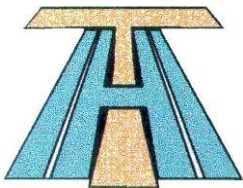


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N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN



Ministerial Direction Scheme Reference No.	A032
Registration No.	E3838
Site Name	AR130, Shankill 4
Townland	Shankill
County	Kilkenny
Excavation Director	Richard Jennings
NGR	266286 161526
Chainage	67100

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

AUGUST 2012

IAC Irish Archaeological
Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3838
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR130, Shankill 4
Site Type	Prehistoric
Townland(s)	Shankill
Parish	Shankill
County	Kilkenny
NGR (easting)	266286
NGR (northing)	161526
Chainage	67100
Height OD (m)	62.247
RMP No.	N/A
Excavation Dates	17 December 2007–8 January 2008
Project Duration	20 March 2007–18 April 2008
Report Type	Final
Report Date	August 2012
Report By	Richard Jennings and Tim Coughlan
Report Reference	Jennings, R. and Coughlan, T. 2012 E3838 Shankill 4 Final Report. Unpublished Final Report. National Monuments Service. Department of Environment, Heritage and Local Government, Dublin.

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This final report has been prepared by Irish Archaeological Consultancy Ltd in compliance with the directions issued to Kilkenny County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and the terms of the Contract between Kilkenny County Council and Irish Archaeological Consultancy Ltd.

CONSULTING ENGINEERS – N9/N10 KILKENNY CONSULT

James Eogan (NRA Senior Archaeologist), Ed Danaher (NRA Archaeologist) and Bernice Kelly (NRA Assistant Archaeologist)

Project Liaison Officer, Kilkenny Co. Council – Joe Gannon and Lisa Mulcahy

NATIONAL MONUMENTS, DoEHLG

Archaeologist – Martin Reid

IRISH ANTIQUITIES DIVISION, NATIONAL MUSEUM OF IRELAND

Assistant Keeper – Nessa O'Connor

ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR130, Shankill 4 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3838 issued by the DoEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between the 17 December 2007 and 8 January 2008.

The excavation has identified a cluster of postholes, stakeholes, pits and a hearth that have been interpreted as a sub-rectangular or sub-oval temporary structure. A second small structure consisting of stakeholes and postholes was recorded to the north. The exact plan of the main structure was difficult to ascertain due to its ephemeral nature. Unlike formal Bronze Age houses that would have very defined elements, this small structure consisted of a somewhat irregular arrangement of stakeholes. Other arrangements of post/stakeholes on the periphery of the structure may represent windbreaks or fences, but could equally be parts of the structure itself. Two probable boundary fences were identified to the east and north of the structures and consisted of stakes/posts that had wide and irregular intervals between, but two clear perpendicular lines could be identified. To the south and west of the structures there were further features primarily in the form of pits, but with some isolated postholes and stakeholes. Two of the pits contained sherds of pottery, while heat shattered stone, flint debitage, charcoal, burnt bone and hazelnut shells were also identified from some of the other pits. It is interpreted that some of the pits functioned as waste pits, possibly associated with the structure. Further possible waste pits were recorded in the south of the site, away from the structures. Some of these pits contained heat shattered stones within their fills, so may be waste pits associated with burnt mound activity or may have functioned as pot-boilers. It is unclear if they were related to the structures to the north. Two of the waste pits were dated to the early Bronze Age, one from the south of the site and one from near the structures. While the structures themselves were undated it is likely that all of the activity on the site was broadly contemporary. The site therefore may have been a campsite linked to burnt mound activity.

The pottery retrieved has been identified as a domestic variant cordoned urn and represents one, and possibly up to three domestic vessels. Although the assemblage is small (six sherds) it represents an important addition to distribution of Bronze Age pottery in the region. The lithics are characterised predominantly by debitage and flakes, and the lack of diagnostic artefacts and the small size of the assemblage means that it has been interpreted by Sternke as making a minor contribution to the archaeological record for the area.

A total of two samples were sent for AMS radiocarbon dating. The results of the analysis dated charred hazelnut from the fill C81 of a pit. The 2 sigma calibrated date was 2140–1880BC (SUERC 30111). The results of the analysis dated ash charcoal from the fill C78 of a pit. The 2 sigma calibrated date was 2193–2030BC (UBA 12238).

The archaeology at Shankill 4 represents a temporary settlement that may be related to small scale burnt mound activity. Evidence from the archaeological landscape confirms that this area was not intensely settled in prehistory and was associated with small temporary settlement and burnt mound sites. The nature and date of the

findings at Shankill are important locally as it confirms the nature of the landscape in the early Bronze Age.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Shankill 4, AR130 (Figure 1), in the townland of Shankill undertaken by Richard Jennings of IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 703m² and was first identified during testing carried out between 27 March and 6 April 2007 by Richard Jennings (E3364) for IAC Ltd on behalf of the National Roads Authority. Shankill 4 was excavated between 17 December 2007 and 8 January 2008 with a team of one director and 12 assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and in the terms of the contract between Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

The methodology adopted was in accordance with the approved Method Statement. The topsoil was removed to the interface between natural and topsoil using a 20 tonne mechanical excavator equipped with a flat toothless bucket under strict archaeological supervision. The remaining topsoil was removed by the archaeological team with the use of shovels, hoes and trowels in order to expose and identify the archaeological remains. A site grid was set up at 10m intervals and was subsequently calibrated to the national grid using GPS survey equipment.

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

A complete photographic record was maintained throughout the excavation. Digital photographs were taken of all features and of work in progress.

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

All artefacts uncovered on site were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

All dating of samples from the site was carried out by means of AMS (Accelerator Mass Spectrometry) Radiocarbon Dating of identified and recommended wood charcoal and charred plant remains samples. All calibrated radiocarbon dates in this report are quoted to two Sigma. Dating of the site also involved pottery analysis through typological study.

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC

Neolithic: 4000–2500BC

Early Bronze Age: 2500–1700BC

Middle Bronze Age: 1700–1200BC

Late Bronze Age: 1200–800BC

Iron Age: 800BC–AD500

Early medieval period: AD500–1100

Medieval period: AD1100–1600

Post-medieval: AD1600–1800

Source:

Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

The site was located in a corner of a pasture field on land with a gentle north-east aspect. Hedgerows to the south and west partially obscured views of the north Kilkenny hills while the land was more open to the north and east where the Blackstairs Mountains were prominent on the horizon. The nearest water source was a stream 400m to the north. This stream also serves as the Kilkenny–Carlow county boundary and feeds into an upper tributary of the River Barrow. Shankill 5 is located c. 180m directly to the north and Shankill 3 is located c. 400m to the south-west. A hearth (KK016-002) is recorded c. 380m to the west.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Mid-yellowish clayey sand	Subsoil

The natural geology in this area was glacial till made up of mid-yellowish brown clayey sand with common small stones.

2.2 PHASE 2 Early Bronze Age Activity

The site consisted of a possible temporary hut structure made up of a roughly oval arrangement of postholes and stakeholes, which enclosed a hearth and a pit with heat shattered stone. Other pits and stakeholes were scattered in the immediate vicinity while four pits with heat shattered stone material were located up to 15m to the southeast (Figure 4).

2.2.1 Hut Structure “A”

The exact plan of the possible hut structure was difficult to ascertain due to its ephemeral nature. Unlike formal Bronze Age houses that would have very defined elements, this small structure probably consisted of a somewhat irregular arrangement of stakeholes with a roughly oval or sub-rectangular plan. Other arrangements of post/stakeholes on the periphery of the structure may represent windbreaks or fences, but could equally be parts of the structure itself.

The structure measured approximately 3.5m by 3m, and was orientated northeast-southwest, with a possible internal division roughly centrally across its width (Figure 5; Plate 1). Overall, the structure and immediately adjacent features occupied an area measuring 7m by 6m.

2.2.1.1 Outer Walls

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C84	N/A	0.13	0.11	0.12	Circular. Rounded point at base	Cut of posthole
C85	C84	0.13	0.11	0.12	Brownish grey sandy clay	Fill of posthole
C102	N/A	0.2	0.19	0.21	Circular. Tapered to point at base	Cut of posthole
C103	C102	0.2	0.19	0.21	Brownish grey silty clay	Fill of posthole
C104	N/A	0.06	0.06	0.04	Circular. Flat base	Cut of stakehole
C105	C104	0.06	0.06	0.04	Brownish grey silty clay	Fill of stakehole
C106	N/A	0.07	0.06	0.05	Circular, slightly angled, blunt point	Cut of stakehole
C107	C106	0.07	0.06	0.05	Brownish grey silty clay	Fill of stakehole
C108	N/A	0.06	0.05	0.11	Circular. Tapered to point	Cut of stakehole
C109	C108	0.06	0.05	0.11	Brownish grey silty clay	Fill of stakehole
C118	N/A	0.14	0.14	0.15	Circular. Sheer sides, rounded point at base	Cut of posthole
C119	C118	0.14	0.14	0.15	Brownish grey silty clay	Fill of posthole
C120	N/A	0.1	0.1	0.16	Circular. Sheer sides, rounded point at base	Cut of posthole
C121	C120	0.1	0.1	0.16	Brownish grey silty clay	Fill of posthole
C136	N/A	0.08	0.07	0.1	Circular. Sheer sides, rounded point at base	Cut of stakehole
C137	C136	0.08	0.07	0.1	Brownish grey silty clay	Fill of stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C138	N/A	0.11	0.1	0.1	Circular. Sheer sides, rounded point at base	Cut of posthole
C139	C138	0.11	0.1	0.1	Brownish grey silty clay	Fill of posthole
C142	N/A	0.1	0.1	0.18	Circular. Sheer sides, rounded point at base	Cut of posthole
C143	C142	0.1	0.1	0.18	Light brown clayey silt	Fill of posthole
C144	N/A	0.1	0.1	0.13	Circular. Sheer sides, rounded point at base	Cut of stakehole
C145	C144	0.1	0.1	0.13	Brownish grey silty clay	Fill of stakehole
C146	N/A	0.06	0.06	0.1	Circular. Sheer sides, rounded point at base	Cut of stakehole
C147	C146	0.06	0.06	0.1	Brownish grey silty clay	Fill of stakehole
C148	N/A	0.13	0.12	0.16	Circular. Tapered to point	Cut of posthole
C149	C148	0.13	0.12	0.16	Brownish grey silty clay	Fill of posthole
C150	N/A	0.1	0.1	0.12	Circular. Sheer sides, rounded point at base	Cut of posthole
C151	C150	0.1	0.1	0.12	Brownish grey silty clay	Fill of posthole
C210	N/A	0.06	0.06	0.13	Circular. Sheer sides, rounded point at base	Cut of stakehole
C211	C210	0.06	0.06	0.13	Brownish grey silty clay	Fill of stakehole
C212	N/A	0.07	0.06	0.1	Circular. Sheer sides, rounded point at base	Cut of stakehole
C213	C212	0.07	0.06	0.1	Mid-grey silty clay	Fill of stakehole
C214	N/A	0.05	0.05	0.09	Circular. Sheer sides, rounded point at base	Cut of stakehole
C215	C214	0.05	0.05	0.09	Mid-grey silty clay	Fill of stakehole
C216	N/A	0.06	0.06	0.05	Circular. Sheer sides, rounded point at base	Cut of stakehole
C217	C216	0.06	0.06	0.05	Mid-grey silty clay	Fill of stakehole
C226	N/A	0.07	0.07	0.09	Circular. Sheer sides, rounded point at base	Cut of stakehole
C227	C226	0.07	0.07	0.09	Brownish grey silty clay	Fill of stakehole
C228	N/A	0.04	0.04	0.12	Circular. Sheer sides, rounded point at base	Cut of stakehole
C229	C228	0.04	0.04	0.12	Brownish grey silty clay	Fill of stakehole
C230	N/A	0.08	0.08	0.07	Circular. Sheer sides, rounded point at base	Cut of stakehole
C231	C230	0.08	0.08	0.07	Brownish grey silty clay	Fill of stakehole
C236	N/A	0.07	0.07	0.12	Circular. Steep sides, rounded point at base	Cut of stakehole
C237	C236	0.07	0.07	0.12	Brownish grey silty clay	Fill of stakehole
C238	N/A	0.12	0.11	0.14	Circular. Sheer sides, rounded point at base	Cut of posthole
C239	C238	0.12	0.11	0.14	Brownish grey silty clay	Fill of posthole
C246	N/A	0.07	0.07	0.08	Circular. Sheer sides, rounded point at base	Cut of stakehole
C247	C246	0.07	0.07	0.08	Brownish grey silty clay	Fill of stakehole
C264	N/A	0.05	0.05	0.05	Circular, blunt point at base	Cut of stakehole
C265	C264	0.05	0.05	0.05	Brownish grey silty clay	Fill of stakehole
C266	N/A	0.05	0.05	0.08	Circular. Sheer sides, rounded point at base	Cut of stakehole
C267	C266	0.05	0.05	0.08	Mid-brownish/grey silty clay	Fill of stakehole
C280	N/A	0.07	0.06	0.08	Circular. Sheer sides, blunt point at base	Cut of stakehole
C281	C280	0.07	0.06	0.08	Mid-grey silty clay	Fill of stakehole
C282	N/A	0.08	0.08	0.11	Circular. Sheer sides, rounded point at base	Cut of stakehole
C283	C282	0.08	0.08	0.11	Mid-brownish/grey silty clay	Fill of stakehole

Finds: None

The outer walls were made up of 9 postholes and 18 stakeholes (Figure 5). All of the postholes and stakeholes were formed from a post or stake being driven into the ground rather than a hole being dug to place the post in with packing added as support. The difference between features interpreted as posthole and stakeholes has been made on the basis of size with the larger postholes possibly having a more significant structural function. The outer walls of the structure tended to have postholes located at the corners (C102, C138, C84, C148 and C150) and centrally along each wall (C120, C142 and C238). There was no obvious posthole in the north-east corner although C264 was one of the larger stakeholes recorded at that location. The largest possible posthole of the structure may have been C277 in the centre of the northeast wall but this feature has been interpreted as being later than

the hut and is discussed below, although it is notable that it is located along the line of the walls of the structure.

The widest gaps between features were 1.6m in the south-west between C84 and C142 and this was possibly the location of an entrance. If it was the entrance then the hearth was positioned at the rear of the structure.

2.2.1.2 Possible Central Internal Division

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C122	N/A	0.08	0.08	0.1	Circular. Sheer sides, rounded point at base	Cut of stakehole
C123	C122	0.08	0.08	0.1	Brownish grey silty clay	Fill of stakehole
C130	N/A	0.09	0.08	0.1	Circular. Concave base	Cut of stakehole
C131	C130	0.09	0.08	0.1	Mid-brownish/grey silty clay	Fill of stakehole
C132	N/A	0.07	0.07	0.09	Circular. Sheer sides, rounded point at base	Cut of stakehole
C133	C132	0.07	0.07	0.09	Brownish grey silty clay	Fill of stakehole
C158	N/A	0.07	0.06	0.11	Circular. Sheer sides, rounded point at base	Cut of stakehole
C159	C158	0.07	0.06	0.11	Brownish grey silty clay	Fill of stakehole
C160	N/A	0.06	0.06	0.1	Circular. Sheer sides, rounded point at base	Cut of stakehole
C161	C160	0.06	0.06	0.1	Brownish grey silty clay	Fill of stakehole

Finds: None

An intermittent line of stakeholes that extended across the centre of the structure may represent an internal partition (Figure 5). This extended from C122 on the north-west wall to C238 in the south-east and consisted of stakeholes C130, C132, C158, and C160. There was a possible deliberate gap in the centre of the alignment between C132 and C158 which measured 1.2m. All the stakeholes were of a similar depth (0.08–0.12m). C130 was truncated slightly by pit C51.

2.2.1.3 Hearth C272 and Associated Stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C110	N/A	0.08	0.07	0.07	Circular. Sheer sides, rounded point at base	Cut of stakehole
C111	C110	0.08	0.07	0.07	Brownish grey silty clay	Fill of stakehole
C112	N/A	0.04	0.04	0.09	Circular. Tapered to point	Cut of stakehole
C113	C112	0.04	0.04	0.09	Brownish grey silty clay	Fill of stakehole
C114	N/A	0.07	0.06	0.13	Circular. Tapered to point	Cut of stakehole
C115	C114	0.07	0.06	0.13	Brownish grey silty clay	Fill of stakehole
C116	N/A	0.09	0.08	0.11	Circular. Sheer sides, rounded point at base	Cut of stakehole
C117	C116	0.09	0.08	0.11	Brownish grey silty clay	Fill of stakehole
C202	N/A	0.05	0.05	0.06	Circular. Sheer sides, rounded point at base	Cut of stakehole
C203	C202	0.05	0.05	0.06	Brownish grey silty clay	Fill of stakehole
C204	N/A	0.08	0.08	0.09	Circular. Sheer sides, rounded point at base	Cut of stakehole
C205	C204	0.08	0.08	0.09	Mid-grey silty clay mod charcoal	Fill of stakehole
C206	N/A	0.04	0.04	0.12	Circular. Sheer sides, rounded point at base	Cut of stakehole
C207	C206	0.04	0.04	0.12	Brownish grey silty clay	Fill of stakehole
C272	N/A	1.03	0.55	0.13	Oval hearth with signs of scorching	Cut of hearth
C273	C272	0.84	0.55	0.05	Red/grey silty clay occasional burnt stones	Upper fill of hearth
C274	C272	1.03	0.55	0.1	Yellow/grey silty clay with charcoal inclusions	Lower fill of hearth

Finds

Context	Find Number	Material	Period	Description
C273	E3838:273:1	Flint	Neolithic	1 piece flint debitage
C274	E3838:274:1	Flint	Neolithic	1 piece flint debitage

A sub-oval hearth C272 was situated in the north-east end of the structure (Figure 5; Plates 2–3). The base showed evidence of being oxidised which indicated high

temperature and *in situ* burning. This layer was sealed by a layer of reddened silty clay with burnt sandstone, C273, patches of burnt clay and charcoal chunks (Figure 6). One flint flake was found within its lower fill and one within its upper fill.

A series of stakeholes flanked the hearth on its north and south sides (Plate 3). These were made up of two different types: those with flat or concave bases and those with tapered points. Three with tapered points, C112, C114 and C202, were less than 0.08m wide and were positioned symmetrically about 0.1m from the hearth on its north side. Two stakeholes with concave points, C110 and C116, were located immediately north of them. The two stakeholes on the south side, C204, C206 were noticeably less tapered and had more vertical sides than the group of three on the north side. It is possible that these stakeholes supported a spit or similar apparatus.

Two pieces of flint debitage (273:1 and 274:1) were recovered from the hearth fills C273 and C274, suggesting that knapping and/or tool re-sharpening took place at the site (Sternke, Appendix 2.2).

Charcoal was recovered from the hearth fill C274 during post-excavation soil flotation and subsequently identified to species. Only one fragment of alder (*Alnus* sp), charcoal was identified. This suggests that the hearth may have been cleared out after the final burning episode (O'Donnell, Appendix 2.3).

2.2.1.4 Pit Features C51, C275 and C277

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C51	N/A	0.58	0.36	0.07	Irregular shallow pit	Cut of pit
C52	C51	0.58	0.36	0.07	Orange-brown silty clay with burnt stones	Fill of pit
C128	N/A	0.06	0.05	0.09	Circular. Tapered rounded point at base	Cut of stakehole
C129	C128	0.06	0.05	0.09	Brownish grey silty clay	Fill of stakehole
C275	N/A	0.65	0.3	0.07	Rectangular pit northwest–southeast	Cut of pit
C276	C275	0.65	0.3	0.07	Yellowish grey silty clay	Fill of pit
C277	N/A	0.23	0.28	0.19	Oval-shaped pit/posthole	Cut of pit/posthole
C278	C277	0.23	0.28	0.19	Mid-grey silty sand	Fill of pit/posthole

Finds

Context	Find Number	Material	Period	Description
C276	E3838:276:1	Chert	Neolithic	1 piece chert debitage

These features are considered together as they may represent a second phase of activity within the hut structure, although they also could be unrelated to the structure and their location within it could be coincidental, as other pits were identified outside it also.

