



Craven Limeworks, Langcliffe, Settle

North Yorkshire

Archaeological Evaluation Report



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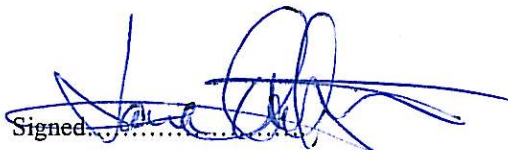
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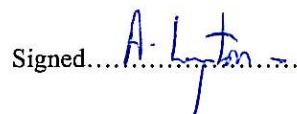
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SUMMARY

Planning permission is being sought by Rural Solutions for the development of the site of the historic Craven Limeworks, at Langcliffe, near Settle, North Yorkshire (SD 8237 6624). The proposed development is to include a Kiln Interpretation Centre, a Rural Business Centre, and a waste disposal facility. The Hoffman Kiln was an innovative design in 1873 when the site was established. It was located adjacent to the then recently established Settle Carlisle railway so as to provide an economic outlet for the lime. It continued in use until, albeit intermittently, until 1939

The site is a Scheduled Monument and Scheduled Monument Consent was required in order to undertake the evaluation. English Heritage issued a brief for an archaeological evaluation of the area of former railway sidings, known as the Stainforth Sidings, and works depot area. This comprised a programme of trial trenching, which was designed to elucidate the extent, depth, function, chronology and relative significance of any archaeological deposits. The results of these works will be used to inform any further required mitigation strategy.

Oxford Archaeology North (OA North) were invited by Rural Solutions to submit a project design for the proposed works in September of 2008 and were, subsequently, commissioned to undertake the work. The archaeological trial trenching, which included the excavation of four trial trenches, was undertaken by OA North in July of 2009 once Scheduled Monument Consent had been granted by Department of Culture Media and Sport (DCMS) for the evaluation.

In the area of the proposed Kiln Interpretation Centre (Trench 1), Rural Business Centre (Trench 2) and the waste disposal facility (Trench 4), the sleepers of rail tracks and the gravel upon which the sidings had been constructed were identified. No examples of the metal tracks were located, presumably having been removed for their value as scrap metal. Trench 3, also in the area of the proposed waste disposal facility, proved to be located in an area of ground that had been deliberately raised to form a loading platform, and which was supported by a retaining wall.

The trenches demonstrated that remains of the Stainforth Sidings still survive in good condition below the current ground surface. The recording of these remains have allowed an opportunity to examine the infrastructure for the movement of coal onto the site and the removal of lime from it, as well as the various alterations to the site. It is highly likely that other structures associated with the site and, particularly, the railway sidings, are likely to have good below ground survival. As such, it is recommended that any further development of the site should be subject to further historical research of the area of the Stainforth Sidings. An archaeologically supervised topsoil strip should be undertaken of those areas that will be impacted upon by the development to ensure that all archaeological features relating to the limeworks are recorded. It is also recommended that a survey and description be made of the retaining wall of the loading platform prior to the construction of the proposed waste disposal depot.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank Emma Darbyshire and Ian Butter of Rural Solutions for commissioning and supporting the project. Thanks are also due to Neil Redfern English Heritage for his advice, support and help in obtaining Scheduled Monument Consent. Especial thanks are due to David Johnson, a local archaeologist, for supplying further information about the site and for the provision of two historical photographs (incorporated into the present report).

The evaluation was directed by Andy Bates and assisted by Pascal Eloy. The report was compiled by Andy Bates, and the illustrations were produced by Anne Stewardson. The finds were examined by Jeremy Bradley and Chris Howard Davis. The project was managed by Jamie Quartermaine, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 Planning permission is being sought for the mixed development of the historic Langcliffe Limeworks near Settle, North Yorkshire (Fig 1). This proposed development includes the construction of a Kiln Interpretation Centre, a rural Business Centre and a waste disposal facility. The Hoffman Kiln was an innovative design in 1873 when the site was established. It was located adjacent to the then recently established Settle Carlisle railway so as to provide an economic outlet for the lime. It continued in use until, albeit intermittently, until 1939
- 1.1.2 The site is a Scheduled Monument (AM 35473) and Scheduled Monument Consent was required in order to undertake the evaluation. In response to a request by Rural Solutions, English Heritage issued a brief for the archaeological evaluation of the area of the former railway sidings, known as the Stainforth Sidings, and a works depot area, which was required to inform the planning process, and also scheduled monument consent for the main development. The brief stipulated a programme of trial trenching, which was designed to elucidate the extent, depth, function, chronology and relative significance of any archaeological deposits (*Appendix 1*). The results of these works will be used to inform a mitigation strategy designed to record any significant archaeological remains that will be destroyed by the proposed development.
- 1.1.3 Oxford Archaeology North (OA North) were invited by Rural Solutions to submit a project design (*Appendix 2*) for the proposed works in September of 2008. Following its approval by English Heritage and the granting of Scheduled Monument Consent (SMC) by the Department of Culture, Media and Sport (DCMS), OA North were commissioned to undertake the work. The archaeological trial trenching was undertaken in April of 2009. This document presents the results of the trial trenching, assesses the potential of the site for archaeological remains, and gives recommendations for any further work to be undertaken prior to the development of the site.

2. METHODOLOGY

2.1 PROJECT DESIGN

- 2.1.1 A project design (*Appendix 2*) was issued by OA North in accordance with a brief by English Heritage (*Appendix 1*) for an archaeological evaluation. All work was carried out in accordance with the Project Design, with the exception that the southernmost trench was split into two smaller trenches (Trenches 3 and 4), which were then located on either side of a dividing retaining wall (Fig 2). The work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (1999), and generally accepted best practice.

2.2 TRIAL TRENCH EVALUATION

- 2.2.1 **Trench configuration:** in total, four trial trenches were excavated across the study area, of varying lengths and measuring 1.8m wide (Fig 2).

- *Trench 1:* 15m in length, was aligned north-east/south-west in the area of the proposed Kiln Interpretation Centre. The trench was positioned over the location of the railway sidings that existed between the Hoffman Kiln and the buildings to the south of the kiln;
- *Trench 2:* 7.4m in length, was placed on a east/west alignment in the area of the proposed Rural Business Centre. The trench was positioned across north/south aligned rail tracks in roughly the middle of the Stainforth Sidings;
- *Trench 3:* 10m in length, was excavated on a east/west alignment in the area of the proposed waste disposal depot. The trench was positioned in an area of the southern part of the site, within which historic maps show no structures;
- *Trench 4:* 9m in length, this trench was excavated on a north-west/south-east alignment in the area of the proposed waste disposal depot. The trench was positioned across the Stainforth Sidings close to where they merged with the Settle to Carlisle Railway.

- 2.2.2 **Excavation:** each trench was excavated by a five ton 360° mechanical excavator, fitted with a 1.8m wide toothless bucket. The machine was operated under archaeological supervision, down to the depth of the archaeological deposits, and thereafter all excavation was undertaken manually. All spoil was scanned for artefacts.

- 2.2.3 Recording comprised a full description and preliminary classification of the deposits and materials revealed on OA North *pro-forma* sheets. The trenches were located with a Total Station and tied into the Ordnance Survey grid, which was located onto the national grid using a differential GPS (accuracy +/- 0.01m). Hand-drawn plans were produced in the field showing the contents of the trenches, with representative sections being drawn at a scale of 1:10 or 1:20 as appropriate. The field survey data was incorporated with digital map data in a CAD system to create the figures used in this report.

- 2.2.4 A full and detailed photographic record of the trenches was maintained, and general views of the trench locations were also produced. Photography was undertaken using 35mm cameras on archival black and white film, as well as transparency. An 8 megapixel digital camera was also used and provided the illustrations for the present report.
- 2.2.5 Trench 2 was excavated in two parts to maintain vehicle access. This was completed by excavating and recording the western half of the trench first, and then following the back-filling of this part of the trench, the eastern half of the trench. All drawings and written records have been combined, as if the trench was excavated in its entirety at the same time, although the photographic record shows the excavation of the two sections of trench.

2.3 FINDS

- 2.3.1 Finds recovery was carried out in accordance with best practice (following current Institute of Field Archaeologists guidelines), and subject to expert advice in order to minimise deterioration. All artefacts recovered from the evaluation trenches were retained for assessment.
- A small assemblage of post-medieval pottery was assessed, but did not warrant detailed analysis.
 - A small amount of iron work, mostly relating to the railway sidings, was assessed but it did not warrant detailed analysis.

2.4 ARCHIVE

- 2.4.1 The results of the archaeological evaluation will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.
- 2.4.2 OA North conforms to best practice in the preparation of project archives for long-term storage. It is intended that the paper archive material be deposited with Yorkshire Dales National Park Authority, and a further copy of the archive can be made available for deposition in the National Archaeological Record. In addition, the Arts and Humanities Data Service (AHDS) online database project *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project. The artefacts are of little archaeological significance and have been discarded.
- 2.4.3 The paper archive generated from the evaluation will be transferred in accordance with the guidelines on archive transfer (AAF 2007).

3. BACKGROUND

3.1 LOCATION, TOPOGRAPHY AND GEOLOGY

- 3.1.1 The proposed development site lies to the east of the B6479 and the Settle to Carlisle Railway, between Langcliffe and Stainforth (NGR SD 8237 6624). The site currently comprises abandoned industrial structures associated with the limeworks, buildings converted from the limeworks to dwellings and structures utilised as a rubbish disposal depot. The site is located at a height of c 180m above Ordnance Datum (AOD).
- 3.1.2 The limeworks were sited so as to exploit the geology of the Yoredale Series Carboniferous Limestone, which underlies large areas of the Yorkshire Dales, and comprises repeated series of limestone, mudstone and sandstone with occasional coal seams in the sandstone (Trueman 1992, 126).

3.2 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 3.2.1 The following historical background was drawn from a report compiled by Lancaster Archaeology Unit (now Oxford Archaeology North) entitled Langcliffe Quarry and Limeworks (Trueman 1992)
- 3.2.2 ***The Craven Lime Industry and Langcliffe:*** the development of the Langcliffe site is part of the history of the Yorkshire Dales lime industry. Raistrick (1967) suggested that a medieval pattern of one-off lime-kilns for building work complemented by a scatter of agricultural sod kilns, only changed in the eighteenth century. Several contemporary writers, making particular reference to the Craven area, recorded a boom in lime burning at this time. Raistrick (1967) does not describe the development of the industry through the latter part of the nineteenth century, but it would seem that by the time John Clark and Michael Wilson went into business as lime-burners in the Giggleswick area in the third quarter of the nineteenth century, they were entering an established local industry. Alongside the activities of Thomas Murgatroyd, who also built kilns at Langcliffe, their opening of the Craven site at Langcliffe in 1872-3, can be seen as part of the late nineteenth century development of large-scale workings that went hand-in-hand with the 1870s construction of the Settle to Carlisle railway (*ibid*). The two limeworks were immediately adjacent, both exploiting the abundant limestone and both using the Settle to Carlisle railway to get coal in and the lime out. The Murgatroyd works exploited the well-established draw kiln technology, while Craven Limeworks used the innovative Hoffman patent technology.
- 3.2.3 ***Thomas Murgatroyd's Limeworks:*** Mitchell (1980) states that Thomas Murgatroyd's firm began 'stone getting for fluxing purposes on Winskill Scar' at about the same time as the Craven Lime Company started operations next door. In Wildman's Almanac of 1876 there is a short report which states that for both firms 'all the necessary sidings are in place' and that they 'are sending off large quantities of lime and limestone, and they keep a great many men employed' (Mitchell 1989). Very little topographical information relevant to this limeworks could be derived from the available documents. In 1887

Murgatroyd gave up the lease for the site, probably because he had gone bankrupt, and it was taken over by W George Perfect of Stainforth. Perfect ran the limeworks until 1896, although the OS first edition 1:2500 map of 1894 describes the site as 'Old Limekilns' (Johnson 2002, 64).

