Environment Agency

Malton, Norton and Old Malton Flood Alleviation Scheme

Archaeological Evaluation Works Specification for Geophysical Survey

BWA 290007 May 2001

Babtie Group Pearl House 32 Queen Street Wakefield WF1 1LE
Tel 01924 362915 Fax 01924 367193

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Author(s) Jonathan Dempsey	Checker Dan Johnston

	Check points	Author	Checker
1	Is this a draft (D) interim (I) or final (F) report?	F	
2	Does this report fulfil its purpose? (Y or N)	Y	
3	Are conclusions/recommendations clear and acceptable? (Y or N)	Y	
4	Have drawings been approved? (Y or N)	Y	
5	Have calculations been checked? (Y or N)	N/A	
6	Have parameters been clearly recorded and correctly used? (Y or N)	N/A	
7	Have assumed parameters been clearly recorded and are they reasonable? (Y or N)	N/A	
8	Does the report appear to be factually correct? (Y or N)		
9	Is the report to a satisfactory presentational standard? (Y or N)	Y	
10	Has the report been correctly compiled? (Y or N) ■ Contents page correct and complete ■ Page and paragraph numbers correct ■ References complete ■ Appendices complete	 Y Y Y Y	

SIGNATURES AND APPROVALS

Author Date

Checker Date

Approved by Project Director Date

NOTES

1 This sheet to be filed with the report and submitted to the Project Director for approval

2 The Checker shall be a staff member with sufficient experience in the subject to be able to review the documentation properly

3 The Checker and Project Director may be the same person however the Author and Checker may not

NYS 8445

Environment Agency
Malton Norton and Old Malton Flood Alleviation Scheme
Archaeological Evaluations – Specification for Geophysical Survey

Contents

Introduction

1 1 The proposed flood alleviation scheme would have an impact on the archaeological resource of Malton Norton and Old Malton North Yorkshire This impact has been identified in an Environmental Statement prepared by Babtie Group for the Environment Agency (Babtie 2001) based on a previous desk based assessment (Babtie 1999) and Preliminary Environmental Report (Babtie 2000)

1 2 As part of the further assessment of the impact a programme of archaeological advance works (evaluation) is being undertaken to obtain further information about known or potential archaeological sites which would be affected The necessary advance works include a programme of geophysical surveys

1 3 This document provides a Specification for non destructive geophysical survey including the following elements

- gradiometer survey of 5 areas with a total area of 6 26 hectares
- resistivity survey of 1 area with a total area of 1 hectare
- ground penetrating radar (GPR) survey of 4 areas with a total overall length of 728m

1 4 The Specification defines the methodologies to be used and the areas required for investigation It requires the provision of a detailed report within 2 working weeks after completion of the on-site data gathering

Archaeological Background

2 1 The towns of Malton Old Malton and Norton lie on the banks of the River Derwent at the crossroads of two important natural routeways The Vale of Pickering and Newtown Dale The Vale of Pickering provides the main east west route from the coast to the Vale of York while Newtown Dale provides a north south route to Pickering and the north The modern town of Malton is situated on the 30m contour in the foothills of Howardian hills with Old Malton and Norton lying on the 23m contour The underlying geology of the area is post glacial sand and gravel deposits overlying and lacustrine clay with oolitic limestone underlying the higher land The land use is a mixture of residential and business with open areas of grassland

2 2 A total of 339 sites of cultural heritage interest were recorded in a study area at Malton Old Malton and Norton Of these three are Scheduled Ancient Monuments (SAMS) designated as sites of National significance one is a Grade I listed building three are Grade II* listed buildings and 114 are Grade II Listed buildings The proposed scheme will have an impact on 23 of these sites of cultural heritage significance It will have a direct impact on two SAMs Scheduled Monument Consent would be required before any works could take place at either of these sites

