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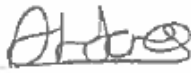
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Huyton Cricket Club, Huyton

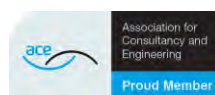
Phase 1 Geo-Environmental Investigation Report

For: Breck Homes Ltd



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1.0 INTRODUCTION

This Phase 1 Geo-Environmental Investigation report has been prepared at the request of Breck Homes Ltd. Instructions to proceed were received in March 2025. Phase 1 desk study work was completed in May 2025.

1.1 Site Location and Description

This report pertains to a c. 2.26 Ha site located to the north of Huyton Lane, Huyton, c. 10.0km north of Liverpool City Centre, at the approximate post code L36 7XH. The National Ordnance Survey Grid Reference for the centre of the site is 344429E, 391316N.

The site currently comprises a vacant plot of land (former cricket club and bowling green) with associated hardstanding in the north-western site section and a disused cricket club pavilion building. The site is bound by residential properties to the north, west and south and Huyton Lane to the east and south-east. Access to the site is off the unnamed track running from Huyton Lane along the north-eastern site boundary. An aerial photo of the site is included below and a site location plan is contained in Appendix 2.



Figure 1: Aerial image of the site dated September 2022.

Proposed Development

This Phase 1 Geo-Environmental Investigation is to be used for submission to the Local Authority as part of a planning application. It is the client's intention to redevelop the site for a residential end use comprising 81 No. dwellings with associated highways, parking areas and private gardens. It is proposed to retain the current on-site pavilion building. An extract of the proposed development plan is included below and provided in full in Appendix 2.



Figure 2: Extract of proposed development plan. Taken from "Proposed Site Layout – Option A" Rev E

1.2 Brief

The brief was to carry out a Phase 1 Geo-Environmental Investigation for the site based upon the proposed development outlined in Section 1.0. The site area is shown on the site location plan contained in Appendix 2.

The investigation was to include the following:

- a) Assess the probable ground conditions and contaminated land conditions on and below the site based on existing and historical site uses and relevant off-site activities, including a site walkover.

- b) Identify sources of contamination that may be present at the site using current contaminated land guidance and develop a conceptual site model for potential human health, ground gas and controlled waters receptors.
- c) Undertake a Preliminary Risk Assessment which will determine the requirement for further environmental (contaminated land) investigation and assessment.
- d) Design, on the basis of the anticipated ground conditions, appropriate ground investigation works and discuss potential development issues (i.e. sub-surface features – obstructions, infilling, compressible ground, faulting, mineral extraction, mining and land instability).

A report was to be provided to summarise findings and to provide recommendations. The limitations of this investigation work and report are included in Appendix 1.

2.0 SCOPE OF INVESTIGATION WORKS

2.1 Walkover Survey

The site was visited on 14th April 2025 in clear weather conditions. Photographs were taken of the site during the walkover survey and these photographs, together with a plan indicating their location and direction, are contained in Appendix 3.

2.2 Documentation

A combined Enviro + Geo Insight report (Ref: GS-4A1-A5S-1K8-VTF) was obtained from Groundsure, an environmental database company, which provides a list of recorded past and present activities at or adjacent to the site which could have an impact on the levels of contamination in the soils and groundwater at the site. As part of the desk study works, the below documents were obtained and examined. Unless otherwise stated, the documents are contained within the Groundsure Enviro + Geo Insight Report in Appendix 5:

a) Groundsure maps, all dated 2025 as follows:

- Historical Land Use map;
- Environmental Permits, Incidents and Registers map;
- Landfill and other Waste Sites map;
- Current Land Use map;
- Hydrogeology and Hydrology maps;
- Environment Agency / Natural Resources Wales flood maps;
- Designated Environmentally Sensitive Sites map;
- Geological maps and Ground Working map;
- Mining, Extraction & Natural Cavities map;
- Natural Ground Subsidence maps;
- Borehole Records map; and
- Railways and Tunnels map.

- b) Aerial photographs of the site dated September 2022, April 2019, June 2015, September 2005 and July 2000.
- c) Historical Ordnance Survey maps dated between 1850 and 2025, at scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.
- d) The following sources were obtained and examined from the British Geological Survey. All items were copied under licence: [C18/01] British Geological Survey ©UKRI. All rights reserved:
- The BGS 1:50,000 drift geological map (sheet ref: 97, dated 1977);
 - The BGS 1:50,000 solid geological map (sheet ref: 97, dated 1980); and
 - The BGS 1:10,560 solid and drift geological map (sheet ref: SJ49SW, dated 1965).
- e) A Zetica UXO Risk Map was obtained and is included in Appendix 6.
- f) A Preliminary UXO Risk Assessment Report was obtained from Brimstone Site Investigation Ltd. and is included in Appendix 6.
- g) The following previous site investigation reports have been obtained from the Knowsley Council Planning Portal:
- Earth Environmental and Geotechnical, *Phase 1 Environmental Desk Study*, Ref. A1356/16, dated April 2016; and
 - Earth Environmental and Geotechnical, *Geoenvironmental Interpretative Report*, Ref. A1356/18/B.0, dated December 2018.

3.0 FINDINGS

3.1 Walkover Survey

The walkover survey was carried out on 14th April 2025 during clear weather conditions. During the walkover survey the following features were noted.

The site currently comprises a disused cricket club ground with a derelict pavilion building located in the north-western part of the site. The River Alt is located along the northern site boundary until the north-western site corner, where it appears to enter a culvert. The ground underfoot was noted to be grass across the majority of the site, with some areas of dense vegetation in the western site section and hardstanding in the northern site section.



Figures 3 & 4: Photographs of the central site section and the existing pavilion (left) and the general site topography (right).

The site is relatively flat, the topography was noted to gently fall from c. 34.00m AOD along the southern boundary to c. 31.50m AOD along the northern and north-western site boundary.



Figure 5: An extract of the LiDAR imagery of the site, showing the relatively flat nature of the site. The dip in topography to the north of the site boundary is consistent with the presence of the River Alt.

On-site features

A suspected mound or stockpile, likely containing Made Ground materials including metals, plastics and timber, was recorded in the southern site section. A number of free-standing sheds or garages were recorded on site, suspected to have been utilised as equipment and / or machinery storage. Established trees were noted along the site boundaries as well as the north western site section. Dense vegetation was noted along site boundaries and in the south-eastern site section. Suspected Japanese Knotweed was also recorded in the eastern site section.



Figures 6 & 7: Established trees and suspected patch of Japanese Knotweed in the eastern site section (left) and suspected on-site stockpile in the southern site section (right).

Services

Disused lamp posts were recorded on site. Multiple cables were also noted on or in the vicinity of the on-site pavilion, indicating the presence of private services to the building. A suspected service entry point was recorded in the south-eastern site corner. Disused pipes were recorded on the sides of the free-standing sheds, indicating the presence of services that extend into the various on-site buildings.



Figures 8 & 9: Evidence for a disused street light system (left) and on-site services into the buildings (right).

Contamination

No evidence of contamination (i.e. spillages or leakages) were identified. Evidence of fly tipping was noted across the site, with metal and plastic canisters and bottles, metal sheets, wooden panels and tyres present in all areas of the site, as well as in the vicinity of the River Alt. No suspected asbestos containing materials were recorded during the walkover, though their presence in the interior of the pavilion cannot be discounted.



Figures 10 and 11: Evidence for fly tipping in the south-western site section (left) and in one of the disused on-site free-standing sheds (right).

3.2 Site History

The site development history has been researched by reference to historical maps, street plans and aerial photographs. The historical maps are included in Appendix 4 to this report and the principal observations, which are divided into on-site history and off-site history, are summarised below:

On-Site History

Date	Site Feature
1850 - 1891	On the earliest historical map the site is recorded as an open field with a river running along its northern and north-eastern boundary.
1891 – 1952	The site is recorded as a cricket ground with an associated pavilion. Between 1906 and 1925, 2 No. additional buildings are constructed to the east and west of the pavilion.
1952 – 1976	A slope is present in the northern site section, sloping towards the south-east. A bowling green is also recorded in the north-western site section, and 2 No. tennis courts are present in the southern site section.
1976 - 2025	The slope is no longer recorded. The eastern small building adjacent to the pavilion is no longer recorded by 1976. The 2 No. tennis courts are also no longer recorded since then. The site remains relatively unchanged until the present day.



Figure 12: Extracts of the OS historical maps dated 1850 (left) and 1966 (right).

Off-Site History

Date	Site Feature	Distance (m)	Direction
1850 - 1978	Numerous ponds are recorded within 500m of the site since the earliest historical records. All of the nearby ponds appear to have been developed by 1978, when they are no longer recorded.	10 – 450	N, E, S, W

1956 - 2025	Huyton wetlands are recorded to the east of the site from the mid-1950s, the area remains unchanged until the present day.	20	E – SE
2001 - 2025	An ambulance station is recorded to the south of the site from the early 2000s, remains unchanged until the present day.	90	S
1953 - 2018	A fire station is recorded to the south of the site from the 1950s, it is no longer recorded after 2018 when it appears to have been demolished.	120	S
1956 - 1978	An additional fire station is recorded to the south of the site from the mid-1950s, no longer recorded by the late 1970s.	200	S
1850 - 1891	A brewery is recorded on the 1850 historical map, no longer present on the 1891 record.	250	SW
1906 - 1925	A trial shaft is recorded on the 1906 historical map, it is no longer present by 1925; a pond is recorded in its place.	300	E

Given the predominantly residential and historically agricultural nature of the area no further significant potential contaminative sources were recorded off site.

3.3 Geology

3.3.1 BGS Geological Map

The BGS 1:50,000 drift and solid geological maps of the area (Sheet No. 97, dated 1977 and 1980, respectively) indicate that the site is underlain by superficial deposits comprising **Glacial Till** which typically comprises a heterogenous mixture of clays, sands and gravels. The site is underlain by bedrock of the **Pennine Middle Coal Measures Formation** comprising mudstone, siltstone and sandstone.



Figure 13: Extracts of the BGS 1:50,000 drift (left) and solid (right) geological maps. Light blue = Glacial Till, Dark grey and light grey = Pennine Middle Coal Measures Formation, Light grey = Chester Formation.

The solid geological map indicates that no faults are present on site, however 2 No. linear features are present 105m to the west and 105m to the east. Based on the

BGS 1:50,000 geological map, the Boundary Fault is recorded to the west of the site, downthrowing to the south-west. The other linear feature is identified as the Dukinfield Marine Band. The bedrock dips is noted to vary significantly in the area of the site, likely due to the significant faulting, a bedrock dip of 50° south west and well as an unknown dip north west and west is recorded in the area of the site. The BGS 1:10,560 geological map indicates a further on-site fault, downthrowing to the south-west, however it is not recorded on any other geological records.

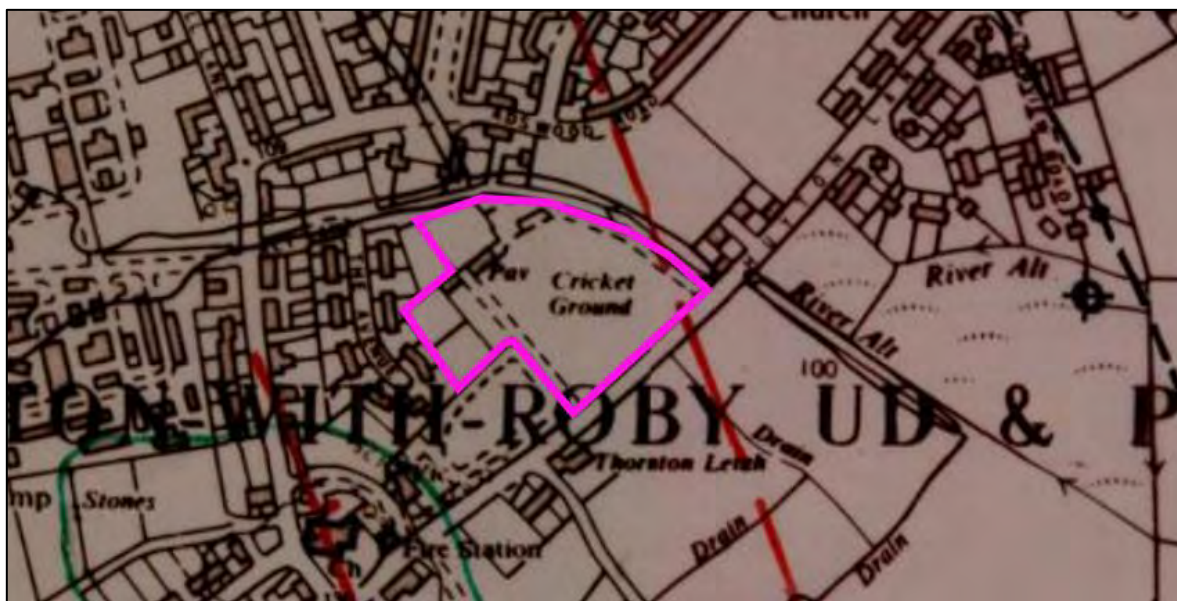


Figure 14: An extract of the BGS 1:10,560 solid and drift geological map of the site and the surroundings, showing a fault in the eastern site section, downthrowing to the north-east.

3.3.2 BGS Borehole Logs

There were no available BGS boreholes on site. There was a single available BGS record related to 2 No. mechanically excavated trial pits located in close proximity to the site within a comparable geological setting, however, no relevant information regarding the underlying ground conditions was available.

3.3.3 BGS Geohazards

Data Type	Details
Ground Stability Data	- The Potential for Shrinking or Swelling Clay Ground Stability Hazards is regarded as very low. - The Potential for Running Sand Ground Stability Hazards is regarded as very low. - The Potential for Compressible Ground Stability Hazards is regarded as negligible. - The Potential for Collapsible Ground Stability Hazards is regarded as very low. - The Potential for Landslide Ground Stability Hazards is regarded as very low. - The Potential for Dissolution Ground Stability Hazards is regarded as negligible.

3.3.4 BGS Estimated Soil Chemistry

The BGS have estimated that the superficial deposits across the site to naturally comprise the following determinands:

- Arsenic: 15mg/kg – 25mg/kg
- Cadmium: 1.8mg/kg – 3.0mg/kg
- Chromium: 90mg/kg – 120mg/kg
- Nickel: 15mg/kg – 30mg/kg
- Lead: 100mg/kg – 200mg/kg
- Bioaccessible Lead: 60mg/kg – 120mg/kg

3.4 Mining

3.4.1 Coal Mining

The site lies within a Mining Remediation Authority Coal Mining Reporting Area but not within a Development High Risk Area. An outcrop is recorded c.250m north-east of the site on the Mining Remediation Authority interactive viewer. The outcrop is not recorded on the BGS 1:10,560 or the 1:50,000 geological map. 5 No. mine entries were recorded in the vicinity of the site. 3 No. of these are located between 250m and 280m to the east and 347m to the north east of the site and are anticipated to be corresponding to the presence of a coal seam to the east of the site. The BGS 1:50,000 solid geological map recorded 2 No. additional coal seams located further to the south-east of the site, anticipated to comprise the Arley Mine and the Rushy Park seams. 2 No. additional mine entries are recorded between 180m and 200m to the south of the site, however no corresponding outcrops were recorded on any of the available geological maps.

