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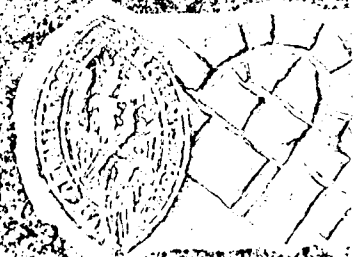
AN ASSESSMENT OF MEADOWS BUSINESS PARK DORNOCH, HIGHLAND



SCOTTISH URBAN ARCHAEOLOGICAL TRUST LTD

AN ASSESSMENT OF MEADOWS BUSINESS PARK DORNOCH, HIGHLAND

RJC/JS

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AN ASSESSMENT

of

MEADOWS BUSINESS PARK

DORNOCH, HIGHLAND

abstract

A proposal was submitted to Historic Scotland in November 1997 for funds to assess the material recovered during a watching brief at the Meadows Business Park, Dornoch carried out by Scottish Urban Archaeological Trust and Resurgam! in Spring 1997. This document reports on the results of that assessment and, having identified the importance of the material recovered, identifies the costs required to proceed to the next stage of post-excavation analyses.

1. PROJECT BACKGROUND

1.1 In May 1997, the Trust was commissioned by Highland Council Archaeology Service to carry out a watching brief in Dornoch to monitor the topsoil-stripping of a new access road into a new business park development on the southern edge of the burgh. Prior to this, no archaeological work had previously been carried out in or around the burgh, although the burgh had been assessed by the Scottish Burgh Survey in 1982 (Turner & Simpson, 1982). A Data Structure Report, with recommendations for further work, was prepared shortly after the watching brief was completed in 1997.

1.2 The top-soil proved to be exceptionally rich in medieval and post-medieval small finds much of which had been retrieved by a local metal detectorist before the watching brief had been commissioned, and which triggered off a condition on the planning application. Perhaps more importantly, the cultivation soil was found to seal much earlier occupation possibly early medieval in date and included at least one building, enclosures, pits, and a large assemblage of ironworking waste - charcoal, slag, clay furnace fragments and possible crucibles. A large number of soil samples were taken, some of which contain quantities of charcoal, enough to provide a range of radio-carbon dates. Given that the site was machine stripped down to the natural sub-soil and that the work was carried out as a watching brief, the site records are basic and many of the features stratigraphically isolated. Much of the work proposed (and the associated cost) is, therefore, for external specialists and the reporting and illustration of the finds assemblage.

1.3 This site is considered important to the future management of the archaeological heritage of Dornoch as the development area was considered to lie outside the limits of the medieval burgh. The medieval and post-medieval finds recovered from the top-soil may have been cleared from elsewhere in the burgh and scattered across the field here but are, nevertheless, the first insight into the archaeological potential of the

burgh. The earlier material, which include structural features, possibly early medieval (Norse or Pictish), may provide a rare example of evidence for continuity of settlement between the early medieval period and the growth of the medieval burgh. The results may also tie in with the work currently being undertaken at Portmahomack, situated directly across the Dornoch Firth. In particular, if the metalworking material indicates industrial activity on the site and is datable to the early medieval period, it will be an important discovery.

1.4 This application is for funds to carry out a programme of post-excavation analyses necessary to gain a fuller understanding of the dating, development, nature and function of activity on this site, and to place this site within the context of the archaeology of the region. The product will be an archive report to be submitted to Historic Scotland. Once the results of the specialist analyses are known, the results may merit full publication. If there was agreement to publish, the archive report could be converted into a publication standard paper to be submitted to a relevant journal but would incur further costs. An estimate of the conservation costs of the artefact assemblage could not be made until X-ray and specialist analysis has been carried out.

1.5 Sourcing the finds and obtaining quotes for specialist work was carried out between April and September 1998.

2. PROJECT OUTLINE

2.1 The various tasks involved in the post-excavation programme have been itemised below. The costing is attached at the end of this report.

3. THE STRATIGRAPHIC RECORD

3.1 The **stratigraphic record** is straightforward. The attached Data Structure Report (see Appendix) lists the site archive. Only a very brief stratigraphic text was prepared for the Data Structure Report. It will, therefore, take two weeks to convert this into a more detailed phased text, integrating the results of the various specialists analyses. To carry out some further background research with a view to writing a general discussion would take a further week.

3.2 Costing

Prepare phased stratigraphic text 5 days @ £125	£625
Phase plans 3 days @ £110 per day	£330
Integrate results of specialist analyses 5 days @ £125 per day	£625
Background research and discussion	

5 days @	£125 per day	£625
Total		**£2205**

4. THE METALLURGICAL DEBRIS

4.1 Potentially, the most important material relating to this site is the **metalworking and industrial waste**, the analyses of which will be undertaken by Dr Effie Photos-Jones of Scottish Analytical Services for Art and Archaeology.

4.2 Project Summary

4.3 The relative abundant and diverse remains of metallurgical waste within the excavated trench at Meadows Business Park, Dornoch (Coleman 1997) warranted the assessment of this material prior to any further scientific and other investigation. The aim of the present assessment is to produce a coherent outline of the investigative approach to be followed and a costing of the analytical and experimental work.

4.4 Introduction

4.5 A total of c 15 kg of metallurgical waste and other associated materials (pottery, bone, shell fragments etc) were retrieved from the excavated trench at the Dornoch Meadows Business Park site (Figure 1). The metallurgical waste included slag, hammer scale, fragments of iron (mostly unshaped), fragments of ore (including a large (c 1 kg) sample of good quality bog iron ore), charcoal etc. It has to be emphasized that samples of bog iron ore tend to be rather absent from Scottish bloomery sites (Photos-Jones et al, in press). The metallurgical debris was spread over both the eastern and western ends of the trench but concentrated mostly on the east. The co-existence of shells (complete and fragmentary, burnt and intact) in association with the metallurgical waste was noted by the excavator and soil and bone specialists. As a result, a closer examination of this type of debris is incorporated in the present study.

4.6 Assessment Methodology

4.7 A thorough visual examination of the contents of the five boxes of Dornoch metallurgical debris and associated material was carried out in the course of a two day assessment in an attempt to establish sample typology. Relative quantities (weight in gr) of the metallurgical waste as a function of their context had already been established (see Coleman 1997). The following typologically distinct groups were evident:

a Slag, spongy and porous
b Slag, solid and compact
c Charcoal fragments
d Fragments of mostly unshaped metallic objects
e Fragments of furnace/hearth building material/lining etc
f Shells/bones
g Other

4.8 A brief description of the contents of each bag is included in Table 1 and a preliminary attempt at establishing the distribution of the different materials is shown in Figure 1.

4.9 Investigative Approach: an outline

4.10 The present investigator nearly always undertakes a physico-chemical approach in the examination of industrial waste. This involves the usage of optical microscopy and analytical tools like the Scanning Electron Microscope with Energy Dispersive Analyser (SEM-EDAX) and x-ray diffraction (XRD) techniques. Occasionally laboratory-based experimental work is required to attempt to simulate (heating or other) conditions under which archaeological material was formed or altered.

4.11 Following the visual examination of the Dornoch material, a number of issues/questions were raised which pertain both to its characterisation (i.e what is it and how it was made) as well as its association with other domestic/industrial waste.

