

Appendix 16.3 Archaeological Excavation Report



Archaeological Excavation Report

Kilcarbery Grange,
Clondalkin,
County Dublin

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for:

South Dublin County Council

Licence Number: 17E0367 Extension

10th December 2018

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1 INTRODUCTION

1.1 General

This report describes the results of an archaeological excavation (Licence Number 17E0367 Extension) carried out on features identified during pre-construction test trenching at Kilcarbery Grange, Clondalkin, County Dublin (figure 1). The excavation was carried out by Dermot Nelis and Colm Flynn on behalf of South Dublin County Council, and took place intermittently between 12th March and 30th April 2018. In total the excavation took 12 no. days to complete.

Archaeological test trenching (Licence Number 17E0367) was undertaken on the site by Dermot Nelis and Colm Flynn (Licensed archaeologists) between 16th November and 8th December 2017. Test trenching was carried out by two machines fitted with 1.8m wide flat buckets, and under constant archaeological supervision. The results of the testing trenching are documented in a separate report which has been submitted to National Monuments Service (NMS), the National Museum of Ireland (NMI) and South Dublin County Council.

The objectives of the archaeological excavation were to preserve by record all features identified during the test trenching phase, and to establish if associated subsoil archaeological remains were present within the development area.

1.2 The Development

South Dublin County Council proposes to develop approximately 1,000 dwellings over a 5–7 year period on a site measuring 87.37 acres (35.36 hectares).

The following townlands are located within the development area: Corkagh Demesne, Deansrath, Kilcarbery and Nangor.

1.3 Project Background

Archaeological research and fieldwork have been undertaken in four phases. The first phase consisted of a paper and digital survey of archaeological, historical and cartographic sources, resulting in the preparation of a detailed desk-based assessment (Nelis 2016). The second phase involved a geophysical survey of the development area (Leigh 2017), while the third phase involved excavating test trenches within the development area (Nelis 2018). The fourth phase relates to

excavation of the archaeological features recorded during the test trenching programme as discussed in this report.

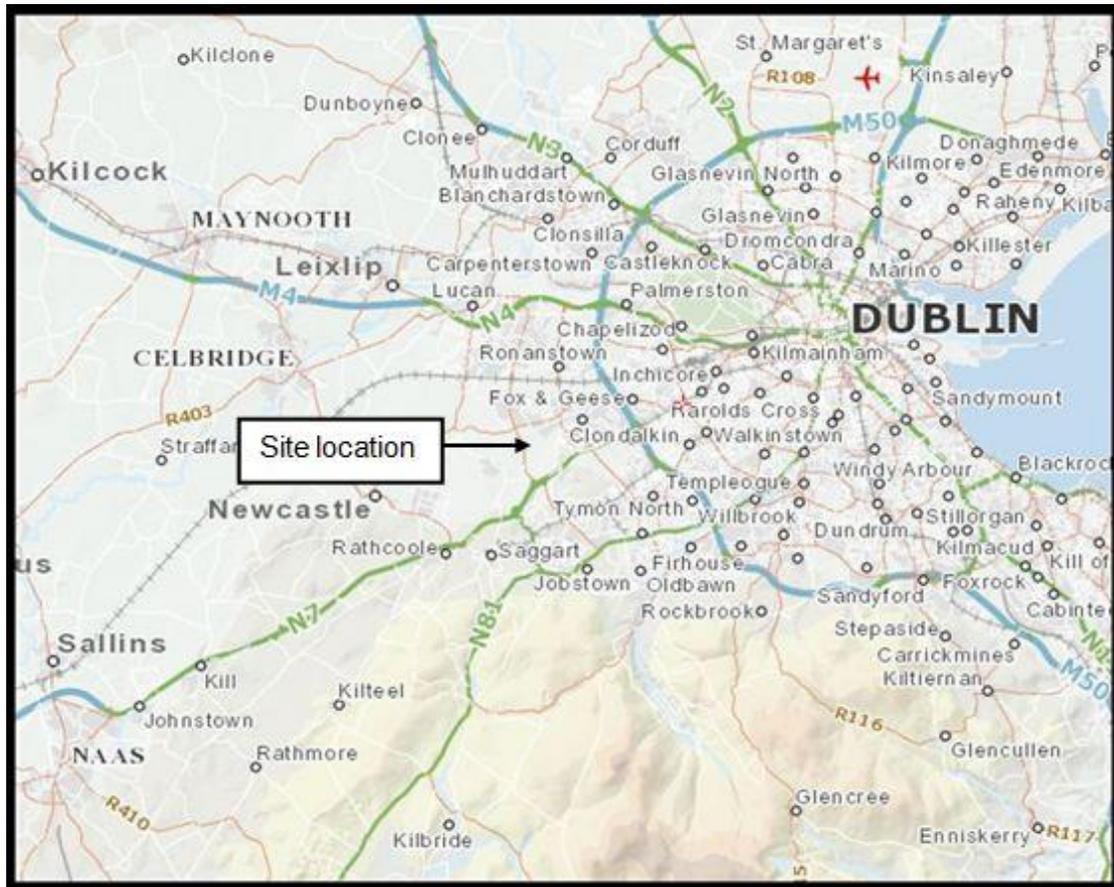


Figure 1: Site location

1.4 Project Team

Dermot Nelis BA ArchOxon ACIfA MIAI

Dermot Nelis graduated from Queen's University Belfast, and after gaining extensive fieldwork experience undertook postgraduate studies at the University of Oxford in archaeological consultancy and project management.

Dermot acted as Senior Archaeologist on several road schemes for various County Councils, and Directed large-scale multi-period excavations associated with those developments. He has completed over 125 Licensed fieldwork programmes and more than 250 archaeological, architectural and cultural heritage desk-based reports and Environmental Impact Assessments.

Colm Flynn BA MIAI

Colm graduated from Galway Mayo Institute of Technology in 2001, with a BA in Archaeology and Heritage Management. Colm became eligible to hold Archaeological Licences in the Republic of Ireland in 2006 and Northern Ireland in 2016.

Colm has worked on large-scale infrastructural development projects throughout Ireland, including road, rail, water, gas, industrial, commercial and residential developments. He has carried out approximately 50 excavations in Ireland, identifying archaeological material from the Neolithic to the Post-Medieval Periods, and has extensive experience contributing to Environmental Impact Assessment Reports.

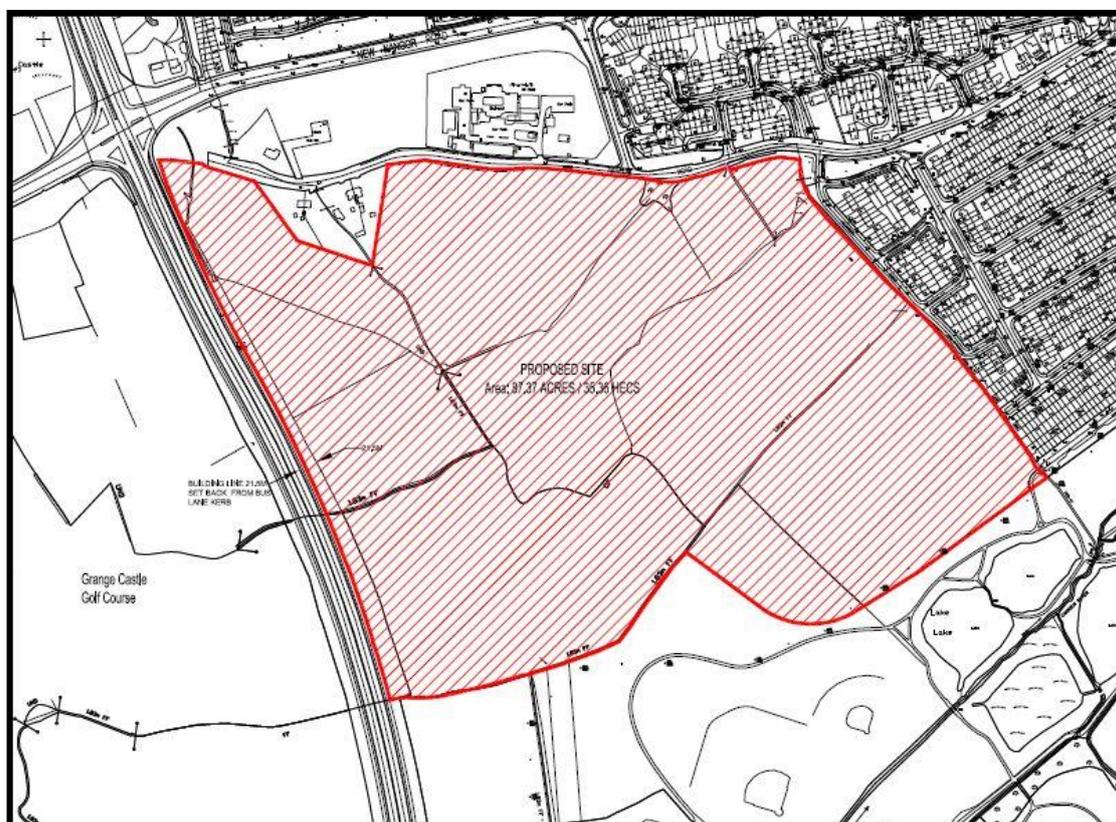


Figure 2: Site layout

2 BASELINE ENVIRONMENTAL STUDY

2.1 Methodology

Research was undertaken in two phases. The first phase consisted of a paper and digital survey of archaeological, historical and cartographic sources. The second phase involved a field inspection of the development area.

2.2 Paper and Digital Survey

The following sources were examined, and a list of sites and areas of archaeological potential was compiled:

- Record of Monuments and Places of County Dublin;
- Cartographic and documentary sources relating to the study area;
- Aerial photographs of Ordnance Survey Ireland and Bing aerial photography;
- Topographical Files of the National Museum of Ireland;
- South Dublin County Council Development Plan (2016-2022).

Record of Monuments and Places is a list of archaeological sites known to the National Monuments Service. Back-up files of the Sites and Monuments Record (SMR) provide details of documentary sources and field inspections where these have taken place.

Cartographic sources are important in tracing land use development within an area of land take, as well as providing important topographical information on sites and areas of archaeological potential. Cartographic analysis of relevant maps has been made to identify any topographical anomalies that may no longer remain within the landscape. **Documentary sources** were consulted to gain background information on the historical and archaeological landscape of the development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its potential to contain previously unidentified archaeological remains.

Topographical Files of the National Museum of Ireland is the archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts, but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information in the discovery of sites of archaeological significance.

South Dublin County Council Development Plan (2016-2022) contains Objectives and Policies on the preservation and management of archaeological features. It was consulted to obtain information on sites within the 1km study area.

2.3 Field Inspection

Field inspection is necessary to determine the extent, character and condition of archaeological remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.



Figure 3: Aerial photograph, showing the development area

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 General

During the Mesolithic period (c. 7,000-4,000 BC) people existed as hunters/gatherers, living on the coastline, along rivers and lakesides. They used flint and other stones to manufacture sharp tools, and locating scatters of discarded stone tools and debris from their manufacture can sometimes identify settlements. The native landscape consisted of woodland with hazel, oak, ash and Scot's pine as the primary species and Mesolithic hunting groups made no significant impact on the landscape.

Late Mesolithic and Neolithic fish traps were discovered during archaeological monitoring of development works on reclaimed land on the north bank of the River Liffey in 2004 (at depths of approximately -6m OD and -4m OD, respectively) (McQuade and O'Donnell 2007, 569-584). A Mesolithic shoreline was revealed and the remains of up to five wooden fish traps were excavated. The fish traps were constructed almost exclusively of hazel (*Corylus avellana*), and while fragmentary, were in a relatively good state of preservation, with tool marks in evidence. Radiocarbon determinations from five wood samples returned a date range of between 6,100 – 5,720 cal BC, suggesting that these are the earliest fish traps recorded in Ireland and the United Kingdom.

The population became more settled during the Neolithic period (c. 4,000-2,400 BC) with a subsistence economy based on crop growing and stock-raising. This period also saw changes in burial practices, and a tradition of burying the dead collectively and carrying out of cremations emerged. Neolithic monuments from County Dublin include portal, passage and wedge tombs.

The Bronze Age (c. 2,400-600 BC) is characterised by the introduction of metalworking technology to Ireland and coincides with many changes in the archaeological record, both in terms of material culture as well as the nature of the sites and monuments themselves. Though this activity has markedly different characteristics to that of the preceding Neolithic period, including new structural forms and new artefacts, it also reflects a degree of continuity. During this period knowledge of metalworking was acquired resulting in changes in material culture such as the introduction of metal tools and artefacts, as well as the introduction of a highly decorated pottery called Beaker pottery. In addition to changes in material

culture, there were changes in burial rite from communal megalithic tombs to single burial in cists.

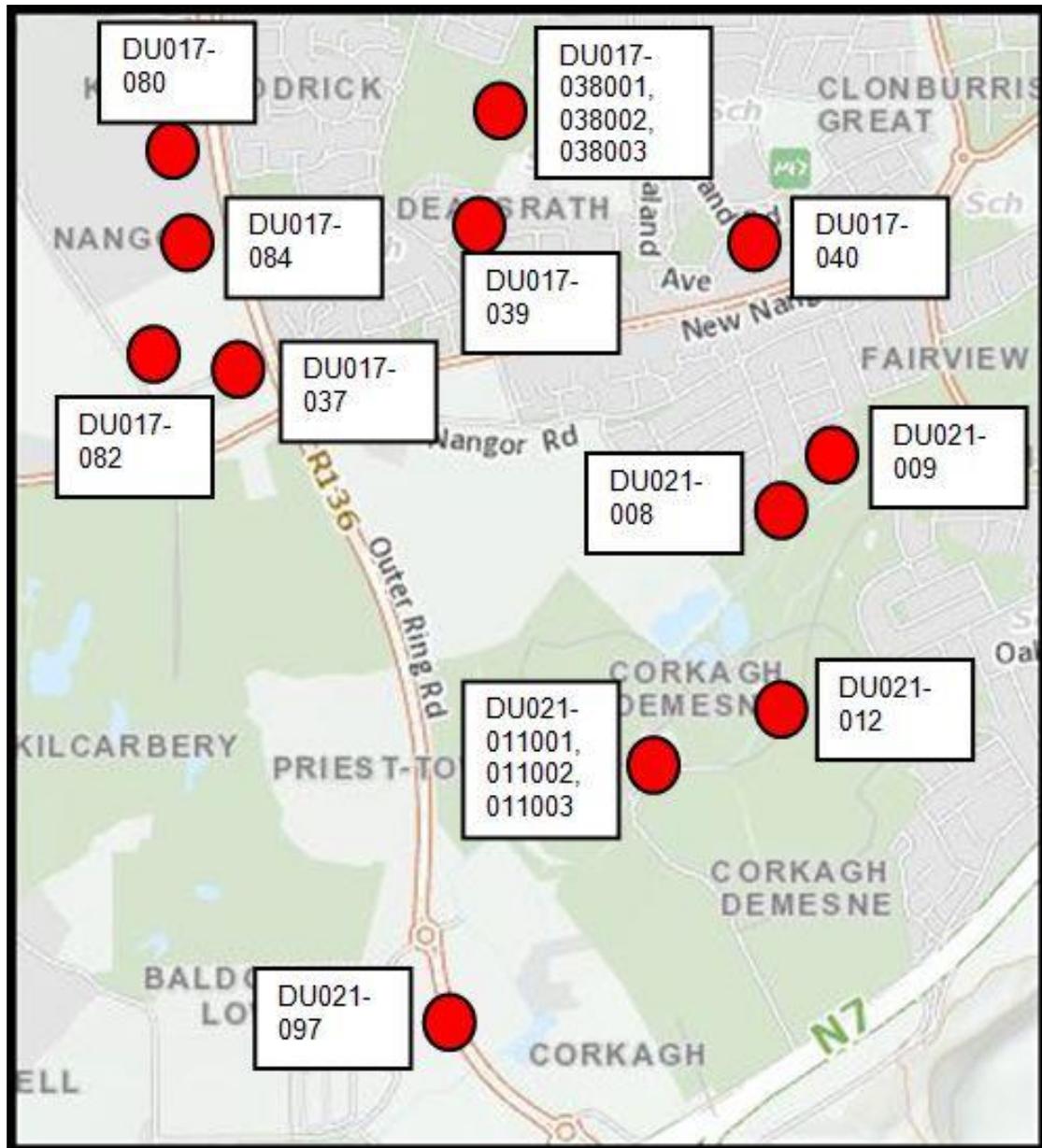


Figure 4: RMP sites within the 1km study area

By the 4th millennium BC, a farming economy was developing that involved forest clearance. Archaeological and pollen records show an increasingly settled landscape with some fixed field boundaries for livestock and cereal production. While farming did spread throughout the country, the preference was for light soils and upland margins with free draining soils and light woodland cover. Extensive use of the productive though heavy soils of the poorly drained central lowlands was restricted by virtue of the limitations of available tools and technology.

Bronze Age monuments from County Dublin include standing stones, stone pairs, cairns, barrows and *fulachta fiadh*, which are one of the most numerous monument types in Ireland with over 4,500 examples recorded (Waddell 2005, 174).