Pit C51 was located 1m west of the hearth and contained heat shattered stones within its fill. There was no evidence of *in situ* burning on the base of this pit so it is not interpreted as being a hearth, but may have been a waste pit. At the base of the pit was a stakehole, C128, filled with mid-brownish grey silty clay. The function of the stakehole is unclear.

A small sub-rectangular pit C275 was located on the north side of the hearth and partially truncated it (Figure 5; Plates 2–3). It is not clear if it had any functional relationship with the hearth or the structure.

Pit/posthole C277 was located at the north end of pit C275 and cut through it. It may have formed part of the north wall of the structure as it was on a similar alignment. Its stratigraphic relationships however indicate that it was later than the hearth C272. As

it is interpreted that the hearth was related to the structure, pit/posthole C277 must be later than the construction of the structure. It must be noted however that there is no stratigraphical evidence to prove that the hearth and the structure are contemporary, leaving a possibility that C277 is part of the hut structure.

One piece of chert debitage (276:1) was recovered from the pit fill C276, suggesting that knapping and/or tool re-sharpening took place at the site (Sternke, Appendix 2.2).

2.2.1.5 Other Internal Stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C134	N/A	0.07	0.07	0.09	Circular. Sheer sides, rounded point at base	Cut of stakehole
C135	C134	0.07	0.07	0.09	Light brown clayey silt	Fill of stakehole
C152	N/A	0.08	0.08	0.21	Circular. Sheer sides, rounded point at base	Cut of stakehole
C153	C152	0.08	0.08	0.21	Brownish grey silty clay	Fill of stakehole
C156	N/A	0.07	0.06	0.1	Circular. Tapered towards point	Cut of stakehole
C157	C156	0.07	0.06	0.1	Brownish grey silty clay	Fill of stakehole
C234	N/A	0.07	0.06	0.12	Circular. Sheer sides, rounded point at base	Cut of stakehole
C235	C234	0.07	0.06	0.12	Brownish grey silty clay	Fill of stakehole

Finds: None

In the southern half of the structure there was a possible alignment of four stakeholes that may represent a further internal division. These extended roughly east–west from posthole C138 at the west corner of the structure to posthole C238 on the east side and included stakeholes C134, C152, C234, and C156.

2.2.1.6 External Stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C92	N/A	0.07	0.06	0.1	Circular. Rounded point at base	Cut of stakehole
C93	C92	0.07	0.06	0.1	Brownish grey silty clay	Fill of stakehole
C168	N/A	0.05	0.05	0.08	Circular. Sheer sides, rounded point at base	Cut of stakehole
C169	C168	0.05	0.05	0.08	Brownish grey silty clay	Fill of stakehole
C240	N/A	0.07	0.06	0.08	Circular. Sheer sides, rounded point at base	Cut of stakehole
C241	C240	0.07	0.06	0.08	Brownish grey silty clay	Fill of stakehole
C242	N/A	0.08	0.07	0.14	Circular. Sheer sides, rounded point at base	Cut of stakehole
C243	C242	0.08	0.07	0.14	Brownish grey silty clay	Fill of stakehole
C248	N/A	0.05	0.04	0.1	Circular. Tapered to point	Cut of stakehole
C249	C248	0.05	0.04	0.1	Brownish grey silty clay	Fill of stakehole
C250	N/A	0.04	0.04	0.1	Circular. Tapered to point	Cut of stakehole
C251	C250	0.04	0.04	0.1	Brownish grey silty clay	Fill of stakehole

Finds: None

Immediately to the east of the structure there was a small cluster of stakeholes that may have formed part of the structure or been related in some way. A further isolated stakehole C92 was located near the north-east corner and it too may have been associated with the structure.

2.2.2 Possible Structure “B”

This comprised two postholes and six stakeholes with no internal features present (Figure 5). It was located to the north of Structure A.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C86	N/A	0.06	0.06	0.11	Circular, tapered at base, leant slightly northwest	Cut of stakehole
C87	C86	0.06	0.06	0.11	Mid-brownish/grey silty clay occasional charcoal	Fill of stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C88	N/A	0.06	0.06	0.11	Circular, rounded point at base, slight lean	Cut of stakehole
C89	C88	0.06	0.06	0.11	Brownish grey silty clay	Fill of stakehole
C90	N/A	0.06	0.06	0.13	Circular. Sheer sides, rounded point at base	Cut of stakehole
C91	C90	0.06	0.06	0.13	Brownish grey silty clay	Fill of stakehole
C94	N/A	0.06	0.07	0.12	Circular. Tapered to point	Cut of stakehole
C95	C94	0.06	0.07	0.12	Mid-brownish/grey silty clay occasional charcoal	Fill of stakehole
C96	N/A	0.05	0.05	0.08	Circular. Sheer sides, rounded point at base	Cut of stakehole
C97	C96	0.05	0.05	0.08	Brownish grey silty clay	Fill of stakehole
C98	N/A	0.05	0.05	0.06	Circular. Sheer sides, rounded point at base	Cut of stakehole
C99	C98	0.05	0.05	0.06	Brownish grey silty clay	Fill of stakehole
C188	N/A	0.18	0.16	0.18	Oval, rounded point at base	Cut of posthole
C189	C188	0.18	0.16	0.18	Mid-brownish/grey silty clay occasional charcoal	Fill of posthole
C190	N/A	0.1	0.1	0.18	Circular, rounded point at base	Cut of posthole
C191	C190	0.1	0.1	0.18	Mid-brownish/grey silty clay occasional charcoal	Fill of posthole

Finds: None

This possible structure was adjacent to Structure “A” which was located immediately to the south and measured 3m west–east by 2.5m north–south. It was oval-shaped and was made up of two postholes in the northwest corner, C188 and C190, and a series of smaller stakeholes: C86, C88, C90, C94, C98, C96. Posthole C188 may have had a single packing stone wedged in on its south-west side but this could have been a part of the fill. The spacing between the postholes/stakeholes was generally 0.6m–0.8m with a 1.75m wide gap evident on the north and south sides.

2.2.3 Possible Boundary Fences

Two alignments of post and stakeholes to the north and east of Structures A and B may represent possible fencelines that may have been used as boundary divisions or markers.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C186	N/A	0.07	0.07	0.09	Circular. Tapered rounded point at base	Cut of stakehole
C187	C186	0.07	0.07	0.09	Soft mid-brownish to grey silty clay	Fill of stakehole
C192	N/A	0.24	0.13	0.09	Oval cut with a flat base	Cut of shallow pit
C193	C192	0.24	0.13	0.09	Light brownish grey silty clay	Fill of shallow pit
C194	N/A	0.07	0.07	0.13	Circular. Tapered rounded point at base	Cut of stakehole
C195	C194	0.07	0.07	0.13	Brownish grey silty clay	Fill of stakehole
C218	N/A	0.05	0.05	0.08	Circular. Tapered rounded point at base	Cut of stakehole
C219	C218	0.05	0.05	0.08	Mid-yellowish/grey silty clay	Fill of stakehole
C252	N/A	0.1	0.11	0.19	Circular. Tapered rounded point at base	Cut of posthole
C253	C252	0.1	0.11	0.19	Mid-brownish/grey silty clay occasional charcoal	Fill of posthole
C256	N/A	0.07	0.06	0.18	Circular. Tapered rounded point at base	Cut of stakehole
C257	C256	0.07	0.06	0.18	Mid-brownish/grey silty clay occasional charcoal	Fill of stakehole
C260	N/A	0.15	0.15	0.2	Circular, concave base	Cut of posthole
C261	C260	0.15	0.15	0.2	Brownish/grey silty clay	Fill of posthole
C268	N/A	0.14	0.13	0.18	Circular, concave base	Cut of posthole
C269	C268	0.14	0.13	0.18	Mid-brownish/grey silty clay	Fill of posthole
C284	N/A	0.13	0.12	0.1	Circular. Steep sides flat base	Cut of posthole
C285	C284	0.13	0.12	0.1	Mid-greyish brown silty clay	Fill of posthole
C286	N/A	0.12	0.13	0.15	Circular. Steep sides flat base	Cut of posthole
C287	C286	0.12	0.13	0.15	Mid-greyish brown silty clay	Fill of posthole

Finds: None

This group of postholes and stakeholes may have formed fencelines associated with a boundary or a possible windbreak (Figures 4–5). While their relationship was tentative their pattern in plan does form two perpendicular alignments. The longer of the two was 15m long and extended roughly north–south and was located on the eastern side of the structures. It was formed by C286, C284, C252, C194, C192, C260 and C268. Extending west, and located to the north of the structures was the second alignment which was 5.5m long and consisted of C218, C186, C256 and C252 from the first line. The stakes/posts had wide and irregular intervals between them, but their overall placement to the east and north of the cluster of activity associated with the structures could indicate possible fencelines delineating boundaries or areas of activity.

2.2.4 Features Adjacent to Structures A and B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	1.78	1.38	0.62	Sub-circular, concave base	Cut of pit
C4	C3	1.78	1.38	0.62	Orangey/brown sandy silt	Fill of pit
C7	N/A	0.56	0.36	0.23	Sub-oval. Flat base	Cut of pit
C8	C7	0.56	0.36	0.23	Mid-brown sandy clay	Fill of pit
C9	N/A	0.45	0.33	0.15	Oval. Base of posthole?	Cut of pit/posthole
C10	C9	0.45	0.33	0.15	Dark brown sandy clay	Fill of pit/posthole
C13	N/A	0.18	0.14	0.12	Oval. Pointed base	Cut of posthole
C14	C13	0.18	0.14	0.12	Mid-brownish/grey silty clay	Fill of posthole
C15	N/A	0.25	0.23	0.13	Oval. Concave base	Cut of posthole
C16	C15	0.25	0.23	0.13	Brownish/grey silty clay	Fill of posthole
C17	N/A	1.38	1.1	0.18	Irregular, fairly flat base	Cut of pit
C18	C17	1.03	1.1	0.18	Black/dark grey sandy clay	Fill of pit
C29	N/A	0.54	0.44	0.14	Circular. Flat base	Cut of pit
C30	C29	0.54	0.44	0.14	Yellowish/grey silty clay	Fill of pit
C31	N/A	0.5	0.34	0.14	Oval cut with a flat base	Cut of small pit
C32	C31	0.5	0.34	0.14	Mid-grey silty clay	Fill of small pit
C81	C17	0.46	0.7	0.16	Orangey/brown sandy clay	Fill of pit
C180	N/A	0.06	0.05	0.11	Circular. Tapered rounded point at base	Cut of stakehole
C181	C180	0.06	0.05	0.11	Light brownish grey silty clay	Fill of stakehole
C182	N/A	0.11	0.1	0.2	Circular. Sheer sides, rounded point at base	Cut of stakehole
C183	C182	0.11	0.1	0.2	Mid-brownish/grey silty clay	Fill of stakehole
C184	N/A	0.62	0.6	0.13	Irregular with concave base	Cut of shallow pit
C185	C184	0.62	0.6	0.13	Light brown silty clay	Fill of shallow pit
C258	N/A	0.08	0.08	0.12	Circular, concave base	Cut of stakehole
C259	C258	0.08	0.08	0.12	Mid-brownish grey silty clay	Fill of stakehole

Finds

Context	Find Number	Material	Period	Description
C8	E3838:008:1	Pottery	Middle Bronze Age	1 domestic cordoned urn pottery necksherd
C8	E3838:008:2	Pottery	Middle Bronze Age	1 domestic cordoned urn pottery necksherd
C8	E3838:008:3	Pottery	Middle Bronze Age	1 abraded domestic urn bodysherd
C8	E3838:008:4	Flint	Neolithic	1 piece flint debitage
C30	E3838:030:1	Pottery	Middle Bronze Age	1 abraded neck/ bodysherd domestic ware
C30	E3838:030:2	Pottery	Middle Bronze Age	1 abraded rimsherd domestic ware
C30	E3838:030:3	Pottery	Middle Bronze Age	1 abraded rimsherd domestic ware
C30	E3838:030:4	Pottery	Middle Bronze Age	1 fragment domestic ware
C81	E3838:081:1	Flint	Neolithic	1 piece flint debitage

A number of pits, postholes and stakeholes were located just outside the hut structures and were generally located to the west and south (Figure 5).

The presence of prehistoric pottery sherds in the fills of C7 and C29 and the discovery of piece of flint and burnt bone (0.1g) in pit C7, and heat shattered stone in pit C29 suggest that they were waste pits (Figure 5; Plates 4–5). An irregular pit, C17, and associated stakehole, C258, were found 1.2m south of the structure. The pit contained a piece of flint debitage and charred hazelnut (0.1g) suggesting that. The shape and size of pits C31 and C184 were similar to pits C7 and C29 and could therefore also have been waste pits although their fills were relatively sterile. Pit C3 to the northwest of the structure was larger and deeper than the others but again produced no finds so its function is unknown. The isolated postholes and stakehole have no know function.

Three sherds of domestic middle Bronze Age pottery (008:1-3) were recovered from the pit fill C8. One vessel (008:1-3) can be readily identified as a domestic variant cordoned urn. This plain vessel has a low, pinched-up horizontal cordon at the junction between the neck and body. The external surface has a fine slurry finish. Three abraded sherds and one fragment (030:1-3) from a middle Bronze Age domestic vessel with flat-topped, slightly everted rim were recovered from the pit fill C30. The dark grey-brown fabric has poorly preserved grey-buff surfaces and is too poorly preserved for further identification (Grogan and Roche, Appendix 2.1).

A piece of flint debitage (8:4) was recovered from the pit fill C8, with a further piece retrieved from pit fill C81 (081:1), suggesting that knapping and/or tool re-sharpening took place at the site (Sternke, Appendix 2.2).

Charcoal was recovered from the pit fills C8 and C81 during post-excavation soil flotation and subsequently identified to species. A variety of wood species were identified from both pits including a number of charcoal fragments of alder (*Alnus* sp.), ash (*Fraxinus* sp.), oak (*Quercus* sp.), and smaller amounts of elm (*Ulmus* sp.), wild/bird cherry (*Prunus avium/padus* sp.), hazel (*Corylus avellana*) and pomaceous (*Maloideae* spp.) charcoal fragments. The charcoal result from the pits represents a mixture of species, probably a result of on site burning and dumping, although the charcoal level from here is low (O'Donnell, Appendix 2.3).

Plant remains were recovered from the pit fill C81. Twelve fragments of charred hazelnut (*Corylus avellana* L.) shell were identified. These are frequently found in Irish archaeobotanical assemblages and, as a result of different taphonomic factors they are probably over-represented in terms of their economic and nutritional importance (Johnston, Appendix 2.4).

Nine burnt bone fragments recovered from pit fill C8 were assessed and identified to species where possible. Two calcined bone fragments were identified to the species of *mus*/mouse and rodent. No definite or statistically detailed conclusions could be drawn from this bone assemblage due to its limited size and poor degree of preservation (McCarthy, Appendix 2.5).

A sample of stone from the pit fill C29 was analysed and identified as not altered, angular to sub-rounded coarse grained, quartz rich, yellow/ red sandstone. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills/ river cobbles. It is therefore possible that these rocks were sourced locally. It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

A small fragment (0.1g) of charred hazelnut was chosen for AMS dating from C81 and returned a result of 3615±40 (SUERC 30111). The 2 Sigma calibrated result for this was 2140–1880BC (SUERC, Appendix 2.7) dating this feature to the early Bronze Age period.

2.2.5 Features in the South of the Site, away from the Structures

No stratigraphic relationships existed between the structures and three loose clusters of features found in the southern part of the site more than 5m from them (Figure 4). These features included four pits with heat-shattered stones, six other small pits, one posthole and two stakeholes.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C21	N/A	0.06	0.06	0.15	Circular. Tapered point	Cut of stakehole
C22	C21	0.06	0.06	0.15	Light grey silty sand	Fill of stakehole
C23	N/A	0.05	0.05	0.08	Circular. Tapered point	Cut of stakehole
C24	C23	0.05	0.05	0.08	Light grey silty clay	Fill of stakehole
C25	N/A	0.50	0.44	0.14	Circular, fairly flat base	Cut of pit
C26	C25	0.50	0.44	0.14	Dark brown sandy clay	Fill of pit
C59	N/A	0.97	0.66	0.09	Oval with concave base	Cut of pit
C60	C59	0.97	0.66	0.09	Brownish grey silty clay	Fill of pit
C61	N/A	0.97	0.66	0.09	Oval, uneven base	Cut of pit
C62	C61	0.97	0.66	0.09	Light grey silty sand	Fill of pit
C65	N/A	0.95	0.65	0.06	Oval, concave base	Cut of pit
C66	C65	0.95	0.65	0.06	Black/dark grey clayey silt	Fill of pit
C67	N/A	0.5	0.35	0.05	Oval, fairly flat base	Cut of pit
C68	C67	0.5	0.35	0.05	Mid-brown/grey sandy silt	Fill of pit
C77	N/A	1.8	1.3	0.34	Circular, concave base	Cut of pit
C78	C77	1.8	1.3	0.34	Black silty clay	Fill of pit
C43	N/A	0.6	0.4	0.16	Oval with concave base	Cut of pit
C44	C43	0.6	0.4	0.16	Mid-grey/grey sandy clay	Fill of pit
C47	N/A	0.76	0.64	0.26	Oval, whole cut bowl-shaped	Cut of pit
C48	C47	0.76	0.64	0.26	Mid-brown/grey silty clay	Fill of pit
C57	N/A	0.53	0.44	0.16	Oval, concave base	Cut of pit
C58	C57	0.53	0.44	0.16	Light reddish grey silty clay	Fill of pit and posthole
C80	N/A	0.25	0.18	0.21	Circular, tapered point	Cut of posthole

Finds: None

A pit, C25, and two stakeholes, C12 and C23, were found 3m south of pit C17 and just over 5m south of the hut structure (Figure 4). The pit contained a few pieces of charcoal and its function was unknown.

Five pits of different shapes and sizes, C59, C61, C65, C67 and C77, were located 12m south-east of the house structure (Figure 4). All were very shallow with the exception of C77, which contained the greatest quantity of heat-shattered stones (Plate 6). A notable feature of these pits, excluding C67, was the presence of high quantities of charcoal and heat-shattered stone in the fills. Pits C43 and C45 were probably related but their function was undetermined (Figure 4). Pit C57 appeared to contain a posthole (C80) on its base. Neither C43 nor C45 contained heat-shattered stones.

Charcoal was recovered from the pit fill C78 during post-excavation soil flotation and subsequently identified to species. A variety of wood species were identified including a large number of ash (*Fraxinus* sp.) charcoal fragments, and smaller amounts of oak (*Quercus* sp.), elm (*Ulmus* sp.) and hazel (*Corylus avellana*) charcoal fragments. The results are dominated by ash, so it is likely that ash stands or

woodlands were growing near to the site. Ash trees prefer moist, well drained and fertile soils and are very intolerant of shade (O'Donnell, Appendix 2.3).

Samples of stone from the pit fills C26, C62 and C66 were analysed and identified as not altered, angular to sub-rounded coarse grained, quartz rich, yellow/ red sandstone. Stone analysed from the pit fill C78 was slightly different in that it is burnt, angular, very coarse grained, quartz rich, red sandstone. The samples are clearly shattered cobbles, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally and is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

A fragment of ash (*Fraxinus excelsior*) charcoal (0.11g) was chosen for AMS dating and returned a result of 3703±21 (UBA 12238). The 2 sigma calibrated date for this is 2193–2030BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age.

