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STORY HOMES

LAND EAST OF CARLETON, PENRITH, CUMBRIA

**ARCHAEOLOGICAL DESK BASED ASSESSMENT
AND GEOPHYSICAL SURVEY**

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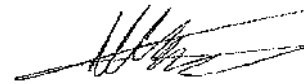
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PREPARED BY:

Cat Peters Researcher



Martin Railton Senior Project Manager



APPROVED BY:

Frank Giecco Technical Director



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SUMMARY

Wardell Armstrong Archaeology was invited by Story Homes to undertake an archaeological desk-based assessment and geophysical survey on land east of Carleton, Penrith, Cumbria (NGR NY 53132 29682).

The desk-based assessment and geophysical survey was undertaken in September 2015 to provide a deeper knowledge and understanding of the archaeological potential of the land at Carleton, prior to development.

The objective of the geophysical survey was to determine the presence/absence, nature and extent of potential archaeological features within the study area, and the presence/absence of any known modern features within the survey area, which may affect the results. Geomagnetic survey was undertaken over the majority of the study area, which comprised a single arable field at the time of the survey.

The desk-based research has found that the proposed development site remained in the agricultural hinterland of Carleton throughout the post-medieval period, incorporating two fields, the southern part utilised as a nursery from at least the late 19th century, with related features gradually encroaching into the site until it was finally cleared and given its present layout between 1971 and 1987. The potential for earlier features surviving was also identified, in the form of possible prehistoric or Roman remains, particularly as a scheduled Roman site exists to the south-east, a road from which is thought to pass through the proposed development site. The potential for medieval remains should also not be ruled out.

The geophysical survey was conducted over the majority of the proposed development area. Most of the geophysical anomalies detected were interpreted as post-medieval agricultural features, including plough furrows, a former trackway and garden/allotment boundaries, which are depicted on 20th century Ordnance Survey maps. A modern service pipe was also detected. These are not considered to be of significance or further interest.

No new archaeological information was detected by the geophysical survey, and no evidence was detected for the Roman road, the projected route of which is believed to have crossed the corner of proposed development area. Despite the largely negative results of the geophysical survey, any proposed development on the site will indirectly impact on the setting of listed heritage assets in the area.

ACKNOWLEDGEMENTS

Wardell Armstrong Archaeology thank Story Homes for commissioning the project, and for all assistance throughout the work. Wardell Armstrong Archaeology also thank Mark Brennand at Cumbria County Council, for providing the HER data, and for all assistance throughout the project. Thanks also go to staff at the Cumbria Archive Centres at Kendal and Carlisle.

The archaeological desk-based assessment was undertaken by Cat Peters. The geophysical survey was undertaken by Clara Dickinson and Steven Chetwynd. The report was written by Cat Peters and Martin Railton with the figures produced by Adrian Bailey. The project was managed by Martin Railton, Senior Project Manager for Wardell Armstrong Archaeology (WAA). The report was edited by Richard Newman, Post-Excavation Manager for WAA.

1 INTRODUCTION

1.1 Circumstances of the Project

1.1.1 Wardell Armstrong Archaeology was invited by Story Homes to undertake a rapid archaeological desk-based assessment and geophysical survey on land east of Carleton, Penrith, Cumbria (NGR NY 53132 29682; Figure 1). The work was undertaken in order to inform a planning application for a proposed residential development at the site. This is in line with government advice as set out in Section 12 of the National Planning Policy Framework (NPPF 2012).

1.1.2 This report outlines the results of the desk-based research and geophysical survey.

2 METHODOLOGY

2.1 Standards

2.1.1 The desk-based assessment was undertaken following *Standard and Guidance for Historic Environment Desk-Based Assessments* (CIfA 2014a).

2.1.2 The survey work was consistent with Historic England guidelines (English Heritage 2008), and undertaken in accordance with *Standard and Guidance for Archaeological Geophysical Survey* (CIfA 2014b).

2.2 Desk-based Assessment

2.2.1 Prior to the commencement of the geophysical survey, a rapid desk-based assessment was undertaken in order to provide historical information relating to the site at Carleton, and its immediate environs. The assessment primarily involved the consultation of the Historic Environment Record (HER) a database of local heritage assets held by Cumbria County Council for the search area, a 500m radius area centred on the centre of the proposed development site.

2.2.2 Following the consultation of the HER, historical mapping and documentary sources were assessed for any additional information on the landscape around the Carleton area of Penrith.

2.3 The Geophysical Survey

2.3.1 **Technique Selection:** geomagnetic survey was selected as the most appropriate technique, given the non-igneous environment, and the expected presence of cut archaeological features at depths of no more than 1.5m. This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features. Data were recorded by the instruments and downloaded into a laptop computer for initial data processing in the field using specialist software.

2.3.2 **Field Methods:** the geophysical study area measured c.3.32ha in total, and was located within a single field of arable a land. A 30m grid was established across this area and tied-in to known Ordnance Survey points Total Station Theodolite.

2.3.3 Geomagnetic measurements were determined using a Bartington Grad601-2 dual gradiometer system, with twin sensors set 1m apart. It was expected that significant

archaeological features at a depth of up to 1.5m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m was used, with a traverse interval of 1m, providing 3600 sample measurements per grid unit, with measurements being recorded at the centre of each grid cell. The data were downloaded on site into a laptop computer for processing and storage.

2.3.4 Data Processing: geophysical survey data were processed using Terra Surveyor software, which was used to produce 'grey-scale' images of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.

2.3.5 Raw data were processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

- *Despike*: to locate and suppress random iron spikes in the gradiometer data (despike was performed on all survey grids using a window of 11x3 and threshold of 2.0).
- *Destripe*: to reduce the effect of striping in the gradiometer data, sometimes caused by misalignment of the twin sensors (zero mean traverse was performed on all survey grids using a threshold of 2 standard deviations).
- *Destagger*: to reduce location inaccuracies in the gradiometer data, sometimes caused by operator error (destagger applied in both x directions by -2 readings).
- *Clip*: to clip data to specified maximum and minimum values, in order to limit large noise spikes in the geophysical data (clipped from -3nT to 3nT).
- *Interpolate*: to match the resolution of the sample intervals in the x and y directions (doubled in the y direction).

2.3.6 Interpretation: four types of geophysical anomaly were detected in the gradiometer data:

- *positive magnetic*: regions of anomalously high or positive magnetic data, which may be associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches.
- *dipolar magnetic*: regions of paired positive and negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, or fired structures, such as kilns or hearths.

- *bipolar magnetic*: typically linear anomalies comprising alternating positive and negative magnetic responses, representing buried metallic structures or service pipes.
- *magnetic disturbance*: areas of high amplitude magnetic disturbance or interference, which may be associated with the presence of modern structures, such as services, fences or buildings.

2.3.7 **Presentation:** the grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey figures. A colour-coded geophysical interpretation diagram is provided, showing the locations and extent of positive, dipolar and bipolar magnetic anomalies, and areas of magnetic disturbance. An archaeological interpretation diagram is also provided, which is based on the interpretation of the geophysical survey results in light of the archaeological and historical context of the site.

2.3.8 An X-Y plot of the raw unprocessed data is included in Appendix 2, which is clipped for display purposes only from -5nT to 5nT.

2.4 The Archive

2.4.1 The data archive for the geophysical survey has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2013). This archive is held at the company offices at Carlisle, Cumbria. The archive comprises a compressed (zipped) file folder, containing the geophysics data, documentation (metadata), and other project material (report and field notes).

2.4.2 Wardell Armstrong Archaeology and Cumbria County Council support the **Online Access to the Index of Archaeological Investigations (OASIS)** project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by Wardell Armstrong Archaeology, as a part of this national project. The OASIS reference for the project is **wardella2-223732**.

3 BACKGROUND

3.1 Location and Geological Context

3.1.1 Carleton is located approximately 2km east of the centre of the market town of Penrith (Figure 1). The proposed development site lies within agricultural land to the east of the crossroads at the historic centre of Carleton, to the east of the Cross Keys Inn Public House and west of Frenchfield Farm, accessed from a road to the south which leads to the Frenchfield playing fields (Figure 2).

3.1.2 The superficial geology of the area consists of Devension till and the bedrock geology comprises sandstone of the Penrith Sandstone Formation (British Geological Survey website <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>).

3.2 Archaeological Desk-Based Assessment

3.2.1 **Introduction:** this historical background is compiled mostly from secondary sources, and from records held in the Historic Environment Record. Asset numbers refer to the gazetteer in Appendix 1, summarizing specific heritage assets within the study area. Other references refer to original documents, held at Cumbria Archive Centre, Carlisle (CAC(C)).

3.2.2 **Prehistoric (up to c. AD 72):** the only evidence for activity from the prehistoric era from within the search area comes from the find of a Neolithic flint arrowhead in 1977 in rubble on a building site (Asset 2). In addition, archaeological work undertaken at Frenchfield in 2007 to the east of the proposed development site found a flint tool, a possible blade, used later as a scraper (Sowerby and Gaskell 2007, 26).

3.2.3 **Roman (c. AD 72 – c. 410):** one find of Roman date has been found within the search area, comprising a bow brooch, at French Field Farm in 1998 (Asset 6). More significantly, a Roman road and settlement are known from the study area (Assets 1 and 3). Cropmarks of the settlement and line of the Roman road were visible at Frenchfield. A series of archaeological investigations on the scheduled settlement site confirmed substantial Roman occupation both in a ribbon development along the road and in the form of a vicus (Asset 1). The road is known to have led from this Roman complex, north-westwards along the modern route of the A6 (Asset 3), though its precise location in the vicinity of the proposed development site is not known. It has not been found in previous works on adjacent land to the east (Railton 2012).

