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Summary

Circumstantial evidence based on field observations suggests that there exists a possibility that the robbed course of Hadrian's Wall may exist, passing directly through Pylon FK5.

A series of observations undertaken during the summer of 2013 appear to corroborate this probable course as an alternative route proved to be incorrect.

1 INTRODUCTION

1.1 Project origins

As part of refurbishment of the electricity transmission system, an archaeological watching brief was requested by English Heritage in order to ascertain whether sensitive past cultural features and deposits may be extant, relating to the potential remains belonging to Hadrian's Wall (figure 1).

This defence formed part of the Roman frontier defences; a probable turf wall, protecting the Cumbrian coast from Bowness-on-Solway to Carlisle, contemporary with the stone wall east of Carlisle.

Because of the archaeological significance and sensitivity of this location, the curatorial planning authority stated that development was subject to the "developer" securing the implementation of a formal programme of archaeological observation and investigation (archaeological watching brief) prior to the forthcoming development.

The study area is not scheduled as an ancient monument but has the potential to possess significant archaeological remains and required curatorial approval for the development to proceed.

Prior to commencement for any development, this formal programme required approval by English Heritage, which was duly sanctioned.

Gerry Martin was commissioned by Mr Chris Sharples, Electricity NorthWest (the client) to prepare a Specification of Works for a Programme of Archaeological Watching Brief Action relating to groundworks and the replacement of Pylon FK 5 at Engine Lonning, Carlisle. This was duly approved by English Heritage.

Gerry Martin Associates Ltd were also requested to prepare a method statement and a mitigation strategy should a further Pylon FK10 require an archaeological management plan. Although Scheduled Monument Consent was applied for, amendment of the method statement by the contractor meant that all construction works were non-invasive and no archaeological commitment was required.

The development of the study area around Pylon FK5 involved the clearance of topsoil and other extraneous material to reduce ground level in order that the bolts at the base of the pylon could be removed and a new tower erected.

Fieldwork took place between November 13th and December 5th 2013.

Parallel with this fieldwork, there has existed considerable academic interest in this location since the later 19th century regarding the course of Hadrian's Wall.

The alignment of the Wall was plotted in four places by R.S.Ferguson in 1886, the course becoming the orthodox interpretation currently adopted by Ordnance Survey.

However, investigations in 1978 and 1988 failed to intercept the course of the Wall as was the case with other smaller investigations. Subsequently, the disposition of landscape features has been questioned by The Archaeological Practice (2007, Report 111) and Gerry Martin Associates Ltd.

Gerry Martin Associates Ltd at the invitation of Carlisle City Council has undertaken some preliminary non-invasive fieldwork in this area seeking to identify alternative courses for the Wall that may take account of the local terrain. It is hoped to test this data at a future time as part of a wider conservation plan for this area.

The following report therefore has attempted to pull together various strands of fieldwork and current thinking in order to provide a definitive statement regarding our present knowledge.

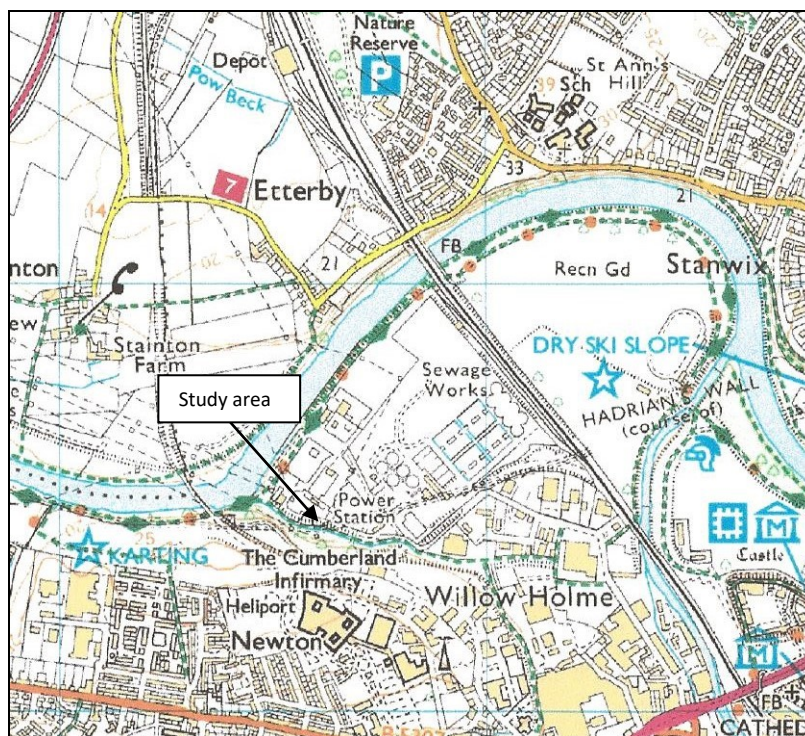


Figure 1. Location of study area. (OS Copyright, Licence no. 100044205)

1.2 Project outline

In response to a request by English Heritage during an earlier project (GMA report 117, 2013), Gerry Martin Associates Ltd undertook a desk-based assessment that investigated the archaeological and past cultural landscape pertaining to this development.

The watching brief failed to identify with confidence the course of Hadrian's Wall, but a number of alternative locations were proposed that took advantage of the cliff overlooking Willowholme, producing a southerly course for the Wall. These thoughts are outlined in GMA Report 117.

During the summer of 2013 part of this alternative hypothesis was tested, the results discussed later in this report (Section 5.4).

It is hoped that further archaeological reconnaissance will take place in 2015 to collate the character and level of preservation of past cultural assets as part of a Heritage Lottery application that will lead to a long-term management plan for this area.

The following report has been assembled to the relevant standards and protocols of the Institute of Field Archaeologists, combined with accepted best practice and in accordance with the brief prepared by English Heritage.

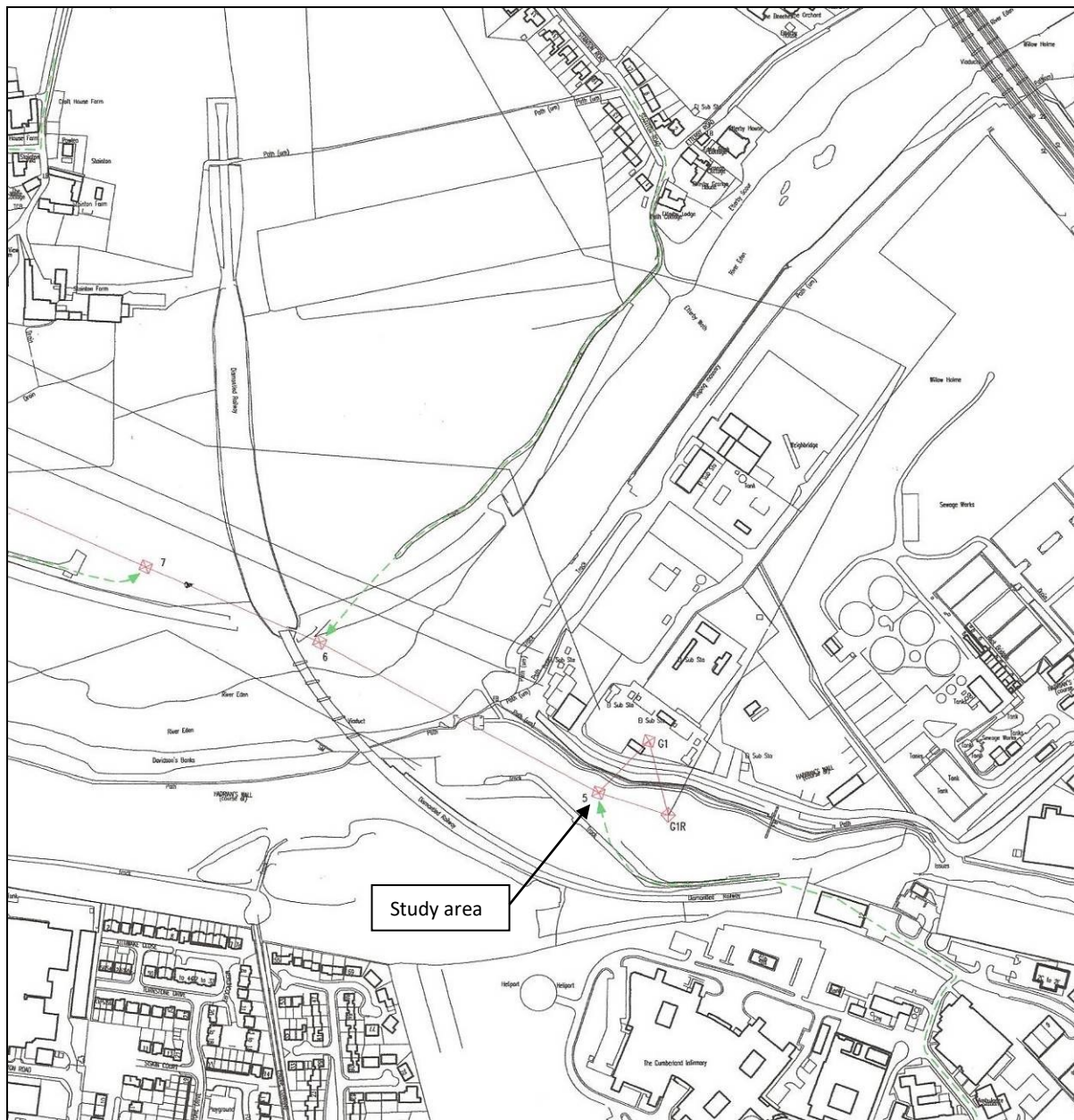


Figure 2. Location of study area FK5 (courtesy Electricity NorthWest)

1.3 Desk-based assessment

The desk-based assessment investigated primary and secondary historical sources, maps and other literature in order to set the survey results into their past cultural, historical and topographic context.