2.2.6 Spread

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C36	N/A	5	3.5	0.07	Irregular. Charcoal-rich clayey silt	Cultural layer

Finds: None

A spread, C36, of charcoal-rich material covered a large portion of the hut Structure A. It was 0.07m deep at its central point but rapidly thinned out nearer its edges. The fill varied from mid- to dark greyish brown in colour and contained frequent charcoal flecks and chunks, suggesting that the layer partially derived from hearth waste. It had the appearance of an abandonment deposit that formed after the structure went out of use. If this was the case then the burnt stone material was possibly deposited in pit C51 while the structures were in place. This implies that the four other features with burnt stone were possibly also contemporary.

2.3 PHASE 3 Topsoil and Plough Soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A			0.3	Dark brown silty clay	Topsoil

Finds

Context	Find Number	Material	Period	Description
C1	E3838:001:1	Flint	Neolithic	Patinated flint flake
C1	E3838:001:2	Chert	Neolithic	1 piece chert debitage

Two flakes were recovered from the dark-brown silty clay topsoil.

The flake (001:1) is made of flint and was produced using the single-platform method (Sternke, Appendix 2.2). The flake most likely dates to the Neolithic period based on its technology. One piece of chert debitage (1:2) was recovered from topsoil, suggesting that knapping and/or tool re-sharpening took place at the site (*Ibid.*).

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Shankill 4. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting - compiled by Michelle Brick

3.1.1 The General Landscape

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slievenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountrugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometers and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlinton, Athy, Carlow, and Graiguenamanagh and runs through northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Banagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Shankill 4 is located in the northern landscape area.

3.1.2 The Northern Landscape

The northern landscape of the N9/N10 crosses the border from Kilkenny into Carlow and traverses the western side of the River Barrow; the Blackstairs Mountains, which are of granite formation, are located to the east of the Barrow. It includes 50 sites discovered during the Phase 4 excavations stretching from Rathcash 1 northwards to Tomard Lower 1. This northern landscape is overlooked to the west by the Castlecomer Plateau, and the excavated sites are all situated on contours of 50–100m OD. From the south-west of the Barrow, and encroaching into the northern landscape, the underlying limestone is dolomitized and consequently the permeability has been increased. The glacial drift comprises slightly sandy (20–60%) slightly gravely clays with a moisture content of 10–20%. There is therefore significantly less sand but higher moisture content than in the southern and central landscapes. This moisture occurs in the wetter deposits in the top 1–2m before ground level in localised areas with silty sand and gravel lenses indicating a high water table. To the east of the River Barrow, localised silty, laminated clays and peat occur. Soft ground was noted in the river's floodplain. The area is also classified as a minor aquifer in the Kilkenny Groundwater Protection Scheme (Buckley & Fitzsimmons, 2002) due to these thick sand and gravel deposits. Progressing northwards, the views become more expansive, and the rising high ground of the Castlecomer Plateau (50–300m OD) bounds the distant landscape. This plateau consists of a variety of hills and peaks, which contain seams of anthracite, the focus of coal mining in the region from the 17th century. The Blackstairs Mountains (735m) are visible on the horizon to the south-east, and most obvious of these is the peak of Mount Leinster (795m). There are impressive views from these plateaus and hills especially to the south, east and west over the Barrow and Nore Valleys.

The prevailing watercourse of this region is the River Barrow which travels north-south through the landscape. The Maudlin River is a tributary of the River Barrow and flows from the west through Old Leighlin; minor tributaries of this river flow through Bannagagole, directly north of Moanmore, and the River Dinin is a tributary of the River Nore which travels south-west from Brennan's Hill through the Castlecomer Plateau. The suffix 'comer' signifies a meeting of the rivers; it also signifies any deep gripe, such, for instance, as the channel formed by a mountain stream (Carrigan 1905). From the hinterland of Kilkenny and the confluence of the Nore and Barrow the Monefelim River contributes to the occurrence of wet grassland and broadleaf woodland. The narrow tributaries of the River Barrow, including the Monefelim River, as well as the Maudlin River, flow from the higher, steep, escarpment located to the west. Subsoils in this area consist of undifferentiated alluvium and soils of mineral alluvium. The route crosses into County Carlow where

at Moanmore (meaning 'great bog') a variety of archaeological features have been recorded. At the most northerly point of the N9/N10 the land is again characterised by its views; here they include the Barrow Valley, Mount Leinster, Brandon Hill, and the Blackstairs Mountains.

3.1.3 Site Specific Landscape

The site was located in a corner of a pasture field on land with a gentle north-east aspect. Hedgerows to the south and west partially obscured views of the north Kilkenny hills while the land was more open to the north and east where the Blackstairs Mountains were prominent on the horizon. The nearest water source was a stream 400m to the north. This stream also serves as the Kilkenny–Carlow county boundary and feeds into an upper tributary of the River Barrow. Shankill 5 is located c. 180m directly to the north and Shankill 3 is located c. 400m to the south-west. A hearth (KK016-002) is recorded c. 380m to the west.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Shankill 4, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Shankill 4 has been identified as being Bronze Age in date.

3.2.1 The General Bronze Age Landscape of the Scheme – compiled by Michelle Brick

The archaeological record implies that the Irish Bronze Age (2500–800BC) population dramatically increased from that of the Neolithic and the evidence for permanent settlements with considerable longevity becomes much more substantial. In addition, a wide range of ritual and funerary activity associated with this settlement is apparent. The overall environmental record for Ireland suggests that there was a general climatic deterioration in the Bronze Age, bringing wetter, colder conditions; during this period there was also accelerated forest clearance with more intensive habitation in the drier lowlands. As a result of extensive development-led projects across the country, understanding of settlement and burial patterns from the early Bronze Age has greatly developed. The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for settlement. In the central part of the current portion of the N9/N10 Phase 4 the fertile Kilkenny lowlands have produced some Bronze Age archaeology, particularly in Danesfort and Ennisnag townlands. In the northern part of the scheme intense settlement is indicated by both burnt mounds and barrows existing on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir. Hillforts appear to be positioned to overlook the settlement activity, as well as the route of the Nore, the lower saddle to the north of the Slieveardagh Hills, and to the south of the spur surmounted by Clonmantagh. A considerable number of ringditches, cremation and inhumation burials (single and grouped), burnt mound sites, structures and domestic settlement evidence, have been recorded as part of the Bronze Age on the N9/N10 Phase 4.

In the southern landscape the exposure of domestic Bronze Age settlement was less forthcoming than that of the northern landscape. There was little direct evidence for structures in the southern and central landscapes with the exception of a cluster of structures in the Danesfort area. Instead most of the settlement activity that fell within the roadtake was noted in the northern landscape, further to the north of Kilkenny and in Carlow. Ritual and burial is a dominant feature of the Bronze Age in Kilkenny

and Carlow as indicated by the presence of flat cemeteries, burial cairns, ringditches, mounds, barrows and hillforts throughout these counties. Freestone Hill situated in Coolgrange, Co. Kilkenny, in the centre of the present landscape is just one example of these sites. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands.

The significant number of burnt mound sites discovered due to the N9/N10 excavations, combined with the previously known examples in the RMP reinforces the concept that Bronze Age activity in Kilkenny and Carlow was considerable. A total of 36 sites with evidence for burnt mound activity were uncovered during the N9/N10 excavations, with an additional example discovered, and preserved outside, the roadtake. The burnt mounds are focussed in the upland area, especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill.

The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for Bronze Age settlement. The patterning of human activity in the region indicates that these were also the principal route-ways in prehistory; both were navigable by small craft but they, and the major tributaries of the Nore - the Dinin and King's Rivers - were also conspicuous landscape features that facilitated accurate navigation through this landscape. The Barrow and Nore also provided access to wider networks beyond the region.

The Northern Landscape: Domestic Settlement

The domestic settlement evidence from the landscape along the northern sections of Kilkenny and the border with Carlow can be characterised by multi-period sites, such as at Moanduff 2–3, and by clusters of activity represented by multiple burnt mound sites and several, possibly associated, structures. This part of the Barrow is overlooked by the hillforts at Freestone Hill (KK020-018002) (Coolgrange), Ballinkillin (CW019-027) and Killoughternane (CW019-065). However, the distinct clustering of the Paulstown area sites suggests the existence of a community separate to that in the immediate vicinity of Freestone Hill although it is probable that the hillforts reflect a wider landscape control system involving co-operation or alliance between a number of communities in the Kilkenny region. In addition to the indirect evidence in the form of burnt mounds and cultural deposits in pits, several structures, of typical Bronze Age morphology, were recovered. At Garryduff 1 an external ring of 37 postholes and stakeholes was positioned in a shallow, curving slot-trench and enclosed an area 11m in diameter with an inner ring of 10 larger postholes (7m diameter). This structure was located on the edge of a break of slope, which led down to an adjacent river. Other features on site may represent a possible grain stand and pits for food storage/rubbish. In the south-western corner of the site a curving arc (12m long) of 18 postholes and stakeholes was identified which may continue beyond the site. Six kilometres to the north of Garryduff 1 was an oval-shaped structure at Shankill 4. This was most likely a hut (4m x 3m) and consisted of postholes, stakeholes, an internal hearth, and outlying pits. An arc of stakeholes measuring 3m by 2.5m on its north side might have formed an entrance porch. Sherds from at least one domestic cordoned urn came from the site. A roundhouse at Moanmore 2 consisted of 14 postholes, a central hearth, and up to 50 associated stakeholes and postholes.

As well as two rectangular Neolithic structures at Moanduff 2–3 there were four, or possibly five, separate areas of Bronze Age activity identified. As the features representing this activity were heavily truncated it is impossible to identify their exact function however some may represent Bronze Age structures. A middle-late Bronze Age enclosure (180m x 160m) and late Bronze Age activity in the form of troughs with burnt clay and stone were also excavated on site. At Coneykeare 1 two very tentative structures were identified by the director and a fifth concentration of activity, incorporating burnt mounds and settlement activity; was noted at Coolnakisha 1. A five post, L-shaped possible temporary structure at Coolnakisha 1 was identified along with two pits containing burnt bone and a moderate amount of charcoal and flint. A spread, also containing a moderate amount of charcoal, burnt bone, flint and heat-shattered stones was located to the north-west of the possible structure. It is most likely that the burnt bone deposits within the features on this site are domestic in nature.

The Northern Landscape; Funerary and Ritual activity

Funerary evidence is represented by ringditches at Kellymount 5 and Paulstown 1 and simple pit cremations also at Paulstown 1. Evidence of the Bronze Age is present at Croan (Aghaviller Parish); where a food vessel was discovered, and also at Cruttenclough; where artefacts of amber, gold and bronze were found; there were 14 gold beads discovered with varying decoration together with graduated amber beads (Lyng 1984). The find circumstances of these artefacts is unknown however similar artefacts in the form of a necklace were discovered at Tara, around the neck of an adolescent male, buried in a pit (Herity and Eogan 1977) and it is likely that the Cruttenclough finds came from a similar burial context. They indicate trading links with Europe and a bronze sunflower pin was also discovered in this townland, which is of late Bronze Age type (Lyng 1984; Eogan 1974a, 87) and originally had a gold foil covering. Other material demonstrating a late Bronze Age presence in the area includes the large hoard from Ballytegan, Co. Laois (Eogan 1983); this contained three sunflower (two covered in gold foil) and one disc-headed pin, two socketed axes, a bracelet of twisted strands and a variety of both solid and hollow bronze rings. The rings are characteristic of Eogan's (1974b; 1993) midland province and this hoard demonstrates ritual activity in the region. Early Bronze Age activity is also evident in the adjacent area of Co. Carlow on the east side of the River Barrow. A cist burial at Killinane contained cremated bone and an upright tripartite bowl food vessel (Moore 1984). Similar discoveries were also found close by in Sliguff and Wells; both townlands are located in west Carlow along the Kilkenny border close to the landscape of the present scheme. The Sliguff cist contained a crouched inhumation that was accompanied by a bowl while the pit cemetery at Baunogenasraid was inserted into the mound of the earlier Linkardstown tomb (Raftery 1974). A large cemetery mound at Ballon Hill was discovered in the 19th century, which revealed a large assemblage of vases and collared urns in both pit and cist burials (Waddell 1990, 51–53).

Six of the sites in this northern landscape of the N9/N10 Phase 4 had evidence for prehistoric funerary activity which was represented by barrows, ringditches, cists and cremation deposits at Rathcash East 1, Garryduff 1, Paulstown 1–2, Kellymount 5, and Coolnakisha 1–2. This evidence broadens the funerary landscape of the Bronze Age in this region. A possible ringditch was recorded at Rathcash East 1. It was formed by two very shallow curvilinear cuts creating a circle with a diameter of 6m and potential openings or entrances (1.45m wide) mirroring one another on the south-east and north-west sides. Nearby activity included a hearth and possible refuse pit. It is possible that this domestic activity was related to funerary practices associated with the ringditch; however, it is perhaps more plausible that, given the lack of associated burial activity (although the enclosed area had been truncated)

and the occurrence of two entrances, the ringditch in fact represents a domestic structure.

At Garryduff 1 two unroofed structures, both comprising arcs of post- and stakeholes, may have been associated with a large, northwest–southeast pit (2m x 1.3m x 0.16m) located close to Structure 1. This pit contained a charcoal-rich deposit with burnt bone, heat-cracked stones and charred hazelnuts which had been deliberately deposited. Three postholes also containing similar material in their fills were arranged around the pit and a definite concentration of burnt bone was noted in this area of the site. It is possible that this pit and the adjacent postholes represent the remains of a draught pit for a pyre with the postholes at either side being used to stabilise the pyre structure for the duration of the process. Two cremation pits were located outside the enclosure which contained quite large chunks of human bone and possible pyre material.

The cemetery complex at Paulstown 1 consisted of both pit and cist burials. Three small cists (averaging 0.6m by 0.32m by 0.16m internally) were made expediently with slabs and blocks of local stone. Three other pits were less formally lined with stone. Each contained cremations but one cist produced two discrete deposits. Three other grave pits formed part of the cemetery. In one of these pits an unburnt human skull was placed on top of a washed cremation deposit. Several burials were accompanied by ceramic gravegoods. These gravegoods included burnt sherds from bipartite vases, a miniature cordoned urn and a miniature vase; a burnt flint scraper as well as charred seeds and hazelnuts also came from one of the cists. The largest grave at Paulstown consisted of a large pit or pits. This contained a complex sequence of deposition which appears to have begun with a circular pit which contained an inverted vase; this was disturbed by the insertion of Vessel 1, another inverted vase which survived intact. A miniature vase (No. 6) may have accompanied one of these burials. Subsequently, a second larger pit extended the grave to the south. The fragmentary remains of three pots (No.s 3–5) were deposited on the base of this pit and a large cremation deposit was placed over them. This deposit contained sherds from Vessels 5 and 6 as did a final silty fill. The evidence suggests that the grave was extended to accommodate burials disturbed from other graves. A large circular pit occurred on the edge of the cemetery (1.55m by 1.48m by 0.80m deep). This had originally been maintained as an open feature that filled naturally with water. Subsequently, a complex sequence of layers containing charcoal, burnt and unburnt bone, charred hazelnut shells and seeds, antler and flint (including flakes, blades and debitage), developed or was deposited in the pit. The proximity of this feature, which appears to have been a well, suggests that it was associated with the funerary activity on the site.

A double ringditch was identified at Kellymount 5. The external ringditch (12m diameter x 1.04m deep) was lined with a spread of burnt mound material, possibly relating to the earlier use of the site as a burnt mound complex. The only artefacts in this external ringditch consisted of three Bronze Age pottery sherds. The internal ringditch (5.6m diameter x 0.2m deep) was situated centrally within the external ringditch and also contained heat-shattered stones in its fills. A central pit had burnt bone inclusions. A further two pits were located to the south of the ringditches and both contained burnt bone inclusions. A substantial part of a vase urn came from one of the troughs associated with the burnt mound complex; while this may be derived from the funerary activity it is evident that the vessel had been used in a domestic context and may have been a deliberate deposit in the base of the trough.

Evidence for funerary activity was also excavated at Coolnakisha 2, where one pit (0.33m x 0.26m x 0.13m) contained 25.5g of charcoal, 0.1g of charred seeds and

390.3g of burnt bone. Other pits and possible pits and spreads also contained burnt bone inclusions, although in much smaller quantities. Both sites produced small quantities of probably middle Bronze Age while residual Neolithic material in the form of three flint scrapers came from Coolnakisha 1.

It is therefore apparent that the central, northern part of Kilkenny contained the most varied evidence for burial and funerary activity. As the N9/N10 progresses northwards sites with a probable continuity of function and chronology emerge: from the Danesfort complex near the King's River to the varied ringditches and cremations at Templemartin 5 and the amalgamation of ritual and burial at Paulstown 1–2.

The Northern Landscape; Burnt Mound Activity

The evidence from the northern landscape was dominated by clusters of burnt mounds and reinforces the patterning already indicated by the previously known archaeological record. Several previously identified burnt mounds were recorded in Cloghoge (KK020-039, KK020-075–076), Rathcash West (KK020-077–078), Shankill (KK016-003, KK016-010) and at Moanmore (meaning 'great bog') (CW015-007, CW015-014). Twenty seven sites with evidence of burnt mound activity were uncovered as part of the N9/N10 Phase 4 excavations within the northern landscape. The underlying limestone geology/glacial drift consisted of sandy/gravel-clays which have a higher moisture content than the southern and central landscapes resulting in a high water table in localised areas. This helps explain the presence of the considerably sized waterholes at these burnt mound sites, notably within the Jordanstown and Kellymount cluster (Jordanstown 2 and 3 and Kellymount 1-3, 5&6). Other clusters of burnt mound activity in the northern landscape occurred at Ballyquirk 1,2 and 4, Moanmore 1 and 3, Moanduff 1,2 and 3, Rathcash 1 and 2, Blanchevillespark 2,3 and 4 and Cranavonane 1 and 2. Other sites exhibiting burnt mound activity include Shankill 6, Bannagagole 1, Rathcash East 2, Tomard Lower 1 and Ballinvally 1. Due to the poor on-site conditions the sites at Cranavonane 2 and Blanchevillespark 2 were not fully resolved but were identified as burnt mounds. Burnt mounds were not excavated at Kellymount 1, Moanduff 2 and 3, Ballyquirk 1 and Ballinvally 1; however features associated with burnt mound activity were recovered and excavated at these sites indicating a clear association with this type of activity.

The Northern Landscape; Route-ways and communications

While it is clear that the rivers and streams are a major feature of the settlement networks the distribution of prehistoric activity, for example on the lowland fringes to the south of the Castlecomer Plateau, shows that other route-ways were functioning at both a local and regional scale. Within these network systems it is possible to identify particular concentrations of human activity. Some of these were already important in the early Neolithic while others became prominent only in the Bronze Age. Among the most significant of these are those in the area around Carlow, on the upper Barrow and its tributary the Burren River, which the archaeological work on the Carlow Bypass has highlighted (Dunne 2007). To the south of this, the eastern side of the Barrow in the Goresbridge area formed the core of a settlement zone that in the Bronze Age extended westwards across the river into the Paulstown area of Co. Kilkenny. The immediate environs of Kilkenny City also appear in the Bronze Age as a settlement focus, underlined as a result of the N9/N10 excavations, while the southern end of the Castlecomer Plateau, with the major focal site on Freestone Hill, has been highlighted by the discovery of new sites on the lowlands immediately to the south around Rathcash.