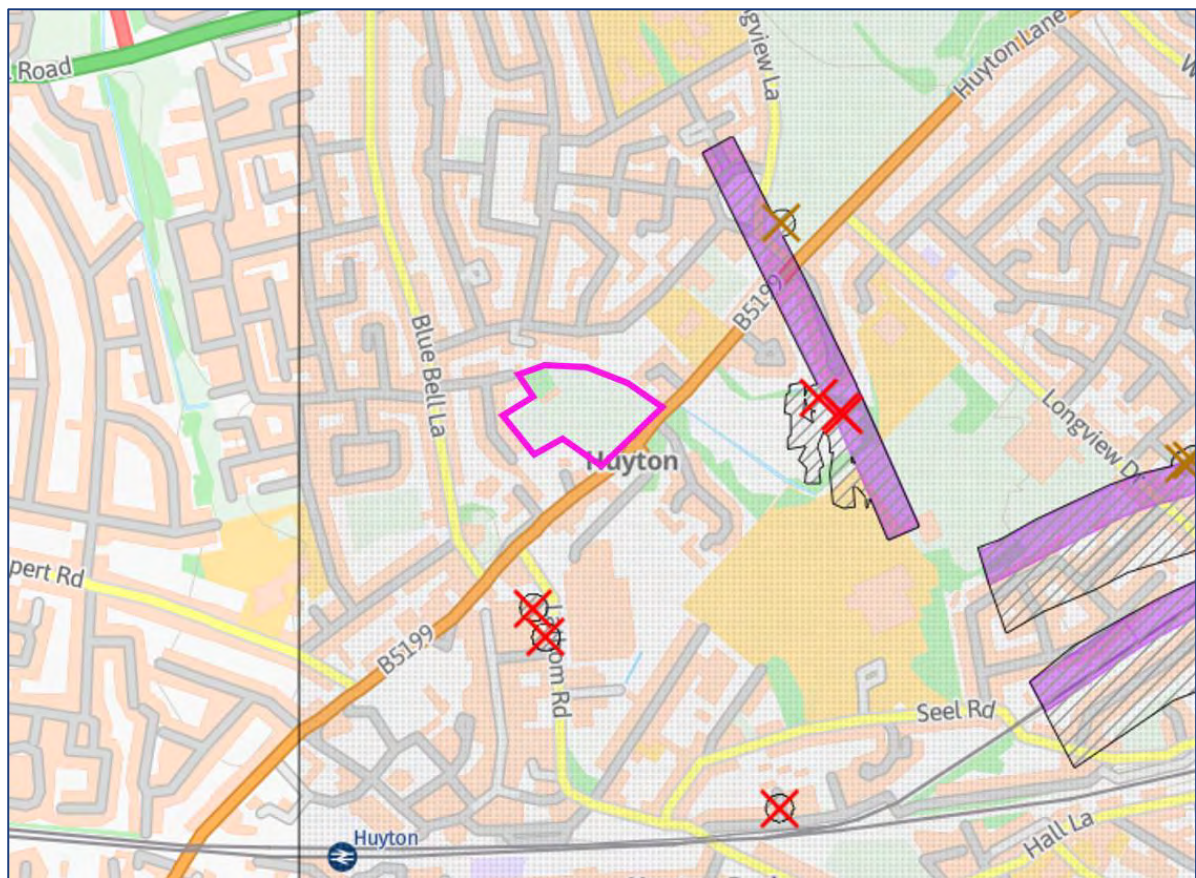


Figure 15: An extract of the Mining Remediation Authority interactive viewer showing the location of the outcropping coal seams (purple), Development High Risk Areas (black hatch) and mine entries (red cross). The site boundary is highlighted in pink.

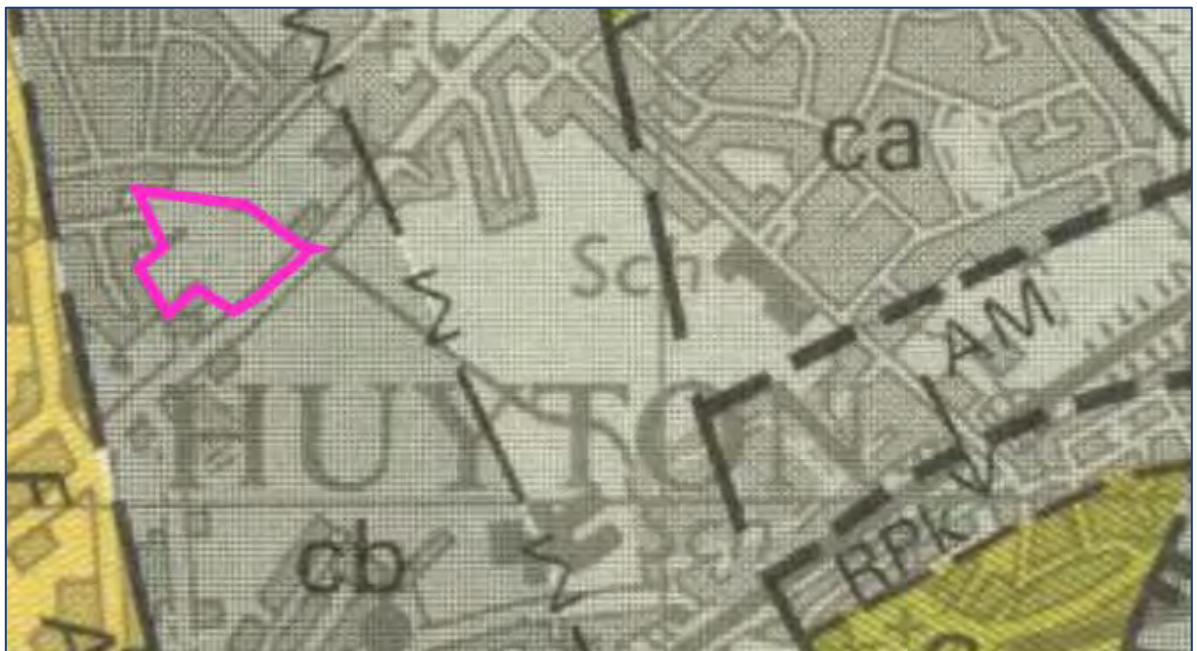


Figure 16: An extract of the BGS 1:50,000 solid geological map showing the location of the linear features in the vicinity of the site, including a marine band to the east, a fault (thin dashed line) and coal seams (thick dashed lines). A bedrock dip is also recorded in the adjacent fault block. The site boundary is highlighted in pink.

3.4.2 Non-Coal Mining

No non-coal mining was recorded on site or within 1000m of the site.

3.4.3 Salt Mining / Brine Extraction

The site does not lie within the Cheshire Brine Subsidence Compensation Board Compensation District or within a Consultation Area.

3.4.4 Historical Surface Excavations

No historical surface ground working were recorded on site. 4 No. historical surface ground workings were recorded within 250m of the site, all related to grave yards recorded between 1850 and 1989.

As ground workings were recorded within the area, as well as due to the historical presence of on-site buildings and bowling greens / pavilion, the presence of further and potentially unrecorded historical on-site excavations cannot be discounted.

3.4.5 Mineral Safeguarding

Where mineral resources are present the mineral planning authority may designate areas as Mineral Safeguarding Areas (MSA) and Mineral Consultation Areas (MCA). These are aimed to safeguard mineral resource areas from unnecessary sterilization by non-mineral development. The BGS Mineral Resources maps designate the areas of potential mineral resources and where active / lapsed planning permission was granted for mineral extraction.

The BGS Mineral Resources Map for Merseyside indicates that the site does not lie within an area designated as containing mineral resources.

No information on the Mineral Safeguarding Areas was available from the Knowsley Council website, however, a report obtained from St Helens Council (*The Evidence Base for Minerals Planning in Merseyside, Final Report*, dated August 2008) states that the only Mineral Safeguarding Area in the jurisdiction of Knowsley Council is the area immediately surrounding the Cronton Clay Pit, located 5.6 km to the south-east of the site. Evidence for clay extraction was noted on aerial imagery of the pit from as recent as March 2024, therefore it is likely that extraction continues.

3.5 Hydrology and Hydrogeology

Environmental data relevant to the site and its immediately surrounding area has been obtained from sources available in the public domain. In addition, an environmental report was obtained from Groundsure. The Enviro + Geo Insight report and associated maps that have been inspected are presented in Appendix 5 and the principal observations in relation to waters and flooding can be summarised as follows:

Data Type	Details
Flooding	- With respect to rivers and seas, the site majority of the site lies within Flood Zone 1. Flood Zones 2 and 3 are recorded in the northern and eastern site sections, anticipated to be related to the presence of the River Alt along the northern and eastern site boundaries. - The northern and eastern site sections are recorded to be susceptible to surface water flooding, the highest risk pertaining to a 1 in 30 year event with a floodwater depth of greater than 1.0m. - A BGS groundwater flooding susceptibility area has also been identified on site, however, the risk is deemed to be low.
Surface Water Features	The River Alt is located along the northern and north-eastern site boundary. It appears to enter an off-site culvert adjacent to the north-western site boundary.
Surface Water Abstractions	- There are no licensed surface water abstractions located on site. - There are 2 No. historical licensed surface water abstractions located within 1931m north-east of the site, both related to the abstraction of water from Longwood Mill Brook at James Whitaker & Sons Nurserymen Ltd, Prescott, Merseyside for spray irrigation.
Superficial Aquifer	The site is underlain by superficial deposits classified as a Secondary Undifferentiated Aquifer.
Bedrock Aquifer	The underlying bedrock is classified as a Secondary A Aquifer - <i>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.</i>
Groundwater Abstractions	There are no recorded groundwater abstraction licenses located on site or within 2km of the site.
Source Protection Zones	- There are no recorded Source Protection Zones recorded on site. - There is a Source Protection Zone 3 (Total Catchment) recorded within 103m west of the site.
Nitrate Vulnerable Zones	- There is a single Nitrate Vulnerable Zone recorded on site - the River Alt NVZ. - There are a further 3 No. Nitrate Vulnerable Zones recorded within 2km of the site, including the River Alt NVZ and Ditton Brook NVZ.
Licensed Discharge Consents	There are no licensed discharge consents to controlled waters recorded on site or within 500m of the site.
Pollution Incidents to Controlled Waters	- There are no recorded pollution incidents to controlled waters located on site. - There are 2 No. pollution incidents recorded within 403m south and 464 west of the site, which pertain to incidents in May 2001 and July 2014 involving an unspecified pollutant and contaminated water, respectively. The 2001 was recorded as a Category 4 (No Impact) incident to controlled waters, and the 2014 incident was recorded as a Category 2 (Significant) incident to controlled waters.

3.6 Hazardous Installations, Landfill and Waste

The following information relating to hazardous installations, landfill and waste obtained from the Groundsure Enviro + Geo Insight report, published information and the walkover survey can be summarised as follows:

Data Type	Details
Environment Agency Recorded Active Landfill Sites	There are no Environment Agency recorded active or recent landfill sites on site or within 500m of the site.
Environment Agency Recorded Historical Landfill Sites	There are no Environment Agency recorded historical landfill sites located on site or within 500m of the site.
BGS Recorded Historical Landfill Sites	There are no BGS recorded landfill sites located on site or within 500m of the site.
Local Authority Recorded Landfill Sites	There are no Local Authority recorded landfill sites located on site or within 500m of the site.
Local Authority Pollution Prevention and Control (Part A(2) and Part B Activities and Enforcements)	There are no Local Authority Part A2 or Part B Activities or Enforcements located on site or within 500m of the site.
Registered Radioactive Substances	There are no Registered Radioactive Substances recorded on site or within 500m of the site.
Registered Waste Treatment, Transfer or Disposal Sites	- There are no historical or registered waste sites, waste treatment, transfer or disposal sites recorded on site or within 500m of the site. - There are no waste exemptions recorded on site. There are 2 No. waste exemptions recorded within 385m south-east relating to the storing and denaturing of controlled drugs for disposal at Victoria Road, Huyton, Liverpool.
Industrial Land Use	- There are no current industrial land uses recorded on site. - There are 6 No. recent industrial uses recorded within 500m of the site, the nearest is the Huyton Ambulance Station located 107m south. - There are no current or recent petrol stations, electricity cables, or gas pipelines recorded on site or within 500m of the site. - There are no historical industrial site uses recorded on site. - There are 20 No. historical industrial land uses recorded within 500m of the site, including fire stations, grave yards, a brewery, a trial shaft, police stations, unspecified heaps and pits. - There are 17 No. historical tanks recorded within 500m of the site, all related to unspecified tanks. - There are 19 No. historical energy features recorded within 500m of the site, all related to electricity substations.
Dangerous Substances	There are no recorded discharges of dangerous substances on site or within 500m of the site.
Hazardous Building Materials	Asbestos materials may be present associated with the presence of the on-site cricket club pavilion.

3.7 Radon

A site-specific radon map is included in the Groundsure Enviro + Geo Insight report which finds that the site lies within an area where less than 1% of homes are above the Action Level and consequently, no radon protection measures are required.

3.8 Previous Ground Investigations

Earth Environmental and Geotechnical Ltd (EEG) have previously undertaken a desk study investigation in 2016 and a ground investigation of the site in 2017 and 2018. The following reports have been produced and are summarised below:

- Earth Environmental and Geotechnical, *Phase 1 Environmental Desk Study*, Ref. A1356/16, dated April 2016; and
- Earth Environmental and Geotechnical, *Geoenvironmental Interpretative Report*, Ref. A1356/18/B.0, dated December 2018.

3.8.1 Desk Study

EEG completed a review of the site history and ground conditions for the site. Ground workings including a graveyard within 174m to the south-west and 2 No. surface mineral workings and quarries within 1km of the site were recorded by EEG, however no dates of operation were available in the report. EEG identified that the site lies within an identified mining area, however it was recorded outside of a Development High Risk Area. No further information regarding coal mining on site was available.

Contamination

No significant potentially contaminative sources were identified across the site in the EEG report, however, EEG state that potential contamination may be present in the Made Ground associated with the former tennis courts where “waste deposits” were recorded. Japanese Knotweed was also identified by EEG adjacent to the former car park. The existence and extent of any possible contamination was deemed unknown by EEG at the time of writing and an intrusive site investigation was recommended to quantify the risks, including undertaking soil sampling for contamination testing and to complete waste characterisation.

Ground Gas

EEG identified the suspected deposited waste materials on site as a potential ground gas source, however, as these were deposited above ground level and were deemed by EEG to be unlikely to contain organic and degradable materials, the associated ground gas risk was deemed low.

Geotechnical Assessment

EEG recommend that a site investigation is undertaken to enable the design of foundations for any new structures. No further geotechnical assessment was undertaken at the Phase 1 stage.

3.8.2 Phase 2 Ground Investigation

The EEG ground investigation included the following exploratory holes:

- 3 No. mechanically excavated trial pits undertaken to depths of between 2.40m and 2.90m bgl (TP01 to TP03);
- 17 No. dynamic sample boreholes undertaken to depths of between 1.20m and 6.00m bgl (WS101 to WS102 and WS201 to WS215); and
- 18 No. dynamic cone penetrometer tests to depths of between 930mm and 960mm bgl (DCP1 to DCP18).

7 No. ground gas and groundwater depth monitoring wells were installed, however, ground gas monitoring has not been undertaken during this Phase 2 site investigation. 20 No. soil samples were sent for subsequent chemical laboratory testing.

The typical ground conditions encountered were as follows:

- **Topsoil** comprising grass and shrubs over brown, clayey, slightly gravelly sand to depths of between c. 0.25m and 0.40m bgl, underlain by:
- Localised **Made Ground** comprising dark grey, gravelly, slightly sandy, slightly silty clay and dark grey, sandy, slightly silty, slightly clayey, angular to subangular, fine to coarse gravel with PFA to depths of between 0.30m and 1.20m bgl, underlain by:

- **Glacial Till** comprising firm to stiff, slightly gravelly, slightly sandy clay and occasional sand lenses to depths of between 2.40m and 6.00m bgl, underlain by:
- (in WS209 and WS212 only) **Pennine Middle Coal Measures Formation** comprising mudstone to a depth of at least 5.00m bgl.

Soft, organic clay with 'patches' of peat was also noted within WS201 to a depth of 6.00m bgl. Groundwater was recorded in TP02 and TP03, noted as water seepage from sand pockets within the fine deposits (at c. 2.00m bgl). Within WS101, WS201–WS208 and WS211–WS214 groundwater strikes were noted between 1.90m and 4.50m bgl.

Geotechnical Testing

Standard penetration tests were undertaken in 1m intervals within the dynamic sample boreholes which recorded N-values of between 2 and 26. Pocket penetrometer and in-situ hand shear vane tests recorded undrained shear strengths of between 30kN/m² and 140kN/m². The dynamic cone penetrometer tests recorded equivalent CBR values of between 6.16% and 18.29%.

13 No. falling head tests were undertaken within WS202, WS203, WS204, WS206, WS208, WS209 and WS210, with between 1 and 3 runs undertaken in each borehole. The permeability coefficients recorded were as follows.

Location	Run	Coefficient of Permeability
WS202	1	2.61×10^{-7}
	2	2.72×10^{-7}
	3	2.67×10^{-7}
WS203	1	1.59×10^{-7}
	2	2.09×10^{-7}
	3	2.78×10^{-7}
WS204	1	7.29×10^{-9}
WS206	1	3.37×10^{-8}
	2	3.37×10^{-8}
	3	1.14×10^{-7}
WS208	1	2.18×10^{-7}
	2	2.78×10^{-7}
	3	1.97×10^{-7}

WS209	1	1.42×10^{-8}
	2	1.42×10^{-8}
	3	1.42×10^{-8}
WS210	1	2.13×10^{-8}
	2	2.84×10^{-8}

Subsequent laboratory geotechnical testing was undertaken. The soils were classified as DS-1, AC-1 based on pH and sulfate values only.

4 No. single stage triaxial tests were undertaken on samples from depths of between 2.60m and 3.00 bgl which recorded undrained shear strengths of between 94kN/m² and 120kN/m². 8 No. Atterberg limit tests were also undertaken which indicate that the Glacial Till is of low plasticity and low to moderate volume change potential.