A ring-barrow (DU017-080) is recorded in Kilmahuddrick townland, approximately 730m north west of the development area (www.archaeology.ie). It was revealed through geophysical survey and test trenching, and consisted of a ditch (2.5m wide x 1.6m deep) which enclosed a maximum area of 13m. Fragments of a human skull were found in the upper fill of the ditch, while a cist-like structure was exposed in the northern quadrant of the ditch. Cremated bone associated with Early Bronze Age pottery and a bead were found within the interior of the enclosing ditch. Soil samples from the ditch contained remains of barley, wheat, oats and evidence for hazel, haw and sloe.

Ring-barrows are circular mounds of earth surrounded by a ditch with an external bank. The mounds were usually quite low and were often no higher than the surrounding bank (Waddell 2005, 365). They are widely distributed, and while they vary in size most seem to range in overall diameter from approximately 15m to 25m. The limited evidence of circular ring-barrows and ring-ditches indicates cremation-type burials from the later centuries BC and early centuries AD, with the occasional deposition of small token deposits of bone. Ring-ditches are interpreted as being the likely remains of ploughed-out ring-barrows, especially when they occur in groups of two or more as ring-barrows sometimes do, forming small cemeteries.

A *fulacht fiadh* (DU017-084) is recorded in Nangor townland, approximately 530m north west of the development area. It is recorded (www.archaeology.ie) that monitoring of topsoil-stripping in 2000 revealed the remains of a small *fulacht fiadh* in this area, consisting of a small pit or trough, a spread of heat-cracked stone and a linear feature to the south west of the trough. The pit/trough consisted of a sub-circular cut into natural geology which measured 1.25m x 0.56m. The spread of stone measured 1.92m north/south x 1.18m with a maximum depth of 0.05m. Approximately 6m to the west of the spread, a linear gully feature was revealed. This consisted of a cut into natural boulder clay measuring 2.57m north/south x 0.28-0.54m. It had a depth of 0.16m with sharply sloping sides and a flat base. The cut was filled with a moderately compact, mid-brown clay containing frequent pieces of oxidised clay and occasional flecks of charcoal. Infrequent fragments of burnt bone were noted in the fill.

A habitation site (DU021-012) is recorded approximately 400m south east of the development area in Corkagh Demesne townland (www.archaeology.ie). Excavations prior to the construction of the North Eastern Gas Pipeline revealed a scatter of stake/post holes in possible association with a gully. Stone implements including a flint leaf-shaped point and a chert end scraper were found.

During the Iron Age (c. 600 BC-400 AD) new influences came into Ireland which gradually introduced the knowledge and use of iron, although for several centuries bronze continued to be widely used. The Iron Age in Ireland however is problematic for archaeologists as few artefacts dating exclusively to this period have been found, and without extensive excavation it cannot be determined whether several monument types, such as ring-barrows or standing stones, date to the Bronze Age or Iron Age. Most knowledge for this period stems from Irish folklore, the epic poems and legends of warrior kings and queens that are traditionally believed to be Celtic in origin.

The Early Medieval period (c. 400-1169 AD) is depicted in the surviving sources as entirely rural, characterised by the basic territorial unit known as *túath*. Walsh (2000, 30) estimates that there were at least 100, and perhaps as many as 150, kings in Ireland at any given time during this period, each ruling over his own *túath*.

The new religious culture brought changes in settlement and agricultural patterns. The ringforts and associated field patterns of the Early Medieval period indicate a life largely based on grazing. During this turbulent period roughly circular defensive enclosures known as ringforts were constructed to protect farmsteads. They were enclosed by an earthen bank and exterior ditch, and ranged from approximately 25m to 50m in diameter. The smaller sized and single banked type (univallate) was more than likely home to the lower ranks of society, while larger examples with more than one bank (bivallate/trivallate) housed the more powerful kings and lords. They are regarded as defended family homesteads, and the extant dating evidence suggests they were primarily built between the 7th and 9th centuries AD (Stout 1997, 22-31).

The ringfort is considered to be the most common indicator of settlement during the Early Medieval period. The most recent detailed study (*ibid.*, 53) has suggested that there is an approximate total of 45,119 potential ringforts or enclosure sites throughout Ireland.

Enclosure sites belong to a classification of monument whose precise nature is unclear. Often they may represent ringforts, which have either been damaged to a point where they cannot be positively recognised, or are smaller or more irregular in plan than the accepted range for a ringfort. An Early Medieval date is in general likely for this site type, though not a certainty.

An enclosure (DU017-040) has been recorded through aerial photography in Bawnoges townland, approximately 600m north east of the development area. This feature no longer survives above-ground.

The Early Medieval period is also characterised by the foundation of a large number of ecclesiastical sites throughout Ireland in the centuries following the introduction of Christianity in the 5th century. The early churches tended to be constructed of wood or post-and-wattle. Between the late 8th and 10th centuries mortared stone churches gradually replaced the earlier structures. Many of the sites, some of which were monastic foundations, were probably originally defined by an enclosing wall or bank similar to that found at coeval secular sites. This enclosing feature was probably built more to define the sacred character of the area of the church than as a defence against aggression. An inner and outer enclosure can be seen at some of the more important sites; the inner enclosure surrounding the sacred area of church and burial ground and the outer enclosure providing a boundary around living quarters and craft areas. Where remains of an enclosure survive it is often the only evidence that the site was an early Christian foundation.

The commencement of Viking raids at the end of the 8th century and their subsequent settlement during the following two centuries marked the first ever foreign invasion of Ireland. Viking settlement evidence is scarce and has been found in Cork, Dublin and Waterford, however excavations there have revealed extensive remains of the Viking towns. Outside these towns, understanding of Viking settlement is largely drawn from documentary and place-name evidence. In addition to Cork, Dublin and Waterford, documentary sources provide evidence for the Viking foundation of the coastal towns of Limerick and Wexford (Edwards 2006, 179). Other indirect evidence which suggest Viking settlement, or at least a Norse influence in Ireland, is represented by upwards of 120 Viking-age coin hoards, possible votive offerings of Viking style objects and the assimilation of Scandinavian art styles into Irish design. While the initial Viking raids would have been traumatic, the wealth and urban expansion brought into the country

as a result of Viking trading would have eventually benefited the Gaelic Irish and cultural assimilation in some parts would have been significant.

The arrival of Anglo-Normans in Ireland towards the end of the 12th century caused great changes during the following century. Large numbers of colonists arrived from England and Wales and established towns and villages. They brought with them new methods of agriculture which facilitated an intensification of production. Surplus foods were exported to markets all along Atlantic Europe which created great wealth and economic growth. Results of this wealth can be seen in the landscape in the form of stone castles, churches and monasteries.

The political structure of the Anglo-Normans centered itself around the establishment of shires, manors, castles, villages and churches. In the initial decades after the Anglo-Norman invasion a distinctive type of earth and timber fortification was constructed- the motte and bailey. Mottes were raised mounds of earth topped with a wooden or stone tower while the bailey was an enclosure, surrounded by an earthen ditch with a timber palisade, used to house ancillary structures, horses and livestock. There are six motte and baileys recorded in County Dublin (www.archaeology.ie).

In certain areas of Ireland Anglo-Norman settlers constructed square or rectangular enclosures, now termed moated sites. Their main defensive feature was a wide, often water-filled, fosse with an internal bank. As in the case of ringforts, these enclosures protected a house and outbuildings usually built of wood. They appear to have been constructed in the latter part of the 13th century though little precise information is available. There are six moated sites recorded in County Dublin (www.archaeology.ie).

A church (DU017-038001), graveyard (DU017-038002) and moated site (DU017-038003) are recorded in Kilmahuddrick townland, approximately 750m north of the development area.

More substantial stone castles followed the motte and bailey and moated sites in the 13th and 14th centuries. Tower houses are regarded as late types of castle and were erected from the 14th to early 17th centuries. Their primary function was defensive, with narrow windows and a tower often surrounded by a high stone wall (bawn). An Act of Parliament of 1429 gave a subsidy of £10 to “*liege*” men to build castles of a minimum size of 20ft in length, 16ft in breadth and 40ft in height (6m x 5m x 12m). By 1449 so

many of these £10 castles had been built that a limit had to be placed on the grants. The later tower houses were often smaller, with less bulky walls and no vaulting. There are 61 tower houses recorded in County Dublin (www.archaeology.ie).

An unclassified castle (DU017-037) is recorded in Nangor townland, approximately 200m north west of the development area. It was named “*Nangor castle*” on the First Edition Ordnance Survey 6-inch map and “*Nangor castle on site of castle*” on a later edition, suggesting that it had been incorporated into a 19th century structure. All buildings on the site have been demolished, leaving no surface trace of the earlier structure. There are earthworks in the field to the south of the castle. Pre-development testing in the vicinity of the castle in 1996 produced evidence for a substantial ditch and an associated shallower linear feature of uncertain date. Trial-trenching in the field bounding the castle to its south uncovered several lignite cores and slivers, pottery and metal slag, suggesting a date in at least the Early Medieval period. Human skeletal remains were also uncovered, as were numerous charcoal-flecked irregular features (www.archaeology.ie).

An unclassified castle (DU021-011001) is recorded in Corkagh Demesne townland, approximately 330m south of the area of land take. According to Ua Broin (www.archaeology.ie), Corkagh House “*stood within the moat of a castle, ruins of which consisted of an arched entrance, portion of a battlemented parapet and eight windows*”. Corkagh House was demolished except for the stable yard in the 1960's, and there is no visible surface trace of the castle or the moated site (DU021-011002). A mill (DU021-011003) of uncertain date has also been noted near Corkagh House (www.archaeology.ie).

A tower house (DU017-039) is recorded approximately 450m north of the development area in Deansrath townland. All that survives of Deansrath Castle is portion of a stair tower, which rises to two storeys with a partially vaulted over-ground floor. It appears to be part of a gatehouse shown in a drawing by Beranger in 1773 (www.archaeology.ie), and was part of a larger castle complex described in the 18th century as defended by a deep enclosing ditch. The Dean of St. Patrick was proprietor in 1641, but by 1656 it was described as the “*stumpe of a castle*”.

A Medieval field system (DU017-082) is centered on a point approximately 380m north west of the development area in Nangor townland. An excavation in 2001

revealed a Medieval ditch complex which appears to have represented the remains of field boundaries with associated water management gullies.

Field systems are regarded as a group or complex of fields which are related and may date to any period from the Neolithic onwards. The practice of enclosing fields in Ireland for agricultural and other purposes dates back to the Neolithic period. The enclosed land could have been used for stock-raising, plant husbandry and crop protection. The fields can vary in size and it is possible that many of them are more extensive than currently thought. A wide range of monuments, such as barrows, ringforts, souterrains, hut sites, ecclesiastical remains *etc.*, can be found inside field systems.

The 14th century throughout north west Europe is generally regarded as having been a time of crisis, and Ireland was no exception. Although the Irish economy had been growing in the late 13th century, it was not developing quickly enough to support the rapidly expanding population, especially when Edward I was using the trade of Irish goods to finance his campaigns in Scotland and Wales. When the Great European Famine of 1315-1317 arrived in Ireland, brought about by lengthy periods of severe weather and climate change, its effects were exacerbated by the Bruce Invasion of 1315-1318. Manorial records which date to the early 14th century show that there was a noticeable decline in agricultural production. This economic instability and decline was further worsened with the onset of the Bubonic Plague in 1348.

Before the Tudors came to the throne the kings of England were also the kings of western France and so, during the 14th and 15th centuries, the various lords who ruled in Ireland were largely left to themselves. The Tudor conquest however brought a greater interest in the affairs of Ireland. They wanted to put a stop to the raids of the Gaelic Irish on areas under English rule. To do this, they ruthlessly put down any rebellions and even quashed inter-tribal feuds. English settlers were then brought in to settle their lands. The first of these plantations occurred in the mid-16th century in what is now Laois and Offaly. After the Desmond rising in Munster in 1585 came another plantation, and parts of south western Tipperary were planted at that time.

From 1593 until 1603 there was a countrywide war between the Gaelic Irish, who were supported by the French, and the Elizabethan English. The Irish were finally defeated and with the "*Flight of the Earls*" from Rathmullan, County Donegal in 1607, Ulster, which had previously been independent of English rule, was planted.

Expansion in the agricultural sector following a period of economic growth in Ireland from the mid-1730s led to rising prices and growth in trade. This increase in agricultural productivity resulted in growth in related industrial development throughout the country.

The 1798 Rebellion was a major event in Ireland's history. Formed in 1791, The United Irishmen had variant views: from parliamentary reform within the existing English structure to an outright overthrow of the system and the establishment of an Irish Republic. This period has been described as the "*crucible of Modern Ireland*" (Killeen 2003, 5).

A mill (DU021-008) is recorded in Fairview townland, approximately 270m east of the area of land take. No further information is recorded on the National Monuments Service online database. A well (DU021-009) is also recorded in Fairview townland, approximately 390m east of the development area. Known as Two Sisters well, it no longer survives above-ground (www.archaeology.ie). A corn-drying kiln (DU021-097) is recorded in Baldonnell Lower townland, approximately 880m south of the development area. Again, no further information is recorded on the National Monuments Service online database.

3.2 Summary of Previous Fieldwork in the General Development Area

Reference to Summary Accounts of Archaeological Excavations in Ireland (www.excavations.ie) revealed that no fieldwork projects, with exception of the test trenching programme and excavation to which this report relates, have been carried out within the development area.

Numerous fieldwork projects revealing extensive archaeological remains have been carried out in townlands surrounding the development area. The following list summarizes sites in which archaeological material has been discovered in close proximity to the development area.

| | |
|-----------------------|----------------------|
| Site name | Corkagh Demesne |
| Licence No. | Not recorded |
| Licence holder | Margaret Gowen |
| Site type | Suspected enclosure |
| ITM | E 705616m, N 730291m |

No further information is recorded on this possible Medieval enclosure.

| | |
|-----------------------|--|
| Site name | Nangor Castle/Grange Castle, Kilmahuddrick, Clondalkin |
| Licence No. | 97E0116 |
| Licence holder | Cia Mc Conway |
| Site type | Medieval? |
| ITM | E 704428m, N 731227m |

Test-trenching was carried out along the line of a road leading northwards from the vicinity of the now-demolished Nangor Castle to Grange Castle, within the area of a proposed industrial park. This was the second phase of testing, the first phase having concentrated on the field to the immediate south of Nangor Castle and its general vicinity.

An intensive geophysical survey had been carried out along the line of the proposed road and several anomalies were identified. This testing specifically examined the areas of anomalies, as agreed with the National Monuments Service. Trenching was carried out by machine, and halted once *in situ* archaeological deposits were encountered. However, as experienced before, only subsoil-cut features survived-years of ploughing and the fairly shallow ploughsoil led to the removal of any potential archaeological stratigraphy.

Seven trenches were opened. Of these, only three, all located in Grange Field 3, to the east of Grange Castle, produced any significant archaeology. Two linear features 0.5-0.8m wide, of unknown date and function, ran in a north/south direction. However, their proximity both to the 15th century castle and to one another could suggest substantial archaeological potential. Some spreads of brown soil had 20th century pottery inclusions in their upper surface, while other areas, a mix of brown soil and broken slate subsoil, were probably the result of the dragging action of the plough.

| | |
|-----------------------|--|
| Site name | Grange Castle Business Park, Kilmahuddrick, Clondalkin |
| Licence No. | 97E0116ext |
| Licence holder | Richard N. O'Brien |
| Site type | Medieval |
| ITM | E 703948m, N 731830m |

Monitoring and excavation were undertaken in advance of the construction of an access road and the excavation of foul sewers for a Business Park at Grange Castle. The excavation work continued until February 1998. Documentary evidence is scarce for Nangor Castle, but it is known that a castle stood on the site in the 16th century.

Grange Castle is an upstanding 15th century tower house. It is proposed to develop an industrial park in this area.

Previous archaeological assessment by Cia Mc Conway and geophysical survey by A. Mc Cleary, ADS Ltd, in February 1997 established that the area was archaeologically sensitive.

In advance of construction of a site access road, topsoil was stripped from a 24m wide area by mechanical excavator, under archaeological supervision, for a distance of 480m northwards from Nangor Road. A further strip, 6m wide and 1.3km long, was excavated for sewers. The full 24m wide strip was excavated in the field adjacent to Grange Castle.

All archaeological features uncovered had been truncated by deep ploughing, resulting in the removal of all but sub-surface features cut into natural boulder clay.

A curving ditch was identified in Field 1; it terminated at Nangor Road, and was orientated north east/south west. It was 30m in length, 0.8-0.9m deep and 1.2-2.4m wide. The eastern terminus continued beyond the limits of the excavation. The upper fills contained charcoal, mortar, flint and animal bone, and were aceramic. A decorated bone comb, stick-pin and knife gave the later ditch phase a terminus *ante quem* of from the 12th to the 13th century AD.

A stone causeway, 0.5-0.6m wide and 0.06-0.1m deep, crossed the ditch. The existence of this ditch had been shown in Mc Conway's assessment.