- 3.2.4 **Craven Lime Company Works:** the partnership of John Clark and Michael Wilson was the driving force behind the Craven Lime Company. They had previously leased limeworks at Austwick Wood, Giggleswick and Mealbank, Ingleton. In taking on the Ingleton site, they acquired rights to the Hoffman patent for lime burning, built a kiln according to this patent and formed a company called the *Ingleton Patent Limeworks*. Construction of the Ingleton Mealbank Hoffman limekiln was started in 1868, and in its heyday was producing 40-60 tons of burned lime per day, which could not be surpassed in quality in England (Lancaster Guardian 13th Aug 1870). In 1893 the Mealbank Kiln was expanded from 14 to 18 chambers, but by 1909 the site was suffering at the hands of a downturn in the lime market and it was closed in 1910 (Fig 3).

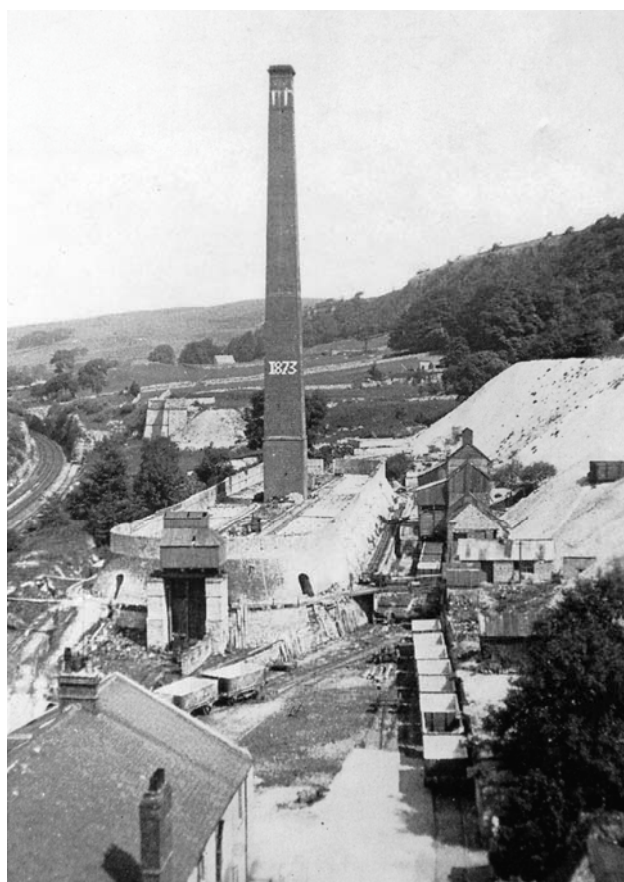


Plate 1: Historic photograph of the Hoffman Kiln showing the sidings in use

- 3.2.5 **Langcliffe:** the success of the Mealbank kiln demonstrated the strength of the lime market, but its profitability was compromised by its remoteness from a rail link and the corresponding cost of transporting the materials in and out. So with the projected arrival of the Settle to Carlisle railway, there seems to have been a clear financial incentive for Clark and Wilson to develop the Langcliffe site. By 1872 the company had been re-formed into the Craven Lime Company Ltd, acquiring the Langcliffe site at a rent of £200 a year and opting

to build a new and bigger Hoffman kiln. The kiln was under construction in 1873 and by 1876 it was fully operational, with lime (and possibly limestone) being sent to Bradford on the Settle to Carlisle railway and coal being transported in the opposite direction (Johnson 2002).

- 3.2.6 The Hoffman kiln operated between 1873 and 1931 and again from 1937 to the outbreak of war in 1939. Although the quarry closed briefly during the 1926 strike, the kiln was kept burning and was probably run continuously through both periods of operation. Between 1939 and 1945 it was used as a chemical store. The precise dates of operation of the other elements of the site have not so far been firmly defined. A pair of Spencer vertical kilns were constructed between 1900 and 1907, when the OS 2nd edition map shows them in place. The kilns were both closed down in 1927, but were not demolished until 1942 (Johnson 2002, 93).
- 3.2.7 Both the Spencer kilns and the Hoffman Kiln were fed by the associated extensive quarry, which was worked during the lifetime of the kilns, but it is not clear if the quarry was worked between 1931 and 1937, or during the Second World War as a supply of limestone for processing elsewhere (Plate 1). However, after the war the site passed through several ownerships, including one John Delaney, of Settle Limes Ltd, which was formed from a partnership of Langcliffe and several other local quarries, and ICI. The markets for the lime included Sheffield and Scotland; apparently ICI was a major purchaser. Limestone from the quarry was also crushed for roadstone.
- 3.2.8 **Limeworking Operations:** it is not intended to describe the operation of the Hoffman Limekiln, as that is described in greater detail elsewhere (Trueman 1992; LUAU 1989; Johnson 2002; Johnson 2003). The wider operation of the overall site is, however, more directly relevant to the present evaluation, as the trenches were located in areas of railway sidings that supplied the kiln. Stone was transported from the quarry face using carts on Jubilee tracks to a crushing plant on the east side of the kiln, and from there tracks led over a sidings dock to a track which led around the perimeter of the kiln (Plate 1). Coal was brought in from sidings off the main Settle to Carlisle line to a rail yard, and from there to a water lift at the southern end off the kiln, which lifted coal carts onto the top of the kiln, where the coal was stored temporarily. The lime was transferred into rail wagons in cuttings immediately adjacent to the kiln and from there were taken to the main line.
- 3.2.9 **Quarry Operations:** towards the end of the 1920s the quarry was divided into three distinct quarry areas, the north and south extremes being referred to as 'Mealy Bank' and 'Slippet'. The appearance of the quarry today, and on early photographs, supports this picture and indicates that the north and south extremes were the last to be worked (Trueman 1992).
- 3.2.10 Explosives were the primary means of bringing stone off the quarry face and of reducing large blocks of stone into manageable pieces. Men, employed to carry out the blasting, used compressed air to drive the boring machines for laying the charges; this was a common power source in quarries by this time. Current evidence does not identify the location of the explosives store or the compressed air plants that must have existed.

- 3.2.11 Variation in the quality of stone is remembered by ex-workers and confirmed by examination of the quarry face. Poor quality material, along with stone that was deemed too small for the kiln, was sent to the stone-crusher to be used as road-stone (Plate 1). Processing the quarried stone and transporting it to the kilns and the crushing plant, began with the 'breakers' and 'fillers'. These men broke the stone into suitable sizes using hammers and loaded it onto tramway carts. Each quarryman worked a 'piece' of the face and had a track for his own cart that led down to a main tramway line running the length of the quarry.
- 3.2.12 The carts were collected by hauliers, whose ponies pulled between six and eight carts at a time. One ex-worker described how a first haulier took stone to the depot for crushing, a second took empty carts back to the quarry face and a third took loaded carts of a smaller size to the kilns. A metal tally, hung on the end of each cart, identified the quarryman that had filled it. On the way to the crusher or kiln, each cart was weighed and the tallies recorded. Four weighing machines are identified on the 1907 map.
- 3.2.13 The growth and the extent of the tramway network in the quarry is recorded on the 1907 map and on early photographs. At the time of survey (1989), the layout of the north portions of this network survived, whereas most of the central area had been lost to the later refuse tip. A single length of surviving iron track was found along part of the route running north-east from the former vertical Spencer kilns. None of the quarrymen's tracks to the quarry faces survive and it is not known where the tramway ponies were stabled, although according to Mitchell two buildings were used, one 'near the road and another within the quarry' (1980, 645).
- 3.2.14 Tramway carts, or 'bogeys', seem to have been of two designs, those for taking stone to the kiln being smaller than those for the crusher. 'Kiln carts' had a flat bottom with the front and back boarded and the sides open to allow the 'fillers' at the quarry face to load them and the Hoffman kiln 'packers' to unload them. Blocks of limestone from the quarry were placed on the carts so that each load tapered towards a point. In this way, a fully laden cart would fit through the kiln's arched entrances. The method of braking the carts apparently consisted of throwing a wooden sprag into the wheels!
- 3.2.15 Oral testimonies appear to describe two self-acting inclines on the site; one associated with the Mealy Bank quarry and one with the Slippet quarry. Although their location is not made clear in the transcriptions, these features probably equate to the surviving incline and the lost incline seen opposite on early photographs. The surviving structure at the top of the Mealy Bank incline has the base for a winding drum and a small shelter for the operator. A tramway associated with the former Spencer kilns, is on a steep slope and may have been a third incline, although the location of the operating mechanism is not clearly identifiable.
- 3.2.16 **Railway Yard:** railway docks (cuttings accommodating sidings) on each of the long sides of the Hoffman kiln open onto what was the Stainforth Sidings, between the quarries and the main line railway. This area must have been a hive of activity during the lifetime of the works (Plates 1 and 2). Wagons of coal, lime and limestone passed through it, and the buildings incorporated workshops and offices. Railway sidings led off from the main rail line, where lines of wagons of coal were held while they waited to be loaded via the water

lift onto the top of the kiln, and empty wagons awaited loading with lime and limestone. There were eight lines of parallel sidings within the yard to accommodate the numbers of stored wagons and to provide access to the water lift and the rail docks on either side of the kiln. By the time of the OS 1909 1:2500 map (Fig 3) there was also a series of sidings on the eastern side of the yard specifically supplying the two Spencer kilns. This map shows the large engine house, and adjacent workshop in the centre of the site; however, by the time of an aerial photograph taken in 1938, during the short-lived reprieve of the site, large stockpiles of limestone were stored to the immediate south of the workshop. It is evident that the buildings were no longer accommodating engines and had by then been adapted for office accommodation.



Plate 2: Historic photograph of the railway yard to the south of the engine shed

4. EVALUATION RESULTS

4.1 INTRODUCTION

- 4.1.1 Four trenches were excavated across the study area, measuring between 7.4m and 15m in length and 3m wide (Fig 2). An overview of the results is presented below; the detailed description of each deposit and archaeological feature are provided in *Appendix 3*, and a finds catalogue is in *Appendix 4*. The location of the trenches in comparison to the 1909 OS map of the area, produced when the Craven Lime Works was still in operation, is given in Figure 4.

