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A66 Melsonby Crossroads to Scotch Corner Improvements

Summary Of Geophysical Survey And Recommendations For Further Archaeological Investigations

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A66 MELSONBY CROSSROADS TO SCOTCH CORNER IMPROVEMENTS

SUMMARY OF GEOPHYSICAL SURVEY AND RECOMMENDATIONS FOR FURTHER ARCHAEOLOGICAL INVESTIGATIONS

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A66 MELSONBY CROSSROADS TO SCOTCH CORNER IMPROVEMENTS

SUMMARY OF GEOPHYSICAL SURVEY AND RECOMMENDATIONS FOR FURTHER ARCHAEOLOGICAL INVESTIGATIONS

EXECUTIVE SUMMARY

A programme of geophysical survey was undertaken between September and November 1998 as part of the Stage 3 archaeological field assessment work for the proposed A66 Greta Bridge to Dyson Lane Improvement Scheme. The work was carried out by GeoQuest Associates for BHWB Environmental Design & Planning, on behalf of North Yorkshire County Council and the Highways Agency.

Some 21 hectares were surveyed, to assess the various route options that were then under consideration. Geophysical anomalies suggestive of possible Iron Age/Romano-British settlement and activity were identified at Melsonby Crossroads and near Sedbury Home Farm, and additional information was gathered on previously known sites at Scotch Corner and Scots Dyke. The probable ploughed down remains of a Roman road alignment were seen near Kirklands Garage. An assessment of the varying route options suggests that at least 13 archaeological sites of varying importance will be affected to some degree by the proposals.

Additional Stage 3 investigations are now proposed so that the scale, depth, nature and date of any archaeological deposits affected by the scheme proposals can be determined. It is suggested that this work should comprise trial trenching, with some test pitting and earthwork survey, and the results would enable an appropriate mitigation strategy to be formulated.

1 INTRODUCTION

1.1 In July 1998 BHWB Environmental Design & Planning were commissioned by North Yorkshire County Council and the Highways Agency to review and update the archaeological information gathered for the above road improvement scheme. A condition survey of the various route options was also carried out (BHWB 1998a), and this led to the formulation of a programme of Stage 3 archaeological field assessment work, in line with the requirements of volume 11 of the Design Manual for Roads and Bridges (DMRB; DOT 1994).

2 PREVIOUSLY IDENTIFIED 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 eleven archaeological sites within the various road improvement corridors. Some of these sites are discussed in detail in the condition survey report, and all can be summarised from east (Scotch Corner) to west (Carkin Moor), as follows:

Site	Description	Importance	NGR	Reference
A9	Iron Age settlement, Vintage Hotel	Regional	NZ21270527 centred	NAA site 1, LP site 8
A8	Iron Age/Romano-British enclosures and field system, east of The Bungalow	Regional	NZ21300540 centred	NAA sites 2 & 2a, LP site 9
A7	Disused quarry, south-east of Sedbury Home Farm	Local	NZ20450573 centred	
A6	Roman road, east of Kirklands Garage	Regional	NZ20150605 centred	NAA site 4, LP site 11
A5	Ridge and furrow earthworks, west of Sedbury Home Farm	Local	NZ20150615 centred	NAA site 6, LP site 12
A4	Scots Dyke, east of Melsonby crossroads	National (SAM)	NZ19400600 centred	NAA site 7, LP site 13
A3	Gatherley Moor quarries, Melsonby crossroads	Local	NZ19201670 centred	NAA site 9, LP site 14
A2	Iron Age enclosures and field system, west of Melsonby crossroads	Regional	NZ19000680-NZ18600695 centred	NAA site 10b & 10d, LP site 15
A1	Iron Age settlement and field system, west of Melsonby crossroads	Regional	NZ18900660-NZ18300690 centred	NAA site 10a & 10c, LP site 16
A10	Quarry pits (site of), west of Jagger Lane	Local	NZ18100705 centred	NAA site 11
A11	Field boundary, west of Jagger Lane	District	NZ17800735 centred	NAA site 12
A12	Quarry pits and ridge and furrow, west of Winston crossroads	Local	NZ17500760 centred	NAA site 13
A13	Iron Age/Romano-British enclosures and field system, east of Carkin Roman fort	Regional	NZ16050847 centred	NAA site 16

2.2 To the west of Kirklands Garage, the existing A66 follows the alignment of the Scotch Corner to Penrith Roman road (Margary 1973, 433-446). It was therefore considered that there was a high potential for as yet undiscovered sites within the proposed road corridor.