Field 7 is located between Grange Castle and the Kilmahuddrick Housing Estate. Two curving ditches were identified in this field. One was found under a Post-Medieval stone and brick trackway. It was 51m in length and varied in width from 1.1m to 1.4m, and in depth from 0.3m to 0.4m. A stone causeway, 0.6-0.84m wide, crossed it towards the western side of Field 7. No datable finds came from the primary fills of the ditch, but the secondary fills consisted of charcoal-rich clays with animal bone. It continued beyond the limits of the excavation at its western end.

A second ditch was found 1.6m east of the eastern terminus of the first. No archaeological features or deposits were found in this gap. The second ditch closely resembled the first; it was 22m long, 2m wide and 0.5-0.6m deep. The primary fills were sterile apart from some animal bone. The secondary fills consisted of charcoal-rich clays in which were found animal bone, mortar, two metal knives and a fragment of worked lignite. An incomplete one-sided decorated bone comb and fragments of another in the upper fills gave a terminus *ante quem* of the 12th to 13th century AD. This ditch continued beyond the limits of excavation at its eastern end. The evidence from Field 7 suggests that extensive Early Medieval and Post-Medieval activity

survives in this area; the ditches can be interpreted as Medieval field boundaries. A pit that contained a deposit of iron slag was found in Field 2, north of the site of Nangor Castle; it was associated with post-holes and stake-holes, though no structural pattern could be discerned. Elsewhere various pits, hearths, furrows and field drains were recorded; some of the hearths may be prehistoric in date.

| | |
|-----------------------|---|
| Site name | Grange/Kilmahuddrick/Nangor (Grange Castle International Business Park), Clondalkin |
| Licence No. | 00E0718 |
| Licence holder | Ian W. Doyle |
| Site type | Monitoring & <i>fulacht fiadh</i> |
| ITM | E 704228m, N 731827m |

Monitoring of topsoil-stripping commenced in early September 2000. In Nangor townland the remains of a small *fulacht fiadh* were revealed. This consisted of a small pit or trough, a spread of heat-cracked stone and a linear feature to the south west of the trough. The pit/trough consisted of a sub-circular cut into natural, 0.56m x 1.25m. The cut was steep-sided, leading to a flat base. It was filled with a mix of silt and compact, stony clays.

A spread of heat-shattered sandstone was located some 0.9m to the west of the trough. This spread consisted of a moderately compact, dark grey, sandy clay with frequent inclusions of heat-shattered sandstone fragments, pieces of burnt clay and charcoal. This spread measured 1.92m north/south x 1.18m with a maximum depth of 0.05m.

Approximately 6m to the west of the spread a linear gully feature was revealed. This gully consisted of a cut into natural boulder clay measuring 2.57m north/south x 0.28–0.54m. This had a depth of 0.16m with sharply sloping sides and a flat base. The cut was filled with a moderately compact, mid-brown clay containing frequent pieces of oxidised clay and occasional flecks of charcoal. Infrequent fragments of burnt bone were noted in the fill. Some 4m to the south of the heat-shattered sandstone spread, a small linear gully feature was excavated. This measured c. 1 m north east/south west x 0.12m with a depth of 0.14m. The fill of this comprised a mid-brown, sandy clay with frequent charcoal flecking. No archaeological objects were recovered.

To the south of the *fulacht fiadh*, a back-filled field boundary was revealed by topsoil-stripping. The alignment of this boundary possibly corresponds with a similar ditch encountered in Field 113.

| | |
|-----------------------|---|
| Site name | Grange Castle International Business Park, Grange and Kishoge |
| License No. | 00E0061 |
| Licence holder | Ian W. Doyle |
| Site type | Various |
| ITM | E 604180m, N 732147m |

Test-trenching was carried out at Grange Castle International Business Park, Clondalkin, Dublin 22, on a site owned by South Dublin County Council, during February 2001. The greater part of the site was under development as a business park.

The assessment was concerned with the area immediately south of the Grand Canal in Grange and Kishoge townlands. It is intended to construct an attenuation lake in this area, which will aid drainage. The lake structure will measure approximately 250m north west/south east x 90m. An underground 110kV electricity cable will run through this area and towards the west for a length of approximately 1.5km. The terrain in the areas to be affected is relatively low-lying and the land has been used for agricultural purposes. The centre of the area intended for the attenuation lake was subjected to ground disturbance in the recent past. This disturbance appears to have been associated with the diversion of a stream and ground was stripped to bedrock in places.

Sixteen trenches were opened by mechanical excavator. These were placed in the areas which would be subjected to disturbance by the attenuation lake and the electricity cable way-leave.

Trench 1 was located at the western end of the lake and associated roadway. It revealed a long linear feature cutting natural subsoil. Where sectioned, the cut for this feature, which measured 2.6m east/west x 16.5m with a depth of 0.35m, comprised a sloping-sided flat-bottomed gully. The upper fill consisted of a moderately compact light brown clay silt with occasional inclusions of mollusc shells and small pebbles. The lower fill comprised a moderately compact grey clay with occasional mollusc shell inclusions. A small undated hearth was revealed in Trench 4, which was also located to the west of the lake.

Trench 13 was opened on the line of the electricity cable way-leave, at a point where a mound and masonry wall were observed in the extreme north eastern corner of the field. What is likely to be a modern agricultural feature was revealed, comprised of a mound, a stone wall and a metalled surface. This is likely to represent a watering-hole for livestock formed by excavating a depression, placing the upcast to the west into a

mound, which was then revetted with a low masonry wall. A metalled surface was then placed at the point of animal access.

| | |
|--|----------------------|
| Site name | Corkagh Demesne |
| Licence No. | 00E0935 |
| Licence holder | Ruth Elliott |
| Site type | Pit furnace |
| ITM | E 705616m, N 730291m |
| <p>A nearly circular pit (measuring 1.5m x 1.2m in plan) with sharply sloping sides, a concave base and a depth of 0.17m was uncovered. Although no finds of slag or metal were recovered, it was interpreted as a probable pit furnace. It was lined by a charcoal-rich black silty clay with occasional inclusions of mottled yellow clay. This appears to have been charcoal laid down to fuel the furnace, which was subsequently raked through to retrieve the product. It was overlain by an orange friable silty clay, which may have been the broken-up remains of the furnace superstructure. A small patch of <i>in situ</i> burnt soil was situated 13.87m north west of this and may have been the remains of a feature related to the pit furnace.</p> <p>The site was situated in a County Council park within the former Corkagh Demesne estate lands. As these parklands were levelled and landscaped in modern or Post-Medieval times, it is possible that features related to the pit furnace were truncated or destroyed. It may also be inferred stratigraphically that the pit furnace was Medieval or earlier in date.</p> | |

| | |
|--|---|
| Site name | Grange Castle International Business Park, Grange and Kishoge |
| License No. | 01E0718 ext. |
| Licence holder | Ian W. Doyle |
| Site type | Post-Medieval |
| ITM | E 719482m, N 736542m |
| <p>The archaeological assessment carried out in this area during February 2001 recommended that an archaeologist be present to monitor the stripping of topsoil. The initial recognition of archaeological features was compromised somewhat by the contractor stripping a quantity of topsoil before informing the archaeologist. However, several metalled surfaces, field drains, pits and gullies of Post-Medieval and modern date were recognised during the stripping when an archaeological presence was established.</p> | |

In Kishoge townland, to the south west of the area intended for the attenuation lake, the remains of a sub-rectangular structure, which appears to have burnt down, were detected. This consisted of what appeared to be the remains of slot-trenches cut into natural boulder clay with a fill of oxidised clay and charcoal. The feature measured 5.8m east/west x 4.6m and appeared to have been truncated through intensive ploughing. Access to this area was not available at the time of the assessment owing to dumping and storage of building materials. This area was later excavated by Edmond O'Donovan.

| | |
|-----------------------|---|
| Site name | Grange Castle International Business Park, Grange and Kishoge |
| License No. | 01E0754 |
| Licence holder | Ian W. Doyle |
| Site type | Medieval field system |
| ITM | E 704328m, N 731197m |

Excavations were carried out in Nangor townland, west of Clondalkin, Dublin 22, during October 2000–January 2001. The excavations revealed a Medieval ditch complex.

Construction of a biotechnology campus commenced in September 2000. The area excavated in Nangor is south of the construction site and outside the immediate area of impact. No detailed development is presently intended for the greater part of this area. However, additional excavation was undertaken to mitigate the impact of a gas pipeline and associated access road in part of the area formerly occupied by the Nangor Castle gardens. Nangor Castle is located immediately outside the southern boundary of the Wyeth Medical Ireland site. References to a castle at this site date from the 15th–16th centuries. All buildings on the site were demolished during the 1970s, but an area of archaeological potential surrounds the site.

Trench 1, which measured 60m north/south x 33m, was located some 90m to the north west of the castle site. Geophysical survey and subsequent test trenching had suggested that the area of Trench 1 held archaeological potential. Excavation in Trench 1 commenced in October 2000 and continued until December 2000. Activity assigned to Phase I in this trench consisted of a linear feature and a pit, both of which cut natural subsoil. These features did not produce pottery or finds. The pit consisted of a rectangular cut into natural subsoil, which contained a series of ash deposits. Areas of oxidised or fire-reddened soil present on the north east and south west sides are indicative of *in situ* burning. This cut was filled with a series of sterile silty layers

and dumps of ash.

The Phase I activity was succeeded by a Medieval phase of activity which consisted of further linear features, pits and cobbled surfaces. These were assigned to a single general phase which is capable of further subdivision based on stratigraphic grounds. Finds retrieved from the fills of these features include approximately 1000 sherds of Leinster Cooking Ware and Dublin-type wares, and assorted iron finds including nails, an armour-piercing arrowhead, a buckle, a key and an intact iron sickle.

Trench 2, located to the east, detected a similar sequence of linear features, which contained sherds of Medieval pottery in their fills. Trench 3, to the south of Trench 1, detected shallow linear features running on an east/west axis. These linear features were succeeded by a pit and a metalled surface, both of which were directly associated with Medieval pottery.

Trench 4, located to the west, was excavated to examine a ditch encountered during an earlier assessment. A ditch orientated north west/south east with steep sloping sides and a rounded U-shaped base was revealed. It was 1.05m wide, narrowing to 0.3m at the base, with a maximum depth of 1.1m. Its fill contained occasional fragments of animal bone, from which a radiocarbon date of cal. AD 601–883 was obtained.

Trench 5, located to the south east of Trench 4, uncovered further Medieval linear features. A narrow ditch which ran across the trench on a south east/north west axis is likely to represent a continuation of a similar feature encountered in Trench A to the south. A series of Post-Medieval field boundaries was also detected in Trench 5.

Trench A was excavated to the south of Trench 5 on the line of the gas pipeline and associated roadway. Excavation in this area revealed an undated metalled surface and a series of ditches/gullies. Excavation of these commenced in January 2001. Although there were relatively few finds from these features, their stratigraphic relationship indicates that there were five phases of ditches and gullies in the trench dating from Medieval to modern times.

The excavation of Trench B, an extension of Trench A, revealed one feature of interest, a substantial Medieval ditch which cut into natural subsoil. This was found in the extreme eastern end of the trench. The ditch ran through Trench B, outside the northern and southern limits of excavation. The cut measured 10m north/south x 2.5m, with a depth of 1.1m as exposed, and had sloping sides and a rounded base. The ditch ran on a north/south axis with a slight curve towards the north east. In overall plan the ditch appears to have been sub-circular, enclosing an area to the east of Trench B. The fills of the ditch comprised black sticky silts with organic content. The

lower and upper fills contained Medieval pottery. No trace of an enclosing bank was detected in the area opened for examination; however the depth of overburden, composed of cultivated soils, in this area may be in part composed of a levelled bank. Trench C, to the north east of Trench B, did not detect the ditch. No archaeological material was detected in Trench C, where it was found that modern disturbance had removed the old ground surface.

In total, some 1600 sherds of native Medieval pottery were recovered from the Nangor excavations. It is of some interest that only two sherds of imported Medieval pottery were recovered. The excavated linear features at Nangor may represent the remains of Medieval field boundaries with associated water-management gullies. The presence of such linear features, which can be dated to the Medieval period by the presence of Leinster Cooking Ware and Dublin-type wares, argues for land enclosure during the Medieval period. That cereal production was the purpose of such enclosures may be suggested by evidence from pollen and macro-plant analysis. The examination of a wide range of Medieval samples from the Nangor excavations has shown a predominance of wheat over other plant remains.

| | |
|-----------------------|---|
| Site name | Grange Castle International Business Park, Grange and Kishoge |
| License No. | 04E0299 |
| Licence holder | Red Tobin |
| Site type | Burnt Mounds |
| ITM | E 703396m, N 731729m |

Excavations were carried out during works on the Griffeen River realignment, part of ongoing infrastructure works within the precincts of the Grange International Business Park. The works are principally aesthetic in purpose, designed to enhance the appearance of the park and to highlight the river, which otherwise would have flowed behind the Takeda Pharmaceuticals complex. The area stripped will also accommodate the extended road network that will serve the business park when it is fully occupied.

Topsoil stripping for this realignment commenced in early December 2003 and continued intermittently until May 2004. Topsoil stripping revealed the locations of three burnt mounds. Of these three features, two were excavated, as the development was likely to have a total impact on them. The third mound was preserved *in situ*, as it was located outside the development area.

Burnt Mound 1

During monitoring of topsoil removal this site was identified as an irregularly shaped deposit of firing material (heat-shattered stone and blackened soil). The burnt-mound material extended 28m east/west along the northern edge of the stripped corridor and extended to the south x 8m from the northern baulk. The feature lay c. 25m to the west of the Griffeen River on gently undulating pasture sloping to the south. The evidence from initial survey work and subsequent excavation suggests that the main spread of this site remains preserved *in situ* to the south of this location.

The nature and extent of the mound material was exaggerated by plough action, which had dragged it from its original focal point to extend over 28m in length. After the removal of topsoil the F2 mound of firing material extended little more than 0.5m from the limit of the excavation. From this southern extremity, the mound rose to the north to a maximum height of 0.65m at the northern limit of the excavation. No cut features were exposed during the excavation.

Burnt Mound 2

The realigned Griffeen River crosses the course of the old river at two locations. To allow for the excavation of the first of these crossings it was necessary to divert the Griffeen River into a third channel. During stripping prior to this channel being dug the second burnt mound was found. During the topsoil removal this site was identified as an irregularly shaped deposit of firing material (heat-shattered stone and blackened soil).

The area of excavation measured 13m east/west x 17.5m. A silted-up streambed abutted the southern part of the mound. The stream appears originally to have flowed from east north east to south west. It had a width of 3-5m, but the length could not be discerned as it extended beyond the limit of excavation. The stream fill contained water-rolled stones, pebbles and a dark-grey silt with a minimum depth of 0.1m. Wood residue, possibly alder, was in evidence and was probably indicative of remnants of fen woodland. This stream system is likely to have been the reason for siting the burnt mound at this location.

One of the earliest features on the site was a grouping of stake-holes cut into the clayey peat. These formed a semi-circular band. All were comparable in shape and size and contained the same fill. They ranged in depth from 2mm to 5mm with a diameter of 6-12mm. Small amounts of heat-affected pebbles and small stones around the sides of the stake-holes may be evidence for packing material. The function of the complex is not clear. Some stake-holes are vertical, while others have been driven into the ground at an angle. They follow a vague north/east to south/west pattern, but the angled stakes do not appear to have offered support to each other or

to any possible structure.

The burnt mound was situated on the northern bank of the silted up stream. The bank was steep-sided. The main concentration of firing material was in the west. No evidence for a trough was found and the only evidence of activity associated with the burnt mound appears to be the stake-hole complex. The mound measured 11m east/west x 4.5m. It is more likely that the original east/west dimensions were closer to being 6m, with a depth of 0.12-0.25m.

Covering and surrounding the burnt mound was a layer of peat measuring 4.64m from north to south x 14.7m, with a surviving depth of 0.2-0.45m. This was a moist dark-reddish-brown peat of moderate compaction that contained inclusions of sphagnum moss, plants and wood. It was most pronounced to the south of the burnt mound, sloping downwards to the stream.

A third burnt mound was recorded during the course of the topsoil-strip. The site was not fully exposed but was identified by a number of concentrations of the characteristic firing material. This site was not impacted on by the development and it was possible to preserve it *in situ*. It was first sealed using a double layer of geotextile material and then covered by a soil bund forming the boundary between the business park and the pitch-and-putt course.

| | |
|-----------------------|--------------------------|
| Site name | Grange/Ballybane/Nangor |
| License No. | 13E0435 |
| Licence holder | Gill McLoughlin |
| Site type | Furnace pit (monitoring) |
| ITM | E 703978m, N 703391m |

Monitoring of a proposed central carriageway at Grange Castle Business Park, Co. Dublin was carried out in November 2013. Monitoring followed an archaeological appraisal carried out in September 2013 and geophysical survey was previously carried out throughout the entire area of Grange Castle Business Park.

Two features of archaeological interest were identified during monitoring of topsoil stripping in the east of the development area in Nangor townland. These features comprised a small bowl furnace (0.36m x 0.33m x 0.15m) filled with charcoal-rich soil and slag, and a shallow oval pit (0.97m x 0.69m x 0.1m) filled with charcoal, thought to be a charcoal clamp.