4.2 TRENCH 1

- 4.2.1 Trench 1 measured 15m in length, and was excavated in a north-east/south-west orientation in the area of railway sidings between the Hoffman Kiln and the former engine shed to the south of the kiln.
- 4.2.2 The trench was excavated to a maximum depth of 0.63m, where a natural glacial till was encountered (**114**) (Fig 5; Plate 3). Overlying the till was a layer of compacted stone chippings (**100**) upon which sleepers for the railway sidings had been constructed. At the western end of the trench a series of five wooden sleepers, **101** to **105**, were laid on an east/west orientation and had once supported two railway tracks (Fig 5; Plates 3 and 4). The position of the sleepers, and the metal fittings attached to sleeper **103**, suggest that this end of the trench has been positioned at the junction of two tracks from Hoffman kiln to the north, which then merged into one track which continued to the south of Trench 1 (Figs 4 and 6). Two lines of limestone, **106** and **107**, are located on the same alignment as the sleepers. The upper surface of these stones is located 50mm higher than the surface of the sleepers, but are thought to have been used to support an element of the sidings. To the south of stone alignment **107**, the impression of a fifth sleeper could be identified from traces of decayed wood within stone layer **100** (Fig 5).
- 4.2.3 At the eastern end of the trench there is evidence of a third rail track, aligned north/south, comprising sleepers **110** and **112** (Fig 5; Plate 5). As above, a third sleeper from this track was visible as traces of decayed wood within layer **100**. This track equates to that shown on the OS 1909 map, which went through the former engine shed to the south of Trench 1 (Figs 4 and 6).
- 4.2.4 In roughly the middle of the trench was a north/south linear cut (**116**) across the trench, truncating layer **100** (Fig 5). It contained a cast iron pipe **115**, with a second east/west aligned pipe, **109**, entering the linear from its eastern side. These pipes were potentially re-used from elsewhere, and appear to have been used to form part of a drain. The feature was back-filled with sediment and sub-angular stone, **108**.
- 4.2.5 All of these deposits and structures, described above, were sealed by a maximum of 0.69m of stone chippings and tarmac, layer **200**. This represents a build up layer following the abandonment of the limeworks.

4.3 TRENCH 2

- 4.3.1 Trench 2 was aligned east/west, measured 7.4m in length, and was targeted on an area in approximately the middle of the Stainforth Sidings (Fig 2). Trench 2 was excavated in two parts, as detailed in the methodology, to enable vehicle access through the site in the course of the excavations.
- 4.3.2 Natural glacial till, **208**, was encountered at a depth of 0.54m below the surface (Fig 7; Plates 6 and 7). Overlying the till was a 0.29m thick deposit of stone chippings, **201** and **204**, which form the compacted stone base upon which the sleepers of railway sidings had been constructed. Evidence of two rail tracks was present in the form of two lines of railway sleepers. At the western end of the trench, sleepers **202** and **203** supported a north/south aligned track (Plate 4). At the eastern end of the trench, sleepers **206** and **207** supported a north-north-east/south-south-west aligned track (Plates 7 and 8). These represent the remains of two of tracks of the Stainforth Sidings visible on the 1909 OS map of the area (Figs 4 and 6). The orientations of the **202/203** sleepers are slightly different from the **206/207** sleepers indicating that the two sets of tracks are converging to the north of the trench. This is confirmed by the OS 1909 map which shows these tracks joining to become a single track around the western side of the engine shed.
- 4.3.3 These sleepers and deposits were sealed by 0.33m of stone chippings and tarmac, overburden **200**. This represents a build up layer following the abandonment of the limeworks.

4.4 TRENCH 3

- 4.4.1 Trench 3 was aligned east/west, measured 10m in length, and was excavated to a maximum depth of 3.6m (Fig 8; Plate 9). There are no structures marked on historic mapping of the area in the location of Trench 3, but the area is reported to have been used as a stockpile area for stone from the Arcow and Fordale quarries after the limeworks has closed (D Johnson pers comm).
- 4.4.2 What was thought to be a glacial till, layer **311**, was located at a depth of 3.6m below the modern ground level. This was located by excavating a sondage in the western 4.6m of the trench through the overlying deposits (Fig 9; Plate 10). For health and safety reasons it was not possible to enter the sondage and all observation and recording was undertaken from the surface.
- 4.4.3 Layers **303** to **309** comprise a number of deposits tipped onto the area in order to level up the natural slope (Fig 9). This levelling activity appears to have taken place to the east of a retaining wall, located between Trenches 3 and 4, to form a platform upon which stone could be stockpiled (Plate 11). Sealing these levelling deposits was 0.2m of crushed limestone, **302**, which was compacted to form a hard surface (Plate 9). Overlying layer **302** in the centre of the trench was a thin deposit of dark grey stone chippings, **310**, with fragmented firebrick inclusions. Overlying the whole of the trench was a 0.22m depth of dark grey stone chippings (**301**), which were most likely the remnants of stone from the Arcow and Fordale quarries that was stockpiled on this area (Plate 12). This was sealed by a 0.20m thick deposit of light-grey stone chippings (**300**) which formed the modern ground surface.

4.5 TRENCH 4

- 4.5.1 Trench 4 was aligned east/west, measured 9m in length, and was excavated to a maximum depth of 0.42m (Fig 10; Plate 13). The trench was located across railway sidings close to where the sidings joined the Settle to Carlisle mainline (Fig 11).
- 4.5.2 Glacial till, **410**, was exposed at a depth of 0.42m below the modern ground surface. Overlying this till were layers **408**, **406** and **401**, which were three successive layers of stone chippings used to form the base upon which the sidings had been constructed. Four timbers were located across the trench, **402**, **403**, **405** and **407**, positioned on a west-north-west/east-south-east orientation. In addition, timber **404** was located protruding from the southern edge of the trench and was aligned north-west/south-east; this timber was effectively within the overlying 0.1m turf, layer **400**, and is thought to be *ex situ*.
- 4.5.3 The largest of these timbers that had been worked into a rectangular shape, **402**, measured a minimum of 0.6m in length, 0.21m wide and 0.07m thick, and was protruding from the northern edge of the trench. This was the only timber which had circular bolt holes, and these were at its east-south-eastern end; it was evidently a railway sleeper. Timbers **403**, **404** and **405** may once have been timber associated with the sidings, although it is noticeable that timbers **403** and **405**, which are entirely within the trench, are too short to have formed railway sleepers in their current form. Alternatively, they performed some other undetermined function of the sidings. Timber **407**, which measured a 0.9m in length within the trench, was 0.1m wide and 0.05m thick, and, although being on the same orientation as most of the timbers, was too narrow and insubstantial to have served as a sleeper. Although the timber undoubtedly had some function in relation to the sidings, it is not certain as to precisely what this was.

5. FINDS

5.1 INTRODUCTION

- 5.1.1 The evaluation trenches produced only a few artefacts, which were as shown in Table 1 a catalogue of the finds is presented in *Appendix 4*.

Material	Description/date	Quantity
Pottery	Post-medieval	33
Ironwork	Nineteenth / twentieth centuries	10
Total		43

Table 1: Summary of the finds assemblage

5.2 POTTERY

- 5.2.1 In total, 33 fragments of post-medieval pottery were recovered from the two contexts within Trench 1 and Trench 2, 31 fragments from context **108** and 2 from **200**. All of these could be characterised as late grey stone ware. The bulk of the pottery from the backfill fill of pipe trench **108** was all from the same vessel and is dated to the mid-to late-nineteenth century.
- 5.2.2 The pottery is of little archaeological significance, has no potential for further analysis and should be discarded.

5.3 IRONWORK

- 5.3.1 In all, 10 fragments of ironwork were examined. All were in fair to good condition, with little surface corrosion. The majority of the group came from context **113**, and comprises large nails of several sizes. Most have round-sectioned shanks, and are most likely to have been machine-made, and thus of relatively recent date. A single square-shanked headless example could be hand-forged. There was, in addition, a large washer from the same context; again it is likely to be of recent date. A large nail was also recovered from context **309**, and had been driven into what appeared to be poor-quality knotty wood.
- 5.3.2 Two rail spikes were recovered from contexts **202** and **206**. Both are in very good condition, and evidence of their use to pin iron rails to wooden sleepers can be inferred from the presence of traces of mineral-preserved wood on their shank.

6. CONCLUSIONS

6.1 DISCUSSION

- 6.1.1 The excavation of the four trial trenches has identified the survival of elements of railway sidings which correspond very closely with those depicted on the OS 1909 map (Figs 4 and 6). No features pre-dating the establishment of the sidings were identified and the deposits post-dating the sidings were twentieth century levelling deposits. Although all tracks have been removed, presumably because of the value of the metal, the railway sleepers and gravels upon which the sidings were constructed, are still present below ground. The only exception to this is in Trench 3 where tip and levelling deposits were identified which were associated with the period of use for the platform following the abandonment of the limeworks, when the area was used as a stone stockpile area for the Arcow and Fordale quarries.
- 6.1.2 **Impact:** there is no documentary evidence of any occupation of the land, beyond its use for agriculture, prior to the establishment of the Craven Limeworks, and this is supported by the excavation evidence. Given the close correlation between the physical remains and the features shown on the OS 1909 map, it is reasonable to predict that the remainder of the siding foundations will survive intact. It is possible to suggest with a reasonable degree of confidence that any development in the area of Trenches 1, 2 and 4 are likely to impact on the archaeological remains of the sidings described above. Trench 3 is in an area raised by levelling deposits, and development here is unlikely to have significant impact on archaeological remains.

6.2 RECOMMENDATIONS

- 6.2.1 The recording of these remains would allow an opportunity to examine the infrastructure for the movement of coal onto the site and the removal of lime from it, the associated alterations to these structures and routes, as well the examination of other potential structures associated with the works. It is recommended that any further development of the site should include a programme of works to mitigate the impact of development upon archaeological remains. This programme of works should include further historical research of the area of the Stainforth Sidings, notably concerning historical mapping and examining the uses of the surrounding buildings and structures. This should examine the potential for illustrative material produced on behalf by the Craven Limeworks. An archaeologically supervised topsoil strip should be undertaken of those areas that will be impacted upon by the development to ensure that all archaeological features relating to the limeworks are recorded. It is also recommended that a survey and description is made of the retaining wall of the loading platform (Plate 11) prior to the construction of the proposed waste disposal depot.

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APPENDIX 1: PROJECT BRIEF

In order to give a clear idea of the likely level of archaeological mitigation required and the cost of this work to any developer, we consider it is necessary that an archaeological evaluation is undertaken in the former sidings and works depot area. Our recommendation is that this should consist of at least 3 trenches located at the following locations:

1. Immediately to the south of the Hoffmann Kiln where the current of the visitor interpretation centre is proposed.
2. Adjacent to the surviving works depot buildings south of the occupied house
3. In the area of the proposed waste disposal facility (as included in the red line of the development as discussed.

We consider these trenches should be sited perpendicular to the former rail lines and sidings with the objective of establishing the state and level of any archaeological deposits.

These works would need scheduled monument consent from the Secretary of State of the Department for Culture, Media and Sport.

To be clear on the former quarry floor/car park site, there will need to be an archaeological mitigation on this area at the time of development but we consider a watching brief condition would be appropriate. We do not consider it necessary to evaluate this area as there is no clear evidence to suggest significant archaeological deposits remain there.

(English Heritage)

APPENDIX 2: PROJECT DESIGN

**Oxford
Archaeology
North**

September 2008

LANGCLIFFE HOFFMAN LIMEKILN NORTH YORKSHIRE

ARCHAEOLOGICAL EVALUATION

Proposals

The following project design is offered in response to a request from Emma Darbyshire, Rural Solutions, for an evaluation at the site of the Craven Limeworks, Langcliffe near Settle, North Yorkshire.

1. INTRODUCTION

1.1 CONTRACT BACKGROUND

1.1.1 Oxford Archaeology North has been invited by Emma Darbishire of Rural Solutions, to submit a project design and costs for an evaluation on the site of the mixed development site at Langcliffe and is in response to a brief prepared by English Heritage. The evaluation is required to examine the area of the former sidings and works depot area and will entail the excavation of three trenches.