2 3 Known prehistoric activity in the study area ranges in date from the Mesolithic to the Iron Age Most of the known sites are find spots of ranging from flint tools to bronze weapons There are also sites associated with burial from the Neolithic to the Iron Age Other sites include a linear ditched dyke from the Bronze Age

2 4 The presence of numerous burials and artefactual finds suggests a significant level of activity in the area throughout the prehistoric period and it is likely that settlement sites were present but have either been destroyed or have not yet been discovered The only known prehistoric settlement is the late Iron Age site at Orchard Cottage in Malton which may have been destroyed just before construction of the Roman fort The full extent of this site is unknown and its significance is enhanced by the scarcity of known Roman towns with continuity of occupation from the Prehistoric period

2 5 A Roman fort was established in Malton in around AD 71 and replaced by a smaller one in about AD 79 Despite periodic partial abandonments it remained in use into the 4th century AD A civil settlement or *vicus* stood outside the south east and east sides of the fort Norton was established in the 3rd century as an industrial settlement with pottery kilns Two cemeteries lie respectively to the south and north east of the fort and roads have been identified There have also been numerous finds of Roman artefacts

2 6 Early Anglo Saxon artefacts have been found at Orchard Field The villages of Old Malton and Norton (were established during the Anglo-Saxon period and there were mills at Norton and Malton The presence of an Anglo-Saxon church at Old Malton is suggested by finds of carved stones and there was also a church at Norton

2 7 A ditch identified during excavation may represent part of an early medieval motte with its associated bailey lying within the Roman fort Malton Castle was built in the early 12th century A church was established on the present site of St Leonard s part of whose nave dates to the 12th century A Gilbertine Priory was founded in 1150 by Eustace Fitzjohn a complex of fishponds was probably associated with the priory

2 8 New Malton may have been founded in the early 12th century although there is evidence for earlier Medieval occupation The town wall was possibly built in the 13th century The River

Derwent was bridged in the 12th century at or around the present county bridge The village of Norton may have become dependent on New Malton at this time

2 9 Lord Eure s mansion was built around 1600 damaged in the civil war and finally destroyed in 1675 Other parts of the town may have been damaged in the civil war

2 10 The subsequent regeneration of the town may be linked to construction of the Derwent Navigation in the 18th century By 1724 Malton stood at the head of a navigable waterway whose economic importance increased until superseded by the railway in the 1840s A number of wharves were built along the Derwent A repairing dock marked on old maps was probably associated with the Navigation A lock was possibly built above Malton Bridge to bypass the mill here as part of an extension of the Navigation to Yedingham opened in 1813 This lock is shown on maps of 1813 and 1844 This extension was opened in 1813 Industnal sites in Malton include mills tanneries and skin yards breweries and associated malt kilns and granaries a foundry lime kilns quarries and saw pits There were also a number of sites associated with the production of bricks and tiles Many of these historic industrial buildings are located close to the river although many of them have been demolished parts of their frontages survive in the present wall

Survey Areas

3 1 **Area A (NGR SE 8003072780)**

3 1 1 Area A is located to the north east of Old Malton and is presently used as pasture for grazing This area lies between the village of Old Malton which has Anglo-Saxon origins and Site 163 a group of fishponds possibly of Medieval date The Cut (Site 58) a Post Medieval drainage channel also lies within this area No archaeological remains are visible in the survey area although the proximity to the village and the fishponds indicates a high potential for the presence of undiscovered archaeological deposits

3 1 2 A gradiometer survey is required over an area of 0 4 hectares (Figure 3)

3 2 **Area B (NGR SE 7993072960)**

3 2 1 Area B is located to the south east of Old Malton The area is used for pasture and recreation Five sites or artefactual findspots lie wholly or partially within this area These include

- Site 89 the possible site of the Saxon village
- Site 90 a findspot of Saxon awls
- Site 93 the Site of a Gilbertine Priory a Scheduled Ancient Monument
- Site 95 the site of a possible Saxon church and
- Site 336 a mill bypass and possible mill