4.12 The characterisation of the material pertains to issues of technology.

a To identify the type of metallurgical practices on site. Although these are largely assumed to be iron-related it is important to establish whether they are associated with smelting or smithing or both. To that end, it would be essential to retrieve evidence for all three 'products' of the iron making cycle, namely ore, slag and metal artefact (in shaped or unshaped form).

Evidence for furnace/hearth is testified by the fragments of partially vitrified clays found on site; these materials are essential in the reconstruction of the process even though no remains of the structures themselves may be evident. Thin wall fragments of shaped vitrified ceramic fabrics (crucibles?) warrant further examination.

The findspot of the materials may pertain to the original spatial distribution of the industrial activities on site.

b To establish the possible distribution of activities within the trench. Although the boundaries of the trench are relatively narrow, presenting only part of the original picture, nevertheless the relative abundance and diversity of the materials found should allow some tentative suggestions. Where do potential smelting or smithing activities concentrate? (The eastern vs western section of the trench.) What is the distribution of the metallurgical waste with respect to other waste or indeed with respect to the charcoal-using hearths vs peat-using hearths (Holden 1997).

The state of preservation of shells (burnt and unburnt, complete or fragmentary) may or may not have an association with the metallurgical waste.

c It is unlikely but not improbable that shells (a source of calcium carbonate) were added as flux within the bloomery furnace. Slag chemical composition

and mineralogical characterisation will determine this question definitively. Shells or the contents thereof may have been used as food or bait but their industrial usage as fertilisers for fields is known already from the pre-historic period (T Pollard, pers comm). Shells are both broken and complete, burnt and unburnt. Some basic laboratory based heating experiments will determine how shell morphology changes as a function of temperature under oxidizing conditions. Comparisons with archaeological material can then be drawn based on photographs taken with the Scanning Electron Microscope. A temperature range for heating of the archaeological materials can therefore be established.

The chemical/petrographic characterisation of individual finds including pottery and stone.

d To attempt to characterise individual finds with specific questions in mind.

i The ongoing, but still at its infancy, technical character-isation of medieval Scottish Pottery fabrics has been based on the expansion of an existing data bank currently held at the National Museums of Scotland and shared between them and the Medieval Scottish Pottery Group (B Wills, pers comm). To that end petrographic and chemical analyses are continually needed which assist in the building up of this important archive. The pottery of the north-east of Scotland either as White Gritty ware or East Coast Redware is under-represented hence the need to undertake thin sectioning or a small number of fragments (2-4) and a preliminary petrological characterisation thereof.

ii A 'moulded' ceramic fragment from unstratified levels with evidence for glazing adhering to the surface was found on site. A very small sample was removed from the surface of this artefact and subjected to XRD analysis. The presence of quartz suggested sandstone (see Figure 2). Therefore this find is not a piece of ceramic but a carved stone. It appears that there exist a small number 'glazed stones' largely unshaped from medieval contexts (B Wills). The 'glaze' on their surface has always been assumed to have been accidental. In the Dornoch sample traces of 'glaze' are seen in both the exterior and the interior surfaces; hence the need to analyse this material further.

4.13 Conclusions

4.14 The Dornoch metallurgical debris presents a unique opportunity to study and elucidate aspects of the metals technology as well as its association with other domestic/industrial activities in the Medieval period in the north-east of Scotland.

4.15 Costing

4.16 Sorting/assessment/sample sectioning
1 day @ £145 per day £145

Sample preparation

20 samples @ £50 per sample	£1000
SEM-EDAX examination and analysis 9 hours @ £65 per hour	£585
XRD 5 samples @ £35 per sample	£175
Experimental work 3 days @ £145 per day	£435
Report writing 7 days @ £145 per day	£1015
Consumables (metallographic etc)	£60
Total	**£3415**

5. THE ENVIRONMENTAL SAMPLES

5.1 A number of **soil samples** were taken during the watching brief. It became apparent during this assessment stage that it was going to prove impossible to obtain quotes from specialists for the analyses of surface collected finds as more material was almost certainly contained within the soil samples. The soil samples were, therefore, processed as part of this assessment. The report follows the division of the site into cultivation soil, west end and east end of the site as laid out in the Data Structure Report

5.2 Eleven un-processed soil samples were provided by SUAT for assessment by Headland Archaeology Ltd. The samples were subjected to flotation and wet sieving in a Siraf-style flotation machine. The floating debris (the flot) was collected in a 300 micro-millimetre sieve and, once dry, scanned by the author using a binocular microscope (Table 1). Residues were wet sieved down to 1 mm and fully sorted by a trained technician. Any items retrieved from the retents were bagged and are recorded in Table 2. The whole retents and any industrial debris were bagged and forwarded to an industrial specialists and the bone and shell to a archaeozoologist for further assessment.

5.3 Results and Discussion

5.4 Cultivation Soil

5.5 Much of the site was covered by a layer of cultivation soil (Context 2) from which a number of medieval finds were recovered. The samples taken from this layer were found to contain quantities of highly fragmented and burnt bone and marine shell. Charcoal was common and there was an absence of the industrial slag that was so prevalent in most other samples. Two pieces of 19/20th century glazed pottery were also recovered from this layer together with a swan animal bone)a feature only seen

in later butchery practice) and two well-preserved sheep skeletons thought to recent in origin (see C. Smith assessment report). This context clearly represents a cultivation soil the formation of which was probably initiated in the medieval period. Although cultivation is thought to have ceased during the 17th century the presence of more recent material suggests continued activity in the area. The mixed nature of this deposit will make interpretation of the biological elements within it of limited value.

5.6 **West end - metalworking debris, ditch and cut features**

5.7 Several samples (Contexts 11, 17, 28) were obtained from the west end of the main trench all of which were sealed by Context 2 above. This area appears to have been used for metalworking and this is reflected in the presence of slag in the retents of Contexts 11 and 28. Context 17, a ditch fill, is significantly different from the other samples in this part of the site in that it is dominated by marine shell (limpets, cockles and others) and probably represents midden material within the ditch. Low concentrations of animal bone and charred cereal grain in addition to metalworking debris in these samples suggest low-levels of domestic activity across this part of the site.

5.8 **East end - possible buildings and enclosures, ditches and pits**

5.9 The samples from the east end of the main trench (Contexts 31-56) also show evidence for metalworking in the form of slag and hammerscale. Bone, particularly burnt bone, marine shell, charcoal and charred grain are all present in larger quantities than in the west end of the trench. This food debris, although still present in relatively low concentrations, could reflect the close proximity to the rounded building within the enclosure which was, in all likelihood, associated with domestic as well as industrial activities. The presence of amorphous charred material and heather twigs from Context 31 is potentially of some interest and could be indicative of peat burning.

5.10 **Conclusion**

5.11 The mixed nature, and low concentration of 'environmental evidence' from Context 2, the cultivation soil, makes it of little interpretive value. Contexts sealed by this layer are, however, likely to be of medieval or earlier in date. The potential value of the metalworking debris from these samples has already been identified and the retents have been sent to an appropriate specialist for analysis. Identifications of the charcoal from this industrial activity would add something to our understanding of the metalworking process but in view of the low numbers of samples present would say little about resource availability or the local environment. The charcoal from the samples would be sufficient for AMS dating of contexts if required.