1.1.2 **Archaeological Background:** this summary is from a survey report by Lancaster University Archaeological Unit (now Oxford Archaeology North) *Langcliffe Quarry Limeworks, Settle: An archaeological Survey of the site and Hoffman kiln* (1989). The Hoffman limekiln at Langcliffe, was part of the Craven Limeworks, and was built in 1872/3 to coincide with the completion of the Settle Carlisle railway line, which it was intended to utilise. The quarry and kiln operated between 1873 and 1931, and then from 1937 to the outbreak of war in 1939. A further limeworks, the Murgatroyd works, was constructed adjacent and had three massive draw kilns which opened straight out onto the Settle Carlisle rail line. This was also constructed in 1873, but had closed by 1907.

1.1.3 **Depot Area:** the large works building (now Craven Cottage (30.4)) was built from the outset and on the 1907 OS plan a railway track was shown running through its centre. The brick building (30.5) to the south of the main works building and the depot office / canteen were built between 1880 and 1907. All other buildings were constructed in the early part of the 20th century (after 1907). The 1907 OS map shows that most of the area of the present depot area was occupied by sidings.

1.2 OXFORD ARCHAEOLOGY NORTH

1.2.1 Oxford Archaeology North (OA North) has considerable experience of the archaeological survey and evaluation of sites and monuments of all periods, having undertaken a great number of small and large projects during the past 20 years. Projects have been undertaken to fulfil the different requirements of various clients and planning authorities, and to very rigorous timetables. OA North has considerable experience of the recording of historic buildings together with the evaluation and excavation of sites of all periods, having undertaken a great number of small and large scale projects during the past 20 years. Fieldwork has taken place within the planning process and construction programmes, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North undertook the original survey of the limeworks (LUAU 1989) and all subsequent investigations of the site (eg LUAU 1997). OA North has an unprecedented knowledge of the site and the industry, and is in a unique position to be able to undertake the proposed evaluation.

1.2.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) registered organisation, registration number 17, and all its members of staff operate subject to the IFA Code of Conduct.

2. OBJECTIVES

2.1 The following programme has been designed, in accordance with a brief by English Heritage, to provide an evaluation of the proposed development within the Craven Limeworks depot. The required stages to achieve these ends are as follows:

2.2 EVALUATION TRENCHING

2.2.1 To implement a programme of trial trenching entailing the excavation of four trenches.

- One on the site of the proposed Kiln Interpretation Centre
- One to the south of Craven Cottage and adjacent to brick building 30.5
- Two on the site of the proposed waste disposal facility at the southern part of the site

2.3 REPORT

- 2.3.1 A written report will present an assessment of the significance of the data generated by this programme within a local and regional context. It will present the evaluation and make an assessment of the archaeological potential of the area, and make recommendations for further work.

3 METHOD STATEMENT

3.1 EVALUATION

- 3.1.1 The brief requires three trenches within the depot area. One on the site of the proposed Kiln Interpretation Centre and is in an area of former sidings as shown on the OS 1907 map. The second is on the site of the Rural Business Centre and would have been beside a building and adjacent chimney shown on the 1907 map. Finally there would be one in the area of the proposed waste disposal facility and was an area of sidings shown on the 1907 map. The brief does not define the length of trenching, but it is proposed to excavate 15m long trenches as these would most effectively fit within the available spaces. However, the trenches on the site of the proposed waste disposal facility will be smaller trenches (c 8m in length) and will be equivalent to a single larger one. The middle trench would need to be smaller in order to fit between the existing buildings and would need to be at least 2m away from the edge of the brick building 30.5, it is therefore proposed that this is of 10m length. It is proposed that the trenches be orientated east/west and will be therefore perpendicular to that of the sidings, so as to most effectively examine these features. The suggested layout is shown on the attached figure.
- 3.1.2 **Methods:** the programme of trenching will establish the presence or absence of any archaeological deposits or structures and, if established, will then test their date, nature, depth and quality of preservation. The trenches will be excavated by a combination of mechanised and manual techniques; the tarmac or topsoil will be removed by mechanical excavator, fitted with a 1.8m wide toothless bucket (the tarmac will initially be removed with a toothed bucket). The uppermost levels of overburden will then be removed using the same machine, but fitted with a toothless ditching bucket, to the top of the first significant archaeological level. The work will be supervised closely by a suitably experienced archaeologist. Spoil from the excavation will be stored adjacent to the trench, and will be backfilled upon completion of the archaeological works. Machine excavation will then be used to define carefully the extent of any surviving foundations, floors, and other remains. Thereafter, structural remains will be cleaned manually to define their extent, nature, form and, where possible, date. It should be noted that no archaeological deposits will be entirely removed from the site. If the excavation is to proceed below a depth of 1.2m, then the trenches will be widened sufficiently to allow the sides to be stepped in. One long section of each trench will be manually cleaned to enable close examination and recording. Sensitive deposits will be manually excavated, which will enable an assessment of the nature, date, survival and depth of deposits and features. The trench will be excavated in a stratigraphical manner, whether by machine or by hand.
- 3.1.3 **Context Recording:** all contexts will be recorded using *pro-forma* sheets, and details will be incorporated into a Harris matrix. Similar object record and photographic record *pro-formas* will be used. All written recording of survey data, contexts, photographs, artefacts and ecofacts will be cross-referenced from *pro-forma* record sheets using sequential numbering.
- 3.1.4 **Photography:** a full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photography will be undertaken using 35mm cameras on archivable black and white print film as well as digital photography using an 8mb digital camera. All frames will include a visible, graduated metric scale. Photographs records will be maintained on special photographic *pro-forma* sheets.
- 3.1.5 **Planning:** the precise location of all archaeological structures encountered will be surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within AutoCAD, which will then be subject to manual survey enhancement. The drawings will be generated at an accuracy appropriate for 1:20 scale, but

can be output at any scale required. Sections will be manually drafted as appropriate at a scale of 1:10. All information will be tied in to control left from the earlier 1989 survey, if possible.

- 3.1.6 Human remains are not expected to be present, but if they are found they will, if possible, be left *in situ* covered and protected. If removal is necessary, then the relevant Home Office permission will be sought, and the removal of such remains will be carried out with due care and sensitivity as required by the *Burials Act 1857*.
- 3.1.7 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996.
- 3.1.8 ***Finds policy:*** finds recovery and sampling programmes will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. OA North employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation. Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham. Samples will also be collected for technological, pedological and chronological analysis as appropriate. OA North employs palaeoecology and soil micromorphology specialists with considerable expertise in the investigation, excavation and analysis of sites of all periods and types, who are readily available for consultation.

3.2 HEALTH AND SAFETY

- 3.2.1 Full regard will, of course, be given to all constraints during the course of the project. OA provides a Health and Safety Statement for all projects and maintains a Safety Policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (3rd Edition, 1997). A risk assessment will be completed in advance of any on-site works. Details of the Safety Policy are presented in *Appendix 1*.
- 3.2.2 OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000. Written details of insurance cover can be provided if required.
- 3.2.3 Normal OA North working hours are between 9.00 am and 5.00 pm, Monday to Friday, though adjustments to hours may be made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the Client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary.

3.3 OTHER MATTERS

- 3.3.1 Access to the site will be arranged via the Client/main contractor.
- 3.3.2 It is assumed that the Client will provide a secure enclosed area for the archaeological work to take place within. It is assumed that the Client will provide access to toilet and temporary office facilities. All other plant will be provided by OA North.
- 3.3.3 The trenches will be backfilled upon completion of the archaeological works. However, paved areas and tarmac surfaces removed during the course of the evaluation will not be reinstated to their current standard.
- 3.3.4 The Client is asked to provide OA North with information relating to the position of live services on the site. OA North will use a cable detecting tool in advance of any machine excavation. The Client is also asked to supply OA North with the results obtained from any geo-technical boring across the site, and any other information on ground conditions that will allow a risk assessment to be formulated.

3.4 REPORT

- 3.4.1 **Archive:** the results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. It will include summary processing and analysis of all features, finds, or palaeoenvironmental data recovered during fieldwork, which will be catalogued by context. This archive can be provided in the English Heritage Centre for Archaeology format and a synthesis will be included in the Yorkshire Dales SMR / North Yorkshire HER. A copy of the archive can also be made available for deposition with the National Archaeological Record. OA North practice is to deposit the original record archive of projects (paper, magnetic and plastic media) with the appropriate County Record Office, and a full copy of the record archive (microform or microfiche) together with the material archive (artefacts, ecofacts, and samples) with an appropriate museum.
- 3.4.2 **Report:** one bound and one unbound copy of a written synthetic report will be submitted to the Client, and a further two copies will be submitted to the Yorkshire Dales SMR. The report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above and present an assessment of the history of the site. The report will include the following:
- a summary
 - a description of the methodology
 - a description of the results
 - a list of the finds
 - an assessment of the identified archaeological resource and how it fits into the previous investigations, documentary data and cartographic sources.
 - a complete bibliography of sources from which data has been derived
 - a set of recommendations for further work.
- 3.4.3 Illustrative material will include a location map, site map, a trench location map, trench plans, survey maps, and also pertinent photographs.

4. WORK PROGRAMME

- 4.1 **Timetable:** the combined fieldwork element is timetabled to take three days.
- 4.2 The post-excavation element of the programme would typically take 15 days; however, if required, an interim report out can be arranged within a short timescale to satisfy the immediate requirements of the archaeological curator.
- 4.3 The project will be managed by **Jamie Quartermaine BA Surv Dip MIFA** (Unit Project Manager) to whom all correspondence should be addressed. OA North adheres by the IFA's Code of Conduct and the Code of Approved Practice for the regulation of Contractual Arrangements in Field Archaeology.

APPENDIX 3: CONTEXT INDEX

Context No	Trial Trench No	Depth (m)	Category	Description
100	1	Unknown	Layer	Gravel layer laid as a compacted base upon which railway sidings were constructed. A dark grey coarse sand with 99% angular stone inclusions a maximum of 90mm by 80mm by 20mm
101	1	0.09m	Wood	Railway sleeper. It measured a minimum of 1.0m in length, continuing beyond the limits of the trial trench, and 0.28m wide, laid on an east/west orientation. Two sub-square holes, 40mm ² in size, were present, and were assumed to have formerly contained fittings used to fix the track to the sleeper. The base of the sleeper was decayed, and the depth of the wood may not represent the original depth of this sleeper.
102	1	0.07m	Wood	Railway sleeper. It measured a minimum of 2.35m in length, continuing beyond the limits of the trial trench, and 0.28m wide, laid on an east/west orientation. The base of the sleeper was decayed, and the depth of the wood may not represent the original depth of this sleeper.
103	1	0.12	Wood	Railway sleeper which measured a minimum of 1.83m in length, continuing beyond the limits of the trial trench, and was 0.28m wide, laid on an east/west orientation. Two iron plates were fixed to the western end of the sleeper. The southerly plate measured 0.14m in length, 0.10m wide and 0.4m in length, was fixed to the sleeper with one remaining bolt and a hole was present for a second bolt, with a 40mm square notch in the western end of the plate. The northerly plate measured 0.46m in length 0.15m wide and 0.05m thick. At each corner a bolt had been used to fix the plate, although only a single squared-headed bolt remained. A 0.12m wide groove had been cut across the sleeper immediately to the east of these plates.
104	1	0.07	Wood	Railway sleeper. It measured a minimum of 1.4m in length, continuing beyond the limits of the trial trench, and 0.28m wide, laid on an east/west orientation. The base of the sleeper was decayed, and the depth of the wood may not represent the original depth of this sleeper.
105	1	0.11	Wood	Railway sleeper. It measured a minimum of 0.43m in length, continuing beyond the limits of the trial trench, and 0.23m wide, laid on an east/west orientation. The base of the sleeper was decayed, and the depth of the wood may not represent the original depth of this sleeper.
106	1	Unknown	Masonry	Alignment of roughly-hewn limestone, a minimum of 0.47m in length and 0.31m wide, laid on an east/west orientation. The stone measured a maximum of 0.40m by 0.31m by 0.23m in size. A single fire brick was also

