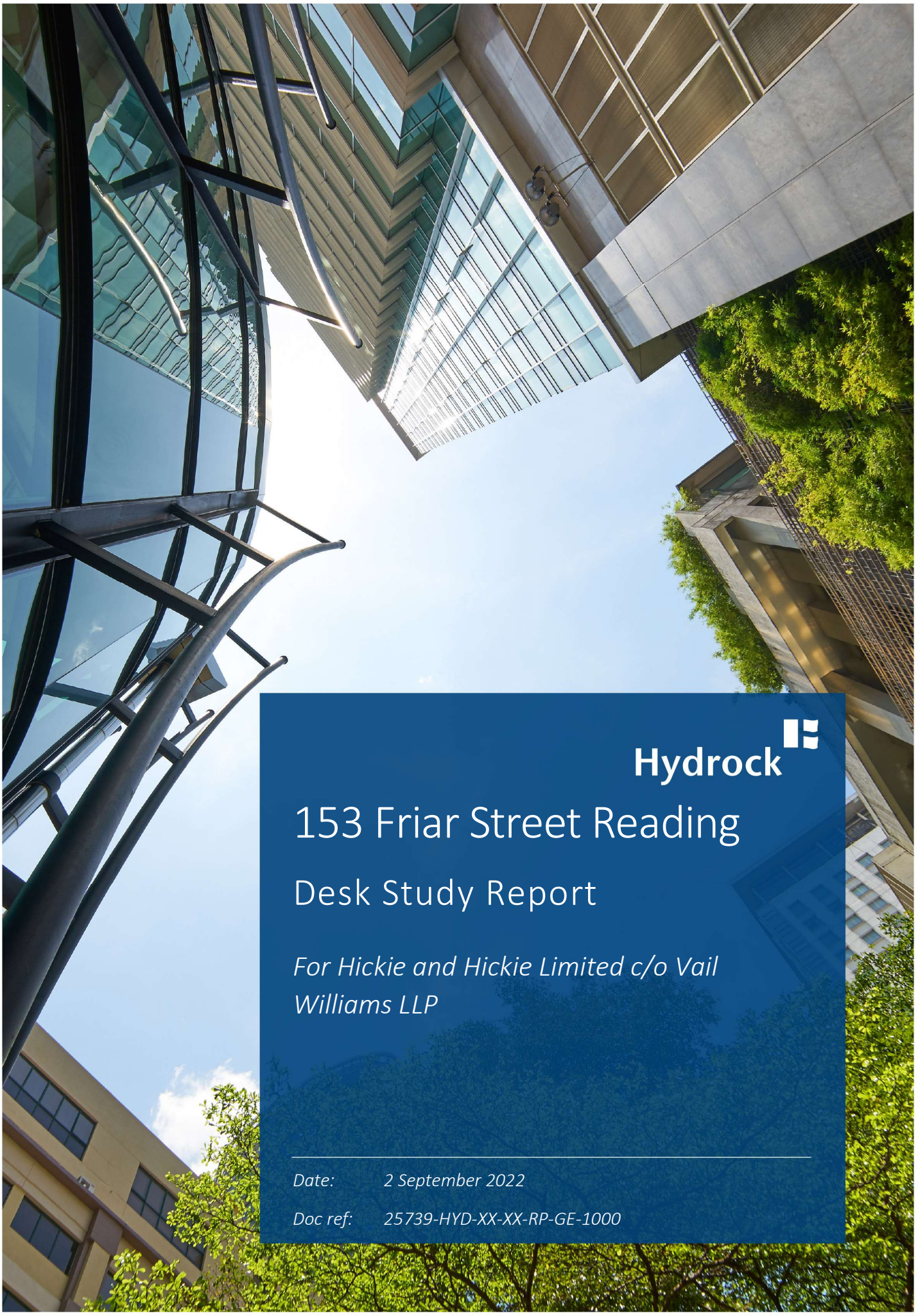


Hydrock

153 Friar Street Reading

Desk Study Report

For Hickie and Hickie Limited c/o Vail Williams LLP

Date: *2 September 2022*

Doc ref: *25739-HYD-XX-XX-RP-GE-1000*

DOCUMENT CONTROL SHEET

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Executive Summary

SITE INFORMATION AND SETTING	
Objectives	Ground Conditions Desk Study Report
Client	Hickie and Hickie Limited c/o Vail Williams LLP
Site name and location	153 Friar Street, Reading.
Proposed development	The site development proposals are understood to comprise a refurbishment of the first and second storey of the building for residential end use.
Site description	The site is located in Reading city centre, approximately 100m south of Reading train station. The National Grid Reference of the approximate centre of the site is 471541E, 173572N. The site is approximately 0.01 Ha in area and measures approximately 12m x 6m. Northern Boundary – Friar Street and primary site access. Southern, Eastern and Western Boundary – Commercial sales structures and residences
DESK STUDY SUMMARY	
Topography	The site is generally level at approximately 47mAOD.
Hydrology	The Thames river lies 530m northeast of the site and the Kennet river lies 300m southeast of the site.
Site History	The site existed as a commercial or residential unit from 1879 (earliest available map). The site underwent either an extension or redesign between 1900 and 1912 to reflect the current structural footprint.
Geology	Superficial: Taplow Gravel Member - Sand and gravel, locally with lenses of silt, clay or peat. Bedrock: Seaford Chalk Formation - Firm white chalk with conspicuous semi-continuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.
Natural geological hazards	5 No. chalk cavities were identified within 500m surrounding the site. There are no known chalk cavities recorded on site. The closest cavity record lies 170m south of the site.
Hydrogeology	The site is underlain by a Secondary A aquifer within the Taplow Gravel Member and a Principal aquifer within the Seaford Chalk Formation
UXO Risk	The non-specialist UXO screening exercise has indicated no further assessment is required with regard to UXO in relation to ground investigation.
ASSESSMENT AND CONCLUSIONS	
Preliminary Geo-environmental Conclusions	Based on historical land uses and its current operational use, the overall risk from land contamination at the site is considered to be low for the current development. The overall risk for a redeveloped site is assessed to be low, as long as potential asbestos containing materials within the building fabric are managed in accordance with CAR 2012. High risk to construction workers and end users from any asbestos present in the existing building can be downgraded to low risk provided all work with asbestos is done in accordance with the Control of Asbestos Regulations (CAR 2012). If present, careful removal will be required prior to refurbishment. Removal under controlled conditions should limit release of fibres to the air and the ground. It is considered unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990. The possible pollutant linkages on an un-remediated site determined by desk study and walk-over are summarised below for risk levels of moderate or greater.

	Source(s)	◄ potential Impact on ►	Receptor(s)
	Potential asbestos within existing building (S02).		Site Users
Preliminary Geotechnical Hazards	As the development proposal includes the refurbishment to the existing building with no additional structural loads or breaking of ground, there are no site-specific geotechnical conclusions. A building survey by a suitably qualified structural engineer is recommended.		
FUTURE CONSIDERATIONS			
Further work	In order to confirm the actual risks to receptors with respect to potential geo-environmental risks, an appropriate survey will need to be undertaken. The survey required should include: • refurbishment survey to be undertaken to confirm that the careful removal of asbestos has taken place prior to the proposed works in accordance with the Control of Asbestos Regulations (CAR 2012); and • discussions with regulatory bodies and the warranty provider regarding the conclusions of this report.		

This Executive Summary forms part of Hydrock Consultants Limited report number 25739-HYD-XX-XX-RP-GE-1000 and should not be used as a separate document.

1. INTRODUCTION

1.1 Terms of reference

In August 2022, Hydrock Consultants Limited (Hydrock) was commissioned by Hickie and Hickie Limited c/o Vail Williams LLP to undertake a Phase 1 desk study at the site located at 153 Friar Street, Reading.

The site is currently a three-storey terraced building with a small basement, currently understood to be designated for commercial use.

Hydrock understands that the first and second storey of the existing building is to be converted for residential use. The site (Title Plan BK488159) is presented in Appendix A.

The investigation works have been undertaken in accordance with Hydrock's proposal referenced (25739-HYD-XX-XX-FP-MD-0001, 12th August 2022) and the Client's instructions to proceed (email dated 12th of August 2022).

1.2 Objectives

The works have been commissioned to support a planning submission under permitted development.

The objectives of the Phase 1 Desk Study are to formulate a preliminary Ground Model and an Initial Conceptual Site Model of the site to identify and make a preliminary assessment of any potential geo-environmental and geotechnical risks to the proposed development.

1.3 Scope

The scope of the Phase 1 Desk Study comprises:

- a field reconnaissance (walkover) to determine the nature of the site and its surroundings including current and former land uses, topography and hydrology;
- acquisition and review of:
  - historical Ordnance Survey maps, to identify any; former potentially contaminative uses shown at the site and immediately surrounding it, and an assessment of the associated contamination risks;
  - a third-party environmental report to identify any; flooding warning areas, local landfills, pollution incidents, abstractions, environmental permits etc. All of which may have had the potential to have environmental impact on the site;
  - topographical, geological and hydrogeological maps;
  - British Geological Survey (BGS) archive records;
  - regional UXO risk maps;
  - a site-specific Natural Chalk Cavities and Mining Database Search;
- development of a preliminary Ground Model representing ground conditions at the site;
- development of an initial Conceptual Site Model (iCSM), including identification of potential contaminant linkages;
- a qualitative assessment of any geo-environmental risks identified; and
- identification of any plausible geotechnical hazards.

1.4 Available information

The following documents have been reviewed by Hydrock from publicly available sources for use in the preparation of this report:

- Drawing Number 2846002P1. Existing and proposed plans, 153 Friar Street, Reading, Hives Architects

It is assumed that Hickie and Hickie Limited c/o Vail Williams LLP have formal reliance upon their contents.

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015+A1:2020, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+ A2:2017, EA LCRM (2021) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with any potential geo-environmental risks assessed qualitatively. This is done using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990). Any potential geotechnical risks are also assessed from the Phase 1 desk study and site reconnaissance stage.

Professional judgement is used to evaluate the findings of the risk assessments and to provide recommendations for the development.

Where relevant the relevant requirements of the current edition of NHBC Standards have also been applied.

The geo-environmental and geotechnical aspects are discussed in separate sections. Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. Designers should take all aspects of the investigation into account.

Remaining uncertainties and recommendations for further work are listed in Section 5 and Section 6 respectively.

