Pyotts Hill Entrenchment
Chineham, Hampshire

Topographic Survey

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wessexarchaeology

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Summary

Wessex Archaeology was commissioned by Hampshire County Council to carry out a topographic survey of a 50m length of Pyotts Hill Entrenchment, a park pale designated as a scheduled monument and located near Chineham, Hampshire.

Acknowledgements

Wessex Archaeology would like to thank Hampshire County Council for commissioning the topographic survey, in particular, Neil Adam, Senior Archaeologist at Hampshire County Council.

The survey was undertaken by Vijaya Pieterson, Rebecca Hall and Roberta Marziani, who wrote this report. Illustrations were provided by Vijaya Pieterson and Kitty Foster. The project was managed on behalf of Wessex Archaeology by Damien Campbell-Bell.

Pyotts Hill Entrenchment
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1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Hampshire County Council ('the client') to undertake a topographic survey of a 50m length of the Pyotts Hill Entrenchment, located near Chineham, Hampshire (hereafter 'the Site'). The Site was centred on NGR 466400 154715 (**Figure 1**).

1.1.2 The proposed development comprises the extension of a road, continuing the alignment of Lillymill Chine, eastwards through the scheduled monument at NGR 466400 154715.

1.1.3 All works were undertaken in accordance with a Written Scheme of Investigation (WSI) which detailed the aims, methodologies and standards to be employed in order to undertake the survey (Wessex Archaeology 2017). Neil Adam approved the WSI, on behalf of the Local Planning Authority (LPA), prior to fieldwork commencing.

1.1.4 The topographic survey was undertaken between the 4th and 6th of September, 2017.

1.2 Scope of the Report

1.2.1 The purpose of this report is to provide a detailed description of the results of the topographic survey, to interpret the results and assess whether the aims of the survey have been met.

1.2.2 The presented results will provide further information on the Scheduled Monument that may be impacted by the proposed development and facilitate an informed decision with regard to the requirement for, and methods of, any further archaeological mitigation.

1.3 Location, topography and geology

1.3.1 Pyotts Hill Entrenchment is a linear earthwork representing the remains of a park pale, and is designated for much of its length as a Scheduled Monument (National Heritage List for England (NHLE) List Entry 1001924).

1.3.2 The Site lies on the north-eastern outskirts of Basingstoke. It measures c.1070m² and is located midway along the scheduled area of Pyotts Hill Entrenchment, to the east of Lillymill Chine. The monument extends approximately 650m northwards from the Site towards Petty's Brook, and approximately 800m southwards from Site towards the road known as Barton's Lane.

1.3.3 The Site is covered by an area of dense undergrowth and woodland. The underlying geology is mapped as London Clay (British Geological Survey online viewer).

1.3.4 Existing ground levels are between 78m and 80m AOD, with elevation increasing from north to south.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Archaeological and historical context

2.1.1 Pyotts Park Entrenchment (NHLE List Entry 1001924; Hampshire Historic Environment Record numbers 20410 and 20468) is an approximately 1200m long linear earthwork feature, possibly representing the remains of a section of the Old Basing park pale. The exact date of construction is unknown but it is associated with the medieval period, and it is possible that it has earlier origins and may represent the remains of Anglo-Saxon defensive features.

2.1.2 The monument survives as an embankment measuring between 1m and 3m in height. An associated ditch lies to the west of the bank. The earthwork can still be traced on present-day Ordnance Survey mapping along the northern half on the entrenchment. It would have enclosed an area of approximately 150 hectares.

2.1.3 The earthworks between the Site and Petty's Brook continue to form part of the parish boundary between Chineham and Old Basing and Lychpit.

2.1.4 Earlier remains in the vicinity of the Site include the Chichester to Silchester Roman road. The projected path of the road crosses the entrenchment approximately 30m north of the Site.

2.1.5 Evidence for medieval activity neighbouring the Pyotts Park Entrenchment include the possible site of a hunting lodge at Basing Deer Park, on which the modern Lodge Farm has been built, and a possible medieval settlement located approximately 1km to the south of the Site.

2.1.6 Several buildings c.500m to the east of the Site, in the area of Lodge Farm, have their origins in the post-medieval period; these include Basing Lodge farmhouse and its associated barn. The Old Toll House, located immediately north of Pyotts Park Entrenchment, is a Grade II Listed Building (NHLE List Entry 1092865) of early 19th century date.

