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A66 CARKIN MOOR TO SCOTCH CORNER IMPROVEMENT

Environmental Statement
Volume 2 Part 3 Cultural Heritage

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July 2002

HIGHWAYS
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Environmental Statement Volume 2 Part 3 Cultural Heritage

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A66 CARKIN MOOR TO SCOTCH CORNER IMPROVEMENT

ENVIRONMENTAL STATEMENT

This specialist report forms Volume 2: Part 3 of the Environmental Statement and has been prepared by:

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CONTENTS

1 INTRODUCTION

1.1 In July 1998 BHWB Environmental Design and Planning were commissioned to review and update the archaeological information gathered for the above road improvement scheme, and to carry out a condition survey of the various route options. A programme of Stage 3 detailed evaluation works, comprising geophysical survey, trial trenching and some earthwork survey was then initiated to assess the archaeological potential and impact of the road scheme, in accordance with the requirements of the Department of Transport's Design Manual for Roads and Bridges, Volume 11 Environment Assessment (DOT 1994).

1.2 This report summarises the methodology and results of the Stage 3 fieldwork carried out to date. From this, an informed assessment of the effects of the scheme has been produced. Mitigation measures designed to offset these effects are also outlined.

2 PREVIOUSLY IDENTIFIED CULTURAL HERITAGE SITES

Archaeological sites

2.1 The combined results of a 1997 archaeological desk-top survey (NAA 1997), a Stage 2 Environmental Assessment Report (Landmark Partnership 1998, 23-25), and the 1998 condition survey (BHWB 1998a) identified a total of 15 known or suspected archaeological sites within or immediately adjacent to the proposed road improvement corridor, as follows from west to east (see figures 1A to 1D):

Site	Description	Importance	NGR
A14	Carkin Moor Roman fort	National (SAM)	NZ16120838 centred
A13	Potential Roman extra-mural settlement, east of Carkin Roman fort	Regional/ County?	NZ16050847 centred
A12	Quarry pits and ridge and furrow, west of Winston crossroads	Local	NZ17500760 centred
A11	Field boundary, west of Jagger Lane	District	NZ17800735 centred
A10	Quarry pits (sites of), west of Jagger Lane	Local	NZ18100705 centred
A1	Iron Age settlement and field system, west of Melsonby crossroads, south of A66	Regional/ County	NZ18900660- NZ18300690 centred
A2	Iron Age enclosures and field system, west of Melsonby crossroads, north of A66	Regional/ County	NZ19000680-NZ18600695 centred
A3	Gatherley Moor quarries, Melsonby crossroads	Local	NZ19201670 centred
A4	Scots Dike, east of Melsonby crossroads	National (SAM)	NZ19400600 centred
A5	Ridge and furrow earthworks, west of Sedbury Home Farm	Local	NZ20150615 centred
A6	Roman road, east of Kirklands Garage	Regional/ County	NZ20150605 centred
A7	Disused quarry, south-east of Sedbury Home Farm	Local	NZ20450573 centred
A8	Iron Age/Romano-British enclosures and field system, east of The Bungalow	Regional/ County	NZ21300540 centred

A9	Iron Age settlement, Vintage Motel	Regional/ County	NZ21270527 centered
A15	Roman road, west of Kirklands Garage	Regional/ County	NZ16200830-NZ20100610 linear

2.2 The Roman road, which ran from its junction with Dere Street near Scotch Corner west over the Stainmore Pass to the Eden Valley (Margary 1993, 433-466) is believed to date from the 1st century AD, and it continued in use throughout the period of Roman occupation and became a focus for military and civilian settlement. It also seems likely that the road followed a pre-existing communications corridor, and a number of small pre-Roman Iron Age settlements and field systems have been identified on, and in close proximity to, the present A66 alignment. While many of these have been located from aerial photographic evidence, some have also been subject to archaeological investigation (eg. Fitts *et al* 1994; Abramson 1995; Casey *et al* 1995). It was therefore considered that there was a high potential for as yet undiscovered archaeological sites, and the reports made it clear that the potential impact of the scheme could not be assessed until further information had been gathered.

Note: This paragraph to be amended slightly to include recent research. Context won't change.

Built environment

2.3 Two built environment sites were identified within or immediately adjacent to the proposed road improvement corridor, as follows from west to east (see figures 1A to 1D):

Site	Description	Importance	NGR
B1	Gatherley Moor Farmhouse (LB II) (Also known as Grenton)	Regional/ County	NZ19180653 accurate
B2	Sedbury Hall Lodge (LB II)	Regional/ County	NZ20690541 accurate

2.4 Two other sites, Kirklands Hotel and garage (NZ19950619) and The Bungalow, west of Scotch Corner (NZ21120531), were also noted within the proposed road improvement corridor, but these are 20th century structures of no importance.

3 GEOPHYSICAL SURVEY

Introduction

3.1 The geophysical survey was undertaken as two linked phases of work, Phase 1 concentrating on the east end of the scheme between Melsonby Crossroads and Scotch Corner, while Phase 2 considered the area to the west of Melsonby as well as some extensions to the Phase 1 areas. In all, some 21 hectares were surveyed, divided between 27 separate areas; the locations of the survey areas are indicated on Figures 1A to 1D, while more detailed plans are provided in the geophysical survey technical report.

3.2 The geophysical survey was undertaken by GeoQuest Associates, working as sub-contractors to BHWB Environmental Design and Planning. Their report was produced in February 1999 (GeoQuest Associates 1999), and the following text provides a summary of the main findings.

Methodology

3.3 The methodology for the geophysical survey was defined by a specification produced by BHWB (1998b), which took account of comments made by the County Archaeological Officer for North Yorkshire. In brief, the surveys were conducted using GeoScan FM36 fluxgate gradiometers and data was collected in 20m square grids with readings taken at 1.0m by 0.5m intervals, thus providing 800 measurements per grid. The grids were tied into the Ordnance Survey National Grid and other survey stations.

3.4 The site survey work took place between September and November 1998 in poor weather conditions, and parts of survey areas S4 and S10 had to be abandoned due to waterlogged ground. The location and extent of the individual survey areas was determined by the base scheme and the eight separate route options which were under consideration at the time. One of the survey areas (S2) coincided with a Scheduled Ancient Monument (Scots Dike; SAM 26946), and so an appropriate Section 42 license was obtained from English Heritage in advance of investigation (EH ref AA/12020/5).

Summary of Results

3.5 In general, all the survey areas exhibited numerous dipolar magnetic anomalies, a fact not unexpected given the proximity of the existing road corridor. The smaller magnetic features are likely to represent surface or near-surface ferrous debris and litter while the larger examples are associated with telegraph poles, buried service pipes, land drains and fences. In addition, some magnetic lineations are likely to be of natural, geological origin. Nevertheless, several areas of significant archaeological potential were recorded. For ease of description in the following text, each survey area is considered to be aligned east-west, and the results are described in scheme order, from west to east.

Area S14

3.6 Survey area S14, which measured 140m by 40m, lay in a relatively flat pasture field at the west end of the scheme on the north side of the existing A66. The survey was required to determine whether any as yet unidentified remains or deposits associated with the Carkin Moor Roman fort (Site A14, which lies just outside the western limit of the scheme) and an adjacent possible extra-mural settlement complex (Site A13) lay within the proposed road corridor. In the event, no geophysical anomalies were identified.

Area S13

3.7 Two separate surveys were undertaken in this area, S13E on a west-facing slope in a pasture field and S13W in a gently sloping field of young cereal. Both survey areas measured 240m by 40m. Evidence for east-west aligned ridge and furrow cultivation was seen at the east end of Area S13E, together

with a presumed associated field boundary. Other features in Area S13W are considered to result from recent ploughing, and a ferrous water pipe was detected running along the south side of this and the adjacent survey areas, parallel to the A66.

Area S12

3.8 The survey work here was divided into three separate areas, in undulating pasture fields on the north side of the existing A66, west of the B6274/A66 crossroads. Area S12W measured 160m by 40m, S12C was 220m by 40m, and S12E measured 320m by 40m.

3.9 Little of interest was recorded in Area S12E, and the barely visible ridge and furrow and possible rounded quarry pits previously identified here (Site A12) were not detected by the geophysical survey. However, several short positive magnetic lineations were seen to the west in Area S12C, and these probably represent soil-filled gullies or ditches, perhaps former field boundaries or the remains of ridge and furrow cultivation, as well as a sub-circular soil-filled pit *c.*8m in diameter. To the west, Area S12W contained some positive anomalies of uncertain origin.

Area S11

3.10 Three discrete surveys took place here, on the south side of the existing A66 on either side of the B6274/A66 crossroads. All areas occupied level ground containing a young cereal crop. Area S11W measured 60m by 40m, S11C was 160m by 40m, and S11E measured 80m by 40m and 40m by 20m. The only item of possible interest was a weak and diffuse positive anomaly seen in Area S11W, which might represent small-scale quarrying or a geological feature.

Area S10

3.11 This survey area, measuring 600m by 40m and 100m by 40m, occupied a gently undulating field of young cereal on the north side of the existing A66, east of the B6274/A66 crossroads. The field was particularly wet at the time of the survey, and a large body of standing water prevented the full investigation of the western end of the area. Several linear anomalies were detected, but their magnetic signatures and plan form suggests that they were land drains. There were no indications of any features associated with the previously identified field boundary (Site A11).

Area S9

3.12 Area S9 lay within a relatively flat field of young oil seed rape, on the north side of the A66. The survey area measured 140m by 40m and no geophysical anomalies were identified.

Area S8

3.13 This survey area measured 450m by 40m within a gently undulating field of young cereal. The work here was required to determine whether any sub-surface remains associated with an Iron Age settlement, enclosures and field

system (Sites A1 and A2) extended into the area of the proposed road corridor. Two irregularly-shaped areas of weak, positive magnetism were identified and these probably represent former quarry pits; the western area coincides with a depression in the field although no features are shown on the Ordnance Survey 1st edition (1857) 6" map. Three other soil-filled ditches were also identified, two running parallel and *c.*10m apart, probably representing part of a trackway.

Area S1

3.14 This area comprised two surveys in the field occupying the north-west quarter of the Melsonby crossroads. Area S1E measured 160m by 40m and was stubble, while S1W measured 140m by 40m and was a young cereal crop. Once again, the survey was required to identify any sub-surface remains associated with an adjacent Iron Age settlement, enclosures and field system (Sites A1 and A2).

3.15 Numerous curvilinear positive magnetic anomalies were detected in Area S1E, probably representing soil-filled ditches and other features associated with ring ditches, enclosures and field boundaries (see Figure 3). It is likely that these are prehistoric in date and they may be associated with the nearby Rock Castle farmstead and field system that was partially excavated in 1987; this was shown to be a multi-phase settlement complex dating from the early Iron Age to the Roman conquest (Fitts *et al* 1994). Only one ditch-like feature was seen in Area S1W to the west, and this may represent a continuation of the prehistoric field system.

Area S2

3.16 This relatively flat area lay north-east of Melsonby crossroads. The survey area measured 240m by 40m and carried an oil seed rape crop. Work was hampered by a steel pylon which created a 20m diameter area of magnetic disturbance. The survey was undertaken to confirm the alignment and dimensions of the Scots Dike linear earthwork (Site A4), a territorial boundary thought to have been constructed during the 6th-7th centuries, and to identify any other associated sub-surface remains which might extend into the proposed road improvement corridor.