2. DESK STUDY (AND FIELD RECONNAISSANCE)

2.1 Data

A number of desk study sources have been used to assemble the following information. These are presented in Appendix D and include:

- Third-party environmental report (Groundsure report, reference HYD-8984785);
- Historical Ordnance Survey mapping;
- BGS Archive Records;
- Zetica UXB Risk Maps (https://zeticauxo.com/downloads-and-resources/risk-maps/);
- Natural Chalk Cavities and Mining Database Search (Stantec Factual Cavities Database Search for the site at 153 Friar Street, Reading, ref: 332511268);

2.2 Site referencing

Table 2.1: Site referencing information

Item	Brief Description
Site name	153 Friar Street
Site address	153 Friar Street, Reading, RG1 1HE
Site location and grid reference	The site is located in Reading city centre, approximately 100m south of Reading train station. The National Grid Reference of the approximate centre of the site is 471541E, 173572N. The site is approximately 0.01 Ha in area and measures approximately 12m x 6m.
Site boundaries	Northern Boundary – Friar Street and primary site access. Southern, Eastern and Western Boundary – Commercial sales structures and residences

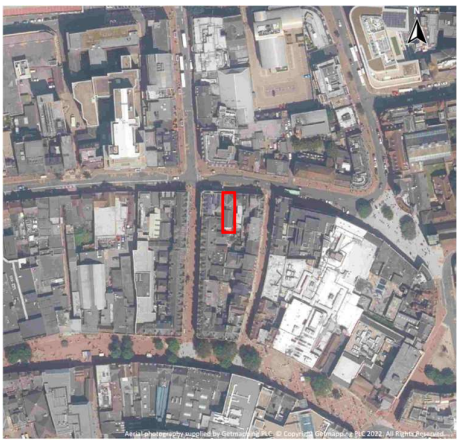


Figure 2.1: Site location
(Reproduced with permission from Groundsure)

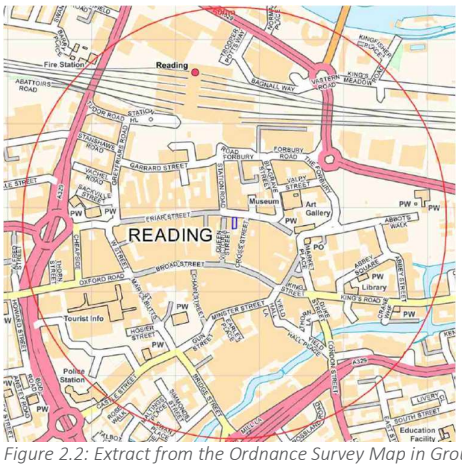


Figure 2.2: Extract from the Ordnance Survey Map in Groundsure Report.
(OS licence 100035207).

A site location plan is presented in Appendix A.

2.3 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 24th of August 2022 to visually identify assess potential geotechnical hazards, contaminant sources for future investigation and identification of possible source-pathway-receptor linkages. The weather during the field reconnaissance survey was sunny and 22 degrees celcius.

A description of the site is presented in Table 2.2 and selected photographs are presented in Figure 2.3 to Figure 2.6. Additional photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site access	The site was accessed from the ground floor of Friar Street.
Site area	The site is rectagonal in shape and has an area of approximately 0.1 ha.
Elevation, topography and any geomorphic features	The site is a single terraced 3 storey building, with ground level at approximately 47m above Ordnance Datum (OD). The site is topographically slightly elevated compared to other surrounding areas of Reading City Centre.
Site boundaries and surrounding land	Northern Boundary – Friar Street, commercial businesses. Reading railway station located approximately 200m north of site. Southern Boundary – Further commercial storage areas (based on satellite imagery) and buildings Eastern Boundary – Cancer research UK storefront and unknown on upper floors. Reading museum and Town Hall located 120m east of the site. Western Boundary – Sta Travel storefront and unknown on upper floors. Further commercial businesses located to the west of the site along Friar Street.
Present land use	The site is currently used as the premises for Hickies Music Shop on the ground floor. The basement and two upper levels are used currently as storage areas. Gas, BT and water service noted on pavement covers outside of property on Friar street.
Vegetation	None observed
General site sensitivity	Site is urban and located within Reading city centre. The site is within a generally commercial area with most ground level structures occupied by storefronts. Damp smell was noted in basement level with dehumidifier running on site.

Site survey sketches with existing dimensions provided by the client are presented in Appendix A.



Figure 2.3: Storefront viewed from Friar Street.



Figure 2.4: Existing services on Friar Street.

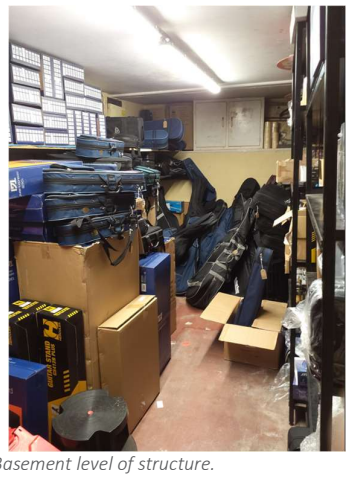


Figure 2.5: Basement level of structure.



Figure 2.6: First story of structure.

2.4 Site history

A study of historical Ordnance Survey maps (Appendix D) has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development. The key findings are summarised in Table 2.3.

Table 2.3: Site history review

Reference	Key features on site	Key features off-site
County Series – 1879: 1:2500 AND 1:500	Site is present as either commercial or residential property with an open garden area in the south. Site boundary covers area of presumed hard standing labelled Dyson Court.	20m south – Horse Repository present 90m east – Carriage Manufactory present 100m north – Royal Horse and Carriage Repository, with livery stables present. 120m south east – corn exchange present 150m northwest – Malthouse present 150m east – Town Hall Present 200m - 250m north – Reading train station present 240m west – Veterinary Infirmary present.

Reference	Key features on site	Key features off-site
		260m South – Yield Hall Foundry present 300m northwest – Rifle factory present
County Series – 1900: 1:2500	No change	150m north east – Construction of several buildings has occurred north of Valpy Street. Rifle Factory, Malthouse and Carriage Manufactory no longer present
County Series – 1912: 1:2500	Dyson Court no longer present, presumed construction has occurred as property is now fully terraced and has modern day structural footprint.	Veterinary Infirmary, Livery Stables and Royal Horse and Carriage Repository no longer present north of site. Livery Stables area now labelled as part of train station. Expanded rail network present within train station.
County Series – 1931: 1:2500	No change	Foundry no longer present. Former Livery Stable area (now part of train station) contains new buildings (use not labelled).
National Grid – 1956 - 1957. 1:1250	No change	10 - 80m north – garage present and significant demolition/construction has occurred directly north of the site. Open area currently present across the road from the site. 110m south west – archaeology find noted (Roman coins) 150m north – Train station expanded area labelled as garage. 160m north east – works present north of Valpy Street 200m north west – archaeology find noted (medieval pottery) 250m north west – Factory present 250m south east - Car park now present.
National Grid – 1962. 1:1250	No change	10m north – bank now present in formerly empty area. Corn exchange no longer present.
National Grid – 1973. 1:10000	No change	450m – 500m south – 2 No. breweries and a factory present.
National Grid – 1978 - 1979. 1:1250 AND 1:10000	No change.	80m north – garage no longer present. 200m northwest – multi storey car park now present. 200m north east – train station car park now present
National Grid – 1986 - 1988. 1:1250	No change.	180m northwest – rooftop car park present 200m northwest – bus station below club. 250m northeast – car park now labelled as Apex Plaza. 400m southwest – Broad street mall present 400m southeast – depot and car park present.

2.5 Geology

The geology of the site area is shown on the 1:10,000 British Geological Survey (BGS) map extract reproduced as part of the Groundsure report and is summarised below:

Table 2.4: Geology

Ref. for Figures	Location	Stratigraphic Name	Description
Superficial Deposits (Figure 2.7)			
1	On site.	Taplow Gravel Member	Sand and gravel, locally with lenses of silt, clay or peat.
2	100m north and south	Alluvium	Soft silts and clays.
Solid Geology (Figure 2.8)			
1	On site.	Seaford Chalk Formation	Firm white chalk with conspicuous semi-continuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.

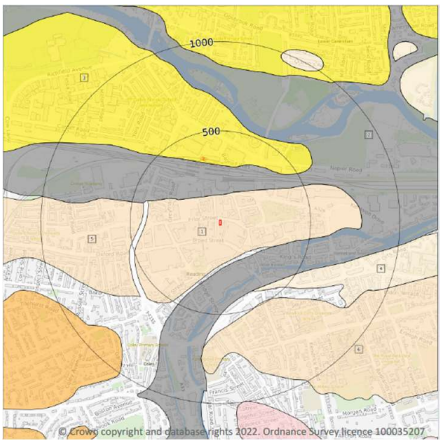


Figure 2.7: Superficial deposits.
(Reproduced with permission from Groundsure)

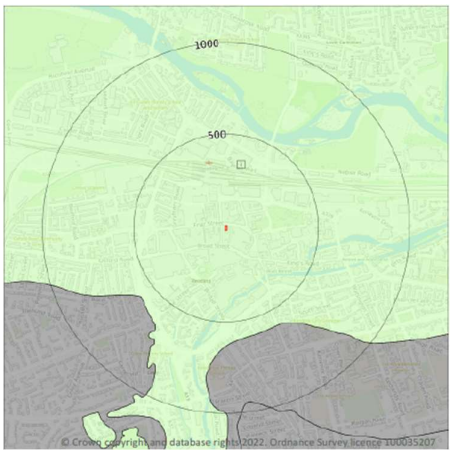


Figure 2.8: Solid geology.
(Reproduced with permission from Groundsure)

A number of borehole logs from the BGS archive have been reviewed. Selected records are summarised below:

- SU77SW74, located 50m to the east of the site, to the South of St Laurence's Church drilled to a depth of 8.00m and recorded:
  - » Made Ground between ground level and 5.6m below ground level (bgl);
  - » Chalk between 5.6m and 8.0m bgl;

2.6 Hydrogeology

2.6.1 Aquifer designations

Based on the inferred geological sequence presented in Section 2.5 and the Environment Agency's interactive aquifer designation map, the aquifer system presented in Table 2.5 applies.

Table 2.5: Aquifer system

Stratum	Aquifer Designation	Comments
Superficial Deposits		
Taplow Gravel Member	Secondary A	Sand and gravel, locally with lenses of silt, clay or peat.
Alluvium	Secondary A	Soft silts and clays.
Solid Geology		
Seaford Chalk Formation	Principal	Firm white chalk with conspicuous semi-continuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.

2.6.2 Groundwater abstraction

There is 1 active licensed groundwater abstractions within 1000m of the site. It is detailed in Table 2.6.

Table 2.6: Groundwater abstractions

Location Relative to Site	Purpose of Abstraction
339m west	Potable groundwater for Primark Store

2.6.3 Groundwater source protection zones and groundwater vulnerability

The site is not within a groundwater Source Protection Zone (SPZ).

2.6.4 Groundwater levels, recharge, and flow

Information from the BGS GeoIndex Maps and supporting data indicate that a highly productive aquifer underlies the site. Principal aquifers in UK up to 450 m thick and yielding 50 to 100 L/s from large diameter boreholes and up to 300 L/s from adited systems. Hard to very hard, good quality water.

Previous boreholes (SU77SW52) encountered groundwater at 2.8m bgl (36.8mAOD) approximately 250m south of the site. It is therefore likely that shallow groundwater can be expected on site, particularly within the Seaford chalk formation.

Shallow groundwater below the site is likely to drain towards the River Thames, some 500m north of the site.

2.6.5 Groundwater quality

The site is split across the edges of two River Basin Districts, Holy Brook and Thames Wallingford to Caversham. However the site largely lies within the Holy Brook River Basin District, and the ground water is classified under the Water Framework Directive as ‘good’.

2.6.6 *Groundwater flooding*

The environmental data within the Groundsure report indicates a moderate risk of groundwater flooding.

2.7 Hydrology

2.7.1 *Surface water system and drainage*

The surface water features in the vicinity of the site are listed in Table 2.7. The site lies on two catchment area boundaries, as stated above.

