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A66

Carkin Moor

to

Scotch Corner



Environmental Statement

Volume 2 - Part 3

Cultural Heritage



**A66 CARKIN MOOR TO SCOTCH
CORNER IMPROVEMENT**

**Environmental Statement
Volume 2 Part 3 Cultural Heritage**

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Appendix 1

Catalogue of Cultural Heritage Sites

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 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), a 1998 condition survey (BHWB 1998a), and more recent research have identified a total of 16 known or suspected archaeological sites within or immediately adjacent to the proposed road improvement corridor (see Appendix 1). These sites, which are shown on figures 1a to 1d, can be summarised as follows, from west to east:

Site	Description	NGR
A1	Roman road, Carkin Moor to Kirklands Garage	NZ20100610- NZ21500555 linear
A2	Carkin Moor Roman fort and adjacent prehistoric settlement	NZ16120838 centred; NZ16050847 centred
A3	Potential Roman extra-mural settlement, east of Carkin Moor Roman fort	NZ16400820 centred
A4	Quarries, ridge and furrow and isolated ditches, west of Winston crossroads	NZ17200770- NZ17600750 linear
A5	Field boundary (cropmarks), west of Jagger Lane	NZ17800735 centred
A6	Quarry pits (sites of), west of Jagger Lane	NZ18100705 centred
A7	Iron Age settlement and field system, west of Melsonby crossroads, south of A66	NZ18900660- NZ18300690 linear
A8	Iron Age field system, west of Melsonby crossroads, north of A66	NZ19000680- NZ18600695 linear
A9	Gatherley Moor quarries, Melsonby crossroads	NZ19201670 centred
A10	Section of Scots Dike, east of Melsonby crossroads	NZ19400600 centred
A11	Ridge and furrow earthworks, west of Sedbury Home Farm	NZ20150615 centred
A12	Roman road (course of), east of Kirklands Garage	NZ20100610- NZ22150055 linear
A13	Iron Age/Romano-British occupation and field system, Black Plantation	NZ20400580 centred
A14	Disused quarry, south-east of Sedbury Home Farm	NZ20450573 centred
A15	Iron Age/Romano-British enclosures and field system, The Bungalow	NZ21300540 centred
A16	Iron Age settlement, Vintage Motel	NZ21270527 centred

- 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 (Casey & Hoffmann 1998, 144). It continued in use throughout the period of Roman occupation and became a focus for military and, to some extent, civilian settlement. It is also probable 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 in close proximity to the present A66 alignment. While many of these sites 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). Further to the west, A66 road improvements over the Stainmoor Pass in the early 1990s were also

preceded by a major archaeological recording project which investigated many sites of all periods (Vyner 2001).

- 2.3 The existing A66 between Carkin Moor and Kirklands Garage is thought to follow the alignment of the Roman road. It was therefore considered that the Carkin Moor to Scotch Corner road improvement corridor had some archaeological potential, both in terms of the Roman road itself and for as yet undiscovered prehistoric, Roman and possibly medieval sites in the vicinity. The earlier desk-top survey reports made it clear that the potential impact of the scheme could not be assessed until further information on the historic resource had been obtained.

Built Environment

- 2.4 Two listed buildings of Special Architectural or Historic Interest were identified within or immediately adjacent to the proposed road improvement corridor (see Appendix 1). These sites are shown on figures 1a to 1d, and can be summarised as follows, from west to east:

Site	Description	NGR
B1	Gatherley Moor Farmhouse (LB II) (Also known as Grenton)	NZ19180653 exact
B2	Sedbury Hall Lodge (LB II)	NZ20690541 exact

- 2.5 There are other, non-listed buildings, for example Kirklands Hotel and garage (NZ19950619) and "The Bungalow", west of Scotch Corner (NZ21120531), within the proposed road improvement corridor, but these are 20th century structures of no importance in heritage terms.

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 fieldwork 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. The final geophysical 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 Environmental Design and Planning (1998b), which took account of comments made by the County Archaeological Officer for North Yorkshire. 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 engineering 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, fences and feeding troughs. 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, 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 A2) and a possible extra-mural settlement (Site A3) lay within the proposed road corridor. In the event, no geophysical anomalies were identified. It had been planned to expand the survey to the west, but access into this area was denied.