3.17 Positive geophysical anomalies were identified on the north and south sides of the pylon, representing a substantial 4.5m wide soil-filled ditch; this almost certainly represented the course of Scots Dike (see Figure 2). Several other positive linear anomalies were also detected in this area, the majority lying to the west of the Dike. These may be part of a field system, of uncertain date, which may or may not be associated with the Dike.

Area S3

3.18 This area occupied a relatively flat, oil seed rape field on the north side of the existing A66, to the west of Kirklands Garage. The survey area measured 340m by 20m. Two very weak linear positive anomalies were detected towards the east end of the survey, one running at right angles to the A66 and the other at a slight angle to it. These may represent former

field boundaries, although none are depicted on the Ordnance Survey 1st edition (1857) 6" map.

Area S4

3.19 Three discrete surveys were undertaken within this former potato field to confirm the alignment and dimensions of the presumed Roman road (Site A6), and to identify any other associated sub-surface remains. The survey areas measured 80m by 20m and 100m by 40m (Area S4W), 60m by 60m (S4C), and 100m by 60m (Area S4E), and all areas had been recently ploughed at the time of the survey.

3.20 A broad, weak and diffuse magnetic lineation was recorded in Areas S4W and S4C, running off in a general north-east direction. It seems likely that this anomaly represents the ploughed-down remains of the Roman road, although it was not identified in Area S4E; presumably it has been ploughed out to a greater extent here. Other discontinuous linear positive anomalies in Area S4W probably represent the remains of ridge and furrow cultivation, which are aligned with the adjacent field boundary, while a small circular anomaly could be a damaged prehistoric ring ditch.

Area S5

3.21 This area comprised two adjoining surveys in a pasture field on the north side of the existing A66, Area S5 and a subsequent northern extension both measured 180m by 40m. Discontinuous linear positive anomalies seen in the south-east corner are likely to be the remains of ridge and furrow cultivation, although two relatively intense curvilinear features could be of more significance. One significant anomaly towards the south-west corner had a combination of both positive and negative readings, a characteristic commonly associated with a kiln structure, and there were other linear anomalies in the area (see Figure 4).

Area S6

3.22 This area also comprised two adjoining surveys in a pasture field, both 160m by 40m. As with Area S5 to the west, the survey was required to determine whether any as yet unidentified remains or deposits lie within the area to be disturbed by the road improvements.

3.23 A complex of apparently interconnecting and overlapping positive anomalies or soil-filled ditches were identified, some in the north-west corner forming an enclosure measuring *c.*22m by 17m (see Figure 5). Another possible kiln structure was also identified on the south side of a prominent east-west linear ditch. Similar features can be seen on aerial photographs to the north and east around Violet Farm, and they may all be related to a large complex identified by a previous geophysical survey (Casey, Howard and Wright 1995; Site A8) to the north-east of "The Bungalow". There may also be a connection with another site identified just to the south-east (Abramson 1995; Site A9). Although the disused and grassed-over quarry (Site A7) was identified by the survey, there were no anomalies to suggest that it was associated with any structures.

Area S7

3.24 Four discrete surveys were undertaken within this relatively level area on the north side of the existing A66 opposite the Sedbury Lay-by. Area S7W2 (200m by 40m) had recently been subjected to subsoil ploughing, while the other areas (S7W1 - 160m by 40m, S7E1 - 160m by 40m, and S7E2 - 100m by 40m) carried cereal stubble. The work was required to assess whether any features associated with the extensive Iron Age/Romano-British complex seen to the east extended into the area of the proposed road improvement corridor.

3.25 The surveys all produced very smooth data, consistent with subsoil disturbance, and the results should not be seen to be an accurate representation of any underlying archaeological features. Nevertheless, some ridge and furrow was seen in the west end of Area S7W2 and two, or possibly one right-angled ditches, were seen in the centre of Area S7E2.

4 EARTHWORK AND TOPOGRAPHIC SURVEY

Introduction

4.1 The previous condition survey report (BHWB 1998a) had suggested that those earthwork sites affected by the scheme should be the subject of a detailed earthwork or topographical survey. This applied to the Gatherley Moor quarries at the Melsonby crossroads (Site A3) and a disused quarry to the south-east of Sedbury Home Farm (Site A7). The area of ridge and furrow at Sedbury Home Farm (Site A5) was withdrawn from the programme, following a re-alignment of the proposals. It was also recommended that the area of Scots Dike (Site A4) be surveyed, to identify any variations in topography associated with the ploughed-down remains of the earthwork bank and ditch.

Methodology and Results

4.2 The area of Scots Dike was surveyed in September 1999 using electronic distance measuring (EDM) equipment. In the absence of any definite breaks of slope, a detailed contour model of an area 60m wide was produced by gathering spot heights over a 1m and 2m grid. Sufficient background information such as field walls and gates was also collected to allow the survey area to be readily located.

4.3 The results of the survey are shown in Figure 2. The survey showed that the ground surface rose gradually from 190.9m AOD in the east to 195.1m AOD in the west. Although the alignment of the ditch of Scots Dike as revealed by the geophysical survey did not coincide with any break of slope, a shelf or terrace approximately 2m wide was evident just to the west. This may correspond to the position of the bank, which has subsequently been removed and/or levelled; the bank can still be seen on the south side of the A66 as an earthwork some 1.5m high and 10m wide. The survey results were also used to help position the trial trenches in this area (see below).

4.4 The survey of the other two sites (A3 and A7) was postponed until a later date, but will be carried out in advance of any construction or development in the area (see Chapter 8 below).

5 TRIAL EXCAVATIONS

Introduction

5.1 The results of the geophysical surveys reduced the number of areas requiring further investigation by limited trial excavation to eleven (see Figures 1A to 1D) within which 35 trenches were dug. The total area of excavation amounted to 1,950 sqm. Plans to excavate a single trench in Area S14 were aborted when access was refused.

5.2 The excavations took place in September and October 1999, and were carried out by Northern Archaeological Associates (NAA), working as sub-contractors to BHWB Environmental Design and Planning. Their final report was produced in March 2000 (NAA 2000), and the following text provides a summary of the main findings.

5.3 The general objectives of the trial excavations were defined as follows:

- to confirm the results of the previous geophysical survey, and to test for the presence of any archaeological deposits or features associated with the geophysical anomalies;
- to identify, as far as possible given the constraints of the trenching proposals, any archaeological deposits or features within the various fieldwork areas not identified by any previous stages of investigation;
- to determine the date, nature, depth and stratigraphic complexity of any archaeological features and deposits within the various fieldwork areas;
- to provide an assessment of the potential and significance of any identified archaeological deposits and features in a local, regional and (if necessary) national context, and to contribute towards an assessment of the likely scope, cost and duration of any further evaluation and/or excavation works that might be required to mitigate against the proposed road improvement proposals.

  Where appropriate, more specific objectives relating to individual sites are described below.

Methodology

5.4 The methodology for the trial excavations was defined in a specification produced by EDAS (1999) on behalf of BHWB, which took account of comments made by the County Archaeological Officer for North Yorkshire, English Heritage and the Highways Agency. Trenches were positioned to sample areas seen as representative of each major component of each site. As one of the areas (S2) coincided with a Scheduled Ancient Monument (Scots Dike; SAM 26946), an appropriate Section 42 license was obtained

from the Department of Culture, Media and Sport in advance of investigation (DCMS ref HSD/9/2/4286 pt 1).

5.5 Topsoil was removed from each trench by tracked excavator under direct archaeological supervision, down to the top of the archaeological features and/or deposits. The archaeological features thus exposed were cleaned and recorded in plan, and selected features were partially excavated by hand. In many cases an additional sondage was excavated to confirm the presence of natural deposits. Excavation and recording was undertaken in sufficient detail to achieve the aims of the evaluation exercise. Weather conditions during the majority of the trenching programme were poor, with heavy rain and wind leading to localised waterlogging.

Summary of results

Area S13

5.6 One trench (S13/8) measuring 20m by 2m was dug across the presumed field boundary and ridge and furrow identified by the geophysical survey in the east end of Area S13E. Excavation revealed one definite north-west/south-east furrow base but the south end of the trench was occupied by a modern ditch cut for a water pipeline and its associated easement.

Area S12

5.7 One trench (S12/9) measuring 15m by 2m was excavated to assess the positive geophysical anomalies identified near the A66 in the west survey area (S12W); other linear anomalies to the north lay outside the proposed road improvement corridor and were not considered. The trench contained no archaeological features and the geophysical anomalies appeared to coincide with a colluvial deposit.

5.8 Two trenches were excavated in the central part of Area 12, S12/10 measuring 40m by 2m and S12/11 measuring 20m by 2m. Trench S12/10 was aligned so as to include the possible sub-circular pit-like anomaly. The trench was found to contain several north-south field drains and another non-archaeological ditch. Towards the centre of the trench, in the area of the presumed pit, a truncated linear feature and a shallow sub-circular feature with a U-shaped base and filled with burnt material including fired daub was found; unfortunately there were no finds to assist with the interpretation of these features.

5.9 The second trench (S12/11) was designed to intersect one of the probable field boundaries anomalies. However, apart from two field drains, no archaeological features were seen.

5.10 A final trench (S12/12, 20m by 2m) was excavated in the south-east corner of survey Area S12E, to investigate some small-scale positive lineations, possibly a small enclosure. The only feature identified here was a small sub-circular pit or scoop containing a grey silty sand with charcoal flecks.

Area S8

5.11 One of the possible quarries identified by the geophysical survey was sampled by a single trench (S8/13) which measured 20m by 2m. No man-made features were detected by the excavations.

5.12 An additional trench (S8/42), measuring 20m by 2m, was excavated towards the west end of this area, to investigate the presumed continued alignment of a field boundary seen on the geophysical survey. The boundary was revealed as a U-shaped ditch 1.25m wide and 0.41m deep with a U-shaped slot on the east side. The ditch was cut by a modern field drain.

Area S1

5.13 A total of four trenches were excavated in Area S1E, mostly to assess the complex of curvilinear positive anomalies seen in the west part of the area and which were thought to represent elements of an Iron Age/Romano-British settlement (see Figure 3). Trench S1/14 was 30m long by 2m wide and the north end was designed to extend into the interior of what appeared to be a large sub-circular enclosure. The main ditch was seen to be 1.45m wide and 0.62m deep, with a U-shaped profile, and the secondary fill produced a fragment of flint. There was a sub-circular pit or scoop at the north-east end of the trench which contained a piece of possibly worked stone.

5.14 Two other trenches formed a cross-shape across a small *c.*10m diameter circular feature which appeared to overlie (or be cut by) a larger ditch; one trench (S1/15) was aligned north-south and measured 20m long by 2m wide while the second (S1/16) was east-west and 30m long by 2m wide. The same linear feature was seen in both trenches; it extended to some *c.*13m and was 1.25m wide and 0.31m deep. No finds were recovered.

5.15 The fourth trench (S1/17) measuring 20m long by 2m wide was designed to investigate some of the negative anomalies and the edge of a possible small quarry. It contained no features of anthropogenic origin, although there was a colluvial deposit at the south end.

Area S2

5.16 Three trenches were planned in Area S2 (see Figure 2). One (Trench S2/20) measured 85m long by 4m wide and was designed to cut across Scots Dike, a presumed 6th or 7th century linear earthwork which extends for over 14km between the Rivers Swale and Tees. Although the geophysical survey results were distorted by an iron pylon, evidence for the course of the east ditch was seen in a *c.*4.5m wide positive anomaly which follows a characteristic dog-leg orientation seen on aerial photographs. The final position of the trench was determined by a combination of the geophysical survey and the topographic survey results.