Table 2.7: Surface water features

Feature	Location Relative to Site
Thames River	530m north east
Kennet River	300m south east

2.7.2 *Surface water abstractions and discharges*

Table 2.8 summarises the active licensed surface water abstractions within 1km of the site.

Table 2.8: Surface water abstractions

Location Relative to Site	Purpose of Abstraction
403m south	Lake and pond throughflow.

There are currently no active licensed surface water discharges within 1km of the site.

2.7.3 *Surface water quality*

Reference to the Environment Agency web site shows the site is located within the catchment known as the Holy Brook River Basin District. The current (2019 cycle 2) overall status under the Water Framework Directive is described as 'Fail' for chemical and "Moderate" for ecological.

The reason for the water body currently having a 'moderate' ecological status is due to dissolved oxygens levels and Macrophytes and Phytobenthos (combined).

The reason for the water body currently having a 'Fail' chemical status is due Polybrominated diphenyl ethers (PBDE).

2.7.4 *Surface water flooding*

The desk study information indicates the proposed development is not at risk of surface water flooding from a source on site, however there is high risk of a 1 in 30 year event triggering 0.3m – 1.0m surface water flood approximately 50m south of the site. A dedicated flood risk assessment is recommended to be undertaken by a specialist.

2.8 Mining and mineral extraction

The site is not within an area of recorded mining, however the Groundsure report has recorded 3 No. point natural cavities within 250 meters of the site. The Groundsure report has also highlighted that the site lies in an area of "Sporadic underground mining of restricted extent possible.

A search of the Stantec Mining Cavities Database indicated that there are no man-made mining cavity records within 0.5km of the site centre. The closest recorded mining cavity is located approximately 680m south of the site in the form of a recorded subsidence event over a possible excavation/shallow bell pit.

There are no records held by the BGS of historical underground working features within 500m of the site boundary and the BGS consider that "sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered".

2.9 Natural ground instability

The site is underlain at shallow depth by potentially soluble strata (Chalk), overlain by sands and gravels with a potentially deep-water table. There is a risk of voids being present due to the dissolution of the chalk. This is discussed in more detail below (Section 2.10).

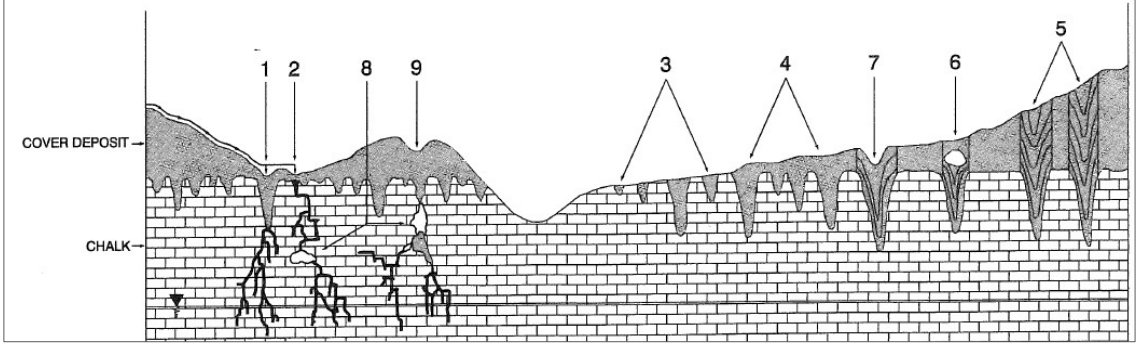
2.10 Natural chalk cavities

2.10.1 Background

The site is underlain at shallow depth by potentially soluble strata (Chalk), overlain by sands and gravels with a potentially deep water table and there is a potential risk of the formation of voids by the dissolution of the chalk.

As shown in Figure 2.9, dissolution features can include voids, collapse sinkholes, and dissolution widened discontinuities in the chalk with dissolution pipe. Subsidence sinkholes are caused by overlying granular materials collapsing into the chalk dissolution features. These often originate by material at depth collapsing into a dissolution void, causing a void to migrate upwards to form a subsidence feature at the surface.

The presence of layers of dense or cemented materials or cohesive layers can prevent or restrict the void reaching the surface, but creating a potential for surface subsidence in the future when conditions change. The collapse of materials into voids can cause either voids, or loosened material which can extend in a zone surrounding the central core of the collapsed material.



1 Swallow hole where water permeates through pre-existing solution pipe below surface hollow.
2 Swallow hole where stream water permeates down through solution widened joints and bedding.
3 Solution pipe remnants, down slope from cover deposits margin, but filled with disturbed cover deposits.
4 Solution pipe below thin cover deposits; shallow zone above pipe mouth being disturbed by subsidence.
5 Solution pipe below thick cover deposits; deep zone above pipe mouth being disturbed by subsidence.
6 Solution pipe beneath cover deposits; resistant layer limits downward subsidence creating a metastable cavity below undisturbed cover
7 Solution pipe beneath cover deposits; upward migration of metastable ground deposits results in a subsidence sinkhole at the surface.
8 Solution cavity' formed in Chalk by solution widening of joints and bedding as ground water permeates downwards to the water table.
9 Solution cavity formed by vadose or phreatic dissolution, whose roof has become destabilised causing collapse of cover.

Figure 2.9: Schematic diagram of natural chalk solution features[1]

2.10.2 Evidence of cavities on site

Hydrock commissioned Stantec to conduct a Factual Cavities Database Search for the site. While no cavities were recorded on site, there were 5 within a 500m radius of the site. The cavities recorded were solution pipes that varied from 1 to 5 in number at each location. The closest cavities identified are south of the site at 170m, 180m and 270m respectively. The report is enclosed in Appendix D.

Currently there is no evidence that cavities have been, or are present, on the site. However, it should be noted the site is covered predominantly by hardstanding and buildings and these factors could obstruct any visible cavities that may have formed.

2.10.3 Conclusions

In summary, there is no documented evidence in the immediate vicinity of the site of significant ground instability due to the collapse of voids within the gravels and Chalk. However, potential risks from this hazard cannot be entirely discounted.

2.11 Waste management

There are no current or historical waste management sites recorded within 250m of the site.

1 From McDowell, et. al. Quarterly Journal of Engineering Geology and Hydrogeology 2008, v.41, p279-290.

2.12 Regulatory Information

Information in the GroundSure Report (Appendix D), relating to various regulatory controls has been reviewed, with a summary presented below in Table 2.9. A total of 3 waste exemption licences are present within 250m of the site.

Table 2.9: Regulatory information within 250m of the site

Number	Distance from Site	Details	Potential Risk	Comment
A	26m N	15, FRIAR STREET, READING, RG1 1DB. Disposal by incineration and sorting and de-naturing of controlled drugs for disposal.	Waste migration towards site.	Likely to be subject to strict controls, potential risk considered very low.
1	83m NW	25b Friar Street READING RG1 1DP. Crushing waste fluorescent tubes	Waste migration towards site.	
2	236m NE	Apex Plaza Forbury Road Reading Berkshire RG1 1AX. Storage of waste in a secure Place.	Waste migration towards site.	Significant distance from site.

2.13 Natural soil chemistry

Information contained within the environmental report (Appendix D) gives indicative (estimated) concentration values for the natural soils at the site for a selection of Contaminants of Potential Concern (CoPC). These have been reproduced in Table 2.10.

Table 2.10: Natural soil chemistry

Element	Arsenic	Cadmium	Chromium	Lead	Nickel
Concentration (mg/kg)	15	<1.8	60 - 90	100	15 - 30

2.14 Radon

The radon risk is reported by reference to the Indicative Atlas of Radon in England and Wales (Miles et al 2007) and Annex A maps in BR 211 (Scivyer 2015).

The guidance and information in the Groundsure environmental report indicates that <1% of properties are affected and the site is not in a Radon Affected Area therefore no radon protection measures are required.

2.15 Unexploded ordnance (UXO)

The non-specialist UXO screening exercise has indicated no further assessment is required with regard to UXO in relation to ground investigation. Further assessment may be considered prudent for construction activities. A copy of the UXO map from Zetica UXO is included in Appendix D.

2.16 Consultations

An enquiry was submitted to the Environmental Health Department of Reading Borough Council on 18th August 2022 requesting a review of their records for relevant information that may assist the assessment. At the time of report writing, a response was still outstanding.

3. INITIAL CONCEPTUAL SITE MODEL

3.1 Introduction

The initial Conceptual Site Model (iCSM) incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an initial Conceptual Site Model is a key component of the LCRM methodology. The iCSM incorporates a ground model of the site physical conditions and an exposure model of the possible contaminant linkages; it forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

3.2 Ground model

The preliminary ground model presented in Section 2 provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model.

3.3 Geotechnical hazard identification

3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table J.1 in Appendix E for further information).

3.3.2 Plausible geotechnical hazards

Plausible geotechnical hazards identified at the site are:

- Uncontrolled Made Ground (variable strength and compressibility).
- Soft / loose compressible ground (low strength and high settlement potential).
- Shrinkage / swelling of the clay fraction of soils under the influence of vegetation.
- Variable lateral and vertical changes in ground conditions.
- Attack of buried concrete by aggressive ground conditions.
- Obstructions.
- Existing below ground structures to remain (on or off-site tunnels, foundations, basements, and adjacent sub-structures).
- Shallow groundwater.
- Running sands and / or loose Made Ground, leading to difficulty with excavation and collapse of side walls.
- Solution features in Chalk.
- Cavities in the superficial deposits, due to solution features.

3.3.3 *Potential development elements affected*

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs
- Roads and pavements.
- Services.
- Retaining walls.
- Construction staff, vehicles and plant operators.
- Concrete below ground.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment.

3.4 Geo-environmental exposure model

3.4.1 *Context*

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential contaminant linkages, based on the source-pathway-receptor (SPR) approach.

A viable contaminant linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 *Potential contaminants*

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

3.4.2.1 *Potential on-site sources of contamination*

- Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01).
- Potential Asbestos Containing Materials within existing building (S02).
- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground / alluvial deposits (S03).

3.4.2.2 *Potential off-site sources of contamination*

- Ground gases (carbon dioxide and methane) from Made Ground from historical carriage manufactory located 90m east of site amongst other nearby historical industrial/commercial land uses (S04).
- Hydrocarbon fuels, lubricants, and solvents from general spillage, together with uncontrolled disposal and spillage from waste receptacles and historical garage located 80m north of site (S05).

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- People (neighbours, site end users) (R01).
- Development end use (buildings, utilities) (R02).
- Groundwater: Secondary A aquifer status of the Taplow Gravel Member and underlying principal Seaford Chalk aquifer (R03).

3.4.4 Potential pathways

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).
- Direct contact with substances deleterious to building materials (P02).
- Methane ingress via permeable soils and/or construction gaps (P03).
- VOC and petroleum hydrocarbon vapour ingress via permeable soils and/or construction gaps (P04).
- Migration of contaminant via leachate migration through the unsaturated zone in the Taplow Gravel Member (P05).
- Migration of contaminant from the groundwater within the Taplow Gravel Member to the groundwater within the Seaford Chalk aquifer (P06).
- Surface water, via drainage discharge (P07).
- Surface water via base flow from groundwater (P08).

