Pentavia, Mill Hill

London NW7 2ET

Archaeological Desk Based Assessment

Date: 22/03/19

Local Planning Authority:
London Borough of Barnet

Site centred at:
TQ 21852 91282

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EXECUTIVE SUMMARY

The site known as Pentavia, Mill Hill has been reviewed for its below ground archaeological potential.

In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

In terms of local designations, the site does not lie within an Archaeological Priority Area as designated by the London Borough of Barnet.

The site is considered likely to have a generally low archaeological potential for all past periods of human activity.

Past post depositional impacts are considered severe as a result of several phases of redevelopment. Substantial quantities of made ground have been identified within the study site boundary.

Proposals comprise the residential redevelopment of the study site.

In view of the available information, no further archaeological mitigation measures are proposed in this particular instance.

1.0 INTRODUCTION AND SCOPE OF STUDY

1.1 This below ground archaeological desk-based assessment has been researched by Sylvia White, and prepared by Richard von Kalinowski-Meager, of CgMs Heritage – Part of RPS on behalf of Meadow Residential and was updated in November 2017 and March 2019.

1.2 The subject of this Assessment comprises the site known as Pentavia, Mill Hill. The site is centred at TQ 21852 91282 within the London Borough of Barnet (see Figs. 1-2, and 14-15).

1.3 In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity. The site does not lie within an Archaeological Priority Area as designated by the London Borough of Barnet (see Figure 2).

1.4 In accordance with relevant policy and guidance on archaeology and planning, and in accordance with the 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists January 2017), Meadow Residential have commissioned CgMs Heritage – Part of RPS to undertake this below ground archaeological desk based assessment.

1.5 This desk-based assessment comprises an updated examination of evidence on the Greater London Historic Environment Record (GLHER) and other sources, including Barnet Local Studies Library and the British Library. The report also includes the results of a comprehensive map regression exercise.

1.6 This document draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of various parts of the site and to consider the need for design, civil engineering, and archaeological solutions to the archaeological potential identified.

2.0 DEVELOPMENT PLAN FRAMEWORK

2.1 Legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.

2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), which was later revised in February 2019. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and has since been periodically updated (http://planningguidance.planningportal.gov.uk).

2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

2.4 Section 16 of the NPPF, entitled *Conserving and Enhancing the Historic Environment* provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance, and:
- Recognition of the contribution that heritage assets make to our understanding of the past.

2.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 128 states that planning decisions should be based on the significance of the heritage asset, and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be *no more than sufficient* to review the potential impact of the proposal upon the significance of that asset.

2.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).

2.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.

2.8 A Nationally Important *Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.

2.9 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.10 *Setting of a heritage asset* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

2.11 The NPPG guidance reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and

thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance, and make the interpretation publically available. Key elements of the guidance relate to assessing harm. It states, an important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Adding, it is the degree of harm, rather than the scale of development that is to be assessed. The level of 'substantial harm' is stated to be a high bar which may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, it is stated harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced, and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.12 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

2.13 The relevant Strategic Development Plan framework is provided by the 2016 London Plan Consolidated with Alterations Since 2011. Policy relevant to archaeology in this document includes the following:

2.14 Policy in the Consolidated London Plan relevant to archaeology at the study site includes the following:

Policy 7.8 Heritage Assets and Archaeology

Strategic

A. **London's heritage assets and historic environment, including listed buildings,** registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, Registered Battlefields, Scheduled Monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.

B. Development should incorporate measures that identify, record, interpret, **protect and, where appropriate, present the site's archaeology.**

Planning Decisions

C. Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.

D. Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.

E. New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.

LDF Preparation

F. Boroughs should, in LDF policies, seek to maintain and enhance the contribution **of built, landscaped and buried heritage to London's environmental quality,** cultural ide**ntity and economy as part of managing London's ability to** accommodate change and regeneration.

G. Boroughs, in consultation with English Heritage, Natural England and other relevant statutory organisations, should include appropriate policies in their LDFs for identifying, protecting, enhancing and improving access to the historic environment and heritage assets and their settings where appropriate, and to archaeological assets, memorials and historic and natural landscape character within their area.

Policy 7.9 Heritage-led Regeneration

Strategic

A. Regeneration schemes should identify and make use of heritage assets and reinforce the qualities that make them significant so they can help stimulate environmental, economic and community regeneration. This includes buildings, landscape features, views, blue ribbon network and public realm.

Planning Decisions

B. The significance of heritage assets should be assessed when development is proposed and schemes designed so that the heritage significance is recognised both in their own right and as catalysts for regeneration. Wherever possible heritage assets (including buildings at risk) should be repaired, restored and put to a suitable and viable use that is consistent with their conservation and the establishment and maintenance of sustainable communities and economic vitality.

2.15 A new London Plan has been prepared in draft, of which the latest version was published in August 2018. Chapter 7 'Heritage and Culture' contains relevant draft polices HC1 to HC7. Of particular relevance to sites containing non-designated heritage assets is draft policy HC1 as follows:

HC1 Heritage and Conservation Growth

A. Boroughs should, in consultation with Historic England and other relevant statutory organisations, develop evidence that demonstrates a clear **understanding of London's historic environment. This evidence should be used** for identifying, understanding, conserving, and enhancing the historic environment and heritage assets, and improving access to, and interpretation of, the heritage assets, landscapes and archaeology within their area.

B. Development Plans and strategies should demonstrate a clear understanding of the historic environment and the heritage values of sites or areas and their relationship with their surroundings. This knowledge should be used to inform **the effective integration of London's heritage in regenerative change by:**

    1. setting out a clear vision that recognises and embeds the role of heritage in place-making

    2. utilising the heritage significance of a site or area in the planning and design process

    3. integrating the conservation and enhancement of heritage assets and their settings with innovative and creative contextual architectural responses that contribute to their significance and sense of place

    4. delivering positive benefits that conserve and enhance the historic environment, as well as contributing to the economic viability, accessibility and environmental quality of a place, and to social wellbeing.

C. Development proposals affecting heritage assets, and their settings, should **conserve their significance, by being sympathetic to the assets' significance and** appreciation within their surroundings. The cumulative impacts of incremental change from development on heritage assets and their settings, should also be actively managed. Development proposals should avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.

D. Development proposals should identify assets of archaeological significance and use this information to avoid harm or minimise it through design and appropriate mitigation. Where applicable, development should make provision for the protection of significant archaeological assets and landscapes. The protection of undesignated heritage assets of archaeological interest equivalent to a scheduled monument should be given equivalent weight to designated heritage assets.

E. Where heritage assets have been identified as being At Risk, boroughs should identify specific opportunities for them to contribute to regeneration and place-making, and they should set out strategies for their repair and re-use.

2.16 The relevant Development Plan framework is provided by the Barnet Local Plan (Core Strategy) and Development Management Policies which were formally adopted by the Council in September 2012, replacing the Unitary Development Plan (2006). They contain the following policies relevant to archaeology:

POLICY CS 5 **PROTECTING AND ENHANCING BARNET'S CHARACTER TO** CREATE HIGH QUALITY PLACES

HERITAGE AND CHARACTER

WE WILL WORK WITH PARTNERS TO PROACTIVELY PROTECT AND ENHANCE **BARNET'S HERITAGE INCLUDING CONSERVATION AREAS, LISTED** BUILDINGS, LOCALLY LISTED BUILDINGS, REGISTERED PARKS AND GARDENS; SCHEDULED MONUMENTS, AREAS OF ARCHAEOLOGICAL **SIGNIFICANCE AND LONDON'S ONLY BATTLEFIELD SITE.**

WE WILL REQUIRE PROPOSALS WITHIN OR AFFECTING THE SETTING OF HERITAGE ASSETS TO PROVIDE A SITE ASSESSMENT WHICH DEMONSTRATES HOW THE PROPOSAL WILL RESPECT AND ENHANCE THE ASSET. POLICY CS 13 ADDRESSES THE ADAPTATION OF HERITAGE ASSETS TO REDUCE CARBON EMISSIONS AND ENSURE EFFICIENT USE OF NATURAL RESOURCES.

WE WILL ENSURE THROUGH OUR PROGRAMME OF CONSERVATION AREA CHARACTER APPRAISALS THAT THESE AREAS ARE PROTECTED AND ENHANCED.

WE WILL ENSURE THROUGH OUR GREEN INFRASTRUCTURE SPD THAT THE **KEY CHARACTERISTICS OF BARNET'S LANDSCAPE (BARNET PLATEAU AND** FINCHLEY RIDGE) ARE PROTECTED AND ENHANCED

WE WILL ENCOURAGE COMMUNITY INVOLVEMENT IN THE REVIEW OF THE LOCAL LIST OF IMPORTANT LOCAL BUILDINGS

THE BARNET CHARACTERISATION STUDY FORMS THE BASELINE FOR THE IDENTIFICATION OF PLACES WITH A CONSISTENT AND COHERENT ARCHITECTURAL CHARACTER. WITHIN THE TYPOLOGIES IDENTIFIED IN THE CHARACTERISATION STUDY WE WILL THROUGH OUR DEVELOPMENT MANAGEMENT POLICIES DPD AND RESIDENTIAL DESIGN GUIDANCE SPD DEVELOP A FRAMEWORK TO PROTECT AND ENHANCE THOSE HIGH QUALITY SUBURBS IN BARNET NOT PROTECTED BY CONSERVATION AREA DESIGNATIONS.

POLICY DM06: BARNET'S HERITAGE AND CONSERVATION

A. ALL HERITAGE ASSETS WILL BE PROTECTED IN LINE WITH THEIR SIGNIFICANCE. ALL DEVELOPMENT WILL HAVE REGARD TO THE LOCAL HISTORIC CONTEXT.

B. DEVELOPMENT PROPOSALS MUST PRESERVE OR ENHANCE THE CHARACTER AND APPEARANCE OF 16 CONSERVATION AREAS IN BARNET.

C. PROPOSALS INVOLVING OR AFFECTING BARNET'S HERITAGE ASSETS SET OUT IN TABLE 7.2 SHOULD DEMONSTRATE THE FOLLOWING:

- THE SIGNIFICANCE OF THE HERITAGE ASSET
- THE IMPACT OF THE PROPOSAL ON THE SIGNIFICANCE OF THE HERITAGE ASSET
- THE IMPACT OF THE PROPOSAL ON THE SETTING OF THE HERITAGE ASSET
- HOW THE SIGNIFICANCE AND/OR SETTING OF A HERITAGE ASSET CAN BE BETTER REVEALED
- THE OPPORTUNITIES TO MITIGATE OR ADAPT TO CLIMATE CHANGE

- HOW THE BENEFITS OUTWEIGH ANY HARM CAUSED TO THE HERITAGE ASSET

D. THERE WILL BE A PRESUMPTION IN FAVOUR OF RETAINING ALL 1,600 LOCALLY LISTED BUILDINGS IN BARNET AND ANY BUILDINGS WHICH MAKES A POSITIVE CONTRIBUTION TO THE CHARACTER OR APPEARANCE OF THE 16 CONSERVATION AREAS.

E. ARCHAEOLOGICAL REMAINS WILL BE PROTECTED IN PARTICULAR IN THE 19 IDENTIFIED LOCAL AREAS OF SPECIAL ARCHAEOLOGICAL SIGNIFICANCE AND ELSEWHERE IN BARNET. ANY DEVELOPMENT THAT MAY AFFECT ARCHAEOLOGICAL REMAINS WILL NEED TO DEMONSTRATE THE LIKELY IMPACT UPON THE REMAINS AND THE PROPOSED MITIGATION TO REDUCE THAT IMPACT.

2.17 In terms of designated heritage assets as defined above and as shown on Figure 2, no nationally designated Scheduled Monuments, Historic Battlefield or Historic Wreck sites lie within the vicinity of the study site. In terms of local designations, the study site does not lie within an Archaeological Priority Area as designated by the London Borough of Barnet.

2.18 In line with relevant planning policy and guidance, this desk based assessment seeks to clarify the site's archaeological potential and the need or otherwise for additional mitigation measures.

3.0 GEOLOGY AND TOPOGRAPHY

3.1 Geology

3.1.1 The solid geology of the study site is shown by the Institute of Geological Sciences (IGS 1979) as London Clay deposits forming the London Basin. Overlying the London Clay is a series of gravel terraces deposited during periods of glacial and inter-glacial conditions (Bridgland 1996).

3.1.2 Further detail is provided by British Geological Survey Sheet 256 (North London: 1994) which shows the site to lie within a large expanse of London Clay.