5.17 A 4m wide rock-cut ditch was revealed by the trench. Under the terms of the Scheduled Monument Consent, excavations were limited to a depth of 0.5m below ground surface, but geotechnical probing showed the ditch to be some 1.48m deep and apparently V-shaped in section. The upper fills were

of a yellowish-brown silt which did not contain any finds. At right angles to the Dike was another rock-cut ditch, 3.1m wide and 0.42m, of uncertain function or date. A third rock-cut linear linked the other ditches together and, while it contained no diagnostic finds, it may represent a length of the Roman roadside ditch. It was not possible to determine its full width but it was at least 0.2m wide and at least 0.5m deep, and was traced for some 32m.

5.18 Two other trenches (S2/18 and S2/19), both 15m long by 2m wide, were dug to the north and west, intersecting smaller positive lineations which might be part of a field system which may or may not be associated with the Dike. In both cases, no archaeological features or deposits were identified in the trenches.

Area S3

5.19 The two weak, linear positive geophysical anomalies towards the east end of this area were assessed by two trenches measuring 20m long by 2m wide (S3/21 and S3/22) aligned approximately parallel to the A66. In both cases, no archaeological features or deposits were seen, although modern plough marks were in evidence.

Area S4

5.20 The possible remains of a ploughed-out Roman road seen on the geophysical survey in the west (Area S4W) and central (Area S4C) parts of this survey area were investigated by two trenches (S4/23 and S4/24) measuring 25m long by 2m wide. Trench S4/23 contained one east-west U-shaped linear feature, 0.36m wide and 0.32m deep, while trench S4/24 contained only a few stones which may have marked the course of the road. Both trenches were scarred by modern plough marks, suggesting that the road surface had been almost completely destroyed.

Area S5

5.21 A total of four trenches (S5/25 to S5/28) were excavated in this area, intersecting with the broadly parallel magnetic lineations which had been detected by the geophysical survey (see Figure 4). One of the trenches (S5/26, 30m long by 2m wide) was designed to take in the possible kiln structure seen towards the central south part of the area, while trench S5/27 crossed another dipolar feature and some other lineations. Trench S5/25 measured 15m by 2m, trench S5/27 was 17m by 3m, and trench S5/28 measured 25m by 2m.

5.22 Trench S5/25 was found to contain a land drain and what appeared to be a heavily truncated post hole; no finds were obtained. Trench S5/26 cut three east-west land drains and revealed some plough marks, but nothing was found at the presumed kiln location. A further land drain was seen in trench S5/27. The anticipated ridge and furrow was not seen in trench S5/28, although an east-west linear feature 0.8m wide and 0.2m deep and a narrow ditch-like slot crossed the centre of the trench. Other features in this trench included a land drain, a possible small quarry, and the vestigial remains of two possible post holes.

Area S6

5.23 The geophysical survey of this area revealed numerous positive linear anomalies, many connecting at right angles to form a possible settlement complex (see Figure 5). The most prominent feature was an apparent rectangular enclosure *c.*22m by 17m can be seen, and some of the other linear features may represent an associated field system. Another possible kiln structure was also identified on the south side of a prominent east-west ditch. A large dipolar area on the south edge of the survey area corresponds to the earthworks of a small quarry.

5.24 This complex had the potential to be a significant site and this was reflected in the level of assessment carried out. A total of six trenches were excavated. The main enclosure complex was assessed by two trenches (S6/29 - 20m by 2m and S6/30 - 40m by 2m) designed to form a T-shape which cut through several of the presumed ditches and extended into the interior. The possible kiln feature and other anomalies were assessed by trench S6/31, which measured 40m by 2m, while three smaller trenches (S6/32-34), each 15m long by 2m wide, cut some of the other positive linear ditch-like features see in the area.

5.25 No archaeological features were identified in trenches S6/29 and S6/31. Trench S6/30 contained a single linear feature, the remains of a small hearth 0.74m by 0.28m containing burnt material and slag, and a possible posthole, all located at the north-east end of the trench. Trench S6/32 contained one central north-south linear feature, the fill of which was very similar to the topsoil; a similar feature was also identified in trench S6/33. Trench S6/34 revealed the same east-west linear ditch as that seen in trench S6/33, which had both been recorded by the geophysical survey. The feature was 0.65m wide and 0.35m deep, and had an asymmetrical V-shaped profile and a rounded base. Another linear feature of the same dimensions was situated some 2m to the south.

Area S7

5.26 Five trenches were dug to assess this large area of survey, and all measured 30m long by 2m wide. Trench S7/35 was designed to examine some probable ridge and furrow seen in the east end of Area S7W2 while trench S7/36 was placed to investigate a "blank" area within the same field but to the west. Trenches S7/37 and S7/38 lay at either end of Area S7W1, and again assessed otherwise "blank" areas. The final trench (S7/39) cut across two linear anomalies in the centre of Area S7E2, just to the west of "The Bungalow"

5.27 No archaeological features were seen in Trenches S7/35, S7/36 and S7/37. Trench S7/38 contained a shallow linear feature, 0.3m wide and 0.09m deep, and a circular pit or scoop 0.95m in diameter and 0.13m deep towards the north end.

5.28 However, trench S7/39, located nearest to "The Bungalow", was most productive. Towards its south end were a sequence of four north-south intercutting ditches which all had V-shaped profiles but which were themselves cut by a modern east-west field drain; one of the ditches had a single fill of dark greyish black silt containing burnt daub and charcoal flecks,

which included carbonised plant microfossil remains. Near the centre of the trench was another linear ditch measuring 0.85m wide and 0.32m deep which contained three separate fills, all with charcoal flecks. Finally, a curving slot (context 3911) measuring 0.34m wide, 0.1m deep and at least 2m in diameter was found on the west side of the north end of the trench. An unstratified sherd of handmade (presumably Iron Age) pottery was noted during the initial cleaning of the trench.

Area S15

5.29 The previous geophysical survey undertaken by Casey *et al* (1995) did not extend to the edge of the A66 in the fields to the east of "The Bungalow", but some of the anomalies were seen to be heading in this general direction (Site A8). As a result, two 30m long by 2m wide trenches were excavated in each field, to assess these features and to test for any other items that might extend into the proposed road corridor. The west trench (S15/40) was aligned at right-angles to the proposed and existing carriageways (ie north-south) while the east trench (S15/41) was aligned east-west.

5.30 Once again, these trenches were productive. Trench S15/40 contained two east-west linear features at the south end. One incorporated a circular expansion, possibly a pit, the fill of which contained fragments of coal, charcoal and a sherd of Roman-period pottery. The fill of the other linear contained Roman and Iron Age sherds of pottery. Another east-west slot, 0.21m wide and 0.11m deep with a U-shaped profile, was seen in the centre of the trench, and two other linears lay further to the north.

5.31 Similar finds were recorded in trench S15/41, together with linear features, a possible sub-circular posthole and a semi-circular gully. A pair of modern field drains also ran east-west along the length of the trench.

6 CONCLUSIONS FROM STAGE 3 FIELDWORK

General Comments

6.1 Overall, the results of the trial trenching were disappointing, and many of the geophysical survey anomalies suspected as being of archaeological interest proved to be natural features. Others were shown to be modern land drains, pipelines, and areas of disturbance. However, the trial trenching was able to show that the archaeological potential of the proposed road corridor was lower than had previously been considered, and that the scheme proposals (as currently planned) will have less archaeological impact than originally thought.

6.2 Three main areas of interest were evident from the evaluation trenches, and two of these relate to known and partly excavated Iron Age and Romano-British sites.

Areas 7E2 and 15: The Bungalow

6.3 The first site lies either side of The Bungalow, and the results here are likely to be associated with a settlement previously investigated on the south side of the A66 in the area of the Vintage Motel (Abramson 1995; Site A9).

Although the central part of the settlement was not located within the relatively small area examined by the A66 trenches, the amounts of burnt material in the backfilled negative features, together with limited amounts of pottery and some carbonised grain in trenches S15/40, S15/41 and S7/39, may be indicative of the proximity of such occupation; one of the circular features seen in trench S7/39 could be interpreted as part of a dwelling. The previous excavations to the south revealed evidence of four main phases of activity (Abramson 1995, 9-12) and this accords well with the series of ditches revealed in trench S7/39.

6.4 The features identified in trenches S15/40 and S15/41 to the east of The Bungalow partly reflect the results of an earlier geophysical survey undertaken between the A66 and Violet Grange Farm (Casey *et al* 1995; Site A8), although that survey did not actually cover the area of the two recent trenches. Nevertheless, the present excavations appear to provide a plausible link between the excavated settlement to the south of the A66, and the surveyed field system to the north. The recovery of both Iron Age and Roman pottery from the A66 trenches reinforces the interpretation of this being a site which demonstrates continuity from the pre-Roman to Roman periods.

Area S1: west of Melsonby crossroads

6.5 The second known occupation site is situated some 5km to the north-west of Scotch Corner, at Rock Castle (Fitts *et al* 1994), and results obtained from trenches S8/42, S1/14, S1/15 and S1/16 can be associated with this site. The amount of material from the A66 trenches is proportionally much smaller than that obtained from the Scotch Corner site, and this may reflect the fact that the main focus of occupation at Rock Castle lies further away. Nevertheless, the features found in trenches S8/42, S1/14, S1/15 and S1/16 probably represent elements of an associated field system, possibly connected with an east-west trackway seen in the excavated site (Fitts *et al* 1994 figures 2B, B and C; also visible on aerial photographs immediately to the south of the A66) in at least one of its phases. There was no indication of any settlement within the proposed road corridor, although this does not mean that it could be present just outside the small sample of ground examined.

Area S2: Scots Dike

6.6 One other area of importance was located during excavation in the vicinity of the scheduled monument of Scot's Dike (trench S2/20). Despite the limited possibilities for excavation on the scheduled monument itself, the dimensions of the ditch and the fact that it is rock-cut at this point have been established, whilst a potentially contemporary perpendicular linear feature has now been explored. An east-west rock-cut ditch might conceivably represent one of the flanking ditches of the Roman road. Unfortunately, the excavations, which were necessarily limited in their nature, produced no evidence to support or deny the assertion that the earthwork is post-Roman in date. It is possible, but by no means certain, that excavation of a full section through the ditch may have produced diagnostic evidence that could have helped to answer this and related questions. As it is, the nature of the

relationship between the Roman road and the linear earthwork remains undefined.

Other sites

6.7 In addition to these three main areas, a few other isolated features were recorded by the trenching. Most of these were field boundaries and ditches considered to be of relatively minor significance (eg in trench 12/10). However, a single linear feature, the remains of a small hearth containing burnt material and slag, and a possible posthole, all located at the north end of trench S6/30, together with other linear ditches in trenches S6/32, S6/33 and S6/34, all point the presence of some activity in this area, although not on the scale previously suggested by the geophysical survey. The area of this site appears to be largely confined to Area S6 (no features were seen in trench 7/35 to the east), although some deposits were identified in trench 5/28 to the west.

6.8 Due to the nature and circumstances of the evaluation trenches undertaken, it was not possible to assess the condition of any Roman road surfaces that might underlie the present trunk road. However, it should be noted that recent work in similar situations (eg. Mudd 1998; Esmonde-Cleary 1998, 388) has shown that well-preserved Roman surfaces can survive, and the possibility of similar deposits below the existing A66 to the west of Sedbury Home Farm cannot be discounted.