3 SUMMARY OF GEOPHYSICAL SURVEY

INTRODUCTION

3.1 A programme of geophysical survey was commissioned as the first phase of the Stage 3 field investigations, with the aim of providing more information about any archaeological remains which might coincide with the various road improvement corridors.

3.2 The work was undertaken as two linked phases of survey, 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 work. In all, some 21 hectares were surveyed, divided between 27 separate areas; the locations of the survey areas are indicated on figure 1, while more detailed plans are provided in the geophysical survey technical report.

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

METHODOLOGY

3.4 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 were collected in 20m square grids with readings taken at 1.0m by 0.5m intervals, thus providing 800 measurements per grid.

3.5 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 conditions. 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 (Ideas 4, 5, 23, 24, 25, 47, 49 and 50/51). As one of the survey areas (S2) coincided with a Scheduled Ancient Monument (Scots Dyke), an appropriate consent was obtained from English Heritage in advance of investigation (EH ref AA/12020/5).

SUMMARY OF RESULTS (see figures 3 and 4 of geophysical survey report)

3.6 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.

3.7 In Area S1E numerous curvilinear positive magnetic anomalies were detected, representing soil-filled ditches and other features associated with ring ditches, enclosures and field boundaries. 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 the area to the west, Area S1W, and this may represent a continuation of the prehistoric field system.

3.8 The survey of Area S2, which contained part of the alignment of Scots Dyke, was hampered by the presence of a steel pylon which created a 20m diameter area of magnetic disturbance. Nevertheless, 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 corresponds to the course of Scots Dyke, a territorial boundary thought to have been constructed during the 6th-7th centuries. Several other positive linear anomalies were also detected in this area, the majority lying to the west of the dyke. These may be part of a field system, of uncertain date, which may or may not be associated with the dyke.

3.9 Two very weak linear positive anomalies were identified in Area S3, 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.

3.10 The course of the Roman road was thought to diverge from the existing A66 just to the east of Kirklands Garage, and Area S4 was surveyed to try and identify any evidence for it's alignment. Although the survey work in this area was disrupted by poor ground conditions, 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 may be a damaged prehistoric ring ditch.

3.11 Further discontinuous linear positive anomalies seen in Area S5 are also likely to be the remains of ridge and furrow, although two relatively intense curvilinear features in the south-east corner may be of more significance. One significant anomaly towards the south-west corner has a combination of both positive and negative readings, a characteristic commonly associated with a kiln structure.

3.12 Area S6 contains a complex of apparently interconnecting and overlapping positive anomalies, some in the north-west corner forming an enclosure measuring *c.*22m by 17m; these anomalies are likely to represent soil-filled ditches. Another possible kiln structure has also been identified just to the south of a prominent east-west ditch. It is probable that these features are associated with, but are perhaps separate from, a large Iron Age/Romano-British settlement and field system complex identified further to the east by aerial photography and previous geophysical survey (Casey, Howard & Wright 1995; Site A8). 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.

3.13 Given the presence of the known and large settlement complex to the east (Site A8), and another identified just to the south-east (Abramson 1995; Site A9), it was expected that the geophysical survey of Area S7 would have identified similar features to those seen in Area S6. However, the three fields which comprised this survey area had been subject to deep subsoil ploughing, and it is likely that many archaeological features will have been badly damaged; the surveys produced very smooth data, which 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.

3.14 Area S8 lay to the west of Area S1, part of which contained a complex of features probably associated with the Rock Castle Iron Age/Romano-British settlement and field system (see above). Within Area S8, 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. These features may be connected to the main site seen in Area S1E, on the north side of the A66, although the apparent lack of other anomalies might suggest otherwise. No geophysical anomalies were identified in Area S9.

3.15 The elongated survey area to the west of the Jagger Lane crossroads (Area S10) was particularly boggy at the time of the survey and part of the area could not assessed due to standing water. However, several linear anomalies were detected, but their magnetic signatures and plan form suggests that they are land drains. There was no indication of the field boundary previously identified in this area (Site A11), although it probably lies to the north of the survey area.