Centred on NY 38547 56423, the study area consisted of a 500m radius from the development at Engine Lonning, Carlisle.

The desk-based assessment required a search of three archival repositories:

- Carlisle Library provided sources for published works including newspaper articles, archaeological and antiquarian reports and trade journals.
- Cumbria Record Office, Carlisle provided the earliest tithe map for the parish, details of landowners and occupiers and cartographic evidence.
- The Historic Environment Record, Kendal provided the Sites and Monuments Record and aerial photographs describing previous archaeological observations within the study area.

1.4 Archive

The archive has been compiled in accordance with the project design and the guidelines set out by Management of Archaeological Projects (English Heritage, 1991) and the Institute of Field Archaeologists (1994 and 2007).

The archive will be deposited with an appropriate repository, Tullie House Carlisle and a copy of the report donated to the County Sites and Monuments Record, as requested by the curatorial authority, English Heritage.

2. BACKGROUND

2.1 Location, topography and geology

The study area is located approximately at a height of 15m OD on relatively flat ground beside the Parham Beck inlet and beneath a steep cliff that forms a ridge overlooking the River Eden.

The disposition of the study area would have provided a sheltered location just south of the River Eden and the confluence with the River Caldew to the north-east.

The ground has become neglected with casual rubbish and waste accumulating, whilst scrub and juvenile trees have colonised the area. Land slips and erosion of the cliff has also produced an accumulation of soil and clay, artificially raising ground level and potentially burying past cultural features.

The drift geology comprises of a series of interleaved pink and grey clays and alluvial sands that reduces into a Devensian Till that overlies red sandstone solid geology. .

3 HISTORICAL BACKGROUND

3.1 Immediate historical background

The earliest map depicting the study area dates to 1610 entitled the Carlisle and the Socrage Manor (D U.L.-SP, Howard of Naworth Papers, C49/1). The map illustrates the study area as lying just outside the Socrage (*sic* Socage; feudal duties and land tenure whereby rents were generally paid as cash payments, the most common form of tenure), Parham Beck forming the western boundary.

George Smith's map of 1746 illustrates the study area as a series of small peaks denoting that a precipitous cliff was present where the site borders the Eden and Parham Beck (described as Poddon Bank). The study area is just below an elevated and tactically superior location, corroborated by the stationing of offensive batteries during the Jacobite Rebellion (figure 3).

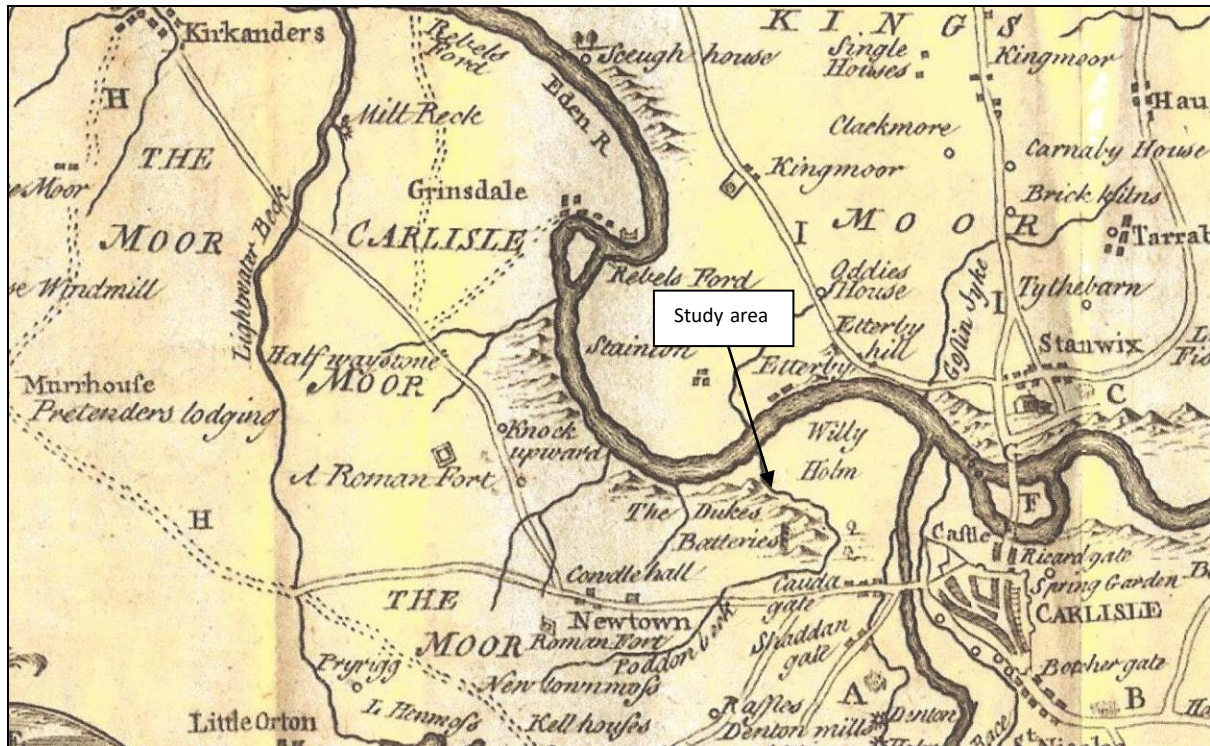


Figure 3. Smith map of 1746 illustrating the environs of the study area

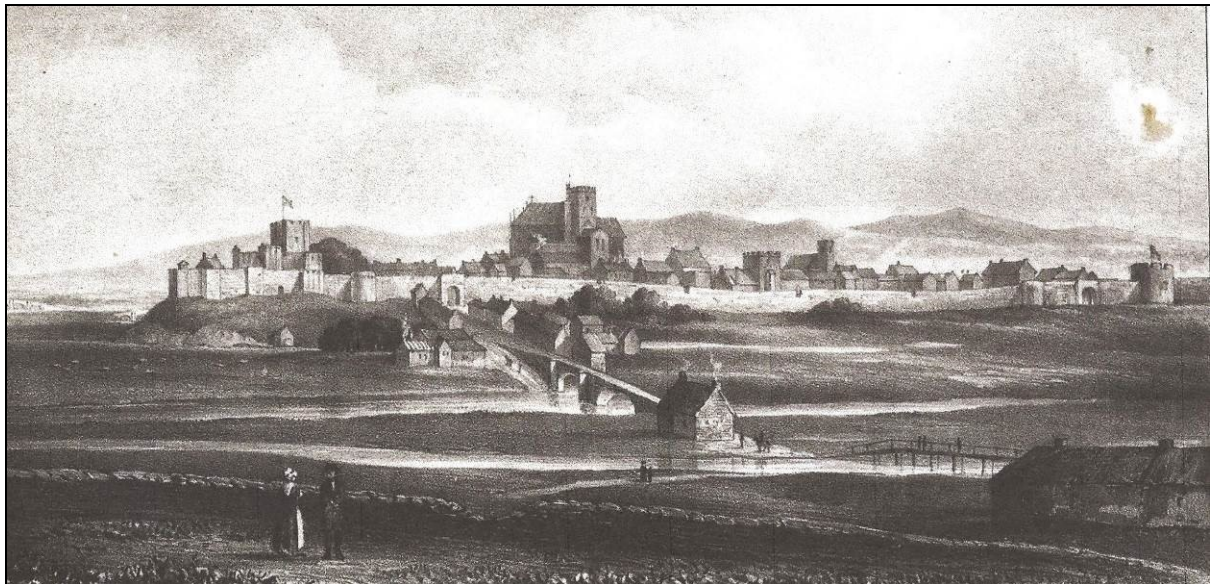


Figure 4. Carlisle from Primrose Bank, published in 1835

An engraving by M.E.Nutter and published in 1835 by Charles Thurnham (figure 4) shows a view of Caldewgate and Willowholme that appears to have been viewed from higher ground in relatively close proximity to the study area.