- 3.2.4 **Early Medieval (c. 410 – 1066):** the name Carleton, may derive from ‘*ton*’ from the Old English or Old Norse word ‘*tun*’, meaning farm (Wooler 2012, 13). This may suggest there was some kind of settlement at Carleton in the early medieval period.
- 3.2.5 **Medieval (1066 – 1540):** there is documentary evidence for a settlement of some kind by the early 14th century, when “*Edward I gave to Robert de Clifford the hamlet of Carleton, its mills and rents*” (Graham 1923, 60, quoted in Wooler 2012, 14). It is possible that the earlier Roman road was utilised during this period (Asset 3).
- 3.2.6 **Post-Medieval (1540 – 1900):** Thomas Denton in the late 17th century, stated that “*Carleton, or the Carles’ town, lyes upon Eymont below the bridge, which was parcel of the honour of Penreth and lyes within the parish, and was holden of the earles of Westmorland in villenage until it came to Robert Lord Clifford*” (quoted in Winchester 2003, 319-320). There seems to have been a property at the location of Carleton Hall since at least the end of the 16th century, as depicted on Saxton’s map of 1576 (Wooler 2012, 18). The present Carleton Hall dates to the early 18th century, as does Carleton Hall farmhouse which is grade II* listed (Asset 11).
- 3.2.7 It is likely that at least the southern part of the proposed development site was part of the land associated with Carleton Hall, since it was owned by the Carleton family, and then the Carleton-Cowper family and the tithe award text (CAC(C) DRC 8/150) indicates that the land was owned by John Cowper in 1849 (Figure 6). Unfortunately, sales records of the estate dating to 1825 and 1947 did not include plans (CAC(C) DBS 6/1/312 and CAC(C) DB 74/3/2/1226). It is likely that the area remained in use as agricultural ground throughout the post medieval period, William Hutchinson, in the late 18th century, noting that the land round Carleton was “*tillage, and turnip land*” (Hutchinson 1797, 321, quoted in Wooler 2012, 18), and Clarke’s map of Penrith of 1787 shows the land as a field by this date (Figure 5). Clarke’s map also suggests that the properties in and around the proposed development site were descended from medieval tofts and crofts, with the crofts to the rear having reversed s-shaped boundaries. This suggests that they were either taken out of a commonfield system or were formed at the same time as the strips of the field were laid out (R. Newman pers. comm).
- 3.2.8 Carleton seems to have been a small settlement until the 19th century, as in 1829, it was described as “*a hamlet and constablewick, one mile south by east of Penrith*” (Parson and White 1829, 503). The Cross Keys was listed at this date, occupied by

Henry Briscoe; it dates to the 18th century (Asset 12). A possible school, Candia, a grade II listed building dates to the mid 19th century (Asset 13). Frenchfield Farm (Assets 14 and 15), to the east of the proposed development site, dates to the mid 19th century, but a farm existed there prior (Wooler 2012, 19), on the opposite side of the road, as depicted in Clarke's Map of 1787 (Figure 5).

3.2.9 Further evidence for activity from the search areas comes from the discovery of a circular lead spindle-whorl found in a field at Carleton in 1985, and, though difficult to date accurately, dates to the post medieval period (Asset 5). Post medieval river dykes, which lie between the rivers Eamont and Lowther, also survive within the search area (Asset 4).

3.2.10 **Modern (1900 – present):** recent housing developments have occurred to the immediate west of the proposed development, and in the wider Carleton area.

3.3 Map Regression

3.3.1 Although some plans have been mentioned in the historic outline above, this section will ascertain the developments within the proposed development site, noted from cartographic sources.

3.3.2 **Hodkinson and Donald's Plan of Penrith, 1774 (Figure 4):** Hodkinson and Donald's map shows the main road east of Carleton Hall, and the hamlet annotated with 'Carlton'. 'French Field' is also in existence by this date, with the rest of the buildings confined to the road side. No features are shown within the proposed development site.

3.3.3 **Clarke's Map of the Town of Penrith, 1787 (Figure 5):** this plan is the earliest encountered by the research to show the study area in detail. It clearly shows the crossroads at Carleton, 'Carleton Hall' to the south-west, and buildings lining the eastern side of the main road heading to 'Edenhall'. 'Frenchfield' is depicted to the south-east on the southern side of the road, with 'Wm Raincock Esqr.' written beneath. The land behind the buildings fronting the 'Road to Edenhall' are depicted as narrow north-west south-east strips, probably crofts suggesting a medieval origin. The proposed development site covers parts of two of these crofts, indicating that a boundary once ran across the proposed development site (Asset 7).

3.3.4 **Tithe Award Plan for Penrith, 1849 (Figure 6):** at some time between 1787 and 1849, the farm of French Field was reconfigured, as on the tithe award plan it is shown on

the north side of the road, with a track leading to it, and the fields in the vicinity were modified as a result. Between these dates, additional buildings were also constructed on the east side of the main road to the west of the proposed development site, and some of the former areas of the fields shown on Clarke's map (Figure 5) had been allocated into smaller spaces, presumably as gardens for the buildings on the street frontage. The proposed development site itself remained relatively unaltered, and covers parts of plots '1212' and '1218', the former field boundary surviving into the mid 19th century (Asset 7). The accompanying tithe award text shows 1212 as owned by 'John Cowper', occupied by 'John Robinson', and used as 'Arable', and 1218 as owned by 'William, Earl of Lonsdale', tenanted by 'Thomas Friar's Trustees' and used as 'Arable'. Plot 1218 has the same owner and occupier as the building to the north-west, in plot 1217.

- 3.3.5 **First Edition Ordnance Survey Mapping, 25 inch to the mile, 1860 (Figure 7):** by at least 1860, and the production of the First Edition Ordnance Survey map, a track existed (Asset 8) running to the south of, and parallel to, the field boundary (Asset 7) running across the proposed development site. This leads from the area to the west, perhaps in use as gardens or nurseries.
- 3.3.6 **Second Edition Ordnance Survey Mapping, 25 inch to the mile, 1900 (Figure 8):** the track formerly noted (Asset 8; confer 3.2.5) is no longer shown on the Second Edition Ordnance Survey map, though a replacement is depicted running parallel to the southern boundary of the proposed development site and turning to run parallel with the eastern boundary (Asset 9). Glasshouses are depicted on the land to the west, further suggesting that the southern part of the proposed development site was a nursery by the late 19th century. The northern part of the proposed development site by this date had a footpath running south-west to north-east across it (Asset 10).
- 3.3.7 **Third Edition Ordnance Survey Mapping, 25 inch to the mile, 1925 (Figure 9):** a similar layout is retained on the 1925 map, though the former track (Asset 8) parallel with the field boundary (Asset 7) had been reintroduced. In addition, straight-lined features, perhaps trenches or walls, dividing up areas of the southern area of the proposed development are also depicted. The number of glasshouses shown to the west indicates that the nursery developed and extended in the early 20th century. The northern part of the proposed development site had remained unchanged, though to

the immediate west, one of the buildings fronting the main road was in 1925, a 'Reading Room'.

- 3.3.8 1968 Ordnance Survey Mapping, 1:2500 (Figure 10):** at some time between 1925 and 1968, the former footpath had gone out of use (Asset 10). The area to the west of the southern part of the proposed development site is annotated 'Nurseries', and further straight-lined features are depicted, suggesting further extensions to the nursery areas. In addition, a glass house towards the western boundary, and a small rectangular building, towards the southern boundary, had been constructed. A dwelling, annotated 'Carleton Brow' is depicted to the south-east of the proposed development site.
- 3.3.9 1971 Ordnance Survey Mapping, 1:2500 (Figure 11):** the 1971 Ordnance Survey map shows the same layout for the proposed development site as the 1968 Ordnance Survey map (Figure 10).
- 3.3.9 1987 Ordnance Survey Mapping, 1:2500 (Figure 12):** at some time between 1971 and 1986, the former nursery had ceased business, as none of the associated features are depicted on the 1987 Ordnance Survey map. An aerial photograph viewed at Cumbria County Council's Historic Environment Record Office in Kendal showed the site on 9th September 1986 (AP NY52NW NY5329.S CCC 2711, 14), with some of the structures at the far western extent of the southern geophysical area surviving, along with the rectangular building at the southern boundary and a field entrance from the southern boundary from the road. No other features were shown. On the 1987 map, only the rectangular building is still depicted at the southern boundary of the proposed development site, and even the former field boundary, shown on Clarke's map of 1787 (Asset 7) had been removed. Two dwellings had been built to the immediate west, on the former nursery ground, annotated 'Three Gables' and 'Shennandoah'. The geophysical area in 1987 consisted of one area of ground, as was the case at the time of the survey.

3.4 Previous Work

- 3.3.1** Several previous archaeological investigations have been undertaken in the vicinity. A programme of archaeological work consisting of a geophysical survey, evaluation and watching brief was undertaken in advance of a proposed development between the A66 and Frenchfield Farm. No definite proof of prehistoric occupation was found, although the geophysical survey found evidence of ditches which may have been pre-

Roman in date. The preservation of Roman deposits adjacent to the Roman road was found to be excellent. The stratigraphy was generally well-preserved and in places was up to 0.5m deep. The Roman road was observed to lie at depths of c.0.15m below the present surface, but other features lay deeper. Away from the line of the road, however, much of the site was archaeological sterile. It was noted that the Roman road had at least three major phases of metaling. Settlement in this area consisted largely of ribbon development along the main road, which appeared to intensify southwards. This settlement was doubtless an extension of a vicus focused on the fort. Although occupation was confined largely to the street frontages, the watching brief demonstrated that isolated areas of intensive Roman activity also occurred away from the road. The limited ceramic evidence suggested that the settlement may have been in decline by the late 3rd century AD. Although a small amount of 4th century pottery was present, the complete absence of common late 3rd and 4th century coin types reinforced that view. Later activity in the main excavated area comprised two parallel linear features cutting across the Roman road and other remains. Only one was excavated and this proved to be a stone-lined culvert, probably of late 18th or early 19th century date (HER Ref: 3/01/316).

- 3.3.2 A magnetic and resistance geophysical survey was undertaken prior to the development of land at Frenchfields where a series of cropmarks had been identified. The surveys found the majority of anomalies recorded were of geological or pedological [study of soils] in origin, although a number of possible archaeological, linear cut features including potential drainage ditches were also found (HER Ref: 3/06/1544).
- 3.3.3 A desk-based assessment and evaluation was undertaken in 2007, prior to a proposed football stadium, car parking and access road. Twelve evaluation trenches were excavated. The known unclassified cropmark was found to be silted-up water courses of natural origin. In one trench the remains of raised surfaces consisting of redeposited clay was found, together with an area of large cobbles which may have been a wall or foundations, and industrial waste material. This evidence was interpreted as a possible area used for processing, such as metal smithing. Five sherds belonging to one Samian vessel were found within the redeposited clay, as well as a possible fragment of Roman brick. In the same trench a piece of worked flint contained within organic material suggestive of bedding or flooring may indicate prior use of the site. Further work was proposed (HER Ref: 3/07/1840; Sowerby and Gaskell 2007).