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2021), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment. An assessment of the Source – Pathway – Receptor linkages is undertaken and is presented in Appendix F (Table K.1).

4. DESK STUDY CONCLUSIONS

4.1 Geotechnical conclusions

As the development proposal includes refurbishment only to the existing building with no additional structural loads or breaking of ground, there are no site-specific geotechnical conclusions. A building survey by a suitably qualified structural engineer is recommended.

4.2 Geo-environmental conclusions

Based on historical and current land uses:

- It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.
- While ingress of ground gas and/or vapours is typically the highest potential risk to a development such as this, it is noted that no significant source of ground gas or vapours has been identified below or in close proximity to the site. For conservatism, it would be prudent to undertake a gas/vapour survey in the basement/ground floor of the building to provide further confidence that no risk is present.
- The overall risk from land contamination at the site is considered to be low for the current development, as it is covered predominantly by hardstanding/building footprint limiting the possibility of contact with the soils, as well as the risk of any significant rainwater infiltration leading to leaching.
- Risks to construction workers and end users from asbestos potentially present in the existing building can be downgraded to low risk provided all work with asbestos is done in accordance with the Control of Asbestos Regulations (CAR 2012). Removal under controlled conditions should limit release of fibres to the air and the ground.
- The overall risk for a refurbished site is assessed to be low, as long as any asbestos containing materials within the building fabric are managed in accordance with CAR 2012.

The possible pollutant linkages (for risk levels of moderate or greater) on an unremediated redeveloped site, as determined by the desk study and walk-over, are summarised in Table 4.1:

Table 4.1: Possible Pollutant Linkages (for Risk Levels of Moderate or Greater)

Source(s)	◄ potential Impact on ►	Receptor(s)
Potential asbestos within existing building (S02).		Site Users

These possible pollutant linkages require further investigation and assessment (see Section 6).

5. UNCERTAINTIES AND LIMITATIONS

5.1 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Hickie and Hickie Limited c/o Vail Williams LLP (the Client), by e-mail dated 10th of August 2022 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in August 2022. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where existing information prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

Whilst the preliminary risk assessment process has identified potential risks to construction workers, consideration of occupational health and safety issues is beyond the scope of this report.

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

6. RECOMMENDATIONS FOR FURTHER WORK

Following the investigation undertaken to date, the following further works will be required:

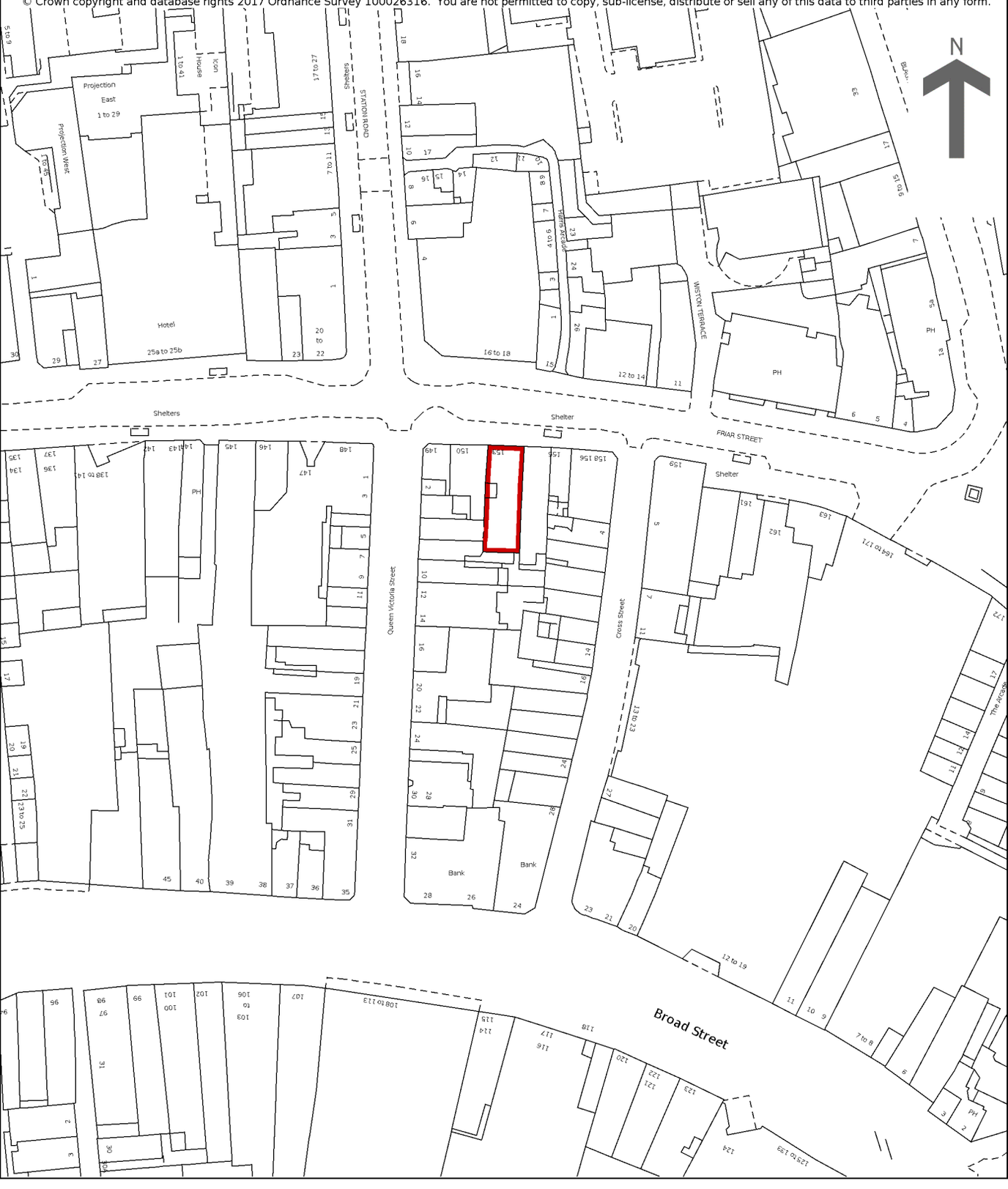
- refurbishment survey to be undertaken to confirm that the careful removal of asbestos has taken place prior to the proposed works in accordance with the Control of Asbestos Regulations (CAR 2012); and
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report.

Appendix A Drawings

HM Land Registry
Current title plan

Title number **BK488159**
Ordnance Survey map reference **SU7173NE**
Scale **1:1250**
Administrative area **Reading**

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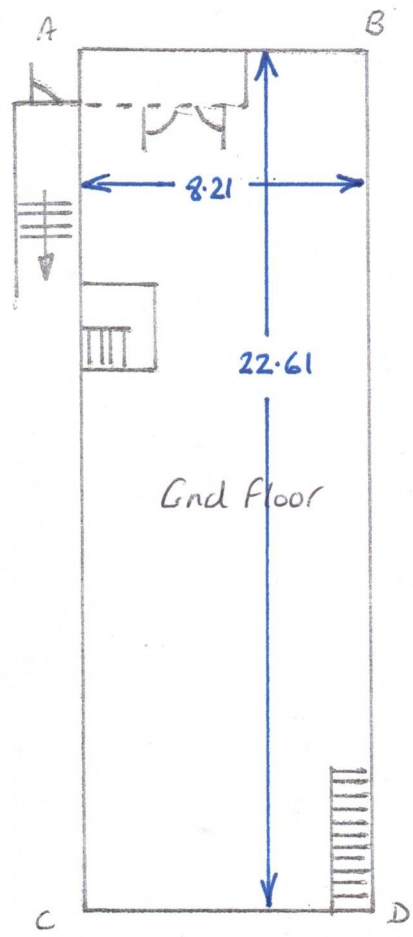
This copy is not an 'Official Copy' of the title plan. An official copy of the title plan is admissible in evidence in a court to the same extent as the original. A person is entitled to be indemnified by the registrar if he or she suffers loss by reason of a mistake in an official copy. If you want to obtain an official copy, the HM Land Registry web site explains how to do this.

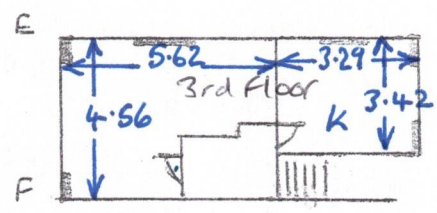
HM Land Registry endeavours to maintain high quality and scale accuracy of title plan images.The quality and accuracy of any print will depend on your printer, your computer and its print settings.This title plan shows the general position, not the exact line, of the boundaries. It may be subject to distortions in scale. Measurements scaled from this plan may not match measurements between the same points on the ground.

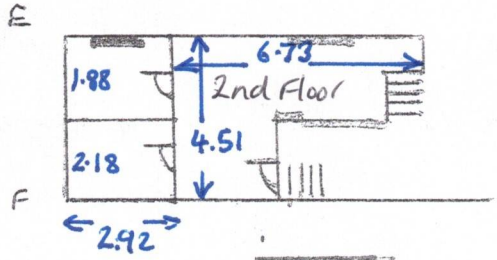
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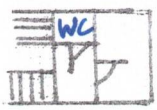
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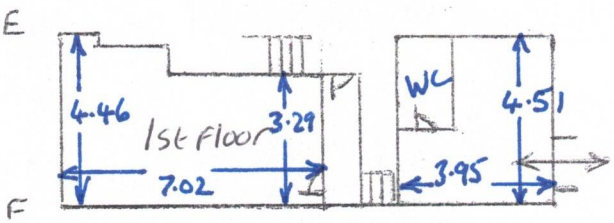
QUEEN VICTORIA STREET.