The picture was based on a sketch of “upwards of one hundred years ago” suggesting a record of the area dating from at least the early 18th century.

The vista illustrates in the foreground, meadow and wet ground with minimal management of the water courses. Caldewgate possesses a formal stone bridge but the bridge above Parham Beck comprises a wooden trestle bridge. A stone wall in the immediate foreground could correspond to the boundary between Plot 283 and Plot 311 depicted on the tithe map (figure 5) although on the Ordnance Survey map of 1874 Primrose Bank is depicted further eastward (figure 7).

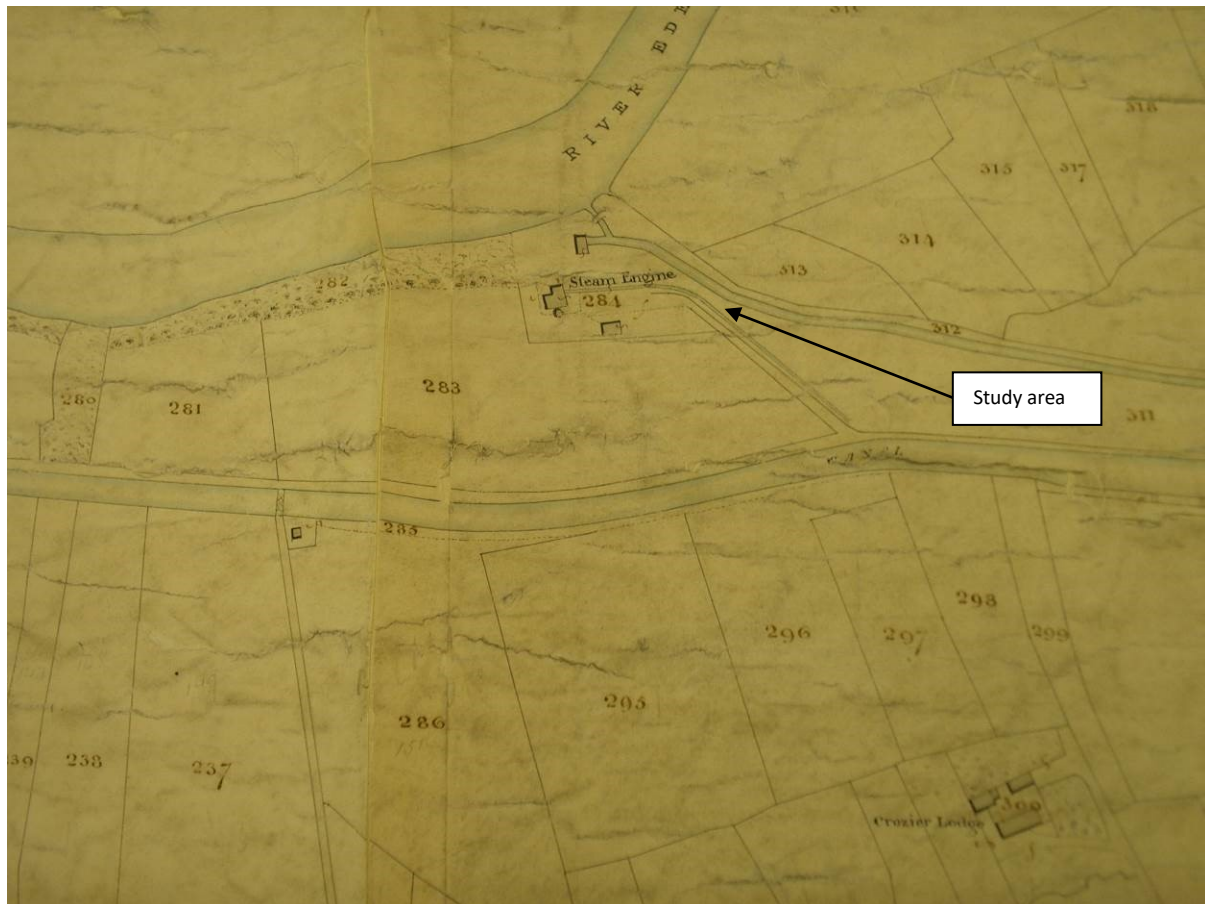


Figure 5. Tithe map of Caldewgate, 1842 (DRC 8/37)

The Caldewgate tithe map of 1842 (DRC 8/37) shows the study area as east of Plot 283 and a small salient marked as Plot 284 encompassing a steam engine (figure 5).

Plot 283 is a fairly large and vacant field bordered by the relatively newly-opened Carlisle-Port Carlisle Canal to the south and access to the steam engine to the east. The steam engine pumped water into the canal and canal basin just to the east of the illustration.

Plot 284 depicts a building housing a steam engine, an appendage attached to the main building and a circular structure that could be a horse gin or most probably a chimney. A probable mill appears to terminate the mill race (Parham Beck) originating from Caldewgate, Carlisle.

A separate building within the curtilage of Plot 284 probably represents Edenside Cottages that remained extant until at least 1971.

The access road appears to follow the crest of the cliff formed by Parham Beck and flanked by a mill race that dates to 1825.

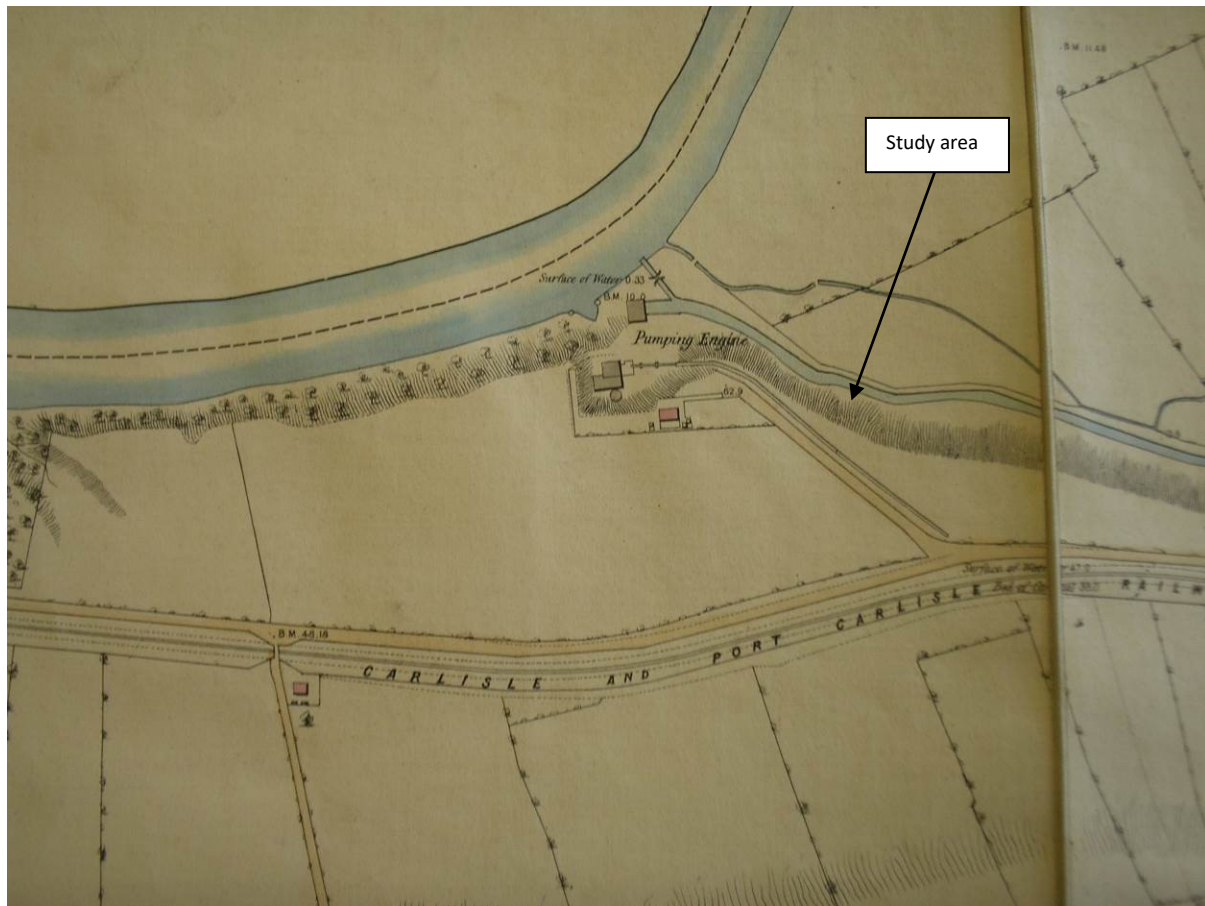


Figure 6. Asquith map of 1853 (DX 1819/1)

The 1853 Asquith map (DX1819/1) was executed on behalf of the Board of Health and led to the public health improvements that resulted in the construction of a mains sewer in 1854 that subsequently located Hadrian's Wall in close proximity to the study area.