3.1.3 Site-specific geotechnical information derived from the study site in March 2015 has indicated the presence of made ground above the London Clay. Test pits excavated within the southwestern, northern and eastern parts of the site terminated within modern made ground at a maximum depth of 1.2m below ground level. Boreholes to the southwest north and east revealed 8.5-10.10m of made ground, above the clay.

3.1.4 The site investigation logs and their location plan are reproduced at Appendix 1.

3.2 Topography

3.2.1 The general topography of the study site comprises a drop in height from northwest to southeast, from a maximum height of 68.52m AOD within the open land to the northwest, to 62.42m AOD in the southeastern corner. The bulk of the open area carparking, situated between the buildings within the central and eastern parts of the site, is level at c.65-67m AOD.

3.2.2 No watercourses or naturally occurring bodies of water are known within the immediate vicinity of the study site. Ponds are shown within the site on historic maps up to the early 1930s, after which they are removed (see Figures 10-11).

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND, WITH ASSESSEMENT OF SIGNIFICANCE

(Including Historic Map Regression exercise)

4.1 Timescales used in this report:

Prehistoric		
Palaeolithic	450,000 -	12,000 BC
Mesolithic	12,000 -	4,000 BC
Neolithic	4,000 -	1,800 BC
Bronze Age	1,800 -	600 BC
Iron Age	600 -	AD 43

Historic		
Roman	AD 43 -	410
Anglo Saxon/Early Medieval	AD 410 -	1066
Medieval	AD 1066 -	1485
Post Medieval	AD 1486 -	1749
Modern	AD 1750 -	Present

4.2 Introduction

4.2.1 This chapter reviews the available archaeological evidence for the study site and the archaeological/historical background of the general area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the study site prior to any assessment of any later development or below ground impacts.

4.2.2 What follows comprises a review of archaeological findspots within a 1.5km radius of the study site, also referred to as the study area, held on the Greater London Historic Environment Record (GLHER), and the Portable Antiquities Database (PAD) together with a historic map regression exercise charting the development of the study area from the eighteenth century onwards until the present day.

4.2.3 In terms of designated heritage assets, as defined above in paragraph 2.7 and as shown on Figure 2, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity. The

site does not lie within an Archaeological Priority Area as designated by the London Borough of Barnet.

4.2.4 In general, there are very few relevant GLHER findspots within the study area search radius. The map regression demonstrates that the site remained open land until the development of the existing buildings during the later twentieth century.

4.2.5 Chapter 5 subsequently considers the site conditions, later development and below ground impacts, and whether the proposed development is likely to impact archaeological assets and potential archaeological assets identified below.

4.3 Prehistoric - Palaeolithic, Mesolithic, Neolithic, Bronze Age and Iron Age

4.3.1 From around 4000 BC the mobile hunter-gathering economy of the Mesolithic gradually gave way to a more settled agriculture-based subsistence. The pace of woodland clearance to create arable and pasture-based agricultural land varied regionally and locally, depending on a wide variety of climatic, topographic, social and other factors. The trend was one of a slow, but gradually increasing pace of forest clearance.

4.3.2 A piece of prehistoric worked flint was found in a Roman context at 33 Thirleby Road, c.1.1km west of the study site (MLO16354, TQ 2059 9080).

4.3.3 A handaxe dated to the Neolithic period has been identified at Flower Lane c.400m to the north of the study site (MLO16358, TQ2170 9180), and an axehead and a number of retouched flakes have been identified in the general Mill Hill area (MLO23415, TQ2200 9200; MLO16357, TQ 2250 9250).

4.3.4 By the 1st millennium, i.e. 1000 BC, the landscape was probably a mix of extensive tracts of open farmland, punctuated by earthwork burial and ceremonial monuments from distant generations, with settlements, ritual areas and defended locations reflecting an increasingly hierarchical society.

4.3.5 A fragment of wattle and daub, of probable late Iron Age date, was identified at Hillside Grove c.150m to the northeast of the study site (MLO16363, TQ2201 9147).

4.3.6 The heavy clays at the site would have provided an unattractive environment, suggesting that early woodland clearance and settlement within the area was limited. Overall therefore the archaeological potential of the study site for prehistoric evidence is defined as generally low, although theoretically isolated residual finds similar to those already identified within the study area, could conceivably be present.

4.4 Roman

4.4.1 The line of Watling Street forms the western boundary of the borough of Barnet, which lies some distance to the west of the study site, with activity identified at Brockley Hill to the northwest (Weinreb, Hibbert & Keay 2008). The projected alignment of a Roman road running parallel to Watling Street, passes c.350m to the east of the study site, as shown on Figure 2. Various excavations conducted along the suggested alignment to the east and southeast of the study site have failed to produce evidence of a Roman road (ELO2751, TQ2270 9080; MLO98031, TQ22644 90769).

4.4.2 A further projected Roman road alignment is shown further to the east, and evidence for this has been identified during archaeological works (MLO16353, TQ 2325 9120 & MLO16364, TQ 2321 9137).

4.4.3 Typical archaeological features associated with Roman roads can include evidence for settlement and occupation, ditches and agricultural land divisions, together with quarry pits and burials.

4.4.4 Two Roman pits were identified at 33 Thirleby Road c.1.1km west of the study site (MLO12684, TQ 2059 9080), whilst finds of Roman material including seven lamps and a number of defaced coins were identified c.650m to the north of the study site (MLO17514, TQ2200 9200).

4.4.5 The study site is thought to have lain too far from the known road alignments for associated archaeological finds or features to occur. Consequently a generally low archaeological potential has been identified for the Roman period at the study site itself.

4.5 Anglo Saxon & Medieval

4.5.1 No finds of Anglo-Saxon date have been identified within a 1.5km radius of the study site. The character, extent and location of post-Roman/Saxon settlement in the area is almost completely unknown. The Roman road Watling Street some distance to the west of the site is recorded in a charter of 957 AD as 'Wicstrete' (VCH) suggesting that the road was still in use, although its strategic function had ceased.

4.5.2 The site of Medieval settlement, including the site of a mill, has been identified c.650m to the north of the study site (MLO72233-4, TQ2200 9200).

4.5.3 Secondary historical sources identify Bunns Lane, which runs close to the site's eastern boundary, as Medieval in date. Bunns Farm, formerly to the northwest of the study site, has also been dated to the fifteenth century, with the lane named after the farm it served (Calder 1993; Oak 1994).

4.5.4 During the Medieval period the general area of the study site is understood to have comprised isolated farmsteads, engaged in a pastoral economy.

4.5.5 Evaluation at Longfield Avenue c.350m to the southeast of the study site revealed sherds of abraded Medieval pottery (MLO66843, TQ2230 9110). Sherds of Fourteenth Century grey coated red ware pottery has been identified at Copthall Fields 1.4km to the east of the study site (MLO16366, TQ2320 9140), and residual sherds of green glazed London ware were found at Hanshaw Drive c.1.1km to the west (MLO75620, TQ 2065 9082).

4.5.6 Overall the archaeological potential of the study site for these periods can be defined as low, though evidence for land division and agricultural activity may conceivably be present.

4.6 Post Medieval and Modern (including map regression exercise)

4.6.1 Early maps show the site to lie in open fields, with the line of Bunns Lane to the east.

4.6.2 The Crow Parish Map of Hendon (Fig 3: 1754) and the associated key shows the site to lie in arable fields named as follows:
824 – Bunn's Mead

825 – Hoval Barn Field
497 – Nearer Mudges Mead
698 – Barn Field (a pond and a barn are shown towards the eastern part of this field)
707 – Lenver Lay
705 – The Pasture Field
746 – Ellen's Mead
80 – Bread Field

4.6.3 The 1796 Cooke Survey of Hendon (Fig 4) shows no change within the site.

4.6.4 The 1828 Whishaw Map of the Parish of Hendon (Fig 5) and the associated key shows the site to lie in arable fields, named as follows:
76 – Hovel's Barn Field
45 – Nearer Mudges by Bunn's Lane
44 – Barn Field, in which is a Barn
36 – Lower Lay
37 – Upper Lay
38 – Pasture Field

4.6.5 The Hendon Tithe Map (Fig 6: 1840) and the associated award shows the site to principally comprise meadow land.

4.6.6 The First Edition Ordnance Survey (Fig 7: 1862-3) shows the site occupied by open fields, with two ponds within the eastern boundary, which may have been former landfill sites recorded by the GLHER on the study site (MLO72410, TQ 2180 9130).

4.6.7 The Second Edition Ordnance Survey (Fig 8: 1896) shows the presence of railway lines to the west (the Midland Railway, opened 1867) and to the east (the Great Northern Railway, Edgware Branch, also opened 1867; Brown 2010; VCH 1975). The Third Edition Ordnance Survey (Fig 9: 1913-14) shows no change from the earlier survey.

4.6.8 The Revised Ordnance Survey (Fig 10: 1932-5) shows the Watford Way/Barnet Bypass (A1), understood to have been constructed in the 1920s, forming the eastern boundary of the study site, with an embankment carrying the road occupying the eastern part of the site.

4.6.9 The 1951 Ordnance Survey (Fig 11) shows the southern part of the site laid out as a sports facility, with a pavilion within the southern corner of the site, and a drain through the centre.

4.6.10 The 1964 Ordnance Survey (Fig 12) shows the site in more detail, with the northern part laid out as allotment gardens.

4.6.11 The composite 1979-1990 Ordnance Survey (Fig 13) shows the site laid out with the Pentavia Retail Park, comprising an open land to the northwest, a large building to the north and west, carparking to the south and east, and a restaurant facility to the south, also with attendant carparking. The M1 motorway, forming the study site's western boundary, is understood to have been constructed in the 1960s.

4.6.12 The 1999 aerial photograph (Fig 14) and the current site survey (Fig 15) show no further change within the study site.

4.6.13 The potential of the study site for the Post Medieval and Modern periods can be identified as low.

4.7 Assessment of Significance

4.7.1 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' to this or future generations.

4.7.2 No archaeological designated heritage assets as defined in the NPPF are recorded on or in close proximity to the study site.

4.7.3 Overall it would appear that while it is possible that while archaeological remains may be present within the study site boundary, the balance of probability is that these will be purely of local significance.

5.0 SITE CONDITIONS AND THE PROPOSED DEVELOPMENT (Review of potential impact upon Archaeological Assets)

5.1 Site Conditions

5.1.1 The site is currently occupied by a block of retail units to the north and west, and a restaurant unit to the south, with attendant carpark hardstanding and overgrown land to the northwest (Figures 14-15).

5.1.2 The construction of the buildings occupying the study site can be considered likely to have had a significant, negative impact on any underlying archaeological remains, due to the cutting of foundations and services.

5.1.3 Twentieth century landforming due to the creation of the sports ground, allotment gardens and the adjacent road can be considered likely to have had an additional, significant negative archaeological impact.

5.1.4 Agricultural/horticultural use of the study site prior to development can be considered likely to have had a moderate, widespread negative archaeological impact.

5.2 The Proposed Development (Figs. 16-17)

5.2.1 Development proposals comprise the redevelopment of site including the demolition of all existing buildings and construction of 844 new Build to Rent Class C3 residential units and 894sqm ancillary Class C3 Build to Rent facilities; 405sqm Class A1 Retail; 326sqm Class A3 and A4 food; and 297sqm Class D1 Community; new pedestrian access off Bunns Lane; open space, landscaping; car parking; and highway/pedestrian improvements.

5.2.2 The scheme will consist of apartment blocks of varying heights and includes basement areas (Fig. 16).

5.3 Review of Potential Development Impacts upon Archaeological Assets

5.3.1 In view of the study site's archaeological potential, combined with the potential for past depositional impacts, the redevelopment proposals are considered unlikely to have a significant or widespread negative archaeological impact.

6.0 SUMMARY AND CONCLUSIONS

6.1 The known as Pentavia, Mill Hill has been reviewed for its below ground archaeological potential.

6.2 In accordance with relevant planning policy and guidance, a desk based assessment has been undertaken to clarify the archaeological potential of the study area.

6.3 In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

6.4 In terms of local designations, the site does not lie within an Archaeological Priority Zone as designated by the London Borough of Barnet.

6.5 The study site can be considered likely to have a generally low archaeological potential for all past periods of human activity.

6.6 Past-post depositional impacts within the study site are considered to have had a severe negative archaeological impact; substantial quantities of made ground have been identified at the site.

6.7 Proposals include the residential redevelopment of the site.

6.8 On the basis of the available information we do not recommend the implementation of any further archaeological mitigation measures in this particular instance.