3 2 2 Site 93 was founded in 1150 Only part of the church survives above ground and is incorporated in to the present church Excavation evidence from the 1940s suggests that buried remains associated with the priory extend further to the east The extent of the Scheduled Area around this monument is shown in Figure 4 It would therefore be necessary to obtain a licence from English Hentage This licence would be obtained by Babtie

3 2 3 A possible earlier Saxon church (Site 95) in this area is indicated by documentary sources and the presence of a Wheelhead cross fragment stone fragments carved in a pre-Norman style Documentary resources and findspots such as Site 90 may indicate the presence of a Saxon village in this area Site 336 is the site of a mill and bypass cut This mill was possible destroyed in the 1840s

3 2 4 Part of the area lies within the old course of the River Derwent as shown on cartographic sources and is therefore possibly made ground This area has also suffered disturbance from the construction of Cut (Site 58) which was constructed in 1810 and which flows through an underground culvert in this area However cartographic sources also show an island in the river and a mill (Site 336) The close proximity to Sites 89 90 95 and 336 indicates a high potential for the presence of undiscovered archaeological remains in this area

3 2 5 A resistivity and gradiometer survey of 1 hectare is required (Figure 4)

3 3 **Area C (cSE7751071630)**

3 3 1 Area C is situated to the north north east of Norton parallel to the River Derwent The landuse is rough pasture

3 3 2 Site 143 is cropmark of a possible ringditch approximately 10m in diameter No further information is known about this site although it has been suggested that it is probably part of a group on the south side of the Derwent (RCHM unpub)

3 3 3 A gradiometer survey is required over an area of 1 6 hectares (Figure 5)

3 4 Area D (cSE7832071290)

3 4 1 Area D is located to the west of Norton to the north east of Brickyard Cottages The area consists of rough scrubland This area may have to be cleared before geophysical survey can be undertaken The underlying geology is sand and gravel deposits overlying warp and lacustrine clay

3 4 2 Site 123 is located immediately to the south west of this area This site consists of the cropmarks of at least six square ditch barrows which range in length from 4 1 to 9 1m and all have internal pits or graves Three of these features are aligned east south east to west north west and the other lie east to west north to south and north east to south west

3 4 3 Site 123 indicates the high potential for the presence of undiscovered archaeological remains in the area A gradiometer survey is required over an area of 2 5 hectares (see Figure 6)

3 5 Area E (cSE7813071160)

3 5 1 Area E is located to the south south west of Area D The area consists of rough scrubland This area may have to be cleared before geophysical survey can be undertaken The underlying geology is sand and gravel deposits overlying warp and lacustrine clay

3 5 2 Site 123 is located immediately to the north east of this area on the southern side of the railway This site consists of the cropmarks of at least six square ditch barrows which range in diameter from 4 1 to 9 1m and all have internal pits or graves Three of these features are aligned east south east to west north west and the other lie east to west north to south and north east to south west

3 5 3 Site 123 indicates the high potential for the presence of undiscovered archaeological remains in the area A gradiometer survey is required over an area of **0** 76 hectares (see Figure 7)

3 6 Area F (c SE7937071660)

3 6 1 Area F is located in the area of the Sundella Drinks factory Malton Previous archaeological investigations pnor to the construction of this factory identified archaeological remains associated with the Roman vicus (Wenham and Heywood 1997) while later investigations in the area of Malton Mill (Site 242) indicate 19th century land reclamation through dumping in this area and a millrace associated with this mill (MAP undated) Geotechnical investigations in this area indicate made ground to a depth of 2 6m below present ground surface (see Appendix 1)

3 6 2 Construction of a new wall in Area F would have an impact on Site 110 (a dismantled railway) This section would also have an impact of minor significance on the Roman fort (Site 65) a Scheduled Ancient Monument It would therefore be necessary to obtain a licence from English Heritage This licence would be obtained by Babtie