- 3.3.4 Following the desk-based assessment and field evaluation, North Pennines Archaeology Ltd undertook the excavation of an area measuring 25m by 40m at Frenchfields, in advance of the construction of a new football stadium and access road. The Frenchfields area was known to contain significant Roman material relating to Brougham Roman fort to the south. The excavation confirmed earlier findings that the area had been prone to flooding from the adjacent River Eamont. An amorphous cobbled area of late prehistoric or Romano-British date was revealed and interpreted as a pathway or an attempt to create a dry surface above the wet ground for animal or human use. Several narrow ditches were also found and interpreted as boundaries, perhaps for a field system or plot divisions located away from the main vicus settlement. Roman pottery found in the naturally accumulated layers on the site may have been deposited while manuring the fields (HER Ref: 3/08/1943; Gaskell 2007).
- 3.3.5 In 2007, a magnetometer survey was conducted over a 27 hectare site at Carleton Heights in advance of a proposed residential development. This was followed by a more detailed survey of 30% of the site. Two linear anomalies were identified but were considered to be more likely geological than archaeological in nature and no further work was recommended (HER Ref: 3/07/1817).
- 3.3.6 A watching brief was conducted during groundworks for the construction of a new football stadium and access road at Frenchfields in 2008, partially within the scheduled area of Roman settlement enclosures and a road. Several new linear U-shaped ditches were found seemingly associated with the enclosures, but their interpretation proved difficult given the small area investigated and the absence of any datable finds. No definitive Roman features were seen (HER Ref: 3/09/2136).
- 3.3.7 In 2008, an archaeological watching brief was maintained during the removal of topsoil to a maximum depth of 0.25m for a small development adjacent to the scheduled remains of Frenchfields Roman road and enclosures. No features or finds were found (HER Ref: 3/08/2182).
- 3.3.8 In 2012, a desk-based assessment was undertaken of land to the immediate north of the present proposed development site. It revealed the potential for Roman remains to survive within the site, relating to the scheduled monument to the south-east and possible route of the Roman road, medieval settlement at Carleton and post medieval agricultural features. A geophysical survey followed (HER event 1601; Wooler 2012).

3.3.9 Following the potential of the area raised by the desk-based assessment, a geophysical survey was undertaken of land to the immediate north of the proposed development site. The survey encountered no evidence for the Roman road in the site, but did encounter plough regimes, a service or water pipe and a possible former stream channel (HER event 1672; Railton 2012).

4 GEOPHYSICAL SURVEY

4.1 Introduction

4.1.1 The geophysical survey was undertaken between 8th and 9th September 2015, covering the majority of the study area, which comprised a single arable field. The survey area was bounded by post and wire fences, which produced strong magnetic disturbance around the periphery of the survey area. A barn was situated on the south side of the field, which also produced very strong magnetic disturbance on the south side of the survey area.

4.1.2 Small discrete dipolar magnetic anomalies were detected across the whole of the study area. These are almost certainly caused by fired/ferrous litter in the topsoil, which is typical for modern agricultural land. These anomalies are indicated on the geophysical interpretation drawings, but not referred to again in the subsequent interpretations.

4.2 Results

4.2.1 A strong linear bipolar magnetic anomaly was detected crossing the northern corner of the field, aligned northeast to southwest, which almost certainly represents a modern service pipe.

4.2.2 Another strong linear bipolar magnetic anomaly was detected crossing the south side of the survey area, aligned northeast to southwest, which probably represents a former trackway depicted on the Second Edition Ordnance Survey map of 1900.

4.2.3 A parallel linear positive magnetic anomaly was detected crossing the centre of the survey area, aligned northwest to southeast, which probably represents a former allotment or garden boundary, as depicted on the Third Edition Ordnance Survey map of 1925.

4.2.4 Several linear bipolar magnetic anomalies and chains of small dipolar magnetic anomalies were detected running between these two features, aligned northwest to southeast, which probably represent further allotment of garden boundaries.

4.2.5 Numerous parallel weak linear positive magnetic anomalies were detected crossing the majority of the survey area, aligned northwest to southeast, which almost certainly represent plough furrows.

4.2.6 No probable archaeological features were detected.

5 CONCLUSIONS

5.1 Conclusions

- 5.1.1 The desk-based research has found that the proposed development site remained in the agricultural hinterland of Carleton throughout the post-medieval period, incorporating two fields or crofts, the southern part utilised as a nursery from at least the late 19th century, with related features gradually encroaching into the site until it was finally cleared and given its present layout between 1971 and 1987. The potential for earlier features surviving was also identified, in the form of possible prehistoric or Roman remains, particularly as a scheduled Roman site exists to the south-east, a road from which is thought to pass through the proposed development site. The potential for medieval remains also exists in the form of back plot remains such as waste pits, though generally development within a croft away from the toft is very limited in Cumbria.
- 5.1.2 The geophysical survey was conducted over the majority of the proposed development area. Most of the geophysical anomalies detected were interpreted as post-medieval agricultural features, including plough furrows, a former trackway and garden/allotment boundaries, which are depicted on 20th century Ordnance Survey maps. A modern service pipe was also detected. Although these features lie within the proposed development site boundary, at maximum these would be considered as of local significance. Development on the site would have a limited impact on the heritage significance of these features.
- 5.1.3 No significant archaeological features were detected by the geophysical survey, and no evidence was detected for the Roman road, the projected route of which is believed to have crossed the corner of proposed development area.
- 5.1.4 Despite the results of the geophysical survey, any proposed development on the site will indirectly impact on the setting of listed heritage assets in the area, and directly impact on any surviving archaeological deposits not identified by the geophysical survey, the potential of survival for which cannot be completely ruled out.

6 BIBLIOGRAPHY

6.1 Primary Sources

Hodkinson and Donald's Plan of Penrith, 1774 (Carlisle Library)

Clarke's Map of the Town of Penrith, 1787 (Carlisle Library)

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Carleton Hall Estate, Sales Particulars, 1947 (CAC(C) DB 74/3/2/1226)

Ordnance Survey Map, 1968

Ordnance Survey Map, 1971

Aerial Photograph of Carleton area, 9th September 1986 (HER: AP NY52NW NY5329.S CCC 2711,14)

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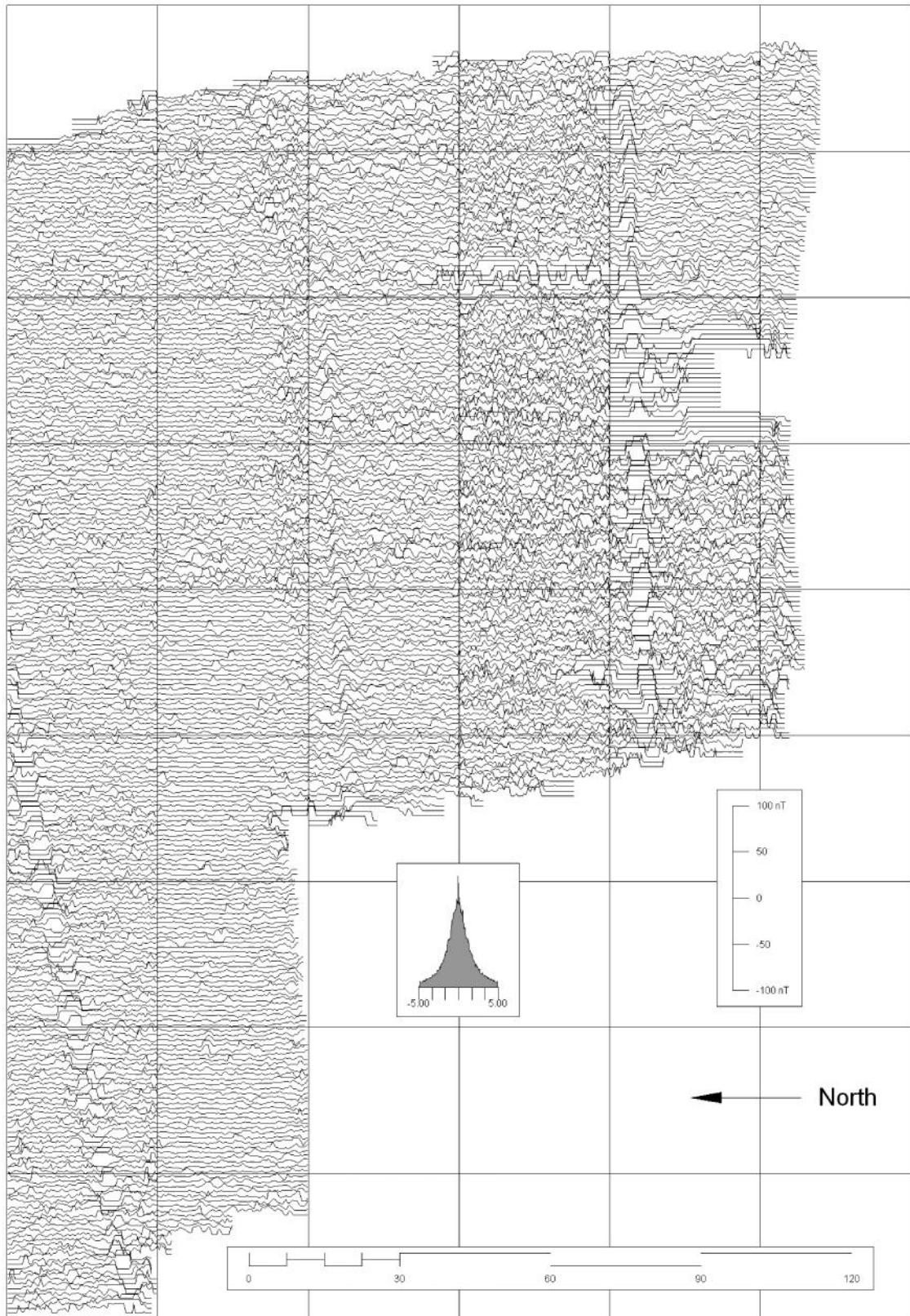
British Geological Survey website <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
(accessed 15/09/15)

Historic England's National Heritage List website
<http://list.historicengland.org.uk/mapsearch.aspx> (accessed 16/09/2015)