SOURCES CONSULTED

1. General

Barnet Local Studies Library

British Library

Greater London Historic Environment Record

Hertfordshire Archives and Local Studies

Portable Antiquities Database

2. Internet

http://archaeologydataservice.ac.uk

http://www.britainfromabove.org.uk/

http://www.british-history.ac.uk/

https://finds.org.uk/database/

https://www.historicengland.org.uk/listing/the-list

https://opendomesday.org.uk

http://www.pastscape.org.uk

http://planningguidance.planningportal.gov.uk

3. Bibliographic

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4. Cartographic

1754 John Rocque's Map of Middlesex

1754 Crow Parish map of Hendon

1796 Cooke Survey of the Parish and Manor of Hendon

1805 Ordnance Survey Drawing

1828 Whishaw map of the Parish of Hendon

1840 Hendon Tithe Map

1862-3 Ordnance Survey

1896 Ordnance Survey

1913 Ordnance Survey

1914 Ordnance Survey

1932 Ordnance Survey

1935 Ordnance Survey

1951 Ordnance Survey

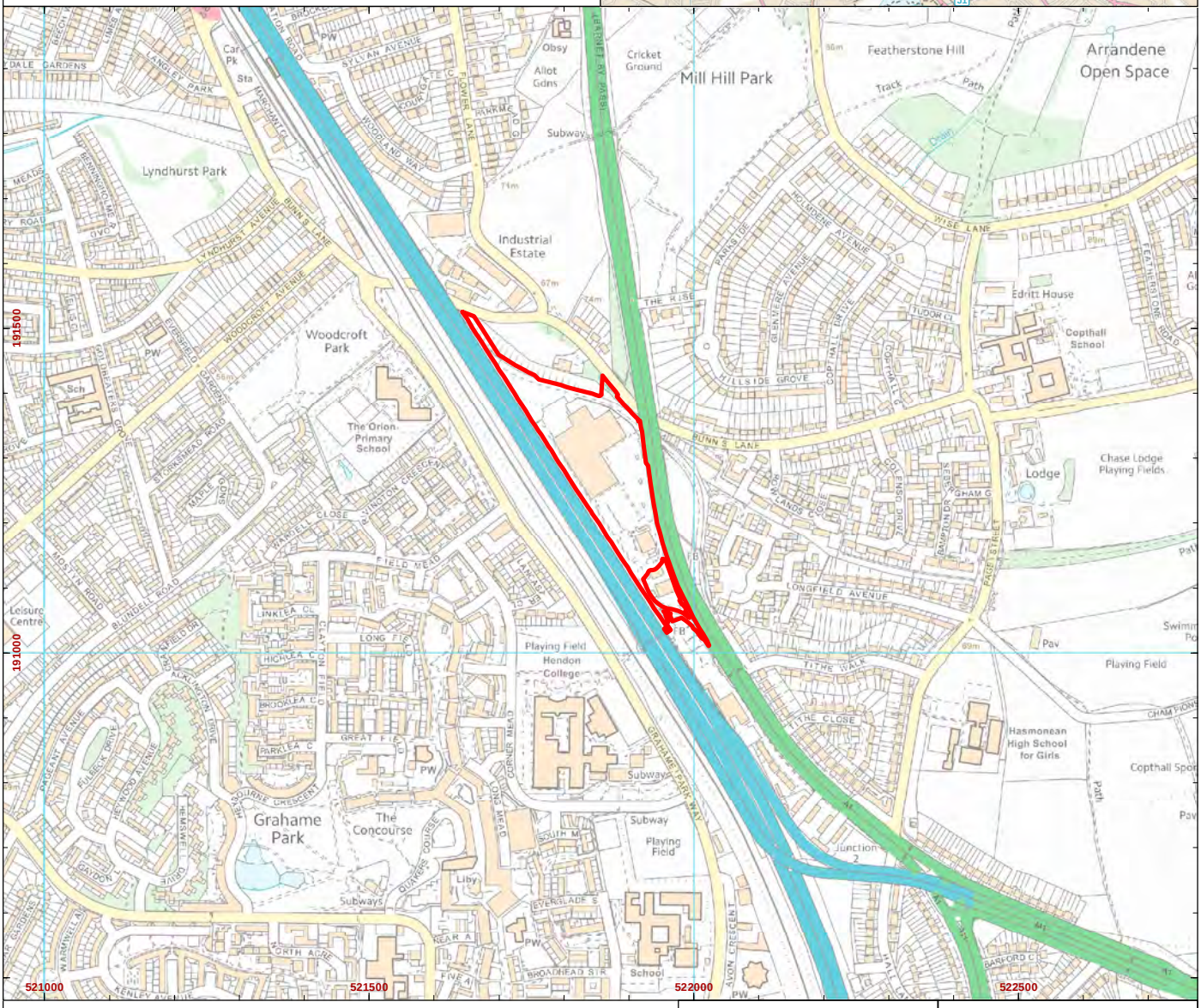
1962 Ordnance Survey

1964 Ordnance Survey

1979-1990 Ordnance Survey

1980-1986 Ordnance Survey

1994 British Geological Survey Sheet 256 (North London)



Site Boundary

N

Scale at A4: 1:10,000

0 250 m

CgMs HERITAGE PART OF RPS

Figure 1:
Site Location

MLO78644
MLO16357
MLO78830
MLO14341
DLO33094 - Mill Hill, APA
MLO103633
MLO79115
ELO7936
MLO61858
MLO61858
MLO107182
MLO61858
MLO72233
MLO72234
ELO5441
MLO61858
MLO23415
MLO61858
MLO17514
MLO16358
MLO106979
MLO69035
ELO5437
MLO107124
MLO16363
DLO33084 - Copthall: Chase Lodge and Holders Hill, APA
MLO16366
ELO5426
MLO16364
MLO72410
ELO16568
MLO9330
ELO16586
DLO33084 - Copthall: Chase Lodge and Holders Hill, APA
MLO107196
MLO66843
MLO66846
ELO16561
MLO16353
DLO33081 - Burnt Oak, APA
ELO1232
ELO1231
ELO1233
ELO5378
MLO75620
MLO77719
MLO16354
MLO12684
MLO61869
ELO17201
ELO16563
MLO72408
MLO72411
ELO5558
ELO2751
ELO16589
MLO98031
MLO107194
MLO107205
ELO17474
MLO72409
MLO107017
MLO105654
MLO107020
MLO99404
ELO8690
MLO99399
MLO101420
ELO3497
MLO99402
MLO99400
MLO99403
MLO103564
MLO99398
MLO99401
ELO11300
MLO78829
MLO99395
MLO99399
ELO13733
ELO13637

520000 520500 521000 521500 522000 522500 523000 523500
192500 192000 191500 191000 190500 190000

CgMs HERITAGE PART OF RPS

- Site Boundary
- Search Radius 1.5km

Designated Heritage Assets:

- Listed Building

Archaeological Priority Area

- DLO33081 - Burnt Oak
- DLO33084 - Copthall: Chase Lodge and Holders Hill
- DLO33094 - Mill Hill

Non-Designated Heritage Assets:

HER Record (Point)

- Find Spot
- Maritime
- Monument

HER Record (Polygon)

- Listed Building
- Monument
- Park
- Roman road

Previous Archaeological Work:

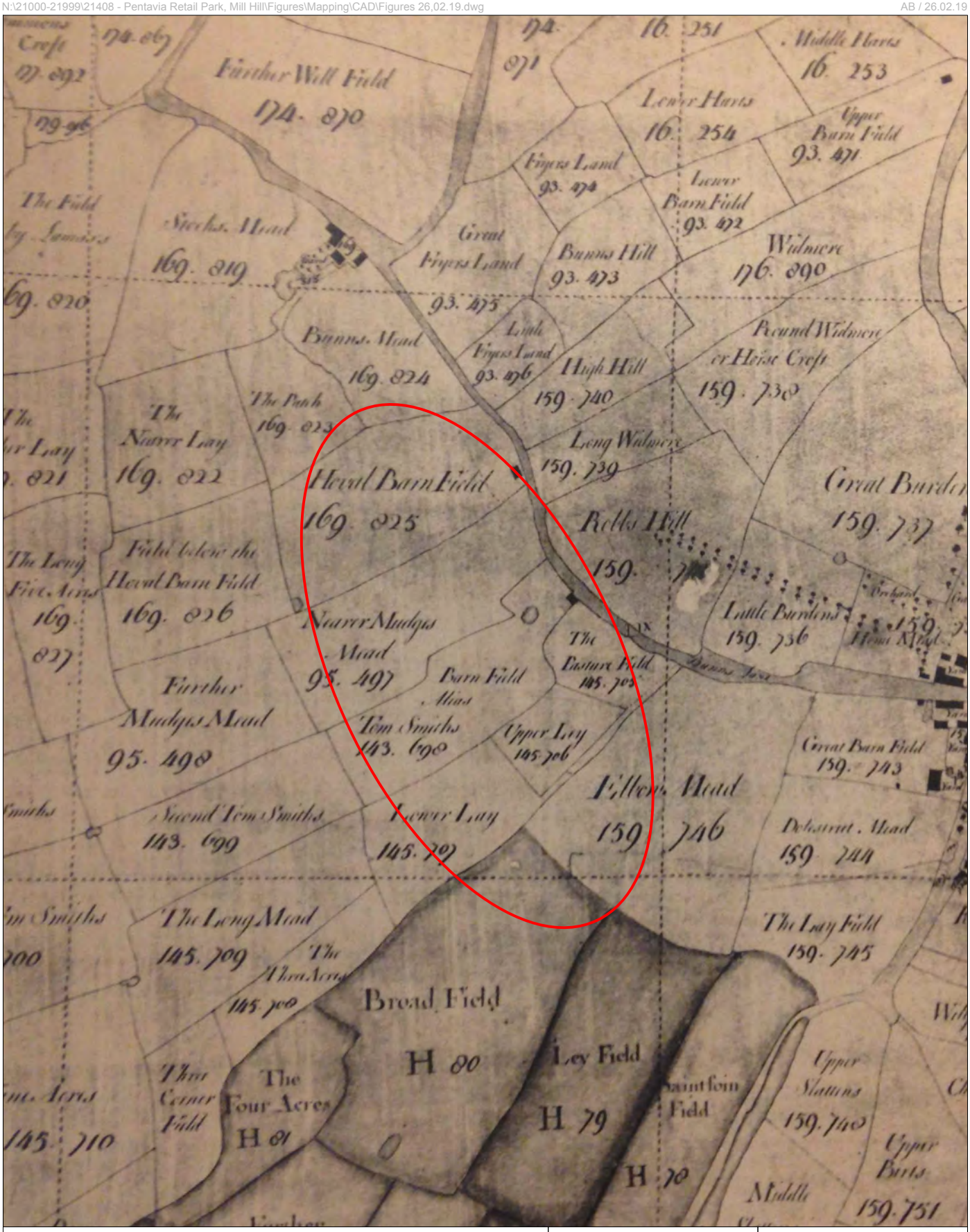
- Event Record (Point)
- Event Record (Polygon)

N

Scale at A3: 1:12,000

0 400 m

Figure 2: Summary of cultural heritage designations (data from GLHER)



Site Location

N

Not to Scale:
Illustrative Only

Figure 3:
1754 Crow Parish Map of Hendon

Site Location

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 4:
1796 Cooke Survey of the Parish and Manor of Hendon