The Northern Landscape; Conclusions

In the northern part of the region, focussed on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir, intense settlement is indicated

by both burnt mounds and barrows. The burnt mounds are focussed in the upland area and especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands. The large number of burnt mounds discovered on the lowland fringe to the east of the plateau, along the Barrow Valley, shows the development of intensive settlement throughout the northern part of the region. In this area the hillforts appear to be positioned to overlook the settlement landscape.

3.2.2 The Site Specific Archaeological Landscape of Shankill 4

There are no previously recorded monuments dating to the prehistoric period in the vicinity of Shankill 4. The site of a *fulacht fiadh* (CW015-014) is recorded c. 900m to the north and the site of a ringfort (CW015-016) is recorded c. 1.5km to the north-east. Ringforts (KK016-005&007) are also recorded c. 900m to the south-east and c. 450m to the SSE. A *fulacht fiadh* site (KK016-003) is also recorded c. 600m to the south-west and a settlement hearth site (KK016-002) is recorded c. 400m to the WSW.

At Shankill 4 an oval prehistoric hut structure made up of postholes and stakeholes and a few shallow outlying pits was excavated. An arc of stakeholes on its north side might have formed a separate sheltered space. The structure was partially covered by an occupation deposit. One of the outlying pits contained heat-shattered stones and the site therefore may have been a campsite linked to burnt mound activity. Sherds of middle Bronze Age pottery were recovered from the site and the site has been dated to the early Bronze Age period. A number of sites were excavated to the NNE of Shankill 4, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. Shankill 5 was situated c. 150m to the NNE and the possible remnants of a structure comprising two parallel slot-trenches was excavated. The slot-trenches may have served as an entrance porch to a larger structure, no longer extant, or may have been part of a small platform unrelated to a habitation dwelling. A nearby group of four shallow postholes may have formed a similar structure. A large stone-filled pit and three other shallow pits, one of which has been dated to the early Iron Age period, four stakeholes and a pit filled with hearth waste which has dated to the medieval period were the only other features of note on the site. It is likely that this site had a number of occupation phases as a stone axe was recovered during the cleaning back of the site ahead of its excavation and one sherd of Beaker pottery was recovered from topsoil. Shankill 6 was located c. 300m to the NNE and four undated small spreads/deposits were excavated at this site. They were the remnants of burnt mound material but no features associated with this type of monument were found and the material appeared to have washed into the area and had silted up in naturally formed depressions. Moanmore 1 was located c. 500m to the NNE and a burnt mound complex consisting of three troughs, an area of burning, a pit, and a series of stakeholes dating to the late Bronze Age was excavated.

A number of sites were also excavated to the SSW of Shankill 4, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. Shankill 3 was located c. 400m away and an undated shallow pit/hearth containing three fills was excavated at this site. Shankill 2 was located c. 900m to the SSW and a medieval cereal drying kiln was excavated at this site. Shankill 1 was located c. 1.35km to the SSW and a small portion of the linear earthwork known as the Rathduff Dyke was excavated.

3.3 Typological Backgrounds

3.3.1 Typological Background of Bronze Age Structures: Vicky Ginn

Interpretation of Irish Bronze Age houses has relied considerably on the British evidence. The re-interpretation in the 1970s of several sites such as Itford Hill and Black Patch, both in Sussex, proved seminal in advancing understanding of how these structures functioned (Musson 1970; Drewett 1979). Further excavations in the South Downs facilitated Guilbert to describe a typical Bronze Age roundhouse of post construction, the posts of which were regularly spaced, apart from towards the back of the structure where there was a tendency toward tight spaced posts (Guilbert 1982). The Sussex region is particularly rich in such Bronze Age settlement remains and the interpretations derived from the evidence have since proven enduring and archetypal. It would not be until 2000 that such discussions were taking place within the published domain in Ireland when Doody summarised and categorised the structure features associated with Bronze Age roundhouses and noted their axis of symmetry, as observed by Guilbert in the 1980s, and their similarity in appearance across Ireland (Doody 2000). Doody identified three basic ground-plans: circular (83%), oval, and rectilinear (*ibid.*); however, these have been recently expanded upon by Ó Néill (*forthcoming*). The circular roundhouses are generally between 3m and 15m in diameter, use locally available materials for construction and have a broadly eastern entrance (Doody 2000). The roof is predominantly supported by at least one ring of posts (often set in a gully or slot-trench) and occasionally a central post. In general, the walls are non-load bearing; the entrance is often emphasised by elaborate door sills or, more commonly, the addition of a porch. Internal features include stakeholes representing divisions, storage pits, waste pits, stone paving, and, more infrequently, hearths; it is therefore particularly interesting that the houses on the N9/N10 do have evidence for internal, off-centre hearths. Interpretations regarding the exact lifespan of a typical roundhouse have been wide-ranging and extend from 15–25 years (e.g. Drewett 1982, 343) to 30–75 years (Brück 1999, 149). A widespread paucity or limitation of chronologically diagnostic artefacts associated with roundhouses further complicates such interpretations. Frequently, roundhouses show signs of repair and rebuild, as was extensively evident at the nucleated site of Corrstown, Co. Londonderry (Ginn & Rathbone, 2012) where 74 roundhouse platforms were excavated. This nucleated site represents the highest concentration of contemporary Bronze Age houses known to date throughout Ireland and Britain. Most excavated examples do occur in isolation or in pairs or small groups of buildings, as along the N9/N10, indicating that the majority of the Irish Bronze Age population lived in small settlement groups.

3.3.2 Typological Background of Burnt Mounds

Burnt mound sites (also commonly referred to as *Fulacht Fiadh*) are one of the most common field monuments found in the Irish landscape. The last published survey (Power *et al.* 1997), carried out over a decade ago, recorded over 7,000 burnt mound sites and in excess of 1,000 sites have been excavated in recent years through development led archaeological investigations. In spite of this no clear understanding of the precise function of these sites has been forthcoming.

Burnt mound sites are typically located in areas where there is a readily available water source, often in proximity to a river or stream or in places with a high water table. In the field burnt mounds may be identified as charcoal-rich mounds or spreads of heat shattered stones, however, in many cases the sites have been disturbed by later agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

Ó Néill (2003–2004, 82) has aptly identified these sites as the apparatus and by-product of pyrolithic technology. This technology involved the heating or boiling of water by placing fire-heated stones into troughs of water. Small shallow round-bottomed pits, generally referred to as pot boiler pits or roasting pits, are often associated with burnt mound sites. The purpose of these pits remains unclear. Occasionally large pits are also identified and may have acted as wells or cisterns. Linear gullies may extend across the site, often linked to troughs and pits, and demonstrate a concern with onsite water management. Post and stakeholes are often found on burnt mound sites and these may represent the remains of small structures or wind breakers.

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al.* 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al.* 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a component of the Bronze Age landscape, the use of pyrolithic technology has a long history in Ireland.

Although there is a general consensus that burnt mound sites are the result of pyrolithic technology for the heating or boiling of water, the precise function of these sites has, to date, not been agreed upon. Several theories have been proposed but no single theory has received unanimous support. The most enduring theory is that burnt mound sites were used as cooking sites. O’Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O’ Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al.* 2007).

3.4 Summary of the Excavation Results

The excavation has identified a cluster of postholes, stakeholes, pits and a hearth that have been interpreted as a sub-rectangular or sub-oval temporary structure. A second small structure consisting of stakeholes and postholes was recorded to the north. The exact plan of the main structure was difficult to ascertain due to its ephemeral nature. Unlike formal Bronze Age houses that would have very defined elements, this small structure probably consisted of somewhat irregular arrangement of stakeholes. Other arrangements of post/stakeholes on the periphery of the structure may represent windbreaks or fences, but could equally be parts of the structure itself. Two probable boundary fences were identified to the east and north of the structures and consisted of stakes/posts that had wide and irregular intervals between but two clear perpendicular lines could be identified. To the south and west of the structures there were further features primarily in the form of pits, but with some isolated postholes and stakeholes. Two of the pits produced sherds of pottery, while heat shattered stone, flint debitage, charcoal, burnt bone and hazelnut shells were also identified from some of the other pits. It is interpreted that some of the pits functioned as waste pits, possibly associated with the structure. Further possible waste pits were recorded in the south of the site, away from the structures. Some of these pits contained heat shattered stones within their fills, so may be waste pits

associated with burnt mound activity or may have functioned as pot-boilers. It is unclear if they were related to the structures to the north. Two of the waste pits were dated to the early Bronze Age, one from the south of the site and one from near the structures. While the structures themselves were undated it is likely that all of the activity on the site was broadly contemporary.

3.5 Summary of the Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are in Appendix 2

Prehistoric pottery analysis

The excavation produced six sherds (plus a single fragment, weight: 27g) representing one, and possibly up to three, middle Bronze Age domestic vessels. The Shankill material adds to the significant concentration of early prehistoric activity on this section of the Barrow Valley.

Lithics analysis

The lithic finds from the archaeological excavation at Shankill 4 are a flint flake, four pieces of flint debitage and two pieces of chert debitage. The assemblage probably dates to the Neolithic period based on its technological characteristics.

Charcoal and Wood Species identification

Charcoal was examined from five contexts at Shankill 4. Alder, hazel, ash, pomaceous fruitwood, cherry, oak and elm were identified from the samples. The charcoal results from three pits demonstrated a variety of taxa, indicating the redeposition of fuel material into the pits. The charcoal results suggest that the people gathered wood from different types of woodland environments, such as scrub, canopy woodland and wet woodlands.

Analysis of Plant Remains

A single sample from this site was examined, C81. The only plant remains identified were hazelnut shell fragments. These are frequently found in Irish archaeobotanical assemblages and, as a result of different taphonomic factors, they are probably over-represented in terms of their economic and nutritional importance.

Animal Bone Analysis

A total of nine burnt bone fragments were recovered from C8 on Shankill 4. Two calcined bone fragments were identified to the species of *mus*/mouse and rodent. Due to size and poor preservation it was not possible to identify a single burnt long bone diaphysis fragment to species. No definite or statistically detailed conclusions could be drawn from the calcined bone assemblage retrieved from Shankill 4 due to its limited size and poor degree of preservation.

Petrographical analysis

A total of five samples of heat-affected stone were submitted for analysis. All of the stone was identified as coarse grained sandstone, which is typical of *fulacht fiadh* material. The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles are clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available,

either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

Radiocarbon Dating

Two samples were sent for AMS radiocarbon dating.

The results of the analysis dated charred hazelnut from the fill C81 of a pit. The 2 sigma calibrated date was 2140–1880BC (SUERC 30111).

The results of the analysis dated ash charcoal from the fill C78 of a pit. The 2 sigma calibrated date was 2193–2030BC (UBA 12238).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Shankill 4 has identified two possible temporary structures as well as pits that may be associated with dumping of domestic waste or could be related to burnt mound activity. The site has been dated to the early Bronze Age. The surrounding physical landscape of the site had no distinguishing features. The site was in generally flat pasture, but was located on a slight northeast facing slope. The nearest obvious water source was a stream over 400m to the north. The identification of features possibly associated with burnt mound activity would not have been anticipated given that burnt mounds are generally located in wetter, marginal landscapes.

The surrounding archaeological landscape shows a number of recorded prehistoric monuments with 1km, although none in the immediate vicinity. Of note are the two *fulachta fiadha* (CW015-014 and KK016-003) and a settlement hearth site (KK016-002) which represent burnt mound activity and possible transient, temporal settlement as this is the nature of the activities recorded at Shankill 4. A number of sites excavated to north and south of Shankill 4 as part of the N9/N10 Phase 4 show further evidence of temporary settlement and burnt mound activity, although the nearest site, Shankill 3 (400m to the south) and Shankill 5 (150m to the north) did not produce any evidence of contemporary activity. The nature of the activity at Shankill 4 would be expected in the context of the surrounding archaeology, and it is clear that the area was not intensively settled in prehistory and was the focus of transient and ephemeral sites.

Structure A, and to a lesser extent Structure B, may have been temporary dwellings made up of small postholes and stakeholes (Figure 5). The former appeared to have supported posts which had been driven into the ground with little preparatory groundwork, as the posthole sides were vertical and there was no packing. The postholes formed the approximate outline of the structure, being placed at the corners or on the centre of the walls, with the stakeholes located beside, or intermittently spaced between them. The stakeholes also formed internal divisions and were clustered around the hearth. The internal divisions are postulated but by no means certain. An internal division would have created a space measuring c. 3m x 2m. The stakeholes around the hearth would have almost certainly supported stakes used for holding objects over the fire for heating.

The presence of infrequent burnt stone material in the fill of the hearth and its abundance in the fill of neighbouring pit C51 raises the possibility that these two groups were linked: perhaps used to mark the end of use of the hut structure. The fact that posthole C277 is stratigraphically later than the hearth suggests that it may have held a commemorative marker post which signalled the location of the campsite after it was abandoned. However, one cannot discount that it was unrelated and from a later phase of activity.

The nature of the structures identified appeared to represent small temporary structures rather than houses with defined elements. However, many of the elements identified at the site would be consistent with features to be expected on the site of a Bronze Age house. It has been identified that Bronze Age houses often have internal features including stakeholes representing divisions, storage pits, waste pits, and hearths, all of which were identified at Shankill 4. It is notable that there are no formal postholes that would have clearly been load-bearing and as such there is no evidence that the Shankill 4 Structure A was roofed. It is for this reason mainly that it is interpreted as a small temporary structure. The identification of pottery sherds from

the waste pits in addition to flint flakes, burnt bone, charcoal and deposits of heat shattered stone point to domestic waste and confirm that site was used as a domestic settlement site, albeit a temporary one.

As has been previously outlined small shallow round-bottomed pits filled with heat-shattered stone, generally referred to as pot boiler pits or roasting pits, are often associated with burnt mound sites. The pit features with associated heat shattered stone at Shankill 4 may represent a series of pot-boilers or roasting pits, although it would be anticipated that some scorching of the base and sides of the pits would have been identified. The lack of scorching suggest that the pits either functioned as troughs or as waste pits into which the burnt material was dumped once cooled, obviously from an activity located outside the limits of the excavated site. While no definitive burnt mound spread was identified at the site, it is possible that it lay outside the limits of the site. However, it is also not unusual for no mound deposit to be recorded on these type of sites and the only evidence for hot-stone technology is within the fills of pits and troughs.

Features immediately outside of the hut structure included possible fence lines to the north and east and six possible rubbish pits, two of which contained pottery and/or lithics. The pottery has been identified as a domestic variant cordoned urn and represents one, and possibly up to three domestic vessels. Although the assemblage is small (six sherds) it represents an important addition to distribution of Bronze Age pottery in the region. The lithics are characterised predominantly by debitage and flakes, and the lack of diagnostic artefacts and the small size of the assemblage means that it has been interpreted by Sternke as making a minor contribution to the archaeological record for the area.

4.2 Conclusions

The archaeology at Shankill 4 represents a temporary settlement that may be related to small scale burnt mound activity. Evidence from the archaeological landscape confirms that this area was not intensely settled in prehistory and was associated with small temporary settlement and burnt mound sites. The nature and date of the findings at Shankill are important locally as it confirms the nature of the landscape in the early Bronze Age.