3 AIMS AND METHODS

3.1 Project aims

3.1.1 With due regard to the CIfA *Standard and guidance for archaeological field evaluation* (CIfA 2014a), the general aims of the survey, as stated in the WSI (Wessex Archaeology 2017) were to:

- To assist in providing a better understanding of the earthworks,
- To compile a lasting record, to analyse the findings/record and then disseminate the results.

3.1.2 Following consideration of the archaeological potential, specific research aims were also defined in the WSI. These were to:

- To conduct a topographic survey, collecting as much data within the Site as possible, allowing for current site conditions,

- To record the remaining extents of Pyotts Hill Entrenchment (NHLE List Entry 1001924) located within the Site,

- To produce a topographic plan, showing 0.25m contours, tree location, limits of vegetation (where practical) and any interpretive detail, and profiles of the entrenchment.

3.2 Methodology

Introduction

3.2.1 All works were undertaken in accordance with the detailed methodology set out within the WSI (Wessex Archaeology 2017) and in general compliance with the standards outlined in CIfA (CIfA 2014a) and Historic England (Historic England 2015) guidance. The methods employed are summarised below.

Survey Methods

3.2.2 The topographic survey was recorded using a Leica ScanStation P40 Laser Scanner. The Leica P40 has a maximum range of 270 m, a ranging error of ±1.2 mm and a ranging noise of 0.4mm at 10m. It uses an eye safe class 1 laser and an inbuilt camera which can produce colour images of up to 700 megapixels, when the scanner's full field of view is scanned.

3.2.3 Survey control was established using a Leica Viva NetRover Global Navigation Satellite System. Five control points (STN 1 to 5) were set out on the kerb adjacent to Lillymill Chine road. To record these control points, 100 RTK position readings were measured and then averaged, achieving a three-dimensional accuracy below 25 mm.

3.2.4 Using the control network, some of the laser scan targets and a profile were surveyed using a Leica Viva TS15 Total Station. Afterwards, these points were used to geo-reference the laser scan data.

3.2.5 As initially defined in the WSI (Wessex Archaeology 2017), a total of 200 scans were to be recorded of both sides of the embankment, while keeping the scanner behind the timber fence and treeline. After a re-assessment of the methodology on site, it was decided that most of the scans could instead be recorded inside the fence line. This method produced a more comprehensive data set of the Site, as scans were recorded near and around the embankment where the vegetation is less dense.

3.2.6 Using the revised methodology, a total of 48 scans were produced with a resolution of 12.5 mm at 10 m. No colour data was captured as photographic information would have not added any useful details to the data set and would have only made the files considerably larger.

3.2.7 A network of 41 paper and temporary targets were used on site to register the scans. The paper targets were 6" in diameter and made up of matte paper while the temporary targets consisted of 4.5" circular twist and turn boards set up on tripods. A total of 19 paper targets were placed along the timber fence line on the west side of the embankment, 15 paper targets were placed on the trees on top and on the side of the embankment and 7 temporary targets were set on top of the embankment.

Laser scan and data processing

3.2.8 The scans were registered using Cyclone software (Cyclone version 9.1). Four main registrations were created: Scanworld Day 3-1 (partial number of scans from day 3), Scanworld Day 3-2 (the remaining scans from Day 3), Scanworld Final 1 (Day 1 and scan

27) and Scanworld Final 2 (Final 1 and Day 2 combined). The combined registration (all Scanworlds combined) has a Mean Absolute Error (MAE) of 0.000 m with disabled constraints and a MAE of 0.006 m with enabled constraints.

Table 1 Registration Results

Registrations	Mean Absolute Error (MAE) for Enabled Constraints	Mean Absolute Error (MAE) for Disabled Constraints
Scanworld Day 3- 1	0.002m	0.000m
Scanworld Day 3- 2	0.000m	0.000m
Scanworld Final 1	0.003m	0.061m
Scanworld Final 2	0.000m	0.000m
Scanworld Combined	0.006m	0.000m

3.2.9 An initial clean-up of the point cloud was carried out in Cyclone, where most of the vegetation and surrounding buildings were removed.

3.2.10 The unified point cloud was exported as one XYZ file. The point cloud in this file contains 108,252,393 points and was geo-referenced in OSGB36(15) using the coordinates recorded with the Total Station for targets T10, T12 and T14.