5.12 Charred grains, primarily, hulled barley with occasional oat, were identified in low concentrations from most samples. Both of these crops, together with occasional weedy elements also recovered would be typical of this part of Scotland in the last two millennia and are therefore of little interpretive value in themselves. Other than recording their presence and so adding to the accruing database on Scottish crops no

further work is envisaged.

5.13 The shell and animal bone elements, recovered from the samples may add further to the list of animal taxa exploited by the inhabitants of Dornoch. These will be the subject of a separate assessment report (see below).

5.14 **Recommendations**

5.15 Bone, shell and metalworking debris are being assessed by appropriate specialists. Of the remaining 'ecofacts' the following are recommended:

1. Identification of charcoal species from features associated with metalworking. This will add to the understanding of industrial activity on the site and, should it be required, provide material for AMS dates.

2. Although no more work is recommended on the identification of charred plant remains the presence of hulled barley (*Hordeum sativum*), oat (*Avena* sp.) and the capsule fragments of wild radish (*Raphanus raphanistrum*), a typical weed of cultivation, should be incorporated into any site publication so adding to the published database on Scottish cereals and their associated weeds.

5.16 Costing

Identification of charcoal and AMS dating	£200
Report writing 1 day @ £160	£160
Total	**£360**

6. THE ARTEFACT ASSEMBLAGE

6.1 The assemblage of artefacts recovered during the recent archaeological investigation of this site, along with previous finds in the immediate vicinity by meal detectorists, constitutes an important collection of medieval and later finds, and forms a valuable body of evidence in our understanding of the site. Given its broad functional context and the quality of the artefacts, the assemblage is also one of regional importance, and its study will contribute to our understanding of medieval and later material culture in north-eastern Scotland.

6.2 A number of rare and unusual artefacts is included in this assemblage. One such artefact is the small, copper alloy bell, recovered largely intact. A group of buckle and brooch fragments is also of high quality. The assemblage merits detailed study and publication. It is important that the integrity of the assemblage is ensured by its consideration in a single report.

6.3 **X-ray examination and conservation**

6.4 It is recommended that a selection of the metallic artefacts is submitted for x-ray

examination, which will aid the identification of particular finds. Several artefacts would benefit from conservation treatment, although this is not a prerequisite for preparation of a report. Conservation of a selection of artefacts would assist in their accurate illustration for publication and would enhance their display potential. Assessment of these conservation needs is best done when the assemblage has been collected together and examined as a unit, and upon examination of x-ray images of the finds.

6.5 **Illustration**

6.6 To accompany a report on the artefacts, a selection of high quality illustrations should be prepared. The selection will be based on the best preserved and most diagnostic components of the assemblage.

6.7 **Assessment of time and cost**

6.8 The following assessment is based upon the preparation of a full catalogue of the material accompanied by a discussion of the artefacts within functional categories and material types. The discussion will be fairly concise where it relates primarily to unstratified material, but where possible the artefact evidence will be discussed in its site and regional context.

6.9 **Time requirements**

Artefact Research 20 days @ £125 per day	£2500
Travel	£30
X-ray costs	£100
Illustration 15 days @ £110 per day	£1650
Total	**£4280**

note
This treatment of the artefact evidence represents a mid-range option, including a level of detail targeted towards the interpretation of the evidence from the site and region. Any conservation requirements would be assessed on completion of x-ray work.

7. THE COINS

7.1 The small assemblage of **coins** recovered from this site -will be studied by Nicholas Holmes, National Museums of Scotland. There are no costs involved in preparing this report, only management time and the delivery and collection of the material.

7.2 Twenty-five coins and one jeton have been reported as found on this site during the period 1995-8. If the modern penny is ignored, the coins are divisible into two distinct groups. The earlier comprises six hammered silver pieces, dating from the 13th and early 14th centuries, with the later containing the remaining eighteen coins, which are base metal issues of the 16th and 17th centuries.

7.3 The six early coins all formed part of a group of metal-detector finds submitted by Mike Gallon in 1996. Since all these coins came from the soil heap, there is no way of establishing their previous provenance, but it is possible that this group of finds represents material scraped up from one particular part of the site, which may have had early medieval occupation.

7.4 The later coins represent a cross-section of the small change of the period c. 1500-1670, and may be accepted as an indication or more or less continuous human activity in the area during that period

7.5 Notable by their absence from this assemblage are billon and copper coins of the 15th century, and since these are commonly associated with occupation at that time, this may be an indication that activity was at a low level in this area during the 15th century.

7.6 With the exception of 15th-century coins, the range of material found on this site compares well with that displayed by the assemblage of almost 300 medieval and early post-medieval coins submitted by Mike Gallon as finds from the fields to the north of Dornoch over the last five years. These coins probably represent those lost in the town and swept out into the fields with midden material. They indicate continuous small-scale commercial activity in the Dornoch area from the late 12th to the late 17th century, and include a fair scatter of 15th-century billon and copper.

7.7 The implications for the Business Park site. therefore, are that it may have been an area of largely early post-medieval activity, but that at least part of it may also have seen some form of occupation in the 13th and 14th centuries. Since coins earlier than about 1200 very rarely occur as individual finds in Scotland, however, their absence from this site does not necessarily rule out earlier medieval activity.

8. THE ANIMAL BONE

8.1 Sieved Residues

8.2 A number of large soil samples was taken from the site during the excavation. The volume of archaeological materials they contained, included numerous fragments of **animal bone** and added substantially to the assemblage already obtained during the rescue excavation.

8.3 After processing in the laboratory by *Headland*, the sieved, sorted residues were quickly scanned in order to assess the quantity of identifiable ecofactual materials present. It was obvious that some larger mammalian bone and tooth fragments were identifiable to species and thus could (and should) be fully recorded. In addition a

small fragment of worked, shaped antler (or perhaps whalebone) was discovered. This fragment should be examined in more detail.

8.4 Study of the sieved samples will help to provide a more complete picture of the economy of the site. In particular the **fish bones** from both the hand excavated contexts, as well as from the sieved samples, should be identified to species level.

8.5 **Hand Excavated Material**

8.6 The bones retrieved by hand received only cursory examination and recording, to species level. They were not, however, subjected to anatomical measurement. Full measurement is desirable in order to estimate the stature, type, and possibly the date range of the animals. In addition the age of the animals at death should be assessed and pathological conditions and butchery described.

8.7 The data derived from both the hand-excavated and sieved deposits will be merged in order to provide background information on the economy of the site.

8.8 **Time Required For Further Study**

8.9 A further 6 days will be required in order to carry out the following work.

8.10 Sieved Residues: Identification and recording of bone contained in sieved residues.

8.11 Hand-excavated bone: Measurement and recording of age, butchery, pathology, etc.

8.12 Fish Bone: Fish bone will be extracted from the sieved residues, fully studied and reported on.

8.13 Collation of data, writing report: A full report, based on the original Data Structure Report, together with all ensuing work on the hand-excavated and sieved samples, will be prepared.