3.3 Cartographic Analysis

Ordnance Survey Map 1:10,560 First Edition 1844 (figure 5)

The development area is recorded as part of 15 fields on the First Edition map. Three townland boundaries, a parish boundary and a barony boundary are recorded within the area of land take. Research suggests that:

“hoards and single finds of Bronze Age weapons, shields, horns, cauldrons and gold personal objects can all be shown to occur on boundaries” (Kelly 2006, 28).

Two small structures are recorded in the north east corner of the development area on the First Edition map, although neither of these features were noted during the test trenching programme. A small area of possibly mixed woodland is recorded in the north west corner, although it is not noted on later edition maps. Several tree-lined field boundaries are recorded within the development area.

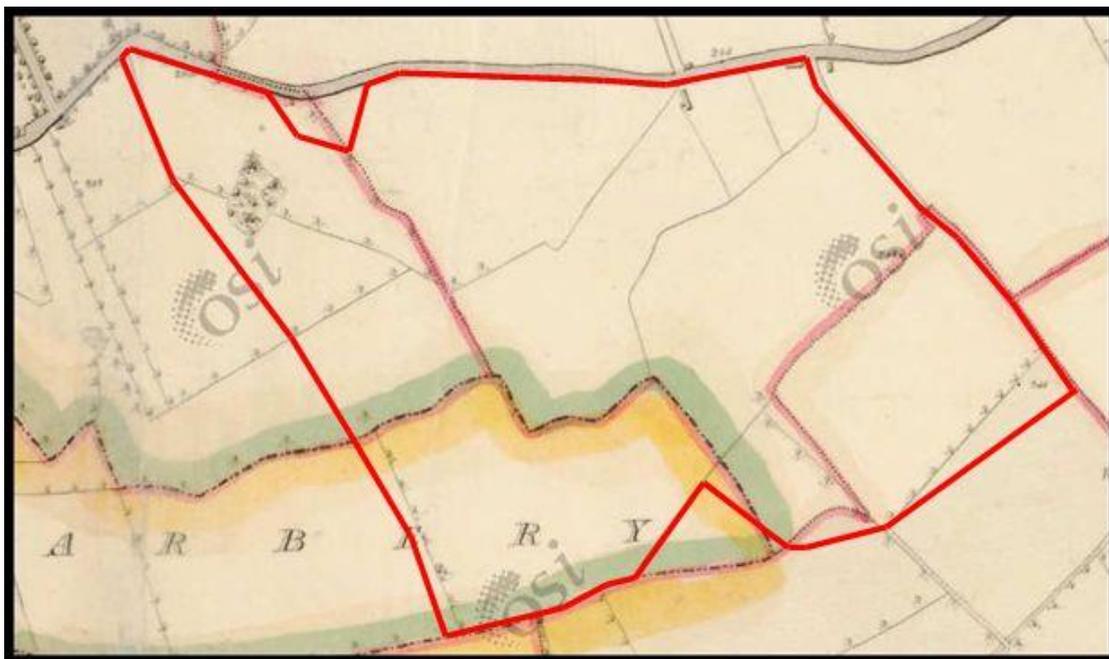


Figure 5: Extract from First Edition 1:10,560 Ordnance Survey Map (1844), showing the development area

With the exception of the above-mentioned two structures, there are no archaeological or additional architectural features recorded on the First Edition 1:10,560 map within the area of land take.

Ordnance Survey Map 1:2,500 First Edition 1863 (figure 6)

Two structures are again noted in the north east corner of the development area. Some townland boundaries have changed between the time of the First Edition 1:10,560 map and the First Edition 1:2,500 map.

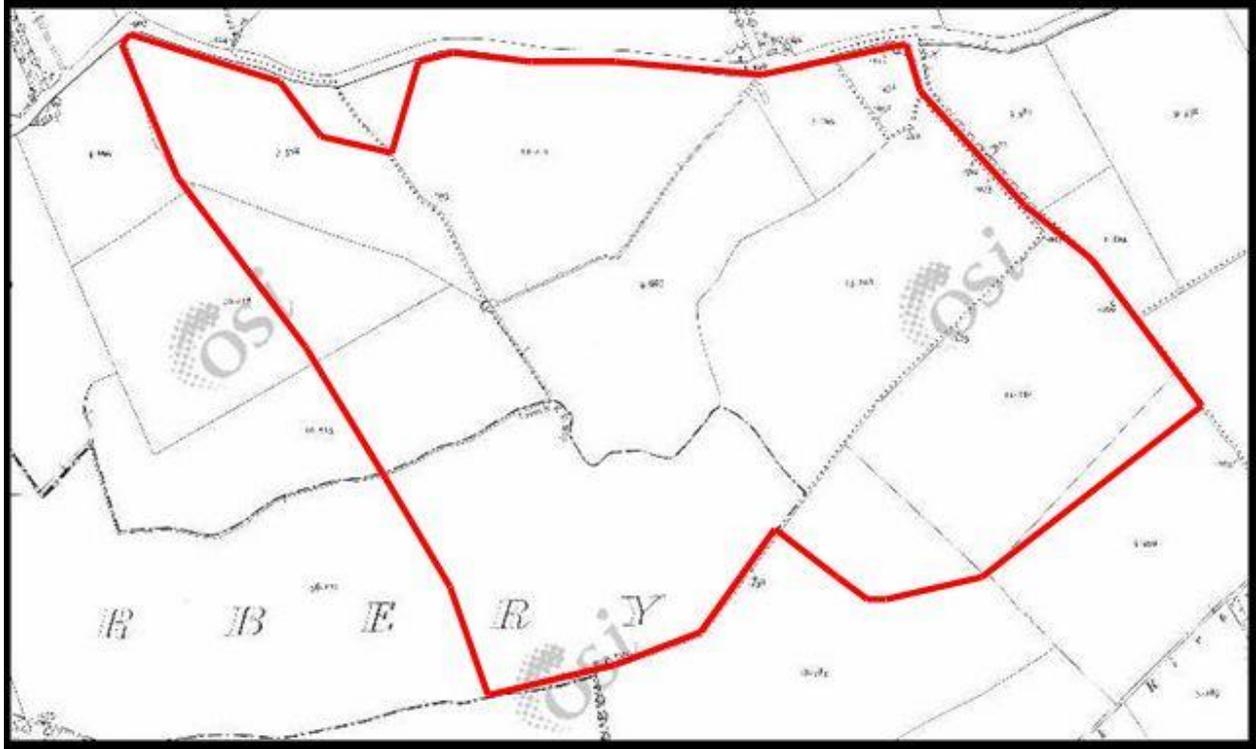


Figure 6: Extract from First Edition 1:2,500 Ordnance Survey Map (1863), showing the development area

With the exception of the above-mentioned two structures, there are no archaeological or additional architectural features recorded on the First Edition 1:2,500 map within the area of land take.

Ordnance Survey Map 1:10,560 Third Edition 1906 (figure 7)

One structure is recorded in the north east corner of the development area where two structures were shown on earlier edition maps. "*Nangor Road*" is named for the first time on the Third Edition map. A possible spring is recorded towards the north east boundary.

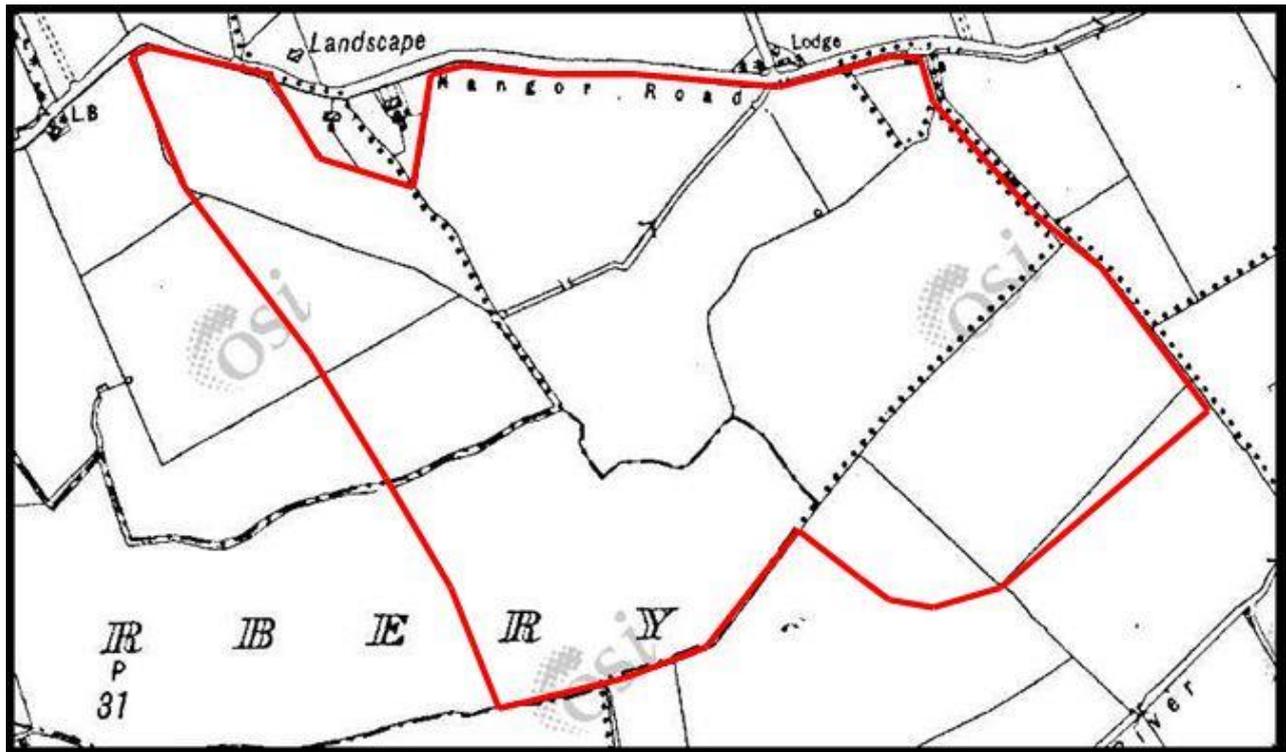


Figure 7: Extract from Third Edition 1:10,560 Ordnance Survey Map (1906), showing the development area

With the exception of the above-mentioned structure, there are no archaeological or additional architectural features recorded on the Third Edition 1:10,560 map within the area of land take

3.4 Aerial Photographs

Aerial photographs held by Ordnance Survey Ireland (www.maps.osi.ie) and Bing aerial photography (www.bing.com/maps) were consulted to look for the presence of archaeological or architectural features within the development area.

The 1995, 2000 and 2005 Ordnance Survey photographs generally record a similar landscape to what was noted during the walkover survey and test trenching programme, although the R136 Outer Ring Road, which forms the western boundary of the development area, is recorded for the first time on the 2005 aerial photograph.

The north west corner of the area of land take, along with a field to the south, are shown as heavily disturbed on the 2005 aerial photograph, and this activity appears to have been associated with R136 Outer Ring Road construction works.

Possible previously unrecorded archaeological features of no recognizable form are noted along the western boundary of the development area on the 1995 black and white aerial photograph (Fields 2 and 5, figure 8). These possible remains are located in two separate fields, but do not appear to take the form of any standard archaeological features. They were not noted on any additional aerial photographs of the development area, and were not recorded as part of the walkover survey, geophysical survey or test trenching programme.

Bing aerial photography noted the area of land take as being similar to what was recorded at the time of the test trenching programme.

With the exception of the tentative features recorded on the 1995 black and white aerial photograph, there was no evidence of any previously unrecorded archaeological or architectural remains within the area of land take.

3.5 County Development Plan

South Dublin County Council Development Plan 2016–2022

It is an Objective (HCL2 Objective 3) of South Dublin County Council to:

"protect and enhance sites listed in the Record of Monuments and Places and ensure that development in the vicinity of a Recorded Monument or Area of Archaeological Potential does not detract from the setting of the site, monument, feature or object and is sited and designed appropriately" (ibid., 153).

There are no Recorded Monuments within the development area. There are 16 Recorded Monuments within the 1km study area, with the closest (Nangor Castle-RMP DU017-037) being located approximately 200m north west of the area of land take.

3.6 Toponyms

Townland names are an important source in understanding the archaeology, geology, land-use, ownership and cultural heritage of an area.

Table 1: Toponyms

| Name | Irish Genitive | Translation |
|------|----------------|-------------|
|------|----------------|-------------|

| | | |
|-----------------|---------------------------|---|
| Corkagh Demesne | <i>Dhiméin Chorcaí</i> | <i>Corcach</i> translates as marsh |
| Deansrath | <i>Ráth an Deagánaigh</i> | The ringfort of the dean (or Deane) |
| Kilcarbery | <i>Chill Chairbre</i> | Possibly translates as Carberry's wood |
| Nangor | <i>Nangair</i> | Possibly translates as place of nettles |

3.7 Topographical Files of the National Museum of Ireland

Information on artefact finds and excavations from County Dublin is recorded by the National Museum of Ireland. Location information relating to such finds is important in establishing prehistoric and historic activity in the study area.

There are no entries recorded in the Topographical Files for any townlands located within the development area.

3.8 Summary

There are no Recorded Monuments within the development area. There are 16 Recorded Monuments within the 1km study area, with the closest (Nangor Castle-RMP DU017-037) being located approximately 200m north west of the area of land take. Reference to Summary Accounts of Archaeological Excavations in Ireland revealed that no fieldwork projects, with exception of the test trenching programme and excavation to which this report relates, have been carried out within the development area. Numerous fieldwork projects revealing extensive archaeological remains have been carried out in townlands surrounding the development area. Three townland boundaries, a parish boundary and a barony boundary are recorded within the area of land take. Two small structures which no longer survive above-ground are recorded in the north east corner of the development area on historic cartographic sources. Possible previously unrecorded archaeological features are noted towards the western boundary of the development area on a 1995 black and white aerial photograph. These possible features are located in two separate fields, but do not appear to take the form of any standard archaeological features. They were not noted on any additional aerial photographs of the development area, and were not recorded as part of the walkover survey, geophysical survey or test trenching programme. There are no entries recorded in the Topographical Files of the National Museum of Ireland for any townlands located within the development area. No archaeological features or artefacts were revealed within any areas of land take as a result of carrying out a pre-test trenching walkover survey.

4 EXCAVATION RESULTS

Test trenching revealed archaeological features in three fields (Fields 6, 8 and 9; figure 8). Excavation of these features was carried out by Dermot Nelis and Colm Flynn, and took place intermittently between 12th March and 30th April 2018. In total the excavation took 12 no. days to complete. Work was stopped during periods of heavy rain. During this time *in situ* archaeological features were covered by heavy-duty plastic sheeting.

The archaeological features were surveyed by GPS at the time of test trenching, and GPS units were used to locate these areas during the excavation stage. A 12 tonne mechanical excavator equipped with a toothless grading bucket was used to remove soil and overburden from each excavation area under constant archaeological supervision. Once the archaeological features were identified, a 5m x 5m area was stripped of topsoil, with an area measuring 10m x 10m stripped in Field 6.

All archaeological features were located in areas which were previously identified during test trenching. No new areas were stripped of topsoil or excavated as part of the excavation works.



Figure 8: Location of Fields 1 - 11 from the excavation programme



Figure 9: Location of excavated archaeological features

Field 6

This field was situated in the southern end of the development area (figure 8). The archaeology in Field 6 consisted of a subcircular pit/hearth (**C5**) and a linear feature (**C7**). Both of these features were located in close proximity to each other (within 5m from each other) in Trench 1, and were cut into natural geology (**C3**).

Topsoil (**C1**) in this area was a friable mid to dark brown silty clay. Natural geology (**C3**) was noted as a compact light brown clay with small stone inclusions evenly distributed.

The subcircular pit/hearth (**C5**) measured 0.6m north east/south west x 0.5m east/west x 0.15m deep (plates 1-2, figure 10). It had a gradual break of slope and sloping sides, and an even mostly flat base. The single fill (**C6**) consisted of charcoal stained blackened fine silt, with some oxidized reddened clay silt. A concentration of oxidized reddened clay silt was identified at the uppermost edge of (**C6**) which may represent scraped-out lining of the hearth, or possibly a collapsed clay roof.

Charcoal was identified in the fill (**C6**) and was sampled for environmental analysis. Post-excavation analysis by Dr. Lorna O'Donnell identified the charcoal as being of oak (Appendix 2). The analysis notes that the oak was derived from larger branches

or trunks and that heartwood was burnt. Oak has been identified as a common flue source for hearths and kilns throughout Irish history.

The linear pit (C7) was located south east of pit/hearth (C5). The pit (C7) measured 3.5m north east/south west x 0.75m east/west x 0.12m deep (plate 3 and figure 10). This feature had a gradual break of slope, with sloping slightly concave sides, and a base that was evenly sloping downwards towards the north east. Both ends of pit C7 were rounded. The fill (C8) of C7 consisted of mid-greyish light brown stoney clay, and was 0.11m deep. A single layer of closely set pebble and cobble stones (C4) was identified pressed into the base of C7 under fill C8. The stones (C4) lined the northern half of the pit (C7) and were evenly set. C4 covered an area measuring 1.2m x 0.3m x 0.07m within pit C7. No diagnostic artefacts were recovered from the pit C7.