3.2.11 Subsequently, the point cloud was imported in Cloud Compare, sub-sampled at 0.01m and rasterised using minimum height values. By doing so, another and more simplified point cloud was exported from the raster file. At this stage, most of the noise was removed resulting in a clean profile of both embankment and ditch.

3.3 Outputs

3.3.1 The data was imported in: ArcGIS (version 10.5) to produce a 0.25m contour plan (Fig.2) and in AutoCAD 2011 to extract profiles (Fig.3) and create a detail plan (Fig.4) and perspective views of the rasterised point cloud (Fig.5).

3.3.2 Previous survey work by Siteline (3248_LEoB_Mode_Complete_020317I.pdf, Siteline, 2016) was also added to the auto-Cad drawing to show location of vegetation and tree canopies.

4 TOPOGRAPHIC SURVEY RESULTS

4.1 Introduction

4.1.1 The topographic survey of the Pyotts Hill Entrenchment extends for 65 m with central point at the end of Lillymill Chine road (NGR 466380, 154718) and 25 m northwards and 40 m southwards from this point. The area of investigation is approximately 26m wide and includes the area at east of the embankment.

4.2 Results

4.2.1 The embankment is oriented north-north east/south-south-west with a ditch running along its west side. The top of the embankment is roughly flat and measures from a maximum of 2.5m to a minimum of 2m width (**Figure 3**). The highest level recorded on top of the bank is approximately 81 m AOD and it is located at the southernmost part of investigation area.

The bank shows a height of approximately 1.4m relative to ground level on the west side and a height of less than 1m relative to the ground level on the east side.

4.2.2 The average depth of the west ditch is approximately 0.80m measured relative to the ground level on its west side (**Figure 4**). The lowest point that was recorded at the bottom of the ditch is approximately 76.90m AOD and it is located at northernmost part of investigation area. The slope of the ditch from its base to the top of the embankment is 21 degrees.

4.2.3 There is noticeable change of height between the ground level to the east side of the bank (79.47 m AOD) and to the west (78.51 m AOD) (**Figure 4**).

4.3 Interpretation

4.3.1 The point cloud suggests possible deposits sliding down in the ditch from the top of the bank as natural consequence of erosion occurring overtime to this type of feature (**Figure 5**).

4.3.2 In a similar way, the occurrence of a silting process that has almost filled up the ditch is also very clear in this profile. It is safe to assume that a mixture of erosion from the bank and silting has contributed to its gradual filling, although not in full.

4.3.3 The profiles in **Figures 4** and the perspective views in **Figure 5** show a concave dip located east of the embankment. This suggests the presence of a possible second ditch on the east side of the embankment.

5 CONCLUSIONS

5.1 Summary

5.1.1 The topographic survey of the Pyotts Hill Entrenchment has revealed a clean profile of the embankment and the ditch on its west side. In addition, it highlights the presence of a second ditch on the east side.

5.2 Discussion

5.2.1 The possible ditch located east of the embankment could represent a feature associated with the former deer park boundary. Deer parks were areas of land, usually enclosed with a park pale, a large fence located on a bank with an internal ditch. The internal ditch to the Pyotts Hill park boundary would have been located on the east side of the embankment.

5.2.2 Unfortunately, the topographic survey has not revealed the possible presence of a park pale on top of the bank. The presence of thick vegetation might have obliterated any signs of paling. Further investigations might be able to shed light on the possible presence of a palisade.

5.2.3 The western ditch, which is still very identifiable in the topographical survey, shows different grades of silting and deposits formed through the erosion of the west side of the embankment. It is the best-preserved feature associated with the embankment, and may suggest a different phase of occupation, either earlier or later to the deer park. Only further investigation will be able to characterise these features with more accuracy.

6 ARCHIVE STORAGE AND CURATION

6.1 Preparation of the archive

6.1.1 An ordered and integrated site archive will be prepared in accordance with the document: Management of Research Projects in the Historic Environment (MoRPHE) (English Heritage 2015a) upon completion of the project.

