A487 PORTHMADOG BYPASS,
PROPOSED ROUNDABOUT WEST OF TREMADOG

ARCHAEOLOGICAL EVALUATION (G1330)

REPORT NO. 182

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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PROPOSED ROUNDABOUT WEST OF TREMADOG

ARCHAEOLOGICAL EVALUATION (G1330)

prepared for Wyn Thomas & Partners

by D. Hopewell
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21 November 1995

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ARCHAEOLOGICAL EVALUATION

1.0 INTRODUCTION

The Welsh office is proposing to construct a by-pass around Tremadog, Porthmadog and Minfordd. The proposed route passes very close to the site of a Roman Bath-house situated just to the north of the existing A487 in Tremadog. The construction of a roundabout is proposed over a low mound called Y Bryn which is located about 100 metres from the bath-house site.

The initial archaeological assessment, carried out by Gwynedd Archaeological Trust (Report no.155 (G1285), also identified a find of horse bones at Y Bryn made during a road widening scheme in the 1860's.

The mound, Y Bryn, would have been above the level of the now drained Glaslyn estuary. The lower land was all reclaimed in the early 19th century therefore the evaluation works were concentrated on the higher land around the mound.

The only visible feature in the area was a length of drystone revetting of indeterminate age at the southern end of Y Bryn. A geophysical survey was carried out in order to ascertain if there were buried sites with no visible remains, associated with the bath-house. A programme of trial trenching was also carried out based on the location of the known sites and the results of the geophysical survey.

2.0 PROJECT DESIGN

A project design (see Appendix 3) was prepared for Wyn Thomas and Partners and agreed by Cadw and the Welsh Office Highways Directorate The aim of the evaluation was to locate and identify any archaeological sites or features within a specified area and to assess the archaeological implications of the development proposal in relation to those sites.

3.0 GEOPHYSICAL SURVEY

3.1 Geophysical survey methodology

The survey was carried out using a Geoscan Research FM36 fluxgate gradiometer. The designated areas were first assessed by preliminary scanning, without formal data logging, in order to identify anomalies and possible problems within the survey area. The areas were then surveyed in detail in 20m x 20m ($\pm$0.5%) grids. Readings were taken at 0.25m intervals with a traverse width of 1.0m giving 1600 readings per grid. The data was then transferred to computer for processing and display using the Geoplot 2.01 programme.

3.2 Geophysical survey results

Initial scanning showed that the underlying bedrock of Y Bryn contained significant amounts of natural Iron giving readings of in excess of 50 nT in places. A typical cut archaeological feature would be expected to produce a reading of $\pm$15 nT and would therefore be masked by the excessive noise from the bedrock. Negative features can however sometimes be identified when cut into a noisy substrate by virtue of their constantly lower readings. Quieter readings were obtained from the lower ground presumably as a result of a greater depth of topsoil.

Most of the field containing Y Bryn had recently been cut for silage making it ideal for survey. The northern half of the eastern margin of the field was however wet and obscured with dense growths of *Juncus spp.* making survey difficult and in places impossible.

It was decided to locate the survey grids as originally planned in the project design i.e. along the east side of Y Bryn and along the edge of the existing A487. This would give a good sample of the higher ground and investigate the quieter area around the base of Y Bryn.

Area 1

An area of 20m x 100m was surveyed along the east side of Y Bryn. The survey was carried out using unidirectional traverses to minimise slope error, using the 1.0 nT sensitivity range. The results are presented in fig. 3 as a trace plot, a grey scale plot and an interpretation diagram.

High levels of background noise were detected on the higher ground as a result of the underlying geology; no anomalies of archaeological interest were identified here.

Several faint linear anomalies of potential archaeological interest (A B and C, fig. 3) were detected at the south-east end of the survey area. This type of anomaly is best interpreted as an infilled, cut feature such as a ditch or drain.

Linear anomaly D produced higher readings with associated negative values, interpreted as magnetic dipoles formed by buried iron.

Area 2

An area of 20m x 40m was surveyed along the edge of the existing A487 using the same methods as above. Part of the easternmost grid was impassable due to dense vegetation and was therefore not surveyed.

The results are presented in fig. 4 as a trace plot, a grey scale plot and an interpretation diagram.

The higher ground was again very noisy due to the natural iron in the bedrock. No significant anomalies were detected in area 2.

4.0 EXCAVATION

4.1 Excavation methodology

Five trial trenches were excavated providing a 6% sample. The location of the trenches was based partly on the results of the geophysical survey and partly on topographical factors.

The turf and plough soil were removed by wheeled JCB and were stacked separately. The trenches were then cleaned by hand and recorded. The written and drawn records comprised either hand drawn or total station plans at appropriate scales (usually at 1:20), hand drawn sections at 1:10 and written context descriptions. The photographic records comprise 35mm format monochrome negatives and colour transparencies. Finds were located by context and environmental samples were taken where necessary. Context descriptions are included as appendix 1 and trenches can be located by reference to fig. 1.

4.2 Excavation results

Trench A (fig.5)

Trench A measured 2m x 30m and was located 6.5 m from the field wall alongside the A48, in an attempt to locate any deposits associated with the nearby Roman bath-house. No features were detected in this area by the geophysical survey.

The western end of the trench contained gritty orange subsoil. Half of a (presumably) circular feature, cut into the subsoil, impinged on the trench. Fig. 6 shows a section of the feature. which was very regular and consisted of well defined deposits of burnt clay, charcoal and possibly humus. The contexts were sieved but no evidence of date or usage were discovered. A flint core and two broken flakes, of possible later mesolithic date, were recovered during the cleaning of the western end of the trench.

The central part of the trench was disturbed by a modern linear feature, possibly associated with the construction of the road. This was cut through the subsoil and a deposit of sub rounded stones and gravel and was backfilled with the same.

The eastern third of the trench was filled with typical estuarine silty clay. A fragment of a probable neolithic flint knife was recovered from within this deposit. Its relatively unpatinated condition suggests that it may have been recently disturbed from a pit or other archaeological feature possibly by ploughing.