3 6 3 Construction of a new wall in Area F could affect unknown remains associated with Roman and Iron Age cemeteries (Sites **6**7 and 104) and a possible Iron Age settlement (Site 124) All these sites are potentially of regional significance but insufficient evidence is available at present to determine the significance of impact

3 6 4 A ground penetrating radar survey of a transect 183m long in this area is required (Figure 9)

3 7 **Area G (c 7901071460)**

3 7 1 The proposed flood defences in this area may have an impact on unknown archaeological deposits associated with the river frontage potentially of early Post Medieval date A ground penetrating radar survey of two transects totalling 199m are required in this area (Figure 10) Geotechnical investigations in this area indicate made ground to a depth of 1 5m below present ground level (see Appendix 1) Below this to a depth of 2 7m below present ground surface is a level of clay with brick fragments While this may indicate undisturbed archaeological deposits this is unconfirmed

3 8 **Area H (c SE 7873071470)**

3 8 1 The flood defences as proposed in this area will have an impact of unknown significance on Site 335 a possible Medieval defensive ditch This site has a high potential for the presence of waterlogged archaeological deposits This section may also have an impact of unknown potential on unknown archaeological remains associated with Site 338 an early Post Medieval repairing dock Previous archaeological excavations in this area have also uncovered evidence for Medieval activity (Site 339)

3 8 2 A ground penetrating radar survey of approximately 188m is required (Figure 10) This consists of areas of hard standing and existing buildings Previous archaeological excavations in the area suggested between 1m and 2m of modern deposits above archaeology (MAP 1999) In the area of the proposed defences natural deposits were encountered between 2 0m and 4 5m (MAP 1999) increasing to 5 2m towards Railway Bridge (see Appendix 1)

3 9 **Area I (c SE 7865071510)**

3 9 1 This section will have an impact of unknown significance on Site 335 a possible Medieval defensive ditch This site has a high potential for the presence of waterlogged archaeological deposits

3 9 1 A ground penetrating radar survey of a transect 138m long is required in this area (Figure 10)

Methodology

4 1 Aims and Objectives of the Survey

4 1 1 The general aims of the geophysical survey programme are to obtain information which will contribute to an evaluation of the archaeological significance of each site or area and which will enable further evaluation and/or mitigation measures to be designed More specific aims and objectives are as follows

(i) to determine (so far as possible) the presence or absence of buried archaeological remains in any of the survey areas

(ii) to clarify the extent layout complexity and/ or depth of the buned remains within the survey areas

(iii) to provide information about the nature and possible interpretation of any geophysical anomalies identified by the survey

(iv) to identify as far as possible any parts of the survey areas which are not responsive to the chosen survey techniques and in which the application of other evaluation methods potentially including other geophysical survey techniques would be appropriate

4 2 On Site Data Collection General Requirements

4 2 1 The Contractor will be expected to provide detailed costings for all processes as specified in the following sections according to the Bill of Quantities

4 2 2 The Contractor will be expected to demonstrate that they have the expertise and facilities to undertake all of the work to the required standards in-house It is not expected that any of the work will be sub contracted

4 2 3 The Contractor will be required to demonstrate at the tender stage that all staff appointed to direct supervise and work on this project are qualified and experienced in all elements of the work which they will perform

4 2 4 Should any modern features be visible on the ground which would in the opinion of the Contractor prevent successful survey of any part of the specified area of survey the survey area shall be adjusted by the Contractor to avoid surveying such areas and a proportional reduction shall be made in the price specified under the relevant item in the Bill of Quantities

4 2 5 Any disputes which arise during the process of pricing for and/or implementing the work specified in this document must in the first case be resolved by the Employer and the Contractor If this fails the issue will be resolved by an independent archaeological expert who shall be appointed jointly by the two parties The expert will act as an arbitrator and his/her judgement will be final and binding on all parties