A possible pit identified in Trench 3 during testing in Field 6 was investigated as part of the excavation phase. The area around this possible feature was topsoil stripped by machine, then hand cleaned and assessed by the excavation team. The location of the possible feature was identified as being non-archaeological, and the result of localized changes in natural soil.

No additional archaeological features or artefacts were identified in Field 6, and all known archaeological features in Field 6 have been fully excavated and recorded.

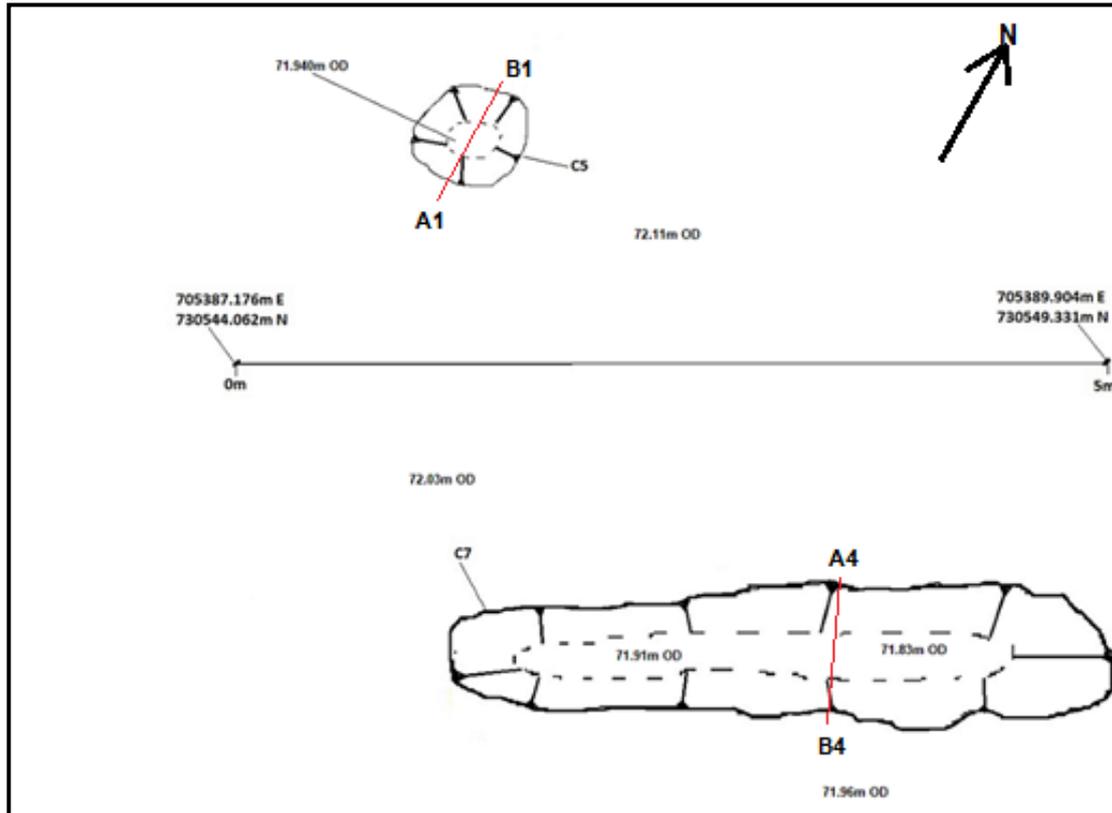


Figure 10: Post-excavation plan of **C5** and **C7** in Field 6



Plate 1: Mid-excavation showing pit/hearth **C5** and fill **C6**, facing north east



Plate 2: Post-excavation showing pit/hearth **C5**, facing west



Plate 3: Pre-excavation showing linear pit **C7**, facing north east

Discussion of Archaeological Features in Field 6

The archaeological features identified in Field 6 contained no diagnostic artefacts or suitable dating material. Oak was identified as the charcoal in **C6**, the fill of hearth/pit **C5**, and is a common fuel source found in hearths throughout Irish archaeology. Single-use hearths can be the result of any number of activities, ranging from domestic cooking and drying to industrial activity and crop processing. Archaeological excavations nearby have identified several hearths and burnt pits. At Grange Castle, Richard O'Brien identified pits and hearths that dated to the Medieval period (Archaeological Licence 97E0116). In Corkagh Demesne, Ruth Elliot identified a Medieval pit furnace with *in situ* scorching of earth (Archaeological Licence 00E0935). In Nangor townland, Ian W. Doyle found pits and hearths of unknown date. Also found during this excavation were Medieval ditches and gullies containing sherds of Medieval pottery (Archaeological Licence 01E0754). Also in Nangor townland, Gill McLoughlin identified a small bowl furnace filled with charcoal-rich soil and slag and a shallow charcoal clamp (Archaeological Licence 13E0435). These features were dated to the early Iron Age and Early Medieval period respectively.

Single-use hearths are common from the Neolithic period (c. 4,000-2,400 BC) to early modern times (1700 AD). The shallow pit (**C7**) had some evidence of partial stone-lining at its base. This flat base could have supported a vertical wooden screen or windbreak, which protected activity at the nearby hearth (**C5**) from the prevailing elements. It is likely both features are contemporary and associated, but are not identifiable as to an archaeological period.

Field 8

Field 8 was located at the eastern end of the development area (figure 8). The archaeological features excavated in Field 8 consisted of a hearth (**C13**) and posthole (**C15**) at the western end of the field, and a shallow pit (**C17**) at the north eastern end.

The hearth (**C13**) and posthole (**C15**) were identified at the west end of Field 8 (plate 4, figure 11). The hearth (**C13**) was irregular in plan and measured 1.7m north/south x 1m east/west x 0.24m deep. It had a sharp break of slope at the northern end and a gradual break of slope and gradual sloping sides at the southern end. The northern part of the base of hearth **C13** was deeper than the southern part and sloped gradually downwards towards the centre of the feature. The fill (**C14**) of hearth **C13**

consisted of heavily oxidized reddened silty clay with some charcoal, brown silt and pebble inclusions. It was cut in to natural geology (**C3**) and was sealed by topsoil (**C1**).

A circular posthole (**C15**) was visible in the base of **C13**. It measured 0.17m x 0.17m x 0.06m and was situated in the west side of **C13**. A single fill of charcoal stained black silt (**C16**) was identified in the posthole (**C13**). The posthole (**C15**) did not truncate the fill (**C14**) of hearth **C13**, and consequently did not post-date the hearth. It is most likely that the posthole (**C15**) and hearth (**C13**) functioned contemporarily. No diagnostic artefacts were recovered from hearth **C13** or posthole **C15**.

The shallow pit (**C17**) was identified at the east end of Field 8. It was sub-rectangular in plan and measured 0.7m north/south x 0.6m east/west x 0.08m deep (plate 5, figure 12). The break of slope was sharp and the sides sloped gradually towards a mostly flat base. The single fill (**C18**) of pit **C17** consisted of light brownish grey sandy silt with a concentration of heat fractured red silt and pebbles towards the centre. Two pottery sherds dating to the late 18th or early 19th century were recovered from **C18**.

Two possible features were identified during test trenching in Trenches 1 and 3 of Field 8. These possible features (**C19**) and (**C20**) and the areas around them were topsoil stripped by machine, then hand cleaned and assessed by the excavation team. The first possible feature (**C19**) was identified in Test Trench 3 and consisted of a thin deposit of oxidized reddened silt with some charcoal. It measured 0.6m x 0.4m x 0.05m and contained a fragment of modern pottery. The second possible feature (**C20**) was identified in Trench 1 as a stone socket filled by loose topsoil.

No additional archaeological features or artefacts were identified in Field 8, and all known archaeological features in Field 8 have been fully excavated and recorded.

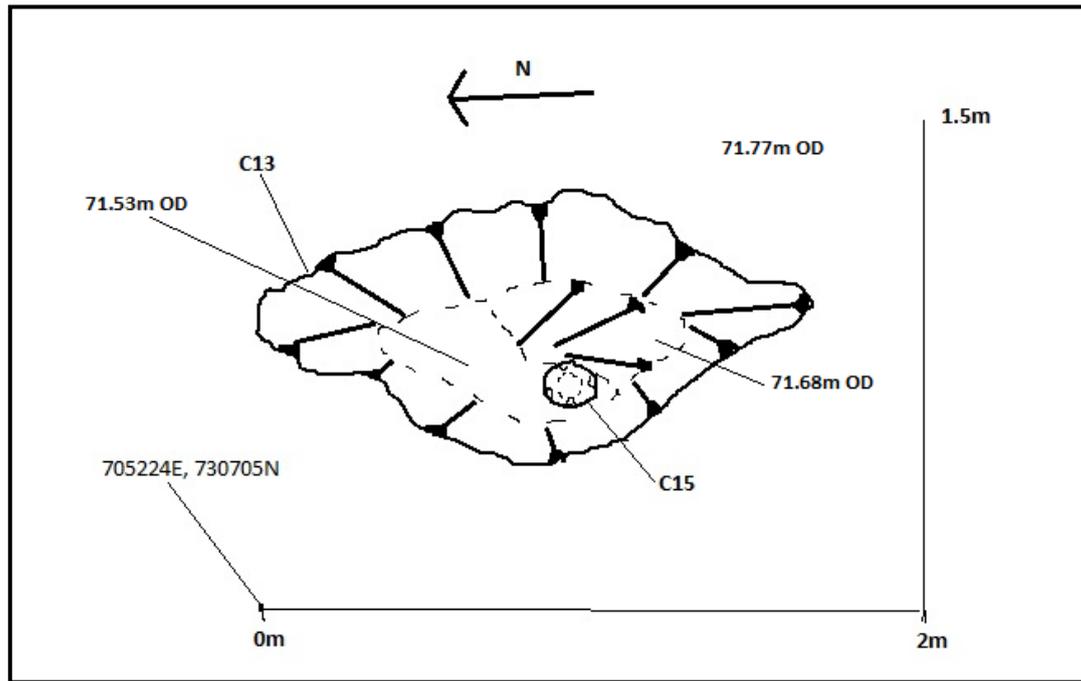


Figure 11: Post-excavation plan of C13 and C15 in Field 8

Figure 12: Post-excavation plan of C17 in Field 8

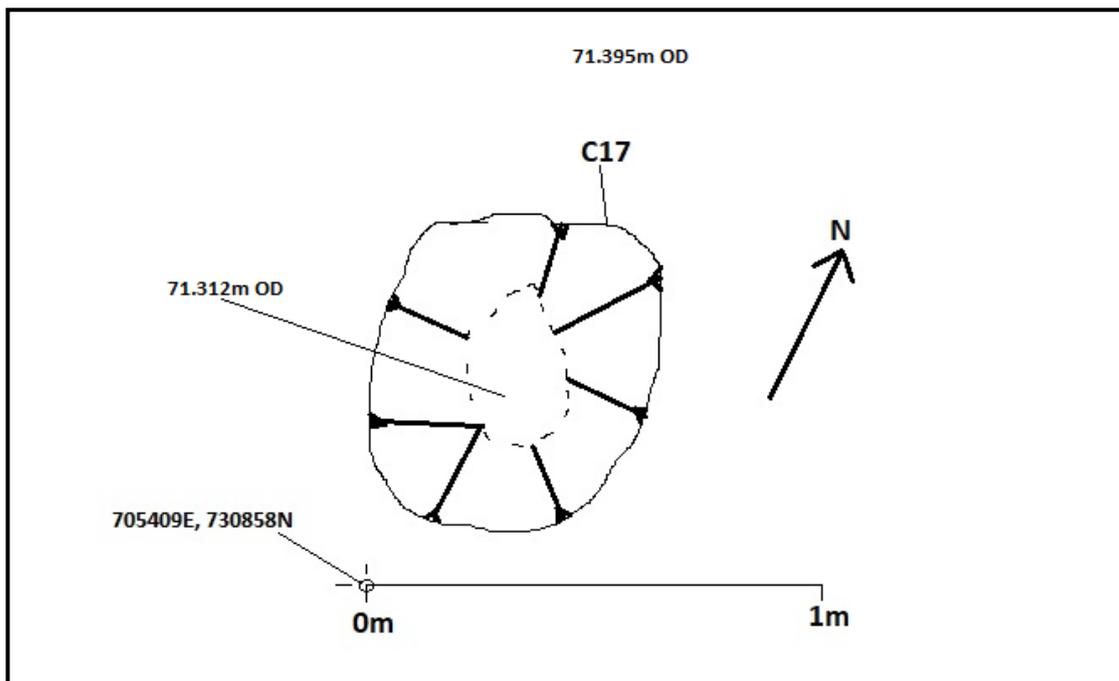




Plate 4: Mid-excavation showing hearth **C13** and posthole **C15**, facing east

Plate 5: Mid-excavation showing pit **C17** and fill **C18**, facing east



Discussion of Archaeological Features in Field 8

The archaeological features identified in Field 8 contained no diagnostic artefacts or suitable datable material. The hearth (C13) and posthole (C15) situated at the west end of the field are considered to have been associated and contemporary. As noted above, single-use hearths such as C13 can be the result of any number of activities, ranging from domestic cooking and drying to industrial activity and crop processing. Postholes such as C15 are often found in proximity to hearth features, and have been interpreted as holding upright wooden posts for roasting meats or holding pots for cooking.

The shallow pit (C17) had a single fill (C18) that contained 18th or 19th century pottery sherds. This pit likely represents a single refuse deposit event, probably associated with agricultural activity in this location. It is unclear if this event is associated with any nearby building or settlement, as no obvious candidate is identifiable on the historic mapping of the area.

Field 9

This area was situated towards the centre of the development area (figure 8). The archaeological features excavated in Field 9 consisted of three associated pits and a separate area containing the complete burial of a young sheep.

The three pits identified and excavated in Field 9 were all situated in land that was prone to flooding after rain. A large field drain was located approximately 20m to the north. The three pits (C9), (C12) and (C21) were located within 5m of each other (figure 13).

Pit C9 was sub-rectangular in plan, orientated roughly east-west, and measured 1.1m long x 0.5m wide x 0.22m deep (plates 6 and 7). It had a sharp break of slope and sloping sides which were slightly concave on the south side. Both the east and west ends of pit C9 were rounded. The base was slightly stony, and mostly flat. The single fill (C10) of pit C9 consisted of charcoal stained blackened silt clay with occasional heat fractured stone inclusions and some charcoal. Specialist environmental analysis of a sample of C10 by Dr. Lorna O'Donnell identified the presence of hazel, ash and pomaceous fruitwood (Appendix 2). Analysis of a sub-sample identified that the main tree type was hazel, and the hazel charcoal assemblage indicates that branches or twigs (and not heavier trunks) were burnt. The ash fragments were identified as originating as trunks and were used as fuel.

The pomaceous fruitwood fragment had four annual rings remaining and is strongly curved. A radiocarbon determination by the Chrono Centre at Queens University Belfast (UBA-38825) of 2395 \pm 37 BP, places the site in the Middle/Late Bronze Age (Appendix 4).

Situated 2.5m to the north of pit **C9** was a sub-linear shallow pit (**C21**). The pit (**C21**) was orientated roughly north east/south west and measured 1.4m long x 0.8m wide x 0.08m deep (plate 9). The break of slope was gradual, and the sides were gradually sloping. The base was mostly flat and even. The single fill (**C22**) of pit **C21** was charcoal stained greyish dark brown fine silt with frequent burnt stones and small flecks of charcoal.

Situated 2m to the west of pit **C9** and 1.8m south west of pit **C21** was a third pit (**C12**). This shallow pit was sub-circular in plan and measured 0.7m east/west x 0.6m north/south x 0.1m deep (maximum) (plate 8). The break of slope was gradual, and the sides were gradually sloping. The base was mostly flat and even with some stones present. The single fill (**C11**) of pit **C12** was charcoal stained greyish dark brown fine silt with frequent burnt stones and small flecks of charcoal. Specialist environmental analysis of a sample of fill **C11** by Dr. Lorna O'Donnell identified the presence of two wood taxa- oak and hazel (Appendix 2). This analysis identified that the oak pieces were suggestive of larger branches or trunks of oak heartwood. In contrast, the strongly curved annual rings of the hazel fragments indicate that branches or twigs were burnt.

A young sheep burial (**C25**) was identified at the north west corner of the Field 9, beside a field boundary ditch and hedgerow and near a drain. This skeleton measured roughly 0.8m east/west x 0.5m north/south (plate 10). No cut was identified with the burial, however when the topsoil (**C1**) was removed the uppermost bones of the articulated skeleton were identifiable sitting on the natural subsoil (**C3**). The skeleton was orientated roughly east/west, with the head at the west. Specialist zoo-archaeological analysis by Arlene Coogan (Appendix 3) of the skeleton confirmed it as being a sheep. The analysis found that 37% of the assemblage was recorded as being of good preservation and 37% of the remains were of medium preservation. The remaining 26% were recorded as being poorly preserved. According to the analysis, it appears that this animal was between 2 and 3.5 years at the time of death. No associated features were identified nearby.