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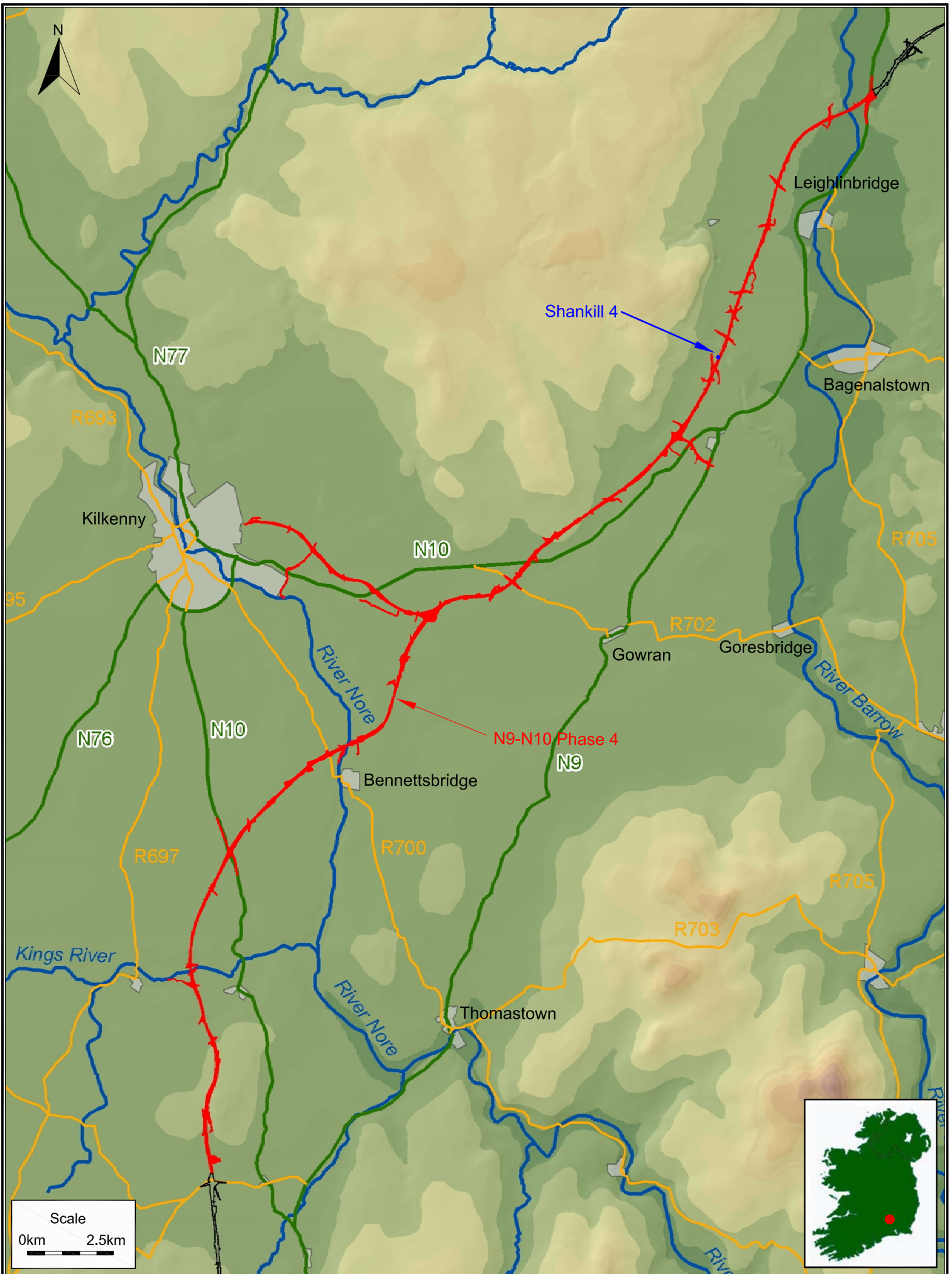
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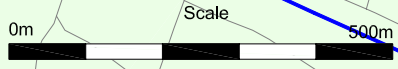
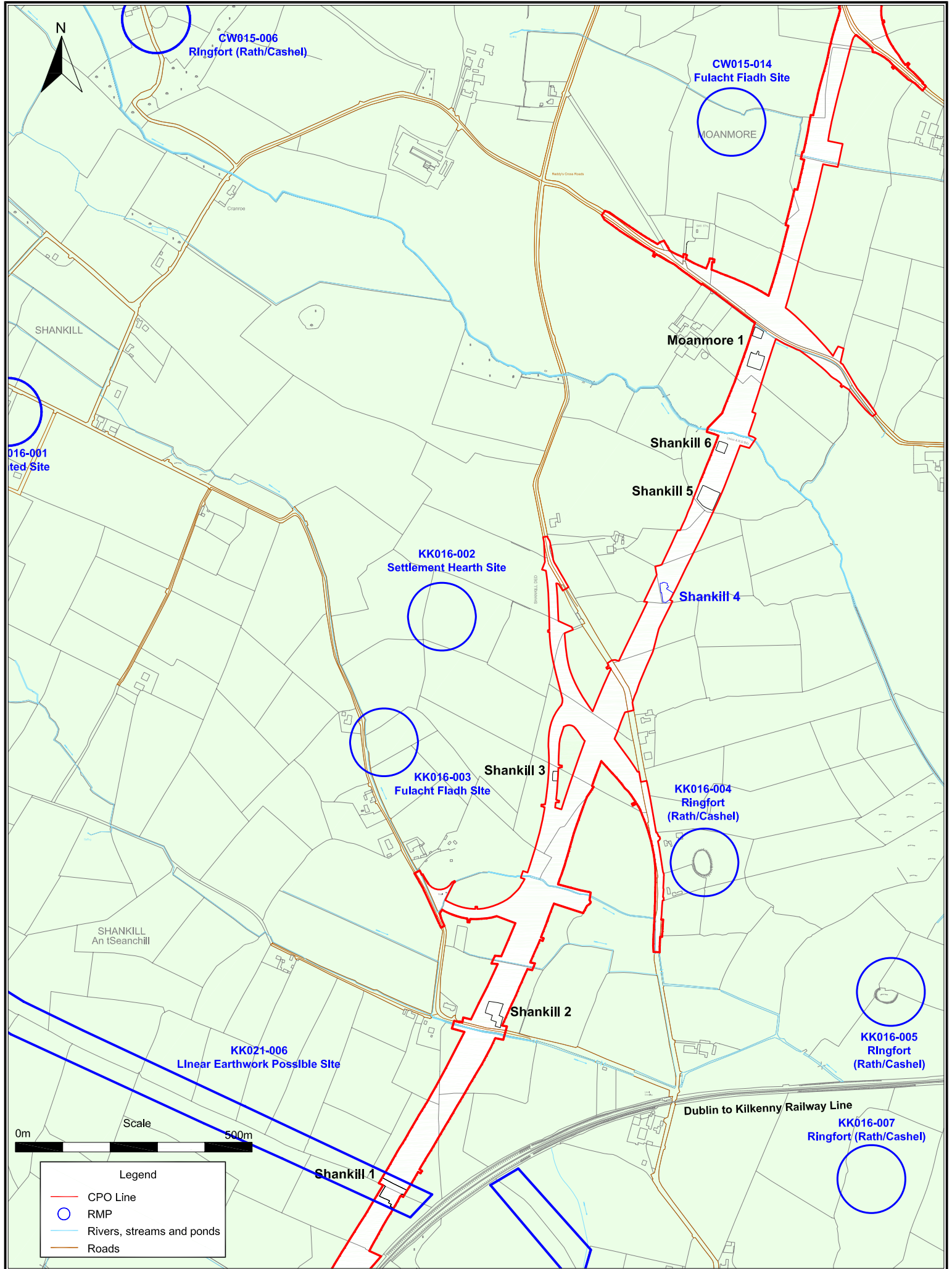
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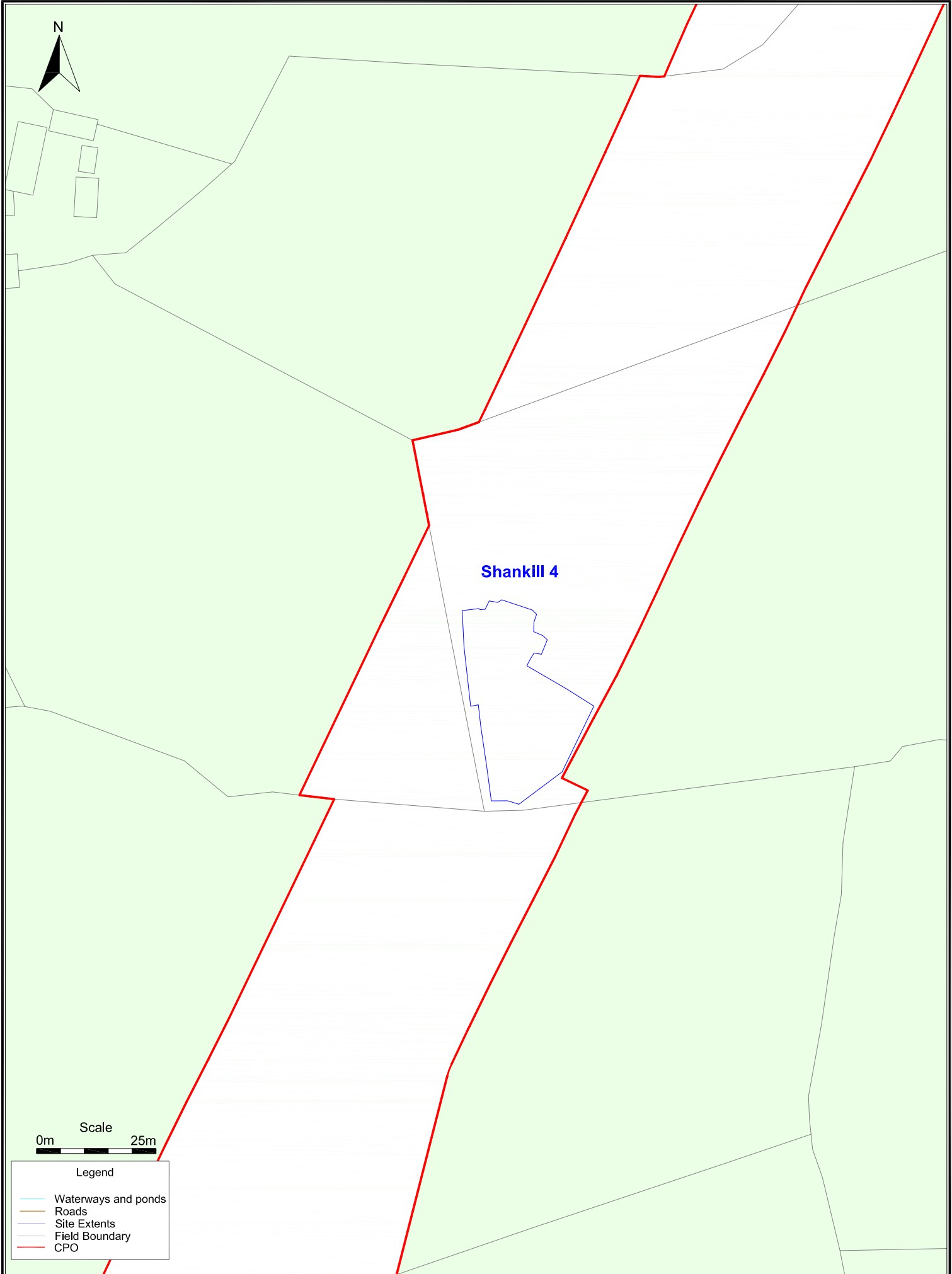
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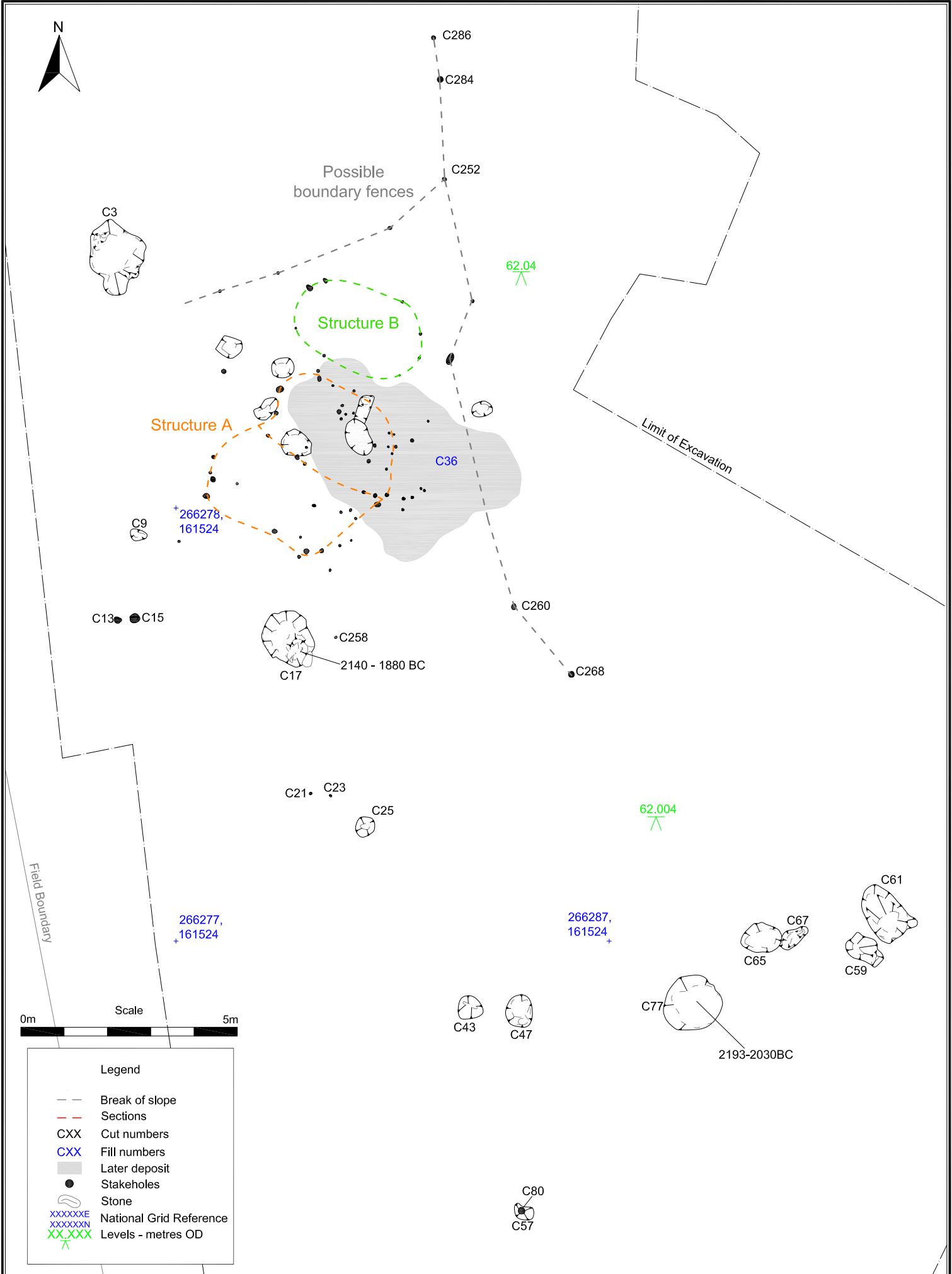
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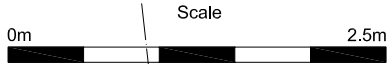
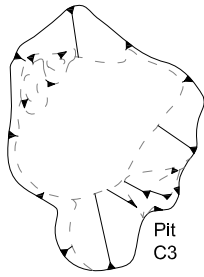


Shankill 4

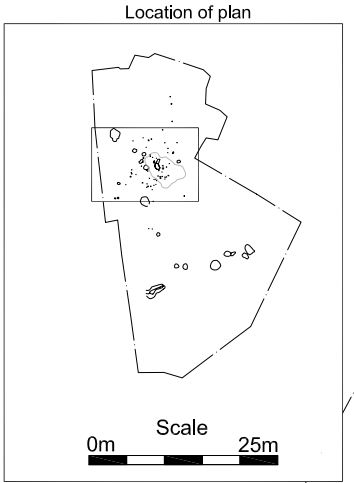
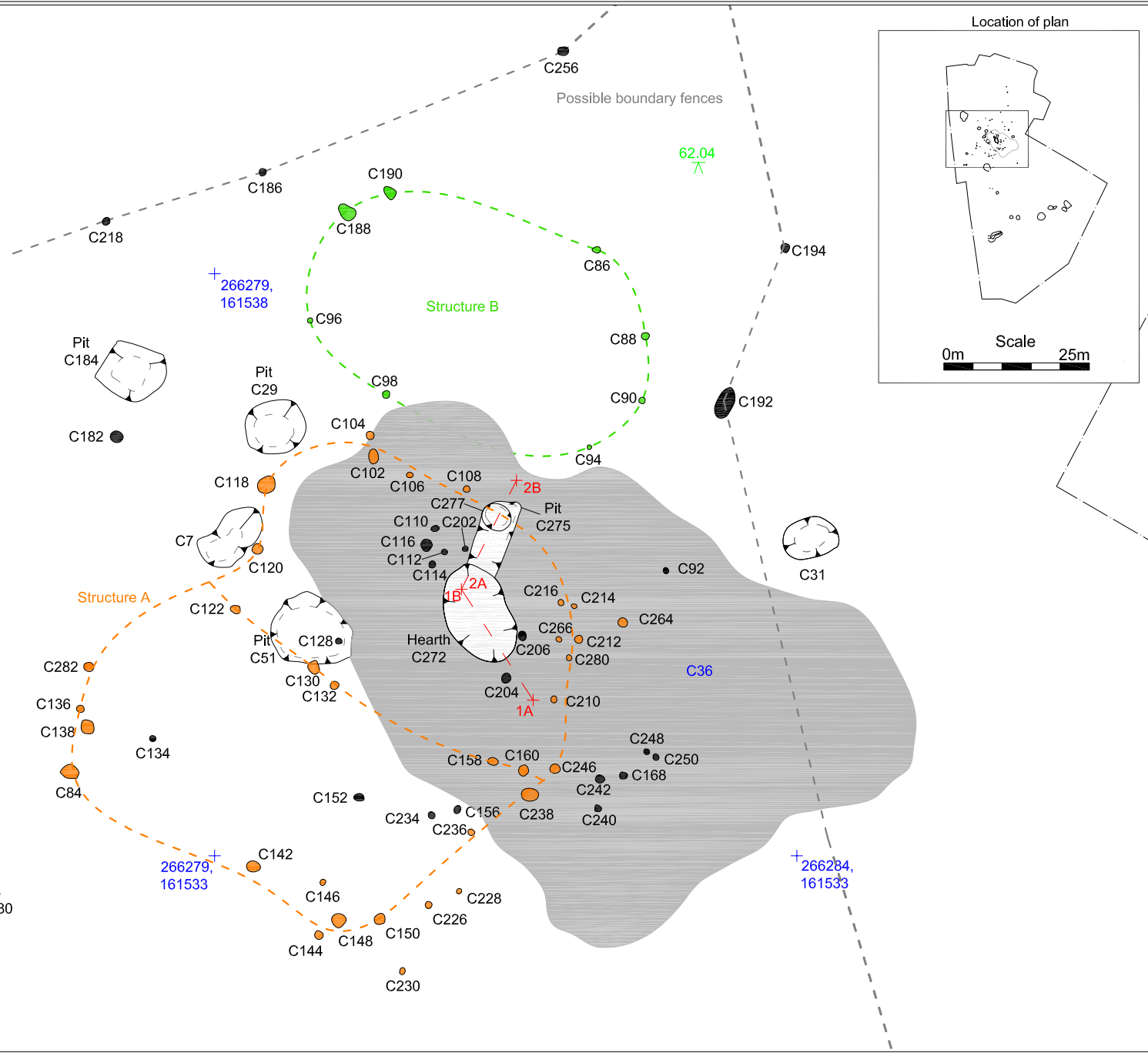
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Legend	
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	Roads
	Site Extents
	Field Boundary
	CPO





Legend	
	Later Deposit
	Stakeholes/ postholes
	Structure A
	Structure B
	Sections
CXX	Cut numbers
CXX	Fill numbers
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XX.XXX X	Levels - metres OD

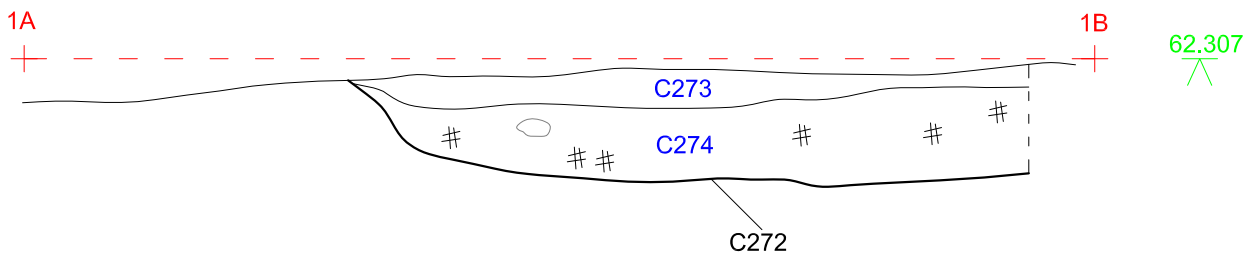


IAC Irish Archaeological Consultancy

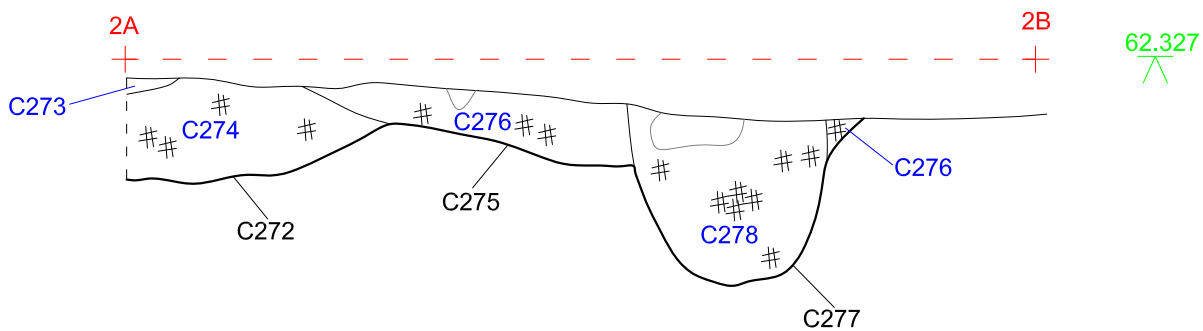
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Client:	Kilkenny County Council

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Northeast facing section of C272



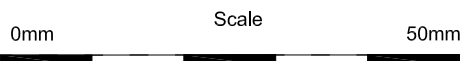
East facing section of C272, C275, C277



Legend	
CXX	Cut Numbers
CXX	Fill Numbers
	Stone
#	Charcoal
XX.XXX	Levels - metres OD



E3838:8:1-2



PLATES



Plate 1: Structure A, post-excavation, facing south-west



Plate 2: Hearth C272, pit C275 and posthole C277, mid-excavation, facing west



Plate 3: East wall of Structure A, hearth C272, pit C275 and posthole C277, post-excavation, facing west