7 ASSESSMENT OF THE EFFECTS OF THE PROPOSALS

Introduction

7.1 The effects of the construction and landscaping proposals, as currently proposed, on the sites and areas of cultural heritage interest identified by the completed Stage 3 fieldwork have been assessed. It should be noted that the effects resulting from off-site planting, haul routes, construction compounds or temporary construction roads have not been considered.

7.2 For archaeological sites and monuments, the main impacts arising from road construction are likely to be:

- possible disturbance and / or destruction of archaeological deposits from works associated with the scheme, whether from actual construction or works associated with secondary operations such as landscaping, balancing ponds, site compounds and borrow pits;
- increased visual intrusion;
- increases in noise, vibration and disturbance;
- severance from other linked features such as field systems, agricultural complexes and landscapes;
- changes in the original landscape;
- loss of amenity.

7.3 For the built environment, the main impacts arising from road construction are likely to be:

- possible demolition, or loss of part of the structure or grounds of a listed building;
- increased visual intrusion;
- increases in noise, vibration and disturbance;
- severance from other linked features such as gardens, outbuildings, lodges etc;
- changes in the original landscape, townscape or garden setting of the house or building;
- loss of amenity.

7.4 It should be noted that in the following sections, the term "site" refers to those sites identified and numbered in the earlier assessment reports (NAA 1997; Landmark Partnership 1998, 23-25; BHWB 1998a), whereas the term "area" refers to the areas of archaeological potential in which non-intrusive Stage 3 archaeological fieldwork has taken place.

The Development Proposals

Scheme description

7.5 A detailed description of the scheme is contained in Section 2.3 of Volume 1 of the Environmental Statement. However, the main features can be summarised as follows:

- the existing A66 carriageway would be retained for two lanes of westbound traffic;
- a new two-lane carriageway would be constructed, at a varying distance, to the north of the existing A66 to carry eastbound traffic;
- new "all-movement" at grade staggered junctions would be constructed at the Winston and Melsonby crossroads;
- a widened central reserve would allow "all-movement" access to and from Warrener Lane South, Sedbury Home Farm, Sedbury Lodge and The Vintage Motel;
- access to and from Sedbury Layby would be left in/left out only;
- accesses onto the A66 from Carkin Moor (Warrener Lane North) and Jagger Lane would be stopped up, except to non-motorised users;
- access to Black Hill Farm would be via a new private means of access off Forcett Lane;

- Kirklands House and garage, and The Bungalow west of Scotch Corner, would be demolished to construct the new eastbound carriageway;
- a new lay-by would be provided for eastbound traffic, to the west of the former Kirklands Garage site;
- extensive tree planting would be provided on the widened central reserve between Sedbury Home Farm and The Vintage Motel;
- no lighting would be provided along the trunk road except on the approach to the Scotch Corner roundabout;
- new balancing ponds would be provided to regulate discharge into existing watercourses, at the following locations:
  - south of the A66, west of Warrener Lane;
  - south of the A66, opposite Kirklands Garage;
  - north of the A66, in the area currently occupied by The Bungalow and related outbuildings.

Modifications to the proposed construction corridor

7.6 Following the results of the various desk-top and Stage 3 surveys undertaken to date, the proposed construction corridor was re-aligned in several areas to take account of archaeological remains.

7.7 At Scots Dike (Site A4/Area S2), the width of the proposed central reserve was reduced as much as possible so as to minimise land take in the area of the scheduled ancient monument, and the method of construction was amended to encompass a raft foundation so as to reduce disturbance to underlying archaeological deposits. The corridor of land take is currently 25m wide.

7.8 In the area immediately to the west of Scotch Corner, the curving alignment of the proposed new eastbound carriageway was tightened as much as possible to minimise land take and reduce the amount of ground disturbance in the area of the Iron Age and Romano-British settlement and field system (Site A8/Areas S7 and S15).

7.9 Other design alterations and/or corridor re-alignments due to constructional and engineering factors have meant that five sites identified by the previous surveys are no longer affected by the scheme; these sites are Site A11 (field boundary west of Jagger Lane), Site A10 (quarry pits (sites of), west of Jagger Lane), Site A1 (Iron Age settlement and field system, west of Melsonby crossroads and south of A66), and Site A5 (ridge and furrow earthworks west of Sedbury Home Farm). Any disturbance to Site A9 (Iron Age settlement at The Vintage Motel) will now be confined within the existing carriageway boundary, where an access road will be built.

Impact of Development

7.10 When making an initial assessment of the impact of the proposed scheme on the known sites of archaeological and architectural interest, all construction works as currently planned have been taken into account.

Grading systems

7.11 Using a combination of professional judgment, the Secretary of State's criteria for scheduling ancient monuments and listing buildings, and the criteria developed by English Heritage in their Monuments Protection Programme, an initial assessment of the grade of importance of each cultural heritage site or area within the proposed construction corridor can be made.

7.12 Guidance given in DMRB volume 11 suggests that a four tier importance grading system can be applied to archaeological sites, namely National, Regional or County, District or Local, and sites which are so badly damaged that so little now remains to justify their inclusion in a higher grade (DOT 1994, 3/1). This importance-grading scheme is also used here, although the District and Local grade is sub-divided to differentiate between sites at the lower end of the scale.

7.13 The importance of the built environment can be graded according to whether the structures are listed or not. The various grades for Listed Buildings are also hierarchical, Grade I buildings being of exceptional interest, Grade II* buildings being particularly important buildings of more than special interest, and Grade II buildings of special interest (DOT 1994, 9/1). In order to correlate with the archaeological grading system, and following established guidance, Grade I and II* buildings are considered to be of National Importance while Grade II buildings are considered to be of Regional or County importance.

7.14 In order to help to assess the impact of the proposals on the identified sites and areas of archaeological or architectural importance, a three tier impact grading system has been devised, based on the scale of impact of the proposals, namely:

Major impact:	Major disturbance (ie. more than 75% of the area of known or estimated archaeological deposits).
Significant impact:	Significant disturbance (ie. between 25% and 75% of the area of known or estimated archaeological deposits).
Small-scale impact:	Minor disturbance (ie. less than 25% of the area of known or estimated archaeological deposits).

In drawing up this information, consideration has also been made of the scale, significance, potential and current condition of the site, defined as the grade of the site.

7.15 A combination of the impact of the proposals and the grade of importance or potential of each site can then be used to produce an assessment of overall adverse impact, defined as being substantial, moderate or slight.

Archaeological sites

7.16 Following the results of the Stage 3 assessments, and taking into consideration the amendments made to the proposed road improvement corridor, it can be seen that a total of eleven archaeological sites will be affected by the current scheme, as follows:

Site / Area no	Site name	Importance
Site A15	Roman road, Carkin Moor to Kirklands Garage	R?
Site A14	Carkin Moor Roman fort	N
Site A13	Potential Roman extra-mural settlement, east of Carkin Roman fort	R?
Site A12	Quarry pits and ridge and furrow, west of Winston crossroads	L
Site A2 Area S1 Area S8	Iron Age enclosures and field system, west of Melsonby crossroads, north of A66	R
Site A3	Gatherley Moor quarries, Melsonby crossroads	L
Site A4 Area S2	Scots Dike, east of Melsonby crossroads	N
Site A6 Area S4	Roman road (course of), east of Kirklands Garage	L
Area S6 Area S5 (part)	Iron Age/Romano-British occupation, Black Plantation	D?
Site A7	Disused quarry, south-east of Sedbury Home Farm	L
Site A8 Area S7 (part) Area 15	Iron Age/Romano-British enclosures and field system, The Bungalow	R

Note: ***This information contained in this table is currently being revised so that sites and areas will be rescheduled as sites only. The drawings in the final version will also be amended to the updated numbering system. Furthermore a gazetteer is being prepared on the revised numbering system, to be included as Appendix 1 in the final document.***

7.17 It should be stressed, however, that the various non-intrusive survey areas were defined by the proposed construction corridor and the identified sites are likely to extend beyond this.

7.18 In addition, the Stage 3 surveys carried out to date have been able to confirm that the geophysical anomalies identified in survey Areas S13, S12W, S12E, S8 and S3 are not archaeological in origin, while deposits associated with continuation of the Roman road at Kirklands Garage (Site A6/Area 4) have been largely destroyed by agricultural activity.

7.19 There is clear archaeological potential associated with the regionally important Iron Age and Roman period settlement at The Bungalow near Scotch Corner (Site A8/Areas S7E2 and S15), and the proposed road corridor will pass through the field system and perhaps even traces of

settlement, if one of the circular features in trench S7/39 is to be interpreted as part of a dwelling. The road improvements in this area cover a corridor 25m wide at the west end, decreasing to 10m wide at the east end, leading to a small-scale impact. More significant disturbance will take place on the presumed Iron Age and Roman field systems and other features identified to the west of Black Plantation (Areas S5 and S6), where the proposed road corridor is up to 45m wide; this site has been graded as being of District importance.

7.20 The nationally important monument of Scots Dike (Site A4/Area S2) will also be crossed by a proposed road corridor 25m wide and, at the time of writing, it is understood that an engineering solution will be employed to carry the road over the monument, so as to reduce any ground disturbance. However, some disturbance may be caused by preparatory works such as topsoil stripping, leading to a small-scale impact.

7.21 The new road corridor to the west of Melsonby crossroads is proposed to be 30m wide, and so there will be a significant impact on the regionally important (presumed) Iron Age deposits and features identified here (Site A2/Areas S1 and S8). However, unlike at Scotch Corner, there was no indication of settlement within the proposed road corridor, although it could be present beyond the small sample examined by the evaluation trenches, and elements of the field system will be significantly affected.

7.22 A significant impact will occur on the remains of quarry pits and ridge and furrow to the west of Winston crossroads (Site A12), where the 30m wide corridor and the construction of a new slip road will pass through the low and denuded locally important earthworks. There will also be a major impact on the earthwork remains of a disused quarry to the south-east of Sedbury Hall Farm (Site A7). Small-scale impacts will occur on the largely destroyed remains of the Roman road just east of Kirklands Garage (Site A6/Area S4), and on part of the Gatherley Moor quarry complex (Site A3); both these sites are considered to be of local importance.

7.23 At the extreme west end of the scheme, the proposed new carriageway will pass through the area which could be occupied by an extra-mural Roman settlement (Site A13) associated with the adjacent fort. Not all this area was able to be investigated by the Stage 3 works, and so the archaeological potential of this site could not be assessed. The proposed road corridor here reduces in width from 35m wide at the east end to 10m at the west end.

7.24 All works within the area of the nationally important Carkin Moor Roman fort itself (Site A14) are confined to the existing deep road cutting, although the regrading of the banks could lead to a small-scale impact; the area of the road cutting is specifically excluded from the area of the scheduled monument.

7.25 It was not possible to assess whether any Roman road surfaces, or any associated features such as roadside ditches, quarry pits, marking-out lines, or even milestations, survive within the existing road corridor. At present, there is a considerable archaeological potential for remains, although the proposed works are mostly limited to removing the upper levels only, and disturbance to underlying deposits should be minimal. Nevertheless, some small-scale impact could be likely.

7.26 Based on current knowledge, the eleven affected sites within the proposed road improvement corridor can be graded in terms of importance as being National (two sites), Regional or County (four sites), District (one site) and Local (four sites). The scale of impact can be categorised as being Major (one site), Significant (three sites), and Small-scale (seven sites), while overall adverse impact can be categorised as Moderate on four sites and Slight on seven sites. Full details of the grades of importance, and levels and details of impact for the archaeological sites, can be found in Table 1.