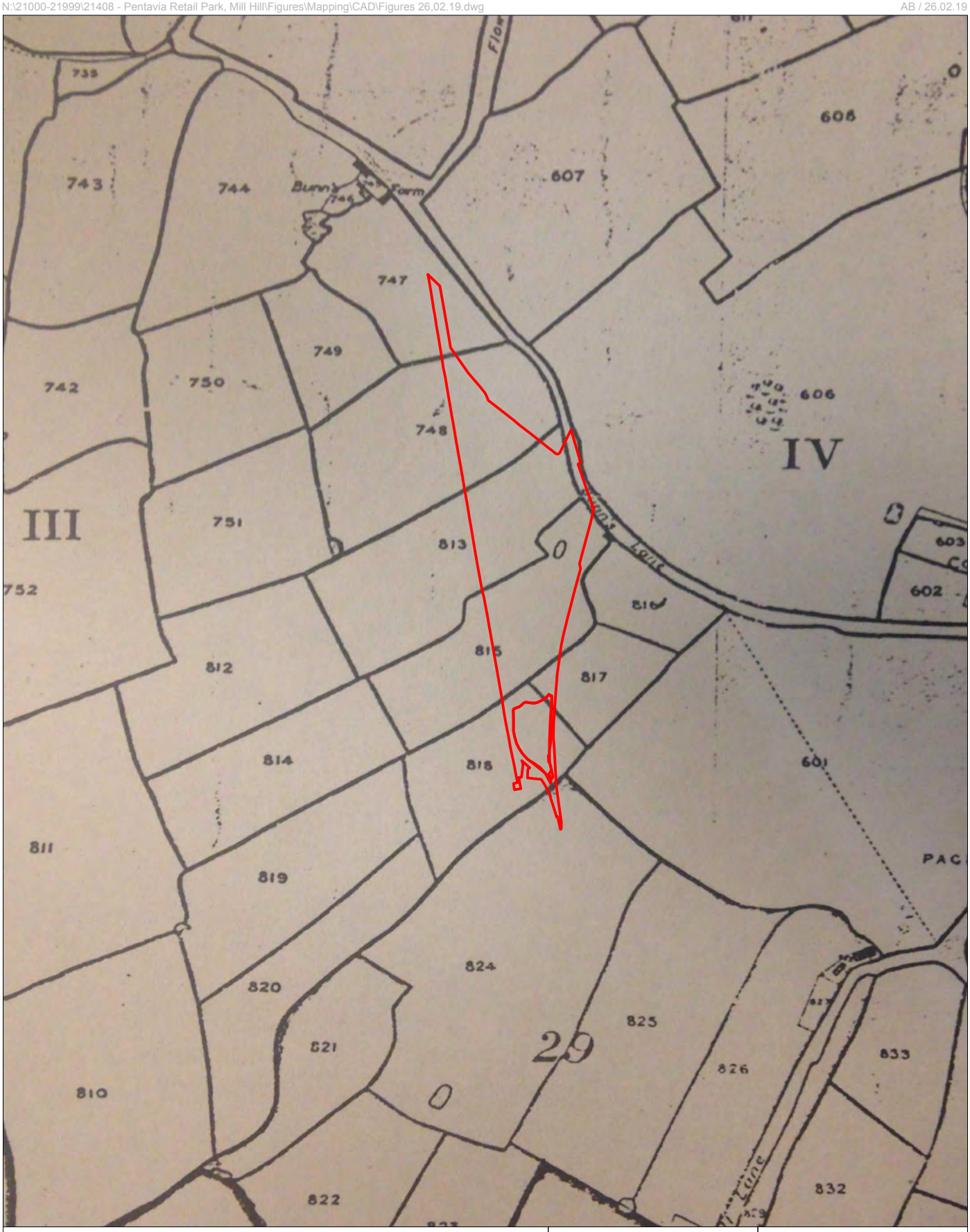
Site Location

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 5:
1828 Whishaw Map of the Parish of Hendon



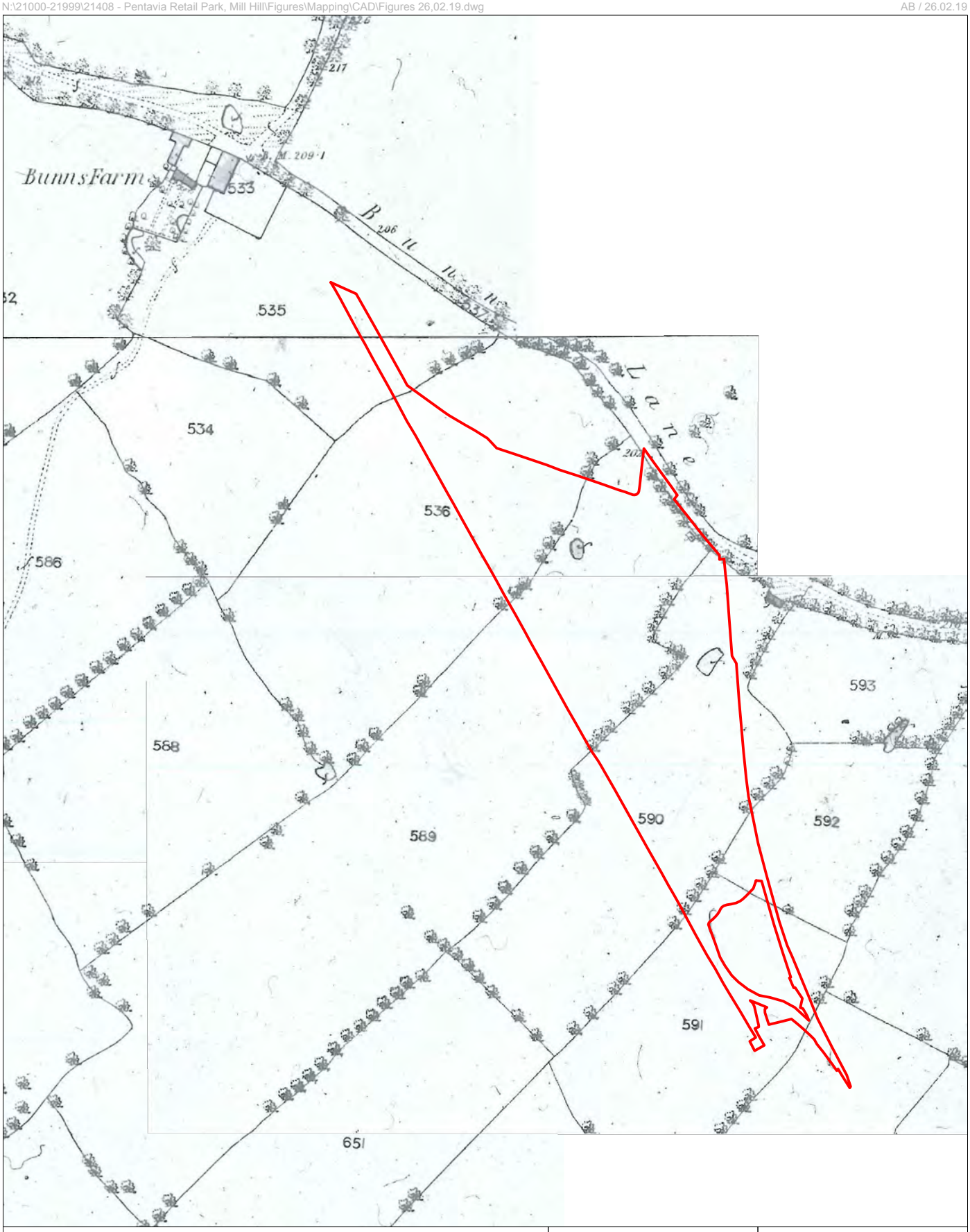
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 6:
1840 Hendon Tithe Map



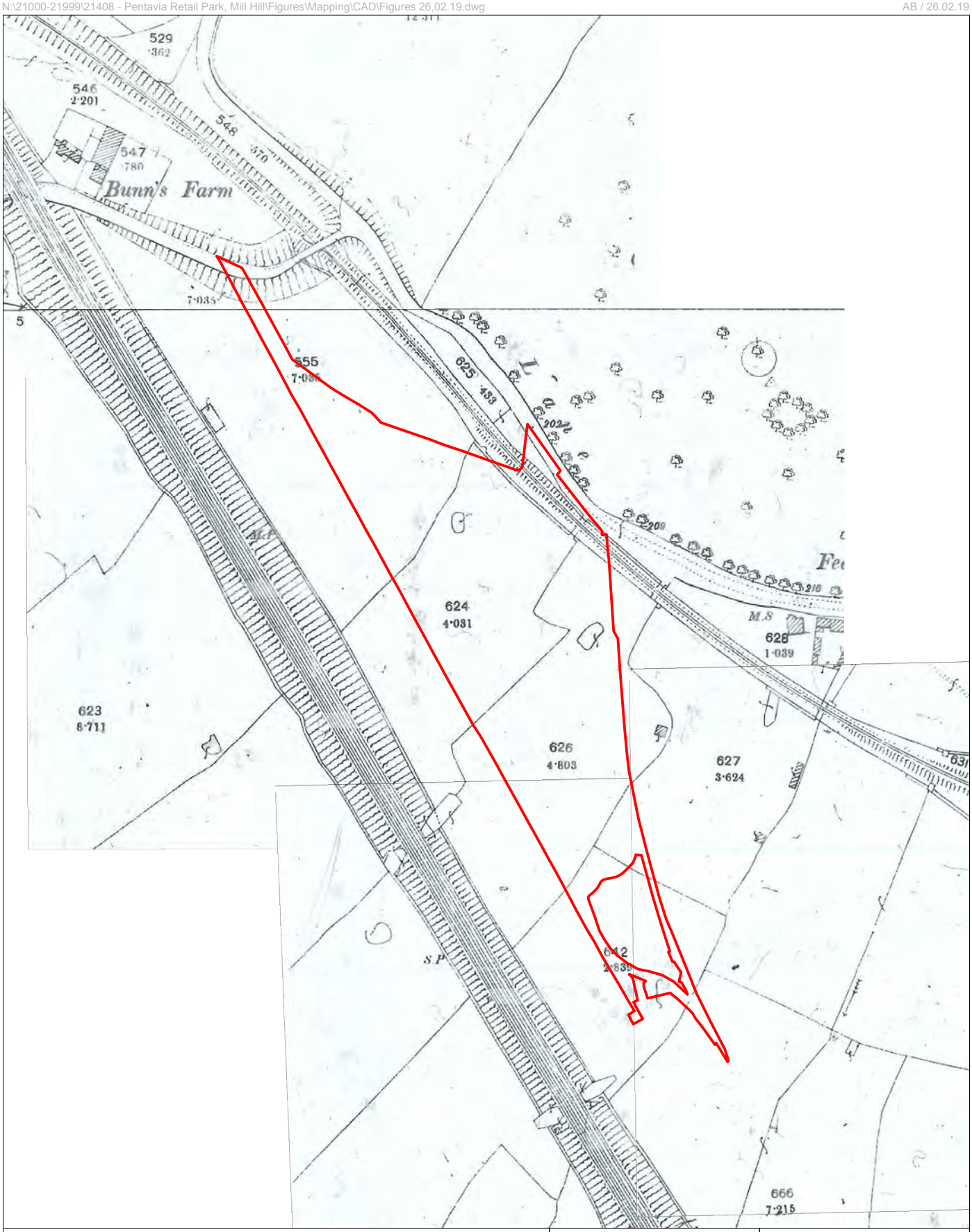
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 7:
1862-3 Ordnance Survey

