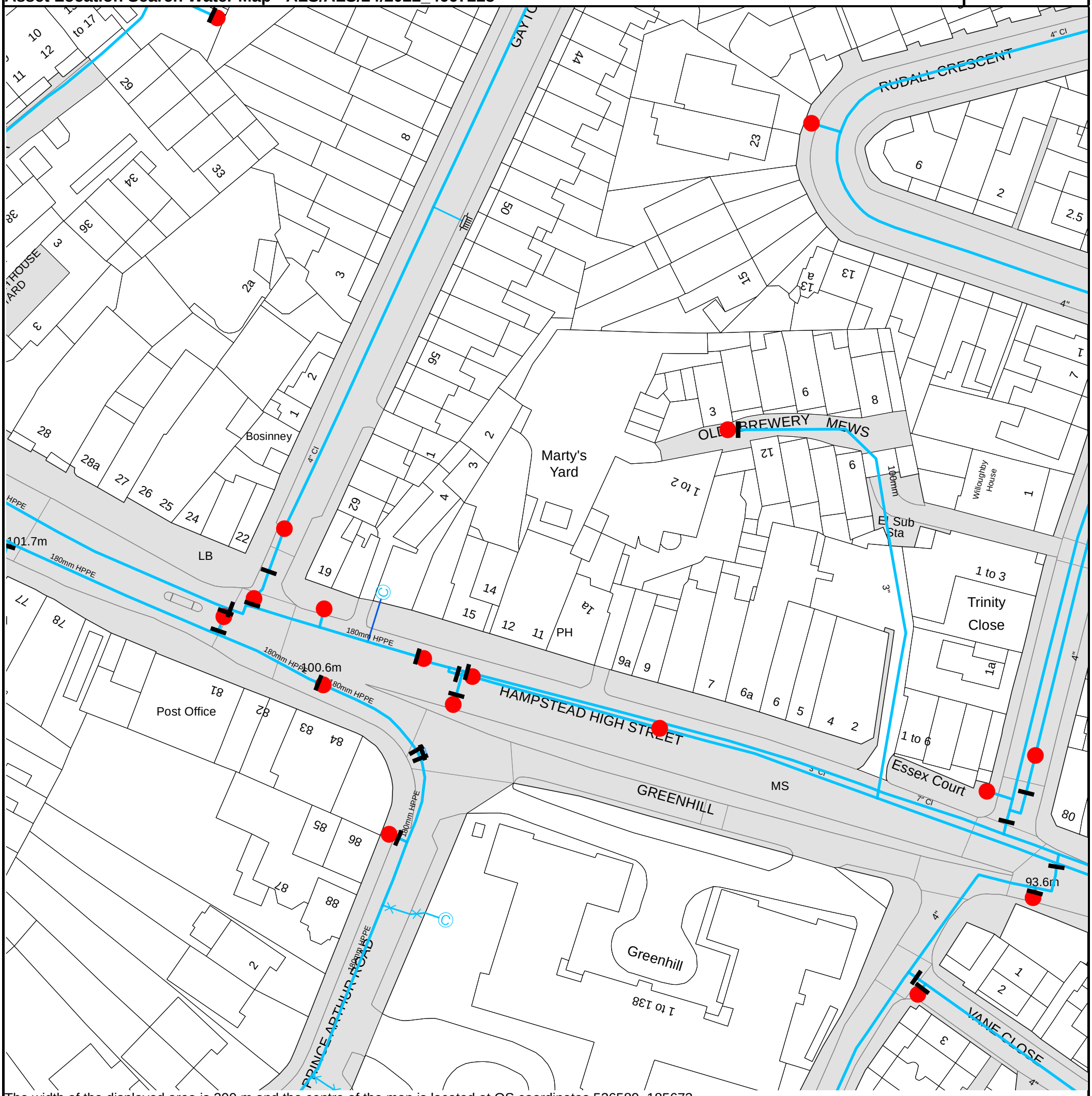
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5601	100.75	95.41
57BA	n/a	n/a
5602	99.12	95.33
571A	n/a	n/a
5701	n/a	n/a
6701	95.26	92.17
6605	95.86	92.56
671B	n/a	n/a
661B	n/a	n/a
661A	n/a	n/a
661D	n/a	n/a
671A	n/a	n/a
5502	104.2	100.37
6602	n/a	n/a
6603	93.95	89.73
661E	n/a	n/a