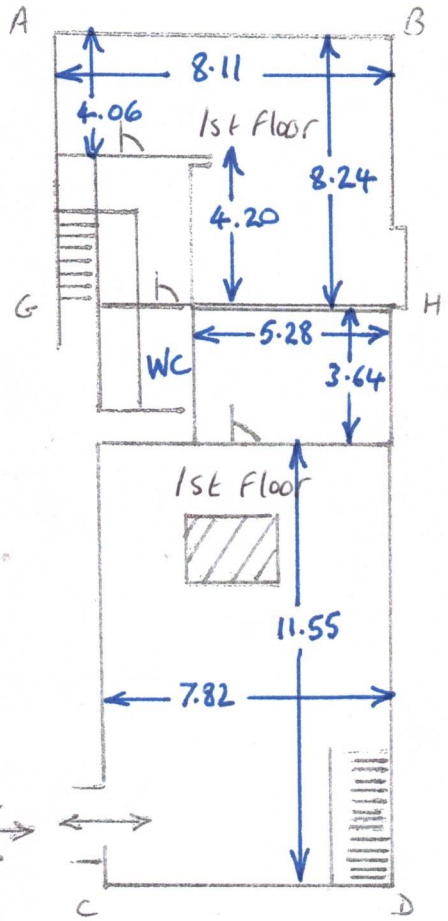


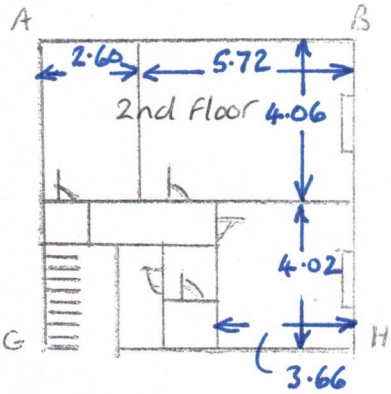








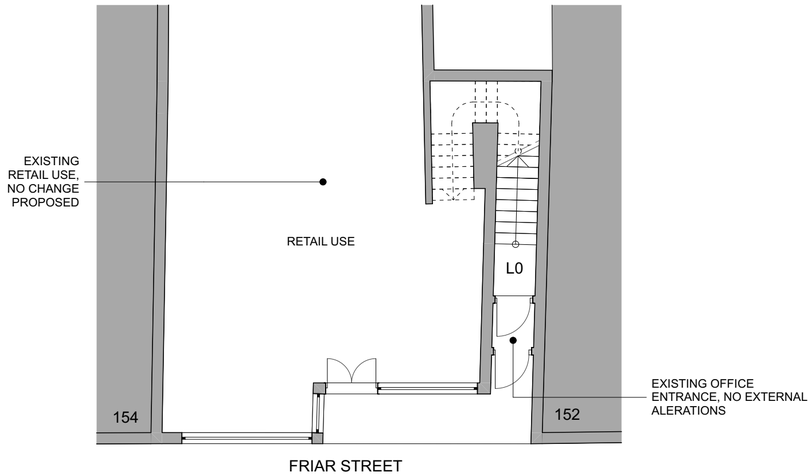




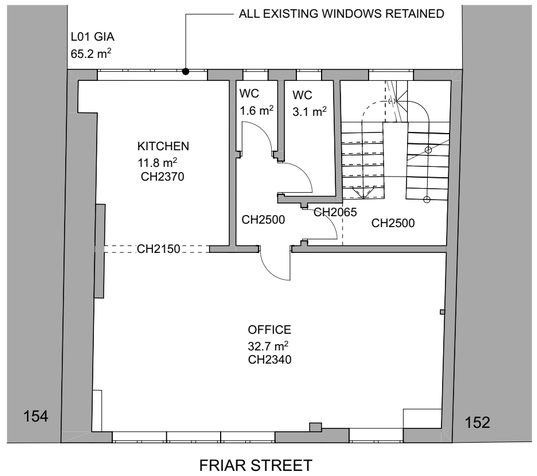
Basement not shown

Approx scale 1:200

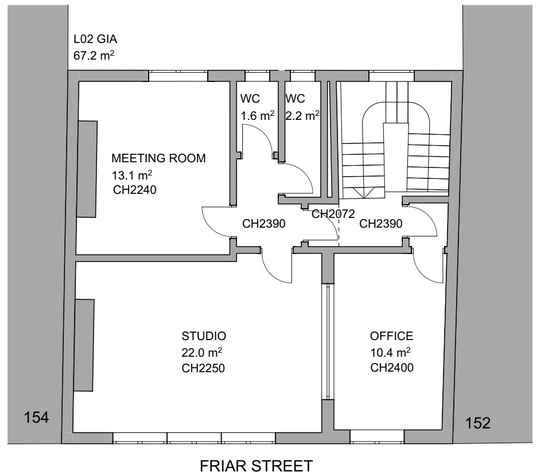
DM 10.11.21.



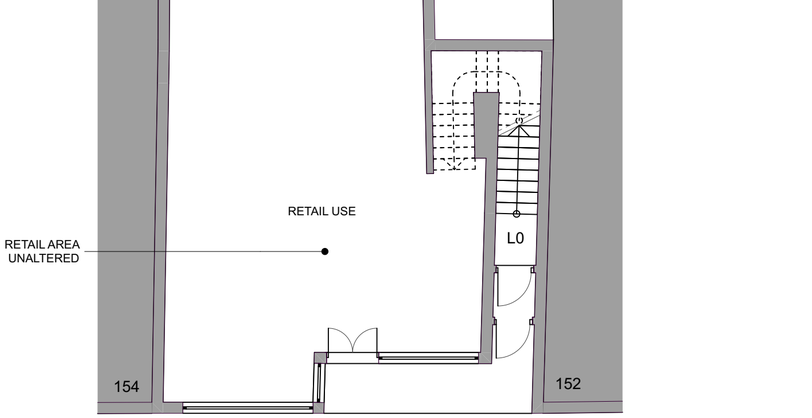
0. EXISTING GROUND FLOOR 1:100



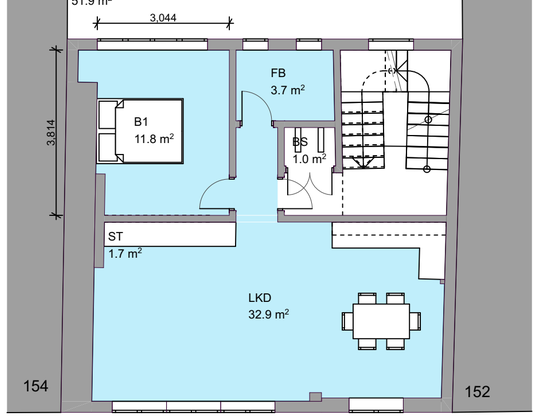
1. EXISTING FIRST FLOOR 1:100



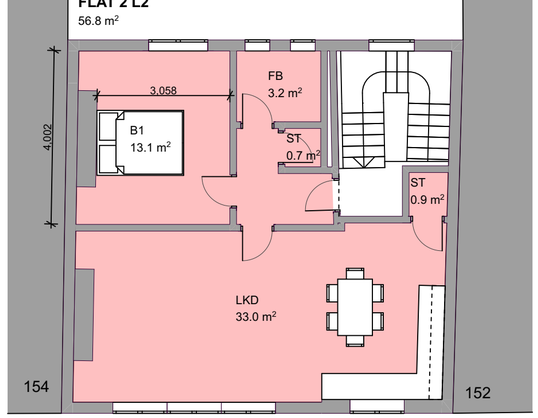
2. EXISITING SECOND FLOOR 1:100



0. PROPOSED GROUND FLOOR



1. PROPOSED FIRST FLOOR



2. PROPOSED SECOND FLOOR

0 1 2 3 4 5m

SCALE

N

WORK IN PROGRESS
16/08/2022

NOTES ORIGINAL A2

NOT FOR CONSTRUCTION

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SUBJECT TO DETAILED DESIGN, DESIGN COORDINATION WITH OTHERS AND PLANNING AND BUILDING CONTROL APPROVAL. SURVEY BY SURVEY AND ENGINEERING SERVICES LTD.

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Rev

National Space Standards Area Check (Areas in m²)			
Flat 1 - 1B 2P	**Requirement**	**Proposal**	
Gross Internal Area	50	53.8	✓
Double Bedroom Area	11.5	11.8	✓
Double Bedroom Width	2.75m	3.0m	✓
Storage	1.5	1.7	✓
Ceiling Height	2.3m	2.35m	✓
National Space Standards Area Check (Areas in m²)			
Flat 2 - 1B 2P	**Requirement**	**Proposal**	
Gross Internal Area	50	56.9	✓
Double Bedroom Area	11.5	13.1	✓
Double Bedroom Width	2.75m	3.0m	✓
Storage	1.5	1.6	✓
Ceiling Height	2.3m	2.35m	✓

ROOMS

B1	BED 1
FB	FAMILY BATH
LKD	LIVING/KITCHEN/DINING
ST	STORE

OTHER AREAS

BS	BICYCLE STORE
B	BINS
L-1	BASEMENT
L0	LEVEL 0
L1	LEVEL 1
GPA	GARDEN PRIVATE AMENITY
BPA	BALCONY PRIVATE AMENITY
OB	OBSCURED GLAZING

Client
Hickies Ltd

Drawing Title
EXISTING AND PROPOSED PLANS

HIVES ARCHITECTS
SINCE 1934
Hives Architects LLP
29 Castle Street, Reading, RG1 7SB
0118 958 7331, admin@hivesarchitects.co.uk

Site
153 Friar Street, Reading, RG1 1HE

Scale
1:100, 1:200, 1:1 @A2

Project Status
PLANNING

Drawn Checked
SB HW

Project Drawing Revision
2846 002P1

Appendix B Field Reconnaissance Photographs

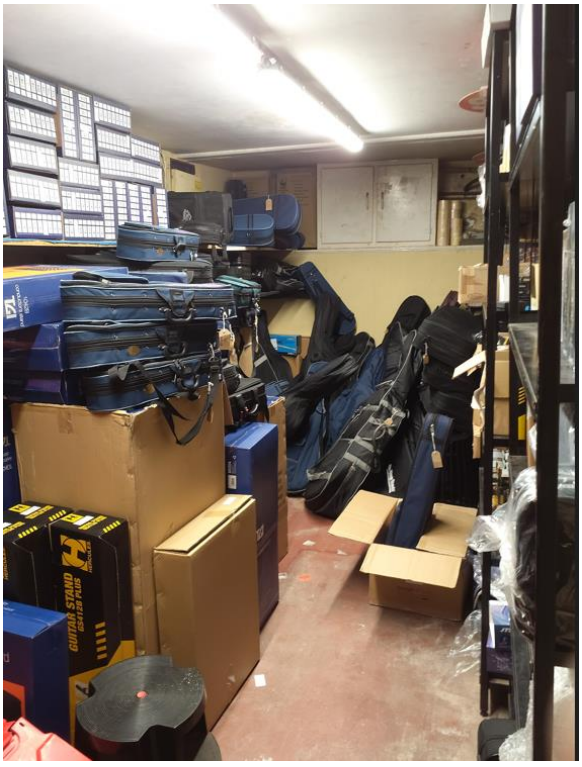
Desk Study Photograph 1	
Date: 25/08/22	
Direction Photograph Taken: South Facing.	
Description: Site storefront and Friar Street.	

Desk Study Photograph 2	
Date: 25/08/22	
Direction Photograph Taken: Looking southeast from central south section of the site.	
Description: Site storefront and Friar Street.	

Desk Study Photograph 3	
Date: 25/08/22	
Direction Photograph Taken: West Facing	
Description: Friar Street, outside site entrance. Service covers present.	

Desk Study Photograph 4	
Date: 25/08/22	
Direction Photograph Taken: South Facing	
Description: Friar Street, outside site entrance. Service covers present.	