3.16 The only item of possible interest to be seen in Area S11 was a weak and diffuse positive anomaly (Area S11W) which might represent small-scale quarrying or a geological feature.

3.17 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. To the west, Area S12W contained some positive anomalies which might be either geological or archaeological in origin.

3.18 Further evidence of ridge and furrow cultivation, this time orientated east-west, was seen in the eastern end of Area S13E, together with an associated field boundary. Other features in Area S13W are considered to result from recent ploughing, and it is clear that there is a ferrous water pipe running along the south side of the A66 in this and the adjacent survey areas.

3.19 Nothing of archaeological significance was identified in Area S14, and it appears that any features that might be associated with the Iron Age/Romano-British enclosure and field system complex (Site A13), and Roman fort on Carkin Moor (which lies just outside the western limit of the scheme) do not extend this far east, at least on the north side of the A66.

4 IMPACTS OF THE BASE SCHEME AND VARIOUS ROUTE OPTIONS

4.1 At the time of writing, it has been determined that the base scheme together with Idea 49, which extends the base scheme to the west almost as far as the Carkin Moor Roman fort, should go forward as the preferred option. However, on-going discussion and liaison means that some parts if not all of the other options (Ideas 4, 5, 23, 24, 25, 47, and 50) may still be considered in conjunction with the base scheme, and for this reason their impacts are also given here.

4.2 As outlined in the previous condition survey (BHWB 1998a), a simple three tier impact grading system can be 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).

4.3 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.

4.4 When discussing the impacts of the various route options and ideas, it should be noted that farm access tracks and underpasses, landscaping, off-site planting schemes, haul routes, construction compounds, temporary construction roads, or the re-routing of services have not yet been considered, unless they form part of one of the scheme ideas.

THE BASE SCHEME

4.5 In summary, the base scheme involves the construction of a second carriageway to the north of the existing A66 corridor and the upgrading of the existing corridor, from Scotch Corner in the east to just west of the Melsonby Crossroads. For the majority of the alignment, the new carriageway will lie immediately to the north of the existing road, although a short section just east of Sedbury Home Farm will swing slightly further north. When making an assessment of impact, all construction works as specified on drawing R00543/054 have been taken into account.

4.6 From east (Scotch Corner) to west (Melsonby Crossroads), the impacts of the base scheme on the identified sites can be summarised as:

Site	Description	Grade	NGR	Impact of proposals
A8 S7E2	Iron Age/Romano-British enclosures and field system (geophysical anomalies), east and west of The Bungalow	R	NZ21300540 centred	Small-scale. Land take extends to a maximum of 20m to the north of the existing road boundary, which appears to pass through the least sensitive part of the site
A7	Disused quarry, south-east of Sedbury Home Farm	L	NZ20450573 centred	Significant. Most of the site will be levelled and buried under the new alignment
S5 S6	Enclosure, field system and kilns (geophysical anomalies), south of Black Plantation	R	NZ20330590-NZ20420575 centred	Significant. Land take extends some 30m-40m north of existing road boundary, and will pass through the kilns and immediately adjacent to the south side of the enclosure
A6 S4	Roman road and associated features, east of Kirklands Garage	R	NZ20150605 centred	Small-scale. The new alignment will coincide with the presumed Roman road for *c*.200m
S3	Field boundaries (geophysical anomalies), west of Kirklands Garage	L	NZ19720630 centred	Small-scale. Land take extends to some 15m north of existing road boundary
A4 S2	Scots Dyke and associated features (geophysical anomalies), east of Melsonby crossroads	SAM	NZ19400600 centred	Small-scale. Land take extends to 20m north of existing road boundary. Only some of the ditches will be affected, and a section of the SAM
A3	Gatherley Moor quarries, Melsonby crossroads	L	NZ19201670 centred	Small-scale. Works encroach into quarry area by some 25m, resulting in the levelling of some earthworks. The majority of the site will remain unaffected
A2 S1E	Iron Age enclosures and field system (geophysical anomalies), west of Melsonby crossroads	R	NZ19100665 centred	Small-scale. Land take extending to 20m at the east end of the area. The main concentration of geophysical anomalies are likely to be avoided

4.7 As the proposed construction works are confined to, or north of, the existing carriageway, Sites A1 (Iron age settlement and field system, west of Melsonby Crossroads), A5 (ridge and furrow west of Sedbury Home Farm), and A9 (Iron Age settlement, Vintage Hotel) will not be affected by the base scheme.