As there was a possibility that archaeological features had been covered by alluvial deposits regular 1m to 1.5m deep scoops were taken along the trench by the JCB. This afforded a quick look at the deeper deposits in the eastern end of the trench but unfortunately the water table was about 0.3m below ground level and further investigation was beyond the scope of this assessment. Only natural deposits were noticed during this process.

Trench B

Trench B measured 2m x 20m and was located on the slightly flattened top of Y Bryn. A thin layer of turf and topsoil was removed to reveal shattered stone and bedrock containing significant amounts of iron pyrites. There were no surviving archaeological deposits in this trench.

Trench C

Trench C measured 2m x 8.5m and extended down the lower eastern slope of Y Bryn and into the marshy area below. A linear anomaly was identified in this area during the geophysical survey.

Two field drains crossed this trench, one was stone filled and the other contained a modern pipe. A line of stone revetting was identified just beneath the turf, close to the bottom of the slope. Further inspection revealed a slight levelling in the slope to either side of the trench, indicating the line of a further 23m of revetment.

The feature detected by the geophysical survey was probably the modern field drain.

Trench D

Trench D measured 2m x 15m and was located at the bottom of the slope towards the south of Y Bryn in order to identify the anomalies detected here during the geophysical survey. The north west end of the trench contained bedrock and very stony subsoil. A 1.5m length of narrow (0.2m wide) drain lined with flat natural stones was located and excavated. The drain was 0.2m deep located on a fairly steep slope and filled with topsoil. No dating evidence was discovered and, as it is too small to be a field drain its function remains unclear.

The centre of the trench was disturbed by two intersecting modern field drains and one older stone filled drain. These were the linear anomalies identified in the geophysical survey. Two stone packed post holes were located just to the south east of the modern drains. One was found to contain the remains of a wooden post which was presumably modern as the soil was not waterlogged in this area and wood would not be expected to survive for long here. A large number of modern iron nails were recovered from around the post settings which may account for the low level iron spikes detected by the gradiometer. The lowest end of the trench was filled by grey estuarine silt.

Trench E

Trench E was excavated in order to investigate the anomalies detected at the south east end of geophysical survey area 1. The trench measured 2m x 5m. The anomalies were quickly discovered to be modern land drains cut into alluvium. Excavation was halted at this point as the land was obviously reclaimed and there was a danger of damaging the field drainage system. A flint core trimming piece of possible mesolithic date was recovered from the topsoil during the excavation of this trench.

5.0 CONCLUSIONS AND RECOMMENDATIONS

No archaeological remains associated with the Roman bath-house were located in this area. The relative abundance of flint working debris recovered from the trial trenches suggest the presence of late mesolithic or neolithic activity around Y Bryn. The fragment of neolithic knife also supports this hypothesis. There may also be extant archaeology related to the undated burnt feature in trench A.

The geophysical survey could not produce reliable data for part of the area under investigation due to the ferrous nature of the underlying bedrock. It is therefore recommended that, in view of the small sample excavated, a watching brief is maintained during the early stages of construction.