Plate 4: Rubbish pit C7, mid-excavation, facing south-east



Plate 5: Circular pit C29, post excavation



Plate 6: Pit C77, mid excavation, facing west

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C1	N/A				Topsoil	Light grey silty clay		
C2	N/A				Natural	Sloped gently to moderately from SW–northeast. Variable. The subsoil is a glacial till with a range of sediment types observed: a mid-yellowish brown clayey sand with occasional black/yellow/white flecks of stone (decayed), some grey pieces of decayed stone (< 2cm size) and frequent large stones		
C3	N/A	1.78	1.38	0.62	Cut of shallow pit	Circular cut with a gentle top break of slope, concave sides, gentle basal break of slope and concave base	C4	C2
C4	C3	1.78	1.38	0.62	Fill of shallow pit	Moderately to loosely compacted, orangeish brown sandy silt with moderate small stone inclusions	C1	C3
C5–C6								
C7	N/A	0.56	0.36	0.23	Cut of pit	Sub-oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and flat base	C8	C2
C8	C7	0.56	0.36	0.23	Fill of pit	Loosely compacted mid-brown sandy clay with charcoal and small stone inclusions	C1	C7
C9	N/A	0.45	0.33	0.15	Possible posthole	Oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and flat base	C10	C2
C10	C9	0.45	0.33	0.15	Fill of possible posthole	Loosely compacted dark brown sandy clay with charcoal and large stone inclusions	C1	C9
C11–C12								
C13	N/A	0.18	0.14	0.12	Posthole	Circular cut with a sharp top break of slope, vertical sides, gentle basal break of slope and pointed base. Associated with C15 and possibly with C9 and C11	C14	C2
C14	C13	0.18	0.14	0.12	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional flecks of charcoal	C1	C13
C15	N/A	0.25	0.23	0.13	Cut of posthole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base	C16	C2
C16	C15	0.25	0.23	0.13	Fill of posthole	Quite compacted brownish grey silty clay with moderate charcoal and pebble inclusions	C1	C15
C17	N/A	1.98	1.1	0.18	Cut of shallow pit	Oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and irregular base	C18	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C18	C17	1.03	1.1	0.18	Fill of shallow pit	Loosely compacted black sandy clay with stones and moderate charcoal inclusions	C81	C17
C19–C20	N/A							
C21	N/A	0.06	0.06	0.15	Cut of stakehole	Circular cut with a sharp top break of slope, vertical sides, gentle basal break of slope and tapered, pointed base. Associated with C23 and C25	C22	C2
C22	C21	0.06	0.06	0.15	Fill of stakehole	Loosely compacted light grey silty sand with occasional charcoal inclusions	C1	C21
C23	N/A	0.05	0.05	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, vertical sides, gentle basal break of slope and a tapered, pointed base. Associated with C21 and C25	C24	C2
C24	C23	0.05	0.05	0.08	Fill of stakehole	Loosely compacted light grey silty sand with occasional charcoal inclusions	C1	C23
C25	N/A	0.5	0.44	0.14	Possible posthole	Circular cut with a gentle top break of slope, concave sides, gentle basal break of slope and flat base. Possibly associated with C21 and C23	C26	C2
C26	C25	0.5	0.44	0.14	Fill of possible posthole	Loosely compacted dark brown sandy clay with charcoal and large stone inclusions	C26	C2
C27–C28	N/A							
C29	N/A	0.54	0.44	0.14	Cut of pit	Circular cut with a sharp top break of slope, concave sides, gentle basal break of slope and flat base	C30	C2
C30	C29	0.54	0.44	0.14	Fill of pit	Moderately compacted mid-yellowish grey silty clay with moderate charcoal and small stone (2–5cm) inclusions	C79	C29
C31	N/A	0.5	0.34	0.14	Cut of small pit	Oval cut with a sharp top break of slope, concave sides, gentle basal break of slope and flat base. Associated with C35	C32	C2
C32	C31	0.5	0.34	0.14	Fill of small pit	Moderately compacted mid-grey silty clay with moderate charcoal and occasional medium sized stone inclusions (6–10cm)	C1	C31
C33–C35	N/A							
C36	N/A	5	3.5	0.07	Fill of natural depression	Loosely compacted dark/mid-greyish brown clayey silt with frequent charcoal inclusions. Culture layer, washed by natural processes into a natural depression, containing charcoal from a nearby hearth	C1	C52, 93, C103, C105, C107, C109, C111, C113, C115, C117, C157, C159, C161, C169, C203, C205, C207, C211, C215, C217, C237, C239,

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
								C241, C243, C247, C249, C251, C265, C267, C273, C276, C278, C281
C37–C42								
C43	N/A	0.6	0.4	0.16	Cut of small pit	Oval cut with a sharp top break of slope, concave sides, gentle basal break of slope and flat base	C44	C2
C44	C43	0.6	0.4	0.16	Fill of small pit	Loosely to moderately compacted mid-greenish grey sandy clay with very occasional charcoal and occasional angular stone inclusions	C1	C43
C45–C46								
C47	N/A	0.64	0.76	0.26	Cut of small pit	Oval cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base	C48	C2
C48	C47	0.64	0.76	0.26	Fill of small pit	Loosely to moderately compacted mid-brownish grey silty clay with occasional burnt, angular stones and charcoal inclusions	C1	C47
C49–C50								
C51	N/A	0.58	0.36	0.07	Cut of pit	Oval cut with a top break of slope that is sharp on the east side and gentle on the west side, concave sides, gentle basal break of slope and flat base	C52	C2
C52	C51	0.58	0.36	0.07	Fill of pit	Moderately compacted orangeish brown silty clay with frequent burnt sandstones and occasional charcoal inclusions	C36	C51
C53–C56								
C57	N/A	0.53	0.44	0.16	Cut of pit	Oval cut with a sharp top break of slope, concave sides, imperceptible basal break of slope and concave base	C80	C2
C58	C57	0.53	0.44	0.16	Fill of pit	Loosely compacted light reddish grey silty clay with stone and charcoal inclusions	C1	C80
C59	N/A	0.97	0.66	0.09	Cut of pit	Oval cut with a gentle top break of slope, gently sloping sides, gentle basal break of slope and uneven base	C60	C2
C60	C59	0.97	0.66	0.09	Fill of pit	Loosely compacted brownish grey silty sand with frequent stone and occasional charcoal inclusions	C1	C59
C61	N/A	1.32	0.92	0.25	Cut of pit	Oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and irregular base	C62	C2
C62	C61	1.32	0.92	0.25	Fill of pit	Loosely compacted light grey silty sand with frequent	C1	C61

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						burnt sandstones and occasional charcoal inclusions		
C63–C64								
C65	N/A	0.95	0.65	0.06	Cut of shallow pit	Oval cut with gentle top break of slope, concave sides, gentle basal break of slope and flat base	C66	C2
C66	C65	0.95	0.65	0.06	Fill of shallow pit	Moderately compacted dark blackish grey clayey silt with angular stones (70%) and moderate charcoal inclusions	C1	C65
C67	N/A	0.5	0.35	0.05	Cut of shallow pit	Oval cut with a gentle top break of slope, vertical sides, sharp basal break of slope and flat base	C68	C2
C68	C67	0.5	0.35	0.05	Fill of shallow pit	Moderately compacted mid-brownish grey sandy silt with moderate angular stones and very occasional charcoal inclusions	C1	C67
C69–C76								
C77	N/A	1.8	1.3	0.34	Cut of pit	Circular cut with a gentle top break of slope, gently sloping sides, gentle basal break of slope and flat base	C78	C2
C78	C77	1.8	1.3	0.34	Fill of pit	Loosely compacted black silty clay with charcoal and small stone inclusions	C1	C77
C79	C29	0.54	0.27	0.14	Fill of pit	Moderately compacted burnt, red sandstones	C1	C30
C80	N/A	0.26	0.18	0.21	Cut of posthole	Oval cut with a sharp top break of slope, concave sides, sharp basal break of slope and V-shaped base	C58	C57
C81	C17	0.46	0.7	0.16	Fill of shallow pit	Loosely compacted orangeish brown sandy clay with moderate stone inclusions	C1	C18
C82–C83								
C84	N/A	0.13	0.11	0.12	Cut of posthole	Circular cut with a sharp top break of slope, vertical sides, gentle basal break of slope and pointed base	C85	C2
C85	C84	0.13	0.11	0.12	Fill of posthole	Quite compacted brownish grey sandy clay with occasional charcoal inclusions	C1	C84
C86	N/A	0.06	0.05	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C88, C90, C94, C96, C108, C106, C104, C98, C188 and C190	C87	C2
C87	C86	0.06	0.05	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (0.5%) and two stone inclusions	C1	C86
C88	N/A	0.06	0.06	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C90, C94, C96,	C89	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						C98, C104, C106, C108, C188 and C190		
C89	C88	0.06	0.06	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C88
C90	N/A	0.06	0.06	0.13	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C94, C96, C98, C104, C106, C108, C188 and C190	C91	C2
C91	C90	0.06	0.06	0.13	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal inclusions	C1	C90
C92	N/A	0.06	0.07	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C93	C2
C93	C92	0.06	0.07	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C92
C94	N/A	0.07	0.07	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C96, C98, C104, C106, C108, C188 and C190	C95	C2
C95	C94	0.07	0.07	0.12	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C94
C96	N/A	0.05	0.05	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C94, C98, C104, C106, C108, C188 and C190. These stakeholes possibly formed part of hut in a temporary camp	C97	C2
C97	C96	0.05	0.05	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) and two stone inclusions	C1	C96
C98	N/A	0.05	0.05	0.06	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C94, C96, C104, C106, C108, C188 and C190	C99	C2
C99	C98	0.05	0.05	0.06	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C98
C100–C101								
C102	N/A	0.2	0.19	0.21	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C103	C2
C103	C102	0.2	0.19	0.21	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (2%) and stone (1%) inclusions	C36	C102

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C104	N/A	0.06	0.06	0.04	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C94, C96, C98, C106, C108, C188 and C190	C105	C2
C105	C104	0.06	0.06	0.04	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C104
C106	N/A	0.07	0.06	0.05	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C94, C96, C98, C104, C108, C188 and C190	C107	C2
C107	C106	0.07	0.06	0.05	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C106
C108	N/A	0.05	0.06	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C86, C88, C90, C94, C96, C98, C104, C106, C188 and C190	C109	C2
C109	C108	0.05	0.06	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C108
C110	N/A	0.08	0.07	0.07	Cut of stakehole	Circular cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base. Associated with C112	C111	C2
C111	C110	0.08	0.07	0.07	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C110
C112	N/A	0.04	0.04	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C108, C110, C114, C116 and C202	C113	C2
C113	C112	0.04	0.04	0.09	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (<1%) inclusions	C36	C112
C114	N/A	0.06	0.07	0.13	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C108, C110, C112, C116 and C202	C115	C2
C115	C114	0.06	0.07	0.13	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (<1%) inclusions	C36	C114
C116	N/A	0.08	0.09	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C108, C110, C112, C114 and C202	C117	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C117	C116	0.08	0.09	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (<1%) inclusions	C36	C116
C118	N/A	0.14	0.14	0.15	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C120 and C122	C119	C2
C119	C118	0.14	0.14	0.15	Fill of posthole	Moderately compacted mid-grey silty clay with occasional charcoal inclusions	C1	C118
C120	N/A	0.1	0.1	0.16	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C118 and C122	C121	C2
C121	C120	0.1	0.1	0.16	Fill of posthole	Moderately compacted mid-grey silty clay with occasional charcoal inclusions	C1	C120
C122	N/A	0.08	0.08	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C118 and C120	C121	C2
C123	C122	0.08	0.08	0.1	Fill of stakehole	Moderately compacted mid-grey silty clay with occasional charcoal inclusions	C1	C122
C124–C127								
C128	N/A	0.05	0.06	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C7, C51, C120, C122, C124, C126, C130, C132 and C200	C129	C2
C129	C128	0.05	0.06	0.09	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C52	C128
C130	N/A	0.09	0.08	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C7, C51, C120, C122, C124, C126, C128, C132 and C200	C131	C2
C131	C130	0.09	0.08	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) and small stone inclusions	C52	C130
C132	N/A	0.07	0.07	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base. Associated with C7, C51, C120, C122, C124, C126, C128, C130 and C200	C133	C2
C133	C132	0.07	0.07	0.09	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C132
C134	N/A	0.07	0.07	0.09	Cut of stakehole	Oval cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base	C135	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C135	C134	0.07	0.07	0.09	Fill of stakehole	Loosely compacted light brown clayey silt with occasional charcoal (2%) and pebble (5%) inclusions	C1	C134
C136	N/A	0.08	0.07	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, sloping sides, sharp basal break of slope and flat base	C137	C2
C137	C136	0.08	0.07	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay	C1	C136
C138	N/A	0.11	0.1	0.1	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C139	C2
C139	C138	0.11	0.1	0.1	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C138
C140–C141								
C142	N/A	0.1	0.1	0.18	Cut of posthole	Oval cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base	C143	C2
C143	C142	0.1	0.1	0.18	Fill of posthole	Loosely compacted greyish/light brown clayey silt with occasional charcoal and pebble inclusions	C1	C142
C144	N/A	0.1	0.1	0.13	Cut of posthole	Circular cut with a sharp top break of slope, concave sides, gentle basal break of slope and concave base	C145	C2
C145	C144	0.1	0.1	0.13	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C144
C146	N/A	0.06	0.06	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C147	C2
C147	C146	0.06	0.06	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C146
C148	N/A	0.13	0.12	0.16	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C147	C2
C149	C148	0.13	0.12	0.16	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C148
C150	N/A	0.1	0.1	0.12	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C151	C2
C151	C150	0.1	0.1	0.12	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) and small stone inclusions	C1	C150
C152	N/A	0.08	0.08	0.21	Cut of stakehole	Circular cut with a sharp top break of slope, steep sloping sides, imperceptible basal break of slope and concave base. Associated with C154 and C234	C153	C2
C153	C152	0.08	0.08	0.21	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C152
C154–C155								

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C156	N/A	0.07	0.07	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C154, C158, C228, C234 and C236	C157	C2
C157	C156	0.07	0.07	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C156
C158	N/A	0.07	0.07	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C154, C156, C228, C234 and C236	C159	C2
C159	C158	0.07	0.07	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C158
C160	N/A	0.06	0.06	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C168, C238, C240, C246, C248 and C250	C161	C2
C161	C160	0.06	0.06	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C160
C162–C167								
C168	N/A	0.05	0.05	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave sides. Associated with C160, C238, C240, C246, C248 and C250	C169	C2
C169	C168	0.05	0.05	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with charcoal and two small stone inclusions	C36	C168
C170–C179								
C180	N/A	0.05	0.06	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C181	C2
C181	C180	0.05	0.06	0.11	Fill of stakehole	Loosely compacted light brownish grey silty clay with charcoal inclusions	C1	C180
C182	N/A	0.11	0.1	0.2	Cut of posthole	Circular cut with a sharp break of slope gradual sides and concave base	C183	C2
C183	C182	0.11	0.1	0.2	Fill of posthole	Circular cut with a gentle top break of slope, concave sides, gentle basal break of slope and concave base	C1	C182
C184	N/A	0.62	0.6	0.13	Cut of pit	Oval cut, gradual break of slope, vertical sides, gradual break, flat base	C185	C2
C185	C184	0.62	0.6	0.13	Fill of pit	Circular cut with a sharp top break of slope, steep	C1	C184

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						sides, imperceptible basal break of slope and concave base		
C186	N/A	0.07	0.07	0.09	Cut of stakehole	Soft mid-brownish grey silty clay	C187	C2
C187	C186	0.07	0.07	0.09	Fill of stakehole	Sub-oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and flat base	C1	C186
C188	N/A	0.18	0.16	0.18	Cut of posthole	Oval cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C189	C2
C189	C188	0.18	0.16	0.18	Fill of posthole	Soft mid-brownish grey silty clay with rare charcoal flecks	C1	C188
C190	N/A	0.1	0.1	0.18	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C191	C2
C191	N/A	0.1	0.1	0.18	Fill of posthole	Soft mid-brownish grey silty clay with rare charcoal flecks	C1	C190
C192	N/A	0.24	0.13	0.09	Cut of shallow pit	Oval cut with a sharp top break of slope, moderately sloping sides, imperceptible basal break of slope and flat base	C193	C2
C193	C192	0.24	0.13	0.09	Fill of shallow pit	Loosely compacted light brownish grey silty clay	C36	C192
C194	N/A	0.07	0.07	0.13	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C195	C2
C195	C194	0.07	0.07	0.13	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C194
C196–C201								
C202	N/A	0.05	0.05	0.06	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C204, C206, C208, C210, C212, C214 and C216	C203	C2
C203	C202	0.05	0.05	0.06	Fill of stakehole	Moderately compacted mid-yellowish grey silty clay with moderate charcoal and occasional small stone (2–4cm) inclusions	C36	C202
C204	N/A	0.08	0.08	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C206, C208, C210, C212, C214 and C216	C205	C2
C205	C204	0.08	0.08	0.09	Fill of stakehole	Moderately compacted mid-grey silty clay with moderate charcoal and occasional small stone (2–3cm) inclusions	C36	C204

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C206	N/A	0.07	0.07	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C204, C208, C210, C212, C214 and C216	C207	C2
C207	C206	0.07	0.07	0.12	Fill of stakehole	Moderately compacted mid-grey silty clay with moderate charcoal and occasional small stone (2–4cm) inclusions	C36	C206
C208–C209								
C210	N/A	0.06	0.06	0.13	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C204, C206, C208, C212, C214 and C216	C211	C2
C211	C210	0.06	0.06	0.13	Fill of stakehole	Moderately compacted mid-grey silty clay with moderate charcoal and occasional small stone (2–4cm) inclusions	C36	C210
C212	N/A	0.07	0.06	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C204, C206, C208, C210, C214 and C216	C213	C2
C213	C212	0.07	0.06	0.1	Fill of stakehole	Moderately compacted mid-grey silty clay with moderate charcoal and occasional small stone (2–3cm) inclusions	C1	C212
C214	N/A	0.05	0.05	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C204, C206, C208, C210, C212 and C216	C215	C2
C215	C214	0.05	0.05	0.09	Fill of stakehole	Moderately compacted mid-yellowish grey silty clay with moderate charcoal and occasional small stone (2–4cm) inclusions	C36	C214
C216	N/A	0.06	0.06	0.05	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base. Associated with C202, C204, C206, C208, C210, C212 and C214	C217	C2
C217	C216	0.06	0.06	0.05	Fill of stakehole	Moderately compacted mid-grey silty clay with moderate charcoal and occasional small stone (2–3cm) inclusions	C36	C216
C218	N/A	0.05	0.05	0.08	Cut of stakehole	Circular cut with a gentle top break of slope, concave sides, gentle basal break of slope and concave base. Associated with C182, C184, C220 and C222	C219	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C219	C218	0.05	0.05	0.08	Fill of stakehole	Moderately compacted mid-yellowish grey silty clay with moderate charcoal and occasional small stone (2–3cm) inclusions	C1	C218
C220–C225								
C226	N/A	0.07	0.07	0.09	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C227	C2
C227	C226	0.07	0.07	0.09	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C226
C228	N/A	0.04	0.04	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C229	C2
C229	C228	0.04	0.04	0.12	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C228
C230	N/A	0.08	0.08	0.07	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C231	C2
C231	C230	0.08	0.08	0.07	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C230
C232–C233								
C234	N/A	0.06	0.07	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C154, C156, C158, C228 and C236	C235	C2
C235	C234	0.06	0.07	0.12	Fill of stakehole	Loosely compacted brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C234
C236	N/A	0.07	0.07	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C237	C2
C237	C236	0.07	0.07	0.12	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (>1%) inclusions	C36	C236
C238	N/A	0.12	0.11	0.14	Cut of posthole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C240, C246, C248 and C250	C239	C2
C239	C238	0.12	0.11	0.14	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (<1%) and stone inclusions	C36	C238
C240	N/A	0.06	0.07	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C238, C242, C248 and C250	C241	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C241	C240	0.06	0.07	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C240
C242	N/A	0.07	0.08	0.14	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C238, C240, C246, C248 and C250	C243	C2
C243	C242	0.07	0.08	0.14	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C242
C244–C245								
C246	N/A	0.07	0.07	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C238, C240, C242, C248 and C250	C247	C2
C247	C246	0.07	0.07	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with charcoal inclusions	C36	C246
C248	N/A	0.04	0.05	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C238, C240, C246 and C250	C249	C2
C249	C248	0.04	0.05	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C248
C250	N/A	0.04	0.05	0.1	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C160, C168, C238, C240, C246 and C248	C251	C2
C251	C250	0.04	0.05	0.1	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C250
C252	N/A	0.1	0.11	0.19	Cut of posthole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C254 and C256	C253	C1
C253	C252	0.1	0.11	0.19	Fill of posthole	Loosely compacted mid-brownish grey silty clay with charcoal inclusions	C252	C2
C254–C255	N/A							
C256	N/A	0.07	0.07	0.18	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C252 and C254	C257	C2
C257	C256	0.07	0.07	0.18	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with charcoal inclusions	C1	C256