4.8 As can be seen from the above table, most of the identified impacts are small scale in nature, and result from land take to the north of the existing carriageway. Impacts would obviously be minimised if the amount of land take was able to be reduced. Of greatest potential is the impact on the nationally important Scots Dyke (Site A4), the enclosure and kiln complex to the south of Black Planation (Site S5/6), and the previously identified Iron Age/Romano-British site to the east of The Bungalow (Site A8). When considering the latter, it should be noted that the previous geophysical survey (Casey, Howard & Wright 1995) did not extend right up to the field boundaries, and there are likely to be as yet unassessed features within these gaps. In addition, Scots Dike is a Scheduled Ancient Monument, and so permission for any ground disturbance including archaeological evaluation would need to be obtained from the Secretary of State in advance of any work.

4.9 It should also be noted that, in addition to the identified sites, there is considerable potential for as yet unrecorded prehistoric and Roman remains within the proposed road improvement corridor, particularly within the existing wide grass verge between Sedbury Home Farm and Scotch Corner.

IDEA 49

4.10 Idea 49 extends the base scheme westwards, from Melsonby Crossroads to a point 220m to the west of Carkin Moor junction. For the majority of the alignment, the new carriageway will lie immediately to the north of the existing road. When making an assessment of impact, all construction works as specified on drawings R00543/121 and R00543/122 have been taken into account.

4.11 As well as those impacts arising from the base scheme (see above), several new impacts can be seen to result from Idea 49. From east (Melsonby Crossroads) to west (Carkin Moor) they can be summarised as follows:

Site	Description	Grade	NGR	Impact of proposals
S1W	Field boundaries (geophysical anomalies), west of Melsonby Crossroads	L	NZ18950670 centred	Small-scale. Land take extending up to 30m north of existing road boundary
S8	Quarry pits and ditches (geophysical anomalies), east of Jagger Lane	L	NZ18720685 centred	Significant. Land take extends to some 20m north of existing road boundary. The ditches should be avoided
A12 S12E	Quarry pits and ridge and furrow, west of Winston crossroads	L	NZ17500760 centred	Small-scale. Land take extends to some 20m north of existing road boundary. No impact on quarry earthworks
S12C	Ridge and furrow, field boundaries and pit (geophysical anomalies), west of Winston crossroads	L	NZ17250770 centred	Small-scale. Land take extends to some 20m north of existing road boundary. Pit will be effected
S13E	Ridge and furrow and field boundary (geophysical anomalies), east of Carkin Moor Junction	L	NZ16900790 centred	Small-scale. Land take extends to some 20m north of existing road boundary
A13 S14	Iron Age/Romano-British enclosures and field system, east of Carkin Roman fort	R	NZ16050847 centred	No features visible on geophysical survey; no impact? Land take extends to some 10m north of existing road boundary

4.12 In addition to the above, there also appears to be a slightly increased land take, from 20m to 30m, on the north side of the A66 towards the west end of the base scheme; this will affect Site A2/S1W (Iron Age enclosures and field system, west of Melsonby crossroads), Site A3 (Gatherley Moor quarries), and Site A4/S2 (Scots Dyke). This results in a greater amount of disturbance to all three sites, which at Site A2/S1W means that a significant proportion of the large curvilinear geophysical anomaly will be disturbed. At Scots Dyke, almost all the geophysical anomalies identified in Area S2 will be destroyed.

4.13 As the proposed construction works are confined to, or north of, the existing carriageway, Site A10 (Site of quarry pits, west of Jagger Lane) will not be affected. Site A11 lies to the north of proposed new carriageway and so will also not be affected.

IDEAS 4, 5 AND 50

4.14 Ideas 4, 5 and 50 all extend the base scheme to the west, as far as the Winston Crossroads; Ideas 4 and 5 propose an 80m diameter roundabout at this junction while Idea 50 proposes a left/right staggered junction. When making an assessment of impact, all construction works as specified on drawings R00543/119, R00543/120 and R00543/123 have been taken into account.