Built environment

7.27 Following the results of the Stage 3 assessments, and taking into consideration the amendments made to the proposed road improvement corridor, it can be seen that the two listed buildings (Site B1 Gatherley Moor Farmhouse and Site B2 Sedbury Hall Lodge) will not be directly affected by the scheme although their setting may be affected. This matter is covered elsewhere in the Environmental Statement. Full details of the grades of importance, and levels and details of impact for the built environment sites, can be found in Table 1.

8 MITIGATION MEASURES

Introduction

8.1 Archaeological remains survive both as upstanding earthworks or as buried features beneath the ploughsoil. All remains will be susceptible to damage and/or destruction as a result of ground disturbance associated with the construction of these proposals and their related landscaping or enhancement works.

8.2 The removal of topsoil and subsoil is likely to destroy most archaeological deposits and, even where embankments and other methods are used to raise the overall ground level, preparatory works often result in the destruction of any archaeological deposits which lie at shallow depths. In addition, while the burying of archaeological features beneath a development can sometimes be an accepted form of preservation *in situ*, this is not always the case and care must be taken to ensure that any significant deposits are not subject to undue compaction and shrinkage. Some form of monitoring might be required to ensure that this does not happen.

8.3 For archaeological sites, possible mitigation measures have been described in the DMRB volume 11 as:

- locate the route away from archaeological remains and their settings;
- design the scheme's vertical alignment and associated earthworks so that archaeological remains are not disturbed;
- undertake appropriate recording works and other investigations in advance of construction;

- undertake appropriate recording works and other investigations during construction.

In practice, a combination of these measures is often used.

8.4 Listed buildings and other elements of the built environment are, by definition, upstanding structures. In addition to demolition, they are particularly susceptible to increased visual intrusion, noise, vibration and disturbance and severance from other linked and associated features.

8.5 For the built environment, possible mitigation measures have been described in the DMRB volume 11 as:

- locate the route away from historic buildings or sites, avoiding demolition wherever possible;

- keep a route low within the natural topography to exploit any natural screening and enhance this by the use of cuttings and, in exceptional circumstances, tunnels. These measures will also help to reduce noise and vibration;

- use other landscaping techniques to integrate a scheme into its setting.

In practice, a combination of these measures is often used.

Phases of Investigation

8.6 It is envisaged that five separate phases of work will be required to ensure that the cultural heritage of the area covered by the proposals have been considered to an appropriate standard. The results of each phase will influence and set the parameters for the next. Phases 1 to 2 deal with the assessment and pre-construction works, phase 3 deals with the recording of archaeological deposits while construction is in progress, and phases 4 and 5 deal with the assimilation, publication and deposition of any results resulting from the previous phases. In detail, these phases comprise:

Phase 1: Detailed evaluation. Initial and intensive fieldwalking, geophysical survey, earthwork survey, trial trenching and initial building assessment as appropriate, leading to the detailed assessment of impact and recommendations for mitigation (DMRB Stage 3).

Phase 2: Pre-construction investigation. Detailed excavation and architectural recording in advance of construction of those sites identified during the previous phase to be of significant archaeological or architectural importance and for which no appropriate mitigation measures can be sought.

Phase 3: Watching brief during construction. Investigation and recording of those sites identified during the DMRB Stages 1 to 3 as not warranting prior investigation, as well as the recording of sites which may be exposed during the course of development.

Phase 4: Post-excavation assessment. Assessment of the results of the archaeological investigations and the potential of the data for analysis leading to recommendations, timetable and costings for subsequent detailed analysis, publication, storage and deposition.

Phase 5: Post-excavation analysis and publication. Data analysis, report preparation and publication followed by deposition of the archive and artefacts and all other materials associated with the investigations with the appropriate institution for long term storage and curation.

Archaeological Sites

8.7 The effects the scheme proposals might have on the archaeological resource were considered from an early stage. In all cases, and with all other constraints and environmental factors being equal, the physical preservation of an archaeological site would be the preferred option. The archaeological excavation of deposits (preservation by record) is seen as a last resort and would only be undertaken when all other avenues have been considered and discounted.

8.8 The Phase 1 detailed evaluation works described above correspond to Stage 3 of the Department of Transport's Stages of Archaeological Assessment as defined in the DMRB volume 11 (DOT 1994). The majority of this work has been completed and is summarised above. The only outstanding elements of this phase are a limited number of additional trial trenches and some test pitting, and some photographic surveys; all this work will take place at a later date, in advance of construction.

8.9 The results of the Phase 1 works completed to date have shown that some of the potential archaeological sites were not of especial importance while others were sufficient to merit further investigation. The results have also enabled specific recommendations to be made for appropriate mitigation works, both in advance of and during construction. Two approaches have been adopted, preservation in situ (ie. burying the archaeological deposits) and preservation by record (ie. full archaeological excavation and recording in advance of development).

8.10 The proposed mitigation measures can be defined in terms of the phases of investigation outline above. These are discussed below and the extent of the works is shown on figures 6A to 6D. A summary of the proposed mitigation measures, from west to east, is given in Table 1.

Phase 1 Detailed evaluation

8.11 Additional trial trenching will be undertaken in the area of the potential extra-mural settlement to the east of the Carkin Moor Roman fort (Site A13), to assess the archaeological potential of this particular area, access into this field was denied during the main programme of trial trenching. The area of the road cutting within the Roman fort itself (Site A14) would also be subject to limited test pitting or trenching, to determine the presence or absence of any archaeological deposits within the area to be disturbed by the regarding

of the embankments. Other trenching will also be undertaken at intervals along the presumed line of the Roman road between Kirklands Garage and Carkin Moor (Site A15), where ground disturbance will be significant, to try and determine whether any former Roman road surfaces survive beneath the existing carriageway. Further trenching will take place within the curtilage of The Bungalow, and to the east of Carkin Moor Roman Fort (Site A14) in the areas of the proposed balancing ponds, to see whether any deposits associated with the Iron Age/Romano-British settlement and fort complex survive.

8.12 All these additional intrusive works would be undertaken in advance of construction and, should any significant deposits and features be identified, the appropriate areas would be subject to further pre-construction investigation as outlined below.

Phase 2 Pre-construction excavation and recording

8.13 It is proposed that Phase 2 pre-construction excavation is carried out at the three main sites identified by the Stage 3 investigation works, namely the area of Iron Age enclosures and field systems to the west of Melsonby crossroads (Site A2/Area S1), the area of Iron Age and Romano-British occupation at Black Plantation (Area S6 and S5 (part)), and the area of Iron Age and Romano-British enclosures and field system at The Bungalow (Site A8/Areas S7 (part) and S15). A similar approach will be adopted in the area of Scots Dike (Site A4/Area S2).

8.14 It is envisaged that this work would be achieved by the careful stripping of the topsoil from the proposed road corridor, and then the recording and selective excavation of features and deposits that are revealed; given the nature of the expected features, (ie. mostly elements of field systems), the amount of detailed, open-area excavation is likely to be small. This work would effectively clear these areas of archaeological deposits, to allow for an uninterrupted construction programme.

8.15 It is also proposed to undertake Phase 2 pre-construction recording work at two of the earthwork sites affected by the scheme, namely the Gatherley Moor quarries (Site A3) and the disused quarry south-east of Sedbury Home Farm (Site A7). It is expected that this work will be limited to a photographic survey at both locations.

Phase 3 Watching brief during construction

8.16 A Phase 3 watching brief would be carried out during the initial phases of construction in the remaining areas considered to be of archaeological importance or potential. This would include the site of the Roman road to the east of Kirklands Garage (Site A6/Area S4) and in Area S8 to the west of the Melsonby Crossroads. A watching brief would also be undertaken during ground works within the existing A66 corridor in the area between The Bungalow and Scotch Corner, including along the proposed footpath between the Vintage Motel and Sedbury Lodge, to identify and record any features which might be associated with the known deposits either side of the road (Sites A9 and A8).

8.17 In view of the results of the Stage 3 works obtained to date, it is not proposed to undertake a standard watching brief along the rest of the scheme corridor, outside the areas noted above.

Phase 4 and 5 Post-excavation assessment, analysis and publication

8.18 The precise details of these works cannot at present be determined, but the work would be commensurate with the nature and scale of any discoveries made during the preceding phases.

Built Environment

8.19 Neither of the two listed buildings (Sites B1 and B3) will be directly affected by the proposals. Mitigation measures designed to off-set the adverse visual impacts for the various listed buildings and other elements of the built environment would normally be achieved through appropriate landscaping techniques, and these have been considered elsewhere in the Environmental Statement.

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TABLE 1: IMPACT OF DEVELOPMENT AND PROPOSED MITIGATION MEASURES

Site / Area no	Site name	Grade of site	Nature of impact	Scale of impact	Overall adverse impact	Proposed mitigation
Site A15	Roman road, Carkin Moor to Kirklands Garage	Regional?	Disturbance confined to removal of top surface of existing A66. Some more significance disturbance in areas of underpasses etc	Small-scale	Slight	Phase 2 trenching with further excavation as necessary
Site A14	Carkin Moor Roman fort	National (SAM)	Disturbance confined to existing road cutting and boundaries	Small-scale	Slight	Phase 2 pitting/trenching with further excavation as necessary
Site A13	Potential Roman extra-mural settlement, east of Carkin Roman fort	Regional?	Land take confined to corridor to north of existing A66 boundary, 35m wide at east end decreasing to 10m at west end	Small-scale	Moderate	Phase 2 trenching with further excavation as necessary
Site A12	Quarry pits and ridge and furrow, west of Winston crossroads	Local	Land take confined to corridor 25m wide to north of existing A66 boundary. Also new slip road onto B6274 at east end of area	Significant	Slight	None
Site A2 Area S1 Area S8	Iron Age enclosures and field system, west of Melsonby crossroads, north of A66	Regional	Land take confined to corridor 30m wide to north of existing A66 boundary	Significant	Moderate	Phase 2 pre-construction excavation and recording, and Phase 3 watching brief
Site A3	Gatherley Moor quarries, Melsonby crossroads	Local	Land take confined to 30m wide corridor to west of junction. New slip road 25m wide passes through quarries on east side of junction	Small-scale	Slight	Phase 2 pre-construction recording

TABLE 1: IMPACT OF DEVELOPMENT AND PROPOSED MITIGATION MEASURES

Site / Area no	Site name	Grade of site	Nature of impact	Scale of impact	Overall adverse impact	Proposed mitigation
Site A4 Area S2	Scots Dike, east of Melsonby crossroads	National (SAM)	Land take confined to corridor 25m wide to north of existing A66 boundary. Design solution to minimise ground disturbance	Small-scale	Slight	Phase 2 pre-construction excavation and recording
Site A6 Area S4	Roman road (course of), east of Kirklands Garage	Local	Land take confined to corridor to north of existing A66 boundary, 10m wide at west end and 25m wide at east end	Small-scale	Slight	Phase 3 watching brief
Area S6 Area S5 (part)	Iron Age/Romano-British occupation, Black Plantation	District?	Corridor of land take up to 45m wide to north of existing A66 boundary	Significant	Slight	Phase 2 pre-construction excavation and recording
Site A7	Disused quarry, south-east of Sedbury Home Farm	Local	Land take extends some 45m from north side of existing A66 boundary	Major	Moderate	Phase 2 pre-construction recording
Site A8 Area S7 (part) Area S15	Iron Age/Romano-British enclosures and field system, The Bungalow	Regional	Land take confined to corridor to north of existing A66 boundary, 25m wide at west end and decreasing to 10m wide at east end	Small-scale	Moderate	Phase 2 pre-construction excavation and recording
Site B1	Gatherley Moor Farmhouse (LB II)	Regional	Proposed works confined to new north carriageway, on north side of existing A66. New access road to be constructed around west and south of building	None	None - setting only	None
Site B2	Sedbury Hall Lodge (LB II)	Regional	Proposed works confined to new north carriageway, on north side of existing A66. New access road to be constructed around front of building	None	None - setting only	None

Note: This information contained in this table is currently being revised so that sites and areas will be rescheduled as sites only. The drawings in the final version will also be amended to the updated numbering system. Furthermore a gazetteer is being prepared on the revised numbering system, to be included as Appendix 1 in the final document.