LIST OF FIGURES

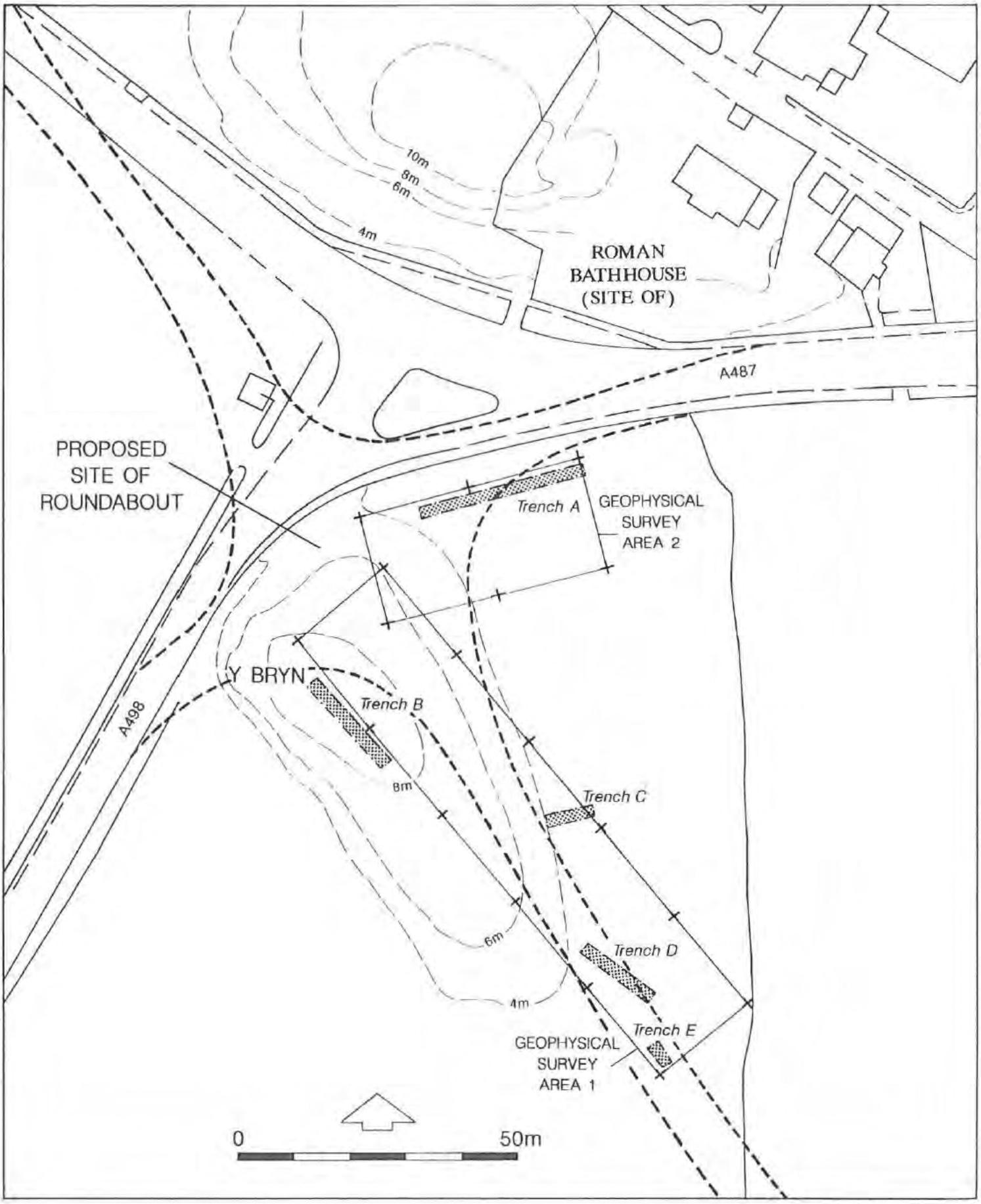


Fig. 1 Location plan.

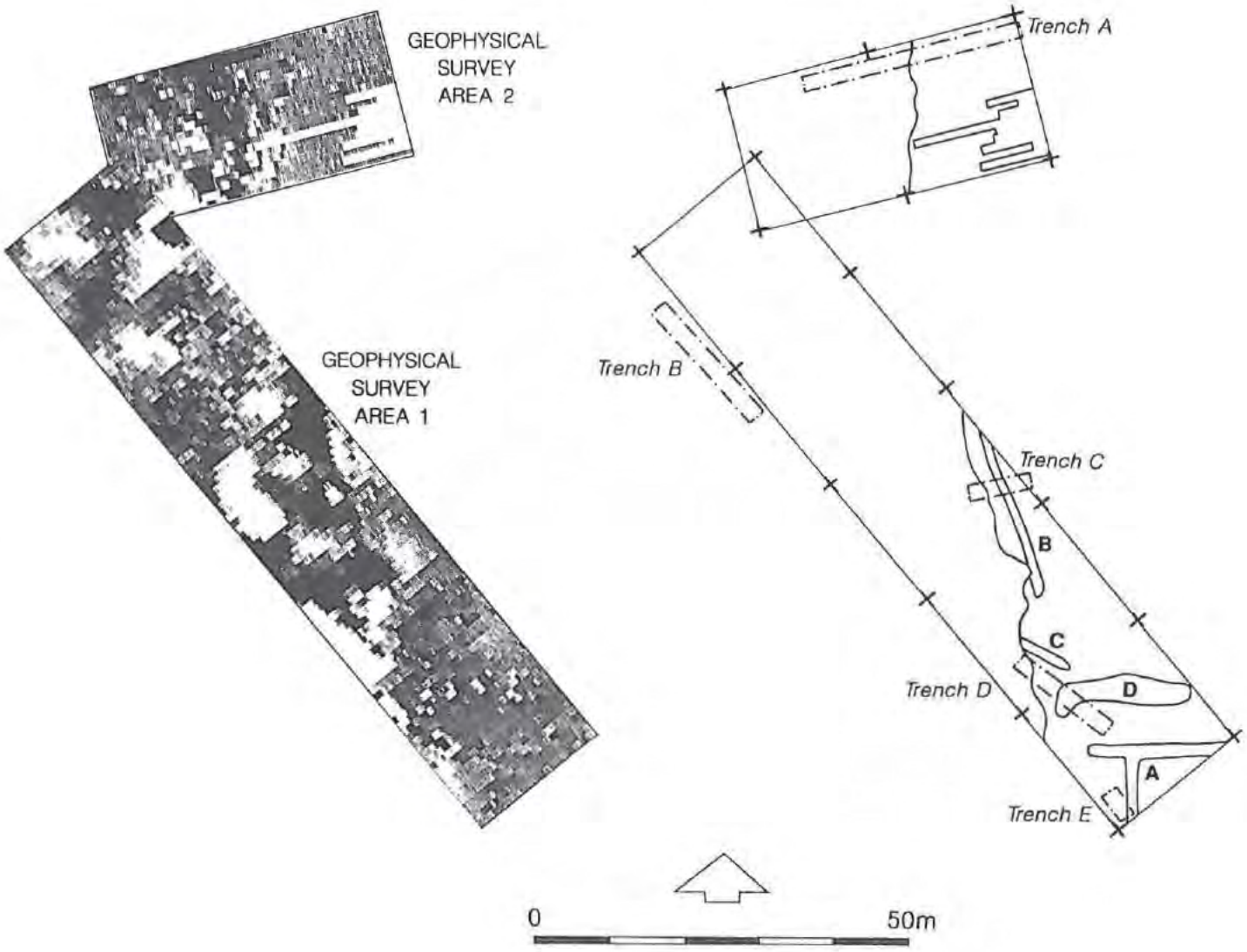


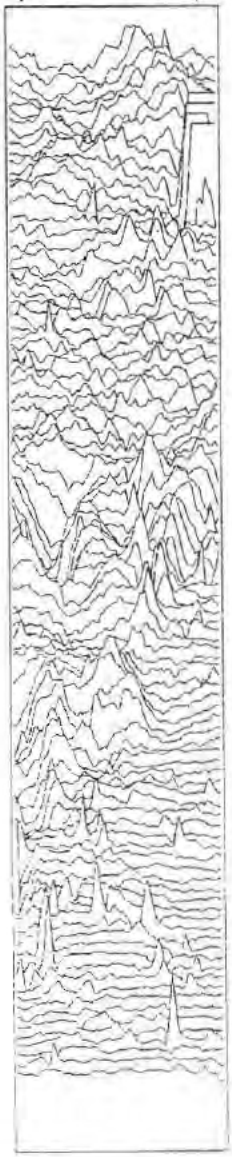
Fig. 2 Geophysical survey areas 1 & 2 - showing trenches A - E in relation to features detected in fluxgate gradiometer survey.