The plot of land remained unchanged from the tithe map but the canal had been converted as a track bed for the Carlisle and Port Carlisle Railway. However, it becomes clear that the Pumping Engine lies in a small enclosure within the cliff, close to river level and beneath Edenside Cottages (figure 6).

The 1874 first edition Ordnance Survey map shows that Plot 283 has been divided by the northward course of the North British Railway to become Plots 117 and 119. The study area lies within Plot 122 described as the Varnish Works.

The Carlisle and Port Carlisle Railway appears largely the same as on Asquith's 1853 map whilst the engine works and sheds at Engine Lonning are new additions.



Figure 7. First Edition 1874 Ordnance Survey map

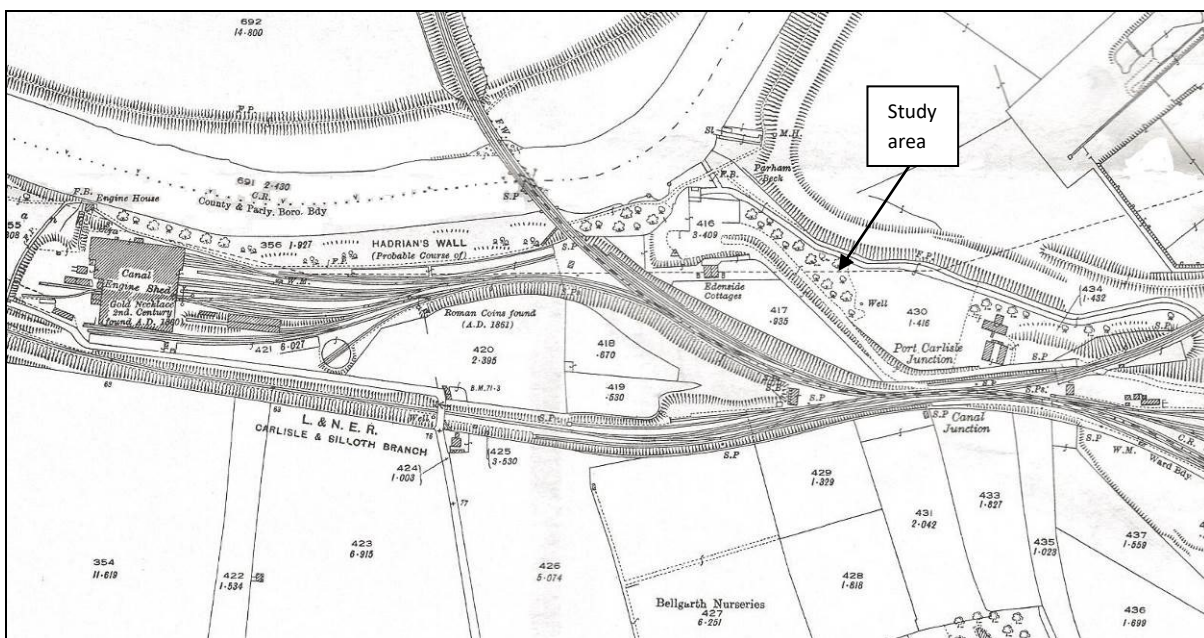


Figure 8. 1924 Ordnance Survey map

The Pumping Engine had become a Bone Manure Works (fertiliser plant) and has been considerably enlarged complete with its own rail link and sidings, albeit probably a narrow gauge tramway comprising of two lines and a parallel ditch.

Formerly plot 311 (figure 5), this land has been sub-divided into at least three properties of which Plot 123 was also adopted as a varnish works. Although mentioned on a map of 1875 (CA/3/5/2/65) regarding deeds for a customary close in Willowholme, little is known of the varnish works.

By 1924, the “Manure Works” had been demolished and its buildings removed. The suite of buildings that comprised of the “Varnish Works” appears to have been extant (figure 8) and survived until at least 1940. The demise of the varnish works was completed by 1971 when it fails to appear on the Ordnance Survey map.

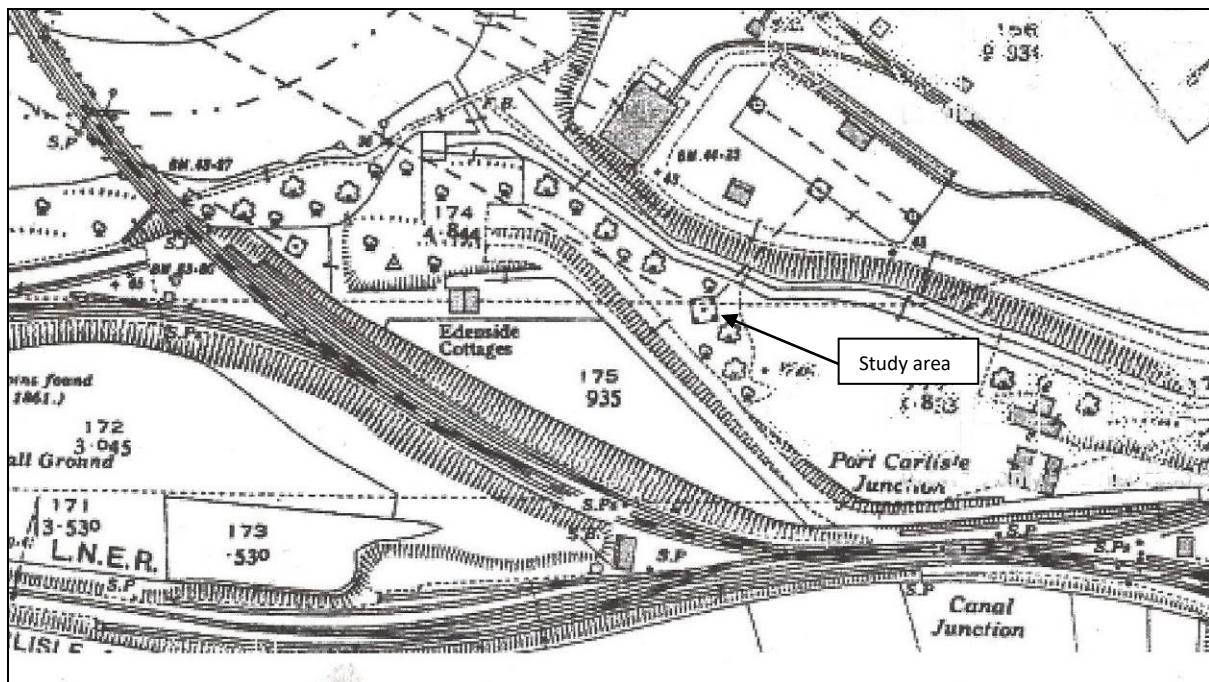


Figure 9. Ordnance Survey map of 1940

Pylon FK5 first appears on an Ordnance Survey map in 1940, the last pylon before the City’s power station (figure 9).

The pylon was extant on 7th September 1932 when the enlarged coal-fired, Willowholme Power Station was under construction (figure 10). This plant replaced the smaller rectangular building in the bottom left hand corner (figure 10); opened in 1927 and the first electricity generating plant at Willowholme.

Construction traffic for Pylon FK5 probably approached from the ridge that was formerly a tramway or railway line servicing the manure works and then branching northwards along an earthen ramp (figure 23).



Figure 10. Pylon FK5 with power station under construction, 1932 courtesy:

<http://www.britainfromabove.org.uk/image/eaw000302>

3.2 Wider implications of Hadrian's Wall and the crossing of the River Eden

The location of the Wall is poorly understood within this locality but is of considerable academic interest as the confluence of rivers and low-lying and marshy ground would have represented a vulnerable point within the defensive system.

The panoramic view of Carlisle (figure 4) clearly illustrates the prominence of the castle, a fortification built directly above a major Roman fort. Either side of this location was Hadrian's Wall: to the north at Stanwix Bank, the stone wall and cavalry fort of *Ala Petriana* and to the west by the Wall along Davidson's Bank, the intervening area being largely conjectural.

The stone wall (Hadrian's Wall) was first observed at Willowholme in 1854 during the construction of a sewer and was observed again in two places in 1886 (figure 11), within the angle between the main railway line and branch line to Port Carlisle as a foundation resting upon river gravels and measuring 2.36m in width. The remains of the Wall were covered by alluvial silt to a depth of 2.44m (Ferguson 1887, 171-174).

In 1932, a further stretch of stone wall was uncovered close to the 1854 intervention revealing a foundation 2.69m in width, comprising a layer of rough sandstone flags bedded in puddled clay and laid directly onto the natural gravel subsoil. Above foundation level, two north-facing stones remained interpreted as the superstructure overlain by a thick deposit of alluvium (Weigel 2010, 11).