FIGURES

LEGEND

KNOWN SITES

- Scheduled Ancient Monuments
- Areas/Sites of Archaeological Importance
- Built Heritage Sites

STAGE 3 INVESTIGATIONS

- Areas of Geophysical Survey
- Location of Trial Excavations

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PROJECT :- A66 PENRITH - MIDDLESBROUGH TRUNK ROAD
CARKIN MOOR TO SCOTCH CORNER IMPROVEMENT

DRG. TITLE :- CULTURAL HERITAGE SITES & AREAS OF STAGE 3 INVESTIGATIONS

DRAWN	PAT
CHECKED	ED
APPROVED/AUTHORISED	CM
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SCALE:-	1:5000
DATE:-	JULY 2002
CONTRACT DRAWING No	
DRAWING No :-	Figure 1A

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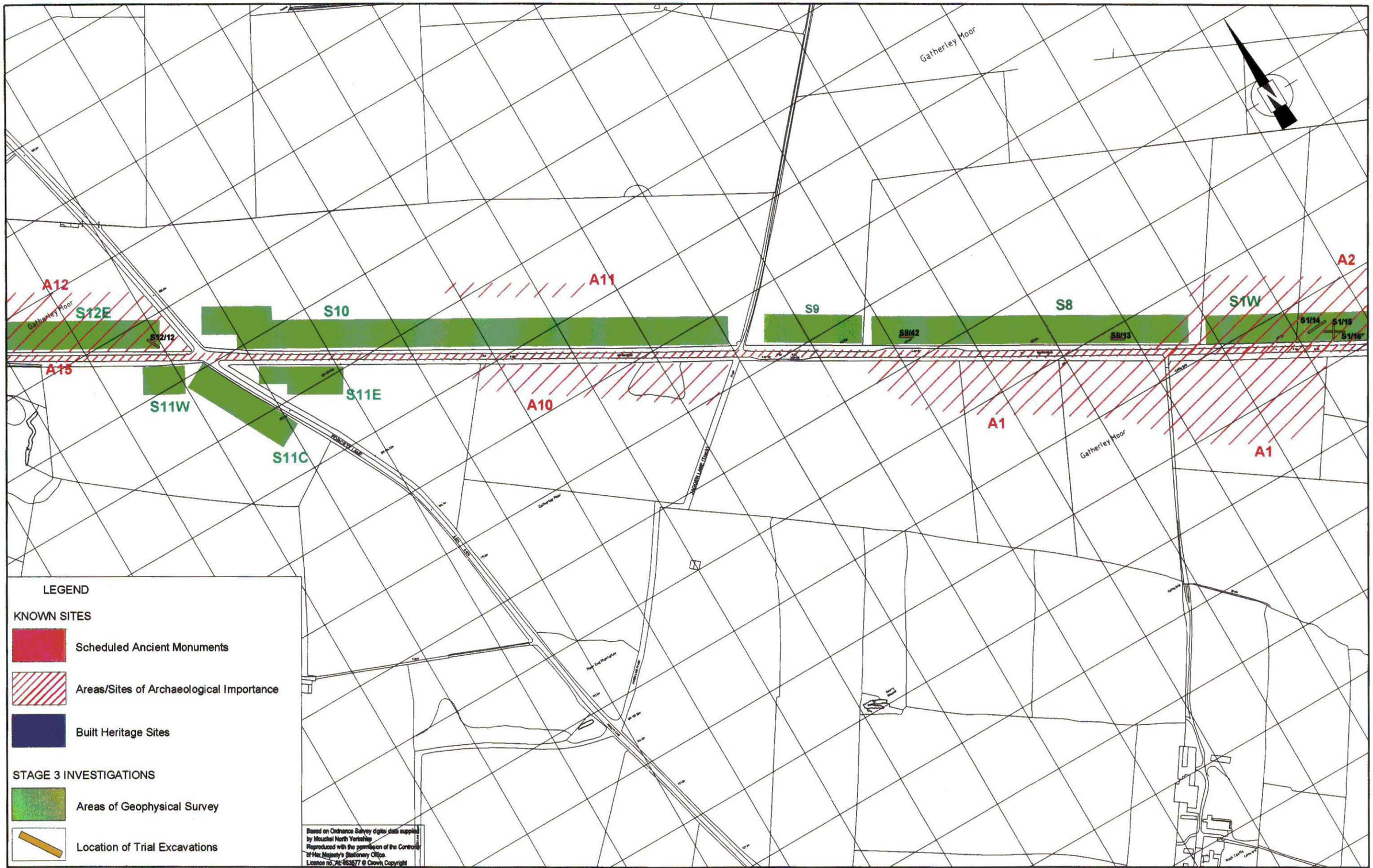

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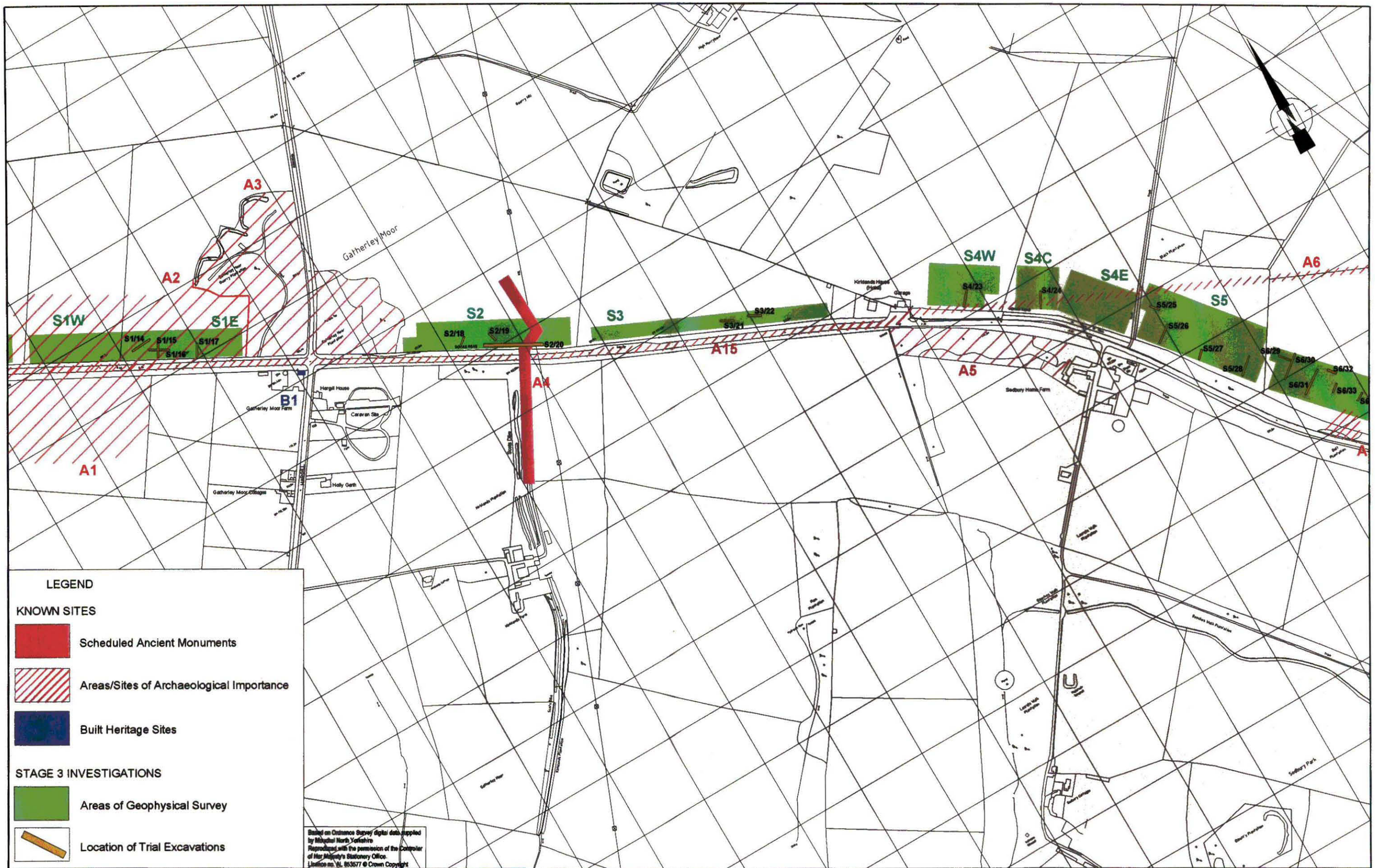

LEGEND

KNOWN SITES

- Scheduled Ancient Monuments
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- Built Heritage Sites

STAGE 3 INVESTIGATIONS

- Areas of Geophysical Survey
- Location of Trial Excavations

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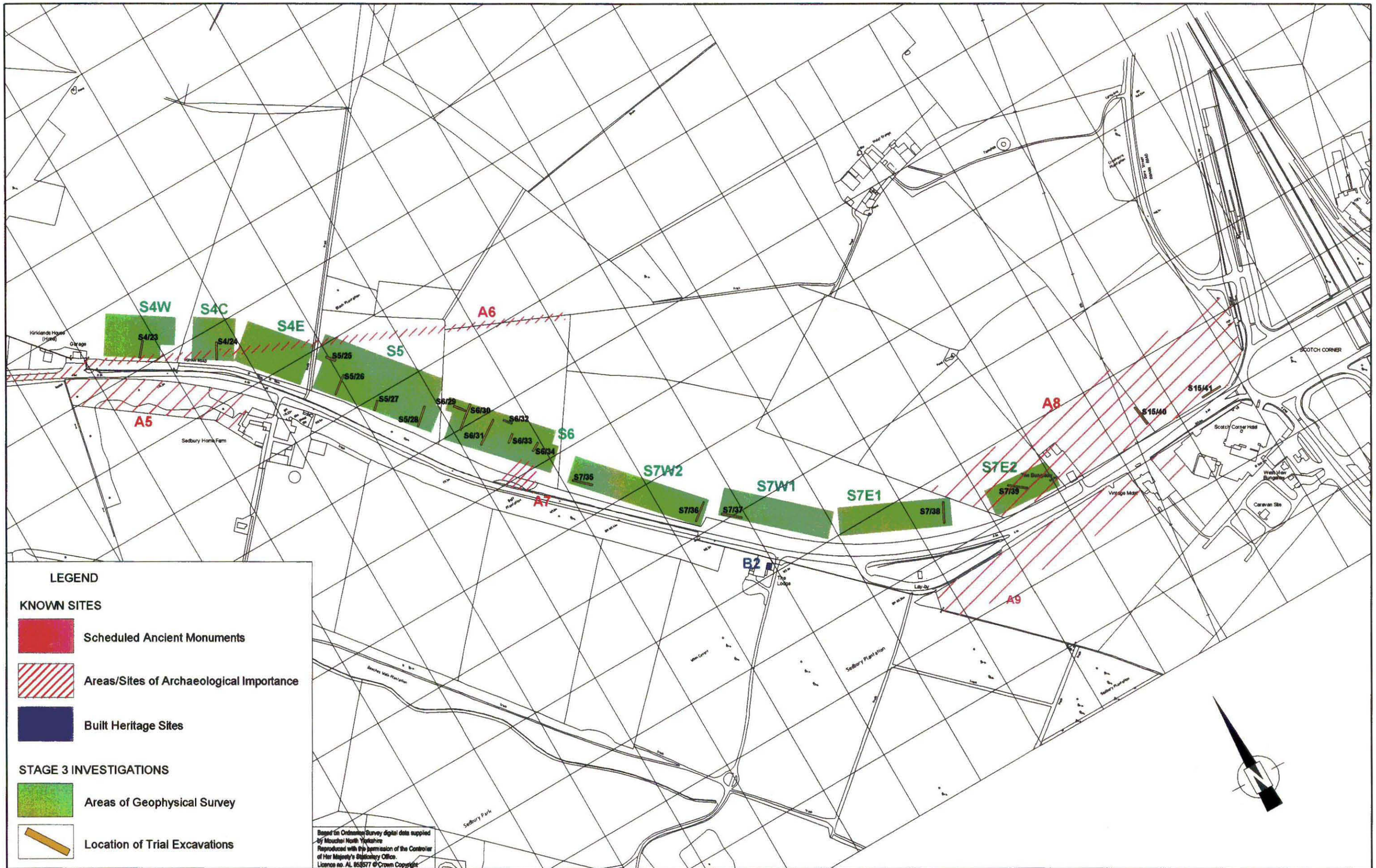