6.2 Security Copy

6.2.1 In line with current best practice (e.g., Brown 2011), on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

6.3 OASIS

6.3.1 An OASIS online record (http://oasis.ac.uk/pages/wiki/Main) has been initiated, and key fields completed on Details, Location and Creators Forms. All appropriate parts of the OASIS online form will be completed for submission, and will include an uploaded .pdf version of the final report. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service ArchSearch catalogue.

7 COPYRIGHT

7.1 Archive and report copyright

7.1.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the Copyright, Designs and Patents Act 1988 with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use shall be non-profitmaking, and conforms to the Copyright and Related Rights Regulations 2003. In some instances, certain regional museums may require absolute transfer of copyright, rather than a licence.

7.1.2 Information relating to the project will be deposited with the HER where it can be freely copied without reference to Wessex Archaeology for the purposes of archaeological research or Development Control within the planning process.

7.2 Third party data copyright

7.2.1 This document and the project archive may contain material that is non-Wessex Archaeology copyright (e.g., Ordnance Survey, British Geological Survey, Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the Copyright, Designs and Patents Act 1988 with regard to multiple copying and electronic dissemination of such material.

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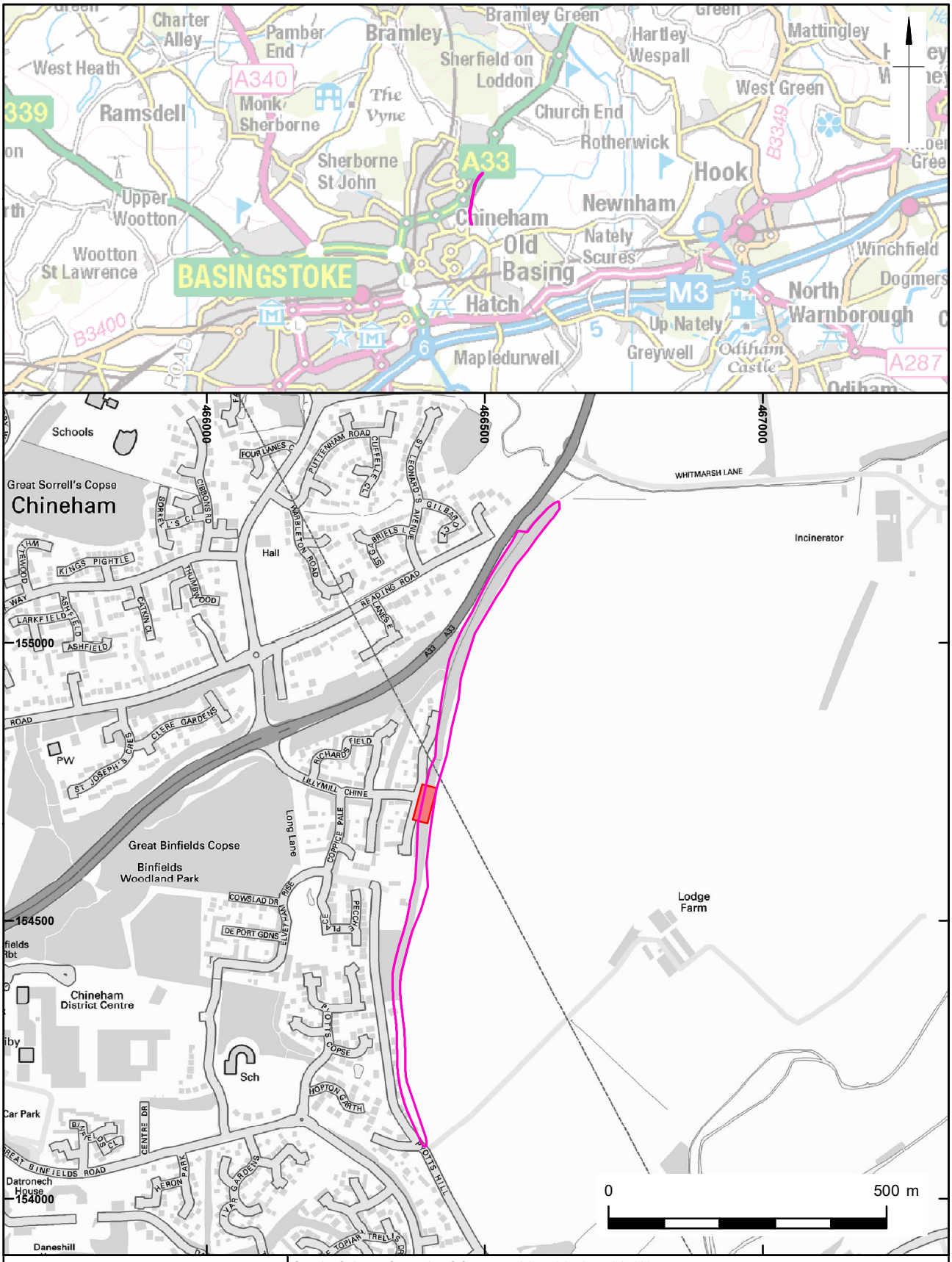