Area S13

- 3.7 Two separate surveys were undertaken in this area, S13W in a gently sloping field of young cereal and S13E on a west-facing slope in a pasture field. 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 were 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, all 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 denuded quarry pits previously identified here (Site A4) 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 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 suggested that they were land drains. There were no indications of any features associated with the previously identified field boundary further to the north (Site A5).

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 A7 and A8) 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 survey blocks in the field to the west of the Melsonby crossroads. Area S1W measured 140m by 40m and was a young cereal crop while area S1E measured 160m by 40m and was stubble. Once again, the survey was required to identify any sub-surface remains associated with an adjacent Iron Age settlement, enclosures and field system (Sites A7 and A8), which had been largely identified from aerial photographic evidence.
- 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 2). 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 east of Gatherley Moor Plantation. 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 A10), 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 represents the course of Scots Dike (see figure 3). 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 field of oil seed rape 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 A12) 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 had 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 positive linear 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 measuring 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, likely to be soil-filled ditches, were identified, some in the north-west corner forming an enclosure measuring c.22m by c.17m (see figure 5). Another possible kiln structure was also identified on the south side of a prominent north-west/south-east 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 A15) to the north and north-east of "The Bungalow". There may also be a connection with another site identified just to the south-east (Abramson 1995; Site A16). Although the disused and grassed-over quarry (Site A14) 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 north-east and east (Site A15) 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 (BHWP 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 A9) and a disused quarry to the south-east of Sedbury Home Farm (Site A14). These surveys will be carried out at a later date, in advance of any construction or development (see Chapter 8 below). The area of ridge and furrow at Sedbury Home Farm (Site A11) was withdrawn from the survey programme, following a re-alignment of the proposals.
- 4.2 It was also recommended that the area of Scots Dike (Site A10) on the north side of the A66 be surveyed, to identify any variations in topography which might be associated with the ploughed-down remains of the earthwork bank and ditch.

Scots Dike Survey

- 4.3 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 240m by 40m 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.
- 4.4 The results of the survey are shown in figure 3. The survey showed that the ground surface rose gradually from 181m AOD in the south-east to 186.5m AOD in the north-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).

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, within which a total of 35 trenches were dug (see figures 1a to 1d). The total area of excavation amounted to 1,950sqm. 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. The final report on the excavations 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.
- 5.4 Where appropriate, more specific objectives relating to individual sites are described below.

Methodology

- 5.5 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 geophysical anomalies and to assess areas seen as being representative of each major component of each site. As one of the areas (S2) coincided with a Scheduled Ancient Monument (Scots Dike; SAM 26946; Site A10), 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).

- 5.6 Topsoil was removed from each trench by tracked excavator under direct archaeological supervision, down to the top of the archaeological features and/or deposits or the natural sub-soil. Any archaeological features thus exposed were cleaned and recorded in plan, and selected features were partially excavated by hand; excavation and recording was undertaken in sufficient detail to achieve the aims of the evaluation exercise. In many cases an additional sondage was excavated to confirm the presence of natural deposits. 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

- 5.7 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

- 5.8 One trench (S12/9) measuring 15m by 2m was excavated to assess the positive geophysical anomalies identified near the A66 in 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.
- 5.9 Two trenches were excavated in the central part of Area S12, 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 excavation revealed several north-south field drains, another non-archaeological ditch, and, in the area of the presumed pit, a truncated linear feature and a shallow sub-circular feature with a U-shaped base filled with burnt material including fired daub; unfortunately there were no finds to assist with the interpretation of these features.
- 5.10 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.
- 5.11 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

- 5.12 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.

- 5.13 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

- 5.14 A total of four trenches were excavated in Area S1E, mostly to assess the complex of positive curvilinear anomalies which were thought to represent elements of an Iron Age/Romano-British settlement (see figure 2). 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.
- 5.15 Two other intersecting trenches crossed 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 from the excavations.
- 5.16 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

- 5.17 Three trenches were planned in Area S2 (see figure 3). One (trench S2/20) measured 85m long by 4m wide and was designed to cut across the Scots Dike. 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.
- 5.18 A rock-cut ditch 4m wide was revealed by the trench, on the alignment predicted by the geophysical survey. Under the terms of the Scheduled Monument Consent, excavations were limited to a depth of 0.5m, 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.