4.15 These three idea options will have the same impacts as Idea 49 and the base scheme (see above), with the exception that Sites S12C, S13E and A13/S14 will no longer be affected as they lie beyond the limits of the options. In addition, the specific impacts at Winston Crossroads will be slightly changed, in that a smaller proportion of the very slight ridge and furrow earthworks (Site A12) will be affected. The design of the roundabout and the left/right junction is such that the possible quarrying activity or geological structure identified in Area S11W will not be affected by construction.

IDEA 24

4.16 Idea 24 proposes the realignment of a section of the new northern carriageway as proposed in the base scheme by some 30m to the north, from a point just to the west of Kirklands Garage to a point *c*.300m to the east, to avoid potential impact on trees. When making an assessment of impact, a draft design as shown on an unnamed 1:12500 scale plan dated September 1998 has been taken into account.

4.17 In addition to those impacts arising from the base scheme (see above), this option will significantly increase the impact on the former Roman road alignment as identified by the geophysical survey in Area S4, and on the enclosure, kiln and field system complex identified to the south of Black Plantation (Area S5/S6). In particular, the whole of the enclosure identified in Area S6 is likely to be completely destroyed.

IDEAS 25 AND 47

4.18 Idea 25 proposes creating a new layby on the north side of the new carriageway to the west of Kirklands Garage, while Idea 47 proposes a new bridleway along the north side of the new carriageway, to the west of Kirklands Garage as far as Sedbury Home Farm. When making an assessment of impact, draft designs as shown on unnamed 1:12500 scale plans dated September 1998 have been taken into account.

4.19 Both ideas will slightly increase the impact on the field boundaries identified by the geophysical survey in Area S3, while Idea 47 will also increase the impact on the former Roman road alignment and associated features identified in Area S4.

IDEA 23

4.20 Idea 23 proposes upgrading the existing A66 about Sedbury Home Farm. When making an assessment of impact, draft design works as shown on an unnamed 1:12500 scale plan dated September 1998 have been taken into account.

4.21 This option will not result in any increased impacts, as the proposed upgrading is confined to a relatively short section within the existing carriageway.

5 RECOMMENDATIONS FOR FURTHER WORK

5.1 It is recommended that the programme of archaeological field investigation is continued, through the excavation of a number of limited trial trenches and/or test pits as appropriate, and some non-intrusive earthwork survey; as noted above, this work corresponds to Stage 3 of the Department of Transport's Stages of Archaeological Assessment as defined in volume 11 of the Design Manual for Roads and Bridges (DMRB; DOT 1994). It is important to stress that this intrusive fieldwork is designed to assess the results of the geophysical surveys and to investigate those areas which were not able to be considered by the non-intrusive survey techniques.

5.2 It should be noted that the recommendations as set out below are at present only provisional, and the scale and extent of the archaeological work may well be amended or altered in light of ongoing route option discussions and decisions. Any firm recommendations or specifications for the work would also need to be agreed with the North Yorkshire County Archaeological Officer in advance of any detailed costings being obtained.

5.3 The combined results of the Stage 3 work (namely geophysical survey and trial trenching) can then be used to formulate an appropriate mitigation strategy for the proposed road improvement scheme. The precise level and nature of this work will depend on the design and construction of the approved route option, but it is likely that some pre-construction investigation (detailed excavation and recording in advance of construction of sites considered to be of significant archaeological importance and for which no appropriate mitigation measures can be sought) and/or a watching brief during construction (investigation and recording of sites not warranting prior investigation, as well as the recording of sites which may be exposed during the course of development) will be required, in addition to the standard post-excavation assessment, analysis and reporting phases.

THE BASE SCHEME

5.4 Given the potential archaeological impact of the base scheme noted above, it would be appropriate to undertake some limited trial trenching to assess the various geophysical anomalies identified within the proposed road corridor. In most cases, the trenches are 2m wide while their lengths are designed to sample specific features and a "blank" area of ground at either end of the trench.

5.5 At the east end of the scheme and to the east of The Bungalow, the projected anomalies recorded by the previous geophysical survey (Casey, Howard & Wright 1995; Site A8) could be assessed through the excavation of four 30m long trenches, positioned in the currently blank areas close to the southern field boundary. The geophysical anomaly seen in Area S7E2 to the west of The Bungalow could also be investigated by one 30m long trench positioned to intersect both ditches.