APPENDIX 1: GAZETTEER OF HERITAGE ASSETS

Asset No.	Source	Name	Period	Grid Reference
1	HER 1168; NHL 1007180	Frenchfield Roman Road and Settlement. Scheduled site	Roman	353531,529457
2	HER 4298	Arrowhead Find	Neolithic	353000,530000
3	HER 11055	A6 Roman Road	Roman	348670,541440
4	HER 15420	Westmorland Holme River Dykes	Post Medieval	352875,528960
5	HER 19230	Spindle-whorl Find	Post Medieval	353000,530000
6	HER 19322	Bow Brooch Find	Roman	353400,529600
7	Clarke's Map of 1787	Former field boundary, seen on Clarke's Map of Penrith, 1787	Post Medieval	353141,529638
8	First Ed OS 1860	Former track running to south of, and parallel to, former field boundary (Asset 7). Gone by 1900 (Figure 8)	Post Medieval	353185,529672
9	Second Ed OS 1900	Former track running parallel to southern site boundary. Gone between 1971 and 1987	Late 19 th century	353136,529623
10	Second Ed OS 1900	Former public footpath on south-west to north-east alignment. Gone between 1925 and 1968	Late 19 th century	353357,529817
11	NHL 1326892	Carleton Hall farmhouse. Grade II* listed	Early 18 th century	352864,529522
12	NHL 1145117	Cross Keys Public House. Grade II listed	18 th century	352970,529676
13	NHL 1137845	Candia. A possible former school. Grade II listed	Mid 19 th century	352982,529706
14	NHL 1145116	Frenchfield farmhouse. Grade II listed	Mid 19 th century	353485,529566
15	NHL 1137840	Outbuildings and cattle shed at rear of Frenchfield farm. Grade II listed	Mid 19 th century	353492,529637

APPENDIX 2: TRACE PLOT



APPENDIX 3: FIGURES






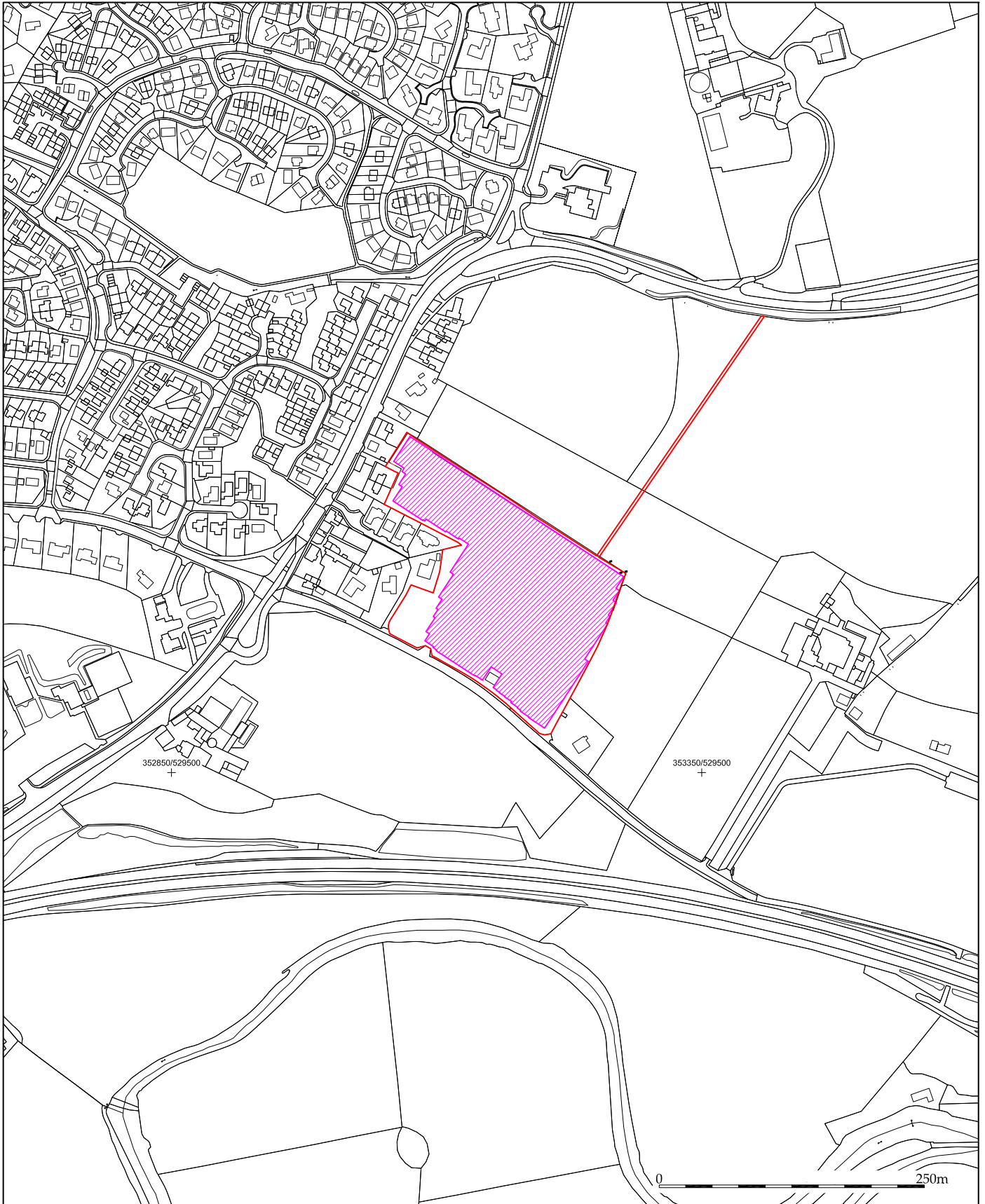
 <p>Wardell Armstrong Archaeology 2015</p>	<p>PROJECT: Land East of Carleton, Penrith, Cumbria</p> <p>SCALE: 1:25,000 at A4</p> <p>REPORT No: CP11467</p> <p>CLIENT: Story Homes</p> <p>DRAWN BY: AB</p> <p>DATE: September 2015</p> <p>FIGURE: 1</p>	<p>KEY:</p>  <p>Site location</p>	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 1: Site location.







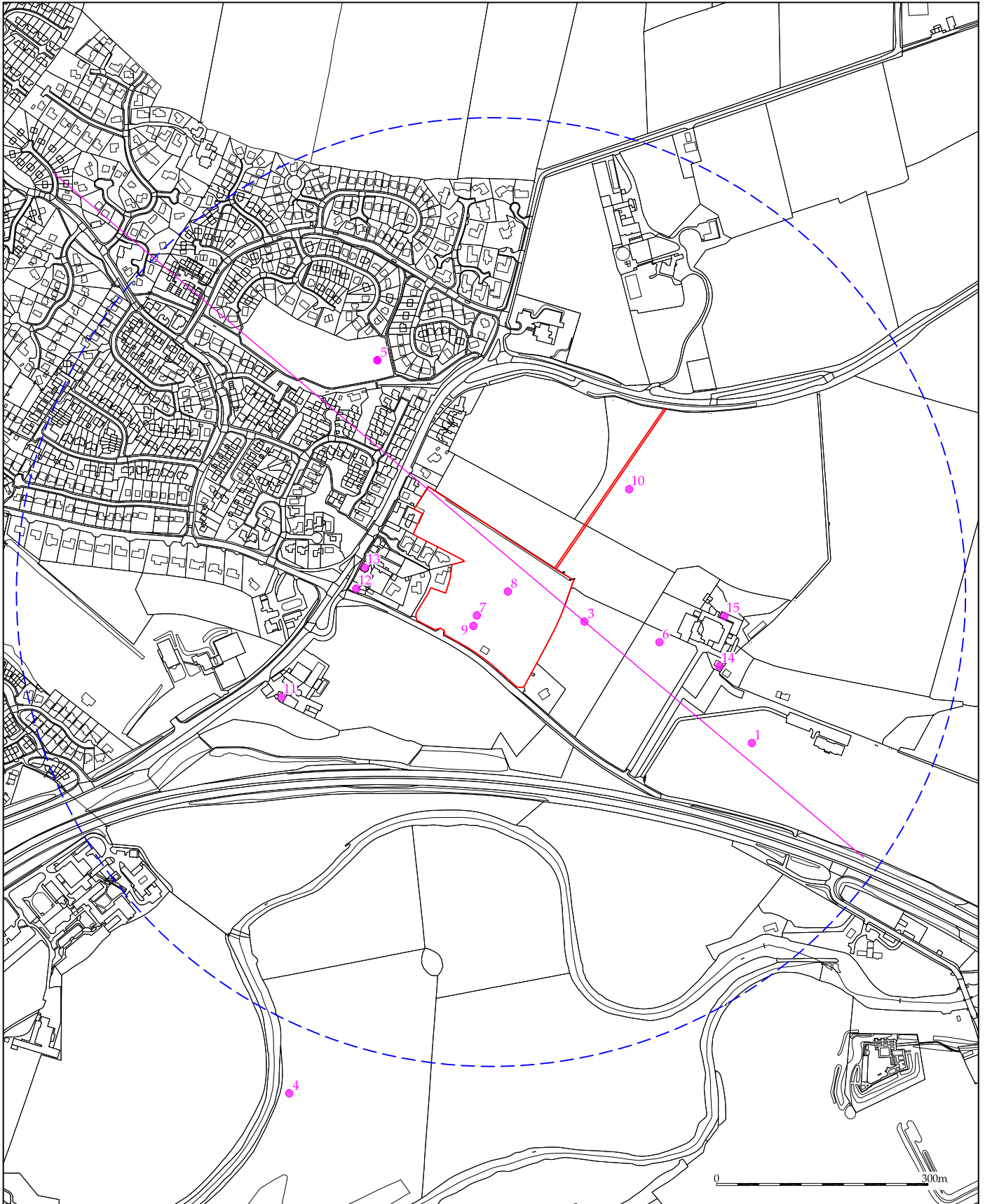
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Figure 2: Detailed site location showing the geophysical survey area.