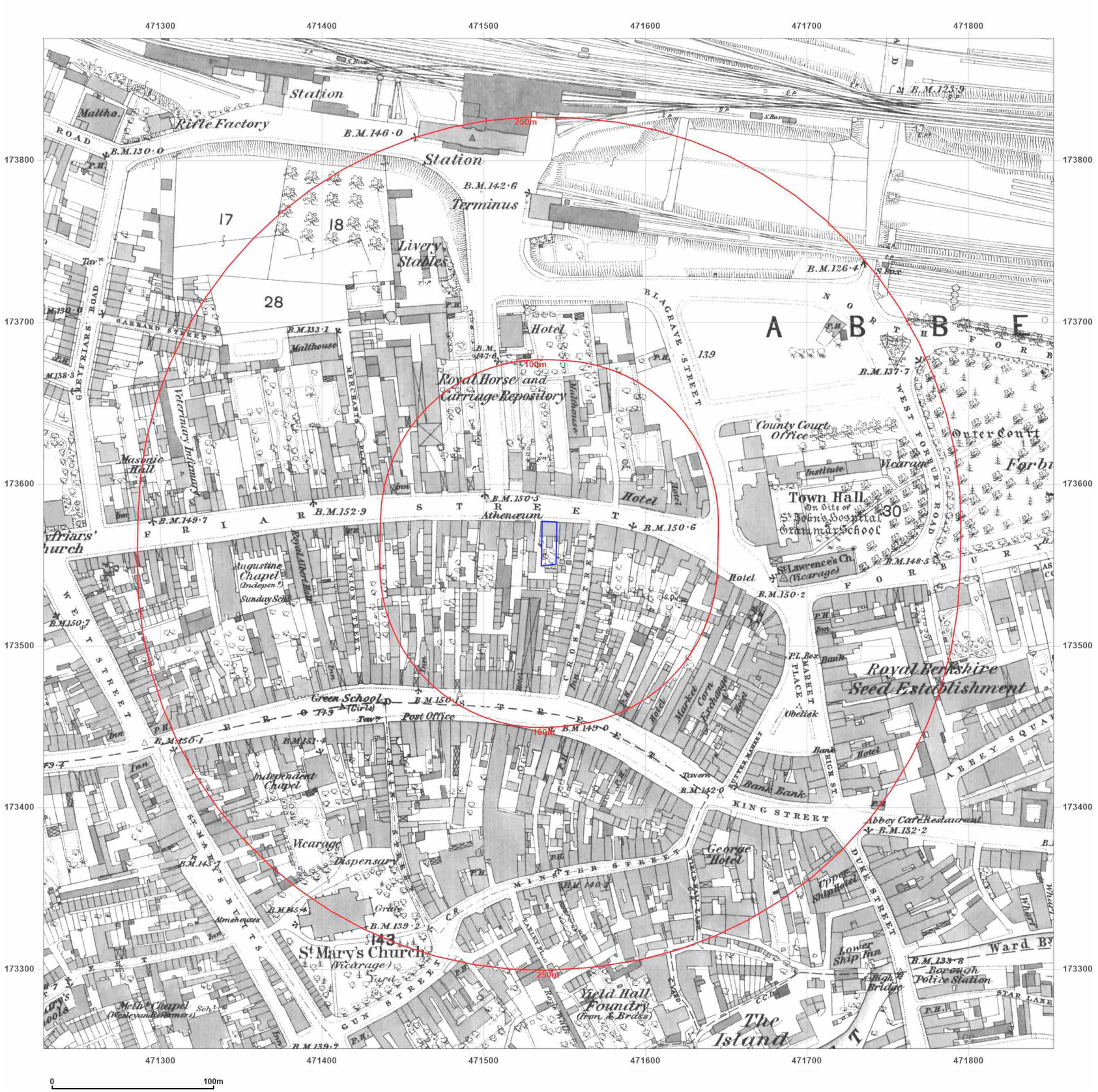
Desk Study Photograph 5	
Date: 25/08/22	
Direction Photograph Taken: South Facing	
Description: Site First Floor, used as storage area.	

Desk Study Photograph 6	
Date: 25/08/22	
Direction Photograph Taken: South Facing	
Description: Site basement, used as storage area.	

Desk Study Photograph 7	
Date: 25/08/22	
Direction Photograph Taken: North Facing	
Description: Site second floor, used as teaching space.	

Desk Study Photograph 8	
Date: 25/08/22	
Direction Photograph Taken: South Facing.	
Description: View from second floor of site. Extraction fans present.	

Appendix C Historical Ordnance Survey Maps



Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1879**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 16 August 2022

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING,
RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series Town Plan

Map date: **1879**

Scale: 1:500

Printed at: 1:1,000

N
W E
S

Surveyed 1879
Revised N/A
Edition N/A
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Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
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S

Surveyed 1900
Revised 1900
Edition N/A
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Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1912**

Scale: 1:2,500

Printed at: 1:2,500

N
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S

Surveyed 1912
Revised 1912
Edition N/A
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Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING,
RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1931**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1931
Revised 1931
Edition N/A
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Production date: 16 August 2022

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1956-1957**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
S

Surveyed 1957 Revised 1957 Edition N/A Copyright N/A Levelled 1951	Surveyed 1956 Revised 1956 Edition N/A Copyright N/A Levelled 1951
Surveyed 1957 Revised 1957 Edition N/A Copyright N/A Levelled 1951	Surveyed 1956 Revised 1956 Edition N/A Copyright N/A Levelled 1951

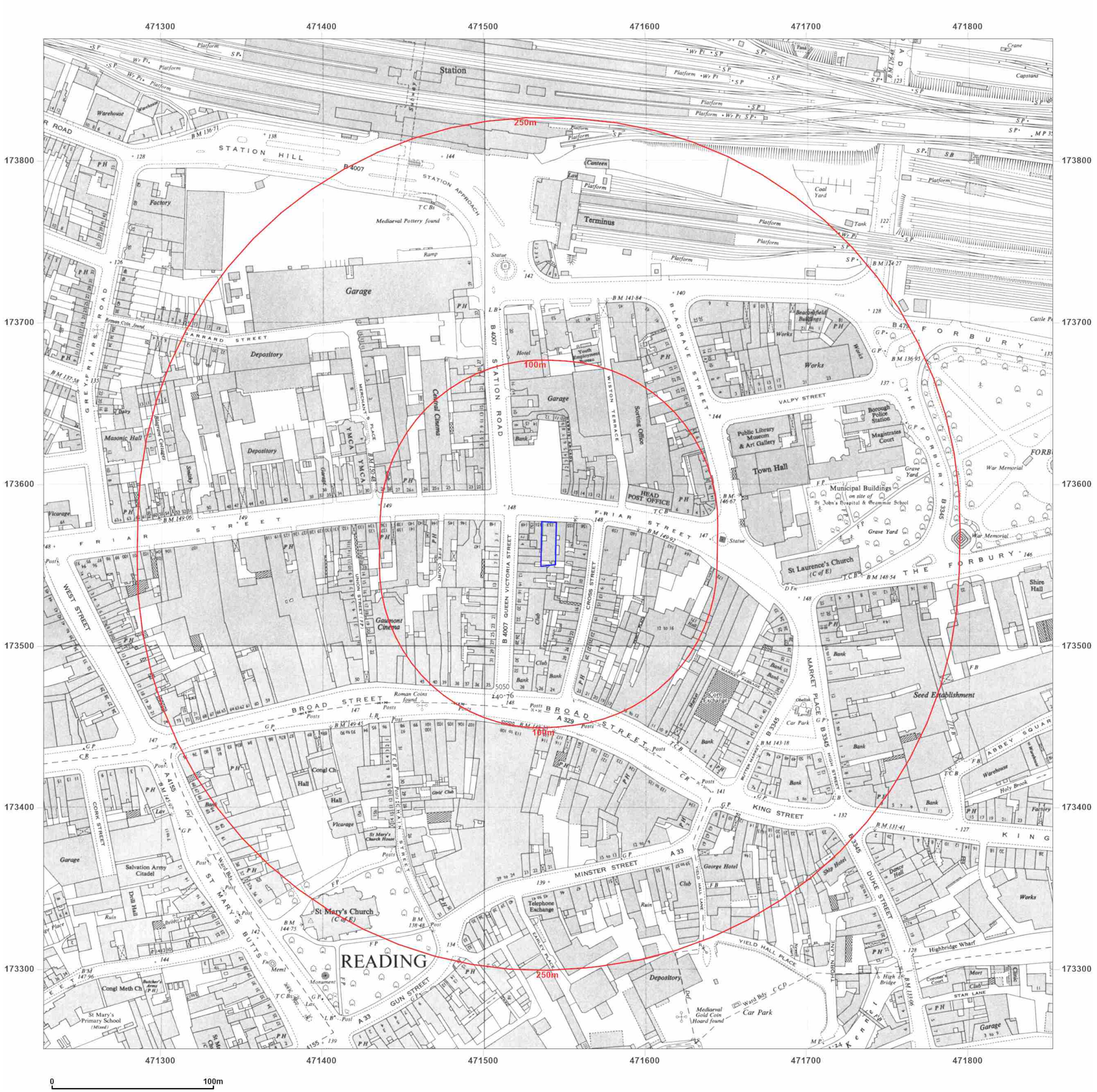
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Production date: 16 August 2022

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1958**

Scale: 1:2,500

Printed at: 1:2,500

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Edition 1958
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Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1961**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1958
Revised 1958
Edition 1961
Copyright 1961
Levelled 1951

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Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1957-1962**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1957 Revised 1962 Edition N/A Copyright 1962 Levelled 1951	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A
Surveyed 1957 Revised 1962 Edition N/A Copyright 1962 Levelled 1951	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING,
RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1962**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1956
Revised 1961
Edition N/A
Copyright 1962
Levelled 1951

Surveyed 1956
Revised 1961
Edition N/A
Copyright 1962
Levelled 1951

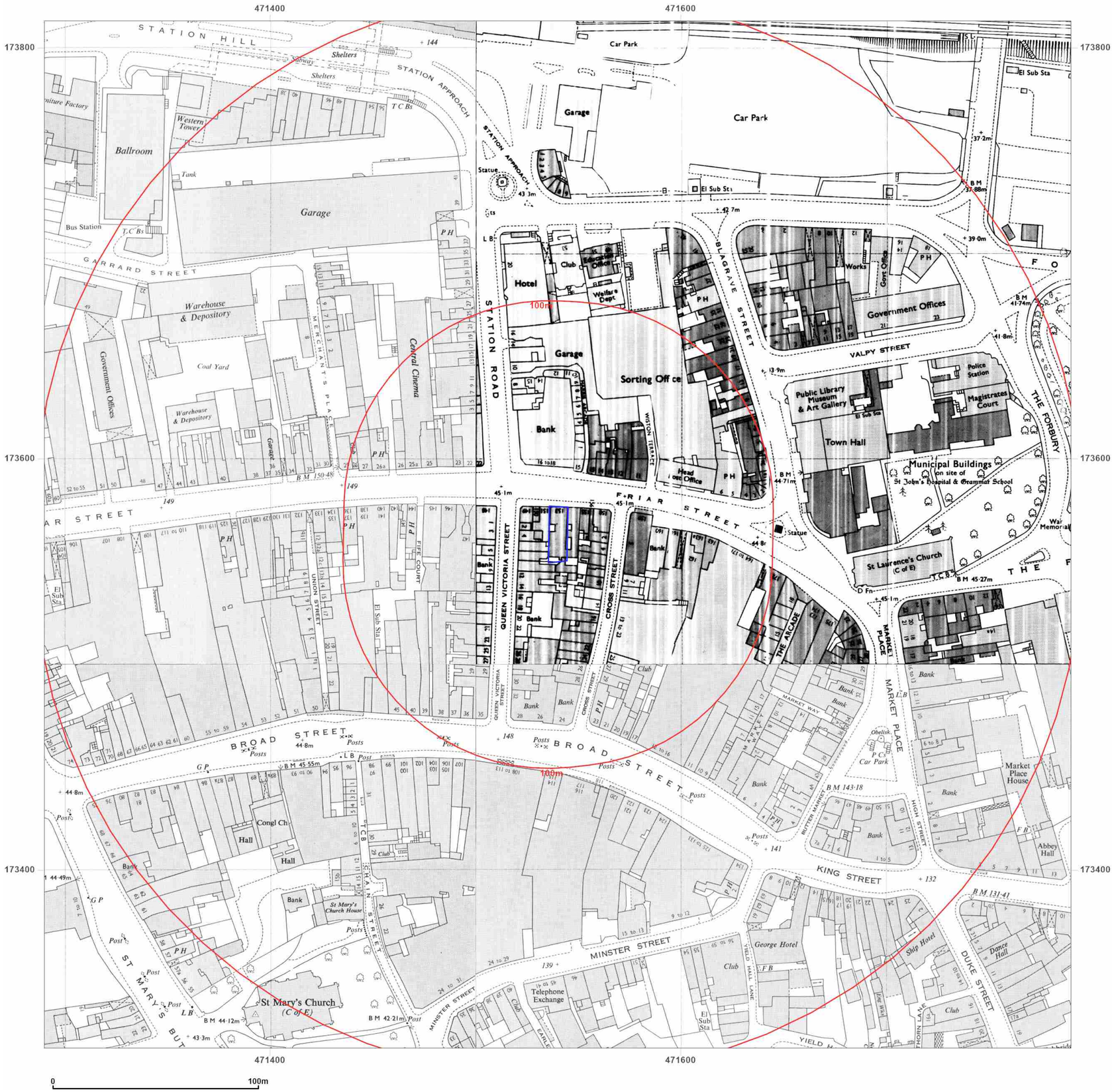
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1968-1971**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1957
Revised 1958
Edition N/A
Copyright 1969
Levelled 1951