- 5.19 Two other trenches (S2/18 and S2/19), both 15m long by 2m wide, were dug to the north and west, to intersect 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.

Area S3

- 5.20 The two weak, positive linear geophysical anomalies identified in 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 evident.

Area S4

- 5.21 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), both 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 in this area.

Area S5

- 5.22 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.
- 5.23 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

- 5.24 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 c.17m, 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.

- 5.25 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 investigated by two trenches (S6/29 - 20m by 2m and S6/30 - 40m by 2m) forming a T-shape which cut through several of the presumed ditches and extending 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 seen in the area.
- 5.26 No archaeological deposits 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

- 5.27 Five trenches were dug to assess this large area, 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 further 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".
- 5.28 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.
- 5.29 However, trench S7/39, located nearest to "The Bungalow", was productive. Towards its south end there was 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

- 5.30 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 A15). As a result, one 30m long by 2m wide trench was 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.
- 5.31 Once again, these trenches were productive. Trench S15/40 contained two east-west linear features at its 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 feature 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.
- 5.32 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 will have less archaeological impact than originally thought.
- 6.2 Four main areas of interest were evident from the Stage 3 fieldwork, and three of these relate to known and partly excavated Iron Age and Romano-British sites.

Area S1: Melsonby Crossroads (Site A8)

- 6.3 The second known occupation site is situated some 5km to the north-west of Scotch Corner, at Rock Castle (Fitts *et al* 1994). Although this site lies beyond the limits of the scheme, the results obtained from trenches S8/42, S1/14, S1/15 and S1/16 suggest an association with this site. The amount of material from the A66 trenches is proportionally much smaller than that obtained from The Bungalow site, and this may reflect the fact that the main focus of occupation at Rock Castle lies further away. Nevertheless, the features found in the trenches 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. The A66 trenches showed that there was no indication of any settlement activity within the proposed road corridor, although further evidence may lie just outside the survey area.

Area S2: Scots Dike (Site A10)

- 6.4 Another area of importance was located during excavation in the vicinity of the Scots Dike (trench S2/20). Despite the limited possibilities for excavation on the scheduled monument itself, the dimensions of the rock-cut ditch have been established, whilst a potentially contemporary perpendicular linear feature has also been explored. A further 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.

Areas S5 and S6: Black Plantation (Site A13)

- 6.5 The geophysical evidence suggested the presence of a significant settlement complex near Black Plantation, but the trial trenches established

that many of the anomalies were modern drains. 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. The area of the 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.

Areas S7E2 and S15: The Bungalow (Site A15)

- 6.6 The results from this site appear to provide a plausible link between the excavated settlement to the south of the A66 (Abramson 1995; Site A16) and the surveyed field system to the north around Violet Grange Farm (Casey *et al* 1995). 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, and one of the circular features seen in trench S7/39 could be interpreted as part of a dwelling. The Vintage Motel excavations 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. The recovery of both Iron Age and Romano-British pottery from the A66 trenches in this area reinforces the interpretation of this being a site which demonstrates continuity from the pre-Roman to Roman periods.

Other Sites

- 6.7 In addition to these four main sites, 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 trenches S12/10 and S13/8).
- 6.8 Due to the nature and circumstances of the evaluation work, and Health and Safety considerations, it was not possible to assess the condition of any Roman road surfaces that might underlie the existing A66 (Site A1). However, it should be noted that recent work in similar situations (eg. Mudd 1998; Vyner 2001) has shown that well-preserved Roman surfaces can survive, and the possibility of similar deposits below the existing road 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, accommodation works, 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.

The Development Proposals

Scheme description

7.4 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 lay-by 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, and a weighbridge facility would be constructed nearby;
- three new balancing ponds would be provided to regulate discharge into existing watercourses, two on the south side of the A66, to the west of Warrener Lane and opposite Kirklands Garage, and one to the north of the A66 in the area currently occupied by "The Bungalow" and its related outbuildings.

Modifications to the proposed construction corridor

7.5 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.

7.6 At Scots Dike (Site A10), the width of the proposed central reserve and adjacent verges were reduced as much as possible so as to minimise land take in the area of the scheduled ancient monument. The method of construction was also amended to encompass a raft foundation, so as to

reduce disturbance to underlying archaeological deposits. The corridor of land take is currently c.25m wide.