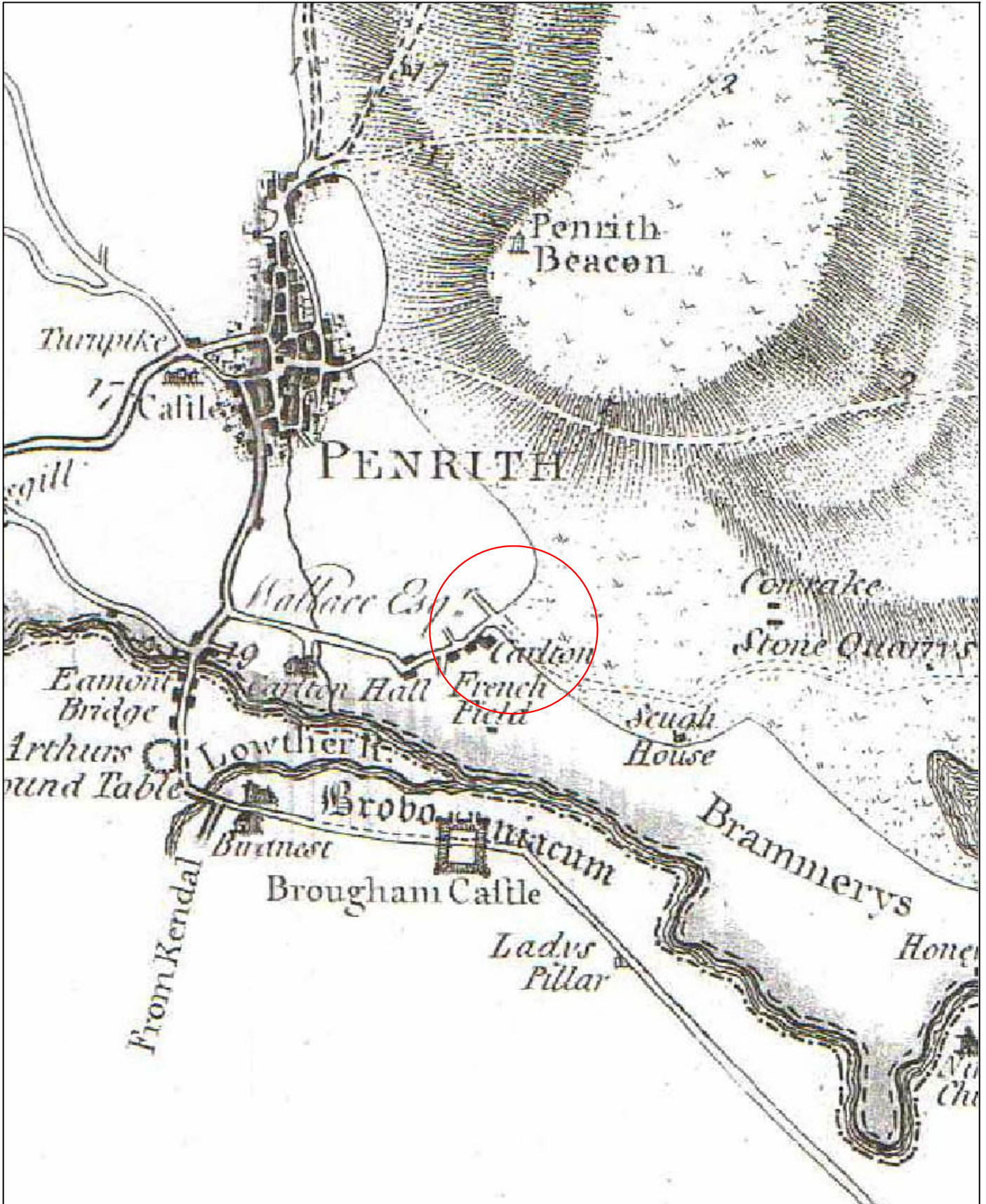
	<p>PROJECT: Land East of Carleton, Penrith, Cumbria</p> <p>SCALE: 1:7,500 at A4</p> <p>REPORT No: CP11467</p> <p>CLIENT: Story Homes</p> <p>DRAWN BY: AB</p> <p>DATE: September 2015</p> <p>FIGURE: 3</p>	<p>KEY:</p> <ul style="list-style-type: none">  Site location  500m radius  Heritage assets 	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 3: Location of heritage assets within a 500m radius of the site.






 <p>Wardell Armstrong Archaeology 2015</p>	<p>PROJECT: Land East of Carleton, Penrith, Cumbria</p> <p>SCALE: Not to scale</p> <p>REPORT No: CP11467</p> <p>CLIENT: Story Homes</p> <p>DRAWN BY: AB</p> <p>DATE: September 2015</p> <p>FIGURE: 4</p>	<p>KEY:</p> <p> Site location</p>	
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Figure 4: Extract from Hodkinson and Donald's Plan of Penrith, 1774.

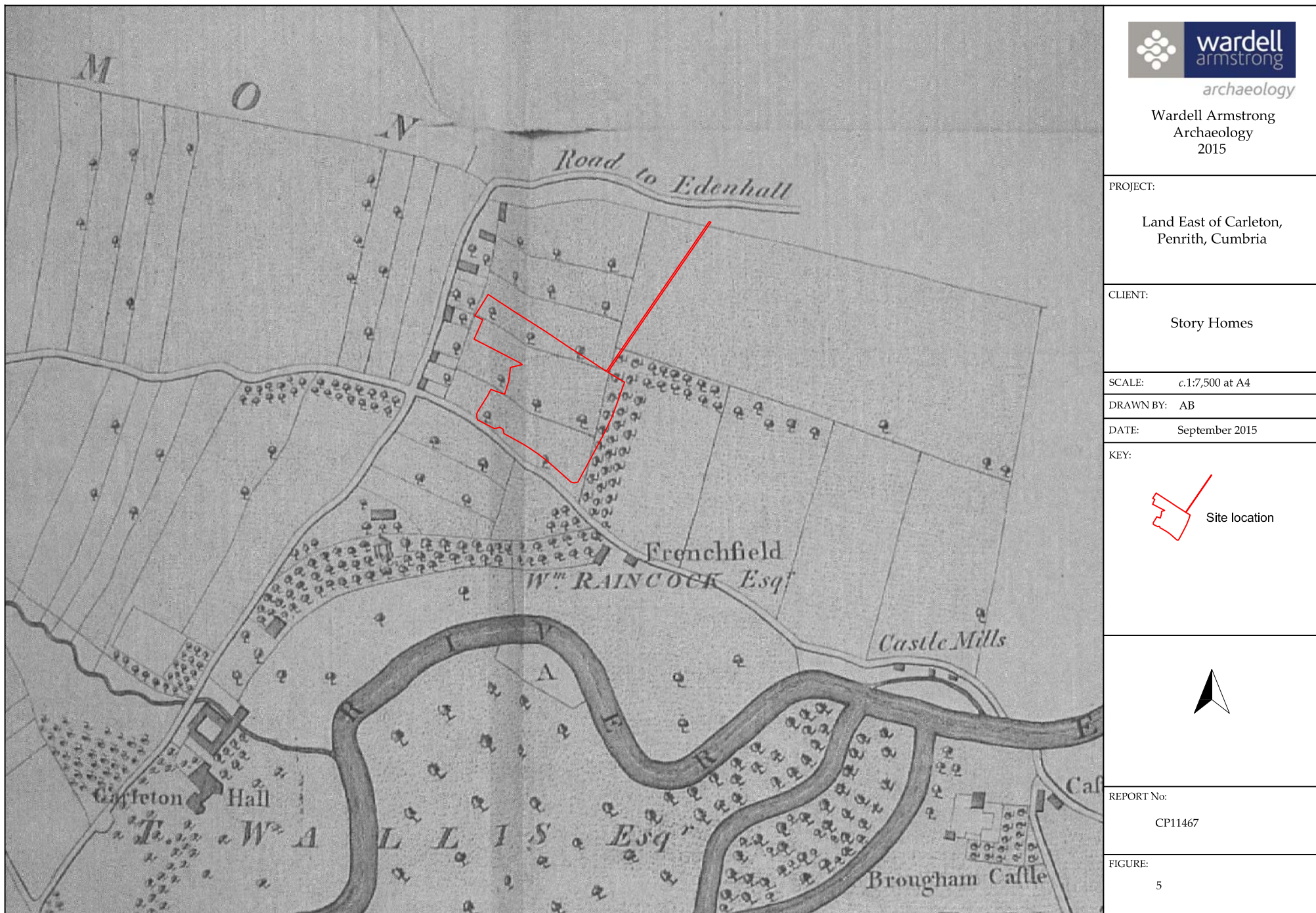


Figure 5: Extract from Clarke's Map of the Town of Penrith, 1787.





PROJECT:	Land East of Carleton, Penrith, Cumbria
CLIENT:	Story Homes
SCALE:	1:4,000 at A4
DRAWN BY:	AB
DATE:	September 2015
KEY:	 Site location
	
REPORT No:	CP11467
FIGURE:	6

Figure 6: Extract from the Tithe Award Plan for Penrith, 1849.