Context No	Trial Trench No	Depth (m)	Category	Description
				included, 0.26m in length and 0.14m wide.
107	1	Unknown	Masonry	Alignment of roughly-hewn limestone, a minimum of 0.17m in length and 0.28m wide, laid on an east/west alignment. The stone measured a maximum of 0.26m by 0.18m by 0.18m in size.
108	1	Unknown	Fill	Fill of 116 . Backfill of pipe trench.
109	1	-	Pipe	Cast iron pipe 1.4m in length and 0.11m in diameter. Laid on an east/west alignment within pipe trench 116 .
110	1	Unknown	Wood	Railway sleeper. It measured a minimum of 1.4m in length, continuing beyond the limits of the trial trench, and 0.25m wide, laid on an east/west orientation. At the western end of the extant wood, a wood stain indicated that the sleeper continued further in this direction, and, therefore, measured a minimum of 1.39m within the trench.
111	1	Unknown	Wood Stain	Wood stain where an east/west aligned railway sleeper had previously been positioned, measuring a minimum of 1.9m in length, continuing beyond the limits of the trial trench, and 0.26m wide.
112	1	Unknown	Wood	Railway sleeper. It measured a minimum of 0.6m in length, continuing beyond the limits of the trial trench, and 0.28m wide, laid on an east/west orientation.
113	1	0.69	Layer	Overburden. A mix of light grey and dark grey gravel used to level the area, sealed by tarmac.
114	1	Unknown	Layer	Glacial till. A mid-orange-brown gravel with 10% sub-rounded and sub-angular stone a maximum of 0.18m by 0.16m by 0.12m in size.
115	1	-	Pipe	Cast iron pipe, 0.13m in diameter, with a 0.25m diameter collar, placed on a north/south alignment within pipe trench 116 .
116	1	Unknown	Cut	Pipe trench. Cut measuring 2.1m wide, aligned north/south and east/west. The trench appears to have been positioned over a junction in this drain, with pipe 109 , coming in from the east into this otherwise north/south aligned linear. Pipe 115 was located after removing one of the stones of the backfill, 108 .
200	2	0.33	Layer	Overburden. Comprised 50mm of tarmac on top of 0.24m of stone chippings used to level the area.
201	2	Unknown	Layer	Layer of stone chippings, laid as a compacted base upon which railway sidings had been constructed. It comprised a very dark-grey coarse gravel, with 99% angular stone inclusions a maximum of 50mm by 40mm by 40mm in size. Located in the eastern 3.15m of the trench. This is essentially the same layer as 204 , but it has greater numbers of stone, which are significantly smaller than those of 204 .
202	2	0.32	Wood	Railway sleeper. It measured a minimum of 2.2m in length, continuing beyond the limits of the trial trench, and 0.25m wide, laid on an

Context No	Trial Trench No	Depth (m)	Category	Description
				east/west orientation. A single steel large steel pin was embedded in the sleeper, presumably once used to fix the rail to it, recovered as OBJ 1000.
203	2	0.32	Wood	Railway sleeper. It measured a minimum of 1.7m in length, continuing beyond the limits of the trial trench, and 0.25m wide, laid on an east/west orientation. One steel pin was present embedded in the wood, measuring 11mm ² .
204	2	0.29m	Layer	A layer of stone chippings, laid as a compacted base upon which railway sidings had been constructed. A very dark-grey coarse gravel, comprised angular stone a maximum of 80mm by 70mm by 40mm in size. Effectively the same layer as 201, but with more frequent stones at the larger end of the scale.
205	2	0.01	Layer	Area of crushed coal, with fragments a maximum of 10mm by 10mm by 10mm in size.
206	2	0.32m	Wood	Railway sleeper. It measured a minimum of 2.48m in length, continuing beyond the limits of the trial trench, and 0.25m wide, laid on an east/west orientation. Three steel pins were present embedded in the wood, measuring 11mm ² , one retained as OBJ 1002.
207	2	0.32m	Wood	Railway sleeper. It measured a minimum of 2.27m in length, continuing beyond the limits of the trial trench, and 0.25m wide, laid on an east/west orientation. One steel pin was present embedded in the wood, measuring 11mm ² .
208	2	Unknown	Layer	Natural glacial till. A mid-orange-brown fine sand silty clay, with 1% to 10% sub-rounded stone inclusions a maximum of 0.12m by 0.11m by 0.07m in size.
300	3	0.20	Layer	Overburden. A very light-grey layer of stone chippings, comprising sub-angular stone a maximum of 70mm by 50mm by 10mm in size.
301	3	0.22	Layer	A layer of dark grey stone chippings, comprising angular stone a maximum of 80mm by 50mm by 30mm in size. It is potentially the remnants of the stone from Fordale and Arcow Quarries stock-piled in this area in the first half of the twentieth century, after the lime works had closed down (D. Johnson pers comm).
302	3	0.20	Layer	Mid-orange brown crushed limestone, comprising angular stone a maximum of 20mm by 10mm by 5mm in size. The layer of stone has been compacted to form a firm surface.
303	3	0.50	Layer	Levelling deposit. A mid-brown coarse sand silty clay, with c 10% to 20% sub-angular stone inclusions.
304	3	0.11	Layer	Levelling deposit. A very light-grey layer of lime.
305	3	1.10	Layer	Levelling deposit. A dark-grey coarse sand silty clay, with c 10% sub-angular stone inclusions a maximum of 0.16m by 0.10m by 0.07m in size.
306	3	0.40	Layer	Levelling deposit. A very light-grey layer of lime.

Context No	Trial Trench No	Depth (m)	Category	Description
307	3	0.64	Layer	Levelling deposit. Depth of trench prevented close inspection of deposit, but comprised a mid-grey deposit, with <i>c</i> 25% small-to medium-sized sub-angular stone inclusions.
308	3	0.14	Layer	Levelling deposit. A very light-grey layer of lime. The depth of the trench prevented close inspection of the deposit.
309	3	0.80	Layer	Levelling deposit. Depth of trench prevented close inspection of the deposit, but comprised a dark grey deposit of coarse sand silty clay with <i>c</i> 10% to 20% stones that were a maximum of 0.12m by 0.10m by 0.10m in size.
310	3	0.03	Layer	A dark-grey gravel, comprising angular stone which are a maximum of 20mm by 15mm by 10mm. The layer also contained fragments of firebrick a maximum of 0.11m by 0.11m by 0.06m in size. It is very similar to layer 301.
311	3	Unknown	Layer	Possibly glacial till, but the layer was not closely inspected due to depth of trench. A mid-orange brown fine sand silty clay, with 1% to 10% sub-rounded stone inclusions a maximum of 0.12m by 0.11m by 0.07m in size.
400	4	0.10	Layer	Overburden, principally a thin layer of turf.
401	4	Unknown	Layer	Layer of stone chippings, laid as a compacted base upon which the railway sidings had been constructed. Comprised light grey angular stone a maximum of 50mm by 40mm by 20mm in size.
402	4	0.07	Wood	Rectangular-shaped wood, 0.60m in length and 0.21m wide, laid on a north-east/south-west orientation. Two circular holes had been drilled through its eastern end, 0.30m in diameter.
403	4	0.095	Wood	Rectangular-shaped wood, 0.80m in length and 0.22m wide, laid on a north-east/south-west orientation.
404	4	0.21	Wood	Rectangular-shaped wood. It measured a minimum of 0.20m in length, although continuing beyond the limits of the trial trench, and 0.21m wide, laid on a north-east/south-west orientation.
405	4	0.11	Wood	Rectangular-shaped wood. It measured 0.60m in length, although a stain from the where the wood has decayed suggests a length of 0.68mm, and a width of 0.17m.
406	4	Unknown	Layer	A layer of stone chippings, laid as a compacted base upon which the railway sidings had been constructed. It comprised very dark-grey angular stone a maximum of 0.13m by 0.11m by 0.05m in size.
407	4	0.05	Wood	Rectangular-shaped wood. It measured a minimum of 0.90m in length, although continuing beyond the limits of the trial trench, and 0.10m wide, laid on a north-east/south-west orientation.
408	4	0.17	Layer	Layer of stone chippings, laid as a compacted base upon which the railway sidings had been constructed. It comprised mid-grey angular stone

Context No	Trial Trench No	Depth (m)	Category	Description
				a maximum of 60mm by 50mm by 30mm in size.
409	4	0.27	Layer	A layer of stone chippings, laid as a compacted base upon which the railway sidings had been constructed. It comprised dark-grey angular stone a maximum of 0.13m by 0.11m by 0.05m in size.
410	4	Unknown	Layer	Glacial till. A mid-orange-brown fine sand silty clay, with c 20% sub-rounded stone inclusions a maximum of 0.12m by 0.08m by 0.04m in size.

APPENDIX 4: FINDS CATALOGUE

Context	Material	Category	No Frags	Description	Period
108	Ceramic	Vessel	31	Late grey stone ware	Mid to late nineteenth-century
113	Iron	Nail	3	'Four-inch' nails. Machine made.	Twentieth-century onwards
113	Iron	Link	1	Oval link, now pulled open, with round section.	Recent
113	Iron	Nail	1	'Six-inch' nail driven into a knotty fragment of poorly-preserved wood.	Recent
113	Iron	Washer	1	Large perforated disc, presumably intended to serve as a washer.	Recent
113	Iron	Nail	1	Large headless nail. Square section implies that it is hand-forged.	Late nineteenth-century onwards
200	Ceramic	Vessel	2	Late grey stone ware	Mid to late nineteenth-century
202	Iron	Spike	1	Well-preserved rail spike. Retains mineral-preserved impression of wood, presumably from the sleeper into which it was driven.	Late nineteenth-century onwards
206	Iron	Spike	1	Well-preserved rail spike	Late nineteenth-century onwards
309	Iron	Sheet	1	Thin strip of sheet metal, bent and distorted.	Recent

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- Figure 2: Trench locations
- Figure 3: Extract from Ordnance Survey 1909 third edition, 1:2500 sheet 132.2, showing the extent of the quarry
- Figure 4: Extract from Ordnance Survey 1909 third Edition, 1:2500 sheet 132.2 superimposed with trench locations
- Figure 5: Plan of Trench 1
- Figure 6: Location of northern archaeology, overlain on Ordnance Survey 1909 third edition map
- Figure 7: Plan of Trench 2
- Figure 8: Plan of Trench 3
- Figure 9: South-facing section of Trench 3
- Figure 10: Plan of Trench 4
- Figure 11: Location of southern archaeology, overlain on Ordnance Survey 1909 third edition map