- 7.7 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 A15).
- 7.8 Other design alterations and/or corridor re-alignments due to constructional and engineering factors have meant that three sites identified by the previous surveys are no longer affected by the scheme; these sites are Site A5 (field boundary west of Jagger Lane), Site A6 (quarry pits (sites of), west of Jagger Lane) and Site A11 (ridge and furrow earthworks west of Sedbury Home Farm). Any disturbance to Site A16 (Iron Age settlement at The Vintage Motel) will now be confined within the existing carriageway boundary, where an access road will be built. The majority of Site A7 (Iron Age settlement and field system, west of Melsonby crossroads and south of A66) will also not be affected by the scheme, although there may be some peripheral impact due to the construction of an underpass.

Impact of Development

- 7.9 When making an initial assessment of the impact of the proposed scheme on the known sites of cultural heritage interest, all construction works as currently proposed have been taken into account.

Grading systems

- 7.10 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.
- 7.11 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. It should also be noted that the grades of importance may alter (either up or down) as new information is gathered on each site.
- 7.12 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.

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7.13 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 c.75% of the area of known or estimated archaeological deposits).

Significant impact: Significant disturbance (ie. between c.25% and c.75% of the area of known or estimated archaeological deposits).

Small-scale impact: Minor disturbance (ie. less than c.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.

7.14 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

7.15 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 twelve archaeological sites will be affected by the current scheme, as follows:

Site	Description	Importance
A1	Roman road, Carkin Moor to Kirklands Garage	Regional?
A2	Carkin Moor Roman fort and adjacent prehistoric settlement	National
A3	Potential Roman extra-mural settlement, east of Carkin Moor Roman fort	Regional?
A4	Quarries, ridge and furrow and isolated ditches, west of Winston crossroads	Local
A7	Iron Age settlement and field system, west of Melsonby crossroads, south of A66	Regional
A8	Iron Age field system, west of Melsonby crossroads, north of A66	District
A9	Gatherley Moor quarries, Melsonby crossroads	District
A10	Section of Scots Dike, east of Melsonby crossroads	National
A12	Roman road (course of), east of Kirklands Garage	Regional
A13	Iron Age/Romano-British occupation and field system, Black Plantation	District
A14	Disused quarry, south-east of Sedbury Home Farm	Local
A15	Iron Age/Romano-British enclosures and field system, The Bungalow	Regional

- 7.16 It should be stressed that the various non-intrusive survey areas were defined by the proposed construction corridor and the identified sites are likely to extend beyond this.
- 7.17 The Stage 3 surveys carried out to date have been able to confirm that geophysical anomalies identified in survey Areas S13W, S12W, S12E, S8 and S3 were not archaeological in origin, while the section of the Roman road at Kirklands Garage (Site A12) within the proposed new road corridor has been largely destroyed by agricultural activity.
- 7.18 The impact of the proposed scheme on the identified archaeological sites and areas can be summarised as follows, from west to east. Full details can be found in Table 1.
- 7.19 At the extreme west end of the scheme, the proposed new carriageway will pass through an area which could be occupied by an extra-mural Roman settlement (Site A3) associated with the adjacent fort. On the north side of the A66, the proposed road corridor reduces from 30m wide at the east end (Warrener Lane North) to 10m at the west end. On the south side of the A66, the construction of a new balancing pond and access track will require a land take of c.200m by c.50m. Not all these areas were able to be investigated by the Stage 3 works, and so the full archaeological potential of this site could not be assessed. The impact is therefore provisionally considered to be significant.
- 7.20 All works within the area of the nationally important Carkin Moor Roman fort (Site A2) are confined to the existing deep road cutting, apart from the repositioning of fence lines. However, the regrading of the cutting sides could have a small-scale impact, and it should be noted that the road cutting is specifically excluded from the area of the scheduled monument.
- 7.21 A significant impact will occur on the locally important remains of quarry pits, ridge and furrow and isolated ditches to the west of Winston crossroads (Site A4), where the 30m wide corridor and the construction of a new slip road and underpass will pass through the site.
- 7.22 To the west of Melsonby crossroads, the new road corridor on the north side of the A66 is proposed to be between 30m-40m wide and this, as well as the construction of a new underpass, will have a significant impact on the presumed Iron Age field system identified here (Site A8). However, there was no indication of any settlement activity within the area of the proposed new corridor, and for this reason the site has been graded as being of District importance. On the south side of the A66, the construction of the new underpass and associated access road may well affect the periphery of another Iron Age settlement complex (Site A7); this area has not yet been assessed, but a small-scale impact is predicted.
- 7.23 There will also be a small-scale impact on the Gatherley Moor Quarry (Site A9). The main area of workings and the ruined building on the west side of Moor Lane will not be directly affected by the scheme, while on the east side of the lane, a new slip road will pass over mostly infilled and less impressive workings.