No additional archaeological features or artefacts were identified in Field 9, and all known archaeological features in Field 9 have been fully excavated and recorded.

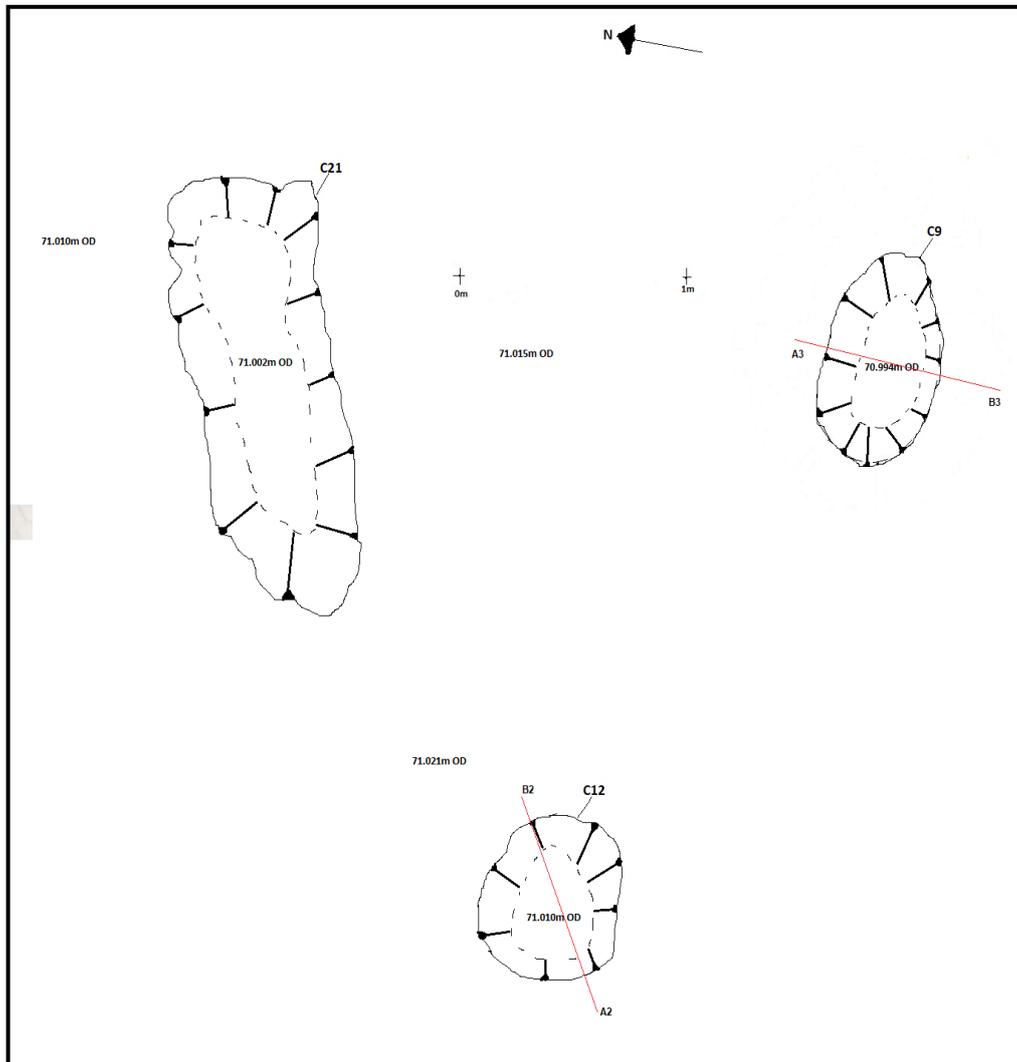


Figure 13: Post-excavation plan of **C9**, **C12** and **C21** in Field 9



Plate 6: Mid-excavation showing pit **C9** and fill **C10**, facing north east

Plate 7: Post-excavation showing pit **C9**, facing north east





Plate 8: Mid-excavation showing pit **C12** and fill **C11**, facing north

Plate 9: Pre-excavation showing pit **C21** and fill **C22**, facing east





Plate 10: Sheep skeleton **C25** *in situ* Field 9, facing north

Discussion of Archaeological Features in Field 9

The pit group discovered at Field 9 is indicative of archaeological features usually associated with a particular type of site known as burnt mounds. Although the “mound” was not present at this location, it is possible it and other associated features remain outside the development area. Alternatively, the mound may have been destroyed over successive ploughing actions. Burnt mounds are widely known in Ireland as *fulacht fiadh* (pl. *fulachta fiadh* or *fulachta fia*). These are common to much of northern Europe and have been the subject of much debate over the last 30 years, following on from experimental work in the 1950s (O’Kelly 1954; Barfield & Hodder 1987; Ó Drisceoil 1990; Buckley 1990; Ó Néill 2000, 2004; Quinn & Moore 2009).

Burnt mound sites are often collectively referred to as pyrolithic (meaning hot stone) sites. They are visible within the landscape as low, grass-covered mounds, which may be horseshoe, crescent, oval or kidney shaped. However, it is commonly found that excavated sites showed no surface trace prior to excavation. Burnt mounds are in general to be found close to streams, lakes, rivers and marshes and sometimes occur in groups, with clusters of two to six being occasionally located within a small area. The mounds are generally composed of a heap of heat-affected stone and

charcoal that gives it a blackened appearance. They often have a depression to one side, which may reveal a trough area. This trough or pit would have held water and can be variously lined with timber, wicker or stone or simply excavated into the natural clay. The trough would have been filled with water and heated stone would have been placed into it, in order to raise the temperature. The stones shattered during this process, and would have been reused up to six times before being removed and piled next to the trough (Buckley 1990, 168-174). This activity was repeated and over time would have eventually formed the mound. The larger of these mounds can contain over 267m³ of heat-affected stone which, when combined with a known trough size and capacity, could be calculated to be re-used up to 4000 times (Ó Neill 2004, 268-69). The usage of these sites may therefore have occurred over a few weeks, months or even years, and owing to the marginal location of many would indicate seasonal or periodic activity.

The suggested function of burnt mounds/*fulachta fiadh* has ranged from the popular traditional view that they represent cooking sites to bathing, curing of animal skins, soap production, garment waterproofing and even ritual practice (O'Kelly 1954; Barfield & Hodder 1987; Ó Drisceoil 1990; Buckley 1990; Ó Néill 2000, 2004, 2009). Other functions have also been suggested, including that they may have been covered by light structures and used as saunas or sweathouses; used for bathing; or for a semi-industrial purpose such as washing or dyeing large quantities of cloth or for dipping hides in hot water as part of the preparation of leather (Waddell 2005). In recent years, brewing has also been suggested as a possible function (Quinn & Moore 2009).

The Irish terminology "*fulacht fia*" has recently come under scrutiny with the suggestion that its use in connection with pyrolithic technology should no longer be considered appropriate, as Medieval manuscripts (such as the Yellow Book of Lecan and the Book of Leinster) refer to *fulacht* as cooking on a spit. The text from the Yellow Book of Lecan states "*a piece of raw meat and another of dressed meat, and a bit of butter on it; and the butter did not melt, and the raw was dressed and the dressed was not burned, even though the three were together on the spit*". An illustration of this spit is also depicted with the text "*fulacht na morrigna inso*" below it (Ó Neill 2004).

The earliest sites appear to date from the early third millennium BC with the majority of examples dating to the Bronze Age, and the latest examples occurring in the Iron

Age and later (O'Neill 2000). Although scientifically dated burnt mounds/*fulacht fiadh* that produce Early Medieval dates are rarer than Bronze Age examples, excavations including Coarhmore, County Kerry (Sheehan 1990, 35) and Ballyman, County Dublin (O'Brien 2005, 297) have provided evidence of Early Medieval pyrolithic activity.

Several burnt mounds/*fulacht fiadh* have been discovered in recent years in Clondalkin, County Dublin. At Grange Park Business Park, two *fulacht fiadh* consisting of burnt-mound spreads, troughs, pits and stakehole groups were excavated by Neil O Flanagan (Licence number: 13E0471). Also at Grange Park Business Park, in Grange and Kishoge townlands, excavations by Red Tobin identified two burnt mounds/*fulacht fiadh* (Licence number: 04E0299).

The terrain around the present excavation area was very wet after rain, and flooded quite quickly. Burnt mounds/*fulacht fiadh* require a ready source of water, and the location of these pits close to a large field drain may possibly have served this purpose well. The radiocarbon determination indicates a Middle/Late Bronze Age date for the pit **C9**. This is a very common date range for pyrolithic activity sites in Ireland. It is suggested that the two additional archaeological features (**C12** and **C21**) identified in proximity to pit **C9** are associated and contemporary, and functioned in some way relating to hot stone working in the Bronze Age.

The sheep burial (**C25**) identified in the north west corner of Field 9 was articulated and almost complete, and was positioned directly on natural geology (**C3**). Sheep are a food source introduced into Ireland by the Anglo-Normans in the late 12th century. They quite quickly became a common food source in areas where cattle could not be supported due to the environmental conditions or quality of grass. This animal was identified as being over 2 years of age, which is the usual age of slaughtered animals. The almost complete nature of the burial indicates that it was not slaughtered for meat, while the absence of butchery marks and articulation of the skeleton supports this contention. The location of the animal in a formerly farmed field could provide an explanation for the isolated presence of the burial. Although no cause of death was identified, an illness resulting in death cannot be ruled out. A sheep farmer likely buried the animal after its death, and did not slaughter the animal, possibly due to concerns of sickness spreading through the herd. Although it is impossible to assign the burial to any date, due to the good condition of a

considerable percentage of the bone assemblage it is likely that the animal was buried in the Post-Medieval or early modern period.

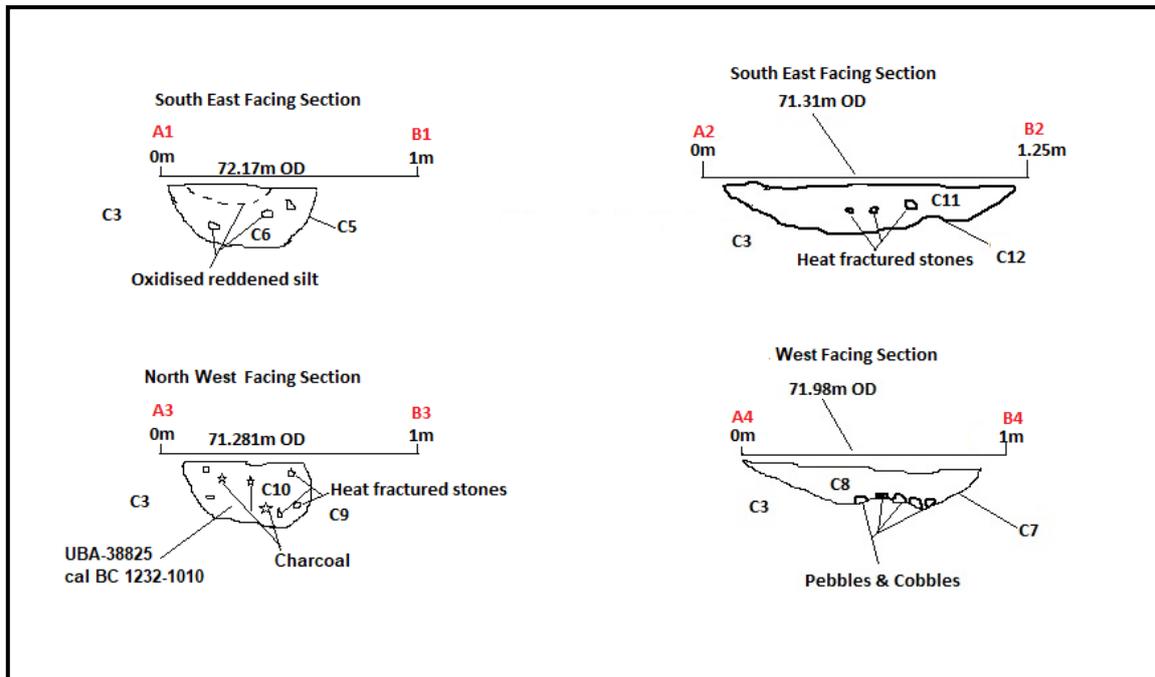


Figure 14: Section drawings of selected features

5 NON-TECHNICAL SUMMARY

This report describes the results of an archaeological excavation carried out on features identified during pre-construction test trenching at Kilcarbery Grange, Clondalkin, County Dublin. The excavation was carried out by Dermot Nelis and Colm Flynn on behalf of South Dublin County Council, and took place intermittently between 12th March and 30th April 2018. In total the excavation took 12 no. days to complete.

The objectives of the archaeological excavation were to preserve by record all features identified during the test trenching phase, and to establish if associated subsoil archaeological remains were present within the development area.

A pit/hearth and a possible screen were identified in Field 6. The archaeological features identified in Field 6 contained no diagnostic artefacts or suitable dating material. No additional archaeological features or artefacts were identified in Field 6, and all known archaeological features in Field 6 have been fully excavated and recorded.

A hearth and posthole were identified in Field 8. These archaeological features contained no diagnostic artefacts or suitable dating material. A shallow Post-Medieval pit was also identified in Field 8. No additional archaeological features or artefacts were identified in Field 8, and all known archaeological features in Field 8 have been fully excavated and recorded.

The archaeology in Field 9 consisted of a group of three pits with heat fractured stone. A radiocarbon determination from a charcoal sample from one of the pits returned a Middle/Late Bronze Age date. A separate area in Field 9 contained an articulated sheep burial of unknown age. No additional archaeological features or artefacts were identified in Field 9, and all known archaeological features in Field 9 have been fully excavated and recorded.

All works were carried out as per the Licence Application and Method Statement submitted to National Monuments Service and the National Museum of Ireland.

All known archaeological features within the development area have been fully excavated and recorded.

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Bing aerial photography

www.excavations.ie

Database of Irish Excavation Reports

www.logainm.ie

Placenames Database of Ireland

www.maps.osi.ie

Ordnance Survey Ireland aerial photographs

www.sdcc.ie

South Dublin County Council

APPENDIX 1: LIST OF CONTEXTS

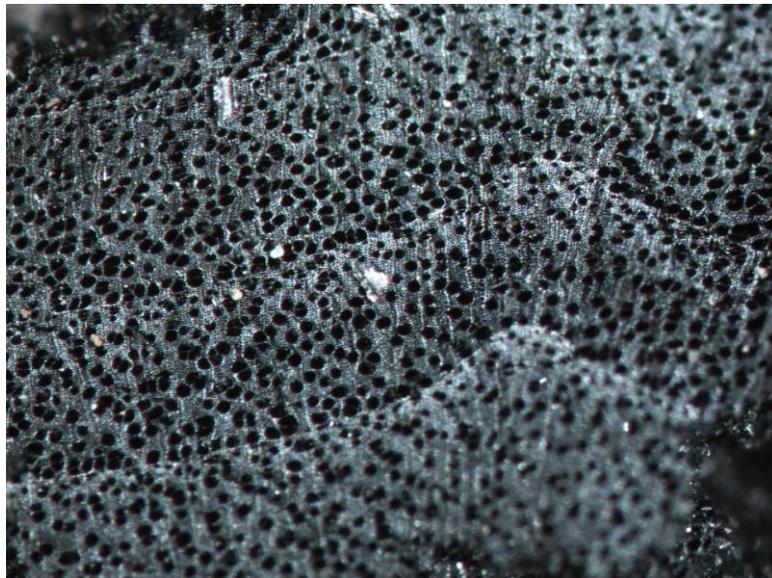
| | |
|------------|--|
| C1 | Topsoil. Generally a friable mid to dark brown silty clay |
| C2 | Not used |
| C3 | Natural geology. Generally a compact light brown clay with small stone inclusions evenly distributed |
| C4 | Small pebbles and cobble stones below fill C8 in pit C7 |
| C5 | Sub-circular pit/hearth, filled by C6 |
| C6 | Single fill of pit/hearth C5 |
| C7 | Linear pit filled by C8 |
| C8 | Fill of linear pit C7 |
| C9 | Pit filled by C10 |
| C10 | Single fill of pit C9 |
| C11 | Single fill of pit C12 |
| C12 | Pit filled by C11 |
| C13 | Hearth filled with C14 and associated with posthole C15 |
| C14 | Single fill of hearth C13 |
| C15 | Circular posthole situated in west side of hearth C13 . Filled with C16 |
| C16 | Single fill of posthole C15 |
| C17 | Shallow pit filled with C18 |
| C18 | Single fill of pit C17 |
| C19 | Non archaeological |
| C20 | Non archaeological |
| C21 | Shallow pit filled by C22 |
| C22 | Single fill of pit C21 |
| C23 | Not used |
| C24 | Not used |
| C25 | Articulated sheep burial in Field 9 |

APPENDIX 2: ENVIRONMENTAL ANALYSIS REPORT

Environmental Analysis

Kilcarbery Grange,
Clondalkin,
County Dublin

Licence Number: 17E0367 Extension



AUTHORS: DR LORNA O'DONNELL AND DR SUSAN LYONS

Non-Technical Summary

The site at Kilcarbery Grange, Clondalkin, County Dublin consisted of three pits, most likely representing single event pyrolithic activity. Radiocarbon dating has shown that the site dates to the Middle/Late Bronze Age. No archaeobotanical remains (non-charcoal) were present. Charcoal was analysed from each of the three pits. Four native Irish wood taxa were identified- hazel, oak, ash and pomaceous fruitwood. These are indicative of a relatively open landscape. Charcoal results compare well to other Bronze Age sites in Dublin and regionally in Ireland.