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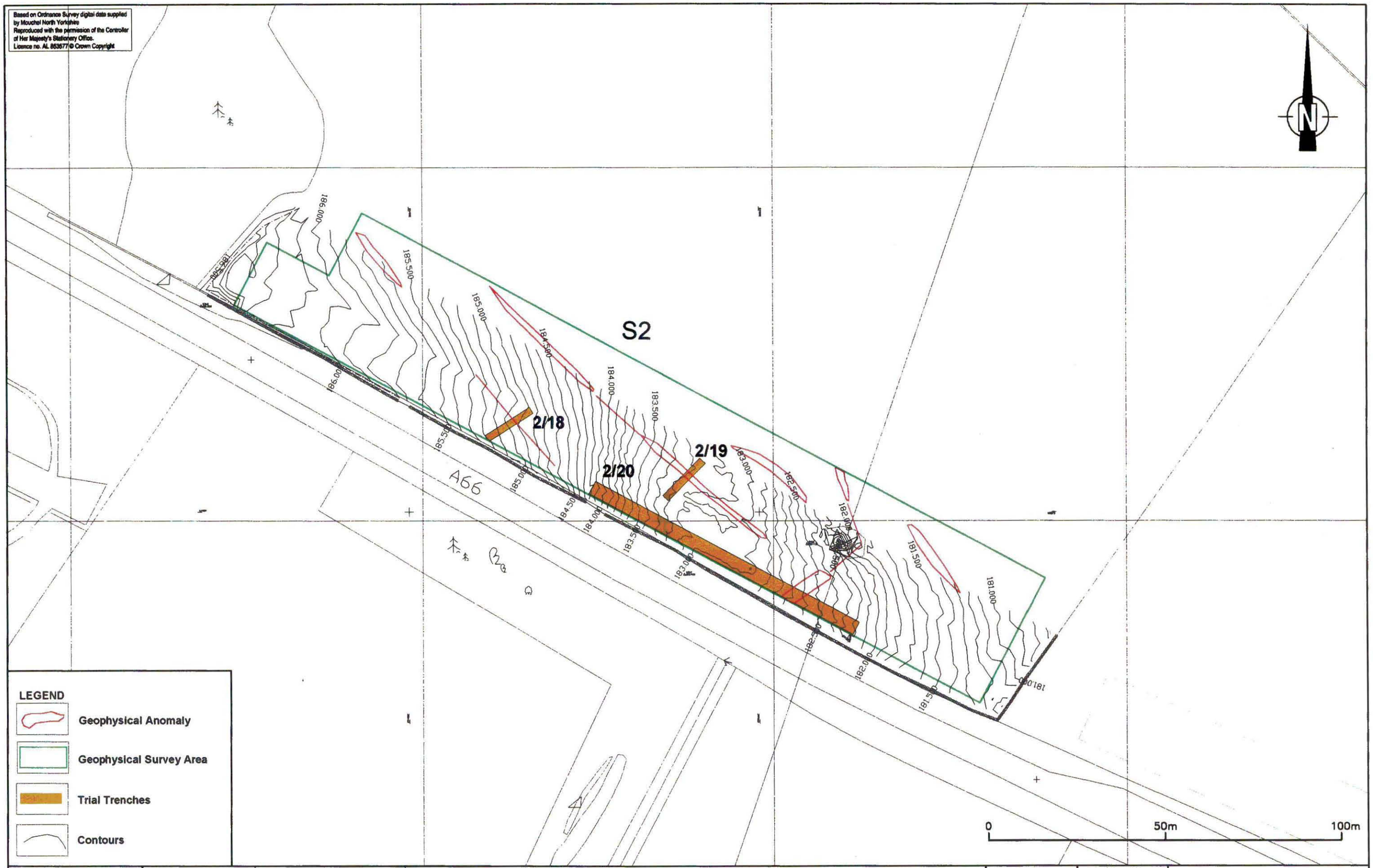

LEGEND

- Geophysical Anomaly
- Geophysical Survey Area
- Trial Trenches
- Contours

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DRG. TITLE :- STAGE 3 INVESTIGATIONS IN AREA S2 (SCOTS DYKE)

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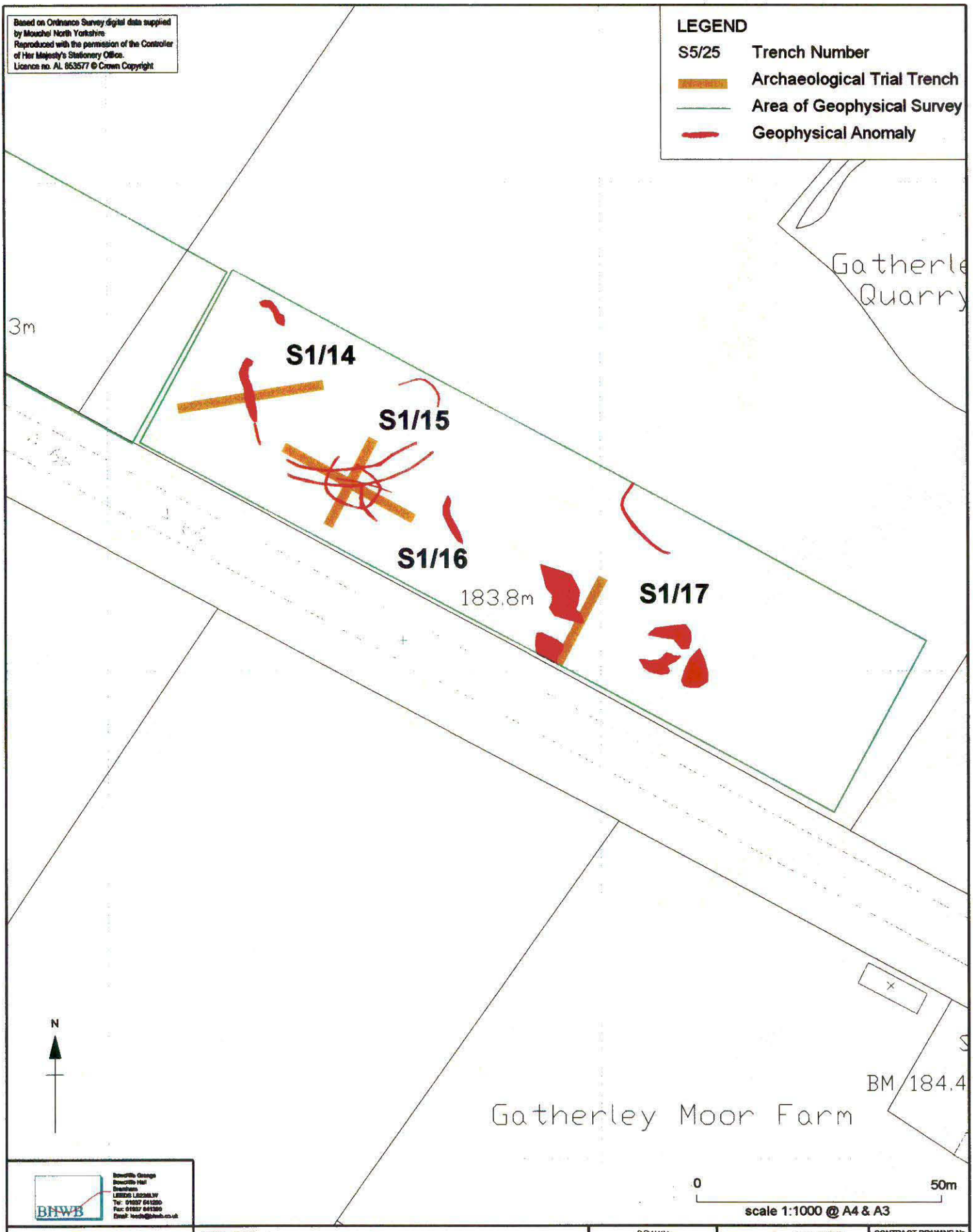

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DRG. TITLE :-
STAGE 3 INVESTIGATIONS IN AREA S1