- 7.24 The nationally important monument of Scots Dike (Site A10) will 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 new 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.
- 7.25 Small-scale impacts will also occur on the course of the Roman road just to the east of Kirklands Garage (Site A12). The Stage 3 investigations have established that the section of Roman road within the new construction corridor has been largely destroyed, although it is likely that well preserved deposits remain in agricultural land beyond the limits of the scheme. For this reason, the site was given a Regional grade of importance.
- 7.26 At Black Plantation, the proposed new road corridor will require a land take of up to 45m wide to the north of the existing carriageway, and this will pass through the majority of the assessed site (Site A13). However, the absence of any definite structures or settlement activity in this area has meant that the site has been graded as being of District importance, but the impact will be significant. There will also be a major impact on the locally important earthwork remains of a small disused quarry to the south-east of Sedbury Hall Farm (Site A14).
- 7.27 There is clear archaeological potential associated with the regionally important Iron Age and Romano-British period site at "The Bungalow" (Site A15), 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. When considering the full extent of this large site, the impact is considered to be small-scale.
- 7.28 Health and Safety and other considerations meant that 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 mile stations, survive within the existing A66 road corridor as part of the Stage 3 investigations mentioned above. At present, there is some potential for archaeological remains to survive beneath the modern road, but it is understood that the proposed works for the existing carriageways will be mostly limited to the removal of the upper levels only. Disturbance to underlying deposits should therefore be minimal but some small-scale impact could occur, particularly if drainage and other similar works are involved.
- 7.29 Based on current knowledge, the twelve affected sites within the proposed road improvement corridor can be graded in terms of importance as being National (two sites), Regional or County (five sites), District (three sites) and Local (two sites). The scale of impact can be categorised as being Major on one site, Significant on four sites, and Small-scale on seven sites, while the overall adverse impact can be categorised as Moderate on two sites and Slight on ten 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

- 7.30 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. 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 (DOT 1994, 7/1) 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;
 - provide for excavation or recording of remains before the start of earthmoving operations;
 - provide for an archaeologist to be "on call" so that any finds during construction can be recorded.

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 (DOT 1994, 12/1) as:
- locate the route away from historic buildings or sites. Demolition of these features should be avoided 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 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 some additional geophysical survey, and a limited number of additional trial trenches and some test pitting; 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 works

- 8.11 Additional geophysical survey, followed by trial trenching if necessary, will be undertaken in the area of the potential extra-mural settlement to the east of the Carkin Moor Roman fort (Site A3), to assess the archaeological potential of this particular area. The area of the road cutting within the Roman fort itself (Site A2) 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 regrading of the embankments.
- 8.12 Other geophysical and/or trial trenching work will take place in the area around Gatherley Moor Farm, to determine whether there are any underlying archaeological deposits associated with the Iron Age settlement and field system complex (Site A7) on this side of the A66 which might be affected by the proposed access road and underpass.
- 8.13 Further trenching will take place within the curtilage of The Bungalow, in the area of the proposed balancing pond, to determine whether any deposits associated with the Iron Age/Romano-British complex (Site A15) survive undisturbed beneath the later development.
- 8.14 These additional works should not involve any disruption to existing traffic flows and, as the results may influence the scale of any subsequent work, they would be undertaken well in advance of construction. 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