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1 INTRODUCTION

This report describes environmental analysis from an archaeological site at Kilcarbery Grange, Clondalkin, County Dublin. The site was excavated by Dermot Nelis and Colm Flynn, under Licence 17E0367 Extension. The report relates to the excavation of three pits, one of which has been radiocarbon dated to the Middle/Late Bronze Age (see Appendix 4). Samples have been analysed from all of the above-mentioned three pits. The aim of the analysis was to examine any evidence for context related variation between the pits, and to interpret local woodland cover in the Kilcarbery Grange area during the Bronze Age.

2 SAMPLING STRATEGY

The sampling strategy was systematic and concentrated on areas of obvious charring.

3 METHODOLOGY

3.1 *Processing*

Samples were taken on site as bulk soil and were processed by Dr Lorna O'Donnell. Flotation, whereby each sample was soaked in water in order to suspend the carbonised material, then took place. The material was then poured off and trapped in a sieve (mesh size 300µm). This flot (*i.e.* the floated material) was dried and stored in sealed plastic bags. The remaining material or the retent was washed through a sieve 2mm in size. Each retent was scanned for archaeological remains such as pottery or bone. They were then stored in sealed, labelled plastic bags.

3.2 *Charcoal identification*

The aim was to identify 50 fragments randomly per sample (Mc Clatchie *et al* 2015). If 50 fragments were not present in a sample, then all possible fragments were identified. Each piece of charcoal was examined and orientated, first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine and examined under a binocular microscope with dark ground light and magnifications generally of 200 and 400. Each taxon or species has anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Nomenclature follows Schweingruber (1978).

3.3 *Details of charcoal recording*

Each taxon group was weighed in grams to two decimal places. The general age group of each taxa per sample was recorded, and the growth rates were classified as

slow, medium, fast or mixed. Ring curvature of the pieces was also noted— for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Figure 1). Insect infestation is usually identified by round holes and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or have been stockpiled.

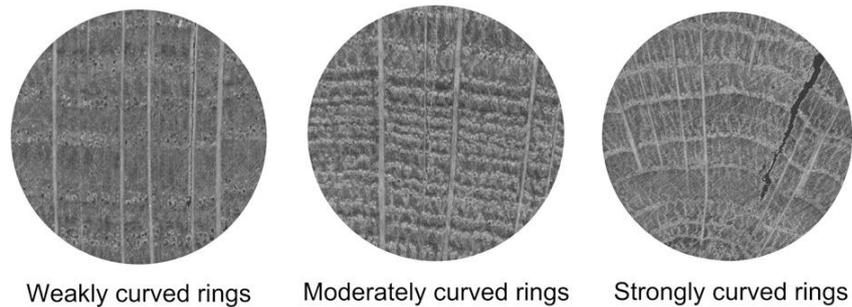


Figure 1: Ring curvature. Weakly curved rings indicate the use of trunks or large branches (Marguerie and Hunot 2007 1421, Figure 3).

4 RESULTS

4.1 Overall charcoal results

Charcoal was analysed from three pits at Kilcarbery Grange (Table 1). Four native Irish taxa were identified, ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), oak (*Quercus* spp.) and pomaceous fruitwood (Maloideae). Hazel is the most commonly identified tree (Figure 2). It, along with oak, was noted in two out of the three contexts examined. Ash and pomaceous fruitwood are both present in one sample (Figure 3).

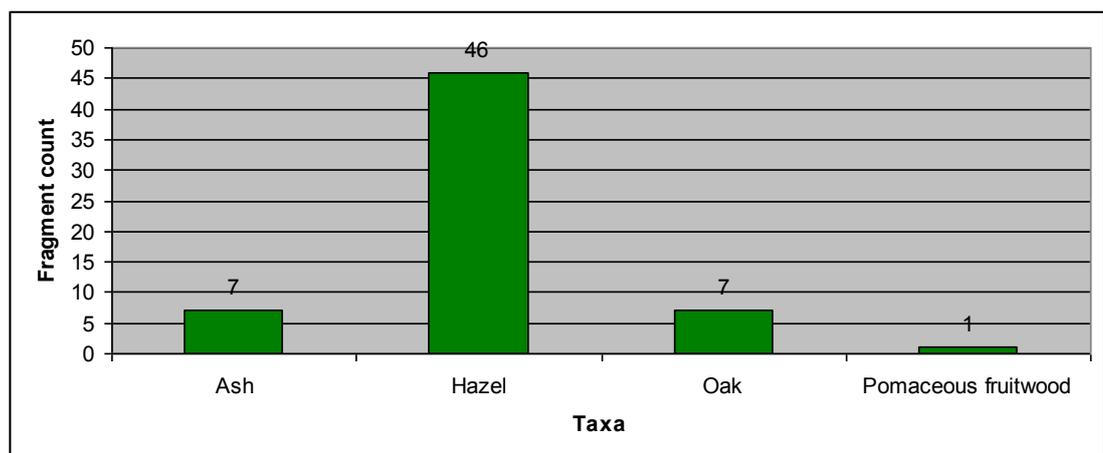


Figure 2: Total charcoal results from Kilcarbery Grange

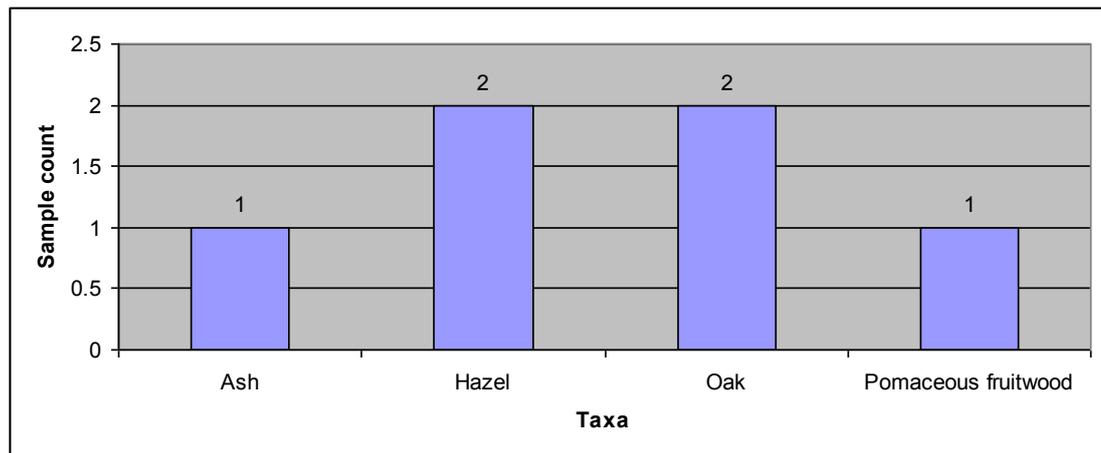


Figure 3: Ubiquity analysis of samples from Kilcarbery Grange

4.2 Contextual charcoal results

Oak is only present in **C6**, the fill of **C5** (Figure 4). The level of charcoal is low, with four fragments being identified. The oak ring counts from **C6** range from three to six (Table 1). Growth is slow to medium and the annual rings are all weakly curved with tyloses present. Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). The ring curvature and tyloses from this sample indicate that the oak was derived from larger branches or trunks and that heartwood was burnt.

Three wood taxa were noted from **C10**, the fill of pit **C9**- hazel, ash and pomaceous fruitwood (Figure 4). The level of charcoal is high, with a sub-sample of 50 fragments being identified. The main tree present is hazel, whose ring counts range from 5-15. Growth is medium, and the annual rings are all strongly curved. This indicates that hazel branches or twigs were burnt. The ash fragments have ring counts of two to 30. Growth is slow to medium and the annual rings are moderately to weakly curved. This suggests that larger branches or trunks of ash were used as fuel. The pomaceous fruitwood fragment has four annual rings remaining and it is strongly curved. A radiocarbon date (UBA-38825) of 2395 \pm 37 BP has been received from this sample, placing the site in the Middle/Late Bronze Age (see Appendix 4).

Two wood taxa were noted from **C11**, the fill of pit **C12**- oak and hazel (Figure 4). The level of charcoal is low, with seven fragments being identified. The oak pieces have between three and five annual rings remaining, the hazel between two and three (Table 1). The weakly curved nature of the oak annual rings, along with the presence of tyloses, suggests that larger branches or trunks of oak heartwood were burnt. In contrast, the strongly curved annual rings of the hazel fragments indicate that branches or twigs were burnt.

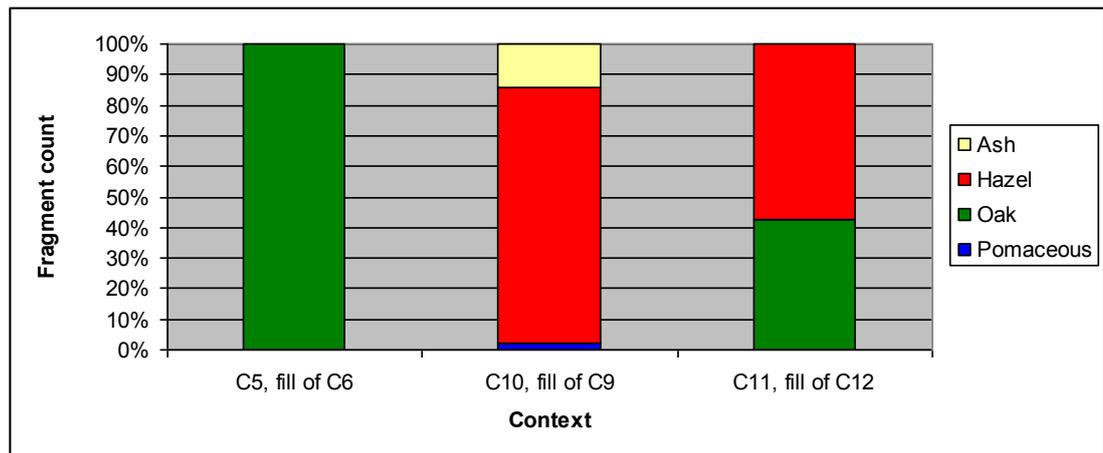


Figure 4: Contextual results from Kilcarbery Grange

4.3 *Archaeobotanical results*

The samples have been scanned for the presence of archaeobotanical (non-charcoal) material by Dr Susan Lyons. No such material was recovered, and as a result will not form any part of the discussion going forward.

5 DISCUSSION

5.1 *General*

The site under discussion most likely represents single use pyrolithic activity. The level of charcoal is relatively low in **C6** and **C11**, but is high in **C10**. Radiocarbon dating has placed activity in the Middle/Late Bronze Age. It is likely that the fuel in the pits represents a random pattern of wood gathering. It is generally assumed that fuel and wood will be gathered from as close to a site as possible (Shackleton and Prins 1992), and therefore archaeological charcoal can reflect the surrounding environment. There are of course problems with this principle, such as particular trees may have been selected over others and there are issues with charcoal fragmentation. Yet, for the purposes of environmental reconstruction, charcoal can be used to provide a floristic background to archaeological sites, particularly when integrated with other environmental data. It is impossible to know however how close to or far away from a site wood was gathered.

5.2 *Local Dublin woodlands*

Four trees were noted from the Kilcarbery Grange samples- hazel, oak, ash and pomaceous fruitwood. It is likely that these trees grew close to the site. Hazel is a medium sized, deciduous tree, and can reach a height of 15m (Plate 1). It will grow on a wide range of soils, including limestone, mildly acid soils and clays (Lipscombe and Stokes 2008, 102).

It is difficult to separate the two native species of Irish oak through wood anatomy; the pedunculate oak (*Quercus robur*) will usually grow on heavy, lowland soils, where it will also tolerate flooding. In contrast, the sessile oak (*Quercus petraea*) will grow on less fertile, acidic soils (Hickie 2002, 60).

Ash needs a good source of light. It grows well on limestone soils and requires many soil nutrients (Orme and Coles, 1985).

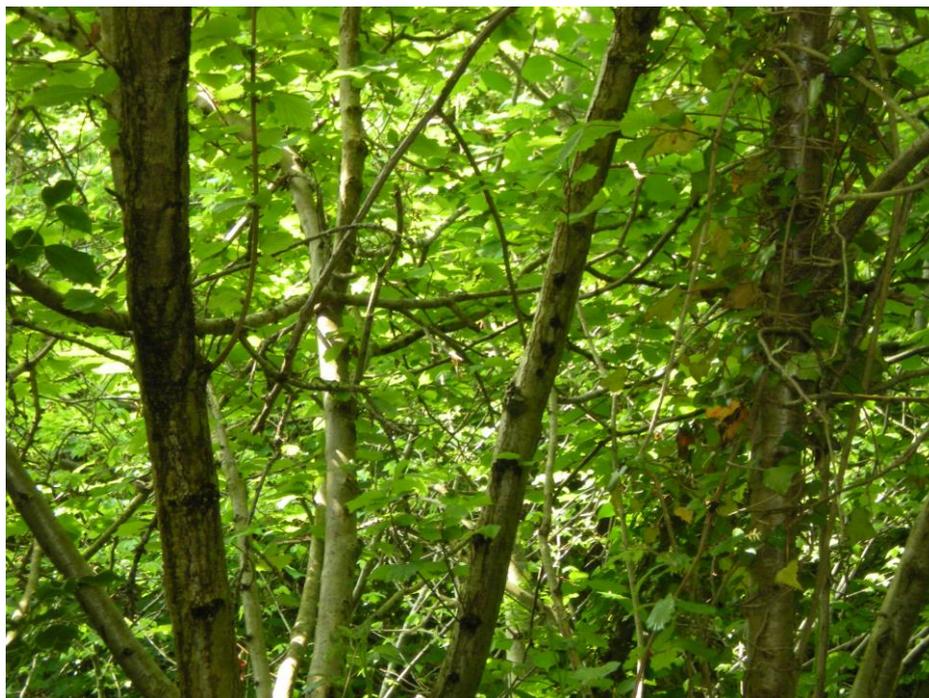


Plate 1: Hazel, a ubiquitous tree in Ireland during the Bronze Age

The Maloideae group (pomaceous fruitwood), a sub-family of the Rosaceae, includes crab apple, wild pear, rowan/whitebeam and hawthorn. Crab apple (*Malus sylvestris*) is a tree of hedges, copses and oak woodland, thriving in fertile and heavy soils. It often grows singly, with large distances between individual trees (Lipscombe and Stokes 2008, 78). Wild pear (*Pyrus pyraeaster*) can grow on woodland edges and can also be found growing in a solitary situation (ibid., 114). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). It is a tree of mountains, woodlands and valleys, growing on a wide range of soils including chalks, acid soils and even peat (Lipscombe and Stokes 2008, 120). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna*) can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Maloideae group.

Overall, the results from Kilcarbery Grange are indicative of a relatively open landscape. The presence of ash and the pomaceous fruitwood suggest that closed canopy woodlands did not prevail in the area. There is no evidence for wetland tree types such as willow (*Salix* spp.) or alder (*Alnus* spp.) within the charcoal results. The site was situated in a poorly drained field, with a drain located approximately 20m to the north which may have been conducive to wetland tree growth.

5.3 *Comparative material*

The charcoal results from Kilcarbery Grange provide a snapshot of information on woodland cover in County Dublin during the Middle to Late Bronze Age. Charcoal from structural and funerary deposits dating to the Beaker period (generally dating to the Early Bronze Age) from Newtown Little townland, County Dublin, has shown a variety of trees were growing in the area at that time, the most common being oak, ash and hazel (O'Donnell 2006). At Kilgobbin townland, County Dublin, ash dominates Early Bronze Age structural contexts (OCarroll 2004).

The four taxa identified from Kilcarbery Grange have been commonly identified from Middle/Late Bronze Age contexts regionally in Ireland, both from the Midlands (OCarroll and Mitchell 2016) and from the south of the country (O'Donnell 2007; O'Donnell 2017).

6 **SUMMARY**

Charcoal was analysed from three pits excavated at Kilcarbery Grange, Clondalkin, County Dublin. Radiocarbon dating suggests that these features date to the Middle/Late Bronze Age. Four native Irish wood taxa were identified- hazel, oak, ash and pomaceous fruitwood. Results are indicative of a relatively open landscape. No wetland indicators were identified. Ring curvature indicates that hazel and pomaceous fruitwood branches and twigs were burnt, while larger branches or trunks of ash and oak were used as fuel. Charcoal results compare well to other Bronze Age sites in Dublin and regionally, with the four wood taxa noted being commonly identified in Middle/Late Bronze Age sites. The samples were all scanned for archaeobotanical remains by Dr Susan Lyons, and it was confirmed that none were present.