This alignment has recently been challenged by research undertaken by The Archaeological Practice Ltd, whilst undertaking a desk-based assessment for the Carlisle Flood Alleviation Scheme during 2007. Examination of the Cumberland Excavation Committee 1886 excavation results (the most extensive survey conducted in this area) suggests that the course of Hadrian's Wall may be slightly northwards towards the west, traversing the Ordnance Survey alignment and being slightly south of the scheduled area before kicking back northwards, crossing the projected line of the Wall on the Ordnance Survey map and crossing both the Caldew and Eden rivers at their confluence (The Archaeological Practice 2006, Figure 35).



Figure 11. Course of Hadrian's Wall with the original Fergusson annotations of 1886

This assertion is based on largely negative evidence, the failure in 1978 and 1988 to discover the Wall along its predicted course, whilst the destructive effects of flood and river erosion may explain an absence of solid material evidence.

Moreover, there has been a failure to accurately map the alignment of the Wall. The 1932 Simpson observation was not located and the model proposed above is reliant on a "best fit" location, whilst the marker stones that outlined the Fergusson 1886 alignment may have been subsequently moved (The Archaeological Practice 2006, 33).

Accurately locating the Wall within the study area is important in order to a) protect the monument and b) to locate the monument should it be outside the protected area (there is no formal scheduling) and therefore currently left unguarded.

Although a credible case is presented, criticism is based on the spatial accuracy and reliability of each observation. On Figure 30 a watching brief marked 12 is inaccurately located in Willowholme Industrial Estate whereas the actual location was within the spur of the Port Carlisle Branch Junction. Extrapolating alignments from relatively ambiguous data sets to complete a 1km stretch of Wall remains unreliable; a minor error perhaps causing a major deflection further along its course.

A further doubt regards the suitability of bridging the confluence of two rivers where high flood levels and headwaters would provide unnecessary challenges; better to span across two separate rivers.

Failure in subsequent fieldwork to encounter the remains of Hadrian's Wall or any trace of the Vallum to the south (Weigel 2010, 5, 12) has suggested that, not all this low-lying flood plain may not have been subject to formal fortification. In all likelihood, any Vallum would have filled with water, effectively a moat or canal rather than a ditch.

The confluence of the rivers Caldew and Eden, perhaps at a more southerly point than now, suggest the following topographic elements could be relevant to the character of the Wall:

1. The unmanaged flood plain was a greater area than present
2. That complicated engineering problems would be encountered within this area should a formal defence be required
3. The area was overlooked on a central bluff by a Roman fort
4. An alternative, important function may be occurring e.g. a navigable river, the Caldew, leading to an unloading facility

Archaeological reconnaissance at the confluence of the rivers Little Caldew and the Caldew (TAP Report 111) demonstrated that to the south the natural geology comprised orange coarse clean gravel with large river cobbles, evidence that the river was broader and deeper than at present.

Filling the channel and observed by this author, was a horizon of dark grey ash and then organic silt, covered by a bar of brown silt, deposited during the 19th and early 20th Century (The Archaeological Practice 2007a).

Although a row of wooden stakes was present, representing the Willowholme Leet cut in 1825 (Weigel 2010, 16), this east-west alignment of stakes lies counter to the present and other relatively recent channel courses noted on Ordnance Survey maps. Therefore, it is conceivable that this alignment respects an earlier river course, (as suggested in figure 4), perhaps when the river was not formalised and when the river had a wider, expansive breadth (Martin 2007).

During 2009, a series of boreholes at 3m intervals conducted by Oxford Archaeology failed to intercept the projected line of the Vallum, the conclusion being that the Vallum was not present to the south of the present study area (Weigel 2010, 19).

There is circumstantial evidence therefore, that either

- The Wall fortifications did not exist because the area was low-lying and unsuitable
- That the Wall fortifications had been removed by subsequent flood damage or changes in the course of the river

- There was no need for fortifications, as the area was protected by the fort or another important function was occurring precluding fortification

Recent archaeological investigations within the Willowholme area have been particularly fruitless.

In 2005, a watching brief within the study area conducted during the erection of a phone mast, revealed only made-up ground to a depth of approximately 3.00m consistent with the ash and gravel that formed the Port Carlisle spur from the mainline railway.

No *in situ* archaeological feature, deposits or cultural artefacts were encountered during the watching brief exercise. Therefore, a strong possibility exists that either no archaeological remains were present or that later modern activity has removed any earlier cultural evidence (Martin 2005).

An evaluation at Earls Osborne Yard, Willowholme in 2011, also failed to identify the presumed course of the Wall despite trenching to a depth whereby natural alluvial deposits lain in the remote past were encountered (Martin 2011).

4 METHODOLOGY

4.1 Project design

The objective of the watching brief investigation is to carry out a formal programme of archaeological observations and investigations during any operations on site that may disturb or destroy archaeological or architecturally informative deposits or remains. The specific aims of the work are to:

- Provide a record of those works associated with the removal of the topsoil
- Provide a record of any significant archaeological or architectural features encountered by intrusive activities

In order to achieve these objectives, a record of all archaeological informative deposits encountered during the ground operations were made consisting of detailed context records on individual proforma sheets and field drawings, according to the protocols set out in the GMA manual.

The targeted investigation involved the excavation around the western leg of Pylon FK5 (figure 12).

The ground-works were hand dug under archaeological supervision. This action consisted of observation of the spoil removal and monitoring the displaced soil. Any past cultural activity and was recorded according to the protocols of the GMA manual.

The specific task in hand was to excavate the bank around the western leg of the pylon in order to release the bolts buried below ground (figure 13). These bolts supported the lowest stage of the pylon to be replaced by a new tower.

No finds were collected, as all material was clearly modern in date.

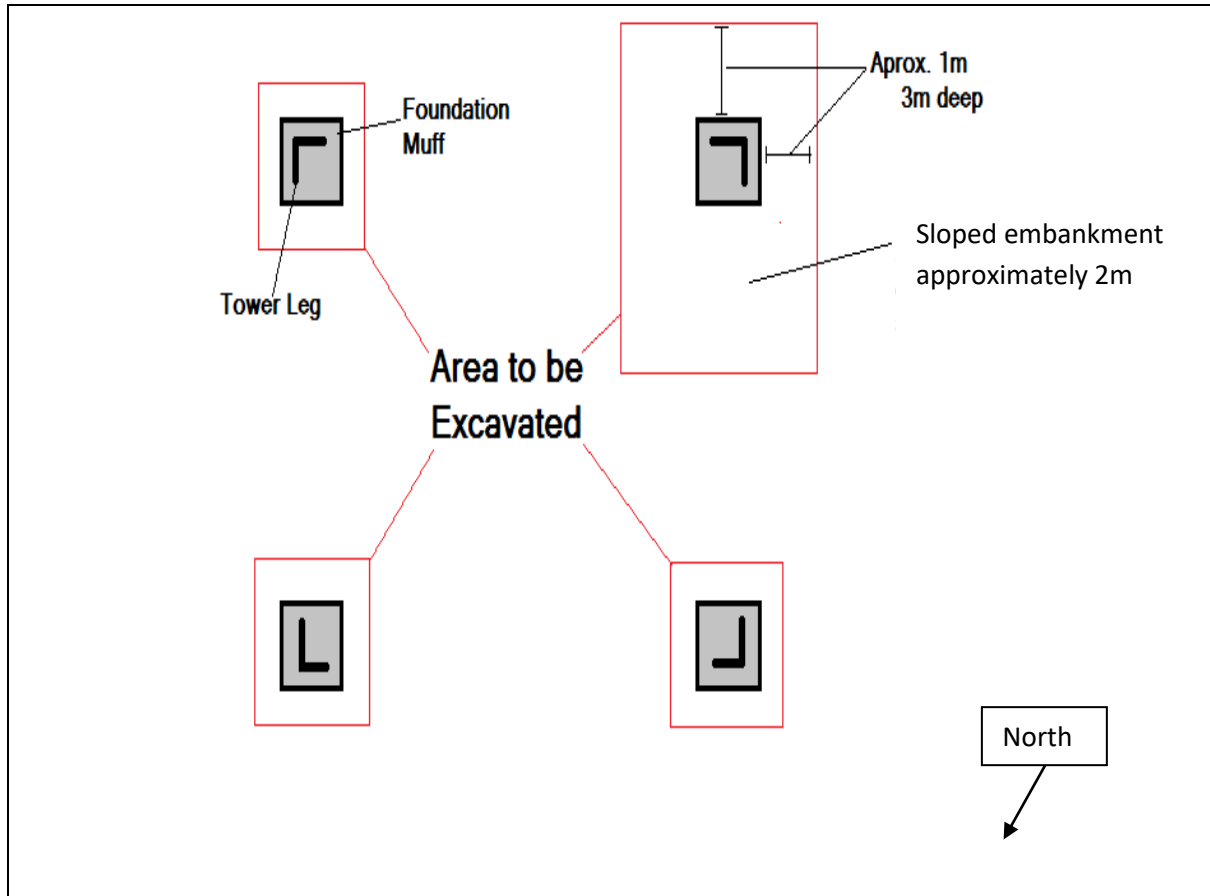


Figure 12. Area around the pylon to be investigated



Figure 13. Western pylon leg prior to excavation

5 ASSOCIATED FIELDWORK

5.1 Field observations

Carlisle City Council proposes to establish a nature reserve at Engine Lonning as part of their suite of conservation programmes. The proposal seeks to protect natural flora and fauna and highlight the industrial heritage of this area. As Hadrian's Wall, a World Heritage Site, traverses this location, a programme assessing past cultural assets will be a significant component within any management plan.