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DRAWING No :- Figure 3

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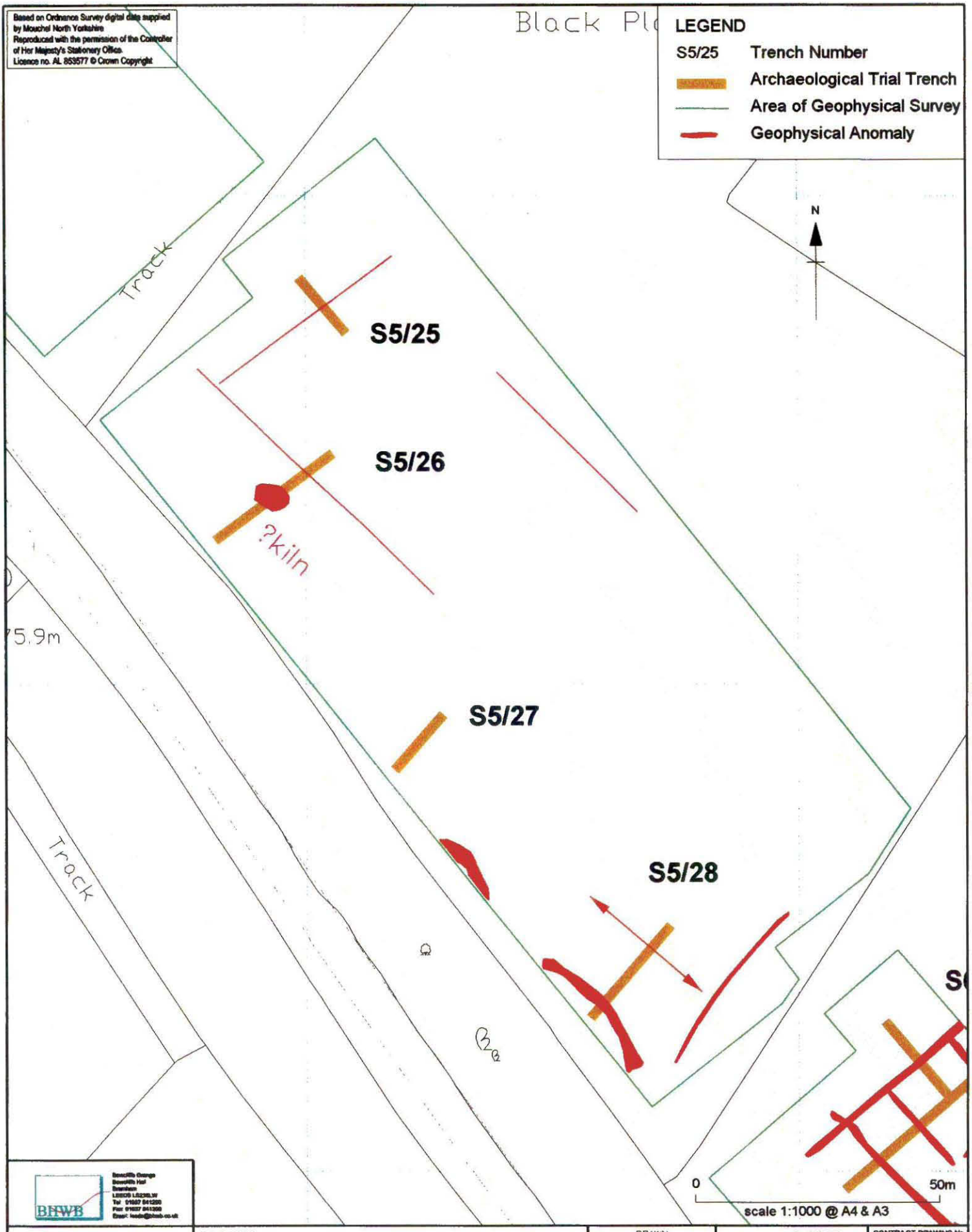

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DRG. TITLE :-
STAGE 3 INVESTIGATIONS IN AREA S5

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DATE:- JULY 2002

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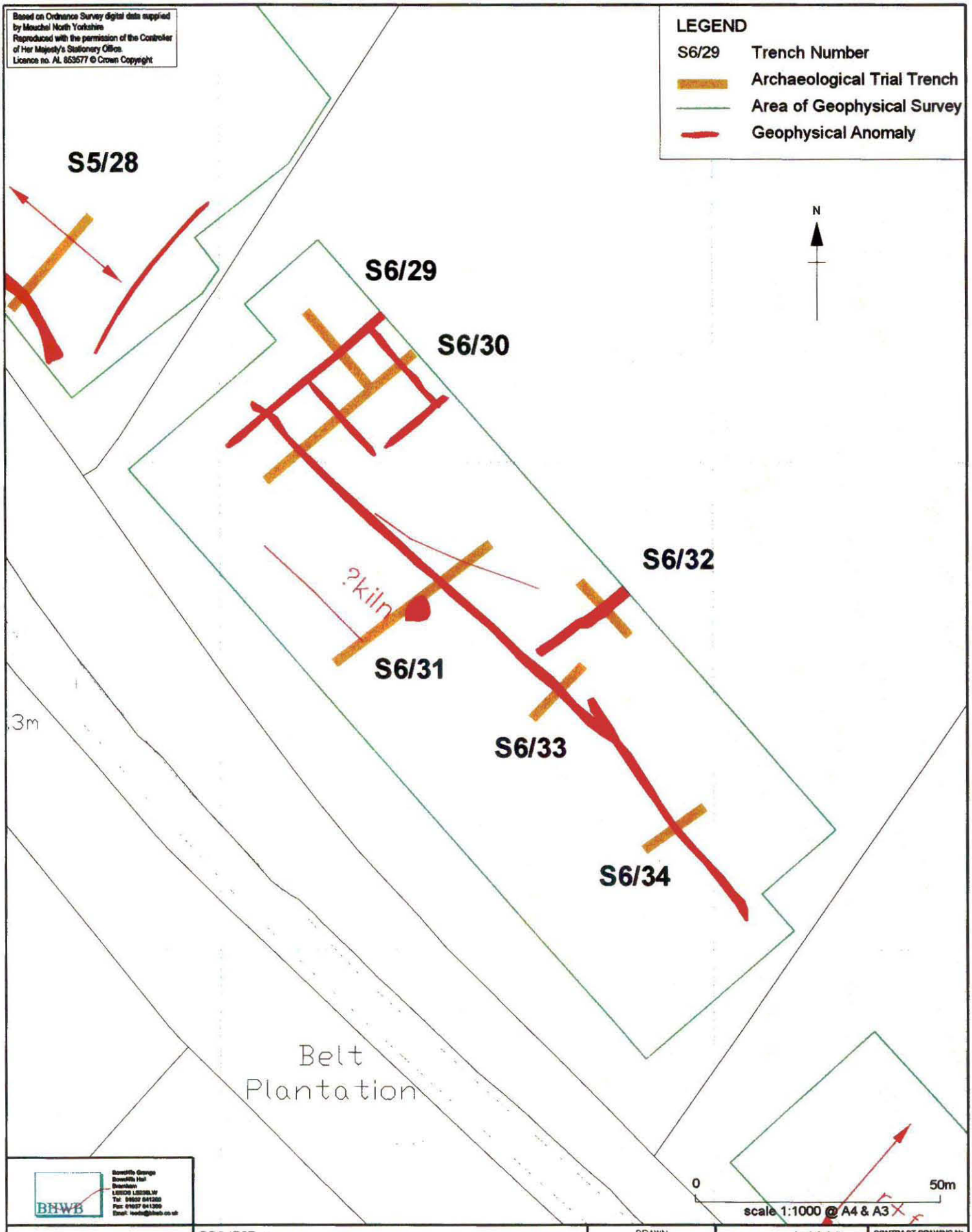

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DRG. TITLE :-
STAGE 3 INVESTIGATIONS IN AREA S6

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DATE:- JULY 2002

CONTRACT DRAWING No

DRAWING No :- Figure 5

Computer Filename : BC:\BHWB_CAD\2163_A66TRUNKROADFIGURES_3-5

Carkin Moor

Gatherley Moor

SITE A13

SITE A14

SITE A15

ROMAN FORT

ROMAN ROAD

LEGEND

Phase 1 Detailed Evaluation

Phase 2 Pre-construction Excavation and Recording

Phase 3 Watching Brief During Construction

NOTE:

SCHEME LAYOUT SHOWN DOES NOT INCLUDE LATEST MINOR CHANGES. FINAL VERSION WILL HAVE LATEST SCHEME LAYOUT.

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DRG. TITLE :- CULTURAL HERITAGE MITIGATION

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Gatherley Moor

SITE S8

SITE A2/AREA S1

SITE A15

LEGEND

- Phase 1 Detailed Evaluation
- Phase 2 Pre-construction Excavation and Recording
- Phase 3 Watching Brief During Construction

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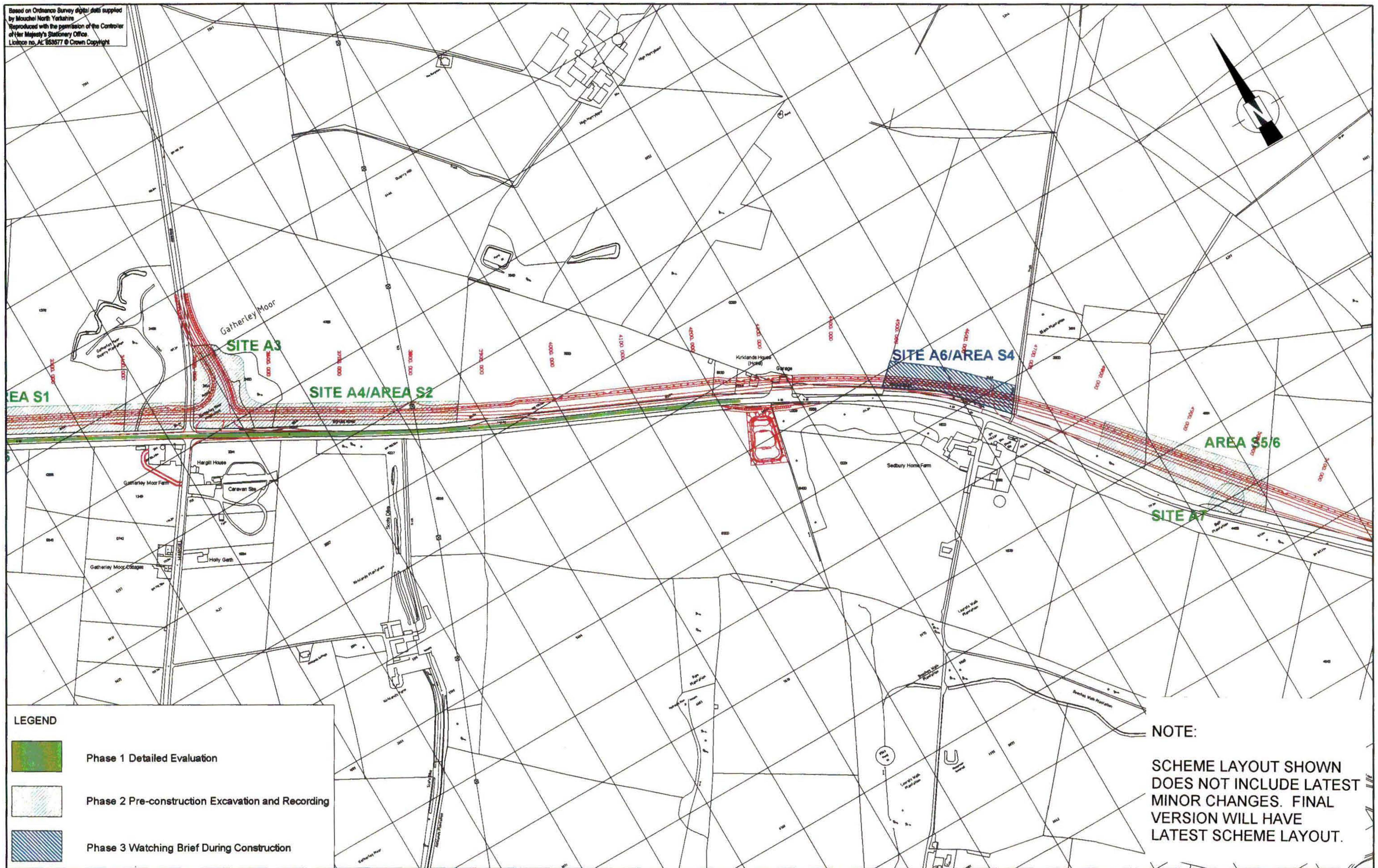

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SITE A6/AREA S4

AREA S5/6

SITE A7

AREA S7

SITE A6/AREA S15

AREA A9

SCOTCH CORNER

Sedbury Home Farm

Sedbury Plantation

LEGEND

- Phase 1 Detailed Evaluation
- Phase 2 Pre-construction Excavation and Recording
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APPROVED/AUTHORISED CM	CONTRACT DRAWING No	DRAWING No :-	Figure 6D

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