- 8.15 It is proposed that Phase 2 pre-construction excavation is carried out at the three of the main sites identified by the Stage 3 investigation works, namely the Iron Age field system to the west of Melsonby crossroads (Site A8), the Iron Age and Romano-British occupation and field system at Black Plantation (Area A13), and the Iron Age and Romano-British enclosures and field system at The Bungalow (Site A15). Depending on the final method of construction used, it is expected that a similar approach will be adopted in the area of Scots Dike (Site A10).
- 8.16 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.
- 8.17 It is also proposed to undertake Phase 2 pre-construction recording work at the two earthwork sites affected by the scheme, namely the Gatherley Moor quarries (Site A9) and the disused quarry to the south-east of Sedbury Home Farm (Site A14). It is expected that this work will comprise a combination of topographical and photographic survey; the work at Gatherley Moor will cover the full extent of the quarry, so that the area to be destroyed by the scheme can be put into context.
- 8.18 Any extant field walls which will be affected by the scheme will also be subject to a Phase 2 recording programme (not shown on figures 6a to 6d). This work would comprise a Level 2 architectural survey as defined by the RCHME, involving both photographic and descriptive elements (RCHME 1996).
- 8.19 Finally, any items of street furniture, such as milestones or mileposts not previously identified by the desk-top and related surveys, should be recorded *in situ* and then removed to alternative and appropriate locations, if they are to be affected by the works.

Phase 3 Watching brief during construction

- 8.20 A Phase 3 watching brief would be carried out during the initial phases of construction in the remaining areas of the scheme considered to be of archaeological importance or potential. This would include the presumed Roman road alignment beneath the existing A66 (Sites A1 and A12), and the western part of the Melsonby site (Site A8). 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 access route 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 A15 and A16). A further watching brief would also be undertaken on the site of the proposed balancing pond opposite Kirklands Garage.

- 8.21 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

- 8.22 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

- 8.23 Neither of the two listed buildings (Sites B1 and B2) 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.

9 REFERENCES

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A66 CARKIN MOOR TO SCOTCH CORNER IMPROVEMENT – VOLUME 2 PART 3: CULTURAL HERITAGE

TABLE 1: IMPACT OF DEVELOPMENT AND PROPOSED MITIGATION MEASURES

Site	Site name	Grade of site	Nature of impact	Scale of impact	Overall adverse impact	Proposed mitigation
A1	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 3 watching brief
A2	Carkin Moor Roman fort	National (SAM)	Disturbance confined to existing road cutting and boundaries	Small-scale	Slight	Phase 1 detailed evaluation (test pits/trenching) followed by Phase 2/3 works as necessary
A3	Potential Roman extra-mural settlement, east of Carkin Moor Roman fort	Regional?	On north side of the A66, land take confined to corridor 30m wide at east end decreasing to 10m at west end. On south side of A66, new balancing pond requires land take of 200m by 50m	Significant	Moderate?	Phase 1 detailed evaluation (geophysical survey/trenching) followed by Phase 2/3 works as necessary
A4	Quarries, ridge and furrow and isolated ditches, 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
A7	Iron Age settlement and field system, west of Melsonby crossroads, south of A66	Regional	Construction of underpass and access road may affect periphery of site	Small-scale	Slight	Phase 1 detailed evaluation (geophysical survey/trenching) followed by Phase 2/3 works as necessary
A8	Iron Age field system, west of Melsonby crossroads, north of A66	District	Land take confined to corridor 30-40m wide to north of existing A66 boundary, and construction of underpass	Significant	Slight	Phase 2 pre-construction excavation and Phase 3 watching brief
A9	Gatherley Moor quarries, Melsonby crossroads	District	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

A66 CARKIN MOOR TO SCOTCH CORNER IMPROVEMENT – VOLUME 2 PART 3: CULTURAL HERITAGE

TABLE 1: IMPACT OF DEVELOPMENT AND PROPOSED MITIGATION MEASURES

Site	Site name	Grade of site	Nature of impact	Scale of impact	Overall adverse impact	Proposed mitigation
A10	Section of 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
A12	Roman road (course of), east of Kirklands Garage	Regional	Land take confined to corridor to north of existing A66 boundary, 10m wide at west end and 25m wide at east end. Stage 3 work established that site mostly destroyed within proposed corridor	Small-scale	Slight	Phase 3 watching brief
A13	Iron Age/Romano-British occupation and field system, Black Plantation	District	Proposed corridor up to 45m wide to north of existing A66 boundary	Significant	Slight	Phase 2 pre-construction excavation and recording
A14	Disused quarry, south-east of Sedbury Home Farm	Local	Proposed corridor covers whole site	Major	Slight	Phase 2 pre-construction recording
A15	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
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
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

FIGURES