8.14 **Costing**

Further analysis and report writing 6 days @ £120 per day	**£720**

9. **THE POTTERY**

9.1 This watching brief produced 31 sherds of pottery. Twenty seven of these are of medieval date. The assemblage is dominated by a gritty version of East Coast Redware which may be a local product. There is a small group of Yorkshire ware which includes an unusual small vessel which may be a container for pigment or unguent. Apart from the four sherds of Victorian china and earthenware there is nothing that suggests a date of any later than the 13th or 14th centuries.

9.2 **Recommendations**

9.3 As this is the first assemblage of medieval pottery from Dornoch it certainly deserves a full report. The presence of a gritty version of East Coast redware is important and extends the distribution of this Scottish tradition. It is known that further sherds of pottery exist in the soil samples and these need to be examined and reported on. Recent chemical analysis of Scottish medieval pottery by the British Geological Survey has proved remarkably successful and it is recommended that 5 sherds of redware are submitted for both ICPS and thin sectioning. This process will cost £30 per sample and will require one days work by the pottery specialist to integrate the results into the final report.

9.4 Costing

5 samples for ICPS at £30 per sample	£150
Report writing 1 day @ 135	£135
Total	**£285**

10. Project Management

10.1 One day's management per specialist @ £125 per day has been allocated for in the project budget. One day has been allocated for the Director @ £180 for editing. One return trip to both Glasgow and Edinburgh to collect material from specialsists at the end of the project has also been allowed for.

10.2 Costing

Project Management 7 days @ £125 per day	£875
Editing 1 day @ £180	£180
Delivery/collection	£100
Total	**1155**

11. Archiving

11.1 One day has been set aside for Treasure Trove/Finds Disposal and one day for deposition of the site archive in the NMRS.

11.2 Cost

Archiving 2 days @ £120 per day	£240

1 return trip to Edinburgh	£40
Total	**£280**

11. BIBLIOGRAPHY

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COSTING FOR POST-EXCAVATION ANALYSIS

MEADOWS BUSINESS PARK, DORNOCH

Preparation of an archive report on the above site

1.	Stratigraphic Report	£2205
2.	Metallurgical Report	£3415
3.	Environmental Report	£423 (incl VAT)
4.	Artefact Report	£4280
5.	Animal Bone Report	£720
6.	Pottery Report	£285
7.	Project Management & Editing	£1155
8.	Archiving	£280
TOTAL		£12763

note

An estimate for conservation costs has not been included.

A WATCHING BRIEF

AT

MEADOWS BUSINESS PARK, DORNOCH

Abstract

A watching brief was commissioned by Highland Council Archaeology Service and carried out jointly by Resurgam! and the Scottish Urban Archaeological Trust in May 1997. The site lay to the south of the former Bishop's Palace (now Bishops Hotel) on the southern edge of the burgh of Dornoch. The watching brief involved monitoring ground works associated with the development of a new business park and was carried out between Monday 19th May and Tuesday 27th May 1997, to a specification prepared by Highland Council Archaeology Service. A range of features was recorded including possible buildings, ditched enclosures and evidence for metalworking all sealed below a deep deposit of medieval cultivation soil. Finds, some of which were recovered by a local metal detectorist, included large quantities of metal slag and burnt clay, medieval small finds such as buckles, horse fittings, coins, medieval and early medieval pottery, animal bone, shell and leather.

1 Introduction

1.1 A watching brief was commissioned by Highland Council Archaeology Service and carried out jointly by Resurgam! and the Scottish Urban Archaeological Trust. The site lay to the south of the former Bishops Palace (now Bishops Hotel) on the southern edge of the burgh of Dornoch and just outside the area of archaeological interest as defined in *Historic Dornoch: The Archaeological Implications of Development* (Scottish Burgh Survey, Simpson & Stevenson, 1982) **figures 1 & 2**. The work involved monitoring ground works associated with the development of a new business park and was carried out over a period of 8 days between Monday 19th May and Tuesday 27th May 1997, to a specification prepared by Highland Council Archaeology Service.

2 Site Location

2.1 The site lies on the south side of The Meadows, the road that runs parallel with, and to the south of, the main thoroughfare of the burgh, Castle Street **figure 2**. The former Bishop's Palace lies immediately to the north. The development area has been under grass since at least the First Edition OS map of the burgh and is also known as The Glebe. The former manse, now the Highland Council offices, stands at the south-west corner of the site, while on the east side stands a recently closed abattoir, now partly in use as a joinery and garage. On The Meadows frontage stands the newly built (but not yet opened) Dornoch Heritage Trust centre, with adjoining car

park. To the south of the site, the low lying fields stretch uninterrupted to the Dornoch Firth.

3 Early History and Burgh Morphology

3.1 The first reference to settlement in Dornoch is contained in a writ by David I (1127 x 1153). Recorded in the Dunfermline Abbey register, it has led to the suggestion that monks from Dunfermline had established a cell in Dornoch. Alternatively, it could refer to an earlier community. Dornoch is traditionally associated with St Barr or St Finbarr and it has long been held that a community of culdee monks had established a cell there.

3.2 David's first bishop in Caithness was Andrew. A Scotsman who had been a Benedictine monk at Dunfermline, he was largely an absentee. His appointment by about 1147 is, however, seen as a deliberate policy of detaching this remote and partly Norse-speaking Scottish province from the Norse-ruled earldom of Orkney. It was not until the 13th century that the *see* was moved from Norse-dominated Halkirk to the more southerly church of Dornoch in the Gaelic-speaking part of the diocese. It was only with the establishment of the Scottish lines of earls of Caithness after 1231, and during the episcopate of Bishop Gilbert, that the church at Dornoch was built or rebuilt, and developed as the cathedral of the diocese. It was largely destroyed in a fire in 1570.

3.3 The Bishop's Palace, which stands to the south and directly opposite the cathedral, is basically late 15th-century in date with some mid 16th-century reconstruction. Extensive rebuilding and renovation was carried out in 1813 to achieve its present appearance. The palace is thought to have comprised three towers and formerly extended across what is now Castle Street towards the cathedral. Like the cathedral, it was largely destroyed in the fire of 1570. The palace of Bishop Gilbert, the builder of the cathedral, may have been on the same site.

3.4 Other than the cathedral and Bishop's Palace, little is known of medieval settlement here, and the town was not officially recognised as a burgh until it received its charter from Charles I in 1628. The principal thoroughfare of the town is Castle Street, leading onto The Square, but these are late additions to the town plan and date to the early nineteenth century. Many of the buildings in High Street, the original thoroughfare and market place in the medieval period, which runs east to west on the north side of the Cathedral, were demolished around this time. Prior to the present watching brief, no archaeological work had been carried out in the burgh.

4 The Development

4.1 The development, to be known as The Meadows Business Park, will provide the infrastructure for up to 10 new business units (planning application SU/1995/112). This comprised the cutting of a new access road from The Meadows leading into the site, essential services and landscaping **figure 3**.

5 Methodology

5.1 Top soil, and what was later identified as medieval cultivation soil, was stripped off by machine down to the natural sand sub-soil and dumped in the adjacent field to the south of the site. Many of the small finds were recovered from here by a local metal detectorist, Mr Mike Gallon.