GRADIOMETER SURVEY - AREA 1

SHADE PLOT
(scale 1:738)

Data clipped to
-25 +25 nT

TRACE PLOT
(scale 1:738)



Resolution 77.2 nT/cm
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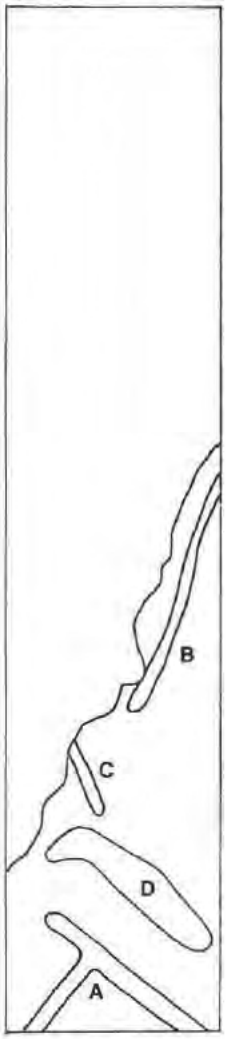
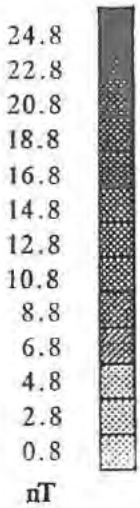
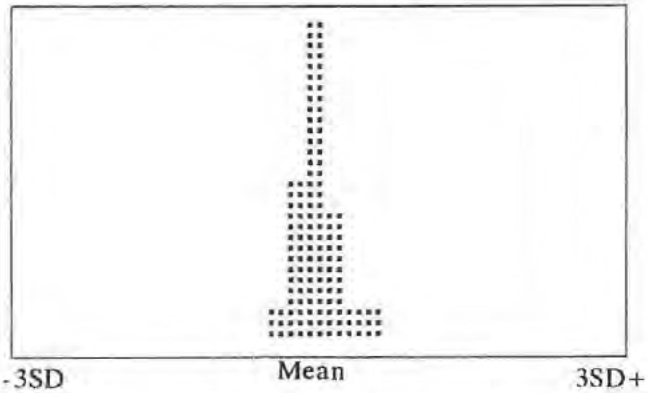
INTERPRETATION
(scale 1:738)





Black Positive
White Negative

HISTOGRAM



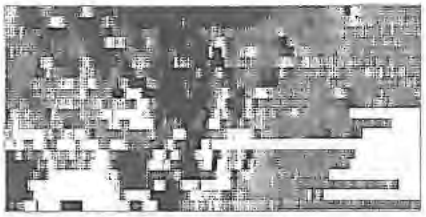
STATISTICS

Mean	12.56518	Dummies	0
SD	41.10762		
3 SD	123.32286		
Min.	-1701.34216		
Max.	1257.15784	Dum.Val.	2047.5

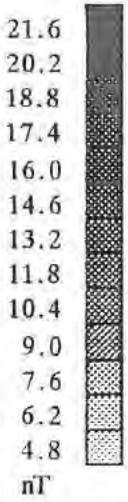
Fig. 3

GRADIOMETER SURVEY - AREA 2

SHADE PLOT
(scale 1:738)

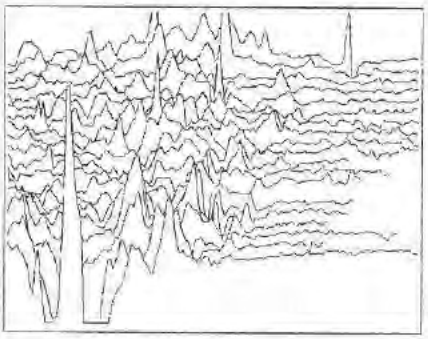


Data clipped to
-25 +25 nT



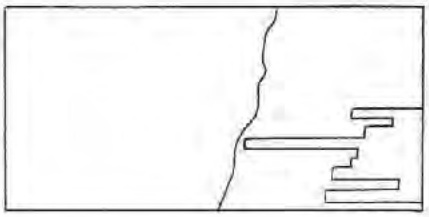
Black Positive
White Negative

TRACE PLOT
(scale 1:738)



Resolution 57.2 nT/cm
Hidden Line On

INTERPRETATION
(scale 1:738)