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- Plate 5: Railway sleepers 110 and 112 at eastern end of Trench 1, with stain of absent sleeper, looking north-east
- Plate 6: General view of Trench 2 (western half) showing sleeper 202 and 203, looking east
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- Plate 8: Railway sleepers 206 and 207 of Trench 2, looking south
- Plate 9: General view of Trench 3, looking west
- Plate 10: Sondage excavated at western end of Trench 3, looking north
- Plate 11: Loading platform located between Trenches 3 and 4, looking north-east
- Plate 12: South-facing section of Trench 3, in centre of trench, looking north
- Plate 13: General view of Trench 4, looking west

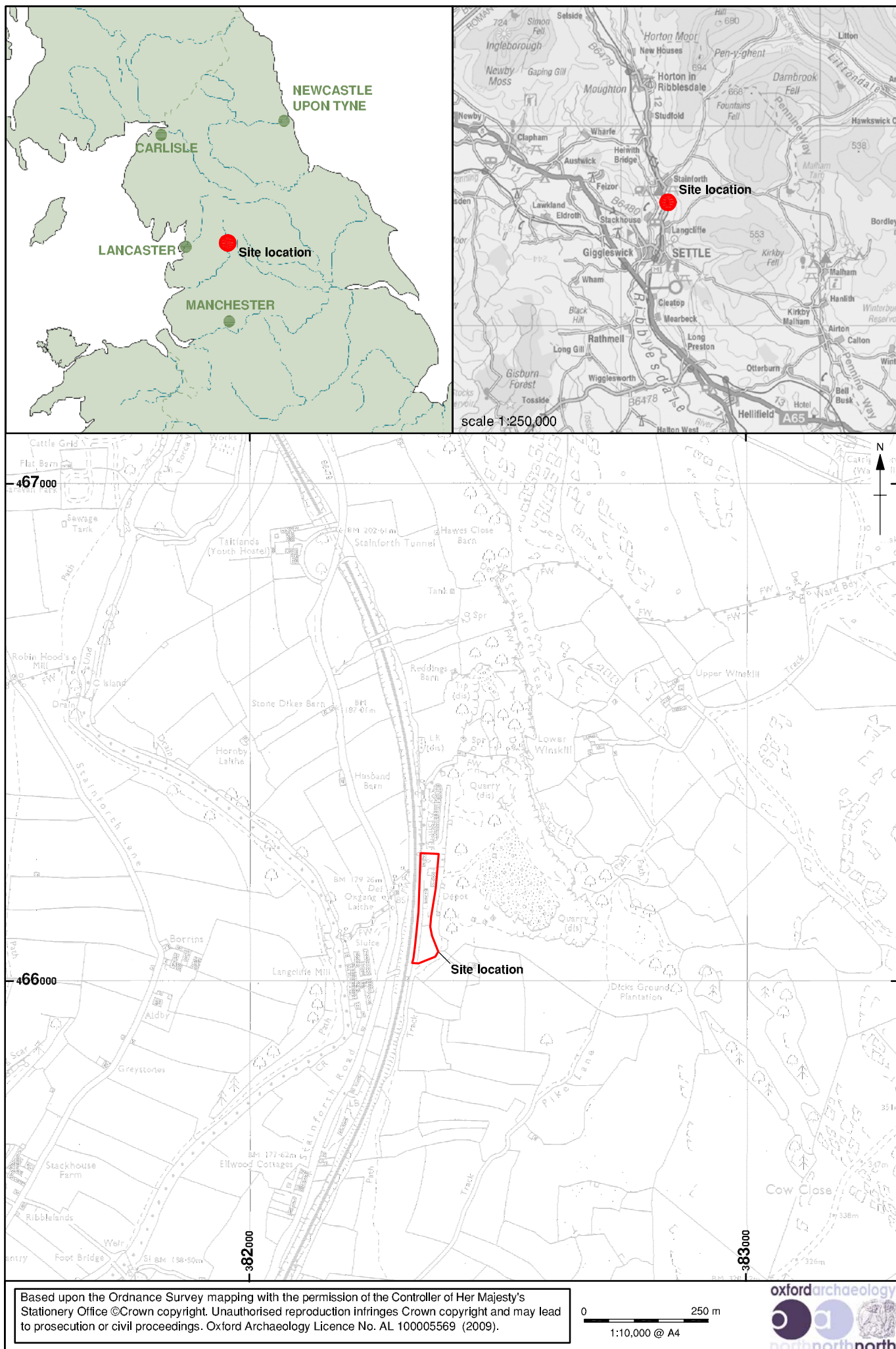


Figure 1: Site location

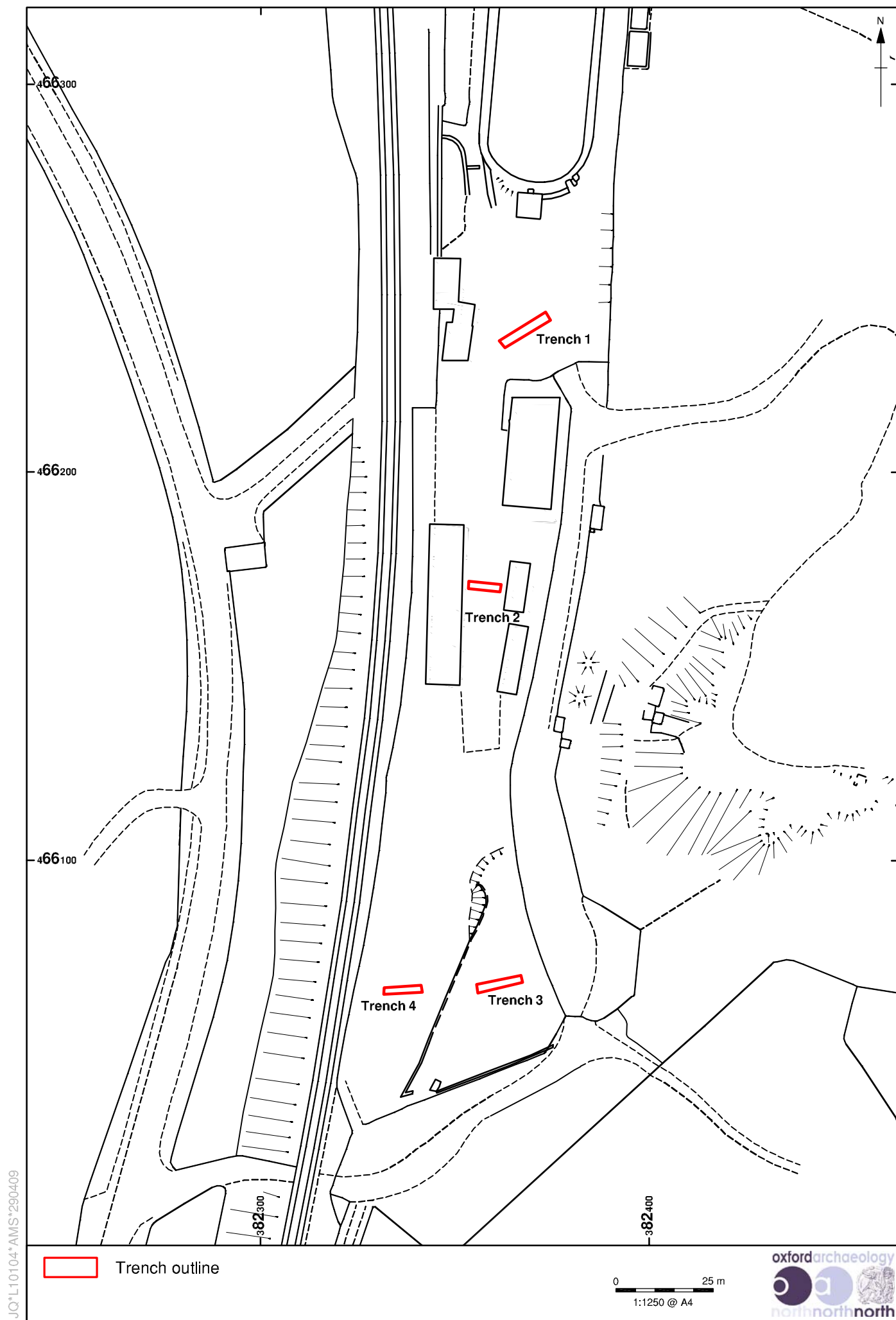


Figure 2: Trench locations

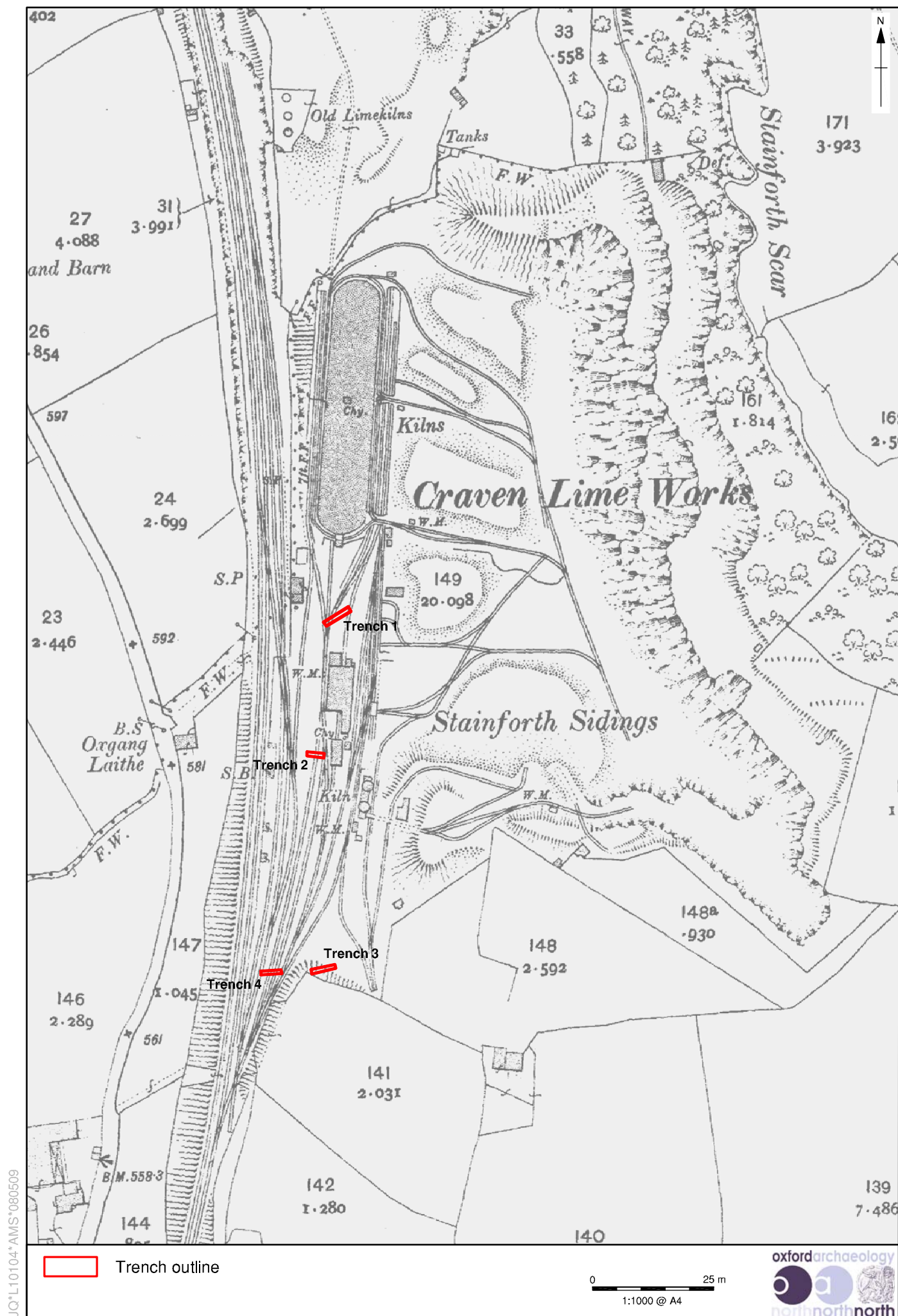


Figure 3: Extract from Ordnance Survey 1909 third Edition, 1:2500 sheet 132.2 showing the extent of the quarry