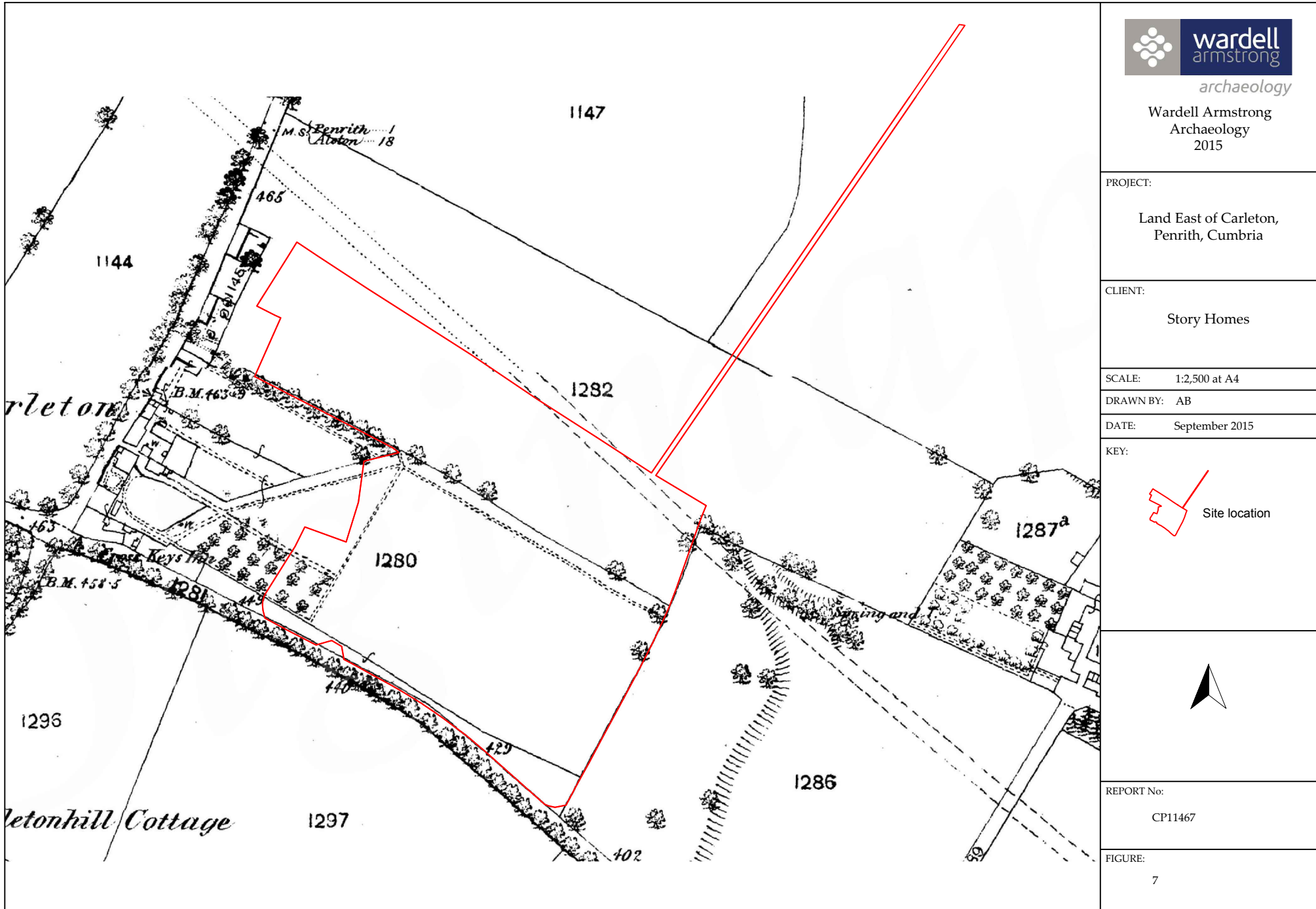
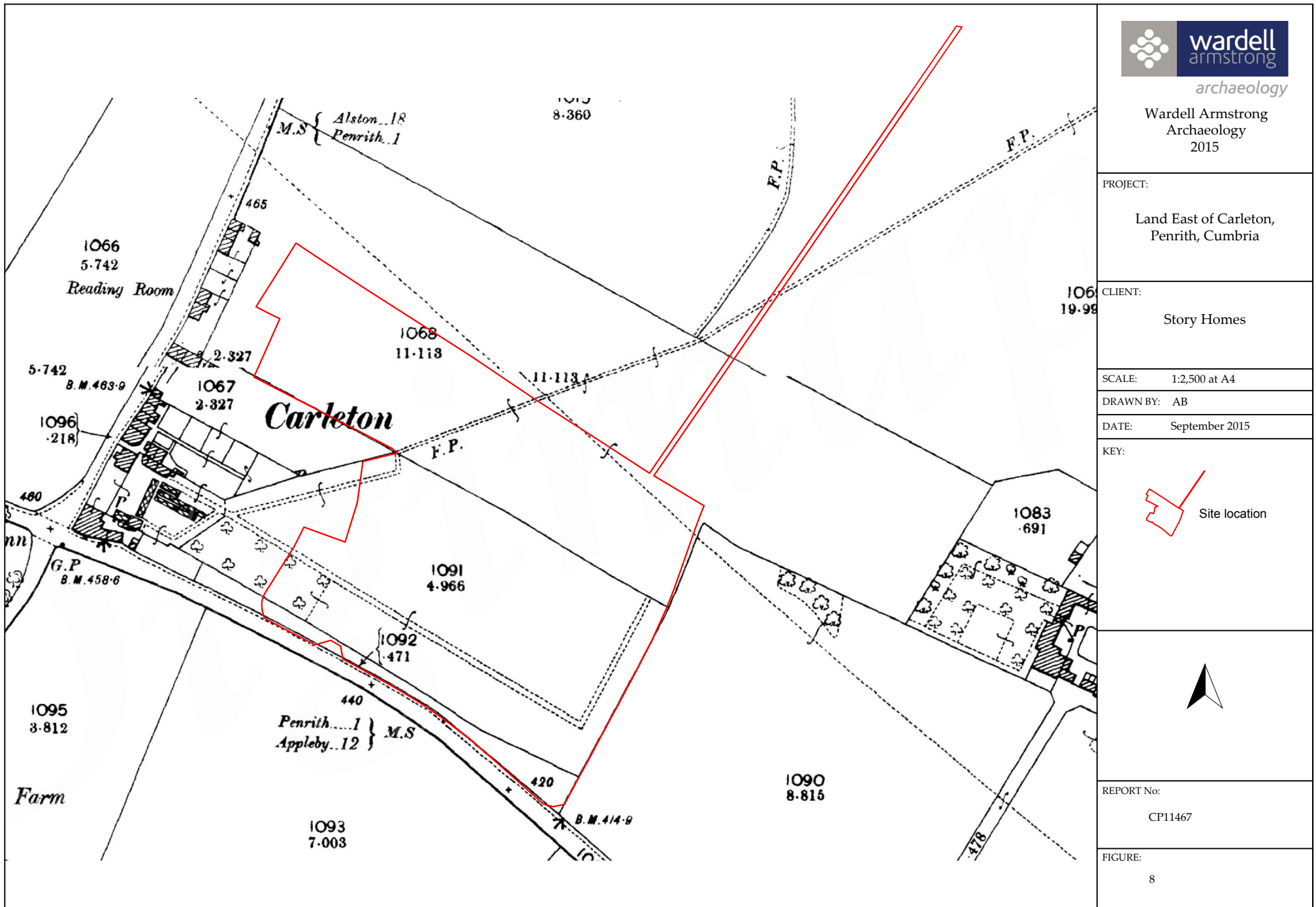


Figure 7: First Edition Ordnance Survey Map, 1860.




PROJECT:
 Land East of Carleton,
 Penrith, Cumbria

CLIENT:
 Story Homes

SCALE: 1:2,500 at A4

DRAWN BY: AB

DATE: September 2015

KEY:
 Site location



REPORT No:
 CP11467

FIGURE:
 8

Figure 8: Second Edition Ordnance Survey Map, 1900.

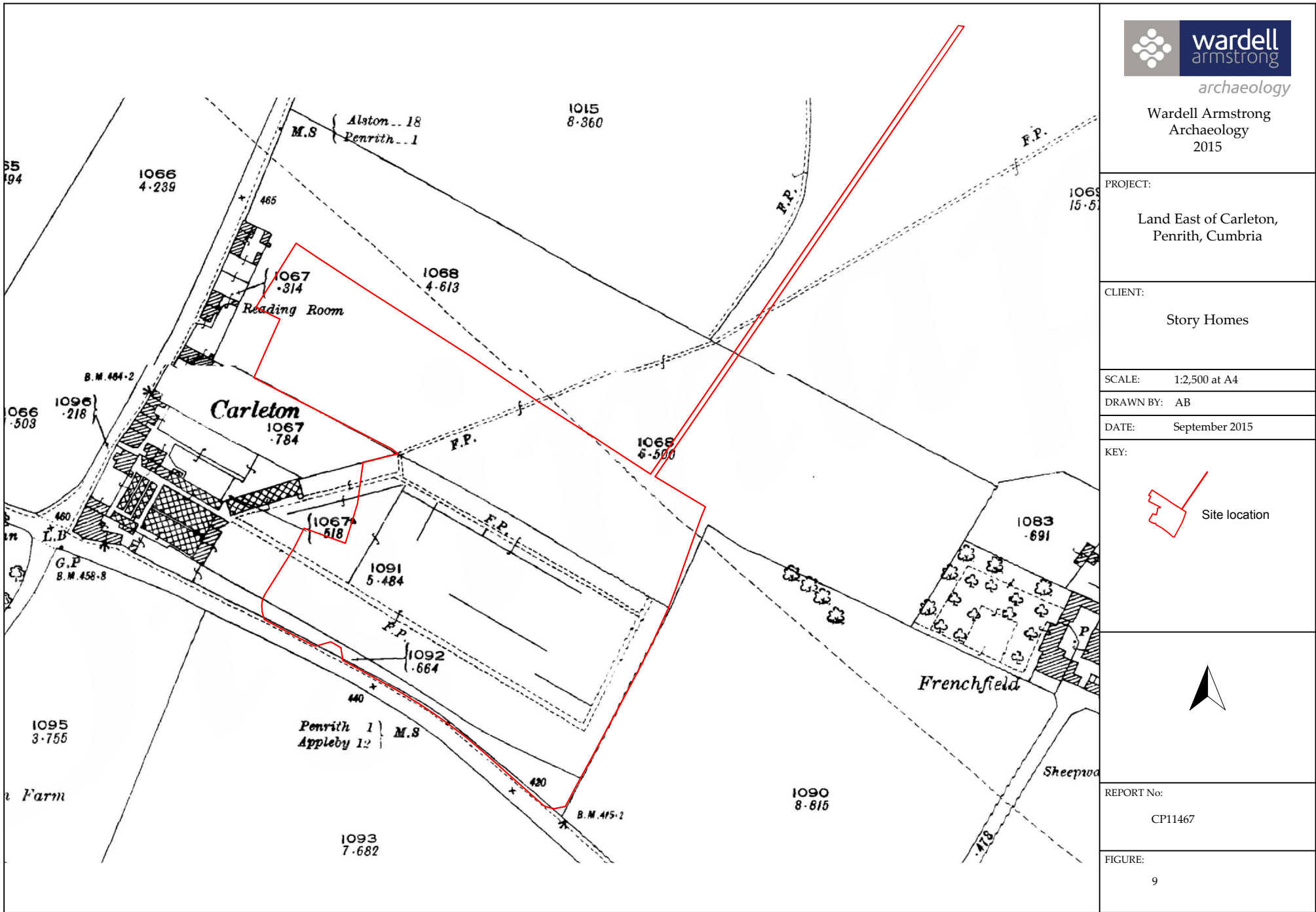
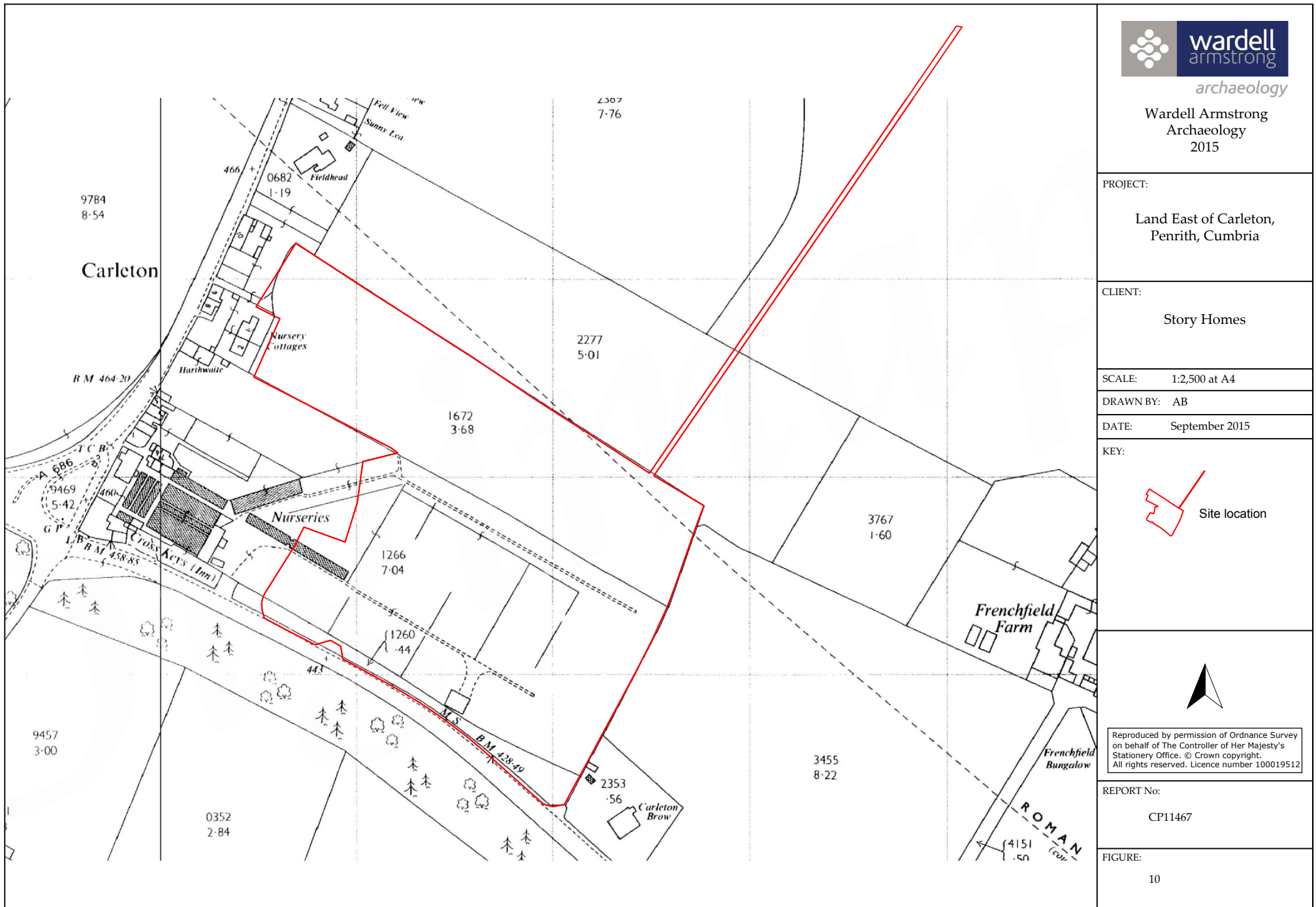