5.2 The watching brief concentrated on monitoring the top soil stripping of the access road, an area measuring approximately 70 m in length and varying in width from between 10 - 15 m at its narrowest point at the western end widening to *c* 30 m at the entrance from The Meadows **figure 3**. The main part of the site, where the business units will be sited, had already been stripped. Once the topsoil had been removed, the floor of the trench was shovel-scraped and inspected for features. Due to constraints on time, and working within the contractors' timetable, the site was divided into three parts of roughly twenty metres in length each, as work progressed from the west end of the site to the entrance off The Meadows. All features were planned at scale 1:50, related to OD and photographed. Slots were excavated through each feature to obtain sketch profiles, soil descriptions and finds, with information recorded on context sheets. Soil samples were taken from a number of features, including pit fills, ditch fills, possible hearths and from the cultivation soils sealing much of the site. Once a basic record had been made, as many features as possible were rapidly excavated to retrieve finds.

5.3 The weather was variable for the first two days, with wind and rain hampering shovel scraping and cleaning. Towards the end of the project, the hot weather dried out the site (sand) and made identifying stratigraphic relationships difficult.

5.4 The watching brief produced considerably more than was anticipated and only a brief summary of the results was possible within the confines of a standard watching brief report. The site archive - lists of contexts, plans, photographs, soil samples and finds - is summarised as a series of appendices at the end of this report.

6 The Results (figure 4)

6.1 Post-medieval ditch

Virtually all the features recorded within the main trench appeared to have been sealed by a thick deposit of cultivation soils **02**. One exception is ditch **27**, which truncated a number of other features at the eastern of the main trench. The ditch was seen in the main North section where it measured c 3-4 m wide and had been cut to a depth of c 1.5 m. The west side of the ditch cut was visible in plan in the floor of the main trench and its possible north side was briefly exposed in plan close to the edge of The Meadows. As the ditch was cut through the cultivation soil, which appears to have gone out of use about the early to mid 17th century, the ditch may be Cromwellian or Jacobite in date. An oval pit **49** containing a worked bone awl had been cut through the ditch on the east side.

6.2 Medieval cultivation soil

A thick, homogeneous deposit of possible cultivation soil **02** was extensive across much of the site and varied in depth between 0.55 m and 0.75 m. A large assemblage of medieval and post-medieval finds was recovered from this feature, much of it by a local metal detectorist - see Finds index below. These included coins, brooches, buckles, a mirror case, pottery, slag and animal bone. The pottery assemblage suggests a 13th to 14th century date for the earliest working of these soils, but with activity continuing through to the 17th century.

6.3 West end - metalworking debris, ditch and cut features

At the western end of the main trench, and sealed by the cultivation soil **02**, the southern side of a curvilinear ditch **18** and a number of cut features **14, 16, 20** and **22** truncated an extensive deposit of disturbed natural sub-soil **23**. Most importantly, layer **23** contained large quantities of slag and burnt clay. A *tuyere* was also recovered. This area lay within what appeared to be a hollow in the sand dunes, with a N-S aligned strip of reddened sand **28** (possibly the truncated remains of a bank which may have been used in the metalworking process itself). Virtually no slag was recovered from the area to the east of this bank other than from the fills of features, and, therefore, the bank may have defined a metalworking zone.

6.4 East end - possible building and enclosure, ditches and pits

Truncating the possible turf bank was a large ditched enclosure **25**, of which the west and north sides were traced in plan. Internally, it measured c 18 m from east to west and terminated at what appeared to be the entrance to a contemporary circular, or round-ended, building at the east end of the enclosure. The entrance **52** comprised a hollow in which layers of flat stones had been laid. The north and south sides of the building survived (the rest lay outwith the trench or had been truncated) and was represented by two shallow, parallel ditches, the inner the foundation for the wall **42**, the outer possibly a drip trench **44**.

The building appears to have measured internally 5 m N-S. Possibly contemporary, was a rectangular pit **59** filled with slag, hammerscale and at least one iron object, partly truncated by a later ditch **57**. A similar feature **39** was also discovered within the enclosure, at the west end. This again contained slag, hammerscale and at least two iron objects. Both **39** and the stone-flagged entrance to the building **52** had been sealed by an extensive layer **37** filling an E-W aligned hollow.

Other features include two intercutting ditches **34**, aligned E-W, which had been truncated by the post-medieval ditch, and several pits, one of which, pit **32**, contained burnt bone and coarse pottery. Pit **36** was 0.4 m deep, and contained large packing stones in the upper fill.

7 Discussion

7.1 The medieval cultivation soils, which largely seal the site and thus preserved the earlier levels, have accumulated over several centuries, and contain a large assemblage of finds which will undoubtedly shed light on medieval Dornoch a period of which so little is known.

7.2 More detailed post-excavation analysis would shed light on the function of the features identified and establish a chronological framework for activity on this site. Even at this stage, there appears to be solid evidence for metalworking, both production (slag and furnace fragments) and manufacturing (hammerscale and objects *in situ*), possibly within defined working areas, and there is at least one building with an associated enclosure. This phase of activity is possibly early medieval in date and would complement the work at nearby Portmahomack.

8 Recommendations

8.1 Many of the features recorded during this watching brief continue beyond the main access road into the site and should not be disturbed further as part of this development. Once the business park is occupied, however, further development here is likely. Any new proposals should, therefore, be monitored and an appropriate programme of archaeological evaluation arranged as early as possible in the development.

8.2 The results of this work were too complex to report within the confines of a standard watching brief. Important information, for example, is contained within the soil samples collected, some of which are known to contain early pottery, animal bone, small finds and charcoal for possible radio-carbon dating as well as paleo-environmental data. The small finds, the bulk of which were recovered by metal detector, are currently held by SUAT, Mike Gallon, Inverness Museum and the National Museums of Scotland. These should be reported on as one assemblage and studied within the context of this site. The metalworking debris is a rare and potentially extremely important find and should be studied by an appropriate specialist.

8.3 A funded programme of post-excavation analysis is therefore recommended, integrating the stratigraphic, artefactual and ecofactual evidence. The publication of the results is also recommended in either a national or regional journal.

8.4 The archaeological work attracted considerable interest amongst the local community and a talk in Dornoch could be arranged as part of the Highland Archaeology Week programme.

9 Acknowledgements

9.1 Resurgam! and SUAT would like to acknowledge the curatorial role of Highland

Council Archaeology Services in managing this project. The authors would also like to thank the members of the Tain Archaeology Group and students on the Certificate of Practical Archaeology at Inverness for coming down to help on Bank Holiday weekend; the contractors, C Miller of Wick, for their help and assistance; Mike Gallon the metal detectorist and Robin Hanley, Inverness Museum, and Nick Holmes, National Museums of Scotland for comments on the finds.

SOIL SAMPLE INDEX

SAMPLE NO	CONTEXT NO	SAMPLE SIZE	DESCRIPTION
01	023	tubs	garden soil
02	113	tubs	ditch fill
03	171	tub	ditch fill
04	281	tub	turf bank
05	382	tubs	charcoal
06	401	tub	hammerscale
07	451	tubs	slag
08	532	tubs	pathway
09	481	finds bag	charcoal
10	587	tubs	charcoal/slag
11	581	finds bag	hammerscale
12	314	tubs	pit fill
13	561	tub	ditch fill

PLANS AND SECTIONS

Location plan showing main site grid points in relation to heritage centre car park and road alignment at scale 1:100.