Foundations

EEG stated that shallow strip foundations would be considered suitable for a proposed commercial retail unit. EEG stated that special consideration may be required in the area where soft clays were recorded at depth (WS201), and that foundations should be deepened in areas where trees and hedges are present.

Chemical Testing

Chemical testing of the solid samples revealed that no elevated concentrations of contaminants were recorded with respect to the commercial end-use scenario.

3.9 Unexploded Ordnance (UXO)

The Zetica UXO risk map, contained in Appendix 6, indicates that the site lies within an area of **moderate risk**. As Liverpool is known to historically have been targeted by bombing, Preliminary and Detailed UXO Risk Assessment Reports have been obtained from Brimstone Site Investigation Ltd. The reports are included in Appendix 6 and are summarised below.

With respect to World War II German bombing of Liverpool, the site was found to be located in the WWII-era administrative boundary of the Urban District of Huyton with Roby, which was impacted with low to moderate bombing. The nearest impact was

recorded on 9th or 10th of January 1940 within a close vicinity to the site (potentially on site), involving a high explosive (HE) bomb strike, however, no visible evidence of bomb damage was recorded on site. Furthermore, an electrical engineering plant located c.2.3km north-east of the site was identified as a primary Luftwaffe bombing target. The railway infrastructure present 620m south of the site was recorded as a potential target of opportunity. No evidence was found that the site itself was targeted.

The 86th Liverpool (Stoneycroft) HG Battalion may have accessed the site due to it being undeveloped during WWII.

Huyton Camp was identified within 140m north of the site, which was recorded as a reinforcement camp in 1940, though no information was available related to the nature of the camp. Brimstone recommended further research to assess possible risk to site from the presence of Huyton Camp.

The report found that during WWII, 19 No. permanent Heavy Anti-Aircraft (HAA) batteries were present in the vicinity of the site and within its range. Consequently, it is possible that an unexploded shell struck the site, as a large number of ammunition was stored in these facilities. Additionally, LAA guns were recorded as likely to have been utilised to defend vulnerable targets, as Luftwaffe activity was known to be frequent, therefore a large amount of ordnance may have been fired. Furthermore, it is considered possible that an unexploded AA shell has historically struck the site and penetrated into the shallow ground.

As the site has changed since WWII, it is likely that the risk associated with shallow buried UXO was partially mitigated, however, any deep (2m bgl and below) UXO may still remain buried, consequently, the associated risk remains.

The Detailed Risk Assessment Report concluded that the risk from UXO at the site was low to moderate. Brimstone recommended that a UXO safety awareness briefing be carried out prior to any intrusive works commencing at the site.

3.10 Animal Burial Sites

The Animal Health and Veterinary Laboratories Agency (AHVLA) no longer routinely respond to consultations relating to records of animal burial sites. Based upon a review of the site history it is considered unlikely that the site has been subject to recorded animal burials.

3.11 Archaeology

We do not anticipate that the site will be affected by archaeological issues, however consultation with the county archaeologist is recommended.

4.0 CONCLUSIONS

4.1 General

The site currently comprises a former site of the Huyton Cricket Club with an associated derelict pavilion and vacant land surrounding the building with an area of hardstanding in the northern site section and a vegetated area in the western site section.

4.2 Ground Conditions and Geotechnical Hazard Identification

The anticipated typical ground conditions across the site are as follows:

- **Topsoil** comprising to a depth of c. 0.50m bgl, underlain by:
- Localised **Made Ground** comprising dark grey, gravelly, slightly sandy, slightly silty clay and dark grey, sandy, slightly silty, slightly clayey, angular to subangular, fine to coarse gravel to depths of between 0.30m and 1.20m bgl, underlain by:
- **Glacial Till** comprising firm to stiff, slightly gravelly, slightly sandy clay and occasional sand lenses to a depth of 6.00m bgl, underlain by:
- (in localised areas of the site) **Pennine Middle Coal Measures Formation** comprising mudstone.

4.2.1 Geotechnical Hazard Identification

Potential geotechnical hazards based on the expected ground conditions that may require further consideration at the site are outlined below:

Factors	Remarks	Considerations	Hazard
Made Ground	Although not anticipated to be widespread, Made Ground has been recorded on site to depths of up to 1.20m bgl.	Made Ground may settle variably, have highly inconsistent bearing capacity and may suffer significant movements that may be problematic for foundations, externals and infrastructure elements without treatment. The presence of Made Ground may be problematic for foundations as there may be loose / soft spots within the Made Ground and it may not be suitable to utilise traditional foundations.	Low

Aggressive Ground and Groundwater	While the risk posed from the natural strata is anticipated to be very low, given the presence of localised Made Ground there is potential for aggressive ground conditions to be present on-site, however, the risk remains low. Based on the EEG classification of the on-site soils as DS-1 and AC-1, the risk is deemed low though full classification in accordance with BRE SD1 should be completed.	Acidic ground / groundwater and sulfate may attack the concrete and steel used in foundations and react with aggregates. The oxidation of pyrite and other sulfides can also occur due to geotechnical activities. This can lead to the generation of high concentrations of sulfate and low pH that attacks construction materials and may lead to the precipitation of gypsum resulting in the heave of foundations and floor slabs. Pyrite oxidation can also be triggered by mixing susceptible materials with lime or cement resulting in high pH that can lead to the expansion of some sulfates that cause heave of stabilised soils.	Low
Shrink and Swell Clays	Established trees are present along the site boundaries and within the site. Low plasticity and low to moderate volume change potential Glacial Till deposits are present at shallow depth.	Some types of ground (e.g., clay soils) can change volume due to changes in moisture content that may be induced by weather variations (e.g., drought), vegetation (e.g., growth or removal of trees) or man-made activities (e.g., changes to local drainage). This shrink / swell behaviour typically causes ground movement to a depth of approx. 3m potentially damaging building foundations, externals, pipes or services by differential movements.	Low to Moderate
Soft Spots	Soft spots may be present across the site associated with localised excavations i.e., previous site investigation.	Soft spots may cause differential settlement of foundations therefore there will be a requirement for localised deepening of foundations where soft spots are present.	Low to Moderate
Obstructions	There may be obstructions present from historical structures.	May act as obstructions to excavations and / or the chosen foundation solution or act as 'hard spots' within the ground if left in-situ.	Low to Moderate
Shallow Bedrock	Bedrock of the Pennine Middle Coal Measures Formation (mudstone) is anticipated at shallow depths below the site in localised areas.	Rock break may be required for the installations of foundations for the proposed buildings and proposed services.	Low to Moderate

4.3 Sources of Contamination and Probable Contaminants

Based on the desk study information the following potentially contaminative sources have been identified:

Potentially Contaminative Source	Associated Determinands	Remarks
On-Site Made Ground	Unknown, anticipated to be metals, semi-metals, PAHs, TPH, asbestos. Ground Gas – carbon dioxide, methane, hydrogen sulfide, VOCs.	Localised Made Ground was recorded to a maximum depth of 1.20m bgl, however, no exceedances of contaminants were recorded during the EEG site investigation.
On-Site Cricket Club Pavilion and Adjacent Buildings	Asbestos	A cricket club pavilion was recorded from the 1890s, therefore asbestos-containing materials may be present within the building and its associated adjacent buildings.

Off-Site Huyton Wetlands	Ground Gas – carbon dioxide, methane.	Organic-rich deposits may be present within the Huyton Wetlands. Due to the proximity to the site, migration of ground gases can occur from the wetlands to the site.
Off-Site Current and Historical Industrial Land Use	Unknown, anticipated to be metals, semi-metals, PAHs, TPH, asbestos.	Industrial land uses have been recorded in the vicinity of the site, including an existing ambulance station (90m south-east), historical fire stations (120m – 200m south), and a historical brewery (250m south-west).
Off-Site Coal Seams (unnamed, Arley and Rushy Park) and the Off-Site Historical Trial Shaft	Ground Gas – carbon dioxide, methane.	3 No. suspected coal seams are present within c. 600m and 715m to the south-east of the site. Additionally, a historical trial shaft was recorded within 300m to the east of the site between 1906 and 1925, suspected to have been related to coal extraction.

It should be noted that potentially contaminative unrecorded historical activities may have occurred (e.g. the use or deposition of Made Ground from off-site during historical on-site developments) and in this event, further contaminative sources may be present.

4.3.1 Unknowns

Following the desk study, the areas of uncertainty are summarised as follows:

- Depth to bedrock; and
- Presence and extent of underground obstructions.

4.4 Identified Pathways of Contamination

Human Health		Ground Gas		Controlled Waters	
A	Ingestion of dust and soil	A	Migration through fractures and fissures in bedrock	A	Vertical migration through coarse Made Ground and coarse soils
B	Dermal contact with dust and soil	B	Preferential migration along foundations & service ducts	B	Lateral migration along low permeability natural soils & pooling at relative low points
C	Inhalation (dust)	C	Migration within groundwater	C	Vertical migration along future foundations and pooling at base
D	Inhalation (vapours)	D	Ingress through cavity walls & floors	D	Migration through porous bedrock
E	Inhalation and oral backgrounds	E	Inhalation	E	Overland flow

4.5 Identified Receptors of Contamination

Human Health receptors include the following:

- End Users (**residential with home grown produce** land use scenario);
- Construction workers; and
- The general public and adjacent site users.

Controlled waters receptors include the following:

- Groundwater contained within the underlying Secondary Undifferentiated Aquifer and Secondary A Aquifer; and
- Surface Water – site-adjacent River Alt.

Other receptors include the following:

- Subsurface plastic (e.g. potable plastic water pipe); and
- Building fabric (e.g. concrete foundations, etc).

4.6 Conceptual Site Model

4.6.1 Conceptual Model for Human Health Risk Assessment

A site conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for the human health of site occupants has been produced as a result of the probable contaminants, pathways and receptors identified above. A diagram of the site conceptual model is included as Appendix 2.

Conceptual Model for Human Health Assessment					
Sources of Contamination	Pathway	Receptor	Hazard (severity)	Likelihood	Risk
On-Site Made Ground On-Site Cricket Club Pavilion and Adjacent Buildings Off-Site Current and Historical Industrial Land Use	A B C E	End users General public	Effect on human health (Medium)	Low likelihood: Localised pockets of Made Ground may be present on site, as evident in the previous ground investigation, but are not anticipated to be widespread or contain significantly elevated concentrations of contaminants. Asbestos may be present within the existing cricket club building in the central site section, as the building was constructed prior to the 2000s. An asbestos survey is recommended to be undertaken prior to any demolition works being undertaken. Areas of soft landscaping are present and may be considered contaminative pathways. Given the lack of contaminative sources and the continued use as a cricket club, the risk remains low given the lack of significant contaminative sources.	Low to Moderate
		Construction workers		Low likelihood, reduced to unlikely with best practice: Construction workers will be at increased risk due to their acute interaction with soils and the anticipated presence of asbestos within the on-site buildings. The appropriate use of PPE, Good Practice and Health and Safety measures will significantly reduce the risk.	Low
	D	End users and general public		Unlikely: No potential sources of VOCs have been identified. If localised contaminative hotspots of VOCs are present (i.e., from possible spillage from gardening equipment or parked cars), given their relative mobility and volatility VOCs are unlikely to remain at significant concentrations.	Low
		Construction workers		Unlikely: Construction workers at increased risk if any disturbance of soil occurs as this may generate a temporary increase in the release of soil vapours, however risk remains low given the lack of a source of VOCs.	Low

4.6.2 Conceptual Model for Ground Gas Risk Assessment

A conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for ground gas has been produced as a result of the probable contaminants, pathways and targets identified above as follows:

Conceptual Model for Ground Gas Risk Assessment					
Source	Pathway	Receptor	Hazard (severity)	Likelihood	Risk
On-Site Made Ground	A	Human occupants	Effect on human health (Mild to Severe*)	Low likelihood: Significant Made Ground deposits are not anticipated on site, however, organic clays with pockets of peat have been recorded in localised areas of the site during the previous ground investigation. Though the site is underlain by fine Glacial Till deposits, the presence of coarse strata cannot be discounted, therefore a potential contaminative pathway still exists. The off-site Huyton Wetlands are likely to contain significant organic deposits, and given their proximity to the site, migration of possible ground gases to site cannot be discounted.	Low to Moderate
Off-Site Huyton Wetlands	B	Site Workers			
	C				
	D	Building and Structures	Damage to building (Medium)		
	E				
Off-Site Coal Seams (unnamed, Arley and Rushy Park) and the Off-Site Historical Trial Shaft	A	Human occupants	Effect on human health (Mild to Severe*)	Low likelihood: Although no coal outcrops have been recorded on site and in close proximity to the site, the risk of mine gas reaching the site cannot be completely discounted due to the likely presence of shallow bedrock, as evident from the previous intrusive ground investigation undertaken by Earth Environmental in 2017 and 2018, where mudstone of the Pennine Middle Coal Measures Formation was identified at shallow depths. Given the presence of Glacial Till across the site, the likelihood of any mine gas migration is reduced, however the lateral continuity of the fine deposits is unknown, therefore a possible pathway to the existing on-site buildings still exists. The on-site buildings are likely to contain large open spaces inside due to their use as part of a cricket club pavilion, though, confined spaces cannot be discounted, therefore the risk is deemed low to moderate.	Low to Moderate
	B	Site Workers			
	C				
	D	Building and Structures	Damage to building (Medium)		
	E				

*Due to the risk of explosion.

4.6.3 Conceptual Model for Controlled Waters Risk Assessment

A site conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for pollution of waters has been produced as a result of the probable contaminants, pathways and targets identified above as follows:

Conceptual Model for Controlled Waters Risk Assessment					
Source	Pathway	Receptor	Hazard (severity)	Likelihood of Occurrence	Risk
On-Site Made Ground Off-Site Current and Historical Industrial Land Use	A C D	Groundwater within the Secondary Undifferentiated and Secondary A Aquifers	Effects to controlled waters (Medium)	Unlikely: No significant potential sources of contamination have been identified on site. Localised Made Ground may be present however is unlikely to contain determinands at elevated concentrations. Additionally, the presence of fine Glacial Till will likely reduce the vertical migration into the underlying aquifers, however the lateral continuity of the fine strata cannot be guaranteed. Following development is it likely that the presence of hardstanding will increase (i.e. building extensions, car parks and roads) on site, therefore vertical migration will also be reduced. Furthermore, if any significant contamination is encountered, remedial measures may be undertaken for human health purposes (i.e. possible removal of source) further reducing the risk to controlled waters.	Low
	B	Surface water courses (The River Alt along the northern site boundary)	Effects to controlled waters: (Mild)	Low likelihood: Lateral migration of contaminants is considered unlikely given the lack of potentially contaminative sources. Although the presence of cohesive Glacial Till at shallow depths may facilitate lateral migration, with the anticipated absence of possible contaminants the risk is deemed low. If additional hardstanding (e.g., car parks and access roads) are to be constructed on site following development, this will further reduce the potential for lateral migration of contaminants.	Low
	E	Surface water courses (The River Alt along the northern site boundary)	Effects to controlled waters: (Mild)	Low likelihood: Although a surface water feature is located adjacent to the northern boundary of the site, the likelihood of overland flow is considered low as little hardstanding is currently present on site to facilitate overland flow. The existing topsoil will facilitate vertical migration rather than lateral migration to the surface water receptors. Although the presence of hardstanding is likely to increase following development, the risk remains very low as any contamination is likely to remain beneath hardstanding.	Low

4.7 Preliminary Risk Assessment Summary

Human Health

Based on the human health conceptual model the risk to human health is deemed low to moderate to end users and construction workers. The risk to construction workers may be increased due to their acute interaction with site soils, however, it is envisaged that with appropriate PPE and site management, risks to construction workers can be mitigated.

Ground Gas

Potential ground gas sources have been identified on site and also from potential off-site sources, consequently, as the risk to site cannot be discounted, it was deemed low to moderate. As a result, ground gas monitoring is recommended to confirm the ground gas regime on site, including 6 No. visits over 3 No. months.

Controlled Waters

Although sensitive receptors have been identified on site (Secondary Undifferentiated and Secondary A Aquifers and The River Alt) no significant contaminative linkages exist, therefore the risk to controlled waters is deemed low. It is considered prudent to undertake groundwater and surface water testing to confirm potential migration of contamination from site to the controlled waters receptors.

If unrecorded contaminative sources are noted, the above conceptual models may require re-assessment.

4.8 Scope of Phase 2 Intrusive Geo-Environmental Ground Investigation

As a result of the preliminary risk assessment, a Phase 2 intrusive geo-environmental ground investigation should be carried out to quantify the identified risks. This intrusive ground investigation works should include the collection of appropriate samples – solid and liquid, across the site for appropriate chemical testing as detailed above.