Figure 9: Third Edition Ordnance Survey Map, 1925.



PROJECT:
Land East of Carleton,
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CLIENT:
Story Homes

SCALE: 1:2,500 at A4

DRAWN BY: AB

DATE: September 2015

KEY:
 Site location



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FIGURE:
10

Figure 10: Ordnance Survey Map, 1968.

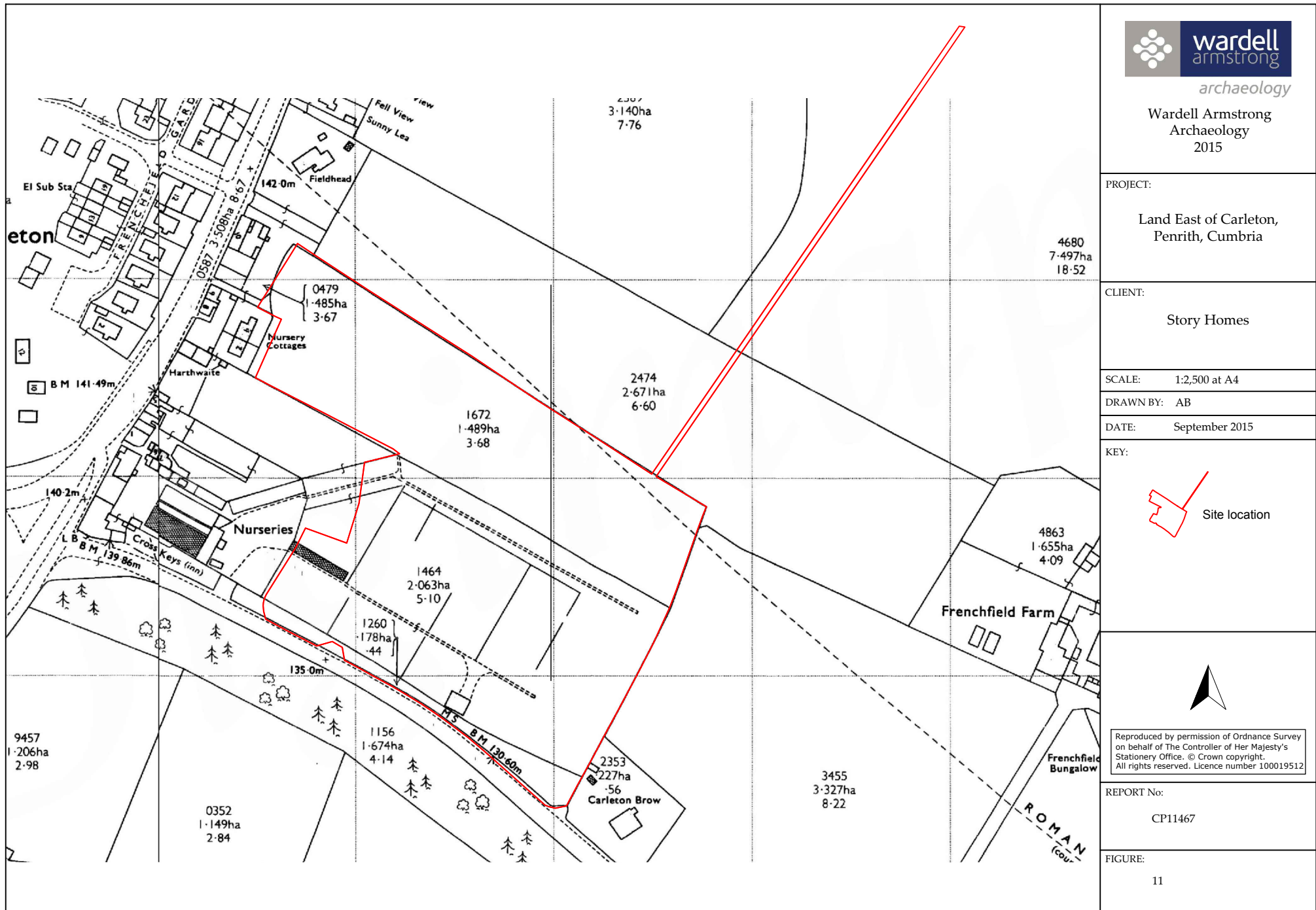


Figure 11: Ordnance Survey Map, 1971.

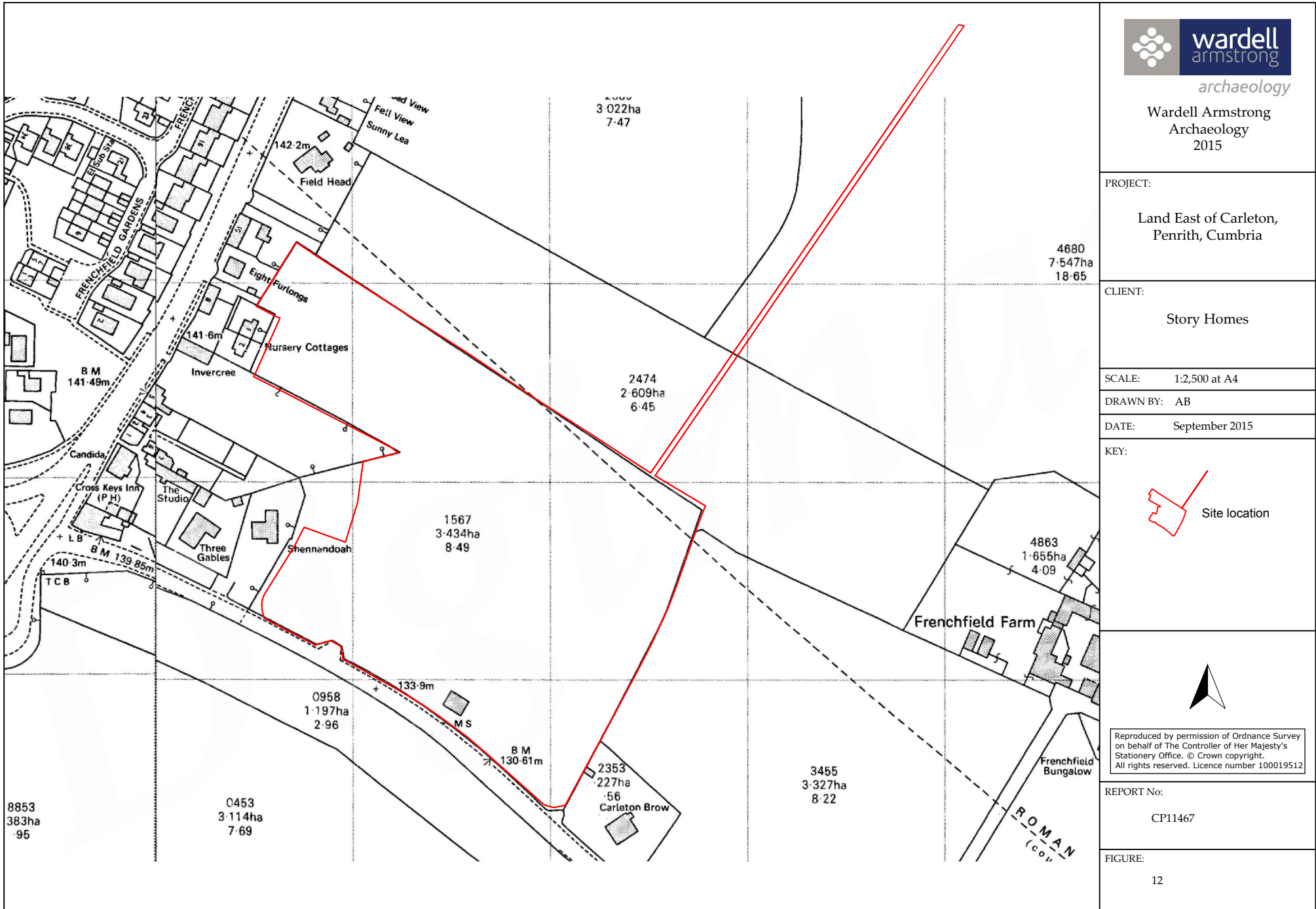


Figure 12: Ordnance Survey Map, 1987.