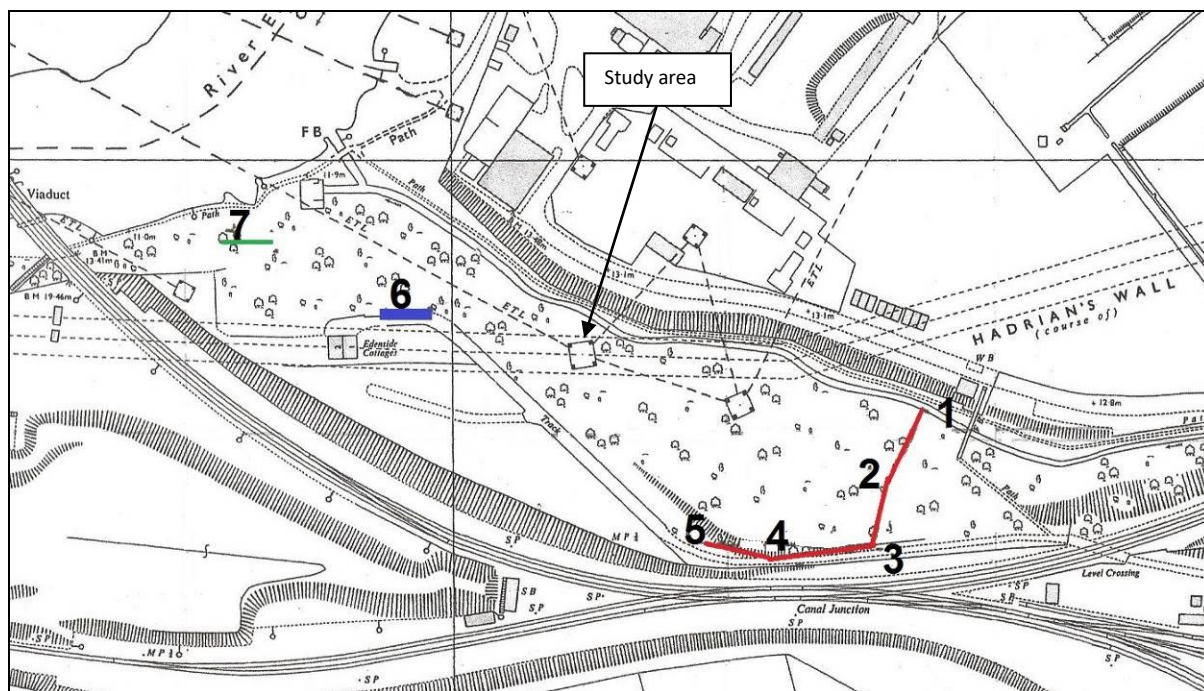


Figure 14. Observations that may relate to a re-alignment of the course of Hadrian's Wall

As a result of a previous watching brief conducted in the summer of 2013, seven key observations (figure 14) were achieved that cast doubt as to the accepted course of Hadrian's Wall. These observations are summarised as follows:

1. NY 38676 56407. A series of upright wooden piles visible within the side of the mill race. No piles are present to the north of the stream but a second set approximately 20m upstream (southwards) appear to be extant.
2. NY 38667 56393. Within the southern revetment wall of the varnish works was a collapsed section that exposed a red sandstone wall extending back at least 1.50m, whose alignment was counter to the walls of the varnish works and did not appear to be part of the 19th century structure. The eastern face was neatly dressed formed from at least two courses of dressed stone blocks and at least 0.30m in height (figure 15). A western crack in the southern wall of the varnish works could indicate the western side of an emergent wall face allowing the wall to be approximately 2.70m in width. The 19th century sandstone building was square in plan with possible hints that it could reflect the footprint of an earlier structure.

3. NY 38640 56354. The eastern extent of a stone wall that then appears to return at a 90 degree angle for approximately 15 metres. A building probably depicted on the 1874, 1924 and 1940 Ordnance Survey maps probably overlies this position and a considerable amount of rubble remains. Emerging on the north side, there is a stretch of wall that is approximately 2.70m in width and comprises dressed, red sandstone blocks, neatly arranged to form a formal approximately north-south aligned wall that descends down the slope.
4. NY 38614 56352. The western limb of an earthen bank 57m west of Observation 3 where the stone wall is no longer visible. The bank is approximately 1.50-2.00m in height and appears pronounced, albeit festooned in undergrowth.
5. NY 38590 56360. A north-west dog-leg from Observation 4 that extends for 33m before the alignment is obliterated by the cutting for the tramway that connected with the former Bone and Manure Works. The bank follows a course that declines below the height of the plateau.
6. NY 38492 56445. The study area discussed in GMA Report 117 (Martin, 2013).
7. NY 38435 56468. A stretch of neatly dressed sandstone, formally arranged, aligned east-west approximately 15m in length. Currently, the top of the alignment is used as a step. The stretch of "wall" is located midway up the slope rather than the crest of the promontory but on an alignment similar to the course of the Wall along Davidson's Bank. A small property boundary on the 1874, 1924 and 1940 Ordnance Survey maps may also follow this course.

5.2 Discussion

The location of Hadrian's Wall in the western part of Willowholme is secured by two observations in close proximity from 1854 (Point A, figure 11) and 1932 (Simpson 1933, 150). Established versions of the course of the Wall appear to take little account of minor deviation and re-alignment; significant as projected western alignments investigated in 1978 and 1988 produced negative results.

Moreover, Ferguson's assertion "that the Wall ran from the Hyssop Holme Well to the Pumping House, or Manure Works" (Ferguson 1887, 168) has been taken too literally.

No alignment including Fergusons' (figure 11) passes through the Manure Works. The Works however, are the closest landmark whilst the course of the Wall does pass through the curtilage or access to the plant. It may be the case that this location is ambiguous rather than definite.

If a less rigid approach is employed then a different alignment may be proposed.

The current ascent of the steep bank where the course of the Wall has been favoured would have technical limitations in both construction and maintenance, whilst its defensive effectiveness could be compromised.

A superior disposition would be slightly inland. This would allow any foe to be drawn into a limited space dominated by a channel (Parham Beck) to be assailed from the west from a high position.

The Wall would descend from the west (Observation 2) at a gentler gradient traversing Parham Beck as a bridge built on wooden piles (Observation 1) or respecting the south side of the channel as suggested by Ferguson's location of the 1854 intervention (figure 11).

The apparent 90 degree turn (Observation 3) would be a vulnerable position, a weak point in the defensive network. It may be expected that extra fortification would be present, quite possibly a Milecastle or at least a watch tower. This salient would potentially be of great academic interest should this hypothesis prove correct.

The survival of a bank that dates back to at least the 1842 tithe map is a potential landscape feature of greater antiquity. No other boundaries are present on the map which suggests that spatial organisation has been partly predicated on this boundary. If the Wall substantially survived, then it is almost certain that it would be integrated into any later spatial organisation. Observation 4 could represent a putative bank or rampart that may have sustained the Wall that dog-legged north-westwards (Observation 5) in order to enclose the bluff overlooking the River Eden.

Tracing the Wall beyond Observation 5 is difficult as 19th century truncation has slighted much of the putative monument either on the alignment suggested by this hypothesis or the orthodox course of the Wall. Observation 6 may reflect an earthen rampart, whilst Observation 7 could be a short stretch of Wall, albeit in a less prominent position than may be expected.

5.3 Programme of investigation

The evidence gathered during this fieldwork is circumstantial and requires testing in order to prove or disprove a re-aligned Wall hypothesis.

The programme can be summarised as the following seven point plan.