4 2 6 All work on site shall be undertaken strictly in compliance with the conditions of the Section 42 Licence and the Contractor shall be responsible for undertaking at their own cost any remedial works which are required in respect of any failure to comply with the license conditions

4 2 7 The methodology set out below for data collection processing and reporting may be varied by agreement prior to or during the course of the contract but should be adhered to for pricing purposes

4 3 Methodology for On Site Data Collection

4 3 1 The gradiometer and resistivity survey shall be carried out using a grid of 20m x 20m squares (the survey grid) The survey gnd shall be accurately tied in to the National Gnd **and** any relevant Local Grid established by the Client and to local features by instrument survey The survey grid shall be set out by the Contractor

4 3 2 Gradiometer survey work shall be carried out using a hand-held fluxgate gradiometer or equivalent geomagnetic sensor and an appropriate data logger Magnetic readings shall be taken every 0 25m along parallel traverses spaced a maximum of 1m apart within each 20m x 20m grid square making a total of at least 1600 readings per grid square

4 3 3 Resistivity survey work shall be carried out using appropriate twin probe equipment and data logger Resistivity readings shall be taken **at least** every 1m along parallel traverses spaced 1m apart within each 20m x 20m grid square making a total of at least 400 readings per gnd square

4 3 4 Data shall be downloaded from the data logger into a separate computer at appropriate intervals and at least daily to ensure security of the data

435 GPR survey shall be carried out in a single continuous transect as shown on the attached drawings The contractor shall advise on the suitability of a single or twin antenna system for each relevant survey area

44 Data Processing

441 The data shall be processed using appropriate software to maximise the clarity of the archaeological data including as appropriate the removal of striping or other survey artefacts random spikes drift in machine calibration and the minimising of background noise or other natural or modern features which tend to obscure archaeological anomalies The Contractor shall indicate in advance what software and methodology they would use in processing the data

45 Report

451 The Contractor shall provide verbal progress reports on request during the contract and will provide interim plots of the survey data for any areas where significant results are obtained as soon as possible and in any case within 5 working days after completion of fieldwork is that area

452 A full report on the geophysical survey will be required within three weeks of the completion of all fieldwork The report shall be prepared in accordance with any of the the requirements referred to above and any guidelines published by English Heritage and shall include as a minimum

(i) a title page which includes the name of the project the title of the report the name of the contractor and of the specific author(s) of the report identifies Babtie Group as the client and gives the date of the report and the report reference number

(ii) a summary of the results (an abstract)

(iii) a description of the background to and circumstances of the work including the nature of the development ultimate client commissioning body and Contractor

(iv) a brief descnption of the location and known archaeology of each site giving the layout and purpose of each survey area with eight figure National Grid References for at least two points which shall be clearly marked on all relevant illustrations (and if relevant Local Gnd

references for the same or another two points also shown on the illustrations) the total area of the survey and any sampling strategy employed

(v) a descnption of the techniques methodology and instrumentation used

(vi) a factual description of the nature and layout of the anomalies recorded at each site with any influences limitations or constraints on the recording and interpretation of the data

(vii) a written archaeological interpretation of the results of the survey

(viii) general and detailed location plans at appropriate scales with all survey areas accurately positioned on Irish Ordnance Survey map bases

(ix) grey scale or dot density plots of the raw unprocessed data at 1 1000 or 1 1250 scale with additional trace plots for magnetic surveys

(x) plots of all processed data illustrated as dot density grey scale a**nd** x y plots at an appropriate scale (1 500 1 1000 or 1 1250 to be agreed with the Employer in advance) with keys and north point (the scale to be used should be consistent throughout the report) accurately positioned on Ordnance Survey map bases using points recorded by instrument survey at the time of the fieldwork

(xi) detailed plots at 1 500 or larger scale of major anomalies or groups of anomalies recorded accurately positioned oriented and on map bases as above where this is required for interpretative purposes