5.6 The various geophysical anomalies in the west end of Area S7W2 could be assessed by one 30m long trench, aligned parallel with the A66 so that features are intersected at right angles.

Further west, the significant features seen in the southern part of Area S6 should be investigated by two 30m long trenches aligned parallel to the A66 towards either corner of the area, together with one 15m square area positioned over the presumed kiln structure; it should be noted that the prominent enclosure feature does not lie within the proposed road corridor for the base scheme. A similar strategy should be adopted for the southern part of Area S5, with two 25m long trenches and one 15m square area excavation over the kiln; both trenches should be aligned at right-angles to the A66 so as to intersect both the ridge and furrow, the curvilinear features, and the dipolar anomalies.

5.7 The Roman road alignment identified in Areas S4W and S4C should be assessed by two 25m long trenches designed to cut the road at right-angles, while the possible field boundaries in Area S3 could be considered by one 60m long trench, parallel to the A66.

5.8 One trench 45m long and 4m wide is considered appropriate to investigate the alignment of Scots Dyke; the extra width is required to facilitate any "stepping-in" that might be required given the presumed depth of this significant and important boundary ditch while the additional length will allow for any subsidiary ditch or bank to be identified. Two other trenches 15m long and 2m wide would be sufficient to assess some of the adjacent linear anomalies, considered to be part of a field system.

5.9 The limited nature of the impact of the base scheme on the presumed Iron Age/Romano-British complex seen in Area S1E means that one trench 40m long would suffice to investigate the east end of the survey area; this should be aligned parallel to the A66.

5.10 It would also be appropriate to look at some areas within the proposed road corridor which did not contain any obvious geophysical anomalies, to test whether these areas are really devoid of archaeological features. This work would be particularly important in Areas S7E1, S7W1 and S7W2 where sub-soiling appears to have masked or removed any positive results. These areas could be accommodated by the adoption of a suitable sampling strategy, probably equivalent to the excavation of two 50m and one 30m long trenches. One 30m long trench should also be dug parallel to the A66 in the southern part of Area S4E.

5.11 In addition to the above, some of those areas which were not able to be considered by the non-intrusive survey techniques should be investigated. At the east end of the scheme, a series of *c*.2m square pits at *c*.80m intervals should be excavated within the existing wide north grass verge, adjacent to the Sedbury lay-by. These would test for the presence of any surviving archaeological deposits which might be associated with the Iron Age/Romano-British settlement complex seen to the north (Site A8) and which would be affected by the proposed corridor improvements. Although any excavations will need to carefully consider the constraints imposed by Health and Safety issues and the presence of the numerous services in the verge, it is important that a sufficient sample of ground is investigated and to some extent, the precise number and density of these pits would be influenced by the results obtained. It would also have been useful to assess some of the other roadside verges further to west, but they are either to heavily vegetated or of insufficient width to accommodate such work.

5.12 Finally, given the extent of destruction likely to occur over the small grassed-over quarry (Site A7) to the east of Sedbury Home Farm, it is considered appropriate that these earthworks are recorded in advance of their disturbance; this can be accommodated by a standard earthwork survey. It not considered necessary to survey any part of the Gatherley Moor Quarries (Site A3), although a photographic record in advance of any disturbance would be appropriate.

IDEA 49 (Extension to Romano-British)

5.13 The fact that the proposals associated with Idea 49 impact on other archaeological sites to the west of Melsonby Crossroads means that a further suite of assessment is necessary, over and above that proposed for the base scheme. As noted above, the proposed trenches aim to assess the identified geophysical anomalies, as well as a few "blank" areas.

5.14 One 20m long trench parallel to the A66 and another 30m long trench at right angles to it would be sufficient to assess any features which might survive to the west of the main Melsonby site, in Area S1W. In Area S8, one 50m long trench could sample the one of the presumed quarries which lie within the proposed road corridor.