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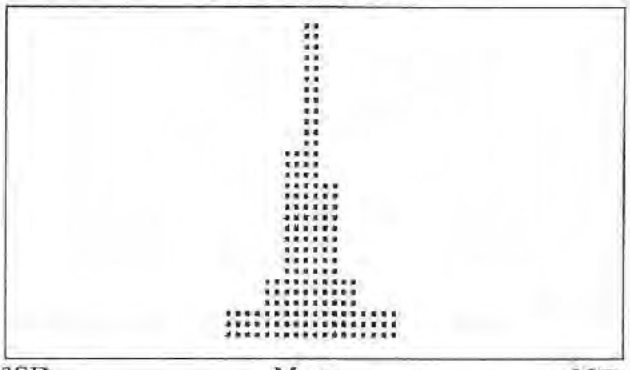
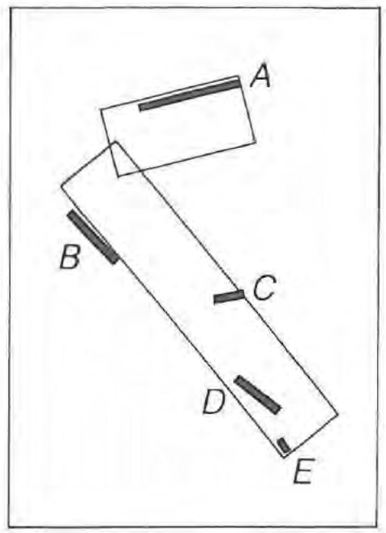
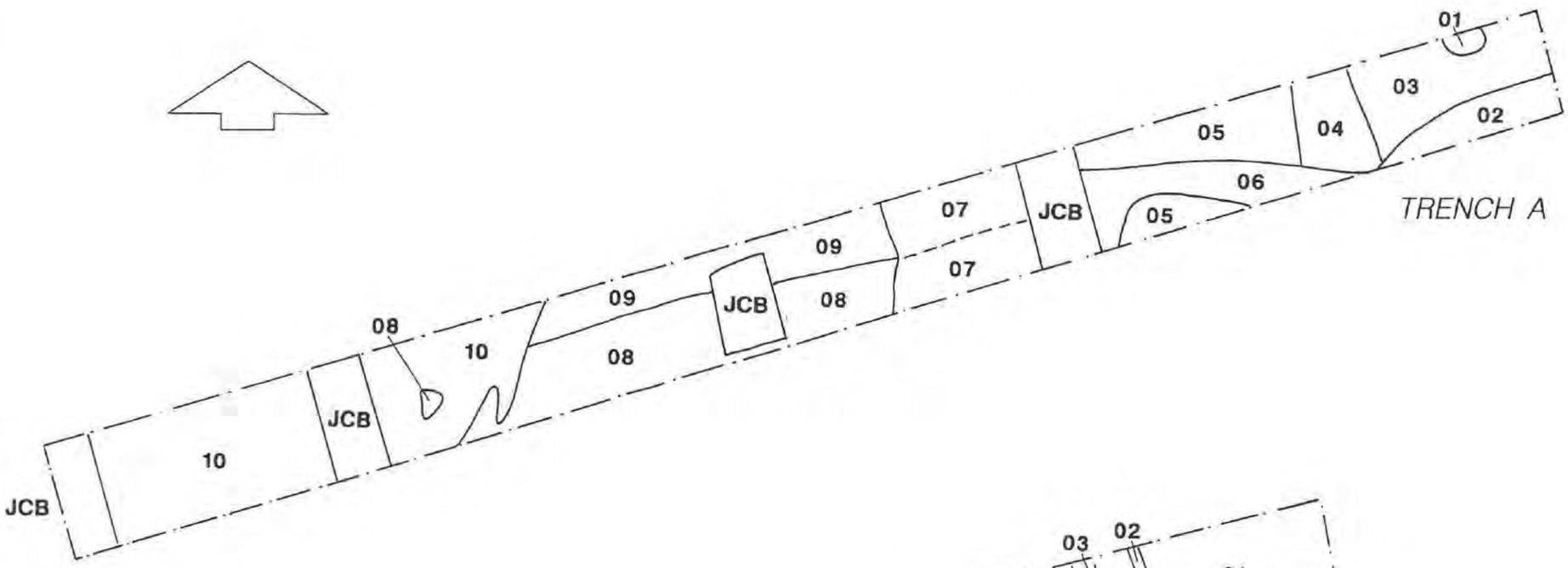


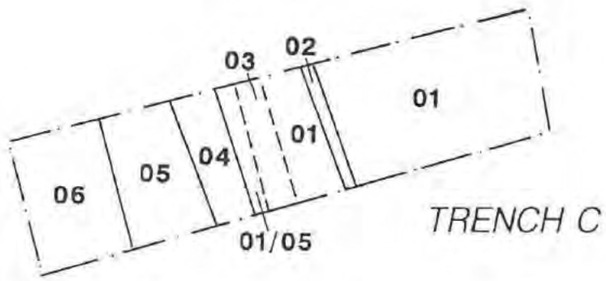
STATISTICS

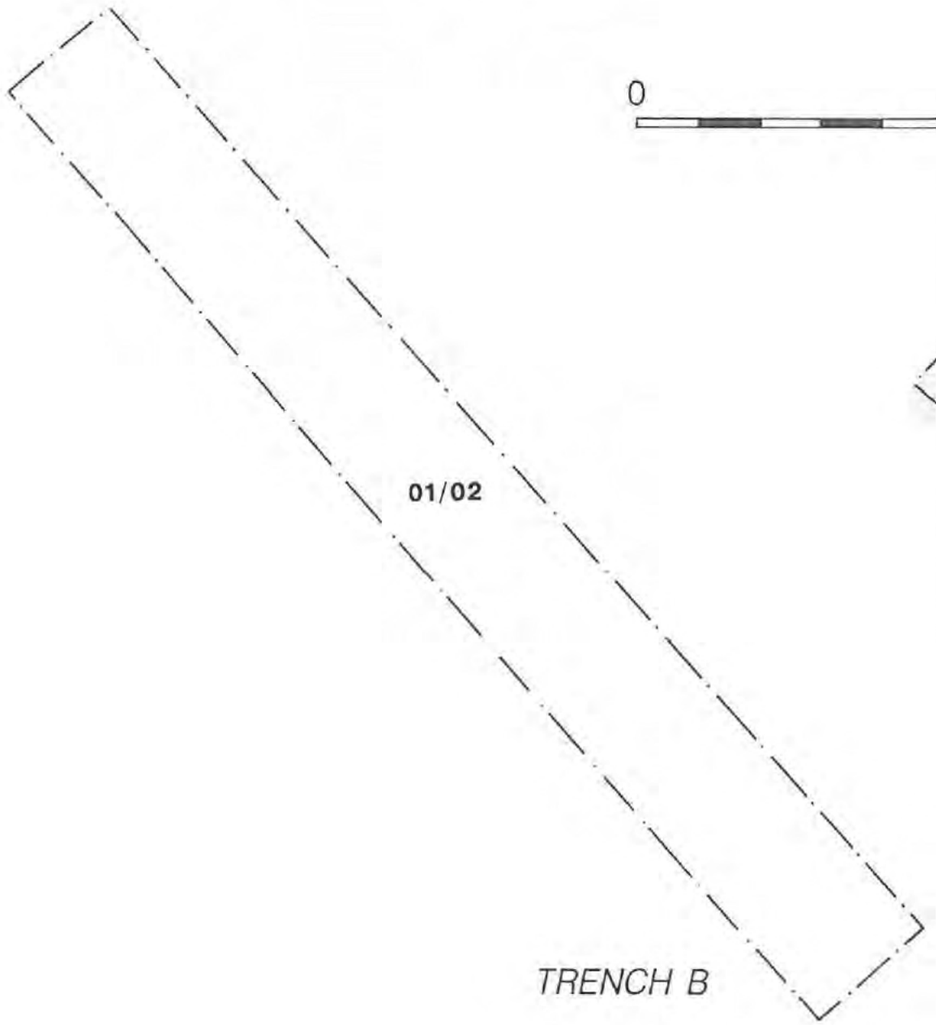
Mean	13.78066	Dummies	272
SD	14.56952		
3 SD	43.70856		
Min.	-124.00000		
Max.	140.00000	Dum.Val.	2047.5