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

Story Homes

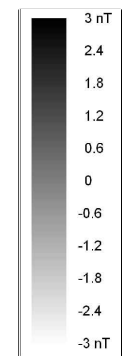
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DRAWN BY: MDR

DATE: September 2015

KEY:

-  Outline of proposed development area
-  Outline of geophysical survey area

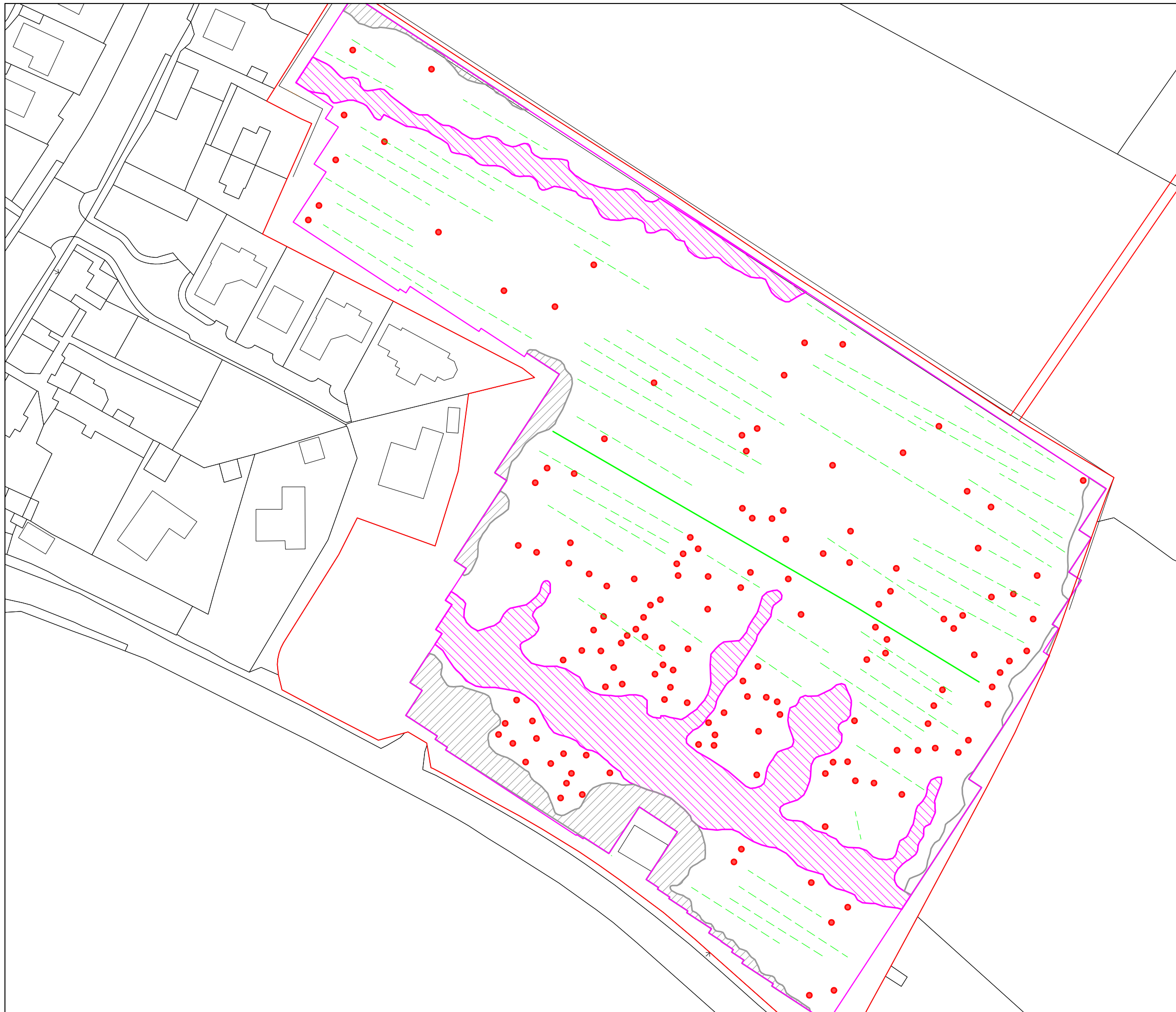


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FIGURE: 13

Figure 13: Geophysical survey.



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PROJECT:

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





CLIENT:

Story Homes

SCALE: 1:1000 at A3

DRAWN BY: MDR

DATE: September 2015

- KEY:
-  Outline of proposed development area
 -  Outline of geophysical survey area
 -  Positive magnetic anomaly
 -  Dipolar magnetic anomaly
 -  Bipolar magnetic anomaly
 -  Magnetic disturbance

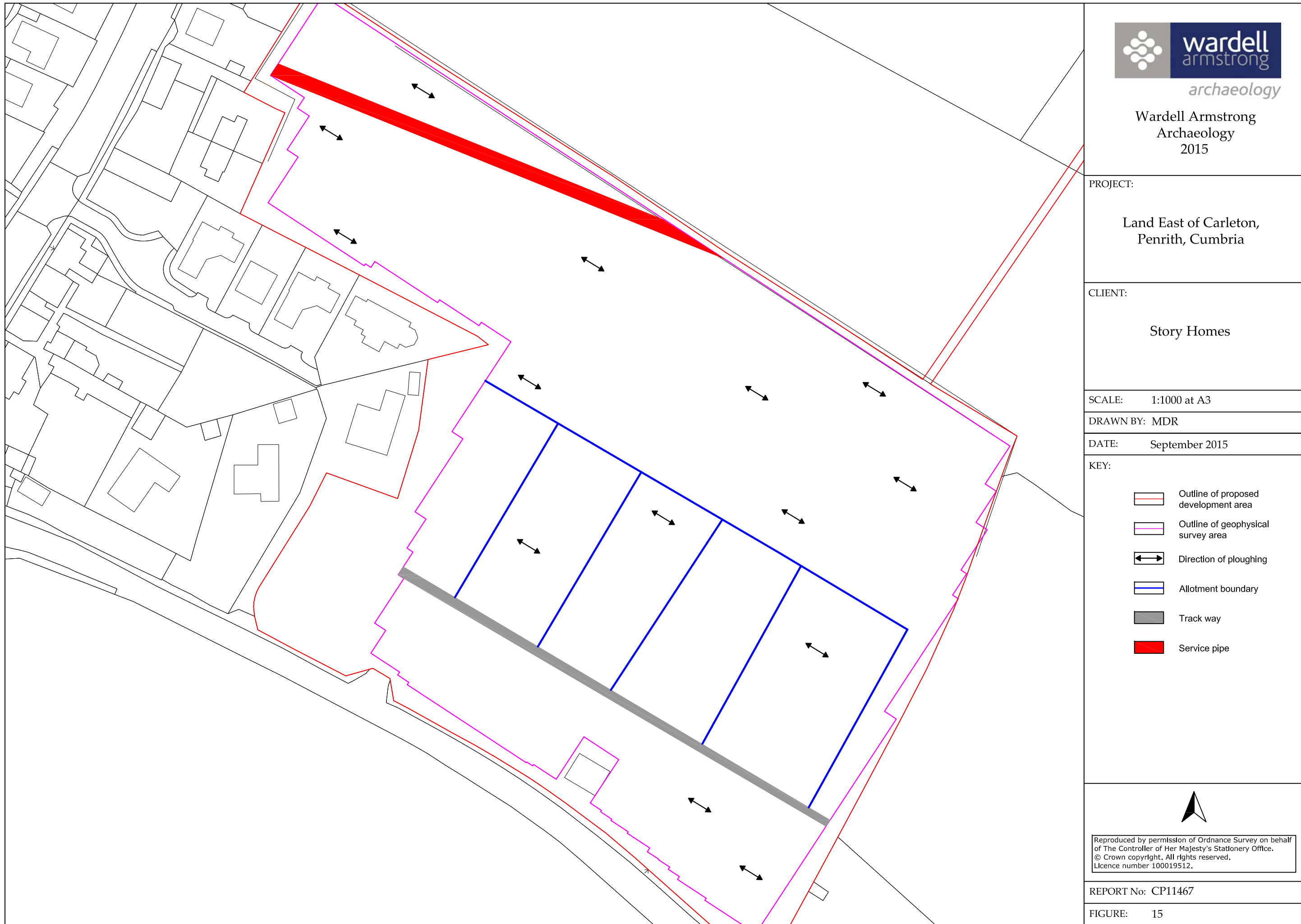


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FIGURE: 14

Figure 14: Geophysical interpretation.



PROJECT:

Land East of Carleton,
Penrith, Cumbria

CLIENT:

Story Homes

SCALE: 1:1000 at A3

DRAWN BY: MDR

DATE: September 2015

- KEY:
- Outline of proposed development area
 - Outline of geophysical survey area
 - Direction of ploughing
 - Allotment boundary
 - Track way
 - Service pipe



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FIGURE: 15

Figure 15: Archaeological interpretation.

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STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)845 111 7777

CARDIFF
22 Windsor Place
Cardiff
CF10 3BY
Tel: +44 (0)29 2072 9191

EDINBURGH
Suite 2/3, Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GREATER MANCHESTER
2 The Avenue
Leigh
Greater Manchester
WN7 1ES
Tel: +44 (0)1942 260101

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)20 7242 3243

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

PENRYN
Tremough Innovation Centre
Tremough Campus
Penryn
Cornwall
TR10 9TA
Tel: +44 (0)1872 560738

SHEFFIELD
Unit 5
Newton Business Centre
Newton Chambers Road
Thorncliffe Park
Chapelton
Sheffield
S35 2PH
Tel: +44 (0)114 245 6244

TRURO
Wheal Jane
Baldhu
Truro
Cornwall
TR3 6EH
Tel: +44 (0)1872 560738

WEST BROMWICH
Thynne Court
Thynne Street
West Bromwich
West Midlands
B70 6PH
Tel: +44 (0)121 580 0909

International offices:

ALMATY
29/6 Satpaev Avenue
Rakhat Palace Hotel
Office Tower, 7th Floor
Almaty
050040
Kazakhstan
Tel : +7-727-3341310

MOSCOW
Suite 2, Block 10,
Letnikovskaya St.
Moscow, Russia
115114
Tel: +7(495) 980 07 67

Wardell Armstrong Archaeology:

CUMBRIA
Cocklakes Yard
Carlisle
Cumbria
CA4 0BQ
Tel: +44 (0)1228 564820

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