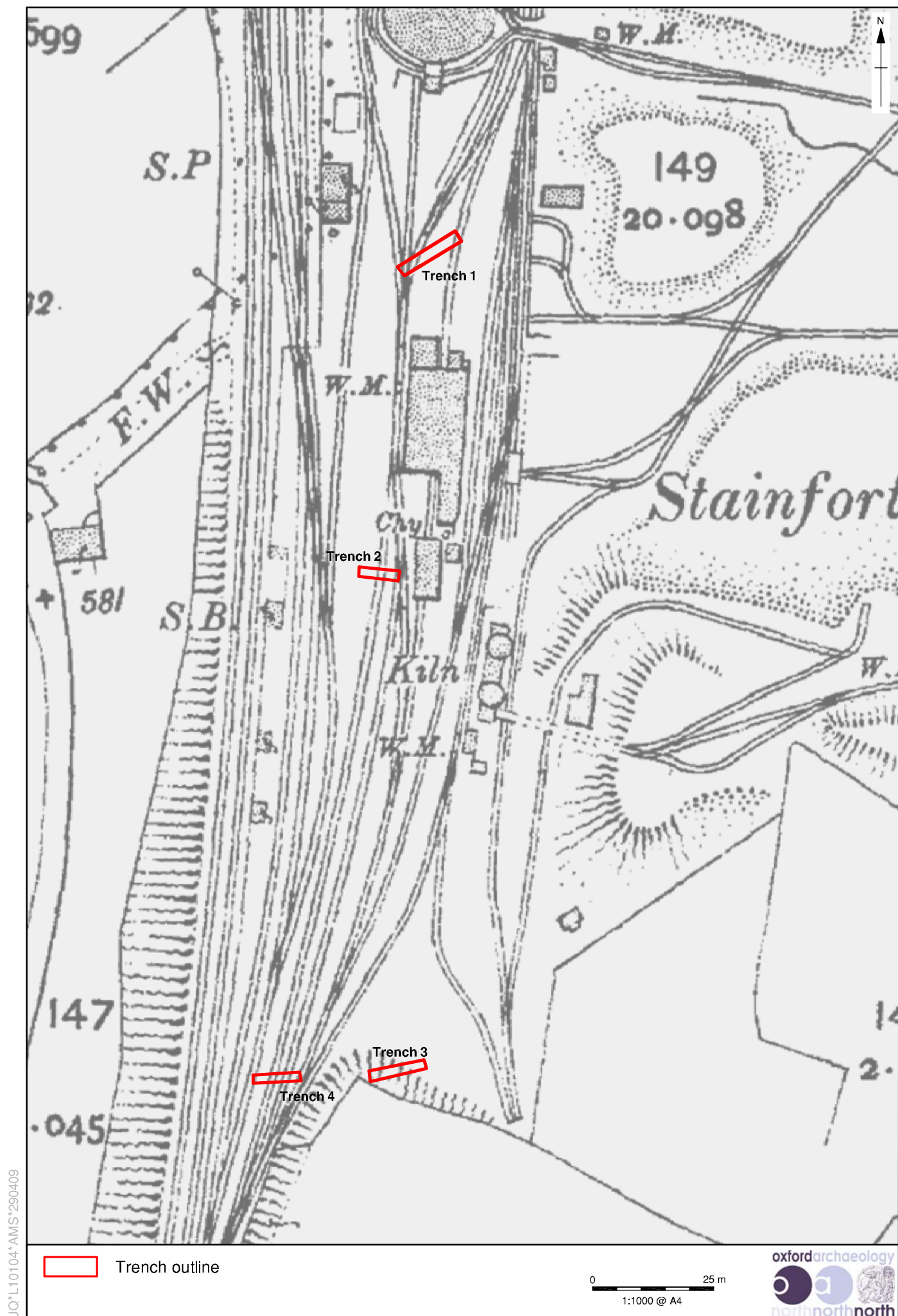


Figure 4: Extract from Ordnance Survey 1909 third Edition, 1:2500 sheet 132.2, superimposed with trench locations

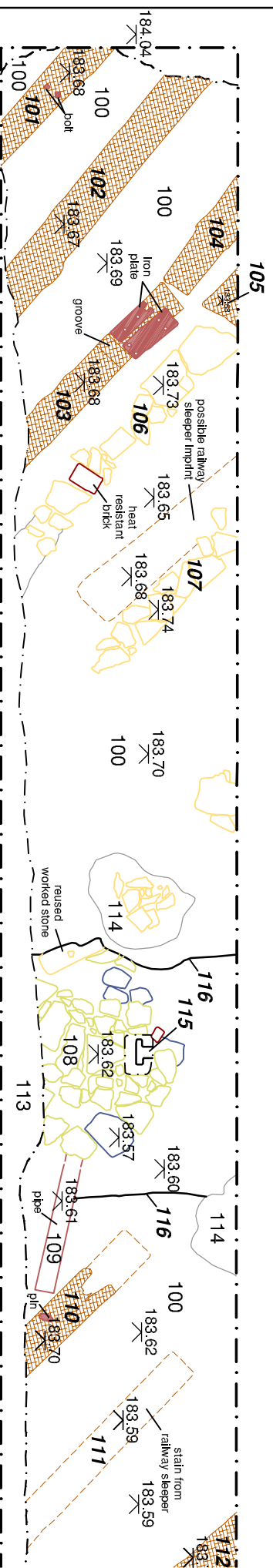


Figure 5: Plan of Trench 1



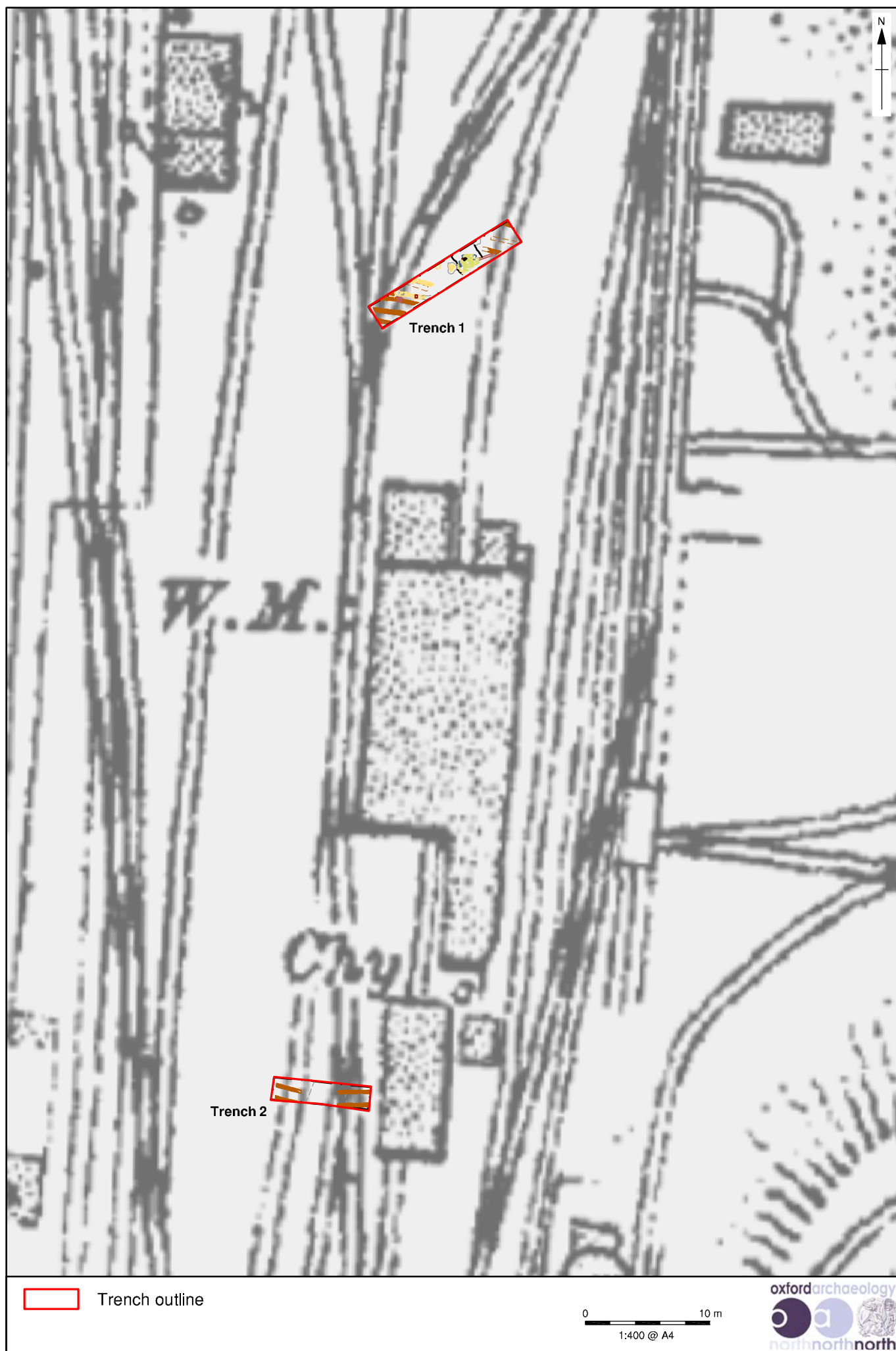
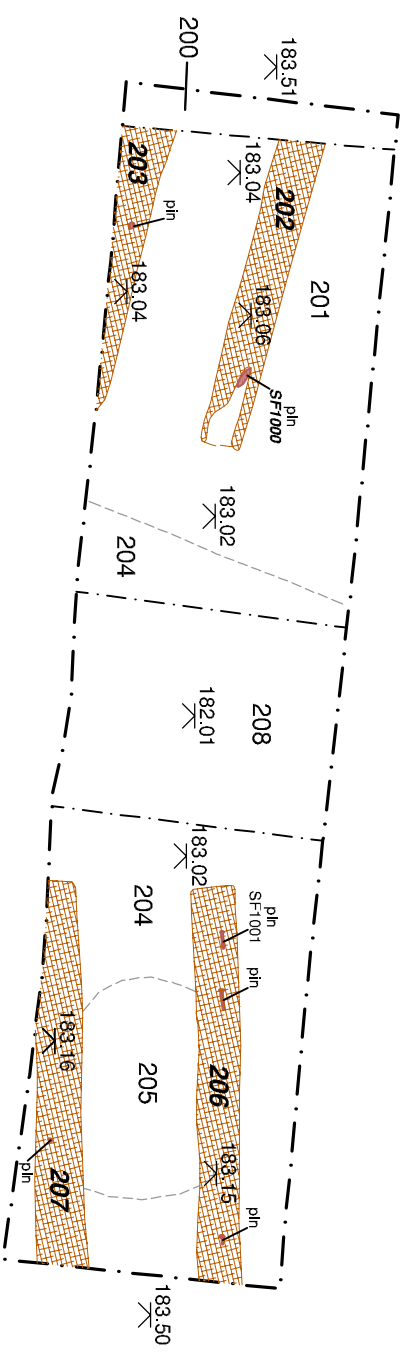