- A short programme of works to define Observations 2 and 3 would require digging beside the wall face to a depth where any wall plinth could be observed resting above a wall foundation. The excavation would be non-destructive, exposing any putative wall. In particular, the wall face exposed in Observation 2, that ran counter to the Varnish Works would be of great interest as its alignment would provide a positive fix for the Wall across Willowholme and onwards to Stanwix.
- Recovery of a timber pile from Observation 1 that may through dendrochronological or radio-carbon dating corroborate whether the piles are part of a Wall alignment
- Chasing the stone wall from Observation 3 to Observation 4 by scrub clearance. If there is an abrupt change from stone to an earth bank this may corroborate the assertion that the western limb of Hadrian's Wall was a turf wall.
- A section through the earth bank close to Observation 5 where a breach has already been made
- Chasing the westwards course of a wall at Observation 7 and observing whether it climbs the slope to continue on the alignment with the Wall at Davidson's Bank
- When the foliage has died back, a topographic survey that may reveal further landscape features

- A photographic survey using an elevated camera which may isolate landscape features in clearer definition

The archaeological programme of works could provide an affirmative response as to whether Roman fortification utilised the advantages of natural topography or followed what is essentially a flat defence with little account of natural and favourable topographic features.

If the Wall did survive along the revised course suggested above rather than the accepted and established alignment, then preservation would appear to be of a particular high quality, rarely seen on the western side of Hadrian's Wall. This would be a considerable heritage asset of great historic and academic significance that would add considerable cultural value to the proposed nature reserve.

5.4 Results of the investigation

During the summer of 2013 Gerry Martin with the approval of Carlisle City Council took the opportunity to investigate Observations 2 and 3 in a voluntary capacity.

Observation 2 involved the removal of extraneous overburden revealing a solid stone surface. It was quickly apparent that a flight of steps (figure 15) leading into a stone building was uncovered consistent with a 19th century date.



Figure 15. Steps forming Observation 2



Figure 16. 19th Century wall, Observation 3

Observation 3 involved excavating beside an extant wall. The wall did not continue eastwards towards Parham Beck but returned southwards to form a stone building (figure 16) associated with a suite of 19th Century buildings.

It was clearly evident that the observations raised by previous fieldwork did not at these locations, support an alternative alignment for Hadrian's Wall. However, the suite of buildings present appears to imply a sophisticated arrangement of structures that possess intrinsic interest regarding 19th Century industrial activity

6 RESULTS

6.1 Study area

According to the Ordnance Survey map, the course of Hadrian's Wall is presumed to pass directly where Pylon FK5 stands (figure 14).

Fieldwork began on Monday 14th November 2013 and closed on December 4th 2013.

The initial action within the study area was the removal of scrub and vegetation in order to produce an area free of impediments.

The ground beside the western pylon foot was cut away in order to test the feasibility of the method statement revealing modern re-deposited clay associated with the erection of the electricity pylon (figure 17).



Figure 17. Initial removal of spoil beside the pylon

The land behind the western foot was then reduced to reveal the following observations:

- A vertical sided cut approximately 3.00m in width filled with brown re-deposited clay with red sandstone debris and occasional brick and slate. The fill was dateable to the late 19th or 20th century (figures 18 and 19) and reduced to a depth of 1.10m.
- An arcing vertical sided cut that post-dated the backfill described above. The fill comprised re-deposited red-brown clay with occasional pieces of 20th century debris (figure 20) reduced to a depth of 2.30m.

The concrete muff surrounding the steel foot of the pylon was then removed.



Figure 18. South side of "Wall" cut



Figure 19. North side of "Wall" cut



Figure 20. Cut for "Wall" with pylon backfill in the foreground

Returning on December 2nd 2013, a rectangular cut measuring 2.00m x 1.90m was initiated around the western foot.

Terminating at the height of the splicing bolts, the working area was 1.50m in depth. At a depth of 1.10m, the natural drift geology consisting of compacted grey clay developing into shale was encountered (figure 21).

The foot of the pylon sat within an irregular plan foundation cut that was not bottomed. The brown clay fill contained a 20th century brick and glass from a beer bottle.



Figure 21. Final excavation of the western pylon leg

6.2 Finds and ecofacts

No artefacts of any great antiquity were present and no deposit warranted an environmental sample.

6.3 Discussion

The watching brief did not reveal any absolute proof that course of Hadrian's Wall had been encountered although it remains possible that the groundworks could have impacted upon its course (figure 14).

The cut found behind the pylon was in the correct place for the presence of Hadrian's Wall, whilst its width measured approximately 3.00m, compatible with Wall observations found elsewhere around Willowholme.

The backfill within this cut was modern which could only mean that any putative Wall fabric had been robbed within recent history.

It has been suggested that this cut was part of the construction cut for the pylon erected *circa* 1932. However, the earlier "Wall" cut was clearly truncated by the construction cut for the present pylon (figure 22). Unless there was an earlier truncation associated with Pylon FK5, this interpretation appears unlikely.

Moreover, a ramp visible to the south suggests that construction traffic approached the pylon from the south (figure 23).