Furthermore, to determine the geotechnical and geological properties of the underlying ground conditions, appropriate intrusive works and associated testing should be undertaken. The rationale and aims for these Phase 2 environmental, geotechnical and geological investigative works are detailed below.

In order to provide adequate assessment in terms of both environmental and geotechnical site parameters, ground investigation works will be required on a spatial basis and in the vicinity of the former cricket club building.

The proposed initial ground investigation works should initially comprise a programme of dynamic sampling boreholes. Depending on the findings of this initial investigation, further works including mechanically excavated trial pits to determine rock break requirements and deep boreholes formed by rotary methods to determine the presence/absence of coal bearing strata may be required.

The rationale for the exploratory holes is discussed below:

- To allow the collection of samples from the Made Ground and natural deposits for chemical laboratory testing (solid samples) for an appropriate suite of determinands and to determine the suitable concrete classification in associated with relevant guidance e.g. BRE Special Digest 1;
- To determine the extent, composition and depth of any Made Ground deposits;
- To determine the nature, thickness and extent of superficial deposits;
- Enable geotechnical testing, including density testing (SPTs), hand shear vane (HSV) testing and undrained shear strengths of the underlying Made Ground and natural deposits for the purposes of sub-structure design;
- To allow installation of ground gas monitoring wells;
- To undertake monitoring and sampling of the on-site groundwater and surface water from the River Alt.

5.0 RECOMMENDATIONS

- As a result of the information gathered and the risks identified in this report, there is a low risk to human health. The risk to controlled waters is deemed very low to low given the lack of significant contaminative linkages.
- A low to moderate ground gas risk has been identified based on ground gas sources, consequently ground gas monitoring is recommended, including 6 No. visits over 3 No. months. On the basis that the site lies within an area where between less than 1% of homes are above the action level no radon protection measures are necessary.
- Ground investigation works should be undertaken in order to determine the ground conditions with a greater degree of certainty and allow design of the proposed development, drainage, services and immediate external areas to be undertaken. It is therefore recommended that exploratory holes are constructed where access is permitted across the site. The use of soakaways is unlikely to be suitable given the presence of low-permeability shallow Glacial Till across the site.
- From the results of the Phase 2 ground investigation work – if this report identifies a potential risk and / or a requirement for further detailed site-specific assessment, a Phase 3 environmental investigation report and / or a Remedial Strategy (informing on potential remediation solutions) may be required.
- The nature and extent of the proposed targeted chemical and environmental testing should be confirmed, if time / commercial constraints allow, with the relevant Local Authority Environmental Health Officer and the Environment Agency prior to undertaking works on-site. Proceeding without agreement between regulatory authorities may result in further assessment being required.
- It should be noted that, if any visual or olfactory evidence of contamination is encountered during remediation or construction work, then the Local Authority

Environmental Health Officer and Environment Agency should be contacted immediately in order to agree any necessary remediation measures.

- Given the possibility of services on site, full service plans should be obtained prior to any intrusive ground investigation works.
- Due to the presence of established trees on site and the presence of cohesive deposits, an arboricultural survey is recommended.
- An asbestos survey is recommended prior to any works being undertaken within or in the vicinity of the on-site existing cricket club building.

APPENDIX 1

LIMITATIONS OF INVESTIGATION WORK AND REPORT AND CONTAMINATED LAND LEGISLATIVE FRAMEWORK

LIMITATIONS OF REPORT

This consultancy report was compiled and carried out by IGE Consulting Limited ('IGE') for the client, as defined in the main report (the 'client'), on the basis of a defined programme and scope of works and the terms of a contract between IGE and the client. IGE undertook this with all reasonable skill and care, taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between IGE and the client. IGE cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outwith the agreed scope of works.

Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices. This report may not be relied upon, or transferred to, by any other party without the written agreement of its author. If a third party relies on this report, it does so wholly at its own and sole risk and IGE disclaims any liability to such parties.

It is IGE's understanding that this report is to be used for the purpose described in the 'Brief' section of this report. That purpose was a significant factor in determining the scope and the services to be provided. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without IGE's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of IGE.

This report is a function of the date it was written and should be read in light of any subsequent changes in legislation, statutory requirements and industry practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of IGE. In the absence of such written advice of IGE, reliance on the report in the future shall be at the client's own and sole risk. Should IGE be requested to review the report in the future, IGE shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between IGE and the client.

The observations and conclusions described in this report are based solely upon the scope of works agreed between the client and IGE. IGE has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. IGE is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the agreed scope of works. For the avoidance of doubt, this report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species (e.g. Japanese Knotweed). It is recommended that the client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the suspected presence asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace full and proper surveys.

Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and 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. The geo-environmental sections are written in broad agreement with BS 10175:2011+A2 2017.

LIMITATIONS OF INVESTIGATION WORK

Desk Study References

This report is based upon IGE's observations of existing physical conditions at the site gained from a walkover survey of the site together with IGE's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. Reliance has been placed on this publicly available data obtained from the sources identified in the main report. When using the information, it has been assumed that it is correct. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst IGE have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report. IGE did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services. IGE is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to IGE and including the doing of any independent investigation of the information provided to IGE except when otherwise provided in the terms of the contract between the client and IGE.

Historical Mapping

Historical Ordnance Survey maps do not provide a comprehensive description of a site history. They provide details of the site from a date prior to the publication of the map (i.e. a snapshot in time). The period between map editions can be substantial (i.e. several decades). Not all map series are available for every date range in many areas of the UK and therefore there will be gaps in this mapped record for some sites. Potentially contaminative land uses could have been present and removed during such periods and may therefore not form a part of this particular record. In addition, there will be potentially contaminative land uses which are not identified on the map records such as small scale storage / use of hazardous materials, illegal / unlicensed waste disposal activities etc. Different map series identify different features utilising different symbols which can result in features that remain on-site being removed from maps. Some features are also not mapped for security reasons (e.g. airfields and other military installations). These areas are mostly shown as blank areas on historical maps.

Site Walkover

During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

Flooding

Flooding in this report is defined as flooding caused by the sea, ditches, rivers, streams, ponds, lakes, reservoirs and the like. It does not extend to flooding caused by surcharged piped drainage systems and investigations into flooding of this nature are excluded from this report.

Extent of Contamination Studies

Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities. The conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the reporting in full. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Intrusive Investigation

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations, the potential exists for ground conditions to be encountered which are different to those considered in this report. The explored extent of the site area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters, based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Exploratory Holes

Where exploratory holes have been carried out as part of this investigation, the spacing has been determined to provide a reasonable indication of the general ground conditions across the site, but the number has ultimately been limited by commercial constraints. The findings of the exploratory holes relate specifically to the exploratory hole locations and are no absolute guarantee of the ground conditions between such locations. Due allowance should be made for the possibility of variation in conditions between exploratory hole locations.

Extent of Contamination Testing

The extent of contaminated land testing carried out on samples obtained from the site has been determined in accordance with the latest legal guidance issued by the government to provide, with reasonable certainty, the probable general levels of contamination present on site that could pose a significant hazard to human health or waters. The extent of site investigation works including chemical testing has also been limited by reasonable commercial constraints. Although extensive testing of samples has been carried out, the volume of samples taken for testing are a minute fraction of the total volume of soils and groundwater present on site. Therefore, there is a residual risk that undetected pockets of contamination may be present on site, situated between testing locations.

When investigating or developing potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and temporally. The absence of certain ground, ground gas, contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Extent of Geo-Environmental Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species e.g. Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace a full and proper survey. If an Unexploded Ordnance (UXO) report has been obtained within the report, it has been so on the basis of Health and Safety concerns and no assessment has been made other than transcribing the recommendations of the sub-contractor contained within the report. In terms of a potential contaminative source, unless ordnance has been manufactured / stored on site, UXOs will only be determined as a contaminative source following a positive identification on site.

PLANNING CONTEXT

The National Planning Policy Framework (NPPF, 2024) states that the purpose of the planning system is to contribute to the achievement of sustainable development. In order to do this the planning system has three overarching objectives, one of which directly relates to the potential for pollution and contaminated land:

- *'environmental objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'.*

In accordance with this environmental objective, Paragraph 125 clarifies that 'making effective use of land' includes to:

- *'give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land'.*

In accordance with this environmental objective, Paragraph 187 clarifies that 'conserving and enhancing the natural environment includes:

- *'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability'; and*
- *'remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate'.*

Paragraph 196 of the NPPF states that planning policies and decisions for developments should also ensure that:

- *'a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation)'; and,*
- *'after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990'; and*
- *'adequate site investigation information, prepared by a competent person, is available to inform these assessments'.*

This report has been prepared and authorised by staff that are competent as defined in the NPPF.

APPENDIX 2

FIGURES AND DRAWINGS



Housetype	m²	Ft²	Total No.	Total m²	Total Ft²
Type B - 2B3P Bungalow (NDSS)	61	657	4	244	2626
Type C - 2B3P House Type (NDSS & M4(2))	74	797	9	666	7169
Type CC - 2B3P House Type (NDSS & M4(2))	74	797	1	74	797
Type F - 3B4P House Type (NDSS)	86	926	13	1118	12034
Type G - 3b4P U/P House Type (NDSS)	90	969	1	90	969
Type I - 3b5P Corner Turner HT (NDSS & M4(2))	106	1141	2	212	2282
Type J - 4b6P House Type (NDSS & M4(2))	114	1227	6	684	7363
Type L1 - 1B2P Maisonette GF M4(3)	65	700	6	390	4198
Type L2 - 2B3P Maisonette FF (NDSS)	72	775	6	432	4650
Type M - 2b3P Apartments (NDSS)	61	657	12	732	7879
Type N1 - 1b2p Apartment (NDSS)	50	538	6	300	3229
Type N2 - 2b3p Apartment (NDSS)	61	657	6	366	3940
Type N3 - 2b3p Apartment (NDSS)	50	538	6	300	3229
Type N4 - 2b3p Apartment (NDSS)	61	657	3	183	1970
TOTAL	81	5791		5791	62334

	Site Area		Density		Footage			
	Ha	Ac	Un/Ha	Un/Ac	m²/Ha	m²/Ac	Ft²/Ha	Ft²/Ac
Gross	2.21	5.46	36.65	14.83	2620.36	1060.42	28205.31	11414.30
Nett	1.80	4.45	45.00	18.21	3217.22	1301.97	3217.22	14014.23

HOUSE TYPE KEY:

TYPE B 2B3P
BUNGALOW 61

TYPE C 2B3P
TYPE CC 2B3P
HOUSE TYPE 74

TYPE F 3B4P
HOUSE TYPE 86

TYPE G 3B4P FLYOVER
HOUSE TYPE 90

TYPE I 3B6P CORNER
HOUSE TYPE 106

TYPE J 4B6P
HOUSE TYPE 114

TYPE L1 1B2P 65 (GF)
TYPE L2 2B3P 72 (FF)

TYPE M1 2B3P 61 (GF)
TYPE M2 2B3P 61 (FF)

TYPE N1 1B2P 50
TYPE N2 2B3P 61
TYPE N3 1B2P 50
TYPE N4 2B3P 61

INDICATES CIRCULATION SPACE

E

JUNE 25

SHW

PLOTS 42-43 SWAPPED WITH PLOTS 63 & 64

D

JUNE 26

SHW

PLOTS 42-43 MOVED OUT OF FLOOD RISK AREA

C

MAY 25

SHW

PLANNERS COMMENTS ENDORSED

M

MAY 25

SHW

REAR GARDEN AREAS UPDATED FOR PLOTS 01-45

A

MAY 25

SHW

PLOTS 62-64 & 81-82 UPDATED

REV

DATE

DRAWN

DESCRIPTION

TITLE:

PROPOSED SITE LAYOUT

Breck Homes

20 Sceptre Court

Bamber Bridge

Preston

PR10 6AW

Tel: 01535 587 000

Web: www.breck.co.uk/homes

hello@breck.co.uk

PROJECT:

HUYTON LANE, KNOWSLEY

DATE:

MARCH 25

SCALE:

1:500

@ A1

JOB REF:

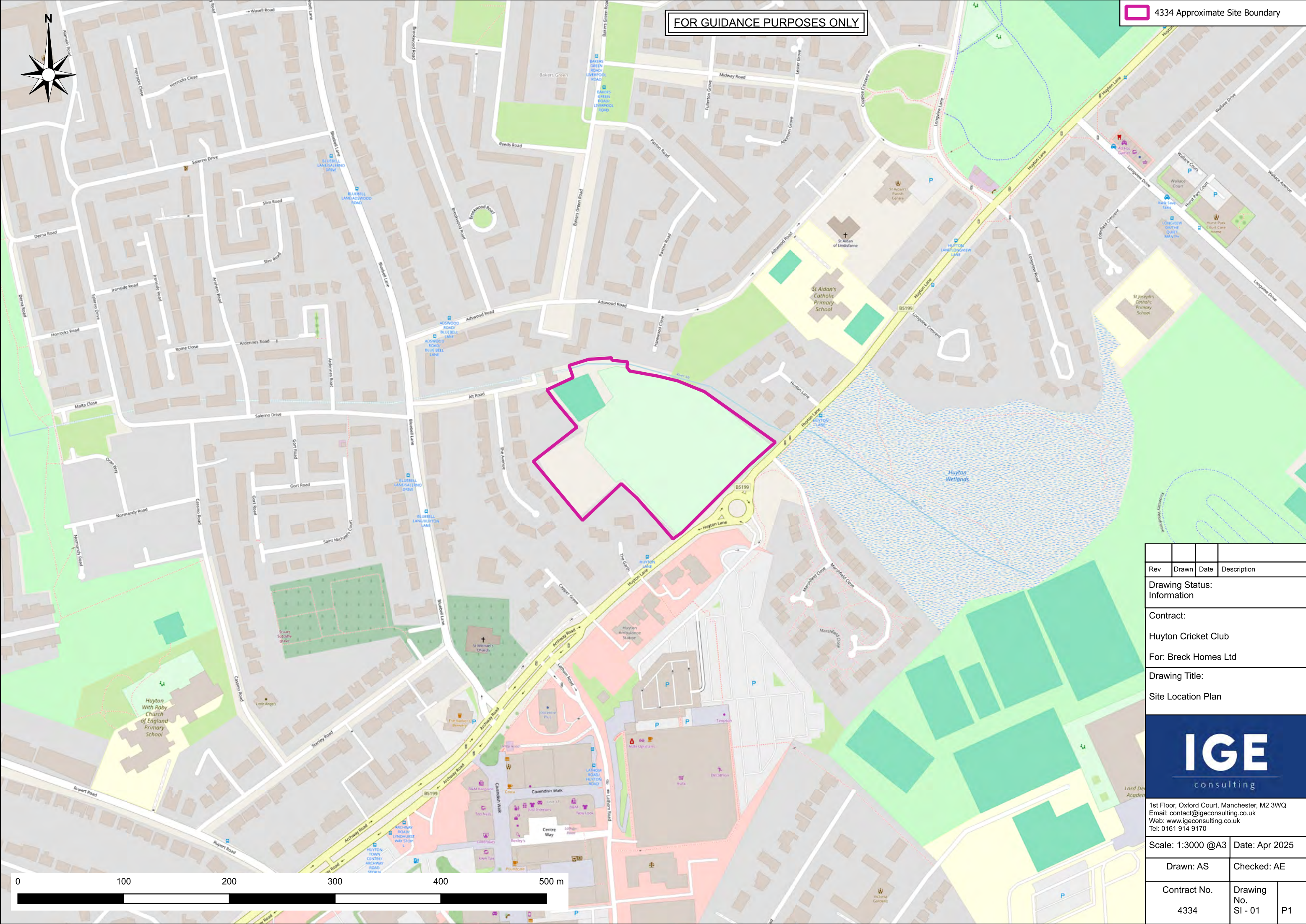
-

DRAWING NUMBER:

Huyton Lane / Proposed Site Layout - Option A

REV:

E



 4334 Approximate Site Boundary

FOR GUIDANCE PURPOSES ONLY

Rev	Drawn	Date	Description
-----	-------	------	-------------

Drawing Status:
Information

Contract:

Huyton Cricket Club

For: Breck Homes Ltd

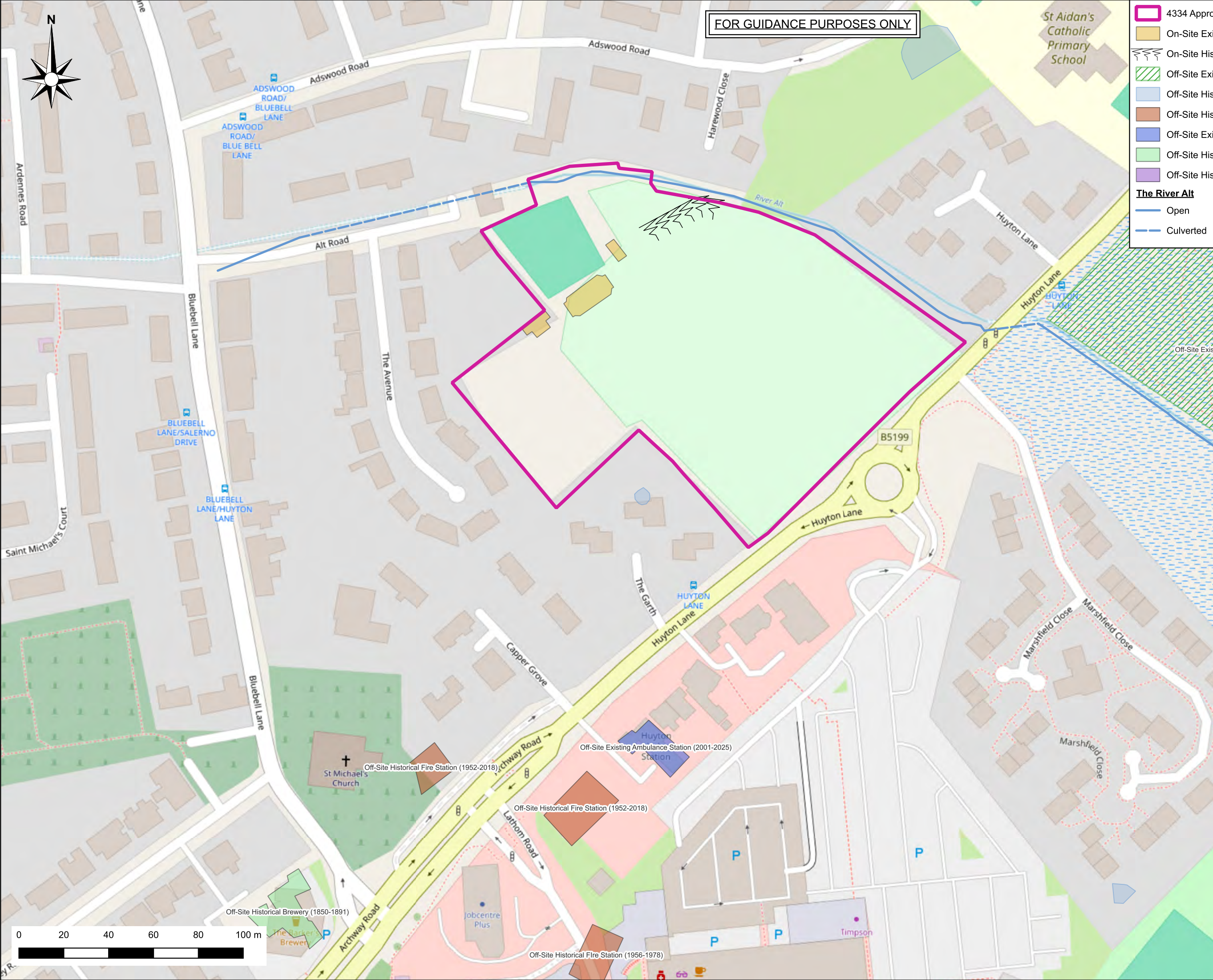
Drawing Title:

Site Location Plan



1st Floor, Oxford Court, Manchester, M2 3WQ
Email: contact@igeconsulting.co.uk
Web: www.igeconsulting.co.uk
Tel: 0161 914 9170

Scale: 1:3000 @A3		Date: Apr 2025	
Drawn: AS		Checked: AE	
Contract No. 4334		Drawing No. SI - 01	P1



FOR GUIDANCE PURPOSES ONLY

4334 Approximate Site Boundary

On-Site Existing Pavilion Buildings (1891-2025)

On-Site Historical Slope (1952-1976)

Off-Site Existing Huyton Wetlands (1956-2025)

Off-Site Historical Ponds (1850-1978)

Off-Site Historical Fire Stations (1952-2018)

Off-Site Existing Ambulance Station (2001-2025)

Off-Site Historical Brewery (1850-1891)

Off-Site Historical Trial Shaft (1906-1925)

The River Alt

Open

Culverted

Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Huyton Cricket Club			
For: Breck Homes Ltd			
Drawing Title: Site Features Plan			
IGE consulting			
1st Floor, 15 Oxford Court, Manchester, M2 3WQ Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 914 9170			
Scale: 1:1500 @A3		Date: Apr 2025	
Drawn: AS		Checked: AE	
Contract No. 4334		Drawing No. SI - 02	P1

SOURCES

Sources

- 1. On-site Made Ground
- 2. On-site cricket club pavilion and adjacent buildings
- 3. Off-site current and historical industrial land use

Secondary Sources

- 4. Pooling beneath current and / or future foundations
- 5. Pooling in relative low points above low permeability deposits
- 6. Pooling within granular lenses within low permeability deposits

Ground Gas Sources

- 1. On-site Made Ground
- 2. Off-site Huyton Wetlands
- 3. Off-site coal seams

PATHWAYS

Pathways To Human Health

- A. Ingestion of dust and soil
- B. Dermal contact with dust and soil
- C. Inhalation (dust)
- D. Inhalation (vapours)
- E. Inhalation and oral backgrounds

Pathways To Controlled Waters

- A. Vertical migration through coarse Made Ground and coarse soils
- B. Lateral migration along low permeability natural soils & pooling at relative low points
- C. Vertical migration along future foundations and pooling at base
- D. Migration through porous bedrock
- E. Overland flow

Ground Gas Pathways

- A. Migration through fractures and fissures in bedrock
- B. Preferential migration along foundations & service ducts
- C. Migration within groundwater
- D. Ingress through cavity walls and floors
- E. Inhalation of ground gas and vapours

RECEPTORS

Receptors

- 1. End user
- 2. Construction workers
- 3. General public / adjacent site users
- 4. Secondary undifferentiated aquifer in superficial deposits
- 5. Secondary A aquifer in bedrock
- 6. Surface water - the River Alt
- 7. Buildings and services

Notes

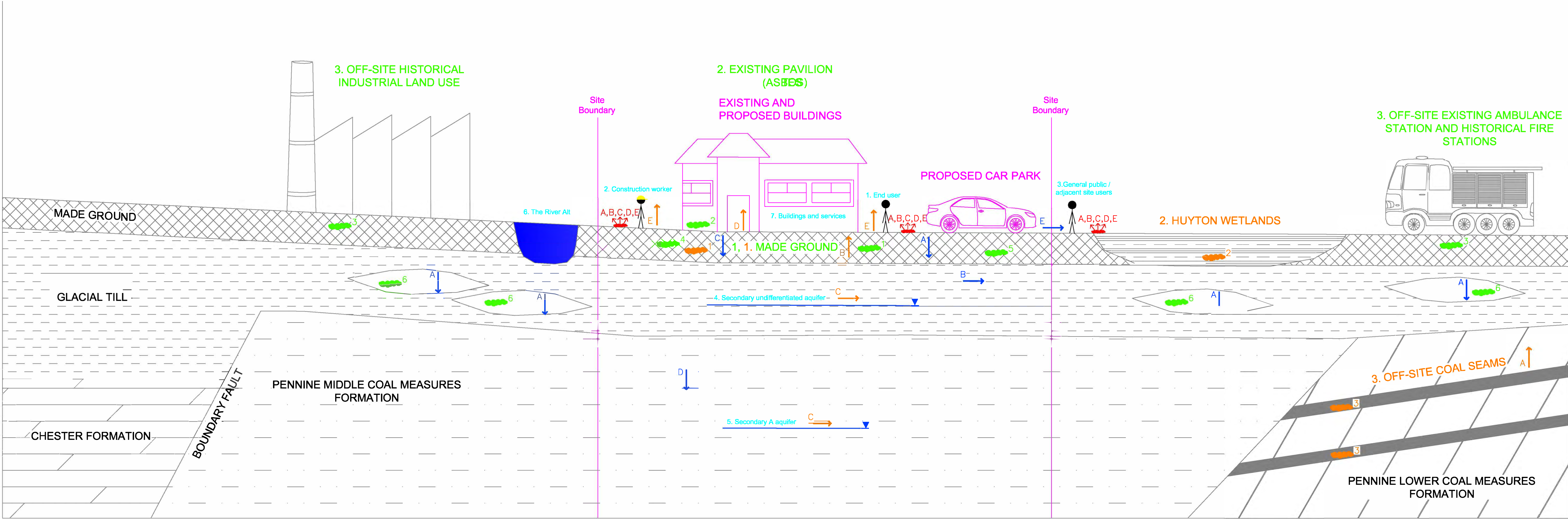
- 1 This drawings is indicative and not to scale.
- 2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

Key

- Made Ground
- Glacial Till (fine)
- Glacial Till (coarse)
- Pennine Middle Coal Measures Formation
- Pennine Lower Coal Measures Formation
- Coal Seam
- Chester Formation

W

E



Rev	Drawn	Date	Description
Drawing Status			
INFORMATION			
Contract			
HUYTON CRICKET CLUB			
FOR: BRECK HOMES LTD			
Drawing Title			
CONCEPTUAL SITE MODEL			
IGE consulting			
1st Floor, 15 Oxford Court, Manchester, M2 3WQ email: contact@igeconsulting.co.uk web: www.igeconsulting.co.uk tel: 0161 914 9170			
Scale	NTS	Date	APR 2025
Drawn	AS	Checked	AE
Contract No.	4334	Drawing No.	SI-03
			P1

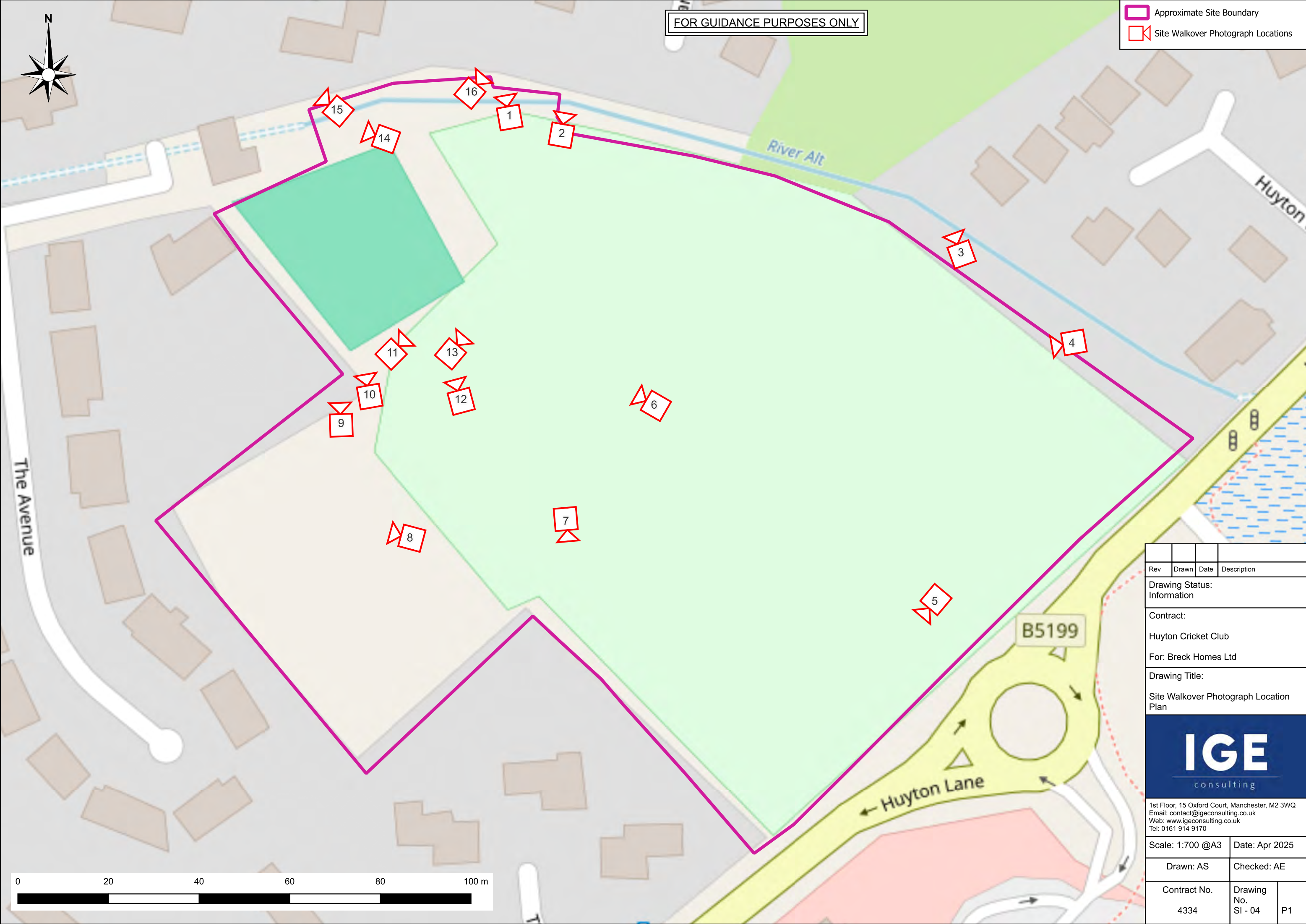
APPENDIX 3

WALKOVER SURVEY PHOTOGRAPHS AND PHOTOGRAPH LOCATION PLAN



FOR GUIDANCE PURPOSES ONLY

- Approximate Site Boundary
- Site Walkover Photograph Locations



Rev	Drawn	Date	Description
Drawing Status: Information			
Contract: Huyton Cricket Club			
For: Breck Homes Ltd			
Drawing Title: Site Walkover Photograph Location Plan			
IGE consulting 1st Floor, 15 Oxford Court, Manchester, M2 3WQ Email: contact@igeconsulting.co.uk Web: www.igeconsulting.co.uk Tel: 0161 914 9170			
Scale: 1:700 @A3		Date: Apr 2025	
Drawn: AS		Checked: AE	
Contract No. 4334		Drawing No. SI - 04	P1



Figure 1 – Access gate to the site in the northern site section, looking north-east.



Figure 2 – The River Alt culvert along the northern site boundary, looking north.



Figure 3 – The River Alt along the northern site boundary, looking north-west.



Figure 4 – The central site section, looking west.



Figure 5 – The south-western site corner with suspected Japanese Knotweed, looking south-west.



Figure 6 – The existing cricket club pavilion in the western site section, looking north-west.



Figure 7 – An unknown on-site excavation in the southern site section, looking south.



Figure 8 – The western site section, looking north-west.



Figure 9 – A suspected shed adjacent to the cricket club building, looking north.



Figure 10 – The interior of the on-site shed, looking north.



Figure 11 – Disused services into the cricket club building, looking north-east.



Figure 12 – The former cricket club building, looking north-east.

SITE WALKOVER PHOTOGRAPHS – 14th April 2025



Figure 13 – Disused services within the former cricket club building, looking north-east.



Figure 14 – The north-western site corner, looking north west.



Figure 15 – Disused street light posts in the north-western site section, looking north-west.



Figure 16 – A suspected service cupboard in the northern site section, looking north-east.