7 RECOMMENDATIONS

- No further charcoal work is required from the analysed samples.
- The retents have all been scanned for any archaeological remains. None were found so they can be disposed of.
- All flots and identified charcoal should be retained permanently in accordance with the National Monuments Act 1930 (Section 2) and the National Monuments Act 1994 (Section 9). The industry norm in Ireland is to identify 50 charcoal fragments per sample. For research purposes, this may need to be increased to 50+ (Mc Clatchie *et al* 2015). Further research could include further radiocarbon dating of the charcoal, cumulative frequency work from the samples, ring width analysis research and also identification checks.

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Table 1: Charcoal identification details from Kilcarbery Grange

| Sample | Context | Pit | Identification | Common name | Fragment count | Weight (g) | Size (mm) | Ring count | Ring curvature | Growth | Charcoal comment | Flot comment |
|--------|---------|-----|---|---------------------|----------------|------------|-----------|------------|------------------------------|----------------|------------------|---------------------------------------|
| 1 | 6 | 5 | <i>Quercus petraea</i> Liebl; <i>Q. robur</i> L. | Oak | 4 | 0.29 | 3-4 | 3-6 | Weakly curved | Slow to medium | Tyloses | All charcoal identified |
| 2 | 10 | 9 | <i>Corylus avellana</i> L. | Hazel | 42 | 11.84 | 5-12 | 5-15 | Strongly curved | Medium | Insect holes | Sub-sample of 50 fragments identified |
| | | | <i>Fraxinus excelsior</i> L. | Ash | 7 | 2.73 | 5-8 | 2-30 | Moderately and weakly curved | Slow to medium | | |
| | | | Maloideae C. Weber | Pomaceous fruitwood | 1 | 0.04 | 4 | 4 | Strongly curved | Medium | | |
| 3 | 11 | 12 | <i>Corylus avellana</i> L. | Hazel | 4 | 0.28 | 5-6 | 2-3 | Strongly curved | Medium | | All charcoal identified |
| | | | <i>Quercus petraea</i> Liebl; <i>Q. robur</i> L. | Oak | 3 | 0.16 | 4-6 | 3-5 | Weakly curved | Medium | Tyloses | |

APPENDIX 3: ANIMAL BONE REPORT

Arlene Coogan, M.A, M.Sc.
Zooarchaeological report
Kilcarbery Grange, Clondalkin, Co. Dublin
Licence Number: 17E0367 Extension

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1. Summary

Animal bone was recovered during testing at Kilcarbery Grange, Clondalkin, Co. Dublin. The articulated remains were discovered in the corner of a pasture field. They were uncovered on top of the natural at a depth of approximately 0.3 m below the topsoil. No evidence of a cut was found in relation to the remains and there were no associated features near the remains. To the northeast of this location was a possible Bronze Age site. The remains from this site were analysed in order to establish what species of animals were present and to gain an insight into the human animal relationships. The animal skeleton was recovered from a single context on the site.

2. Introduction

The remains were analysed in order to gain information in relation to the activities which were occurring at the site in question. Fragmentation was low and the preservation of the assemblage was good-medium overall. The bones which were analysed were recovered from the context (C25) within the site.

3. Materials and Method

The bones within the assemblage were hand collected from the site during the excavation process.

3.1 Identification and Quantification

The analysis and recording of this assemblage follows the methodology described by McCormick and Murry (2007). During analysis the fragments within the assemblage were divided into two different categories. These categories are countable fragments and non-countable fragments. Countable fragments refer to bones where 50% or more of the diagnostic area of the bone was present. For each animal bone fragment, the following characteristics were recorded where possible: the species, bone element and side, fusion, tooth and mandible wear stages (according to Hillson 1996 & Grant 1982), and sex and measurements (according to Von den Driesch 1976). The preservation of the bones and taphonomic markers such as butchery marks, gnawing and weathering were also recorded when identified. Information such as species, element, preservation and taphonomy were recorded where possible.

The term sheep/goat is used when it is not possible to determine between the species. Non-countable fragments were recorded within the main database for this site. Although ribs and cranial fragments are common elements within this assemblage they will not be discussed in relation to the quantification of the remains and will therefore be classed as non-countable fragments. That is unless a complete skull is identified. The reason for this is due to the level of fragmentation that can occur with one single rib and the cranium. They can become fragmented into several pieces which could each be counted individually resulting in an inaccurate quantification of results.

3.2 Ageing and Sex Determination

In order to determine the age of the individuals within this assemblage a number of elements were examined. The epiphysial fusion and the dental development and wear stage was examined when possible. The level of fusion is categorised by unfused, fusing or fused. Reitz and Wing (2005) and Silver (1963) provide information relating to the assessment of age. In order to determine the age of the individual the eruption and wear of the teeth was used where possible. The method described by Hillson (1996) and Grant (1982) was used. In

order to determine the sex of the individuals, the measurement of the distal breadth of metacarpals was used for cattle using the criteria explained by McCormick (1997).

3.3 Taphonomy and Pathology

When discussing taphonomic factors such as burning, butchery and gnawing marks on the bones, the criteria discussed by Lyman (1994) was followed. Evidence of burning was assessed by three categories: partially burned/charred, calcined or burnt/blackened. Butchery marks were recorded in relation to the type of mark: cut, chop and/or sawn. Where observed, pathological modifications were recorded in as much detail as possible. The effects on the bones was assessed using the criteria set out by Baker and Brothwell (1980), Baker (1970), Fox (1939) and Siegel (1976).

4. Analyses and results

4.1 Summary of findings: Assemblage overview

The preservation of this assemblage was good-medium overall (*Figure 1*). 37% of the assemblage was recorded as being of good preservation and 37% of the remains were of medium preservation. The remaining 26% recorded as being poorly preserved.

Within this report a number of bone elements will be referred to as non-countable, that is that they were either unidentifiable to both species and element or that they were identifiable to either species or element alone due to the level of fragmentation. The non-countable category also includes bone elements such as ribs and cranial fragments. Rib and cranial elements are regarded as non-countable as they can become fragmented into several pieces resulting in miscalculation of elements present. Within this assemblage the TNF (Total number of fragments) including the non-countable fragments was 169. A total of 125 fragments of bone were identifiable to both species and element. The remaining 44 bone elements were unidentifiable to species and element. The results will be discussed further below.

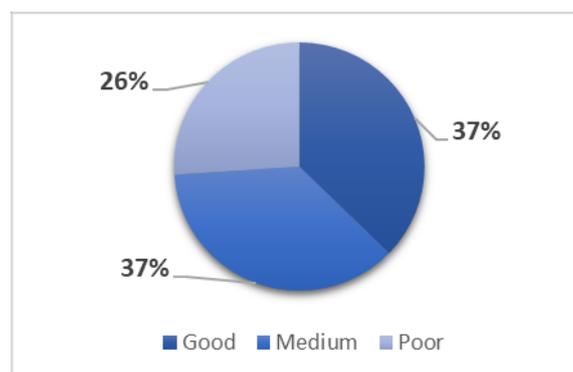


Figure 1 Preservation of assemblage

4.2 Summary of findings: Identification and Quantification

Just one species was identified within this assemblage. Of the 169 bone elements within the assemblage, 125 bone elements were identified as sheep (*Ovis arie*). The remaining 44 bone elements could not be identified to species or element, however due to the nature of the assemblage, it is highly possible that the unidentified bone elements belong to the same animal. A number of elements are identified within the assemblage representing both the cranial and post cranial elements. (*Table 1*). Both left and right elements were recorded for this animal indicating that the minimum number of individuals within the assemblage was 1.

| Element | Right | Left | Unknown | Present | Non-Countable | Total |
|-------------------------|-----------|-----------|-----------|-----------|---------------|------------|
| Atlas | - | - | - | 1 | - | 1 |
| Axis | - | - | - | 1 | - | 1 |
| Calcaneus | - | - | 3 | - | - | 3 |
| Cranial fragments | - | - | 12 | - | - | 12 |
| Femur | 2 | 1 | 1 | - | - | 4 |
| Humerus | - | - | 1 | - | - | 1 |
| Mandible | 2 | 1 | 1 | - | - | 4 |
| Metatarsal | 1 | 1 | - | - | - | 2 |
| Non-Countable | - | - | - | - | 44 | 44 |
| Pelvis | - | - | 1 | - | - | 1 |
| Phalange (Proximal) | 1 | 1 | - | - | - | 2 |
| Phalange (Intermediate) | - | 1 | - | - | - | 1 |
| Radius | 1 | 1 | - | - | - | 2 |
| Rib | - | - | 36 | - | - | 36 |
| Scapulae | 1 | 1 | 1 | - | - | 3 |
| Skull | - | - | 1 | - | - | 1 |
| Tarsal | 1 | 1 | - | - | - | 2 |
| Tibia | 1 | 1 | - | - | - | 2 |
| Tooth | - | - | 6 | - | - | 6 |
| Ulna | 1 | 1 | - | - | - | 2 |
| Vertebra (Corpus) | - | - | - | 9 | - | 9 |
| Vertebra (Lumbar) | - | - | - | 5 | - | 5 |
| Vertebra (Thoracic) | - | - | - | 16 | - | 16 |
| Vertebrae (Unknown) | - | - | - | 9 | - | 9 |
| Total | 11 | 10 | 63 | 41 | 44 | 169 |

Table 1 Illustrating the element representation for assemblage

4.3 Summary of findings: Ageing and Sex Determination

A number of teeth were identified within the mandible fragments of the animal. In the left side of the mandible the M3, M2 and P4 were present. In the right side the M3, M2, P4, P3 and P2 were identified. Sheep teeth erupt at different times. According to Silver, 1963, the P2 to P4 can erupt between 21 and 24 months. The M2 erupts between 9 and 12 months while the M3 erupts between 18 and 24 months (Table 2). The teeth showed evidence of slight wear suggesting that the animal in question would have been aged over 2 years at the time of death.

| Tooth | Tooth eruption age (Silver, 1963) | Tooth in wear |
|-----------|-----------------------------------|---------------|
| M3 | 18-24 months | Yes |
| M2 | 9-12 months | Yes |
| P4 | 21-24 months | Yes |
| P3 | 21-24 months | Yes |
| P2 | 21-24 months | Yes |
| | | |

Table 2 Illustrating the age at death estimation based on tooth eruption

Silver also provides information relating to the epiphyseal fusion and age. The stages of fusion within the bone elements in the assemblage were compared with the table compiled by Silver. A number of the articulations of bone elements were unfused but present indicating the animal was young at the time of death. Based on this, the results indicate that the animal

in question was between 2 and 3.5 years at the time of death. (*Table 3*). According to both the tooth eruption and the epiphyseal fusion it appears that this animal was between 2 and 3.5 years at the time of death.

| Element | Fusion within assemblage | Fusion stage (Silver, 1963) |
|-------------------|------------------------------------|--|
| Femur | Proximal end | 2.5-3 years |
| Femur | Distal end (unfused but present) | 3-3.5 years |
| Metatarsal | Complete (unfused) | Proximal before birth Distal 18-24 months |
| Radius | Complete (unfused) | Proximal 10 months Distal 3 years |
| Tibia | Proximal end (fused) | 3-3.5 years |
| Tibia | Proximal end (unfused but present) | 3-3.5 years |
| Ulna | Complete (unfused) | 3 years |
| | | |

Table 3 Illustrating the age at death estimation based on tooth eruption epiphyseal fusion

Due to the fragmentation of the pelvis sexing of the animal was not possible.

4.4 Summary of findings: Taphonomy and Pathology

There was no evidence of any taphonomy or pathological markers on the bones within the assemblage.

5. Discussion and Conclusion

The animal bone discussed in this report was recovered during testing and excavation at Kilcarbery Grange, Clondalkin, Co. Dublin. The remains were discovered in the corner of a pasture field. They were uncovered on top of the natural at a depth of approximately 0.3 m below the topsoil. No evidence of a cut was found in relation to the remains and there were no associated features near the remains. The remains from this site were analysed in order to establish what species of animals were present at the site and to gain an insight into the human animal relationships. The animal skeleton was recovered from a single context on the site.

The remains from this site represent a single sheep. The remains were well preserved, fragmentation was low and the remains were of good to medium preservation. Both cranial and post cranial elements were recorded and both left and right-side elements were identified. Using information provided by Silver, 1963, the approximate age at death of the animal was determined. The animal appears to have been quite young at the time of death, approximately between 2 and 3.5 years at the time of death. No evidence of taphonomy markers were identified on the bones indicating that the animal was not slaughtered or butchered. Despite the proximity of the location of the skeleton and the possible Bronze Age site, the lack of a cut near the skeleton and the lack of associated features near the remains indicates that this skeleton was not associated with the archaeological features and was not of archaeological significance.

6. Recommendations

As the remains appear to have no archaeological significance it is recommended that they be discarded with approval from the National Museum. However, the final decision should be made by the National Museum of Ireland in agreement with the Director/Licence holder.

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| | | | | | | | | | |
|------|---|------------|--------------------------|---|----------|--|--|---------|----------------------------------|
| Good | O | Femur | Fragmented | | | | | | |
| Good | O | Femur | Fragmented | R | | | | | |
| Good | O | Tibia | Fragmented | L | | | | Fused | Proximal end fused |
| Good | O | Tibia | Fragmented | R | | | | Unfused | Proximal end unfused but present |
| Good | O | Radius | Fragmented | L | | | | | |
| Good | O | Radius | | R | | | | Unfused | |
| Good | O | Metatarsal | | R | | | | Unfused | |
| Good | O | Metatarsal | Fragmented | L | | | | | |
| Good | O | Ulna | | R | | | | Unfused | |
| Good | O | Ulna | | L | | | | Unfused | |
| Good | O | Tarsal | | R | | | | | |
| Good | O | Tarsal | | L | | | | | |
| Good | O | Phalanges | Proximal | R | | | | | |
| Good | O | Phalanges | Proximal | L | Proximal | | | | |
| Good | O | Phalanges | Intermediate | L | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented | | | | | | |
| Med | O | Cranial | Fragmented, Zygomatic | | | | | | |
| Med | O | Cranial | Fragmented, Zygomatic | | | | | | |
| Med | O | Humerus | Fragmented | | | | | | |
| Med | O | Calcaneus | Fragmented | | | | | | |
| Med | O | Calcaneus | Fragmented | | | | | | |
| Med | O | Calcaneus | Fragmented | | | | | | |
| Good | O | Atlas | | | | | | | |
| Good | O | Axis | | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic | | | | | | |
| Good | O | Vert | Thoracic, spinus process | | | | | | |
| Good | O | Vert | Thoracic, spinus process | | | | | | |
| Good | O | Vert | Thoracic, spinus process | | | | | | |
| Good | O | Vert | Thoracic, spinus process | | | | | | |
| Good | O | Vert | Thoracic, spinus process | | | | | | |

| | | | | | | | | | |
|------|----|-----|-----|--|--|--|--|--|--|
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |
| Poor | 0? | Unk | Unk | | | | | | |

APPENDIX 4: RADIOCARBON DATING

| UBANo | Sample ID | Material Type | ¹⁴ C Age | ± | F14C | ± |
|-----------|---------------------------|---------------|---------------------|----|--------|--------|
| UBA-38825 | Kilcarbery Grange, Dublin | | 2935 | 37 | 0.6939 | 0.0032 |

Dermot Nelis
Dermot Nelis Archaeology



¹⁴CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification: UBA-38825

Date of Measurement: 2018-09-19

Site:

Sample ID: Kilcarbery Grange, Dublin

Material Dated: charcoal

Pretreatment: AAA

Submitted by: Dermot Nelis |

Conventional ¹⁴C
Age: 2935±37 BP
using AMS
Fraction corrected δ¹³C

Information about radiocarbon calibration

RADIOCARBON CALIBRATION PROGRAM*

CALIB REV7.0.0

Copyright 1986–2013 M Stuiver and PJ Reimer

*To be used in conjunction with:

Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215–230.

Annotated results (text) – –

Export file – c14res.csv

38825

UBA-38825

Radiocarbon Age BP 2935 +/- 37

Calibration data set: intcal13.14c

% area enclosed cal AD age ranges

Reimer et al. 2013

relative area under
probability distribution

68.3 (1 sigma) cal BC 1210– 1107

1102– 1085

0.866

0.114

1063– 1059

0.019

95.4 (2 sigma) cal BC 1257– 1248

1232– 1016

0.011

0.989

References for calibration datasets:

Reimer PJ, Bard E, Bayliss A, Beck JW, Blackwell PG, Bronk Ramsey C, Buck CE, Cheng H, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Haflidason H, Hajdas I, Hattala C, Heaton TJ, Hogg AG, Hughen KA, Kaiser KF, Kromer B, Manning SW, Niu M, Reimer RW, Richards DA, Scott EM, Southon JR, Turney CSM, van der Plicht J.

IntCal13 and MARINE13 radiocarbon age calibration curves 0–50000 years calBP Radiocarbon 55(4). DOI: 10.2458/azu_js_rc.55.16947

Comments:

* This standard deviation (error) includes a lab error multiplier.

** 1 sigma = square root of (sample std. dev.² + curve std. dev.²)

** 2 sigma = 2 x square root of (sample std. dev.² + curve std. dev.²)

where ² = quantity squared.

[] = calibrated range impinges on end of calibration data set

0* represents a "negative" age BP

1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.