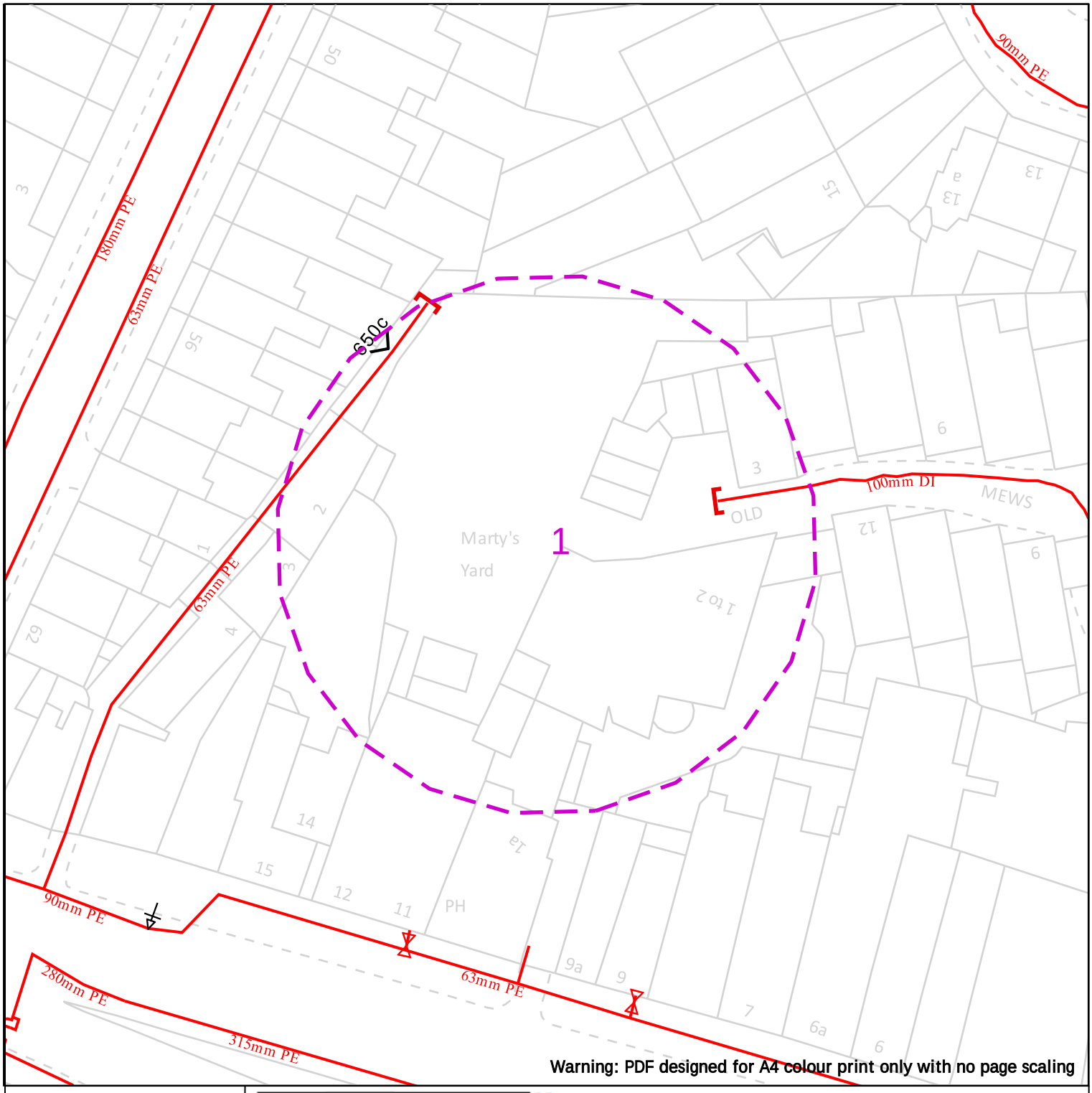
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Water Map - ALS/ALS/24/2022_4667228



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 526589, 185673.

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 21/06/2022
Job Reference: 26004791
Site Location: 526600 185690
Requested by: Mrs Nicola Watson