Survey area

Extent of Pyotts Hill entrenchment Scheduled Monument

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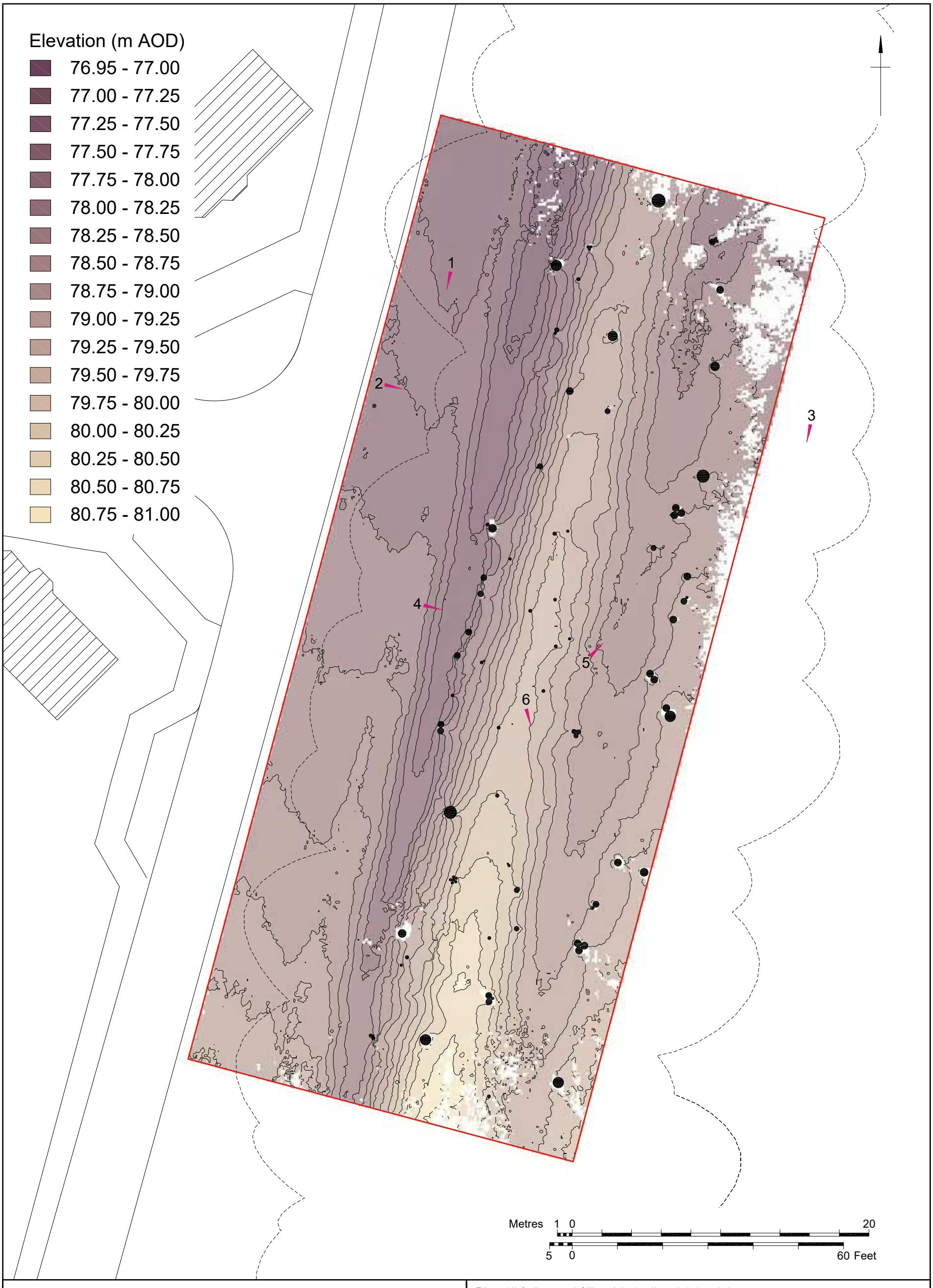
Site location plan