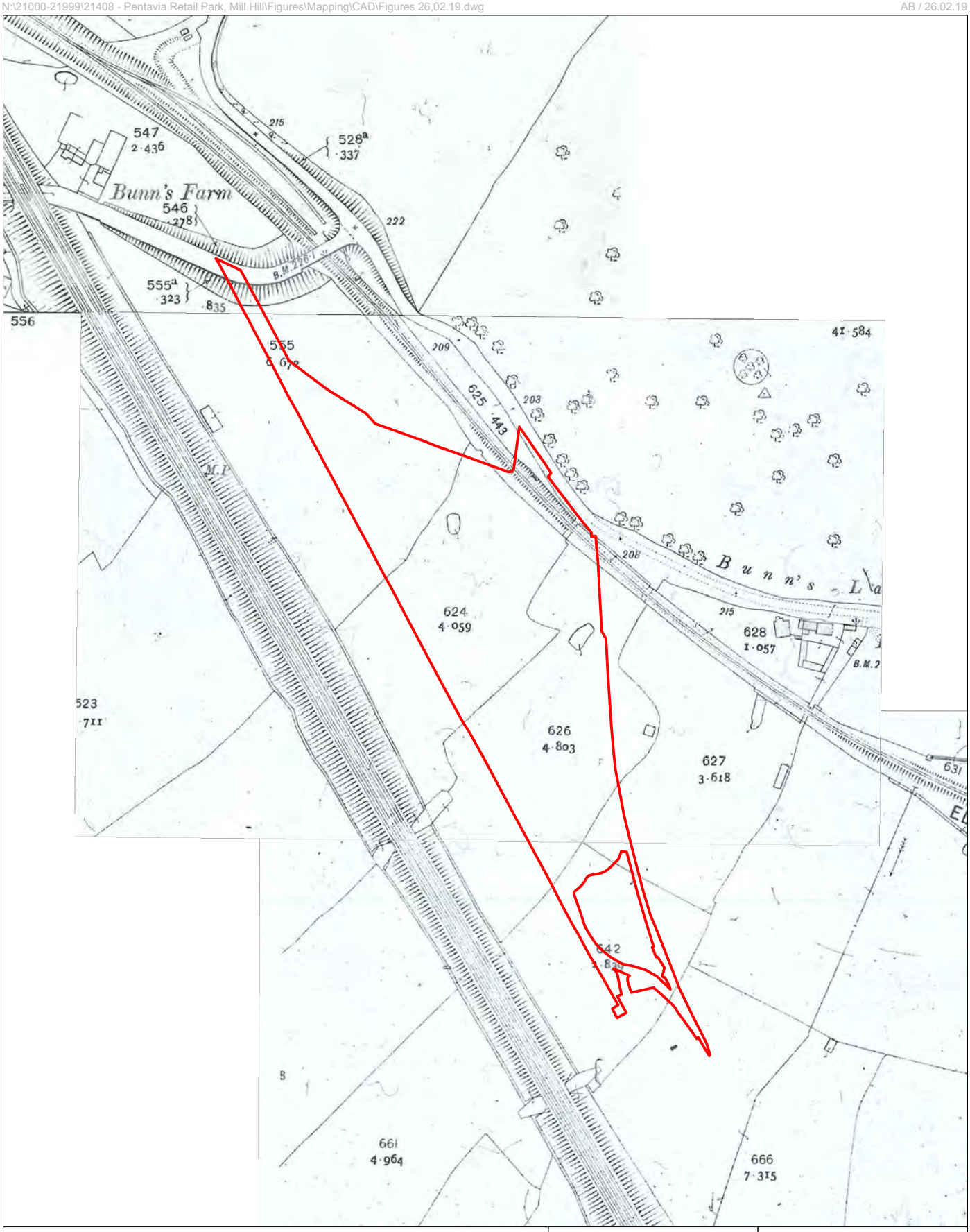


Site Boundary

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 8:
1896 Ordnance Survey



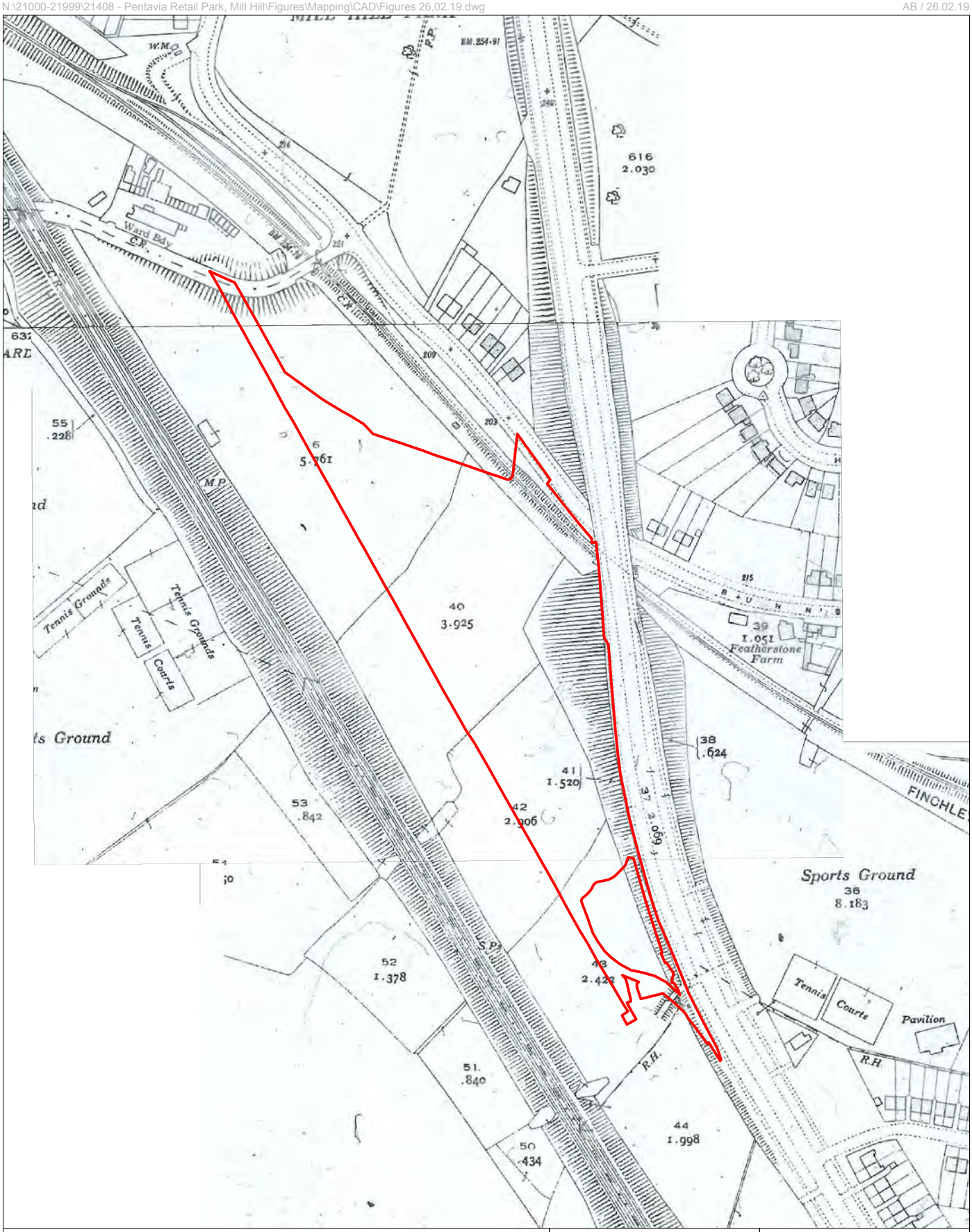
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 9:
1913-1914 Ordnance Survey



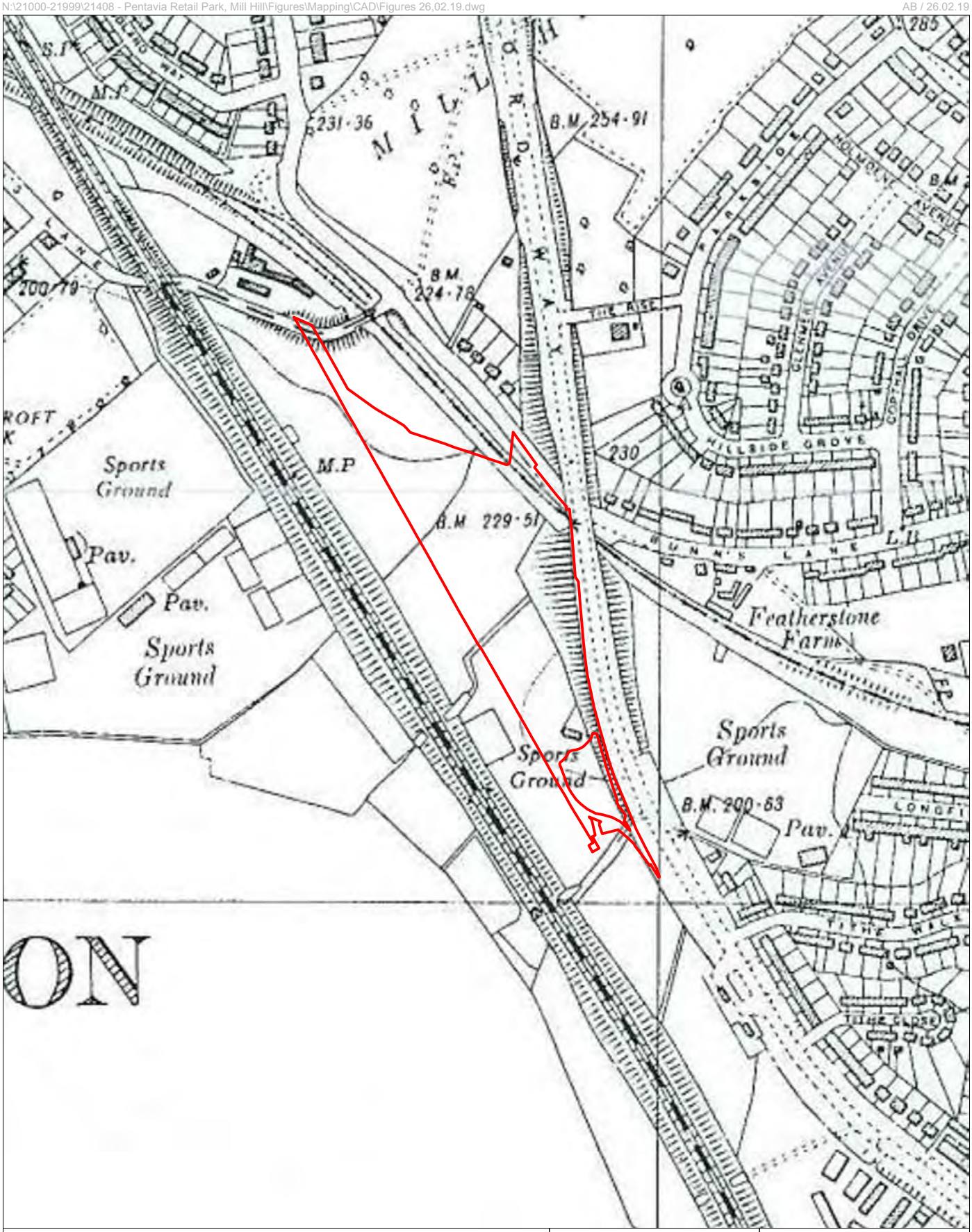
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 10:
1932-1935 Ordnance Survey



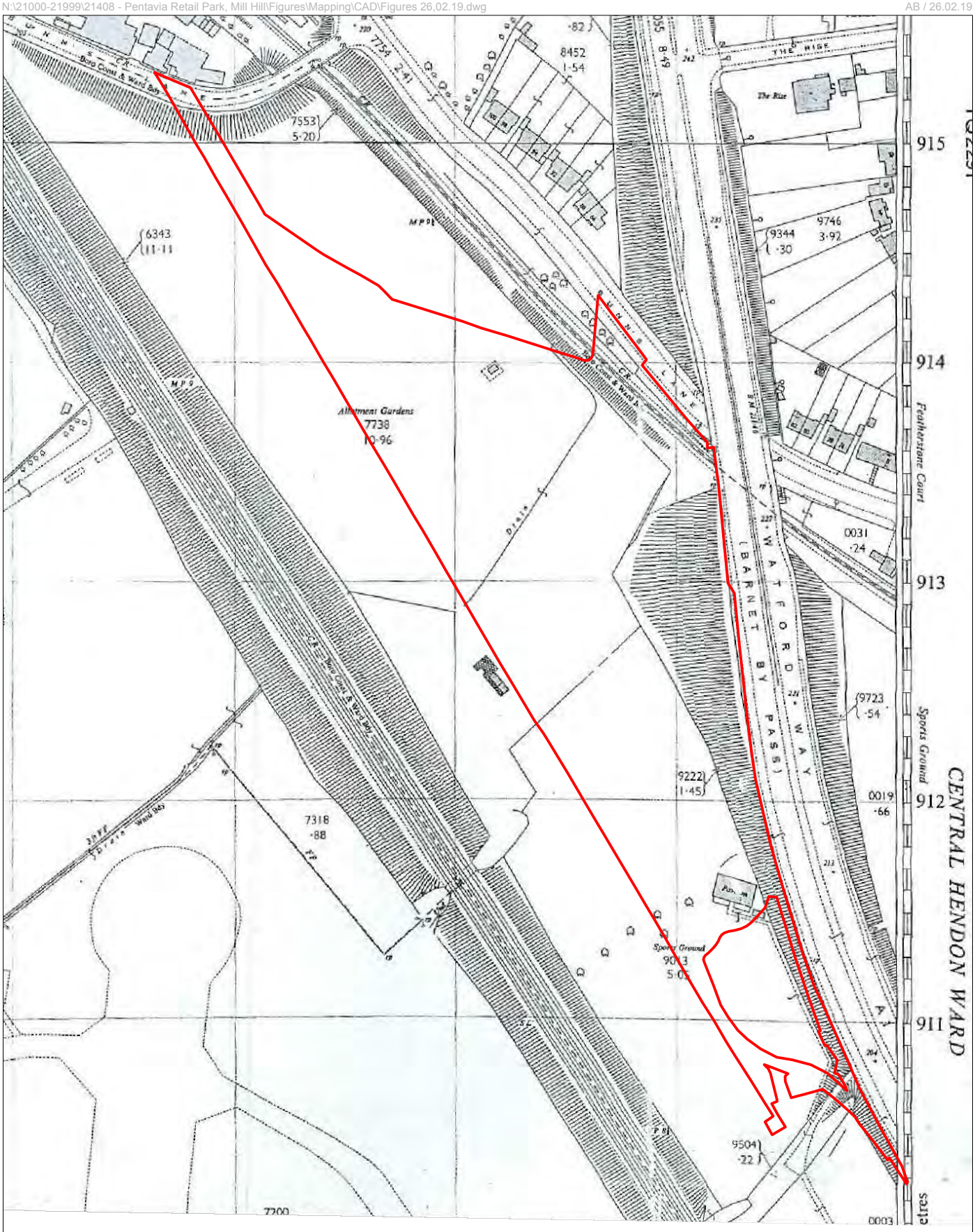
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 11:
1951 Ordnance Survey