Base plan (5 x A3 sheets in total) of all the features recorded on the line of the main access road at scale 1:50, forming 3 x A3 sheets of permatrace, with overlays for the central and eastern sheets.

Main N section of road cutting at scale 1:10 (3 x A4 sheets).

Plan at scale 1:20 of cut **12** (2 x A4 sheets).

Plan of cut **8** (1 A4 sheet) at scale 1:10.

Plan at scale 1:20 of cut **10** with profile.

A4 sheet with profile of cut **8**, and 2 profiles of cut **12**, all at scale 1:10.

Note

Profiles of all features were drawn as measured sketches on the back of relevant context sheets.

CONTEXT INDEX

NO	DESCRIPTION
01	Loosely compacted sandstone rubble, pebbles and mortar. Modern make-up for Heritage Centre car park.
02	Dark brown compact sandy loam with occasional charcoal flecks, bone fragments and shell flecks and fragments. Cultivation soil extensive across much of development area. Medieval to c 17th century.
03	Moderately compact yellow sand with no visible inclusions, observed in main south section only. Wind-blown sand.
04	Pale brown sand with frequent charcoal fragments on surface; moderate small-large slag fragments. Buried turf line.
05	Very pale, golden brown compact sand with grey silty root lines. Extensive across site but varies in colour. Natural sand sub-soil, heavily iron panned.
06	Black compact sand with mod stones. Contained slag, charcoal, burnt clay and bone. Fill of linear cut 08.
07	Grey brown loosely compacted silty sand with large stones. Lower fill of 08.
08	Curvilinear cut at west end of main trench, with concave base. Cut through natural sand, contains 07 + 06. Cut for house ?
09	Grey brown sticky sandy silt with occasional slag fragments. Fill of cut 10.
10	Shallow, irregular cut feature with concave base. Contains 09.
11	Grey brown silty sand with dark grey silt lenses, possibly organic. Fill of linear cut 12.
12	Curvilinear cut filled with 11. Varies in width, c 0.9 m and depth, c 0.4 m and from flat base to concave base. Ditch.
13	Mixed dark grey fine sand with patches of mid brown sand, occasional pebbles, shell fragments, charcoal fragments and flecks, and animal bone. Fill of hearth 14.
14	Cut for small hearth, contains 13.
15	Grey brown sandy silt fill of linear cut 16.
16	Shallow linear cut filled with 15.
17	Brown sand with shell fragments, pebbles, animal bone, slag. Lower fill has no inclusions other than occasional charcoal flecks. Fill of curvilinear ditch/gully 18.
18	Cut for curvilinear ditch/gully, filled with 17. Width c 0.35m, depth 0.2 m to 0.3 m. N terminal recorded in plan on north side of trench at west end.
19	Compact sandy silt with shell, slag and burnt clay. Fill of 20.
20	Curvilinear cut filled with 19. Severely truncated at north end.
21	Dark grey sandy silt fill of irregular cut/depression 22. Contained shell and burnt clay.
22	Irregular cut/depression containing fill 21.
23	Fine dull yellow sand extensive across west end of trench. shallow at north end, thickening at south end to 0.3m. Fills hollow in sand dunes, with significant quantity of slag.
24	Grey brown sand with shell, sandstone fragments, stones, pebbles, charcoal, animal bone. Fill of curvilinear ditch 25.
25	Cut for curvilinear ditch, filled with 24. Ditch for enclosure around house at east end of trench ?.

26 Loose dark brown sand silt with cockle shells, slag. Fill of ditch 27.
27 Cut for curvilinear ditch, filled with 26. Also visible in main north section and in plan at entrance to site. Large enclosure, possibly post-medieval.
28 Reddish orange fine sand, cut by ditch 25 to east. Possible turf bank, aligned N-S.
29 Compact dark brown fine sand with occasional large stones, burnt bone, small charc frags. Fill of small oval cut 30.
30 Small oval cut filled with 29. Diameter 0.4 m, depth 0.18m. Concave base. Small pit or post hole.
31 Dark grey to black compacted layer with coarse pottery, burnt clay and burnt bone. Fill of circular pit 32.
32 Shallow cut filled with 31. Pit.
33 Compact sand with pebbles, bone and slag. Fill of ditch 34.
34 Cut for possible ditch filled with 33. Concave base, sides at 45°.
35 Dark brown compact sand with charcoal flecks, and medium to large stones in upper fill. Fill of post hole 36.
36 Cut for post-pit, filled with 35. Shallow gully on south side appears to be part of same cut. Vertical sides and flat base. Post-pit.
37 Extensive layer of grey brown sand filling E-W aligned hollow.
38 Compacted charcoal fill of 39, with slag, burnt clay, hammerscale and at least 2 iron objects.
39 Rectilinear cut with concave base, filled with 38. Possible anvil-base.
40 Lens of hammerscale around 39.
41 Compact sand and silt with pebbles and slag. Fill of ditch or construction slot 42.
42 Cut for ditch or construction slot, filled with 41. Vertical sides and flat base.
43 Organic fill of construction slot 44. Possibly rotted sill beam.
44 Possible construction cut for wall, containing 43. Vertical sides. Possibly associated with cut 42, comprising wall foundation and drip trench.
45 Yellow sand. Natural sub-soil.
46 Compact sand silt loam with animal bone, shell and charcoal. Fill of rubbish pit 47.
47 Cut for rubbish pit, filled with 46.
48 Sand and silt fill of pit 49. Lower fill comprised laminated bands of charcoal.
49 Cut for oval pit, filled with 48. Sloping sides and flat base.
50 Compact pale grey sand and silt with charcoal. Fill of post-hole 51.
51 Cut for oval shaped, shallow post-hole, filled with 50.
52 Arrangement of large flat stones, seemingly packed around central slab. Pathway into house ?.
53 Fill between pathway stones 52, or trample. Cockles and slag present.
54 Compact redeposited yellow and white sand. Possibly fill of post-hole 55.
55 Post hole with post pad to support post, filled with 54.
56 Compact grey sand and silts with shells and slag. Fill of ditch/slot 57.
57 Cut for ditch, filled with 56. Vertical sides and flat base.
58 Charcoal fill of cut 59. Slag, hammerscale and iron objects present.
59 Rectangular cut containing 58. Possibly pit for anvil base.