Figure 1



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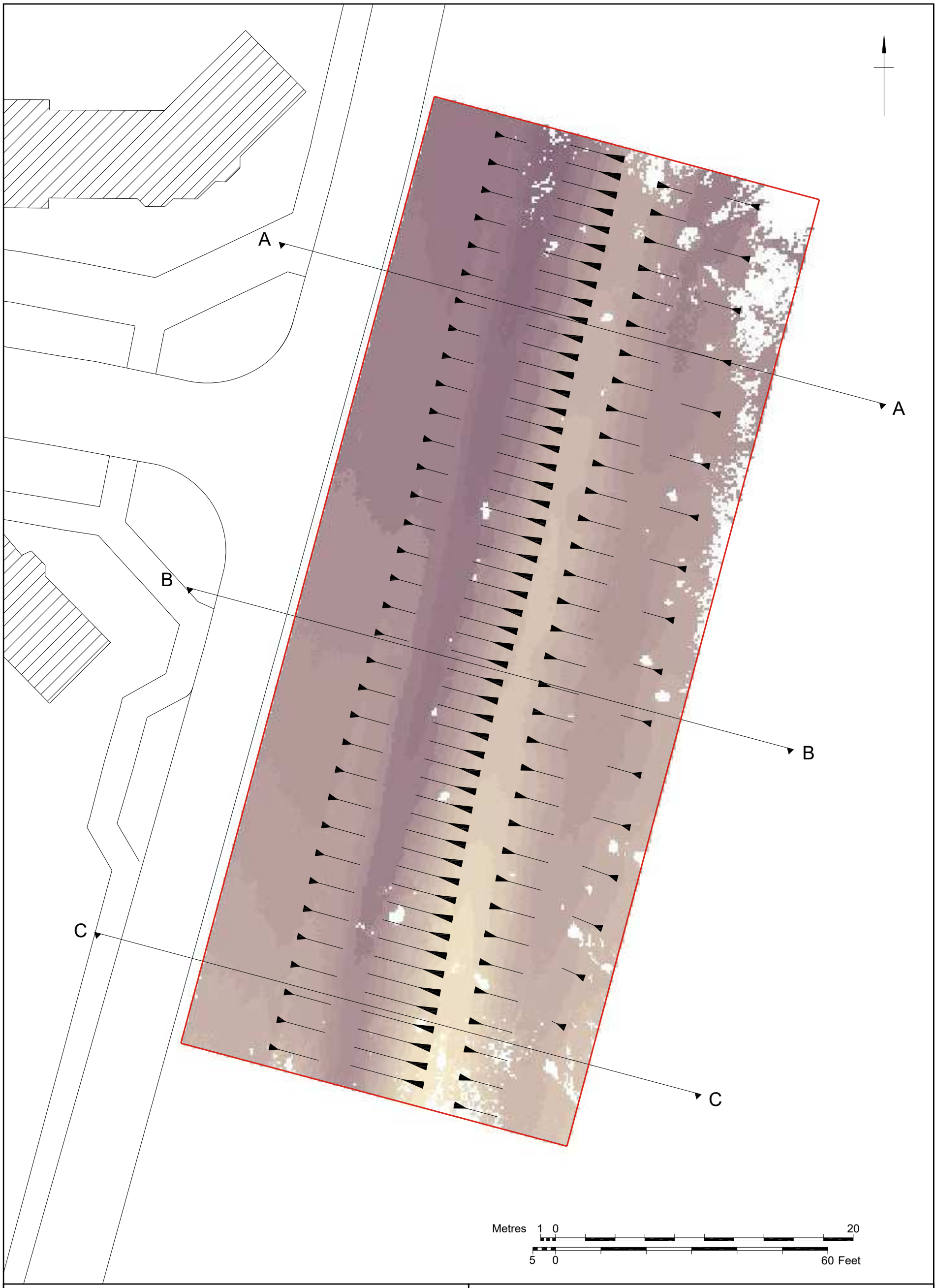
Topographic plan of showing tree locations and canopy extents