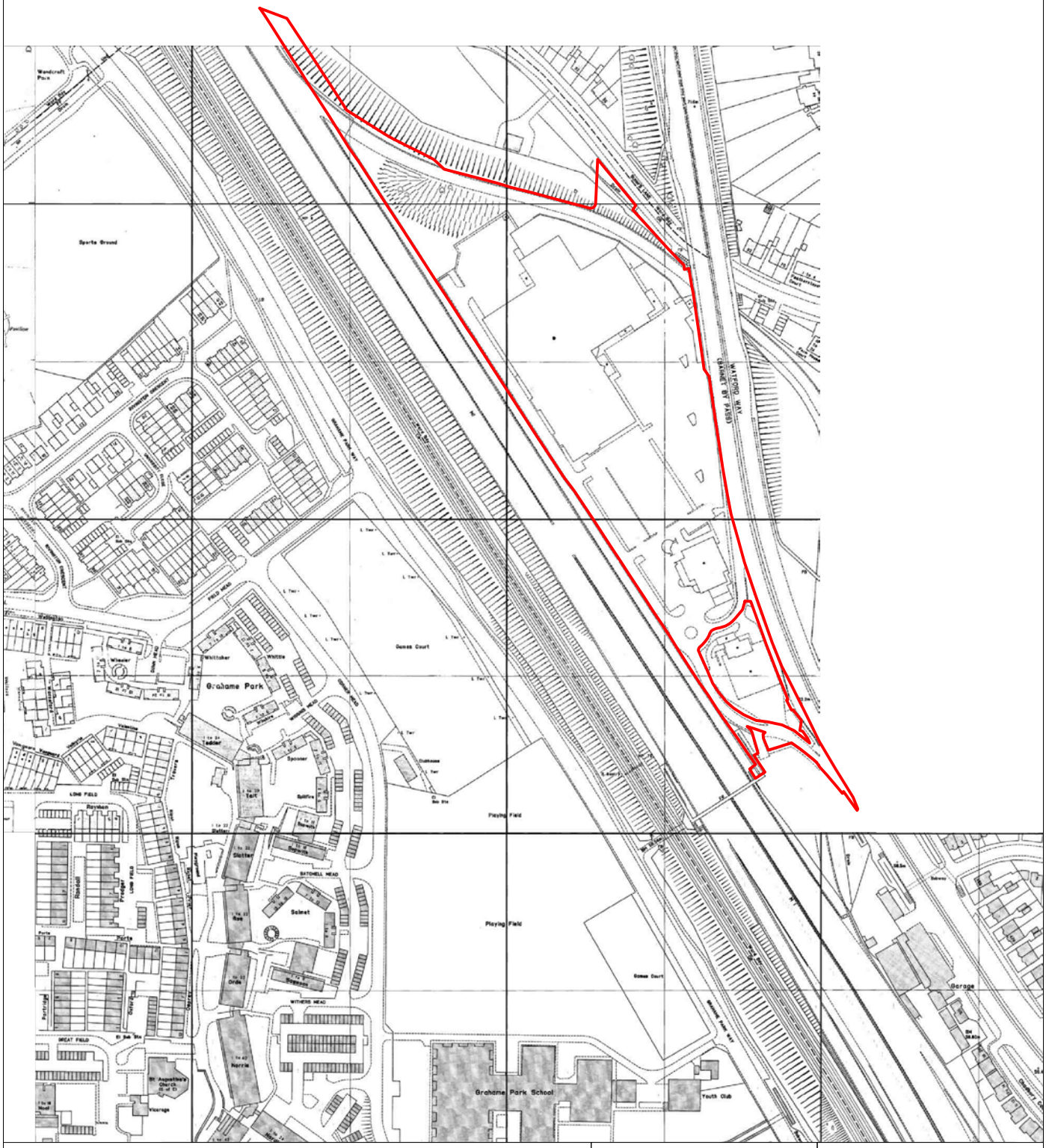


Site Boundary

N

Not to Scale:
Illustrative Only

Figure 12:
1964 Ordnance Survey



Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 13:
1979-1990 Ordnance Survey