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C258	N/A	0.08	0.08	0.12	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C259	C2
C259	C258	0.08	0.08	0.12	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C258
C260	N/A	0.15	0.15	0.2	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C261	C2
C261	C260	0.15	0.15	0.2	Fill of posthole	Loosely compacted brownish grey silty clay with charcoal inclusions	C1	C260
C262–C263								
C264	N/A	0.05	0.05	0.05	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C204, C206, C208, C210, C212, C214, C216, C266 and C280	C265	C2
C265	C264	0.05	0.05	0.05	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C264
C266	N/A	0.05	0.06	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, steeply sloping sides, imperceptible basal break of slope and concave base. Associated with C204, C206, C208, C210, C212, C214, C216, C264 and C280	C267	C2
C267	C266	0.05	0.06	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C36	C266
C268	N/A	0.13	0.14	0.18	Cut of posthole	Circular cut with a sharp top break of slope, steep sides, imperceptible basal break of slope and concave base	C269	C2
C269	C268	0.13	0.14	0.18	Fill of posthole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C268
C270–C271								
C272	N/A	1.03	0.55	0.13	Cut of hearth	Sub-oval cut with a gentle top break of slope, concave sides, gentle basal break of slope and flat base. Associated with C275 and C277	C274	C2
C273	C272	0.84	0.55	0.05	Fill of hearth	Moderately compacted mid-reddish grey silty clay with occasional burnt sandstones and burnt clay patches	C36	C274
C274	C272	1.03	0.5	0.1	Fill of hearth	Loosely compacted mid-yellowish grey silty clay with moderate charcoal and occasional small and medium-sized stone (2–14cm) inclusions	C273	C272
C275	N/A	0.65	0.3	0.07	Cut of shallow pit	Rectangular cut, orientated northeast–southwest,	C276	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						with corners visible on the north-west, but imperceptible on the south-west. The top break of slope was gentle. The sides were concave on the south-east and steep on the north-west. The basal break of slope was gentle on the south-east and sharp on the north-west. The base was flat. Cut by C277 and associated with C272 and C277		
C276	C275	0.65	0.3	0.07	Fill of shallow pit	Moderately compacted mid-yellowish grey silty clay with occasional small and medium-sized (2–10cm) stone and charcoal inclusions	C36	C275
C277	N/A	0.23	0.28	0.19	Cut of posthole	Circular cut with a gentle top break of slope, concave sides, gentle basal break of slope and concave base. Associated with C272 and C275	C278	C2
C278	C277	0.23	0.28	0.19	Fill of posthole	Moderately compacted mid-grey silty sand with occasional charcoal and medium-sized (6–14cm) stone inclusions	C36	C277
C279	Same as C188							
C280	N/A	0.07	0.06	0.08	Cut of stakehole	Circular cut with a sharp top break of slope, vertically sloping sides, gentle basal break of slope and flat base. Associated with C204, C208, C210, C212, C214 and C216	C281	C2
C281	C280	0.07	0.06	0.08	Fill of stakehole	Loosely compacted mid-brownish grey silty clay	C36	C280
C282	N/A	0.08	0.08	0.11	Cut of stakehole	Circular cut with a sharp top break of slope, steep sides, gentle basal break of slope and concave base	C283	C2
C283	C282	0.08	0.08	0.11	Fill of stakehole	Loosely compacted mid-brownish grey silty clay with occasional charcoal (1%) inclusions	C1	C282
C284	N/A	0.13	0.12	0.1	Cut of posthole	Circular cut with a gentle top break of slope, vertically sloping sides, gentle basal break of slope and flat base. Associated with C252 and C256	C285	C2
C285	C284	0.13	0.12	0.1	Fill of posthole	Loosely compacted mid-greyish brown silty clay with occasional charcoal inclusions	C1	C284
C286	N/A	0.12	0.13	0.15	Cut of posthole	Circular cut with a sharp top break of slope, vertically sloping sides, sharp basal break of slope and pointed base. Associated with C252, C256 and C284	C287	C2
C287	C286	0.12	0.13	0.15	Fill of posthole	Loosely compacted mid-greyish brown silty clay with occasional pebble inclusions	C1	C286

Appendix 1.2 Catalogue of Artefacts


Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3838:001:1	1	1	Flake	Flint flake	Flint	A patinated flint flake and was produced using the single-platform method	N/A
E3838:001:2	1	2	Debitage	Chert debitage	Chert	Chert debitage	N/A
E3838:008:1-2	8	1-2	Urn	Sherd of middle Bronze Age domestic pottery	Ceramic	Neckherd of middle Bronze Age domestic pottery, part of a domestic variant cordoned urn	N/A
E3838:008:3	8	3	Vessel	Sherd of middle Bronze Age domestic pottery	Ceramic	Abraded bodysherd of middle Bronze Age domestic pottery without surviving surfaces	N/A
E3838:008:4	8	4	Vessel	Sherd of middle Bronze Age domestic pottery	Flint	Flint debitage	N/A
E3838:030:1	30	1	Vessel	Sherd of middle Bronze Age domestic pottery	Ceramic	Neck / bodysherd of middle Bronze Age domestic ware	N/A
E3838:030:2-3	30	2-3	Vessel	Sherd of middle Bronze Age domestic pottery	Ceramic	Rimsherd of middle Bronze Age domestic ware	N/A
E3838:030:4	30	4	Vessel	Fragment of middle Bronze Age domestic pottery	Ceramic	Fragment of middle Bronze Age domestic ware	N/A
E3838:081:1	81	1	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3838:273:1	273	1	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3838:274:1	274	1	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3838:276:1	276	1	Debitage	Chert debitage	Chert	Chert debitage	N/A

Appendix 1.3 Catalogue of Ecofacts

During post excavation works specific samples were processed with a view to further analysis. A total of 112 soil samples were taken from features at Shankill 4 and were processed by flotation and sieving through a 250µm mesh. Only 23 produced ecofacts. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	seeds	burnt animal bone	animal bone	human bone	Heat-affected stone	Other
C8	11	Pit	9.2g		0.1g				
C26	1	Posthole	2.6g					Yes	
C29	4	Pit	8.4g					Yes	
C31	21	Pit	5.2g						
C36	108	Pit	4.0g						
C62	18	Pit	4.6g					Yes	
C66	5	Pit	5.4g					Yes	
C78	20	Pit	9.9g					Yes	
C81	22	Pit	0.5g	0.1g				Yes	
C91	53	Stakehole	0.1g						
C103	91	Stakehole	0.5g						
C119	37	Stakehole	0.2g						
C121	95	Stakehole	0.8g						
C149	48	Stakehole	0.2g						
C185	104	Pit	0.2g						
C189	34	Stakehole	<0.1g						
C191	87	Stakehole	0.4g						
C229	72	Stakehole	0.1g						
C239	99	Stakehole	0.1g						
C267	65	Stakehole	0.2g						
C273	103	Hearth							18.8g (burnt clay)
C274	105	Hearth	0.1g						
C278	107	Posthole	1.2g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR130 Shankill 4		
Excavation Registration Number: E3838		
Site director: Richard Jennings		
Date: March 2011		
Field Records	Items (quantity)	Comments
Site drawings (plans)	16	
Site sections, profiles, elevations	10	
Other plans, sketches, etc.	1	
Timber drawings		
Stone structural drawings		
Site diary/note books	1	
Site registers (folders)	1	
Survey/levels data (origin information)		
Context sheets	287	
Wood Sheets		
Skeleton Sheets		
Worked stone sheets		
Digital photographs	173	
Photographs (print)		
Photographs (slide)		
Security copy of archive		

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Prehistoric Pottery Report – Eoin Grogan and Helen Roche

Appendix 2.2 Lithics Analysis Report – Farina Sternke

Appendix 2.3 Charcoal and Wood Report – Lorna O’Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Appendix 2.5 Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrological Report – Stephen Mandal

Appendix 2.7 Radiocarbon Dating Results – SUERC and QUB Laboratory

N9/N10 Phase 4 -Knocktopher to Powerstown

**The prehistoric pottery from Shankill 4, Co. Kilkenny
(AR130, E3838)**

Eoin Grogan and Helen Roche

May 2009

Summary

The site produced six sherds (plus a single fragment, weight: 27g) representing one, and possibly up to three, middle Bronze Age domestic vessels. The Shankill material adds to the significant concentration of early prehistoric activity on this section of the Barrow Valley.

The middle Bronze Age pottery

The site produced a small assemblage of six sherds (2 rim-, three neck- and one bodysherd, plus one fragment, weight: 27g). The pottery came from features to the west of a small structure (Jennings 2008).

One vessel (Group I) can be readily identified as a domestic variant cordoned urn (Brindley 2007, 143; Kavanagh 1976, 330; Waddell 1995, 113, 118; Grogan and Roche forthcoming). This plain vessel has a low, pinched-up horizontal cordon at the junction between the neck and body. The external surface has a fine slurry finish. One, and possibly two other, similar vessels are also represented.

There is a limited distribution of this material in the region although small quantities of middle Bronze Age pottery, including domestic urns, came from Ballyquirk 2 (Elliot 2008; Grogan and Roche 2009a), to the north at Moanduff 2, and sites 1 and 2 at Coolnakisha, Co. Carlow (Phelan and Zimny 2009; O'Carroll 2008a; 2008b; Grogan and Roche 2009b; 2009c; 2009d), and to the south at Danganbeg 1 (Devine and Zimny 2008; Grogan and Roche 2009e).

References

Brindley, A. 2007a *The dating of food vessels and urns in Ireland*. Bronze Age Studies 7, Department of Archaeology, National University of Ireland, Galway.

Devine, E. and Zimny, P. 2008 E3606 Danganbeg 1 Stratigraphic Report. Unpublished Stratigraphic Report. National Monuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Elliott, R. 2008 E3864 Ballyquirk 2 Stratigraphic Report. Unpublished Stratigraphic Report. National Monuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Grogan, E and Roche, H 2009a The prehistoric pottery assemblage from Ballyquirk 2, Co. Kilkenny (AR113, E3862). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009b The prehistoric pottery assemblage from Moanduff 2, Co. Carlow (AR155, E3735). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009c The prehistoric pottery assemblage from Coolnakisha 1, Co. Carlow (AR139, E3768). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009d The prehistoric pottery assemblage from Coolnakisha 2, Co. Carlow (AR140, E3767). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009e The prehistoric pottery assemblage from Danganbeg 1, Co. Kilkenny (AR058, E3606). N9/N10 Knocktopher to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H forthcoming An assessment of middle Bronze Age domestic pottery in Ireland. UCD School of Archaeology, Wordwell, Bray.

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Kavanagh, R 1976 Collared and Cordoned Urns in Ireland, *Proceedings of the Royal Irish Academy* **76C**, 293–403.

O'Carroll, E 2008a E3768 Coolnakisha 1 Stratigraphic Report. Unpublished Stratigraphic Report. National Monuments Service. Department of the Environment, Heritage and Local Government, Dublin.

O'Carroll, E 2008b E3767 Coolnakisha 2 Stratigraphic Report. Unpublished Stratigraphic Report. National Monuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Phelan, S and Zimny, P 2009 E3735 Moanduff 2 Stratigraphic Report. Unpublished Stratigraphic Report. National Monuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Waddell, J 1995 The Cordoned Urn tradition. In I. Kinnes and G. Varndell (eds), *'Unbaked Urns of Rudely Shape'*, 113–22. Oxbow Monograph **55**, Oxford.

CATALOGUE

The excavation number E3838 is omitted throughout: only the context number, in **bold**, followed by the find number is included (e.g. **30**:1). Numbers in square brackets (e.g. **08**:[1–2]) indicate that the sherds are conjoined. The thickness refers to an average dimension; where relevant a thickness range is indicated. Vessel numbers have been allocated to pottery where some estimation of the form of the pot is possible, or where the detailed evidence of featured sherds (e.g. rims, shoulders), decoration or fabric indicates separate pots. Group numbers (Roman numerals) refer to sherds from a vessel where the overall form is not identifiable principally due to the absence of sufficient feature (rim/ neck/ shoulder) sherds. While this generally indicates separate pots due to the nature of the material is it possible that some Vessel Groups may represent portions of vessels otherwise identified by Vessel Numbers. Individual sherds that could not be definitely ascribed to either category are described separately; these may come from further pots that are not, however, included in the calculations of minimum and maximum numbers of vessels. Fragments are small sherds (generally less than 10mm square) where only one surface has survived while crumbs are very small pieces ($\leq 5 \times 5$ mm) generally without surviving surfaces. The inclusions were examined using simple magnification and in some cases attribution reflects probable, rather than certain, identification.

Worn: some wear damage to surfaces and edge breaks much worn: considerable wear damage

Abraded: very considerable wear resulting in loss of surfaces

R. rimsherd N. necksherd Be. bellysherd B. bodysherd

Middle Bronze Age domestic pottery

Features adjacent to hut structure on west side

Fill 08 of pit 07

Group I. This is represented by 2 necksherds (08:[1–2]) from a vessel with an upright, very gently concave neck and a low, pinched-up horizontal cordon at the junction with the body. The grey-brown fabric has a smooth light buff external surface that had been finished with fine slurry. There is a medium content of dolerite inclusions (≤ 3.87 x 3.04mm, up to 4.48 x 4mm). Neck thickness: 9.98mm; weight: 12g.

Comment This is a domestic variant cordoned urn.

Other sherds

Abraded bodysherd (08:3) without surviving surfaces. This is of dark grey-brown fabric with a medium content of dolerite inclusions. Body thickness: 9.97mm; weight: 6g.

Other pottery

Fill 30 of pit 29

Group II. This is represented by 3 abraded sherds (1 neck-/bodysherd: 30:1; 2 possible rimsherds: 30:2–3; 1 fragment: 30:4) from a vessel with flat-topped, slightly everted rim. The dark grey-brown fabric has poorly preserved grey-buff surfaces. There is a medium to high content of dolerite inclusions (≤ 3 x 2mm, up to 4.48 x 4mm). Neck thickness: 9.98mm; weight: 9g.

Comment This material is too poorly preserved for further identification but it may be middle Bronze Age domestic ware.

Vessel No.	Context/feature	Number of sherds	Rimsherds	Necksherds	Base-angledsherds	Bellysherds	Bodysherds	Fragments	Inclusions	Vessel size (cm)	Weight (g)	Pottery type	Decorated
Group I	08	2	0	2	0	0	0	0	D	-	12	Domestic cordoned urn	c
Other	08	1	0	0	0	0	1	0	D	-	6	Domestic urn?	-
Group II	30	3	2	1	0	0	0	1	D	-	9	Middle Bronze Age?	-

D dolerite c cordoned

Table 1. Details of pottery including individual vessels from Shankill 4, Co. Kilkenny.

Vessel	Context	Sherds to draw	Section only	Photograph
Group I	08	N. 08:[1–2]		

R. rim N. neck Be. belly

Table 2. Suggestions for illustration: Shankill 4, Co. Kilkenny.

LITHICS FINDS REPORT FOR E3838 SHANKILL 4 (A032/153), CO. KILKENNY

N9/N10 ROAD SCHEME – PHASE 4B

FARINA STERNKE MA, PHD

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Quantification

Provenance

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 Technology/Morphology

 Dating

Conservation

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Table 1 Composition of the lithic assemblage from Shankill 4 (E3838)

Introduction

A total of seven lithic finds from the archaeological investigations of a prehistoric site at Shankill 4, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with an oval house with a hearth and possibly associated pits.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3838:001:1	1	Flint	Flake	Patinated	Yes	18	23	5	No	No
E3838:001:2	1	Chert	Debitage							
E3838:008:4	8	Flint	Debitage							
E3838:081:1	81	Flint	Debitage							
E3838:273:1	273	Flint	Debitage							
E3838:274:1	274	Flint	Debitage							
E3838:276:1	276	Chert	Debitage							

Table 1 Composition of the Lithic Assemblage from Shankill 4 (E3838)

Methodology

All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification

The lithics are five flaked pieces of flint and two flaked pieces of chert (Table 1). One artefact is larger than 20mm in length and/or width and was therefore recorded in detail.

Provenance

The lithic artefacts were recovered from the topsoil and the hearth.

Condition:

The recorded lithic (E3838:001:1) survives in patinated, incomplete condition. The lithic also bears the remnants of cortex.

Technology/Morphology:

The artefacts represent a flake and six pieces of debitage (Table 1).

FLAKES

The flake (E3838:001:1) is made of flint and was produced using the single-platform method. It measures 18mm in length, 23mm in width and 5mm in thickness. The flake most likely dates to the Neolithic period based on its technology.

DEBITAGE

The presence of six pieces of debitage (four flints and two cherts) suggests that knapping and/or tool re-sharpening took place at the site.

Dating:

The assemblage is technologically diagnostic and appears to date to the Neolithic period.

Conservation

Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

Discussion

Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a single platform and a bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Shankill 4 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern lithic assemblages (O'Hare 2005).

Summary

The lithic finds from the archaeological excavation at Shankill 4, Co. Kilkenny are a flint flake, four pieces of flint debitage and two pieces of chert debitage.

The assemblage probably dates to the Neolithic period based on its technological characteristics.

This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

References

Inizan, M-L, Reduron-Ballinger, M., Roche, H. and Tixier, J. 1999 *Technology and Terminology of Knapped Stone 5*. CREP, Nanterre.

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Appendix 2.3 Charcoal and Wood Report – Lorna O’Donnell

Client – Irish Archaeological Consultancy Ltd

Site Name- Shankill 4

Excavation number –E3868 AR130

County – Kilkenny

Author- Lorna O’Donnell

Date –16/10/09

Summary Charcoal Report

Illustrations

Figures

- Figure 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches
- Figure 2 Total charcoal identifications from Shankill 4 (fragment count and weights)

Tables

- Table 1 Charcoal identification details from Shankill 4

1 Introduction

This report describes the charcoal analysis of samples from Shankill 4 excavated by Richard Jennings. The site was excavated as part of the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). The site consisted of a possible temporary hut structure, hearth, pits and some burnt stone material. A radiocarbon date of 2193-2030BC has been received from C78. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site. It can also identify any species selection patterns at Shankill 4. This report is summary in nature only, further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along the N9/N10 (Lyons *et al* forthcoming).

2 Methodology (After IAC Ltd)

2.1 Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1-2 weeks.
- Any samples containing a high clay content will be soaked in water for 1-2 days to aid the sieving process.

2.2 Charcoal identification

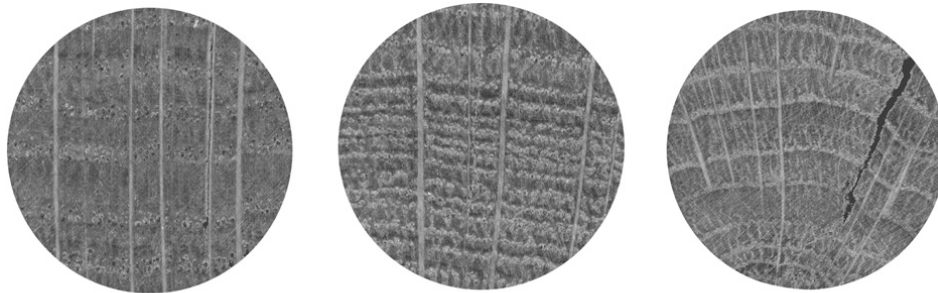
Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have 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. It was aimed to identify fifty fragments per sample.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements were taken with a graticule in the microscope in order to make the

scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The 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 (Fig. 1). 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). Insect infestation is usually recognised 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 may have been stockpiled.