(xii) interpretative plots of the whole of each survey area (in colour if necessary) accurately located on an Ordnance Survey base at 1 1250 scale (or 1 2500 if necessary and agreed with the Employer in advance) with keys and north points

(xiii) a copy of the interpretative plots accurately located on scheme drawings to aid the assessment of archaeological impact at an appropriate scale

(xiv) plots of the GPR data accompanied by interpretative section drawings

(xv) the report should also identify any areas which were unresponsive or less responsive to the chosen survey technique(s) together with an interpretation of the reasons for any such variations in responsiveness and any recommendations for alternative techniques

4 5 3 The Contractor should note that five comb bound copies and one unbound copy of the report will be required One disk copy of the report shall also be supplied the software format for the text and for digitally stored drawing files shall be agreed with the Employer prior to the start of survey work Digital drawings should preferably be presented in a format which enables them to be interrogated for co ordinate data

Additional Requirements

5 1 Timing of the Project

5 1 1 The geophysical survey will be required to start on a date to be agreed The final report will be complete and delivered to the Employer within two working weeks of the completion of the site work

5 1 2 The Contractor shall submit a detailed programme of works after appointment and before commencing works

5 2 Access

5 2 1 The Employer shall be responsible for all negotiations and arrangements with land owners/occupiers The Contractor shall liaise with the Employer over such arrangements before submitting his detailed programme of works

5 3 Monitoring

5 3 1 The Contractor will be subject to regular monitoring and supervision by the Employer or his representative This will ensure that the specification is being followed and that high professional standards are being maintained It will also enable the Contractor to raise any problems which arise during the course of the project

5 4 General

5 4 1 All tenders must be fully priced in accordance with this contract documentation The Bill of Quantities which must be fully priced as indicated lists those elements into which the project has been divided for pricing purposes

5 4 2 The project may attract interest from local people on the media Any enquiries from members of the public or the media shall be referred to the Employer without making any unauthorised statements or comments

5 5 Copyright

5 5 1 The Contractor shall assign copyright in any reports drawings or other documentation produced by them as part of this contract to the Employer upon written request and shall in any case grant to the Employer licence to reproduce all or part of any report drawing or other documentation produced as part of this project The Contractor shall retain the right to be identified as the author of any such reports drawings or documentation

Bill Of Quantities

6 1 Contractors should note that the Bill of Quantities is to be fully priced as indicated each page totalled and carried forward to a cumulative summary Each item shall be priced individually lump sum prices placed against sections of the Bill of Quantities shall not be considered acceptable

6 2 All rates and prices will be expressed in Pounds or parts thereof to two decimal places No unauthorised alterations shall be made to the text or pricing units

BILL OF QUANTITIES

Item	Description	Qty	Unit	Rate	£	p
1	Contingency Sum		Item			
2	Allow for all preliminary items or preparatory works bring to site maintain on site and remove from site all equipment required for the execution of the works		Item			
3	Undertake gradiometer and/ or resistivity survey in Survey Area A to E all as specified		Hectare			
4	Undertake Ground Penetrating Radar Survey in Survey Areas F to I all as specified		Hectare			
5	ETC					
	Allow for the production of interim plots six copies of a report and a disk copy of a report all as specified		Item			
				Total carried forward to Form of Tender		

Bibliography

Babtie 1999 Malton and Norton Flood Alleviation Scheme Cultural Hentage Assessment Report unpublished report prepared for the Environment Agency

Babtie 2000 Malton and Norton Flood Alleviation Scheme Preliminary Environemtal Assessment unpublished report prepared for the Environment Agency

MAP 1999 Safeway Store plc Castlegate Malton North Yorkshire – Archaeological Evaluation

Robinson JF 1978 The Archaeology of Malton And Norton

Wenham LP and Haywood B 1997 The 1968 to 1970 excavation in the Vicus at Malton North Yorkshire Leeds