TABLE 2 - Composition of the retents from Dornoch

Sample No	Context No	Ceramics	Metal	Fish Bone	Large animal bone	Small animal bone	Marine shell	Charred seeds	Charcoal	Slag	Comments
1	2	*	*	***	***	***	***		****		see 1
2	11				*		*		**	*	small bone frags mostly burnt
3	17				*		****				see 2
4	28					*	*		*	*	all highly fragmented
5	38				*		*		**	***	
6	40						*			***	1 shell frag.
7	45				***		*		*	*	see 3
8	53				*		*			***	
10	58				*		***		***	***	small bone and shell frags
12	31				***		**		**	*	burnt bone and teeth; bivalve molluscs
13	56				*		***			***	

1 animal bone highly fragmented; 2 fragments of glazed pottery; one piece of silver foil; one fragment of hazel shell

2 limpets, bivalves and others with many fragments

3 whole vertebra, and some teeth - some burnt; some roundwood

Key
* = rare, ** = occasional, *** = common

TABLE 1 - Composition of the flots from Dornoch

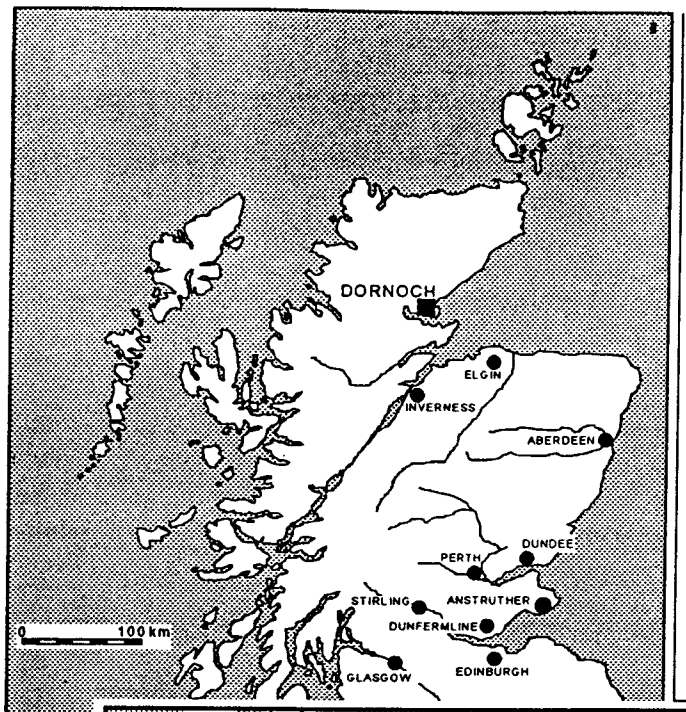
Sample No	Context No	Char-coal	Barley grain	Oat grain	Vesi-cular Frags	Comments
1	2	*	*			
2	11	*	*	*		hulled barley
3	17	**	*			
4	28	**				one cf flax seed, 2 Raphanus siliquas and 3 seeds
5	38	****				over one litre of charcoal possibly masking grain
6	40	**	*			one small legume seed
7	45	****	**	**		
8	53	***	**			
10	58	****	**			one Raphanus sp siliqua frag; some charcoal is large lumps
12	31	****	**		***	heather charcoal and other species
13	56	***	**			

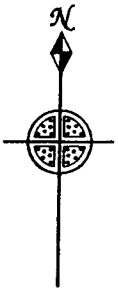
Key
* = rare, ** = occasional, *** = common, **** = abundant