5.15 Further to the west, the T-shaped feature seen in Area S12C should be assessed by means of a 10m square trench placed at the junction of the two ditches, while two additional 15m long trenches in either southern corner would investigate the other responses recorded in this area. In Area S12W, one trench 15m long could confirm whether the anomalies seen here are in fact geological rather than archaeological in origin, while one 20m long trench could sample the features seen towards the east end of Area S13E. Given the proximity of the Iron Age/Romano-British settlement complex and Roman fort on Carkin Moor, it would be appropriate to assess Area S14 by means of one 30m long trench placed parallel to the A66.

5.16 In addition, the increased land take in Areas S1E (Site A2) and S2 (Site A4) within the area of the base scheme means that more of these regionally important sites need to be assessed. This can be accommodated at the former site, through the excavation of a 20m by 20m area over the south-west corner of the curvilinear ditched feature to coincide with a second possible hut circle, while at the latter site two more trenches 15m long should be dug to assess some of the other ditches lying to the east and west of Scots Dyke.

5.17 It is considered that the scale and nature of the geophysical responses in Areas S10, S12E and S13W are such that investigation is not warranted at this stage.

IDEAS 4, 5 AND 50

5.18 A similar trench layout as that proposed for Idea 49 could be adopted to assess the impacts of these options, with the exception of Areas S12C, S12W, S13E and S14 which do not fall within the proposals. Given the additional impact with the junction at Winston Crossroads, it would be appropriate to excavate one 20m long trench, either in Area S11E for Idea 50 or in Area S11C for Ideas 4 and 5, to test for the presence of any as yet unidentified deposits.

IDEA 24

5.19 The increased impacts on the enclosure, kiln and field system complex identified to the south of Black Plantation (Area S5/S6) arising from this option means that additional evaluation work is required in this area, specifically within the enclosure and ditch system which would not be affected by the base scheme; this work can be accommodated through the excavation of five 15m long trenches. The increased impacts on the Roman road in Area S4 can be accommodated within those trenches already proposed under the base scheme.

IDEAS 23, 25 AND 47

5.20 The increased impacts resulting from Ideas 25 and 47 can be accommodated within those trenches already proposed under the base scheme. No additional evaluation work is required to accommodate Idea 23.

SUMMARY OF RECOMMENDATIONS

Site	Description	Grade	Impacts	Stage 3 recommendations
A8 S7E2	Iron Age/Romano-British enclosures and field system (geophysical anomalies), east and west of The Bungalow	R	Base scheme: small-scale	Base scheme: trenching and test pits
A7	Disused quarry, south-east of Sedbury Home Farm	L	Base scheme: significant	Base scheme: earthwork survey
S5 S6	Enclosure, field system and kilns (geophysical anomalies), south of Black Plantation	R	Base scheme: significant. Idea 24: significant	Base scheme: trenching. Idea 24: additional trenching
A6 S4	Roman road and associated features, east of Kirklands Garage	R	Base scheme: small-scale. Ideas 24 & 47: significant	Base scheme: trenching. Ideas 24 & 47: additional trenching
S3	Field boundaries (geophysical anomalies), west of Kirklands Garage	L	Base scheme: small-scale. Ideas 25 & 47: significant	Base scheme: trenching.
A4 S2	Scots Dyke and associated features (geophysical anomalies), east of Melsonby crossroads	SAM	Base scheme: small-scale. Ideas 4, 5, 49 & 50: significant	Base scheme: trenching. Ideas 4, 5, 49 & 50: additional trenching
A3	Gatherley Moor quarries, Melsonby crossroads	L	Base scheme: small-scale. Ideas 4, 5, 49 & 50: significant	Base scheme: none. Ideas 4, 5, 49 & 50: none
A2 S1E	Iron Age enclosures and field system (geophysical anomalies), west of Melsonby crossroads	R	Base scheme: small-scale. Ideas 4, 5, 49 & 50: significant	Base scheme: trenching. Ideas 4, 5, 49 & 50: additional trenching
S1W	Field boundaries (geophysical anomalies), west of Melsonby Crossroads	L	Ideas 4, 5, 49 & 50: small-scale	Ideas 4, 5, 49 & 50: trenching
S8	Quarry pits and ditches (geophysical anomalies), east of Jagger Lane	L	Ideas 4, 5, 49 & 50: significant	Ideas 4, 5, 49 & 50: trenching
A12 S12E	Quarry pits and ridge and furrow, west of Winston crossroads	L	Ideas 4, 5, 49 & 50: small-scale	Ideas 4, 5, 49 & 50: trenching
S12C	Ridge and furrow, field boundaries and pit (geophysical anomalies), west of Winston crossroads	L	Idea 49: small-scale	Idea 49: trenching
S13E	Ridge and furrow and field boundary (geophysical anomalies), east of Carkin Moor Junction	L	Idea 49: small-scale	Idea 49: trenching
A13 S14	Iron Age/Romano-British enclosures and field system, east of Carkin Roman fort	R	Idea 49: no impact?	Idea 49: trenching