Figure 6: Location of northern archaeology, overlain on Ordnance Survey 1909 third Edition map





Limit of excavation
Internal limit of excavation



Railway sleeper
Iron



Spot height (m aOD)



0
1:50 @ A4
1 m



Figure 7: Plan of Trench 2

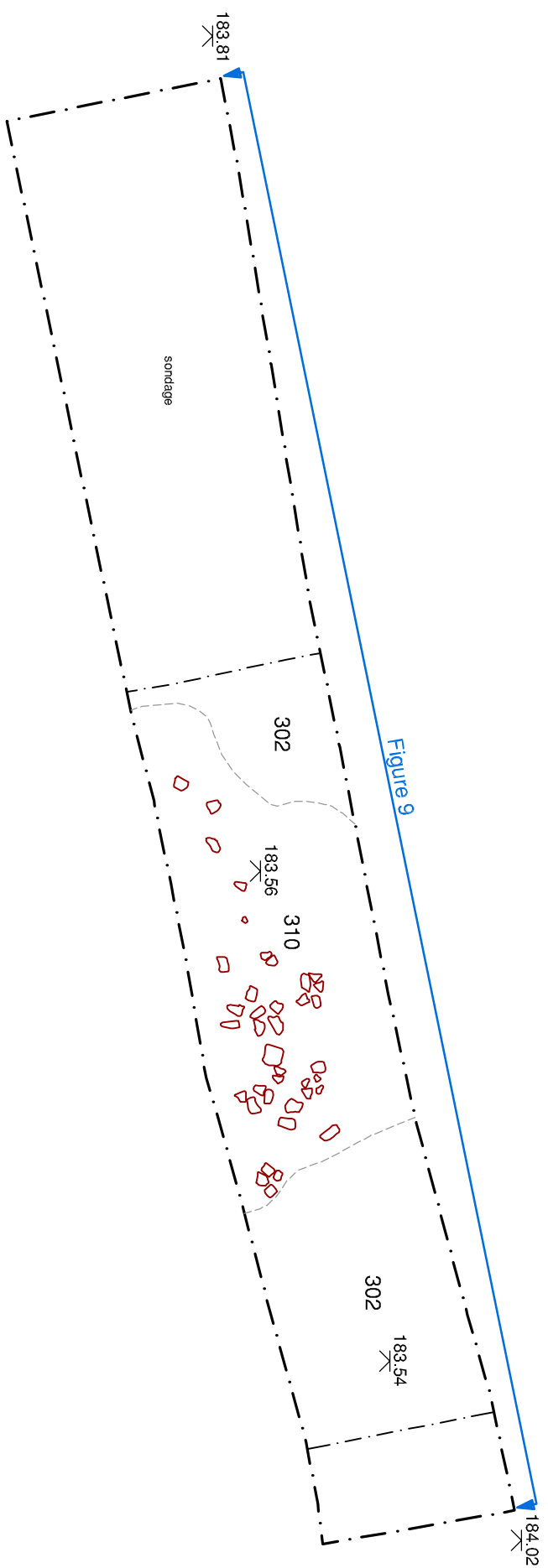


Figure 9



Limit of excavation



Brick

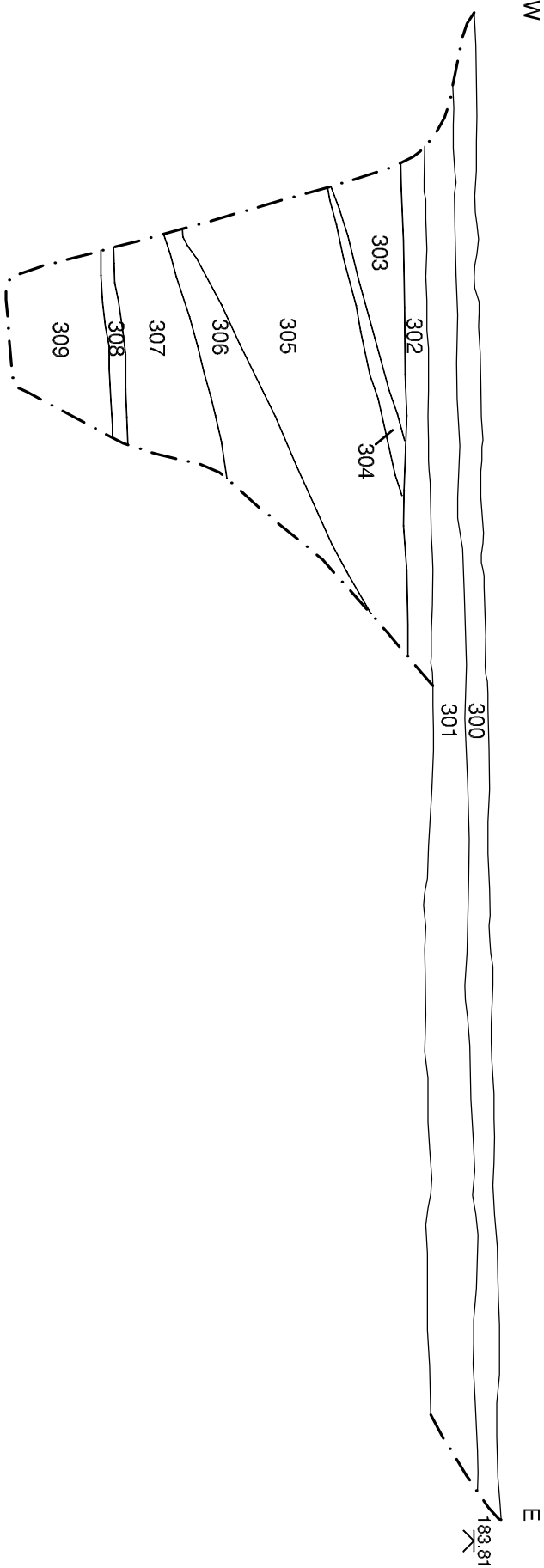


Internal limit of excavation



Spot height (m aOD)

Figure 8: Plan of Trench 3



Limit of excavation

183.59

Spot height (m aOD)

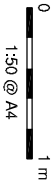
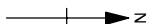
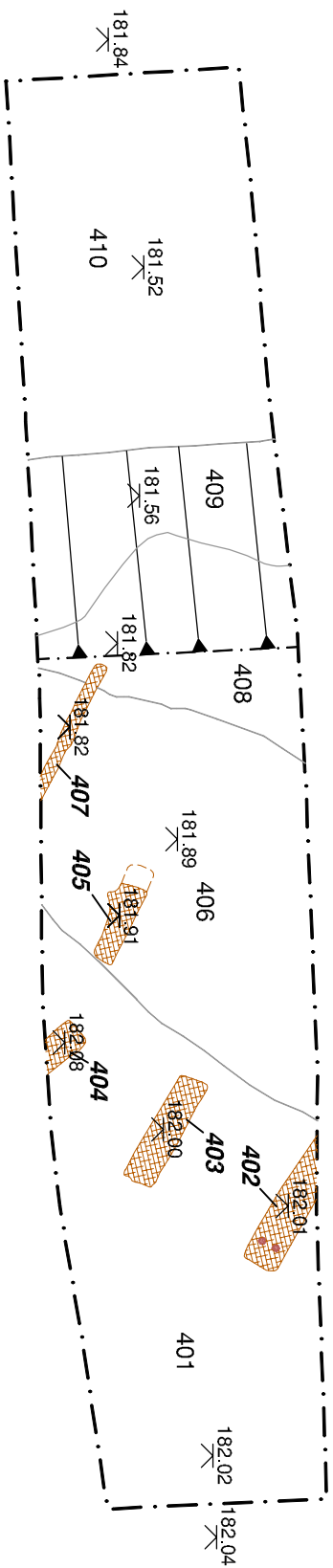


Figure 9: South-facing section of Trench 3



Limit of excavation

Internal limit of excavation



Railway sleeper

Iron

183.59

Spot height (m aOD)

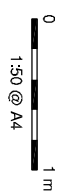


Figure 10: Plan of Trench 4



Figure 11: Location of southern archaeology, overlain on Ordnance Survey 1909 third Edition map



Plate 3: General view of Trench 1, looking east



Plate 4: Railway sleepers **101**, **102**, **103** and stone alignment **108** in Trench 1, looking south-west



Plate 5: Railway sleepers **110** and **112** at eastern end of Trench 1, with stain of absent sleeper, looking north-east



Plate 6: General view of Trench 2 (western half) showing sleeper **202** and **203**, looking east

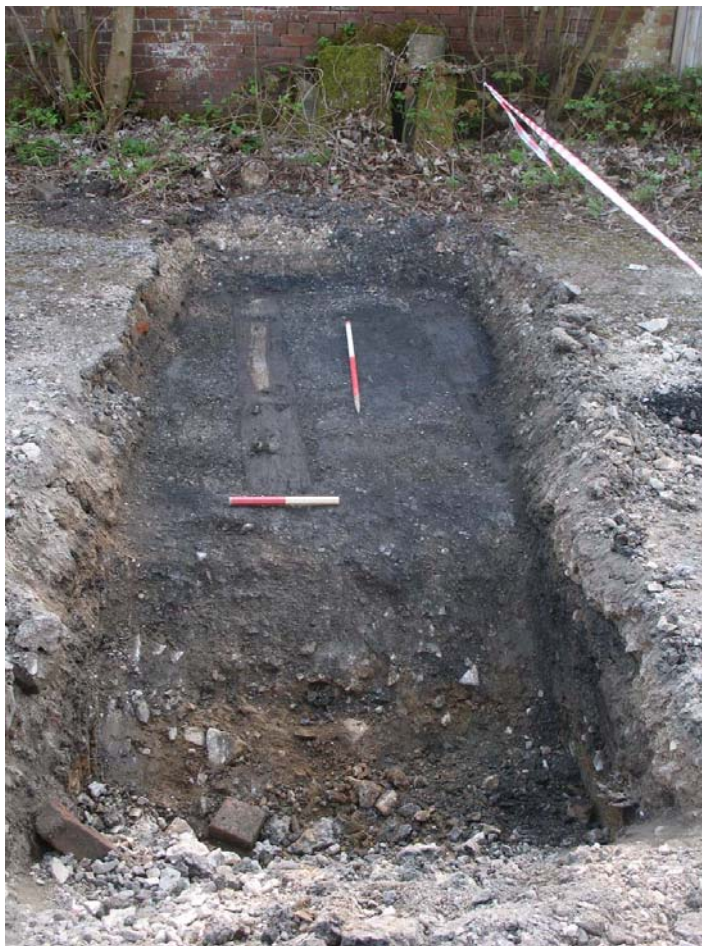


Plate 7: General view of Trench 2 (eastern half), looking east



Plate 8: Railway sleepers **206** and **207** of Trench 2, looking south



Plate 9: General view of Trench 3, looking west



Plate 10: Sondage excavated at western end of Trench 3, looking north



Plate 11: Loading platform located between Trenches 3 and 4, looking north-east



Plate 12: South-facing section of Trench 3, in centre of trench, looking north



Plate 13: General view of Trench 4, looking west