Weakly curved rings Moderately curved rings Strongly curved rings

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.

(After Marguerie and Hunot 2007 1421, Fig. 3).

3 Results

Charcoal was examined from four contexts from Shankill 4. Seven wood types were identified, alder (*Alnus* sp.), hazel (*Corylus avellana*), ash (*Fraxinus* sp.), pomaceous fruitwood (Maloideae), wild/bird cherry (*Prunus avium*), oak (*Quercus* sp.) and elm (*Ulmus* sp.). The results are dominated by ash (Fig. 2).

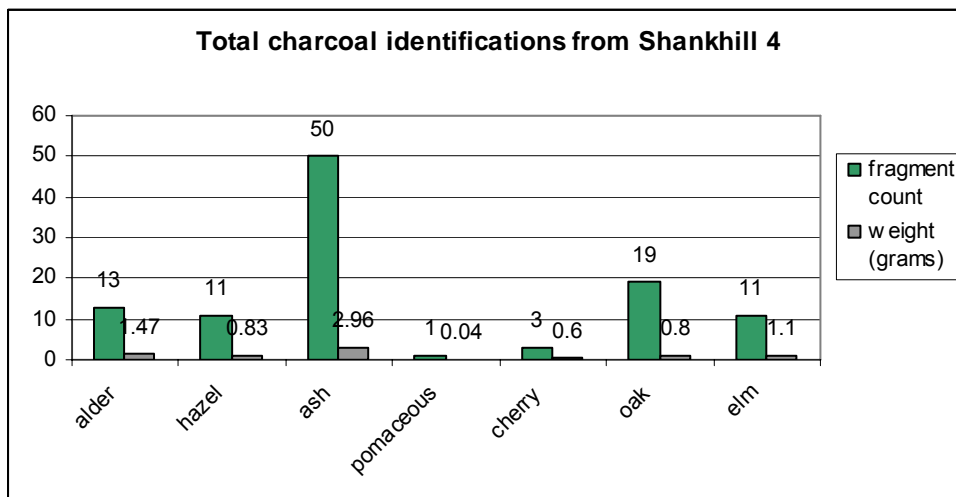


Fig. 2

Charcoal was examined from three pit fills from the site. Pit C7 (Fill C8) was a rubbish pit, and alder, hazel, ash, cherry, oak and elm were identified from here. Pit C17 (Fill C81) was located adjacent to the hut structure on the south side. The

charcoal level from here is low, alder, hazel, ash and pomaceous fruitwood were identified. Pit C77 (Fill 78) was located south of the hut structure. Hazel, ash, oak and elm were identified from this pit. Overall, the charcoal results from the pits represent a mixture of species, probably a result of on site burning and dumping. The charcoal level from the hearth (Cut 272 Fill 274) is very low, only one fragment of alder was identified from it. This suggests that the hearth may have been cleared out after the final burning episode.

4 Discussion

It is presumed that while people may have managed trees during prehistory in Ireland, that they did not plant them, and therefore that the trees would grow in optimum soil conditions. A consideration of the preferred growth conditions of the trees from Shankill 4 should provide a background to the type of soil conditions close to the site.

The charcoal results from Shankill 4 indicate that the people were gathering fuel from a mosaic of different wood types. Overall, the results are dominated by ash, so it is likely that ash stands or woodlands were growing near to the site. Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188). Two more large canopy trees identified from the site are oak and elm. Oak is frequently identified from Irish archaeological sites. It is a strong, robust timber, which burns well at high temperatures. The oak present could be either our native sessile oak (*Quercus petraea*) or our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak. (Beckett 1979, 40-41). Elm trees prefer heavy moist clays and loams but will also grow on chalk soils (Lipscombe and Stokes 2008, 210).

A shrub or scrub element is indicated by the presence of hazel, cherry and pomaceous fruitwood. Hazel is a very tolerant tree; it can grow from wet to dry conditions (but not waterlogged ones) (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11).

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 200, 78). Wild pear (*Pyrus pyraster*) can grow on woodland edges (Lipscombe and Stokes 2008, 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. Spindle trees will grow in a wide range of soils and prefer light to grow.

A wetland element is indicated by the identification of alder. It needs a constant source of water to grow. It can be seen beside rivers, streams and can form carr woodland.

5 Summary

Charcoal was examined from five contexts at Shankill 4. Alder, hazel, ash, pomaceous fruitwood, cherry, oak and elm were identified from the samples. The charcoal results from three pits demonstrated a variety of taxa, indicating the redeposition of fuel material into the pits. The charcoal results suggest that the people gathered wood from different types of woodland environments, such as scrub, canopy woodland and wet woodlands.

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Table 1 Charcoal identification details from Shankill 4

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Insect holes	Tyloses
8	7	11	9.2	rubbish pit	<i>Alnus</i> sp. (alder)	11	1.4	5-10	5-10	medium			
					<i>Corylus avellana</i> (hazel)	3	0.28	5-10	5-8	medium	strongly curved		
					<i>Fraxinus</i> sp. (ash)	14	0.69	5-10	4-7	fast			
					<i>Prunus avium/padus</i> sp. (wild/bird cherry)	3	0.6	5-10	5-6	medium			
					<i>Quercus</i> sp. (oak)	18	0.75	5-10	5-8	medium	weakly curved		
					<i>Ulmus</i> sp. (elm)	1	0.03	5-10	4	medium			
78	77	20	9.9	pit fill	<i>Corylus avellana</i> (hazel)	7	0.54	5-10	4-8	medium			
					<i>Fraxinus</i> sp. (ash)	30	2.15	5-10	2-5	fast			
					<i>Quercus</i> sp. (oak)	1	0.05	6	4				
					<i>Ulmus</i> sp. (elm)	10	1.07	5-10	2-6	fast			
81	17	22	0.5	pit fill	<i>Alnus</i> sp. (alder)	1	0.02	4	4	medium	strongly curved		
					<i>Corylus avellana</i> (hazel)	1	0.01	4	5	medium			
					<i>Fraxinus</i> sp. (ash)	6	0.12	3-5	4-5	medium			
					Maloideae spp. (pomaceous)	1	0.04	4	4	medium			
274	272	105	0.1	hearth	<i>Alnus</i> sp. (alder)	1	0.05	4	7	medium			

**The Plant Remains Report from
Shankill 4 AR130 E3838
By
Penny Johnston**

Introduction

This report details the analysis of plant remains recovered from excavation at Shankill 4. The site at Shankill 4 comprised a post- and stake- built structure, with a central hearth and associated pits. Radiocarbon dates suggested an Early Bronze Age phase of activity.

Methodology

The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out. As a result, only limited interpretation of the plant remains from this site is possible.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6–X45). Suitable plant material was identified and the results of analysis are presented in Tables 1 – 31 at the end of this report. Scientific names are mainly confined to these identification tables in order to facilitate easy reading of the text. Nomenclature and taxonomic orders generally follows Stace (1997).

Results

A single sample from this site was examined, C81 (S22). The only plant remains identified were hazelnut shell fragments (Table 27). These are frequently found in Irish archaeobotanical assemblages and, as a result of different taphonomic factors (as outlined in Monk 2000), they are probably over-represented in terms of their economic and nutritional importance.

Table : Identified plant remains from Shankill 4

Context	81
Sample	22
Hazelnut shell fragments (<i>Corylus avellana</i> L.)	12

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**Osteoarchaeological Report of Burnt Bone from
E3838 A032/: Shankill 4 AR130
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4b: Knocktopher to Powerstown**

**Author: Aoife McCarthy MA BA
Date: April 2010**

1. Introduction

1.1 Introduction

This report details the osteological analysis of burnt bone samples recovered during excavations at Site E3838 Shankill 4 in the townland of Shankill, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in April 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of burnt bone fragments recovered during sieving of bulk soil samples was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 3 fragments from 3 possible skeletal elements, weighing 0.09g were recorded within the assemblage. The degree of preservation of the burnt bone material recovered was poor. The burnt bone assemblage recovered at Shankill 4 originated from C8 the loosely compacted sandy clay fill of pit feature C7. A charcoal sample retrieved from archaeological context C78 was classified to species and issued for AMS dating. A sample of ash charcoal from pit fill C78 returned a two sigma calibrated date of Cal. 2193–2030BC placing the feature within the Bronze Age period.

Two burnt bone fragments (66.7%) of the burnt bone material were classified to species. Due to fragmentation combined with poor preservation and small size it was not possible to identify a single fragment (33.3%) this was classed as an indeterminate vertebrate long bone diaphysis. The burnt remains recovered from Shankill 4 contained bones from a possible 2 species of; mouse and rodent.

2. Methodology

SPECIES IDENTIFICATION: Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material. The closely related taxa of sheep and goat are difficult to distinguish and were grouped under the term '*caprinae*'.

- NISP: Number of Identified Specimens Indicates the total number of fragments found.
- MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.
- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.
- MNE: Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid

getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

AGEING: Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear patterns refers to the alteration of the enamel surface and exposure of inner dentine through use.

BIOMETRICAL DATA: Due to fragmentation and the nature of burnt bone material recovered measurements and biometrical data analysis were not possible.

SEX DETERMINATION: Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due to fragmentation and the nature of burnt bone material recovered from Shankill 4.

BUTCHERY/GNAWING/BURNING: Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

PATHOLOGY: The discovery of any injury and/or pathology was recorded for all specimens, where present.

3. Results

Context 8 Sample 11

A series of three poorly preserved calcined bone fragments (0.09g) representing 3 possible skeletal elements were identified within sandy-clay fill C8 of pit feature C7. The species of mouse and rodent were identified within the burnt bone material. However, small fragment size and poor preservation meant it was not possible to identify the species of a single fragment.

Mus/Mouse

A single calcined mus/mouse rib corpus fragment weighing 0.01g was recovered within burnt bone material. The rib corpus fragment displayed evidence of exposure to a high level of heat resulting in calcination. Calcination of the bone fragment manifested as surface colour change to white combined with surface cracking. A white or pale grey colour indicates exposure of bone to temperatures in excess of c. 600°C combined with a ready oxygen supply (McKinley, 2004).

Rodent

A single poorly preserved calcined fragment of rodent size skull weighing 0.04g was retrieved from pit fill C8. The fragment of skull bone exhibited evidence of exposure to a high level of heat in the form of colour change to white and surface cracking of the bone. Contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. Such distortion to the bone structure reduces its size and as detailed alters bone colour (Luff R. & Pearce J. 1994).

Indeterminate Vertebrate

Due to fragmentation, poor preservation and small fragment size a single unidentifiable long bone fragment of indeterminate vertebrate weighing 0.04g was recovered at Shankill 4. The long bone diaphysis fragment of indeterminate vertebrate recovered displayed evidence of exposure to a high level of heat, resulting in the calcination of the bone. As Devlin J.P. & Herrmann N. P (2008, 109) state *“increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white.”*

4. Summary

Nine burnt bone fragments recovered from archaeological context C8 on Shankill 4 were submitted for examination. The bone samples were assessed and identified to species where possible; two calcined bone fragments were identified to the species of *mus*/mouse and rodent. Due to size and poor preservation it was not possible to identify a single burnt long bone diaphysis fragment to species. No definite or statistically detailed conclusions could be drawn from the calcined bone assemblage retrieved from Shankill 4 due to its limited size and poor degree of preservation.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C8	11	Rodent Size	Skull													W		1	0.04	Poorly preserved calcined skull fragment, surface shows cracking
2	C8	11	Mus	Rib													W		1	0.01	Tiny calcined fragment of rodent size rib.
3	C8	11	Unid	Long Bone													W		1	0.04	Small poorly preserved calcined fragment of diaphysis.

Key:

C= Context
 S=Sample
 Anat=Anatomical Element
 Prox=Proximal
 Dist=Distal

But=Butchery
 Bu=Burnt
 G=Gnaw
 Q=Quantity of Pieces
 G=Grey

N=No
 Unid=Unidentifiable
 Taxa=Taxon
 B=Black

W=White
 R=Rodent
 Cn=Carnivore

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GLOSSARY OF TERMS:

BOS: Latin term for Cow

SUS: Latin term for Pig

CERVUS: Latin term for Deer

EQUUS: Latin term for Horse

OVIS: Latin term for Sheep

CAPRINAE: Latin term for Sheep/Goat

CANIS: Latin term for Dog

LEPUS: Latin term for Hare

AVES: Latin term for Bird

TAPHONOMY: The study of the processes affecting an organism after death from the time of burial until collection.

TRABECULAR BONE: Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.

DIAPHYSIS: Bone shaft

CORPUS COSTAE: Body of Rib Bone

**PETROGRAPHICAL REPORT ON STONE SAMPLES TAKEN DURING
ARCHAEOLOGICAL EXCAVATIONS AT
SHANKILL 4 (E3838)
EURGEOL DR STEPHEN MANDAL MI**

1. Introduction

This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4b Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

2. Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)

The bedrock under the site consists of crinoidal wackestone/ packstone limestone belonging to the Ballyadams Formation (shown on Figure 1 as BM).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)

Coolbaun Formation (CQ) – Shale and mudstone with thin coals

Moyadd Coal Formation (MC) – Shale, siltstone and minor sandstone

Bregaun Flagstone Formation (BE) – Thick flaggy sandstone and siltstone

Killeshin Siltstone Formation (KN) – Muddy siltstone and silty mudstone

Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)

Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone

Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone

Milford Formation (MI) – Peloidal calcarenite limestone

Butlersgrove Formation (BU) – Very dark grey argillaceous limestones

Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone

Ballymartin Formation (BT) – Limestone and dark grey calcareous shales

Quinagh Formation (QU) – Lenticular mudstone and coarse siltstone

Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian

Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones

Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician

Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone

Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions

The Tullow Pluton (Tw) – Fine to coarse granites dating to c. 405Ma

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, c. 360

million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iapetus Ocean, a major ocean which at its widest was probably greater than 3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton c. 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

3. Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Shankill 4	A032/153	AR130	E3838	1	26	Not altered;	Angular to sub-rounded;	Sandstone, coarse grained, quartz rich, red/yellow
Shankill 4	A032/153	AR130	E3838	4	29	Not altered;	Angular to sub-rounded;	Sandstone, coarse grained, quartz rich, red/yellow
Shankill 4	A032/153	AR130	E3838	5	66	Not altered;	Angular to sub-rounded;	Sandstone, coarse grained, quartz rich, red/yellow
Shankill 4	A032/153	AR130	E3838	18	62	Not altered;	Angular to sub-rounded;	Sandstone, coarse grained, quartz rich, red/yellow
Shankill 4	A032/153	AR130	E3838	20	78	Burnt;	Angular;	Sandstone, very coarse grained, quartz rich, red

4. Potential Sources

Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

5. Discussion

Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 159 samples were examined from the scheme across 33 sites (see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; very coarse to medium grained sandstone, typically

red to yellow in colour. All samples contained a variation of this type of rock as their principal component. Just under half (73) of the samples are clearly burnt / altered, but this does not rule out the possibility that the stone from other samples had been burnt. All bar one (a sample from Kellymount 5 (E3858:43:156)) contained angular pieces of stone, and 122 (77%) also contained sub-rounded to rounded pieces. A total of 63 of the samples contained pebbles and / or cobbles, in most cases broken. Five of the samples contained minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Pebbles	Limestone
Kilree 1	A032/107	AR091	E3728	1	0	1	0	0	0
Dunbell Big 2	A032/130	AR095	E3853	1	1	1	1	0	0
Holdenstown 4	A032/101	AR100	E3682	7	7	7	7	0	0
Rathcash 1	A032/133	AR102	E3859	3	0	3	3	3	0
Rathcash 2	A032/134	AR103	E3860	12	12	12	12	12	0
Rathcash East 2	A032/136	AR105	E3893	3	0	3	3	0	0
Blanchvillespark 3	A032/140	AR109	E3913	3	0	3	3	3	0
Blanchvillespark 4	A032/141	AR110	E3914	3	3	3	0	0	0
Ballyquirk 1	A032/143	AR112	E3863	1	1	1	1	0	0
Ballyquirk 2	A032/144	AR113	E3864	5	5	5	1	0	0
Ballinvally 1	A032/146	AR115	E3836	1	0	1	1	0	0
Garryduff 1	A032/147	AR116	E3852	4	0	4	0	0	0
Jordanstown 2	A032/151	AR120	E3851	4	4	4	0	0	0
Kellymount 6	A032/122	AR121	E3758	3	3	3	3	0	0
Jordanstown 3	A032/152	AR122	E3916	2	2	2	2	2	0
Kellymount 2	A032/111	AR124	E3757	11	4	11	11	9	1
Kellymount 3	A032/112	AR125	E3856	13	2	13	2	0	1
Kellymount 5	A032/114	AR127	E3858	27	10	26	24	21	3
Shankill 4	A032/153	AR130	E3838	5	1	5	4	0	0
Shankill 5	A032/154	AR131	E3850	2	1	2	1	0	0
Moanmore 1	A032/156	AR133	E3835	6	1	6	1	0	0
Moanmore 2	A032/157	AR134	E3843	2	0	2	2	0	0
Bannagagole 1	A032/159	AR136	E3844	3	2	3	3	3	0
Moanduff 1	A032/160	AR137	E3839	7	1	7	7	3	0
Coolnakisha 1	A032/128	AR139	E3768	1	0	1	1	1	0
Cranavonane 1	A032/164	AR141	E3842	2	2	2	2	2	0
Tomard Lower 1	A032/117	AR144	E3733	1	0	1	1	1	0
Paulstown 1	A032/093	AR145	E3642	3	1	3	3	2	0
Rathgarvan or Clifden 1	A032/125	AR147	E3760	1	0	1	1	0	0
Maddockstown 1	A032/126	AR148	E3759	3	3	3	3	0	0
Leggetsra East 1	A032/118	AR154	E3734	1	1	1	1	0	0
Moanduff 3	A032/120	AR156	E3736	1	0	1	1	1	0
Ballyquirk 4	A032/167	AR157	E3848	17	6	17	17	0	0
Grand Total :				159	73	158	122	63	5

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4b Road Scheme

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles are clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

6. References

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Appendix 2.7 Radiocarbon Dating Results – SUERC & QUB Laboratory

The “Measured radiocarbon age” is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The “Calibrated date range” is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence

Calibration dataset: OxCal3 (SUERC 30111)

Calibration dataset: intcal04.14c (UBA 12238)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C81, fill of pit	22	Charred hazelnut	<i>Corylus avellana</i> / 0.1g	SUERC	SUERC 30111	AMS (Std)	2030–1920BC (1 sigma), 2140–1880BC (2 sigma)	3615±40	- 24.1
C78, fill of pit	20	Charcoal	<i>Fraxinus excelsior</i> / 0.11g	QUB	UBA 12238	AMS (Std)	2136–2040BC (1 sigma), 2193–2030BC (2 sigma)	3703±21	- 27.7

References for calibration datasets:

PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111–1150.

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.

APPENDIX 3 LIST OF RMPS IN AREA

RMP No	Description
CW015-006	Ringfort
CW015-014	<i>Fulacht fiadh</i>
KK016-002	Hearth
KK016-003	<i>Fulacht fiadh</i>
KK016-004	Ringfort
KK016-005	Ringfort

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 1	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3456	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3458	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Stonecarthy West 2	UA2	E3974	Tim Coughlan	251372/142037
Rathduff Bayley 1	UA4	E4011	Tim Coughlan	251005/143564