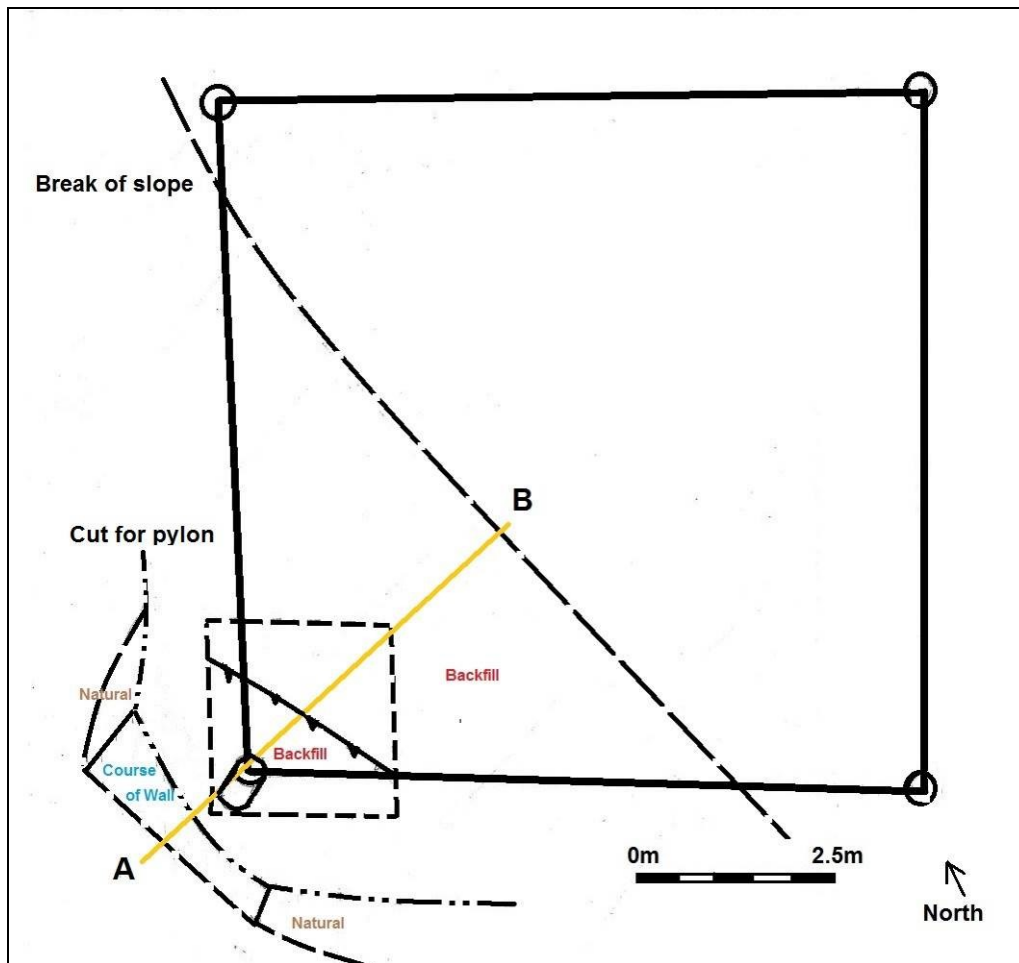


Figure 22. Plan of the works



Figure 23 Ramp approaching Pylon FK5

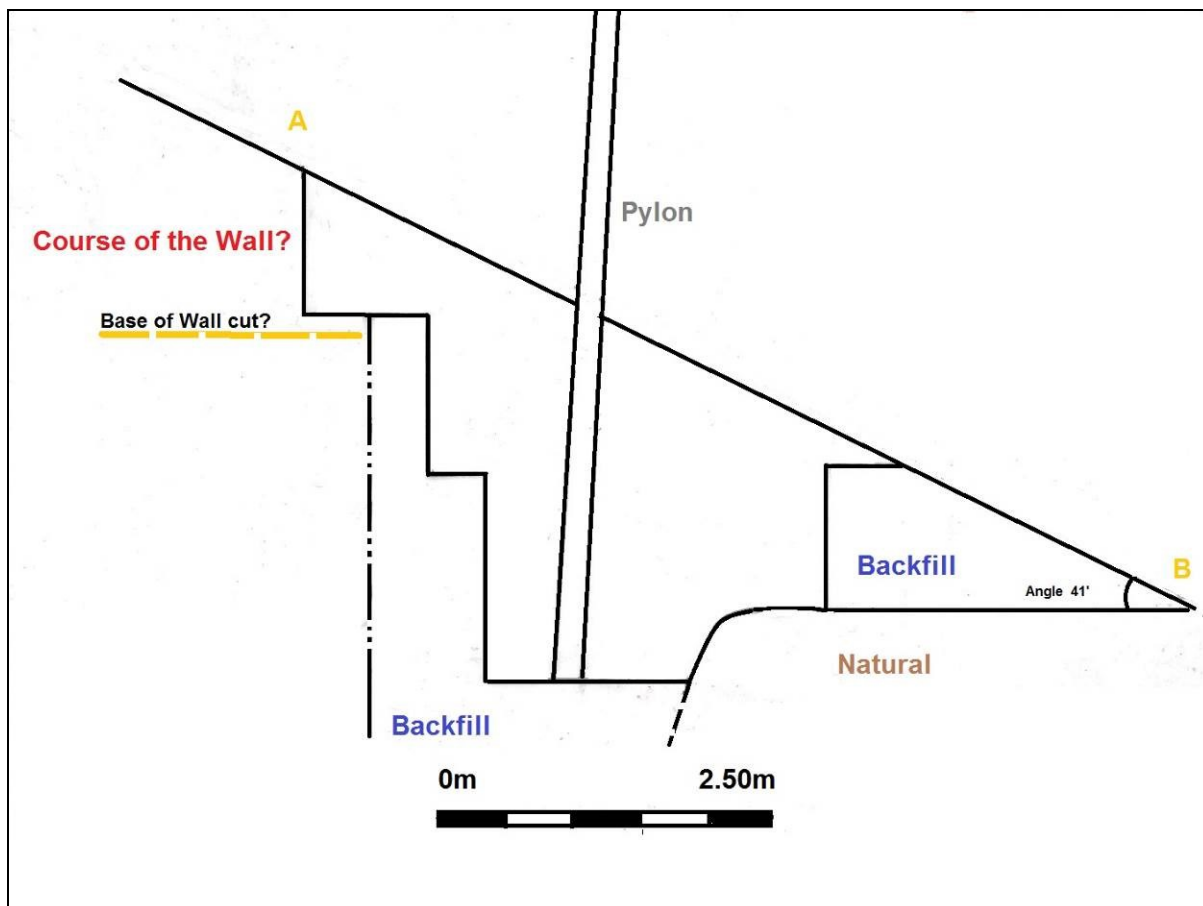


Figure 24. Schematic section through the intervention

The depth of the “Wall” cut remains unknown but was at least 0.50m in depth (figure 18). Truncation by the pylon had obliterated any putative remains within the intervention (figure 24).

The orientation of the “Wall” was difficult to ascertain as only approximately 0.50m of its course was visible (figure 22). However, it appeared to maintain a north-eastern course akin to the 1874 Ordnance Survey map (figure 7) rather than the eastern course recorded on recent Ordnance Survey mapping (figures 8, 9 and 14).

There exists a reasonable possibility that the 1874 Ordnance Survey map could be correct.

When the varnish and bone manure works were created during the mid-19th century, the Wall was not subject to statutory protection. Quite possibly, it was an acknowledged landmark, Ferguson appears to allude to this (Ferguson 1887, 168) and its location taken for granted.

If this cut feature did represent the course of the Wall, it appears to have been completely robbed.

Extrapolating from this observation, the course of the Wall must have steeply climbed the bank to a flat plateau connecting with the course of the Wall, illustrated on current Ordnance Survey maps.

Test excavation at the summit of the plateau above the pylon would confirm if this hypothesis remains correct or whether the enlarged cut was part of earlier works to erect the pylon.

7 PYLON FK10

7.1 Observations of Pylon FK10

It was originally anticipated that intrusive works would affect the refurbishment of Pylon FK10 as it lay between the courses of the Vallum and the Wall, both Scheduled Ancient Monuments subject to statutory protection (figure 25).

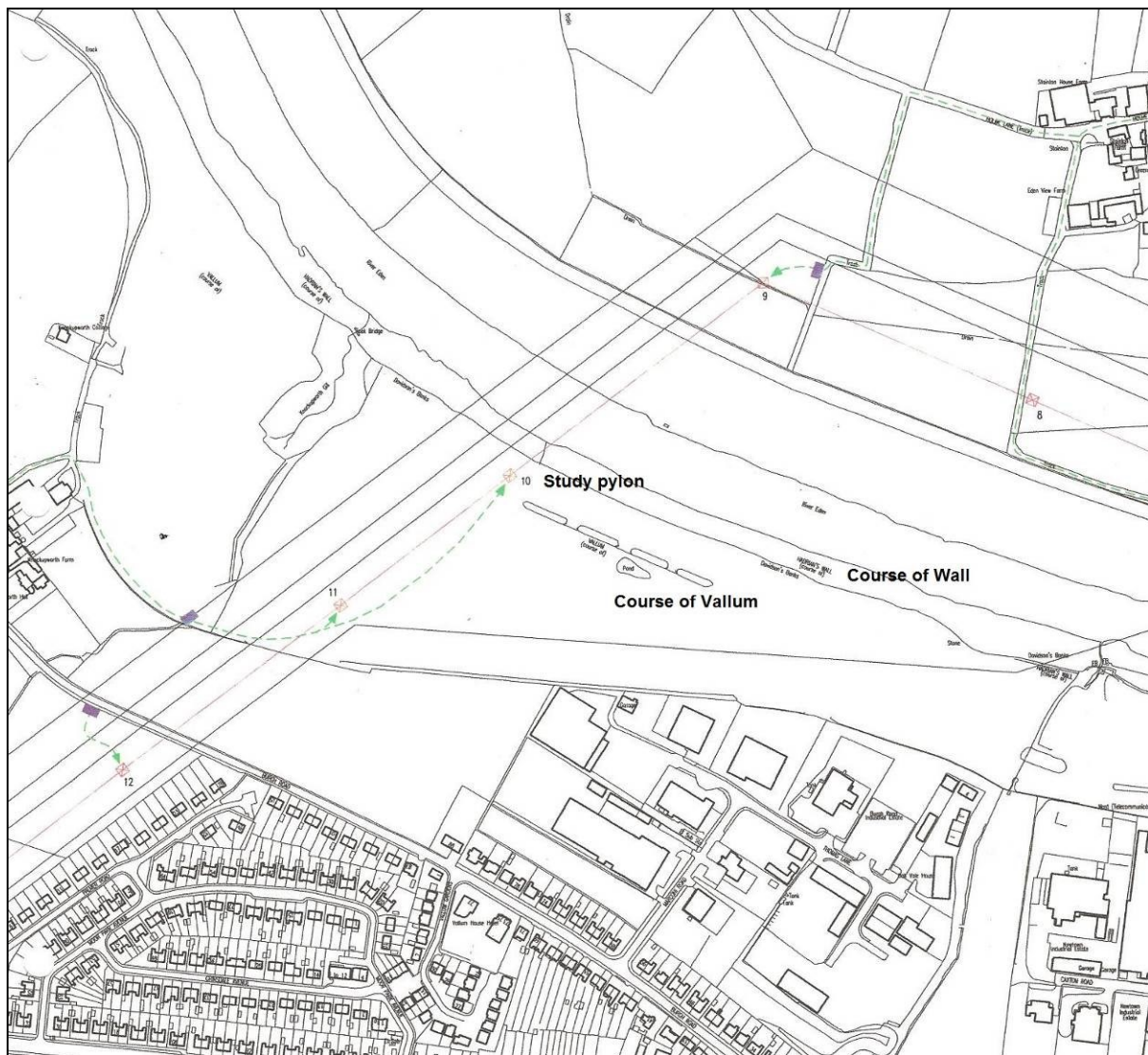


Figure 25. Location of Pylon FK10 (courtesy of Electricity NorthWest)

Scheduled Monument Consent was applied for, in case minimal enabling works impacted upon the monument. Fortunately, a mitigation strategy involving mats to access the pylon (figure 26) and removal of the concrete muffs by hand (figure 27) meant that this action was not expedited.

Adopting this mitigation strategy, the pylon was successfully refurbished and no further archaeological coverage was required.



Figure 26. Mats leading to pylon FK10



Figure 27. Base of Pylon FK10 without muffs

8 ARCHIVE

The archive has been compiled in accordance with the project design and the guidelines set out by English Heritage (1991, 2006) and the Institute of Field Archaeologists (1994, 2008).

The archive will be deposited with an appropriate repository, Tullie House Museum, Carlisle and a copy of the report donated to the County Sites and Monuments Record, as requested by the curatorial authority.

9 ACKNOWLEDGMENTS

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