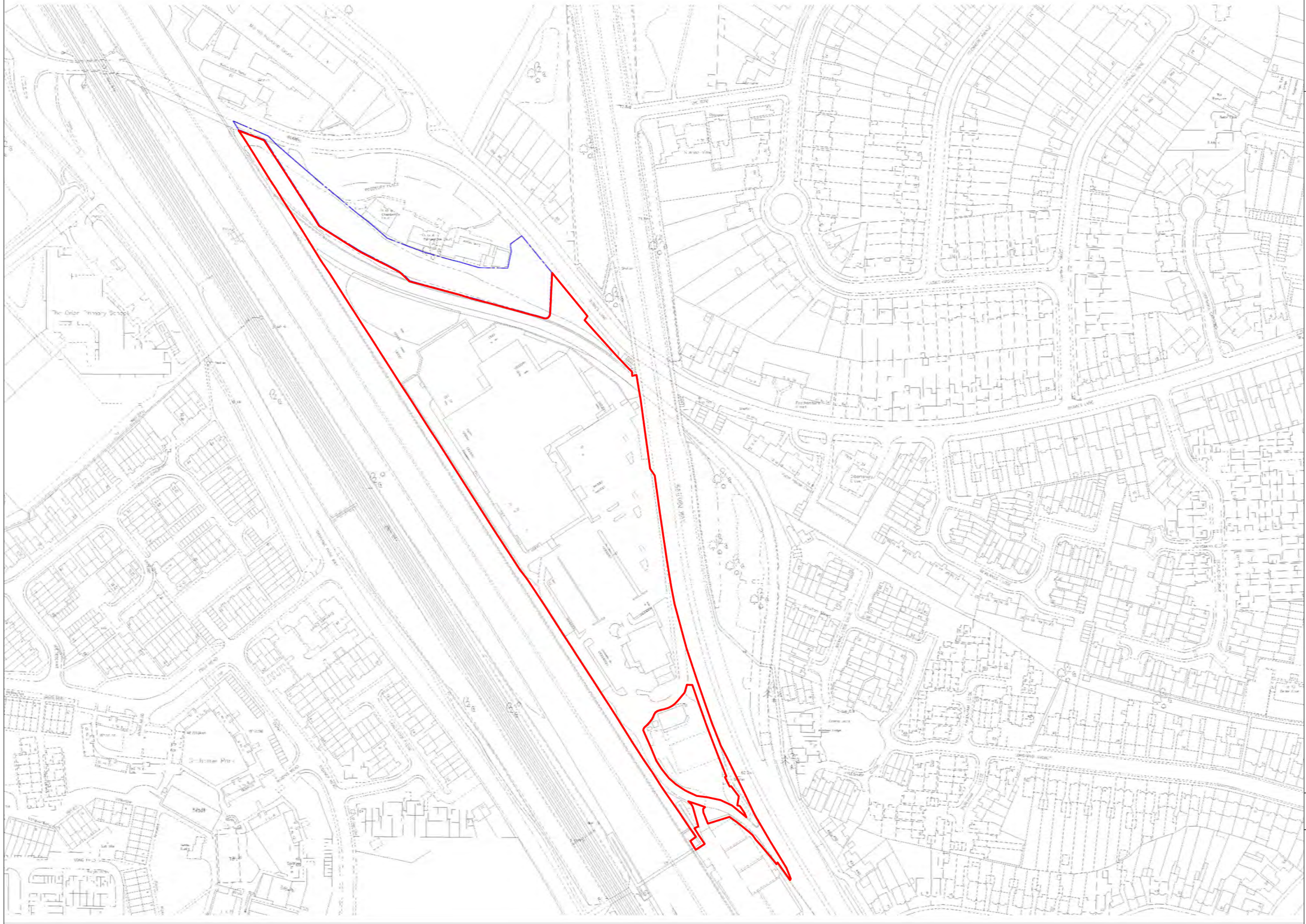
Site Boundary

N

CgMs HERITAGE
PART OF RPS

Not to Scale:
Illustrative Only

Figure 14:
1999 Aerial photo



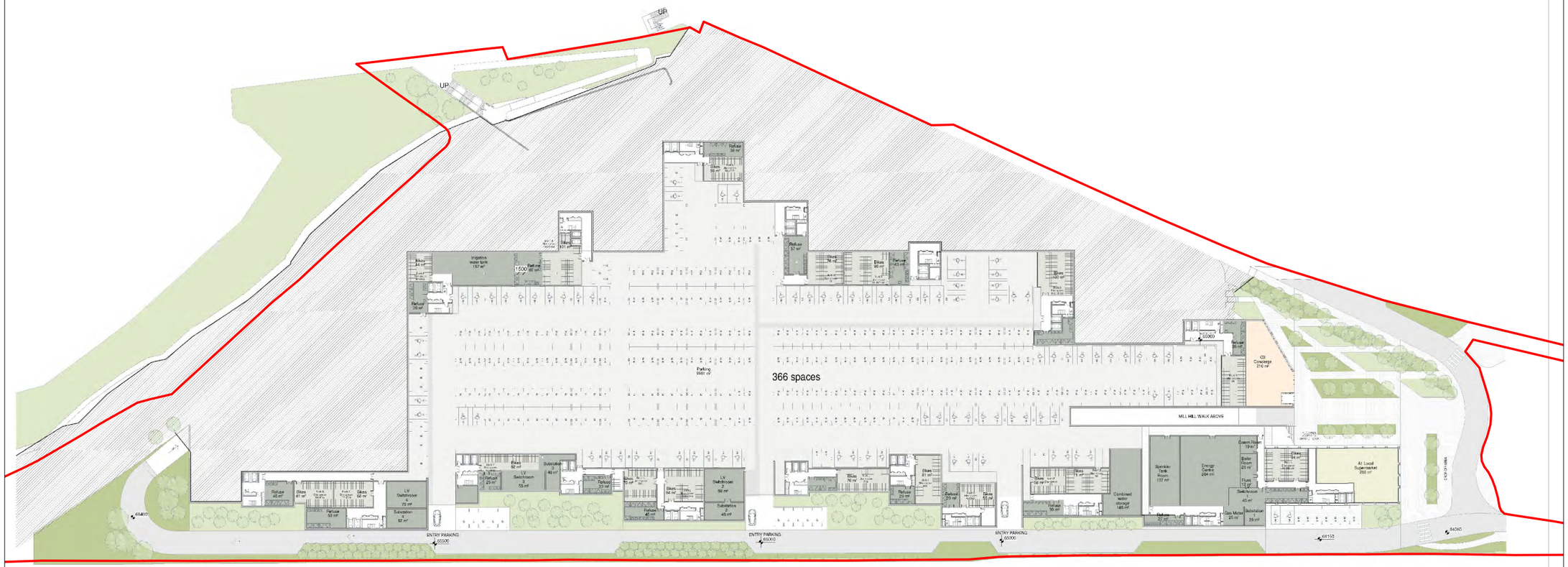
CgMs HERITAGE
PART OF RPS

Site Boundary

N

Not to Scale:
Illustrative Only

Figure 15:
Current Site Survey



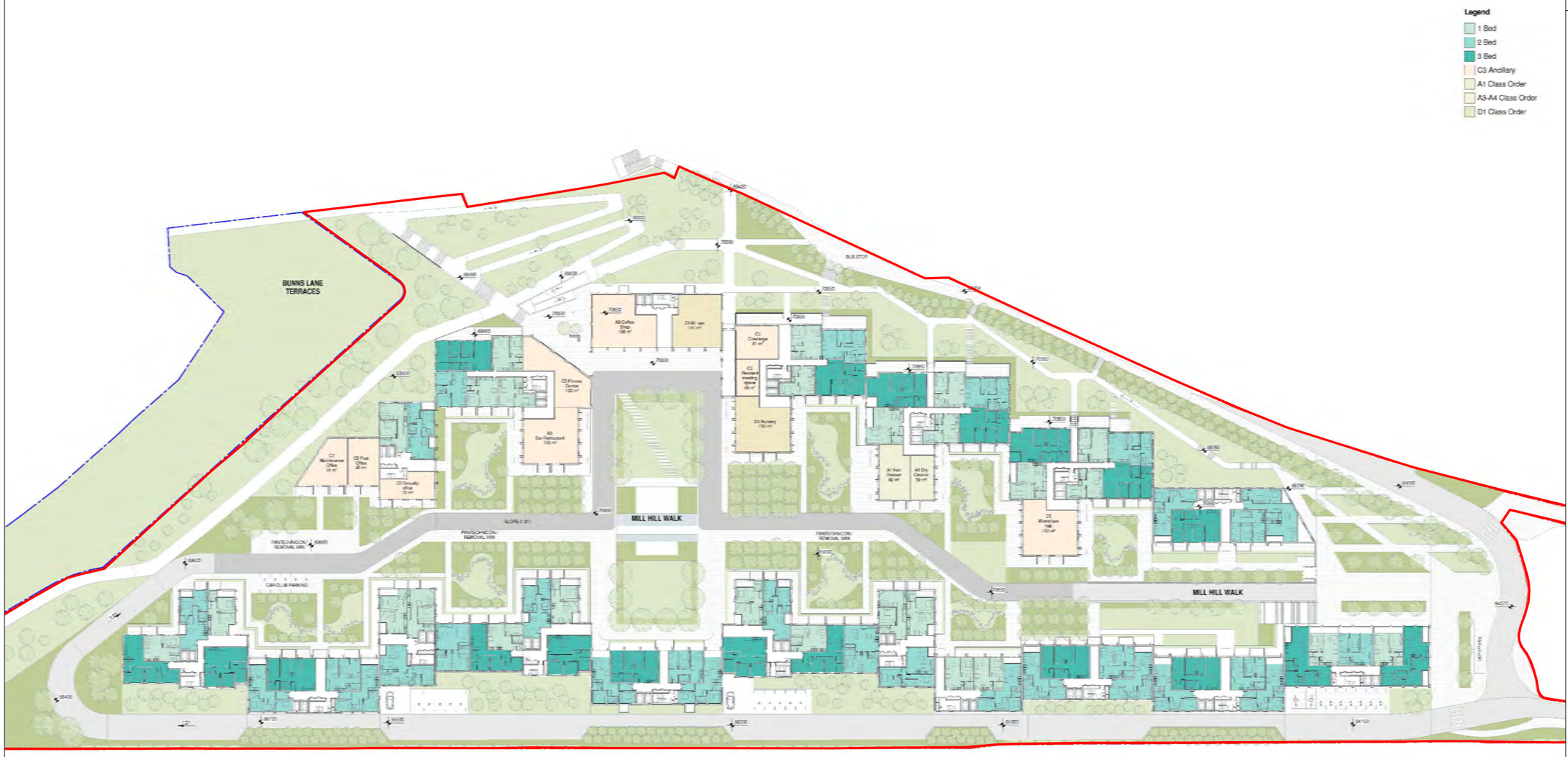
CgMs HERITAGE PART OF RPS

Site Boundary

N

Not to Scale:
Illustrative Only

Figure 16:
Proposed Development:
Lower Ground Floor



Site Boundary

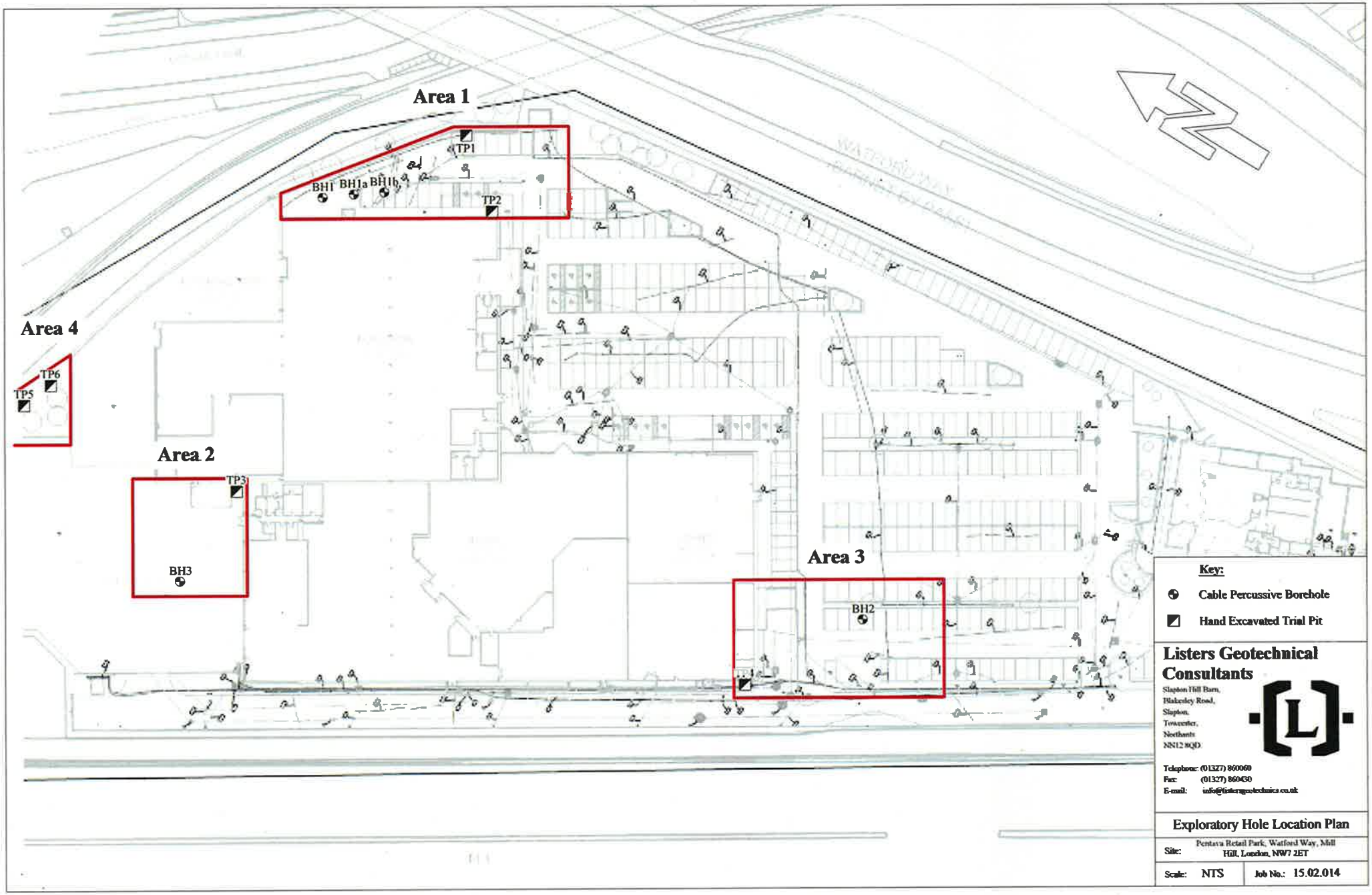
Not to Scale:
Illustrative Only

Figure 17:
Proposed Development:
Ground Floor

Appendix 1

Geotechnical investigations

March 2015



Key:

- Cable Percussive Borehole
- Hand Excavated Trial Pit

Listers Geotechnical Consultants

Slapton Hill Barn,
Blakesley Road,
Slapton,
Towcester,
Northants
NN12 8QD

Telephone: (01327) 860060
Fax: (01327) 860450
E-mail: info@listersgeotechnics.co.uk

Exploratory Hole Location Plan

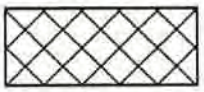
Site: Pentava Retail Park, Watford Way, Mill Hill, London, NW7 2ET

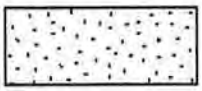
Scale: NTS

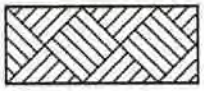
Job No.: 15.02.014

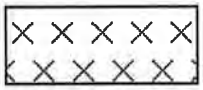
1.0 SOIL/ROCK SYMBOLS

1.1 Soils

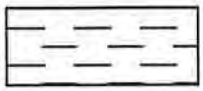

Made Ground

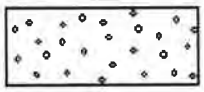

Sand

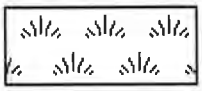

Topsoil


Silt

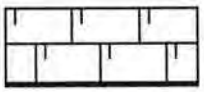

Boulders and Cobbles

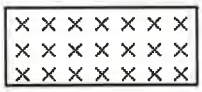

Clay

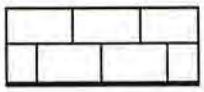

Gravel


Peat

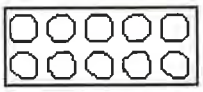
1.2 Rocks, Sedimentary

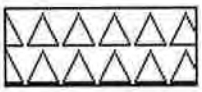

Chalk


Siltstone

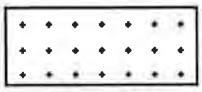

Limestone


Mudstone


Conglomerate


Breccia


Coal


Sandstone

SOIL/ROCK SYMBOLS

LOCATION: Pentavia Retail Park, Mill Hill

TEST LOCATION: TP1

Date of Excavation: 02/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m	Strata Change: Depth (Thickness) -m	Samples: Depth -m	Samples: Type	Hand Vane kPa	Water Level -m
MADE GROUND Block paving over a bed of sand		0.00	(0.20)				
MADE GROUND Brown and grey clayey sandy fine to coarse sub-angular GRAVEL of brick and concrete sub-base			0.20 (0.40)	0.40	D		Dry
MADE GROUND Brown slightly gravelly slightly sandy CLAY. Gravel is fine sub-angular brick. Contains occasional roots			0.60 (0.60)	1.00	D		
Trial Pit terminated at 1.20 m		1.00	1.20				

Ground Level: 66.80 m AOD

Grid Reference: 521906, 191349

Remarks:

1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0.50 x 0.50 x 1.20m.
3. Maximum depth of visible roots: 1.20m.
4. No groundwater encountered.
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

TEST LOCATION: TP2

Date of Excavation: 02/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m	Strata Change: Depth (Thickness) -m	Samples: Depth -m	Samples: Type	Hand Vane kPa	Water Level -m
MADE GROUND Paving slab over a bed of sand		0.00	(0.20)				
MADE GROUND Concrete			0.20 (0.10)				
MADE GROUND Brown slightly gravelly slightly sandy CLAY. Gravel is fine sub-angular brick			0.30	0.50	D		Dry
			(0.90)				
		1.00		1.00	D		
Trial Pit terminated at 1.20 m			1.20				

Ground Level: 66.90 m AOD

Grid Reference: 521895, 191334

Remarks:

1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0.50 x 0.50 x 1.20m.
3. Maximum depth of visible roots: None recorded.
4. No groundwater encountered.
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill **TEST LOCATION:** TP3

Date of Excavation: 02/03/2015

Description of Strata	Strata Change			Samples		Hand Vane kPa	Water Level -m
	Legend	Depth -m	Depth (Thickness) -m	Depth -m	Type		
		0.00					
MADE GROUND Paving slab over a bed of sand			(0.20)				
			0.20				
MADE GROUND Red brown sandy fine to medium sub-angular GRAVEL of granite sub-base. Terram at 0.30m.			(0.10)				
			0.30				
MADE GROUND Grey sandy fine to coarse sub-rounded to sub-angular GRAVEL of concrete, flint and granite				0.40	D		Dry
			(0.60)				
Trial pit terminated at 0.90m due to the presence of services			0.90				
Trial Pit terminated at 0.90 m		1.00					

Ground Level: 66.90 m AOD

Grid Reference: 521820, 191348

Remarks:

1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0.50 x 0.50 x 0.90m.
3. Maximum depth of visible roots: None recorded.
4. No groundwater encountered.
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill **TEST LOCATION:** TP4

Date of Excavation: 02/03/2015

Description of Strata	Strata Change			Samples		Hand Vane kPa	Water Level -m
	Legend	Depth -m	Depth (Thickness) -m	Depth -m	Type		
		0.00					
MADE GROUND Brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium sub-angular brick, concrete and flint			(0.90)	0.30	D		Dry
Trial pit terminated at 0.90m due to concrete slab and services				0.80	D		
Trial Pit terminated at 0.90 m			0.90				
		1.00					

Ground Level: 66.80 m AOD

Grid Reference: 521843, 191236

Remarks:
1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0.50 x 0.50 x 0.90m.
3. Maximum depth of visible roots: None recorded.
4. No groundwater encountered.
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill **TEST LOCATION:** TP5

Date of Excavation: 04/03/2015

Description of Strata	Strata Change			Samples		Hand Vane kPa	Water Level -m
	Legend	Depth -m	Depth (Thickness) -m	Depth -m	Type		
MADE GROUND Brown sandy gravelly CLAY. Gravel is fine to coarse sub-rounded to angular brick, concrete and some plastic		0.00	(0.70)	0.50	B		Dry
Trial Pit terminated at 0.70 m		0.70					
		1.00					

Ground Level: 65.60 m AOD

Grid Reference:

Remarks:
1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0.50 x 0.50 x 0.70m.
3. Maximum depth of visible roots: None recorded.
4. No groundwater encountered
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

Geotechnical Consultants

LOCATION: Pentavia Retail Park, Mill Hill **TEST LOCATION:** TP6

Date of Excavation: 04/03/2015

Description of Strata	Strata Change			Samples		Hand Vane kPa	Water Level -m
	Legend	Depth -m	Depth (Thickness) -m	Depth -m	Type		
MADE GROUND Brown sandy gravelly CLAY. Gravel is fine to coarse sub-rounded to angular brick, concrete and some plastic		0.00	(0.50)				
Trial Pit terminated at 0.50 m			0.50	0.50	B		Dry
		1.00					

Ground Level: 65.60 m AOD

Grid Reference:

Remarks:

1. Method of excavation: Hand excavated.
2. Trial pit dimensions: 0 50 x 0.50 x 0.50m.
3. Maximum depth of visible roots: None recorded.
4. No groundwater encountered.
5. Sides stable.
6. Logged by Lee Chippington to BS5930 +A2.