Figure 2



Site boundary

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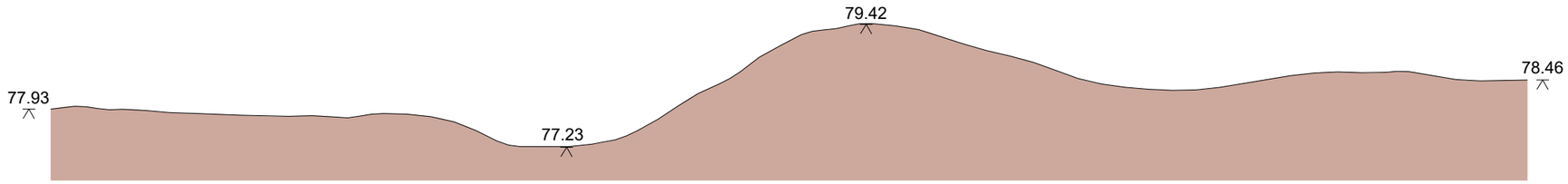
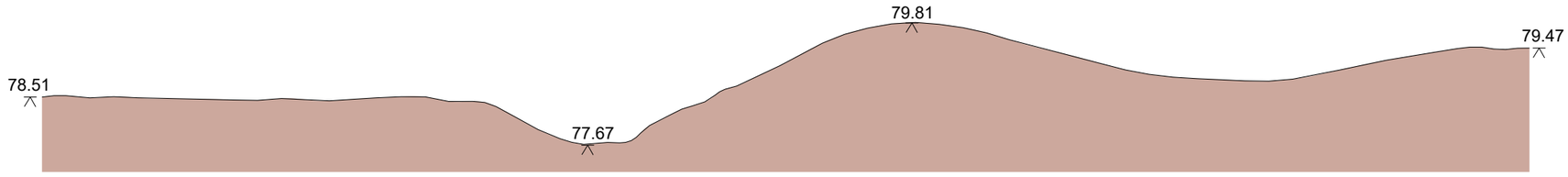
Topographic plan showing changes in slope

Figure 3



Profile A



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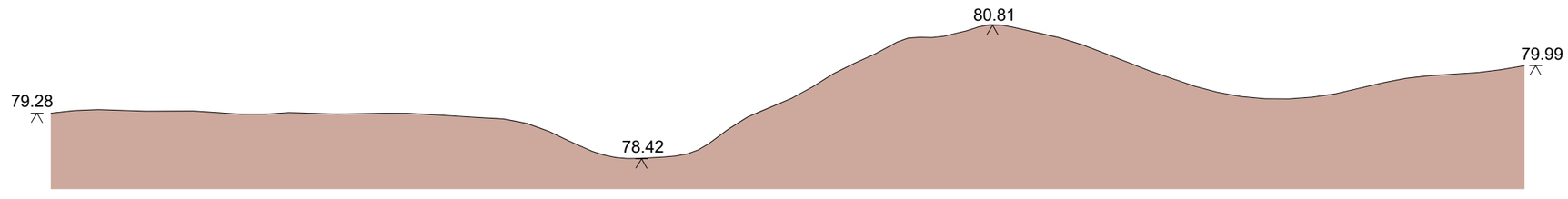