Your Scheme/Reference: P21-270

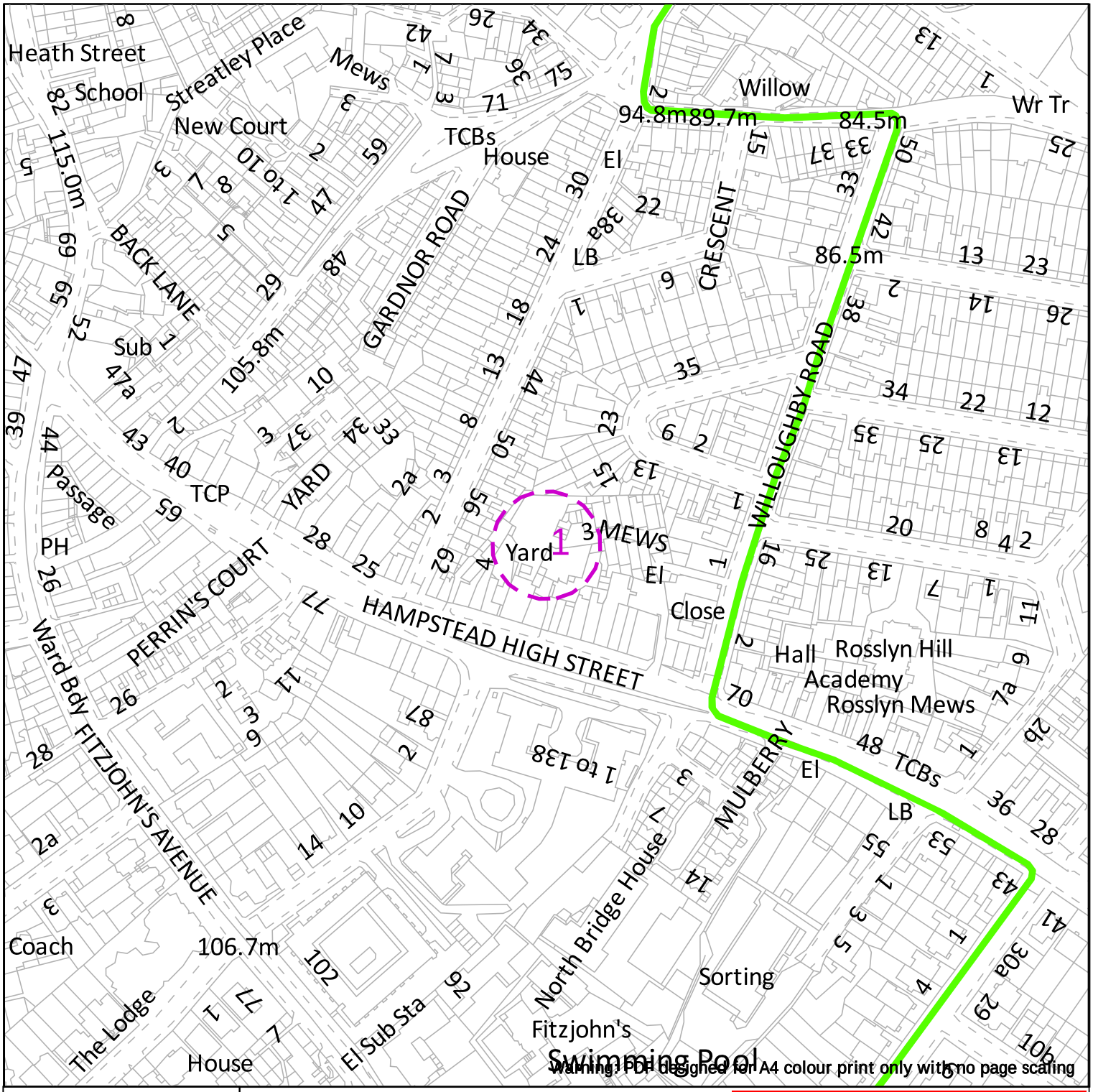
View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999



nationalgrid

100m

EXTREME CAUTION - HIGH VOLTAGE
RISK OF DEATH OR SERIOUS INJURY

Dig Sites Area: Line:

Underground Cables

Overhead Lines

Fibre Cables

NationalGrid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

AssetProtection@NationalGrid.com

Date Requested: 20/06/2022
Job Reference: 26004791
Site Location: 526600 185690
Requested by: Mrs Nicola Watson

Your Scheme/Reference: P21-270

Scale: 1:2500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows those pipes owned by National Grid Electricity Transmission plc in its role as a Licensed Electricity Transporter (ET). Electricity cables owned by other ETs, or otherwise privately owned, may be present in this area. Information with regards to such cables should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Ancillary equipment such as cooling systems and communication cables are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by National Grid Electricity Transmission plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of cables and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near electricity apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

National Grid Electricity Emergency Number: 0800 40 40 90

Available 24 hours, 7 days/week. Calls may be recorded and monitored

Geotechnical &
Environmental
Associates

Herts:

Widbury Barn
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SG12 7QE
tel 01727 824666
mail@gea ltd.co.uk

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Kingston on Soar
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midlands@gea ltd.co.uk

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M1 5AN
tel 0161 209 3032
mail @ gea ltd.co.uk