APPENDIX 4

HISTORICAL ORDNANCE SURVEY MAPS

Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1892

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A



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Production date: 08 April 2025

Map legend available at:
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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1907

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1907
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

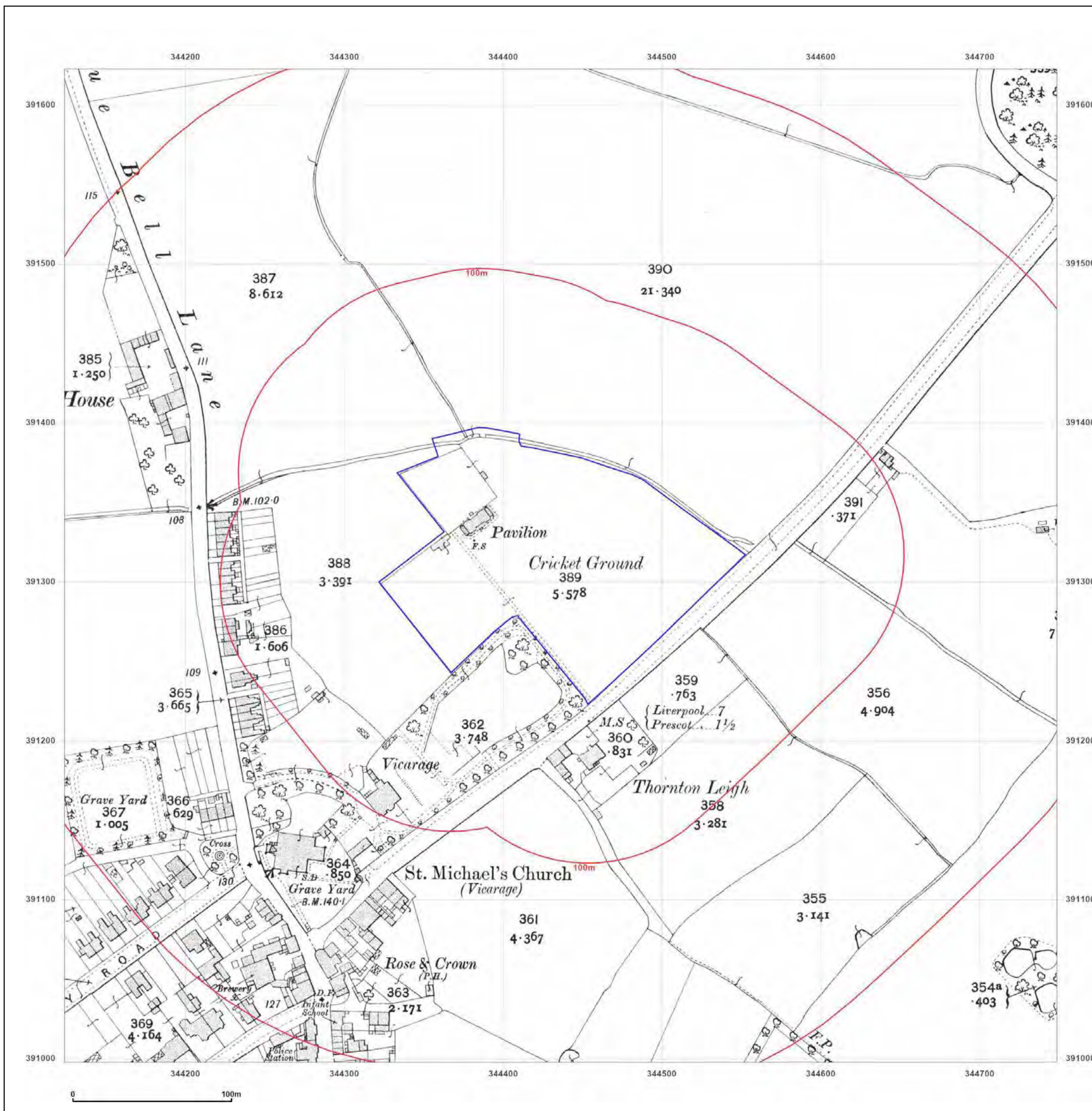


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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1927

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1927
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

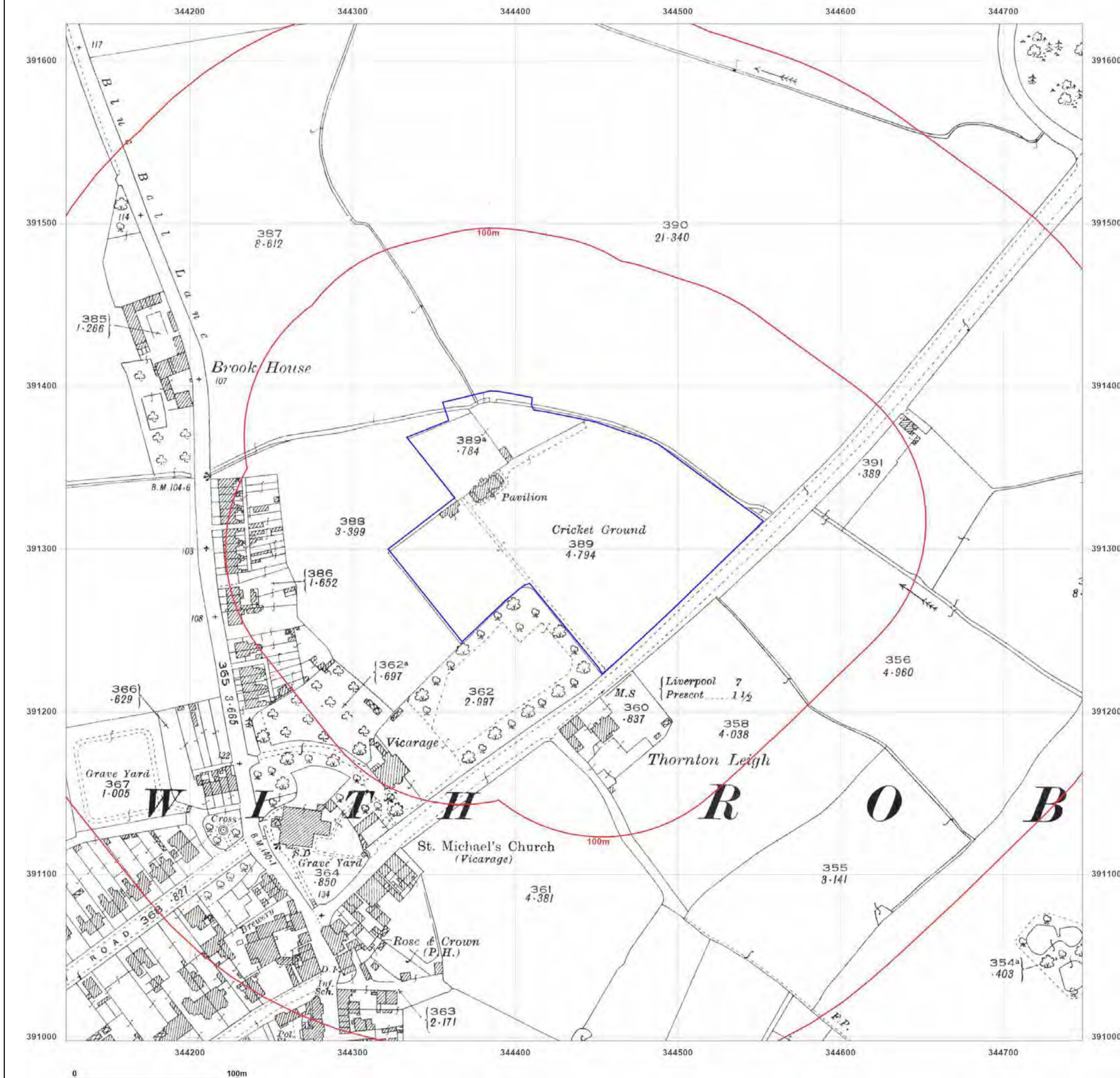


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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1951-1952

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1947

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

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1947

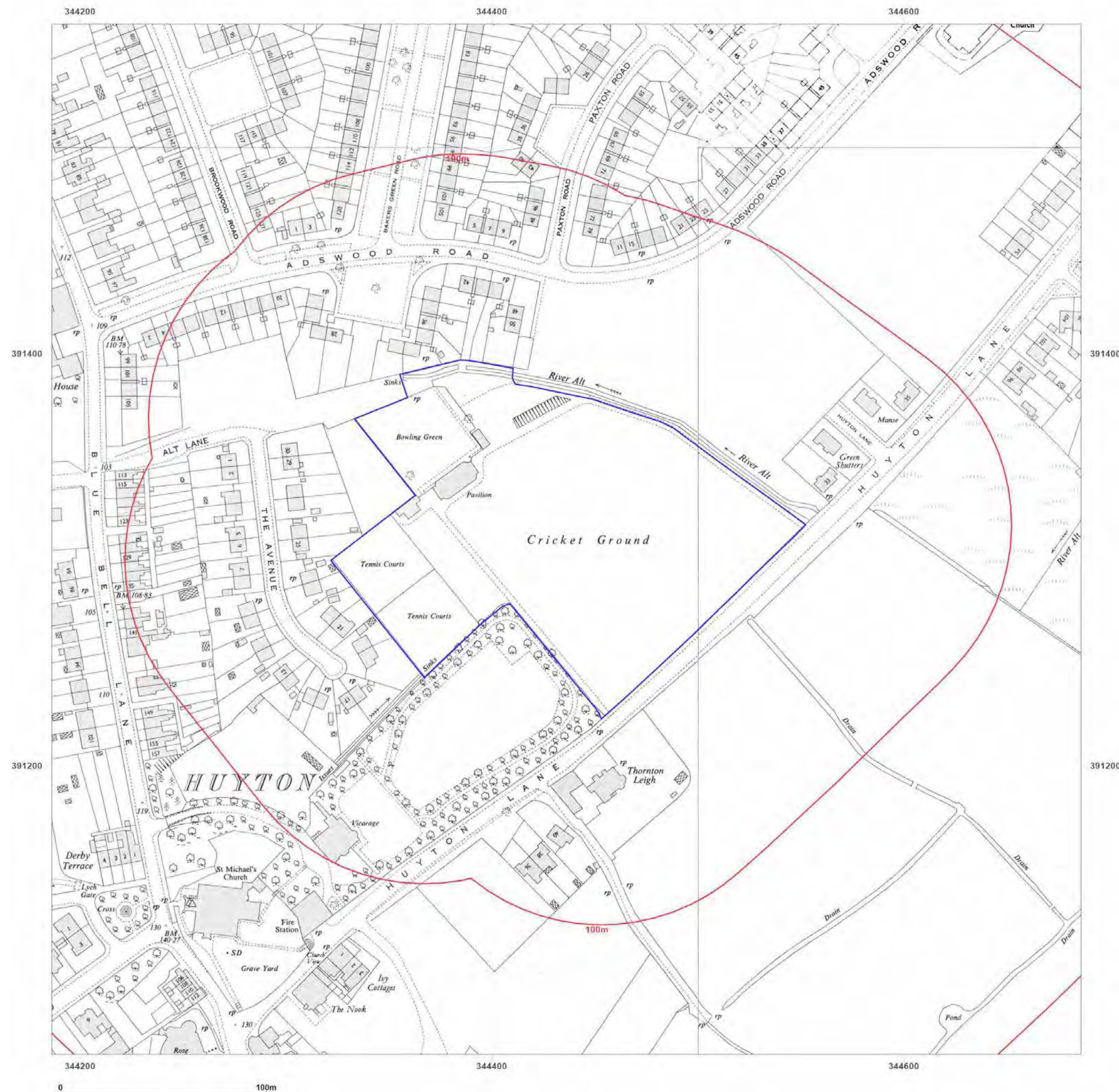


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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1966

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1951
Revised 1965
Edition N/A
Copyright 1966
Levelled 1960

Surveyed 1951
Revised 1966
Edition N/A
Copyright 1966
Levelled 1957

Surveyed 1953
Revised 1966
Edition N/A
Copyright 1966
Levelled 1957

Surveyed 1966
Revised 1966
Edition N/A
Copyright 1966
Levelled 1957

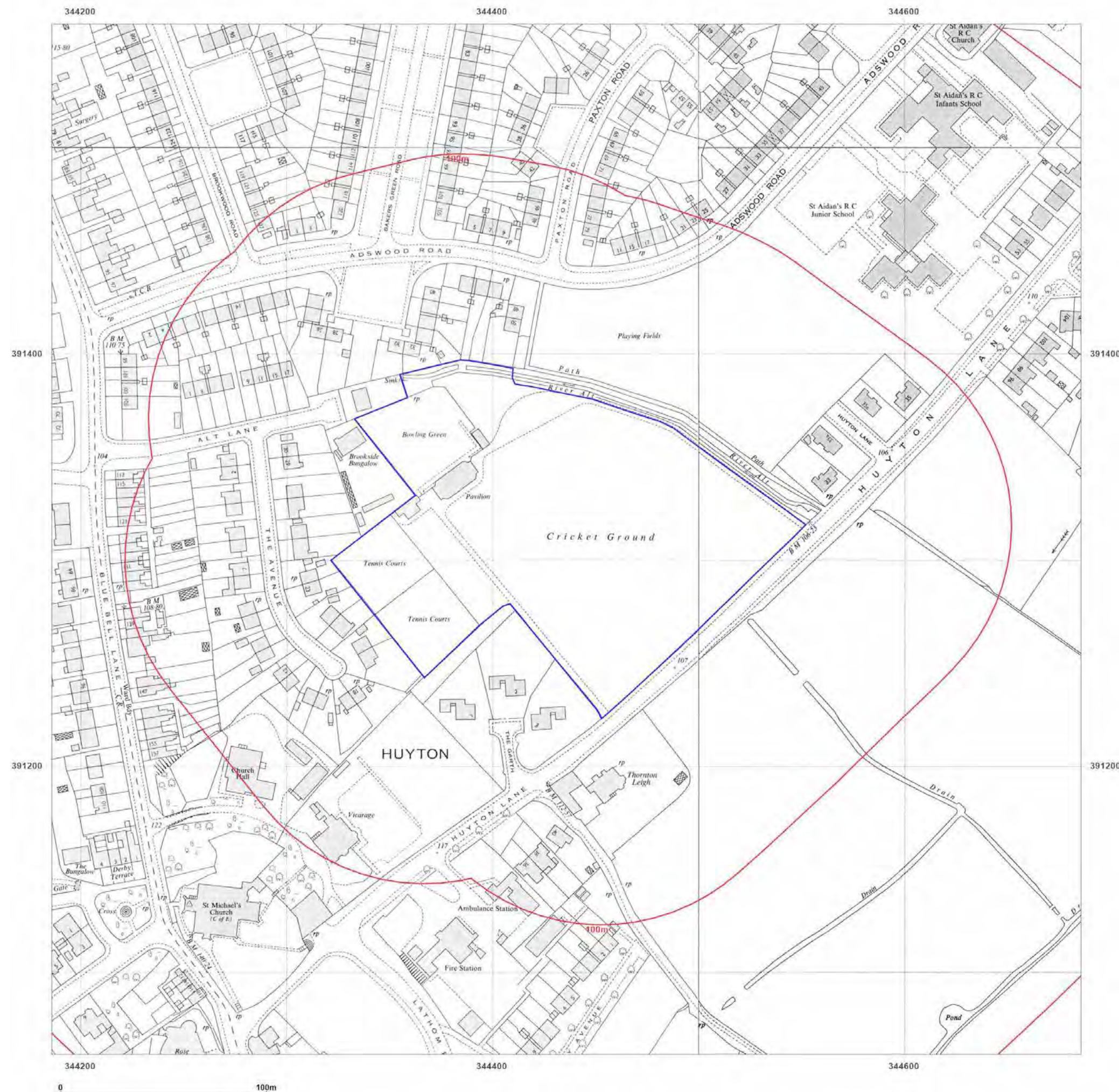


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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1967-1970

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1966
Revised 1966
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Copyright 1967
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Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1976

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1957
Revised 1975
Edition N/A
Copyright 1976
Levelled 1957

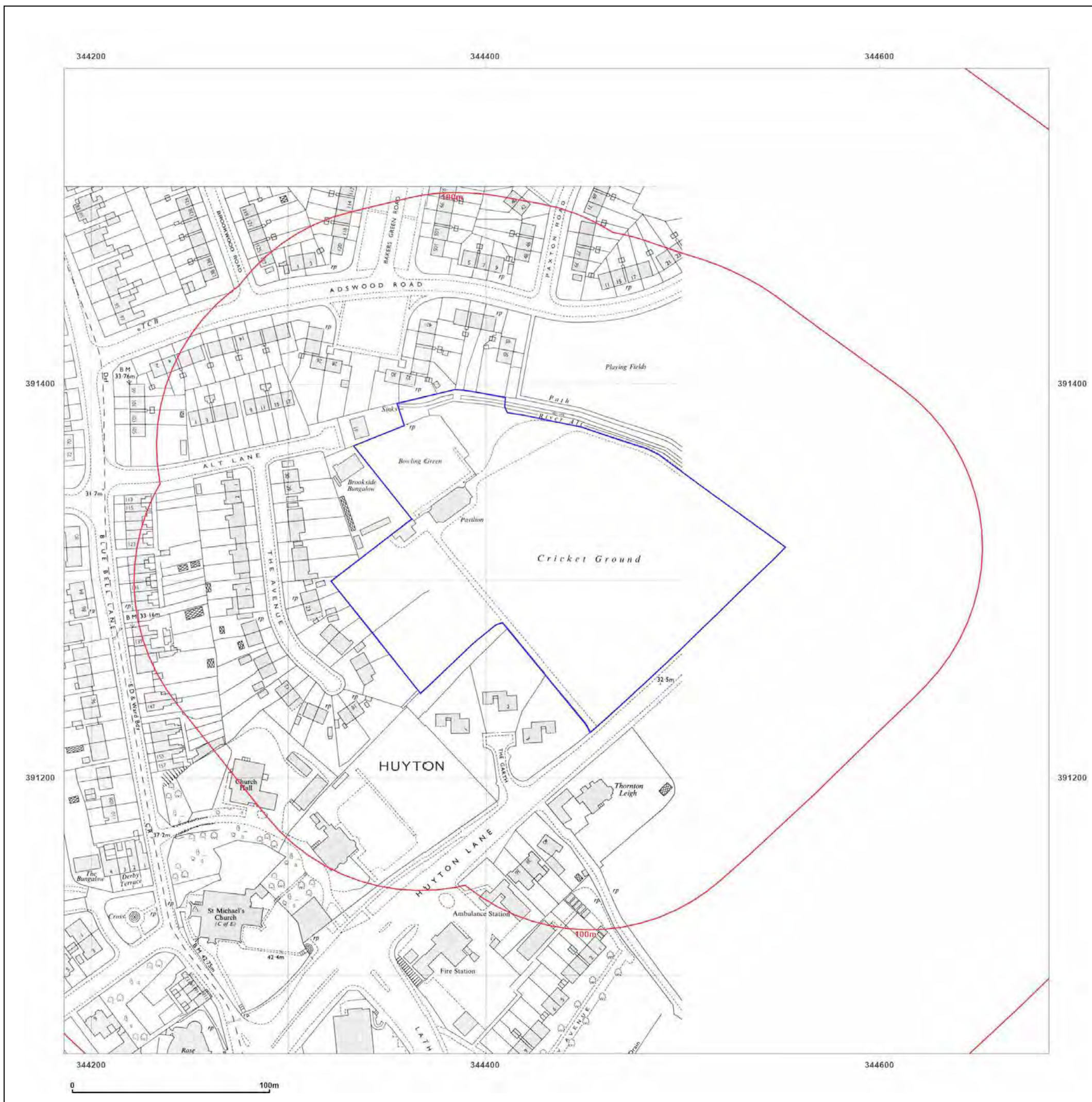


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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid

Map date: 1984-1989

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1957
Revised 1987
Edition N/A
Copyright 1987
Levelled 1957

Surveyed 1957
Revised 1984
Edition N/A
Copyright 1984
Levelled 1957

Surveyed 1957
Revised 1989
Edition N/A
Copyright 1989
Levelled 1957

Surveyed 1957
Revised 1987
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Copyright 1987
Levelled 1957

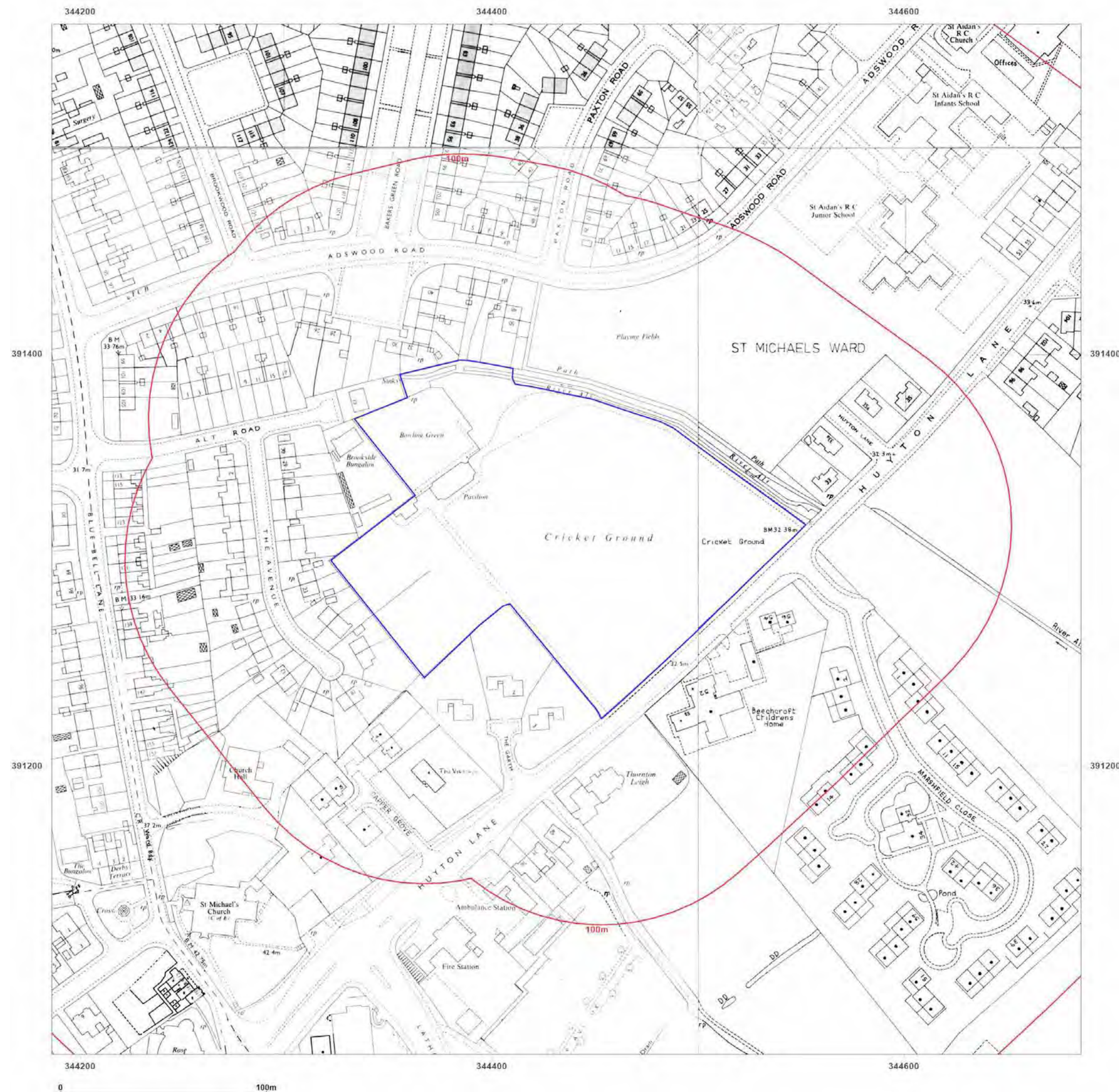


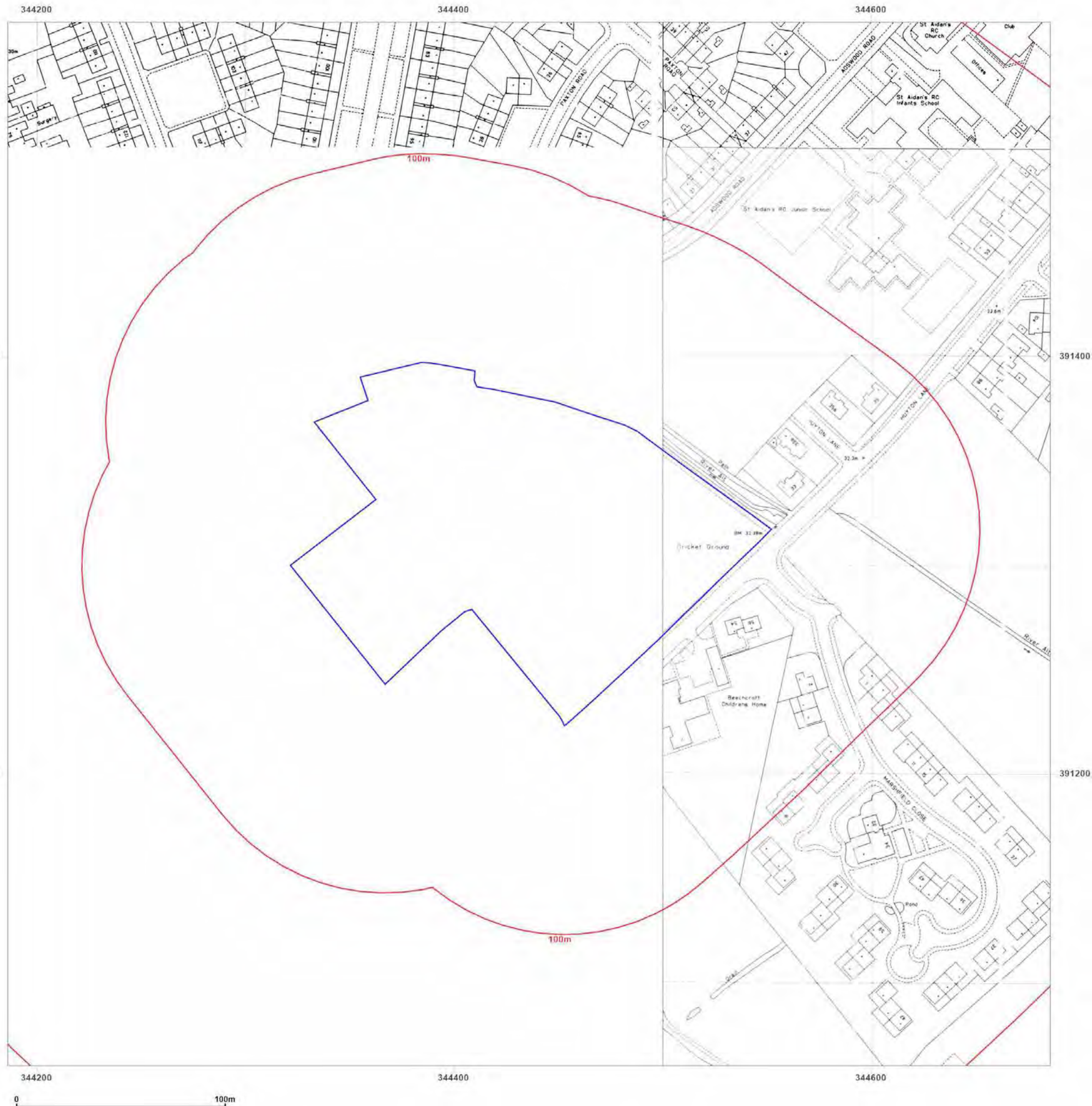
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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

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Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: National Grid
Map date: 1993
Scale: 1:1,250
Printed at: 1:2,000

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



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KNOWSLEY, L36 7XH

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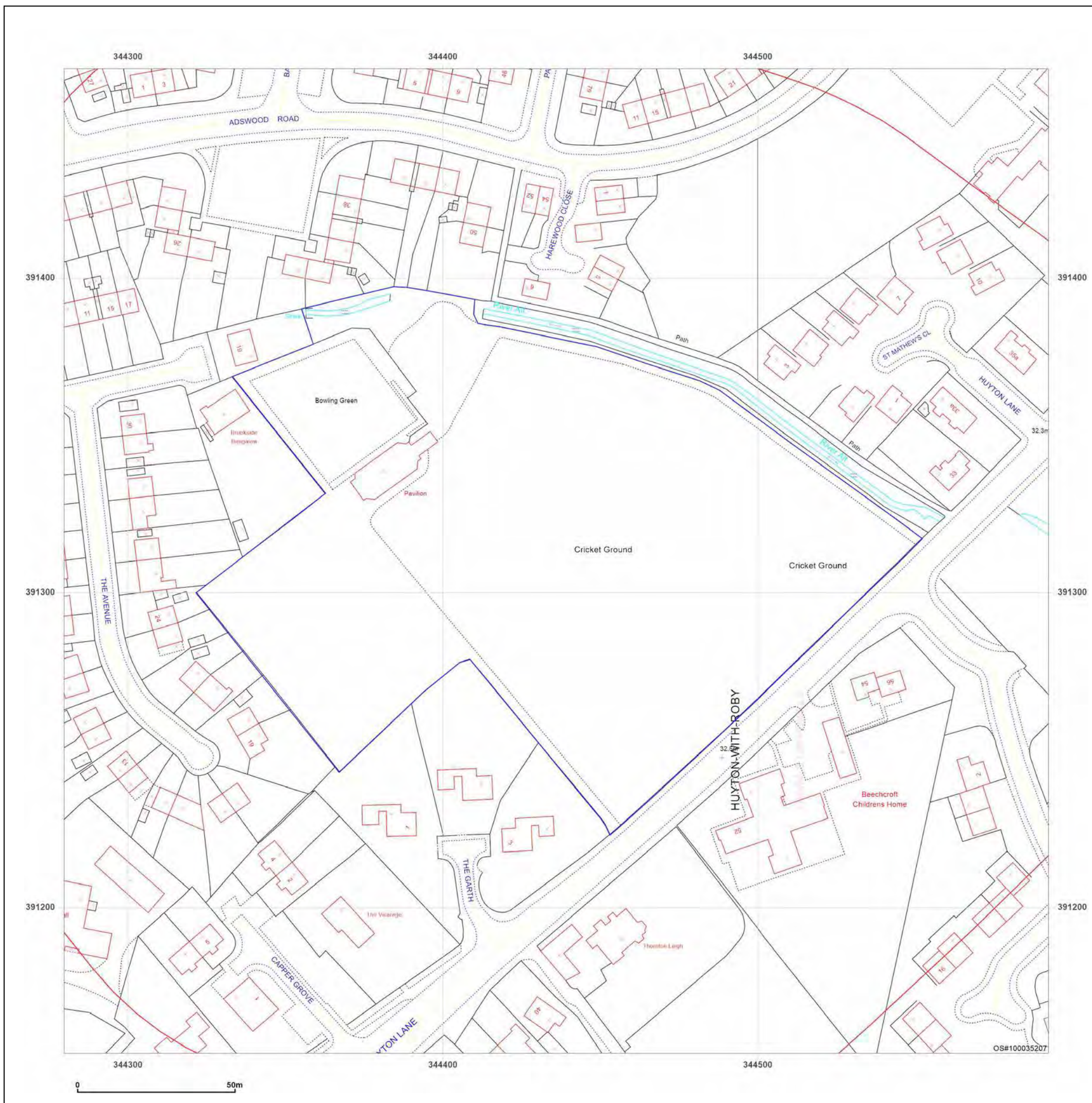


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KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1850

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Printed at: 1:10,560



Surveyed 1847
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

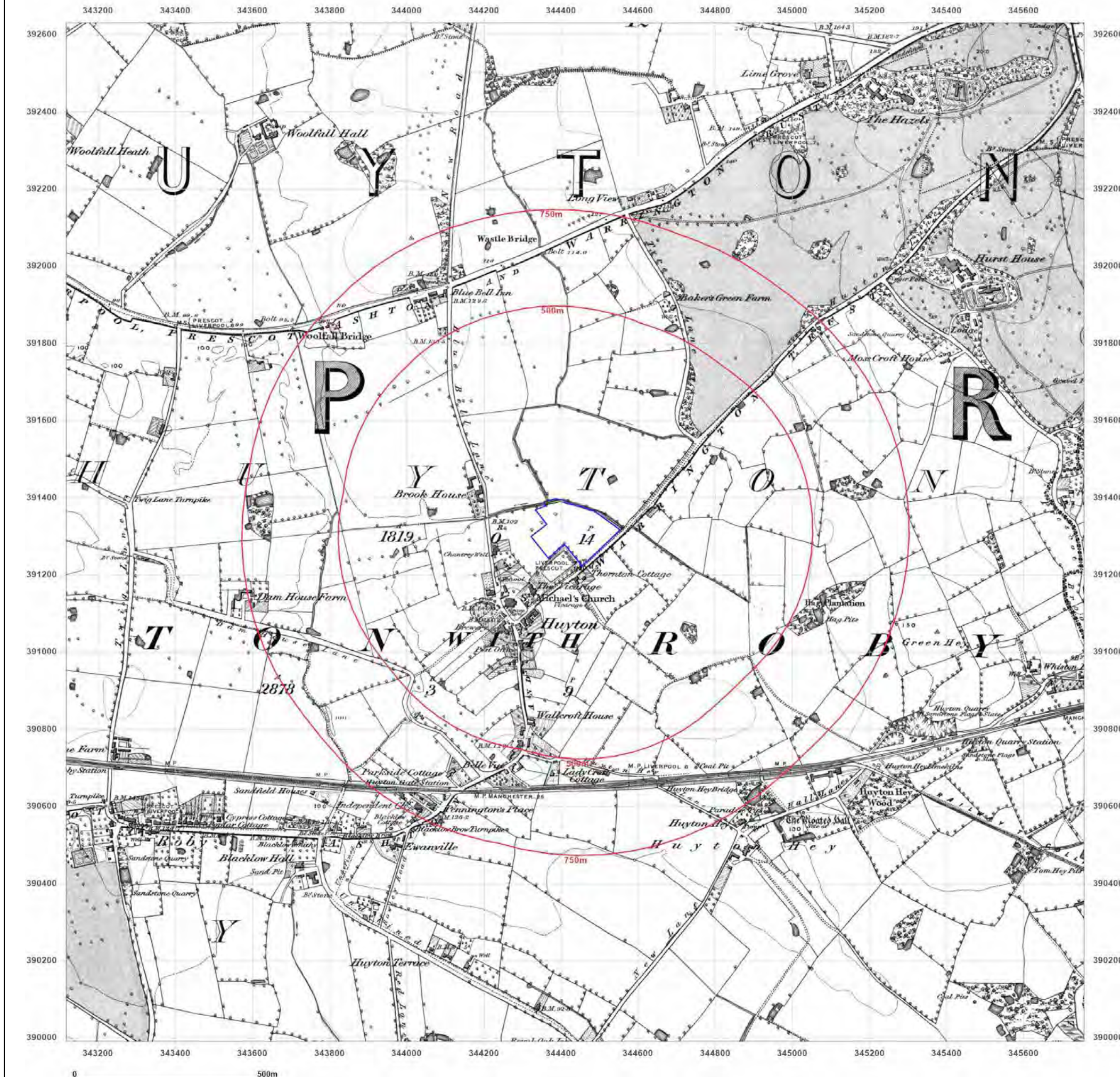


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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1891