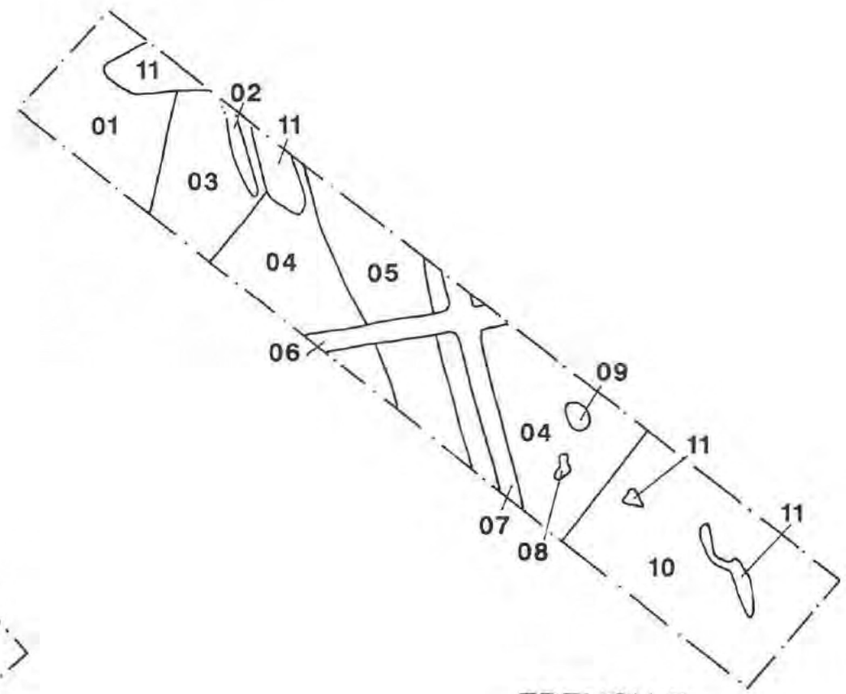
Fig. 4 Results of gradiometer survey - Area 2.











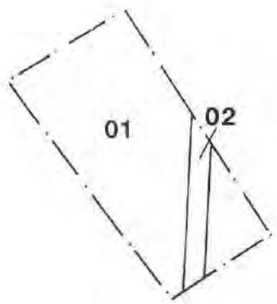


Fig. 5 Plan of features in trenches A - E.

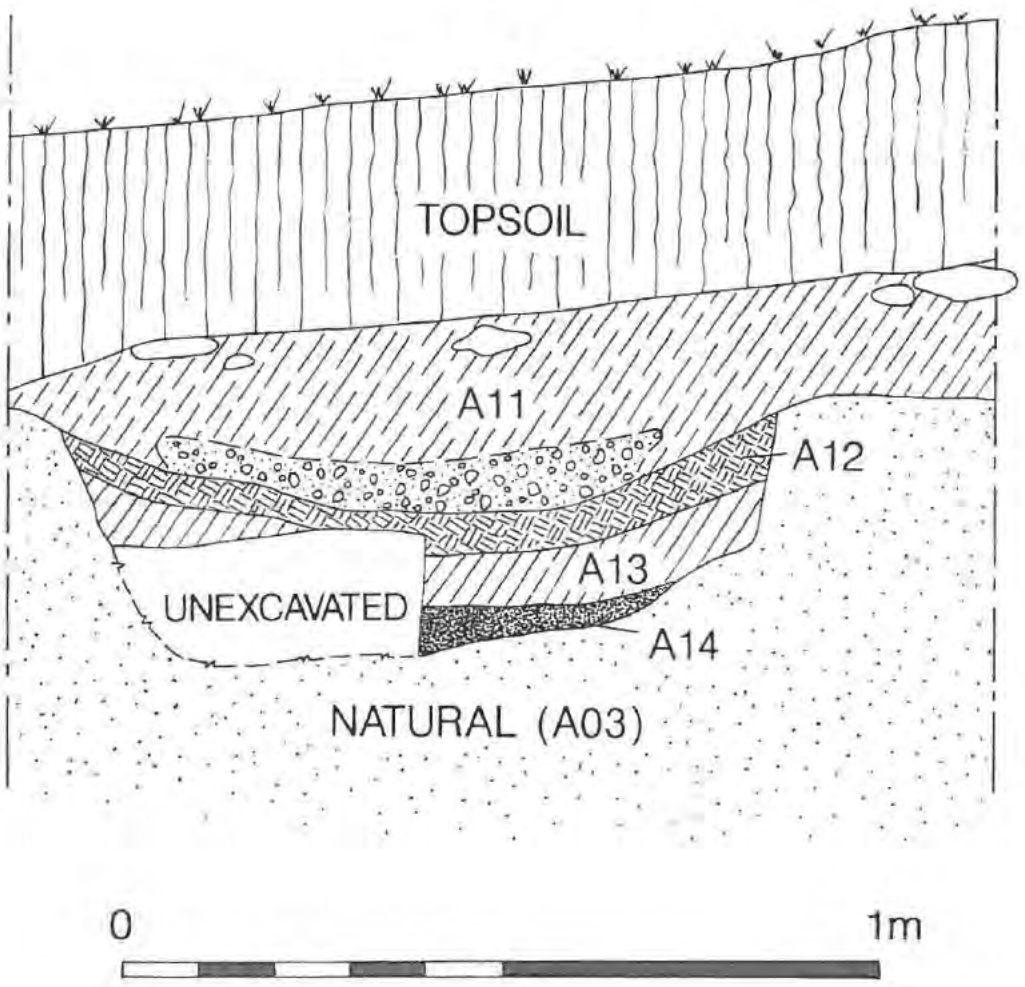


Fig. 6 Section through feature (01) in trench A.