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
V	Vane Test
P	Penetrometer Test
M	Mexe Penetrometer
CBR	CBR Sample
UF	Under Foundations

TRIAL PIT LOG

Report No. 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH1

Date of Boring: 02/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m Scale	Strata Change: Depth -m Strata	Samples: Depth -m	Samples: Type	SPT CPT N Value	Water Level -m
MADE GROUND Paving slab with a sand base		0.0	0.20				
			0.50	0.50	D		
MADE GROUND Concrete		1.0	(1.00)	1.00	D		
				1.20	D	18	
MADE GROUND Grey and red brown sandy fine to coarse sub-angular GRAVEL of brick and concrete			1.50	1.50	B		
MADE GROUND Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse sub-rounded to sub-angular brick, concrete and flint		2.0		2.00	D	5	
				2.50	D		
			(2.50)				
		3.0		3.00	D	5	Dry
				3.50	D		
Borehole terminated at 4.00m due to refusal *Base of borehole at 4.00 m*		4.0	4.00	4.00	D	50+	
		5.0					
		6.0					
		7.0					
		8.0					
		9.0					
		10.0					

Ground Level: 66.50m AOL

Grid Reference: 521880, 191366

Borehole Diameter: 150mm

Casing to: 4.00m

Instrumentation: None

Remarks:
1. Method of excavation: Cable percussive rig
2. No groundwater encountered.
3. Logged by Lee Chippington to BS5930 +A2

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
U	Undisturbed Sample
	(No. of blows shown in brackets)
SPT	Standard Penetration Test
CPT	Cone Penetration Test
*	Extrapolated Value
A	Amber
V	Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH1A

Date of Boring: 02/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m Scale	Strata Change: Depth -m Strata	Samples: Depth -m	Samples: Type	SPT CPT N Value	Water Level -m
MADE GROUND Paving slabs with a sand base		0.0	0.20	0.20	B		
MADE GROUND Brown sandy very clayey fine to coarse sub-angular to angular GRAVEL of brick and concrete			0.70	0.70	D		
		1.0		1.20	D	19	
MADE GROUND Grey and brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse sub-rounded to sub-angular brick, concrete and flint				1.50	D		
		2.0		2.00	D	11	
			(3.30)	2.50	D		
		3.0		3.00	D	10	Dry
				3.50	D		
Borehole terminated at 4.00m due to refusal *Base of borehole at 4.00 m*		4.0	4.00	4.00	D	50+	
		5.0					
		6.0					
		7.0					
		8.0					
		9.0					
		10.0					

Ground Level: 66.50m AOL

Grid Reference: 521881, 191364

Borehole Diameter: 150mm

Casing to: 4.00m

Instrumentation: None

Remarks:
1. Method of excavation: Cable percussive rig.
2. No groundwater encountered.
3. Logged by Lee Chippington to BS5930 +A2

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
U	Undisturbed Sample
	(No. of blows shown in brackets)
SPT	Standard Penetration Test
CPT	Cone Penetration Test
*	Extrapolated Value
A	Amber
V	Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH1B

Date of Boring: 05/03/2015

Description of Strata	Strata Change			Samples		SPT CPT N Value	Water Level -m
	Legend	Depth -m		Depth -m	Type		
		Scale	Strata				
LONDON CLAY FORMATION (Contd/..)..Stiff brown slighty sandy CLAY		10.0		10.00	SPT	15	
		11.0		11.00	D		
				11.50	U	(40)	
			(6.50)				
		12.0					
				12.50	D		
		13.0		13.00	SPT	25	
				14.00	D		
		14.0		14.50	U	(53)	
LONDON CLAY FORMATION Stiff grey slightly sandy CLAY		15.0	15.00	14.95	D		
				15.50	B		
		16.0		16.00	SPT	31	
		17.0		17.00	D		
			(5.00)	17.50	U	(76)	
		18.0		17.95	D		
				18.50	D		
		19.0		19.00	SPT	32	
Base of borehole at 20.00 m		20.0					

Ground Level: 66.50m AOL

Grid Reference: 521883, 191362

Borehole Diameter: 150mm

Casing to: 2.00m

Instrumentation: None

Remarks:
1. Method of excavation: Cable percussive rig.
2. Groundwater strike at 4.00m, after 20 mins water level 3.80m.
3. Logged by Lee Chippington to BS5930 +A2

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
U	Undisturbed Sample (No. of blows shown in brackets)
SPT	Standard Penetration Test
CPT	Cone Penetration Test
*	Extrapolated Value
A	Amber
V	Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH2

Date of Boring: 04/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m Scale	Strata Change: Depth -m Strata	Samples: Depth -m	Samples: Type	SPT CPT N Value	Water Level -m
MADE GROUND Block paving on a sand base		0.0	0.20 0.40	0.50	B		
MADE GROUND Concrete		1.0		1.00 1.20	D SPT	14	
MADE GROUND Grey brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse sub-rounded to sub-angular brick, concrete, flint and some chalk and clinker				1.50	D		
		2.0		2.00	SPT	10	
				2.50	D		
		3.0		3.00	SPT	10	
				3.50	D		▼
		4.0		4.00	SPT	50+	▽
			(8.10)	4.50	D		
		5.0		5.00	SPT	35	
				5.50	D		
		6.0		6.00	SPT	27	
				6.50	D		
		7.0		7.00	SPT	9	
				7.50	D		
		8.0		8.00	SPT	11	
			8.50	8.50	B		
LONDON CLAY FORMATION Stiff brown slightly sandy CLAY		9.0		9.00	U	(39)	
				9.45 9.50	D D		
Continued next sheet		10.0					

Ground Level: 66.50m AOL

Grid Reference: 521867, 191226

Borehole Diameter: 150mm

Casing to: 7.50m

Instrumentation: Standpipe installed to 6.00m depth

Remarks:

1. Method of excavation: Cable percussive rig.
2. Groundwater strike at 4.00m. After 20 mins water level 3.50m.
3. Chiselling: 4.00m to 4.30m (30 mins).
4. Logged by Lee Chippington to BS5930 +A2

▽ Water Strike
▼ Water (Standing Level)
W Water Sample
B Bulk Sample
D Small Disturbed Sample
U Undisturbed Sample
(No. of blows shown in brackets)
SPT Standard Penetration Test
CPT Cone Penetration Test
* Extrapolated Value
A Amber
V Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH2

Date of Boring: 04/03/2015

Description of Strata	Strata Change: Legend	Strata Change: Depth -m Scale	Strata Change: Depth -m Strata	Samples: Depth -m	Samples: Type	SPT CPT N Value	Water Level -m
LONDON CLAY FORMATION (Contd/..)..Stiff brown slightly sandy CLAY		10.0	(4.00)	10.00	SPT	22	
		11.0		11.50	SPT	14	
		12.0	12.50	12.50	B		
LONDON CLAY FORMATION Stiff grey slightly sandy CLAY				13.00	SPT	24	
		13.0		14.00	D		
		14.0		14.50	SPT	18	
		15.0		15.50	D		
		16.0	(7.50)	16.00	SPT	29	
		17.0		17.00	D		
		18.0		17.50	SPT	27	
				18.50	D		
		19.0		19.00	SPT	29	
Base of borehole at 20.00 m		20.0					

Ground Level: 66.50m AOL

Grid Reference: 521867, 191226

Borehole Diameter: 150mm

Casing to: 7.50m

Instrumentation: Standpipe installed to 6.00m depth

Remarks:

1.Method of excavation: Cable percussive rig.
2.Groundwater strike at 4.00m. After 20 mins water level 3.50m.
3.Chiselling: 4.00m to 4.30m (30 mins).
4.Logged by Lee Chippington to BS5930 +A2

▽	Water Strike
▼	Water (Standing Level)
W	Water Sample
B	Bulk Sample
D	Small Disturbed Sample
U	Undisturbed Sample
	(No. of blows shown in brackets)
SPT	Standard Penetration Test
CPT	Cone Penetration Test
*	Extrapolated Value
A	Amber
V	Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH3

Date of Boring: 03/03/2015

Description of Strata	Strata Change			Samples		SPT CPT N Value	Water Level -m
	Legend	Depth -m		Depth -m	Type		
		Scale	Strata				
MADE GROUND Concrete		0.0	0.20 0.40	0.40	D		
MADE GROUND Brown and grey coarse angular GRAVEL of brick and concrete sub-base				0.50 0.80	B D		
MADE GROUND Brown and grey slightly gravelly slightly sandy CLAY. Gravel is fine to coarse sub-rounded to sub-angular brick and flint		1.0		1.20	SPT	19	
				1.50	D		
		2.0		2.00	SPT	13	
				2.50	D		
		3.0		3.00	SPT	15	
				3.50	D		
		4.0		4.00	SPT	14	
				4.50	D		
		5.0		5.00	SPT	11	▼ ▽
			(10.10)	5.50	D		
		6.0		6.00	SPT	10	
				6.50	D		
		7.0		7.00	SPT	11	
				7.50	D		
		8.0		8.00	SPT	12	
				8.50	D		
		9.0		9.00	SPT	12	
				9.50	D		
		10.0					

Continued next sheet

Ground Level: 66.80m AOL

Grid Reference: 521796, 191347

Borehole Diameter: 150mm

Casing to: 6.00m

Instrumentation: Standpipe installed to 6.00m depth

Remarks:
1 Method of excavation: Cable percussive rig.
2.Groundwater strike at 5 50m. After 20 mins water level at 5 00m
3 Logged by Lee Chippington to BS5930 +A2.

▽ Water Strike
▼ Water (Standing Level)
W Water Sample
B Bulk Sample
D Small Disturbed Sample
U Undisturbed Sample
(No of blows shown in brackets)
SPT Standard Penetration Test
CPT Cone Penetration Test
* Extrapolated Value
A Amber
V Vial

BOREHOLE LOG

Report No 15.02.014

LOCATION: Pentavia Retail Park, Mill Hill

BOREHOLE NO. BH3

Date of Boring: 03/03/2015

Description of Strata	Strata Change			Samples		SPT CPT N Value	Water Level -m
	Legend	Depth -m		Depth -m	Type		
		Scale	Strata				
MADE GROUND (Contd/..)..Brown and grey slightly gravelly slightly sandy CLAY. Gravel is fine to coarse sub-rounded to sub-angular brick and flint		10.0	10.50	10.00	SPT	11	
				10.50	B		
LONDON CLAY FORMATION Stiff brown slightly sandy CLAY		11.0		11.50	U	(39)	
		12.0		12.50	D		
		13.0	(5.00)	13.00	SPT	20	
		14.0		14.00	D		
				14.50	U	(54)	
		15.0		14.95	D		
LONDON CLAY FORMATION Very stiff grey slightly sandy CLAY			15.50	15.50	B		
		16.0		16.00	SPT	24	
		17.0		17.00	D		
			(4.50)	17.50	U	(69)	
		18.0		17.95	D		
				18.50	D		
		19.0		19.00	SPT	27	
Base of borehole at 20.00 m		20.0					

Ground Level: 66.80m AOL

Grid Reference: 521796, 191347

Borehole Diameter: 150mm

Casing to: 6.00m

Instrumentation: Standpipe installed to 6.00m depth

Remarks:
1. Method of excavation: Cable percussive rig
2. Groundwater strike at 5.50m. After 20 mins water level at 5.00m.
3. Logged by Lee Chippington to BS5930 +A2

▽ Water Strike
▼ Water (Standing Level)
W Water Sample
B Bulk Sample
D Small Disturbed Sample
U Undisturbed Sample
(No. of blows shown in brackets)
SPT Standard Penetration Test
CPT Cone Penetration Test
* Extrapolated Value
A Amber
V Vial

BOREHOLE LOG

Report No 15.02.014

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