Surveyed 1956
Revised 1970
Edition N/A
Copyright 1971
Levelled N/A

Surveyed 1957
Revised 1969
Edition N/A
Copyright 1970
Levelled 1951

Surveyed 1956
Revised 1967
Edition N/A
Copyright 1968
Levelled 1951

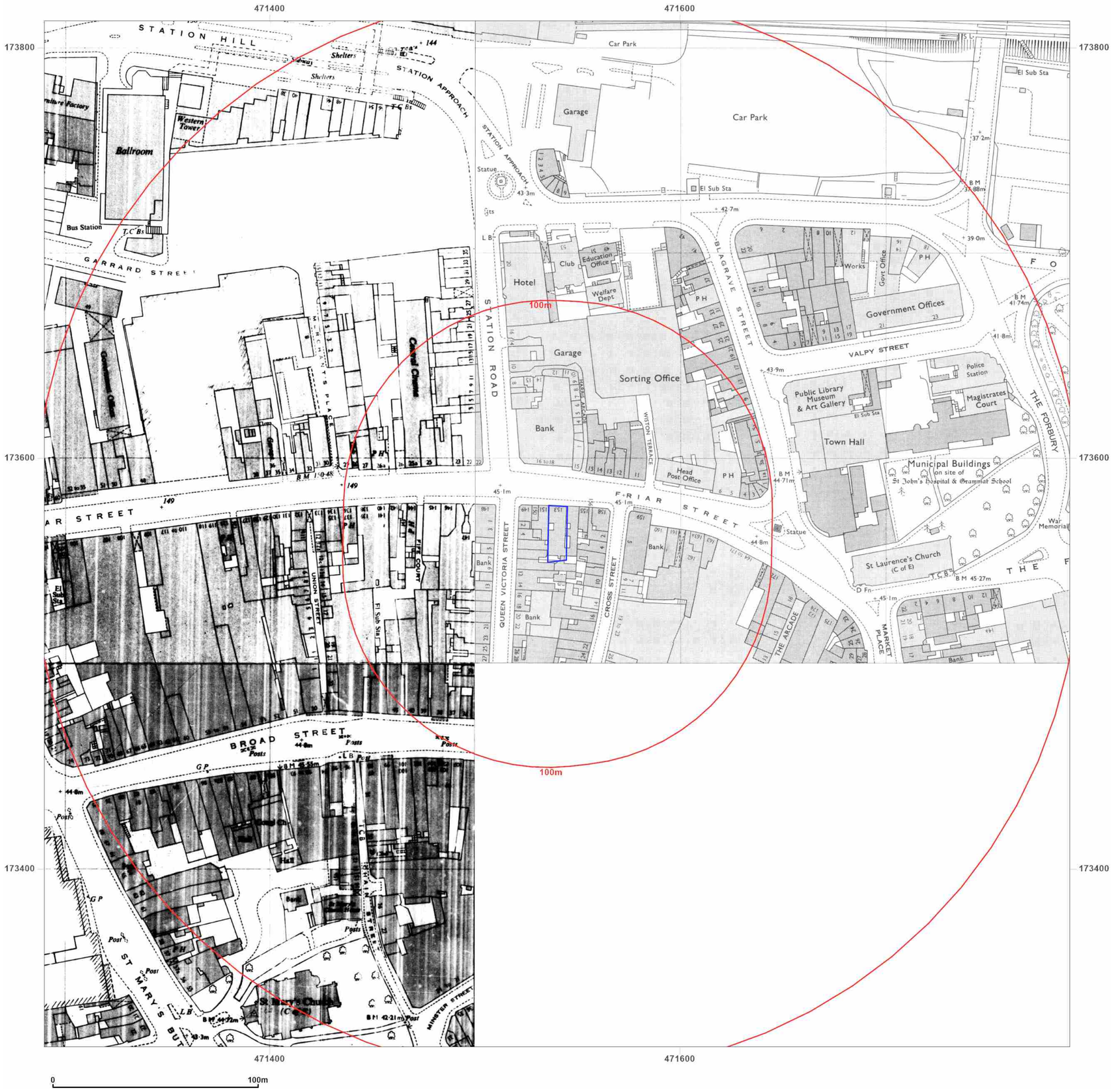
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Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1971-1974**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright 1974 Levelled N/A	Surveyed 1956 Revised 1970 Edition N/A Copyright 1971 Levelled 1951
Surveyed N/A Revised N/A Edition N/A Copyright 1973 Levelled N/A	

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Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1978-1979**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1979
Levelled 1972

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1979
Levelled 1973

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

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1979
Levelled 1973

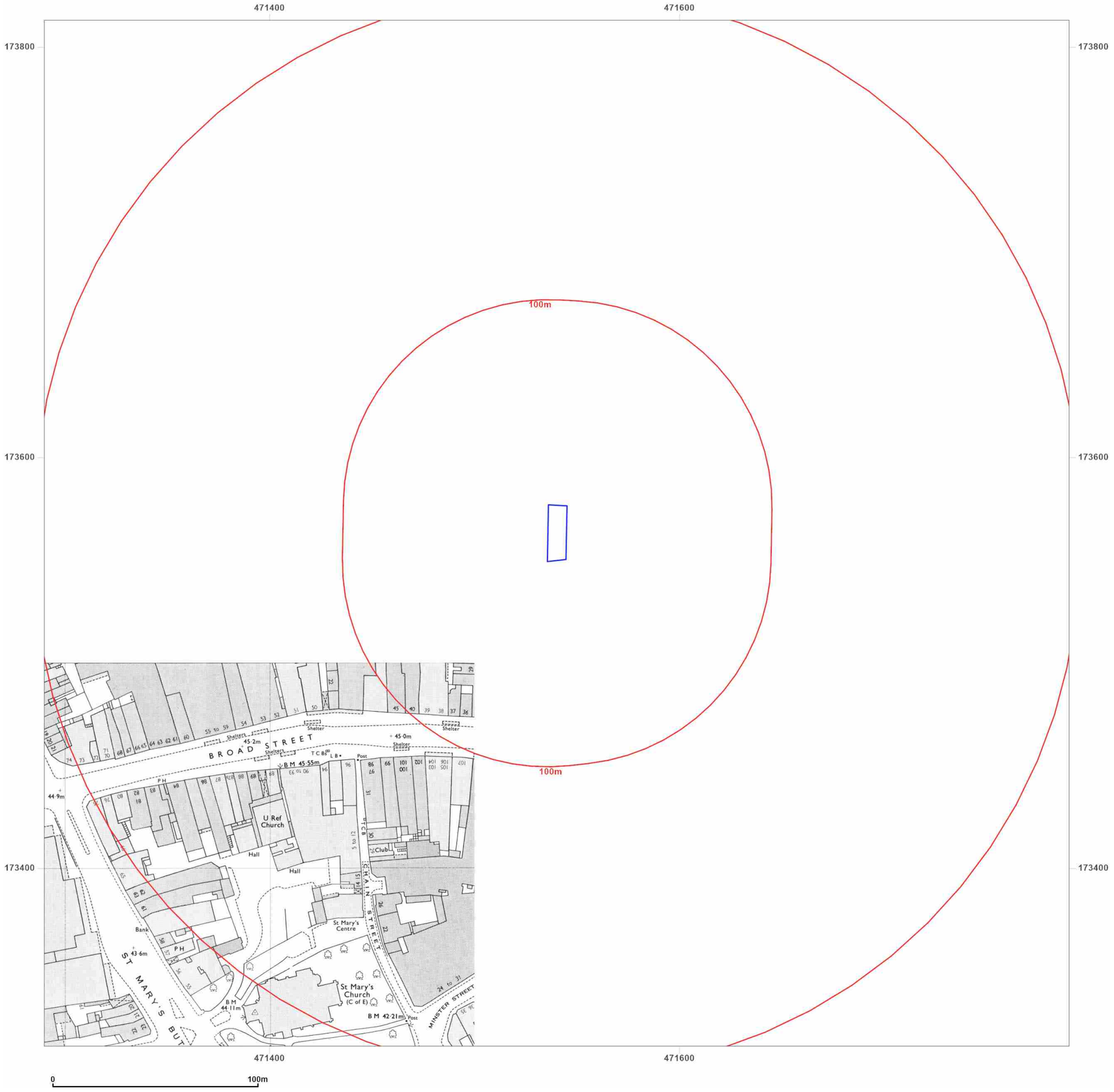
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Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

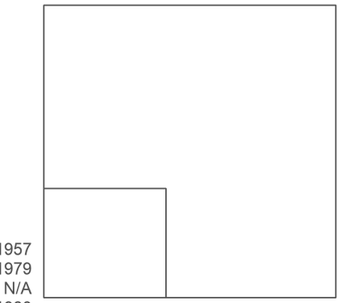
Map Name: National Grid

Map date: **1980**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1957
Revised 1979
Edition N/A
Copyright 1980
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1986-1988**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1957 Revised 1984 Edition N/A Copyright 1986 Levelled 1973	Surveyed 1956 Revised 1984 Edition N/A Copyright 1986 Levelled 1973
Surveyed 1973 Revised 1988 Edition N/A Copyright 1988 Levelled 1973	Surveyed 1958 Revised 1987 Edition N/A Copyright 1988 Levelled 1973

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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1988-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1973 Revised 1988 Edition N/A Copyright 1988 Levelled 1973	Surveyed 1958 Revised 1984 Edition N/A Copyright 1988 Levelled 1973
Surveyed 1993 Revised N/A Edition N/A Copyright 1993 Levelled N/A	Surveyed 1973 Revised 1988 Edition N/A Copyright 1988 Levelled 1973

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1988-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1993
Revised N/A
Edition N/A
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Levelled N/A