APPENDIX 1

CONTEXT DESCRIPTIONS

Trench A (fig. 5)

A01 Semicircular (only part of the feature was exposed as it was against at the edge of the trench) patch, 1.05m in diameter, of pinkish and greyish brown clay, becoming more orange with charcoal inclusions around the circumference. See section (fig. 6) and below for further details.

A02 Firm grey silty clay with orange mottling and 15% rounded and sub rounded pebbles. Natural subsoil.

A03 Hard grey gritty clay with orange mottles. Natural subsoil.

A04 Hard light grey clay with orange mottles. Natural subsoil.

A05 Firm dark greyish brown mixed clay, silt and small stones. Natural subsoil.

A06 Firm light grey but very mixed clay stones and gravel containing slate and modern debris. Fill of modern trench derived from A05.

A07 Firm mixed clay, stones, slate, and gravel; more mixed at the south of the trench. Disturbance due to modern trench.

A08 Loose grey gravel with 50% small sub rounded stones and occasional pieces of burnt clay at top of deposit. Possible fluvial deposit.

A09 As A08, but containing lumps (typically 30cm in diameter) of grey clay. Fill of modern trench derived from A08.

A10 Firm grey clayey silt with orange mottles. Alluvium.

The feature recorded as A01, above, was quarter sectioned. In plan the part of the feature exposed in the trench was perfectly semi circular and it assumed that it is part of a circular feature. The surviving cut was steep sided, 35cm deep, with a rounded base. The following fills were identified.

A11 As central A01; Firm pinkish and greyish brown silty clay with a concentration of gravel at the bottom of the context. This was probably derived from a mixture of A12 from below and plough soil as it can be assumed that the feature has been truncated by ploughing.

A12 Firm orange brown silty clay with charcoal pieces concentrated around the circumference of the context.

A13 Firm, uniform, bright orange, clay with charcoal pieces concentrated around the circumference of the context. Burnt clay.

A14 Black gravel and silt containing 50% small charcoal fragments (generally $\leq$2mm) and possibly some humus.

Trench B

B01 Fractured igneous bedrock.

B02 Shattered bedrock

Trench C

C01 Clean very light grey sand. Alluvium.

C02 Fill of modern land drain containing segmented pipe.

C03 Plough damaged dry stone revetment. Stones roughly rectangular, typically 40cm across.

C04 Stone filled land drain.

C05 Firm grey silty clay. Natural subsoil.

C06 Reddish orange clayey silt containing varying amounts of shattered bedrock. Natural subsoil.

Trench D

D01 Hard greenish grey silty clay containing chips of bedrock. Orange iron staining present around bedrock. Natural subsoil.

D02 Small drain, 20cm wide and a maximum of 20cm deep. Sides lined with flat natural stones. Filled with grey topsoil.

D03 As D01 but with orange mottles. Natural Subsoil.

D04 As D01 but more grey. Natural Subsoil.

D05 Stone filled land drain

D06 Fill of modern land drain containing segmented pipe.

D07 Fill of modern land drain containing segmented pipe.

D08 Stone packed post setting containing remains of post with occasional ? copper nails hammered into it. Presumably modern feature, large amounts of modern iron nails also found in the vicinity.

D09 Stone packed post setting presumably associated with D08.

D10 Hard grey silty sandy clay containing chips of bedrock. Natural Subsoil.

D11 Bedrock.

Trench E

E01 Firm grey clayey silt with orange mottles. Alluvium.

E02 Fill of modern land drain containing segmented pipe.

APPENDIX 2

WORKED STONE - FLINT

Trench A

1. u/s Core. L30, B30, D22mm. Mid-grey-brown flint mostly corticated to cream. A small, single platform core. The platform is a previous flake scar. Damaged recently, presumably by plough.

2. u/s Flake fragment. L30, B15, D6mm. Incomplete length, bulbar end missing. Mid-grey-brown flint partly corticated to a buff-grey colour. A secondary flake retaining some cortex showing it came from a well rounded and corticated pebble.

3. u/s Flake fragment. L28, B13, D4mm. Incomplete length, bulbar end missing. Colour as 2 (above). A straight-sided tertiary flake from a well-prepared core. One straight side shows light damage, possibly indicating utilisation.

4. Context A10 Knife/scraper fragment. L49, B34, D4mm. Incomplete length and breadth. Dark brown flint, fresh and uncorticated. A thin, tertiary flake with neat, steep, unifacial trimming around one convex end and shallower unifacial trimming along one side. Some minor damage, probably as a result of ploughing. The fresh condition compared to those above suggests it derived from a sealed context, eg. a pit, relatively recently.

Trench E

5. Topsoil Core trimming piece. L53, B20, D12mm. Mid-grey? flint corticated to a mottled off white/light grey. A 'crested blade' resulting from trimming a prepared core.

SUMMARY

None of these pieces are individually closely datable but the knife/scraper fragment is fairly certainly of Neolithic date and the core trimming piece would fit in with this. The small, single platform core however, is typical of the later Mesolithic while the two flakes would fit in with either period. The topographic situation in which the pieces were found, a low knoll overlooking a broad flat valley floor, would be very suitable for temporary occupation during Later Mesolithic or Neolithic hunting/gathering.

The material of most of the pieces is likely to be pebble flint from the glacial till. The knife-scraper however, is of a different and better quality material which may have been deliberately imported from an in situ source.

APPENDIX 3

PROJECT DESIGN FOR ARCHAEOLOGICAL EVALUATION OF PROPOSED ROUNDABOUT WEST OF TREMADOG: A487 PORTHMADOG BYPASS (G1330)

Prepared for Wyn Thomas and Partners 10/04/95

1. PROJECT BACKGROUND

The Welsh Office is proposing to construct a by-pass around Tremadog, Porthmadog and Minffordd. At the Tremadog end of the by-pass the proposed road and passes very close to the site of a Roman bath-house, and the proposed roundabout is located over a low mound called Y Bryn. The purpose of this Project Design is to describe the work required and the costs involved for evaluating the archaeology of the area at Y Bryn and the associated bath-house. The Design has been requested by Wyn Thomas and Partners, on behalf of Sir William Halcrow and Partners Ltd.