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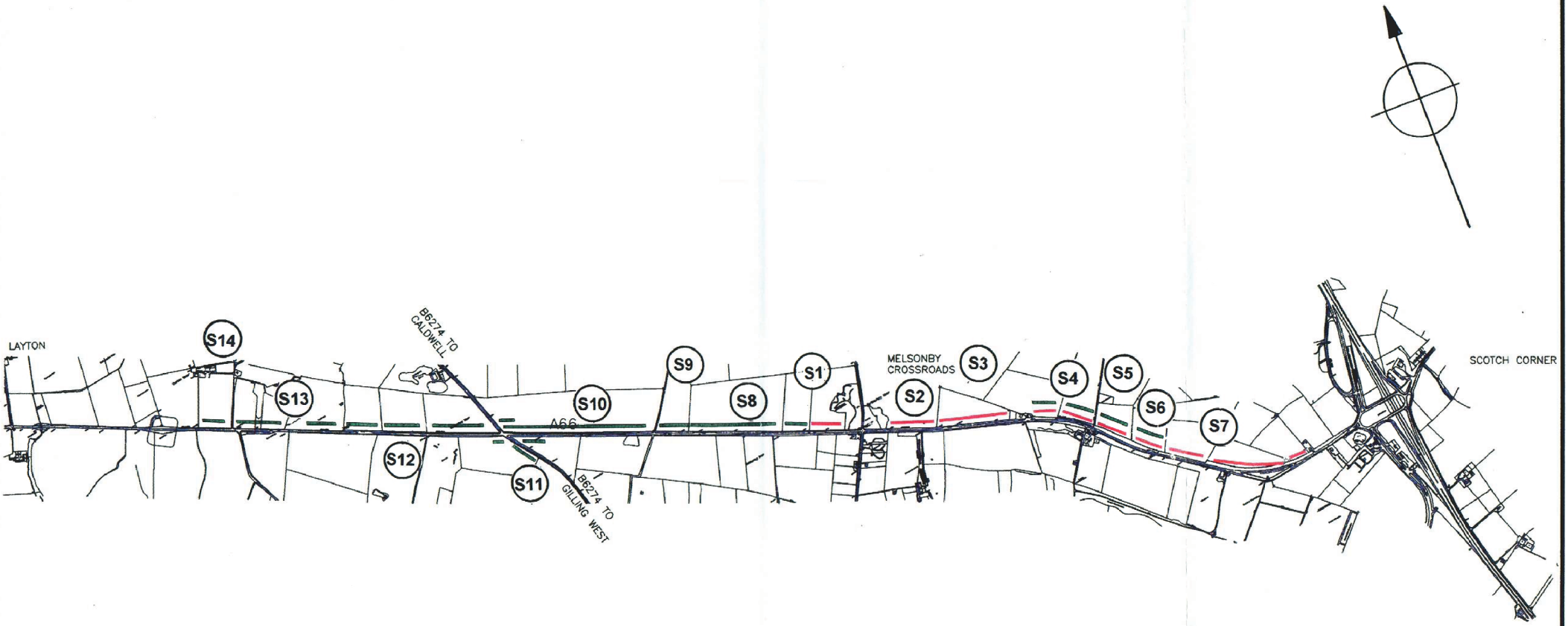

PHASE 1 GEOPHYSICAL SURVEY

PHASE 2 GEOPHYSICAL SURVEY

Project: A66 MELSONBY CROSSROAD TO SCOTCH CORNER IMPROVEMENTS

Project No. 2163

Date MAR 99

Client: HIGHWAYS AGENCY

Figure: 1

Title: LOCATION OF SURVEY AREAS
GEOPHYSICAL SURVEY

BHWB

Scale 1:20,000

0 1400