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1891
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Copyright N/A
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Revised 1891
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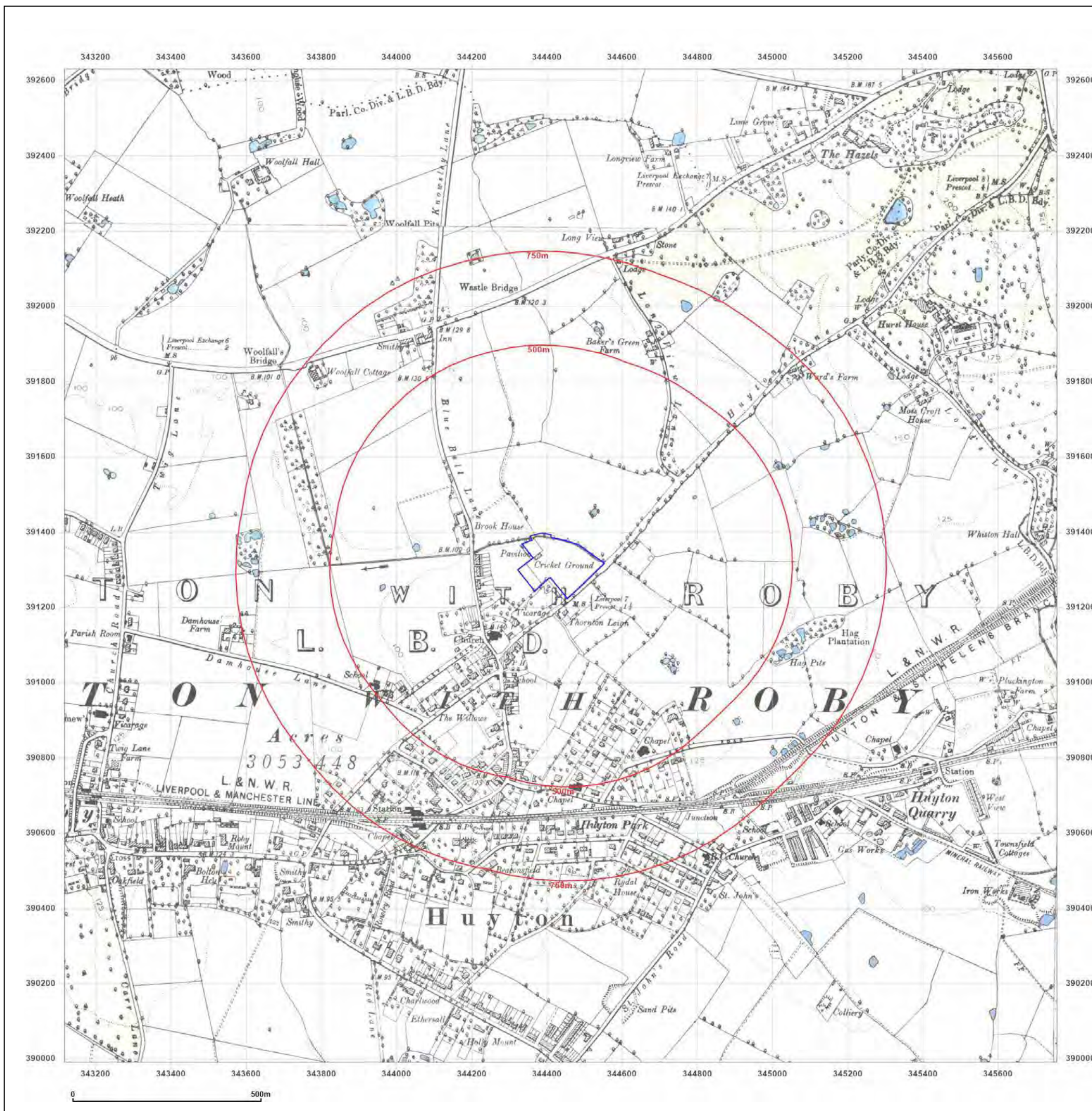


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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1906

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1891
Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

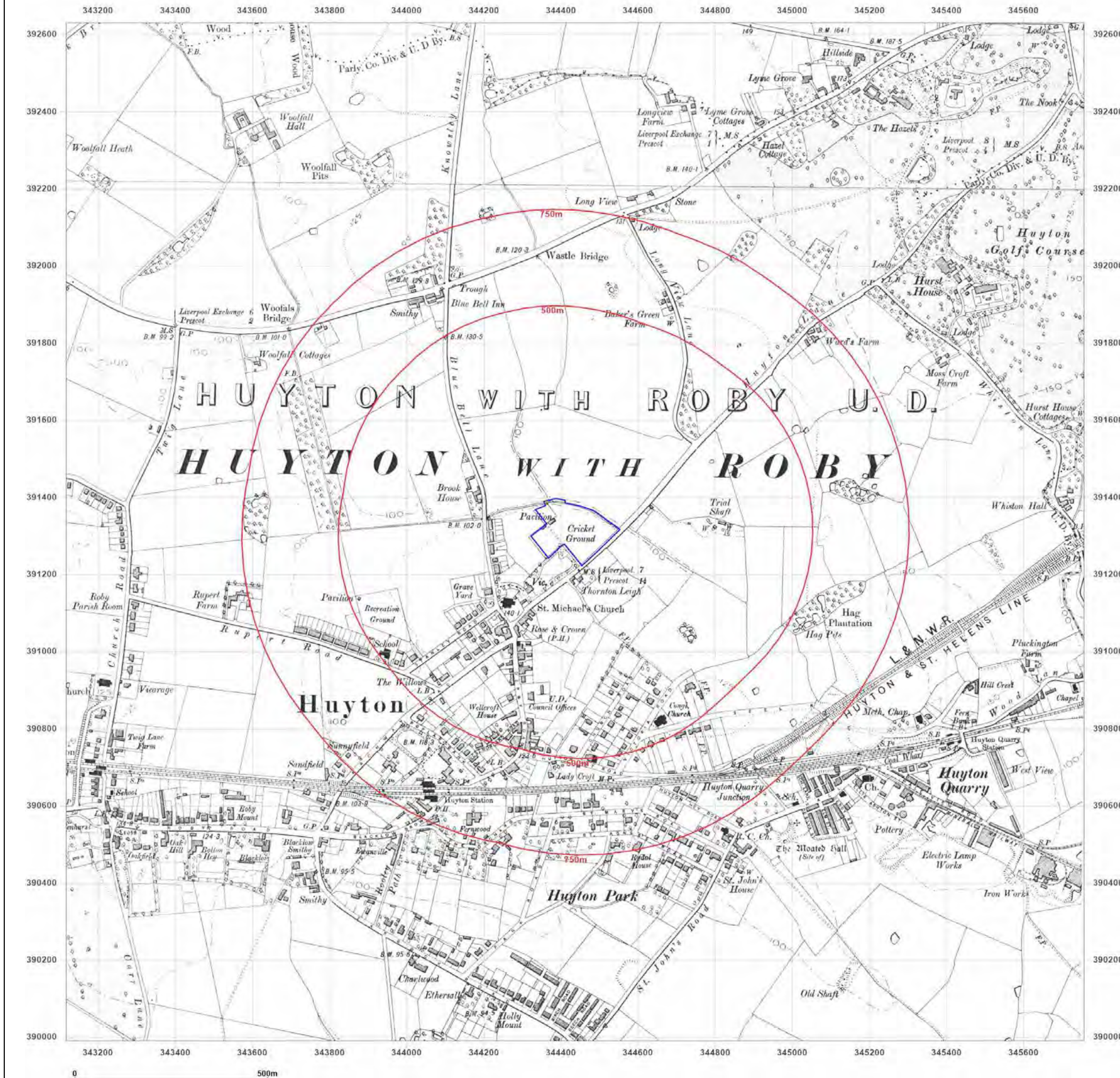


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Production date: 08 April 2025

Map legend available at:
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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1925

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1849
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1848
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

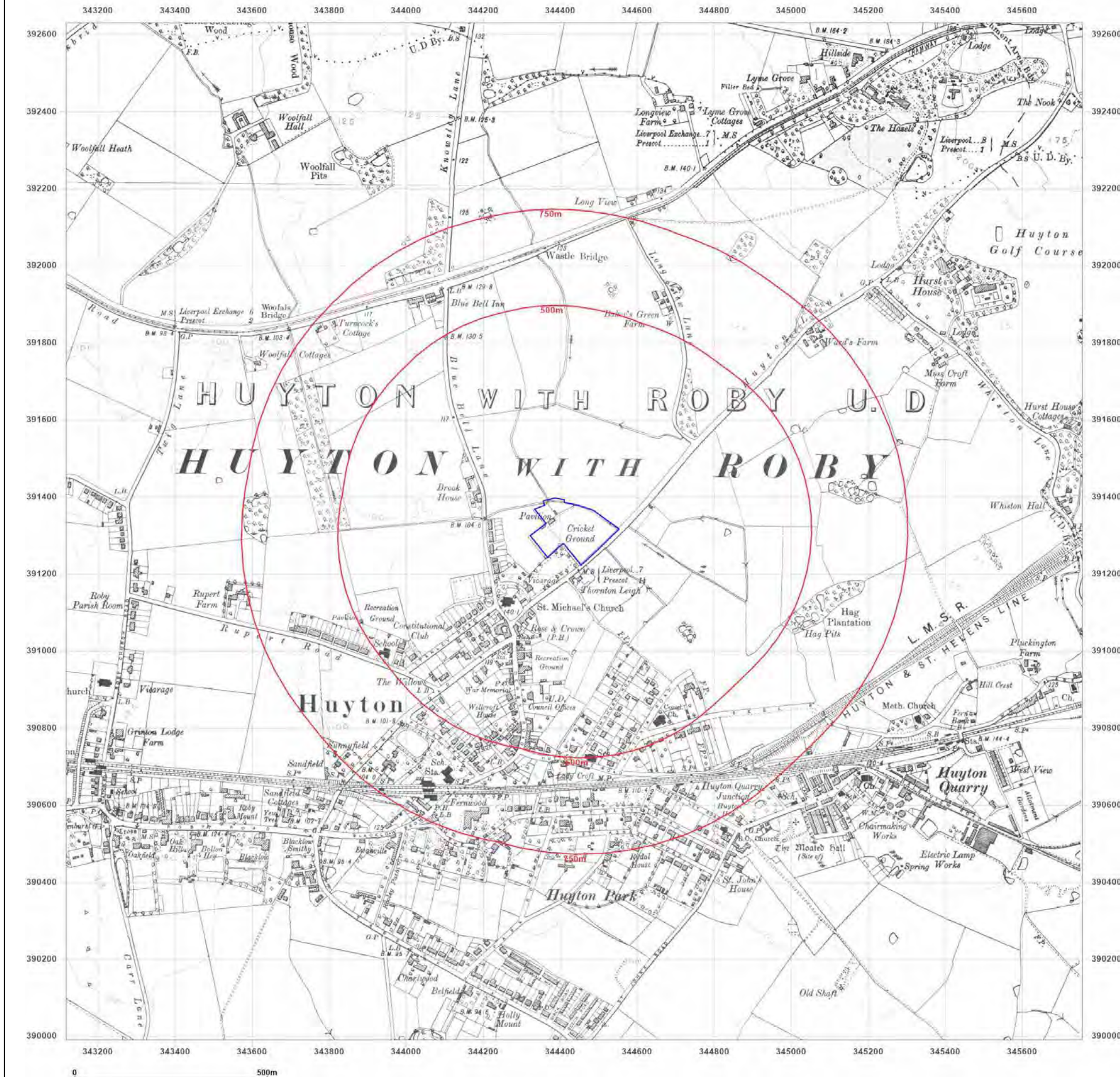


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Production date: 08 April 2025

Map legend available at:
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Site Details:

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HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1925

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1849
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1848
Revised 1925
Edition N/A
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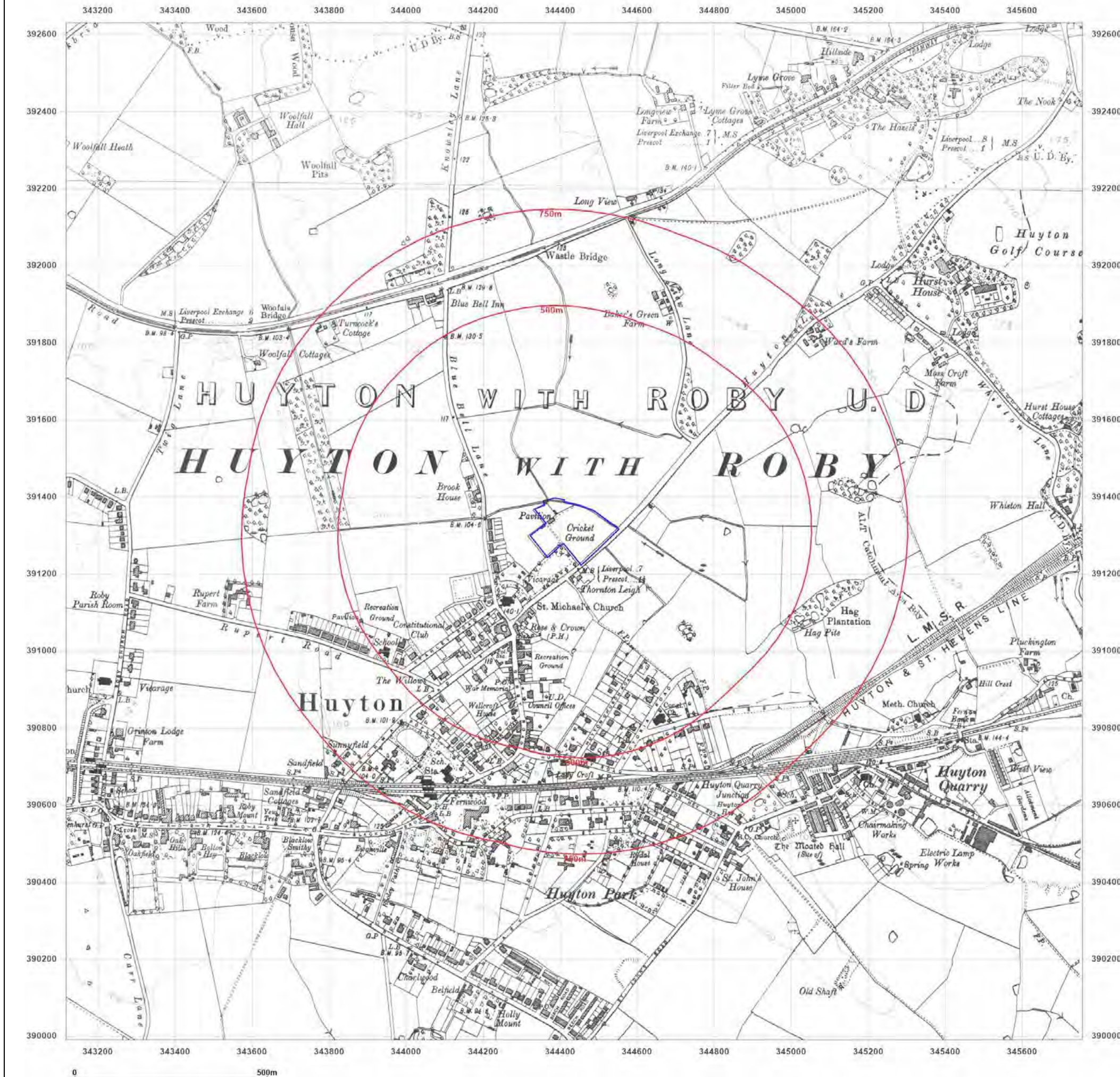


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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1848
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Edition 1938
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Site Details:

HUYTON CRICKET CLUB,
HUYTON LANE, HUYTON,
KNOWSLEY, L36 7XH

Client Ref: 4334-080425/AS
Report Ref: GS-YL7-131-N2W-F24
Grid Ref: 344436, 391310

Map Name: Provisional

Map date: 1955-1956

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1954
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Edition N/A
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