Surveyed 1973
Revised 1984
Edition N/A
Copyright 1988
Levelled 1973

Surveyed N/A
Revised 1991
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1973 Revised 1993 Edition N/A Copyright 1993 Levelled 1973	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A
	Surveyed 1993 Revised N/A Edition N/A Copyright 1993 Levelled N/A

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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

Map date: **1993-1994**

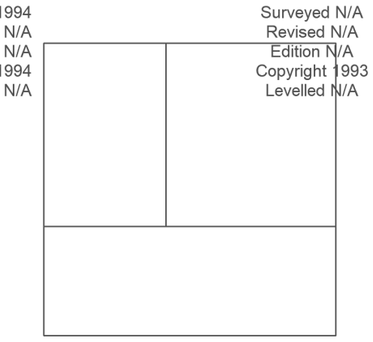
Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1994
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: National Grid

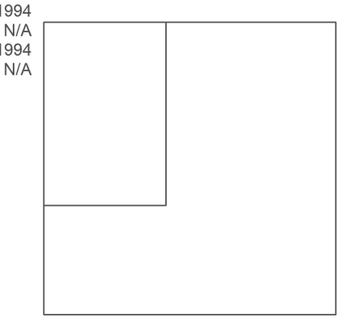
Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1994
Revised 1994
Edition N/A
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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2003

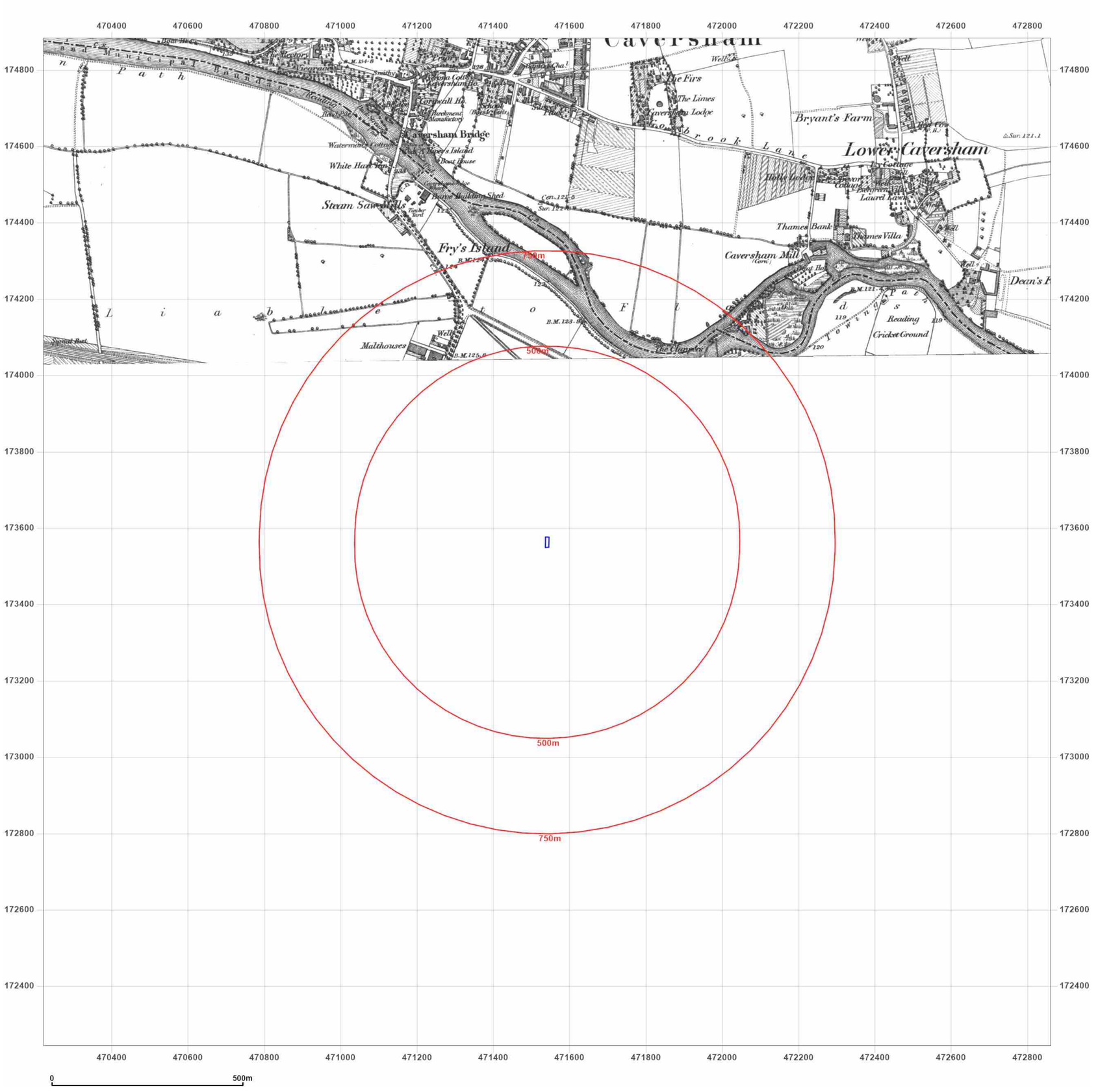
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Site Details:

153, FRIAR STREET, READING, RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

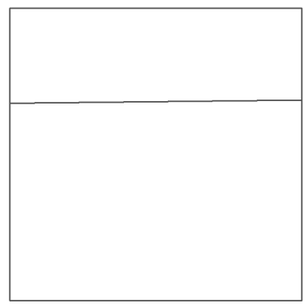
Map date: **1878**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1878
Revised 1878
Edition N/A
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Groundsure INSIGHTS

Site Details:

153, FRIAR STREET, READING,
RG1 1HE

Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1897-1900**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1877
Revised 1897
Edition 1900
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1898
Edition 1900
Copyright N/A
Levelled N/A

Surveyed N/A
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

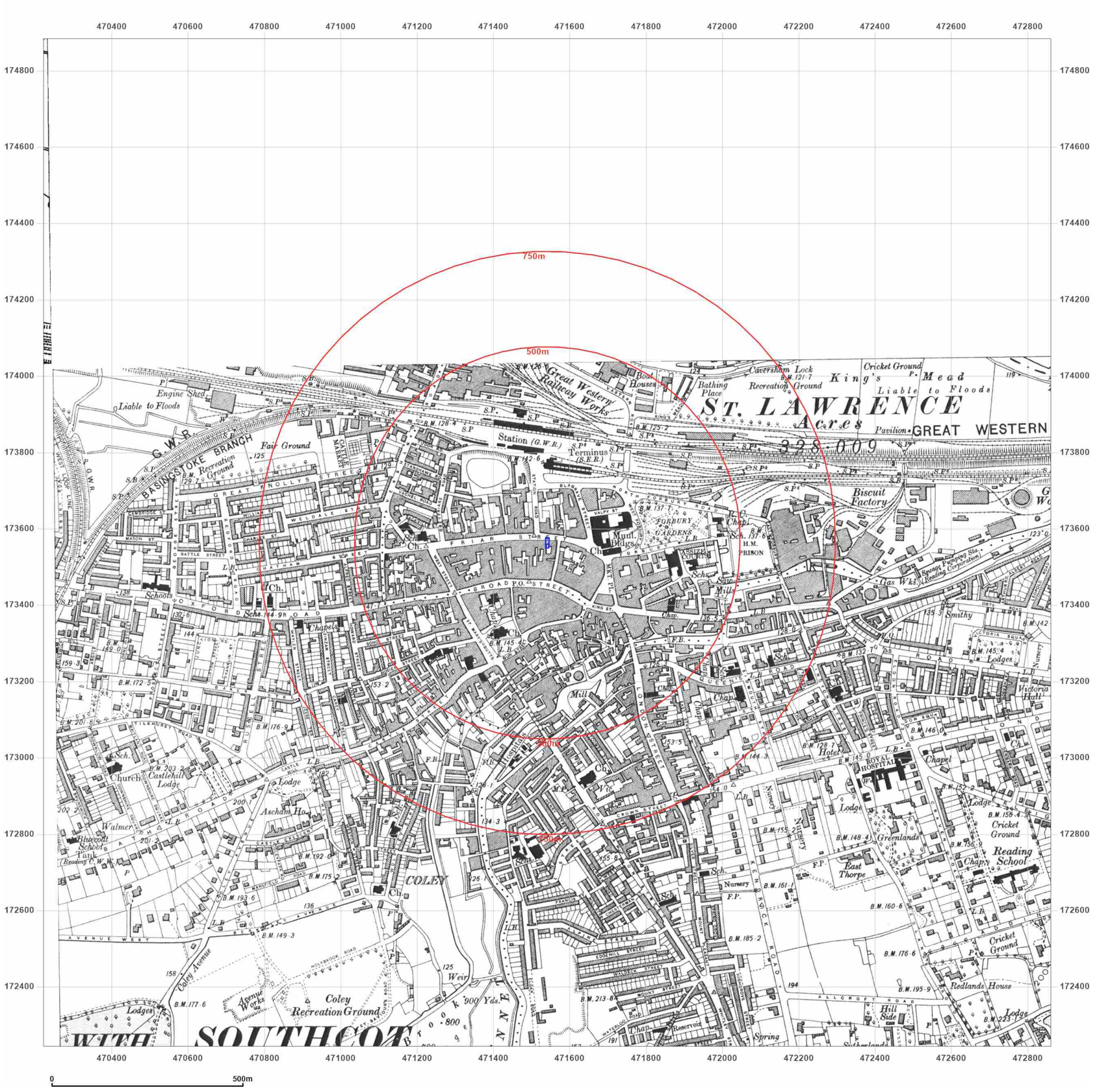
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Groundsure INSIGHTS

Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

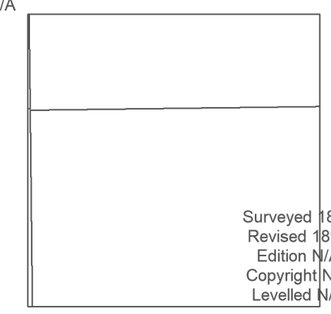
Map date: **1898-1900**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed N/A
Revised N/A
Edition 1900
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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

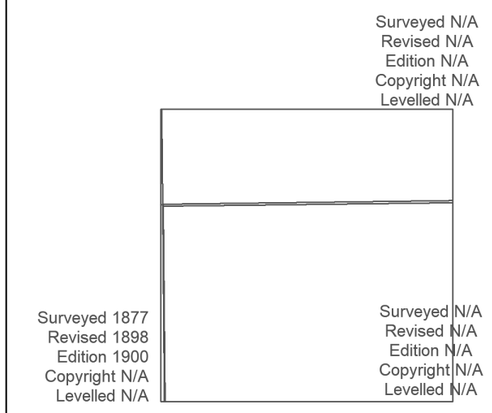
Map Name: County Series

Map date: **1900**

Scale: 1:10,560

Printed at: 1:10,560

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Site Details:

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Client Ref: 25739-GELO
Report Ref: HYD-8984784
Grid Ref: 471540, 173563

Map Name: County Series

Map date: **1910-1914**

Scale: 1:10,560

Printed at: 1:10,560

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Levelled N/A

Surveyed 1877
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised 1914
Edition 1913
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Levelled N/A

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