FIG 1

Dornoch

Regional Setting





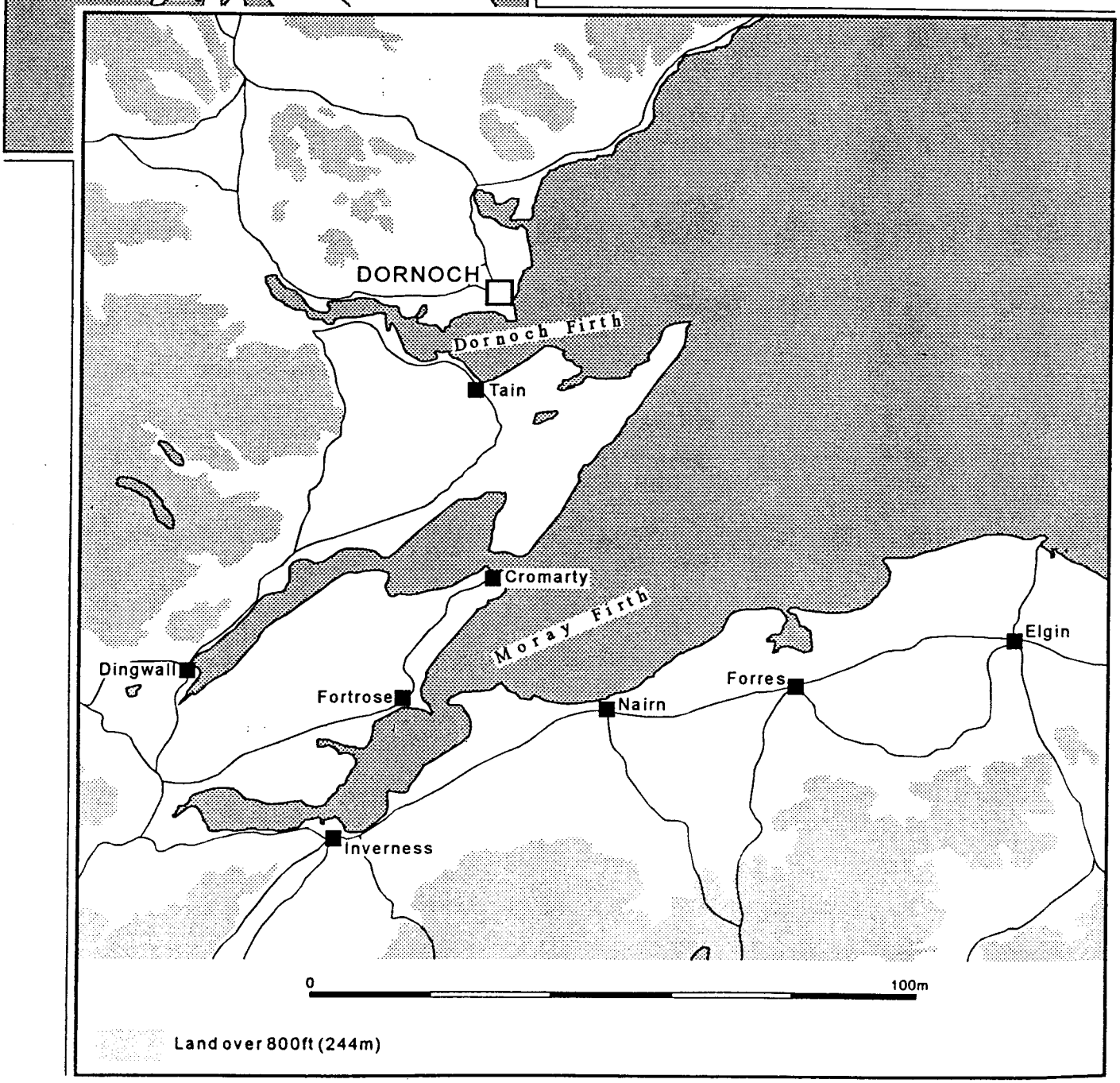


FIG 2

Location of Development at The Meadows, Dornoch

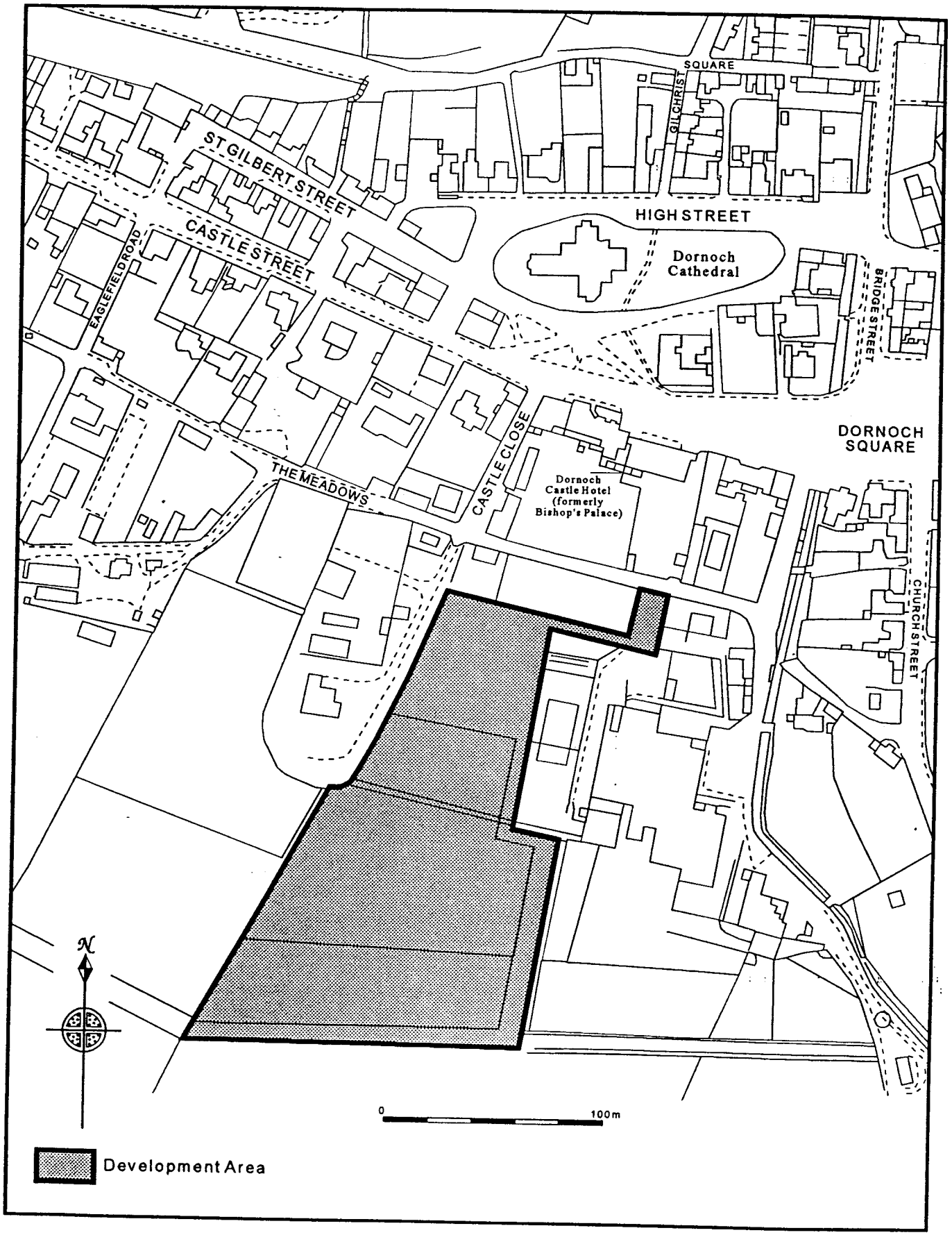


FIG 3

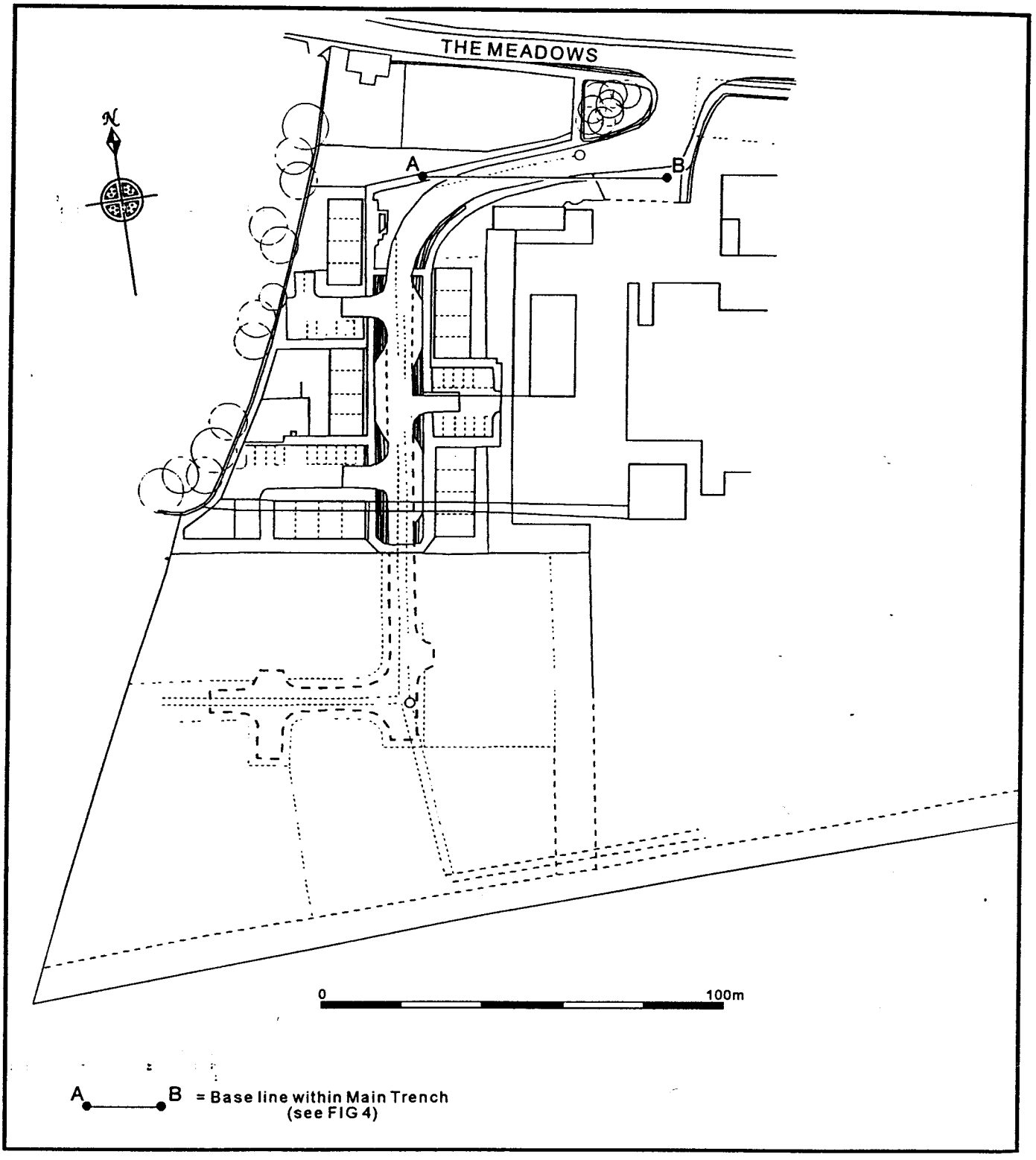

THE MEADOWS
N
A
B
0
100m
A B = Base line within Main Trench
(see FIG 4)

FIG 4

Trench Plan