2.0 KNOWN ARCHAEOLOGY

The initial archaeological assessment (Gwynedd Archaeological Trust Report No. 155) identified two sites in the vicinity; the Roman bath-house (Scheduled Ancient Monument No. Cn 174), and a find of horse bones at Y Bryn made during the road widening scheme in the 1860's.

3. ARCHAEOLOGICAL EVALUATION AIMS

The aims of this phase of the evaluation of will be to:

- identify any archaeological sites which may be affected by the proposed roundabout;

- provide evidence of date and function (where possible) of the different features discovered;

- assess the relative importance of the remains in national, regional and local terms;

- assess the archaeological implications of the development proposal in relation to each site; and to

- recommend appropriate mitigatory measures for each site, which will reflect the archaeological importance of the site and the degree to which it will be affected by the development.

4. PROGRAMME OF WORK

4.1 Introduction

This phase of the overall archaeological evaluation will involve the examination of a number of sites identified during the initial archaeological assessment as being of high archaeological potential, but which require further work before appropriate mitigatory responses can be recommended. The evaluation makes use of a number of archaeological techniques (see below) to identify the nature of the archaeology present, and concludes with a report which

will contain full mitigatory recommendations based on the information gained from the initial assessment and the evaluation work specified in this project design.

4.2 Methods and techniques

4.2.1 Geophysical survey

Geophysical survey will be carried out by gradiometer survey using quick scanning initially in order to locate potential features to be subjected to detailed survey. It is anticipated that this latter will cover two main survey areas; one measuring 20 m by 120 along the east side of Y Bryn, and along the line of the proposed road, and the other measuring 40 m by 20 m along the edge of the existing A487.

Geophysical Survey
Time: 4 man-days
Staff: 2
Grade: Project Supervisor, Project Assistant

4.2.2 Trial excavation

The location of the trial trenches will be partly based on the information produced by the geophysical survey, and partly on random sampling. An adequate sample would be 4 trenches, each measuring 20 m by 2 m, providing a 6% sample. Approximate locations if the geophysical survey does not suggest an alternative are shown on the attached plan.

The trial trenches will be deturfed and cleared by machine excavator (usually a wheeled JCB or similar), the turf and the top soil being stacked separately. The trenches will then be cleaned by hand. Once the trenches are clean, any features noted will be recorded. recording will involve: black and white photographs and colour transparencies at no less than 1:35 mm format, pan and section drawings at an appropriate scale (generally 1:20 and 1:10 respectively), and written descriptions on GAT context forms. Finds will be located by context or three dimensionally where particularly significant. Environmental and industrial samples will be taken where significant relevant deposits are revealed.

Trial Trenching
Time: 15 man-days
Staff: 3
Grade: Project Supervisor, Project Assistant

5. FINAL REPORT

Following the completion of the fieldwork, a final report will be produced for submission to the landscape consultants. The report will detail and synthesise the results of the evaluation work and incorporate the results of the initial assessments. It will be to an acceptable publication standard and will comprise:

a) a copy of the agreed Project Design;

b) a scale plan showing the route and locations of sites;

c) the results of the geophysical surveys;

d) plans and sections at an appropriate scale of each trench;

e) other illustrations as appropriate;

f) a description of the archaeology revealed including its extent and character, an interpretation and date, and an assessment of the importance (regionally/nationally) and condition (quality and state of preservation) of known archaeological and historical remains identified;

g) recommendations for mitigation strategies for each site;

f) a full bibliography of all sources consulted; and

g) all specialist reports.

The report will be compiled using WordStar7 software. The client will be supplied with one hard copy of the report with further copies at cost (a copy of the report can also be supplied on disc if required in WordStar 6/7 or ASCII format). A copy will also be lodged with the Gwynedd Sites and Monuments Record on the understanding that this will become a public document after an appropriate period of time (generally not exceeding six months).

Staff: 2
Grade: Project Supervisor, Illustrator
Time: 6 man-days (includes EDM & magnetometer processing)

6. DEPOSITION OF ARCHIVES

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled, and cross-referenced, and lodged in an appropriate place (to be decided in consultation with the Site and Monuments Record) within six months of the completion of the project.

Staff: 1
Grade: Project Supervisor
Time: 3 man-days

7. PERSONNEL

The work will be supervised by the Trust's Projects Manager Mr Andrew Davidson. The work will be undertaken by one of the Trust's Archaeological Field Officers experienced in the relevant skills/periods required and carried out by trained Project Assistants.

8. TIMING

Should the project design and costings be judged acceptable by the client, The Trust would be able to make personnel available to carry out the work programme identified above with one months notice.

A report will be available two weeks after the end of the fieldwork

9. DEPOSITION OF FINDS

The vast majority of finds recovered from archaeological excavations comprise pottery fragments, bone, environmental and charcoal samples, and non-valuable metal items such as nails. Often many of these finds become unstable (ie they begin to disintegrate) when removed from the ground. All finds are the property of the land owner, however, it is Trust policy to recommend that all finds are donated to an appropriate museum where they can receive specialist treatment and study. At the very least the Trust would request access to the finds for a reasonable period to allow for study and publication.

10. ACCESS

Access on to the site will be arranged by the clients.

11. HEALTH & SAFETY

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (1991; 1993 supplement)

12. INSURANCE

The Trust holds public liability insurance with an indemnity limit of £2,500,000 through Russell, Scanlon Limited Insurance Brokers, Wellington Circus, Nottingham NG1 5AJ (policy 01 1017386 COM).

13. OTHER

Any queries concerning the above should be directed to Mr Andrew Davidson at the Gwynedd Archaeological Trust Offices, Garth Road, Bangor. Telephone (01248) 352535)