Profile C

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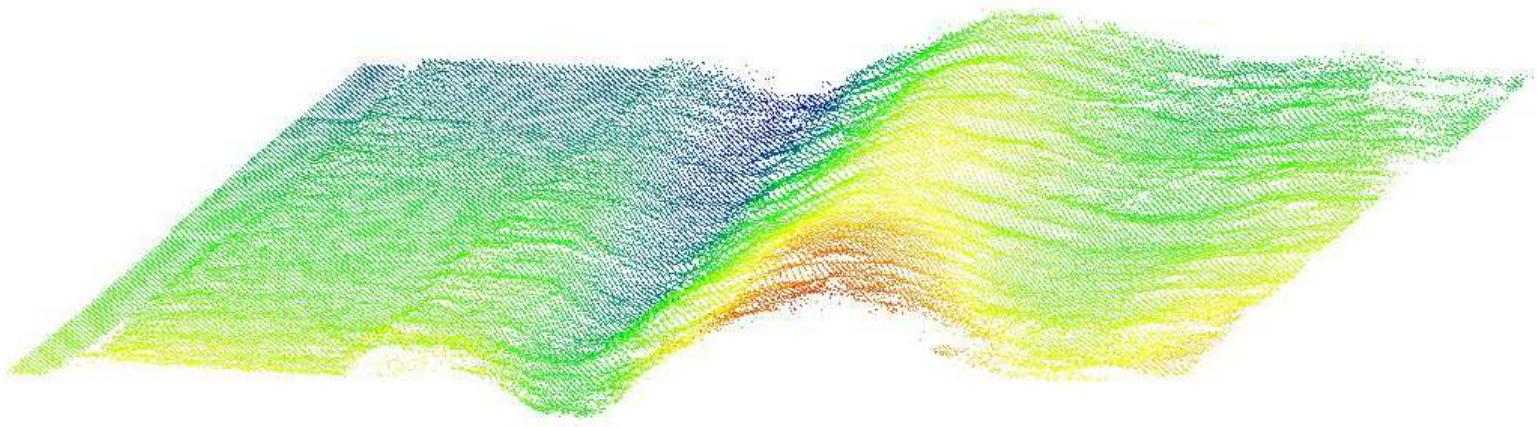
Profiles across the north, centre and south of the Site. All levels in metres above Ordnance Datum.

Figure 4



View from the south showing the composite point cloud

Detailed view showing the west side of the embankment meeting the west ditch, from the south-west

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Composite point cloud perspective views scalar field value

Figure 5

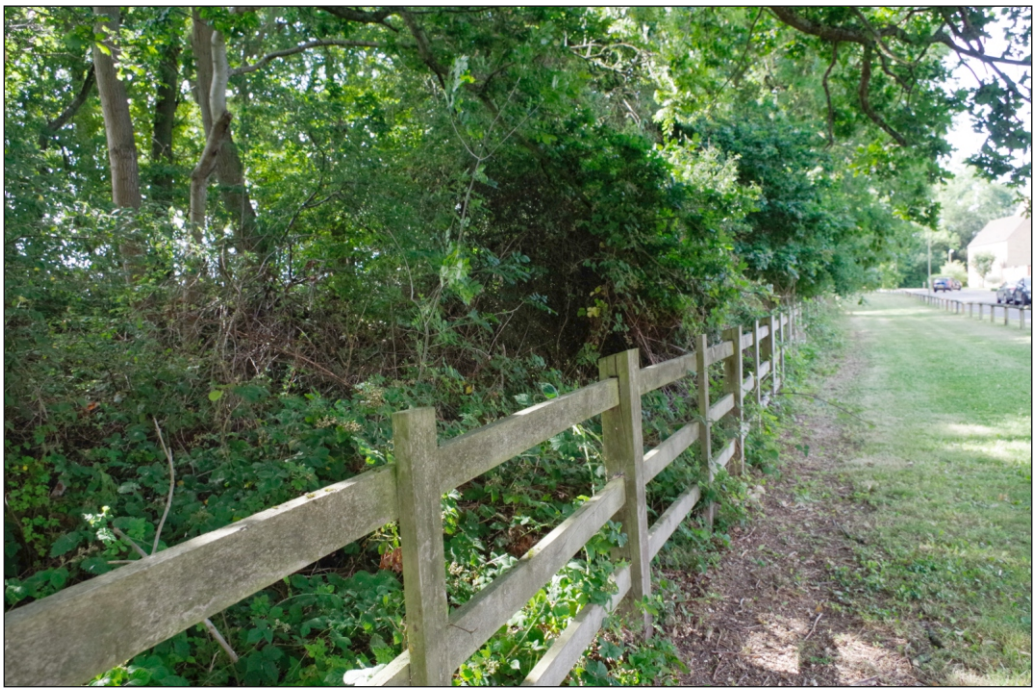

Plate 1: South-west facing view along the western Site boundary

Plate 2: View of the western Site boundary, from the north-west

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Plate 3: South-west facing view along the eastern Site boundary

Plate 4: View of the central section of the embankment and west ditch from the western Site boundary

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Plate 5: View from the central section of the embankment showing the east ditch and eastern Site boundary

Plate 6: South-east facing view across the central section of the east ditch showing targets 13, 15, 37 and 18

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